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# Intel® Xeon® Processor E3-1515M v5

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- Specifications
  - Ordering Code: SC3120AKIT

- Essentials

SPEC Code: SR2PA

- Supplemental Information

Code Name: Kaby Lake

- Memory Specifications

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## Specifications

[Export specifications](#)

## Essentials

- Product Collection [Intel® Xeon® Processor E3 v5 Family](#)
- Code Name [Products formerly Skylake](#)
- Vertical Segment Mobile
- Processor Number E3-1515MV5
- Status Launched
- Launch Date Q1'16
- Lithography 14 nm
- Recommended Customer Price

## Performance

- # of Cores 4
- # of Threads 8
- Processor Base Frequency 2.80 GHz
- Max Turbo Frequency 3.70 GHz
- Cache 8 MB SmartCache
- Bus Speed 8 GT/s DMI3
- TDP 45 W
- Configurable TDP-down 35 W

## Supplemental Information

- Embedded Options Available Yes
- Conflict Free Yes
- Datasheet [View now](#)

[Learn how Intel is pursuing conflict-free technology.](#)

## Memory Specifications

- Max Memory Size (dependent on memory type) 64 GB
- Memory Types DDR4-2133, LPDDR3-1866, DDR3L-1600

- Max Memory Bandwidth 34.1 GB/s
- ECC Memory Supported ‡ Yes

## Graphics Specifications

- Processor Graphics ‡ Intel® Iris™ Pro Graphics P580
- Graphics Base Frequency 350 MHz
- Graphics Max Dynamic Frequency 1.00 GHz
- Graphics Video Max Memory 64 GB
- eDRAM 128 MB
- Graphics Output eDP/DP/HDMI/DVI
- 4K Support Yes, at 60Hz
- Max Resolution (HDMI 1.4)‡ 4096x2304@24Hz
- Max Resolution (DP)‡ 4096x2304@60Hz
- DirectX\* Support 12
- OpenGL\* Support 4.4
- Intel® Quick Sync Video Yes
- Intel® Clear Video HD Technology Yes
- # of Displays Supported ‡ 3
- Device ID 0x193D

[Optimize popular games to play on Intel Graphics](#)

## Expansion Options

- PCI Express Revision 3.0
- PCI Express Configurations ‡ Up to 1x16, 2x8, 1x8+2x4
- Max # of PCI Express Lanes 16

## Package Specifications

- Sockets Supported FCBGA1440
- Max CPU Configuration 1
- T<sub>JUNCTION</sub> 100°C
- Package Size 42mm x 28mm
- Low Halogen Options Available See MDDS

## Advanced Technologies

- Intel® Turbo Boost Technology ‡ 2.0
- Intel® vPro™ Technology ‡ Yes
- Intel® Hyper-Threading Technology ‡ Yes
- Intel® Virtualization Technology (VT-x) ‡ Yes
- Intel® Virtualization Technology for Directed I/O (VT-d) ‡ Yes
- Intel® VT-x with Extended Page Tables (EPT) ‡ Yes
- Intel® TSX-NI Yes
- 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® Flex Memory Access Yes
- Intel® Identity Protection Technology ‡ Yes
- Intel® Stable Image Platform Program (SIPP) Yes
- Intel® Smart Response Technology Yes

## Security & Reliability

- Intel® AES New Instructions Yes
- Secure Key Yes
- Intel® Software Guard Extensions (Intel® SGX) Yes
- Intel® Memory Protection Extensions (Intel® MPX) Yes
- OS Guard Yes
- Intel® Trusted Execution Technology ‡ Yes
- Execute Disable Bit ‡ Yes

## Ordering and Compliance

## Ordering and spec information

### Intel® Xeon® Processor E3-1515M v5 (8M Cache, 2.80 GHz) FC-BGA14F, Tray

- Spec Code SR2QT
- Ordering Code JQ8066202193208
- Step N0
- RCP

## Trade compliance information

- ECCN5A992C
- CCATSG077159
- US HTS8542310001

## PCN/MDDS Information

### SR2QT

- 948619 [PCN](#) | [MDDS](#)

## Launch Date

The date the product was first introduced.

## Lithography

Lithography refers to the semiconductor technology used to manufacture an integrated circuit, and is reported in nanometer (nm), indicative of the size of features built on the semiconductor.

## Recommended Customer

-unit purchase quantities, and are subject to change without notice. Prices may vary for other package types and shipment quantities. If sold in bulk, price represents individual unit. Listing of RCP does not constitute a formal pricing offer from Intel.

## # of Cores

Cores is a hardware term that describes the number of independent central processing units in a single computing component (die or chip).

## # of Threads

A Thread, or thread of execution, is a software term for the basic ordered sequence of instructions that can be passed through or processed by a single CPU core.

## Processor Base Frequency

Processor Base Frequency describes the rate at which the processor's transistors open and close. The processor base frequency is the operating point where TDP is defined. Frequency is measured in gigahertz (GHz), or billion cycles per second.

## Max Turbo Frequency

Max turbo frequency is the maximum single core frequency at which the processor is capable of operating using Intel® Turbo Boost Technology. Frequency is measured in gigahertz (GHz), or billion cycles per second.

## Cache

CPU Cache is an area of fast memory located on the processor. Intel® Smart Cache refers to the architecture that allows all cores to dynamically share access to the last level cache.

## Bus Speed

A bus is a subsystem that transfers data between computer components or between computers. Types include front-side bus (FSB), which carries data between the CPU and memory controller hub; direct media interface (DMI), which is a point-to-point interconnection between an Intel integrated memory controller and an Intel I/O controller hub on the computer's motherboard; and Quick Path Interconnect (QPI), which is a point-to-point interconnect between the CPU and the integrated memory controller.

Thermal Design Power (TDP) represents the average power, in watts, the processor dissipates when operating at Base Frequency with all cores active under an Intel-defined, high-complexity workload. Refer to Datasheet for thermal solution requirements.

## Configurable TDP-down

Configurable TDP-down is a processor operating mode where the processor behavior and performance is modified by lowering TDP and the processor frequency to fixed points. The use of Configurable TDP-down is typically executed by the system manufacturer to optimize power and performance. Configurable TDP-down is the average power, in watts, that the processor dissipates when operating at the Configurable TDP-down frequency under an Intel-defined, high-complexity workload.

## Embedded Options Available

Embedded Options Available indicates products that offer extended purchase availability for intelligent systems and embedded solutions. Product certification and use condition applications can be found in the Production Release Qualification (PRQ) report. See your Intel representative for details.

[Find products with Embedded Options Available](#)

## Conflict Free

“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.

## Max Memory Size (dependent on memory type)

Max memory size refers to the maximum memory capacity supported by the processor.

## Memory Types

Intel® processors come in four different types: a Single Channel, Dual Channel, Triple Channel, and Flex Mode.

## Max # of Memory Channels

The number of memory channels refers to the bandwidth operation for real world application.

## Max Memory Bandwidth

Max Memory bandwidth is the maximum rate at which data can be read from or stored into a semiconductor memory by the processor (in GB/s).

## ECC Memory Supported ‡

ECC Memory Supported indicates processor support for Error-Correcting Code memory. ECC memory is a type of system memory that can detect and correct common kinds of internal data corruption. Note that ECC memory support requires both processor and chipset support.

[Find products with ECC Memory Supported ‡](#)

## Processor Graphics ‡

Processor Graphics indicates graphics processing circuitry integrated into the processor, providing the graphics, compute, media, and display capabilities. Intel® HD Graphics, Iris™ Graphics, Iris Plus Graphics, and Iris Pro Graphics deliver enhanced media conversion, fast frame rates, and 4K Ultra HD (UHD) video. See the [Intel® Graphics Technology](#) page for more information.

## Graphics Base Frequency

Graphics Base frequency refers to the rated/guaranteed graphics render clock frequency in MHz.

## Graphics Max Dynamic Frequency

Graphics max dynamic frequency refers to the maximum opportunistic graphics render clock frequency (in MHz) that can be supported using Intel® HD Graphics with Dynamic Frequency feature.

## Graphics Video Max Memory

The maximum amount of memory accessible to processor graphics. Processor graphics operates on the same physical memory as the CPU (subject to OS, driver, and other system limitations).

## eDRAM

eDRAM (embedded DRAM) is a capacitor-based dynamic random-access memory integrated on the processor die.

## Graphics Output

Graphics Output defines the interfaces available to communicate with display devices.

## 4K Support

4K support indicates the product's support of 4K resolution, defined here as minimum 3840 x 2160.

## Max Resolution (HDMI 1.4)‡

Max Resolution (HDMI) is the maximum resolution supported by the processor via the HDMI interface (24bits per pixel & 60Hz). System or device display resolution is dependent on multiple system design factors; actual resolution may be lower on your system.

## Max Resolution (DP)‡

Max Resolution (DP) is the maximum resolution supported by the processor via the DP interface (24bits per pixel & 60Hz). System or device display resolution is dependent on multiple system design factors; actual resolution may be lower on your system.

## DirectX\* Support

DirectX indicates support for a specific version of Microsoft's collection of API's (Application Programming Interfaces) for handling multimedia compute tasks.

## OpenGL\* Support

OpenGL (Open Graphics Library) is a cross-language, multi-platform API (Application Programming Interface) for rendering 2D and 3D vector graphics.

## Intel® Quick Sync Video

Intel® Quick Sync Video delivers fast conversion of video for portable media players, online sharing, and video editing and authoring.

[Find products with Intel® Quick Sync Video](#)

## Intel® Clear Video HD Technology

Intel® Clear Video HD Technology, like its predecessor, Intel® Clear Video Technology, is a suite of image decode and processing technologies built into the integrated processor graphics that improve video playback, delivering cleaner, sharper images, more natural, accurate, and vivid colors, and a clear and stable video picture.

Intel® Clear Video HD Technology adds video quality enhancements for richer color and more realistic skin tones.

## PCI Express Revision

PCI Express Revision is the version supported by the processor. Peripheral Component Interconnect Express (or PCIe) is a high-speed serial computer expansion bus standard for attaching hardware devices to a computer. The different PCI Express versions support different data rates.

## PCI Express Configurations ‡

PCI Express (PCIe) Configurations describe the available PCIe lane configurations that can be used to link the PCH PCIe lanes to PCIe devices.

## Max # of PCI Express Lanes

A PCI Express (PCIe) lane consists of two differential signaling pairs, one for receiving data, one for transmitting data, and is the basic unit of the PCIe bus. # of PCI Express Lanes is the total number supported by the processor.

## Sockets Supported

The socket is the component that provides the mechanical and electrical connections between the processor and motherboard.

## T<sub>JUNCTION</sub>

Junction Temperature is the maximum temperature allowed at the processor die.

## Intel® Turbo Boost Technology ‡

Intel® Turbo Boost Technology dynamically increases the processor's frequency as needed by taking advantage of thermal and power headroom to give you a burst of speed when you need it, and increased energy efficiency when you don't.

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## Intel® vPro™ Technology ‡

Intel® vPro™ Technology is a set of security and manageability capabilities built into the processor aimed at addressing four critical areas of IT security: 1) Threat management, including protection from rootkits, viruses, and malware 2) Identity and web site access point protection 3) Confidential personal and business data protection 4) Remote and local monitoring, remediation, and repair of PCs and workstations.

[Find products with Intel® vPro™ Technology ‡](#)

## Intel® Hyper-Threading Technology ‡

Intel® Hyper-Threading Technology (Intel® HT Technology) delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner.

[Find products with Intel® Hyper-Threading Technology ‡](#)

## Intel® Virtualization Technology (VT-x) ‡

Intel® Virtualization Technology (VT-x) allows one hardware platform to function as multiple “virtual” platforms. It offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions.

## Intel® Virtualization Technology for Directed I/O (VT-d) ‡

Intel® Virtualization Technology for Directed I/O (VT-d) continues from the existing support for IA-32 (VT-x) and Itanium® processor (VT-i) virtualization adding new support for I/O-device virtualization. Intel VT-d can help end users improve security and reliability of the systems and also improve performance of I/O devices in virtualized environments.

[Find products with Intel® Virtualization Technology for Directed I/O \(VT-d\) ‡](#)

## Intel® VT-x with Extended Page Tables (EPT) ‡

Intel® VT-x with Extended Page Tables (EPT), also known as Second Level Address Translation (SLAT), provides acceleration for memory intensive virtualized applications. Extended Page Tables in Intel® Virtualization Technology platforms reduces the memory and power overhead costs and increases battery life through hardware optimization of page table management.

[Find products with Intel® VT-x with Extended Page Tables \(EPT\) ‡](#)

## Intel® TSX-NI

Intel® Transactional Synchronization Extensions New Instructions (Intel® TSX-NI) are a set of instructions focused on multi-threaded performance scaling. This technology helps make parallel operations more efficient via improved control of locks in software.

## Intel® 64 ‡

Intel® 64 architecture delivers 64-bit computing on server, workstation, desktop and mobile platforms when combined with supporting software.<sup>1</sup> Intel 64 architecture improves performance by allowing systems to address more than 4 GB of both virtual and physical memory.

[Find products with Intel® 64 ‡](#)

## Instruction Set

An instruction set refers to the basic set of commands and instructions that a microprocessor understands and can carry out. The value shown represents which Intel’s instruction set this processor is compatible with.

## Instruction Set Extensions

Instruction Set Extensions are additional instructions which can increase performance when the same operations are performed on multiple data objects. These can include SSE (Streaming SIMD Extensions) and AVX (Advanced Vector Extensions).

## Idle States

Idle States (C-states) are used to save power when the processor is idle. C0 is the operational state, meaning that the CPU is doing useful work. C1 is the first idle state, C2 the second, and so on, where more power saving actions are taken for numerically higher C-states.

## Enhanced Intel SpeedStep® Technology

Enhanced Intel SpeedStep® Technology is an advanced means of enabling high performance while meeting the power-conservation needs of mobile systems. Conventional Intel SpeedStep® Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. Enhanced Intel SpeedStep® Technology builds upon that architecture using design strategies such as Separation between Voltage and Frequency Changes, and Clock Partitioning and

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# Thermal Monitoring Technologies

Thermal Monitoring Technologies protect the processor package and the system from thermal failure through several thermal management features. An on-die Digital Thermal Sensor (DTS) detects the core's temperature, and the thermal management features reduce package power consumption and thereby temperature when required in order to remain within normal operating limits.

## Intel® Flex Memory Access

Intel® Flex Memory Access facilitates easier upgrades by allowing different memory sizes to be populated and remain in dual-channel mode.

## Intel® Identity Protection Technology ‡

Intel® Identity Protection Technology is a built-in security token technology that helps provide a simple, tamper-resistant method for protecting access to your online customer and business data from threats and fraud. Intel® IPT provides a hardware-based proof of a unique user's PC to websites, financial institutions, and network services; providing verification that it is not malware attempting to login. Intel® IPT can be a key component in two-factor authentication solutions to protect your information at websites and business log-ins.

## Intel® Stable Image Platform Program (SIPP)

Intel® Stable Image Platform Program (Intel® SIPP) can help your company identify and deploy standardized, stable image PC platforms for at least 15 months.

## Intel® Smart Response Technology

Intel® Smart Response Technology combines the fast performance of a small solid state drive with the large capacity of a hard disk drive.

## Intel® AES New Instructions

Intel® AES New Instructions (Intel® AES-NI) are a set of instructions that enable fast and secure data encryption and decryption. AES-NI are valuable for a wide range of cryptographic applications, for example: applications that perform bulk encryption/decryption, authentication, random number generation, and authenticated encryption.

[Find products with Intel® AES New Instructions](#)

## Secure Key

Intel® Secure Key consists of a digital random number generator that creates truly random numbers to strengthen encryption algorithms.

## Intel® Software Guard Extensions (Intel® SGX)

Intel® Software Guard Extensions (Intel® SGX) provide applications the ability to create hardware enforced trusted execution protection for their applications' sensitive routines and data. Run-time execution is protected from observation or tampering by any other software (including privileged software) in a system.

[Find products with Intel® Software Guard Extensions \(Intel® SGX\)](#)

## Intel® Memory Protection Extensions (Intel® MPX)

Intel® Memory Protection Extensions (Intel® MPX) provides a set of hardware features that can be used by software in conjunction with compiler changes to check that memory references intended at compile time do not become unsafe at runtime due to buffer overflow or underflow.

## Intel® Trusted Execution Technology ‡

Intel® Trusted Execution Technology for safer computing is a versatile set of hardware extensions to Intel® processors and chipsets that enhance the digital office platform with security capabilities such as measured launch and protected execution. It enables an environment where applications can run within their own space, protected from all other software on the system.

[Find products with Intel® Trusted Execution Technology ‡](#)

## Execute Disable Bit ‡

Execute Disable Bit is a hardware-based security feature that can reduce exposure to viruses and malicious-code attacks and prevent harmful software from executing and propagating on the server or network.

## PA

Pre Active: Orders may be taken, but not scheduled, nor shipped.

Active: This specific part is active.

## EN

End of Life: Product End of Life notification has been published.

## NO

No Orders after Last Order Entry Date: Used for end of life products. Allows for delivery and returns.

## OB

Obsolete: Inventory available. No future supplies will be available.

## RP

Retired Price: This specific part is no longer being manufactured or purchased and no inventory is available.

## RT

Retired: This specific part is no longer being manufactured or purchased and no inventory is available.

## NI

Not Implemented: No Orders, Inquiries, Quotes, Deliveries Returns, or Shipments.

## QR

Quality/Reliability Hold.

## RS

Reschedule

**More support options for Intel® Xeon® Processor E3-1515M v5 (8M Cache, 2.80 GHz)**

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

Downloaded from [Arrow.com](#) 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/](http://www.intel.com/technology/turboboost/) for more information.

The Recommended Customer Price (“RCP”) is pricing guidance for Intel products. Prices are for direct Intel customers, typically represent 1,000-unit purchase quantities, and are subject to change without notice. Taxes and shipping, etc. not included. Prices may vary for other package types and shipment quantities, and special promotional arrangements may apply. If sold in bulk, price represents individual unit. Listing of these RCP does not constitute a formal pricing offer from Intel. Please work with your appropriate Intel representative to obtain a formal price quotation.

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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