



Intel® Core™ i7-4510U Processor (4M Cache, up to 3.10 GHz)

Specifications

- Essentials

Processor Number	i7-4510U
Status	Launched
Launch Date	Q2'14
Lithography	22 nm
Recommended Customer Price	\$393.00

- Performance

# of Cores	2
# of Threads	4
Processor Base Frequency	2.00 GHz
Max Turbo Frequency	3.10 GHz
Cache	4 MB SmartCache
Bus Speed	5 GT/s DMI2
TDP	15 W

- Supplemental Information









Embedded Options Available	 No
Datasheet	Link
Conflict Free	Yes

- Memory Specifications

Max Memory Size (dependent on memory type)	16 GB
Memory Types	DDR3L 1333/1600, LPDDR3 1333/1600
Max # of Memory Channels	2
Max Memory Bandwidth	25.6 GB/s
ECC Memory Supported ‡	 No

- Graphics Specifications

Processor Graphics ‡	Intel® HD Graphics 4400
Graphics Base Frequency	200.00 MHz
Graphics Max Dynamic Frequency	1.10 GHz
Graphics Video Max Memory	2 GB
Graphics Output	eDP/DP/HDMI/VGA
Max Resolution (HDMI 1.4)‡	3200x2000@60Hz
Max Resolution (DP)‡	3200x2000@60Hz
Max Resolution (VGA)‡	N/A
DirectX* Support	11.2/12
OpenGL* Support	4.3

Intel® Quick Sync Video		Yes
Intel® InTru™ 3D Technology		Yes
Intel® Flexible Display Interface (Intel® FDI)		Yes
Intel® Clear Video HD Technology		Yes
Intel® Wireless Display		Yes
# of Displays Supported ‡		3
Device ID		0xA16
- Expansion Options		
PCI Support		No
PCI Express Revision		2.0
PCI Express Configurations ‡		4x1, 2x4
Max # of PCI Express Lanes		12
- I/O Specifications		
USB Revision		3.0
# of USB Ports		4
Total # of SATA Ports		4
Integrated LAN		No
Integrated IDE		No
General Purpose IO		Yes
UART		Yes
Max # of SATA 6.0 Gb/s Ports		4
- Package Specifications		
Sockets Supported		FCBGA1168
Max CPU Configuration		1
T _{JUNCTION}		100°C
Package Size		40mm x 24mm x 1.5mm
Low Halogen Options Available		See MDDS
- Advanced Technologies		
Intel® Turbo Boost Technology ‡		2.0
Intel® vPro Technology ‡		No
Intel® Hyper-Threading Technology ‡		Yes
Intel® Virtualization Technology (VT-x) ‡		Yes
Intel® Virtualization Technology for Directed I/O (VT-d) ‡		No
Intel® VT-x with Extended Page Tables (EPT) ‡		Yes
Intel® TSX-NI		No
Intel® 64 ‡		Yes
Instruction Set		64-bit
Instruction Set Extensions		SSE4.1/4.2, AVX 2.0
Idle States		Yes
Enhanced Intel SpeedStep® Technology		Yes
Thermal Monitoring Technologies		Yes

Intel® ME Firmware Version	9.5
Intel® HD Audio Technology	Yes
Intel® Identity Protection Technology ‡	Yes
Intel® Rapid Storage Technology	Yes
Intel® Smart Connect Technology	Yes
- Intel® Data Protection Technology	
Intel® AES New Instructions	 Yes
Secure Key	Yes
- Intel® Platform Protection Technology	
Trusted Execution Technology ‡	 No
Execute Disable Bit ‡	Yes
Anti-Theft Technology	Yes

Ordering and Spec Information

Trade Compliance Information

ECCN	CCATS	US HTS
5A992CN3	G071701++	8542310000-HYBRD

Ordering and Spec Information

Spec Code	Ordering Code	Step	RCP
Intel® Core™ i7-4510U Processor (4M Cache, up to 3.10 GHz) FC-BGA12F, Tray			
SR1EB	CL8064701477301	D0	\$393.00

Download Drivers



Intel® Graphics Driver for Windows® 10 [15.40][4th Gen]

Installs Intel® Graphics Driver 15.40.28.4501 for Windows® 10

Version: 15.40.28.4501 (Latest) **Date:** 8/12/2016

Operating Systems: Windows® 10, 64-bit*



Intel® Graphics Driver for Windows 7*/8.1* [15.36]

Installs the Intel® Graphics Driver version 15.36.31.4414 for Windows 7* and Windows 8.1*.

Version: 15.36.31.4414 (Latest) **Date:** 5/13/2016

Operating Systems: Windows 7, 32-bit*, Windows 7, 64-bit*, Windows 8.1, 32-bit*, Windows 8.1, 64-bit*



BIOS Implementation Test Suite (BITS)

This download installs version build 2073 of the BIOS Implementation Test Suite (BITS).

Version: Build 2073 (Latest) **Date:** 2/2/2016

Operating Systems: OS Independent



Intel® Processor Diagnostic Tool

This download installs the Intel® Processor Diagnostic Tool release 3.0.0.25, which is compatible with multiprocessor systems.

Version: 3.0.0.25 (Latest) **Date:** 1/25/2016

Operating Systems: Linux*, Windows 7*, Windows Server 2008 R2*, 5 more



SCS200 User Guide

Intel® Industrial Solutions System Consolidation Series – SCS200 User Guide

Version: 1.0 (Latest) **Date:** 6/17/2015

Operating Systems: OS Independent



Intel® Graphics Driver for Windows® 10 [15.40][4th Gen]

Installs Intel® Graphics Driver 15.40.25.4463 for Windows® 10.

Version: 15.40.25.4463 **Date:** 6/17/2016
(Previously Released)

Operating Systems: Windows® 10, 64-bit*



Intel® Graphics Driver for Windows® 10 [15.40][4th Gen]

Downloads version 15.40.22.4424 of the Intel® Graphics Driver for Windows® 10.

Version: 15.40.22.4424 (Previously Released) **Date:** 4/29/2016

Operating Systems: Windows® 10, 64-bit*



Intel® Graphics Driver for Windows® 10 [15.40][4th Gen]

This driver (version 15.40.18.4380) for Windows® 10 fixes some hangs, graphics corruption, and functional issues seen across a number of games.

Version: 15.40.18.4380 (Previously Released) **Date:** 3/8/2016

Operating Systems: Windows® 10, 64-bit*



Intel® Graphics Driver for Windows 7*/8.1* [15.36]

This download installs the Intel® Graphics Driver version 15.36.28.4332 for Windows* 7 and Windows 8.1 supporting 4th and 5th Generation Intel® Core™ Processors.

Version: 15.36.28.4332 (Previously Released) **Date:** 12/11/2015

Operating Systems: Windows 7, 32-bit*, Windows 7, 64-bit*, Windows 8.1, 32-bit*, Windows 8.1, 64-bit*



Intel® Beta Graphics Driver for Windows® 10 and Windows 7*/8.1* [15.40]

This download installs Beta versions 15.40.12.64.4326 and 15.40.12.4326 of the graphics driver for Windows* 7/8.1/10.

Version: Beta 15.40.12.4326 (Previously Released) **Date:** 11/20/2015

Operating Systems: Windows 7, 32-bit*, Windows 7, 64-bit*, Windows 8.1, 32-bit*, 3 more



Intel® Graphics Driver for Windows® 10 [15.40][4th Gen]

This installer provides Intel® Graphics Driver version 15.40.10.4300 for the Windows® 10 operating system.

Version: 15.40.10.4300 (Previously Released) **Date:** 10/26/2015

Operating Systems: Windows® 10, 64-bit*



Intel® Graphics Driver for Windows 7*/8.1* [15.36]

This download installs version 15.36.26.4294 of the Intel® Graphics Driver for Windows* 7/ 8.1, 32 and 64-bit.

Version: 15.36.26.4294 (Previously Released) **Date:** 10/9/2015

Operating Systems: Windows 7, 32-bit*, Windows 7, 64-bit*, Windows 8.1, 32-bit*, Windows 8.1, 64-bit*



Intel® Graphics Driver for Windows® 10 [15.40][4th Gen]

This download installs version 15.40.7.64.4279 of the Intel® Graphics Driver for Windows* 10, 64-bit.

Version: 15.40.7.64.4279 (Previously Released) **Date:** 9/1/2015

Operating Systems: Windows® 10, 64-bit*



Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 64bit

This download installs the Intel® Iris™, Iris™ Pro and Intel® HD Graphics Driver version 15.36.24.64.4264 for Windows* 7/8/8.1, 64-bit

Version: 15.36.24.64.4264 (Previously Released) **Date:** 8/19/2015

Operating Systems: Windows 7, 64-bit*, Windows 8.1, 64-bit*



Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 32bit

Installs the Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 32-bit version 15.36.23.4264 (10.18.14.4264)

Version: 15.36.24.4264 (Previously Released) **Date:** 8/19/2015

Operating Systems: Windows 7, 32-bit*, Windows 8.1, 32-bit*



Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 64bit

This download installs version 15.36.23.64.4251 of the Intel® Iris™, Intel® Iris™ Pro, and Intel® HD Graphics Driver for Windows* 7/8/8.1, 64-bit.

Version: 15.36.23.64.4251 (Previously Released) **Date:** 7/27/2015


Operating Systems: Windows 7, 64-bit*, Windows 8, 64-bit*, Windows 8.1, 64-bit*





Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 32bit

Installs the Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 32-bit version 15.36.23.4251 (10.18.14.4251)

Version: 15.36.23.4251 (Previously Released) **Date:** 7/23/2015
Operating Systems: Windows 7, 32-bit*, Windows 8, 32-bit*, Windows 8.1, 32-bit*

 **Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 64bit**
This download installs version 15.36.21.64.4222 of the Intel® Iris™, Iris™ Pro and Intel® HD Graphics Driver for Windows* 7/8/8.1, 64-bit.
Version: 15.36.21.64.4222 (Previously Released) **Date:** 5/29/2015
Operating Systems: Windows 7, 64-bit*, Windows 8, 64-bit*, Windows 8.1, 64-bit*

 **Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 32bit**
Installs the Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 32-bit version 15.36.21.4222 (10.18.10.4222)
Version: 15.36.21.4222 (Previously Released) **Date:** 5/29/2015
Operating Systems: Windows 7, 32-bit*, Windows 8, 32-bit*, Windows 8.1, 32-bit*

 **Intel® Iris™, Iris™ Pro, and HD Graphics Driver for Windows* 7/8/8.1 64bit**
This download installs version 15.36.19.64.4170 of the Intel® Iris™ and HD Graphics Driver for Windows* 7/8/8.1, 64-bit.
Version: 15.36.19.64.4170 (Previously Released) **Date:** 4/10/2015
Operating Systems: Windows 7, 64-bit*, Windows 8, 64-bit*, Windows 8.1, 64-bit*

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Refer to Datasheet for formal definitions of product properties and features.

"Announced" SKUs are not yet available. Please refer to the Launch Date for market availability.

Some products can support AES New Instructions with a Processor Configuration update, in particular, i7-2630QM/i7-2635QM, i7-2670QM/i7-2675QM, i5-2430M/i5-2435M, i5-2410M/i5-2415M. Please contact OEM for the BIOS that includes the latest Processor configuration update.

‡ This feature may not be available on all computing systems. Please check with the system vendor to determine if your system delivers this feature, or reference the system specifications (motherboard, processor, chipset, power supply, HDD, graphics controller, memory, BIOS, drivers, virtual machine monitor-VMM, platform software, and/or operating system) for feature compatibility. Functionality, performance, and other benefits of this feature may vary depending on system configuration.

"Conflict free" and "conflict-free" means "DRC conflict free", which is defined by the U.S. Securities and Exchange Commission rules to mean products that do not contain conflict minerals (tin, tantalum, tungsten and/or gold) that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo (DRC) or adjoining countries. Intel also uses the term "conflict-free" in a broader sense to refer to suppliers, supply chains, smelters and refiners whose sources of conflict minerals do not finance conflict in the DRC or adjoining countries. Intel processors manufactured before January 1, 2013 are not confirmed conflict free. The conflict free designation refers only to product manufactured after that date. For Intel Boxed Processors, the conflict free designation refers to the processor only, not to any additional included accessories, such as heatsinks/coolers.

See <http://www.intel.com/content/www/us/en/architecture-and-technology/hyper-threading/hyper-threading-technology.html?wapkw=hyper+threading> for more information including details on which processors support Intel® HT Technology.

Max Turbo Frequency refers to the maximum single-core processor frequency that can be achieved with Intel® Turbo Boost Technology. See www.intel.com/technology/turboboost/ for more information.

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System and Maximum TDP is based on worst case scenarios. Actual TDP may be lower if not all I/Os for chipsets are used.

Low Halogen: Applies only to brominated and chlorinated flame retardants (BFRs/CFRs) and PVC in the final product. Intel components as well as purchased components on the finished assembly meet JS-709 requirements, and the PCB / substrate meet IEC 61249-2-21 requirements. The replacement of halogenated flame retardants and/or PVC may not be better for the environment.

For benchmarking data see <http://www.intel.com/performance>.

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See <http://www.intel.com/content/www/us/en/processors/processor-numbers.html> for details.

Processors that support 64-bit computing on Intel® architecture require an Intel 64 architecture-enabled BIOS.

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