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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.

March 4, 2020 - Version 556

Additions in this update

► New product(s)
  ThinkPad 11e Yoga Gen 6

► Others
  ThinkPad E14 - spec updated
  ThinkPad E15 - spec updated
  ThinkPad E495 - spec updated
  ThinkPad E590 - spec updated
  ThinkPad E595 - spec updated
  ThinkPad L380 - spec updated
  ThinkPad L380 Yoga - spec updated
  ThinkPad L390 - spec updated
  ThinkPad L390 Yoga - spec updated
  ThinkPad L490 - spec updated
  ThinkPad L590 - spec updated
  ThinkPad T495 - spec updated
  ThinkPad X390 - spec updated
  ThinkPad X395 - spec updated
  ThinkPad Yoga 11e (5th Gen) - spec updated

Withdrawals in this update

► Withdrawn product(s)
  None
### ThinkPad 11e (5th Gen) Platform Specifications

#### Processor
<table>
<thead>
<tr>
<th>Number</th>
<th>Processor</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Burst Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
<th>Graphics</th>
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<tbody>
<tr>
<td>m3-7Y30</td>
<td>7th Generation Intel® Core™ m / i5 Processor, Intel Celeron® processor, or Intel Pentium® Silver processor</td>
<td>2</td>
<td>1.0 GHz</td>
<td>2.6 GHz</td>
<td>4MB</td>
<td>LPDDR3-1866</td>
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<td>DDR4-2400</td>
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<td>2.7 GHz</td>
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<td>Intel UHD Graphics 600</td>
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<td>Pentium Silver N5030</td>
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<td>3.1 GHz</td>
<td>4MB</td>
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</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
<table>
<thead>
<tr>
<th>Size (Width x Height)</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 (Horizontal)</th>
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</thead>
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<tr>
<td>11.6&quot; HD (1366x768)</td>
<td>TN Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>400:1 or 500:1</td>
<td>45%</td>
<td>90°</td>
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<tr>
<td>11.6&quot; HD (1366x768)</td>
<td>IPS 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>

#### Multi-touch (opt)
- Capacitive-type multi-touch, supports 10-finger gesture (HD IPS only, NOT available in EMEA)

#### 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™
- 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 (US only)

#### WWAN
- None

#### SIM card
- None

### Additional Specifications
- **Dimensions**: WxDxH: 11.81" x 8.27" x 0.86"; 300mm x 210mm x 21.9mm
- **Weight**: Starting at 2.99 lb / 1.36 kg
- **Case color**: Black
- **Case material**: Display cover: PC/ABS+GF; Bottom: PC/ABS plastic
- **Smart card reader**: None
- **Media reader**: MicroSD card reader
- **Ports**: Two USB 3.1 Gen 1, 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
- **Camera**: HD720p camera, fixed focus
- **Audio support**: HD Audio, Realtek® ALC3287 codec, stereo speakers, 2W x 2, Dolby® Audio™, mono digital microphone, combo audio/microphone jack
- **Keyboard**: 6-row, spill-resistant, multimedia Fn keys
- **Touchpad**: Buttonless Mylar surface touchpad below keyboard, multi-touch
- **Security chip**: Power-on password, supervisor password, security keyhole
- **Security chip**: Discrete TPM 2.0, TCG Certified
- **Fingerprint reader**: None
- **NFC**: None
- **Battery**: Integrated Li-ion 42Wh battery
- **Max battery life**: MobileMark® 2014: 13.9 hr
- **AC adapter**: 45W or 65W slim tip AC adapter, 45W or 65W USB Type-C AC 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
- **Limited warranty**:
  - One of the following, configurable by model:
    - 1-year depot repair service
    - 3-year/1-yr battery depot repair service
- **Environment**: EPEAT™ Silver; ENERGY STAR® 6.1; RoHS-compliant

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

<table>
<thead>
<tr>
<th>Processor</th>
<th>7th Generation Intel® Core™ m / i5 Processor, Intel Celeron® processor, or Intel Pentium® Silver processor</th>
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</thead>
<tbody>
<tr>
<td><strong>Processor Number</strong></td>
<td><strong># of Cores</strong></td>
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<tr>
<td>i5-7Y54</td>
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<tr>
<td>Celeron N4100</td>
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<td>Celeron N4120</td>
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<td>Pentium Silver N5000</td>
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<td>Pentium Silver N5030</td>
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<table>
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<tr>
<th>Graphics</th>
<th>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)</th>
</tr>
</thead>
</table>

| 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 |
| MultiTouch | Capacitive-type multi-touch, supports 10 fingers |
| Hinge | Yoga hinge, 360 degree |

| Convertible mode | Laptop, tent, stand and tablet |
| Pen (Optional) | • Pen upgradable (with a pen garage ready) |
| | • 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 wireless, integrated in Wi-Fi + Bluetooth combo adapter |

| Bluetooth™ | None |

| WWAN | None |

| Weight | From 3.4 lb / 1.54kg |

| Environment | EPEAT® Gold; ENERGY STAR® 6.1; RoHS-compliant |

| Dimensions | WxDxH: 11.81” x 8.27” x 0.89”; 300mm x 210mm x 22.5mm |

| Smart card reader | None |
| Media reader | MicroSD card reader |
| Ports | 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 |

| Control buttons | Power button, volume control button |

| Camera | One of the following, configurable by model: |
| | • Windows 10 Pro in S mode |
| Preload | • Windows 10 Pro 64 |

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

| Security | Power-on password, hard disk password, supervisor password, security keyhole |
| Security chip | Discrete TPM 2.0, TCG Certified |
| System Mgt | None |
| Fingerprint reader | None |
| NFC | None |

| Battery | Integrated Li-Ion 42Wh battery |
| Max battery life | MobileMark® 2014: 12 hrs |

| 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/1-yr battery depot repair service |

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

<p>| Lenovo | February 2020 |</p>
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<tr>
<th>Processor</th>
<th>10th Generation Intel® Core™ i3 / i5 / i7 Processor</th>
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| i3-10110U | 2
| i5-10210U | 4
| i7-10510U | 8
| i7-10710U | 12

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<th>Discrete Graphics (Memory)</th>
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<td>AMD GeForce 625 (2GB GDDR5)</td>
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<td>AMD Radeon RX 640 Graphics (2GB GDDR5)</td>
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| Chipset Memory | Intel SoC (System on Chip) platform 16GB max / 2666MHz DDR4, one DDR4 SO-DIMM socket |

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<th>Display</th>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
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<tbody>
<tr>
<td>14.0&quot; FHD (1920x1080)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>90°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.0&quot; FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>170°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Multi-touch | None |

<table>
<thead>
<tr>
<th>Storage</th>
<th>Up to two drives (one M.2 SSD and one HDD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• HDD / SATA 6.0Gb/s, 2.5&quot; wide, 7mm high, Active Protection System™</td>
<td></td>
</tr>
<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 or PCIe 3.0 x 4</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>
<tr>
<td>• Intel Optane™ Memory integrated with SSD, PCIe NVMe 3.0 x 4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optane™ memory (optional)</th>
<th>None</th>
</tr>
</thead>
</table>

| Ethernet | Gigabit Ethernet Connection, Realtek 8111GUS |

<table>
<thead>
<tr>
<th>WLAN + Bluetooth™</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Realtek RD8822CE, 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>
<td></td>
</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 | None |
| 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 | 12.8 hr |
| AC adapter | 45W or 65W USB Type-C AC adapter |

<table>
<thead>
<tr>
<th>Operating system (optional)</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Windows® 10 Home 64</td>
<td></td>
</tr>
<tr>
<td>• Windows 10 Pro 64</td>
<td></td>
</tr>
<tr>
<td>• Windows 10 Pro in S mode</td>
<td></td>
</tr>
<tr>
<td>• No OS</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limited warranty (optional)</th>
<th>1-year mail-in repair service</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>
</tbody>
</table>

| 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.

February 2020
### Processor
<table>
<thead>
<tr>
<th>Number</th>
<th>Cores</th>
<th>Threads</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>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>6MB</td>
<td></td>
<td>Discrete Graphics (Memory)</td>
</tr>
<tr>
<td>i7-10710U</td>
<td>6</td>
<td>12</td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>8MB</td>
<td></td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* i7-10710U is NOT available in EMEA

**Processor 10th Generation Intel® Core™ i3 / i5 / i7 Processor

Note: The specifications above may not be available in all regions. Lenovo February 2020

### Graphics
- Integrated Graphics
- Discrete Graphics (Memory)

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

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

### Display
<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contract Ratio</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6” 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>
</tr>
<tr>
<td>15.6” 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>
</tr>
</tbody>
</table>

### Multi-touch
- Multi-touch: Limited warranty (optional)
- Touch style fingerprint reader on power button
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

### 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 / PCle NVMe, PCIe 3.0 x 2 or PCle 3.0 x 4
  - M.2 2280 SSD / PCle NVMe, PCIe 3.0 x 4
  - Intel Optane™ Memory H10 with Solid State Storage, M.2 2280, PCle NVMe 3.0 x 4

### Optane™ memory (optional)
- Intel Optane memory, PCle NVMe, PCIe 3.0 x 2
- Intel Optane™ Memory integrated with SSD, PCle NVMe 3.0 x 4

### Ethernet
- Gigabit Ethernet Connection, Realtek R8111GUS

### WLAN + Bluetooth™
- One of the following, configurable by model:
  - 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

### Security
- Security chip: Integrated model: discrete TPM 2.0, TCG Certified
- Security chip: Discrete model: firmware TPM 2.0 integrated in chipset

### Battery
- Battery: Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter
- Max battery life: MobileMark® 2014: 12.2 hr

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

### Limited warranty (optional)
- 1-year mail-in repair service
- 1-year depot repair service
- 1-year depot with 2-year system board repair service

### 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.
ThinkPad E480 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>i3-7020U</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</td>
<td>3.1 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>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>i7-8550U</td>
<td>8</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>

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>1.6 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>1.8 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 displays;
- 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)
- **Some:** HDD / SATA 6.0Gb/s, 2.5” wide, removable, upgradable, Active Protection System™
- **Some:** M.2 SSD / PCIe NVMe

### Optical

- **Optane™ memory**: Optional!
- **Intel Optane memory, PCle NVMe, PCle 3.0 x 2**
- **Optical**: None

### Ethernet

- Gigabit Ethernet Connection, Realtek R8111GUS

### WLAN + Bluetooth™

- One of the following, configurable by model:
  * RealtekRTL8821CE, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
  * Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
  * 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

### 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

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

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

### Weight

- Starting at 3.87 lb / 1.75kg

### Case color

- Black or silver

### Case material

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

### Memory

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

### Keyboard

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

### Audio support

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

### 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

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip (opt):
  * Firmware TPM 2.0 integrated in chipset or discrete TPM 2.0 TCG Certified
  * None

### Fingerprint reader (opt)

- Touch style fingerprint reader on the palm rest
- 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**: 13.51 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

### 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 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>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 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

### Display

- **Size / Resolution**: 14.0" FHD (1920x1080) Antiglare TN 220 nits 16:9 400:1 90° Non-touch
- **Refresh Rate**: 60Hz
- **Aspect Ratio**: 16:9
- **Contrast Ratio**: 400:1
- **Viewing Angle**: 90°
- **Multi-touch**: Non-touch

### 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

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

### 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, M2 card
- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M2 card

### WWAN

None

### SIM card

None

### 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

### 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

### 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

### 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

One of the following, configurable by model:

- 1-year mail-in repair service
- 1-year depot repair service
- 1-year 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 E490s 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>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>1</td>
<td>1.8 GHz</td>
<td>4.5 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graphics**

- Intel UHD Graphics 620 in processor only or
- Intel UHD Graphics 620 in processor and AMD Radeon RX 540X Graphics, 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@24Hz (HDMI)

**Chipset**

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

**Memory**

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

**Display**

- 14.0" FHD (1920x1080) Anti-glare TN 220 nits 16:9 400:1 90° Non-touch
- 14.0" FHD (1920x1080) Anti-glare IPS 250 nits 16:9 600:1 170° Non-touch

**Storage**

- One of the following, configurable by model:
  - M.2 2280 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

**Camera**

- HD720p camera, fixed focus

**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**

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

**Battery**

- Integrated Li-ion 42Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

**Max battery life**

- MobileMark® 2014: 11.5 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**

- 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
September 2019
### 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</td>
<td>L2 / 4MB L3</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</td>
<td>L2 / 4MB L3</td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 3700U</td>
<td>8</td>
<td>16</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB</td>
<td>L2 / 4MB L3</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 Memory** AMD SoC (System on Chip) platform 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

**Display**

<table>
<thead>
<tr>
<th>Size / Resolution</th>
<th>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>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>400:1</td>
<td>90°</td>
<td>Non-touch</td>
</tr>
<tr>
<td>14.0” FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</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 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

**Camera** HD720p camera, fixed focus

**Audio support** HD Audio, Synaptic 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

**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

**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.
## ThinkPad E580 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>
<th>System clocks down for processors with lower memory controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7020U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3 MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i3-7130U</td>
<td>1</td>
<td>2</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3 MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i5-7260U</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3 MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
</tbody>
</table>

* i3-7130U is NOT available in US and EMEA

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

### Memory

- * 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, upgradable, Active Protection System™
- Some: M.2 SSD / PCIe NVMe

### Optical

- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- None

### Ethernet

- Gigabit Ethernet Connection, Realtek R8111GUS

### Storage

- One of the following, configurable by model:
  - Realtek® RTL8821CE, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
  - 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

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

### Environment

- EPEAT® Gold (US only); ENERGY STAR® 6.1; RoHS-compliant
<table>
<thead>
<tr>
<th>Processor 8th Generation Intel® Core™ i3 / i5 / i7 Processor</th>
<th>Dimensions</th>
<th>WxDxH: 14.53&quot; x 9.94&quot; x 0.78&quot;;</th>
<th>Weight</th>
<th>Starting at 4.68 lb / 2.12 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td># of Cores</td>
<td>Base Frequency</td>
<td>Max Turbo Frequency</td>
<td>Cache</td>
</tr>
<tr>
<td>Number</td>
<td>Threads</td>
<td>GHz</td>
<td>GHz</td>
<td>MB</td>
</tr>
<tr>
<td>i3-8145U</td>
<td>2</td>
<td>2.1</td>
<td>3.9</td>
<td>4MB</td>
</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>1.6</td>
<td>3.9</td>
<td>6MB</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>8</td>
<td>1.8</td>
<td>4.6</td>
<td>8MB</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel UHD Graphics 620 in processor only or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intel UHD Graphics 620 in processor and</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| | and supports external digital monitor via HDMI or USB Type-C; | | | | | | *
| | supports dual independent display; | | | | | | *
| | Max resolution: 4096x2304@60Hz (USB Type-C); | | | | | | *
| | 4096x2160@24Hz (HDMI) | | | | | | *
| Display | Size / Resolution | Type | Surface | Brightness | Aspect Ratio | Contrast Ratio | Viewing Angle | Multi-touch |
| 15.6" HD (1366x768) | TN | Anti-glare | 220 nits | 16:9 | 400:1 | 90° | Non-touch |
| 15.6" FHD (1920x1080) | IPS | Anti-glare | 250 nits | 16:9 | 600:1 | 170° | Non-touch |
| Multi-touch | None | | | | | | |
| Storage | Up to two drives (one M.2 SSD and one HDD): | | | | | | |
| | • HDD / SATA 6.0Gbps, 2.5" wide, 7mm high, Active Protection System™ | | | | | | |
| | • M.2 2280 SSD / SATA 6.0Gbps | | | | | | |
| | • M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2 | | | | | | |
| | • M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4 | | | | | | |
| | * Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation | | | | | | |
| Optane™ memory | Optional: | | | | | | |
| 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 | | | | | | |
| Note: The specifications above may not be available in all regions. Lenovo February 2020
# ThinkPad E595 Platform Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<th>AMD Ryzen™ Mobile Processors with Radeon™ Vega Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Processor</td>
</tr>
<tr>
<td>3200U</td>
<td>Ryzen 3</td>
</tr>
<tr>
<td>3500U</td>
<td>Ryzen 5</td>
</tr>
<tr>
<td>3700U</td>
<td>Ryzen 7</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*

<table>
<thead>
<tr>
<th>Display</th>
<th>Size / Resolution</th>
<th>Type</th>
<th>Surface</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&quot; HD (1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>90°</td>
<td>Non-touch</td>
<td></td>
</tr>
<tr>
<td>15.6&quot; FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>600:1</td>
<td>170°</td>
<td>Non-touch</td>
<td></td>
</tr>
</tbody>
</table>

| Multi-touch | None |

<table>
<thead>
<tr>
<th>Storage</th>
<th>Up to two drives (one M.2 SSD and one HDD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDD / SATA 6.0Gb/s, 2.5&quot; wide, 7mm high, Active Protection System™</td>
<td></td>
</tr>
<tr>
<td>M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2 or PCIe 3.0 x 4</td>
<td></td>
</tr>
<tr>
<td>M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4</td>
<td></td>
</tr>
</tbody>
</table>

| Optical | Gigabit Ethernet Connection, Realtek R8111GUS |

<table>
<thead>
<tr>
<th>WWAN</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM card</td>
<td>None</td>
</tr>
</tbody>
</table>

| WWAN | None |

| Ethernet | Gigabit Ethernet Connection, Realtek R8111GUS |

<table>
<thead>
<tr>
<th>WLAN + Bluetooth™</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card</td>
<td></td>
</tr>
<tr>
<td>Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card</td>
<td></td>
</tr>
</tbody>
</table>

| 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 mail-in repair service</td>
<td></td>
</tr>
<tr>
<td>1-year depot repair service</td>
<td></td>
</tr>
<tr>
<td>1-year limited onsite service</td>
<td></td>
</tr>
</tbody>
</table>

| 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 L13 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>i3-10110U</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>8</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics in processor; supports external digital monitor via HDMI or USB Type-C.
- 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

<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>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3”</td>
<td>HD (1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>90°</td>
</tr>
<tr>
<td>13.3”</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits (non-touch) / 300 nits (multi-touch)</td>
<td>16:9</td>
<td>800:1 (non-touch) / 700:1 (multi-touch)</td>
<td>170°</td>
</tr>
</tbody>
</table>

### Multi-touch (optional)

- 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 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™

- One of the following, configurable by model:
  - Intel Wireless-AC 9560, 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 (NOT available until May 2020)

### WWAN

- SIM card
  - None

### SIM card

- None

### Dimensions

<table>
<thead>
<tr>
<th>Weight</th>
<th>12.26” x 8.62” x 0.69”</th>
<th>311.5mm x 219mm x 17.6mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Starting</td>
<td>3.06 lb / 1.38 kg</td>
<td></td>
</tr>
</tbody>
</table>

### Case color

- Black or Silver

### Case material

- Display cover: Aluminum
- Bottom: GFRP

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

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**Lenovo**

December 2019
## 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>1.8 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td>Intel UHD Graphics</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>Intel UHD Graphics</td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

Intel UHD Graphics in processors; 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" FHD (1920x1080)
- **Resolution**: IPS Anti-reflection
- **Brightness**: 300 nits
- **Aspect Ratio**: 16:9
- **Contrast Ratio**: 800:1
- **Color Gamut**: 72%
- **Viewing Angle**: 170°

### Storage

One of the following, configurable by model:
- M.2 2242 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, 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

One of the following, configurable by model:
- Intel Wireless-AC 9560, 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 (NOT available until May 2020)

### WWAN

None

### SIM card

None

### Dimensions

<table>
<thead>
<tr>
<th>Width x Depth x Height</th>
<th>Weight</th>
<th>Case color</th>
<th>Case material</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.26&quot; x 8.62&quot; x 0.69&quot;</td>
<td>311.5mm x 219mm x 17.6mm</td>
<td>Black or Silver</td>
<td>Display cover: Magnesium / Aluminum Bottom: GFRP</td>
</tr>
</tbody>
</table>

### Weight

Starting at 3.17lb / 1.43kg

### Security

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

### Security chip

Discrete TPM 2.0, TCG Certified

### System Mgt (opt)

Intel vPro Technology

### Fingerprint reader

Optional: Touch style fingerprint reader on the palm rest

### Battery

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

### Warranty

- **3-year/1-yr battery limited onsite service**
- **3-year/1-yr battery depot repair service**
- **1-year + 2-year depot repair service**
- **1-year depot repair service**

### Light sensor

None

### Gyroscope

None

### Operating system

<table>
<thead>
<tr>
<th>Windows 10 Home 64</th>
<th>Windows 10 Pro 64</th>
<th>Windows 10 Pro in S mode</th>
</tr>
</thead>
</table>

### Limitation

<table>
<thead>
<tr>
<th>1-year depot repair service</th>
<th>1-year depot with 2-year system board repair service</th>
<th>1-year + 2-year depot repair service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year limited onsite service</td>
<td>3-year/1yr battery depot repair service</td>
<td>3-year/1yr battery limited onsite service</td>
</tr>
</tbody>
</table>

### 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 L380 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>Cel 3965U</td>
<td>2</td>
<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
</tr>
<tr>
<td>i3-7020U</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>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>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>8th Generation Intel Core i5 / i7 Processor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

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 Memory

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: 13.3” (338mm) HD (1366x768), anti-glare, LED backlight, 250 nits, 16:9 aspect ratio, 500:1 contrast ratio
Some: 13.3” (338mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

### Multi-touch

On-cell touch, supports 10-finger gesture

### 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 optional ThinkPad Ethernet Extension Cable

### WLAN + Bluetooth

- 11ac, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- Intel 8265ac card supports B14.2 but is limited to B14.1 by Windows OS

### WWAN

None

### SIM card

None

### Memory

### Chipset

- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- Intel 8265ac card supports B14.2 but is limited to B14.1 by Windows OS

### 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
- 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
- Optional: ThinkPad Ethernet Extension Cable

### Monitor cable

Optional:
- 3-year/1-yr battery limited onsite service
- 1-year + 2-year limited onsite service
- 1-year depot repair service
- 1-year + 2-year limited onsite service
- 3-year/1-yr battery limited onsite service

### 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

### Security chip

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

### Security

- Intel vPro Technology
- Discrete TPM 2.0, TCG Certified
- Power-on password, hard disk password, supervisor password, security keyhole
- Anti-spoofing technology
- Security keyhole

### 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
- * 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 depot repair service
- 1-year depot with 2-year system board repair service
- 1-year + 2-year depot repair service
- 1-year + 2-year limited onsite 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.

Lenovo
February 2020
### 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>i3-7020U</td>
<td>2</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>3.3 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>8</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>
</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>
</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@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

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

#### Display
- 13.3" (338mm) FHD (1920x1080), LED backlight, IPS, 300 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle, AR (anti-reflection)
- Capacitive-type multi-touch, AR (anti-reflection), supports 10-finger gesture
- Yoga hinge, 360 degree Convert-mode Pen
- ThinkPad Pen Pro, active pen for multi-touch display, on-board garage

#### 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)
- None

#### Optical
- None

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

#### WLAN + Bluetooth™
- 11ac, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
- 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
- None

#### SIM card
- None

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

#### Video
- Rear camera, 5MP resolution, auto focus
- World facing: Rear camera, 5MP resolution, auto focus
- IR & 720p: up to 2014:
- HDMI to VGA: Lenovo USB-C to VGA Adapter
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter

#### Security
- Intel vPro Technology
- Discrete TPM 2.0, TCG Certified
- Power-on password, hard disk password, supervisor password, security keyhole
- Anti-spoofing technology
- Optional: Touch style fingerprint reader on the keyboard bezel, near Field Communication

#### Battery
- Integrated Li-Ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- Max battery life: 12.85 hrs
- MobileMark® 2014: 12.85 hrs

#### AC adapter
- 45W or 65W USB Type-C AC adapter
- Battery life varies significantly with settings, usage, & other factors

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

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

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

---

**Dimensions**
- WxHxD: 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

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

**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
- 10 Home 64 or Windows 10 Pro 64

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

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February 2020
## ThinkPad L390 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>Cel 4305U</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 610</td>
</tr>
<tr>
<td>i3-8145U</td>
<td>2</td>
<td>4</td>
<td>1</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>4</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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 (USB Type-C); 4096x2160@30Hz (HDMI)

### Chipset

Intel SoC (System on Chip) platform (optional)

### 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</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
<th>Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>HD (1366x768)</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>90°</td>
<td>Intel R6</td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1 (non-touch)</td>
<td>170°</td>
<td>Intel R6</td>
</tr>
</tbody>
</table>

### Multi-touch (optional)

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

### Storage

One of the following, configurable by model:
- M.2 2280 SSD / SATA 6.00Gb/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, PCle 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

### USB

USB-C to USB-C Cable 2m:
- Lenovo USB-C to USB-C Cable 2m
- Lenovo USB-C to USB-A Adapter
- Lenovo USB-C to HDMI Adapter
- Lenovo USB-C to DisplayPort Adapter
- Lenovo USB-C to Ethernet Adapter
- Lenovo USB-A to Adapter

### Optional Accessories

USB-C to USB-C Cable 2m:
- Lenovo USB-C to USB-C Cable 2m

### Camera

HD720p 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

### Security chip

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

### Security

Discrete TPM 2.0, TCG Certified

### System Mgl (optional)

Intel vPro Technology

### Operating system

Windows 10 Home 64 or Windows 10 Pro 64

### 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*

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

### Environment

EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant
## ThinkPad L390 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>i3-8145U</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>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>4.1 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>1.8 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: 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

### 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 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
  - None

### 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

- 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: Aluminum / Magnesium
- 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

### Keyboard

- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
  - Dual array microphone, headphone / microphone combo jack

### Security

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

### 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: * Depending on many factors, actual data transfer speed may be lower than theoretical speed
- * Battery life varies significantly with settings, usage, & other factors
- 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

- ENERGY STAR® 7.1; RoHS-compliant

### Note

The specifications above may not be available in all regions.
## ThinkPad L480 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</th>
<th>Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cel 3965U</td>
<td>2</td>
<td></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>i3-7020U</td>
<td>4</td>
<td></td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i3-7130U</td>
<td>4</td>
<td></td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i5-7200U</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
<tr>
<td>i5-7300U</td>
<td>4</td>
<td>8</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
<td></td>
</tr>
</tbody>
</table>

* i3-7130U IS NOT available in US and EMEA

### Graphics

<table>
<thead>
<tr>
<th>Processor</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel HD Graphics 610 / 620</td>
<td>DDR4-2133</td>
<td></td>
</tr>
<tr>
<td>Intel UHD Graphics 620</td>
<td>DDR4-2400</td>
<td></td>
</tr>
</tbody>
</table>

### Chipset

<table>
<thead>
<tr>
<th>Memory</th>
<th>Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel SoC (System on Chip) platform</td>
<td>DDR4-2133</td>
</tr>
</tbody>
</table>

### Display

<table>
<thead>
<tr>
<th>Display</th>
<th>Multi-touch (opt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some: 14.0” (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio</td>
<td>On-cell touch, supports 10-finger gesture (FHD only)</td>
</tr>
<tr>
<td>Some: 14.0” (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle</td>
<td></td>
</tr>
</tbody>
</table>

### Storage

<table>
<thead>
<tr>
<th>Storage</th>
<th>Optical</th>
</tr>
</thead>
<tbody>
<tr>
<td>System has one HDD slot or one M.2 2280 slot exclusively for storage</td>
<td>None</td>
</tr>
</tbody>
</table>

### Optical

<table>
<thead>
<tr>
<th>Ethernet</th>
<th>WLan + Bluetooth™ (optional)</th>
<th>Operating system</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>One of the following, configurable by model:</td>
<td>Optional: Windows® 10 Home 64 or Windows 10 Pro 64</td>
</tr>
</tbody>
</table>

### SIM card (opt)

<table>
<thead>
<tr>
<th>SIM card (opt)</th>
<th>WWAN (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of the following, configurable by model:</td>
<td></td>
</tr>
<tr>
<td>* Wireless WAN upgradable</td>
<td></td>
</tr>
<tr>
<td>* Integrated Mobile Broadband 4G LTE, Intel XMM™ 7262 (Fibocam L830-EB), M.2 card (EEMA only)</td>
<td></td>
</tr>
<tr>
<td>* Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocam L850-GL), M.2 card</td>
<td></td>
</tr>
</tbody>
</table>

### Security chip

<table>
<thead>
<tr>
<th>Security chip</th>
<th>vPro (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power-on password, hard disk password, supervisor password, security keyhole</td>
<td>Intel vPro Technology</td>
</tr>
</tbody>
</table>

### Battery

<table>
<thead>
<tr>
<th>Battery</th>
<th>Max battery life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter</td>
<td>MobileMark® 2014: 12.2 hr</td>
</tr>
</tbody>
</table>

### Case material

<table>
<thead>
<tr>
<th>Case material</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC/ABS plastic</td>
<td>Starting at 3.71 lb / 1.68 kg</td>
</tr>
</tbody>
</table>

### Operating system

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Limited warranty (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional: Windows® 10 Home 64 or Windows 10 Pro 64</td>
<td>One of the following, configurable by model:</td>
</tr>
</tbody>
</table>

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

Lenovo
November 2019
## ThinkPad L490 Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th>Core</th>
<th>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>-</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 610</td>
</tr>
<tr>
<td>5-8114U</td>
<td>4</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>5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-8365U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<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></td>
<td></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></td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

- Intel UHD Graphics 610 or 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon 535s, 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
- 64GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- Installed memory is actually 2666MHz 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>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot; HD</td>
<td>(1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>14.0&quot; FHD</td>
<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>
</tr>
</tbody>
</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
- 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
- None

### Ethernet

- Non-vPro model: Intel Ethernet Connection I219-V (Jacksonville)
- vPro model: Intel Ethernet Connection I219-LM (Jacksonville)
- Lenovo Unixx MEGACARD 2000 (optional)
- Lenovo Ethernet Card I211-AM (optional)
- One of the following, configurable by model:
  - Intel Ethernet Connection I219-V (Jacksonville)
  - Intel Ethernet Connection I219-LM (Jacksonville)
  - Intel i219-TL (Jacksonville)

### WLAN

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

### WWAN

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

### Sim card

- None

### 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
  - 1-year limited onsite service
  - 1-year + 2-year depot repair service
  - 1-year + 2-year limited onsite service
  - 3-year/1-year depot repair service

### 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 L580 Platform Specifications

**Processor**

- **Intel® Celeron® Processor, 7th Generation Intel Core™ i3 / i5 Processor or**
- **Processor Number**
  - Cel 3965U
  - 3-7020U
  - 3-7130U
  - 5-7200U
  - 5-7300U
- **# of Cores**
  - 2
  - 4
  - 4
  - 4
- **Threads**
  - 2
  - 4
  - 4
  - 4
- **Base Frequency**
  - 2.2 GHz
  - 2.3 GHz
  - 2.7 GHz
  - 2.5 GHz
  - 2.6 GHz
- **Max Turbo Frequency**
  - -
  - 3 GHz
  - 3.1 GHz
  - 3.1 GHz
  - 3.5 GHz
- **Cache**
  - 2MB
  - 3MB
  - 3MB
  - 3MB
  - 3MB
- **Memory Types**
  - DDR4-2133
  - DDR4-2400
- **Processor Graphics**
  - Intel HD Graphics 610
  - Intel HD Graphics 620

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

**Display**

- Some: 15.6" (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle

**Multi-touch**

- None

**Storage**

- System has one SSD slot or one M.2 2280 slot exclusively for storage
- Some: SSD / 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
- * 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 (special bid only)
  - 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

**Dimensions**

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

**Weight**

- Starting at 4.46 lb / 2.0 kg

**Case color**

- Black

**Case material**

- PC/ABS plastic

**ExpressCard**

- None

**Smart card reader**

- Optional: Smart card reader

**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 (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

**Camera (optional)**

- HD720p camera, fixed focus

**Audio support**

- HD Audio, Realtek ALC3287 codec /
- Stereo speakers, 2x 2. DollyAudio™ /
- dual array microphone, headphone / microphone combo jack

**Keyboard**

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

**Security chip**

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

**Fingerprint reader**

- Optional: Touch style match on chip fingerprint reader on the palm rest, anti-spoofing 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: 12 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
  - 1-year depot with 2-year system board repair service
  - 1-year + 2-year depot repair service
  - 1-year + 2-year limited onsite service
  - 3-year/1-yr battery limited onsite 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 Property Rights**

February 2020

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

**Processor**

<table>
<thead>
<tr>
<th>Processor Type</th>
<th>Number</th>
<th>Core</th>
<th>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>Intel Celeron Processor</td>
<td>4305U</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td>2.4 GHz</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 610</td>
</tr>
<tr>
<td>Intel Celeron Processor</td>
<td>8258U</td>
<td>2</td>
<td>2</td>
<td>1.7 GHz</td>
<td>2.4 GHz</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>Intel Core i3-8130U</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2.4 GHz</td>
<td>4.0 GHz</td>
<td>4MB</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Intel Core i5-8265U</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2133</td>
<td></td>
</tr>
<tr>
<td>Intel Core i7-8565U</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td></td>
</tr>
</tbody>
</table>

**Memory**

- Installed memory is actually 2666MHz but run at 2133MHz or 2400MHz due to Intel limitation.

**Chipset**

Intel SoC (System on Chip) platform.

**Display**

- 15.6" HD (1366x768) TN Anti-glare 220 nits 16:9 500:1 45° 90°
- 15.6" 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 Gb/s, 2.5" wide, 7mm high. Active Protection System™
- SSD / SATA 6 Gb/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

**Optane™ memory (opt)**

- Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- M.2 2280 SSD supports M.2 SSD adapter limitation

**Ethernet**

- Intel Ethernet Connection 2121-V (Jacksonville)
- Intel Ethernet Connection 2121-MA (Jacksonville)

**WLAN + Bluetooth™ (optional)**

- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card (NOT available in EMEA)
- Intel Wireless-AC 8260, 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 upgradeable (special bid only in EMEA)
- Integrated Mobile Broadband 4G LTE-A, 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**

- 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 / 2.03 kg

**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), 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

**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**

- One of the following, configurable by model:
  - 6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight
  - TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

**Camera (optional)**

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

**Audio support**

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

**Keyboard**

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

**Security**

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

**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)
- MobileMark® 2014: 12 hr

**Max battery life**

- 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
  - 1-year depot with 2-year system board repair service
  - 1-year limited onsite service
  - 1-year + 2-year depot repair service
  - 1-year + 2-year limited onsite 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**

- ENERGY STAR®, Silver

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

February 2020
### 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>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Generation Intel® Core™ i5 / i7 Processor or Intel Xeon® E Processor</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<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>DDR4-2666</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>DDR4-2666</td>
<td>Intel UHD Graphics 630</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>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
</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
- 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-glare, 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
- M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s

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

#### WWAN
- None

#### Dimensions
- WxDxH (non-touch): 14.24” x 9.67” x 0.72”
- WxDxH (multi-touch): 14.24” x 9.67” x 0.74”
- 361.8mm x 245.7mm x 18.4mm

#### Weight
- Non-touch model: starting at 3.76 lb / 1.7 kg
- Multi-touch model: starting at 4.06 lb / 1.8 kg

#### Case color
- Black

#### Case material
- Display cover: CFRP/GFRP hybrid
- Bottom: Aluminum alloy

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 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>
<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>i7-9850H</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>i9-9880H</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 in processor only or Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro T1000 or T2000, 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
- 64GB max / 2666MHz DDR4, ECC or non-ECC (ECC function supported only on Xeon processor), dual-channel capable, two 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; FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-gare</td>
<td>300 nits</td>
<td>16:9</td>
<td>72% NTSC</td>
<td>170°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.6&quot; FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-gare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>72% NTSC</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>15.6&quot; UHD (3840x2160)</td>
<td>IPS</td>
<td>Anti-gare</td>
<td>300 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100% Adobe</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>15.6&quot; UHD (3840x2160)</td>
<td>OLED</td>
<td>Anti-reflection / Anti-smudge</td>
<td>SDR 400nit, HDR 300nit (peak)</td>
<td>16:9</td>
<td>10000:1</td>
<td>100% DCI-P3</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

### Pen (optional)

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

### 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)

<table>
<thead>
<tr>
<th>RAID support</th>
<th>None</th>
</tr>
</thead>
</table>

### Optical 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

### Environment

- EPEAT Silver; ENERGY STAR 7.1; RoHS-compliant

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

Lenovo

November 2019
ThinkPad P43s Platform Specifications

Product Specifications Reference (PSREF)

Processor
8th Generation Intel® Core™ 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>i5-8350U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8650U</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

Display
Size Resolution Type Surface Brightness Aspect Ratio Contrast Ratio Color Gamut Viewing Angle
14.0” FHD (1920x1080) IPS Anti-glare 250 nits (non-touch) 300 nits (multi-touch) 16:9 700:1 45% 170°
14.0” FHD (1920x1080) Low Power IPS Anti-glare 400 nits 16:9 800:1 72% 170°
14.0” FHD (2560x1440) IPS Anti-glare 400 nits 16:9 1000:1 72% 170°

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

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

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

Multi-touch (opt)
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

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

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 LB30-EB, M.2 card (EMEA only)

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

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

Lenovo
November 2019
### Processor

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

<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>
</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>
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<tr>
<td>E3-1505M v4</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 P530</td>
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<tr>
<td>i7-7700HQ</td>
<td>4</td>
<td>8</td>
<td>2.8 GHz</td>
<td>3.8 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics 630</td>
</tr>
<tr>
<td>E3-1505M v6</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>
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<tr>
<td>i7-7820HQ</td>
<td>4</td>
<td>8</td>
<td>3.1 GHz</td>
<td>4.2 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics 630</td>
</tr>
</tbody>
</table>

**Chipset**

Mobile Intel CM238 Chipset

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

* System clocks down for processors with lower memory controller

**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); 4096x2160@24Hz (HDMI)

**Chipset**

Mobile Intel CM238 Chipset

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

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# ThinkPad P52 Platform Specifications

**Product Specifications Reference (PSREF)**

## Processor
8th Generation Intel® Core™ i7 / i9 Processor or Intel Xeon® E 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></td>
<td></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>i9-8950HK</td>
<td></td>
<td></td>
<td>2.9 GHz</td>
<td>4.8 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>E-2176M</td>
<td></td>
<td></td>
<td>2.7 GHz</td>
<td>4.4 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
</tr>
</tbody>
</table>

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

## 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

## 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 4, 32Gb/s

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

## RAID (optional)
RAID 0/1 support

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

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

## Bluetooth™
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

## Weight
14.86" x 9.93" x 1.02-1.21"; 377.4mm x 252.3mm x 25.8-30.7mm

## Case color
Non-touch model: starting at 5.4 lb / 2.45kg
Multi-touch model: starting at 6.4 lb / 2.9kg

## 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

## 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 Fn keys, numeric keypad, LED backlight

## UltraNav™
3-button TrackPoint® pointing device and 3-button Mylar surface multi-touch touchpad

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

## Security chip
vPro (optional)

## Fingerprint reader
Touch style match on chip fingerprint reader on the palm rest

## Color calibration
None

## NFC (optional)
Near Field Communication

## Battery
Swappable Li-ion 90Wh battery

## Max battery life
Discrete mode: 6.1 hr; Hybrid mode: 8.9 hr

## AC adapter
170W 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-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

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># of Threads</th>
<th>Base Frequency</th>
<th>Turbo Frequency</th>
<th>Cache</th>
<th>Processor Graphics</th>
<th>Memory Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Generation Intel® Core™ i5 / i7 Processor</td>
<td>8</td>
<td>8</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>Intel UHD Graphics 620</td>
<td>DDR4-2400</td>
</tr>
<tr>
<td>5-8350U</td>
<td>4</td>
<td></td>
<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-8550U</td>
<td>4</td>
<td></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
- Intel Ethernet Connection I219-LM (Jacksonville)
- Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

#### 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

#### 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

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

#### Ethernet

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

#### SIM card (optional)

- NANO-SIM card slot, optional Verizon LTE (US) SIM card
- Lenovo USB-C to DisplayPort Adapter
- Lenovo HDMI to VGA Monitor Adapter
- Lenovo USB-C to DisplayPort Adapter

### Dimensions

- WxDxH: 14.40" x 9.95" x 0.79-0.80"
- 365.8mm x 252.8mm x 19.95-20.2mm

### Weight

- Starting at 4.39 lb / 1.99 kg

### Case color

- Black

### Case material

- **Display cover:** GFRP + PPS; Bottom: GFRP

### Media reader

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

### Ports

- Two USB 3.1 Gen 1 (one Alway On), one USB 3.1 Type-C Gen 2 (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

### Camera (optional)

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

### Audio support

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

### Security

- Security chip
- Security chip: Intel vPro Technology
- Security chip: Intel vPro Technology
- Security chip: Discrete TPM 2.0, TCG Certified

### Security (optional)

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

### Keyboard

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

### Battery

- Optional integrated Li-ion 32Wh battery and swappable Li-ion 24Wh, 48Wh, or 72Wh battery
- **Max battery life:**
  - **MobileMark® 2014**
    - Models 48Wh: 12.2 hr
    - 72Wh: 18.5 hr
    - 32Wh + 24Wh: 13.5 hr
    - 32Wh + 48Wh: 20.1 hr
    - 32Wh + 72Wh: 26.3 hr

### 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
  - 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

### Environment

- EPEAT® Silver; ENERGY STAR® 6.1; RoHS-compliant
### ThinkPad P53 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>i5-9400H</td>
<td>4</td>
<td>2.5 GHz</td>
<td>4.3 GHz</td>
<td>8 MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>i7-9750H</td>
<td>8</td>
<td>2.6 GHz</td>
<td>4.5 GHz</td>
<td>12 MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>i7-9750H</td>
<td>8</td>
<td>2.6 GHz</td>
<td>4.5 GHz</td>
<td>12 MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>i9-9980H</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.8 GHz</td>
<td>16 MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>E-2276M</td>
<td>6</td>
<td>2.8 GHz</td>
<td>4.7 GHz</td>
<td>12 MB</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

**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>DCI-P3 GAMUT</th>
<th>View Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot;</td>
<td>FHD (201x1080)</td>
<td>IPS 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>QUADRO® T1000 (4GB GDDR5)</td>
<td>IPS 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 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 Anti-glare</td>
<td>100000:1</td>
<td>16.9</td>
<td>100%</td>
<td>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
- 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, PCIe 3.0 x 4
  - *HDD is only available for T1000 and T2000 graphics model

**Optane™ memory (optional)**

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

**RAID (optional)**

- RAID 0/1/5 support

**Optical**

- None

**Ethernet**

- Non-vPro model: Intel Ethernet Connection i219-V (Jacksonville)
- vPro model: Intel Ethernet Connection i219-LM (Jacksonville)

**Wi-Fi (optional)**

- Intel Wi-Fi 6 AX200, Wi-Fi 2x2 802.11ax + 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-A, Fibocom L850-GL, M.2 card

**SIM card (optional)**

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

**Dimensions**

- WxDxH (non-touch): 14.86"x9.93"x0.96-1.16"; 377.4mm x 252.3mm x 24.5-29.4mm
- WxDxH (multi-touch): 14.86"x9.93"x1.02-1.21"; 377.4mm x 252.3mm x 28.8-30.7mm

**Weight**

- Non-touch model: starting at 5.51 lb / 2.5 kg;
- Multi-touch model: starting at 6.4 lb / 2.9 kg

**Case color**

- Black

**Smart card reader**

- Optional: Smart card reader

**Media reader**

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

**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

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

**Keyboard**

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

**Security**

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

**Fingerprint reader**

- Touch style match-on-chip fingerprint reader on the palm rest

**Color calibration**

- X-Rite Pantone factory color calibration (UHD model only)

**NFC (optional)**

- Near Field Communication

**Battery**

- Integrated Li-ion 90Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- Discrete mode: 8 hr;
- Hybrid mode: 13 hr

**AC adapter**

- 170W or 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 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

**Military Specifications**

- MIL-STD-810G military testing

**Environmental**

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

Note: The specifications above may not be available in all regions.
## 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>8</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>8</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td></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

- 8GB max / 2400MHz DDR4, dual-channel capable;
- DDR4-2400, supports external digital monitor via HDMI or USB Type-C;
- Supports single sided M.2 2280 drives only;
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### 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&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>Dolby Vision HDR</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100% Adobe</td>
<td>170°</td>
</tr>
</tbody>
</table>

### Multi-touch (opt)

- 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;
- Supports external digital monitor via HDMI or USB Type-C;
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### 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 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;

### 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
  - HD Audio, Realtek ALC3287 codec / microphone combo jack

### Audio support

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

### Security

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

### Security chip

- Discrete TPM 2.0, TCG Certified;

### System Mgt (opt)

- Intel vPro Technology;

### Monitor cable (optional)

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

### Bundled Accy (optional)

- None;

### Keyboard

- 6-row, spill-resistant, multimedia Fn keys, numeric keypad, 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

- Discrete TPM 2.0, TCG Certified;

### System Mgt (opt)

- Intel vPro Technology;

### Finger print 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);

### Max battery life

- MobileMark® 2014: 15 hr (FHD model) / 10 hr (UHD model);

### 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;

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

Lenovo
November 2019
## ThinkPad P72 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>7-8750H</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>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 630</td>
</tr>
<tr>
<td>E-2186M</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 630</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: 3840x2160@60Hz (DisplayPort via Mini DisplayPort cable): 5120x2880@90Hz (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

- None
- None

### 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)

- RAIDs 0/1 support
- 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, M.2 card
- Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN

- None

### SIM card

- None

---

### Dimensions

- **WxHxD:** 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

### Case color

- Black

### Case material

- **Display cover:** GFRP + PPS: Bottom: Magnesium/Aluminum

### Smart card reader

- Optional: Smart card reader

### Media reader

- None

### 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
**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>
<td>2.3 GHz</td>
<td>4.8 GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics P630</td>
</tr>
<tr>
<td>i7-9880H</td>
<td>8</td>
<td>16</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>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 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)

### Chipset

- Mobile Intel CM246 Chipset
- Intel UHD (3840x2160) Memory

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
<th>Type</th>
<th>Surface</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>17.3&quot; FHD</td>
<td>IPS Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>72%</td>
<td>160°</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>100%</td>
<td>100%</td>
<td>170°</td>
</tr>
</tbody>
</table>

### 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)
- 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 (optional)

- None

### SIM card

- None

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip
  - vPro (optional)
  - Intel vPro Technology
- Fingerprint reader
  - Touch style match on chip fingerprint reader on the palm rest
- Color calibration
  - Optional: X-Rite Pantone factory color calibration (UHD model only)
- NFC (optional)
  - Near Field Communication
- Battery
  - Integrated Li-ion 99Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

### 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

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

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**Lenovo November 2019**
### Processor Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<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></td>
<td>2.3 GHz</td>
<td>3.4 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 520 or 620 in processor only.
- 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.

### 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, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio.
- Some: 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 120° viewing angle.

### Storage

- System has one SSD slot or one M.2 2280 slot exclusively for storage.
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Action Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. x8GB 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)
- vPro model: Intel Ethernet Connection i219-LM (Jacksonville)

### WLAN

- One of the following, configurable by model (WiGiG can coexist with WWAN): Reackle™ RTL8822BE, 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 Dual Band Wireless-AC 9265, 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 upgradable
  - 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 (optional)

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

### Dimensions

- Weight: WxDxH: 13.25" x 9.15" x 0.79"; 336.6mm x 232.5mm x 19.95mm

### Case color

- Black

### Case material

- Display cover: Hybrid magnesium or PP; 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 (optional)

- ThinkPad WiGig dock

### Monitor cable

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

### Camera

- Camera (optional): 720p: HD720p resolution, fixed focus
- IR & 720p: IR camera and HD720p camera (mutually exclusive with WiGig)

### Audio support

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

### Keyboard

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

### Security

- Security chip vPro (optional): Power-on password, hard disk password, supervisor password, security keyhole
- Security chip vPro Technology
- Fingerprint reader: Intel vPro Technology
- Near Field Communication

### Internal battery

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

### External battery

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

### AC adapter

- Battery life varies significantly with settings, usage, & other factors: 45W or 65W 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
  - 1-year depot with 2-year system board repair service
  - 1-year limited onsite 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
**ThinkPad T470s Platform Specifications**

**Product Specifications Reference (PSREF)**

**Lenovo**

**April 2019**

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### Processor

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

<table>
<thead>
<tr>
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**or 7th Generation Intel Core i5 / i7 Processor**

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<td>DDR4-2133</td>
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<td>5-7300U</td>
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<td>7-7600U</td>
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<td>3.9 GHz</td>
<td>4MB</td>
<td></td>
<td></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

**Memory**

- Intel SoC (System on Chip) platform;
- 2GB or 4GB max / 2400MHz DDR4, dual-channel capable;
- 4GB or 8GB memory soldered to systemboard, one DDR4 SO-DIMM socket

### 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) QHD (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 (OPT)

- 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)

### 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)
- None

### Optical

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

### Ethernet

- 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 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter
  - * Intel 8260ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

### 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 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter
  - * Intel 8260ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

### Bluetooth

- One of the following, configurable by model (with or without WiGig):
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE-A, Qualcomm Snapdragon XM7 LTE-A (Sierra Wireless EM7455), M.2 card
  - Micro-SIM card slot, opt Verizon LTE (US) or Lenovo Connect (EMEA) SIM card

### 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

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**Lenovo**

**April 2019**
### Processor

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</table>

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

<table>
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<tr>
<td>7-8550U</td>
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<td>Intel UHD Graphics 620</td>
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</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 i7 models in EMEA); supports external display 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

* System locks down for processors with lower memory controller

### Display

**Some:** 14.0” (355mm) HD (1366x768), anti-glare, LED backlight, 170° viewing angle

**Some:** 14.0” (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

**Some:** 14.0” (355mm) 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 (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 4

**Some:** 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, in WWAN slot as 2nd Storage, mutually exclusive with WWAN

**Installed M.2 SSD is PCIe 3.0 x 2 but run at PCIe 3.0 x 4 due to M.2 SSD adapter limitation**

### Optical

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)

### 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™ 76xx (Fibocom L830-EB), M.2 card (EAME only)
- Integrated Mobile Broadband 4G LTE-A
- Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

**SIM card (opt)**

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

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

### Camera

HD720p camera with ThinkShutter camera privacy, fixed focus

IR camera and HD720p camera, fixed focus

Discrete Camera 2.0, TCG Certified

Intel vPro Technology

Discrete TPM 2.0, TCG Certified

### Security chip

Fingerprint reader (optional): Touch style match on chip fingerprint reader on the keyboard bezel, anti-spoofing technology

NFC (optional): Near Field Communication

### Battery

Optimized lithium-ion 24Wh battery

Optimized Lithium-Ion 48Wh battery

Integrated battery

Discrete battery

* Battery life varies significantly with usage, & other factors

45W or 65W USB Type-C AC adapter

### AC adapter

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 limited onsite service
- 3-year/3-yr battery limited onsite service

### 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 limited onsite service
- 3-year/3-yr battery limited onsite service

### Additional Features

Lenovo vPro Technology

Discrete TPM 2.0, TCG Certified

Intel vPro Technology

Discrete TPM 2.0, TCG Certified

Intel vPro Technology

Discrete TPM 2.0, TCG Certified

### Lenovo USB-C to DisplayPort Adapter

Lenovo HDMI to VGA Monitor Adapter

### Lenovo USB-C to DP

Lenovo USB-C to DisplayPort Adapter

### Intel SoC (System on Chip) platform

Integrated Magnesium

Integrated PPS

Discrete Magnesium

Discrete PPS

### Product Specifications Reference (PSREF)

ThinkPad T480 Platform Specifications

December 2019
### ThinkPad T480s Platform Specifications

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#### 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
- 20GB or 24GB max / 2400MHz DDR4, dual-channel capable, 4GB or 8GB memory soldered to systemboard, one DDR4 SO-DIMM socket
- * 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, 170° viewing angle, supports ThinkPad Privacy Guard on some models
- **Some**: 14.0” (355mm) 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-Y (Jacksonville)
- **vPro model**: Intel Ethernet Connection I219-LM (Jacksonville)
- **Non-vPro model**: Intel’s Ethernet Connection I219-Y (Jacksonville)
- **vPro model**: Intel’s Ethernet Connection I219-LM (Jacksonville)
- **Non-vPro model**: One of the following, configurable by model:
  - Wireless WAN upgradeable
  - 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
- **vPro model**: One of the following, configurable by model:
  - Wireless WAN upgradeable
  - 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

#### WAN (optional)

- **One of the following, configurable by model:**
  - Wireless WAN
  - Integrated Mobile Broadband 4G LTE
  - Integrated Mobile Broadband 4G LTE-A

#### SIM card (opt)

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

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

### Lenovo

February 2020
## ThinkPad T490 Platform Specifications

**Product Specifications Reference (PSREF)**

**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>8-8256U</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</td>
</tr>
<tr>
<td>8-8365U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics</td>
</tr>
<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</td>
</tr>
<tr>
<td>7-8665U</td>
<td>6</td>
<td>12</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics</td>
</tr>
</tbody>
</table>

**or 10th Generation Intel i5 / i7 Processor (NOT available in EMEA)**

<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>5-1021U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.2 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>7-1051U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.9 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>7-1071U</td>
<td>6</td>
<td>12</td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics</td>
</tr>
</tbody>
</table>

**Graphics**

- Intel UHD Graphics 620 or Intel UHD Graphics in processor 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 Memory**

- 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>Brightness</th>
<th>Aspect Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0“ HD</td>
<td>(1366x768)</td>
<td>TN Anti-glare</td>
<td>220 nits</td>
<td>400:1</td>
<td>45%</td>
</tr>
<tr>
<td>14.0“ FHD</td>
<td>(1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits (multi-touch)</td>
<td>1000:1</td>
<td>72%</td>
</tr>
<tr>
<td>14.0“ FHD</td>
<td>(1920x1080)</td>
<td>IPS Anti-glare</td>
<td>400 nits (multi-touch)</td>
<td>1000:1</td>
<td>72%</td>
</tr>
<tr>
<td>14.0“ WQHD (2560x1440)</td>
<td>IPS Glossy</td>
<td>500 nits</td>
<td>1500:1</td>
<td>100%</td>
<td>Adobe 170°</td>
</tr>
</tbody>
</table>

**Multi-touch (opt)**

- On-cell touch, supports 10-finger gesture (FHD only)
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed*

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

**Optical**

- Ethernet: None
- 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:
  - 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

**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
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L860-GL, MIIM, 4x4, M.2 card

**SIM card (opt)**

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

---

**Dimensions**

<table>
<thead>
<tr>
<th>Weight</th>
<th>Models</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>3.37 lb / 1.53 kg</td>
<td>3.41 lb / 1.55 kg</td>
</tr>
<tr>
<td>FHD</td>
<td>3.23 lb / 1.46 kg</td>
<td>3.56 lb / 1.61 kg</td>
</tr>
</tbody>
</table>

**Weight Low Power / WQHD**

- Windows 10 Home 64 (optional)
- Windows 10 Pro 64 (optional)

**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
  - 1-year limited onsite service
  - 3-year/1-year battery depot repair service
  - 1-year + 2-year/1-year battery limited onsite service
  - 3-year/1-year battery limited onsite service

**Environmental**

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

**Lenovo February 2020**

Note: The specifications above may not be available in all regions.
**ThinkPad T490 Secure Access / Healthcare Edition Platform Specifications**

Product Specifications Reference (PSREF)

**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>4.1 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 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**

4GB max / 2400MHz DDR4, dual-channel capable, 8GB or 16GB memory soldered to system board, one DDR4 SO-DIMM socket

* Installed memory is actually 2986MHz 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; 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>
<td></td>
</tr>
<tr>
<td>14.0&quot; IPS Anti-glare</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>
<td></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 2980, 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, Intel Wireless-AC 9560, supported by Intel 1.85 GHz 4x4 2x2 Wi-Fi + 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:

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

**SIM card (optional)**

None

**Smart card reader**

None

**RFID reader**

RFID reader supporting RFID / NFC

**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

**Monitor cable (optional)**

* 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
- HD camera and HD720p camera with ThinkShutter camera privacy, fixed focus
- HD Audio, Realtek® ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium

**Audio support**

- Microphone far-field microphone, headphone / microphone combo jack
- microphone far-field microphone, headphone / microphone combo jack

**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)

Max battery life

MobileMark® 2014: 16.11 hr

* 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 Pro

**Limited warranty (optional)**

- 1-year depot repair service
- 1-year depot with 2-year system board repair service
- 1-year limited onsite service
- 3-year/1-yr battery depot repair service
- 1-year + 2-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

**Mil-Spec test**

MIL-STD-810G military testing

**Environment**

EPEAT Silver; ENERGY STAR® 7.1; RoHS-compliant

**Dimensions**

<table>
<thead>
<tr>
<th>Weight</th>
<th>Models</th>
<th>Privacy Guard</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.41 lb / 1.55 kg</td>
<td>FHD</td>
<td>None</td>
</tr>
<tr>
<td>3.56 lb / 1.61 kg</td>
<td>Privacy Guard</td>
<td>None</td>
</tr>
</tbody>
</table>

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

Lenovo

February 2020
## ThinkPad T490s Platform Specifications

### Product Specifications Reference (PSREF)

#### Processor
- **8th Generation Intel® Core™ i5 / i7 Processor**
  - Processor Number
  - # of Cores
  - # of Threads
  - 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>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 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>4.1 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>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8665U</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;
- 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*

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

### Display
- **Size**
- **Resolution**
- **Type**
- **Surface**
- **Brightness**
- **Aspect Ratio**
- **Contrast Ratio**
- **Color Gamut**
- **Viewing Angle**

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
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</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot; FHD</td>
<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits (non-touch)</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot; FHD</td>
<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits (multi-touch)</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot; FHD</td>
<td>(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>14.0&quot; WQHD</td>
<td>(2560x1440)</td>
<td>IPS</td>
<td>Glossy</td>
<td>500 nits</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 upgradeable
  - 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 (opt)
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

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

### Weight
- **Models**
  - Black with FHD
  - Black with FHD Low Power / WQHD / Privacy Guard
  - Silver

<table>
<thead>
<tr>
<th>Case color</th>
<th>Case material</th>
<th>Display cover</th>
<th>Smart card reader</th>
<th>Media reader</th>
<th>Ports</th>
<th>Camera</th>
<th>Audio support</th>
<th>Security</th>
<th>Security chip</th>
<th>Fingerprint reader</th>
<th>Battery</th>
<th>Max battery life</th>
<th>Operating system</th>
<th>Limited warranty</th>
<th>MIL-Spec test</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Silver</td>
<td>CFRP Hybrid</td>
<td>Optional: Smart card reader</td>
<td>MicroSD card reader</td>
<td>Two USB 3.1 Gen 1</td>
<td>(one Always On), one USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of PD &amp; DP), HDMI 1.4b, Ethernet extension connector, nano-SIM card slot (WWAN models), headset / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole, <em>Depending on many factors, actual data transfer speed may be lower than theoretical speed</em></td>
<td>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</td>
<td>Power-on password, hard disk password, supervisor password, security keyhole, Discrete TPM 2.0, TCG Certified</td>
<td>Intel vPro Technology</td>
<td>Optional: Touch touch match on chip fingerprint reader on the palm rest</td>
<td>Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter</td>
<td>45W, 65W, or 65W slim USB-C AC adapter</td>
<td>Optional: Windows® 10 Home 64 or Windows 10 Pro 64</td>
<td>One-year depot repair service</td>
<td>MIL-STD-810G military testing</td>
<td>ENERGY STAR® 7.1; RoHS-compliant</td>
</tr>
</tbody>
</table>

### Bundled Accy
- 45W, 65W, or 65W slim USB-C AC adapter
- Lenovo USB-C to DisplayPort Adapter
- Lenovo USB-C to VGA Adapter

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

### Security
- None
- **Environment**
  - EPEAT
  - Mil-Spec test
  - RoHS-compliant

**Note:** The specifications above may not be available in all regions.
### 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 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 Graphics</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 Graphics</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 Graphics</td>
</tr>
</tbody>
</table>

### Graphics

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

- 14.0" FHD (1920x1080) IPS Anti-glare
- 250 nits (non-touch)
- 300 nits (multi-touch)
- 400 nits
- 16:9
- 700:1
- 45%
- 170°

### 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

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

### Bluetooth

- One of the following, configurable by model:
  - 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

### 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

### Camera

- One of the following, configurable by model:
  - HD 720p 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® Audio™ Premium /
  - dual array far-field microphone (optional for special bid model),
  - headphone / microphone combo jack

### Audio

- Stereo speakers, 2W x 2, Dolby

### 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
- Security chip
- System Mgt
- Fingerprint reader

### Battery

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

### AC adapter

- One of the following, configurable by model:
  - MobileMark® 2014: 13.4 hr
  - Battery life varies significantly with settings, usage, & other factors

### 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 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

### 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.
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 Graphics</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 Graphics</td>
</tr>
</tbody>
</table>

Graphics

AMDRadeon 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 8GBor 16GB/2400MHzDDR4/soldered to systemboard, nosockets

Display

- 14.0" FHD(1920x1080): IPS Anti-glare 250 nits (non-touch) 300 nits (multi-touch) 16.9 700:1 45% 170°
- 14.0" FHD(1920x1080): Low Power IPS Anti-glare 400 nits 16.9 800:1 72% 170°
- 14.0" FHD(1920x1080): ThinkPad Privacy Guard IPS Anti-glare 400 nits 16.9 1000:1 72% 170°

Multi-touch (opt)

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

Storage

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

Optical

None

Ethernet

RealtekRTL8111EPV Gigabit Ethernet connection

WLAN (optional)

IntelWireless-AC9260, 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 upgradable
- Integrated Mobile Broadband 4G LTE-A, FibocomL850-GL, M.2 card

SIM card (opt)

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

Dimensions

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

Smart card reader

Optional: Smart card reader

Media reader

MicroSD card reader

Ports

OneUSB 3.1 Gen 1 (Always On), oneUSB 3.1 Gen 2, twoUSB 3.1 Type-C Gen 2 (w/ the function of Power Delivery and DisplayPort 1.4), 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

Monitor cable (optional)

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

Bundled Accy

Optional:
- ThinkPad Ethernet Extension Adapter Gen 2

Audio support

HD Audio, Realtek ALC3287 codec / ALC3235 codec
- HD Audio, Realtek ALC3287 codec / ALC3235 codec:
- HD Audio, Realtek ALC3287 codec / ALC3235 codec:
- HD Audio, Realtek ALC3287 codec / ALC3235 codec:
- HD Audio, Realtek ALC3287 codec / ALC3235 codec:

Audio

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 / optional dual array far-field 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 with ThinkShutter camera privacy, fixed focus

HD Audio, Realtek ALC3287 codec / stereo speakers, 1W x 2, Dolby Audio™ Premium / optional dual array far-field 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 match on chip fingerprint reader on the palm rest

Finger stype match on chip fingerprint reader on the palm rest

Battery

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

Max 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 (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-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.

February 2020
## 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>i5-8350U</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>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>

**Specifications**

- Base Frequency: The minimum frequency at which the processor can operate.
- Max Turbo Frequency: The maximum frequency the processor can reach.
- Cache: The amount of data that is temporarily stored between the processor and main memory.
- Memory Types: The types of memory the processor can support.
- Processor Graphics: The integrated graphics processing unit.

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

---

### 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 at 60Hz (USB Type-C); 4096x2160 at 30Hz (HDMI)

### Chipset

- Intel SoC (System on Chip) platform.
- Dual-channel capable, two DDR4 SO-DIMM sockets.
- * System clocked down for processors with lower memory controller.

**Display**

- On-cell touch, supports 10-finger gesture (FHD only).
- Multi-touch (opt)
- Security chip
- Security keyhole
- Active Protection System
- On-off switch
- Security lock slot
- Discrete model: starting at 4.29 lb / 1.95 kg
- Integrated model: starting at 4.39 lb / 1.99 kg

### 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

### 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
- Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

### WWAN (optional)

- One of the following, configurable by model:
  - MobileMark® 2014
  - Battery life varies significantly with settings, usage, & other factors

### Battery

- Optional integrated Li-ion 32Wh battery and external Li-ion 24Wh, 48Wh, or 72Wh 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, 13.6 hr, 20.3 hr, 26.1 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 (optional)

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

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT® Silver; ENERGY STAR® 6.1; RoHS-compliant
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># 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>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>i5-8565U</td>
<td>6</td>
<td>8</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>
<tr>
<td>i7-8565U</td>
<td>8</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 or Intel UHD Graphics 620 in processor and 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

<table>
<thead>
<tr>
<th>Size/Type</th>
<th>Resolution (inches)</th>
<th>Display 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; FHD</td>
<td>(1920x1080)</td>
<td>IPS Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>15.6&quot; UHD</td>
<td>(3840x2160)</td>
<td>HDR, Dolby Vision™ IPS Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100% Adobe</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
- M.2 2280 SSD / PCIe NVMe, PCIe 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 (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 Nano-SIM card slot, optional Verizon LTE (US) SIM card

Dimensions WxHxD: 14.40" x 9.76" x 0.75"; 365.8mm x 248mm x 19.1mm

Weight FHD model: 3.87 lb / 1.75 kg;
UHD model: 3.86 lb / 1.75 kg

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

Monitor cable (optional) USB-C to VGA: Lenovo USB-C to VGA Adapter
USB-C to DP: Lenovo USB-C to DisplayPort Adapter (NOT available in EMEA)

Bundled Accy 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® Audio™ Premium / dual array far-field microphone (optional for special bid model), headphone / microphone combo jack

Keyboard 6-row, spill-resistant, multimedia Fn keys, numeric keypad, 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

System Mgt (opt) Intel vPro Technology

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

Near Field Communication

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

Max battery life MobileMark® 2014: 14.98 hr (9.5 hr for UHD model with discrete graphics)

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

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

Mi-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 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>
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<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>
<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>LPDDR3-2133</td>
<td>Intel UHD 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>
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<tbody>
<tr>
<td>i5-8500U</td>
<td>4</td>
<td>8</td>
<td>1.7 GHz</td>
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<td>6MB</td>
<td>LPDDR3-1866</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>LPDDR3-2133</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>LPDDR3-2133</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 Type-C; supports three independent displays; Max resolution: 5120x2880@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

Chipset

Intel SoC (System on Chip) platform

Memory

8GB or 16GB / 2133MHz LPDDR3 / soldered to system board, 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, 72% gamut, 170° viewing angle
- 14.0" (355mm) QHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle
- 14.0" (355mm) HDR WQHD (2560x1440) with Dolby Vision™, glossy, LED backlight, IPS, 500 nits, 16:9 aspect ratio, 1500:1 contrast ratio, 100% gamut, 170° viewing angle

Multi-touch (opt)

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

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™

One of the following, configurable by model:
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card (special bid only)

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

WWAN (optional)

Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocorn LB50-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

Dimensions

WxDxH: 12.74" x 8.55" x 0.63"; 323.55mm x 217.11mm x 15.95mm

Weight

Starting at 2.49 lb / 1.13 kg

Case color

Black or Silver (silver case is NOT available in EMEA)

Case material

Display cover: CFRP/GFPR hybrid; Bottom: magnesium alloy / PPS hybrid

Smart card reader

None

Media reader

MicroSD card reader, supports UHS-II

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, 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

Optional: ThinkPad Ethernet Extension Adapter Gen 2

Camera (optional)

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

Audio support

HD Audio, Realtek® ALC3286 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack, Dolby® Atmos™ via headphones

Keyboard

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

* TrackPoint® pointing device and buttonless glass surface multi-touch touchpad

Security chip

vPro (optional)

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

Security

Discrete TPM 2.0, TCG Certified

Fingerprint reader

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 (charge up to 80% in 1hr) with 65W AC adapter

Max battery life

MobileMark® 2014: 19.3 hr

AC adapter

45W, 45W Low Halogen, 65W, or 65W Low Halogen 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
- 3-year/3-yr battery limited onsite service

Mi-Spec test

MIL-STD-810G military testing

Environment

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

Lenovo

February 2020
## 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>i7-8665U</td>
<td>4</td>
<td>8</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>
</tbody>
</table>

or 10th Generation Intel Core i5 / i7 Processor (NOT available in EMEA)

<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>i5-10210U</td>
<td>4</td>
<td>8</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>i7-10510U</td>
<td>6</td>
<td>12</td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>LPDDR3-2133</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 / 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

### 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-reflection</td>
<td>300 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</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>
<tr>
<td>14.0&quot;</td>
<td>WQHD (2560x1440)</td>
<td>IPS Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>UHD (3840x2160)</td>
<td>IPS Glossy</td>
<td>500 nits</td>
<td>16:9</td>
<td>1400:1</td>
<td>90%</td>
<td>170°</td>
</tr>
</tbody>
</table>

### 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 + Bluetooth™

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 and NOT available in AP)

### 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 (optional)

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

### Weight

WxDxH (other model): 12.72" x 8.54" x 0.59"; 323mm x 217mm x 14.95mm

### Case material

- 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
- 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, Realetix® ALC3266 codec / Dolby® Atmos™ speaker system, 2W x 2, 0.8 x 2 / four 360° far-field microphones, headphone / microphone combo jack
- Audio support: One of the following, configurable by model:
  - Power-on password, supervisor password, security keyhole
  - Security chip: Discrete TPM 2.0, TCG Certified
  - System Mgl (optional): Intel vPro Technology
  - Finger print reader: Touch style match on chip fingerprint reader on the palm rest
- Battery: Integrated Li-ion 51Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter
- Max battery life: 10 Home 64 or Windows 10 Pro 64

Limited warranty:

- 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; ENERGY STAR® 7.1; RoHS-compliant
**ThinkPad X1 Extreme Platform Specifications**

<table>
<thead>
<tr>
<th>Processor 8th Generation Intel® Core™ i5 / i7 Processor</th>
<th>Media reader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Number</td>
<td>Media reader</td>
</tr>
<tr>
<td>8th Generation Intel® Core™ i5 / i7 Processor</td>
<td>SD Card reader (SD, SDHC, SDXC), supports UHS-II SD card</td>
</tr>
<tr>
<td>Processor Number</td>
<td>Ports</td>
</tr>
<tr>
<td># of Cores</td>
<td>Ports</td>
</tr>
<tr>
<td># of Threads</td>
<td>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</td>
</tr>
<tr>
<td>Base Frequency</td>
<td>* Power Delivery only supports power-out for charging peripherals</td>
</tr>
<tr>
<td>Max Turbo Frequency</td>
<td>* Depending on many factors, actual data transfer speed may be lower than theoretical speed</td>
</tr>
<tr>
<td>Types</td>
<td>HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter</td>
</tr>
<tr>
<td>Cache</td>
<td>USB-C to DP*: Lenovo USB-C to DisplayPort Adapter</td>
</tr>
<tr>
<td>Memory</td>
<td>Optional: ThinkPad Ethernet Extension Cable</td>
</tr>
<tr>
<td>Graphics Intel UHD Graphics 630</td>
<td>Camera (optional)</td>
</tr>
<tr>
<td>Intel UHD Graphics 630</td>
<td>One of the following, configurable by model:</td>
</tr>
<tr>
<td>Chipset Mobile Intel CM246 Chipset</td>
<td>Fault tolerant power management for extended compute sessions</td>
</tr>
<tr>
<td>Memory Mobile Intel CM246 Chipset</td>
<td>Intel vPro Technology</td>
</tr>
<tr>
<td>64GB max / 2666MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets</td>
<td>Intel vPro Technology</td>
</tr>
<tr>
<td>Display Mobile Intel CM246 Chipset</td>
<td>Integrated Li-ion 80Wh battery, supports Rapid Charge (charge up to 80% in 1hr)</td>
</tr>
<tr>
<td>Some: 15.6&quot; (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle</td>
<td>Discrete mode: 9.5 hr; Hybrid mode: 14.9 hr</td>
</tr>
<tr>
<td>Some: 15.6&quot; (396mm) HDR UHD (3840x2160) with Dolby Vision™, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1200:1 contrast ratio, 100% gamut, 170° viewing angle, multi-touch, anti-reflection (AR)</td>
<td>Battery life varies significantly with settings, usage, &amp; other factors</td>
</tr>
<tr>
<td>Multi-touch (optional)</td>
<td>135W slim tip AC adapter</td>
</tr>
<tr>
<td>Pen (optional) Lenovo Pen Pro (special bid only)</td>
<td>Operating system Optional: Windows® 10 Home 64 or Windows 10 Pro 64</td>
</tr>
<tr>
<td>Storage Up to 2 drives (two M.2 SSD)</td>
<td>Limited warranty (optional) One of the following, configurable by model:</td>
</tr>
<tr>
<td>RAID (optional) RAID 0/1 support None</td>
<td>1-year depot repair service</td>
</tr>
<tr>
<td>Optical</td>
<td>Security</td>
</tr>
<tr>
<td>Ethernet Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via bundled or optional ThinkPad Ethernet Extension Cable</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>WLAN Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card</td>
<td>Intel vPro Technology</td>
</tr>
<tr>
<td>Bluetooth™ Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>WWAN None</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>SIM card None</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>Dimensions WxDxH (non-touch): 14.24&quot; x 9.67&quot; x 0.72&quot;; WxDxH (multi-touch): 14.24&quot; x 9.67&quot; x 0.74&quot;</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>Weight Case color Black</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>Case material Display cover: CFRP/GFRP hybrid; Bottom: Aluminum alloy</td>
<td>Security chip vPro (optional)</td>
</tr>
<tr>
<td>Operating system Optional: Windows® 10 Home 64 or Windows 10 Pro 64</td>
<td>Limited warranty (optional) One of the following, configurable by model:</td>
</tr>
<tr>
<td>Power</td>
<td>1-year depot repair service</td>
</tr>
<tr>
<td>Ports</td>
<td>Limited warranty (optional) One of the following, configurable by model:</td>
</tr>
<tr>
<td>Media reader</td>
<td>1-year depot repair service</td>
</tr>
<tr>
<td>Battery</td>
<td>Limited warranty (optional) One of the following, configurable by model:</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3-year/1-yr battery depot repair service</td>
</tr>
<tr>
<td>Weight</td>
<td>135W slim tip AC adapter</td>
</tr>
<tr>
<td>Case color</td>
<td>Limited warranty (optional) One of the following, configurable by model:</td>
</tr>
<tr>
<td>Case material</td>
<td>3-year/1-yr battery limited onsite service</td>
</tr>
<tr>
<td>Display cover: CFRP/GFRP hybrid; Bottom: Aluminum alloy</td>
<td>MIL-Spec test MIL-STD-810G military testing</td>
</tr>
<tr>
<td>Environment EPEAT™ Gold (US only); ENERGY STAR® 7.0; RoHS-compliant</td>
<td>MIL-Spec test MIL-STD-810G military testing</td>
</tr>
</tbody>
</table>

Note: The specifications above may not be available in all regions.
ThinkPad X1 Extreme (2nd 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>Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-9300H</td>
<td>4</td>
<td>8</td>
<td>2.4 GHz</td>
<td>4.1 GHz</td>
<td>8MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<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>
<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>i7-9850H</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>i9-9880H</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>
</tbody>
</table>

Graphics

- Intel UHD Graphics 630 in processor and NVIDIA GeForce GTX 1650 Max-Q, 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

Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution 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>72% NTSC</td>
<td>170°</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% NTSC</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% Adobe</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>OLED</td>
<td>Anti-reflection</td>
<td>400nit</td>
<td>16:9</td>
<td>100000:1</td>
<td>100% DCi-P3</td>
</tr>
</tbody>
</table>

Multi-touch (optional)

- 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 0/1 support
- Optional: NVMe up to 3.0 x 4

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

- None

SIM card

- None

Dimensions

<table>
<thead>
<tr>
<th>WxDxH (non-touch)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.24&quot; x 9.67&quot; x 0.72&quot;</td>
<td>361.8mm x 245.7mm x 18.4mm</td>
</tr>
<tr>
<td>WxDxH (multi-touch)</td>
<td>14.24&quot; x 9.67&quot; x 0.74&quot;</td>
</tr>
</tbody>
</table>

Case color

- Non-touch model: Black paint (FHD model) or black weave (UHD model)
- Multi-touch model: starting at 4.0 lb / 1.81 kg

Case material

- Display cover: CFPR/GFPR 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

Monitor cable (optional)

- 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

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, Synaptic CX11880 codec / stereo speakers, 2W x 2, Dolby Audio Premium / optional dual 360° far-field microphone, headphone / microphone combo jack, Dolby Atmos sound system

Keyboard

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

Security

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

Security chip

- System Mgt (optional)
  - Intel vPro Technology
  - Discrete TPM 2.0, TCG Certified

Fingerprint reader (optional)

- Touch style match on chip fingerprint reader on the keyboard bezel

Color calibration (optional)

- 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

AC adapter

- 135W slim tip 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-st battery depot repair service
  - 3-year/1-year battery limited onsite service

Mi-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.
<table>
<thead>
<tr>
<th>Processor 7th Generation Intel® Core™ i5 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Number</td>
</tr>
<tr>
<td>i5-7300U</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8th Generation Intel Core i5 / i7 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Number</td>
</tr>
<tr>
<td>i5-8250U</td>
</tr>
<tr>
<td>i5-8500U</td>
</tr>
<tr>
<td>i7-8650U</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) |

<table>
<thead>
<tr>
<th>Chipset Memory</th>
<th>Intel SoC (System on Chip) platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>8GB or 16GB / 2133MHz LPDDR3 / soldered to system board, no sockets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display</th>
<th>14.0&quot; (355mm) FHD (1920x1080), LED backlight, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle, IPS, AR (anti-reflection)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-touch</td>
<td>Capacitive-type multi-touch, AR (anti-reflection), AS (anti-smudge), supports 10-finger gesture, reduces overall display brightness by 10%</td>
</tr>
<tr>
<td>Hinge</td>
<td>Yoga hinge, 360 degree</td>
</tr>
<tr>
<td>Convert-mode Pen (optional)</td>
<td>Laptop, tent, stand, and tablet</td>
</tr>
<tr>
<td>Storage</td>
<td>M.2 SSD / SATA 6.0Gb/s (e.g. xxxG SSD)</td>
</tr>
<tr>
<td>Optical</td>
<td>None</td>
</tr>
</tbody>
</table>

| Ethernet | Native Intel Ethernet Connection WGI219-LM (vPro) via optional ThinkPad Ethernet Extension Cable |

<table>
<thead>
<tr>
<th>WLAN</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card</td>
</tr>
<tr>
<td></td>
<td>• Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card</td>
</tr>
</tbody>
</table>

| Bluetooth™ | 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 (opt) | Nano-SIM card slot, optional Verizon LTE (US) SIM card |

| Dimensions | WxDxH: 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 |

<table>
<thead>
<tr>
<th>Processor 8th Generation Intel Core i5 / i7 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Number</td>
</tr>
<tr>
<td>i5-8550U</td>
</tr>
<tr>
<td>i5-7360U</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) |

<table>
<thead>
<tr>
<th>Chipset Memory</th>
<th>Intel SoC (System on Chip) platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>8GB or 16GB / 2133MHz LPDDR3 / soldered to system board, no sockets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display</th>
<th>14.0&quot; (355mm) FHD (1920x1080), LED backlight, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle, IPS, AR (anti-reflection)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-touch</td>
<td>Capacitive-type multi-touch, AR (anti-reflection), AS (anti-smudge), supports 10-finger gesture, reduces overall display brightness by 10%</td>
</tr>
<tr>
<td>Hinge</td>
<td>Yoga hinge, 360 degree</td>
</tr>
<tr>
<td>Convert-mode Pen (optional)</td>
<td>Laptop, tent, stand, and tablet</td>
</tr>
<tr>
<td>Storage</td>
<td>M.2 SSD / SATA 6.0Gb/s (e.g. xxxG SSD)</td>
</tr>
<tr>
<td>Optical</td>
<td>None</td>
</tr>
</tbody>
</table>

| Ethernet | Native Intel Ethernet Connection WGI219-LM (vPro) via optional ThinkPad Ethernet Extension Cable |

<table>
<thead>
<tr>
<th>WLAN</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card</td>
</tr>
<tr>
<td></td>
<td>• Intel Wireless-AC 9260, Wi-Fi 2x2 802.11ac + Bluetooth 5.0, M.2 card</td>
</tr>
</tbody>
</table>

| Bluetooth™ | 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 (opt) | Nano-SIM card slot, optional Verizon LTE (US) SIM card |

| Dimensions | WxDxH: 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 |

Smart card reader | None |
Media reader | MicroSD card reader, supports UHS-II |
Ports | Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 2 / Thunderbolt 3 (Power Delivery, DisplayPort, Data transfer), HDMI 1.4, Ethernet extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, microSD card reader |
WiGig dock | * Depending on many factors, actual data transfer speed may be lower than theoretical speed |
Monitor cable | None |
Audio support | **WWAN models and HDR panel models can not support IR camera** |
Fingerprint reader | Touch style match on chip fingerprint reader on the palm rest |
NFC (optional) | Near Field Communication |
Battery | Integrated Li-Ion 54Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter |
Max battery life | MobileMark® 2014: 15.4 hrs |
AC adapter | 45W or 65W USB Type-C AC adapter |
Light sensor | Ambient Light Sensor |
G-sensor | 3D accelerometer |
Gyroscope | 3D gyrometer |
GPS | GPS function is integrated into WWAN module |
Preload | Windows® 10 Pro 64 |
Limited warranty (optional) | One of the following, configurable by model: |
| Model 1 | 1-year depot repair service |
| Model 2 | 1-year depot with 2-year system board service |
| Model 3 | 3-year/1-yr battery depot repair service |
| Model 4 | 3-year/1-yr battery limited onsite service |
Mil-Spec test | MIL-STD-810G military testing |
Environment | EPEAT™ Silver; ENERGY STAR®; RoHS-compliant |

Lenovo December 2019
### ThinkPad X1 Yoga (4th Gen) Platform Specifications

**Processor**
- 8th Generation Intel® Core™ i5 / i7 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>i5-8265U</td>
<td>4</td>
<td>8</td>
<td></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></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>i7-8665U</td>
<td>4</td>
<td>8</td>
<td></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>
</tbody>
</table>

or 10th Generation Intel Core i5 / i7 Processor (NOT available in EMEA)

<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>i5-10210U</td>
<td>4</td>
<td>8</td>
<td></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>i7-10510U</td>
<td>6</td>
<td>12</td>
<td></td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td>LPDDR3-2133</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 / Thunderbolt; supports three independent displays; Max resolution: 5K@60Hz (Thunderbolt); 4K@24Hz (HDMI)

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

**Memory**
- 8GB or 16GB / 2133MHz LPDDR3 / soldered to systemboard, no sockets

**Display**
- 14.0” FHD (1920x1080) Low Power
  - IPS Anti-reflection Anti-smudge
  - 400 nits
  - 16:9
  - 800:1
  - 72%
  - 170°

**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

**Pen**
- 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™ SSD / PCIe NVMe 3.0 x 2
  - Intel Optane Memory H10 with Solid State Storage, M.2 2280, PCIe NVMe 3.0 x 4
  - None

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

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

**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**
- WXxDH (Privacy Guard): 12.71” x 8.58" x 0.63"; 323mm x 218mm x 15.95mm
- WXxDH (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

**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

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

**Audio support**
- 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

**Keyboard**
- TrackPoint® pointing device and buttonless glass surface multi-touch touchpad

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

**Fingerprint reader**
- Touch style match on chip fingerprint reader on the palm rest

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

**Audio support**
- 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

**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**
- Optional: Lenovo HDMI to VGA Monitor Adapter
- Optional: ThinkPad Ethernet Extension Adapter Gen 2

**Bundle Accy**
- **AC adapter** 45W, 65W, or 65W slim USB-C AC adapter
- Integrated Li-ion 51Wh 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
- Windows® 10 Home 64 or Windows 10 Pro 64

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

**Limited warranty (optional)**
- 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

**Software**
- Discrete TPM 2.0, TCG Certified
- Intel vPro Technology

**Security**
- Security chip

**Battery**
- Integrated Li-ion 51Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W AC adapter

**Max battery life**
- MobileMark® 2014: 18.1 hr
- Battery life varies significantly with settings, usage, & other factors

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

**NFC (optional)**
- Near Field Communication

**Environment**
- EPEAT™ Gold; ENERGY STAR™ 7.1; RoHS-compliant

**Lenovo**
- February 2020
ThinkPad X270 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>3-6006U</td>
<td>1</td>
<td>2</td>
<td>2.0 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>3-6100U</td>
<td>1</td>
<td>2</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>3-6200U</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>3-6300U</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>7-6500U</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 620</td>
</tr>
<tr>
<td>7-6600U</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>
<tr>
<td>7-7600U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.8 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

**Chipset**

Inte 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)

**Memory**

* 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, 500:1 contrast ratio
Some: 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, IPS, 500 nits, 16:9 aspect ratio, 170° viewing angle
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

**Storage**

System has one HDD slot or one M.2 2280 slot exclusively for storage

**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 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1 (US only)

**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)
- Integrated Mobile Broadband 4G LTE
- Intel XMM™ 7160 (Fibocom LB31-EAU) (EMEA only)

**SIM card (optional)**

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

<table>
<thead>
<tr>
<th>Processor 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>
</tr>
</thead>
<tbody>
<tr>
<td>5-7130U</td>
<td>2</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>5-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>3.6 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>5-7200U</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>5-7200U</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>

* i3-7130U is NOT available in US and EMEA; i5-7200U is NOT available in US

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

<table>
<thead>
<tr>
<th>Processor Number</th>
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<tbody>
<tr>
<td>5-8350U</td>
<td>2</td>
<td>4</td>
<td>2.2 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>5-8525U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.7 GHz</td>
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<td>6MB</td>
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<td>Intel UHD Graphics 620</td>
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<tr>
<td>7-8565U</td>
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<td>8</td>
<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2133</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>DDR4-2133</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 Type-C;
- supports three independent displays;
- supports three independent displays;
- supports three independent displays;

**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. xxGB SSD M.2)
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxGB SSD M.2 PCIe NVMe)
  - None

**Optical**

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

**WLAN + Bluetooth™ (opt)**

- 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)**

- Wireless WAN upgradeable (special bid only)
- 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 upgradeable
  - Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card

**Smart card reader**

- Optional: Smart card reader

**Media reader**

- MicroSD card reader, in the combo slot with nano-SIM card

**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, combo slot of nano-SIM card (WWAN models) and microSD card reader, headphone / microphone combo jack, optional smart card reader, side docking connector, 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

**Bundled Accy**

- Optional: ThinkPad Ethernet Extension Adapter Gen 2

**Camera (optional)**

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

**Audio support**

- 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

**Security**

- Security chip
- Intel vPro Technology

**Bundled Accy**

- Intel vPro Technology
- 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 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

**Max battery life**

- MobileMark® 2014: 16.6 hr
- * Battery life varies significantly with settings, usage, & other factors

**AC adapter**

- 45W or 65W USB-C AC adapter

**Environment**

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

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

Lenovo
February 2020
<table>
<thead>
<tr>
<th>Processor 7th Generation Intel® Core™ i5 Processor</th>
<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>1.6-2600U</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 620</td>
</tr>
<tr>
<td>2.6-7300U</td>
<td>2</td>
<td>4</td>
<td></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>
<tr>
<td>or 8th Generation Intel Core ™ i3 / i5 / i7 Processor</td>
<td>Processor Number</td>
<td># of Cores</td>
<td># of Threads</td>
<td>Base Frequency</td>
<td>Max Turbo Frequency</td>
<td>Cache</td>
<td>Memory Types</td>
<td>Processor Graphics</td>
</tr>
<tr>
<td>3-8130U</td>
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<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>5-8250U</td>
<td>4</td>
<td>8</td>
<td></td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>5-8350U</td>
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<td>1.7 GHz</td>
<td>3.6 GHz</td>
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<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>7-8550U</td>
<td>4</td>
<td>8</td>
<td></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></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 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

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

* System clocks down for processors with lower memory controller

**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**

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)

**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

**SIM card (optional)**

Nano-SIM card slot

**Dimensions**

WxH: 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

**Smart card reader**

Optional: Smart card reader (mutually exclusive with NFC)

**Media reader**

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

**W/Gig 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
- 1080p: HD 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

**Keyboard**

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

**UltraNav™**

TrackPoint® pointing device and 3+2 buttons Mylar surface multi-touch click pad

**Security**

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

**Battery**

Li-ion 51Wh battery

Max battery life

* 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

**G-sensor/3D compass**

Ambient Light Sensor

3D gyrometer

**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

**Environment**

EPEAT® Gold; ENERGY STAR®; RoHS-compliant

Lenovo

December 2019
## ThinkPad X390 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor</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>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>1.8 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>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>

or 10th Generation Intel Core i5 / i7 Processor (NOT available in EMEA)

<table>
<thead>
<tr>
<th>Processor</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>i5-10210U</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>i7-10510U</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>
<tr>
<td>i7-10710U</td>
<td>1.1 GHz</td>
<td>4.7 GHz</td>
<td>12MB</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

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4GB</td>
<td>2400MHz DDR4</td>
</tr>
<tr>
<td>8GB</td>
<td>soldered to systemboard, no sockets</td>
</tr>
<tr>
<td>16GB</td>
<td>2400MHz DDR4</td>
</tr>
<tr>
<td>32GB</td>
<td>2400MHz DDR4</td>
</tr>
</tbody>
</table>

### Display

- 13.3" HD (1366x768) TN Anti-glare 250 nits 16:9 1000:1 72% 178°
- 13.3" FHD (1920x1080) IPS Anti-glare 300 nits 16:9 800:1 (non-touch) 700:1 (multi-touch) 72% 170°
- 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) *Installed memory is actually 2966MHz but run at 2400MHz due to Intel limitation

### 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™ (optional)

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

### WWAN (optional)

Wireless WAN upgradable (special bid only in EMEA)

### 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

### Security chip

Discrete TPM 2.0, TCG Certified

### 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) with 65W AC adapter

### Max battery life

MobileMark® 2014: 17.6 hr

### 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 (optional)

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

### Mi-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.

---

**Processor 8th Generation Intel Core™ i3 / 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>i3-8154U</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>i5-8265U</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>i5-8365U</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>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8665U</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>

**Note:** The specifications above may not be available in all regions. Lenovo February 2020
ThinkPad X390 Yoga Platform Specifications

### Processor
- **Type**: 8th Generation Intel® Core™ i5 / i7 Processor
- **Number**: 8
- **Threads**: 8
- **Base Frequency**: 1.6 GHz
- **Max Turbo Frequency**: 4.8 GHz
- **Cache**: 8MB
- **Memory Types**: DDR4-2400
- **Graphics**: Intel UHD Graphics 620

### Chipset
- **SoC (System on Chip)**: Intel
- **Platform**: Pen
- **Convert-mode**: Laptop, tent, stand and tablet

### Display
- **Type**: Laptop, tent, stand and tablet
- **Resolution**: 4096x2160
- **Refresh Rate**: 60Hz
- **Supports**: Three independent displays, supports external digital monitor via HDMI or USB Type-C, supports three independent displays, supports external digital monitor via HDMI or USB Type-C, supports three independent displays, supports external digital monitor via HDMI or USB Type-C, supports three independent displays, supports external digital monitor via HDMI or USB Type-C.
- **Max resolution**: 4096x2304 @ 60Hz (Thunderbolt);
- **Max resolution**: 4096x2160 @ 24Hz (HDMI)
- **Max resolution**: 4096x2304 @ 60Hz (Thunderbolt);
- **Max resolution**: 4096x2160 @ 24Hz (HDMI)

### Storage
- **M.2 SSD**: 2280, PCIe NVMe
- **M.2 SSD**: 2280, PCIe NVMe
- **M.2 SSD**: 2280, PCIe NVMe
- **M.2 SSD**: 2280, PCIe NVMe

### Optical Drive
- **Type**: None

### Ethernet
- **Type**: Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)

### WLAN (optional)
- **Type**: 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™ (opt)
- **Type**: Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)
- **Type**: Integrated Mobile Broadband 4G LTE, support Nano-SIM card slot, optional Verizon LTE (US) SIM card for special bid only

### WWAN (optional)
- **Type**: One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE, support Nano-SIM card slot, optional Verizon LTE (US) SIM card for special bid only

### Security Chip
- **Type**: Security chip
- **Type**: Security chip
- **Type**: Security chip
- **Type**: Security chip

### Security
- **Type**: Security
- **Type**: Security
- **Type**: Security
- **Type**: Security

### Camera
- **Type**: Three in one camera
- **Type**: Three in one camera
- **Type**: Three in one camera
- **Type**: Three in one camera

### Media reader
- **Type**: One of the following, configurable by model:
  - One of the following, configurable by model:
  - One of the following, configurable by model:
  - One of the following, configurable by model:

### Ports
- **Type**: One of the following, configurable by model:
  - One of the following, configurable by model:
  - One of the following, configurable by model:
  - One of the following, configurable by model:

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

### Operating system
- **Type**: Windows 10 Home 64 or Windows 10 Pro 64
- **Type**: Windows 10 Home 64 or Windows 10 Pro 64
- **Type**: Windows 10 Home 64 or Windows 10 Pro 64
- **Type**: Windows 10 Home 64 or Windows 10 Pro 64

### Limited warranty (optional)
- **Type**: One of the following, configurable by model:
  - One of the following, configurable by model:
  - One of the following, configurable by model:
  - One of the following, configurable by model:

### Environmental test
- **Type**: EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant
- **Type**: EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant
- **Type**: EPEAT™ Silver; ENERGY STAR® 7.1; RoHS-compliant
- **Type**: 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 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</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 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 Pro 3500U</td>
<td>6</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 Pro 3700U</td>
<td>8</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 Graphics</td>
</tr>
</tbody>
</table>

Note: The specifications above may not be available in all regions. Lenovo February 2020

## Graphics

AMD Radeon Vega 6, Vega 8, or Vega 10 Graphics in processor; supports three independent displays; Max resolution: 4096x2304@60Hz (USB-C); 4096x2160@24Hz (HDMI)

## Chipset

AMD SoC (System on Chip) platform

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

* Installed memory is actually 2666MHz but run at 2400MHz due to AMD 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>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>
</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) / 700:1 (multi-touch)</td>
<td>72%</td>
</tr>
<tr>
<td>13.3&quot;</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>
</tr>
</tbody>
</table>

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

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

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

## SIM card (optional)

None

## Bluetooth™

Bundled Accy

- 8GB DDR4-2400
- AMD SoC (System on Chip) platform
- 2MB L2 / 4MB L3
- Radeon Vega 8 Graphics
- Radeon Vega 10 Graphics
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
- Nano-SIM card slot, optional Verizon LTE (US) SIM card
- One of the following, configurable by model:
  - Wireless WAN upgradeable
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

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

## Power

Dimensions

<table>
<thead>
<tr>
<th>WxDxH:</th>
<th>12.28&quot; x 8.55&quot; x 0.67&quot;</th>
<th>311.9mm x 217.2mm x 16.9mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Models</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HD / FHD multi-touch</td>
<td>FHD non-touch</td>
</tr>
<tr>
<td></td>
<td>2.91 lb / 1.32 kg</td>
<td>2.82 lb / 1.28 kg</td>
</tr>
</tbody>
</table>

## Case color

Black

## Case material

Display cover: PPS/GE; Bottom: Magnesium/Aluminum

## Smart card reader

Optional: Smart card reader

## Media reader

MicroSD card reader, in the combo slot with nano-SIM card

## Ports

- One USB 3.1 Gen 1 (Always On), one USB 3.1 Gen 2, two USB 3.1 Type-C Gen 2 (w/ the function of Power Delivery and DisplayPort 1.4), HDMI 2.0, Ethernet extension connector, combo slot of nano-SIM card (WWAN models) and microSD card reader, headphone / microphone combo jack, optional smart 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

## Bundled Accy

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

Optional: ThinkPad Ethernet Extension Adapter Gen 2

## Optional:

- Lenovo USB-C to VGA Monitor Adapter
- Optional: ThinkPad Ethernet Extension Adapter Gen 2

## 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

## 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 (optional)

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
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Included software: may differ from its retail version (if available), and may not include user manuals or all program functionality. Software license agreements may apply.

Battery life: Battery life (and recharge times) will vary based on many factors including screen brightness, applications, features, power management, battery conditioning, and other customer preferences.


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