

MODEL NAME: PL101FCL01.0

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Planned Lifetime:

Phase-out Control:

EOL Schedule:

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A. Physical Specifications

1. TFT LCD Panel

NO.	Item	Unit	Specification	Remark
1	Display Resolution	dot	1920 RGB (H) x 1200 (V)	
2	Active Area	mm	217.44 (H) x 135.9 (V)	
3	Screen Size	inch	10.1 (Diagonal)	
4	Dot Pitch	μm	113.25	
5	Color Configuration	–	R. G. B. Stripe	
6	Color Depth	–	16.7M colors	
7	Overall Dimension	mm	234.8 (H) x 158.1 (V) x 10.16 (T)	Note. 1
8	Weight	g	608 +/- 10%	
9	Display Mode	–	Normally Black	Note. 2

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2. Touch Panel

NO.	Item	Unit	Specification	Remark
1	Channel (Resolution)	-	26(RX)*41(TX)	(X0 ~ X40 Y0 ~ Y25)
2	Touch Panel Controller	-	mXT1067TD-AT	Excluded
3	Finger Size	-	Φ12 mm	
4	Minimal Pinch Separation (Center to Center)	-	All direction 15 mm @Φ12mm	
5	Accuracy Linearity	-	Core and Edge $\leq \pm 2.0$ mm @Φ12 mm copper	
			Edge $\leq \pm 2$ mm @ Φ12-mm copper	
6	Linearity Response Time	-	Core $\leq \pm 1$ mm @ Φ12-mm copper	
			Edge $\leq \pm 1$ mm @ Φ12-mm copper	
7	Report Rate	-	>100 Hz	
8	Response Time	-	<25 ms	

3. Cover lens

NO.	Item	Unit	Specification	Remark
1	Outline dimension	mm	220.44 (H) x 138.9 (V) x 1.8 (T)	
2	ASF	mm	219.92 (H) x 138.38 (V) x 0.11 (T)	Excluded
3	ASF Part No.	-	NOF PFX4605	
4	Haze		<0.9 %	
5	Contact angle		$\geq 110^\circ$	
6	Surface hardness		3H(750gf)	

C. Electrical Specifications

1. TFT LCD Panel Pin Assignment

Recommended Connector: FH41-60S-0.5SHED

No.	Pin Name	I/O	Description	Remarks
1	LED+	-	LED power supply voltage	
2	LED+	-	LED power supply voltage	
3	NC			
4	LEDB1-		LED power supply voltage	
5	LEDB2-		LED power supply voltage	
6	LEDB3-		LED power supply voltage	
7	LEDB4-	-	LED power supply voltage	
8	NC			
9	THB+		Thermistor B+	
10	THB-		Thermistor B-	
11	VDD	PI	3.3V power supply	
12	SDI		Interface of OTP (System side: NC)	
13	SDO		Interface of OTP (System side: NC)	
14	SCL		Interface of OTP (System side: NC)	
15	CSB		Interface of OTP (System side: NC)	
16	STBYB		Standby signal	
17	GRB		Reset signal	
18	VDD	PI	3.3V power supply	
19	VDD	PI	3.3V power supply	
20	NC	-		
21	GND	-	Power Ground	
22	D13P		Positive LVDS differential input (Even)	
23	D13N		Negative LVDS differential input (Even)	
24	GND		Power Ground	
25	CLK1P		Positive LVDS differential clock input (Even)	
26	CLK1N		Negative LVDS differential clock input (Even)	
27	GND		Power Ground	
28	D12P		Positive LVDS differential input (Even)	
29	D12N		Negative LVDS differential input (Even)	
30	GND		Power Ground	
31	D11P		Positive LVDS differential input (Even)	
32	D11N		Negative LVDS differential input (Even)	
33	GND		Power Ground	
34	D10P		Positive LVDS differential input (Even)	

35	D10N		Negative LVDS differential input (Even)	
36	GND		Power Ground	
37	D03P		Positive LVDS differential input (Odd)	
38	D03N		Negative LVDS differential input (Odd)	
39	GND		Power Ground	
40	CLK0P		Positive LVDS differential clock input (Odd)	
41	CLK0N		Negative LVDS differential clock input (Odd)	
42	GND		Power Ground	
43	D02P		Positive LVDS differential input (Odd)	
44	D02N		Negative LVDS differential input (Odd)	
45	GND		Power Ground	
46	D01P		Positive LVDS differential input (Odd)	
47	D01N		Negative LVDS differential input (Odd)	
48	GND		Power Ground	
49	D00P		Positive LVDS differential input (Odd)	
50	D00N		Negative LVDS differential input (Odd)	
51	GND		Power Ground	
52	NC			
53	SHLR		Horizontal scan direction control	Note1
54	UPDN		Vertical scan direction control	Note1
55	NC			
56	VPP		OTP voltage (NC, AUO internal use)	
57	VPP		OTP voltage (NC, AUO internal use)	
58	NC			
59	GND		Power Ground	
60	GND		Power Ground	

I: Digital signal input, O: Digital signal output, G: GND, PI: Power input; T: touch panel signal

2. Touch Sensor Pin Assignment

Recommended Connector: Yeonho 05002HR-H80G5

Recommended Controller: **Microchip/Atmel mXT1067TD**

Pin No.	Symbol	I/O	Description
1	GND	P	Ground
2	GND	P	Ground
3	GND	P	Ground
4	NC		NO connection
5	DS0	S	Driven Shield Signal
6	X20	S	X line connection
7	X19	S	X line connection
8	X18	S	X line connection
9	X17	S	X line connection
10	X16	S	X line connection
11	X15	S	X line connection
12	X14	S	X line connection
13	X13	S	X line connection
14	X12	S	X line connection
15	X11	S	X line connection
16	X10	S	X line connection
17	X9	S	X line connection
18	X8	S	X line connection
19	X7	S	X line connection
20	X6	S	X line connection
21	X5	S	X line connection
22	X4	S	X line connection
23	X3	S	X line connection
24	X2	S	X line connection
25	X1	S	X line connection
26	X0	S	X line connection
27	DS0	S	Driven Shield Signal
28	DS0	S	Driven Shield Signal
29	Y00	S	Y line connection
30	Y01	S	Y line connection
31	Y02	S	Y line connection
32	Y03	S	Y line connection
33	Y04	S	Y line connection
34	Y05	S	Y line connection

35	Y06	S	Y line connection
36	Y07	S	Y line connection
37	Y08	S	Y line connection
38	Y09	S	Y line connection
39	Y10	S	Y line connection
40	Y11	S	Y line connection
41	Y12	S	Y line connection
42	Y13	S	Y line connection
43	Y14	S	Y line connection
44	Y15	S	Y line connection
45	Y16	S	Y line connection
46	Y17	S	Y line connection
47	Y18	S	Y line connection
48	Y19	S	Y line connection
49	Y20	S	Y line connection
50	Y21	S	Y line connection
51	Y22	S	Y line connection
52	Y23	S	Y line connection
53	Y24	S	Y line connection
54	Y25	S	Y line connection
55	DS0	S	Driven Shield Signal
56	DS0	S	Driven Shield Signal
57	X21	S	X line connection
58	X22	S	X line connection
59	X23	S	X line connection
60	X24	S	X line connection
61	X25	S	X line connection
62	X26	S	X line connection
63	X27	S	X line connection
64	X28	S	X line connection
65	X29	S	X line connection
66	X30	S	X line connection
67	X31	S	X line connection
68	X32	S	X line connection
69	X33	S	X line connection
70	X34	S	X line connection
71	X35	S	X line connection

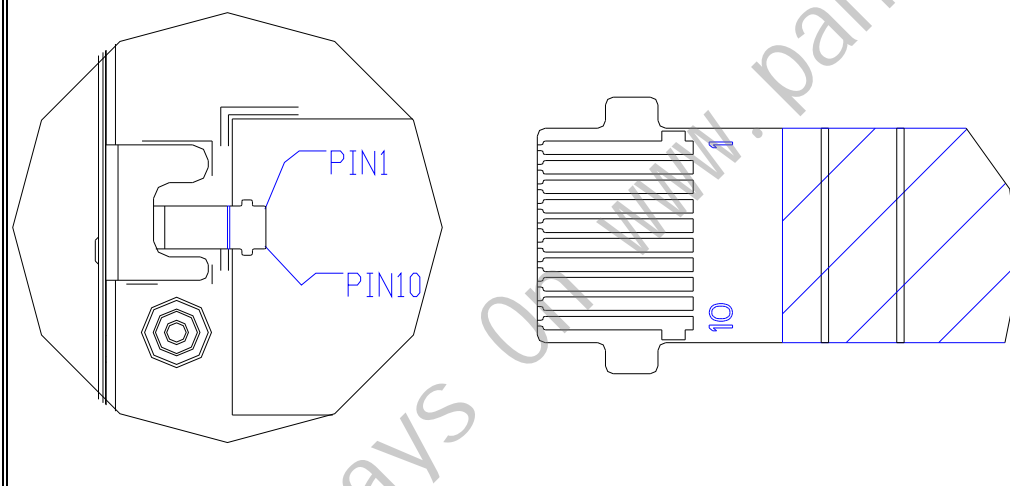
3. LED Light Bar Pin Assignment

Recommended Connector: Hirose FH52-10S-0.5SH

Thermistor: NCU15XH103F6SRC

PIN No.	Pin Name	I/O	Description	Remarks
1	A1		Backlight Anode 1	
2	A2		Backlight Anode 2	
3	NC		-	
4	C1		Backlight Cathode 1	
5	C2		Backlight Cathode 2	
6	C3		Backlight Cathode 3	
7	C4		Backlight Cathode 4	
8	NC		-	
9	Rin		Temperature Sensor	
10	Rout		Temperature Sensor	

Golden Finger Side :



Note: This display has signal light bar.

a. DE mode timing (Note 1)

Parameter		Symbol	Min.	Typ.	Max.	Unit.	Remark
CLK Frequency		F_{CLK}	73.9	74.2	85	MHz	
HSYNC	Period	T_H	1020	1024	1150	CLK	
	Horizontal display area	T_{HD}	960			CLK	
	Blanking	$T_{HBP} + T_{HFP}$	60	64	158	CLK	
VSYNC	Period	T_V	1206	1208	1329	HS	
	Vertical display area	T_{VD}	1200			HS	
	Blanking	$T_{VBP} + T_{VFP}$	6	8	67	HS	

Note 1: Both two ports of LVDS need to follow this timing chart

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3. Absolute Maximum Ratings

Items	Symbol	Values		Unit	Condition
		Min.	Max.		
Power Voltage	VDD	-0.3	5	V	GND = 0 V
Operation Temperature	Topa	-30*	85	°C	Ambient
Storage Temperature	Tstg	-40	95	°C	Ambient

Note 1: Functional operation should be restricted under normal ambient temperature.

Note 2: *No permanent functional defect between -40 °C and -30 °C

4. DC Electrical Characteristics

The following items are measured under stable condition and suggested application circuit.

a. Power specification

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Power Supply	VDD	3	3.3	3.6	V	Note 1
	IVDD		500	700	mA	Note 1
	IVDD inrush current			1.5	A	

b. Signal DC electrical characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Input high level voltage	V _{IH}	0.7VDD	-	VDD	V	Note 1
Input low level voltage	V _{IL}	GND	-	0.6	V	Note 1
Output high level voltage	V _{OH}	VDD - 0.4	-	VDD	V	Note 1
Output low level voltage	V _{OL}	GND	-	0.4V	V	Note 1
Differential input high threshold	R _{XVTH}	-	-	0.1	V	Note 2.3
Differential input low threshold	R _{XVTL}	-0.1	-	-	V	Note 2.3
Input differential voltage	V _{ID}	0.1	-	(1.5 - R _{XVCM})*2	V	Note 2.3
Differential Input Common Mode Voltage	R _{XVCM}	1	1.2	1.4	V	Note 2.3

Note 1: TTL interface signal DC characteristics(SDI, SDO, SCL, CSB, STBYB, GRB, SHLR, UPDN)

Note 2: LVDS interface signal DC characteristic

Fig. 4. LVDS DC characteristics diagram

c. Backlight driving conditions (Note 1)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
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Forward Current	I_F	at 25 ~ 60 °C	--	80	85	mA	Single serial ,Note 1,2
Forward Current	I_F	at 85 °C	--	--	40	mA	Single serial ,Note1,2
Forward Voltage	V_F	$I_F = 85$ (mA) at 25 °C	2.8*8	3.00*8	3.4*8	V	Note 3
Forward Voltage	V_F	$I_F = 85$ (mA) at -40 °C	2.89*8	3.2*8	3.53*8	V	Note 3
NTC Thermistor Resistance	R	at 25 °C	9.9k	10k	10.1k	ohm	Non-lighting
LED Life Time	T_{LED}	at 25 °C	10k	--	--	Hrs	Note 4

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5. AC Electrical Characteristics

a. Input AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
VDD power on slew time	T_{POR}	1	-	20	ms	From 0V to 90% VDD Note 1

b. Differential signal AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock frequency	R_{xFCLK}	73.9	74.2	85	MHz	
Clock high time	T_{LVCH}	-	$4/(7 \cdot T_{LVCLK})$	-	ns	
Clock low time	T_{LVCL}	-	$3/(7 \cdot T_{LVCLK})$	-	ns	
Input data skew margin	T_{RSKM}	-	-	0.25	UI	VCC_IF=1.8V w/o SSC
1 Data bit time	UI	-	1/7	-	T_{LVCLK}	

6. Power On/Off Sequence

The LCD adopts high voltage driver IC, so it could be permanently damaged under a wrong power on/off sequence. The suggested LCD power sequence is below:

Power on timing:

Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	--	--	20	Ms
T2	20	--	--	ms
T3	10	--	--	ms
T4	20	--	--	ms
T5	160	--	--	ms

a. Power off sequence:

Power off timing:

Parameter	Value			Unit
	Min.	Typ.	Max.	
T4	20	--	20	Ms
T5	140	--	--	ms
T6	20	--	--	
T7	1	--	--	ms

D. Optical Specifications (Note 1, 2)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response Time (25°C)	Tr+ Tf	$\theta = 0^\circ$	-	-	25	ms	Note 3, 4
Response Time (-30°C)	Tr+ Tf	$\theta = 0^\circ$	-	-	350	ms	
Contrast ratio	CR	$\theta = 0^\circ$	900:1	1000:1	-		Note 4, 5, 6
		40° horizontal, +20°/-10° vertical	500:1				

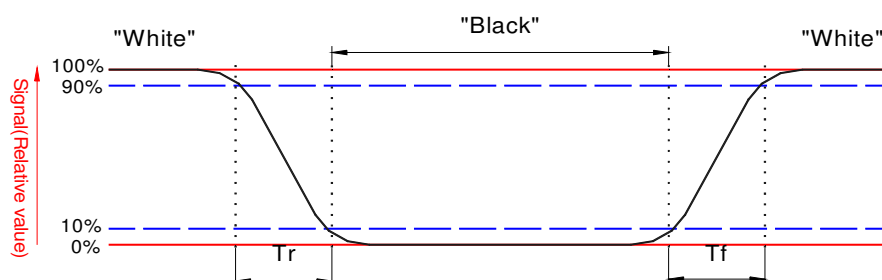
Note 1: Measurement should be performed in the dark room, optical ambient temperature = 25 °C, and backlight current $I_L = 90\text{mA(TBD)}$.

Note 2: To be measured in the center area of TFT-LCD with a field angle of 1° by Topcon luminance meter SR3, after 10 minutes operation and warm up 30 minutes.

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Note 3: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "black state" to "white state" (falling time) and from "white state" to "black state" (rising time), respectively.



Note 4: Based on liquid crystal characteristics, the response time will become slower and the color of panel will become darker than the above optical specification when ambient temperature is below 25 °C.

Note 5: Contrast ratio is calculated with the following formula.
(8-degree viewing)

G. Reliability Test Items(Note 1 ~ 7)

No.	Test items	Conditions		Remark	Validation stage
1	High temperature storage	Ta= 95 °C	240 Hrs		
2	Low temperature storage	Ta= -40 °C	240 Hrs		
3	Low temperature operation	Ta= -30 °C	240 Hrs		
4	High temperature operation	Ta= 85 °C	1000 Hrs	Note 5	
5	High temperature and high humidity	Ta= 65 °C, 90 % RH On 1hr / Off 47hr	1000 Hrs	Note 5	
6	Thermal Shock	-40 °C (30min) ~ 85 °C (30min) / 632 cycles 1 Hrs/cycle		Note 5	
7	Power Temperature Cycling	-30 °C ~ 85 °C / 3hr/cycle / 211 hrs		Note 5	

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