

SPEC.NO.	TQ3C-8EAS0-E1CRG08-02
DATE	November 15, 2006

S P E C

FOR : _____

TYPE : KG057QV1CA - G00

C O N T E N T S

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3. Mechanical Specifications
4. Absolute Maximum Ratings
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17. Outline Drawing



KYOCERA CORPORATION
KAGOSHIMA HAYATO PLANT
LCD DIVISION

This specification is subject to change without notice.
Consult Kyocera before ordering.

Original	Designed by :Engineering Dept.			Confirmed by :QA Dept.	
Issue Date	Prepared	Checked	Approved	Checked	Approved
July 30,2002	<i>T. Oudera</i>	<i>F. Yamaguchi</i>	<i>Y. Matsumoto</i>	<i>To. Adh</i>	<i>T. Minami</i>

Warning

1. This Kyocera LCD module has been specifically designed for use only in electronic devices and industrial machines in the area of audio control, office automation, industrial control, home appliances, etc. The module should not be used in applications where the highest level of safety and reliability are required and module failure or malfunction of such module results in physical harm or loss of life, as well as enormous damage or loss. Such fields of applications include, without limitation, medical, aerospace, communications infrastructure, atomic energy control. Kyocera expressly disclaims any and all liability resulting in any way to the use of the module in such applications.
2. Customer agrees to indemnify, defend and hold Kyocera harmless from and against any and all actions, claims, damages, liabilities, awards, costs and expenses, including legal expenses, resulting from or arising out of Customer's use, or sale for use, or Kyocera modules in applications.

Caution

1. Kyocera shall have the right, which Customer hereby acknowledges, to immediately scrap or destroy tooling for Kyocera modules for which no Purchase Orders have been received from the Customer in a two-year period.

Revision Record

Date		Designed by: Engineering Dept.			Confirmed by: QA Dept.	
		Prepared	Checked	Approved	Checked	Approved
Nov. 15, 2006		<i>T. Onodera</i>	<i>Y. Yamaguchi</i>	<i>Y. Masunoto</i>	<i>Sh. Arai</i>	<i>T. Minami</i>
Rev. No.	Date	Page	Descriptions			
01	Oct. 8, 2004	1	2. Construction and Outline ~ Change "DC/DC converter" "DC-DC conberter"			
		2	4-2. Environmental absolute maximum ratings ~ Add comment "*2 (Please refers to 15. Precautions for use)"			
		4,5	5-1. VDD = 5.0V, 5-2. VDD = 3.3V ~ Delete () ~ *3 Display high frequency pattern. Add "Temp.=25 "			
		8	7. Circuit Block Diagram ~ Change "*3 DC/DC converter" "*3 DC-DC converter"			
		9	~ Add page "7-1. Power supply"			
		10	8-2. CFL ~ Change SYMBOL "HV HOT", "GND COLD" ~ Delete "LEVEL"			
		12	10. Input Timing Characteristics ~ Change "FRM"			
		15	12. Back light characteristics ~ Delete ()			
		17	15-1. Installation of the LCD ~ Add comment "8. This kyocera LCD..."			
			15-3. LCD operation ~ Change comment "2. Adjust LCD driving..."			
15-4. Storage ~ Change comment "2. Always store the LCD..."						
02	Nov. 15, 2006	-	Change "Warning"			
		1	1. Application ~ Add comment "『RoHS Compliant』"			
			2. Construction and Outline ~ "Additional circuit" Add "Temperature Compensation Circuit(for Contrast)"			
		4	5-1. VDD =5.0V ~ Change "LCD driving voltage" ~ Add comment "*2 This LCD Module" ~ Add comment "*3 Frame frequency....."			
		5	5-2. VDD = 3.3V ~ Change "LCD driving voltage" ~ Add comment "*2 This LCD Module" ~ Add comment "*3 Frame frequency....."			
		6	6. Optical Characteristics ~ Change "Viewing angle range"			

Revision Record

Date		Designed by: Engineering Dept.			Confirmed by: QA Dept.	
		Prepared	Checked	Approved	Checked	Approved
Nov. 15, 2006		<i>T. Oudera</i>	<i>F. Yamaguchi</i>	<i>Y. Matsumoto</i>	<i>Zo. Adh</i>	<i>T. Minami</i>
Rev. No.	Date	Page	Descriptions			
02	Nov. 15, 2006	11	8-1. LCD ~ Change "LCD side connector" "08-6210-020-340-800" "08-6210-020-340-800+"			
			8-2. CFL ~ Add "Recommended matching connector" "SM02(8.0)B-BHS-1-TB(LF)(SN)"			
		14	10-1. Switching characteristics ~ Delete comment " trCP,tfCP 30 ns"			
		16	12. Backlight Characteristics ~ Change comment "*1 The Non-load output voltage....." ~ Add comment "* Prolonged storage in darkness....."			
		18	15-5. Screen Surface ~ Add comment "6. Do not disassemble LCD....." ~ Add comment "7. Please do not use....." ~ Add comment "8. Liquid crystal may leak....."			
		20	17. Outline Drawing ~ Change Drawing			

1 . Application

This data sheet defines the specification for a 320×240 dot, Transmissive monochrome mode dot matrix type Liquid Crystal Display with CFL backlight. 『RoHS Compliant』

2 . Construction and Outline

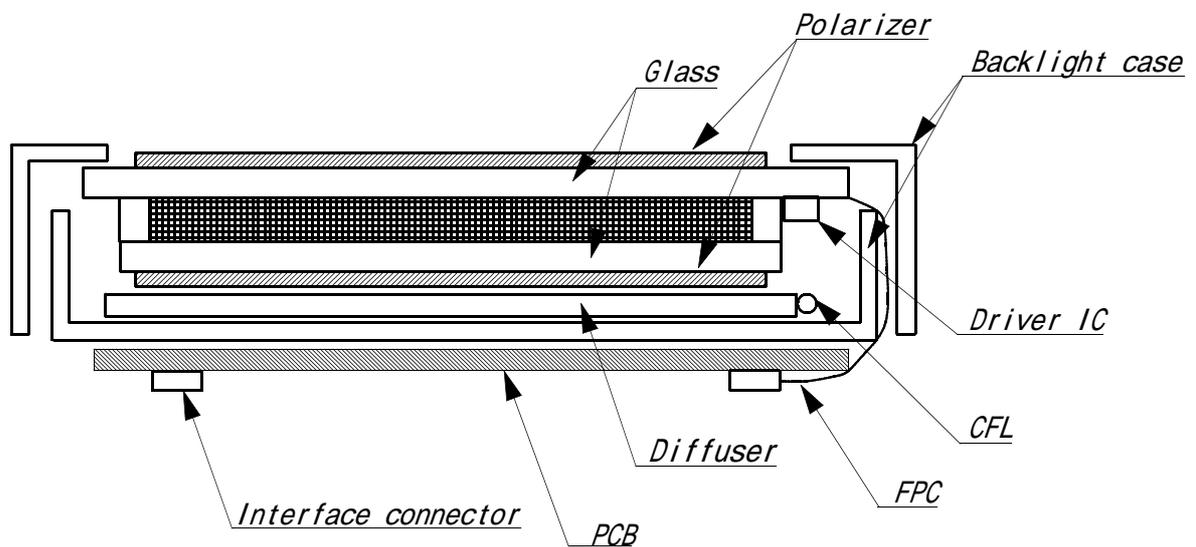
320×240 dots, COG type LCD with CFL backlight.

Backlight system : Side-edge type CFL (1 tube).

Inverter : option.
Recommended Inverter : PH-BLC08-K3(HITACHI MEDIA ELECTRONICS)
or Equivalent.

Polarizer : Glare treatment.

Additional circuit : Bias voltage circuit, Randomizing circuit, DC - DC converter
Temperature Compensation Circuit (for Contrast)



This drawing is showing conception only

3 . Mechanical Specifications

ITEM	SPECIFICATION	UNIT
Outline dimensions	144.0 (W) × 104.8 (H) × 12.7 (D)	mm
Effective viewing area	117.2 (W) × 88.4 (H)	mm
Dot number	320 (W) × 240 (H)	Dots
Dot size	0.34 (W) × 0.34 (H)	mm
Dot pitch	0.36 (W) × 0.36 (H)	mm
Display color *1	White *2	-
Base color *1	Black *2	-
Mass	175	g

*1 Due to the characteristics of the LC material, the color vary with environmental temperature.

*2 Negative-type display

Display data "H" : Dots ON : White
 Display data "L" : Dots OFF : Black

4 . Absolute Maximum Ratings

4-1. Electrical absolute maximum ratings

ITEM	SYMBOL	MIN.	MAX.	UNIT
Supply voltage for logic	VDD	0	7.0	V
Supply voltage for LCD driving	VCONT	0	VDD	V
Input signal voltage *1	Vin	0	VDD	V

*1 Input signal : CP,LOAD,FRM,DISP,D0 ~ D3

4-2. Environmental absolute maximum ratings

ITEM	SYMBOL	MIN	MAX	UNIT
Operating temperature *1	Top	0	60	
Storage temperature *2	T _{STO}	-20	60	
Operating humidity *3	H _{op}	10	*4	%RH
Storage humidity *3	H _{STO}	10	*4	%RH
Vibration	-	*5	*5	-
Shock	-	*6	*6	-

*1 LCD's display quality shall not be guaranteed at the temperature range of :
below 0 ° and upper 40 °.

*2 Temp. = -20 ° < 48 h. , Temp = 60 ° < 168 h.
Store LCD panel at normal temperature/humidity. Keep it free from vibration and shock.
LCD panel that is kept at low or high temperature for a long time can be defective due to the
other conditions, even if the temperature satisfies standard.
(Please refers to 15. Precautions for use)

*3 Non-condensation.

*4 Temp. ≤ 40 ° , 85% RH Max.
Temp. > 40 ° , Absolute Humidity shall be less than 85%RH at 40 ° .

*5

Frequency	10 ~ 55 Hz	Converted to acceleration value: (0.3 ~ 9m/s ²)
Vibration width	0.15 mm	
Interval	10-55-10 Hz 1 minute	

2 hours in each direction X/Y/Z (6 hours as total)
EIAJ ED-2531.

*6 Acceleration: 490m/s²
Pulse width : 11 ms
3 times in each direction : ±X/±Y/±Z.
EIAJ ED-2531.

5 .Electrical Characteristics

5-1. VDD = 5.0V

VDD = 5V ±5%, Temp.= 0 ~ 60

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply voltage for logic	VDD	-	4.75	5.00	5.25	V
LCD driving voltage *1 *3	Vop =VCONT	0 ~ 50 *2	1.45	1.95	2.45	V
		~ 60	-	-	2.55	V
Input voltage	Vin	"H" level	0.8VDD	-	VDD	V
		"L" level	0	-	0.2VDD	V
Clock frequency	f _{cp}	-	1.34	1.44	7.1	MHz
Frame frequency *4	f _{FRM}	-	70	75	80	Hz
Current consumption for logic	IDD	*5	-	28.5	42.8	mA
Power consumption	Pdisp		-	142.5	214.0	mW

*1 Maximum contrast ratio is obtained by adjusting the LCD supply voltage (Vop= VCONT) for driving LCD.

*2 This LCD Module has the Temperature Compensation Circuit.

*3 Frame frequency : f_{FRM} = 75Hz

*4 In consideration of display quality, it is recommended that frame frequency is set in the range of 70-80Hz. When you have to use higher frame and clock frequencies, confirm the LCD's performance and quality prior to finalizing the frequency values: Generally, as frame and clock frequencies become higher, current consumption will get bigger and display quality will be degraded.

*5 Display high frequency pattern, (see below).
VDD = 5V , Vop = VCONT , f_{FRM} = 75 Hz , f_{cp} = 1.44MHz, Temp. = 25
Pattern:

```

1 2 3 4 5 6 ----- 320(dot)
1
2
3
:
:
239
240
(dot)

```

5-2. VDD = 3.3V

VDD = 3.3V ± 0.3V, Temp. = 0 ~ 60

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply voltage for logic	VDD	-	3.0	3.3	3.6	V
LCD driving voltage *1 *3	Vop =VCONT	0 ~ 50 *2	1.45	1.95	2.45	V
		~ 60	-	-	2.55	V
Input voltage	Vin	"H" level	0.8VDD	-	VDD	V
		"L" level	0	-	0.2VDD	V
Clock frequency	f _{cp}	-	1.34	1.44	7.1	MHz
Frame frequency *4	f _{FRM}	-	70	75	80	Hz
Current consumption for logic	IDD	*5	-	41.5	62.3	mA
Power consumption	Pdisp		-	137.0	205.6	mW

*1 Maximum contrast ratio is obtained by adjusting the LCD supply voltage (Vop= VCONT) for driving LCD.

*2 This LCD Module has the Temperature Compensation Circuit.

*3 Frame frequency : f_{FRM} = 75Hz

*4 In consideration of display quality, it is recommended that frame frequency is set in the range of 70-80Hz. When you have to use higher frame and clock frequencies, confirm the LCD's performance and quality prior to finalizing the frequency values: Generally, as frame and clock frequencies become higher, current consumption will get bigger and display quality will be degraded.

*5 Display high frequency pattern, (see below).
VDD = 3.3V , Vop = VCONT , f_{FRM} = 75 Hz , f_{cp} = 1.44MHz, Temp. = 25
Pattern:

```

1 2 3 4 5 6 ----- 320(dot)
1
2
3
:
:
239
240
(dot)

```

6 .Optical Characteristics

Temp. = 25

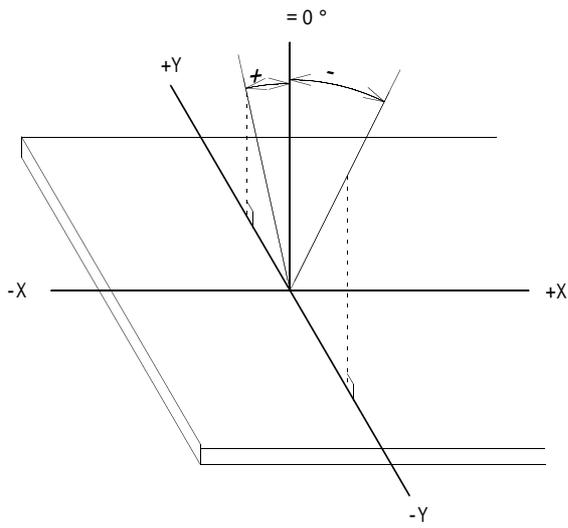
ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Response time	Rise	Tr	= =0 °	-	210	310	ms	
	Down	Td	= =0 °	-	130	230	ms	
Viewing angle range			CR 2	Upper	-	20	-	deg.
				Lower	-	40	-	
				Left	-	45	-	deg.
				Right	-	45	-	
Contrast ratio		CR	= =0 °	5.0	10.0	-	-	
Brightness		L	IL=4.0mArms	160	220	-	cd/m ²	
Chromaticity coordinates	White	x	= =0 °	0.26	0.31	0.36	-	
		y		0.25	0.30	0.35		
	Black	x	= =0 °	0.28	0.33	0.38		
		y		0.27	0.32	0.37		

Optimum contrast is obtained by adjusting the LCD driving voltage(Vop) while at the viewing angle of = =0 ° .

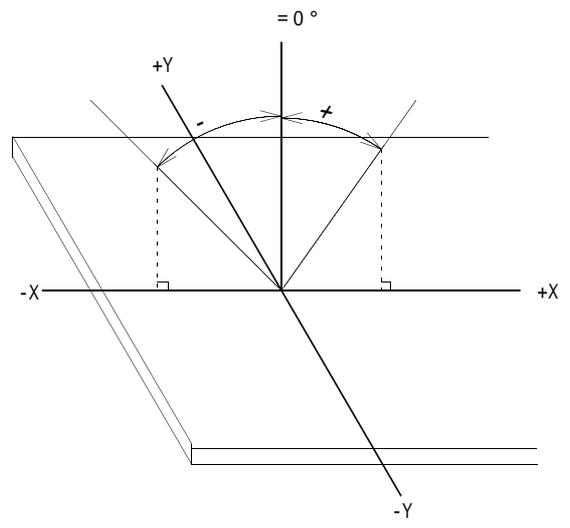
6-1. Contrast ratio is defined as follows:

$$CR = \frac{\text{Brightness at all pixels "White"}}{\text{Brightness at all pixels "Black"}}$$

6-2. Definition of viewing angle

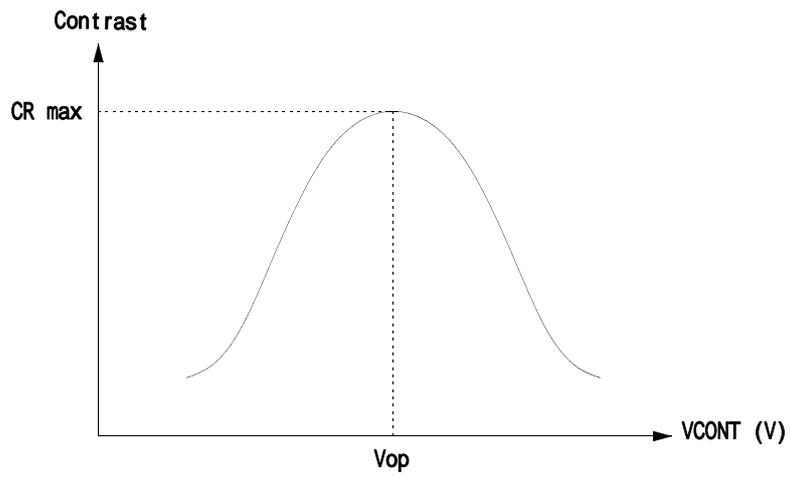


(direction)

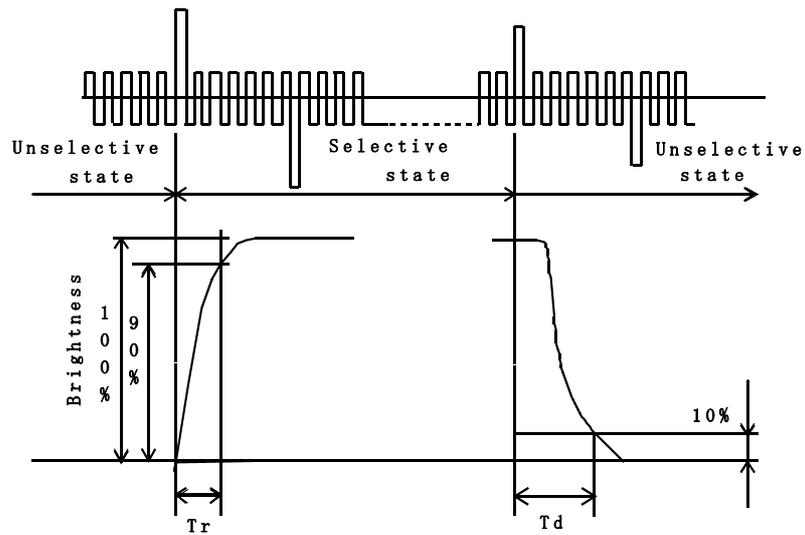


(direction)

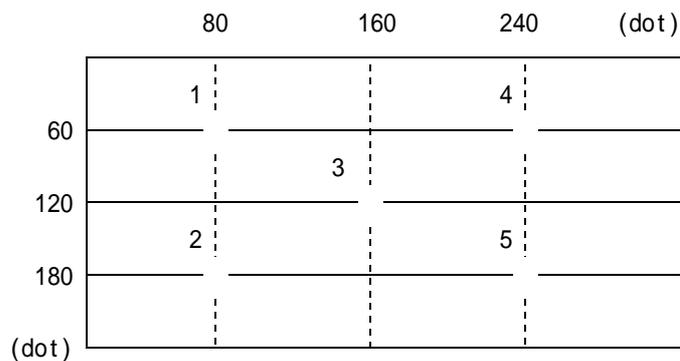
6-3. Definition of Vop



6-4. Definition of response time

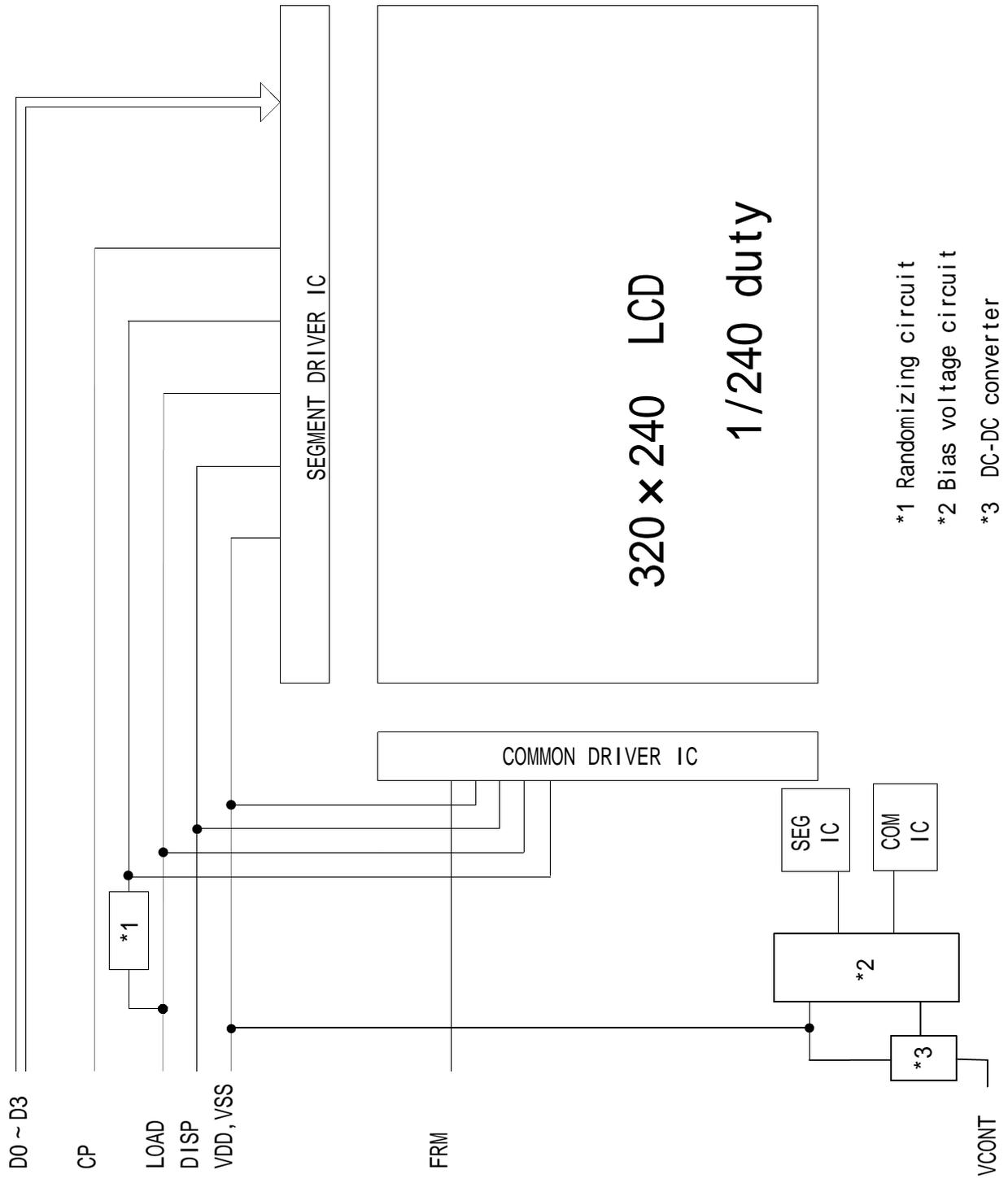


6-5. Measuring points

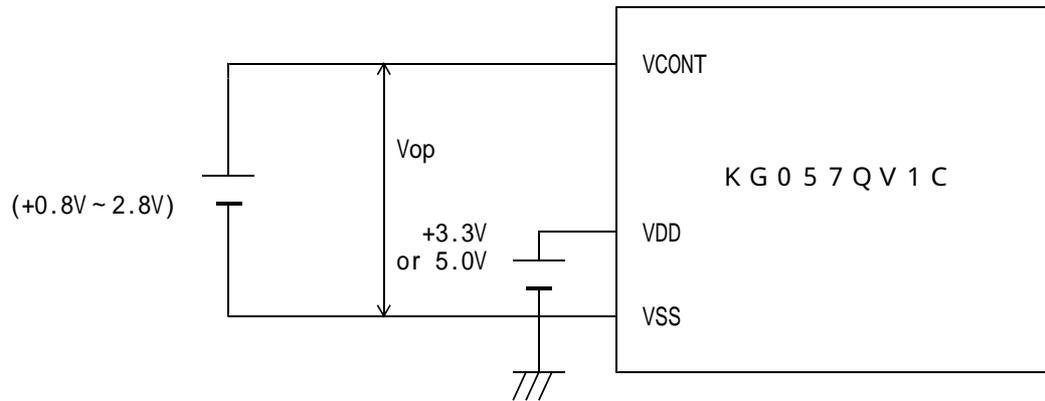


- 1) Rating is defined as the average brightness inside the viewing area.
- 2) 30 minutes after CFL is turned on. (Ambient Temp.=25)
- 3) The inverter should meet the rating of the CFL;
-Sine, symmetric waveform without spike in positive and negative.
- 4) Measuring Inverter : PH-BLC08-K3(HITACHI MEDIA ELECTRONICS)

7. Circuit Block Diagram



7-1. Power supply



8 . Interface Signals

8-1.LCD

PIN NO.	SYMBOL	DESCRIPTION	LEVEL
1	FRM	Synchronous signal for driving scanning line	H
2	LOAD	Data signal latch clock	H L
3	CP	Data signal shift clock	H L
4	DISP	Display control signal	H(ON),L(OFF)
5	VDD	Power supply for logic	
6	VSS	GND	
7	VCONT	LCD adjust voltage	
8	NC	No connect	
9	NC		
10	NC		
11	NC		
12	D3		
13	D2	4 bit parallel data.	H(ON),L(OFF)
14	D1		
15	D0		
16	VDD	Power supply for logic	
17	VDD		
18	VSS	GND	
19	VSS		
20	VSS		

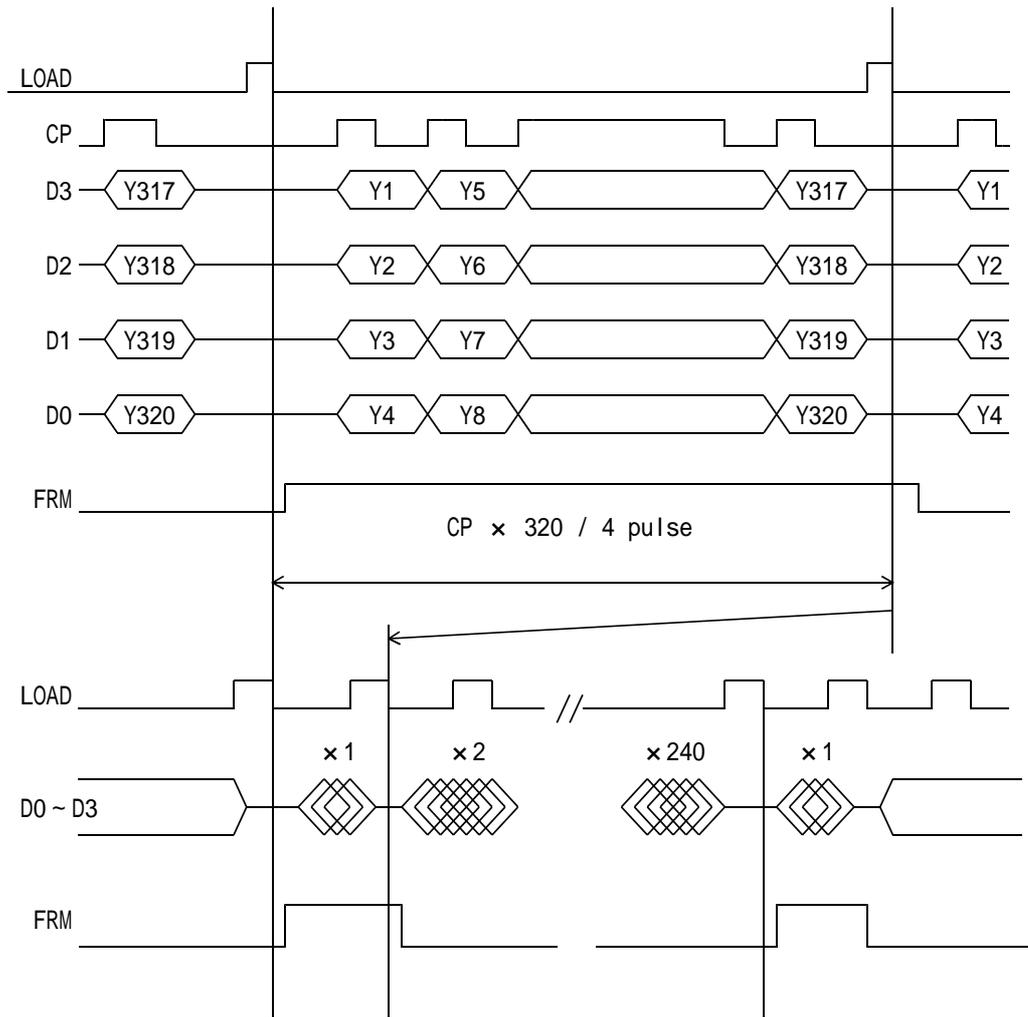
LCD side connector : 08-6210-020-340-800+ (ELCO)
 Recommended matching FFC or FPC : P = 0.5mm

8-2. CFL

PIN NO.	SYMBOL	DESCRIPTION
1	HOT	Inverter output high voltage side
2	NC	No connect
3	COLD	Inverter output low voltage side

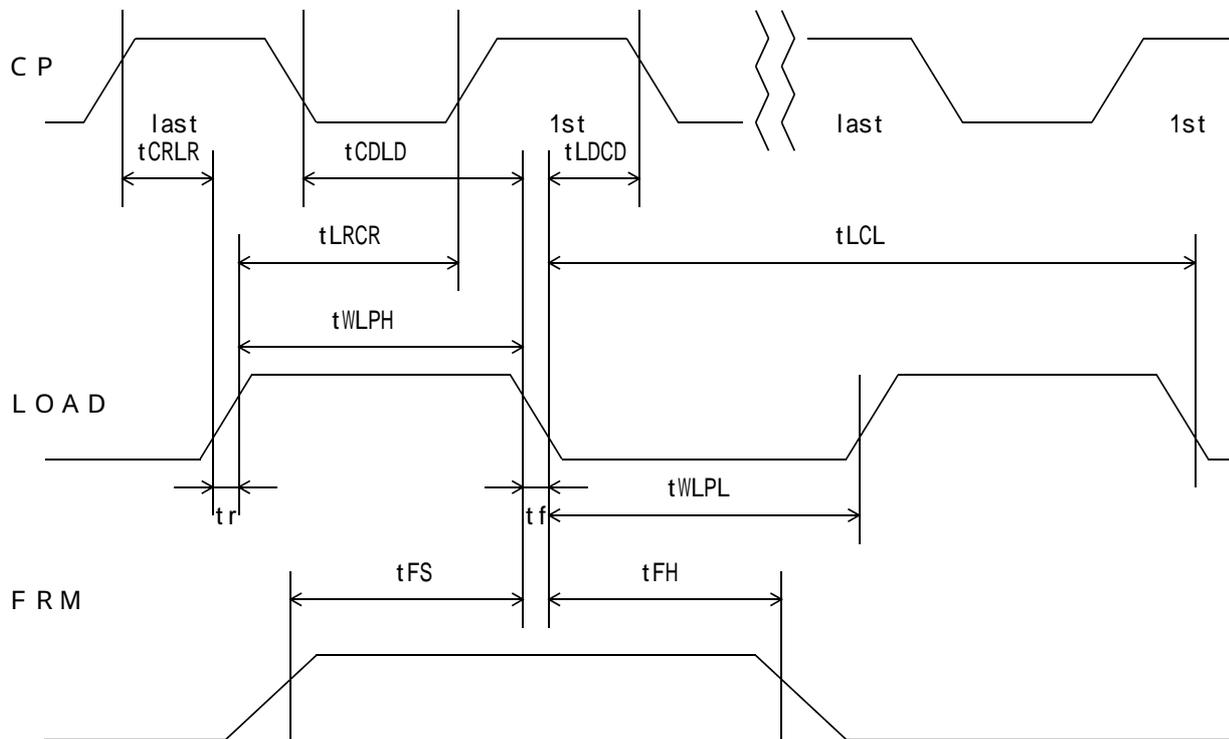
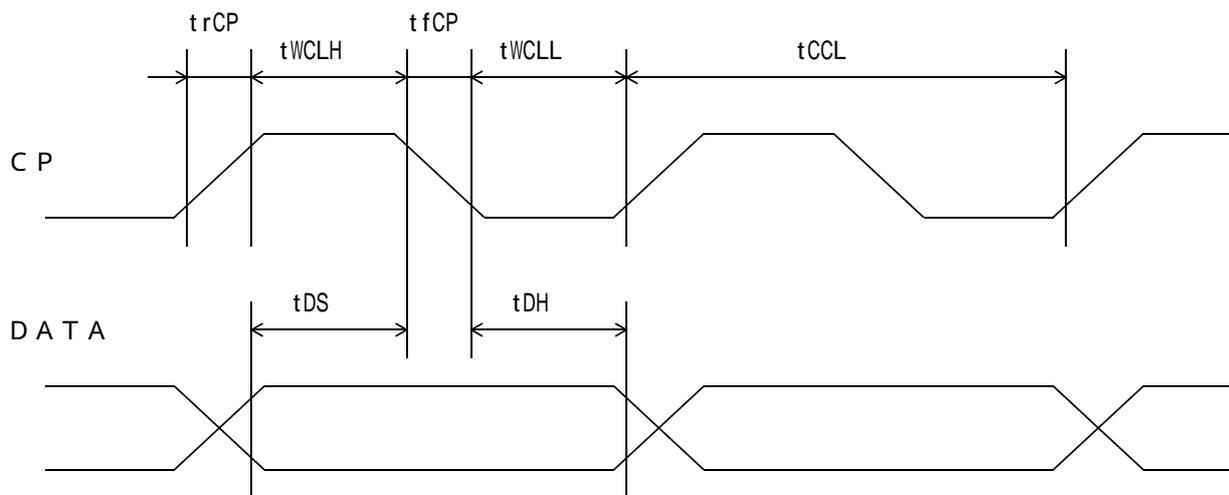
LCD side connector : BHR-03VS-1 (JST)
 Recommended matching connector : SM02(8.0)B-BHS-1 (JST)
 : SM02(8.0)B-BHS-1-TB(LF)(SN) (JST).....(RoHS Compliant)

9 . Interface Timing Chart



- * The cycle of load signal should be stable and continuously applied without interruption.
- * The above-mentioned timing chart shows a reference to set up a LCD module, not an electrical rating.

10. Input Timing Characteristics



10-1. Switching characteristics

Input Characteristics ; VDD = +3.3V ± 0.3V and +5.0V ± 5%, Temp. = 25

ITEM	SYMBOL	MIN.	MAX.	UNIT
CP Cycle *1, *2	tCCL	140	-	ns
CP "H" Pulse Width *2	tWCLH	60	-	ns
CP "L" Pulse Width *2	tWCLL	60	-	ns
CP Rise Up Time *2	trCP	-	40	ns
CP Fall Down Time *2	tfCP	-	40	ns
Data Set Up Time	tDS	40	-	ns
Data Hold Time	tDH	50	-	ns
LOAD "H" Pulse Width	tWLPH	60	-	ns
LOAD "L" Pulse Width	tWLPL	300	-	ns
LOAD Cycle *3	tLCL	400	-	ns
CP Rise LOAD Rise Delay Time	tCRLR	10	-	ns
CP Down LOAD Down Delay Time	tCDLD	60	-	ns
LOAD Rise CP Rise Delay Time	tLRCR	60		ns
LOAD Down CP Down Delay Time	tLDLD	60		ns
Input Signal Rise Up Time	tr	-	40	ns
Input Signal Fall Down Time	tf	-	40	ns
FRM Data Set Up Time	tFS	40	-	ns
FRM Data Hold Time	tFH	60	-	ns

*1 CP Cycle is adjust so that FRM signal is 75Hz.

*2 The formula of condition

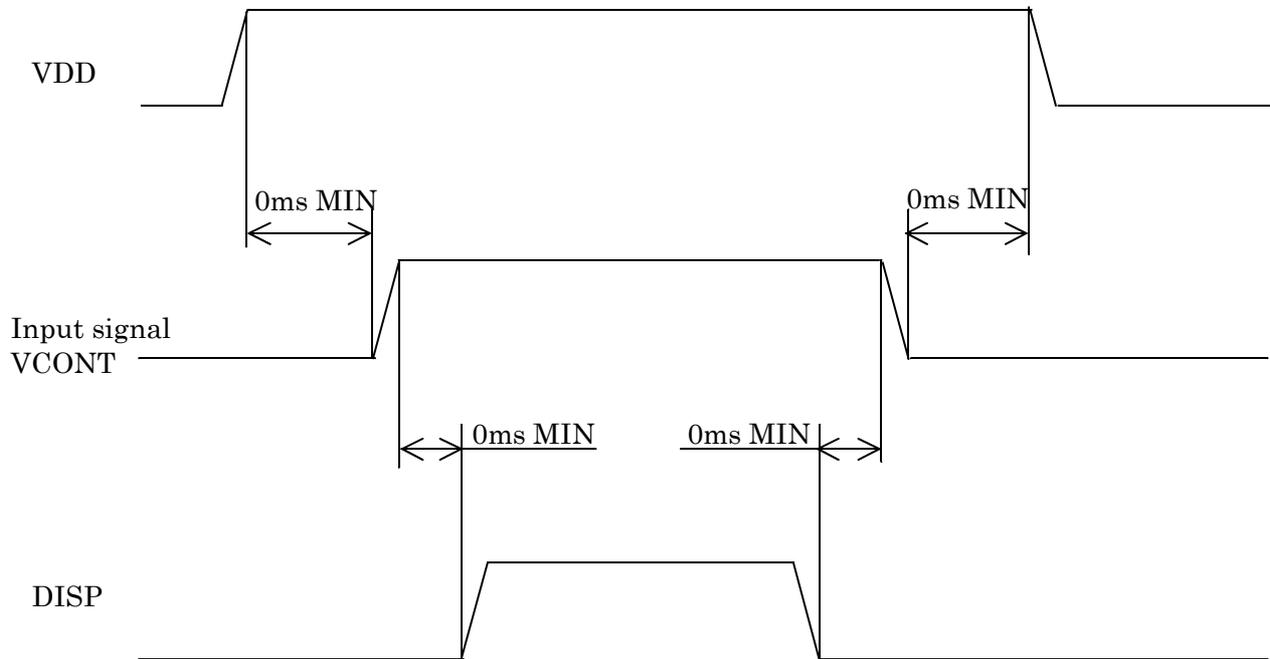
$$trCP + tfCP < tCCL - (tWCLH + tWCLL)$$

Please use on condition that , is filled.

*3 LOAD Cycle is const.

1 1 . Supply Voltage Sequence Condition

DO NOT apply DC voltage to the LCD panel. DC voltage induce irreversible electrochemical reactions and reduce LCD life. Always follow the power supply ON/OFF sequence of VDD first, input signal second, V0-V5 third and finally DISP.
This will prevent DC driving of the LCD or CMOS LSI latch up as shown below.



- * Input signal : CP,LOAD,FRM,D0~D3
- * The above sequence should be designed as to keep each normal figure on condition that liquid crystal module is loaded on your system.
- * Control the input signal and VEE to the above ON - OFF timing when you switch ON/OFF the display during VDD and DISP are on.
And also design the circuit as VEE's OFF level become GND level.
- * Control the supply voltage sequence not to float all signal line when the LCD panel is driving.

1 2 . Backlight Characteristics

CFL ratings

Temp.= 25

ITEM	SYMBOL	MIN.	TYP.	MAX.	NOTE
Starting discharge Voltage *1	VS	-	-	795 Vrms	0
		-	-	530 Vrms	25
Discharging tube current *2	IL	3.0 mArms	4.0 mArms	6.0 mArms	-
Discharging tube voltage	VL	-	330 Vrms	-	-
Operating life (IL=4.0 mArms) *3	T	45,000 h	58,000 h	-	-
Operating frequency	F	40 kHz	-	100 kHz	-

- *1 The Non-load output voltage (VS) of the inverter should be 1.3 times the maximum VS at the low temperature to provide margin to assure that the CFL will start, because actual VS may increase due to leakage current from the CFL cables. (Reference value: 1035 Vrms Min)
- *2 We recommend that you should set the discharging tube current at lower than typical value so as to prevent the heat accumulation of CFL tube from deteriorating a performance of the LCD.
- *3 Do not apply more than 6.0 mA discharging tube current. Because CFL maybe broken due to over current.
- *4 When the illuminance or quantity of light has decreased to 50 % of the initial value. Average life time of CFL will be decreased when LCD is operating at lower and Higher temperature.
- * Prolonged storage in darkness and/or low temperature may slow the ignition and rise to full brightness of the CFL in an LCD Module. Please use an inverter designed to provide sufficient driving voltage for more than 1 second. Also a decreased Starting Discharge Voltage or shortened ignition time may not turn ON the CFL lamp.

1 3 . Lot Number Identification

The lot number shall be indicated on the back of the backlight case of each LCD.

KG057QV1CA - G00 - _____ - MADE IN _____

YEAR
MONTH
DATE
Version Number
Country of origin(Japan or China)

YEAR	2006	2007	2008	2009	2010	2011
CODE	6	7	8	9	0	1

MONTH	JAN.	FEB.	MAR.	APR.	MAY	JUN.
CODE	1	2	3	4	5	6

MONTH	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
CODE	7	8	9	X	Y	Z

1 4 . Warranty

14-1. Incoming inspection

Please inspect the LCD within one month after your receipt.

14-2. Production Warranty

Kyocera warrants its LCDs for a period of 12 months after receipt by the purchaser, and within the limits specified. Kyocera shall, by mutual agreement, replace or rework defective LCDs that are shown to be Kyocera's responsibility.

1 5 . Precautions for use

15-1. Installation of the LCD

1. Please ground the hole located at right side of a LCD module, in order to stabilize brightness and display quality.
2. A transparent protection plate shall be added to protect the LCD and its polarizers.
3. The LCD shall be installed so that there is no pressure on the LSI chips.
4. The LCD shall be installed flat, without twisting or bending.
5. The display window size should be the same as the effective viewing area.
6. In case you use outside frame of effective viewing area as outward appearance of your product, unevenness of its outward appearance is out of guarantee.
7. Do not pull the CFL lead wires and do not bend the root of the wires.
Housing should be designed to protect CFL lead wires from external stress.
8. This Kyocera LCD module has been specifically designed for use in general electronic devices, but not for use in a special environment such as usage in an active gas.
Hence, when the LCD is supposed to be used in a special environment, evaluate the LCD thoroughly beforehand and do not expose the LCD to chemicals such as an active gas.

15-2. Static Electricity

1. Since CMOS ICs are mounted directly onto the LCD glass, protection from static electricity is required. Operation should wear ground straps.

15-3. LCD Operation

1. The LCD shall be operated within the limits specified. Operation at values outside of these limits may shorten life, and/or harm display images.
2. Adjust "LCD driving voltage" to obtain optimum viewing angle and contrast.
3. Operation of the LCD at temperature below the limit specified may cause image degradation and/or bubbles. It may also change the characteristics of the liquid crystal.
This phenomenon may not recover. The LCD shall be operated within the temperature limits specified.

15-4. Storage

1. The LCD shall be stored within the temperature and humidity limits specified.
Store in a dark area, and protected the LCD from direct sunlight or fluorescent light.
2. Always store the LCD so that it is free from external pressure onto it.

15-5. Screen Surface

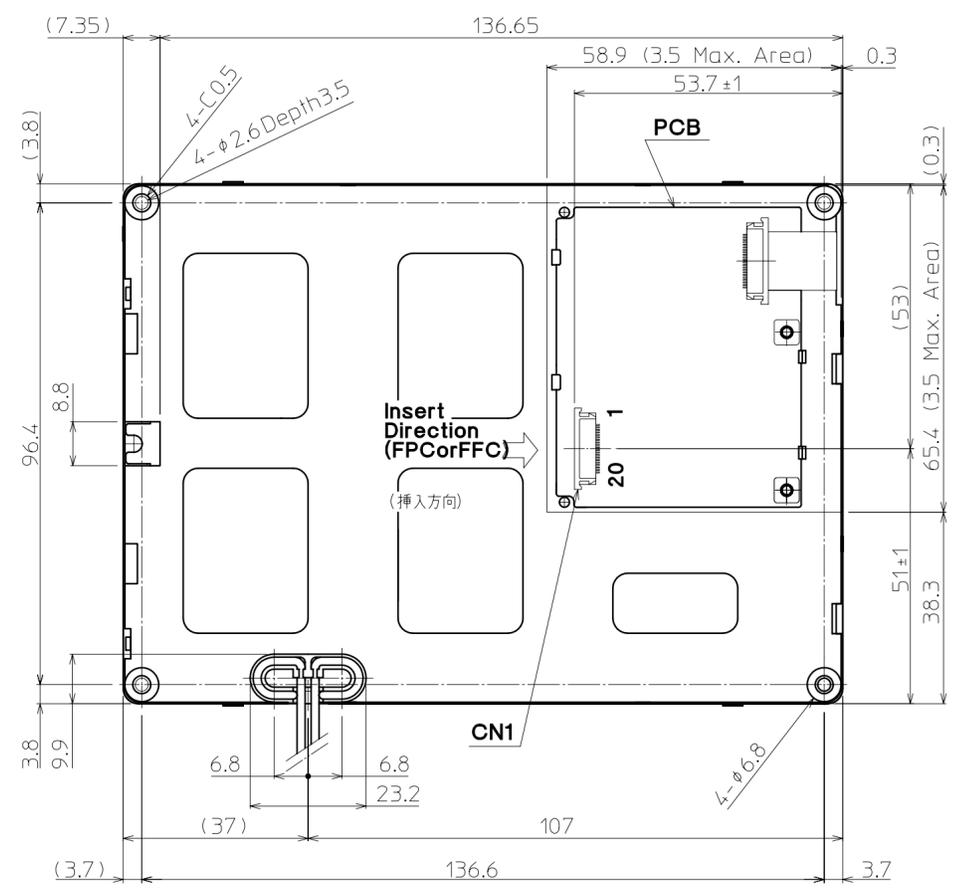
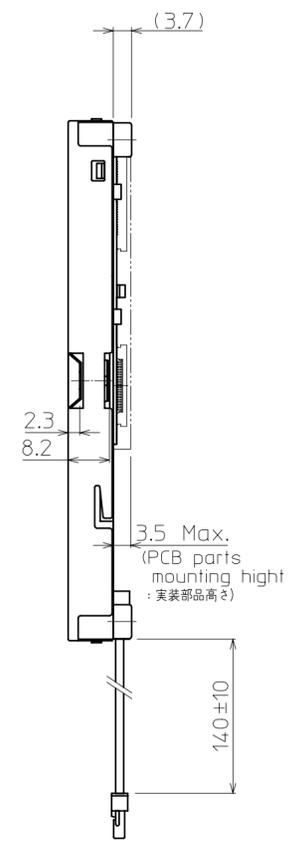
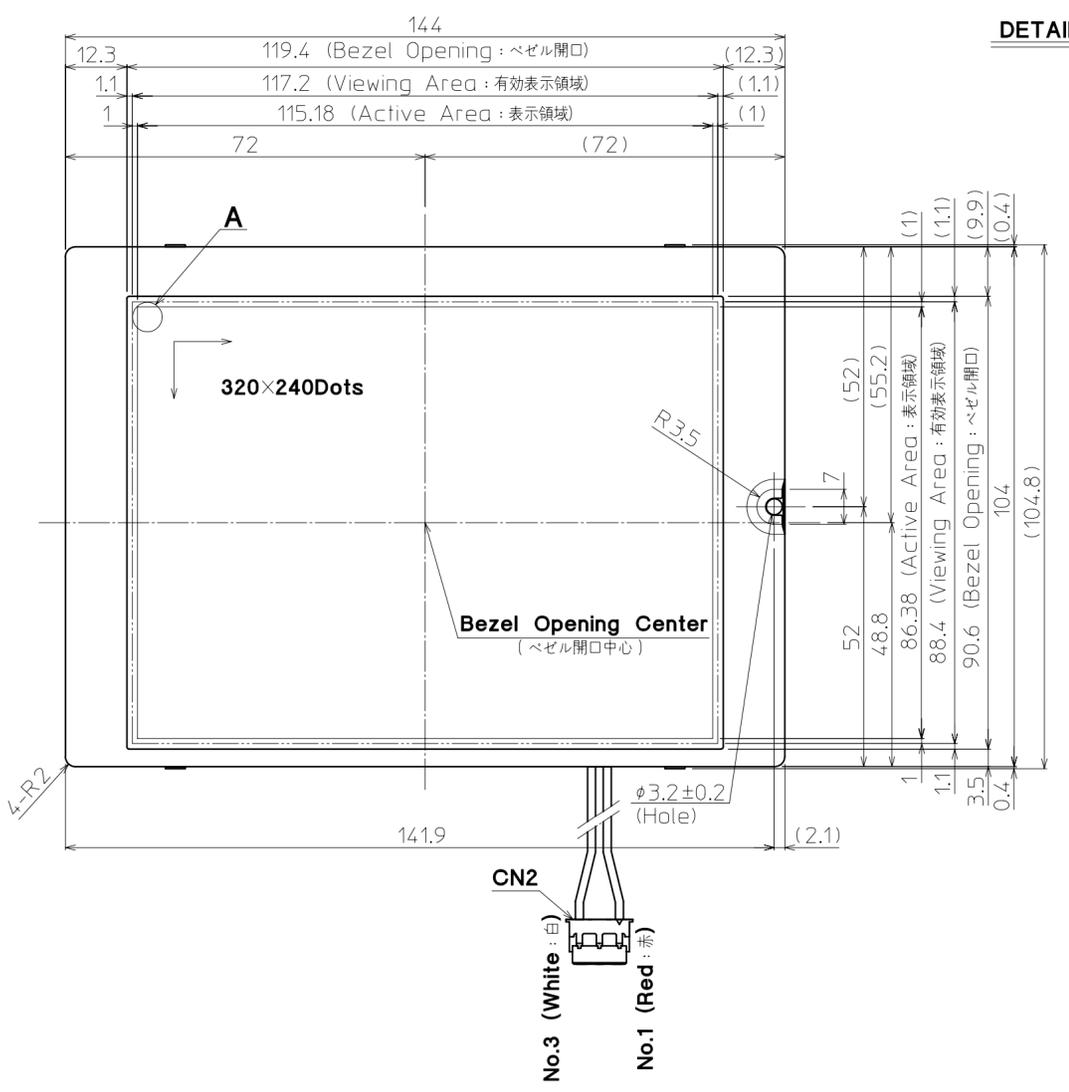
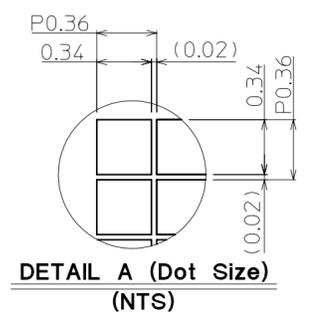
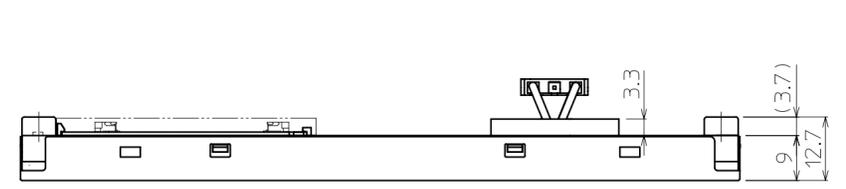
1. DO NOT store in a high humidity environment for extended periods.
Image degradation, bubbles, and/or peeling off of polarizer may result.
2. The front polarizer is easily scratched or damaged.
Prevent touching it with any hard material, and from being pushed or rubbed.
3. The LCD screen may be cleaned with a soft cloth or cotton pad.
Methanol, or Isopropyl Alcohol may be used, but insure that all solvent residue is removed.
4. Water may cause damage or discoloration of the polarizer.
Clean any condensation or moisture from any source immediately.
5. Always keep the LCD free from condensation during testing.
Condensation may permanently spot or stain the polarizers.
6. Do not disassemble LCD module because it will result in damage.
7. Please do not use solid-base image pattern for long hours because a temporary afterimage may appear. We recommend to use screen saver etc. in cases where a solid-base image pattern must be used.
8. Liquid crystal may leak when the module is broken. Be careful not to let the fluid go into your eyes and mouth. In the case the fluid touches your body, rinse it off right away with water and soap.

1 6 . Reliability Data / Environmental Test

TEST ITEM	TEST CONDITION	TEST TIME	RESULT
High Temp. Atmosphere	60	240 h.	Display Quality : No defect Display Function : No defect Current Consumption : No defect
Low Temp. Atmosphere	-20	240 h.	Low Temp. Bubble : None Solid Crystallization of Liquid Crystal : None Display Quality : No defect Display Function : No defect Current Consumption : No defect
High Temp. Humidity Atmosphere	40 90%RH	240 h.	Display Quality : No defect Display Function : No defect Peel-off of Organic Sealing : None Current Consumption : No defect
Temp. Cycle	-20 0.5 h. R.T. 0.5 h. 60 0.5 h.	10cycles	Display Quality : No defect Display Function : No defect Peel-off of Organic Sealing : None Bubble on Cell : None
High Temp. Operation	60 Vop	500 h.	Display Quality : No defect Display Function : No defect Current Consumption : No defect

- * Each test item uses a test LCD only once. The tested LCD is not used in any other tests.
- * The LCD is tested in circumstances in which there is no condensation.
- * The tested LCD is inspected after 24 hours of storage at room temperature and room humidity after each test is finished.
- * The reliability test is not an out-going inspection.
- * The results of the reliability test are for your reference purpose only.
The reliability test is conducted only to examine the LCD's capability.

No	Description	Drawn	Checked	Checked	Approved
△	・Change Connector(LEAD FREE) ・Add Matching Connector(LEAD FREE) ・Add Japanese Comment	'05.05.06 石渡	'05.05.06 倉元		'05.05.06 阿部
△	Change the parts No. of Connector (Typographical error) (コネクタ-品名変更(誤記訂正))	'06.04.25 野崎	'06.04.25 茶園		'06.04.26 朝倉



Note

△08-6240-020-340-800-
 1. Connector CN1:08-6240-020-340-800+ (ELCO)
 (コネクタ) CN2:BHR-03VS-1 (JST)
 2. Matching Connector CN2:△SM02(8.0)B-BHS-1 (JST)
 (適合コネクタ) △SM02(8.0)B-BHS-1-TB-(LF)(SN) (JST)
 △SM02-(8.0)B-BHS-1 (JST)
 △SM02-(8.0)B-BHS-1-TB-(LF)(SN) (JST)

3. The drawing is the front view of the LCD.
 Information is displayed starting at the upper
 left hand corner, moving right then down to
 the lower right hand corner.
 (LCDの正面図において、画像データの表示は左上コーナーから始まり、
 右へ進み下へ送られ右下コーナーへ向かう。)

4. Tolerance without indication: ±0.5
 (指示無き公差)

Material 材質	Treatment 処理	Approved '02.07.26	Checked	Checked '02.07.26	Drawn 倉元	Scale 1:1(NTS)	Title KG057QV1CA		Year-Month-Day '02.07.26	Size 2
Quantity 製作数	Description; 備考	RoHS 05006AAA	阿部	今村			Outline Dimensions		Drawing No. 121A5018200-2	

SPEC.NO.	TQ3C-8EAS0-E2CRG08-00
DATE	July 30, 2002

FOR : _____

KYOCERA INSPECTION STANDARD

TYPE : KG057QV1CA-G00

KYOCERA CORPORATION
KAGOSHIMA HAYATO PLANT
LCD DIVISION

Original	Designed by :Engineering Dept.			Confirmed by :QA Dept.	
Issue Data	Prepared	Checked	Approved	Checked	Approved
July 30, 2002	<i>Y. Yamazaki</i>	<i>M. Fujitani</i>	<i>H. CHINO</i>	<i>S. Hayashi</i>	<i>Y. Yoshida</i>

Revision Record

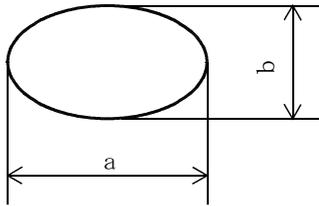
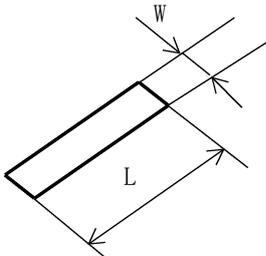
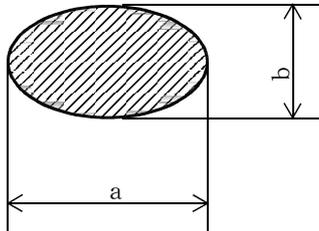
Date	Designed by: Engineering Dept.			Confirmed by: QA Dept.	
	Prepared	Checked	Approved	Checked	Approved
Rev. No.	Date	Page	Descriptions		

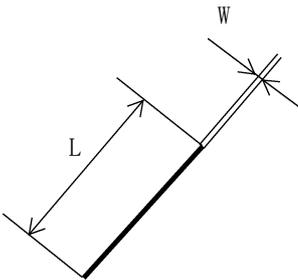
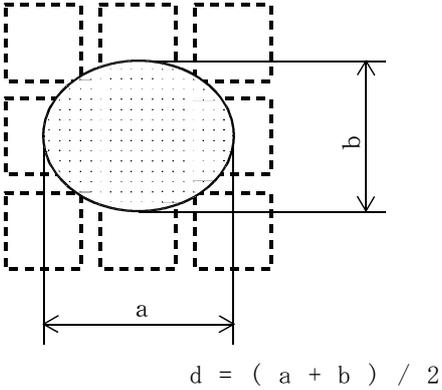
Visuals specification

1)Note

Item	Note
General	<p>1. When defects specified in this Inspection Standards are inspected, operating voltage(Vop) shall be set at the level where optimized contrast is available. Display quality is applied up to effective viewing area. (Bi-Level INSPECTION)</p> <p>2. This inspection standard about the image quality shall be applied to any defect within the effective viewing area and shall not be applicable to outside of the area.</p> <p>3. Should any defects which are not specified in this standard happen, additional standard shall be determined by mutual agreement between customer and Kyocera.</p> <p>4. Inspection conditions</p> <p>Luminance : 500 Lux minimum . Inspection distance : 300 mm (from the sample) Temperature : 25 ± 5 °C Direction : right above</p>
Definition of Inspection item	<p>Pinhole, Bright spot Black spot, Scratch Foreign particle</p> <p>The color of a small area is different from the remainder. The phenomenon does not change with voltage.</p>
	<p>Contrast variation</p> <p>The color of a small area is different from the remainder. The phenomenon changes with voltage.</p>
	<p>Polarizer (Scratch, Bubble, Dent)</p> <p>Scratch, Bubble and Dent in the polarizer which can be observed in on / off state.</p>

2) Standard

Inspection item	Judgement standard																						
Pinhole, Bright spot Black spot, Foreign particle	<div style="text-align: center;">  $d = (a + b) / 2$ <table border="1" data-bbox="587 566 1393 801"> <thead> <tr> <th>Category</th> <th>Size (mm)</th> <th>Acceptable number</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>$d \leq 0.2$</td> <td>neglected</td> </tr> <tr> <td>B</td> <td>$0.2 < d \leq 0.3$</td> <td>5</td> </tr> <tr> <td>C</td> <td>$0.3 < d \leq 0.5$</td> <td>3</td> </tr> <tr> <td>D</td> <td>$0.5 < d$</td> <td>0</td> </tr> </tbody> </table> </div>	Category	Size (mm)	Acceptable number	A	$d \leq 0.2$	neglected	B	$0.2 < d \leq 0.3$	5	C	$0.3 < d \leq 0.5$	3	D	$0.5 < d$	0							
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Scratch, Foreign particle	<div style="text-align: center;">  <table border="1" data-bbox="557 1171 1422 1473"> <thead> <tr> <th></th> <th>Width (mm)</th> <th>Length (mm)</th> <th>Acceptable No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>$W \leq 0.03$</td> <td>—</td> <td>neglected</td> </tr> <tr> <td>B</td> <td rowspan="3">$0.03 < W \leq 0.1$</td> <td>$L \leq 2.0$</td> <td>neglected</td> </tr> <tr> <td>C</td> <td>$2.0 < L \leq 4.0$</td> <td>3</td> </tr> <tr> <td>D</td> <td>$4.0 < L$</td> <td>0</td> </tr> <tr> <td>E</td> <td>$0.1 < W$</td> <td>—</td> <td>According to Circular</td> </tr> </tbody> </table> </div>		Width (mm)	Length (mm)	Acceptable No.	A	$W \leq 0.03$	—	neglected	B	$0.03 < W \leq 0.1$	$L \leq 2.0$	neglected	C	$2.0 < L \leq 4.0$	3	D	$4.0 < L$	0	E	$0.1 < W$	—	According to Circular
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Contrast variation	<div style="text-align: center;">  $d = (a + b) / 2$ <table border="1" data-bbox="587 1821 1393 2007"> <thead> <tr> <th>Category</th> <th>Size (mm)</th> <th>Acceptable number</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>$d \leq 0.5$</td> <td>neglected</td> </tr> <tr> <td>B</td> <td>$0.5 < d \leq 0.7$</td> <td>3</td> </tr> <tr> <td>C</td> <td>$0.7 < d$</td> <td>0</td> </tr> </tbody> </table> </div>	Category	Size (mm)	Acceptable number	A	$d \leq 0.5$	neglected	B	$0.5 < d \leq 0.7$	3	C	$0.7 < d$	0										
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Inspection item	Judgement standard																			
Polarizer (Scratch, Bubble, Dent)	<p data-bbox="544 248 708 277">(1) Scratch</p>  <table border="1" data-bbox="560 689 1422 1021"> <thead> <tr> <th></th> <th>Width (mm)</th> <th>Length (mm)</th> <th>Acceptable No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>$W \leq 0.1$</td> <td>—</td> <td>neglected</td> </tr> <tr> <td>B</td> <td rowspan="2">$0.1 < W \leq 0.3$</td> <td>$L \leq 5.0$</td> <td>neglected</td> </tr> <tr> <td>C</td> <td>$5.0 < L$</td> <td>0</td> </tr> <tr> <td>D</td> <td>$0.3 < W$</td> <td>—</td> <td>0</td> </tr> </tbody> </table>		Width (mm)	Length (mm)	Acceptable No.	A	$W \leq 0.1$	—	neglected	B	$0.1 < W \leq 0.3$	$L \leq 5.0$	neglected	C	$5.0 < L$	0	D	$0.3 < W$	—	0
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	<p data-bbox="544 1070 807 1099">(2)Bubble (dent)</p>  <table border="1" data-bbox="587 1675 1393 2007"> <thead> <tr> <th>Category</th> <th>Size (mm)</th> <th>Acceptable number</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>$d \leq 0.2$</td> <td>neglected</td> </tr> <tr> <td>B</td> <td>$0.2 < d \leq 0.3$</td> <td>5</td> </tr> <tr> <td>C</td> <td>$0.3 < d \leq 0.5$</td> <td>3</td> </tr> <tr> <td>D</td> <td>$0.5 < d$</td> <td>0</td> </tr> </tbody> </table>	Category	Size (mm)	Acceptable number	A	$d \leq 0.2$	neglected	B	$0.2 < d \leq 0.3$	5	C	$0.3 < d \leq 0.5$	3	D	$0.5 < d$	0				
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