Spec No.	TQ3C-8EAF0-E1YAZ10-00
Date	January 16, 2015

SPEC

TYPE : TCG104XGLPAPNN-AN40

< 10.4 inch XGA transmissive color TFT with LED backlight and constant current circuit for LED backlight>

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Issued
Jan 22, 2015
KYOCERA
Display Corp.

KYOCERA DISPLAY CORPORATION

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Consult Kyocera before ordering.

Original Issue Date	Designed by: Engineering dept.			Confirmed by: QA dept.	
	Prepared	Checked	Approved	Checked	Approved
January 16, 2015	M. Koyama	Y. Yamazaki	W. Yano	O. Sato	I. Hama

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

Rev.No.	Date	Page	Descriptions

1. Application

This document defines the specification of TCG104XGLPAPNN-AN40. (RoHS Compliant)

2. Construction and outline

LCD	: Transmissive color dot matrix type TFT
Backlight system	: LED
Polarizer	: Anti-Glare treatment
Interface	: LVDS
Additional circuit	: Timing controller, Power supply (3.3V input) With constant current circuit for LED Backlight(12V input)

3. Mechanical specifications

Item	Specification	Unit
Outline dimensions 1)	230(W)×180.2(H)×10.5(D)	mm
Active area	210.432(W)×157.824(H) (26.3cm/10.4 inch(Diagonal))	mm
Dot format	1,024×(B,G,R)(W)×768(H)	dot
Dot pitch	(0.0685)(W)×(0.2055)(H)	mm
Base color 2)	Normally Black	-
Mass	480	g

1) Projection not included. Please refer to outline for details.
2) Due to the characteristics of the LCD material, the color varies with environmental temperature.

4. Absolute maximum ratings

4-1. Electrical absolute maximum ratings

Item		Symbol	Min.	Max.	Unit
Supply voltage(+3.3V)		V_{DD}	-0.3	3.95	V
Supply voltage(+12V)		V_{IN}	-0.3	14.0	V
Input signal Voltage 1)	RxINi+, RxINi- (i=0,1,2,3)	V_{I1}	-0.3	V_{DD}+0.3	V
	CK IN+, CK IN-	V_{I2}	-0.3	V_{DD}+0.3	V
	MODE, SC	V_{I3}	-0.3	V_{DD}+0.3	V
	BLBRT, BLEN	V_{I4}	-0.3	V_{IN}	V

1) V_{DD} must be supplied correctly within the range described in 5-1.

4-2. Environmental absolute maximum ratings

Item	Symbol	Min.	Max.	Unit
Operating temperature (Ambient) 1)	T_{OP}(Ambient)	-30	80	°C
Operating temperature (Panel) 2)	T_{OP}(Panel)	-30	80	°C
Storage temperature 3)	T_{STO}	-30	80	°C
Operating humidity 4)	H_{OP}	10	5)	%RH
Storage humidity 4)	H_{STO}	10	5)	%RH
Vibration	-	6)	6)	-
Shock	-	7)	7)	-

1) Operating temperature means a temperature which operation shall be guaranteed. Since display performance is evaluated at 25°C, another temperature range should be confirmed.

2) Panel surface temperature (all the surface).

3) Temp. = -30°C＜48h , Temp. = 80°C＜168h
Store LCD at normal temperature/humidity. Keep them free from vibration and shock.
An LCD that is kept at a low or a high temperature for a long time can be defective due to other conditions, even if the low or high temperature satisfies the standard.
(Please refer to "Precautions for Use" for details.)

4) Non-condensing

5) Temp.≦40°C, 85%RH Max.
Temp.＞40°C, Absolute humidity shall be less than 85%RH at 40°C.

6)

Frequency	10～55 Hz	Acceleration value (0.3～9 m/s²)
Vibration width	0.15mm	
Interval	10-55-10 Hz 1 minutes	

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

7) Acceleration: 490 m/s², Pulse width: 11 ms
3 times in each direction: ±X, ±Y, ±Z
EIAJ ED-2531

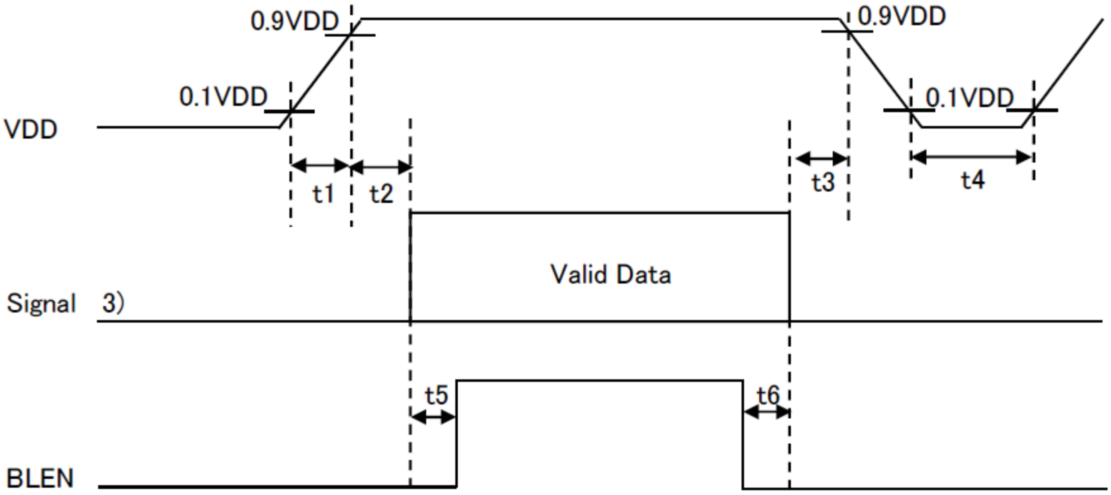
5. Electrical characteristics

5-1. LCD

Temp. = -30～80°C

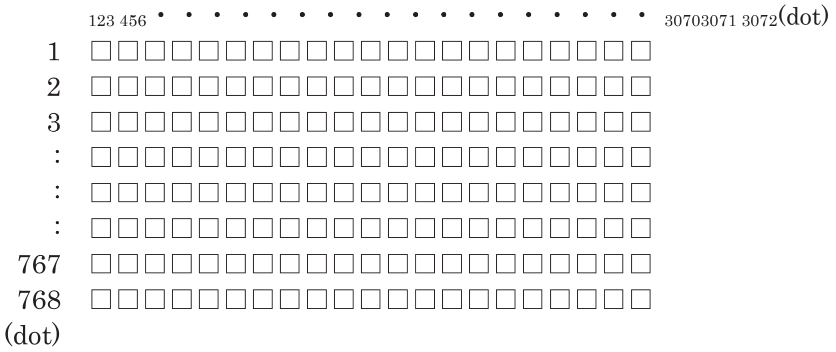
Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	1)	V_{DD}	-	3.0	3.3	3.6	V
Current consumption		I_{DD}	2)	-	270	350	mA
Permissive input ripple voltage		V_{RP}	V_{DD}=3.3V	-	-	100	mVp-p
Input signal voltage	3)	V_{IL}	"Low" level	0	-	0.3V_{DD}	V
		V_{IH}	"High" level	0.7V_{DD}	-	V_{DD}	V
Input leak current		I_{OL}	V_{I3}=0V	-10	-	10	μA
		I_{OH}	V_{I3}=3.3V	-	-	400	μA
LVDS Input voltage	4)	V_L	-	0	-	1.9	V
Differential input voltage		V_{ID}	-	200	-	600	mV
Differential input threshold voltage	4) 5)	V_{TL}	"Low" level	V_{CM}-100	-	-	mV
		V_{TH}	"High" level	-	-	V_{CM}+100	mV
Terminator		R_1	-	-	100	-	Ω
V_{DD}-turn-on conditions	1) 6)	t1	-	0.1	-	20	ms
		t2	-	10	-	-	ms
		t3	-	0	-	-	ms
		t4	-	2	-	-	s
		t5	-	200	-	-	ms
		t6	-	200	-	-	ms

1) V_{DD}-turn-on conditions



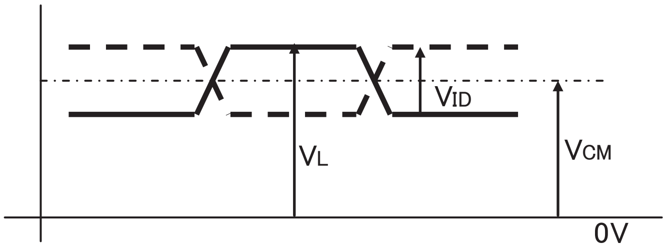
2) Display pattern:

V_{DD} = 3.3V, Temp. = 25°C


123 456
30703071 3072(dot)
1
2
3
:
:
:
767
768
(dot)

3) Input signal : MODE, SC

4) Input signal : RxIN3+, RxIN3-, RxIN2+, RxIN2-, RxIN1+, RxIN1-, RxIN0+, RxIN0-
CK IN+, CK IN-


VID
VL
VCM
0V

5) V_{CM} : LVDS Common mode voltage (V_{CM}=1.25V

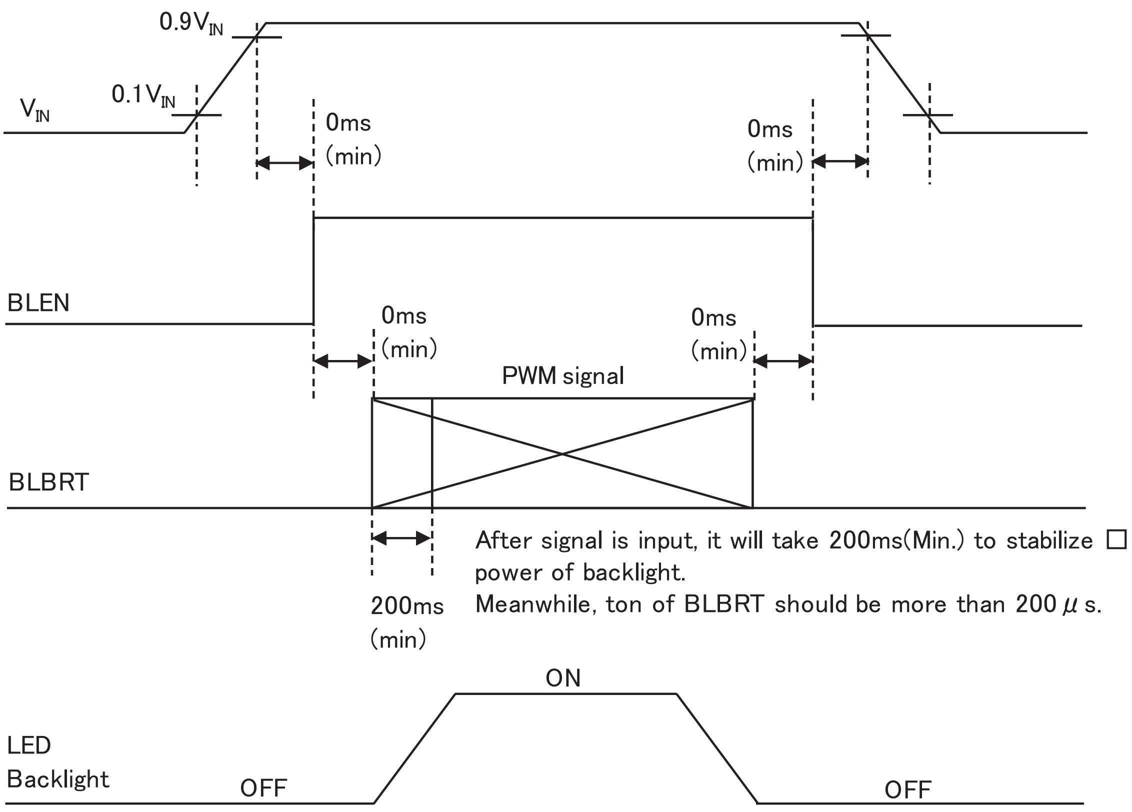
6) Please power on LVDS transmitter at the same time as VDD, or LVDS transmitter should be powered on first.

5-2. Constant current circuit for LED Backlight

Temp. = -30～80°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage 1)	V_{IN}	-	10.8	12.0	13.2	V
Current consumption	I_{IN}	2)	-	870	1,120	mA
Permissive input ripple voltage	V_{RP_BL}	V_{IN}=12.0V	-	-	100	mVp-p
BLBRT Input signal voltage	V_{IL_BLBRT}	"Low" level	0	-	0.8	V
	V_{IH_BLBRT}	"High" level	2.3	-	V_{IN}	V
BLBRT Input pull-down resistance	R_{IN_BLBRT}	-	100	300	500	kΩ
BLEN Input signal voltage	V_{IL_BLEN}	"Low" level	0	-	0.8	V
	V_{IH_BLEN}	"High" level	2.3	-	V_{IN}	V
BLEN Input pull-down resistance	R_{IN_BLEN}	-	100	300	500	kΩ
PWM Frequency 3)	f_{PWM}	-	200	-	10k	Hz
PWM Duty ratio 3)	D_{PWM}	f_{PWM}=200Hz	1	-	100	%
		f_{PWM}=2kHz	10	-	100	%
		f_{PWM}=10kHz	50	-	100	%
Operating life time 4), 5)	T	Temp.=25°C	-	70,000	-	h

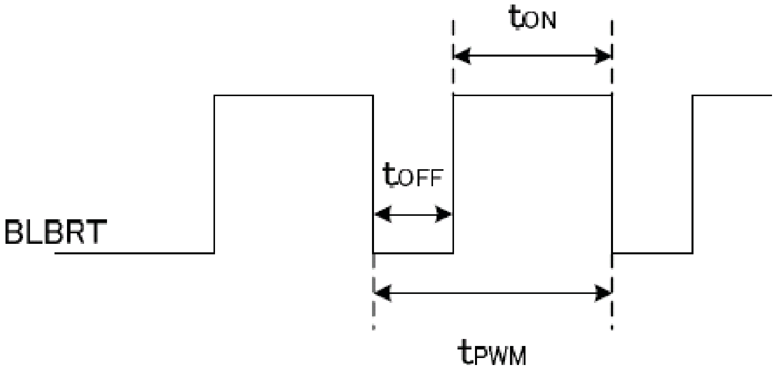
1) V_{IN}-turn-on conditions


0.9V_{IN}
0.1V_{IN}
V_{IN}
0ms (min)
0ms (min)
BLEN
0ms (min)
0ms (min)
PWM signal
BLBRT
200ms (min)
LED Backlight
OFF
ON
OFF

After signal is input, it will take 200ms(Min.) to stabilize □ power of backlight.
Meanwhile, ton of BLBRT should be more than 200 μs.

2) V_{IN} = 12V, Temp. = 25℃, D_{PWM} = 100%

3) PWM Timing Diagram



t_{ON}, t_{OFF} ≧ 50 μs.
In case of lower frequency, the deterioration of the display quality, flicker etc., may occur.

4) When brightness decrease 50% of minimum brightness.
The average life of a LED will decrease when the LCD is operating at higher temperatures.

5) Life time is estimated data.(Condition : IF=(80)mA, Ta=25℃ in chamber).

6. Optical characteristics

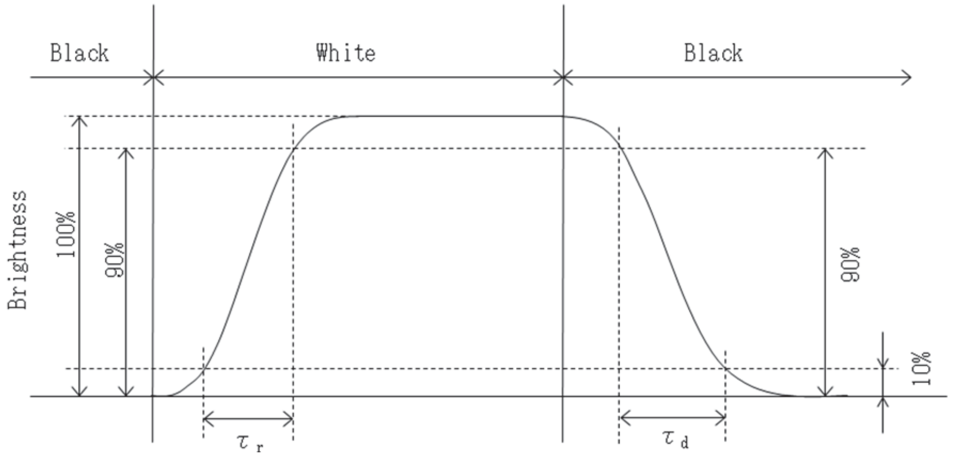
Measuring spot = ϕ 6.0mm, Temp. = 25°C

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Response time	Rise	τ_r	$\theta=\phi=0°$	-	18	-	ms
	Down	τ_d	$\theta=\phi=0°$	-	12	-	ms
Viewing angle range View direction		θ UPPER	$CR \geqq 10$	-	85	-	deg.
		θ LOWER		-	85	-	
		ϕ LEFT		-	85	-	deg.
		ϕ RIGHT		-	85	-	
Contrast ratio		CR	$\theta=\phi=0°$	490	700	-	-
Brightness		L	IF=(80)mA/Line	910	1300	-	cd/m^2
Chromaticity coordinates	Red	x	$\theta=\phi=0°$	0.550	0.600	0.650	-
		y		0.300	0.350	0.400	
	Green	x	$\theta=\phi=0°$	0.285	0.335	0.385	
		y		0.520	0.570	0.620	
	Blue	x	$\theta=\phi=0°$	0.100	0.150	0.200	
		y		0.070	0.120	0.170	
	White	x	$\theta=\phi=0°$	0.265	0.315	0.365	
		y		0.290	0.340	0.390	

6-1. Definition of contrast ratio

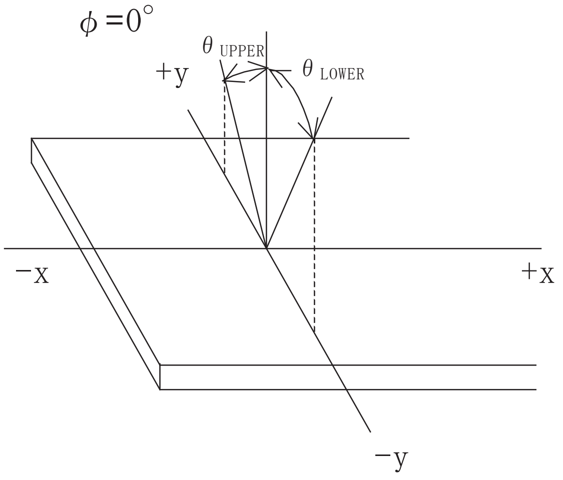
$$\text{CR(Contrast ratio)} = \frac{\text{Brightness with all pixels "White"}}{\text{Brightness with all pixels "Black"}}$$

6-2. Definition of response time

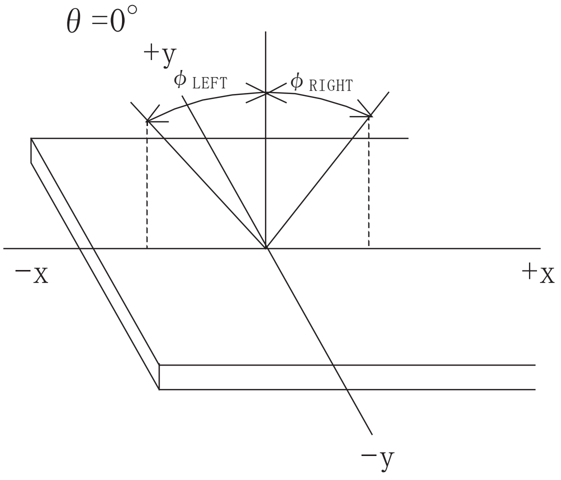


6-3. Definition of viewing angle

【FPC side】

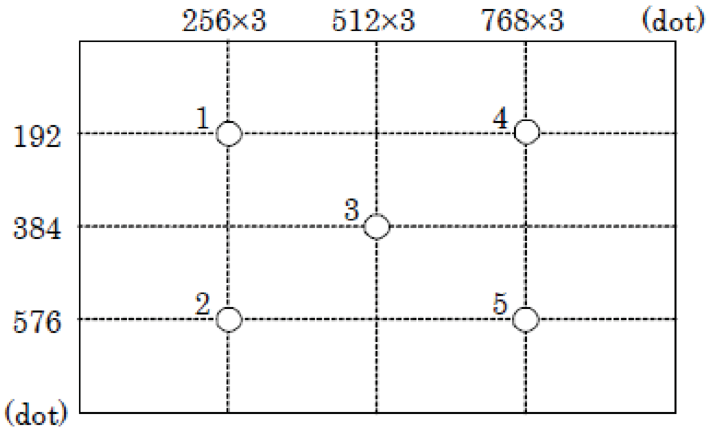

φ =0°
θ UPPER
θ LOWER
+y
−x
+x
−y

θ direction


θ =0°
+y
φ LEFT
φ RIGHT
−x
+x
−y

φ direction

6-4. Brightness measuring points


256×3
512×3
768×3
(dot)
192
384
576
(dot)
1
2
3
4
5

1) Rating is defined as the white brightness at center of display screen(3).
2) 5 minutes after LED is turned on. (Ambient Temp.=25℃)

7. Interface signals

7-1. Interface signals

No.	Symbol	Description	Note
1	V_{DD}	+3.3V power supply	
2	V_{DD}	+3.3V power supply	
3	GND	GND	
4	GND	GND	
5	RxIN0-	LVDS receiver signal CH0(-)	LVDS
6	RxIN0+	LVDS receiver signal CH0(+)	LVDS
7	GND	GND	
8	RxIN1-	LVDS receiver signal CH1(-)	LVDS
9	RxIN1+	LVDS receiver signal CH1(+)	LVDS
10	GND	GND	
11	RxIN2-	LVDS receiver signal CH2(-)	LVDS
12	RxIN2+	LVDS receiver signal CH2(+)	LVDS
13	GND	GND	
14	CK IN1-	LVDS receiver signal CK(-)	LVDS
15	CK IN1+	LVDS receiver signal CK(+)	LVDS
16	GND	GND	
17	RxIN3-	LVDS receiver signal CH3(-)	LVDS
18	RxIN3+	LVDS receiver signal CH3(+)	LVDS
19	MODE	Bit data select signal(GND: 6bit mode、High: 8bit mode)	
20	SC	Scan direction control(GND: Normal、High: Reverse)	1)

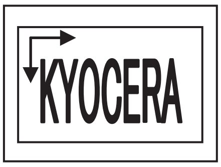
LCD connector	:	20186-020E-11F	(I-PEX)
Matching connector	:	20197-020U-F	(I-PEX)
	:	20197-T20U-F	(I-PEX)

LVDS receiver : Embedded in ASIC

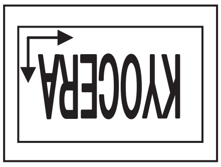
Matching LVDS transmitter : THC63LVDM83R(THine Electronics) or compatible

1) Scanning

SC : GND



SC : High



7-2. LED

No.	Symbol	Description	Note
1	V_{IN}	+12V power supply	
2	V_{IN}	+12V power supply	
3	BLBRT	PWM signal(Brightness adjustment)	
4	BLEN	ON/OFF terminal voltage	
5	GND	GND	
6	GND	GND	

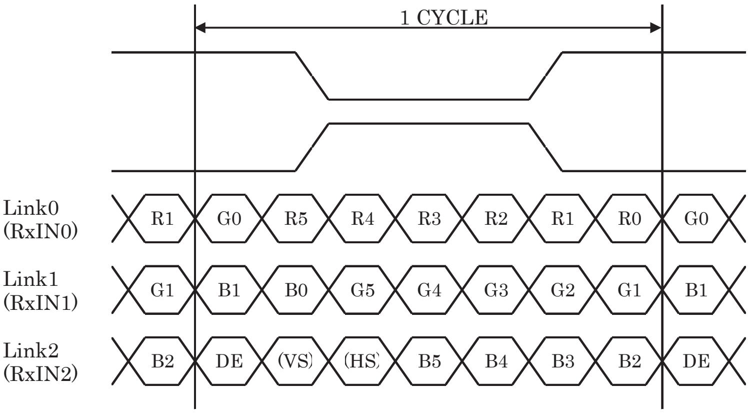
LCD connector : SM06B-SHLS-G-TF(LF)(SN) (JST)
Matching connector : SHLP-6V-S-B (JST)

7-3. Data mapping(6bit input)

1) Location of MODE (THC63LVDM83R(THine Electronics) or compatible)

Transmitter		MODE
Pin No.	Data	= L(GND)
51	TA0	R0(LSB)
52	TA1	R1
54	TA2	R2
55	TA3	R3
56	TA4	R4
3	TA5	R5(MSB)
4	TA6	G0(LSB)
6	TB0	G1
7	TB1	G2
11	TB2	G3
12	TB3	G4
14	TB4	G5(MSB)
15	TB5	B0(LSB)
19	TB6	B1
20	TC0	B2
22	TC1	B3
23	TC2	B4
24	TC3	B5(MSB)
27	TC4	(HS)
28	TC5	(VS)
30	TC6	DE
50	TD0	GND
2	TD1	GND
8	TD2	GND
10	TD3	GND
16	TD4	GND
18	TD5	GND
25	TD6	(NA)

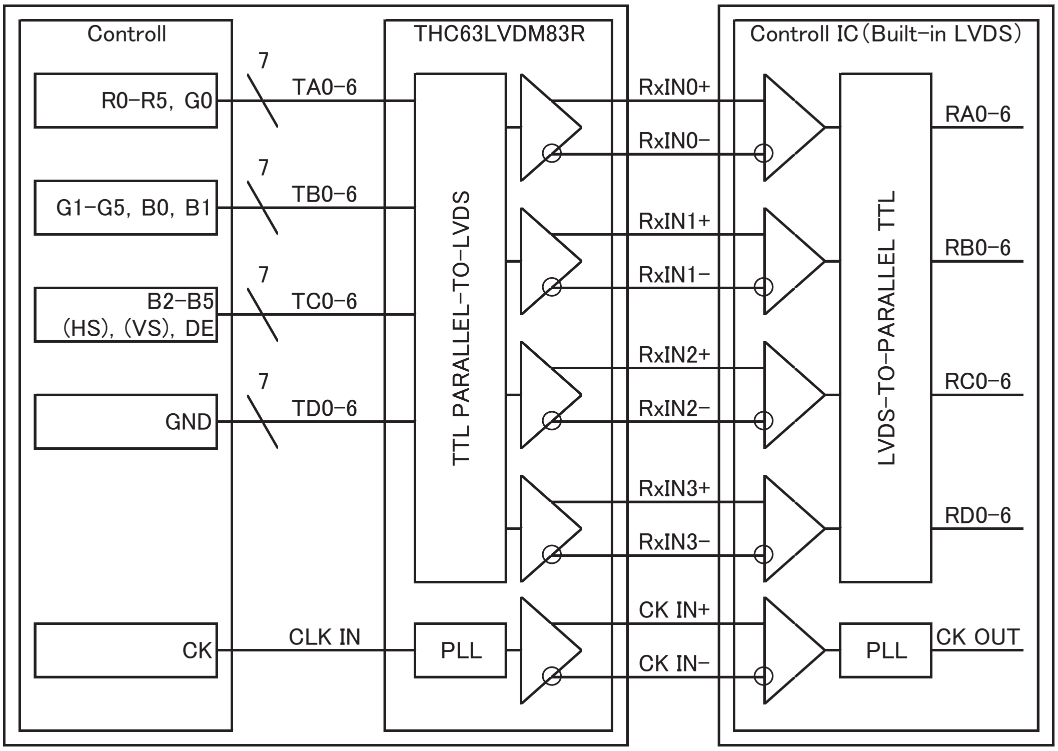
MODE=L(GND)


1 CYCLE
Link0
(RxIN0)
R1
G0
R5
R4
R3
R2
R1
R0
G0
Link1
(RxIN1)
G1
B1
B0
G5
G4
G3
G2
G1
B1
Link2
(RxIN2)
B2
DE
(VS)
(HS)
B5
B4
B3
B2
DE

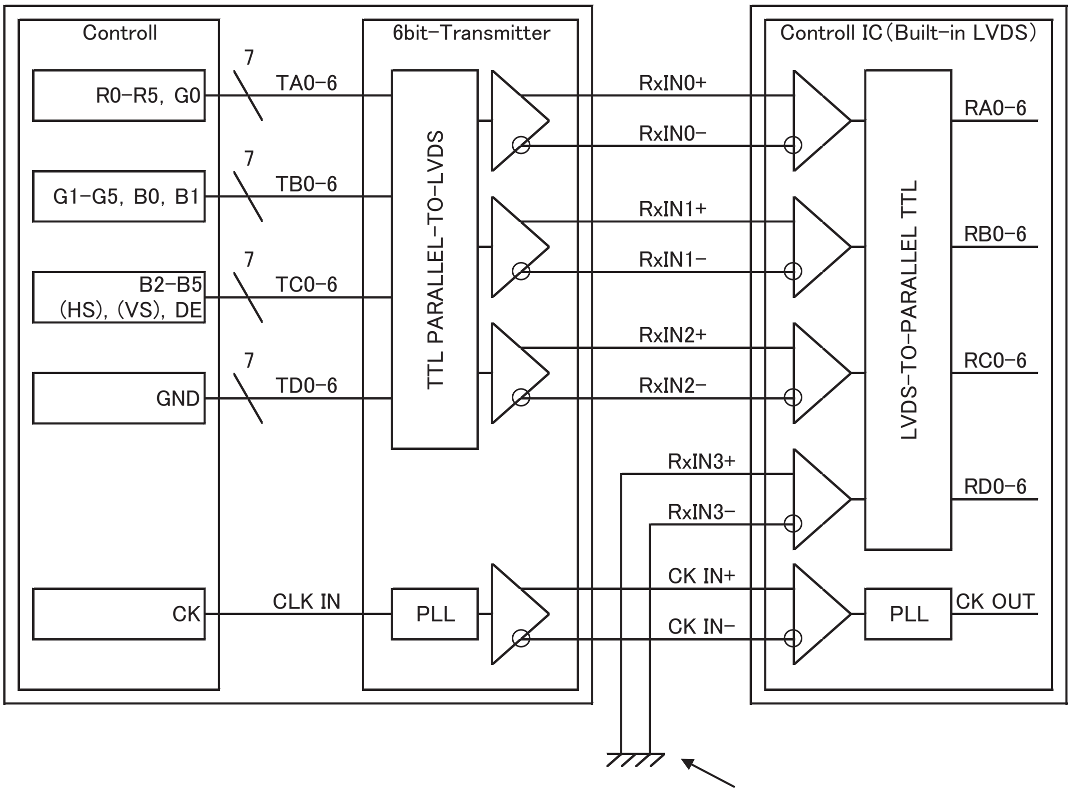
DE : DATA ENABLE
HS : HSYNC
VS : VSYNC

2) Block Diagram

MODE=L(GND)


Controll
R0−R5, G0
G1−G5, B0, B1
B2−B5
(HS), (VS), DE
GND
CK
7
TA0−6
TB0−6
TC0−6
TD0−6
CLK IN
THC63LVDM83R
TTL PARALLEL−TO−LVDS
PLL
RxIN0+
RxIN0−
RxIN1+
RxIN1−
RxIN2+
RxIN2−
RxIN3+
RxIN3−
CK IN+
CK IN−
Controll IC (Built−in LVDS)
LVDS−TO−PARALLEL TTL
PLL
RA0−6
RB0−6
RC0−6
RD0−6
CK OUT

When using "6-bit Transmitter", please connect the unused channel of the control IC receiver as described in the diagram below.


Controll
R0−R5, G0
G1−G5, B0, B1
B2−B5
(HS), (VS), DE
GND
CK
7
TA0−6
TB0−6
TC0−6
TD0−6
CLK IN
6bit−Transmitter
TTL PARALLEL−TO−LVDS
PLL
RxIN0+
RxIN0−
RxIN1+
RxIN1−
RxIN2+
RxIN2−
RxIN3+
RxIN3−
CK IN+
CK IN−
Controll IC (Built−in LVDS)
LVDS−TO−PARALLEL TTL
PLL
RA0−6
RB0−6
RC0−6
RD0−6
CK OUT

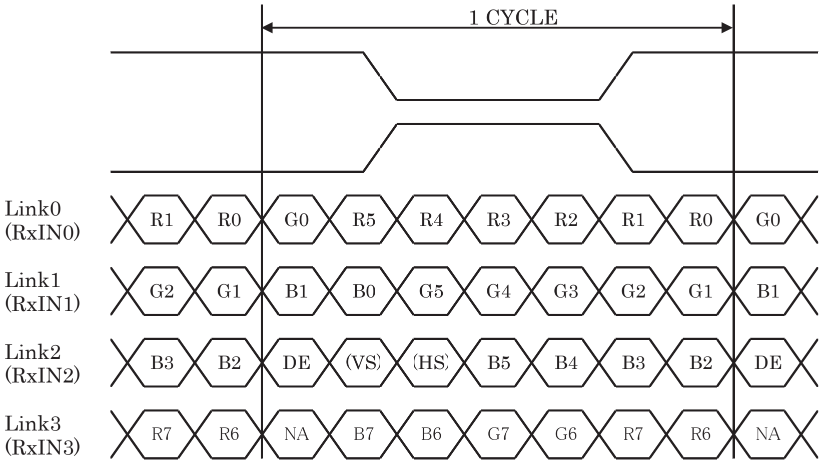
Please connect RxIn3+/RxIn3− to GND.

7-4. Data mapping(8bit input)

1) Location of MODE (THC63LVDM83R(THine Electronics) or compatible)

Transmitter		MODE
Pin No.	Data	= H(3.3V)
51	TA0	R0(LSB)
52	TA1	R1
54	TA2	R2
55	TA3	R3
56	TA4	R4
3	TA5	R5
4	TA6	G0(LSB)
6	TB0	G1
7	TB1	G2
11	TB2	G3
12	TB3	G4
14	TB4	G5
15	TB5	B0(LSB)
19	TB6	B1
20	TC0	B2
22	TC1	B3
23	TC2	B4
24	TC3	B5
27	TC4	(HS)
28	TC5	(VS)
30	TC6	DE
50	TD0	R6
2	TD1	R7(MSB)
8	TD2	G6
10	TD3	G7(MSB)
16	TD4	B6
18	TD5	B7(MSB)
25	TD6	(NA)

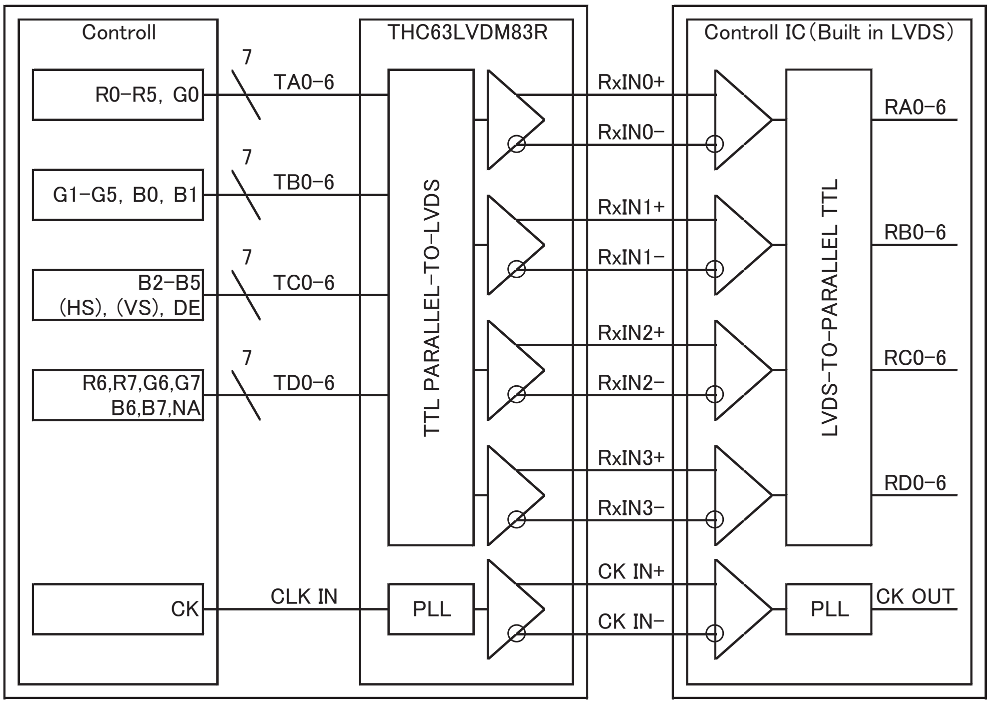
MODE= H(3.3V)


1 CYCLE
Link0
(RxIN0)
R1 R0 G0 R5 R4 R3 R2 R1 R0 G0
Link1
(RxIN1)
G2 G1 B1 B0 G5 G4 G3 G2 G1 B1
Link2
(RxIN2)
B3 B2 DE (VS) (HS) B5 B4 B3 B2 DE
Link3
(RxIN3)
R7 R6 NA B7 B6 G7 G6 R7 R6 NA

DE : DATA ENABLE
HS : HSYNC
VS : VSYNC

2) Block Diagram

MODE= H(3.3V)



Controll
R0−R5, G0
G1−G5, B0, B1
B2−B5
(HS), (VS), DE
R6,R7,G6,G7
B6,B7,NA
CK
7
TA0−6
7
TB0−6
7
TC0−6
7
TD0−6
CLK IN
THC63LVDM83R
TTL PARALLEL−TO−LVDS
PLL
RxIN0+
RxIN0−
RxIN1+
RxIN1−
RxIN2+
RxIN2−
RxIN3+
RxIN3−
CK IN+
CK IN−
Controll IC (Built in LVDS)
LVDS−TO−PARALLEL TTL
PLL
RA0−6
RB0−6
RC0−6
RD0−6
CK OUT

8. Input timing characteristics

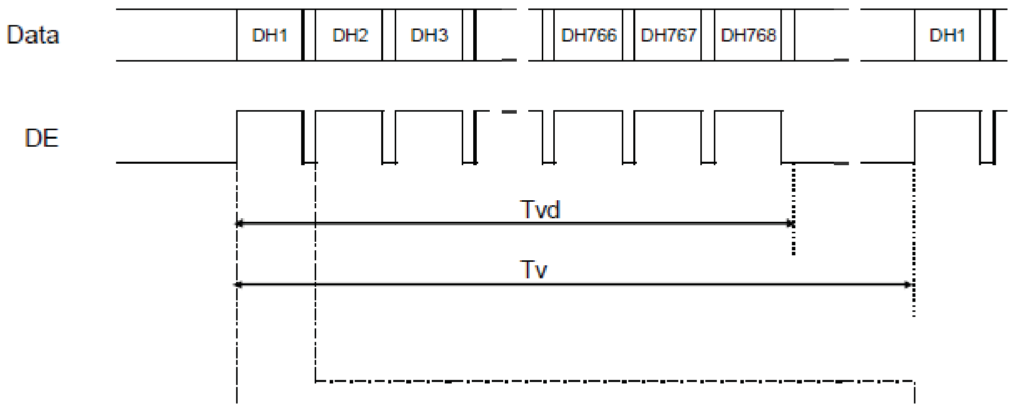
8-1. Timing characteristics

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Clock (CK)	Frequency	1/Tc	52	65	71	MHz	
Enable signal (DE)	Horizontal Period	Th	1,114	1,344	1,400	Dot	
			15.7	20.7	23.7	μ s	1)
	Horizontal display period	Thd		1,024		Tc	
	Vertical Period	Tv	778	806	845	Line	
	Vertical display period	Tvd		768		Th	
Refresh rate		fv	50	60	70	Hz	2)

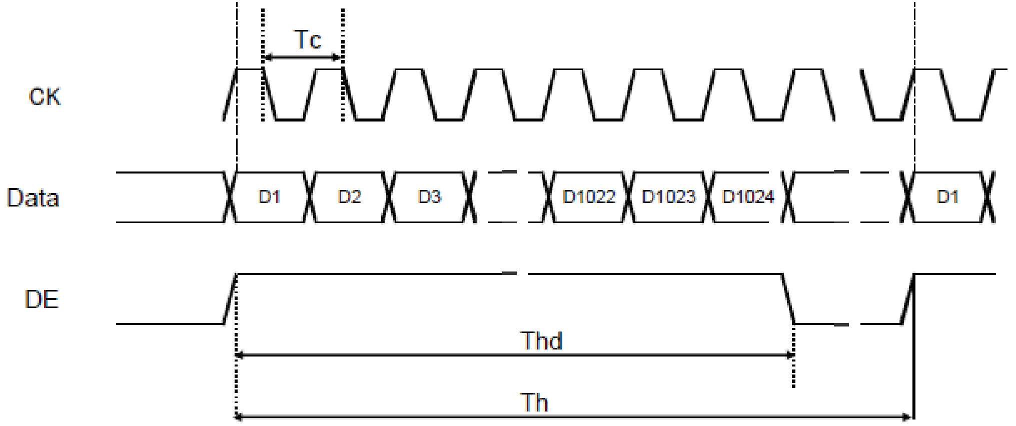
1) Please set a clock frequency, a vertical dormant period, and the horizontal dormant period so that the Horizontal Period should not reach less than Min. value.

2) If the refresh rate reach less than Min. value, the deterioration of the display quality, flicker etc., may occur.(fv=1/Tv)

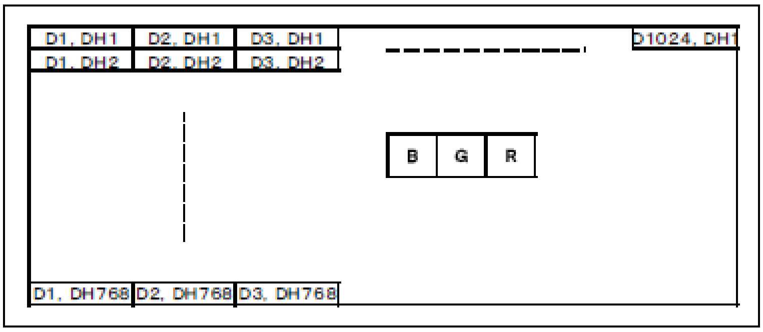
Vertical Timing Diagram


Data
DH1
DH2
DH3
DH766
DH767
DH768
DH1
DE
Tvd
Tv

Horizontal Timing Diagram


Tc
CK
Data
D1
D2
D3
D1022
D1023
D1024
D1
DE
Thd
Th

8-2. Input Data Signals and Display position on the screen


D1, DH1
D2, DH1
D3, DH1
D1024, DH1
D1, DH2
D2, DH2
D3, DH2
B
G
R
D1, DH768
D2, DH768
D3, DH768

9. Lot number identification

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

TCG104XGLPAPNN-AN40 - □□ - □□ - □ MADE IN □□□□□
↓↓ ↓ ↓ ↓
1 2 3 4 5

No1. - No5. above indicate
1. Year code
2. Month code
3. Date
4. Version Number
5. Country of origin (Japan or China)

Year	2015	2016	2017	2018	2019	2020
Code	5	6	7	8	9	0

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

10. Warranty

10-1. Incoming inspection

Please inspect the LCD within one month after your receipt.

10-2. Production warranty

Kyocera warrants its LCD's for a period of 12 months from the ship date. Kyocera shall, by mutual agreement, replace or re-work defective LCD's that are shown to be Kyocera's responsibility.

11. Precautions for use

11-1. Installation of the LCD

1) A transparent protection plate shall be added to protect the LCD and its polarizer.
2) The LCD shall be installed so that there is no pressure on the LSI chips.
3) Since this product is wide viewing product, occurrence level of in-plane unevenness by the external stress is different compared to current normal viewing product. So there is a possibility that in-plane unevenness will be occurred by over twist, strain giving by attaching to LCD, and over pressure to touch panel. Please be careful of stress when designing the housing.
4) A transparent protection sheet is attached to the polarizer. Please remove the protection film slowly before use, paying attention to static electricity.

11-2. Static electricity

1) Since CMOS ICs are mounted directly onto the LCD glass, protection from static electricity is required.
2) Workers should use body grounding. Operator should wear ground straps.

11-3. 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) Please select the best display pattern based on your evaluation because flicker, lines or nonuniformity or unevenness can be visible depending on display patterns.

11-4. Storage

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

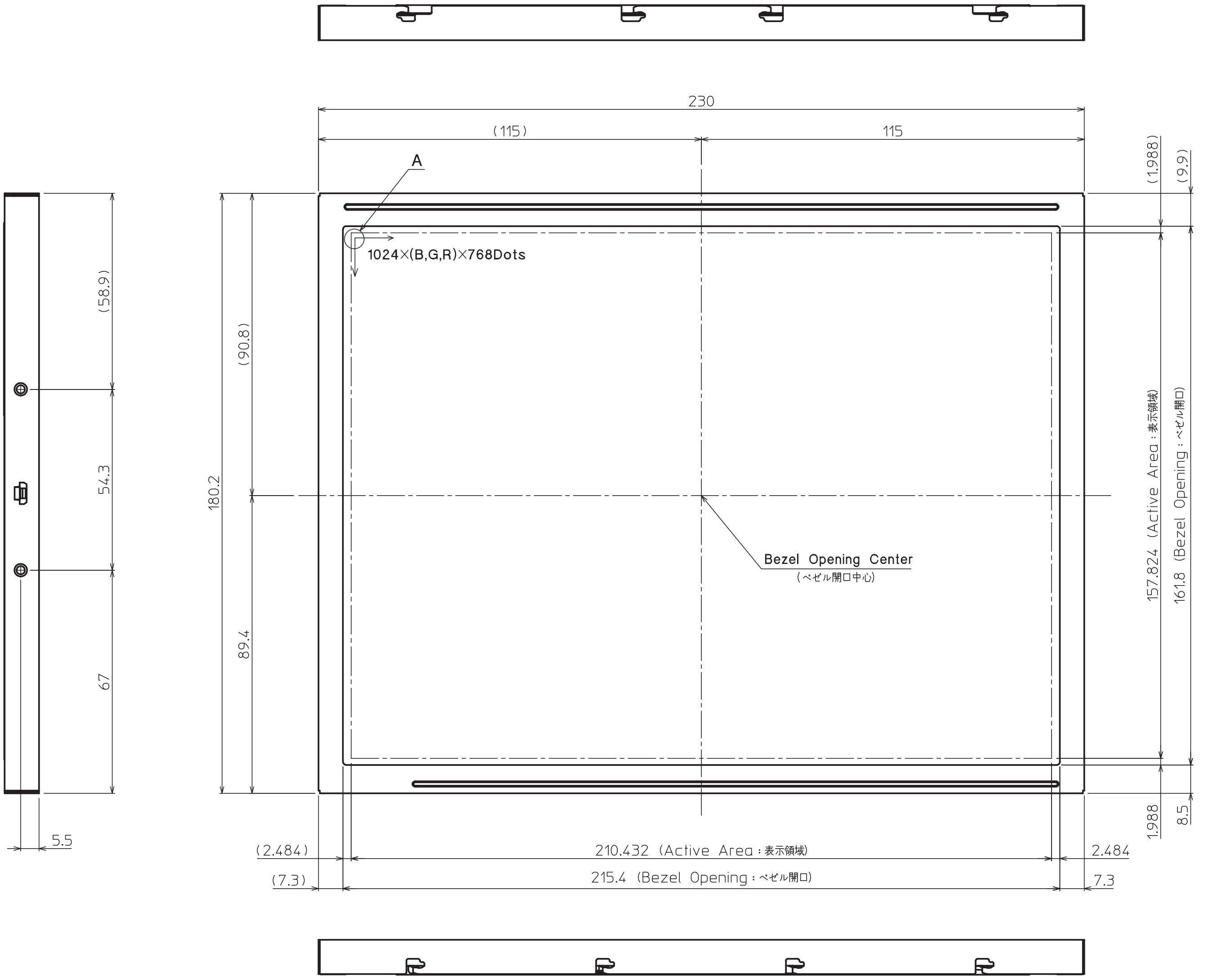
11-5. Usage

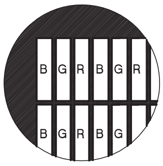
1) DO NOT store in a high humidity environment for extended periods. Polarizer degradation bubbles, and/or peeling off of the polarizer may result.
2) The front polarizer is easily scratched or damaged. Prevent touching it with any hard material, and from being pushed or rubbed.
3) The LCD screen may be cleaned by wiping the screen surface with a soft cloth or cotton pad using a little Ethanol.
4) Water may cause damage or discoloration of the polarizer. Clean condensation or moisture from any source immediately.
5) Always keep the LCD free from condensation during testing. Condensation may permanently spot or stain the polarizer.
6) Do not disassemble LCD because it will result in damage.
7) This Kyocera LCD 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.
8) Please do not use solid-base image pattern for long hours because a temporary afterimage may appear. We recommend using screen saver etc. in cases where a solid-base image pattern must be used.
9) Liquid crystal may leak when the LCD 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.

12. Reliability test data

Test item	Test condition	Test time	Judgement
High temp. atmosphere	80°C	240h	Display function : No Defect Display quality : No Defect Current consumption : No Defect
Low temp. atmosphere	-30°C	240h	Display function : No Defect Display quality : No Defect Current consumption : No Defect
High temp. humidity atmosphere	40°C 90% RH	240h	Display function : No Defect Display quality : No Defect Current consumption : No Defect
Temp. cycle	-30°C 0.5h R.T. 0.5h 80°C 0.5h	10cycles	Display function : No Defect Display quality : No Defect Current consumption : No Defect
High temp. operation	80°C	500h	Display function : No Defect Display quality : No Defect Current consumption : No Defect

1) Each test item uses a test LCD only once. The tested LCD is not used in any other tests.
2) The LCD is tested in circumstances in which there is no condensation.
3) The reliability test is not an out-going inspection.
4) The result of the reliability test is for your reference purpose only.
The reliability test is conducted only to examine the LCD's capability.


230
(115)
115
A
1024×(B,G,R)×768Dots
(58.9)
54.3
67
5.5
(90.8)
180.2
89.4
Bezel Opening Center
(ベゼル開口中心)
(1.988)
(9.9)
157.824 (Active Area：表示領域)
161.8 (Bezel Opening：ベゼル開口)
1.988
8.5
(2.484)
210.432 (Active Area：表示領域)
2.484
(7.3)
215.4 (Bezel Opening：ベゼル開口)
7.3

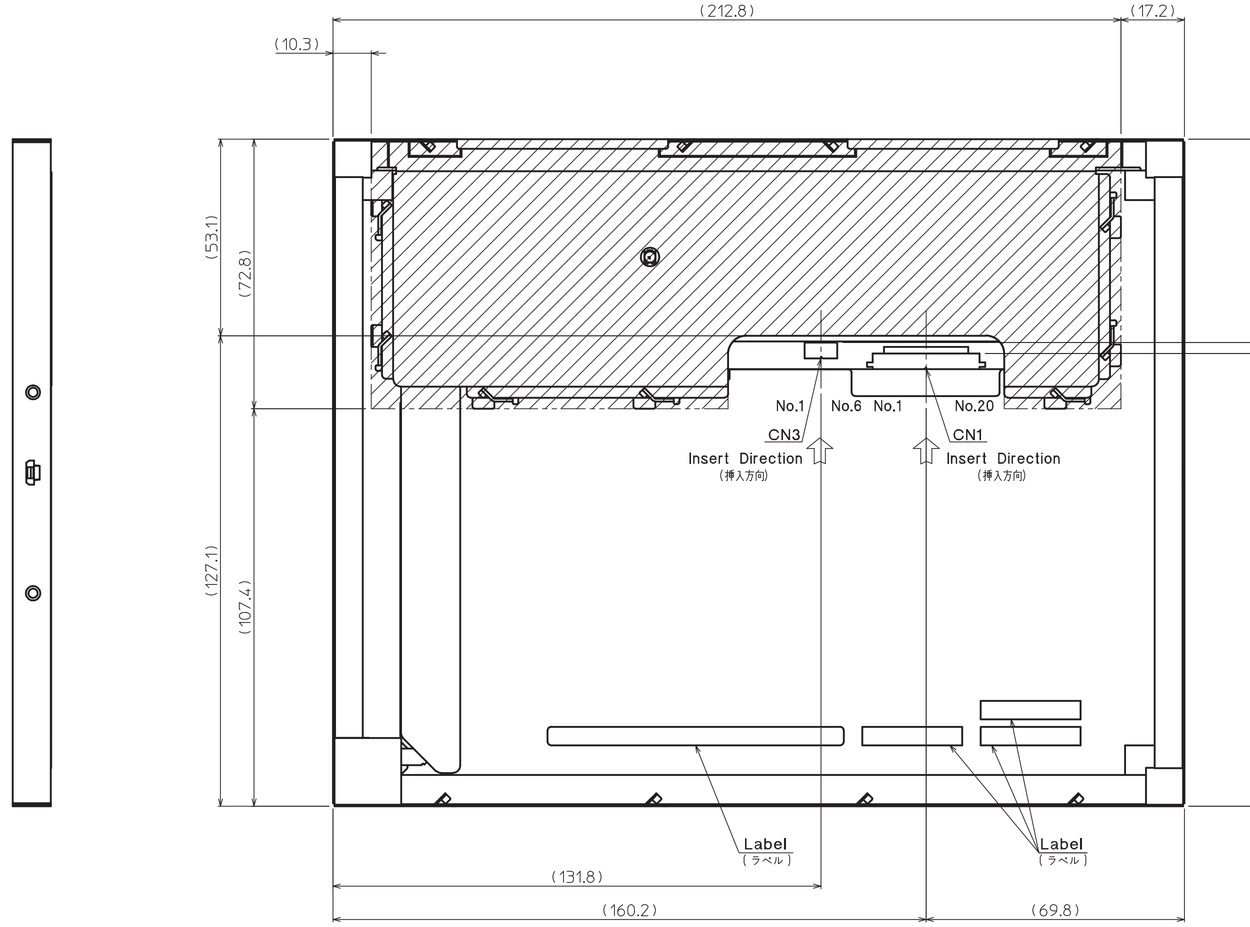

B
G
R
B
G
R
B
G
R
B
G

DETAIL A (Dot Size)
(NTS)

Note. (注記)
1. Connector CN1： 20186-020E-11F (I-PEX)
(コネクター) CN3： SM06B-SHLS-G-TF(LF)(SN) (JST)
2. Matching Connector CN1： 20197-020U-F (I-PEX)
(適合コネクター) 20197-T20U-F (I-PEX)
CN3： SHLP-6V-S-B (JST)
3. The Information of LCD is displayed starting at the upper left hand corner, moving right then down to the lower right hand corner.
(LCD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)

5. There is a poss
stress giving by
Please be care
(過度な捻じり(ひずみ)、L
ありますので、筐体設計に
6. Max screw lengt
(最大ネジ長)
7. Max screw torqu
(最大ネジ締め付けトルク)

Material 材 質	Treatment 処 理	Approved '15.01.22 加藤	Checked	Checked '15.01.22 蔭山	Drawn 車	Scale 1:1 (NTS)	Title
Quantity 製作数	Description; 備 考 RoHS					⊕	



(212.8)
(17.2)
(10.3)
(53.1)
(72.8)
(127.1)
(107.4)
No.1
No.6
No.1
No.20
CN3
Insert Direction
(挿入方向)
CN1
Insert Direction
(挿入方向)
Label
(ラベル)
Label
(ラベル)
(131.8)
(160.2)
(69.8)

▨ : Projected part is 10.5mm thickness.
(厚み10.5mm)

Material 材 質	Treatment 処 理	Approved '15.01.22	Checked	Checked '15.01.22	Drawn	Scale 1:1	Title
Quantity 製作数	Description; 備 考 RoHS	加藤		蔭山	車		

Spec No.	TQ3C-8EAF0-E2YAZ10-00
Date	January 16, 2015

KYOCERA INSPECTION STANDARD

TYPE : TCG104XGLPAPNN-AN40

KYOCERA DISPALY CORPORATION

Original Issue Date	Designed by : Engineering dept.			Confirmed by : QA dept.	
	Prepared	Checked	Approved	Checked	Approved
January 16, 2015	M. Koyama	Y. Yamazaki	W. Yano	O. Sato	I. Hamano

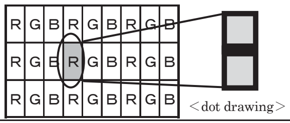
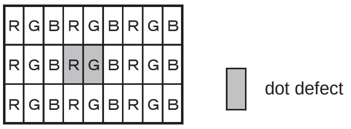
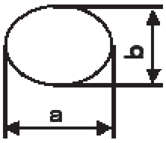
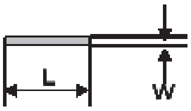
Revision record

Date	Designed by : Engineering dept.			Confirmed by : QA dept.	
	Prepared	Checked	Approved	Checked	Approved

Rev.No.	Date	Page	Descriptions

Visuals specification

1) Note

	Note		
General	1. Customer identified anomalies not defined within this inspection standard shall be reviewed by Kyocera, and an additional standard shall be determined by mutual consent. 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. 3. Inspection conditions Luminance : 500 Lux min. Inspection distance : 300 mm. Temperature : 25 ± 5℃ Direction : Directly above		
Definition of inspection item	Dot defect	Bright dot defect	The dot is constantly "on" when power applied to the LCD, even when all "Black" data sent to the screen. Inspection tool: 5% Transparency neutral density filter. Count dot: If the dot is visible through the filter. Don't count dot: If the dot is not visible through the filter.  R G B R G B R G B R G B R G B R G B R G B R G B R G B <dot drawing> There is an electrode in the middle of the dot and one dot is shown in the left drawing.
		Black dot defect	The dot is constantly "off" when power applied to the LCD, even when all "White" data sent to the screen. Similar size compared to bright dot.
		White dot (Circular/foreign particle)	Pixel works electrically, however, circular/foreign particle makes dot appear to be "on" even when all "Black" data is sent to the screen.
		Adjacent dot	Adjacent dot defect is defined as two or more bright dot defects or black dot defects.  R G B R G B R G B R G B R G B R G B R G B R G B R G B dot defect
	External inspection	Bubble, Scratch, Foreign particle (Polarizer, Cell, Backlight)	Visible operating (all pixels "Black" or "White") and non operating.
		Appearance inspection	Does not satisfy the value at the spec.
	Others	CFL wires	Damaged to the CFL wires, connector, pin, functional failure or appearance failure.
	Definition of size	Definition of circle size  $d = (a + b)/2$	Definition of linear size 

2) Standard

<table>
<tr><th colspan="2">Classification</th><th colspan="2">Inspection item</th><th>Judgement standard</th></tr>
<tr><td rowspan="7">Defect (in LCD glass)</td><td rowspan="6">Dot defect</td><td colspan="2">Bright dot defect</td><td>Acceptable number : 4
Bright dot spacing : 5 mm or more</td></tr>
<tr><td colspan="2">Black dot defect</td><td>Acceptable number : 5
Black dot spacing : 5 mm or more</td></tr>
<tr><td rowspan="2">2 dot join</td><td>Bright dot defect</td><td>Acceptable number : 2</td></tr>
<tr><td>Black dot defect</td><td>Acceptable number : 3</td></tr>
<tr><td colspan="2">3 or more dots join</td><td>Acceptable number : 0</td></tr>
<tr><td colspan="2">Total dot defects</td><td>Acceptable number : 5 Max</td></tr>
<tr><td>Others</td><td colspan="2">White dot, Dark dot (Circle)</td><td>
<table>
<tr><th>Size (mm)</th><th>Acceptable number</th></tr>
<tr><td>d ≦ 0.2</td><td>(Neglected)</td></tr>
<tr><td>0.2 < d ≦ 0.4</td><td>5</td></tr>
<tr><td>0.4 < d ≦ 0.5</td><td>3</td></tr>
<tr><td>0.5 < d</td><td>0</td></tr>
</table>
</td></tr>
<tr><td colspan="2" rowspan="4">External inspection (Defect on Polarizer or between Polarizer and LCD glass)</td><td colspan="2">Polarizer (Scratch)</td><td>
<table>
<tr><th>Width (mm)</th><th>Length (mm)</th><th>Acceptable number</th></tr>
<tr><td>W ≦ 0.1</td><td>―</td><td>(Neglected)</td></tr>
<tr><td rowspan="2">0.1 < W ≦ 0.3</td><td>L ≦ 5.0</td><td>(Neglected)</td></tr>
<tr><td>5.0 < L</td><td>0</td></tr>
<tr><td>0.3 < W</td><td>―</td><td>0</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Polarizer (Bubble)</td><td>
<table>
<tr><th>Size (mm)</th><th>Acceptable number</th></tr>
<tr><td>d ≦ 0.2</td><td>(Neglected)</td></tr>
<tr><td>0.2 < d ≦ 0.3</td><td>5</td></tr>
<tr><td>0.3 < d ≦ 0.5</td><td>3</td></tr>
<tr><td>0.5 < d</td><td>0</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Foreign particle (Circular shape)</td><td>
<table>
<tr><th>Size (mm)</th><th>Acceptable number</th></tr>
<tr><td>d ≦ 0.2</td><td>(Neglected)</td></tr>
<tr><td>0.2 < d ≦ 0.4</td><td>5</td></tr>
<tr><td>0.4 < d ≦ 0.5</td><td>3</td></tr>
<tr><td>0.5 < d</td><td>0</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Foreign particle (Linear shape)
Scratch</td><td>
<table>
<tr><th>Width (mm)</th><th>Length (mm)</th><th>Acceptable number</th></tr>
<tr><td>W ≦ 0.03</td><td>―</td><td>(Neglected)</td></tr>
<tr><td rowspan="3">0.03 < W ≦ 0.1</td><td>L ≦ 2.0</td><td>(Neglected)</td></tr>
<tr><td>2.0 < L ≦ 4.0</td><td>3</td></tr>
<tr><td>4.0 < L</td><td>0</td></tr>
<tr><td>0.1 < W</td><td>―</td><td>(According to circular shape)</td></tr>
</table>
</td></tr>
</table>

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