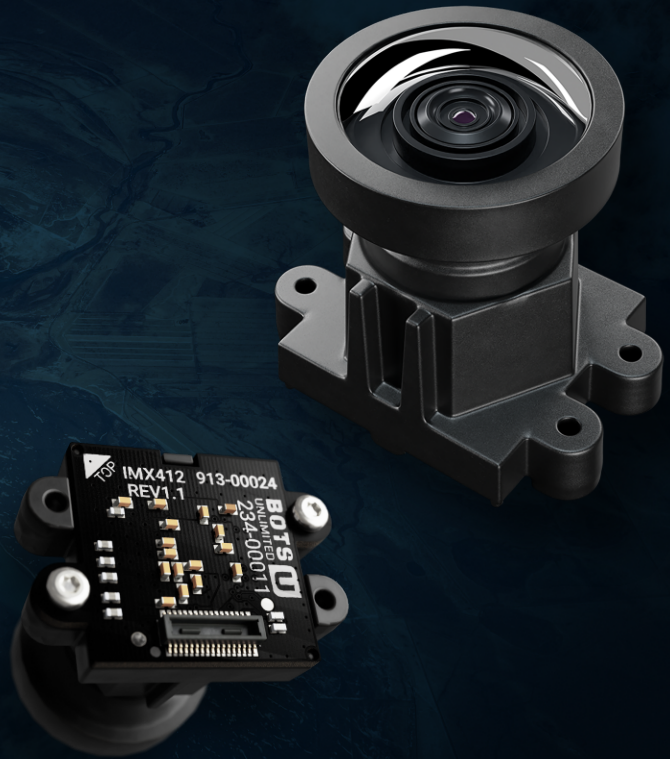


IM-01-412

- Sony STARVIS IMX412 12.3 MP Sensor
- 4K High-Resolution Streaming
- Enhanced Low-Light Performance
- Standard M12 Threaded Lens Mount
- 152° Wide Field of View



Product Summary

The BOTS UNLIMITED IM-01-412 Camera Module is a high-performance imaging solution for applications requiring exceptional image quality, compact form factor, and seamless integration. At its core is the Sony IMX412-AACK sensor, a 12.3 MP, 1/2.3" CMOS sensor known for its excellent low-light performance and high-resolution imaging capabilities.

The module features a MIPI CSI-2 interface with four data lanes, enabling fast and reliable image data transmission and supporting 4K video capture for superior visual clarity. A 152.4° wide field-of-view lens captures expansive scenes with minimal distortion, making it well-suited for robotics, surveillance, and embedded vision systems.

The module includes a standard M12 threaded lens mount for versatility, allowing users to customize optics based on application requirements. Its compact design and integrated mounting features streamline installation, enabling easy integration into end products—not just for development or testing but also for production.

Additionally, the camera module is NDAA compliant and manufactured to meet high quality and sourcing standards.

Specifications

Image Sensor

CMOS Sensor	Sony IMX412-AACK
Shutter Type	CMOS Rolling Shutter
Resolution	12.3 MP 4056 x 3040 px
Pixel Size	1.55 μm x 1.55 μm
Optical Format	1/2.3"
Chromacity	Color
Bit Depth	10/12 bit
Framerate	59.9 FPS (4 Lane) 30 FPS (2 Lane)

Camera Interface

Input Voltage	V_{DIG} 1.05V (0.95V - 1.15V) V_{IF} 1.8V (1.7V - 1.9V) V_{ANA} 2.8V (2.7V - 2.9V)
Drive Frequency	6 / 12 / 18 / 24 / 27 MHz
Data Interface	MIPI CSI-2 2 / 4 Lane
Communication Interface	I ² C (CCI)
Connector PN	DF40C-30DP-0.4V(51)
Mating Connector PN	DF40C-30DS-0.4V(51)

Mechanical & Environmental

Dimensions	25.4856 mm W x 17.018 mm H x 23.256 mm D
Weight	TBD
Operating Temperature	-20° to +75° C (function) -20° - +60° C (performance)
Storage Temperature	-30° to +80° C
Ambient Humidity	20% to 95% RH

Lens

Field of View	152.4° Diagonal 119° Horizontal 88.4° Vertical
F/No.	2.5
CRA	<18.2°
TV Distortion	-24%
Effective Focal Length	3.1mm
TTL	23mm
IR-Cut Filter	650±10nm Ta=50%
Mount Style	M12
Factory Focus Range	TBD

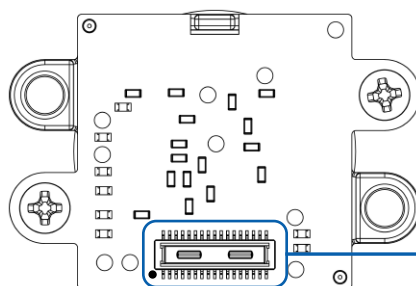
Software Support

Driver	V4L2 Based Device Driver Libargus / Argus Camera Isaac ROS Compliant
Supported Platforms	NVIDIA Jetson Family ModalAI VOXL 2 Qualcomm Robotics Platforms

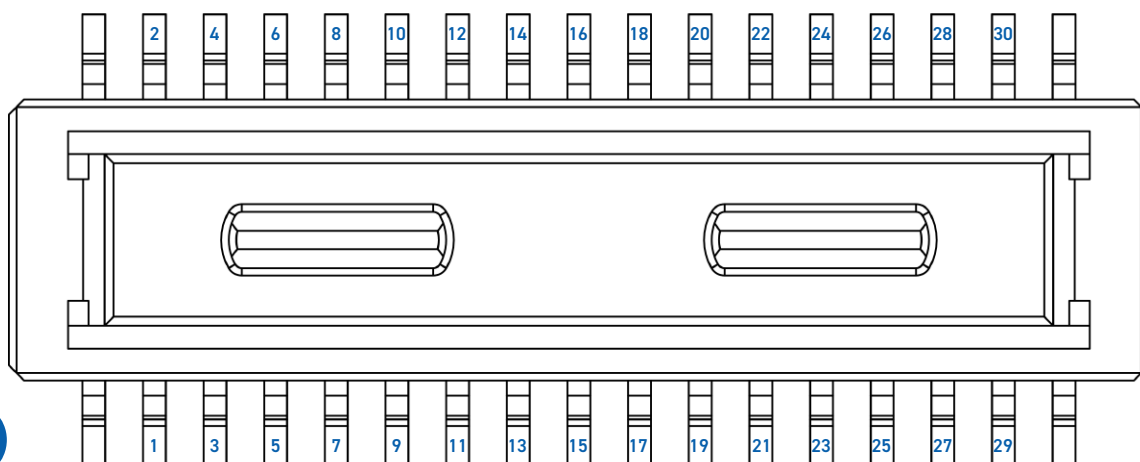
Compliance & Manufacturing

Country of Origin	Indonesia Option for Mexico or USA Available
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Connector Pinout



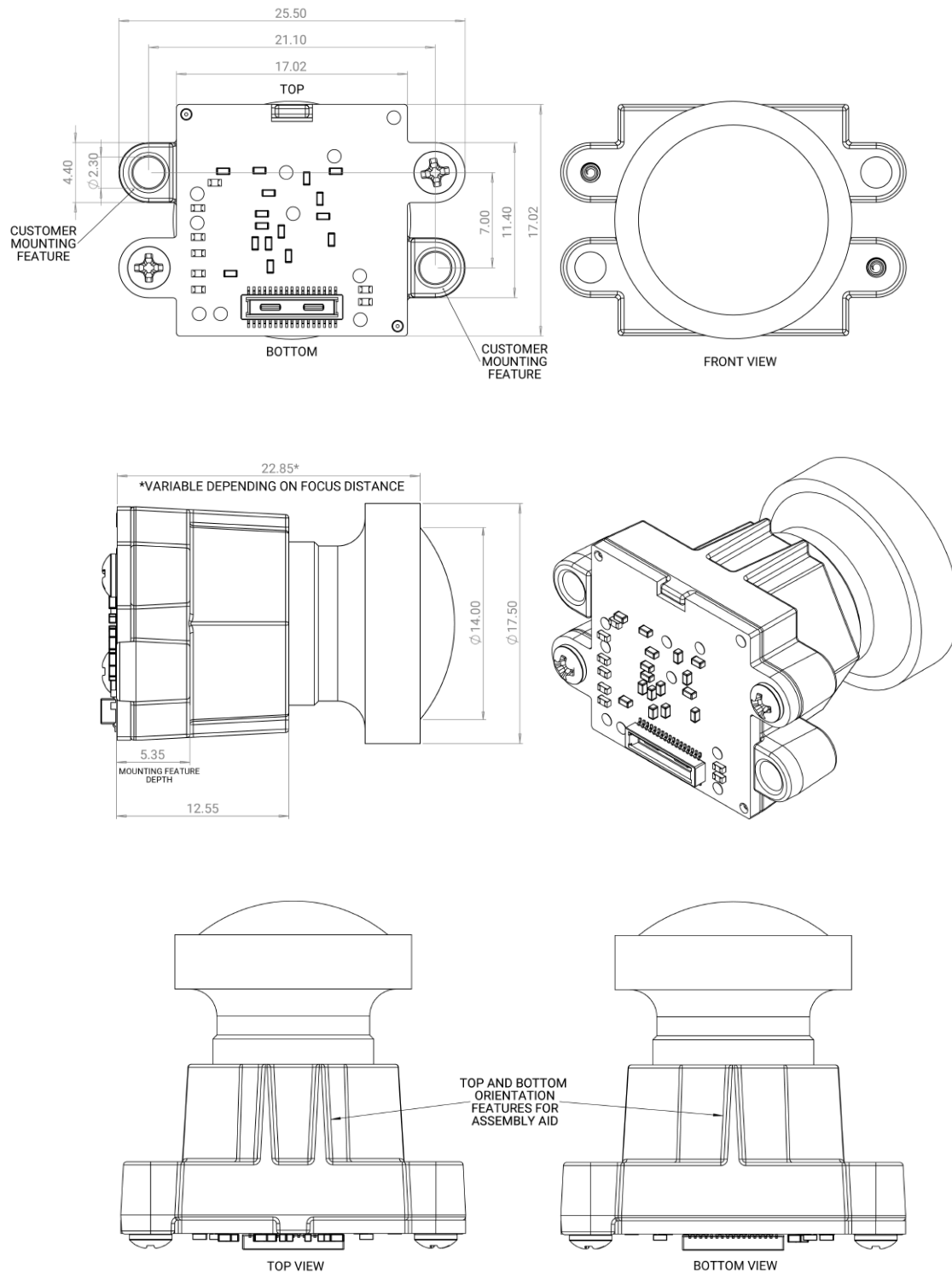
Connector Location

Pin 1 Indicator
On Silkscreen

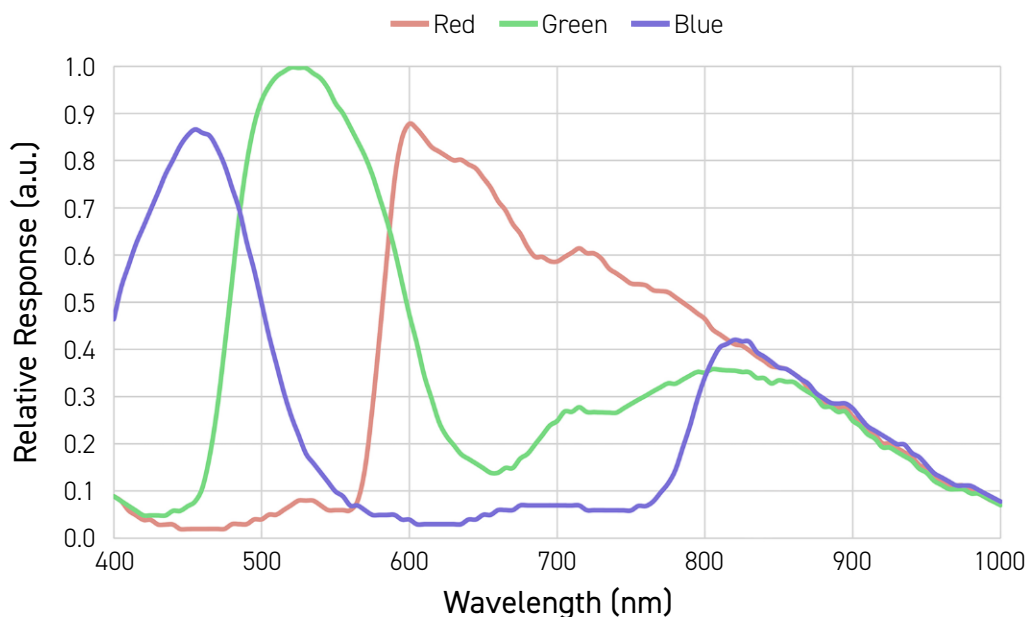
DF40C-30DP-0.4V(51)

Pin No.	Assignment	Description	Pin No.	Assignment	Description
1	GND	Ground	2	GND	Ground
3	MIPI_DCK_P	MIPI Output CLK+	4	NC	No Connect
5	MIPI_DCK_N	MIPI Output CLK-	6	+1V8	V_{IF} 1.8V Input Voltage
7	GND	Ground	8	+1V1	V_{DIG} 1.05V Input Voltage
9	MIPI_DM01_P	MIPI Output DATA1+	10	INCK	External Input Clock
11	MIPI_DM01_N	MIPI Output DATA1-	12	GND	Ground
13	GND	Ground	14	TP1 / NC	Connected only to TP1
15	MIPI_DM02_P	MIPI Output DATA2+	16	XVS	Vertical Sync Signal
17	MIPI_DM02_N	MIPI Output DATA2-	18	NC	No Connect
19	GND	Ground	20	+2V8	V_{ANA} 2.8V Input Voltage
21	MIPI_DM03_P	MIPI Output DATA3+	22	NC	No Connect
23	MIPI_DM03_N	MIPI Output DATA3-	24	I2C_SDA	I ² C Data Input/Output
25	GND	Ground	26	I2C_SCL	I ² C Clock Input
27	MIPI_DM04_P	MIPI Output DATA4+	28	GND	Ground
29	MIPI_DM04_N	MIPI Output DATA4-	30	XCLR	Reset Signal

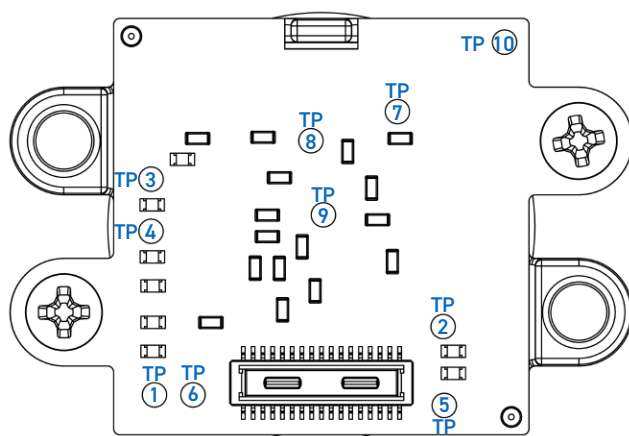
Mechanical Drawing



Spectral Sensitivity Characteristic



Test Points



Test Point No.	Description
TP1	Tied to Pin 14 of Connector / No Connect with IMX412
TP2	INCK - Input Clock
TP3	I ² C SDA
TP4	I ² C SCL
TP5	Reset Signal
TP6	XVS - Vertical Sync
TP7	1.8V - V_{IF}
TP8	1.05V - V_{DIG}
TP9	2.8V - V_{ANA}
TP10	GND - Ground