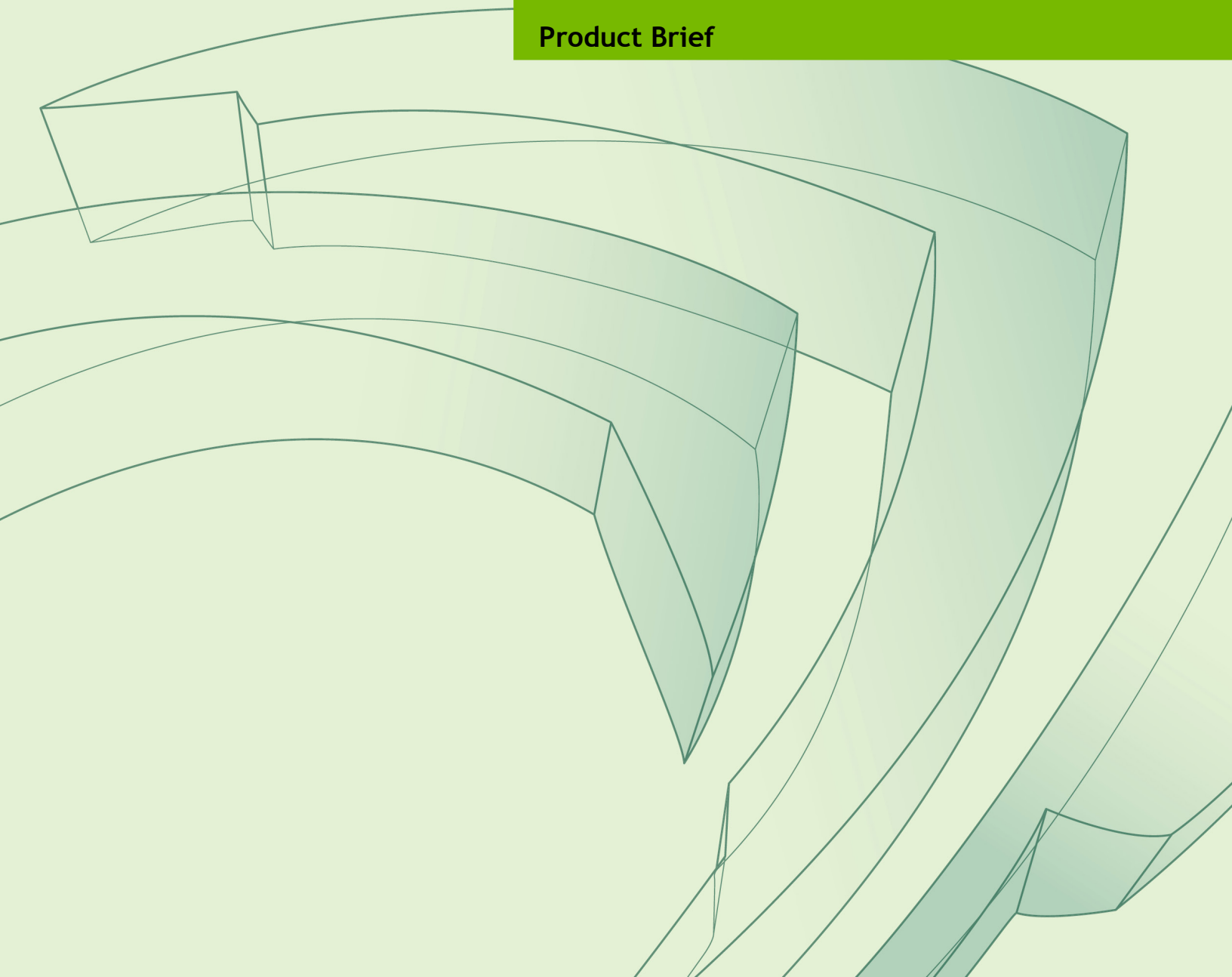




TESLA P40 GPU ACCELERATOR

PB-08338-001_v01 | November 2016

Product Brief



DOCUMENT CHANGE HISTORY

PB-08338-001_v01

Version	Date	Authors	Description of Change
01	November 29, 2016	WT, SM	Initial Release

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OVERVIEW

The NVIDIA® Tesla® P40 GPU Accelerator is a dual-slot 10.5 inch PCI Express Gen3 graphics card based on a high-end NVIDIA® Pascal™ graphics processing unit (GPU). The Tesla P40 GPU Accelerator has 24 GB GDDR5 memory and a 250 W maximum power limit.

The Tesla P40 GPU Accelerator is offered as a 250 W passively cooled board that requires system air flow to properly operate the card within its thermal limits. It is designed for single precision GPU compute tasks as well as to accelerate graphics in virtual remote workstation environments. A new feature of the Tesla P40 GPU Accelerator is the support of the “INT8” instruction which is optimized for deep learning inference. As a result, Tesla P40 delivers 47 TOPS (Tera-operations per second) of inference performance which enable high throughput and real-time inference services.

In addition, deep learning models today are trained on GPU servers but typically deployed in separate cluster for inference. The Tesla P40 dramatically simplifies operations such that the same server can now be used for both high performance training and inference.

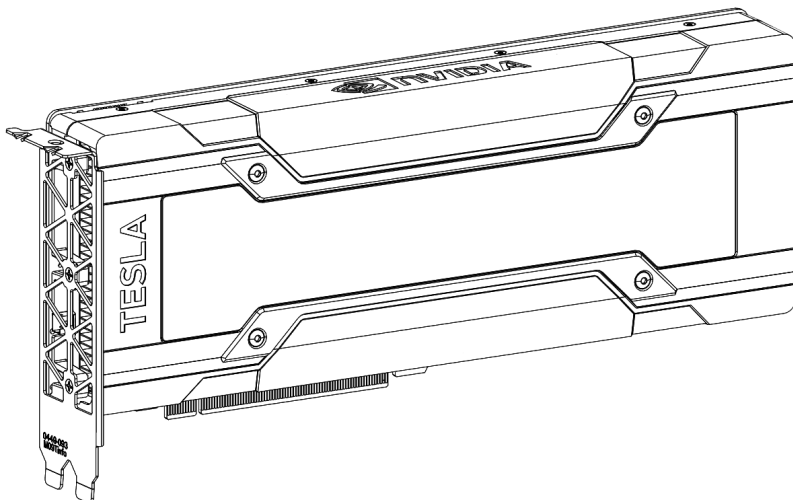


Figure 1. NVIDIA Tesla P40 Board

AIRFLOW DIRECTION SUPPORT

The Tesla P40 board supports bidirectional airflow. The following diagrams illustrate the airflow options supported.

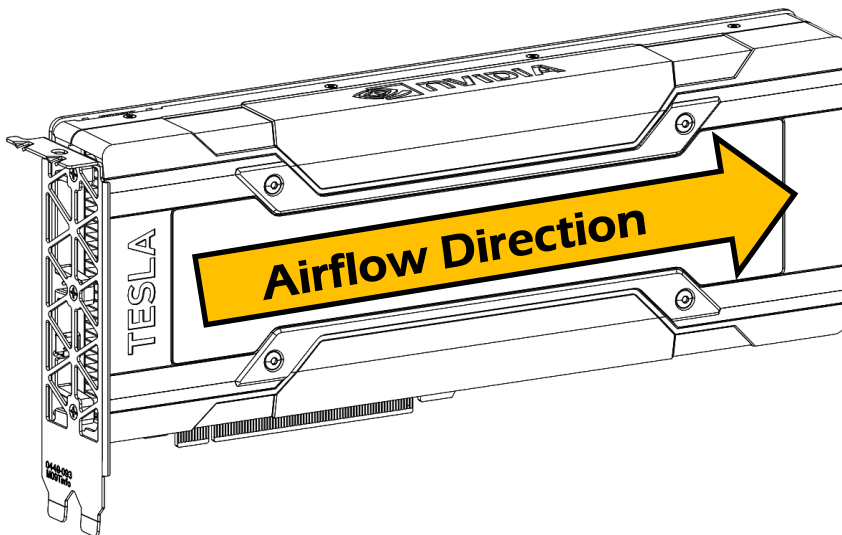


Figure 2. Tesla P40 (PG610 SKU 200): Left-to-Right Airflow

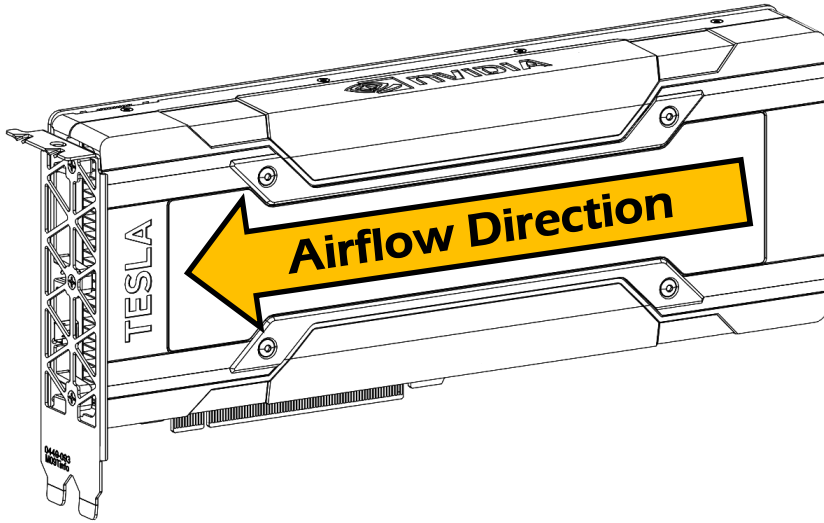


Figure 3. Tesla P40 (PG610 SKU 200): Right-to-Left Airflow

SPECIFICATIONS

PRODUCT SPECIFICATIONS

Table 1 provides the product specifications for the Tesla P40 board.

Table 1. Product Specifications

Specification		Description
Product SKU		PG610 SKU 200 NVPN: 699-2G610-0200-100
Total board power		250 W
GPU SKU		GP102-895-A1
PCI identifiers		Device ID: 0x1B38 Vendor ID: 0x10DE Sub-Vendor ID: 0x10DE Sub-System ID: 0x11D9
NVIDIA® CUDA® cores		3840
GPU clocks	Base	1303 MHz
	Boost	1531 MHz
VBIOS	EEPROM size	4 Mbit
	UEFI	Supported
PCI Express interface		PCI Express 3.0 ×16 Lane and polarity reversal supported
Thermal cooling solution		Passive
Physical dimensions		NVIDIA Form Factor 3.0 compliant 4.376 inches × 10.5 inches, dual-slot
Power connectors and headers		One CPU 8-pin auxiliary power connector
Weight	Board	968 Grams (excluding bracket and extenders)
	Bracket with screws	20 Grams

Specification		Description
	Long offset extender	52 Grams
	Straight extender	42 Grams

Table 2 provides the memory specifications for the Tesla P40 board.

Table 2. Memory Specifications

Specification		Description
Memory clocks	Performance	3615 MHz
	Idle	405 MHz
Memory size		24 GB
Memory I/O		384-bit
Memory configuration		24 pcs 512M × 16 GDDR5
Memory bandwidth		Up to 347 GB/s

Table 3 provides the software specifications for the Tesla P40 board.

Table 3. Software Specifications

Specification	Description
Compatibility modes supported	Compute (default) Graphics
Base address	BAR0: 16 MB BAR1: 32 GB (Compute) or 256 MB (Graphics) BAR3: 32 MB I/O BAR: 4 KB (Graphics only)
PCI class code	0x03 - Display controller
PCI sub class codes	0x02 - 3D Controller (Compute) 0x00 - VGA-Compatible Controller (Graphics)
ECC support	Support configurable (enabled by default)
SMBus (8-bit address)	0x9E (write), 0x9F (read)
SMBus direct access	Supported
SMBPBI (SMBus Post Box Interface)	Supported

Table 4 provides the environment conditions specifications for the Tesla P40 board.

Table 4. Board Environmental and Reliability Specifications

Specification	Condition
Operating temperature	0 °C to 45 °C
Storage temperature	-40 °C to 75 °C
Operating humidity	5% to 95% relative humidity
Storage humidity	5% to 95% relative humidity
Mean time between failures (MTBF)	Uncontrolled environment: 703379.3 hours at 35 °C Controlled environment: 9913208.1 hours at 35 °C

FORM FACTOR

The NVIDIA Tesla P40 board conforms to the NVIDIA Form Factor 3.0 specification.

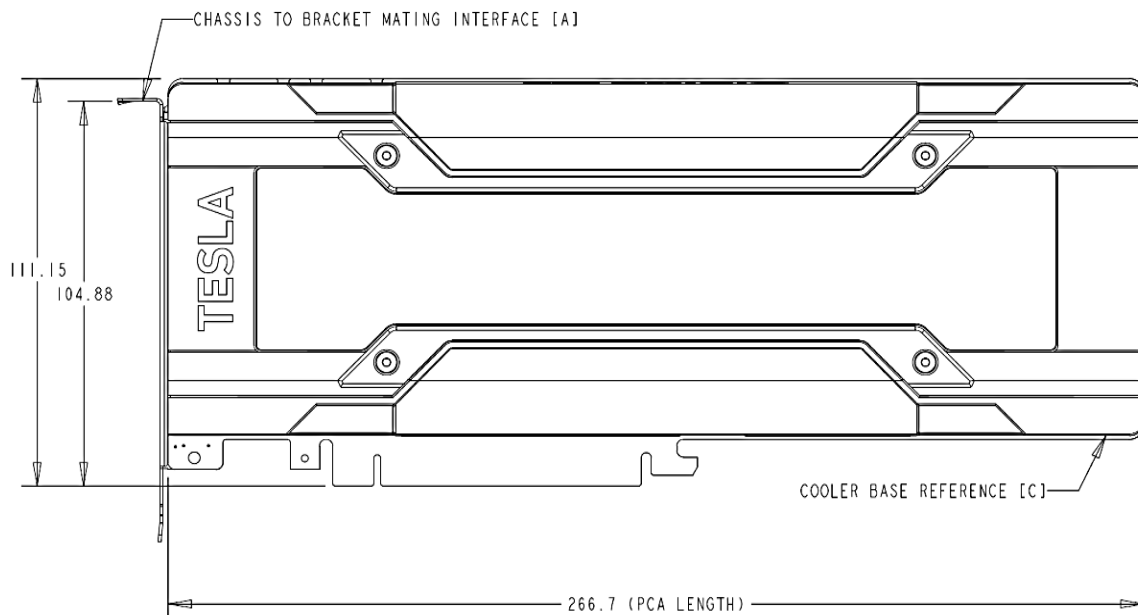


Figure 4. Tesla P40 Board Dimensions

POWER CONNECTOR PLACEMENT

The board provides a CPU 8-pin power connector on the East edge of the board.

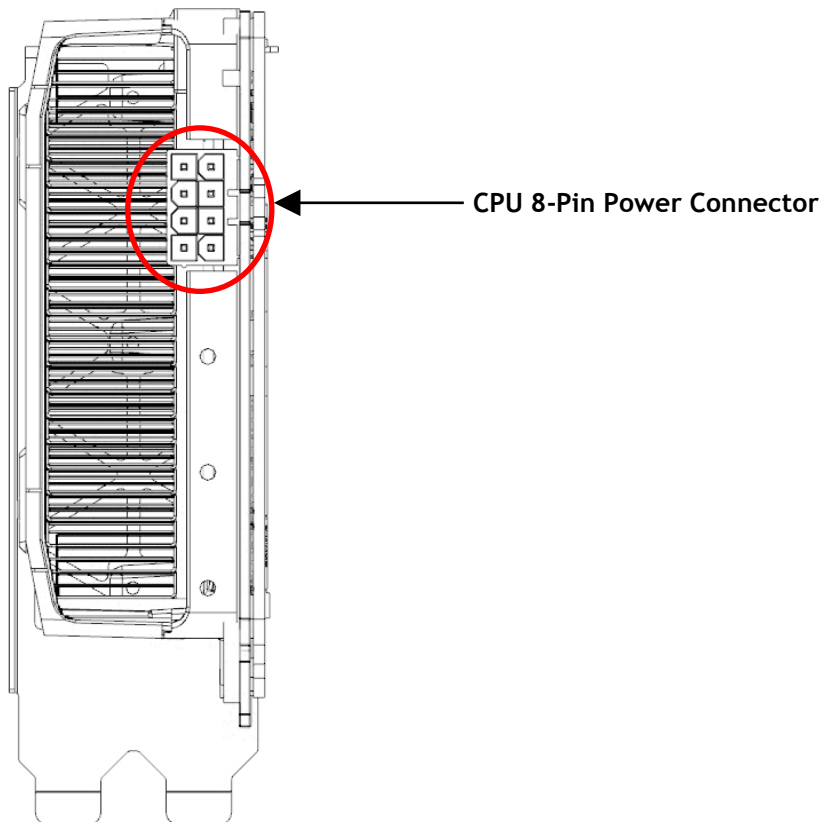


Figure 5. CPU 8-Pin Power Connector

Table 5 lists supported auxiliary power connections for the Tesla P40 board.

Table 5. Supported Auxiliary Power Connections

Board Connector	PSU Cable
CPU 8-pin	1x CPU 8-pin cable
CPU to PCIe 8-pin dongle	2x PCIe 8-pin cable 2x PCIe 6-pin cable ¹ 1x PCIe 8-pin cable and 1x PCIe 6-pin cable ¹

Notes:

¹Each PCIe 6-pin cable must be capable of carrying up to 50% of the average power and tolerate 50% of the peak currents.

CPU 8-Pin to PCIe 8-Pin Dongle

Figure 6 lists the pin assignments of the dongle.

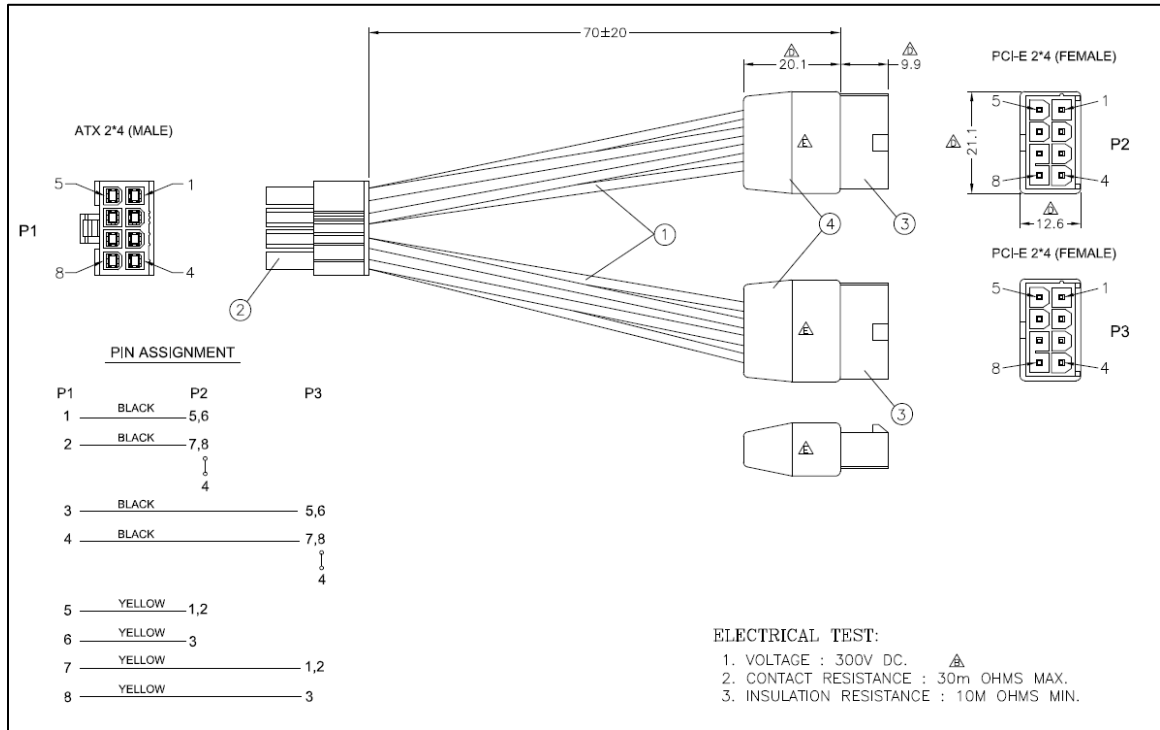


Figure 6. CPU 8-Pin to PCIe 8-Pin Dongle

SUPPORT INFORMATION

CERTIFICATES AND AGENCIES

Certifications

- ▶ Windows Hardware Quality Lab (WHQL):
 - Certified Windows 7, Windows 8.1, Windows 10
 - Certified Windows Server 2008 R2, Windows Server 2012 R2
- ▶ Ergonomic requirements for office work W/VDTs (ISO 9241)
- ▶ EU Reduction of Hazardous Substances (EU RoHS)
- ▶ Joint Industry guide (J-STD) / Registration, Evaluation, Authorization, and Restriction of Chemical Substance (EU) – (JIG / REACH)
- ▶ Halogen Free (HF)
- ▶ EU Waste Electrical and Electronic Equipment (WEEE)

Agencies

- ▶ Australian Communications and Media Authority and New Zealand Radio Spectrum Management (RCM)
- ▶ Bureau of Standards, Metrology, and Inspection (BSMI)
- ▶ Conformité Européenne (CE)
- ▶ Federal Communications Commission (FCC)
- ▶ Industry Canada - Interference-Causing Equipment Standard (ICES)
- ▶ Korean Communications Commission (KCC)
- ▶ Underwriters Laboratories (cUL, UL)
- ▶ Voluntary Control Council for Interference (VCCI)

LANGUAGES

Table 6. Languages Supported

Languages	Windows ¹	Linux
English (US)	Yes	Yes
English (UK)	Yes	Yes
Arabic	Yes	
Chinese, Simplified	Yes	
Chinese, Traditional	Yes	
Czech	Yes	
Danish	Yes	
Dutch	Yes	
Finnish	Yes	
French (European)	Yes	
German	Yes	
Greek	Yes	
Hebrew	Yes	
Hungarian	Yes	
Italian	Yes	
Japanese	Yes	
Korean	Yes	
Norwegian	Yes	
Polish	Yes	
Portuguese (Brazil)	Yes	
Portuguese (European/Iberian)	Yes	
Russian	Yes	
Slovak	Yes	
Slovenian	Yes	
Spanish (European)	Yes	
Spanish (Latin America)	Yes	
Swedish	Yes	
Thai	Yes	
Turkish	Yes	

Note:

¹Windows 7, Windows 8, Windows 8.1, and Windows 10 are supported.

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