


MDT0430GIHR-HDMI	480 x 272	HDMI Interface	TFT Module
Specification			
Version: 2		Date: 03/04/2021	
Revision			
1	03/02/2021	First issue	
2	01/04/2021	Modify GPIO18=>GPIO18(PWM_BL)	

Display Features		
Display Size	4.3"	
Resolution	480 x 272	
Orientation	Landscape	
Appearance	RGB	
Logic Voltage	5V	
Interface	HDMI	
Brightness	700 cd/m ²	
Touchscreen	RTP	
Module Size	105.50 x 84.20 x 23.23mm	
Operating Temperature	-20°C ~ +70°C	
Pinout	40 way connector	
Pitch	---	Weight / Display

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

Display Accessories	
Part Number	Description
MCIB-HDMI/HDMI	Male To Male HDMI Connector

Optional Variants	
Appearances	Voltage



Summary

TFT 4.3" is a IPS transmissive type color active matrix TFT liquid crystal display that use amorphous silicon TFT as switching devices. This module is a composed of a TFT_LCD module, It is usually designed for industrial application and this module follows RoHs,

General Specifications

- Size: 4.3 inch
- Dot Matrix: 480 x RGBx272(TFT) dots
- Module dimension: 105.5(W) x 84.2(H) x 23.23(D) mm
- Active area: 95.04 x 53.856 mm
- Pixel pitch: 0.198 x 0.198 mm
- LCD type: TFT, Normally Black, Transmissive
- Viewing Angle: 80/80/80/80
- Aspect Ratio: 16:9
- Controller IC: TFP401
- Interface: HDMI(only for DVI)
- Backlight Type: LED, Normally White
- RTP Interface: USB
- With /Without TP: With RTP
- Surface: Anti-Glare

*Color tone slight changed by temperature and driving voltage.



Interface

1. LCM PIN Definition(CON4)

Pin	Symbol	Function	Remark
1	NC	No connector	
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 connector	
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	

2. LCM PIN Definition(CON5)

Pin	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	
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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3. HDMI (only for DVI)

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	
13-16	NC	-	No connection	
17	GND	P	Ground	
18	5V	P	Power Supply	
19	Detect	I/O	Hot plug detect	

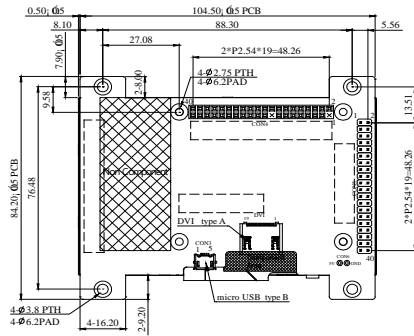
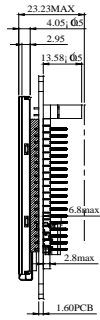
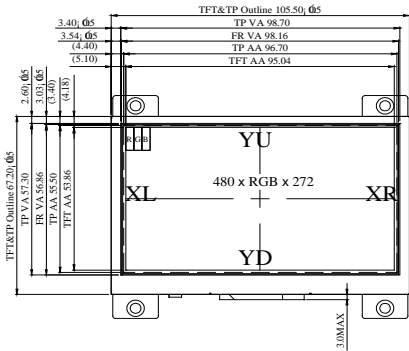
I: input, O: output, P: Power

4. RTP USB PIN Definition (CON3)

Pin	Symbol	Function	Remark
1	5V	Power Supply (5V)	
2	D-	Data line -	
3	D+	Data line +	
4	NC	No connection	
5	GND	Power Ground	



Contour Drawing



DVI

Pin	Symbol
1	RX2+
2	GND
3	RX2-
4	RX1+
5	GND
6	RX1-
7	RX0+
8	GND
9	RX0-
10	RXC+
11	GND
12	RXC-
13	NC
14	NC
15	NC
16	NC
17	GND
18	5V
19	Detect

CON4

Pin	Symbol	Pin	Symbol
1	NC	21	GPI009
2	5V	22	GPI025
3	GPI002	23	GPI011
4	5V	24	GPI008
5	GPI003	25	GND
6	GND	26	GPI007
7	GPI004	27	ID_SD
8	GPI014	28	ID_SC
9	GND	29	GPI005
10	GPI015	30	GND
11	GPI017	31	GPI006
12	GPI018	32	GPI012
13	GPI027	33	GPI013
14	GND	34	GND
15	GPI022	35	GPI019
16	GPI023	36	GPI016
17	NC	37	GPI026
18	GPI024	38	GPI020
19	GPI010	39	GND
20	GND	40	GPI021

CON5

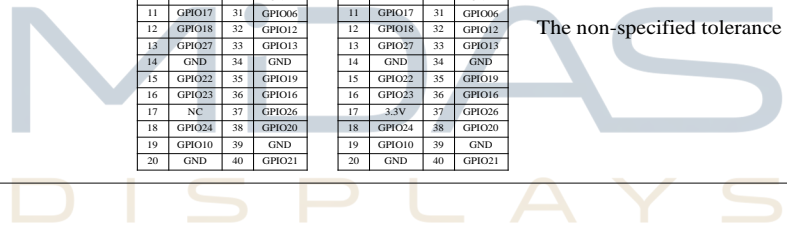
Pin	Symbol	Pin	Symbol
1	3.3V	21	GPI009
2	5V	22	GPI025
3	GPI002	23	GPI011
4	5V	24	GPI008
5	GPI003	25	GND
6	GND	26	GPI007
7	GPI004	27	ID_SD
8	GPI014	28	ID_SC
9	GND	29	GPI005
10	GPI015	30	GND
11	GPI017	31	GPI006
12	GPI018	32	GPI012
13	GPI027	33	GPI013
14	GND	34	GND
15	GPI022	35	GPI019
16	GPI023	36	GPI016
17	3.3V	37	GPI026
18	GPI024	38	GPI020
19	GPI010	39	GND
20	GND	40	GPI021

CON3

PIN NO.	SYMBOL
1	5V
2	D-
3	D+
4	NC
5	GND

Note.
380nm transmittance(UV Cut at 380nm)<1.0%

The non-specified tolerance of dimension is ; ± 0.3 mm .



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Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	°C
Storage Temperature	TST	-30	—	+80	°C

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

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

Electrical Characteristics

1. Operating conditions:

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
Supply Voltage For LCM	VDD	—	—	5.0	—	V	—
Supply Current For LCM	IDD	—	—	1,000	1500	mA	Note 1
LED life time	—	—	—	50,000	—	Hr	Note 4

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

Note 2 : Please make sure to support enough current.

Note3 : RTP driver is base on the mouse driver program and through USB port connect to PC or embedded board. Can only support the single touch.

Note 4: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IL =40mA. The LED lifetime could be decreased if operating IL is lager than 40mA



Optical Characteristics

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark	
Response time	Tr+ Tf	$\theta=0^\circ, \Phi=0^\circ$	-	30	40	ms	Note 3	
Contrast ratio	CR	At optimized viewing angle	640	800	-	-	Note 4	
Color Chromaticity	White	Wx	$\theta=0^\circ, \Phi=0^\circ$	0.27	0.32	0.37	-	Note 2,6,7
		Wy		0.295	0.345	0.395	-	
Viewing angle	Hor.	Θ_R	$CR \geq 10$	70	80	-	Deg.	Note 1
		Θ_L		70	80	-		
	Ver.	Φ_T		70	80	-		
		Φ_B		70	80	-		
Brightness	-	-	550	700	-	cd/m ²	Center of display	
Uniformity	(U)	-	75	-	-	%	Note 5	

Ta=25±2°C, IL=40mA

Note 1: Definition of viewing angle

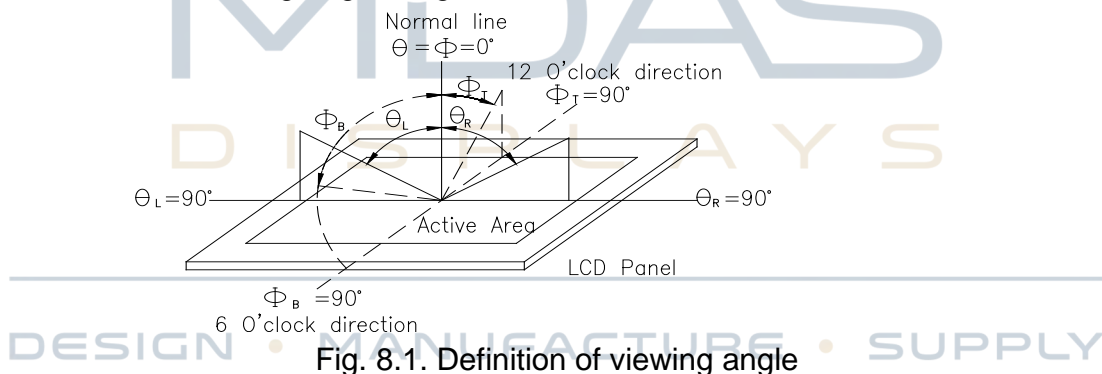


Fig. 8.1. Definition of viewing angle

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-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

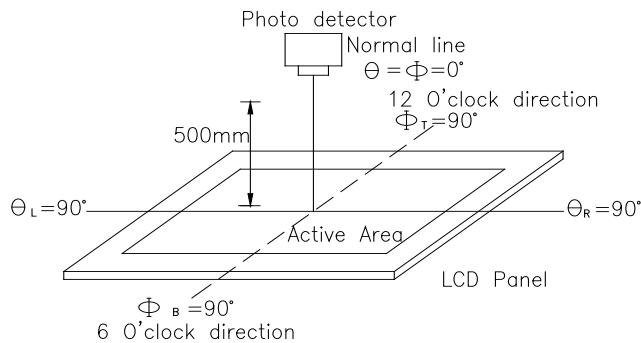
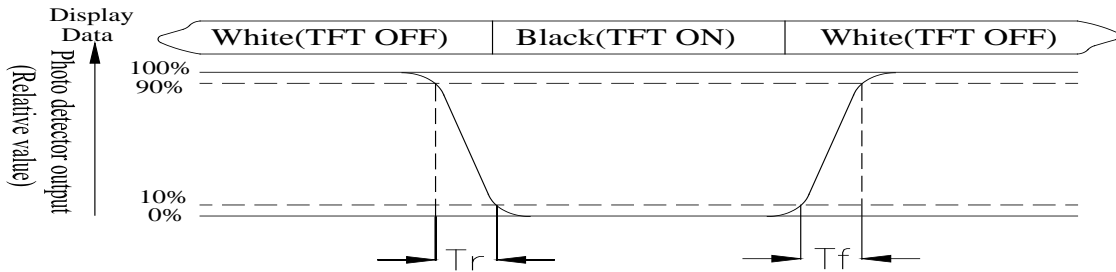


Fig. 8.2. Optical measurement system setup



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.

$$\text{Luminance Uniformity (U)} = \text{Lmin/Lmax} \times 100\%$$

L = Active area length

W = Active area width

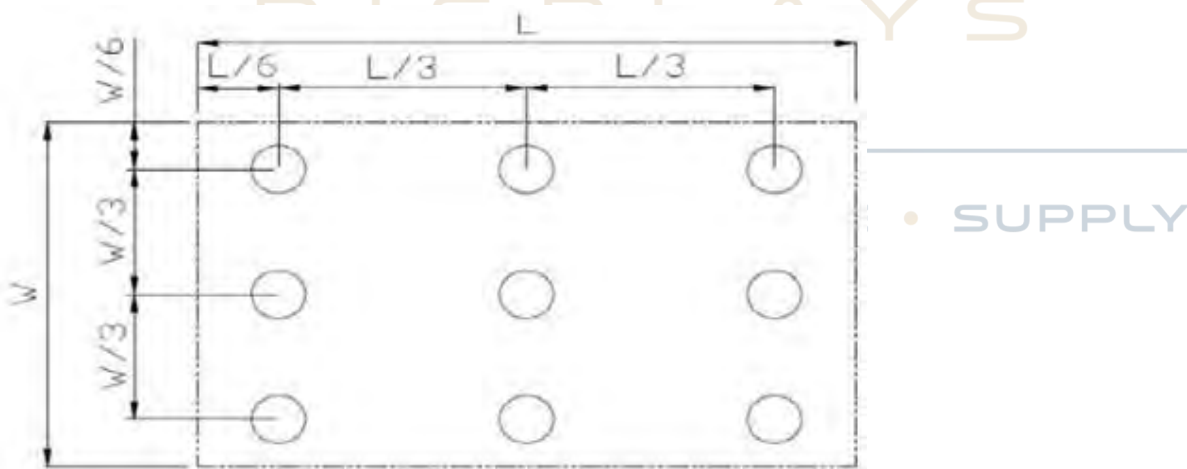


Fig 8.3. Definition of uniformity

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.



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.	80°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°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.

