



SPECIFICATION FOR LCM+CTP Module KD035QVFMA064-04-C021A

MODULE:	KD035QVFMA064-C021A
CUSTOMER:	

REV	DESCRIPTION	DATE
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ISO9001 : 2008
ISO/TS16949 : 2009
TEXIM-EUROPE

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* Description

This is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This model is composed of a Transmissive type TFT-LCD Panel, driver circuit, back-light unit. The resolution of a 3.5" TFT-LCD contains 240X320 pixels, and can display up to 65K/262K colors.

* Features

- Low Input Voltage: 3.3V(TYP)
- Display Colors of TFT LCD: 65K/262K colors
- Interface: 8/16/18Bit MCU Interface
 - 3 SPI+16/18Bit RGB Interface
 - 3 line Serial Interface
- CTP Interface: I2C

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	53.28(H)*71.04 (V) (3.5inch)	mm	-
CTP View area	54.28(H)*72.04(V)	mm	-
Driver element	TFT active matrix	-	-
Display colors	65/262K	colors	-
Number of pixels	240(RGB)*320	dots	-
TFT Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.222 (H) x 0.222 (V)	mm	-
Viewing angle	Free	o'clock	-
TFT Controller IC	HX8347A	-	-
CTP Driver IC	FT6336G	-	-
Display mode	Transmissive/Normally Black	-	-
Touch mode	Single point and Gestures	-	-
LCD Operating temperature	-30~+85	°C	-
LCD Storage temperature	-40~+90	°C	-

* Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)		63.0		mm	-
	Vertical(V)		85.0		mm	-
	Depth(D)		4.73		mm	-
Weight			TBD		g	-

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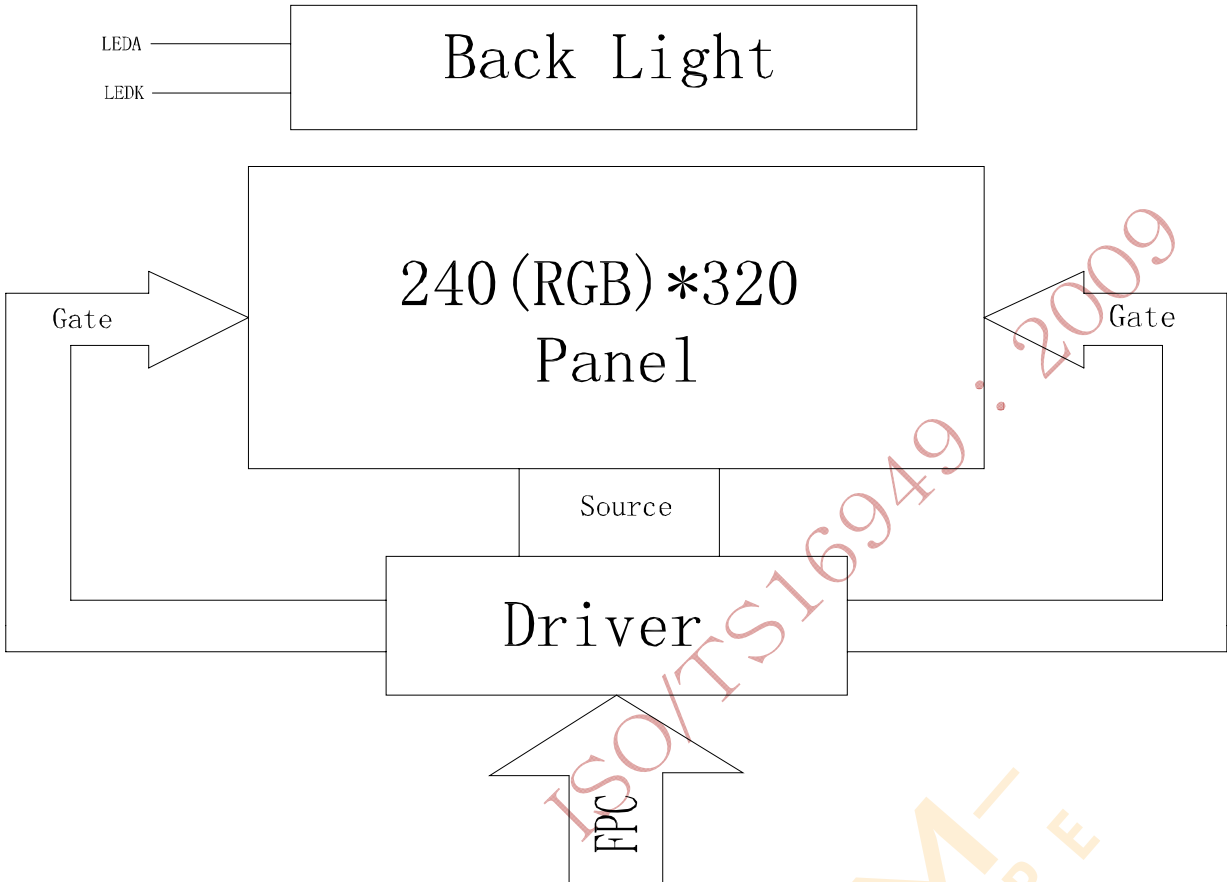
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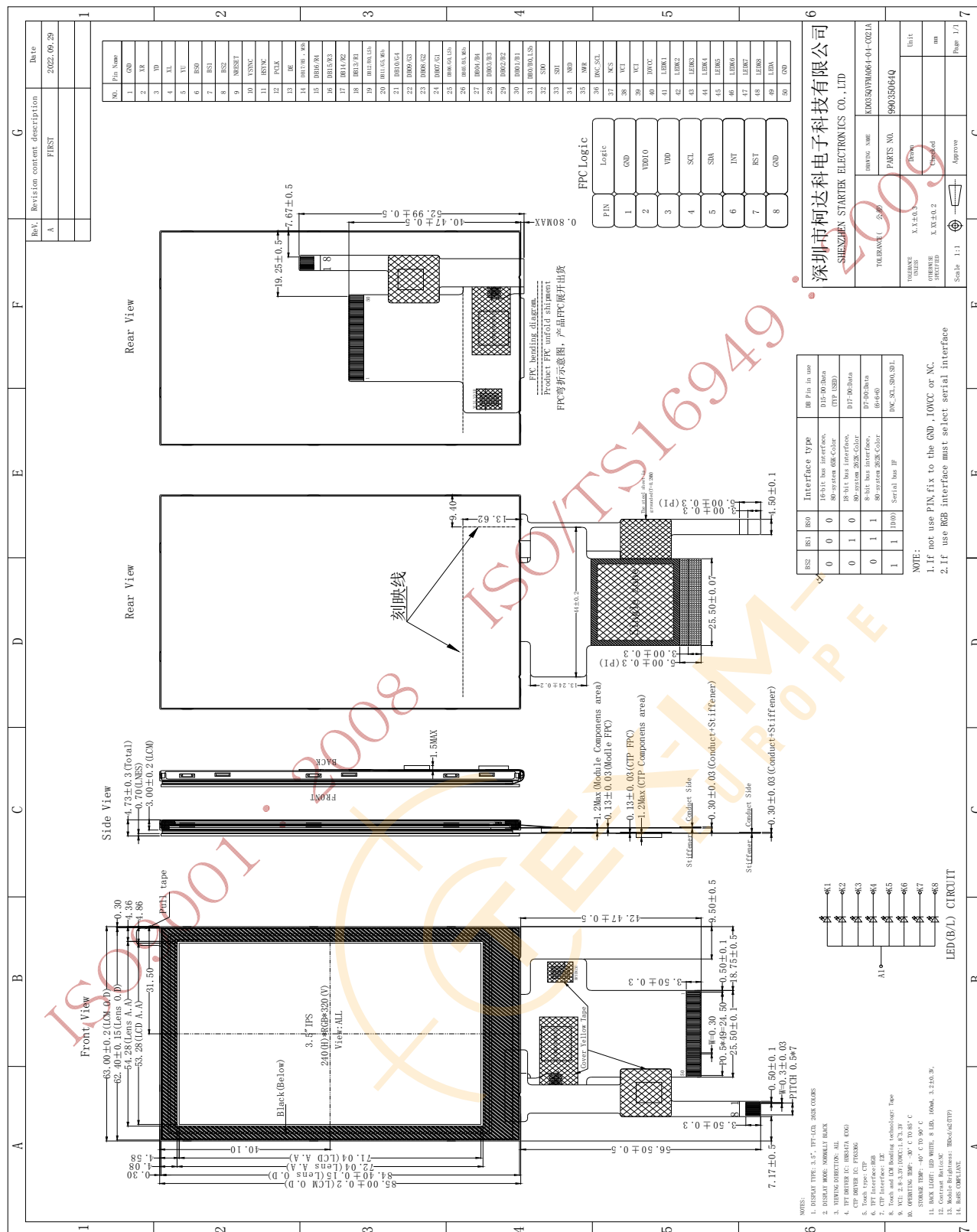


1. Block Diagram



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2. Outline dimension



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3. Input terminal Pin Assignment

3.1 TFT

NO.	SYMBOL	DISCRIPTION	I/O
1	GND	Ground.	P
2	YU(NC)	Touch panel Top Film Terminal	A/D
3	XL(NC)	Touch panel LIFT Glass Terminal	A/D
4	YD(NC)	Touch panel Bottom Film Terminal	A/D
5	XR(NC)	Touch panel Right Glass Terminal	A/D
6	BS0	MPU Parallel interface bus and serial interface select If use RGB Interface must select serial interface. Fix this pin at VCI and GND.	I
7	BS1		
8	BS2		
9	NRESET	This signal will reset the device and must be applied to properly initialize the chip.	I
10	VSYNC	Frame synchronizing signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I
11	HSYNC	Line synchronizing signal for RGB interface operation. fix this pin at VCI or GND when not in use	I
12	PCLK	Dot clock signal for RGB interface operation Fix this pin at VCI or GND when not in use.	I
13	DE	Data enable signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I
14-31	DB17-DB0	18-bit parallel bi-directional data bus for MCU system and RGB interface mode . Fix to GND level when not in use	I
32	SDO	Serial data output pin in serial bus system interface. If not used, please open this pin.	O
33	SDI	Serial input signal. The data is applied on the rising edge of the SCL signal. If not used, fix this pin at VCI or GND.	I
34	NRD	Serves as a read signal and MCU read data at the rising edge. fix this pin at VCI or GND when not in use.	I
35	NWR	NWR pin, serves as a write signal	I

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36	DNC_SCL	DNC_SCL pin as Serial Clock when operates in the serial interface	I
37	NCS	Chip select input pin ("Low" enable). fix this pin at VCI or GND when not in use.	I
38	VCI	Supply voltage(3.3V).	P
39	VCI	Supply voltage(3.3V).	
40	IOVCC	Supply voltage(1.8-3.3V)	P
41	LEDK1	Cathode pin OF backlight	P
42	LEDK2	Cathode pin OF backlight	P
43	LEDK3	Cathode pin OF backlight	P
44	LEDK4	Cathode pin OF backlight	P
45	LEDK5	Cathode pin OF backlight	P
46	LEDK6	Cathode pin OF backlight	P
47	LEDK7	Cathode pin OF backlight	P
48	LEDK8	Cathode pin OF backlight	P
49	LEDA	Anode pin of backlight	P
50	GND	Ground.	P

3.2 CTP

NO.	SYMBOL	DISCRIPTION	I/O
1	GND	Ground.	P
2	VDDIO	I/O power supply voltage.	P
3	VDD	Supply voltage.	P
4	SCL	I2C clock input.	I
5	SDA	I2C data input and output	I/O
6	INT	External interrupt to the host.	I
7	RST	External Reset, Low is active.	I
8	GND	Ground.	P

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4. LCD Optical Characteristics

4.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit.	Note
Contrast Ratio		CR	$\Theta=0$	500	800	--		
Response time	Rising	T _R	Normal viewing angle	--	16	21	msec	
	Falling	T _F		--	19	24		
Color gamut		S(%)		--	72	--	%	
Color Filter Chromaticity	White	W _X		0.336	0.340	0.344		
		W _Y		0.356	0.360	0.364		
	Red	R _X		0.618	0.620	0.622		
		R _Y		0.338	0.340	0.342		
	Green	G _X		0.348	0.350	0.352		
		G _Y		0.620	0.622	0.624		
	Blue	B _X		0.148	0.150	0.152		
		B _Y		0.033	0.035	0.037		
Viewing angle	Hor.	Θ_L	CR>10	--	80	--		
		Θ_R		--	80	--		
	Ver.	Θ_U		--	80	--		
		Θ_D		--	80	--		
		Option View Direction			Free			

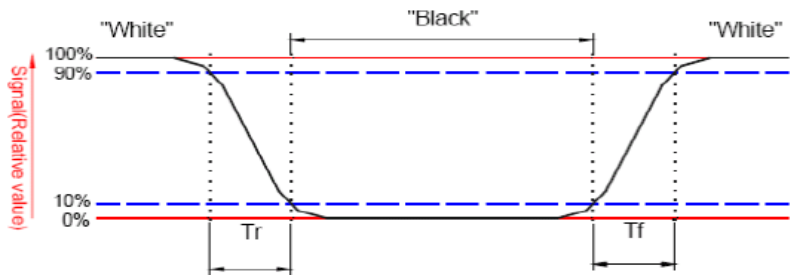
4.2 Measuring Condition

- Measuring surrounding: dark room
- Ambient temperature: $25 \pm 2^\circ\text{C}$
- 15min. warm-up time.



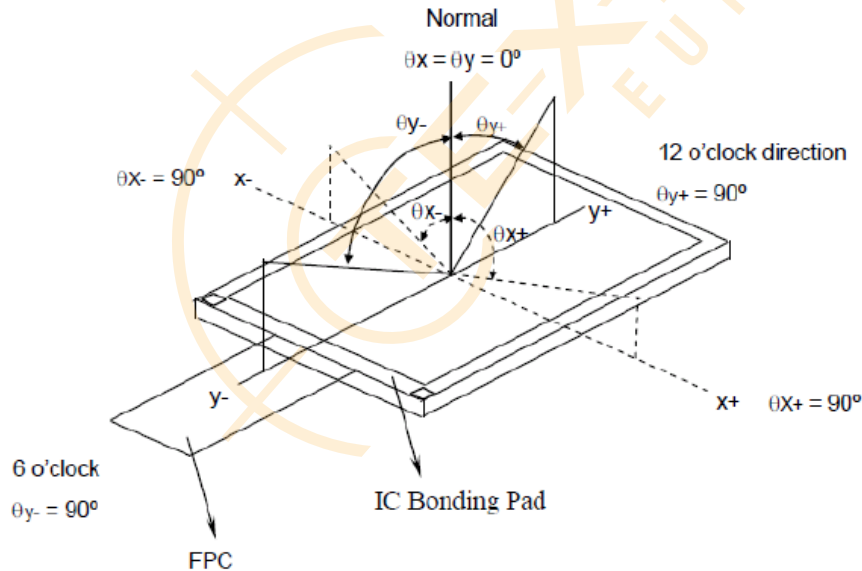
4.3 Measuring Equipment

- Note 1: Ambient temperature = 25°C.
- Note 2: To be measured with a viewing cone of 2° by Topcon luminance meter BM-5A.
- Note 3: To be measured with Otsuta chromaticity meter LCF-2100M, CF only measure under C light simulation.
- Note 4: CTC shipping status is cell without polarizer. Transmittance of Specification is cell with polarizer.
The tolerance of Transmittance is $\pm 10\%$.
- Note 5: Definition of response time:
The output signals of TRD-100 are measured when the input signals are changed to "White" (falling time) and from "White" to "Black" (rising time), respectively. The interval is between the 10% and 90% of amplitudes. Refer to figure as below.



- Note 6: Definition of contrast ratio:
Contrast ratio is calculated by the following formula.
- $$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

- Note 7: Definition of viewing angle



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Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)

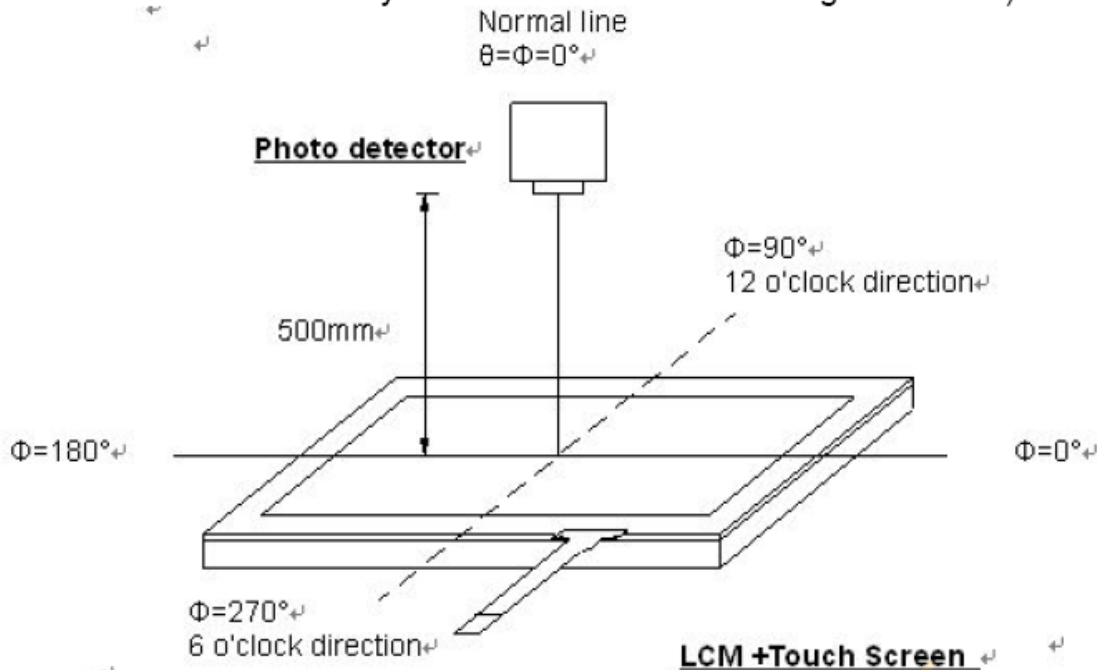


Fig. 4-2 Optical measurement system setup

Fig. Optical measurement system setup

Note 2: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 3: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is $V_{LED} = 5.0V$.

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5. Electrical Characteristics

5.1 Absolute Maximum Rating (Ta=25 VSS=0V)

Characteristics	Symbol	Min.	Max.	Unit
Digital Supply Voltage	VCI	-0.3	6.0	V
Digital interface supply Voltage	IOVCC	-0.3	6.0	V
LCD Operating temperature	T _{OP}	-40	+85	°C
LCD Storage temperature	T _{ST}	-40	+90	°C

NOTE: If the absolute maximum rating of even is one of the above parameters is exceeded even momentarily, the quality of the product may be degraded. Absolute maximum ratings, therefore, specify the values exceeding which the product may be physically damaged. Be sure to use the product within the range of the absolute maximum ratings.

5.2 DC Electrical Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Note
Digital Supply Voltage	VCI	2.5	3.3	3.6	V	
Digital interface supply Voltage	IOVCC	1.65	1.8	3.3	V	
Normal mode Current consumption	IDD	--	9	--	mA	
Level input voltage	V _{IH}	0.7IOVCC		IOVCC	V	
	V _{IL}	GND		0.3IOVCC	V	
Level output voltage	V _{OH}	0.8IOVCC		IOVCC	V	
	V _{OL}	GND		0.2IOVCC	V	



5.3 LED Backlight Characteristics

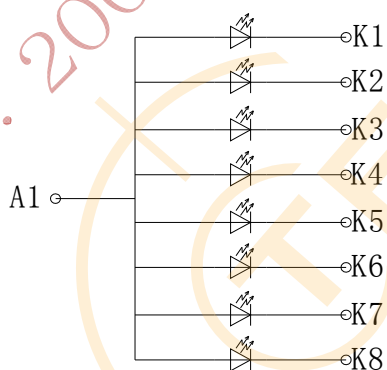
The back-light system is edge-lighting type with 8chips White LED

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I_F	120	160	--	mA	
Forward Voltage	V_F	--	3.2	--	V	
LCM Luminance	L_V	355	405	--	cd/m ²	Note3
LED life time	Hr	50000	--	--	Hour	Note1,2
Uniformity	AVg	80	--	--	%	Note3

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition:

$T_a = 25 \pm 3^\circ\text{C}$, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note (2) The "LED life time" is defined as the module brightness decrease to 50% original brightness at $T_a = 25^\circ\text{C}$ and $I_L = 160\text{mA}$. The LED lifetime could be decreased if operating I_L is larger than 160mA. The constant current driving method is suggested.



LED(B/L) CIRCUIT

LED WHITE, 8 LED, 160mA, $3.2\text{V} \pm 0.3\text{V}$

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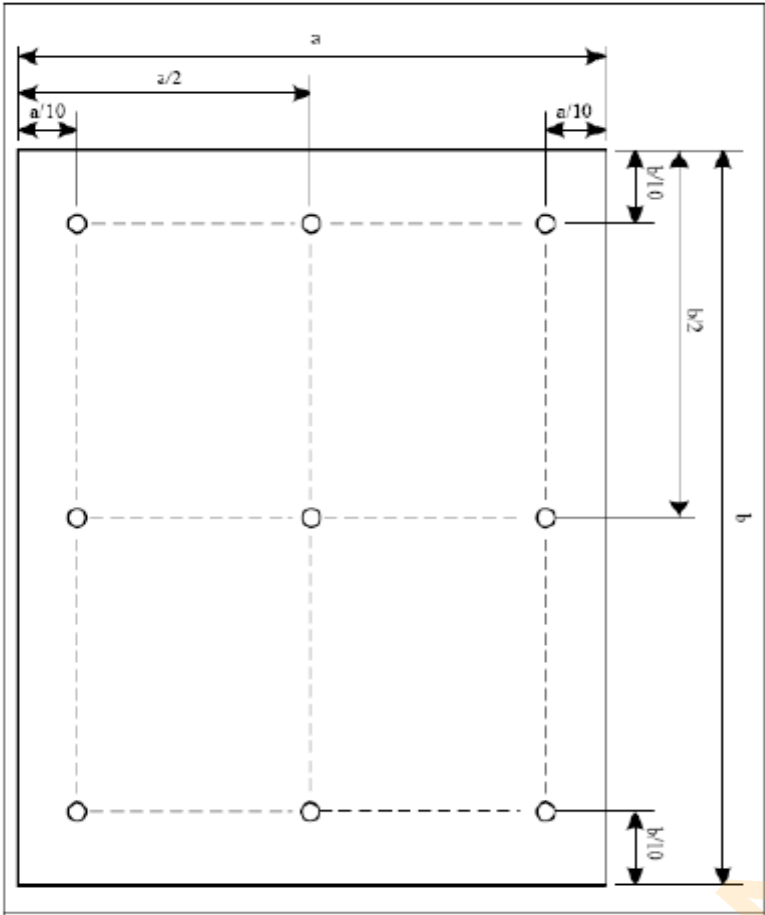
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支持小量
NO MOQ

品种齐全
In Full Range



NOTE 3: Luminance Uniformity of these 9 points is defined as below:



$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

$$\text{Luminance} = \frac{\text{Total Luminance of 9 points}}{9}$$

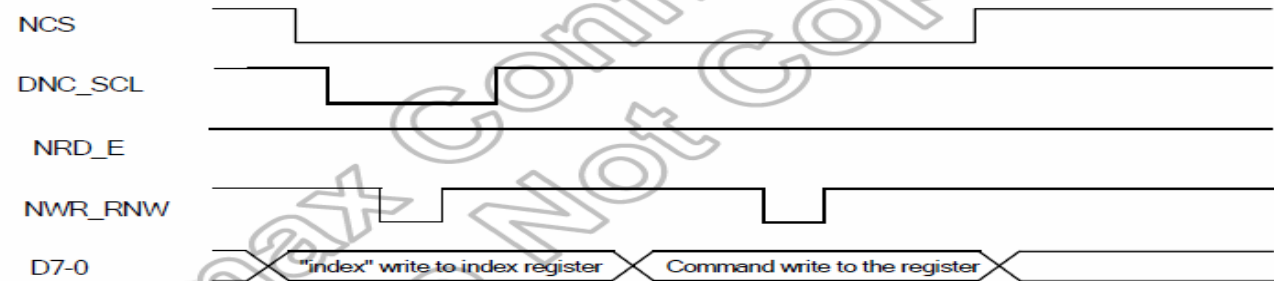
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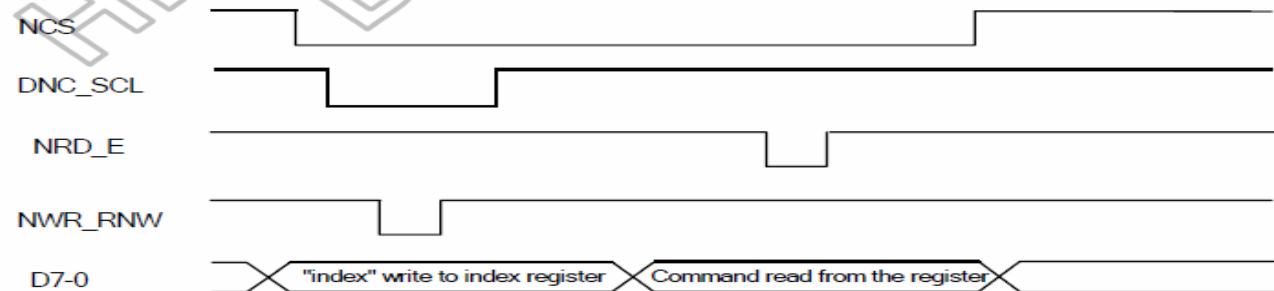
6. AC Characteristic

6.1 Display Parallel Interface Timing Characteristics (8080 system)

Write to the register



Read the register



Signal	Symbol	Parameter	Min.	Max.	Unit	Description
DNC_SCL	tAST	Address setup time	10	-	ns	-
	tAHT	Address hold time (Write/Read)	10	-		
NCS	tCHW	Chip select "H" pulse width	0	-	ns	-
	tCS	Chip select setup time (Write)	35	-		
	trCSFM	Chip select setup time	180	-		
	tCSF	Chip select wait time (Write/Read)	10	-		
	tCSH	Chip select hold time	10	-		
NWR_RNW	tWC	Write cycle	100	-	ns	-
	tWRH	Control pulse "H" duration	15	-		
	tWRL	Control pulse "L" duration	20	-		
NRD_E	trCFM	Read cycle	250	-	ns	When read from GRAM
	trDHFM	Control pulse "H" duration	15	-		
	trDLFM	Control pulse "L" duration	180	-		
D17 to D0	tDST	Data setup time	10	-	ns	For maximum CL=30pF For minimum CL=8pF
	tDHT	Data hold time	10	-		
	trAT	Read access time (ID)	-	180		
	trATFM	Read access time (FM)	-	340		
	tODH	Output disable time	20	80		

Note: The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.

Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.

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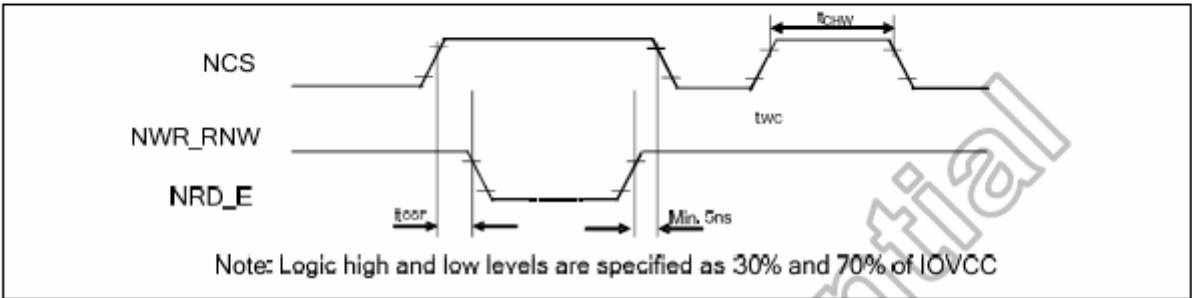
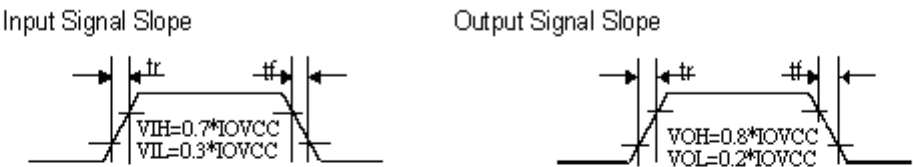
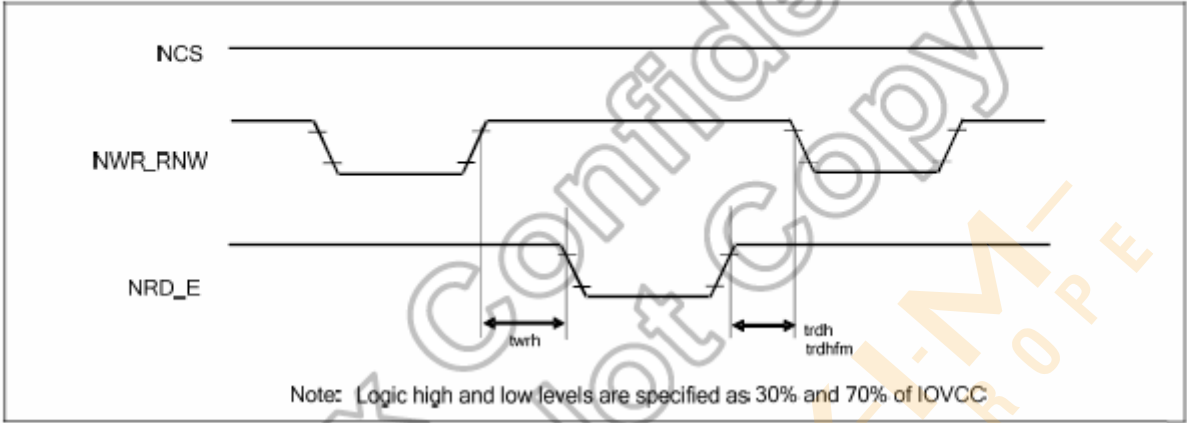


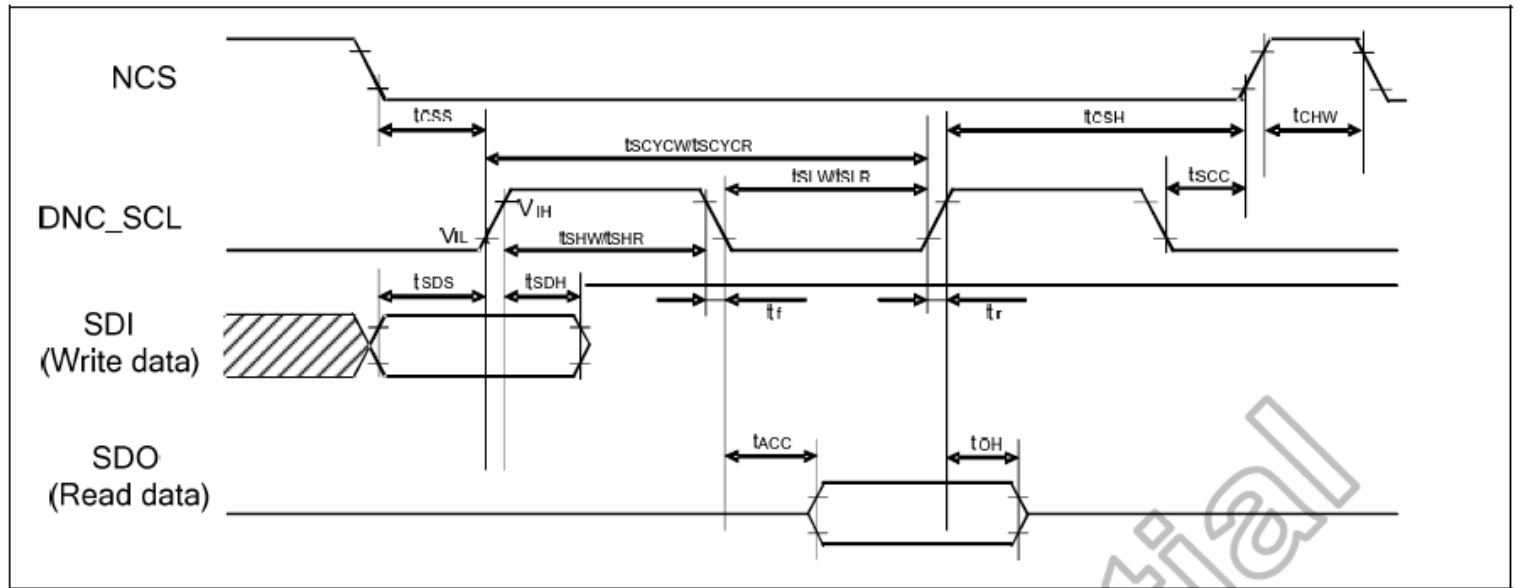
Figure 7. 2 Chip Select Timing



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6.2 Display Serial Interface Timing Characteristics



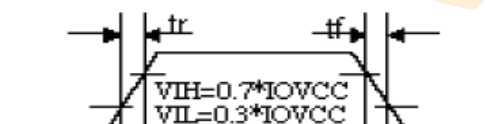
(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.3V to 3.3V, Ta = -40 to 85° C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Serial clock cycle (Write)	tSCYCW		100	-	-	ns
DNC_SCL "H" pulse width (Write)	tSHW	DNC_SCL	35	-	-	ns
DNC_SCL "L" pulse width (Write)	tSLW		35	-	-	ns
Data setup time (Write)	tSDS	SDI	30	-	-	ns
Data hold time (Write)	tSDH		30	-	-	ns
Serial clock cycle (Read)	tSCYCR		150	-	-	ns
DNC_SCL "H" pulse width (Read)	tSHR	DNC_SCL	60	-	-	ns
DNC_SCL "L" pulse width (Read)	tSLR		100	-	-	ns
Access Time	tACC	SDO for maximum CL=30pF For minimum CL=8pF	10	-	100	ns
Output disable time	tOH	SDO For maximum CL=30pF For minimum CL=8pF	15	-	100	ns
DNC_SCL to Chip select	tSCC	DNC_SCL, NCS	50	-	-	ns
NCS "H" pulse width	tCHW	NCS	45	-	-	ns
Chip select setup time	tCSS		60	-	-	ns
Chip select hold time	tCSH		80	-	-	ns

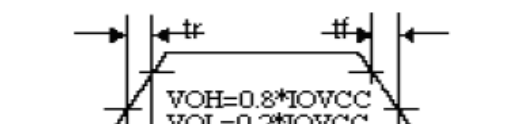
Note: The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.

Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.

Input Signal Slope



Output Signal Slope

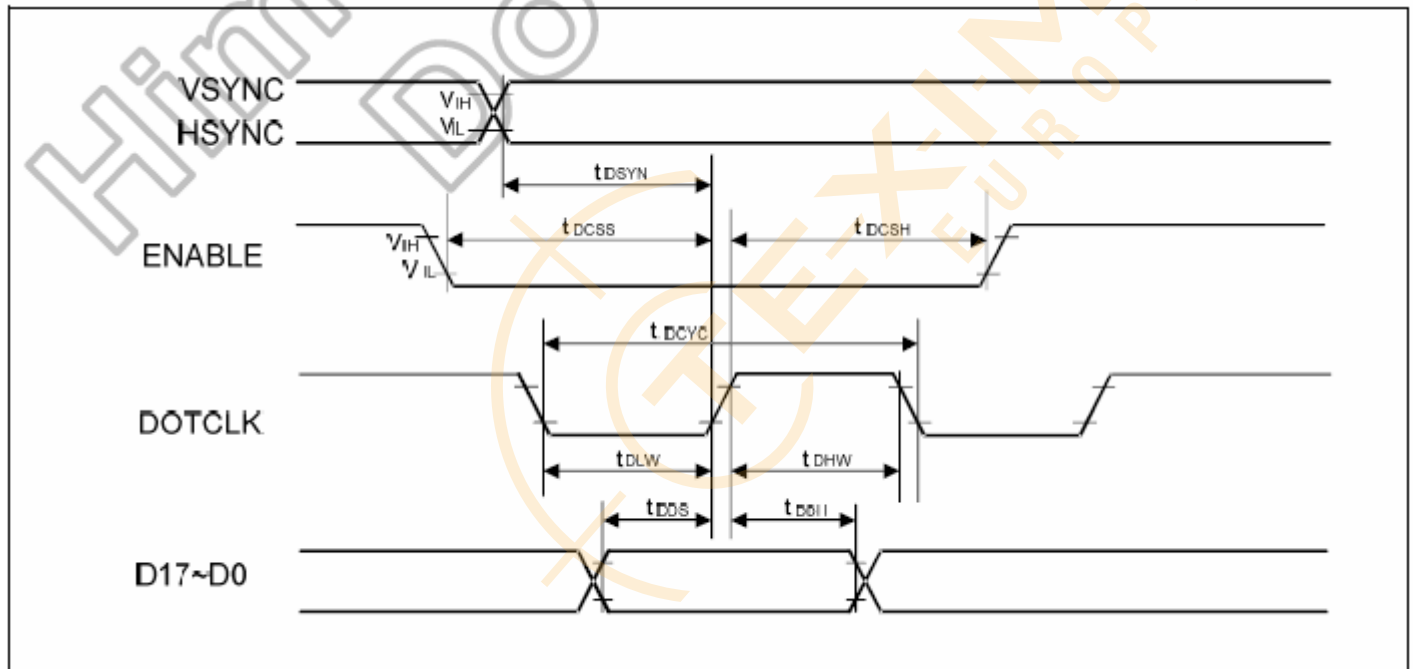
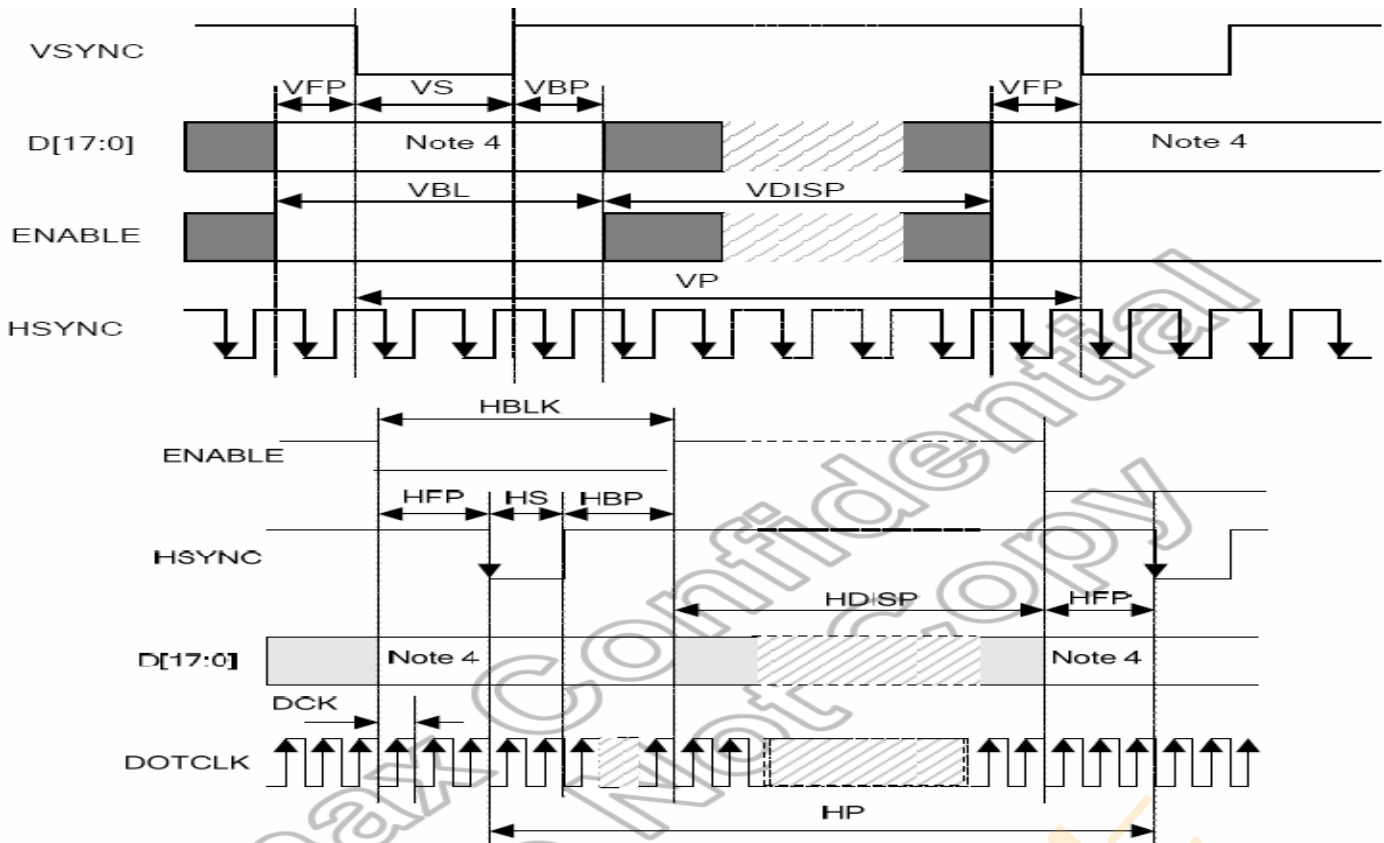


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6.3 Parallel RGB Interface Timing Characteristics



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Symbol	Parameter	Conditions	Related Pins	Min.	Typ.	Max.	Unit
VS	VSYNC Low Pulse Width	-	VSYNC	1	-	-	Line
VBP	Vertical Back Porch	-	VSYNC	1	-	-	Line
VFP	Vertical Front Porch	-	VSYNC	1	-	-	Line
VDISP	Vertical Active Area	-	VSYNC, HSYNC	-	320	-	Line
HS	HSYNC Low Pulse Width	-	HSYNC	2	-	-	DOTCLK
HBP	Horizontal Back Porch	-	HSYNC	2	-	-	DOTCLK
HFP	Horizontal Front Porch	-	HSYNC	2	-	-	DOTCLK
HDISP	Horizontal Active Area	-	HSYNC, DOTCLK	-	240	-	DOTCLK
t _{DCYC}	DOTCLK cycle time	VRR = Min. 50 Hz Max. 65 Hz	DOTCLK	100 (note2)	-	226 (note3)	ns
t _{DLW} t _{CHW}	DOTCLK Low time DOTCLK High time	-		50 15	- -	- -	ns
t _{DDS} t _{DDH}	RGB Data setup time RGB Data hold time	-	DOTCLK, D17-D0	15 15	- -	- -	ns
t _{DCSS} t _{DCSH}	ENABLE setup time ENABLE hold Time	-	ENABLE	15 15	- -	- -	ns
t _{DSYN}	SYNC setup time	-	DOTCLK, HSYNC, VSYNC	15	-	-	ns

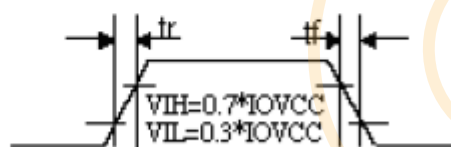
Note: (1) The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.

(2) 16.6 MHz

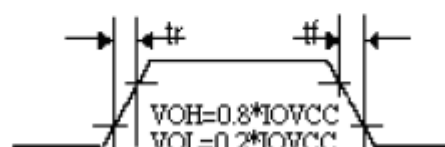
(3) 4.4MHz

(4) Data line can be set to "H" or "L" during blanking time – Don't care.

Input Signal Slope



Output Signal Slope



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6.4 Reset Input Timing

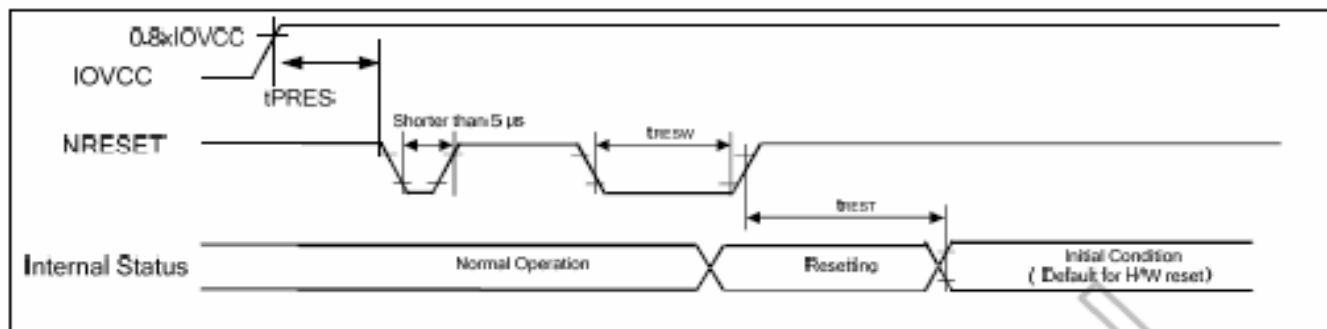


Figure 7.7 Reset input timing

Symbol	Parameter	Related Pins	Min.	Typ.	Max.	Note	Unit
tRESW	Reset low pulse width ⁽¹⁾	NRESET	10	-	-	-	μs
tREST	Reset complete time ⁽²⁾	-	-	-	5	When reset applied during STB mode	ms
		-	-	-	120	When reset applied during STB mode	ms
tPRES	Reset goes high level after Power on time	NRESET & IOVCC	1	-	-	Reset goes high level after Power on	ms

Note: (1) Spike due to an electrostatic discharge on NRESET line does not cause irregular system reset according to the table below.

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

- (2) 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 STB Out –mode. The display remains the blank state in STB –mode) and then return to Default condition for H/W reset.
- (3) During Reset Complete Time, ID2 and VCOMOF value in OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (tREST) within 5ms after a rising edge of NRESET.
- (4) Spike Rejection also applies during a valid reset pulse as shown below:



- (5) It is necessary to wait 5msec after releasing !RES before sending commands. Also STB Out command cannot be sent for 120msec.

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7. CTP Specification

7.1 Electrical Characteristics

7.1.1 Absolute Maximum Rating

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	VDD	-0.3	3.6	V	1
I/O Digital Voltage	VDDIO	1.8	3.6	V	1

NOTES:

- If used beyond the absolute maximum ratings, FT6336G may be permanently damaged. It is strongly recommended that the device be used within the electrical characteristics in normal operations. If exposed to the condition not within the electrical characteristics, it may affect the reliability of the device.

7.1.2 DC Electrical Characteristics (Ta=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Digital supply voltage	VDD		2.8	3.3	3.6	V	
I/O Digital supply voltage	VDDIO		1.8	3.3	3.6	V	
Normal operation mode Current consumption	I _{opr}	VDD=2.8V Ta=25°C MCLK=17.5Mhz	-	4	-	mA	
Monitor mode Current consumption	I _{mon}		-	1.5	-	mA	
Sleep mode Current consumption	I _{slp}			50		uA	
Level input voltage	V _{IH}		0.7V _{DDIO}	-	V _{DDIO}	V	
	V _{IL}		-0.3	-	0.3V _{DDIO}	V	
Level output voltage	V _{OH}	I _{OH} =-0.1mA	0.7V _{DDIO}	-	-	V	
	V _{OL}	I _{OH} =0.1mA	-	-	0.3V _{DDIO}	V	



7.2 AC Characteristics

Table 4-1 AC Characteristics of Oscillators

Item	Symbol	Test Condition	Min	Typ.	Max	Unit	Note
OSC clock 1	fosc1	VDDA= 2.8V; Ta=25℃	34.65	35	35.35	MHz	

Table 4-2 AC Characteristics of sensor

Item	Symbol	Test Condition	Min	Typ.	Max	Unit	Note
Sensor acceptable clock	ftx	VDDA= 2.8V; Ta=25℃	0	100	300	KHz	
Sensor output rise time	Ttxr	VDDA= 2.8V; Ta=25℃	-	100	-	nS	
Sensor output fall time	Ttxf	VDDA= 2.8V; Ta=25℃	-	80	-	nS	
Sensor input voltage	Trxi	VDDA= 2.8V; Ta=25℃	-	5	-	V	

7.2.1 I2C Interface

The I2C is always configured in the Slave mode. The data transfer format is shown in Figure4-1:

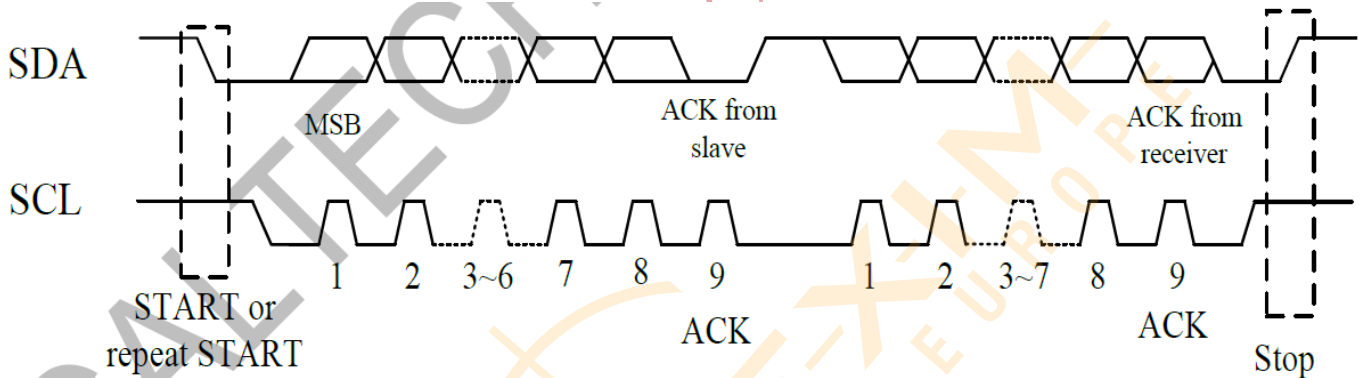


Figure 4-1 I2C Serial Data Transfer Format

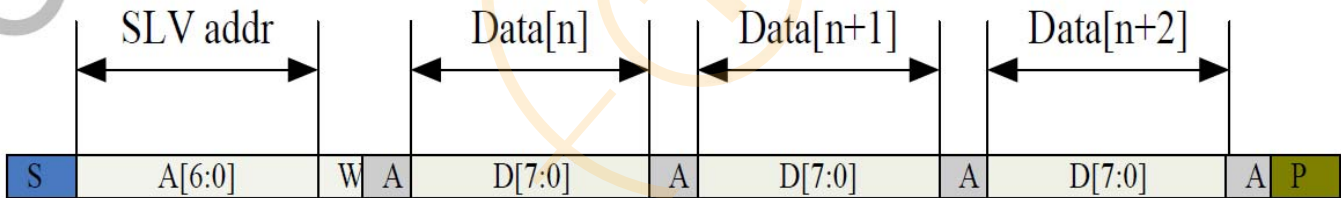


Figure 4-2 I2C master write, slave read

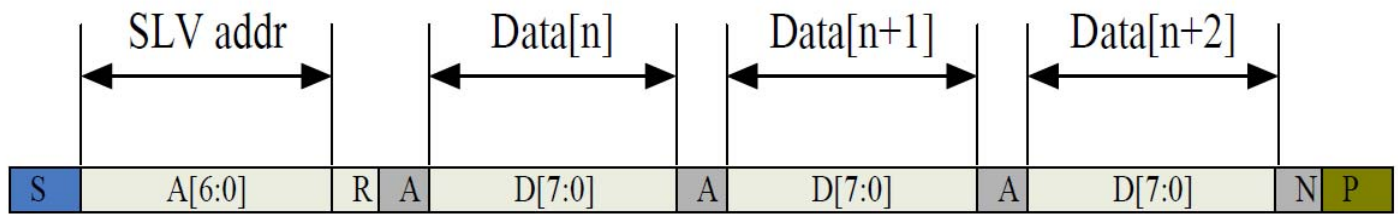


Figure 4-3 I2C master read, slave write

Table 4-3 lists the meanings of the mnemonics used in the above figures.

Table 4-3 Mnemonics Description

Mnemonics	Description
S	I2C Start or I2C Restart
A[6:0]	Slave address
R/W	READ/WRITE bit, '1' for read, '0' for write
A(N)	ACK(NACK)
P	STOP: the indication of the end of a packet (if this bit is missing, S will indicate the end of the current packet and the beginning of the next packet)

I2C Interface Timing Characteristics is shown in Table 4-4.

Table 4-4 I2C Timing Characteristics

Parameter	Min	Max	Unit
SCL frequency	10	400	KHz
Bus free time between a STOP and START condition	4.7	\	us
Hold time (repeated) START condition	4.0	\	us
Data setup time	250	\	ns
Setup time for a repeated START condition	4.7	\	us
Setup Time for STOP condition	4.0	\	us



8. LCD Module Out-Going Quality Level

8.1 VISUAL & FUNCTION INSPECTION STANDARD

8.1.1 Inspection conditions

Inspection performed under the following conditions is recommended.

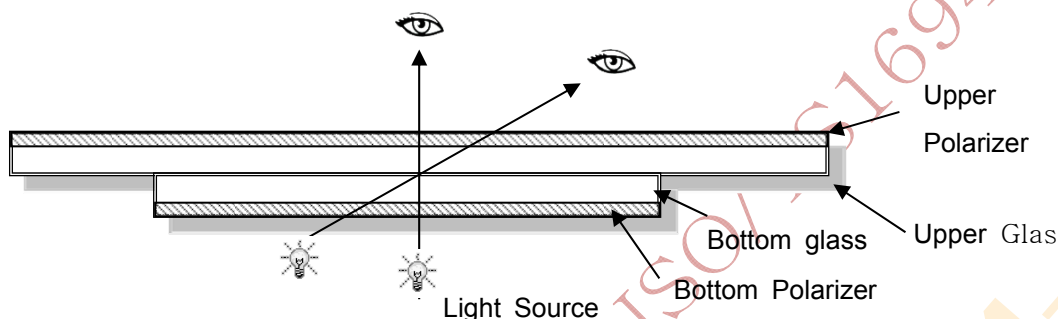
Temperature : $25\pm 5^{\circ}\text{C}$

Humidity : $65\%\pm 10\%\text{RH}$

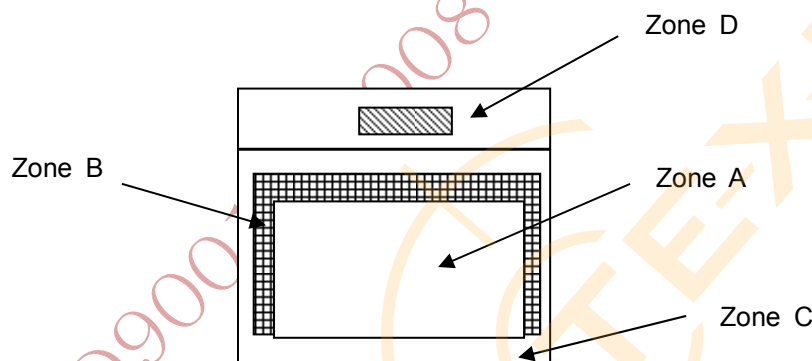
Viewing Angle : Normal viewing Angle.

Illumination: Single fluorescent lamp (300 to 700Lux)

Viewing distance: 30-50cm



8.1.2 Definition



Zone A : Effective Viewing Area(Character or Digit can be seen)

Zone B : Viewing Area except Zone A

Zone C Cover (Zone A+Zone B) which can not be seen after assembly by customer .)

Zone D : IC Bonding Area

Note:

As a general rule ,visual defects in Zone C can be ignored when it doesn't effect product function or appearance after assembly by customer

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8.1.3 Sampling Plan

According to GB/T 2828-2003 ; , normal inspection, Class II

AQL:

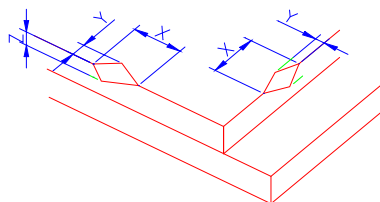
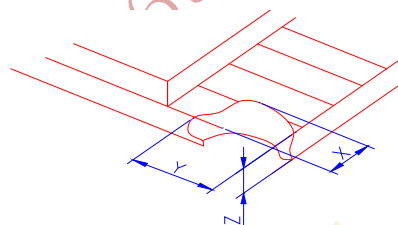
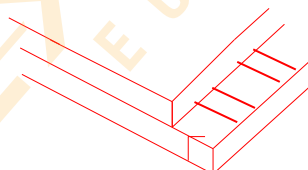
Major defect	Minor defect
0.65	1.5

LCD: Liquid Crystal Display , TP: Touch Panel , LCM: Liquid Crystal Module

No	Items to be inspected	Criteria	Classification of defects
1	Functional defects	1) No display, Open or miss line 2) Display abnormally, Short 3) Backlight no lighting, abnormal lighting. 4) TP no function	Major
2	Missing	Missing component	
3	Outline dimension	Overall outline dimension beyond the drawing is not allowed	
4	Color tone	Color unevenness, refer to limited sample	Minor
5	Spot Line defect	Light dot, Dim spot, Polarizer Bubble ; Polarizer accidented spot.	
6	Soldering appearance	Good soldering , Peeling off is not allowed.	
7	LCD/Polarizer/TP	Black/White spot/line, scratch, crack, etc.	



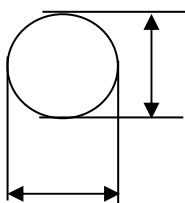
8.1.4 Criteria (Visual)

Number	Items	Criteria(mm)						
1.0 LCD Crack/Broken NOTE: X: Length Y: Width Z: Height L: Length of IT O, T: Height of LCD	(1) The edge of LCD broken	 <table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤3.0mm</td><td><Inner border line of the seal</td><td>≤T</td></tr></table>	X	Y	Z	≤3.0mm	<Inner border line of the seal	≤T
	X	Y	Z					
	≤3.0mm	<Inner border line of the seal	≤T					
(2)LCD corner broken	 <table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤3.0mm</td><td>≤L</td><td>≤T</td></tr></table>	X	Y	Z	≤3.0mm	≤L	≤T	
X	Y	Z						
≤3.0mm	≤L	≤T						
(3) LCD crack	 Crack Not allowed							



2.0

Spot defect



Y

X

$$\Phi = (X+Y)/2$$

① light dot (LCD/TP/Polarizer black/white spot, light dot, pinhole, dent, stain)

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.10$	Ignore		
$0.10 < \Phi \leq 0.25$			
$0.25 < \Phi \leq 0.3$			
$\Phi > 0.35$			

② Dim spot (LCD/TP/Polarizer dim dot, light leakage, dark spot)

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.1$	Ignore		
$0.10 < \Phi \leq 0.25$			
$0.25 < \Phi \leq 0.3$			
$\Phi > 0.35$			

③ Polarizer accidented spot

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.2$	Ignore		
$0.3 < \Phi \leq 0.5$			
$\Phi > 0.5$			

④ Pixel bad points (light dot, Dim dot, color dot)

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.1$	Ignore		
$0.15 < \Phi \leq 0.25$			
$\Phi > 0.3$			

⑤ Polarizer Bubble

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.2$	Ignore		
$0.3 < \Phi \leq 0.4$			
$0.5 < \Phi \leq 0.6$			
$\Phi > 0.6$			

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NO MOQ

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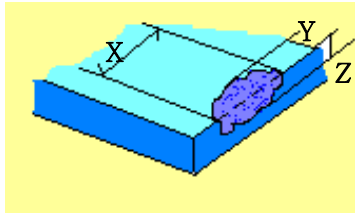
3.0	Line defect (LCD/TP /Polarizer backlight black/white line, scratch, stain)	Width(mm)	Length(m)	Acceptable Qty		
				A	B	C
		$\Phi \leq 0.05$	Ignore	Ignore		Ignore
		$0.05 < W \leq 0.06$	$L \leq 4.0$	$N \leq 3$		
		$0.07 < W \leq 0.08$	$L \leq 3.0$	$N \leq 2$		
$0.08 < W$	Define as spot defect					
4.0	Electronic Components SMT	Not allow missing parts, solderless connection, cold solder joint, mismatch, The positive and negative polarity opposite				
5.0	Display color & Brightness	1. Color : Measuring the color coordinates, The measurement standard according to the datasheet or samples. 2. Brightness : Measuring the brightness of White screen, The measurement standard according to the datasheet or Samples.				

6.0	CTP Related	CTP Cover sensor acc identified black/white spot					
			Size Φ (mm)	Acceptable Qty			
				A	B	C	
			$\Phi \leq 0.1$	Ignore			Ignore
			$0.1 < \Phi \leq 0.2$	3 (distance $\geq 10\text{mm}$)			
			$0.20 < \Phi \leq 0.25$	2			
$\Phi > 0.3$	0						



		CTP Cover	<table><tr><td>Width(mm)</td><td>Ignore (mm)</td><td colspan="3">Acceptable Qty</td></tr><tr><td></td><td></td><td>A</td><td>B</td><td>C</td></tr><tr><td>$\Phi \leq 0.05$</td><td>Ignore</td><td colspan="3">Ignore</td></tr><tr><td>$0.05 < W \leq 0.06$</td><td>$L \leq 4.0$</td><td colspan="3">$N \leq 3$</td></tr><tr><td>$0.07 < W \leq 0.08$</td><td>$L \leq 3.0$</td><td colspan="3">$N \leq 2$</td></tr><tr><td>$0.08 < W$</td><td colspan="4">Define as spot defect</td></tr></table>	Width(mm)	Ignore (mm)	Acceptable Qty					A	B	C	$\Phi \leq 0.05$	Ignore	Ignore			$0.05 < W \leq 0.06$	$L \leq 4.0$	$N \leq 3$			$0.07 < W \leq 0.08$	$L \leq 3.0$	$N \leq 2$			$0.08 < W$	Define as spot defect			
Width(mm)	Ignore (mm)	Acceptable Qty																															
		A	B	C																													
$\Phi \leq 0.05$	Ignore	Ignore																															
$0.05 < W \leq 0.06$	$L \leq 4.0$	$N \leq 3$																															
$0.07 < W \leq 0.08$	$L \leq 3.0$	$N \leq 2$																															
$0.08 < W$	Define as spot defect																																
		CTP Cover Pinhole/ Lack of ink	<table><tr><td rowspan="5"> Zone Size (mm) $\Phi \leq 0.1$ $0.1 < \Phi \leq 0.2$ $0.25 < \Phi \leq 0.3$ $\Phi > 0.35$ </td><td colspan="4">Acceptable Qty</td></tr><tr><td colspan="4">C</td></tr><tr><td colspan="4">Ignore</td></tr><tr><td colspan="4">3(distance $\geq 10\text{mm}$)</td></tr><tr><td colspan="4">2</td></tr><tr><td colspan="4">0</td></tr></table>	Zone Size (mm) $\Phi \leq 0.1$ $0.1 < \Phi \leq 0.2$ $0.25 < \Phi \leq 0.3$ $\Phi > 0.35$	Acceptable Qty				C				Ignore				3(distance $\geq 10\text{mm}$)				2				0								
Zone Size (mm) $\Phi \leq 0.1$ $0.1 < \Phi \leq 0.2$ $0.25 < \Phi \leq 0.3$ $\Phi > 0.35$	Acceptable Qty																																
	C																																
	Ignore																																
	3(distance $\geq 10\text{mm}$)																																
	2																																
0																																	
		CTP Bonding bubble/ accidented spot	<table><tr><td rowspan="5">Size $\Phi(\text{mm})$</td><td colspan="2">Acceptable Qty</td></tr><tr><td>A</td><td>B</td></tr><tr><td colspan="2">Ignore</td></tr><tr><td colspan="2">3(distance $\geq 10\text{mm}$)</td></tr><tr><td colspan="2">2</td></tr><tr><td colspan="2">0</td></tr></table>	Size $\Phi(\text{mm})$	Acceptable Qty		A	B	Ignore		3(distance $\geq 10\text{mm}$)		2		0																		
Size $\Phi(\text{mm})$	Acceptable Qty																																
	A	B																															
	Ignore																																
	3(distance $\geq 10\text{mm}$)																																
	2																																
0																																	
		Assembly deflection	beyond the edge of backlight $\leq 0.2\text{mm}$																														
		TP cover broken X : length Y : width Z : height	<table><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>$X \leq 0.5\text{mm}$</td><td>$Y \leq 0.5\text{mm}$</td><td>$Z < \text{cover thickness}$</td></tr></table> Circuitry broken is not allowed.	X	Y	Z	$X \leq 0.5\text{mm}$	$Y \leq 0.5\text{mm}$	$Z < \text{cover thickness}$																								
X	Y	Z																															
$X \leq 0.5\text{mm}$	$Y \leq 0.5\text{mm}$	$Z < \text{cover thickness}$																															



			X	Y	Z	
		TP cover broken	$X \leq 0.3\text{mm}$	$Y \leq 0.3\text{mm}$	$Z < \text{LCD thickness}$	
		X : length Y : width Z : height	* Circuitry broken is not allowed.			
						

Criteria (functional items)

Number	Items	Criteria (mm)
1	No display	Not allowed
2	Missing segment	Not allowed
3	Short	Not allowed
4	Backlight no lighting	Not allowed
5	TP no function	Not allowed

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NO MOQ

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9. Reliability Test Result

Item	Condition	Inspection after test
High Temperature Operating	70℃,96H	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD; 2.Non-display; 3.Missing segments/line; 4.Glass crack; 5.Current IDD is twice higher than initial value.
Low Temperature Operating	-20℃, 96HR	
High Temperature Storage	80℃, 96HR	
Low Temperature Storage	-30℃, 96HR	
High Temperature & High Humidity Storage	+60℃, 90% RH ,96 hours.	
Thermal Shock (Non-operation)	-30℃,30 min ↔ 80℃,30 min, Change time:5min 20CYC.	
ESD test	C=150pF, R=330,5points/panel Air:±8KV, 5times; Contact:±6KV, 5 times; (Environment: 15℃~35℃, 30%~60%).	
Vibration (Non-operation)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition).	
Box Drop Test	1 Corner 3 Edges 6 faces,80cm(MEDIUM BOX)	

Remark:

- 1.The test samples should be applied to only one test item.
- 2.Sample size for each test item is 5~10pcs.
- 3.For Damp Proof Test, Pure water(Resistance > 10MΩ) should be used.
- 4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.
- 5.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

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10. Cautions and Handling Precautions

10.1 Handling and Operating the Module

(1) When the module is assembled, it should be attached to the system firmly.

Do not warp or twist the module during assembly work.

(2) Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.

(3) Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.

(4) Do not allow drops of water or chemicals to remain on the display surface.

If you have the droplets for a long time, staining and discoloration may occur.

(5) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

(6) The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane.

Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.

(8) Protect the module from static; it may cause damage to the CMOS ICs.

(9) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

(10) Do not disassemble the module.

(11) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

(12) Pins of I/F connector shall not be touched directly with bare hands.

(13) Do not connect, disconnect the module in the "Power ON" condition.

(14) Power supply should always be turned on/off by the item 6.1 Power On Sequence & 6.2 Power Off Sequence

10.2 Storage and Transportation.

(1) Do not leave the panel in high temperature, and high humidity for a long time.

It is highly recommended to store the module with temperature from 0 to 35 °C and relative humidity of less than 70%

(2) Do not store the TFT-LCD module in direct sunlight.

(3) The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.

(4) It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module.

In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.

(5) This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.

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11. Packing

---TBD-----

ISO9001 : 2008
ISO/TS16949 : 2009
TEXIM-EUROPE

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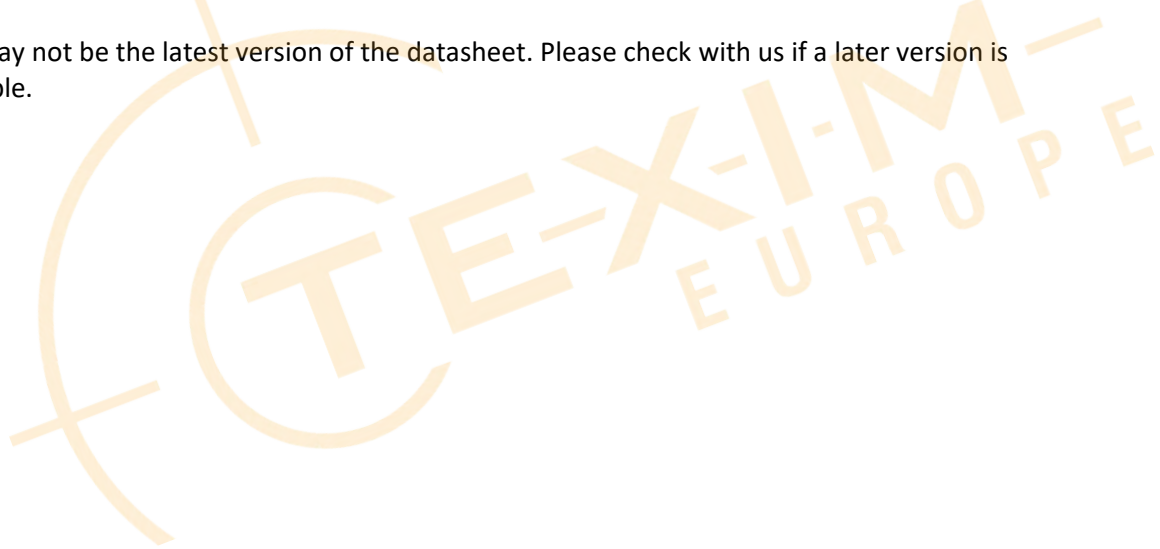
It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.





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