

MDT0430A3OS-RGB	480 x 272	RGB Interface	TFT Module
(MCT043C0W480272LML)			
Specification			
Version: 4		Date: 11/07/2017	
Revision			
1	17/11/2016	First issue	
2	22/02/2017	Modify CTP Interface	
3	11/05/2017	Modify Operation	
4	10/07/2017	Sequence.	
		Updated Accessories.	

Display Features			
Display Size	4.3"		
Resolution	480 x 272		
Orientation	Landscape		
Appearance	RGB		
Logic Voltage	3.3V		
Interface	RGB		
Brightness	400 cd/m ²		
Touchscreen	---		
Module Size	105.50 x 67.20 x 2.95mm		
Operating Temperature	-20°C ~ +70°C		
Pinout	40 way FFC		
Pitch	0.5mm		
		Box Quantity	Weight / Display
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DESIGN • MANUFACTURE • SUPPLY

Display Accessories	
Part Number	Description
MDIB-11	The MDIB-11 is an HDMI to RGB converter. Ideal for connecting a range of Midas TFT displays to a Single Board Computer such as the Raspberry Pi.

Optional Variants	
Appearances	Voltage



Summary

TFT 4.3" is a TN transmissive type color active matrix TFT liquid crystal display that use amorphous silicon TFT as switching devices. This module is 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 67.2(H) x 2.95(D) mm
- Active area: 95.04 x 53.856 mm
- Dot pitch: 0.066 x 0.198 mm
- LCD type: TFT, Normally White, Transmissive
- View Direction: 12 o'clock
- Gray Scale Inversion Direction: 6 o'clock
- Aspect Ratio: 16:9
- Backlight Type: LED, Normally White
- With /Without TP: Without TP
- Surface: Glare

*Color tone slight changed by temperature and driving voltage.

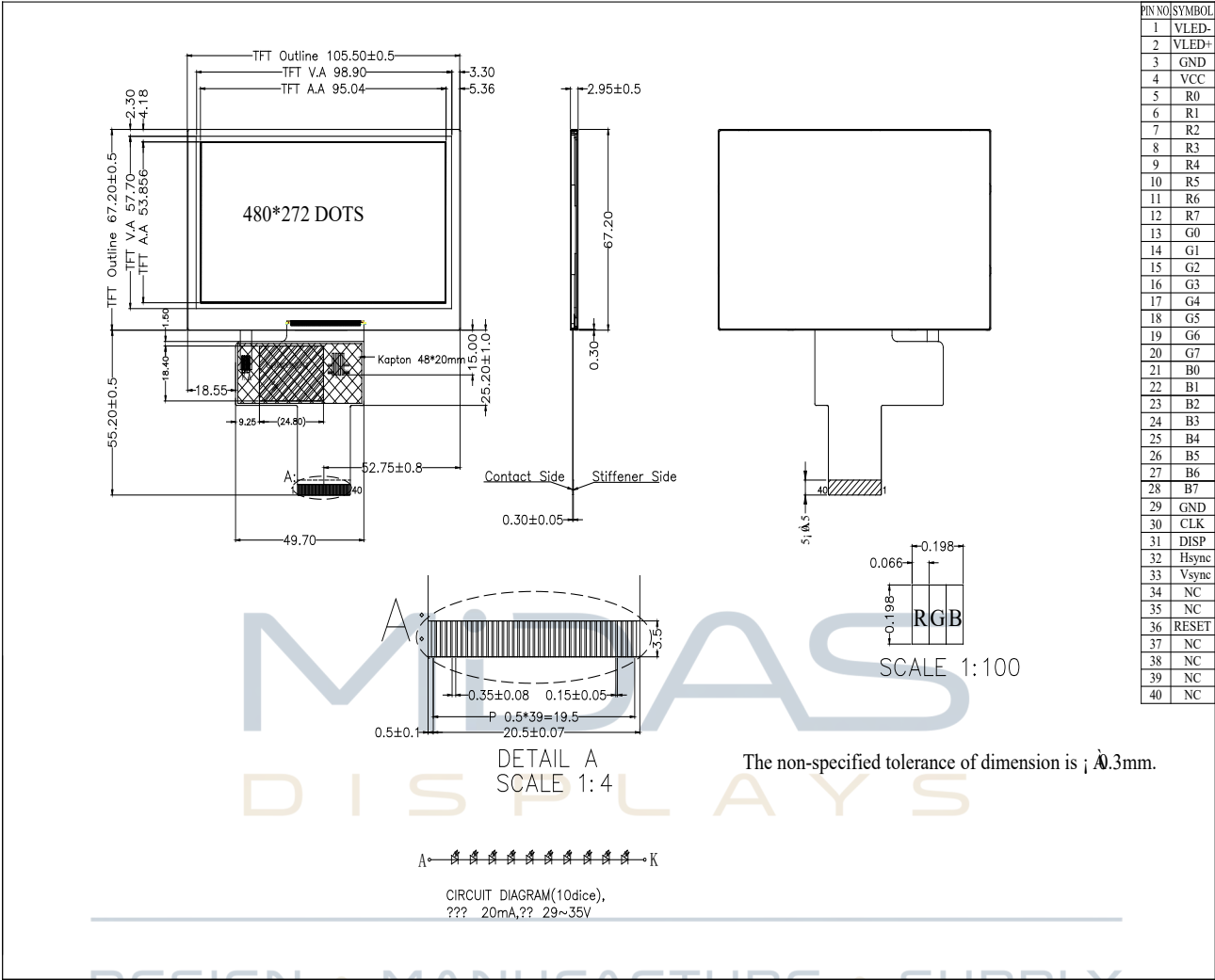


Interface

LCM PIN Definition

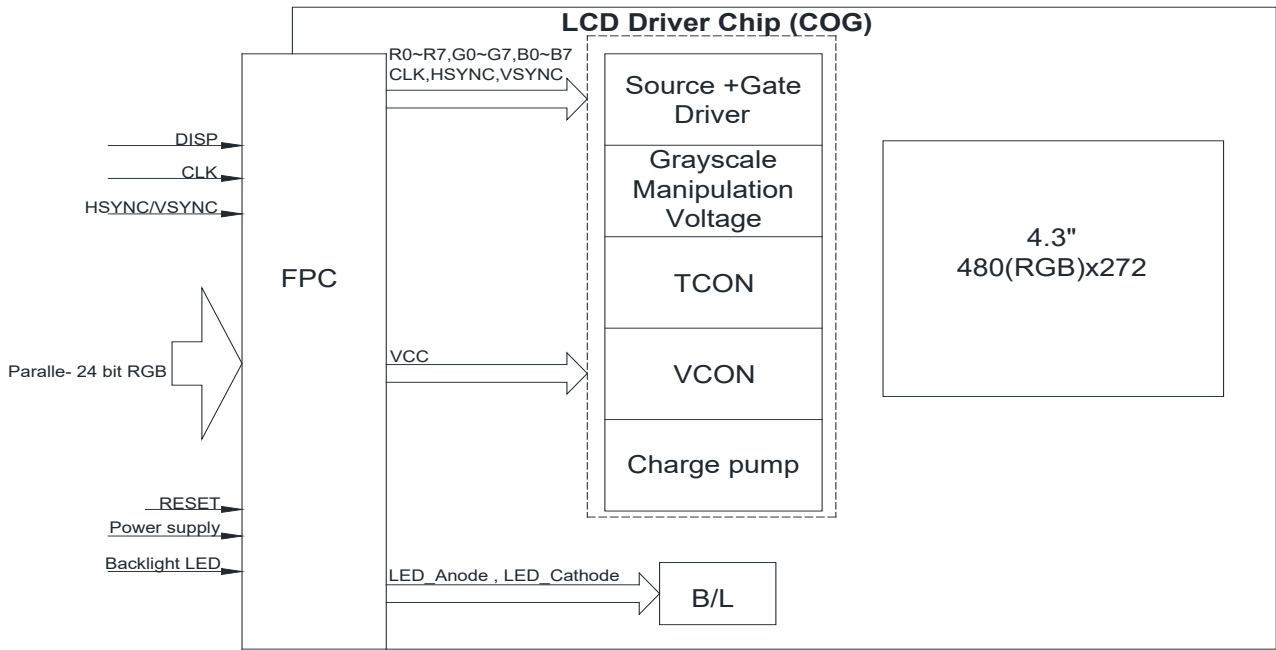
Pin	Symbol	Function	Remark
1	VLED-	Power for LED backlight cathode	
1	VLED+	Power for LED backlight anode	
3	GND	Power ground	
4	VCC	Power voltage	
5	R0	Red data (LSB)	
6	R1	Red data	
7	R2	Red data	
8	R3	Red data	
9	R4	Red data	
10	R5	Red data	
11	R6	Red data	
12	R7	Red data (MSB)	
13	G0	Green data (LSB)	
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	CLK	Pixel clock	
31	DISP	Display on/off	
32	Hsync	Horizontal sync signal	
33	Vsync	Vertical sync signal	
34	NC	No connection	
35	NC	No connection	
36	RESET	Hardware reset	
37	NC	No connection	
38	NC	No connection	
39	NC	No connection	
40	NC	No connection	

Contour Drawing



Block Diagram

LCD Panel



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

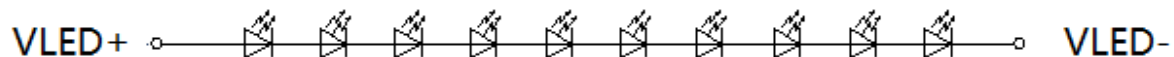
Operating conditions:

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	VCC	—	3.0	3.3	3.5	V
Digital operation current	Icc	-		17	25	mA

LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current		-	20	-	mA	
Power Consumption			640	680	mW	
LED voltage	VBL+	30	32	34	V	Note 1
LED Life Time		-	50,000	-	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



Note 2 : $T_a = 25^{\circ}\text{C}$

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

DC CHARATERISTICS

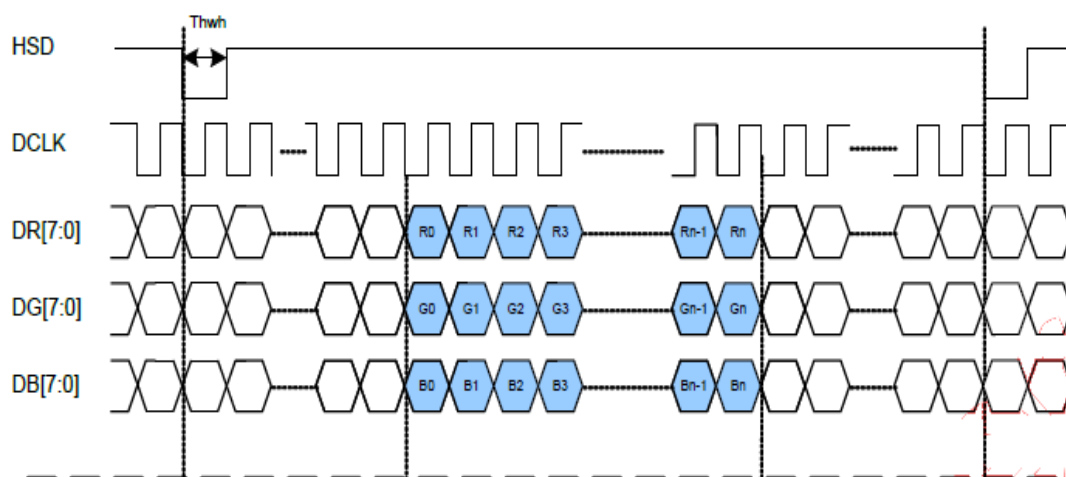
Parameter	Symbol	Rating			Unit	Condition
		Min	Typ	Max		
Low level input voltage	V_{IL}	0	-	$0.3V_{CC}$	V	
High level input voltage	V_{IH}	$0.7V_{CC}$	-	VCC	V	

AC CHARATERISTICS

Parallel SYNC mode RGB input timing table

Signal	Symbol	Min	Typ	Max	Unit
DCLK frequency	fclk	5	9	12	MHz
VSD period time	Tv	277	288	400	H
VSD display area	Tvd	272			H
VSD back porch	Tvb	3	8	31	H
VSD front porch	Tvfp	2	8	97	H
HSD display area	Thd	480			CLK
HSD period time	Thb	520	525	800	CLK
HSD back porch	Thbp	36	40	255	CLK
HSD front porch	Thfp	4	5	65	CLK
CLK cycle time	Tclk	83	110	200	ns
Clock width of high level	Tcwh	40	-	60	%
Clock width of low level	Tcwl	40	-	60	%
Clock rising time	trck	9	-	-	ns
Clock falling time	tfck	9	-	-	ns
Data Setup Time	tdesu	12	-	-	ns
Data Hold Time	tdahd	12	-	-	ns

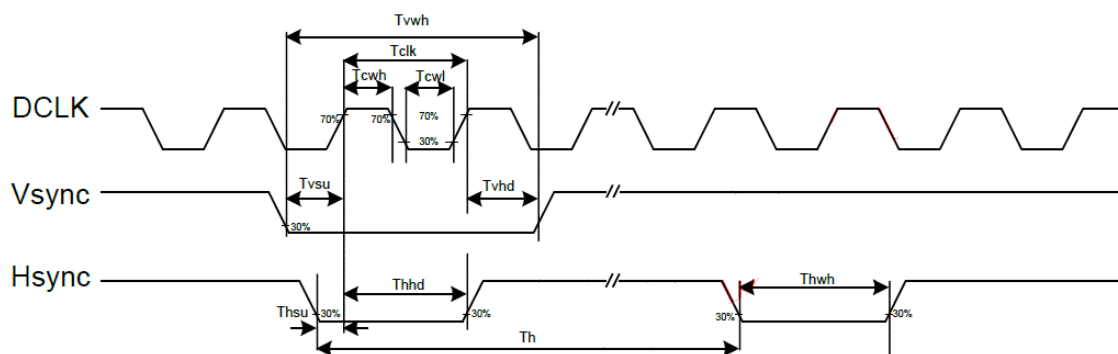
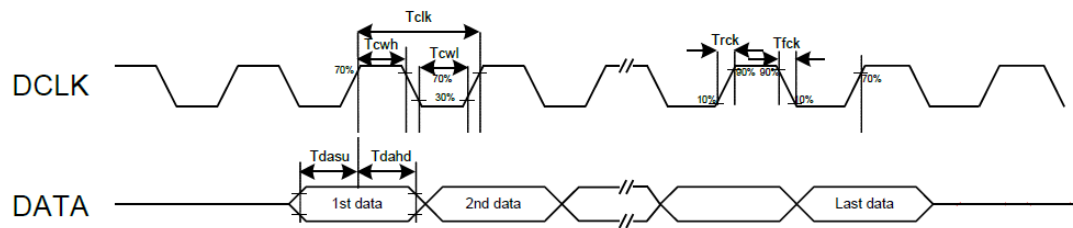
(HV Mode)



Waveform

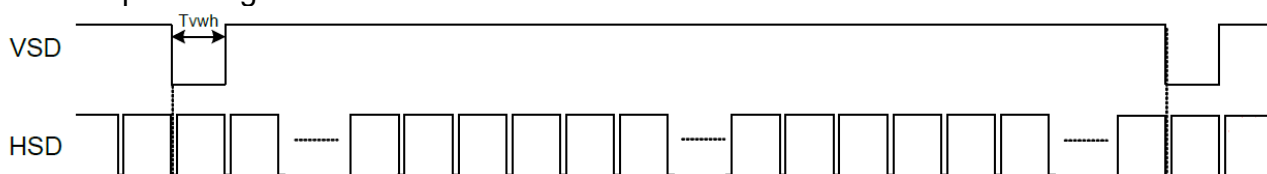
Timing Chart

Clock and Data Input Waveforms



Data Input Format

Vertical input timing



Optical Characteristics

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time	Tr	$\theta=0^\circ$ 、 $\Phi=0^\circ$	-	4	7	ms	Note 3
	Tf		-	11	17	ms	
Contrast ratio	CR	At optimized viewing angle	300	500	-	-	Note 4
Color Chromaticity	White	$\theta=0^\circ$ 、 $\Phi=0^\circ$	0.26	0.31	0.36	-	Note 2,5
			0.28	0.33	0.38	-	
Viewing angle (Gray Scale Inversion Direction)	Hor.	Θ_R	-	75	-	Deg.	Note 1
		Θ_L	-	75	-		
	Ver.	Φ_T	-	75	-		
		Φ_B	-	75	-		
			-	75	-		
Brightness	-	-	300	400	-	cd/m ²	Center of display

Ta=25±2℃, IL=20mA

Note 1: Definition of viewing angle range

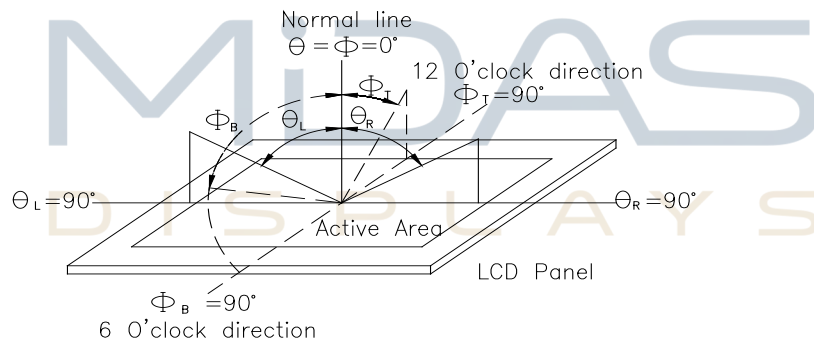


Fig. 11.1. Definition of viewing angle

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

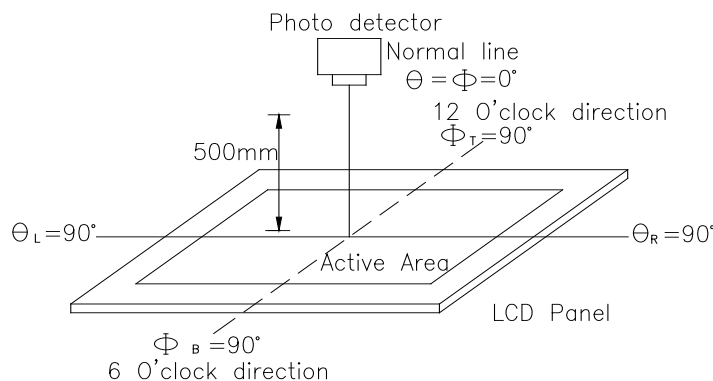
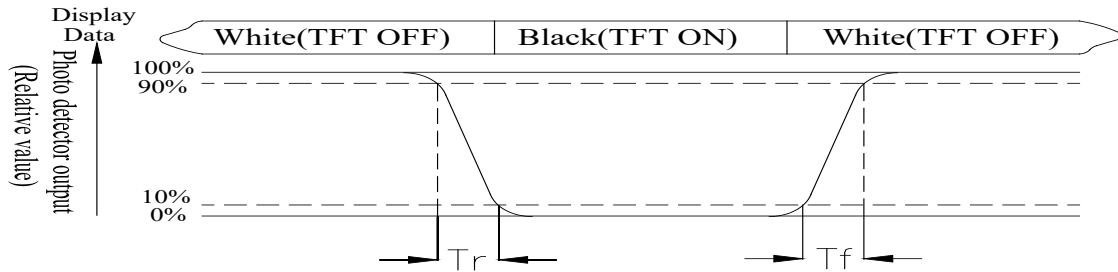


Fig. 11.2. Optical measurement system setup

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: White $V_i = V_{i50} \pm 1.5V$

Black $V_i = V_{i50} \pm 2.0V$

" $\pm$ " means that the analog input signal swings in phase with VCOM signal.

" $\pm$ " means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

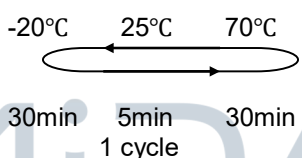
Note 6: Definition of color chromaticity (CIE 1931)

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 	-20°C/70°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 3 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.