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MCT070HDMI-A-CTP	800 x 480	HDMI Interface	TFT Module

Specification

Version: 2	Date: 31/10/2016

Revision

1	10/05/2018	First issue
2	11/06/2018	Modify Electrical Characteristics

Display Features	
Display Size	7.0”
Resolution	800 x 480
VGA Size	WVGA
Orientation	Landscape
Appearance	RGB
Logic Voltage	5V
Interface	HDMI
Brightness	350 cd/m^2
Touchscreen	CTP
Module Size	165.00 x 100.00 x 26.08
Operating Temperature	-20°C ~ +70°C
Pinout	50 - Way

RoHS compliant

Box Quantity	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	HDMI-to-HDMI interconnect board.
MCIC-USB	Type-A USB to Micro-B USB interconnect cable.

Optional Variants

Appearances	Voltage
Capacitive Touch Panel No Touch Panel	

Summary

TFT 7.0”is a TN 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.

Troubleshooting

Introduction

Our range of Midas HDMI displays with direct connectivity to Raspberry Pi are compatible with all models up to Raspberry Pi 3 Model B. However, for the latest version of Raspberry Pi 3 Model B+ there is a minor compatibility issue. Fortunately we have an easy fix for this, and here we will show you everything you need to know.

The Issue

All the boards on our Midas HDMI displays have a 5V to 3.3V regulator for supplying various components on the board when only 5V is supplied. Raspberry Pi boards also have a similar regulator, but unfortunately there seems to be a conflict between the two regulators when both display and Raspberry Pi are connected.

The Solution

To solve this issue, you simply remove the 3.3V regulator by de-soldering it from our board. On the 5” displays (MCT050HDMI) this component is labelled “U5”. For the 7” (MCT070HDMI) and 10.1” (MCT101HDMI) displays the component is labelled “U6”. After removing this component, the display will work with all Raspberry Pi versions including models B and B+.

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In order to remove this component, first apply a reasonable amount of solder between the three parallel pins until they are all connected together. The top individual pin is already connected to the bottom middle pin, so simply apply heat with the soldering iron on the three connected pins until the solder melts, and then quickly remove the component with a tweezer. Finally remove any excess solder and ensure there is no bridging/connection over the solder pads on the board.

F.A.Q.

Q. Is this solution reversible? Can I put the component back after removing it?

A. Yes, this solution is not permanent. If the component has not been damaged by mishandling and was correctly removed, it can then be placed back using a normal soldering procedure.

Q. Will this solution damage the board/display?

A. This depends on how the procedure is handled. Please ensure that the person applying this method has some experience in soldering components and the correct health & safety procedures are applied. If care is taken, then this should not cause any damage to the board or display.

General Specifications

- Size: 7.0 inch
- Dot Matrix: 800 x RGBx480(TFT) dots
- Module dimension: 165.0(W) x 100(H) x 26.08(D) mm
- Active area: 154.08 x 85.92 mm
- Dot pitch: 0.0642 x 0.179 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
- Interface: HDMI
- CTP FW Version: 03
- With /Without TP: With CTP
- Surface: Glare

*Color tone slight changed by temperature and driving voltage.

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Interface

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

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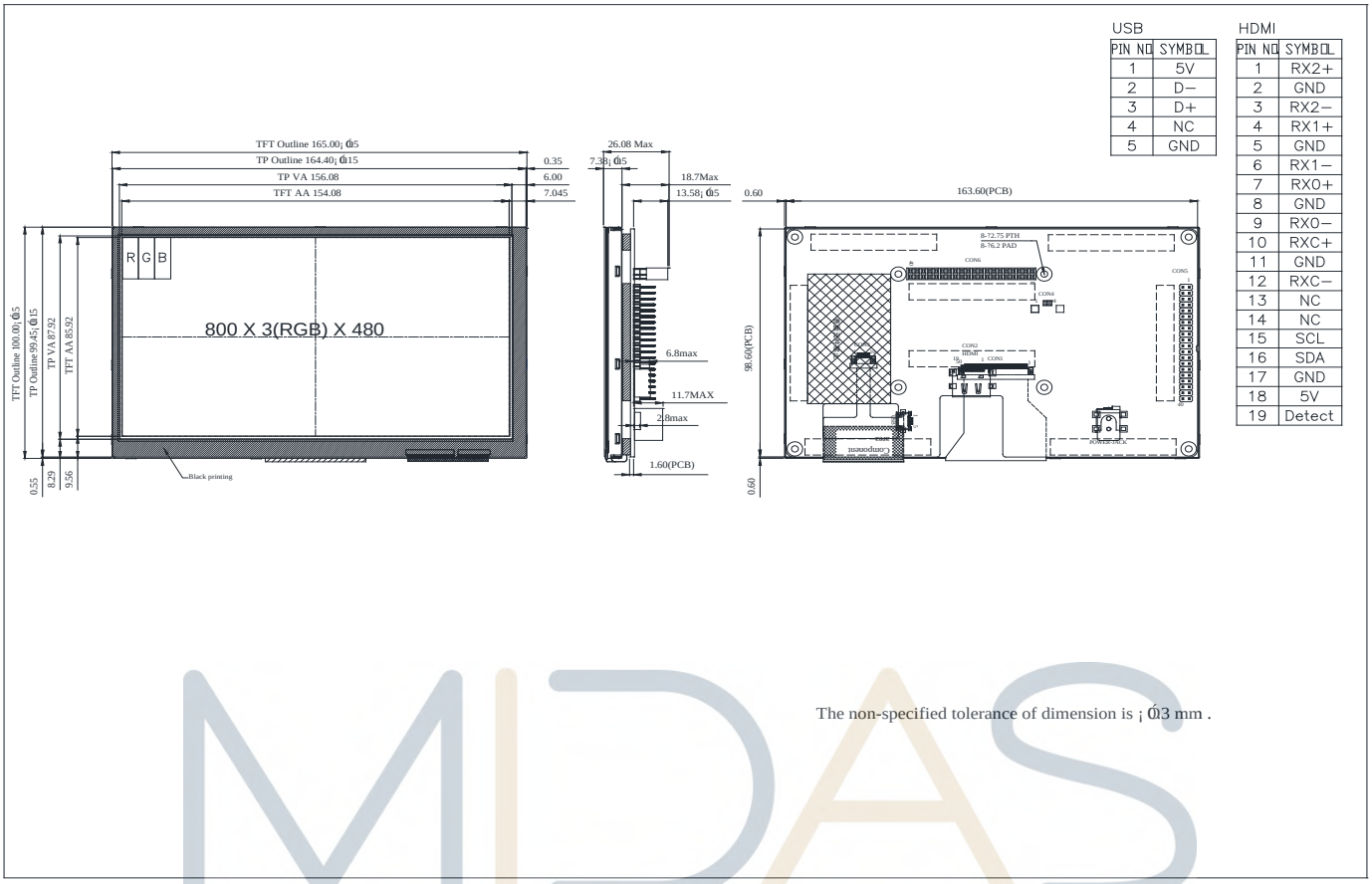
USB

Pin No.	Symbol	I/O	Function	Remark
1	5V	P	Power Supply	
2	D-	I/O	USB Data -	
3	D+	I/O	USB Data +	
4	NC	-	No connection	
5	GND	P	Ground	

POWER JACK

Pin No.	Symbol	I/O	Function	Remark
1	VLED+	P	Power Supply	
2	VLED-	P	Ground	
3	NC		No connection	

Contour Drawing



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Absolute Maximum Ratings

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

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

1. Temp. ≦60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃

Electrical Characteristics

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	—	—	640	940	mA	Note1

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

Note 2 : Display with Raspberry pi the driver power is over USB , first make sure you have a 2A 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.

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

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Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr	θ=0°、Φ=0°	-	10	20	.ms	Note 3
		Tf		-	15	30	.ms	
Contrast ratio		CR	At optimized viewing angle	400	500	-	-	Note 4
Color Chromaticity	White	Wx	θ=0°、Φ=0	0.26	0.30	0.32	-	Note 2,5,6
		Wy		0.27	0.28	0.33	-	
Viewing angle (Gray Scale Inversion Direction)	Hor.	ΘR	CR≧10	60	70	-	Deg.	Note 1
		ΘL		60	70	-		
	Ver.	ΦT		40	50	-		
		ΦB		60	70	-		
Brightness		-	-	250	350	-	cd/m^2	Center of display

Ta=25±2℃, IL=180mA

Note 1: Definition of viewing angle range

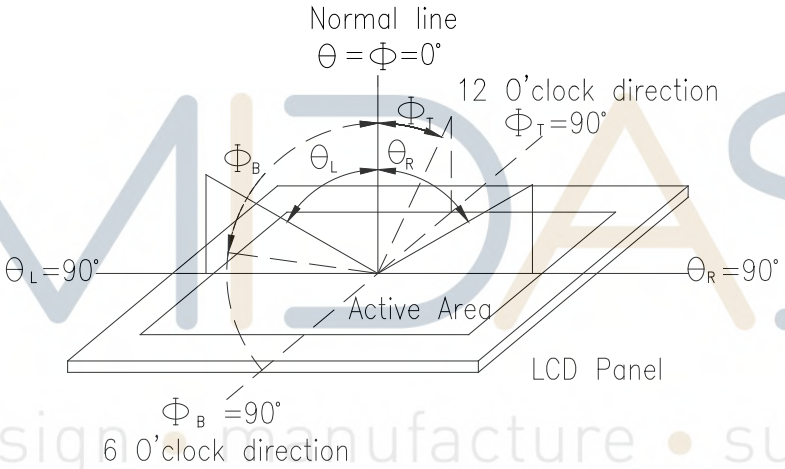


Fig. 8.1. Definition of viewing angle

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.

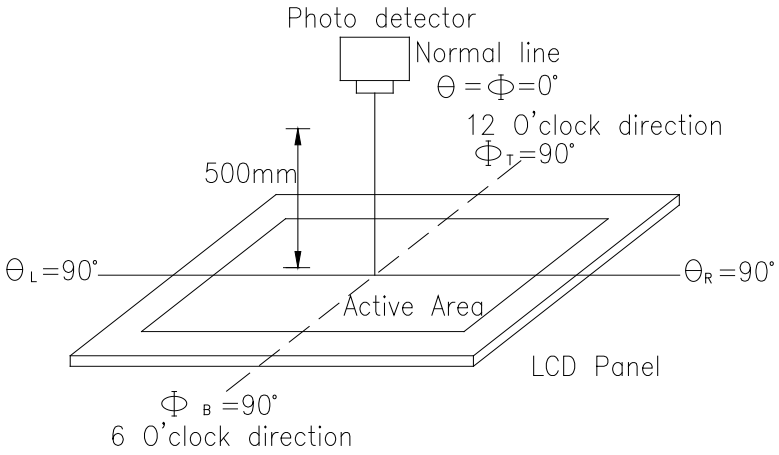
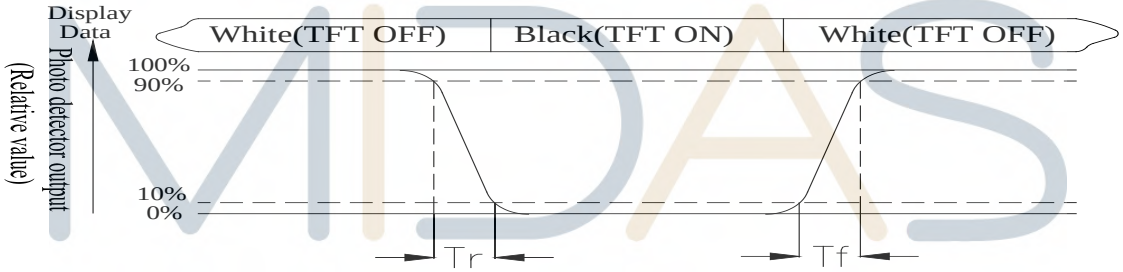


Fig. 8.2. Optical measurement system setup

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, Tr, is the time between photo detector output intensity changed from 90%to 10%. And fall time, Tf, 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 Vi = Vi50 ± 1.5V
Black Vi = Vi50 ± 2.0V
“±” means that the analog input signal swings in phase with VCOM signal.
“±” 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℃~70℃)

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℃ 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30℃ 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℃ 200hrs	——
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20℃ 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60℃,90% RH max	60℃,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation -20℃ 25℃ 70℃ 30min 5min 30min 1 cycle	-20℃/70℃ 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.

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