TFT LCD

multicompPRO

Description

This product is a 21.5″ (16:10) diagonally measured active display with high resolution 1920×1080 display. This model is composed of a TFT LCD panel, backlight system, projected capacitive touch panel and HDMI included Stereo D/A Converter. It is designed to make Raspberry Pi usage easy. Can simply use this TFT display with your Raspberry Pi, or also you can use this as computer display with any device which has HDMI output. This 21.5″ TFT model comes in 1920×1080 resolution that would be great for embedded computing usage too.

Specifications

Panel Size	: 21.5″
Number of Pixels	: 1920 (W) × RGB × 1080 (H) Pixels
Active Area	: 476.06mm (W) × 267.79mm (H)
Pixel Pitch	: 0.24795mm (W) × 0. 24795mm (H)
Outline Dimension	: 520.64mm (W) × 312.11mm (H) × 29.5mm (T)
Number of Colours	: 16.7M
Display Mode	: Normally Black
View Direction	: Free direction
Display Format	: RGB vertical stripe
Surface Treatment	: Clear (≥6H)
Contrast Ratio	: 1000 (Typ.)
Luminance	: 450cd/m^2 (Typ.)
Video Input Interface	: HDMI (Compliance HDMI V1.4)
Audio Output Interface	: Analog Output
Backlight	: White LED
Operation Temperature	: -10°C to +60°C
Storage Temperature	: -20°C to +60°C
Weight	: 3400g

Absolute Maximum Ratings

Electrical Absolute Rating
HDMI TFT LCD Module

Item	Symbol	Values		Unit	Note
		Min.	Max.		
Power supply voltage	12V	11	14	V	-

Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Operating Temperature	Top	-10	-	+60	°C	Ambient Temperature
Storage Temperature	Tst	-20	-	+60		

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Electrical Characteristics

HDMI TFT LCD Module

Item	Symbol	Values			Unit	Note
		Min.	**Typ.**	**Max.**		
Supply Voltage	12V	11	12	13	V	
PWM frequency		100	-	10K	Hz	
PWM Duty		17	-	100	%	<17%=OFF
PWM Dimming Voltage	V_{PWM-IH}	3.3	-	8	V	
	V_{PWM-IL}	-	0.3	-		
LED Enable Control Voltage	V_{LED_EN-IH}	3.3	-	12		
	V_{LED_EN-IL}	-	-	0.5		
Supply Current	ICC(12V)	-	2060	2260	mA	
LED life time		30000	-	-	Hr	(1)

Note 1:

The "LED life time" is defined as the module brightness decrease to 50% original brightness that the ambient temperature is 25°C 60% RH.

Projected Capacitive Touch Panel Specification

Main Feature

Item	Specification	Unit
Screen Size	21.5 inches	Diagonal
Type	Transparent Type Projected Capacitive Touch Panel	
Input Mode	Finger/ Passive Pen / Glove	
View Area	477.95 (H)(typ.) × 269.42 (V)(typ.)	mm
Resolution	4096(H) × 4096(V)	
Interface	USB	
Operating system OS	Windows / Linux / Android/ Mac/ QNX	
Touch number	10 points	
Cover glass pencil-hardness	6H(min.)	-
Report Rate	>100Hz	
Response Time	25 (typ.)	ms
Digital Power Supply	USB: 5V DC (typ.)	V
Power Consumption	TBC	mA
Controller Model	EE80H805680	

Pin Assignments and Definitions: JP1(USB)

Pin No.	Symbol	I/O	Function
1	GND	P	Ground
2	VDD_5V	P	Power Supply Voltage, DC 5V
3	GND	P	Ground

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Pin No.	Symbol	I/O	Function
4	D+	I/O	D+
5	D-	I/O	D

Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Brightness		-	Note1, Note 3, (θ= 0°, Normal Viewing Angle)	360	450	-	cd/m^2
Uniformity		B-uni		(75)	-	-	%
Contrast Ratio		CR		800	1000	-	-
Response Time		Tr		-	12	22	ms
		Tf		-	10	20	ms
Colour Chromaticity	White	Wx		0.263	0.313	0.363	-
		Wy		0.279	0.329	0.379	-
View angle	Horizontal	θx+	Centre CR≥10	80	89	-	
		θx-		80	89		
	Vertical	θY+		80	89		
		θY-		80	89		

Note: The following optical specifications shall be measured in a darkroom or equivalent state (ambient luminance ≤1 lux, and at room temperature). The operation temperature is 25°C±2°C. The measurement method is shown in Note1.

Note 1: The method of optical measurement
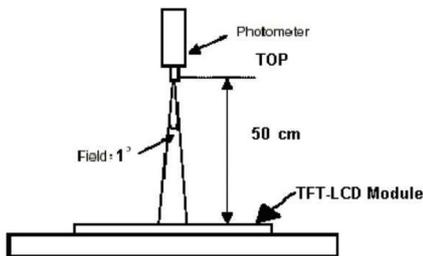
Note 2: Measured at the centre area of the panel and at the viewing angle of the θx=θy =0°

Note 3: Definition of Contrast Ratio (CR):

CR = Luminance with all pixels in white state ÷ Luminance with all pixels in Black state

**Note 4:** Definition of Viewing Angle:

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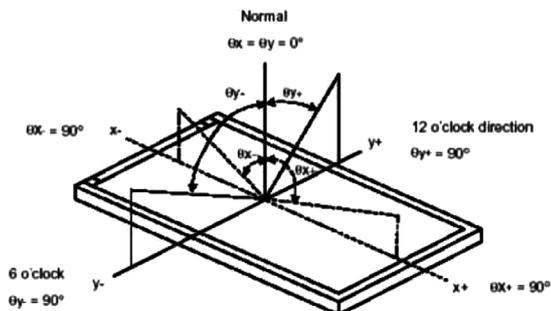
Note 5: Definition of Brightness Uniformity (B-uni):
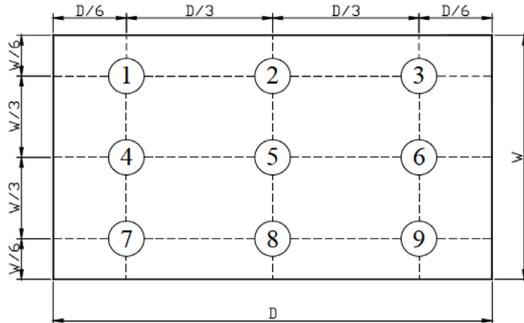
B-uni = (Minimum luminance of 9 points÷Maximum luminance of 9 points) X 100%

**Note 6:** Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (Tr)" and the "Falling Time (Tf)" respectively. Tr and Tf are defined as following figure
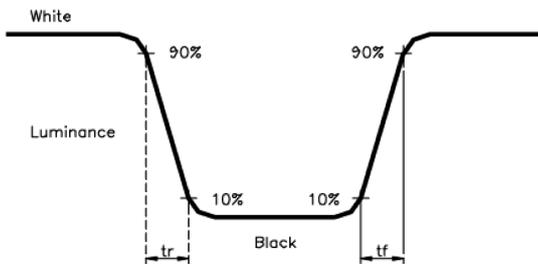
Note 7: Definition of Chromaticity:

The colour coordinates (Wx,Wy),(Rx,Ry),(Gx,Gy),and (Bx,By) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

Diagram
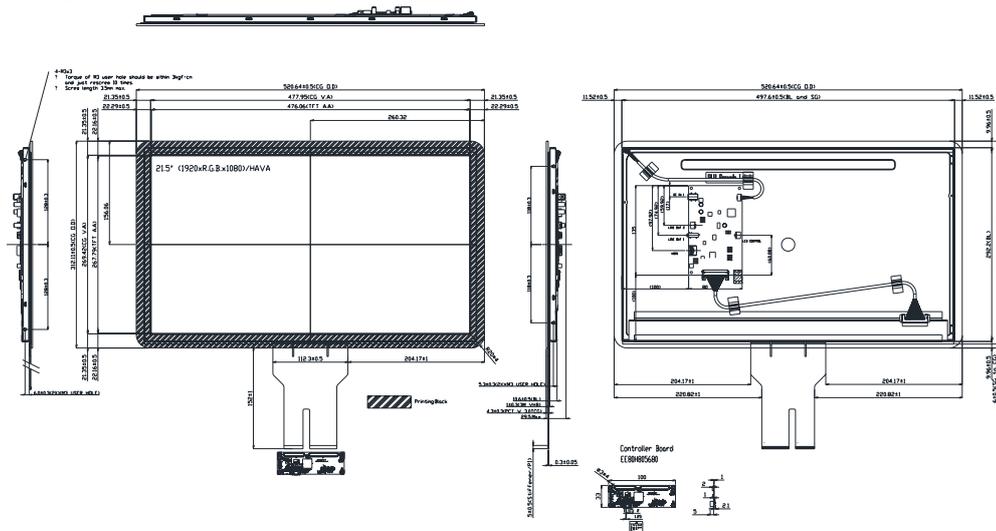
Dimensions : Millimetres

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Pin Description

Power Input (DC1)

Pin No.	Symbol	I/O	Function	Note
1	12V	P	Power Supply +12V	12V
2	GND	P	Ground	⊖—Ⓖ—⊕
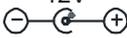
Back-light Control (LED CONTROL)

Pin No.	Symbol	I/O	Function	Note
1	GND	P	Ground	-
2	PWM	I	Back-light Dimming control (internal pull up to 3.3V)	*
3	NC	I	No connection. (internal control)	

* When PWM not connected, back-light default is typical brightness.

Audio line out (LINE OUT 2)

Pin No.	Symbol	I/O	Function	Note
1	R_CH	A	HDMI Audio: Right Channel Analog Output	
2	GND	P	Ground	
3	L_CH	A	HDMI Audio: Left Channel Analog Output	

Standard 3.5mm Phone Jack (LINE OUT 1)

HDMI Audio Analog Output

Left
Right
Ground
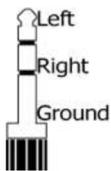
HDMI

Pin No.	Symbol	I/O	Function	Note
1	TMDS 2+	I	TMDS Data2+	
2	GND	P	TMDS Data2 Shield	
3	TMDS 2-	I	TMDS Data2-	
4	TMDS 1+	I	TMDS Data1+	
5	GND	P	TMDS Data1 Shield	
6	TMDS 1-	I	TMDS Data1-	
7	TMDS 0+	I	TMDS Data0+	
8	GND	P	TMDS Data0 Shield	
9	TMDS 0-	I	TMDS Data0-	
10	TMDS CLK+	I	TMDS Clock+	
11	GND	P	TMDS Clock Shield	
12	TMDS CLK-	I	TMDS Clock-	

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Pin No.	Symbol	I/O	Function	Note
13	N.C.	-	N.C.	
14	N.C.	-	N.C.	
15	DDC_SCL	I	IIC SCL to EDID ROM	
16	DDC_SDA	I/O	IIC SDA to EDID ROM	
17	GND	P	DDC/CEC Ground	
18	HD_5V	P	+5V Power	
19	HPD	O	Hot Plug Detect	

Block Diagram

TFT LCD Module

Project Touch Panel

1920 x RGB x 1080

Backlight Unit

Source IC+Gate IC

DC/DC Circuit
HDMI to LVDS Bridge
Stereo D/A Converter

GND
PWM

VDD_5V
D+
D-
GND

12V
GND

HDMI

Audio
Line out
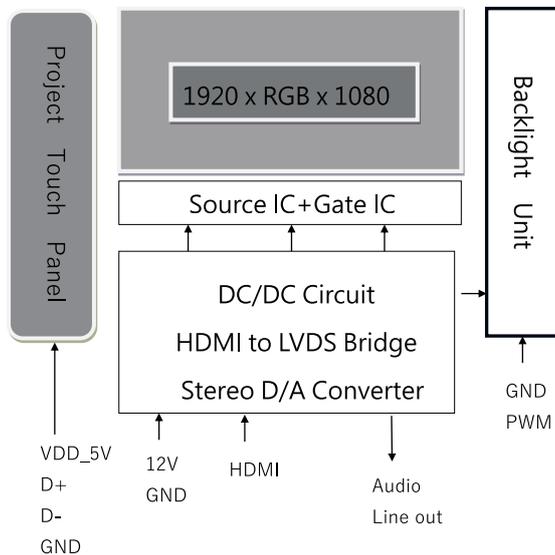
Part Number Table

Description	Part Number
TFT LCD, 21.5″, HDMI, 1920×1080, Capacitive Touch	MP013342

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