



HAMPO-F1MA-OV5645 V2.1

5MP OmniVision OV5645 MIPI Interface Auto Focus Camera Module



Front View



Back View

Specifications

Camera Module No.	HAMPO-F1MA-OV5645 V2.1
Resolution	5MP
Image Sensor	OV5645
Sensor Type	1/4"
Pixel Size	1.4 um x 1.4 um
EFL	3.29 mm
F.NO	2.80
Pixel	2592 x 1944
View Angle	68.7°(DFOV) 58.1°(HFOV) 45.0°(VFOV)
Lens Dimensions	8.50 x 8.50 x 5.17 mm
Module Size	36.14 x 8.50 mm
Module Type	Auto Focus
Interface	MIPI
Auto Focus VCM Driver IC	Embedded
Lens Model	HAMPO-LENS-M5101
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +70°C
Mating Connector	BBR43-24KB533



HAMPO-F1MA-OV5645 V2.1

5MP OmniVision OV5645 MIPI Interface Auto Focus Camera Module



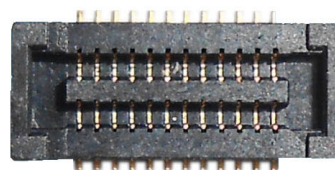
Top View



Side View



Bottom View

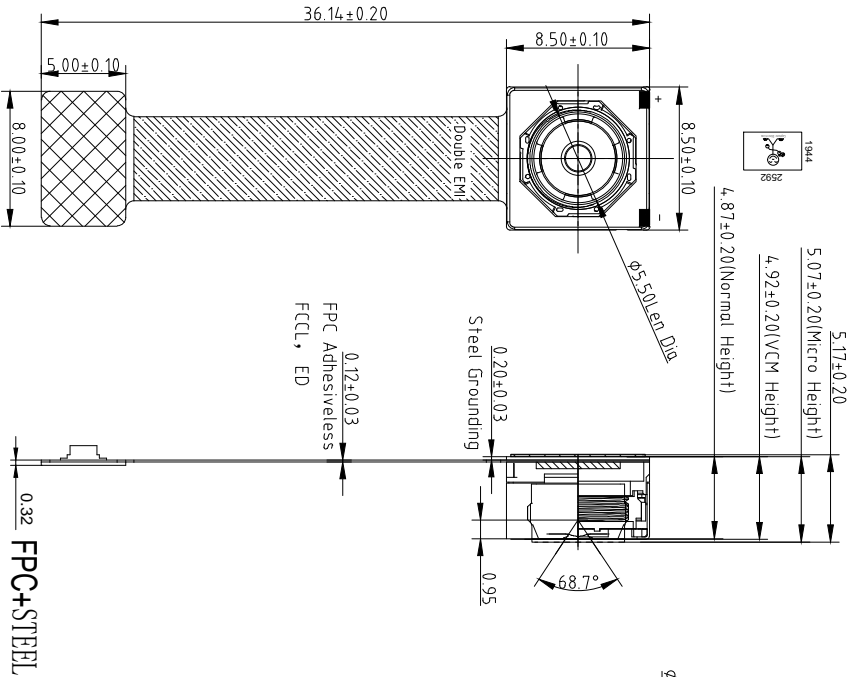


Mating Connector

ROHS

PIN NO	NAME
1	MCLK
2	PW/DN
3	GND
4	DATAN0
5	DATAP0
6	CLKN
7	CLKP
8	GND
9	IOVDD(1.8V)
10	AVDD(2.8V)
11	GND
12	RESET
13	SCL
14	SDA
15	GND
16	DATAN1
17	DATAP1
18	AGND
19	NC
20	NC
21	NC
22	DVDD(1.5V)
23	APVDD(2.8V)
24	NC

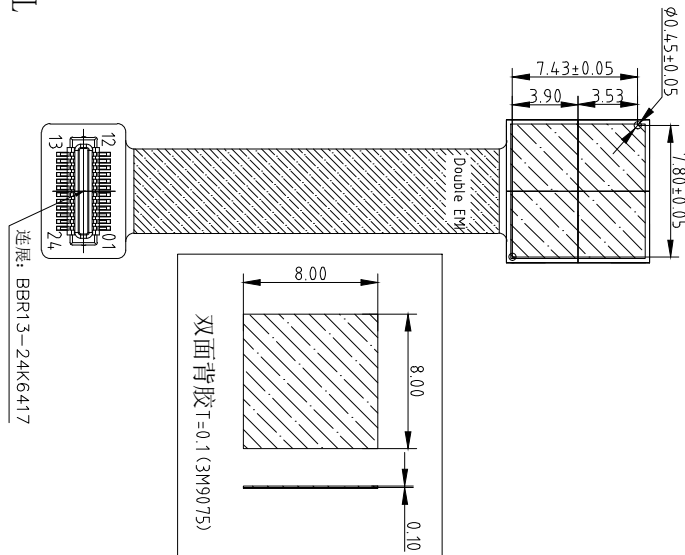
焦距 (FFL)	3.29
光圈 (F. NO)	2.8
视场角 (View Angle)	68.7°
畸变 (Distortion)	< 1%
镜头类型 (Lens Size)	1/4 inch
像素 (Array Size)	2592*1944
感光芯片 (Chip Type)	OV5645



TOP VIEW

SIDE VIEW

BOTTOM VIEW



Designed By:	Kevin
Checked By:	Feng Liu
Approved By:	Aouly_Yan
Model Name:	F1MA-OV5645 V2.1
Projection Type:	Unit: mm
Third Angle	Scale: 1:1
Sheet:	1 of 1
Version:	1/0

HAMPO-LENS-M5101

TECHNICAL DRAWING: LENS ASSEMBLY

FRONT VIEW:

- Overall diameter: $\phi 51.40$
- Inner diameter: $\phi 4.7$
- Mounting holes: 4 holes, diameter $\phi 4.18 \pm 0.1$ mm, spaced at $4-45^\circ$.
- Mounting hole radius: $R0.15$
- Center hole diameter: $\phi 1.15$
- Center hole depth: 0.89 mm (MAX)
- Center hole chamfer: 0.95 mm (D)
- Center hole chamfer angle: 68.7° (D)
- Center hole chamfer radius: 0.89 mm (MAX)
- Center hole chamfer angle: 73° (MAX)

SIDE VIEW:

- Overall height: 4.18 ± 0.10 mm
- Mounting hole depth: 1.30 mm
- Mounting hole chamfer: 0.85 mm
- Mounting hole chamfer angle: 1.43°
- Mounting hole chamfer radius: 0.85 mm
- Mounting hole chamfer angle: 68.7° (D)
- Mounting hole chamfer radius: 0.89 mm (MAX)
- Mounting hole chamfer angle: 73° (MAX)
- Mounting hole chamfer radius: 0.89 mm (MAX)
- Mounting hole chamfer angle: 68.7° (D)
- Mounting hole chamfer radius: 0.89 mm (MAX)
- Mounting hole chamfer angle: 73° (MAX)

SPECIFICATION TABLE:

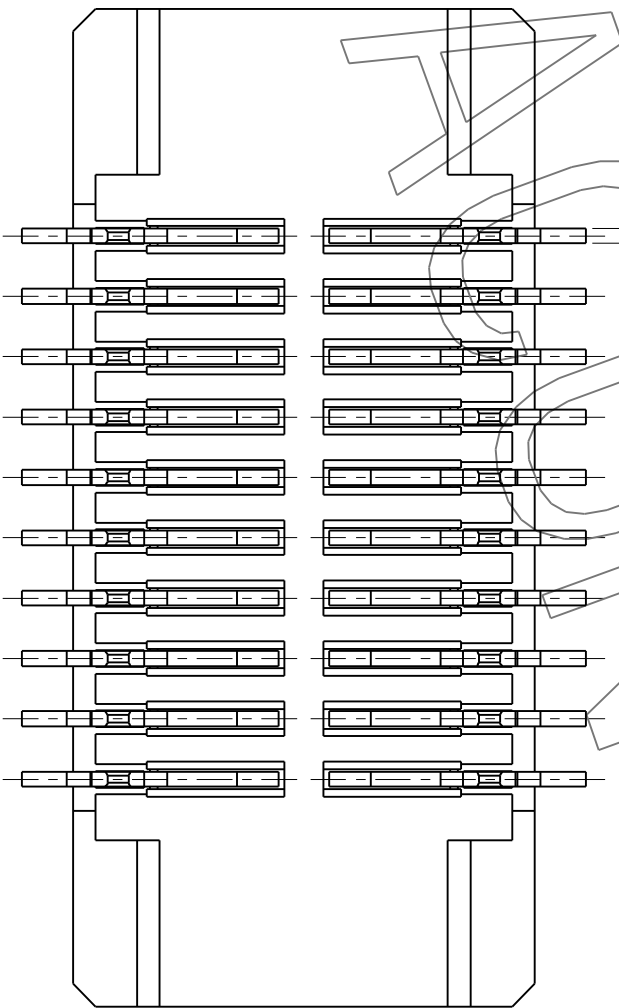
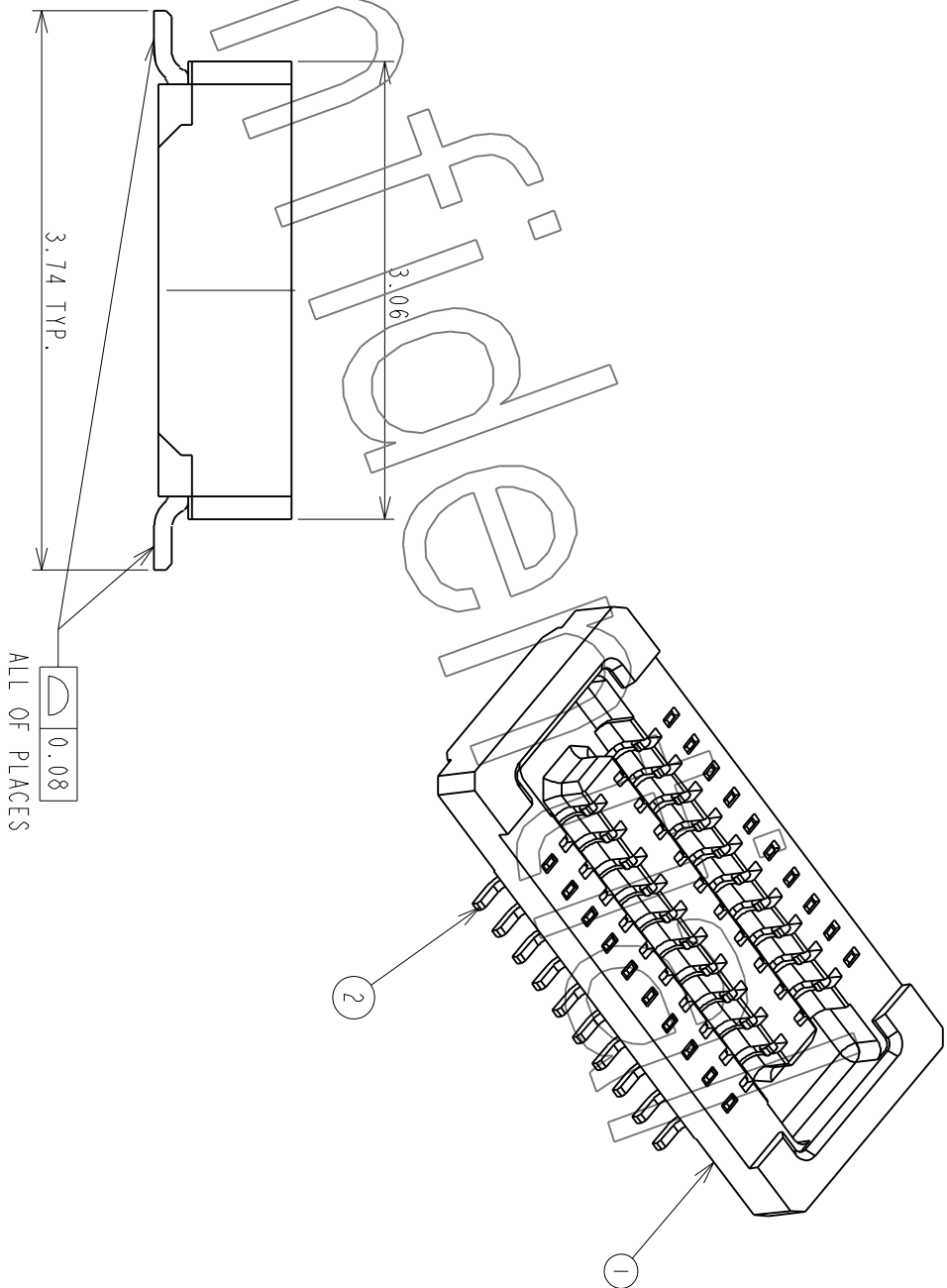
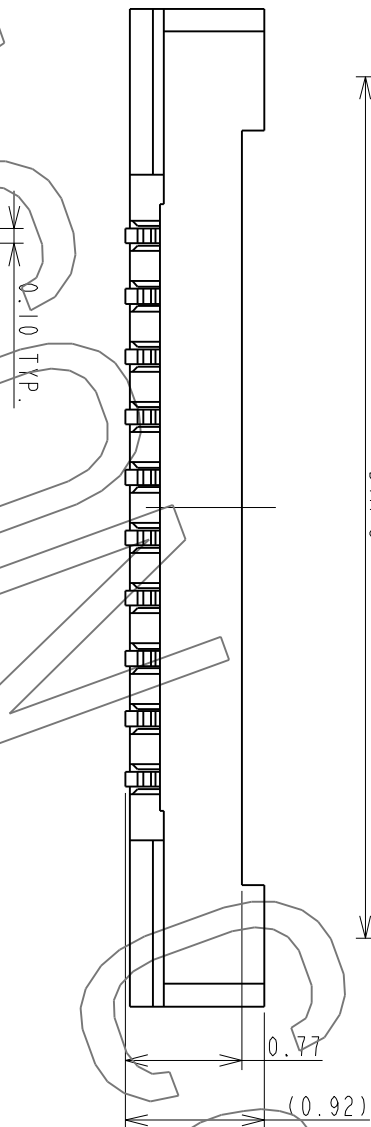
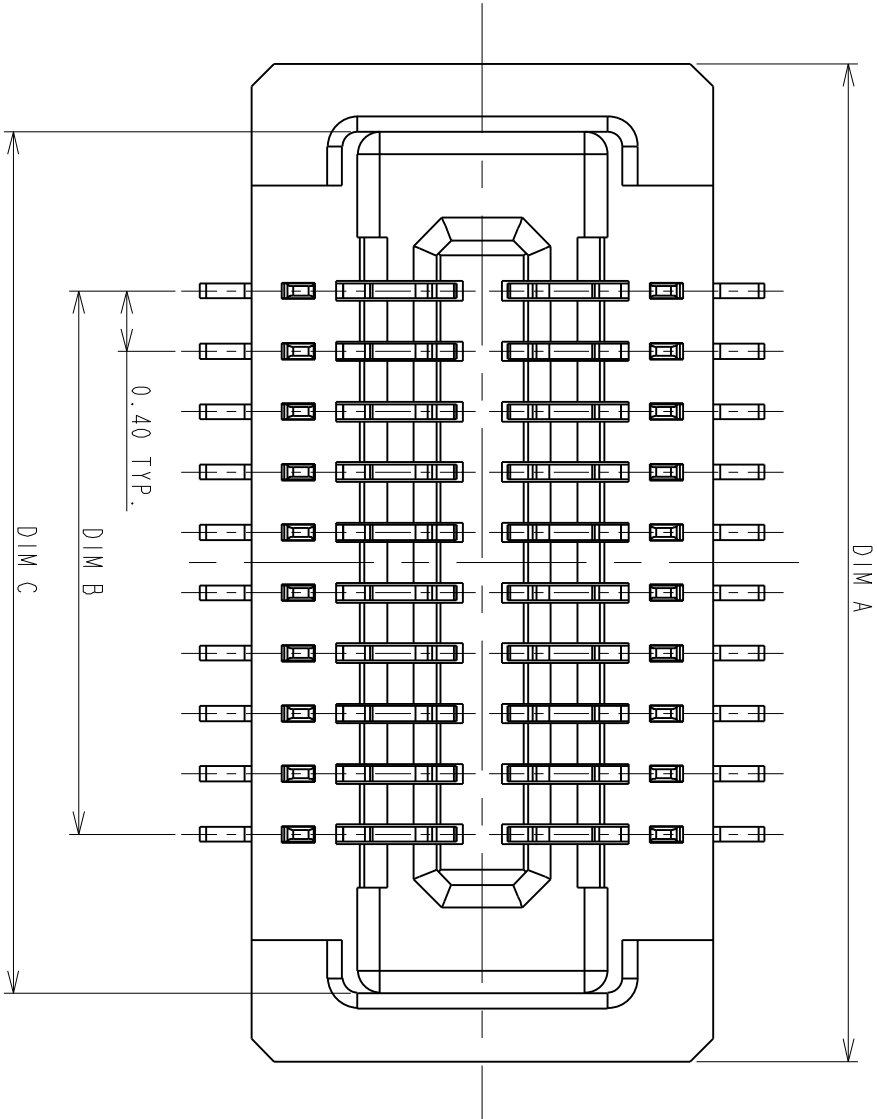
SPECIFICATION	
1. SENSOR SIZE	1/4" (5M CSP)
2. MAX IMAGE CIRCLE	$\phi 4.90$ mm
3. TOTAL TRACK	4.18 ± 0.1 mm
4. BFL	3.29 mm
5. OPTICAL BFL	1.43 mm
6. MECHANICAL BFL	0.85 mm
7. F/NO	2.8 \pm 5%
8. VIEW OF FIELD	45.0° (Y=1.35) 58.1° (Y=1.814) 68.7° (Y=2.268)
9. OPTICAL DISTORTION	<1.0%
10. TV DISTORTION	<1.0%
11. RELATIVE ILLUMINATION	>42.3%
12. CONSTRUCTION	4P-IR FILTER
13. CHIEF RAY ANGLE	<25°
14. CUT FREQUENCY AT 50%	650 \pm 10 nm
15. THREAD	M6.0X0.35P
16. IMAGE QUALITY	330 lp/mm 0.7V 200 μ m/mm
17. APPEARANCE QUALITY (Scratch/Dig)	CENTER: 20/10 EDGE: 40/20

NOTE:

- 镜头表面不可有油污、灰尘、毛丝等异物。
- 镜头配VCM锁附高度为 4.7 ± 0.1 mm，扭力为 $20-60$ gf.cm。
- 镜头承受推力为 ≥ 2.0 kg。
- 镜头品质参数需符合图中要求。

IR CUT IMAGE PLANE

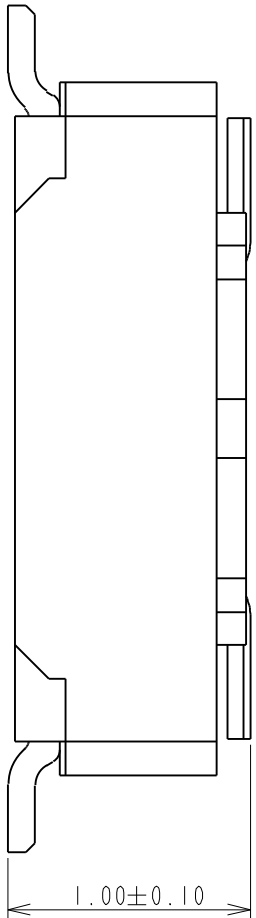
REV.	EC#	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
A	TJECR10018-02	NEW RELEASE PER NPI10009	11/05/10'	RAIN	DICK, SON	HARDWARE
B	TJECR13014	ΔA X1, AX1	05/13/13'	RAIN	SteveM DESIGN	Jeff HARDWARE



ITEM	NAME	Q'TY	PART #	MATERIAL / FINISH
2	CONTACT	XX	T-BBR43-100X30	COPPER ALLOY/PLATING GOLD
1	HOUSING	1	I-BBR43-1XXX33	HIGH TEMP RESIN/UL 94 V-0
TOLERANCES UNLESS OTHERWISE SPECIFIED				
GENERAL		X.XX ±0.38		
DESIGN		.XX ±0.25		
RAIN		.XXX ±0.05		
ANGLES		X° ±3.0°		
		.XX° ±1.0°		
SCALE 20:1		CHECKED		
SHEET 1 OF 2		HARDWARE 04/24/10'		
UNIT MM		APPROVED DATE		
		DICK, LEE 04/24/10'		
		CUSTOMER DRAWING		
		SERIES BBR		
		DWG NO. C-BBR43-04-01		
		REV. B		



P0.4*H1.0mm BOARD TO BOARD
CONN. RECEPTACLE
WITHOUT HOLD DOWN



PRODUCT NUMBERING CODE:

BBR43	-	XX	K	X	5	X	X
1	2	3	4	5	6	7	

1. PRODUCTION CODE:

BBR43: BOARD TO BOARD 0.4 PITCH RECEPTACLE

2. POSITIONS:

XX: POSITIONS(SEE TABLE A

3. INSULATOR COLOR:

K: BLACK

4. CONTACT PLATING:

- 1: GOLD 1u" MIN
- 2: GOLD 5u" MIN
- 3: GOLD 10u" MIN
- B: GOLD 4u" MIN FOR SPOT PLATING
- ALL OVER: Ni 50~100u"

5. TYPE OF HEIGHT:

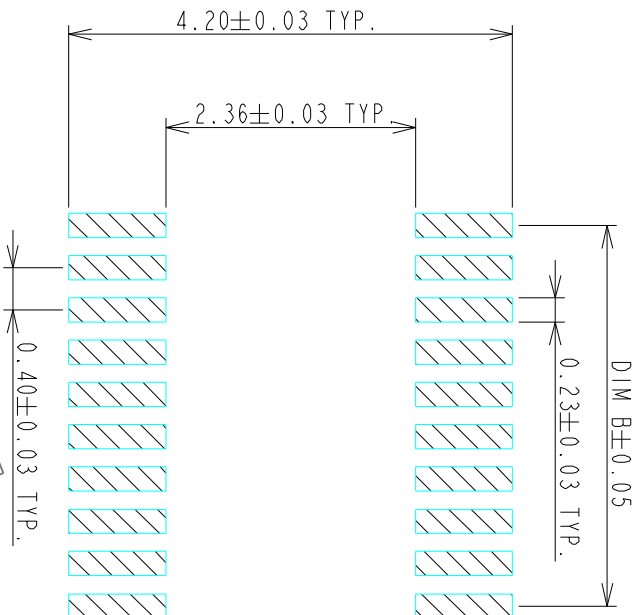
5: H=0.77mm

6. TYPE OF HOLD DOWN:

3: WITHOUT HOLD DOWN

7. OTHER

- 2: WITH POST, FINISHED PRODUCTS
- 3: WITHOUT POST, FINISHED PRODUCTS



RECOMMENDED P.C. BOARD PATTERN DIMENSION (WITHOUT HOLD DOWN)

NOTES:			
1.0: RATING:			
1.1: VOLTAGE: 60V AC/DC			
1.2: CURRENT: 0.5 AMPS			
1.3: OPERATION TEMPERATURE: -40°C TO +85°C			
2.0: ELECTRICAL CHARACTERISTIC:			
2.1: CONTACT RESISTANCE: 50 mΩ MAX INITIAL			
2.2: INSULATION RESISTANCE: 1000 MΩ MIN INITIAL			
2.3: DIELECTIC WITHSTANDING VOLTAGE: 250V AC FOR ONE MINUTE			
3.0 TOLERANCES UNLESS OTHERWISE SPECIFIED			
GENERAL:	DIMENSION >10.00	±0.13	
	DIMENSION 5.00~10.00	±0.10	
	DIMENSION <5.00	±0.05	

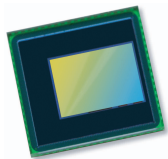
POSITIONS	DIM A	DIM B	DIM C
10	4.61	1.60	3.71
14	5.41	2.40	4.51
16	5.81	2.80	4.91
18	6.21	3.20	5.31
20	6.61	3.60	5.71
22	7.01	4.00	6.11
24	7.41	4.40	6.51
26	7.81	4.80	6.91
30	8.61	5.60	7.71
32	9.01	6.00	8.11
34	9.41	6.40	8.51
40	10.61	7.60	9.71
44	11.41	8.4	10.51
48	12.21	9.20	11.31
50	12.61	9.60	11.71
54	13.41	10.40	12.51
60	14.61	11.60	13.71
70	16.61	13.60	15.71
80	18.61	15.60	17.71

4.0 ALL COPLANARITY IS 0.08mm MAX. BEFORE REFLOW

ALL COPLANARITY IS 0.10mm MAX. AFTER REFLOW

TOLERANCES UNLESS OTHERWISE SPECIFIED		DRAWN		DATE	
GENERAL	X ₁ ±0.38	RAIN		04/15/10	
	X ₂ ±0.13	DESIGN		DATE	
	XXX ±0.05	RAIN		04/15/10	
ANGLES	X ₁ ° ±3.0°	CHECKED		DATE	
	X ₂ ° ±2.0°				
	X ₃ ° ±1.0°				
SCALE	20:1	HARDWARE		04/24/10	
SHEET	2 OF 2	APPROVED		DATE	
UNIT	MM	DICK, LEE		04/24/10	
		CUSTOMER DRAWING		TITLE	
				P0.4*11.0mm BOARD TO BOARD CONN. RECEPTACLE WITHOUT HOLD DOWN	
				SERIES	
				BBR	
				SIZE	
				A3	
				REV.	
				B	





OV5645 5-megapixel product brief



available in
a lead-free
package

High Quality 5-Megapixel Photography and HD Video for Low-Cost Mobile Devices

OmniVision's OV5645 is a high performance, 5-megapixel system-on-chip (SOC) ideally suited for the cost-sensitive segment of the mobile handset market. The CameraChip™ sensor's single MIPI port replaces both a bandwidth-limited DVP interface and a costly embedded JPEG compressor, allowing the new OV5645 sensor to save significant silicon area and cost. An embedded autofocus control with voice coil motor driver offers further cost savings for the end user, making the OV5645 a highly attractive alternative to other 5-megapixel sensors currently on the market.

The OV5645 also features a new picture-in-picture (PIP) architecture that offers an easy-to-implement, low-cost dual camera system solution for mobile handsets and smartphones. The feature is based on a master/slave configuration where a front-facing camera (OV7965) can be connected through the OV5645 master camera, enabling a two-camera system with PIP functionality without the need for an additional MIPI interface into the baseband processor.

Built on OmniVision's 1.4-micron OmniBSI™ pixel architecture, the OV5645 offers high performance 5-megapixel photography and 720p HD video at 60 frames per second (FPS) and 1080p HD video at 30 FPS with complete user control over formatting and output data transfer. The sensor's 720p HD video is captured in full field-of-view with 2 x 2 binning, which doubles the sensitivity and improves the signal-to-noise ratio (SNR). A unique post-binning, re-sampling filter function removes zigzag artifacts around slant edges and minimizes spatial artifacts to deliver even sharper, crisper color images.

Find out more at www.ovt.com.

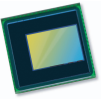
Applications

- Cellular Phones
- PC Multimedia
- Toys
- Digital Still Cameras

Product Features

- 1.4 μm x 1.4 μm pixel with OmniBSI™ technology for high performance (high sensitivity, low crosstalk, low noise, improved quantum efficiency)
- optical size of 1/4"
- automatic image control functions: automatic exposure control (AEC), automatic white balance (AWB), automatic band filter (ABF), automatic 50/60 Hz luminance detection, and automatic blacklevel calibration (ABLC)
- image quality controls: color saturation, hue, gamma, sharpness (edge enhancement), lens correction, defective pixel canceling, and noise canceling
- support for output formats: RAW RGB, RGB565/555/444, YUV422/420, YCbCr422
- support for video or snapshot operations
- support for internal and external frame synchronization for frame exposure mode
- support for LED and flash strobe mode
- support for horizontal and vertical sub-sampling, binning
- support for minimizing artifacts on binned image
- support for data compression output
- support for anti-shake
- standard serial SCCB interface
- dual lane MIPI output interface
- embedded 1.5V regulator for core power
- programmable I/O drive capability, I/O tri-state configurability
- support for black sun cancellation
- support for images sizes: 5 megapixel, and any arbitrary size scaling down from 5 megapixel
- support for auto focus control (AFC) with embedded AF VCM driver
- embedded microcontroller
- suitable for module size of 8.5 x 8.5 x <6mm with both CSP and RW packaging

OV5645



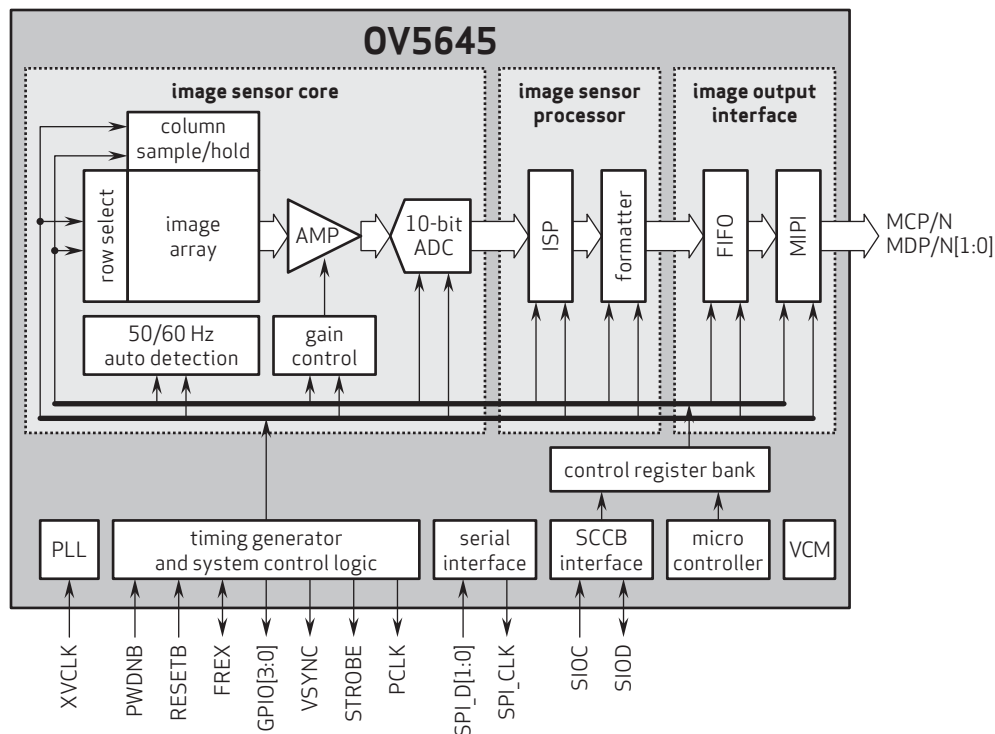
Ordering Information

- **OV5645-A66A**
(color, lead-free, 66-pin CSP3)
- **OV5645-G04A**
(color, chip probing, 200 μm backgrinding, reconstructed wafer)

Product Specifications

- **active array size:** 2592 x 1944
- **power supply:**
 - core: 1.5V \pm 5% (with embedded 1.5 regulator)
 - analog: 2.6 - 3.0V (2.8V typical)
 - I/O: 1.8V / 2.8V
- **temperature range:**
 - operating: -30°C to 70°C junction temperature
 - stable image: 0°C to 50°C junction temperature
- **output formats:** 8-/10-bit RGB RAW, RGB565/555/444, YUV422/420, YCbCr422 output
- **lens size:** 1/4"
- **lens chief ray angle:** 29.1°
- **input clock frequency:** 6 - 27 MHz
- **max S/N ratio:** 36 dB
- **maximum image transfer rate:**
 - QSGA (2592X1944): 15 fps
 - 1080p: 30 fps
 - 1280x960: 45 fps
 - 720p: 60 fps
- **shutter:** rolling shutter / frame exposure
- **maximum exposure interval:** 1964 x t_{row}
- **pixel size:** 1.4 μm x 1.4 μm
- **image area:** 3673.6 μm x 2738.4 μm
- **package/die dimensions:**
 - CSP3: 6200 μm x 4860 μm
 - COB: 6190 μm x 4850 μm

Functional Block Diagram



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OmniVision



Cameras Applications



IMAGING DEVICES





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	Major Difference is Not Allowed.
		Be Torn/Chopped	Copper Crack Exposure is Not Allowed.
		Marking	Clear, Recognizable (Within 30cm Distance)
	Holder	Scratches	The Inside Crack Exposure is Not Allowed
		Gap	Meet the Height Standard
		Screw	Make Sure Screws Are Presented (If Any)
		Damage	The Inside Crack Exposure is Not Allowed
	Lens	Scratch	No Effect On Resolution Standard
		Contamination	No Effect On Resolution Standard
		Oil Film	No Effect On Resolution Standard
		Cover Tape	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

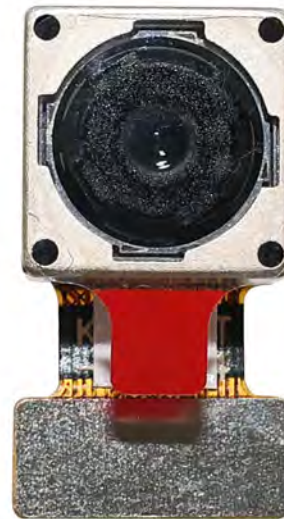


HAMPO Package Solutions

Hampo Camera Module



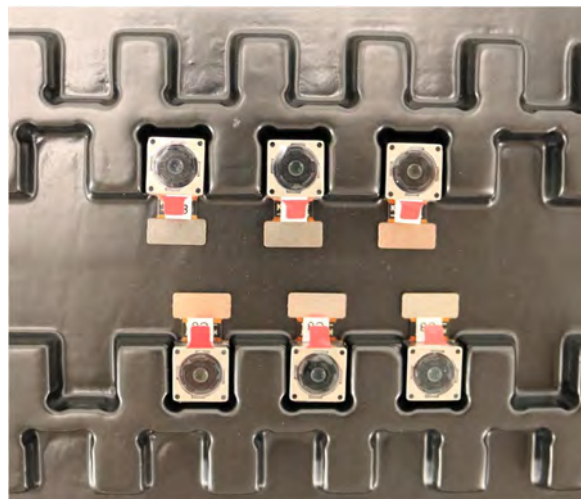
Complete with Lens Protection Film



Tray with Grid and Space



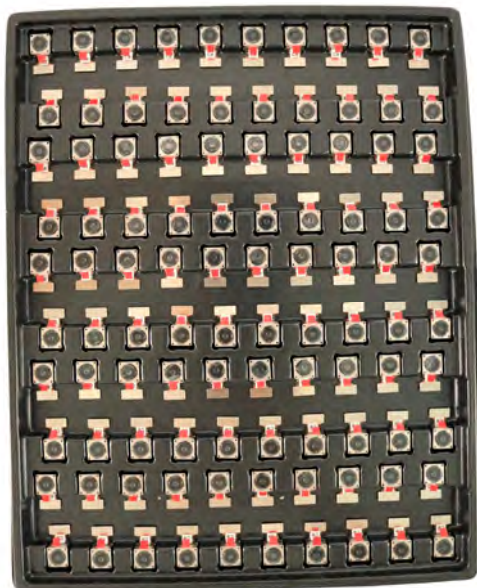
Place Cameras on the Tray



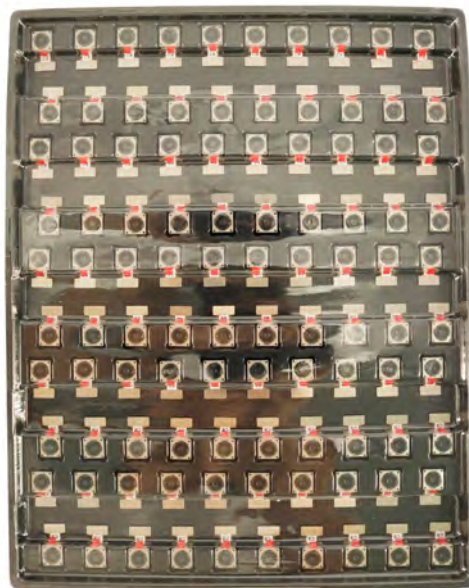


Camera Modules Package Solution

Full Tray of Cameras



Cover Tray with Lid



Place Tray into Anti-Static Bag



Vacuum the Anti-Static Bag





Camera Modules Package Solution

Sealed Vacuum Anti-Static Bag with Labels

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





Large Order Package Solution

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





An open, empty cardboard box with a white interior lining. The box is shown from a top-down perspective, with the lid flaps open and the interior surface visible. The cardboard is a light brown color, and the white lining is a smooth, slightly reflective material. The box is centered against a plain white background.




<p>HAMPO Model No.</p> <p>HAMPO M612 (H612E V1.8)</p> <p>OSDIP, MP Interface</p> <p>Auto Focus, 70.8 Degree</p> <p>MADE IN CHINA</p>	<p>Tray 1 of 1</p> <p>300 PIECES</p> <p>Production Date</p> <p>20 August 2022</p> <p>Date Code</p> <p>2234 (Week 34, 2022)</p>
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Sample Order and Connector Package Solution

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



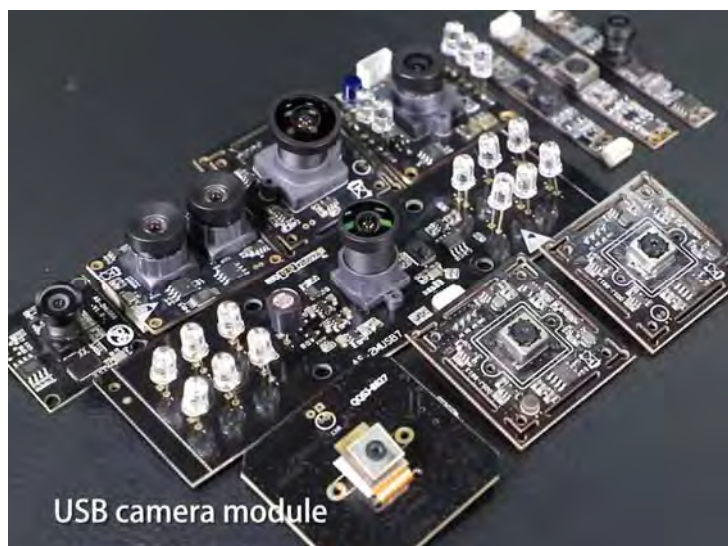


Company HAMPO

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 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

Hampo provides the following limited warranty if you purchased the Product(s) directly from Hampo company or from Hampo's website, www.hampotech.com. Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. Hampo 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, Hampo 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 Hampo is solely limited to repair and/or replacement on the terms set forth above. Hampo is not reliable or responsible for any subsequent events.



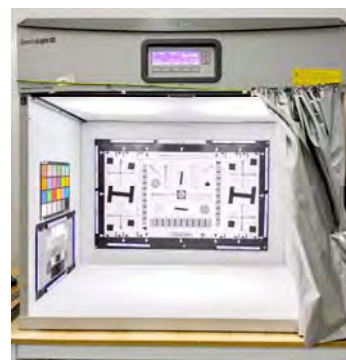


Hampo Strength

Powerful Factory



Professional Service



Promised Delivery

