

SPEC for Mass Production

Spec No.	TQ3C-8EAF0-E1YBH15-02
Date	March 18, 2026

TYPE : TCG062HVLBAVNN-GN20

<6.2 inch HVGA transmissive color TFT with LED backlight
and constant current circuit for LED backlight>

CONTENTS

1. Application
2. Construction and outline
3. Mechanical specifications
4. Absolute maximum ratings
5. Electrical characteristics
6. Optical characteristics
7. Interface signals
8. Input timing characteristics
9. Backlight characteristics
10. Lot number identification
11. Warranty
12. Precautions for use
13. Reliability test data
14. Outline drawing



KYOCERA CORPORATION

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

Original Issue Date	Designed by: Engineering dept.			Confirmed by: QA dept.
	Prepared	Checked	Approved	Approved
June 29, 2023	<i>K. Komurasaki</i>	<i>T. Masuda</i>	<i>I. Kawajiri</i>	<i>T. Sawada</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.
2. Please note that we may not be able to respond to new environmental regulations after receiving the final mass production order for this product.

Spec No.

TQ3C-8EAF0-E1YBH15-02

Part No.

TCG062HVLBAVNN-GN20

Page

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Revision record

Date		Designed by : Engineering dept.			Confirmed by : QA dept.
		Prepared	Checked	Approved	Approved
March 18, 2026		<i>K. Komurasaki</i>	<i>T. Masuda</i>	<i>I. Kawajiri</i>	<i>T. Sawada</i>
Rev. No.	Date	Page	Descriptions		
01	Sept. 14, 2023	6	7. Interface signals -Change the model numbers of LCD connector and Matching connector due to EOL. -Add a note about LCD connector.		
		-	Revise the outline drawing.		
02	Mar. 18, 2026	-	Removed the CONFIDENTIAL notation		
		2	4-2. Environmental absolute maximum ratings Revised note on operating temperature		
		2-5, 9	Changed symbols Temp. → Ta Ta → Temp.		
		6	7. Interface signals - Added "CN1" designation to the LCD connector and Mating connector descriptions. - Added description of scan direction		
		11	10. Lot number identification Revised the description		

1. Application

This document defines the specification of TCG062HVLBAVNN-GN20 (RoHS Compliant).

2. Construction and outline

LCD	: Transmissive color dot matrix type TFT
Backlight system	: LED
Polarizer	: Glare treatment
Additional circuit	: Power supply (3.3V input) (with constant current circuit for LED Backlight)

3. Mechanical specifications

Item	Specification	Unit
Outline dimensions 1)	173(W)×70(H)×6.7(D)	mm
Active area	147.84(W)×55.44(H) (15.8cm/6.2 inch(Diagonal))	mm
Effective viewing area	149.8(W)×57.4(H)	mm
Dot format	640×(B,G,R)(W)×240(H)	dot
Dot pitch	0.077(W)×0.231(H)	mm
Base color 2)	Normally Black	-
Mass	115	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 for LCD drive		V_{DD}	0	4.0	V
Supply voltage for Backlight		V_{INB}	0	6.0	V
Input signal voltage	RxINi+, RxINi- 1) 2)	V_{I1}	-0.3	V_{DD}	V
	RxCK IN+, RxCK IN- 2)	V_{I2}	-0.3	V_{DD}	V
	SC	V_{I3}	-0.3	V_{DD}	V
	BLIN (Backlight ON-OFF)	V_{I4}	0	V_{INB}	V
	VBRT (Brightness adjust voltage)	V_{I5}	0	V_{INB}	V

1) $i=0,1,2$

2) 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 1)	T_{OP}	-20	70	°C
Storage temperature 2)	T_{STO}	-30	80	°C
Operating humidity 3)	H_{OP}	10	4)	%RH
Storage humidity 3)	H_{STO}	10	4)	%RH
Vibration	-	5)	5)	-
Shock	-	6)	6)	-

1) Operating temperature range defines the operation only and the contrast, response time and other display optical characteristics are set at T_a (Ambient Temperature) = 25°C.

2) $T_a = -30^{\circ}\text{C} < 48\text{h}$, $T_a = 80^{\circ}\text{C} < 168\text{h}$

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.)

3) Non-condensing

4) $T_a \leq 40^{\circ}\text{C}$, 85%RH Max.

$T_a > 40^{\circ}\text{C}$, Absolute humidity shall be less than 85%RH at 40°C.

5)

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

2 hours in each direction X, Y, Z (6 hours total)

EIAJ ED-2531

6) Acceleration: 490 m/s², Pulse width: 11 ms

3 times in each direction: $\pm X$, $\pm Y$, $\pm Z$

EIAJ ED-2531

6. Optical characteristics

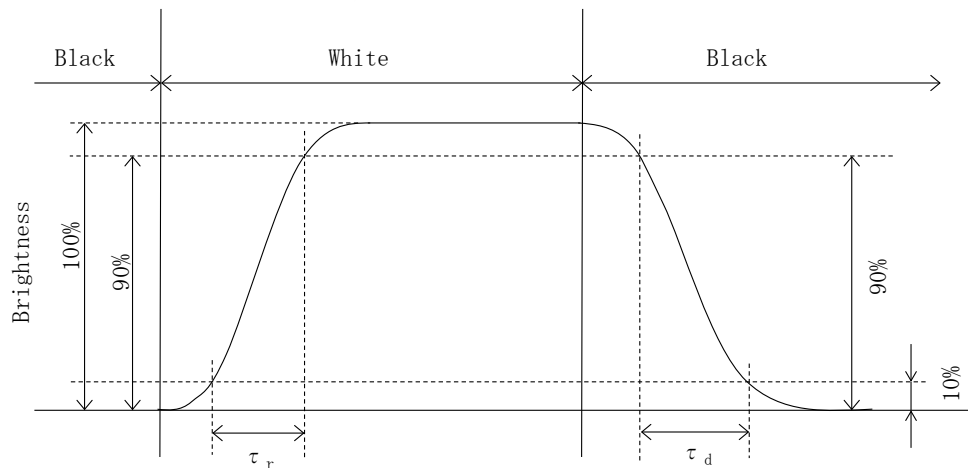
Measuring spot= ϕ 6.0mm, Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Response time	Rise	τ_r	$\theta = \phi = 0^\circ$	-	18	-	ms
	Down	τ_d	$\theta = \phi = 0^\circ$	-	12	-	ms
Viewing angle range		θ_{UPPER}	$CR \geq 10$	-	85	-	deg.
		θ_{LOWER}		-	85	-	
		ϕ_{LEFT}		-	85	-	deg.
		ϕ_{RIGHT}		-	85	-	
Contrast ratio		CR	$\theta = \phi = 0^\circ$	300	500	-	-
Brightness		L	IF=17.5 mA/Line	350	500	-	cd/m ²
Chromaticity coordinates	Red	x	$\theta = \phi = 0^\circ$	0.555	0.605	0.655	-
		y		0.285	0.335	0.385	
	Green	x	$\theta = \phi = 0^\circ$	0.290	0.340	0.390	
		y		0.510	0.560	0.610	
	Blue	x	$\theta = \phi = 0^\circ$	0.105	0.155	0.205	
		y		0.065	0.115	0.165	
	White	x	$\theta = \phi = 0^\circ$	0.255	0.305	0.355	
		y		0.270	0.320	0.370	

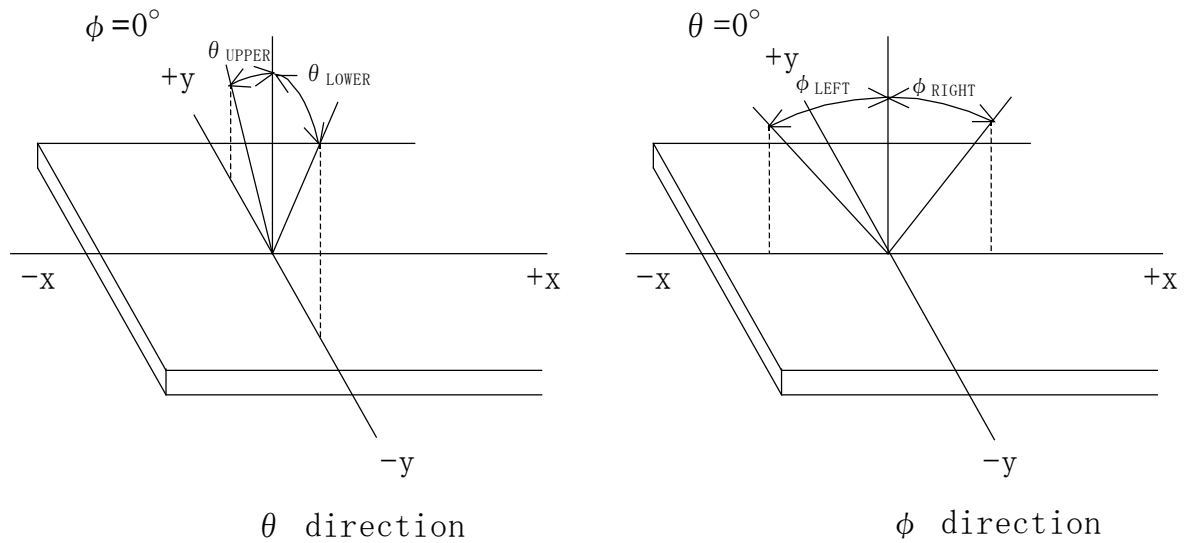
6-1. Definition of contrast ratio

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

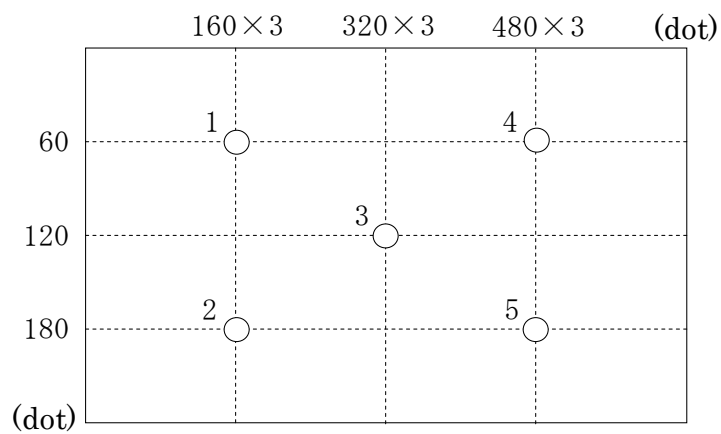
6-2. Definition of response time



6-3. Definition of viewing angle



6-4. Brightness measuring points



- 1) Rating is defined on the average in the viewing area. (measured point 1~5)
- 2) Measured 5 minutes after the LED is powered on. ($T_a=25^\circ\text{C}$)

7. Interface signals

No.	Symbol	Description	Note
1	GNDB	GND for LED backlight	
2	GNDB	GND for LED backlight	
3	GNDB	GND for LED backlight	
4	VBRT	Brightness adjust voltage (0V[max]~2.8V[min])	
5	BLN	Backlight ON-OFF (H: ON, L: OFF)	
6	V _{INB}	Power supply for LED backlight	
7	V _{INB}	Power supply for LED backlight	
8	V _{INB}	Power supply for LED backlight	
9	NC	NC	
10	NC	NC	
11	V _{DD}	+3.3V power supply	
12	V _{DD}	+3.3V power supply	
13	GND	GND	
14	GND	GND	
15	RxIN0-	LVDS receiver signal CH0(-)	LVDS
16	RxIN0+	LVDS receiver signal CH0(+)	LVDS
17	GND	GND	
18	RxIN1-	LVDS receiver signal CH1(-)	LVDS
19	RxIN1+	LVDS receiver signal CH1(+)	LVDS
20	GND	GND	
21	RxIN2-	LVDS receiver signal CH2(-)	LVDS
22	RxIN2+	LVDS receiver signal CH2(+)	LVDS
23	GND	GND	
24	RxCIN-	LVDS receiver signal CK(-)	LVDS
25	RxCIN+	LVDS receiver signal CK(+)	LVDS
26	GND	GND	
27	NC	NC	
28	NC	NC	
29	GND	GND	
30	SC	Scan direction control	1)

LCD connector (CN1) : FI-X30SSLA-HF (JAE)

*This connector has 32pins and pin No.1 and No.32 connect to GND.

Above interface signal table specifies 30pins assigned from pin No.2 to No.31.

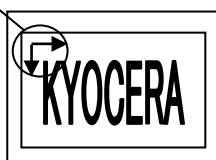
Matching connector (CN1) : FI-X30HL (JAE)

LVDS receiver : BU90R104(ROHM)

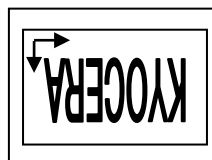
Matching LVDS transmitter : BU8254KVT(ROHM) or compatible

1) Scan direction

SC : GND or Open
Scan direction



SC : High



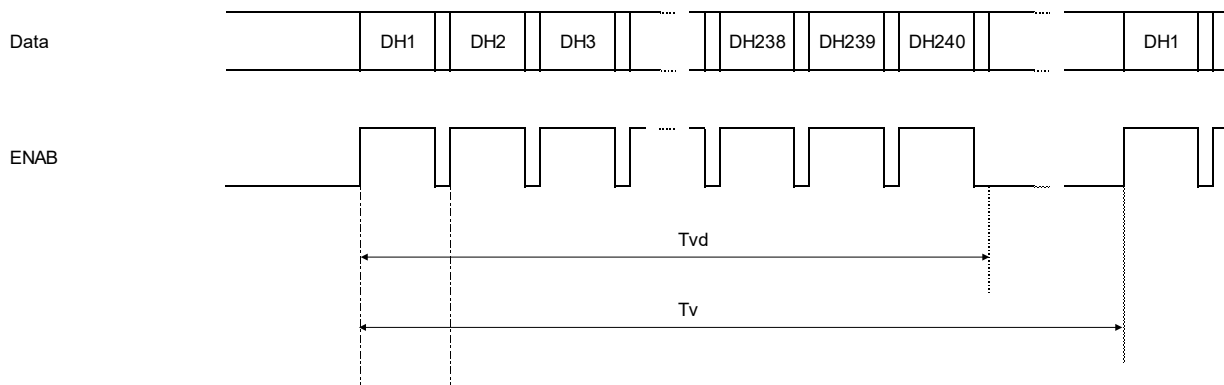
8. Input timing characteristics

8-1. Timing characteristics

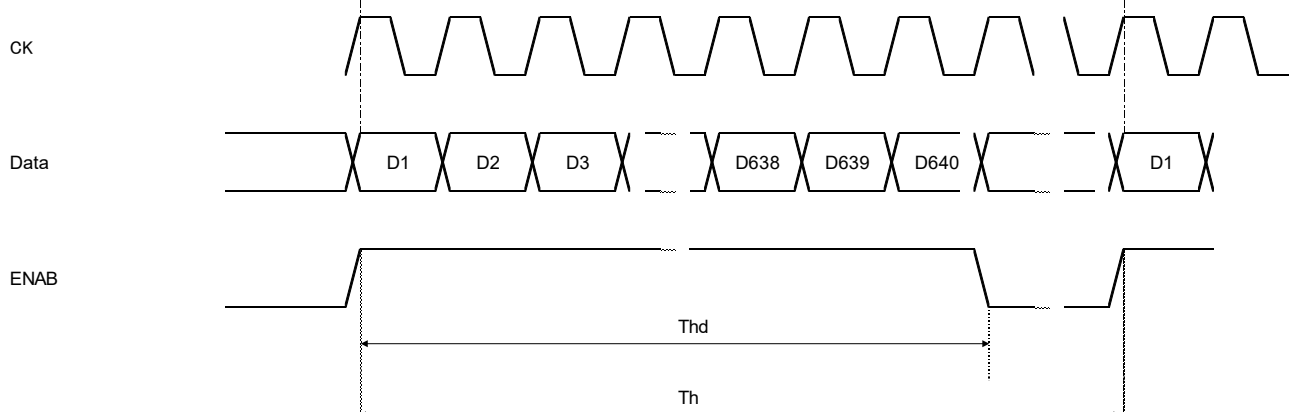
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Clock (CK)	Frequency	1/Tc	11.58	12.85	14.16	MHz	1)
Enable signal (DE)	Horizontal period	Th	766	816	866	Tc	
			54.1	63.5	-	μs	2)
	Horizontal display period	Thd	640			Tc	
	Vertical period	Tv	250	262	320	Th	
Vertical display period		Tvd	240			Th	
Refresh rate		fv	50	60	70	Hz	3)

- 1) If the display is used under the condition which is out of specifications such as higher clock frequency than specified value, there is a possibility phenomenon such as display error including white display, malfunction and no image may occur.
Please use the display under the conditions written in the specification.
- 2) 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.
- 3) If the refresh rate reach less than Min. value, the deterioration of the display quality, flicker etc., may occur. ($fv=1/Tv$)
- 4) CK count of each Horizontal Scanning Time should be always the same. Vertical invalid data period should be "n" × "Horizontal Scanning Time". (n: integer) Frame period should be always the same.

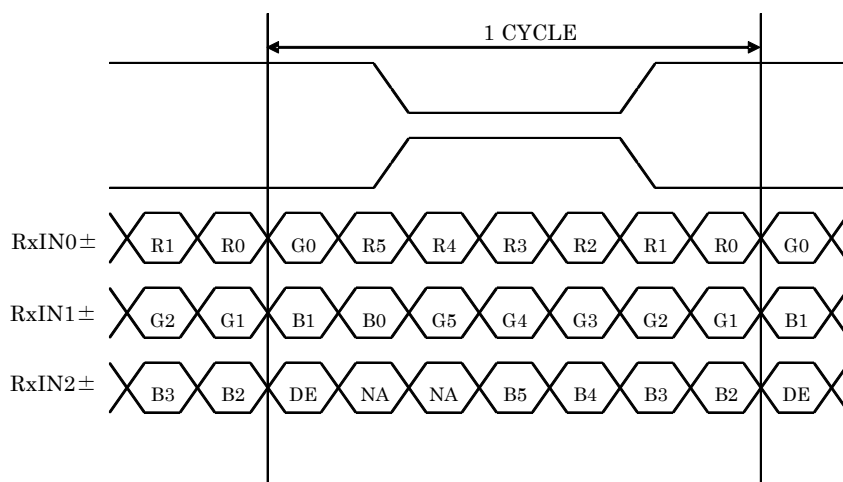
Vertical Timing Diagram



Horizontal Timing Diagram



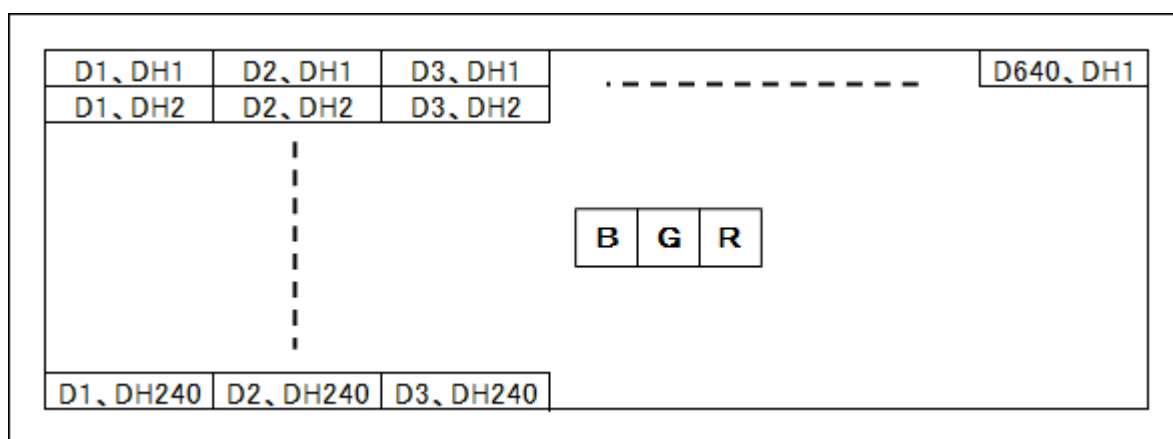
8-2. Data (6bit input)



DE: Data Enable

NA: Not Applicable

8-3. Input data signals and display position on the screen

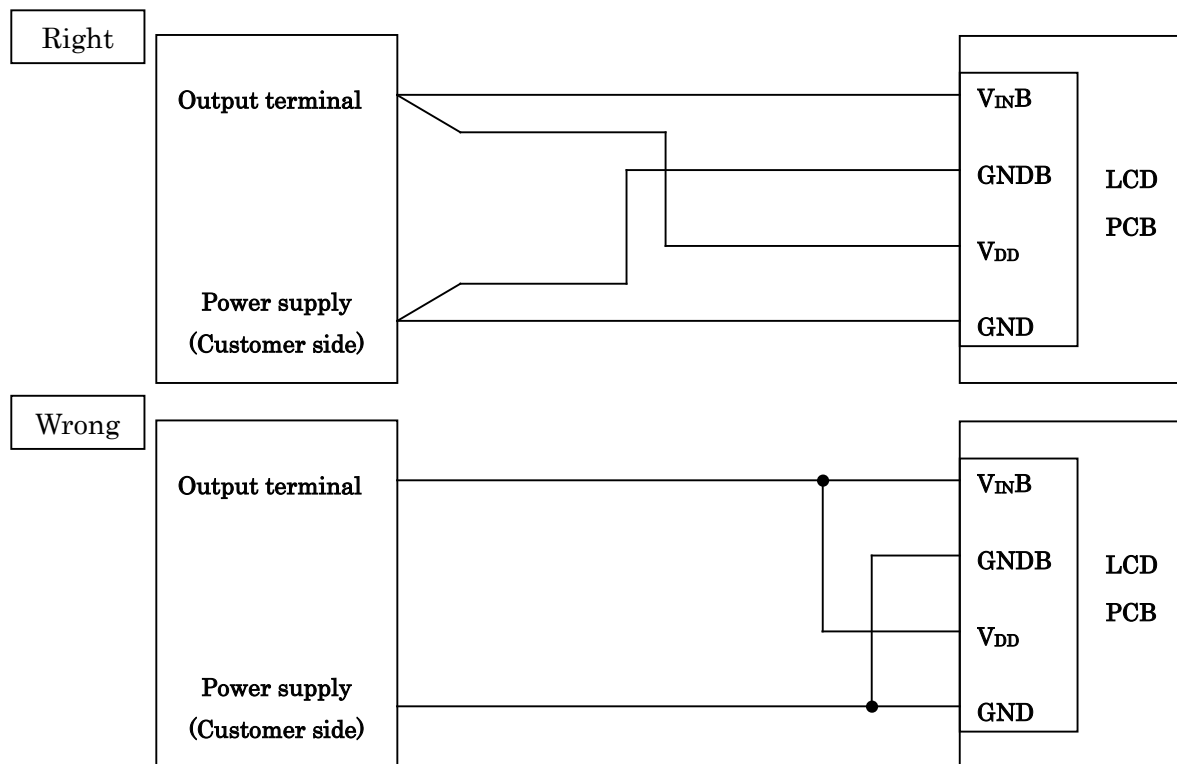


9. Backlight characteristics

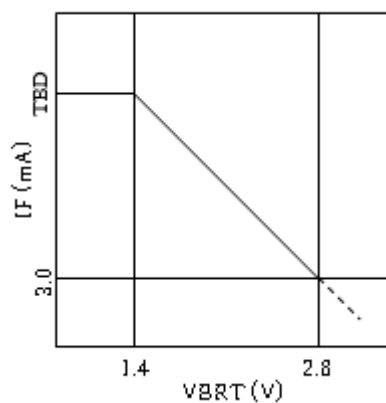
Ta=25°C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage	V _{INB}	3.0	-	5.5	V	Ta=-20~70°C
ON-OFF (H)	BLEN	0.8V _{INB}	-	V _{INB}	V	-
ON-OFF (L)		0.0	-	0.2V _{INB}	V	-
LED forward current 1) 2)	I _F	16.5	17.5	18.5	mA	VBRT=0~1.4V
		2.8	3.0	3.2		VBRT=2.8V
Supply current	I _{INB}	-	395	500	mA	V _{INB} =3.3V, I _F =17.5mA
		-	255	325		V _{INB} =5.0V, I _F =17.5mA
Operating life 3) 4)	T	-	40,000	-	h	I _F =17.5mA, Temp.=25°C

- 1) For each LED.
- 2) A forward current below 5.0mA may reduce the brightness uniformity of the LED backlight.
This is because the amount of light from each LED chip is different. Therefore, please evaluate carefully before finalizing the input current.
- 3) When brightness decrease 50% of minimum brightness.
The average life of a LED will decrease when the LCD is operating at higher temperatures.
- 4) Life time is estimated data. (Condition: I_F=17.5 mA, Temp.=25°C in chamber).
- 5) When you start-up, please charge in sequence of V_{INB}->BLEN, or VBRT. When you shut-down, please stop in sequence of BLEN and/or VBRT->V_{INB}.
- 6) Please do not connect the other than our backlight to this output connector on the PCB.
- 7) In case V_{DD} and V_{INB} are supplied by a single power source, V_{DD} & V_{INB}, and GND & GNDB are connected directly and separately from the output on the power source. If the common wire are used for V_{DD} & V_{INB}, and for GND & GNDB, and are split near the PCB, and connect to each LCD driving circuit and backlight driving circuit, a flicker might be occurred due to a ripple between the both circuits.

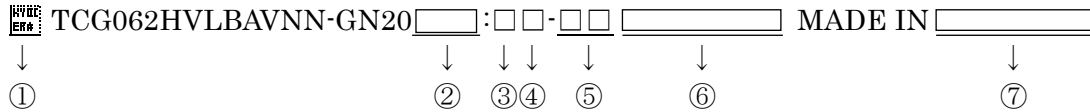


8) VBRT-IF characteristics



10. Lot number identification

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



No.① – No.⑦ above indicate

- ① Data matrix (For internal control purpose only)
- ② Internal reference number (Printed as necessary)
- ③ Year code (The last digit of the year)
- ④ Month code
- ⑤ Date
- ⑥ Serial number
- ⑦ Country of origin

④ Month code

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

11. Warranty

11-1. Incoming inspection

Please inspect the LCD within one month after your receipt.

11-2. Production warranty

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

12. Precautions for use

12-1. 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) The LCD shall be installed flat, without twisting or bending.
- 4) Please design the housing window so that its edges are between the active area and the effective area of the LCD screen.
- 5) A transparent protection sheet is attached to the polarizer. Please remove the protection film slowly before use, paying attention to static electricity.

12-2. 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.

12-3. 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.

12-4. 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.

12-5. 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.

13. 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	70°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.

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Date	March 18, 2026

KYOCERA INSPECTION STANDARD

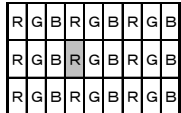
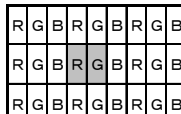
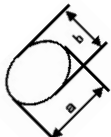
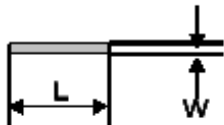
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Visuals specification

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 (H1): 300 mm Distance between LCD panel surface and ND filter (H2): $0 < H2 < 30$ mm *ND filters are placed parallel to the LCD panel. Temperature: $25 \pm 5^{\circ}\text{C}$		
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. 
		Black dot defect (Including circular ones)	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. Circular black dots shall be evaluated according to the criteria for circular white dots and circular black dots.
		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. 
	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.
Definition of size	Definition of circle size		Definition of linear size
	 a: major axis, b: minor axis $d = (a + b) / 2$		

2) Standard

Classification		Inspection item		Judgement standard		
Defect (in LCD glass)	Single dot	Bright dot defect		Acceptable number : 4 Bright dot spacing : 5 mm or more		
		Black dot defect		Acceptable number : 5 Black dot spacing : 5 mm or more		
	Adjacent dot	2 dots	Bright dot defect	Acceptable number : 2		
			Black dot defect	Acceptable number : 3		
		3 or more dots		Acceptable number : 0		
	Total dot defects		Acceptable number : 5 Max			
	Others	Circular white dots and circular black dots		Size (mm)		Acceptable number
				d ≤ 0.2		(Neglected)
0.2 < d ≤ 0.4				5		
0.4 < d ≤ 0.5				3		
0.5 < d				0		
External inspection (Defect on Polarizer or between Polarizer and LCD glass)	Polarizer (Scratch)		Width (mm)		Length (mm)	Acceptable number
			W ≤ 0.1		—	(Neglected)
			0.1 < W ≤ 0.3	L ≤ 5.0		(Neglected)
				5.0 < L		0
			0.3 < W		—	0
	Polarizer (Bubble)		Size (mm)		Acceptable number	
			d ≤ 0.2		(Neglected)	
			0.2 < d ≤ 0.3		5	
			0.3 < d ≤ 0.5		3	
			0.5 < d		0	
	Foreign particle (Circular shape)		Size (mm)		Acceptable number	
			d ≤ 0.2		(Neglected)	
			0.2 < d ≤ 0.4		5	
			0.4 < d ≤ 0.5		3	
			0.5 < d		0	
	Foreign particle (Linear shape) Scratch		Width (mm)		Length (mm)	Acceptable number
			W ≤ 0.03		—	(Neglected)
			0.03 < W ≤ 0.1	L ≤ 2.0		(Neglected)
				2.0 < L ≤ 4.0		3
			4.0 < L		0	
0.1 < W			—	(According to circular shape)		
Color variation (Mura)		Not visible through 5% ND filter.				

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Part No.

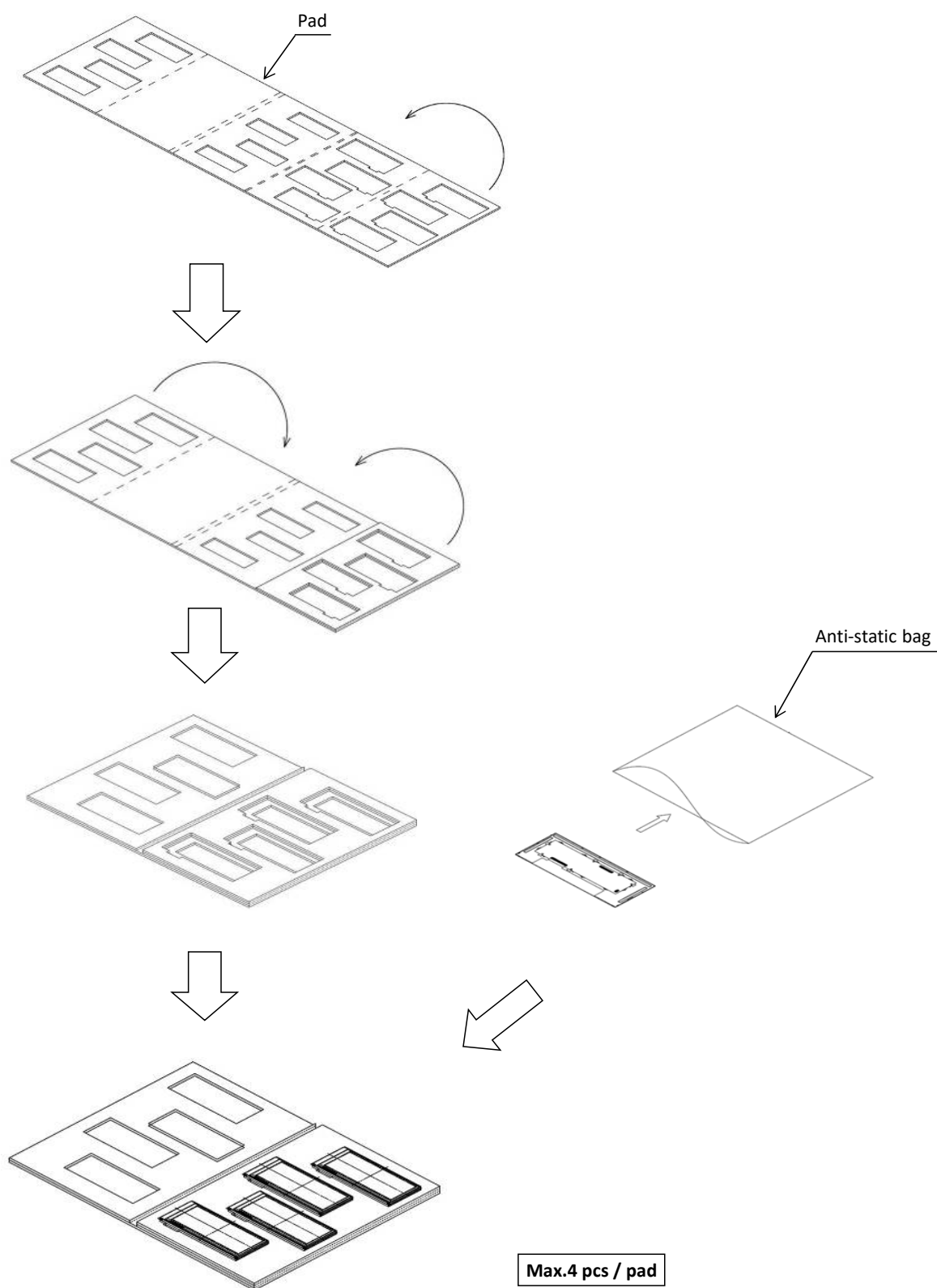
TCG062HVLBAVNN-GN20

Page

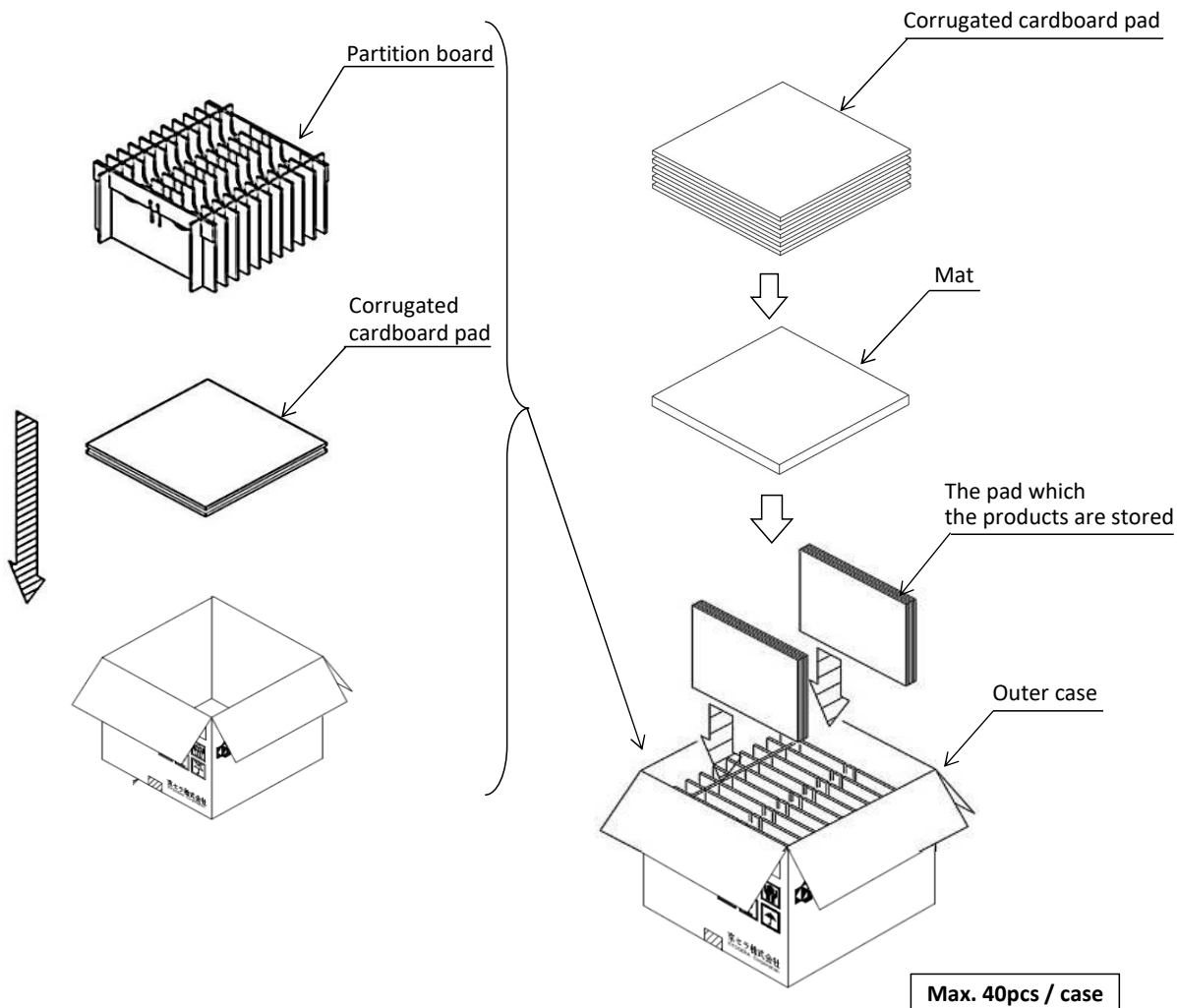
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Revision record

Date		Designed by : Engineering dept.			Confirmed by : QA dept.
		Prepared	Checked	Approved	Approved
March 18, 2026		<i>K. Komurasaki</i>	<i>T. Masuda</i>	<i>I. Kawajiri</i>	<i>T. Sawada</i>
Rev. No.	Date	Page	Descriptions		
01	Mar. 18, 2026	-	Removed the CONFIDENTIAL notation		

1. How to store LCDs in the pad

2. How to store LCDs in the box



3. Location of the labels

