

**PRODUCT** : CAMERA MODULE**MODEL NO.** : CM8042-A300SA-E**SUPPLIER** : TRULY SEMICONDUCTORS LTD.**DATE** : December 18, 2007

CERT. No. 946535  
 ISO9001  
 TL9000

# SPECIFICATION

Revision: 0.4

**CM8042-A300SA-E**

preliminary

If there is no special request from customer, TRULY SEMICONDUCTORS Co., 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 SEMICONDUCTORS Co., 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 SEMICONDUCTORS LTD:      CUSTOMER:**

Quality Assurance Department: \_\_\_\_\_  
 Approved by: \_\_\_\_\_  
 Technical Department: \_\_\_\_\_

Approved by: \_\_\_\_\_



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<b>WRITTEN BY</b>	<b>CHECKED BY</b>	<b>APPROVED BY</b>
HUANG WEI NA	YAN SI ZHI	LIU TIE NAN

**Key Information**

<b>Module No.</b>		<b>CM8042-A300SA-E</b>
Module Size		10.0mm X 10.0mm X 5.90mm
Image Quality		≥800 TV line
Sensor Type		OV3640
Array Size	UXGA	2048 X 1536
Power supply	core	1.5VDC +/-5%
	Analog	2.5~3.0 VDC
	I/O	1.71V to1.89V
Lens		1/4 inch 4Plastic+ IR
Focus(F.NO)		2.8
View Angle		65°
Image Area		3626μm x 2709μm
Object distance		10cm-infinity
Sensitivity		TBD
Pixel size		1.75μm x 1.75μm
IR Cutter		650+/-10nm
Sensor Temperature Range	Operating	-20° C to 70° C
	Stable Image	0° C to 50° C
Output Formats(8-bit)		YUV(422/420)/YCbCr422 RGB565/555/444, CCIR656, 8-bit compressed data 8-/10-bit Raw RGB Data
Maximum Image Transfer Rate	QXGA	15 fps
	XGA	30 fps
S/N Rate		TBD
Dynamic Range		TBD
substrate		FPC
IC Package		56PIN –CSP2
Power requirement	Active	TBD
	Standby	TBD
Fixed Pattern noise		TBD
Scan Mode		Progressive
Dark current		TBD
Package		Antistatic Plastic

## Pin Assignment

No.	Name	Pin type	Description
1	STROBE	I/O	Strobe output or scan chain test mode input
2	AGND	Ground	Ground for analog circuit
3	SIO_D	I/O	SCCB data
4	AVDD	Power	Analog power
5	SIO_C	Input	SCCB input clock
6	RESET	Input	Reset (active low with internal pull-up resistor)
7	VSYNC	I/O	Vertical sync output
8	PWDN	Input	Power down active high with internal pull- down resistor
9	HREF	I/O	Horizontal reference output
10	DVDD	Reference	Power for digital core
11	DOVDD	Power	Power for I/O circuit
12	Y9	I/O	Video port output bit[9]
13	XCLK	Input	System clock input Note: There is no internal pull-up/pull-down resistor
14	Y8	I/O	Video port output bit[8]
15	DGND	Ground	Digital Ground
16	Y7	I/O	Video port output bit[7]
17	PCLK	I/O	Pixel clock output
18	Y6	I/O	Video port output bit[6]
19	Y2	I/O	Video port output bit[2]
20	Y5	I/O	Video port output bit[5]
21	Y3	I/O	Video port output bit[3]
22	Y4	I/O	Video port output bit[4]
23	AF_VCC	Power	Power supply for VCM
24	AF_AGND	Power	VCM Ground

## Electrical Characteristics

### 1. Absolute Maximum Ratings

parameter	absolute maximum rating <sup>a</sup>	
stable operating temperature	0°C to +50°C	
operating temperature	-20°C to +70°C	
ambient storage temperature	-40°C to +95°C	
ambient humidity	TBD	
supply voltage (with respect to ground)	$V_{DD-A}$	4.5V
	$V_{DD-C}$	3V
	$V_{DD-IO}$	4.5V
electro-static discharge (ESD)	human body model	2000V
	machine model	200V
all input/output voltages (with respect to ground)	-0.3V to $V_{DD-IO} + 1V$	
lead-free temperature, surface-mount process	245°C	

- a. Exceeding the absolute maximum ratings shown above invalidates all AC and DC electrical specifications and may result in permanent damage to the device.

### 2. DC Characteristics (-20°C < $T_a$ < 70°C)

TBD

### 3. AC Characteristics ( $T_A=25^\circ\text{C}$ , $V_{DD-A}=2.8\text{V}$ )

symbol	parameter	min	typ	max	unit
<b>ADC parameters</b>					
B	analog bandwidth		30		MHz
DLE	DC differential linearity error		0.5		LSB
ILE	DC integral linearity error		1		LSB
	setting time for hardware reset			<1	ms
	setting time for software reset			<1	ms
	setting time for UXGA/SVGA mode change			<1	ms
	setting time for register setting			<300	ms
<b>digital inputs</b>					
$V_{IL}$	input voltage LOW			0.54	V
$V_{IH}$	input voltage HIGH	1.26			V
$C_{IN}$	input capacitor			10	pF
<b>digital outputs (standard loading 25 pF)</b>					
$V_{OH}$	output voltage HIGH	1.62			V
$V_{OL}$	output voltage LOW			0.18	V
<b>serial interface inputs</b>					
$V_{IL}$	SCL and SDA	-0.5	0	0.54	V
$V_{IH}$	SCL and SDA	1.26	1.8	2.3	V

## 4. Timing Characteristics

symbol	parameter	min	typ	max	unit
oscillator and clock input					
$f_{osc}$	frequency (XVCLK)	6	24	27	MHz
$t_r, t_f$	clock input rise/fall time			5 (10 <sup>a</sup> )	ns

a. if using the internal PLL

**Note:** For more information of sensor please refer to the OV3640 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 $\leq$ 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**

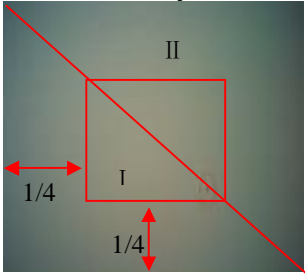
**A:** The defect can be found in the finished product, or have obvious visual differences from good products, such as crack, defect and dust, or influence image quality, or are appointed by the customer. We will emphasize these items and check all products.

**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 $\geq$ 1000 8 point of 0.7 viewing field $\geq$ 800	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	<p>Wound pixel</p> 	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

## Package Specification

### Packaging Design

Product No.	CM8042-A300SA-E	Release date					
Product name	Compact Camera Module	Releaser					
Supplier	TRULY SEMI CONDUCTORS LTD	Recycle	( )YES ( )NO				
Quantity/ each box	TBD	Material for box	( ) paper ( ) plastic				
Outer carton box size	TBD	Box type	( )new ( )update				
Quantity / inner box * Quantity / outer box	TBD	Weight	<table border="1"> <tr> <td>g / pcs</td> <td rowspan="2">BOX=TYPE Record of SRF Dept.</td> <td rowspan="2">Kg(Max)</td> </tr> <tr> <td>Kg / outer box</td> </tr> </table>	g / pcs	BOX=TYPE Record of SRF Dept.	Kg(Max)	Kg / outer box
g / pcs	BOX=TYPE Record of SRF Dept.	Kg(Max)					
Kg / outer box							

Packing Standards:

There are TBD modules each plastic plate.

There are TBD modules each inner carton box..

There are TBD inner carton boxes each outer carton box.

#### Requirements of outer carton box :

1. Weight(Max): TBD Kg
2. Height (Max): TBD 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

**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 SEMICONDUCTORS LTD.

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

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