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TFT | CHARACTER | UWVD | FSC | SEGMENT | CUSTOM | REPLACEMENT

TFT Display Module

Part Number

E26RE-RW300-N

Overview:

- 2.6-inch TFT: 320x240 (52.80x39.60mm)
- 3/4 SPI+16/18-bit RGB Interface
- 8/9/16/18-bit MCU Interface
- 3-line/4-line Serial Interface
- White LED back-light
- Operating Temp: -20° to 70°C
- Storage Temp: -30°C to 80°C
- Transmissive/ Normally White
- No Touch Panel
- 300 NITS
- Controller: ILI9342C
- RoHS Compliant

Description

This is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This model is composed of a Transmissive type TFT-LCD Panel, driver circuit, back-light unit. The resolution of a 2.6" TFT-LCD contains 320x240 pixels, and can display up to 65K/262K colors.

Features

Display Colors of TFT LCD: 65K/262K colors

-Interface: 8/9/16/18Bit MCU Interface

3/4SPI+16/18Bit RGB Interface

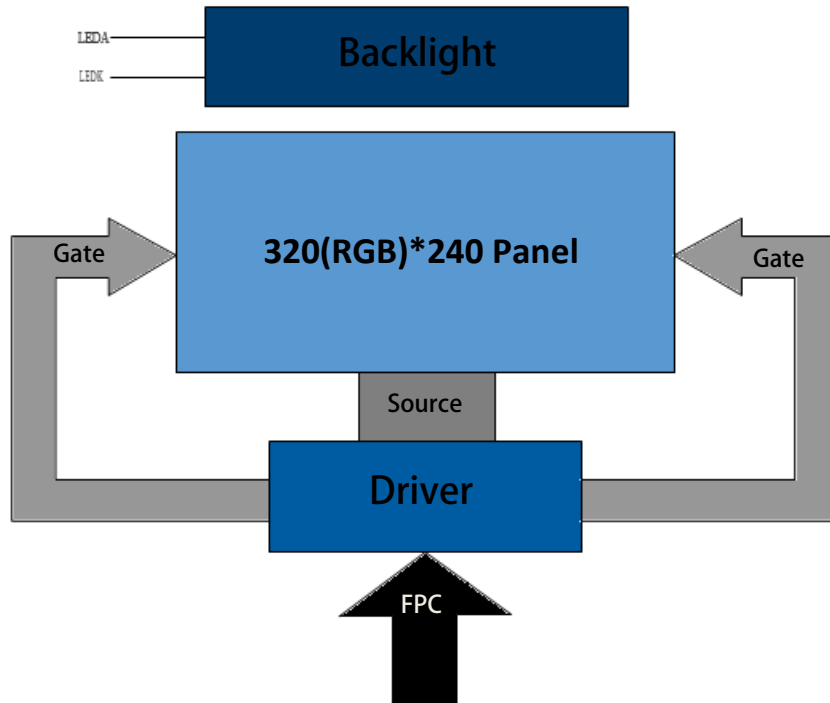
3-line/4-line Serial Interface

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	52.80(H)*39.60 (V) (2.6inch)	mm	-
Driver element	TFT active matrix	-	-
Display colors	65K/262K	colors	-
Number of pixels	320(RGB)*240	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.165(H)*0.165(V)	mm	-
Viewing angle	12:00	o'clock	-
Controller IC	ILI9342C	-	-
Display mode	Transmissive/ Normally White	-	-
Operating temperature	-20~+70	°C	-
Storage temperature	-30~+80	°C	-

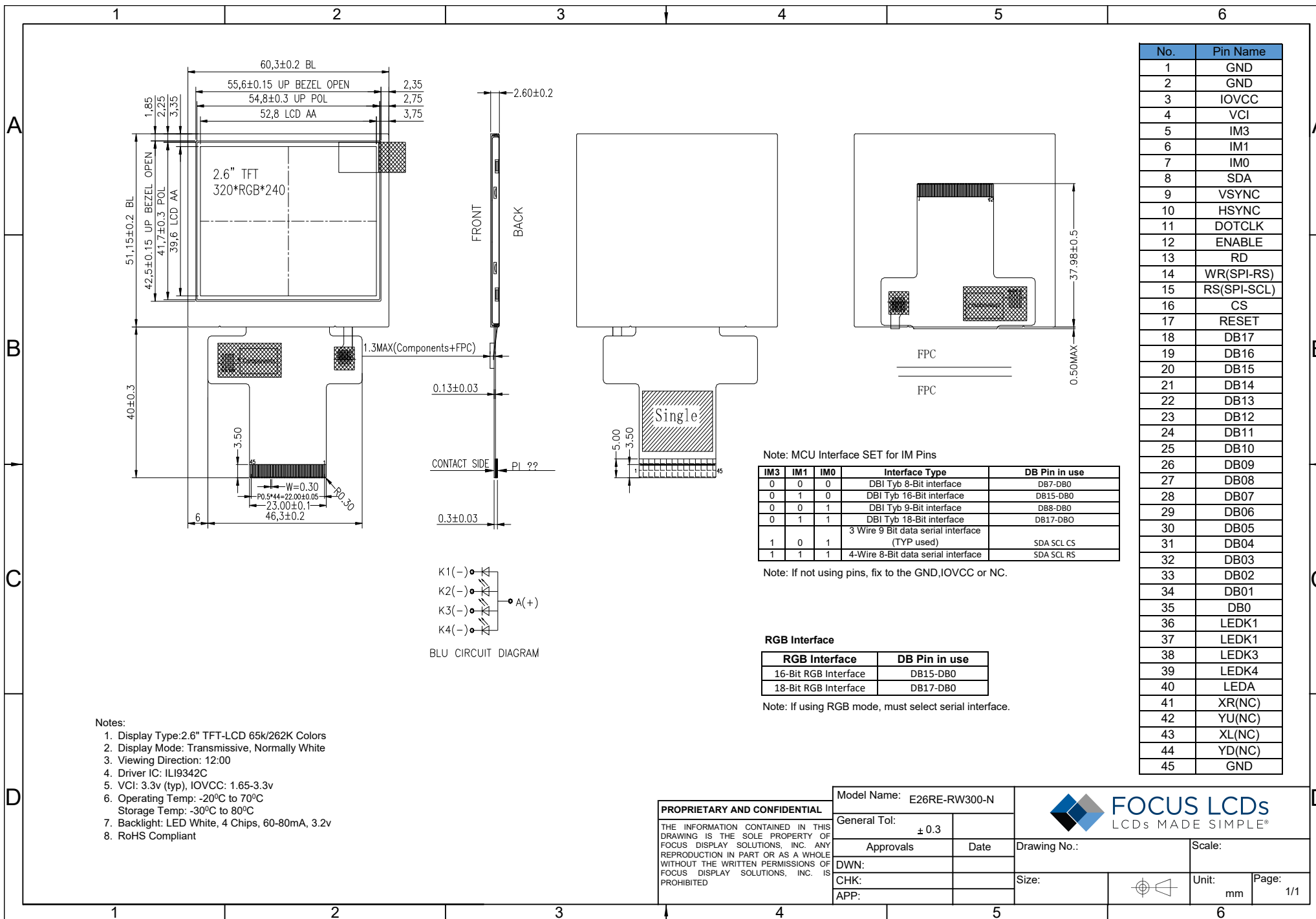
Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)		60.30		mm	-
	Vertical(V)		51.15		mm	-
	Depth(D)		2.60		mm	-
Weight			TBD		g	-

1. Block Diagram



2. Outline dimensions



3. Input Terminal Pin Assignment

NO.	SYMBOL	DISCRIPTION	I/O																																			
1	GND	Ground.	P																																			
2	GND	Ground.	P																																			
3	IOVCC	Supply voltage(1.65-3.3V)	P																																			
4	VCI	Supply voltage(3.3V).	P																																			
5	IM3	Interface Selection <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>IM3</th> <th>IM2</th> <th>IM0</th> <th>Interface type</th> <th>DB Pin in use</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>DBI Tyb_ 8-bit interface</td> <td></td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>DBI Tyb_ 16-bit interface</td> <td>DB15-DB0</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>DBI Tyb_ 9-bit interface</td> <td>DB8-DB0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>DBI Tyb_ 18-bit interface</td> <td>DB17-DB0</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>3-Wire 9 BIT data serial interface.</td> <td>SDA SCL CS</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>4-Wire 8 BIT data serial interface</td> <td>SDA SCL CS RS</td> </tr> </tbody> </table>	IM3	IM2	IM0	Interface type	DB Pin in use	0	0	0	DBI Tyb_ 8-bit interface		0	1	0	DBI Tyb_ 16-bit interface	DB15-DB0	0	0	1	DBI Tyb_ 9-bit interface	DB8-DB0	0	1	1	DBI Tyb_ 18-bit interface	DB17-DB0	1	0	1	3-Wire 9 BIT data serial interface.	SDA SCL CS	1	1	1	4-Wire 8 BIT data serial interface	SDA SCL CS RS	I
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6	IM2		I																																			
7	IM0		I																																			
8	SDA	Serial input signal.The data is applied on the rising edge of the SCL signal. If not used, fix this pin at VCI or GND.	I																																			
9	VSUNC	Frame synchronizing signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I																																			
10	HSUNC	Line synchronizing signal for RGB interface operation. fix this pin at VCI or GND when not in use	I																																			
11	DOTCLK	Dot clock signal for RGB interface operation Fix this pin at VCI or GND when not in use.	I																																			
12	ENABLE	Data enable signal for RGB interface operation. fix this pin at VCI or GND when not in use.	I																																			
13	RD	Serves as a read signal and MCU read data at the rising edge. fix this pin at VCI or GND when not in use.	I																																			
14	WR(SPI-RS)	(WR): Serves as a write signal and writes data at the rising edge. 4-line system (RS): Serves as command or parameter select. Fix to IOVCC or GND level when not in use.	I																																			
15	RS(SPI-SCL)	This pin is used to select "Data or Command" in the parallel interface. When RS = '1', data is selected. When RS = '0', command is selected. This pin is used serial interface clock in 3-wire 9-bit / 4-wire 8-bit serial data interface. If not used, this pin should be connected to IOVCC or GND. RS_SCL1 is equal to RS(SCL).	I																																			
16	CS	Chip select input pin ("Low" enable). This pin can be permanently fixed "Low" in MPU interface mode only. CSX1 is equal to CSX.	I																																			
17	RES	This signal will reset the device and must be applied to properly initialize the chip. Signal is active low. RESX1 is equal to RESX	I																																			
18-35	DB17	18-bit parallel bi-directional data bus for MCU system and RGB interface mode Fix to GND level when not in use	I/O																																			
36	LEDK1	Cathode pin OF backlight	P																																			
37	LEDK2	Cathode pin OF backlight	P																																			
38	LEDK3	Cathode pin OF backlight	P																																			
39	LEDK4	Cathode pin OF backlight	P																																			
40	LEDA	Anode pin of backlight	P																																			
41	XR	Touch panel Right Glass Terminal	A/D																																			
42	YU	Touch panel Top Film Terminal	A/D																																			
43	XL	Touch panel LIFT Glass Terminal	A/D																																			
44	YD	Touch panel Bottom Film Terminal	A/D																																			
45	GND	Ground.	P																																			

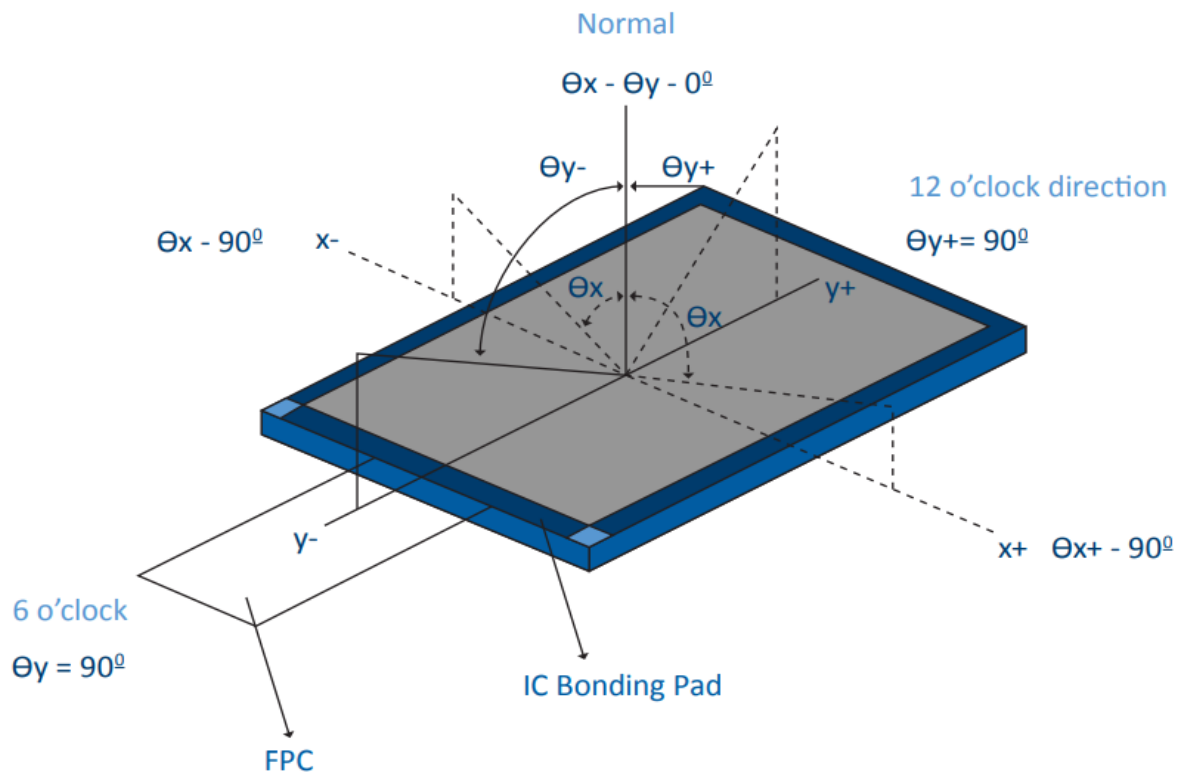
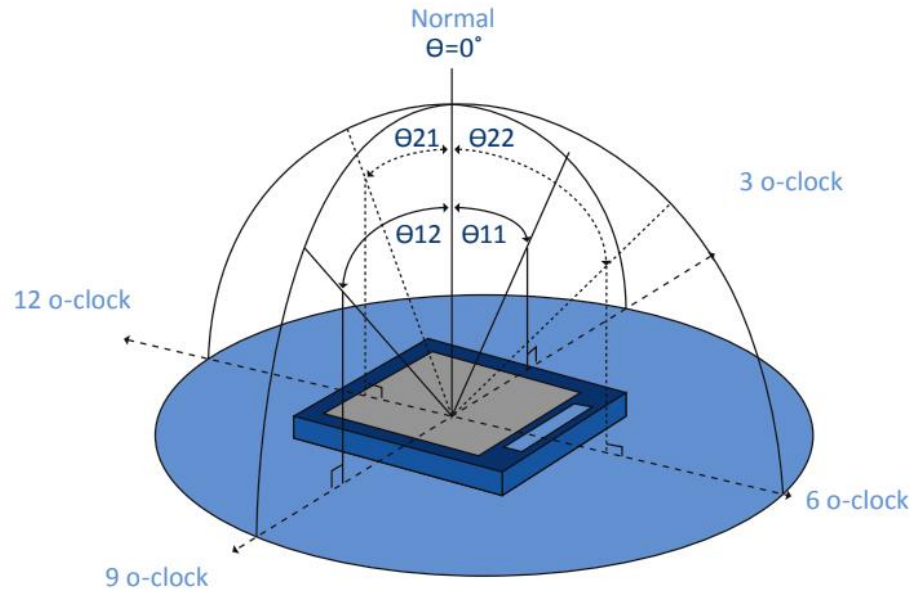
4. LCD Optical Characteristics

4.1 Optical specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.	Note
Contrast Ratio	CR	$\Theta=0$	--	300	--		
Response time	Rising	T_{R+T_F}	Normal viewing angle	35	50	msec	
	Falling						
Color gamut	S(%)		--	58	--	%	
Color Filter Chromacity	White	W_X	0.27	0.310	0.35		
		W_Y	0.296	0.336	0.376		
	Red	R_X	0.601	0.621	0.641		
		R_Y	0.342	0.363	0.383		
	Green	G_X	0.324	0.344	0.364		
		G_Y	0.588	0.608	0.628		
	Blue	B_X	0.130	0.150	0.170		
		B_Y	0.055	0.075	0.095		
Viewing angle	Hor.	Θ_L	CR>10	--	50	--	deg
		Θ_R		--	50	--	
	Ver.	Θ_U		--	35	--	
		Θ_D		--	50	--	
Option View Direction	12 O'Clock						

Optical Specification Reference Notes:

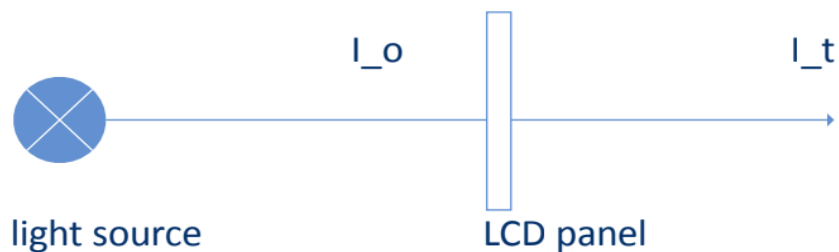
(1) Definition of Viewing Angle: The viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3,9 o'clock direction and the vertical or 6,12 o'clock direction with respect to the optical axis which is normal to the LCD surface.



(2) Definition of Contrast Ratio (Cr): measured at the center point of panel. The contrast ratio (Cr) measured on a module, is the ratio between the luminance (Lw) in a full white area (R=G=B=1) and the luminance (Ld) in a dark area (R=G=B=0).

$$Cr = \frac{L_w}{L_d}$$

(3) Definition of transmittance (T%): The transmittance of the panel including the polarizers is measured with electrical driving.



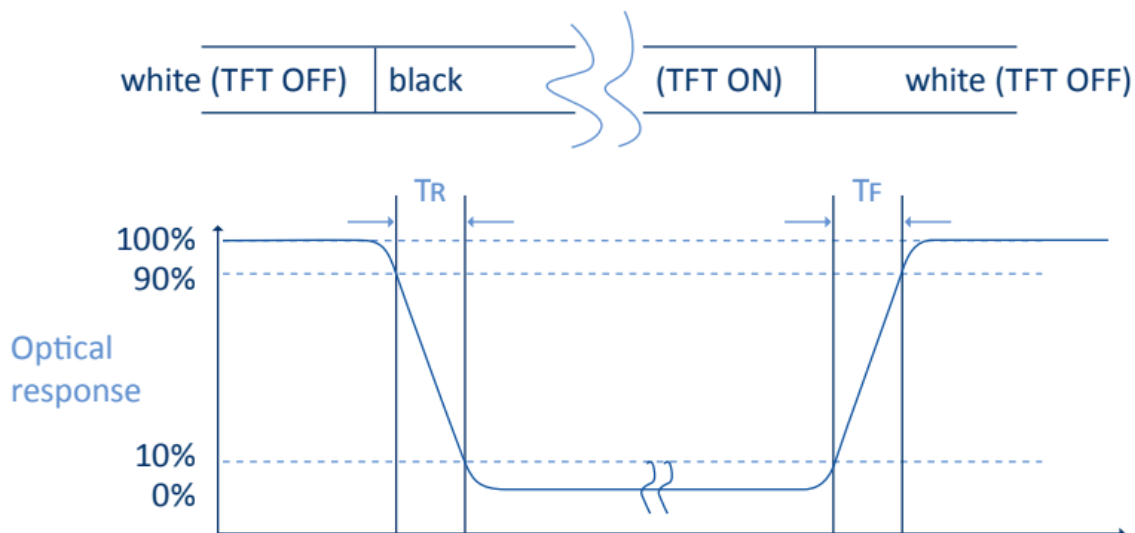
The transmittance is defined as:

$$Tr = \frac{I_t}{I_o} \times 100\%$$

I_o = the brightness of the light source.

I_t = the brightness after panel transmission

(4) Definition of Response Time (Tr, Tf): The rise time 'Tr' is defined as the time for luminance to change from 90% to 10% as a result of a change of the electrical condition. The fall time 'Tf' is defined as the time for luminance to change from 10% to 90% as a result of a change of the electrical condition.



(5) Definition of Color Gamut: Measuring machine CFT-01. NTSC's Primaries: R(x,y,Y),G(x,y,Y), B(x,y,Y). FPM520 of Westar Display Technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

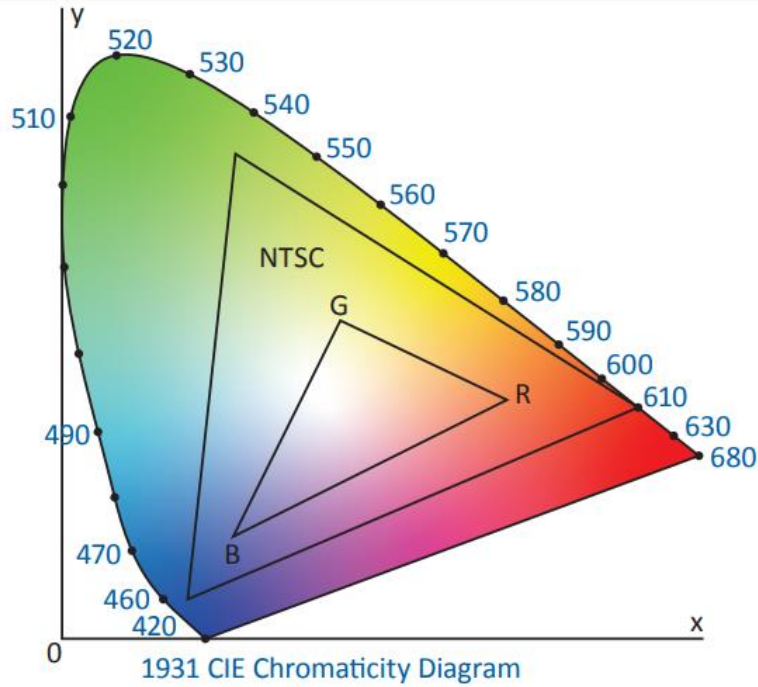
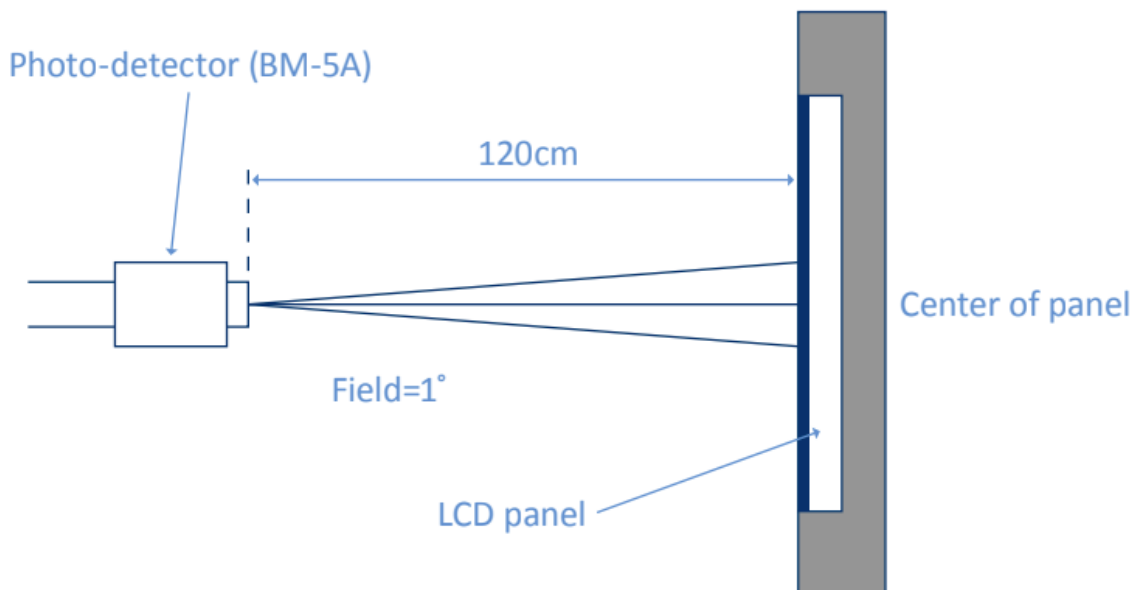


Fig. 1931 CIE chromacity diagram

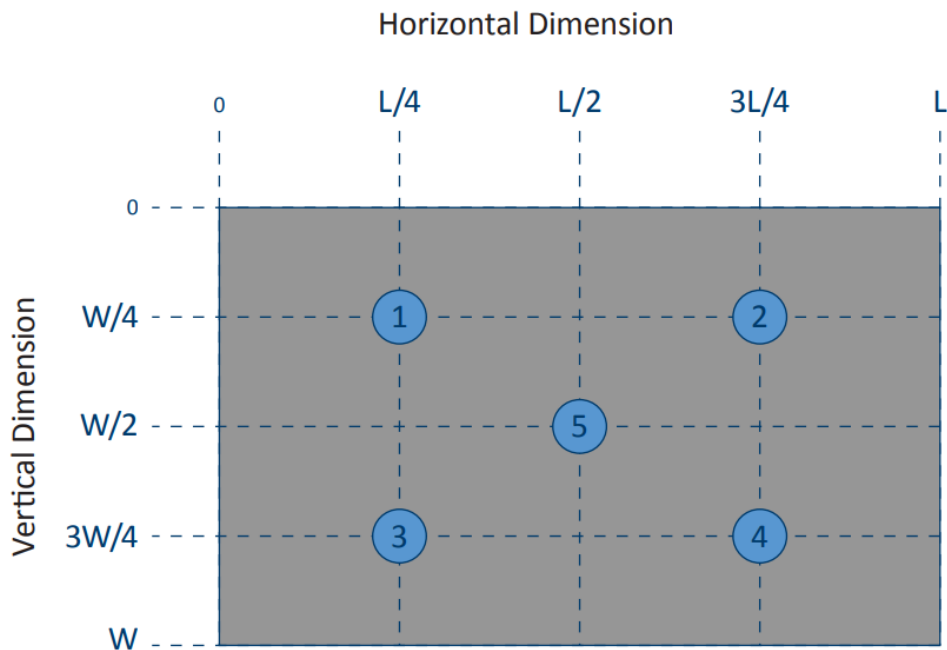
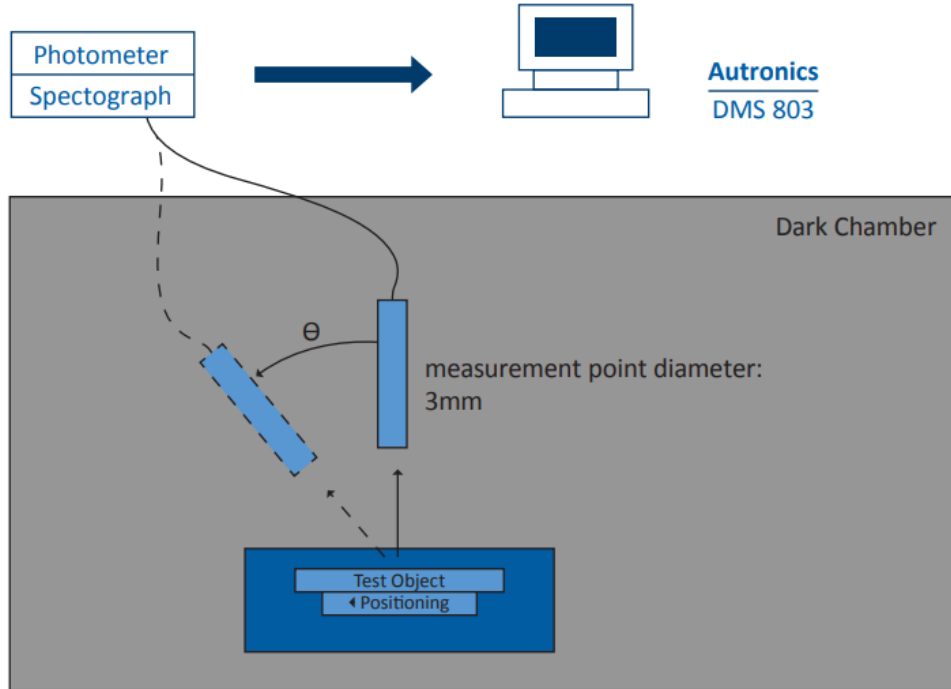
$$\text{Color gamut: } S = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}} \times 100\%$$

(6) Definition of Optical Measurement Setup:



(6) Optical Measurement Setup Continued:

The LCD module should be stabilized at a 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.



X = test point
X = 1 to 5

5. Electrical Characteristics

5.1 Absolute Maximum Rating (Ta=25)

Characteristics	Symbol	Min	Max	Unit
Digital Supply Voltage	VCI	-0.3	4.2	V
Interface Operation Voltage	IOVCC	-0.3	3.3	V
Operating temperature	TOP	-20	+70	°C
Storage temperature	TST	-30	+80	°C

NOTE: If the absolute maximum rating of even is one of the above parameters is exceeded even momentarily, the quality of the product may be degraded. Absolute maximum ratings, therefore, specify the values exceeding which the product may be physically damaged. Be sure to use the product within the range of the absolute maximum ratings.

5.2 DC Electrical Characteristics

Characteristics	Symbol	Min	Typ.	Max	Unit	Note
Digital Supply Voltage	VCI	2.5	2.8	3.3	V	
Interface Operation Voltage	VDDIO	1.65	1.8	3.3	V	
Normal Mode Current Consumption	IDD	--	3	--	mA	
Level input voltage	VIH	0.7 IOVCC		IOVCC	V	
	VIL	GND		0.3 IOVCC	V	
Level output voltage	VOH	0.8 IOVCC		IOVCC	V	
	VOL	GND		0.2 IOVCC	V	

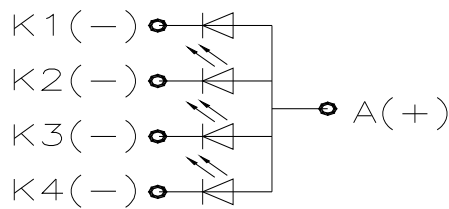
5.3 LED Backlight Characteristics

Item	Symbol	Min	Typ.	Max	Unit	Note
Forward Current	IF	70	80	--	mA	
Forward Voltage	VF	--	3.2	--	V	
LCM Luminance	LV	300	--	--	cd/m2	Note 3
LED lifetime	Hr	50000	--	--	hour	Note1&2
Uniformity	AVG	80	--	--	%	Note 3

The back-light system is edge-lighting type with 4 chips White LED

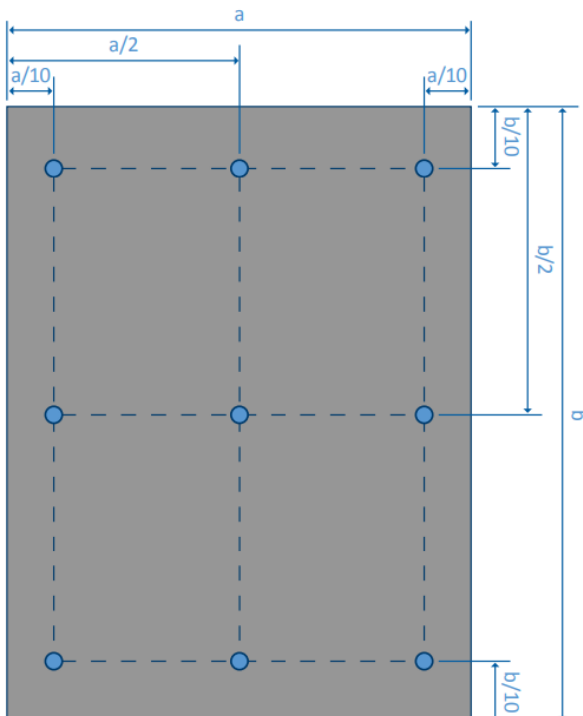
Note 1: LED lifetime (Hr) can be defined as the time in which it continues to operate under the condition: $T_a=25\pm 3^\circ\text{C}$, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note 2: The "LED lifetime" is defined as the module brightness decrease to 50% original brightness at $T_a=25^\circ\text{C}$ and $I_L=80\text{mA}$. The LED lifetime could be decreased if operating I_L is larger than 80mA. The constant current driving method is suggested.



BLU CIRCUIT DIAGRAM

Note 3: Luminance Uniformity of these 9 points is defined as below:



$$\text{Luminance} = \frac{\text{Total Luminance of 9 points}}{9}$$

$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points(1-9)}}{\text{maximum luminance in 9 points(1-9)}}$$

6 Timing Characteristics

For more information on the timing characteristics of this module, please refer to controller ILI9342C Specification

7. Quality Inspection Methodology

For more information on the quality control methods for this module, please visit <https://focuslcds.com/content/LCD%20Quality%20Inspection%20Standards.pdf>

8. Cautions and Handling Precautions

8.1 Handling and Operating the Module

1. When the module is assembled, it should be attached to the system firmly. Do not warp or twist the module during assembly work.
2. Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.
3. Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.
4. Do not allow drops of water or chemicals to remain on the display surface. If you have the droplets for a long time, staining and discoloration may occur.
5. If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
6. The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane. Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
7. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.
8. Protect the module from static; it may cause damage to the CMOS ICs.
9. Use finger stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
10. Do not disassemble the module.
11. Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
12. Pins of I/F connector shall not be touched directly with bare hands.
13. Do not connect, disconnect the module in the "Power ON" condition.
14. Power supply should always be turned on/off by the item Power On Sequence & Power Off Sequence

8.2 Storage and Transportation

1. Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35 °C and relative humidity of less than 70%
2. Do not store the TFT-LCD module in direct sunlight.
3. The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.
4. It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module. In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.
5. This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.