

# **Specification for Approval**

**Samsung Electro-Mechanics Co.,LTD**

# Specification for Approval

## Revision History

Rev.	Date	Description of Change	Rev. Page
1	2005.07.30	The Primary Specification	1.0

Rev.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Page																	
Rev.	0	0	0	0	0	0	0	0	0								
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Rev.																	
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# SPECIFICATIONS

■ **NOMENCLATURE** : **AU-85B**

■ **CUSTOMER PART NO.** :

■ **CUSTOMER SAP Material NO** :

■ **CUSTOMER MODEL REF** :

■ **VENDER PART NO.** : **MOMBD420G1A**

Checked	Approved
WY CHOI	
11/08/05	

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MODEL

1/2.7" COLOR UXGA CAMERA

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### 1. Specification

NO.	Item	Specifications	
2-1	Image sensor	Manufacturer	Biomorphic VLSI (part number: Bi8921)
		Image Format	1/2.7" UXGA CMOS Color Image Sensor
		Active Pixels	1608×1208
		Frame Rate	12 fps @ 30Mhz (Full Frame)
		Output Data	8bit, YUV(or YCbCr) 422 / RGB 565 / JPEG
		Exposure Control	AUTO
		White Balance	AUTO
		Gamma	AUTO
2-2	Lens	Focal Length	f <sub>l</sub> = 5.96mm
		F Number	1:2.8
		Angular field of View	62°(Diagonal)
		Composition	2P2G Lens
2-3	Power	Source	2.85V(Typical)
		Rated current	72mA @ 30Mhz Imager clock, 2.85V
2-4	Interface	I <sup>2</sup> C (Address: 0x45)	
2-5	Dimension	10.0×10.0×9.84 (mm)	

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## 2. Block Diagram

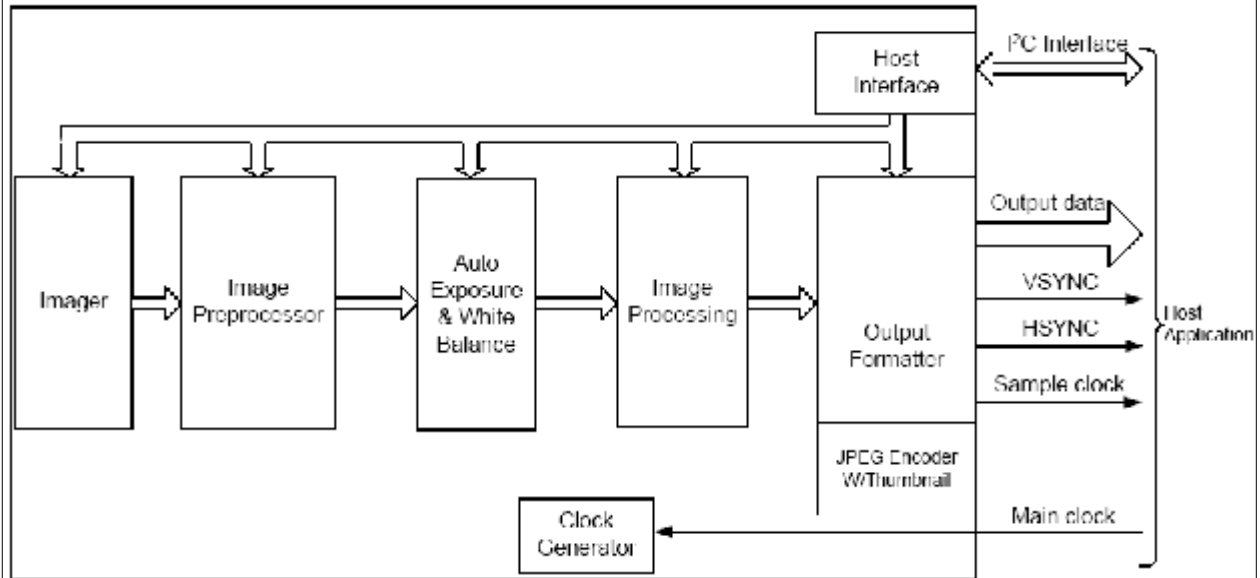
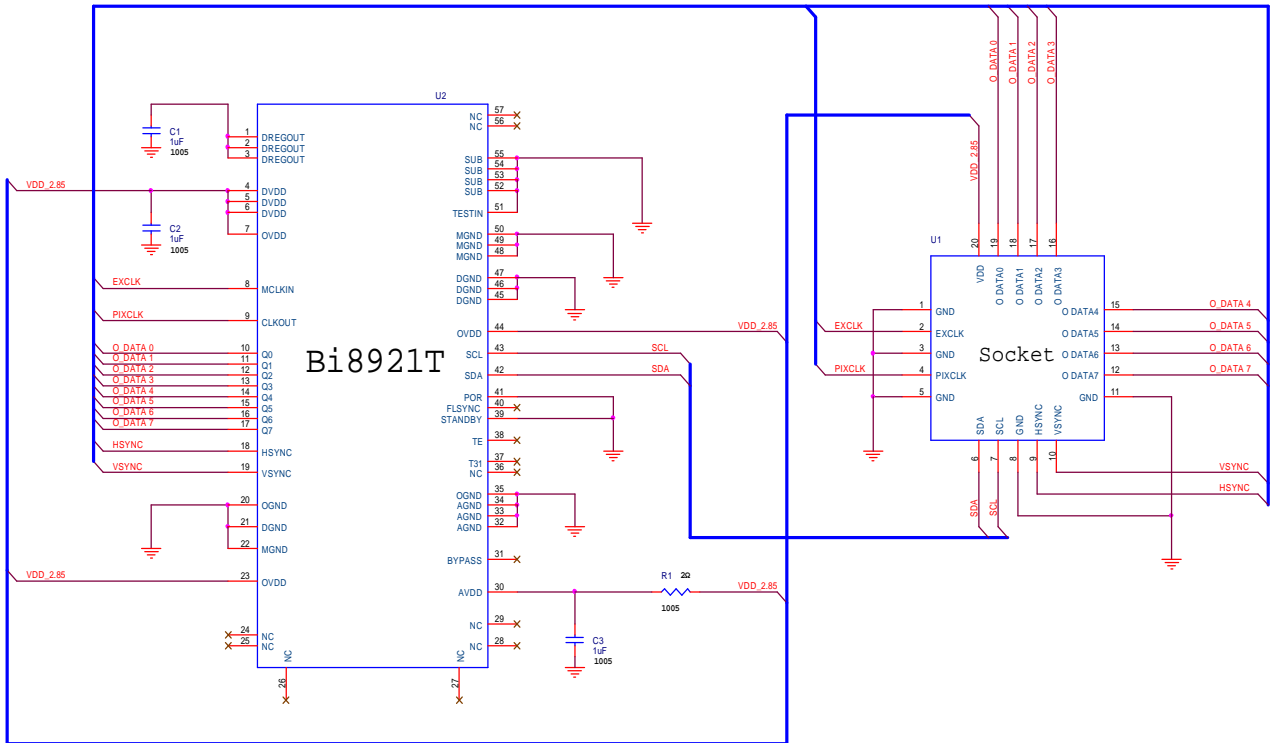


Figure 1. Bi8921 Sensor Internal Block Diagram

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### 3. Schematic



#### Pin Description

Pin	Symbol	Description	Pin	Symbol	Description
1	GND	Ground	2	EXCLK	External clock
3	GND	Ground	4	PIXCLK	Pixel output clock
5	GND	Ground	6	SDA	I2C serial data
7	SCL	I2C serial clock	8	GND	Ground
9	HSYNC	Horizontal Line Synchronization	10	VSYNC	Vertical Frame Synchronization
11	GND	Ground	12	DATA7	Image Output Data Bit7
13	DATA6	Image Output Data Bit6	14	DATA5	Image Output Data Bit5
15	DATA4	Image Output Data Bit4	16	DATA3	Image Output Data Bit3
17	DATA2	Image Output Data Bit2	18	DATA1	Image Output Data Bit1
19	DATA0	Image Output Data Bit0	20	VDD	Power for camera

# 4. Mechanical Drawing

ZONE	LTR	REVISIONS	DRAWN	CHECKED	APPROVED
		VER-02 → VER 2.1	SHIELD CAN DESIGN CHANGE		
		VER-20 → VER 2.2	SHIELD CAN DESIGN CHANGE		

**REVISIONS**

ZONE	LTR	REVISIONS	DRAWN	CHECKED	APPROVED
		VER-02 → VER 2.1	SHIELD CAN DESIGN CHANGE		
		VER-20 → VER 2.2	SHIELD CAN DESIGN CHANGE		

**NOTE**

- INITIAL CONDITION
  - SENSOR THICKNESS 0.3MM.
  - SENSOR SIZE IS AROUND 6.72X7.69MM.
  - SENSOR PAD PITCH MIN 0.45MM
  - PASSIVE MAX 4PCS( SIZE 10X0.5X0.5MM)
  - EFFECTIVE IMAGE-AREA CENTER AND SENSOR'S ARE CONCENTRIC POINT.
  - PCB THICKNESS 0.4MM. ELECTRO PLATING.
  - PCB PIN OUT IS DEFINED.
- THIS MODULE IS COMPATIBLE WITH X75 MODULE SOCKET.
- LENS SPEC IS NEEDED TUNING AND AGREEMENT.
- COVER GLASS IS INCLUDED
- THIS DRAWING IS BASE ON THE SPECIFICATION OF EACH PART.
- CRITICAL DIMENSION FOR CPK STUDY ARE MARKED WITH AS QUARE(\*)
- SHIELD CAN MATERIAL IS C770(NICKEL-SILVER CUNI8Zn20)

Technical drawing showing dimensions: 9.84 ±0.2, 10 ±0.1, 9.81, 9 ±0.1, 10 ±0.1, 9 ±0.1, 0.8, 0.31, 0.38, 4.95 ±0.1, 0.4 ±0.04, 1.8 ±0.1, 10 ±0.1, 8.6 ±0.1, 25 ±0.05, 8.6 ±0.1, 10 ±0.1.

**UNLESS OTHERWISE SPECIFIED**

DEC.	TOLERANCES (LENGTH)	MO/DAY/YR
+	4 ~ 20	00-300
-	20-100	300 ~
X	100-300	300 ~
XX	300 ~	300 ~
XXX	300 ~	300 ~

UNIT : mm

ALGUE ±1°

CHAMFER 1 ~ 1.5

BREAK SHARP EDGE 0.3MAX

CORNER RAD 0.3 ~ 0.8

**PART LIST**

DET	NAME	MATERIAL	QTY	FINAL SIZE	STOCK SIZE	REMARK

**SIGNATURES**

MO/DAY/YR	MO/DAY/YR
08.18.2005	08.18.2005
08.18.2005	08.18.2005

**WARRANTY**

DEPT	PDM NO	DWG NO
MOS/6TEAM		

**SCALE** 5 / 1

**WT** Kg

**SHEET 2 OF 1**

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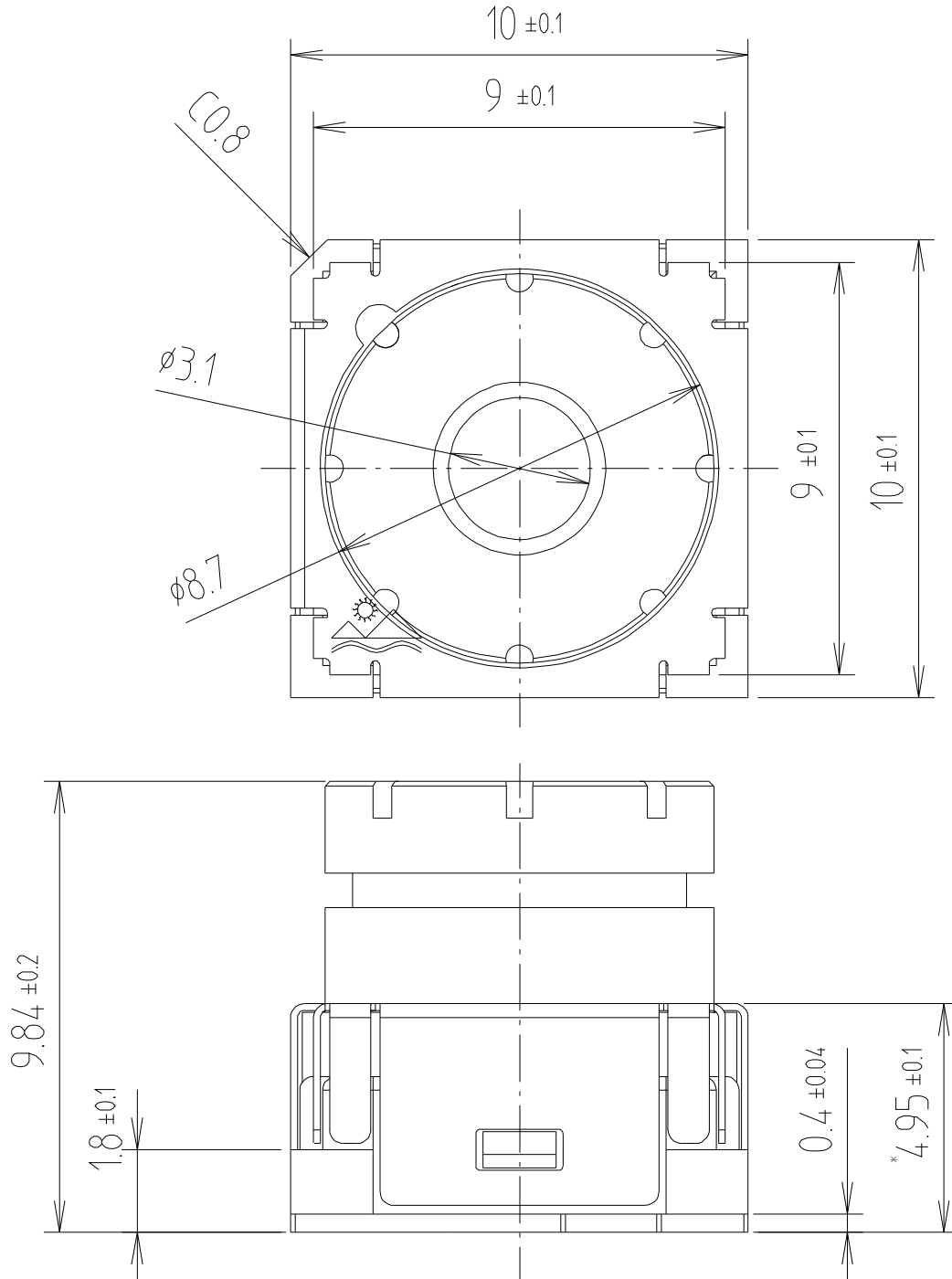


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**4-1. Dimension tolerance**



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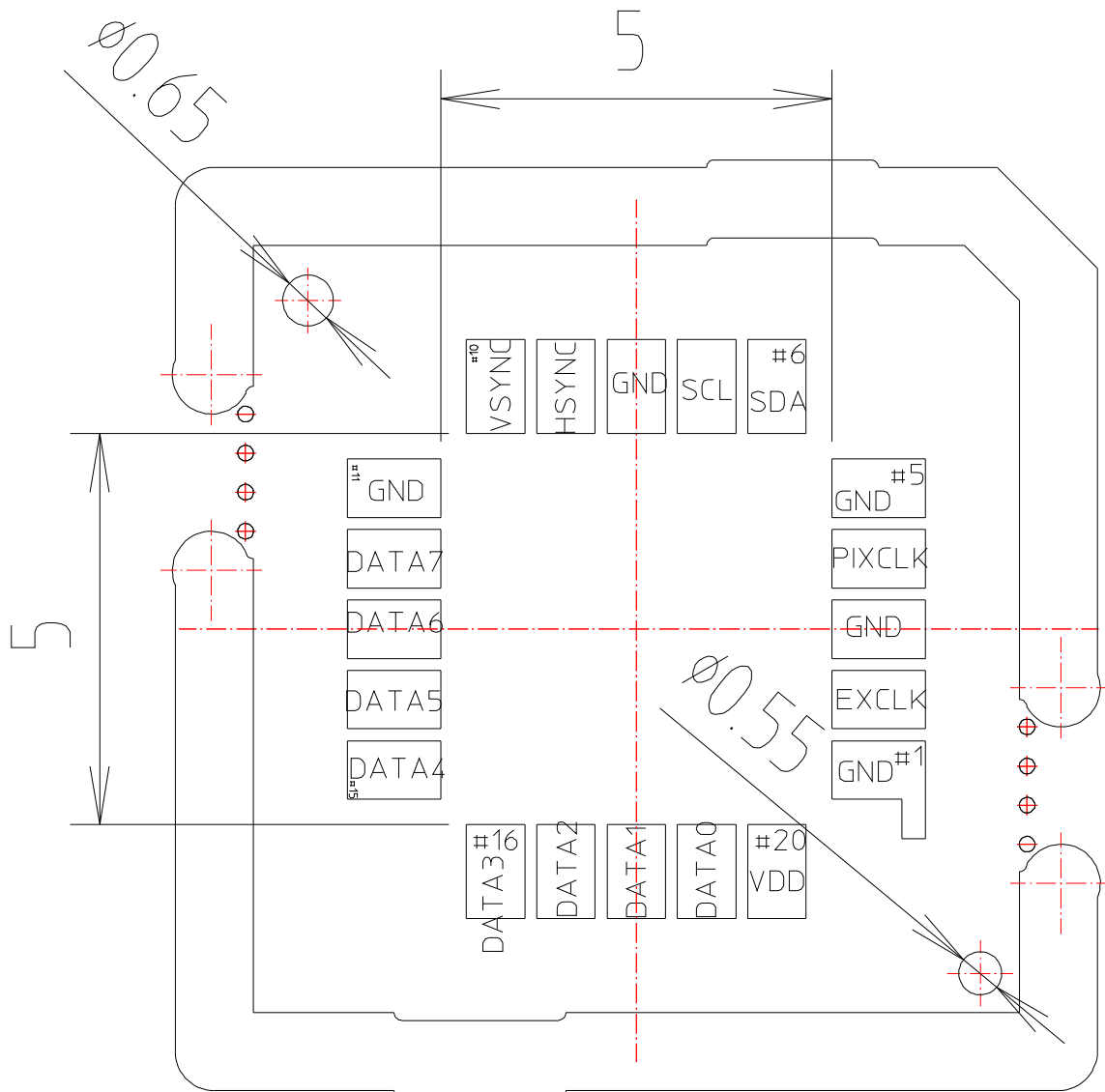
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## 4-2. PCB dimension and pad location

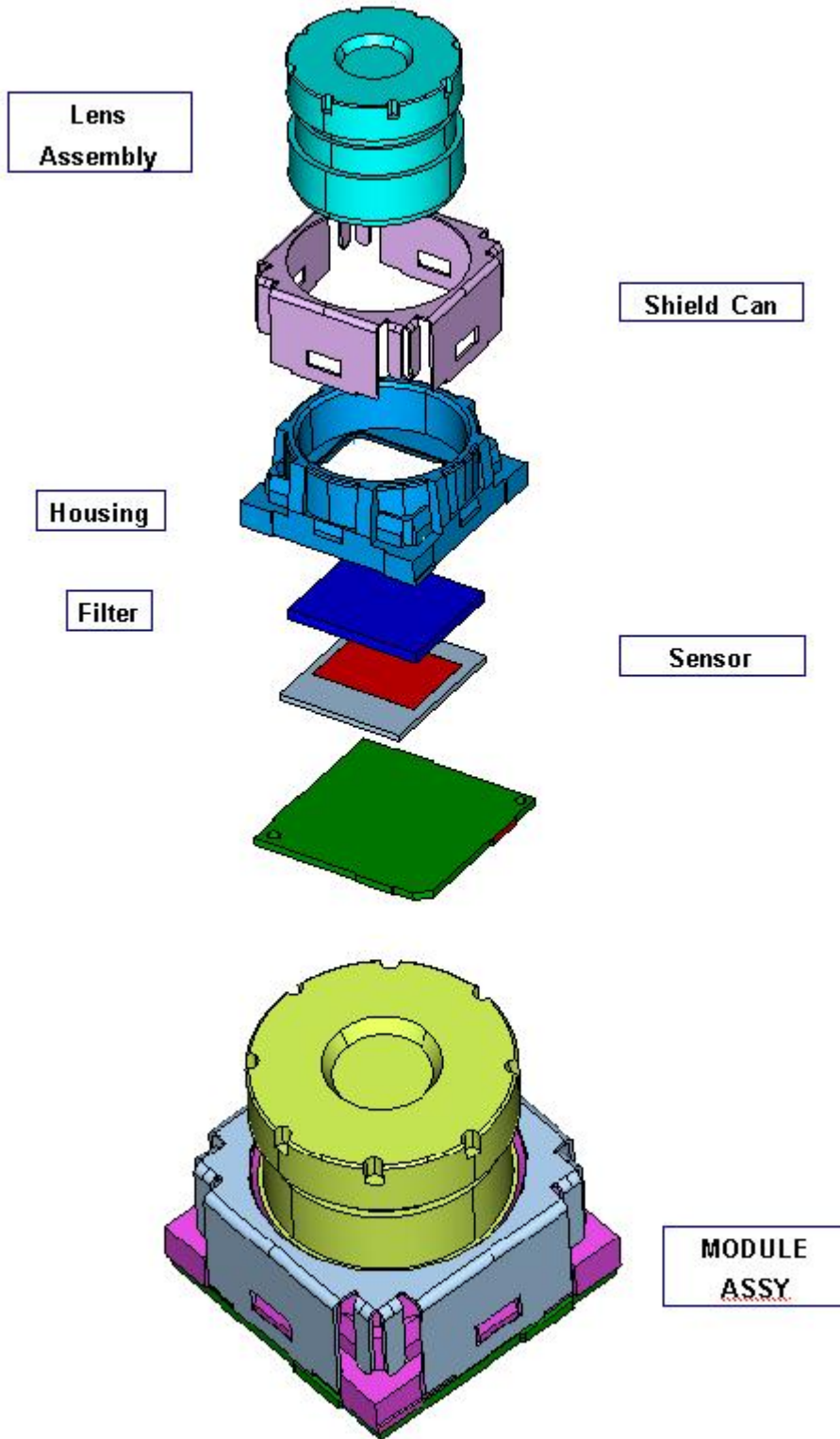
Type	socket type
Number of pad	20 pad



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### 5. Structure



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### 6. Part Specification

#### 6-1. Bill of Material

Item	Quantity	Reference	Maker	Specification
Image Sensor	1	U	Biomorphic	1/2.7" 2.0M CMOS
PCB	1	Shape	SEMCO	4-Layer, 0.4T
Housing Ass'y	1	Shape	Domestic	Nylon66 Black, D-263
Lens	1	Shape	Domestic	2P2G Lens
Housing Adhesive	0.02g	Housing Part	Ablestik	Thermal Cure
Lens Adhesive	0.002g	Lens Part	Loctite	UV Cure
Chip Ceramic	3	C	SEMCO	1.0uF, 1005 size, 2ea
Chip Resistor	1	R	SEMCO	2Ω, 1005 size, 1ea
Shield Can	1	Structure	Domestic	C7701H, T0.15

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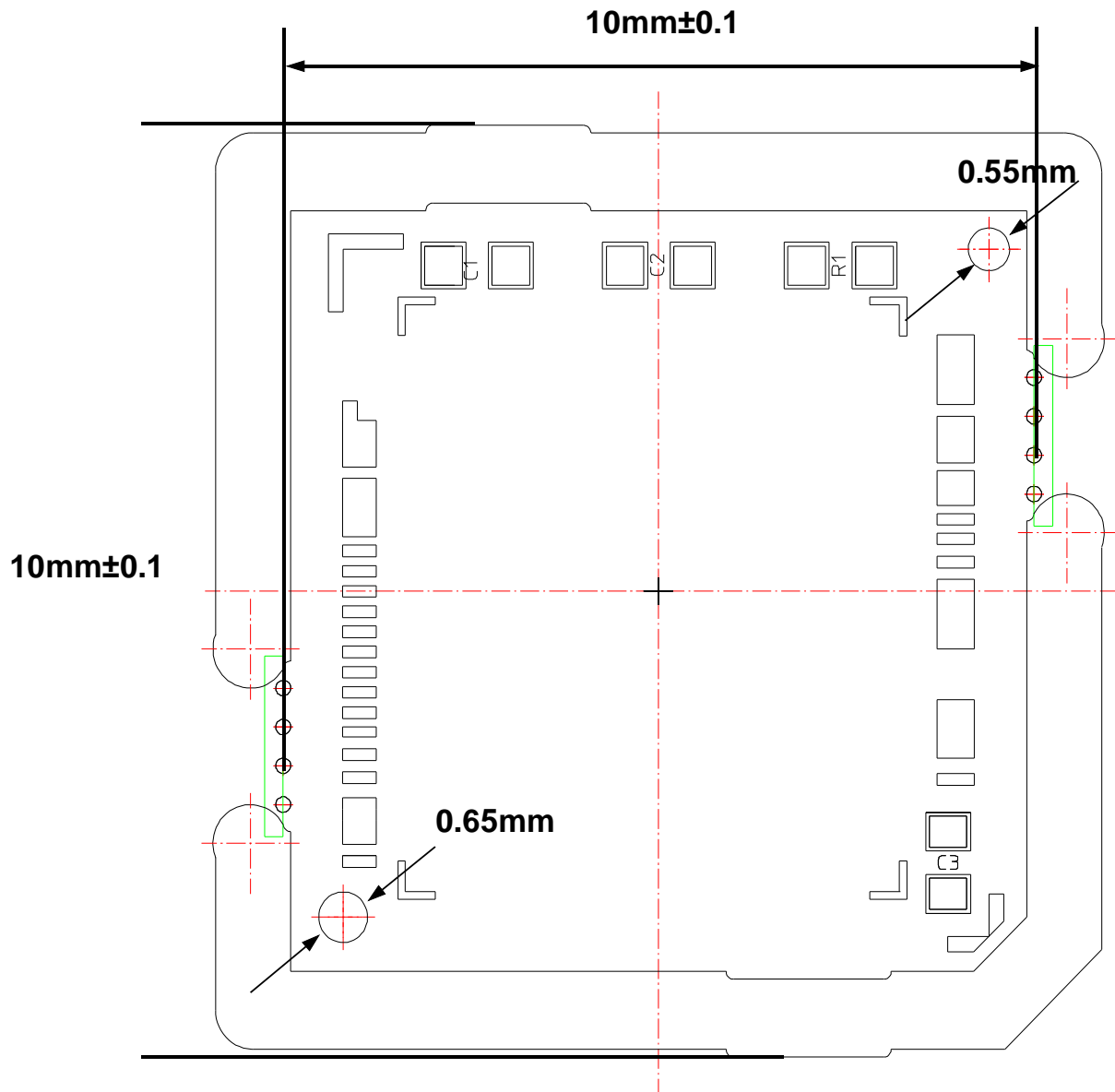
**6-2. PCB Specification**

Item	Feature	Unit	Specification
Design	Layer	-	4L
	Strip Size	mm	120 x 70
	Total Thick	mm	0.4 +/- 0.05
Material	CCL	-	HL- 832 0.15mm(12um Copper Foil)
	Prepreg	-	GHPL- 830 60um Typ.
	Solder Mask	-	AUS 308 by Taiyo
Cross Section Thickness	Solder Mask Thickness	um	10~35um
	M1 & M4 Copper Thickness	um	Ref 27um
	M2 & M3 Copper Thickness	um	12 +/- 6um
Via & Via Wall Cu Thickness	PTH (L1~L4)	-	0.25mm (Via Wall Cu: Min 15um )
Pattern	Trace Width Spec	um	Ref 127
	Bond Pad Width Spec	um	Min 130
Surface Treatment	Au Plating Thick	um	Min 0.5
	Ni Plating Thick	um	Min 5
Others	X- out	개	20% per Strip
	X- out 방법	-	Top : UV white ink Bottom: Scratch

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6-3. PCB Outline



MODEL

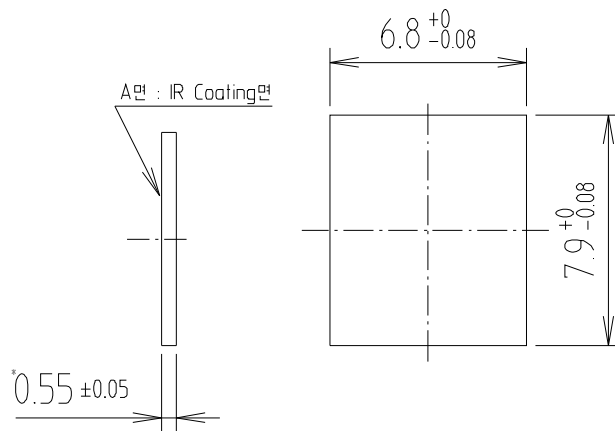
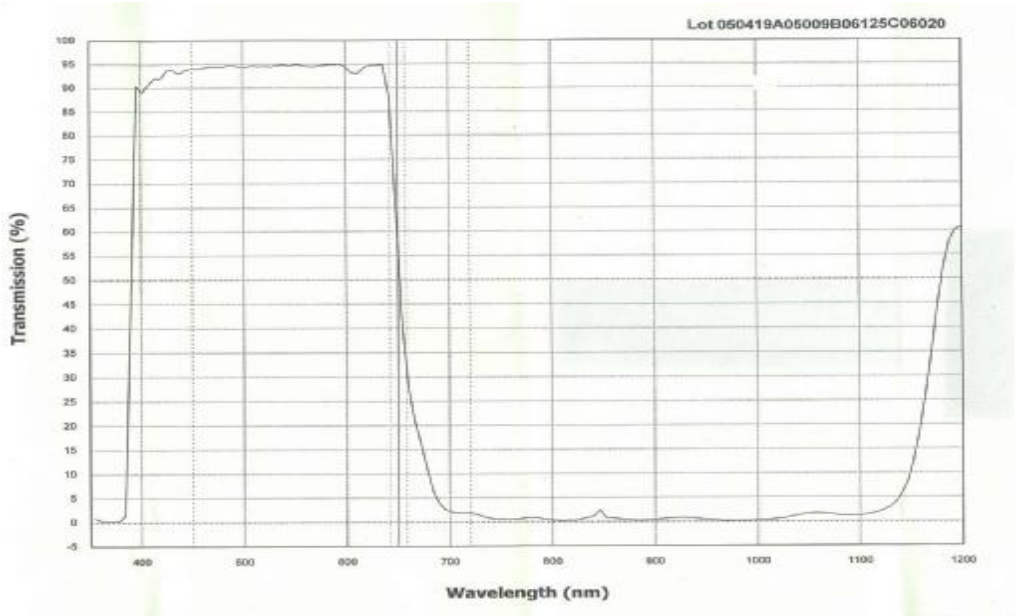
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## 6-4. IR-filter Spec.

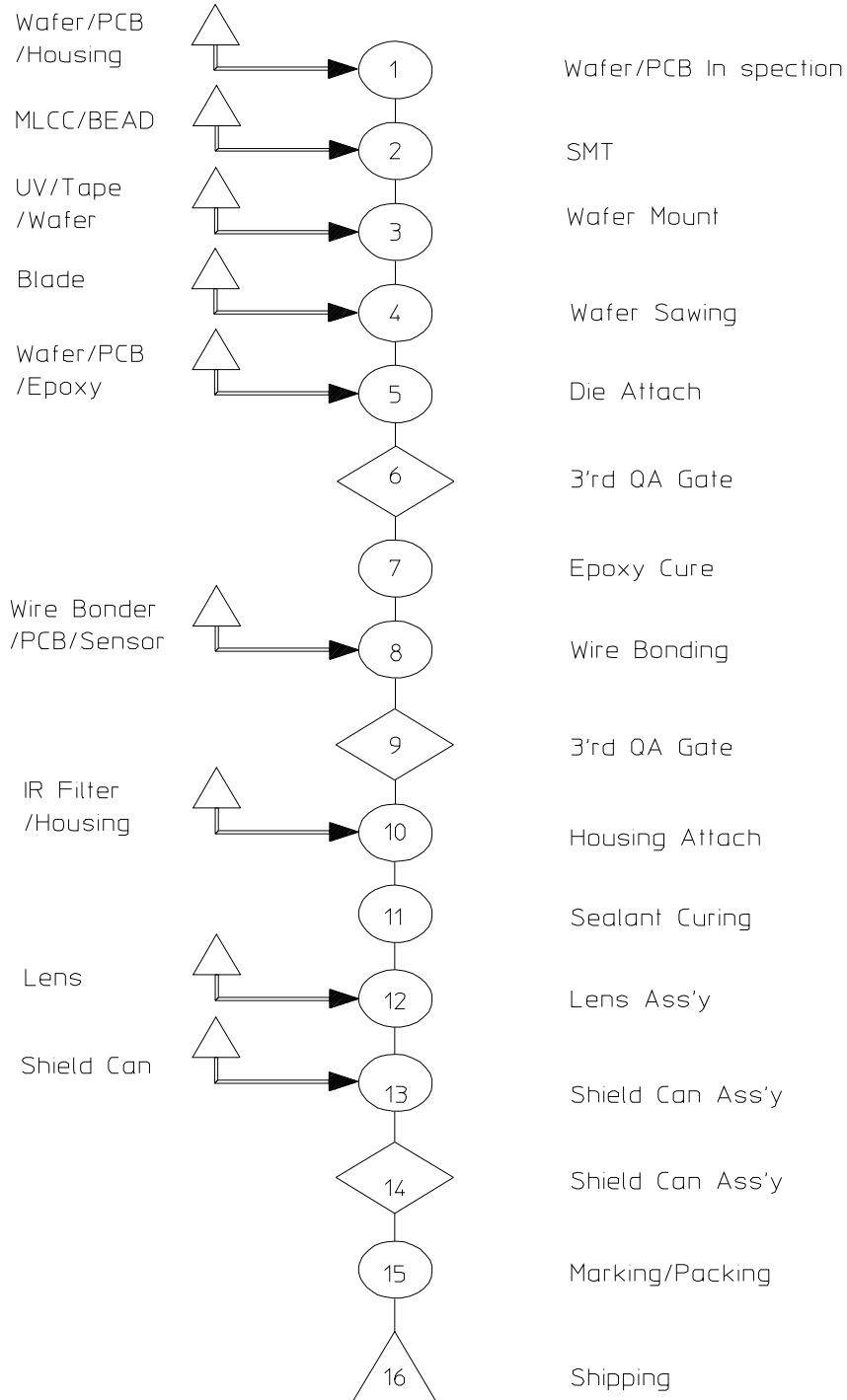


Element	Specification
Material	D-263 GLASS
Detachment	over 5kg
Transmittance	T(Average) > 90% @ 460 - 610nm
	T = 50% @ 650 ± 8nm
	T (Average) < 10% @ 710 - 1000 nm

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## 7. Manufacturing Process



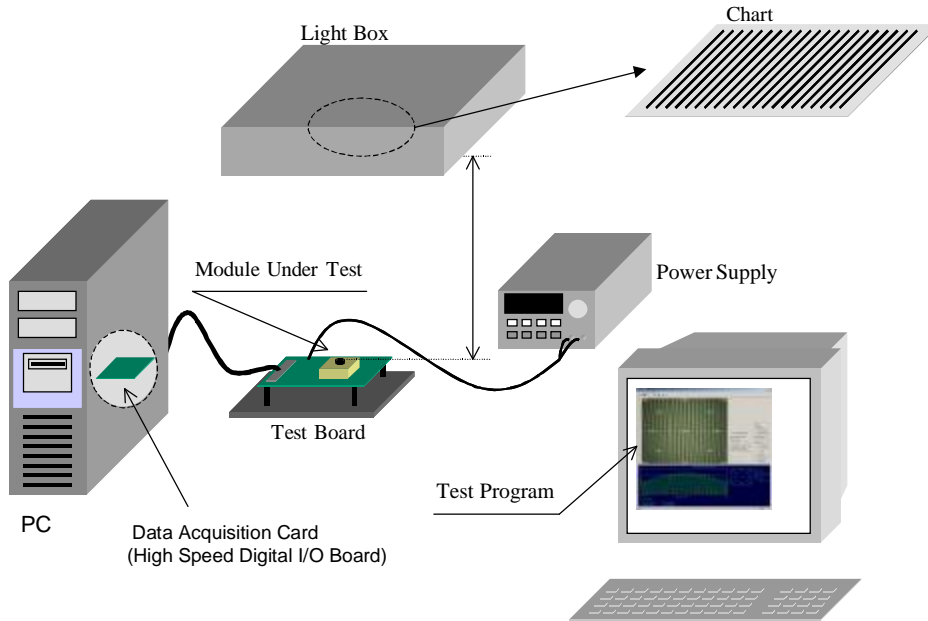
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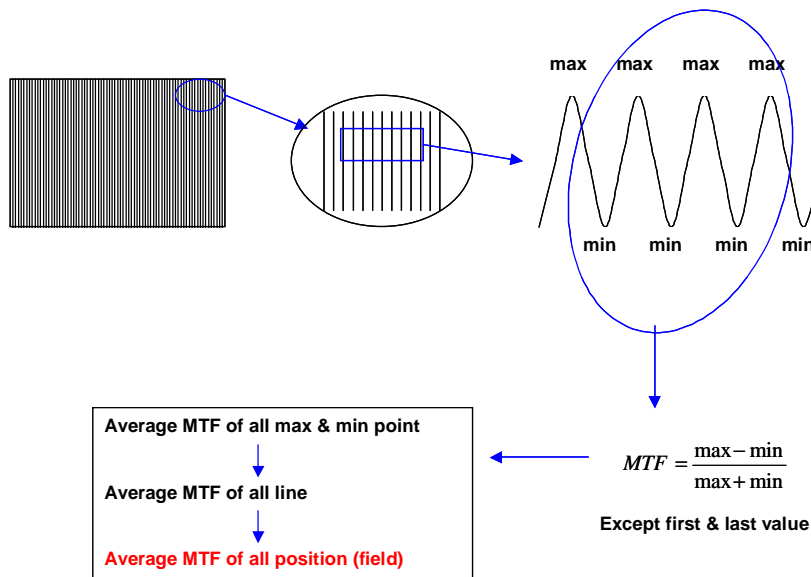


## 8. Camera Module Test

### 8-1 Test System



### 8-2 MTF(Modulation Transfer Function) Measurement



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### 8.3 Image Inspection

1) Black Cluster(Spot)

- Cluster means that there is any other aggregation of dark bad pixels (lower under 15% from neighboring pixel's mean level)
- Cluster with neighboring dark bad pixels more than 3 pixels is not allowed on the whole image area. (1600x1200)

2) Blotch

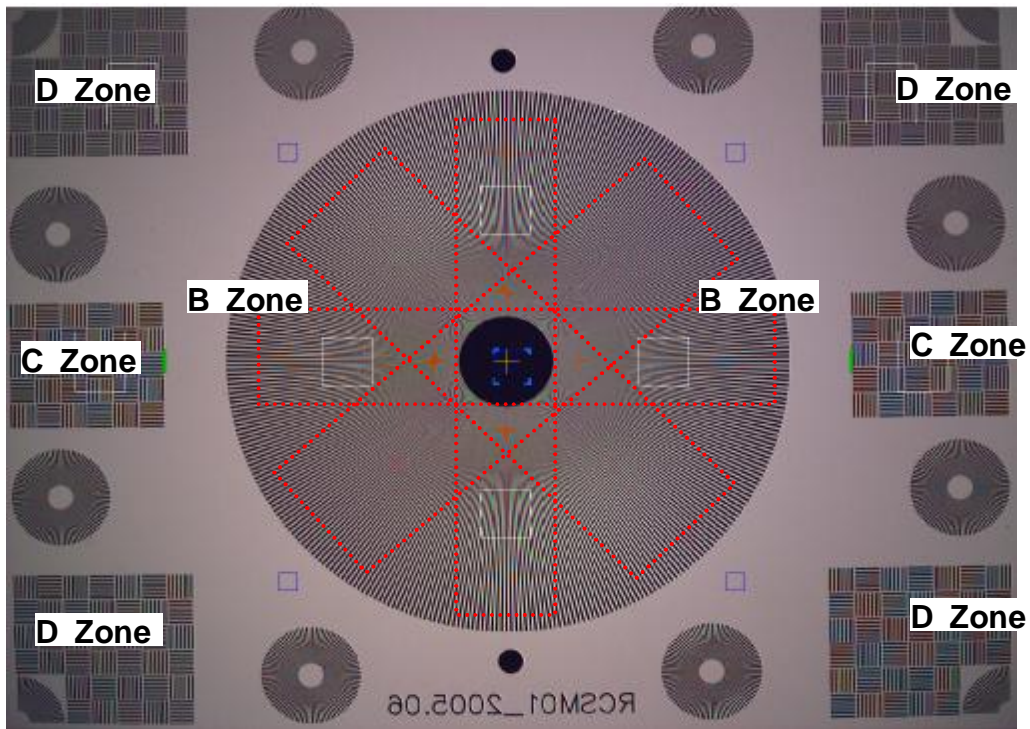
- Blotch caused by dust or other contamination at IR filter and lens is not allowed on the whole image area. (1600x1200)

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## 9. Focusing Method

### 9-1 FOCUSING

- a. Focusing Distance : Infinity
  - ※ focusing distance : from the camera module's upper to the mega star chart
- b. Focusing
  - Use relay lens jig(collimating system for infinite focusing)
  - Focusing Spec of each zone
    - B-Zone : 0.87
    - C-Zone : 0.35
    - D-Zone : 0.28
    - Delta D: 0.24
    - Field C-Zone : 0.65
    - Field D-zone : 0.75
  - The optimum condition of good quality
    - Both x-moire and cross-moire should be in optimum condition.
  - Standards - optimum Moire to the lowest limit moire  
(by adjusting the relay lens holder)



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### 10. Reliability

#### 10-1. Module Reliability Test

NO.	Item	Specifications
6-2-2	Dry Heat Test	70±2℃, 16hr phone off
6-2-3	Temperature Shock Test	85±2℃ 1hr ↔ -40±2℃ 1hr, 100cycle
6-2-4	Damp Heat cycle Test	55±2℃,12hr ↔ 25±2℃ 12hr Humidity 93±3% 6cycle
6-2-5	Constant Cold Test	-40±2℃, 16hr power off
6-2-4	Damp Heat cycle(repetition)	55±2℃,12hr ↔25±2 12hr,Humidity 93±3% 6cycle
6-3-1	Vibration Test	X,Y,Z axis (each direction) 10Hz~ 500Hz(45min), 500Hz~1800Hz(45min) 0.053 G <sup>2</sup> /8G.S RMS (non packing)
6-3-3	Drop Test	152cm (18times) Free fall on the steel plate (with bare module)
	ESD Test	150 pF, 330 Ω, Air Discharge ±12 Kv, 15times (Ground Connection) ±12 Kv, 15times (Non Ground Connection) Total 60 times
6-2-8	Aging by Temperature	85℃, 1000Hr
6-2-9	Aging by Damp Heat Constant	40±3℃, 93±2%, 42days

- After Operating & Storage Test, performance should be checked in 24 hours.
- Standards of performance : Shape, Operating State, Image Quality

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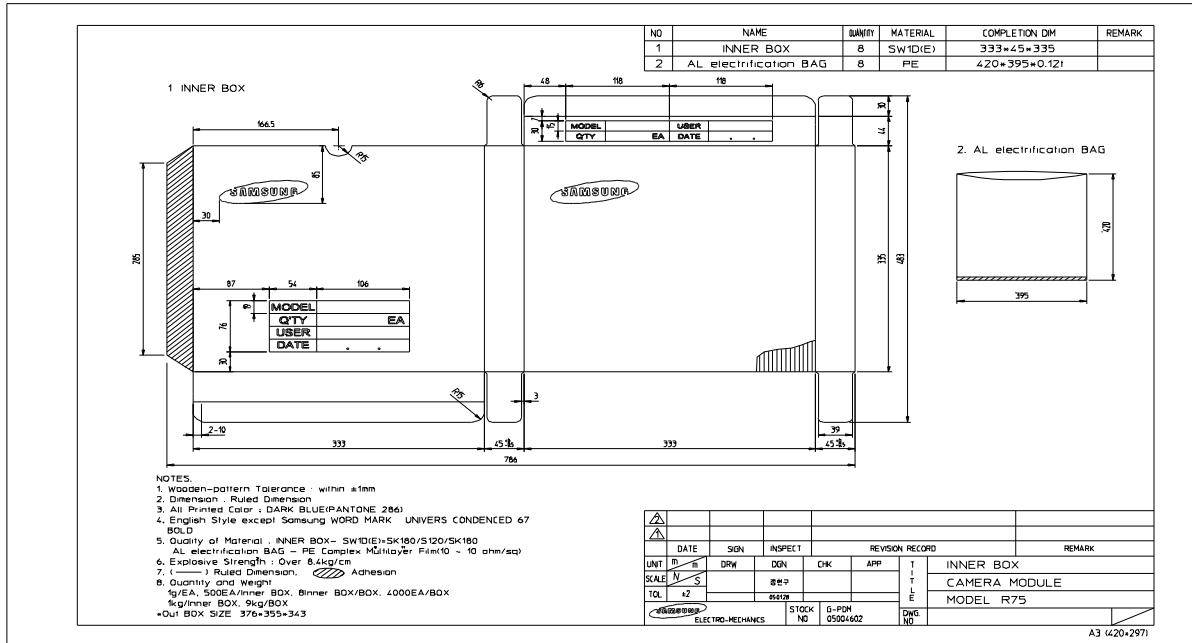


# Specifications

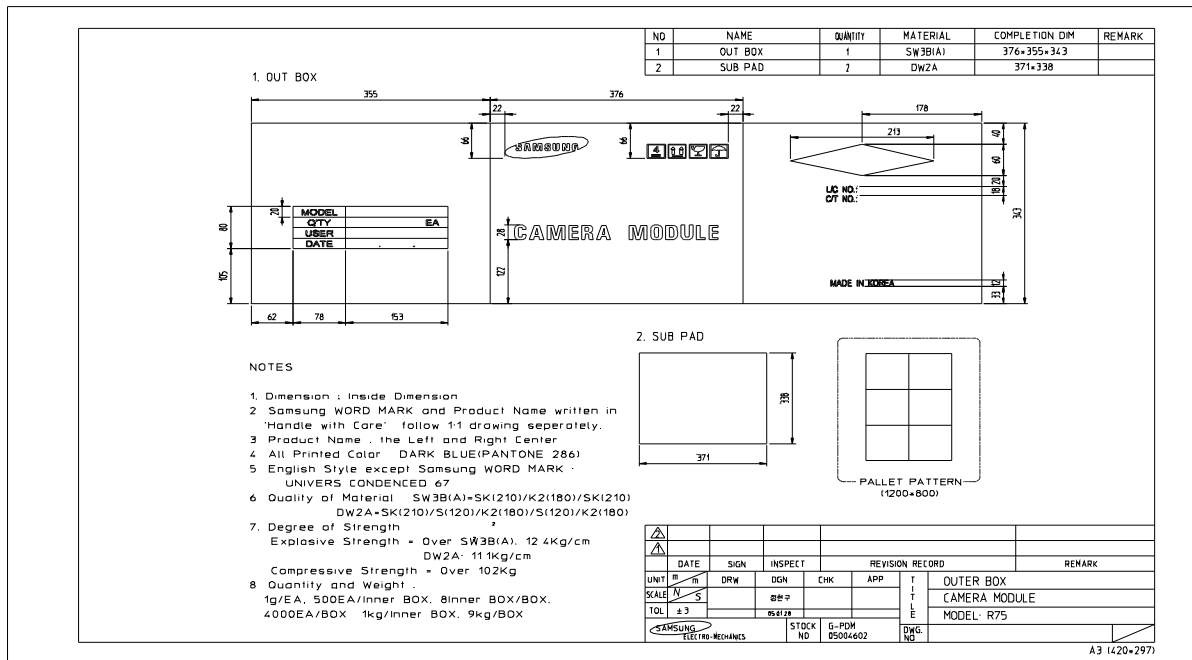
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## 11-2 The Packing Specification of Inner Box/Out Box - Inner Box (AL electrification BAG)



## - Out BOX (SUB PAD)



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## - Sleeve BOX

NO	NAME	QUANTITY	MATERIAL	COMPLETION DIM	REMARK
1	Sleeve BOX	1	DW4A	1165*765*730	
2	Sleeve Cover	7	DW3A	1188*788*93	

**1 Sleeve BOX**

**2 Sleeve Cover**

**NOTES**

1. Dimension inside Dimension
2. Samsung WORD MARK and Product Name written in Handle with Care follow 1: 1 drawing separately.
3. Product Name : the Left and Right Center
4. All Printed Color : DARK BLUE(PANTONE 286)
5. English Style except Samsung WORD MARK UNIVERS CON-DENCED 67 BOLD
6. Quality of Material : DW4A = KL1300/K2180/KL300/K2180/KL300  
DW3A = SK1210/K2180/SK210/K2180/SK1210
7. Explosive Strength Over DW4A = 34.2kg/cm<sup>2</sup> DW3A = 18.5kg/cm<sup>2</sup>

DATE	SIGN	INSPECT	REVISION RECORD	REMARK		
UNIT	DRW	DGN	CHK	APP	T	Sleeve Box, Sleeve Cover
SCALE	N	S	REV		E	CAMERA MODULE
TOL	#5					MODEL: R75

A3 1420-2971

## - Loading

NO	NAME	QUANTITY	MATERIAL	COMPLETION DIM	REMARK

**REEL**

**AI electrification BAG**

**INNER BOX**

**SUB PAD**

**OUT BOX**

**Sleeve Cover**

**Sleeve Box**

**CAMERA MODULE**

**Sleeve Cover**

**PALLET**

DATE	SIGN	INSPECT	REVISION RECORD	REMARK		
UNIT	DRW	DGN	CHK	APP	T	Drawing for Loading
SCALE	N	S	REV		E	CAMERA MODULE
TOL	#5					MODEL: R75

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**MODEL**

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