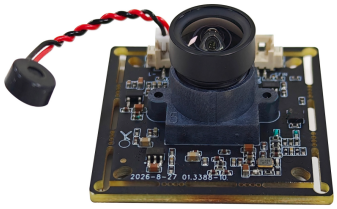
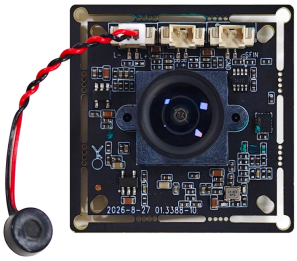
HAMPO-USB-3388-V1.0

1080P M12*P0.5 Fixed Focus USB 2.0 Camera Module





This 2MP global shutter camera module is designed for wrist-mounted egocentric data capture, robot learning, and embodied AI applications.

The global shutter sensor delivers stable 30fps video without rolling shutter distortion, helping maintain reliable image quality during fast hand and object movements.

The onboard 6-axis IMU supports selectable 100/200/500Hz sampling, with hardware timestamps synchronized with camera frames for accurate visual-inertial data fusion.

A per-unit factory calibration file, including camera intrinsics and distortion coefficients, is available to simplify system integration and minimize the need for on-site calibration.

Unified hardware timestamps are provided for camera frames and IMU data, with complete SDK/API support for integration.

The module supports plug-and-play USB 2.0 connectivity and cross-platform SDKs for Windows, Linux, and ROS, making it suitable for rapid deployment in robotic and AI applications.

Key Features:

- **Global Shutter——harp Images During Fast Hand Movements.**

All pixels are exposed simultaneously, eliminating rolling shutter distortion and helping maintain clear, stable images during fast wrist and hand movements. This provides a reliable visual input for egocentric data capture, VIO/SLAM, robot learning, and embodied AI applications.

- **Built-in 6-Axis IMU–Simplified VIO Integration**

The integrated accelerometer and gyroscope eliminate the need for an external inertial sensor. It provides motion data for visual-inertial odometry (VIO), SLAM, and motion analysis, reducing overall system complexity.

- **Factory Calibration– Plug and Play,No On-site Setup**

Each unit can be provided with its own factory calibration parameters, including camera intrinsics and distortion coefficients. This reduces the need for time-consuming on-site calibration and simplifies system integration.

- **Unified Hardware Timestamp– Precise Camera & IMU Synchronization**

Camera frames and IMU samples share a unified hardware timestamp, enabling precise temporal alignment between visual and inertial data. This supports reliable visual-inertial data fusion and high-quality egocentric datasets. Complete SDK/API support is provided for seamless integration.

- **Wrist-Mounted Design — Built for Egocentric Data Capture**

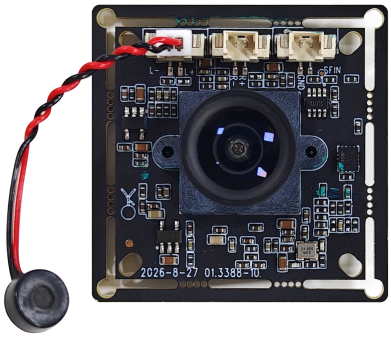
Designed for wrist-mounted applications, the camera provides a first-person view of hand and object interactions. It is suitable for robot learning, embodied AI, human-robot interaction, manipulation tasks, and egocentric dataset collection.

HAMPO-USB-3388-V1.0
1080P M12*0.5P Fixed Focus USB 2.0 Camera Module

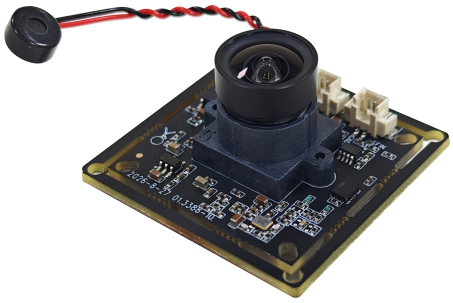
Camera Module No.	HAMPO-USB-3388-V1.0
Resolution	1920*1080p/1200p
Frame Rate	30 fps
Sensor Size	1/2.6"
Pixel Size	3.0μm*3.0μm
Dynamic Range	Linear mode: 61.56 dB / HDR mode: 91.56 dB
FOV	D= 123°/H=115°/V=87°
Lens TTL	15±0.3mm
Focus Type	Fixed Focus
Interface	USB 2.0
Output Format	MJPG/H.264/H.265
Auto Control	Saturation, Contrast, Acutance White Balance, Exposure
Function Description	3D reconstruction / VR vision / Depth detection
Voltage	DC 5V
Working Current	MAX 320mA
PCB Size	100*94*60mm
Hardware Synchronization	All cameras synchronized to a common hardware trigger/shutter signal
IMU	Built-in 6-axis IMU in Head and Wrist units where required
IMU Sampling data	500HZ
Timestamp	Unified timestamp for all camera frames and IMU
SDK/API	SDK/API to be provided
Calibration Data	Camera intrinsic parameters + distortion coefficients + extrinsic parameters where applicable
Working Temperature	0°C to +60°C
Storage Temperature	-20°C to +70°C
Mount	M12*P0.5mm

Compatibility with Windows, Android, Mac OS, Linux, or Raspberry Pi

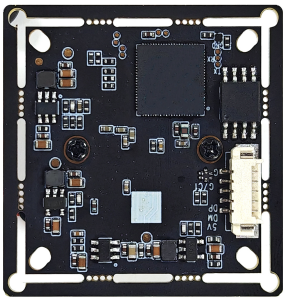
HAMPO-USB-3388-V1.0
1080P M12*0.5P Fixed Focus USB 2.0 Camera Module



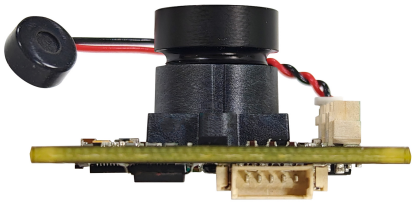
Top View



Side View

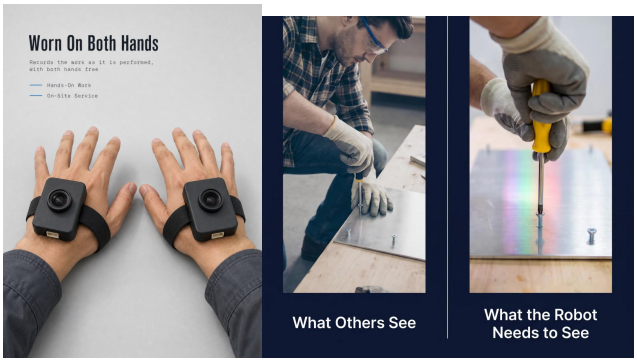


Bottom View



Side View

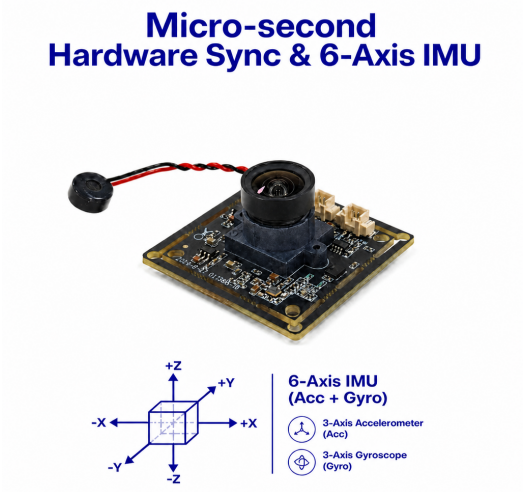
Application Built for Egocentric Data Collection



▶ Hand-Mounted Egocentric Capture — Record What the Human Sees



▶ From kitchens to factories，lab — Ego Camera is designed for large-scale



Built for human demonstration capture, embodied AI, and VIO/SLAM. Hand-held

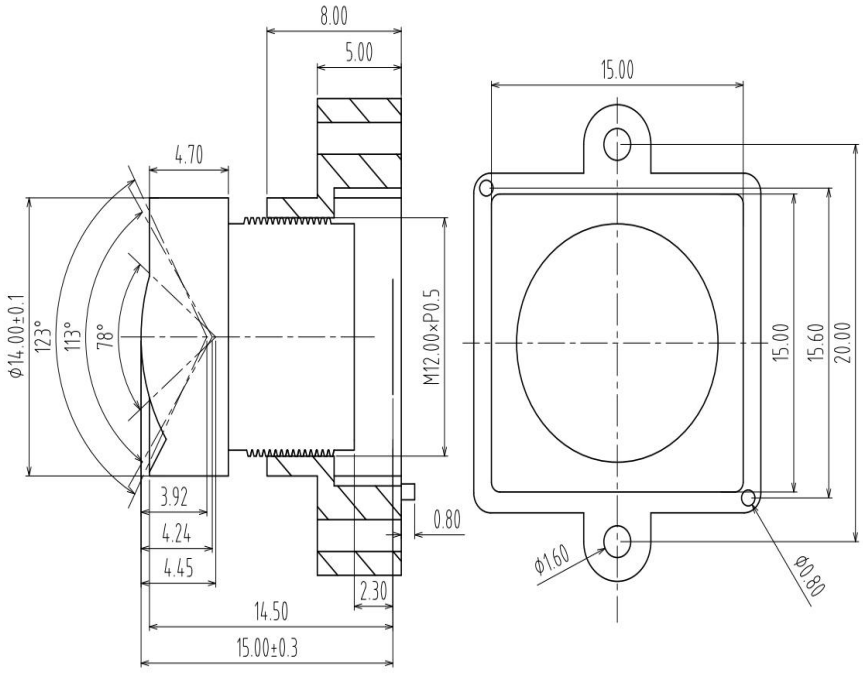
◆ Global Shutter ◆ Hardware Sync ◆ Factory Pre-Calibrated

HAMPO-USB-3388-V1.0
1080P M12*0.5P Fixed Focus USB 2.0 Camera Module

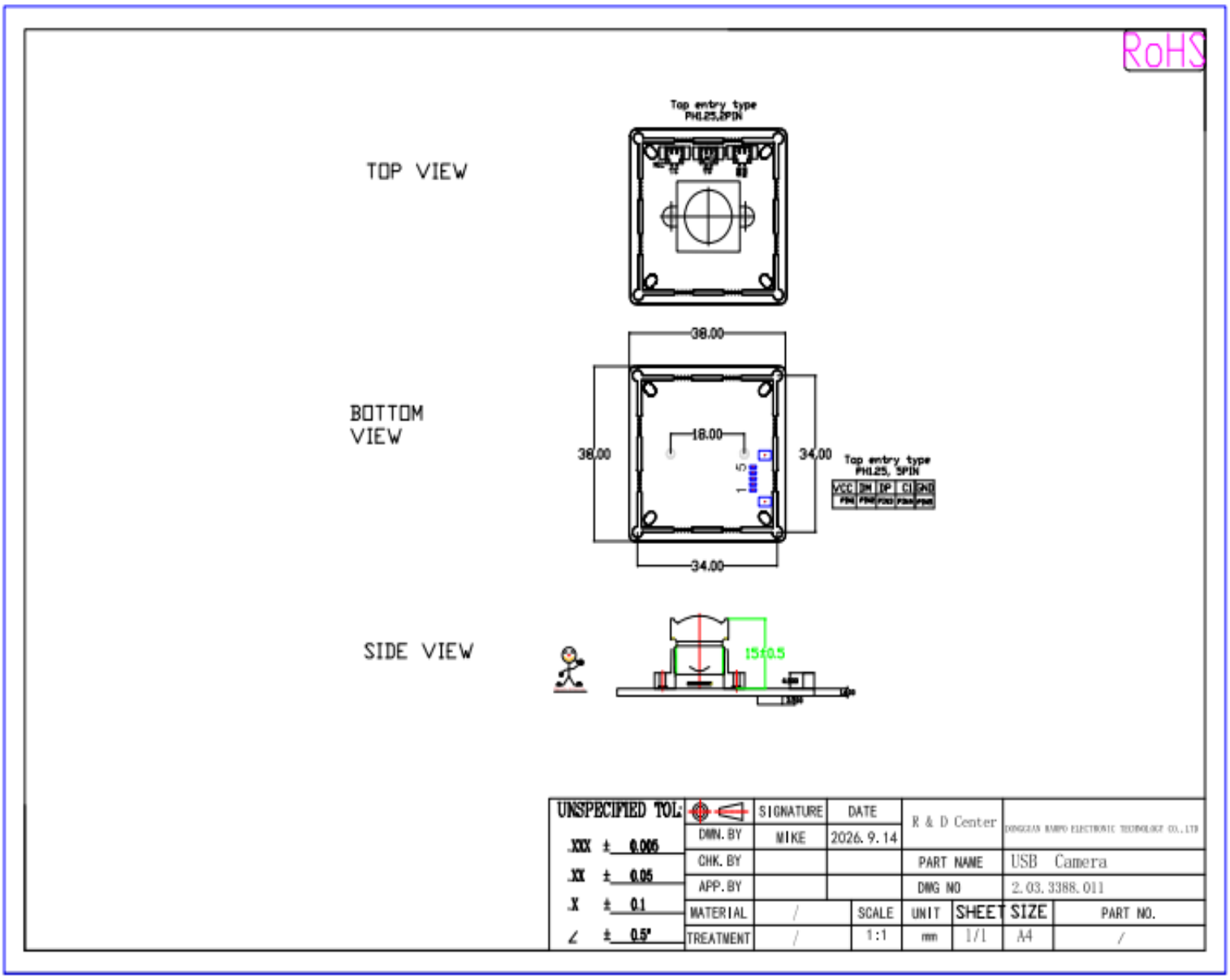
FORMAT	RESOLUTION	FRAME RATE
		USB 2.0
MJPG	1920 x 1080 (2MP)	30 FPS
	1280 x 720 (720 HD)	30 FPS
	640 x 480 (VGA)	30 FPS
YUY2	1920 x 1080 (1080P)	15 FPS
	1280 x 720 (720)	30 FPS
	640 x 480 (VGA)	30 FPS

Lens Specifications

1	EFL		2.0			
2	B.F.L		2.3			
3	F.F.L		4.0			
4	F.NO		2.0			
5	Image circle(max)		Φ6.5			
6	Sensor		GC4653	OV4689	IMX335	IMX415
7	FOV	HFOV	107°	109°	107°	113°
		VFOV	72°	75°	89°	78°
		DFOV	116°	119°	122°	123°
8	TV distortion		2%	2.3%	2.5%	2.6%
9	Thread size		M12×P0.5			
10	Structure		6E			
11	IR filter		650 IR			
Tavg>=88% @ 420-600 nm T=50% @ 650±10nm Tavg<=5% @ 700-1050 nm						



Dimension


RoHS
TOP VIEW
Top entry type
PH1.25,2PIN
BOTTOM
VIEW
38.00
38.00
18.00
34.00
34.00
Top entry type
PH1.25, 5PIN
VCC DM DP CI GND
SIDE VIEW
15±0.5
UNSPECIFIED TOL:
.XXX ± 0.005
.XX ± 0.05
.X ± 0.1
∠ ± 0.5°
SIGNATURE
DATE
DWN. BY
MIKE
2026.9.14
CHK. BY
APP. BY
MATERIAL
/
TREATMENT
/
SCALE
1:1
R & D Center
DONGGUAN HAMPO ELECTRONIC TECHNOLOGY CO.,LTD
PART NAME
USB Camera
DWG NO
2.03.3388.011
UNIT
mm
SHEET
1/1
SIZE
A4
PART NO.
/

1/2.6-inch 2.3 Mp CMOS Digital Image Sensor with Global Shutter

AR0234CS

ON Semiconductor®

www.onsemi.com

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

Description

The AR0234CS is a 1/2.6−inch 2Mp CMOS digital image sensor with an active−pixel array of 1920 (H) x 1200 (V). It incorporates a new innovative global shutter pixel design optimized for accurate and fast capture of moving scenes at full resolution 120 frame per second. The sensor produces clear, low noise images in both low−light and bright scenes. It includes sophisticated camera functions such as auto exposure control, windowing, row skip mode, column−skip mode, pixel−binning and both video and single frame modes. It is programmable through a simple two−wire serial interface. The AR0234CS produces extraordinarily clear, sharp digital pictures with an industry leading Global Shutter Efficiency, and its ability to capture both continuous video and single frames makes it the perfect choice for a wide range of applications, including scanning and industrial inspection.

Table 1. KEY PERFORMANCE PARAMETERS

Parameter	Typical Value
Optical Format	1/2.6−inch (6.8 mm)
Active Pixels	1920 (H) x 1200 (V) = 2.3 Mp
Pixel Size	3.0 μm
Color Filter Array	RGB or Monochrome
Chief Ray Angle	0° or 28°
Shutter Type	Global Shutter
Input Clock Range	6−54 MHz
Output Pixel Clock (Maximum)	90 MHz
Output Serial Parallel	 8−bit/10−bit MIPI, 1, 2, or 4−lane D−PHY 1.2, CSI−2 1.2 8−bit/10−Bit
Frame Rate Full resolution 720p	 120fps (4− lane MIPI), Default Max data rate 900 Mbps/lane 30 fps (Parallel) 120 fps (MIPI) 50 fps (Parallel)
Responsivity Monochrome Color	 56 Ke/lux*s 22.3 Ke/lux*s
SNRMAX	38 dB
Dynamic Range	71.4 dB
Supply Voltage I/O Digital Analog	 1.8 or 2.8 V 1.2 V 2.8 V
Operational Power Consumption	<395 mW at 120 FPS, Full Resolution
Operating Temperature	−40°C to + 85°C (Ambient) −40°C to +105°C (Junction)
Package Options	9.995 x 5.595 CSP Bare Die

Features

- Superior Low−light and IR Performance
- HD Video (1080p120)
- 8−bit/10−bit MIPI, 1/2/4−lane MIPI or 8−bit/10−bit Parallel Data Interface
- Automatic Black Level Calibration (ABLC)
- On−chip Auto Exposure Control with Statistics Engine for Any 5x5 Programmable Region of Interest (ROI).
- Horizontal and Vertical Mirroring, Windowing and Pixel Binning
- Flexible Control for Row and Column Skip Mode
- Different On−Chip Trigger Modes for Synchronization
- Built in Strobe Illumination Control
- On−Chip Phase Lock Loop (PLL)
- On−Chip Lens Shading Correction

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Applications

- Bar Code Scanner
- Gesture Recognition
- 3D Scanning
- Positional Tracking
- Iris Scanning
- Augmented Reality
- Virtual Reality
- Biometrics
- Machine Vision

ORDERING INFORMATION

Table 2. AVAILABLE PART NUMBERS

Part Number	Product Description	Orderable Product Attribute Description
AR0234CSSM28SUKA0-CP	2.3MP 1/2.6", Mono, 28° CRA	CSP Chip Tray with Protective Film
AR0234CSSM28SUKA0-CR	2.3MP 1/2.6", Mono, 28° CRA	CSP Chip Tray without Protective Film
AR0234CSSM28SUKA0-CP1	2.3MP 1/2.6", Mono, 28° CRA	CSP Chip Tray with Protective Film Low MOQ
AR0234CSSM28SUD20	2.3MP 1/2.6", Mono, 28° CRA	Bare Die
AR0234CSSM28SUKAH3-GEVB	2.3MP 1/2.6", Mono, 28° CRA	Demo Headboard
AR0234CSSM00SUKA0-CP	2.3MP 1/2.6", Mono, 0° CRA	CSP Chip Tray with Protective Film
AR0234CSSM00SUKA0-CR	2.3MP 1/2.6", Mono, 0° CRA	CSP Chip Tray without Protective Film
AR0234CSSM00SUKA0-CP1	2.3MP 1/2.6", Mono, 0° CRA	CSP Chip Tray with Protective Film Low MOQ
AR0234CSSM00SUD20	2.3MP 1/2.6", Mono, 0° CRA	Bare Die
AR0234CSSM00SUKAH3-GEVB	2.3MP 1/2.6", Mono, 0° CRA	Demo Headboard
AR0234CSSC28SUKA0-CP	2.3MP 1/2.6", RGB, 28° CRA	CSP Chip Tray with Protective Film
AR0234CSSC28SUKA0-CR	2.3MP 1/2.6", RGB, 28° CRA	CSP Chip Tray without Protective Film
AR0234CSSC28SUKA0-CP1	2.3MP 1/2.6", RGB, 28° CRA	CSP Chip Tray with Protective Film Low MOQ
AR0234CSSC28SUD20	2.3MP 1/2.6", RGB, 28° CRA	Bare Die
AR0234CSSC28SUKAH3-GEVB	2.3MP 1/2.6", RGB, 28° CRA	Demo Headboard
AR0234CSSC00SUKA0-CP	2.3MP 1/2.6", RGB, 0° CRA	CSP Chip Tray with Protective Film
AR0234CSSC00SUKA0-CR	2.3MP 1/2.6", RGB, 0° CRA	CSP Chip Tray without Protective Film
AR0234CSSC00SUKA0-CP1	2.3MP 1/2.6", RGB, 0° CRA	CSP Chip Tray with Protective Film Low MOQ
AR0234CSSC00SUD20	2.3MP 1/2.6", RGB, 0° CRA	Bare Die
AR0234CSSC00SUKAH3-GEVB	2.3MP 1/2.6", RGB, 0° CRA	Demo Headboard

NOTE: Please check with an ON Semiconductor sales representative for availability of these parts.

Table 3. FRAME RATES FOR MASTER, AUTOMATIC TRIGGER AND MULTI-SENSOR SYNC MODE

Resolution	Interface	Frame Rate (frames per sec)
Full_Resolution 1920x1200	MIPI	120
		60
		30
	Parallel	30
2x2_Binning 960x600	MIPI	237
		120

Table 4. FRAME RATES FOR PULSE TRIGGER MODE

Resolution	Interface	Frame Rate (frames per sec)
Full_Resolution 1920x1200	MIPI	60
		30
	Parallel	30
2x2_Binning 960x600	MIPI	120
		60

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

Company HAMPO

Dongguan Hampo Electronic Technology Co., Ltd. was established in 2015, a next-generation technology driven manufacturer specialized in research, design and produce of audio and video products. Hampo is occupying 150,000 square feet automated plants with 500 employees of annual throughput 180,000,000 units cameras.

Hampo 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. Hampo specialize in customized camera design, raw material, electronic engineering, firmware and 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

Hampo provides the following limited warranty if you purchased the products directly from Hampo company or from Hampo's website, www.hampotech.com. Products purchased from other sellers or sources are not covered by this limited warranty. Hampo guarantees that the products will be free from defects in materials and workmanship under normal use for a period of one year from the date you receive the product warranty period.

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

This limited warranty of Hampo is solely limited to repair or replacement on the terms set forth above. Hampo is not reliable or responsible for any subsequential events.

Dongguan Hampo Electronic Technology Co., Ltd.
Address：No. 58, New Arising Industrial Zone,
Tangxia Town, Dongguan, Guangdong, China.

www.hampotech.com
fairy@hampotech.com

Tel (+86) 769 8798 9852
Fax (+86) 879 8798 9853
Mobile (+86) 158 1867 7270

Skype FairyTan
WeChat (+86) 15818677270
WhatsApp (+86) 15818677270