

YDS-MFA55-AR1335 V1.0 NL

13MP OnSemi AR1335 PLCC MIPI Interface M12 Fixed Focus Camera Module No Lens



Front View



Back View

Specifications

Camera Module No.	YDS-MFA55-AR1335 V1.0 NL
Resolution	13MP
Image Sensor	AR1335_PLCC
Sensor Type	1/3.2"
Pixel Size	1.1 um x 1.1 um
Pixel	4208 x 3120
Module Size	50.00 x 20.00 mm
Module Type	Fixed Focus
Interface	MIPI
Fixed Focus VCM Driver IC	None
Lens Type	No Lens
Operating Temperature	-30°C to +70°C
Mating Connector	DF30FC-30DS-0.4V

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13MP OnSemi AR1335 PLCC MIPI Interface M12 Fixed Focus Camera Module No Lens

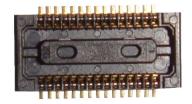


Top View



Side View

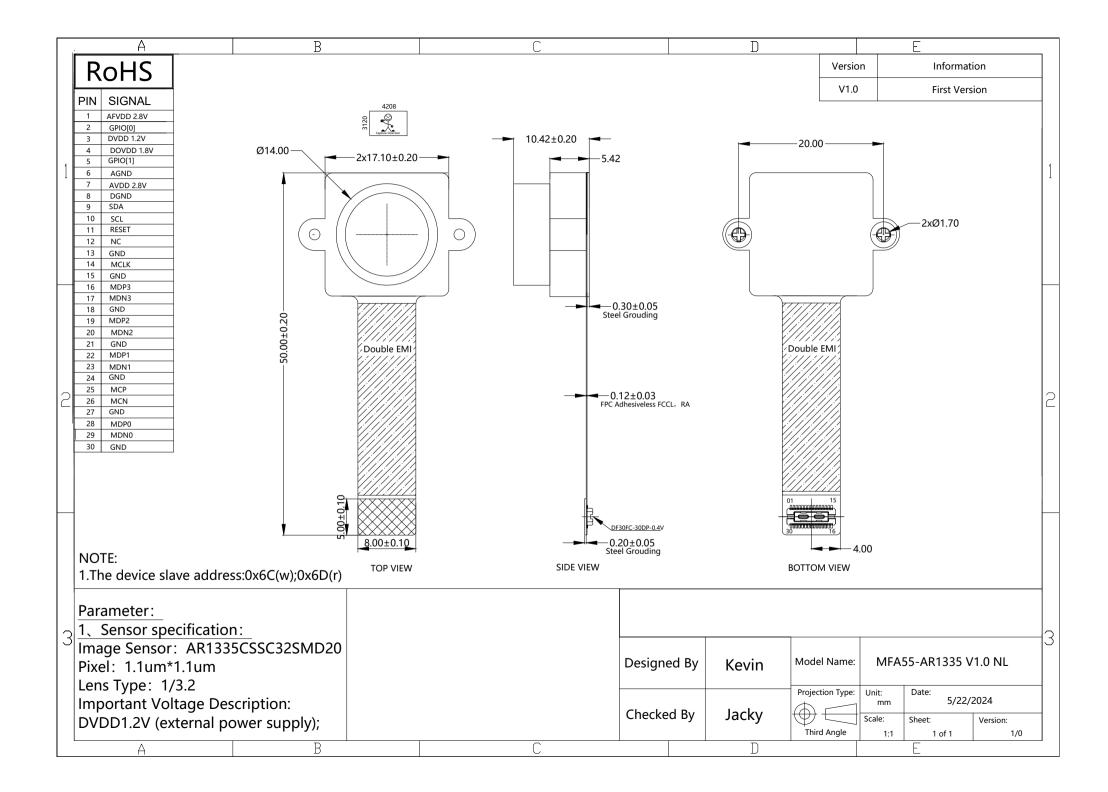




Bottom View

Mating Connector

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Product Overview

AR1335: 13 MP 1/3" CMOS Image Sensor

For complete documentation, see the data sheet.



The AR1335 is a 1/3.2-inch CMOS active-pixel digital image sensor with a pixel array of 4208H x 3120V. The AR1335 digital image sensor, features breakthrough 1.1 m pixel technology that delivers superior low-light image quality through leading sensitivity, quantum efficiency and linear full well. This allows image quality that rivals digital still cameras. With a sensor architecture focused on low power and a high Chief Ray Angle (CRA) for low Z-heights, the AR1335 is ideal for smartphone and other mobile device applications. It incorporates sophisticated on-chip camera functions such as windowing, mirroring, column and row skip modes, and snapshot mode. It is programmable through a simple two-wire serial interface. The AR1335 sensor can generate full resolution image at up to 30 frames per second (fps) and supports advanced video modes including 4K 30fps, 1080P 60fps and 720P 120fps.

Features

- 13MP CMOS sensor with advanced 1.1µm pixel BSI technology
- · Data interfaces: 2,3 and 4 lane MIPI
- · Bit-depth compression available for MIPI: 10-8 and 10-6 to lower bandwidth
- 3D synchronization controls to enable stereo video capture
- 6.8 kbits one time programmable memory (OTPM)
- Programmable controls: gain, horizontal and vertical blanking, auto black level offset correction, frame size/rate, exposure, leftright and top-bottom image reversal, window size, and panning
- Two on-die phase-locked loop (PLL) oscillators for super low noise performance
- · On-chip temperature sensor
- · Bayer pattern horizontal down-size scaler
- Simple two-wire fast-mode+ serial interface For more features, see the data sheet

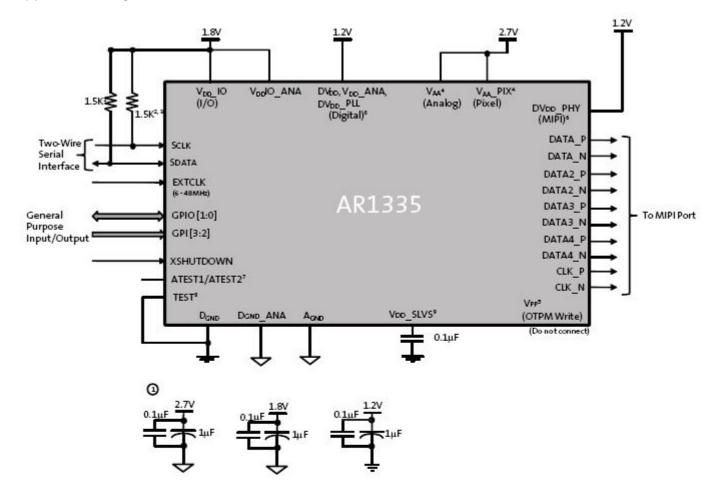
Applications

- Mobile
- 4K video capture
- · High resolution still capture

End Products

- Smart Phone
- · Digital Still Camera
- · PC Camera
- · Consumer devices

Part Electrical	Specifica	tions									
Product	Compliance	Status	Туре	Megapixel s	Frame Rate (fps)	Optical Format	Shutter Type	Pixel Size (µm)	Output Interface	Color	Package Type
AR1335CSSC11SMD2 0	Pb-free Halide free	Active	CMOS	13	30	1/3.2 inch	Electronic Rolling	1.1 x 1.1	MIPI	RGB	
AR1335CSSC11SMKA 0-CP	Pb-free Halide free	Active	CMOS	13	30	1/3.2 inch	Electronic Rolling	1.1 x 1.1	MIPI	RGB	ODCSP- 63
AR1335CSSC11SMKA 0-CR	Pb-free Halide free	Active	CMOS	13	30	1/3.2 inch	Electronic Rolling	1.1 x 1.1	MIPI	RGB	ODCSP- 63
AR1335CSSC32SMD2 0	Pb-free Halide free	Active	CMOS	13	30	1/3.2 inch	Electronic Rolling	1.1 x 1.1	MIPI	RGB	
AR1335CSSM11SMD2 0	Pb-free Halide free	Active	CMOS	13	30	1/3.2 inch	Electronic Rolling	1.1 x 1.1	MIPI	RGB	
AR1335CSSM32SMD2 0	Pb-free Halide free	Active	CMOS	13	30	1/3.2 inch	Electronic Rolling	1.1 x 1.1	MIPI	RGB	



For connectivity above:

- Notes: 1. All power supplies should be adequately decoupled; recommended cap values are:
 - 2.7V: 1.0μF and 0.1μF
 - 1.2V: 1.0uF and 0.1µF
 - 1.8V: 1.0uF and 0.1µF
 - 2. Resistor value 1.5kΩ is recommended, but may be greater for slower two-wire speed.
 - 3. This pull-up resistor is not required if the controller drives a valid logic level on SCLK at all times.
 - 4. VAA and VAA_PIX must be tied together.
 - 5. Internal charge pump is used for OTPM programming.
 - 6. Digital and MIPI supply can be tied together.
 - 7. ATEST1/ATEST2 must be left floating.
 - 8. TEST pin must be tied to DGND.
 - 9. VDD_SLVS must be connected to DGND through a bypass cap (0.1uF).

For more information please contact your local sales support at www.onsemi.com. Created on: 9/30/2017



1/3.2-Inch 13 Mp CMOS Digital Image Sensor

AR1335 Datasheet, Rev. A

For the latest datasheet, please visit: www.aptina.com

Features

- 13 Mp CMOS sensor with advanced 1.1 μm pixel BSI technology
- Data interfaces: two-, three-, and four-lane serial mobile industry processor interface (MIPI)
- Bit-depth compression available for MIPI Interface: 10-8 and 10-6 to enable lower bandwidth receivers for full frame rate applications
- 3D synchronization controls to enable stereo video capture
- 6.8 kbits one-time programmable memory (OTPM) for storing shading correction coefficients and module information
- Programmable controls: gain, horizontal and vertical blanking, auto black level offset correction, frame size/rate, exposure, left-right and top-bottom image reversal, window size, and panning
- Two on-die phase-locked loop (PLL) oscillators for super low noise performance
- On-chip temperature sensor
- Bayer pattern horizontal down-size scaler
- Simple two-wire fast-mode+ serial interface
- · Low dark current
- Interlaced multi-exposure readout enabling High Dynamic Range (HDR) still and video applications
- On-chip lens shading correction
- Support for external mechanical shutter
- Support for external LED or Xenon Flash
- Extended Flash duration up to start of frame readout

Applications

- Cellular phones
- Digital still cameras
- PC cameras
- PDAs

	-				
Paramet	er	Value			
Optical f	ormat	1/3.2 -inch 13 Mp (4:3)			
Active pi	xels	4208H x 3120V			
Pixel size	2	1.1µm Back Side Illuminated (BSI)			
Chief ray	vangle (CRA)	32°			
Die size		6.3 mm x 5.7 mm			
Input clo	ock frequency	6 - 48 MHz			
Interface	2	4-lane MIPI (2- and 3-lane supported); Max data rate: 1.2Gbps/lane			
Subsampling modes (column and row)		skip2 bin2 skip3 bin3 skip4 bin4 skip2bin2			
ADC reso	olution	10 bits, on-die			
Analog g	gain	1x - 7.75x			
Digital g	ain	Up to 7.98x			
Scaler		Adjustable scaling up to 8x			
Tempera	ture sensor	10-bit, controlled by two-wire serial I/F			
Compres	sion	DPCM: 10-8-10, 10-6-10			
3D supp	ort	Frame rate and exposure synchronization			
Supply	VAA, VAA_PIX	2.6 - 2.9 V (2.7 V nominal)			
voltage	Vdd_IO, VddIO_ANA	1.7 - 1.9 V (1.8 V nominal)			
Vdd, Vdd_ANA, Vdd_PLL, Vdd_PHY		1.14 - 1.3 V (1.2 V nominal)			
Power consumption		270 mW at 60°C (TYP) at 13 Mp 30 fps			
Respons	ivity	4700 e ⁻ /lux-sec			
SNRMAX		37 dB			
Dynamio	Range	69 dB			
Operatir Tempera	lg ture Range	-30°C to +70°C			

Table 1: Key Performance Parameters

(at junction) - TJ



AR1335: 1/3.2-Inch 13Mp CMOS Digital Image Sensor Ordering Information

Mode	Resolution	Readout Configuration	HFOV	FPS	Power Consumption [mW]		
	4:3 Snapshot Mode						
13 M full resolution	4208x3120	13M full mode	100%	30	270		
13 M full resolution	4208x3120	13M full mode	100%	24	250		
VGA	640 x 480	Crop+Subsampling+Scaling	61%	120	190		
QVGA	320 x 240	Crop+Subsampling+Scaling	30%	240	165		
		16:9 Video Mode 30 FPS					
4K UHD	3840 x 2160	Cropping	91%	30	230		
4K Cinema	4096 x 2160	Cropping	97%	30	235		
1080p	1920 x 1080	Crop+Subsampling+Scaling	91%	30	160		
1080p LP	1920 x 1080	Crop+Subsampling+Scaling	91%	30	135		
720p	1280 x 720	Crop+Subsampling+Scaling	91%	30	140		
		16:9 Video Mode 60 FPS					
1080p	1920 x 1080	Crop+Subsampling+Scaling	91%	60	210		
1080p LP	1920 x 1080	Crop+Subsampling+Scaling	91%	60	180		
720p	1280 x 720	Crop+Subsampling+Scaling	91%	60	175		
3M 30 FPS							
3M	2000 x 1500	Crop+Subsampling+Scaling	95%	30	195		
3M LP	2000 x 1500	Crop+Subsampling+Scaling	95%	30	170		
	16:9 Video Mode 120 FPS						
720p	1280 x 720	Crop+Subsampling+Scaling	91%	120	260		

Table 2:Mode of Operation and Power

Ordering Information

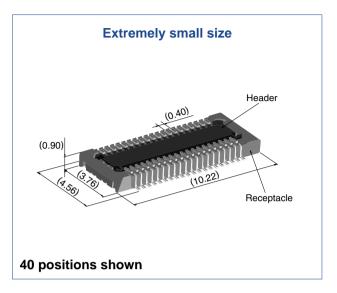
Table 3: Available Part Numbers

Part Number	Description
AR1335CSSC32SMD20	Bare die

0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-FPC Connectors

DF30 Series





Overview

Continuous miniaturization and increased component density on PCB created demand for extremely low profile connectors. This series is addition of a new extremely low profile connectors to Hirose's wide range of high reliability board-to-board/board-to-FPC connection solutions.

Features

1. Contact reliability

Concentration of the contact's normal forces at the single point assures good contact wipe and electrical reliability, while confirming the fully mated condition with a definite tactile click.

2. Self alignment

Recognizing the difficulties of mating extremely small connectors in limited spaces the connectors will self align in horizontal axis within 0.3 mm.

3. Automatic board placement

Packaged on tape-and-reel the plug and headers have sufficiently large flat areas to allow pick-up with vacuum nozzles of automatic placement equipment.

4. Variety of contact positions and styles

Available in standard contact positions of: 20, 22, 24, 30, 34, 40, 50, 60, 70 and 80 with and without metal fittings. Addition of metal fittings does not affect external dimensionsof the connectors.

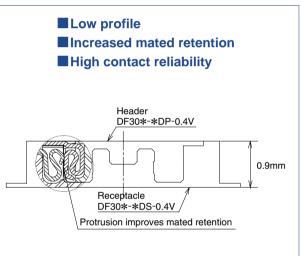
Smaller contact positions are also available.

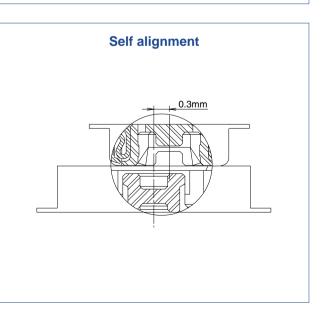
5. Support for continuity test connector

Connectors which have increased insertion and removal durability are available for continuity tests. Contact your Hirose sales representative for details.

Applications

Čellular phones, PDA's, mobile computers, digital cameras, digital video cameras, and other devices demanding high reliability connections in extremely limited spaces.





Product Specifications

	Rated current 0.3A	Operating temperature range	-35℃ to 85℃ (Note 1)	Storage temperature range	10°C to 60°C (Noto 2)
Rating	Rated voltage 30V AC	1 0 1 0	: Relative humidity 20% to 80%		()
	_			, , , , , , , , , , , , , , , , , , ,	,

Item	Specification	Conditions
1. Insulation resistance	50 MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	100V AC / one minute
3. Contact resistance	100 mΩ max.	100 mA
4. Vibration	No electrical discontinuity of 1 μ s or more	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis
5. Humidity	Contact resistance: 100 m Ω max. Insulation resistance: 25 M Ω min.	96 hours at temperature of $40^{\circ}C\pm 2^{\circ}C$ and RH of 90% to 95%
6. Temperature cycle	Contact resistance: 100 m Ω max. Insulation resistance: 50 M Ω min.	Temperature: -55 °C→ $+5$ °C to $+35$ °C→ $+85$ °C→ $+5$ °C to $+35$ °C Duration: 30 → 10 → 30 → 10 (Minutes) 5 cycles
7. Durability (insertions/withdrawals)	Contact resistance: 100 mΩ max.	50 cycles(Connector for conductivity tests: 500 cycles)
8. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 300°C for 3 seconds

Note 1: Includes temperature rise caused by current flow.

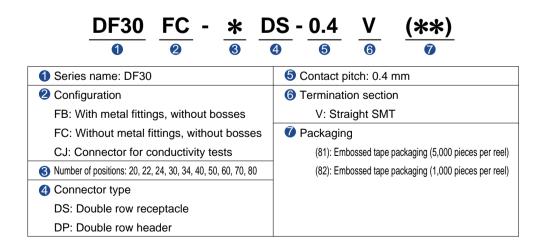
Note 2: The term "storage" refers to products stored for long period of time prior to mounting and use. Operating temperature range and humidity range covers non-conducting condition of installed connectors in storage, shipment or during transportation.

Materials and Finishes

Connectors	Component	Material	Finish	Remarks
Receptacles	Insulator	LCP	Color : Black	UL94V-0
and	Contacts	Phosphor bronze	Gold plated	
Headers	Metal fittings	Phosphor bronze	Tin-cupper plated	

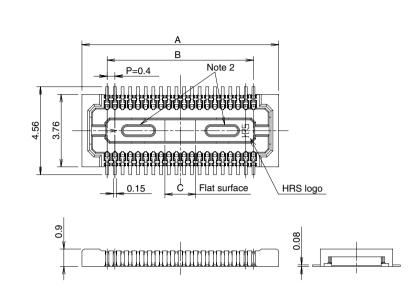
Ordering information

Receptacles and Headers

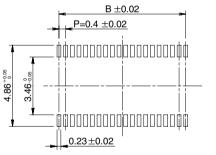


Receptacles (without metal fittings)





Recommended PCB mounting pattern



Recommended solder paste thickness: 120 μm

(81): Embossed tape packaging (5,000 pieces per reel)

[Specification number] -**, (**)

Tolerances non- accumulative. Unit: mm						
Part Number	CL No.	Number of contacts	А	В	C	
DF30FC-20DS-0.4V(**)	CL684-1109-8-**	20	6.22	3.6	1.2	
DF30FC-22DS-0.4V(**)	CL684-1110-7-**	22	6.62	4.0	1.2	
DF30FC-24DS-0.4V(**)	CL684-1111-0-**	24	7.02	4.4	1.2	
DF30FC-30DS-0.4V(**)	CL684-1112-2-**	30	8.22	5.6	1.2	
DF30FC-34DS-0.4V(**)	CL684-1113-5-**	34	9.02	6.4	1.36	
DF30FC-40DS-0.4V(**)	CL684-1078-6-**	40	10.22	7.6	1.6	
DF30FC-50DS-0.4V(**)	CL684-1114-8-**	50	12.22	9.6	2.0	
DF30FC-60DS-0.4V(**)	CL684-1082-3-**	60	14.22	11.6	2.4	
DF30FC-70DS-0.4V(**)	CL684-1115-0-**	70	16.22	13.6	2.8	
DF30FC-80DS-0.4V(**)	CL684-1116-3-**	80	18.22	15.6	3.2	

Note 1: Order by number of reels.

Note 2: Receptacles with 24 or fewer contacts positions will not have recessed areas.

4	HRS
4	

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Cameras Applications

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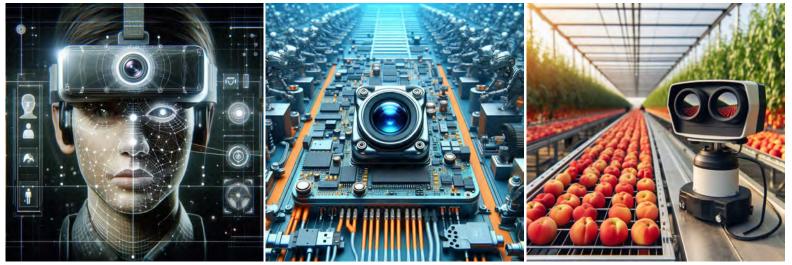


Automotive Driver Pilot





Video Conference



Live Streaming

Eye Tracker Biometric Detection

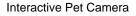
Machine Vision

Agricultural Monitor



Night Vision Security

Drone and Sports Eagle Eyes



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Camera Module Pinout Definition Reference Chart

OmniVision Sony Samsung On-Semi Ap	tina 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
FREX	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 DM01P	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 D00 Y0	DVP data output port 0
D1 D01 Y1	DVP data output port 1
D2 D02 Y2	DVP data output port 2
D3 D03 Y3	DVP data output port 2
D4 D04 Y4	DVP data output port 3
D5 D05 Y5	DVP data output port 5
D6 D06 Y6	DVP data output port 6
D7 D07 Y7	DVP data output port 7
D8 D08 Y8	DVP data output port 7
D9 D09 Y9	DVP data output port 9
D10 D010 Y10	DVP data output port 9 DVP data output port 10
D11 D011 Y11	DVP data output port 10 DVP data output port 11
	עשר שמומ שעוףטו דיו

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Camera Reliability Test

	Reliability Inspection Item		Testing Mathed	A coorton oo Critorio
Cat	egory	Item	Testing Method	Acceptance Criteria
	Storage	High 60°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Temperature	Low -20°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Operation	High 60°C 24 Hours	Temperature Chamber	No Abnormal Situation
Environmental	Temperature	Low -20°C 24 Hours	Temperature Chamber	No Abnormal Situation
Environmental	Humidity	60°C 80% 24 Hours	Temperature Chamber	No Abnormal Situation
	High 60°C 0.5 HoursLow -20°C 0.5 HoursCycling in 24 Hours		Temperature Chamber	No Abnormal Situation
	Drop Test	Without Package 60cm	10 Times on Wood Floor	Electrically Functional
	(Free Falling)	With Package 60cm	10 Times on Wood Floor	Electrically Functional
	Vibration Test	50Hz X-Axis 2mm 30min	Vibration Table	Electrically Functional
Physical		50Hz Y-Axis 2mm 30min	Vibration Table	Electrically Functional
Filysical		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
		Contact Discharge 2 KV	ESD Testing Machine	Electrically Functional
	ESD Test	Air Discharge 4 KV	ESD Testing Machine	Electrically Functional
Electrical	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



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Camera Inspection Standard

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Inspection Item			Increation Mathed	Standard of Inspection
Category		Item	Inspection Method	Standard of Inspection
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

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YDSCAM Package Solutions

YDS Camera Module



Tray with Grid and Space

Complete with Lens Protection Film



Place Cameras on the Tray





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your best camera partner

YDSCAM Package Solutions

Full Tray of Cameras

DS



Place Tray into Anti-Static Bag

Cover Tray with Lid



Vacuum the Anti-Static Bag



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YDSCAM Package Solutions

Sealed Vacuum Anti-Static Bag with Labels

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



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YDSCAM Package Solutions

Place Foam Sheets Between Tray Bags



Place Foam Sheets and Trays into Box



Seal the Carbon Box



Foam Sheets are Larger Than Trays



Foam Sheets are Tightly Fitting in Box



Label the Carbon Shipping Box



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YDSCAM Package Solutions

USB Camera Module







Place Camera Sample into Anti-Static Bag

Place USB Cameras into Tray







Seal the Tray with Anti-Static Bag



Label the Carbon Shipping Box



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Complete with Lens Protection Film



YDSCAM Package Solutions

Place Camera Sample into Anti-Static Bag





Label the Sample Bags

Place Connectors into Anti-Static Bag



Place Connectors into Reel



Place Samples into the Carbon Box





Place Connectors into the Carbon Box



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YDS

Company YDSCAM

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

YDS 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. YDS 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

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



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YDS Strength

Y

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