Lenovo® ThinkPad W540

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ThinkPad W540 Platform Specifications

Positioning	*Mobile workstation; two spindles*
Processor	4th Generation Intel® Core™ i5 / i7 / i7 Extreme Processor

Processor Number	# of Cores	# of Threads	Base Frequency	Max Turbo Frequency	Cache	Memory Speed	Processor Graphics
i5-4200M	2	4	2.5 GHz	3.1 GHz	3MB		
i5-4210M			2.6 GHz	3.2 GHz	3MB		
i5-4330M			2.8 GHz	3.5 GHz	3MB		
i7-4600M			2.9 GHz	3.6 GHz	4MB		
i7-4700MQ	4	8	2.4 GHz	3.4 GHz	6MB	DDR3L-1600	Intel HD Graphics 4600
i7-4710MQ			2.5 GHz	3.5 GHz	6MB		
i7-4800MQ			2.7 GHz	3.7 GHz	6MB		
i7-4810MQ			2.8 GHz	3.8 GHz	6MB		
i7-4900MQ			2.8 GHz	3.8 GHz	8MB		
i7-4910MQ			2.9 GHz	3.9 GHz	8MB		
i7-4930MX			3 GHz	3.9 GHz	8MB		

Memory	*dual-core model:* 16GB max[7], two 204-pin SO-DIMM sockets *quad-core model:* 32GB max, four 204-pin SO-DIMM sockets, only 4+4, 8+8, 4+4+4+4, and 8+8+8+8 combinations supported *All:* PC3-12800 1600MHz DDR3L, non-parity, dual-channel capable
Optical *(optional)*	DVD burner, 9.5mm Ultrabay slim, removable
Ultrabay	One modular bay for removable devices (right side, cold swap), 9.5mm high, bottom access
Storage	*Some:* Solid State Drive (SSD) / SATA 6.0Gb/s, 2.5" wide, 7mm high *Some:* Hard Disk Drive (HDD) / SATA 6.0Gb/s, 2.5" wide, 7mm or 9.5mm high, Active Protection System™ *All:* removable, upgradable, supports the second disk, Shock Mounted
M.2 SSD	*Some:* M.2 Solid State Drive (SSD), via M.2 card slot, exclusive with WWAN card

Widescreen display	*Some:* **15.6"** (396mm) **FHD (1920x1080)**, anti-glare, LED backlight,
	     300 nits, 16:9 aspect ratio, 500:1 contrast ratio
	Some: **15.5"** (394mm) **3K (2880x1620)**, anti-glare, LED backlight,
	     350 nits, 16:9 aspect ratio, 1000:1 contrast ratio, **IPS**

Multi-touch	None
Color calibration	*Optional:* Pantone® color calibrator by X-Rite® color calibration sensor in palm rest, LED indicator
Camera *(optional)*	HD720p resolution, wide view angle, low light sensitive, face tracking, fixed focus
Graphics	NVIDIA® Optimus™ technology, auto-switch between discrete and integrated graphics, **Intel HD Graphics 4600** in processor, and **NVIDIA Quadro® K1100M** or **K2100M**, PCI Express® x16, **2GB** memory, supports external analog monitor via VGA and digital monitor via Mini DisplayPort / Thunderbolt™; supports three independent displays; *Max external resolution:* 3840x2160@60Hz (DisplayPort via MiniDP cable); 3840x2160@60Hz (Thunderbolt); 1920x1200@60Hz (VGA)
Keyboard	6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight
UltraNav™	TrackPoint® pointing device and Mylar surface touchpad, integrated five buttons, multi-touch
ThinkLight™	None
Dimensions[3]	*15.6W" (WxDxH):* 14.83" x 9.77" x 1.10-1.16"; 376.6mm x 248.1mm x 27.9-29.5mm
Weight[2]	*6-cell:* starting at 5.57 lb (2.53kg); *9-cell:* starting at 5.95 lb (2.70kg)
Case material	Glass-Fiber Reinforced Plastic
Battery type	Li-Ion 6-cell *(56Wh)* or 9-cell *(99.9Wh)*, HW Authentication
Max battery life[10]	*6-cell:* up to 6.2 hr; *9-cell:* up to 11.1 hr
AC adapter	*dual-core:* 135-watt AC adapter; *quad-core:* 170-watt AC adapter
Chipset	**Mobile Intel QM87 Express Chipset**
ExpressCard	One slot (ExpressCard/34)
Smart card reader	*Optional:* Smart card reader
Media reader	4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card
Ports	Two USB 3.0, two USB 2.0 (one Always On), VGA, Mini DisplayPort / Thunderbolt, Ethernet (RJ-45), Dock connector

Audio support	HD Audio, Realtek® ALC3232 codec, Dolby® Home Theater® v4 / stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack
WLAN[4]	*One of the following, configurable by model:* • ThinkPad 11b/g/n, 2x2, Wi-Fi + Bluetooth combo adapter, M.2 card • Intel Wireless-N 7260, 2x2, Wi-Fi + BT combo adapter, M.2 card • Intel Dual Band Wireless-N 7260, 2x2, Wi-Fi + BT combo adapter, M.2 card • Intel Dual Band Wireless-AC 7260, 2x2, Wi-Fi + BT combo adapter, M.2 card

WWAN *(optional)*	*One of the following, configurable by model (mutually exclusive with M.2 SSD):*
	• Wireless WAN upgradable
	• Wireless WAN, Sierra Wireless EM7355, Qualcomm® Gobi™ 4G LTE/
	  HSPA+/EVDO/GSM/GPRS/EDGE, GPS, M.2 card (US models)
	• Wireless WAN, Ericsson® N5321,
	  HSPA+ 21Mbps/GSM/GPRS/EDGE, GPS, M.2 card (WE models)
	• Wireless WAN, Sierra Wireless EM7345,
	  Intel 4G LTE/HSPA/GSM/GPRS/EDGE, GPS, M.2 card (WE models)

SIM card *(optional)*	*One of the following, configurable by model:* • AT&T® or Verizon® LTE (4G), contract required with service provider (US models) • Lenovo SIM, out-of-box service, pay-as-you-go via credit card, no contract required (WE models) • User selectable, contract required with service provider
Bluetooth™	Bluetooth 4.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter
Ethernet	Intel Ethernet Connection I217-LM (Clarkville)
NFC	*Optional:* Near Field Communication
Security	Power-on password, hard disk password, supervisor password, security keyhole
Security chip	Trusted Platform Module, TCG 1.2-compliant
vPro *(optional)*	Intel vPro Technology
Fingerprint reader	*Optional:* Fingerprint reader on the palm rest, swipe sensor
Limited warranty[12]	*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[24] • 3-year/1-yr battery limited onsite service, IWS (International Warranty Service[17])

Preload		

Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 8 / 8.1 Pro 64-bit
• Lenovo Solution Center
• ThinkVantage Product Recovery
• Rescue and Recovery™
• ThinkVantage System Update
• Lenovo Cloud Storage by SugarSync
• PC Device Stage
• Adobe® Reader®
• Nitro Pro
• Evernote®
• Skype™
• Microsoft® Office preloaded;
  purchase a product key to activate
• Norton™ Internet Security
  (30 days of virus definitions)
• Cyberlink PowerDVD (DVD±RW)
• Cyberlink Power2Go (DVD±RW)
• Cyberlink PowerProducer (DVD±RW)
	Some: Windows 8 / 8.1 64-bit
	Some: Windows 8 / 8.1 Pro 64-bit
	• Lenovo Solution Center
	• Lenovo Support
	• Lenovo Companion
	• ThinkVantage System Update
	• Lenovo Reach (Windows 8.1 model)
	• Hightail - Metro (Windows 8.1 model)
	• Lenovo Cloud Storage by SugarSync
	  - Metro (Windows 8 model)
	• Lenovo Cloud Storage by SugarSync
	  (Windows 8 model)
	• PC Device Stage
	• AccuWeather
	• Amazon Kindle
	• Nitro Pro
	• Evernote
	• Skype
	• Rara Streaming
	• Norton Studio
	• Microsoft Office preloaded;
	  purchase a product key to activate
	• Norton Internet Security
	  (30 days of virus definitions)
	• Cyberlink PowerDVD(DVD±RW)
	• Cyberlink Power2Go (DVD±RW)
	• Cyberlink PowerProducer (DVD±RW)

For ISV certifications, please visit www.lenovo.com/support/ISV

Environment	EPEAT™ Gold; ENERGY STAR® 6.0; RoHS-compliant

ThinkPad W540 20BG (Optimus) - TopSeller

Model	Processor	vPro	Graphics	Memory	Display	Storage	RAID	Optical	WLAN & Bluetooth	WWAN / M.2 SSD	SIM card	Smart card reader	Camera	Backlit keyboard	Finger-print reader	NFC	Color calibrator	Battery cells	Power adapter (watt)	Preload	Base warranty (year)	Global	Ann date (m/y)
20BG0010US	i7-4700MQ	No	K1100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0011US	i7-4700MQ	No	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0012US	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0013US	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0014US	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG001YUS	i7-4700MQ	No	K1100M	8GBx1	15.6" FHD	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0020US	i7-4800MQ	vPro	K1100M	8GBx1	15.6" FHD	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0022US	i7-4800MQ	vPro	K1100M	8GBx1	15.5" 3K IPS	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG004HUS	i7-4800MQ	vPro	K1100M	8GBx1	15.6" FHD	512G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	07/14
20BG0015US	i7-4800MQ	vPro	K2100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0016US	i7-4800MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	X-Rite	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0017US	i7-4800MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	X-Rite	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG0021US	i7-4800MQ	vPro	K2100M	8GBx1	15.6" FHD	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 DG Win7	3-depot	No	11/13
20BG004GUS	i7-4800MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	512G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	X-Rite	9	170W	Win8 DG Win7	3-depot	No	07/14

- *For detailed platform specifications, please see* *sheet*

Processor						
4th Generation Intel® Core™ i5 / i7 / i7 Extreme Processor						
	Processor	# of Cores	Base Frequency	Max Turbo Frequency	Cache	Memory Speed
	i5-4200M	2	2.5 GHz	3.1 GHz	3MB	DDR3L-1600
	i5-4330M		2.8 GHz	3.5 GHz	3MB	
	i7-4600M		2.9 GHz	3.6 GHz	4MB	
	i7-4700MQ	4	2.4 GHz	3.4 GHz	6MB	
	i7-4800MQ		2.7 GHz	3.7 GHz	6MB	
	i7-4900MQ		2.8 GHz	3.8 GHz	8MB	
	i7-4930MX		3 GHz	3.9 GHz	8MB	

Memory
dual-core model: 16GB max[7], two 204-pin SO-DIMM sockets
quad-core model: 32GB max, four 204-pin SO-DIMM sockets,
  only 4+4, 8+8, 4+4+4+4, and 8+8+8+8 combinations supported
All: PC3-12800 1600MHz DDR3L, non-parity, dual-channel capable

Optical
Ultrabay *Some:* DVD burner, 9.5mm Ultrabay slim, removable
One modular bay for removable devices (right side, cold swap), 9.5mm high

Storage *Some:* SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high
Some: HDD / SATA 6.0Gb/s, 2.5" wide, 7mm or 9.5mm high, APS

M.2 SSD *Some:* M.2 Solid State Drive (SSD), via M.2 card slot, exclusive with WWAN card

Widescreen display *Some:* 15.6" (396mm) **FHD (1920x1080)**, 300 nits, 500:1 contrast ratio
Some: 15.5" (394mm) **3K (2880x1620)**, 350 nits, 1000:1 contrast ratio, IPS

Multi-touch None
Color calibration *Optional:* Pantone® color calibrator by X-Rite® color calibration sensor in palm rest
Camera *(optional)* HD720p resolution, wide view angle, low light sensitive, face tracking, fixed focus

Graphics NVIDIA® Optimus™ technology, auto-switch between discrete and
integrated graphics, **Intel HD Graphics 4600** in processor, and
NVIDIA Quadro® K1100M or **K2100M**, PCI Express® x16, **2GB** memory

Dimensions[3] *15.6W" (WxDxH):* 14.83" x 9.77" x 1.10-1.16"; 376.6mm x 248.1mm x 27.9-29.5mm
Weight[2] *6-cell:* starting at 5.57 lb (2.53kg); *9-cell:* starting at 5.95 lb (2.70kg)
Case material Glass-Fiber Reinforced Plastic
Battery type Li-Ion 6-cell *(56Wh)* or 9-cell *(99.9Wh)*, HW Authentication
Max battery life[10] *6-cell:* up to 6.2 hr; *9-cell:* up to 11.1 hr
AC adapter *dual-core:* 135-watt AC adapter; *quad-core:* 170-watt AC adapter

Audio support HD Audio, Realtek® ALC3232 codec, Dolby® Home Theater® v4 /
stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack

Keyboard 6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight
UltraNav™ TrackPoint® pointing device and Mylar surface touchpad,
integrated five buttons, multi-touch
ThinkLight™ None

Chipset **Mobile Intel QM87 Express Chipset**
ExpressCard One slot (ExpressCard/34)
Smart card reader *Optional:* Smart card reader
Media reader 4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card
Ports Two USB 3.0, two USB 2.0 (one Always On),
VGA, Mini DisplayPort / Thunderbolt, Ethernet (RJ-45), Dock connector

WLAN[4]
11b/g/n+BT: ThinkPad 11b/g/n, 2x2, Wi-Fi + BT, M.2 card
7260 b/g/n+BT: Intel Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card
7260 a/b/g/n+BT: Intel Dual Band Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card
7260 ac+BT: Intel Dual Band Wireless-AC 7260, 2x2, Wi-Fi + BT, M.2 card

WWAN *(optional)* *Upg:* Wireless WAN upgradable
EM7355: Sierra Wireless EM7355, Qualcomm® Gobi™ 4G LTE/
HSPA+/EVDO/GSM/GPRS/EDGE, GPS

SIM card *(optional)* *AT&T / Verizon:* AT&T® / Verizon® LTE (4G), contract required with service provider
Select: User selectable, contract required with service provider

Bluetooth™ Bluetooth 4.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter
Ethernet Intel Ethernet Connection I217-LM (Clarkville)
NFC *Optional:* Near Field Communication

Security Power-on password, hard disk password, supervisor password, security keyhole
Security chip Trusted Platform Module, TCG 1.2-compliant
vPro *(optional)* Intel vPro Technology
Fingerprint reader *Optional:* Fingerprint reader on the palm rest, swipe sensor

Preload
Win8 / 8.1 DG Win7: Windows® 7 Professional 64 preinstalled
through downgrade rights in Windows 8 / 8.1 Pro 64-bit
Win8 / 8.1 64: Windows 8 / 8.1 64-bit
Win8 / 8.1 P64: Windows 8 / 8.1 Pro 64-bit

Limited warranty[12] **1-year** - depot / **3-years** (1-yr battery) - depot / **3-years** (1-year battery) **onsite**

See footnotes for more detailed information

Model	Processor	vPro	Graphics	Memory	Display	Storage	RAID	Optical	WLAN & Bluetooth	WWAN / M.2 SSD	SIM card	Smart card reader	Cam-era	Backlit key-board	Finger-print reader	NFC	Color cali-brator	Bat-tery cells	Power adapter (watt)	Preload	Base warranty (year)	Glob-al	Ann date (m/y)
20BH001BUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-depot	No	11/13
20BH001DUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	128G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	No	11/13
20BH001FUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	2x500G 7200	0	None	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	No	11/13
20BH001GUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	2x500G 7200	1	None	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	No	11/13
20BH001VUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-depot	No	11/13
20BH002CUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH002DUS	i7-4800MQ	vPro	K1100M	4GBx2	15.5" 3K IPS	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH002FUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH002HUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH002RUS	i7-4800MQ	vPro	K1100M	8GBx1	15.6" FHD	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH002TUS	i7-4800MQ	vPro	K1100M	8GBx1	15.5" 3K IPS	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH004MUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	180G SSD Opal	No	DVD±RW	7260 a/b/g/n+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	04/14
20BH004NUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 a/b/g/n+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	04/14
20BH004QUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	128G SSD	No	DVD±RW	7260 a/b/g/n+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	04/14
20BH001PUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	500G 5400	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-depot	No	01/14
20BH001TUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	512G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-depot	No	01/14
20BH001UUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-depot	No	01/14
20BH001XUS	i7-4900MQ	vPro	K2100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-depot	No	11/13
20BH002KUS	i7-4800MQ	vPro	K2100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-depot	Yes	11/13
20BH002PUS	i7-4800MQ	vPro	K2100M	4GBx2	15.5" 3K IPS	512G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	X-Rite	9	170W	Win8 P64	3-depot	Yes	11/13

- *For detailed platform specifications, please see* [ThinkPad W540 Platform Specifications](#) *sheet*

Processor	4th Generation Intel® Core™ i5 / i7 / i7 Extreme Processor

Processor	# of Cores	Base Frequency	Max Turbo Frequency	Cache	Memory Speed
i5-4200M	2	2.5 GHz	3.1 GHz	3MB	
i5-4330M		2.8 GHz	3.5 GHz	3MB	
i7-4600M		2.9 GHz	3.6 GHz	4MB	
i7-4700MQ	4	2.4 GHz	3.4 GHz	6MB	DDR3L-1600
i7-4800MQ		2.7 GHz	3.7 GHz	6MB	
i7-4900MQ		2.8 GHz	3.8 GHz	8MB	
i7-4930MX		3 GHz	3.9 GHz	8MB	

Memory	*dual-core model:* 16GB max[7], two 204-pin SO-DIMM sockets *quad-core model:* 32GB max, four 204-pin SO-DIMM sockets, only 4+4, 8+8, 4+4+4+4, and 8+8+8+8 combinations supported *All:* PC3-12800 1600MHz DDR3L, non-parity, dual-channel capable
Optical Ultrabay	*Some:* DVD burner, 9.5mm Ultrabay slim, removable One modular bay for removable devices (right side, cold swap), 9.5mm high
Storage M.2 SSD	*Some:* SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high *Some:* HDD / SATA 6.0Gb/s, 2.5" wide, 7mm or 9.5mm high, APS *Some:* M.2 Solid State Drive (SSD), via M.2 card slot, exclusive with WWAN card
Widescreen display Multi-touch Color calibration Camera *(optional)*	*Some:* 15.6" (396mm) **FHD (1920x1080)**, 300 nits, 500:1 contrast ratio *Some:* 15.5" (394mm) **3K (2880x1620)**, 350 nits, 1000:1 contrast ratio, IPS None *Optional:* Pantone® color calibrator by X-Rite® color calibration sensor in palm rest HD720p resolution, wide view angle, low light sensitive, face tracking, fixed focus
Graphics	NVIDIA® Optimus™ technology, auto-switch between discrete and integrated graphics, **Intel HD Graphics 4600** in processor, and **NVIDIA Quadro® K1100M** or **K2100M**, PCI Express® x16, **2GB** memory
Dimensions[3] Weight[2] Case material Battery type Max battery life[10] AC adapter	*15.6W" (WxDxH):* 14.83" x 9.77" x 1.10-1.16"; 376.6mm x 248.1mm x 27.9-29.5mm *6-cell:* starting at 5.57 lb (2.53kg); *9-cell:* starting at 5.95 lb (2.70kg) Glass-Fiber Reinforced Plastic Li-Ion 6-cell (56Wh) or 9-cell (99.9Wh), HW Authentication *6-cell:* up to 6.2 hr; *9-cell:* up to 11.1 hr *dual-core:* 135-watt AC adapter; *quad-core:* 170-watt AC adapter

Audio support	HD Audio, Realtek® ALC3232 codec, Dolby® Home Theater® v4 / stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack
Keyboard UltraNav™ ThinkLight™	6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight TrackPoint® pointing device and Mylar surface touchpad, integrated five buttons, multi-touch None
Chipset ExpressCard Smart card reader Media reader Ports	**Mobile Intel QM87 Express Chipset** One slot (ExpressCard/34) *Optional:* Smart card reader 4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card Two USB 3.0, two USB 2.0 (one Always On), VGA, Mini DisplayPort / Thunderbolt, Ethernet (RJ-45), Dock connector
WLAN[4]	*11b/g/n+BT:* ThinkPad 11b/g/n, 2x2, Wi-Fi + BT, M.2 card *7260 b/g/n+BT:* Intel Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card *7260 a/b/g/n+BT:* Intel Dual Band Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card *7260 ac+BT:* Intel Dual Band Wireless-AC 7260, 2x2, Wi-Fi + BT, M.2 card
WWAN *(optional)*	*Upg:* Wireless WAN upgradable *EM7355:* Sierra Wireless EM7355, Qualcomm® Gobi™ 4G LTE/ HSPA+/EVDO/GSM/GPRS/EDGE, GPS
SIM card *(optional)*	*AT&T / Verizon:* AT&T® / Verizon® LTE (4G), contract required with service provider *Select:* User selectable, contract required with service provider
Bluetooth™ Ethernet NFC	Bluetooth 4.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter Intel Ethernet Connection I217-LM (Clarkville) *Optional:* Near Field Communication
Security Security chip vPro *(optional)*	Power-on password, hard disk password, supervisor password, security keyhole Trusted Platform Module, TCG 1.2-compliant Intel vPro Technology
Fingerprint reader	*Optional:* Fingerprint reader on the palm rest, swipe sensor
Preload	*Win8 / 8.1 DG Win7:* Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 8 / 8.1 Pro 64-bit *Win8 / 8.1 64:* Windows 8 / 8.1 64-bit *Win8 / 8.1 P64:* Windows 8 / 8.1 Pro 64-bit
Limited warranty[12]	**1-year** - depot / **3-years** (1-yr battery) - depot / **3-years** (1-year battery) **onsite**

See footnotes for more detailed information

Model	Processor	vPro	Graphics	Memory	Display	Storage	RAID	Optical	WLAN & Bluetooth	WWAN / M.2 SSD	SIM card	Smart card reader	Cam-era	Backlit key-board	Finger-print reader	NFC	Color cali-brator	Bat-tery cells	Power adapter (watt)	Preload	Base warranty (year)	Glob-al	Ann date (m/y)
20BH004PUS	i7-4800MQ	vPro	K2100M	4GBx2	15.5" 3K IPS	512G SSD	No	DVD±RW	7260 a/b/g/n+BT	Upg	None	None	720p	Backlit	Finger	None	X-Rite	9	170W	Win8 P64	3-depot	Yes	04/14
20BH004RUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	512G SSD	No	DVD±RW	7260 a/b/g/n+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-depot	Yes	04/14

- *For detailed platform specifications, please see ThinkPad W540 Platform Specifications sheet*

Processor	4th Generation Intel® Core™ i5 / i7 / i7 Extreme Processor

Processor	# of Cores	Base Frequency	Max Turbo Frequency	Cache	Memory Speed
i5-4200M	2	2.5 GHz	3.1 GHz	3MB	DDR3L-1600
i5-4330M		2.8 GHz	3.5 GHz	3MB	
i7-4600M		2.9 GHz	3.6 GHz	4MB	
i7-4700MQ	4	2.4 GHz	3.4 GHz	6MB	
i7-4800MQ		2.7 GHz	3.7 GHz	6MB	
i7-4900MQ		2.8 GHz	3.8 GHz	8MB	
i7-4930MX		3 GHz	3.9 GHz	8MB	

Memory	*dual-core model:* 16GB max[7], two 204-pin SO-DIMM sockets *quad-core model:* 32GB max, four 204-pin SO-DIMM sockets, only 4+4, 8+8, 4+4+4+4, and 8+8+8+8 combinations supported *All:* PC3-12800 1600MHz DDR3L, non-parity, dual-channel capable
Optical **Ultrabay**	*Some:* DVD burner, 9.5mm Ultrabay slim, removable One modular bay for removable devices (right side, cold swap), 9.5mm high
Storage **M.2 SSD**	*Some:* SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high *Some:* HDD / SATA 6.0Gb/s, 2.5" wide, 7mm or 9.5mm high, APS *Some:* M.2 Solid State Drive (SSD), via M.2 card slot, exclusive with WWAN card
Widescreen display	*Some:* 15.6" (396mm) **FHD (1920x1080)**, 300 nits, 500:1 contrast ratio *Some:* 15.5" (394mm) **3K (2880x1620)**, 350 nits, 1000:1 contrast ratio, IPS
Multi-touch	None
Color calibration	*Optional:* Pantone® color calibrator by X-Rite® color calibration sensor in palm rest
Camera *(optional)*	HD720p resolution, wide view angle, low light sensitive, face tracking, fixed focus
Graphics	NVIDIA® Optimus™ technology, auto-switch between discrete and integrated graphics, **Intel HD Graphics 4600** in processor, and **NVIDIA Quadro® K1100M** or **K2100M**, PCI Express® x16, **2GB** memory
Dimensions[3]	*15.6W" (WxDxH):* 14.83" x 9.77" x 1.10-1.16"; 376.6mm x 248.1mm x 27.9-29.5mm
Weight[2]	*6-cell:* starting at 5.57 lb (2.53kg); *9-cell:* starting at 5.95 lb (2.70kg)
Case material	Glass-Fiber Reinforced Plastic
Battery type	Li-Ion 6-cell (56Wh) or 9-cell (99.9Wh), HW Authentication
Max battery life[10]	*6-cell:* up to 6.2 hr; *9-cell:* up to 11.1 hr
AC adapter	*dual-core:* 135-watt AC adapter; *quad-core:* 170-watt AC adapter

Audio support	HD Audio, Realtek® ALC3232 codec, Dolby® Home Theater® v4 / stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack
Keyboard **UltraNav™** **ThinkLight™**	6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight TrackPoint® pointing device and Mylar surface touchpad, integrated five buttons, multi-touch None
Chipset	**Mobile Intel QM87 Express Chipset**
ExpressCard	One slot (ExpressCard/34)
Smart card reader	*Optional:* Smart card reader
Media reader	4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card
Ports	Two USB 3.0, two USB 2.0 (one Always On), VGA, Mini DisplayPort / Thunderbolt, Ethernet (RJ-45), Dock connector
WLAN[4]	*11b/g/n+BT:* ThinkPad 11b/g/n, 2x2, Wi-Fi + BT, M.2 card *7260 b/g/n+BT:* Intel Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card *7260 a/b/g/n+BT:* Intel Dual Band Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card *7260 ac+BT:* Intel Dual Band Wireless-AC 7260, 2x2, Wi-Fi + BT, M.2 card
WWAN *(optional)*	*Upg:* Wireless WAN upgradable *EM7355:* Sierra Wireless EM7355, Qualcomm® Gobi™ 4G LTE/ HSPA+/EVDO/GSM/GPRS/EDGE, GPS
SIM card *(optional)*	*AT&T / Verizon:* AT&T® / Verizon® LTE (4G), contract required with service provider *Select:* User selectable, contract required with service provider
Bluetooth™ **Ethernet** **NFC**	Bluetooth 4.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter Intel Ethernet Connection I217-LM (Clarkville) *Optional:* Near Field Communication
Security **Security chip** **vPro** *(optional)*	Power-on password, hard disk password, supervisor password, security keyhole Trusted Platform Module, TCG 1.2-compliant Intel vPro Technology
Fingerprint reader	*Optional:* Fingerprint reader on the palm rest, swipe sensor
Preload	*Win8 / 8.1 DG Win7:* Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 8 / 8.1 Pro 64-bit *Win8 / 8.1 64:* Windows 8 / 8.1 64-bit *Win8 / 8.1 P64:* Windows 8 / 8.1 Pro 64-bit
Limited warranty[12]	**1-year** - depot / **3-years** (1-yr battery) - depot / **3-years** (1-year battery) **onsite**

See footnotes for more detailed information

ThinkPad W540 20BH (Optimus) - Onsite (Windows 8)

Model	Processor	vPro	Graphics	Memory	Display	Storage	RAID	Optical	WLAN & Bluetooth	WWAN / M.2 SSD	SIM card	Smart card reader	Camera	Backlit keyboard	Finger-print reader	NFC	Color cali-brator	Bat-tery cells	Power adapter (watt)	Preload	Base warranty (year)	Glob-al	Ann date (m/y)
20BH001AUS	i7-4800MQ	vPro	K1100M	4GBx1	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH001CUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH001EUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	128G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH001HUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	2x500G 7200	1	None	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3x-onsite	No	11/13
20BH001WUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH002EUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	2x500G 7200	0	None	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002JUS	i7-4800MQ	vPro	K1100M	4GBx2	15.5" 3K IPS	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002MUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002NUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002QUS	i7-4800MQ	vPro	K1100M	4GBx2	15.6" FHD	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002SUS	i7-4800MQ	vPro	K1100M	8GBx1	15.6" FHD	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002UUS	i7-4800MQ	vPro	K1100M	8GBx1	15.5" 3K IPS	240G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH001KUS	i7-4900MQ	vPro	K2100M	4GBx2	15.6" FHD	500G 7200	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH001MUS	i7-4900MQ	vPro	K2100M	4GBx2	15.6" FHD	128G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH001NUS	i7-4900MQ	vPro	K2100M	4GBx2	15.6" FHD	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH001QUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	500G 5400	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-onsite	No	01/14
20BH001RUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	180G SSD Opal	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-onsite	No	01/14
20BH001SUS	i7-4900MQ	vPro	K2100M	8GBx1	15.5" 3K IPS	512G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	NFC	X-Rite	9	170W	Win8 P64	3-onsite	No	01/14
20BH001YUS	i7-4900MQ	vPro	K2100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	None	Finger	None	None	9	170W	Win8 P64	3-onsite	No	11/13
20BH002GUS	i7-4800MQ	vPro	K2100M	4GBx2	15.6" FHD	256G SSD eDrive	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	None	9	170W	Win8 P64	3-onsite	Yes	11/13
20BH002LUS	i7-4800MQ	vPro	K2100M	4GBx2	15.5" 3K	512G SSD	No	DVD±RW	7260 ac+BT	Upg	None	None	720p	Backlit	Finger	None	X-Rite	9	170W	Win8 P64	3-onsite	Yes	11/13

- *For detailed platform specifications, please see* [ThinkPad W540 Platform Specifications](#) *sheet*

Processor	4th Generation Intel® Core™ i5 / i7 / i7 Extreme Processor				

Processor	# of Cores	Base Frequency	Max Turbo Frequency	Cache	Memory Speed
i5-4200M	2	2.5 GHz	3.1 GHz	3MB	
i5-4330M		2.8 GHz	3.5 GHz	3MB	
i7-4600M		2.9 GHz	3.6 GHz	4MB	
i7-4700MQ	4	2.4 GHz	3.4 GHz	6MB	DDR3L-1600
i7-4800MQ		2.7 GHz	3.7 GHz	6MB	
i7-4900MQ		2.8 GHz	3.8 GHz	8MB	
i7-4930MX		3 GHz	3.9 GHz	8MB	

Memory
dual-core model: 16GB max[7], two 204-pin SO-DIMM sockets
quad-core model: 32GB max, four 204-pin SO-DIMM sockets,
only 4+4, 8+8, 4+4+4+4, and 8+8+8+8 combinations supported
All: PC3-12800 1600MHz DDR3L, non-parity, dual-channel capable

Optical Ultrabay
Some: DVD burner, 9.5mm Ultrabay slim, removable
One modular bay for removable devices (right side, cold swap), 9.5mm high

Storage
Some: SSD / SATA 6.0Gb/s, 2.5" wide, 7mm high
Some: HDD / SATA 6.0Gb/s, 2.5" wide, 7mm or 9.5mm high, APS

M.2 SSD
Some: M.2 Solid State Drive (SSD), via M.2 card slot, exclusive with WWAN card

Widescreen display
Some: 15.6" (396mm) **FHD (1920x1080)**, 300 nits, 500:1 contrast ratio
Some: 15.5" (394mm) **3K (2880x1620)**, 350 nits, 1000:1 contrast ratio, IPS

Multi-touch None
Color calibration *Optional:* Pantone® color calibrator by X-Rite® color calibration sensor in palm rest
Camera *(optional)* HD720p resolution, wide view angle, low light sensitive, face tracking, fixed focus

Graphics
NVIDIA® Optimus™ technology, auto-switch between discrete and
integrated graphics, **Intel HD Graphics 4600** in processor, and
NVIDIA Quadro® K1100M or **K2100M**, PCI Express® x16, **2GB** memory

Dimensions[3] *15.6W" (WxDxH):* 14.83" x 9.77" x 1.10-1.16"; 376.6mm x 248.1mm x 27.9-29.5mm
Weight[2] *6-cell:* starting at 5.57 lb (2.53kg); *9-cell:* starting at 5.95 lb (2.70kg)
Case material Glass-Fiber Reinforced Plastic
Battery type Li-Ion 6-cell (56Wh) or 9-cell (99.9Wh), HW Authentication
Max battery life[10] *6-cell:* up to 6.2 hr; *9-cell:* up to 11.1 hr
AC adapter *dual-core:* 135-watt AC adapter; *quad-core:* 170-watt AC adapter

Audio support HD Audio, Realtek® ALC3232 codec, Dolby® Home Theater® v4 / stereo speakers, 1W x 2 / dual array microphone, combo audio/microphone jack

Keyboard UltraNav™ 6-row, spill-resistant, multimedia Fn keys, numeric keypad, optional LED backlight TrackPoint® pointing device and Mylar surface touchpad, integrated five buttons, multi-touch
ThinkLight™ None

Chipset **Mobile Intel QM87 Express Chipset**
ExpressCard One slot (ExpressCard/34)
Smart card reader *Optional:* Smart card reader
Media reader 4-in-1 reader (MMC, SD, SDHC, SDXC), supports UHS-II SD card
Ports Two USB 3.0, two USB 2.0 (one Always On), VGA, Mini DisplayPort / Thunderbolt, Ethernet (RJ-45), Dock connector

WLAN[4]
11b/g/n+BT: ThinkPad 11b/g/n, 2x2, Wi-Fi + BT, M.2 card
7260 b/g/n+BT: Intel Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card
7260 a/b/g/n+BT: Intel Dual Band Wireless-N 7260, 2x2, Wi-Fi + BT, M.2 card
7260 ac+BT: Intel Dual Band Wireless-AC 7260, 2x2, Wi-Fi + BT, M.2 card

WWAN *(optional)*
Upg: Wireless WAN upgradable
EM7355: Sierra Wireless EM7355, Qualcomm® Gobi™ 4G LTE/ HSPA+/EVDO/GSM/GPRS/EDGE, GPS

SIM card *(optional)*
AT&T / Verizon: AT&T® / Verizon® LTE (4G), contract required with service provider
Select: User selectable, contract required with service provider

Bluetooth™ Bluetooth 4.0 wireless, integrated in Wi-Fi + Bluetooth combo adapter
Ethernet Intel Ethernet Connection I217-LM (Clarkville)
NFC *Optional:* Near Field Communication

Security Power-on password, hard disk password, supervisor password, security keyhole
Security chip Trusted Platform Module, TCG 1.2-compliant
vPro *(optional)* Intel vPro Technology
Fingerprint reader *Optional:* Fingerprint reader on the palm rest, swipe sensor

Preload
Win8 / 8.1 DG Win7: Windows® 7 Professional 64 preinstalled through downgrade rights in Windows 8 / 8.1 Pro 64-bit
Win8 / 8.1 64: Windows 8 / 8.1 64-bit
Win8 / 8.1 P64: Windows 8 / 8.1 Pro 64-bit

Limited warranty[12] **1-year** - depot / **3-years** (1-yr battery) - depot / **3-years** (1-year battery) **onsite**

See footnotes for more detailed information