

PRODUCT : CAMERA MODULE

MODEL NO. : CM5629-B500BA-E

SUPPLIER : TRULY OPTO-ELECTRONICS LTD.

DATE : November 3, 2010



CERT. No. 946535
ISO9001
TL9000

SPECIFICATION

Revision:1.0

CM5629-B500BA-E

If there is no special request from customer, TRULY OPTO-ELECTRONICS LTD. will not reserve the tooling of the product under the following conditions:
1. There is no response from customer in two years after TRULY OPTO-ELECTRONICS LTD. submit the samples;
2. There is no order in two years after the latest mass production.
And correlated data (include quality record) will be reserved one year more after tooling was discarded.

TRULY OPTO-ELECTRONICS LTD: **CUSTOMER:**

Quality Assurance Department: _____
Approved by:

Technical Department: _____

Approved by:

CONTENTS

n KEY INFORMATION

n PIN ASSIGNMENT

n ELECTRICAL CHARACTERISTICS

n MECHANICAL DRAWING

n APPEARANCE SPECIFICATION

n IMAGE SPECIFICATION

n QA PLAN

n PRECAUTIONS FOR USING CCM MODULES

n PACKAGE SPECIFICATION

n PRIOR CONSULT MATTER

n FACTORY CONTACT INFORMATION

WRITTEN BY	CHECKED BY	APPROVED BY
HUANG WEI NA	WEI YOU XING	LIU TIE NAN

Key Information

Module No.		CM5629-B500BA-E
Module Size		8.50mm X 8.50mm X5.50mm
Sensor Type		MT9P111
Full resolution		2592 X1944
Supply voltage	I/O	1.7V-1.9V or 2.8-3.1V
	Digital	1.7V-1.95V
	Analog	2.5-3.1V
	AF_VDD	2.8V
Lens		1/4 INCH 4P+IR
Focus(F.NO)		2.8
View Angle		67.4°
Active pixel array area		3.62 mm x 2.72 mm
Object distance		10cm-infinity
Responsivity		0.5 V/lux-sec (preliminary)
Pixel size		1.4μm x1.4μm
IR Cutter		650+/-10nm
Sensor Temperature Range	Operating	-30° C to 70° C
	storage	-40° C to 85° C
Output Formats		YCbCr, 565RGB, 555RGB, 444RGB, JPEG 4:2:2, processed Bayer, RAW8- and RAW10-bit
Frame Rate	Full resolution	15 fps
	preview mode	30 fps
SNR MAX		34.7dB
Dynamic Range		60dB
IC Package		Bare die
Sensor Power Consumption		550 mW at 30 fps, 1280 x 720 video mode
		300 mW at 30 fps, preview mode
ADC resolution		12-Bit,on-die
Package		Antistatic Plastic

Auto-Focus Specification

NO.	Item	Specification
1	Auto-Focus Type	VCM (Voice Coil Motor)
2	VCM Driver	Sensor internal
3	Power Supply	2.6~3.3 V
4	Rated Current	≤ 100mA
5	Resistance	30±1.5Ω
6	Settling Time	TBD
7	Hysteresis	≤ 10μm
8	Focusing Range	10cm to infinity
9	Life Time	TBD

Pin Assignment

No.	Name	Pin type	Description
1	PWDN	Input	Controls sensor's standby mode, active HIGH.
2	HREF	Output	Identifies pixels in the active line.
3	VSYNC	Output	Identifies rows in the active image.
4	RESET	Input	Master reset signal, active LOW (can be left floating if not used).
5	DVDD(1.8V)	Supply	Digital power
6	DOVDD(2.8V)	Supply	I/O power supply
7	AVDD(2.8V)	Supply	Analog power supply
8	AGND	Supply	Analog Ground
9	PCLK	Output	Pixel clock. Used for sampling DOUT, FRAME_VALID, and LINE_VALID.
10	DGND	Ground	Digital ground
11	MCLK	Input	Master clock input, 2-64MHZ.
12	DGND	Ground	Digital ground
13	SIOD	I/O	Slave two-wire serial interface data to and from the host processor.
14	SIOC	Input	Slave two-wire serial interface clock from the host processor.
15	Y9	output	Parallel pixel data output [9]
16	Y8	output	Parallel pixel data output [9]
17	Y7	output	Parallel pixel data output [9]
18	Y6	output	Parallel pixel data output [6]
19	Y5	output	Parallel pixel data output [5]
20	Y4	output	Parallel pixel data output [4]
21	Y3	output	Parallel pixel data output [3]
22	Y2	output	Parallel pixel data output [2]
23	OTP	Input	High voltage programming pin for one-time programmable (OTP) memory (must be left floating for normal operation).
24	VCM	Supply	VCM power supply

Electrical Characteristics

1. Absolute Maximum Ratings

Symbol	Parameter	Rating		Unit
		Min	Max	
VDD_MAX	Core digital voltage	-0.3	2.4	V
VDD_IO_MAX	I/O digital voltage	-0.3	4.0	V
VAA_MAX	Analog voltage	-0.3	4.0	V
VAA_PIX_MAX	Pixel supply voltage	-0.3	4.0	V
VDD_PLL_MAX	PLL supply voltage	-0.3	4.0	V
VIH_MAX	Input HIGH voltage		VDD_IO + 0.3	V
UIL_MAX	Input LOW voltage	-0.3		V
T_OP	Operating temperature (measured at junction)	-30	75	°C
T_ST	Storage temperature	-40	85	°C

2.DC Electrical Definitions and Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
VDD	Core digital voltage		1.7	1.8	1.95	V
VDD_IO1	I/O digital voltage		1.7	1.8	1.95	V
VDD_IO2	I/O digital voltage		2.5	2.8	3.1	V
VAA	Analog voltage		2.5	2.8	3.1	V
VAA_PIX	Pixel supply voltage		2.5	2.8	3.1	V
VDD_PLL	PLL supply voltage		2.5	2.8	3.1	V
IDD	Digital operating current	Context A	-	91	-	mA
IAA	Analog operating current	Context A	-	93	-	mA
IAA_PIX	Pixel supply current	Context A	-	2	-	mA
IDD_PLL	PLL supply current	Context A	-	31	-	mA
IDDIO_MIPI	MIPI supply current	Context A	-	NA	-	mA
	Total supply current	Context A	-	217	-	mA
	Total power consumption	Context A	-	555	-	mW
IDD	Digital operating current	Context B	-	58	-	mA
IAA	Analog operating current	Context B	-	47	-	mA
IAA_PIX	Pixel supply current	Context B	-	2	-	mA
IDD_PLL	PLL supply current	Context B	-	0	-	mA
IDDIO_MIPI	MIPI supply current	Context B	-	NA	-	mA
	Total supply current	Context B	-	127	-	mA
	Total power consumption	Context B	-	308	-	mW
Hard standby	Total standby current when asserting the STANDBY signal	VDD Disable ON R0x0028[0] = 1 (T _J = 70°C)			20	μA
Hard standby	Total standby current when asserting the STANDBY signal	VDD Disable OFF R0x0028[0] = 0 (T _J = 70°C)		170		μA
Soft standby (clock on at 24 MHz)	Total standby current when asserting R0x0018[0] = 1	VDD Disable ON R0x0028[0] = 1		1.7		mA
Soft standby (clock OFF)	Total Standby Current when asserting R0x0018[0] = 1	VDD Disable ON R0x0028[0] = 1		180		μA
SHUTDOWN	Total standby current when asserting the SHUTDOWN signal				10	μA

Notes: 1. Context A: 30 fps preview mode.
2. Context B: 15 fps full resolution mode.

Timing Specifications

Power-up Sequence

Powering up the sensor is independent of voltages applied in a particular order, as shown in Figure 35. The timing requirements for other signals are shown in Table 51. It is advised that the user manually assert a hard reset upon power up.

Figure 35: Power-Up Sequence

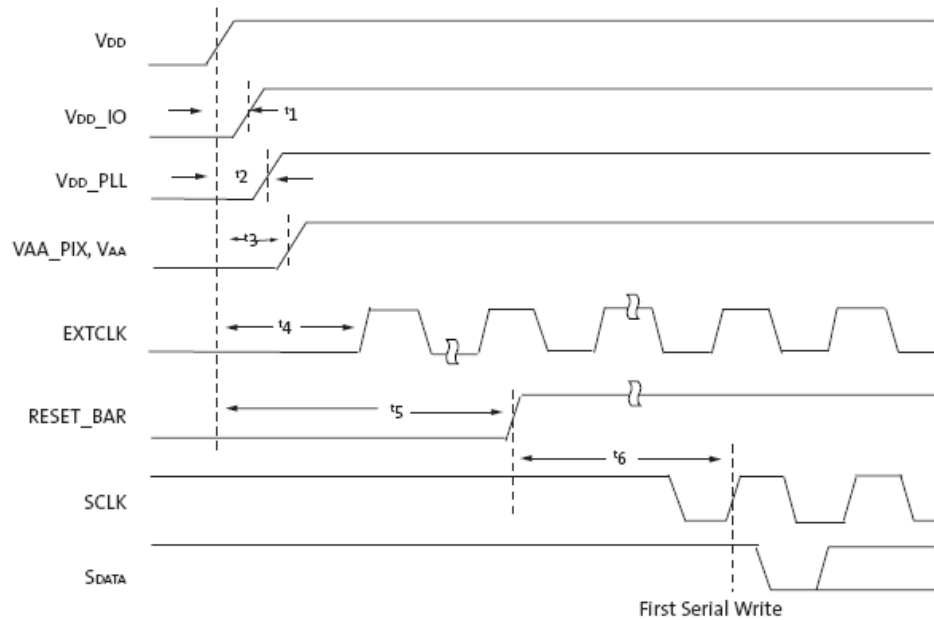


Table 51: Power-Up Signal Timing

Parameter	Symbol	Min	Typ	Max	Unit
VDD to VDD_IO	t_1	0	–	–	ms
VDD to VDD_PLL	t_2	1	–	–	
VDD to VAA_PIX	t_3	0	–	–	
VDD to EXTCLK Activation	t_4	–	500	–	
RESET_BAR activation time	t_5	70	–	–	EXTCLKs
First serial write	t_6	100	–	–	EXTCLKs

Note: All supplies are referenced to VDD.

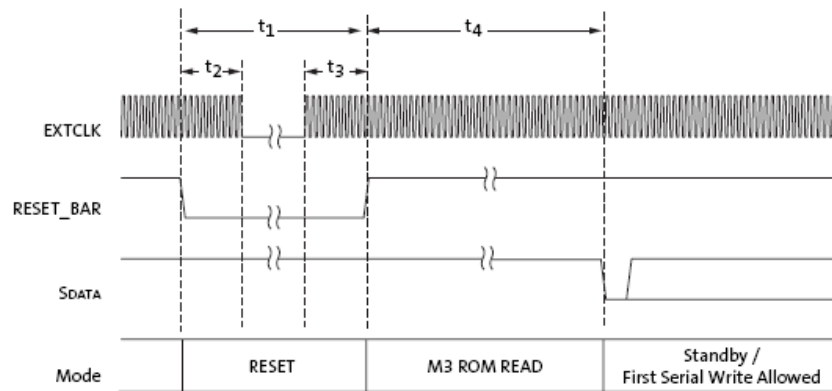
Reset

Two types of reset are available:

- A hard reset is issued by toggling RESET_BAR.
- A soft reset is issued by writing commands through the two-wire serial interface.

Hard Reset

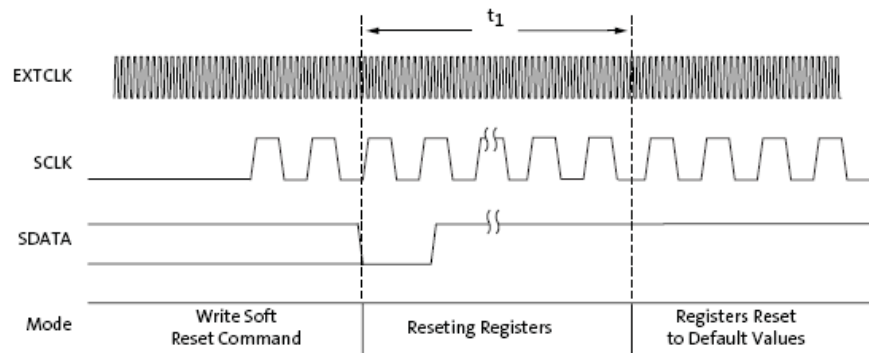
After hard reset, the output FIFO is configured for operation but disabled and all outputs are tri-stated. These outputs can be enabled through the two-wire serial interface. After hard reset, the output FIFO is configured for operation but disabled and all outputs are tri-stated. These outputs can be enabled through the two-wire serial interface. The hard reset signal sequence is shown in Figure 36 on page 275. Hard reset timing is shown in Table 52 on page 275.

Figure 36: Hard Reset Signal Sequence

Table 52: Hard Reset Signal Timing

Parameter	Symbol	Min	Typ	Max	Unit
RESET_BAR pulse width	t_1	70	–	–	EXTCLKs
Active ECXTCLK after RESET_BAR is asserted	t_2	10	–	–	
Active EXTCLK before RESET_BAR is de-asserted	t_3	10	–	–	
First two-wire serial interface communication after RESET is HIGH	t_4	–	100	–	

Soft Reset

A soft reset sequence to the sensor has the same affect as the hard reset and can be activated writing to a register through the two-wire serial interface. The soft reset signal sequence is shown in Figure 37. Soft reset timing is shown in Table 53.

Figure 37: Soft Reset Signal Sequence

Table 53: Soft Reset Signal Timing

Parameter	Symbol	Min	Typ	Max	Unit
Active EXTCLK after soft reset command is asserted	t_1	–	100	–	EXTCLKs

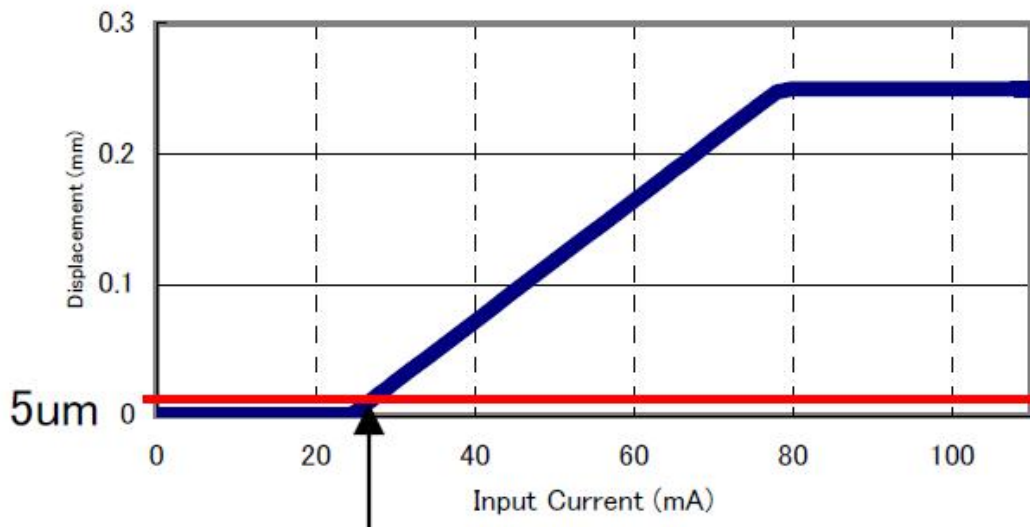
Note: For more information of sensor please refer to the MT9P111 specification

VCM Specification

NO.	Item	Condition	Specification
1	Motor Size	Without terminal	8.5*8.5*3.45 mm
2	Absolute Max Current		≤100mA
3	Moving Tilt	∞→10cm	<30'
4	Starting Current	Moving direction is upward	≥15mA
5	Hysteresis	At stroke range:0.005 ~ 0.15mm	≤10μm
6	Sensitivity		3.5 ~ 7.0μm/mA
7	Motion Range	Driving Current 100mA	0~0.19 mm with lens
8	Terminal Resistance	20±5°C	28±10%Ω
9	Lens Unit Mass		≤0.15g

Performance Diagram

Input Current vs Displacement



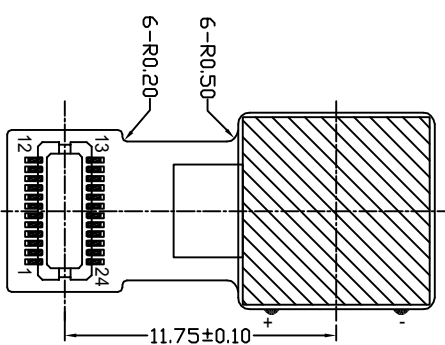
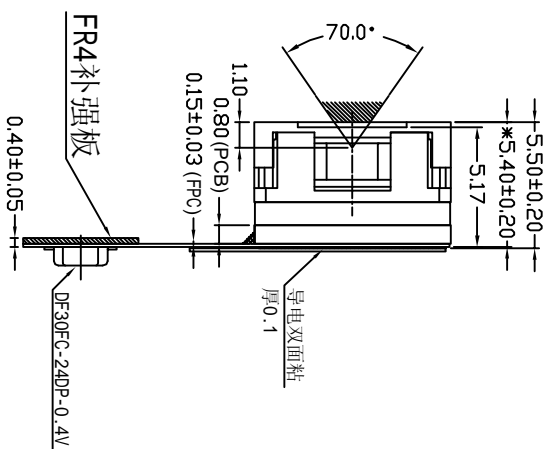
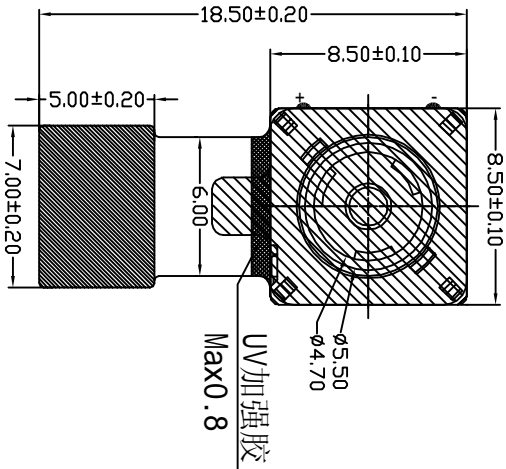
Mechanical Drawing

ROHS



CM5629-B500BA-E Camera Module

Customer No.:



24PIN DESCRIPTION

PIN NO.	SIGNAL
1	PW/DN
2	HREF
3	VSYNC
4	RESET
5	DVDD(1.8V)
6	D0VDD(2.8V)
7	AVDD(2.8V)
8	AGND
9	PCLK
10	DGND
11	MCLK
12	DGND
13	S10D
14	S10C
15	Y9
16	Y8
17	Y7
18	Y6
19	Y5
20	Y4
21	Y3
22	Y2
23	OTP
24	VCM(2.8V)

Actuator Specification

Type	VCM Parameter
Control Mode	IIC
Supply Voltage	2.8V~3.3 V
Coil Resistance	30±1.5 ohm
Rated Current	no more than 85mA
Lens Movement	0.25mm or more

备注：
1.带*号尺寸为关键尺寸

主要参数 (Module Specification)	
焦距 (F#)	3.37
光圈 (F-NO)	2.8
视场角 (View Angle)	67.4°
畸变 (Distortion)	< 1 %
景深 (Focusing Range)	10 cm~Infinity
感光芯片 (Chip Type)	MT9P111 (S0C5140)
像素 (Array Size)	5.0M
镜头类型 (Lens Size)	1/4INCH 4P+1R

CUSTOMER APPROVE

Mechanical Electrical

AMEND

NO.	CONTENT	DATE
△	更改马达焊点位置	20101012
△	更改Pin定义	20101008

手机摄像头模组

TOLERANCE:
DECIMAL
x ± .30
xx ± .20
≤ ± 1/4"

TRULY OPTO-ELECTRONICS LTD.

PRODUCT NO.	CM5629-B500BA-E	DRAW. NO.	REV
D/W/N	陈波明 20100918	DSN	陈波明 20100918
CHKD	杨永超 20100918	APPD	刘铁楠 20100918
NOT IN SCALE		UNIT	mm
		SHEET	

Appearance Specification

NO.	Item	Standard	Importance Class
1	Top side of Lens	No obvious impurity and oil impurity on the front of lens within the half area; The defect(unfeeling) limitation: width \leq 1mm, length \leq 2mm, the defect number \leq 2; No feeling defect; The width of defects and gaps on the outside of Lens \leq 0.3mm. Others are unlimited.	A
2	Screw glue	Normally screw glue shall be symmetrical distributed around lens circle side. Particular circs, glue distribution must not disturb customer's assembly operation.	A
3	L1 Glass	No defect and dust check from 45° angle under the reflexing light and from 0° under the highlight	A
4	Holder	No obvious impurity and distortion of outline. The width and length of defect is unlimited, the depth \leq 0.1mm and \leq 1/4 of the thickness of Holder.	B
5	Sealed glue	Sealed glue distributing between holder and FPC must be symmetrical and smooth. Not allow glue leakage and asymmetric thickness. After holder assembly, the thickness distance between one side and its opposite side shall be less than 0.2mm. Excess glue over the holder shall not make the outside dimension be out of control.	A
6	FPC/PCB	Edge defect limitation: width \leq 1/2H (H is minimum.), length \leq 1mm, defect numbers per edge \leq 2(No tearing gap inby edge for FPC); Edge outshoot limitation (width \leq 0.3mm, length \leq 1mm). No obvious impurity and crease on the surface. If there was shield film on the surface, the spot size of the film shall be less than 0.3mm \times 1mm and no line is exposed. If it was not be cleaned and did not influence the total thickness, it would be permitted. Label and mark shall be clear enough to be discerned.	A
7	Connector	No dust, fingerprint, and not allows to turning colors, distortion; Solder must be well; No open circuit or short circuit	A

8	Gold finger	No dust, fingerprint, and not allows to turning colors, burned, unsmoothed and peeled; No open circuit or short circuit; The defect width shall be smaller than 20% of gold finger's width. No copper/nickel exposed in defect. Numbers of defected pin shall be less than 3. The defect limitation:width \leq 0.08mm,length \leq 5mm.	A
9	Stiffener	Holder anchor pole length overtopping the steel plate shall be less than 0.2mm. No dust, rust and deep scratch on the steel surface without Double coated tapes.	B
10	Double coated tapes	Adhered direction shall be right. Not allows to excess steel plate edge. No alveoli and stick. Not allows to peel glue and rip protective paper when tear the protective paper.	B
11	Protective film	No dust in the glue side. Not allows to float or drop. Adhered direction shall be right.	B

Remark:

1. The definition of the appearance importance class

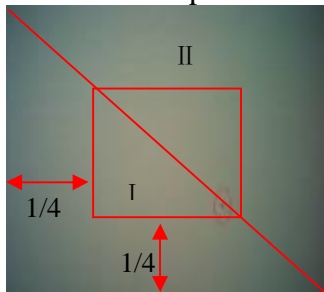
A: The defect can be found in the finished product, or have obvious visual differences from good products, such as crack, defect and dust, or influence image quality, or are appointed by the customer. We will emphasize these items and check all products.

B: The defect can be found in the finished product and has visual difference from the good one, but will not affect customer's aesthetic judgement. Or the defect can not be found in the finished product and will not generate functional problem, but will slightly influence sequential manufacture process or condition. We will supervise these items in the manufacturing process and check products selectively.

2. Sampling standard

Referenced standard: GB/T 2828.1-2003/ISO 2859-1:1999 and ANSI/ASQC.4-1993 II

Image Specification

NO.	Item	Standard	Important Class
1	TV Line	Center \geq 1250 8 point of 0.7 viewing field \geq 1000	A
2	Shading	The lightness of 90% viewing area \geq 40% of center lightness(Lens correction Shading [Turn off]); The lightness of 90% viewing area \geq 60% of center lightness(Lens correction Shading [Turn on])	A
3	Dust	No dust in the center viewing area; Border area according to the limit samples	A
4	Dead pixel	No in the viewing area.	A
5	Wound pixel 	I area: Blemish number \leq 1 II area: Blemish number \leq 4	B
6	Color	Color distortion ratio of center \pm 15%	B
7	Gray Scale	Margin of two near scales' brightness \geq 6	B
8	Distortion	$<$ 1%	B
9	Flare	No flare in 45° viewing angle; No ghost in full viewing angle	B

QA Plan

NO.	Item	Sampling frequency	Measure	Remark
Image and reliability item				
1	TV Line	AQL 0.65 II Class	Same as production	100% Inspection
2	Shading	AQL 0.65 II Class	Same as production	100% Inspection
3	Dust	AQL 0.65 II Class	Same as production	100% Inspection
4	Dead pixel	AQL 0.65 II Class	Same as production	100% Inspection
5	Wound pixel	AQL 1.5 II Class	Same as production	100% Inspection
6	Color	AQL 1.5 II Class	Same as production	100% Inspection
7	Gray Scale	AQL 1.5 II Class	Same as production	100% Inspection
8	Distortion	N=5,c=0 per batch	Same as production	Sampling by QA
9	Flare	N=5,c=0 per batch	Same as production	Sampling by QA
Appearance Check Items				
1	Top side of Lens	AQL 1.0 II Class	Same as production	100% Inspection
2	Screw glue	AQL 1.0 II Class	Same as production	100% Inspection
3	L1 Glass	AQL 1.0 II Class	Same as production	100% Inspection
4	Holder	AQL 1.5 II Class	Same as production	100% Inspection
5	Sealed glue	AQL 1.0 II Class	Same as production	100% Inspection
6	FPC/PCB	AQL 1.0 II Class	Same as production	100% Inspection
7	Connector	AQL 1.0 II Class	Same as production	100% Inspection
8	Gold finger	AQL 1.0 II Class	Same as production	100% Inspection
9	Stiffener	AQL 1.5 II Class	Same as production	100% Inspection
10	Double coated tapes	AQL 1.5 II Class	Same as production	100% Inspection
11	Protective film	AQL 1.5 II Class	Same as production	100% Inspection

Sample:

Referenced standard: GB/T 2828.1-2003/ISO 2859-1:1999 and ANSI/ASQC.4-1993 II

PRECAUTIONS FOR USING CCM MODULES

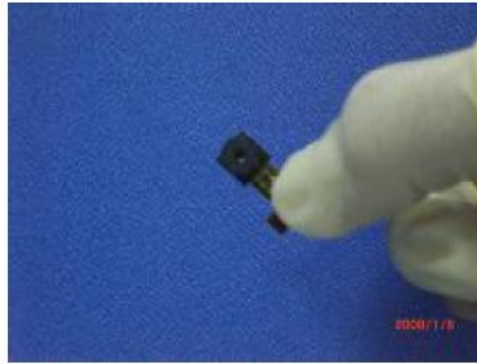
Handing Precautions

- DO NOT try to open the unit enclosure as there is no user-serviceable component inside. To prevent damage to the camera module by electrostatic discharge, handling the camera module only after discharging all static electricity from yourself and ensuring a static-free environment for the camera module.
- DO NOT touch the top surface of the lens.
- DO NOT press down on the lens.
- DO NOT try to focus the lens.
- DO NOT put the camera module in a dusty environment.
- To reduce the risk of electrical shock and damage to the camera module, turn off the power before connect and disconnect the camera module.
- DO NOT drop the camera module more than 60 cm onto any hard surface.
- DO NOT expose camera module to rain or moisture.
- DO NOT expose camera module to direct sunlight.
- DO NOT put camera in a high temperature environment.
- DO NOT use liquid or aerosol cleaners to clean the lens.
- DO NOT make any charges or modifications to camera module.
- DO NOT subject camera module to strong electromagnetic field.
- DO NOT subject the camera module to excessive vibration or shock.
- DO NOT Impact or nip CCM module with spiculate things
- DO NOT alter, modify or change the shape of the tab on the metal frame.
- DO NOT make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- DO NOT damage or modify the pattern writing on the printed circuit board.
- Absolutely DO NOT modify the zebra rubber strip (conductive rubber) or heat seal connector
- Except for soldering the interface, DO NOT make any alterations or modifications with a soldering iron.
- DO NOT twist FPC of CCM.

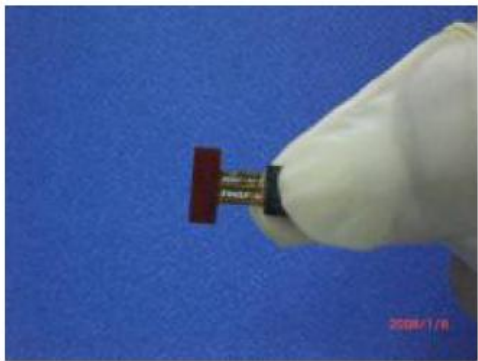
Apply indication



Correct



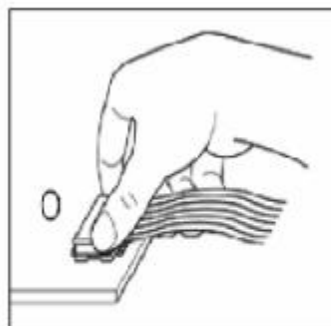
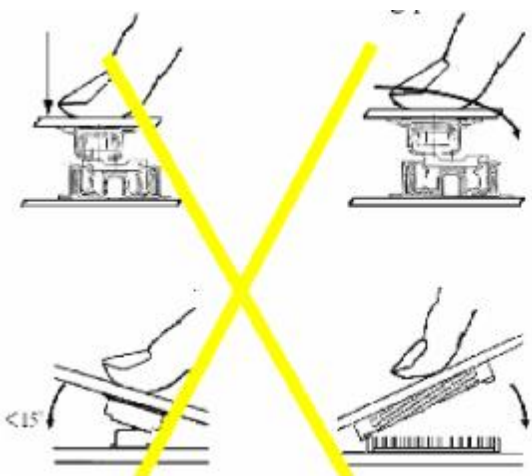
Incorrect



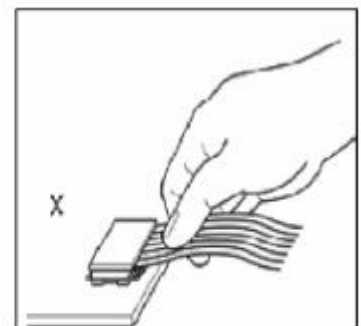
Incorrect

Precaution for assemble the module with BTB connector:

Please note the position of the male and female connector position, don't assemble or assemble like the method which the following picture shows

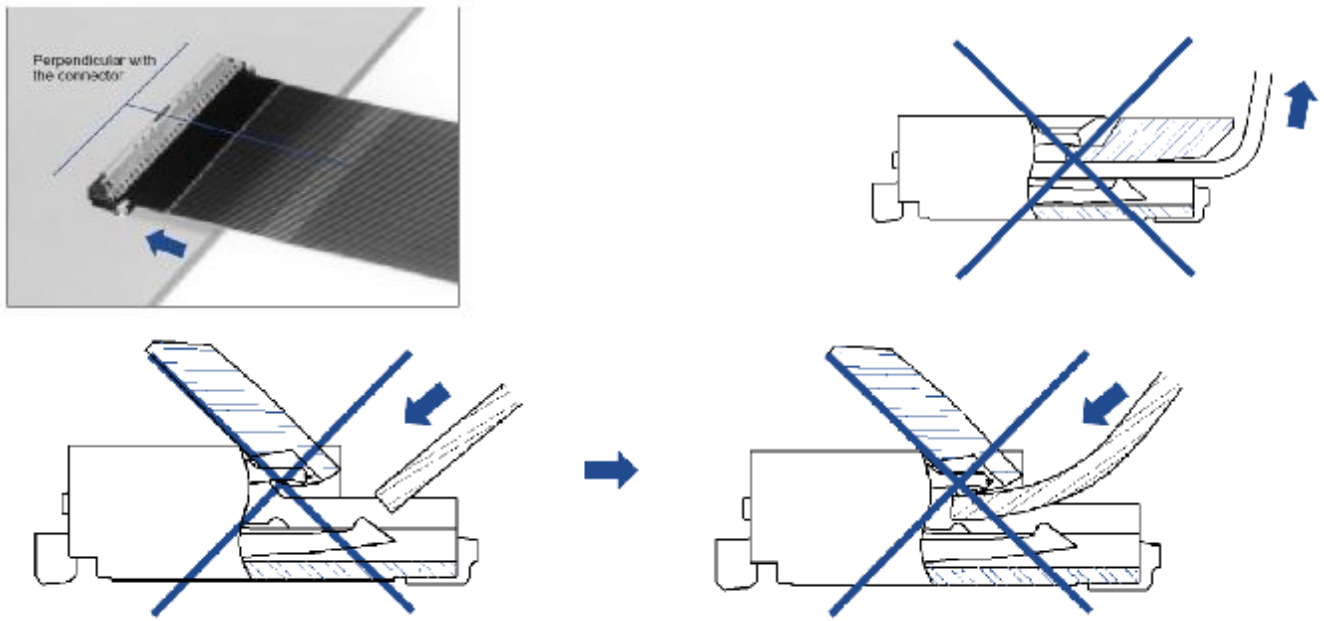


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NG

Precaution for assemble the module with ZIF connector:



Precaution for soldering the CCM:

	Manual soldering	Machine drag soldering	Machine press soldering
No ROHS product	290°C ~350°C. Time: 3-5S.	330°C ~350°C. Speed: 4-8 mm/s.	300°C ~330°C. Time: 3-6S. Press: 0.8~1.2Mpa
ROHS product	340°C ~370°C. Time: 3-5S.	350°C ~370°C. Speed: 4-8 mm/s.	330°C ~360°C. Time: 3-6S. Press: 0.8~1.2Mpa

- (1) If soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation. (This does not apply in the case of a non-halogen type of flux.) It is recommended that you protect the lens surface with a cover during soldering to prevent any damage due to flux spatters.
- (2) The CCM module and board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

Other precautions

For correct using please refer to the relative criterions of electronic products.

Limited Warranty

Unless agreed between TRULY and customer, TRULY will replace or repair any of its CCM modules which are found to be functionally defective when inspected in accordance with TRULY CCM acceptance standards for a period of one year from date of shipments. Cosmetic/visual defects must be returned to TRULY within 90 days of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of TRULY limited to repair and/or replacement on the terms set forth above. TRULY will not be responsible for any subsequent or consequential events.

Return CCM under warranty

No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are:

- Holder is apart from module.
- Holder or Connector is anamorphic.
- Connector is turnup.
- FPC is lacerated or disconnection, and so on.

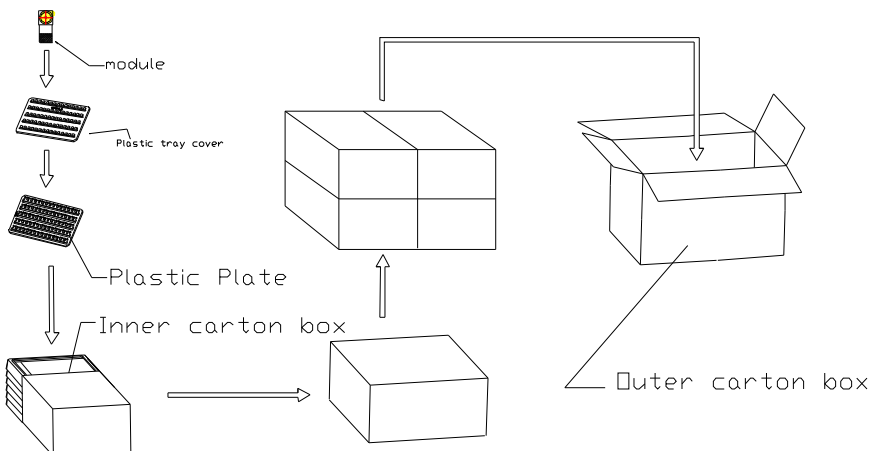
Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB eyelet, conductors and terminals.

Package Specification

Packaging Design One

Product No.	CM5629-B500BA-E	Release date									
Product name	Compact Camera Module	Releaser									
Supplier	TRULY OPTO-ELECTRONICS LTD.	Recycle	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO								
Quantity/ each box	TBD	Material for box	<input checked="" type="checkbox"/> paper <input type="checkbox"/> plastic								
Outer carton box size	405mm*290mm*290mm	Box type	<input checked="" type="checkbox"/> new <input type="checkbox"/> update								
Quantity / inner box * Quantity / outer box	TBD	Weight	<table border="1"> <tr> <td></td> <td>g / pcs</td> <td>BOX=TYPE Record of SRF Dept.</td> <td>TBD</td> </tr> <tr> <td></td> <td>Kg / outer box</td> <td></td> <td>Kg(Max)</td> </tr> </table>		g / pcs	BOX=TYPE Record of SRF Dept.	TBD		Kg / outer box		Kg(Max)
	g / pcs	BOX=TYPE Record of SRF Dept.	TBD								
	Kg / outer box		Kg(Max)								

Packing Standards:



There are TBD modules each plastic plate.

There are TBD modules each inner carton box..

There are 4 each outer carton box.

Requirements of outer carton box :

1. Weight(Max): TBD Kg
2. Height (Max): 0.29 M
3. Prohibition: Box made by log

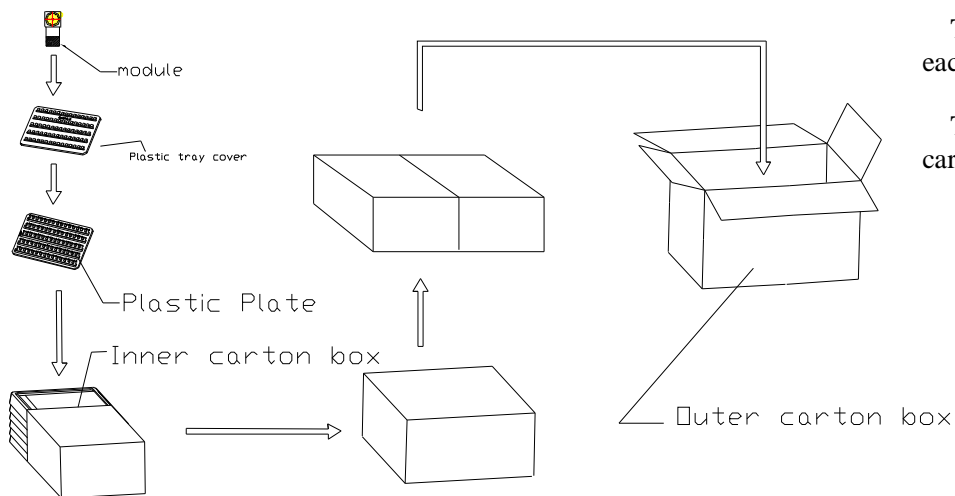
Material for Plastic tray

It is made of antistatic polystyrene which has no chemical pollution. Surface resistivity : 10^6 ohm/sq

Packaging Design Two

Product No.	CM5629-B500BA-E	Release date							
Product name	Compact Camera Module	Releaser							
Supplier	TRULY OPTO-ELECTRONICS LTD.	Recycle	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						
Quantity/ each box	TBD	Material for box	<input checked="" type="checkbox"/> paper <input type="checkbox"/> plastic						
Outer carton box size	405 mm *290 mm *170 mm	Box type	<input checked="" type="checkbox"/> new <input type="checkbox"/> update						
Quantity / inner box * Quantity / outer box	TBD	Weight	<table border="1"> <tr> <td>g / pcs</td> <td>BOX=TYPE Record of SRF Dept.</td> <td>TBD</td> </tr> <tr> <td>Kg / outer box</td> <td></td> <td>Kg(Max)</td> </tr> </table>	g / pcs	BOX=TYPE Record of SRF Dept.	TBD	Kg / outer box		Kg(Max)
g / pcs	BOX=TYPE Record of SRF Dept.	TBD							
Kg / outer box		Kg(Max)							

Packing Standards:



There are TBD modules each plastic plate.

There are TBD modules each inner carton box..

There are 2 each outer carton box.

Requirements of outer carton box :

4. Weight(Max): TBD Kg
5. Height (Max): 0.17 M
6. Prohibition: Box made by log

Material for Plastic tray

It is made of antistatic polystyrene which has no chemical pollution. Surface resistivity : 10^6 ohm/sq

PRIOR CONSULT MATTER

- ①For Truly standard products, we keep the right to change material, process for improving the product property without notice on our customer.
②For OEM products, if any change needed which may affect the product property, we will consult with our customer in advance.
- If you have special requirement about reliability condition, please let us know before you start the test on our samples.

FACTORY CONTACT INFORMATION

FACTORY NAME: TRULY OPTO-ELECTRONICS LTD.

FACTORY ADDRESS: Truly Industrial Area, ShanWei City, GuangDong, China

FACTORY PHONE: 86-0660-3380061 **FAX:** 86-0660-3371772