PRODUCT	:	CAMERA MODULE
MODEL NO.	:	CM8277-B800BA-E
SUPPLIER	:	TRULY OPTO-ELECTRONICS LTD.
DATE	:	July 22, 2011

CERT. No. 946535
ISO9001
TL9000

SPECIFICATION

Revision: 0.2

CM8277-B800BA-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:

REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
0.1	2011-05-14	Initial drawing	Only for reference
0.2	2011-07-22	Update Sensor Electrical Characteristics Update Module Mechanical Drawing	P.7~P.10 P.14

CONTENTS

WRITTEN BY	CHECKED BY	APPROVED BY
OU WEI HONG	WEI YOU XING	LIU TIE NAN

Key Information

Camera Module No. CM8277-B800BA-E			
SENSOR	Sensor Type		A8140
	Array Size		3264 X 2448
	Power supply	Digital Core	1.2V（Internal regulator）
		Analog	2.4-3.1V (2.8V nominal)
		I/O	1.7-1.95V
	Sensor Power Consumption	Full resolution	Parallel: 290 mW (estimate) at 55°C (TYP)
			MIPI: 290 mW (estimate) at 55°C (TYP)
		Standby	TBD (15μA estimate (by XSHUTDOWN pin).
	Pixel size		1.4μm x1.4μm
	Operation temperature		-30 ° C to 70 ° C
	Color Filter		RGB Bayer
	Output Formats		RAW Bayer 8/10/12-bit
	Max. data rate	Parallel	100 Mbps at 100MHz PIXCLK
		MIPI	1000 Mbps per lane
	Sub-sampled readout		1/2 ~ 1/8
LENS	EFL		4.27mm
	F.NO		2.8
	FOV		67.4°
	Distortion		<1%
	Construction		1/3.2 INCH 4P+ IR
ISP	Support sensor pixel counts		8Mega pixels
	Maximum pixel rate		133 MHz
	Main Function		Face Detection
			Smile Face Detection
			Face AF
			Image Stabilization
			JPEG compression function
			Various filters, chroma suppression, color tone correction, gamma correction
			Noise reduction
			High-definition digital zoom processing
			RGB interpolation, YUV conversion
			Lens peripheral circuit control function
			Power-saving functions
	Power supply voltage	VDD_CORE	1.1V
		VDD_DRAM	1.1V
		VDD_CAM	1.8+/-0.15V
		VDD_HOST	1.8/2.6/2.85V
		VDD_SYS	2.6/2.85V
	Power consumption		TBD
	Operation temperature		-30°C ~ +70°C
Camera Module	Module Size		8.5mm x 8.5mm x 6.10mm
	Output Format		JPEG stream (YUV 422, YUV420, Gray Scale)
	Array Size		8.0Mega
	Focal Range		10cm~Infinity
	Temperature Range		-20°C to 60°C
	Power Consumption		TBD

Module Pin Assignment

No.	Name	Pin type	Description
1	VDD-SYS	Power	SYS system I/O power supply
2	VDD-CAM	Power	Camera system I/O power supply 1.8V
3	GND	Power	Ground
4	VDD-CORE	Power	ISP core power supply
5	VDD-CORE	Power	ISP core power supply
6	GND	Power	Ground
7	VDD-DRAM	Power	RAM system I/O power supply
8	GND	Power	Ground
9	VDD-HOST	Power	Host system I/O power supply
10	AVDD	Power	Power for analog circuit 2.8V
11	AGND	Power	Analog Ground
12	MCLK	Input	External Clock
13	GND	Power	Ground
14	IIC-SDA	I/O	Serial data from reads and writes to control and status registers.
15	IIC-SCL	Input	Serial clock for access to control and status registers.
16	GND	Power	Ground
17	LED-EN	Output	LED enable signal output
18	LED-SET	Output	LED setting signal output
19	GND	Power	Ground
20	RESET	Input	System Master Reset
21	STBY	Input	Power Down Control
22	INT	I/O	Interrupt
23	GND	Power	Ground
24	MITX-DATA2P	Output	Differential MIPI (sub-LVDS) serial data 2nd lane (positive). Can be left floating when using 1-lane MIPI serial interface.
25	MITX-DATA2N	Output	Differential MIPI (sub-LVDS) serial data 2nd lane (negative). Can be left floating when using 1-lane MIPI serial interface.
26	GND	Power	Ground
27	MITX-DATE1P	Output	Differential MIPI (sub-LVDS) serial data (positive).
28	MITX-DATE1N	Output	Differential MIPI (sub-LVDS) serial data (negative).
29	GND	Power	Ground
30	MITX-CLOCKP	Output	Differential MIPI (sub-LVDS) serial clock/strobe (positive).
31	MITX-CLOCKN	Output	Differential MIPI (sub-LVDS) serial clock/strobe (negative).
32	GND	Power	Ground
33	LED-SDA	I/O	LED Serial data from reads and writes to control and status registers.
34	LED-SCL	Input	LED Serial clock for access to control and status registers.
35	GND	Power	Ground

36	YCC-VSYNC	Output	Vertical synchronization
37	GND	Power	Ground
38	YCC-HSYNC	Output	Horizontal synchronization
39	GND	Power	Ground
40	YCC-PCLK	Output	PCLK synchronizes
41	GND	Power	Ground
42	YCC-DATE0	Output	Image Data<0>
43	YCC-DATE1	Output	Image Data<1>
44	YCC-DATE2	Output	Image Data<2>
45	YCC-DATE3	Output	Image Data<3>
46	YCC-DATE4	Output	Image Data<4>
47	YCC-DATE5	Output	Image Data<5>
48	YCC-DATE6	Output	Image Data<6>
49	YCC-DATE7	Output	Image Data<7>
50	GND	Power	Ground

Sensor Electrical Characteristics

1. Absolute Maximum Ratings

Table 39: Absolute Maximum Values

f_{EXTCLK} = 25 MHz; V_{AA} = 3.1V; V_{AA_PIX} = 3.1V; V_{DD_IO} = 1.95V; V_{DD} (DIGITAL CORE) = 1.2V; V_{DD_PLL} = 1.2V; Output load = 68.5pF; T_J = 70°C; Mode = Full Resolution (3264x2488); Frame rate = 15 fps

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{DD1V8_MAX}	Core digital voltage		1.7	1.8	1.95	V
$V_{DD\_IO\_MAX}$	I/O digital voltage	V_{DD_IO} = 1.8V	1.7	1.8	1.95	V
V_{AA}	Analog voltage		2.7	2.8	3.1	V
V_{AA_PIX}	Pixel supply voltage		2.7	2.8	3.1	V
I_{DD} (V_{DD} + PLL)	Digital operating current	Worst case current	–	–	95	mA
I_{DD_IO}	I/O digital operating current	Worst case current (MIPI)	–	–	1	mA
I_{AA}	Analog operating current	Worst case current	–	–	128	mA
I_{AA_PIX}	Pixel supply current	Worst case current	–	–	12	mA
T_{OP}	Operating temperature	Measure at junction	-30	–	70	°C
T_{STG}	Storage temperature		-40	–	85	°C

Caution Stresses greater than those listed in Table 40 may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. This is a stress rating only, and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Table 40: Absolute Max Voltages

Symbol	Parameter	Condition	Min	Max	Unit
VDD1V8_MAX	Core digital voltage		-0.3	2.1	V
$V_{DD\_IO\_MAX}$	I/O digital voltage		-0.3	3.5	V
V_{AA}	Analog voltage		-0.3	3.5	V
V_{AA_PIX}	Pixel supply voltage		-0.3	3.5	V

2.DC Characteristics

Table 37: DC Electrical Characteristics (Control Interface)

f_{EXTCLK} = 25 MHz; V_{AA} = 2.8V; V_{AA_PIX} = 2.8V; V_{DD_IO} = 1.8V; V_{DD} (DIGITAL CORE) = 1.2V; V_{DD_PLL} = 1.2V; Output load = 68.5pF; T_J = 55°C

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IH}	Input HIGH voltage		0.7 x V_{DD_IO}	–	V_{DD_IO} + 0.5	V
V_{IL}	Input LOW voltage		–0.5	–	V_{DD_IO} x 0.3	V
I_{IN}	Input leakage current	No pull-up resistor; V_{IN} = V_{DD_IO} or D_{GND}	–	–	10	µA
C_{IN}	Input pad capacitance		–	6	–	pF

Operating Voltages

VAA and VAA_PIX must be at the same potential for correct operation of the MT9E013.

Table 38: DC Electrical Definitions and Characteristics (Using Internal Regulator)

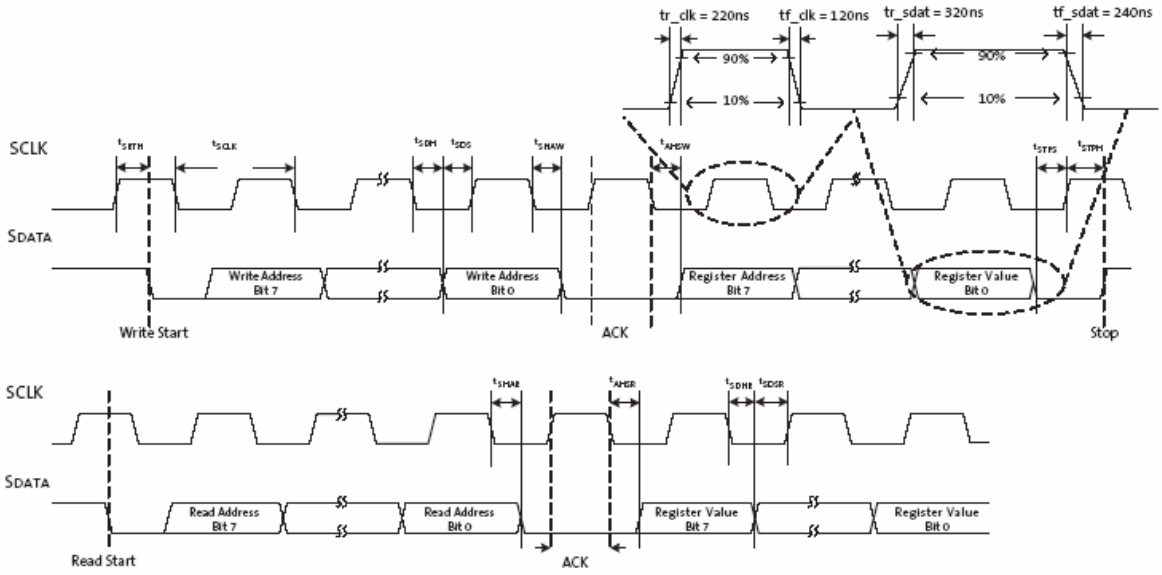
f_{EXTCLK} = 25 MHz; VAA = 2.8V; VAA_PIX = 2.8V; VDD_IO = 1.8V; VDD (DIGITAL CORE) = 1.2V; VDD_PLL = 1.2V; Output load = 68.5pF; TJ = 55°C; Mode = Full Resolution (3264x2488); Frame rate = 11.5 fps

Symbol	Parameter	Condition	Min	Typ	Max	Unit
VDD_TX	PHY digital voltage		1.7	1.8	1.95	V
VDD_IO	I/O digital voltage		1.7	1.8	1.95	V
VAA	Analog voltage		2.65	2.8	3.1	V
VAA_PIX	pixel supply voltage		2.65	2.8	3.1	V
IAA	Analog current		75	80	85	mA
IAA_PIX	Pixel supply current		5	5.5	6.5	mA
IDD_TX	PHY digital operating current		0	0	0	mA
IDD_IO	I/O digital current		0.03	0.0425	0.05	mA
IDD (VDD + PLL)	Digital current		47	52	57	mA
	Hard Standby (No clock)	Analog		7.5	13	µA
		Digital (VDD)		3.5	15	µA
	Hard Standby (With clock)	Analog		20	23	µA
		Digita l(VDD)		3.5	15	µA
	Soft Standby (No clock)	Analog		7.5	13	µA
		Digital (VDD)		0.9	2	mA
	Soft Standby (With clock)	Analog		20	23	µA
		Digital (VDD)		0.9	2	mA

Two-Wire Serial Register Interface

The electrical characteristics of the two-wire serial register interface (SCLK, SDATA) are shown in Figure 56 and Table 32. The SCLK and SDATA signals feature fail-safe input protection, Schmitt trigger input, and suppression of input pulses of less than 50ns.

Figure 56: Two-Wire Serial Bus Timing Parameters



Note: Read sequence: For an 8-bit READ, read waveforms start after WRITE command and register address are issued.

Table 32: Two-Wire Serial Register Interface Electrical Characteristics

f_{EXTCLK} = 25 MHz; V_{AA} = 2.8V; V_{AA_PIX} = 2.8V; V_{DD_IO} = 1.8V; V_{DD} (digital core) = 1.2V; V_{DD_PLL} = 1.2V; V_{DD_TX} = 1.8V; Output load = 68.5pF; T_J = 55°C

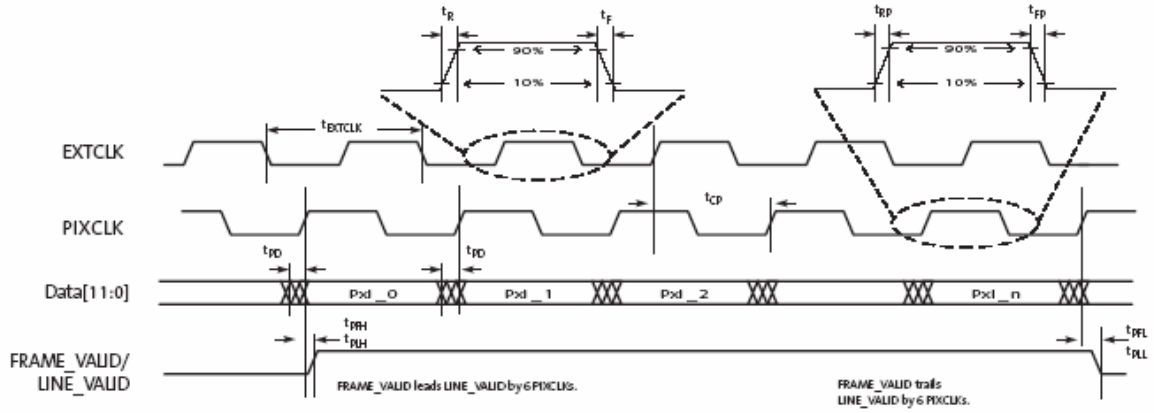
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IL}	Input LOW voltage		-0.5	–	0.3 x V_{DD_IO}	V
V_{IH}	Input HIGH voltage		0.7 x V_{DD_IO}	–	V_{DD_IO} + 0.5	V
I_{IN}	Input leakage current	No pull up resistor; V_{IN} = V_{DD_IO} or D_{GND}	10	–	14	µA
V_{OL}	Output LOW voltage	At specified 2mA	0.11	–	0.3	V
I_{OL}	Output LOW current	At specified V_{OL} 0.1V	–	–	6	mA
C_{IN}	Input pad capacitance		–	–	6	pF
C_{LOAD}	Load capacitance		–	–	N/A	pF

Table 33: Two-Wire Serial Register Interface Timing Specification

MCLK = 25 MHz, Slew rate= 4, Ambient temperature; V_{AA}=2.8V, V_{AA_PIX} = 2.8V; V_{DD} (digital core) = 1.2V; V_{DD_PLL} =1.2V; Output load <20pF

Symbol	Parameter	Condition	Min	Typ	Max	Unit
f_{SCLK}	Serial Interface Input clock	-	100	–	400	KHz
t_{SCLK}	Serial Interface Input period	VCMF	–	2.5	–	µs
	S_{CLK} duty cycle	VOD	40	48.5	60	%
t_R	S_{CLK}/S_{DATA} rise time		–	0.369/ 0.191	–	µs
t_{SRTS}	Start setup time	Master WRITE to slave	0.3			µs
t_{SRTH}	Start hold time	Master WRITE to slave	0.4			µs
t_{SDH}	S_{DATA} hold	Master WRITE to slave	0.3			µs
t_{SDS}	S_{DATA} setup	Master WRITE to slave	0.62			µs
t_{SHAW}	S_{DATA} hold to ACK	Master WRITE to slave	0.15		0.65	µs
t_{AHSW}	ACK hold to S_{DATA}	Master WRITE to slave	0.15		0.70	µs
t_{STPS}	Stop setup time	Master WRITE to slave	0.61			µs
t_{STPH}	Stop hold time	Master WRITE to slave	0.58			µs
t_{SHAR}	S_{DATA} hold to ACK	Master WRITE to slave	0.3		1.65	µs
t_{AHSR}	ACK hold to S_{DATA}	Master WRITE to slave	0.3		0.65	µs
t_{SDHR}	S_{DATA} hold	Master WRITE to slave	0.012			µs
t_{SDSR}	S_{DATA} setup	Master WRITE to slave	0.3			µs

Figure 57: Parallel Data Output Timing Diagram



Note: PLL disabled for ^tCP.

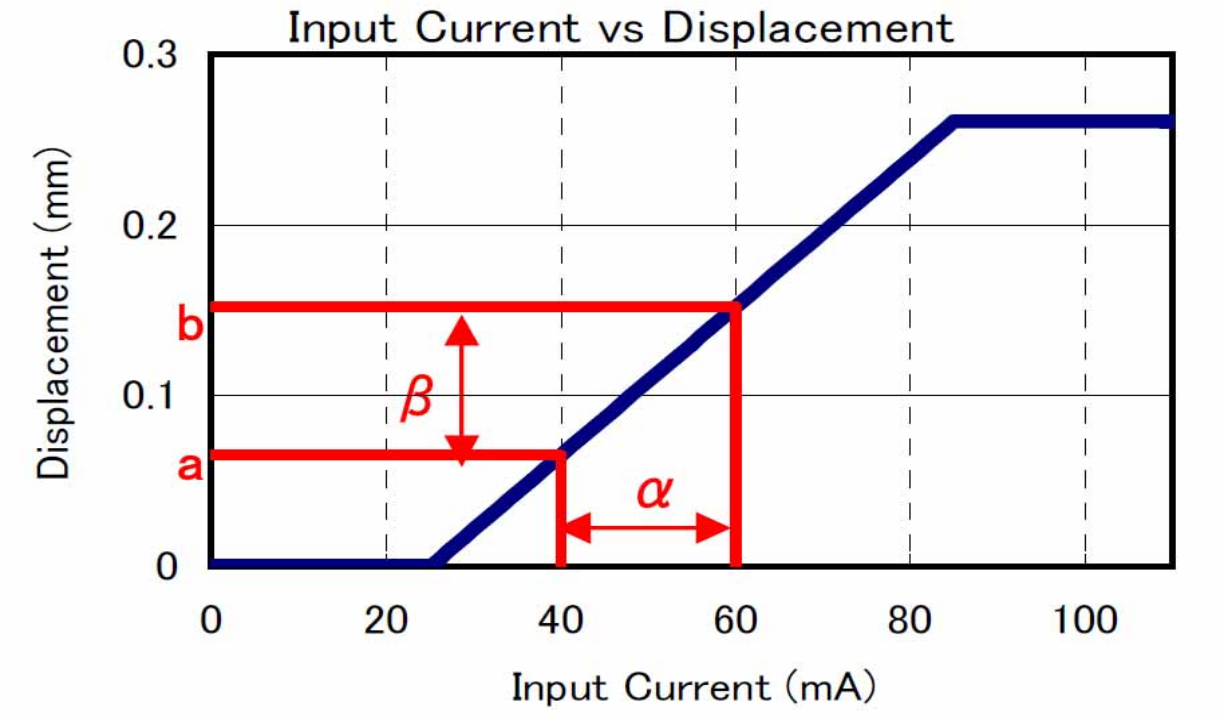
Note: For more information of sensor please refer to the MT9E013 specification.

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	15.7±10%Ω
6	Settling Time	TBD
7	Hysteresis	≤10μm
8	Focusing Range	10cm to infinity

VCM Specification

NO.	Item	Condition	Specification
1	Motor Size	Without terminal	8.5*8.5*4.3mm
2	Absolute Max Current		≤100mA
3	Moving Tilt	∞→10cm	＜20 ′
4	Starting Current	Moving direction is upward	12~35mA
5	Hysteresis	At stroke range:0.005～0.15mm	≤10μm
6	Sensitivity		8.0μm/mA or less
7	Motion Range	Driving Current 100mA	0~0.28 mm with lens
8	Terminal Resistance	20±5℃	15.7±10%Ω
9	Lens Unit Mass		≤0.10g



ISP Characteristics

Absolute Maximum Rating

Item	Symbol	Condition	Rating	Unit
Power supply voltage	V_{DD_CORE} V_{DD_PLL} V_{DD_DRAM}	LSI core power supply PLL power supply eDRAM power supply	–0.45 to +1.8	V
	V_{DD_CAM}	Sensor interface power supply	–0.5 to +2.5	V
	V_{DD_MIPI}	MIPI interface power supply	–0.5 to +2.5	V
	V_{DD_HOST}	HOST/YCC interface power supply	–0.5 to +4.6	V
	V_{DD_SYS}	System interface power supply	–0.5 to +4.6	V
	V_{DD33AF}	Power supply for Anti-Fuse	–0.5 to +4.6	V
Input voltage	V_I	I/O pins that use the V_{DD_HOST} and V_{DD_SYS} power supplies, $V_I < V_{DD}$ +0.5 V Note	–0.5 to +4.6	V
		I/O pins that use the V_{DD_CAM} and V_{DD_MIPI} power supplies, $V_I < V_{DD}$ +0.5 V Note	–0.5 to +2.5	V
Storage temperature	T_{stg}		–40 to +125	°C

Note V_{DD} is the power supply voltage applied to the relevant power supply input pin.

Recommended Operating Conditions

Item	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Power supply voltage	V_{DD_CORE} V_{DD_PLL} V_{DD_DRAM}	LSI core power supply PLL power supply eDRAM power supply	[T.B.D]	1.1	[T.B.D]	V
	V_{DD_CAM}	Sensor interface power supply	1.65	1.8	1.95	V
	V_{DD_MIPX}	MIPI RX/TX interface power supply	1.65	1.8	1.95	V
	V_{DD_HOST}	HOST/YCC interface power supply	1.65	1.8	1.95	V
			2.45	2.6	2.75	
			2.7	2.85	3.0	
	V_{DD_SYS} Note	System interface power supply	1.65	1.8	1.95	V
			2.45	2.6	2.75	
			2.7	2.85	3.0	
	V_{DD33AF} Note	Power supply for Anti-Fuse	2.45	2.6	2.75	V
			2.7	2.85	3.0	V
Operating ambient temperature	T_A		–20		+70	°C
Input voltage	V_I	The I/O buffer power supply voltage is V_{DD}.	0	–	V_{DD}	V

Note When operating the on-chip SPI flash ROM, V_{DD_SYS} can only be specified in a range of 2.85 ±0.15 V. When using V_{DD_SYS} at 2.6 ±0.15 V, handle the SPI1_ pins as unused pins.

Pin Capacitances

(T_A = 25°C)

Item	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Input pin capacitance	C_{TI}	V_{DD} = 0 V, f = 1 MHz	–	–	10	pF
Output pin capacitance	C_{TO}	V_{DD} = 0 V, f = 1 MHz				pF
Input/output pin capacitance	C_{TIO}	V_{DD} = 0 V, f = 1 MHz				pF
IIC pin capacitance	C_{TIO_IIC}	V_{DD} = 0 V, f = 1 MHz				pF
MIPI input/subLVDS pin capacitance	C_{TI_SL}	V_{DD} = 0 V, f = 400 MHz	–	–	7	pF
MIPI output pin capacitance	C_{TO_MITO}	V_{DD} = 0 V, f = 400 MHz	–	–	7	pF

DC Characteristics

Item	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Input voltage, low	V_{IL_18}		–0.2	–	0.35 × V_{DD}	V
Input voltage, high	V_{IH_18}		0.65 × V_{DD}	–	V_{DD} +0.2	V
Output voltage, low	V_{OL_18} Note		–	–	0.2	V
Output voltage, high	V_{OH_18} Note		V_{DD} –0.3	–	–	V
Input leakage current, low	I_{LL_18}	Normal With pull-up resistor With pull-down resistor	– – –	– – –	13 60 60	μA
Input leakage current, high	I_{LH_18}	Normal With pull-up resistor With pull-down resistor	–13 –60 –60	– – –	– – –	μA
Output current, low (V_{OL} = 0.45 V)	I_{OL_18}	Driving current register = 00 (I_{OLH} = 4 mA)	3.0	–	–	mA
Output current, high (V_{OH} = V_{DD}–0.45 V)	I_{OH_18}	Driving current register = 00 (I_{OLH} = 4 mA)	3.0	–	–	mA
Pull-down resistance	R_{PD}		25	50	75	kΩ
Pull-up resistance	R_{PU}		25	50	75	kΩ
MIPI input voltage range	V_{PIN}		–50	–	+1350	mV
MIPI common mode voltage	V_{CMRX}		70	–	330	mV
MIPI differential input voltage, low	V_{IDTL}	Threshold voltage at receive side	–70	–	–	mV
MIPI differential input voltage, high	V_{IDTH}	Threshold voltage at receive side	–	–	70	mV
MIPI input voltage, low	V_{ILHS}	Single end input	–40	–	–	mV
MIPI input voltage, high	V_{IHHS}	Single end input	–	–	460	mV
MIPI termination resistance	Z_{ID}		80	100	125	Ω

Note This value guarantees the operation when there is no load allowing DC current to flow.

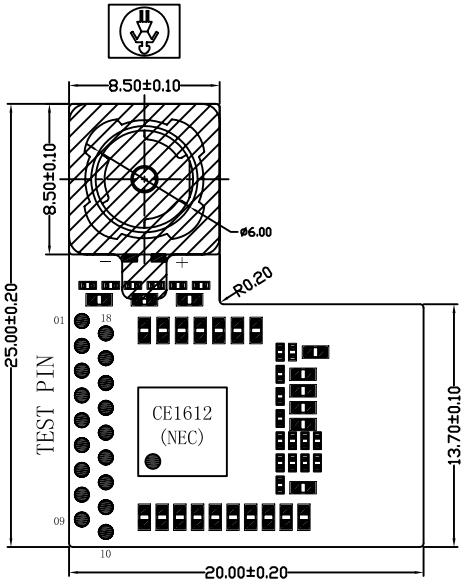
Note: For more information of sensor please refer to the ISP MC-10239 specification.

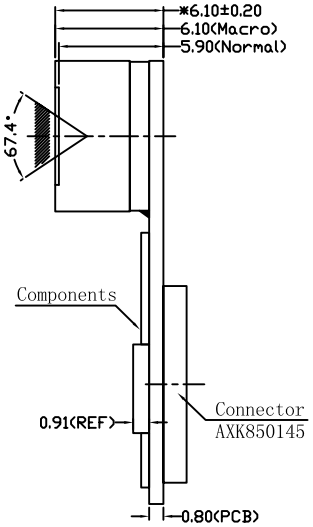
Module Mechanical Drawing

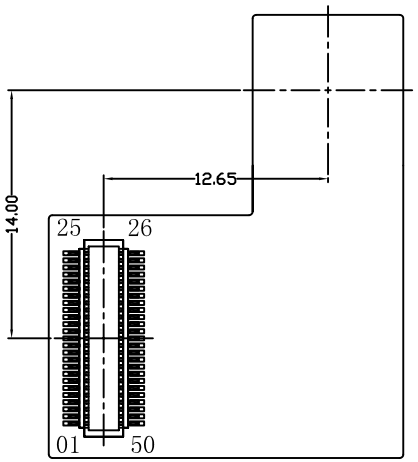
RoHS

Customer No.:

CM8277-B800BA-E Camera Module







MODULE 50PIN DESCRIPTION

PIN NO	NAME	PIN NO	NAME
1	VDD_SYS_2.8V	26	GND
2	VDD_CAM_1.8V	27	MITX_DATA1P
3	GND	28	MITX_DATA1N
4	VDD_CORE_1.1V	29	GND
5	VDD_CORE_1.1V	30	MITX_CLOCKP
6	GND	31	MITX_CLOCKN
7	VDD_DRAM_1.1V	32	GND
8	GND	33	LED_SDA
9	VDD_HOST_1.8V/2.8V	34	LED_SCL
10	AVDD_2.8V	35	GND
11	AGND	36	YCC_VSYNC
12	MCLK	37	GND
13	GND	38	YCC_HSYNC
14	IIC_SDA	39	GND
15	IIC_SCL	40	YCC_PCLK
16	GND	41	GND
17	LED_EN	42	YCC_DATA0
18	LED_SET	43	YCC_DATA1
19	GND	44	YCC_DATA2
20	RESET	45	YCC_DATA3
21	STBY	46	YCC_DATA4
22	INT	47	YCC_DATA5
23	GND	48	YCC_DATA6
24	MITX_DATA2P	49	YCC_DATA7
25	MITX_DATA2N	50	GND

Note:
1. * CRITICAL DIMENSIONS
2. UNSPECIFICED CHAMFER:R=0.2

TEST PAD PIN DESCRIPTION

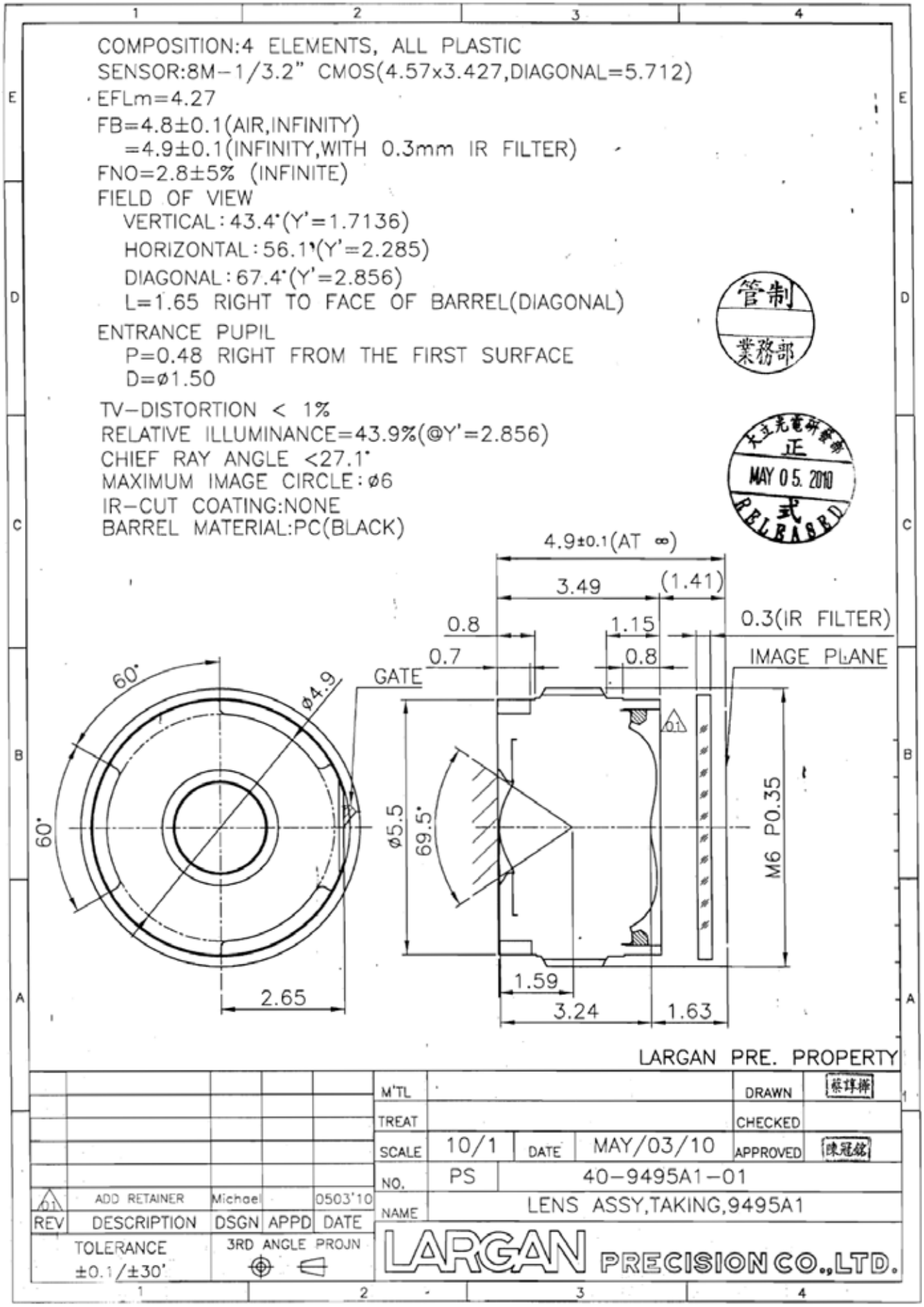
PIN NO	NAME	PIN NO	NAME
1	DGND	10	SPI1_SIO2
2	VDD_SYS	11	SPI1_SIO1
3	SPI1_CLK	12	SPI1_SIO3
4	SPI1_CEZ	13	SPI1_SIO0
5	C_TRSTZ	14	C_TMS
6	C_RTCKO	15	GPIO_15
7	C_TCK	16	SYS_STBY
8	C_TDI	17	C_DEBUGEN
9	C_TDO	18	GPIO_60

主要参数(Module Specification)	
焦距(EFL)	4.27 mm
光圈(F.NO)	2.8
视场角(View Angle)	67.4° (Diagonal)
畸变(Distortion)	< 1 %
景深(Focusing Range)	10 cm~Infinity
感光芯片(Chip Type)	A8140
象素(Array Size)	8.0M
镜头类型(lens Size)	1/3.2INCH 4P+IR

Actuator Specification	
Type	VCM Parameter
Control Mode	IIC
Supply Voltage	2.6V~3.3 V
Coil Resistance	15.7ohm±10%
Rated Current	100mA
Lens Movement	0.30mm(Max)

CUSTOMER APPROVE		AMEND			手机摄像模组	TRULY OPTO-ELECTRONICS LTD.		
Mechanical	Electrical	NO.	CONTENT	DATE	TOLERANCE : DECIMAL .x ± .30 .xx ± .20 ∠ ± 1/4	PRODUCT NO. CM8277-B800BA-E	DRAW NO.	REV A
						DWN 温美梅 20110228	DSN 温美梅 20110228	
						CHKD 韦有兴 20110228	APPD Laurence 20101021	
						NOT IN SCALE	UNIT mm	SHEET:

Lens Specification



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≤1mm, length≤2mm, the defect number≤2; No feeling defect; The width of defects and gaps on the outside of Lens≤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≤0.1mm and ≤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≤1/2H (H is minimum.)、length≤1mm、defect numbers per edge≤2(No tearing gap inby edge for FPC); Edge outshoot limitation (width≤0.3mm, length≤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×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≤0.08mm,length≤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

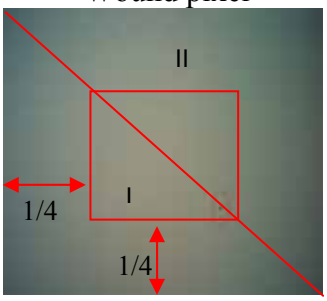
A：The defect can be found in the finished product, or have obvious visual differences from good products, such as crack, defect and dust, or influence image quality, or are appointed by the customer. We will emphasize these items and check all products.

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≥1400 8 point of 0.7 viewing field ≥900	A
2	Shading	The lighteness of 90% viewing area ≥ 40% of center lighteness(Lens correction Shading [Turn off]); The lighteness of 90% viewing area ≥ 60% of center lighteness(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≤1 Ⅱ area：Blemish number≤4	B
6	Color	Color distortion ratio of center±15%	B
7	Gray Scale	Margin of two near scales' brightness≥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:

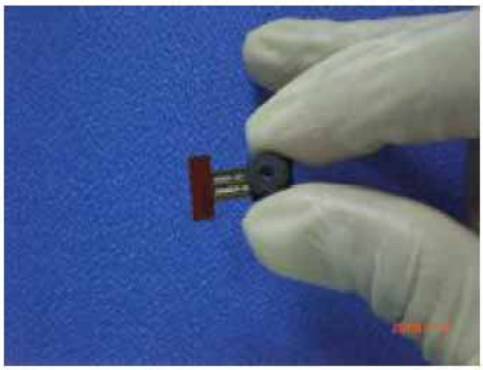
Referenced standard: GB/T 2828.1-2003/ISO 2859-1:1999 and ANSI/ASQC.4-1993 II

PRECAUTIONS FOR USING CCM MODULES

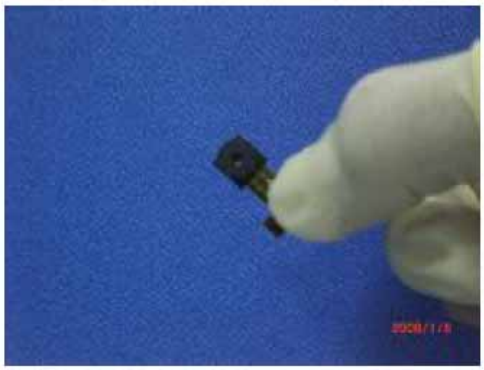
Handing Precautions

—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.

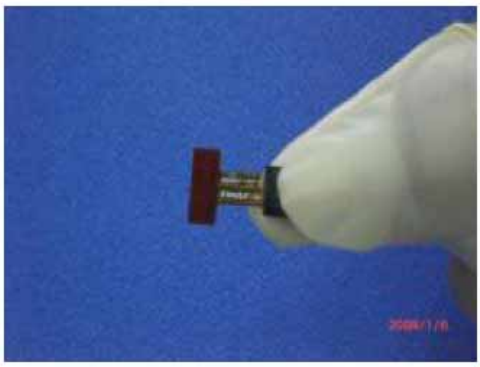
Apply indication



Correct



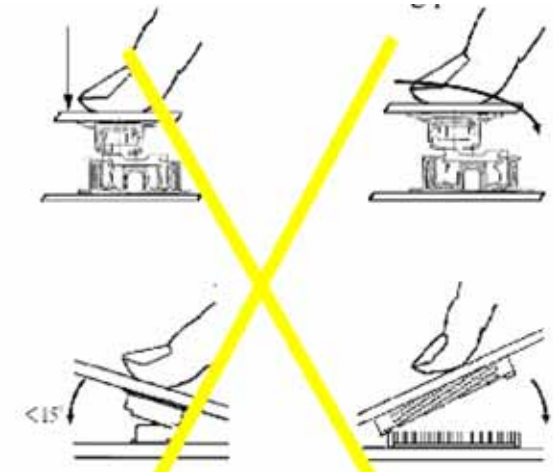
Incorrect

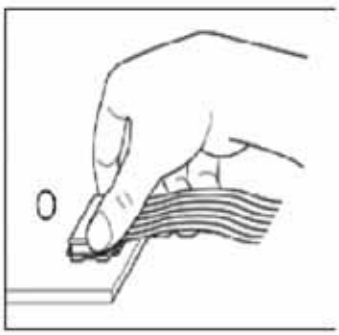


Incorrect

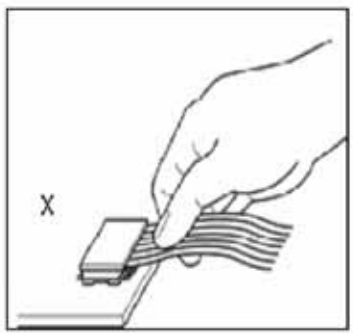
Precaution for assemble the module with BTB connector:

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



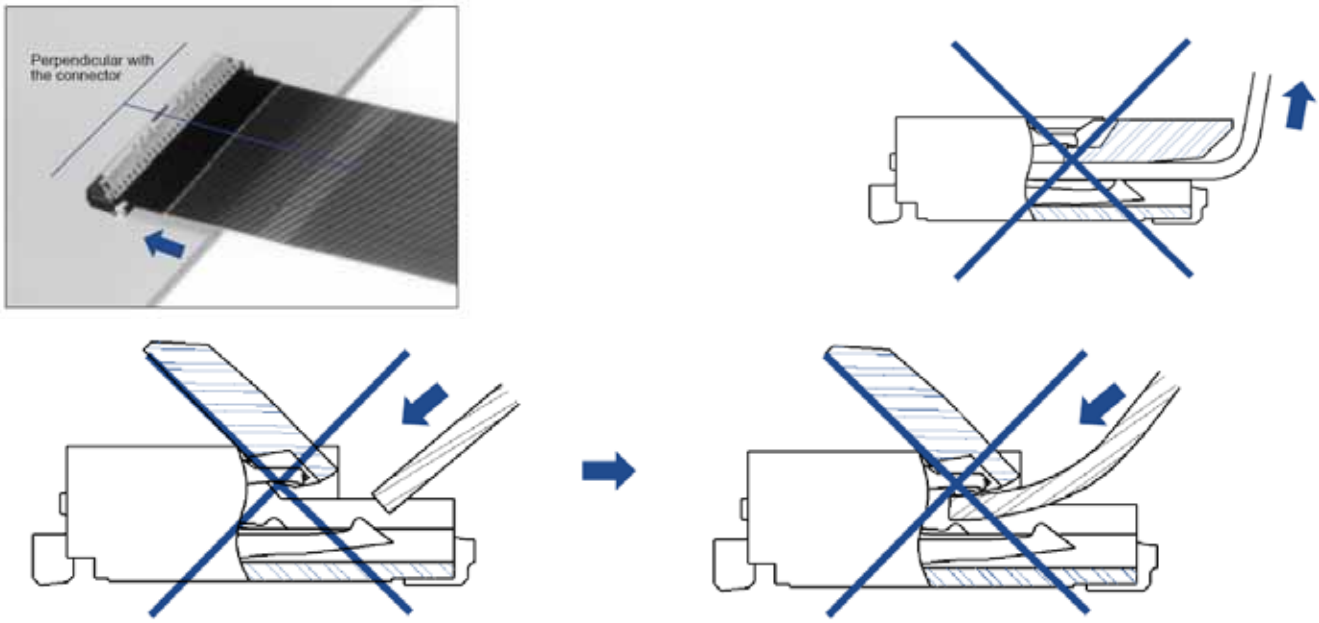


OK



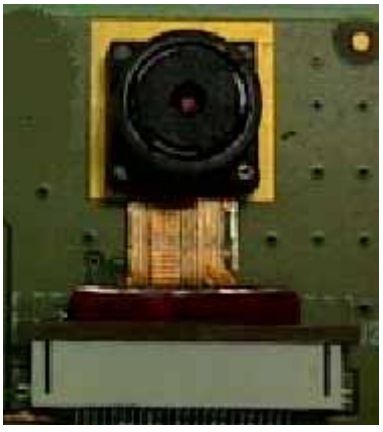
NG

Precaution for assemble the module with ZIF connector:



Precaution for assembling the module to terminal unit

The temperature of running module is high base on the high-integrated sensor. In order to enhance the heat dissipation and reduce the noise infection from high temperature, TRULY recommend that the module's backside should be touched with rigid material directly, like as PCB or metal. If necessary, it's recommended the module backside is affixed with the materials which can transfer heat, like as electric-fabric, electric-adhesive, or electric-sponge.



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 discon-nexion, and so on.

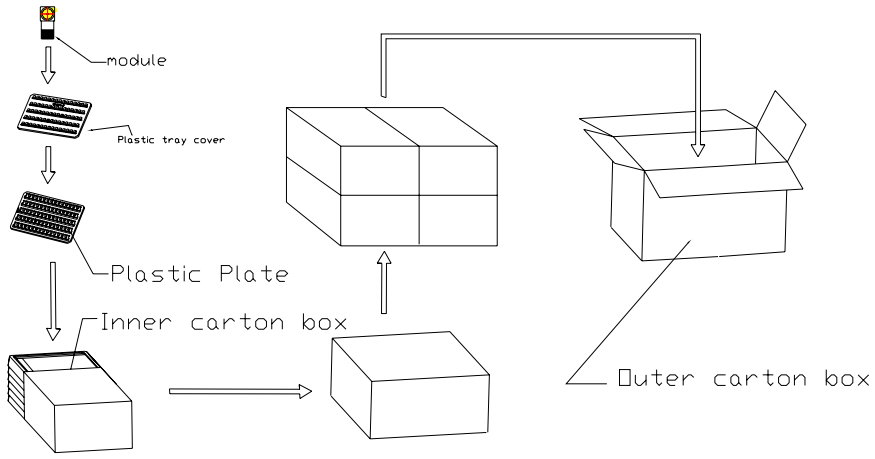
Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB eyelet, conductors and terminals.

Package Specification

Packaging Design One

Product No.	CM8277-B800BA-E	Release date			
Product name	Compact Camera Module	Releaser			
Supplier	TRULY OPTO-ELECTRONICS LTD.	Recycle		☐YES ■ NO	
Quantity/ each box	TBD	Material for box		■ paper ☐ plastic	
Outer carton box size	405mm*290mm*290mm	Box type		■new ☐update	
Quantity / inner box * Quantity / outer box	TBD	Weight	g / pcs Kg / outer box	BOX=TYPE Record of SRF Dept.	TBD Kg(Max)

Packing Standards:



There are TBD modules each plastic plate.

There are TBD modules each inner carton box..

There are TBD modules 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

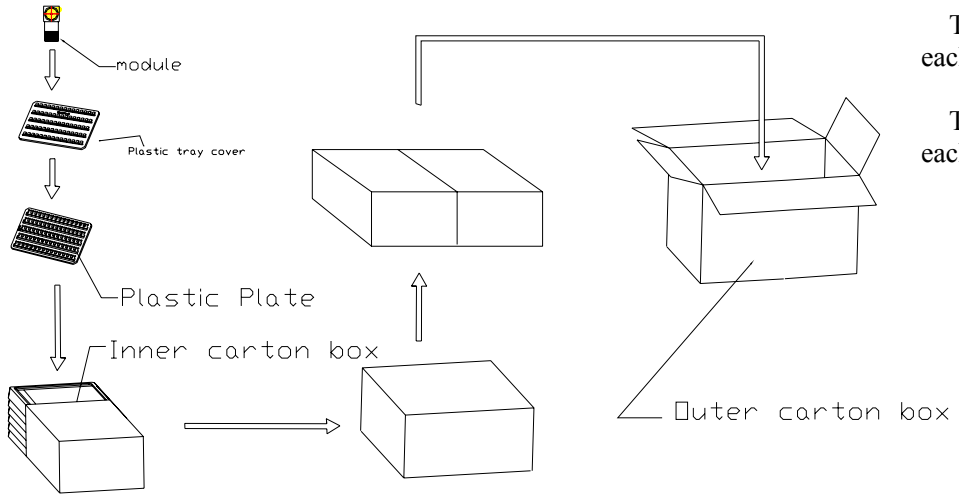
Material for Plastic tray

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

Packaging Design Two

Product No.	CM8277-B800BA-E	Release date			
Product name	Compact Camera Module	Releaser			
Supplier	TRULY OPTO-ELECTRONICS LTD.	Recycle		☐YES	■ NO
Quantity/ each box	TBD	Material for box		■ paper	☐ plastic
Outer carton box size	405 mm *290 mm *170 mm	Box type		■new	☐update
Quantity / inner box * Quantity / outer box	TBD	Weight	g / pcs Kg / outer box	BOX=TYPE Record of SRF Dept.	TBD Kg(Max)

Packing Standards:



There are TBD modules each plastic plate.

There are TBD modules each inner carton box..

There are TBD modules 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

1.①For 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.
2. 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