江西合力泰科技有限公司
JIANGXI HOLITECH TECHNOLOGY CO., LTD.

SPECIFICATION

Revision: A2
Product Model: HIB018A012

Designed by	R&D Checked by	Quality Department by	Approved by
陈俊	曾勇	肖会黎	卢剑辉

Approval by Customer

OK

NG，Problem survey:

Approved By _____

1. If there is no special request from customer, quality Co.,ltd. Will not reserve the tooling of the product under the following conditions:
   1.1 There is no response from customer in one year after quality Co.,ltd.Submit the samples;
   1.2 There is no order in one year after the latest mass production.
2. All correlated data (include quality record) will be reserved one year more after tooling was discarded.
3. If there is no special request from customer, The product of quality Co.,ltd. Will repair only one year.

Note: Please fax back after confirmation. Thanks!
TEL：0086-796 5376036 FAX：0086-796 5376036 http://www.szlcd.com
ADD: Wentian Economics Development Zone, Taihe County, Jian City, Jiangxi Province,CHINA

Revision record

VEV NO.	REV DATE	CONTENTS	Note
A0	2017/07/10	FIRST ISSUE	
A1	2017/09/05	完善信息	
A2	2018/01/12	更改 FPC 外形	

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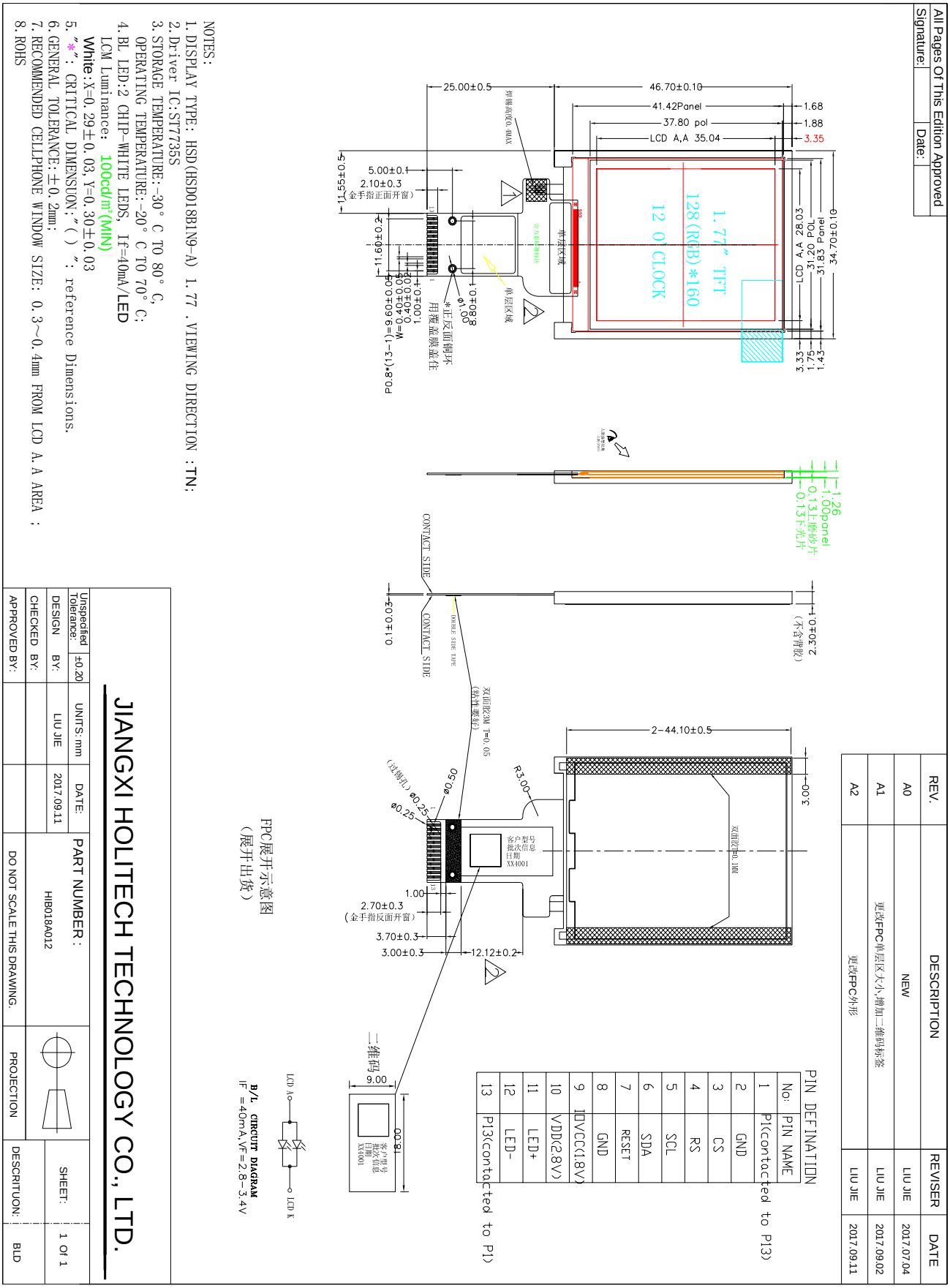
1. General Information

ITEM	Standard value	UNIT
LCD SIZE	1.77	Inch
LCD Type	TN TFT Transmissive	---
Driver Element	a-Si TFT Active matrix	---
Number of Dots	128*(RGB)*160	Dots
Pixel Arrangement	RGB Vertical Stripe	---
Pixel Pitch (H*V)	0.180*0.180	mm
Active Area	28.03*35.04	mm
LCD Outline (H*V)	31.83*41.42	mm
Viewing Direction	12 O'clock	---
Control IC	ST7735s	---
Module Size(H*V*T)	34.70(W)*46.70(L)*2.3(H)	mm
Back Light	2 White LED	---
Interface	SPI	---
Approx. Weight	5.6	g

2. External Dimensions

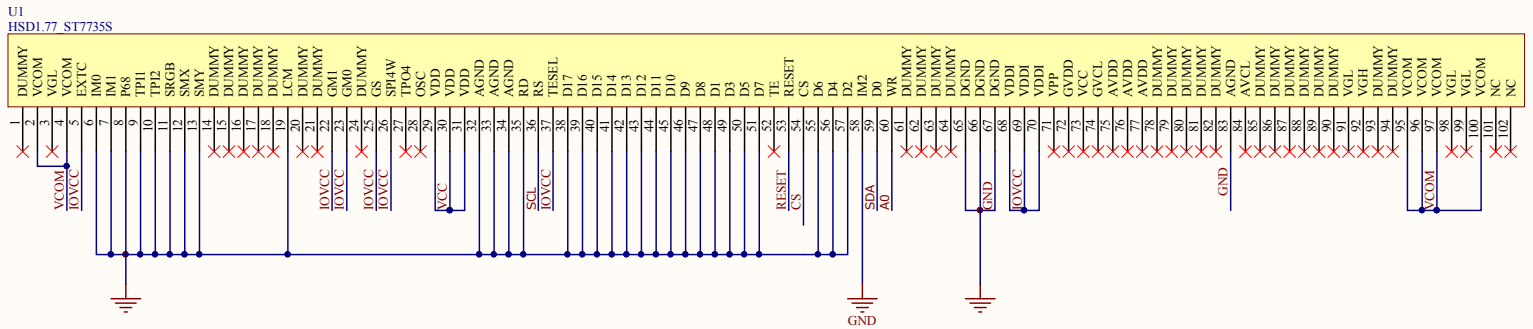
单 LCM

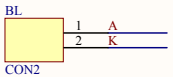


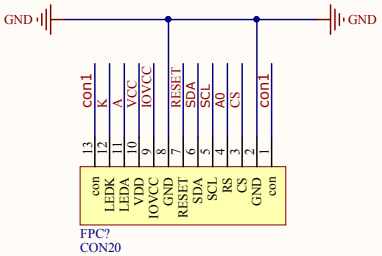
3.PRODUCT PICTURE 实物图

4.原理图/Layout 图

LCM 原理图


U1
HSD1.77_ST7735S
DUMMY
VCOM
VGL
VCOM
EXTC
IM0
IM1
P68
TPI1
TPI2
SRGB
SMX
SMY
DUMMY
DUMMY
DUMMY
DUMMY
LCM
DUMMY
DUMMY
GM1
GM0
DUMMY
GS
SPI4W
TPO4
OSC
VDD
VDD
VDD
AGND
AGND
AGND
RD
RS
TESEL
D17
D16
D15
D14
D13
D12
D11
D10
D9
D8
D1
D3
D5
D7
TE
RESET
CS
D6
D4
D2
IM2
D0
WR
DUMMY
DUMMY
DUMMY
DUMMY
DGND
DGND
DGND
VDDI
VDDI
VDDI
VPP
GVDD
VCC
GVCL
AVDD
AVDD
AVDD
AVDD
DUMMY
DUMMY
DUMMY
DUMMY
DUMMY
AGND
AVCL
DUMMY
DUMMY
DUMMY
DUMMY
DUMMY
VGL
VGH
DUMMY
DUMMY
VCOM
VCOM
VCOM
VGL
VGL
VCOM
NC
NC
VCOM
IOVCC
IOVCC
IOVCC
IOVCC
VCC
SCL
IOVCC
RESET
CS
SDA
A0
GND
GND
IOVCC
GND
VCOM
GND


BL
1
2
A
K
CON2


GND
GND
con1
13
12
11
10
9
8
7
6
5
4
3
2
1
K
A
VCC
IOVCC
RESET
SDA
SCL
A0
CS
con1
con
LEDK
LEDA
VDD
IOVCC
GND
RESET
SDA
SCL
RS
CS
GND
con
FPC?
CON20

更改GM0/GM1 连接

5.关键物料 BOM

LCM BOM

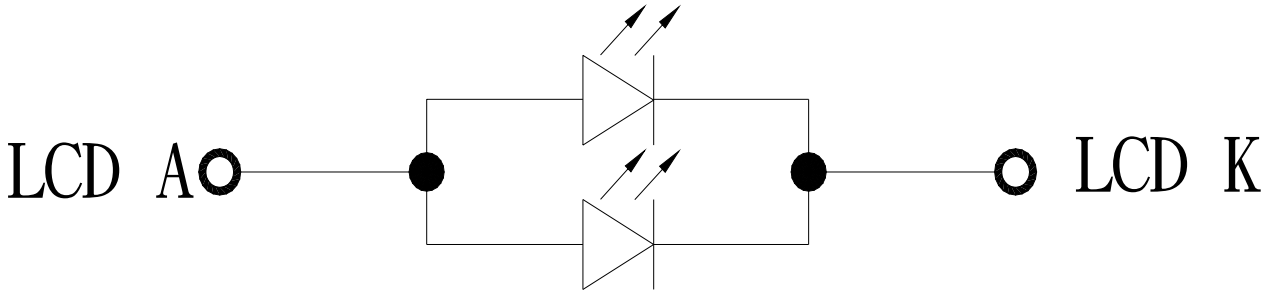
规　　格	单位	组成用量	底数	备　注
TFT 模组/HIB018A012-A1	pcs	1000	1000	
TFT 屏_FOG/HIB018A012	pcs	1000	1000	
TFT_LCD 小片/HSD018B1N9-A/委外切割	pcs	1000	1000	
TFT 大板/HSD018B1N9-A	pcs	1000	1000	
TFT 配片/SLP37.8×31.2×0.13/耐盐雾/雾度 42%/上 45°	pcs	1000	1000	三利谱
TFT 配片/SLP37.8×31.2×0.13/耐盐雾/光片/下 45°	pcs	1000	1000	三利谱
IC/ST7735S-G4-1	pcs	1000	1000	
ACF/AC-805A/W1.5*100m	m	14.78	1000	
硅胶/TSE399-B/黑色	ml	50	1000	
ACF/CP9731SB/W1.5×50m	m	21.3	1000	
FPC 线路板/HIB018A012-A2	pcs	1000	1000	世域兴
背光/HIB018A012-A0	pcs	1000	1000	诚宇
易撕贴/15×8/绿色	pcs	1000	1000	
绝缘胶/4*4*0.05max/黄色透明耐高温	pcs	1000	1000	
吸塑/HIB018A012-A0/350×250×13 透明 PET 防静电/背光厂提供	pcs	78.571	1000	背光厂提供
塑料袋/410×550/PE	pcs	7.143	1000	
泡棉板/570*420*20mm/白色/防静电	pcs	3.571	1000	外箱内前后各垫一个
泡棉板/570*200*20mm/白色/防静电	pcs	3.571	1000	外箱内左右各垫一个
泡棉板/380*200*20mm/白色/防静电	pcs	3.571	1000	外箱内上下各垫一个
珍珠棉/310*210*0.5mm/红色/防静电	pcs	71.429	1000	
内盒/380*265*100mm/单坑台 K 纸/不要印合力泰 LOGO	pcs	7.143	1000	
外箱/590×440×260/K636K	pcs	1.786	1000	

ROHS

6.Interface Description

NO.	SYMBOL	Description	I/O
1	P1	contacted to P13	
2	GND	Ground	
3	CS	Chip Selection Pin	
4	RS	this pin is used as D/CX (data/ command selection)	
5	SCL	In Serial Interface, this is used as SCL	
6	SDA	SPI interface input pin	
7	RESET	Reset Pin	
8	GND	Ground	
9	IOVCC(1.8V)	Power Supply for I/O System	
10	VDD(2.8V)	Power Supply for Analog	
11	LED+	LED Anode	
12	LED-	LED Cathode	
13	P13	contacted to P1	

7.Backlight Characteristics



B/L CIRCUIT DIAGRAM

IF =40mA,VF=2.8-3.4V

Item	Symbol	MIN	TYP	MAX	UNIT	Test Condition	Note
Supply Voltage	**Vf**	**2.8**	**3.1**	**3.4**	**V**	**If=40mA**	**-**
Supply Current	**If**	**-**	**40**	**60**	**mA**		**-**
Uniformity for LCM	**-**	**75**	**80**	**-**	%		**-**
Life Time	**-**	**20000**	**-**	**-**	**Hr**		**-**
Backlight Color	**White**						

8.Absolute Maximum Ratings

LCM 极限电气参数

Parameter	SYMBOL	Min	Typ	Max	Unit	Note
TFT Gate ON Voltage	VGH	14	15	16	V	*1*2
TFT Gate OFF Voltage	VGL	-8.5	-7.5	-6.5	V	
TFT Common Voltage	Vcom	-1.5	-0.75	3.5	V	
Data (RGB signal)Voltage	Vsig	0.2		5.2	V	

9.Electrical Characteristics

9.1LCM 电气性能

Parameter	Symbol	Condition	Specification			Unit	Related Pins
			Min	Typ	Max		
Power & Operation Voltage							
System Voltage	VDD	Operating Voltage	2.3	2.75	4.8	V	
Interface Operation Voltage	VDDI	I/O Supply Voltage	1.65	1.8	3.7	V	
Gate Driver High Voltage	VGH		10		15	V	
Gate Driver Low Voltage	VGL		-12.4		-7.5	V	
Gate Driver Supply Voltage		| VGH-VGL |	17.5		27.5	V	
Input / Output							
Logic-High Input Voltage	VIH		0.7VDDI		VDDI	V	Note 1
Logic-Low Input Voltage	VIL		VSS		0.3VDDI	V	Note 1
Logic-High Output Voltage	VOH	IOH = -1.0mA	0.8VDDI		VDDI	V	Note 1
Logic-Low Output Voltage	VOL	IOL = +1.0mA	VSS		0.2VDDI	V	Note 1
Logic-High Input Current	IIH	VIN = VDDI			1	uA	Note 1
Logic-Low Input Current	IIL	VIN = VSS	-1			uA	Note 1
Input Leakage Current	IIL	IOH = -1.0mA	-0.1		+0.1	uA	Note 1
VCOM Voltage							
VCOM Amplitude	VCOM		-2		-0.425	V	
Source driver							
Source Output Range	Vsout		0.1		GVDD	V	
Gamma Reference Voltage	GVDD		3.15		4.7	V	
Source Output Settling Time	Tr	Below with 99% precision			20	us	Note 2
Output Offset Voltage	Voffset				35	mV	Note 3

9.2 功耗规格

（环境温度 25℃,VCI=IOVCC=3.3V）测试 Vcc 电流

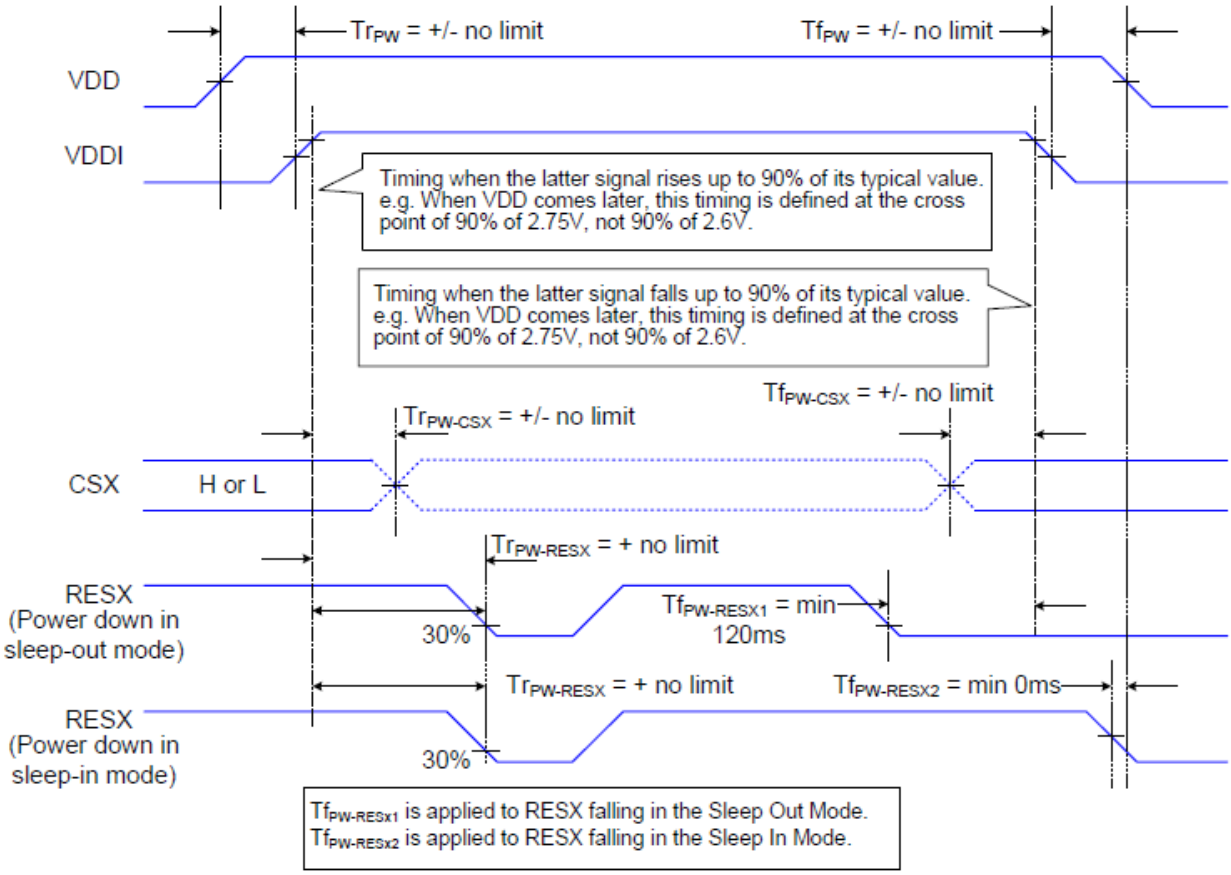
参数	Min	Typ	Max	单位
LCD Normal work	0.7	1.2	1.5	mA
LCD Sleep mode	7	10	30	uA

9.3 ROHS

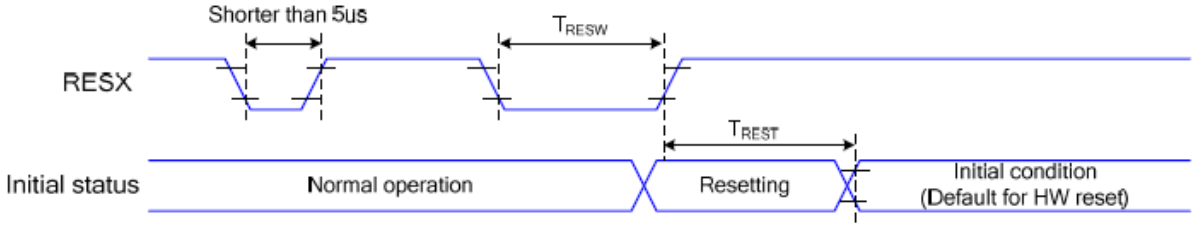
测试项目	测试设备	限量值	内容
Pb	XRF	有机材料＜100PPM; 无机材料＜700PPM	N.D.
Hg	XRF	<700PPM	N.D.
Cd	XRF	<700PPM	N.D.
Cr	XRF	<700PPM	N.D.
Br	XRF	<700PPM	N.D.

10.Timing Characteristics.

10.1The power on/off sequence



10.2 Reset Timing



Related Pins	Symbol	Parameter	MIN	MAX	Unit
RESX	tRESW	Reset Pulse Duration	10	-	us
	tREST	Reset Cancel	-	5	ms
				120	ms

10.3 Serial Interface Characteristics (4-line Serial)

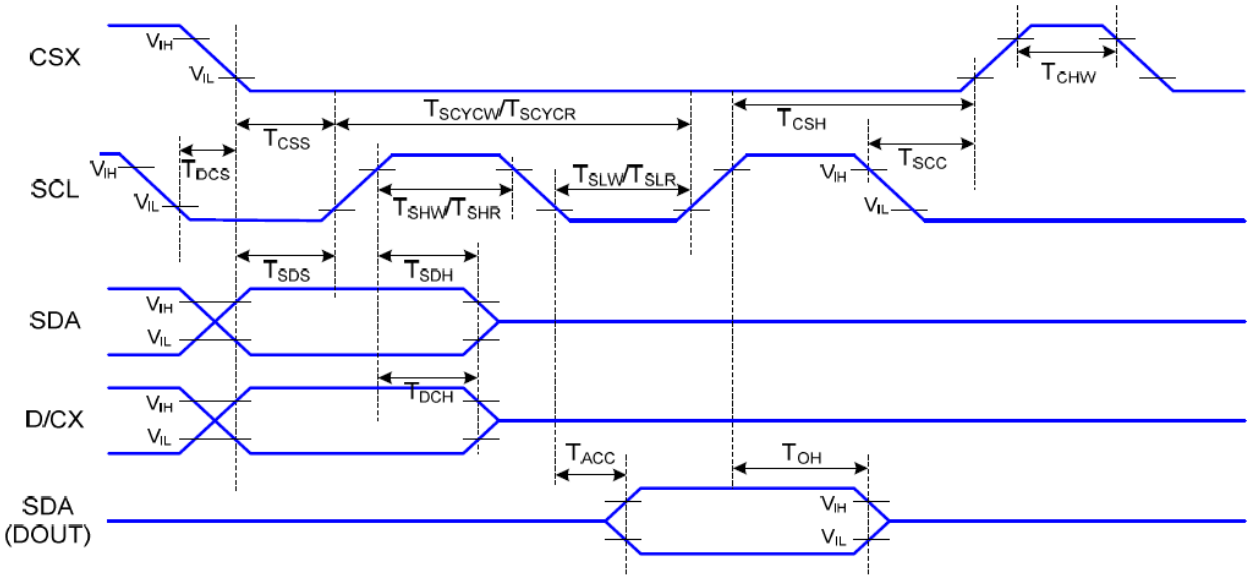


Figure 7 4-line Serial Interface Timing

Ta=25 ℃, VDDI=1.65~3.7V, VDD=2.5~4.8V

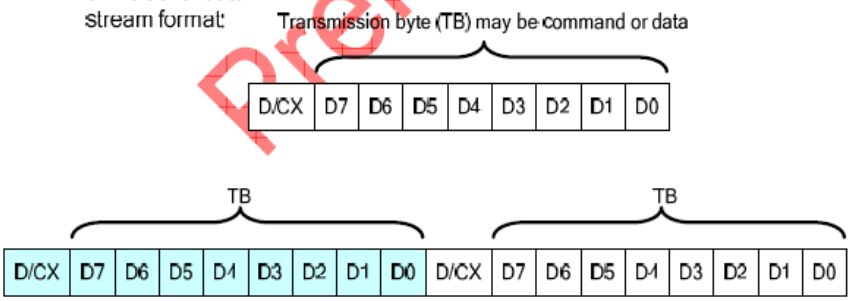
Signal	Symbol	Parameter	MIN	MAX	Unit	Description
CSX	TCSS	Chip Select Setup Time (Write)	45		ns	
	TCSH	Chip Select Hold Time (Write)	45		ns	
	TCSS	Chip Select Setup Time (Read)	60		ns	
	TSCC	Chip Select Hold Time (Read)	65		ns	
	TCHW	Chip Select “H” Pulse Width	40		ns	
SCL	TSCYCW	Serial Clock Cycle (Write)	66		ns	-Write Command & Data Ram
	TSHW	SCL “H” Pulse Width (Write)	15		ns	
	TSLW	SCL “L” Pulse Width (Write)	15		ns	
	TSCYCR	Serial Clock Cycle (Read)	150		ns	-Read Command & Data Ram
	TSHR	SCL “H” Pulse Width (Read)	60		ns	
	TSLR	SCL “L” Pulse Width (Read)	60		ns	
D/CX	TDCS	D/CX Setup Time	10		ns	
	TDCH	D/CX Hold Time	10		ns	
SDA (DIN) (DOUT)	TSDS	Data Setup Time	10		ns	For Maximum CL=30pF For Minimum CL=8pF
	TSDH	Data Hold Time	10		ns	
	TACC	Access Time	10	50	ns	
	TOH	Output Disable Time	15	50	ns	

10.4 Command Write Mode

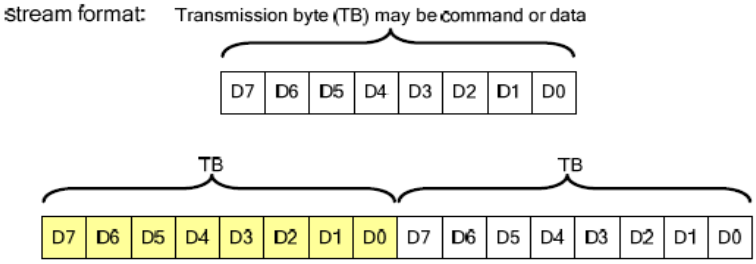
The write mode of the interface means the micro controller writes commands and data to the LCD driver. 3-lines serial data packet contains a control bit D/CX and a transmission byte. In 4-lines serial interface, data packet contains just transmission byte and control bit D/CX is transferred by the D/CX pin. If D/CX is "low", the transmission byte is interpreted as a command byte. If D/CX is "high", the transmission byte is stored in the display data RAM (memory write command), or command register as parameter.

Any instruction can be sent in any order to the driver. The MSB is transmitted first. The serial interface is initialized when CSX is high. In this state, SCL clock pulse or SDA data have no effect. A falling edge on CSX enables the serial interface and indicates the start of data transmission.

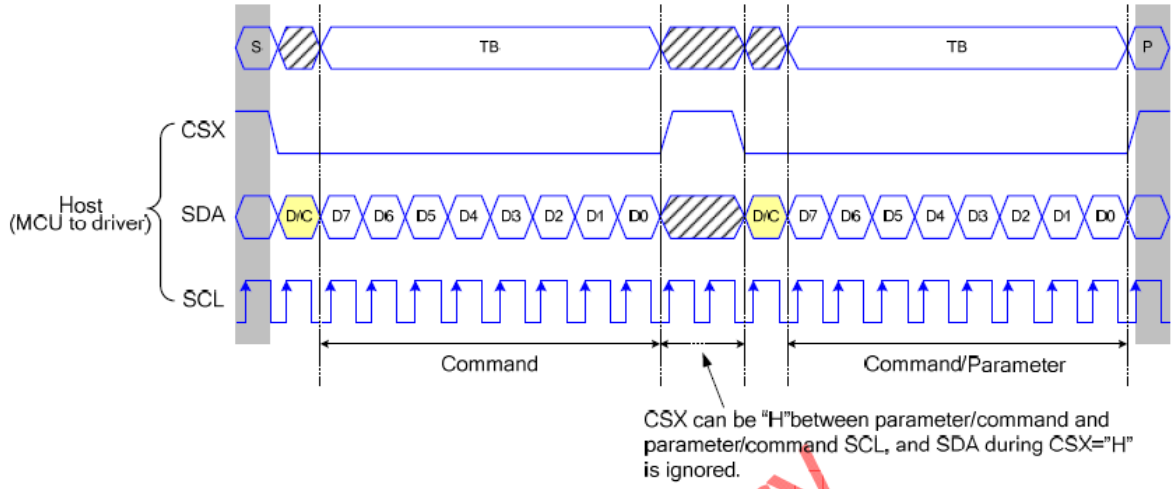
3-line serial data stream format:



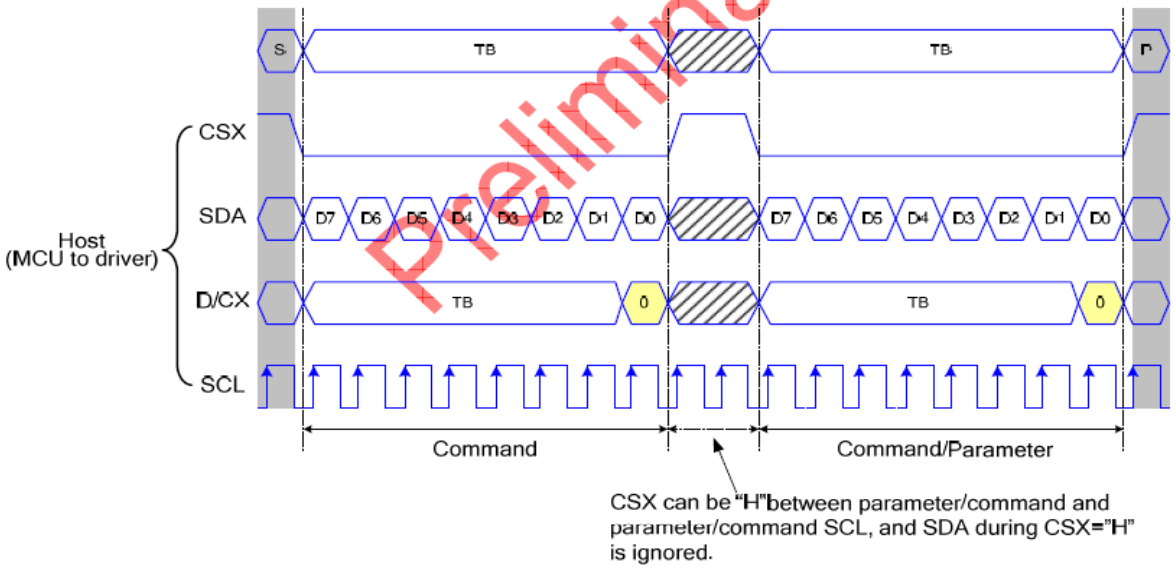
4-line serial data stream format:



When CSX is “high”, SCL clock is ignored. During the high period of CSX the serial interface is initialized. At the falling edge of CSX, SCL can be high or low (see Figure 17). SDA is sampled at the rising edge of SCL. D/CX indicates whether the byte is command (D/CX=’0’) or parameter/RAM data (D/CX=’1’). D/CX is sampled when first rising edge of SCL (3-lines serial interface) or 8th rising edge of SCL (4-lines serial interface). If CSX stays low after the last bit of command/data byte, the serial interface expects the D/CX bit (3-lines serial interface) or D7 (4-lines serial interface) of the next byte at the next rising edge of SCL..



3-line Serial Interface Write Protocol (Write to Register with Control Bit in Transmission)

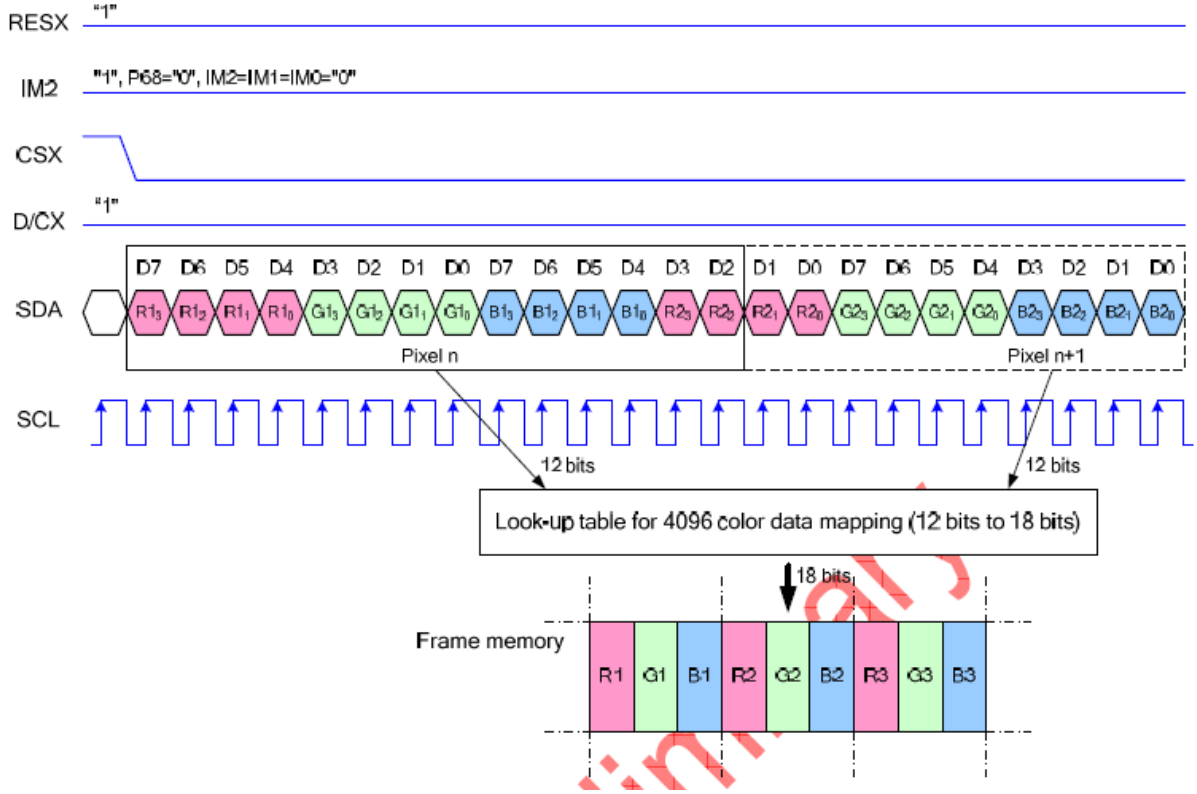


4-line Serial Interface Write Protocol (Write to Register with Control Bit in Transmission)

10.5Data Color Coding

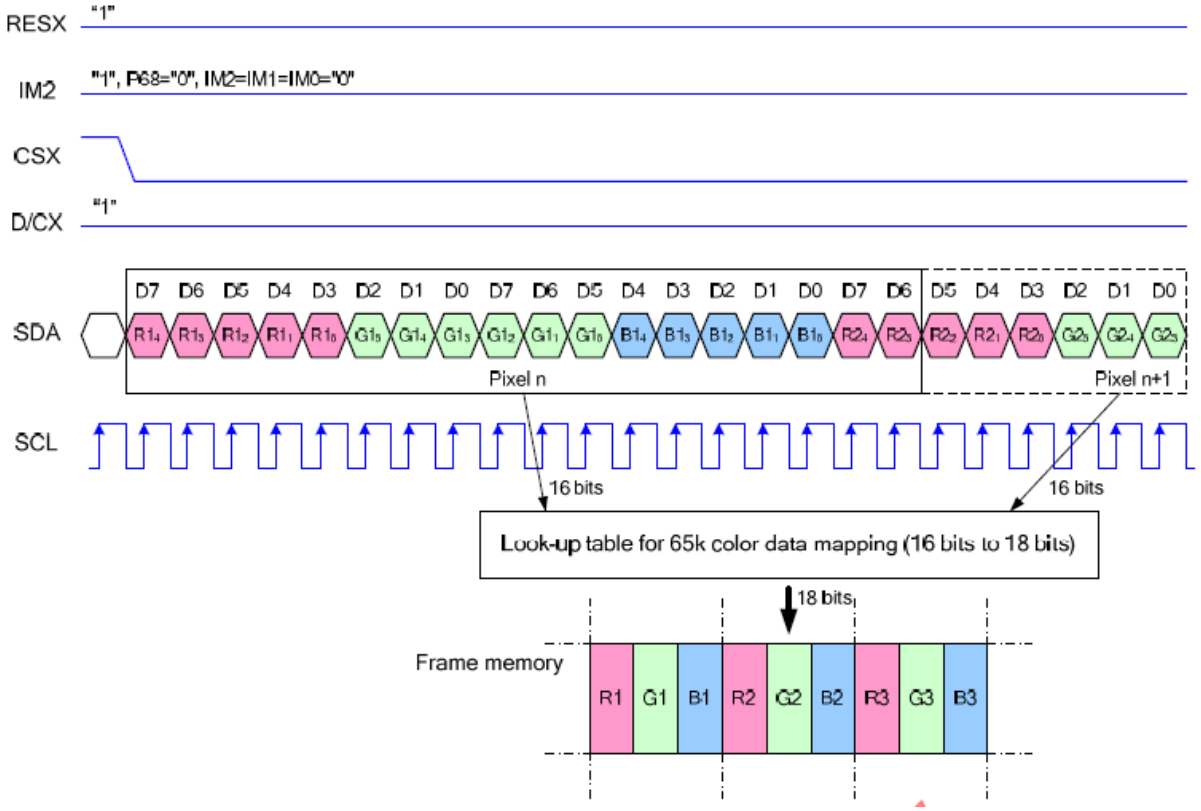
Different display data formats are available for three colors depth supported by the LCM listed below.
4k Colors, RGB 4-4-4-bit Input
65k Colors, RGB 5-6-5-bit Input
262k Colors, RGB 6-6-6-bit Input

Write Data for 12-bit/Pixel (RGB 4-4-4-bit Input), 4K-Colors, 3AH="03h"



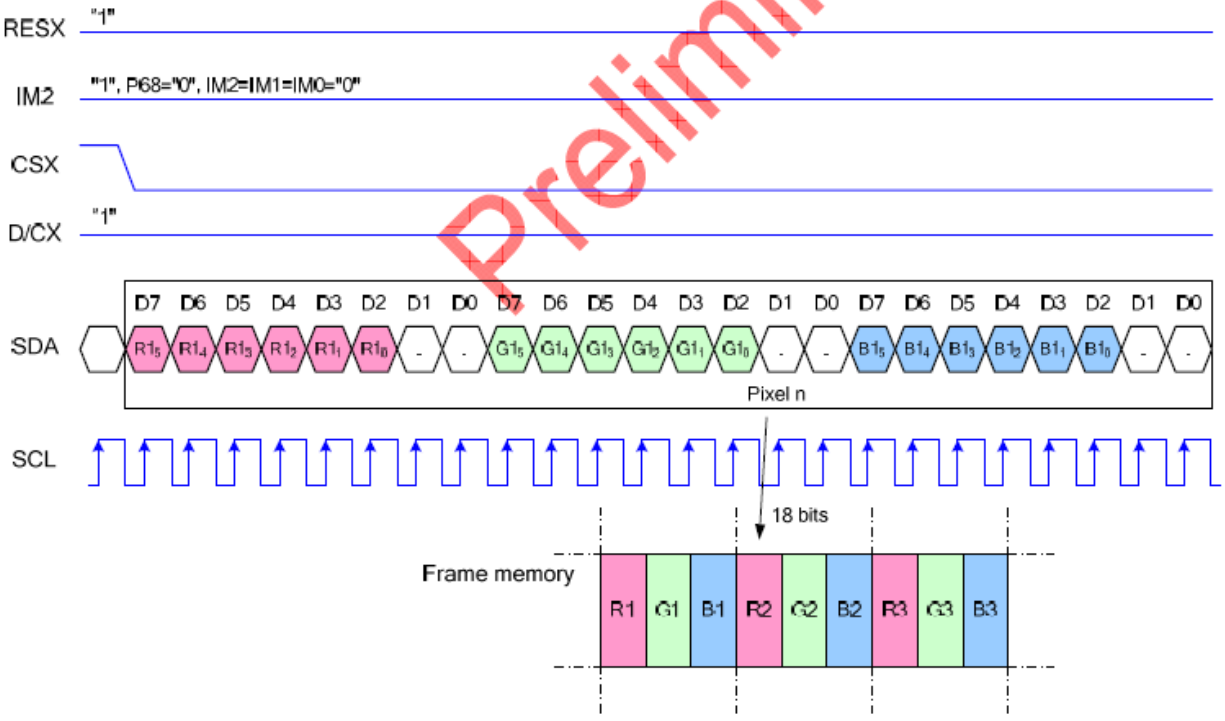
Note 1. pixel data with the 12-bit color depth information
Note 2. The most significant bits are: Rx3, Gx3 and Bx3
Note 3. The least significant bits are: Rx0, Gx0 and Bx0

Write Data for 16-bit/Pixel (RGB 5-6-5-bit Input), 65K-Colors, 3AH="05h"



Note 1. pixel data with the 16-bit color depth information
Note 2. The most significant bits are: Rx4, Gx5 and Bx4
Note 3. The least significant bits are: Rx0, Gx0 and Bx0

Write Data for 18-bit/Pixel (RGB 6-6-6-bit Input), 262K-Colors, 3AH="06h"



Note 1. pixel data with the 18-bit color depth information
Note 2. The most significant bits are: Rx5, Gx5 and Bx5
Note 3. The least significant bits are: Rx0, Gx0 and Bx0

11.Optical Characteristics

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Viewing Angle range	Horizontal	RIGHT	Center CR>10	30	40		deg
		LEFT		30	40		
	Vertical	UP		30	40		
		DOWN		10	20		
Transmittance (without polarizer)		T%	Viewing Normal angle **Θx = 0 Θy = 0**		19.1		%
Brightness(LCM)		-			100		nit
Contrast Ratio		CR		150			-
Response Time (by Quick)		T_R			2	4	ms
		T_F			6	12	
Color gamut		S(%)			60		%
CF only Color Chromaticity (CIE 1931)	Red	Rx	Viewing Normal Angle **Θx = 0 Θy = 0**	TYP. -0.03	0.58	TYP. + 0.03	-
		Ry			0.34		-
	Green	Gx			0.31		-
		Gy			0.57		-
	Blue	Bx			0.15		-
		By			0.08		-
	White	Wx			0.28		-
		Wy			0.30		-
Uniformity for LCM					75%	80%	

Note1. Surface luminance is the LCD surface from the surface with all pixels displaying white For more information see FIG 1.
Lv=Average Suface Luminance with all white pixels (P1,P2,P3,P4,P5)

Note2. The umiformity in surface luminance (& White) is determined by measuring luminance at each test position 1 through 5,and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance.For more information see FIG 1.

Note3. Contrast Ratio(CR) is defined mathematically by the folowing fomula Formula. For more information see FIG 1:

Note4. Response time is the time required for the display to transition from White to black(Rise Time Tr) and from black to white(Decay Time Tf) For additional information see FIG 2..

Note 5. Viewing angle is the angle at which the contrast ratio is greater than 2. For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface For more information see FIG 3.

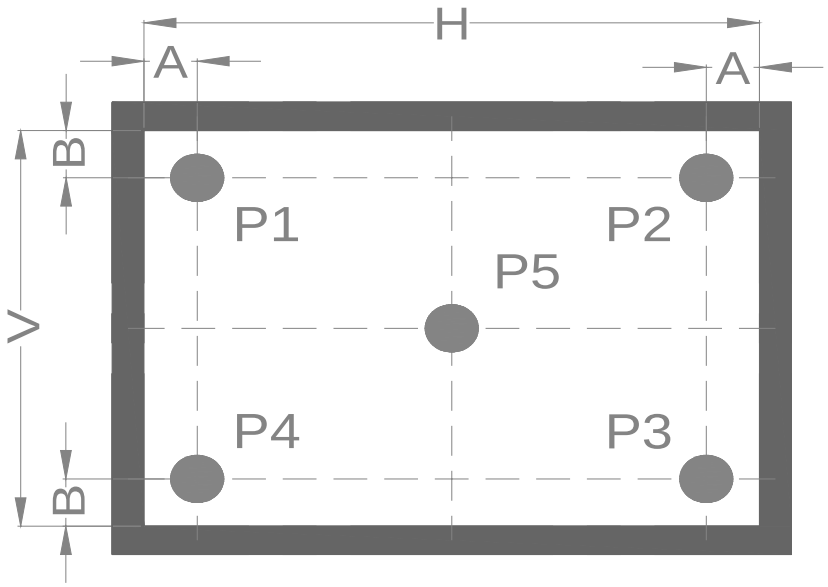
Note 6. CIE(x,y) chromaticity, The x,y value is determined by screen active area position 5 For more information see FIG 1.

Note7. NTSC ratio; For more information see FIG 3.

Note8. For Viewing angle and response time testing, the testing data is base on Autronic-Melchers' s ConoScope. Series Instruments. For comtrast ratio, Surface Luminance, Luminance uniformity and CIE, the testing data is base on BM-7 photo detector.

Note9. For TFT transmissive module. Gray scale reverse occurs in direction of panel viewing angle

FIG. 1. Measuring method for Contrast ratio, surface luminance, Luminance uniformity,CIE (x, y) chromaticity.



A : 5mm
B : 5mm
H, V : Active Area
Lihgt spot size Ø =5mm, 500mm
distance from the LCD suface to
detector lens measurement
instrument is luminance meter BM-7

FIG. 2. The definition of Response Time

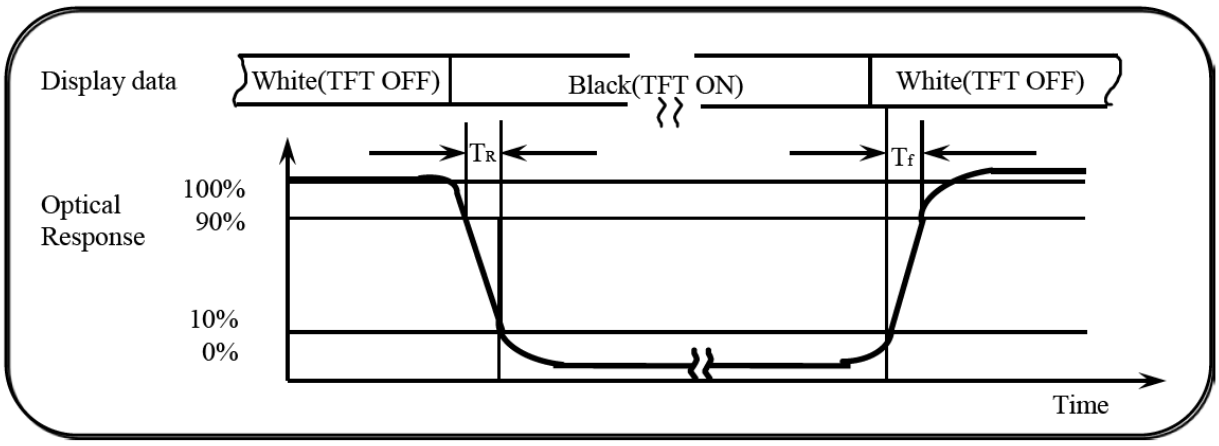
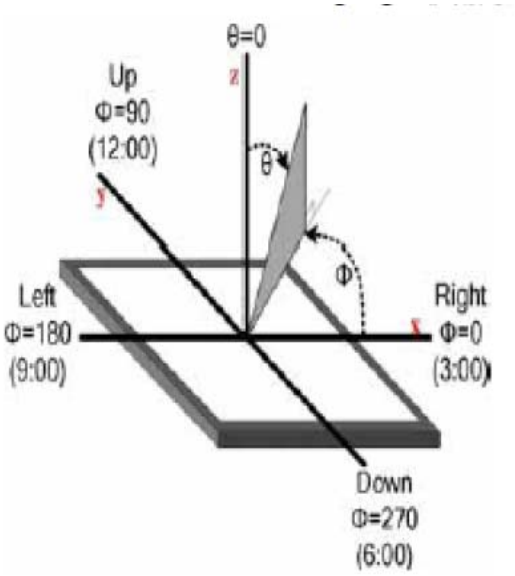
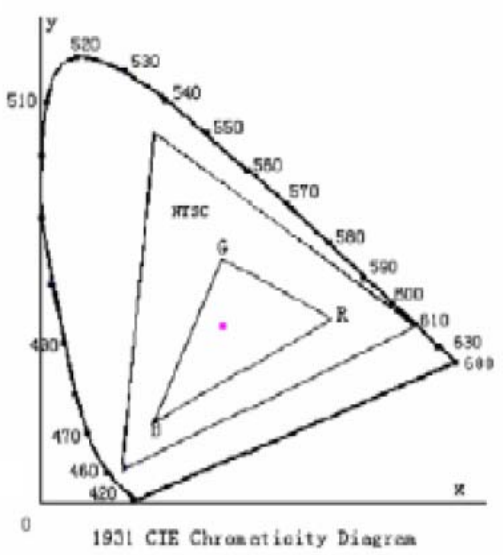


FIG. 3. The definition of viewing angle





1931 CIE Chromaticity Diagram

Fig.4. 1931 CIE chromaticity diagram

12. Reliability Test Conditions And Methods

LCM 可靠性测试

NO.	TEST ITEMS	TEST CONDITION	INSPECTION AFTER TEST
1	High Temperature Storage	80℃±3℃×120Hours	Note 1，Note 4
2	Low Temperature Storage	－30℃±3℃×120Hours	Note 1，Note 4
3	High Temperature Operating	70℃±3℃×120Hours	Note 1，Note 4
4	Low Temperature Operating	－20℃±3℃×120Hours	Note 1，Note 4
5	Operate at High Temperature and Humidity	+60℃, 90%RH ,120hrs	Note 4
6	ESD TEST	150pF/330Ω +-4kV contact discharge; +-8kV air discharge.	
7	Thermal Shock	-30℃/(60mins) ~ +80℃/(60mins) for a total 24 cycles, Start with cold temperature and end with high temperature.	Note 4
8	盐雾试验	盐雾浓度：5% NaCl 溶液PH值：6.5-7.2 盐雾箱温度：35℃±2℃； 样品放入以上条件盐雾箱，连续喷盐雾24小时，然后移出进行16小时晾干，检查	
9	包装振动	频率：10HZ～55HZ; 振幅：0.75mm; 振动方向/时间：Z 轴90min	
10	包装跌落	跌落高度：H:1m(G≤9kg), H:80cm(9kg＜G≤18kg), H:60cm(G＞18kg); 坠地地面:水泥地; 方向/次数:6 面3 棱2 角各 次,共11 次	

Note 1: Ta is the ambient temperature of samples.
Note 2: Ts is the temperature of panel's surface.
Note 3: 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,but don't guarantee all of the cosmetic specification.
Note 4: Before cosmetic and function test, the product must have enough recovery time,at least 2 hours at room temperature.

13. LCD 电测与外观检验标准

LCM 外观检验标准

范围：

本标准适用于 LCM 事业部内部半成品及成品检查.如客户要求，以客户提供的检验标准为准。

2.抽样计划：

根据 GB/T 2828.1-2012 正常单次检验标准制定，可以接受/拒收的标准依据为：

严重缺陷：0.25

轻微缺陷：0.65

如客户有指定，则按客户指定抽样计划执行。

2.检验条件

2.1 环境光照度：外观检查 1200~2000 lux。电测检查≤50lux

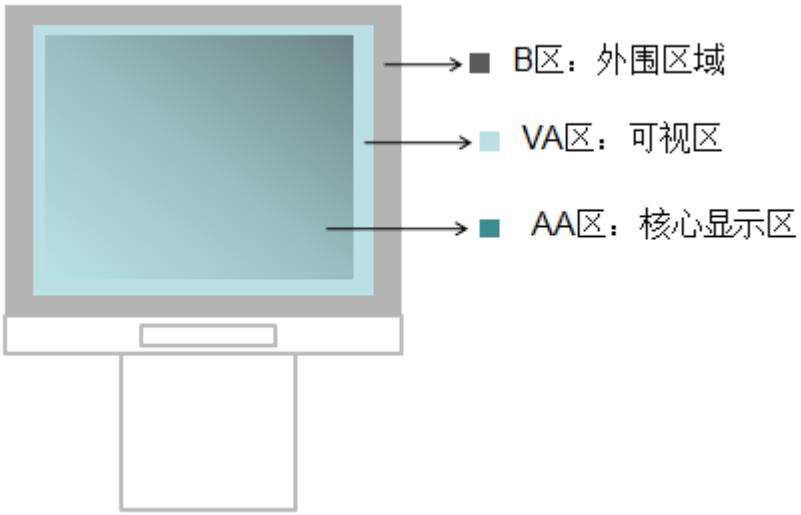
2.2 环境温度 25±5° C，湿度 35%~75%RH

2.3 目视被检验物体，距离 30cm±5 cm，时间 5～10 秒，作外观检验。按《产品图纸》中的视角方向进行检验。角度旋转+-15 度

2.4 计量单位

在此检查规范内，没有特别说明，使用单位均为 mm。

3.LCD 区域定义：



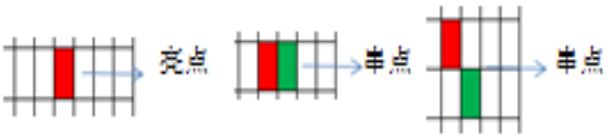
B 区：非可视区，通常在后段装配或者客户端组装后被盖住。带 **TP** 的产品则该区域为边缘区域。

VA 区：可视区

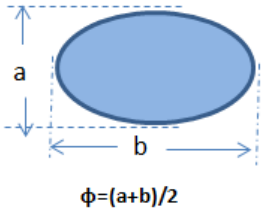
AA 区：图像显示区

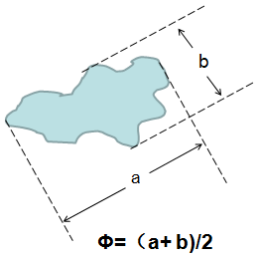
VA 区和 **AA** 区的严格定义参照图纸要求。

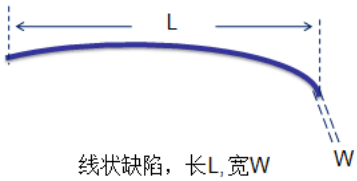
4. 缺陷项目及接收标准

<table>
<tr><th>编号</th><th>缺陷名称</th><th>接收标准</th><th>分类</th></tr>
<tr><td>1</td><td>外形尺寸</td><td>按图纸标注尺寸及公差进行判定</td><td>重缺陷</td></tr>
<tr><td>2</td><td>漏笔、缺划</td><td>缺横线、缺竖线，不允许</td><td>重缺陷</td></tr>
<tr><td>3</td><td>无显示</td><td>无画面显示，不允许</td><td>重缺陷</td></tr>
<tr><td>4</td><td>显示异常</td><td>显示乱码，不允许</td><td>重缺陷</td></tr>
<tr><td>5</td><td>背光不亮,死灯、背光不均</td><td>背光不亮或是有一颗以上 LED 灯不亮，背光均匀性未达到标准要求不允许</td><td>重缺陷</td></tr>
<tr><td>6</td><td>无触摸，触摸漂移</td><td>不允许</td><td>重缺陷</td></tr>
<tr><td>7</td><td>底色不均</td><td>以限度样板为准（前提是满足规格书中均匀性要求）</td><td>重缺陷</td></tr>
<tr><td>8</td><td>显示淡</td><td>超出规格书中亮度及对比度，NG</td><td>重缺陷</td></tr>
<tr><td>9</td><td>TFT 子像素点坏死 (dot defect)</td><td>
<table>
<tr><th colspan="4">Spot defect</th></tr>
<tr><td rowspan="2">Area / Defect size</td><td colspan="3">Acceptable number</td></tr>
<tr><td>AA</td><td>VA</td><td>B</td></tr>
<tr><td>Φ≤0.1</td><td colspan="3">ignore</td></tr>
<tr><td>0.1<Φ≤0.15</td><td>2</td><td>2</td><td rowspan="3">ignore</td></tr>
<tr><td>0.15<Φ≤0.2</td><td>1</td><td>1</td></tr>
<tr><td>0.2<Φ</td><td>0</td><td>0</td></tr>
<tr><td colspan="4">1.Distance between spots need be bigger than 10mm.
2. Ignore means it is acceptable, but spot cluster(3 spots in 1mm² area) is not allowed.
3. Most 3 spots in the whole LCM.</td></tr>
</table>
示意图： 

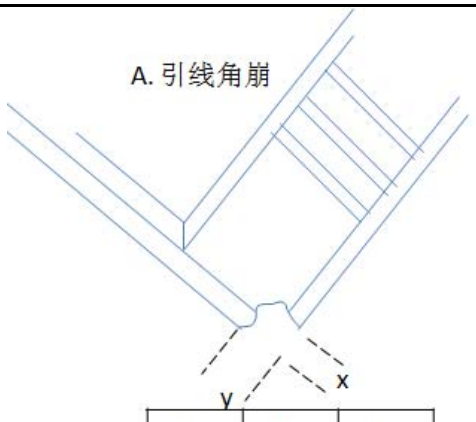
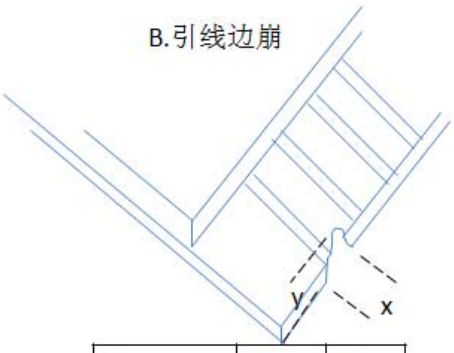
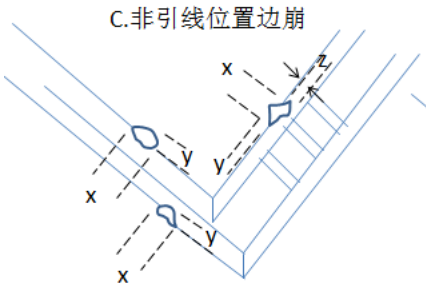
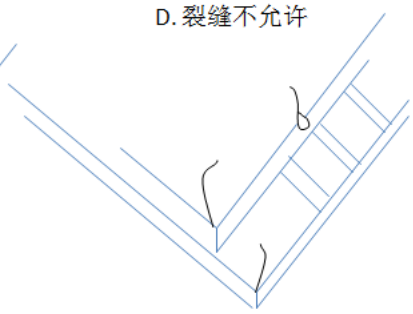
亮点/暗点的按照各型号亮点检查标准。
备注：
1) 亮点指暗画面时，一个子像素点显示发亮；
2) 暗点则指白色画面时，一个子像素点显示发暗；
3) 当缺陷的部分大于 1/2 子像素点时，当作一个亮点/暗点。</td><td>轻缺陷</td></tr>
</table>

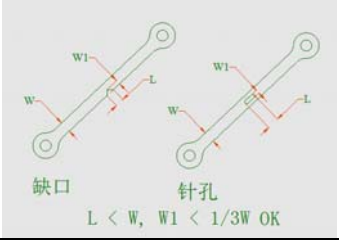
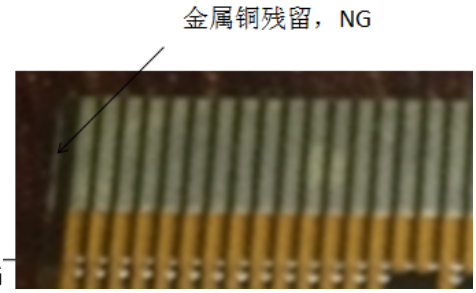
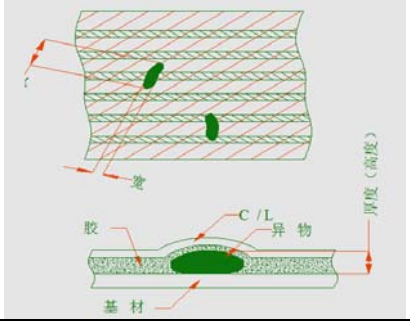
<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>点状缺陷（黑点，白点，异物点）
Spot defect</td><td> 

ϕ=(a+b)/2
 

Φ=（a+ b)/2
选定最长的一边 a,对 应垂直方向的宽度为b。点的直径为长加宽的一半。</td><td>轻 缺陷</td></tr>
<tr><td>11</td><td>线状缺陷（毛线，细划伤等）
Line Defect</td><td>
<table>
<tr><td colspan="5">Line Defect</td></tr>
<tr><td colspan="2">Size</td><td colspan="3">Acceptable Number</td></tr>
<tr><td>L</td><td>W</td><td>AA</td><td>VA</td><td>B</td></tr>
<tr><td>ignore</td><td>W<0.01</td><td colspan="3">Ignore</td></tr>
<tr><td>L≤3</td><td>0.01≤W≤0.03</td><td>2</td><td>2</td><td rowspan="4">Ignore</td></tr>
<tr><td>L≤3</td><td>0.03≤W≤0.05</td><td>1</td><td>1</td></tr>
<tr><td>L>3</td><td>W>0.01</td><td>0</td><td>0</td></tr>
<tr><td>Ignore</td><td>w>0.05</td><td>Treat as spot</td><td>Treat as spot</td></tr>
<tr><td colspan="5">Distance between two lines need bigger than 10mm.</td></tr>
</table>


线状缺陷，长L, 宽W
 
形成大于半圆的线，当作点缺陷</td><td>轻 缺陷</td></tr>
<tr><td>12</td><td>模糊黑白团、贴合水印、黑影、Mura</td><td>模糊点指不易发现的脏污，淡黑、白团、Mura。用 ND5%滤光片遮盖，不可见可接受。必要时可制定限度样板</td><td>轻 缺陷</td></tr>
<tr><td>13</td><td>玻璃崩角、崩边</td><td>以下接收标准的前提为 超出图纸尺寸不允许,裂缝不允许，崩伤线路不允许(FPC 邦定线路除外)</td><td>轻 缺陷</td></tr>
</table>

		 x | y | z ≤2 | ≤1 | 不限 ≤1 | ≤2 | 不限  x | y | z ≤5 | ≤0.5 | 不限 1/8 X方向总长 | y≤0.3 | 不限  x | y | z ≤3 | ≤1 | ≤1/2单玻璃厚度 注：不允许触及边框，不允许造成贴片气泡/片翘  注：由于玻璃裂缝具有延伸性，任何形式的裂缝均不允许	
14	偏光片气泡	进入 **VA** 区，按照点线接收标准； 边沿气泡未进入 **VA** 区的，气泡最多不能超过环氧框 **4/5**; 备注 **1**：图纸无标注 **VA** 区的，应以客户机壳盖住后不可见为接收准则 备注 **2**：气泡大到有扩大风险或偏光片翘起风险的，不允许。	轻缺陷
15	表面凹坑，凸点，	**Φ≤0.5mm**，可接收；**Φ>0.5mm**，不接收	轻缺陷
16	偏光片贴附	不允许超出玻璃边，不允许超出图纸尺寸 偏光片的边必须整齐，如成锯齿状，不能进入 **1/2** 环氧框 偏光片的任何边角翘起不允许 偏光片方向类别错误不允许	轻缺陷
17	边框胶（环氧框）缺陷	胶缺失及胶气泡或杂质不能超过 **1/3** 边框胶。 边框胶突起不能进入视区。	轻缺陷
18	保护胶缺陷	打胶高度不超过偏光片表面 胶必须完全覆盖 **ITO** 走线，且无贯穿气泡、针孔	轻缺陷
19	一线胶	漏涂一线胶，**NG**	轻缺

			陷
20	点银浆	银浆需连通上下层，厚度不可高过偏光片	轻缺陷
21	FPC 折痕	死折(指没有弧度呈角度的弯折)不允许。 备注：特殊要求允许死折的，以图纸要求为准。	轻缺陷
22	线路缺口、针孔、杂质	线路缺口或杂质不允许超过 1/3 线路宽度，长度要小于线宽。 	轻缺陷
23	金手指厚度	金手指厚度超出图纸要求，NG； 金手指轻易从连接器松脱，NG；金手指无法插入连接器，NG；	轻缺陷
24	金手指划伤，异物	表面不可露铜、露镍、脱层及氧化 金手指不允许有污渍、脏污。可擦除印记需退回清洁	轻缺陷
25	插接金手指偏位	偏位超出图纸要求，NG；  边沿残留金属铜，NG	轻缺陷
26	覆盖膜与铜面间异物	1.导电性异物 NG 2.目视可见的黑色异物 NG 3.横跨两根导体的异物 NG 	轻缺陷
27	焊接缺陷	假焊、虚焊，锡渣残留、短路等不可有 焊接高度默认为不能超过 0.4mm，图纸有要求以图纸为准	轻缺陷
28	组装偏位	不可超出图纸要求	轻缺陷
29	卡扣变形	卡扣失去作用，NG	轻缺陷
30	产品喷码	图纸有要求内容的，参照图纸要求。客户无要求的印流程单批号。 以能识别出喷码内容为接收标准。	轻缺陷

31	泡棉胶	视窗内的泡棉不可以超出显示区，以 **45°** 角检验，看见泡棉胶 **NG** 背面泡棉胶必须检验，不可超出 **TP** 与 **TFT** 组合，目视不可见为 **OK**	轻 缺陷
32	**IC** 遮光纸	需完全覆盖 **IC**，不能超出玻璃边，不能搭到偏光片,不可翘起	轻 缺陷
33	高温胶	参考图纸,完全覆盖住焊接区，不可超出模组边沿，不可翘起.	轻 缺陷
34	易撕贴	易撕贴要能将保护膜撕起	轻 缺陷
35	保护膜	保护膜不能有破损	轻 缺陷
36	标签	**1.**标签的使用和贴附需符合规格要求。标签内容不能涂改 **2.**如是条码或二维码,扫描内容需与要求一致	轻 缺陷

14. Handling Precautions

14.1 Mounting method

The LCD panel of quality Co.,ltd module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

14.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent [recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Salfur (S)

If goods were sent without being sili8con coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (CI), Salfur (S) from customer, Responsibility is on customer.

14.3 Caution against static charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to Vdd or Vss, do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

14.4 packing

- Module employ LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity

14.5 Caution for operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

14.6 storage

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it . And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.
- Storing with no touch on polarizer surface by the anything else.
  [It is recommended to store them as they have been contained in the inner container at the time of delivery from us

14.7 Safety

- It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.
- When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water

15. Precaution For Fse

15.1

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

15.2

On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- When a question is arisen in this specification
- When a new problem is arisen which is not specified in this specifications
- When an inspection specifications change or operating condition change in customer is reported to quality Co.,ltd , and some problem is arisen in this specification due to the change
- When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.

16 Packing Method

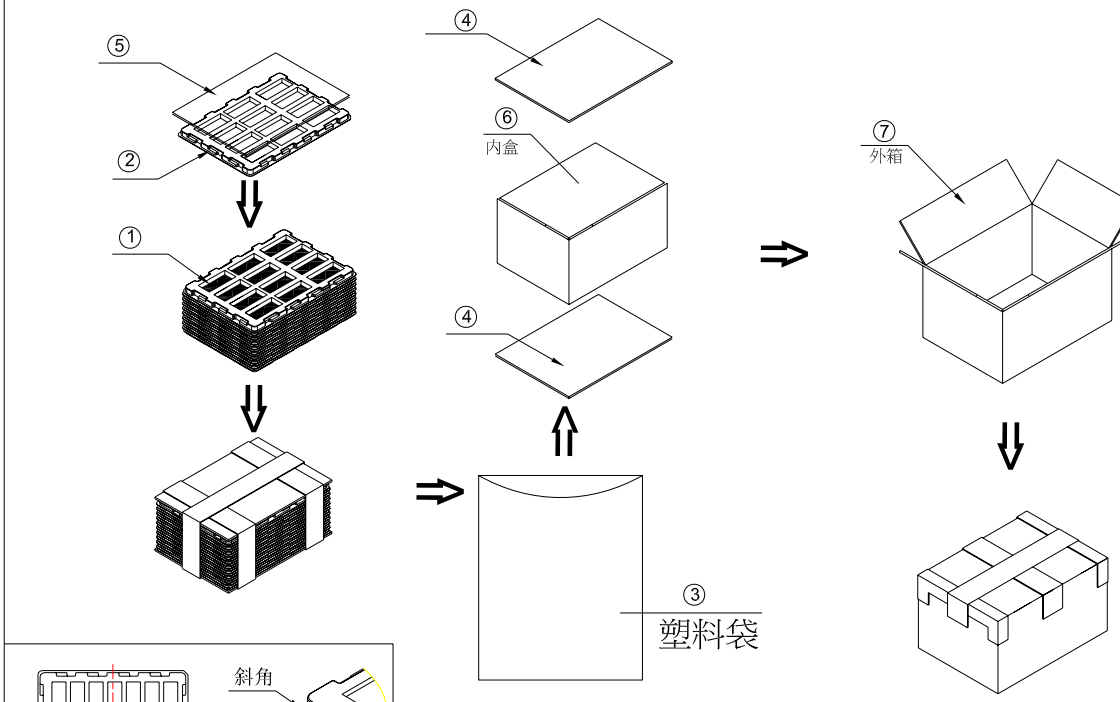
Ver. A0	LCM包裝規格書 LCM Packaging Specifications	Approved by	Checked by	Prepared by
Documents NO. PKG-HIB018A012				

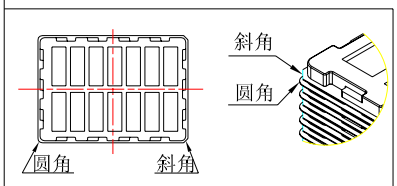
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Material Name	Material Number	Description	Quantity
①	成品 (LCM)	8000065036	TFT模组/HIB018A012-A1	560
②	吸塑(Tray)	3000009066	吸塑/HIB018A012-A0	44
③	塑 料 袋	3000005794	塑料袋/410x550/PE	4
④	泡棉板	3000005605	泡棉板/530*380*20mm/白色	6
⑤	珍珠棉	3000005436	珍珠棉/310*210*0.5mm/红色/防静电	40
⑥	内盒	3000000610	内盒/380*265*100mm/单坑台K纸/不要印合力泰LOGO	4
⑦	外箱	3000009054	外箱/590x440x260/K636K	1

2.單箱數量規格表 (Packaging Specifications and Quantity) :

(1)Total LCM quantity in carton : Quantity per tray 4 x 14x No. of tray (11-1) = 560





吸塑盘叠加必须交错180度.

REVISION STATUS

Rev.Date	Description	REVISOR
2018.01.04	FIRST ISSUE	LIU JIE
NOTE		