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)* Ultrabay	DVD burner, 9.5mm Ultrabay slim, removable 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 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
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
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

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™ 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)* Fingerprint reader	Power-on password, hard disk password, supervisor password, security keyhole Trusted Platform Module, TCG 1.2-compliant Intel vPro Technology *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