



HIGHNESSTM

One of a kind

HM101WX111I-PT
10.1" Color TFT-LCD with
Multi-Point Projected Touch Screen

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HIGHNESS MICROELECTRONICS LTD.

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1. GENERAL DESCRIPTION

1.1 OVERVIEW

HM101WX111I-PT is a 10.1" TFT Liquid Crystal Display module with LED Backlight units and 40 pins LVDS interface. This module supports 1280 x 800 WXGA mode and can display 16.2M/ 262k colors. The LED driving device for Backlight is built in PCBA.

1.2 FEATURES

- WXGA (1280 x 800 pixels) resolution
- DE (Data Enable) only mode
- LVDS Interface with 1pixel/clock
- Wide operating temperature.
- RoHS compliance

1.3 APPLICATION

- TFT LCD Monitor
- Factory Application
- Amusement

1.4 GENERAL SPECIFICATIONS

Item	Specification	Unit
Active Area	216.96 (H) x 135.60 (V) (10.1" diagonal)	mm
Bezel Opening Area	218.96 (H) x 137.6 (V)	mm
Driver Element	a-Si TFT active matrix	-
Pixel Number	1280 x R.G.B x 800	pixel
Pixel Pitch	0.1695 (H) x 0.1695 (V)	mm
Pixel Arrangement	RGB vertical Stripe	-
Display Colors	16,194,277 / 262,144	color
Display Mode	Normally Black	-
Surface Treatment	Hard Coating (3H), Anti-Glare	-
Module Power Consumption	6.18	W
Touch Screen Type	P-cap Multi Touch	-
Touch Screen Interface	USB	-

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit
Module Size	Horizontal(H)	230.2	230.7	231.2	mm
	Vertical(V)	152.05	152.55	153.05	mm
Bezel Area	Horizontal	217.66	218.96	218.26	mm
	Vertical	137.3	137.6	137.9	mm
Active Area	Horizontal	-	216.96	-	mm
	Vertical	-	135.6	-	mm

2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit
		Min.	Max.	
Operating Ambient Temperature	T _{OP}	-20	+65	°C
Storage Temperature	T _{ST}	-25	+70	°C

2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

Item	Symbol	Value		Unit
		Min.	Max.	
Power Supply Voltage	VCC	-0.3	4	V

2.2.2 BACKLIGHT UNIT

Item	Symbol	Value		Unit
		Min.	Max.	
Converter Voltage	V_i	-0.3	18	V
Enable Voltage	EN	---	5.5	V
Backlight Adjust	ADJ	---	5.5	V

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Parameter	Symbol	Value			Unit	
		Min.	Typ.	Max.		
Power Supply Voltage	V_{CC}	3.0	3.3	3.6	V	
Ripple Voltage	V_{RP}	-	-	100	mVp-p	
Rush Current	I_{RUSH}	-	-	1.5	A	
Power Supply Current	White	I _{CC}	-	265	320	mA
	Black		-	210	260	mA
LVDS differential input voltage	V_{id}	200	-	600	mV	
LVDS common input voltage	V_{ic}	1.0	1.2	1.4	V	
Differential Input Voltage for LVDS Receiver Threshold	"H" Level	V_{IH}		100	mV	
	"L" Level	V_{IL}	-100		mV	
Terminating Resistor	R_T	-	100		Ohm	

3.2 BACKLIGHT UNIT

Ta = 25 ± 2 °C

Parameter	Symbol	Value			Unit	
		Min.	Typ.	Max.		
Converter Power Supply Voltage	V _i	10.8	12.0	13.2	V	
Converter Power Supply Current	I _i	-	0.45	0.50	A	
Backlight Power Consumption	P _{BL}	-	5.3	5.8	W	
EN Control Level	Backlight on	-	2.5	3.3	5.0	V
	Backlight off	-	0	---	0.8	V
PWM Control Level	PWM High Level	-	2.5	3.3	5.0	V
	PWM Low Level	-	0	-	0.15	V
PWM Control Duty Ratio	-	-	1	-	100	%
PWM Control Frequency	f _{PWM}	-	190	200	20k	Hz
LED Life Time	L _L	-	50,000	-	-	Hrs

4. INPUT TERMINAL PIN ASSIGNMENT

4.1 TFT LCD MODULE

Pin No.	Symbol	Function	Polarity
1	VCCS	Power Supply +3.3V(typical)	
2	VCCS	Power Supply +3.3V(typical)	
3	VCCS	Power Supply +3.3V(typical)	
4	Data format	L or NC : 8bit Input Mode H : 6bit Input Mode	
5	NC	No Connection (Reserve for INX test)	
6	NC	No Connection (Reserve for INX test)	
7	NC	No Connection (Reserve for INX test)	
8	Rxin0-	LVDS Differential Data Input	Negative
9	Rxin0+	LVDS Differential Data Input	Positive
10	VSS	Ground	
11	Rxin1-	LVDS Differential Data Input	Negative
12	Rxin1+	LVDS Differential Data Input	Positive
13	VSS	Ground	
14	Rxin2-	LVDS Differential Data Input	Negative
15	Rxin2+	LVDS Differential Data Input	Positive
16	VSS	Ground	
17	RxCLK-	LVDS Differential Clock Input	Negative
18	RxCLK+	LVDS Differential Clock Input	Positive
19	VSS	Ground	
20	Rxin3-	LVDS Differential Data Input	Negative
21	Rxin3+	LVDS Differential Data Input	Positive
22	VSS	Ground	
23	NC	No Connection (Reserve)	
24	NC	No Connection (Reserve)	
25	VSS	Ground	
26	VSS	Ground	
27	LED_PWM	PWM Control Signal od LED Converter	
28	LED_EN	Enable Control Signal od LED Converter	
29	LED_GND	LED Ground	
30	LED_GND	LED Ground	
31	LED_GND	LED Ground	
32	LED_GND	LED Ground	
33	LED_GND	LED Ground	
34	NC	No Connection (Reserve)	
35	NC	No Connection (Reserve)	
36	LED_VCCS	LED Power Supply	
37	LED_VCCS	LED Power Supply	
38	LED_VCCS	LED Power Supply	
39	LED_VCCS	LED Power Supply	
40	LED_VCCS	LED Power Supply	

5. INTERFACE TIMING

5.1 INPUT SIGNAL TIMING SPECIFICATIONS

The input signal timing specifications are shown as the following table and timing diagram.

Signal	Item	Symbol	Min.	Typ.	Max.	Unit
DCLK	Pixel Clock	$1/T_C$	60.40	71.1	74.7	MHz
DE	Vertical Total Time	T_V	810	823	829	T_H
	Vertical Address Time	T_{VD}	800	800	800	T_H
	Horizontal Total Time	T_H	1362	1440	1480	T_C
	Horizontal Address Time	T_{HD}	1280	1280	1280	T_C

6. OPTICAL CHARACTERISTICS

6.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V _{CC}	3.3	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Converter Voltage	V _i	12	V
Converter Duty		100%	

6.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown in 7.2. The following items should be measured under the test conditions described in 7.1 and stable environment.

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Color Chromaticity	Red	Rx	Typ - 0.05	0.592	Typ+ 0.05	-	
		Ry		0.340			
	Green	Gx		0.316			
		Gy		0.591			
	Blue	Bx		0.154			
		By		0.123			
	White	Wx		0.313			
		Wy		0.329			
	Center Luminance of White	L _c		750			850
Dynamic Contrast Ratio	CR	600	800		-		
Response Time	T _R	θ _x =0°, θ _y =0°	-	14	17	ms	
	T _F		-	11	14		
White Variation	ΔW	θ _x =0°, θ _y =0°	70	-	-	%	
Viewing Angle	Horizontal	Δ _{x+}	CR ≥ 10	80	85	-	Deg.
		Δ _{x-}		80	85	-	
	Vertical	Δ _{y+}		80	85	-	
		Δ _{y-}		80	85	-	

7. TOUCH SCREEN SPECIFICATION

General Specifications	
Type	Projective Capacitive Touch
Size	10.1"
Input Method	Finger
Glass Thickness	TBA
Environmental Specifications	
Operating Temperature	-20° to +70° C
Storage Temperature	-40° to +85° C
Operating Humidity	20% to 85% RH (Non-Condensing)
Storage Humidity	10% to 90% RH (Non-Condensing)
Optical Specifications	
Transparency	≥ 84% (± 3%)
Haze	< 3%
Electrical Specifications	
Max. Voltage	5V DC
Max. Current	35mA
Loop Resistance	X: 20~500Ω, Y: 20~500Ω
Linearity	X ≤ 1.5%, Y ≤ 1.5%
Chattering	≤ 15ms
Insulation	≥ 20MΩ/25V (DC)
Mechanical Specifications	
Operating Force	10-80 g
Durability	35,000,000 touch at a single point
Hardness	> 3H
Capacitance	< 5 nF

8. RELIABILITY TEST CRITERIA

Test Item	Test Condition
High Temperature Storage Test	70°C, 240 hours
Low Temperature Storage Test	-25°C, 240 hours
Thermal Shock Storage Test	-25°C, 0.5 hour ← → 70°C, 0.5 hour; 100cycles, 1 hour/cycle)
High Temperature Operation Test	65°C, 240 hours
Low Temperature Operation Test	-20°C, 240 hours
High Temperature & High Humidity Operation Test	60°C, RH 90%, 240 hours
ESD Test (Operation)	150pF, 330Ω, 1 sec/cycle Condition 1: panel contact, ±8 KV Condition 2: panel non-contact ±15 KV
Shock (Non-Operating)	50G, 11ms, half sine wave, 1 time for ± X, ± Y, ± Z direction
Vibration (Non-Operating)	1.5G, 10 ~ 300 Hz sine wave, 10 min/cycle, 3 cycles each X, Y, Z direction