SPECIFICATION
FOR
LCD MODULE

MODULE NO.: TG240X04
DOC.REVISION 00

Customer Approval:

	SIGNATURE	DATE
PREPARED BY (RD ENGINEER)	Fr.li	Mar-20-2010
PREPARED BY (QA ENGINEER)	ChenLei	Mar-20-2010
CHECKED BY	Sean	Mar-20-2010
APPROVED BY	Rio	Mar-20-2010

DOCUMENT REVISION HISTORY

Version	DATE	DESCRIPTION	CHANGED BY
00	Mar-20-2010	First Issue	

CONTENTS

1. __Features & Mechanical Specifications__

Item	Contents	Unit
	LCD	
LCD Type	TFT / Transmissive / Normally White	--
Viewing direction	12 O'clock	--
Backlight	White LED x3	--
Interface	8080-16bit Parallel bus interface	--
Driver IC	ST7781	--
Outline Dimension	42.72(W) × 59.46(H) × 3.0(T)	mm
Glass area (W×H×T)	40.58 × 52.82 /56.96 × 0.5	mm
Active area (W×H)	36.72 × 48.96	mm
Number of Dots	240(RGB) × 320	--
Dot pitch (W×H)	0.051 × 0.153	mm
Pixel pitch (W×H)	0.153 × 0.153	mm
Operating Temperature	-20 ～ +70	℃
Storage temperature	-30 ～ +80	℃

2. Dimensional Outline
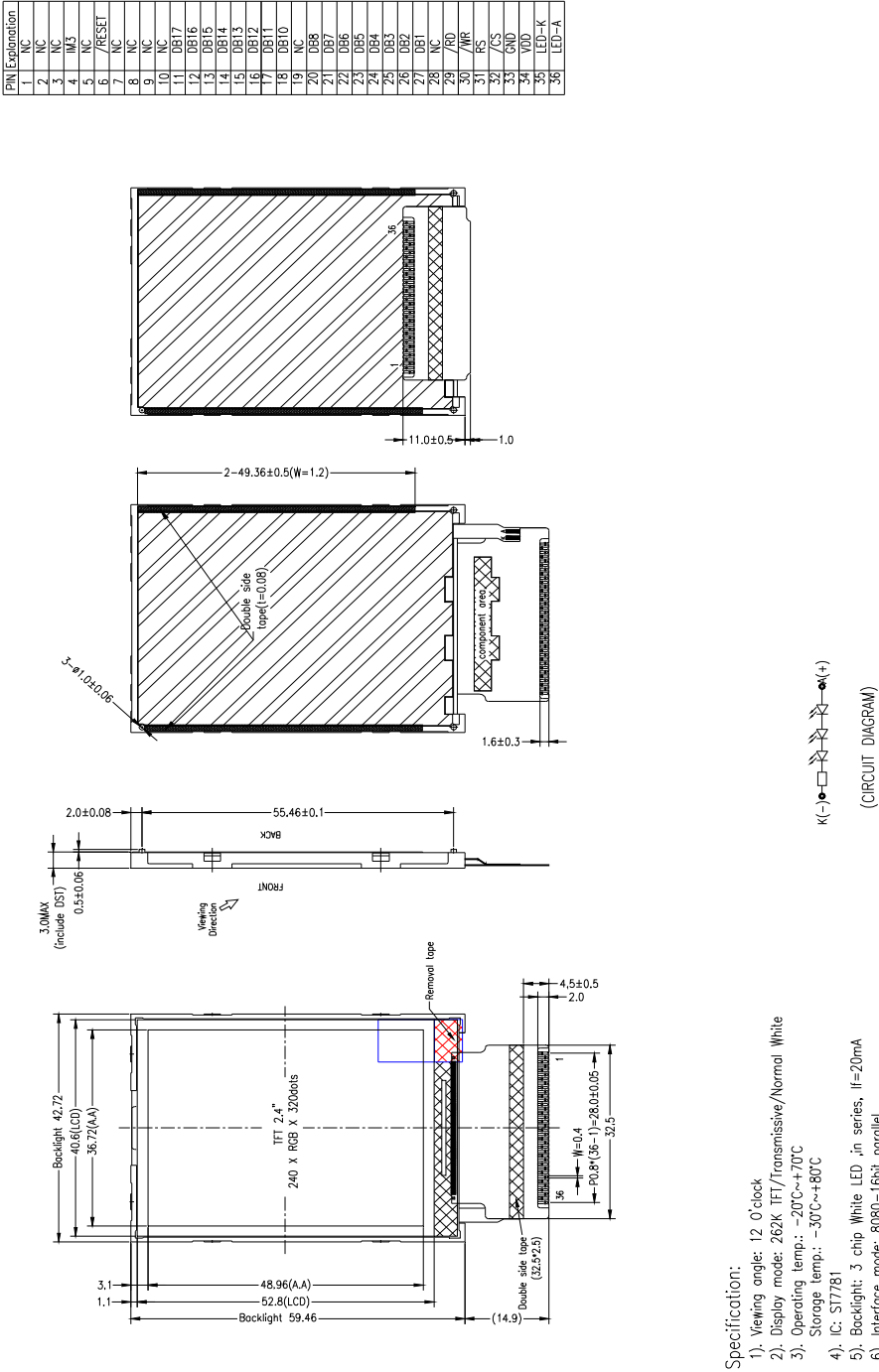
Figure 1. Dimensional outline

3. Block Diagram
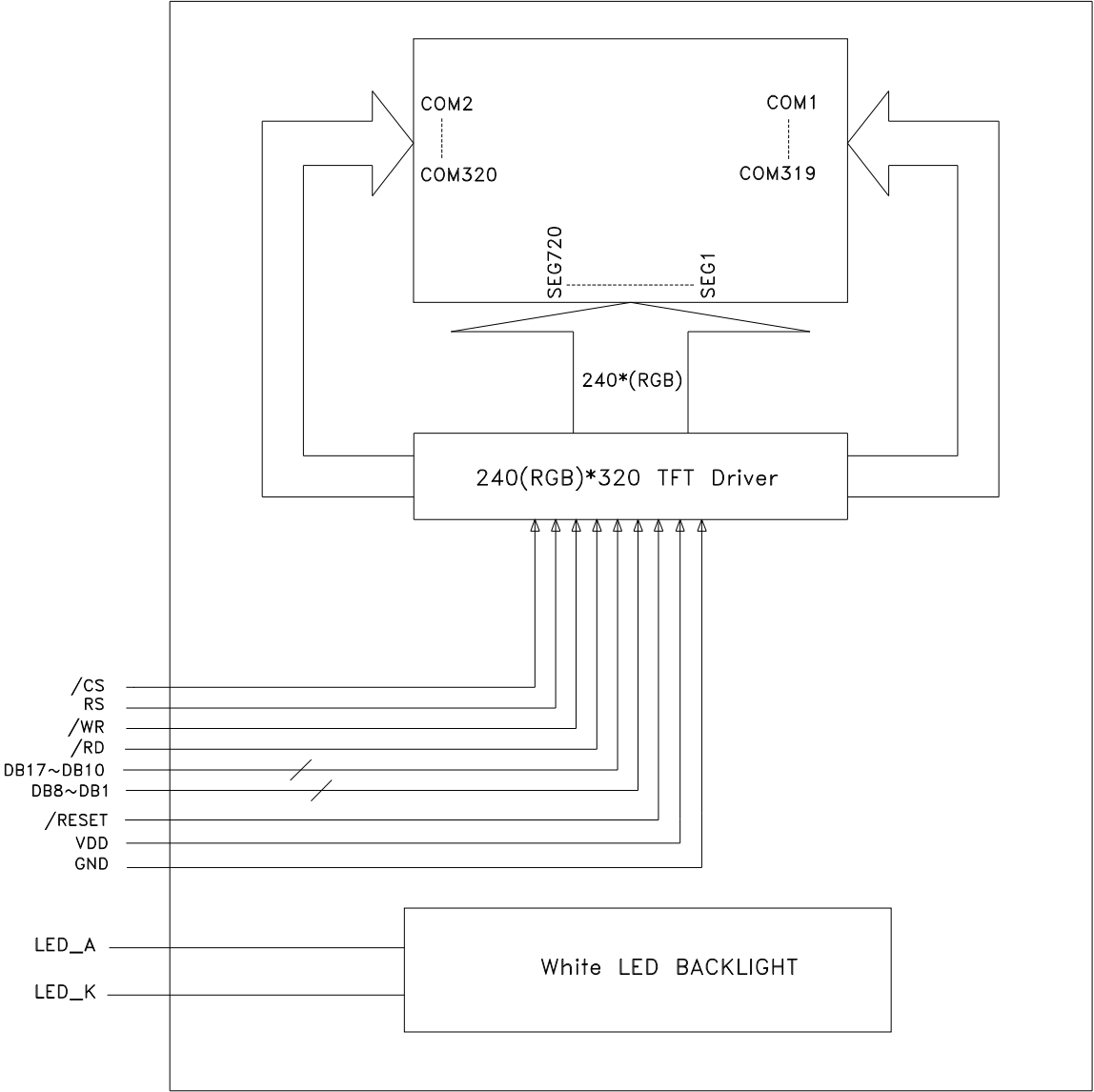
Figure 2. Block diagram

4. Pin Description

PIN No.	SYMBOL	Function
1~5	NC	No Connect
6	/RESET	Reset pin. (Active Low)
7~10	NC	No Connect
11~18	DB17~DB10	Data Bus
19	NC	No Connect
20~27	DB8~DB1	Data Bus
28	NC	No Connect
29	/RD	Read signal.
30	/WR	Write signal.

31	RS	A register select signal.
		  RS ='1': display data or parameter.
		  RS ='0': command.

32	/CS	A chip select signal. (Active Low)
33	GND	Ground
34	VDD	Supply voltage
35	LED-K	Backlight LED Cathode
36	LED-A	Backlight LED Anode

Interface Note:

R1	R2	Interface Mode
Short	Open	8080-16bit interface: DB17～DB10, DB8～DB1 (default mode)
Open	Short	8080-8bit interface: DB17~DB10

1. Unused pins should connect to GND.
2. R1, R2 are SMT Components on the FPC.

5. Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply Voltage range	VDD	-0.3 to +4.6	V
Operating Temperature range	TOP	-20 to +70	℃
Storage Temperature range	TST	-30 to +80	℃

6. Electrical Characteristics

DC Characteristics

Item	Symbol	Min.	Type.	Max.	Unit
Logic Supply Voltage	VDD	2.5	-	3.3	V

7. Backlight Characteristics

White LED $\times$ 3　in Series　　　　　　　　　　　　　　　　　**(Ta = 25°C)**

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	VF	IF = 20mA	-	9.6	-	V
Uniformity	△Bp	-	80	-	-	%
Luminance for LCD	Lv	IF = 20mA	-	1800	-	cd/m^2

8. Electro-Optical Characteristics

Optical specification

| Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (without Polarizer)		T(%)	—	—	13.5	—	—	—
Contrast Ratio		CR	$\Theta=0$	400	500	—	—	(1)(2)
Response time	Rising	T_R	Normal viewing angle	—	2	4	msec	(1)(3)
	Falling	T_F	—	—	6	12		
Color gamut		S(%)			60		%	
Color chromaticity (CIE1931)	White	W_x		TBD	0.308	TBD		(1)(4) CF glass (C-light)
		Wy		TBD	0.325	TBD		
	Red	Rx		TBD	0.630	TBD		
		Ry		TBD	0.337	TBD		
	Green	Gx		TBD	0.284	TBD		
		Gy		TBD	0.543	TBD		
	Blue	Bx		TBD	0.143	TBD		
		By		TBD	0.120	TBD		
Viewing angle	Hor.	Θ_L	CR>10	TBD	45	—		
		Θ_R		TBD	45			
	Ver.	Θ_U		TBD	45	—		
		Θ_D		TBD	20	—		
Optima View Direction			12 O'clock					(5)

Measuring Condition
- Measuring surrounding : dark room
- Ambient temperature : 25±2°C
- 15min. warm-up time.

Measuring Equipment
- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.
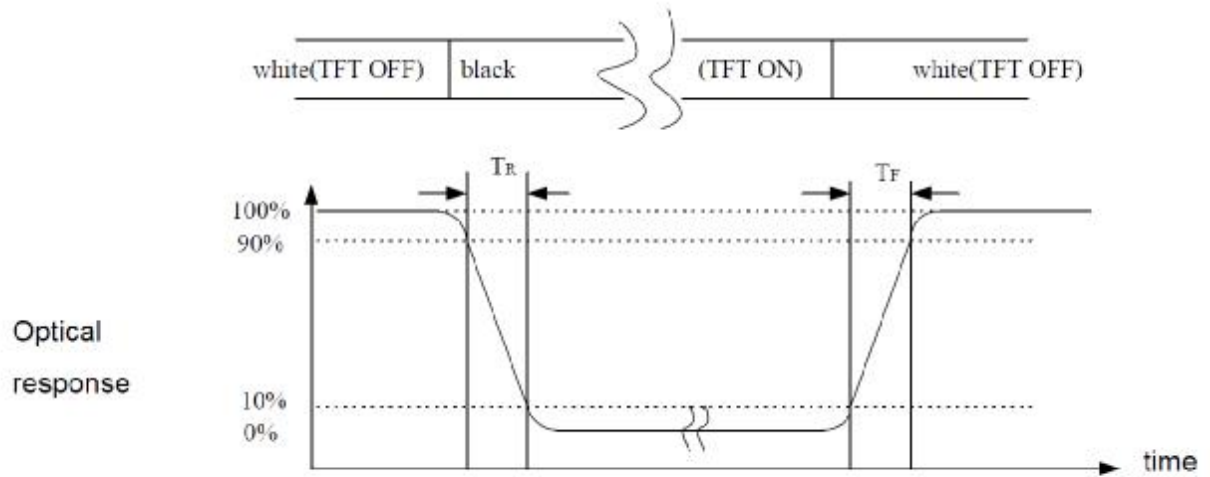
Note (1) Definition of Viewing Angle :

Θ_U

12' o'clock
$\Phi=90°$

Θ_L

Θ_R

$\Phi=180°$
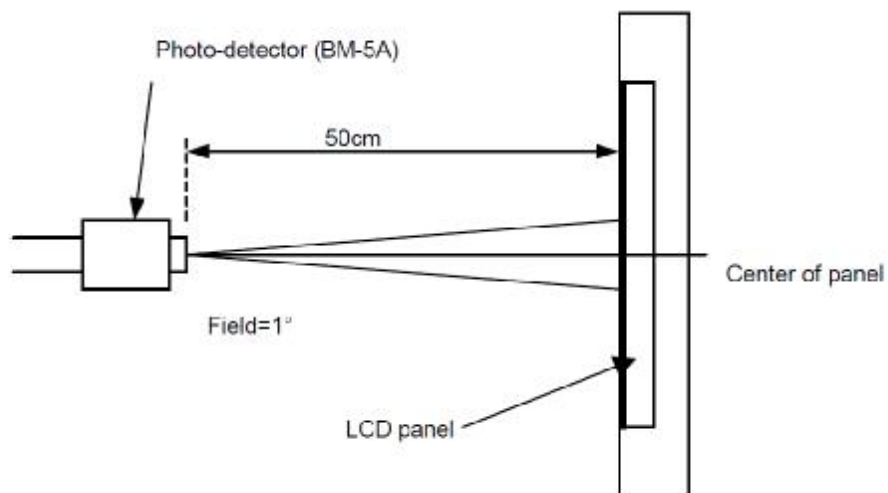
$\Phi=0°$

Θ_D

6' o'clock
$\Phi=270°$
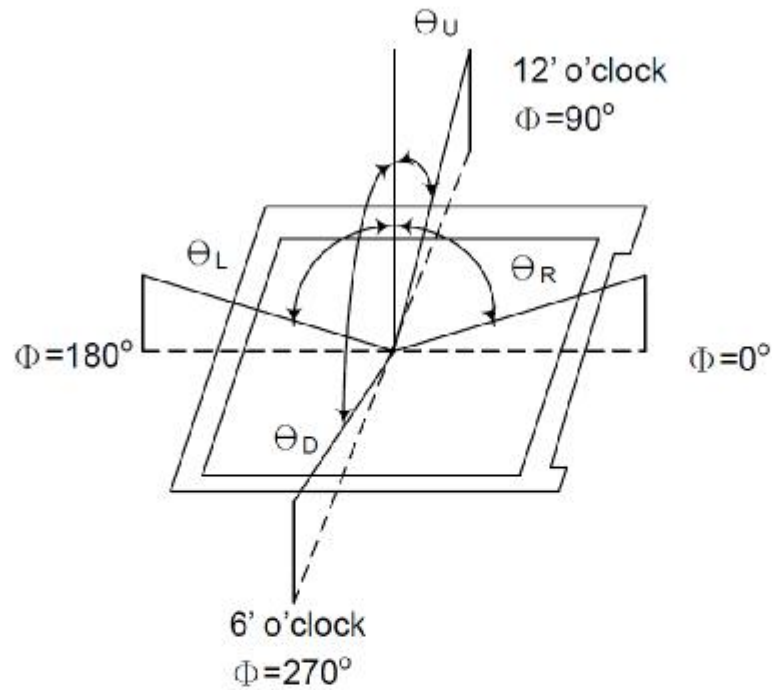
Note (2) Definition of Contrast Ratio(CR) :
measured at the center point of panel

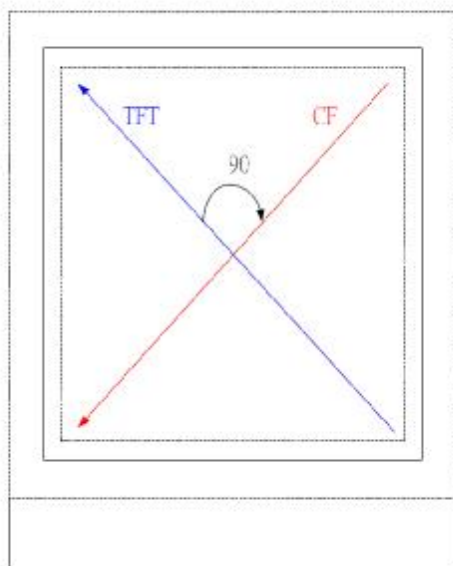$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time : Sum of T_R and T_F

Note (4) Definition of optical measurement setup

Note (5) Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.


TFT Face up

9. Instruction Description

No	Registers	W/R	RS	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
IR	Index Register	W	0	–	–	–	–	–	–	–	–	ID7	ID6	ID5	ID4	ID3	ID2	ID1	ID0
00h	Driver ID Code Read	R	1	0	1	1	1	0	1	1	1	1	0	0	0	0	0	1	1
01h	Driver Output Control	W	1	0	0	0	0	0	SM	0	SS	0	0	0	0	0	0	0	0
02h	LCD Driving Wave Control	W	1	0	0	0	0	0	1	BC0	EOR	0	0	0	0	0	0	0	0
03h	Entry Mode	W	1	TRI	DPM	0	BGR	0	0	HWM	0	0	0	HDI	VD0	AM	0	0	0
04h	Resize Control	W	1	0	0	0	0	0	0	RCV1	RCV0	0	0	RCH1	RCH0	0	0	RSZ1	RSZ0
07h	Display Control 1	W	1	0	0	PTDE1	PTDE0	0	0		BASEE	0	0	GON	DTE	CL	0	D1	D0
08h	Display control 2	W	1	0	FP6	FP5	FP4	FP3	FP2	FP1	FP0	0	BP6	BP5	BP4	BP3	BP2	BP1	BP0
09h	Display Control 3	W	1	0	0	0	0	0	PTS2	PTS1	PTS0	0	0	PTG1	PTG0	ISC3	ISC2	ISC1	ISC0
0Ah	Display Control 4	W	1	0	0	0	0	0	0	0	0	0	0	0	0	FMARKOE	FMI2	FMI1	FMI0
0Dh	Frame Marker Position	W	1	0	0	0	0	0	0	0	FMP8	FMP7	FMP6	FMP5	FMP4	FMP3	FMP2	FMP1	FMP0
10h	Power Control 1	W	1	0	0	0	SAP	0	BT2	BT1	BT0	APE	AP2	AP1	AP0	0	0	STB	0
11h	Power Control 2	W	1	0	0	0	0	0	DC12	DC11	DC10	0	DC02	DC01	DC00	0	VC2	VC1	VC0
12h	Power Control 3	W	1	0	0	0	0	0	0	0	0	VCIRE	0	0	0	VRH3	VRH2	VRH1	VRH0
13h	Power Control 4	W	1	0	0	0	VDV4	VDV3	VDV2	VDV1	VDV0	0	0	0	0	0	0	0	0
20h	DRAM Horizontal Address Set	W	1	0	0	0	0	0	0	0	0	AD7	AD6	AD5	AD4	AD3	AD2	AD1	AD0
21h	DRAM Vertical Address Set	W	1	0	0	0	0	0	0	0	AD16	AD15	AD14	AD13	AD12	AD11	AD10	AD9	AD8
22h	Write Data to DRAM	W	1	DRAM Write Data (WD17-0) / Read Data (RD17-0)															
22h	Read Data from DRAM	R	1																
29h	VCOMH Control	W	1	0	0	0	0	0	0	0	0	0	0	VCM5	VCM4	VCM3	VCM2	VCM1	VCM0
2Bh	Frame Rate and Color Control	W	1	0	0	0	0	0	0	0	0	0	0	0	0	FRS3	FRS2	FRS1	FRS0
30h	Gamma Control 1	W	1	0	0	0	0	0	KP1[2]	KP1[1]	KP1[0]	0	0	0	0	0	KP0[2]	KP0[1]	KP0[0]
31h	Gamma Control 2	W	1	0	0	0	0	0	KP3[2]	KP3[1]	KP3[0]	0	0	0	0	0	KP2[2]	KP2[1]	KP2[0]
32h	Gamma Control 3	W	1	0	0	0	0	0	KP5[2]	KP5[1]	KP5[0]	0	0	0	0	0	KP4[2]	KP4[1]	KP4[0]
35h	Gamma Control 4	W	1	0	0	0	0	0	RP1[2]	RP1[1]	RP1[0]	0	0	0	0	0	RP0[2]	RP0[1]	RP0[0]
36h	Gamma Control 5	W	1	0	0	0	VRP1[4]	VRP1[3]	VRP1[2]	VRP1[1]	VRP1[0]	0	0	0	0	VRP0[3]	VRP0[2]	VRP0[1]	VRP0[0]
37h	Gamma Control 6	W	1	0	0	0	0	0	KN1[2]	KN1[1]	KN1[0]	0	0	0	0	0	KN0[2]	KN0[1]	KN0[0]
38h	Gamma Control 7	W	1	0	0	0	0	0	KN3[2]	KN3[1]	KN3[0]	0	0	0	0	0	KN2[2]	KN2[1]	KN2[0]
39h	Gamma Control 8	W	1	0	0	0	0	0	KN5[2]	KN5[1]	KN5[0]	0	0	0	0	0	KN4[2]	KN4[1]	KN4[0]
3Ch	Gamma Control 9	W	1	0	0	0	0	0	RN1[2]	RN1[1]	RN1[0]	0	0	0	0	0	RN0[2]	RN0[1]	RN0[0]
3Dh	Gamma Control 10	W	1	0	0	0	VRN1[4]	VRN1[3]	VRN1[2]	VRN1[1]	VRN1[0]	0	0	0	0	VRN0[3]	VRN0[2]	VRN0[1]	VRN0[0]
50h	Horizontal Address Start Position	W	1	0	0	0	0	0	0	0	0	HSA7	HSA6	HSA5	HSA4	HSA3	HSA2	HSA1	HSA0
51h	Horizontal Address End Position	W	1	0	0	0	0	0	0	0	0	HEA7	HEA6	HEA5	HEA4	HEA3	HEA2	HEA1	HEA0
52h	Vertical Address Start Position	W	1	0	0	0	0	0	0	0	VSA8	VSA7	VSA6	VSA5	VSA4	VSA3	VSA2	VSA1	VSA0
53h	Vertical Address End Position	W	1	0	0	0	0	0	0	0	VEA8	VEA7	VEA6	VEA5	VEA4	VEA3	VEA2	VEA1	VEA0
60h	Gate Scan Control 1	W	1	GS	0	NL5	NL4	NL3	NL2	NL1	NL0	0	0	SCN5	SCN4	SCN3	SCN2	SCN1	SCN0
61h	Gate Scan Control 2	W	1	0	0	0	0	0	0	0	0	0	0	0	0	0	NDL	VLE	REV
80h	Partial Image 1 Display Position	W	1	0	0	0	0	0	0	0	PTDP08	PTDP07	PTDP06	PTDP05	PTDP04	PTDP03	PTDP02	PTDP01	PTDP00
81h	Partial Image 1 Start Address	W	1	0	0	0	0	0	0	0	PTSA08	PTSA07	PTSA06	PTSA05	PTSA04	PTSA03	PTSA02	PTSA01	PTSA00
82h	Partial Image 1 End Address	W	1	0	0	0	0	0	0	0	PTEA08	PTEA07	PTEA06	PTEA05	PTEA04	PTEA03	PTEA02	PTEA01	PTEA00
83h	Partial Image 2 Display Position	W	1	0	0	0	0	0	0	0	PTDP18	PTDP17	PTDP16	PTDP15	PTDP14	PTDP13	PTDP12	PTDP11	PTDP10
84h	Partial Image 2 Start Address	W	1	0	0	0	0	0	0	0	PTSA18	PTSA17	PTSA16	PTSA15	PTSA14	PTSA13	PTSA12	PTSA11	PTSA10
85h	Partial Image 2 End Address	W	1	0	0	0	0	0	0	0	PTEA18	PTEA17	PTEA16	PTEA15	PTEA14	PTEA13	PTEA12	PTEA11	PTEA10
90h	Panel Interface Control 1	W	1	0	0	0	0	0	0	DIV11	DIV10	0	RTN5	RTN5	RTN4	RTN3	RTN2	RTN1	RTN0
92h	Panel Interface Control 2	W	1	0	0	0	0	0	NOW12	NOW11	NOW10	0	0	0	0	0	0	0	0
D2h	EEPROM ID Code	W	1	0	0	0	0	0	0	0	0	0	ID6	ID5	ID4	ID3	ID2	ID1	ID0
D9h	EEPROM Control Status	W	1	0	0	0	0	0	0	0	0	0	ID_EN	VCM_EN	0	0	0	0	0
DFh	EEPROM Write Command	W	1	0	0	0	0	0	0	0	0	EE_IB7	EE_IB6	EE_IB5	EE_IB4	EE_IB3	EE_IB2	EE_IB1	EE_IB0
				0	0	0	0	0	0	0	0	EE_CMD7	EE_CMD6	EE_CMD5	EE_CMD4	EE_CMD3	EE_CMD2	EE_CMD1	EE_CMD0
				0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0
FAh	EEPROM Enable	W	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MTPPROG	0
FEh	EEPROM VCOM Offset	W	1	0	0	0	0	0	0	0	0	0	0	0	VCMF4	VCMF3	VCMF2	VCMF1	VCMF0
FFh	FAh/FEh Enable	W	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	FXEN

10. AC Characteristics
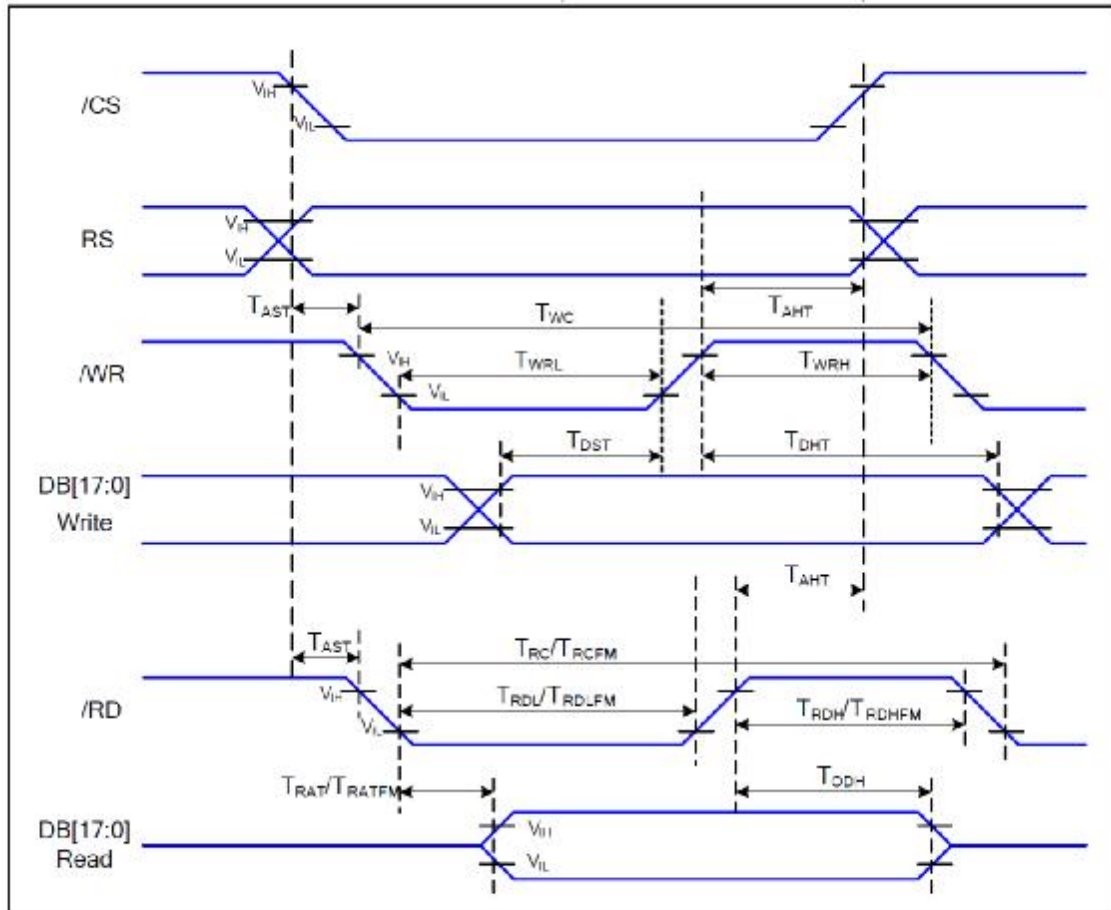
Parallel Interface Timing Characteristics (8080-Series MCU Interface)

VDDI=1.65 to 3.3V, VDD=2.5 to 3.3V, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	Min	Max	Unit	Description
RS	T_{AST}	Address Setup Time	10	-	ns	
	T_{AHT}	Address Hold Time (Write/Read)	5	-	ns	
/WR	T_{WC}	Write Cycle	100	-	ns	
	T_{WRH}	Control Pulse "H" Duration	50	-	ns	
	T_{WRL}	Control Pulse "L" Duration	50	-	ns	
/RD (ID)	T_{RC}	Read Cycle (ID)	150	-	ns	Read ID Data
	T_{RDH}	Control Pulse "H" Duration (ID)	50	-	ns	
	T_{RDL}	Control Pulse "L" Duration (ID)	100	-	ns	
/RD (FM)	T_{RCFM}	Read Cycle (FM)	300	-	ns	Read Frame Memory
	T_{RDHFM}	Control Pulse "H" Duration (RAM)	150	-	ns	
	T_{RDLFM}	Control Pulse "L" Duration (RAM)	150	-	ns	
DB[17:0]	T_{DST}	Data Setup Time	10	-	ns	T_{RAT}, T_{RATFM}: 3K ohm Pullup or Down and 30pF Parallel Cap. To GND. T_{ODH}: 3K ohm Pullup or Down.
	T_{DHT}	Data Hold Time	15	-	ns	
	T_{RAT}	Read Access Time (ID)	-	100	ns	
	T_{RATFM}	Read Access Time (FM)	-	100	ns	
	T_{ODH}	Output Disable Time	50	-	ns	

Parallel Interface Characteristics

11.Quality Specifications

All The raw material are Rohs complicant.

11.1 Standard of the product appearance test

Manner of appearance test: The inspection should be performed in using 20W x 2 fluorescent lamps. Distance between LCM and fluorescent lamps should be 100 cm or more. Distance between LCM and inspector eyes should be 30 cm or more.

Viewing direction for inspection is 45° from vertical against LCM.
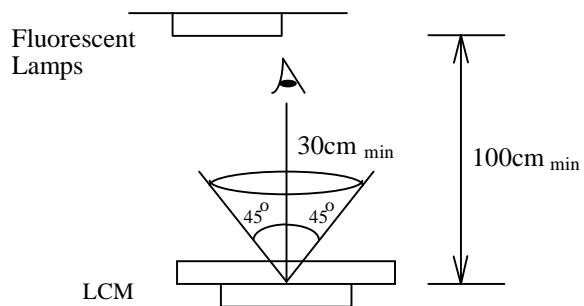
Definition of zone:
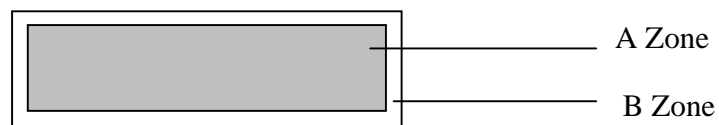
A Zone: viewing area
B Zone: outside viewing area

11.2 Specification of quality assurance
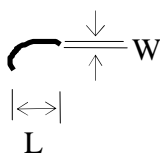
AQL inspection standard
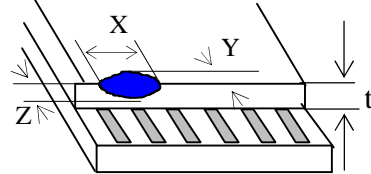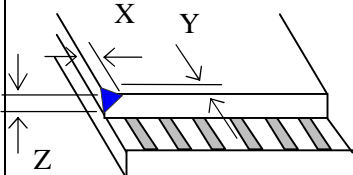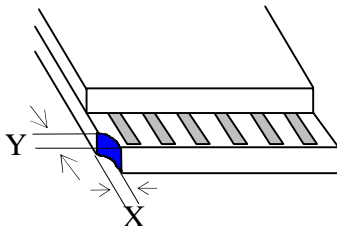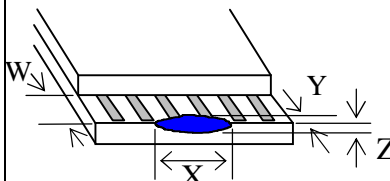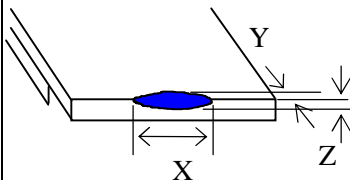
Sampling method: MIL-STD-105E, Level II, single sampling
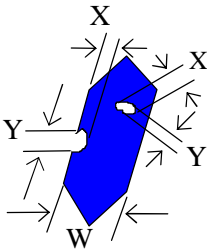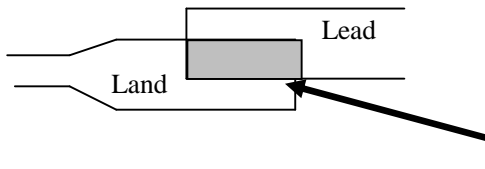
Defect classification (Note: * is not including)
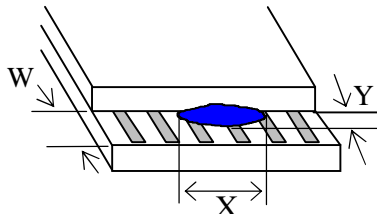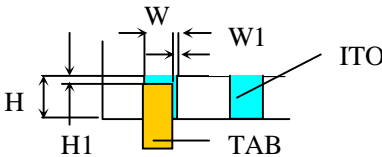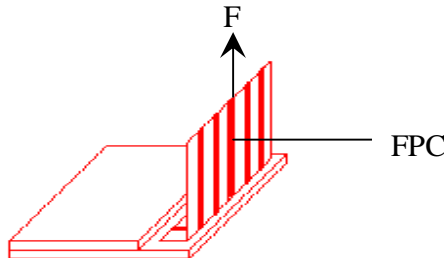
Classify		Item		Note	AQL
Major	Display state	Short or open circuit			0.65
		LC leakage			
		Flickering		1	
		No display			
		Wrong viewing direction			
		Contrast defect (dim, ghost)		2	
		Back-light		1,8	
	Non-display	Flat cable or pin reverse		10	
		Wrong or missing component		11	
Minor	Display state	Background color deviation		2	1.0
		Black spot and dust		3	
		Line defect, Scratch		4	
		Rainbow		5	
		Chip		6	
		Pin hole		7	
	Polarizer	Protruded		12	
		Bubble and foreign material		3	
	Soldering	Poor connection		9	
	Wire	Poor connection		10	
	TAB	Position, Bonding strength		13	

Note on defect classification

No.	Item	Criterion
1	Short or open circuit LC leakage Flickering No display Wrong viewing direction Wrong Back-light	Not allow
2	Contrast defect Background color deviation	Refer to approval sample
3	Point defect, Black spot, dust (including Polarizer) $\phi = (X+Y)/2$	 Unit：mm
4	Line defect, Scratch	 Unit: mm
5	Rainbow	Not more than two color changes across the viewing area.

For item 3 (Point defect):

Point Size	Acceptable Qty.
$\phi \leq 0.10$	Disregard
$0.10 < \phi \leq 0.20$	3
$0.20 < \phi \leq 0.25$	2
$0.25 < \phi \leq 0.30$	1
$\phi > 0.30$	0

For item 4 (Line defect):

Line		Acceptable Qty.
L	W	
---	$0.015 \geq W$	Disregard
$3.0 \geq L$	$0.03 \geq W$	2
$2.0 \geq L$	$0.05 \geq W$	
$1.0 \geq L$	$0.1 > W$	1
---	$0.05 < W$	Applied as point defect

No	Item	Criterion		

No	Item	Criterion
6	Chip Remark: 　X: Length direction 　Y: Short direction 　Z: Thickness direction 　t: Glass thickness 　W: Terminal Width	(see figures and tables below)

Acceptable criterion

X	Y	Z
≦2	0.5mm	≦t/2

Acceptable criterion

X	Y	Z
≦2	0.5mm	≦t

Acceptable criterion

X	Y	Z
≦3	≦2	≦t
shall not reach to ITO		

Acceptable criterion

X	Y	Z
Disregard	≦0.2	≦t

Acceptable criterion

X	Y	Z
≦5	≦2	≦t/3

No.	Item	Criterion
7	Segment pattern W = Segment width $\phi = (X+Y)/2$	(1) Pin hole $\phi < 0.10$mm is acceptable. <table><tr><td>Point Size</td><td>Acceptable Qty</td></tr><tr><td>$\phi \leq 1/4W$</td><td>Disregard</td></tr><tr><td>$1/4W < \phi \leq 1/2W$</td><td>1</td></tr><tr><td>$\phi > 1/2W$</td><td>0</td></tr></table> Unit: mm
8	Back-light	(1) The color of backlight should correspond its specification. (2) Not allow flickering
9	Soldering	(1) Not allow heavy dirty and solder ball on PCB. (The size of dirty refer to point and dust defect) (2) Over 50% of lead should be soldered on Land. Lead Land 50% lead
10	Wire	(1) Copper wire should not be rusted (2) Not allow crack on copper wire connection. (3) Not allow reversing the position of the flat cable. (4) Not allow exposed copper wire inside the flat cable.
11*	PCB	(1) Not allow screw rust or damage. (2) Not allow missing or wrong putting of component.

No	Item	Criterion
12	Protruded W: Terminal Width	 Acceptable criteria: $Y \leq 0.4$
13	TAB	1. Position $W1 \leqslant 1/3W$ $H1 \leqslant 1/3H$ 2 FPC bonding strength test P (=F/FPC bonding width) $\geqslant$650gf/cm ,(speed rate: 1mm/min) 5pcs per SOA (shipment)

14	Total no. of acceptable Defect	A. Zone
		
		  Maximum 2 minor non-conformities per one unit.
		  Defect distance: each point to be separated over 10mm
		
		B. Zone
		
		  It is acceptable when it is no trouble for quality and assembly
		  in customer's end product.

11.3 Reliability of LCM

Reliability test condition:

Item	Condition	Time (hrs)	Assessment
High temp. Storage	60°C	48	No abnormalities in functions and appearance
High temp. Operating	50°C	48	
Low temp. Storage	-20°C	48	
Low temp. Operating	-10°C	48	
Humidity	40°C/ 90%RH	48	
Temp. Cycle	-20°C ← 25°C →60°C (60 min ← 5 min → 60min)	10cycles	

Recovery time should be 24 hours minimum. Moreover, functions, performance and appearance shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature (20 ± 8°C), normal humidity (below 65% RH), and in the area not exposed to direct sun light.

11.4 Precaution for using LCD/LCM

LCD/LCM is assembled and adjusted with a high degree of precision. Do not attempt to make any alteration or modification. The followings should be noted.

General Precautions:
1. LCD panel is made of glass. Avoid excessive mechanical shock or applying strong pressure onto the surface of display area.
2. The polarizer used on the display surface is easily scratched and damaged. Extreme care should be taken when handling. To clean dust or dirt off the display surface, wipe gently with cotton, or other soft material soaked with isoproply alcohol, ethyl alcohol or trichlorotriflorothane, do not use water, ketone or aromatics and never scrub hard.
3. Do not tamper in any way with the tabs on the metal frame.
4. Do not made any modification on the PCB without consulting Regal Honour.
5. When mounting a LCM, make sure that the PCB is not under any stress such as bending or twisting. Elastomer contacts are very delicate and missing pixels could result from slight dislocation of any of the elements.
6. Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels and also cause rainbow on the display.
7. Be careful not to touch or swallow liquid crystal that might leak from a damaged cell. Any liquid crystal adheres to skin or clothes, wash it off immediately with soap and water.

Static Electricity Precautions:
1. CMOS-LSI is used for the module circuit; therefore operators should be grounded whenever he/she comes into contact with the module.
2. Do not touch any of the conductive parts such as the LSI pads; the copper leads on the PCB and the interface terminals with any parts of the human body.
3. Do not touch the connection terminals of the display with bare hand; it will cause disconnection or defective insulation of terminals.
4. The modules should be kept in anti-static bags or other containers resistant to static for storage.
5. Only properly grounded soldering irons should be used.
6. If an electric screwdriver is used, it should be grounded and shielded to prevent sparks.
7. The normal static prevention measures should be observed for work clothes and working benches.
8. Since dry air is inductive to static, a relative humidity of 50-60% is recommended.

Soldering Precautions:
1. Soldering should be performed only on the I/O terminals.
2. Use soldering irons with proper grounding and no leakage.
3. Soldering temperature: 280°C±10°C
4. Soldering time: 3 to 4 second.
5. Use eutectic solder with resin flux filling.
6. If flux is used, the LCD surface should be protected to avoid spattering flux.
7. Flux residue should be removed.

Operation Precautions:
1. The viewing angle can be adjusted by varying the LCD driving voltage Vo.
2. Since applied DC voltage causes electro-chemical reactions, which deteriorate the display, the applied pulse waveform should be a symmetric waveform such that no DC component remains. Be sure to use the specified operating voltage.
3. Driving voltage should be kept within specified range; excess voltage will shorten display life.
4. Response time increases with decrease in temperature.
5. Display color may be affected at temperatures above its operational range.
6. Keep the temperature within the specified range usage and storage. Excessive temperature and humidity could cause polarization degradation, polarizer peel-off or generate bubbles.
7. For long-term storage over 40°C is required, the relative humidity should be kept below 60%, and avoid direct sunlight.

Limited Warranty

Combix Int'l Co., Ltd. and modules are not consumer products, but may be incorporated by Regal Honour's customers into consumer products or components thereof, Combix Int'l Co. does not warrant that its LCDs and components are fit for any such particular purpose.

1. The liability of Combix Int'l Corp. limited to repair or replacement on the terms set forth below. Regal Honour will not be responsible for any subsequent or consequential events or injury or damage to any personnel or user including third party personnel and/or user. Unless otherwise agreed in writing between Combix Int'l Co. and the customer, Combix Int'l Co. will only replace or repair any of its LCD which is found defective electrically or visually when inspected in accordance with Combix Int'l Co. general LCD inspection standard. (Copies available on request)
2. No warranty can be granted if any of the precautions state in handling liquid crystal display above has been disregarded. Broken glass, scratches on polarizer mechanical damages as well as defects that are caused accelerated environment tests are excluded from warranty.
3. In returning the LCD/LCM, they must be properly packaged; there should be detailed description of the failures or defect.