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Summary of Changes

This section describes the technical changes made in this edition.
This edition might also include minor corrections and editorial changes which are not identified.

January 22, 2020 - Version 554

Additions in this update
► New product(s)
  None
► Others
  None

Withdrawals in this update
► Withdrawn product(s)
  None
### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Burst Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>m3-7Y30</td>
<td>2</td>
<td></td>
<td>1.0 GHz</td>
<td>2.6 GHz</td>
<td>4MB</td>
<td>LPDDR3-1866</td>
<td>Intel HD Graphics 615</td>
</tr>
<tr>
<td>i5-7267U</td>
<td>4</td>
<td></td>
<td>1.2 GHz</td>
<td>3.2 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
<tr>
<td>Celeron N4100</td>
<td>4</td>
<td></td>
<td>1.1 GHz</td>
<td>2.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
<tr>
<td>Celeron N4120</td>
<td>4</td>
<td></td>
<td>1.1 GHz</td>
<td>2.6 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
<tr>
<td>Pentium Silver N5000</td>
<td>4</td>
<td></td>
<td>1.1 GHz</td>
<td>2.7 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 615, Intel UHD Graphics 600 or 605 in processor, supports external digital monitor via HDMI or USB Type-C; supports dual independent display.
- Maximum resolution: 3840x2160 @ 30Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform

### Memory

- 4GB or 8GB / 1866MHz LPDDR3 or 2400MHz DDR4 / soldered to systemboard, no sockets

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.6&quot;</td>
<td>HD (1366x768)</td>
<td>TN</td>
<td>250 nits</td>
<td>16:9</td>
<td>400:1 or 500:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>11.6&quot;</td>
<td>HD (1366x768)</td>
<td>IPS</td>
<td>250 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>45%</td>
<td>170°</td>
</tr>
</tbody>
</table>

### Multi-touch (opt)

- Capacitive-type multi-touch; supports 10-finger gesture (HD IPS only)

### Storage

- eMMC flash memory on board or M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s

### Optical

- None

### Ethernet

- Realtek RTL8111GUS Gigabit Network Connection

### WLAN + Bluetooth™

- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card (US only)

### WWAN

- None

---

**Note:** The specifications above may not be available in all regions.
### ThinkPad Yoga 11e (5th Gen) Platform Specifications

#### Processor
- **7th Generation Intel® Core™ m / i5 Processor, Intel Celeron® processor, or Intel Pentium® Silver processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Burst Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>m3-7Y30</td>
<td>2</td>
<td></td>
<td>1.0 GHz</td>
<td>2.6 GHz</td>
<td>4MB</td>
<td>LPDDR3-1866</td>
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<td>i5-7Y54</td>
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<td>4</td>
<td>1.2 GHz</td>
<td>3.2 GHz</td>
<td>4MB</td>
<td></td>
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</tr>
<tr>
<td>Celeron N4100</td>
<td>4</td>
<td></td>
<td>1.1 GHz</td>
<td>2.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
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<tr>
<td>Celeron N4120</td>
<td>4</td>
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<td>1.1 GHz</td>
<td>2.7 GHz</td>
<td>4MB</td>
<td></td>
<td>Intel UHD Graphics 600</td>
</tr>
<tr>
<td>Pentium Silver N5000</td>
<td>4</td>
<td></td>
<td>1.1 GHz</td>
<td>2.7 GHz</td>
<td>4MB</td>
<td></td>
<td>Intel UHD Graphics 600</td>
</tr>
</tbody>
</table>

#### Graphics
- Intel HD Graphics 615, Intel UHD Graphics 600 or 605 in processor, supports external digital monitor via HDMI or USB Type-C;
- supports dual independent display;
- Max resolution: 3840x2160@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

#### Chipset
- Intel SoC (System on Chip) platform

#### Memory
- 4GB or 8GB / 1866MHz LPDDR3 or 2400MHz DDR4 / soldered to systemboard, no sockets

#### Display
- 11.6” (295mm) HD (1366x768), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle, Corning® Gorilla® Glass
- Capacitive-type multi-touch, supports 10 fingers

#### MultiTouch
- Yoga hinge, 360 degree

#### Convertible mode
- Laptop, tent, stand and tablet

#### Pen
- Optional: ThinkPad Pen Pro, batteries required, on-board garage

#### Storage
- eMMC flash memory on board or M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s

#### Optical
- None

#### Ethernet
- Realtek RTL8111GUS-CG Gigabit Network Connection

#### WLAN
- One of the following, configurable by model:
  - Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
  - Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card

#### Bluetooth™
- Bluetooth wireless, integrated in Wi-Fi + Bluetooth combo adapter

#### WWAN
- None

#### Dimemsions
- WxDxH: 11.81” x 8.27” x 0.89”;
- 300mm x 210mm x 22.5mm

#### Weight
- From 3.4 lb / 1.54kg

#### Case color
- Black

#### Case material
- Display cover: PC/ABS+GF;
- Bottom: PC/ABS plastic

#### Media reader
- MicroSD card reader

#### Ports
- One of the following, configurable by model:
  - Two USB 3.1 Gen 1,
  - one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort),
  - HDMI1.4, Ethernet (RJ-45), headphone / microphone combo jack,
  - microSD card reader, security keyhole

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

#### Control buttons
- Power button, volume control button

#### Camera
- One of the following, configurable by model:
  - HD720p resolution, low light sensitive, fixed focus

#### Audio support
- World facing: Rear camera, 5MP resolution, auto focus
- HD Audio, Realtek® ALC3287 codec Dolby Audio™ / stereo speakers, 2W x 2 / monaural microphone, headphone / microphone combo jack

#### Keyboard
- 6-row, multimedia Fn keys
- Two buttons click pad below keyboard, multi-touch

#### UltraNav™
- None

#### Security chip
- Power-on password, hard disk password, supervisor password, security keyhole

#### System Mgt (opt)
- None

#### Fingerprint reader
- None

#### Battery
- Integrated Li-Ion 42Wh battery
- MobileMark® 2014: 12 hrs
- * Battery life varies significantly with settings, usage, & other factors

#### Max battery life
- Limited warranty

#### AC adapter
- 45W or 65W slim tip AC adapter or USB Type-C AC adapter

#### Preload
- One of the following, configurable by model:
  - Windows® 10 Home 64
  - Windows 10 Pro 64
  - Windows 10 Pro in S mode

#### Limited warranty
- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year depot repair service

#### Mil-Spec test
- MIL-STD-810G military testing

#### Environment
- EPEAT™ Gold; ENERGY STAR™ 6.1; RoHS-compliant

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Lenovo
December 2019
<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
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<th>Graphics</th>
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<tr>
<td>i3-10110U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
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<td>DDR4-2666</td>
<td>Intel UHD Graphics</td>
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<tr>
<td>i5-10210U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>6MB</td>
<td>DDR4</td>
<td>AMD Radeon 625 (2GB GDDR5)</td>
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<tr>
<td>7-10510U</td>
<td>6</td>
<td>12</td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>DDR4</td>
<td>AMD Radeon RX 640 Graphics (2GB GDDR5)</td>
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<table>
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<th>Integrated Graphics</th>
<th>Discrete Graphics (Memory)</th>
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<tbody>
<tr>
<td>Intel UHD Graphics</td>
<td>AMD Radeon RX 640 Graphics (2GB GDDR5)</td>
<td></td>
</tr>
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</table>

- supports external digital monitor via HDMI or USB Type-C;
- supports three independent displays;
- Max resolution: 3840x2160@60Hz (USB Type-C); 3840x2160@30Hz (HDMI)

<table>
<thead>
<tr>
<th>Chipset Memory</th>
<th>Intel SoC (System on Chip) platform</th>
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<tr>
<td>DDR4-2666</td>
<td>DDR4 SO-DIMM socket</td>
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<thead>
<tr>
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<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
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<tr>
<td>14.0&quot; FHD (1920x1080)</td>
<td>TN Anti-glare</td>
<td>220 nits</td>
<td>16.9</td>
<td>400:1</td>
<td>90°</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14.0&quot; FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits</td>
<td>16.9</td>
<td>700:1</td>
<td>170°</td>
<td></td>
<td></td>
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</table>

| Multi-touch | None |

<table>
<thead>
<tr>
<th>Storage</th>
<th>Up to two drives (one M.2 SSD and one HDD)</th>
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</thead>
<tbody>
<tr>
<td>HDD / SATA 6.0Gb/s</td>
<td>2.5&quot; wide, 7mm high, Active Protection Systemtm</td>
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<tr>
<td>M.2 2280 SSD / SATA 6.0Gb/s</td>
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<tr>
<td>M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2 or PCIe 3.0 x 4</td>
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<tr>
<td>Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 or 4</td>
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<tr>
<td>None</td>
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</tr>
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</table>

| Optical Ethernet | Gigabit Ethernet Connection, Realtek R8111GUS |

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<tr>
<th>WLAN + Bluetooth™</th>
<th>One of the following, configurable by model:</th>
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</thead>
<tbody>
<tr>
<td>Realtek® RTL8822CE, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card</td>
<td></td>
</tr>
<tr>
<td>Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card</td>
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</tr>
<tr>
<td>Intel Wi-Fi 6 AX201, Wi-Fi 2x2 802.11ax + Bluetooth 5.0, M.2 card</td>
<td></td>
</tr>
</tbody>
</table>

| WWAN SIM card | None |

| WWAN | None |

<table>
<thead>
<tr>
<th>Case Material</th>
<th>Dimensions (WxDxH)</th>
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</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>12.80&quot; x 9.13&quot; x 0.70&quot;</td>
</tr>
<tr>
<td>PC/ABS</td>
<td>12.80&quot; x 9.13&quot; x 0.81&quot;</td>
</tr>
<tr>
<td>Aluminum Display cover + PC/ABS Bottom</td>
<td>12.80&quot; x 9.13&quot; x 0.74&quot;</td>
</tr>
</tbody>
</table>

| Case color | Black or silver |
| Case material | Display cover: Aluminum or PC/ABS plastic; Bottom: Aluminum or PC/ABS plastic |

| Smart card reader | None |
| Media reader | None |
| Ports | One USB 2.0, two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), headphone / microphone combo jack, security keyhole |
| Monitor cable | None |
| Bundled Acyc | None |

| Camera | HD720p camera with optional ThinkShutter camera privacy, fixed focus |
| Audio support | HD Audio, Synaptic® CX11880 codec / stereo speakers, 2W x 2, Dolby® Advanced Audio / dual array microphone, headset / microphone combo jack |
| Keyboard | 6-row, spill-resistant, multimedia Fn keys, optional LED backlight |
| UltraNav™ | TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad |
| Security | Power-on-password, hard disk password, supervisor password, security keyhole |
| Security chip | Integrated model: discrete TPM 2.0, TCG Certified |
| System Mgt | Discrete model: firmware TPM 2.0 integrated in chipset |

| Battery | Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter |
| Max battery life | MobileMark® 2014: 12.8 hr |
| AC adapter | 45W or 65W USB Type-C adapter |
| Operating system (optional) | One of the following, configurable by model: |
| Windows® 10 Home 64 | Windows 10 Pro 64 |
| Windows 10 Pro in S mode | Windows 10 Pro in S mode |
| No OS | No OS |
| Limited warranty (optional) | 1-year mail-in repair service |
| 1-year depot repair service | 1-year depot with 2-year system board repair service |
| 1-year limited onsite service | 1-year limited onsite service |
| Mil-Spec test | MIL-STD-810G military testing (by the end of Dec. 2019) |
| Environment | EPEAT™ Silver: ENERGY STAR® 7.1; RoHS-compliant |
### ThinkPad E15 Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-10110U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
<td>4.1 GHz</td>
<td>4MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>i5-10210U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>i7-1065G7</td>
<td>6</td>
<td>12</td>
<td>1.8 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Graphics**

- Integrated Graphics
- Discrete Graphics (Memory)

**Chipset Memory**

- Intel SoC (System on Chip) platform
- 16GB max / 2666MHz DDR4, one DDR4 SO-DIMM socket

**Display**

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot; FHD</td>
<td>(1920x1080)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16.9</td>
<td>170°</td>
</tr>
<tr>
<td>15.6&quot; FHD</td>
<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16.9</td>
<td>170°</td>
</tr>
</tbody>
</table>

**Multi-touch**

- Supports multi-touch on the display panel and full touchpad support
- Pointing device: Touchpad with TrackPoint®
- Keyboard: 6-row backlit keyboard

**Storage**

- Up to two drives: One M.2 SSD and one HDD
- HDD: SATA 6.0 Gb/s, 7mm high, Active Protection System
- M.2 SSD: 2280 format, 80 Gb/s
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- Intel Optane™ Memory H10 with Solid State Storage

**Optical**

- None

**Ethernet**

- Gigabit Ethernet Connection, Realtek 8111GUS

**WLAN + Bluetooth**

- Realtek® RTL8822CE, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
- Intel Wi-Fi 6 AX201, Wi-Fi 2x2 802.11ax + Bluetooth 5.0, M.2 card

**WWAN**

- SIM card: None

**Environment**

- Limited warranty: 1-year mail-in repair service, 1-year depot repair service
- MIL-Spec test: MIL-STD-810G military testing (by the end of Jan. 2020)

**Note:** The specifications above may not be available in all regions.
ThinkPad E480 Platform Specifications

### Processor

7th Generation Intel® Core™ i3 / i5 Processor (i3-7130U is NOT available in US and EMEA) or Processor 8th Generation Intel Core i3 / i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7020U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7200U</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz / 3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and AMD Radeon RX 550 Graphics, 2GB GDDR5 memory; supports external digital monitor via HDMI or USB Type-C; supports dual independent display; Max resolution: 1920x1080 (HDMI)@60Hz

### Chipset

Intel SoC (System on Chip) platform

### Memory

32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

* System clocks down for processors with lower memory controller

### Display

- Some: 14.0" (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio
- Some: 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 400:1 contrast ratio

### Multi-touch

None

### Storage

Up to 2 drives (one M.2 SSD and one HDD)

### Optane™ memory

Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

### Ethernet

Gigabit Ethernet Connection, Realtek R8111GUS

### WLAN + Bluetooth™

- Intel Dual Band Wireless-AC 3165, 1x1, Wi-Fi + Bluetooth 4.1, M.2 Card
- * Intel 3165ac card supports BT4.2 but is limited to BT4.1 by Windows OS

### WWAN

SIM card None

### Smart card reader

None

### Media reader

MicroSD card reader

### Ports

- One USB 2.0, two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 2 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), headphone / microphone combo jack, microSD card reader, security keyhole
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Camera

HD720p camera, fixed focus

### Audio support

HD Audio, Synaptics® CX11852 codec / stereo speakers, 1.5W x 2, Dolby® Advanced Audio / dual array microphone, headphone / microphone combo jack

### Keyboard

- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

### Security

Power-on password, hard disk password, supervisor password, security keyhole

### Battery

Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

### Operating system

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty

One of the following, configurable by model:
- 1-year mail-in repair service
- 1-year depot repair service

### Environment

EPET™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

Note: The specifications above may not be available in all regions.
## ThinkPad E490 Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-8145U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8365U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

* i5-8365U is for special bid only

**Graphics**

Intel UHD Graphics 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon RX 550X Graphics, 2GB GDDR5 memory; supports external digital monitor via HDMI or USB Type-C; supports dual independent display; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)

**Chipset**

Intel SoC (System on Chip) platform

**Memory**

32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

* Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation

**Display**

<table>
<thead>
<tr>
<th>Size / Resolution</th>
<th>Surface Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
<th>Multi-touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0” HD (1366x768)</td>
<td>Anti-glare TN</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>90°</td>
<td>Non-touch</td>
</tr>
<tr>
<td>14.0” FHD (1920x1080)</td>
<td>Anti-glare TN</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>90°</td>
<td>Non-touch</td>
</tr>
<tr>
<td>14.0” FHD (1920x1080)</td>
<td>Anti-glare IPS</td>
<td>250 nits</td>
<td>16:9</td>
<td>600:1</td>
<td>170°</td>
<td>Non-touch</td>
</tr>
</tbody>
</table>

**Multi-touch**

None

**Storage**

Up to two drives (one M.2 SSD and one HDD)

- HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4

* Installed M.2 2280 SSD is PCIe 3x4 but run at PCIe 3x2 due to M.2 SSD adapter limitation

**Optane™ memory**

Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

**Optical**

None

**Ethernet**

Gigabit Ethernet Connection, Realtek R8111GUS

**WLAN + Bluetooth™**

One of the following, configurable by model:

- Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card

**WWAN**

None

**SIM card**

None

**Dimensions**

### Aluminum (WxDxH):
- 12.96” x 9.53” x 0.78”:
  - 329mm x 242mm x 19.9mm
- PC/ABS (WxDxH):
  - 12.96” x 9.53” x 0.83”:
  - 329mm x 242mm x 21.9mm

**Weight**

Starting at 3.87 lb / 1.75 kg

**Case color**

Black or silver

**Case material**

- Display cover: Aluminum or PC/ABS plastic;
- Bottom: PC/ABS plastic

**Smart card reader**

None

**Media reader**

MicroSD card reader

**Ports**

One USB 2.0, two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 2 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), headphone / microphone combo jack, microSD card reader, security keyhole

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

**Monitor cable**

None

**Camera**

HD720p camera, fixed focus

**Audio support**

HD Audio, Synaptic® CX11880 codec / stereo speakers, 1.5W x 2, Dolby® / Advanced Audio / dual array microphone, headphone / microphone combo jack

**Keyboard**

UltraNav™:
- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

**Security**

Power-on password, hard disk password, supervisor password, security keyhole

**Security chip**

Integrated model:
- discrete TPM 2.0, TCG Certified

Discrete model:
- firmware TPM 2.0 integrated in chipset

**System Mgt**

Fingerprint reader:
- Optional: Touch style fingerprint reader on the palm rest

NFC:
- None

**Battery**

Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

**Max battery life**

- MobileMark® 2014: 13 hr

* Battery life varies significantly with settings, usage, & other factors

**AC adapter**

45W or 65W USB Type-C AC adapter

**Operating system**

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

**Limited warranty**

One of the following, configurable by model:

- 1-year mail-in repair service
- 1-year depot repair service
- 1-year limited onsite service

**Environment**

EPEAT® Silver; ENERGY STAR® 7.1; RoHS-compliant

**Lenovo December 2019**

Note: The specifications above may not be available in all regions.
<table>
<thead>
<tr>
<th>Processor 8th Generation Intel® Core™ i5 / i7 Processor</th>
<th>Dimensions</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor Number</strong></td>
<td><strong># of Cores</strong></td>
<td><strong># of Threads</strong></td>
</tr>
<tr>
<td>I5-8265U</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>I7-8565U</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Chipset</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel UHD Graphics 620 in processor only or Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent display; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)</td>
<td>Intel SoC (System on Chip) platform</td>
<td>32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets</td>
</tr>
</tbody>
</table>

* Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation |

<table>
<thead>
<tr>
<th>Display</th>
<th>Multi-touch</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot; FHD (1920x1080) Anti-glare TN</td>
<td>16:9</td>
<td>220 nits</td>
</tr>
<tr>
<td>14.0&quot; FHD (1920x1080) Anti-glare IPS</td>
<td>16:9</td>
<td>250 nits</td>
</tr>
</tbody>
</table>

* Multi-touch |

<table>
<thead>
<tr>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security chip Power-on password, hard disk password, supervisor password, security keyhole</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Li-ion 42Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Optional: Windows® 10 Home 64 or Windows 10 Pro 64</th>
</tr>
</thead>
</table>

| WWAN Sim card | None |

<table>
<thead>
<tr>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited warranty 1-year depot repair service</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lenovo September 2019</th>
</tr>
</thead>
</table>

Note: The specifications above may not be available in all regions.
### ThinkPad E495 Platform Specifications

**Processor AMD Ryzen™ Mobile Processors with Radeon™ Vega Graphics**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 3200U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>1MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 3 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 3500U</td>
<td>4</td>
<td>8</td>
<td>2.1 GHz</td>
<td>3.7 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 3700U</td>
<td>4</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon RX Vega 10 Graphics</td>
</tr>
</tbody>
</table>

**Graphics**

AMD Radeon Vega 3, Vega 8, or RX Vega 10 Graphics in processor; supports external digital monitor via HDMI or USB Type-C; supports dual independent display; Max resolution: 3840x2160@60Hz (USB Type-C); 3840x2160@30Hz (HDMI)

**Chipset**

AMD SoC (System on Chip) platform

**Memory**

32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

*Installed memory is actually 2666MHz but run at 2400MHz due to AMD limitation*

**Display**

<table>
<thead>
<tr>
<th>Size / Resolution</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Viewing Angle</th>
<th>Multi-touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0” HD (1366x768) Anti-glare TN</td>
<td>220 nits 16:9 400:1 90°</td>
<td>Non-touch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.0” FHD (1920x1080) Anti-glare IPS</td>
<td>250 nits 16:9 600:1 170°</td>
<td>Non-touch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Storage**

Up to two drives (one M.2 SSD and one HDD)

- HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2 or PCIe 3.0 x 4
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4

**Optical**

None

**Ethernet**

Gigabit Ethernet Connection, Realtek R8111GUS

**WLAN + Bluetooth™**

One of the following, configurable by model:

- Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card

**WWAN**

SIM card None

**Battery**

Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

**Max battery life**

*Battery life varies significantly with settings, usage, & other factors*

**AC adapter**

45W or 65W USB Type-C AC adapter

**Operating system**

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

**Limited warranty**

- 1-year mail-in repair service
- 1-year depot repair service

**Mil-Spec test**

MIL-STD-810G military testing

**Environment**

EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

**Dimensions**

Aluminum (WxDxH): 12.96” x 9.53” x 0.78”; 329mm x 242mm x 19.9mm

PC/ABS (WxDxH): 12.96” x 9.53” x 0.83”; 329mm x 242mm x 21.9mm

Starting at 3.87 lb / 1.75 kg

**Weight**

**Case color**

Black

**Case material**

Display cover: Aluminum or PC/ABS plastic;

Bottom: PC/ABS plastic

**Smart card reader**

None

**Media reader**

MicroSD card reader

**Ports**

One USB 2.0, two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), headphone / microphone combo jack, microSD card reader, security keyhole

*Depending on many factors, actual data transfer speed may be lower than theoretical speed

**Monitor cable**

None

**Bundled Accy**

None

**Camera**

HD720p camera, fixed focus

**Audio support**

HD Audio, Synaptic® CX11880 codec / stereo speakers, 1.5W x 2, Dolby® Advanced Audio / dual array microphone, headphone / microphone combo jack

**Keyboard**

UltraNav™ 6-row, spill-resistant, multimedia Fn keys

**Security chip**

Power-on password, hard disk password, supervisor password, security keyhole

**Fingerprint reader**

None

**NFC**

None

**Battery**

Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

**Max battery life**

*Battery life varies significantly with settings, usage, & other factors

**AC adapter**

45W or 65W USB Type-C AC adapter

**Operating system**

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

**Limited warranty**

- 1-year mail-in repair service
- 1-year depot repair service

**Mil-Spec test**

MIL-STD-810G military testing

**Environment**

EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

**Note:** The specifications above may not be available in all regions.

Lenovo

December 2019
## ThinkPad E580 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7020U</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7130U</td>
<td></td>
<td></td>
<td></td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5-7200U</td>
<td></td>
<td></td>
<td></td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only or AMD Radeon RX 550 Graphics, 2GB GDDR5 memory;
- supports external digital monitor via HDMI or USB Type-C;
- supports dual independent display;
- Max resolution: 2560x1440 (HDMI)@60Hz

### Chipset

- Intel SoC (System on Chip) platform

### Memory

- 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- * System clocks down for processors with lower memory controller

### Display

- Some: 15.6" (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 600:1 contrast ratio

### Multi-touch

- None

### Storage

- Up to 2 drives (one M.2 SSD and one HDD)
- Some: HDD / SATA 6.0Gb/s, 2.5" wide, removable, upgradeable, Active Protection System
- Some: M.2 SSD / PCIe NVMe

### Optane™ memory

- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

### Optical

- None

### Ethernet

- Gigabit Ethernet Connection, Realtek R8111GUS

### WLAN + Bluetooth™

- One of the following, configurable by model:
  1. Realtek® RTL8821CE, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
  2. Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
  3. Intel Dual Band Wireless-AC 3165, 1x1, Wi-Fi + Bluetooth 4.1, M.2 Card
- * Intel 3165ac card supports BT4.2 but is limited to BT4.1 by Windows OS

### WWAN

- None

### SIM card

- None

### Dimensions

- WxDxH: 14.53" x 9.92" x 0.78"; 369mm x 252mm x 19.95mm
- Starting at 4.7 lb / 2.1kg

### Case material

- Display cover: Aluminum;
- Bottom: PC/ABS plastic

### Camera

- HD720p camera, fixed focus

### Audio support

- HD Audio, Synaptic® CX11852 codec / stereo speakers, 2W x 2, Dolby® Advanced Audio / dual array microphone, headphone / microphone combo jack

### Keyboard

- 6-row, spill-resistant, multimedia Fn Keys, numeric keypad, optional LED backlight

### Security

- Security chip (opt): vPro
- Security: Power-on password, hard disk password, supervisor password, security keyhole
- Firmware TPM 2.0 integrated in chipset or discrete TPM 2.0 TCG Certified

### TrackPoint® pointing device

- 6.1; RoHS-compliant

### Battery

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

### AC adapter

- 45W or 65W USB Type-C AC adapter

### Operating system

- Optional: Windows 10 Home 64 or Windows 10 Pro 64

### Limited warranty

- One of the following, configurable by model:
  1. 1-year mail-in repair service
  2. 1-year depot repair service

### Environmental test

- MIL-STD-810G military testing

### Note:
The specifications above may not be available in all regions.

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**Lenovo**

August 2019
ThinkPad E590 Platform Specifications

Product Specifications Reference (PSREF)

Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-8145U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

Graphics

- Intel UHD Graphics 620 in processor only
- Intel UHD Graphics 620 in processor and AMD Radeon RX 550X Graphics, 2GB GDDR5 memory; supports external digital monitor via HDMI or USB Type-C; supports dual independent display.
- Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)

Chipset

- Intel SoC (System on Chip) platform

Memory

- 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- * Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation

Optane™ memory

- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

Storage

- Up to two drives (one M.2 SSD and one HDD):
  - M.2 2280 SSD / SATA 6.0Gb/s
  - M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
  - M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
  - * Installed M.2 2280 SSD is PCIe 3x4 but run at PCIe 3x2 due to M.2 SSD adapter limitation

Optical

- None

Ethernet

- Gigabit Ethernet Connection, Realtek R8111GUS

WLAN + Bluetooth™

- One of the following, configurable by model:
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
  - Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card

WWAN

- None

SIM card

- None

Display

<table>
<thead>
<tr>
<th>Size / Resolution</th>
<th>Surface Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
<th>Multi-touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6” HD (1366x768)</td>
<td>Anti-glare, TN</td>
<td>220 nits</td>
<td>16:9</td>
<td>600:1</td>
<td>170°</td>
<td>Non-touch</td>
</tr>
<tr>
<td>15.6” FHD (1920x1080)</td>
<td>Anti-glare, IPS</td>
<td>250 nits</td>
<td>16:9</td>
<td>600:1</td>
<td>170°</td>
<td>Non-touch</td>
</tr>
</tbody>
</table>

Multi-touch

- None

Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip: Integrated model: discrete TPM 2.0, TCG Certified
- Discrete model: firmware TPM 2.0 integrated in chipset

System Mgt

- None

Fingerprint reader

- Optional: Touch style fingerprint reader on the palm rest

Battery

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter
- Max battery life: MobileMark® 2014: 11 hr
- AC adapter: 45W or 65W USB Type-C AC adapter

AC adapter

- * Battery life varies significantly with settings, usage, & other factors

Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

Limited warranty

- 1-year mail-in repair service
- 1-year depot repair service

Mil-Spec test

- MIL-STD-810G military testing

Environment

- EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.

Lenovo
August 2019
## ThinkPad E595 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 3200U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>1MB L2 + 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 3 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 3500U</td>
<td>4</td>
<td>8</td>
<td>2.1 GHz</td>
<td>3.7 GHz</td>
<td>2MB L2 + 4MB L3</td>
<td></td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 3700U</td>
<td>4</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB L2 + 4MB L3</td>
<td></td>
<td>Radeon RX Vega 10 Graphics</td>
</tr>
</tbody>
</table>

### Graphics

- AMD Radeon Vega 3, Vega 8, or RX Vega 10 Graphics in processor;
- Supports external digital monitor via HDMI or USB Type-C;
- Supports dual independent display;
- Max resolution: 3840x2160@60Hz (USB Type-C); 3840x2160@30Hz (HDMI)

### Chipset

- AMD SoC (System on Chip) platform
- 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

### Memory

* Installed memory is actually 2866MHz but run at 2400MHz due to AMD limitation

### Display

<table>
<thead>
<tr>
<th>Size / Resolution</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Viewing Angle</th>
<th>Multi-touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot; HD (1366x768)</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
</tr>
<tr>
<td>15.6&quot; FHD (1920x1080)</td>
<td>Anti-glare</td>
<td>IPS</td>
<td>250 nits</td>
<td>16:9</td>
</tr>
</tbody>
</table>

### Storage

- Up to two drives (one M.2 SSD and one HDD)

#### Optical

- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4

### Ethernet

- Gigabit Ethernet Connection, Realtek RTL8188EG

### WLAN + Bluetooth™

- One of the following, configurable by model:
  - Optional: Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
  - Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card

### WWAN

- None

### Smart card reader

- None

### Media reader

- MicroSD card reader

### Ports

- One of the following, configurable by model:
  - USB 2.0, two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), headphone / microphone combo jack, microSD card reader, security keyhole

### Display cover

- Aluminum

### Monitor cable

- None

### Bundled Acce

- None

### Camera

- HD720p camera, fixed focus

### Audio support

- HD Audio, Synaptic CX11880 codec

### Keyboards

- HD Audio, Synaptic CX11880 codec
- 6-row, spill-resistant, multimedia Fn keys
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

### Security chip

- Discrete TPM 2.0, TCG Certified

### Security keyhole

- None

### Health Monitoring

- None

### Battery

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

### Limited warranty

- One of the following, configurable by model:
  - 1-year mail-in repair service
  - 1-year depot repair service

### Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Environment

- MIL-STD-810G military testing
- EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.
## ThinkPad L13 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-10110U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
<td>4.1 GHz</td>
<td>4MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>i5-10210U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i7-10510U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The specifications above may not be available in all regions. Lenovo December 2019

### Graphics

- Intel UHD Graphics in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304 @ 60Hz (USB Type-C); 4096x2160 @ 30Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform
- 4GB, 8GB, or 16GB / 2666MHz DDR4 / soldered to system board, no sockets

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>HD (1366x768)</td>
<td>Anti-glare TN</td>
<td>250 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>90°</td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>Anti-glare IPS</td>
<td>300 nits (multi-touch)</td>
<td>16:9</td>
<td>800:1 (multi-touch)</td>
<td>170°</td>
</tr>
</tbody>
</table>

**Multi-touch:** On-cell touch, supports 10-finger gesture (FHD only)

### Storage

- One of the following, configurable by model:
  - M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
  - M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
  - Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4
  - None

### Optical

- Native Intel Ethernet connection I219-V (Non-vPro) or I219-LM (vPro), RJ45 connector via optional ThinkPad Ethernet Adapter Gen 2 or Lenovo USB-C to Ethernet Adapter

### Ethernet

- Varies depending on many factors, actual data transfer speed may be lower than theoretical speed

### Monitor cable

- (optional)
- Lenovo USB-C to VGA Adapter
- Lenovo USB-C to HDMI Adapter
- Lenovo USB-C to DisplayPort Adapter
- Lenovo HDMI to VGA Monitor Adapter

### Bundled Accessories

- (optional)
- Lenovo USB-C to USB-A Adapter
- Lenovo USB-C to USB-C Cable 2m
- Lenovo USB-C to Ethernet Adapter
- ThinkPad Ethernet Extension Adapter Gen 2

### Camera

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus

### Audio support

- HD Audio, Synaptics® CX11880 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack

### Keyboard

- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
  - TrackPoint® pointing device and buttonless Mylar surface touchpad, multi-touch

### Security

- Power-on password, hard disk password, supervisor password, security keyhole

### Security chip

- Intel vPro Technology

### System Mgt (opt)

- Intel vPro Technology

### Fingerprint reader

- Optional: Touch style fingerprint reader on the palm rest

### NFC

- None

### Battery

- Integrated Li-ion 46Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

### Max battery life

- MobileMark® 2014: 14.1 hr

### AC adapter

- 45W, 65W, or 65W slim USB-C AC adapter

### Operating system

- Windows 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro in S mode

### Limited warranty

- (optional)
  - 1-year depot repair service
  - 1-year depot repair service with 65W AC adapter
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

### MIL-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT® Gold / ENERGY STAR® 7.1 / RoHS-compliant

### Note:

The specifications above may not be available in all regions.
## ThinkPad L13 Yoga Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-10110U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
<td>4.1 GHz</td>
<td>4MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>i5-10210U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>8MB</td>
<td></td>
</tr>
<tr>
<td>i7-10510U</td>
<td>8</td>
<td></td>
<td>1.3 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The specifications above may not be available in all regions. Lenovo December 2019

### Graphics

- Intel UHD Graphics in processor;
- supports external digital monitor via HDMI or USB Type-C;
- supports three independent displays;
- Max resolution: 4096x2304 @ 60Hz (USB Type-C);
- 4096x2160 @ 30Hz (HDMI)

### Chipset

Intel SoC (System on Chip) platform

### Memory

4GB, 8GB, or 16GB / 2666MHz DDR4 / soldered to system board, no sockets

### Display

- Size: 13.3" (1920x1080) IPS
- Resolution: FHD (1920x1080)
- Type: Anti-reflection
- Brightness: 300 nits
- Aspect Ratio: 16:9
- Contrast Ratio: 800:1
- Color Gamut: 72%
- Viewing Angle: 170°

### Multi-touch

Capacitive-type multi-touch, supports 10-finger gesture, anti-reflection (AR), could reduce the brightness by up to 10%

### Hinge

- Yoga hinge, 360 degree

### Convert-mode Pen

- ThinkPad Pen Pro, active pen for multi-touch display, on-board rechargeable

### Storage

- One of the following, configurable by model:
  - M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
  - M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
  - Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

### Optical

None

### Ethernet

Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro), RJ45 connector via optional ThinkPad Ethernet Extension Adapter Gen 2 or Lenovo USB-C to Ethernet Adapter

### WLAN + Bluetooth™

- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
- Intel Wi-Fi 6 AX210, Wi-Fi 2x2 802.11ax + Bluetooth 5.0, M.2 card

### WWAN

**SIM card:** None

### SIM card

None

### Weight

Starting at 3.17lb / 1.43kg

### Case color

Black or Silver

### Case material

- Display cover: Magnesium / Aluminum
- Bottom: GFRP

### Operating system

- Windows 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro in S mode

### Limited warranty

**(optional)**
- 1-year depot repair service
- 1-year depot with 2-year system board repair service
- 3-year/1-yr battery depot repair service
- 3-year/1-yr battery limited onsite service

### Mil-Spec test

MIL-STD-810G military testing

### Media reader

- MicroSD card reader
- Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet extension connector, headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole

### Monitor cable

*(optional)*
- Lenovo USB-C to VGA Adapter
- Lenovo USB-C to HDMI Adapter
- Lenovo USB-C to DisplayPort Adapter
- Lenovo HDMI to VGA Monitor Adapter
- Lenovo USB-C to USB-A Adapter
- Lenovo USB-C to USB-C Cable 2m
- Lenovo USB-C to Ethernet Adapter
- ThinkPad Ethernet Extension Adapter Gen 2

### Camera

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus
  - World facing camera, 5MP resolution, auto focus (fingerprint model only)

### Audio support

- HD Audio, Synaptic™ CX11880 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack

### Keyboard

6-row, spill-resistant, multimedia Fn keys, optional LED backlight, TrackPoint® pointing device and buttonless Mylar surface touchpad, multi-touch

### Security

- Security chip
- System Mgt (opt)
- Fingerprint reader
- Intel vPro Technology
- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified

### Battery

Integrated Li-ion 46Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

### Max battery life

* Battery life varies significantly with settings, usage, & other factors
- MobileMark® 2014: 12.23 hr
- 45W, 65W, or 65W slim USB-C AC adapter

### Light sensor

- None

### G-sensor

- Yes

### Gyroscope

- None

### Environment

- EPEAT® Silver; ENERGY STAR® 7.1; RoHS-compliant

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

Note: The specifications above may not be available in all regions.

Lenovo
December 2019
### Processor Specifications Reference (PSREF)

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Celeron® Processor, 7th Generation Intel Core™ i3 / i5 Processor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3965U</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
<td></td>
</tr>
<tr>
<td>3-7020U</td>
<td>4</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>Intel HD Graphics 620</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-7130U</td>
<td>2</td>
<td>2</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-7200U</td>
<td>2</td>
<td>2</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8th Generation Intel Core i5 / i7 Processor</td>
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<td></td>
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<tr>
<td>i5-8130U</td>
<td>4</td>
<td>4</td>
<td>2.2 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td></td>
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</tr>
<tr>
<td>i5-8350U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5-8550U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics Specifications

- Intel HD Graphics 610, 620 or Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

### Chipset Specifications

- Intel SoC (System on Chip) platform
- Dual-channel capable, two DDR4 SO-DIMM sockets

### Display Specifications

- **Dimensions:** WxDxH: 12.67" x 8.83" x 0.74"; 321.8mm x 224.2mm x 18.8mm
- **Weight:** Starting at 3.22 lb / 1.46 kg
- **Case color:** Black or Silver
- **Case material:** Display cover: Aluminum
- **Smart card reader:** None
- **Media reader:** MicroSD card reader
- **Ports:** Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet extension connector, headphone / microphone combo jack, microSD card reader, security keyhole
- **Monitor cable:** (optional) USB-C to VGA: Lenovo HDMI to VGA Monitor Adapter
- **USB-C to DP:** Lenovo USB-C to DisplayPort Adapter
- **Bundled Accy:** Optional: ThinkPad Ethernet Extension Cable
- **Camera:** HD720p camera, fixed focus
- **Audio support:** HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ / dual array microphone, headphone / microphone combo jack
- **Keyboard:** 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
- **UltraNav™:** TrackPoint® pointing device and buttonless Mylar surface touchpad, multi-touch
- **Security chip:** Power-on password, hard disk password, supervisor password, security keyhole
- **Fingerprint reader:** Intel vPro Technology
- **Battery:** Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter
- **Max battery life:** MobileMark® 2014: 16.1 hr
- **AC adapter:** 45W or 65W USB Type-C AC adapter
- **Operating system:** Optional: Windows® 10 Home 64 or Windows 10 Pro 64
- **Limited warranty:** One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service
- **Mil-Spec test:** MIL-STD-810G military testing
- **Environment:** EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

**Note:** The specifications above may not be available in all regions.
## ThinkPad L380 Yoga Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i7-7500U</td>
<td>6</td>
<td>12</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>16MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-7200U</td>
<td>4</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7300U</td>
<td>4</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7130U</td>
<td>4</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304
- DDR4-2133 Intel HD Graphics 620
- DDR4-2400 Intel UHD Graphics 620

### Chipset

- Intel SoC (System on Chip) platform
- Up to 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

### Security

- Power-on password, hard disk password, supervisor password, security keyhole

### Display

- Multi-touch (opt)
- Convert-mode (opt)

### Storage

- One of the following, configurable by model:
  - M.2 SSD / SATA 6.0Gbps (e.g. xxxGB SSD M.2)
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32GB/s (e.g. xxxGB SSD M.2 PCIe NVMe)
  - None

### Optical

- None

### Ethernet

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)

### WLAN + Bluetooth™

- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card

### WWAN

- None

### SIM card

- None

### Smart card reader

- None

### Media reader

- MicroSD card reader

### Ports

- Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet extension connector, headphone / microphone combo jack, microSD card reader, security keyhole

### Monitor cable

- Optional: USB-C to VGA: Lenovo USB-C to VGA Adapter
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter

### Camera

- 720p: HD720p resolution, low light sensitive, fixed focus
- World facing: Rear camera, SMP resolution, auto focus

### Audio support

- HD Audio, Realtek ALC3287 codec, Dolby® Advance / stereo speakers, 2W x 2 / dual array microphone, headphone / microphone combo jack

### Dimensions

- WxDxH: 12.67" x 8.82" x 0.74"; 322mm x 224.2mm x 18.8mm

### Weight

- Starting at 3.44 lb / 1.56 kg

### Case color

- Black or Silver

### Case material

- Display cover: Aluminum

### Bottom

- GFRP

### Weight

- Starting at 3.44 lb / 1.56 kg

### Battery

- Integrated Li-Ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

### Max battery life

- 12.85 hrs

### AC adapter

- 45W or 65W USB Type-C AC adapter

### Preload

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT™ Gold; ENERGY STAR® 6.1; RoHS-compliant

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*Disclaimer: The specifications are subject to change without notice.*

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**Lenovo**

**December 2019**
## ThinkPad L390 Platform Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<th>Intel® Celeron® Processor or 8th Generation Intel Core™ i3 / i5 / i7 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Number</td>
</tr>
<tr>
<td>Intel® Celeron® Processor</td>
<td>4305U</td>
</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
</tr>
<tr>
<td>i5-8565U</td>
<td>4</td>
</tr>
</tbody>
</table>

| Processor Graphics | DDR4-2400 | Intel UHD Graphics 620 |

| Graphics | Intel UHD Graphics 610 or 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI) |

| Chipset Memory | Intel SoC (System on Chip) platform 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets *Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation |

<table>
<thead>
<tr>
<th>Display</th>
<th>Size</th>
<th>Resolution</th>
<th>Surface</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
<th>Multi-touch (opt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>HD (1366x768)</td>
<td>Anti-glare</td>
<td>TN</td>
<td>250 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>90°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>Anti-glare</td>
<td>IPS</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1 (non-touch)</td>
<td>170°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• M.2 2280 SSD / SATA 6.0Gb/s</td>
<td></td>
</tr>
<tr>
<td>• M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2</td>
<td></td>
</tr>
<tr>
<td>• M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4</td>
<td></td>
</tr>
<tr>
<td>• Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4</td>
<td></td>
</tr>
</tbody>
</table>

| Optical | None |

| Ethernet | Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via optional ThinkPad Ethernet Extension Cable or Lenovo USB-C to Ethernet Adapter |

| WLAN Bluetooth™ | Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter |

| WWAN SIM card | None |

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Width x Height: 12.67&quot; x 8.83&quot; x 0.74&quot;; 321.8mm x 224.2mm x 18.8mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Starting at 3.22 lb / 1.46 kg</td>
</tr>
<tr>
<td>Case color</td>
<td>Black or Silver</td>
</tr>
<tr>
<td>Case material</td>
<td>Display cover: Aluminum</td>
</tr>
</tbody>
</table>

| Media reader | None |
| Monitor cable (optional) | Smart card readerNone |
| Ports | MicroSD card reader |
| Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet extension connector, headphone / microphone combo jack, microSD card reader, security keyhole |

| Monitor cable (optional) | *Depending on many factors, actual data transfer speed may be lower than theoretical speed |
| Cable (optional) | USB-C to VGA Adapter: Lenovo USB-C to VGA Adapter |
| Cable (optional) | USB-C to HDMI Adapter: Lenovo USB-C to HDMI Adapter |
| Cable (optional) | USB-C to HDMI (plus Power) Adapter: Lenovo USB-C to HDMI plus Power Adapter |
| Cable (optional) | USB-C to DisplayPort Adapter: Lenovo USB-C to DisplayPort Adapter |
| Cable (optional) | USB-C to Ethernet Adapter: Lenovo USB-C to Ethernet Adapter |
| Cable (optional) | USB-C to USB-A Adapter: Lenovo USB-C to USB-A Adapter |
| Cable (optional) | USB-C to USB-C Cable 2m: Lenovo USB-C to USB-C Cable 2m |

| Camera | HD 720p camera, fixed focus |
| Audio support | HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack |

| Keyboard | 6-row, spill-resistant, multimedia Fn keys, optional LED backlight |
| UltraNav™ | TrackPoint® pointing device and buttonless Mylar surface touchpad, multi-touch |

| Security chip | Power-on password, hard disk password, supervisor password, security keyhole |
| Security | Discrete TPM 2.0, TCG Certified |
| System Mgt (opt) | Intel vPro Technology |
| Fingerprint reader | Optional: Touch style fingerprint reader on the palm rest |
| NFC (optional) | Near Field Communication |

| Battery | Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter |
| Max battery life | MobileMark® 2014: 14.61 hr |
| AC adapter | Battery life varies significantly with settings, usage, & other factors |
| Operating system | Optional: Windows® 10 Home 64 or Windows 10 Pro 64 |

<table>
<thead>
<tr>
<th>Limited warranty</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1-year depot repair service</td>
<td></td>
</tr>
<tr>
<td>• 1-year depot with 2-year system board repair service</td>
<td></td>
</tr>
<tr>
<td>• 1-year limited onsite service</td>
<td></td>
</tr>
<tr>
<td>• 3-year/1-yr battery depot repair service</td>
<td></td>
</tr>
<tr>
<td>• 3-year/1-yr battery limited onsite service</td>
<td></td>
</tr>
<tr>
<td>Mil-Spec test</td>
<td>MIL-STD-810G military testing</td>
</tr>
</tbody>
</table>

| Environment | EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant |

Note: The specifications above may not be available in all regions.
ThinkPad L390 Yoga Platform Specifications

Processor
8th Generation Intel® Core™ i3 / i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-8145U</td>
<td>2</td>
<td>4</td>
<td>2.1 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>4</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>4</td>
<td>1.8 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

Graphics
Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

Chipset
Intel SoC (System on Chip) platform

Memory
32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

Display
13.3" FHD (1920x1080) IPS Anti-reflection

Multi-touch
Capacitive-type multi-touch, supports 10-finger gesture, anti-reflection (AR), could reduce the brightness by up to 10%

Hinge
Yoga hinge, 360 degree

Multi-mode
Laptop, tent, stand and tablet

Pen (optional)
ThinkPad Pen Pro, active pen for multi-touch display, on-board garage

Storage
One of the following, configurable by model:
- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

Optical
None

Ethernet
Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via optional ThinkPad Ethernet Extension Cable or Lenovo USB-C to Ethernet Adapter

WLAN
Bluetooth™
Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

WWAN
None

SIM card
None

Dimensions
WxDxH: 12.67" x 8.83" x 0.74"; 321.8mm x 224.2mm x 18.8mm

Weight
Starting at 3.44 lbs / 1.56 kg

Case color
Black or Silver

Case material
Display cover: Magnesium / Aluminum

Bottom: GFRP

Camera
One of the following, configurable by model:
- HD720p camera, fixed focus
- IR camera and HD720p camera, fixed focus (black model only)
- World facing camera, 5MP resolution, auto focus (mutually exclusive with fingerprint reader)

Audio support
HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack

Security
- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip
  Discrete TPM 2.0, TCG Certified

Fingerprint reader
Optional: Touch style fingerprint reader on the palm rest (mutually exclusive with World facing camera)

NFC (optional)
Near Field Communication

Battery
Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

Max battery life
MobileMark® 2014: 12.17 hr

AC adapter
45W or 65W USB-C AC adapter

Operating system
Optional: Windows® 10 Home 64 or Windows 10 Pro 64

Limited warranty
One of the following, configurable by model:
- 1-year depot repair service
- 1-year depot with 2-year system board repair service
- 3-year/1-year battery depot repair service
- 3-year/1-year battery limited onsite service

Mil-Spec test
MIL-STD-810G military testing

Environment
EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.

Lenovo
December 2019
## ThinkPad L480 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cel 3965U</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td>2.0 GHz</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
</tr>
<tr>
<td>i3-7202U</td>
<td>4</td>
<td>4</td>
<td>2.3 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>3.0 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7200U</td>
<td>4</td>
<td></td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7300U</td>
<td>4</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

### Chipset

- Intel SoC (System on Chip) platform
- 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- *System clocks down for processors with lower memory controller*

### Display

- **Some:** 14.0" (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- **Some:** 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle

### Multi-touch (optional)

- On-cell touch, supports 10-finger gesture (FHD only)

### Storage

- System has one HDD slot or one M.2 2280 slot exclusively for storage
- **Some:** HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- **Some:** SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxGB SSD)
- **Some:** M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
- **Some:** 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN

### Optical

- None

### Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

### WLAN + Bluetooth™ (optional)

- One of the following, configurable by model:
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card (US only)
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card

### Memory

- Intel® Celeron® Processor, 7th Generation Intel Core™ i3 / i5 Processor or
- Number
  - # of Cores
  - # of Threads
  - Base Frequency
  - Max Turbo Frequency
  - Cache
  - Memory Types
  - Processor Graphics

### WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7262 (Fibocom L830-EB), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

### SIM card (optional)

- *For non-WWAN model, it means the model is NOT WWAN upgradable*
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Dimensions

- WxDxH: 13.19" x 9.25" x 0.89"; 335mm x 235mm x 22.5mm

### Weight

- Starting at 3.71 lb / 1.68 kg

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- *Integrated Mobile Broadband 4G LTE, Discrete TPM 2.0, TCG Certified
- Discrete Intel vPro Technology
- Touch style match on chip fingerprint reader on the keyboard bezel, anti-spoofing technology

### Monitor cable (optional)

- USB-C to VGA: Lenovo USB-C to VGA Adapter
- Multimedia Fn keys, optional LED backlight

### Camera

- *HD720p camera, fixed focus*
- *IR camera and HD720p camera, fixed focus
- *HD Audio, Realtek ALC3257 codec / stereo speakers, 2W x 2, Dolby® Audio® / dual array microphone, headphone / microphone combo jack
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Operating system

- Windows® 10 Home 64 or Windows 10 Pro 64
- MobileMark® 2014: 12.2 hr
- *Battery life varies significantly with settings, usage, & other factors
- 45W or 65W USB Type-C AC adapter

### Battery

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- *Battery life varies significantly with settings, usage, & other factors

### Near Field Communication

- NFC (optional)

### Environment

- EPEAT® Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

### Note:

The specifications above may not be available in all regions.

Lenovo
November 2019
## Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cel 4305U</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td></td>
<td>2MB</td>
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<td>Intel UHD Graphics 610</td>
</tr>
<tr>
<td>3-8145U</td>
<td>4</td>
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<td>1.6 GHz</td>
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<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

Note: The specifications above may not be available in all regions. Lenovo October 2019

## Graphics

- Intel UHD Graphics 610 or 620 in processor or Intel UHD Graphics 620 in processor and AMD Radeon 535, 2GB GDDR5 memory (discrete models are NOT available in EMEA).
- Supports external digital monitor via HDMI or USB Type-C.
- Supports three independent displays.
- Max resolution: 4996x2304@60Hz (USB Type-C); 4996x2160@24Hz (HDMI)

## Chipset Memory

- Intel SoC (System on Chip) platform
- 64GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

## Display

- 14.0" HD (1366x768) TN Anti-glare 220 nits 16:9 800:1 45% 90°
- 14.0" FHD (1920x1080) IPS Anti-glare 250 nits 16:9 800:1 45% 170°

## Multi-touch (opt)

- On-cell touch, supports 10-finger gesture (FHD only)

## Storage

- HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- Installed memory is actually 2666MHz but run at 2133MHz or 2400MHz due to Intel limitation

## Optane™ memory (opt)

- Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

## Optical

- None

## Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

## WLAN - Bluetooth™ (optional)

- One of the following, configurable by model:
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card (NOT available in EMEA)
  - Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
  - Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0

## WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable (special bid only in EMEA)
  - Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card

## SIM card

- None

Note: The specifications above may not be available in all regions.
ThinkPad L580 Platform Specifications

Processor: Intel® Celeron® Processor, 7th Generation Intel Core™ i3 / i5 Processor or

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
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<th>Base Frequency</th>
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<tr>
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<td>4</td>
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*8th Generation Intel Core i3 / i5 / i7 Processor

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<td>5-8250U</td>
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<td>3.5 Gz</td>
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<td>DD4-2133</td>
<td>Intel HD Graphics 610</td>
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</tbody>
</table>

Graphics: Intel HD Graphics 610, 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and AMD Radeon 530, 2GB GDDR5 memory (discrete models are NOT available in EMEA);
supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160 @30Hz (HDMI)

Chipset Memory: Intel SoC (System on Chip) platform

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<tr>
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<th># of Threads</th>
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<td>4.0 Gz</td>
<td>8MB</td>
<td>DD4-2133</td>
<td>Intel UHD Graphics 620</td>
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</tbody>
</table>

Display: Intel HD Graphics 610, 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and AMD Radeon 530, 2GB GDDR5 memory (discrete models are NOT available in EMEA);
supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160 @30Hz (HDMI)

Multi-touch: Intel SoC (System on Chip) platform

Storage: Intel HD Graphics 610, 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and AMD Radeon 530, 2GB GDDR5 memory (discrete models are NOT available in EMEA);
supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160 @30Hz (HDMI)

Optical: Intel HD Graphics 610, 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and AMD Radeon 530, 2GB GDDR5 memory (discrete models are NOT available in EMEA);
supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160 @30Hz (HDMI)

Ethernet: Intel HD Graphics 610, 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and AMD Radeon 530, 2GB GDDR5 memory (discrete models are NOT available in EMEA);
supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160 @30Hz (HDMI)

WLAN + Bluetooth™ (optional):

One of the following, configurable by model:
• Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card (US only)
• Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card

WWAN (optional): One of the following, configurable by model:
• Integrated Mobile Broadband 4G LTE-A
• Integrated Mobile Broadband 4G LTE
• Intel XMM™ 7262 (Fibocom L830-EB), M.2 card (EMEA only)
• Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

Note: The specifications above may not be available in all regions.
## ThinkPad L590 Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
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</table>

### Graphics

- Intel UHD Graphics 610 or 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon 535, 2GB GDDR5 memory (discrete models are NOT available in EMEA); supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160 @24Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform
- *Installed memory is actually 2866MHz but run at 2133MHz or 2400MHz due to Intel limitation*

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
<th>Multi-touch</th>
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<tr>
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<td>90°</td>
<td>None</td>
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<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>45%</td>
<td>170°</td>
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</table>

### Storage

- HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4 due to M.2 SSD adapter limitation
- Installed M.2 2280 SSD is PCIe 3x4 but run at PCIe 3x2 due to M.2 SSD adapter limitation
- *Installed memory is actually 2866MHz but run at 2133MHz or 2400MHz due to Intel limitation*

### Optane™ memory

- Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

### Optical

- None

### Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)
- *One of the following, configurable by model:*
  - Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card (NOT available in EMEA)
  - Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
  - Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0

### WWAN (optional)

- Wireless WAN upgradable (special bid only in EMEA)
- Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
- For non-WWAN model, it means the model is NOT WWAN upgradable

### SIM card

- None

### Dimensions

- WxDxH: 14.82" x 10.02" x 0.90"; 376.5mm x 254.5mm x 22.95mm

### Weight

- Starting at 4.48 lb / 2.0 kg

### Case color

- Black

### Case material

- PC/ABS plastic

### Smart card reader

- Optional: Smart card reader

### Media reader

- MicroSD card reader

### Ports

- Two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 2 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole
- Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Monitor cable

- (optional)
  - HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter
  - USB-C to VGA: Lenovo USB-C to VGA Adapter
  - USB-C to DP: Lenovo USB-C to DisplayPort Adapter

### Bundled Accy

- None

### Camera (optional)

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - 1080p camera with ThinkShutter camera privacy, fixed focus

### Audio support

- HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Advanced Audio / dual array microphone, headphone / microphone combo jack

### Keyboard

- 6-row, spill-resistant, multimedia F keys, numeric keypad, optional LED backlight

### Security

- Power-on password, hard disk password, supervisor password, security keyhole

### Security chip

- System Mgmt (opt)
  - Intel vPro Technology

### Fingerprint reader

- Optional: Touch style fingerprint reader on the palm rest

### NFC (optional)

- Near Field Communication

### Battery

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

### AC adapter

- MobileMark® 2014: 12 hr
- Battery life varies significantly with settings, usage, & other factors
- 45W, 65W, or 65W slim USB-C AC adapter

### Limited warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT Silver; ENERGY STAR® 7.1; RoHS-compliant

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Note: The specifications above may not be available in all regions.

Lenovo

December 2019
## ThinkPad P1 Platform Specifications

### Processor

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<th># of Cores</th>
<th># of Threads</th>
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<th>Reference (PSREF)</th>
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<tr>
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</tbody>
</table>

### Graphics

Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro P1000 or P2000, 4GB GDDR5 memory; supports external digital monitor via HDMI or Thunderbolt; supports four independent displays; Max resolution: 5K@60Hz (Thunderbolt), 4K@60Hz (HDMI)

### Chipset

Mobile Intel CM246 Chipset

### Memory

64GB max / 2666MHz DDR4, ECC or non-ECC (ECC function supported only on Xeon processor), dual-channel capable, two DDR4 SO-DIMM sockets

### Display

- **Some:** 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle
- **Some:** 15.6" (396mm) UHD (3840x2160), anti-reflection, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1200:1 contrast ratio, 100% gamut, 170° viewing angle, multi-touch

### Multi-touch (opt) Pen (optional)

Capacitive-type multi-touch, supports 10-finger gesture (4K only)

### Storage

Up to two M.2 SSD, supports single sided M.2 2280 drives only

### RAID (optional)

RAID 0/1 support

### Optical

None

### Ethernet

Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via bundled or optional ThinkPad Ethernet Extension Cable

### WLAN Bluetooth

Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card

Bluetooth 5.0, wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN

None

### SIM card

None

### Dimensions

**WxDxH (non-touch):** 14.24" x 9.67" x 0.72" 361.8mm x 245.7mm x 18.4mm

**WxDxH (multi-touch):** 14.24" x 9.67" x 0.74" 361.8mm x 245.7mm x 18.7mm

### Weight

- **Non-touch model:** starting at 3.66 lb / 1.7 kg
- **Multi-touch model:** starting at 4.06 lb / 1.8 kg

### Case color

Black

### Case material

- **Display cover:** CFRP/GFPR hybrid
- **Bottom:** Aluminum alloy

Note: EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

- **Battery life varies significantly with settings, usage, & other factors**

### Limited warranty

One of the following, configurable by model:

- Windows 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro 64 for Workstations

### Operating system

One of the following, configurable by model:

- Windows 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro 64 for Workstations

### Smart card reader

Optional: Smart card reader

### Media reader

None

### Ports

SD Card reader (SD, SDHC, SDXC), supports UHS-II SD card

Two USB 3.1 Gen 1 (one Always On), two USB Type-C / Thunderbolt 3 (with the function of Power Delivery and DP), HDMI 2.0, Ethernet extension connector, headphone / microphone combo jack, optional smart card reader, SD card reader, security keyhole

- **Power Delivery only supports power-out for charging peripherals**
- **Depending on many factors, actual data transfer speed may be lower than theoretical speed**

### Monitor cable

(optional)

- **USB-C to DP:** Lenovo USB-C to DisplayPort Adapter
- **HDMI to VGA:** Lenovo HDMI to VGA Monitor Adapter
- **Bundled Accy:** Lenovo USB-C to DisplayPort Adapter

### Bundled Accy

Lenovo USB-C to DisplayPort Adapter

### Camera (optional)

One of the following, configurable by model:

- **HD720p camera with ThinkShutter camera privacy, fixed focus**
- **IR camera and HD720p camera, fixed focus**

### Audio support

HD Audio, Realtek ALC3286 codec / stereo speakers, 2W x 2, Dolby Audio Premium / dual array microphone, headphone / microphone combo jack, Dolby Atmos headphone

### Keyboard

6-row, spill-resistant, multimedia Fn keys, LED backlight

### TrackPoint

Pointing device and buttonless glass surface multi-touch touchpad

### Security

Power-on password, hard disk password, supervisor password, security keyhole

- **Discrete TPM 2.0, TCG Certified**

### Security chip

Intel vPro Technology

### Fingerprint reader

Touch style match on chip fingerprint reader on the keyboard bezel

### Color calibration

None

### NFC

None

### Battery life

Integrated Li-ion 80Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

- **Discrete mode:** 7.36 hr
- **Hybrid mode:** 13.87 hr

### Max battery life

- **(MobileMark 2014)**
- **Battery life varies significantly with settings, usage, & other factors**

### AC adapter

135W slim tip AC adapter

### Operating system

One of the following, configurable by model:

- Windows 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro 64 for Workstations

### Limited warranty

One of the following, configurable by model:

- 1-year depot repair service
- 2-year system board repair service
- 3-year/1-yr battery depot repair service

### Hardware warranty

- 1-year depot repair service
- 2-year system board repair service
- 3-year/1-yr battery depot repair service

### MI-Spec test

MIL-STD-810G military testing

### Environment

EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

Lenovo

November 2019
### ThinkPad P1 (2nd Gen) Platform Specifications

**Product Specifications Reference (PSREF)**

- **Processor**
  - 9th Generation Intel® Core™ i5 / i7 / i9 Processor or Intel Xeon® E Processor
  - Processor Number: 5-9400H, 7-9750H, 7-9850H, 9-9880H, E-2276M
  - Core Count: 4 / 6
  - Thread Count: 8
  - Base Frequency: 2.5 GHz / 2.6 GHz / 2.3 GHz / 2.8 GHz
  - Max Turbo Frequency: 4.3 GHz / 4.6 GHz / 4.8 GHz / 4.7 GHz
  - Cache: 8MB / 12MB / 16MB
  - Memory Types: DDR4-2666 / DDR4-2400

- **Graphics**
  - Intel UHD Graphics 630 in processor only or Intel UHD Graphics P630

- **Chipset**
  - Mobile Intel C246 Chipset

- **Memory**
  - Mobile 64GB max / 2666MHz DDR4
  - ECC or non-ECC (ECC function supported only on Xeon processor), dual-channel capable, two DDR4 SO-DIMM sockets

- **Display**
  - 15.6" FHD (1920x1080) IPS Anti-glare: 300 nits, 16:9, 72% NTSC, 700:1, 72%
  - 15.6" UHD (3840x2160) HDR: 500 nits, 16:9, 1200:1, 100% Adobe
  - 15.6" UHD (3840x2160) HDR, Multi-touch: 400nit, HDR 300nit (peak): 100% DCI-P3
  - Multi-touch (opt): Capacitive-type multi-touch, supports 10-finger gesture (UHD OLED only), AR (anti-reflection) / AS (anti-smudge) coating, AR (anti-reflection) / AS (anti-smudge) coating

- **Pen (optional)**
  - Lenovo Pen Pro (special bid only)

- **Storage**
  - Up to two M.2 SSD, supports single sided M.2 2280 drives only
  - M.2 2280 SSD / PCIe NVMe 3.0 x 4

- **RAID (optional)**
  - RAID 0/1 support

- **Optical**
  - None

- **Ethernet**
  - Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via bundled or optional ThinkPad Ethernet Extension Cable

- **WLAN (optional)**
  - Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax – Bluetooth 5.0
  - Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

- **WWAN SIM card**
  - None

- **Battery**
  - Integrated Li-ion 80Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

- **Max battery life**
  - MobileMark® 2014: 13.8 hr

- **AC adapter**
  - 135W slim tip AC adapter

- **Operating system**
  - One of the following, configurable by model:
    - Windows® 10 Home 64
    - Windows 10 Pro 64
    - Windows 10 Pro 64 for Workstations

- **Limited warranty**
  - One of the following, configurable by model:
    - 1-year depot repair service
    - 1-year depot with 2-year system board repair service
    - 3-year/1-yr battery depot repair service
    - 3-year/1-yr battery limited onsite service

- **Mil-Spec test**
  - MIL-STD-810G military testing

- **Environment**
  - EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

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**Note:** The specifications above may not be available in all regions.

Lenovo
November 2019
## Lenovo ThinkPad P43s Platform Specifications

### Processor 8th Generation Intel® Core™ i7 Processor

<table>
<thead>
<tr>
<th>Number</th>
<th>Processor # of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Gen Intel® Core™ i7 Processor</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics
- Intel UHD Graphics 620 in processor and NVIDIA Quadro® P520, 2GB GDDR5 memory:
  - supports external digital monitor via HDMI or USB Type-C;
  - supports three independent displays;
- Max resolution: 3840x2160@60Hz (USB-C); 3840x2160@30Hz (HDMI)

### Chipset Memory
- Intel SoC (System on Chip) platform
- 8GB or 16GB memory soldered to systemboard, one DDR4 SO-DIMM socket
- *Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation*

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits (non-touch) 300 nits (multi-touch)</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>Low Power</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>ThinkPad Privacy Guard</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>WQHD (2560x1440)</td>
<td>Dolby Vision®</td>
<td>IPS Glossy</td>
<td>500 nits</td>
<td>16:9</td>
<td>1500:1</td>
<td>100%</td>
<td>170°</td>
</tr>
</tbody>
</table>

### Multi-touch (optional)
- On-cell touch, supports 10-finger gesture (FHD only)

### Storage
- Supports single sided M.2 2280 drives only
  - M.2 2280 SSD / Sata 6.0Gb/s
  - M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
  - M.2 2282 SSD / PCIe NVMe, PCIe 3.0 x 2
  - Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

### Optical
- None

### Ethernet
- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

### WLAN
- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)
- One of the following, configurable by model:
  - Wireless WAN upgradeable (special bid only in EMEA)
  - Integrated Mobile Broadband 4G LTE, Fibocom LB30-EB, M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - *For non-WWAN model, it means the model is NOT WWAN upgradeable*

### SIM card (optional)
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Case color
- Black

### Case material
- *Display cover: PPS / 50% GF; Bottom: PA / 50% GF*

### Smart card reader
- Optional: Smart card reader

### Media reader
- MicroSD card reader

### Ports
- Two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), one USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of PD and DP), HDMI 1.4b, Ethernet (RJ-45), nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed*

### Monitor cable (optional)
- HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter
- USB-C to VGA: Lenovo USB-C to VGA Adapter
- USB-C to HDMI: Lenovo USB-C to HDMI Adapter
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter

### Bundled Acce (optional)
- None

### Security
- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip
- System Mgt (optional)
- Intel vPro Technology

### Battery
- Integrated Li-ion 50Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- MobileMark® 2014: 14.7 hr
- *Battery life varies significantly with settings, usage, & other factors*

### Operating system
- Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty
- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

### Enviroment
- EPEAT® Silver; ENERGY STAR® 7.1; RoHS-compliant

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Note: The specifications above may not be available in all regions.

Lenovo
November 2019
ThinkPad P51 Platform Specifications

Processor 6th or 7th Generation Intel® Core™ i7 Processor or Intel Xeon® Processor E3 v5 or v6 Family

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i7-6820HQ</td>
<td>4</td>
<td>8</td>
<td>2.7 GHz</td>
<td>3.6 GHz</td>
<td>8MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 530</td>
</tr>
<tr>
<td>E3-1505M v5</td>
<td>4</td>
<td>8</td>
<td>2.8 GHz</td>
<td>3.7 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics 630</td>
</tr>
<tr>
<td>i7-7700HQ</td>
<td>4</td>
<td>8</td>
<td>2.8 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics 630</td>
</tr>
<tr>
<td>E3-1535M v5</td>
<td>4</td>
<td>8</td>
<td>3.0 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics P630</td>
</tr>
<tr>
<td>i7-7820HQ</td>
<td>4</td>
<td>8</td>
<td>3.1 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics P630</td>
</tr>
</tbody>
</table>

Graphics Intel HD Graphics 530, 630, P530, or P630 in processor and NVIDIA Quadro® M1200 or M2200, 4GB memory; supports external digital monitor via HDMI, Mini DisplayPort, or Thunderbolt™; supports four independent displays; Max resolution: 3840x2160@60Hz (DisplayPort via Mini DisplayPort cable): 3840x2160@60Hz (Thunderbolt); 4096x2160@24Hz (HDMI)

Chipset Mobile Intel CM238 Chipset

Memory 64GB max / 2400MHz DDR4, ECC or non-ECC (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets

Display Some: 15.6” (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 160° viewing angle

Some: 15.6” (396mm) 4K (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% gamut, 170° viewing angle

Multi-touch (opt)Capacitive-type multi-touch, supports 10-finger gesture, 220 nits (FHD only)

ThinkPad Pen Pro, active pen for multi-touch display

Storage Up to 3 drives (two M.2 SSD and one HDD), supports single sided M.2 2280 drives only

Some: HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™

HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™

RAID (optional)RAID 0/1 support

Optical None

Ethernet Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)

vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

WLAN One of the following, configurable by model:

• Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT 4.1, M.2 card

• Intel Dual Band Wireless-A 8265, Wi-Fi 2x2 802.11ac + BT 4.2, M.2 card

BlueTooth™ Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

* Intel 8260ac / 8265ac card support BT4.2 but is limited to BT4.1 by Windows OS

WWAN (optional) One of the following, configurable by model:

• Wireless WAN upgradeable

• Integrated Mobile Broadband 4G LTE-A, Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card

SIM card (opt)Micro-SIM card slot, opt Verizon LTE (US) or Lenovo™ Connect (EMEA) SIM card

Dimensions WxDxH: 14.86” x 9.93” x 0.96-1.16”; 377.4mm x 252.3mm x 24.5-29.4mm

WxDxH (Touch): 14.86” x 9.93” x 1.02-1.21”; 377.4mm x 252.3mm x 25.8-30.7mm

Weight Models

Non-touch 5.6 lb / 2.55kg

Multi-touch 6.2 lb / 2.82kg

Case color Black

Display cover: Glass-Fiber Reinforced Plastic

Bottom: Magnesium/Aluminum

Camera (optional) HD720p resolution, fixed focus

Audio support HD Audio, Realtek® ALC3268 codec / stereo speakers, 2W x 2 / dual array microphone, combo audio/microphone jack

Smart card reader Optional: Smart card reader

ExpressCard One slot (ExpressCard/34)

Ports 4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card

Operating system

• Windows 10 Pro 64 for Workstations

• Windows 10 Pro 64

• Windows 10 Pro

• Windows 10 Pro for Workstations

Battery Lithium Polymer 4-cell (66Wh) or 6-cell (90Wh)

Max battery life 10 (MobileMark® 2014)

Model

4-cell

6-cell

Discrete Graphics 4.5 hr

4.1 hr

Hybrid Graphics 6.5 hr

8.9 hr

AC adapter None

* Battery life varies significantly with settings, usage, & other factors

Operating system One of the following, configurable by model:

• Windows® 7 Professional 64

• Windows® 10 Pro 64

Limited warranty One of the following, configurable by model:

• 1-year depot repair service

• 3-year/1-year battery depot repair service

• 3-year/1-year battery limited onsite service

Mi-Spec test MIL-STD-810G military testing

Environment EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

Lenovo November 2019
## ThinkPad P52 Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8750H</td>
<td>6</td>
<td>12</td>
<td>2.2 GHz</td>
<td>4.1 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>7-8850H</td>
<td>6</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>9-8950HK</td>
<td>6</td>
<td>12</td>
<td>2.9 GHz</td>
<td>4.8 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics P630</td>
</tr>
<tr>
<td>E-2176M</td>
<td>6</td>
<td>12</td>
<td>2.7 GHz</td>
<td>4.4 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics P630</td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro P1000 (4GB memory), P2000 (4GB memory), or P3200 (6GB memory, VR ready); supports external digital monitor via HDMI, Mini DisplayPort, or Thunderbolt;
  - supports four independent displays;
  - Max resolution: 3840x2160@60Hz (DisplayPort via Mini DisplayPort cable);
  - 5120X2880@30Hz (Thunderbolt);
  - 4096x2160@60Hz (HDMI)

### Chipset

- Mobile Intel CM246 Chipset
  - 128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets
  - "Installed DIMMs are actually 2666MHz but run at 2400MHz due to Intel limitation"
  - "128GB non-ECC memory for special bid only"

### Display

- **Some**: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 160° viewing angle
  - **Some**: 15.6" (396mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% gamut, 170° viewing angle, multi-touch

### Multi-touch (opt)

- Capacitive-type multi-touch, supports 10-finger gesture (4K only)

### Pen

- Supports pen accessory, please see the accessory compatibility for details

### Storage

- Up to 3 drives (two M.2 SSD and one HDD), supports single sided M.2 2280 drives only
  - **Some**: M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32GB/s
  - **Some**: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 32GB/s

### Optane™ memory

- Optional: Intel Optane memory, PCle NVMe, PCie 3.0 x 2

### RAID (optional)

- RAID 0/1 support
- Optical

### Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
  - vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

### WLAN

- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

### SIM card (opt)

- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Dimensions

- **WxDxH**: 14.86" x 9.93" x 0.96-1.16"; 377.4mm x 252.3mm x 24.5-29.4mm
- **WxDxH(Touch)**: 14.86" x 9.93" x 1.02-1.21"; 377.4mm x 252.3mm x 25.8-30.7mm

### Weight

- **Non-touch model**: starting at 5.4 lb / 2.45kg
- **Multi-touch model**: starting at 6.4 lb / 2.9kg

### Case color

- Black

### Case material

- **Display cover**: Glass-Fiber Reinforced Plastic;
  - **Bottom**: Magnesium/Aluminum

### Smart card reader

- Optional: Smart card reader

### ExpressCard

- None

### Media reader

- 4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card

### Ports

- Three USB 3.1 Gen 1 (one Always On), two USB Type-C / Thunderbolt 3 (with the function of Power Delivery and DP), Mini DisplayPort 1.4, HDMI 2.0, Ethernet (RJ-45), nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, 4-in-1 reader (MMC, SD, SDHC, SDXC), security keyhole
  - "Power Delivery only supports power-out for charging peripherals" * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Camera (optional)

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera, fixed focus

### Audio support

- HD Audio, Realtek ALC3286 codec / stereo speakers, 2W x 2, Dolby Audio Premium / optional dual array microphone, headphone / microphone combo jack, Dolby Atmos headphone

### Keyboard

- 6-row, spill-resistant, multimedia F keys, numeric keypad, LED backlight
- 3-button TrackPoint pointing device and 3-button Mylar surface multi-touch touchpad

### Security

- Security chip
  - vPro (optional)
  - Fingerprint reader
  - Touch style match on chip fingerprint reader on the palm rest

### Security keyhole

- Fingerprint reader
  - (optional)
  - vPro (optional)

### Battery

- Swappable Li-ion 90Wh battery
- Hybrid mode: 6.1 hr; 170W slim tip AC adapter

### Limited warranty (optional)

- 1-year depot repair service
- 3-year/1-year battery depot repair service
- 3-year/1-year battery limited onsite service

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT Silver; ENERGY STAR® 6.1; RoHS-compliant

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**Note:** The specifications above may not be available in all regions.

**Lenovo November 2019**
ThinkPad P52s Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8350U</td>
<td>4</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8550U</td>
<td>4</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i7-8650U</td>
<td>4</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graphics**

- Intel UHD Graphics 620 in processor and NVIDIA Quadro® P500, 2GB GDDR5 memory;
- supports external digital monitor via HDMI or USB Type-C;
- supports three independent displays;
- Max resolution: 4096x2304 @60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

**Chipset**

- Intel SoC (System on Chip) platform

**Multi-touch (opt) Pen**

- On-cell touch, supports 10-finger gesture (FHD only)

**Storage**

- System has one HDD slot or one M.2 2280 slot exclusively for storage, and supports single sided M.2 2280 drives only
- Some: HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxGB SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
- Some: 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s,
  - in WWAN slot as 2nd Storage, mutually exclusive with WWAN

**Optane™ memory (opt)**

- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

**Ethernet**

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

**WLAN + Bluetooth™**

- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- * Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

**WWAN (optional)**

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7262 (Fibocom L830-EB), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card
  - * For non-WWAN model, it means the model is NOT WWAN upgradable
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

**Display**

- 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 45% gamut, 170° viewing angle
- Some: 15.6" (396mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 72% gamut, 170° viewing angle

**Audio support**

- HD Audio, Realtek® ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / optional dual array microphone, headphone / microphone combo jack

**Camera**

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera, fixed focus

**UltraNav™**

- 6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

**Security chip**

- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified

**Fingerprint reader**

- Optional: Touch style match on chip fingerprint reader on the palm rest anti-spoofing technology

**AC adapter**

- 65W USB Type-C AC adapter

**Battery**

- Optional integrated Li-ion 32Wh battery and swappable Li-ion 24Wh, 48Wh, or 72Wh battery

**Max battery life**

- Models
  - 48Wh
  - 72Wh
  - 32Wh + 24Wh
  - 32Wh + 48Wh
  - 32Wh + 72Wh

- Max battery life
  - 12.2 hr
  - 18.5 hr
  - 13.5 hr
  - 20.1 hr
  - 26.3 hr

**Environmental**

- EPEAT Silver; ENERGY STAR® 6.1; RoHS-compliant

**Miscellaneous**

- Lenovo USB-C to DisplayPort Adapter
- Lenovo HDMI to VGA Monitor Adapter
- Lenovo 4-in-1 reader (MMC, SD, SDHC, SDXC)
- Optional: Smart card reader

**Advanced**

- Limited warranty
  - One of the following, configurable by model:
    - 1-year depot repair service
    - 1-year depot with 2-year system board repair service
    - 3-year/1-year battery depot repair service
    - 3-year/1-year battery limited onsite service
    - 3-year (including battery) limited onsite service

- MIL-Spec test
  - MIL-STD-810G military testing

**Notes:**

- The specifications above may not be available in all regions.

Lenovo
November 2019
# ThinkPad P53 Platform Specifications

## Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th Generation Intel® Core™ i5 / i7 / i9 Processor or Intel Xeon® E Processor</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>4.3 GHz</td>
<td>8MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>9th Generation Intel® Core™ i5</td>
<td>6</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.5 GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>9th Generation Intel® Core™ i7</td>
<td>6</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.6 GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>9th Generation Intel® Core™ i9</td>
<td>8</td>
<td>16</td>
<td>2.3 GHz</td>
<td>4.8 GHz</td>
<td>16MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>E-2276M</td>
<td>6</td>
<td>12</td>
<td>2.8 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics P630</td>
</tr>
</tbody>
</table>

## Graphics

- Intel UHD Graphics 630 or P630 in processor and NVIDIA® Quadro® T1000 (4GB GDDR5), T2000 (4GB GDDR5), RTX 3000 (6GB GDDR6, VR ready), RTX 4000 (8GB GDDR6, VR ready), or RTX 5000 (16GB GDDR6, VR ready); supports external digital monitor via HDMI or Thunderbolt®; supports five independent displays; Max resolution: 5K@60Hz (Thunderbolt); 4K@60Hz (USB-C or HDMI)

## Chipset

Mobile Intel CM246 Chipset

## Memory

128GB max / 2666MHz DDR4 ( ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets

## Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>72%</td>
<td>160°</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>72%</td>
<td>160°</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100%</td>
<td>170°</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>OLED</td>
<td>Anti-glare/anti-smudge</td>
<td>SDR 400nit, HDR 500nit (peak)</td>
<td>16:9</td>
<td>10000:1</td>
<td>100% DCL-P3</td>
<td>170°</td>
</tr>
</tbody>
</table>

## Multi-touch (optional)

Capacitive-type multi-touch, supports 10-finger gesture (UHD only), anti-reflection (AR), anti-smudge (AS) coating

## Pen (optional)

Lenovo Pen Pro (special bid only)

## Storage

Up to 3 drives (3x M.2 SSD or 1x HDD + 2x M.2 SSD), supports single sided M.2 2280 drives only

- HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- M.2 2280 SSD / PCIe NVMe, Pcle 3.0 x 4

* HDD is only available for T1000 and T2000 graphics model

## Optane™ memory (optional)

Intel Optane memory, PCIe NVMe, Pcle 3.0 x 2

## RAID (optional)

RAID 0/1/5 support

## Optical

Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)

## Ethernet

Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)

## WLAN (optional)

Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0

## Bluetooth® (optional)

Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

## WWAN (optional)

One of the following, configurable by model:
- Wireless WAN upgradable (special bid only in EMEA)
- Integrated Mobile Broadband 4G LTE-A, Fibocomb L850-GL, M2 card

* For non-WWAN model, it means the model is NOT WWAN upgradable

## SIM card (optional)

Nano-SIM card slot, optional Verizon LTE (US) SIM card

## Operating system

One of the following, configurable by model:
- Windows® 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro for Workstations

## Security

Power-on password, hard disk password, supervisor password, security keyhole

## Security chip

vPro (optional): Intel vPro Technology

## Finger print reader

Touch style match on chip fingerprint reader on the palm rest

## Bluetooth

Integrated Li-ion 90Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

## Battery

Max battery life (MobileMark 2014): 8 hr

* Battery life varies significantly with settings, usage, & other factors

## AC adapter

170W or 230W slim tip AC adapter

## Display cover

Glass-Fiber Reinforced Plastic

## Case color

Black

## Case material

Magnaesium

## SDIMM sockets

Four DDR4-2666, four DDR4-2400, four DDR4-2133

## Memory

Max resolution: 5K@60Hz (Thunderbolt); 4K@60Hz (USB-C or HDMI)

## Monitor cable (optional)

HDMI to VGA: Lenovo USB-C to VGA Monitor Adapter

## Ports

- Two USB 3.1 Gen 1 (one Always On)
- One USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort)
- Two USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of PD and DP)
- HDMI 2.0, Ethernet (RJ-45), nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, 4-in-1 reader (MMC, SD, SDHC, SDXC), security keyhole

* Power Delivery only supports power-out for charging peripherals
* USB-C Dock is not supported in right-side USB-C port
* Depending on many factors, actual data transfer speed may be lower than theoretical speed

## Video

Integrated Mobile Broadband 4G LTE-A, Fibocomb L850-GL, M.2 card

## Multimedia

HD720p camera with ThinkShutter camera privacy, fixed focus

## Camera (optional)

- HD720p camera with ThinkShutter camera privacy, fixed focus
- HD camera and HD720p camera with ThinkShutter camera privacy, fixed focus

## Audio

HD Audio, Synthetic® CX11880 codec / stereo speakers, 2W x 2 / optional dual array far-field microphone, headphone / microphone combo jack, Dolby Atmos® sound system

## Sound system

Dolby Atmos

## Wi-Fi

2x2 802.11ax + Bluetooth

## LAN

Intel Ethernet Connection I219-V (Jacksonville)

## Operating system

One of the following, configurable by model:
- Windows® 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro for Workstations

## Limited warranty

One of the following, configurable by model:
- 1-year depot repair service
- 3-year/1-yr battery depot repair service
- 3-year/1-yr battery limited onsite service

## Mil-Spec test

MIL-STD-810G military testing

## Environment

EPEAT® Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.

Lenovo
November 2019
## ThinkPad P53s Platform Specifications

### Processor
<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8665U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics
- Intel UHD Graphics 620 in processor and NVIDIA Quadro P520, 2GB GDDR5 memory;
- supports external digital monitor via HDMI or USB Type-C;
- supports three independent displays;
- Max resolution: 3840x2160@60Hz (USB-C); 3840x2160@30Hz (HDMI)

### Chipset
- Intel SoC (System on Chip) platform
- 48GB max / 2400MHz DDR4, dual-channel capable,
- 8GB or 16GB memory soldered to systemboard, one DDR4 SO-DIMM socket
- * Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation

### Memory
- 8MB soldered to systemboard

### Display
<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>Dolby Vision HDR</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100% Adobe</td>
</tr>
</tbody>
</table>

### Multi-touch Pen
- On-cell touch, supports 10-finger gesture (FHD only)

### Storage
- Supports single sided M.2 2280 drives only
  - M.2 2280 SSD / SATA 6.0Gb/s
  - M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
  - M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
  - Intel Optane Memory H10 with Solid State Storage, M.2 2280, PCIE NVMe 3.0 x 4

### Optical
- None

### Ethernet
- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

### WLAN
- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0

### WWAN (optional)
- One of the following, configurable by model:
  - Wireless WAN upgradeable (special bid only in EMEA)
  - Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
- * For non-WWAN model, it means the model is NOT WWAN upgradeable

### SIM card (optional)
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Camera (optional)
- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus

### Audio support
- HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / optional dual array far-field microphone, headphone / microphone combo jack

### Keyboard
- 6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

### Security
- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip
- System Mgt (optional)
- Intel vPro Technology
- Fingerprint reader
- Optional: Touch style match on chip fingerprint reader on the palm rest

### Battery
- Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- * Battery life varies significantly with settings, usage, & other factors

### AC adapter
- 65W USB Type-C AC adapter

### Operating system
- Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty
- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-year battery depot repair service
  - 3-year/1-year battery limited onsite service

### Mil-Spec test
- MIL-STD-810G military testing

### Environment
- EPEAT Silver; ENERGY STAR® 7.1; RoHS-compliant

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Note: The specifications above may not be available in all regions.

Lenovo November 2019
## ThinkPad P72 Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8750H</td>
<td>12</td>
<td>2.2 GHz</td>
<td>4.1 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-8850H</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-2176M</td>
<td>12</td>
<td>2.7 GHz</td>
<td>4.4 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
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<td></td>
</tr>
<tr>
<td>E-2186M</td>
<td>12</td>
<td>2.9 GHz</td>
<td>4.8 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graphics**
- Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro P600 (4GB memory), P2000 (4GB memory), P3200 (6GB memory), P4200 (8GB memory), or P5200 (16GB memory);
- supports external digital monitor via HDMI, Mini DisplayPort, or Thunderbolt;
- supports four independent displays;
- Max resolution: 3200x1800@60Hz (DisplayPort via Mini DisplayPort cable); 5120x2880@30Hz (Thunderbolt); 4096x2160@60Hz (HDMI)

**Chipset**
- Mobile Intel CM246 Chipset

**Memory**
- 128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets
- *Installed DIMMs are actually 2666MHz but run at 2400MHz due to Intel limitation

**Display**
- **Some:** 17.3" (439mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 800:1 contrast ratio, 72% gamut, 170° viewing angle
- **Some:** 17.3" (439mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% Adobe gamut, 170° viewing angle

**Multi-touch Pen**
- None
- Supports pen accessory, please see the accessory compatibility for details

**Storage**
- Up to 3 drives (two M.2 SSD and one HDD), supports single sided M.2 2280 drives only
- **Some:** HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System
- **Some:** M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s

**Optane Memory**
- **Optional:** Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- **RAID (optional):** RAIDX0/1 support

**Optical**
- None

**Ethernet**
- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

**WLAN Bluetooth**
- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

**WWAN**
- None

**SIM card**
- None

---

**Dimensions**
- **WxDxH:** 16.38" x 11.06" x 0.96-1.16"; 416mm x 281mm x 24.5-29.4mm

**Weight**
- Starting at 7.5 lb / 3.4kg

**Battery**
- Li-ion 99Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

**Max battery life**
- 16 hr
- *Battery life varies significantly with settings, usage, & other factors

**AC adapter**
- 230W slim tip AC adapter

**Operating system**
- One of the following, configurable by model:
  - Windows 10 Home 64
  - Windows 10 Pro 64
  - Windows 10 Pro 64 for Workstations

**Limited warranty**
- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

**Mil-Spec test**
- MIL-STD-810G military testing

**Environment**
- EPEAT Gold (US only); ENERGY STAR 7.0; RoHS-compliant

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**Note:** The specifications above may not be available in all regions.

**Lenovo November 2019**

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**Memory**

<table>
<thead>
<tr>
<th>Processor</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Generation Intel Core™ i7 Processor or Intel Xeon™ E Processor</td>
<td>6</td>
<td>2.2 GHz</td>
<td>4.1 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td></td>
</tr>
<tr>
<td>12MB</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-year/1-yr battery depot repair service</td>
<td>2.7 GHz</td>
<td>4.4 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows 10 Pro 64</td>
<td>2.9 GHz</td>
<td>4.8 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EPEAT**

**Processor**
- 8th Generation Intel® Core™ i7 Processor or Intel Xeon™ E Processor
- Processor Number
- Number
- # of Cores
- # of Threads
- Base Frequency
- Max Turbo Frequency
- Cache
- Memory Types
- Processor Graphics

**Graphics**
- Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro P600 (4GB memory), P2000 (4GB memory), P3200 (6GB memory), P4200 (8GB memory), or P5200 (16GB memory);
- supports external digital monitor via HDMI, Mini DisplayPort, or Thunderbolt;
- supports four independent displays;
- Max resolution: 3200x1800@60Hz (DisplayPort via Mini DisplayPort cable); 5120x2880@30Hz (Thunderbolt); 4096x2160@60Hz (HDMI)

**Chipset**
- Mobile Intel CM246 Chipset

**Memory**
- 128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets
- *Installed DIMMs are actually 2666MHz but run at 2400MHz due to Intel limitation

**Display**
- **Some:** 17.3" (439mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 800:1 contrast ratio, 72% gamut, 170° viewing angle
- **Some:** 17.3" (439mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% Adobe gamut, 170° viewing angle

**Multi-touch Pen**
- None
- Supports pen accessory, please see the accessory compatibility for details

**Storage**
- Up to 3 drives (two M.2 SSD and one HDD), supports single sided M.2 2280 drives only
- **Some:** HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System
- **Some:** M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s

**Optane Memory**
- **Optional:** Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- **RAID (optional):** RAIDX0/1 support

**Optical**
- None

**Ethernet**
- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

**WLAN Bluetooth**
- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

**WWAN**
- None

**SIM card**
- None

---

**Dimensions**
- **WxDxH:** 16.38" x 11.06" x 0.96-1.16"; 416mm x 281mm x 24.5-29.4mm

**Weight**
- Starting at 7.5 lb / 3.4kg

**Battery**
- Li-ion 99Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

**Max battery life**
- 16 hr
- *Battery life varies significantly with settings, usage, & other factors

**AC adapter**
- 230W slim tip AC adapter

**Operating system**
- One of the following, configurable by model:
  - Windows 10 Home 64
  - Windows 10 Pro 64
  - Windows 10 Pro 64 for Workstations

**Limited warranty**
- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

**Mil-Spec test**
- MIL-STD-810G military testing

**Environment**
- EPEAT Gold (US only); ENERGY STAR 7.0; RoHS-compliant

---

**Note:** The specifications above may not be available in all regions.

**Lenovo November 2019**
ThinkPad P73 Platform Specifications

Product Specifications Reference (PSREF)

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-9400H</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>4.3 GHz</td>
<td>8MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>i7-9750H</td>
<td>6</td>
<td>12</td>
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<tr>
<td>i7-9850H</td>
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<td>12</td>
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<td>12MB</td>
<td></td>
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</tr>
<tr>
<td>i7-9880H</td>
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<td>16MB</td>
<td></td>
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</tr>
<tr>
<td>E-2278M</td>
<td>6</td>
<td>12</td>
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<td>4.7 GHz</td>
<td>12MB</td>
<td></td>
<td>Intel UHD Graphics P630</td>
</tr>
</tbody>
</table>

**Note:** The specifications above may not be available in all regions. Lenovo November 2019

### Graphics

- Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro P620 (4GB GDDR5), T2000 (4GB GDDR5), RTX 3000 (6GB GDDR6, VR ready), RTX 4000 Max-Q (8GB GDDR6, VR ready), or RTX 5000 Max-Q (16GB GDDR6, VR ready); supports external digital monitor via HDMI or Thunderbolt™; supports five independent displays; Max resolution: 5K@60Hz (Thunderbolt); 4K@60Hz (USB-C or HDMI)
- Supports external monitor via HDMI or Thunderbolt; supports five independent displays; Max resolution: 5K@60Hz (Thunderbolt); 4K@60Hz (USB-C or HDMI)

### Chipset Memory

- Mobile Intel CM246 Chipset
- Memory: 128GB max / 2666MHz DDR4 (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets

### Display

- Size: 17.3" FHD (1920x1080)
- Resolution: IPS Anti-glare
- Brightness: 300 nits
- Aspect Ratio: 16:9
- Contrast Ratio: 700:1
- Color Gamut: 100% sRGB
- Viewing Angle: 170°
- Size: 17.3" UHD (3840x2160)
- Resolution: Dolby Vision® HDR
- Brightness: 400 nits
- Aspect Ratio: 16:9
- Contrast Ratio: 1000:1
- Color Gamut: 100% sRGB
- Viewing Angle: 170°

### Multi-touch Pen

- None
- None

### Storage

- Up to 3 drives (two M.2 SSD and one HDD), supports single sided M.2 2280 drives only
- HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- Optane™ memory: Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- RAID (optional): RAID 0/1 support
- Optical: None

### Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

### WLAN (optional)

- Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN

- None

### SIM card

- None

### Operating system

- One of the following, configurable by model:
  - Windows® 10 Home 64
  - Windows 10 Pro 64
  - Windows 10 Pro for Workstations

### Limited warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-year battery depot repair service
  - 3-year/1-year battery limited onsite service

### Mil-Spec test

- MIL-STD-810G military testing

Note: The specifications above may not be available in all regions.
## Processor Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
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<th># of Threads</th>
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<th>Cache</th>
<th>Memory Types</th>
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<tbody>
<tr>
<td>i5-6200U</td>
<td>2</td>
<td>4</td>
<td></td>
<td>2.3 GHz</td>
<td>2.8 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
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<tr>
<td>i5-6300U</td>
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<td>2.4 GHz</td>
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<td>3MB</td>
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<td></td>
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<td>3.1 GHz</td>
<td>4MB</td>
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<td>Intel HD Graphics 620</td>
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</tr>
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</table>

### 7th Generation Intel Core i3 / i5 / i7 Processor

<table>
<thead>
<tr>
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<th>Number</th>
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<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.4 GHz</td>
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<td>3MB</td>
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<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i3-7200U</td>
<td>2</td>
<td>4</td>
<td></td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i3-7300U</td>
<td>2</td>
<td>4</td>
<td></td>
<td>2.5 GHz</td>
<td>3.5 GHz</td>
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<td>i7-7500U</td>
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<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i7-7600U</td>
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<td>4</td>
<td></td>
<td>2.8 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

* i5-6500U is NOT available in EMEA.

### Graphics

- Intel HD Graphics 520 or 620 in processor only, or
- Intel HD Graphics 620 in processor and NVIDIA GeForce® 940MX, 2GB 2.5GHz GDDR5 memory (discrete models are NOT available in EMEA); supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
- Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)

### Chipset

Intel SoC (System on Chip) platform

32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- System clocks down for processors with lower memory controller

### Display

* Some: 14.0” (355mm) HD (1366x768), anti-glares, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio
* Some: 14.0” (355mm) FHD (1920x1080), anti-glar, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
* Some: 14.0” (355mm) FHD (1920x1080), anti-glares, LED backlight, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

### Multi-touch (opt)

On-cell touch, supports 10-finger gesture (FHD IPS panel with PPS cover only)

### Storage

System has one HDD slot or one M.2 2280 slot exclusively for storage
- Some: HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5” wide, 7mm high (e.g. xxxGB SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
- Some: 128GB M.2 SSD / SATA 6.0Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN and WiGig

### Optical

None

### Ethernet

Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- Intel Ethernet Connection I219-LM (Jacksonville)

WLAN

- Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Tri-Band Wireless-AC 18265, WiGig 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1, M.2 card

Bluetooth™

- Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter
  - Intel 8265ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

WWAN (optional)

One of the following, configurable by model (WWAN can coexist with WiGig):
- Wireless WAN upgrade
- Integrated Mobile Broadband 4G LTE-A
- Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card
- Integrated Mobile Broadband 4G LTE
- Intel XMM™ 7160 (Fibocom L831-EAU), M.2 card (EMEA only)

SIM card (opt)

- Micro-SIM card slot, opt Verizon LTE (US) or Lenovo® Connect (EMEA) SIM card

### Dimensions

<table>
<thead>
<tr>
<th>Weight</th>
<th>Model</th>
<th>3-cell or 3-3-cell</th>
<th>6-cell or 3-6-cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium</td>
<td>3.49 lb / 1.58 kg</td>
<td>3.92 lb / 1.78 kg</td>
<td></td>
</tr>
<tr>
<td>PPS</td>
<td>3.63 lb / 1.65 kg</td>
<td>4.35 lb / 1.85 kg</td>
<td></td>
</tr>
</tbody>
</table>

### Case color

Black

### Case material

- Display cover: Hybrid Magnesium Hybrid or PPS;
- Bottom: Glass-Fiber Reinforced Plastic

### Smart card reader

Optional: Smart card reader

### Media reader

4-in-1 reader (MMC, SD, SDHC, SDXC), supports SD 3.0, UHS-I

### Ports

- Three USB 3.1 Gen 1 (USB 3.0, one Always On),
- USB 3.1 Type-C Gen 2 / Thunderbolt 3 (w/ the function of Power Delivery and DP),
- HDMI 1.4b, Ethernet (RJ-45), Dock connector

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

### WiGig dock (opt)

ThinkPad WiGig dock

### Monitor cable

Optional: Lenovo USB-C to VGA Adapter

### Audio support

HD Audio, Realtek ALC3268 codec / stereo speakers, 2W x 2 / dual array microphone, combo audio/microphone jack

### Keyboard

6-row, spill-resistant, multimedia Fn keys, optional LED backlight

### UltraNav™

TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TC Certified
- Intel vPro Technology
- Fingerprint reader
- Optional: Touch style match on chip fingerprint reader on the keyboard bezel
- Near Field Communication

### NFC (optional)

Optional: Integrated L-Polymer 3-cell (24Wh)

### Internal battery

- Li-Polymer 3-cell (24Wh) or Li-ion 6-cell (48Wh or 72Wh)

### External battery

Max battery life (MobileMark® 2014)

- Discrete
  - 6.9 hr
  - 13.9 hr
  - 21.6 hr
  - 28.1 hr

### AC adapter

* Battery life varies significantly with settings, usage, & other factors

### Operating system

One of the following, configurable by model:
- Microsoft Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 10 Pro 64
- Windows 10 Home 64
- Windows 10 Pro 64

### Limited warranty

One of the following, configurable by model:
- 1-year depot repair service
- 1-year depot with 2-year system board repair service
- 1-year limited onsite service
- 3-year/1yr battery depot repair service
- 3-year/1yr battery limited onsite service

### Mil-Spec test

MIL-STD-810G military testing

### Environment

- EPEAT™ Gold (US only)
- ENERGY STAR® 6.1
- RoHS-compliant

---

**Note:** The specifications above may not be available in all regions.

Lenovo
December 2019
## ThinkPad T470s Platform Specifications

**Processor 6th Generation Intel® Core™ i5 / i7 Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-6200U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>2.8 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i5-6300U</td>
<td>2</td>
<td>4</td>
<td>2.4 GHz</td>
<td>3.0 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i7-6600U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

or 7th Generation Intel Core i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
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<td>2</td>
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<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

**Graphics**

Intel HD Graphics 520 or 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)

**Chipset**

Intel SoC (System on Chip) platform supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)

**Memory**

- 2GB or 4GB max / 2400MHz DDR4, dual-channel capable, 4GB or 8GB memory soldered to systemboard, one DDR4 SO-DIMM socket (optional)
- *System clocks down for processors with lower memory controller

**Display**

Some: 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 160° viewing angle

Some: 14.0" (355mm) WQHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 160° viewing angle

On-cell touch, supports 10-finger gesture, 250 nits (FHD only)

**Multi-touch (optional)**

**Storage**

One of the following, configurable by model:
- M.2 SSD / SATA 6.0Gb/s (e.g. xxxGB SSD M.2)
- M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxxGB SSD M.2 PCIe NVMe)

**Optical**

None

**Ethernet**

Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)

vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

**WLAN**

One of the following, configurable by model (WiGig is mutually exclusive with WWAN):
- Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Tri-Band Wireless-AC 18265, WiGig 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1, M.2 card

**Bluetooth™**

Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

* Intel 8265ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

**WWAN (optional)**

One of the following, configurable by model (mutually exclusive with WiGig):
- Wireless WAN upgradable
- Integrated Mobile Broadband 4G LTE-A, Qualcomm Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card
- Micro-SIM card slot, opt Verizon LTE (US) or Lenovo® Connect (EMEA) SIM card

**Smart card reader**

Optional: Smart card reader

**Media reader**

4-in-1 reader (MMC, SD, SDHC, SDXC)

**Ports**

Three USB 3.1 Gen 1 (USB 3.0, one Always On), USB 3.1 Type-C Gen 2 / Thunderbolt 3 (w/ the function of Power Delivery and DP), HDMI 1.4b, Ethernet (RJ-45), Dock connector

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

**WiGig dock (optional)**

ThinkPad WiGig dock, mutually exclusive with WWAN

**Monitor cable (optional)**

USB-C to VGA: Lenovo USB-C to VGA Adapter

**Camera (optional)**

HD720p resolution, fixed focus

**Audio support**

6-row, spill-resistant, multimedia Fn keys, optional LED backlight

UltraNav™ pointing device and buttonless Mylar surface multi-touch touchpad

Security

Power-on password, hard disk password, supervisor password, security keyhole

Security chip

Discrete TPM 2.0, TCG Certified

vPro Technology

Intel vPro Technology

Fingerprint reader

Optional: Touch style match on chip fingerprint reader on the palm rest

NFC (optional)

Near Field Communication

**Battery life**

Max battery life

MobileMark® 2014: up to 10.5 hr

* Battery life varies significantly with settings, usage, & other factors

**AC adapter**

45W slim tip AC adapter, 45W or 65W USB Type-C AC adapter

**Operating system**

One of the following, configurable by model:
- Windows® 7 Professional 64 preinstalled
- through downgrade rights in Windows 10 Pro 64
- Windows 10 Home 64
- Windows 10 Pro 64

Limited warranty

One of the following, configurable by model:
- 1-year depot repair service
- 3-year/1-yr battery depot repair service
- 3-year/1-yr battery limited onsite service

**Mil-Spec test**

MIL-STD-810G military testing

**Environment**

EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

Lenovo

April 2019
### Processor

**7th Generation Intel® Core™ i5 Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
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<td>3MB</td>
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<tr>
<td>i5-7300U</td>
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<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

**8th Generation Intel Core i3 / i5 / i7 Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-8130U</td>
<td>2</td>
<td>4</td>
<td>2.2 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8350U</td>
<td>4</td>
<td>8</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8650U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and NVIDIA® GeForce® MX150, 2GB GDDR5 memory (discrete graphics is available only on 7 models in EMEA); supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

### Chipset

Intel SoC (System on Chip) platform

### Memory

32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

### Display

- **On-cell touch**, supports 10-finger gesture (FHD only)
- **Active Protection System**
- **Max resolution**: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

### Storage

- **System has one HDD slot or one M.2 2280 slot exclusively for storage**
- **HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™**
- **SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxGB SSD)**
- **M.2 SSD / PCIe NVMe, PCIe 3.0 x 4**
- **128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2**
- **in WWAN slot as 2nd Storage, mutually exclusive with WWAN**

### Optical

- **Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2**
- **UltraNav™**

### Ethernet

- **Non-vPro model**: Intel Ethernet Connection I219-VM (Jacksonville)
- **vPro model**: Intel Ethernet Connection I219-LM (Jacksonville)

### WWAN + Bluetooth® (opt)

**Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card**

### WWAN (optional)

- **One of the following, configurable by model (mutually exclusive with Intel Optane memory):**
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A
  - Intel XMM™ 7360 (Fibocom L850-GL), M.2 card
- **For non-WWAN model, it means the model is NOT WWAN upgradable**

### SIM card (opt)

- **Nano-SIM card slot, optional Verizon LTE (US) SIM card**
- **UltraNav™**

### Monitor cable (optional)

- **HDMI to VGA Monitor Adapter**
- **USB-C to DisplayPort Adapter**

### Security

- **Power-on password, hard disk password, supervisor password, security keyhole**
- **Discrete TPM 2.0, TCG Certified**
- **Intel vPro Technology**

### Battery

- **Max battery life**

<table>
<thead>
<tr>
<th>Discrete model</th>
<th>Integrated model</th>
<th>Battery life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 24Wh</td>
<td>24Wh + 24Wh</td>
<td>7.2 hr</td>
</tr>
<tr>
<td>48Wh, 72Wh</td>
<td>24Wh + 48Wh</td>
<td>14.4 hr</td>
</tr>
<tr>
<td>24Wh + 72Wh</td>
<td>24Wh + 24Wh + 48Wh</td>
<td>21.8 hr</td>
</tr>
</tbody>
</table>

### Operating system

- **Optional**: Windows® 10 Home 64 or Windows 10 Pro 64

### Environment

- **EPEAT® Gold (US only); ENERGY STAR® 6.1; RoHS-compliant**

---

**Note**: The specifications above may not be available in all regions.

Lenovo

December 2019
ThinkPad T480s Platform Specifications

Product Specifications Reference (PSREF)

7th Generation Intel® Core™ i5 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
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</tr>
</thead>
<tbody>
<tr>
<td>i5-7200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
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</table>

or 8th Generation Intel Core i5 / i7 Processor

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<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only or
- Intel UHD Graphics 620 in processor and NVIDIA® GeForce® MX150,
- 2GB GDDR5 memory (discrete models are NOT available in EMEA);
- supports external digital monitor via HDMI or USB Type-C;
- supports three independent displays;
- Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

Chipset

- Intel SoC (System on Chip) platform
- Supports three independent displays
- Supports ThinkPad Privacy Guard on some models
- System clocks down for processors with lower memory controller

Display

- Some: 14.0” (358mm) FHD (1920x1080), anti-glare, LED backlight, IPS,
- 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle,
- supports ThinkPad Privacy Guard on some models
- Some: 14.0” (356mm) WQHD (2560x1440), anti-glare, LED backlight, IPS,
- 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut,
- 170° viewing angle

Multi-touch (opt)

- On-cell touch, supports 10-finger gesture, 250 nits (FHD only)

Storage

- One of the following, configurable by model:
  - M.2 SSD / SATA 6.0Gb/s
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s

Optical

- None

Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

WLAN + Bluetooth

- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- * Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

SIM card (opt)

- Nano-SIM card slot, optional Verizon LTE (US) SIM card

Note: The specifications above may not be available in all regions.

Dimensions

- WxDxH: 13.03” x 8.93” x 0.73”; 331mm x 226.8mm x 18.45mm

Weight

- Starting at 2.9 lb / 1.32 kg

Case color

- Black or Silver

Case material

- Display cover: CFRP Hybrid;
- Bottom: Magnesium

Smart card reader

- Optional: Smart card reader

Media reader

- 4-in-1 reader (MMC, SD, SDHC, SDXC)

Ports

- Two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort),
- one USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of PD and DP),
- HDMI 1.4b, Ethernet (RJ-45), nano-SIM card slot (WWAN models),
- headphone / microphone combo jack, optional smart card reader,
- 4-in-1 reader (MMC, SD, SDHC, SDXC),
- side docking connector, security keyhole

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

USB-C to VGA: Lenovo USB-C to VGA Adapter
USB-C to DP: Lenovo USB-C to DisplayPort Adapter

Camera

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - HD Audio, Realtek® ALC3287 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium /
  - dual array microphone, headphone / microphone combo jack

Audio support

- HD Audio, Realtek® ALC3287 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium /
- dual array microphone, headphone / microphone combo jack

Keyboard

- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight

Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified

Fingerprint reader

- Optional: Touch style match on chip fingerprint reader on the palm rest, anti-spoofing technology

NFC (optional)

- Near Field Communication

Battery

- Integrated Li-ion 57Wh battery, supports Rapid Charge (0-80% in 60 mins) with 65W USB Type-C AC adapter
- Max battery life
  - MobileMark® 2014: 15.6 hr

AC adapter

- 45W or 65W USB Type-C AC adapter

Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

Limited warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

Mil-Spec test

- MIL-STD-810G military testing

Near Field Communication

- 45W or 65W USB Type-C AC adapter

Certifications

- ENERGY STAR® 6.1; RoHS-compliant
- EPEAT™ Silver
- ENERGY STAR® 6.1; RoHS-compliant

Lenovo

August 2019
### ThinkPad T490 Platform Specifications

**Processor**
- 8th Generation Intel Core™ i5 / i7 Processor
- Processor Number
  - i5-8265U: 4 cores, 8 threads, 1.6 GHz to 4.1 GHz, 6MB cache, DDR4-2400, Intel UHD Graphics 620
  - i5-8365U: 4 cores, 8 threads, 1.6 GHz to 4.1 GHz, 6MB cache, DDR4-2400, Intel UHD Graphics 620
  - i7-8865U: 4 cores, 8 threads, 1.9 GHz to 4.6 GHz, 8MB cache, DDR4-2400, Intel UHD Graphics 620
- or 10th Generation Intel Core i5 / i7 Processor (NOT available in EMEA)
- Processor Number
  - i5-10210U: 4 cores, 8 threads, 1.6 GHz to 3.3 GHz, 6MB cache, DDR4-2400, Intel UHD Graphics
  - i7-10510U: 4 cores, 8 threads, 1.8 GHz to 4.9 GHz, 8MB cache, DDR4-2400, Intel UHD Graphics

**Graphics**
- Intel UHD Graphics 620 or Intel UHD Graphics in processor only or Intel UHD Graphics 620 or Intel UHD Graphics in processor and NVIDIA® GeForce® MX250, 2GB GDDR5 memory;
- supports external digital monitor via HDMI or Thunderbolt;
- supports three independent displays;
- Max resolution: 4096x2304 @60Hz (Thunderbolt); 4096x2160 @24Hz (HDMI)

**Chipset**
- Intel SoC (System on Chip) platform
- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0

**Display**
- Size: 14.0" FHD (1920x1080) IPS Anti-glare
- 14.0" WQHD (2560x1440)

**Multi-touch (opt)**
- On-cell touch, supports 10-finger gesture (FHD only)

**Storage**
- M.2 2280 SSD / SATA 6.0Gb/s (NOT available in EMEA)
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 2
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

**Optical**
- None

**Ethernet**
- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

**WLAN**
- One of the following, configurable by model:
  - Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
  - Intel Wi-Fi 6 AX201, Wi-Fi 2x2 802.11ax + Bluetooth 5.0 (AX201 for 10th Gen processor only)

**WWAN (optional)**
- One of the following, configurable by model:
  - Wireless WAN upgradable (special bid only in EMEA)
  - Integrated Mobile Broadband 4G LTE, Fabcom L830-EB, M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Flobcom L850-GL, M.2 card
  - Integrated Mobile Broadband 4G LTE-A, Flobcom L860-GL, MIMO 4x4, M.2 card
  - For non- WWAN model, it means the model is NOT WWAN upgradable

**SIM card (opt)**
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

**Camera**
- Integrated Li-ion 50Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

**Battery life**
- AC adapter: 45W, 65W, or 65W slim USB-C AC adapter

**Operating system (optional)**
- Windows® 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro in S mode

**Limited warranty (optional)**
- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board repair service
  - 3-year/1-yr battery depot repair service
  - 1-year + 2-year/1-yr battery limited onsite service
  - 3-year/1-yr battery limited onsite service

**Mi-Spec test**
- MIL-STD-810G military testing

**Environment**
- EPEAT® Silver; ENERGY STAR® 7.1; RoHS-compliant

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**Note:** The specifications above may not be available in all regions.
### Processor

<table>
<thead>
<tr>
<th>Processor</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>8 MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8365U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>i7-8655U</td>
<td>4</td>
<td>8</td>
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<td></td>
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<td>8</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8 MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 620 in processor only or
- Intel UHD Graphics 620 in processor and NVIDIA® GeForce® MX250, 2GB GDDR5 memory;
- supports external digital monitor via HDMI or Thunderbolt;
- supports three independent displays;
- Max resolution: 4096x2304@60Hz (Thunderbolt); 4096x2160@24Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform

### Memory

- 48GB max / 2400MHz DDR4, dual-channel capable,
- 8GB or 16GB memory soldered to system board, one DDR4 SO-DIMM socket
- *installed memory is actually 2966MHz but run at 2400MHz due to Intel limitation*

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot; FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits (non-touch) 300 nits (multi-touch)</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0&quot; FHD (1920x1080)</td>
<td>ThinkPad Privacy Guard</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

### Multi-touch (optional)

- On-cell touch, supports 10-finger gesture (FHD only)

### Storage

- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

### Optical

- None

### Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

### WLAN (optional)

- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable (special bid only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - *For non-WWAN model, it means the model is NOT WWAN upgradable*

### SIM card (optional)

- None

### Processor Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
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<td>4.8 GHz</td>
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<td></td>
</tr>
</tbody>
</table>

### Case material

- Black

### Case color

- Display cover: PPS / 50% GF
- Keyboard cover: PC/ABS + Magnesium alloy
- (with ISO 22196 compliant anti-microbial surface treatment)

### Smart card reader

- None

### Media reader

- MicroSD card reader

### Ports

- Two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), one USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of PD and DP), HDMI 1.4b, Ethernet (RJ-45), nano-SIM card slot (WWAN model), headphone / microphone combo jack, microSD card reader, side docking connector, security keyhole
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed HDMI to VGA:
  - Lenovo HDMI to VGA Monitor Adapter
  - USB-C to VGA: Lenovo USB-C to VGA Adapter
  - USB-C to HDMI: Lenovo USB-C to HDMI Adapter
  - USB-C to DP: Lenovo USB-C to DisplayPort Adapter

### Monitor cable (optional)

- None

### Camera (optional)

- One of the following, configurable by model:

### Audio support

- HD720p camera with ThinkShutter camera privacy, fixed focus
- IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus
- HD Audio, Realtek® ALC3287 codec / stereo speakers, 2W x 2, Dolby® UltraAudio® / dual array far-field microphone, headphone / microphone combo jack

### Security chip

- Security chip
- System Mgt (opt): Intel vPro Technology
- Security support
- Power-on password, hard disk password, supervisor password, security keyhole

### Battery

- Integrated Li-ion 50Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- AC adapter: 45W, 65W, or 65W slim USB-C AC adapter
- *Battery life varies significantly with settings, usage, & other factors*
- MobileMark® 2014: 16.11 hr

### Operating system

- Optional: Windows® 10 Pro 64

### Limited warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

### MIL-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT™ Silver / ENERGY STAR® 7.1 / RoHS-compliant

Note: The specifications above may not be available in all regions.
## ThinkPad T490s Platform Specifications

### Processor

<table>
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<tr>
<td>7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or Thunderbolt; supports three independent displays; Max resolution: 4096x2304 @60Hz (Thunderbolt); 4096x2160 @24Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform
- 8GB, 16GB or 32GB / 2400MHz DDR4 / soldered to systemboard, no sockets
- Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits (non-touch) / 300 nits (multi-touch)</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>ThinkPad Privacy Guard</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>WQHD (2560x1440)</td>
<td>HDR, Dolby Vision™</td>
<td>IPS Glossy</td>
<td>16:9</td>
<td>1500:1</td>
<td>100% Adobe</td>
<td>170°</td>
</tr>
</tbody>
</table>

### Storage

- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

### Optical

- None

### Ethernet

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via bundled or optional Thinkpad Ethernet Extension Adapter Gen 2

### WLAN - Bluetooth™ (optional)

- One of the following, configurable by model:
  - Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
  - Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0

### WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - For non-WWAN model, it means the model is NOT WWAN upgradable
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

### SIM card (opt)

### Dimensions

- WxDxH (black with FHD / Privacy Guard): 12.95" x 8.90" x 0.66"; 329.0mm x 226.15mm x 16.7mm
- WxDxH (black with FHD Low Power / WQHD): 12.94" x 8.99" x 0.63"; 328.8mm x 225.8mm x 16.1mm
- WxDxH (silver): 12.96" x 8.92" x 0.68"; 329.15mm x 226.45mm x 17.2mm

### Weight

<table>
<thead>
<tr>
<th>Models</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black with FHD</td>
<td>2.98 lb / 1.35 kg</td>
</tr>
<tr>
<td>Black with FHD Low Power</td>
<td>2.81 lb / 1.27 kg</td>
</tr>
<tr>
<td>Silver</td>
<td>3.29 lb / 1.49 kg</td>
</tr>
</tbody>
</table>

### Case color

- Black or Silver

### Case material

- Black or Silver

### Cover

- Display cover: CFPR Hybrid (black) or Aluminum (silver)
- Bottom: Magnesium

### Monitor cable (optional)

- Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Media reader

- MicroSD card reader

### Ports

- Two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), one USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of PD and DP), HDMI 1.4b, Ethernet extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole

### Camera

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus
  - HD Audio, Realtek ALC3287 codec / stereo speakers, 1W x 2, Dolby Audio Premium / dual array far-field microphone (optional for special bid model), headphone / microphone combo jack

### Audio support

- HD Audio, Realtek ALC3287 codec / stereo speakers, 1W x 2, Dolby Audio Premium / dual array far-field microphone (optional for special bid model), headphone / microphone combo jack

### Keyboard

- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight

### Security

- Power-on password, hard disk password, supervisor password, security keyhole

### Security chip

- Discrete TPM 2.0, TCG Certified

### Security keyhole

- Optional

### Battery

- Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter
- * Battery life varies significantly with settings, usage, & other factors

### AC adapter

- 45W, 65W, or 65W slim USB-C AC adapter

### Operating system

- One of the following, configurable by model:
  - Windows 10 Home 64 or Windows 10 Pro 64

### Limited warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery depot repair service

### MIL-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT™ Gold; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.
# ThinkPad T495 Platform Specifications

## Processor AMD Ryzen™ PRO Mobile Processors with Radeon™ Vega Graphics

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Graphics Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 Pro 3300U</td>
<td>4</td>
<td>4</td>
<td>2.1 GHz</td>
<td>3.5 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 6</td>
</tr>
<tr>
<td>Ryzen 5 Pro 3500U</td>
<td>4</td>
<td>8</td>
<td>2.1 GHz</td>
<td>3.7 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 8</td>
</tr>
<tr>
<td>Ryzen 7 Pro 3700U</td>
<td>4</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 10</td>
</tr>
</tbody>
</table>

Note: The specifications above may not be available in all regions. Lenovo December 2019

## Graphics AMD Radeon Vega 6, Vega 8, or Vega 10 Graphics in processor;
supports external digital monitor via USB-C or HDMI; supports four independent displays; Max resolution: 4096x2304 @ 60Hz (USB-C); 4096x2160 @ 300 nits (HDMI)

## Chipset AMD SoC (System on Chip) platform

| 32GB max / 2400MHz DDR4, dual-channel capable, 8GB or 16GB memory soldered to systemboard, one DDR4 SO-DIMM socket |

## Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0”</td>
<td>HD (1366x768)</td>
<td>TN  Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>14.0”</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits (non-touch) 300 nits (multi-touch)</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0”</td>
<td>FHD (1920x1080) Low Power</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
</tbody>
</table>

## Multi-touch (opt)

On-cell touch, supports 10-finger gesture (FHD only)

## Storage

- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2

## Optical

None

## Ethernet Realtek® RTL8111 Gigabit Ethernet connection

| 10Home 64 or Windows 10 Pro 64 |

## WLAN One of the following, configurable by model:

- Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0

## Bluetooth™

- Bluetooth 4.2 or 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

## WWAN (optional) One of the following, configurable by model:

- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card

## SIM card (opt) Nano-SIM card slot, optional Verizon LTE (US) SIM card

## Dimensions WxDxH: 12.95” x 8.94” x 0.70”; 329mm x 227mm x 17.9mm

## Weight Models

<table>
<thead>
<tr>
<th>Weight</th>
<th>HD</th>
<th>FHD</th>
<th>FHD Low Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models</td>
<td>3.46 lb / 1.57 kg</td>
<td>3.66 lb / 1.57 kg</td>
<td>3.94 lb / 1.45 kg</td>
</tr>
</tbody>
</table>

## EcoDesign

- Limited warranty

<table>
<thead>
<tr>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year depot repair service</td>
</tr>
<tr>
<td>3-year/1-yr battery depot repair service</td>
</tr>
<tr>
<td>1-year + 2-year/1-yr battery limited onsite service</td>
</tr>
<tr>
<td>3-year/1-yr battery limited onsite service</td>
</tr>
</tbody>
</table>

## Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip
- System Mgt
- Discrete TPM 2.0, TCG Certified
- DASH Management
- Fingerprint reader
- Optional: Touch style match on chip fingerprint reader on the palm rest

## NFC None

## Battery Integrated Li-ion 50Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

## Max battery life

- MobileMark® 2014: 13.4 hr
- Battery life varies significantly with settings, usage, & other factors

## AC adapter

- 45W or 65W USB Type-C AC adapter

## Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

## Environment

- EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.
ThinkPad T495s Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 5 Pro 3500U</td>
<td>4</td>
<td>8</td>
<td>2.1 GHz</td>
<td>3.7 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 8</td>
</tr>
<tr>
<td>Ryzen 7 Pro 3700U</td>
<td>4</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 10</td>
</tr>
</tbody>
</table>

### Graphics

AMD Radeon Vega 8 or Vega 10 Graphics in processor; supports external digital monitor via USB-C or HDMI; supports three independent displays; Max resolution: 4096x2304@60Hz (USB-C); 4096x2160@24Hz (HDMI)

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16.9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(non-touch)</td>
<td>300 nits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low Power</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16.9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(multi-touch)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16.9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td></td>
<td>ThinkPad Privacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Chipset

AMD SoC (System on Chip) platform

### Memory

8GB or 16GB / 2400MHz DDR4 / soldered to systemboard, no sockets

* Installed memory is actually 2666MHz but run at 2400MHz due to AMD limitation

### Software

#### Operating System

<table>
<thead>
<tr>
<th>Models</th>
<th>Weight</th>
<th>Case color</th>
<th>Case material</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD</td>
<td>2.92 lb / 1.33 kg</td>
<td>Black</td>
<td>Display cover: CFRP Hybrid; Bottom: Magnesium/Aluminum</td>
</tr>
<tr>
<td>Low Power</td>
<td>2.76 lb / 1.25 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Privacy Guard</td>
<td>2.89 lb / 1.31 kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ports

#### Smart card reader

Optional: Smart card reader

#### Media reader

MicroSD card reader

#### Ports

One USB 3.1 Gen 1 (Always On), one USB 3.1 Gen 2, two USB 3.1 Type-C Gen 2 (with the function of Power Delivery and DisplayPort), HDMI 2.0, Ethernet extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole

### Audio support

Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Security

#### Security chip

Discrete TPM 2.0, TCG Certified

#### Security System Mgt

DASH Management

#### Fingerprint reader

Optional: Touch style match on chip fingerprint reader on the palm rest

### Batteries

Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

#### Battery life

MobileMark® 2014: 16.4 hr

* Battery life varies significantly with settings, usage, & other factors

### AC adapter

45W or 65W USB Type-C AC adapter

### Operating system

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty

One of the following, configurable by model:

* 1-year depot repair service
* 3-year/1-yr battery depot repair service
* 3-year/1-yr battery limited onsite service

### Mil-Spec test

MIL-STD-810G military testing

### Environment

EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.
### ThinkPad T580 Platform Specifications

#### Processor
**7th Generation Intel® Core™ i5 Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-7200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

**or 8th Generation Intel Core i5 / i7 Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8500U</td>
<td>4</td>
<td>8</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8650U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

#### Graphics
- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and NVIDIA® GeForce® MX150, 2GB GDDR5 memory, supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

#### Chipset
- Intel SoC (System on Chip) platform
- Intel SoC (System on Chip) platform
- * System clocks down for processors with lower memory controller

#### Display
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle
- Some: 15.6" (396mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 72% gamut, 170° viewing angle
- On-cell touch, supports 10-finger gesture (FHD only)

#### Storage
- System has one HDD slot or one M.2 2280 slot exclusively for storage
- Some: HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxG SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
- Some: 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN

#### Optane™ memory
- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- None

#### Ethernet
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- * Optional 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

#### WWAN
- One of the following, configurable by model:
  - Wireless WAN upgradable (special bid only)
  - Integrated Mobile Broadband 4G LTE
  - Intel XMM™ 7265 (FibocCom L830-EB), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A
  - Intel XMM™ 7360 (FibocCom L850-GL), M.2 card
  - * For non-WWAN model, it means the model is NON WWAN upgradable

#### SIM card
- Optional: Nano-SIM card slot, optional Verizon LTE (US) SIM card

#### Chipset
- Intel SoC (System on Chip) platform
- Intel SoC (System on Chip) platform
- * System clocks down for processors with lower memory controller

#### Display
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle
- Some: 15.6" (396mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 72% gamut, 170° viewing angle
- On-cell touch, supports 10-finger gesture (FHD only)

#### Storage
- System has one HDD slot or one M.2 2280 slot exclusively for storage
- Some: HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxG SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
- Some: 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN

#### Optane™ memory
- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- None

#### Ethernet
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- * Optional 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

#### WWAN
- One of the following, configurable by model:
  - Wireless WAN upgradable (special bid only)
  - Integrated Mobile Broadband 4G LTE
  - Intel XMM™ 7265 (FibocCom L830-EB), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A
  - Intel XMM™ 7360 (FibocCom L850-GL), M.2 card
  - * For non-WWAN model, it means the model is NOT WWAN upgradable

#### Display
- System clocks down for processors with lower memory controller

#### Security chip
- Security chip
- vPro (optional)
- Intel vPro Technology
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

#### Camera (optional)
- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera, fixed focus
- Audio support
  - HD Audio, Realtek® ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone (optional for special bid model), headphone / microphone combo jack

#### Monitor cable
- Optional: Monitor cable
- (optional)
- Lenovo USB-C to DisplayPort Adapter
- Lenovo HDMI to VGA Monitor Adapter
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter

#### Battery
- Max battery life (MobileMark® 2014)
- Models
  - 24Wh
  - 48Wh
  - 72Wh
  - 32Wh + 24Wh
  - 32Wh + 48Wh
  - 32Wh + 72Wh
  - Max battery life
  - 5.6 hr
  - 12.5 hr
  - 18.1 hr
  - 15.8 hr
  - 20.3 hr
  - 26.1 hr

#### AC adapter
- Optional: 45W or 65W USB Type-C AC adapter

#### Operating system
- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

#### Limited warranty (optional)
- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board repair service
  - 3-year/1-yd battery depot repair service
  - 3-year/1-yd battery limited onsite service

#### Mil-Spec test
- MIL-STD-810G military testing

#### Environment
- EPEAT™ Silver; ENERGY STAR® 6.1; RoHS-compliant

---

Note: The specifications above may not be available in all regions.
**ThinkPad T590 Platform Specifications**

**Product Specifications Reference (PSREF)**

**Processor**

8th Generation Intel® Core™ i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8365U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8865U</td>
<td>4</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

**Graphics**

Intel UHD Graphics 620 in processor or Intel UHD Graphics 620 in processor only or NVIDIA® GeForce MX250, 2GB GDDR5 memory; supports external digital monitor via HDMI or Thunderbolt.

**Chipset**

Intel SoC (System on Chip) platform, 48GB max / 2400MHz DDR4, dual-channel capable, 8GB or 16GB memory soldered to systemboard, one DDR4 SO-DIMM socket

*Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation*

**Display**

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6”</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
</tr>
<tr>
<td>15.6”</td>
<td>UHD (3840x2160)</td>
<td>HDR, Dolby Vision™</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
</tr>
</tbody>
</table>

**Storage**

- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

**Optical**

None

**Ethernet**

Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)

vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

**WLAN (optional)**

Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0 Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

**WWAN (optional)**

- Wireless WAN Upgradeable (spec only in EMEA)
- Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card

**SIM card**

Nano-SIM card slot, optional Verizon LTE (US) SIM card

**Power**

- 8th Generation Intel® Core™ i5 / i7 Processor
- Processor Number: 8
- Base Frequency: 1.6 GHz
- Max Turbo Frequency: 4.6 GHz
- Cache: 6MB
- Memory: DDR4-2400

**Processor Specifications Reference (PSREF)**

*Note: The specifications above may not be available in all regions.*

Lenovo
August 2019
### ThinkPad X1 Carbon (6th Gen) Platform Specifications

**Product Specifications Reference (PSREF)**

#### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>LPDDR3-1866</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

or 8th Generation Intel Core i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
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<th>Processor Graphics</th>
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</thead>
<tbody>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.4 GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8350U</td>
<td>4</td>
<td>8</td>
<td>1.7 GHz</td>
<td>4.6 GHz</td>
<td>6MB</td>
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<tr>
<td>7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-8650U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Chipset

- Intel SoC (System on Chip) platform

#### Memory

- 8GB or 16GB / 2133MHz LPDDR3 / soldered to systemboard, no sockets
- *System clocks down for processors with lower memory controller*

#### Display

- One of the following, configurable by model:
  - 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle
  - 14.0" (355mm) QHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle
  - 14.0" (355mm) HDR QHD (2560x1440) with Dolby Vision™, glossy, LED backlight, IPS, 500 nits, 16:9 aspect ratio, 1500:1 contrast ratio, 170° viewing angle
- On-cell touch, supports 10-finger gesture (FHD only)

#### Storage

- One of the following, configurable by model:
  - M.2 SSD / SATA 6.0Gb/s (e.g. xxxGB SSD M.2)
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32GB/s (e.g. xxxGB SSD M.2 PCIe NVMe)

#### Optical

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)

#### Ethernet

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)
- via bundled or optional ThinkPad Ethernet Extension Adapter Gen 2

#### WWAN (optional)

- Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card
- *For non-WWAN model, it means the model is NOT WWAN upgradable*

#### SIM card (optional)

- Nano-SIM card slot, optional Verizon LTE (US) SIM card

#### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays:
- Max resolution: 5120x2880@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

#### Chipset

- Intel SoC (System on Chip) platform

#### Audio

- HD Audio, Realtek ALC3286 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack, Dolby® Atmos™ via headphones

#### Camera

- HD720p camera with ThinkShutter camera privacy, fixed focus
- IR camera and HD720p camera, fixed focus
- HD Audio, Realtek ALC3286 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack, Dolby® Atmos™ via headphones

#### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified
- Intel vPro Technology
- Fingerprint reader Touch style match on chip fingerprint reader on the palm rest, anti-spoofing technology

#### Battery

- Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter
- Battery life varies significantly with settings, usage, & other factors
- MobileMark® 2014: 19.3 hr
- AC adapter 45W, 65W, or 65W Low Halogen USB-C AC adapter

#### Display

- 12.74" x 8.55" x 0.63"; 323.5mm x 217.1mm x 15.95mm

#### Weight

- Starting at 2.49 lb / 1.13 kg

#### Case material

- Black or Silver (silver case is NOT available in EMEA)
- **Display cover:** CFP/R/GFPR hybrid;
- **Bottom:** magnesium alloy / PPS hybrid

#### Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

#### Warranty

- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

#### Mil-Spec test

- MIL-STD-810G military testing

#### Environment

- EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

**Lenovo August 2019**
ThinkPad X1 Carbon (7th Gen) Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8365U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>8</td>
<td>16</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>or 10th Generation Intel Core i5 / i7 Processor (NOT available in EMEA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graphics**

- Intel UHD Graphics 620 or Intel UHD Graphics in processor; supports external digital monitor via HDMI or USB Type-C / Thunderbolt; supports three independent displays; Max resolution: 5K@60Hz (Thunderbolt); 4K@24Hz (HDMI)

**WWAN** (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L860-GL, MIMO 2x2, M.2 card

**SIM card (opt)**

- Nano-SIM card slot, optional Verizon LTE (US) SIM card

**Dimensions**

- WxDxH (Privacy Guard): 12.72" x 8.54" x 0.61"; 323mm x 217mm x 15.4mm
- WxDxH (other model): 12.72" x 8.54" x 0.59"; 323mm x 217mm x 14.95mm

**Weight**

- Privacy Guard model: starting at 2.66 lb / 1.21 kg;
- Other model: starting at 2.4 lb / 1.09 kg

**Case color**

- Black paint or black weave

**Case material**

- Display cover: Carbon Fiber;
- Bottom: magnesium alloy

**Media reader**

- None

**Ports**

- Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, side docking connector, security keyhole

**Smart card reader**

- None

**Chipset**

- Intel SoC (System on Chip) platform
- 8GB or 16GB / 2133MHz LPDDR3 / soldered to systemboard, no sockets

**Battery**

- Integrated LI-ion 51Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

**Max battery life**

- MobileMark® 2014: 18.3 hr
- Battery life varies significantly with settings, usage, & other factors
- AC adapter
- 45W, 65W, or 65W slim USB-C AC adapter

**Operating system**

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

**Limited warranty**

- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

**WLAN + Bluetooth™**

- One of the following, configurable by model:
  - Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ax + Bluetooth 5.0
  - Intel Wi-Fi 6 AX201, Wi-Fi 2x2 802.11ax + Bluetooth 5.0
  - AX201 for 10th Gen processor only and NOT available in AP

**Note:** The specifications above may not be available in all regions.

Lenovo December 2019
ThinkPad X1 Extreme (2nd Gen) Platform Specifications

### Processor
- **9th Generation Intel® Core™ i5 / i7 / i9 Processor**
- **Number**
  - i5-9300H: 4 cores, 8 threads
  - i5-9400H: 4 cores, 8 threads
  - i7-9750H: 6 cores, 12 threads
  - i7-9850H: 6 cores, 12 threads
  - i9-9880H: 8 cores, 16 threads
- **Base Frequency**: 2.4 GHz, 2.5 GHz, 2.6 GHz, 2.6 GHz, 2.3 GHz, 2.3 GHz
- **Max Turbo Frequency**: 4.1 GHz, 4.3 GHz, 4.5 GHz, 4.6 GHz, 4.8 GHz, 4.8 GHz
- **Cache**: 8MB, 8MB, 12MB, 12MB, 16MB
- **Processor Graphics**: Intel UHD Graphics 630
- **Memory Types**: DDR4-2666, DDR4-2666, DDR4-2666, DDR4-2666, DDR4-2666
- **Graphics Intel UHD Graphics 630 in processor and NVIDIA® GeForce® GTX 1650, 4GB GDDR5 memory**
- **Supports external digital monitor via HDMI or Thunderbolt**
- **Max resolution**: 5K@60Hz (Thunderbolt); 4K@60Hz (HDMI)

### Graphics
- **Intel UHD Graphics 630 in processor and NVIDIA® GeForce® GTX 1650, 4GB GDDR5 memory**
- **Supports external digital monitor via HDMI or Thunderbolt**
- **Max resolution**: 5K@60Hz (Thunderbolt); 4K@60Hz (HDMI)

### Chipset
- **Mobile Intel CM246 Chipset**
- **Memory**
  - 64GB max / 2666MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

### Display
- **15.6" FHD (1920x1080) IPS Anti-glare 300 nits 16:9 72% NTSC 170°**
- **15.6" FHD (1920x1080) IPS Anti-glare 500 nits 16:9 1200:1 72% NTSC 170°**
- **15.6" UHD (3840x2160) Dolby Vision HDR IPS Anti-glare 500 nits 16:9 1200:1 100% Adobe 170°**
- **15.6" UHD (3840x2160) Dolby Vision HDR OLED Anti-reflection Anti-smudge SDR 400nit, HDR 900nit (peak) 16:9 100000:1 100% DCI-P3 170°**

### Multi-touch (opt)
- **Capacitive-type multi-touch, supports 10-finger gesture (UHD OLED only), anti-reflection (AR), anti-smudge (AS) coating**

### Pen (optional)
- **Lenovo Pen Pro (special bid only)**

### Storage
- **Up to two M.2 SSD**
- **RAID (optional)**
- **Optical**

### Ethernet
- **Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)**

### WLAN (optional)
- **Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0**
- **Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter**

### WWAN
- **None**
- **SIM card**

### Dimensions
- **WxHxD**: 14.24" x 9.67" x 0.72", 361.8mm x 245.7mm x 18.4mm
- **Weight**: 14.24" x 9.67" x 0.74", 361.8mm x 245.7mm x 18.7mm

### Case color
- **Non-touch model**: starting at 3.75 lb / 1.7 kg
- **Multi-touch model**: starting at 4.0 lb / 1.81 kg

### Case material
- **Display cover**: CFRP/GFRP hybrid
- **Bottom**: Aluminum alloy

### Smart card reader
- **Optional**: Smart card reader

### Media reader
- **SD Card reader (SD, SDHC, SDXC), supports UHS-II SD card**

### Ports
- **Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of Power Delivery and DisplayPort)**
- **HDMI 2.0, Ethernet extension connector, headphone / microphone combo jack, optional smart card reader, SD card reader, security keyhole, slim tip AC adapter**
- **Power Delivery only supports power-out for charging peripherals**
- **Depending on many factors, actual data transfer speed may be lower than theoretical speed**
- **HDMI to VGA**: Lenovo HDMI to VGA Monitor Adapter
- **USB-C to VGA**: Lenovo USB-C to VGA Adapter
- **USB-C to DP**: Lenovo USB-C to DisplayPort Adapter
- **Bundled Accy**: Optional: ThinkPad Ethernet Extension Cable

### Monitor cable (optional)
- **USB-C to VGA**: Lenovo USB-C to VGA Adapter
- **USB-C to DP**: Lenovo USB-C to DisplayPort Adapter

### Keyboard
- **6-row, spill-resistant, multimedia Fn keys, LED backlight**
- **TrackPoint® pointing device and buttonless glass surface multi-touch touchpad**

### Security
- **Power-on password, hard disk password, supervisor password, security keyhole**
- **Discrete TPM 2.0, TCG Certified**
- **Intel vPro Technology**
- **Fingerprint reader**: Touch style match on chip fingerprint reader on the keyboard bezel

### Color calibration
- **Option**: X-Rite Pantone factory color calibration (UHD model only)

### Battery
- **Integrated Li-ion 80Wh battery, supports Rapid Charge (charge up to 80% in 1hr)**
- **Max battery life**: MobileMark® 2014: 14 hr
- **155W slim tip AC adapter**

### Operating system
- **Optional**: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty
- **One of the following, configurable by model:**
  - 1-year depot repair service
  - 3-year/1-year battery depot repair service
  - 3-year/1-year battery limited onsite service

### Mil-Spec test
- **MIL-STD-810G military testing**

### Environment
- **EPEAT Silver; ENERGY STAR® 7.1; RoHS-compliant**

Note: The specifications above may not be available in all regions.

Lenovo
December 2019
### Processor Specifications

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
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<th>Memory Types</th>
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<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
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</tr>
<tr>
<td>i7-8550U</td>
<td>4</td>
<td>8</td>
<td>2.4 GHz</td>
<td>4.3 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor;
- Supports external digital monitor via HDMI or USB Type-C;
- Supports three independent displays;
- Max resolution: 5120x2880@60Hz (USB Type-C);
- 4096x2160@30Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform;
- Supports three independent displays;
- Max resolution: 5120x2880@60Hz (USB Type-C);
- 4096x2160@30Hz (HDMI)

### Display

- 14.0” (355mm) FHD (1920x1080), LED backlight, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle, IPS, AR (anti-reflection);
- Some: 14.0” (355mm) WQHD (2560x1440), LED backlight, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle, IPS, AR (anti-reflection);
- Some: 14.0” (355mm) HDR WQHD (2560x1440) with Dolby Vision<sup>®</sup>, LED backlight, 500 nits, 16:9 aspect ratio, 1500:1 contrast ratio, 100% gamut, 170° viewing angle, IPS, AR (anti-reflection);
- Capacitive-type multi-touch, AR (anti-reflection), AS (anti-smudge), supports 10-finger gesture, reduces overall display brightness by 10%.

### Multi-touch

- Capacitive-type multi-touch, AR (anti-reflection), AS (anti-smudge), supports 10-finger gesture, reduces overall display brightness by 10%.

### Hinge

- Yoga hinge, 360 degree

### Convert-mode

- Laptop, tent, stand, and tablet

### Storage

- Some: M.2 SSD / SATA 6.0Gb/s (e.g. xxxG SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxxG SSD PCIe NVMe)
- None

### Optical

- Native Intel Ethernet Connection WGI219-LM (vPro)
- via optional ThinkPad Ethernet Extension Cable

### Ethernet

- One of the following, configurable by model:
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
  - Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card
  - Bluetooth 4.2 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- Integrated Mobile Broadband 4G LTE-A
- Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

### SIM card (optional)

- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Dimensions

- 13.11” x 9.02” x 0.67”
- 333mm x 229mm x 17.05mm

### Weight

- Starting at 3.08 lb / 1.4kg

### Case color

- Black or silver

### Case material

- Display cover: Carbon-Fiber and Glass-Fiber hybrid
- Bottom: magnesium-PPS hybrid

---

**Specifications Reference (PSREF)**

Lenovo

December 2019
## ThinkPad X1 Yoga (4th Gen) Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

- **8th Generation Intel® Core™ i5 / i7 Processor**
  - Processor Number
  - # of Cores
  - Base Frequency
  - Max Turbo Frequency
  - Cache
  - Memory Types
  - Processor Graphics

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Gen</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>8th Gen</td>
<td>7-8565U</td>
<td>1</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8th Gen</td>
<td>7-8665U</td>
<td>1</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8th Gen</td>
<td>5-10210U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>8th Gen</td>
<td>7-10510U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8th Gen</td>
<td>7-10710U</td>
<td>6</td>
<td>1.2</td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>LPDDR3-2133</td>
</tr>
</tbody>
</table>

- **10th Generation Intel Core i5 / i7 Processor**
  - Processor Number
  - # of Cores
  - Base Frequency
  - Max Turbo Frequency
  - Cache
  - Memory Types
  - Processor Graphics

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th Gen</td>
<td>6</td>
<td>8</td>
<td>1.1 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th Gen</td>
<td>7-11955U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td></td>
<td></td>
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<tr>
<td>10th Gen</td>
<td>7-11959U</td>
<td>6</td>
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<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>LPDDR3-2133</td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 620 or Intel UHD Graphics in processor; supports external digital monitor via HDMI or USB Type-C / Thunderbolt; supports three independent displays; Max resolution: 5K@60Hz (Thunderbolt); 4K@24Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform
- 8GB or 16GB / 2133MHz LPDDR3 / soldered to systemboard, no sockets
- Intel UHD Graphics 620 or Intel UHD Graphics in processor
- MAX resolution: 5K@60Hz (Thunderbolt); 4K@24Hz (HDMI)

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080) Low Power</td>
<td>IPS Anti-reflection Anti-smudge</td>
<td>400 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080) ThinkPad Privacy Guard</td>
<td>IPS Anti-reflection Anti-smudge</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>WQHD (2560x1440)</td>
<td>IPS Anti-reflection Anti-smudge</td>
<td>300 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>UHD (3840x2160)</td>
<td>IPS Anti-reflection Anti-smudge</td>
<td>500 nits</td>
<td>16:9</td>
<td>1400:1</td>
<td>90%</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

### Multi-touch

- Capacitive-type multi-touch, supports 10-finger gesture, AR (anti-reflection) / AS (anti-smudge) coating
- Could reduce the brightness by up to 10%

### Hinge

- Yoga hinge, 360 degree

### Convert-mode

- Laptop, tent, stand and tablet
- ThinkPad Pen Pro, active pen for multi-touch display, on-board rechargeable

### Storage

- One of the following, configurable by model:
  - **M.2 2280 SSD / SATA 6.0Gb/s**
  - **M.2 2280 SSD / PCIe NVMe 3.0 x 4**
  - **Intel Optane™ Memory H10 with Solid State Storage**
  - **M.2 2280, PCIe NVMe 3.0 x 4**

### Optical

- None

### Ethernet

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)
  - via optional ThinkPad Ethernet Extension Adapter Gen 2

### WLAN

- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L960-GL, MIMO 2x2, M.2 card

### SIM card (opt)

- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Dimensions

- **WxDxH (Privacy Guard):** 12.71" x 8.58" x 0.63"; 323mm x 218mm x 15.95mm
- **WxDxH (other model):** 12.71" x 8.58" x 0.61"; 323mm x 218mm x 15.5mm

### Weight

- Privacy Guard model: starting at 3.24 lb / 1.47 kg
- Other model: starting at 2.99 lb / 1.36 kg

### Case color

- Iron Grey
- Magnesium

### Case material

- Display cover: Aluminum
- Bottom: Magnesium

### Smart card reader

- None

### Media reader

- None

### Ports

- Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 2 / Thunderbolt 3
- with the function of Power Delivery and DisplayPort, HDMI 1.4b, Ethernet extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, side docking connector, security keyhole
- Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Monitor cable

- Bundled Accy
- Optional: Lenovo HDMI to VGA Monitor Adapter
- Optional: ThinkPad Ethernet Extension Adapter Gen 2

### Camera (optional)

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus

### Audio support

- IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus
- HD Audio, Realtek ALC3286 codec / Dolby Atmos™ speaker system, 2W x 2, 0.8 x 2 / four 360° far-field microphones, headphone / microphone combo jack

### Security

- Security chip
- System Mgt (opt)
- Power-on password, hard disk password, supervisor password, security keyhole
- Intel vPro Technology
- Fingerprint reader
- Touch style match on chip fingerprint reader on the palm rest

### NFC (optional)

- Near Field Communication

### Battery

- 45W, 65W, or 65W slim USB-C AC adapter
- Battery life varies significantly with settings, usage, & other factors

### Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty

- 3-year/1-yr battery limited onsite service
- 1-year depot repair service
- 1-year Home 64 or Windows 10 Pro 64

### AC adapter

- 45W, 65W, or 65W slim USB-C AC adapter

### Environment

- EPEAT™ Gold; ENERGY STAR® 7.1; RoHS-compliant

* Depending on many factors, actual data transfer speed may be lower than theoretical speed
* Depending on many factors, actual data transfer speed may be lower than theoretical speed

Note: The specifications above may not be available in all regions.

Lenovo December 2019
## Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-6006U</td>
<td>2</td>
<td>4</td>
<td>2.0 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i3-6100U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i5-6260U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>3.8 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i5-6300U</td>
<td>2</td>
<td>4</td>
<td>2.4 GHz</td>
<td>3.0 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i7-6500U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i7-6600U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
</tbody>
</table>

## Processor (7th Generation Intel Core™ i3 / i5 / i7 Processor)

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7100U</td>
<td>2</td>
<td>4</td>
<td>2.4 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i7-7500U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>3.5 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i7-7600U</td>
<td>2</td>
<td>4</td>
<td>2.8 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

## Graphics
Intel HD Graphics 520 or 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2160@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)

## Chipset
Intel SoC (System on Chip) platform

## Memory

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>16GB max</td>
<td>DDR4-2133 Intel HD Graphics 520</td>
</tr>
</tbody>
</table>

## Display
- **Multi-touch (optional)**
  - On-cell touch, supports 10-finger gesture (FHD 4K only)
- **Storage**
  - System has one SSD slot or one M.2 2280 slot exclusively for storage
  - SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
  - SDD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxGB SSD)
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
  - 128GB M.2 SSD / SATA 6.0Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN and WiGig

## Optical
- None

## Ethernet
- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)

## WLAN
- One of the following, configurable by model (WiGig is mutually exclusive with WWAN):
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1
  - Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1
  - Intel Tri-Band Wireless-AC 18265, WiGig 2.4GHz + Wi-Fi 2x2 802.11ac + BT4.1
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter
- Radio software: Intel 8265ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

## Bluetooth™
- Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

## WWAN (optional)
- One of the following, configurable by model (mutually exclusive with WiGig):
  - Wireless WAN upgradable
  - Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless EM7455)
  - Integrated Mobile Broadband 4G LTE (IMEA only)

## SIM card (optional)
- Micro-SIM card slot, opt Verizon LTE (US) or Lenovo® Connect (EMEA) SIM card

## Dimensions
<table>
<thead>
<tr>
<th>Weight</th>
<th>Models</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.79 lb</td>
<td>No + 3-cell</td>
<td>2.98 lb</td>
</tr>
<tr>
<td>2.98 lb</td>
<td>3-cell + 3-cell</td>
<td>3.33 lb</td>
</tr>
<tr>
<td>3.33 lb</td>
<td>3 + 6-cell</td>
<td>1.52 kg</td>
</tr>
</tbody>
</table>

## Case color
Black

## Case material
Display cover: Glass-Fiber Reinforced Plastic
Bottom: Glass-Fiber Reinforced Plastic

## Smart card reader
Optional: Smart card reader

## Ports
- 4-in-1 reader (MMC, SD, SDHC, SDXC)
- Two USB 3.1 Gen 1 (USB 3.0, one Always On), USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), Dock connector

## Security
- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified

## Security chip
- Intel vPro Technology

## Finger print reader
Optional: Touch style match on chip fingerprint reader on the palm rest

## Multi-touch (optional)
- On-cell touch, supports 10-finger gesture (FHD 4K only)

## Operating system
- One of the following, configurable by model:
  - Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 10 Pro 64
  - Windows 10 Home 64
  - Windows 10 Pro 64

## Limited warranty
- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service

## MIL-Spec test
MIL-STD-810G military testing

## Environment
- EPEAT® Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

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Lenovo
August 2019
## ThinkPad X280 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7020U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i3-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

or 8th Generation Intel Core / i5 / i7 Processor

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
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<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
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</thead>
<tbody>
<tr>
<td>i3-8130U</td>
<td>2</td>
<td>4</td>
<td>2.2 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8350U</td>
<td>4</td>
<td>8</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-7550U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-7650U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor;
- supports external digital monitor via HDMI or USB-C;
- supports three independent displays;
- Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform
- 4GB, 8GB, or 16GB / 2400MHz DDR4 / soldered to systemboard, no sockets
- * 4GB memory is NOT available in US and EMEA
- * System clocks down for processors with lower memory controller

### Display

- **Some:** 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio
- **Some:** 12.5" (317.5mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

### Multi-touch (opt)

- On-cell touch, supports 10-finger gesture (FHD only)
- * FHD non-touch model is NOT available in US

### Storage

- One of the following, configurable by model:
  - M.2 SSD / SATA 6.0Gb/s (e.g. xxxGB SSD M.2)
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxxGB SSD M.2 PCIe NVMe)

### Optical

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)
- via bundled or optional ThinkPad Ethernet Extender Adaptation Gen 2

### WLAN + Bluetooth™

- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- * Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

### WWAN (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE
  - Intel XMM™ 7262 (Fibocom LB30-E8), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A
  - Intel XMM™ 7360 (Fibocom LB50-GL), M.2 card
- * For non-WWAN model, the model is NOT WWAN upgradable

### SIM card (opt)

- Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card

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**Note:** The specifications above may not be available in all regions.

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**Lenovo**

September 2019
## ThinkPad X380 Yoga Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i7-7200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i7-7300U</td>
<td>4</td>
<td>8</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

or 8th Generation Intel Core / i5 / i7 Processor

### Graphics

Intel UHD Graphics 620 in processor only; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

### Chipset

Intel SoC (System on Chip) platform

### Memory

8GB or 16GB / 2400MHz DDR4 / soldered to systemboard, no sockets

### Display

13.3" (337.8mm) FHD (1920x1080), LED backlight, IPS 300 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle, AR (anti-reflection)

### Multi-touch

Capacitive-type multi-touch, AR (anti-reflection), AS (anti-smudge), supports 10-finger gesture

### Hinge

Yoga hinge, 360 degree

### Convert-mode Pen

Laptop, tent, stand, yoga and tablet

### Storage

ThinkPad Pen Pro, active pen for multi-touch display, on-board rechargeable

### Optical

Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via optional ThinkPad Ethernet Extension Cable

### WLAN

Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card Bluetooth 4.2 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

One of the following, configurable by model:

- Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
- Nano-SIM card slot

### SIM card (opt)

None

### Dimensions

WxDxH: 12.34" x 8.75" x 0.72"; 313.5mm x 222.2mm x 18.2mm

### Weight

Starting at 3.17 lb / 1.43kg

### Case color

Black or silver

### Case Material

Carbon-Fiber Hybrid

### Media reader Ports

One microSD card slot (microSD, microSDHC, microSDXC), UHS-I Two USB 3.1 Gen 1 (one Always On), Ethernet extension connector, one USB 3.1 Type-C Gen 2 / Thunderbolt 3 (Power Delivery, DisplayPort, Data transfer), HDMI 1.4b, microSD card reader, nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader

* Depending on many factors, actual data transfer speed may be lower than theoretical speed

### WiGig dock Monitor cable

( optional )

USB-C to VGA: Lenovo USB-C to VGA Plus Power Adapter

USB-C to DP: Lenovo USB-C to DisplayPort Adapter

HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter

### Camera

One of the following, configurable by model:

- 720p: HD720p camera, fixed focus
- IR & 720p: IR camera and HD720p camera, fixed focus

### Audio support

HD Audio, Conexant® CX11771 codec / stereo speakers, 2W x 2 / optional dual array microphone, headphone / microphone combo jack

### Security

Power-on password, hard disk password, supervisor password, security keyhole

### Security chip System Mgt (opt)

Intel vPro Technology

### Fingerprint reader

Optional: Touch style match on chip fingerprint reader on the palm rest

### Battery

Li-Ion 51Wh battery

Max battery life MobileMark® 2014: 13.6 hrs

* Battery life varies significantly with settings, usage, & other factors

### AC adapter

45W or 65W AC adapter (slim tip), 45W or 65W USB Type-C AC adapter

### Light sensor

Ambient Light Sensor

3D accelerometer and 3D magnetometer

3D gyroscope

### Operating system

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty

One of the following, configurable by model:

- 1-year depot repair service
- 1-year depot with 2-year system board service
- 3-year/1-yr battery depot repair service
- 3-year/1-yr battery limited onsite service

### Mil-Spec test

MIL-STD-810G military testing

### Environment

EPEAT™ Gold; ENERGY STAR®; RoHS-compliant

### Lenovo

December 2019
ThinkPad X390 Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-8145U</td>
<td>2</td>
<td>2.1 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>5-8265U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>5-8365U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8565U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8655U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

or 10th Generation Intel Core i5 / i7 Processor (NOT available in EMEA)

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10210U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-10510U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 620 or Intel UHD Graphics in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays;
- Max resolution: 4096x2304 @60Hz (Thunderbolt); 4096x2160 @24Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform
- Memory: 4GB, 8GB, 16GB or 32GB / 2400MHz DDR4 / soldered to systemboard, no sockets
  - * 32GB memory is NOT available for models with 10th Gen processor
  - * Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation

### Display

- Model: 13.3" HD (1366x768) TN Anti-glare 250 nits 16:9 500:1 45% 90°
- Model: 13.3" FHD (1920x1080) IPS Anti-glare 300 nits 16:9 800:1 (non-touch) / 700:1 (multi-touch) 72% 170°
- Model: 13.3" FHD (1920x1080) ThinkPad Privacy Guard IPS Anti-glare 400 nits 16:9 1000:1 72% 178°

### Multi-touch (opt)

- On-cell touch, supports 10-finger gesture (FHD only)

### Storage

- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

### Optical

- None

### Ethernet

- Native Intel Ethernet Connection i219-V (Non-vPro) or i219-LM (vPro) via bundled or optional ThinkPad Ethernet Extension Adapter Gen 2

### WLAN (optional)

- Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
- Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0

### Bluetooth™ (opt)

- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- Wireless WAN upgradable (special bid only in EMEA)
- Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - * For non-WWAN model, it means the model is NOT WWAN upgradable

### SIM card (opt)

- Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified

### Security chip

- Intel vPro Technology
- Fingerprint reader
  - * Optional: Touch style match on chip fingerprint reader on the palm rest

### NFC (optional)

- Near Field Communication

### Battery

- Integrated Li-ion 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- Carbide 1-10: 11.0; PPS 2.85 lb / 1.29 kg; 11.28: 11.69 lb / 5.34 kg; 12.28: 12.69 lb / 5.76 kg
- Battery life varies significantly with settings, usage, & other factors

### AC adapter

- 45W, 65W, or 65W slim USB-C AC adapter

### Operating system

- Windows 10 Home 64 or Windows 10 Pro 64

### Limited warranty (optional)

- 1-year depot repair service
- 1-year limited onsite service
- 3-year/1-year battery depot repair service
- 3-year/1-year battery limited onsite service

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- ENERGY STAR: Gold, ENERGY STAR: 7.1, RoHS-compliant

**Note:** The specifications above may not be available in all regions.

Lenovo
December 2019
**ThinkPad X390 Yoga Platform Specifications**

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8365U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (Thunderbolt); 4096x2160@24Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform

### Memory

- 8GB or 16GB / 2400MHz DDR4 / soldered to systemboard, no sockets
* Installed memory is actually 2933MHz but run at 2400MHz due to Intel limitation

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-reflection</td>
<td>300 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
</tr>
</tbody>
</table>

### Multi-touch

- Capacitive-type multi-touch, supports 10-finger gesture, anti-reflection (AR), AS (anti-smudge), could reduce the brightness by up to 10%

### Hinge

- Yoga hinge, 360 degree

### Pen

- ThinkPad Pen Pro, active pen for multi-touch display, on-board rechargeable

### Storage

- M.2 2280 SSD / SATA 6.0Gb/s
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4

### Optical

- None

### Ethernet

- Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via bundled or optional ThinkPad Ethernet Extension Adapter Gen 2

### WLAN (optional)

- One of the following, configurable by model:
  - Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
  - Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + Bluetooth 5.0
  - Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### Bluetooth™ (opt)

- One of the following, configurable by model:
  - Bluetooth 5.0, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
* For non-WWAN model, it means the model is NOT WWAN upgradable

### SIM card (opt)

- Nano-SIM card slot, optional Verizon LTE (US) SIM card for special bid only

### Operating system

- Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty (optional)

- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year system board repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/3-yr battery depot repair service
  - 3-year/1-yr battery limited onsite service
  - 3-year/3-yr battery limited onsite service

### Mi-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

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**Note:** The specifications above may not be available in all regions.

Lenovo

January 2020
ThinkPad X395 Platform Specifications

Processor:

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
</table>
| Ryzen 3  
Pro 3300U | 4      | 4          | 2.1 GHz     | 3.5 GHz        | 2MB L2 / 4MB L3    | DDR4-2400 | Radeon Vega 6 Graphics |
| Ryzen 5  
Pro 3500U | 4      | 8          | 2.1 GHz     | 3.7 GHz        | 2MB L2 / 4MB L3    | DDR4-2400 | Radeon Vega 8 Graphics |
| Ryzen 7  
Pro 3700U | 4      | 8          | 2.3 GHz     | 4.0 GHz        | 2MB L2 / 4MB L3    | DDR4-2400 | Radeon Vega 10 Graphics |

Graphics:

AMDRadeon Vega 6, Vega 8, or Vega 10 Graphics in processor;
supports external digital monitor via USB-C or HDMI;
supports three independent displays;
Max resolution: 4096x2304@60Hz (USB-C); 4096x2160@24Hz (HDMI)

Chipset:

AMDSoC (System on Chip) platform
8GB or 16GB / 2400MHz DDR4 / soldered to systemboard, no sockets

Display:

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>HD (1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>300:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>800:1 (non-touch)</td>
<td>700:1 (multi-touch)</td>
<td>72%</td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080) + ThinkPad Privacy Guard</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>178°</td>
</tr>
</tbody>
</table>

Multi-touch (opt):

On-cell touch, supports 10-finger gesture (FHD only)

Storage:

M.2 2280 SSD / SATA 6.0Gb/s
M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
None

Optical:

None

Ethernet:

Native Realtek®RTL8153 Gigabit Ethernet connection via bundled or optional ThinkPad Ethernet Extension Adapter Gen 2

WLAN (optional):

Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0

Bluetooth™:

Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

WWAN (optional):

One of the following, configurable by model:

- Wireless WAN upgradeable
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card

SIM card (opt):

Nano-SIM card slot, optional Verizon LTE (US) SIM card

Dimensions:

WxDxH: 12.28" x 8.55" x 0.67"; 311.9mm x 217.2mm x 16.9mm

Weight:

Models | HD / FHD multi-touch | FHD non-touch | FHD Privacy Guard |
--------|----------------------|---------------|------------------|
        | 2.91 lb / 1.32 kg   | 2.82 lb / 1.28 kg | 3.01 lb / 1.37 kg |

Case color:

Black

Case material:

Display cover: PPS/GE; Bottom: Magnesium/Aluminum

Smart card reader:

Optional: Smart card reader

Ports:

MicroSD card reader, in the combo slot with nano-SIM card

Media reader:

One of the following, configurable by model:

- One USB 3.1 Gen 1 (Always On), one USB 3.1 Gen 2, two USB 3.1 Type-C Gen 2
- combo slot of nano-SIM card (WWAN models) and microSD card reader, combo slot of nano-SIM card (WWAN models) and microSD card reader, side docking connector, security keyhole
- Depending on many factors, actual data transfer speed may be lower than theoretical speed

Monitor cable:

HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter
USB-C to VGA: Lenovo USB-C to VGA Adapter

Bundled Accy (optional):

ThinkPad Ethernet Extension Adapter Gen 2

Audio support:

6-row, spill-resistant, multimedia Fn keys, optional LED backlight

Audio:

7.1; RoHS-compliant

Camera (optional):

One of the following, configurable by model:

- HD720p camera with ThinkShutter camera privacy, fixed focus
- HD720p camera with ThinkShutter camera privacy, fixed focus
- HD Audio, Realtek ALC3287 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium / dual array far-field microphone, headphone / microphone combo jack

Keyboard:

Wireless keyboard with 6-row, spill-resistant, multimedia Fn keys, optional LED backlight

TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

Security:

Power-on password, hard disk password, supervisor password, security keyhole

Security chip:

Discrete TPM 2.0, TCG Certified

System Mgt:

DASH Management

Fingerprint reader (optional):

Touch style match on chip fingerprint reader on the palm rest

Audio:

7.1; RoHS-compliant

Audio:

7.1; RoHS-compliant

Battery:

Integrated Li-ion 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

Max battery life:

MobileMark® 2014: 14.5 hr

* Battery life varies significantly with settings, usage, & other factors

AC adapter:

45W or 65W USB Type-C AC adapter

Operating system:

Optional: Windows® 10 Home 64 or Windows 10 Pro 64

Limited warranty:

One of the following, configurable by model:

- 1-year depot repair service
- 3-year/1-yr battery depot repair service
- 3-year/1-yr battery limited onsite service

Mil-Spec test:

MIL-STD-810G military testing

Environment:

EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant

Note: The specifications above may not be available in all regions.

Lenovo
December 2019
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Limited warranty: Support unrelated to a warranty issue may be subject to additional charges.

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- **Depot or Courier Service**: Parts and labor repair coverage where shipping (including packaging) or delivery to the repair center is paid for by Lenovo.
- **Expedited Depot**: Parts and labor coverage with expedited turnaround. Shipping (including packaging) or delivery to the repair center is paid for by Lenovo.
- **Onsite / In-home Service**: Parts and labor repair coverage where labor is provided onsite at your place of business.


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