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Project No. 项目编号	ET070WS06-TT
Customer 客户名称	
Module No. 客户型号	
Product type 产品内容	**Standard LCD Module** **TFT：600*RGBx1024Dots** **6.95”TFT LCD+CTP**

客户确认Customer Approval	
项目负责人Project Manager	
品质主管Director of Quality	
采购工程师Purchasing Engineer	

PREPARED BY	CHECKED BY	APPROVED BY

1. Introduction

1.1 Scope of application

This specification applies to the LCD module that is supplied by YOURITECH Technology CO., LTD.
LCD specification: Dots 600xRGBx1024
As to basic specification of the driver IC, refer to the IC (JD9365DA-H3) specification and data book.
All material & processing of the LCD module should be Lead Free.

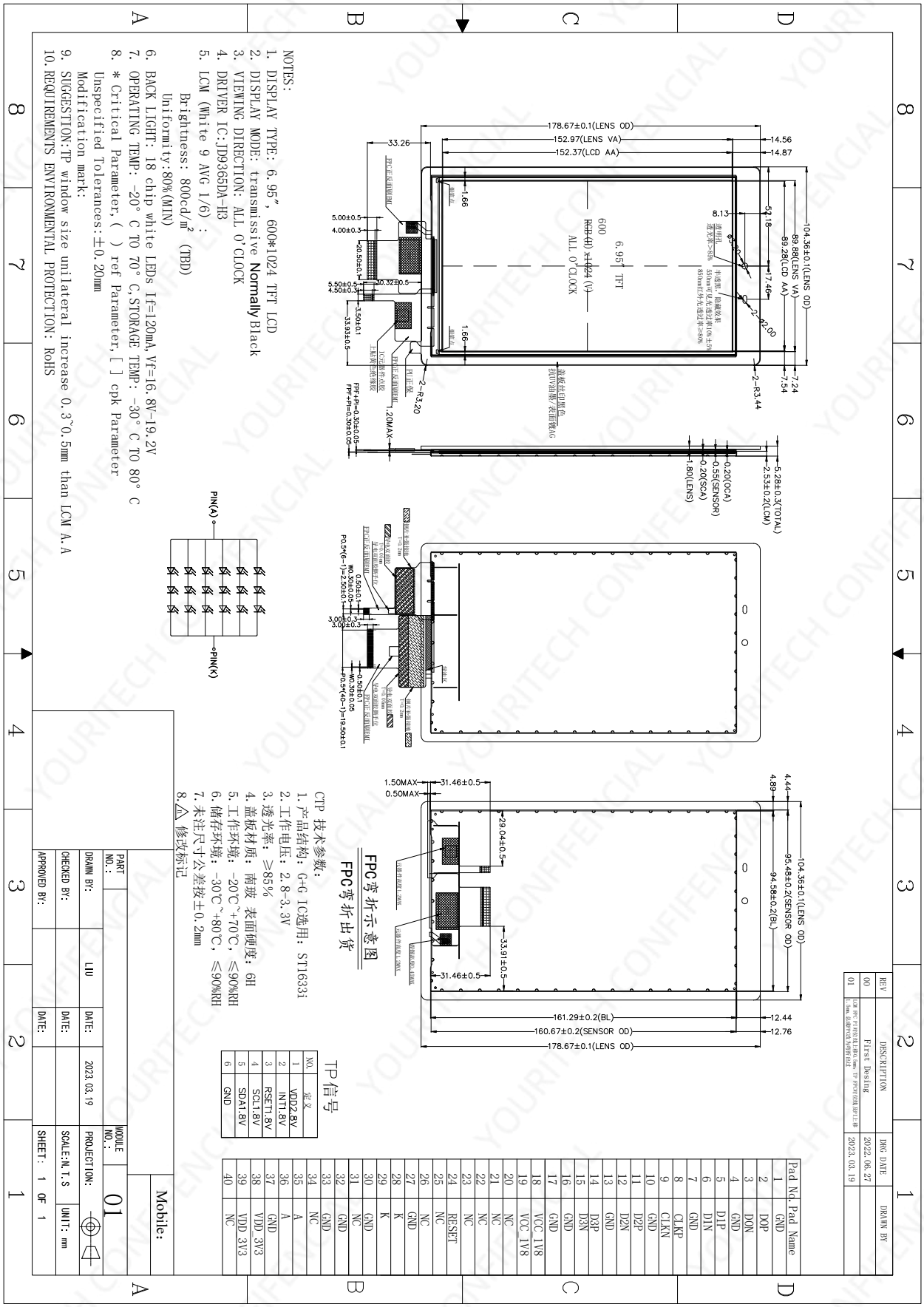
1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL+CTP;
ALL Viewing Type LCD
600 dot-segment and 1024 dot-common outputs;
16.7M Color can be selected by software;
White LED back light;
4lane MIPI interface

1.3 Applications:

2. LCM General specification

ITEM	Sandard value	Unit
LCD Type	Normally Black	--
Drive element	TFT active matrix	--
Number of pixels	600*3RGB(H)X1024(V)	Dots
Pixel arrangement	RGB Vertical Stripe	--
Pixel Pitch (W*H)	0.1488(H) X 0.1488(V)	mm
Active area	89.28(H) x 152.37(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	JD9365DA-H	--
TFT interface	4lane MIPI interface	--
Approx. Weight	TBD	g
LCM Size(W*H*T)	94.58(W) ×161.29(H) ×2.53(T)	mm
LCM+CTP Size(W*H*T)	104.36(W) ×178.67(H) ×5.28(T)	mm
Touch structure	G+G	--
Touch Driver IC	ST1633I	--
Touch Interface	I2C	--


NOTES:
1. DISPLAY TYPE: 6.95", 600*1024 TFT LCD
2. DISPLAY MODE: transmissive Normally Black
3. VIEWING DIRECTION: ALL 0'CLOCK
4. DRIVER IC:JD9365DA-H3
5. LCM (White 9 AVG 1/6) :
Brightness: 800cd/m² (TBD)
Uniformity:80%(MIN)
6. BACK LIGHT: 18 chip white LEDs If=120mA, Vf=16.8V~19.2V
7. OPERATING TEMP: -20° C TO 70° C,STORAGE TEMP: -30° C TO 80° C
8. * Critical Parameter,( ) ref Parameter,[ ] cpk Parameter
Unspecified Tolerances:±0.20mm
Modification mark:
9. SUGGESTION:TP window size unilateral increase 0.3~0.5mm than LCM A.A
10. REQUIREMENTS ENVIRONMENTAL PROTECTION: RoHS
178.67±0.1(LENS OD)
152.97(LENS VA)
152.37(LCD AA)
104.36±0.1(LENS OD)
99.88(LENS VA)
99.28(LCD AA)
6.95" TFT
600
RGB(H) x1024 (V)
ALL 0'CLOCK
5.28±0.3(TOTAL)
2.53±0.2(LCM)
0.20(OCA)
0.55(SENSOR)
0.20(SCA)
1.80(LENS)
1.20MAX
FPC弯折示意图
FPC弯折出货
104.36±0.1(LENS OD)
95.48±0.2(SENSOR OD)
94.58±0.2(BL)
161.29±0.2(BL)
160.67±0.2(SENSOR OD)
178.67±0.1(LENS OD)
PIN(A)
PIN(K)
CTP 技术参数:
1. 产品结构: G+G IC选用: ST1633i
2. 工作电压: 2.8~3.3V
3. 透光率: ≥85%
4. 盖板材质: 南玻 表面硬度: 6H
5. 工作环境: -20℃~+70℃, ≤90%RH
6. 储存环境: -30℃~+80℃, ≤90%RH
7. 未注尺寸公差按±0.2mm
8.△ 修改标记
TP 信号
NO. 定义
1 VDD2.8V
2 INT1.8V
3 RSET1.8V
4 SCL1.8V
5 SDA1.8V
6 GND
REV DESCRIPTION DRG DATE DRAWN BY
00 First Desting 2022.06.27
01 2023.03.19
Pad No. Pad Name
1 GND
2 DOP
3 DON
4 GND
5 D1P
6 D1N
7 GND
8 CLKP
9 CLKN
10 GND
11 D2P
12 D2N
13 GND
14 D3P
15 D3N
16 GND
17 GND
18 VCC_1V8
19 VCC_1V8
20 NC
21 NC
22 NC
23 NC
24 RESET
25 NC
26 NC
27 GND
28 K
29 K
30 GND
31 NC
32 GND
33 GND
34 NC
35 A
36 A
37 GND
38 VDD_3V3
39 VDD_3V3
40 NC
Mobile:
PART NO.:
MODULE NO.: 01
DRAWN BY: LIU DATE: 2023.03.19
PROJECTION:
CHECKED BY: DATE: SCALE:N.T.S UNIT: mm
APPROVED BY: DATE: SHEET: 1 OF 1

3.Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T_{OPR}	-20	+70	°C
LCM Storage Temperature	T_{STG}	-30	+80	°C
TP Operating Temperature & Humidity (20% ~ 90%RH)	T_{OPR}	-20	+70	°C
TP SStorage Temperature & Humidity (20% ~ 90%RH)	T_{STG}	-30	+80	°C
Humidity	RH	--	90	%

4.Electrical Characteristics

4.1 TFT DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for I/O	VDDIO	1.65	1.8	3.3	V
Supply Voltage for(DC/DC)	VDD	2.6	3.3	3.6	V
Current Consumption	I_{DD}	--	--	--	mA
	$I_{DD-SLEEP}$	--	--	--	uA

4.2 Back-Light Unit Characeristics

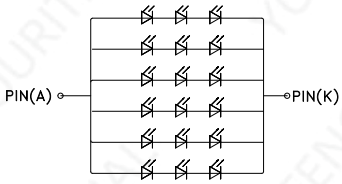
The back-light system is an edge-lighting type with 18 white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V_F	16.8	--	19.2	V	--
Forward current	I_F	--	120	--	mA	--
Luminance(With LCD+CTP)	Lv	--	800	--	cd/m^2	--
LED life time	N/A	--	20,000	--	Hr	Note 1

Note:

(1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I_L=20mA/LED. The LED life time could be decreased if operating I_L is larger than 25mA/LED.

Backlight circuit diagram shown in below:



5. Module Function Description

Pin No.	Symbol	LCM Functional	Notes
1	GND	Power Ground	
2	MIPI_D0+	High speed interface data differential signal input/output pins	
3	MIPI_D0-	High speed interface data differential signal input/output pins	
4	GND	Power Ground	
5	MIPI_D1+	High speed interface data differential signal input/output pins	
6	MIPI_D1-	High speed interface data differential signal input/output pins	
7	GND	Power Ground	
8	MIPI_CLK+	High speed interface clock differential signal input/output pins	
9	MIPI_CLK-	High speed interface clock differential signal input/output pins	
10	GND	Power Ground	
11	MIPI_D2+	High speed interface data differential signal input/output pins	
12	MIPI_D2-	High speed interface data differential signal input/output pins	
13	GND	Power Ground	
14	MIPI_D3+	High speed interface data differential signal input/output pins	
15	MIPI_D3-	High speed interface data differential signal input/output pins	
16~17	GND	Power Ground	
18~19	VCC 1.8V	power supply for the I/O circuit	
20~23	NC	NC	
24	RESET	Reset pin. Setting either pin low initializes the LSI	
25~26	NC	NC	
27	GND	Power Ground	
28~29	LEDK	Power supply for backlight cathode input terminal.	
30	GND	Power Ground	
31	NC	NC	
32~33	GND	Power Ground	
34	NC	NC	
35~36	LEDA	Power supply for backlight anode input terminal.	
37	GND	Power Ground	
38~39	VDD 3.3V	power supply for DC/DC circuit	
40	NC	NC	

CTP PIN Description:

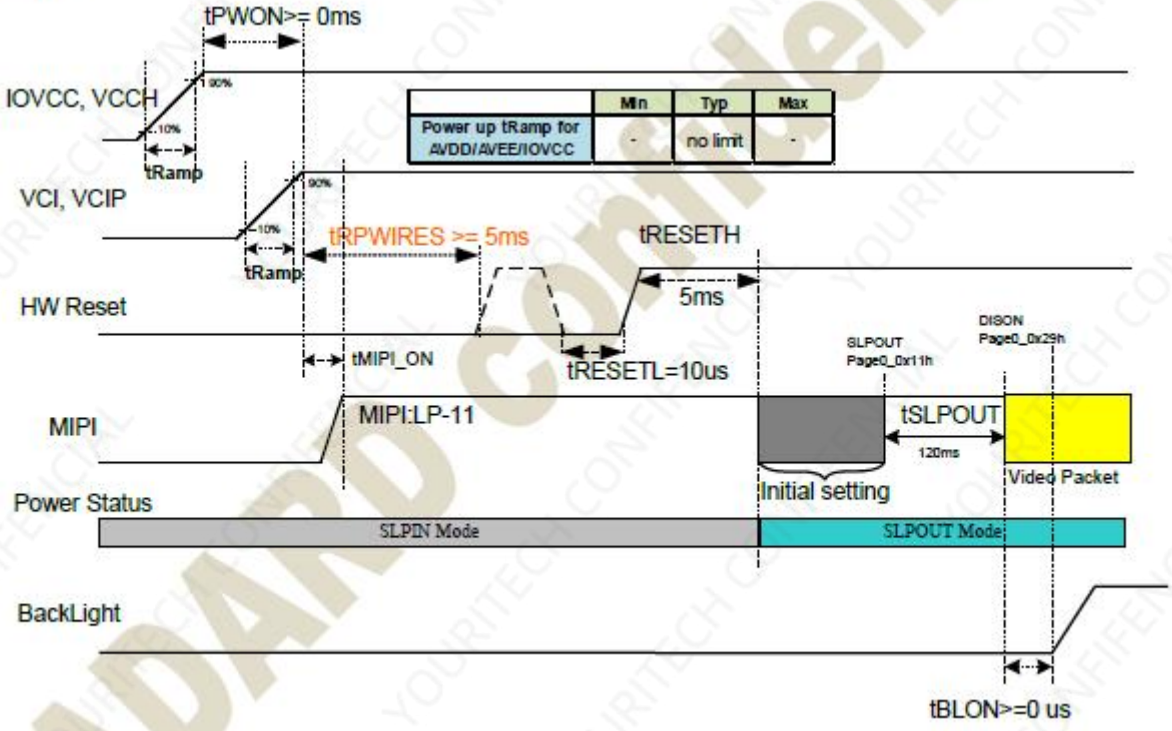
Pin No.	Symbol	CTP Functional	Notes
1	CTP_VCC2.8V	Touch panel Power supply 2.8~3.3V	
2	CTP_INT 1.8V	Touch panel interrupt output	
3	CTP_RST 1.8V	Touch panel reset	
4	CTP_SCL 1.8V	Touch panel I2C clock	
5	CTP_SDA 1.8V	Touch panel I2C data	
6	GND	Power Ground	

6.Timing Characteristics

Power on sequence for differential power mode

Symbol	Min	Typ	Max	Unit	Remark
tRamp	-	no limit	-	us	
tPWON	0	-	-	ms	
tON1	0	-	-	ms	
tMIPI-ON	0	-	tRPWIRES	ms	
tRPWIRES	5	-	-	ms	
tRESETL	10	-	-	us	
tRESETH	5	-	-	ms	
tSLPOUT	120	-	-	ms	
tBLON	0	-	-	ms	

BOOSTM[1:0]=10 (Internal DC/DC power mode : Charge Pump, FP7721)
VCCD=IOVCC=VCCH=1.65V ~ 3.6V, VCI=VCIP=2.5V ~ 4.8V.
Power on:



Burst Mode Data Transmission

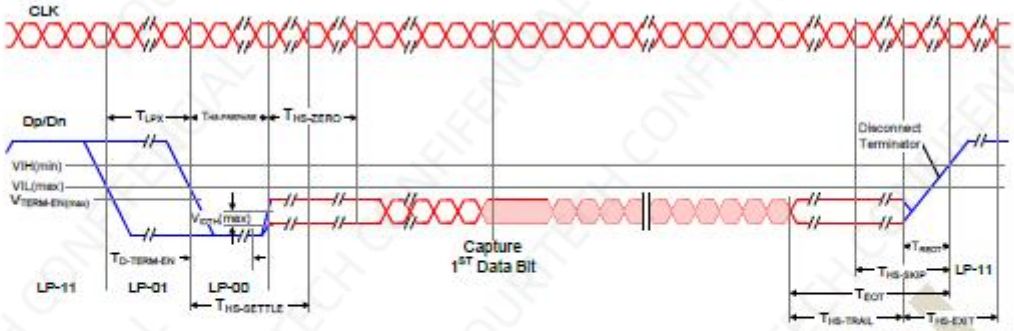


Figure 11.7: High-Speed Data Transmission in Bursts

Parameter	Description	Min	Typ	Max	UNIT
T_{LPX}	Transmitted length of any Low-Power state period	50	-	-	ns
$T_{HS-PREPARE}$	Time that the transmitter drives the Data Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission	40 + 4*UI	-	85 + 6*UI	ns
$T_{HS-PREPARE}$ + $T_{HS-ZERO}$	$T_{HS-PREPARE}$ + time that the transmitter drives the HS-0 state prior to transmitting the Sync sequence.	145 + 10*UI	-	-	ns
$T_{D-TERM-EN}$	Time for the Data Lane receiver to enable the HS line termination.	-	-	35 + 4*UI	ns
$T_{HS-SETTLE}$	Time interval during which the HS receiver shall ignore any Data Lane HS transitions.	85 + 6*UI	-	145 + 10*UI	ns
$T_{HS-TRAIL}$	Time that the transmitter drives the flipped differential state after last payload data bit of a HS transmission burst	max(n*8*UI, 60 + n*4*UI)	-	-	ns
$T_{HS-EXIT}$	Time that the transmitter drives LP-11 following a HS burst.	100	-	-	ns

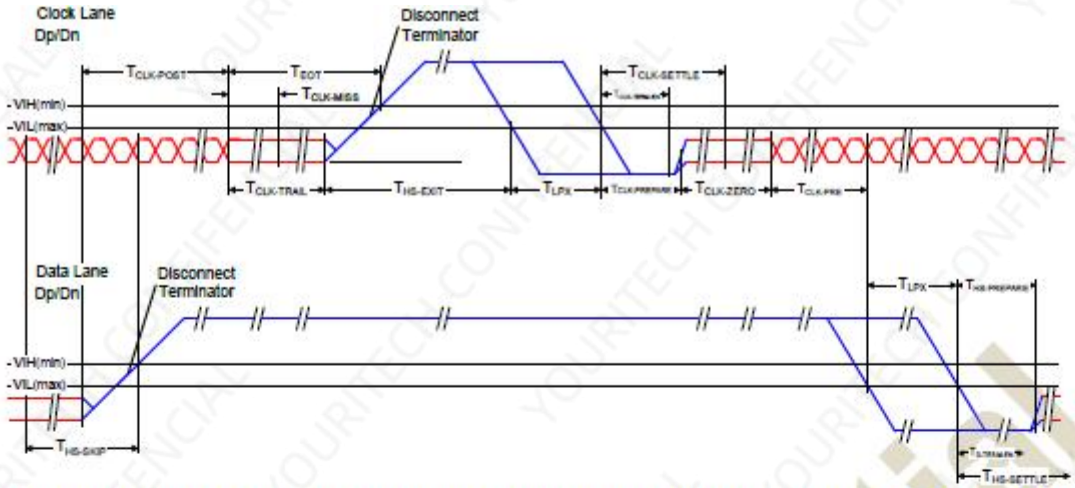


Figure 11.8: Switching the Clock Lane between Clock Transmission and Low-Power Mode

Parameter	Description	Min	Typ	Max	UNIT
$T_{CLK-POST}$	Time that the transmitter continues to send HS clock after the last associated Data Lane has transitioned to LP Mode.	60 + 52*UI	-	-	ns
$T_{CLK-PRE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	8*UI	-	-	ns
$T_{CLK-PREPARE}$	Time that the transmitter drives the Clock Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission.	38	-	95	ns
$T_{CLK-PREPARE}$ + $T_{CLK-ZERO}$	$T_{CLK-PREPARE}$ + time that the transmitter drives the HS-0 state prior to starting the Clock.	300	-	-	ns
$T_{CLK-TERM-EN}$	Time for the Clock Lane receiver to enable the HS line termination.	-	-	38	ns
$T_{CLK-TRAIL}$	Time that the transmitter drives the HS-0 state after the last payload clock bit of a HS transmission burst.	60	-	-	ns
$T_{HS-EXIT}$	Time that the transmitter drives LP-11 following a HS burst.	100	-	-	ns

Reset input timings

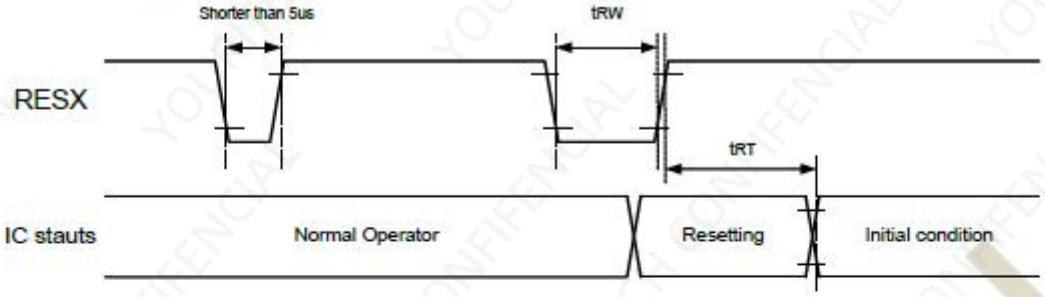


Figure 11.1: Reset input timings

Symbol	Parameter	Related pins	Min.	Max.	Unit
t_{RW}	Reset pulse width(2)	RESX	10	-	µs
t_{RT}	Reset complete time(3)	-	-	5 (Note 5)	ms
		-	-	120 (Note 6, 7)	ms

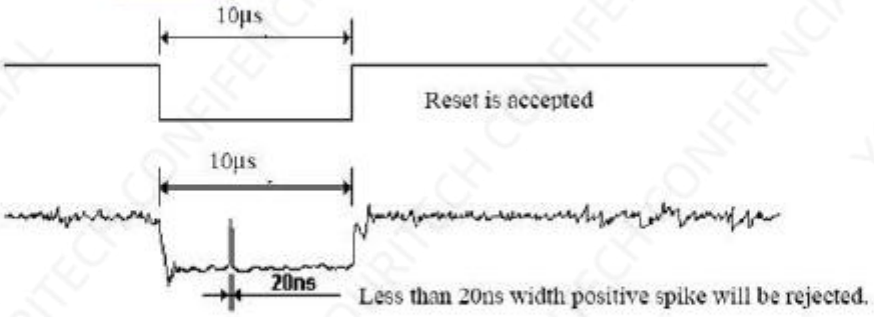
Note: (1) The reset complete time also required time for loading ID bytes from OTP to registers. This loading is done every time when there is HW reset cancel time (tRT) within 5 ms after a rising edge of RESX.

(2) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5 µs	Reset Rejected
Longer than 10 µs	Reset
Between 5 µs and 10 µs	Reset Start

(3) During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode) and then returns to Default condition for H/W reset.

(4) Spike Rejection also applies during a valid reset pulse as shown below:



(5) When Reset is applied during Sleep In Mode.

(6) When Reset is applied during Sleep Out Mode.

(7) It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

(8) After Sleep Out Command, it is necessary to wait 120msec then send RESX.

Table 11.3: Reset timings

7. Optical Characteristics

Item		Specification	Unit	Note
Screen Size		6.95	inch	-
Shipping size		Cut：1109.92 (H) x 644.72 (V) x 0.4(D)	mm	
Cell Outline Dimension		93.28(H)x 159.82(V)x 0.4(D)	mm	
Active Area		89.28 (H)x 152.3712(V)	mm	
Driver Element		a-Si TFT active matrix	-	-
Cell Transmittance		5.0%(Typ) 4.5%(Min)	-	Center point at C-Light
Pixel Number		600(RGB) x 1024	pixel	-
Pixel Pitch		148.8(H) x 148.8(V)	um	-
Pixel Arrangement		RGB stripe	-	-
Display Mode		Normally Black	-	-
Response Time		30 (Typ.) 35(Max.)	ms	
Contrast Ratio		1000:1(Typ);800:1(Min)		
View Angle		L/R/U/D:85/85/85/85(Typ.)		
Driver IC		ICNL9707	-	
		FL7703NI/JD9365DA/HX8394F /ILI9881C/ ER88577B		Compatibility
Operation Temperature		-20~70	℃	
Storage Temperature		-30~80	℃	
Chromaticity	NTSC Ratio	50% (Typ.) 45% (Min.)		Only CF Under C-light
	White	(0.302±0.03,0.342±0.03)		
	R			
	G			
	B			
Weight		1369.9 _1/8 Cut	g	Q panel

1. The color chromaticity coordinates specified 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.

2. Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression,

Contrast Ratio (CR): $CR = \frac{CR_W}{CR_D}$

CR_W : Luminance of LCD module with full screen white pattern (255,255, 255) at center point.

CR_D : Luminance of LCD module with full screen Dark pattern (0, 0, 0) at center point.

Where the measure point of to the Contrast Ratio is the center of the panel.

1. Definition of Response time (Tg):

Measured response time is determined by 10% to 90% brightness difference of rising (T_R) and falling (T_F) time.

2. The test backlight spectrum is as follows

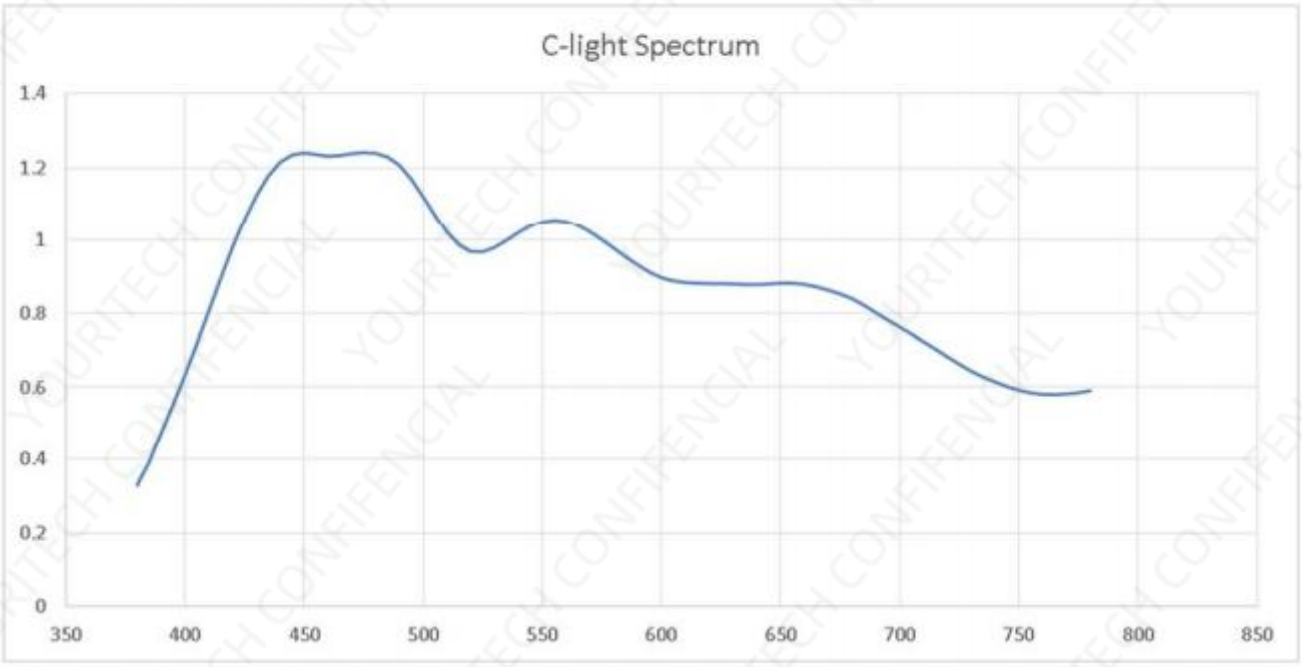


Figure 1：C light spectrum

8. Reliability Test Item

No.	Test Item	Test Condition	Notes
1	High Temp. Storage	+80°C / 96H	1. Functional test isOK. Missing Segment,short, unclear segment non-display,display abnormally and liquid crystal leakare un-allowed. 2. No low temperature bubbles,end seal loose andfall, frame rainbow.
2	Low Temp. Storage	-30°C / 96H	
3	High Tempe. Operating	+70°C / 96H	
4	Low Tempe. Operating	-20°C / 96H	
5	High Temperature /Humidity storage	50°C x 90%RH /96H	
6	Thermal and cold shock	Static state，-20℃（30min）~60℃（30min），10 cycles	

9. Packing Method----TBD

- END -