

# Lenovo P1 gen 6

Version: 2.0 | 07/19/2023

## SECTION I: SYSTEM OVERVIEW

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Description	ThinkPad P1 Designed with the modern user in mind, the ThinkPad® P1 is the perfect combination of workstation know-how, ultra-premium design, and true mobility, without sacrificing looks for power.
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### CPU

Processor Support	Intel 13th Gen Raptor Lake H Series (45W) Core i7 and i9
Type	BGA

### Operating Systems

Preloaded	Windows 11SV2 64-bit (Sun Valley 2) Windows 11 Pro 64-bit (22H2) Windows 11 Home 64-bit Windows 11 Home Single Language 64-bit Windows 11 Home Chinese Language Edition 64-bit Windows 10 Pro 64-bit preinstalled through downgrade rights in Windows 11 Pro 64-bit (22H2) Windows 10 CMIT Government Edition (21H2 LTSC) Ubuntu Linux 64-bit (Version 20.04 LTS, running the 4.15.0 kernel) Ubuntu Linux Data Science Workstation Fedora 36 Linux (depending on NVIDIA open source driver status) No Operating System
Supported	Ubuntu Linux 22.04 Cert only Red Hat Enterprise Linux (RHEL) 8.6 (depending on NVIDIA open source driver status)

### Memory

Number of DIMM Slots	2 DIMM sockets
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Channels	Single Channel w/ 1DIMM Dual Channel w/ 2DIMMs
Type	DDR5 SoDIMM
ECC Support	No
Speed	Up to 5600MHz
Max DIMM Size	48GB
Max System Memory	96GB
Min System Memory	8GB
Soldered Memory	None
Disclaimers	No ECC memory on P1 Gen 6

## Storage

Storage Slots	2x M.2 (NV RTX A1000, 2000 Ada) 1x M.2 (NV RTX 35/4/5000 Ada, NV GF RTX 4060/80/90)
SATA	None
PCIe	Solid State Drive, 2x OPAL2 PCIe NVMe M.2
SAS	None
Interface	PCIe Gen 4 Performance or Gen 4 Value
Security	OPAL2 for NVMe SSD
Optional Hard Disk Drive Controllers	None

## Video

Integrated Graphics	For Intel® i7-13700H Processor Graphics Intel® Iris Xe Graphics Utilized via "Hybrid Mode" in BIOS For Intel® i7-13800H vPro Processor Graphics Intel® Iris Xe Graphics Utilized via "Hybrid Mode" in BIOS For Intel® i9-13900H vPro Processor Graphics Intel® Iris Xe Graphics Utilized via "Hybrid Mode" in BIOS
Discrete Graphics	NV RTX A1000, NV RTX 2/35/4/5000 Ada, NV GF RTX 4060/80/90
Adapter	None
Bus Interface	PEG

## Display

Resolutions	WUXGA (FHD+) / WQXGA (QHD+) / WQUXGA (UHD+) OLED Touch
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## Camera

Resolution	FHD 1080p + IR Hybrid Camera/ 5MP+ IR Hybrid Camera with human presence detection
Frames per Second	30 fps
Focus	Fixed 50cm
Camera Interface	USB 2.0
IR Camera	Yes, On Select Model

## Keyboard

Number of Keys	US : 84 / UK : 85 / JP :89
Numpad	No
Size	100% ISO
Function Key Features	Yes
Backlit	Yes
Keyboard size	Como 2021 Full size KB without NumPad (Bottom loading)
Key stroke	1.5mm
Key pitch	19.05 mm (Vertical & Horizontal)
Keyboard backlight	Yes
Keyboard thickness	4.55mm

## Touchpad / Fingerprint Reader

TrackPoint Details	COMO TrackPoint module (t5.55mm)
Finger Print Reader Model	Synaptics Metallica 8x8 FPR, MoC - integrated with Power button
Multi-Touch	Yes
Resolution	1000 ppi
TouchPad/Trackpad thickness	3.3mm
TouchPad/Trackpad type	3 Buttons Clickpad
Trackpad size	115mm x 62mm
Trackpad material/finish	Glass surface

## I/O - Ports and Connectors

USB	2x USB-A 3.2 (Gen1) (1 powered) 2x USB C Gen 3x2
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Thunderbolt	2x Thunderbolt 4 (USB-C/DP1.4/PD)
HDMI	1x HDMI 2.1
Audio Combo Jack	1x Microphone & Headphone Combo Jack (3.5mm)
Media Card Reader	Dedicated SD Express 7.0 Card Reader (UHS-I) (MMC,SD,SDHC SDXC)
Smart Card Reader	None
Power Connector	DC-In
Docking Port	Docking Via Thunderbolt 4 / USB-C
VirtualLink	None
Network adapter	No native RJ-45 port RJ-45 functionality provided via USB-C to Ethernet Adapter
Disclaimers	HDMI 2.1: Up to 8K/60Hz

## Power Connector

Main	DC-In
USB-C	2x Thunderbolt 4 (USB-C/DP/PD)

## Ethernet

Vendor	N/A
Count	N/A
EEPROM	N/A
Speeds	N/A
Functions	N/A
Connectors	No native RJ-45 port RJ-45 functionality provided via USB-C to Ethernet Adapter

## WWAN

Model	Fibocom L860-GL-16 4G CAT16 (WW and PRC only)
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## Near Field Communications

Model	Foxconn NXP NPC300 NFC
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## Audio

Vendor	Realtek
Type	Intel High Definition Audio (2 channel)
Internal Speaker	2 channel
Connectors	Microphone & Headphone Combo Jack (3.5mm)
Chipset	ALC3306 w/ Smart Amp
Number of Channels	4-channel DAC, 4-channel ADC
Number of Bits/Audio Resolution	16/20/24-bit PCM format
Sampling Rate (Recording/Playback)	44.1k/48k/96k/192kHz sample rate
Signal to Noise Ratio	Mic In: 95dB FSA Headphone Out@32ohm: 100dB FSA
Analog Audio	None
Dolby Digital	Dolby ATMOS
Digital Out (S/PDIF)	No
Speaker Power Rating	2W@4ohm/ch

## Power adapter

Type	Slim 170/230W AC Adapter	Slim 170W AC Adapter	Slim 230W AC Adapter
Dimensions	200cc (118 x 77 x 22mm)	240cc (142 x 77 x 22mm)	353cc (160 x 87 x 25.4mm)
Weight	Max 370g	Max 475g	Max 815g
Input Voltage	100-240V	100-240V	100-240V

## Security

TPM	Version 2.0
Asset ID	Yes
vPro	Intel vPro for WS

## Chassis Information

Format	16" Thin & Light
Color	Deep Black Carbon Fiber Weave

Thermal Solutions	Internal Dual FAN, Intelligent Cooling, KBD air intake, Dual by-pass design Vapor Chamber and Liquid Metal Cooling
Dimensions	Length 14.15 inches 359.5 millimeters Width 9.99 inches 253.8 millimeters Height Non-Touch 0.69 inches 17.5 millimeters Touch 0.68 inches 17.3 millimeters
Weight	Non-Touch Model: 4 Cell Battery 1.86kgs/4.11lbs Touch Model: 4 Cell Battery 1.78kgs/3.92lbs

## Packaging Parameters

	Standard	Retail
Height (mm)	329mm	325mm
Height (inch)	12.95in	12.79in
Width (mm)	518mm	531mm
Width (inch)	20.39in	20.90in
Depth (mm)	80mm	80mm
Depth (inch)	3.14in	3.14in
Weight (kgs)	3.3kgs	4.1kgs
Weight (lbs)	7.27lbs	9.03lbs

## Security & Serviceability

Hardware Maintenance Manual	P1 Gen 6 HMM — need link
Drivers & Software	P1 Gen 6 Drivers & Software — need link
Self Healing BIOS	Yes
Access Panel	Removable bottom cover
Number of Screws	7
Swappable Components	Bottom cover, memory module, M.2 solid-state drive, coin-cell battery, TrackPoint pointing cap, SIM Tray
Storage Slots	2 slots
Memory	2 SoDIMM slots
Restore CD/DVD/USB Set	None, Restore Media available via Lenovo Customer Support Center
Cable Lock Support	Security-lock slot, Optional Kensington Cable Lock

Power-On Password	Yes
Hard Disk Password	Yes; User and Master hard disk password
Supervisor Password	Yes
NIC LEDs (integrated)	None
Security Chip	Yes (for TPM 2.0)
Access Panel Key Lock	Bottom Cover Tamper Detection
Boot Sequence Control	Yes

## Operating Environment

Operating - Air Temperature	At altitudes up to 2438 m (8000 ft) - Operating: 5°C to 35°C (41°F to 95°F)
Non Operating - Air Temperature	At altitudes up to 2438 m (8000 ft) - Storage: 5°C to 43°C (41°F to 109°F)
Humidity	Operating: 8% to 95% at wet-bulb temperature 23°C (73°F) Storage: 5% to 95% at wet-bulb temperature 27°C (81°F)
Corrosive Gas	G1
Particulates	P1

## SECTION II: SUPPORTED COMPONENTS

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### Supported Components

Processor	Intel® Core™ i7-13700H processor (E-cores up to 3.70 GHz P-cores up to 5.0 GHz) Intel® Core™ i7-13800H vPro processor (E-cores up to 4.0 GHz P-cores up to 5.20 GHz) Intel® Core™ i9-13900H vPro processor (E-cores up to 4.1 GHz P-cores up to 5.4 GHz)
Memory Support	DDR5 5600MHz SoDIMM
Chipset (PCH)	OnPkg PCH-P
Size of BIOS Flash	64MB + 16MB
Super I/O	None
Clock	Crystal
Audio	Realtek High Definition Audio
Ethernet	No native RJ-45 port RJ-45 functionality provided via USB-C to Ethernet Adapter

## Memory

System Capacity Options	8GB 16GB 32GB 48GB
Memory Types	8GB DDR5 5600MHz SoDIMM 16GB DDR5 5600MHz SoDIMM 32GB DDR5 5600MHz SoDIMM 48GB DDR5 5600MHz SoDIMM
Brand of Memory	Samsung SK Hynix Ramaxel
Memory Speed	5600MHz
Disclaimers	No ECC memory on P1 Gen 6

## Storage

2.5" SAS Hard Disk Drive (HDD)	None
2.5" SATA Hard Disk Drive (HDD)	None
2.5" SATA Solid State Drive (SSD)	None
M.2 (NGFF) PCIe Solid State Drive (SSD)	256GB OPAL2 PCIe 4x4 Value TLC (M.2 2280-S3) 512GB OPAL2 PCIe 4x4 Value TLC (M.2 2280-S3) 1TB OPAL2 PCIe 4x4 Value TLC (M.2 2280-S3) 512GB OPAL2 PCIe 4x4 Performance TLC (M.2 2280-S3) 1TB OPAL2 PCIe 4x4 Performance TLC (M.2 2280-S3) 2TB OPAL2 PCIe 4x4 Performance TLC (M.2 2280-S3) 4TB OPAL2 PCIe 4x4 Performance TLC (M.2 2280-S3)
2.5" PCIe Solid State Drive (SSD)	None
Brand of Drive	Samsung Western Digital Hynix Kioxia
Intel Optane Storage Technology	None
RAID	Optional, Selectable in BIOS
RAID Level and Requirements	RAID-0/1

## Removeable Media

Media Card Reader Specifications	SD Express 7.0 UHS-II
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## SECTION III: Supported Component Detail

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### CPU Specifications

CPU	Intel® Core™ i7-13700H processor (E-cores up to 3.50 GHz P-cores up to 5.0 GHz)	Intel® Core™ i7-13800H vPro processor (E-cores up to 4.0 GHz P-cores up to 5.20 GHz)	Intel® Core™ i9-13900H vPro processor (E-cores up to 4.10 GHz P-cores up to 5.40 GHz)
Integrated Graphics	Intel® Iris Xe Graphics	Intel® Iris Xe Graphics	Intel® Iris Xe Graphics
# of Cores	6 P-cores and 8 E-cores	6 P-cores and 8 E-cores	6 P-cores and 8 E-cores
# of Threads	20	20	20
Processor Base Frequency	2.4GHz on P-cores and 1.8GHz on E-cores	2.5GHz on P-cores and 1.8GHz on E-cores	2.6GHz on P-cores and 1.9GHz on E-cores
Max Turbo Frequency	E-cores up to 3.50 GHz P-cores up to 5.0 GHz	E-cores up to 4.0 GHz P-cores up to 5.20 GHz	E-cores up to 4.10 GHz P-cores up to 5.40 GHz
Cache	24 MB	24 MB	24 MB
TDP	45 W	45 W	45 W

### Display Specifications

Model	WUXGA Non-Touch	WQXGA Non-Touch	WQUXGA OLED Touch
Resolution	FHD+ (1920 x 1200)	QHD+ (2560 x 1600)	UHD+ (3840 x 2400)
Diagonal	16"	16"	16"
Aspect Ratio	16:10	16:10	16:10
Backlight	LED	LED	LED
PPI	FHD+: 142	QHD+: 189	UHD+: 283
Active Area	FHD+: 344.68mm x 215.42mm	QHD+: 344.68mm x 215.42mm	UHD+: 344.448mm x 215.280mm
Refresh Rate	Max 60Hz	Max 165Hz	Max 60Hz
Contrast Ratio	FHD+: 1200:1	QHD+: 1200:1	UHD+: 100,000:1
Viewing Angle	FHD+: 89/89/80/80 degree	QHD+: 85/85/85/85 degree	UHD+: 87.5/87.5/87.5/87.5 degree
Color gamut	100% sRGB	100% sRGB	100% DCI-P3
Brightness	300 nits	500 nits	400 nits (SDR) 500 nits (HDR)
HDR	N/A	N/A	HDR400 Dolby Vision

Color Depth	FHD+: 16.7M (8-bit)	QHD+: 16.7M (8-bit)	RGB 8-bit + 2FRC(HDR) RGB 8-bit(SDR)
Interface	FHD+: eDP 1.4	QHD+: eDP 1.4	UHD+: eDP 1.4
Panel ID Recognition	EDID in BIOS Table	EDID in BIOS Table	EDID in BIOS Table
Weight	330g max	330g max	200g max
Color Calibrator	X-Rite Pantone Color Calibration	X-Rite Pantone Color Calibration	X-Rite Pantone Color Calibration
Panel Technology	IPS, Anti-Glare	IPS, Anti-Glare	OLED, Glare
Touch Panel	None	None	Multi-Finger Touch Panel

## SSD Specifications

2.5" SATA Solid State Drive (SSD)	N/A
M.2 (NGFF) PCIe Solid State Drive (SSD)	2x M.2 2280-S3 PCIe
2.5" PCIe Solid State Drive (SSD)	N/A
Intel Optane Storage Technology	N/A

## Solid State Storage Devices

Supported Types	M.2	M.2	M.2
Dimensions inches/centimeters (W x D x H)	22.0 (+-0.15) x 80.0 (+-0.15) x 2.3 (max)	22.0 (+-0.15) x 80.0 (+-0.15) x 2.3 (max)	22.0 (+-0.15) x 80.0 (+-0.15) x 3.5 (max)
Size	M.2 2280-S3	M.2 2280-S3	M.2 2280-D2
Interface Type	PCIe NVMe	PCIe NVMe	PCIe NVMe
Read/Write IOPS Specifications	Read: 300K (512GB/1TB), 200K (256GB) Write: 240K (512GB/1TB), 190K (256GB) IOPS, 4K Random, 32 q depth, 4 threads	Read: 550K (1TB/2TB), 350K (512GB) Write: 400K (1TB/2TB), 370K (512GB) IOPS, 4K Random, 32 q depth, 8 threads	Read: 600K (4TB) Write: 400K (4TB) IOPS, 4K Random, 32 q depth, 8 threads
Bandwidth Performance	PCIe Gen4x4 Value (16Gb/S)	PCIe Gen4x4 Performance (16Gb/S)	PCIe Gen4x4 Performance (16Gb/S)
Power Consumption (Max)	5.0W	8.2W	7.4W
Active(AVG)	5.0W (Sequential read)	8.2W (Sequential read)	7.4W (Sequential read)
Idle	5mW (Low power state)	5mW (Low power state)	5mW (Low power state)
Min MTBF	2,000,000 (h)	2,000,000 (h)	2,000,000 (h)



## WLAN

Model	Garfield Peak 2 Intel Wi-Fi 6E AX211 (Gig+) + BT5.3 (HW Ready)
Antenna Diversity	Supported
MIMO	Supported
Radio ON/OFF Control	Supported
Connector interface	M.2 CNVi
Operating Temperature (Adapter Shield)	0c to +80c
Humidity Non-Operating	50%~90% Rh non condensing (at temperatures of 25c to 35c)
Operating Systems	Microsoft Windows 11, Windows 10, Linux
Wi-Fi Alliance	Wi-Fi CERTIFIED 6 with Wi-Fi 6E, Wi-Fi CERTIFIED a/b/g/n/ac, WMM, WMM-PowerSave, WPA3, Protected Management Frames, Wi-Fi Direct, Wi-Fi Agile Multiband
IEEE WLAN Standard	IEEE 802.11-2016 and select amendments (selected feature coverage) IEEE 802.11a, b, d, e, g, h, i, k, n, r, u, v, w, ac, ax; Fine Timing Measurement based on 802.11-2016, Wi-Fi Location R2 (802.11az) HW readiness
Roaming	Support seamless roaming between access points
Bluetooth	BT 5.3 (HW Ready)
Authentication Protocols	802.1X EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0 - MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA')
Encryption	128-bit AES-CCMP, 256-bit AES-GCMP
Regulatory	For a list of country approvals, please contact your local Intel representatives
US Government	FIPS 140-2
Product Safety	UL,C-UL,CB (IEC 60950-1)
Disclaimers	For more details, please refer to the Intel document as below. <a href="https://www.intel.es/content/www/es/es/products/docs/wireless/wi-fi-6e-ax211-module-brief.html">https://www.intel.es/content/www/es/es/products/docs/wireless/wi-fi-6e-ax211-module-brief.html</a>

## Battery

Dimension	L: 312mm*W: 58.8mm*T 9.4mm
Weight	MAX 343.2g
Type (Chemistry and Cell)	Li-Polymer (4S1P), 4-cell
Voltage	15.52 V
Battery Capacity	90Wh
Charging Time	On Charge Time (0- 100%) * 120 min Off Charge Time (0 - 80%) ** 60 min Off Charge Time (0 - 100%) ** 120 min
Operating Temperature Range	between 10°C (50°F) and 35°C (95°F)
Warranty	1 Year / 3 Year Available

## SECTION IV: BIOS / Certifications / Standards / Environmental

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### BIOS Specifications

WMI Support	Yes, if it is BIOS Setup change by WMI.
ROM-Based Setup Utility (F1)	Yes
Bootblock Recovery	No
Replicated Setup	Yes, it supported with SRSETUP tool.
Boot Control	Yes, it means Boot order change.
Discrete Mode	Yes
Memory Change Alert	N/A
Thermal Alert	N/A
Asset Tag	Yes
System/Emergency ROM Flash Recovery with Video	N/A But FW based ROM flash recovery is supported.
Remote Wakeup/Remote Shutdown	Yes, if Remote wakeup is Wake on LAN from S4/S5.
Keyboard-less Operation	N/A
Per-port Control	Yes, if it is I/O port enable/disable by BIOS Setup.
Adaptive Cooling	Yes, if it is thermal & fan control.
Security	Yes, BIOS password / Hard disk password / Finger print
Intel(R) AMT (includes ASF 2.0)	Yes. If you select vPro model
Intel(R) TXT	Yes. If you select vPro model
Memory Modes	N/A

### EMC & Safety

EMC	Published, Certified Existing Reports EMC - Australia EMC - Belarus EMC - Canada EMC - EU/EFTA EMC - Japan EMC - Kazakhstan
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	<p>EMC – New Zealand  EMC – Russia  EMC – United Kingdom  EMC – USA/Territories</p>
Safety	<p>To access the latest User Guide and Safety and Warranty Guide, go to: <a href="https://support.lenovo.com">https://support.lenovo.com</a>  Low Halogen Declaration of Conformance  TNOT-2017-0040  Section 9 – Low Halogen Scorecard  Homologation PCRB Compliant  In the following countries: Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bermuda, Bolivia, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, Central African Republic, Chad, China, Colombia, Comoros, Congo, Costa Rica, Djibouti, Dominican Republic, Egypt, El Salvador, Eritrea, Ethiopia, EU/EFTA, Fiji, Gabon, Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Haiti, Honduras, Hong Kong, India, Indonesia, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Laos, Lebanon, Liberia, Macau, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Qatar, Russia, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, South Africa, South Korea, Sri Lanka, Swaziland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, Uruguay, USA/Territories, Uzbekistan, Venezuela, Vietnam, Zambia, Zimbabwe, Brazil – Inmetro 170 Govt Bids, Guinea-Bissau, Lesotho</p>

## Environmental

Energy Star	<p>ENERGY STAR® Version 8.0  For more information about ENERGY STAR, go to: <a href="https://www.energystar.gov">https://www.energystar.gov</a></p>
EPEAT	EPEAT Gold Certification Available on select models
IT ECO declaration	<p>The latest environmental information about Lenovo products is available at: <a href="https://www.lenovo.com/ecodeclaration">https://www.lenovo.com/ecodeclaration</a></p>
Hazardous Substances	<p>The latest environmental information about Lenovo products is available at: <a href="https://www.lenovo.com/ecodeclaration">https://www.lenovo.com/ecodeclaration</a>  European Union RoHS  This Lenovo product, with included parts (cables, cords, and so on) meets the requirements of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (“RoHS recast” or “RoHS 2”).  For more information about Lenovo worldwide compliance on RoHS, go to: <a href="https://www.lenovo.com/rohs-communication">https://www.lenovo.com/rohs-communication</a></p>

## Manageability

Industry Standard Specifications	This product meets the following industry standard specifications for manageability functionality:
Remote Manageability Software Solutions	<p>Lenovo ThinkManagement Console  Microsoft System Center Configuration Manager  LANDesk Management Suite for Lenovo Vantage Technologies  (<a href="http://www.landesk.com/lenovo">www.landesk.com/lenovo</a>)</p>

System Software Manager	Lenovo ThinkStation supports software management tools from the ThinkVantage System Update suite: System Update Update Retriever
Service, Support, and Warranty	On-site Warranty and Service: Three-years, limited warranty and service offering delivers on-site, next business-day service for parts and labor and includes free telephone support 8am to 5pm. Global coverage ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering.
Materials Used	90% Recycled Magnesium C Cover 55% Recycled Aluminum D Cover 90% PCC Plastic Speaker Enclosure 90% PCC Plastic Battery Pack Enclosure 30% PCC Plastic 170W AC Adapter Low Temperature Solder (motherboard, SSD, fingerprint reader module, ClickPad) Plastic free packaging with 90% recycled and/or FSC certified content (standard)
TCO Certification	9.0
Disclaimers	1. EPEAT registered where applicable. EPEAT registration varies by country. See <a href="http://www.epeat.net">www.epeat.net</a> for registration status by country. 2. Product packaging shall contain, on average, a minimum total percentage of 90% by weight of any combination of the following materials: Recycled content, biobased plastic, non-wood biobased fiber material, and/or sustainably forested material