![HP logo]

HP Z230 Tower Intel® Core™ i5 i5-4670 8 GB DDR3-SDRAM 1 TB HDD NVIDIA® Quadro® K600 Windows 7 Professional Mini Tower Workstation Black

Brand : HP

Product code: F3F51PA

Product name : Z230 Tower

Intel Core i5-4670 (3.4GHz, 6MB cache, 4 cores), Intel PCH C226, 8GB 1600MHz DDR3 non-ECC, 1TB 7200 rpm SATA, NVIDIA Quadro K600, Intel HD Graphics 4600, SATA SuperMulti DVD, Gigabit Ethernet, Windows 7 Professional 64-bit/Windows 8 Pro 64-bit
HP Z230 Tower. Processor frequency: 3.4 GHz, Processor family: Intel® Core™ i5, Processor: i5-4670. Internal memory: 8 GB, Internal memory type: DDR3-SDRAM, Memory clock speed: 1600 MHz. Total storage capacity: 1 TB, Storage media: HDD, Optical drive: DVD Super Multi. On-board graphics card model: Intel® HD Graphics 4600, Discrete graphics card model: NVIDIA® Quadro® K600. Operating system installed: Windows 7 Professional, Operating system architecture: 64-bit. Power supply: 400 W. Product type: Workstation

Processor

Processor manufacturer *	Intel
Processor family *	Intel® Core™ i5
Processor generation	4th gen Intel® Core™ i5
Processor *	i5-4670
Processor number of cores	4
Processor threads	4
Processor boost frequency	3.8 GHz
Processor frequency *	3.4 GHz
Processor socket	LGA 1150 (Socket H3)
Processor cache	6 MB
Processor cache type	Smart Cache
Bus type	QPI
FSB Parity	✘
Processor lithography	22 nm
Processor operating modes	64-bit
Processor series	Intel Core i5-4600 Desktop series
Processor codename	Haswell
Thermal Design Power (TDP)	84 W
Tcase	72.72 °C
PCI Express slots version	3.0
Maximum number of PCI Express lanes	16
PCI Express configurations	1x16, 2x8, 1x8+2x4
Number of processors installed	1
Number of QPI links	1
Stepping	C0
Maximum internal memory supported by processor	32 GB
Memory types supported by processor	DDR3-SDRAM
Memory clock speeds supported by processor	1333,1600 MHz
Memory bandwidth supported by processor (max)	25.6 GB/s
ECC supported by processor	✘

Memory

Internal memory *	8 GB
Internal memory type	DDR3-SDRAM
Memory layout (slots x size)	2 x 4 GB
Memory slots	4x DIMM

Design

Product colour *	Black
Country of origin	China

Performance

Chipset	Intel® C226
Product type *	Workstation

Software

Operating system installed *	Windows 7 Professional
Operating system architecture	64-bit
Recovery operating system	Windows 8 Pro

Processor special features

Intel® Small Business Advantage (Intel® SBA)	✘
Intel Wireless Display (WiDi) Technology	✔
Intel 64	✔
Enhanced Intel SpeedStep Technology	✔
Embedded options available	✘
Intel® InTru™ 3D Technology	✔
Intel® Insider™	✔
Intel Clear Video HD Technology	✔
Intel Clear Video Technology	✘
Intel VT-x with Extended Page Tables (EPT)	✔
Intel TSX-NI	✘
Idle States	✔
Thermal Monitoring Technologies	✔
Intel Stable Image Platform Program (SIPP)	✔
Intel AES New Instructions	✔
Intel® Secure Key	✔
Intel® OS Guard	✔
Intel Trusted Execution Technology	✔
Execute Disable Bit	✔
Intel FDI Technology	✔
Intel Flex Memory Access	✘
Intel Fast Memory Access	✘

Memory

Memory clock speed	1600 MHz
Non-ECC	✔
Memory channels	Dual-channel

Storage

Total storage capacity *	1 TB
Storage media *	HDD
Optical drive *	DVD Super Multi
Number of HDDs installed	1
Hard drive capacity	1 TB
Hard drive interface	SATA
Hard drive rotational speed	7200 RPM

Graphics

On-board graphics card *	✔
Discrete graphics card model *	NVIDIA® Quadro® K600
Discrete graphics card memory	1 GB
On-board graphics card family	Intel® HD Graphics
On-board graphics card model *	Intel® HD Graphics 4600
On-board graphics card base frequency	350 MHz
On-board graphics card dynamic frequency (max)	1200 MHz
Maximum on-board graphics card memory	1.74 GB
Number of displays supported (on-board graphics)	3
On-board graphics card DirectX version	11.1
On-board graphics card ID	0x412

Network

Ethernet LAN connection *	✔
Ethernet LAN data rates	10,100,1000 Mbit/s
Cabling technology	10/100/1000Base-T(X)
Wi-Fi *	✘

Ports & interfaces

USB 2.0 ports quantity *	6
USB 3.2 Gen 1 (3.1 Gen 1) Type-A ports quantity *	4
DVI port	✘
PS/2 ports quantity	2
Ethernet LAN (RJ-45) ports	1
Microphone in	✔
Headphone outputs	1
Line-out	✔
Line-in	✔

Expansion slots

PCI Express x1 (Gen 2.x) slots	1
PCI Express x4 (Gen 2.x) slots	1
PCI Express x16 (Gen 2.x) slots	1
PCI Express x16 (Gen 3.x) slots	1

Design

Form factor *	Mini Tower
Water cooling system	✘
Number of 3.5" bays	2
Number of 5.25" bays	2
Number of 2.5" bays	1

Processor special features

Intel® Smart Cache	✔
Intel Enhanced Halt State	✔
Intel Demand Based Switching	✘
Intel Clear Video Technology for MID	✘
Processor package size	37.5 x 37.5 mm
Supported instruction sets	AVX 2.0, SSE4.1, SSE4.2
Processor code	SR14D
Scalability	1S
CPU configuration (max)	1
Graphics & IMC lithography	22 nm
Thermal solution specification	PCG 2013D
Intel Virtualization Technology for Directed I/O (VT-d)	✔
Intel Identity Protection Technology version	1.00
Intel Stable Image Platform Program (SIPP) version	1.00
Intel Secure Key Technology version	1.00
Intel Virtualization Technology (VT-x)	✔
Intel Small Business Advantage (SBA) version	1.00
Intel TSX-NI version	0.00
Intel Dual Display Capable Technology	✔
Intel Rapid Storage Technology	✘
Processor ARK ID	75047
Intel® Smart Response Technology	✘
Intel® Rapid Start Technology	✘
Intel Turbo Boost Technology	2.0
Intel Smart Connect Technology	✘
Intel Hyper-Threading Technology	✘
Intel® Quick Sync Video Technology	✔
Intel My WiFi Technology	✔
Intel Identity Protection Technology	✔
Intel Anti-Theft Technology	✔
Conflict-Free processor	✔

Power

Power supply *	400 W

Weight & dimensions

Width *	170 mm
Depth *	442 mm
Height *	399 mm
Weight *	8.8 kg

Packaging content

Mouse included	✘
Keyboard included	✘

Display

Display included *	✘

Other features

Optical drives quantity	1

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