EMBEDDED VISION MODULE
on SONY's IMX378 Exmor RS

The Embedded Vision module on SONY's IMX378 Exmor RS imager is made for high-quality video imaging, especially in systems that require optical image stabilization. The module is a perfect ready-to-go component to set-up embedded vision solutions allowing a short time to market. The sugar-cube sized module is equipped a standard MIPI interface. Framos has created a test and development path to provide easy swift prototype and short time to market for mass production. Compatible with common industry hardware devices and familiar sample software, it's ready within minutes from opening the box to getting the first test pictures. Together with break-out boards, mini-computers like the Raspberry Pi or Jetson TX families, and a power supply, the module enables easy development of miniaturized embedded vision.

KEY BENEFITS & FEATURES:

- **Elite-Level Image Quality**
  Based on Sony's IMX378 with excellent pixel architecture, 12MP, HDR, SME-HDR and PDAF

- **Shaking and Vibration Removal**
  Active Optical Image Stabilization for movement compensation and stable video

- **Ready-to-Go MIPI Output**
  Immediate compatibility with most embedded devices like Raspberry Pi and Jetson.

- **Easy-to-Use Development Environement**
  Deep testing and evaluation with short time-to-market

The IMX378 embedded vision module creates better and more stable image and video streams in consumer video devices, VR / AR or MR systems, head cams, free-moving robots, drones, general AI / machine vision systems and outdoor applications. They are great devices for the excellent capturing of human activities and for device 'awareness'.

The module is equipped with an AOIS (Active Optical Image Stabilization) capability. A gyroscope measures the motion of the module and the lens moves left, right, up or down to compensate. The resulting image stream is stabilized removing random and periodic vibrations, that, otherwise, would deteriorate the video stream.

SONY IMX378 EMBEDDED VISION MODULES

The modules' high-quality imaging is based on the SONY IMX378 Exmor RS elite-class rolling shutter sensor. With its 12 Megapixel resolution it provides full-resolution and 4K video at 60fps and HD quality at up to 240fps. The image sensor comes with a back-illuminated and stacked pixel architecture, matching high sensitivity with on board phase detection auto-focus (PDAF) and many features such as Spatially Multiplexed Exposure High Dynamic Range (SME-HDR) imaging mode for a single frame event HDR.

SPECIFICATIONS

Image Sensor	All pixel scan CMOS image sensor		
	Image size	Type 1 / 2.3 (Diago nal 7.857 mm)	
	Module effective pixels	4056 (H) x 3040 (V)	1233 M pixels
	Number of recommended recording pixels	4040 (H) x 3024 (V)	1221 M pixel
Lens	Focal length	4.52 mm (35mm equivalent: 25mm)	
	F value	2.0	
	Angle of view (INF position)	Horizontal / Vertical / Diagonal 66.2° / 52.3° / 78.4°	
	Focus range	100mm to infinity with auto focus (Resolution is not guaranteed for all focus range)	
Focus Control	Feedback control VSM linear motor		
Output	MIPI CSI-2 (4 lane) RAW Data 12/10/8 COMP8 output		
	Frame rate	Capture mode (all images)	Max 60 frame / sec
		4K2K movie (16:9)	Max 60 frame / sec
		Full HD movie (16:9)	Max 240 frame / sec
Input CLK	6 MHz 27 MHz		
Others	Power supply	Image sensor (analog)	2.8 ± 0.1 V
		Image sensor (digital)	1.05 ± 0.1 V
		I/O	1.8 ± 0.1 V
		Actuator	3.3 ± 0.1 V
	Operating temperature	T operation	10 ~ +60 °C (TBD)
	Storage temperature	T storage	30 ~ +80 °C (TBD)
	Recommended operating temperature	T specification	0 ~ +45 °C (TBD)
	Package dimensions (All)	13.1mm (W) x 21.0mm(D) x 5.9mm (H)	
	Package dimensions (Module)	13.1mm (W) x 12.5mm(D) x 5.9mm (H)	
		(Camera head block / Without tolerance)	
	Package mass	Around 1.6 ± 0.1g TBD	

EVALUATION & DEVELOPEMENT

The module is available with I/F camera boards, 15P FFC interface and I/F board for Jetson. The set can be connected to both Raspberry Pi3 and Jetson TX2 Develop Kit.

I/F Board for Jetson

CA378-AOIS

I/F Board for camera

15P FFC 160mm
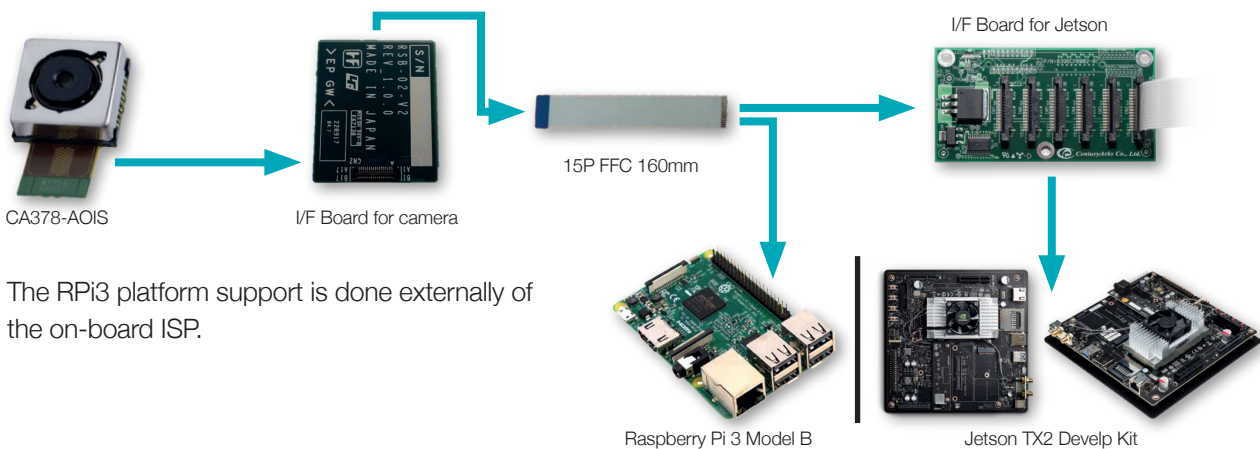
The RPi3 platform support is done externally of the on-board ISP.

Raspberry Pi 3 Model B

Jetson TX2 Develp Kit