General Electrical Touch Co., Limited
香港通用电子触控有限公司

/SIMPLEPLUS
Touch Displays

Specification

Module No. : GEA-121E01-DC9521-G020

Client Name :

Client Ref. :

Version No. : A3

Client Confirmation	Approved by	Prepared by
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Date of Issue：2020/07/13

Issue History

Version	History	Date	Remarks
A1	First Issue	2020/07/13	
A2	3.1.6 Connector Pin Assignment	2020/11/26	
A3	Removed 6.General Precaution Added 6.1 Label&6.3 Firmware Version	2023/07/14	

CONTENTS

1. Purpose 4
2. Feature 5
2.1 Overview 5
2.2 Absolute Maximum Ratings 5
2.3 Module Structure 6
2.4 Physical Specifications 7
3. Electrical Specifications 8
3.1 Display Electrical Specifications 8
3.1.1 TFT LCD Module 8
3.1.2 GOA Timing 9
3.1.3 Power Sequence 10
3.1.4 LVDS Interface Characteristic 11
3.1.5 Interface timing Parameter 14
3.1.6 Connector Pin Assignment 15
3.2 Touch Panel Electrical Specifications 17
3.2.1 Interface Connection 17
3.2.2 Connector Pins Definition 17
3.2.3 I^2C Interface 17
4. Optical Specifications 18
4.1 Display Optical Specifications 18
4.1.1 Overview 18
4.1.2 Optical Specifications 18
4.2 Appearance Specifications 21
4.2.1 Terms Definition 21
4.2.2 Inspection Conditions 22
4.2.3 Printing Area Appearance Inspection Criteria 23
4.2.4 View Area Appearance Inspection Criteria 24
4.2.5 Glass Breakage 26
5. Reliability Test 27
6. Label, Package and Firmware Version 28
6.1 Label 28
6.1.1 Product Label Information 28
6.1.2 Product Label Size and Position 28
6.2 Package 29
6.2.1 Packaging Steps 29
6.2.2 Carton Information 29
6.3 Firmware Version 29
7. Mechanical Drawing 30

1. Purpose

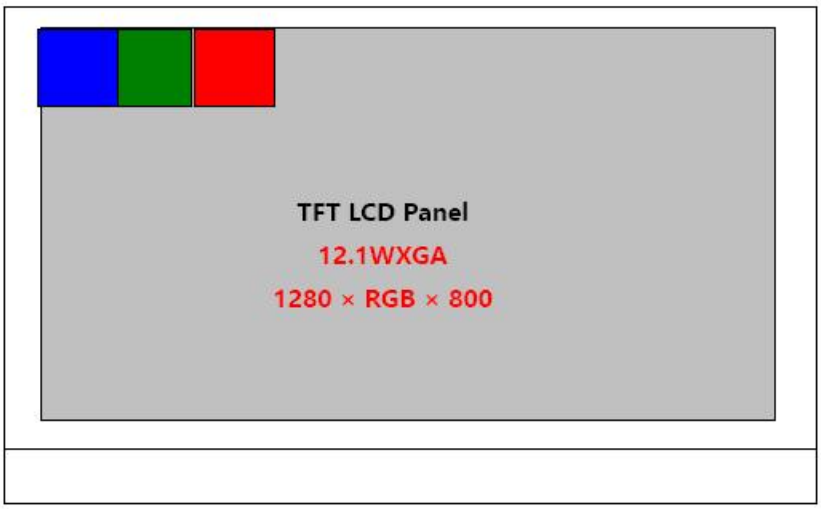
This specification document is issued for the 12.1” TFT Liquid Crystal Display bonded with Capacitive-Type Touch Panel delivered by General Electrical Touch Co., Limited. This document defined the general provisions (including structure, performance, characteristics and quality guarantee) for the specific module listed at the front page of this document. In the event of conflict between this document and other documents, this document including the attachments and drawing, is highest-level specification for this products.

2. Feature

2.1 Overview

The touch part is a 12.1 inch DITO glass Capacitive-Type Touch Panel. It uses a SIS9521 touch controller with USB&I^{2}C communication.

The display part BOE EV121WXM-N10 which is a color active matrix TFT LCD Panel using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 12.1inch diagonally measured active area with WXGA resolutions (1280 horizontal by 800 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors.



2.2 Absolute Maximum Ratings

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

<Absolute Maximum Ratings>

Parameter	Symbol	Min.	Max.	Unit	Remarks
LC operating Voltage [Note1]	V_{OP}		5.0	V	Ta=25+/-5°C
Operating Temperature (Humidity)	T_{OP}	-20	+70	℃	
Storage Temperature (Humidity)	T_{ST}	-30	+80	℃	

Notes:

1. Liquid Crystal driving voltage Due to the characteristics of LC Material, this voltage varies with environmental temperature.

2.3 Module Structure

Main Component	Materials	Remarks
Cover Glass	2mm chemical strengthened glass	black printed boarder
Adhesive	SCA	Thickness: 0.25 mm
Touch Sensor	DITO glass	0.55mm, 60~90Ω/□
Air Bonding Tape	3M 4905	Thickness: 0.5 mm
Display	TFT LCD	BOE EV121WXM-N10

2.4 Physical Specifications

Item	Specifications	Remark
TFT Active Area	261.12(H) x 163.20(V) mm	
Touch Visible Area	262.10(H) x 164.20(V) mm	
Number Of Pixels	1280(H) x 800(V)	
Pixel Pitch	0.07(H) x 0.2(V) mm	
Pixel Arrangement	1P2D	
Display Colors	16.7M	
Display Mode	Normally Black	
Luminance	Typ 400 nit, Min 300 nit	
Transmittance	5.8% (Typ)	Without APF
Color Gamut	48% (Typ)	
Contrast Ratio	1200:1 (Typ)	
Display Response Time	25ms (Typ)	
Optima Viewing Direction (Human Eye)	85/85/85/85Deg. (Typ)	CR>10
Display Driver IC	HX8255-A	
Touch Activation	Multi-finger touch	
Touch Resolution	29X, 46Y	
Touch Controller	SIS9521	
Bonding Method	CG to touch sensor: optical bonding TP module to display: tape bonding	
Outline Dimension	298.00(H) x 204.00(V) x 12.00mm (Typ)	
Weight	0.9 KG	

3. Electrical Specifications

3.1 Display Electrical Specifications

3.1.1 TFT LCD Module

<LCD Module Electrical Specifications>

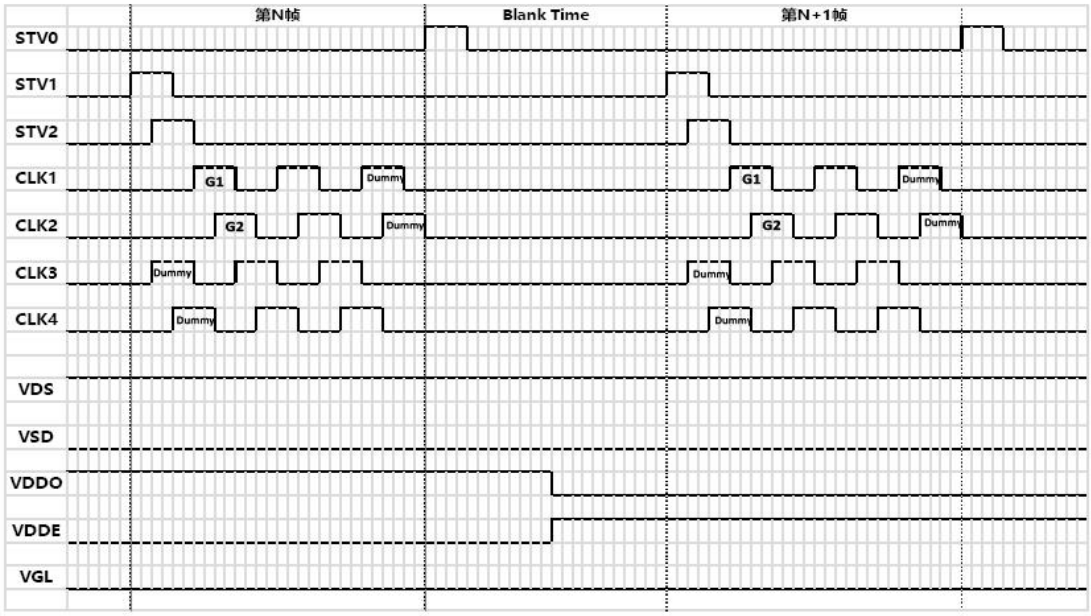
Parameter	Symbol	Value	Range	Unit	Remark
TFT Gate ON Voltag	VGH	23	-	V	Note1
TFT Gate OFF Voltage	VGL	-8	-	V	Note2
TFT Common Electrode Voltage	Vcom	3.5	2~5	V	Note3
TFT Kick-Back Voltage Max	ΔVp Max	—	—	V	
TFT Kick-Back Voltage Min	ΔVp Min	—	—	V	
LCD Panel Signal Processing Board	VDD	3.3	3.0~3.6	V	
LCD Panel Signal Current	—	0.6	0.5~0.8	A	
Backlight Input Voltage	—	12	11~13	V	
Backlight Input Current	—	0.4	0.3~0.5	A	
LCD Panel Display Power	—	6.5	6~7	W	
Backlight Power	—	4.5	4~5	W	

Notes:
1. VGH is TFT Gate operating voltage.
2. VGL is TFT Gate operating voltage. The low voltage level of VGL signal must be fluctuates with same phase as Vcom.
3. Vcom must be adjusted to optimize display quality, as Crosstalk and Contrast Ratio etc.. We just kindly recommend the setting-voltages the reference value.

In order to get the optimized display quality, the setting-voltage should be changed according to customer's developing condition. (The display quality could be changed by customer's setting –voltage.)

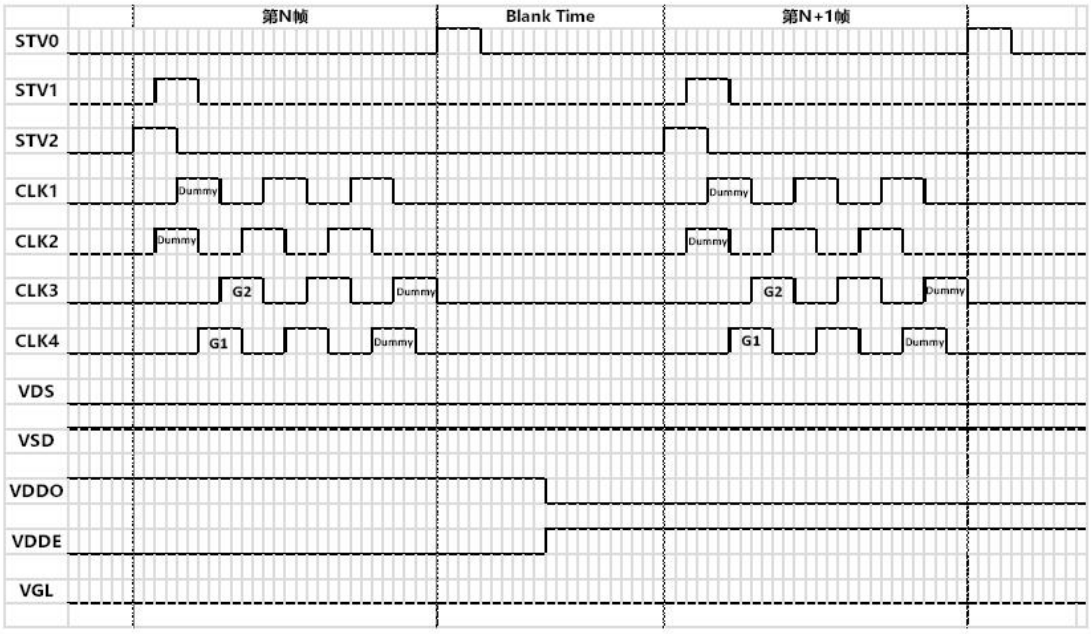
3.1.2 GOA Timing

Forward (CLK signal Duty Cycle =50%)



CLK signal Duty Cycle =45%, within 40%~50% is adjustable; VGH =23V, VGL =-8V; VDDO&VDDE period is integer frame time (180 frames), is about 3s. When high and low voltage switching time is within Blank Time; VD/S =VGH, VS/D =VGL.

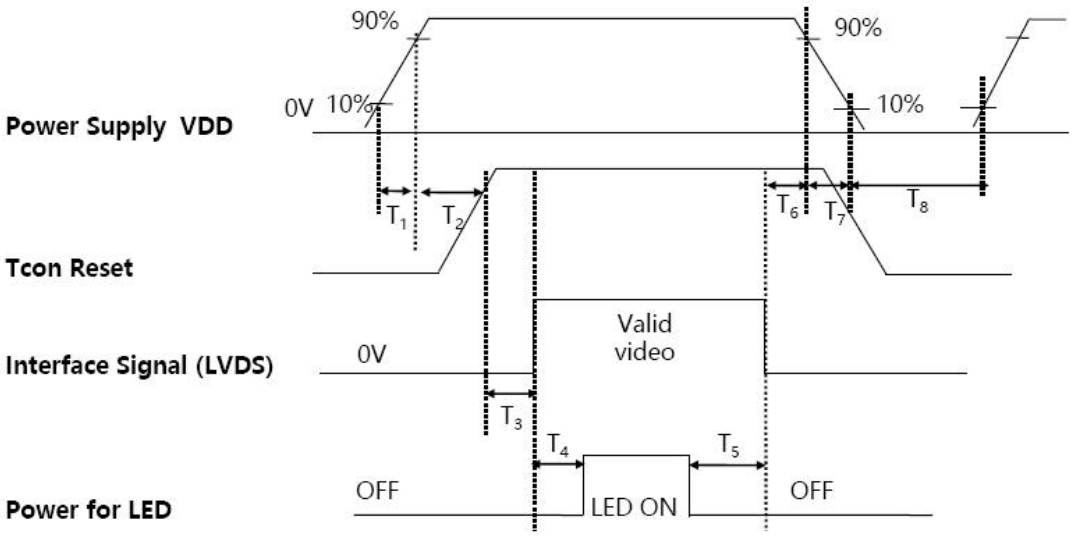
Backward (CLK signal Duty Cycle =50%)



CLK signal Duty Cycle =45%, within 40%~50% is adjustable; VGH =23V, VGL =-8V; VDDO&VDDE period is integer frame time (180 frames), is about 3s. When high and low voltage switching time is within Blank Time; VD/S =VGL, VS/D =VGH.

3.1.3 Power Sequence

[Ta =25±2°C]

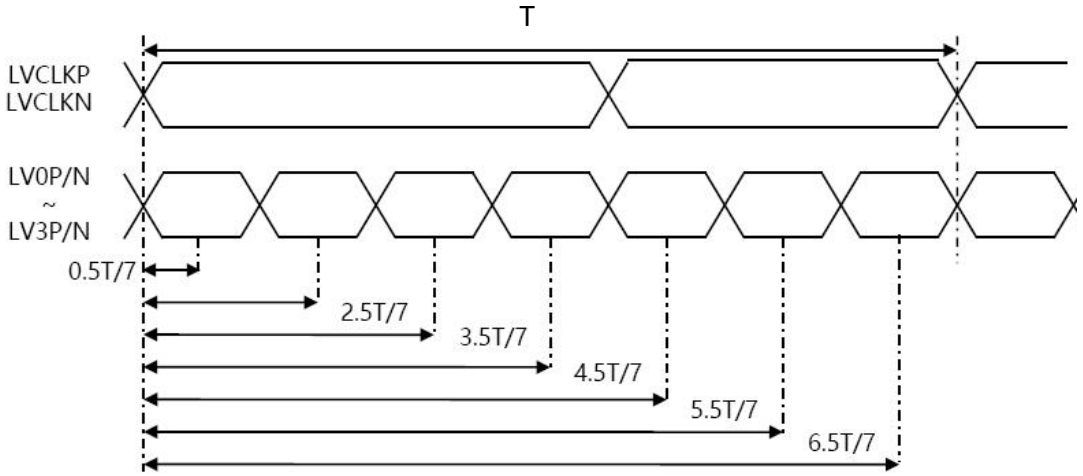


<Sequence Table>

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.1	-	8	(ms)
T2	-	8	-	(ms)
T3	0	-	-	(ms)
T4	300	-	-	(ms)
T5	300	-	-	(ms)
T6	0	-	50	(ms)
T7	0	-	10	(ms)
T8	500	-	-	(ms)

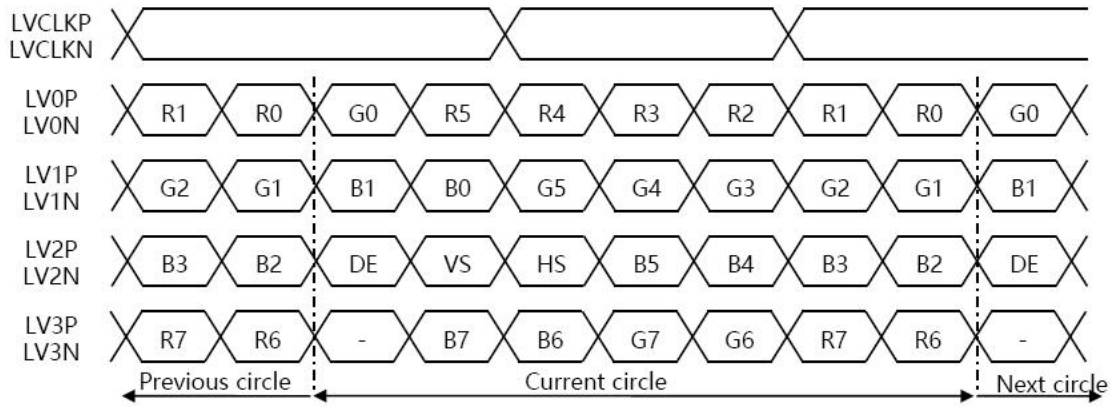
3.1.4 LVDS Interface Characteristic

1. Data Format



< LVDS input data ideal strobe position >

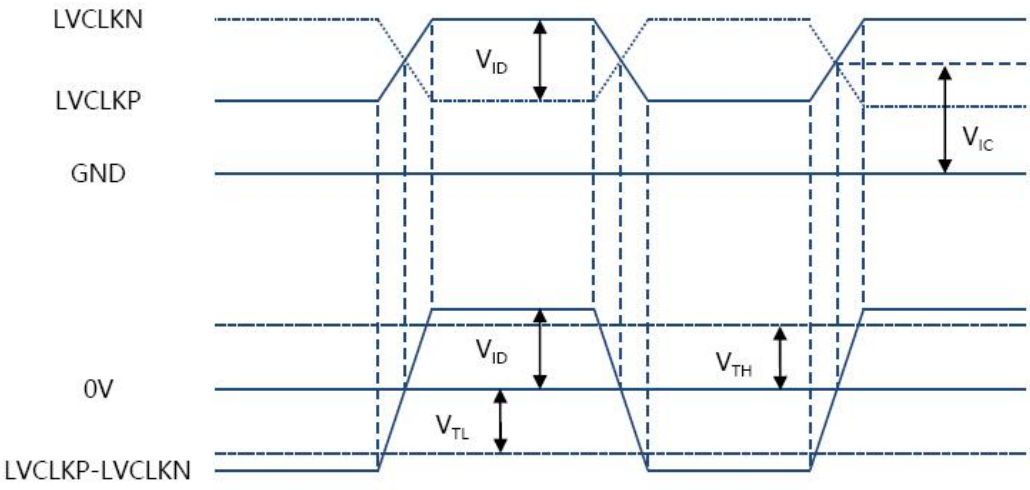
2. LVDS input data mapping



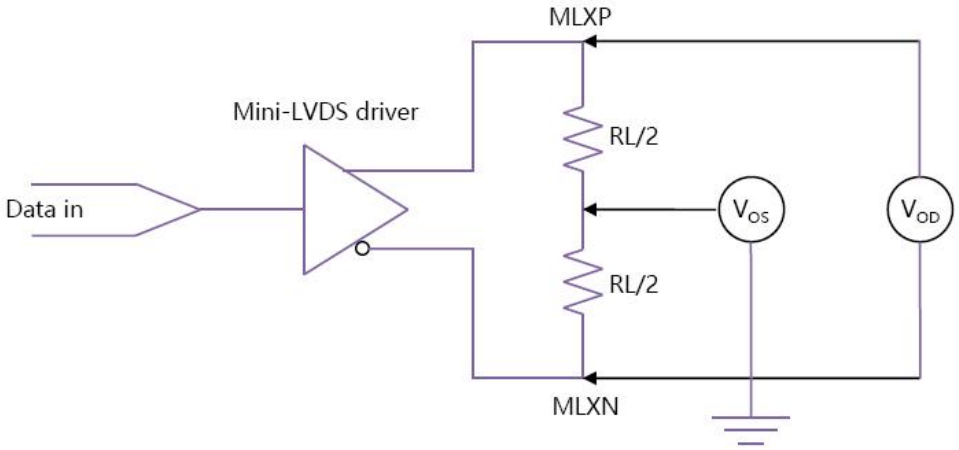
< 8 bit LVDS input data mapping >

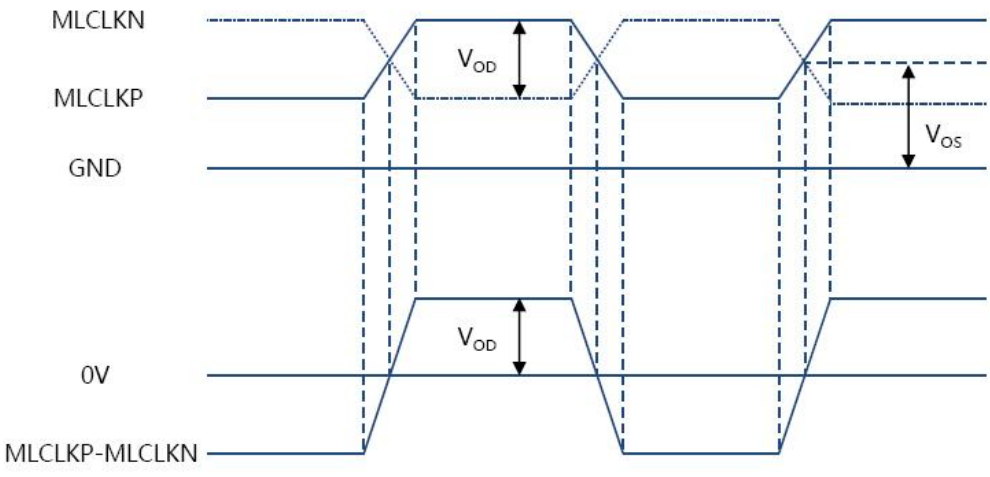
3. DC Specification

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Supply current	I_{DD}	-	100	-	mA	
LVDS DC specifications						
Differential input high threshold	V_{TH}	-	-	+100	mV	V_{IC}=1.2V
Differential input low threshold	V_{TL}	-100	-	-	mV	
LVDS common mode voltage	V_{IC}	0.7	-	1.6	V	
LVDS swing voltage	V_{ID}	±100	-	±600	mV	
Mini-LVDS DC specifications						
Output differential voltage range	V_{OD}	±170	±200	±230	mV	PI=14KΩ RL=100Ω (T_A=25℃)
Output differential voltage deviation		0.64	-	0.96	mV	
Output offset voltage range	V_{OS}	1.0	1.2	1.4	V	
Output offset voltage deviation		1.0	1.2	1.4	V	



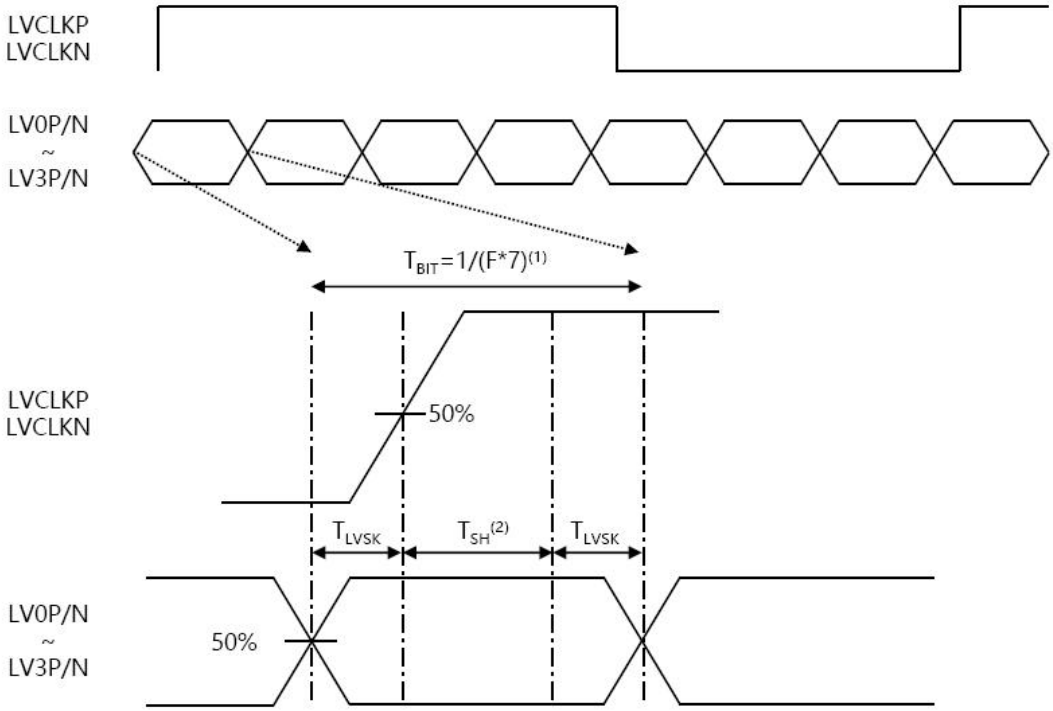
< LVDS V_{ID} and V_{IC} definition>





< Mini-LVDS V_{OD} and V_{OS} definition>

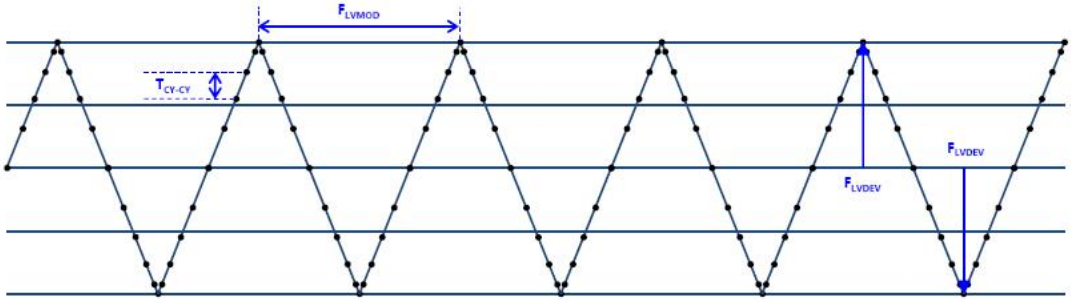
4. AC Specification



Note: 1. T_{BIT}: Data period

2. Internal CLK sampling data window

< LVDS channel to channel skew>



< LVDS input SSC>

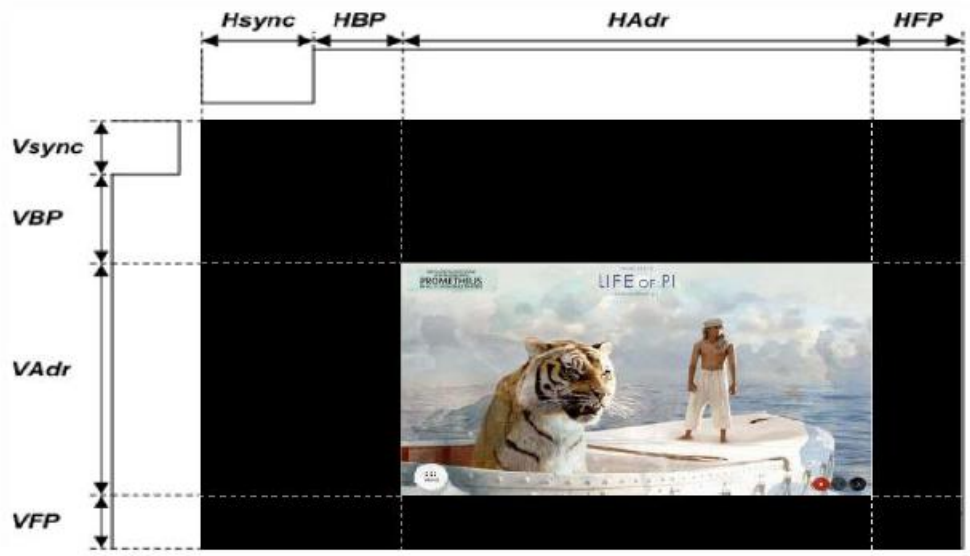
<AC Specification>

Description	Symbol	Condition	Min	Typ	Max	Unit
LVDS Input frequency	F	-	68	-	74	MHz
LVDS channel to channel skew	T_{LVSK}	F=65MHz V_{IC}=1.2V V_{ID}=±200mV	-600	-	+600	ps
Modulating frequency of input clock during SSC	F_{LVMOD}	F=85MHz V_{IC}=1.2V V_{ID}=±200mV	10	-	300	KHz
Maximum deviation of input clock frequency during SSC	F_{LVDEV}		-3	-	+3	%
Cycle to cycle jitter	T_{CY-CY}		-	-	200	ps

3.1.5 Interface timing Parameter

<Timing Parameter>

Item			Symbol	min	typ	max	UNIT
LCD	Frame Rate		-	59	60	61	Hz
	Pixels Rate		-	69.922	71	72.293	MHz
Timing	Horizontal	Horizontal total time	tHP	-	1440	-	t_{CLK}
		Horizontal Active time	tHadr		1280		t_{CLK}
		Horizontal Back Porch	tHBP		80		t_{CLK}
		Horizontal Front Porch	tHFP		48		t_{CLK}
	Vertical	Vertical total time	tvp		823		t_H
		Vertical Active time	tVadr		800		t_H
		Vertical Back Porch	tVBP		14		t_H
		Vertical Front Porch	tVFP		3		t_H
Lane				-	1	-	Lane



3.1.6 Connector Pin Assignment

1. LCD panel signal

CN1 SOCKET: DF19G-20P-1H (54) (HIROSE ELECTRIC CO., LTD (HRS))
Adaptable plug: DF19G -20S-1C(05) (HIROSE ELECTRIC CO., LTD (HRS))

Pin NO.	Pin name	Description
1	VCC	Power supply
2	VCC	
3	N.C.	Not connect
4	GND	Ground
5	D0-	Pixel data
6	D0+	
7	GND	Ground
8	D1-	Pixel data
9	D1+	
10	GND	Ground
11	D2-	Pixel data
12	D2+	
13	GND	Ground
14	CLK-	Pixel data
15	CLK+	
16	GND	Ground
17	SDA	Not connect
18	SCL	Not connect
19	D3-	Pixel data
20	D3+	

2. LED Driver

CN2 SOCKET: MSA24038P6 (SIN SHENG TERMINAL & MACHINE INC. (SMT))
Adaptable plug: P24038P6 (SIN SHENG TERMINAL & MACHINE INC. (SMT))

Pin NO.	Pin name	Description	Remark
1	PWM	Luminance control	
2	BRTC	Backlight ON/OFF control	High or Open : Backlight ON Low : Backlight OFF
3	GND	Ground	
4	GND	Ground	
5	VDD	Power supply	
6	VDD	Power supply	

3. FPC Pin Assignment

1	DUMMY	49	Source 241	97	GMA_SEL	145	PAIR	193	VDS
2	NULL	50	VR16	98	STBYB	146	DATAPOL	194	DUMMY
3	TEST1	51	VR15	99	RESETB	147	SEL2	195	STV1
4	TEST2	52	VR14	100	DUMMY	148	SEL1	196	STV1
5	GND	53	VR13	101	DUMMY	149	SEL0	197	STV2
6	GND	54	VR12	102	VSSD_T	150	TTL_SEL	198	STV2
7	GND	55	VR11	103	VSSD_T	151	DUMMY	199	DUMMY
8	GND	56	VR10	104	DUMMY	152	DUMMY	200	CLK4
9	GND	57	VR9	105	DUMMY	153	DUMMY	201	CLK4
10	GND	58	VR8	106	VDDD	154	DUMMY	202	CLK3
11	DUMMY	59	VR7	107	VDDD	155	VSSH	203	CLK3
12	FEED1	60	VR6	108	VDDD	156	VSSH	204	CLK2
13	FEED1	61	VR5	109	DUMMY	157	VSSH	205	CLK2
14	DUMMY	62	VR4	110	VSSD_IF	158	VDDL	206	CLK1
15	VDDO	63	VR3	111	VSSD_IF	159	VDDL	207	CLK1
16	VDDO	64	VR2	112	VSSD_IF	160	VDDA	208	DUMMY
17	DUMMY	65	VR1	113	DUMMY	161	VDDA	209	STV0
18	VDDE	66	DIO1	114	DUMMY	162	VDDA	210	STV0
19	VDDE	67	DUMMY	115	DUMMY	163	DUMMY	211	VGL
20	DUMMY	68	VDDA	116	D5N_DC1	164	DUMMY	212	VGL
21	VGL	69	VDDA	117	D5P_DC0	165	DUMMY	213	DUMMY
22	VGL	70	VDDL	118	D4N_DB7	166	DUMMY	214	VDDE
23	STV0	71	VDDL	119	D4P_DB6	167	VSSD	215	VDDE
24	STV0	72	DUMMY	120	D3N_DB5	168	VSSD	216	DUMMY
25	DUMMY	73	VSSH	121	D3P_DB4	169	VSSD	217	VDDO
26	CLK1	74	VSSH	122	CLKN_CLK	170	VSSD	218	VDDO
27	CLK1	75	DUMMY	123	CLKP_DB3	171	DUMMY	219	DUMMY
28	CLK2	76	VDDD	124	D2N_DB2	172	VDDD	220	FEED1
29	CLK2	77	VDDD	125	D2P_DB1	173	VDDD	221	FEED1
30	CLK3	78	VDDD	126	D1N_DB0	174	VDDD	222	DUMMY
31	CLK3	79	DUMMY	127	D1P_DA7	175	DUMMY	223	VGL
32	CLK4	80	VSSD	128	D0N_DA6	176	VSSH	224	DUMMY
33	CLK4	81	VSSD	129	D0P_DA5	177	VSSH	225	GND
34	DUMMY	82	VSSD	130	DUMMY	178	VDDL	226	GND
35	STV2	83	DUMMY	131	VSSD	179	VDDL	227	GND
36	STV2	84	DUMMY	132	VSSD	180	VDDA	228	GND
37	STV1	85	DUMMY	133	DUMMY	181	VDDA	229	GND
38	STV1	86	DUMMY	134	VDDD_IF	182	DUMMY	230	TEST2
39	DUMMY	87	DUMMY	135	VDDD_IF	183	DIO2	231	TEST1
40	VDS	88	VDDA	136	VDDD	184	source 1200	232	NULL
41	VDS	89	VDDA	137	POL	185	VCOM	233	DUMMY
42	DUMMY	90	VDDA	138	LD	186	VCOM		
43	VSD	91	VDDL	139	FS	187	VCOM		
44	VSD	92	VDDL	140	CS1	188	DUMMY		
45	DUMMY	93	VSSH	141	CS0	189	VSD		
46	VCOM	94	VSSH	142	ODLY1	190	VSD		
47	VCOM	95	VSSA	143	ODLY0	191	DUMMY		
48	VCOM	96	VSSA	144	RL	192	VDS		

3.2 Touch Panel Electrical Specifications

3.2.1 Interface Connection

Item	Specification	Remarks
FPC type	COF	
Connector	USB-MINI-B	
	Molex 53261-1071	or compatible
Communication	USB and I^2C	

3.2.2 Connector Pins Definition

<Molex 53261-1071 Pins Definition>

Pin	Definition	Description
1	Vcc	5V
2	USB Data+	
3	USB Data-	
4	SDA	I^2C serial data
5	SCL	I^2C serial clock
6	INT	Interrupt pin sending request to HOST
7	Reset	Low active power on reset signal
8	GPIO0	General purpose input/output port
9	GND	
10	GND-Shielding	

3.2.3 I^2C Interface

Slaver address	0x5c(7-bits addressing, programmable)
Clock rate	@400 kHz(fast mode)
Interrupt mode	Default active low, level trigger
_CID	PNP0C50
_DSM	3CDFF6F7-4267-4555-AD05-B30A3D8938DE
HID Descriptor address	0x0000

4. Optical Specifications

4.1 Display Optical Specifications

4.1.1 Overview

The test of Optical specifications shall be measured in a dark room (ambient luminance ≤1lux and temperature =25±2℃) with the equipment of Luminance meter system (Goniometer system and CS-2000) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. The center of the measuring spot on the Display surface shall stay fixed. The backlight should be operating for 30 minutes prior to measurement.

4.1.2 Optical Specifications

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle Range	Horizontal	Θ3	CR>10		85	-	Deg.	Note1
		Θ9			85	-	Deg.	
	Vertical	Θ12			85	-	Deg.	
		Θ6			85	-	Deg.	
Luminance		Lum	Θ = 0°	300	400	-	nit	
Contrast ratio		CR	Θ = 0°	800	1200	-		Note2
Transmittance		Tr		5.2	5.8	-	%	Note3
Color Gamut		CG		40	48	-	%	
Reproduction of color	Red	Rx	Θ = 0°	0.556	0.596	0.636		Note4 (Based on BLU)
		Ry		0.292	0.332	0.372		
	Green	Gx		0.295	0.335	0.375		
		Gy		0.512	0.552	0.592		
	Blue	Bx		0.109	0.149	0.189		
		By		0.079	0.119	0.159		

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
White Chromaticity	Wx	Θ = 0°	0.263	0.313	0.363		
	Wy		0.279	0.329	0.379		
Response Time (Rising + Falling)	$T_r + T_f$	Ta= 25° C Θ = 0°	-	25	35	ms	Note 5
White luminance uniformity	ΔY		70	80	-	%	Note 6
LED Life time			50,000			Hrs	Note 7

Note:

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see Figure 1).

2.Contrast measurements shall be made at viewing angle of Θ= 0 and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see Figure1)

Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3.Transmittance is the Value without APF and without CG.

4.The color chromaticity coordinates specified in the above table shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

5.The electro-optical response time measurements shall be made as FIGURE 2 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Tf.

6.The White luminance uniformity on LCD surface is then expressed as: ΔY=(Minimum Luminance of 9points/Maximum Luminance of 9points)*100.(see Figure3)

7. The lifetime is determined as the time at which luminance of LED become 50% of the initial brightness or not normal lighting at IPIN=26mA on condition of continuous operating at 25 ±2°C.

Figure1 Measurement Set Up

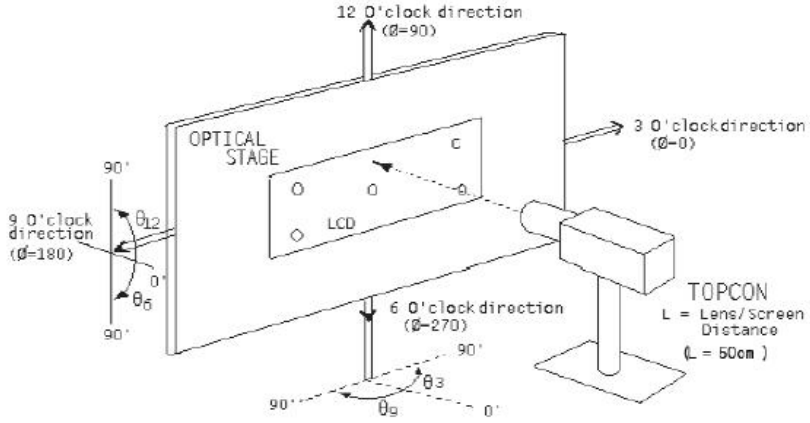


Figure2 Response Time Testing

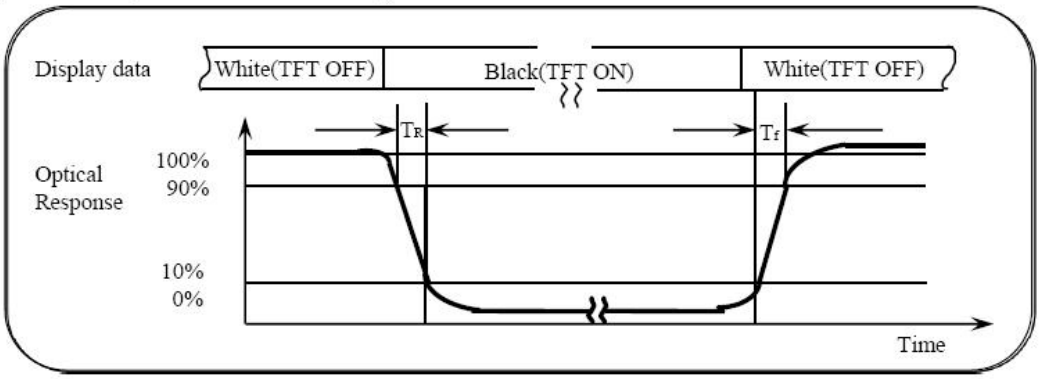
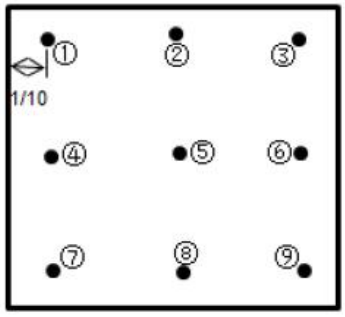


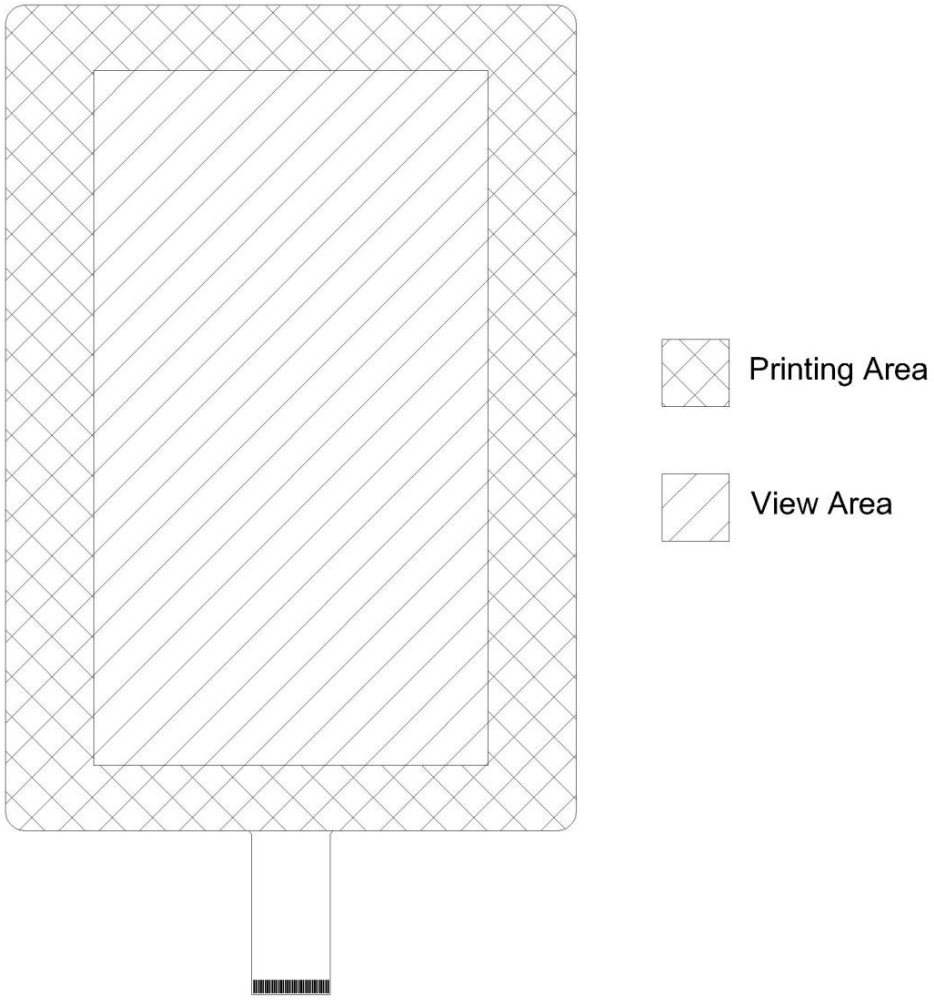
Figure3 White luminance uniformity



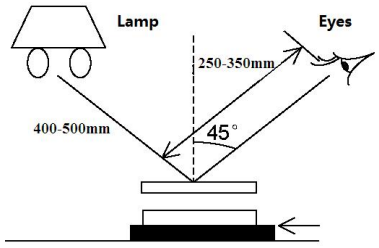
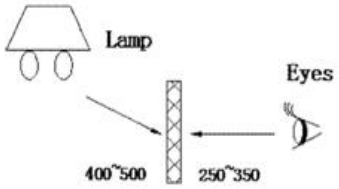
Pattern:W255
Point:9 point,From the edge of 10%

4.2 Appearance Specifications

4.2.1 Terms Definition



4.2.2 Inspection Conditions

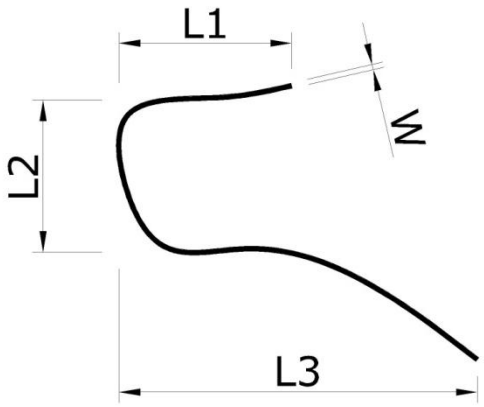
Items	Conditions	Remarks
Inspection Lamp	Florescent Cool White Lamp, 1000~1200Lux	
Inspection with Reflect Light (RL)	*Normal eyes level 1.0 (with Glasses accepted); *Distance between Lamp and product:40-50cm; *Distance between Eyes and Product:25-35cm; *Angle of view: 45°; *Black background; *Inspection time no more than 10s.	
Inspection with Through Light (TL)	*Normal eyes level 1.0 (with Glasses accepted); *Distance between Lamp and Product: 40-50cm; *Distance between Eyes and Product: 25-35cm; *Angle of view: 45°; *Black background; *Inspection time no more than 10s.	

4.2.3 Printing Area Appearance Inspection Criteria

Items	Conditions	Inspection Criteria	Method
Light Transparent Hole/Light Leakage	TL	Not Allowed (Repaired with black marker pen at the back side can be accepted.)	Eye view
Ink Off	TL	Not Allowed	Eye view
Stain and Dirty Mark	RL	*Stain and dirty mark refer to visible sheet contamination; the non-cleanable stain should be inspected as “Dot-like Defects”. *Contamination cannot be cleaned by soft cloth and alcohol, Not Allowed; *Contamination can be cleaned by soft cloth and alcohol, Accept; but if the ratio of such contamination defected products is more than 10% of all the inspected products, Not Allowed;	Eye view
Liner-like Defects	RL	Refer to 4.2.4 Liner-like Defects.	Eye view, dot/wire gauge
Dot-like Defects	RL	Refer to 4.2.4 Dot-like Defects.	Eye view, dot/wire gauge
Logo/ Letter	RL	*Logo Break; Not Allowed *within a shaping printing < 120 mm: ± 0.10 ≥120 mm <400 mm: ± 0.15 ≥400 mm: ± 0.25 *between shaping printing(offset to 2nd, 3rd, etc. color) <400 mm: ± 0.30 ≥400 mm: ± 0.50	Eye view, dot/wire gauge

4.2.4 View Area Appearance Inspection Criteria

(W=Width, L=Length)



L=L1+L2+L3

<Liner-like Defects>

Condition	Width(mm)	Length(mm)	Criteria
RL	W≤0.03	Not limited	*Accept QTY: not limited.
	0.03<W≤0.06	L≤10	*Accept QTY: not more than 6; *Not allowed if the distance between 2 objects is less than 20 mm.
	0.06<W≤0.10	L≤10	*Accept QTY: not more than 4; *Not allowed if the distance between 2 objects is less than 20 mm.
	W>0.10	L>10	*Not allowed.
	Liner-like Defects including: Liner Foreign Object/Scratch.		

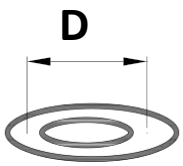
< Dot-like Defects> (D=Diameter)

Condition	Average Diameter(mm)	Criteria
RL	D≤0.20	*Not limited.
	0.20<D≤0.30	*Accept Qty: not more than 10; *Not allowed if the distance between 2 defects is less than 20mm.
	0.30<D≤0.40	*Accept Qty: not more than 5; *Not allowed if the distance between 2 defects is less than 20mm.
	D>0.40	*Not allowed.
	Dot-like Defects including: Foreign Objects/Stab.	

< Stain and Dirty Mark>

Condition	Criteria
RL	* Stain and Dirty Mark refer to the visible contamination in mass, Dot-like contamination should be inspect as “Dot-like Defects”; *Contamination cannot be clean by soft cloth and alcohol, Not Allowed; *Contamination can be clean by soft cloth and alcohol, Accept; but if the ratio of such defected products are more than 10% of all the inspected products, Not Allowed.

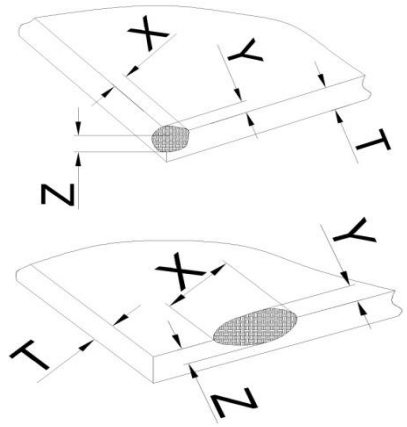
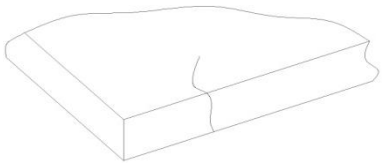
< Surface Fisheye>

Condition	Average Diameter(mm)	Criteria	Remarks
RL	D≤0.15	*Accept QTY: not more than 3; * Not allowed if the distance between 2 objects is less than 50 mm.	
	0.15<D≤0.30	*Accept Qty: not more than 2; * Not allowed if the distance between 2 objects is less than 50 mm.	
	0.30<D≤0.50	*Accept Qty: not more than 1.	
	D>0.50	*Not allowed.	

<Defects of back side, locates outside the View Area>

The Appearance defects, such as Scratch, Foreign Object, Stain and Dirty-mark, on the backside of Module not lead to the performance failure	Accept
FPC and sensor pin bonding migration not more than pin width 1/2	Accept
Scratches on bonding area on silver	Not Allowed
Mechanical damages on FPC(dent/kink)	Not Allowed
Glue residue, broken and oxidation on gold fingers	Not Allowed

4.2.5 Glass Breakage

Items	Criteria	Remarks
Corner/ Edge Breakage	*(X+Y)/2< 0.3 mm, Z< 1/3T mm; distance between 2 defects more than 5 mm; *Accept QTY: not more than 3.	
Crack	Not Allowed.	

5. Reliability Test

The Reliability test items and its conditions are shown in below.

No	Test Items	Conditions	
1	High temperature storage test	Ta =80℃, 240 hrs	
2	Low temperature storage test	Ta =-30℃, 240 hrs	
3	High temperature & high humidity operation test	Ta =60℃, 90%RH, 240hrs	
4	High temperature operation test	Ta =70℃, 240hrs	
5	Low temperature operation test	Ta =-20℃, 240hrs	
6	Thermal shock	Ta = -30℃↔80℃, 100 cycle	
7	Vibration test	Frequency	10/300/10 Hz, Sine X/Y/Z Direction
		Gravity/AMP	1.5 G
		Period	±X, ±Y, ±Z 30 min
8	Shock test	Gravity	100G
		Pulse width	6msec, Half-sine wave
		Direction	±X, ±Y, ±Z
9	Image Stacking	25°C 5*5 Chess 1hr L127 10Min disappear	
10	ESD (Operation) (note 1)	Air	±8KV, 150pF(330) 1sec, 10 points, 10 times/point
		Contact	±6KV, 150pF(330) 1sec, 10 points, 10 times/point
11	Impact Resistance	Steel ball: 64 g Height: 30 cm	

Note:

1. The final ESD result is based on the customer's complete machine test, If there is a problem, BOEOT will improve together.

6. Label, Package and Firmware Version

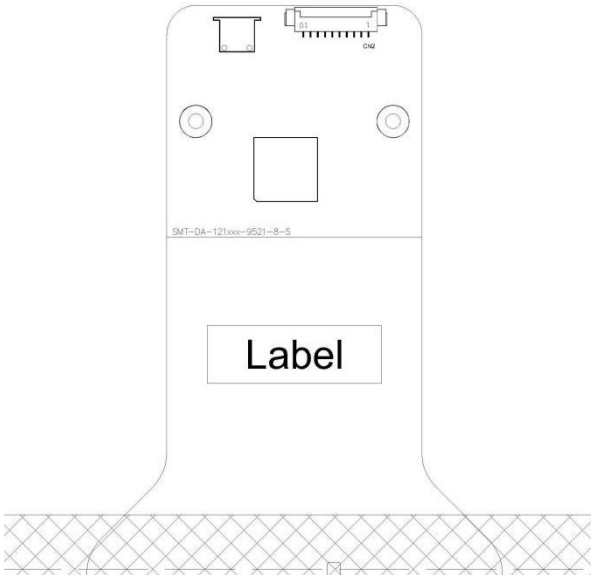
6.1 Label

6.1.1 Product Label Information

GEA-121E01-DC9521-G020
Product code.
SMT-DA-121N000-SU9521-8-5
Touch sensor type for test.
12123280001EDC2
121: product active area size 2328: YYWW 0001: series number EDC2: internal code

6.1.2 Product Label Size and Position

Label size: 30mm*10mm. Label position: front side of touch sensor FPC.



6.2 Package

6.2.1 Packaging Steps

TBC

6.2.2 Carton Information

Size	55*40*25 (L*W*H)	cm
Product QTY of full box	TBC	PCS
Total weight	TBC	kg
Single product weight	TBC	kg

6.3 Firmware Version

fw_9521_D_12_1_S+_8_5.bin

fw_9521_D_12_1_S+_8_5.bin

7. Mechanical Drawing