

# Intel® Joule™ Module

Maker. Innovator. Entrepreneur.

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## Introduction

This System on a Module combines a 64-bit, Quad-Core compute engine with power management services, wireless connectivity and high speed I/O to accelerate your time to market.

The Module integrates compatible and complementary technologies while eliminating the need to select, procure and place discrete devices.



## Module Features:

- Quad-Core processing unit
- UEFI compliant BIOS
- Multiple SKUs (1.5GHz and 1.7GHz)
- Built-In 3 or 4GB RAM and 8 or 16GB eMMC
- Intel® HD Graphics
- On-Chip Image Signal Processor (ISP)
- Bluetooth\* 4.1 compliant
- Wi-Fi\* (802.11ac) Dual Band MIMO

## Software & Firmware:

- Linux\* 4.4 Kernel
- A Linux\*-based OS

## Physical Interfaces

- HDMI\* 1.4b output at 1080p
- MIPI\* CSI and DSI interface
- Up to 48 GPIO (including 4 PWMs)
- Up to 2 USB 3.0 interfaces plus 1 USB 2.0 with OTG support
- Up to 4 independent UARTs
- I2C, I2S, and SPI interfaces
- PCIe, 2.0 interface (muxed with USB 3.0)

## Intel® RealSense™ compatibility:

- Intel RealSense API enables 3D scanning, object recognition, and person tracking

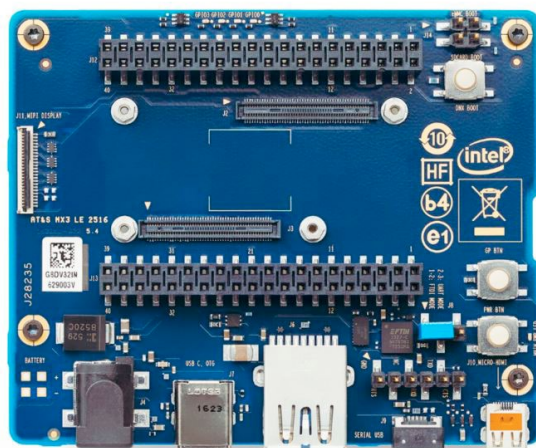
[Support for Intel® RealSense™ cameras and libraries >](#)

### Expansion Board for the Intel® Joule™ Module

The expansion board is intended to breakout all I/O interfaces from the Intel® Joule™ module into easily accessible connectors.

All board design files are open source to enable end-users and hardware ecosystem partners to design custom expansion boards for the Intel Joule module.

Proven schematics and layout recommendations can reduce custom expansion board fabrication risks and costs.



### Technical Specifications

#### PHYSICAL

Dimensions	70 x 85 mm
Operating temperature	32 to 158°F (0 to 70°C)

#### INTERFACES

Micro HDMI connector	Micro-SD* card slot
USB 3.0 Type A connector	MIPI* display connector
USB 3.0 Type C connector	RTC battery holder
3 Buttons: DnX boot, general purpose, and power	LEDs (1 power, 4 general purpose)

Two 2x20 pin breakout connectors:	- 5 I2C interfaces
- 19.2 MHz and 32.768 kHz clocks	- 2 digital microphone interfaces
- 2 SPI interface	- 8 dedicated GPIOs with reference BIOS/IFWI
- 4 UARTs, 3 full and 1 half	- 4 PWM ports
- I2S interface	

#### POWER DELIVERY

DC Jack	
USB Type C	



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