Movidius
an intel company

# Myriad 2 MA2x5x Vision Processor

**Transforming Devices Through Ultra Low-Power Machine Vision**

## VPU PRODUCT BRIEF

Movidius provides the ultimate in low-power vision processing solutions, which include the **Myriad 2 family of vision processing units (VPUs)** plus a comprehensive **Myriad Development Kit (MDK)**, a reference hardware EVM and optional Machine Vision Application Packages.

The Myriad 2 MA2x5x family of system-on-a-chip (SoC) devices offers significant computation performance and image processing capability with a low-power footprint. The Myriad 2 lineup includes the following product configurations:

**MA2150: 1 Gbit DDR**
**MA2155: 1 Gbit DDR and secure boot**
**MA2450: 4 Gbit DDR**
**MA2455: 4 Gbit DDR and secure boot**

Myriad 2 VPUs offer TeraFLOPS (trillions of floating-point operations per second) of performance within a nominal 1 Watt power envelope. The Myriad 2 architecture includes enough performance to support multiple cameras with flexible image signal processing pipelines for each camera, and software programmable vision processing with fixed- and floating-point datatypes supported. A robust overall dataflow design ensures mitigation of processing bottlenecks.

### FLEXIBLE COMBINATION OF MACHINE VISION WITH ISP

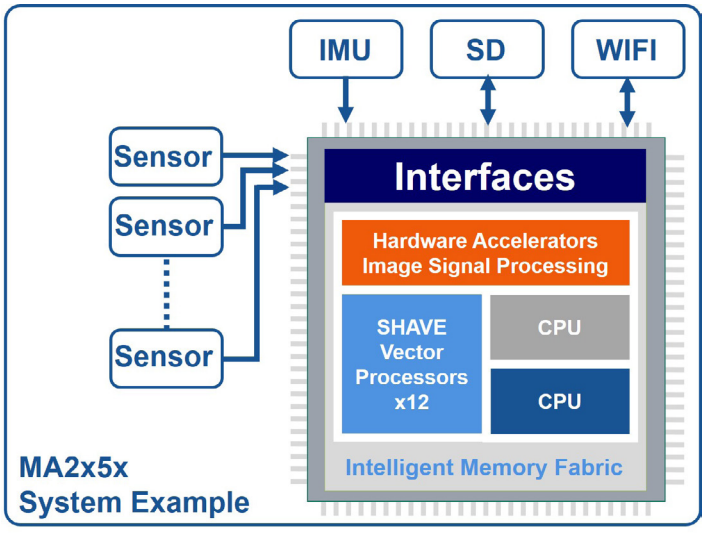
Myriad 2 MA2x5x incorporates an innovative approach to combine image signal processing with vision processing. A set of imaging/vision hardware accelerators supports a world-class ISP pipeline without any roundtrips to memory; at the same time they are repurposed to accelerate developers' vision processing algorithms in conjunction with a set of special purpose VLIW vision processor cores. All processing elements are tied together with a multi-ported memory that enables implementation of demanding applications with high efficiency.

### TARGET APPLICATIONS

- Deep Neural Network-based Classification
- Pose Estimation
- 3D Depth
- Visual Inertial Odometry (Navigation)
- Gesture/Eye Tracking and Recognition

### EXAMPLE PRODUCT CATEGORIES

- AR/VR Head Mounted Displays (HMDs)
- Drones/UAVs
- Security/Surveillance Cameras
- Service Robotics




See the **MDK Product Brief** for an overview of the robust Myriad Development Kit, including the software development frameworks, tools, drivers, and libraries, to enable developers to implement applications on Movidius VPUs.

For more details on the Myriad 2 Platform, please visit the Movidius website: www.movidius.com

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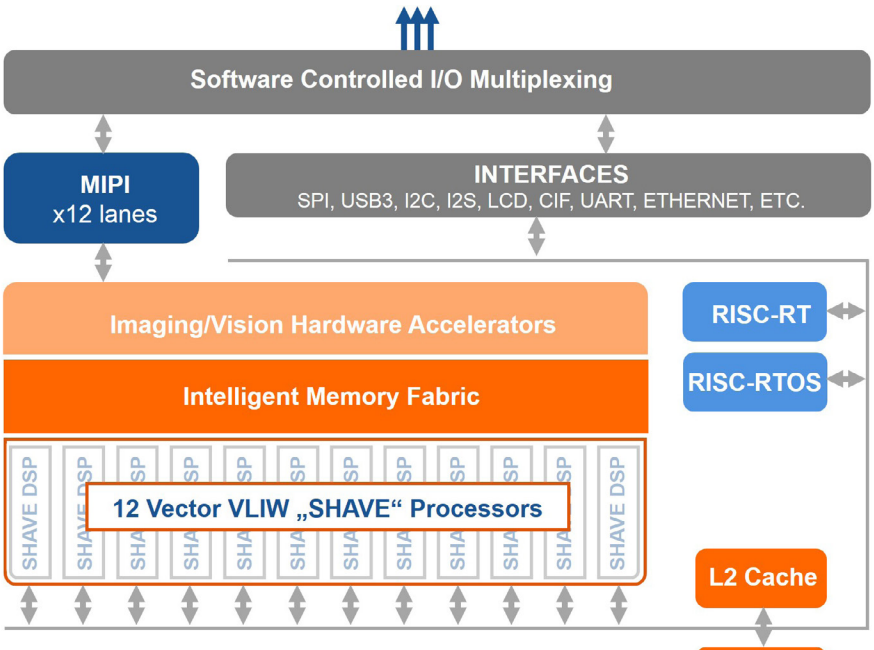
## MYRIAD 2 SoC SPECIFICATIONS

- **Heterogeneous, high throughput, multi-core architecture based on**
  - 12 VLIW 128-bit vector SHAVE Processors optimized for machine vision
  - Configurable hardware accelerators for image and vision processing, with line-buffers enabling zero local memory access ISP mode
  - 2 x 32-bit RISC processors
  - Supports data and task parallelism
  - Programmable Interconnect
- **Support for 16/32-bit floating point and 8/16/32-bit integer operations**
- **Homogeneous, centralized memory architecture; 2MB of on-chip memory**
- **400 GB/sec of sustained internal memory bandwidth**
- **256 KB of L2 Cache**
- **Power management: 20 power islands; low power states**
- **Nominal 600 MHz operation at 0.9 V**
- **Rich set of interfaces:**
  - 12 Lanes MIPI, 1.5 Gbps per lane configurable as CSI-2 or DSI
  - I2C, SPI for control and configuration
  - I2S for audio input
  - Banks of configurable GPIO, PWM
  - USB3 with integrated PHY
  - 2-Slot SDIO
  - Debug interface
  - 1 Gbit Ethernet
- **Available package configurations**
  - MA2150/MA2155:
    6.5mm x 6.5mm
    0.4mm pitch,
    225 Ball BGA
    1Gb LPDDR II
  - MA2450/MA2455:
    8mm x 9.5mm
    0.5mm pitch
    270 Ball BGA,
    4Gb LPDDR III
- **Advanced low-power 28nm HPC process node**




**Myriad 2 MA2x5x Block Diagram**

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