



深圳市一众显示科技有限公司

SHEN ZHEN TEAM SOURCE DISPLAY TECH. CO, LTD.

TFT-LCD Module Specification

Module NO.: TST314C-03A

Version: V1.0

APPROVAL FOR SPECIFICATION

APPROVAL FOR SAMPLE

For Customer' s Acceptance:	
Approved by	Comment

Team Source Display:		
Presented by	Reviewed by	Organized by

Version No.	Date	Content	Remark
V1.0	2017-03-27	Initial Release	

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1. GENERAL DESCRIPTION

TST314C-03A is a transmissive type color active matrix liquid crystal display(LCD) which uses amorphous thin film transistor(TFT) as switching devices. This product is composed of a TFT LCD panel,driver IC,FPC,Backlight and touch screen.The following table described the feathures of TST314C-03A.

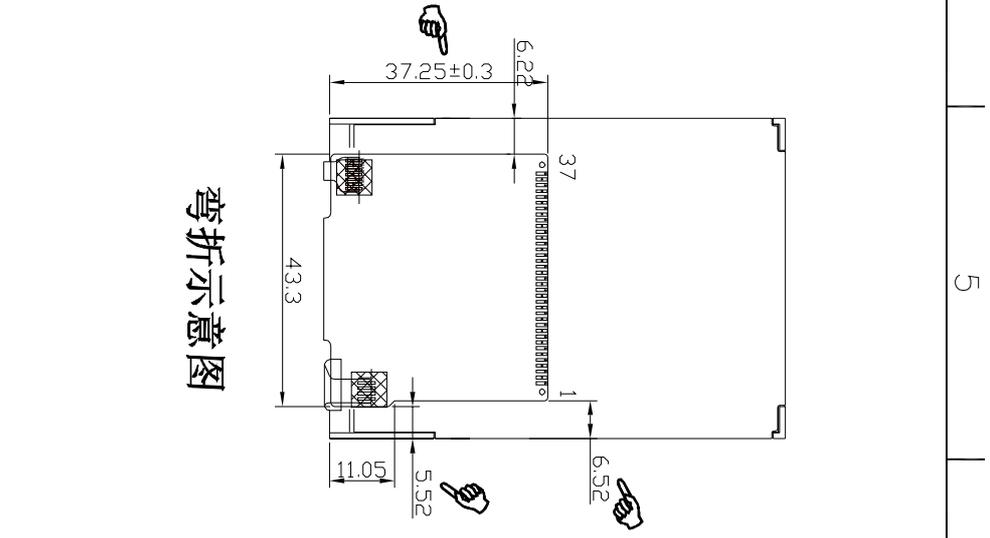
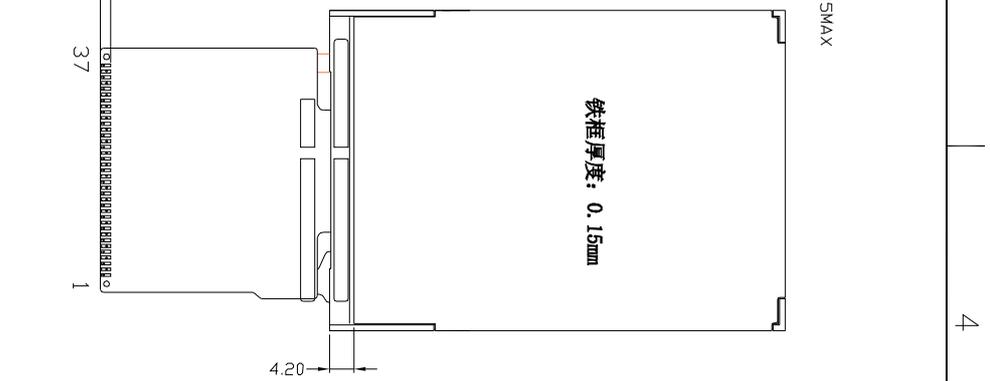
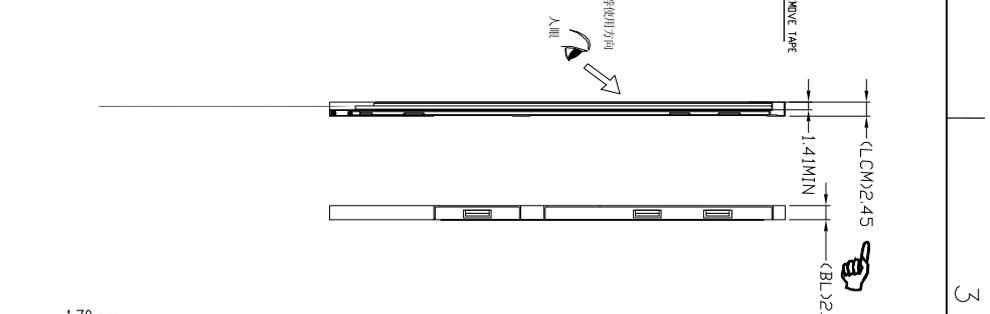
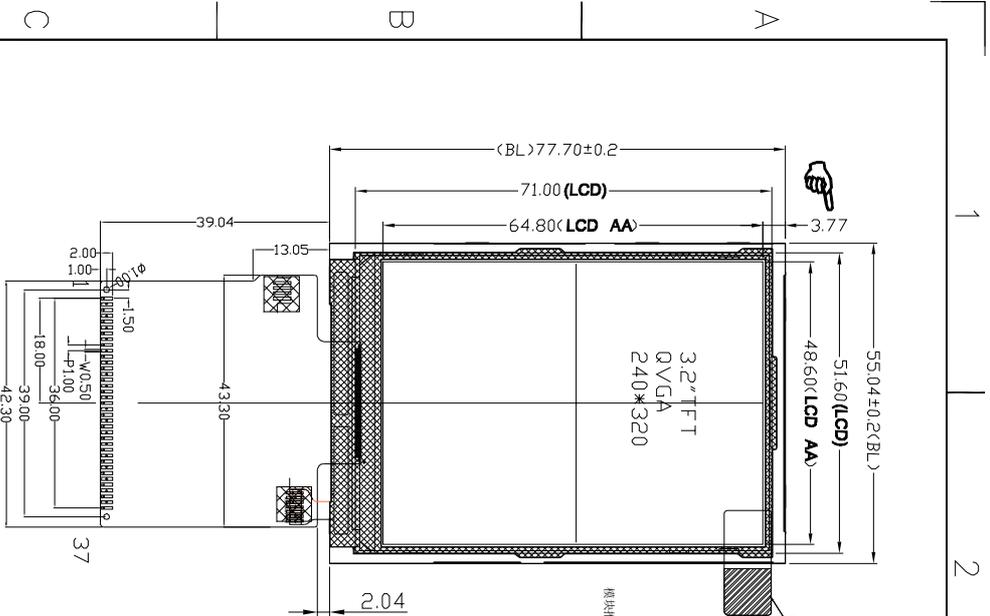
2. FEATURES

Display Mode	TFT LCD, Normally white, Transmissive Type,
Color Pixel Arrangement	RGB vertical Strip
Driver IC.	ILI9341
Number of colors	65 K color
Interface	MPU I/F(8/9/16/18 bit) , RGB I/F (18 bit)
Viewing Direction	12 O'clock
Lifetime of Module	50,000H

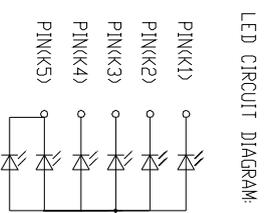
3. MECHANICAL SPECIFICATION

Item	Specifications	Unit
Dimensional outline	55.04(H)×77.7(V)×2.4(M)*	Mm
Number of Pixels	240(H)× 3(R,G,B) × 320(V)	Dot
Pixel Pitch	0.2025(H) × 0.2025(V)	Mm
Active area	47.87(H)×63.84 (V)	Mm

*note : This isn't include FPC.



弯折示意图



FPC 设计为高8位/16位
兼容, 默认16位

PIN	DESCRIPTION
1	GND
2	VDD
3	VDD
4	CS
5	RS
6	WR
7	RD
8	RESET
9	DB0
10	DB1
11	DB2
12	DB3
13	DB4
14	DB5
15	DB6
16	DB7
17	DB8
18	DB9
19	DB10
20	DB11
21	DB12
22	DB13
23	DB14
24	DB15
25	GND
26	Y- /NC
27	X- /NC
28	Y+ /NC
29	X+ /NC
30	LEDK1
31	LEDK2
32	LEDK3
33	LEDK4
34	LEDK5
35	LEDA
36	LEDA
37	GND

LCD Type	3.2" TFT, Transmissive, Normally white, TN
Resolution	240*(RGB)*320
View Direction	6 O'CLOCK
Driver IC	ILI9341V
Color Depth	65K
Interface Types	MCU16-bit(default)
Operating voltage	VDD=3.3V
With/without TP	Without
Backlight LEDs	6 LEDs, 120mA
Operating temperature	-20 °C ~ 70 °C
Storage Temperature	-30 °C ~ 80 °C
luminance	350 cd/m ²

"Need to pay attention to size"

"*As the focus control size"



东莞市一众显示科技有限公司
DONG GUAN TEAM SOURCE DISPLAY TECH. CO. LTD.

版本 (Version)	变更记录 (Change History)	日期 (Date)	视角 (View):	比例 (Proportion):	设计 (DESIGN)	审核 (AUDITING)	批准 (APPROVED)
V1			单位 (Unit):	页 面 (Page):	1 : 1		
V2			产品型号 (Product Type):	1 / 1	TST314C-03A		
V3			版本 (Version):	V1	2017.3.27		

5. MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	NOTE
Operation Temperature	T _{OP}	-20	70	°C	
Storage Temperature	T _{ST}	-30	80	°C	
Power supply voltage1	VCC, IOVCC	-0.3	+4.6	V	

6. Pin Assignment

PIN NO.	Symbol	description
1	GND	System Ground. (0V)
2	VDD	Power supply +2.8V
3	VDD	Power supply +2.8V
4	CS	Chip select signal.
5	RS	Data/Command Selection pin
6	WR	write signal
7	RD	read signal
8	RESET	Reset input signal
9 ~ 24	DB0~DB15	Data BUS
25	GND	System Ground. (0V)
26	Y-/YD	RTP pin
27	X-/XL	RTP pin
28	Y+/YU	RTP pin
29	X+/XR	RTP pin
30 ~ 34	LEDK1~LEDK5	Backlight K Cathode input pin.
35	LEDA	Backlight A Aethod input pin.
36	LEDA	Backlight A Aethod input pin.
37	GND	System Ground. (0V)

Select a mode to interface to an MPU. In serial interface operation, the IM0 pin is used to set the ID bit of device code.

IM3	IM2	IM1	IM0/ ID	Interface Mode	DB Pin	Colors
0	0	0	0	Setting disabled	-	-
0	0	0	1	Setting disabled	-	-
0	0	1	0	80-system 16-bit interface	DB17-10, DB8-1	262,144 see Note 1
0	0	1	1	80-system 8-bit interface	DB17-10	262,144 see Note 2
0	1	0	*(ID)	Clock synchronous serial interface	-	65,536
0	1	1	0	Setting disabled	-	-
0	1	1	1	Setting disabled	-	-
1	0	0	0	Setting disabled	-	-
1	0	0	1	Setting disabled	-	-
1	0	1	0	80-system 18-bit interface	DB17-0	262,144
1	0	1	1	80-system 9-bit interface	DB17-9	262,144
1	1	0	0	Setting disabled	-	-
1	1	0	1	Setting disabled	-	-
1	1	1	0	Setting disabled	-	-
1	1	1	1	Setting disabled	-	-

Note2:

- Notes: 1. 65,536 colors in one transfer mode
- 2. 65,536 colors in two transfers mode

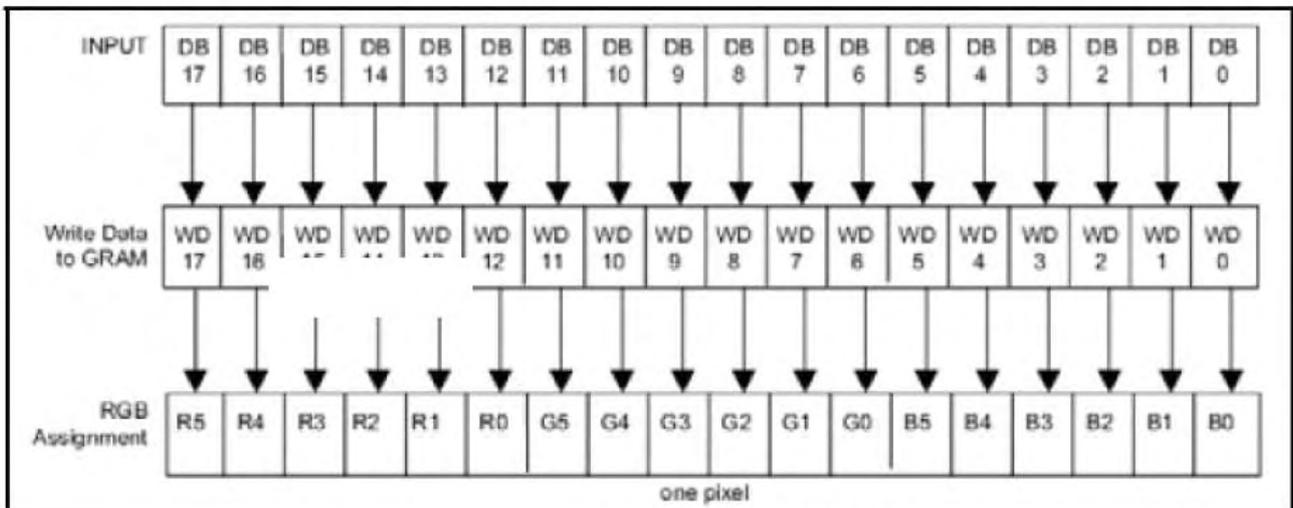


Figure 6-8 18-bit interface (262,144 colors)

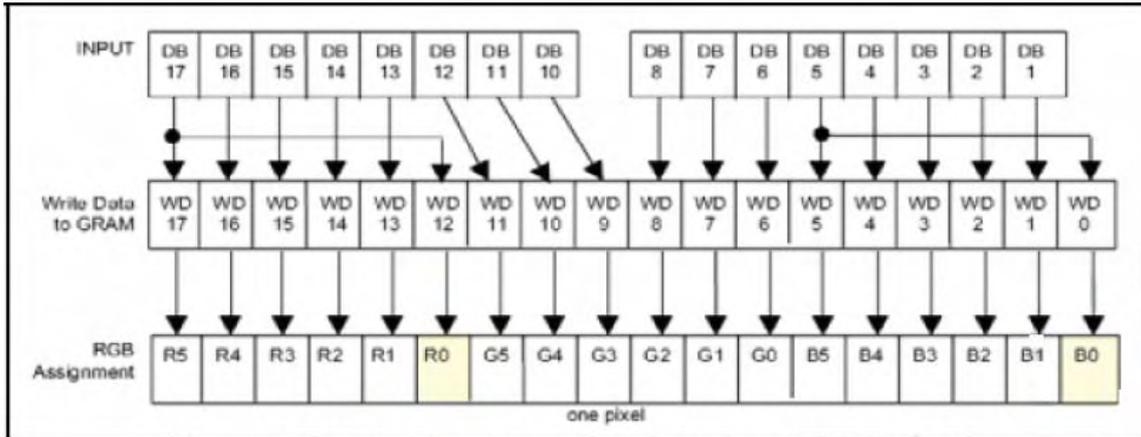


Figure 6-9 16-bit interface (65,536 colors) TRIREG= 0

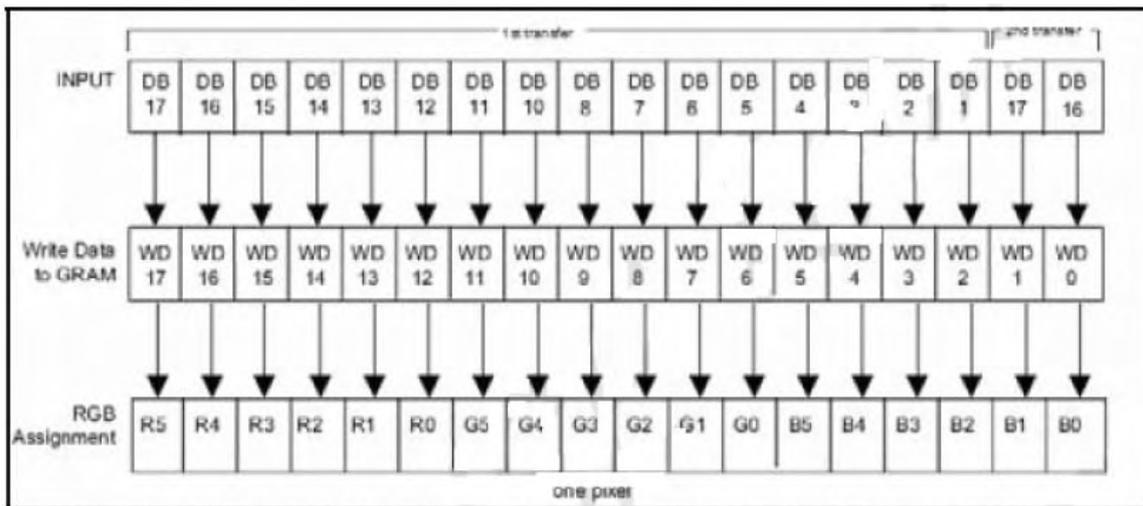


Figure 6-10 16-bit interface (262,144 colors) TRIREG = 1, DFM = 0

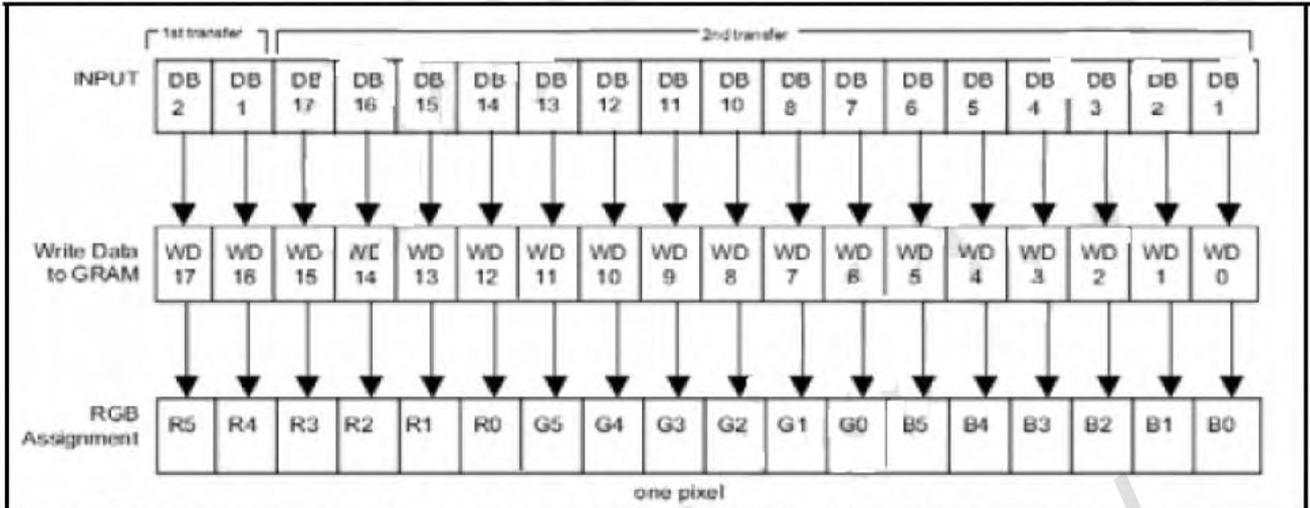


Figure 6-11 16-bit interface (262,144 colors) TRIREG = 1, DFM = 1

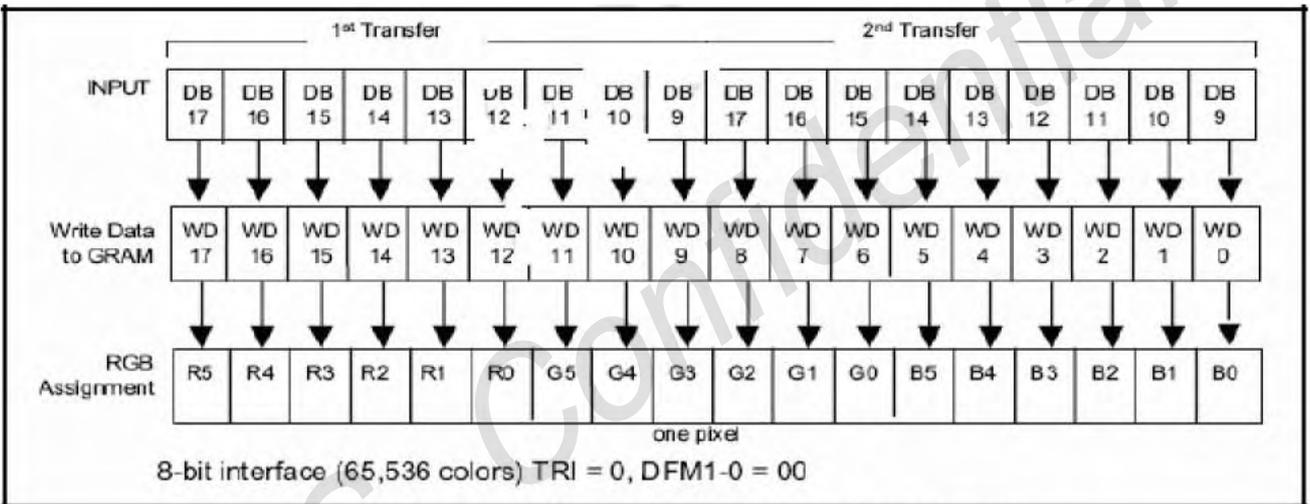


Figure 6-12 9-bit interface (262,144 colors)

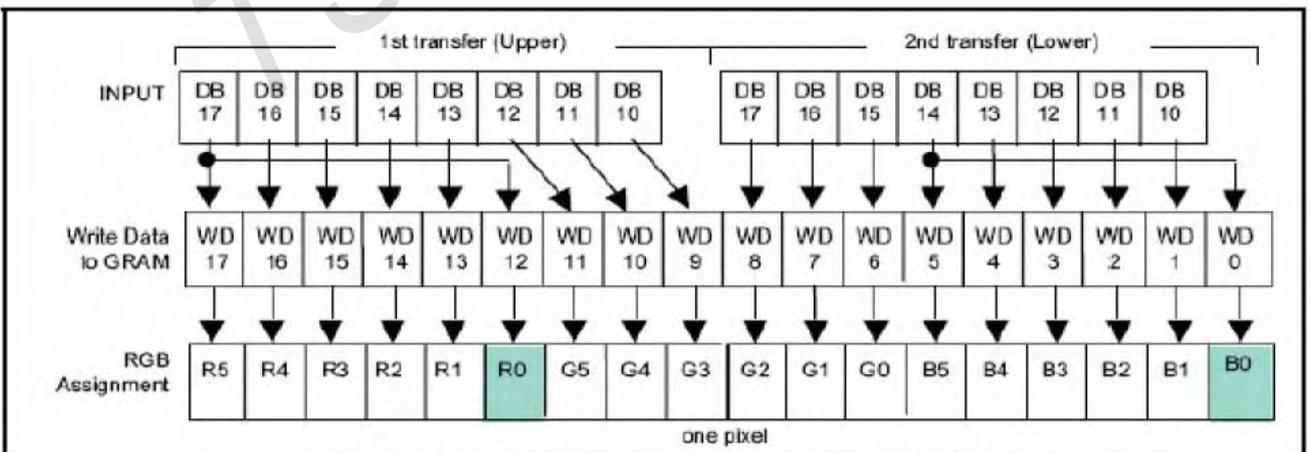


Figure 6-13 8-bit interface (65,536 colors) TRIREG = 0

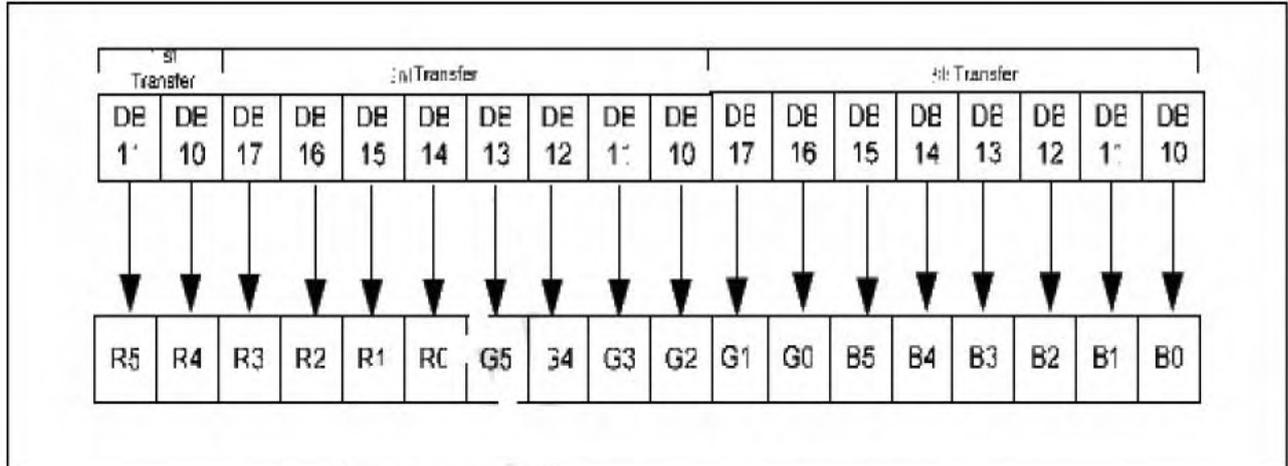


Figure 6-14 8-bit interface 262 colors) TRIREG = 1, DFM=0.

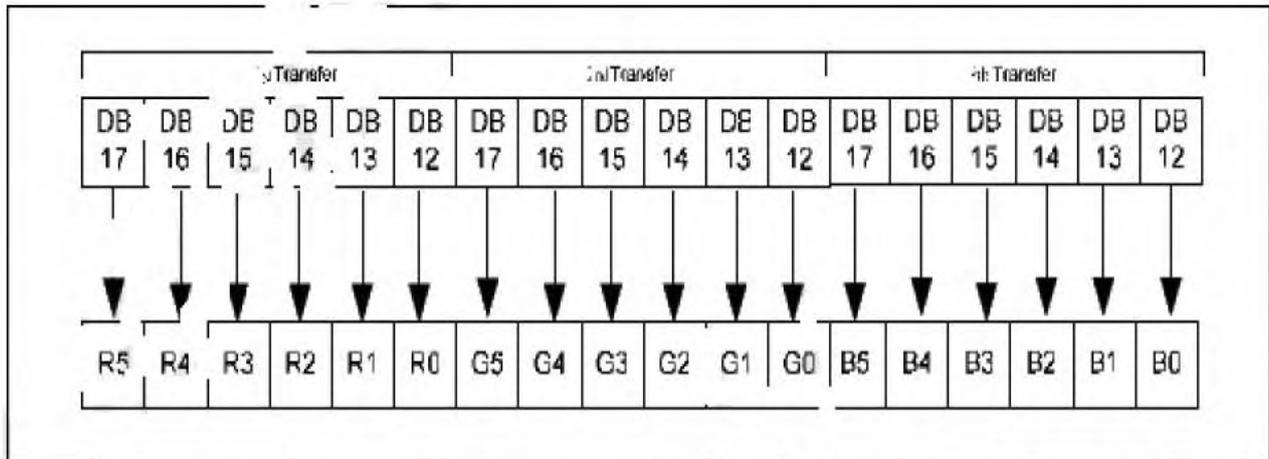
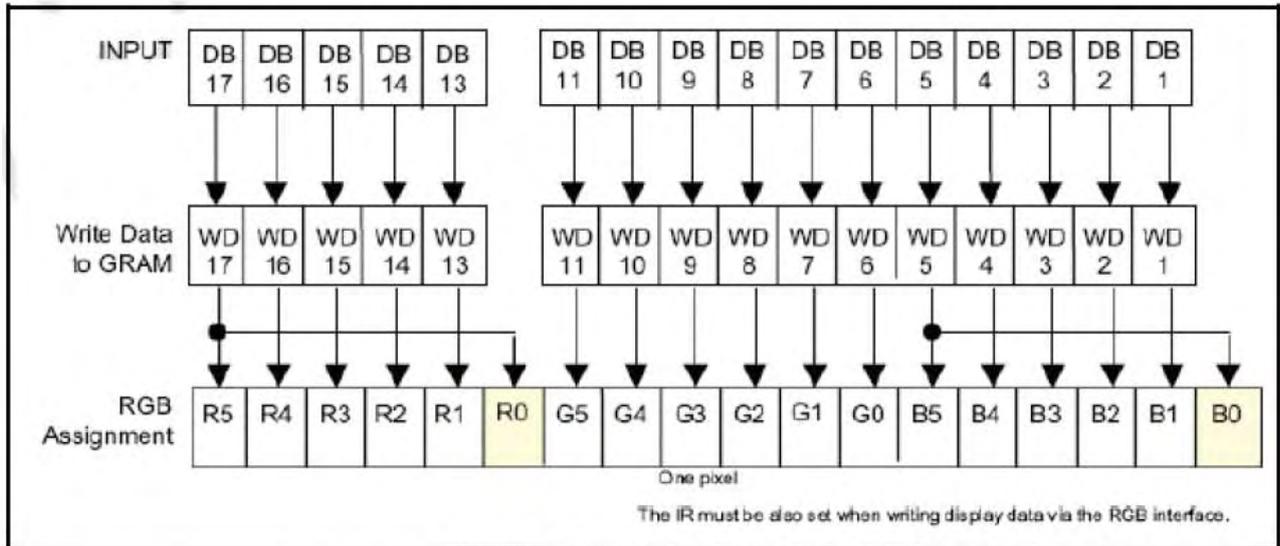
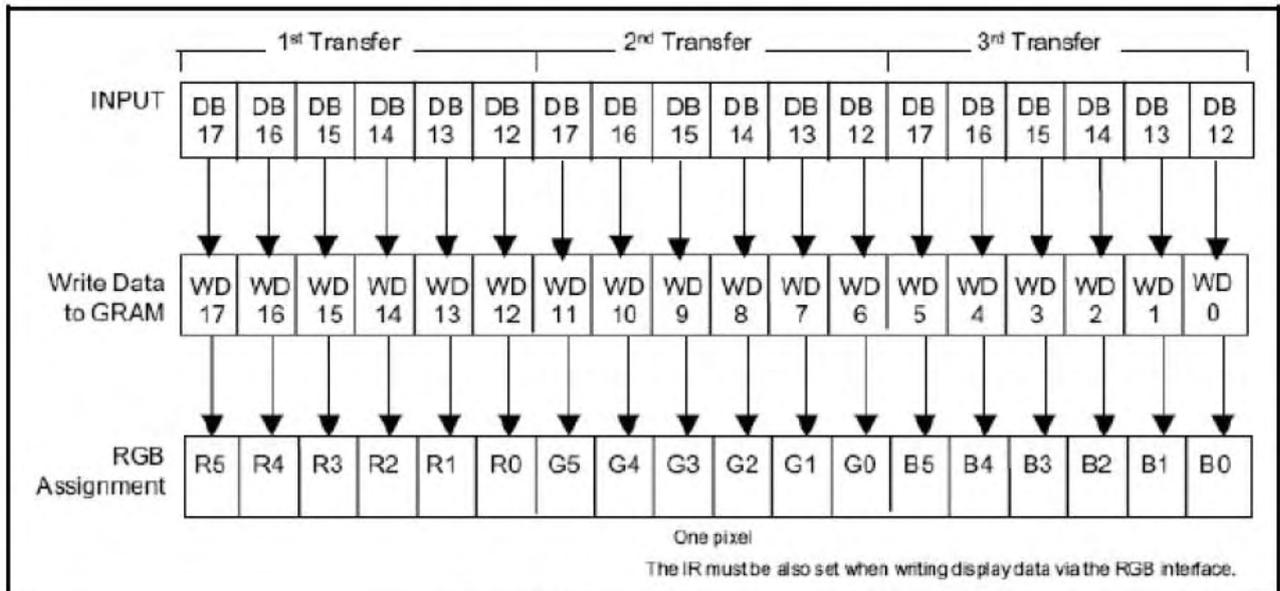


Figure 6-15 8-bit interface (262K colors) TRIREG = 1, DFM=1



16-bit RGB interface (65,563 colors)



6-bit RGB interface (262,144 colors)

7. ELECTRICAL CHARACTERISTICS

7.1.LCM DC CHARACETRISTIC

Typical operating conditions

(GND=AVSS=0V)

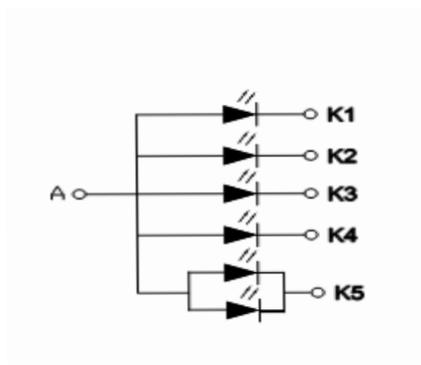
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power supply	VCC	2.5	-	3.3	V	
	IOVCC	1.65	-	3.3		
Driver Input signal voltage	H	V_{IH}	$0.8 \cdot IOVCC$	-	IOVCC	V
	L	V_{IL}	GND	-	$0.2 \cdot IOVCC$	V
Driver output signal voltage	H	V_{OH}	$0.8 \cdot IOVCC$	-	-	V
	L	V_{OL}	-	-	$0.2 \cdot IOVCC$	V
Power consumption	P_{LCD}	-	30	-	mW	*1

Note:

*1: Not include backlight.

7.2.BACKLIGHT CHARACETRISTIC

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power Consumption	P	288	330	450	mW	Backlight unit
LED Current	I_{LED}	18	20	25	mA	Single LED
LED Voltage	V_{LED}	3.2	3.3	3.6	V	Single LED

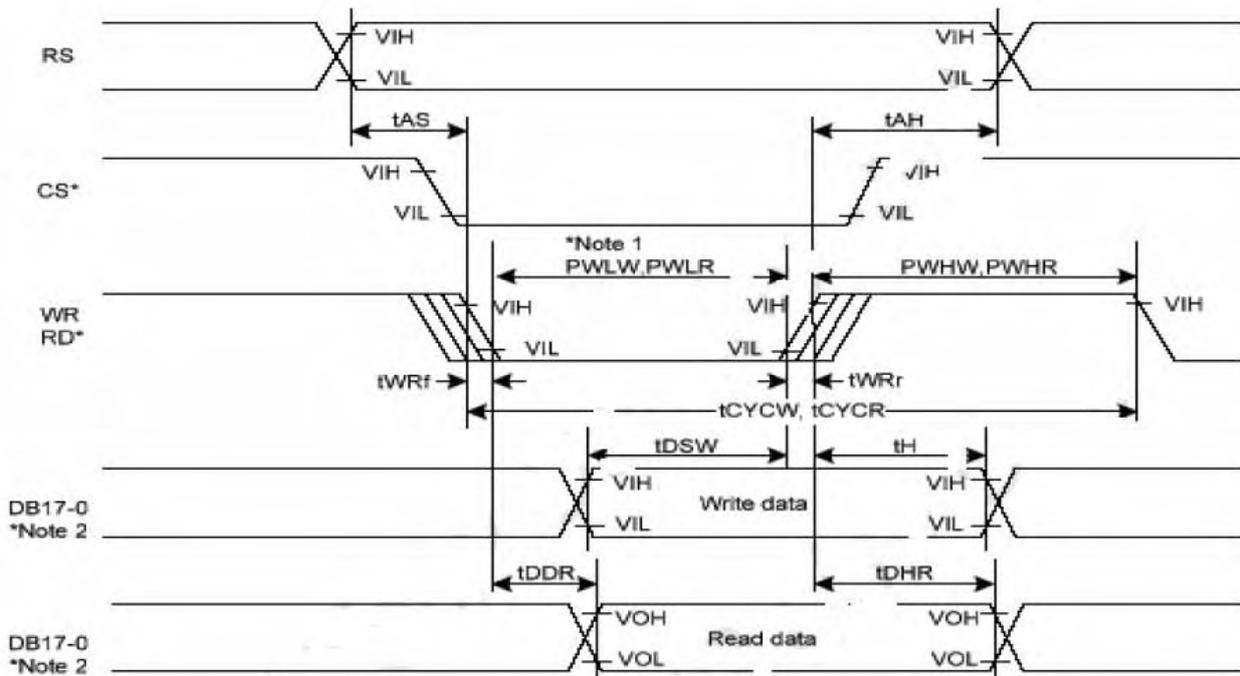


7.3.AC CHARACETRISTIC

A.80-system (18-bit / 16-bits) bus interface

Normal write operation (HWM=0 or 1), IOVCC=1.65V~3.30V

Item	Symbol	Unit	Min.	Typ.	Max.	
Bus cycle time	Write	tCYCW	ns	125	-	-
	Read	tCYCR	ns	450	-	-
Write low-level pulse width	PWLW	ns	45	-	-	
Read low-level pulse width	PWLR	ns	170	-	-	
Write high-level pulse width	PWHW	ns	70	-	-	
Read high-level pulse width	PWHR	ns	250	-	-	
Write/Read rise/ fall time	tWRr, WRf	ns	-	-	25	
Setup time	Write (RS to CS*, WR*)	tAS	ns	0	-	-
	Read (RS to CS*, RD*)		ns	10	-	-
Address Hold Time	tAH	ns	2	-	-	
Write data setup time	tDSW	ns	25	-	-	
Write data hold time	tH	ns	10	-	-	
Read data delay time	tDDR	ns	-	-	150	
Read data hold time	tDHR	ns	5	-	-	



Note1: PWLW and PWLR are defined by the overlap period when CS is "Low" and WR* or RD* is "Low".
 *Note2: Unused DB pins must be fixed at "IOVcc 1" or "IOGND 1".

B. Clock-synchronized serial interface

Normal Write Function (HWM=0), High-speed Write Function (HWM=1), IOVCC=1.65~3.30V

Item	Symbol	Unit	Min.	Typ.	Max.	
Serial Time Clock Cycle	Write (received)	tSCYC	ns	100	-	20.000
	Read (transmitted)	tSCYC	ns	350	-	20.000
Serial Clock high-level width	Write (received)	tSCH	ns	40	-	-
	Read (transmitted)	tSCH	ns	150	-	-
Serial Clock low-level width	Write (received)	tSCL	ns	40	-	-
	Read (transmitted)	tSCL	ns	150	-	-
Serial clock rise/fall time	tSCr, tSCf	ns	-	-	20	
Chip select setup time	tCSU	ns	20	-	-	
Chip select hold time	tCH	ns	60	-	-	
Serial input data setup time	tSISU	ns	30	-	-	
Serial input data hold time	tSIH	ns	30	-	-	
Serial output data delay time	tSOD	ns	-	-	130	
Serial output data hold time	tSOH	ns	5	-	-	

C. RGB interface

18-/16-bit RGB interface (HWM=0 or 1), IOVCC=1.65~3.30V

Item	Symbol	Unit	Min.	Typ.	Max.
VSYNC/HSYNC Setup time	TSYNCS	clock	0	-	1
ENABLE Setup time	TENS	ns	10	-	-
ENABLE Hold time	TENH	ns	20	-	-
DOTCLK low-level pulse width	PWDL	ns	40	-	-
DOTCLK high-level pulse width	PWDH	ns	40	-	-
DOTCLK cycle time	TCYCD	ns	100	-	-
Data setup time	TPDS	ns	10	-	-
Data hold time	TPDH	ns	40	-	-
DOTCLK, VSYNC and HSYNC rise/fall time	Trgbr Trgbf	ns	-	-	25

6-bit RGB interface (HWM=0 or 1), IOVCC=1.65~3.30V

Item	Symbol	Unit	Min.	Typ.	Max.
VSYNC/HSYNC setup time	TSYNCS	clock	0	-	1
ENABLE setup time	TENS	ns	10	-	-
ENABLE hold time	TENH	ns	25	-	-
DOTCLK low-level pulse width	PWDL	ns	25	-	-
DOTCLK high-level pulse width	PWDH	ns	25	-	-
DOTCLK cycle time	TCYCD	ns	60	-	-
Data setup-time	TPDS	ns	10	-	-
Data hold time	TPDH	ns	25	-	-
DOTCLK, VSYNC, and HSYNC rise/fall time	Trgb Ttrgbf	ns	-	-	25

8. ELECTRO-OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
Brightness	L	White pattern	160	200	-	cd/m ²	
Response time	T _R +T _F	Θ=ϕ=0	-	25	-	ms	Note 2
Contrast ratio	CR	At the center point of A.A.	300	350	-		
Color Chromaticity	White	W _x	Θ=ϕ=0	0.273	0.313	0.353	Note 2
		W _y		0.289	0.329	0.369	
Viewing Angle	Horizontal	CR ≥ 10	-	110	-	Degree	
	Vertical		-	120	-		

Note.1 These items are measured by C light.

Note.2 Definition of Viewing Angle(θ, ϕ),refer to Fig.1 as below :

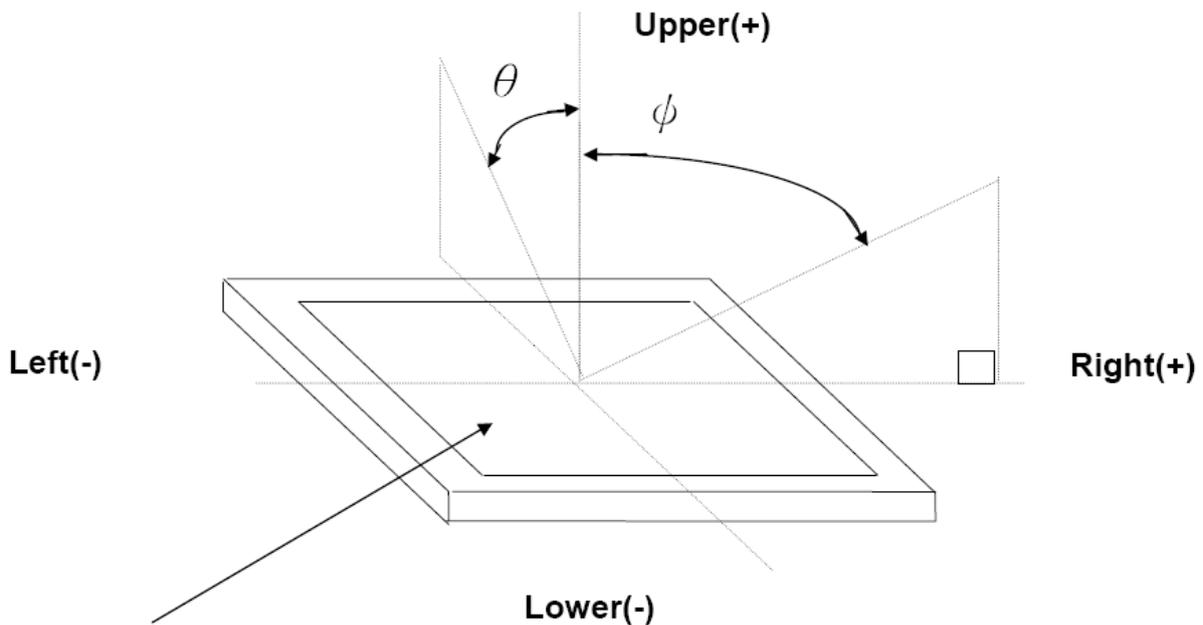


Fig.1 Definition of Viewing Angle

9. RELIABILITY

9.1.MTTF

The LCD module shall be designed to meet a minimum MTTF value of 50,000 hours with normal condition. (25°C in the room without sunlight; not include life time of backlight).

9.2.Tests

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Operating	70°C 240 hrs	<ul style="list-style-type: none"> ◦ No defect of Operational function in room temperature are allowable. ◦ Leakage current should be below double of initial value.
2	Low Temperature Operating	-20°C 240 hrs	
3	High Temperature Non-Operating	80°C 240 hrs	
4	Low Temperature Non-Operating	-30°C 240 hrs	
5	High Temperature/ Humidity Non-Operating	50°C,90%RH 240 hrs	
6	Temperature Shock Non-Operating	-30°C ↔ 80°C (30min) (5min) (30min) 10 CYCLES	
7	Electro-static Discharge	HBM: ±2KV	

Note 1: Test after 24 hours in room temperature.

Note 2: The sampling above is individually for each reliability testing condition.

Note 3: The color fading of polarizing filter should not care.

Note 4: All of the reliability testing chamber above, is using D.I. water.(Min value:1.0 MΩ-cm)

Note 5: In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

9.3.Color performance

No.	ITEM	Criterion (initial)
1	Luminance	>50%
2	NTSC	>70%
3	Contrast Ratio	>50%

10. RoHS COMPLIANT WARRANTY

RoHS Hazardous substances including:

- Cd < 100 ppm
- Pb < 1000 ppm
- Hg < 1000 ppm
- Cr +6 < 1000 ppm
- PBDE < 1000 ppm
- PBB < 1000 ppm

11. PRECAUTIONS FOR USE

11.1. Safety

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

11.2. Storage Conditions

- (1) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\%\text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.
- (6) Do not exposed to direct sun light of fluorescent lamps.

11.3. Installing LCD Module

Attend to the following items when installing the LCM.

- (1) Cover the surface with a transparent protective plate or touch panel to protect the polarizer and LC cell.
- (2) When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The

measurement tolerance should be $\pm 0.1\text{mm}$.

11.4. Precautions For Operation

- (1) Viewing angle varies with the change of liquid crystal driving voltage (V_o). Adjust V_o to show the best contrast.
- (2) Driving the LCD in the voltage above the limit will shorten its lifetime.
- (3) Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.
- (4) When turning the power on, input each signal after the positive/negative voltage becomes stable.
- (5) Do not apply water or any liquid on product which composed of T/P.

11.5. Handling Precautions

- (1) Avoid static electricity which can damage the CMOS LSI; please wear the wrist strap when handling.
- (2) The polarizing plate of the display is very fragile. so, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface; it may cause display abnormal .
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) Do not apply water or any liquid on product, which composed of T/P.

11.6.arranty

- (1) The period is within 12 months since the date of shipping out under normal using and storage conditions.
- (2) The warranty will be avoided in case of defect induced by customer.

Packing

PARAMETER	Specification	Unit
Outside box	390(L) x 350(W) x 480(H)	mm
Inside pearl wool box	330(L)x185(W)x110(H)	mm
Product quantity of Inside box	64	pcs
Total product quantity	64*8=512	pcs
Total weight	12.5 \pm 0.5	Kg

