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Version 548, September 2019
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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.

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Additions in this update

► New product(s)
  None

► Others
  ThinkPad P1 (2nd Gen) - Spec updated
  ThinkPad P43s - Spec updated
  ThinkPad P53 - Spec updated
  ThinkPad T490 - Spec updated
  ThinkPad T490s - Spec updated
  ThinkPad X1 Carbon (7th Gen) - Spec updated
  ThinkPad X1 Extreme (2nd Gen) - Spec updated
  ThinkPad X390 - Spec updated

Withdrawals in this update

► Withdrawn product(s)
  ThinkPad L470
  ThinkPad X1 Carbon (5th Gen)
### Processor

<table>
<thead>
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<th>Processor</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Burst Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
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<tr>
<td>m3-7Y30</td>
<td>2</td>
<td>4</td>
<td>1.0 GHz</td>
<td>2.6 GHz</td>
<td>4MB</td>
<td>LPDDR3-1866</td>
<td>Intel HD Graphics 615</td>
</tr>
<tr>
<td>i5-7Y54</td>
<td>2</td>
<td>4</td>
<td>1.2 GHz</td>
<td>3.2 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
<tr>
<td>Celeron N4100</td>
<td>2</td>
<td>4</td>
<td>1.1 GHz</td>
<td>2.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
<tr>
<td>Pentium Silver N5000</td>
<td>4</td>
<td>4</td>
<td>1.1 GHz</td>
<td>2.7 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 600</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 615, Intel UHD Graphics 600 or 605 in processor, supports external digital monitor via HDMI or USB Type-C; supports dual independent display; 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

- **Size**: 11.6" HD (1366x768)
  - **Type**: TN
  - **Brightness**: 250 nits
  - **Aspect Ratio**: 16:9
  - **Contrast Ratio**: 400:1 or 500:1
  - **Color Gamut**: 45% sRGB
  - **Viewing Angle**: 90°
- **Size**: 11.6" HD (1366x768)
  - **Type**: IPS
  - **Brightness**: 250 nits
  - **Aspect Ratio**: 16:9
  - **Contrast Ratio**: 800:1
  - **Color Gamut**: 45% sRGB
  - **Viewing Angle**: 170°

### Storage

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

### 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

### 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

### 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

### Touchpad

- 6-row, spill-resistant, multimedia Fn keys
- Buttonless Mylar surface touchpad below keyboard, multi-touch

### Security

- Power-on 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: 13.9 hr
- *Battery life varies significantly with settings, usage, & other factors

### 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
  - No OS

### 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

### Environment

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

Note: The specifications above may not be available in all regions.
<table>
<thead>
<tr>
<th>Processor</th>
<th>AMD PRO A-Series APUs</th>
</tr>
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<tbody>
<tr>
<td><strong>Processor</strong></td>
<td><strong>Number</strong></td>
</tr>
<tr>
<td>PRO A10-8730B</td>
<td>4</td>
</tr>
<tr>
<td>PRO A12-8830B</td>
<td>4</td>
</tr>
<tr>
<td>PRO A10-9700B</td>
<td>2.5 GHz</td>
</tr>
<tr>
<td>PRO A12-9800B</td>
<td>2.7 GHz</td>
</tr>
</tbody>
</table>

* Windows 7 is only supported by PRO A10-8730B and PRO A12-8830B

<table>
<thead>
<tr>
<th>Graphics</th>
<th>AMD Radeon R5 or R7 Graphics in processor only; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2160@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipset</td>
<td>AMD SoC (System on Chip) platform</td>
</tr>
<tr>
<td>Memory</td>
<td>16GB max / 1866MHz DDR4, one DDR4 SO-DIMM socket</td>
</tr>
<tr>
<td>Display</td>
<td>Some: 12.5&quot; (317.5mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio; Some: 12.5&quot; (317.5mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 100:1 contrast ratio, 170° viewing angle</td>
</tr>
<tr>
<td>Multi-touch (opt)</td>
<td>On-cell touch, supports 10-finger gesture (FHD only, US only)</td>
</tr>
<tr>
<td>Storage</td>
<td>System has one HDD slot or one M.2 slot exclusively for storage. Some: SSD / SATA 6.0Gb/s, 2.5&quot; wide, 7mm high, Active Protection System™; Some: SSD / SATA 6.0Gb/s, 2.5&quot; wide, 7mm high (e.g. xxxGB SSD); Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s</td>
</tr>
<tr>
<td>Optical</td>
<td>None</td>
</tr>
<tr>
<td><strong>WLAN</strong></td>
<td>Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + BT 4.1, M.2 card</td>
</tr>
<tr>
<td><strong>Bluetooth™</strong></td>
<td>Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter</td>
</tr>
<tr>
<td><strong>WWAN (optional)</strong></td>
<td>Wireless WAN upgradable; Integrated Mobile Broadband 4G LTE-A, Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless EM7455)</td>
</tr>
<tr>
<td><strong>SIM card (opt)</strong></td>
<td>Micro-SIM card slot, opt Verizon LTE (US) SIM card</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>WxDxH: 12.03&quot; x 8.21&quot; x 0.80&quot;; 305.5mm x 208.5mm x 20.3mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Models: No + 3-cell 3-cell + 3-cell 3-cell + 6-cell Weight: 2.79 lb / 1.27 kg 2.98 lb / 1.36 kg 3.33 lb / 1.52 kg</td>
</tr>
<tr>
<td><strong>Case color</strong></td>
<td>Black</td>
</tr>
<tr>
<td><strong>Case material</strong></td>
<td>Glass-Fiber Reinforced Plastic</td>
</tr>
</tbody>
</table>

Note: The specifications above may not be available in all regions.
### ThinkPad A285 Platform Specifications

- **Processor**
  - AMD Ryzen PRO Mobile Processors with Radeon Vega Graphics
  - Specifications Reference (PSREF)
  - Note: The specifications above may not be available in all regions. Lenovo April 2019

- **Chipset**
  - AMD SoC (System on Chip) platform
  - 8GB or 16GB / 2400MHz DDR4, soldered to systemboard, no sockets

- **Display**
  - Some: 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight
  - Some: 12.5" (317.5mm) FHD (1920x1080), anti-glare, LED backlight
  - Max resolution: 5120x2880@60Hz (USB Type-C); 4096x2160@60Hz (HDMI)

- **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**
  - Gigabit Ethernet connection
  - via bundled or optional ThinkPad Ethernet Extension Adapter Gen 2

- **WLAN**
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card

- **WWAN (optional)**
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card
  - * For non-WWAN model, it means the model is NOT WWAN upgradable

- **SIM card (optional)**
  - Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card
  - Optional: MobileMark 2014: 10.55 hr

- **Dimensions**
  - WxDxH (HD & FHD multi-touch):
    - 12.11" x 8.26" x 0.70"; 307.7mm x 209.8mm x 17.8mm
  - WxDxH (FHD non-touch):
    - 12.11" x 8.26" x 0.69"; 307.7mm x 209.8mm x 17.4mm

- **Weight**
  - FHD non-touch model: 2.48 lb / 1.13 kg
  - HD non-touch model: 2.78 lb / 1.26 kg
  - FHD multi-touch model: 2.79 lb / 1.27 kg

- **Case color**
  - Black

- **Case material**
  - Display cover: Carbon Fiber (FHD non-touch model) or PPS (HD & FHD multi-touch model)
  - Bottom: Magnesium/Aluminum

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

- **Battery**
  - Integrated Li-ion 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
  - 45W or 65W USB Type-C AC adapter

- **AC adapter**
  - MobileMark® 2014: 10.55 hr
  - * Battery life varies significantly with settings, usage, & other factors

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

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

- **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

- **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

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

- **Processor Specifications**

<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>Ryzen 3 PRO 2300U</td>
<td>4</td>
<td>2.0 GHz</td>
<td>3.4 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 6 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 PRO 2500U</td>
<td>8</td>
<td>2.0 GHz</td>
<td>3.6 GHz</td>
<td></td>
<td></td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 PRO 2700U</td>
<td>8</td>
<td>2.2 GHz</td>
<td>3.8 GHz</td>
<td></td>
<td></td>
<td>Radeon Vega 10 Graphics</td>
</tr>
</tbody>
</table>

Note: The specifications above may not be available in all regions.
ThinkPad A475 Platform Specifications

Processor AMD PRO A-Series APUs

<table>
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<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>PRO A10-8730B</td>
<td>4</td>
<td>4</td>
<td>2.4 GHz</td>
<td>3.3 GHz</td>
<td>2MB</td>
<td>DDR4-1866</td>
<td>AMD Radeon™ R5 Graphics</td>
</tr>
<tr>
<td>PRO A12-8830B</td>
<td>4</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.4 GHz</td>
<td>2MB</td>
<td>DDR4-1866</td>
<td>AMD Radeon™ R7 Graphics</td>
</tr>
<tr>
<td>PRO A10-9700B</td>
<td>4</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.4 GHz</td>
<td>2MB</td>
<td>DDR4-1866</td>
<td>AMD Radeon™ R7 Graphics</td>
</tr>
<tr>
<td>PRO A12-9800B</td>
<td>4</td>
<td>4</td>
<td>2.7 GHz</td>
<td>3.6 GHz</td>
<td>2MB</td>
<td>DDR4-1866</td>
<td>AMD Radeon™ R7 Graphics</td>
</tr>
</tbody>
</table>

* Windows 7 is only supported by PRO A10-8730B and PRO A12-8830B

Graphics AMD Radeon R5 or R7 Graphics in processor only; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2160@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

Chipset AMD SoC (System on Chip) platform

Memory 32GB max / 1866MHz 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, 350:1 contrast ratio
Some: 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

Multi-touch (opt) On-cell touch, supports 10-finger gesture (FHD only, US 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: M.2 SSD / PCIe NVMe, PCIe 3.0 x 4 run at PCIe 3.0 x 2 due to M.2 SSD adapter limitation

Optical

Ethernet Realtek® RTL8111EPV Gigabit Ethernet connection

WLAN Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card

Bluetooth™ Bluetooth 4.1 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
- Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless EM7455)

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

SIM card (opt) Micro-SIM card slot, opt Verizon LTE (US) SIM card

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

Weight Models
3-cell or 3 + 3-cell 3.49 lb / 1.65 kg
6-cell or 3 + 6-cell 3.92 lb / 1.78 kg

PPS 3.63 lb / 1.65 kg 4.35 lb / 1.85 kg

Case color Black

Case material Display cover: Magnesium Hybrid or PPS (Magnesium Hybrid for US only); 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 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), Dock connector

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

Monitor cable Optional: Lenovo USB-C to VGA Adapter

Camera (optional) HD720p resolution, fixed focus

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

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

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

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

Security chip dTPM 1.2: discrete TPM 1.2, TCG Certified

Fingerprint reader Optional: Touch style match on chip fingerprint reader on the keyboard bezel

NFC None

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

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

Max battery life (MobileMark® 2014)

<table>
<thead>
<tr>
<th>Models</th>
<th>3-cell</th>
<th>3 + 3-cell</th>
<th>6-cell 48Wh</th>
<th>3 + 6-cell 48Wh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max battery life</td>
<td>5.13 hr</td>
<td>10.26 hr</td>
<td>10.26 hr</td>
<td>15.4 hr</td>
</tr>
</tbody>
</table>

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

AC adapter 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
- Windows® 10 Home 64
- Windows® 10 Pro 64

Limited warranty One of the following, configurable by model:

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

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

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

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

Lenovo August 2019
### ThinkPad A485 Platform Specifications

**Product Specifications Reference (PSREF)**

#### Processor

<table>
<thead>
<tr>
<th>AMD Ryzen™ PRO Mobile Processors with Radeon™ Vega Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor Number</strong></td>
</tr>
<tr>
<td>Ryzen 3 PRO 2300U</td>
</tr>
<tr>
<td>Ryzen 5 PRO 2500U</td>
</tr>
<tr>
<td>Ryzen 7 PRO 2700U</td>
</tr>
</tbody>
</table>

#### Graphics

AMD Radeon Vega 6, Vega 8, or Vega 10 Graphics in processor only; supports external digital monitor via HDMI or USB Type-C; supports four independent displays; Max resolution: 5120x2880 at 60Hz (USB Type-C); 4096x2160 at 60Hz (HDMI)

#### Chipset

AMD SoC (System on Chip) platform

#### Memory

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, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 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: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™

Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 4

#### Optical

None

#### Ethernet

Realtek® RTL8111GUL Gigabit Ethernet connection

#### WLAN

Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card

#### 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

**Weight**

<table>
<thead>
<tr>
<th>Models</th>
<th>WxDxH: 13.25&quot; x 9.15&quot; x 0.79&quot;</th>
<th>336.6mm x 232.5mm x 19.95mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium</td>
<td>3.49 lb / 1.58 kg</td>
<td>3.92 lb / 1.78 kg</td>
</tr>
<tr>
<td>PPS</td>
<td>3.63 lb / 1.65 kg</td>
<td>4.08 lb / 1.85 kg</td>
</tr>
</tbody>
</table>

#### Case color

Black

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

#### Note:

The specifications above may not be available in all regions.

---

**Smart card reader**

Optional: Smart card reader

**Media reader**

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

**Ports**

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

**Monitor cable (opt)**

HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter

**Bundled Accy (opt)**

HDMI to VGA Monitor Adapter

**Camera (optional)**

One of the following, configurable by model:

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

**Audio support**

HD Audio, Realtek® 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**

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 keyboard bezel

**Battery**

Integrated Li-ion 24Wh battery and external Li-ion 24Wh, 48Wh, or 72Wh battery

**Max battery life**

(MobileMark® 2014)

<table>
<thead>
<tr>
<th>Models</th>
<th>24Wh</th>
<th>48Wh</th>
<th>72Wh</th>
<th>24Wh + 24Wh</th>
<th>24Wh + 48Wh</th>
<th>24Wh + 72Wh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max battery life</td>
<td>5.37 hr</td>
<td>10.76 hr</td>
<td>16.4 hr</td>
<td>10.76 hr</td>
<td>16.4 hr</td>
<td>22.15 hr</td>
</tr>
</tbody>
</table>

**AC adapter**

45W or 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-yr battery depot repair service
- 3-year/1-yr battery limited onsite service

**Mil-Spec test**

MIL-STD-810G military testing

**Environment**

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

---

Lenovo

May 2019
## ThinkPad E480 Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-7020U</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>3-7130U</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>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>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-8130U</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>5-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

**Graphics**

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

**Chipset**

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

**Display**

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

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

**Multi-touch**

None

**Storage**

- Up to 2 drives (one M.2 SSD and one HDD)
- Some: HDD / SATA 6.0GB/s, 2.5" wide, removable, upgradable, Active Protection System™
- Some: M.2 SSD / PCIe NVMe
- Optane™ memory Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

**Optical**

None

**Ethernet**

- Gigabit Ethernet Connection, Realtek R8111GUS

**WLAN**

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

**Bluetooth**

- Intel 3165ac card supports BT4.2 but is limited to BT4.1 by Windows OS

**WWAN**

None

**SIM card**

None

**Memory**

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

**Chipset**

Intel SoC (System on Chip) platform

**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

**Display cover**

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

**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

**Camera**

- HD720p camera, fixed focus

**Audio support**

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

**Keyboard**

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

**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 USB Type-C 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

**Operational 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

**Environmental**

- 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

<table>
<thead>
<tr>
<th>Processor</th>
<th>8th Generation Intel® Core™ i3 / i5 / i7 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Number</td>
<td># of Cores</td>
</tr>
<tr>
<td>i3-8145U</td>
<td>2</td>
</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</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) |

<table>
<thead>
<tr>
<th>Chipset</th>
<th>Intel SoC (System on Chip) platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>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</td>
</tr>
</tbody>
</table>

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

| Multi-touch | None |

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

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

| Optical | None |

| Ethernet | Gigabit Ethernet Connection, Realtek R8111GUS |

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

| WWAN | None |
| SIM card | None |

| Processor Specifications Reference (PSREF) | | |

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

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

<table>
<thead>
<tr>
<th>Processor</th>
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</tr>
<tr>
<td>i5-8265U</td>
<td>4</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</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) |

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<tr>
<th>Chipset</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>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</td>
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| Multi-touch | None |

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<th>Storage</th>
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</tr>
</thead>
</table>

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

| Optical | None |

| Ethernet | Gigabit Ethernet Connection, Realtek R8111GUS |

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

| WWAN | None |
| SIM card | None |

| Processor Specifications Reference (PSREF) | | |

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

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

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<tr>
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</tr>
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</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) |

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<tbody>
<tr>
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<td>Non-touch</td>
</tr>
</tbody>
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| Multi-touch | None |

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</tr>
</thead>
</table>

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

| Optical | None |

| Ethernet | Gigabit Ethernet Connection, Realtek R8111GUS |

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

| WWAN | None |
| SIM card | None |

| Processor Specifications Reference (PSREF) | | |

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

| 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™ Silver; ENERGY STAR® 7.1; RoHS-compliant |
### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
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<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>1.8 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</td>
<td>1.8 GHz</td>
<td>4.5 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 or 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
  - *Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation*

### Display

- **Size / Resolution**: 14.0" FHD (1920x1080) Anti-glare TN 220 nits 16:9 400:1 90°
- **Type**:
  - Non-touch
  - **Size / Resolution**: 14.0" FHD (1920x1080) Anti-glare IPS 250 nits 16:9 600:1 170°
  - **Type**:
    - Non-touch
- **Brightness**:
  - 220 nits (TN)
  - 250 nits (IPS)
- **Aspect Ratio**: 16:9
- **Contrast Ratio**: 400:1 (TN); 600:1 (IPS)
- **Viewing Angle**: 90° (TN); 170° (IPS)
- **Built-in Camera**: HD720p camera, fixed focus
- **Audio**: HD Audio, Synaptic CX11880 codec / stereo speakers, 2W x 2, Dolby™ Audio™ Premium / dual array microphone, microphone combo jack

### Storage

- **Optical Storage**:
  - M.2 2280 SSD / SATA 6.0Gb/s
  - M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- **Internal Memory**:
  - 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- **External Storage**:
  - Supports external digital monitor via HDMI or USB Type-C
  - Supports three independent displays
- **Max resolution**:
  - 4096x2304@60Hz (USB Type-C)
  - 4096x2160@24Hz (HDMI)

### Display

- **Multi-touch**: None
- **Security**: Power-on password, hard disk password, supervisor password, security keyhole
- **Security Chip**:
  - Integrated model: discrete TPM 2.0, TCG Certified
  - Discrete model: firmware TPM 2.0 integrated in chipset

### Ethernet

- Gigabit Ethernet Connection, Realtek R8111GUS
- **Integrated Li-ion 42Wh battery**, supports Rapid Charge (charge up to 80% in 1hr)
  - with 65W USB Type-C AC adapter

### 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
- **Battery**: Integrated Li-ion 42Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
  - with 65W USB Type-C AC adapter
- **Max battery life**
  - MobileMark® 2014: 11.5 hr
  - *Battery life varies significantly with settings, usage, & other factors*
- **AC adapter**: 45W or 65W USB Type-C AC adapter

### WWAN

- None
- **Mil-Spec test**: MIL-STD-810G military testing

### SIM card

- None
- **Operating system**:
  - Optional: Windows® 10 Home 64 or Windows 10 Pro 64

### Dimensions

- **WxDxH**: 12.96" x 9.13" x 0.70"; 329mm x 232mm x 17.9mm
- **Weight**: Starting at 3.68 lb / 1.67 kg
- **Case color**: Black or silver
- **Case material**: Aluminum

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

**Product Specifications Reference (PSREF)**

Processor AMD Ryzen™ Mobile Processors with Radeon™ Vega Graphics

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 3200U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>1MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 3 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 3500U</td>
<td>4</td>
<td>8</td>
<td>2.1 GHz</td>
<td>3.7 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 3700U</td>
<td>8</td>
<td>16</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon RX Vega 10 Graphics</td>
</tr>
</tbody>
</table>

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

Chipset AMD SoC (System on Chip) platform

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

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

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

Multi-touch None

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

Optical • 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

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

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

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

Starting at 3.87 lb / 1.75 kg

Case color Black

Case material Display cover: Aluminum or PC/ABS plastic;

Bottom: PC/ABS plastic

Smart card reader None

Media reader MicroSD card reader

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

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

Monitor cable None

Camera HD720p camera, fixed focus

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

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

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

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 USB Type-C AC adapter

Max battery life 11 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 1-year depot repair service

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

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

Lenovo
August 2019
<table>
<thead>
<tr>
<th>Processor 7th Generation Intel® Core™ i3 / i5 Processor or 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>Specifications Reference (PSREF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7020U</td>
<td>2</td>
<td>2</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>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5-7260U</td>
<td>2</td>
<td>4</td>
<td>3.5 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processor 7th Generation Intel® Core™ i3 / i5 Processor or 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>Specifications Reference (PSREF)</th>
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</thead>
<tbody>
<tr>
<td>i3-7100U</td>
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<td>2</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5-7260U</td>
<td>2</td>
<td>4</td>
<td>3.5 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Processor 8th Generation Intel Core i3 / i5 / i7 Processor | # of Cores | # of Threads | Base Frequency | Max Turbo Frequency | Cache | Memory Types | Processor Graphics | Specifications Reference (PSREF) |
|---|---|---|---|---|---|---|---|
| i5-8250U | 4 | 8 | 1.6 GHz | 3.4 GHz | 6MB | DDR4-2400 | Intel UHD Graphics 620 |

**Notes:**

- *i3-7130U is NOT available in US and EMEA*
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed*
- *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*

**Dimensions:**

- WxHxD: 14.53” x 9.92” x 0.78”; 369mm x 252mm x 19.95mm
- Starter at 4.7 lb / 2.1kg

**Camera:**

- HD720p camera, fixed focus

**Audio support:**

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

**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:**

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

**Optane™ memory:**

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

**Optical:**

- None

**Ethernet:**

- Gigabit Ethernet Connection, Realtek R8111GUS

**WLAN + Bluetooth™:**

- One of the following, configurable by model:
  - Realtek® 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

**Battery:**

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter
- MobileMark® 2014: 12.23 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.
### Processor

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

### Graphics

- Intel UHD Graphics 620 in processor only 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

- 15.6" HD (1366x768)
- 15.6" FHD (1920x1080)

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

### Optane™ memory

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

### Optical

None

### Ethernet

Gigabit Ethernet Connection, Realtek R8111GUS

### WLAN + Bluetooth™

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

### WWAN

None

### SIM card

None

### Dimensions

| WxDxH: | 14.53" x 9.94" x 0.78"; 369mm x 252.5mm x 19.9mm |

### Weight

Starting at 4.68 lb / 2.12 kg

### Case color

Black or silver

### Case material

Display cover: Aluminum; Bottom: PC/ABS plastic

### Smart card reader

None

### Media reader

MicroSD card reader

### Ports

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

### Monitor cable

None

### Camera

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

### Audio support

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

### Security

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

### Security chip

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

### System Mgt

None

### Fingerprint reader

Optional: Touch style fingerprint reader on the palm rest

### NFC

None

### Battery

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

### Max battery life

2014: 11 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 mail-in repair service
- 1-year depot repair service

### Mil-Spec test

MIL-STD-810G military testing

### Environment

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

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

Lenovo
August 2019
### ThinkPad E595 Platform Specifications

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

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

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

**Chipset** AMD SoC (System on Chip) platform

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

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

**Display**

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

**Multi-touch** None

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

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

**Optical** None

**Ethernet** Gigabit Ethernet Connection, Realtek RTL811GUS

**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

**Dimensions** WxDxH: 14.53” x 9.92” x 0.78”;

<table>
<thead>
<tr>
<th>Weight</th>
<th>Case color</th>
<th>Case material</th>
<th>Display cover</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>369mm x 252mm x 19.9mm</td>
<td>Black</td>
<td></td>
<td>Aluminum</td>
<td>PC/ABS plastic</td>
</tr>
</tbody>
</table>

**Smart card reader** None

**Media reader** MicroSD card reader

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

**Monitor cable** Bundled Accy

**Camera** HD720p camera, fixed focus

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

**Keyboard** 6-row, spill-resistant, multimedia Fn keys

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

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

**Security** Discrete TPM 2.0, TCG Certified

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

**Max battery life** MobileMark® 2014: 10.3 hr

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

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

**Limited warranty** One of the following, configurable by model:

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

**Mil-Spec test** None

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

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

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

Lenovo August 2019
### ThinkPad L380 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>
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<tbody>
<tr>
<td>Cel 3965U</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
</tr>
<tr>
<td>i3-7020U</td>
<td>4</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

#### 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>i5-8130U</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>
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<td>i5-8350U</td>
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<td>3.6 GHz</td>
<td>6MB</td>
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<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</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

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

- 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

#### 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

- None

#### SIM card

- None

#### Memory

- None

#### SIM card

- None

#### WWAN

- None

#### Bluetooth

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

#### Mil-Spec test

- MIL-STD-810G military testing

#### Environment

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

#### Lenovo

- August 2019
## ThinkPad L390 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>
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<tbody>
<tr>
<td>i3-8145U</td>
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<td>Intel UHD Graphics 620</td>
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<tr>
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<td>8</td>
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<td>i7-8565U</td>
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<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
- * Installed memory is actually 2966MHz 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>Contrast Ratio</th>
<th>Viewing Angle</th>
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<tbody>
<tr>
<td>13.3&quot; HD</td>
<td>(1366x768)</td>
<td>Anti-glare</td>
<td>TN 250 nits</td>
<td>16:9</td>
<td>500:1</td>
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<tr>
<td>13.3&quot; FHD</td>
<td>(1920x1080)</td>
<td>Anti-glare</td>
<td>IPS 250 nits</td>
<td>16:9</td>
<td>700:1 (non-touch) 800:1 (multi-touch)</td>
</tr>
</tbody>
</table>

### Multi-touch (opt)

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

### Storage

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

### Optical

- None

### Ethernet

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

### WLAN

- 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 3.22 lb / 1.46 kg

### Case color

- Black or Silver

### Case material

- Display cover: Aluminum
- Bottom: GFRP

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified
- Intel vPro Technology
- Optional: Touch style fingerprint reader on the palm rest
- Near Field Communication

### Battery

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

### 7th Generation Intel® Core™ i3 / i5 Processor or

<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>Max Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
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</thead>
<tbody>
<tr>
<td>i3-7020U</td>
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<td>Intel HD Graphics 620</td>
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<tr>
<td>i3-7130U</td>
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<td>4</td>
<td>2.7 GHz</td>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
<td>i5-7200U</td>
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<td>Intel HD Graphics 620</td>
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<tr>
<td>i5-7300U</td>
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<td>3.5 GHz</td>
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<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>Max 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>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-8250U</td>
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<td>8</td>
<td>1.6 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8350U</td>
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<td>8</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</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 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

- Intel SoC (System on Chip) platform
- 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- Intel XMM™ 7660 (Fibocom L850-GL), M.2 card
- Intel XMM™ 7660 (Fibocom L850-GL), M.2 card

### Display

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

### Storage

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

### WWAN (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7660 (Fibocom L850-GL), M.2 card
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7660 (Fibocom L850-GL), M.2 card

### SIM card (optional)

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

### Dimensions

- WxDxH: 13.18" x 9.25" x 0.89"; 335mm x 235mm x 22.5mm

### Weight

- Starting at 3.71 lb / 1.68 kg

### Case color

- Black

### Case material

- PC/ABS plastic

### Smart card reader

- Optional: Smart card reader

### Media reader

- MicroSD card reader

### Ports

- Two USB 3.1 Gen 1 (one Always On), 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

### Monitor cable

- * Depending on many factors, actual data transfer speed may be lower than theoretical speed
- * HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter
- * Optional: USB-C to VGA: Lenovo USB-C to VGA Adapter

### Camera

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

### Audio support

- Microphone: HD Audio, Realtek ALC3287 codec / dual array microphone

### Keyboard

- 6-row, spill-resistant, multimedia F10 keys, optional LED backlight

### Security

- Security chip: Discrete TPM 2.0, TCG Certified

### Security chip

- Intel vPro Technology

### Fingerprint reader

- Optional: Touch style match on chip fingerprint reader on the keyboard bezel, anti-spoofing technology

### NFC (optional)

- Near Field Communication

### Battery

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

### AC adapter

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

### Operating system

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

### Limited warranty

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

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

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

---

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

Lenovo
August 2019
### ThinkPad L490 Platform Specifications

#### 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>Processor Graphics</th>
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</thead>
<tbody>
<tr>
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<td>2</td>
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<td>2MB</td>
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<td>Intel UHD Graphics 610</td>
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<tr>
<td>5-8145U</td>
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<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>
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<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
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<td>5-8365U</td>
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</tr>
</tbody>
</table>

#### Graphics
- Intel UHD Graphics 610 or 620 in processor or Intel UHD Graphics 620 in processor and AMD Radeon 535, 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 Memory
- Intel SoC (System on Chip) platform
- Installed memory is actually 2666MHz but run at 2133MHz or 2400MHz due to Intel limitation

#### Display
- 14.0" HD (1366x768) TN Anti-glare 220 nits 16:9 45% 90°
- 14.0" FHD (1920x1080) IPS Anti-glare 250 nits 16:9 700:1 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
- 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)

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

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

#### Note:
The specifications above may not be available in all regions.
# ThinkPad L570 Platform Specifications

**Product Specifications Reference (PSREF)**

<table>
<thead>
<tr>
<th>Processor</th>
<th>6th Generation Intel® Core™ i3 / i5 / i7 Processor or 7th Generation Intel Core i3 / i5 / i7 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor Number</strong></td>
<td><strong># of Cores</strong></td>
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<tr>
<td>3-6100U</td>
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<td>2</td>
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<td>7-6500U</td>
<td>2</td>
</tr>
<tr>
<td>7-6600U</td>
<td>2</td>
</tr>
</tbody>
</table>

**Notes:**
- Processor is NOT available in EMEA
- System clocks down for processors with lower memory controller
- Max resolution: 3840x2160@60Hz (DP via mDP cable); 1920x1200@60Hz (VGA)
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
- Some: 15.6" (396mm) FHD, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
- Some: 15.6" (396mm) LED backlight, IPS, 250 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
- Some: 15.6" (396mm) anti-glare, LED backlight, IPS, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio

**Graphics**
- Intel HD Graphics 520, 610, or 620 in processor only, supports three independent displays
- Max resolution: 3840x2160@60Hz (DP via mDP cable); 1920x1200@60Hz (VGA)

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

**Display**
- Some: 15.6" (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 350:1 contrast ratio
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio

**Multi-touch**
- None

**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, 16GB/s
- Some: 128GB M.2 SSD / SATA 6.0Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN

**Optical (optional)**
- DVD-ROM or DVD burner, 9mm high, fixed, not removable, tray-in

**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:
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card (US only)
  - 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

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

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

**Note:** Specifications above may not be available in all regions.
ThinkPad L580 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>
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<tr>
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<td>Intel HD Graphics 610</td>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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</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>2</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>i3-8250U</td>
<td>4</td>
<td>4</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8350U</td>
<td>8</td>
<td>8</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8370U</td>
<td>8</td>
<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>
</tbody>
</table>

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

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
- System SoC platform is only in non-VA models
- supports 2x DDR4 SO-DIMM sockets
- supports systems with lower memory controller

Display

- 15.6" (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- 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

- Integrated Mobile Broadband 4G LTE
- Intel XMM™ 7262 (Fibocom L830-EB), M.2 card (EMEA only)
- Intel XMM™ 7360 (Fibocom L850-GL), M.2 card

Optical

- None

Ethernet

- Non-VA 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

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

**Product Specifications Reference (PSREF)**

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cel 4305U</td>
<td>2</td>
<td>2</td>
<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 610</td>
</tr>
<tr>
<td>5-8145U</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>5-8265U</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>
<tr>
<td>7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8665U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

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

### Chipset

- Intel SoC (System on Chip) platform
- Intel vPro Technology

### 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; HD</td>
<td>(1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>15.6&quot; FHD</td>
<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</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)

### WLAN + Bluetooth™ (Optional)

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

### WWAN (Optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - 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

### Note:

The specifications above may not be available in all regions.
### ThinkPad P1 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>i5-8400H</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>i7-8750H</td>
<td>6</td>
<td>12</td>
<td>2.5 GHz</td>
<td>4.3 GHz</td>
<td>9MB</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® P1000 or P2000, 4GB GDDR5 memory;
- supports external digital monitor via HDMI or Thunderbolt™;
- supports four independent displays;
- Max resolution: 5K@60Hz (Thunderbolt); 4K@60Hz (HDMI)

#### Chipset

- Mobile Intel CM246 Chipset

#### Memory

- 4GB 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, 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, anti-reflection (AR)

#### Multi-touch (opt)

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

#### Storage

- Up to 2 drives (two M.2 SSD)

#### RAID (optional)

- M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s
- RAIDX0 / RAID 0/1 support
- None

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

#### WWAN™

- None

#### Dimensions

<table>
<thead>
<tr>
<th>Wx Dx H (non-touch)</th>
<th>14.24&quot; x 9.67&quot; x 0.72&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wx Dx H (multi-touch)</td>
<td>14.24&quot; x 9.67&quot; x 0.74&quot;</td>
</tr>
</tbody>
</table>

#### Weight

<table>
<thead>
<tr>
<th>Non-touch model</th>
<th>starting at 3.76 lb / 1.7 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-touch model</td>
<td>starting at 4.06 lb / 1.8 kg</td>
</tr>
</tbody>
</table>

#### Case color

- Black

#### Case material

<table>
<thead>
<tr>
<th>Display cover</th>
<th>CFRP/GFRP hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>Aluminum alloy</td>
</tr>
</tbody>
</table>

#### Note:

- The specifications above may not be available in all regions.
- Lenovo August 2019
<table>
<thead>
<tr>
<th>Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
</tr>
<tr>
<td># of Cores</td>
</tr>
<tr>
<td>8-9400H</td>
</tr>
<tr>
<td>9-9750H</td>
</tr>
<tr>
<td>9-9850H</td>
</tr>
<tr>
<td>9-8880H</td>
</tr>
<tr>
<td>E-2278M</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 3; four independent displays; Max resolution: 5K @ 60Hz (Thunderbolt 3); 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”</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>701</td>
<td>72% NTSC</td>
<td>170°</td>
</tr>
<tr>
<td>15.6”</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>72% NTSC</td>
<td>170°</td>
</tr>
<tr>
<td>15.6”</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>
<td>170°</td>
</tr>
</tbody>
</table>

**Multi-touch (opt)**

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

**Pen**

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

**Storage**

- Up to two M.2 SSD
- M.2 2280 SSD / PCIe NVMe 3.0 x 4

**RAID (optional)**

- RAID 0/1 support
- None

**Ethernet**

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

**WWAN**

- None

**SIM card**

- None

**Battery**

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

**Max battery life**

- *MobileMark 2014*: 13.8 hr
- Battery life varies significantly with settings, usage, & other factors

**AC adapter**

- 135W slim tip AC adapter

**Operating system**

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

**Limited warranty**

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

Lenovo September 2019
**ThinkPad P43s Platform Specifications**

**Product Specifications Reference (PSREF)**

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

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**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>7-8565U</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>7-8665U</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>

**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 system board, one DDR4 SO-DIMM socket
- *Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation*

**Display**

- **Size**
  - 14.0"  
- **Resolution**
  - FHD (1920x1080)  
- **Type**
  - IPS Anti-glare  
- **Brightness**
  - 250 nits (non-touch)
  - 300 nits (multi-touch)
- **Aspect Ratio**
  - 16:9  
- **Contrast Ratio**
  - 700:1
- **Color Gamut**
  - 45%  
- **Viewing Angle**
  - 170°

- **Size**
  - 14.0"  
- **Resolution**
  - FHD (1920x1080) Low Power  
- **Type**
  - IPS Anti-glare  
- **Brightness**
  - 400 nits
- **Aspect Ratio**
  - 16:9  
- **Contrast Ratio**
  - 800:1
- **Color Gamut**
  - 72%  
- **Viewing Angle**
  - 170°

- **Size**
  - 14.0"  
- **Resolution**
  - ThinkPad Privacy Guard  
- **Type**
  - IPS Anti-glare  
- **Brightness**
  - 400 nits
- **Aspect Ratio**
  - 16:9  
- **Contrast Ratio**
  - 1000:1
- **Color Gamut**
  - 72%  
- **Viewing Angle**
  - 170°

- **Size**
  - 14.0"  
- **Resolution**
  - WQHD (2560x1440)  
- **Type**
  - Dolby Vision HDR  
- **Brightness**
  - 500 nits
- **Aspect Ratio**
  - 16:9  
- **Contrast Ratio**
  - 1500:1
- **Color Gamut**
  - 100% Adobe  
- **Viewing Angle**
  - 170°

**Storage**

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

**Optical**

None

**Ethernet**

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

**WLAN**

- Intel Wireless-AC 9560, 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, 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 (optional)**

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

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**Dimensions**

- *WxDxH: 12.95" x 8.94" x 0.70"; 329mm x 227mm x 17.9mm*

**Weight**

- Models
  - FHD
  - FHD Low Power
  - WQHD
- Weight
  - 3.43 lb / 1.55 kg
  - 3.28 lb / 1.49 kg
  - 3.24 lb / 1.47 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 Type C 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 / 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)**

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

**Bundled Accy**

- Lenovo USB-C to USB-C 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, Realtek ALC3287 codec /
- stereo speakers, 2W x 2, Dolby Audio Premium /
- dual array far-field microphone, headphone / microphone combo jack

**Keyboard**

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

**Fingerprint reader**

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

**Battery**

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

**Max battery life**

- MobileMark 2014: 14.7 hr
- *Battery life varies significantly with settings, usage, & other factors

**AC adapter**

- 65W USB Type-C AC adapter

**Operating system**

- Windows 10 Home 64 or Windows 10 Pro 64

**Limited warranty**

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

August 2019
ThinkPad P51 Platform Specifications

Product Specifications Reference (PSREF)

**Processor**
- 6th or 7th Generation Intel® Core™ i7 Processor or Intel Xeon® Processor E3 v5 or v6 Family
- Base Frequency: 2.7 GHz to 3.7 GHz
- Max Turbo Frequency: 3.6 GHz to 4.2 GHz
- Cache: 8 MB
- Memory Types: DDR4-2133 to DDR4-2400
- Processor Graphics: Intel HD Graphics 530, 630, P530

**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);
- Supports four independent displays;
- Max resolution: 3840x2160@60Hz (Thunderbolt);
- 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
- * System clacks down for processors with lower memory controller

**Memory**
- Max capacity: 64GB
- Max speed: 2400MHz

**Display**
- FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits;
- 16:9 aspect ratio, 1000:1 contrast ratio, 100% gamut, 170° viewing angle;
- 4K (3840x2160) resolution, anti-glare, LED backlight, IPS, 300 nits;
- 16:9 aspect ratio, 700:1 contrast ratio, 160° viewing angle

**Storage**
- Up to 3 drives (two M.2 SSD and one HDD)
- 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
- RAID 0/1 support

**Networking**
- Intel Ethernet Connection I219-V (Jacksonville)
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel 8260ac / 8265ac card support BT4.2 but is limited to BT4.1 by Windows OS

**WLAN**
- One of the following, configurable by model:
- 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
- Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

**WWAN**
- One of the following, configurable by model:
- Qualcomm Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card

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

**Operating system**
- One of the following, configurable by model:
  - Windows® 7 Professional 64
  - 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

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

**AC adapter**
- 170W slim tip AC adapter

**Camera**
- HD720p resolution, fixed focus

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

**Finger print reader**
- Optional: Touch style match on chip fingerprint reader on the palm rest

**Color calibration**
- Optional: X-Rite® color calibrator by X-Rite® color calibration sensor in palm rest

**AC adapter**
- 3-button Mylar surface multi-touch touchpad

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

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

**touchpad**
- 3-button TrackPoint® pointing device and 3-button Mylar surface multi-touch touchpad

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

**Processor (Number)**
- i7-7700HQ, 2.8 GHz to 3.8 GHz, 6MB L3 Cache, 8 MB of L2 Cache
- i5-7300HQ, 2.5 GHz to 3.4 GHz, 6MB L3 Cache, 6 MB of L2 Cache
- i5-7200HQ, 2.5 GHz to 3.1 GHz, 6MB L3 Cache, 4 MB of L2 Cache

**Camera (optional)**
- HD720p resolution, fixed focus

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

**Smart card reader**
- Optional: Smart card reader

**ExpressCard**
- One slot (ExpressCard/34)

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

**Ports**
- Four USB 3.1 Gen 1 (USB 3.0, one Always On), USB Type-C / Thunderbolt 3, Mini DisplayPort 1.2a, HDMI 1.4b, Ethernet (RJ-45), Dock connector

**Camera**
- Optional: Windows® 10 Home 64

**Battery**
- 4-cell 6-cell 66Wh or 6-cell 90Wh

**Camera**
- Optional: Windows® 10 Home 64

**Battery**
- 4-cell 6-cell 66Wh or 6-cell 90Wh

**AC adapter**
- 170W slim tip AC adapter

**Operating system**
- One of the following, configurable by model:
  - Windows® 7 Professional 64
  - 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

**Mi-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 P52 Platform Specifications

**Product Specifications Reference (PSREF)**

### Processor

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

### Graphics

- Intel UHD Graphics 630 or P630 in processor and NVIDIA Quadro P1000 (4GB memory), P2000 (4GB memory), or P3200 (6GB memory, VR ready); supports external digital monitor via HDMI, Mini DisplayPort, or Thunderbolt; supports four independent displays; Max resolution: 3840x2160@60Hz (DisplayPort via Mini DisplayPort cable); 5120x2880@30Hz (Thunderbolt); 4096x2160@60Hz (HDMI)

### Chipset

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

### Display

- Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 160° viewing angle
- Some: 15.6" (396mm) 4K (3840x2160), anti-glare, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% gamut, 170° viewing angle, multi-touch
- Capacitive-type multi-touch, supports 10-finger gesture (4K only)
- Supports pen accessory, please see the accessory compatibility for details

### Storage

- Up to 3 drives (two M.2 SSD and one HDD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s
- *Power Delivery only supports power-out for charging peripherals

### Optane™ memory

- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Ethernet

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

### WLAN

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

### WWAN (optional)

- Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7380 (Fibocom L950-9L), M.2 card

### SIM card (optional)

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

### Memory

- 8th Generation Intel® Core™ i7 / i9 Processor or Intel Xeon® E Processor

### Weight

- 14.86" x 9.93" x 0.96-1.16"; 377.4mm x 252.3mm x 24.5-29.4mm

### Case color

- Black

### Case material

- Glass-Fiber Reinforced Plastic; Bottom: Magnesium/Aluminum

### Smart card reader

- Optional: Smart card reader

### 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 / dual array microphone, headphone / microphone combo jack, Dolby Atmos® headphone

### Security chip

- Intel vPro Technology

### 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 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

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

**Lenovo**

**August 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>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>I5-8550U</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>I7-8550U</td>
<td>8</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>I7-8650U</td>
<td>8</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics
- Intel 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 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
- 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16.9 aspect ratio, 170° viewing angle
- Some: 15.6" (396mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16.9 aspect ratio, 1000:1 contrast ratio, 72% gamut, 170° viewing angle

### 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 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)
- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
  - * System clocks down for processors with lower memory controller

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

### WLAN + (optional)
- 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 10

### WWAN (optional)
- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4GE 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 (opt)
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### Dimensions
- 14.40” x 9.95” x 0.79-0.80”
- 365.8mm x 258.2mm x 19.95-20.2mm

### Weight
- Starting at 4.39 lb / 1.99 kg

### Case color
- Black

### Case material
- Display cover: Glass-Fiber Reinforced Plastic (PPS);
- Bottom: Glass-Fiber Reinforced Plastic

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

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

### Ports
- Two USB 3.1 Gen 1 (one Always On), one USB 3.1 Type-C Gen 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

### Monitor cable (optional)
- HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter

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

### Audio support
- HD Audio, Realtek® 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, numeric keypad, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

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

### Fingerprint reader (optional)
- Touch style match on chip fingerprint reader on the palm rest
- anti-spoofing technology

### NFC (optional)
- Near Field Communication

### 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 planar repair service
  - 3-year/1-yr battery depot repair service
  - 3-year/1-yr 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

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*Note: The specifications above may not be available in all regions.*
### ThinkPad P53 Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>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></td>
<td></td>
</tr>
<tr>
<td>i7-9750H</td>
<td>6</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.6 GHz</td>
<td>12MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i9-9880H</td>
<td>8</td>
<td>16</td>
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<td>4.8 GHz</td>
<td>16MB</td>
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<td>E-2276M</td>
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<td>12</td>
<td>2.8 GHz</td>
<td>4.7 GHz</td>
<td>12MB</td>
<td></td>
<td></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, Mini DisplayPort, 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 (inches)</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>72%</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>72%</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100%</td>
</tr>
<tr>
<td>15.6&quot;</td>
<td>UHD (3840x2160)</td>
<td>OLED</td>
<td>AR, AS</td>
<td>350 nits</td>
<td>16:9</td>
<td>100000:1</td>
<td>100% OCI-P3</td>
</tr>
</tbody>
</table>

**Multi-touch (opt)**

- Capacitive-type multi-touch, supports 10-finger gesture (UHD only), anti-reflection (AR), anti-smudge (AS) coating
- Supports pen accessibility, please see the accessory compatibility for details

**Storage**

- Up to 3 drives
  - HDD / SATA 6 Gb/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 0/1/5 support None

**Ethernet**

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

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

**WLAN (optional)**

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

**WWAN (optional)**

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

**SIM card (opt)**

- One of the following, configurable by model:
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

**Dimensions**

<table>
<thead>
<tr>
<th>WxDxH (non-touch)</th>
<th>14.86&quot; x 9.93&quot; x 0.96-1.16&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Non-touch model: starting at 5.51 lb / 2.5 kg; Multi-touch model: starting at 6.4 lb / 2.9 kg</td>
</tr>
</tbody>
</table>

**ExpressCard**

Optional: Smart card reader

**Media reader**

None

**Ports**

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

**Monitor cable**

Available: Lenovo USB-C to DisplayPort Adapter

**Media reader**

None

**Battery**

- Integrated Li-ion 90Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- Hybrid mode: 13 hr
- *Battery life varies significantly with settings, usage, & other factors

**Audio support**

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

**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
- Optional: X-Rite Pantone factory color calibration (UHD model only)
- NFC (optional)
- Near Field Communication

**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

**Environment**

EPEAT Silver; ENERGY STAR 7.1; RoHS-compliant

**Lenovo September 2019**

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>
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<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Generation Intel® Core™ i7 Processor</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>
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<tr>
<td>7-8651U</td>
<td></td>
<td></td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
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<td>7-8661U</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Specifications Reference (PSREF)**

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

Lenovo

August 2019

### Graphics

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

### Chipset

- Memory Chipset
- 8GB or 16GB memory soldered to system board, one DDR4 SO-DIMM socket
- 48GB max / 2400MHz DDR4, dual-channel capable,
- Intel SoC (System on Chip) platform

### Display

- 15.6" FHD (1920x1080) IPS Anti-glare 250 nits 16:9 700:1 45% 170°
- 15.6" UHD (3840x2160) Dolby Vision™ HDR IPS Anti-glare 500 nits 16:9 1200:1 100% Adobe 170°

### Multi-touch (opt)

- On-cell touch, supports 10-finger gesture (FHD only)
- None

### Storage

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

### Optical

- None

### Ethernet

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

### WLAN

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

### WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - 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 (opt)

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

**Dimensions**

- Wx Dx H: 14.40" x 9.76" x 0.75"; 365.8mm x 248mm x 19.1mm

**Weight**

- starting at 3.87 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

**Bundled Accy**

- One of the following, configurable by model:
  - UltraNav™ pointing device and buttonless Mylar surface multi-touch touchpad
  - HD Audio, Realtek® ALC3287 codec /
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus
  - Dolby® Audio™ Premium / stereo speakers, 2W x 2, Dolby® Audio™ Premium /
  - dual array far-field microphone, headphone / microphone combo jack

**Camera (optional)**

- 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

**Audio support**

- Power-on password, hard disk password, supervisor password, security keyhole
- Diskette drive, by default

**Security**

- Security chip
- Security System Mgt (opt)
- Intel vPro Technology

**Fingerprint reader**

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

**Battery**

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

**Max battery life**

- 15 hr (FHD model) / 10 hr (UHD model)

**AC adapter**

- 65W USB Type-C AC adapter

**Environmental**

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

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

Lenovo

August 2019
ThinkPad P72 Platform Specifications

Product Specifications Reference (PSREF)

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
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<tbody>
<tr>
<td>7-8750H</td>
<td>6</td>
<td>12</td>
<td>2.2 GHz</td>
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<tr>
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<td>E-2186M</td>
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<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 @ 30Hz (Thunderbolt); 4096x2160 @ 60Hz (HDMI)

**Chipset**

Mobile Intel CM246 Chipset

**Memory**

128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets

**Display**

- Some: 17.3” (439mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle
- Some: 17.3” (439mm) 4K (3840x2160), anti-glare, LED backlight, IPS, 400 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% Adobe C, 170° viewing angle

**Multi-touch Pen**

None

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

**Storage**

Up to 3 drives (two M.2 SSD and one HDD)

- 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

**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™**

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

**WWAN**

None

**SIM card**

None

**Dimensions**

WxDxH: 16.38” x 11.06” x 0.96-1.16”

**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

**ExpressCard**

None

**Media reader**

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

**Ports**

Four 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), headphone / microphone combo jack, optional smart card reader, 4-in-1 reader (MMC, SD, SDHC, SDXC), security keyhole

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

**Monitor cable**

Lenovo Mini-DisplayPort to DisplayPort Monitor Cable

**Camera (optional)**

IR camera and HD720p camera, fixed focus

**Audio support**

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

**Keyboard**

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

**Fingerprint reader**

Touch style match on chip fingerprint reader on the palm rest

**Security chip**

Intel vPro Technology

**Battery**

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

**ADP**

230W slim tip AC adapter

**Operating system**

Windows® 10 Home 64

**Limited warranty**

One of the following, configurable by model:

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

**Mil-Spec test**

MIL-STD-810G military testing

**Environment**

EPEAT™ Gold (US only); ENERGY STAR® 7.0; RoHS-compliant

Lenovo
May 2019

Note: The specifications above may not be available in all regions.
**ThinkPad P73 Platform Specifications**

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
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<th>Memory Types</th>
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<tr>
<td>E-9850H</td>
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<td>E-2878H</td>
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<td>2.3 GHz</td>
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<td>16MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
</tbody>
</table>

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**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

**Memory**

128GB max / 2666MHz 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**

<table>
<thead>
<tr>
<th>Size/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>17.3” FHD (1920x1080)</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></td>
</tr>
<tr>
<td>17.3” UHD (3840x2160) Dolby Vision™ HDR</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>100%</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

---

**Multi-touch Pen**

None

---

**Storage**

Up to 3 drives (two M.2 SSD and one HDD)
- 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

---

**Ethernet**

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

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

---

**WLAN Bluetooth™**

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

**WWAN**

None

**SIM card**

None

---

**Camera**

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

**Audio support**

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

---

**Security**

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

**Security chip vPro (optional)**

Discrete TPM 2.0, TCG Certified

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 (HDMU model only)

NFC (optional) Near Field Communication

---

**Battery**

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

Max battery life

**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

---

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

---

**Lenovo August 2019**
## ThinkPad T470 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>
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</thead>
<tbody>
<tr>
<td>i5-6200U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>2.8 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i5-6300U</td>
<td>2</td>
<td>4</td>
<td>2.4 GHz</td>
<td>3.0 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i7-6500U</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>
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<tr>
<td>i7-6600U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

**Note:** The specifications above may not be available in all regions. Lenovo September 2018

### Graphics

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

### Chipset

- Intel SoC (System on Chip) platform
- Intel Ethernet Connection I219-LM (Jacksonville) or I219-V (Jacksonville)

### Display

- Intel XMM™ 7160 (Fibocom L831-EAU), M.2 card (EMEA only)

### Storage

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

### Optical

- None

### Ethernet

- Intel Ethernet Connection I219-V (Jacksonville) or I219-LM (Jacksonville)

### WLAN

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

### Bluetooth™

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

### 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 E7455), M.2 card
  - Integrated Mobile Broadband 4G LTE

### SIM card (opt)

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

### WWAN (optional)

- Integrated Mobile Broadband 4G LTE-A
  - Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless E7455), M.2 card
  - Integrated Mobile Broadband 4G LTE

### Security chip

- Discrete TPM 2.0, TCG Certified

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Near Field Communication

### NFC (optional)

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

### Power

- 3-cell 3 + 3-cell 6-cell 48Wh 6-cell 72Wh 3 + 6-cell 48Wh 3 + 6-cell 72Wh

### Storage

- System has one HDD slot or one M.2 2280 slot exclusively for storage
- HDD / SATA 6.0Gb/s, 2.5" wide, 7mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxGB SSD)
- 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 WiGi

### Weight

- Dimensions: 336.6mm x 232.5mm x 19.95mm

### Camera (optional)

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

### Audio

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

### AC adapter

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

---

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

Lenovo September 2018
### ThinkPad T470s Platform Specifications

**Product Specifications Reference (PSREF)**

**Lenovo**

April 2019

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#### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
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<td>2.8 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
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<td>3.4 GHz</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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</tbody>
</table>

* or 7th Generation Intel Core i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
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<th>Max Turbo Frequency</th>
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<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

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#### 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**
  - 2GB or 4GB max / 2400MHz DDR4, dual-channel capable, 4GB or 8GB memory soldered to system board; one DDR4 SO-DIMM socket
  - Intel SoC (System on Chip) platform
  - *System clocked down for processors with lower memory controller

#### Display

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

#### Storage

- **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)

#### Optical

- **None**

---

#### Ethernet

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

#### WLAN

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

#### Bluetooth

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

#### WWAN (optional)

- **One of the following, configurable by model (mutually exclusive with WiGig):**
  - Wireless WAN upgradeable
  - Integrated Mobile Broadband 4G LTE-A, Qualcomm Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card

#### SIM card (opt)

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

#### Security

- **Security chip**
  - Intel vPro Technology
- **Fingerprint reader**
  - Optional: Touch style match on chip fingerprint reader on the palm rest
- **TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad
- **Near Field Communication (NFC) (optional)**

#### Operating System

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

#### Limited warranty

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

---

**Camera (optional)**

- HD720p resolution, fixed focus

**Audio support**

- (models without camera are NOT available in EMEA)
- HD Audio, Realtek® ALC3268 codec / stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack

**Keyboard**

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

**System language**

- Gold (US only); ENERGY STAR® Gold (EMEA)

**Environment**

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

---

**Dimensions**

- WxDxH: 13.03" x 8.93" x 0.67-0.74*; 331mm x 226.8mm x 16.9-18.8mm

**Weight**

- Starting at 2.9 lb / 1.32 kg

**Case color**

- Black or Silver

**Case material**

- **Display cover:** CFRP Hybrid;
  - **Bottom:** Magnesium

**Smart card reader**

- Optional: Smart card reader

**Media reader**

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

**Ports**

- 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

**WWAN (optional)**

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

**Acoustic noise**

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

**AC adapter**

- 5V 2A, dock power adapter, 24V 1.5A AC adapter

**Rated battery capacity**

- 26Wh (front Li-Polymer 3-cell) and rear Li-ion 3-cell (23Wh), both Integrated

**Battery life**

- **Internal battery**
  - Front Li-Polymer 3-cell (23Wh) and rear Li-ion 3-cell (26Wh), both Integrated
  - MobileMark® 2014: up to 10.5 hr

**AC adapter**

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

---

**Lenovo**

April 2019
### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>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>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
<td>i3-8130U</td>
<td>2</td>
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<td>4.1 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only or Intel HD Graphics 620 or Intel UHD Graphics 620 in processor and NVIDIA® GeForce® MX150, 2GB GDDR5 memory (discrete graphics is available only on i7 models in EMEA); supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@30Hz (HDMI)

### Chipset 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:** 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, 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
- 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
- Integrated Magnesium
- Integrated PPS
- Discrete Magnesium
- Discrete PPS

### Optane™ memory

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

### Ethernet

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

### WLAN + Bluetooth™

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

### WWAN (optional)

- One of the following, configurable by model (mutually exclusive with Intel Optane memory):
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7360 (Fibocom LB50-GL), M.2 card (EzEM only)
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom LB50-GL), M.2 card (EzEM only)

### SIM card (optional)

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

### Dimensions

<table>
<thead>
<tr>
<th>Weight</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.25&quot; x 9.15&quot; x 0.79&quot;</td>
<td>24Wh or 24Wh + 24Wh</td>
</tr>
<tr>
<td>336.6mm x 232.5mm x 19.95mm</td>
<td>48Wh, 72Wh, or 24Wh + 48Wh / 72Wh</td>
</tr>
</tbody>
</table>

### Battery

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

### Security

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

### Audio support

- HD720p camera with ThinkShutter camera privacy, fixed focus
- HD camera and HD720p camera, fixed focus
- HD Audio, Realtek ALC297 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack

### Camera

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

### Display port

- On-cell touch, supports 10-finger gesture (FHD only)
- External HD Audio, Realtek ALC3267 codec / Premium Audio
- IR camera and HD720p camera, fixed focus
- HD Audio, Realtek ALC297 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack

### Operating system

- Windows® 10 Home 64 or Windows 10 Pro 64
- Lenovo USB-C to DisplayPort Adapter

### AC adapter

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

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant
## ThinkPad T480s 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>i5-7200U</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>

### 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
- 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) QWHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle

### Multi-touch (opt)

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

### Storage

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

### Optical

- None

### Ethernet

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

### WLAN + Bluetooth™

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

### WWAN (optional)

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

### SIM card (opt)

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

### Media reader

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

### Ports

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

### Camera

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

### Audio support

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

### Keyboard

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

### Security

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

### Fingerprint reader

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

### NFC (optional)

- Near Field Communication

### Battery

- Integrated Li-ion 57Wh battery, supports Rapid Charge (0-80% in 60 mins) with 65W USB Type-C AC adapter
- MobileMark® 2014: 15.6 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 planar 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® 6.1; RoHS-compliant

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

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

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>
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<tbody>
<tr>
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<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>7-10510U</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 620</td>
</tr>
</tbody>
</table>

### Graphics

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

### Chipset

Intel SoC (System on Chip) platform

8GB or 16GB memory soldered to systemboard, one DDR4 SO-DIMM socket

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

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot;</td>
<td>HD (1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>14.0&quot;</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>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080) Low Power</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080) ThinkPad Privacy Guard*</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>100:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>WQHD (2560x1440) HDR, Dolby Vision®</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>

* 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

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

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

### 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)

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

* Only non-WWAN and WWAN upgradeable are available on 20Q9 / 20QH models

### SIM card (opt)

Nanosim card slot, optional Verizon LTE (US) SIM card

---

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

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

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>1.6 GHz</td>
<td>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>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
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<tr>
<td>i5-8565U</td>
<td>4</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
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</tr>
<tr>
<td>i7-8665U</td>
<td>4</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

#### Graphics
Intel UHD Graphics 620 in processor; 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
8GB, 16GB or 32GB / 2400MHz DDR4 / soldered to system board, no sockets * Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation

#### 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>14.0” 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>14.0” 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>
<td></td>
</tr>
<tr>
<td>14.0” FHD (1920x1080) ThinkPad Privacy Guard</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0” WQHD (2560x1440) HDR, Dolby Vision™</td>
<td>IPS Glossy</td>
<td>500 nits</td>
<td>16:9</td>
<td>1500:1</td>
<td>100% Adobe</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

#### Multi-touch (opt)
On-cell touch, supports 10-finger gesture (FDA 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 LB850-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
<table>
<thead>
<tr>
<th>Model</th>
<th>WX x DX x HX (black with FHD / Privacy Guard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>12.95” x 8.90” x 0.66” / 329.0mm x 226.15mm x 16.7mm</td>
</tr>
<tr>
<td>i5-8365U</td>
<td>12.94” x 8.99” x 0.63” / 328.8mm x 225.8mm x 16.1mm</td>
</tr>
<tr>
<td>i5-8565U</td>
<td>12.96” x 8.92” x 0.68” / 329.15mm x 226.45mm x 17.2mm</td>
</tr>
</tbody>
</table>

#### Weight
<table>
<thead>
<tr>
<th>Models</th>
<th>Black with FHD</th>
<th>Black with FHD Low Power / WQHD / Privacy Guard</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>2.96 lb / 1.35 kg</td>
<td>2.81 lb / 1.27 kg</td>
<td>3.29 lb / 1.49 kg</td>
</tr>
</tbody>
</table>

#### Case color
- Case color: Black or Silver

#### Case material
- Case material: CFPR Hybrid (black) or Aluminum (silver)
- Bottom: Magnesium

#### 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 extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole

#### Display cover: CFP Hybrid (black) or Aluminum (silver)

#### Monitor cable (optional)
- Depending on many factors, actual data transfer speed may be lower than theoretical speed

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

#### Audio support
- Audio support: HD Audio, Realtek ALC3287 codec / stereo speakers, 1W x 2, Dolby Audio™ Premium

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

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

#### Battery
- Battery: Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

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

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

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

#### Environment
- Environment: ENERGY STAR® 7.1; RoHS-compliant

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

Lenovo
August 2019
## ThinkPad T495 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 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, Vega 8, or Vega 10 Graphics in processor; supports external digital monitor via USB-C or HDMI; supports four independent displays; Max resolution: 5120x2880@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 system board, one DDR4 SO-DIMM socket

### Display

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

### Multi-touch (optional)

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

### Storage

- M.2 2280 SSD / 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

- 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 upgradable
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

### SIM card (optional)

- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

### 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, 2W x 2, Dolby Audio Premium / dual array far-field microphone, headphone / microphone combo jack

### Audio support

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

### Security

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

### Battery

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

### Operating system

- Windows 10 Home 64 or Windows 10 Pro 64

### Limited warranty

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

### Mil-Spec test

- MIL-STD-810G military testing

### Environment

- EPEAT Silver; ENERGY STAR 7.1; RoHS-compliant

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

Lenovo
July 2019
### ThinkPad T495s Platform Specifications

#### Processor

<table>
<thead>
<tr>
<th>Processor Number</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>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>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 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 Memory

- AMD SoC (System on Chip) platform
- 8GB or 16GB / 2400MHz DDR4 / soldered to system board, 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>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” FHD</td>
<td>(1920x1080)</td>
<td>IPS Anti-giare</td>
<td>250 nits (non-touch) 300 nits (multi-touch)</td>
<td>16.9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0” FHD (non-Touch)</td>
<td>1920x1080</td>
<td>IPS Anti-giare</td>
<td>400 nits</td>
<td>16.9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>14.0” ThinkPad Privacy Guard</td>
<td>1920x1080</td>
<td>IPS Anti-giare</td>
<td>400 nits</td>
<td>16.9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

#### Multi-touch (opt)

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

#### Storage

- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- None

#### Ethernet

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

#### Weight

<table>
<thead>
<tr>
<th>Models</th>
<th>Weight (FHD)</th>
<th>Weight (FHD Low Power)</th>
<th>Weight (FHD Privacy Guard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD</td>
<td>2.92 lb / 1.33 kg</td>
<td>2.76 lb / 1.25 kg</td>
<td>2.89 lb / 1.31 kg</td>
</tr>
<tr>
<td>Low Power</td>
<td>12.95” x 8.90” x 0.66”</td>
<td>329.0mm x 226.15mm x 16.7mm</td>
<td></td>
</tr>
<tr>
<td>Privacy Guard</td>
<td>12.94” x 8.89” x 0.63”</td>
<td>328.8mm x 225.8mm x 16.1mm</td>
<td></td>
</tr>
</tbody>
</table>

#### Case color

- Black

#### Case material

- Display cover: CFRP Hybrid
- Bottom: Magnesium/Aluminum

#### Smart card reader

- Optional: Smart card reader

#### Media reader ports

- MicroSD card reader (Optional)
- One of the following, configurable by model:
  - USB 3.1 Gen 1 (Always On), one USB 3.1 Gen 2, two USB 3.1 Type-C Gen 2 (with the function of Power Delivery and DisplayPort), HDMI 2.0, Ethernet extension connector, nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

#### Monitor cable (optional)

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

#### Audio support

- One of the following, configurable by model:
  - HD720p camera with ThinkShutter camera privacy, fixed focus
  - IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus
  - HD Audio, Realtek® ALC3287 codec / stereo speakers, 1W x 2, Dolby® Audio™ Premium / dual array far-field microphone, headphone / microphone combo jack
  - * Depending on many factors, actual data transfer speed may be lower than theoretical speed

#### Keyboards

- 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
- Diskette drive, optional fingerprint reader on the palm rest
- None

#### FingerPrint reader

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

#### Battery

- Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- Max battery life: MobileMark® 2014: 16.4 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

- One of the following, configurable by model:
  - 1-year depot repair service
  - 3-year/1-yr battery depot repair service
  - None

#### MIL-Spec test

- MIL-STD-810G military testing

#### Environment

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

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

Lenovo
August 2019
ThinkPad T580 Platform Specifications

Processor 7th Generation Intel® Core™ i5 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>5-7200U</td>
<td>2</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>5-7300U</td>
<td>2</td>
<td>2.5 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>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-8250U</td>
<td>4</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>5-8350U</td>
<td>4</td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>7-8550U</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>8</td>
<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

Graphics

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

Chipset

- Intel SoC (System on Chip) platform
- * System clocks down for processors with lower memory controller

Display

- **Some:** 15.6” (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16.9 aspect ratio, 700:1 contrast ratio, 170° viewing angle
- **Some:** 15.6” (396mm) UHD (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16.9 aspect ratio, 1000:1 contrast ratio, 72% gamut, 170° viewing angle
- On-cell touch, supports 10-finger gesture (FHD only)

Storage

- System has one HDD slot or one M.2 2280 slot exclusively for storage
- **Some:** HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- **Some:** SSD / SATA 6.0Gb/s, 2.5” wide, 7mm high (e.g. 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

- Non-vPro model: Intel Ethernet Connection 219-V (Jacksonville)
- vPro model: Intel Ethernet Connection 219-LM (Jacksonville)
- * Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

WLAN + Bluetooth

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

WWAN (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7362 (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 (opt)
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

Dimensions

- WxDxH: 14.40” x 9.95” x 0.79-0.80”; 365.88mm x 252.88mm x 19.95-20.2mm

Weight

- Integrated model: starting at 4.29 lb / 1.95 kg
- Discrete model: starting at 4.39 lb / 1.99 kg

Case color

- Black

Display cover

- Glass-Fiber Reinforced Plastic (PPS)
- Glass-Fiber Reinforced Plastic

Smart card reader

- Optional: Smart card reader

Media reader

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

Ports

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

Monitor cable

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

Camera

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

Audio support

- HD Audio, Realtek 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, numeric keypad, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad

Security chip

- Security chip: Intel vPro Technology
  - Fraud-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

Battery

- Optional integrated Li-ion 32Wh battery and external Li-ion 24Wh, 48Wh, or 72Wh battery
- 4-in-1 reader (MMC, SD, SDHC, SDXC)

Max battery life

- (MobileMark® 2014)
  - Models: 24Wh, 48Wh, 72Wh
  - 32Wh + 24Wh, 32Wh + 48Wh, 32Wh + 72Wh

Max battery life

- 5.8 hr, 12.5 hr, 18.1 hr
- 13.8 hr, 20.3 hr, 26.1 hr

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 planar 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.
### Processor

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<td>1.6 GHz</td>
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<td>1.6 GHz</td>
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<tr>
<td>i7-8565U</td>
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<td>8</td>
<td>1.8 GHz</td>
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<td>8 MB</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
- 48GB max / 2400MHz DDR4, dual-channel capable, 8GB or 16GB memory soldered to system board, 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 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 Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
<td></td>
</tr>
<tr>
<td>15.6&quot; UHD (3840x2160)</td>
<td>IPS Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1200:1</td>
<td>100% Adobe</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

### Multi-touch (opt)

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

### Storage

- M.2 2280 SSD / SATA 6.0Gbps
- 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
- None

### Optical

- None

### Ethernet

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

### WLAN (optional)

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

### WWAN (optional)

- One of the following, configurable by model:
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EAME only)
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

### SIM card

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

### Monitor cable (optional)

- USB-C to VGA: Lenovo USB-C to VGA Adapter (NOT available in EMEA)
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter (NOT available in EMEA)
- Bundled Acessory: None

### 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 / stereo speakers, 2W x 2, Dolby® Audio® Premium / 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
- Fingerprint reader (optional): Touch style match on chip fingerprint reader on the palm rest

### Battery

- Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter
- MobileMark® 2014: 14.98 hr (9.5 hr for UHD model with discrete graphics)
- AC adapter: 45W or 65W USB Type-C AC adapter

### Ports

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

###環境 (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</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>i5-7300U</td>
<td>2</td>
<td>4</td>
<td></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>or 8th Generation Intel Core i5 / i7 Processor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>i5-8250U</td>
<td>4</td>
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<td>3.4 GHz</td>
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<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>850U</td>
<td></td>
<td></td>
<td></td>
<td>1.7 GHz</td>
<td>3.6 GHz</td>
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</tr>
<tr>
<td>7-8550U</td>
<td>1.8 GHz</td>
<td>4</td>
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<td>1.8 GHz</td>
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<tr>
<td>7-8650U</td>
<td>1.9 GHz</td>
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<td>1.9 GHz</td>
<td>4.2 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Graphics | Intel HD Graphics 620 or Intel UHD Graphics 620 in processor; supports external digital monitor via HDMI or USB Type-C; supports three independent displays; Max resolution: 5120x2880 @60Hz (USB Type-C); 4096x2160@30Hz (HDMI) |

| Chipset | Intel SoC (System on Chip) platform |
| Memory | 8GB or 16GB / 2133MHz LPDDR3 / soldered to systemboard, no sockets *System clocks down for processors with lower memory controller |

| Display | One of the following, configurable by model: |
|         | • 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle |
|         | • 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 |
|         | • 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) None |

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

| 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) | Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card *For non-WWAN model, it means the model is NOT WWAN upgradable |
| SIM card (opt) | NANO-SIM card slot, optional Verizon LTE (US) SIM card |

<table>
<thead>
<tr>
<th>Processor Specifications</th>
<th>Reference (PSREF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lenovo</td>
<td>August 2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product Specifications Reference (PSREF)</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>WyDxH: 12.74&quot; x 8.55&quot; x 0.63&quot;; 323.5mm x 217.1mm x 15.95mm</td>
<td>Starting at 2.49 lb / 1.13 kg</td>
<td></td>
</tr>
</tbody>
</table>

| Case color | Black or Silver (silver case is NOT available in EMEA) |
| Case material | Display cover: CFRPP/GFRP 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) |
| Monitor cable | HDMI to VGA: Lenovo HDMI to VGA Monitor Adapter |
| Bundled Acce | Optional: ThinkPad Ethernet Extension Adapter Gen 2 |

| Camera (optional) | One of the following, configurable by model: |
| Security chip | Power-on password, hard disk password, supervisor password, security keyhole |
| Security chip | Diskette TPM 2.0, TCG Certified |
| Audio support | Intel vPro Technology |
| Keyboard | HD Audio, Realtek ALC3286 codec / stereo speakers, 1W x 2, Dolby Audio™ Premium / dual array microphone, headphones / microphone combo jack, Dolby Atmos™ via headphones |
| UltraNav™ | 6-row, spill-resistant, multimedia Fn keys, LED backlight |
| UltraNav™ | TrackPoint® pointing device and buttonless glass surface multi-touch touchpad |

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

| Limited warranty | One of the following, configurable by model: |
| Limited warranty | • 1-year depot repair service |
| Limited warranty | • 1-year depot with 2-year planar repair service |
| Limited warranty | • 3-year/1-yr battery depot repair service |

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

| Battery | Integrated Li-ion 57Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter |
| Battery | MobileMark® 2014: 19.3 hr |
| Battery | Near Field Communication |
| Battery | Battery life varies significantly with settings, usage, & other factors |
| Battery | AC adapter 45W, 65W, or 65W Low Halogen USB-C AC adapter |

| Mil-Spec test | MIL-STD-810G military testing |
| Environment | EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant |
## 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>
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<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5-8665U</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 620 or Intel UHD Graphics in processor; supports external digital monitor via HDMI or USB Type-C / Thunderbolt; supports three independent displays; Max resolution: 4096x2304 at 60Hz (Thunderbolt); 4096x2160@24Hz (HDMI)
- Multi-touch IPS Anti-glare 300 nits 16:9 700:1 72% 170°
- IPS Glossy 500 nits 16:9 1400:1 90% 170°
- 14.0" FHD (1920x1080)
- 14.0" FHD (1920x1080), Multi-touch
- 14.0" WQHD (2560x1440)
- 14.0" UHD (3840x2160)
- 2019: Black; 2014: Silver; ENERGY STAR

### Chipset Memory

- Intel SoC (System on Chip) platform
- 8GB or 16GB / 2133MHz LPDDR3 / soldered to systemboard, no sockets

### Display

- Size
- Resolution
- Type
- Surface
- Brightness
- Aspect Ratio
- Contrast Ratio
- Color Gamut
- Viewing Angle
- Multi-touch

### 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
  - Intel Optane SSD, M.2 2280, PCIe NVMe 3.0 x 2
  - None

### Ethernet

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

### Battery

- Integrated Li-ion 51Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter
- Battery life varies significantly with settings, usage, & other factors

### Operating system

- Windows 10 Home 64 or Windows 10 Pro 64
- MobileMark 2014: 18.3 hr

### Limited warranty

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

### FCC (optional)

- Near Field Communication (NFC)

### Security chip

- Security chip
- System Mgt (opt)

### Camera (optional)

- Camera cable
- Camera
- Camera support

### Audio support

- HD Audio, Realtek
- Dolby Atmos speaker system, 2W x 2, 0.8 x 2 / 4 array far-field microphones, headphone / microphone combo jack

### Smart card reader

- None

### SIM card (opt)

- 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
  - Integrated Mobile Broadband 4G LTE-A, Fibocom L960-GL, MIMO 2x2, M.2 card

### Bluetooth

- Bluetooth

### Smart card reader

- None

### Media reader

- None

### Optional:

- Lenovo HDMI to VGA Monitor Adapter
- Lenovo Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)
- Lenovo UltraNav™ pointing device and buttonless glass surface multi-touch touchpad
- Intel vPro Technology
- Touch style match on chip fingerprint reader on the palm rest

### Environment

- MIL-Spec test
- MIL-STD-810G military testing
- EPEAT Silver; ENERGY STAR 7.1; RoHS-compliant

### Note

- The specifications above may not be available in all regions.
<table>
<thead>
<tr>
<th>Processors</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>8th Gen Intel® Core™ i5 / i7</td>
<td>8th Gen Intel® Core™ i5-8300H</td>
<td>4</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2666</td>
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</tr>
<tr>
<td>8th Gen Intel® Core™ i5-8400H</td>
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<td>2.5 GHz</td>
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<tr>
<td>7th Gen Intel® Core™ i7-8750H</td>
<td>6</td>
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</tr>
<tr>
<td>7th Gen Intel® Core™ i7-8850H</td>
<td>6</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Graphics | Intel UHD Graphics 630 in processor and NVIDIA® GeForce® GTX 1050 Ti, 4GB GDDR5 memory; supports external digital monitor via HDMI or Thunderbolt®; supports four independent displays; Max resolution: 5K @ 60Hz (Thunderbolt®); 4K @ 60Hz (HDMI) |

| Chipset | Mobile Intel CM246 Chipset |
| Memory | 64GB max / 2666MHz DDR4, 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 |
| 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 2 drives (two M.2 SSD) |
| RAID (optional) | M.2 SSD / SATA 6.0Gb/s (e.g. 3xXGB SSD M.2) |
| Optical | M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxxGB SSD M.2 PCIe NVMe) |
| 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 |
| WWAN | Bluetooth 5.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter |
| SIM card | None |
| Dimensions (touch) | 14.24" x 9.67" x 0.72"; 361.8mm x 245.7mm x 18.4mm |
| Dimensions (multi-touch) | 14.24" x 9.67" x 0.74"; 361.8mm x 245.7mm x 18.7mm |
| Case color | Black |
| Case material | Display cover: CFRP/GFRP hybrid; Bottom: Aluminum alloy |

Note: The specifications above may not be available in all regions.
ThinkPad X1 Extreme (2nd Gen) Platform Specifications

### Processor
- **9th Generation Intel® Core™ i5 / i7 / i9 Processor**

### Graphics
- Intel UHD Graphics 630 in processor and NVIDIA® GeForce® GTX 1650, 4GB GDDR5 memory; supports external digital monitor via HDMI or Thunderbolt™.

### Chipset
- Mobile Intel CM246 Chipset
- DDR4, dual-channel capable, two DDR4 SO-DIMM sockets

### Display
- **15.6” FHD (1920x1080)**
  - IPS Anti-glare 300 nits 16:9 700:1 72% NTSC 170°
- **15.6” FHD (1920x1080)**
  - Dolby Vision HDR
  - Anti-glare 500 nits 16:9 1200:1 72% NTSC 170°
- **15.6” UHD (3840x2160)**
  - Dolby Vision HDR
  - Anti-glare 500 nits 16:9 1200:1 100% Adobe 170°
- **15.6” UHD (3840x2160)**
  - Dolby Vision HDR, Multi-touch
  - OLED, AR, AS SDR 400nits, HDR 500nits (peak) 16:9 100000:1 100% DCI-P3 170°

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

### Storage
- Up to two M.2 2280 SSD / PCIe NVMe 3.0 x 4

### RAID (optional)
- RAID 0/1 support None

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

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

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

### WWAN SIM card
- None

---

### Dimensions
- **WxDxH (non-touch):** 14.24”x9.67”x0.72” (361.8mm x 245.7mm x 18.4mm)
- **WxDxH (multi-touch):** 14.24”x9.67”x0.74” (361.8mm x 245.7mm x 18.7mm)

### Weight
- **Non-touch model:** starting at 3.75 lb / 1.7 kg
- **Multi-touch model:** starting at 4.0 lb / 1.81 kg

### Case color
- Black paint (FHD model) or black weave (UHD model)

### Case material
- **Display cover:** CFFP/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): HDMI to VGA / Lenovo HDMI to VGA Monitor Adapter
- USB-C to VGA: Lenovo USB-C to VGA Adapter
- USB-C to DP: Lenovo USB-C to DisplayPort Adapter

### Bundled Accy
- Optional: ThinkPad Ethernet Extension Cable

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

### Security chip
- Discrete TPM 2.0, TCG Certified

### Security
- Intel vPro Technology

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

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

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

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

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

Lenovo
September 2019
### Processor Specifications

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
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<tbody>
<tr>
<td>i3-6006U</td>
<td>2</td>
<td>4</td>
<td>2.0 GHz</td>
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**or 7th Generation Intel Core™ / i5 / i7 Processor**

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<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>
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<tr>
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<td>i5-7300U</td>
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<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

### Graphics

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

### Chipset

- Intel SoC (System on Chip) platform
- 16GB max / 2400MHz DDR4, one DDR4 SO-DIMM socket
- * System clocks down for processors with lower memory controller

### Display

- 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 170° viewing angle
- 12.5" (317.5mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle
- On-cell touch, supports 10-finger gesture (FHD only)

### Storage

- System has one HDD slot or one M.2 2280 slot exclusively for storage
- 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. 3GxGB 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

### Optical

- None

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

### WLAN

- One of the following, configurable by model (WiGig is mutually exclusive with WWAN):
  - Intel® Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1
  - 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
  - Intel 8265ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

### Bluetooth™

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

### WWAN (optional)

- One of the following, configurable by model (mutually exclusive with WiGig):
  - Wireless WAN upgradable
  - Integrated Mobile Broadband 4G LTE-A, Qualcomm® Snapdragon™ X7 LTE-A (Sierra Wireless EM7455)
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7160 (Fibocom LB311-EAU) (EMEA only)

### SIM card (optional)

- Micro-SIM card slot, opt Verizon LTE (US) or Lenovo® Connect (EMEA) SIM card
ThinkPad X280 Platform Specifications

Product Specifications Reference (PSREF)

**Processor**
7th Generation Intel® Core™ i3 / i5 Processor
- i3-7130U is NOT available in US and EMEA; i5-7200U is NOT available in US

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th>Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
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<td>i5-7200U</td>
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</table>

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

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th>Threads</th>
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<th>Max Turbo Frequency</th>
<th>Cache</th>
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</table>

**Chipset**
Intel SoC (System on Chip) platform
* 4GB memory is NOT available in US and EMEA
* System clocks down for processors with lower memory controller

**Memory**
4GB, 8GB, or 16GB / 2400MHz DDR4 / soldered to systemboard, no sockets

**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
* 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)

**Storage**
One of the following, configurable by model:
- M.2 SSD / SATA 6.0Gb/s (e.g. x8GB SSD M.2)
- M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxxGB SSD M.2 PCIe NVMe)

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

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

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

**SIM card (opt)**
For non-WWAN model, it means the model is NOT WWAN upgradable
Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card

**Weight**
FHD non-touch model: 2.49 lb / 1.13 kg; HD non-touch model: 2.78 lb / 1.26 kg; FHD multi-touch model: 2.79 lb / 1.27 kg

**Case color**
Black

**Case material**
Display cover: Carbon Fiber (FHD non-touch model) or Glass Fiber (HD & FHD multi-touch model);
Bottom: Magnesium/Aluminum

**Smart card reader**
Optional: Smart card reader

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

**Ports**
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
- IR camera and HD720p camera, fixed focus

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

**Keyboard**
6-row, spill-resistant, multimedia F keys, optional LED backlight

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

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

**Security chip**
Intel vPro Technology

**Battery**
Integrated Li-ion 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

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

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

**NFC** (optional)
Near Field Communication

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

**Dimensions**
WxDxH: 12.11” x 8.26” x 0.69-0.70”; 307.7mm x 209.8mm x 17.4-17.8mm

**Lenovo Limited warranty**
- 1-year depot with 2-year planar repair service
- MobileMark® 2014: 16.6 hr

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

**Misc test**
MIL-STD-810G military testing

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

Lenovo September 2019
### ThinkPad X390 Platform Specifications

#### Processor
- 8th Generation Intel® Core™ i3 / i5 / i7 Processor
- Processor Number
- # of Cores
- # of Threads
- Base Frequency
- Max Turbo Frequency
- Cache
- Memory Types
- Processor Graphics

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

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

#### Memory
- 4GB, 8GB, 16GB or 32GB / 2400MHz DDR4 / soldered to systemboard, no sockets

#### Display
- Size: 13.3" HD (1366x768)
- Type: TN
- Resolution: 250 nits
- Brightness: 45% 90°
- Aspect Ratio: 16:9
- Contrast Ratio: 500:1
- Color Gamut: 72% 170°
- Viewing Angle: 160°

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

#### Bluetooth™
- 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, 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

#### Weight
- Models: FHD Non-touch, HD
- PPS: 2.70 lb / 1.22 kg

#### Case material
- Display cover: Carbon Fiber (FHD non-touch only) or PPS;
- Bottom: Magnesium/Aluminum

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

#### Audio support
- HD Audio, Realtek® ALC3287 codec / stereo speakers, 1W x 2. Dolby® Audio® Premium / dual array far-field microphone, headphone / microphone combo jack

#### Security
- Security chip: Discrete TPM 2.0, TCG Certified
- Security keyhole: Intel vPro Technology
- Biometric fingerprint reader: Optional: Touch style match on chip fingerprint reader on the palm rest
- Near Field Communication (NFC): Optional

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

#### Battery
- Integrated Li-ion 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr)

#### Max battery life
- 18.6 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
- One of the following, configurable by model:
  - 1-year depot repair service
  - 1-year depot with 2-year planar 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.

September 2019
### ThinkPad X395 Platform Specifications

Product Specifications Reference (PSREF)

**Processor**

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<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>
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<tbody>
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<td>2.1 GHz</td>
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<td>Radeon Vega 6 Graphics</td>
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<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>
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<tr>
<td>Ryzen 7 Pro 3700U</td>
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<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, 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**

AMD SoC (System on Chip) platform

**Memory**

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

**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>
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<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>
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<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>800:1 (non-touch)</td>
<td>72%</td>
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<tr>
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<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</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

**Optical**

None

**Ethernet**

Native Realtek RTL8153 Gigabit Ethernet connection via bundled or optional ThinkPad Ethernet Extension Adapter Gen 2

**WLAN (optional)**

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

**Bluetooth™**

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

**WWAN (optional)**

One of the following, configurable by model:
- Wireless WAN upgradeable
- Integrated Mobile Broadband 4G LTE-A, Fibocom L850-GL, M.2 card

**SIM card (opt)**

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

**Battery**

Integrated Li-ion 48Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter

**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**

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

**Environmental**

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

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

Lenovo
July 2019
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Limited warranty: Support unrelated to a warranty issue may be subject to additional charges.

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- **Carry-in or Mail-in Service:** Parts and labor repair coverage where the customer is responsible for shipping (including packaging) or delivery to authorized warranty provider or repair center.
- **Depot or Courier Service:** Parts and labor repair coverage where shipping (including packaging) or delivery to the repair center is paid for by Lenovo.
- **Expedited Depot:** Parts and labor coverage with expedited turnaround. Shipping (including packaging) or delivery to the repair center is paid for by Lenovo.
- **Onsite / In-home Service:** Parts and labor repair coverage where labor is provided onsite at your place of business.

If Lenovo determines your product problem is covered by the product warranty and cannot be resolved over the telephone, a technician will be dispatched to arrive onsite, typically the next day.


Visit www.lenovo.com/warranty for Lenovo Warranty Services terms and conditions for complete details and restrictions.

**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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