

1.3 General Specifications

Item	Specification	Unit
Screen size (diagonal)	10.3	inch
Aspect ratio	12:9	-
Display resolution	1280RGBx480	-
Pixel Arrangement	RGB – stripe 0.0635(x3) x 0.1905 (square pixels)	-
LCD technology	Active matrix TFT	-
Image mode	Normally Black	-
Display type / technology	Transmissive IPS	-
Brightness	1233	Cd/m ²
Display colors	262K (6 bits) / 16.2M (8 bits)	-
Backlight	White LED	-
Module type	LCD, backlight, TP	-
Operating Temperature	-30to +85 (surface temperature) -40'C with limited performance	°C
Electronics and interface		
Panel interface	RSDS	
LCD Power consumption	1000	mW
LED BL Power consumption	10.24(20 pcs LED)	W
Total Power consumption	11.24(LCD driving + LED)	W
Basic display features		
Preferred viewing direction	Horizontal axis	-
Surface treatment	Hard Coating (3H), AG	-
Visibility with polarised sunglass	OK	-
Mechanical dimensions		
Active area (LCD)	243.84x 91.44	mm ²
Outline dimension	Max.262x108.5	mm ²
Thickness	Max.15.0	mm
Weight	470	g

3 Input / output pinning and connector description

3.1 LC-module without power board on FPC

	Input signal name RSDS	I/Opin (Input, O:output, P:power)	Typical voltage (Volt)		description			
1	VCC1	P	3.0	power supply	External main and I/O power supply			
2	VSS	P	0.00	Digital ground	External main and I/O power supply			
3	VDDN	P	-6.60	power supply	External power supply for source driver			
4	VSSA	P	0.00	analog ground	Analog circuit ground			
5	VDDP	P	6.60	power supply	External power supply for source driver			
6	RSDS B0/B1 +	OPEN	6 bit mode is selected for this module. Pin 6 ,7,14,15,22,23 should be open.					
7	RSDS B0/B1 -	OPEN						
8	RSDS B2/B3 +	I						
9	RSDS B2/B3 -	I						
10	RSDS B4/B5 +	I						
11	RSDS B4/B5 -	I						
12	RSDS B6/B7 +	I						
13	RSDS B6/B7 -	I						
14	RSDS G0/G1 +	OPEN						
15	RSDS G0/G1 -	OPEN						
16	RSDS G2/G3 +	I						
17	RSDS G2/G3 -	I						
18	RSDS G4/G5 +	I						
19	RSDS G4/G5 -	I						
20	RSDS G6/G7 +	I						
21	RSDS G6/G7 -	I						
22	RSDS R0/R1 +	OPEN						
23	RSDS R0/R1 -	OPEN						
24	RSDS R2/R3 +	I						
25	RSDS R2/R3 -	I						
26	RSDS R4/R5 +	I						
27	RSDS R4/R5 -	I						
28	RSDS R6/R7 +	I						
29	RSDS R6/R7 -	I						
30	VSS	P				Digital ground	Digital ground	Logic circuit and I/O ground (0V)
31	CLKP	I				pixel clock	pixel clock	Pixel clock signal
32	CLKN	I				pixel clock	pixel clock	
33	VSS	P				Digital ground	Digital ground	Logic circuit and I/O ground (0V)
34	HS	I				Synchronous signal		Line synchronous signal (HS) for SYNC mode, or start pulse (DIO) for dumb source mode.
35	VS	I	Frame synchronous signal (VS) for SYNC mode, or polarity (POL) for dumb source mode.					
36	DE	I	Data enable signal (DE) for DE mode, or latch (LD) for dumb source mode.					
37	BIST	OPEN	H	3.0	For internal test			
			L	0.00				
38	RESET	I	H	3.0	Reset pin			
			L	0.00				
Reset pin RESETB=0: reset RESETB=1: normal operation								

			L	0.00		EEPEN=0: disable (default) EEPEN=1: enable Set Low to disable this function for this module
40	SIDEN	I	H	3.0	chip ID identification	Enable chip ID identification in SPI. See "SPI interface". SIDEN=0: disable SIDEN=1: enable (default) Set Low to disable this function for this module
			L	0.00		
41	U/D	OPEN	H	3.0	For internal test only	This pin is not in use since this function is controlled by software setting for this module.
			L	0.00		
42	R/L	OPEN	H	3.0	For internal test only	This pin is not in use since this function is controlled by software setting for this module.
			L	0.00		
43	DINT	OPEN	H	3.0	For internal test only	This pin is not in use since this function is controlled by software setting for this module.
			L	0.00		
44	ESDAI	OPEN			For internal test only	these pins should be open or connected to ground as they are not in use for this module
45	ESDAO	OPEN				
46	ESCL	OPEN				
47	ECS	OPEN				
48	SDAO	O		SPI	SPI	Serial data output of SPI
49	SDAI	I				Serial data input of SPI
50	SCL	I				Clock signal of SPI
51	CSB	I				Chip select signal CSB=0: Selected (accessible) CSB=1: Not selected (inaccessible)
52	VSSA	P	0.00	analog ground	analog ground	Analog circuit ground
53	VSSA	P				Analog circuit ground
54	VCC2	P	3.0	power supply	power supply	External power supply for internal references
55	VCC1	P	3.0	power supply	power supply	External main and I/O power supply
56	VDD_OTP	OPEN	9.50	For internal test only		this pin should be open or connected to ground as it is not in use for this module
57	VGL	P	-12.00	power supply	power supply	power supply for Gate off output
58	VGH	P	14.00	power supply	power supply	power supply for Gate on output
59	VDD	P	3.30	power supply	power supply	Digital power supply
60	VSS	P	0.00	Digital ground	Digital ground	Logic circuit and I/O ground (0V)

Note:

Voltage levels listed in this table are for indication, chapter Electrical characteristics is leading.

Pins reserved for internal test are suggested to keep open or default setting.

H and L are both allowed since the pins are useless for function setting.

3.2 Backlight

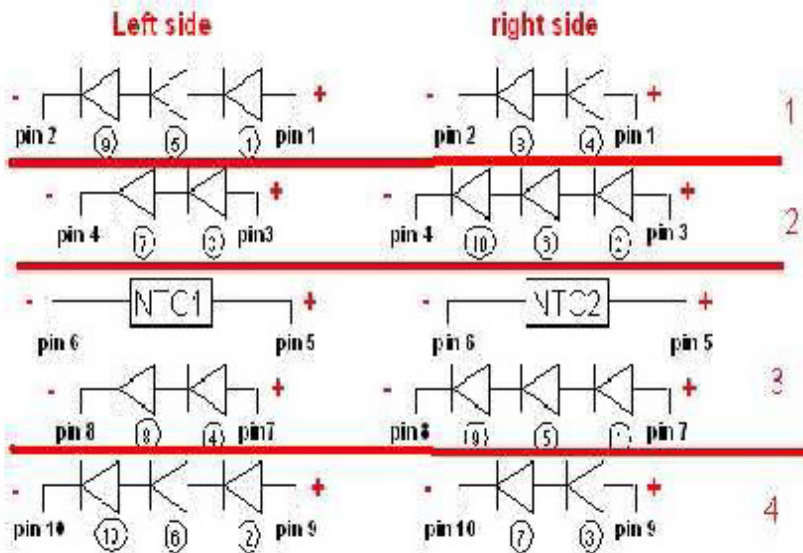
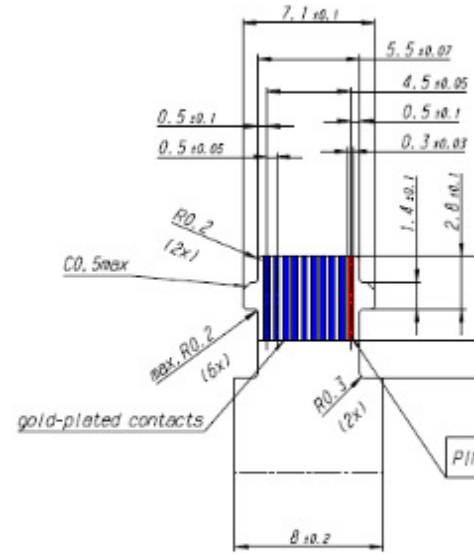
Left side

Pin1	LED1+l
Pin2	LED1-l
Pin3	LED3+l
Pin4	LED3-l
Pin5	NTC1
Pin6	GND
Pin7	LED4+l
Pin8	LED4-l
Pin9	LED 2+l
Pin10	LED 2-l

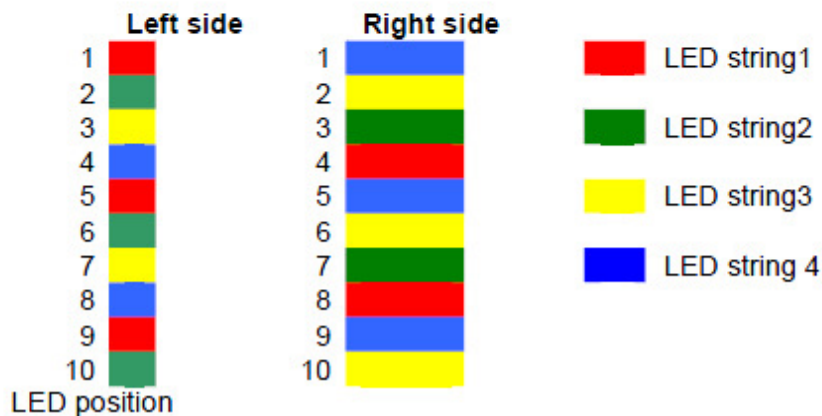
Pinning table

Right side

Pin1	LED1+r
Pin2	LED1-r
Pin3	LED3+r
Pin4	LED3-r
Pin5	NTC2
Pin6	GND
Pin7	LED4+r
Pin8	LED4-r
Pin9	LED 2+r
Pin10	LED 2-r



Connection diagram



4 Absolute maximum ratings

There is a difference between the maximum value of a parameter's specification and its absolute maximum value. The maximum value indicates that the performance will be reduced when you go beyond this value but this is reversible. Where the absolute maximum value as indicated in this section is a value beyond which permanent damage to the product or its function may be expected.

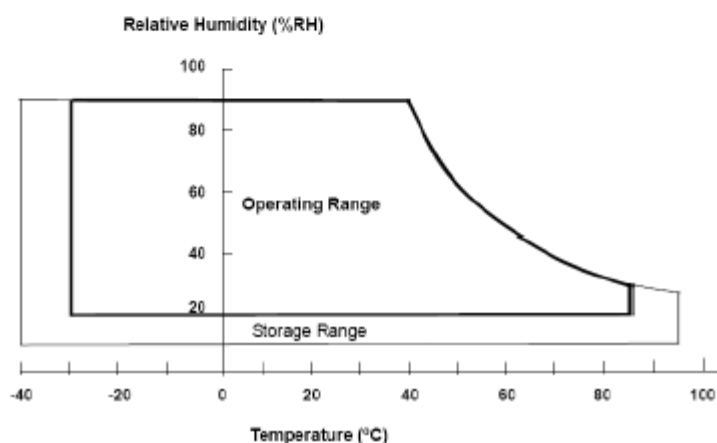
Function operation should be restricted to the conditions described under Normal Operating Conditions.

4.1 Absolute ratings of environment

Item	Symbol	Min.	Max.	Unit	Remark
Operating temperature	OTR	-30	+85	°C	Note 1,2
Storage temperature	STR	-40	+90	°C	Note 1

Note 1: Panel surface temperature, no condensation allowed under any condition.

Note 2: Operating from -40/-30°C possible, readable to some extent, cosmetic defects can happen.



To prevent overheating the LCM backside cold air flow is required.

4.2 Absolute ratings of TFT LCD module

Item	Symbol	Min.	Max.	Unit	Remark
Main and I/O power Supply	VCC1	0	3.96	V	
Power Supply for internal reference	VCC2	0	3.96	V	
Power Supply Source driver	VDDN	-7.37	0	V	
Power Supply Source driver	VDDP	0	7.37	V	
Power Supply Gate driver	VDD	-0.3	7.0	V	
Power Supply Gate off	VGL	VGH - 42	0.3	V	
Logic signals Gate on	VGH	-0.3	42	V	
Digital inputs		-0.3	7.3		

Note: GND=0V

4.3 Absolute ratings of Backlight unit

Item	Symbol	Min.	Max.	Unit	Remark
LED Light Bar Power Supply Current	led	0	280	mA	Per chain

5 Electrical characteristics

5.1 Recommended operation conditions (based on GND=0V; Ta 25°C±2°C)

Item	Symbol	Min.	Typ	Max.	Unit	Remark
Power Supply	VCC1	2.7	3.0	3.6	V	Note 2
Power Supply	VCC2	2.7	3.0	3.6	V	Note 2
Power Supply Source driver	VDDN	-6.7	-6.6	-6.5	V	Note 1,2
Power Supply Source driver	VDDP	6.5	6.6	6.7	V	Note 1,2
Digital Power Supply	VDD	2.3	3.3	5.0	V	Note 2
Power Supply Gate off	VGL	-13	-12	-10	V	Note 2
Power Supply Gate on	VGH	13	14	20	V	Note 2
Logic signals off	VIL	0		0.2VCC	V	
Logic signals on	VIH	0.8VCC		VCC	V	
Power Supply	VCC1	26	30.7	35.6	mA	
Power Supply	VCC2	26	30.7	35.6	mA	
Power Supply Source driver	VDDN	46.3	56.6	61.9	mA	
Power Supply Source driver	VDDP	36.2	45.4	50.4	mA	
Digital Power Supply	VDD	0.1	0.12	0.15	mA	
Power Supply Gate off	VGL	0.23	0.25	0.3	mA	
Power Supply Gate on	VGH	0.22	0.27	0.31	mA	

Note 1 Typ value of VDDP and VDDN might be adjusted for design margin if the optical performance can be kept.

Note 2 :

The VCC (VCC1,VCC2) & VDD ripple shall be less than 50m Volt (+/- value)

The VDDN &VDDP ripple is suggested to be less than 100mVolt mVolt (+/- value).

The VGH &VGL ripple is suggested to be less than 100mVolt mVolt (+/- value)

Ripple higher than the suggested value should be verified by the actual application.

5.2 Backlight Unit (based on GND=0V; Ta 25°C±2°C)

Item	Symbol	min	Typ	Max.	Unit	Remark
LED Power Supply Voltage			16	18	V	Per chain
LED Power Supply Voltage			3.2	3.6	V	Per LED *
LED Power Supply current			160		mA	Per chain
Power Consumption	P		10.24	11.52	W	Total backlight
LED Life Time	Lbl	50000			hours	
Number of Chains		-	4			
Leds per Chains		-	5			

Note:

1. LED type used Nichia NS2W150T. There are 2 brightness ranks PA12 and PA13, 3 color ranks t03, t04, t05 used.

2. The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta = 25 ±2 °C and IL = typ setting (Per EA) until the brightness becomes 50% of its original value.

