

GENERAL SPECIFICATION

ITEM	DESCRIPTION				
Product No	SG640480BFCB-H				
LCD Type	<input type="checkbox"/> STN Gray	<input type="checkbox"/> STN Yellow Green	<input type="checkbox"/> STN Blue		
	<input type="checkbox"/> FSTN Negative White & Black		<input checked="" type="checkbox"/> FSTN Positive Black & White		
Rear Polarizer	<input type="checkbox"/> Reflective		<input checked="" type="checkbox"/> Transflective	<input type="checkbox"/> Transmissive	
Backlight Type	<input type="checkbox"/> NO B/L	<input type="checkbox"/> LED	<input checked="" type="checkbox"/> CCFL		<input type="checkbox"/> EL
Backlight Color	<input type="checkbox"/> Yellow Green	<input type="checkbox"/> Green	<input type="checkbox"/> Amber	<input checked="" type="checkbox"/> White	<input type="checkbox"/> Blue Green
View Direction	<input checked="" type="checkbox"/> 6 O'clock			<input type="checkbox"/> 12 O'clock	
Temperature Range	<input type="checkbox"/> Normal			<input checked="" type="checkbox"/> Wide	
Frame	<input type="checkbox"/> Black			<input type="checkbox"/> Silver	

TO BE VERY CAREFUL !

The LCD driver ICs are made by CMOS process, which are very easy to be damaged by static charge, make sure the user is grounded when handling the LCM.

ABSOLUTE MAXIMUM RATING

(1) Electrical Absolute Ratings

Item	Symbol	Min.	Max.	Unit	Note
Power Supply for Logic	$V_{DD}-V_{SS}$	-0.3	7.0	Volt	
Power Supply for LCD	$V_{EE}-V_{SS}$	0	30.0	Volt	
Input Voltage	V_{IN}	-0.3	V_{DD}	Volt	

(2) Environmental Absolute Maximum Ratings

Item	Normal Temperature				Wide Temperature			
	Operating		Storage		Operating		Storage	
	Min,	Max.	Min,	Max.	Min,	Max.	Min,	Max.
Ambient Temperature	0°C	+50°C	-20°C	+70°C	-20°C	+70°C	-30°C	+80°C
Humidity(without condensation)	Note 2,4		Note 3,5		Note 4,5		Note 4,6	

Note 2 $T_a \leq 50^\circ\text{C}$: 80% RH max

$T_a > 50^\circ\text{C}$: Absolute humidity must be lower than the humidity of 85%RH at 50°C

Note 3 T_a at -20°C will be <48hrs at 70°C will be <120hrs when humidity is higher than 75%.

Note 4 Background color changes slightly depending on ambient temperature. This phenomenon is reversible.

Note 5 $T_a \leq 70^\circ\text{C}$: 75RH max

$T_a > 70^\circ\text{C}$: absolute humidity must be lower than the humidity of 75%RH at 70°C

Note 6 T_a at -30°C will be <48hrs, at 80°C will be <120hrs when humidity is higher than 75%.

ELECTRICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ	Max.	Unit	note
Power Supply for Logic	$V_{DD}-V_{SS}$	-	2.7	4.5	5.5	Volt	
Input Voltage	V_{IL}	L level	V_{SS}	$0.2 V_{DD}$	-	Volt	
	V_{IH}	H level	$0.8 V_{DD}$	V_{DD}	-	Volt	
LCM Recommend LCD Module Driving Voltage	$V_{EE}-V_{SS}$	$T_a=0^{\circ}C$	22.5	23.5	24.5	Volt	
		$T_a=25^{\circ}C$	21.0	22.0	23.5		
		$T_a=50^{\circ}C$	19.5	20.5	21.5		
Power Supply Current for LCM	I_{DD} (B/L OFF)	$V_{DD}=4.5V$ $V_{DD}-V_o=21.2V$ FLM=64HZ	-	30.0	10.0	mA	
	I_{EE}		-	6.0	20.0		
CCFL Staring Voltage	V_{FLS}	-	-	750	-	Vrms	
CCFL driving Voltage	V_{FLD}	-	-	360	-	Vrms	
CCFL driving Current	I_{FLD}	$V_{FLD}=450Vrms$ $f_{FL}=30kHz$	-	5.0	-	mA	
CCFL driving frequency	f_{FL}	$V_{FLD}=450Vrms$ $F_{FL}=30kHz$	15	30	85	KHZ	
CCFL saturation Time	t_{SAT}	$T_a=25^{\circ}C$		1		minut	

OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ	Max.	Unit	note
Contrast	K	$25^{\circ}C$	12	16.5	-	-	7
Response Time	T_r	$25^{\circ}C$	-	150	-	ms	
	T_f			220			
Viewing angle range	θf	$25^{\circ}C$	-	33	37	Degree	9,10
	θb		-	20	22		
	θr			45	50		
	θl		-	45	50		
Frame frequency	Fr	$25^{\circ}C$	-	70	-	HZ	8,10
Color	x	$25^{\circ}C$	-	0.31	-	-	
	y		-	0.34	-	-	
Luminance	L	$25^{\circ}C$	100	120	-	cd/m ²	

ELECTRICAL CHARACTERISTICS

ITEM	DESCRIPTION
Product No.	SG640480B
Module Size	197.0 (W)mm×145.0(H)mm×11.0(D)mm Max
Viewing Area	153.0(W)mm×115.4(H)mm
Dot Size	0.217(W)mm×0.217(H)mm
Dot Pitch	0.237(W)mm×0.237(H)mm
Resolution	640×480(H) Dots Matrix
Duty Ratio	1/240 Duty
Controller	Without
DC/DC Converter	Without
CCFL Inverter	Without
EL Driver	Without

INTERFACE PIN ASSIGNMENT

FFC CABLE PITCH 1.0mm(SUMITOMO)

PIN NO.	PIN OUT	FUNCTION DESCRIPTION
1	FP	Frame Pulse
2	LP	Latch Pulse in one line
3	SCP	Shift Clock Pulse for X-Drivers
4	DISP	Sequence Signal of Power Supply("L":OFF)
5	VDD	Power Supply for Logic(+5V)
6	VSS	Ground(0V)
7	VEE	Power Supply for Contrast Control
8	UD0	Data Input for Upper Screen
9	UD1	Data Input for Upper Screen
10	UD2	Data Input for Upper Screen
11	UD3	Data Input for Upper Screen
12	LD0	Data Input for Lower Screen
13	LD1	Data Input for Lower Screen
14	LD2	Data Input for Lower Screen
15	LD3	Data Input for Lower Screen

Mating Connector :6224-015-001-008(ELCD)

FL Connector MITSUMI :M63-M83-04

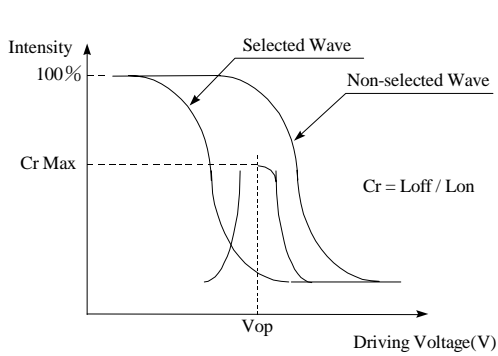
Pin No.	Signal	Function
1	VFL	Power Supply for FL(Hot)
2	NC	No Connection
3	NC	No Connection
4	VFLG	Power Supply for FL(Ground)

Mating Connector : MITSUMI : M61M73-04

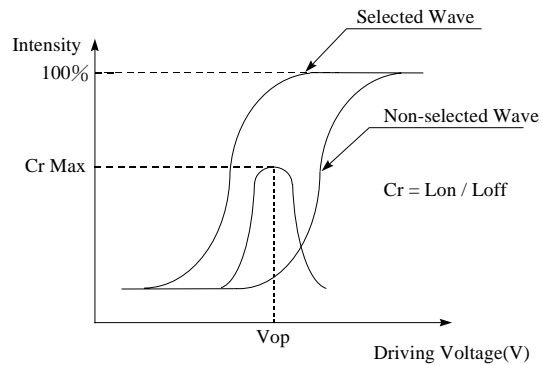
M60-04-30-114P (STRAIGHT)

M60-04-30-134P (ANGLE)

[Note 7] Definition of Operation Voltage (Vop)

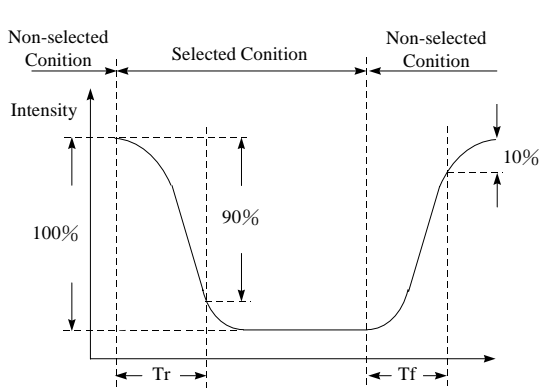


[positive type]

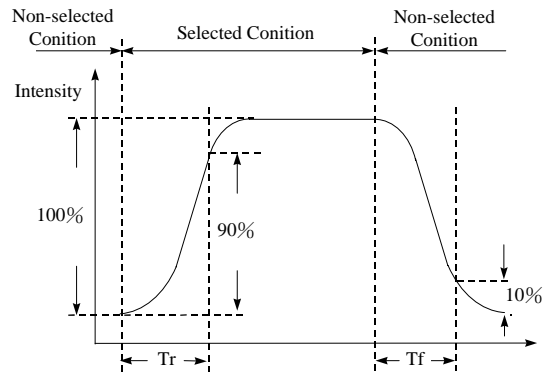


[Negative type]

[Note 8] Definition of Response Time (Tr, Tf)



[positive type]



[Negative type]

Conditions:

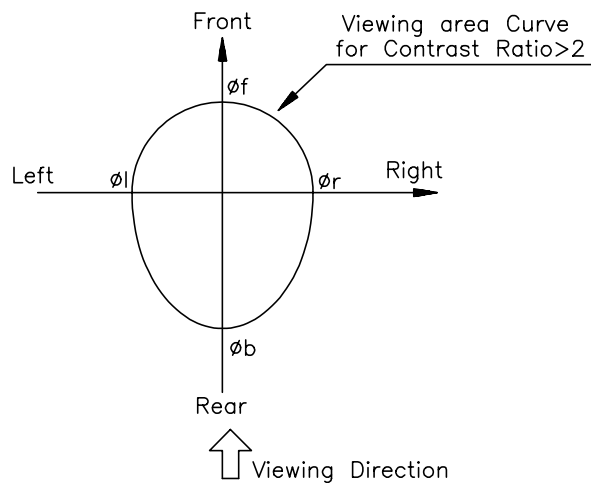
Operating Voltage : Vop

Frame Frequency : 64 Hz

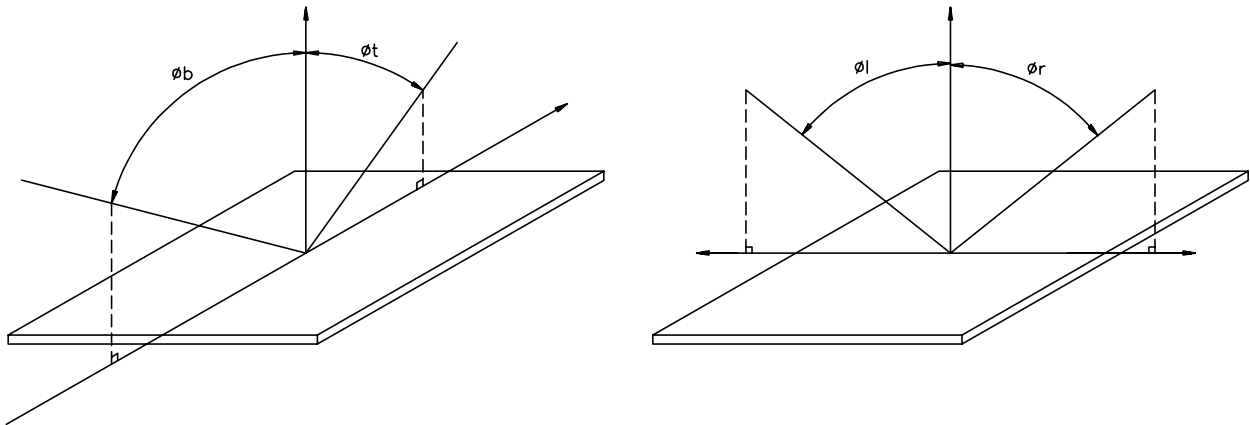
Viewing Angle (θ, φ): $0^\circ, 0^\circ$

Driving Wave form : 1/N duty, 1/a bias

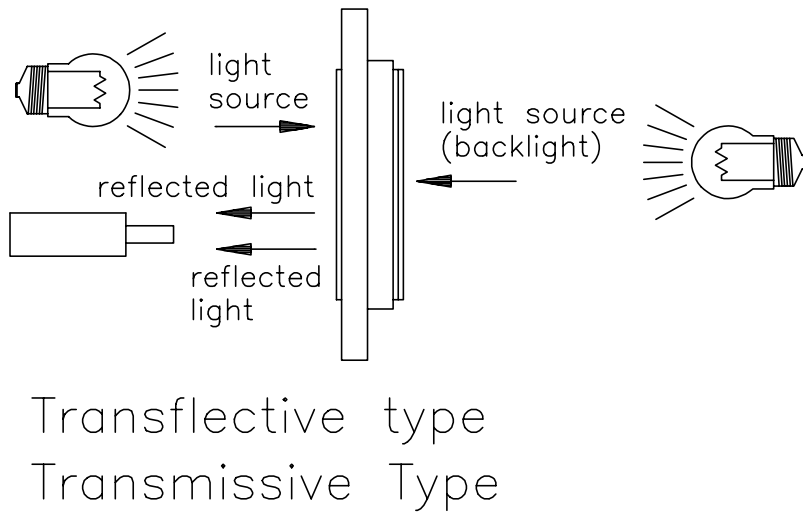
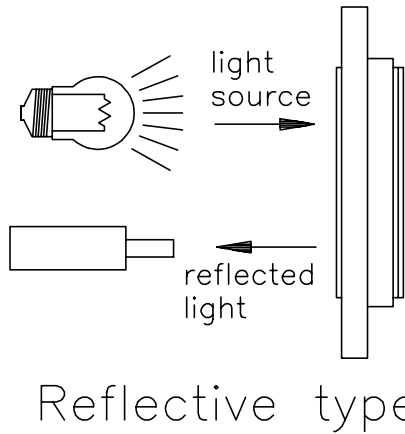
[Note 9] Definition of Viewing Direction



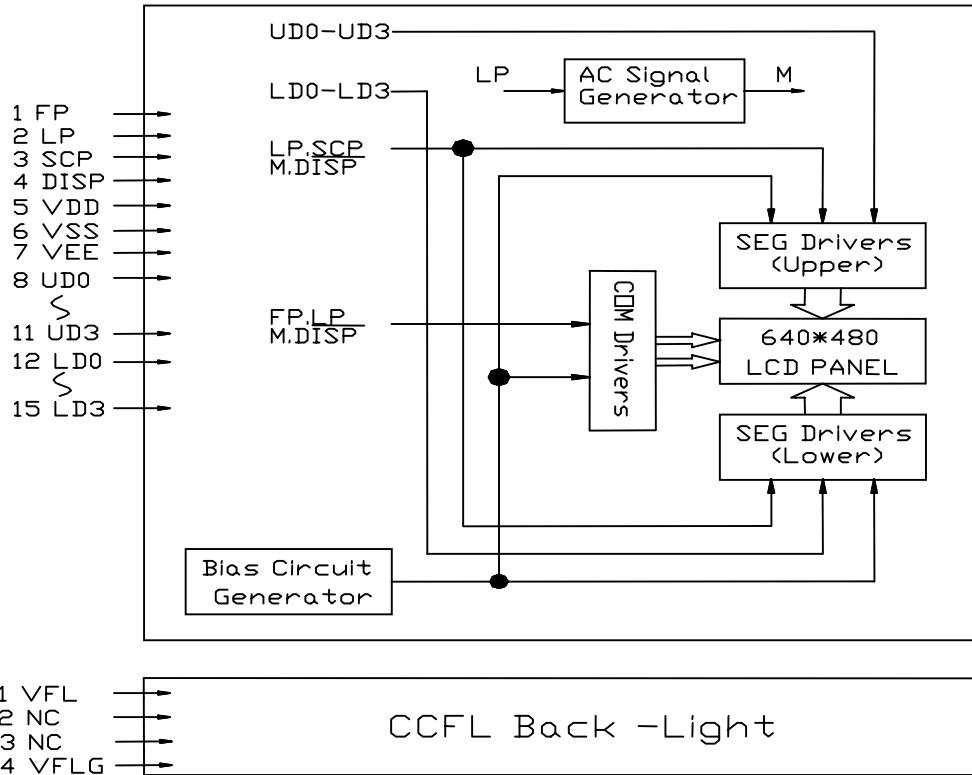
[Note 10] Definition of viewing angle



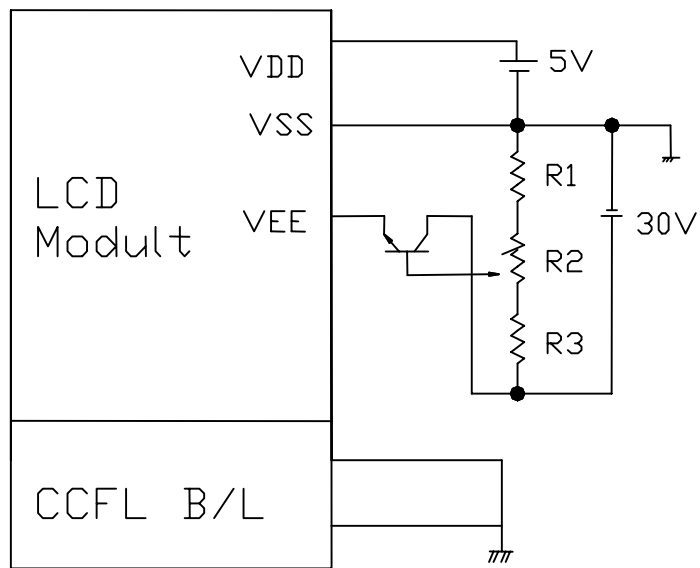
[Note 11] Description of Measuring Equipment



BLOCK DIAGRAM



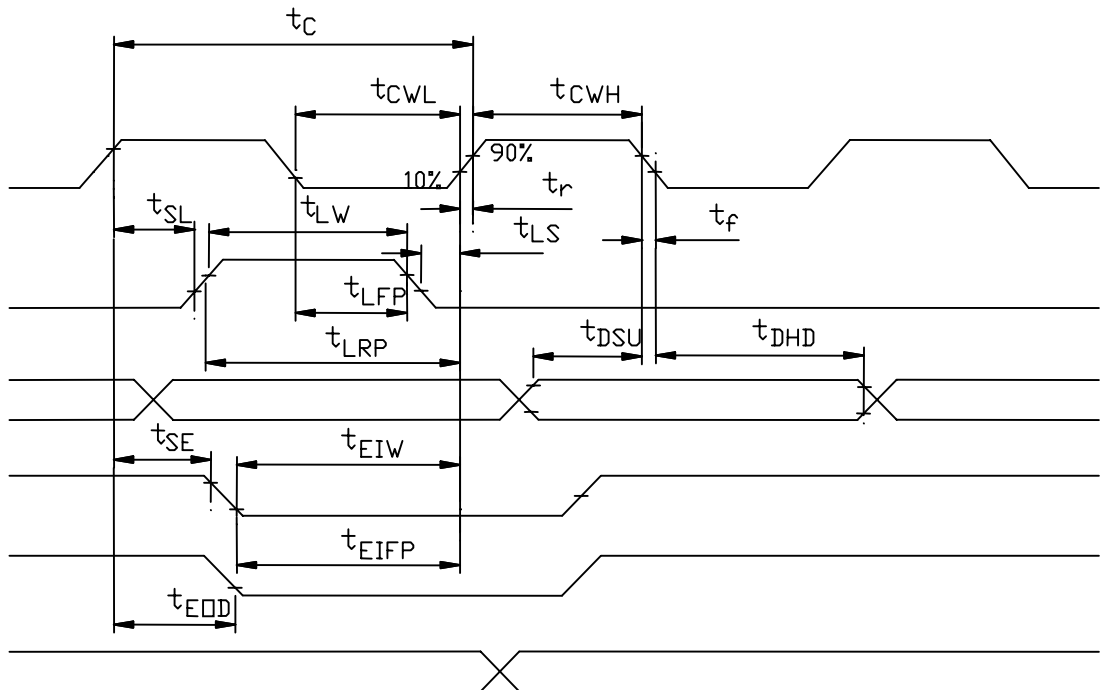
POWER SUPPLY



TIMING CHARACTERISTICS

1 Segment interface timing : ($V_{SS}=V_5=0V, V_{DD}=2.5V$ to $4.5V, V_{EE}=+15.0V$ to $+24V, T_a=0$ to $50^\circ C$)

ITEM	Symbol	Test Condition	Min	Max	Units
Clock Cycle	t_c	-	125	-	ns
SCP Pulse Width	t_{CWL} t_{CWH}	-	50	-	ns
DATA Set-up Time	t_{DSU}	-	50	-	ns
DATA Hold Time	t_{DHD}	-	50	-	ns
SCP Rise/Fall Time	t_r, t_f	-	-	(*5)	ns
LP Rise Time	t_{LRP}	-	50	-	ns
LP Fall Time	t_{LFP}	-	50	-	ns
LP Pulse Width	t_{LW}	-	45	-	ns
SCP-to-LP Delay Time	t_{SL}	-	40	-	ns
LP-to-SCP Delay Time	t_{LS}	-	40	-	ns
EIO-in Fall Time	t_{EIFP}	-	40	-	ns
EIO-in Pulse Width	t_{EIW}	-	40	-	ns
SCP-to-EIO Delay Time	t_{SE}	-	20	-	ns
EIO-out Delay Time	t_{EOD}	(*6)	-	80	ns



SUNLIKE DISPLAY

Model No :SG640480B

DISPLAY PATTERN

	SEG1	SEG2	SEG3	SEG4		SEG637	SEG638	SEG639	SEG640
COM1	UD3	UD2	UD1	UD0	.....	UD3	UD2	UD1	UD0
COM2	UD3	UD2	UD1	UD0	.....	UD3	UD2	UD1	UD0
.....								
COM239	UD3	UD2	UD1	UD0	.....	UD3	UD2	UD1	UD0
COM240	UD3	UD2	UD1	UD0	.....	UD3	UD2	UD1	UD0
COM1	LD3	LD2	LD1	LD0	.....	LD3	LD2	LD1	LD0
COM2	LD3	LD2	LD1	LD0	.....	LD3	LD2	LD1	LD0
.....								
COM479	LD3	LD2	LD1	LD0	.....	LD3	LD2	LD1	LD0
COM480	LD3	LD2	LD1	LD0	.....	LD3	LD2	LD1	LD0

SUNLIKE DISPLAY

Model No :SG640480B

RELIABILITY TEST

NO	Item	Conditions		Note
1	High Temp. Operaion	50°C	240HR	
2	High Temp. Storage	70°C	240HR	
3	Low Temp. Operaion	0°C	240HR	
4	Low Temp. Storage	-20°C	240HR	
5	High Temp. /Humid Storage	40°C 90%RH	240HR	
6	Thermal Shock	-20°C ,30min +40°C , 30min	10cycles	
7	Vibration Test (IEC-68-2-6)	Frequency : 10~55Hz Duration : 20times,6 min/time Amplitude : 0.75 mm	-	
8	Shock (IEC-68-2-27)	Duration : 11mS Acceleration : 100g	-	X,Y,Z dirction

HANDLING PRECAUTIONS

- (1) Treat polarizer very carefully since it is easy to be damaged.
- (2) When cleaning the display surface, use soft cloth (e.g. gauze) with a solvent (recommended below) and wipe lightly.
 - ◆ ethyl alcohol
 - ◆ iso-propanol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvents:

- ◆ water
- ◆ ketone
- ◆ aromatics

- (3) Direct current causes electro-chemical reaction with remarkable degradation of the display quality. Give careful consideration to prevent direct current at ON/OFF timing and during operation.
- (4) Avoid strong shock and drop from the height.
- (5) To prevent LCD panels from degradation, do not operate or store them exposed directly to sunshine or high temperature/humidity.
- (6) Give careful consideration to avoid electrical static discharge which causes uneven contrast.
- (7) Even a small condensation on the contact pads (terminals) causes electro-chemical reaction which makes missing row and column. Give careful attention to avoid condensation. When assembling with zebra connector, clean the surface of the pads with alcohol and keep the air very clean.

LCD PRODUCT QUALITY STANDARD

DISPLAY APPEARANCE

NO	Item	Criteria
1	inclusions (black spot, white spot,dust)	(1) round type diameter mm(a*) no of defect* $a \leq 0.20$ neglect $0.20 < a \leq 0.35$ 5max $0.35 < a$ none (2) linear type length mm(1) width mm(W) no. of defect na $W \leq 0.03$ neglect $1 \leq 3$ $0.03 < W \leq 0.08$ 6 $3 < 1$ $0.08 < W$ none
2	scratch	1. scratch on protective film is permitted. 2. scratch on polarizer shall be as follow: (1) round type diameter mm(a*) no of defect $a \leq 0.15$ neglect $0.15 < a \leq 0.20$ 2 max $0.20 < a$ none (2) linear type be judged by 1.-(2) linear type
3	dent	diameter < 1.5mm
4	bubble	not exceeding 0.5mm average diameter is acceptable between glass and polarizing film
5	pin hole	$(a+b)/2 \leq 0.15\text{mm}$ maximum number: ignored $0.15 < (a+b)/2 \leq 0.20\text{mm}$ maximum number : 10
6	dotdefect	$(a+b)/2 \leq 0.20\text{mm}$ maximum number: ignored $0.20 < (a+b)/2 \leq 0.30\text{mm}$ maximum number: 5 x=width
7	contrast irregularity(spot)	diametr spec no of defect $a \leq 0.50\text{mm}$ neglect $0.50 < a \leq 0.75$ 5 $0.75 < a \leq 1.00$ 3 $1.00 < a$ none
8	dot width	design width
9	color tone and uniformity	obvious uneven color is not permitted