



HIGHNESSTM

HM185HD111A V.R Rel.0

18.5" Color TFT-LCD

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22nd Nov 2019

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1. GENERAL DESCRIPTION

1.1 OVERVIEW

HM185HD111A V.R Rel.0 is a 18.5" TFT Liquid Crystal Display product with driver ICs and 1ch-LVDS interface. This product supports 1366 x 768 HDTV format and can display 16.7M colors (8-bit).

2.0 DISPLAY CHARACTERISTICS

CHARACTERISTICS ITEMS	SPECIFICATIONS
Screen Diagonal [in]	18.5
Pixels [lines]	1366 x 768
Active Area [mm]	409.8 (H) x 230.4 (V) (18.5" diagonal)
Sub-Pixel Pitch [mm]	0.1 (H) x 0.3 (V)
Pixel Arrangement	RGB Vertical Stripe
White Luminance (Center) [cd/m ²]	500 cd/m ² (Typ.)
Weight [g]	1290g (Typ.)
Display Mode	Transmissive Mode / Normally Black
Contrast Ratio [CR]	3000:1 (Typ.)
Glass thickness (Array / CF) [mm]	0.5 / 0.5
Response Time	8.5ms (Typ.)
Viewing Angle (CR>20)	+88/-88 (H), +88/-88(V) (CR≥20) (Typ.)
Color Chromaticity	R = (0.660, 0.325) G = (0.273, 0.590) B = (0.135, 0.107) W = (0.309, 0.351)
Polarizer Surface Treatment	Anti-Glare coating (Haze 1%)
Physical Size	430.4 (W) x 254.6 (H) Typ. x 9.9 (D) Typ
Rotation Function	Unachievable
Temperature Range Operating [°C] Storage [°C]	0 to +70 -20 to +70

2.1 ELECTRICAL ABSOLUTE RATINGS

2.1.1 TFT LCD MODULE

Item	Symbol	Value		Unit
		Min.	Max.	
Power Supply Voltage	V_{CC}	(-0.3)	(5.5)	V
Logic Input Voltage	V_{IN}	(-0.3)	(3.6)	V

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

(Ta = 25 ± 2 °C)

Parameter		Symbol	Value			Unit
			Min.	Typ.	Max.	
Power Supply Voltage		V _{CC}	4.5	5	5.5	V
Rush Current		I _{RUSH}	—	—	(2.1)	A
Power consumption	White Pattern	P _T	—	(4.13)	(4.89)	Watt
	Black Pattern	P _T	—	(2.7)	(3.03)	Watt
	Heavy Loading pattern Ex: Horizontal Stripe (by cell and platform)	P _T	—	(4.10)	(4.5)	Watt
Power Supply Current	White Pattern	—	—	(0.82)	(0.91)	A
	Black Pattern	—	—	(0.53)	(0.61)	A
	Heavy Loading pattern Ex: Horizontal Stripe (by cell and platform)	—	—	(0.76)	(0.90)	A
LVDS interface	Differential Input High Threshold Voltage	V _{LVTH}	+100	—	—	mV
	Differential Input Low Threshold Voltage	V _{LVTL}	—	—	-100	mV
	Common Input Voltage	V _{CM}	1.0	1.2	1.4	V
	Differential input voltage (single-end)	V _{ID}	200	—	600	mV
	Terminating Resistor	R _T	—	100	—	ohm
CMIS interface	Input High Threshold Voltage	V _{IH}	2.7	—	3.3	V
	Input Low Threshold Voltage	V _{IL}	0	—	0.7	V
LED Channel Voltage		V _L	46.4	50.4	54.4	V
LED Channel Current		I _L	-	240	-	mA
LED Lifetime			50000	-	-	Hr
Power Consumption		P _D	-	2.5	-	W
		P _{BL}	22.3	24.2	26.1	W
		P _{total}	-	26.7	-	W

4. INPUT TERMINAL PIN ASSIGNMENT

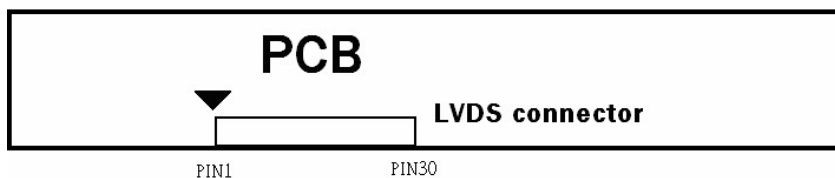
4.1 TFT LCD OPEN CELL INPUT

CNF1 Connector Pin Assignment (GS23301-0321R-7H (Foxconn) ; 187098-30091 (P-TWO))

Matting connector : FI-X30HL (JAE)

Pin	Name	Description
1	VCC	+5.0V power supply
2	VCC	+5.0V power supply
3	VCC	+5.0V power supply
4	VCC	+5.0V power supply
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	NC	No connection
9	SELLVDS	Select LVDS Format LVDS data format Selection(0V~0.7V→JEDIA, 2.7V~3.3V/Open→VESA) 【Do Not Floating】
10	NC	NC
11	GND	Ground
12	RX0-	Negative LVDS differential data input. Channel 0
13	RX0+	Positive LVDS differential data input. Channel 0
14	GND	Ground
15	RX1-	Negative LVDS differential data input. Channel 1
16	RX1+	Positive LVDS differential data input. Channel 1
17	GND	Ground
18	RX2-	Negative LVDS differential data input. Channel 2
19	RX2+	Positive LVDS differential data input. Channel 2
20	GND	Ground
21	RXLCK-	Negative LVDS differential clock input.
22	RXCLK+	Positive LVDS differential clock input.
23	GND	Ground
24	RX3-	Negative LVDS differential data input. Channel 3
25	RX3+	Positive LVDS differential data input. Channel 3
26	GND	Ground
27	NC	No connection
28	NC	No connection
29	NC	No connection
30	GND	Ground

Note (1) LVDS connector pin order defined as below.



4.2 BACK-LIGHT INTERFACE CONNECTION

- CN1 LED Light Bar Connector: PH2.0

Pin	Function
1	- Cathode
2	+ Anode

- CN2 LED Light Bar Connector: PH2.0

Pin	Function
1	- Cathode
2	+ Anode

4.3 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics. The following items should be measured under the test conditions described and stable environment shown in Table.

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Color Chromaticity	Red	Rcx	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing angle at normal direction Standard light source "C"	Typ. -0.03	(0.660)	Typ. +0.03	-
		Rcy			(0.325)		-
	Green	Gcx			(0.273)		-
		Gcy			(0.590)		-
	Blue	Bcx			(0.135)		-
		Bcy			(0.107)		-
	White	Wcx			(0.309)		-
		Wcy			(0.351)		-
White Luminance		-		-	400	500	cd/m ²
Transmittance		T%	$\theta_x=0^\circ, \theta_y=0^\circ$ Module@60Hz	-	(4.9)	-	%
Transmittance Variation		δT		-	-	1.42	
Contrast Ratio		CR		2000	3000	-	-
Response Time		Gray to gray		-	8.5	20	ms
Viewing Angle	Horizontal	θ_{x+}	CR \geq 20	80	88	-	Deg.
		θ_{x-}		80	88	-	
	Vertical	θ_{Y+}		80	88	-	
		θ_{Y-}		80	88	-	

5. RELIABILITY TEST

Environment test conditions are listed as following table.

Items	Required Condition
Temperature Humidity Bias (THB)	Ta= 70°C, 80%RH, 300hours
High Temperature Operation (HTO)	Ta= 70°C, 50%RH, 300hours
Low Temperature Operation (LTO)	Ta= 0°C, 300hours
High Temperature Storage (HTS)	Ta= 70°C, 300hours
Low Temperature Storage (LTS)	Ta= -20°C, 300hours
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Duration: 30 Minutes each Axis (X, Y, Z)
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)
Drop Test	Height: 46 cm, package test
Thermal Shock Test (TST)	-20°C/30min, 70°C/30min, 100 cycles
On/Off Test	On/10sec, Off/10sec, 30,000 cycles
ESD (Electrostatic Discharge)	Contact Discharge: ± 15KV, 150pF(330Ω) 1sec, 15 points, 25 times/ point.
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 15 points, 25 times/ point.
Altitude Test	Operation:18,000 ft Non-Operation:40,000 ft