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.

June 5, 2019 - Version 543

Additions in this update

► New product(s)
  ThinkPad L490 announced June 2019
  ThinkPad L590 announced June 2019
  ThinkPad T495 announced May 2019
  ThinkPad T495s announced June 2019
  ThinkPad X395 announced June 2019

► Others
  None

Withdrawals in this update

► Withdrawn product(s)
  None
## Processor

<table>
<thead>
<tr>
<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>
<th>Graphics</th>
</tr>
</thead>
<tbody>
<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>
<td>Intel HD Graphics 615, Intel UHD Graphics 600, supports external digital monitor via HDMI or USB Type-C</td>
</tr>
<tr>
<td>i5-7Y54</td>
<td>4</td>
<td></td>
<td>1.1 GHz</td>
<td>2.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 605</td>
<td>Intel UHD Graphics 605</td>
</tr>
</tbody>
</table>

## Chipset

- Intel SoC (System on Chip) platform
- 4GB or 8GB / 1866MHz LPDDR3 or 2400MHz DDR4 / soldered to systemboard, no sockets

## Display

- Some: 11.6” (295mm) HD (1366x768), anti-glare, LED backlight, 250 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
- Some: 11.6” (295mm) HD (1366x768), anti-glare, LED backlight, IPS, multi-touch, 250 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle

## Multi-touch

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

## Storage

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

## Optane™ memory

- 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)

## 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

## Media reader

- MicroSD card reader

## Ports

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

## Camera

- HD720p camera, fixed focus

## Audio support

- HD Audio, Realtek ALC3287 codec, stereo speakers, 2W x 2, Dolby Audio™, monaural digital microphone, combo audio/microphone jack

## Keyboard

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

## Touchpad

- Buttonless Mylar surface touchpad below keyboard, multi-touch

## Security chip

- vPro

## Fingerprint reader

- None

## NFC

- None

## Battery

- Integrated Li-ion 42Wh battery
  * Battery life varies significantly with settings, usage, & other factors

## Max battery life

- MobileMark® 2014: 13.9 hr

## Preload

- 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

## Military

- MIL-STD-810G military certification

## Environment

- EPEAT™ Silver; ENERGY STAR® 6.1; RoHS-compliant
## ThinkPad A275 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>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™ R5 Graphics</td>
</tr>
<tr>
<td>PRO A12-9800B</td>
<td>2</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: 16GB max / 1866MHz DDR4, one DDR4 SO-DIMM socket

### Display

- On-cell touch, supports 10-finger gesture (FHD only, US only)
- Some: 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- Some: 12.5" (317.5mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

### Storage

- System has one HDD slot or one M.2 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

### Optical

- None

### Ethernet

- Realtek® RTL8111EPV Gigabit Ethernet connection

### WLAN

- Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + BT 4.1, M.2 card
- Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WWAN (optional)

- 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 (optional)

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

### Dimensions

<table>
<thead>
<tr>
<th>Weight</th>
<th>Models</th>
<th>3-cell + 3-cell</th>
<th>3 + 6-cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>2.79 lb / 1.27 kg</td>
<td>2.98 lb / 1.36 kg</td>
<td>3.33 lb / 1.52 kg</td>
</tr>
</tbody>
</table>

### Case color

- Black
- Glass-Fiber Reinforced Plastic

### Case material

- Black
- 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 (USB 3.0, one Always On), USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45)
- Monitor cable:
  - USB-C to VGA: Lenovo USB-C to VGA Monitor Adapter
  - USB-C to DP: Lenovo USB-C to DisplayPort Adapter

### Camera (optional)

- HD720p resolution, fixed focus

### Audio support

- HD Audio, Realtek ALC3268 codec / stereo speakers, 1.5W 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

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip: dTPM 1.2: discrete TPM 1.2, TCG Certified
- dTPM 2.0: discrete TPM 2.0, TCG Certified
- Touch style match on chip fingerprint reader on the palm rest

### Internal battery

- Optional: Integrated Li-ion or Li-Polymer 3-cell (23Wh)

### External battery

- Li-ion 3-cell (23Wh) or 6-cell (48Wh)

### AC adapter

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

### Preload

- Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 10 Pro 64
- Lenovo Solution Center
- Lenovo PowerEngage
- ThinkVantage System Update
- ThinkVantage Product Recovery
- Adobe® Reader
- Microsoft® Office preloaded; purchase a product key to activate
- discrete TPM 1.2, TCG Certified
- discrete TPM 2.0, TCG Certified
- Touch style match on chip fingerprint reader on the palm rest
- None

### 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 certification

### Environment

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

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

Lenovo
April 2019
## ThinkPad A285 Platform Specifications

**Processor AMD Ryzen® PRO Mobile Processors with Radeon® Vega Graphics**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 PRO 2300U</td>
<td>4</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>8</td>
<td>2.0 GHz</td>
<td>3.6 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 PRO 2700U</td>
<td>8</td>
<td>8</td>
<td>2.2 GHz</td>
<td>3.8 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 only;
- supports external digital monitor via HDMI or USB Type-C;
- supports four independent displays;
- Max resolution: 5120x2880@60Hz (USB Type-C); 4096x2160@60Hz (HDMI)

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

**Display**
- 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 800:1 contrast 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

**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
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s

**Optical**
- 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
- Bluetooth 4.2, wireless integrated in Wi-Fi + Bluetooth combo adapter

**WWAN (optional)**
- Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7390 (Fibocom L850-GL), M.2 card
- * For non-WWAN model, it means the model is NOT WWAN upgradable

**SIM card (opt)**
- Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card

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

**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

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

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**Lenovo**

April 2019
### Processor AMD PRO A-Series APUs

<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>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

### Display

- **Some:** 14.0” (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 350:1 contrast ratio
- **Some:** 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:** SSD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- **Some:** M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s

### Optical None

### Ethernet Realtek® RTL8111EPV Gigabit Ethernet connection

### WLAN Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + BT 4.1, M.2 card

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

### WWAN (optional)

- 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-cell or 3 + 3-cell**
- **Magnesium**
  - 3.49 lb / 1.58 kg
  - 3.92 lb / 1.78 kg
- **PPS**
  - 3.63 lb / 1.65 kg
  - 4.35 lb / 1.95 kg

### Case color Black

### Case material

- **Display cover:** Magnesium Hybrid or PPS (Magnesium Hybrid for US only);
- **Bottom:** Glass-Fiber Reinforced Plastic

### Security

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

### Multi-touch

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

### Internal battery

- Optional: Integrated Li-Polymer 3-cell (24Wh)
- **Max battery life** (MobileMark® 2014)
  - Models
    - 3-cell
    - 3 + 3-cell
    - 6-cell 48Wh
    - 3 + 6-cell 48Wh
  - **Max battery life**
    - 5.13 hr
    - 10.26 hr
    - 15.4 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

### Preload

- Windows® 7 Professional 64 preinstalled
- Some: Windows 10 Home 64
- Some: Windows 10 Pro 64
  - Lenovo Solution Center
  - Lenovo PowerEdge
  - ThinkVantage Product Recovery
  - ThinkVantage System Update
  - Adobe® Reader®
  - Microsoft® Office preloaded:
  - purchase a product key to activate

### Limited warranty

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

### Environment EPEAT® Gold (US only); ENERGY STAR® 6.1; RoHS-compliant
ThinkPad A485 Platform Specifications

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

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 PRO 2300U</td>
<td>4</td>
<td>2</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</td>
<td>2.0 GHz</td>
<td>3.6 GHz</td>
<td></td>
<td>Radeon Vega 8 Graphics</td>
<td></td>
</tr>
<tr>
<td>Ryzen 7 PRO 2700U</td>
<td>8</td>
<td>4</td>
<td>2.2 GHz</td>
<td>3.8 GHz</td>
<td></td>
<td>Radeon Vega 10 Graphics</td>
<td></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@60Hz (USB Type-C); 4096x2160@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: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high, M.2 SSD / PCIe NVMe, PCIe 3.0 x 2.
Some: 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, in WWAN slot as 2nd Storage, mutually exclusive with WWAN
* Installed SSD is PCIe 3.0 x 4 but run at PCIe 3.0 x 2 due to M.2 SSD adapter limitation

Optical None

Ethernet Realtek® RTL8111GUL Gigabit Ethernet connection

WWAN (optional) Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card

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

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

<table>
<thead>
<tr>
<th>Models</th>
<th>24Wh or 24Wh + 24Wh</th>
<th>48Wh, 72Wh, or 24Wh + 48Wh + 72Wh</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
Case material Display cover: Magnesium Hybrid or PPS;
Bottom: Glass-Fiber Reinforced Plastic

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

Lenovo
May 2019
# ThinkPad E480 Platform Specifications

## Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-7200U</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>i5-7202U</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>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8250U</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>i7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

## Graphics

- Supports external digital monitor via HDMI or USB Type-C.
- Supports dual independent display.
- Max resolution: 1920x1080 (HDMI) @ 120Hz
- Intel HD Graphics 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon RX 550 Graphics, 2GB DDR5 memory.
- Supports external digital monitor via HDMI or USB Type-C.
- Supports dual independent display.
- Max resolution: 1920x1080 (HDMI) @ 120Hz

## 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
- 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 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™
- M.2 SSD / PCIe NVMe

### Some:
- M.2 SSD / PCIe NVMe

## Optane™ memory

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

## Optical

None

## Ethernet

Gigabit Ethernet Connection, Realtek 88111GUS

## 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

## WWAN

None

## SIM card

None

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

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 2200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.4 GHz</td>
<td>1MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 3 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 2500U</td>
<td>4</td>
<td>8</td>
<td>2.0 GHz</td>
<td>3.6 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 7 2700U</td>
<td>2</td>
<td>8</td>
<td>2.2 GHz</td>
<td>3.8 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: 1920x1080 (HDMI)@60Hz

### Chipset

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

### Display

- **Some:** 14.0” (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16.9 aspect ratio, 400:1 contrast ratio
- **Some:** 14.0” (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16.9 aspect ratio, 400:1 contrast ratio

### Multi-touch

- None

### Storage

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

### Optical

- None

### Ethernet

- Gigabit Ethernet Connection, Realtek RTL8111GUS

### WLAN + Bluetooth™

- One of the following, configurable by model:
  - Qualcomm QCNFA435, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
  - 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

### WWAN

- None

### SIM card

- None

### Dimensions

- **Aluminum (WxDxH):** 12.96” x 9.53” x 0.78”; 329mm x 242mm x 19.9mm
- **PC/ABS (WxDxH):** 12.96” x 9.53” x 0.86”; 329mm x 242mm x 21.9mm

### Weight

- Starting at 3.87 lb / 1.75kg

### 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 of the following, configurable by model:
  - Qualcomm QCNFA435, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card
  - 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

### Camera

- HD720p camera, fixed focus

### Audio support

- HD Audio, Conexant® CX11852 codec / stereo speakers, 1.5W 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: Discrete TPM 2.0, TCG Certified
- Fingerprint reader: None
- NFC: None
- Battery: Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
  - with 65W USB Type-C AC adapter

### Limited warranty

- 1-year depot repair service

### Environment

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

---

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

Lenovo
April 2019
# Processor Specifications

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Generation Intel® Core™ i3 / i5 / i7</td>
<td>2-8</td>
<td>1-4</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>
</tbody>
</table>

### Graphics
- Intel UHD Graphics 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon RX 550X Graphics, 2GB DDR5 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
- *Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation*
- 14.0” FHD (1920x1080) Anti-glare IPS 250 nits 16:9 170° Non-touch
- 14.0” HD (1366x768) Anti-glare TN 220 nits 16:9 90° Non-touch

### Multi-touch
- None

### Storage
- Up to two drives (one M.2 SSD and one HDD)
  - HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
  - M.2 2280 SSD / SATA 6.0Gb/s
  - M.2 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 8111GUS

### 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

### Security
- Power-on password, hard disk password, supervisor password, security keyhole
- Security chip: Integrated model: discrete TPM 2.0, TCG Certified
- System Mgt: Discrete model: firmware TPM 2.0 integrated in chipset
- 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 hr
- AC adapter: 45W or 65W USB Type-C AC adapter

### Limited warranty
- 1-year depot repair service

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

### Environment
- EPEAT™ Bronze; ENERGY STAR® 7.0; RoHS-compliant

---

**Note:** The specifications above may not be available in all regions.
### ThinkPad E490s Platform Specifications

#### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th>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>i7-8565U</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.5 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Graphics
- Intel UHD Graphics 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon RX 540X Graphics, 2GB DDR5 memory;
- supports external digital monitor via HDMI or USB Type-C;
- supports three independent displays;
- Max resolution: 1920 x 1080 (USB Type-C); 1920 x 1080 (HDMI)

#### Chipset
- Intel SoC (System on Chip) platform
- *Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation*

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

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

#### 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

#### Optane\™ memory
- 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

#### 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

#### Graphics types:
- Intel UHD Graphics

#### Processor types:
- Intel Core i5 / i7

#### Processor Graphics:
- Intel UHD Graphics 620

#### Camera
- HD720p camera, fixed focus

#### Audio support
- HD Audio, Conexant\® CX11880 codec /
  stereo speakers, 2W x 2. Dolby\® Audio\™ Premium /
  dual array microphone, headphone / microphone combo jack

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

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

#### Battery
- Integrated Li-ion 42Wh 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

#### Limited warranty
- 1-year depot repair service

#### Preload (optional) Windows\® 10 Home 64 or Windows 10 Pro 64

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

#### Environment
- EPEAT\™ Bronze; ENERGY STAR\® 7.0; RoHS-compliant

---

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

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Lenovo

May 2019
### Processor Specifications

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<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>2</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 RX Vega 10 Graphics</td>
</tr>
</tbody>
</table>

### Graphics Specifications

- 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 and Memory Specifications

- AMD 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 AMD limitation*

### Display Specifications

<table>
<thead>
<tr>
<th>Size / Resolution</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) Anti-glare TN</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>90°</td>
<td>Non-touch</td>
</tr>
<tr>
<td>14.0&quot; FHD (1920x1080) Anti-glare IPS</td>
<td>250 nits</td>
<td>16:9</td>
<td>600:1</td>
<td>170°</td>
<td>Non-touch</td>
</tr>
</tbody>
</table>

### Multi-touch

- None

### Storage Specifications

- 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 R8111GUS
- Gigabit Ethernet via Intel 82583V or 82583V+2
- *Depending on many factors, actual data transfer speed may be lower than theoretical speed*

### WWAN

- None

### Preload

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

### Limited Warranty

- 1-year depot repair service

### Environment

- EPEAT™ Bronze; ENERGY STAR® 7.0; RoHS-compliant
## ThinkPad E580 Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Number</th>
<th>Processor</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th Gen</td>
<td>i3-7100U</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></td>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td></td>
<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>8th Gen</td>
<td>i3-8130U</td>
<td>2</td>
<td>4</td>
<td>2.2 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td></td>
<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 HD Graphics 620</td>
</tr>
<tr>
<td></td>
<td>i7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel HD 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 RX 550 Graphics, 2GB DDR5 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: 15.6” (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio

Some: 15.6” (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio

**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

**WWAN**

None

**Dimensions**

WxDxH: 14.53” x 9.92” x 0.78”; 369mm x 252mm x 19.95mm

**Weight**

Starting at 4.7 lb / 2.1kg

**Case material**

Top: Polyurethane; Bottom: PC/ABS plastic

**Audio support**

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

**Camera**

HD720p camera, fixed focus

**Media reader**

None

**Keyboard**

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

**Security**

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

**Security chip (opt)**

Firmware TPM 2.0 integrated in chipset or discrete TPM 2.0 TCG Certified

**Optiplex Security**

Firmware TPM 2.0 integrated in chipset or 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**

2014: 12.23 hr

**AC adapter**

45W or 65W USB Type-C AC adapter

**Preload (optional)**

Windows® 10 Home 64 or Windows 10 Pro 64

**Limited warranty**

1-year depot repair service

**Mil-Spec test**

MIL-STD-810G military certification

**Environment**

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

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

Lenovo

April 2019
## ThinkPad E585 Platform Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<th>AMD Ryzen™ Mobile Processors with Radeon™ Vega Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Number</td>
<td># of Cores</td>
</tr>
<tr>
<td>Ryzen 3 2200U</td>
<td>2</td>
</tr>
<tr>
<td>Ryzen 5 2500U</td>
<td>4</td>
</tr>
<tr>
<td>Ryzen 7 2700U</td>
<td></td>
</tr>
</tbody>
</table>

| Graphics | AMD Radeon Vega 3, Vega 8, or RX Vega 10 Graphics in processor only; supports external digital monitor via HDMI or USB Type-C; supports dual independent display; Max resolution: 1920x1080 (HDMI)@60Hz |

<table>
<thead>
<tr>
<th>Chipset</th>
<th>AMD 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</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display</th>
<th>Some: 15.6&quot; (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio (NOT available in EMEA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Some: 15.6&quot; (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 600:1 contrast ratio</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multi-touch</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>Up to 2 drives (one M.2 SSD and one HDD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical</td>
<td>Some: M.2 SSD / PCIe NVMe</td>
</tr>
<tr>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>

| Ethernet | Gigabit Ethernet Connection, Realtek RTL8111GUS |

<table>
<thead>
<tr>
<th>WLAN + Bluetooth™</th>
<th>One of the following, configurable by model:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Qualcomm QCNFA435, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card</td>
</tr>
<tr>
<td></td>
<td>• Realtek® RTL8821CE, Wi-Fi 1x1 802.11ac + Bluetooth 4.1, M.2 card</td>
</tr>
<tr>
<td></td>
<td>• Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card</td>
</tr>
</tbody>
</table>

| WWAN | None |
| SIM card | None |

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

### Dimensions
WxDxH: 14.53" x 9.92" x 0.79"; 369mm x 252mm x 19.95mm

### Weight
Starting at 4.7 lb / 2.1kg

### Case color
Black

### 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

### Camera
HD720p camera, fixed focus

### Audio support
HD Audio, Conexant® CX11852 codec / stereo speakers, 1.5W x 2, Dolby® Advance Audio / dual array microphone, headphone / microphone combo jack

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

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

### Security
Discrete TPM 2.0, TCG Certified

### Battery
Integradted 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: 8.63 hr

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

### Preload (optional)
Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty
1-year depot repair service

### Mil-Spec test
None

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

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Lenovo
April 2019
ThinkPad E590 Platform Specifications

<table>
<thead>
<tr>
<th>Processor 8th Generation Intel® Core™ i3 / i5 / i7 Processor</th>
<th>Dimensions</th>
<th>Weight</th>
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<tr>
<td>Processor</td>
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<td>3-8145U</td>
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<td>5-8265U</td>
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<td>7-8565U</td>
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<td>Graphics</td>
<td>Intel UHD Graphics 620 in processor only or Intel UHD Graphics 620 in processor and AMD Radeon RX 550X Graphics, 2GB DDR5 memory; supports external digital monitor via HDMI or USB Type-C; supports dual independent display; Max resolution: 4096x2160@60Hz (USB Type-C); 4096x2160@24Hz (HDMI)</td>
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<tr>
<td>Display</td>
<td>Size / Resolution</td>
<td>Surface</td>
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<tr>
<td>15.6” HD (1366x768)</td>
<td>Anti-glare</td>
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<tr>
<td>15.6” FHD (1920x1080)</td>
<td>Anti-glare</td>
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<td>Chipset</td>
<td>Intel SoC (System on Chip) platform</td>
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<td>Memory</td>
<td>32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets</td>
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<td>* Installed memory is actually 2666MHz but run at 2400MHz due to Intel limitation</td>
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<td>Security chip</td>
<td>Integrated model: discrete TPM 2.0, TCG Certified</td>
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<td>System Mgt</td>
<td>Discrete model: firmware TPM 2.0 integrated in chipset</td>
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<td>Notebook Reader</td>
<td>Optional: Touch style fingerprint reader on the palm rest</td>
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<td>Battery</td>
<td>Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter</td>
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<td>Max battery life</td>
<td>MobileMark® 2014: 11 hr</td>
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<td>AC adapter</td>
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<td>Mobile Broadband (optional) Windows® 10 Home 64 or Windows 10 Pro 64</td>
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<td>Limited warranty: 1-year depot repair service</td>
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</tbody>
</table>
### 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 7 3700U</td>
<td>4</td>
<td>8</td>
<td>2.3 GHz</td>
<td>4.0 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td>DDR4-2400</td>
<td>Radeon RX Vega 10 Graphics</td>
</tr>
<tr>
<td>Ryzen 5 3500U</td>
<td>4</td>
<td>8</td>
<td>2.1 GHz</td>
<td>3.7 GHz</td>
<td>2MB L2 / 4MB L3</td>
<td></td>
<td>Radeon Vega 8 Graphics</td>
</tr>
<tr>
<td>Ryzen 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></td>
<td>Radeon Vega 3 Graphics</td>
</tr>
</tbody>
</table>

### Graphics

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

### Chipset

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

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

### 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 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 9.92" x 0.78"; 369mm x 252mm x 19.9mm
- Weight: Starting at 4.7 lb / 2.1kg

### Case color

- Black

### 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 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

- Bundled Accy: None

### Camera

- HD720p camera, fixed focus

### Audio support

- HD Audio, Conexant 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

### Security chip

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

### Security

- Discrete TPM 2.0, TCG Certified

### Fingerprint reader

- None

### Security keyhole

- None

### Battery

- Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
- 65W USB Type-C AC adapter
- Max battery life: 10.3 hr
- MobileMark® 2014: 10.3 hr
- *Battery life varies significantly with settings, usage, & other factors

### AC adapter

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

### Preload (optional)

- Windows® 10 Home 64 or Windows 10 Pro 64

### Limited warranty

- 1-year depot repair service

### Environment

- EPEAT® Bronze; ENERGY STAR® 7.0; RoHS-compliant

---

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

Lenovo April 2019
## ThinkPad L380 Platform Specifications

**Product Specifications Reference (PSREF)**

<table>
<thead>
<tr>
<th>Processor</th>
<th>Intel® Celeron® Processor, 7th Generation Intel Core™ i3 / i5 Processor or</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor Number</strong></td>
<td><strong># of Cores</strong></td>
</tr>
<tr>
<td>Cel 3965U</td>
<td>2</td>
</tr>
<tr>
<td>i5-7200U</td>
<td>2</td>
</tr>
<tr>
<td><strong>8th Generation Intel Core i5 / i7 Processor</strong></td>
<td><strong># of Cores</strong></td>
</tr>
<tr>
<td>i5-8250U</td>
<td>2</td>
</tr>
<tr>
<td>i5-8550U</td>
<td>2</td>
</tr>
<tr>
<td>i5-8550U</td>
<td>4</td>
</tr>
<tr>
<td><strong>Graphics</strong></td>
<td>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)</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>Intel SoC (System on Chip) platform 32GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>DDR4-2400</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Some: 13.3&quot; (338mm) HD (1366x768), anti-glare, LED backlight, 250 nits, 16:9 aspect ratio, 500:1 contrast ratio</td>
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<tr>
<td></td>
<td>Some: 13.3&quot; (338mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle</td>
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<tr>
<td></td>
<td>Some: 13.3&quot; (338mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 800:1 contrast ratio, 170° viewing angle, on-cell touch</td>
</tr>
<tr>
<td><strong>Multi-touch (opt)</strong></td>
<td>on-cell touch, supports 10-finger gesture</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>One of the following, configurable by model:</td>
</tr>
<tr>
<td></td>
<td>M.2 SSD / SATA 6.0Gb/s (e.g. xxxGB SSD M.2)</td>
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<td></td>
<td>M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32GB/s (e.g. xxxGB SSD M.2 PCIe NVMe)</td>
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<tr>
<td><strong>Optane™ memory</strong></td>
<td>None</td>
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<tr>
<td><strong>Optical</strong></td>
<td>None</td>
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<tr>
<td><strong>Ethernet</strong></td>
<td>Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro) via optional ThinkPad Ethernet Extension Cable</td>
</tr>
<tr>
<td><strong>WLAN + Bluetooth™</strong></td>
<td>Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card</td>
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<tr>
<td></td>
<td>* Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS</td>
</tr>
<tr>
<td><strong>WWAN</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>SIM card</strong></td>
<td>None</td>
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</tbody>
</table>

### Specifications

- **Dimensions**: WxDxH: 12.67" x 8.83" x 0.74"; 321.8mm x 224.2mm x 18.8mm
- **Weight**: Starting at 3.22 lb / 1.46 kg
- **Case color**: Black or Silver
- **Case material**: Display cover: Aluminum; Bottom: GFRP
- **Chipset**: Intel SoC (System on Chip) platform
- **Camera**: HD720p camera, fixed focus
- **Audio support**: HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ / dual array microphone, headphone / microphone combo jack
- **Keyboard**: UltraNav™ 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
- **Security**: Power-on password, hard disk password, supervisor password, security keyhole
- **Security chip**: Intel vPro Technology
- **Fingerprint reader**: Optional: Touch style 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
- **Max battery life**: MobileMark® 2014: 16.1 hr
- **AC adapter**: 45W or 65W USB Type-C AC adapter
- **Preload**: 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 certification
- **Environment**: EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant

Note: The specifications above may not be available in all regions.
## ThinkPad L390 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>Number</td>
</tr>
<tr>
<td># of Cores</td>
<td># of Threads</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; 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 2666MHz but run at 2400MHz due to Intel limitation |

<table>
<thead>
<tr>
<th>Display</th>
<th>Size</th>
<th>Resolution</th>
<th>Surface</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>HD (1366x768)</td>
<td>Anti-glare</td>
<td>TN</td>
<td>250 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>90°</td>
<td></td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>Anti-glare</td>
<td>IPS</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1 (non-touch) 800:1 (multi-touch)</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

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

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

| Optical memory | None |

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

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

| WWAN SIM card | None |

| 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 |

| Processor Specifications Reference (PSREF) | Note: The specifications above may not be available in all regions. Lenovo May 2019 |

| Smart card reader | None |
| Media reader | MicroSD card reader |
| Ports | Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet extension connector, headphone / microphone combo jack, microSD card reader, security keyhole |
| Monitor cable (optional) | * Depending on many factors, actual data transfer speed may be lower than theoretical speed |
| USB-C to VGA: | Lenovo USB-C to VGA Adapter |
| USB-C to VGA + Power Adapter: | Lenovo USB-C to VGA plus Power Adapter |
| USB-C to HDMI: | Lenovo USB-C to HDMI Adapter |
| USB-C to HDMI + Power Adapter: | Lenovo USB-C to HDMI plus Power Adapter |
| USB-C to DP: | Lenovo USB-C to DisplayPort Adapter |
| Bundled | Lenovo USB-C to RJ45: Lenovo USB-C to Ethernet Adapter |
| Accessories (optional) | USB-C to USB-A: Lenovo USB-C to USB-A Adapter |
| USB-C to USB-C: | Lenovo USB-C to USB-C Cable 2M |
| Camera | HD720p camera, fixed focus |
| Audio support | HD Audio, Realtek ALC3287 codec / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack |
| Keyboard UltraNav™ | 6-row, spill-resistant, multimedia Fn keys, optional LED backlight |
| TrackPoint® pointing device and buttonless Mylar surface touchpad, multi-touch |
| Security chip | Power-on password, hard disk password, supervisor password, security keyhole |
| Security | Discrete TPM 2.0, TCG Certified |
| System Mgt | None |
| Fingerprint reader | Optional: Touch style fingerprint reader on the palm rest |
| NFC (optional) | Near Field Communication |
| Battery | Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr) with 65W USB Type-C AC adapter |
| Max battery life | MobileMark® 2014: 14.61 hr |
| AC adapter | * Battery life varies significantly with settings, usage, & other factors |
| Preload | 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 |
| • 5-year/1-yr battery limited onsite service |
| Environment | MIL-Spec test MIL-STD-810G military certification |
| Note: The specifications above may not be available in all regions. Lenovo May 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 or Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-6006U</td>
<td>2</td>
<td>4</td>
<td>2.0 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i3-6100U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>i5-6200U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz 2.8 GHz</td>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i7-7500U</td>
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<td>2.7 GHz 3.5 GHz</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i7-7600U</td>
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<td>4</td>
<td>2.8 GHz 3.9 GHz</td>
<td>4MB</td>
<td></td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

* i7 processor is NOT available in EMEA

### Graphics

- Intel HD Graphics 620 in processor or 7th Generation Intel Core i3 / i5 / i7 Processor
- Intel HD Graphics 620 in processor only, or Intel HD Graphics 620 in processor and AMD Radeon R5 M430, 2GB memory; supports external analog monitor via VGA and digital monitor via Mini DisplayPort; 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
- System clocks down for processors with lower memory controller

### Display

- Some: 14.0" (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- Some: 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

### Storage

- System has one HDD slot or one M.2 2280 slot exclusively for storage
- Some: HDD / SATA 6.0Gb/s, 2.5" wide, 7mm or 9.5mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxGB SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, 16Gb/s
- Some: 128GB M.2 SSD / SATA 6.0Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN

### Optical

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

### WLAN

- Realkt® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Bluetooth 4.1, wireless in WiFi + Bluetooth combo adapter
- * Intel 8260ac / 8265ac card support BT4.2 but is limited to BT4.1 by Windows OS

### Bluetooth™

- One of the following, configurable by model:
  - Realkt® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Bluetooth 4.1, wireless in WiFi + Bluetooth combo adapter
  - * Intel 8260ac / 8265ac card support BT4.2 but is limited to BT4.1 by Windows OS

### WWAN (optional)

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

### SIM card (optional)

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

### Dimensions

- Wx Dx H: 13.35" x 9.25" x 0.94"; 339mm x 235mm x 23.9mm

### Weight

- Integrated model: 4.13 lb / 1.87 kg; 4.45 lb / 2.02 kg
- Discrete model: 4.16 lb / 1.89 kg; 4.48 lb / 2.03 kg

### Camera (optional)

- HD720p resolution, fixed focus

### Audio support

- HD Audio, Realtek ALC3268 codec / stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack

### Security

- Security chip
  - Security chip vPro (optional)
  - Fingerprint reader
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Optical Drive

- No Drive

### Warranty

- 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

### Preload

- Windows 7 Professional 64 preinstalled
  - Some: Windows 10 Home 64
  - Some: Windows 10 Pro 64
  - Lenovo Companion
  - Lenovo Solution Center
  - Lenovo PowerEngage
  - ThinkVantage System Update
  - Adobe® Reader®
  - Microsoft® Office preloaded:
    - purchase a product key to activate
    - purchase a product key to activate
    - McAfee® LiveSafe® (30-day trial)
### Processor Specifications

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7200U</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7300U</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>3.8 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<th>Memory Types</th>
<th>Processor Graphics</th>
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</thead>
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<tr>
<td>i3-8130U</td>
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<td>4</td>
<td>2.2 GHz</td>
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<td>Intel UHD Graphics 620</td>
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<td>i5-8250U</td>
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<td>1.6 GHz</td>
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<td>Intel UHD Graphics 620</td>
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<tr>
<td>i5-8550U</td>
<td>4</td>
<td>8</td>
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<td>4.0 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

* (3-7130U 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 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)
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Chipset

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

### Display

- On-cell touch, supports 10-finger gesture (FHD only)
- 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 must exit S3 state to enable RWWAN; WWAN is turned OFF in S4 state
- Three models offer 5Gbps U.2 SSD, a high-speed interface that supports NVMe SSDs
- 3Gbps U.2 SSD present in WWAN models

### Multimedia

- Optional: Smart card reader
- Optional: TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad
- Security chip: Intel vPro Technology, Discrete TPM 2.0, TCG Certified

### Security

- Power-on password, hard disk password, supervisor password, security keyhole
- Integrated mobile broadband 4G LTE

### Battery

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

### AC adapter

- Preload: 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 certification

### Environment

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

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

April 2019

Lenovo
### Processor Specifications

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
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</thead>
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<tr>
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<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
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<td>5-8145U</td>
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<td>Intel UHD Graphics 620</td>
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<tr>
<td>7-8565U</td>
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<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>7-8665U</td>
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<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 620 in processor only or Intel UHD Graphics 620 in processor only and 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
- 64GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- Installed memory is actually 2666MHz but run at 2133MHz or 2400MHz due to Intel limitation

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0” 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>14.0” 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>

### Multi-touch (opt)

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

### Storage

- HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- SSD / SATA 6.0Gb/s, 2.5” wide, 7mm high
- M.2 2280 SSD / PCIe NVMe, PCIe 3.0 x 4
- M.2 2242 SSD / PCIe NVMe, PCIe 3.0 x 2
- Installed M.2 2280 SSD is PCIe 3x4 but run at PCIe 3x2 due to M.2 SSD adapter limitation

### Optane™ memory (opt)

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

### 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:
  - Realtek RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.2, M.2 card
  - Intel Wireless-AX 2260, Wi-Fi 2x2 802.11ax + Bluetooth 5.0
  - Intel Wireless-A 2260, Wi-Fi 2x2 802.11ax + Bluetooth 5.0

### SIM card

- None

### Note:

The specifications above may not be available in all regions.
ThinkPad L570 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>3-6006U</td>
<td>2</td>
<td>4</td>
<td>2.0 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>3-6100U</td>
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<td>4</td>
<td>2.3 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
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<tr>
<td>5-6200U</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>
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<tr>
<td>5-6300U</td>
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<td>4</td>
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<td>3.0 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>7-6500U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
<tr>
<td>7-6600U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
</tr>
</tbody>
</table>

Inte Celeron® Processor or 7th Generation Intel Core i3 / i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cel 3965U</td>
<td>2</td>
<td>4</td>
<td>2.2 GHz</td>
<td>-</td>
<td>2MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
</tr>
<tr>
<td>3-7100U</td>
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<td>4</td>
<td>2.4 GHz</td>
<td>-</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
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<tr>
<td>5-7200U</td>
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<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
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<tr>
<td>5-7300U</td>
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<td>4</td>
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<td>DDR4-2133</td>
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<tr>
<td>7-7500U</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
</tr>
<tr>
<td>7-7600U</td>
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<td>4</td>
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<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 610</td>
</tr>
</tbody>
</table>

* Processor is NOT available in EMEA

### Graphics

Intel HD Graphics 520, 610, or 620 in processor only; supports external analog monitor via VGA and digital monitor via Mini DisplayPort; supports three independent displays; Max resolution: 3840x2160@60Hz (DP via mDP cable); 1920x1200@60Hz (VGA)

### Chipset

Intel SoC (System on Chip) platform

### Memory

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, 600:1 contrast ratio, 160° viewing angle

### 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 2, 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 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

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

### WWAN (optional)

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

### SIM card (opt)

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

### Dimensions

WxDxH: 14.84" x 10.04" x 1.08-1.21"; 377mm x 255mm x 27.6-30.85mm

### Weight

Starting at 5.25 lb / 2.38 kg

### Case color

Black

### Case material

PC/ABS plastic

### ExpressCard (opt)

One slot (ExpressCard/34)

### Smart card reader

Optional. Smart card reader

### Media reader

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

### Ports

Four USB 3.1 Gen 1 (USB 3.0, one Always On), VGA, Mini DisplayPort, Ethernet (RJ-45), Dock connector

### Monitor cable

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

### Camera (optional)

With HD720p resolution, fixed focus

### Audio support

HD Audio, Realtek® ALC3245 codec / stereo speakers, 1.5W x 2 / dual array microphone, combo audio/microphone jack

### Keyboard

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, TCGB Certified Intel vPro Technology

### Fingerprint reader

Optional: Swipe style fingerprint reader on the palm rest

### NFC

None

### Battery

Li-ion 6-cell (48Wh)

### Max battery life

MobileMark® 2014: 14.8 hr

### AC adapter

45W slim tip AC adapter

### Preload

Windows® 7 Professional 64 preinstalled
Some: Windows 10 Home 64
Some: Windows 10 Pro 64

### Lenovo Solution Center

Lenovo Solution Center

### Lenovo PowerEngage

Lenovo PowerEngage

### ThinkVantage Product Recovery

ThinkVantage Product Recovery

### Lenovo Setting

ThinkVantage System Update

### Adobe Reader

Adobe® Reader

### Microsoft Office preloaded;

Microsoft Office preloaded;

### Lenovo Office preloaded;

purchase a product key to activate

### Microsoft Office preloaded;

purchase a product key to activate

### McAfee LiveSafe™ (30-day trial)

Some: McAfee LiveSafe™ (30-day trial)

### 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 certification

### 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 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>
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<th>Memory Types</th>
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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>i3-7130U</td>
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<td></td>
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<tr>
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<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8550U</td>
<td>4</td>
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<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
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</tr>
</tbody>
</table>

8th Generation Intel Core i3 / i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>i5-8250U</td>
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<td>1.6 GHz</td>
<td>3.4 GHz</td>
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<tr>
<td>i5-8350U</td>
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<td>1.7 GHz</td>
<td>3.6 GHz</td>
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<tr>
<td>i7-8550U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.0 GHz</td>
<td>8MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* i3-730U 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

Intel SoC (System on Chip) platform

* System clocks down for processors with lower memory controller

Display

Some: 15.6" (396mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
Some: 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 300:1 contrast ratio, 178° viewing angle

Multi-touch

None

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

None

Optical

None

Ethernet

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

WLAN + Bluetooth™ (optional)

One of the following, configurable by model:
- Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card (US only)
- Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + Bluetooth 4.1, M.2 card
- Intel 8265ac card supports BT4.2 but is limited to BT4.1 by Windows OS

WWAN (optional)

One of the following, configurable by model:
- Integrated Mobile Broadband 4G LTE-A:
  - Intel XMM™ 7600 (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

Width: 14.82" x 10.02" x 0.90"; 376.5mm x 254.5mm x 22.95mm
Starting at 4.46 lb / 2.0 kg

Weight

Case color

Black

Case material

PC/ABS plastic

ExpressCard

None

Smart card reader

Optional: Smart card reader

Media reader

MicroSD card reader

Ports

Two USB 3.1 Gen 1 (one Always On), two USB 3.1 Type-C Gen 1 (with the function of Power Delivery and DisplayPort), HDMI 1.4b, Ethernet (RJ-45), nano-SIM card slot (WWAN models), headphone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole

Keyboard

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

Security

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

Security chip

Discrete TPM 2.0, TC Certified

Fingerprint reader

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

Battery

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

Max battery life

MobileMark® 2014: 14 hr
* Battery life varies significantly with settings, usage, & other factors

AC adapter

45W or 65W USB Type-C AC adapter

Preload

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 certification

Environment

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

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

Lenovo April 2019
## 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>
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</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>3-8145U</td>
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<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<tr>
<td>5-8265U</td>
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<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
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<td></td>
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<td>5-8365U</td>
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<td>4.1 GHz</td>
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<td>7-8565U</td>
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</tr>
<tr>
<td>7-8665U</td>
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<td>8MB</td>
<td></td>
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</tr>
</tbody>
</table>

#### Graphics

- Intel UHD Graphics 610 or 620 in processor only or Intel UHD Graphics 620 in processor and Intel SoC (System on Chip) platform
- 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); 4096x1260@24Hz (HDMI)

#### Chipset Memory

- Intel SoC (System on Chip) platform
- 64GB max / 2400MHz DDR4, dual-channel capable, two DDR4 SO-DIMM sockets
- *Installed memory is actually 2666MHz but run at 2133MHz or 2400MHz due to Intel limitation

#### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.6&quot; HD (1366x768)</td>
<td>TN</td>
<td>Anti-glare</td>
<td>220 nits</td>
<td>16:9</td>
<td>400:1</td>
<td>45%</td>
<td>90°</td>
<td></td>
</tr>
<tr>
<td>15.6&quot; FHD (1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
<td></td>
</tr>
</tbody>
</table>

#### Multi-touch

- None

#### Storage

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

- None

#### Optical

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

#### Ethernet

- 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 Wireless-AX 22260, Wi-Fi 2x2 802.11ax + Bluetooth 5.0
- *Integrated Mobile Broadband 4G LTE, Fibocom L830-EB, M.2 card (EMEA only)
- *For non-WWAN model, it means the model is NOT WWAN upgradable

#### 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.

**Dimensions**: WxDxH: 14.82" x 10.02" x 0.90"; 376.55mm x 254.55mm x 22.95mm
**Weight**: Starting at 4.48 lb / 2.03 kg
**Color**: Black
**PC/ABS plastic

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

**Battery**: Integrated Li-ion 45Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
**Max battery life**: MobileMark 2014: 13.3 hr

**Fingerprint reader**: Optional: Touch style match on chip fingerprint reader on the palm rest
**NFC (optional)**: Near Field Communication

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

**Preload**: 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

**Environment**: EPEAT™ Bronze; ENERGY STAR® 7.1; RoHS-compliant
ThinkPad P1 Platform Specifications

Processor 8th Generation Intel® Core™ i5 / i7 Processor or Intel Xeon® E Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>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>4</td>
<td>8</td>
<td>2.2 GHz</td>
<td>4.1 GHz</td>
<td>9MB</td>
<td></td>
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<tr>
<td>i7-8850H</td>
<td>6</td>
<td>12</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
<td>9MB</td>
<td></td>
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<tr>
<td>E-2176M</td>
<td>2</td>
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<td>2.7 GHz</td>
<td>4.4 GHz</td>
<td>12MB</td>
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<td></td>
</tr>
</tbody>
</table>

Graphics Intel UHD Graphics 630 in processor and NVIDIA Quadro P1000 or P2000 Max-Q, 4GB GDDR5 memory; supports external digital monitor via HDMI or Thunderbolt™; supports four independent displays; Max resolution: 5120x2880@30Hz (Thunderbolt); 4096x2160@60Hz (HDMI)

Chipset Mobile Intel CM246 Chipset

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

Display Some: 15.6" (396mm) FHD (1920x1080), anti- glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 72% gamut, 100% viewing angle, multi-touch, anti-reflection (AR)

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

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

Optane™ memory None

RAID (optional) RAID 0/1 support

Optical None

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

WLAN 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

Dimensions WxDxH (non-touch): 14.24" x 9.67" x 0.72"; WxDxH (multi-touch): 14.24" x 9.67" x 0.74"

Weight Non-touch model: starting at 3.76 lb (1.7 kg); Multi-touch model: starting at 4.06 lb (1.8 kg)

Case color Black

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

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

Smart card reader Optional: Smart card reader

Media reader None

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

Audio support • HD720p camera with ThinkShutter camera privacy, fixed focus

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

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

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

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

Audio HD Audio, Realtek® ALC3286 codec / Premium / dual array microphone, headphone / microphone combo jack, Dolby Atmos® headphone

Ports HDMI 2.0, Ethernet extension connector, headphone / microphone combo jack, optional smart card reader, 4-in-1 reader (MMC, SD, SDHC, SDXC), security keyhole

Security chip Discrete TPM 2.0, TCG Certified

Touchpad One of the following, configurable by model:

Security Intel vPro Technology

Fingerprint reader One of the following, configurable by model:

Security chip None

Battery None

AC adapter 330W slim tip AC adapter

Preload One of the following, configurable by model:

Operating system Windows® 10 Home 64

Windows® 10 Pro 64

Windows® 10 Pro 64 for Workstations

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

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

Lenovo May 2019
## Lenovo ThinkPad P51 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># Cores</th>
<th># Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i7-6820HQ</td>
<td>4</td>
<td>8</td>
<td>2.7 GHz</td>
<td>3.6 GHz</td>
<td>8MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 530</td>
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<tr>
<td>E3-1505M v6</td>
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<td>8</td>
<td>2.8 GHz</td>
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<td></td>
<td>DDR4-2400</td>
<td>Intel HD Graphics 630</td>
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<tr>
<td>i7-7700HQ</td>
<td>4</td>
<td>8</td>
<td>2.8 GHz</td>
<td>3.8 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics P530</td>
</tr>
<tr>
<td>i7-7820HQ</td>
<td>4</td>
<td>8</td>
<td>2.9 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel HD Graphics P630</td>
</tr>
</tbody>
</table>

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

### Graphics

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

### Chipset

Mobile Intel CM238 Chipset

46GB max / 2400MHz DDR4, ECC or non-ECC (ECC function supported only on Xeon processor), dual-channel capable, four DDR4 SO-DIMM sockets

* System clocks down for processors with lower memory controller

### Display

- **Some:** 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 160° viewing angle
- **Some:** 15.6" (396mm) 4K (3840x2160), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 100% gamut, 170° viewing angle

### Multi-touch (optional)

ThinkPad Pen Pro, active pen for multi-touch display

### 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

### Optical (optional)

RAID 0/1 support

### Ethernet

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

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

### WLAN

One of the following, configurable by model:

- Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + 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

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

### WWAN

One of the following, configurable by model:

- Wireless WAN upgradeable
- Integrated Mobile Broadband 4G LTE-A, Qualcomm Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card
- Micro-SIM card slot, opt Verizon LTE (US) or Lenovo® Connect (EMEA) SIM card

### SIM card (optional)

- 4G/LTE for Windows 10 Pro 64 preinstalled through downgrade rights in Windows 10 Pro 64
- Windows 10 Home 64
- Windows 10 Pro 64
- Windows 10 Pro 64 for Workstations

### Limitations

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

### Preload

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
- Windows 10 Pro 64 for Workstations

### Limited warranty

One of the following, configurable by model:

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

### Mi-Spec test

MIL-STD-810G military certification

### Environment

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

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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>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>2.2 GHz</td>
<td>4.1 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
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<tr>
<td>7-8850H</td>
<td>6</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
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<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
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<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>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

#### Memory

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

#### Display

- Some: 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

#### Multi-touch (opt)

- 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

#### Optane™ memory

- Optional: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2
- RAID (optional): RAID 0/1 support
- Optical: None

#### Ethernet

- Intel Ethernet Connection I219-V (Jacksonville)
- 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 (opt)

- Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7380 (Fibocem L590-GL), M.2 card

#### SIM card (opt)

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

#### Dimensions

<table>
<thead>
<tr>
<th>WxDxH</th>
<th>Weight (Touch)</th>
<th>Case color</th>
<th>Case material</th>
<th>Smart card reader</th>
<th>Media reader</th>
<th>Ports</th>
<th>Audio support</th>
<th>Camera (optional)</th>
<th>Security芯片</th>
<th>Security keyhole</th>
<th>Battery life</th>
<th>Security keyhole type</th>
<th>Preload</th>
<th>Limited warranty</th>
<th>Mil-Spec test</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.86&quot; x 9.93&quot; x 0.96-1.16&quot;</td>
<td>14.86&quot; x 9.33&quot; x 1.02-1.21&quot;</td>
<td>Black</td>
<td>Display cover: PPS; Bottom: Magnesium/Aluminum</td>
<td>Optional: Smart card reader</td>
<td>4-in-1 reader (MM, SD, SDHC, SDXC), supports UHS-II SD card</td>
<td>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 (MM, SD, SDHC, SDXC), security keyhole</td>
<td>* Power Delivery only supports power-out for charging peripherals</td>
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<tr>
<td>* Power Delivery only supports power-out for charging peripherals</td>
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<td></td>
</tr>
<tr>
<td>* Depending on many factors, actual data transfer speed may be lower than theoretical speed</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### 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

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

#### Fingerprint reader

- Touch style match on chip fingerprint reader on the palm rest
- None

#### Color calibration

- Near Field Communication

#### Battery life

- Li-ion 90Wh battery
- Hybrid mode: 8.9 hr
- * Battery life varies significantly with settings, usage, & other factors

#### AC adapter

- 170W slim tip AC adapter

#### Preload

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

#### Limited warranty

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

#### Mil-Spec test

- MIL-STD-810G military certification

#### Environment

- EPEAT Gold (US only); ENERGY STAR® 6.1; RoHS-compliant
ThinkPad P52s Platform Specifications

**Processor**

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

**Graphics**
- Intel 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**
- 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
- None

**Optane™ memory**
- Optional: Intel Optane memory, PCle NVMe, PCIe 3.0 x 2, SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high (e.g. xxxGB SSD)

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

**WWAN (optional)**
- One of the following, configurable by model:
  - Wireless WAN upgradeable
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

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

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

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

**Monitor cable**
- Optional: Lenovo HDMI to VGA Monitor Adapter
- Optional: Lenovo USB-C to DP 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
- Discrete TPM 2.0, TCQ Certified
- Intel vPro Technology

**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

**Max battery life**
- Models 48Wh 72Wh 32Wh + 24Wh 32Wh + 48Wh 32Wh + 72Wh
- Max battery life: 12.2 hr 18.5 hr 13.5 hr 20.1 hr 26.3 hr

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

**Preload**
- Windows® 10 Home 64 or Windows 10 Pro 64

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

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

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

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**Dimensions**
- WxDxH: 14.40" x 9.95" x 0.79-0.80"; 365.8mm x 252.8mm x 19.95-20.2mm
- Weight starting at 4.39 lb / 1.99 kg

---

Lenovo
May 2019
## Processor Specifications

<table>
<thead>
<tr>
<th>Processor</th>
<th># of Cores</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
<th>Chipset</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8750H</td>
<td>6</td>
<td>2.2 GHz</td>
<td>4.1 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
<td>Mobile Intel CM246 Chipset</td>
<td>128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor)</td>
</tr>
<tr>
<td>7-8850H</td>
<td>6</td>
<td>2.6 GHz</td>
<td>4.3 GHz</td>
<td>9MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
<td>Mobile Intel CM246 Chipset</td>
<td>128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor)</td>
</tr>
<tr>
<td>E-2176M</td>
<td>12</td>
<td>2.7 GHz</td>
<td>4.4 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
<td>Mobile Intel CM246 Chipset</td>
<td>128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor)</td>
</tr>
<tr>
<td>E-2186M</td>
<td>12</td>
<td>2.9 GHz</td>
<td>4.8 GHz</td>
<td>12MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 630</td>
<td>Mobile Intel CM246 Chipset</td>
<td>128GB non-ECC or 64GB ECC max / 2400MHz DDR4 (ECC function supported only on Xeon processor)</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, 72% gamut, 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 CG, 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 RAID (optional)
- **Optional**: Intel Optane memory, PCIE NVMe, PCIE 3.0 x 2

## Optical
- None

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

## WLAN
- 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

---

**Note:** The specifications above may not be available in all regions.
## ThinkPad T470 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>6th Generation Intel® Core™ i5 / i7</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>7th Generation Intel Core i3 / i5 / i7</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 620</td>
</tr>
</tbody>
</table>

### Graphics

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

### Chipset

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

### Display

- System clocks down for processors with lower memory controller
- Some: 14.0° (355mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio
- Some: 14.0° (355mm) FHD (1920x1080), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 or 500:1 contrast ratio
- Some: 14.0° (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle
- Multi-touch (opt) On-cell touch, supports 10-finger gesture (FHD IPS panel with PPS cover only)

### Storage

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

### Optical

- None

### Ethernet

- Non-vPro model: Intel Ethernet Connection 2129-V (Jacksonville)
- vPro model: Intel Ethernet Connection 2129-LM (Jacksonville)

### WLAN

- One of the following, configurable by model (WiGig can coexist with WLAN):
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Tri-Band Wireless-AC 18265, WiGig 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1, M.2 card

### Bluetooth™

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

### WWAN (optional)

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

### WWAN (optional)

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

### Smart card reader

- Optional: Smart card reader

### Media reader

- 4-in-1 reader (MMC, SD, SDHC, SDXC), supports SD 3.0, UHS-I
- Three USB 3.1 Gen 2 / Thunderbolt 3
- USB 3.1 Type-C Gen 2 / Thunderbolt 3 (with the function of Power Delivery and DP), HDMI 1.4b, Ethernet (RJ-45), Dock connector
- * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### W GiG dock (opt)

- ThinkPad WiGig dock
- Optional: Lenovo USB-C to VGA Adapter

### Monitor cable

- Camera (optional): 720p, HD720p resolution, fixed focus
- Audio support: HD Audio, Realtek ALC3268 codec / stereo speakers, 2W x 2 / dual array microphone, combo audio/microphone jack

### Security

- Keyboards
  - 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
  - TrackPoint® pointing device and buttonless Mylar surface multi-touchpad
- Security chip
  - Power-on password, hard disk password, supervisor password, security keyhole
  - Discrete TPM 2.0, TCG Certified

### NFC (optional)

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

### Security features

- Optional: Near Field Communication

### Internal battery

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

### Preload

- Windows® 7 Professional 64 preinstalled
- Some: Windows 10 Home 64
- Some: Windows 10 Pro 64
- Lenovo Solution Center
- Lenovo PowerEngage
- ThinkVantage Product Recovery
- ThinkVantage System Update
- Adobe® Reader®
- Microsoft® Office preloaded:
  - purchase a product key to activate
  - McAfee® LiveSafe™ (30-day trial)

### 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 certification

### 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>i5-6200U</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>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>
<tr>
<td>i7-7600U</td>
<td>2</td>
<td>4</td>
<td>2.8 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

or 7th 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>i5-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>i5-7700U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
<td>i7-7600U</td>
<td>2</td>
<td>4</td>
<td>2.8 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

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

### Chipset
- Intel SoC (System on Chip) platform
- 20GB or 24GB max DDR4 / 2400MHz DDR4, dual-channel capable, 4GB or 8GB memory soldered to systemboard, one DDR4 SO-DIMM socket
- * System clocks down for processors with lower memory controller
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Intel Tri-Band Wireless-AC 18265, WiGig 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
- Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### Display
- Some: 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 160° viewing angle
- Some: 14.0" (355mm) QHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 160° viewing angle
- On-cell touch, supports 10-finger gesture, 250 nits (FHD only)

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

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

### Ethernet
- One of the following, configurable by model (WiGig is mutually exclusive with WWAN):
  - Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Intel Tri-Band Wireless-AC 18265, WiGig 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter

### WLAN
- One of the following, configurable by model (WiGig is mutually exclusive with WWAN):
  - Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1, M.2 card
  - Qualcomm Snapdragon™ X7 LTE-A (Sierra Wireless EM7455), M.2 card
  - Micro-SIM card slot, opt Verizon LTE (US) or Lenovo® Connect (EMEA) SIM card

### 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 certification

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

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**Product Specifications Reference (PSREF)**

Lenovo

April 2019
## ThinkPad T480 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th Generation Intel® Core™ i5 Processor</td>
<td>7-7200U</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>or 8th Generation Intel Core i3 / i5 / i7 Processor</td>
<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>
</tbody>
</table>

### Graphics

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

### Chipset

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

### Multi-touch (opt)

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

### Storage

- System has one HDD slot or one M.2 2280 slot exclusively for storage
- Some: HDD / SATA 6.0Gb/s, 2.5” wide, 7mm high, Active Protection System™
- Some: SSD / SATA 6.0Gb/s, 2.5” wide, 7mm high (e.g. xxxGB SSD)
- Some: M.2 SSD / PCIe NVMe, PCIe 3.0 x 4
- Some: 128GB M.2 SSD / PCIe NVMe, PCIe 3.0 x 2, in WWAN slot as 2nd Storage, mutually exclusive with WWAN
- Installed M.2 SSD is PCIe 3.0 x 4 but run at PCIe 3.0 x 2 due to M.2 SSD adapter limitation

### Optane™ memory

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

### Ethernet

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

### WLAN +

- 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):
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7262 (Fibocom L830-EB), M.2 card (EMEA only)
  - Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7360 (Fibocom L850-GL), M.2 card
- * For non-WWAN model, it means the model is NOT WWAN upgradable

### SIM card (opt)

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

---

### Dimensions & Weight

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>WxDxH: 13.25&quot; x 9.15&quot; x 0.79&quot;</td>
<td>336.6mm x 232.5mm x 19.95mm</td>
</tr>
</tbody>
</table>

### Models

- 24Wh or 24Wh + 24Wh
- 48Wh, 72Wh, or 24Wh + 48Wh / 72Wh

### Integrated Magnesium

- 3.49 lb / 1.6 kg
- 3.92 lb / 1.8 kg

### Integrated PPS

- 3.63 lb / 1.65 kg
- 4.08 lb / 1.85 kg

### Discrete Magnesium

- 3.53 lb / 1.60 kg
- 3.97 lb / 1.80 kg

### Discrete PPS

- 3.68 lb / 1.67 kg
- 4.12 lb / 1.87 kg

### Case color

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

### Smart card reader

- Optional: Smart card reader

### Media reader

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

### 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 media reader (MMC, SD, SDHC, SDXC), side docking connector, security keyhole

### Monitor cable (optional)

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

### HDMI to VGA

- Lenovo HDMI to VGA Monitor Adapter
- USB-C to 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
  - HD Audio, Realtek® ALC297 codecs / stereo speakers, 2W x 2, Dolby® Audio™ Premium / dual array microphone, headphone / microphone combo jack

### Audio support

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

### Security

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

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

### Max battery life (MobileMark® 2014)

- 7.2 hr
- 14.4 hr
- 21.8 hr
- 28.0 hr

### AC adapter

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

### Preload

- 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

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

Lenovo
May 2019

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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>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>
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<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>
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<td>Intel UHD Graphics 620</td>
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<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) WQHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 72% gamut, 170° viewing angle

### Multi-touch (opt)

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

### Storage

One of the following, configurable by model:

- M.2 SSD / SATA 6.0Gb/s
- M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s

### Optane™ memory
None

### Ethernet

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

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

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

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

### WWAN (optional)

One of the following, configurable by model:

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

### Battery

Integrated Li-ion 57Wh battery, supports Rapid Charge (0-80% in 60 mins) with 65W USB Type-C AC adapter

### AC adapter

45W or 65W USB Type-C AC adapter

### System clocks down for processors with lower memory controller

### Audio support

- Intel 82801YF codec
- Realtek ALC3287 codec
- 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
- TrackPoint® pointing device and buttonless Mylar surface multi-touch touchpad
- Power-on password, hard disk password, supervisor password, security keyhole
- Discrete TPM 2.0, TCG Certified
- Intel vPro Technology
- Fingerprint reader

### 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 certification

### Environment

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

**Note:** The specifications above may not be available in all regions.
ThinkPad T490 Platform Specifications

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

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

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

Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Surface</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot; FHD</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>90°</td>
</tr>
<tr>
<td>14.0&quot; FHD</td>
<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>14.0&quot; Low Power</td>
<td>(1920x1080)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>700:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>14.0&quot; ThinkPad Privacy Guard</td>
<td>(2560x1440)</td>
<td>IPS</td>
<td>Anti-glare</td>
<td>500 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0&quot; WQHD</td>
<td>(2560x1440)</td>
<td>IPS</td>
<td>Glossy</td>
<td>500 nits</td>
<td>16:9</td>
<td>1500:1</td>
<td>100%</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

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

Optical

Non-vPro model: Intel Ethernet Connection 1219-V (Jacksonville)
vPro model: Intel Ethernet Connection 1219-LM (Jacksonville)

Ethernet

WLAN (optional) Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
Bluetooth® (opt) 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, Fibocom L850-GL, M.2 card
- Integrated Mobile Broadband 4G LTE-A, Fibocom L860-GL, MIMO 4x4, M.2 card
- Nano-SIM card slot, optional Verizon LTE (US) SIM card

Battery Integrated Li-ion 50Wh battery, supports Rapid Charge (charge up to 80% in 1hr)
Max battery life MobileMark® 2014: 16.11 hr
AC adapter 45W or 65W USB Type-C AC adapter
Preload 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 certification

Environment EPEAT® Bronze; ENERGY STAR® 7.0; RoHS-compliant

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

Lenovo

May 2019
**ThinkPad T490s Platform Specifications**

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

<table>
<thead>
<tr>
<th>Processor</th>
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</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>
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<td>i5-8365U</td>
<td>8</td>
<td>1.6 GHz</td>
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<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

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

**Chipset**
- Intel SoC (System on Chip) platform
- 8GB, 16GB or 32GB / 2400MHz DDR4 / soldered to systemboard, no sockets
  - Installed memory is actually 2866MHz but run at 2400MHz due to Intel limitation

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

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

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

**Optical**
- None

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

**WLAN + Bluetooth™**
- One of the following, configurable by model:
  - Intel Wireless-AC 9560, Wi-Fi 2x2 802.11ac + Bluetooth 5.0
  - Intel Wireless-AX 22260, 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
  - Nano-SIM card slot, optional Verizon LTE (US) SIM card

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

**Dimensions**
- WxDxH (black with FHD / Privacy Guard):
  - 12.95" x 8.90" x 0.66": 329.0mm x 226.15mm x 16.7mm
  - 12.94" x 8.89" x 0.63": 326.8mm x 225.8mm x 16.1mm
- WxDxH (silver):
  - 12.96" x 8.92" x 0.68": 329.15mm x 226.45mm x 17.2mm

**Weight**
- Models
  - Black with FHD
  - Black with FHD Low Power / WQHD / Privacy Guard
  - Silver
  - Weight
    - 2.96 lb / 1.35 kg
    - 2.81 lb / 1.27 kg
    - 3.29 lb / 1.49 kg

**Case color**
- Black or Silver

**Case material**
- Display cover: CFRP 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), head/phone / microphone combo jack, optional smart card reader, microSD card reader, side docking connector, security keyhole

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

**Audio support**
- One of the following, configurable by model:
  - Intel S100A codec / 6-row, spill-resistant, multimedia Fn keys, optional LED backlight
  - Intel S100A codec / 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

**System Mgt (opt)**
- Intel vPro Technology

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

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

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

**Max battery life**
- MobileMark® 2014: 20 hr
- *Battery life varies significantly with settings, usage, & other factors

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

**Preload**
- 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 certification

**Environment**
- EPEAT® Bronze; ENERGY STAR® 7.0; RoHS-compliant

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

Lenovo
May 2019
**ThinkPad T495 Platform Specifications**

**Processor**

<table>
<thead>
<tr>
<th>Processor</th>
<th>Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Controller</th>
<th>Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryzen 3 Pro 3300U</td>
<td>4</td>
<td>4</td>
<td></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 5350U</td>
<td>4</td>
<td>8</td>
<td></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 7370U</td>
<td>4</td>
<td>8</td>
<td></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

**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™**

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)**

None

**Dimensions**

<table>
<thead>
<tr>
<th>WxDxH:</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.95&quot; x 8.94&quot; x 0.70&quot;</td>
<td>3.46 lb / 1.57 kg</td>
</tr>
<tr>
<td>329mm x 227mm x 17.9mm</td>
<td>3.46 lb / 1.57 kg</td>
</tr>
</tbody>
</table>

**Weight Models**

- HD
- FHD
- FHD Low Power

**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**

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, microSD card reader, side docking connector, security keyhole

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

**Camera (optional)**

One of the following, configurable by model:

- HD720p camera with ThinkShutter camera privacy, fixed focus
- 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
- ALC3287 codec / Realtek drivers

**Keyboard**

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

**Security**

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

**Battery**

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

**Max battery life**

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

**AC adapter**

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

**Preload**

- 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 certification

**Environment**

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

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

Lenovo
May 2019
### ThinkPad T495s Platform Specifications

**Processor**

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

**Graphics**

- 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@80Hz (USB-C); 4096x2160@24Hz (HDMI)

**Chipset Memory**

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

**Display**

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>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”</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-giare</td>
<td>250 nits (non-touch)</td>
<td>300 nits (multi-touch)</td>
<td>16.9</td>
<td>700:1</td>
<td>45%</td>
<td>170°</td>
</tr>
<tr>
<td>14.0”</td>
<td>FHD (1920x1080)</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”</td>
<td>FHD (1920x1080)</td>
<td>ThinkPad Privacy Guard</td>
<td>IPS Anti-giare</td>
<td>400 nits</td>
<td>16.9</td>
<td>1000:1</td>
<td>72%</td>
<td>170°</td>
</tr>
</tbody>
</table>

**Multi-touch (opt)**

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

**Storage Optical**

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

**Ethernet**

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

**WLAN (optional)**

- Intel Wireless-AC 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

**Battery**

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

**AC adapter**

- MobileMark2014: 16.4 hr
  * Battery life varies significantly with settings, usage, & other factors

**Preload**

- 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

**Environment**

- MIL-STD-810G military certification
- EPEAT™ Bronze; ENERGY STAR® 7.1; RoHS-compliant

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

**Specifications Reference (PSREF)**

June 2019
## ThinkPad T580 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>5-7200U</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>intel HD Graphics 620</td>
</tr>
<tr>
<td>5-7300U</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>5-8250U</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>5-8350U</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 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)
- Intel HD Graphics 620 or Intel UHD Graphics 620 in processor only
- 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

- 15.6" (396mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 250 nits, 16:9 aspect ratio, 1000:1 contrast ratio, 72% gamut, 170° viewing angle
- 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
- Optical: 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: Intel Optane memory, PCIe NVMe, PCIe 3.0 x 2

### Optical

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

### Ethernet

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

### WWAN (optional)

- One of the following, configurable by model:
  - Integrated Mobile Broadband 4G LTE, Intel XMM™ 7662 (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
  - Nanosim card slot, optional Verizon LTE (US) SIM card

### SIM card (opt)

- Optional: Smart card reader

### Media reader

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

### Ports

- i5-8250U: 2-in-1 reader (MMC, SD, SDHC, SDXC)
- i5-8350U: 2-in-1 reader (MMC, SD, SDHC, SDXC)
- i5-8550U: 2-in-1 reader (MMC, SD, SDHC, SDXC)
- i5-8650U: 2-in-1 reader (MMC, SD, SDHC, SDXC)

### Monitor cable

- (optional)

### 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
- Discrete TPM 2.0, TCG Certified
- Intel vPro Technology

### Security chip

- 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 external Li-ion 24Wh, 48Wh, or 72Wh battery
- Max battery life (MobileMark® 2014):
  - Models: 24Wh 48Wh 72Wh 32Wh + 24Wh 32Wh + 48Wh 32Wh + 72Wh
  - Max battery life:
    - 5.8 hr: 12.5 hr 18.1 hr 13.8 hr 20.3 hr 26.1 hr

### AC adapter

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

### Limited warranty

- 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 certification

### Environment

- EPEAT™ Gold (US only); ENERGY STAR® 6.1; RoHS-compliant
ThinkPad T590 Platform Specifications

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

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-8265U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.9 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8350U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.8 GHz</td>
<td>4.6 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i7-8665U</td>
<td>4</td>
<td>8</td>
<td>1.9 GHz</td>
<td>4.8 GHz</td>
<td>8MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

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

Chipset Intel SoC (System on Chip) platform

Memory 48GB max / 2400MHz DDR4, dual-channel capable, 8GB or 16GB memory soldered to systemboard, one DDR4 SO-DIMM socket

Display 15.6" 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 • 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

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

Optical None

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

WLAN (optional) 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 None

Dimensions Wx Dx H: 14.40" x 9.76" x 0.79"; 365.8mm x 248.0mm x 19.95mm

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

Case color Black

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

Smart card reader Optional: Smart card reader

Media reader MicroSD card reader

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

Monitor cable (optional) Lenovo HDMI to VGA Monitor Adapter

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

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

Bundled Accy None

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

Audio support • HD720p camera with ThinkShutter camera privacy, fixed focus
• IR camera and HD720p camera with ThinkShutter camera privacy, fixed focus

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

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

Security chip Discrete TPM 2.0, TCG Certified

System Mgl (opt) Intel vPro Technology

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

Biometric option None

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

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

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

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

Product Specifications Reference (PSREF)

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

Lenovo
May 2019
## ThinkPad X1 Carbon (5th Gen) Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-6200U</td>
<td>2</td>
<td>4</td>
<td>2.3 GHz</td>
<td>2.8 GHz</td>
<td>3MB</td>
<td>LPDDR3-1866</td>
<td>Intel HD Graphics 520</td>
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<tr>
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<td>Intel HD Graphics 520</td>
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<td>Intel HD Graphics 520</td>
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<td>i5-7600U</td>
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<td>3.9 GHz</td>
<td>3MB</td>
<td>LPDDR3-1866</td>
<td>Intel HD Graphics 520</td>
</tr>
</tbody>
</table>

### Graphics
- Intel HD Graphics 520 or 620 in processor;
- Supports external digital monitor via HDMI or USB Type-C;
- Supports three independent displays;
- Max resolution: 4096x2304@60Hz (USB Type-C); 4096x2160@24Hz (HDMI);
- Display cover: Black or Silver (silver is NOT available in EMEA);
- Weight: Starting at 2.49 lb / 1.13 kg;
- Case color: Black or Silver (silver is NOT available in EMEA);
- Case material: Magnesium alloy hybrid.

### Chipset
- Intel SoC (System on Chip) platform;
- Memory: 8GB or 16GB / 1866MHz LPDDR3 / soldered to systemboard, no sockets;
- Display:
  - 14.0" (355mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, aspect ratio 16:9, contrast ratio 700:1, viewing angle 170°;
  - 14.0" (355mm) QHD (2560x1440), anti-glare, LED backlight, IPS, 300 nits, aspect ratio 16:9, contrast ratio 700:1, viewing angle 170°;
- Multi-touch: None;
- Storage:
  - M.2 SSD / SATA 6.0Gb/s (e.g. xxxGB SSD M.2);
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32Gb/s (e.g. xxxGB SSD M.2 PCIe NVMe);
- Optical: None;
- Ethernet: Native Intel Ethernet Connection i219-V (Non-vPro) or i219-LM (vPro) via bundled or optional ThinkPad Ethernet Extension Cable;
- WLAN:
  - Intel Dual Band Wireless-AC 8265, 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;
- WWAN (optional):
  - Qualcomm Snapdragon™ X7 LTE-A;
  - Sierra Wireless EM7455;
- SIM card (optional):
  - Micro-SIM card slot, opt Verizon LTE (US) or Lenovo™ Connect (EMEA) SIM card;
- Dimensions: 12.74” x 8.55” x 0.63”; 323.5mm x 217.1mm x 15.95mm;
- Weight: Starting at 2.49 lb / 1.13 kg;
- Color: Black or Silver (silver is NOT available in EMEA);
- Case material: CFFRP/GFRP hybrid;

### Security
- Security chip:
  - vPro (optional);
  - Non-vPro (optional);
- Security keyhole:
  - Discrete TPM 2.0, TCG Certified;
- Intel vPro Technology;
- Intel Security:
  - Intrusion detection software;
  - Hardware-based encryption;
- Trusted Platform Module (TPM);
  - Discrete TPM 2.0, TCG Certified;
  - 3-year/1-yr battery limited onsite service;
  - 3-year/1-yr battery depot repair service;
  - 1-year depot repair service;
- Power-on password, hard disk password, supervisor password, security keyhole;
- MobileMark® 2014: 15.5 hr;
- Battery life varies significantly with settings, usage, & other factors;
- Battery life: 13.5 hr (57Wh) RapidCharge battery;

### Preload
- Windows® 7 Professional 64 preinstalled; Some: Windows 10 Home 64;
- Windows 10 Pro 64;
- 3-year/1-yr battery limited onsite service; 3-year/1-yr battery depot repair service; 1-year depot repair service;
- Lenovo PowerEngage;
- McAfee LiveSafe™ (30-day trial);
- Microsoft Office preloaded; purchase a product key to activate;
- Lenovo Solution Center;
- Lenovo Companion;
- Lenovo Setting;
- Microsoft Office preloaded; purchase a product key to activate;

### Environment
- EPEAT® Gold (US only); ENERGY STAR® v. 6.1; RoHS-compliant;
- MIL-STD-810G military certification;
- MIL-STD-STD military certification;

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*Lenovo April 2019*
ThinkPad X1 Carbon (6th Gen) Platform Specifications

Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5-7300U</td>
<td>2</td>
<td>4</td>
<td>2.6 GHz</td>
<td>3.5 GHz</td>
<td>3MB</td>
<td>LPDDR3-1866</td>
<td>Intel HD Graphics 620</td>
</tr>
<tr>
<td>or 8th Generation Intel Core i5 / i7 Processor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i5-8250U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>3.4 GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics 620</td>
</tr>
</tbody>
</table>

Graphics

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

Chipset

- Intel SoC (System on Chip) platform

Memory

- 8GB or 16GB / 2133MHz LPDDR3 / soldered to 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. 256GB SSD M.2)
  - M.2 SSD / PCIe NVMe, PCIe 3.0 x 4, 32GB/s (e.g. 32GB SSD M.2 PCIe NVMe)

Optane™ memory

- None

Optical

- None

Ethernet

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

WLAN + Bluetooth™

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

WWAN (optional)

- 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: 12.74" x 8.55" x 0.63"; 323.5mm x 217.1mm x 15.95mm

Weight

- Starting at 2.49 lb / 1.13 kg

Case color

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

Case material

- Display cover: CFRP/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)
  - HDMI to VGA: Lenovo HDMI to VGA Monitor 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 ALC3286 codec / stereo speakers, 1W x 2, Dolby Audio™ Premium / dual array microphone, headphone / microphone combo jack, Dolby Atmos™ via headphones

Keyboard

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

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

Security

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

Security chip

- Intel vPro Technology

Fingerprint reader

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

NFC (optional)

- Near Field Communication

Battery

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

Max battery life

- MobileMark® 2014: 19.3 hr
  - * Battery life varies significantly with settings, usage, & other factors

AC adapter

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

Preload

- 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 certification

Environment

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

Lenovo

April 2019
**ThinkPad X1 Extreme Platform Specifications**

<table>
<thead>
<tr>
<th>Processor</th>
<th>8th Generation Intel® Core™ i5 / i7 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>i5-8300H</td>
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<tr>
<td># of Cores</td>
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<td># of Threads</td>
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<td>Base Frequency</td>
<td>2.3 GHz</td>
</tr>
<tr>
<td>Max Turbo Frequency</td>
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<tr>
<td>Cache</td>
<td>8MB</td>
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<tr>
<td>Memory Types</td>
<td>DDR4-2666</td>
</tr>
<tr>
<td>Processor Graphics</td>
<td>Intel UHD Graphics 630</td>
</tr>
</tbody>
</table>

| Graphics | Intel UHD Graphics 630 in processor and NVIDIA® GeForce® GTX 1050 Ti Max-Q, 4GB GDDR5 memory; supports external digital monitor via HDMI or Thunderbolt™; supports four independent displays; Max resolution: 5120x2880@30Hz (Thunderbolt); 4096x2160@60Hz (HDMI) |

| Chipset Memory | Mobile Intel CM246 Chipset 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 Some: 15.6" (396mm) HDR 4K (3840x2160) with Dolby Vision™, 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) |

| Pen | Supports pen accessory, please see the accessory compatibility for details |

| Storage | Up to 2 drives (two M.2 SSD) • 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) |

| Optane™ memory RAID (optional) | 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™ | 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 |

| Dimensions | WxDxH (non-touch): 14.24" x 9.67" x 0.72"; 361.8mm x 245.7mm x 18.4mm WxDxH (multi-touch): 14.24" x 9.67" x 0.74"; 361.8mm x 245.7mm x 18.7mm |

| Weight | Non-touch model: starting at 3.76 lb (1.7 kg); Multi-touch model: starting at 4.06 lb (1.8 kg) |

| Case color | Black |
| Case material | Display cover: CFFRP/GFRP hybrid; Bottom: Aluminum alloy |

Note: The specifications above may not be available in all regions.
ThinkPad X270 Platform Specifications

Product Specifications Reference (PSREF)

Processor

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor Number</th>
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<tr>
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<td>i7-6300U</td>
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<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
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<tr>
<td>i7-6500U</td>
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<td>4</td>
<td></td>
<td>2.6 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 520</td>
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<tr>
<td>or i7 Generation Intel Core i3 / i5 / i7 Processor</td>
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<th>Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
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<th>Graphics</th>
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<td>2.4 GHz</td>
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<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<td>i5-7200U</td>
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<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
<td>i5-7300U</td>
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<td>i7-7500U</td>
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<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
<td>i7-7600U</td>
<td>2</td>
<td>4</td>
<td></td>
<td>2.8 GHz</td>
<td>3.9 GHz</td>
<td>4MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
</tr>
</tbody>
</table>

Graphics

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

Chipset

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

Display

- Some: 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 500:1 contrast ratio
- Some: 12.5" (317.5mm) HD (1366x768), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 170° viewing angle
- Some: 12.5" (317.5mm) FHD (1920x1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

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 / SATA 6.0Gb/s, in WWAN slot as 2nd Storage, mutually exclusive with WWAN and WiGig

Optical

- None

Ethernet

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

WLAN

- One of the following, configurable by model (WiGig is mutually exclusive with WWAN):
  - Realtek® RTL8822BE, Wi-Fi 2x2 802.11ac + BT4.1
  - Intel Dual Band Wireless-AC 8260, Wi-Fi 2x2 802.11ac + BT4.1
  - Intel Dual Band Wireless-AC 8265, Wi-Fi 2x2 802.11ac + BT4.1
  - Intel Tri-Band Wireless-AC 18265, WiGig 802.11ad + Wi-Fi 2x2 802.11ac + BT4.1 (US only)
- Bluetooth 4.1 wireless, integrated in Wi-Fi + Bluetooth combo adapter
  - * Intel 8265ac / 18265ac card support BT4.2 but is limited to BT4.1 by Windows OS

WWAN (optional)

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

SIM card (opt)

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

Dimensions

- WxDxH: 12.03" x 8.21" x 0.80"; 305.5mm x 208.5mm x 20.3mm

Weight

- Models:
  - No + 3-cell
  - 3-cell + 3-cell
  - 3 + 6-cell
- Weight:
  - 2.79 lb / 1.27 kg
  - 2.98 lb / 1.36 kg
  - 3.33 lb / 1.52 kg

Case color

- Black

Case material

- Glass-Fiber Reinforced Plastic

Display cover:

- Lenovo Companion

BBE

- None

Security

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

Security chip

- Intel vPro Technology
- Intel vPro Technology
- Intel vPro Technology

Fingerprint reader

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

 NFC (optional)

- None

Internal battery

- Li-ion 3-cell (23Wh)
- Li-ion 3-cell (23Wh) or 6-cell (48Wh or 72Wh)

Internal battery life

- Max battery life: 6.52 hr
- 13.04 hr
- 20.1 hr
- 26.9 hr

AC adapter

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

Preload

- Windows® 7 Professional 64 preinstalled
- Some: Windows 10 Home 64
- Some: Windows 10 Pro 64
- Lenovo Solution Center
- Lenovo PowerEngage
- Lenovo Companion
- Lenovo Setting
- Microsoft Office preloaded
- purchase a product key to activate
- McAfee® LiveSafe® (30-day trial)

Limitation

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

Mil-Spec test

- MIL-STD-810G military certification

Environment

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

Lenovo

April 2019
ThinkPad X280 Platform Specifications

Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i3-7130U</td>
<td>2</td>
<td>4</td>
<td>2.7 GHz</td>
<td>3.1 GHz</td>
<td>3MB</td>
<td>DDR4-2133</td>
<td>Intel HD Graphics 620</td>
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<tr>
<td>i5-7200U</td>
<td>4</td>
<td>8</td>
<td>2.5 GHz</td>
<td>3.4 GHz</td>
<td>4MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
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<td>i5-7300U</td>
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<td>2.6 GHz</td>
<td>3.5 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: 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 (1366×768), anti-glare, LED backlight, 220 nits, 16:9 aspect ratio, 400:1 contrast ratio
Some: 12.5" (317.5mm) FHD (1920×1080), anti-glare, LED backlight, IPS, 300 nits, 16:9 aspect ratio, 700:1 contrast ratio, 170° viewing angle

Multi-touch (opt)

On-cell touch, supports 10-finger gesture (FHD only)
* FHD non-touch model is NOT available in US

Storage

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

Optane™ memory

None

Optical

None

Ethernet

Native Intel Ethernet Connection I219-V (Non-vPro) or I219-LM (vPro)
* Intel 8265ac card supports BT4.2 but is limited to BT1.4 by Windows OS

WLAN + Bluetooth™

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

WWAN (optional)

One of the following, configurable by model:
* Integrated Mobile Broadband 4G LTE, Intel XMM™ 7660 (Fibocom L830-EB), M.2 card (EMEA only)
* Integrated Mobile Broadband 4G LTE-A, Intel XMM™ 7660 (Fibocom L850-GL), M.2 card

SIM card (opt)

Nano-SIM card slot, in the combo slot with microSD card reader, optional Verizon LTE (US) SIM card

Notes:
- The specifications above may not be available in all regions.
- Depending on many factors, actual data transfer speed may be lower than theoretical speed.
- *Battery life varies significantly with settings, usage, & other factors.

Lenovo April 2019
## ThinkPad X390 Platform Specifications

### Processor

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
<th># of Threads</th>
<th>Base Frequency</th>
<th>Max Turbo Frequency</th>
<th>Cache</th>
<th>Memory Types</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>i7-8565U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.1 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8465U</td>
<td>4</td>
<td>8</td>
<td>1.6 GHz</td>
<td>4.6 GHz</td>
<td>6MB</td>
<td>DDR4-2400</td>
<td>Intel UHD Graphics 620</td>
</tr>
<tr>
<td>i5-8265U</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>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>
</tbody>
</table>

### Graphics

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

### Chipset

- Intel SoC (System on Chip) platform
- 8GB, 16GB or 32GB / 2400MHz DDR4 / soldered to system board, no sockets

### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Type</th>
<th>Brightness</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3&quot;</td>
<td>HD (1366x768)</td>
<td>TN Anti-glare</td>
<td>250 nits</td>
<td>16:9</td>
<td>500:1</td>
<td>45%</td>
<td>90°</td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>IPS Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>800:1</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>13.3&quot;</td>
<td>FHD (1920x1080)</td>
<td>ThinkPad Privacy Guard</td>
<td>Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
</tr>
</tbody>
</table>

### Multi-touch (optional)

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

### Storage

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

### Optane™ memory

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

### 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:
  - 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

### Memory

- 8GB or 32GB / 2400MHz DDR4 / soldered to system board, no sockets
- 8GB, Intel SoC (System on Chip) platform

### Smart card reader

- Optional: Smart card reader

### Media reader

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

### Ports

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

### Monitor cable (optional)

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

### Bundled Accy

- 2014:
  - 3-year/1-yr battery depot repair service
  - 1-year depot repair service
  - Discrete TPM 2.0, TCG Certified
  - Power-on password, hard disk password, supervisor password, security keyhole

### Keyboard

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

### 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

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

### NFC

- Optional: Near Field Communication

### 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
- MobileMark® 2014: 17.6 hr

### AC adapter

- 54W or 65W USB Type-C AC adapter

### Preload

- 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

### Mi-Spec test

- MIL-STD-810G military certification

### Environment

- EPEAT® Bronze; ENERGY STAR® 7.0; RoHS-compliant

Note: The specifications above may not be available in all regions.
### ThinkPad X395 Platform Specifications

**Processor**

<table>
<thead>
<tr>
<th>Processor Number</th>
<th># of Cores</th>
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<th>Cache</th>
<th>Memory Controller</th>
<th>Processor Graphics</th>
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</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>2.1 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 three independent displays;
Max resolution: 4096x2304@60Hz (USB-C); 4096x2160@24Hz (HDMI)

**Chipset Memory**

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

**Display**

<table>
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<tr>
<th>Size</th>
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<td>45%</td>
<td>90°</td>
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<tr>
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<td>(1920x1080)</td>
<td>IPS Anti-glare</td>
<td>300 nits</td>
<td>16:9</td>
<td>(non-touch) 700:1 (multi-touch)</td>
<td>72%</td>
<td>170°</td>
</tr>
<tr>
<td>13.3” FHD</td>
<td>(1920x1080)</td>
<td>IPS Anti-glare</td>
<td>400 nits</td>
<td>16:9</td>
<td>1000:1</td>
<td>72%</td>
<td>178°</td>
</tr>
</tbody>
</table>

**Multi-touch (opt)**

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

**Storage**

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

**Optical**

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, FibeCom 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: 12.28” x 8.55” x 0.67”
- 7.91” x 3.01” x 0.16”

### Weight

- Models
  - HD / FHD multi-touch
  - HD / FHD non-touch
  - FHD Privacy Guard
- Weight
  - 2.91 lb / 1.32 kg
  - 2.82 lb / 1.28 kg
  - 3.01 lb / 1.37 kg

### Case color

- Black

### Case material

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

### Smart card reader

Optional: Smart card reader
- One USB 3.1 Type-C Gen 2 (with the function of Power Delivery and DisplayPort),
- HDMI 2.0, Ethernet extension connector,
- combo slot of nano-SIM card (WWAN models) and microSD card reader,
- side docking connector, security keyhole
  * Depending on many factors, actual data transfer speed may be lower than theoretical speed

### Media reader

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

### Bundled Accy

Optional: ThinkPad Ethernet Extension Adapter Gen 2

### Monitor cable

**USB-C to VGA**

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

### Keyboard

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

### 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

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

### Battery

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

### Preload

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 certification

### Environmental

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

Note: The specifications above may not be available in all regions.
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- **Expedited Depot:** Parts and labor coverage with expedited turnaround. Shipping (including packaging) or delivery to the repair center is paid for by Lenovo.
- **Onsite / In-home Service:** Parts and labor repair coverage where labor is provided onsite at your place of business.

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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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