



Model No.TM101DDHG04

MODEL NO. : TM101DDHG04

ISSUED DATE: 2017-03-31

VERSION : Ver 2.0

- Preliminary Specification
- Final Product Specification

Customer : _____

Approved by	Notes

TIANMA Confirmed :

Prepared by	Checked by	Approved by
Haiping_luo		Guangkun_an

This technical specification is subjected to change without notice

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Record of Revision

Rev	Issued Date	Description	Editor
1.0	2016-12-13	Fin Specification Release	Jinzhao Xian
1.1	2016-01-13	Add rework QC flow chart in page 35	Jinzhao Xian
1.2	2016-01-18	Add Incoming Inspection Standard in page 36 Add Customer G-code in page 27	Jinzhao Xian
2.0	2017-03-31	Update pin defination	Haiping_luo

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1 General Specifications

1.1 Display Spec & Electrical Characteristics

Feature		Spec
Display Spec.	Size	10.1 inch
	Resolution	1024(RGB) × 600
	Technology Type	a-si TFT
	Pixel Configuration	R.G.B. Vertical Stripe
	Pixel pitch(mm)	0.2175x0.2088
	Display Mode	TM, Normally White
	Surface Treatment	AG,HC(3H)
	Viewing Direction	12 o'clock
	Gray Scale Inversion Direction	6 o'clock
	With /Without TSP	Without TSP
	LED Numbers	30 LED (JuFei)
	Weight (g)	210(typ), 220 (max)
Electrical Characteristics	Interface	6/8 bit LVDS
	Color Depth	16.7M
	Driver IC	HX8282*1+HX8677*2
	Module Power Consumption(W)	2.43(max)

Note 1: Requirements on Environmental Protection: Q/S0002

Note 2: LCM weight tolerance: ± 5%

Note 3: Power Consumption measure at Black image

1.2 Mechanical Characteristics

Item		Min	Typ	Max
LCM (W x H x D) (mm)	With Tape	232.85x136.85x2.8	233.1x137.1x3.05	233.35x137.35x3.3
	Without Tape	232.8x136.8x2.8	233.0x137.0x3.0	233.2x137.2x3.2
Bezel Opening Area (mm)		225.52x128.08	225.72x128.28	225.92x128.48
Active Area(mm)		222.52x125.08	222.72x125.28	222.92x125.48

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2 Input/Output Terminals

Recommended connector: IMSA-9637S-40Y801

Pin	Symbol	I/O	Description	Remark
1	VCOM	P	VCOM Power supply	
2	VDD	P	Power supply(3.3V typ)	
3	VDD	P	Power supply(3.3V typ)	
4	NC	P	No connection(Reserved for TM test)	
5	RESET (GRB)	I	Global Reset.Normally pull high.	
6	STBYB	I	Standby mode control.Normally pull high.	
7	GND	P	Ground	
8	Rxin0-	I	LVDS differential data input	
9	Rxin0+	I		
10	GND	P	Ground	
11	Rxin1-	I	LVDS differential data input	
12	Rxin1+	I		
13	GND	P	Ground	
14	Rxin2-	I	LVDS differential data input	
15	Rxin2+	I		
16	GND	P	Ground	
17	RxCLK-	I	LVDS differential clock input	
18	RxCLK+	I		
19	GND	P	Ground	
20	Rxin3-	I	LVDS differential data input	
21	Rxin3+	I		
22	GND	P	Ground	
23	NC		No connection	
24	NC		No connection	
25	GND	P	Ground	
26	NC		No connection	
27	NC		No connection	

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28	SELB(HSD)	I	LVDS 6/8 bit selection control SEL="L":8bit Use only 8 bit SEL="h":6bit Use only 6 bit
29	AVDD	P	Analog power
30	GND	P	Ground
31	LED-	P	Back light cathode
32	LED-	P	
33	L/R	P	Source Driver internal shift register is controlled by this pin as shown below: Normally pull high.
34	U/D	I	Gate Driver Up/down Scan setting.Normally pull low.
35	VGL	I	Negative power of TFT
36	NC		No connection
37	NC		No connection
38	VGH	P	Positive power of TFT
39	LED+	P	Back light anode
40	LED+	P	

3 Absolute Maximum Ratings

GND=0V, Ta =25℃

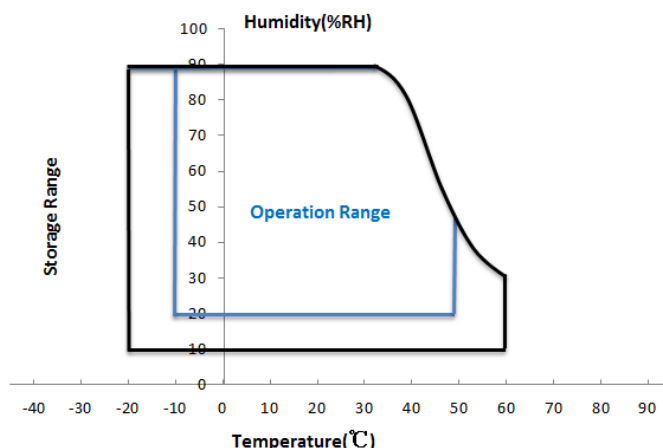
Item	Symbol	Min	Max	Unit	Remark
Power Voltage	VDD	2.8	3.6	V	
Operating Ambient Temperature	TOPR	-10	50	℃	
Storage Ambient Temperature	TSTG	-20	60	℃	
Operating and Storage Humidity	HSTG	10%	90%	% (RH)	

Note: LCM surface Temperature reach 60℃ is ok, When Operating condition.

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4 Electrical Characteristics

4.1 Driving TFT LCD Panel

VDD=3.3V, GND=0V, Ta=25°C

Item	Symbol	Min	Typ	Max	Unit	Remark
Power Supply Voltage	VDD	2.80	3.30	3.60	V	
Power For Analog Circuit	AVDD	10.72	11.02	11.34	V	
Gate On Voltage	VGH	20.46	21.14	23.54	V	
Gate Off Voltage	VGL	-7.35	-7	-6.65	V	
Common Voltage	Vcom	--	4.33	--	V	
Input Signal Voltage	Low Level	VIL	GND	--	0.2xVDD	V
	High Level	VIH	0.8xVDD	--	VDD	V
Current of digital supply voltage	I _{VDD}	--	--	22	mA	VDD=3.3V
Current of analog supply voltage	I _{AVDD}	--	--	40	mA	AVDD=11.02V
Current of Gate on voltage	I _{VGH}	--	--	0.8	mA	VGH=21.14V
Current of Gate off voltage	I _{VGL}	--	--	0.8	mA	VGL=-7.0V
Current of Vcom	I _{vcom}	--	--	0.01	mA	

Note: The current of supply voltage measure at black image.

4.2 Driving Backlight

Ta=25°C

Item	Symbol	Min	Typ	Max	Unit	Remark
------	--------	-----	-----	-----	------	--------

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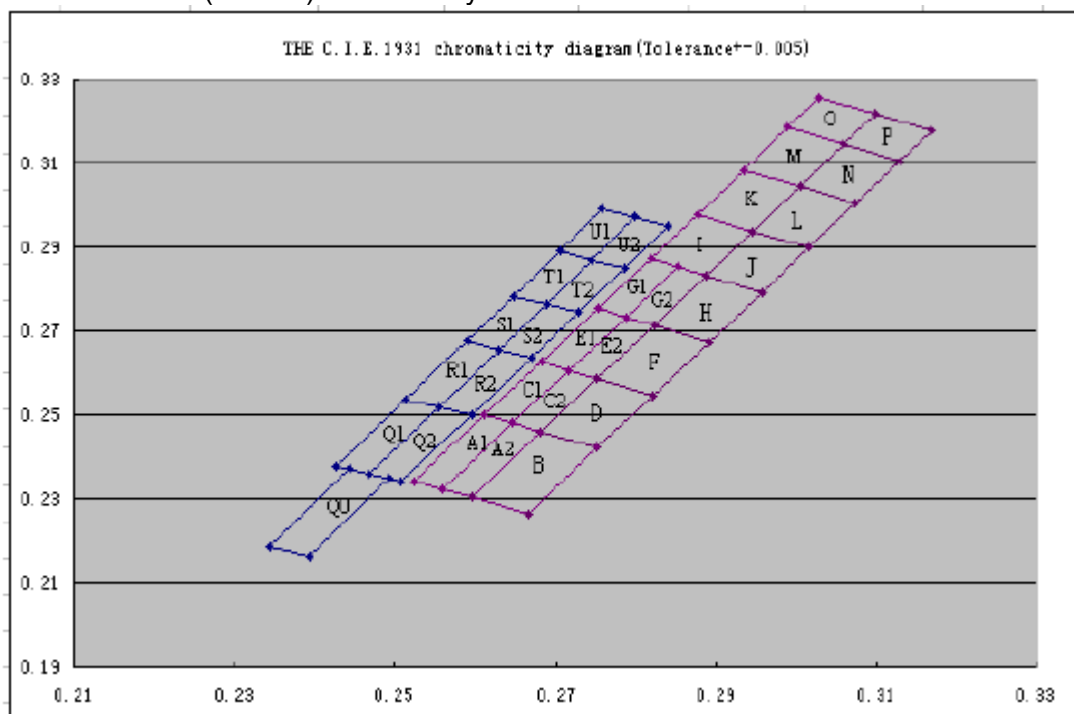
Forward Current	I_F	--	200	--	mA	30 LEDs(3 LED Serial,10 LED Parallel)
Forward Current Voltage	V_F	8.4	9.0	9.45	V	
Backlight Power Consumption	W_{BL}	--	1800	--	mW	
LED lifetime	--	15000	--	--	hrs	

Note1: The LED driving condition is defined for each LED module (3 LED Serial,10 LED Parallel).

Note2: Under LCM operating, the stable forward current should be input. And forward voltage is for reference only.

Note3: Optical performance should be evaluated at only $T_a=25^{\circ}C$,If LED is driven by high current, high ambient temperature & humidity condition, the life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

Note4: LED C(C1+C2) chromaticity and BIN code 5-2~6-2.

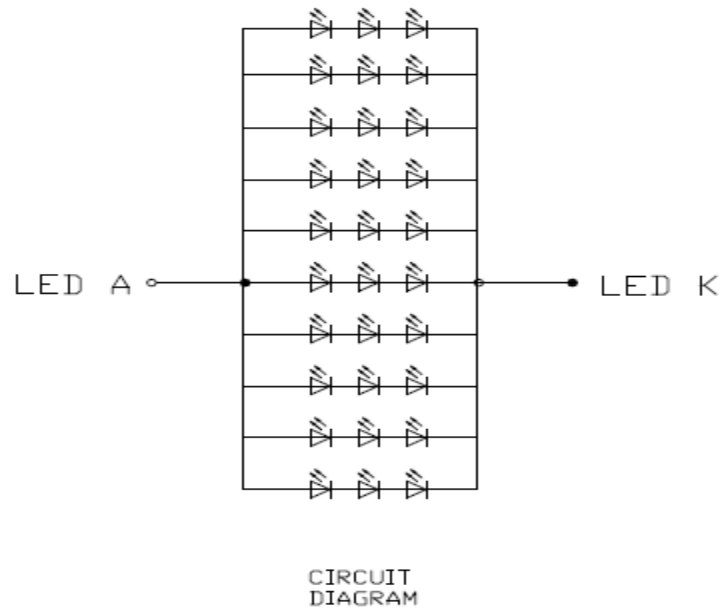


BIN CODE	Min.(v)	Max.(v)
5-2	2.8	2.9
6-1	2.9	3.0
6-2	3.0	3.1

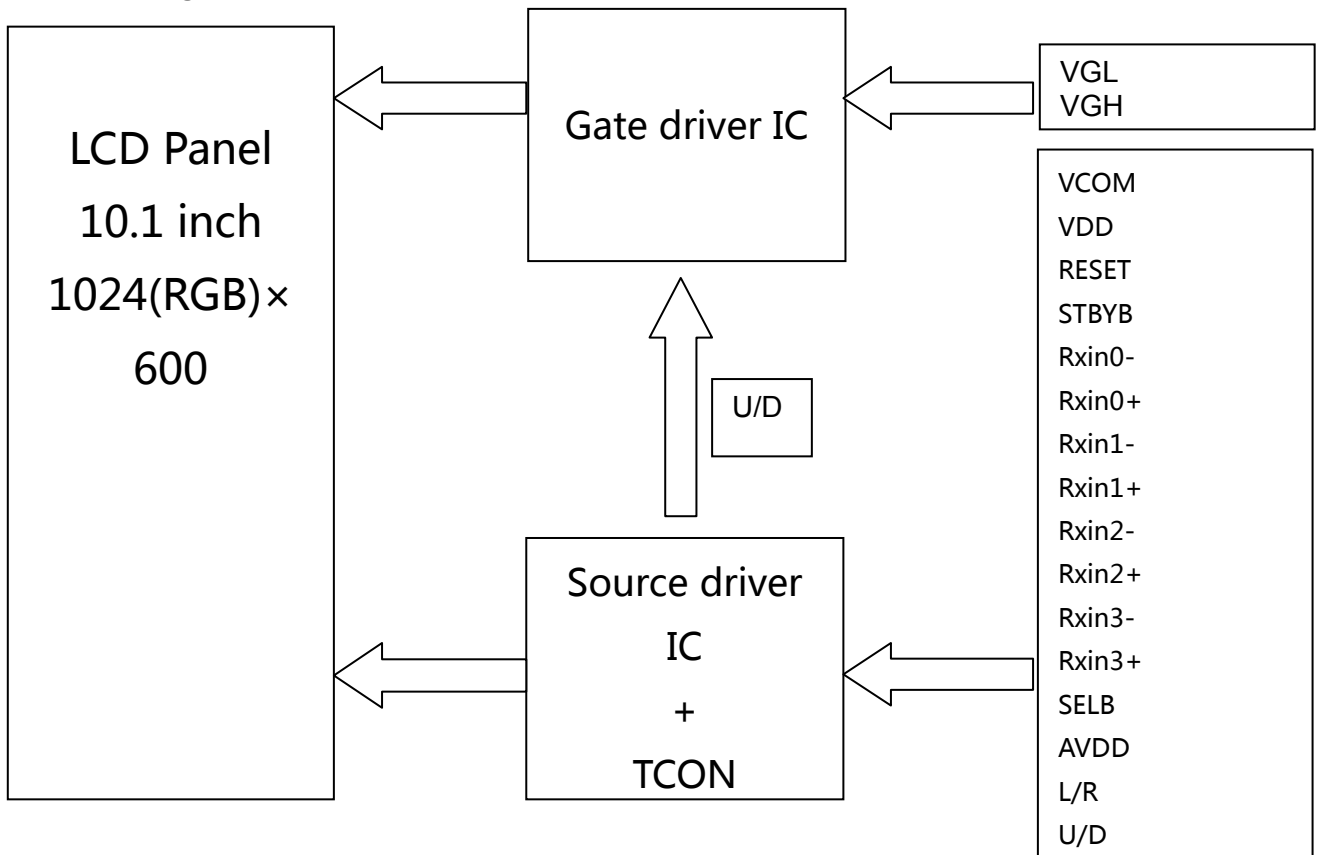
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4.3 Block Diagram

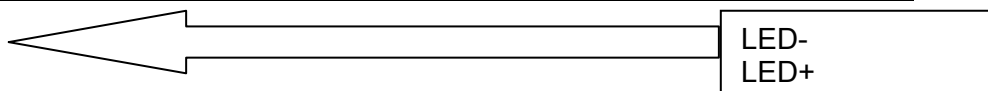


Back light

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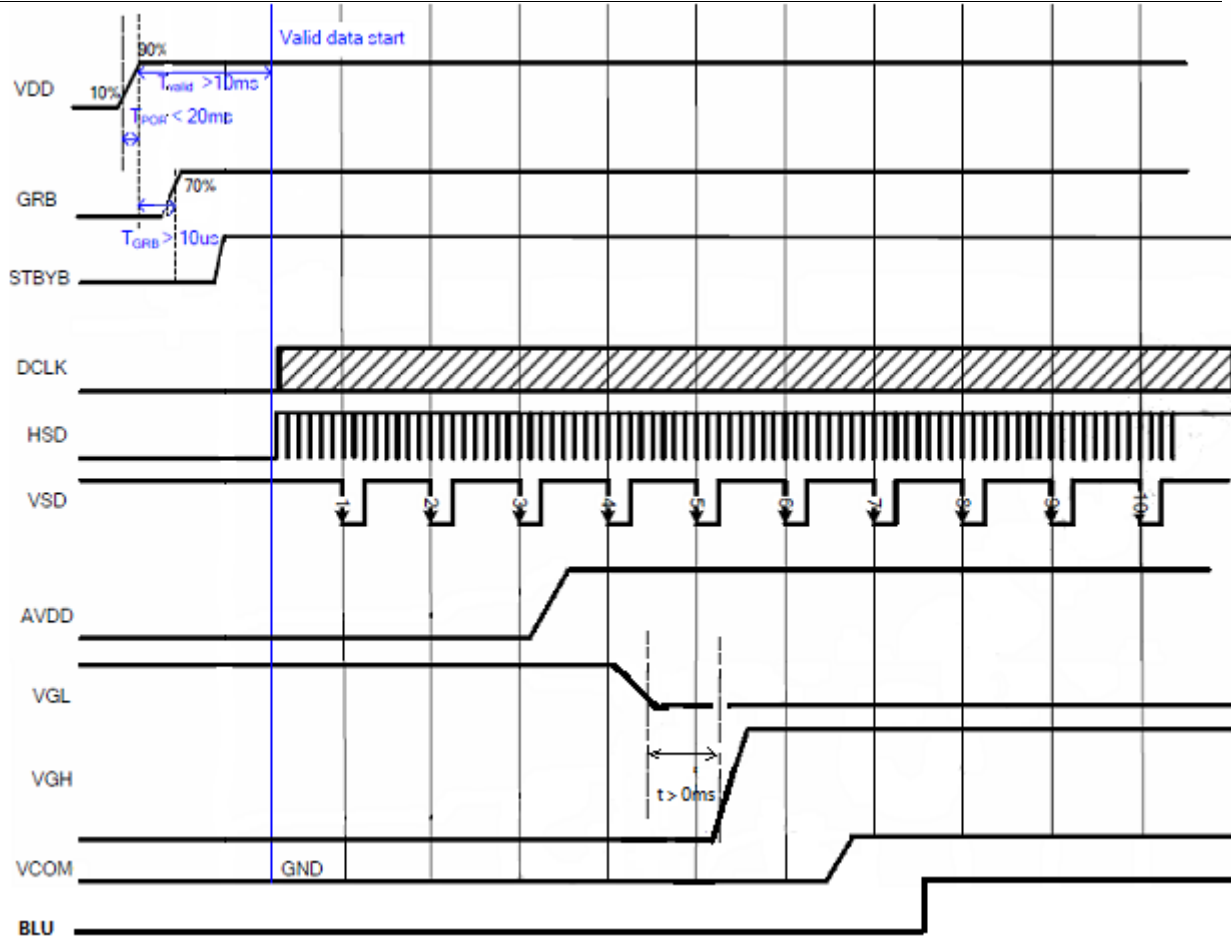
5 Timing Chart

5.1 Power on/off sequence

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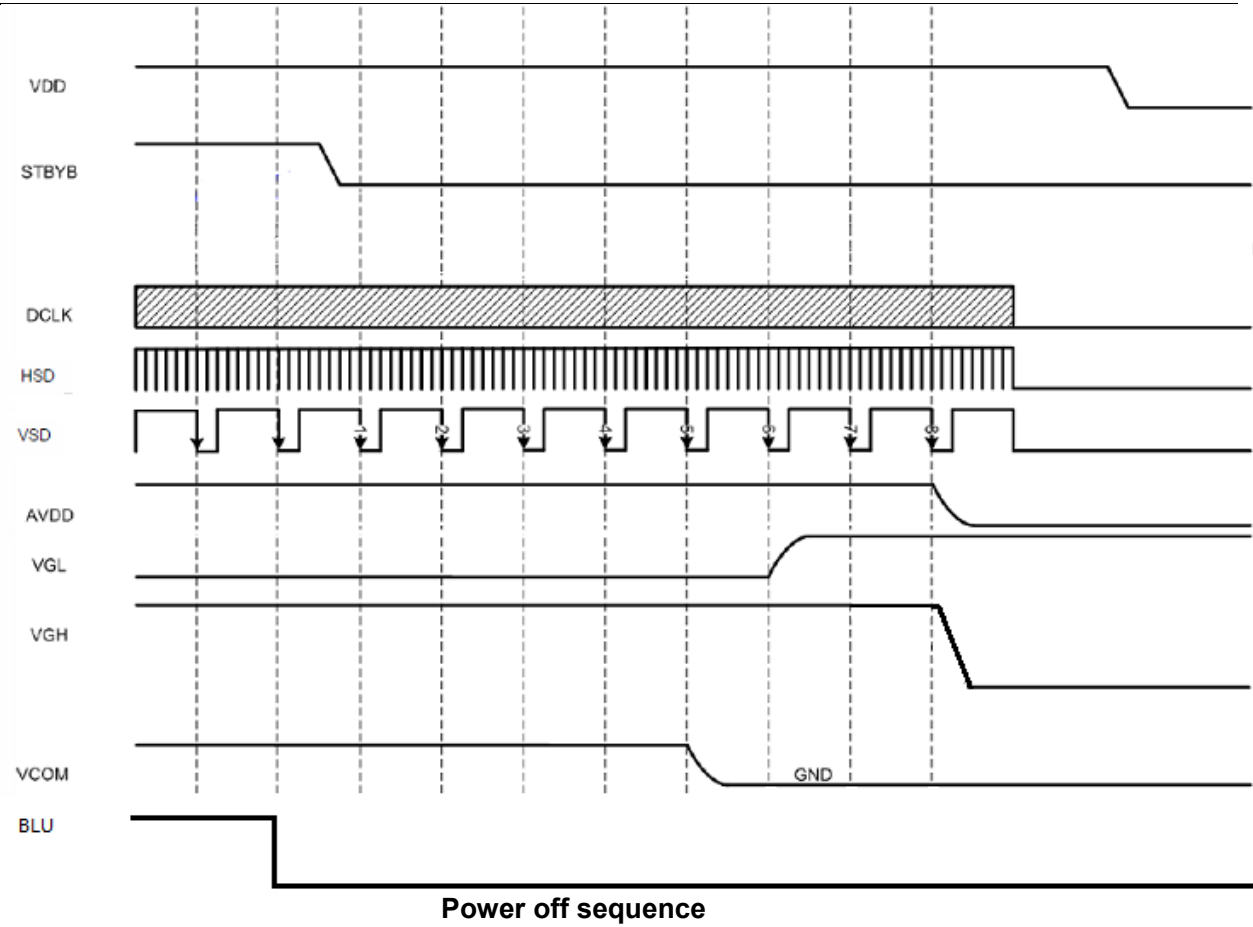


Power on sequence

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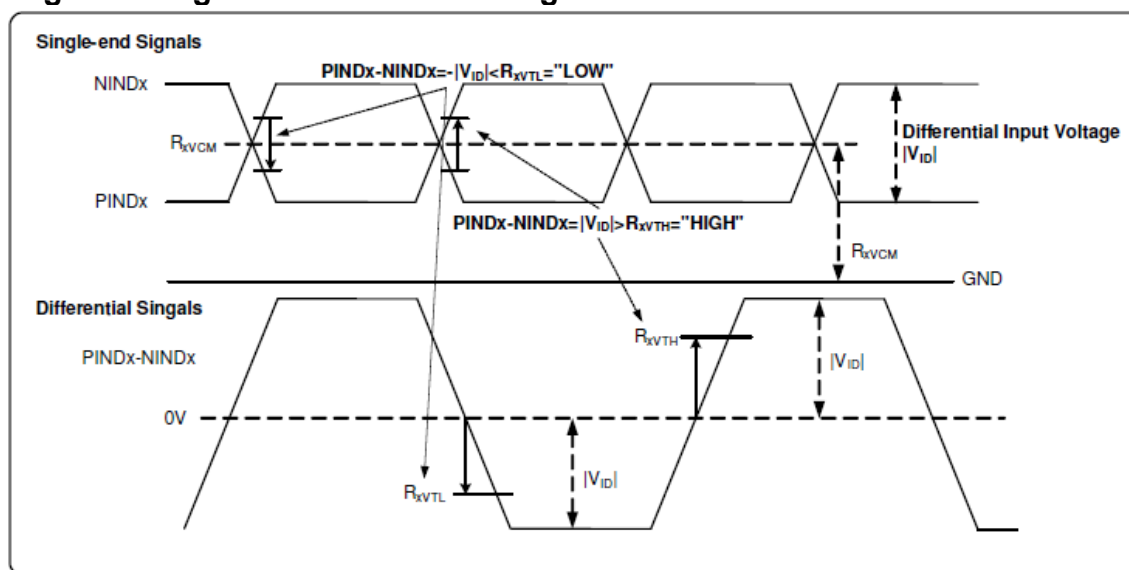
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5.2 LVDS signal timing characteristic

Electrical characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Differential input high Threshold voltage	R_{XVTH}	$R_{XVCM}=1.2V$	-	-	+0.1	V
Differential input low threshold voltage	R_{XVTL}	-	-0.1	-	-	V
Input voltage range (Single-end)	R_{XVIN}	-	0	-	$VDD-1.2+ V_{ID} /2$	V
Differential input common mode voltage	R_{XVCM}	-	$ V_{ID} /2$	-	$VDD-1.2$	V
Differential input voltage	$ V_{ID} $	-	0.2	-	0.6	V
Differential input leakage Current	$R_{V_{XIZ}}$	-	-10	-	+10	μA
LVDS digital operating Current	I_{ddlvds}	$F_{clk}=65MHz, VDD=3.3V$	-	15	30	mA
LVDS digital stand-by Current	I_{stlvds}	Clock & all functions are stopped	-	10	50	μA

Single-end signals & Differential singals

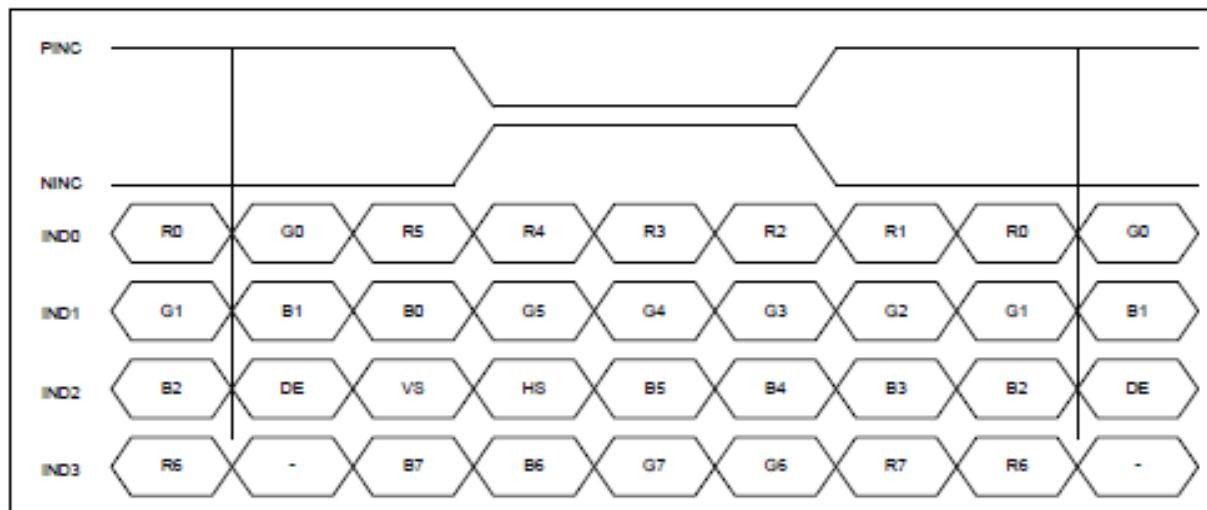


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5.3 LVDS mode data input format 8-bit LVDS input Timing



DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	40.8	51.2	67.2	MHz
Horizontal display area	thd		1024		DCLK
HSD period	th	1114	1344	1400	DCLK
HSD blanking	thb+ thfp	90	320	376	DCLK
Vertical display area	tvd		600		T _H
VSD period	tv	610	635	800	T _H
VSD blanking	tvbp+ tvfp	10	35	200	T _H

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5.4 Display colors and input data signals

This product can display in equivalent to 16,777,216 colors in 256 gray scales. Also the relation between display colors and input data signals is as the following table.

Display colors		Data signal (0: Low level, 1: High level)																							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑																								
	↓																								
	bright	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	↑																								
	↓																								
	bright	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Blue gray scale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	↑																								
	↓																								
	bright	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0

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6 Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark	
View Angles	θT	$CR \geq 10$	65	75	-	Degree	Note2,3	
	θB		70	80	-			
	θL		70	80	-			
	θR		70	80	-			
Contrast Ratio	CR	$\theta=0^\circ$	600	800	-		Note 3	
Response Time	T_{ON}	25°C	-	7	10	ms	Note 4	
	T_{OFF}		-	9	18			
Chromaticity	White	Backlight is on	x	0.241	0.281	0.321		Note 1,5
			y	0.260	0.300	0.340		
	Red		x	0.518	0.558	0.598		Note 1,5
			y	0.288	0.328	0.368		
	Green		x	0.276	0.316	0.356		Note 1,5
			y	0.522	0.562	0.602		
	Blue		x	0.115	0.155	0.195		Note 1,5
			y	0.074	0.114	0.154		
Uniformity	U		70	80	-	%	Note 6	
NTSC			40	50	-	%	Note 5	
Luminance	L		250	300	-	cd/m ²	Note 7	

Test Conditions:

1. $I_F=20$ mA, and the ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

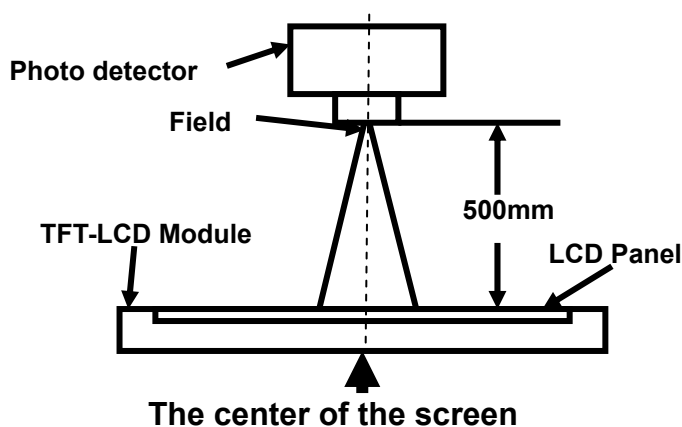
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Note 1: Definition of optical measurement system.

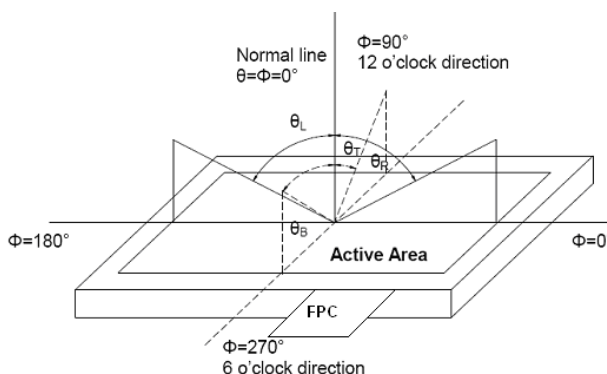
The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen.



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).



Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

“White state “: The state is that the LCD should drive by voltage of white.

“Black state”: The state is that the LCD should drive by voltage of black.

Note 4: Definition of Response time

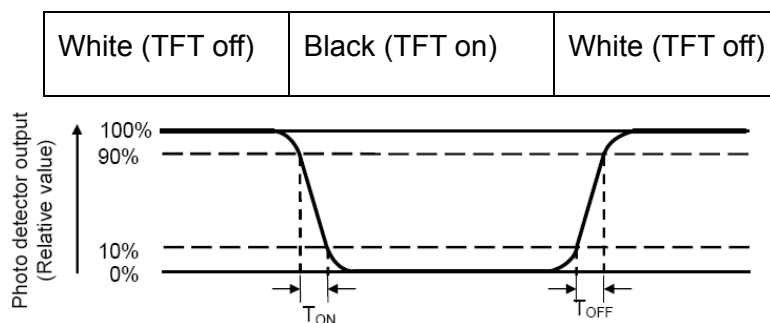
The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10%

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to 90%.



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas as below. Every measuring point is placed at the center of each measuring area.

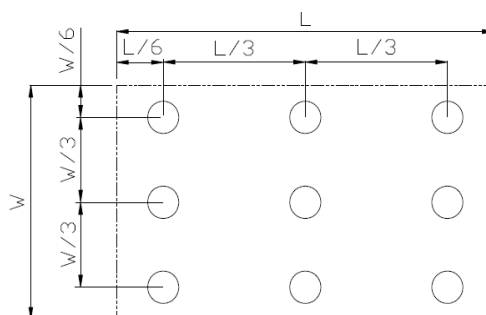
$$\text{Luminance Uniformity (U)} = L_{\min} / L_{\max}$$

L_{\max} : The measured Maximum luminance of all measurement position.

L_{\min} : The measured Minimum luminance of all measurement position.

L -----Active area length

W ----- Active area width



Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

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7 Environmental / Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ta= +50°C,240hrs	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	Ta= -10°C,240hrs	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	Ta = +60°C,240hrs	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	Ta = -20°C,240 hrs	IEC60068-2-1:2007 GB2423.1-2008
5	Storage and Operation at high Temperature and Humidity	Ta=+60°C, 90% RH 240 hours	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-20°C 30 min~+60°C 30 min, Change time:5min,100 Cycles	Start with cold temperature, End with high temperature, IEC60068-2-14:1984,G B2423.22-2002
7	ESD	MM model : 0Ω /200pF ±200 V HBM model : 1.5kΩ/100pF ±1500 V	IEC61000-4-2:2001 GB/T17626.2-2006
8	Vibration Test	Stroke:1.5G Sweep:10Hz~500 Hz 0.5 hours for each direction of X.Y.Z. (1.5 hours for total)	IEC60068-2-6:1982 GB/T2423.10—1995
9	Mechanical Shock (Non OP)	60G 6ms, ± X,± Y,± Z 3times, for each direction	IEC60068-2-27:1987 GB/T2423.5—1995

Note1: Ta is the ambient temperature of sample.

Note2: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Note3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation.

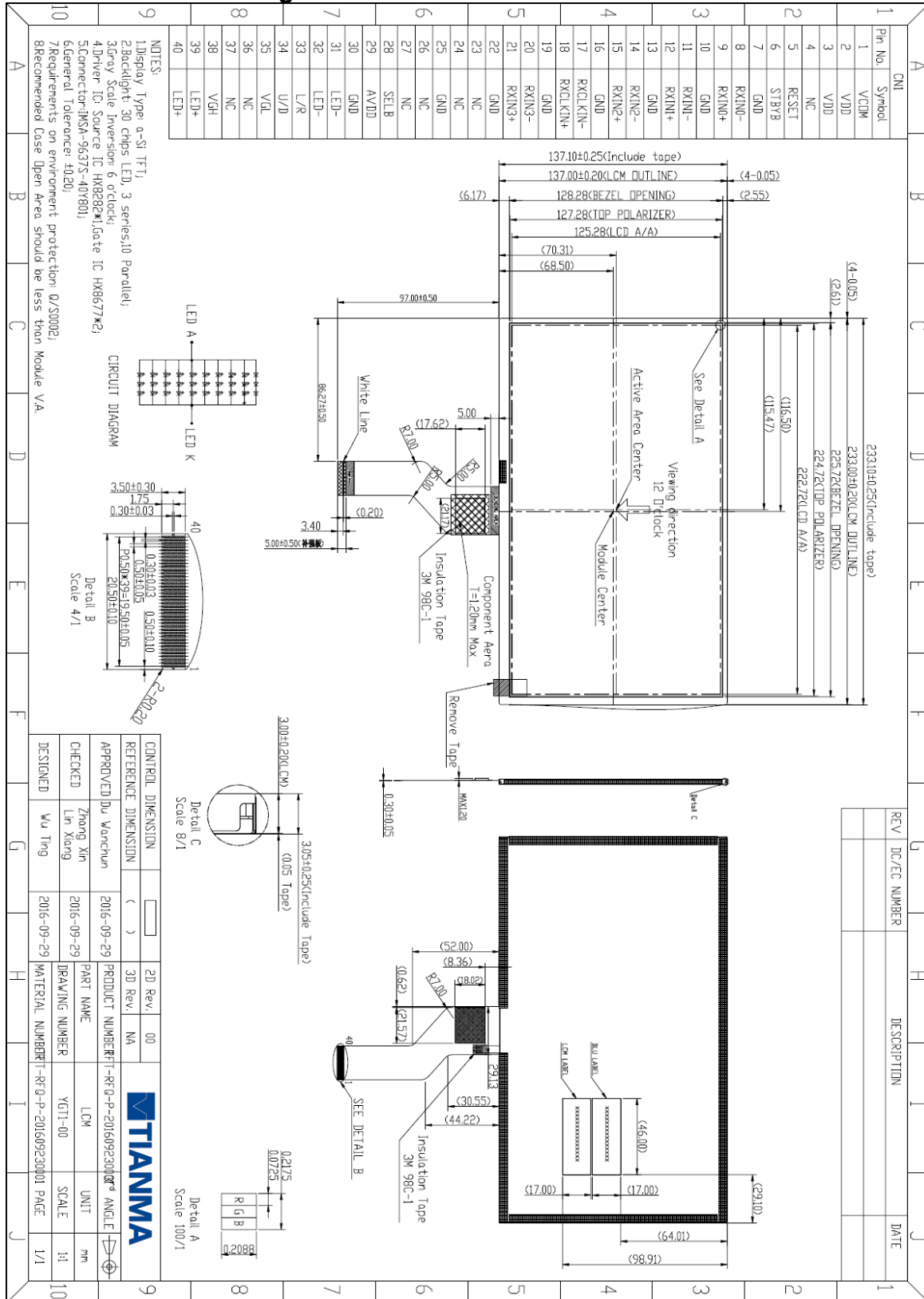
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8 Mechanical Drawing

8.1 Mechanical Drawing

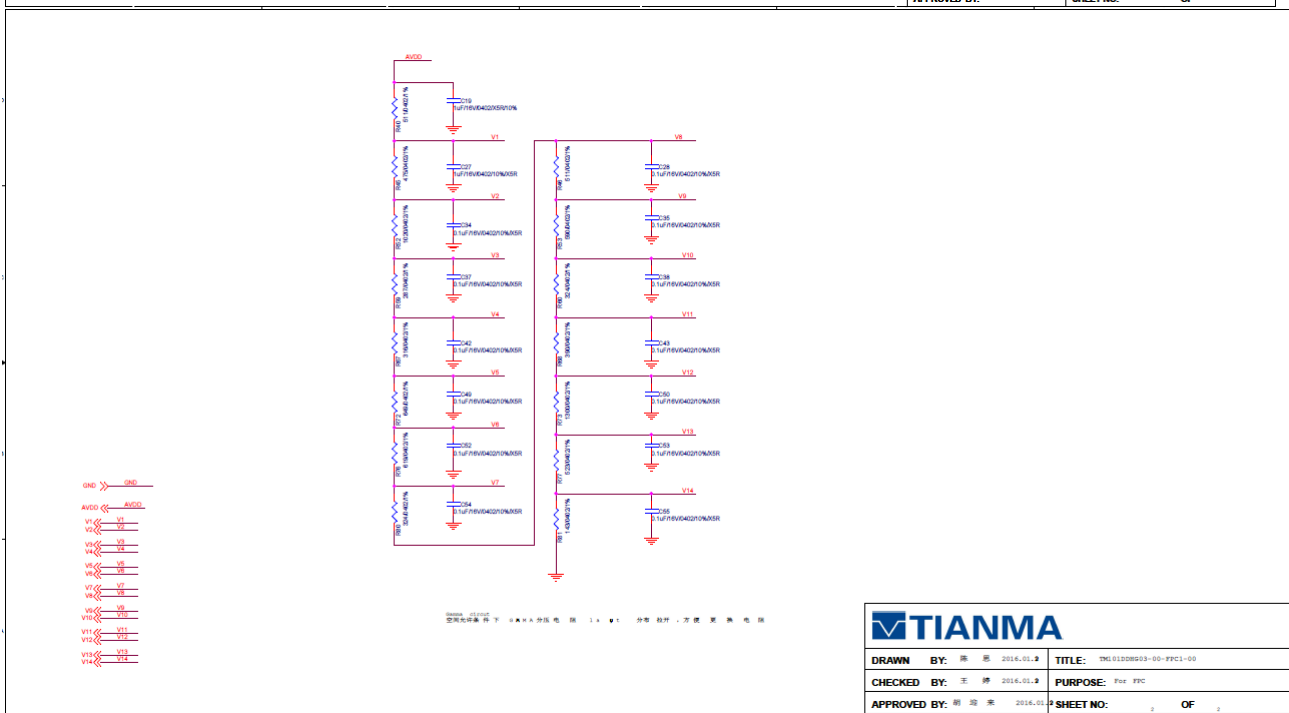
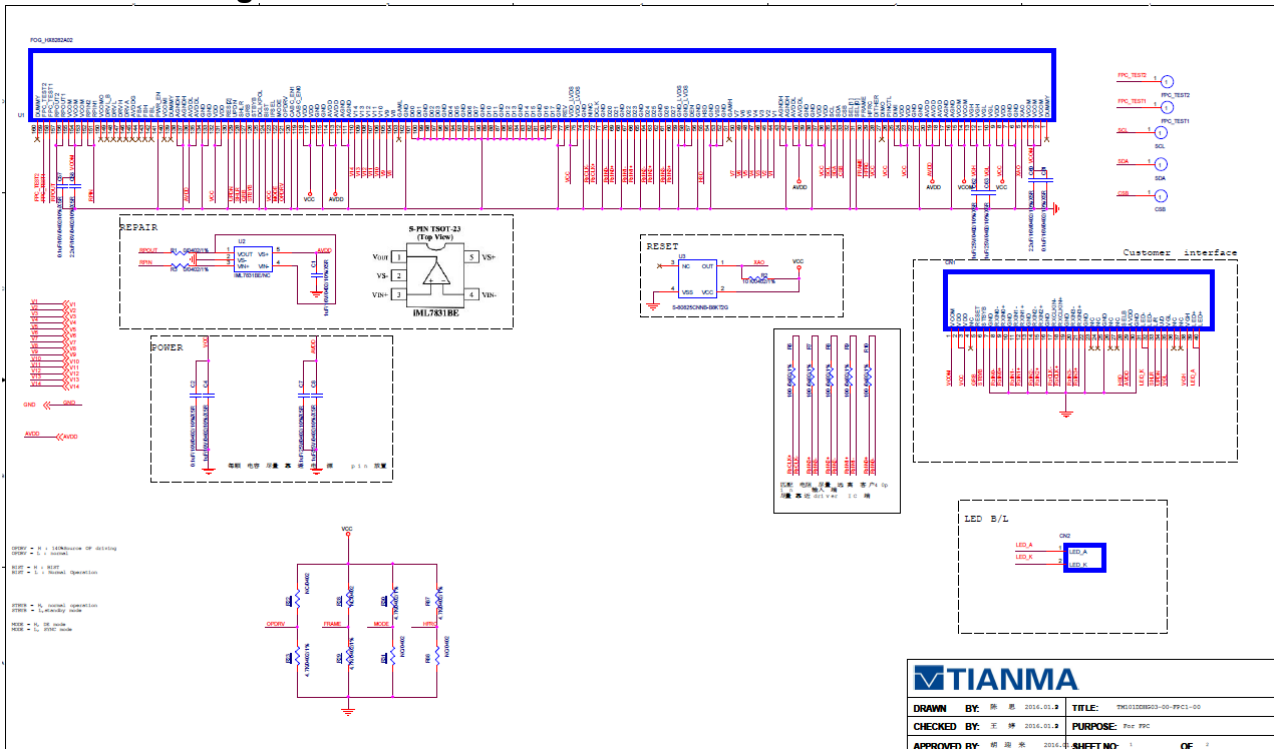


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8.2 FPC Drawing

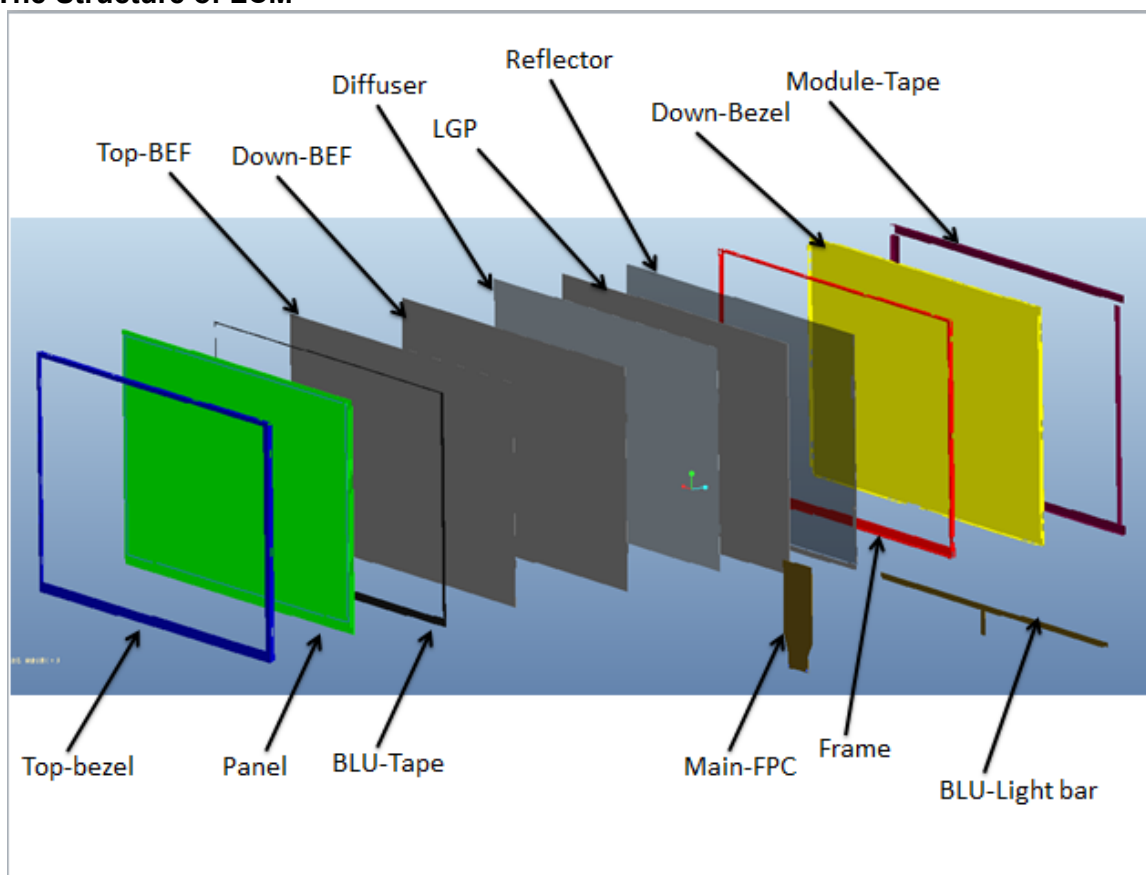


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Model No.TM101DDHG04

8.3 The Structure of LCM



Part List

NO	Parts	Parts No.	Supplier	Material	Supplier	Parts NO. of Supplier
1	Top Bezel	1610315671	Huiqun	Top Bezel	Huiqun	1610315670
2	Top Pol	1040325450	Sanlipu	Top Pol	Sanlipu	1040325450
3	Bottom pol	1040325460	Sanlipu	Bottom pol	Sanlipu	1040325460
4	TFT-Glass	1017000170	Nippon Electric Glass	TFT-Glass	Nippon Electric Glass	1100*1300
5	Color Filter	F1Y10B050	Inesa	Color Filter	Inesa	T101DSG01T1A
6	Liquid crystal	1057000380	HCCH	Liquid crystal	HCCH	HAG635137-A
7	Source IC	1590322930	HIMAX	Chip	Maxchi	Silicon
				Gold bump	ChipMOS	Gold

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Model No.TM101DDHG04

NO	Parts	Parts No.	Supplier	Material	Supplier	Parts NO. of Supplier
8	Gate IC	1590003320	HIMAX	Chip	UMC	Silicon
				Gold bump	Chipbond	Gold
8	Backlight	1580327041	Weizhi	FPC	Jinpeng	FPC
				Housing	Chuguang	URZ2501
				Reflector	Tianlihui	UXQ1-100
				LGP	Yuanli	PMMA
				Diffuser	Jizhi	B100s2
				Prism Down	Guangyao	KL77-150
				Prism Up	Guangyao	SH26-150
				LED	Jufei	CBS206W
				Bezel-Down	Dacheng	SUS304
				Black-White double side tape	Zongyan	SK-8960WB
				Double side tape	Zhongyi	5072
				Transparent PET	Lianchu	LC-100D
				Double side tape	Jishui	550P5BS
				Blue release paper	Zhongyi	Blue release paper
				Black-White side tape	Zhongyi	3G-BW650M
				Release film	Zongbang	Z-75140L
				Black-Black double side tape	Jishui	550MBS
Double side tape	Tianlihui	3803BH				
Solder	Yongan	LF-RMAF8F2				
Black ink	Anjiete	70000-00030				

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Model No.TM101DDHG04

NO	Parts	Parts No.	Supplier	Material	Supplier	Parts NO. of Supplier
9	FOG-ACF	1510000260	Sony	ACF	Sony	CP1220 IS 50M
10	COG-ACF	1510290460	UKC	ACF	UKC	ACF-CP34531-18YA
11	FPC	1540344300	Sandeguan	Base Film	Xinyang	W-1003ED-N2
				Protect Film	Taihong	FHT0515
				PI	Yaseng	AHIPI820XSS1
				Thermosetting Adhesive	Dongyi	P40-250A1
				Ink	Taiyang	S-411W
				NI	Xiejun	KG-531
				Au	Xiejun	KG-545
				Resistance	Dayi	RM04FTN6490 RM04FTN5230
				Capacitance	Murata	GRM155R61C105KA12D GRM155R61A105KE15D GRM155R61E104KA87D GRM155R61E105KA12D
				Capacitance	Sumsung	CL05A104KP5NNNC CL05A104K05NNNC CL05A225K05NQNC
				Resistance	Guoju	RC0402FR-07511RL RC0402FR-07475RL RC0402FR-071K02L RC0402FR-07287RL RC0402FR-07316RL RC0402FR-07619RL RC0402FR-07324RL RC0402FR-07590RL RC0402FR-07390RL RC0402FR-071K3L RC0402FR-07143RL RC0402FR-070RL RC0402FR-0710KL RC0402FR-07100RL RC0402FR-074K7L
				IC	Seiko	S-80825CNNB-B8KT2U
				Solder	Tamura	TLF-204-NH

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Model No.TM101DDHG04

NO	Parts	Parts No.	Supplier	Material	Supplier	Parts NO. of Supplier
12	UV glue	1520000180	Hitachi	UV glue	Hitachi	TF-3348-50F
13	UV glue	1520000120	DYMAX	UV glue	DYMAX	DYMAX-3069-T-moto HF
14	Tape	1670000940	Juxiang	Tape	Huangguan	7965 7982
				Red tape	Xianchu	-
15	Insulation tape	1670319790	Hongju	Insulation Tape	3M	3M 98C-12
				PET	Xianchu	-
16	Insulation tape (Bul)	1670319860	Renhong	Insulation tape	3M	98C-1

8.4 Product Code

8.4.1 Bar Code definition on module



Note: Bar Code definition

Definition label is Panel ID, and it is unique and includes manufacture relevant information, for instance TM101DDHG04. Label definition as below:

M 1 P 6B00400M00 6 B 2 01G
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Means shop code A(Array)、C(Cell)、F(CF)、M(Module)
- ② Means Fab ID 1~9
- ③ Means Production Type P(production)、E(Engineering)、D(Dummy)、T(Test)
- ④ Means Lot ID
- ⑤ Means Years, 0(2010)~9(2019)
- ⑥ Means Months 1~9,A(Otc)、B(Nov)、C(Dec)

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Model No.TM101DDHG04

- ⑦ Means Day ...1~31 Day means 1~9 and A~X (Not included I and O)
- ⑧ Means Serial Number 001~ZZZ (Not included I and O)

8.4.2 Product Name Criterion

TFT Module Code		Active Area(size)	Resolution	Product Type	Producing Area	Serial NO.1		Serial NO.2	
T	M	XXX	X	X	H	X	X	X	X

Note: Serial NO.2 will vary as product material change, and serial number manage product inside of factory.

For Instance: TM:TIANMA Active Area(size): 3.5inch ---035;10.4inch---104;
Producing Area: H means shanghai Tianma

Resolution	480x240	640x240	960x240	1024x600	128x128	128x160	176x220	240x320
Symbol	A	B	C	D	E	F	G	H
Kind	Delta	Delta	Delta	Stripe	Stripe	Stripe	Stripe	Stripe
Resolution	176x220	1366x800	320x240	240x400	1440x900	400x240	480x234	320x480
Symbol	G	J	K	L	M	N	U	P
Kind	Stripe	Stripe	Stripe	Stripe	Stripe	Stripe	Stripe	Stripe
Resolution	640x480	800x480	800x600	1024x768	others			
Symbol	Q	R	S	T	X			
Kind	Stripe	Stripe	Stripe	Stripe	--			

8.4.3 Product Name Criterion

TSP+BL(CCFL)+FPC+M4	A
TSP+BL(LED)+FPC+M4	B
BL(CCFL)+FPC+M4	C
BL(LED)+FPC+M4	D
BL(LED)+FPC+M4.Dual Display	E
FPC+M4	F
M4	G
M3	H
M2	Y
M1	J
BL(CCFL)+FPC+M4+PCB	K

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Model No.TM101DDHG04

BL(LED)+FPC+M4+PCB	L
TSP+BL(CCFL)+FPC+M4+PCB	M
TSP+BL(LED)+FPC+M4+PCB	N
Others	X
M1:Panel(array+CF)	
M2:Panel(array+CF+LC)	
M3:Panel(array+CF+LC+PLZ)	
M4:Panel(array+CF+LC+PLZ+Driver)	

Note:

CF: Color Filter, LC: Liquid Crystal, PLZ: Polarization Plate.

8.4.4 Product Manufacture Area

Cell Manufacturer: Shanghai AVIC Optoelectronics Co.,Ltd.

Address: 3388th Huaning Rd.Minhang District,Shanghai.China 201108

Country of Origin: China

Module Manufacturer: ShanghaiTianma Micro-Electronics Co.,Ltd.

Address: 889 huiqing Rd.Pudong District,Shanghai.China 201201

Country of Origin: China

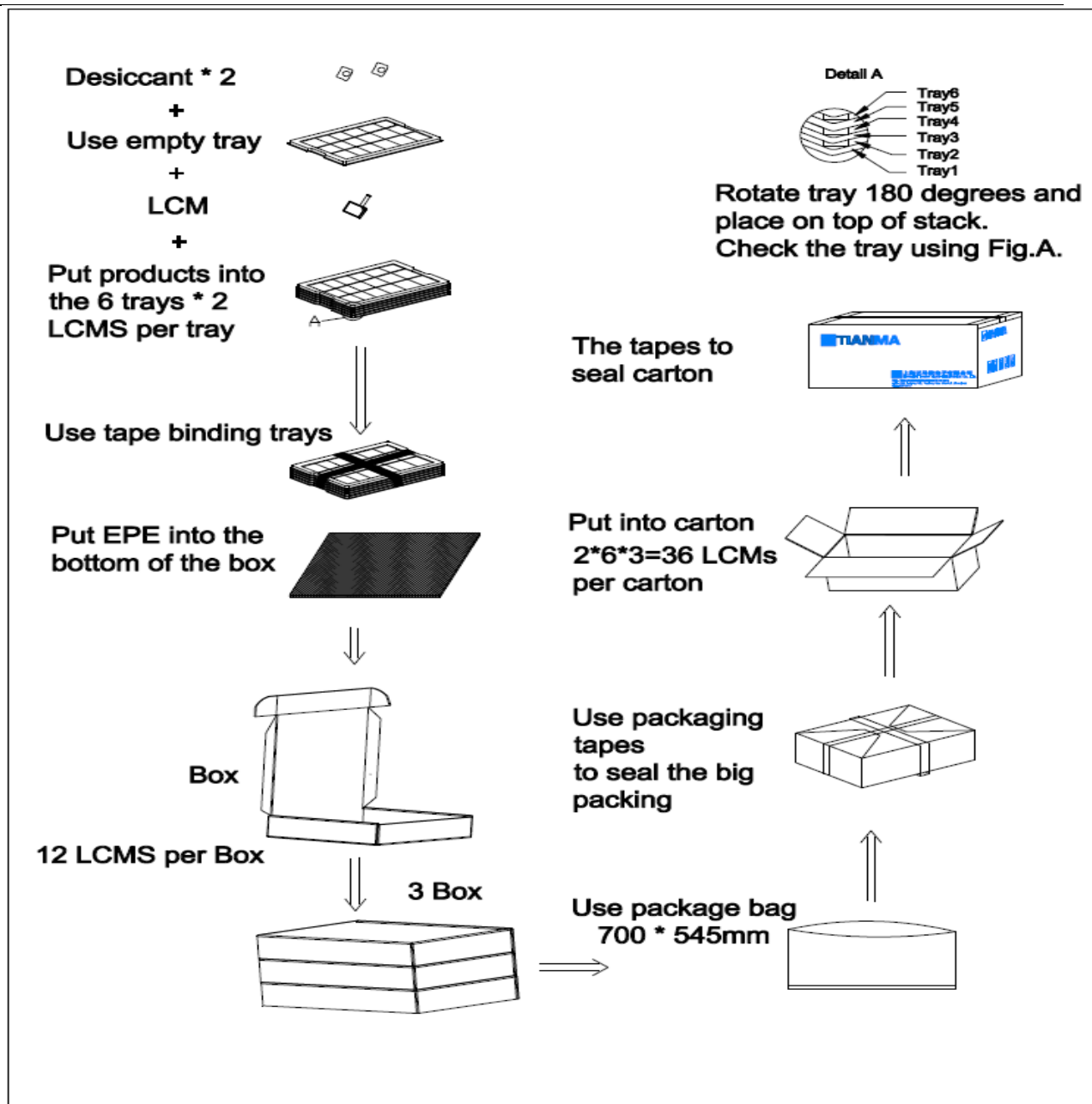
9 Packing Drawing

No	Item	Model (Material)	Dimensions(mm)	Unit Weight(Kg)	Quantity	Remark
1	LCM module	TM101DDHG04	233×137×3.00mm	0.210	36	
2	Tray	PET (Transmit)	485×330×14.00mm	0.150	21	
3	Dust-Proof Bag	PE	700×545×0.05mm	0.021	1	
4	EPE	EPE	485*330*5mm	0.545	3	
5	Box	CORRUGATED PAPER	520*345*74mm	0.227	3	
6	Desiccant	DESICCANT	45×35	0.002	6	
7	Carton	CORRUGATED PAPER	544*365*250mm	1.01	1	
8	Total weight	14.07 ±5% Kg				

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Model No.TM101DDHG04



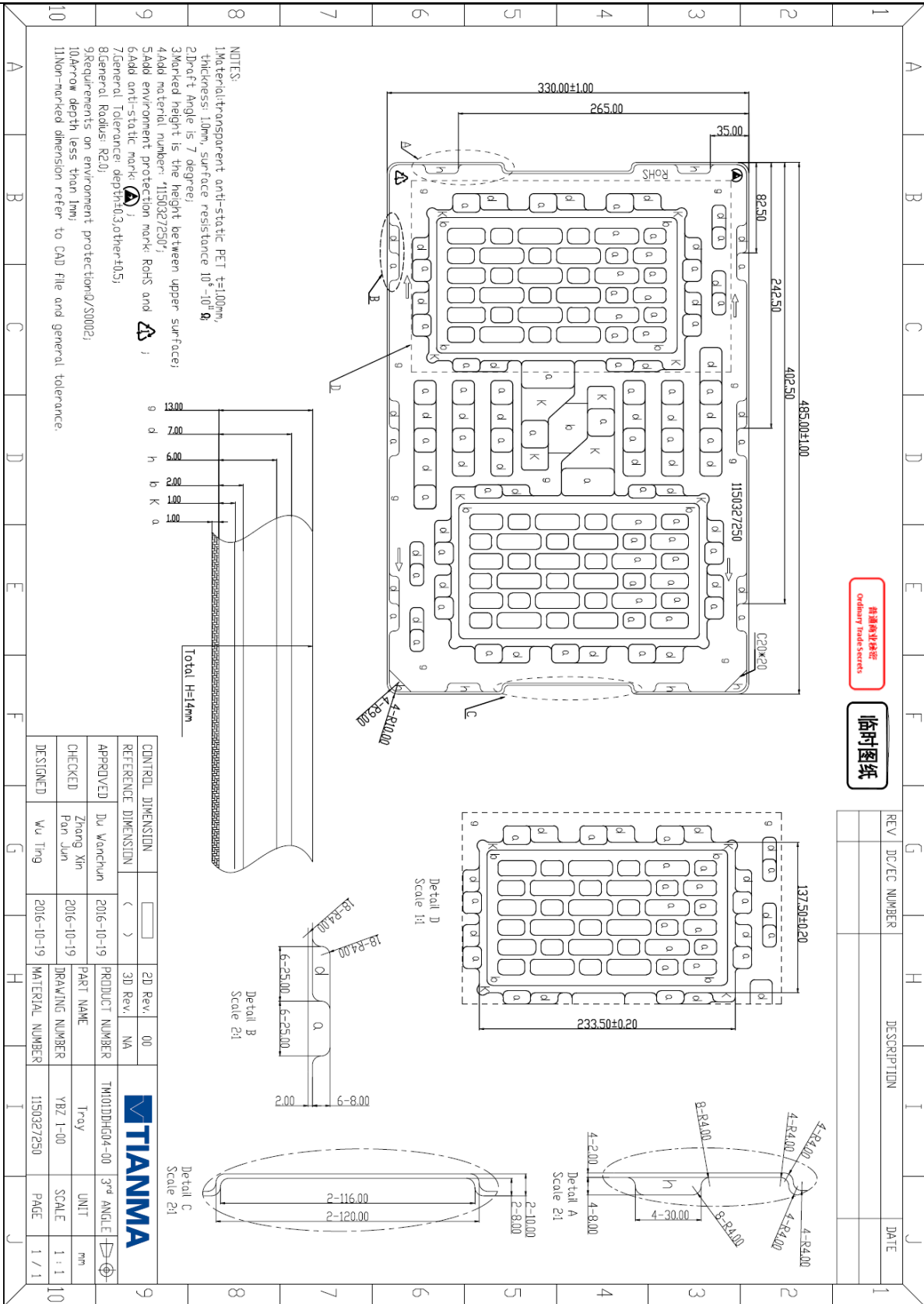
Carton ID



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10 Precautions for Use of LCD Modules

10.1 Handling Precautions

- a. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- b. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- c. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- d. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- e. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcoholSolvents other than those mentioned above may damage the polarizer. Especially, do not use the following: — Water — Ketone — Aromatic solvents
- f. Do not attempt to disassemble the LCD Module.
- g. If the logic circuit power is off, do not apply the input signals.
- h. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
 1. Be sure to ground the body when handling the LCD Modules.
 2. Tools required for assembly, such as soldering irons, must be properly ground.
 3. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
 4. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2 Storage precautions

- a. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.
- b. The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:
Temperature : 0°C ~ 40°C Relatively humidity: ≤80%
- c. The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 Transportation Precautions

- a. The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.



Model No.TM101DDHG04

11 Outgoing Inspection Report

OQC 成品出货检验报告 OUTGOING INSPECTION REPORT		保存部门 Dept.	QC
		保存期限 Save	管理日期+3年
		保存方式 How	纸档/电子档
物料名称 Model NO		检查日期 Check Date	出货数量 Outgoing Numbers
客户 Customer P/N		订单号 Order NO	结果 Result [] OK [] NG
供应商 Supplier P/N	上海天马微电子股份有限公司	<input type="checkbox"/> 正常检查 Normal Inspection <input type="checkbox"/> 放宽检查 Reduced Inspection <input type="checkbox"/> 加严检查 Tightened Inspection <input type="checkbox"/> 全数检查注 Total Inspection	
检查项目 Items of Inspection		规格标准 Standard	
外观检查 Visual Inspection		"TFT-LCD Module出货检验标准 TFT-LCD Module outgoing inspection standards" [] OK [] NG	
电性检查 ET		TFT-LCD Module出货检验标准 TFT-LCD Module outgoing inspection standards [] OK [] NG	
包装检查项目 Item of Packaging Inspection			
检查项目 Items of Inspection		检查结果记录 Result	
1. 检查产品型号、等级、工单与入库单是否一致 1.check the product name,level and work order is consistent with shipping order or not		[] OK [] NG	
2. 检查内箱数量与外箱标签数量是否一致 2.check the number of innerbox is consistent with the record on lable or not		[] OK [] NG	
3. 检查包装方式是否与包装式样书规范一致 3.check the packing method is the same as packed sample or not		[] OK [] NG	
4. 检查外箱标签是否齐全、整洁、符合要求 4.check the label on outer box is complete, clean and compliance or not		[] OK [] NG	
5. 确认客户有无特殊需求，有特殊需求需根据客户特殊需求作业。 5. recognize the special needs of customer, and whether operating according to the needs		[] OK [] NG	
仓库检查项目 Warehouse inspection items			
检查项目 Items of Inspection		检查结果记录 Result	
1. 检查出货型号、数量、等级与出货通知单是否一致。 1.check the shipment module name,quantity,level and shipment notification is consistent.		[] OK [] NG	
2. 检查仓库唛头信息内容及贴附方式是否正确。 2.check the content of warehouse marks and the method of attached is correct ot not		[] OK [] NG	
3. 检查每托产品外箱表面是否清洁、平整、无明显破损、变形。 3.check each outer-box is clean,smooth and without obvious damage and deformation		[] OK [] NG	
4. 确认客户有无特殊需求，有特殊需求需根据客户特殊需求作业。 4.recognize the special needs of customer, and whether operating according to the needs		[] OK [] NG	
备注：此批产品出货满足客户的环保要求 Notes: This batch of products meets the customer's HSF requirements .			
		OQC Prepared	Check
			Approved
		/	

SH-J-FM0100703 Rev1.3

Note: This Outgoing Inspection Report what is suitable for all lot of modules is give to customer.

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Model No.TM101DDHG04

12 QC Flow Chart

12.1 Array QC Flow Chart

QC flow chart										
Module Name:TM101DDHG03			Revision:1.0		Responsibility:QC					
Date(Orig.): 2016-1-04			Date(Rev.):		Prepared by:Zhangheng Xiang		Approved by:Dongjin Song			
Process	Management Item	Quality Spec	Measuring instrument/ Inspection method	Sample size & frequency		Control method	Responsibility	Reaction Plan		
				LOT ID	SLOT ID					
PVD	pre-depo	1. EUV lamp(1-4)	all: ON	by meter	all		Recipe setting PQA check	Engineer	stop production and Inform shift Engineer	
		2. Transfer speed	4100-4300 mm/min		all			Engineer		
	PVD	PVD	1. discharge pressure	refer to recipe card	by meter	all		Recipe setting PQA check	Engineer	stop production and Inform shift Engineer
			2. Ar flow			all				
			3. Discharge power			all				
			4. magnet scan times			all				
			5. H(0-4) temperature S(3-5) temperature			2次/天				
	AOI	AOI	1. Gate: Defect number	1. Gate: Defect≤40	AOI	2. 7	1. Gate: 1/2	Recipe setting	Engineer	stop production and Inform shift Engineer
			2. S/D: Defect number	2. S/D: Defect≤30		2. S/D: 1/2/3				
			3. ITO: Defect number	3. ITO: Defect≤40		3. ITO: 1/2/3/4				
	RS	RS	1. Gate RS	RS: ≤ 0.45±0.07W/□	RSM100	1. 6	1. Gate: 1/2	Recipe setting	Engineer	stop production and Inform shift Engineer
			2. S/D RS	RS: ≤ 0.58±0.2W/□	RSM100	1. 6	2. S/D: 1/2/3	Recipe setting	Engineer	stop production and Inform shift Engineer
3. ITO RS			RS: ≤ 85±40W/□	RSM100	1. 6	3. ITO: 1/2/3/4	Recipe setting	Engineer	stop production and Inform shift Engineer	
GATE Thickness	GATE Thickness	Thickness & uniformity	Thickness: 2600A Uniformity: 10%	AISPR100	1. 6	1/12/23	Recipe setting	Engineer	stop production and Inform shift Engineer	
Process	Management Item	Quality Spec	Measuring instrument/ Inspection method	Sample size & frequency		Control method	Responsibility	Reaction Plan		
				LOT ID	SLOT ID					
CVD	pre-depo cleaning	1. EUV lamp(1-4)	all: ON	by meter	all		Recipe setting PQA check	Engineer	stop production and Inform shift Engineer	
		2. Transfer speed	4100-4300 mm/min		all			Engineer		
	CVD	CVD	Deposition Time	refer to Array recipe card	by meter	all		Recipe setting PQA check	Engineer	stop production and Inform shift Engineer
			Gas ingredient			all			Engineer	
			Pressure			all			Engineer	
			Space			all			Engineer	
			R/F power			all			Engineer	
			Chamber Temperature			all			Engineer	
			AOI			AOI	1. Active: Defect number		1. Active: Defect≤30	
	2. Passivation: Defect number	2. Passivation: Defect≤30		2. 7	1/2		Engineer			
	Thickness measure	Thickness measure	1. Active: Thickness & uniformity	Thickness: SiNx 3000 ±300A a-Si 2000 ±200A n ⁺ -a-Si 500 ±50A Uniformity: ≤ ±10%	AIELL100 AISPR100	1. 6	1/2/3	Recipe setting	Engineer	stop production and Inform shift Engineer
			2. Passivation: Thickness & uniformity	Thickness: P-SiNx 2000 ±200A Uniformity: ≤ ±10%	AISPR100		1/2/3	Recipe setting	Engineer	stop production and Inform shift Engineer

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Model No.TM101DDHG04

Process	Management Item	Quality Spec	Measuring instrument/ Inspection method	Sample size & frequency		Control method	Responsibility	Reaction Plan		
				LOT ID	SLOT ID					
PHOTO	Cleaning	EUV illuminance	≥40mw/cm2, Uni. <15%	TEL CS1000	1/week		{Euv intensity measurement}	Engineer	adjust the recipe	
	Bake									
	Cooling									
	PR Coating	TPR	1.5±0.05um, Uni. ±4%	SR	1/2weeks		{TPR Trend Chart}	Engineer	adjust the recipe	
	Bake	VCD Parameter	refer to Array recipe card	TEL CS1000	all		Recipe setting	Engineer	stop machine	
		SB Parameter			all		Recipe setting PQA check	Engineer	test more and rework	
		HB Parameter			all		Recipe setting PQA check	Engineer	test more and rework	
	Cooling									
	Exposure	Scan speed	refer to Array recipe card	MPA6000	all		Recipe setting	Engineer	adjust the recipe	
		exposure illuminance			1/week		{MPA Intensity Uni.}	Engineer	adjust the recipe	
		Step Parameter			all		Recipe setting	Engineer	adjust the recipe	
	Develop	Development Temperature	23±0.5℃	TEMP MONITOR	1/Shift		{EQ Parameter Check List}	Engineer	stop machine	
		Developer concentration	2.380±0.01%	NAGAS MONITOR	1/Shift		{EQ Parameter Check List}	Engineer	stop machine	
		Developer flow	13L/min, +3/-4	NAGAS MONITOR	1/Shift		{EQ Parameter Check List}	Engineer	adjust the recipe	
		Developer time	refer to Array recipe card	TEL CS1000	all		Recipe setting PQA check	Engineer	test more and rework	
		Defect number	1. Gate:Defect≤40	AIADI300 (100/400)	1. Initial workpiece Confirm 2. 2. 7	1/2/23		daily Process Chart	Engineer	test more and rework
			2. Active:Defect≤30			1/2/23		daily Process Chart	Engineer	test more and rework
			3. S/D:Defect≤30			1/2/23		daily Process Chart	Engineer	test more and rework
			4. Passivation: Defect≤30			1/2/23		daily Process Chart	Engineer	test more and rework
			5. ITO: Defect≤40			1/2/23		daily Process Chart	Engineer	test more and rework
	CDC&OL	CD: ±0.5um	A1CDC100	1. Initial workpiece Confirm 2. 1	1/2/23		SPC	Engineer	rework and adjust the recipe	
		CD bar: ±0.5um			1/2/23		SPC	Engineer	rework and adjust the recipe	
		CD bar: ±0.5um Overlay: <1.2um			1/2/23		SPC	Engineer	rework and adjust the recipe	
		Via: ±0.5um Overlay: <1.2um			1/2/23		SPC	Engineer	rework and adjust the recipe	
		CD bar: ±0.5um Overlay: <1.2um			1/2/23		SPC	Engineer	rework and adjust the recipe	
WET	EUV	EUV illuminance	>40mw/cm2	by meter	1/shift		{EQ Parameter Check List}	Engineer	Inform shift Enginee	
	Etching	Etch time	refer to Array recipe card	by meter	all		Recipe setting PQA check	Engineer	Inform shift Enginee	
		TANK temperature	refer to Array recipe card	by meter	1/shift		{EQ Parameter Check List}	Engineer		
		Chemical concentration	refer to Array recipe card	by EMS	1/shift		{EQ Parameter Check List}	Engineer	Inform shift Enginee	
	Rinse	Spray Flow	refer to Array recipe card	by meter	all		{EQ Parameter Check List}	Engineer	Inform shift Enginee	
	Air. Knife	A. Knife flow	refer to Array recipe card	by meter	1次/shift		{EQ Parameter Check List}	Engineer	Inform shift Enginee	
	Stripper	Oscillation Time	refer to Array recipe card	by meter	all		Recipe setting PQA check	Engineer	Inform shift Enginee	
		Tank temperature	refer to Array recipe card	by meter	1/shift		Recipe setting PQA check	Engineer	Inform shift Enginee	
	Rinse	Spray Flow	refer to Array recipe card	by meter	1/shift		{EQ Parameter Check List}	Engineer	Inform shift Enginee	
	Air. Knife	A. Knife flow	refer to Array recipe card	by meter	1/shift		{EQ Parameter Check List}	Engineer	Inform shift Enginee	
		1. Gate:Defect number	1. Gate: Defect≤40	AI AEI300 (100/200)	1. Initial workpiece Confirm 2. 2. 7	Gate: 1/12/23		Recipe setting	Engineer	Inform shift Enginee
		2. S/D:Defect number	2. S/D: Defect≤30			S/D: 1/12/23			Engineer	Inform shift Enginee
		3. ITO:Defect number	3. ITO: Defect≤40			ITO: 1/12/23			Engineer	Inform shift Enginee
		1. Gate CD	CD: ±0.5um	A1CDC200	1. Initial workpiece Confirm 2. 2. 7	1/12/23		Recipe setting	Engineer	Inform shift Enginee
		2. CD	CD bar: ±0.5um							
	3. S/D CD	CD: ±0.5um								
	4. ITO CD	CD bar: ±0.5um								

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Model No.TM101DDHG04

12.2 Cell QC Flow Chart

Module Name:TM101DDHG03				Revision:1.0		Responsibility:QC		
Date(Orig.): 2016-1-04				Date(Rev.):		Prepared by:Zhangheng Xiang		Approved by: Dongjin Song
process	process name	Management Item	Quality Spec	Measuring instrument/ Inspection method	Sample size & frequency	Control Method	Responsibility	Reaction Plan
	CF Unpack	1. CF corner direction 2. Vacuum Error	1. Upleft 2. >-50kpa	OIC auto inspection +visual inspection	100%	EQ alarm automatic	Engineer	Inform Engineer and IQC
	PI Coat	1. Thickness 2. printing accuracy	1. 1.000±100A 2. ±0.3mm	1. By Array SPR 2. CCD visual insp	1. 2Sheet/week 2. 1S/line change	Process Card	Engineer	Inspect All Sheet and Inform Engineer
	PI Pre Bake	1. Preure Temperature 2. Preure Time	1. 100°C±3° C 2. 120sec	EQ Setting	First Lot 1sheet/Lot	Process Card	Engineer	Inspect All Sheet and Inform Engineer
	PI inspection	1. printing quality	1. CELL inspection standards	AOI inspecting	100%	(PI Inspection record List)	Operator	Inspect All Sheet and Inform Engineer
	PI Main Bake	1. MainCure Temperature 2. MainCure Time 3. Cooling Time	1. 230° C±5°C 2. 1800sec 3. 360sec	EQ Setting	First Lot 1sheet/Lot	Process Card	Operator	Inspect All Sheet and Inform Engineer
	Rubbing	1. Pretilt angle	1. Process card	ODF Cell Gap Instrument	1. 2sheet/LOT	SPC control	Engineer	Inspect All Sheet and Inform Engineer
	Steam Inspection	1. Film appearance	1. No Defect	1. Steam inspection	1. 1sheet/LOT	(Rubbing Inspection record List)	Engineer	product hold, inform Engineer
	Seal Dispence	1. Seal Area Accuracy 2. N2 pressure 3. coating speed	1. Process card 2. 0.45Mpa±0.15Mpa 3. 80mm/s	1. By Laser Sensor 2. EQ Setting	1. 1sheet/10sheet 2. confirm when line change	1. First Piece Check (Seal dispenser condition adjust record sheet) 2. (ODF lint start/change check sheet)	Engineer	product continuous and restart after adjust to normal
	Spacer Spray	1. Spacer density 2. Spray Accuracy 3. Cluster Counter 4. Density inspection point number	1. 220±25ea/mm2 2. CV < 15% 3. L:10; M:20; S:40 4. 20个	1. Spacer Counter 2. OP confirm recipe setting when line change	1. 100% 2. 1sheet(First Lot)	1. All inspect by EQ 2. (ODF line start/change check sheet)	OP	product continuous and restart after adjust to normal
	Speer Cure	1. Cure Temperature 2. Cure Time	1. 120±3°C 2. 600Sec	1. EQ auto inspection 2. OP confirm recipe setting when line change	First Lot	(ODF line start/change check sheet)	OP	product continuous, and EQ stop, inform engineer
	LC Dispence	1. Gap Measurement 2. LC drop amount 3. LC drop accuracy 4. LC type	1. 4.0±0.2um 2. Process card 3. Auto adjust to ±0.3% when production 4. Process card	1. Cell Gap 2. Recipe Setting 3. EQ auto measure	1. 2 sheet/LOT 2. check at line change 3. Process 20sheet/time	1. SPC control 2. (ODF lint start/change check sheet) 3. EQ auto sampling, and record	Engineer/OP	Inform Engineer to confirm EQ status
	UV Cure	1. Lighting Illumination 2. UV Lighting Time	1. 160mw/cm 2. 50Sec	Recipe Setting	First Lot/Time	(ODF lint start/change check sheet)	Engineer	Product hold, inform engineer confirm EQ status
	MisAlign inspection	Vacuum Assembly System & Misalign Checker	±5µm	Misalign checker	5sheet/lot	SPC control	Engineer	Product hold, inform engineer confirm EQ status
	Main Cure	1. Cure Temperature 2. Cure Time	1. 120±3°C 2. 3600Sec	EQ auto check	First Lot/Time	(ODF lint start/change check sheet)	Engineer	Product hold, inform engineer confirm EQ status
	Visual Inspection	1. LC divulge 2. display abnormal 3. LC bubble	1. No	visual inspecting	100%	inspecting record	Operator	Product hold, inform engineer confirm EQ status
	Gap Inspection	cell gap	Process card	EQ auto measure	2sheet/lot	SPC control	Engineer	Product hold, inform engineer confirm EQ status

process	process name	Management Item	Quality Spec	Measuring instrument/ Inspection	Sample size & frequency	Control Method	Responsibility	Reaction Plan
	Inline Scribe	1. Panel Appearance	Q/S-4001-2008 Cell 1/4 outgoing inspection standards	Visual Check	100%	Process Flow List	Operator	Hold Products, Stop Producing Inform Engineer
	CELL Scribe	1. Cutting Precision	1. ±0.15mm/Recipe Card	1. AOI	1pcs/machine	imital workpiece confirm/switch mode	OP/Engineer	Hold Products, Stop Producing Inform Engineer
	Cosmetic Inspection	1. Panel Appearance	1. Q/S-4007-2008 TFT-LCD Cell outgoing inspection standards	Visual Check	100%	Process Flow List	Operator	Hold Products, Stop Producing Inform Engineer
	1st Visual Test	1. display quality	1. Q/S-4007-2008 TFT-LCD Cell outgoing inspection standards	Jig	100%	1. 1ST V/T yield data	Operator	Hold Products, Stop Producing Inform Engineer
	Pol Attach	1. Pol Attach Position Accuracy 2. Particle 3. VMI 4. Black gap 5. Broken	1. Recipe Card 2. Q/S-4007-2008 TFT-LCD Cell outgoing inspection standards	1. first lot check 2. Jig 3. Visual Check	8PCS/LOT	POL attach check record	Operator	Hold Products, Stop Producing Inform Engineer
	Auto Clave	1. temp 2. pressure 3. time	1. Recipe Card	Parameter Check	1.1 time/class	Process Flow List	Operator	Hold Products, Stop Producing Inform Engineer
	2nd Visual Test	1. display quality	Q/S-4007-2008 TFT-LCD Cell outgoing inspection standards	Jig	100%	2ST V/T yield data	Operator	Hold Products, Stop Producing Inform Engineer
	Cosmetic Inspection	1. Appearance quality	Q/S-4007-2008 TFT-LCD Cell outgoing inspection standards	Visual Check	100%	Cosmetic yield data	Operator	Hold Products, Stop Producing Inform Engineer

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Model No.TM101DDHG04

12.3 Module QC Flow Chart

Module Name:TM101DDHG03			Revision:1.0		Responsibility:QC			
Date(Orig.): 2016-1-04			Date(Rev.):		Prepared by:Zhangheng Xiang		Approved by:Dongjin Song	
Process	Process name	Management Item	Quality Spec	Measuring instrument/ Inspection method	Sample size &frequency	Control method	Responsibility	Reaction Plan
COG	COG bonding	1. Panel cleanliness 2. Time 3. Pressure 4. Temperature 5. Parallelism	1. water angle≤15° 2. process card 3. process card&COG profile 4. process card&COG profile 5. pressure standard	1. water angle instrument 2/3/4. COG instrument 5. FUJI paper	initial workpiece confirm/switch mode	{COG switch line list} {Module COG Bonding list}	Operator PQC	1. inform engineer 2. adjust and confirm sample again
AOI	AOI	1. ACF Bonding effect 2. IC bonding accuracy	1. Module test standard	Microscope	100%	Machine alarm	Operator	1. confirm again 2. adjust and confirm sample again
ACF	ACF	1. Temp 2. Pressure 3. Time	1. Thermometer Record/Check	1. Microscope	First Piece Check	{J-FM0101402 MODULE FOG ACF List}	Operator	1. check pre and post20 pieces 2. if find more than one defective products, inform engineer
FOG	FOG	1. Attachment State 2. Parallelism 3. Temperature 4. Time 5. FPC pulling force	1. process card&FOG profile 2. pressure standard 3. process card&FOG profile 4. process card 5. above 0.6N/mm	1. Load Cell Pressure Tester/EQ Parameter 2. UV paper 3. 4. Temp. Tester/EQ Parameter 5. Pull Tester	initial workpiece confirm/switch mode	{MODULE FOG BONDING list} {FOG pressure list} {Pull test list}	Operator	1. inform engineer 2. adjust and confirm sample again
MI	MI	1. FOG Bonding effect 2. IC bonding accuracy	1. Module test standard	1. Microscope 2. SPC control	10%	{Module COG BONDING list} {LCM MI Record} {Module SPC list}	Operator	1. check pre and post20 pieces 2. if find more than one defective products, inform engineer
Glue coating&UV cure	Glue coating&UV cure	1. Glue code 2. UV energy 3. RIF appearance	1/2. process card&SOP 3. process card	1. appearance 2. UV tester 3. callipers	1. initial workpiece confirm 2. 1 time/shift 3. initial workpiece confirm: 6piece/lot 10pieces/2hours	{MODULE glue coating list} {equipment maintain list}	Operator PQC	1. adjust/check and inform engineer
ET1	ET1	1. Test tool 2. Display quality 3. Light intensity	1. process card 2. 3 {TFT-LCD Module test standard}	1. ET tool 2. electrical test 3. illuminometer	1. Initial workpiece Confirm: 6pieces/1 time/1 lot 2. all lot 3. 1 time/1month	{ Electrical Property list} {Light intensity list}	Operator	1. adjust/check and inform engineer
BL Assembly	BL Assembly	assembly quality	process card&SOP	visual check	1. initial workpiece confirm: 6piece/lot 2. all lot	{MODULE ASSY List}	Operator	1. adjust/check and inform engineer
Bezel Assembly	Bezel Assembly	1. Bezel Model 2. Bezel Assembly State	1/2. process card&SOP	visual check	1. initial workpiece confirm: 6piece/lot 2. all lot	{MODULE ASSY List}	Operator	1. adjust/check and inform engineer
Tape Affixed	Tape Affixed	attaching quality	process card&SOP	visual check	1. initial workpiece confirm: 6piece/lot 2. all lot	{MODULE ASSY List}	Operator	1. adjust/check and inform engineer
ET2	ET2	1. Test tool 2. Display quality 3. Light intensity	1. process card 2. 3 {TFT-LCD Module test standard}	1. ET tool 2. electrical test 3. illuminometer	1. Initial workpiece Confirm: 6pieces/1 time/1 lot 2. all lot 3. spot check:1 time/1month	{ Electrical defect property list} {Light intensity list}	Operator	1. adjust/check and inform engineer
Cosmetic inspection	Cosmetic inspection	1. Appearance quality 2. Light intensity	1. process card 2. {TFT-LCD Module test standard}	1. visual test 2. illuminometer	1. Initial workpiece Confirm: 6pieces/1 time/1 lot 2. all lot 3. spot check:1 time/1month	{Visual defect property list} {Light intensity list}	Operator	1. adjust/check and inform engineer
OQC	OQC	1. Test tool 2. Display quality 3. Appearance quality 4. Light intensity	1. process card 2. 3, 4 {TFT-LCD Module test standard}	1. ET/VT tool 2. electrical test 3. visual test 4. illuminometer	1. AQL: 0.25 2. 1 time/1 month	{OQC inspection list} {Light intensity list}	OQC	goods rejected
Packing	package	1. packing method 2. packing quality	1. process card 2. process card&SOP&BOM	1. visual check	1/2. Initial workpiece Confirm: 6pieces/1 time/1 lot	{ MODULE packing list }	Operator	adjust and confirm sample again

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Model No.TM101DDHG04

12.4 Rework QC Flow Chart

QC flow chart								
TM101DDHG04-00			Revision:L0		Responsibility:QC			
Date(Orig.):			Date(Rev.):		Prepared by:Zhangheng Xiang		Approved by:Dongjin Song	
Process	Process name	Management Item	Quality Spec	Measuring instrument/ Inspection method	Sample size & frequency	Control method	Responsibility	Reaction Plan
Process 1								
Check								
		1. Bonding effect (CFOG FA) 2. Bonding accuracy (CFOG FA) 3. Assemble quality 4. Welding quality	1. process card 2. rework SOP 3. mouldie test standard	1. Microscope 2. ET/VT tool 3. Visual test 4. Bakelite solid bars	100%	(SH-H-FM0121803 Module rework list) (SH-H-FM0121804 Module FA list)	Operator PQC	1. confirm again 2. adjust and confirm sample again
Process 2								

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13 Incoming Inspection Standard

13.1. Scope:

The incoming inspection standards shall be applied to TFT-LCD Modules (hereinafter called "Modules") that supplied by Shanghai Tianma Micro-Electronics Corporation.

13.2. Incoming Inspection

The customer shall inspect the modules within twenty calendar days of the delivery date (the "inspection period") at its own cost. The result of the inspection (acceptance or rejection) shall be recorded in writing, and a copy of this writing will be promptly sent to the seller, If the results of the inspecting from buyer does not send to the seller within twenty calendar days of the delivery date. The modules shall be regards as acceptance.

Should the customer fail to notify the seller within the inspection period, the buyers right to reject the modules. Shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

13.3. Inspection Sampling Method

13.1. Lot size: Quantity per shipment lot per model

13.2. Sampling type: Normal inspection, Single sampling

13.3. Inspection level:

Please see the detail information as below:

Lot Size	Cosmetic Check			Function Check		Dimension Check	
	n	Ac: Re (Major defects)	Ac: Re (Minor defects)	n	Ac: Re	n	Ac:Re
2~500	50	0:1	1:2	5	0:1	5	0:1
501~1200	75						
1201~3200	120						
3201~10000							
10001~35000	135		2:3				
35001~150000	170						
150001~500000	200						
≥500001	245						

Notes:

Cosmetic check:

Cosmetic defects are classified as major defects and minor defects according to the degree of defectiveness.



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Item No	Items to be inspected	
Major defects	missing	Missing function component
	Crack	Glass Crack
Minor defects	Obvious cosmetic defect, but do not influence product' finally using	1) Protective film broken 2) Pol scratch

Function check :

Item No	Items to be inspected	
Function defect	Function	1) No display 2) Display abnormally 3) Short circuit 4) line defect

Dimension check :

Item No	Items to be inspected	
Dimension	Important product's size which may influence costumer side assembly	

13.4. Inspection Conditions

13.4.1 Ambient conditions:

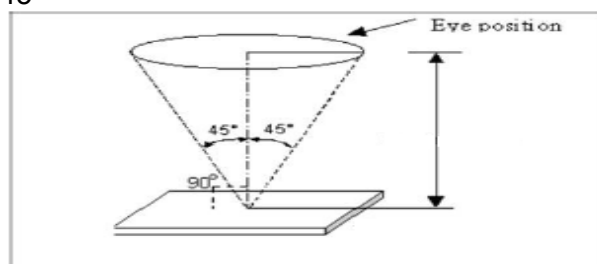
- a. Temperature: Room temperature $25\pm 5^{\circ}\text{C}$
- b. Humidity: $(60\pm 10)\% \text{RH}$
- c. Illumination: Appearance $700\pm 100 \text{ Lux}$, Display $100\pm 50 \text{ Lux}$ (The luminance at an inspection desk surface with single non-directive fluorescent lamp)

13.4.2 Viewing distance

The distance between the LCD and the inspector's eyes shall be at least $30\pm 5 \text{ cm}$.

13.4.3 Viewing Angle

U/D: $45^{\circ}/45^{\circ}$, L/R: $45^{\circ}/45^{\circ}$



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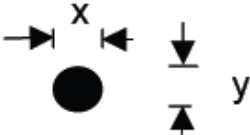
13.5. Inspection Criteria

Defects are classified as major defects and minor defects according to the degree of defectiveness defined herein.

13.5.1 Major defect

Item No	Items to be inspected	Inspection Standard
a	All functional defects	1) No display 2) Display abnormally 3) Short circuit 4) line defect
b	missing	Missing function component
c	Crack	Glass Crack

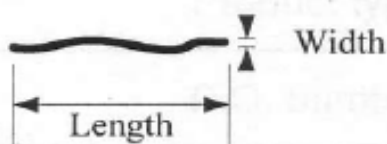
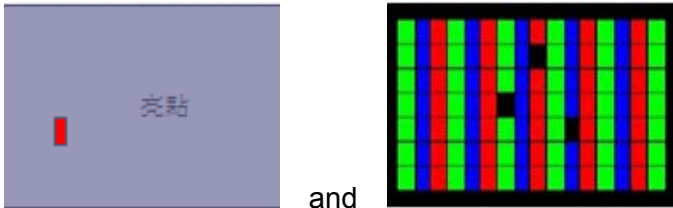
13.5.2 Minor defect

Item No	Items to be inspected	Inspection standard	
a	Spot Defect Including Black spot White spot Pinhole Foreign particle Polarizer dirt	For dark/white spot is defined $\varphi = (x+y) / 2$	
			
		$\Phi > 0.20$ distance between spot must be larger than $\geq 5\text{mm}$	
		Size $\varphi(\text{mm})$	Acceptable Quantity
		$\varphi \leq 0.20$	Ignore
	$0.20 < \varphi \leq 0.50$	3	
	$0.50 < \varphi$	Not allowed	
b	Line Defect Including	Define:	

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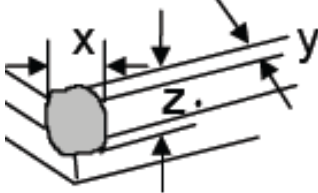
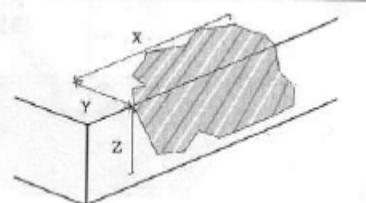
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	Black line White line Scratch			
		Distance between line defect $\geq 5\text{mm}$		
		Width(mm)	Length(mm)	Acceptable Quantity
		$W \leq 0.05$		Ignore
		$0.05 < W \leq 0.1$ $L \leq 2.0$		4
		$0.1 < W$	Follow a	
c	Polarizer Dent/Bubble	Size ϕ (mm)		Acceptable Quantity
		$\phi \leq 0.20$		Ignore
		$0.20 < \phi \leq 0.5$		3
		$0.5 < \phi$		0
d	Sub Pixel Electrical Defect	Bright and Black Sub Pixel define:		
				
		Item		Acceptable Quantity
		Black Sub Pixel defect		2
		Bright Sub Pixel defect		0
		Total Sub Pixel defect		2
Distance between black Sub Pixel		$> 15\text{mm}$		
e	FPC	Broken		Not allowed
		Crease		Can't resume is not allowed
f	Bezel	Dirt		No harm
		Wrap		
		Broken		

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		Sunken	No dangerous
g	Glass defect	1. Corner Fragment:	
			
		Size(mm)	Acceptable Quantity
		$X \leq 3\text{mm}$ $Y \leq 3\text{mm}$ $Z \leq T$	Ignore T: Glass thickness X: Length Y: Width Z: thickness
		2. Side Fragment:	
			
Size(mm)	Acceptable Quantity		
$X \leq 6.0\text{mm}$ $Y \leq 1.0\text{mm}$ $Z \leq T$	Ignore T: Glass thickness X: Length Y: Width Z: thickness		

Note:

1. The AQL inspection sample method is applied for customer, not for SHTM. For SHTM does full inspection in production line.
2. Dot defect is defined as the defective area of the dot area is larger than 50% of the dot area.
3. Mura is checker by 6% ND filter. ND application method: the parallel vertical distance between ND and panel is 3~5cm, the distance of eyes look squarely to the panel is 30±5cm, checked by 3s.
4. Foreign particle on the surface of the LCM should be ignore.
5. The phenomenon that can be seen in all screen(Black、White、R、G、B), which seems like BL LED light directly sending out through the panel, need to be less than 1/3 dot.

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13.6. Mechanics specification:

As for the outside dimension, weight of the modules, please refer to product specification for more details

13.7. Precaution

Please pay attention to the following items when you use the LCD Modules:

1. Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
2. Adopt measures for good heat radiation. Be sure to use the module with in the specified temperature.
3. Avoid dust or oil mist during assembly.
4. Following the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
5. Less EMI: it will be more safety and less noise.
6. Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
7. Avoid to display the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image stains.
8. Be sure to turn off the power when connection of disconnecting the circuit.
9. Polarizer scratches easily, please handle it carefully.
10. Display surface never likes dirt of stains.
11. A dew drop may lead to destruction. Please wipe off and moisture before using module.
12. Sudden temperature changes cause condensation, and it will cause polarizer damaged.
13. High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
14. Acetic acid or chlorine compounds are not friends with TFT display module.
Static electricity will damage the module; please do not touch the module without any grounded device.
15. Do not disassemble and reassemble the module by self.
16. Be careful do not touch the rear side directly.
17. Not strong vibration or shock. It will cause module broken.
18. Storage the modules in suitable environment with regular packing.
19. Be careful or injury from a broken display module.
20. Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the display non-uniformity of other function issue.