

IMT-FIC20S12F-C10-L62 V1.1

20MP Sony IMX350 MIPI Interface Fixed Focus Camera Module



Front View



Back View

Specifications

Camera Module No.	IMT-FIC20S12F-C10-L62 V1.1
Resolution	20MP
Image Sensor	IMX350
Sensor Type	1/2.78"
Pixel Size	1.00 um x 1.00 um
EFL	5.60 mm
F.NO	2.20
Pixel	5184 x 3880
View Angle	129.0°(DFOV) 104.1°(HFOV) 83.5°(VFOV)
Lens Dimensions	8.50 x 8.50 x 5.45 mm
Module Size	67.00 x 11.50 mm
Module Type	Fixed Focus
Interface	MIPI
Auto Focus VCM Driver IC	None
Lens Type	650nm IR Cut
Operating Temperature	-20°C to +70°C
Mating Connector	BAF04-30083-0500



IMT-FIC20S12F-C10-L62 V1.1 20MP Sony IMX350 MIPI Interface Fixed Focus Camera Module



Top View



Side View



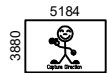
Bottom View



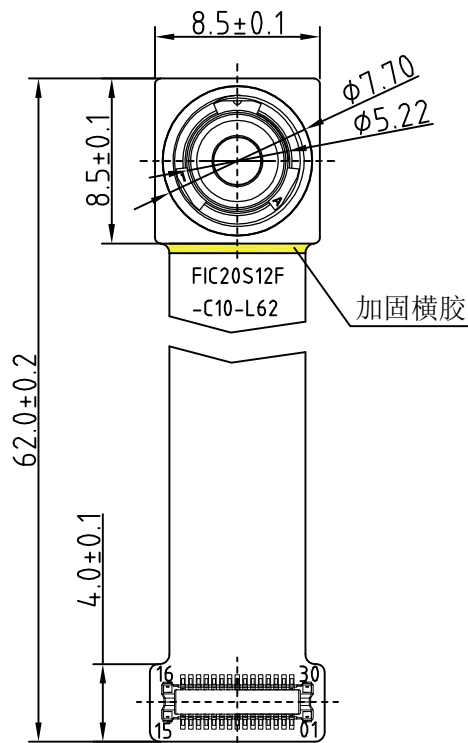
Mating Connector

ROHS

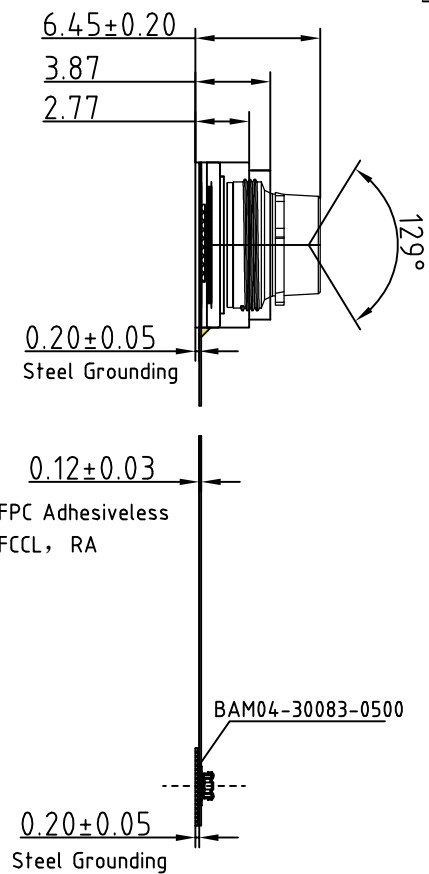
PIN	SIGNAL
1	LED+
2	AF_VDD
3	LED-
4	AF_GND
5	NC
6	DOVDD
7	SDA
8	SCL
9	NC
10	RESET
11	DVDD
12	AVDD
13	AGND
14	MCLK
15	DGND
16	DGND
17	MDP0
18	MDN0
19	DGND
20	MDP1
21	MDN1
22	DGND
23	MDP2
24	MDN2
25	DGND
26	MCP
27	MCN
28	DGND
29	MDP3
30	MDN3



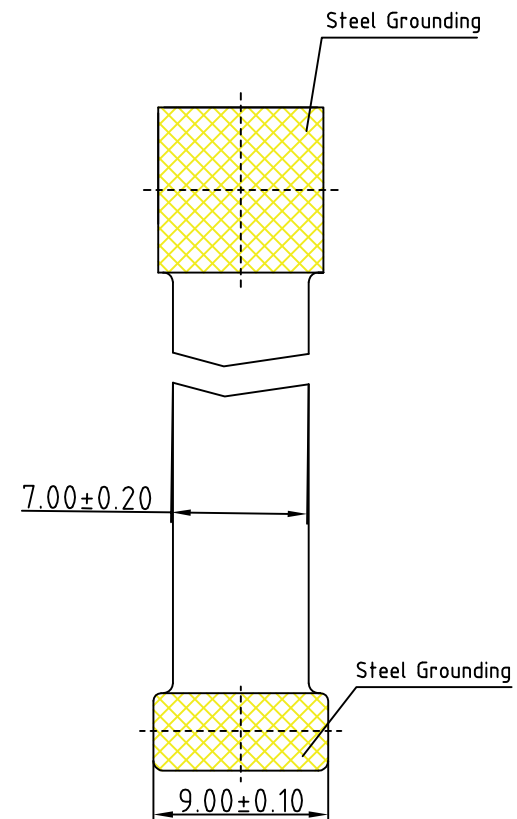
Version	Mark	Information	Date
V1.1	PD	First Version	2023-08-29



TOP VIEW



SIDE VIEW



BOTTEM VIEW

NOTE:
The device slave address(L): Write 0x34/Read 0x35

Parameters:

1、Sensor specification:

Image Sensor: IMX350
Pixel Size: 1um×1um
Image Size: 1/2.78
AVDD电压: 2.8V, DOVDD电压: 1.8V
DVDD电压: 1.05V

2、Lens specification:

FOV: D:129°,H:104.1°,V:83.7°
F/NO.: 2.2
TV distortion: -14.2%
TTL: 5.6mm

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Designed By	Kevin	Model Name:	FIC20S12F-C10-L62		
Checked By	Aouly Yan	Projection Type:	Unit:	Material:	
			mm	-----	
		Scale:	1:1	Sheet:	1 of 1
				Version:	1/0

[Product Brief]

Ver.1.0

IMX350

Diagonal 6.475 mm (Type 1/2.78) 20Mega-Pixel CMOS Image Sensor with Square Pixel for Color Cameras

General description and application

IMX350 is a diagonal 6.475 mm (Type 1/2.78) 20 Mega-pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Exmor RS™ technology to achieve high speed image capturing by column parallel A/D converter circuits and high sensitivity and low noise image (comparing with conventional CMOS image sensor) through the backside illuminated imaging pixel structure. R, G, and B pigment primary color mosaic filter is employed. By introducing spatially multiplexed exposure technology, high dynamic range still pictures and movies are achievable. It equips an electronic shutter with variable integration time. It operates with four power supply: analog 2.8 V, 1.8V, digital 1.05 V and 1.8 V for input/output interface and achieves low power consumption. It is optionally operational with conventional three power supplies by using an analog power supply voltage of 2.8V. In addition, this product is designed for use in cellular phone and tablet pc. When using this for another application, Sony Semiconductor Solutions Corporation does not guarantee the quality and reliability of product. Therefore, don't use this for applications other than cellular phone and tablet pc. Consult your Sony Semiconductor Solutions Corporation sales representative if you have any questions.

Functions and Features

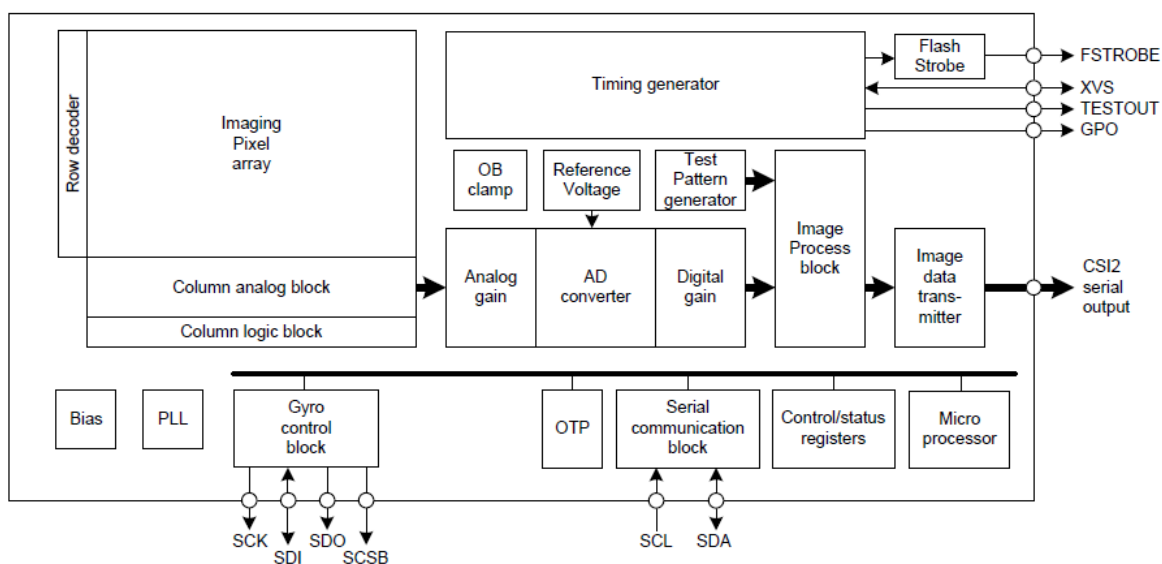
- ◆ Back-illuminated and stacked CMOS image sensor Exmor RS
- ◆ High Frame Rate 30fps@Full resolution / 60fps@4K2K / 240fps@1080p / 240fps@720p
- ◆ Spatially Multiplexed Exposure High Dynamic Range (SME-HDR) with equivalent full pixels (Raw data output)
- ◆ Phase Detection Auto Focus (PDAF)
- ◆ Electronic Image Stabilization (EIS)
- ◆ Diffraction Limit Compensation (DLC)
- ◆ High signal to noise ratio(SNR)
- ◆ Dual sensor synchronization operation
- ◆ Built-in 2D Dynamic Defect Pixel Correction
- ◆ Lens Shading Correction (LSC)
- ◆ Built-in temperature sensor
- ◆ Output video format of RAW10/8, COMP8
- ◆ Pixel binning readout function
- ◆ Two PLLs for independent clock generation for pixel control and data output interface
- ◆ CSI-2 serial data output (MIPI 2lane/4lane, Max. 2.3Gbps/lane, D-PHY spec. ver. 1.2 compliant)
- ◆ 2-wire serial communication
- ◆ Advanced Noise Reduction (Chroma noise reduction and RAW noise reduction)
- ◆ 10K bit of OTP ROM for users

Device Structure

- ◆ CMOS image sensor
- ◆ Image size : Diagonal 6.475 mm (Type 1/2.78)
- ◆ Total number of pixels : 5216 (H) × 4032 (V) approx. 21.03 M pixels
- ◆ Number of effective pixels : 5216 (H) × 3896 (V) approx. 20.32 M pixels
- ◆ Number of active pixels : 5184 (H) × 3880 (V) approx. 20.11 M pixels
- ◆ Chip size : 6.415 mm (H) × 4.759 mm (V)
- ◆ Unit cell size : 1.00 μm (H) × 1.00 μm (V)
- ◆ Substrate material : Silicon

Functional Description

Block Diagram



* Exmor RS is a trademark of Sony Corporation. The Exmor RS is a Sony's CMOS image sensor with high-resolution, high-performance and compact size by replacing a supporting substrate in Exmor R™ which changed fundamental structure of Exmor™ pixel adopted column parallel A/D converter to back-illuminated type, with layered chips formed signal processing circuits.



Cameras Applications



Automotive Driver Pilot



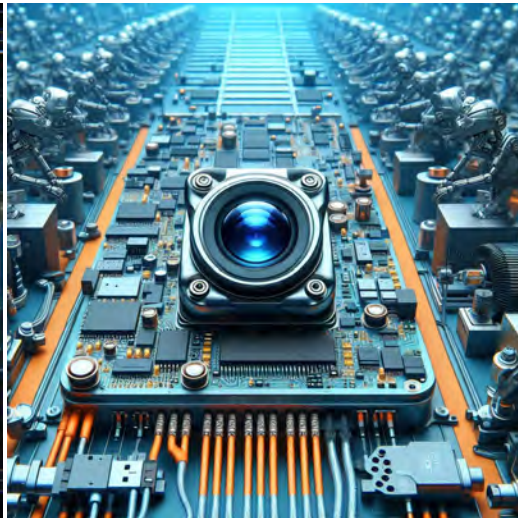
Live Streaming



Video Conference



Eye Tracker Biometric Detection



Machine Vision



Agricultural Monitor



Night Vision Security



Drone and Sports Eagle Eyes



Interactive Pet Camera



Camera Module Pinout Definition Reference Chart

OmniVision	Sony	Samsung	On-Semi	Aptina	Himax	GalaxyCore	PixArt	SmartSens	Sensors	
Pin Signal										
Description										
DGND GND										ground for digital circuit
AGND										ground for analog circuit
PCLK DCK										DVP PCLK output
XCLR PWDN XSHUTDOWN STANDBY										power down active high with internal pull-down resistor
MCLK XVCLK XCLK INCK										system input clock
RESET RST										reset active low with internal pull-up resistor
NC NULL										no connect
SDA SIO_D SIOD										SCCB data
SCL SIO_C SIOC										SCCB input clock
VSYNC XVS FSYNC										DVP VSYNC output
HREF XHS										DVP HREF output
DOVDD										power for I/O circuit
AFVDD										power for VCM circuit
AVDD										power for analog circuit
DVDD										power for digital circuit
STROBE FSTROBE										strobe output
FSIN										synchronize the VSYNC signal from the other sensor
SID										SCCB last bit ID input
ILPWM										mechanical shutter output indicator
FREQ										frame exposure / mechanical shutter
GPIO										general purpose inputs
SLASEL										I2C slave address select
AFEN										CEN chip enable active high on VCM driver IC
MIPI Interface										
MDN0 DN0 MD0N DATA_N DMO1N										MIPI 1st data lane negative output
MDP0 DP0 MD0P DATA_P DMO1P										MIPI 1st data lane positive output
MDN1 DN1 MD1N DATA2_N DMO2N										MIPI 2nd data lane negative output
MDP1 DP1 MD1P DATA2_P DMO2P										MIPI 2nd data lane positive output
MDN2 DN2 MD2N DATA3_N DMO3N										MIPI 3rd data lane negative output
MDP2 DP2 MD2P DATA3_P DMO3P										MIPI 3rd data lane positive output
MDN3 DN3 MD3N DATA4_N DMO4N										MIPI 4th data lane negative output
MDP3 DP3 MD3P DATA4_P DMO4P										MIPI 4th data lane positive output
MCN CLKN CLK_N DCKN										MIPI clock negative output
MCP CLKP MCP CLK_P DCKN										MIPI clock positive output
DVP Parallel Interface										
D0 DO0 Y0										DVP data output port 0
D1 DO1 Y1										DVP data output port 1
D2 DO2 Y2										DVP data output port 2
D3 DO3 Y3										DVP data output port 3
D4 DO4 Y4										DVP data output port 4
D5 DO5 Y5										DVP data output port 5
D6 DO6 Y6										DVP data output port 6
D7 DO7 Y7										DVP data output port 7
D8 DO8 Y8										DVP data output port 8
D9 DO9 Y9										DVP data output port 9
D10 DO10 Y10										DVP data output port 10
D11 DO11 Y11										DVP data output port 11



Camera Reliability Test

Reliability Inspection Item		Testing Method	Acceptance Criteria	
Category	Item			
Environmental	Storage Temperature	High 60°C 96 Hours	Temperature Chamber	No Abnormal Situation
		Low -20°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Operation Temperature	High 60°C 24 Hours	Temperature Chamber	No Abnormal Situation
		Low -20°C 24 Hours	Temperature Chamber	No Abnormal Situation
	Humidity	60°C 80% 24 Hours	Temperature Chamber	No Abnormal Situation
	Thermal Shock	High 60°C 0.5 Hours Low -20°C 0.5 Hours Cycling in 24 Hours	Temperature Chamber	No Abnormal Situation
Physical	Drop Test (Free Falling)	Without Package 60cm	10 Times on Wood Floor	Electrically Functional
		With Package 60cm	10 Times on Wood Floor	Electrically Functional
	Vibration Test	50Hz X-Axis 2mm 30min	Vibration Table	Electrically Functional
		50Hz Y-Axis 2mm 30min	Vibration Table	Electrically Functional
		50Hz Z-Axis 2mm 30min	Vibration Table	Electrically Functional
	Cable Tensile Strength Test	Loading Weight 4 kg 60 Seconds Cycling in 24 Hours	Tensile Testing Machine	Electrically Functional
Electrical	ESD Test	Contact Discharge 2 KV	ESD Testing Machine	Electrically Functional
		Air Discharge 4 KV	ESD Testing Machine	Electrically Functional
	Aging Test	On/Off 30 Seconds Cycling in 24 Hours	Power Switch	Electrically Functional
	USB Connector	On/Off 250 Times	Plug and Unplug	Electrically Functional





Camera Inspection Standard

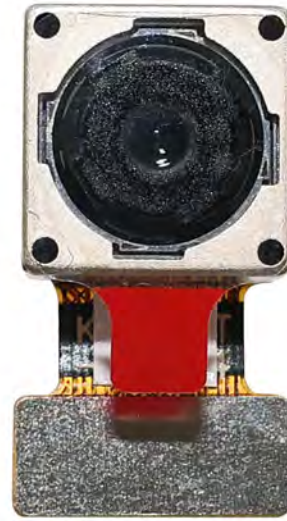
Inspection Item		Inspection Method	Standard of Inspection		
Category	Item				
Appearance	FPC / PCB	Color	The Naked Eye	Major Difference is Not Allowed.	
		Be Torn/Chopped	The Naked Eye	Copper Crack Exposure is Not Allowed.	
		Marking	The Naked Eye	Clear, Recognizable (Within 30cm Distance)	
	Holder	Scratches	The Naked Eye	The Inside Crack Exposure is Not Allowed	
		Gap	The Naked Eye	Meet the Height Standard	
		Screw	The Naked Eye	Make Sure Screws Are Presented (If Any)	
		Damage	The Naked Eye	The Inside Crack Exposure is Not Allowed	
	Lens	Scratch	The Naked Eye	No Effect On Resolution Standard	
		Contamination	The Naked Eye	No Effect On Resolution Standard	
		Oil Film	The Naked Eye	No Effect On Resolution Standard	
		Cover Tape	The Naked Eye	No Issue On Appearance.	
	Function	Image	No Communication	Test Board	Not Allowed
			Bright Pixel	Black Board	Not Allowed In the Image Center
Dark Pixel			White board	Not Allowed In the Image Center	
Blurry			The Naked Eye	Not Allowed	
No Image			The Naked Eye	Not Allowed	
Vertical Line			The Naked Eye	Not Allowed	
Horizontal Line			The Naked Eye	Not Allowed	
Light Leakage			The Naked Eye	Not Allowed	
Blinking Image			The Naked Eye	Not Allowed	
Bruise			Inspection Jig	Not Allowed	
Resolution			Chart	Follows Outgoing Inspection Chart Standard	
Color			The Naked Eye	No Issue	
Noise			The Naked Eye	Not Allowed	
Corner Dark			The Naked Eye	Less Than 100px By 100px	
Color Resolution			The Naked Eye	No Issue	
Dimension	Height	The Naked Eye	Follows Approval Data Sheet		
	Width	The Naked Eye	Follows Approval Data Sheet		
	Length	The Naked Eye	Follows Approval Data Sheet		
	Overall	The Naked Eye	Follows Approval Data Sheet		

IMT Package Solutions

IMT Camera Module



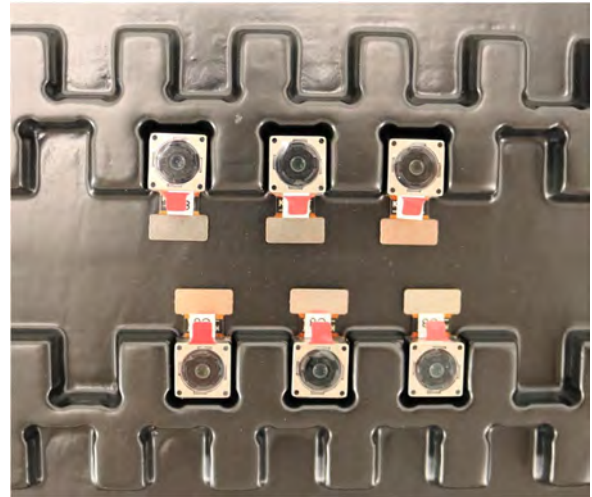
Complete with Lens Protection Film



Tray with Grid and Space

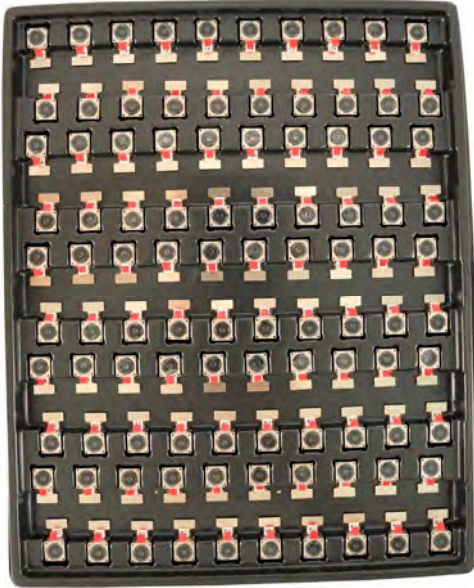


Place Cameras on the Tray

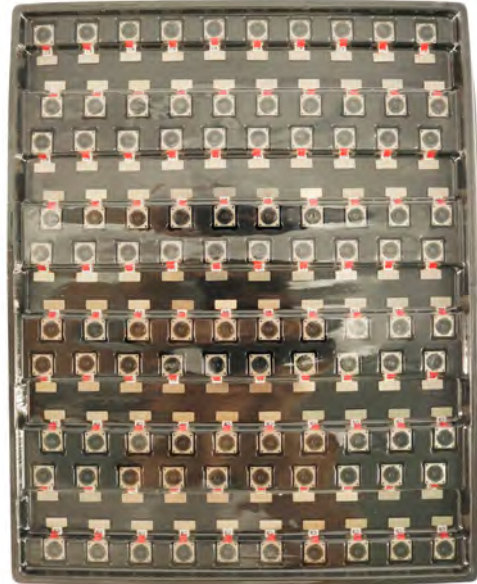


IMT Package Solutions

Full Tray of Cameras



Cover Tray with Lid



Place Tray into Anti-Static Bag



Vacuum the Anti-Static Bag





IMT Package Solutions

Sealed Vacuum Anti-Static Bag with Labels

1. Model and Description
2. Quantity
3. Manufacturing Date Code
4. Caution



IMT Package Solutions

Place Foam Sheets Between Tray Bags



Foam Sheets are Larger Than Trays



Place Foam Sheets and Trays into Box



Foam Sheets are Tightly Fitting in Box



Seal the Carbon Box



Label the Carbon Shipping Box

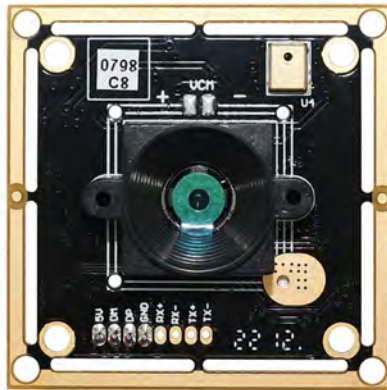




IMT Package Solutions

USB Camera Module

Complete with Lens Protection Film



Place Camera Sample into Anti-Static Bag

Place USB Cameras into Tray



Seal the Tray with Anti-Static Bag

Label the Carbon Shipping Box





IMT Package Solutions

Place Camera Sample into Anti-Static Bag



Place Connectors into Anti-Static Bag



Label the Sample Bags



Place Connectors into Reel



Place Samples into the Carbon Box



Place Connectors into the Carbon Box

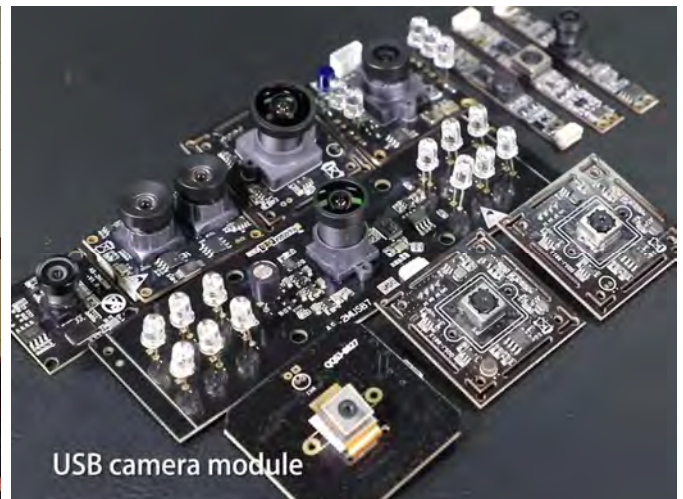


Company INNOMAKER

InnoMaker Technologies Limited (IMT) was established in 2017, a next-generation technology driven manufacturer specialized in research, design, and produce of audio and video products. IMT is occupying 20,000 square feet automated plants with 100 employees of annual throughput 30,000,000 units cameras.

IMT provides OEM, ODM design, contract manufacturing, and builds the camera products. You may provide the requirements to us, even with a hand draft, our sales and engineering work together to meet your needs. We consider ourselves your last-term partner in developing practical and innovative solutions.

Our team covers everything from initial concept development to mass produced product. IMT specializes in customized camera design, raw material, electronic engineering, firmware/software development, product testing, and packing design. Our experienced strategic supply systems offer a robust and dependable manufacturing capacity for orders of various sizes.



Limited Warranty

IMT provides the following limited warranty if you purchased the Product(s) directly from IMT company or from IMT's website www.InMakerTech.com. Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. IMT guarantees that the Product(s) will be free from defects in materials and workmanship under normal use for a period of one (1) year from the date you receive the product ("Warranty Period").

For all Product(s) that contain or develop material defects in materials or workmanship during the Warranty Period, IMT will, at its sole option, either: (i) repair the Product(s); (ii) replace the Product(s) with a new or refurbished Product(s) (replacement Product(s) being of identical model or functional equivalent); or (iii) provide you a refund of the price you paid for the Product(s).

This Limited Warranty of IMT is solely limited to repair and/or replacement on the terms set forth above. IMT is not reliable or responsible for any subsequent events.





Our Company Strength

Powerful Factory



Professional Service



Promised Delivery

