DATA MODUL

SPECIFICATION

KYOCERA

TCG057QVLCSAFC-GA00

5.7” - QVGA - RGB

Version:
Date: 01.02.2023

Note: This specification is subject to change without prior notice

www.data-modul.com

SPEC for Mass Production

Spec No.	TQ3C-8EAF0-E1YAN63-00
Date	February 1, 2023

TYPE : TCG057QVLCSAFC-GA00

< 5.7 inch QVGA transmissive color TFT
with LED backlight and touch panel >

CONTENTS

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	Checked	Approved
February 1, 2023	*T. Onodera*	*I. Kawajiri*	*A. Iwasaki*	*Y. Aritsubo*	*M. Aoyama*

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 indemnity, 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.

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 TCG057QVLCSAFC-GA00. (RoHS Compliant)

2. Construction and outline

LCD	: Transmissive color dot matrix type TFT
Backlight system	: LED
Polarizer	: Glare treatment
Additional circuit	: Timing controller, Power supply (3.3V input) (without constant current circuit for LED backlight)
Touch panel	: Analog type, Non-Glare treatment

3. Mechanical specifications

3-1. LCD

Item	Specification	Unit
Outline dimensions 1)	127.2 (W)× 100.4 (H) ×6.75 (D)	mm
Active area	115.2 (W) × 86.4 (H) (14.4cm / 5.7 inch (Diagonal))	mm
Dot format	320×(B,G,R) (W) × 240 (H)	dot
Dot pitch	0.12 (W) × 0.36 (H)	mm
Base color 2)	Normally White	-
Mass	135	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.

3-2. Touch panel

Item	Specification	Unit
Input	Radius-0.8 stylus or Finger	-
Actuation Force	0.05～0.8	N
Transmittance	Typ. 79	%
Surface hardness	Pencil hardness 2H or more according	-
Anti newton's ring treatment	None	-

4. Absolute maximum ratings

4-1. Electrical absolute maximum ratings

Item	Symbol	Min.	Max.	Unit
Supply voltage for logic	V_{DD}	0	4.0	V
Input signal voltage 1)	V_{IN}	-0.3	6.0	V
LED forward current 2) 3)	IF	-	30	mA
Supply voltage for touch panel	V_{TP}	0	6.0	V
Input current of touch panel	I_{TP}	0	0.5	mA

1) Input signal : CK, R0～R5, G0～G5, B0～B5, H_{SYNC}, V_{SYNC}, ENAB, R/L, U/D
2) For each "AN-CA"
3) Do not apply reversed voltage.

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 means a temperature which operation shall be guaranteed. Since display performance is evaluated at 25°C, another temperature range should be confirmed.
2) Temp. = -30°C＜48h , Temp. = 80°C＜168h
Store LCD panels at normal temperature/humidity. Keep them free from vibration and shock. An LCD panel 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) Temp.≦40°C, 85%RH Max.
Temp.＞40°C, Absolute humidity shall be less than 85%RH at 40°C.
5)

Frequency	10～55 Hz	Acceleration value (0.3～9 m/s²)
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) 6 Acceleration: 490 m/s², Pulse width: 11 ms
3 times in each direction: ±X, ±Y, ±Z
EIAJ ED-2531

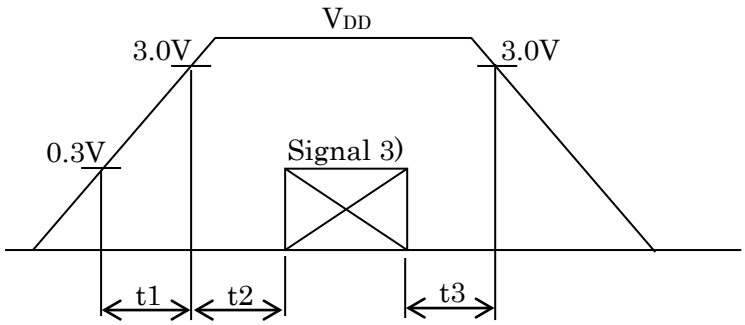
5. Electrical characteristics

5-1. LCD

Temp. = -20～70°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)	-	60	80	mA
Permissive input ripple voltage	V_{RP}	-	-	-	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

1) V_{DD}-turn-on conditions



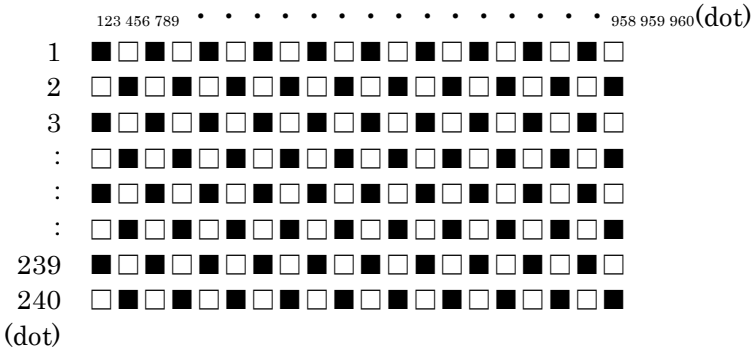
0＜t1≦20ms

0＜t2≦50ms

0＜t3≦1s

2) Display pattern:

V_{DD} = 3.3V, Temp. = 25°C



3) Input signal : CK, R0～R5, G0～G5, B0～B5, H_{SYNC}, V_{SYNC}, ENAB, R/L, U/D

5-2. Touch panel

Item	Specification
Supply voltage for touch panel	5.0V
Terminal resistance	xL～xR : 200Ω～1,000Ω
	yU～yL : 200Ω～800Ω
Linearity	less than ±2.0%(when calibrated with 4 points)
Insulation resistance	100MΩ or more at DC25V

6. Optical characteristics

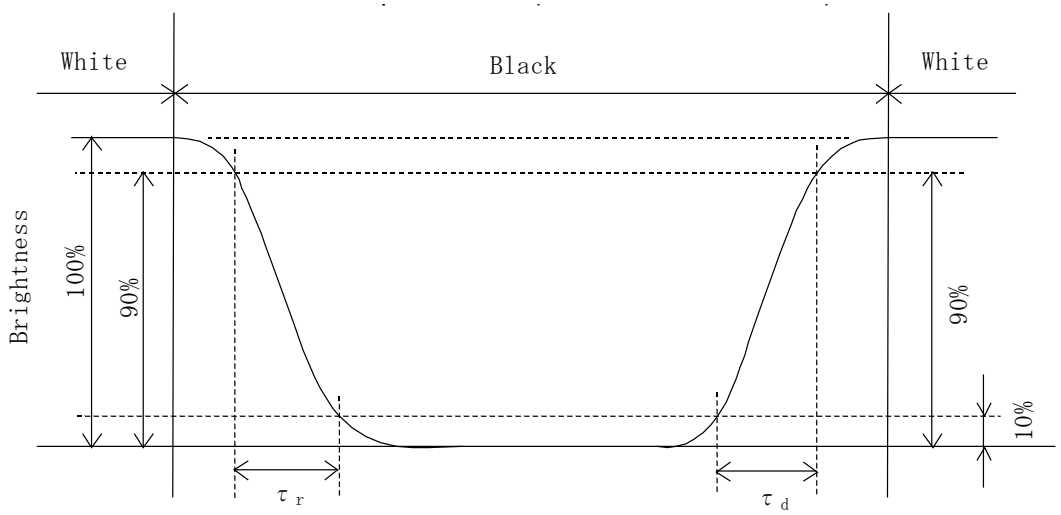
Measuring spot = ϕ 6.0mm, Temp. = 25°C

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Response time	Rise	τ_r	$\theta = \phi = 0°$	-	10	-	ms
	Down	τ_d	$\theta = \phi = 0°$	-	25	-	ms
Viewing angle range View direction : 12 o'clock (Gray inversion)		θ UPPER	CR≧5	-	80	-	deg.
		θ LOWER		-	80	-	
		ϕ LEFT		-	80	-	deg.
		ϕ RIGHT		-	80	-	
Contrast ratio		CR	$\theta = \phi = 0°$	300	500	-	-
Brightness		L	IF=15mA/Line	165	240	-	cd/m²
Chromaticity coordinates	Red	x	$\theta = \phi = 0°$	0.57	0.62	0.67	-
		y		0.32	0.37	0.42	
	Green	x	$\theta = \phi = 0°$	0.28	0.33	0.38	
		y		0.54	0.59	0.64	
	Blue	x	$\theta = \phi = 0°$	0.09	0.14	0.19	
		y		0.04	0.09	0.14	
	White	x	$\theta = \phi = 0°$	0.28	0.33	0.38	
		y		0.30	0.35	0.40	

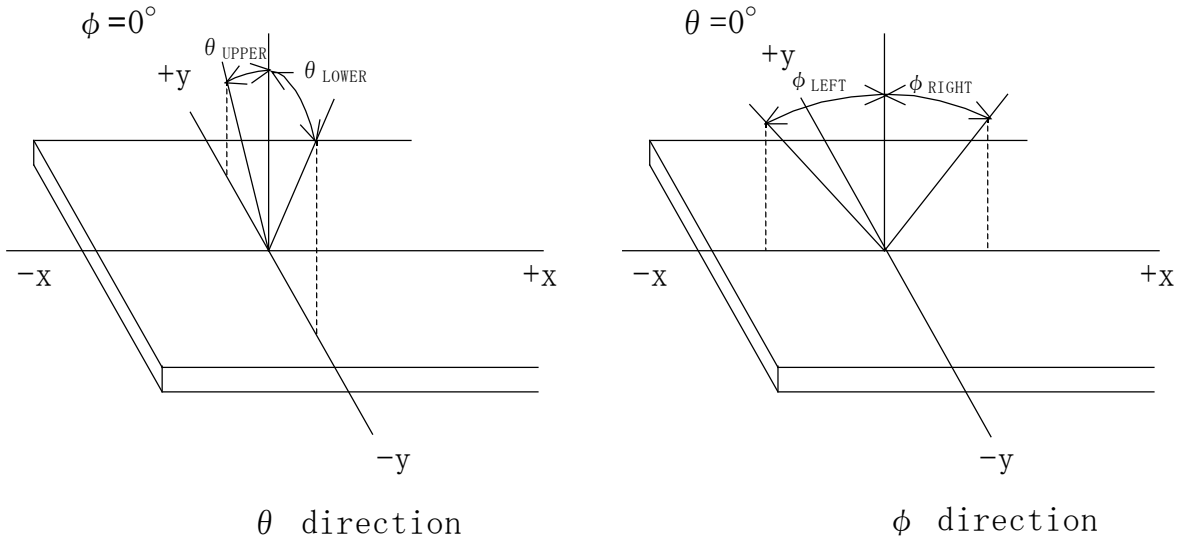
6-1. Definition of contrast ratio

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

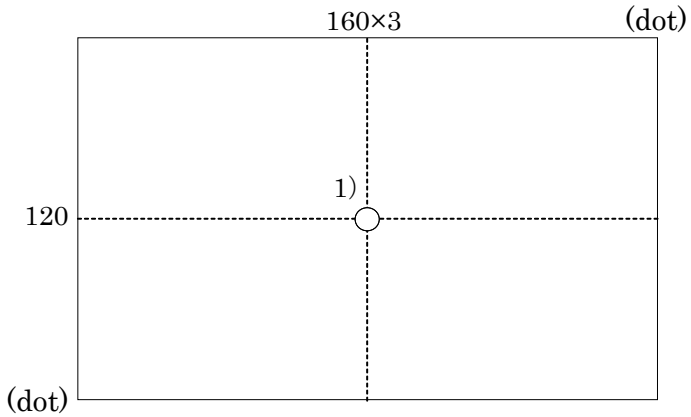
6-2. Definition of response time



6-3. Definition of viewing angle



6-4. Brightness measuring point



1) Rating is defined as the white brightness at center of display screen.
2) Measured 5 minutes after the LED is powered on. (Ambient temp. = 25°C)

7. Interface signals

7-1. LCD

No.	Symbol	Description	I/O	Note
1	GND	GND	-	
2	CK	Clock signal for sampling each data signal	I	
3	H_{SYNC}	Horizontal synchronous signal (negative)	I	
4	V_{SYNC}	Vertical synchronous signal (negative)	I	
5	GND	GND	-	
6	R0	RED data signal (LSB)	I	
7	R1	RED data signal	I	
8	R2	RED data signal	I	
9	R3	RED data signal	I	
10	R4	RED data signal	I	
11	R5	RED data signal (MSB)	I	
12	GND	GND	-	
13	G0	GREEN data signal (LSB)	I	
14	G1	GREEN data signal	I	
15	G2	GREEN data signal	I	
16	G3	GREEN data signal	I	
17	G4	GREEN data signal	I	
18	G5	GREEN data signal (MSB)	I	
19	GND	GND	-	
20	B0	BLUE data signal (LSB)	I	
21	B1	BLUE data signal	I	
22	B2	BLUE data signal	I	
23	B3	BLUE data signal	I	
24	B4	BLUE data signal	I	
25	B5	BLUE data signal (MSB)	I	
26	GND	GND	-	
27	ENAB	Signal to settle the horizontal display position (positive)	I	1)
28	V_{DD}	3.3V power supply	-	
29	V_{DD}	3.3V power supply	-	
30	R/L	Horizontal display mode select signal L : Normal , H : Left / Right reverse mode	I	2)
31	U/D	Vertical display mode select signal H : Normal , L : Up / Down reverse mode	I	2)
32	NC	No connect	-	
33	CA1	Cathode 1	-	
34	CA2	Cathode 2	-	
35	CA3	Cathode 3	-	
36	NC	No connect	-	
37	AN1	Anode 1	-	
38	AN2	Anode 2	-	
39	AN3	Anode 3	-	
40	NC	No connect	-	

LCD connector : IMSA-9681S-40A-GF (IRISO)
Recommended matching FFC or FPC : 0.5mm pitch

1) The horizontal display start timing is settled in accordance with a rising timing of ENAB signal.
In case ENAB is fixed "Low", the horizontal start timing is determined.
Don't keep ENAB "High" during operation.

2)

R/L = L
U/D = H

R/L = H
U/D = H

R/L = L
U/D = L

R/L = H
U/D = L

7-2. Touch panel

No.	Symbol	Description
1	yL	y-Lower terminal
2	xL	x-Left terminal
3	yU	y-Upper terminal
4	xR	x-Right terminal

Touch panel side connector : 1.25mm pitch

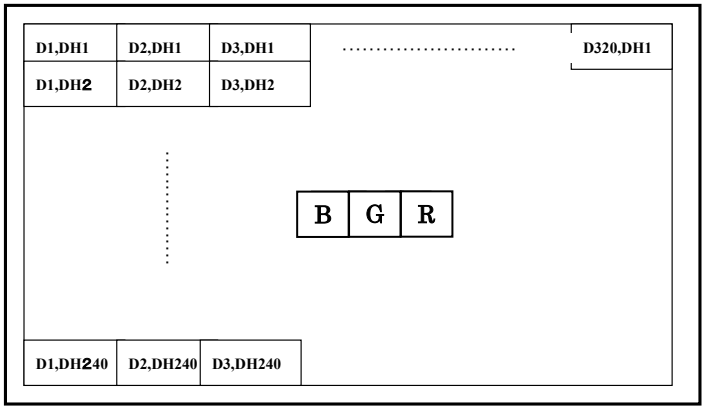
8. Input timing characteristics

8-1. Timing characteristics 1)

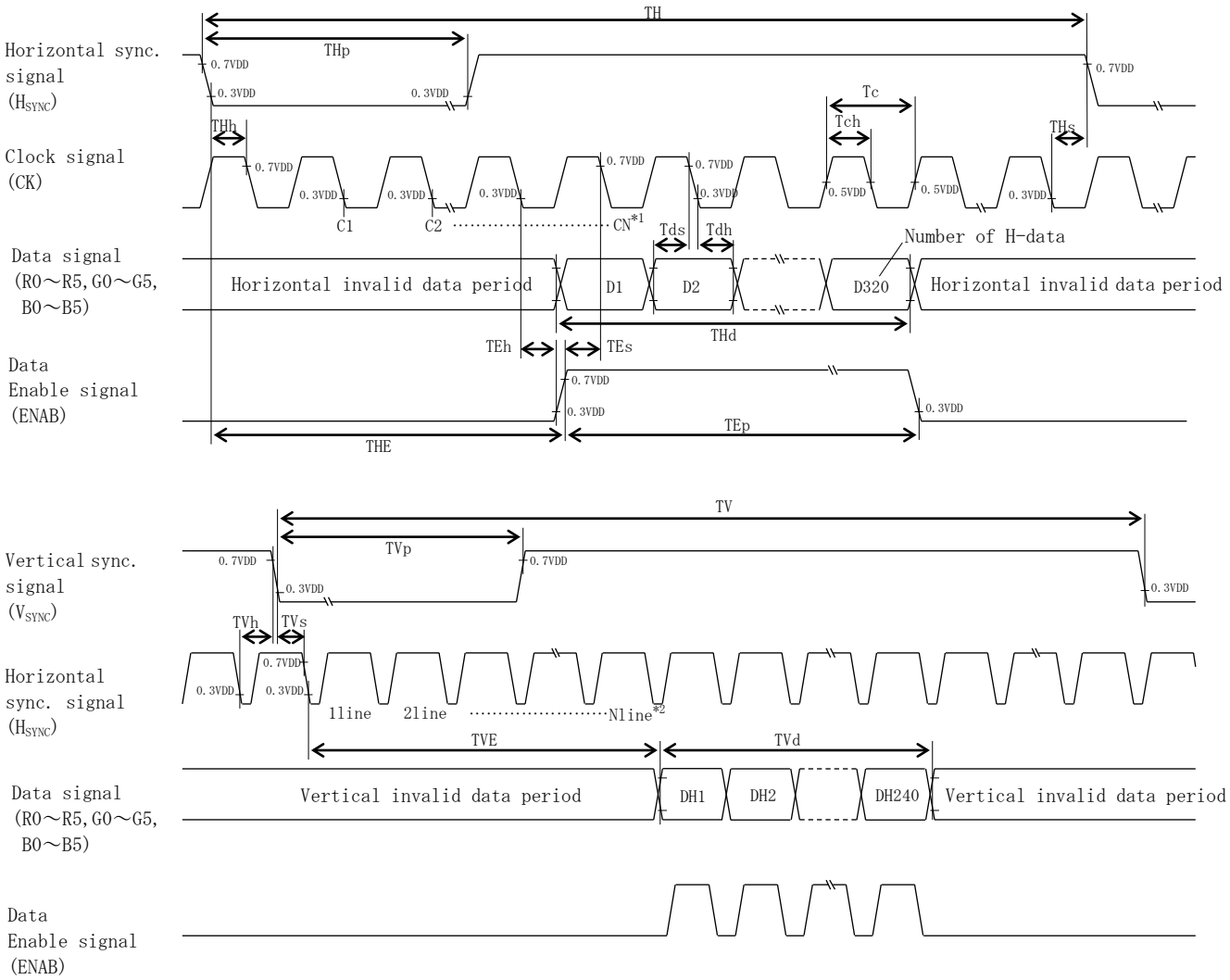
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Clock	Frequency	1/Tc	—	6.3	7.0	MHz	2)
	Duty ratio	Tch/Tc	40	50	60	%	
Data	Set up time	Tds	12	—	—	ns	
	Hold time	Tdh	12	—	—	ns	
Horizontal sync. signal	Cycle	TH	50.0	63.6	—	μs	
			360	400	450	clock	
	Pulse width	THp	5	30	—	clock	
	Set up time	THs	12	—	—	ns	
	Hold time	THh	12	—	—	ns	
Vertical sync. signal	Cycle	TV	251	262	280	line	
	Pulse width	TVp	1	3	5	line	
	Set up time	TVs	2	—	—	clock	
	Hold time	TVh	12	—	—	ns	
Enable signal (ENAB)	Pulse width	TEp	320			clock	
	Set up time	TEs	12	—	—	ns	
	Hold time	TEh	12	—	—	ns	
HSYNC - Enable signal phase difference		THE	36	68	88	clock	
Vertical sync. signal start position		TVE	2	18	38	line	
Horizontal display period		THd	320			clock	
Vertical display period		TVd	240			line	

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) In case of lower frequency, the deterioration of the display quality, flicker etc., may occur.
3) When ENAB is fixed at "Low", the horizontal display starts from the data of C68 (clock) as shown in 8-3.
4) When ENAB is fixed at "Low", the vertical sync. signal start position is 18 (line) as shown in 8-3.

8-2. Input data signals and display position on the screen



8-3. Input timing characteristics



1) When ENAB is fixed at "Low", the horizontal display starts from the data of C68 (clock).

2) When ENAB is fixed at "Low", the vertical sync. signal start position is 18 (line).

9. LED backlight characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward current 1)	IF	-	15	-	mA	Ta=-20～70°C
Forward voltage 1)	VF	-	22.1	25.0	V	IF=15mA, Ta=-20℃
		-	21.7	24.5	V	IF=15mA, Ta=25℃
		-	21.3	24.1	V	IF=15mA, Ta=70℃
Operating life time 2) 3)	T	-	40,000	-	h	IF=15mA, Ta=25℃

1) For each “AN-CA”
2) When brightness decrease 50% of minimum brightness.
3) Life time is estimated data. (Condition : IF=15mA, Ta=25℃ in chamber).
4) An input 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.
5) LED formation: 7 series, 3 parallel

10. Design guidance for analog touch panel

10-1. Electrical (In customer's design, please remember the following considerations.)

1) Do not use the current regulated circuit.
2) Keep the current limit with top and bottom layer.
   (Please refer to “Electrical absolute maximum ratings” for details.)
3) Analog touch panel can not sense two points touching separately.
4) A contact resistance is appeared at the touch point between top and bottom layer.
   After this resistance has stable read of the touch panel position data.
5) Because noise of inverter or peripheral circuits may interfere signal of touch panel itself
   it is necessary to design carefully in advance to avoid these noise problem.

10-2. Software

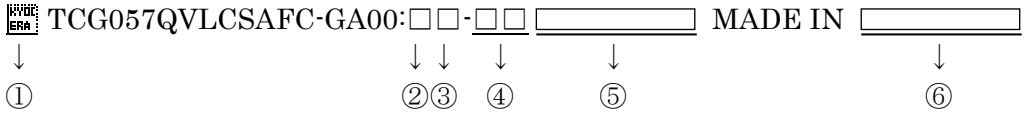
1) Do the "User Calibration".
2) "User Calibration" may be needed with long term using.
   Include "User Calibration" menu in your software.
3) When drawing a line with a stylus, there may be a slight discontinuity when the stylus passes over a spacer-dot. If necessary, please provide a compensation feature within your software.

10-3. Mounting on display and housing bezel

1) Do not use an adhesive tape to bond it on the front of touch panel and hang it to the housing bezel.
2) Never expand the touch panel top layer (PET-film) like a balloon by internal air pressure.
   The life of the touch panel will be extremely short
3) If a dew will be on the heat-sealed area or exposed traces at the end of a flexible tail,
   the migration of silver can occur. This will cause sometimes a short circuit.

11. Lot number identification

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



No.① – No.⑥ above indicate
- ① Data matrix (For internal control purpose only)
- ② Year code (The last digit of the year)
- ③ Month code
- ④ Day code
- ⑤ Version number (Max. 7 characters)
- ⑥ Country of origin

③ 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

12. Warranty

12-1. Incoming inspection

Please inspect the LCD within one month after your receipt.

12-2. 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.

13. Precautions for use

13-1. Installation of the LCD

1) The LCD shall be installed so that there is no pressure on the LSI chips.
2) The LCD shall be installed flat, without twisting or bending.
3) Must maintain a gap between inside of bezel and touch panel to avoid malfunction or electrode damage of touch panel.

13-2. 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.

13-3. 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.

13-4. 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.

13-5. Usage

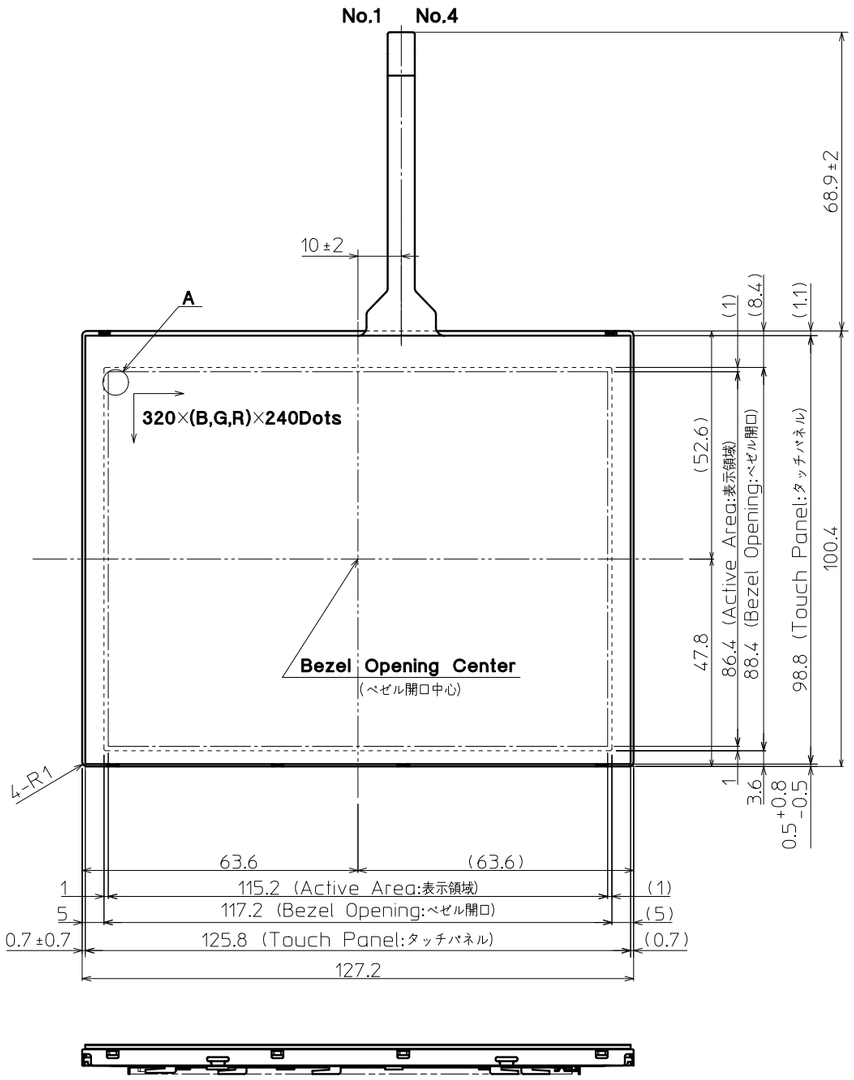
1) DO NOT store in a high humidity environment for extended periods. Polarizer degradation bubbles, and/or peeling off of the polarizer may result.
2) Do not push or rub the touch panel's surface with hard to sharp objects such as knives, or the touch panel may be scratched.
3) When the touch panel is dirty, gently wipe the surface with a soft cloth, sometimes moistened by mild detergent or alcohol. If a hazardous chemical is dropped on the touch panel by mistake, wipe it off right away to prevent human contact.
4) Touch panel edges are sharp. Handle the touch panel with enough care to prevent cuts.
5) Always keep the LCD free from condensation during testing. Condensation may permanently spot or stain the polarizer.
6) Do not disassemble LCD module because it will result in damage.
7) 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.
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 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.

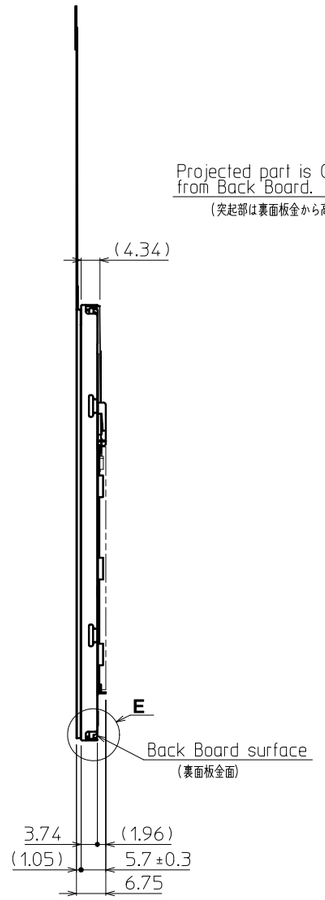
14. Reliability test data

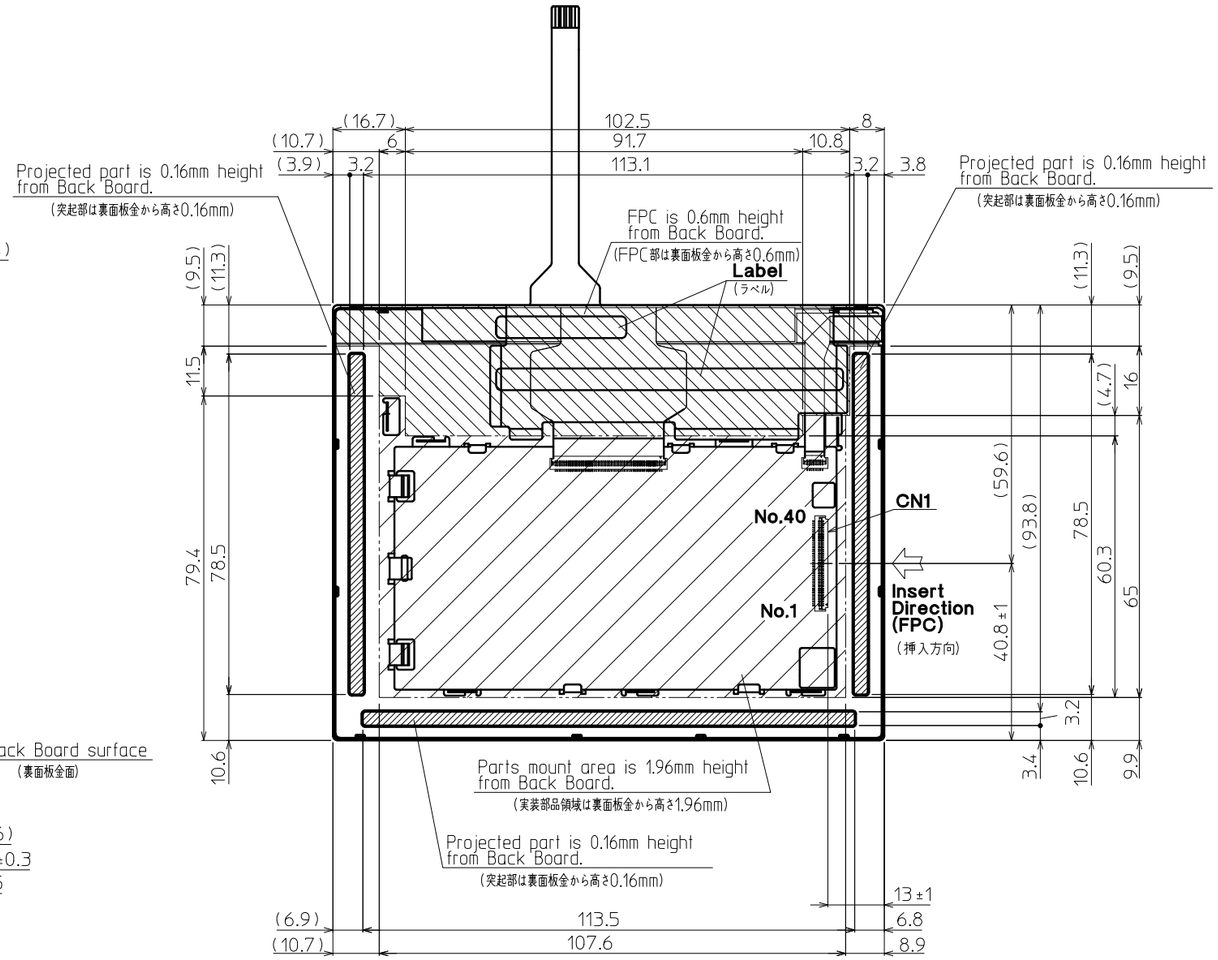
Test item	Test condition	Test time	Judgement
High temp. atmosphere	80°C	240h	Display function : No defect Display quality : No defect Current consumption : No defect
Low temp. atmosphere	-30°C	240h	Display function : No defect Display quality : No defect Current consumption : No defect
High temp. humidity 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
Point Activation life	Silicon rubber, Tip : R = 4.0 Hitting force 3N Hitting speed 2 time/s	one million times	Terminal resistance : No defect Insulation resistance : No defect Linearity : No defect Actuation Force : 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.

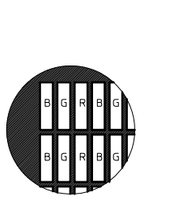
No	Description	Drawn	Checked	Checked	Approved



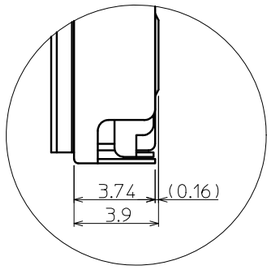




※The thickness to a metallic side of the surface is indicated.
(表面側の金属面までの厚みを示しています。)



DETAIL A (Dot Size)
(NTS)



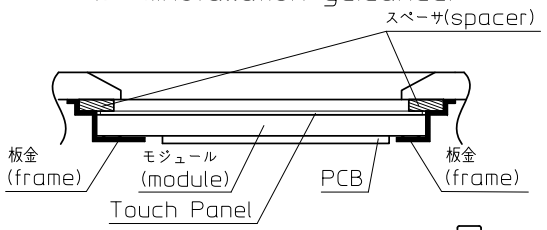
DETAIL E (5:1)

Note. (注記)
1. Connector CN1: IMSA-9681S-40A-GF (IRISO)
(コネクター)
2. 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。)
3. Tolerance without indication: ±0.5
(指示無き公差)
4. Touch Panel P/N: P2005800(121A8038100)

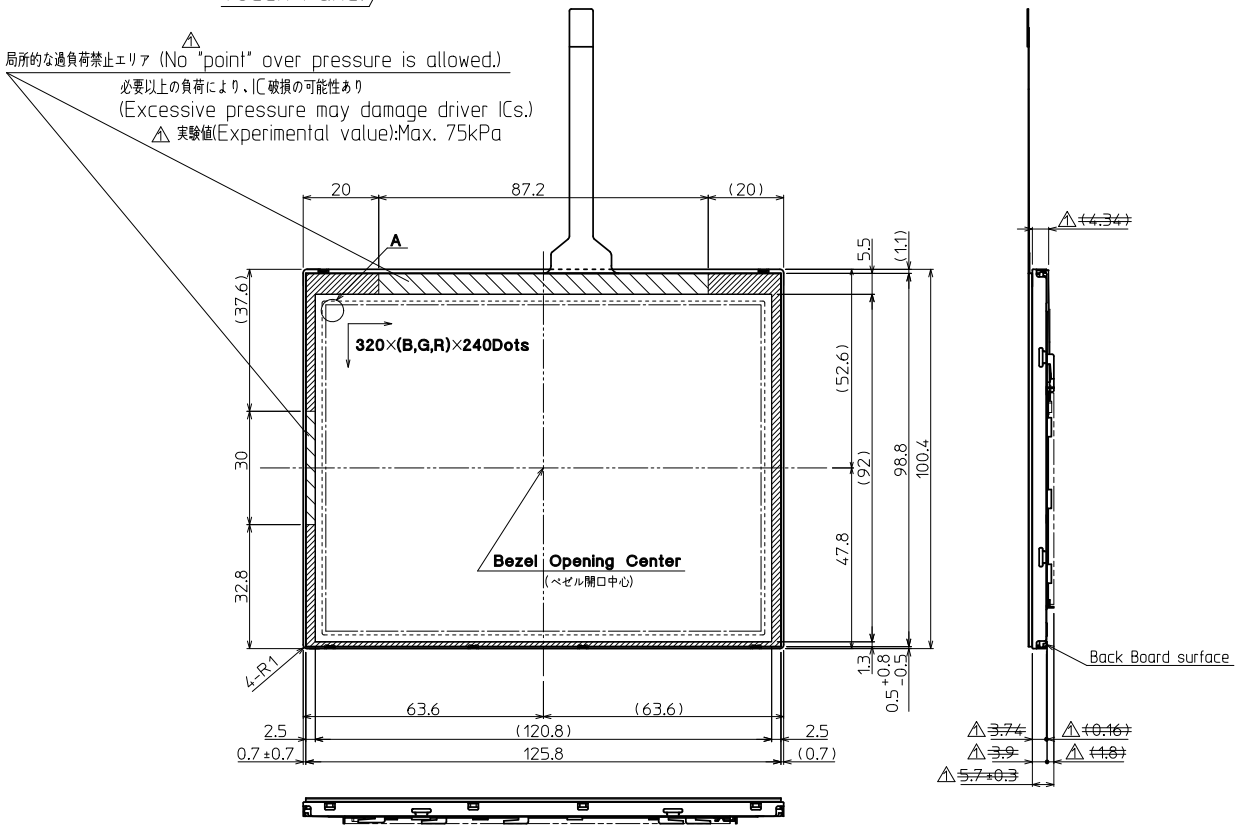
Material 材質	Treatment 処理	Approved	Checked	Checked	Drawn	Scale	Title		Year–Month–Day	Size
		'21.10.26		'21.10.25		1:1(5:1,NTS)	TCG057QVLCSAFC	KYOCERA	'21.10.22	2
Quantity 製作数	Description; 備考 RoHS 121A5062900	宇佐美		本間	蔭山		Outline Dimensions	Drawing No. 121A9020600		

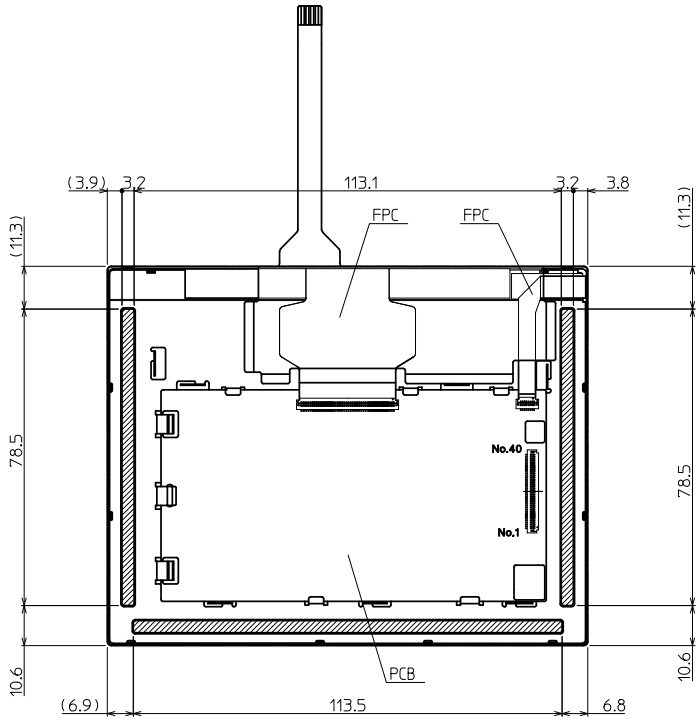
No	Description	Drawn	Checked	Checked	Approved
⚠	·Change comment (Typographical error) (コメント変更 (誤記訂正)) ·Add Comment (コメント追記) ·Change Title (図面タイトル変更) ·Delete Dimensions (6points) (寸法削除 (6箇所))	'10.01.23 茶圓	'10.01.26 朝倉		'10.01.26 朝倉

※取り付け例(Installation guidance)



参考(for Reference)





取り付け方法
(Installation of the LCD)

ケースにモジュールをはめ込み(X,y固定)、裏面からZ方向を固定する事が可能。
(The LCD module shall be held in the X/Y direction by the housing, and in the Z direction using a backboard.)

斜線部の領域にて、下記の条件を満たし押さえることが望ましい。
(To hold the LCD module in place, it shall be supported with pressure applied to the hatched areas indicated by the descriptions below.)

押さえつけ可能領域
(Pressure may be applied in this area.)

押さえつけ可能領域。但し、局所的な過負荷禁止。
(No "point" over pressure is allowed.)

表面取り付け条件
(Installation conditions (Front side))

1.上辺長辺側、左短辺中央部に局所的な負荷がかからないように取り付けこと
(1. The LCD shall be installed so that there is no point pressure applied in the middle of the left and upper border around the viewing area.)

2.広い範囲で均一に押さえることが望ましい
(2. The LCD shall be uniformly supported over as wide an area as possible.)

注記(Note)
指定外公差(Torelance without indication) :±0.5

裏面取り付け条件
(Installation conditions (Back side))

1.PCBへの接触無きこと
(1. Do not allow any foreign material to contact the PCB.)

2.FPCエリア押さえ不可
(2. Do not use any part of the FPC area to hold the LCD module in place)

3.PCB周りの板金突起部押さえ不可
(3. Do not apply pressure on the projected metal part of the PCB.)

4.モジュールがたわむこと無きよう押さえつけのこと
(4. Do not allow the LCD module to bend or twist.)

5.広い範囲で均一に押さえることが望ましい
(5. Support the LCD with uniform pressure over as wide an area as possible.)

Material 材質	Treatment 処理	Approved	Checked	Checked	Drawn	Scale	Title		Year-Month-Day	Size
		'08.03.25		'08.03.25		1:1(NTS)	⚠ TCG057QVLB* with T/P	KYOCERA	'08.03.23	2
Quantity 製作数	Description; 備考 RoHS	阿部		鶴崎	倉元		⚠ Module Installation	Drawing No.	121A5068400-1	

002-110930-1

参考(for Reference)

IRISO 製 9681 シリーズコネクタの取り扱い上の注意
Precautions when using IRISO.9681 series connector

操作方法

FPC/FFC挿入方法 FPC/FFC insertion

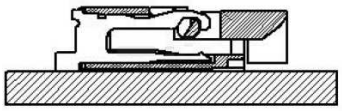
①カバー先端を上方向に上げて開けて下さい。(カバーは回転動作をします)

① pull up the cover tip to open up. (the cover will rotate to operate)

カバーの先端部分を親指や人差し指の爪により、矢印方向に跳ね上げる感じでロック解除を行って下さい。破損の原因となりますので、水平方向には押さないで下さい。

To release the lock, flip the lock to a direction of arrow with the nail of pointer or thumb.

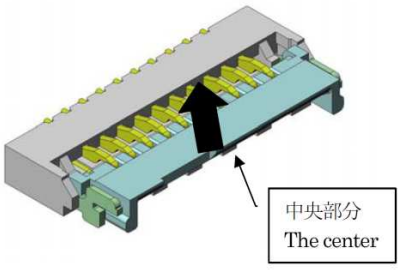
Please Don't push the cover horizontally; it causes damage.



補足 addition

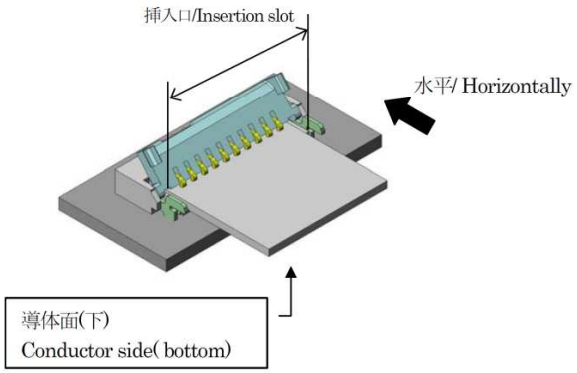
カバー中央部分を上方向へ跳ね上げてロック解除を行って下さい。

Flip the center part of cover to release the lock.



②FPC/FFC の導体面を下にして挿入して下さい。

②Make the conductor side of FPC/FFC below, and insert it.



補足 addition

FPC/FFC の挿入は、カバーを 130° 開いた状態で、挿入口に対して水平になる様、挿入して下さい。カバーが倒れない様、手で軽く支えますとより挿入し易くなります。

To insert a FPC/FFC, open the cover in 130° , and insert the FPC/FFC horizontally to an insertion slot.

Supporting the cover lightly by hand will be the way to insert easily.

使用上の注意点

9681 シリーズは、小型・薄型である為、強度は強くありませんので、取り扱いには十分注意して下さい。

Please handle with fragile care.

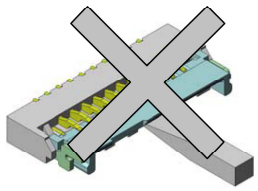
9681series are small and thin, so the strength are little short.

作業の際は、手袋及びアースバンドを着用して下さい。

Please wear gloves and a ground belt when the time of the work.

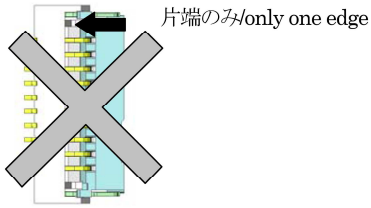
ロック解除の際に、ドライバー等先端が細く硬い工具を使用しての操作は行わないで下さい。変形・破損する事があります。

In case of releasing the lock, please don't use hard tools with thin tip, like a driver. It can be deformed and damaged.



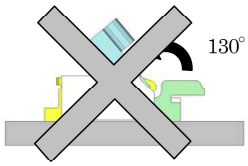
ロック解除時、カバー片端（左 or 右）のみに力を加えてロック解除を行わないで下さい。変形・破損する事があります。

In case of releasing the lock, please don't make a force on the one edge of cover. It can be deformed and damaged.



カバーは 130° 以上開かない構造の為、更に後ろへ強い力を加えないで下さい。変形・破損する事があります。

The cover is structured not to open more than 130° , so please don't add a strong force backward. It can be deformed and damaged.



FPC/FFC は、挿入口に正しく挿入して下さい。斜め挿入等、正しく挿入されていない場合は、導通不良の原因となります。

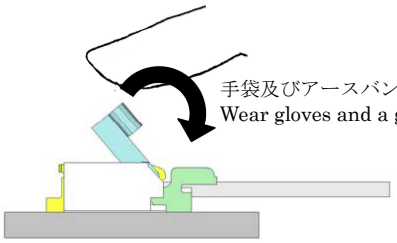
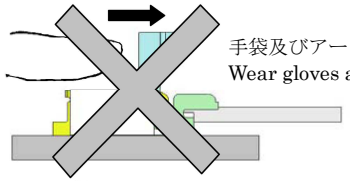
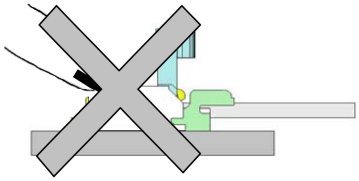
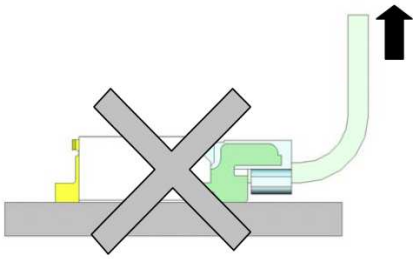
Please insert FPC/FFC in insertion slot properly. If it's not inserted properly, like leaned insertion, it will cause a bad connection.

FPC/FFC は、弊社推奨サイズを使用して下さい。弊社推奨サイズ以外を使用した場合は品質保証出来ません。

Please use our preferred size of FPC/FFC. We can not certify the quality except using our recommended size of FPC/FFC.

イリソ電子工業株式会社作成の資料より引用

Refer to the data made by IRISO ELECTRONICS CO., LTD.

操作方法	使用上の注意点
FPCのロック方法 The method to lock the FPC ①カバーを回転させてロックして下さい。 ①Turn down the cover to lock it.  補足/addition ロック後、カバー両端を軽く押すと、カバーの半ロックを防止できます。 After locking, to push the both edge of cover with light force can prevent a half lock 開閉作業の際は、コンタクトに触れないで下さい。変形による接触不良の原因となります。 Please don't touch the contact while opening and shutting the cover. It causes bad connection by deformed contact.	ロック操作の際に下図の矢印方向に強い力を加えてカバーを押さないで下さい。変形・破損の原因となります。 In case of lock operation, please don't push the cover strongly to the direction of arrow. It causes deformation and damage. 水平方向に押す /Pushing in a horizontal direction  根元を押す /Pushing the base  その他/ Others コネクタの構造上、上方向への引張強度は強くありませんので、上方向へ強い力を加えないで下さい。使用上、FPC/FFC に引張力が加わる場合は、上方向の力がコネクタに加わらない様、FPC/FFC をテープ等で固定して下さい。 As a structure of connector, the strength to upper direction is little short. So please don't make a force in above direction. In case of necessary to draw a FPC/FFC out, Please fix the FPC/FFC with a tape to protect the connector from an upper force.  カバーをロックした状態で、FPC/FFC に引張力を加えないで下さい。FPC/FFC 導体面の削れ、及び半挿入状態による導通不良の原因となります。 Please don't draw the FPC/FFC out while the cover is locked. It causes scraping the conductor surface and bad connection by half insertion.

イリソ電子工業株式会社作成の資料より引用
Refer to the data made by IRISO ELECTRONICS CO., LTD.

Spec No.	TQ3C-8EAF0-E2YAN63-00
Date	February 1, 2023

KYOCERA INSPECTION STANDARD

TYPE : TCG057QVLCSAFC-GA00

KYOCERA CORPORATION

Original Issue Date	Designed by : Engineering dept.			Confirmed by : QA dept.	
	Prepared	Checked	Approved	Checked	Approved
February 1, 2023	*T. Onodera*	*I. Kawajiri*	*A. Iwasaki*	*Y. Aritsubo*	*M. Aoyama*

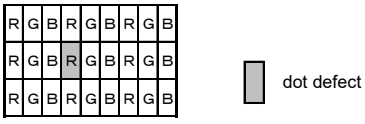
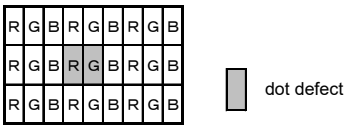
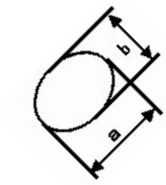
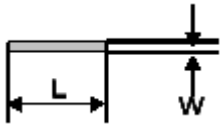
Revision record

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

Rev.No.	Date	Page	Descriptions

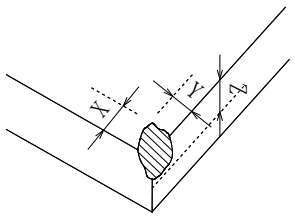
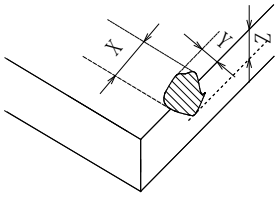
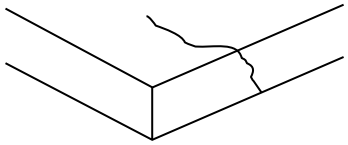
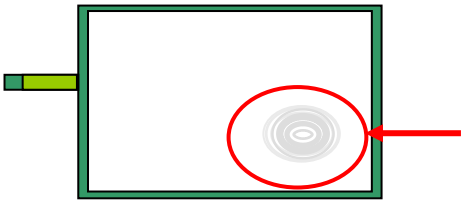
Visuals specification

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 active 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. 
		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. 
	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  a: major axis, b: minor axis d = (a + b) / 2	Definition of linear size 

2) Standard

<table>
<tr><th colspan="3">Classification</th><th colspan="2">Inspection item</th><th>Judgement standard</th></tr>
<tr><td rowspan="8">Defect (in LCD glass)</td><td rowspan="2">Single dot</td><td colspan="2">Bright dot defect</td><td colspan="2">Acceptable number : 4
Bright dot spacing : 5 mm or more</td></tr>
<tr><td colspan="2">Black dot defect</td><td colspan="2">Acceptable number : 5
Black dot spacing : 5 mm or more</td></tr>
<tr><td rowspan="3">Adjacent dot</td><td rowspan="2">2 dots</td><td>Bright dot defect</td><td colspan="2">Acceptable number : 2</td></tr>
<tr><td>Black dot defect</td><td colspan="2">Acceptable number : 3</td></tr>
<tr><td colspan="2">3 or more dots</td><td colspan="2">Acceptable number : 0</td></tr>
<tr><td colspan="3">Total dot defects</td><td colspan="2">Acceptable number : 5 Max</td></tr>
<tr><td>Others</td><td colspan="2">White dot, Dark dot (Circle)</td><td colspan="2"><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 rowspan="5">External inspection (Defect on Polarizer or between Polarizer and LCD glass)</td><td colspan="2">Polarizer (Scratch)</td><td colspan="2"><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 colspan="2"><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 colspan="2"><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 colspan="2"><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>
<tr><td colspan="2">Color variation (Mura)</td><td colspan="2">Not to be significantly visible.
Consultation shall be held as necessary.</td></tr>
</table>

<table>
<tr><th>Inspection item</th><th>Judgement standard</th></tr>
<tr><td>Scratch,
Foreign particle
(Touch panel
portion)</td><td>
<table>
<tr><th>Item</th><th>Width(mm)</th><th>Length(mm)</th><th>Acceptable number</th></tr>
<tr><td rowspan="4">Scratch
(Linear shape)</td><td>W ≦ 0.03</td><td>L ≦ 20</td><td>Neglected</td></tr>
<tr><td>0.03 ＜ W ≦ 0.05</td><td>L ≦ 10</td><td>2pcs within φ20mm</td></tr>
<tr><td>0.05 ＜ W ≦ 0.08</td><td>L ≦ 6</td><td>2pcs within φ20mm</td></tr>
<tr><td>0.08 ＜ W ≦ 0.1</td><td>L ≦ 4</td><td>1pcs within φ30mm</td></tr>
<tr><td rowspan="2">Foreign
(line like)</td><td>W ≦ 0.05</td><td>Neglected</td><td>Neglected</td></tr>
<tr><td>0.05 ＜ W ≦ 0.1</td><td>L ≦ 5</td><td>2pcs within φ30mm</td></tr>
<tr><td rowspan="2">Foreign
(Circular shape)</td><td colspan="2">d ≦ 0.2</td><td>Neglected</td></tr>
<tr><td colspan="2">0.2 ＜ d ≦ 0.3</td><td>2pcs within φ30mm</td></tr>
</table>
Above are applied to the visible area.
Unless there are foreign particle and damage affected seriously to the electrical performance out of the active area, we approve of this product.
</td></tr>
<tr><td>Glass crack
(Touch panel
portion)</td><td>(t = Glass thickness)
<table>
<tr><th>Item</th><th colspan="3">Size (mm)</th><th>Acceptable number</th></tr>
<tr><td rowspan="3">Corner crack</td><td rowspan="3">  </td><td>X</td><td>≦3</td><td rowspan="3">2 pcs
/panel</td></tr>
<tr><td>Y</td><td>≦3</td></tr>
<tr><td>Z</td><td>＜t</td></tr>
<tr><td rowspan="3">Crack in
other area
than in
corner</td><td rowspan="3">  </td><td>X</td><td>≦5</td><td rowspan="3">2 pcs
/side</td></tr>
<tr><td>Y</td><td>≦1.5</td></tr>
<tr><td>Z</td><td>＜t</td></tr>
<tr><td>Progressive
crack</td><td colspan="3">  </td><td>0 pcs</td></tr>
</table>
Above are applied to the visible area.
Unless there are foreign particle and damage affected seriously to the electrical performance out of the active area, we approve of this product.
</td></tr>
<tr><td>Newton’s ring</td><td>Neglected.
  </td></tr>
</table>

Document No.	TQ3C-8EAF0-E3YAN63-00
Date	February 1, 2023

KYOCERA PACKAGING STANDARD

TYPE : TCG057QVLCSAFC-GA00

KYOCERA CORPORATION

Original Issue Date	Designed by : Engineering dept.			Confirmed by : QA dept.	
	Prepared	Checked	Approved	Checked	Approved
February 1, 2023	*T. Onodera*	*I. Kawajiri*	*A. Iwasaki*	*Y. Aritsubo*	*M. Aoyama*

KYOCERA

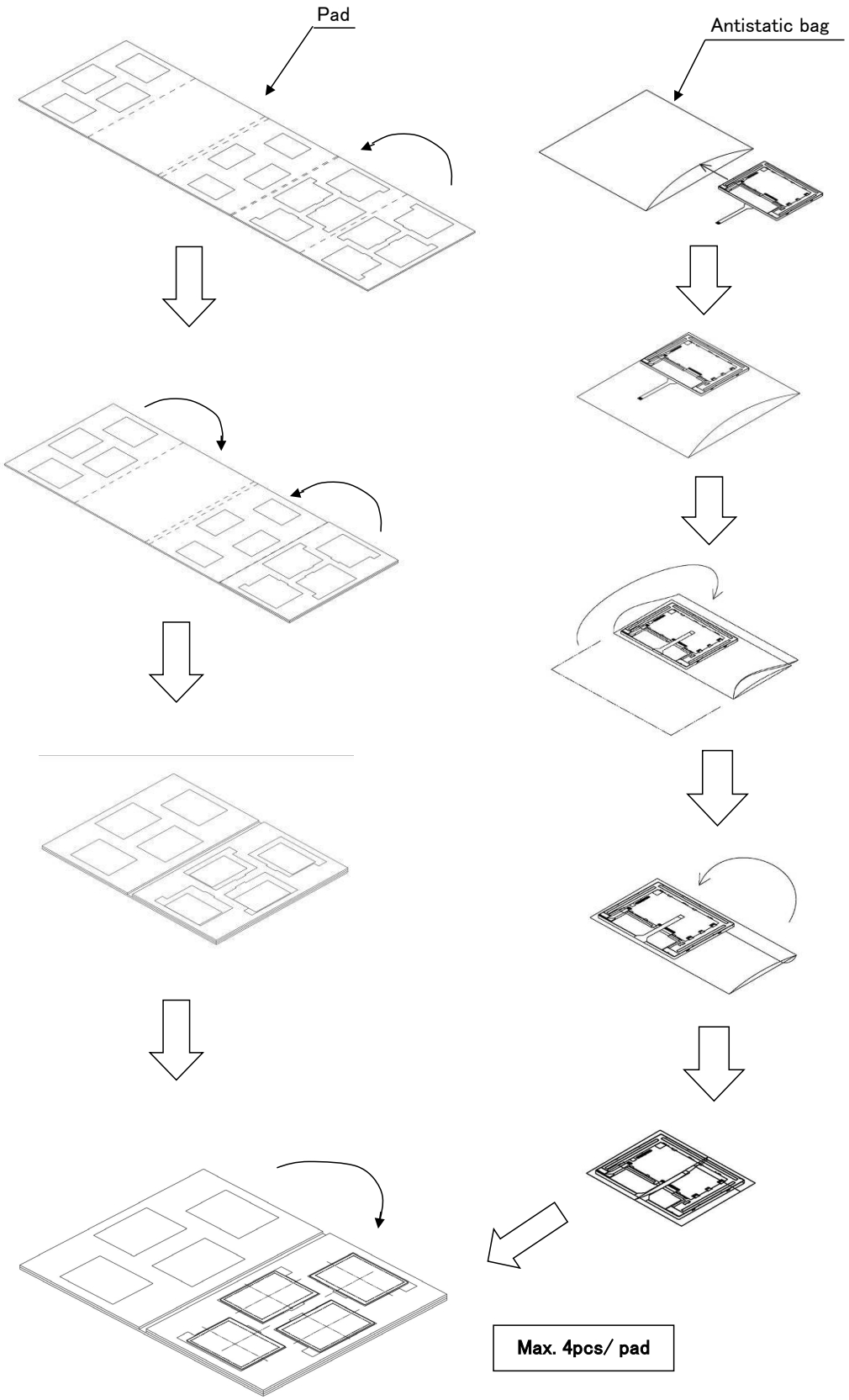
Revision record

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

RevNo.	Date	Page	Descriptions

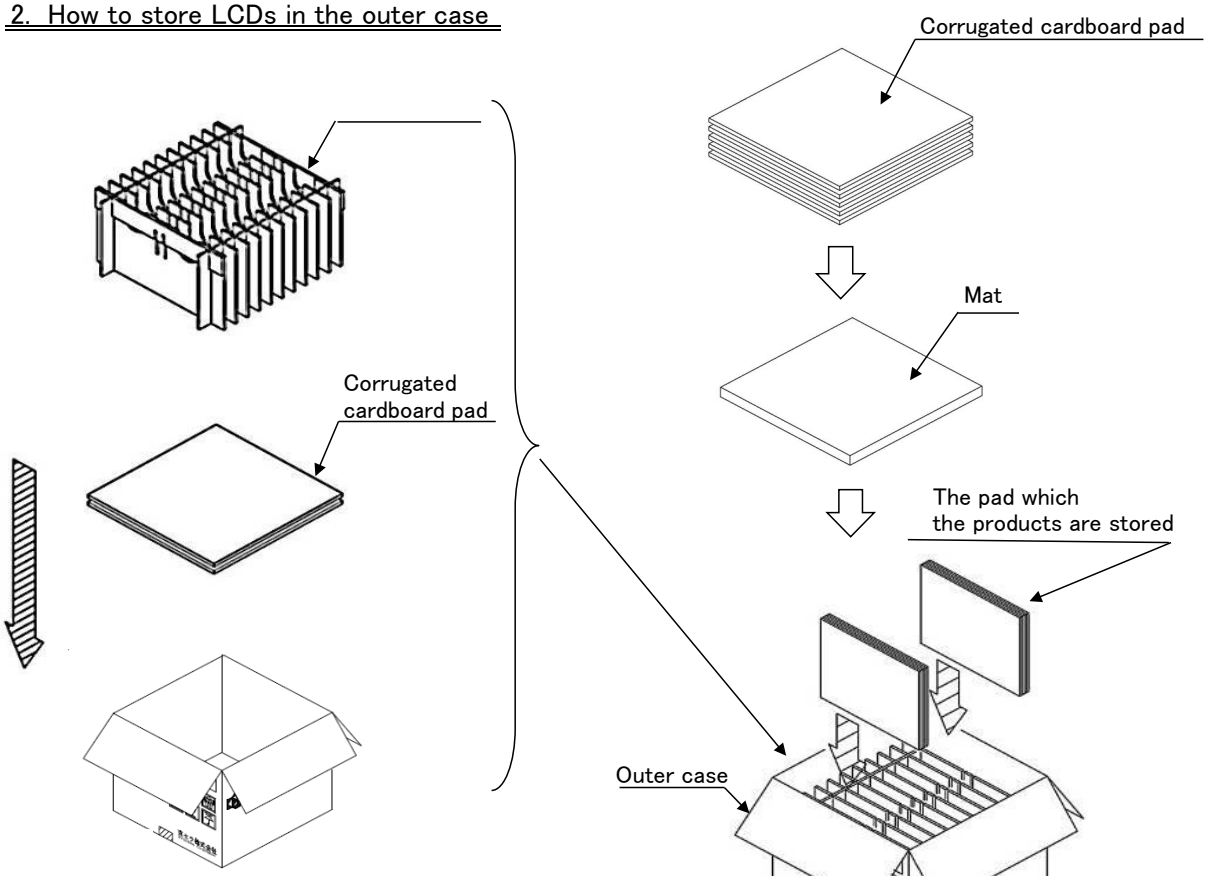
TCG057QVLCSAFC_Packaging Standard	

1. How to store LCDs in the pad



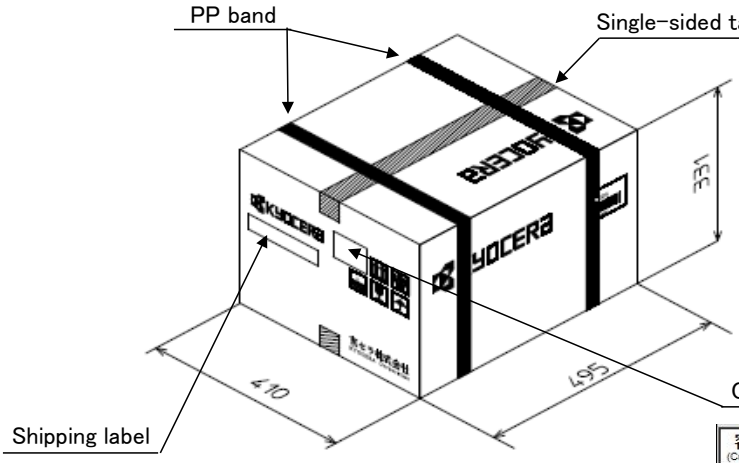
TCG057QVLCSAFC_Packaging Standard	

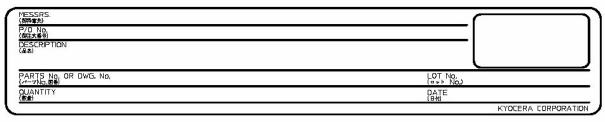
2. How to store LCDs in the outer case



Max.40pcs/ outer case

3. Location of the labels





客先 (Customer)				京セラ株式会社
品名 (Parts No.)				
数量 (QTY)				
検査者 (Check)				
検査者 (Check)				

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