Product Specification

To :

Date :

TFT LCD

1280400LVDS0736

ACCEPTED BY : (A1)

Tentative

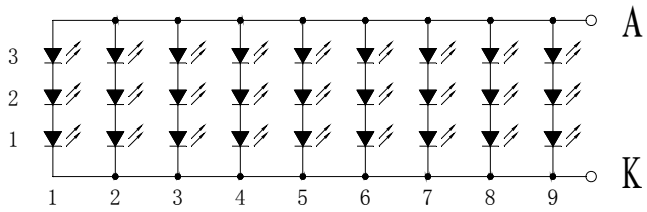
APPROVED BY	CHECKED BY	PREPARED BY

REVISION STATUS

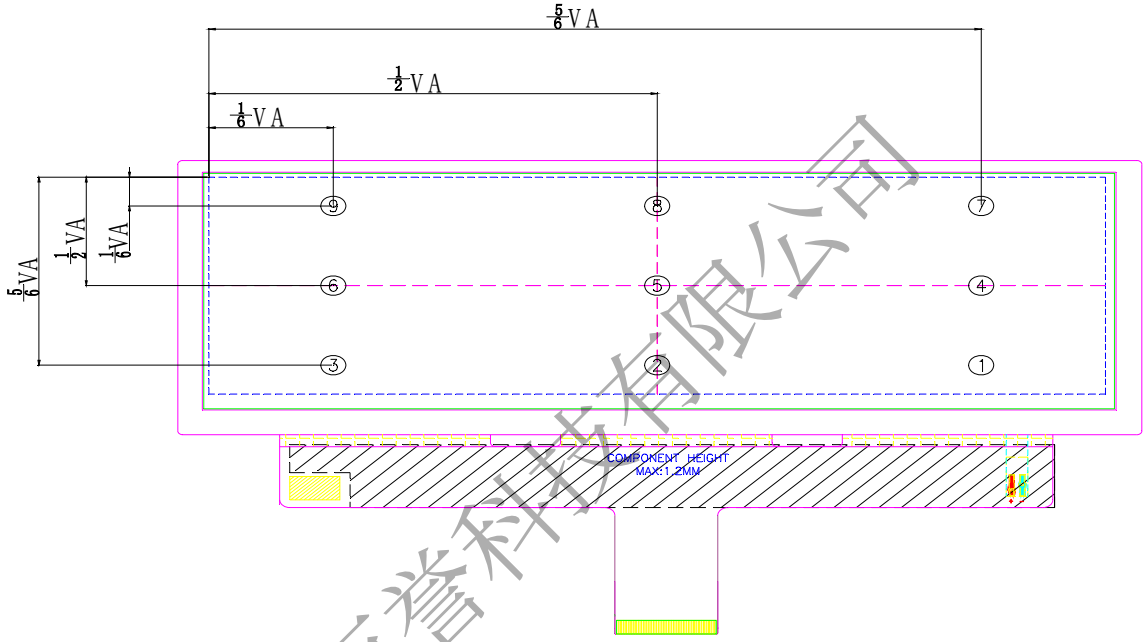
REVISION NOTICE	DESCRIPTION	PAGE	REV. DATE
A0	issued	--	2017/03/25

目　　录

一.测试电路图 Test Circuit Diagram:

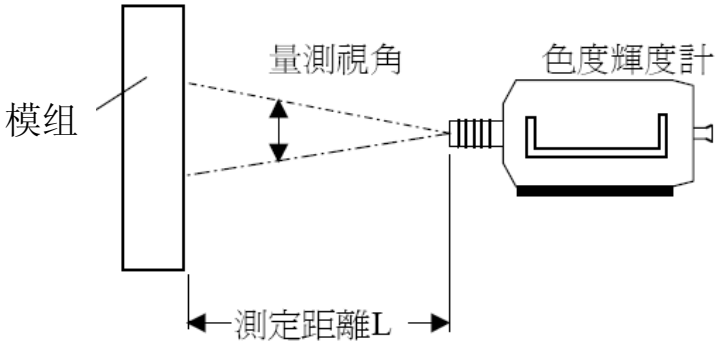


二.测试点位置图 Test Point Space Diagram:



三.测试条件如下 Test Condition as follow:

1. 环境温度：25±2℃
2. 环境湿度：55%±10%。
3. 环境照度：Dark Room10 LUX 以下,无风状态。
4. 使用限流电源测试： 9x30mA(单颗 LED 灯 30mA)`
5. 测量仪器：BM-7 (TOPCON)
6. 电流表：FLUKE 187
7. 色彩辉度计：BM-7(TOPCON)
8. 量测视角 1°
9. 测定距离 L= 500mm
10. 测量方式：(如右图)



四.极限参数 Absolute Maximum Rating:

（除非特别说明，环境温度 Ta=25℃,Unless specified,The Ambient temperature Ta=25℃）

项 目 Item	符 号 Symbol	条 件 Conditions	值 Rating	单 位 Unit
1 极限直流正向电流 Absolutemaximumforward current	Ifm	---	9X35	mA
2 脉冲驱动时极限正向电流 Peak forward current	Ifp	1 msec 脉冲，1/10 占空比 1 msec Plus 10% Duty Cycle	9X100	mA
3 极限功耗 Power dissipation	Pd	---	315X10.5	mW
4 工作温度 Operating Temperature Range	Topr	---	-20∽+70℃	℃
5 贮存温度 Storage Temperature Range	Tstg	---	-30∽+85℃	℃

当工作温度高于 25℃时，Ifm,Ifp 和 Pd 必须降低；电流降低率是-0.36mA/℃(直流驱动)，或-0.86mA/℃(脉冲驱动)，功耗降低率是-0.75mW/℃产品的工作电流不能大于对应工作温度条件 Ifm 或 Ifp 的 60%.

For operation above 25℃,The Ifm Ifp & Pd must be derated,the Current derating is -0.36mA/℃ for DC drive and-0.86mA/℃ for Pulse drive,the Power dissipation is -0.75mW/℃.The product working current must not more than the 60% of the Ifm or Ifp according to the working temperature.

五.电光特性 Electric Light Characteristic:

（除非特别说明，环境温度 Ta=25℃,Unless specified,The Ambient temperature Ta=25℃）

项目 Item	符号 Symbol	最小值 Min.	典型值 Typ	最大值 Max.	单位 Unit	测试条件 Condition
1.正向电压 Forward Voltage	Vf	8.4	9.6	10.5	V	IF=270mA
2.色坐标 Chromaticity Coordinate	X	0.27	--	0.35	---	IF=270mA
	Y	0.28	--	0.36	---	IF=270mA
3.亮度 （AVG） Luminance	Lv	600	700	---	cd/㎡	IF=270mA
4.均匀性 Uniformity	△Lv	75	---	---	%	IF=270mA

备注：因白色 LED 无波长特性,供货时无法做到整批颜色一致.

Note: There is no wavelength feature for white led, and there will be a few difference of that color when producing.

六.信赖性测试 Reliability Test ：

项目	试验方法	判定基准
高温动作试验	温度 70±2℃, 120Hr 动作后、常温放置 2Hr	A, B, C, D, E
低温动作试验	温度-20±2℃、常湿 , 120Hr 动作后、常温放置 2Hr	A, B, C, D, E
高温高湿保存试验	温度 60±2℃、湿度 90% RH, 120Hr 放置后、常温放置 2Hr	A, B, C, D, E
高温保存试验	温度 85±2℃、常湿 120Hr 放置后、常温放置 2Hr	A, B, C, D, E
低温保存试验	温度-30±2℃、常湿 120Hr 放置后、常温放置 2Hr	A, B, C, D, E
冷热冲击试验	-20℃(0.5h)→70℃(0.5h)为 1 次 温度循环、100 次温度循环后常温放置 2Hr	A, B, C, D, E
振动试验（非动作）	X、Y、Z 每个方向,频率：10~50Hz；2G；1 小时	A, B, C

判定标准:

A：点亮无问题

B：辉度维持 75%以上

C：外观无异常变化(损坏、伤痕、锈蚀、严重变形等情形)

D：均匀变化在 30%以内

E：色度变化在 0.02 以内

七.产品寿命 Product Life:

1. 背光源模块寿命之定义：当辉度变为最初始值的 50%时。
2. 规格：MTBF 30,000Hrs。
3. 条件：在供电电流为 270MA, 25±2℃ , 60±20%RH 时测试.

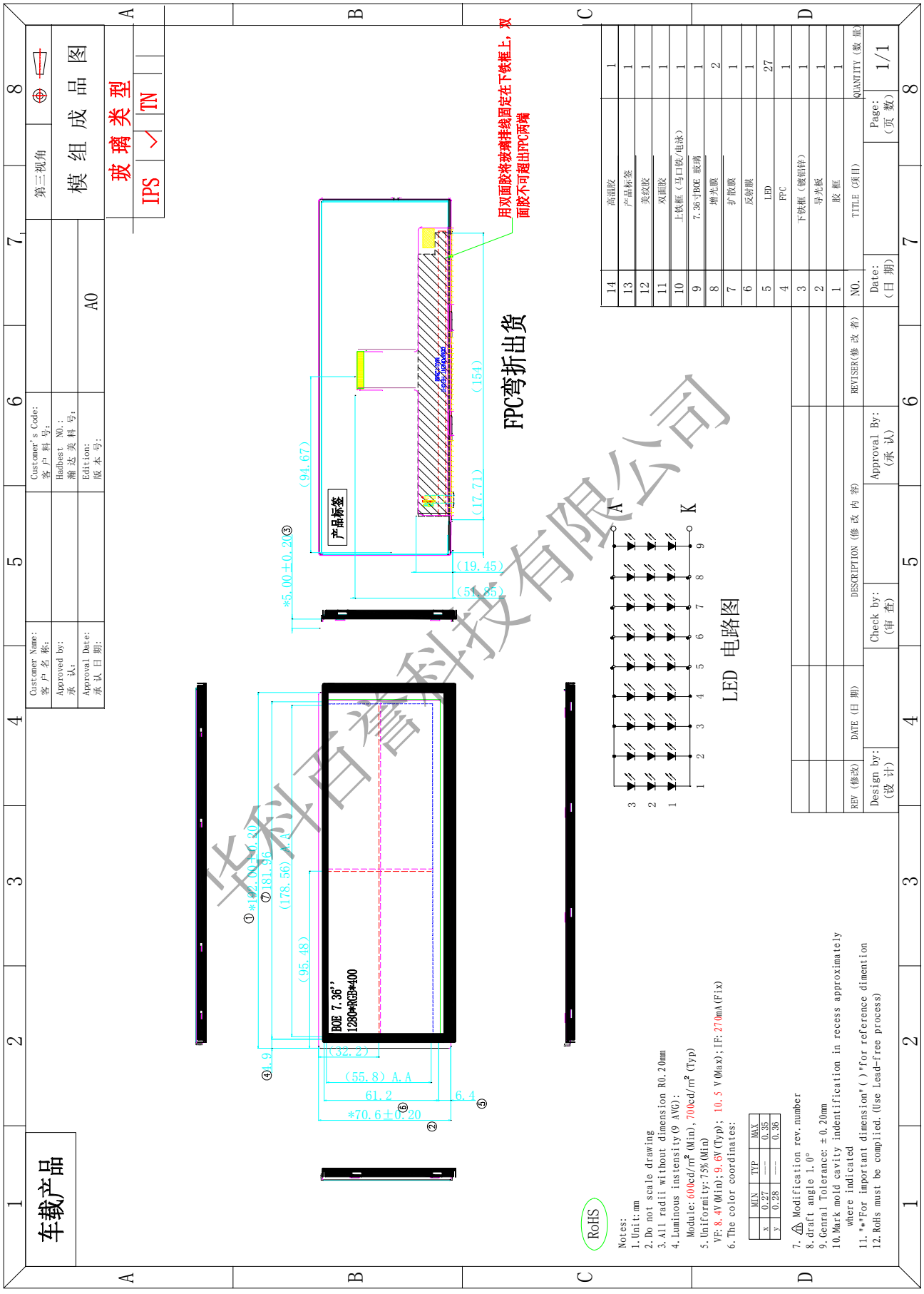
八. 欧盟 RoHS 标准 European Union RoHS Standard:

有害物质名称	铅 (Pb)	镉 (Cd)	汞 (Hg)	六价铬 (Cr^{6+})	多溴联苯 (PBBs)	多溴联苯醚 (PBDEs)	包装材料 (Pb+Cd+Hg+Cr^{6+})
限定标准（ppm）	1000	100	1000	1000	1000	1000	100

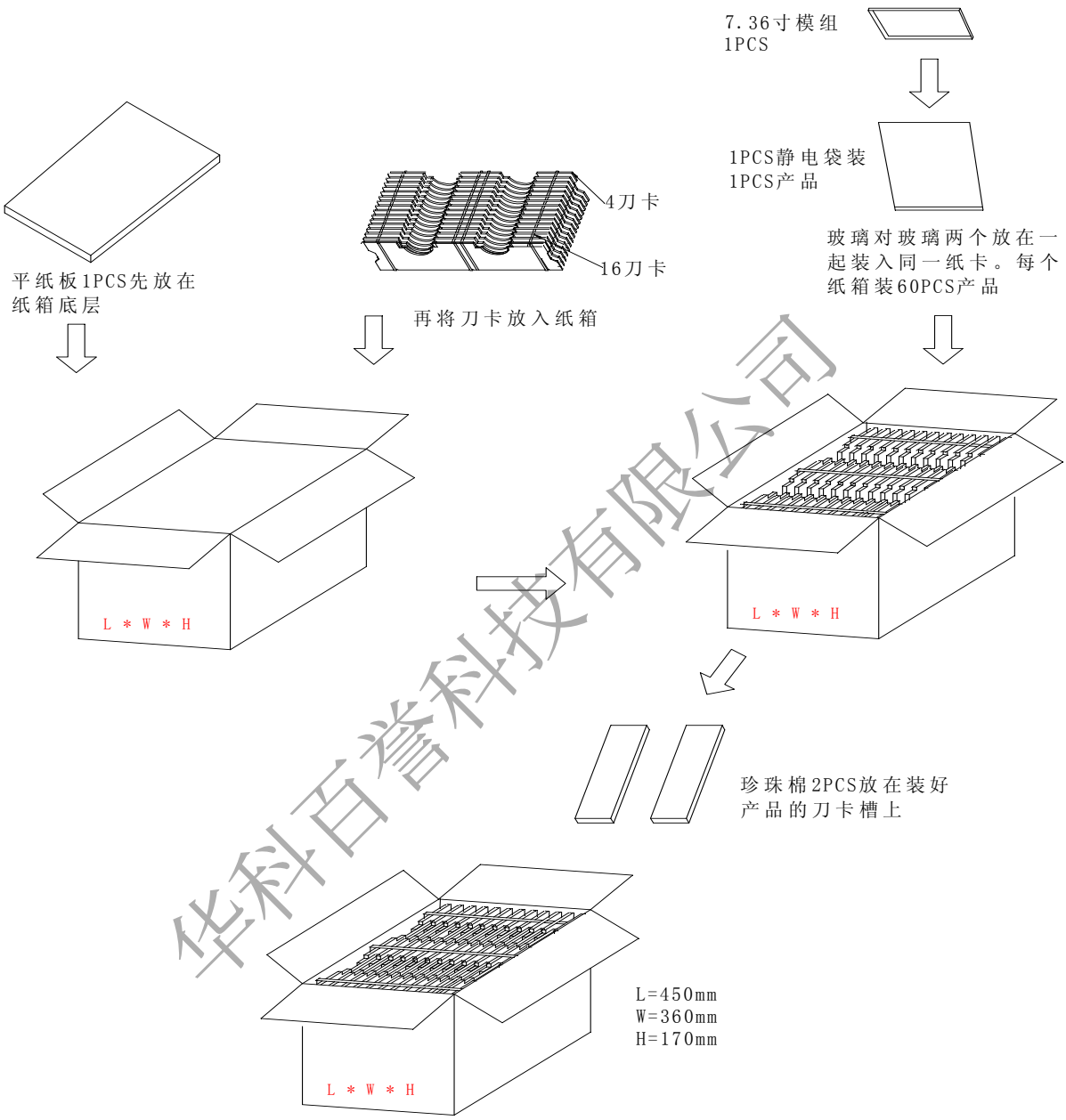
九. 其它 Others:

1. 针对客户提供的 TFT-LCD 进行加背光组装 TFT-LCM，关于 TFT-LCD 电性部分请参考原厂 TFT-LCD 规格书.
2. 本承认书如有疑问,双方协议解决.

十.模组成品图 Finished Module



十一. 模组包装图 Mold train packing chart：



十二.外观检验规格

一．基本描述：

名 称:	TFT-LCD显示屏	料 号	所有尺寸	品 牌	/
使用机型	通用	型 号	所有型号	材 质	/
产地/封装地	/	供应商规格	参规格书	供应商/代理商	/

二．产品核对：

No.	项目	具体要求
1	供应商检验报告	核实供应商提供的测试报告，跟实际样品测试结果相同。
2	环保物料(RoHS)	确认为环保物料。
3	生产周期	产品上需具备有可识别的生产周期,且管制期限在半年范围之内。

三.外观及工艺：

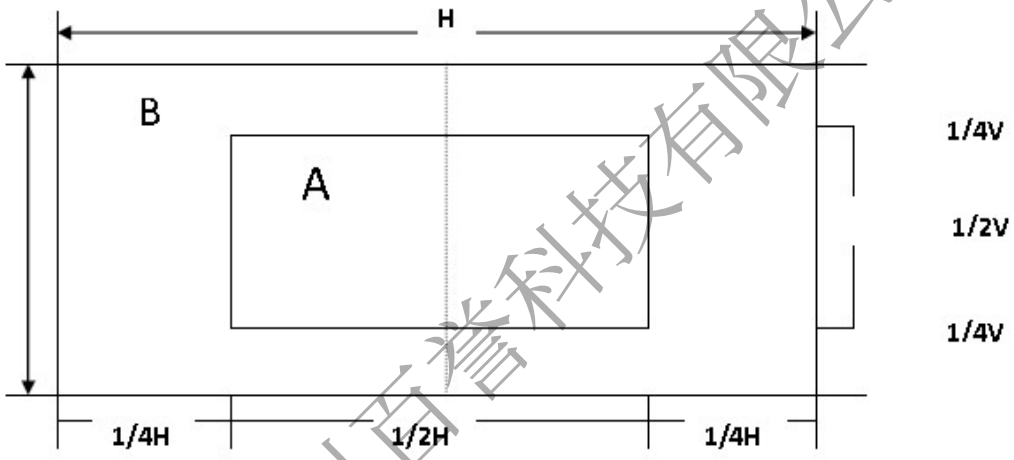
No.	检验项目	具体要求
1	外观及工艺	a 包装方式要符合易碎品包装要求,防冲撞、防静电；产品的内外包装严禁变形、破损、受潮、挤压等不良现象。
		b 外贴标签及产品上标有性能参数的字唛必须清晰,不能影响辨认。
		c 产品封装不能有影响功能的破损、划伤、表面无异物、支架无氧化、生锈、变形、电镀不良、沾有异物、无明显气泡等。
		d 产品背部背光组件不可有异物、不可粘附有影响其变色的气体、液体或固体物质；底部基座平整，外框与基座结合无翘起、撞痕、裂痕等现象。

四.结构尺寸：

No.	项目	尺寸要求	备注
1	机械结构	a 产品外壳的长、宽、厚度、接口核对与其规格书一致；显示面积符合标准。	
		b 产品的背光驱动驱动口、I/0 口必需符合公司制程要求。	
		c 产品的装配符合公司的成品使用环境要求；必须耐振、适应车载环境。	

五.显示外观

No.	项目	参数要求	备注
检验条件		眼睛和产品的距离为30 $^{+}_{-}$5 cm，与产品面在22.5º---157.5º的角度内进行检查，检查环境的光照度约为300---700Lux。	

外观	NO.	Item	夹具，在全白，全黑，红，绿，蓝画面下观察，30^{+5}_{-} cm距离观察。	A	B	Total
	1	亮点		0		0
	2	暗点		≤1	≤2	3（点间距≥5cm）
		Total		≤1	≤2	≤3
	3	偏光片异物	菲林、目视	≤0.1mm		忽略不计，1cm²≤5个
				0.1mm≤D≤0.25mm		2（7寸以下点间距＞2cm，≥7寸点间距＞5cm）
				D（点大小）>0.25mm		0
	4	批次来料可接受的缺陷品比率≤2%。				
						
	5	线、点状缺陷项目	线状	菲林、目视	长度（L）mm	宽度（W）mm	允许条（个）数
					L≤0.5	W≤0.1	2（点间距≥5cm）
					0.5<L≤1.0		1
					L>1.0	W>0.1	不允许
			点状（背光异物）		D（点大小）≤0.2		3（点间距≥5cm）
					0.2<D（点大小）≤0.3		2（点间距≥5cm）
					D（点大小）>0.3		不允许
	6	花屏		目视	不允许		
	7	碰伤		目视	不允许		
	8	亮度		目视	见规格书（符合要求即可）		
	9	白斑		目视	不允许(在150Lux的环境下)		
	10	阴影（黑块）		目视	不允许		

TITLE : AV074ZAB-NW0

Preliminary Product Specification

Rev. P0

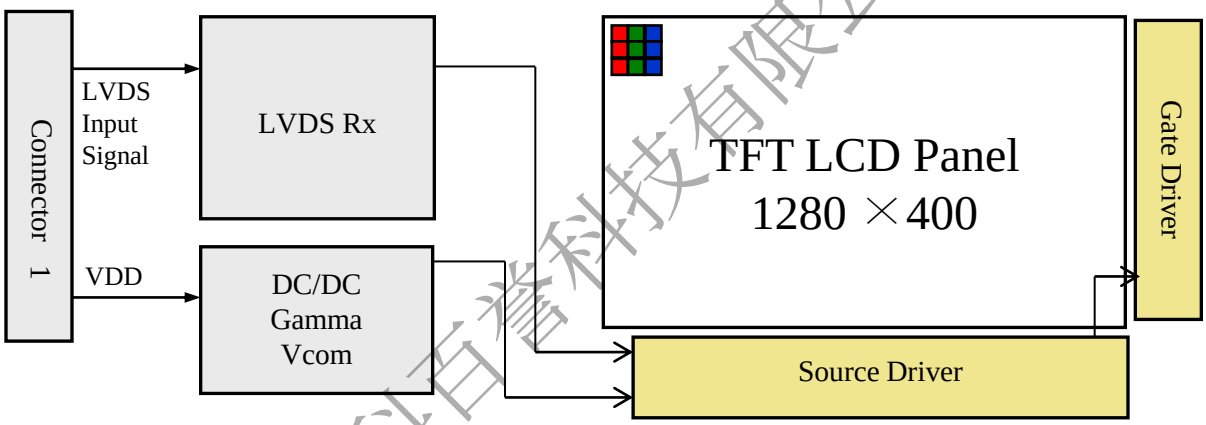
BEIJING BOE OPTOELECTRONICS TECHNOLOGY

REV.	ECN No.	DESCRIPTION OF CHANGES	DATE	PREPARED
0		Initial Release	2015.01.05	徐帅

1.0 GENERAL DESCRIPTION

1.1 Introduction

AV074ZAB-NW0 is a color active matrix TFT LCD module using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 7.36inch diagonally measured active area with resolutions 1280 horizontal by 400 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.



1.2 Features

- 1 Channel LVDS Interface with 1 pixel / clock
- Synce mode
- 8-bit color depth, display 16.7M colors
- Low driving voltage and low power consumption
- RoHS Compliant

1.3 Application

- Vehicle Device

1.4 General Specification

The followings are general specifications at the model 7.36inch Smart Rearview Mirror (listed in Table 1.)

< Table 1. General Specifications >

Parameter	Specification	Unit	Remarks
Dimensional outline	186(H) × 66.4(V) ×1.0(typ.)	mm	
Active area	178.56(H) ×55.8(V)	mm	
CF Size	183.36(H) ×62.6(V)	mm	
C/F Polarizer	181.36(H) ×60.6(V) ×0.140(D)	mm	
TFT Polarizer	181.36(H) ×60.6 (V) ×0.124(D)	mm	
Number of pixels	1280(H) ×400(V)	pixels	
Pixel pitch	46.5(H)×RGB×139.5(V)	㎛	
Pixel arrangement	Pixels RGB stripe arrangement		
Display colors	16.7M(8bits)	colors	
Display mode	Normal Black		
Outline Dimension	186(H) × 66.4(V) ×1.0(body) (typ.)	mm	
Weight	TBD	gram	
Source Driver IC	ST5821CA		
Gate Driver IC	ST5084CA		
Power Consumption	TBD	Watt	
Surface Treatment	C/F Polarizer: HC (Hard Coating) TFT Polarizer: Clear		

2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. LCD Module Electrical Specifications >

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	V_{DD}	-0.3	3.9	V	Note
Operating Temperature	T_{OP}	-20	+70	℃	
Storage Temperature	T_{ST}	-30	+85	℃	

Notes : Permanent damage to the device may occur if maximum values are exceeded functional operation should be restricted to the condition described under normal operating conditions.

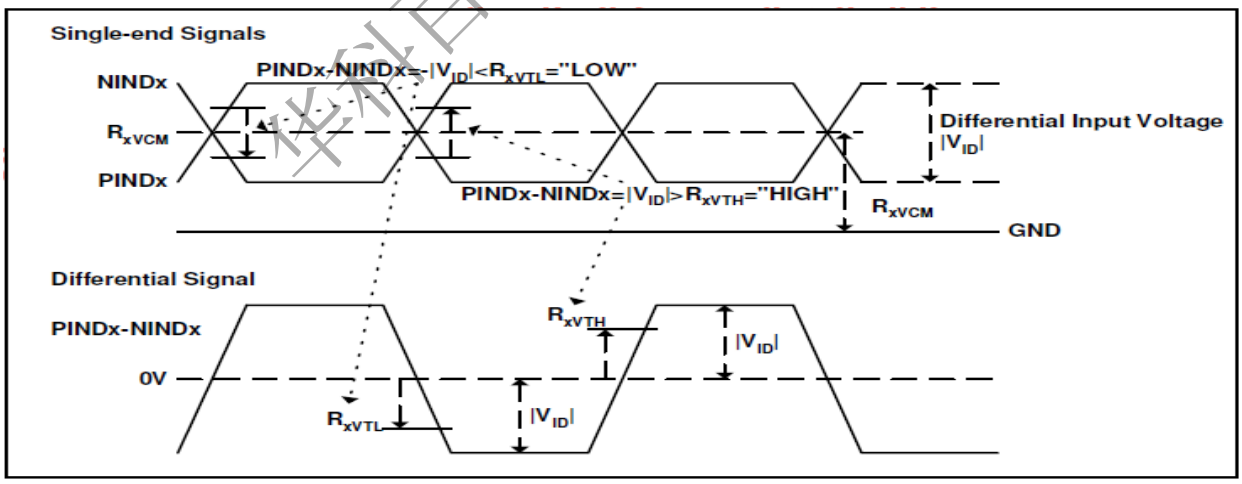
3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 3. LCD Module Electrical Specifications >

[Ta =25±2 ℃]

Parameter		Symbol	Values			Unit	Notes
			Min	Typ	Max		
Power Supply Input Voltage		VDD	3	3.3	3.6	Vdc	
Power Supply Ripple Voltage		VRP			300	mV	
Power Consumption		PDD		0.4	0.5	Watt	1,2
Rush current		IRUSH	-	-	1	A	
LVDS Interface	Differential Input High Threshold Voltage	VLVTH	100		300	mV	
	Differential Input Low Threshold Voltage	VLVTL	-300		-100	mV	
	Common Input Voltage	VLVC	1	1.2	1.7-|Vid|/2	V	
	Differential input voltage	|Vid|	0.2	-	0.6		
CMOS Interface	Input High Threshold Voltage	VIH	2.6	-	3.3	V	
	Input Low Threshold Voltage	VIL	0	-	0.8	V	



Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.
The current draw and power consumption specified is for VDD=3.3V, Frame rate f_V=60Hz and Clock frequency = 38.4MHz. Test Pattern of power supply current is Black.
2. The duration of rush current is about 2ms and rising time of Power Input is 1ms(min)

3.2 Panel Electrical Specifications

< Table 4.Panel Electrical specifications >

Parameter	Symbol	Value			Unit	Remarks
		MIN	Typ.	MAX		
Digital Voltage	VDD	3.0	3.3	3.6	V	
	I_{VDD}	25	50	75	mA	
Positive Analog Voltage	AVDD	10.1	10.2	10.3	V	
	I_{AVDD}	15	30	45	mA	
TFT Gate ON Voltage	VGH	20	21	22	V	VGH-VGL<=40V
	I_{VGH}	-	-	1	mA	
TFT Gate OFF Voltage	VGL	-7	-7.5	-8	V	
	I_{VGL}	-	-	1	mA	
TFT Common Electrode Voltage	VCOM	3	4.15	5	V	
	I_{VCOM}	-	-	1	mA	

Notes :
1: AVDD should be set to satisfy the characteristic of LC. Recommended value is 10.2V

2: VGH should be set to satisfy charging ratio of TFT pixel. Recommended range is 20~22V

3: VGL recommended range is -7~-8V
.
3 : VCOM should be adjusted to make the flicker level be minimum and optimize display quality.

4.0 INTERFACE CONNECTION

4.1 Input Signal & Power

- LVDS Signal interface : 40Pin. The recommended model is FH12A-40S-0.5SH manufactured by Hirose

< Table 5. LCM Module Input Connector Pin Configuration >

Pin No.	Symbol	I/O	Description	Remark
1	VCOM	P	Common Voltage_3.02	
2	VDD	P	Digital power_3.3V	
3	VDD	P	Digital power_3.3V	
4	NC	-	Not connect	
5	RESET	I	Global reset pin	Note2
6	STBYB	I	Standby mode	Note3
7	GND	P	Ground	
8	RXIN0-	I	Negative LVDS differential data input	
9	RXIN0+	I	Positive LVDS differential data input	
10	GND	P	Ground	
11	RXIN1-	I	Negative LVDS differential data input	
12	RXIN1+	I	Positive LVDS differential data input	
13	GND	P	Ground	
14	RXIN2-	I	Negative LVDS differential data input	
15	RXIN2+	I	Positive LVDS differential data input	
16	GND	P	Ground	
17	RXCLKIN-	I	Negative LVDS differential clock input	
18	RXCLKIN+	I	Positive LVDS differential clock input	
19	GND	P	Ground	
20	RXIN3-	I	Negative LVDS differential data input	
21	RXIN3+	I	Positive LVDS differential data input	
22	GND	P	Ground	
23	NC_SDA	-	Not connect (SPI interface for online test and programming use)	客户端NC
24	NC_SCL	-	Not connect (SPI interface for online test And programming use)	客户端NC
25	GND	P	Ground	
26	NC_CS	-	Not connect (SPI interface for online test a nd programming use)	客户端NC
27	NC	-	Not connect	
28	SELB	I	6bit/8bit mode select	Note4
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	

Pin No.	Symbol	I/O	Description	Remark
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	L/R	I	Horizontal inversion	Note5
34	U/D	I	Vertical inversion	Note5
35	VGL	P	Negative power for TFT	
36	NC	-	Not connect	客户端NC
37	NC_VDDMTP	-	Not connect (For MTP programming)	客户端NC
38	VGH	P	Positive power for TFT	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

Note.1

I/O definition : I---Input ; O---Output ; P---Power/Ground

Note.2

Suggest to connection with an RC reset circuit for stability , Normally pull high .

(47kΩ + 0.1uF or external MCU control, tPOR > 1ms)

Note 3

-STBYB="H (3.3V)": normal operation ;

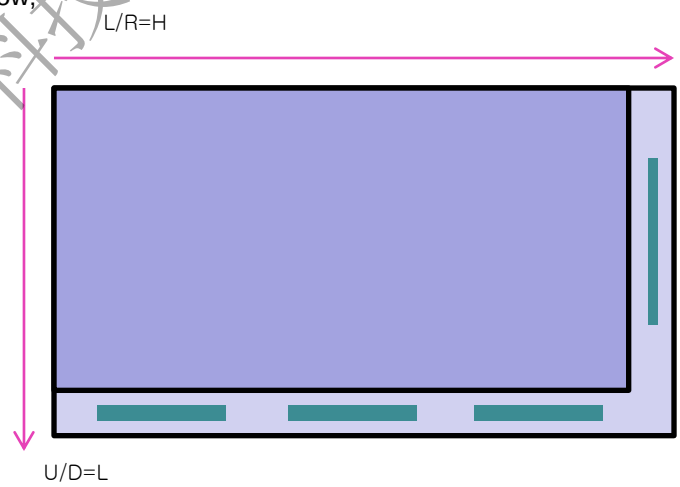
-STBYB="L (GND)": timing controller, source driver will turn off, all output are High-Z

Note 4

- If LVDS input data is 8 bits, SELB must be set to Low;

Note.5

Scan Control Input		Scanning direction
L/R	U/D	
VDD	GND	Up to Down, Left to Right
GND	GND	Up to Down, Right to Left
VDD	VDD	Down to Up, Left to Right
GND	VDD	Down to Up, Right to Left



5.0 SIGNAL TIMING SPECIFICATIONS

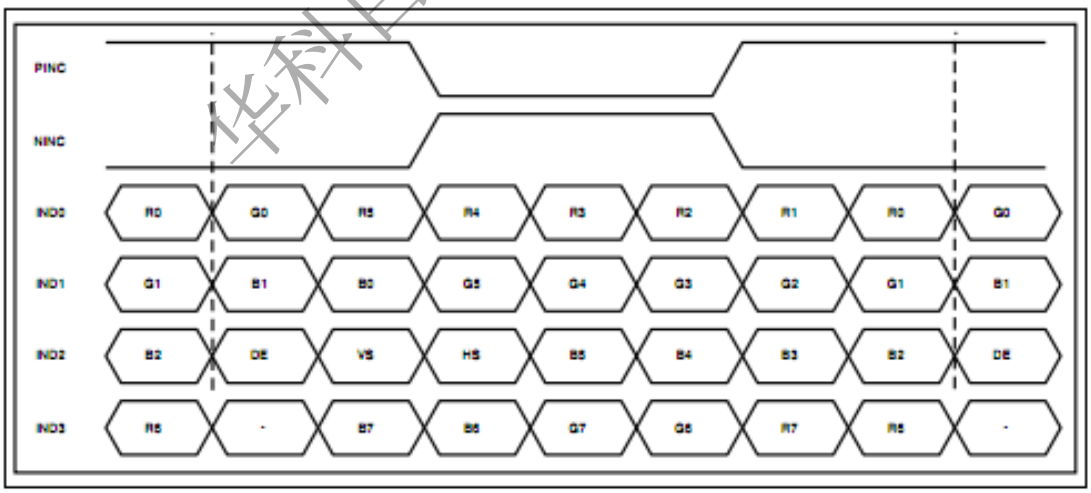
5.1 Timing Parameters (Sync mode)

< Table 6. Timing Table >

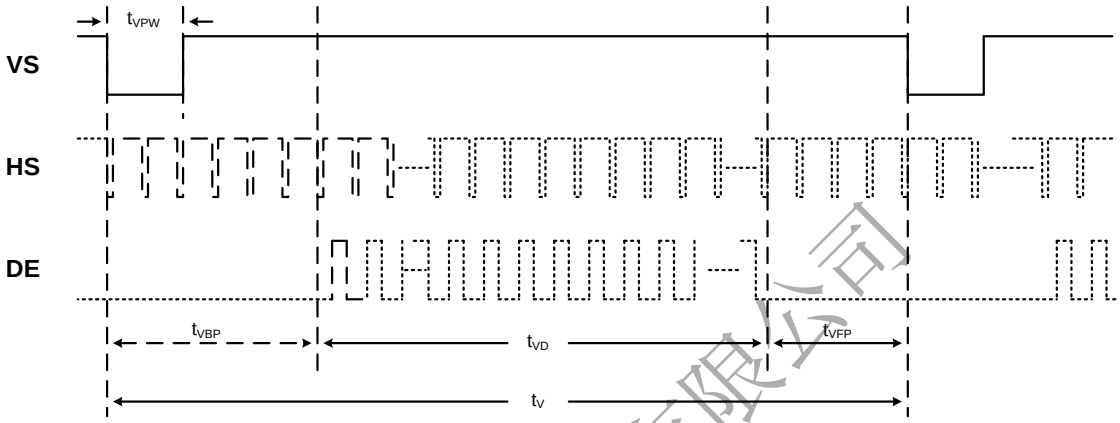
Parameter	Symbol	Value			Unit	Note
		Min.	Recommend	Max.		
CLK frequency	t_{CLK}	35.3	38.4	56.4	Mhz	
Horizontal back porch	t_{HBP}	20	20	20	t_{CLK}	
Horizontal display area	t_{HD}	1280	1280	1280	t_{CLK}	
Horizontal front porch	t_{HFP}	15	64	159	t_{CLK}	
Horizontal period	t_H	1315	1364	1459	t_{CLK}	
Horizontal pulse width	t_{HPW}	1	1	15	t_{CLK}	
Vertical back porch	t_{VBP}	45	45	45	t_H	
Vertical display area	t_{VD}	400	400	400	t_H	
Vertical front porch	t_{VFP}	3	24	199	t_H	
Vertical period	t_V	448	469	644	t_H	
Vertical pulse width	t_{VPW}	1	1	40	t_H	

Notes: This product is Sync mode..

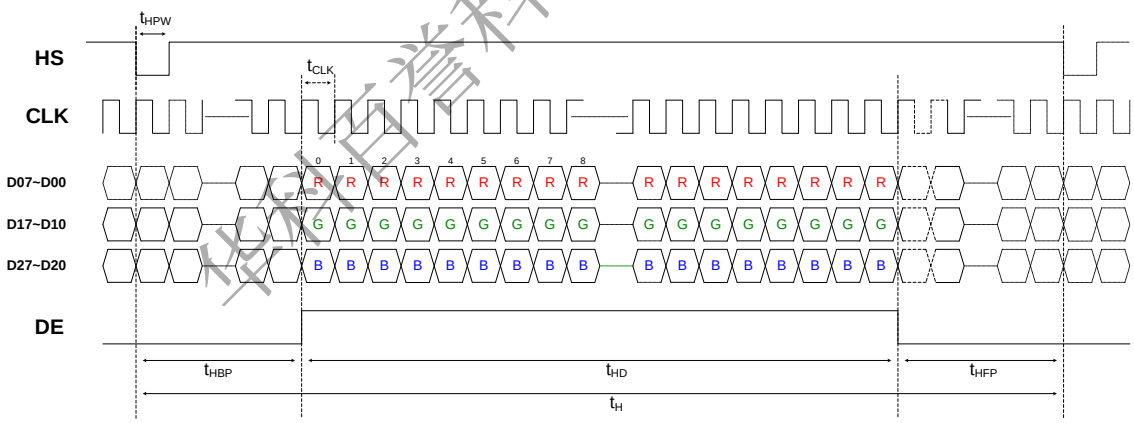
8-bit LVDS input (HSD='L')



Vertical input timing



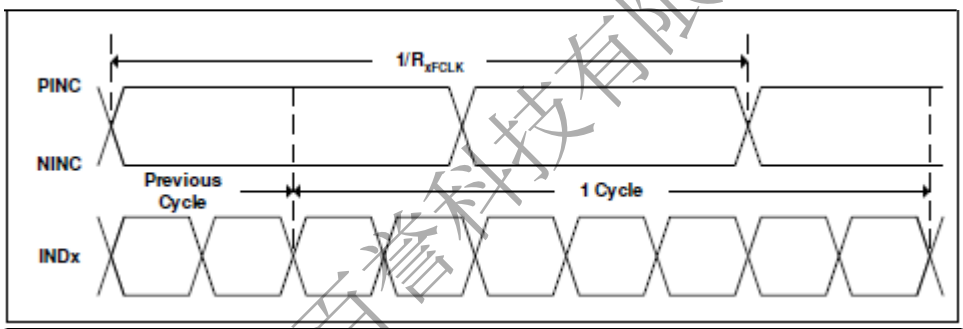
Horizontal input timing

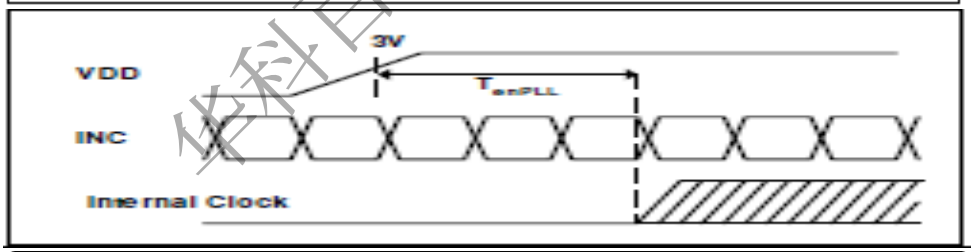


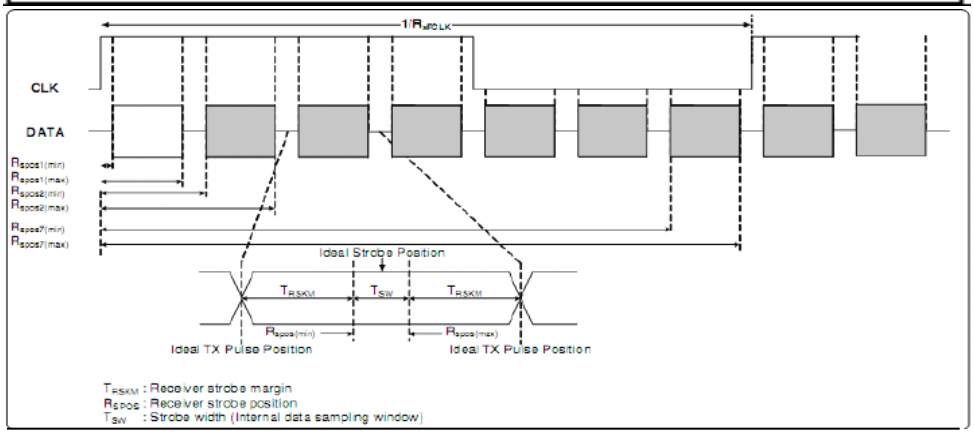
5.2 LVDS Rx Interface Timing Parameter

The specification of the LVDS Rx interface timing parameter is shown in Table 7.

Parameters	Symbols	Min	Typ	Max	Unit	Condition
Clock frequency	RxFCLK	TBD	38.4	TBD	MHz	
Input data skew margin	TRSKM	500	-	-	ps	|VID|=400mV RxVCM=1.2V RxFCLK=71MHz
Clock high time	TLVCH	-	4/(7*RxFCLK)		ns	
Clock low time	TLVCL		3/(7*RxFCLK)		ns	
PLL wake-up time	TenPLL			150	us	





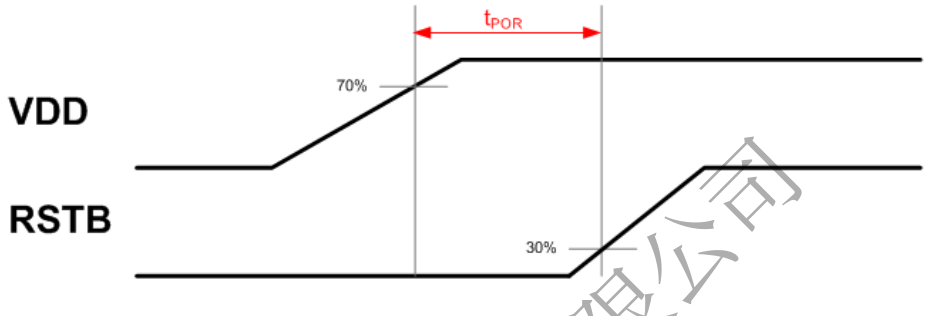


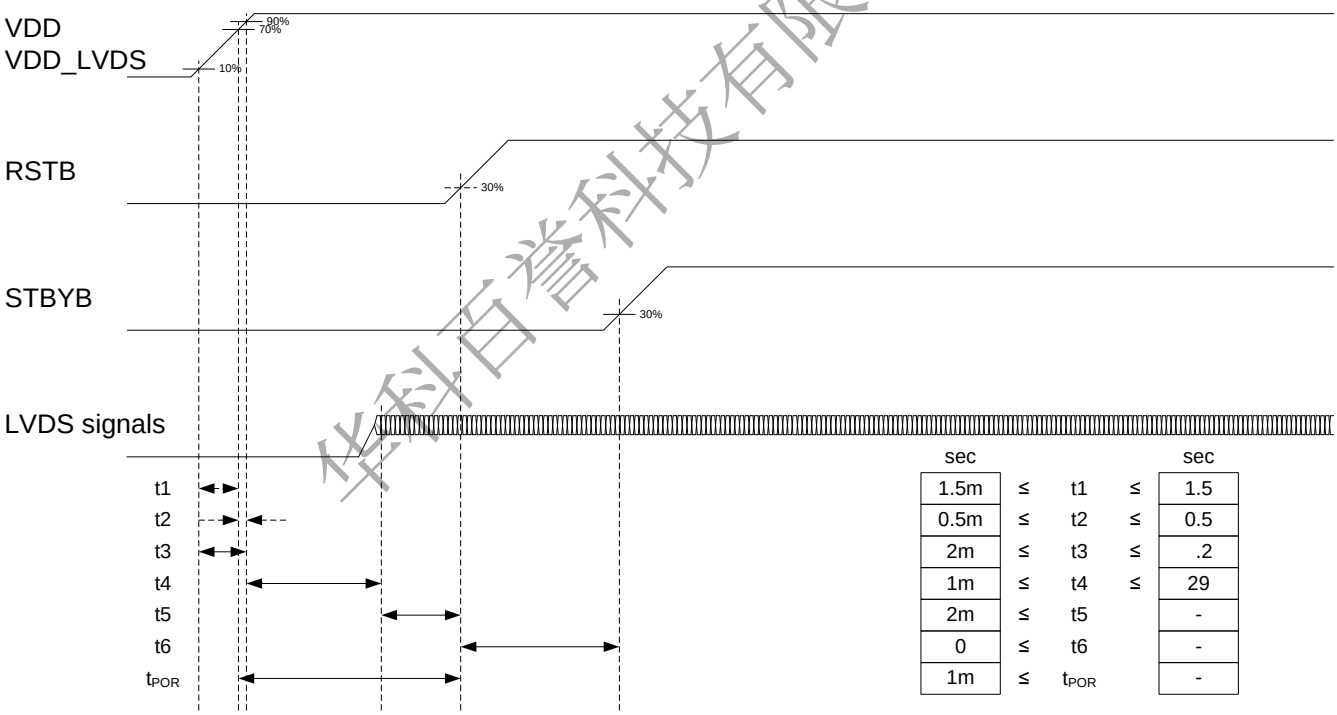
5.3 Input Signals, Basic Display Colors & Gray Scale Of Colors

Color & Gray Scale		Input Data Signal																							
		Red Data								Green Data								Blue Data							
		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
	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
	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
	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
Gray Scale of Red	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
	△	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	▽	1	1	1	1	1	1	1	0	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
Gray Scale of Green	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
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	▽	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	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
Gray Scale of Blue	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
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	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
Gray Scale of White	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
	△	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1
	▽	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	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

5.4 Power Sequence

Recommend power on reset timing
tPOR min. timing spec.: tPOR>1ms



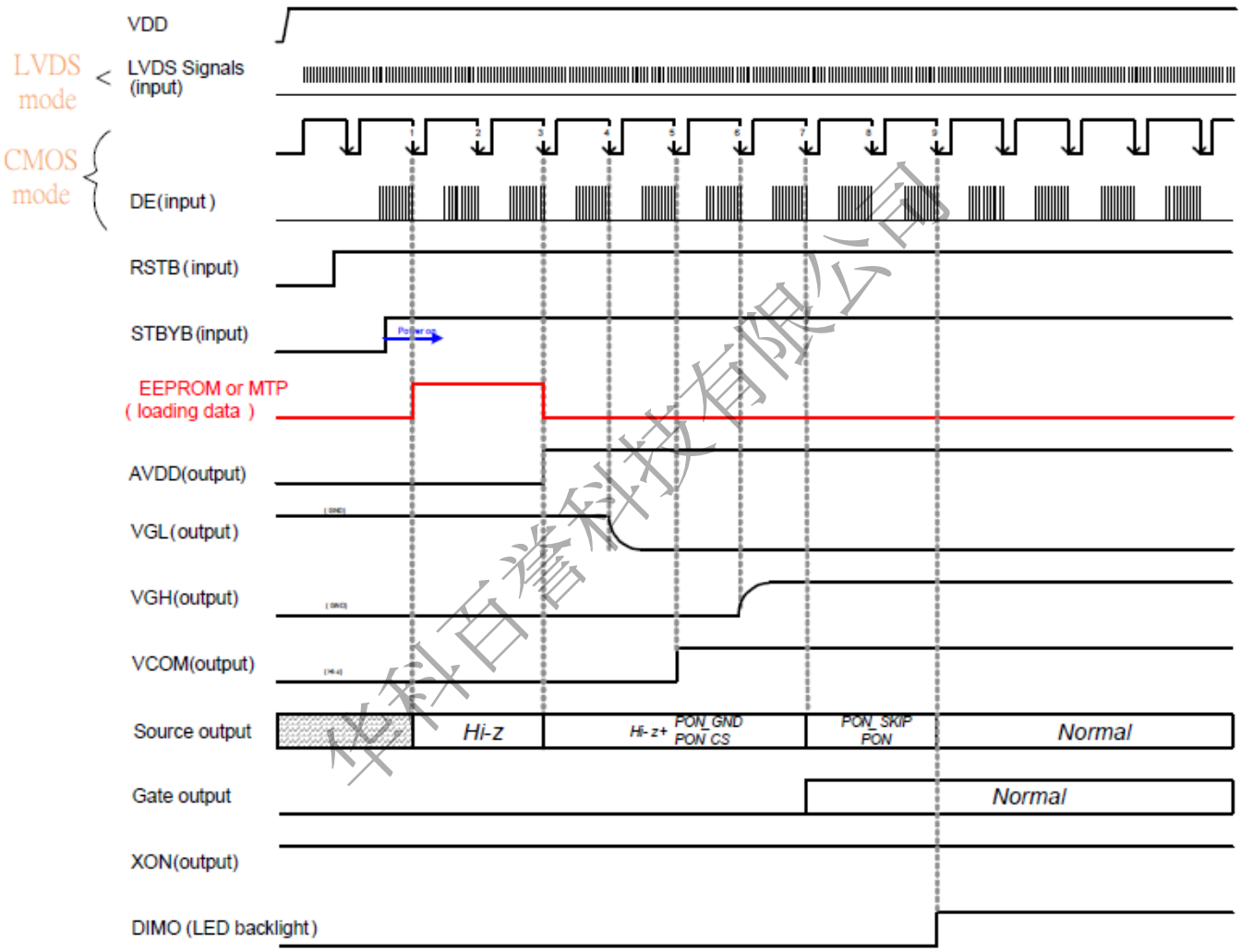


sec				sec
1.5m	≤	t1	≤	1.5
0.5m	≤	t2	≤	0.5
2m	≤	t3	≤	.2
1m	≤	t4	≤	29
2m	≤	t5		-
0	≤	t6		-
1m	≤	tPOR		-

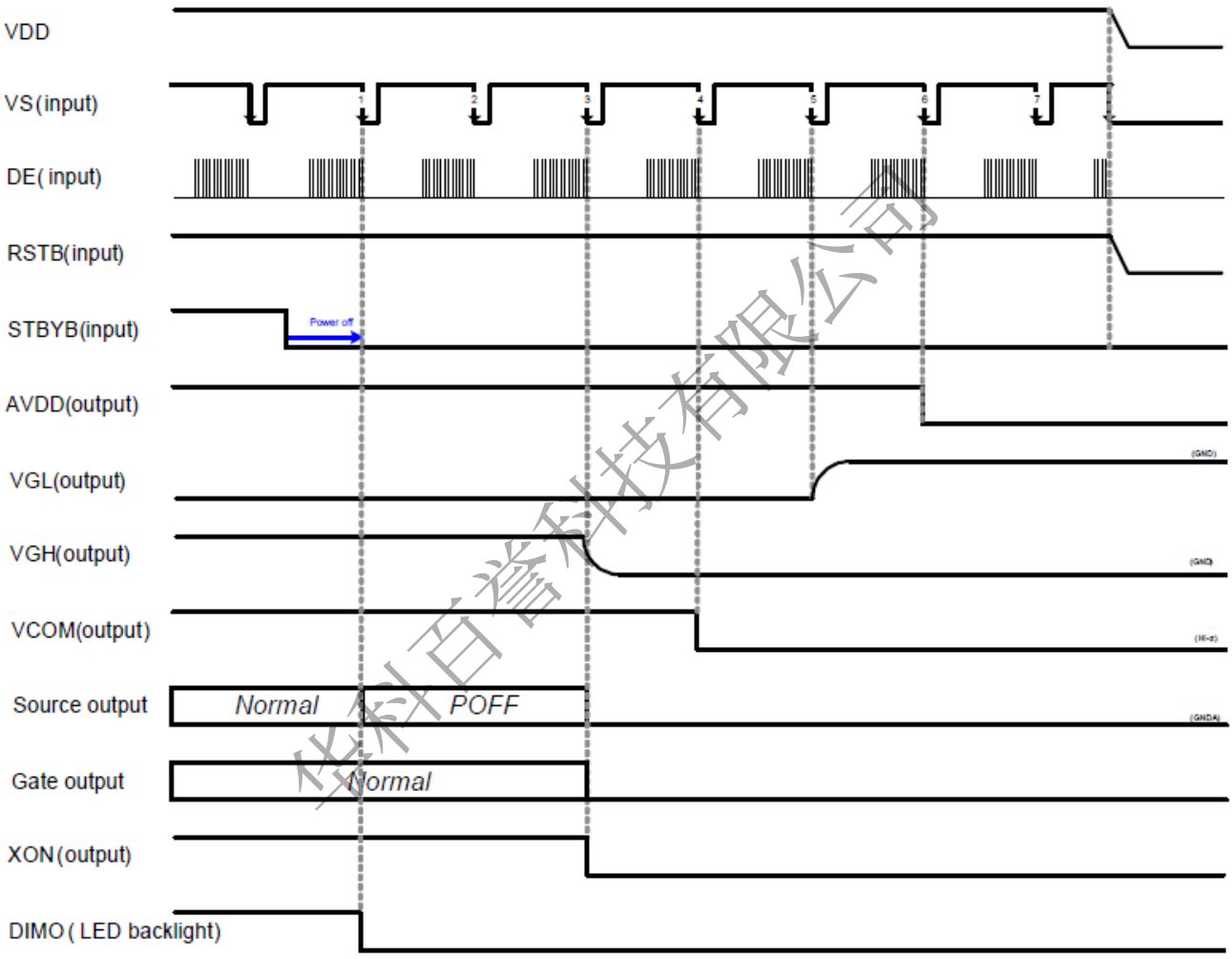
Notes:

1. When the power supply VDD is 0V, keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on. Back Light must be turn on after power for logic and interface signal are valid.

power on sequence
tPOR min. timing spec.: tPOR>1ms



Power off Sequence



6.0 OPTICAL SPECIFICATIONS

The test of Optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = 25±2℃) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) 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°. We refer to $\theta_{Ø=0}$ (=θ_3) as the 3 o'clock direction (the "right"), $\theta_{Ø=90}$ (= θ_{12}) as the 12 o'clock direction ("upward"), $\theta_{Ø=180}$ (= θ_9) as the 9 o'clock direction ("left") and $\theta_{Ø=270}$(= θ_6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the Display surface shall stay fixed. The measurement shall be executed after 30 minutes warm-up period. VDD shall be 12.0V +/-10% at 25°C. Gray scale reversal occur in 6 o 'clock direction. Optimum viewing angle direction is 12 o'clock,.

.

[VDD = 3.3V, Frame rate = 60Hz, Ta =25±2 ℃]

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Θ_3	CR > 10	-	89	-	Deg.	Note 1
		Θ_9		-	89	-	Deg.	
	Vertical	Θ_{12}		-	89	-	Deg.	
		Θ_6		-	89	-	Deg.	
Color Gamut		-	-	45	50	-	%	NTSC
Contrast ratio		CR	Θ = 0° (Center C-source) Normal Viewing Angle	700	1000	-	-	Note 2
Transmittance		Trans.		4.5%	5.00%	5.5%	-	Note 3
Reproduction of color	White	W_x		TYP. - 0.03	0.307	TYP. + 0.03		Note 5
		W_y			0.343			
	Red	R_x			0.617			
		R_y			0.328			
	Green	G_x			0.290			
		G_y			0.554			
	Blue	B_x			0.139			
		B_y			0.161			
Response Time		T_g		-	25	35	ms	Note 6
Gamma Scale					**2.2**			

Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing 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.
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 FIGURE 1 shown in Appendix) Luminance Contrast Ratio (CR) is defined mathematically.

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

3. Center Luminance of white is defined as the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.
4. The White luminance uniformity on LCD surface is then expressed as : ΔY =Minimum Luminance of 9 points / Maximum Luminance of 9 points.
(see FIGURE 2 and FIGURE 3).
5. The color chromaticity coordinates specified in Table 4. 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.
6. The electro-optical response time measurements shall be made as FIGURE 3 shown in Appendix by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Td, and 90% to 10% is Tr.

7.0 MECHANICAL CHARACTERISTICS

7.1 Dimensional Requirements

FIGURE 4 (located in Appendix) shows mechanical outlines for the model BAT070WSM-NW 1-3800(3G00).

Other parameters are shown in Table 12.

<Table 12. Dimensional Parameters>

Parameter	Specification	Unit
Dimensional outline	186(H) × 66.4(V) ×1.0(typ.)	mm
Weight	35.5	gram
Active area	178.56(H) ×55.8(V)	mm
Pixel pitch	46.5(H)×RGB×139.5(V)	mm
Number of pixels	1280(H) ×400(V) (1 pixel = R + G + B dots)	pixels

7.2 AG and Polarizer Hardness.

The surface of the LCD has an AG coating to minimize reflection and a coating to reduce scratching.

8.0 RELIABLITY TEST

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

<Table 13. Reliability Test Parameters >

No	Test Items	Conditions
1	High temperature storage test	Ta = **85** ℃, 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 ℃ (0.5 hr), 100 cycle
7	Image Sticking	25 ℃ ± 2 ℃ ; 2hrs

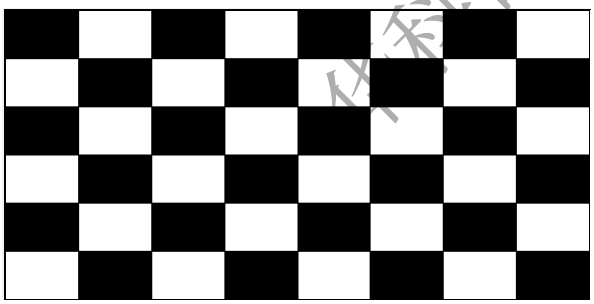


Image Sticking –pattern

Mid-Gray pattern

Condition of Image Sticking test：25 ℃± 2 ℃
Operation with test pattern sustained for 2 hrs, then change to gray pattern immediately.
After 5 mins, the mura must be disappeared completely.

Note: Before image sticking test, vcom voltage should be adjusted to make flicker level be minimum.

9.0 Product ID Rule

A V 074 ZA B - N W 0

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Dimension

Code	Description
A	Automotive

② Display mode

Code	Description
V	ADS

③ Size

Code	Description
074	≈7.36inch

④ Resolution

Code	Description
ZA	1280*400

⑤ Product mode

Code	Description
B	FOGA

⑥ Business mode

Code	Description
N	Normal

⑦ Rev. No

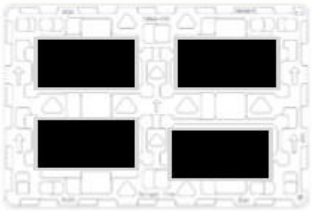
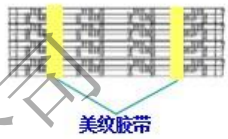
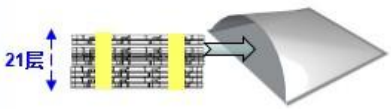
Code	Description
W	准前装

⑧ Rev. No

Code	Description
0	Rev. 0

10.0 PACKING INFORMATION

Packing Flow

将FOB放入到Tray中。 4 FOB/Tray	将盛装FOB的Tray叠码20层，然后加放1个Tray作盖。(Tray要互旋180°) 80 FOB/21 Tray	用美纹胶带延平行于Tray的宽边方向捆绑两道，每道至少缠绕胶带3圈。（捆绑前确认Tray是否每一层都旋转叠码）
 Step 1	 Step 2	 Step 3
将21层 Tray放入一个Shielding bag，并抽真空。 80 FOB/Shielding Bag	抽真空后，上下个扣一个EPE Board，然后将其放入Box。 80 FOB/Inner Box	采用“H”形封箱方式，对Box进行封箱，并在Box的Mark处粘贴相应标签。 80 FOB/Inner Box
 Step 4	 Step 5	 Step 6
按“田”字型码拍。 12 Inner Box/Pallet	套上Dual Cover和Paper Corner，并用打包带打包。 960 FOB/Pallet	
 Step 7	 Step 8	

10.1 Box label

Label and Position

数量：1 Label/Box

Remark：标签粘贴时请按Box左侧Mark框的左上角为基准。

数量：1 Label/Pallet

11.0 HANDLING & CAUTIONS

(1) Cautions when taking out the module
- Pick the pouch only, when taking out module from a shipping package.

(2) Cautions for handling the module
- As the electrostatic discharges may break the LCD module, handle the LCD module with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.
- As the LCD panel and back - light element are made from fragile glass material, impulse and pressure to the LCD module should be avoided.
- As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.
- Do not pull the interface connector in or out while the LCD module is operating.
- Put the module display side down on a flat horizontal plane.
- Handle connectors and cables with care.

(3) Cautions for the operation
- When the module is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.

(4) Cautions for the atmosphere
- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

(5) Cautions for the module characteristics
- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

(6) Other cautions
- Do not disassemble and/or re-assemble LCD module.
- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

12.0 APPENDIX

Figure 1. Response Time Testing

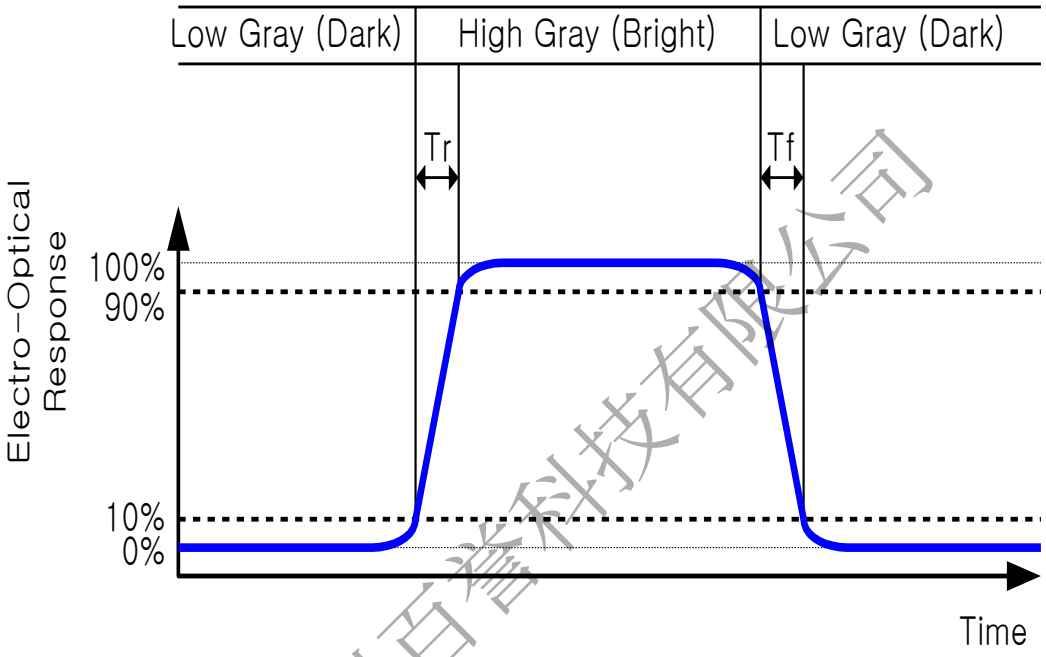


Figure 2. TFT-LCD FOG Outline Dimensions (Front view)

Note ：尺寸未考虑膨胀量

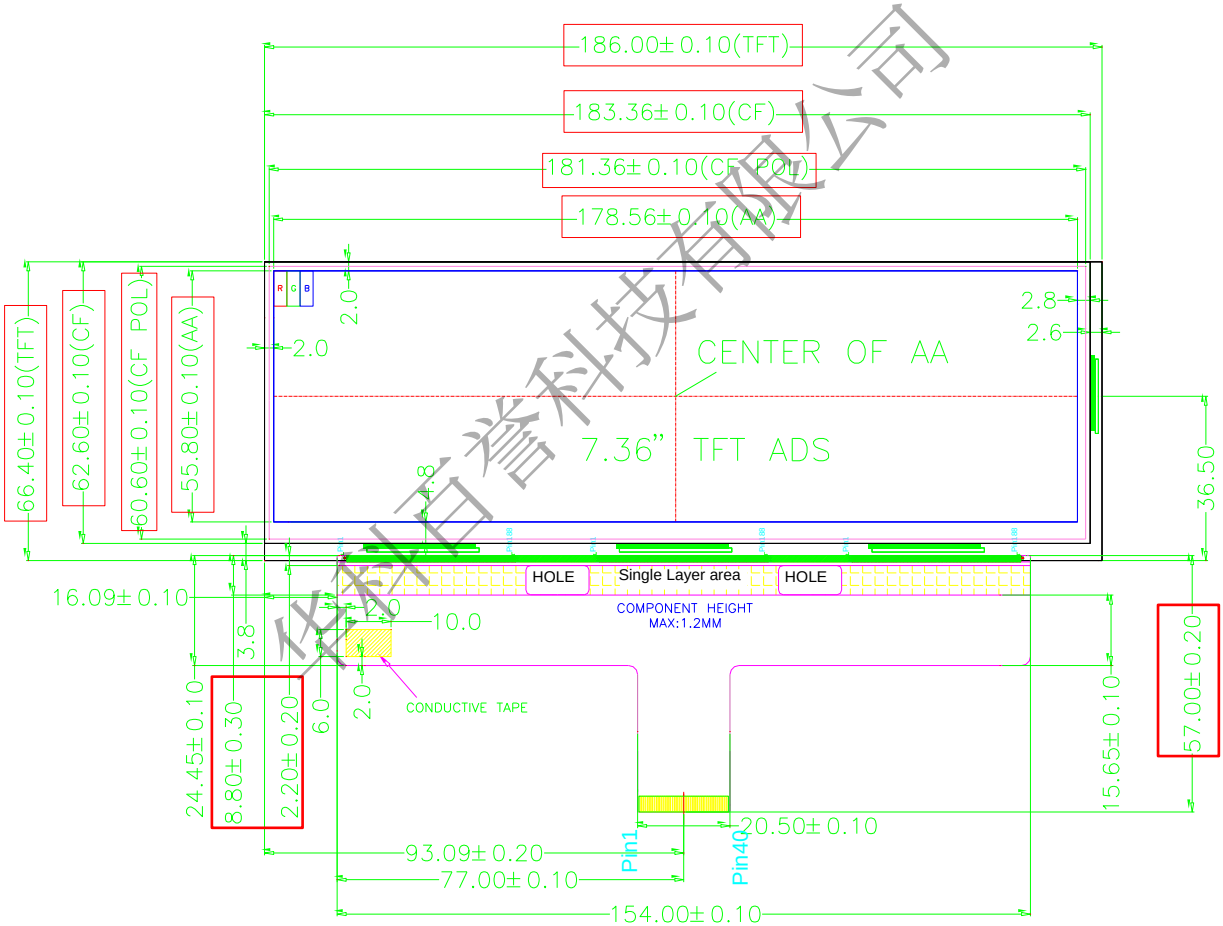


Figure 3. TFT-LCD FOG Outline Dimensions (Rear view)