



**SPECIFICATION
FOR
LCM+CTP Module
KD101WXFID005-C012A**

MODULE:	KD101WXFID005-C012A
CUSTOMER:	

REV	DESCRIPTION	DATE
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STARTEK	INITIAL	DATE
PREPARED BY		
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APPROVED BY		

CUSTOMER	INITIAL	DATE
APPROVED BY		

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Revision History

[illegible]

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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 10.1'TFT-LCD contains 800X1280 pixels, and can display up to 16.7M colors.

*** Features**

-Low Input Voltage: 3.3V (TYP)

-Display Colors of TFT LCD: 16.7M colors

TFT Interface: 4 Lane MIPI

CTP Interface: I2C

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	135.36(H) *216.576(V) (10.1inch)	mm	-
CTP View area	136.36(H) *217.576(V)		
Driver element	TFT active matrix	-	-
Display colors	16.7M	colors	-
Number of pixels	800(RGB)*1280	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.1692 (H) x 0.1692 (V)	mm	-
Viewing angle	ALL	o'clock	-
Display mode	Transmissive/Normally Black	-	-
LCD Driver IC	JD9366		
CTP Driver IC	FT5926QSM		
Touch Mode	10 points and Gesture		
Operating temperature	-0~+50	°C	-
Storage temperature	-20~+60	°C	-

*** Mechanical Informations**

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)		159.00		mm	-
	Vertical(V)		244.60		mm	-
	Depth(D)		4.85		mm	-
Weight			TBD		g	-

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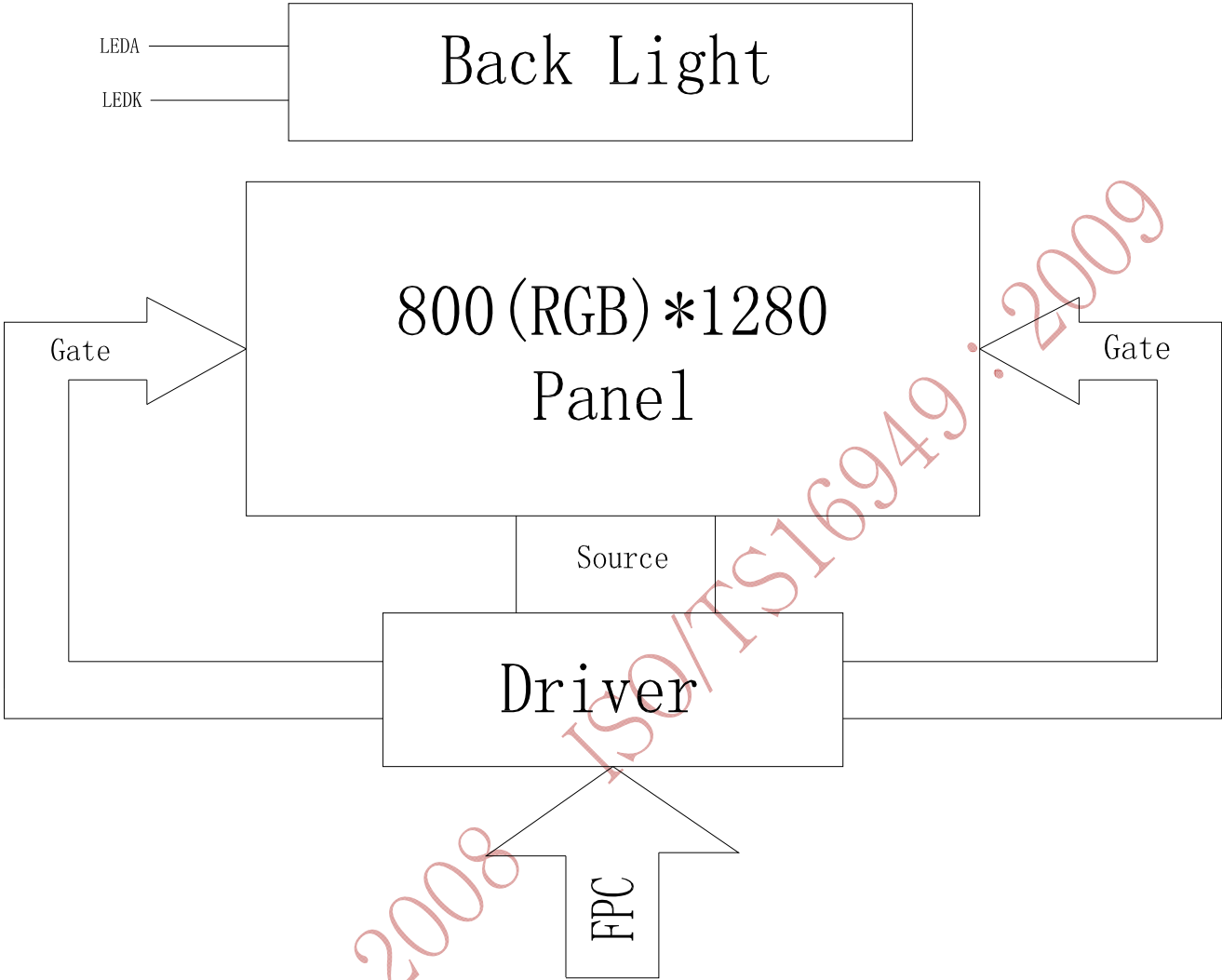
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1. Block Diagram



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NOTES:

1. DISPLAY TYPE: 10.1", 16.7M COLORS
2. DISPLAY MODE: NORMALLY BLACK
3. VIEWING DIRECTION: IPS
4. DRIVER IC: JD9366 (COG)
5. DRIVER IC: FT5926GSM (CTP)
6. INTERFACE: MIPI (LCM)
7. INTERFACE: I2C or USB (CTP)
8. VDD1: 3.3V
9. OPERATING TEMP: 0°C TO 50°C
10. STORAGE TEMP: -20°C TO 60°C
11. BACK LIGHT: LED WHITE, 30 LED, 200mA, 9.9±0.3V
12. RoHS COMPLIANT.



3. Input terminal Pin Assignment

3.1 TFT

NO.	SYMBOL	DISCRIPTION	I/O
1	NC	--	-
2	VDDI	Power supply(3.3V)	P
3	VDDI	Power supply(3.3V)	P
4	GND	Ground	P
5	RESET	System reset signal	I
6	NC	--	-
7	GND	Ground	P
8	MIPI_0N	Negative MIPI Differential Data Pair 0	I
9	MIPI_0P	Positve MIPI Differential Data Pair 0	I
10	GND	Ground	P
11	MIPI_1N	Negative MIPI Differential Data Pair 1	I
12	MIPI_1P	Positve MIPI Differential Data Pair 1	I
13	GND	Ground	P
14	MIPI_CKN	Negative MIPI Differential Clock Input	I
15	MIPI_CKP	Positve MIPI Differential Clock Input	I
16	GND	Ground	P
17	MIPI_2N	Negative MIPI Differential Data Pair 2	I
18	MIPI_2P	Positve MIPI Differential Data Pair 2	I
19	GND	Ground	P
20	MIPI_3N	Negative MIPI Differential Data Pair 3	I
21	MIPI_3P	Positve MIPI Differential Data Pair 3	I
22	GND	Ground	P
23	NC	--	-
24	NC	--	-

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25	GND	Ground	P
26	NC	--	-
27	NC	--	-
28	NC	--	-
29	NC	--	-
30	GND	Ground	P
31	LED-	LED Cathode	P
32	LED-	LED Cathode	P
33	NC	--	-
34	NC		-
35	NC	--	-
36	NC	--	-
37	NC	--	-
38	NC	--	-
39	LED+	LED Anode	P
40	LED+	LED Anode	P

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**3.2 CTP**

NO.	SYMBOL	DISCRIPTION	I/O
1	PSEL	Power Select pin	I
2	VBUS	VBUS sensor input	P
3	DN	USB D-	I/O
4	DP	USB D+	I/O
5	GND	Ground.	P
6	IOVCC	Supply voltage.	P
7	VDD	Supply voltage.	P
8	SCL	I2C clock input.	I/O
9	SDA	I2C data input and output	I/O
10	INT	External interrupt to the host.	I
11	RST	External Reset, Low is active.	I
12	SS	Ground. (I2C Interface select)	P

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4. LCD Optical Characteristics

4.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit.	Note
Contrast Ratio		CR	$\Theta=0$	600	800	--		Note 2
Response time	Rising	T_{R+T_F}	Normal viewing angle	--	25	30	msec	Note 6
	Falling							
NTSC		--	CIE1931	45	60	--	%	Note 7
Color Filter Chromaticity	White	W_X		TBD	TBD	TBD		Note 5
		W_Y		TBD	TBD	TBD		
	Red	R_X		TBD	TBD	TBD		
		R_Y		TBD	TBD	TBD		
	Green	G_X		TBD	TBD	TBD		
		G_Y		TBD	TBD	TBD		
	Blue	B_X		TBD	TBD	TBD		
		B_Y		TBD	TBD	TBD		
Luminance Uniformity	13 Points	--		75	80	%		Note 4
Viewing angle	Hor.	Θ_L	CR>10	85	89	--	degree	Note 1
		Θ_R		85	89	--		
	Ver.	Θ_U		85	89	--		
		Θ_D		85	89	--		
Option View Direction		ALL						--

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Notes :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles 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 (see FIGURE 1).
2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ 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) Luminance Contrast Ratio (CR) is defined mathematically.

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

3. Center Luminance of white is defined as luminance values of 9point average across 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. the LED current is setting at 18mA.
4. The White luminance uniformity on LCD surface is then expressed as :
 $\Delta Y = \text{Minimum Luminance of 13 points} / \text{Maximum Luminance of 13points}$ (see FIGURE 2).
5. The color chromaticity coordinates specified in Table 5 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 3by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_d .

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7. Definition of Color of CIE Coordinate and NTSC Ratio.

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

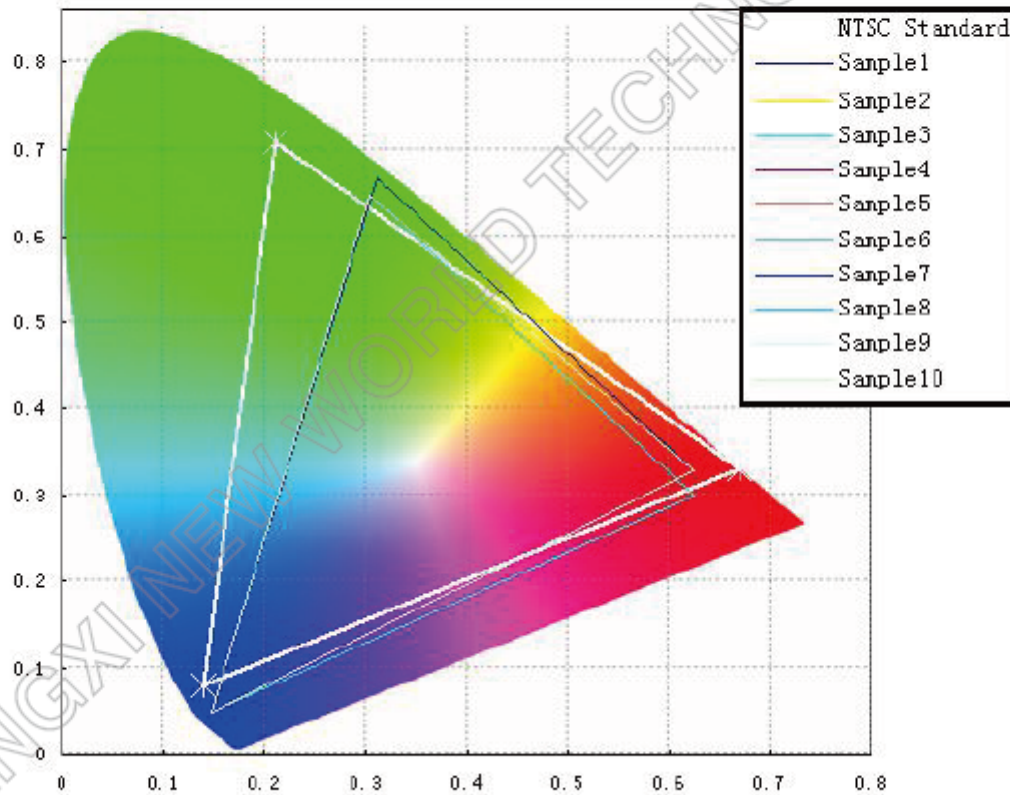
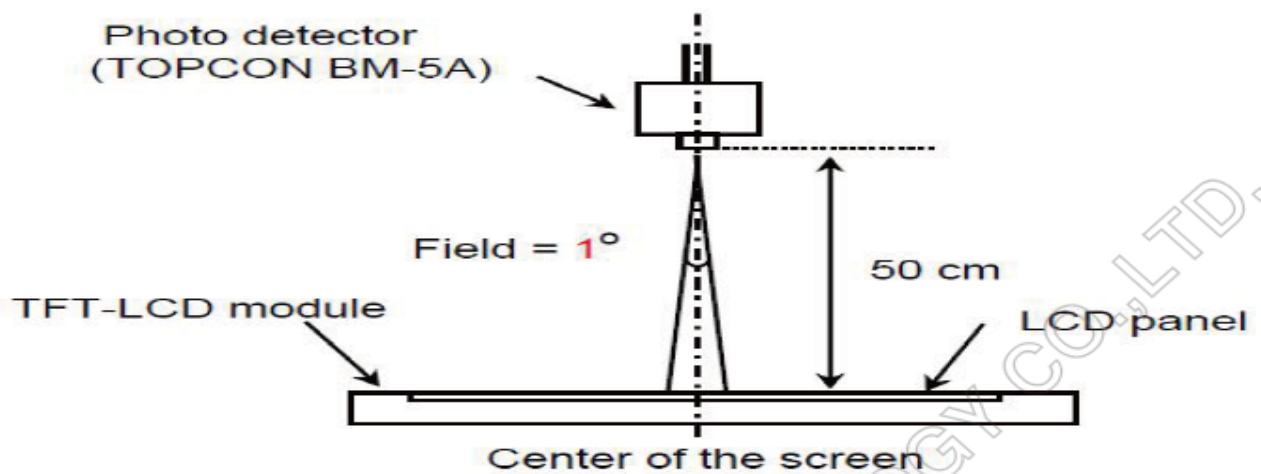


Figure 1. Measurement Set Up

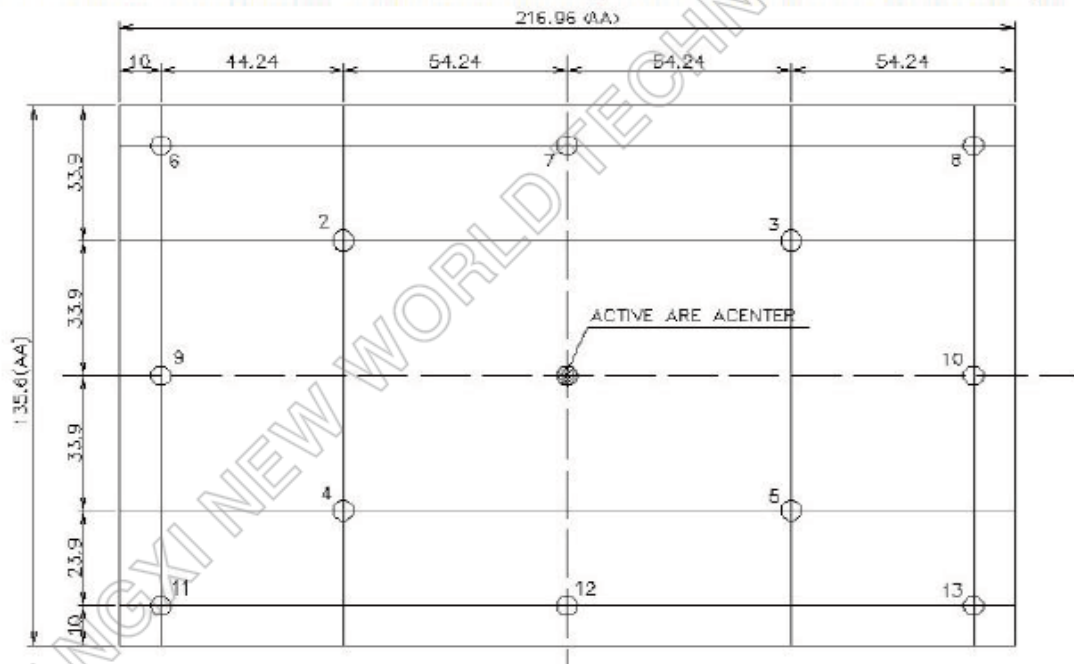


Optical characteristics measurement setup

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Figure 2. White Luminance and Uniformity Measurement Locations (13 points)



Center Luminance of white is defined as luminance values of center 13points across 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. The White luminance uniformity on LCD surface is then expressed as :

$\Delta Y_{13} = \text{Minimum Luminance of five points} / \text{Maximum Luminance of nine points (see FIGURE 2)}.$

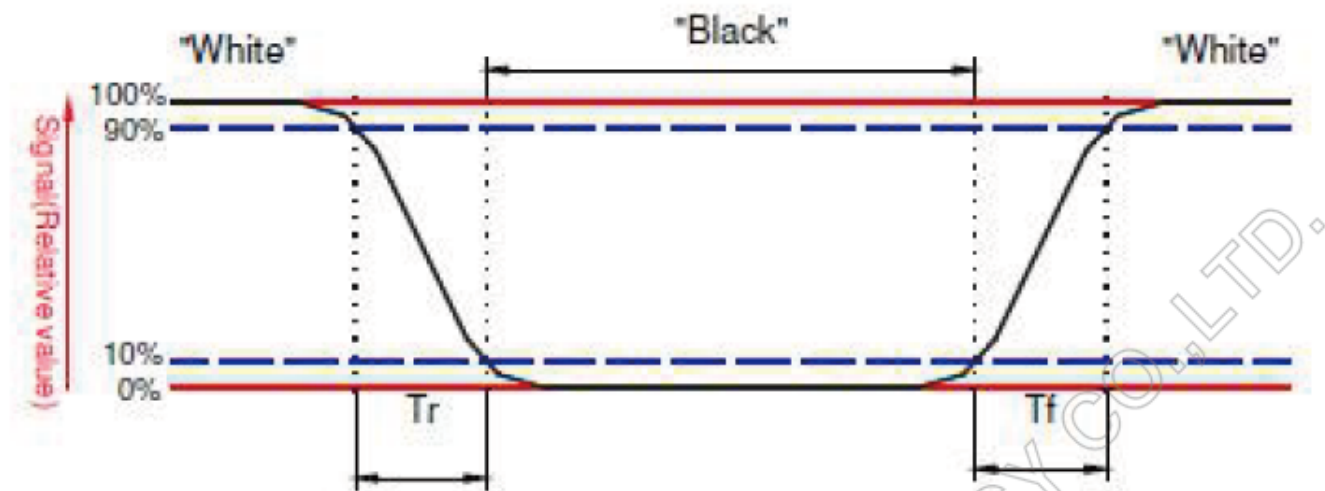
The White luminance uniformity on LCD surface is then expressed as :

$\Delta Y_5 = \text{Minimum Luminance of 5 points} / \text{Maximum Luminance of 5points (see FIGURE 2)}.$

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Figure 3. Response Time Testing



The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (falling time) and from "White" to "Black" (rising time), respectively. The response time interval between the 10% and 90% of amplitudes(Refer to FIGURE 3).

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5. Electrical Characteristics

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

Characteristics	Symbol	Min.	Max.	Unit
Logic Supply Voltage	VDDI	1.65	3.6	V
Operating temperature	T _{OP}	0	+50	°C
Storage temperature	T _{ST}	-20	+60	°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	VDDI	3.0	3.3	3.6	V	
Normal mode Current consumption	IDD	--	TBD	--	mA	
Level input voltage	V _{IH}	0.7VDDI		VDDI	V	
	V _{IL}	GND		0.3VDDI	V	
Level output voltage	V _{OH}	0.8VDDI		VDDI	V	
	V _{OL}	GND		0.2VDDI	V	



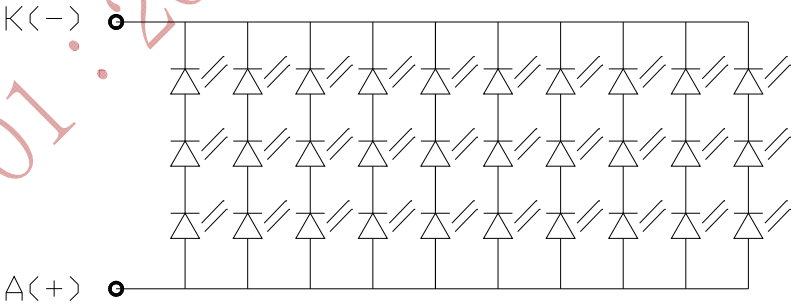
5.3 LED Backlight Characteristics

The back-light system is edge-lighting type with 30 chips White LED

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I _F	150	200	--	mA	
Forward Voltage	V _F	--	9.6	--	V	
LCM Luminance	L _v	TBD	TBD	--	cd/m ²	Note3
LED life time	Hr	15000	--	--	Hour	Note1,2
Uniformity	AV _g	80	--	--	%	Note3

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition:
Ta=25±3 °C, typical IL value indicated in the above table until the brightness becomes less than 50%.

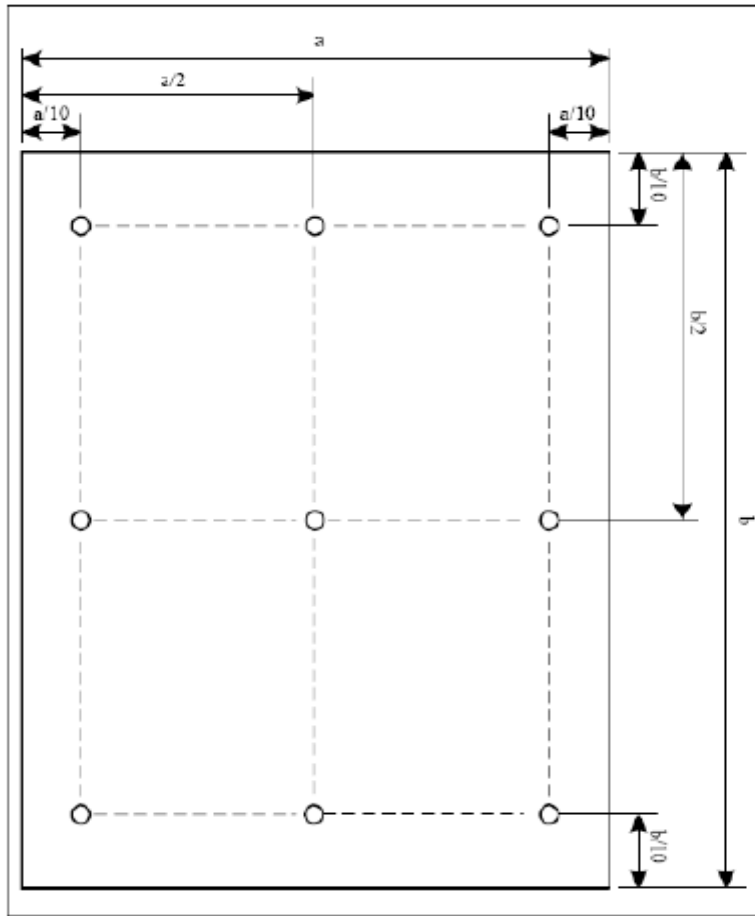
Note (2) The “LED life time” is defined as the module brightness decrease to 50% original brightness at
Ta=25°C and IL=200mA. The LED lifetime could be decreased if operating IL is larger than 200mA. The
constant current driving method is suggested.



B/L Circuit



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



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

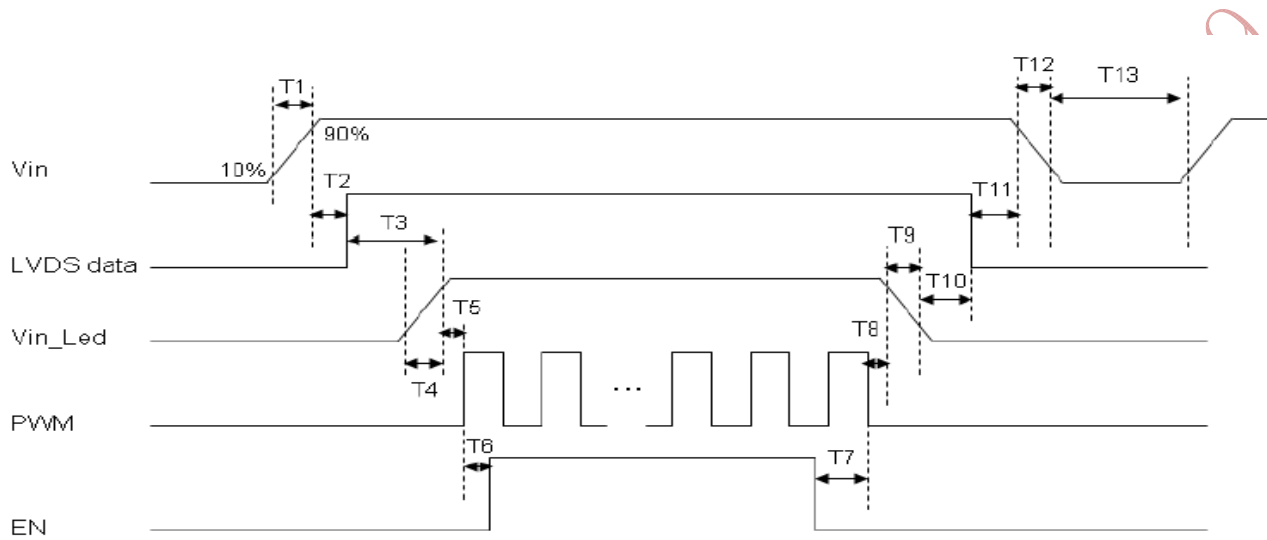
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5.4 Power ON/OFF Sequence

Interface signals are also shown in the chart. Signals from any system shall be Hi- resistance state or low level when VDD voltage is off.



Parameter	Symbol	Unit	Min	Typ.	Max
VIN Rise Time	T1	ms	0.5	--	10
VIN Good to Signal Valid	T2	ms	30	--	90
Signal Valid to Backlight On	T3	ms	200	--	--
Backlight Power On Time	T4	ms	0.5	--	--
Backlight VDD Good to System PWM On	T5	ms	10	--	--
System PWM ON to Backlight Enable ON	T6	ms	10	--	--
Backlight Enable Off to System PWM Off	T7	ms	0	--	--
System PWM Off to B/L Power Disable	T8	ms	200	--	--
Backlight Power Off Time	T9	ms	0.5	10	30
Backlight Off to Signal Disable	T10	ms	200	--	--
Signal Disable to Power Down	T11	ms	0	--	50
VIN Fall Time	T12	ms	0.5	10	30
Power Off	T13	ms	500	--	--

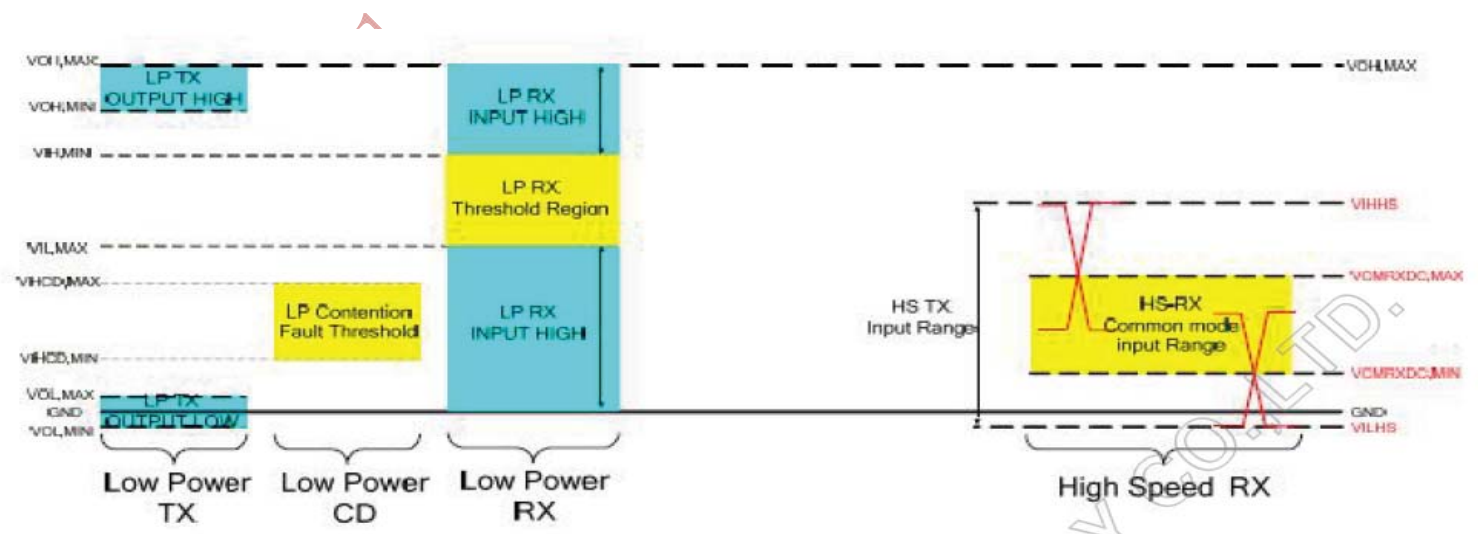


6. AC Characteristics Timing

6.1 DC Characteristics for MIPI-DSI

VDDI=3.3V, Ta = 0°C ~ 50°C

Parameter	Symbol	MIN	TYP	MAX	Unit
Power supply voltage for MIPI interface					
Power supply voltage for MIPI interface	VCIP	1.75	2.8	6.0	V
	VDDH	1.15	1.2	1.375	V
LPDT Input Characteristics					
Pad signal voltage range	VI	-50	-	1350	mV
Ground Shift	VGND _{SH}	-50	-	50	mV
Logic 0 input threshold	VIL	0	-	550	mV
Logic 1 input threshold	VIH	880	-	VDDH	mV
Input hysteresis	VHYST	25	-		mV
LPDT Output Characteristics					
Output low level	VOL	-50	-	50	mV
Output high level	VOH	1.1	1.2	1.3	V
Logic 1 contention threshold	VIH _{CD} , MIN	450	-	VDDH	mV
Logic 0 contention threshold	VIL _{CD} , MAX	0	-	200	mV
Output impedance of LPDT	ZOLP	80	100	125	ohm
Hi-speed Input/Output Characteristics					
Single-end input low voltage	VIL _{HS}	-40	-	-	mV
Single-end input high voltage	VIH _{HS}	-	-	460	mV
Common mode voltage	VCM _{RXDC}	70	-	330	mV
Hi-speed transmit voltage	VOD	140	200	250	mV
Differential input impedance	ZID	80	100	125	ohm



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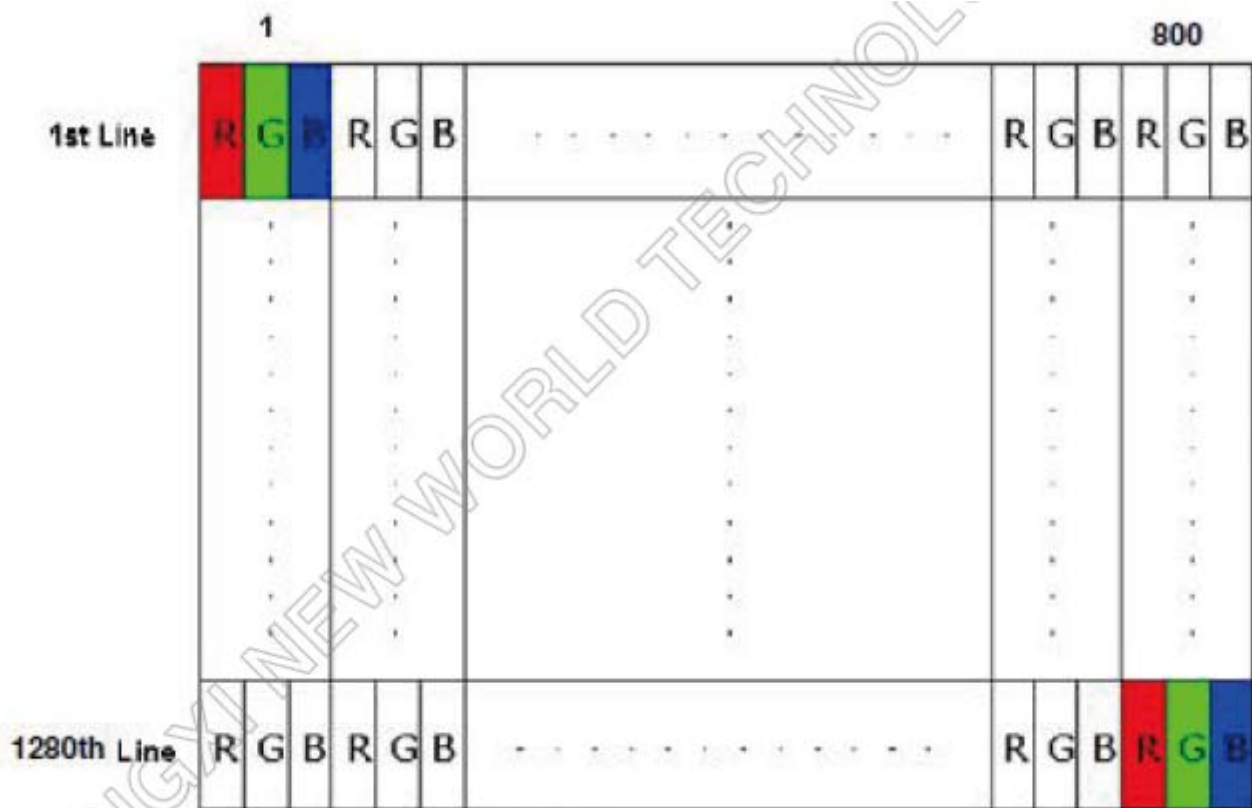
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6.2 Data Input Format



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6.3 Signal Timing Specifications

Operated by DE only

Item	Symbol	Min.	Typ.	Max.	Unit
MIPI Video data-rate (4 Lane)	Frequency		450	500	Mbps
PCLK Frequency	FPCLK	63.06	67.33	81.51	MHz
HS low pulse width	HS	6	18	78	PCLK
Horizontal Back Porch	HBP	5	18	78	PCLK
Horizontal Front Porch	HFP	5	18	78	PCLK
Horizontal Active	HA	-	800	-	PCLK
Horizontal Total	HT	816	854	888	PCLK
VS low pulse width	VS	2	4	200	Line
Vertical Back Porch	VBP	2	10	200	Line
Vertical Front Porch	VFP	4	20	200	Line
Vertical Active	VA	-	1280	-	Line
Vertical Total	VT	1288	1314	1530	Line
Vertical Refresh Rate	VRR		60		Hz

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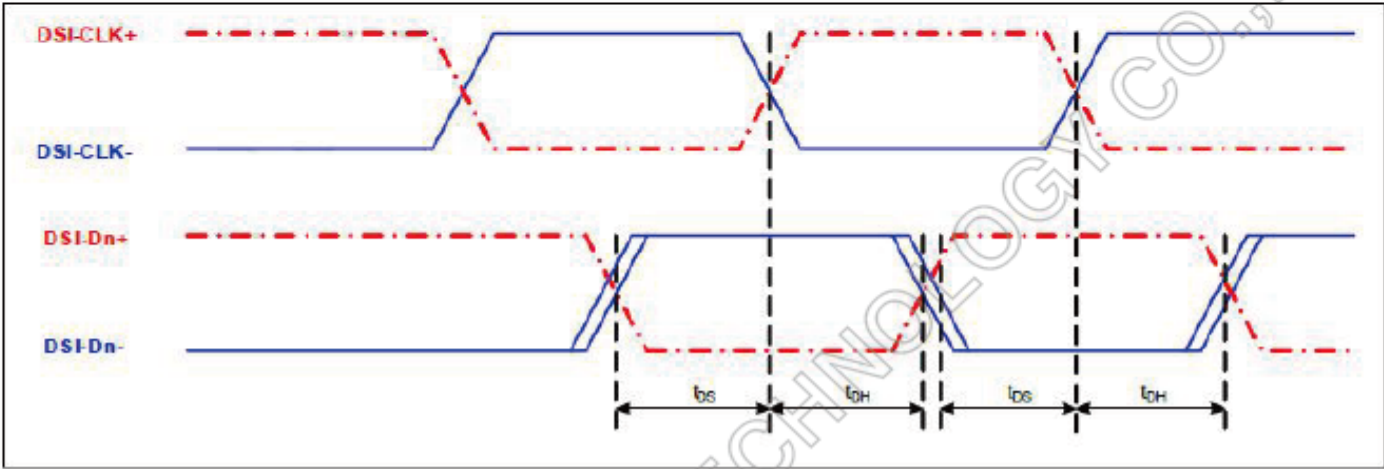
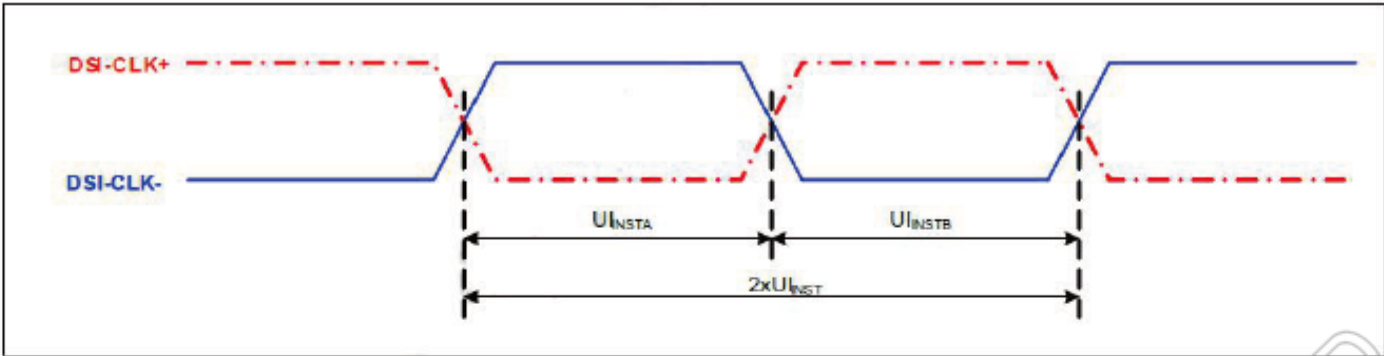
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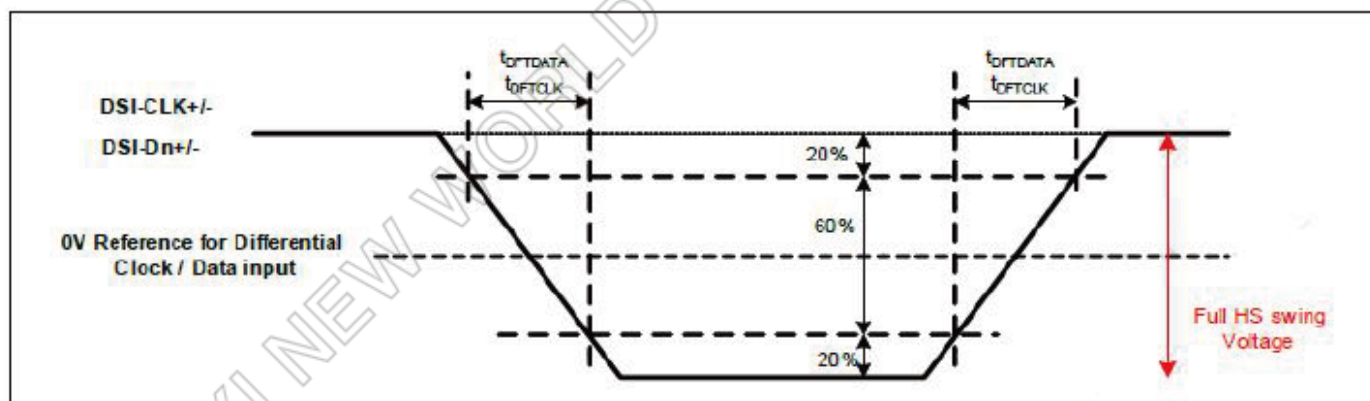
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6.4 MIPI High Speed Mode

Parameter	Symbol	Parameter	Specification			Unit
			Min	Typ	Max	
DSI-CLK+/-	$2xUI_{INST}$	Double UI instantaneous	2.22	-	25	ns
DSI-CLK+/-	UI_{INSTA}, UI_{INSTB}	UI instantaneous Halfs	1.11	-	12.5	ns
DSI-Dn+/-	t_{DS}	Data to clock setup time	0.15	-	-	UI
DSI-Dn+/-	t_{DH}	Data to clock hold time	0.15	-	-	UI
DSI-CLK+/-	t_{DRTCLK}	Differential rise time for clock	150	-	0.3UI	ps
DSI-Dn+/-	$t_{DRTDATA}$	Differential rise time for data	150	-	0.3UI	ps
DSI-CLK+/-	t_{DFTCLK}	Differential fall time for clock	150	-	0.3UI	ps
DSI-Dn+/-	$t_{DFTDATA}$	Differential fall time for data	150	-	0.3UI	ps





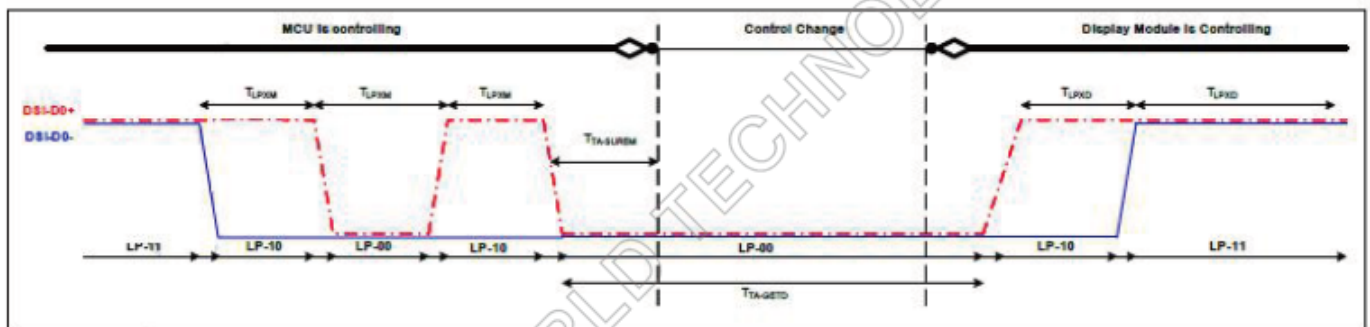
AC characteristics for MIPI-DSI High speed mode

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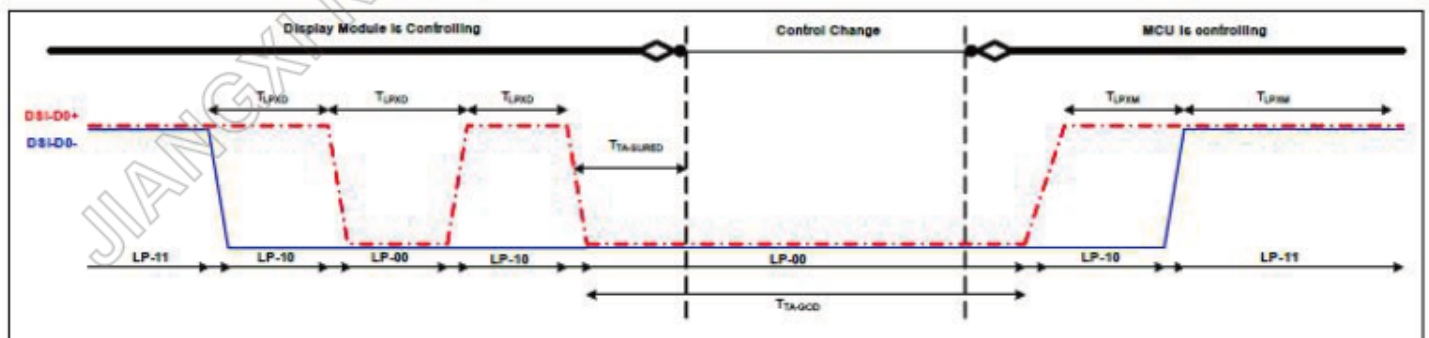


6.5 MIPI Low power mode

Parameter	Symbol	Parameter	Specification			Unit
			Min	Typ	Max	
DSI-D0+/-	T_{LPXM}	Length of LP-00, LP-01, LP-10 or LP-11 periods MPU,Display Module	50	-	-	ns
DSI-D0+/-	T_{LPXD}	Length of LP-00, LP-01, LP-10 or LP-11 periods Display Module,MPU	58	-	-	ns
DSI-D0+/-	$T_{TA-SURED}$	Time-out before the MPU start driving	T_{LPXD}	-	$2XT_{LPXD}$	ns
DSI-D0+/-	$T_{TA-GETD}$	Time to drive LP-00 by display module	$5XT_{LPXD}$	-	-	ns
DSI-D0+/-	T_{TA-GOD}	Time to drive LP-00 after turnaround request - MPU	$4XT_{LPXD}$	-	-	ns
DSI-D0+/-	Ratio T_{LPX}	Ratio of T_{LPXM} / T_{LPXD} between MCU and display module	2/3	-	3/2	



BTA from the MCU to the Display Module



BTA from the Display Module to the MCU

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常备库存
Stock For Sale

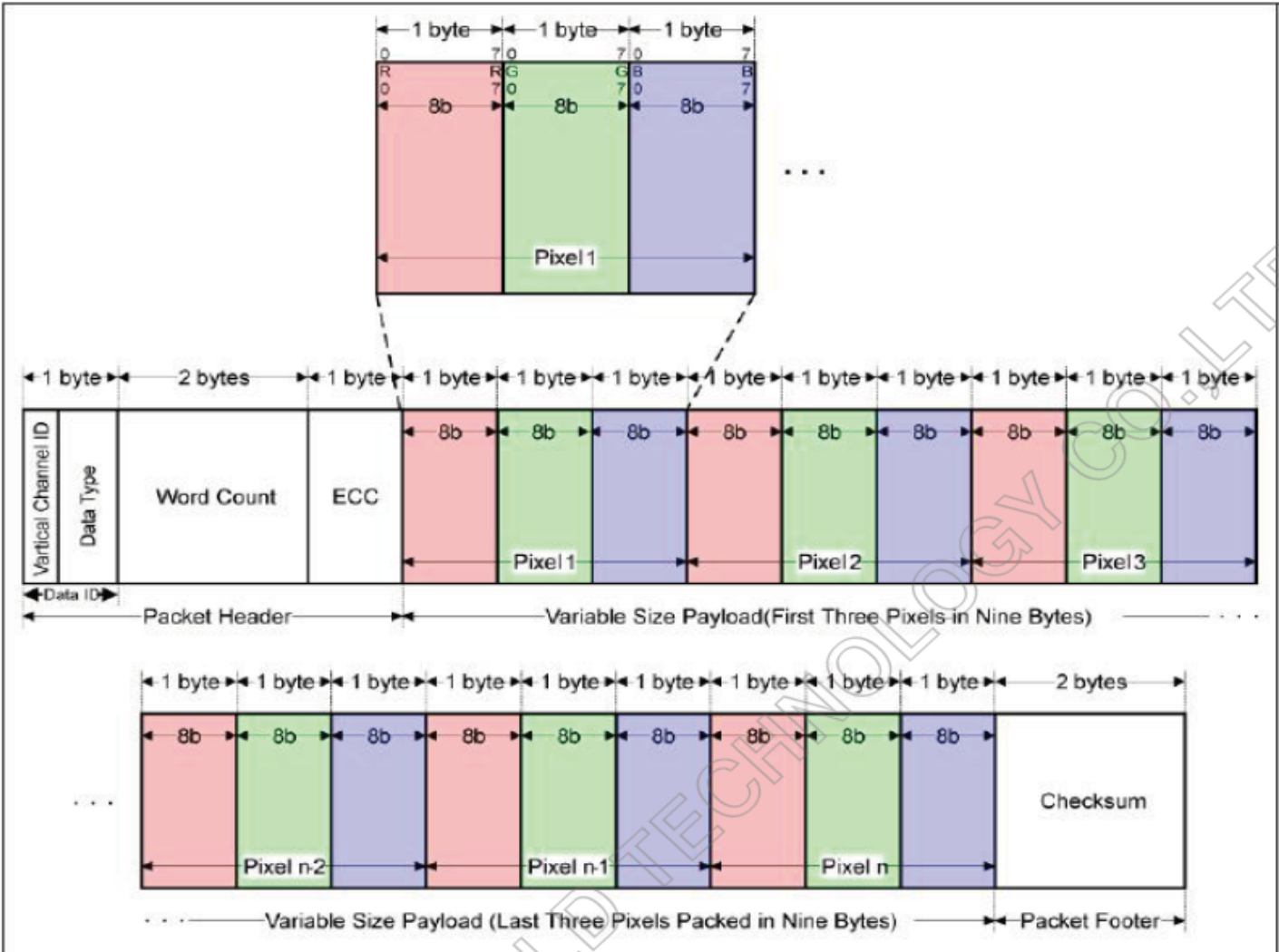
长期供货
Long Time supply

支持小量
NO MOQ

品种齐全
In Full Range



6.6 MIPI 24bit RGB Data Mode





6.7 Color Data Input Assignment

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		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
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	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
	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	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:			:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:
	:			:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	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(255)	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	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:			:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:
	:			:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:
	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(254)	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(255)	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	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	:			:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:
	:			:	:	:	:	:	:			:	:	:	:	:	:			:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(254)	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(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

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常备库存
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长期供货
Long Time supply

支持小量
NO MOQ

品种齐全
In Full Range



7. CTP Specification

7.1 Electrical Characteristics

7.1.1 Absolute Maximum Rating

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	VDD	2.7	3.6	V	--
Operating temperature	T _{OP}	0	+50	°C	--
Storage temperature	T _{ST}	-20	+60	°C	--

7.1.2 DC Electrical Characteristics (Ta=25°C)

(Ambient temperature:25°C, AVDD=2.8V, VDDIO=1.8V or VDDIO=AVDD)

Item	Min.	Typ.	Max.	Unit	Note
Normal mode operating current	--	--	15.6	mA	
Sleep mode operating current	--	37	--	uA	
Monitor mode operating current	--	0.54	--	mA	
Digital Input low voltage/VIL	-0.3	--	0.3*VDD	V	
Digital Input high voltage/VIH	0.7*VDD	--	VDD	V	
Digital Output low voltage/VOL	--		0.3*VDD	V	
Digital Output high voltage/VOH	0.7*VDD			V	

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7.1.3 AC Characteristics

(Ambient temperature:25℃, AVDD=3.3V, VDDIO=3.3V)

Parameter	Min	Typ	Max	Unit
OSC oscillation frequency	47	48	49	MHZ

7.2 I2C Timing

FT5X26 supports the I2C interfaces, which can be used by a host processor or other devices. The I2C is always configured in the Slave mode. The data transfer format is shown in **Figure 2-4**.

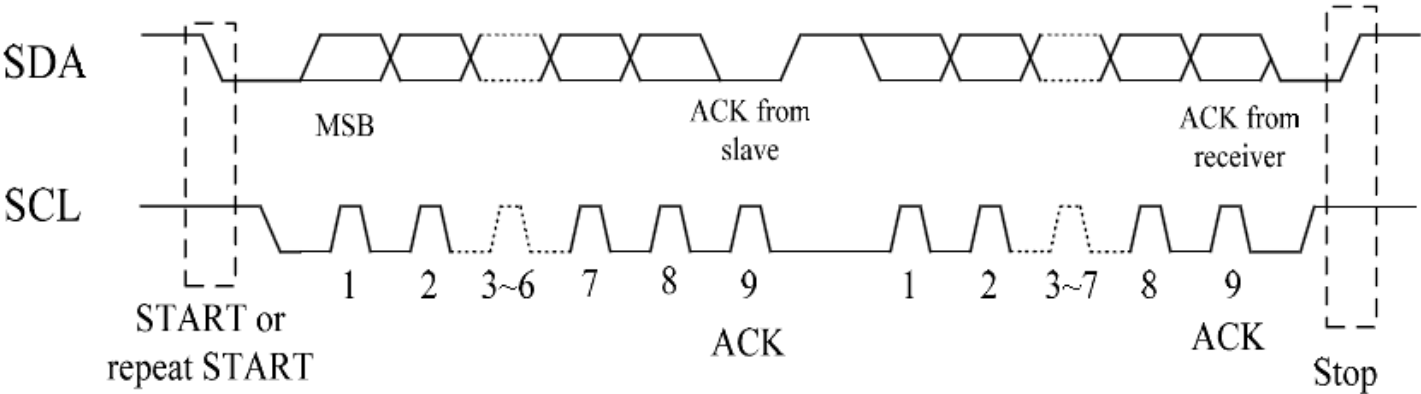


Figure 2-4 I2C Serial Data Transfer Format

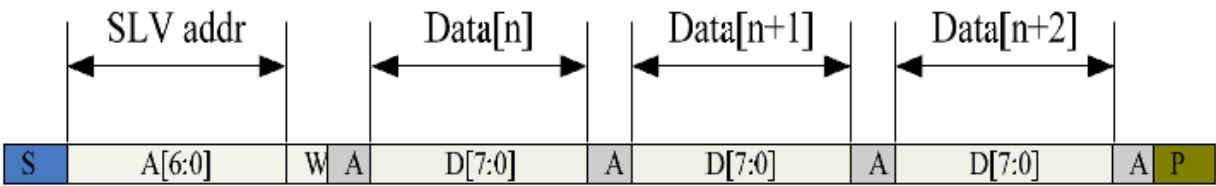


Figure 2-5 I2C master write, slave read

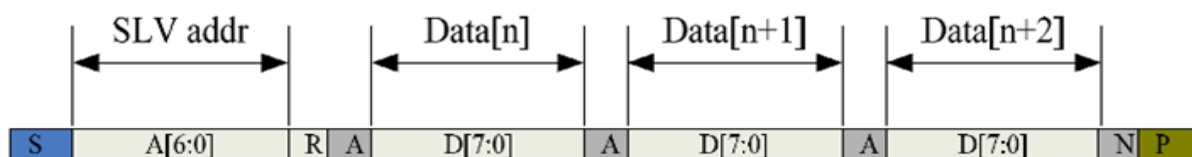


Figure 2-6 I2C master read, slave write

Table 2-1 lists the meanings of the mnemonics used in the above figures.

Table 2-1 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) bit
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 2-2.

Table 2-2 I2C Timing Characteristics

Parameter	Min	Max	Unit
SCL frequency	0	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

ISO9001

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NO MOQ

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7.3 USB Timing

USB is configured in device mode, and a Full speed USB function is supported. The USB function controller is as follows.

- USB 2.01-compliant composite device , full speed (12Mbps) ;
- Require external crystal (12MHz) ;
- Support USB LPM L1;
- integrated transceiver;
- Support USB-HID protocol for Win8.
- Vendor ID: 0x2808

ISO9001 : 2008 ISO/TS16949

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7.4 POWER ON/Reset Sequence

Reset should be pulled down to be low before powering on and powering down. I2C/SPI shouldn't be used by other devices during Reset time after IOVCC powering on (T_{prt}). INT signal will be sent to the host after initializing all parameters and then start to report points to the host. If Power is down, the voltage of supply must be below 0.3V and T_{pdt} is more than 5ms.

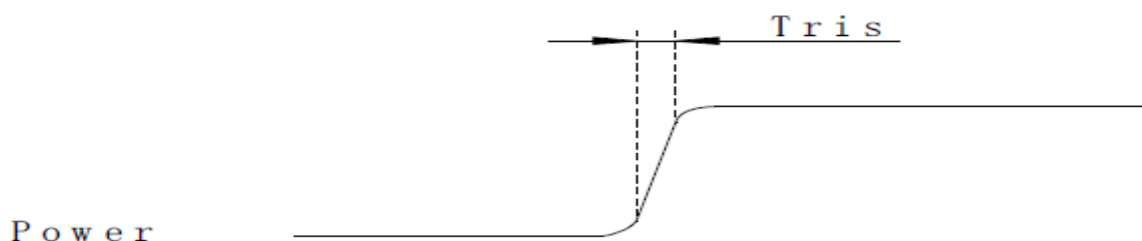
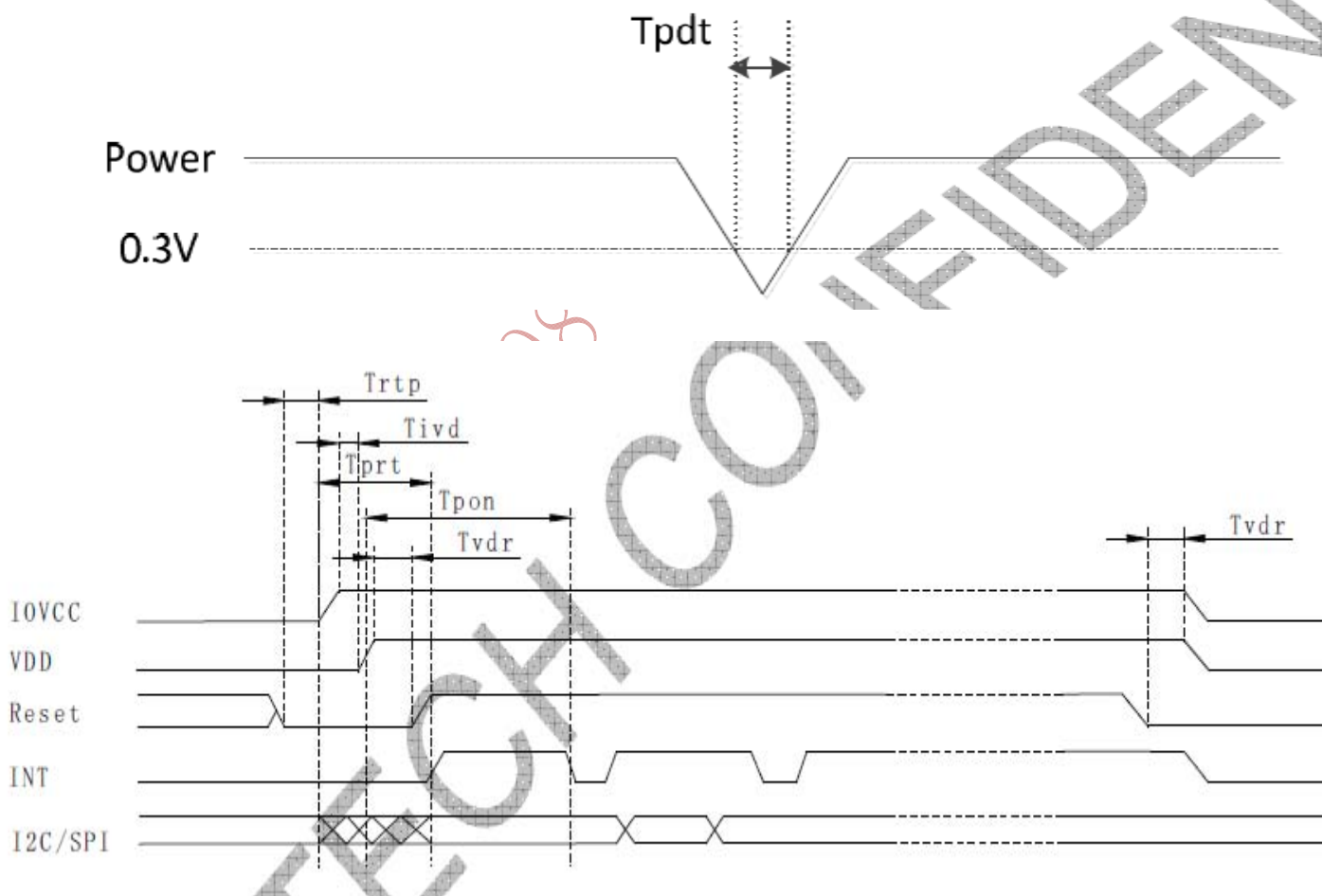


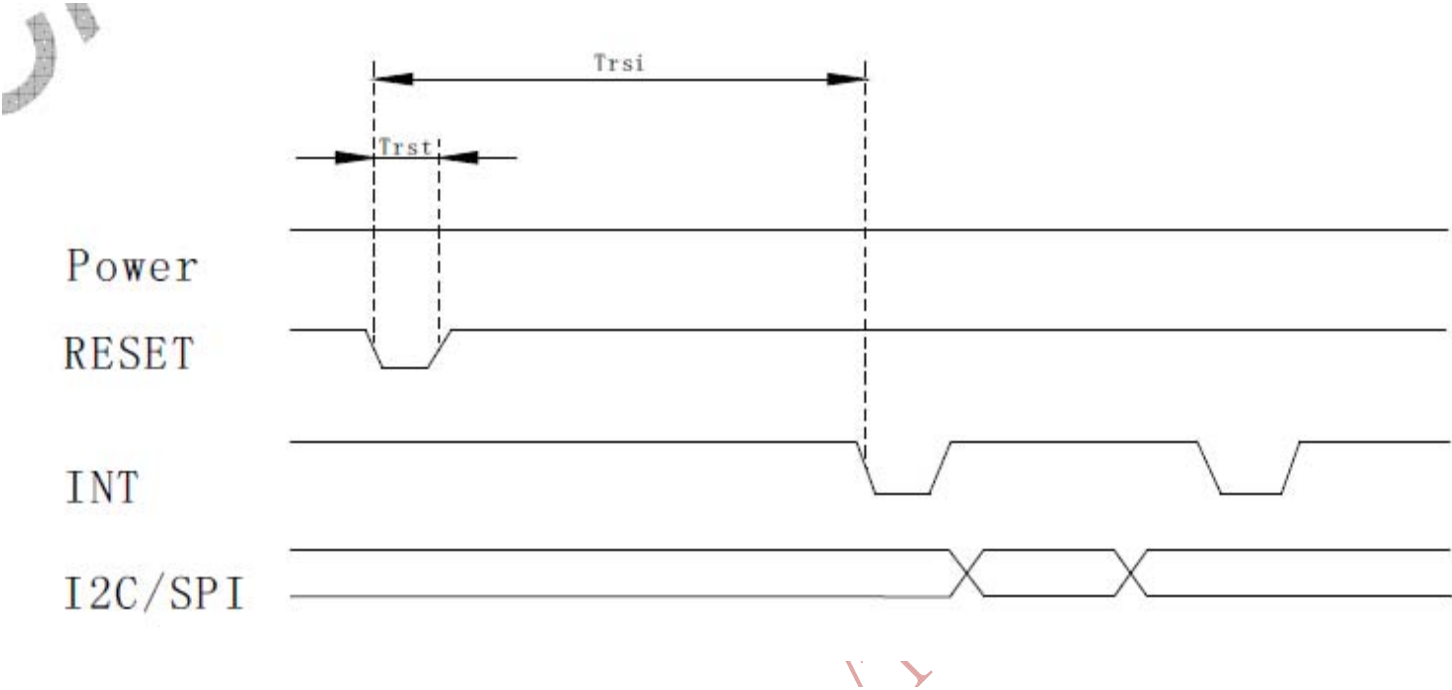
Figure 3-7 Power on time



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常备库存 Stock For Sale	长期供货 Long Time supply	支持小量 NO MOQ	品种齐全 In Full Range	



Reset time must be enough to guarantee reliable reset, the time of starting to report point after resetting approach to the time of starting to report point after powering on.



Parameter	Description	Min	Max	Units
Tris	Rise time from 0.1VDD to 0.9VDD	--	5	ms
Tpdt	Time of the voltage of supply being below 0.3V	5	--	ms
Trtp	Time of resetting to be low before powering on	100	--	μ S
Tivd	Delay time of VDD powering on after IOVCC powering on	10	--	μ S
Tprt	Reset time after IOVCC powering on	$2Tris+Tivd+Tvdr$	--	ms
Tpon	Time of starting to report point after powering on	400	--	ms
Tvdr	Reset time after VDD powering on	1	--	ms
Trsi	Time of starting to report point after resetting	400	--	ms
Trst	Reset time	1	--	ms

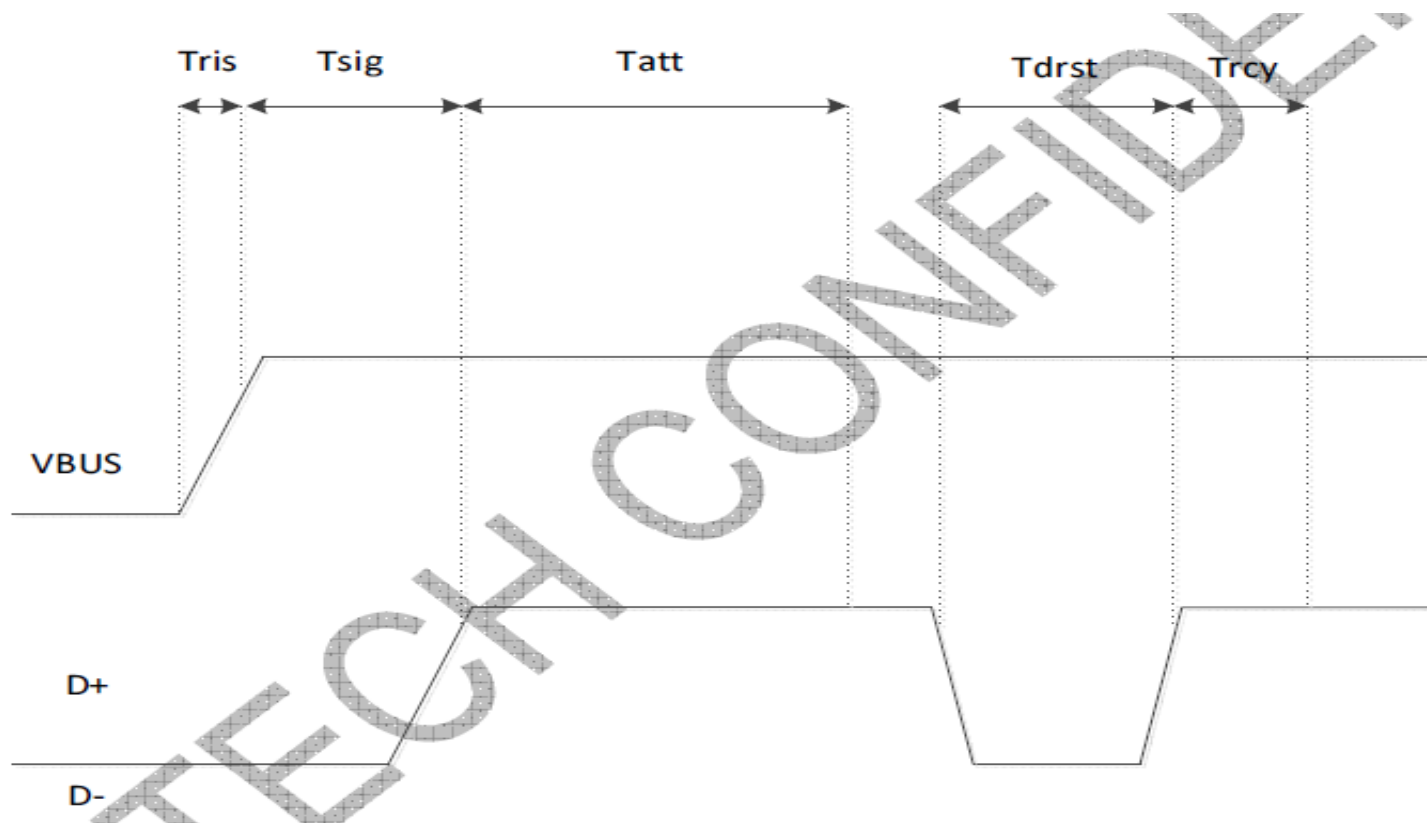


Table 3-7 USB Power on/Reset Sequence Parameters

Parameter	Description	Min	Max	Units
T_{ris}	Rise time from 0.1VDD to 0.9VDD	--	5	ms
T_{sig}	Time required for the device internal power rail to stabilize and for D+ or D- to reach VIH (min)	100	--	ms
T_{att}	Time ensures that the electrical and mechanical connection is stable before software attempts to reset the attached device	100	--	ms
T_{drst}	Time hubs drive reset to a device	10	--	ms
T_{rcy}	The USB System Software guarantees a minimum of 10 ms for reset recovery	10	--	ms

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Stock For Sale

长期供货
Long Time supply

支持小量
NO MOQ

品种齐全
In Full Range



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.

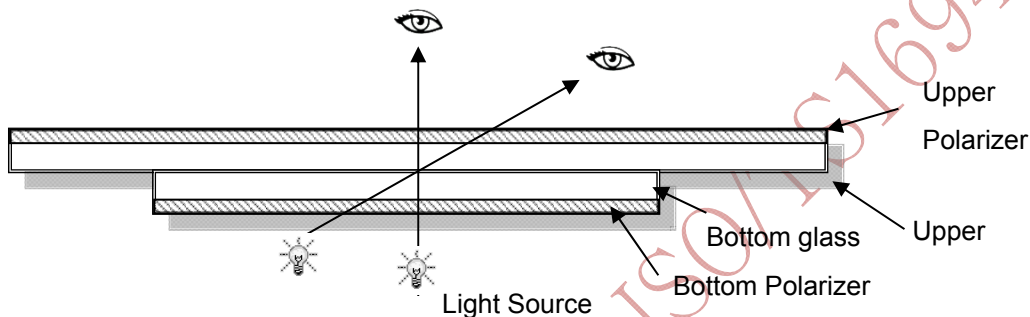
Temperature : $25\pm 5^{\circ}\text{C}$

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

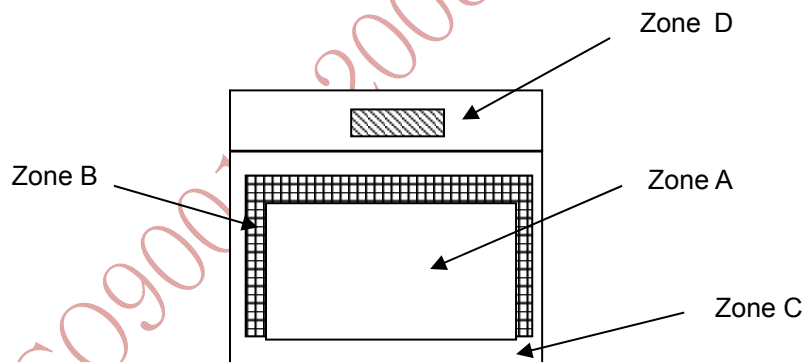
Viewing Angle : Normal viewing Angle.

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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常备库存 Stock For Sale	长期供货 Long Time supply	支持小量 NO MOQ	品种齐全 In Full Range	



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.	

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常备库存
Stock For Sale

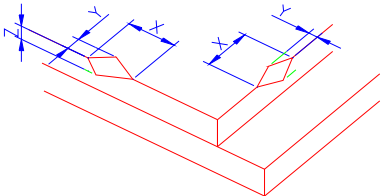
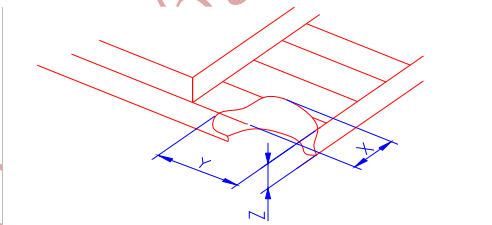
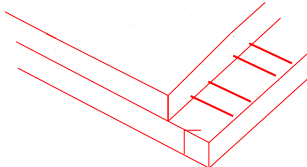
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8.1.4 Criteria (Visual)

Number	Items	Criteria(mm)						
1.0 LCD Crack/Broken NOTE: X: Length Y: Width Z: Height L: Length of ITO, 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							

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常备库存
Stock For Sale

长期供货
Long Time supply

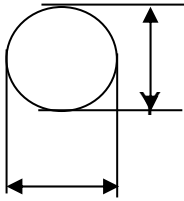
支持小量
NO MOQ

品种齐全
In Full Range



2.0

Spot defect



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		
$0.10 < \Phi \leq 0.25$	4(distance $\geq 10\text{mm}$)		
$0.25 < \Phi \leq 0.35$	3		
$\Phi > 0.4$	0		

Ignore

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		
$0.10 < \Phi \leq 0.25$	4(distance $\geq 10\text{mm}$)		
$0.25 < \Phi \leq 0.35$	3		
$\Phi > 0.4$	0		

Ignore

③ Polarizer accidented spot

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.2$	Ignore		
$0.3 < \Phi \leq 0.5$	3(distance $\geq 10\text{mm}$)		
$\Phi > 0.5$	1		

Ignore

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

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.15$	Ignore		
$0.2 < \Phi \leq 0.3$	2(distance $\geq 10\text{mm}$)		
$\Phi > 0.4$	1		

Ignore

⑤ Polarizer Bubble

Zone Size (mm)	Acceptable Qty		
	A	B	C
$\Phi \leq 0.2$	Ignore		
$0.3 < \Phi \leq 0.4$	4(distance $\geq 10\text{ m}$)		
$0.4 < \Phi \leq 0.5$	3		
$\Phi > 0.5$	1		

Ignore

Part. No

KD101WXFID005-C012A

REV

V1.0

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常备库存
Stock For Sale

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Long Time supply

支持小量
NO MOQ

品种齐全
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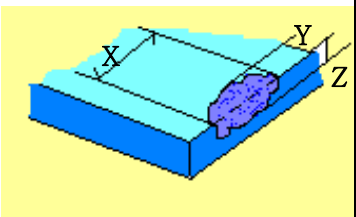
3.0	Line defect (LCD/TP /Polarizer backlight black/white line, scratch, stain)	Width(mm)	Length(m m)	Acceptable Qty		
				A	B	C
		$\Phi \leq 0.05$	Ignore	Ignore		Ignore
		$0.05 < W \leq 0.06$	$L \leq 4.0$	$N \leq 3$		
		$0.07 < W \leq 0.08$	$L \leq 3.0$	$N \leq 2$		
		$0.08 < W$	Define as spot defect			
4.0	Electronic Comp onents SMT	Not allow missing parts, solderless connection, cold solder joint, mis match, The positive and negative polarity opposite				
5.0	Display color& B rightness	1. Color: Measuring the color coordinates, The measurement standar d according to the datasheet or samples. 2. Brightness: Measuring the brightness of White screen, The meas urement standard according to the datasheet or Samples.				
6.0	LCD Mura	By 5% ND filter invisible.				

7.0	CTP Related	CTP Cover sensor accidented black/white spot				
			Size Φ (mm)	Acceptable Qty		
				A	B	C
			$\Phi \leq 0.1$	Ignore		Ignore
			$0.15 < \Phi \leq 0.25$	4 (distance $\geq 10\text{mm}$)		
			$0.25 < \Phi \leq 0.35$	3		
$\Phi > 0.4$	1					



			<table><tr><th rowspan="2">Width(mm)</th><th rowspan="2">Ignore(mm)</th><th colspan="3">Acceptable Qty</th></tr><tr><th>A</th><th>B</th><th>C</th></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="3">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><th rowspan="2">Zone Size (mm)</th><th>Acceptable Qty</th></tr><tr><th>C</th></tr><tr><td>$\Phi \leq 0.2$</td><td>Ignore</td></tr><tr><td>$0.2 < \Phi \leq 0.3$</td><td>4(distance $\geq 10\text{mm}$)</td></tr><tr><td>$0.3 < \Phi \leq 0.4$</td><td>3</td></tr><tr><td>$\Phi > 0.4$</td><td>0</td></tr></table>	Zone Size (mm)	Acceptable Qty	C	$\Phi \leq 0.2$	Ignore	$0.2 < \Phi \leq 0.3$	4(distance $\geq 10\text{mm}$)	$0.3 < \Phi \leq 0.4$	3	$\Phi > 0.4$	0																
Zone Size (mm)	Acceptable Qty																													
	C																													
$\Phi \leq 0.2$	Ignore																													
$0.2 < \Phi \leq 0.3$	4(distance $\geq 10\text{mm}$)																													
$0.3 < \Phi \leq 0.4$	3																													
$\Phi > 0.4$	0																													
		CTP Bonding bubble/ accidented spot	<table><tr><th rowspan="2">Size Φ(mm)</th><th colspan="2">Acceptable Qty</th></tr><tr><th>A</th><th>B</th></tr><tr><td>$\Phi \leq 0.1$</td><td colspan="2">Ignore</td></tr><tr><td>$0.15 < \Phi \leq 0.2$</td><td colspan="2">3(distance $\geq 10\text{mm}$)</td></tr><tr><td>$0.2 < \Phi \leq 0.25$</td><td colspan="2">2</td></tr><tr><td>$\Phi > 0.25$</td><td colspan="2">0</td></tr></table>	Size Φ (mm)	Acceptable Qty		A	B	$\Phi \leq 0.1$	Ignore		$0.15 < \Phi \leq 0.2$	3(distance $\geq 10\text{mm}$)		$0.2 < \Phi \leq 0.25$	2		$\Phi > 0.25$	0											
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$\Phi > 0.25$	0																													
		Assembly deflection	beyond the edge of backlight $\leq 0.2\text{mm}$																											
		TP cover broken X : length Y : width Z : height	<table><tr><th>X</th><th>Y</th><th>Z</th></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≤0.3mm	Y≤0.3mm	Z<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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常备库存
Stock For Sale

长期供货
Long Time supply

支持小量
NO MOQ

品种齐全
In Full Range



9. Reliability Test Result

Item	Condition	Inspection after test
High Temperature Operating	50℃, 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	0℃, 96HR	
High Temperature Storage	60℃, 96HR	
Low Temperature Storage	-20℃, 96HR	
High Temperature & High Humidity Storage	+40℃, 90% RH ,96 hours.	
Thermal Shock (Non-operation)	-20℃, 30 min ↔ 60℃, 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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NO MOQ

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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

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