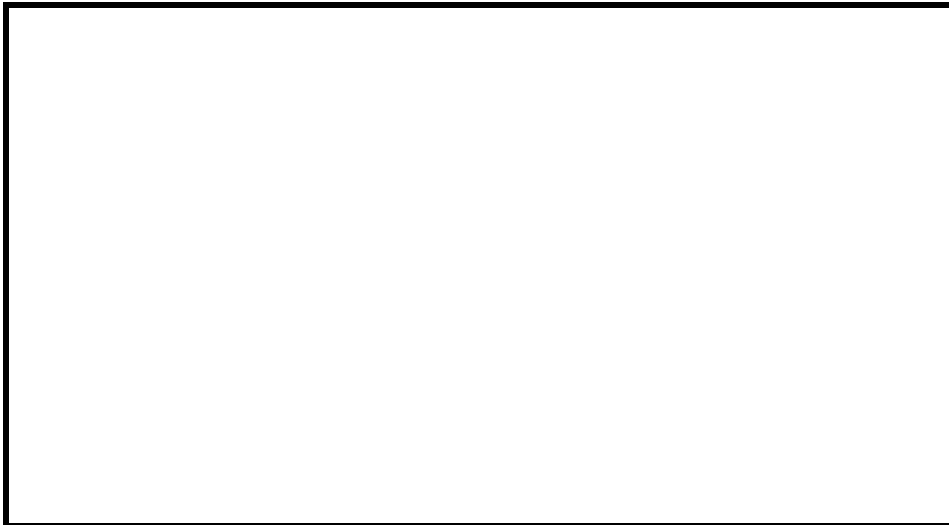LIQUID CRYSTAL DISPLAY MODULE

4.3" WVGA (800 x RGB x 480) TFT with Touch-Panel

Product Code: 43WVF1G-0

Product Specification

APPROVAL

Seiko Instruments Inc.
Mobile Display Division
1-8 Nakase Mihama-ku Chiba-shi,
Chiba ,261 , Japan

History of Revision

Revision	Contents	Date	In Charge
a	First publication	May. 15, 2008	Y.Fujino

b	P.4: Changed model number of SII:
	    "RA169Z"　　"RA169Z20"
	P.4: Changed drawing No:
	    "RA169Z 1A"　　"RA169Z20 1A"
	P.4: Changed model number of SII(Clear type):
	    "RA169Z10A"　　"RA169Z20A"
	P.4: Changed model number of SII(Anti glare type):
	    "RA169Z10B"　　"RA169Z20B"
	P.7: Deleted product name of LED
	P.17: Changed "11-4 Packing process".
		Oct. 2, 2008	Y.Fujino

1.0	P.4: Changed model number of SII:
	    "RA169Z20"　　"43WVF1G-0"
	P.4: Changed drawing No:
	    "RA169Z20 1A"　　"43WVF1G-0 1A"
	P.15: Modify "9-5 Storage".
	P.--: Deleted "( )" "TBD" "preliminary"
		Apr. 22, 2009	A.Uehata

Contents

1. General

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT ANY NOTICE.

1-1 Application
>   This specification applies to the LCD module designated 43WVF1G-0 LCD to be delivered from Seiko Instruments Inc. (hereinafter "SII").

1-2 Name of product, model number
>   Name of product: LCD module
>   Model number of SII: 43WVF1G-0

1-3 Mechanical Dimensions
>   Please refer to drawing No "43WVF1G-0 1A".

1-4 Quality Assurance Standard
>   Quality assurance standard should be based on the Delivery Inspection Standard.

Note:
>   (   ): Target value for sample production. Might be modified after evaluation of sample.
>   TBD: To Be Determined after evaluation of sample.

2. Product specifications

   This product is LCD module with 4.3inch WVGA (800RGB x 480 dots) LCD module.

2-1 Basic Specifications

Module size:	106mm(W)x69.8mm(H)x4.37mm(t) (except FPC length)
Active area:	93.6mm(W)x56.16mm(H)
Dot pitch:	0.039mmx0.117mm, 217dpi
Weight:	64.3 g typ.

Dispplay size:	4.3 inch
Number of pixels:	800RGBx480 dots
Dot layout:	Vertical stripes
Interface:	24bit Parallel RGB
Number of colors:	16,777,216 colors
Display mode:	FFS Mode, Transmissive Mode, Normally Black
Viewing angle(U/D/R/L):	80/80/80/80 (@CR$\geq$10)
Drive method:	Line inversion
Back Light Unit:	Bottom edge type, 10-LEDs, Serial
Touch-Panel:	Film/Glass type
Surface treatment:	Clear type

Operating temperature:	From -20 to +60 °C (dry)
Storage temperature:	From -30 to +70 °C (dry)

2-2 Interface (LCD)

No.	Symbol	Description
1	VSS	Ground: 0V
2	VSS	Ground: 0V
3	DVDD	Digital power supply: 3.3V(Typ.)
4	DVDD	Digital power supply: 3.3V(Typ.)
5	R0	Red data(LSB)
6	R1	Red data
7	R2	Red data
8	R3	Red data
9	R4	Red data
10	R5	Red data
11	R6	Red data
12	R7	Red data(MSB)
13	G0	Green data(LSB)
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data
19	G6	Green data
20	G7	Green data(MSB)
21	B0	Blue data(LSB)
22	B1	Blue data
23	B2	Blue data
24	B3	Blue data
25	B4	Blue data
26	B5	Blue data
27	B6	Blue data
28	B7	Blue data(MSB)
29	VSS	Ground: 0V
30	PCLK	Dot clock: Data sampling at the PCLK falling edge
31	DISP	Display On/Off: Low active
32	HSYNC	Horizontal sync input with negative polarity
33	VSYNC	Vertical sync input with negative polarity
34	DE	Data enable input with positive polarity
35	AVDD	Analog power supply: 5.0V(Typ.)
36	AVDD	Analog power supply: 5.0V(Typ.)
37	VSS	Ground:0V
38	VSS	Ground:0V
39	VLED-	LED backlight power supply: cathode
40	VLED+	LED backlight power supply: anode

2-3 Interface (Touch-Panel)

No.	Symbol	Description
1	YU	Top electrode – differential analog
2	XL	Left electrode – differential analog
3	YD	Bottom electrode – differential analog
4	XR	Right electrode – differential analog

3. Recommended Power ON/OFF Sequence

3-1 Power ON/OFF Sequence

To prevent the device damage from latch up or DC operation, the Power ON/OFF Sequence shall be as shown in below.
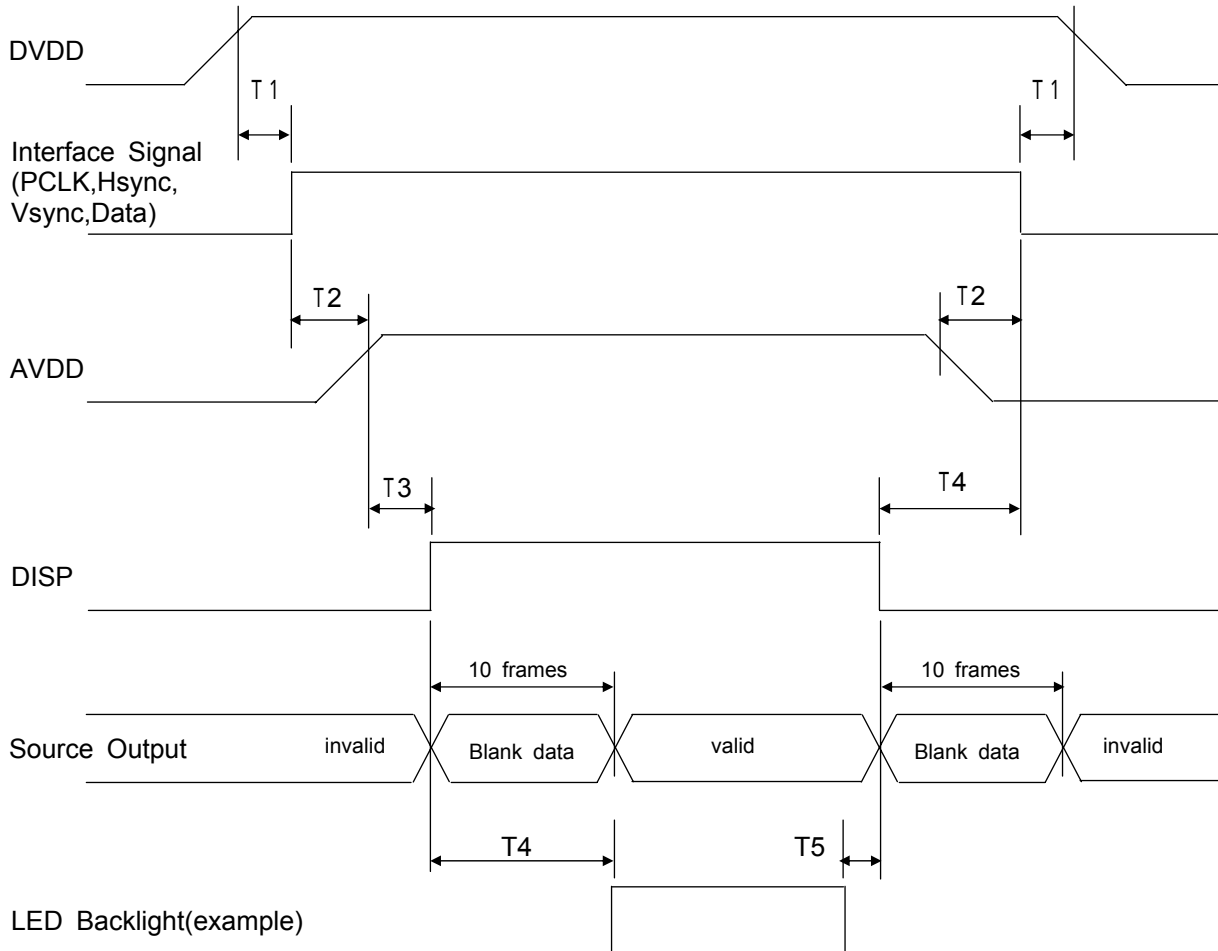
Parameter	Specification	unit
T1	0 < T1 < 50	ms
T2	0 < T2 < 50	ms
T3	0 < T3 < 50	ms
T4	170 (10 frames) < T4	ms
T5	0 < T5	ms

NOTE:
When DISP pin is pulled "H", blank data is output for 10 frames first, from the falling edge of the following VSYNC signal. Similarly, when DISP is pulled "L", 10 frames of blank data will be output from the falling edge of the following VSYNC, too.

4. Electrical Characteristics

4-1 Absolute Maximum Rating

VSS=0V

Item		Symbol	Standard	Unit	Remark
Supply Voltage		DVDD	-0.3 to +5.0	V	
		AVDD	-0.3 to +5.5		
Backlight LED	DC forward current	If	35	mA	*1,2
	Reverse voltage	Vr	5	V	*2
	Power dissipation	Pd	123	mW	*2
Touch-Panel	Input voltage	Vin	7	V	
Storage temperature range		Tstg	-30 to +70	°C	Dry
Operating temperature range		Top	-20 to +60	°C	Dry

Note: Use over the absolute maximum rating might affect reliability and might cause malfunction.

*1: Ambient Temperature vs. Allowable Forward Current
*2: Apply to 1 LED. Backlight consists of 10 LEDs.
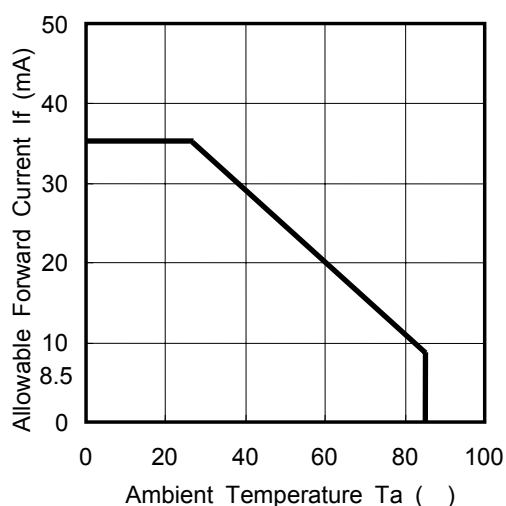
4-2 Electrical Characteristics

VSS=0V, Ta=25 degree C

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power supply voltage	DVDD	2.25	3.3	3.6	V	
	AVDD	4.8	5.0	5.2	V	
Current consumption	IDVDD	-	6.3	9.1	mA	*1
	IAVDD	-	36.5	52.8	mA	
Input high voltage	VIH	0.7DVDD	-	DVDD	V	
Input low voltage	VIL	0	-	0.3DVDD	V	
LED forward voltage	Vf	-	3.2	3.5	V	*2
LED current	IF	-	20	-	mA	

*1: DVDD=3.3V,AVDD=5.0V,fclk=33.5MHz,1/tv=60Hz, All white pattern.
*2: IF=20mA. Apply to 1 LED.

4-3 Parallel RGB Input Timing Characteristics

VSS=0V, DVDD=3.3V, AVDD=5.0V, Ta=25 degree C

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Clock frequency	fclk	-	33.5	50	MHz	*1
Hsync cycle	1/th	-	31.5	-	KHz	*1
Vsync cycle	1/tv	-	60	-	Hz	*1
Horizontal cycle	th	-	1063	-	CLK	*1
Horizontal display period	thd	-	800	-	CLK	
Horizontal front porch	thf	-	164	-	CLK	*1
Horizontal pulse width	thp	-	10	-	CLK	*1
Horizontal back porch	thb	-	89	-	CLK	*1
Vertical cycle	tv	-	523	-	H	*1
Vertical display period	tvd	-	480	-	H	
Vertical front porch	tvf	-	10	-	H	*1
Vertical pulse width	tvp	-	10	-	H	*1
Vertical back porch	tvb	-	23	-	H	*1

Note: Unit CLK=1/fclk, H=th

*1: Please change the value to fit on your system.
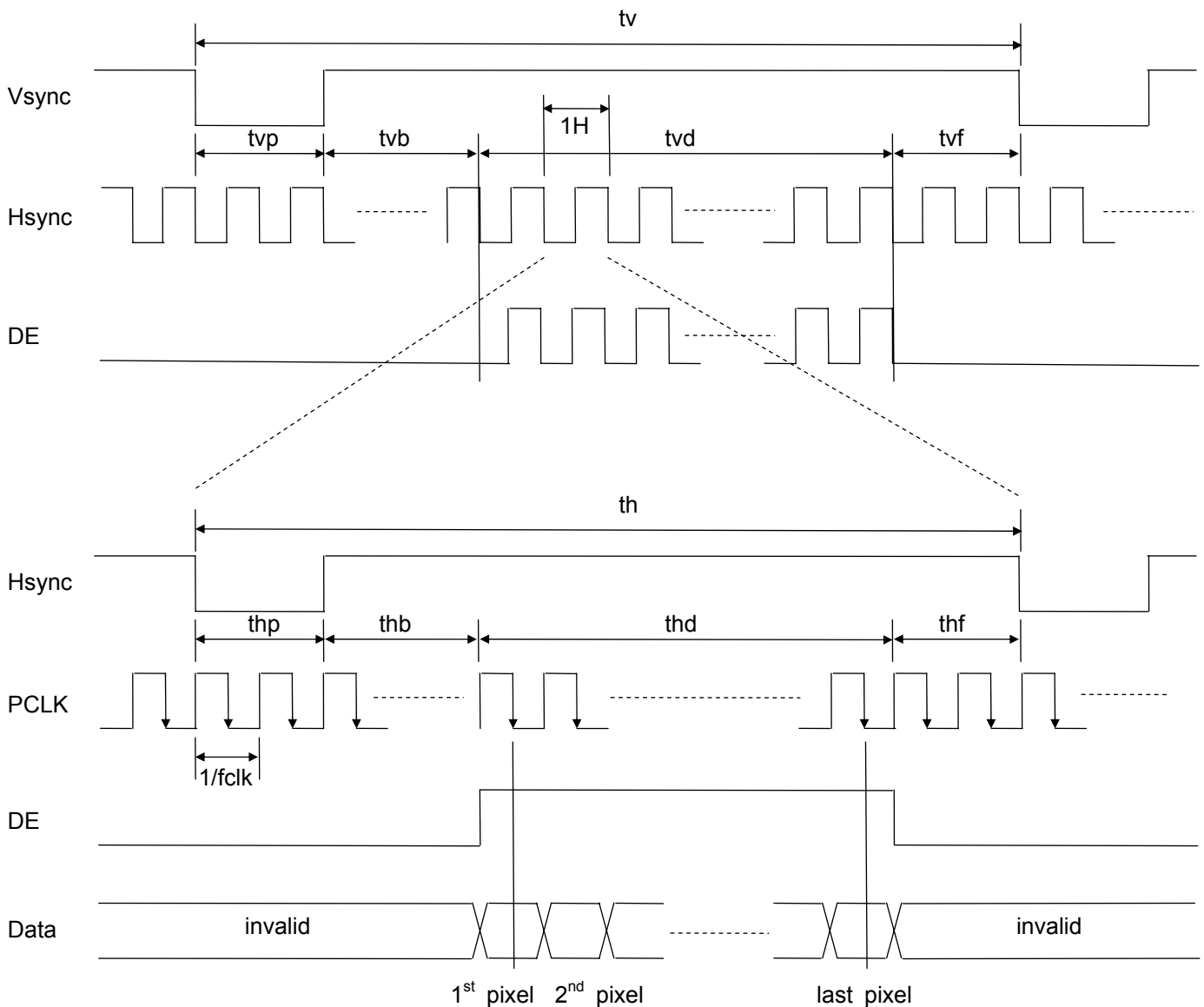
NOTE: Data sampling at the PCLK falling edge.

4-4 AC Timing Characteristics

VSS=0V, DVDD=3.3V, AVDD=5.0V, Ta=25 degree C

Item	Symbol	Min.	Typ.	Max.	Unit
PCLK pulse width	Tcw	8	-	-	ns
Vsync setup time	Tvst	12	-	-	ns
Vsync hold time	Tvhd	12	-	-	ns
Hsync setup time	Thst	12	-	-	ns
Hsync hold time	Thhd	12	-	-	ns
Data setup time	Tdsu	4	-	-	ns
Data hold time	Tdhd	2	-	15	ns
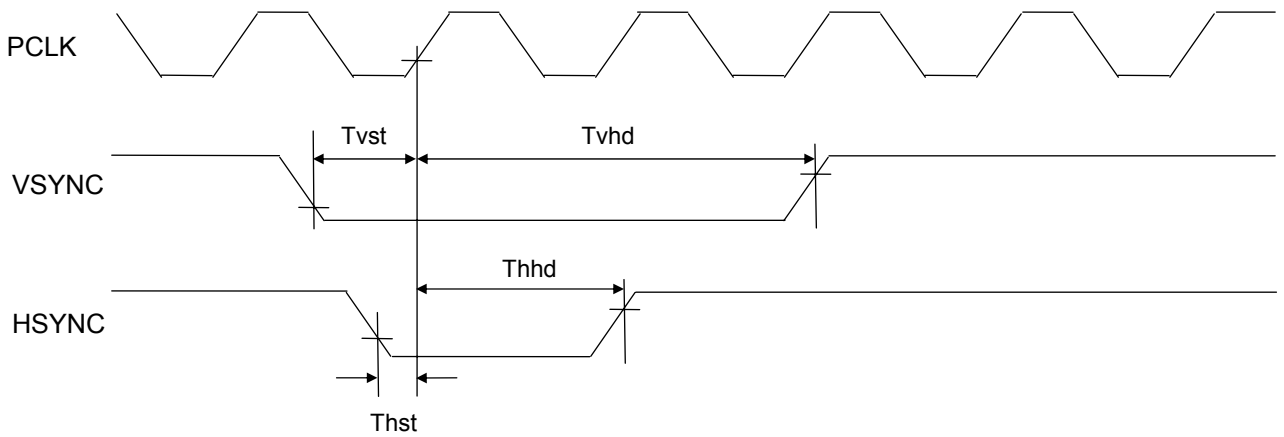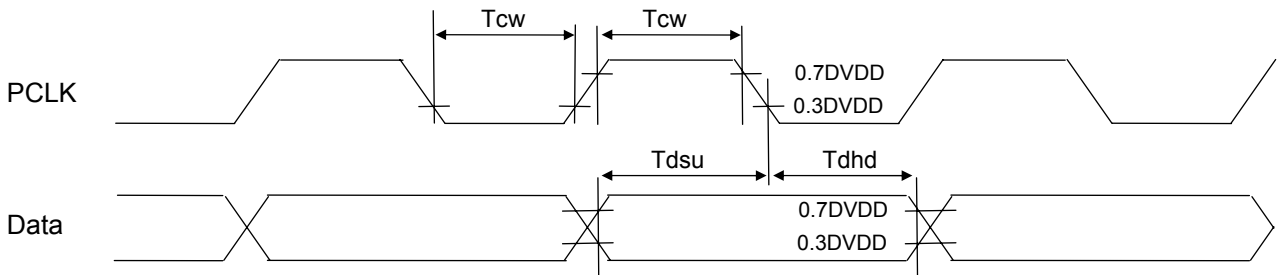
4-5 Pixel Data Format
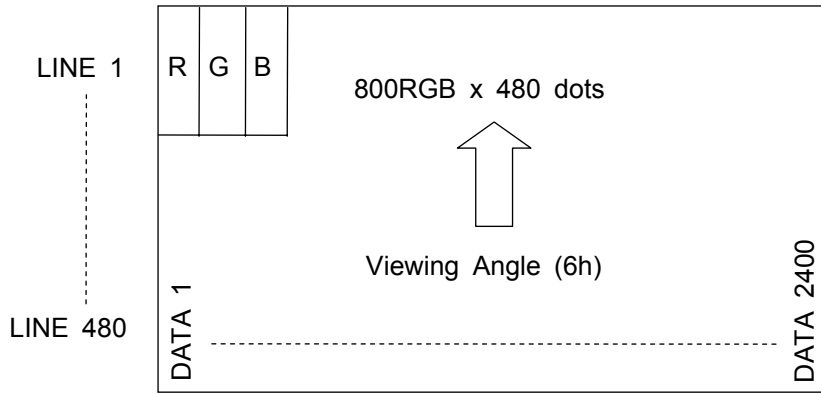
4-6 Input Data Signal and Each Colors

DISPLAY		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
														INPUT DATA SIGNAL											
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	GREEN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	RED	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GRAY SCALE OF RED	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑					↑								↑								↑			
	↓					↓								↓								↓			
	light	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↓	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAY SCALE OF GREEN	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	↑					↑								↑								↑			
	↓					↓								↓								↓			
	light	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	↓	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	GREEN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
GRAY SCALE OF BLUE	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	↑					↑								↑								↑			
	↓					↓								↓								↓			
	light	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	↓	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	BLUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
GRAY SCALE OF WHITE	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
	↑					↑								↑								↑			
	↓					↓								↓								↓			
	light	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1
	↓	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: 0 = Low level voltage, 1 = High level voltage

5. LCD Optical Characteristics

VSS=0V, DVDD=3.3V, AVDD=5.0V, fclk=33.5MHz, 1/tv=60Hz, IF=20mA, Ta=25 degreeC

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Contrast ratio		C	θ=0°, =0°	300	400	-	-
Range of viewing angle (:6h–12h) *1		U	C≥10	-	80	-	degree
		D		-	80	-	
Range of viewing angle (θ:3h–9h) *1		θR		-	80	-	
		θL		-	80	-	
Color	White	x	BM-7 (TOPCON) θ=0°, =0°	0.28	0.33	0.38	-
		y		0.30	0.35	0.40	-
	Red	x		0.55	0.60	0.65	-
		y		0.30	0.35	0.40	-
	Green	x		0.29	0.34	0.39	-
		y		0.52	0.57	0.62	-
	Blue	x		0.10	0.15	0.20	-
		y		0.07	0.12	0.17	-
NTSC ratio			↑	45	50	-	%
B/W Response time		Ton+ Toff	θ=0°, =0°	-	35	50	msec

*1: Without Touch Panel

*Definition of ,

Transmissive mode

θ=0°, =0°
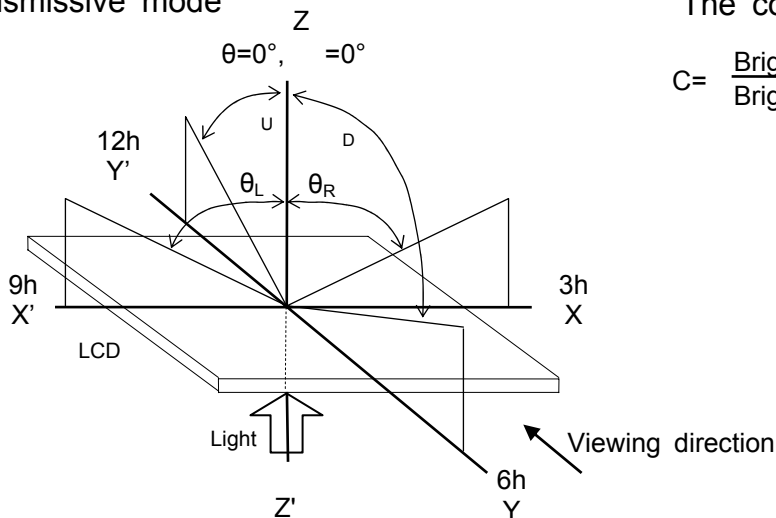
*Definition of contrast C

The contrast ratio is defined as follows:

$$C= \frac{\text{Brightness of selected position(white)}}{\text{Brightness of unselected position(black)}}$$

*Definition of response time (Ton, Toff)

The response time is defined as the following figure.
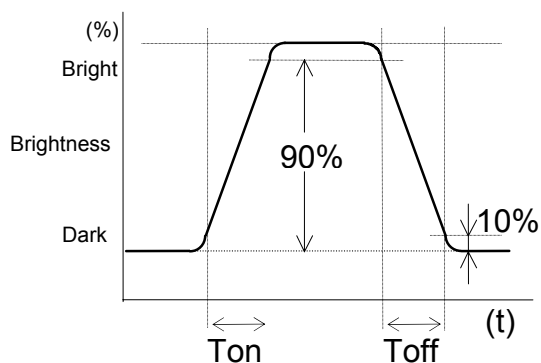
6. LED Backlight Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	unit
Brightness *1 *2 *3	Bp	Ta=25ºC±3ºC	250	350	-	cd/m^2
Uniformity *1 *2 *4	Δ Bp	30-80%RH	70	-	-	%

Note: Due to the dispersion of Vf, the fixed voltage supply can not control the brightness of LED.Therefore, SII strongly recommends using the constant current power supply.
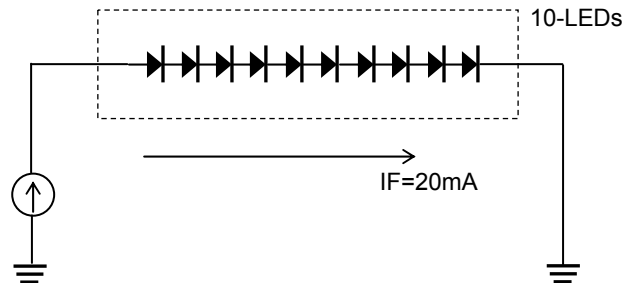
*1　　The data is measured after LEDs are turned on for 5 minutes.

*2　　Tester: BM-7　TOPCON　; spot size=1°field　;Distance=500mm
　　　Conditions
　　　LED backlight power supply : 20mA
　　　LCD: White color

*3　　Brightness in the center of the LCD panel.

*4　　Definition of Uniformity (ΔB$_P$)
　　　ΔB$_P$ = B$_P$ (Min.) / B$_P$ (Max.) x 100[%]
　　　B$_P$ (max.) = Maximum brightness in 5 measurement spots (refer to below chart).
　　　B$_P$ (Min.) = Minimum brightness in 5 measurement spots (refer to below chart).

Measurement spots　5 spots
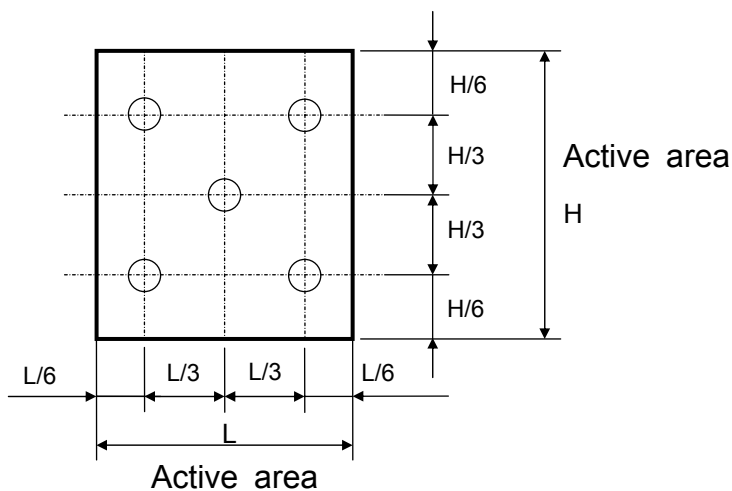
7. Touch Panel Characteristics

7-1 Electrical characteristics

Ta=25 degree C

Item	Min.	Typ.	Max.	Unit	Remark
Linearity	-1.5	-	1.5	%	*1,*2
Termial resistance	200	-	900	Ohm	X(Film side)
	160	-	640	Ohm	Y(Glass side)
Insulation resistance	20	-	-	M Ohm	DC 25V 1min.
Input Voltage	-	5.0	7.0	V	
Chattering	-	-	10	ms	*3
Transparency	83	-	-	%	

Note: Do not operate it with a thing except a polyacetal pen (Tip R0.8 or less) or a finger,
Especially those with hard or sharp tips such as a ball point pen or a mechanical pencil.

*1: Definition of Linearity(%) = ΔV / (EV – SV) x 100[%]
ΔV = The deffence between the ideal voltage and measured voltage on each measuring line
SV = Voltage of starting Points
EV = Voltage of ending Points
*2: 80gf less input with Tip R0.8 polyacetal pen.
*3: Tip R0.8 polyacetal pen, Tip R8.0 Rubber.

7-2 Mechanical characteristics

Ta=25 degree C

Item	Min.	Typ.	Max.	Unit	Remark
Activation force	-	20	50	gf	*1
Pen Sliding Durability	Write 100,000	-	-	times	*2
Hitting Durability	1,000,000	-	-	times	*3
Surface hardness	3	-	-	H	*4

*1: Stylus pen Input: Tip R0.8 polyacetal pen or Finger
*2: Measurement for surface area
    - Scratch 100,000 times straight line
    - Force = 250gf
    - Speed = 180mm/sec
    - Length = 30mm
    - Stylus = Tip R0.8 polyacetal pen
    - Electric Load = None
*3: Measurement for center part
    - Hit 1,000,000 times at the same point
    - Force = 250gf
    - Hitting Pad = Tip R0.8 polyacetal pen & Tip R8.0 silicon rubber
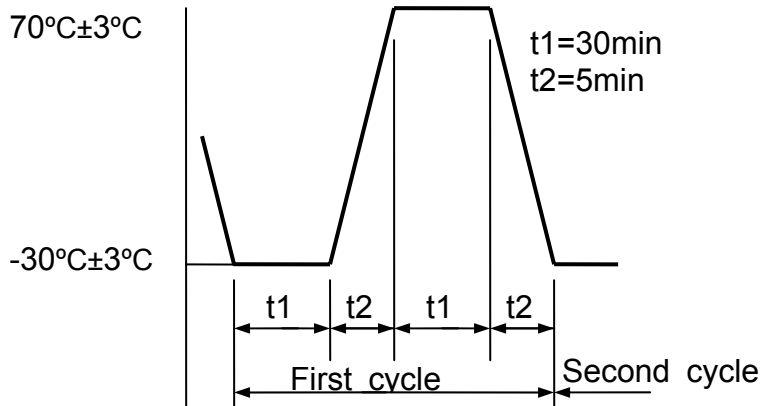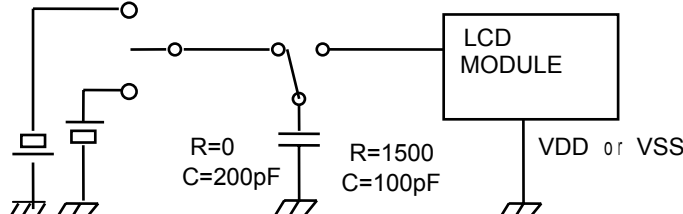   - Hitting speed = 3 times/sec
    - Electric Load = None
*4: JIS K5400

8. Reliability

SII will develop engineering samples that meet the reliability level in mass production.

8-1 Reliability levels

Test Items	Condition
High temperature storage	+70°C±3°C, for 240 hours *Measure after 12hours left at normal temperature and humidity.
Low temperature storage	-30°C±3°C for 240 hours *Measure after 12hours left at normal temperature and humidity.
Operation at high temperature	+60°C±3°C, 30%RH max for 240 hours *Measure after 12hours left at normal temperature and humidity.
Operation at low temperature	-20°C±3°C, for 240 hours *Measure after 12hours left at normal temperature and humidity.
Operation at high temperature and high humidity	+40°C±3°C, 90%RH max. (no condensation) for 240 hours *Measure after 12hours left at normal temperature and humidity.
Temperature cycle storage	70°C±3°C t1=30min t2=5min -30°C±3°C t1 t2 t1 t2 First cycle Second cycle Repeat 5 cycles *Measure after 12hours left at normal temperature and humidity
Vibration	Sweep at 10Hz to 50Hz, amplitude 1.5mm for 2 hours each in X, Y, and Z directions. Apply shipping package to this test.
Mechanical shock	Drop onto the tiled floor from 60 centi meter heights, 6 faces. Apply shipping package to this test.
ESD	1) 200V max. under below condition. (EIA Standard: MM) 2) 1000V max. under below condition. (EIA Standard: HBM) (Each terminal on I/F.) LCD MODULE R=0 C=200pF R=1500 C=100pF VDD VSS

8-2 Criteria

(1) Functional characteristics: No abnormalities.
(2) Display characteristics: Satisfy the original standard.
        No uneven contrast, No bubble, No blur, etc.
(3) Electrical characteristics: Satisfy the original standard.
(4) Appearance: No relief, etc at joint.

9. Handling Precautions

9-1 Operation
Burn-in sometimes happens when the same character was displayed at along time. Therefore, to prevent Burn-in, SII recommended to set up a Screen-saver function.

9-2 Safety
DO NOT put it in your mouth in case LCD panel has broken. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

9-3 Handling
(1) The LCD panel is plate glass. **DO NOT** subject the panel to mechanical shock or to excessive force on its surface.
(2) The polarizer attached to the display is very easy to damage, handle it with care to avoid scratching.
(3) To avoid contamination on the display surface, **DO NOT** touch the display surface with bare hands.
(4) Provide a space so that the LCD panel does not come into contact with other components.
(5) To protect the LCD panel from external pressure, put covering glass (acrylic board or similar board) to keep appropriate space between them.
(6) Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where dew condensation occurs.
(7) Property of semiconductor devices may be affected when they are exposed to light possibly resulting in malfunctining of the ICs.
To prevent such malfunctioning of the ICs, your design and mounting layout done are so that the IC is not exposed to light in actual use.

9-4 Static Electricity
(1) Ground soldering iron tips, tools and testers when they operate.
(2) Ground your body when handling the products.
(3) **DO NOT** apply voltage to the input terminal without applying power supply.
(4) **DO NOT** apply voltage that exceeds the absolute maximum rating.
(5) Store the products in an anti-electrostatic container.

9-5 Storage
Store the products in a dark place at 25±10 degree C, low humidity (65%RH or less). **DO NOT** store the products in an atmosphere containing organic solvents or corrosive gases.

9-6 Cleaning
(1) **DO NOT** wipe the polarizer with dry cloth, as it might cause scratch.
(2) Wipe the polarizer with a soft cloth soaked with petroleum IPA, other chemical might damage.

9-7 Waste
When dispose of LCD module, manage it as the production waste.

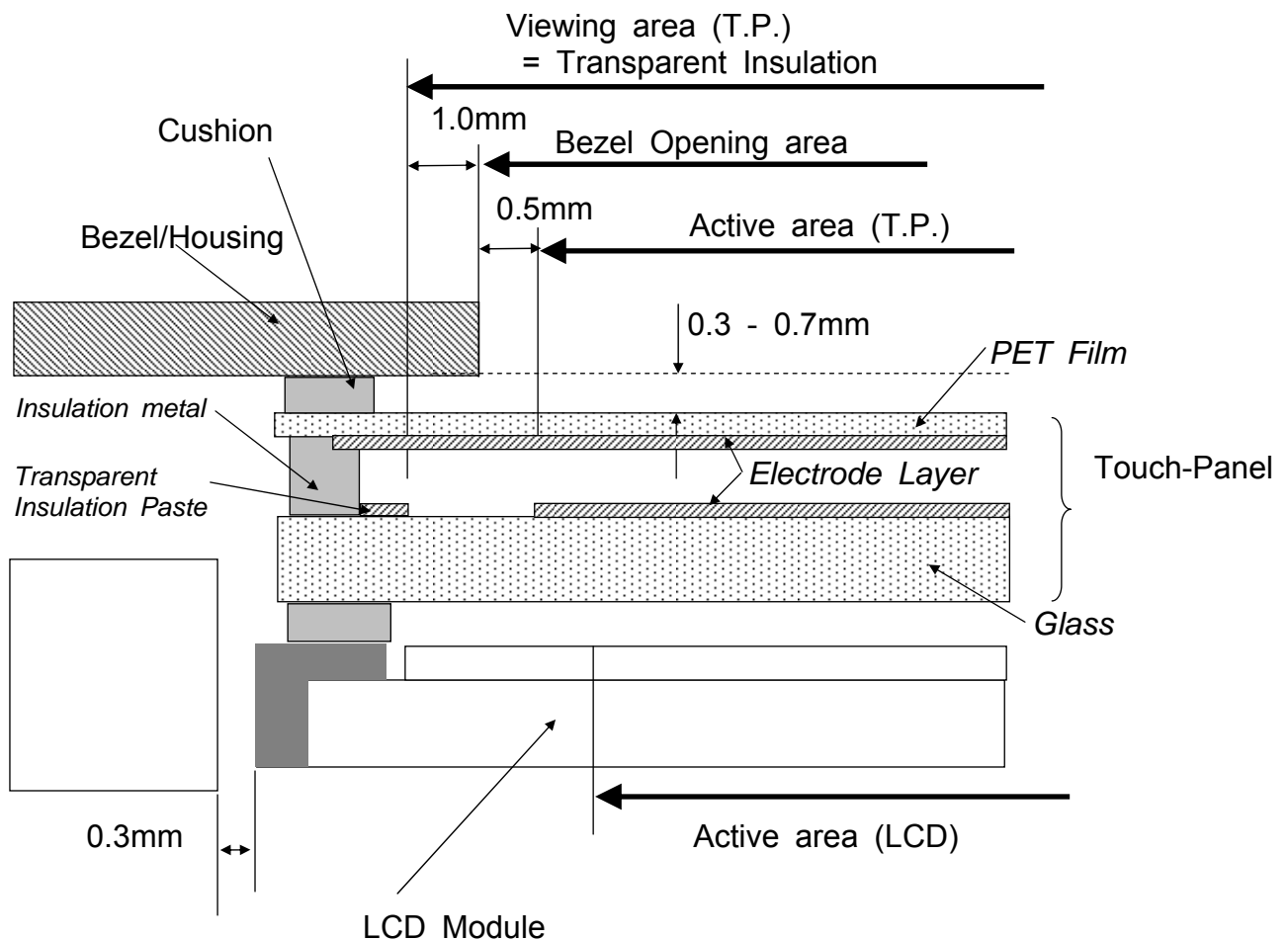## 10. Design/Handing Guideline for Touch Panel

10-1 Bezel/Housing design
(1) If a consumer will put a palm on housing in normal usage, care should be taken as follows.
(2) Keep the gap, for example 0.3 to 0.7mm, between bezel edge and T/P surface. The reason is to avoid the bezel edge from contacting T/P surface that may cause "short" with bottom layer
(3) Insertion a cushion material is recommended.
(4) The cushion material should be limited just on the busbar insulation paste area. If it is over the transparent insulation paste area, a "short" may be occurred.
(5) There is one where a resistance file is left in the T/P part of the end of the pole. Design to keep insulation from the perimeter to prevent from mis-operation and so on.
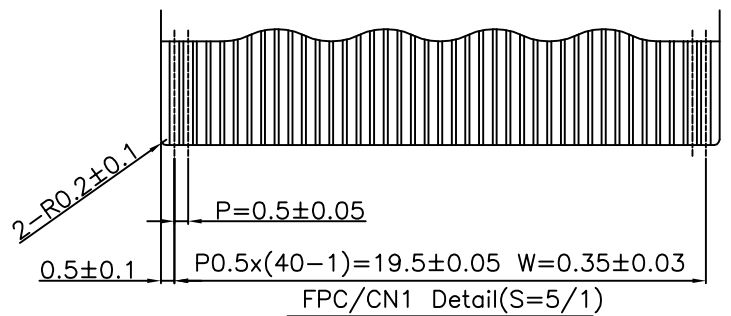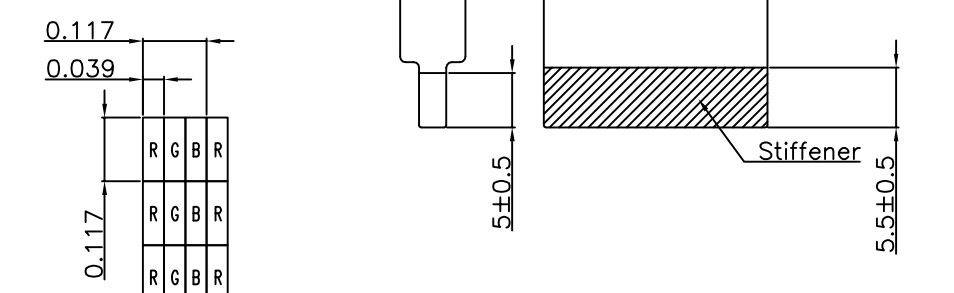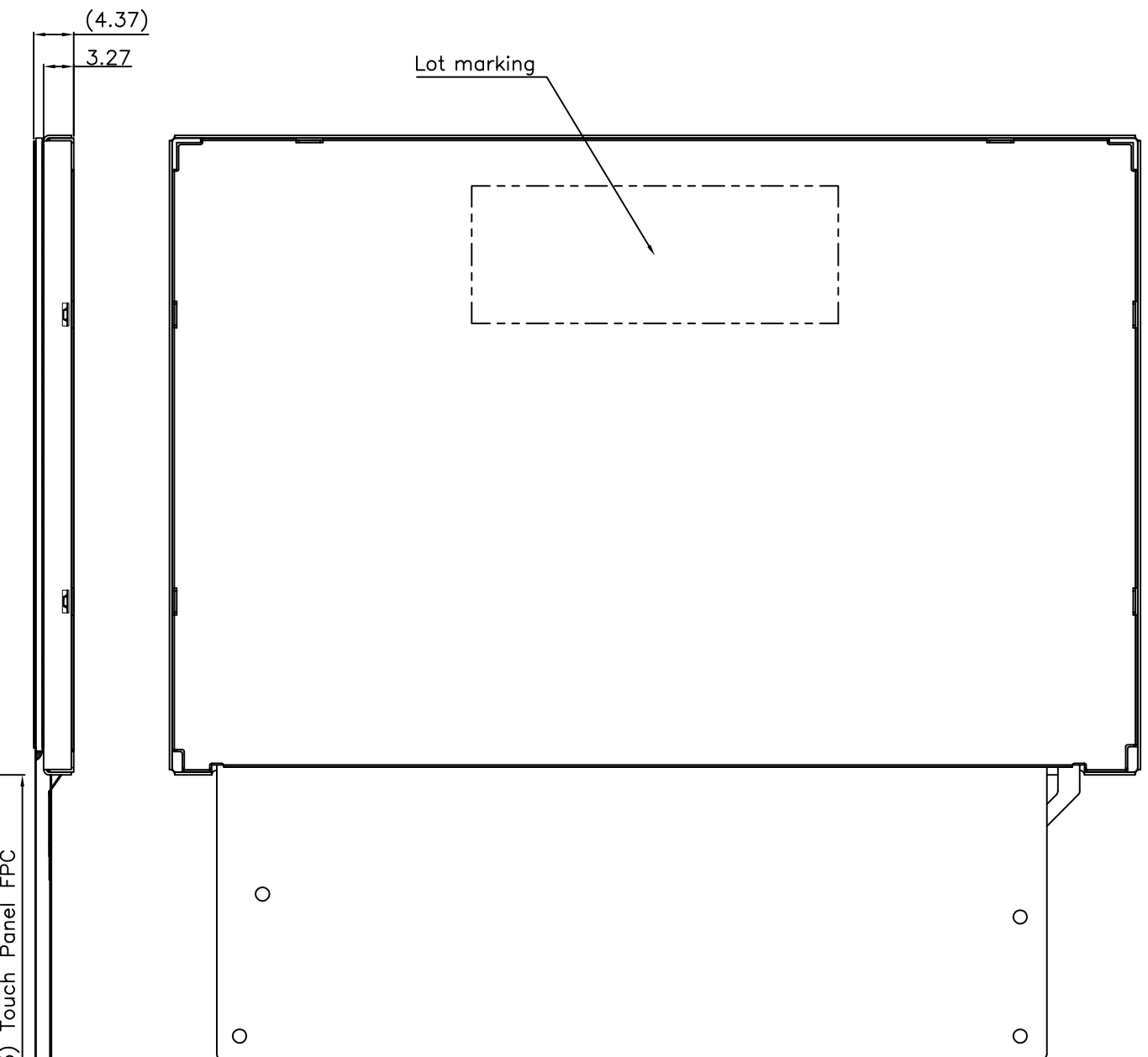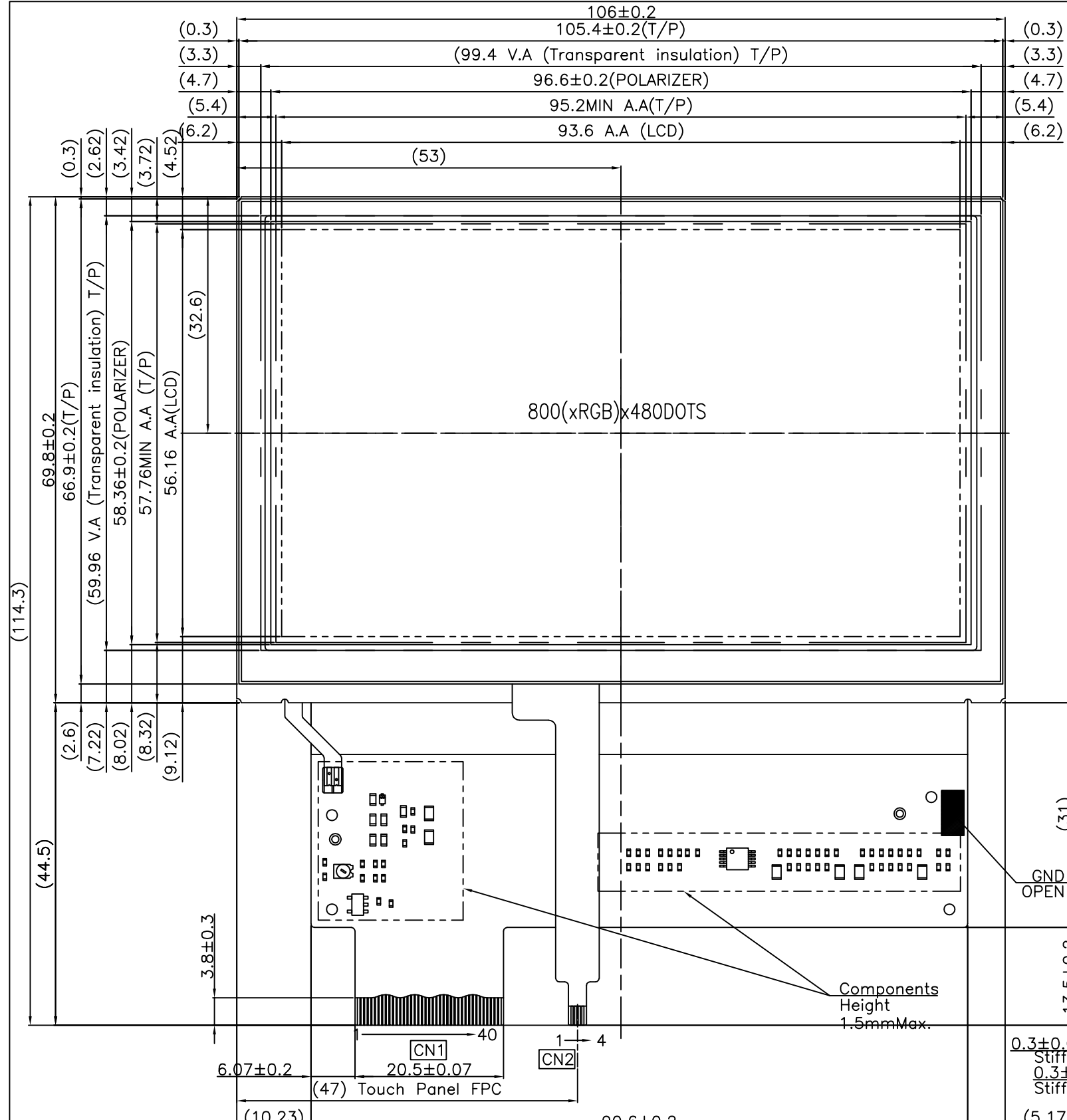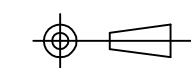
10-2 Mounting on diplay and housing bezel
(1) In all cases, T/P should be supported from the backside of the Plastic.
(2) Do not to use an adhesive tape to bond it on the front of T/P and hang it to the housing bezel.
(3) Never expand the T/P top layer (PET Film) like a balloon by internal air pressure. The life of the T/P will extremely short.
(4) Top layer, PET, dimension is changing with environment temperature and humidity. Avoid a stress from housing bezel to top layer, because it may cause "waving".
(5) The input to the Touch Panel sometimes distorts touch panel itself.
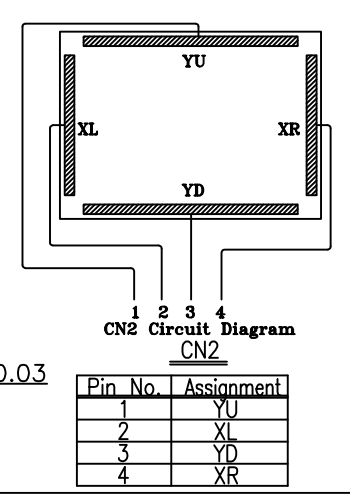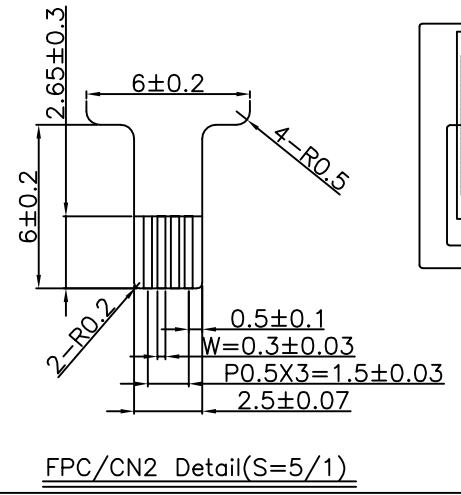
10-3 Prohibited Operation
To using the stylus pen or fingernail sliding at the edge of the housing is prohibited.
It would cause the cracking of the ITO coating and damage the touch panel.
It also request not to press this area while assembling.

General tolerance ±0.15

106±0.2
105.4±0.2(T/P)
(99.4 V.A (Transparent insulation) T/P)
96.6±0.2(POLARIZER)
95.2MIN A.A(T/P)
93.6 A.A (LCD)
(53)
(0.3) (0.3)
(3.3) (3.3)
(4.7) (4.7)
(5.4) (5.4)
(6.2) (6.2)

(0.3)
(2.62)
(3.42)
(3.72)
(4.52)
(32.6)

69.8±0.2
66.9±0.2(T/P)
(59.96 V.A (Transparent insulation) T/P)
58.36±0.2(POLARIZER)
57.76MIN A.A (T/P)
56.16 A.A(LCD)

(114.3)

800(xRGB)x480DOTS

Lot marking

(4.37)
3.27

(2.6)
(7.22)
(8.02)
(8.32)
(9.12)

(44.5)

3.8±0.3

Touch Panel FPC
(31)
GND
OPEN
(44.5) Touch Panel FPC
13.5±0.2
Components Height 1.5mmMax.

6.07±0.2
40
CN1
20.5±0.07
(47) Touch Panel FPC
(10.23)
1 4
CN2
0.3±0.05
Stiffener
0.3±0.05
Stiffener
(5.17)
90.6±0.2

0.117
0.039
R	G	B	R
R	G	B	R
R	G	B	R
0.117
Dot detail (S=100/1)

5±0.5
5.5±0.5
Stiffener

2-R0.2±0.1
P=0.5±0.05
0.5±0.1
P0.5x(40-1)=19.5±0.05 W=0.35±0.03
FPC/CN1 Detail(S=5/1)

Note:Connector recommendation
HIROSE FH12A-40S-0.5S

CN1

No.	Signal	No.	Signal
1	VSS	21	B0
2	VSS	22	B1
3	DVDD	23	B2
4	DVDD	24	B3
5	R0	25	B4
6	R1	26	B5
7	R2	27	B6
8	R3	28	B7
9	R4	29	VSS
10	R5	30	PCLK
11	R6	31	DISP
12	R7	32	HSYNC
13	G0	33	VSYNC
14	G1	34	DE
15	G2	35	AVDD
16	G3	36	AVDD
17	G4	37	VSS
18	G5	38	VSS
19	G6	39	VLED-
20	G7	40	VLED+

2.65±0.3
6±0.2
6±0.2
2-R0.2
4-R0.5
0.5±0.1
W=0.3±0.03
P0.5X3=1.5±0.03
2.5±0.07
FPC/CN2 Detail(S=5/1)

CN2 Circuit Diagram
YU
XL   XR
YD
1 2 3 4
CN2

Pin No.	Assignment
1	YU
2	XL
3	YD
4	XR

MATERIAL
TREATMENT
PART NUMBER | SCALE(A2) | UNIT | DATE
(1) | 2/1 | 1=1mm | 10.Apr,2009
CAL.
43WVF1G-0

ST09-142	1	Set up for mass production
ST08-165	a	Set up for sample
CHIEF	LEADER	DESIGNED	DRAWN	CHECKED
K.Takahashi	M.Suzuki	M.Suzuki	M.Suzuki	A.Takenezawa

TITLE
Assembly drawing
REV. 1
DRAWING
No. 43WVF1G-0 1A
PAGE 1

Seiko Instruments Inc.