



深圳市一众显示科技有限公司

SHEN ZHEN TEAM SOURCE DISPLAY TECH. CO, LTD.

# TFT-LCD Module Specification

**Module NO.:** TST043WQHS-67

**Version:** V1.4

APPROVAL FOR SPECIFICATION

APPROVAL FOR SAMPLE

For Customer' s Acceptance:	
Approved by	Comment

Team Source Display:		
Presented by	Reviewed by	Organized by



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# 1. LCM Specification

## 1.1 Description

TST043WQHS-67( is a transmissive type color active matrix liquid crystal display(LCD) which uses amorphous thin film transistor(TFT) as switching devices. This product is composed of a TFT LCD panel, a drive IC, a FPC, and a LED-backlight unit. The active display area is 4.3inches diagonally measured and the native resolution is 480\*RGB\*272.Features of this product are listed in the following table.

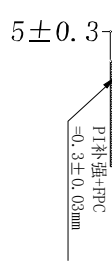
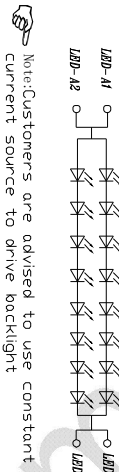
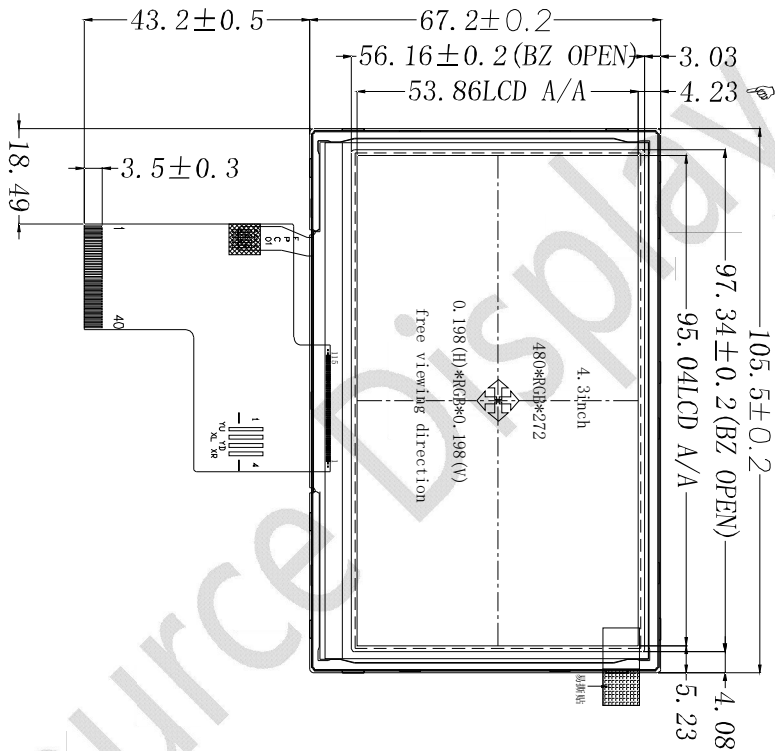
## 1.2 Functions & Features

**Table 1.1 Module Functions & Features**

Parameter	Value	Unit
LCD Mode	TFT/Transmissive	-
Color Depth	16.7M	-
Display Resolution	480*RGB*272	pixels
Module Size	105.5 (H)*67.2(V)*3.05(T)(Exclude FPC)	mm
Active Area (A.A.)	95.04 (L)* 53.86 (W)	mm
Pixel Arrangement	RGB-stripe	-
Viewing Direction	ALL	
Display Mode	Normally Black	
LCD Controller/Driver	ST7282	-
IC Package Type	COG	-
Interface	RGB24-bit	-
Power Supply Voltage	3.3	V
Backlight	White LED*16	pcs

## 2. Mechanical Specification

LCD Type	4.3" TFT, Transmissive, Normally Black, FFS
Resolution	480(RGB)*272
View Direction	free
Driver IC	ST7282
Color Depth	16.7M
Interface Types	RGB24-bit
Operating Voltage	VDD=3.3V
TP/Lens	Without
Backlight LEDs	16 LEDs, 40mA, 24.2V
Surface Luminance	900(Typ), 1000(max)cd/m <sup>2</sup> , IF=40mA
Operating temperature	-20 °C ~ 70 °C
Storage Temperature	-30 °C ~ 80 °C
Storage Humidity	60% ~ 90% max



Pin	Symbol	Description
1	VDD	Power for LBD
2	VDD	Power for LBD
3	VDD	Power ground
4	VDD	Power supply
5	AO	Blue data (DS)
6	AI	Red data
7	BI	Red data
8	BI	Red data
9	BI	Red data
10	BI	Red data
11	BI	Red data
12	BI	Red data (DS)
13	BO	Green data (LS)
14	CI	Open data
15	CO	Open data
16	CI	Open data
17	CI	Open data
18	CI	Open data
19	CI	Open data
20	CI	Open data
21	BO	Blue data (LS)
22	BI	Blue data
23	BI	Blue data
24	BI	Blue data
25	BI	Blue data
26	BI	Blue data
27	BI	Blue data
28	BI	Blue data (DS)
29	VDD	Power Ground
30	CLK	Pixel clock
31	HSP	Display on/off
32	HSW	Horizontal sync
33	VSW	Vertical sync
34	DE	Data enable
35	NC	NC
36	GND	GND
37	XR	NC
38	YD	NC
39	XL	NC
40	VU	NC

版本 (Version)	变更记录 (Change History)	日期 (Date)	视角 (View):	比例 (Proportion):	设计 (DESIGN)	审核 (AUDITING)	批准 (APPROVED)
A0	初次版本	2019-3-25	单位 (Unit):	M M	页 (Page):	1 / 1	
A1	按实际样品亮度更新背光电压参数	2019-4-12	产品型号 (Product Type):	TST043WQHS-67			Ar-on
A2	按实际样品亮度更新背光电压参数	2019-4-30	图纸版本 (Version):	A2			2019.4.30

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### 3. Pin Descriptions (参见 P5 页模组图)

Pin No.	Symbol	Description
1	LED-	Cathode of LED backlight
2	LED+	Anode of LED backlight
3	GND	Power ground
4	VDD	Power voltage
5	R0	Red data (LSB)
6	R1	Red data
7	R2	Red data
8	R3	Red data
9	R4	Red data
10	R5	Red data
11	R6	Red data
12	R7	Red data (MSB)
13	G0	Green data (LSB)
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data
19	G6	Green data
20	G7	Green data(MSB)
21	B0	Blue data(LSB)
22	B1	Blue data
23	B2	Blue data
24	B3	Blue data
25	B4	Blue data
26	B5	Blue data
27	B6	Blue data
28	B7	Blue data(MSB)
29	GND	Power ground
30	DCLK	Pixel clock
31	DISP	Display on/off
32	HSYN	Horizontal sync signal
33	VSYNC	Vertical sync signal
34	DE	Data enable
35	NC	NO connect
36	GND	Power ground
37	NC	NO connect
38	NC	NO connect
39	NC	NO connect
40	NC	NO connect

## 4. Electrical Units

### 4.1 Absolute Maximum Ratings

The absolute maximum ratings are list on Table 4.1. When used out of the absolute maximum ratings, the LCM may be permanently damaged. Using the LCM within the following electrical characteristics limit is strongly recommended for normal operation. If these electrical characteristic conditions are exceeded during normal operation, the LCM will malfunction and cause poor reliability.

**Table 4.1 Module Absolute Maximum Ratings**

Item	Symbol	Unit	Value	Note
Power Supply Voltage (1)	VCC	V	-0.3 to + 3.6	
Power Supply Voltage (2)	VGH ~ VSS	V	10.0 to +20.0	
Power Supply Voltage (3)	VSS ~ VGL	V	5.0 to +15.0	
Operating Temperature	Top	°C	-20 to +70	
Storage Temperature	Tst	°C	-30 to +80	
Operating Humidity	Hop	%(RH)	10~90	

(VSS=0V)

### 4.2 Electrical characteristics (Ta=25°C)

**Table 4.2:DC Characteristic**

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	Logic VCC	---	2.8	-	3.3	V
Input Voltage	H level V <sub>IH</sub>	---	0.8V <sub>dd</sub>	---	V <sub>dd</sub>	V
	L level V <sub>IL</sub>		0	---	0.2V <sub>cc</sub>	
Current Consumption	I <sub>DD</sub>	With internal voltage generation; VDD=3.3V;Tamb=25°C;	---	---	TBD	mA
LCD Driving Voltage	VOP	---	---	TBD	---	V

## 4.3 Backlight Specification

**Table 4.3 Back-light Characteristics**

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	VF	Only Backlight	-	24.2	-	V
Supply Current	IF		40			mA
Average Brightness	IV	(With LCD dots all on)	-	900	1000	Cd/m <sup>2</sup>
CIE Color Coordinate (Without LCD)	X	Backlight Current IF=40mA	-	-	-	-
	Y		-	-	-	
Uniformity	B	Backlight Current IF=40mA	80	-	-	%
LED Lifetime	-	IF=40mA	20000	30000	-	Hours
Color	White					

**Note:** With 16 pcs white LED parallel connection.

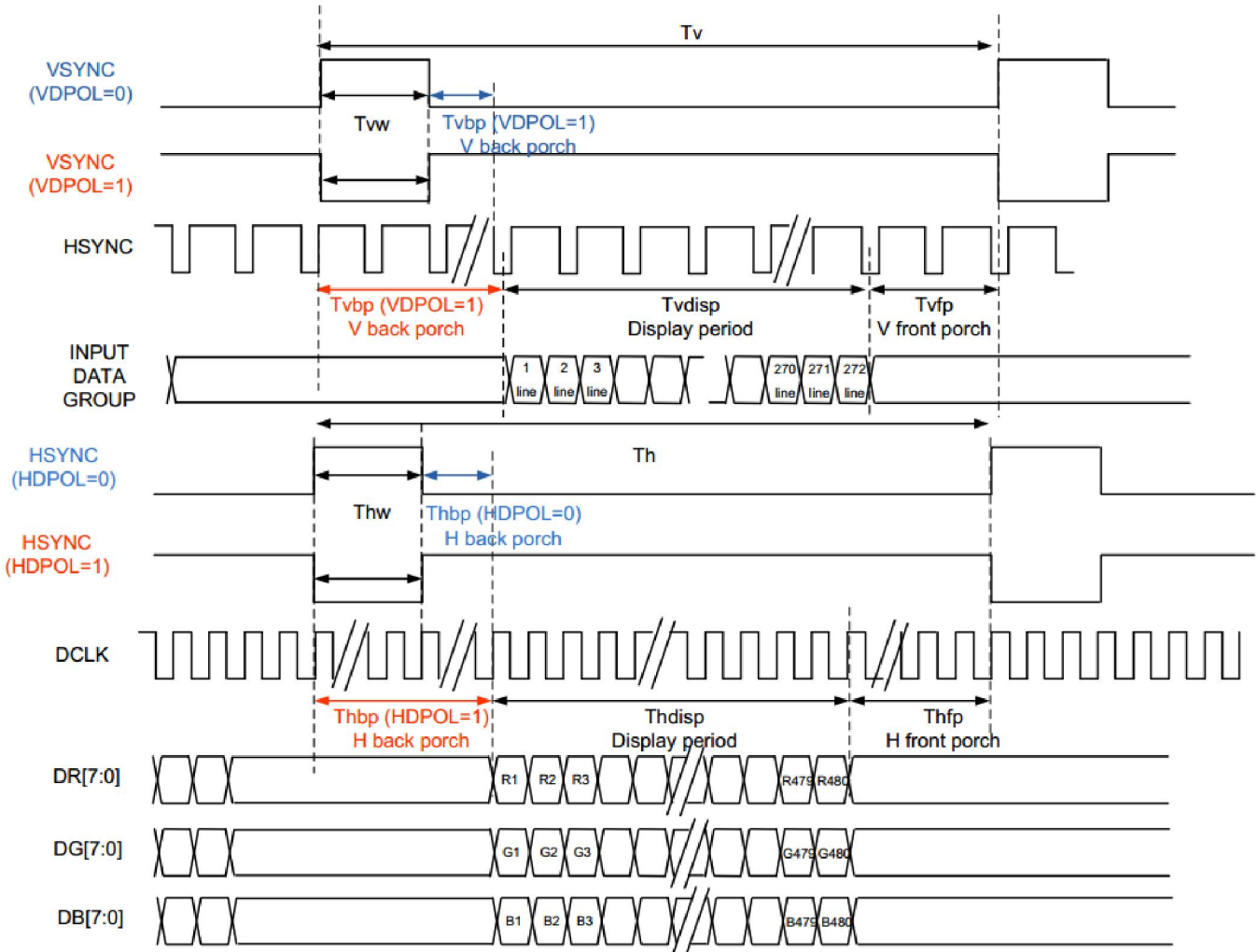
## 5. AC Characteristics

### 5.1 Parallel 24-bit RGB Mode Timing Table

Item	Symbol	Min.	Typ.	Max.	Unit	Remark	
DCLK Frequency	Fclk	8	9	12	MHz		
DCLK Period	Tclk	83	111	125	ns		
HSYNC	Period Time	Th	485	531		DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43		DCLK	By H_Blanking setting
	Front Porch	Thfp	2	8		DCLK	
	Pulse Width	Thw	2	4		DCLK	
VSYNC	Period Time	Tv	276	292		H	
	Display Period	Tvdisp		272		H	
	Back Porch	Tvbp	2	12		H	By V_Blanking setting
	Front Porch	Tvfp	2	8		H	
	Pulse Width	Tvw	2	4		H	

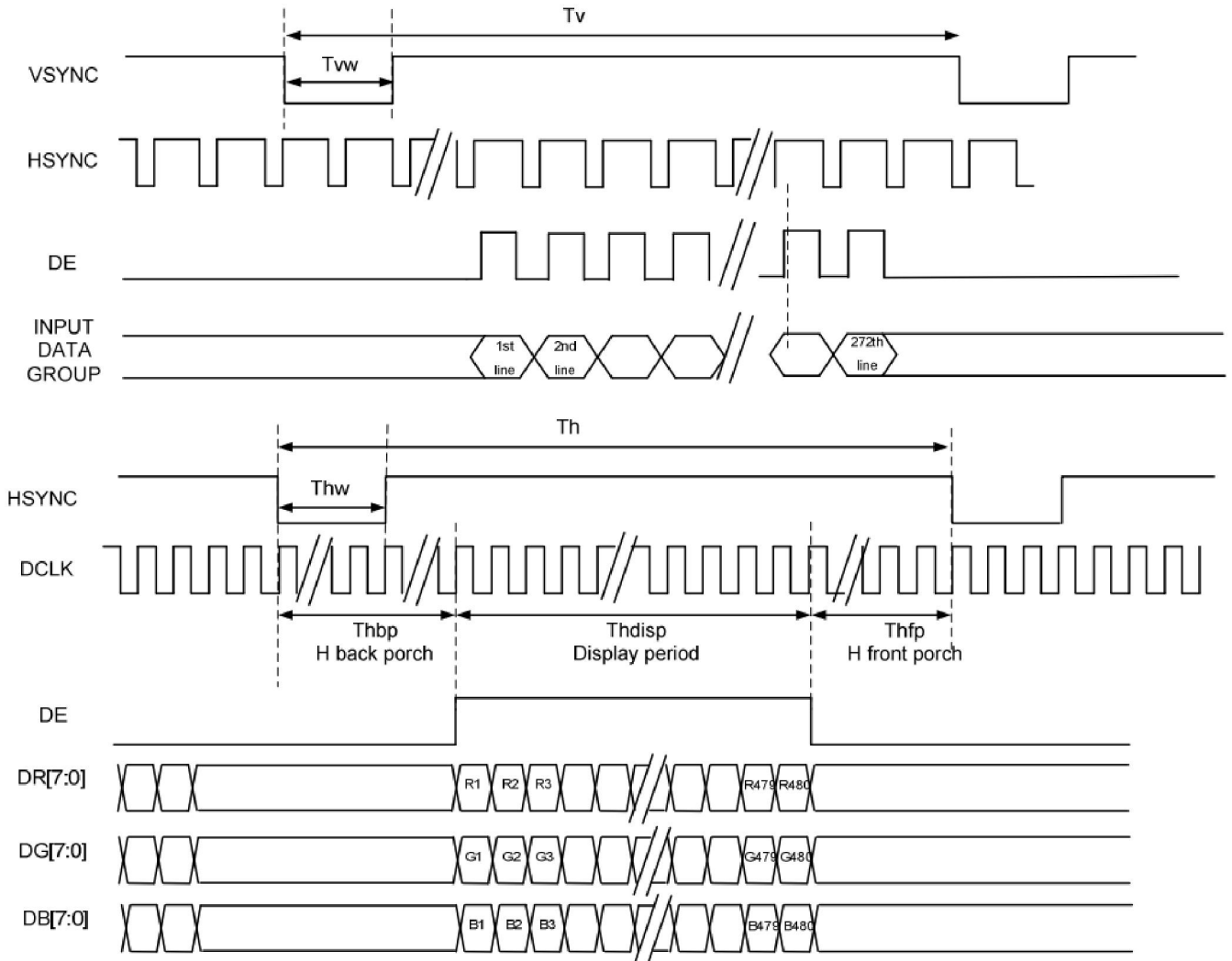


## 5.2 SYNC Mode Timing Diagram

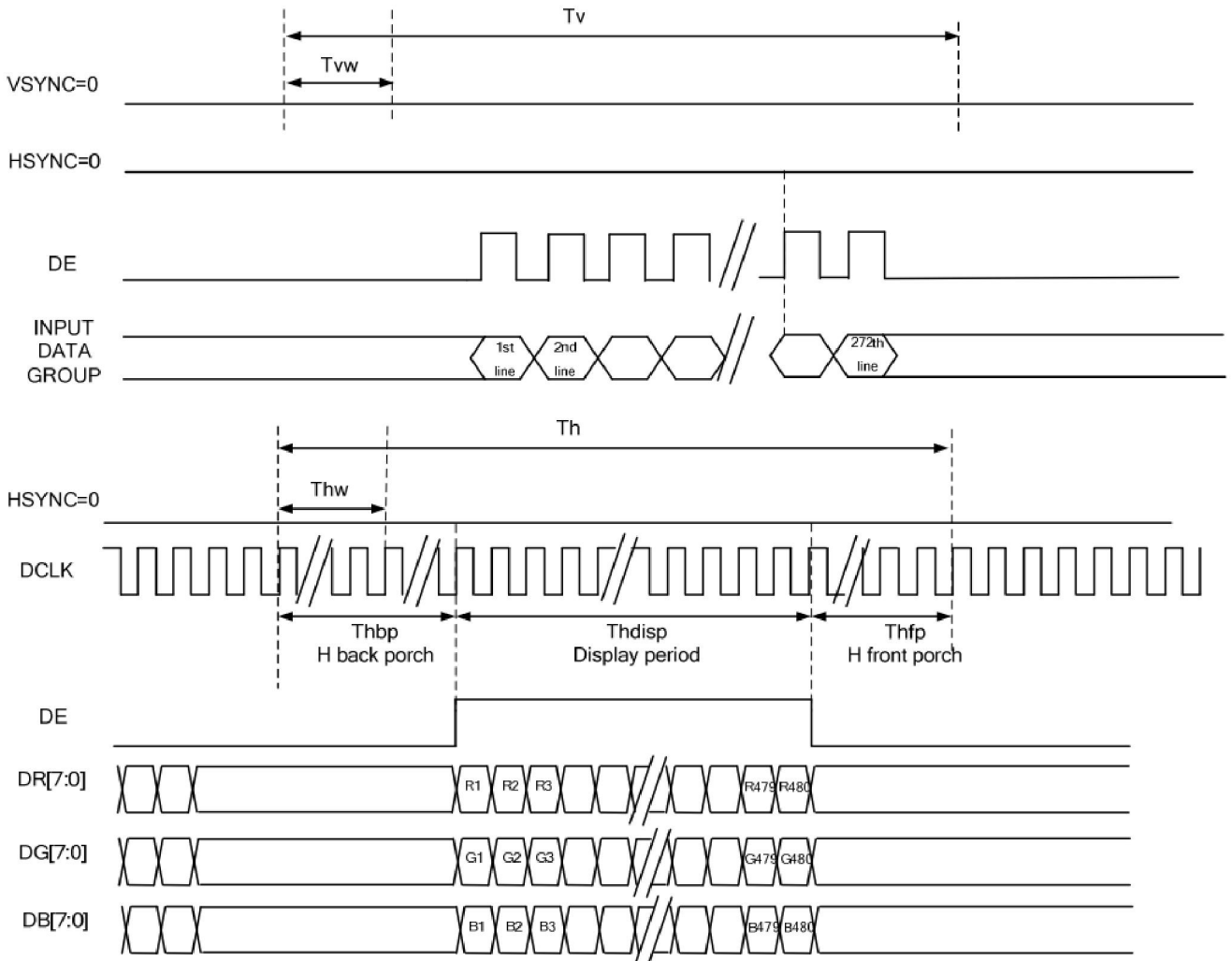


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### 5.3 SYNC-DE Mode Timing Diagram



# 5.4 SYNC-DE Mode Timing Diagram



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## 6. Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25°C. The values specified are at an approximate distance 50cm from the TFT-LCD surface at a viewing angle of  $\Phi$  and  $\theta$  equal to 0° .

Measurement condition: Refer to next pages ( C-light source, Halogen Lamp )

\*1): with Polarizer \*2): without Polarizer \*3): Only Color Filter glass

Items		Symbol	Condition	Specifications			Unit	
				Min.	Typ.	Max.		
Contrast Ratio		CR		-	800	-	-	
Response Time		T <sub>R</sub>		-	30	-	ms	
		T <sub>F</sub>					ms	
Chromaticity	Red	X <sub>R</sub>			TBD		-	
		Y <sub>R</sub>			TBD		-	
	Green	X <sub>G</sub>			TBD		-	
		Y <sub>G</sub>			TBD		-	
	Blue	X <sub>B</sub>			TBD		-	
		Y <sub>B</sub>			TBD		-	
	White	X <sub>W</sub>			0.30	0.32	0.34	-
		Y <sub>W</sub>			0.36	0.38	0.40	-
Viewing angle	Hor.	L(3 o'clock)	Center CR≥10	-	80	-	deg.	
		R(9 o'clock)		-	80	-		
	Ver.	U(12 o'clock)		-	80	-		
		D(6 o'clock)		-	80	-		

Note

## 7. Reliability Test Items

No.	Test Items	Test Condition	Remarks
1	High Temperature Storage	T = 80°C for 240hr	Module (Without Contamination)
2	Low Temperature Storage	T = -30°C for 240hr	
3	High Temperature Operating	T = 70°C for 240hr	
4	Low Temperature Operating	T = -20°C for 240hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 50°C /90% for 240hr (But no condensation dew)	
6	Thermal Shock	-20±2°C~25~70±2°C×10cycles (30min.) (5min.) (30min.)	
7	ESD test	Voltage:±8KV R: 330Ω, C:150pF,Air discharge, 10time	
8	Packing Shock	1corner, 3edge, 6face / 1.0mDrop	Packing
9	Packing Vibration	Frequency: 10Hz~55Hz~10Hz Amplitude: 1.5mm, X, Y, Z direction for total 3hours	