

Lenovo ThinkPad P52s

Version: 1 | 06/17/2020

DOWNLOADS

Hardware Maintenance Manual	P52s HMM
Drivers & Software	P52s Drivers & Software

SECTION I: Platform Overview

Description	ThinkPad P52s On-the-Go Power and Performance The ThinkPad® P52s offers all-day mobility with mid-range performance for users constantly in motion. A perfect mix of power and performance in an Ultrabook™ form factor; designed to inspire designers, engineers, and students to be creative whether collaborating in the office, on a job site, or when visiting customers.
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CPU

Processor Support	Intel 8th gen Kaby Lake U / R Series Core i5 / i7
Socket Type	BGA

Operating Systems

Preloaded	Windows 10 Pro 64 Windows 10 Home 64
Supported	Windows 10 Pro 64 Windows 10 Home 64

Memory

Number of DIMM Slots	2
Channels	Single Channel w/ 1DIMM Dual Channel w/ 2DIMMs
Type	DDR4
ECC Support	No
Speed	2400 MHz
Max DIMM Size	16GB
Max System Memory	32GB
Min System Memory	4GB
Soldered Memory	None

Storage

Storage Slots	1 x M.2 2280 1 x HDD
SATA	1x 2.5" SATA HDD
PCIe	Solid State Drive, OPAL2 PCIe-NVMe M.2 2280-S3 - TLC
SAS	None
Interface	SATA/PCIE
Security	OPAL2 for NVMe SSD

Video

Integrated Graphics	Processor Graphics Intel® UHD Graphics 620
Discrete Graphics	NVIDIA Quadro P500
Adapter	None
Bus Interface	PEG

Display

Resolutions	FHD / UHD
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Camera

Resolution	HD 720p
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Frames per Second	30 fps
Focus	Fixed 50cm
Camera Interface	USB 2.0
IR Camera	Yes

Keyboard

Number of Keys	US : 105 / UK : 106 / JP : 110
Numpad	Yes
Size	100% ISO
Function Key Features	Yes
Backlit	Yes
Keyboard size	CS16 KYB with numberpad
Key stroke	1.8mm
Key pitch	19.05mm
Keyboard backlight	Optional backlit
Keyboard thickness	Standard

Touchpad / Fingerprint Reader

TrackPoint Details	COMO TrackPoint module (t5.5mm)
Finger Print Reader Model	Synaprics Metallica 8x8 FPR, MoC
Multi-Touch	Yes
Resolution	1000ppi
TouchPad/Trackpad thickness	0.8 +/- 0.1mm
TouchPad/Trackpad type	3+2BCP (3 on KBD, 2 on TouchPad)
Trackpad size	100mm x 69 mm
Trackpad material/finish	Mylar surface

I/O – Ports and Connectors

USB	2x USB 3.1 (Gen 1) (1 powered)
Thunderbolt	Thunderbolt 3, 2 Ports (USB Type C)
HDMI	1x HDMI (2.0) DP1.4
Audio Combo Jack	1x Microphone & Headphone Combo Jack (3.5mm)
Media Card Reader	1x 4-in-1 Media Card Reader (MMC,SD,SDHC SDXC)
Smart Card Reader	1x Smart Card Reader (Optional)

Power Connector	DC-In
Docking Port	Docking Via Thunderbolt 3 / USB-C
VirtualLink	No
Network adapter	Gigabit Ethernet (RJ-45)

Power Connector

Main	DC-In
USB-C	1x Thunderbolt 3 (USB-C/DP/PD)

Ethernet

Vendor	Intel
Count	x1
Speeds	10/100/1000 Mbps
Functions	Wake On LAN MAC Address Pass Through PXE Boot Flash Over LAN
Connectors	RJ45

WWAN

Model	Intel® XMM™ 7160 (Fibocom L831-EAU) Sierra EM7565
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Near Field Communications

Model	Yes, optional
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Audio

Vendor	Realtek
Type	High Definition Audio Codec
Internal Speaker	Yes, dual speakers
Connectors	Microphone & Headphone Combo Jack (3.5mm)
Chipset	ALC3286
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	Yes
Digital Out (S/PDIF)	No
Speaker Power Rating	2W@4ohm/ch

Power adapter

Type	65W AC Adapter
Dimensions	142cc (28.5 x 46 x 108 mm) 65W 210g(Adapter), 62g(Power Cord)
Input Voltage	100-240V

Security

TPM	Yes, TPM2.0
Asset ID	Yes
vPro	Yes on vPro model

Chassis Information

Color	Black
Thermal Solutions	Internal Dual FAN, Intelligent Cooling
Dimensions	Length 14.40 inches 365.8 millimeters Width 9.95 inches 252.8 millimeters Height 0.78 inches 19.95 millimeters
Weight	Non-Touch Model: 4 Cell Battery 1.95kg/4.3lbs Touch Model: 4 Cell Battery 1.98kg/4.37lbs

Packaging Parameters

Height (mm)	334
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Height (inch)	13.1
Width (mm)	520
Width (inch)	20.5
Depth (mm)	80
Depth (inch)	3.1
Weight (kgs)	3.175kgs
Weight (lbs)	7.0lbs

Security & Serviceability

Self Healing BIOS	No
Access Panel	Removeable bottom cover
Number of Screws	8
Swappable Components	Removable battery, Base cover assembly, TrackPoint pointing stick, Lenovo factory recovery USB key, Power cord, ac power adapter (45W or 65W)
Storage Slots	2 storage slots for no-WWAN model 1 storage slot for WWAN model
Memory	2 SODIMM slots
System Board	1190 System Board. No self-service CRU.
Restore CD/DVD/USB Set	None. Purchase via Lenovo Customer Support Center
Cable Lock Support	Security-lock slot
Power-On Password	Yes
Hard Disk Password	Yes; User and Master hard disk password
Supervisor Password	Yes
NIC LEDs (integrated)	Yes (if it means the LED for Ethernet)
Security Chip	Yes (for TMP 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: Platform Detail

Supported Components

Processor	Intel® Core™ i5-8350U Intel® Core™ i7-8550U Intel® Core™ i7-8650U
Memory Support	DDR4 2400MHz SO-DIMM
Chipset (PCH)	Integrated Soc
Size of BIOS Flash	16 MB
Super I/O	Crystal
Audio	Realtek High Definition Audio
Ethernet	Non-vPro model: Intel® Ethernet Connection I219-V (Jacksonville) vPro model: Intel® Ethernet Connection I219-LM (Jacksonville)

Memory

System Capacity Options	4GB 8GB 16GB
non-ECC	4GB DDR4 2400 SDRAM 2400MHz SODIMM 8GB DDR4 2400 SDRAM 2400MHz SODIMM 16GB DDR4 2400 SDRAM 2400MHz SODIMM
Brand of non-ECC Memory	Samsung SK Hynix Micron Ramaxel
Memory clock frequency(MHz)	2400 MHz

Storage

2.5" SAS Hard Disk Drive (HDD)	Available on some models
2.5" SATA Hard Disk Drive (HDD)	Available on some models
2.5" SATA Solid State Drive (SSD)	Available on some models
M.2 (NGFF) PCIe Solid State Drive (SSD)	128GB SATA (M.2 2242) 256GB Opal 2 PCIe NVMe M.2 2280-S3 512GB Opal 2 PCIe NVMe M.2 2280-S3 1TB Opal 2 PCIe NVMe M.2 2280-S3
2.5" PCIe Solid State Drive (SSD)	None

Brand of Drive	Seagate Toshiba WD
Intel Optane Storage Technology	None
Removeable Media	

SECTION III: Supported Component Detail

CPU Specifications

CPU	Intel® Core™ i7-8650U	Intel® Core™ i7-8550U	Intel® Core™ i5-8350U
Integrated Graphics	Intel® UHD Graphics 620	Intel® UHD Graphics 620	Intel® UHD Graphics 620
# of Cores	4	4	4
# of Threads	8	8	8
Processor Base Frequency	1.90 GHz	1.80 GHz	1.70 GHz
Max Turbo Frequency	4.20 GHz	4.00 GHz	3.60 GHz
Cache	8 MB	8 MB	6 MB
TDP	15 W	15W	15W
Intel ARK Spec Link	Intel® Core™ i7-8650U	Intel® Core™ i7-8550U	Intel® Core™ i5-8350U

Display Specifications

Model	FHD; FHD w/oncell touch	UHD
Resolution	1920 x 1080	3840 x 2160
Diagonal	15.6"	15.6"
Aspect Ratio	Ratio 16:9	Ratio 16:9
Backlight	LED	LED
PPI	141 (Pixel Pitch: 0.17925mm x 0.17925mm)	282 (Pixel Pitch: 0.09mm x 0.09mm)
Active Area	344.16mm x 193.59mm	345.6mm x 194.4mm
Refresh Rate	60Hz	48Hz
Contrast Ratio	Ratio 700:1	Ratio 1000:1
Viewing Angle	85/85/85/85 degree	85/85/85/85 degree
Color gamut	45% sRGB	72% Adobe
Brightness	250nits	300nits

Color Depth	Native 262K (RGB 6-bit data driver)	Native 16M (RGB 8-bit data driver)
Interface	eDP 1.2	eDP 1.4a
Panel ID Recognition	EDID in BIOS Table	EDID in BIOS Table
Weight	380g	365g

HDD Specifications

2.5" SAS Hard Disk Drive (HDD)	N/A
2.5" SATA Hard Disk Drive (HDD)	Yes

HDD Storage Device Specifications

Connector	SATA
Transfer Rate (Gb/sec)	6.0Gb/s

HDD Performance

Spindle Speed(RPM)	5400RPM&7200RPM
Power off to Spindle Stop(sec)	10 max
DC Power to Drive Ready(sec)	No Power to ATA Command Accept(seconds) 500G/1TB(1 Platter) - 3 2TB(2 Platter) - 4
Receipt of Start Unit Command to Drive Ready(sec)	"Standby to Ready(seconds) 3 Max Unloaded to Ready(seconds) 1 Max"
Average Latency(msec)	10 Max

HDD Power Management

Input (VDC)	12V
Typical (Watts)	5400-> 5.0, 7200-> 5.5 (Spind up)(Max)
Idle (Watts)	5400-> 1.1, 7200-> 1.3 (Typcial)

HDD Dimensions

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Height (mm - Max)	7.0 +/- 0.2
Width (mm)	69.85 +/- 0.25
Depth (mm - Max)	100.2 +/- 0.25
Weight (grams)	5400rpm - 95 Max 7200rpm - 95 Max

HDD Temperature

Operating(C) Ambient	0 to 55
Operating(C) Base Casting	Surface Temperature (disk enclosure side): 60C for 5400RPM 63C for 7200RPM Surface Temperature (card side of device): 63C
Non-Operating(C) Ambient	-40 to 65
Gradient(C per Hour)	20 max

HDD Shock

Operating(Gs @ 2ms)	350
Non-Operating(Gs @ 2ms)	N/A (1000G/1ms)

SSD Specifications

2.5" SATA Solid State Drive (SSD)	N/A
M.2 (NGFF) PCIe Solid State Drive (SSD)	1x M.2 2280 PCIe & SATA
2.5" PCIe Solid State Drive (SSD)	N/A
Intel Optane Storage Technology	N/A

Solid State Storage Devices

Supported Types	M.2
Dimensions inches/centimeters (W x D x H)	22.0 (+-0.15) x 80.0 (+-0.15) x 2.3 (max)
Size	M.2 2280
Interface Type	PCIe NVMe
Read/Write IOPS	Read: 250K (512GB/1TB/2TB), 200K (256GB)

Specifications	Write: 240K (512GB/1TB/2TB), 190K (256GB) IOPS, 4K Random, 32 q depth, 4 threads
Bandwidth Performance	PCIe Gen3x4 (8Gb/S)
Power Consumption (Max)	5.0W
Active(AVG)	5.0W (Sequential read)
Idle	5mW (Low power state)
Min MTBF	2,000,000 (h)
Min Sequential Read	3000MB/s (512GB/1TB/2TB), 2900MB/s (256GB)
Min Sequential Write	1600MB/s (512GB/1TB/2TB), 900MB/s (256GB)
Hardware Encryption	Yes

Discrete Graphics Adapter

GPU Name	Quadro P500
CUDA Processing Cores	256
GPU Memory	2 GB
Memory Bandwidth	40 GBps
Memory Type	GDDR5
Memory Interface	64-bit
TGP Max Power Consumption	18W
Display Port	1.4
OpenGL	4.5
Shader Model	5
DirectX	12
PCIe Generation	3
Floating-Point Performance	0.75
VR Ready	No
Simultaneous Multi-Projection	No
NVIDIA FXAA/TXAA Antialiasing	Yes
NVIDIA nView Display Management Technology	No
GPU Direct for Video	No
Vulkan Support	Yes
NVIDIA Optimus	Yes

WLAN

Model	Intel® Dual Band Wireless-AC 8265
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Connector: Main, Aux/GNSS, GNSS	ANT1:Main 2 WiFi + BT; ANT2: AUX 1 WiFi
Antenna Diversity	Supported
MIMO	Supported
GNSS Bian	N/A
Radio ON/OFF Control	Supported
Connector interface	M.2: PCIe, USB, or UART (M.2 1216 only)
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 7*, Microsoft Windows 8.1*, Microsoft Windows 10*, Linux* (limited feature support), Android
Wi-Fi Alliance	Wi-Fi CERTIFIED* a/b/g/n/ac, WMM*, WMM-PS*, WPA*, WPA2*, WPS2*, Protected Management Frames, Wi-Fi Direct* for peer to peer device connections, Wi-Fi Miracast* as Source.
IEEE WLAN Standard	IEEE 802.11a/b/g/n/ac, 802.11d, 802.11e, 802.11h, 802.11i, 802.11w; 802.11r, 802.11k, 802.11v pending OS support; Fine Timing Measurement based on 802.11REVmc
Roaming	Support seamless roaming between access points
Bluetooth*	Dual Mode Bluetooth® 4.2, BLE
Authentication	WPA and WPA2, 802.1X (EAP-TLS, TTLS, PEAP, LEAP, EAP-FAST), EAP-SIM, EAP-AKA, EAP-AKA
Authentication Protocols	PAP, CHAP, TLS, MS-CHAP*, MS-CHAPv2
Encryption	64-bit and 128-bit WEP, 128-bit AES-CCMP
Regulatory	For a list of country approvals, please contact your local Intel representatives.
US Government	FIPS10, FISMA
Product Safety	UL,C-UL,CB (IEC 60950-1)

Battery

Type (Chemistry and Cell)	Li-ion Polymer
Battery Life	Max >12 hours battery life
Battery Capacity	Integrated 4S1P (4-cell) 32Wh battery Removable rear 24Wh, 48Wh, or 72Wh battery
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

BIOS Specifications

WMI Support	Yes, if it is BIOS Setup change by WMI.
ROM-Based Setup Utility (F1)	Yes
Replicated Setup	Yes, it supported with SRSETUP tool.
Boot Control	Yes, it means Boot order change.
Asset Tag	Yes
System/Emergency ROM Flash Recovery with Video	N/A, I don't know this feature.
Remote Wakeup/Remote Shutdown	Yes, if Remote wakeup is Wake on LAN from S4/S5. I don't know the Remote shutdown situation.
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

EMC & Safety

EMC	Published, Certified Existing Reports EMC - Australia EMC - Belarus EMC - Canada EMC - China EMC - EU/EFTA EMC - Japan EMC - Kazakhstan EMC - New Zealand EMC - Russia EMC - South Korea EMC - Taiwan EMC - USA/Territories Not Applicable / Not Required EMC - Israel EMC - Moldova EMC - Serbia EMC - Turkey EMC - Uzbekistan EMC - Vietnam
Safety	To access the latest User Guide and Safety and Warranty Guide, go to: https://support.lenovo.com Low Halogen Declaration of Conformance TNOT-2017-0040

	<p>Section 9 – Low Halogen Scorecard Izod Test – EPEAT Compliant 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>
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Environmentals

Energy Star	<p>ENERGY STAR® Version 7.0 For more information about ENERGY STAR, go to: https://www.energystar.gov</p>
EPEAT	EPEAT Declaration of Conformance For Machine Types: 20LB, 20LC
IT ECO declaration	<p>The latest environmental information about Lenovo products is available at: https://www.lenovo.com/ecodeclaration</p>
Hazardous Substances	<p>The latest environmental information about Lenovo products is available at: https://www.lenovo.com/ecodeclaration 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: https://www.lenovo.com/rohs-communication</p>

Manageability

Industry Standard Specifications	Intel LAN with AMT
Remote Manageability Software Solutions	<p>Lenovo ThinkManagement Console Microsoft System Center Configuration Manager LANDesk Management Suite for ThinkVantage Technologies (www.landesk.com/lenovo)</p>
System Software Manager	<p>Lenovo ThinkPad supports software management tools from the Lenovo Vantage System Update suite: System Update Update Retriever</p>
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.