


MCT101HDMI-A	1280 x 800	HDMI Interface	TFT Module
(MDT1010GIH-HDMI) <b>Specification</b>			
Version: 1		Date: 22/06/2019	
<b>Revision</b>			
1	21/06/2019	First issue	

Display Features			
Display Size	10.10"		
Resolution	1280 x 800		
Orientation	Landscape		
Appearance	RGB		
Logic Voltage	5V		
Interface	HDMI		
Brightness	1100 cd/m <sup>2</sup>		
Touchscreen	---		
Module Size	230.56 x 155.01 x 25.60mm		
Operating Temperature	-20°C ~ +70°C		
Pinout	40 Way Connector		Box Quantity
Pitch	---		Weight / Display

\* - For full design functionality, please use this specification in conjunction with the TFP401 specification. (Provided Separately)

Display Accessories	
Part Number	Description
MCIB-HDMI/HDMI	HDMI-to-HDMI interconnect board.

Optional Variants	
Appearances	Voltage



## Summary

TFT 10.1" is a IPS transmissive type color active matrix TFT liquid crystal display . In-Plane Switching (IPS) was one of the first refinements to produce significant gains in the light-transmissive characteristics of TFT panels. It is a technology that addresses the two main issues of a standard twisted nematic (TN) TFT display: colour and viewing angle.

## General Specifications

- Screen Diagonal: 10.1 inch
- Number of Pixels: 1280 x 3(RGB) x 800 dots
- Module dimension: 230.56 x 155.01 x 25.6 mm
- Active area: 216.96 (H) x 135.6(V) mm
- Pixel pitch: 0.1695 × 0.1695 mm
- Display Mode: Normally Black
- Pixel Arrangement: R.G.B. Vertical Stripe
- Backlight Type: LED, Normally White
- Aspect Ratio: 16:9
- Electrical Interface (Logic): HDMI
- With /Without TP: Without TP
- Surface: Anti-Glare

\*Color tone slight changed by temperature and driving voltage.



# Interface

## . CON6

Pin No.	Symbol	Function	Remark
1	3.3V	TFT Module Power limit can only output 3.3V,100mA	Note1
2	5V	Raspberry Pi:Power 5V	
3	GPIO02	Raspberry Pi:GPIO02	
4	5V	Raspberry Pi:Power 5V	
5	GPIO03	Raspberry Pi:GPIO03	
6	GND	Raspberry Pi:GND	
7	GPIO04	Raspberry Pi:GPIO04	
8	GPIO14	Raspberry Pi:GPIO14	
9	GND	Raspberry Pi:GND	
10	GPIO15	Raspberry Pi:GPIO15	
11	GPIO17	Raspberry Pi:GPIO17	
12	GPIO18	Raspberry Pi:GPIO18 (Backlight Enable)	
13	GPIO27	Raspberry Pi:GPIO27	
14	GND	Raspberry Pi:GND	
15	GPIO22	Raspberry Pi:GPIO22	
16	GPIO23	Raspberry Pi:GPIO23	
17	3.3V	TFT Module Power limit can only output 3.3V,100mA	Note1
18	GPIO24	Raspberry Pi:GPIO24	
19	GPIO10	Raspberry Pi:GPIO10	
20	GND	Raspberry Pi:GND	
21	GPIO09	Raspberry Pi:GPIO09	
22	GPIO25	Raspberry Pi:GPIO25	
23	GPIO11	Raspberry Pi:GPIO11	
24	GPIO08	Raspberry Pi:GPIO08	
25	GND	Raspberry Pi:GND	
26	GPIO07	Raspberry Pi:GPIO07	
27	ID_SD	Raspberry Pi:ID_SD	
28	ID_SC	Raspberry Pi:ID_SC	
29	GPIO05	Raspberry Pi:GPIO05	
30	GND	Raspberry Pi:GND	
31	GPIO06	Raspberry Pi:GPIO06	
32	GPIO12	Raspberry Pi:GPIO12	



33	GPIO13	Raspberry Pi:GPIO13	
34	GND	Raspberry Pi:GND	
35	GPIO19	Raspberry Pi:GPIO19	
36	GPIO16	Raspberry Pi:GPIO16	
37	GPIO26	Raspberry Pi:GPIO26	
38	GPIO20	Raspberry Pi:GPIO20	
39	GND	Raspberry Pi:GND	
40	GPIO21	Raspberry Pi:GPIO21	

Note1: The 3.3V supply current is limited; please pay special attention to use

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**CON5**

Pin No.	Symbol	Function	Remark
1	NC	No connection	
2	5V	Raspberry Pi:Power 5V	
3	GPIO02	Raspberry Pi:GPIO02	
4	5V	Raspberry Pi:Power 5V	
5	GPIO03	Raspberry Pi:GPIO03	
6	GND	Raspberry Pi:GND	
7	GPIO04	Raspberry Pi:GPIO04	
8	GPIO14	Raspberry Pi:GPIO14	
9	GND	Raspberry Pi:GND	
10	GPIO15	Raspberry Pi:GPIO15	
11	GPIO17	Raspberry Pi:GPIO17	
12	GPIO18	Raspberry Pi:GPIO18 (Backlight Enable)	
13	GPIO27	Raspberry Pi:GPIO27	
14	GND	Raspberry Pi:GND	
15	GPIO22	Raspberry Pi:GPIO22	
16	GPIO23	Raspberry Pi:GPIO23	
17	NC	No connection	
18	GPIO24	Raspberry Pi:GPIO24	
19	GPIO10	Raspberry Pi:GPIO10	
20	GND	Raspberry Pi:GND	
21	GPIO09	Raspberry Pi:GPIO09	
22	GPIO25	Raspberry Pi:GPIO25	
23	GPIO11	Raspberry Pi:GPIO11	
24	GPIO08	Raspberry Pi:GPIO08	
25	GND	Raspberry Pi:GND	
26	GPIO07	Raspberry Pi:GPIO07	
27	ID_SD	Raspberry Pi:ID_SD	
28	ID_SC	Raspberry Pi:ID_SC	
29	GPIO05	Raspberry Pi:GPIO05	
30	GND	Raspberry Pi:GND	
31	GPIO06	Raspberry Pi:GPIO06	
32	GPIO12	Raspberry Pi:GPIO12	
33	GPIO13	Raspberry Pi:GPIO13	



34	GND	Raspberry Pi:GND	
35	GPIO19	Raspberry Pi:GPIO19	
36	GPIO16	Raspberry Pi:GPIO16	
37	GPIO26	Raspberry Pi:GPIO26	
38	GPIO20	Raspberry Pi:GPIO20	
39	GND	Raspberry Pi:GND	
40	GPIO21	Raspberry Pi:GPIO21	

## HDMI

Pin No.	Symbol	I/O	Function	Remark
1	Rx2+	I	+LVDS Differential Data Input	
2	GND	P	Ground	
3	Rx2-	I	-LVDS Differential Data Input	
4	Rx1+	I	+LVDS Differential Data Input	
5	GND	P	Ground	
6	Rx1-	I	-LVDS Differential Data Input	
7	Rx0+	I	+LVDS Differential Data Input	
8	GND	P	Ground	
9	Rx0-	I	-LVDS Differential Data Input	
10	RxC+	I	+LVDS Differential Clock Input	
11	GND	P	Ground	
12	RxC-	I	-LVDS Differential Clock Input	
13-14	NC	-	No connection	
15	SCL	I/O	DDC(Data Display Channel) Clock	
16	SDA	I/O	DDC(Data Display Channel) Data	
17	GND	P	Ground	
18	5V	P	Power Supply	
19	Detect	I/O	Hot plug detect	

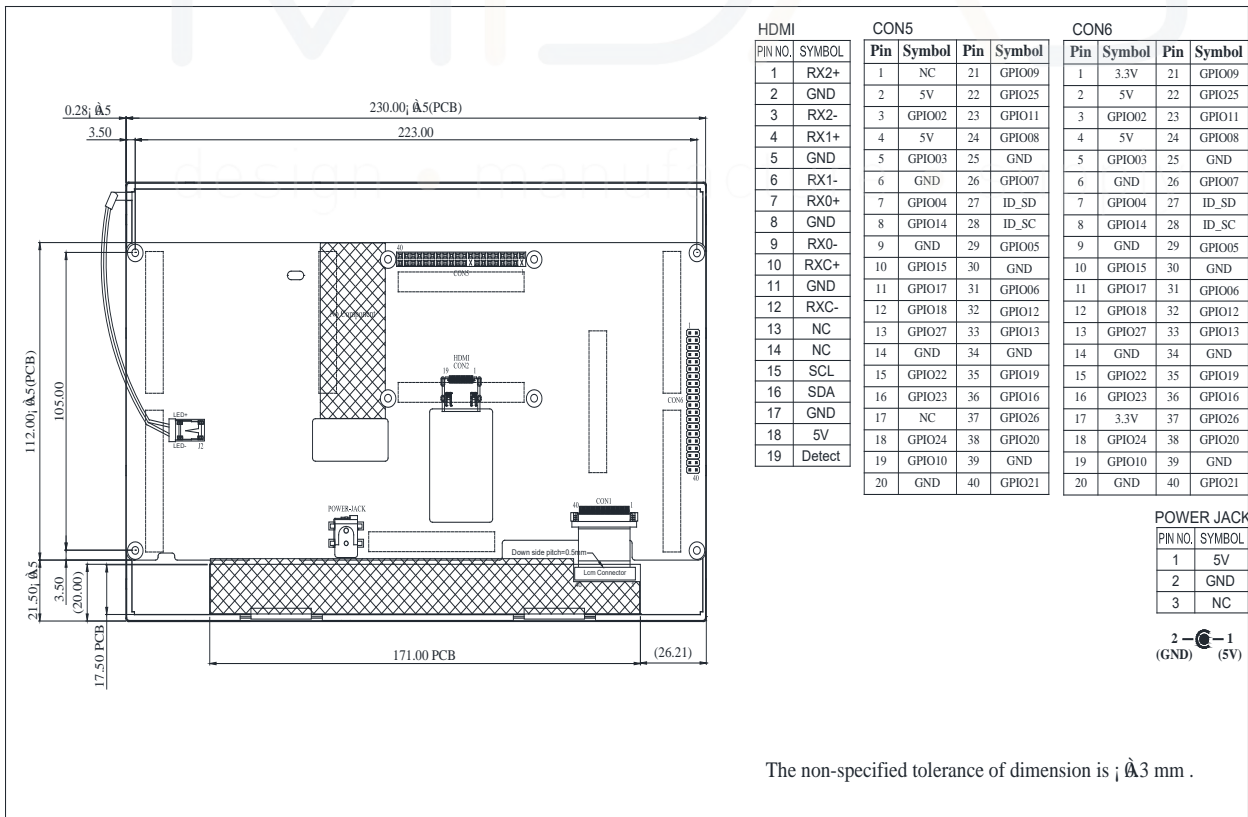
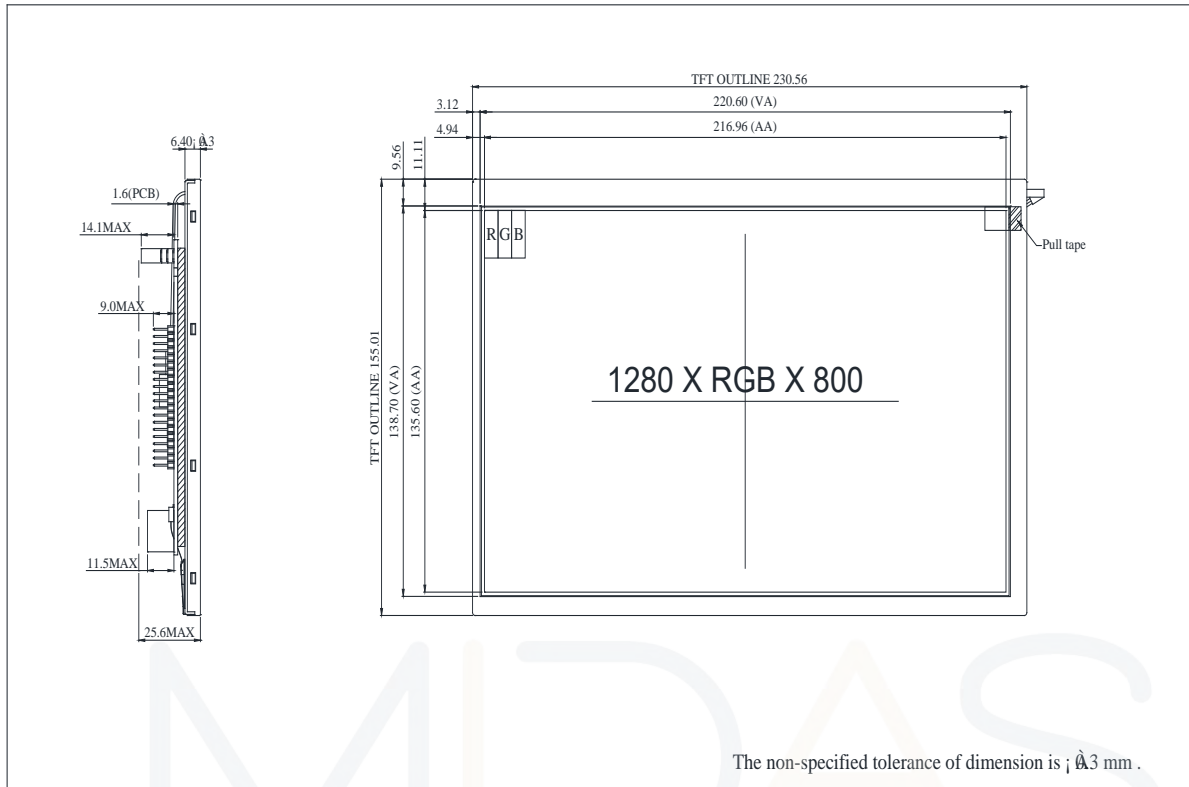
I: input, O: output, P: Power

## POWER-JACK

Pin No.	Symbol	I/O	Function	Remark
1	5V	P	Power Supply (5V)	
2	GND	P	Ground	
3	NC	-	No connection	



# Contour Drawing



## Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	°C
Storage Temperature	TST	-20	—	+70	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp.  $\leq 60^{\circ}\text{C}$ , 90% RH MAX. Temp.  $> 60^{\circ}\text{C}$ , Absolute humidity shall be less than 90% RH at  $60^{\circ}\text{C}$

## Electrical Characteristics

### 1. Operating conditions:

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
Supply Voltage For LCM	VDD	—	4.9	5	5.1	V	—
Supply Current For LCM	IDD	—	—	1.9	2.7	A	Note 1
LED life time	—	—	50000	—	—	Hr	Note 3

Note 1 : This value is test for VDD =5.0V , Ta=25°C only

Note 2 : Display with Raspberry pi the driver power is over USB , first make sure you have a 3A power supply, with a good quality USB cable, a thin wire power cable is no good. Make sure its 24AWG or smaller, shorter USB cables are better too.

Note 3: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IL =480mA. The LED lifetime could be decreased if operating IL is lager than 480mA.

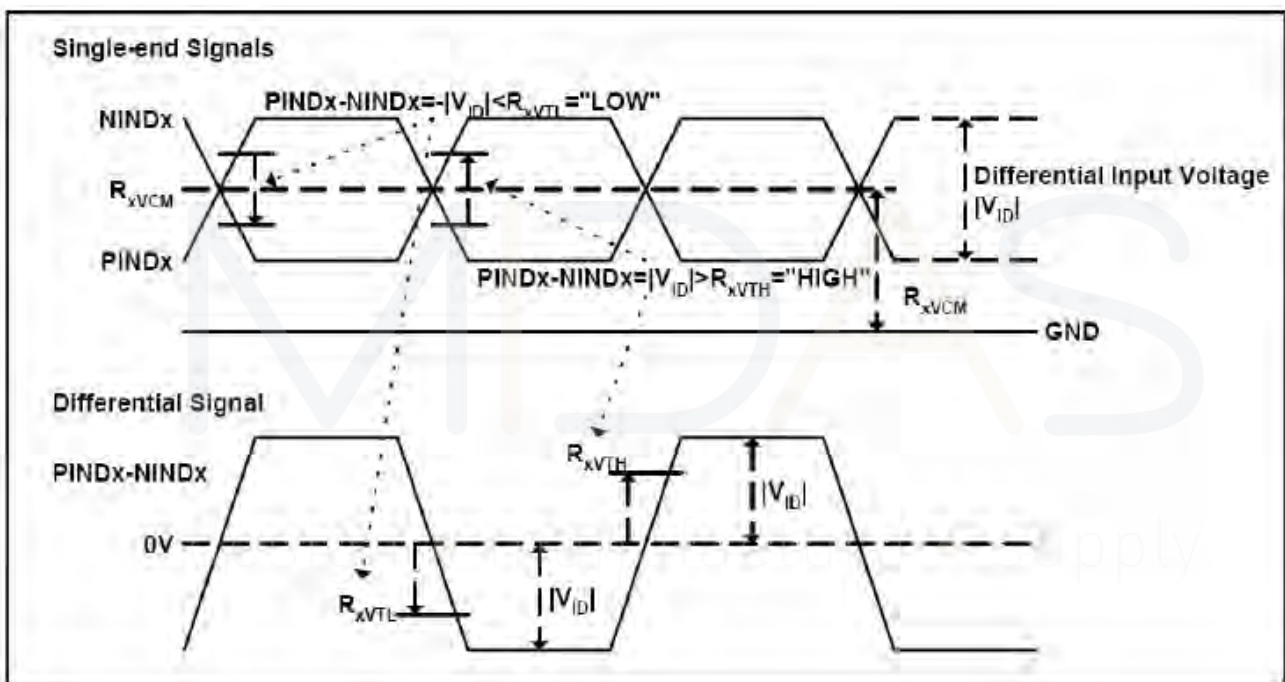




# LVDS Signal Timing Characteristics

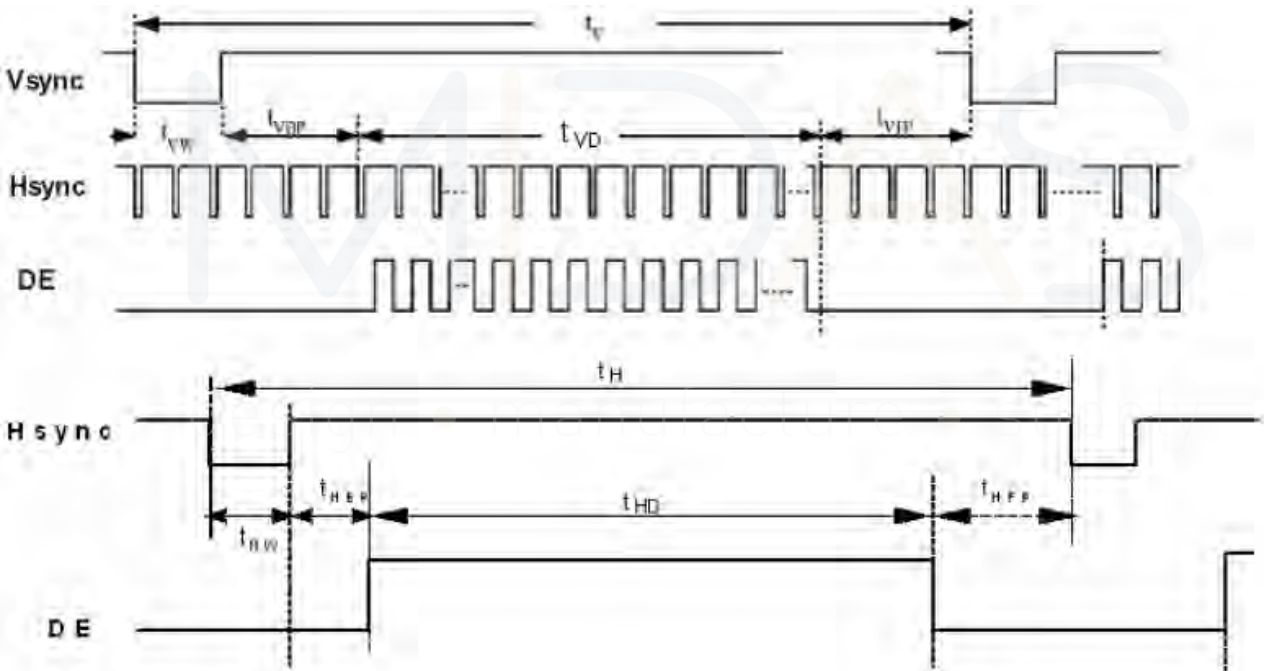
## AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	MAX.		
LVDS Differential input high Threshold voltage	RxVTH	-	-	+100	mV	RXVCM=1.2 V
LVDS Differential input low Threshold voltage	RxVTL	-100	-	-	mV	
LVDS Differential input common mode voltage	RxVCM	0.7	-	1.6	V	
LVDS Differential voltage	VID	200	-	600	mV	

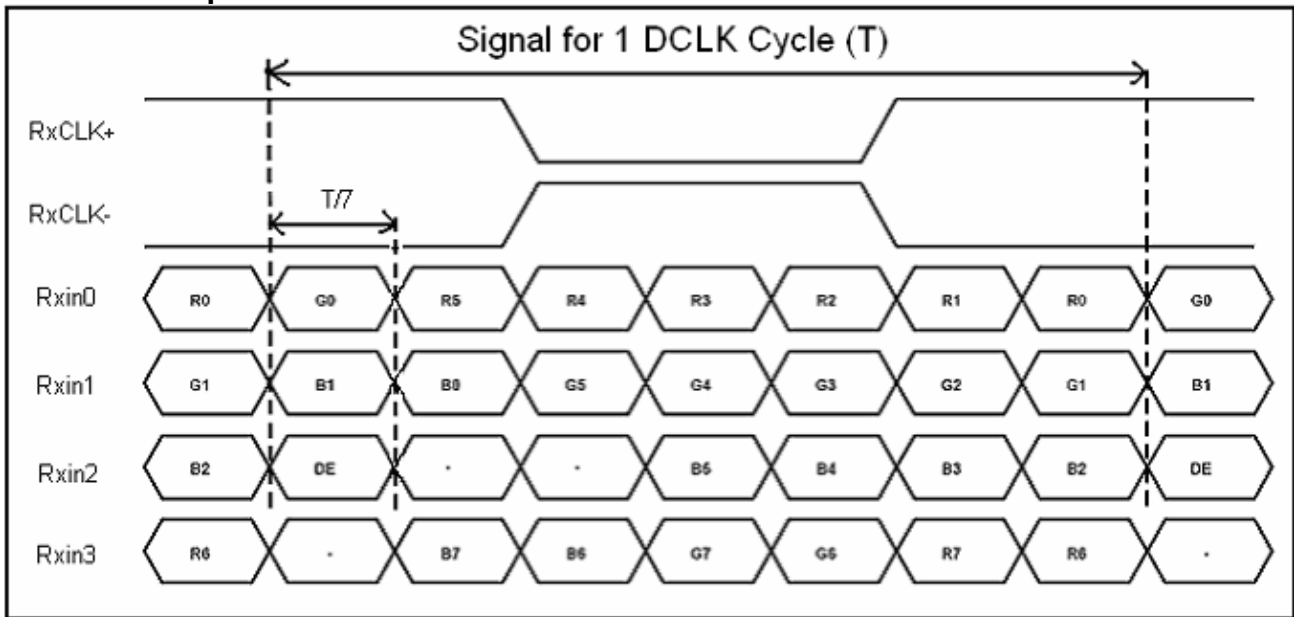


### Timing Table

Parameter	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	1/Tc	68.9	71.1	73.4	Mhz	Frame rate =60Hz
Horizontal display area	thd	1280			Tc	
HS period time	th	1410	1440	1470	Tc	
HS Width +Back Porch +Front Porch	t <sub>HW</sub> + t <sub>HBP</sub> +t <sub>HFP</sub>	60	160	190	Tc	
Vertical display area	tvd	800			tH	
VS period time	tv	815	823	833	tH	
VS Width +Back Porch +Front Porch	t <sub>VW</sub> + t <sub>VBP</sub> +t <sub>VFP</sub>	15	23	33	tH	



## LVDS Data Input Format



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## Optical Characteristics

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark	
Response time	Tr	$\theta=0^\circ$ 、 $\Phi=0^\circ$	-	10	20	.ms	Note 3	
	Tf		-	15	30			
Contrast ratio	CR	At optimized viewing angle	600	800	-	-	Note 4	
Color Chromaticity	White	$\theta=0^\circ$ 、 $\Phi=0$	Wx	0.26	0.31	0.36	-	Note 2,5
			Wy	0.28	0.33	0.38	-	
Viewing angle	Hor.	$CR \geq 10$	$\Theta_R$	75	85	-	Deg.	Note 1
			$\Theta_L$	75	85	-		
	Ver.		$\Phi_T$	75	85	-		
			$\Phi_B$	75	85	-		
Brightness	-	-	1000	1100	-	cd/m <sup>2</sup>	Center of display	
Uniformity	(U)	-	70	-	-	%	Note5	

Ta=25±2°C

Note 1: Definition of viewing angle range

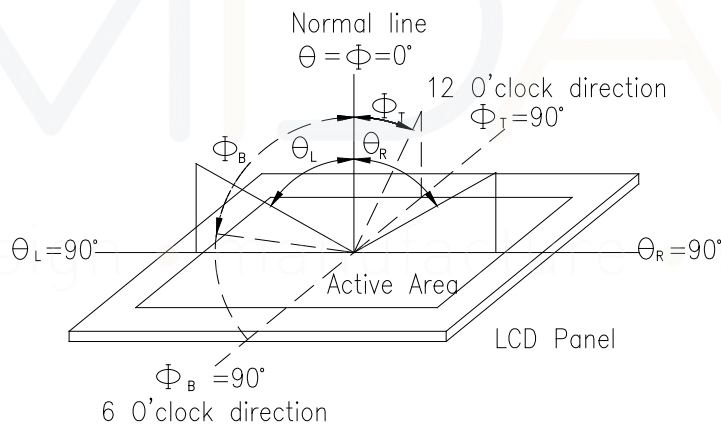


Fig. 9.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

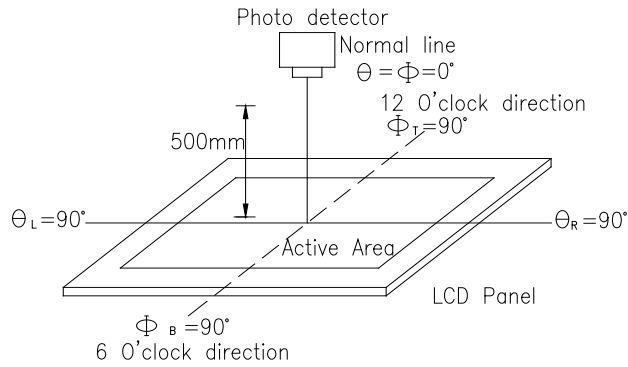
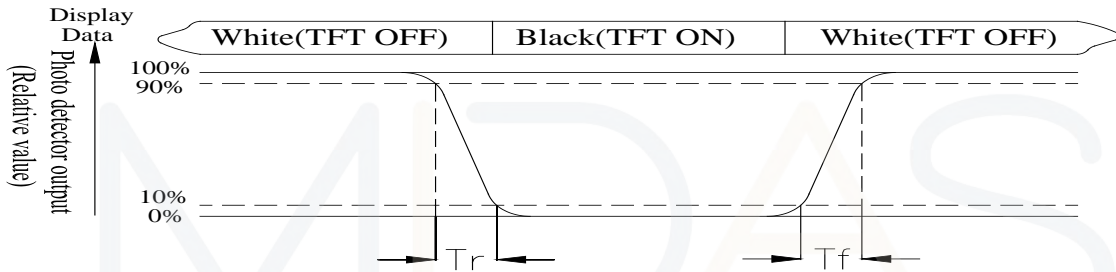


Fig. 9.2. Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time,  $T_r$ , is the time between photo detector output intensity changed from 90% to 10%. And fall time,  $T_f$ , is the time between photo detector output intensity changed from 10% to 90%



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$



Note 5: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (reference the picture in below). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) =  $L_{min}/L_{max} \times 100\%$

L = Active area length

W = Active area width

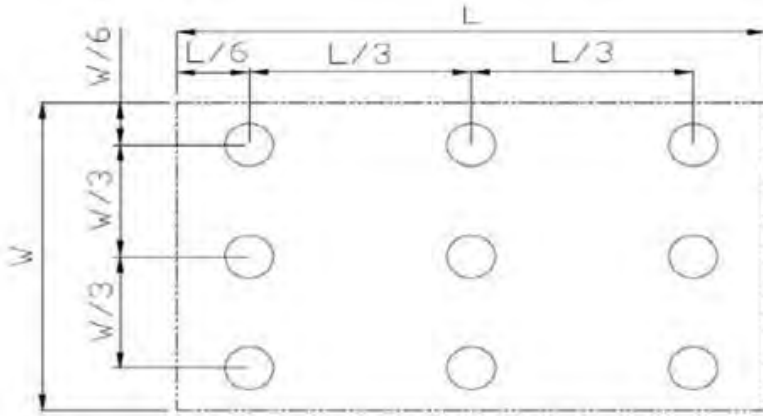


Fig 9.3. Definition of uniformity

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

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# Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	70°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-20°C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60°C,90%RH max	60°C,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation <div style="text-align: center;"> <p style="margin: 0;">-20°C    25°C    70°C</p> <p style="margin: 0;">30min    5min    30min</p> <p style="margin: 0;">1 cycle</p> </div>	-20°C/70°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact) , ±800v(air), RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

