TFT LCD

RoHS Compliant

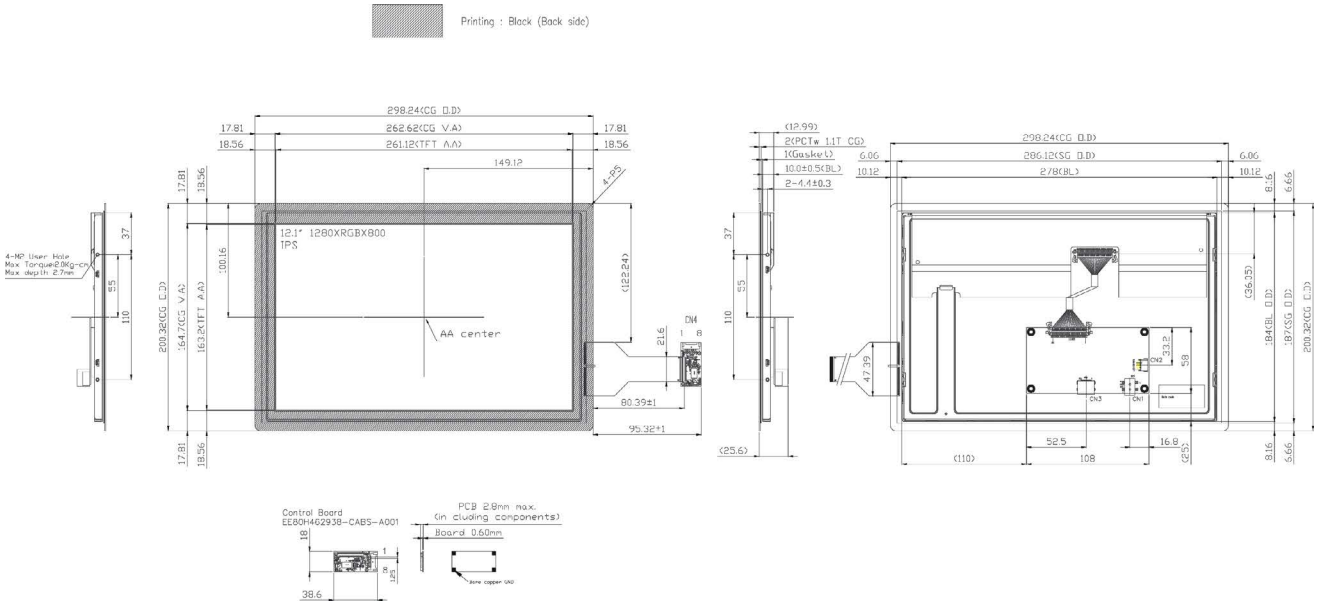
Description

MP010840 is a 12.1 (16:10) inch diagonally measured active display with high resolution XGA 1280 × 800 display and high brightness. This model is composed of a TFT LCD panel, backlight system , a projected capacitive touch panel and HDMI . It is designed to make Raspberry Pi usage easy. You 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 12.1” TFT model comes in 1280 × 800 resolution that would be great for embedded computing usage too.

Features

No.	Item	Specification	Unit
1	Panel Size	12.1”	Inch
2	Number of Pixels	1280 (W) x RGB x 800 (H)	Pixels
3	Active Area	261.12 (W) × 163.2 (H)	mm
4	Pixel Pitch	0.204 (W) x 0.204 (H)	mm
5	Outline Dimension	298.24 (W) × 200.32 (H) × 25.6(T)	mm
6	Number of Colours	16.7M	- -
7	Display Mode	IPS / Normally Black / Transmissive	- -
8	View Direction	Free direction	- -
9	Display Format	RGB vertical stripe	- -
10	Surface Treatment	Clear 7H(min.)	- -
11	Contrast Ratio	1000 (Typ.)	- -
12	Luminance (cd/m^2)	500 (Typ.)	cd/m2
13	Video Input Interface	HDMI (Compliance HDMI V1.4)	- -
14	Backlight	White LED	- -
15	Operation Temperature	-30 to 80	°C
16	Storage Temperature	-30 to 80	°C
17	Weight	(TBD)	g

Mechanical Specification



Pin Description

Power Input(CN1) [DC JACK:SCD480CCS000B00GE or compatible]

Pin No.	Symbol	I/O	Function	Note
1	12V	P	Power Supply +12V	12V
2	GND	P	Ground	

Back-light Control(CN2) [WAFER P2.0mm:2001S-03-RTE or compatible]

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

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

HDMI (CN3) [HDMI A TYPE:PHD0911A2301E or compatible]

Pin No.	Symbol	I/O	Function
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–
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

Absolute Maximum Ratings

Electrical Absolute Rating
HDMI TFT LCD Module

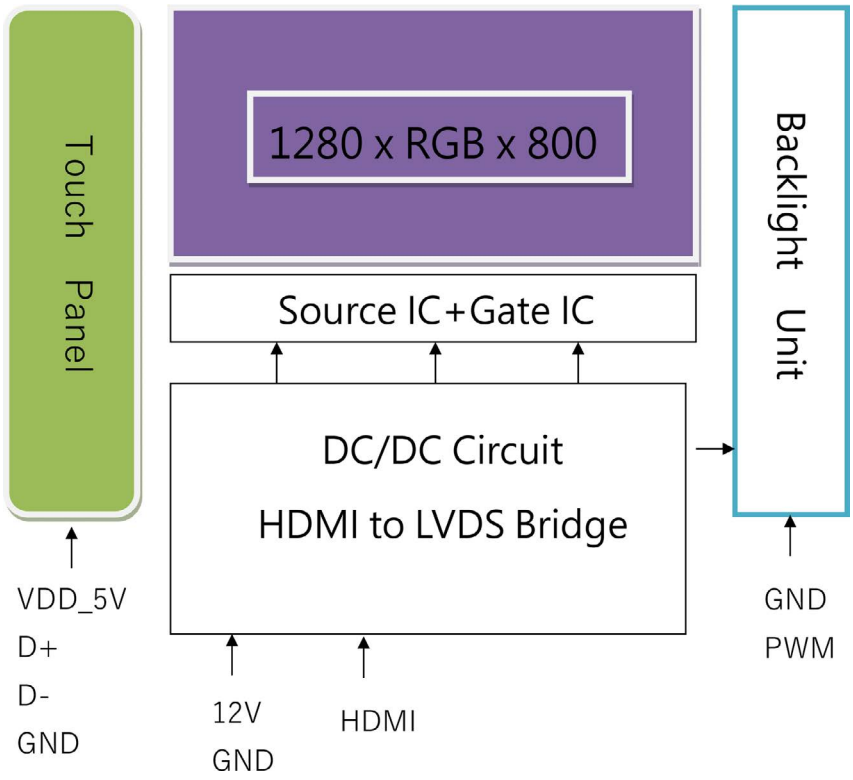
Item	Symbol	Values		Unit
		Min	Max.	
Power supply voltage	12V	10	14	V

Environment Absolute Rating

Item	Symbol	Values		Unit	Note
		Min	Max.		
Operating Temperature	Top	-30	80	°C	Ambient temperature
Storage Temperature	Tst				

Block Diagram

TFT LCD Module



Electrical Characteristics

HDMI TFT LCD Module

Item	Symbol	Values			Unit	Note
		Min	Typ.	Max.		
Supply Voltage	12V	11	12	13	V	
PWM frequency		190	200	20K	Hz	
PWM Duty		5	-	100	%	(3), Suggestion @190Hz≤ fPWM<1kHz
		20	-			(3), @1kHz≤fPWM ≤20kHz
PWM Dimming Voltage	V_{PWM-IH}	3	3.3	5	V	
	V_{PWM-IL}	0	-	0.3		
LED Enable Control Voltage	V_{LED_EN-IH}	3	3.3	5		
	V_{LED_EN-IL}	-	-	0.3		
Supply Current	ICC(12V)	-	TBD	-	mA	
LED life time		50000	-	-	Hr	(1)

Note

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 Panel Specifications

Main Feature

Item	Specification	Unit
Screen Size	12.1 inches	Diagonal
Type	Transparent Type Projected Capacitive Touch Panel	--
Input Mode	Human's Finger	--
View Area	262.62 (H)(typ.) X 164.7 (V)(typ.)	mm
Interface	USB	--
Operating system OS	Windows / Linux / Android	
Touch number	10 points	
Cover glass pencil-hardness	7H(min.)	--
Report Rate	>100Hz	--
Response time	25 (typ.)	ms
Digital Power Supply	5V DC	V
Power Consumption	TBD	mA
Controller Model	EE80H462938	

CN4(USB) Pin Assignments and Definitions

Item	Name	I/O	Unit
1	VDD_5V	P	Power Supply Voltage, 3.3V ~ 5V DC
2	D+	I/O	D+
3	D-		D-
4	GND	P	Ground
5	NC	--	N.C.
6			
7			
8			

Optical Characteristics

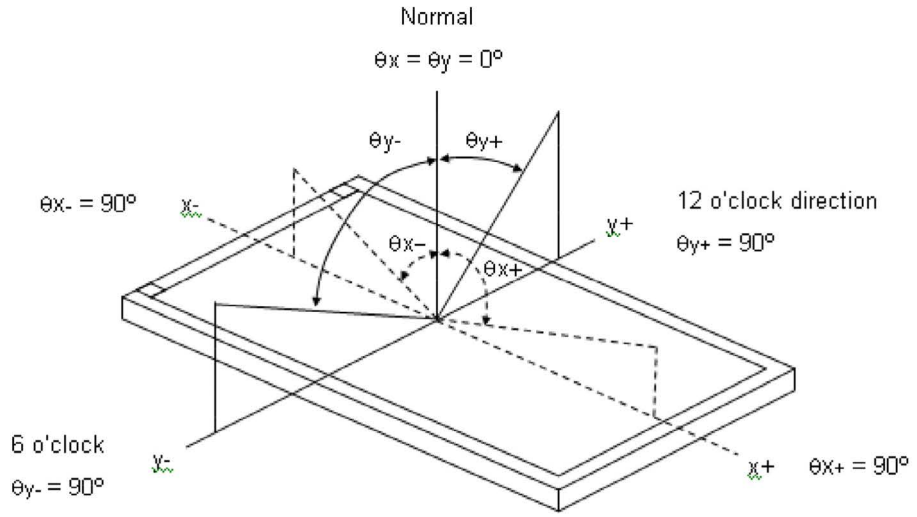
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Brightness		--	Note1, Note 3, (θ= 0°, Normal Viewing Angle)	400	500	--	cd/m2	(4)(5)
Contrast Ratio		CR		800	1000	--	--	(2)(5)
White Variation		δW		--	1.25	1.4	--	(5)(6)
Response Time		Tr		--	12	17	ms	(3)
		Tf		--	8	13		
Colour Chromaticity	White	Wx		0.263	0.313	0.363	--	(1)(5)
		Wy		0.279	0.329	0.379		
	Red	Rx		0.602	0.652	0.702		
		Ry		0.288	0.338	0.388		
	Green	Gx		0.276	0.326	0.376		
		Gy		0.558	0.608	0.658		
	Blue	Bx		0.1	0.15	0.2		
		By		0.003	0.053	0.103		
View angle	Horizontal	θx+	Center CR≥10	80	88	--	Deg	(1)(5)
		θx-						
	Vertical	θY+						
		θY-						

Note:

Test Conditions

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25 ±2	°C
Ambient Humidity	Ha	50 ±10	%RH
Supply Voltage	Vcc	3.3	V
Convertor Voltage	According to typical value in “3. Electrical Characteristics”		
Convertor Duty			

Note (1) Definition of Viewing Angle (θx, θy):



Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

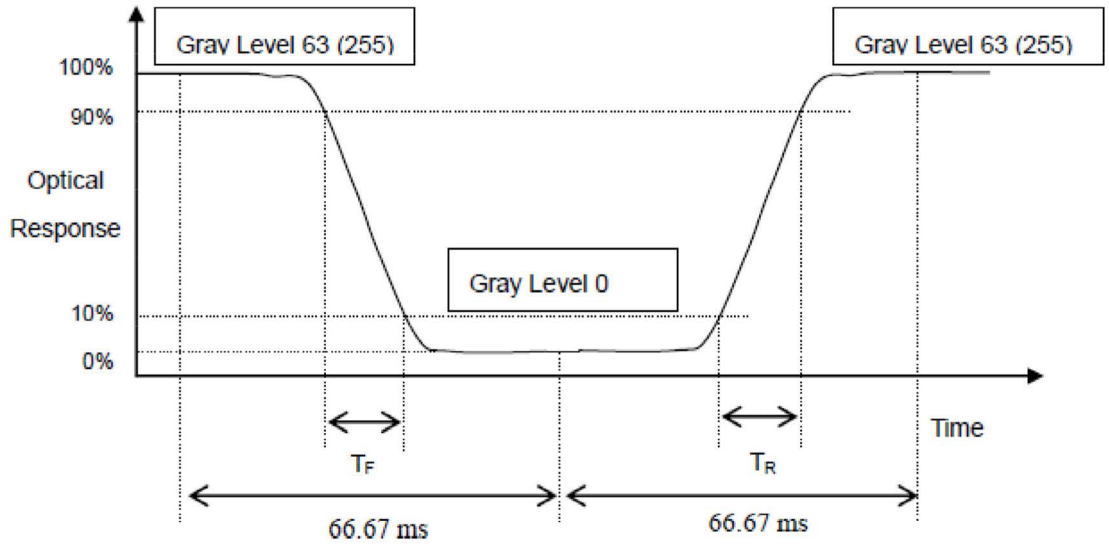
L63: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

Note (3) Definition of Response Time (T_R, T_F):



Note (4) Definition of Luminance of White (L_c):

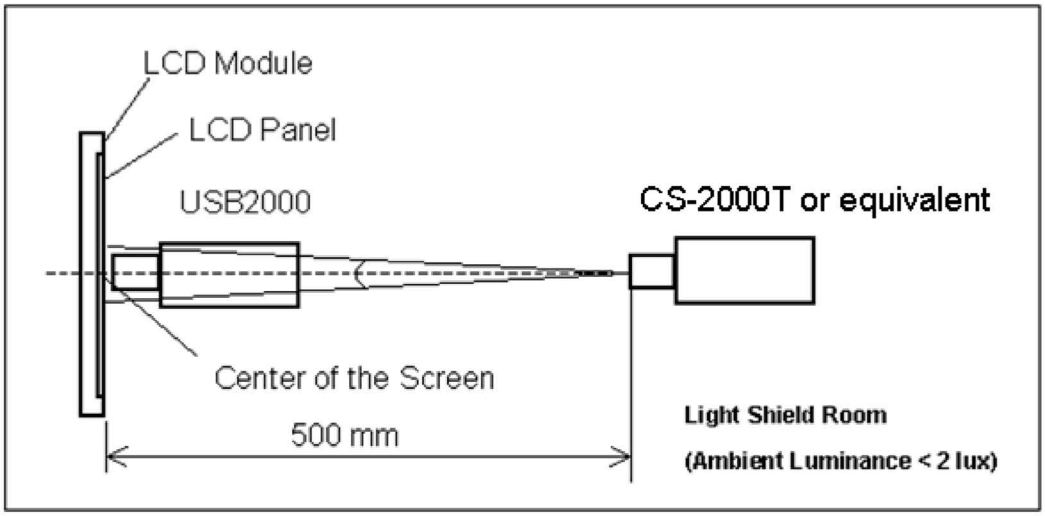
Measure the luminance of gray level 255 at center points

L_c = L (5)

L (x) is corresponding to the luminance of the point X at Figure in Note (6).

Note (5) Measurement Setup:

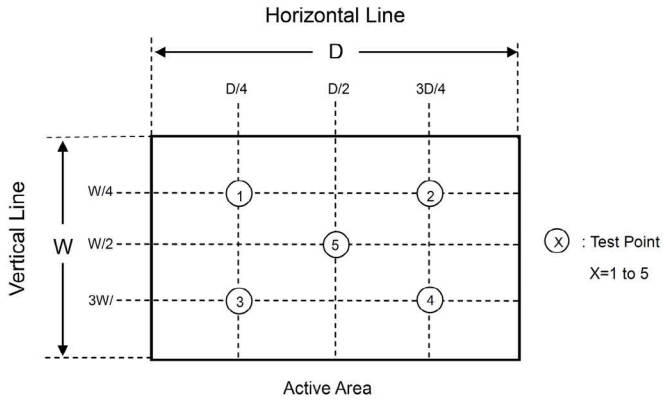
The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note (6) Definition of White Variation (δW):

Measure the luminance of gray level 255 at 5 points

$$\delta W = \frac{\text{Maximum [L (1), L (2), L (3), L (4), L (5)]}}{\text{Minimum [L (1), L (2), L (3), L (4), L (5)]}}$$



Part Number Table

Description	Part Number
TFT LCD, Capacitive Touch Panel, 12.1”, HDMI, 1280 × 800	MP010840