**OVERVIEW**

<table>
<thead>
<tr>
<th></th>
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</tbody>
</table>

Notes:
- Ports with * are only available on selected models
- The combination of 5 and 6 is side docking connector
PERFORMANCE

Processor

Processor Family
10th Generation Intel® Core™ i5 / i7 Processor

<table>
<thead>
<tr>
<th>Processor Name</th>
<th>Cores</th>
<th>Threads</th>
<th>Base Frequency</th>
<th>Max Frequency</th>
<th>Cache</th>
<th>Memory Support</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core i5-10210U</td>
<td>4</td>
<td>8</td>
<td>1.6GHz</td>
<td>4.2GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>Core i5-10310U</td>
<td>4</td>
<td>8</td>
<td>1.7GHz</td>
<td>4.4GHz</td>
<td>6MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>Core i7-10510U</td>
<td>4</td>
<td>8</td>
<td>1.8GHz</td>
<td>4.9GHz</td>
<td>8MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>Core i7-10610U</td>
<td>4</td>
<td>8</td>
<td>1.8GHz</td>
<td>4.9GHz</td>
<td>8MB</td>
<td>LPDDR3-2133</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>Core i7-10710U</td>
<td>6</td>
<td>12</td>
<td>1.1GHz</td>
<td>4.7GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics</td>
</tr>
<tr>
<td>Core i7-10810U</td>
<td>6</td>
<td>12</td>
<td>1.1GHz</td>
<td>4.9GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics</td>
</tr>
</tbody>
</table>

Operating System

Operating System
- Windows® 10 Pro 64
- Windows 10 Home 64
- Fedora Linux
- Linux
- Ubuntu Linux
- No operating system

Graphics

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Type</th>
<th>Memory</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel UHD Graphics</td>
<td>Integrated</td>
<td>Shared</td>
<td>DirectX® 12</td>
</tr>
</tbody>
</table>

Monitor Support

Monitor Support
Supports up to 3 independent displays (native display and 2 external monitors via HDMI® and Thunderbolt™)
- HDMI supports up to 4K@24Hz
- Thunderbolt supports up to 5K@60Hz

Chipset

Chipset
Intel SoC (System on Chip) platform

Memory

Max Memory[^4]
- 8GB soldered memory, not upgradable
- 16GB soldered memory, not upgradable

Memory Slots
Memory soldered to systemboard, no slots, dual-channel

Memory Type
LPDDR3-2133

Notes:
1. The max memory is based on the test results with current Lenovo® memory offerings. The system may support more memory as the technology develops.

Storage

[^4]: memory specifications apply to specific ThinkPad X1 Carbon Gen 8 models.
One drive, up to 2TB M.2 2280 SSD, optional Intel Optane™ Memory integrated with SSD, M.2

<table>
<thead>
<tr>
<th>Storage Type*</th>
<th>Disk Type</th>
<th>Interface</th>
<th>RPM</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.2 2280 SSD</td>
<td>PCIe® NVMe®, PCIe 3.0 x4</td>
<td>-</td>
<td>-</td>
<td>Opal2</td>
</tr>
<tr>
<td>Intel Optane Memory with Solid State Storage, M.2 2280</td>
<td>PCIe NVMe, PCIe 3.0 x4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes:
1. The storage capacity supported is based on the test results with current Lenovo storage offerings. The system may support larger storage as the technology develops.

**Removable Storage**

Optical
None

Card Reader
No card reader

**Multi-Media**

Audio Chip
High Definition (HD) Audio, USI 4551-513711-00 codec

Speakers
Stereo speakers, 2W x2 and 0.8W x2, Dolby® Atmos®

Microphone
Four microphones, quad-array, 360° far-field

Camera**
- 720p, with ThinkShutter, fixed focus
- IR & 720p hybrid, with ThinkShutter, fixed focus

**Battery**

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

Max Battery Life**
MobileMark® 2014: 19.5 hr
MobileMark 2018: 13.8 hr
JEITA 2.0: 19.8 hr

Notes:
1. All battery life claims are approximate maximum and based on results using the MobileMark 2014, MobileMark 2018, JEITA 2.0, continuous 1080p video playback (with 150nits brightness and default volume level) or Google Power Load Test (PLT) battery-life benchmark tests. Actual battery life will vary and depends on many factors such as product configuration and usage, software use, wireless functionality, power management settings, and screen brightness. The maximum capacity of the battery will decrease with time and use.

**Power Adapter**

Power Adapter**[q]
- 45W USB-C (2-pin) AC adapter, supports PD 3.0, 100-240V, 50-60Hz
- 45W USB-C (3-pin) AC adapter, supports PD 3.0, 100-240V, 50-60Hz
- 65W USB-C (2-pin) AC adapter, supports PD 3.0, 100-240V, 50-60Hz
- 65W USB-C slim (2-pin) AC adapter, supports PD 3.0, 100-240V, 50-60Hz
- 65W USB-C slim (3-pin) AC adapter, supports PD 3.0, 100-240V, 50-60Hz
- 65W USB-C (3-pin) AC adapter, supports PD 3.0, 100-240V, 50-60Hz

Notes:
1. AC adapter offerings depend on the country.

**DESIGN**
### Display

<table>
<thead>
<tr>
<th>Size</th>
<th>Resolution</th>
<th>Touch</th>
<th>Type</th>
<th>Brightness</th>
<th>Surface</th>
<th>Aspect Ratio</th>
<th>Contrast Ratio</th>
<th>Color Gamut</th>
<th>Viewing Angle</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>None</td>
<td>IPS</td>
<td>400 nits</td>
<td>Anti-glare</td>
<td>16:9</td>
<td>800:1</td>
<td>72% NTSC</td>
<td>170°</td>
<td>-</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>WQHD (2560x1440)</td>
<td>None</td>
<td>IPS</td>
<td>300 nits</td>
<td>Anti-glare</td>
<td>16:9</td>
<td>1000:1</td>
<td>72% NTSC</td>
<td>170°</td>
<td>-</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>UHD (3840x2160)</td>
<td>None</td>
<td>IPS</td>
<td>500 nits</td>
<td>Glossy</td>
<td>16:9</td>
<td>1500:1</td>
<td>90% DCI-P3</td>
<td>170°</td>
<td>Dolby Vision™, DisplayHDR™ 400</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>Multi-touch</td>
<td>IPS</td>
<td>400 nits</td>
<td>Anti-glare</td>
<td>16:9</td>
<td>700:1</td>
<td>72% NTSC</td>
<td>170°</td>
<td>-</td>
</tr>
<tr>
<td>14.0&quot;</td>
<td>FHD (1920x1080)</td>
<td>Multi-touch</td>
<td>IPS</td>
<td>500 nits</td>
<td>Anti-glare</td>
<td>16:9</td>
<td>1000:1</td>
<td>72% NTSC</td>
<td>170°</td>
<td>ThinkPad® Privacy Guard</td>
</tr>
</tbody>
</table>

**Touchscreen**
- Capacitive-type multi-touch, supports 10-point touch
- Non-touch

**Notes:**
1. California Electronic Waste Recycling Fee
   In California, per state law, Lenovo charges an electronic waste recycling fee on this covered device at the time of sale of the product. For more information, go to https://www.calrecycle.ca.gov/Electronics/Consumer
2. WQHD is not available in EMEA.

### Input Device

**Keyboard**
6-row, spill-resistant, multimedia Fn keys with Unified Communications controls

**Keyboard Backlight**
LED backlight

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

### Mechanical

#### Dimensions (WxDxH)

<table>
<thead>
<tr>
<th>Models</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD Privacy Guard models</td>
<td>323 x 217 x 15.4 mm (12.72 x 8.54 x 0.61 inches)</td>
</tr>
<tr>
<td>Non-Privacy Guard models</td>
<td>323 x 217 x 14.95 mm (12.72 x 8.54 x 0.59 inches)</td>
</tr>
</tbody>
</table>

#### Weight

<table>
<thead>
<tr>
<th>Models</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD Privacy Guard models</td>
<td>1.21 kg (2.66 lbs)</td>
</tr>
<tr>
<td>Non-Privacy Guard models</td>
<td>1.09 kg (2.4 lbs)</td>
</tr>
</tbody>
</table>

**Case Color**
- Black, paint
- Black, weave

**Case Material**
Carbon fiber (top), magnesium alloy (bottom)

**Notes:**
1. The system dimensions and weight vary depending on configurations.

### CONNECTIVITY
Network

Onboard Ethernet**
- Gigabit Ethernet, Intel Ethernet Connection I219-LM (vPro models), 1x RJ-45 via optional ThinkPad Ethernet Extension Adapter Gen 2, supports Wake-on-LAN
- Gigabit Ethernet, Intel Ethernet Connection I219-V (non-vPro models), 1x RJ-45 via optional ThinkPad Ethernet Extension Adapter Gen 2, supports Wake-on-LAN

WLAN + Bluetooth®[1]
- Intel Wi-Fi® 6 AX201, 802.11ax 2x2 Wi-Fi + Bluetooth 5.2

WWAN*[2]
- Wireless WAN upgradable to 4G (with antenna ready)
- Integrated Mobile Broadband 4G LTE, Quectel EM05-CE, M.2 card
- Integrated Mobile Broadband 4G LTE-A, CAT9, Fibocom L850-GL, M.2 card
- No support

SIM Card**
- Gemalto eSIM
- Nano SIM card, Lenovo Connect 4 months, 4G LTE
- No SIM card inbox

NFC
- Near Field Communication
- No support

Notes:
1. Wi-Fi 6 full features might be limited by country-level restrictions.
2. Bluetooth 5.2 is supported with driver version 22.30 and later.
3. For non-WWAN model, it means the model is NOT WWAN upgradable.

Ports[1]

Standard Ports
- 1x USB 3.2 Gen 1
- 1x USB 3.2 Gen 1 (Always On)
- 2x USB-C 3.2 Gen 2 / Thunderbolt 3 (support data transfer, Power Delivery 3.0 and DisplayPort™ 1.2)
- 1x HDMI 1.4b
- 1x Ethernet extension connector
- 1x Headphone / microphone combo jack (3.5mm)
- 1x Side docking connector

Optional Ports
- 1x Nano-SIM card slot (WWAN model)

Notes:
1. The transfer speed of following ports will vary and, depending on many factors, such as the processing speed of the host device, file attributes and other factors related to system configuration and your operating environment, will be slower than theoretical speed.
   - USB 2.0: 480 Mbit/s
   - USB 3.2 Gen 1 (SuperSpeed USB 5Gbps, formerly USB 3.0 / USB 3.1 Gen 1): 5 Gbit/s
   - USB 3.2 Gen 2 (SuperSpeed USB 10Gbps, formerly USB 3.1 Gen 2): 10 Gbit/s
   - USB 3.2 Gen 2x2 (SuperSpeed USB 20Gbps): 20 Gbit/s
   - Thunderbolt 3/4: 40 Gbit/s
   - FireWire 400: 400 Mbit/s
   - FireWire 800: 800 Mbit/s

Docking

Docking
Various docking solutions supported via side docking connector, Thunderbolt or USB-C.
For more compatible docking solutions, please visit Docking for ThinkPad X1 Carbon Gen 8

Monitor Cable

Monitor Cable
- Lenovo HDMI to VGA Monitor Adapter
SECURITY & PRIVACY

Security

Security Chip†
- Discrete TPM 2.0, TCG certified
- Firmware TPM 2.0 integrated in chipset
- Disabled (in some regions)

Physical Locks
Kensington® Security Slot

Smart Card Reader
No smart card reader

Fingerprint Reader
Touch style fingerprint reader on palm rest, match-on-chip

BIOS Security
- Power-on password
- Supervisor password
- Hard disk password
- Self-healing BIOS

Other Security
- ThinkShutter camera cover
- (Optional) IR camera for Windows Hello
- (Optional) Privacy Guard with Privacy Alert

MANAGEABILITY

System Management

System Management[*]
- Intel vPro
- Non-vPro

Notes:
1. Intel vPro offers a superset of DASH's defined capabilities.

SERVICE

Warranty

Base Warranty**[a]
- 1-year depot service
- 1-year depot with 2-year system board service
- 1-year limited onsite service
- 1-year + 2-year depot service
- 1-year + 2-year limited onsite service
- 3-year (1-yr battery) depot service
- 3-year (1-yr battery) limited onsite service
- No base warranty

Notes:
1. More information of warranty policy, please access https://pcsupport.lenovo.com/warranty

ENVIRONMENTAL

Operating Environment

Temperature[b]

ThinkPad X1 Carbon Gen 8 - February 13 2022
• Operating: 5°C (41°F) to 35°C (95°F)
• Storage and transportation in original shipping package: -20°C (-4°F ) to 60°C (140°F)
• Storage without package: 5°C (41°F) to 43°C (109°F)

Humidity
• Operating: 8% to 95% at wet-bulb temperature 23°C (73°F)
• Storage and transportation: 5% to 95% at wet-bulb temperature 27°C (81°F)

Altitude
Maximum altitude (without pressurization): 3048 m (10,000 ft)

Notes:
1. When you charge the battery, its temperature must be no lower than 10°C (50°F).

ACCESSORIES

Bundled Accessories

Bundled Accessories
• ThinkPad Ethernet Extension Adapter Gen 2
• None

CERTIFICATIONS

Green Certifications

Green Certifications
• EPEAT™ Gold
• ENERGY STAR® 8.0
• TCO Certified
• RoHS compliant

Other Certifications

Mil-Spec Test
MIL-STD-810G military test passed

Other Certifications
Athena certified

• Feature with ** means that only one offering listed under the feature is configured on selected models.
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