



Product Specification

4.3" TFT LCD Module

Model No :	FB043ELP302-A
Resolution:	480*800
Interface:	RGB+SPI
Luminance:	350cd/m ² (typ)

- ☒ Tentative Specification
☐ Preliminary Specification
☐ Approval Specification

APPROVED		
Designed by	Checked by	Approved by

CUSTOMER APPROVED		
Prepared by	Checked by	Approved by

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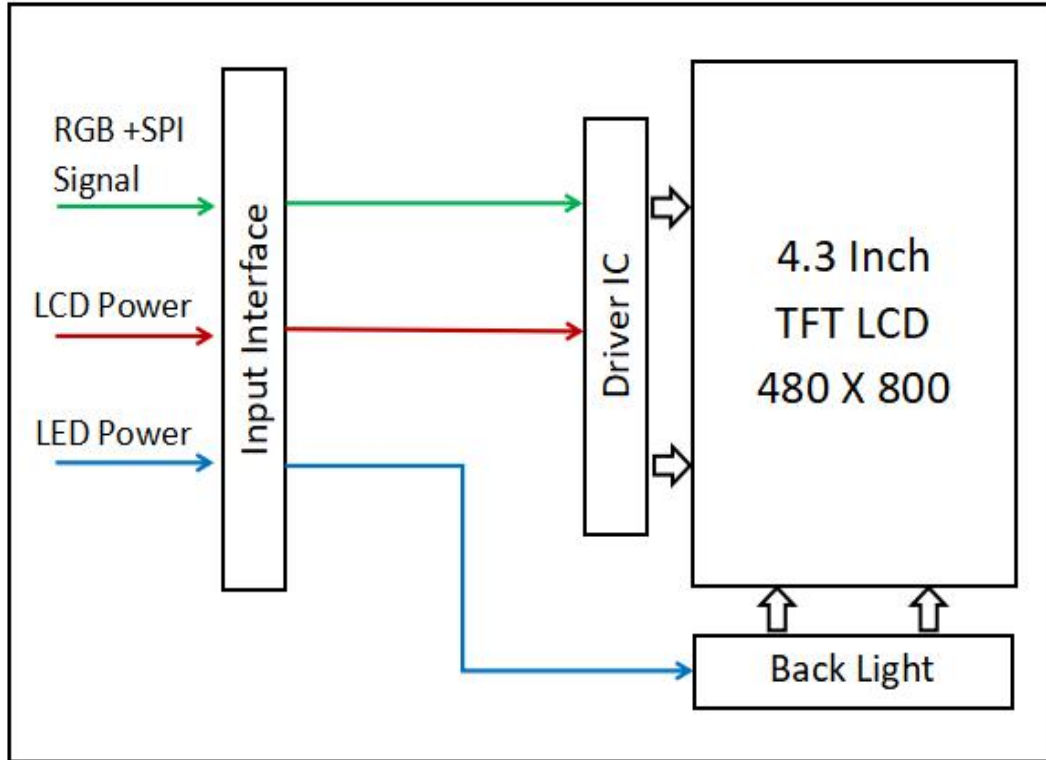
Contents

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1.General Description

The LCM FB043ELP302-A is a 480 x 3RGB x800 dots matrix 4.3 "TFT LCD module.

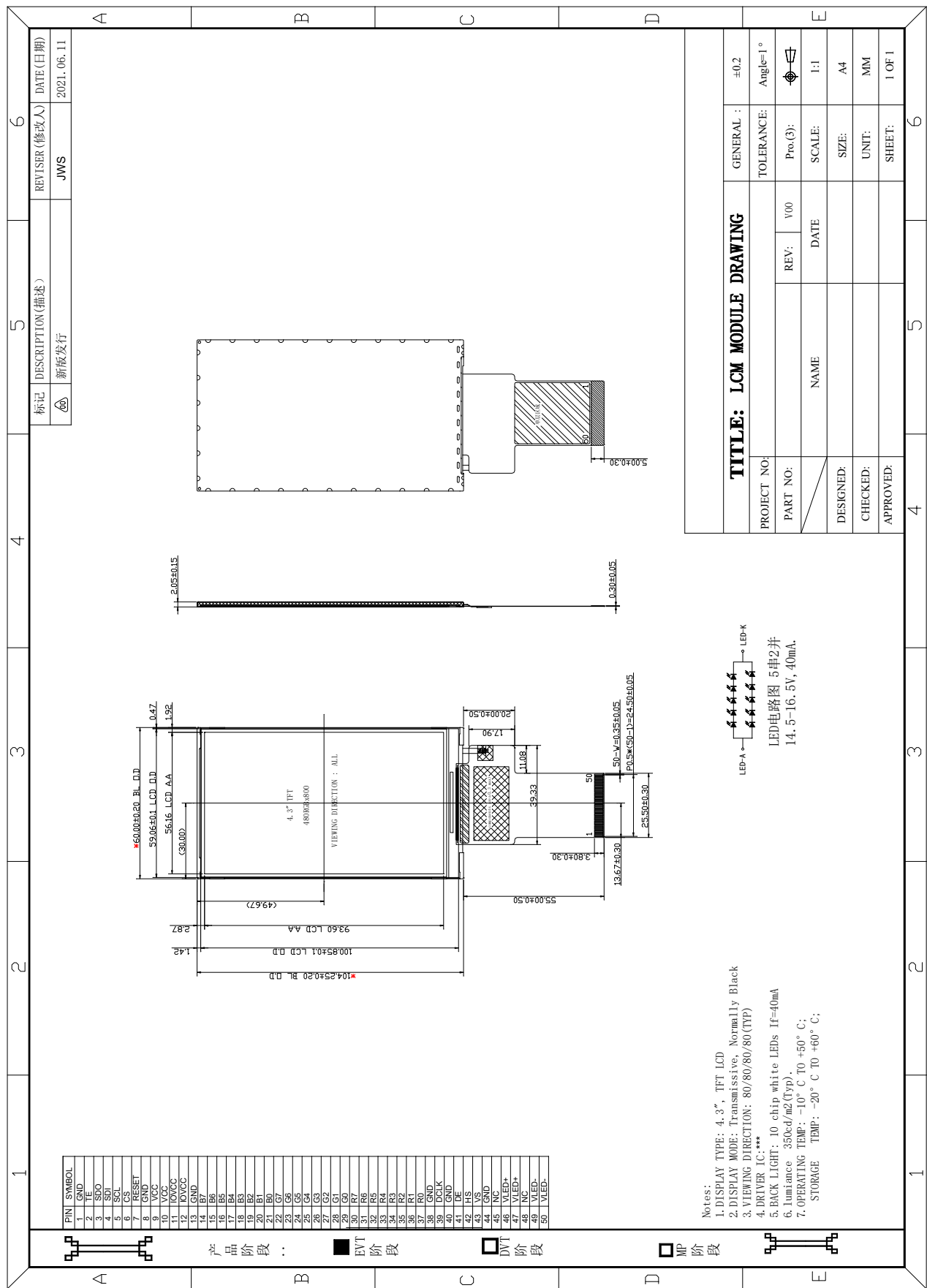


2. Mechanical Specifications

No.	Item	Specification
1	LCD Type	4.3 inch
2	Resolution	480(RGB)X800
3	Display mode	Normally Black
4	Outline size	60.00(H) x 104.00(V) x 2.05(body)
5	Active area	56.16(W) x93.60(H)
5	Pixel pitch	0.039(H) x 0.117(V)
6	Viewing direction	ALL
7	Display Color	16.7M
8	Surface Treatment	AG
9	Interface	RGB+SPI
10	Brightness	350 cd/m ² (typ)
11	Driver IC	ILI9806



3.Outline Dimension





4.Interface Assignment

Pin No.	Symbol	Description	Remark
1	GND	Ground	
2	TE	Tearing effect output	
3	SDO	Serial data output pin used for the SPI Interface	
4	SDI	Serial data input pin used for the SPI Interface	
5	SCL	Serial clock input pin used for the SPI Interface	
6	CS	A chip select signal.	
7	RESET	Global reset pin	
8	GND	Ground	
9	VCC	Power supply for analog system(3.3V)	
10	VCC	Power supply for analog system(3.3V)	
11	IOVCC	Power supply for I/O block(1.8V or 3.3V)	
12	IOVCC	Power supply for I/O block(1.8V or 3.3V)	
13	GND	Ground	
14	B7	Blue data	
15	B6	Blue data	
16	B5	Blue data	
17	B4	Blue data	
18	B3	Blue data	
19	B2	Blue data	
20	B1	Blue data	
21	B0	Blue data	
22	G7	Green data	
23	G6	Green data	
24	G5	Green data	
25	G4	Green data	
26	G3	Green data	
27	G2	Green data	
28	G1	Green data	
29	G0	Green data	
30	R7	Red data	
31	R6	Red data	
32	R5	Red data	
33	R4	Red data	
34	R3	Red data	
35	R2	Red data	
36	R1	Red data	
37	R0	Red data	
38	GND	Ground	
39	DCLK	Sample clock	
40	GND	Ground	
41	DE	Data Input Enable	
42	HS	Horizontal Sync Input	
43	VS	Vertical Sync Input	
44	GND	Ground	
45	NC	No connection	
46	LEDA	LED anode	
47	LEDA	LED anode	
48	NC	No connection	
49	LEDK	LED cathode	
50	LEDK	LED cathode	



5. Operation Specifications

5.1 Absolute Max. Rating

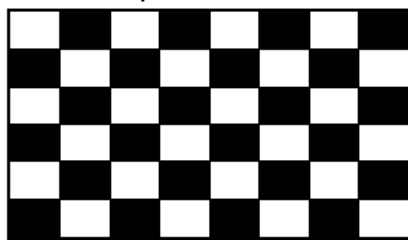
Item	Symbol	Values		Unit
		Min.	Max.	
Power Voltage	VCC	-0.3	3.6	V
	IOVCC	-0.3	3.6	
Input Signal Voltage	V _I	-0.3	IOVCC	V
Operation Temperature	T _{OP}	-10	50	°C
Storage Temperature	T _{ST}	-20	60	°C

5.2 Typical Operation Conditions

Item	Symbol	Values			Unit
		Min.	Typ.	Max.	
Power Voltage	VDD	2.5	3.3	3.6	V
	IOVCC	1.65	3.3	3.6	V
Current Consumption	I _{VDD}	-	TBD	-	mA
	I _{IOVCC}	-	TBD	-	mA
Power Consumption	P _{LCD}	-	TBD	-	W
	P _{LED}	-	0.66	-	W

Note :1. The measuring position is the connector of LCM and the test conditions are under 25°C, Frame Rate=60Hz

2. The specified current and power consumption are under the VCC = 3.3V , 25°C, Frame Rate=60Hz condition and Mosaic pattern, The LED driving condition is ILED=40mA.



5.3 LED Back Light Specification

Item	Symbol	Condition	Min	Typ.	Max	Unit
Forward Voltage	V _f	I _f =40mA	14.5	-	16.5	V
Luminance for LCM	Y _u	I _f =40mA	-	350	-	cd/m ²

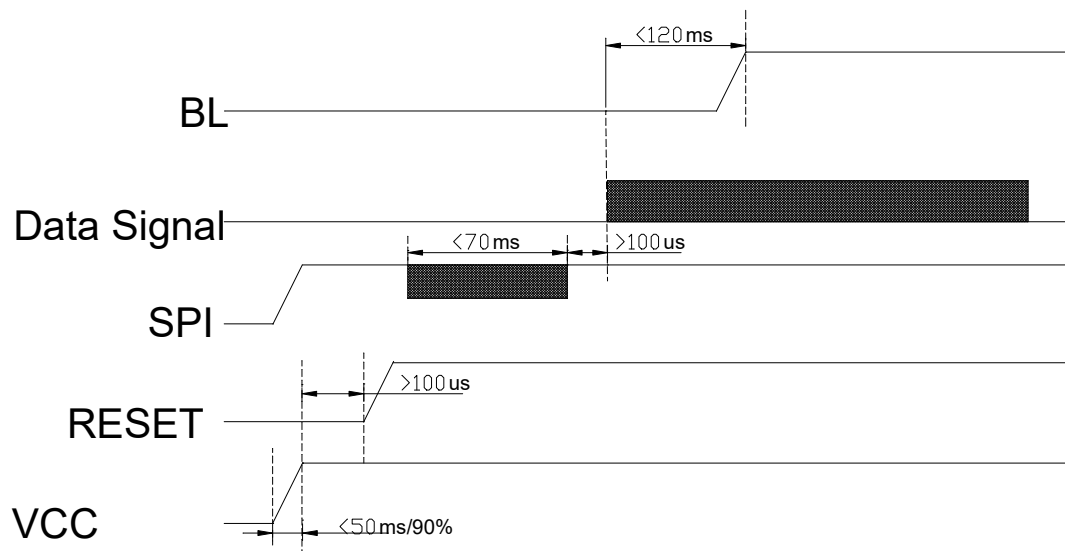


LED电路图 5串2并
14.5-16.5V, 40mA.

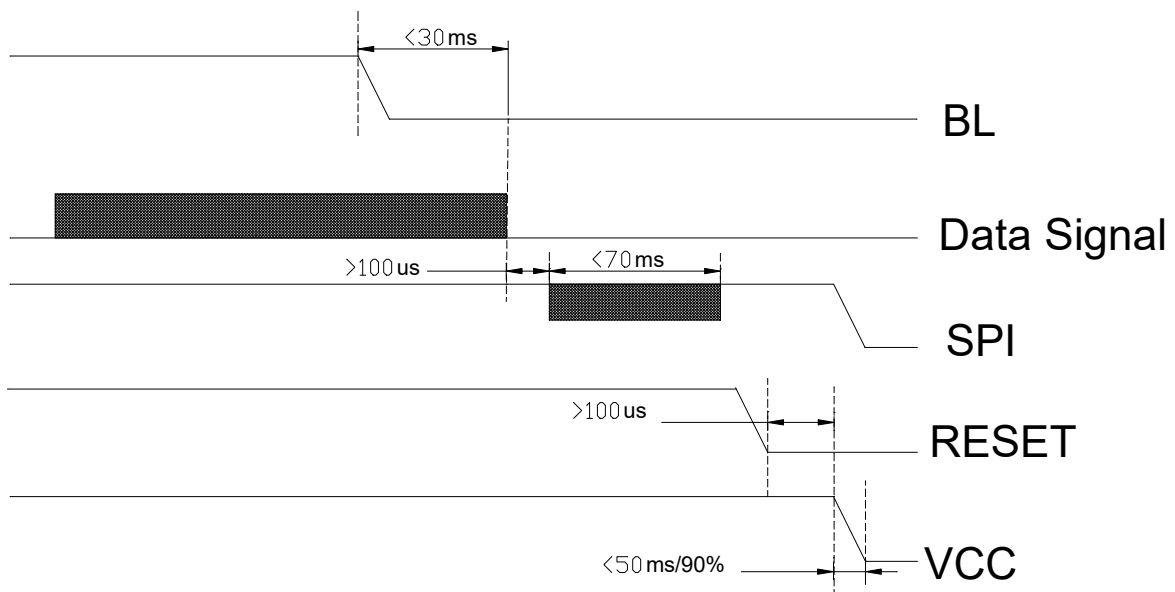


5.4 Power On/Off Sequence

To prevent the device damage from latch up, the power on/off sequence shown below must be followed.



POWER ON

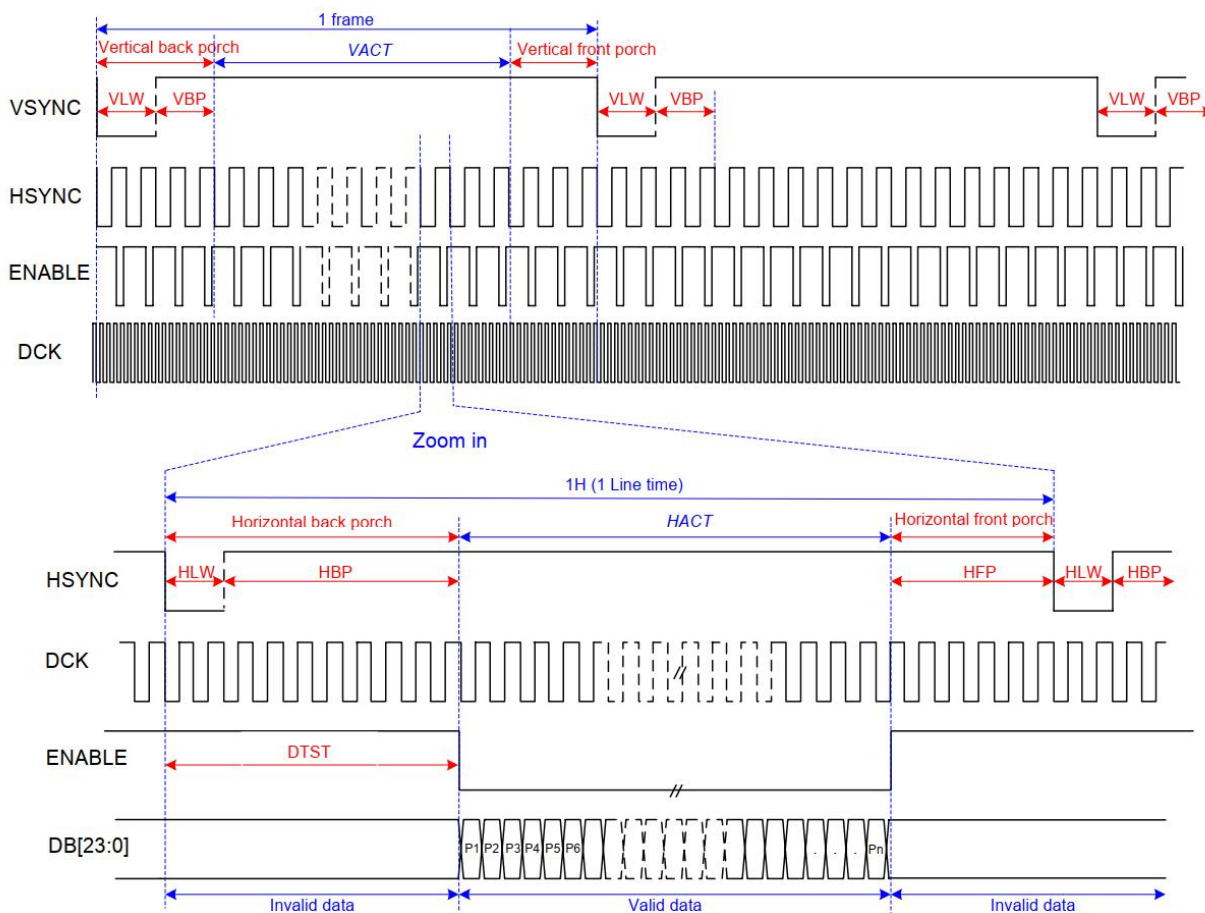


POWER OFF



6. Signal Timing Characteristics

6.1 Signal Electrical Characteristics



VLW : VSYNC Low pulse Width
HLW : HSYNC Low pulse Width
DTST : Data Transfer Startup Time
Pn : pixel 1, pixel 2..., pixel n.

6.2 Timing Setting Table

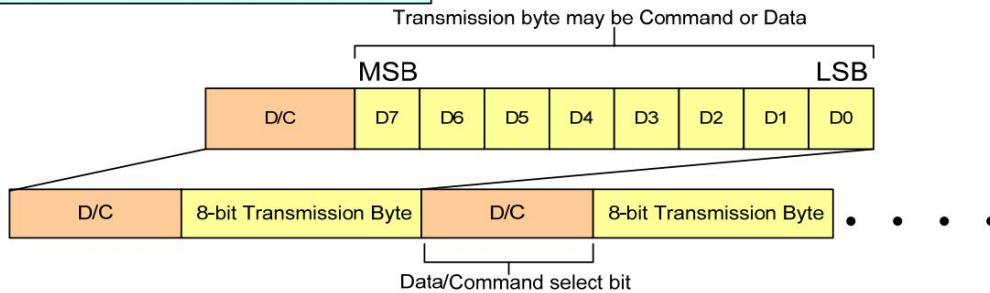
Parameter		Symbol	Min.	Typ.	Max.	Unit
Frame Rate		/	-	60	-	Hz
Clock frequency		1/Tclock	16.6	-	41.7	MHz
Horizontal Section	Period	Th	-	-	-	Tclock
	Active	T _H DISP	480			
	Blanking	T _H FP	2	-	-	
		T _H BP	2	-	126	
		T _H S	1	-	-	
Vertical Section	Period	Tv	-	-	864	Tline
	Active	T _V DISP	800			
	Blanking	T _V F _P	1	-	255	
		T _V B _P	1	-	126	
		T _V S	1	-	-	

6.3 SPI Write Cycle Sequence

In write mode of the interface, the host writes commands and data to the ILI9806E. The 3-line serial data packet contains a D/C (data/command) select bit and a transmission byte. If the D/C bit is "low", the transmission byte is interpreted as a command byte. If the D/C bit is "high", the transmission byte is stored in the command register as a parameter data.

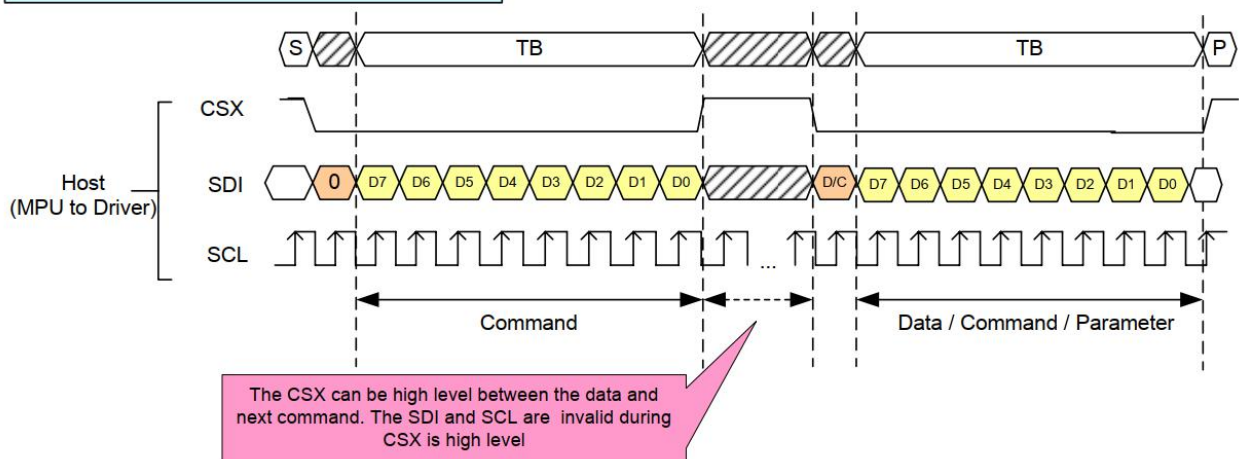
Any instruction can be sent in any order to the ILI9806E and the MSB is transmitted first. The serial interface is initialized when the CSX status is high. In this state, SCL clock pulse and SDI data are ineffective. A falling edge on CSX enables the serial interface and indicates the start of data transmission. See the detail of data format for 3-line serial interface.

3-line Serial Interface Data Format



The host drives the CSX pin to low and setting the D/C bit on the SDI pin. The bit is read by the ILI9806E on the first rising edge of the SCL signal. On the next falling edge of the SCL, the MSB data bit (D7) is set on the SDI pin by the host. On the next falling edge of the SCL, the next bit (D6) is set on the SDI pin. If the optional D/C signal is used, a byte is eight read cycles long. The 3-line serial interface writes sequences described in the Figure 3 below.

3-line Serial Interface Protocol

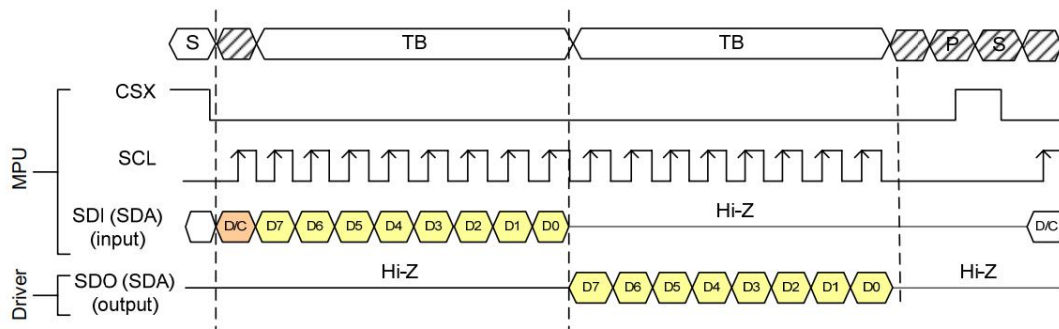




6.4 SPI Read Cycle Sequence

In read mode of the interface, the host reads the register value from the ILI9806E. The host sends a command (Read ID or register command), then a byte is (bytes are) transmitted in the opposite direction. The ILI9806E samples the SDI (input data) at the rising edges of the SCL (serial clock), and shifts SDO (output data) at the falling edges of the SCL (serial clock). The read mode has three types of transmitted command data (8-/24-/32-bit) according command code.

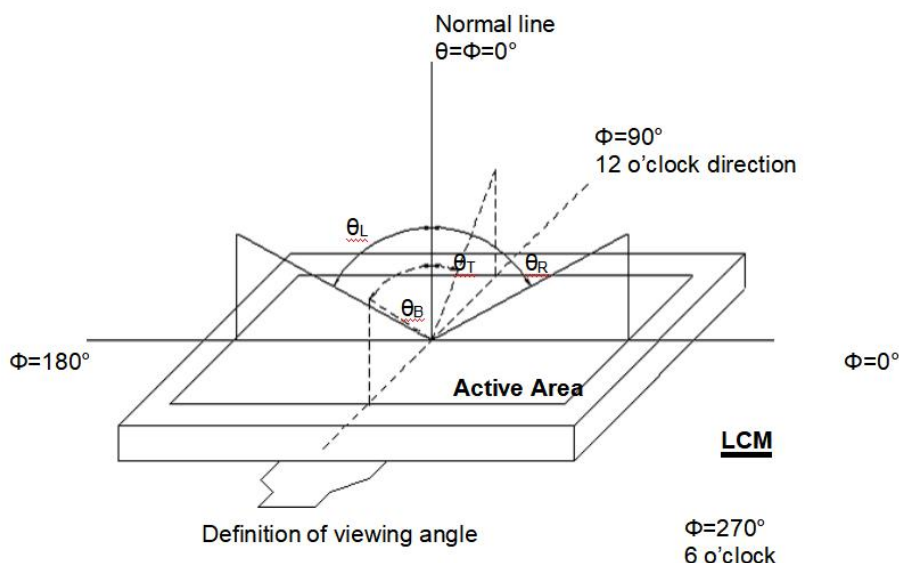
3-line Serial Protocol (for RDID2/RDID3/0Ah/0Bh/0Ch/0Dh/0Eh/0Fh command: 8-bit read)



7. Optical specifications

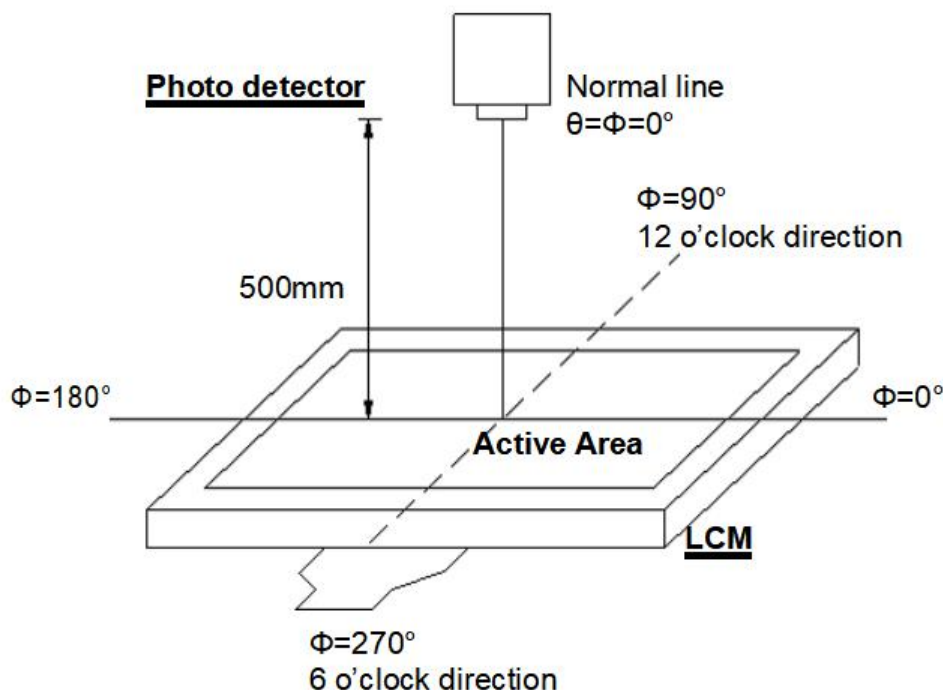
Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	$\Phi=180^\circ$ (9 o'clock)	-	85	-	degree	Note 1
	θ_R	$\Phi=0^\circ$ (3 o'clock)	-	85	-		
	θ_T	$\Phi=90^\circ$ (12 o'clock)	-	85	-		
	θ_B	$\Phi=270^\circ$ (6 o'clock)	-	85	-		
Response time Rise+Fall	T_{RT}	Normal $\theta=\Phi=0^\circ$	-	30	40	msec	Note 3
Contrast ratio	CR		-	800	-	-	Note 4
Color chromaticity	W_X		0.27	-	0.31	-	Note 2
	W_Y		0.28	-	0.32	-	Note 5
NTSC	Ratio		-	50	-	%	Note 6
Luminance	L		350	400	-	cd/m ²	Note 6

Note 1: Definition of viewing angle range



Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm ,Response time is measured by Photo detector TOPCON BM-7A, other items are measured by BM-7A/Field of view: 1° /Height: 500mm.)

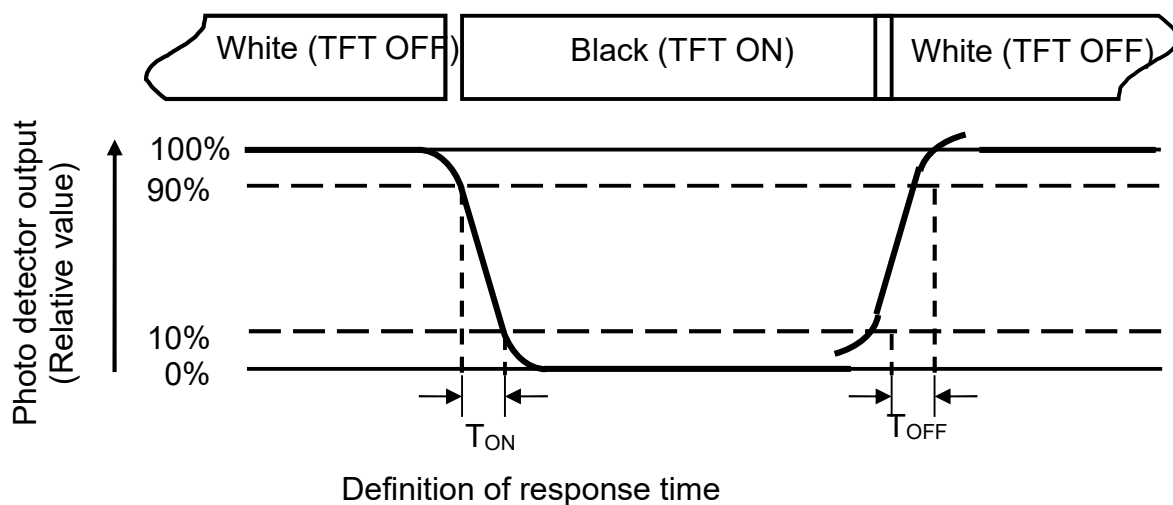


Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector



output intensity changed from 10% to 90%.



Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

8. Reliability Test Conditions And Methods

Item	Test Conditions	Remark
High Temperature Storage	Ta = 70°C 96 hrs	
Low Temperature Storage	Ta = -20°C 96 hrs	
High Temperature Operation	Ts = 60°C 96 hrs	
Low Temperature Operation	Ta = -10°C 96 hrs	
Operate at High Temperature and Humidity	50°C, 90%RH max. 96 hrs	Operation
Thermal Shock	-10°C~+60°C 10cycles 1 Hrs/cycle	Non-operation
Electrostatic Discharge	Contact=±4KV, class B Air=±8KV, class B	

Note1: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note2: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.



9. Package Drawing

TBD