



Advanced Display Solutions Specialist

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(v) Preliminary Specifications
(i) Final Specifications

Module	10.1 Inch Color TFT-LCD
Model Name	AG101YA-010N-CTG-V1

Customer Date Checked & Approved by	Approved by Date <u>Grace Hung</u> Prepared by <u>Ken Wang</u>

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0.1 2017/06/15	All	First draft specification	-

1. Operating Precautions

- 1) Since front polarizer is easily damaged, please be cautious and not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or soft cloth.
- 5) Since the panel is made of glass, it may be broken or cracked if dropped or bumped on hard surface.
- 6) To avoid ESD (Electro Static Discharge) damage, be sure to ground yourself before handling TFT-LCD Module.
- 7) Do not open nor modify the module assembly.
- 8) Do not press the reflector sheet at the back of the module to any direction.
- 9) In case if a module has to be put back into the packing container slot after it was taken out from the container, do not press the center of the LED light bar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
- 10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) TFT-LCD Module is not allowed to be twisted & bent even force is added on module in a very short time. Please design your display product well to avoid external force applying to module by end-user directly.
- 12) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
- 13) Severe temperature condition may result in different luminance, response time and lamp ignition voltage.
- 14) Continuous operating TFT-LCD display under low temperature environment may accelerate lamp exhaustion and reduce luminance dramatically.
- 15) The data on this specification sheet is applicable when LCD module is placed in landscape position.
- 16) Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.
- 17) In order not to damage the touch panel, please remove the protected film as slow as possible in an environment with a humidity range from 60% to 80%

2. General Description

AG101YA-010N-CTG-V1 is a Color Active Matrix Liquid Crystal Display composed of a TFT LCD panel and LED backlight system. The screen format is intended to support the 16:10 WXGA, 1280(H) x800(V) screen and 16.2M colors with LED backlight driving circuit. All input signals are LVDS interface compatible.

2.1 Display Characteristics

The following items are characteristics summary under 25 °C condition:

Items	Unit	Specifications
Screen Diagonal	[inch]	10.1"
Active Area	[mm]	216.96(H) x 135.6(V)
Pixels H x V		1280 x 800
Pixel Pitch	[mm]	0.1695 X 0.1695
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		MVA, Normally Black
Nominal Input Voltage VDD	[Volt]	3.3 (Typical)
Power Consumption (Max)	[Watt]	Logic: 0.89W Backlight: 7.4W (For reference)
Weight (Max.)	[Grams]	350g
Physical Size (Max.)	[mm]	227.69 x 148.31 x 7.75 (PCBA side)
Electrical Interface		LVDS
Surface Treatment		Glare
Support Color		262K (6bits)/16.2M (8bits) colors
Temperature Range Operating Storage (Non-Operating)	[°C] [°C]	-20 to +60 -30 to +70
RoHS Compliance		RoHS Compliance

2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25 °C (Room Temperature):

Item	Unit	Conditions	Min.	Typ.	Max.	Note
White Luminance	[cd/m2]	I _{LED} = 70mA (5p average)	800	1000	---	
Uniformity	%	5 points	70%		---	
Contrast Ratio			1000	1300	---	
Response Time	[msec]	Rising + Falling	---	25	35	
Viewing Angle	[degree]	Horizontal (Right)	80	85	---	
	[degree]	CR = 10 (Left)	80	85	---	
	[degree]	Vertical (Upper)	80	85	---	
	[degree]	CR = 10 (Lower)	80	85	---	
Color / Chromaticity Coordinates (CIE 1931)		Red x	0.513	0.563	0.613	
		Red y	0.278	0.328	0.378	
		Green x	0.281	0.331	0.381	
		Green y	0.527	0.577	0.627	
		Blue x	0.109	0.159	0.209	
		Blue y	0.083	0.133	0.183	
		White x	0.263	0.313	0.363	
		White y	0.279	0.329	0.379	
Color Gamut	%		---	45	---	

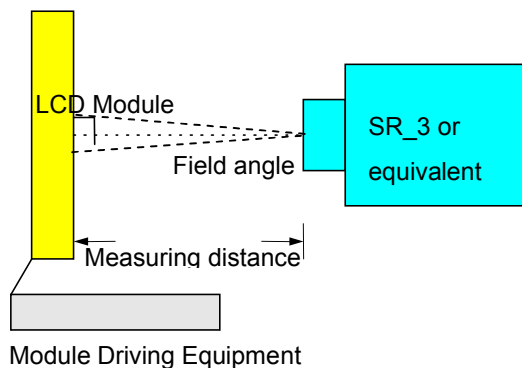
Note 1: Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR_3 or equivalent)

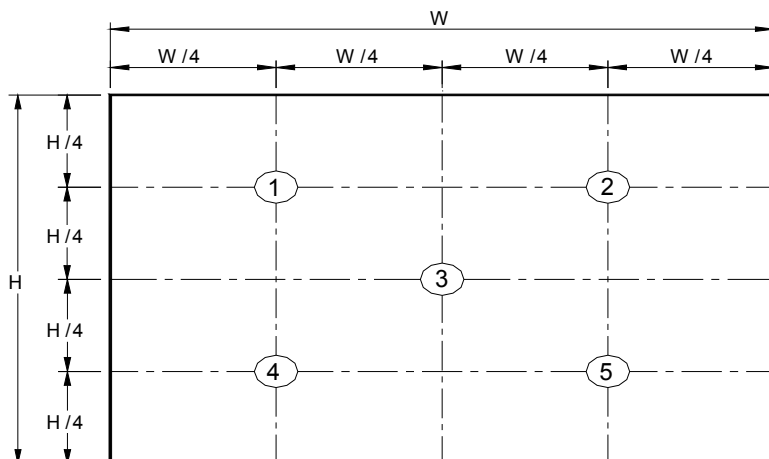
Aperture Field angle 2° with 50cm measuring distance

Test Point Follow Note 2 position

Environment < 1 lux



Note 2: Definition of 5 points position



Note 3: The luminance uniformity of 5 points is defined by dividing the minimum luminance values by the maximum test point luminance

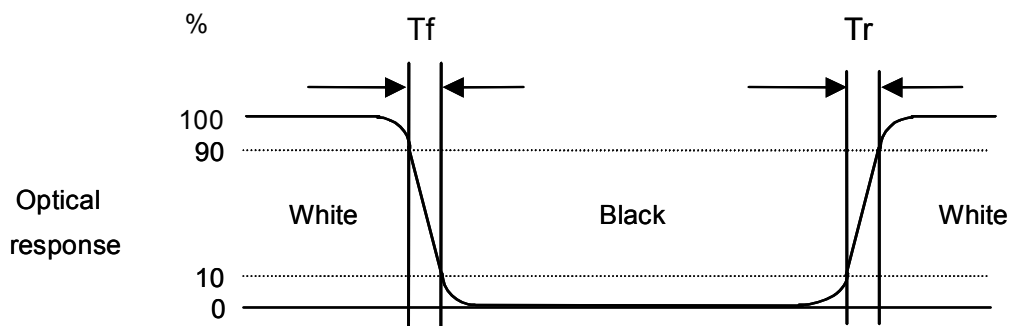
$$\delta_{w5} = \frac{\text{Minimum Brightness of five points}}{\text{Maximum Brightness of five points}}$$

Note 4: Definition of contrast ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

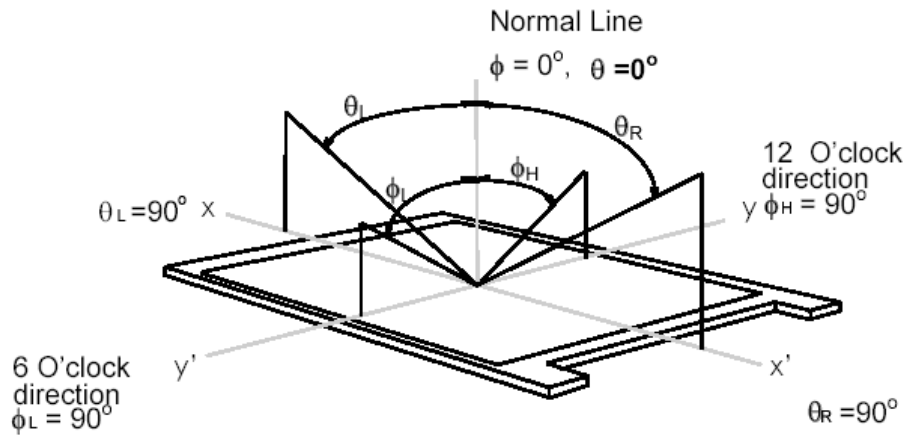
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "White" to "Black" (falling time) and from "Black" to "White" (rising time), respectively. The response time interval is between 10% and 90% of amplitudes. Please refer to the figure as below.



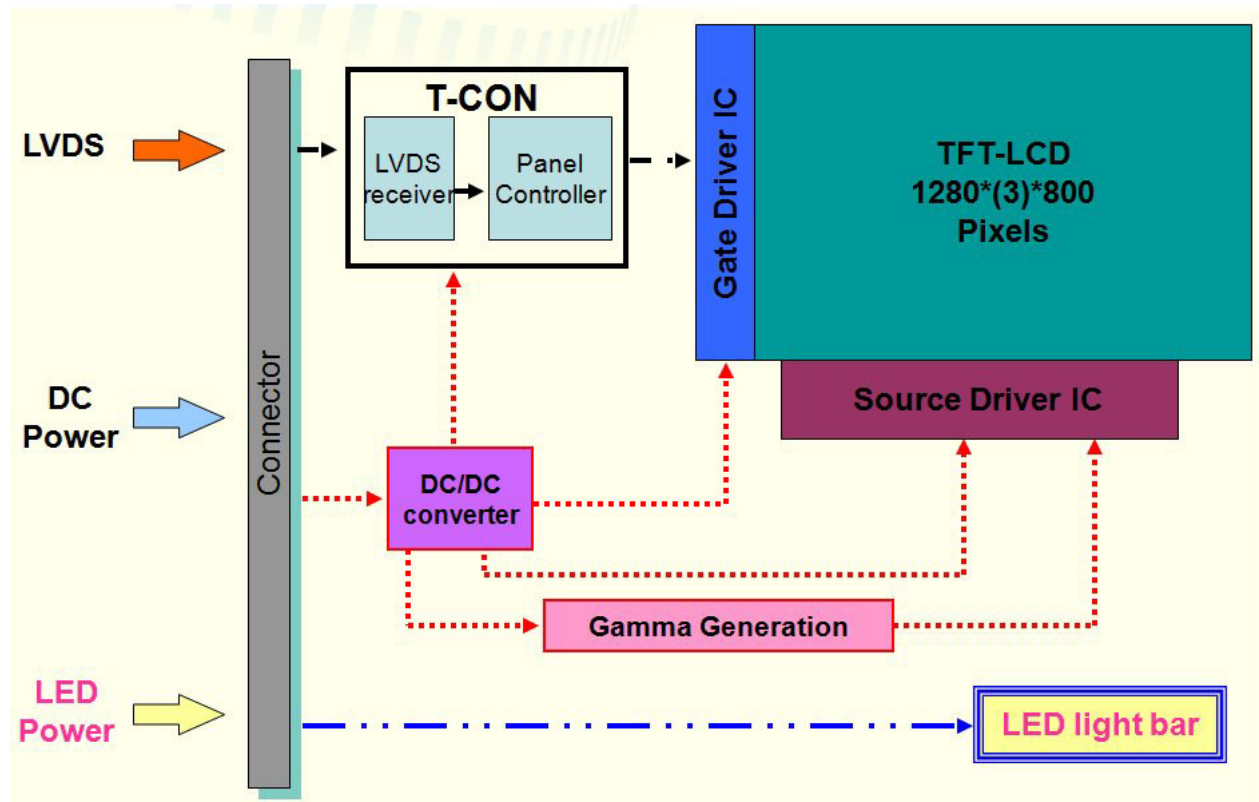
Note 6: Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as below: 90° (θ) horizontal left and right, and 90° (ϕ) vertical high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated to its center to develop the desired measurement viewing angle.



3. Functional Block Diagram

The following diagram shows the functional block of the 10.1 inch color TFT/LCD module:



4. Absolute Maximum Ratings

4.1 Absolute Ratings of TFT LCD Module

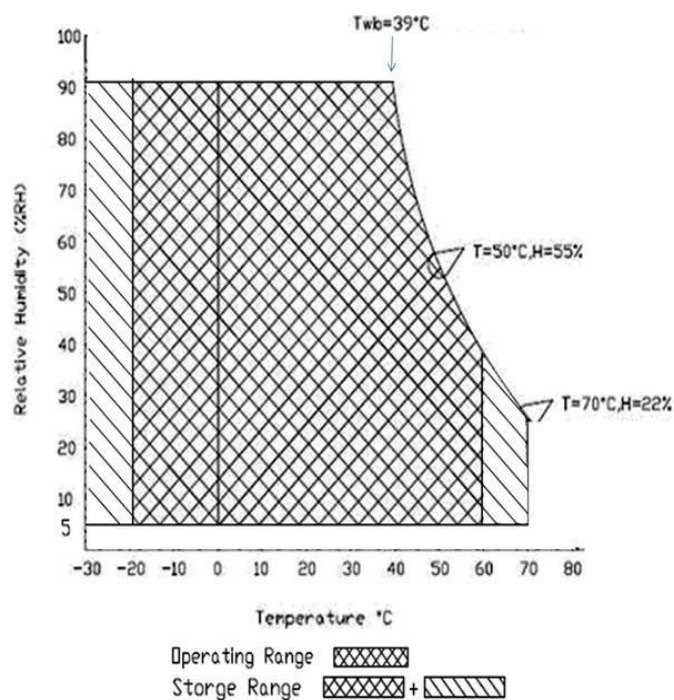
Item	Symbol	Min	Max	Unit
Logic/LCD drive Voltage	VDD	-0.3	+4.0	[Volt]
LCD Input Signal Voltage	V _{SIGNAL}	-0.3	VDD+0.3	[Volt]

4.2 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit
Operating Temperature	TOP	-20	+60	[°C]
Humidity	HOP	5	90	[%RH]
Storage Temperature	TST	-30	+70	[°C]

Note 1: Permanent damage to the device may occur if exceed maximum values

Note 2: Maximum wet-bulb temperature is less than 39°C and no condensation



5. Electrical Characteristics

5.1 TFT LCD Module

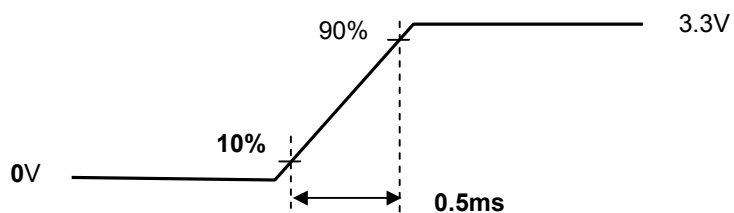
5.1.1 Power Specification

The power specification are measured under 25°C and frame frequency under 60Hz

Symbol	Parameter	Min	Typ	Max	Units	Remark
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	
IDD	VDD Current	-	192	270	[mA]	All Black Pattern (VDD=3.3V, at 60Hz)
Irush	LCD Inrush Current	-	-	1500	[mA]	Note 1
PDD	VDD Power	-	0.63	0.89	[Watt]	All Black Pattern (VDD=3.3V, at 60Hz)
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	[mV] p-p	All Black Pattern (VDD=3.3V, at 60Hz)

Note 1 : Maximum Measurement Condition : White Pattern at 3.3V driving voltage. ($P_{max} = V_{3.3} \times I_{white}$)

Note 2 : Measure Condition



VDD rising time

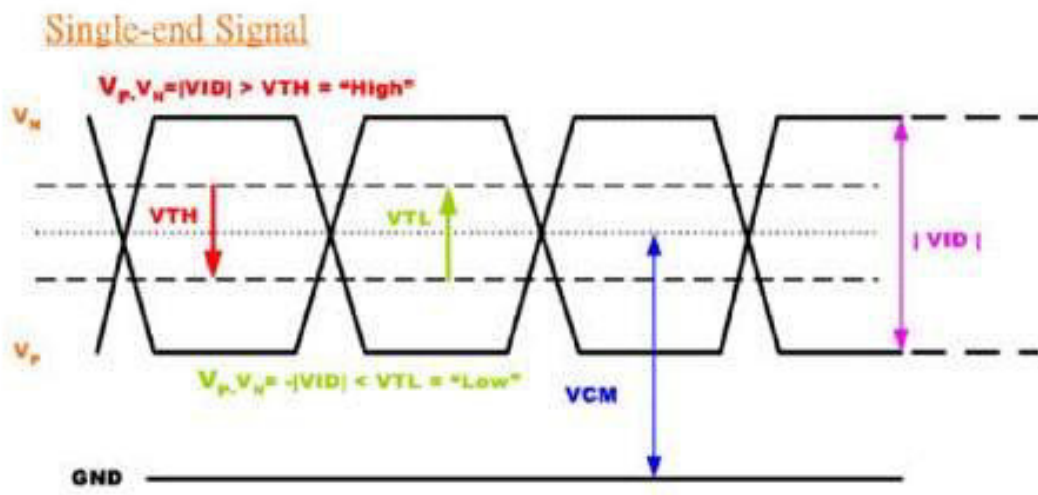
5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off.

Signal electrical characteristics are as follows;

Symbol	Item	Min.	Typ.	Max.	Unit	Remark
VTH	Differential Input High Threshold	---		100	[mV]	VCM=1.2V
VTL	Differential Input Low Threshold	-100		----	[mV]	VCM=1.2V
VID	Input Differential Voltage	100		600	[mV]	
VICM	Differential Input Common Mode Voltage	0.7		1.6	[V]	VTH/VTl=+-100mV

Note: LVDS Signal Waveform.



5.2 Backlight Unit

5.2.1 Parameter guideline for LED

Following characteristics are measured under a stable condition using an inverter at 25°C (Room Temperature):

Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
V_{LED}	Input Voltage	25.2	28.8	32.4	[Volt]	Note 2
I_F	LED Forward Current	---	70	---	[mA]	Ta = 25°C
Operation Life	---	50,000	---	---	Hrs	$I_F=70mA$ (Ta=25°C)

Note 1: Ta means ambient temperature of TFT-LCD module.

Note 2: V_{LED} typical value is defined for LED backlight (100% PWM dimming)

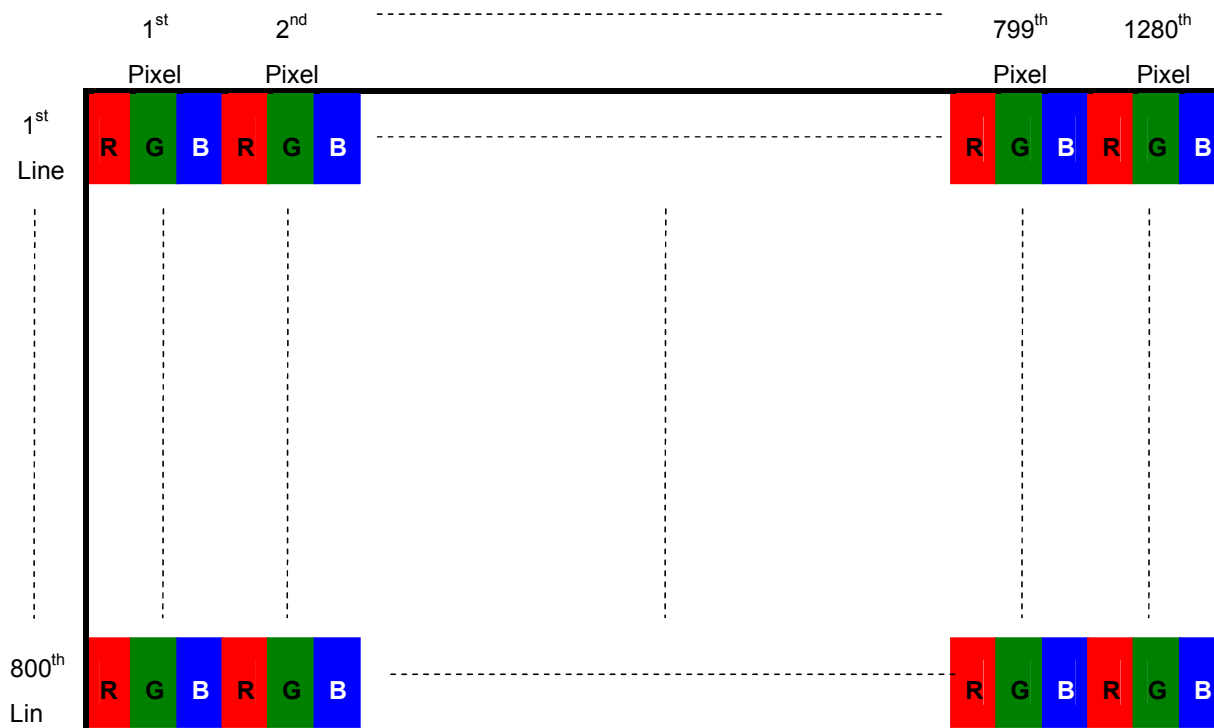
Note 3: If AG101YA-010N-CTG-V1 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 4: Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

6. Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship between input signal and LCD pixel format.



The module uses a LVDS receiver embedded in AGDs ASIC. LVDS is a differential signal technology for LCD interface and a high-speed data transfer device.

6.2 Signal Description

6.2.1 LVDS Connector Description

Physical interface is described as for the connector on module.

These connectors are capable of accommodating the following signals and will be following components.

Connector Name / Designation	For Signal Connector
Manufacturer	JAE or compatible
Type	HD1S040HA1 or compatible

6.2.2 LVDS Pin Assignment

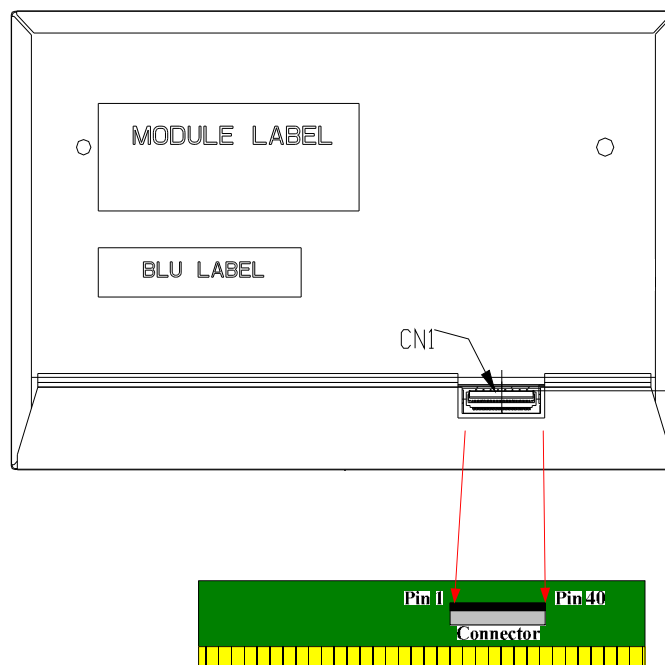
LVDS is a differential signal technology for LCD interface and high speed data transfer device.

Pin No	Symbol	Function
1	NC	No Connection (Reserved)
2	VDD	Power Supply +3.3V
3	VDD	Power Supply +3.3V
4	VDD	Power Supply +3.3V
5	NC	No Connection (Reserved)
6	NC	No Connection (Reserved)
7	NC	No Connection (Reserved)
8	Rin0-	-LVDS differential data input(R0-R5,G0)
9	Rin0+	+LVDS differential data input(R0-R5,G0)
10	GND	Ground
11	Rin1-	-LVDS differential data input(G1-G5,B0-B1)
12	Rin1+	+LVDS differential data input(G1-G5,B0-B1)
13	GND	Ground
14	Rin2-	-LVDS differential data input(B2-B5,DE)
15	Rin2+	+LVDS differential data input(B2-B5,DE)
16	GND	Ground
17	ClkIN-	-LVDS differential clock input
18	ClkIN+	+LVDS differential clock input
19	GND	Ground-Shield
20	Rin3-	-LVDS differential data input(R6-R7,G6-G7,B6-B7)
21	Rin3+	+LVDS differential data input(R6-R7,G6-G7,B6-B7)
22	GND	Ground-Shield
23	SEL68	Selection for either 6bit or 8bit LVDS input: SEL68 = " High" or "NC", accepts 6bit LVDS data input; SEL68 = " Low", accepts 8bit LVDS data input.

24	NC	No Connection (Reserved)
25	VOUT	Positive voltage to connection LED BLU
26	VOUT	Positive voltage to connection LED BLU
27	VOUT	Positive voltage to connection LED BLU
28	NC	No Connection (Reserved)
29	LB3	Constant current feedback signal 3
30	LB3	Constant current feedback signal 3
31	LB3	Constant current feedback signal 3
32	LB2	Constant current feedback signal 2
33	LB2	Constant current feedback signal 2
34	LB2	Constant current feedback signal 2
35	LB1	Constant current feedback signal 1
36	LB1	Constant current feedback signal 1
37	LB1	Constant current feedback signal 1
38	NC	No Connection (Reserved)
39	GND	Ground
40	GND	Ground

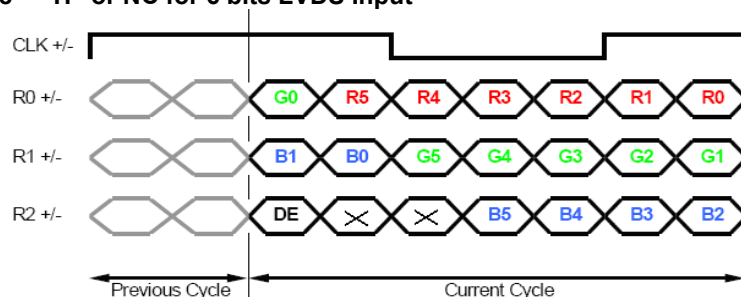
Note 1: Input signals shall be low or High-impedance state when VDD is off.

Note 2: High stands for "3.3V", Low stands for "0V", NC means "No Connection".

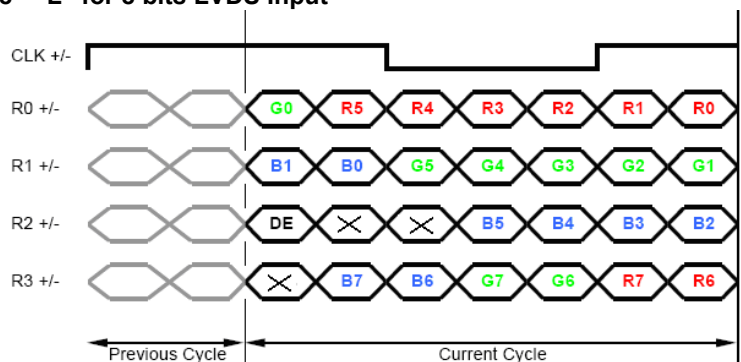


6.3 The Input Data Format

SEL68 = "H" or NC for 6 bits LVDS Input



SEL68 ="L" for 8 bits LVDS Input



Signal Name	Description	
R7 R6 R5 R4 R3 R2 R1 R0	Red Data 7 (MSB) Red Data 6 Red Data 5 Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0 (LSB)	Red-pixel Data For 8Bits LVDS input MSB: R7 ; LSB: R0 For 6Bits LVDS input MSB: R5 ; LSB: R0
G7 G6 G5 G4 G3 G2 G1 G0	Green Data 7 (MSB) Green Data 6 Green Data 5 Green Data 4 Green Data 3 Green Data 2 Green Data 1 Green Data 0 (LSB)	Green-pixel Data For 8Bits LVDS input MSB: R7 ; LSB: R0 For 6Bits LVDS input MSB: R5 ; LSB: R0
B7 B6 B5 B4 B3 B2 B1 B0	Blue Data 7 (MSB) Blue Data 6 Blue Data 5 Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0 (LSB)	Blue-pixel Data For 8Bits LVDS input MSB: R7 ; LSB: R0 For 6Bits LVDS input MSB: R5 ; LSB: R0
RxCLKIN	Data Clock	The signal is used to strobe the pixel data and DE signals. All pixel data shall be valid at the falling edge when the DE signal is high.
DE	Display Timing	This signal is strobed at the falling edge of RxCLKIN. When the signal is high, the pixel data shall be valid to be displayed.

Note: Output signals from any system shall be low or High-impedance state when VDD is off.

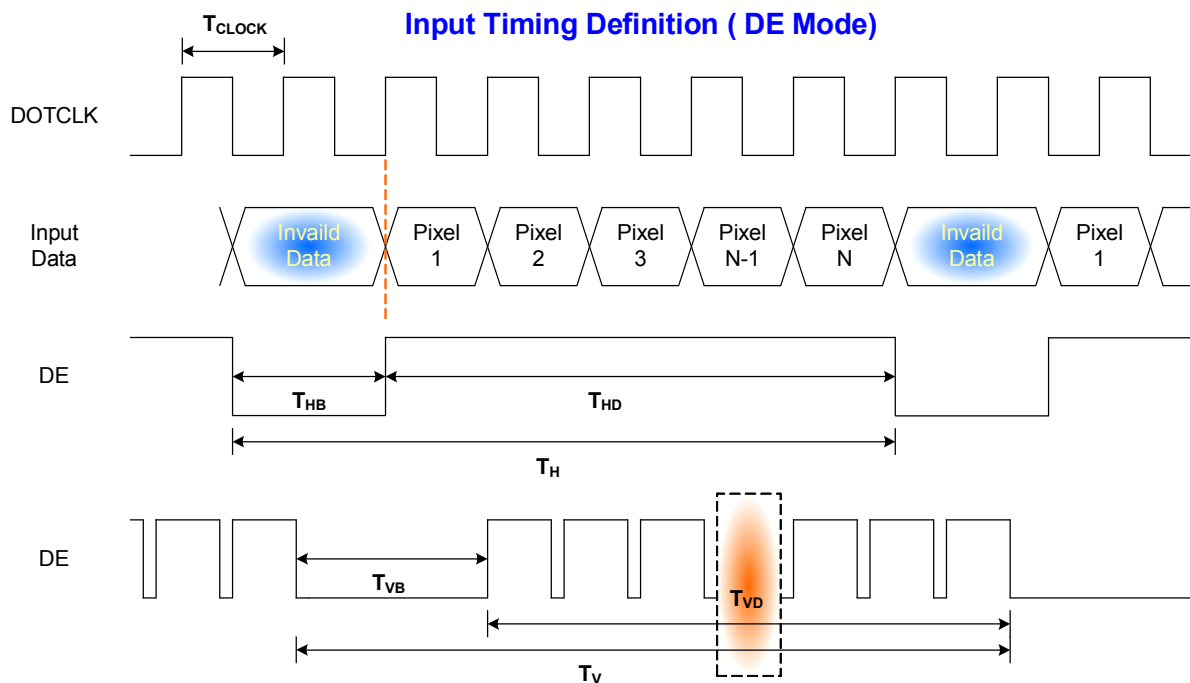
6.4 Interface Timing

6.4.1 Timing Characteristics

Signal		Symbol	Min.	Typ.	Max.	Unit
Clock Frequency		1/ T _{Clock}	64	68.93	85	MHz
Vertical Section	Period	T _V	808	816	1023	T _{Line}
	Active	T _{VD}	800			
	Blanking	T _{VB}	8	16	223	
Horizontal Section	Period	T _H	1330	1408	2047	T _{Clock}
	Active	T _{HD}	1280			
	Blanking	T _{HB}	50	128	767	
Frame Rate		F	---	60	---	Hz

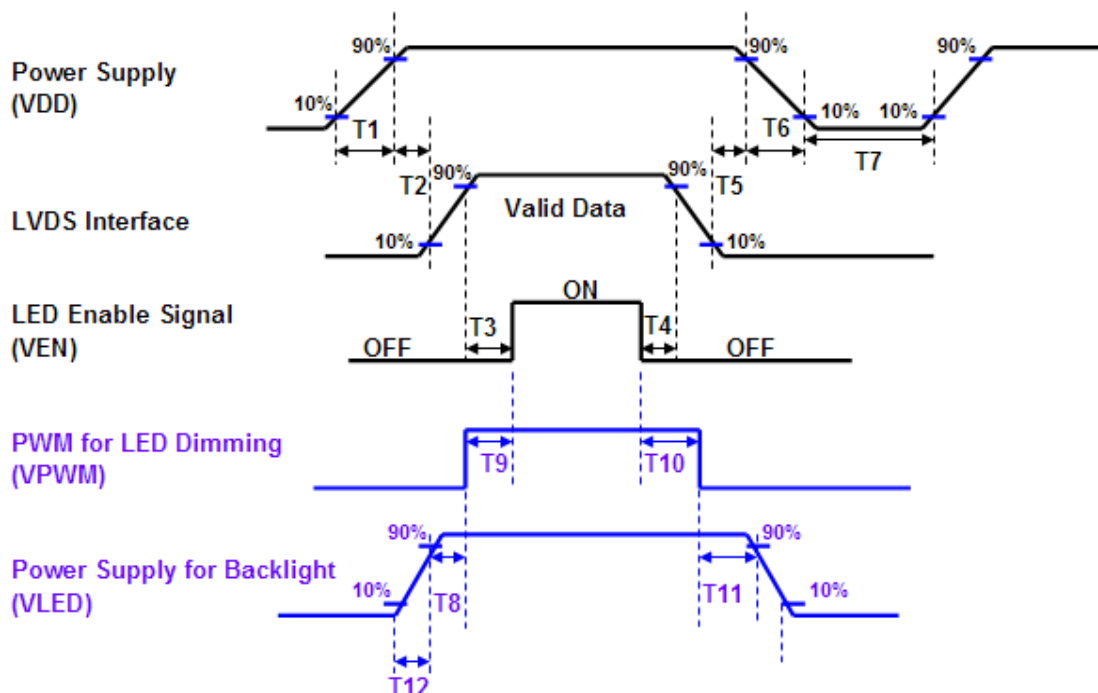
Note : DE mode.

6.4.2 Input Timing Diagram



6.5 Power ON/OFF Sequence

VDD power and lamp on/off sequence is as below. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Power ON/OFF sequence timing

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.5		10	[ms]
T2	0		50	[ms]
T3	200		-	[ms]
T4	200		-	[ms]
T5	0		50	[ms]
T6	0		10	[ms]
T7	500		-	[ms]
T8	10		-	[ms]
T9	0		180	[ms]
T10	0		180	[ms]
T11	10		-	[ms]
T12	0.5		10	[ms]

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

7. Reliability Test Criteria

Items	Required Condition	Note
Temperature Humidity Bias	40 °C /90%,300Hr	
High Temperature Operation	60 °C, 300Hr (center point of panel surface)	
Low Temperature Operation	-20 °C, 300Hr	
Hot Storage	70 °C, 300Hr	
Cold Storage	-30 °C, 300Hr	
Thermal Shock Test	-30 °C /30 min , 70 °C /30 min , 20cycles	
Hot Start Test	70 °C /1 Hr min. power on/off per 5 minutes, 5 times	
Cold Start Test	-20 °C /1 Hr min. power on/off per 5 minutes, 5 times	
On/off test	On/10 sec, Off/10 sec, 30,000 cycles	
ESD	Contact : $\pm 8KV$ / operation, Class B Air : $\pm 15KV$ / operation, Class B	Note 1
Shock test	220G,2ms, Half-sine wave, 1 times for each direction ($\pm X$, $\pm Y$, $\pm Z$), non-operation	
Vibration test	1.5G, (10~500Hz, random), 30 mins / axis (X, Y, Z), non-operation	

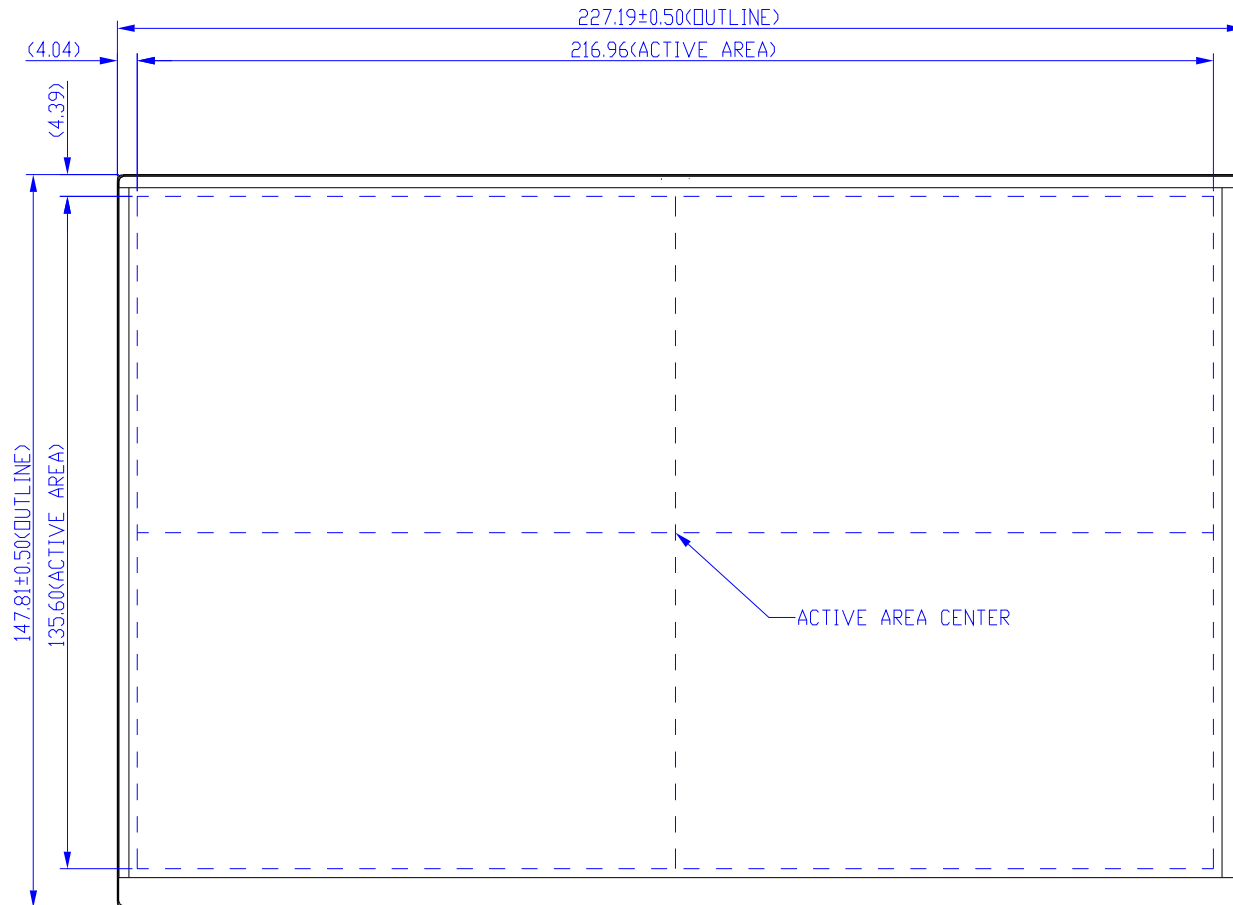
Note1: According to EN61000-4-2 , ESD class B: Some performance degradation allowed. No data lost
Self-recoverable. No hardware failures.

Note2:

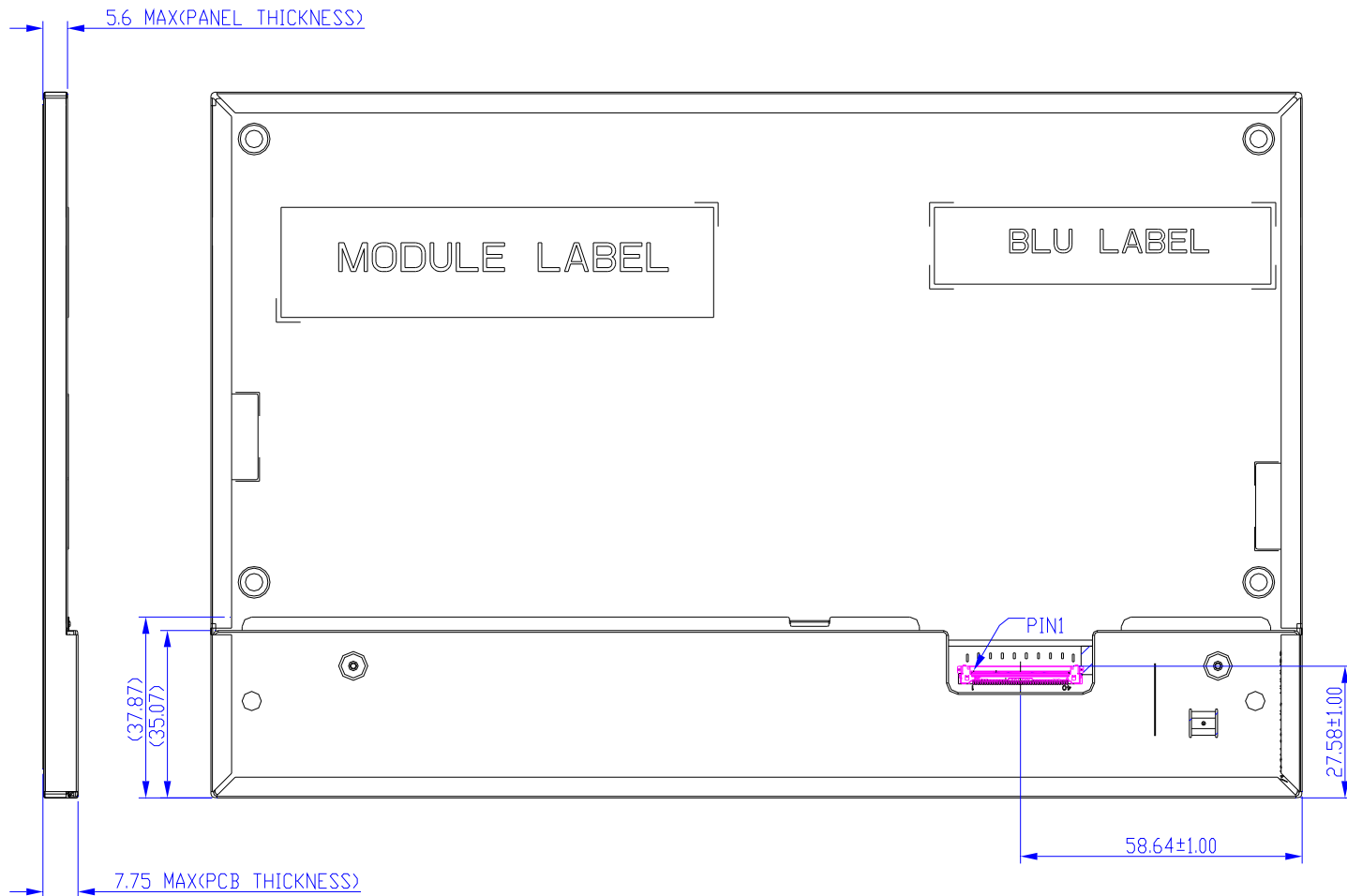
- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module. Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 24 hours at least in advance.

8. Mechanical Characteristics

8.1 Outline Dimension (Front View)



8.2 Outline Dimension (Rear View)

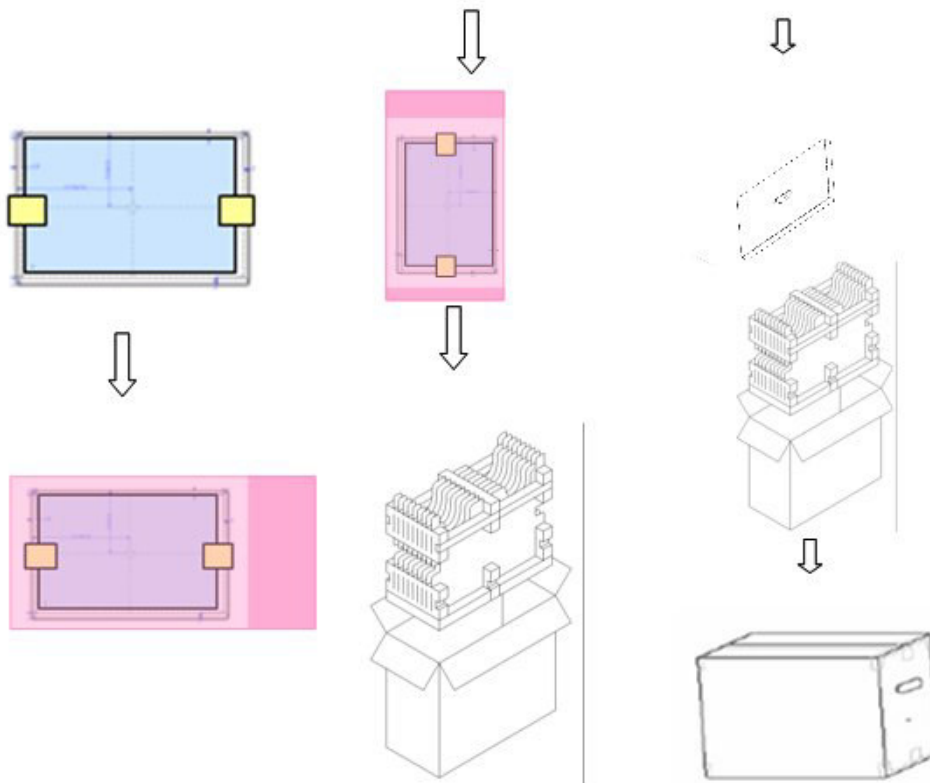


9. Label and Packaging

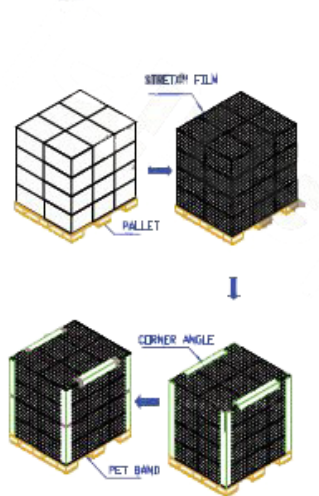
9.1 Shipping Label



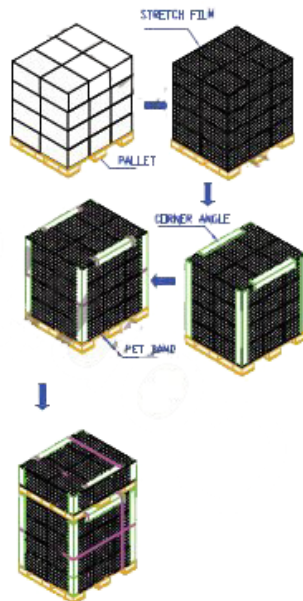
9.2 Carton/Pallet Package



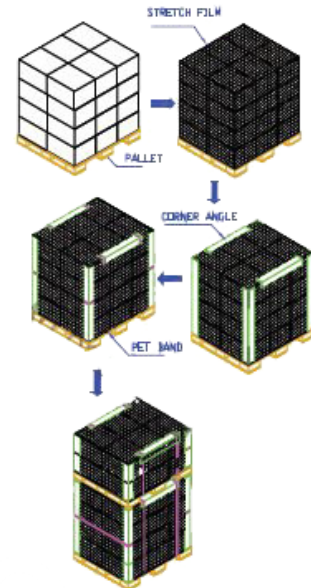
	SHIPPING BY AIR	SHIPPING BY SEA	SHIPPING BY SEA_HQ
MODULE/CARTON	44	44	44
CARTON/LAYER	6	6	6
LAYER/PALLET	4	4+1	4+2
MODULE/PALLET	1056	1320	1584
CARTON SIZE(MM)	450(L)*375(W)*320(H)	450(L)*375(W)*320(H)	450(L)*375(W)*320(H)
PALLET SIZE(MM)	1150(L)*910(W)*132(H)	1150(L)*910(W)*132(H)	1150(L)*910(W)*132(H)
TOTAL PALLET HEIGHT(MM)	1412	1864	2184
TOTAL PALLET WEIGHT(KG)	298	372	446



ONE PALLET SHIPMENT EXAMPLE
SHIPPING BY AIR USED



TWO PALLETS SHIPMENT EXAMPLE
SHIPPING BY SEA USED



TWO PALLETS SHIPMENT EXAMPLE
SHIPPING BY SEA_HQ USED

10 Safety

10.1 Sharp Edge Requirements

There will be no sharp edges or comers on the display assembly that could cause injury.

10.2 Materials

10.2.1 Toxicity

There will be no carcinogenic materials used anywhere in the display module. If toxic materials are used, they will be reviewed and approved by the responsible AGD toxicologist.

10.2.2 Flammability

All components including electrical components that do not meet the flammability grade UL94-V1 in the module will complete the flammability rating exception approval process.

The printed circuit board will be made from material rated 94-V1 or better. The actual UL flammability rating will be printed on the printed circuit board.

10.3 Capacitors

If any polarized capacitors are used in the display assembly, provisions will be made to keep them from being inserted backwards.

10.4 National Test Lab Requirement

The display module will satisfy all requirements for compliance to:

UL 60950-1 second edition

U.S.A. Information Technology Equipment



PART NO.: AG101YA-010N-CTG-V1
Touch Screen Specification

PH: 724-552-4904
FAX: 724-552-4905
EMAIL: sales@agdisplays.com
WEB: www.agdisplays.com
ADDRESS: 220 Huff Ave, Suite 400
Greensburg, PA 15601

(V) Preliminary Specifications
() Final Specifications

Module	10.1" Inch touch panel
Model Name	AG101YA-010N-CTG-V1

Customer	Date
Checked & Approved by	
Note: This Specification is subject to change without notice.	

Approved by	Date
Grace Hung	2016/12/29
Prepared by	
Jeff Fan	2016/12/29

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Record of Revision

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1. Handling Precautions

- 1) Since front surface is easily damaged, pay attention not to scratch it.
- 2) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 3) When the sensor surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 4) Since the sensor is made of glass, it may break or crack if dropped or bumped on hard surface.
- 5) Since conductive materials are used in sensor, take care of static electricity when handling.
- 6) Please touch with the finger or electric pen during the capacitive touch screen operation.
- 7) The purpose of product protective film is to prevent the damage for product during the cargo transportation. Therefore the dirty and scratch on the outer surface of protective film is acceptable. We also strongly recommend that product protective film can not be used in customer process. We recommend removing this product protective film during cosmetic inspection process.
- 8) Strongly recommend customer to remove the protective film, cleaning and visual inspection before assembly, and then do the following assembly. Don't use the peeled off protective film again, because the peeled off protective film already has been contaminated by operator glove stain or user fingerprint stain.
- 9) Before customer uses our touch panel product for cosmetic inspection , lamination or assembly, strongly recommend customer or user to remove the protective film completely, then use the clean room level specific dry clean cloth (or clean wiper or cotton swab) and cleaning solvent (IPA or Ethanol) to clean the removable surface dirty (not Glue Residue). Of course, user must wear the clean glove and necessary clean dress. The product surface clean handling procedure is also very critical that AGD could provide AGD effective cleaning process experience sharing to customer. After effective surface cleaning, customer can start the cosmetic inspection and suitable dry clean cloth re-cleaning for some dust or water stain. Customer must confirm that there is no any new coming particle, dirty, dust, water stain or user glove fingerprint stain from customer process on the product surface after cleaning. Finally, customer can start to laminate or assemble product.

2. General Specification

AG101YA-010N-CTG-V1 is a Projected Capacitive Touch Panel with I2C/USB interface to support and compatible with s multi-touch on Android system.

2.1 Feature

Item		Specification
Type		Projected Capacitive Touch Panel
Structure		Glass
Panel Size		10.1 inch
Total Thickness		1.2 ± 0.15 mm (sensor_1.1mm & ASF_0.1mm)
Input Mode		Multi Finger
Temperature Range	Operating	-20℃ ~ + 60 ℃
	Storage	-30℃ ~ + 70 ℃

2.2 Touch Dimension

Item		Specification
O.D.		257.35 mm * 175.5 mm
Thickness		1.1 mm
TP Viewing Area		218.92 mm * 137.82 mm
Total Weight		160g (max.)

2.3 Touch Characteristic

Item	Specification
Substrate Material	SDL CS Glass
Chemical Strength	≥ 200 mpa
Surface Hardness	$\geq 7H$
Interface	I2C/USB
Touch Resolution	Same with display resolution
Single / Multi-touch Accuracy	Center:1mm Edge 1.5mm
Linearity	Center +/-1mm Edge:±1.5mm
The smallest distance between 2 points	5 mm
Channel (X * Y)	46 * 29
Report Rate (points /sec)	>100Hz
Power Consumption	301.32 mW (max.)
Operating System	Android 6.2

2.4 Optical Characteristic

Item	Specification
Transmittance (%)	88% +/- 3%
Haze	3% (max.)
AS coating	AS coating

Note: Optical specification is measured in the dark room, and ambient temperature = 25°C

3. Electrical Specification

3.1 Electrical Characteristic

Item		Min	Typ	Max	Unit
Power Supply		3	3.3	3.6	Voltage
Power Supply Current	Active Mode	-	83.7	-	mA
	Idle Mode	-	21.5	-	mA
	Sleep Mode	-	9.3	-	mA

3.2 Touch Driver Connector

Connector Name / Designation	TP Connector
Manufacturer	eGalax_eMPIA Technology Inc.
Type / Part Number	EXC- 3160

3.3 Pin Assignment

PIN	SYMBOL	DESCRIPTION
1	GND	GROUND
2	D-	USB D-
3	D+	
4	I2C_INT	INTERRUPT SIGNAL (FROM SENSOR)
5	I2C_SCL	I2C CLOCK
6	I2C_SDA	I2C DATA
7	VDD_3.3V	SUPPLY VOLTAGE 3.3V
8	NC	NO CONNECTION

4. Test Criteria

4.1 Reliability

Item	Condition	Remark
High temp High humidity Storage	40°C , 90% RH, 240hrs	Note1
Low Temperature Storage	-30°C , 240hrs	
High temperature Storage	70°C , 240hrs	
Low Temperature Operation	-20°C , 240hrs	
High Temperature Operation	60°C , 240hrs	
Thermal shock	-30 °C/30 min, 80 °C /30 min, 100 cycles	
ESD	Contact Discharge: $\pm 8KV$, 150pF(330 Ω) 1sec, 9 points, 10 times/ point Air Discharge: $\pm 15KV$, 150pF(330 Ω) 1sec, 9 points, 10 times/ point	Note 2

Note1.

- No premanent cosmetic damage after test
- No functional failure after test
- No extremelty loss of anti-blocking particals
- Need OM or 2.5D inspection after test

Note2.

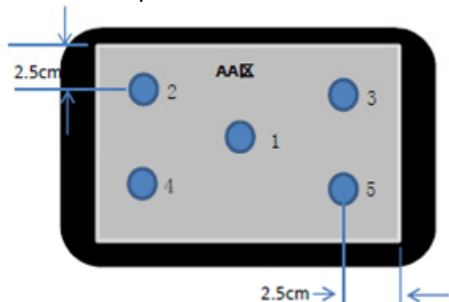
According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost, Self-recoverable.
No hardware failures.

4.2 Mechanical

Item		Condition	Remark
Touch panel	Ball Drop Test	133g, 50cm (center) 133g, 30cm (edge)	Note1
	Hardness	Loading: 500g, Position: VA area of test sample	
FPC	Direct Pulling Test	500g, 90°, 25mm/min	Note2

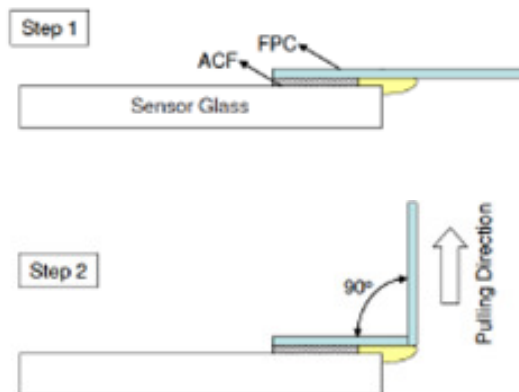
Note1.

The ball drop test illustration is showed as follow:



Note2.

The FPC test illustration is showed as follow:

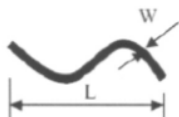


5. Cosmetic Specification

Defect Item and definition

Defects count method · number and distance between defects

A. Linear defects scale by the length / width

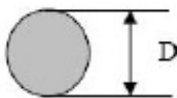


Size	Pass Criteria
$L \leq 2\text{mm}$ or $W \leq 0.05\text{mm}$	Ignore
$2\text{mm} < L \leq 5\text{mm}$ or $0.05\text{mm} < W \leq 0.1\text{mm}$	$N \leq 2$, distance $> 30\text{mm}$
$L > 5\text{mm}$ or $W > 0.1\text{mm}$	Not Allowed

* Linear defects include Scratch / Line shape defect (Stain, Dirt, Dent, Foreign material)

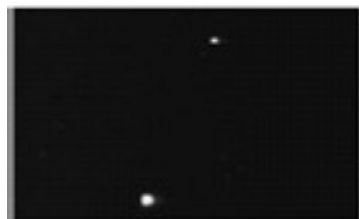
B. Dot defects is counted in diameter “D” as below.

Active Area only, and scaled by



Size	Acceptable Q'TY
$D \leq 0.2\text{mm}$	Ignore
$0.2\text{mm} < D \leq 0.5\text{mm}$	$N \leq 2$ distance $> 30\text{mm}$
$D > 0.5\text{mm}$	Not Allowed

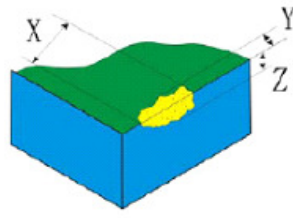
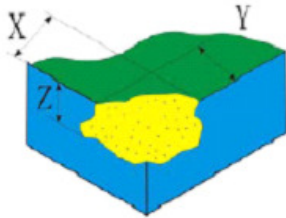
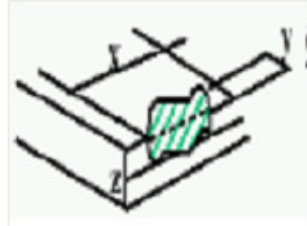
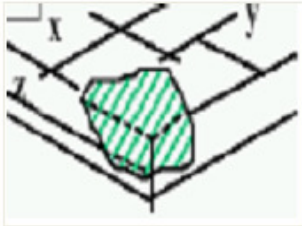
C. BM pin hole



Size	Acceptable Q'TY
$D \leq 0.1\text{mm}$	Ignore
$0.1\text{mm} < D \leq 0.2\text{mm}$	$N \leq 2$ (distance $\geq 10\text{mm}$)
$D > 0.2\text{mm}$	Not Allowed

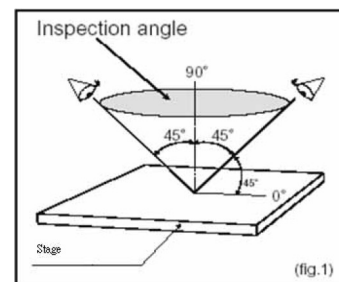
D. Chipping

	Judge item	Inspection specification
Glass	Wire (on array)	No damaged $\leq 1/3$ lead length of efficient circuit
	Edge	No extended crack
		Chipping in Corner : $X \leq 2\text{mm}, Y \leq 2\text{mm}, Z \leq 1/2$ Glass thickness (Fig.1)
		Chipping around the edge : $X \leq 5\text{mm}, Y \leq 2\text{mm}, Z \leq 1/2$ Glass thickness (Fig.2)



Inspection Environment

- A. The luminance in appearance detecting should be 3000LUX, and the luminance in electrical detecting should be between 1500LUX.
- B. The detecting distance should be 30cm +/-5cm.
- C. No other objects and raised appearance on the surface.
- D. Be inspected under general daylight lamp.
- E. Inspection view-angle:



Glass crack

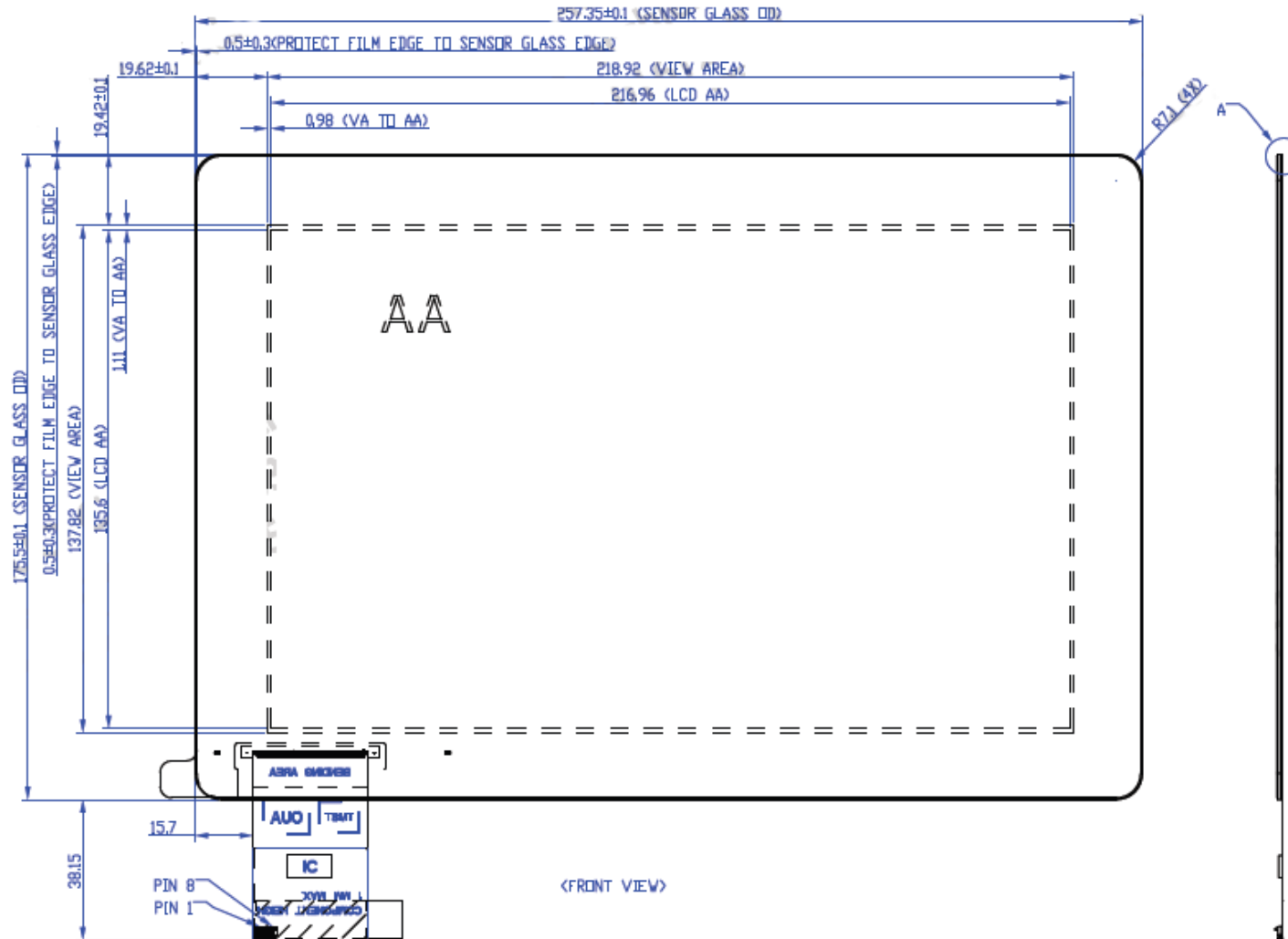
Glass crack

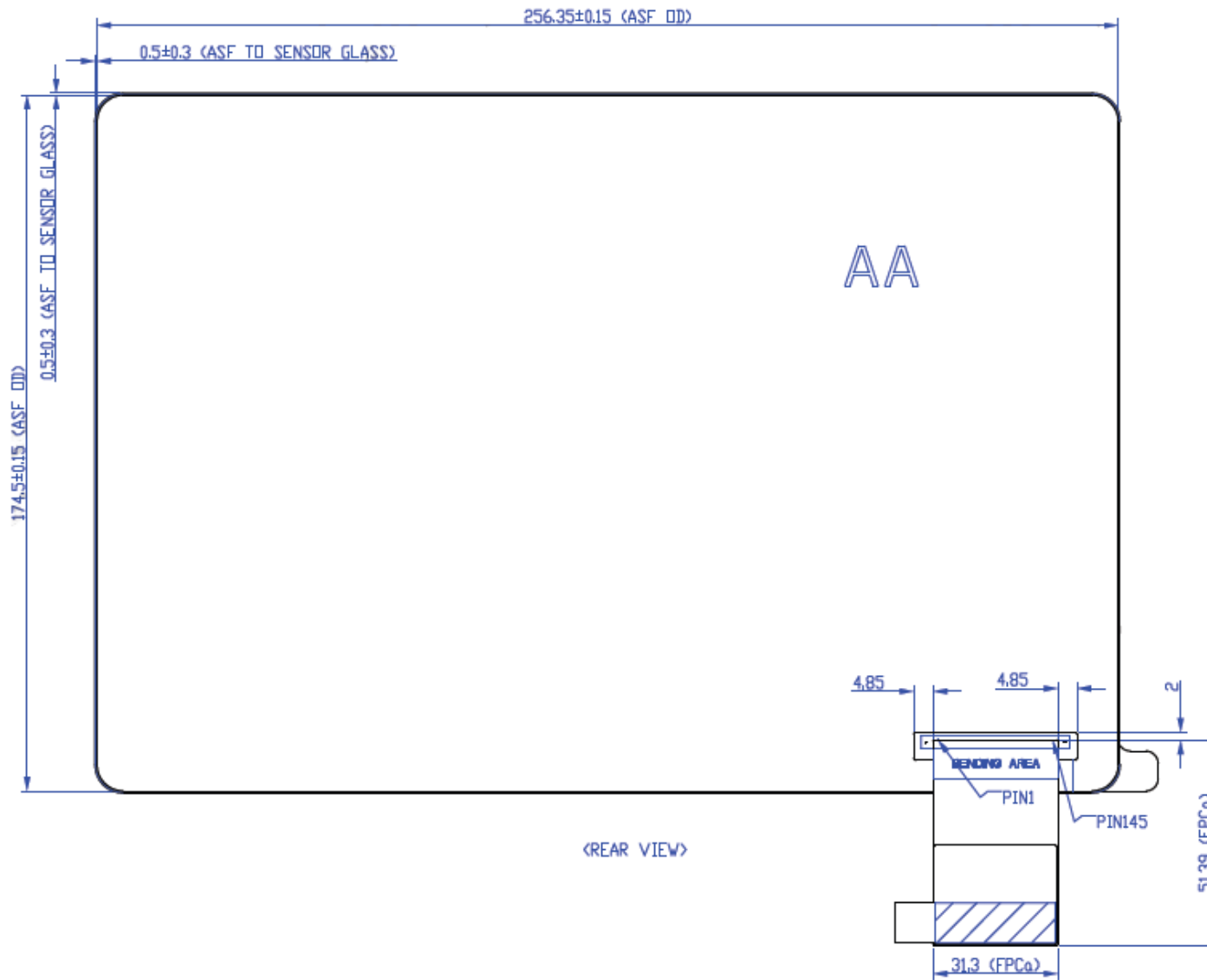


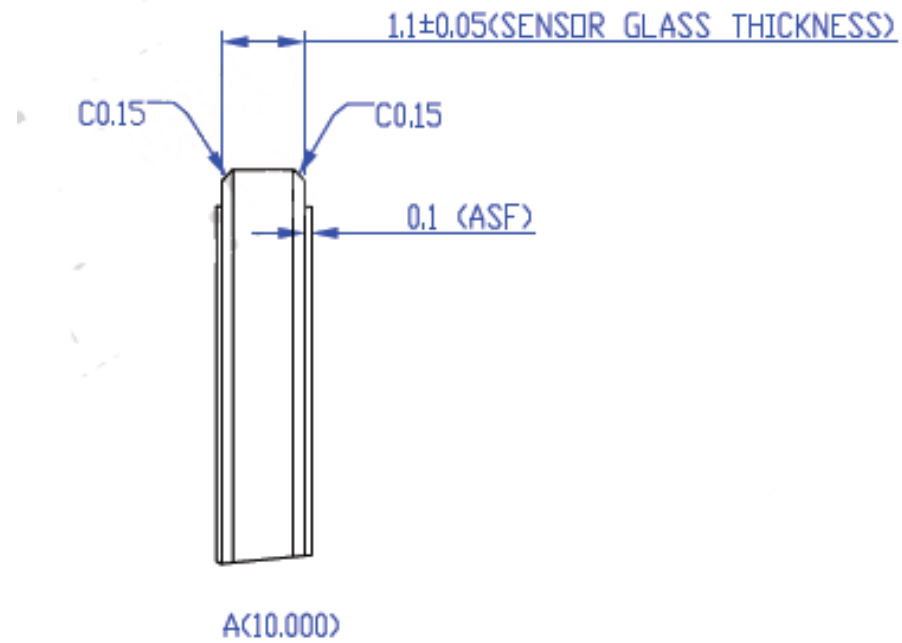
-No glass cracks of any kind allowed (including creeping cracks)

6. Touch Drawing

6.1 Sensor 2D drawing





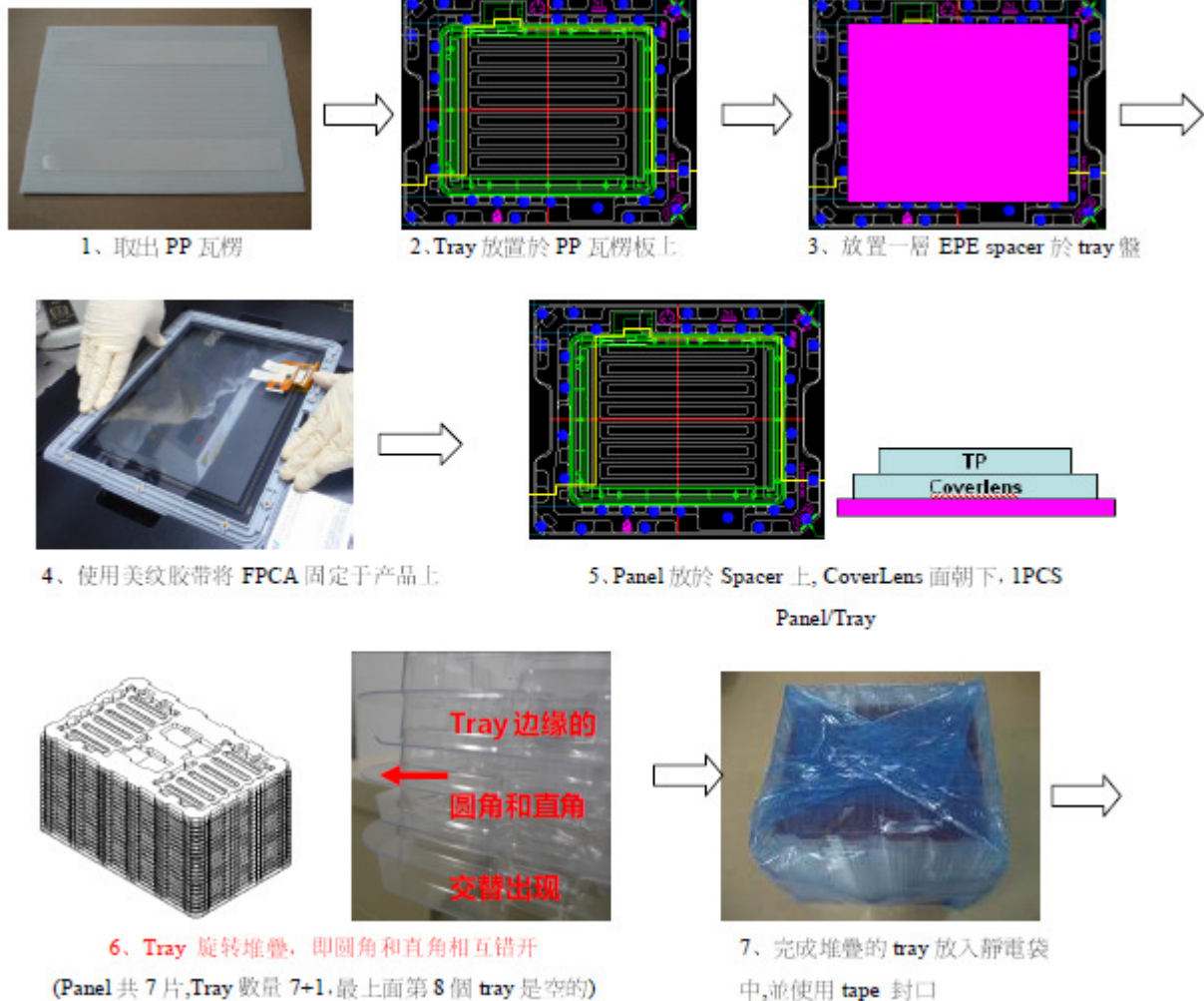


7. Packing Specification

7.1 Packing drawing

Packing combined with LCD, no touch module only packing required.

包裝流程圖 Packing instruction (示意圖)



7.2 Shipping label drawing

Label size: 30mm x 12mm

