

### Technical Specifications

#### HP Storage Solutions for HP Business Notebooks

##### Models

<b>Optical Drives</b>	HP External USB DVD/RW	F2B56AA
	2013 Upgrade Bay DVD AMO - Carrier and Drive	G1Y56A
<b>Removable Hard Drives</b>	HP 500 GB 7200 rpm Primary SATA Hard Drive	F3B97AA
	HP 1 TB 7200 rpm Primary SATA Hard Drive	L3M56AA
	2013 Upgrade Bay 750GB HDD AMO Carrier and Drive	G1Y57AA
<b>Solid State Drives</b>	HP 256 GB TLC Solid State Drive 2.5"	M0F34AA
	HP 256 GB PCIe NVMe M.2 Solid State Drive	V3K66AA
	HP 256 GB Value 2280 SATA3 M.2 Solid State Drive	1DE47AA
	HP 256 GB TLC 2280 SATA3 M.2 Solid State Drive	1DE48AA
	HP 256GB TLC PCI-e 3x4 NVMe M.2 Solid State Drive	1FU87AA
	HP 512 GB PCIe NVMe M.2 Solid State Drive	V3K67AA
	HP 512 GB TLC PCI-e 3x4 NVMe M.2 Solid State Drive	1FU88AA
	HP 1 TB 2280 PCI-E 3x4 NVME M.2 Solid State Drive	X2E90AA
	HP 512 GB TLC 2.5 Solid State Drive	2JB96AA
	HP 128 GB TLC 2280 M.2 Solid State Drive	2JB95AA
	HP 256GB SED TLC SATA- 3 M.2 SSD	3JP90AA
HP 512GB TLC SATA- 3 M.2 SSD	3JP91AA	
<b>Brackets</b>	HP Mobile Workstation HDD/SSD Bracket	J2D73AA

### Technical Specifications

#### HP Storage Solutions

HP storage solutions for your HP business notebook provide additional flexibility and expandability with a range of options that include optical drives, hard drives, and solid state drives.

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#### Optical Drives

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##### HP External USB DVD/RW

With the HP External USB Optical Drive, any available USB port on your notebook or Ultrabook™ becomes a ticket to optical storage. Simply connect the drive with the included USB cable, and get immediate read/write access to your optical media.

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##### Key Benefits

- Write to or access large files, media or music from CDs or DVDs
  - Connect easily through a USB 2.0 port
  - Lightweight, compact design stores easily into a carrying case or backpack
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##### 2013 Upgrade Bay DVD AMO - Carrier and Drive

Create CDs and DVDs, back up or archive permanent data files on CD or DVD media with the HP 2013 Upgrade Bay DVD AMO - Carrier and Drive.

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##### Key Benefits

- Write to or access large files, media or music from CDs or DVDs
  - Up to 4.7 GB of data storage capacity (up to 8.5 GB double layer).
  - Lightweight, compact design stores easily into a carrying case or backpack.
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#### Removable Hard Drives

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##### HP 500 GB/750 GB/ 1 TB 7200rpm Primary SATA Hard Drive

The HP Hard Drives are convenient and affordable solutions for users who require additional storage or a faster dedicated second hard drive.

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##### Key Benefits

- Extend the life of your HP Business Notebook by providing additional storage
  - Easy low-cost back-up solution without burdening network resources
  - Switch drives between most HP business notebooks
  - SMART predictive failure analysis (PFA)
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##### 2013 Upgrade Bay 750 GB HDD AMO Carrier and Drive

The 2013 HP Upgrade Bay 750 GB HDD AMO Carrier and Drive is a convenient and affordable solution for users who require additional storage or a faster dedicated second hard drive.

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##### Key Benefits

- Easy back-up solution without burdening network resources.
  - Warm swappable.
  - High speed SATA data transfer.
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### Technical Specifications

- Power/drive activity LED indicator.
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## Solid State Drives

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### HP 240 GB and 256, 512 GB, or 1 TB Solid State Drives

The HP 240 GB, 512 GB, and 1 TB Solid State Drives provide many performance and durability improvements over traditional Hard Disk Drive (HDD) technology. With no moving parts, solid state drives do not need to spin up or mechanically seek files like conventional hard disk drives do. These drive characteristics significantly improve boot-up, shut down, and application loading times as well as overall application responsiveness.

The HP 256 GB SED Solid State Drive includes Trusted Computing Group (TCG) Opal-compliant self-encryption for enhanced data security that adds a layer of authentication to your drive.

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#### Key Benefits

- Store your data with a hard drive with no moving parts
  - Get faster transfer speeds and higher cell endurance with Multi Level Cell (MLC) NAND flash memory
  - Significantly improve boot up, shut down, and application loading times
  - Improved protocol for enhanced data integrity
  - Performance increase to up to 6 Gb/s maximum external (burst) data transfer rate
  - Native Command Queuing allows the drive to have several write or read commands outstanding at the same time
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## Bracket

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### HP Mobile Workstation HDD/SSD Bracket

Easily replace or upgrade your hard drive or solid state drive with the HP Mobile Workstation HDD/SSD Bracket.

Simply insert the drive (sold separately) into the bracket, and the bracket into the available drive slot on your HP Mobile Workstation or HP ZBook.

Rest easy with a one-year parts replacement limited warranty.

### Technical Specifications

#### Optical Drives

<b>HP External USB DVD/RW Drive</b>	<b>Drive</b>	Manual tray-load		
	<b>Interface</b>	USB 2.0		
	<b>Dimensions (HxWxD)</b>	0.55 x 5.41 x 5.94 in (1.40 x 14.40 x 13.75 cm)		
	<b>Form Factor</b>	External		
	<b>Access Times</b>	<b>CD</b>	1/3 Stroke: 140 ms	
		<b>DVD</b>	1/3 Stroke: 160 ms	
	<b>Supported Media (read)</b>	DVD-ROM, DVD-R DVD-R , DVD-R DL, DVD-RW, DVD-RAM, DVD+R, DVD+R DL, and +RW CD-ROM, CD-ROM XA, CD-DA Super Audio CD CD-R discs CD-RW discs CPRM (DVD-R/RW/RAM) supported		
	<b>Supported Media (write)</b>	DVD-R DVD-R DL DVD-RW DVD-RAM DVD+R DVD+R DL DVD+RW CD-R/RW		
	<b>Maximum speed</b>		<b>Normal</b>	
	<b>Write</b>	<b>DVD-RW</b>	6X maximum by ZCLV	
		<b>DVD+RW</b>	8X maximum by ZCLV	
	<b>Read</b>	<b>CD-RW</b>	24 X maximum by ZCLV	
		<b>DVD-R/RW/ROM</b>	8 X maximum	
<b>DVD-R DL</b>		8 X maximum		
<b>DVD-RAM</b>		6 X maximum		
<b>DVD-Video</b>		4 X maximum		
<b>M-DISC(DVD+R SL)</b>		8 X maximum		
<b>DVD+R/+RW</b>		8 X maximum		
<b>DVD+R DL</b>		8 X maximum		
<b>CD-R/RW/ROM</b>		24 X maximum		
<b>CD-DA</b>		24 X maximum		
<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature (operating)</b>			
	<b>Read and Write</b>	5 to 40 °C		
	<b>Relative Humidity (operating)</b>	10% to 80%		
	<b>Read</b>	15% to 85% (Non-Condensing)		
	<b>Write</b>	15% to 80% (Depend on the Temperature)		
	<b>Temperature (non-operating)</b>	-30 to 40 °C		
	<b>Relative Humidity (non-operating)</b>	10% to 90% (Non-Condensing)		

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<b>Operating systems supported</b>	Windows 8, Windows 7, Windows Vista, Windows XP, Windows 2008, Windows 2003, Mac OS X
<b>System requirements</b>	Pentium IV 2.4 GHz or higher, compatible (Recommended: Pentium IV 3.2 GHz or Higher) RAM: 256 MB or higher (Recommended: 128 MB) HDD: 20 GB or more of available space Video Memory: 64 MB or higher (Recommend: 128 MB) Interface: USB 2.0
<b>Option kit contents</b>	HP Mobile USB DVD/RW Drive, software, documentation
<b>Compatibility</b>	All HP Business Notebook PCs, HP Mobile Workstations

**Note:** Actual speeds may vary. Intended only for creation and storage of original material and other lawful uses. Double-layer discs may not be compatible with many existing single-layer DVD drives and players.

#### 2013 Upgrade Bay DVD AMO - Carrier and Drive

<b>Drive</b>	Manual tray-load
<b>Orientation</b>	Horizontal or vertical
<b>Operating Temperature</b>	5 to 50 °C
<b>Interface</b>	SATA 1.0
<b>Transfer Mode</b>	1X CD-ROM = 150 Kbytes/second 1X DVD-ROM = 1350 Kbytes/second (1KB = 1024 Bytes) DVD+R Write 10800 KB/s up to 8X DVD+R DL Write 5400 KB/s up to 6X DVD+RW Write 10800 KB/s up to 8X DVD-R Write 10800 KB/s up to 8X. DVD-R DL Write 5400 KB/s up to 6X DVD-RW Write 8100 KB/s up to 6X DVD-RAM Write 6750 KB/s up to 5X CD-R Write 3600 KB/s up to 24X. CD-RW Write 2400 KB/s up to 16X CD-ROM Read 3600 KB/s up to 24X. DVD-ROM Read 10800 KB/s up to 8X.
<b>Weight</b>	4.94 lb (140 g)
<b>Dimensions (HxWxD)</b>	5.51 x 5.09 x .62 in 13.99 x 12.93 x 1.58 cm
<b>Form Factor</b>	Commands for DVD Devices. Small Form Factor Connector Standards
<b>Capacity</b>	Read Write
<b>Access Times</b>	CD DVD
<b>Max Data transfer rates (sustained)</b>	24X CD-ROM 8X DVD 24X CD-R 16X CD-RW 8X DVD+R 4X DVD+RW 8X DVD-R

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	4X DVD-RW
	2.4X DVD+R(9)
	5X DVD-RAM
<b>Supported Media</b> (read)	DVD-R DVR-W DVD+RW DVD+R DVD+R DL DVD-R DL DVD-RAM
<b>Supported Media</b> (write)	CD-R CD-RW DVD-R DVD-R DL DVD-RW DVD+R DVD+R DL DVD+RW DVD-RAM
<b>Max Media Capacity</b> (read)	9.40 GB
<b>Max Media Capacity</b> (write)	8.50 GB
<b>Power</b>	5 VDC < 800 mA Read (typical at O.D.) < 1,000 mA Write (typical at O.D.) <1600 mA (maximum-excluding spike current <1ms duration) <65 mA (stand-by - partial if supported) <40 mA (stand-by - slumber)
<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature</b> (operating) <b>Relative Humidity</b> (operating) <b>Maximum Wet Bulb Temperature</b> (operating)
<b>Operating systems supported</b>	Windows 7 and Windows 8
<b>Option kit contents</b>	2013 Upgrade Bay DVD AMO - Carrier and Drive and documentation
<b>Compatibility</b>	HP ZBook 15/17 Mobile Workstations

**Note:** Actual speeds may vary. Intended only for creation and storage of original material and other lawful uses. Double-layer discs may not be compatible with many existing single-layer DVD drives and players.

### Removable Hard Drives

<b>HP 500 GB 7200rpm Primary SATA Hard Drive</b>	<b>Drive Weight</b>	0.25 lb (115g)
	<b>Capacity</b>	500 GB
	<b>Height</b>	0.27 in (7 mm)
	<b>Width</b>	2.75 in (70 mm)
	<b>Interface</b>	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ
	<b>Transfer Rate</b>	<b>Synchronous</b> (maximum) 150 MB/s (Drive Capability)

### Technical Specifications

<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b>	1.5ms
	<b>Average</b>	11ms
	<b>Maximum</b>	22ms
<b>Rotational Speed</b>	7200 rpm	
<b>Logical Blocks</b>	976,773,168	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]	
<b>Features</b>	ATA Security	
<b>Compatibility</b>	HP ProBook 430, 440, 450, 470, 445 , 450, 470, 640, 650, 645, 655 , 4440s, 4540s, 4740s, 4445s/4446s, 4545s, 6470b, 8470p, 6570b, 8570p Notebook PCs	

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 465 GB is user available.

#### HP 1 TB 7200rpm Primary SATA Hard Drive

<b>Drive Weight</b>	115g	
<b>Capacity</b>	1000GB	
<b>Height</b>	9.5mm	
<b>Width</b>	70mm	
<b>Interface</b>	ATA-8, SATA 3.0	
<b>Transfer Rate</b>	<b>Synchronous (maximum)</b> 600MB/s	
<b>Seek Time</b> (typical reads, including settling)	<b>Single Track</b> 2ms	
	<b>Average</b> 13ms	
	<b>Maximum</b> 15ms	
<b>Rotational Speed</b>	7200 rpm	
<b>Logical Blocks</b>	1,465,149,168	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C) [case temp]	
<b>Features</b>	ATA Security	
<b>Compatibility</b>	HP EliteBook 700, 800 Notebook PCs, HP ZBook 14/15/17 Mobile Workstations	

**Note:** 1 TB = a trillion bytes. Actual formatted capacity is less. Up to 931 GB is user available.

#### HP 2013 Upgrade Bay 750 GB Hard Drive

<b>Weight</b> (without HDD)	1.59 lb (45 g)
<b>Dimensions</b> (HxWxD)	5.30 x 5.04 x .60 in 13.45 x 12.80 x 1.53 cm
<b>Formatted Capacity</b>	750 GB
<b>Total logical sectors</b>	1465149168
<b>Interface</b>	SATA 3.0
<b>Data Transfer rate @ Disk to Buffer SATA</b>	170 Mbytes/s up to 600MB/s
<b>RPM</b>	7200
<b>Operating systems supported</b>	Windows 7 and Windows 8
<b>Operating Temperature</b>	0 to 60°C
<b>Option kit contents</b>	HP 2013 Upgrade Bay 750 GB Hard Drive and documentation
<b>Compatibility</b>	HP ZBook 15, 17 Mobile Workstations

### Technical Specifications

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 698 GB is user available.

### Solid State Drives

<b>HP 256 GB M.2 Solid State Drive</b>	<b>Capacity*</b>	256 GB
	<b>NAND Flash Memory</b>	Multi Level Cell (MLC) with wear leveling controller
	<b>Interface type</b>	SATA 6 Gb/sec (SATA Gen3 compliant)
	<b>Dimensions-external (W x H x D)</b>	2.74 x 0.276 x 3 in (2.2 x 8 x 0.15 cm)
	<b>Weight</b>	<0.02 lb (10 g)
	<b>Internal transfer rate</b>	<b>Write speed</b> Up to 465 MB/s
		<b>Read speed</b> Up to 515 MB/s
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b> Up to 100 MB/s (Support Ultra DMA 5)
	<b>Power</b>	<b>DC power requirement</b> 3.3 VDC 3.3%-100 mV ripple pk-pk
		<b>Total power consumption</b> < 6.6 Watt (max value)
	<b>Environmental (all conditions, non-condensing)</b>	<b>Temperature (operating)</b> 32° to 158° F (0° to 70° C)
		<b>Relative Humidity (operating)</b> 5% to 95%
		<b>Maximum Wet Bulb Temperature (operating)</b> 104° F (40° C)
	<b>Operating systems supported</b>	Windows® 7 Home Basic 32-bit, Windows 7 Home Premium 32- and 64-bit, Windows 7 Professional 32- and 64-bit, Windows XP Professional 32-bit, Windows XP Professional x64 or Windows XP Home. No driver is required for this device, although the HP-tested driver is recommended. Native support is provided by the operating system.
	<b>Regulations</b>	UL, CSA, EN60950-1:2006, CISPR Pub 22 Class B, CNS 13438, AS/NZS CISPR 22:2002 Class B,
	<b>Option kit contents</b>	HP 256GB SSD M.2, documentation
	<b>Compatibility</b>	TBD

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 238 GB is user available.

<b>HP 256 GB TLC Solid State Drive</b>	<b>Capacity*</b>	256 GB
	<b>NAND Flash Memory</b>	
	<b>Interface type</b>	SATA 3 (6Gbps)
	<b>Dimensions-external (W x H)</b>	2.5 x .27 in (63.5 mm x 7mm)
	<b>Weight</b>	0.10 lb (45 g)
	<b>Interface</b>	SATA 3 (6Gbps)
	<b>READY TIME, MAXIMUM (to Not Busy)</b>	1.0 s
	<b>Access times, Logical</b>	TYP.



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<b>Data Transfer rate (4k sector Random / 128k Sequential )</b>	0.1 ms
<b>Sequential Read</b>	Up to 510 MB/s
<b>Random Read</b>	Up to 90K IOPS
<b>Sequential Write</b>	Up to 280 MB/s
<b>Random Write</b>	Up to 70K IOPS
<b>Logical Blocks</b>	500118192
<b>Operating Temperature</b>	0 to 70 °C
<b>Option kit contents</b>	HP 256 GB Solid State Drive, documentation
<b>Compatibility</b>	HP 245, 250, 250, 255 G4

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 238 GB is user available.

### Technical Specifications

<b>HP 256 GB PCIe NVMe M.2 Capacity*</b>	256 GB	
<b>Solid State Drive</b>	<b>Interface type</b>	M.2 PCIe Gen 3x4 NVMe
	<b>Form Factor</b>	M.2 2280 Single Sided
	<b>Dimensions-external</b> (W x H x D)	80.15 x 22.15 x 2.38 (mm)
	<b>Weight</b>	<0.02 lb (10 g)
	<b>Internal transfer rate</b>	<b>Sequential Write speed</b> Up to 1260 MB/s
		<b>Sequential Read speed</b> Up to 2150 MB/s
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b> Up to 100 MB/s (Support Ultra DMA 5)
	<b>Power</b>	<b>DC power requirement</b> 3.3 VDC 3.3%-100 mV ripple pk-pk
		<b>Total power consumption</b> < 6.6 Watt (max value)
	<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature (operating)</b> 32° to 158° F (0° to 70° C)
		<b>Relative Humidity (operating)</b> 5% to 95%
		<b>Maximum Wet Bulb Temperature (operating)</b> 104° F (40° C)
	<b>Operating systems supported</b>	Windows® 7 Home Basic 32-bit, Windows 7 Home Premium 32- and 64-bit, Windows 7 Professional 32- and 64-bit, Windows XP Professional 32-bit, Windows XP Professional x64 or Windows XP Home. No driver is required for this device, although the HP-tested driver is recommended. Native support is provided by the operating system.
	<b>Regulations</b>	UL, CSA, EN60950-1:2006, CISPR Pub 22 Class B, CNS 13438, AS/NZS CISPR 22:2002 Class B~~
	<b>Option kit contents</b>	256 GB SSD M.2, documentation
	<b>Compatibility</b>	ZBook 15, 17 G3

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

<b>HP 512 GB PCIe NVMe M.2 Capacity*</b>	512 GB	
<b>Solid State Drive</b>	<b>Interface type</b>	M.2 PCIe Gen 3x4 NVMe
	<b>Form Factor</b>	M.2 2280 Double Sided
	<b>Dimensions-external (W x H x D)</b>	80.15 x 22.15 x 2.38 (mm)
	<b>Weight</b>	<0.02 lb (10 g)
	<b>Internal transfer rate</b>	<b>Sequential Write speed</b> Up to 1500 MB/s
		<b>Sequential Read speed</b> Up to 2150 MB/s
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b> Up to 100 MB/s (Support Ultra DMA 5)
	<b>Power</b>	<b>DC power requirement</b> 3.3 VDC 3.3%-100 mV ripple pk-pk
		<b>Total power consumption</b> < 6.6 Watt (max value)
	<b>Environmental (all conditions, non-condensing)</b>	<b>Temperature (operating)</b> 32° to 158° F (0° to 70° C)
		<b>Relative Humidity (operating)</b> 5% to 95%
		<b>Maximum Wet Bulb Temperature (operating)</b> 104° F (40° C)
	<b>Operating systems supported</b>	Windows® 7 Home Basic 32-bit, Windows 7 Home Premium 32- and 64-bit, Windows 7 Professional 32- and 64-bit, Windows XP Professional 32-bit, Windows XP Professional x64 or Windows XP Home. No driver is required for this device, although the HP-tested driver is recommended. Native support is provided by the operating system.
	<b>Regulations</b>	UL, CSA, EN60950-1:2006, CISPR Pub 22 Class B, CNS 13438, AS/NZS CISPR 22:2002 Class B~~
	<b>Option kit contents</b>	512 GB SSD M.2, documentation
	<b>Compatibility</b>	ZBook 15, 17 G3

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

<b>HP 1 TB PCI-E 3x4 NVME 2280 M.2 Solid State Drive</b>	<b>Capacity*</b>	1 TB	
	<b>Interface type</b>	PCIe NVMe Gen3X4	
	<b>Form Factor</b>	M.2 2280	
	<b>Dimensions-external (W x H x D)</b>	0.87 x 0.14 in (22 x 3.65 mm)	
	<b>Weight</b>	0.02 lb (10 g)	
	<b>Internal transfer rate</b>	<b>Sequential Write speed</b>	2,400 MB/s
		<b>Sequential Read speed</b>	1,500 MB/s
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b>	
	<b>Power</b>	<b>DC power requirement</b>	
		<b>Total power consumption</b>	
		<b>Nominal voltage</b>	+3.3 V
		<b>Temperature (operating)</b>	0 to 70 C
	<b>Environmental (all conditions, non- condensing)</b>	<b>Relative Humidity (operating)</b>	5 to 95 %
		<b>Maximum Wet Bulb Temperature (operating)</b>	35 C
		<b>Operating systems supported</b>	Win 7 Pro 64, Win 10 Home 64 Chinese Market CPPP Win 10 Home 64 High-end Win 10 Home 64 High-end Chinese Market Win 10 Home 64 High-end Single Language Win 10 Pro 64 Win 10 Pro 64 Downgrade Win 7 64 FreeDOS 2.0
	<b>Regulations</b>	RoHS	
		UL	
		CSA	
		EN 60950-1	
		FCC	
		AS/ NZ CISPR	
		BSMI	
KCC			
CE			
<b>Option kit contents</b>	HP 1 TB Solid State Drive 2280 M.2 PCI-E 3x4 NVME, documentation		
<b>Compatibility</b>	ZBook 15U G3		
	ZBook 15 G3		
	ZBook 15 Studio G3		
	ZBook 17 G3		

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

#### HP 256GB Value 2280 SATA3 M.2 SSD

<b>Capacity*</b>	256 GB	
<b>NAND Flash Memory</b>	Flash 5st Generation. 1T ODP 8CE NAND Density	
<b>Interface type</b>	SATA 6 Gb/sec (Partially Complies with revision 3.2)	
<b>Dimensions-external (H x W x L)</b>	0.09 x 0.86 x 3.1 in (0.23 x 2.2 x 8 cm)	
<b>Weight</b>	0.01 lb (8 g)	
<b>Internal transfer rate</b>	<b>Write speed</b>	Up to 515 MB/s
	<b>Read speed</b>	Up to 535 MB/s
<b>Power</b>	<b>Supply Voltage</b>	3.3V ± 5%
	<b>Voltage Ripple/Noise (max.)</b>	100mV p-p
<b>Environmental (all conditions, non- condensing)</b>	<b>Temperature (operating)</b>	0 ~ 70 °C
	<b>Relative Humidity (non- condensing)</b>	5% to 95%
	<b>Shock (1/2 sine pulse)</b>	1,500 G (0.5ms)
<b>Regulations</b>	CE Comunaute Europeenne, BSMI Bureau of Standards, Metrology and Inspection, KCC Korea Communications commission, VCCI Voluntary Control Council for Interference, C-Tick Radio Telecommunication Labeling, FCC Federal Communications Commission, IC Industry Canada, UL Underwriters Laboratories, Inc., TUV Technischer Uberwachungs Verine e.V, CB Scheme of the IECEE for Mutual Recognition of Test Certificates for Electrical Equipment	
<b>Option kit contents</b>	HP 256GB SSD M.2, documentation	
<b>Compatibility</b>	HP ProBook 430, 440, 450, 470 G4	

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

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#### HP 256GB TLC 2280 SATA3 M. 2 SSD

<b>Capacity*</b>	256 GB
<b>NAND Flash Memory</b>	Flash 1st Generation. 4T HDP 16CE, 2T ODP 8CE, 1T QDP 4CE NAND Density
<b>Interface type</b>	SATA 6 Gb/sec (Partially Complies with revision 3.2)
<b>Dimensions-external (H x W x L)</b>	0.09 x 0.86 x 3.1 in (0.23 x 2.2 x 8 cm)
<b>Weight</b>	0.01 lb (9 g)
<b>Internal transfer rate</b>	<b>Write speed</b> Up to 515 MB/s <b>Read speed</b> Up to 530 MB/s
<b>Power</b>	<b>Supply Voltage</b> 3.3V ± 5% <b>Voltage Ripple/Noise (max.)</b> 100mV p-p
<b>Environmental (all conditions, non- condensing)</b>	<b>Temperature (operating)</b> 0 ~ 70 °C <b>Humidity (non-condensing)</b> 5% to 95% <b>Linear Shock (1/2 sine pulse)</b> 1,500 G (0.5ms)
<b>Regulations</b>	CE Comunaute Europeenne, BSMI Bureau of Standards, Metrology and Inspection, KCC Korea Communications commission, VCCI Voluntary Control Council for Interference, C-Tick Radio Telecommunication Labeling, FCC Federal Communications Commission, IC Industry Canada, UL Underwriters Laboratories, Inc., TUV Technischer Uberwachungs Verine e.V, CB Scheme of the IECEE for Mutual Recognition of Test Certificates for Electrical Equipment
<b>Option kit contents</b>	HP 256GB SSD M.2, documentation
<b>Compatibility</b>	HP ProBook 430, 440, G3, 640, 650 G2 HP EliteBook 840, 850, G3

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

<b>HP 256GB TLC PCI-e 3x4 NVMe M.2 SSD</b>	<b>Capacity*</b>	256 GB		
	<b>Interface type</b>	PCI-E		
	<b>Dimensions-external</b> (H x W x L)	0.86 x 3.14 x 0.09 in (2.2 x 8 x 0.23 cm)		
	<b>Weight</b>	0.01 lb (8 g)		
	<b>Internal transfer rate</b>	<b>Write speed</b>	Up to 515 MB/s	
		<b>Read speed</b>	Up to 535 MB/s	
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b>		
	<b>Power</b>	<b>DC power requirement</b>	3.3V	
		<b>Total power consumption</b>	80mW in active mode	
	<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature</b> (operating)	0 ~ 70 °C	
		<b>Relative Humidity</b> (non-condensing)	5% to 95%	
	<b>Operating systems supported</b>	Windows 8, 8.1, 10		
	<b>Regulations</b>	CE Comunaute Europeenne, BSMI Bureau of Standards, Metrology and Inspection, KCC Korea Communications commission, VCCI Voluntary Control Council for Interference, C-Tick Radio Telecommunication Labeling, FCC Federal Communications Commission, IC Industry Canada, UL Underwriters Laboratories, Inc., TUV Technischer Uberwachungs Verine e.V, CB Scheme of the IECCE for Mutual Recognition of Test Certificates for Electrical Equipment		
	<b>Option kit contents</b>	M.2 Drive, Product Notice, Warranty		
<b>Compatibility</b>	HP EliteBook 840/850 G4, 720 G4, 820 G4, 745/755 G4 HP ProBook 640/650/645/655 G3			

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

<b>HP 512GB TLC PCI-e 3x4 NVMe M.2 SSD</b>	<b>Capacity*</b>	512 GB		
	<b>Interface type</b>	PCI-E		
	<b>Form Factor</b>	M2		
	<b>Dimensions-external</b> (H x W x L)	0.86 x 3.14 x 0.09 in (2.2 x 8 x 0.23 cm)		
	<b>Weight</b>	0.01 lb (8 g)		
	<b>Internal transfer rate</b>	<b>Write speed</b>	Up to 515 MB/s	
		<b>Read speed</b>	Up to 535 MB/s	
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b>		
	<b>Power</b>	<b>DC power requirement</b>	3.3V	
		<b>Total power consumption</b>	80mW in active mode	
	<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature</b> (operating)	0 ~ 70 °C	
		<b>Relative Humidity</b> (non-condensing)	5% to 95%	
	<b>Operating systems supported</b>	Windows 8, 8.1, 10		
	<b>Regulations</b>	CE Comunaute Europeenne, BSMI Bureau of Standards, Metrology and Inspection, KCC Korea Communications commission, VCCI Voluntary Control Council for Interference, C-Tick Radio Telecommunication Labeling, FCC Federal Communications Commission, IC Industry Canada, UL Underwriters Laboratories, Inc., TUV Technischer Uberwachungs Verine e.V, CB Scheme of the IECEE for Mutual Recognition of Test Certificates for Electrical Equipment		
<b>Option kit contents</b>	M.2 Drive, Product Notice, Warranty			
<b>Compatibility</b>	HP EliteBook 840/850 G4, 720 G4, 820 G4, 745/755 G4 HP ProBook 640/650/645/655 G3			

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.



### Technical Specifications

<b>HP 512GB TLC 2.5 SSD</b>	<b>Capacity*</b>	512 GB
	<b>Interface type</b>	SATA
	<b>Form Factor</b>	2280 Double Sided
	<b>Dimensions-external</b> (H x W x L)	80.15 x 22.15 x 2.38 (mm)
	<b>Weight</b>	0.21 lb (10 g)
	<b>Internal transfer rate</b>	<b>Sequential Write speed</b> 515MB/s for sequential write speed
		<b>Read speed</b> 530MB/s for sequential read
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b>
	<b>Power</b>	<b>DC power requirement</b> 5V
		<b>Total power consumption</b> 90mW in active mode
	<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature (operating)</b> 0 ~ 70 degree C
		<b>Relative Humidity (operating)</b> 5% to 95%
		<b>Maximum Wet Bulb Temperature</b> 104° F (40° C)
	<b>Operating systems supported</b>	
<b>Regulations</b>		
<b>Option kit contents</b>	512 GB SSD, documentation	
<b>Compatibility</b>		

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

#### HP 128 GB TLC 2280 Solid State Drive

<b>Capacity*</b>	128 GB
<b>Interface type</b>	SATA
<b>Form Factor</b>	2280 Double Sided
<b>Dimensions-external (H x W x L)</b>	80.15 x 22.15 x 2.38 (mm)
<b>Weight</b>	0.21 lb (10 g)
<b>Internal transfer rate</b>	<b>Sequential Write speed</b> 515MB/s for sequential write speed <b>Read speed</b> 530MB/s for sequential read
<b>Host transfer rate</b>	<b>Ultra DMA mode</b>
<b>Power</b>	<b>DC power requirement</b> 3.3V <b>Total power consumption</b> 80mW in active mode
<b>Environmental (all conditions, non- condensing)</b>	<b>Temperature (operating)</b> 0 ~ 70 degree C <b>Relative Humidity (operating)</b> 5% to 95% <b>Maximum Wet Bulb Temperature (operating)</b> 104° F (40° C)
<b>Operating systems supported</b>	
<b>Regulations</b>	
<b>Option kit contents</b>	128 GB SSD, documentation
<b>Compatibility</b>	

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

<b>HP 256 GB SED TLC SATA-3 SSD</b>	<b>Capacity*</b>	256 GB	
	<b>Interface type</b>	SATA-3	
	<b>Form Factor</b>	2280	
	<b>Dimensions-external (H x W x L)</b>	80 x 22 x 2.38 (mm)	
	<b>Weight</b>	0.02 lb (9 g)	
	<b>Internal transfer rate</b>	<b>Sequential Write speed</b>	Up to 515 MB/s
		<b>Read speed</b>	Up to 530 MB/s
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b>	
	<b>Power</b>	<b>DC power requirement</b>	3.3V +- 5%
		<b>Total power consumption</b>	100mW Active Power
		<b>Nominal voltage</b>	+3.3 VOLTS
	<b>Environmental (all conditions, non-condensing)</b>	<b>Temperature (operating)</b>	0 TO 70 °C
		<b>Relative Humidity (operating)</b>	5 to 95 %
		<b>Maximum Wet Bulb Temperature (operating)</b>	40 °C
	<b>Operating systems supported</b>	Win 7 Pro 64,	
		Win 10 Home 64 Chinese Market CPPP	
		Win 10 Home 64 High-end	
		Win 10 Home 64 High-end Chinese Market	
		Win 10 Home 64 High-end Single Language	
		Win 10 Pro 64	
Win 10 Pro 64 Downgrade Win 7 64			
FreeDOS 2.0			
<b>Regulations</b>	RoHS		
	UL		
	CSA		
	EN 60950-1		
	FCC		
	AS/ NZ CISPR		
	BSMI		
	KCC		
CE			
	CISPR 22 - Class B		
<b>Option kit contents</b>			
<b>Compatibility</b>			

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

<b>HP 512GB TLC SATA-3 M.2 SSD</b>	<b>Capacity*</b>	512 GB
	<b>Interface type</b>	SATA-3
	<b>Form Factor</b>	M.2 2280
	<b>Dimensions-external (H x W x L)</b>	80 x 22 x 2.38 (mm)
	<b>Weight</b>	0.02 lb (9 g)
	<b>Internal transfer rate</b>	<b>Sequential Write speed</b> Up to 515 MB/s
		<b>Read speed</b> Up to 530 MB/s
	<b>Host transfer rate</b>	<b>Ultra DMA mode</b>
	<b>Power</b>	<b>DC power requirement</b> 3.3V +- 5%
		<b>Total power consumption</b> 100mW Active Power
		<b>Nominal voltage</b> +3.3 VOLTS
	<b>Environmental (all conditions, non-condensing)</b>	<b>Temperature (operating)</b> 0 TO 70 °C
		<b>Relative Humidity (operating)</b> 5 to 95 %
		<b>Maximum Wet Bulb Temperature (operating)</b> 40 °C
	<b>Operating systems supported</b>	Win 7 Pro 64, Win 10 Home 64 Chinese Market CPPP Win 10 Home 64 High-end Win 10 Home 64 High-end Chinese Market Win 10 Home 64 High-end Single Language Win 10 Pro 64 Win 10 Pro 64 Downgrade Win 7 64 FreeDOS 2.0
	<b>Regulations</b>	RoHS UL CSA EN 60950-1 FCC AS/ NZ CISPR BSMI KCC CE CISPR 22 - Class B
	<b>Option kit contents</b>	
	<b>Compatibility</b>	

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 167 GB is user available.

### Technical Specifications

#### Spares Information

<b>Optical Drives</b>	HP External USB DVD/RW	TBD
	HP Upgrade Bay -- SuperMulti (DL) DVD+/-RW SATA Drive	375197-001

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<b>Removable Hard Drives</b>	HP 2011 Upgrade Bay 500 GB Hard Drive	657405-001 (drive)
		657406-001 (cradle)
		657407-001 (bezel kit)

**Note:** GB = 1 billion bytes. Actual formatted capacity is less. Up to 465 GB is user available.

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#### Service and Support

Each HP Storage Solution carries a one-year limited warranty. Additional support is available 24 hours a day, seven days a week by phone as well as online support forums.

**Note:** Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details.

### Summary of Changes

<b>Date of change:</b>	<b>Version 1 to 2</b>		<b>Description of change:</b>
June 5, 2014	v30to v30.1	Added	SSDs and updated the compatibility section
July 1, 2014	v30.1 to v31	Updated	Updated HP 500 GB 7200rpm specs for height
July 30, 2014	v31 to v32	Added	HP 256 GB SED Opal 2 Solid State Drive
January 27, 2015	v32 to v33	Added	HP 1TB 7200rpm Primary SATA Hard Drive and HP 256 GB Solid State Drive M.2 2260 Added new disclaimers
February 6, 2015	v33	Removed	HP 2011 Upgrade Bay 500 GB Hard Drive and HP 256 GB SED Solid State Drive
February 23, 2015	v33 to v34	Added	HP 256 GB Solid State Drive TLC 2.5"
November 17, 2015	v34 to v35	Added	HP 240 GB Solid State Drive
		Updated	Legal disclaimer Storage disclaimer
January 20, 2016	v35 to v36	Added	HP 256 GB M.2 PCIe NVMe Solid State Drive V3K66AA HP 512 GB M.2 PCIe NVMe Solid State Drive V3K67AA
April 1, 2016	v36 to v37	Added	HP 1 TB Solid State Drive 2280 M.2 PCI-E 3x4 NVME
January 26, 2017	V37 to 38	Added	HP 256GB Value 2280M2 SATA3 SSD, 1DE47AA HP 256GB TLC 2280M2 SATA3 SSD, 1DE48AA
April 18, 2017	V38 to 39	Added  Removed	HP 256GB TLC PCI-e 3x4 NVMe M.2 SSD 1FU87AA HP 512GB TLC PCI-e 3x4 NVMe M.2 SSD 1FU88AA HP 240 GB Solid State Drive 2.5" T3Y75AA HP 256 GB SED Opal 2 Solid State Drive 2.5" K1Z11AA HP 512 GB Solid State Drive 2.5" J2V75AA
June 29, 2017	V39 to V40	Added	HP 512GB TLC 2.5 SSD - 2JB96AA & HP 128 GB TLC 2280 M.2 SSD - 2JB95AA added
January 2, 2018	V40 to V41	Added	HP 256GB SED TLC SATA- 3 M.2 SSD 3JP90AA HP 512GB TLC SATA- 3 M.2 SSD 3JP91AA
October 10, 2019	V41 to V42	Removed	M.2 references removed from HP 512GB TLC 2.5 SSD and HP 128 GB TLC 2280 Solid State Drive specs
October 25 2019	V42 to V43	Removed	M.2 references completely removed from HP 512GB TLC 2.5 SSD and HP 128 GB TLC 2280 Solid State Drive specs

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