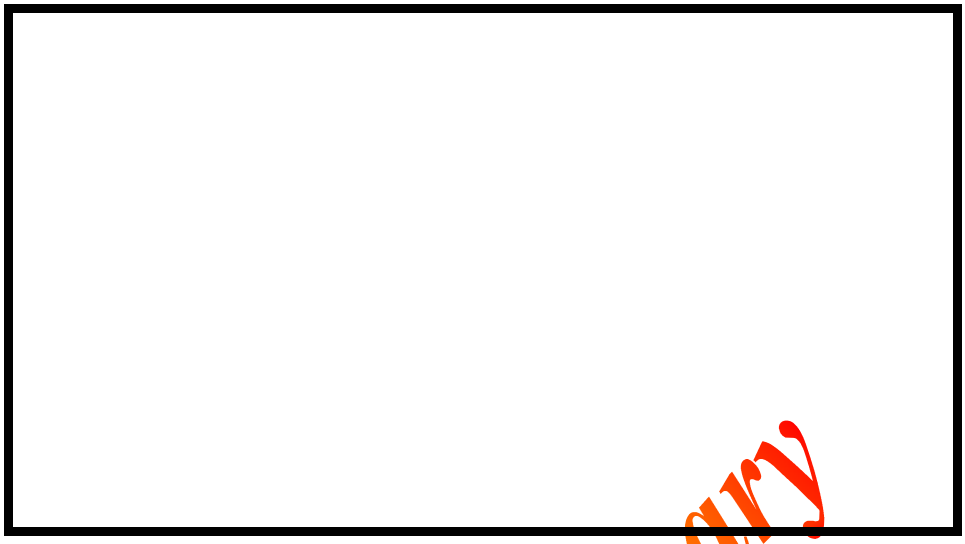
LIQUID CRYSTAL DISPLAY MODULE

3.5” WVGA (480 x RGB x 800) TFT

Product Code: 35WVF0HZ2

Product Specification

APPROVAL



Seiko Instruments Inc.

History of Revision

Revision	Contents	Date
a	First publication	Feb. 1, 2010
b	Changed P10,11 4-1 Power on sequence No.14～No.19 P14 6. LCD Characteristics Contrast ratio Min.(200)/Typ.(500)→Min.(500)/Typ.(800) Added P13 5-3 Electrical Characteristics Operating(Checker)	May.14, 2010
c	Changed P4 1-3 Mechanical Dimensions and Circuit diagram 35WVF0HZ2 1A,35WVF0H-0 6A,35WVF0H-0 6B P4 2-1 Basic Specification Weight:TBD→(17.2)g P5 2-2 Interface BLU_PWM and BLU_EN Description, P5 2-2 IM0～IM3 Description, P10,11 4-1 Power on sequence No.14～No.19 P14 6. LCD Characteristics NTSC ratio 70→(67) Added P4 2-1 Basic Specification Dynamic Backlight Control Function BLC	Jul. 14, 2010

Contents

1. General

1-1 Application

This specification applies to the LCD module designated 35WVF0HZ2 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: 35WVF0HJZ2

1-3 Mechanical Dimensions and Circuit diagram

Refer to drawing No “35WVF0HZ2 1A,35WVF0H-0 6A,35WVF0H-0 6B ”.

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 480 (x3:RGB) x 800dots LCD module with LCD driver.

2-1 Basic Specifications

Display contents:	480x(3:RGB)x800 dots
LCD module size:	51.46x90.55x2mm(typ) (except FPC length and Contact Spring)
Viewing area:	46.36x76.6mm min.
Active area:	45.36x75.6mm typ.
Dot pitch:	0.0945x0.0945mm
Display mode:	TFT LCD, 16M colors, Transmissive Mode
Viewing direction:	6h
Drive method:	Column inversion
Weight:	(17.2)g typ.
LCD driver:	LG4573(LGE)
Backlight Control : (for Low current consumption)	CABC for LG4573
Operating temperature:	From -20 to +70 °C (dry)
Storage temperature	From -30 to +80 °C (dry)

2-2 Interface

61Pins(RGB+SPI interface)

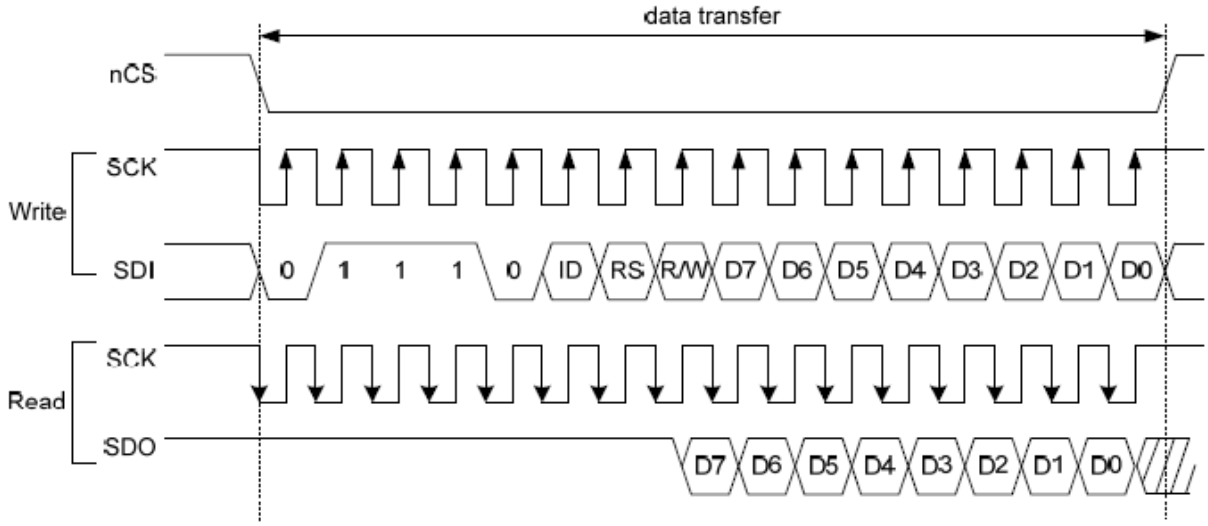
No.	Synbol	Description	
1	LED-	LED power suplly (-)	
2	LED+	LED power suplly (+)	
3	NC	Non-connection	
4	NC	Non-connection	
5	NC	Non-connection	
6	NC	Non-connection	
7	VCI	Analog and Logic power supply (2.7V～2.9V)	
8	IOVCC	Interface power supply (1.7V～1.9V)	
9	BLU_PWM	B/L PWM for for Backlight Control Function *1	
10	BLU_EN	B/L ON/OFF If not used,leave this pin open.	
11	IM0	GND	SPI + MIPI DPI(RGB_IF) Reference IM[3:0]:0100:Mipi DBI TypeC + MIPI DPI(RGB_IF) Refer to LG4573 data sheet
12	IM1	GND	
13	IM2	IOVCC	
14	IM3	IOVCC	
15	/RESET	RESET: Active Low	
16	DB21(R5/R5)	(RGB_IF) Color Coding R5/R5	
17	DB20(R4/R4)	(RGB_IF) Color Coding R4/R4	
18	DB19(R3/R3)	(RGB_IF) Color Coding R3/R3	
19	DB18(R2/R2)	(RGB_IF) Color Coding R2/R2	
20	DB17(R1/R1)	(RGB_IF) Color Coding R1/R1	
21	DB16(R0/R0)	(RGB_IF) Color Coding R0/R0	
22	DB23(*/R7)	(RGB_IF) Color Coding - /R7	
23	DB22(*/R6)	(RGB_IF) Color Coding - /R6	
24	DB13(G5/G5)	(RGB_IF) Color Coding G5/G5	
25	DB12(G4/G4)	(RGB_IF) Color Coding G4/G4	
26	DB11(G3/G3)	(RGB_IF) Color Coding G3/G3	
27	DB10(G2/G2)	(RGB_IF) Color Coding G2/G2	
28	DB9(G1/G1)	(RGB_IF) Color Coding G1/G1	
29	DB8(G0/G0)	(RGB_IF) Color Coding G0/G0	
30	DB15(*/G7)	(RGB_IF) Color Coding - /G7	
31	DB14(*/G6)	(RGB_IF) Color Coding - /G6	
32	DB5(B5/B5)	(RGB_IF) Color Coding B5/B5	
33	DB4(B4/B4)	(RGB_IF) Color Coding B4/B4	
34	DB3(B3/B3)	(RGB_IF) Color Coding B3/B3	
35	DB2(B2/B2)	(RGB_IF) Color Coding B2/B2	
36	DB1(B1/B1)	(RGB_IF) Color Coding B1/B1	
37	DB0(B0/B0)	(RGB_IF) Color Coding B0/B0	
38	DB7(*/B7)	(RGB_IF) Color Coding - /B7	
39	DB6(*/B6)	(RGB_IF) Color Coding - /B6	

*1 Please set the optimum value on the customer side. If not used,leave this pin open.

No.	Synbol	Description
40	/RD	Not Use This pin should be connected to GND
41	/WR/SCK	(SPI_IF)Serial Clock :Active High
42	RS	Not Use This pin should be connected to GND
43	/CS	(SPI_IF)Chip select :Active Low
44	SDI	(SPI_IF) Serial Input
45	SDO	(SPI_IF) Serial Output
46	VSYNC	(RGB_IF) Vertical Frame Synchronization Signal :ActiveLow
47	HSYNC	(RGB_IF) Horizontal Frame Synchronization Signal Active Low
48	DE	(RGB_IF) Data Enable Signal Active High
49	DOTCLK	(RGB_IF) Pixel Clock :Active High
50	NC	Non-connection
51	GND	GND
52	NC	Non-connection
53	NC	Non-connection
54	GND	GND
55	NC	Non-connection
56	NC	Non-connection
57	GND	GND
58	NC	Non-connection
59	NC	Non-connection
60	GND	GND
61	VCC	Analog and Logic power supply (2.7V～2.9V)

3. SPI_IF and RGB_IF

3-1 SPI_IF



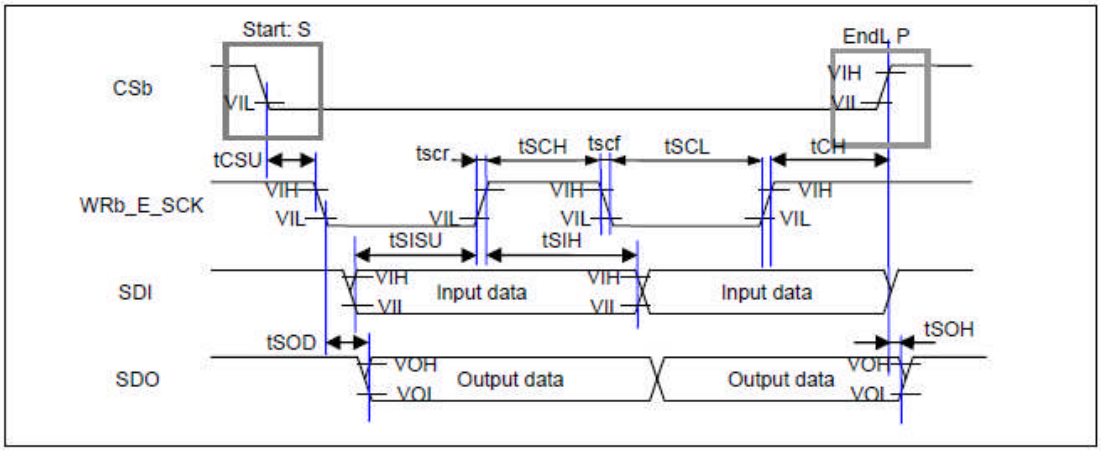
For example

COMMAND:3Ah → 70h,3Ah

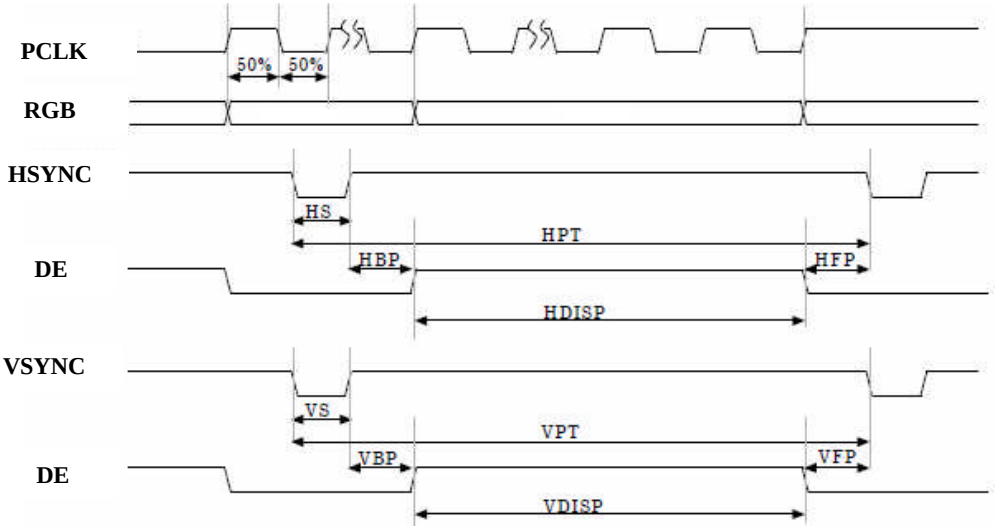
Parameter:70h → 72h,70h

3-2 SPI_IF AC Characteristics

Item		Symbol	Unit	Min	Typ	Max
Serial clock cycle time	Write (received)	tSCYC	ns	20	-	-
	Read (transmitted)			100	-	-
Serial clock "High" level pulse width	Write (received)	tSCH	ns	10	-	-
	Read (transmitted)			50	-	-
Serial clock "Low" level pulse width	Write (received)	tSCL	ns	10	-	-
	Read (transmitted)			50	-	-
Serial clock rise/fall time		tscr, tscf	ns	-	-	20
Chip select setup time		tCSU	ns	20	-	-
Chip select hold time		tCH	ns	10	-	-
Serial input data setup time		tSISU	ns	5	-	-
Serial input data hold time		tSIH	ns	10	-	-
Serial output data setup time		tSOD	ns	80	-	150
Serial output data hold time		tSOH	ns	-	-	80



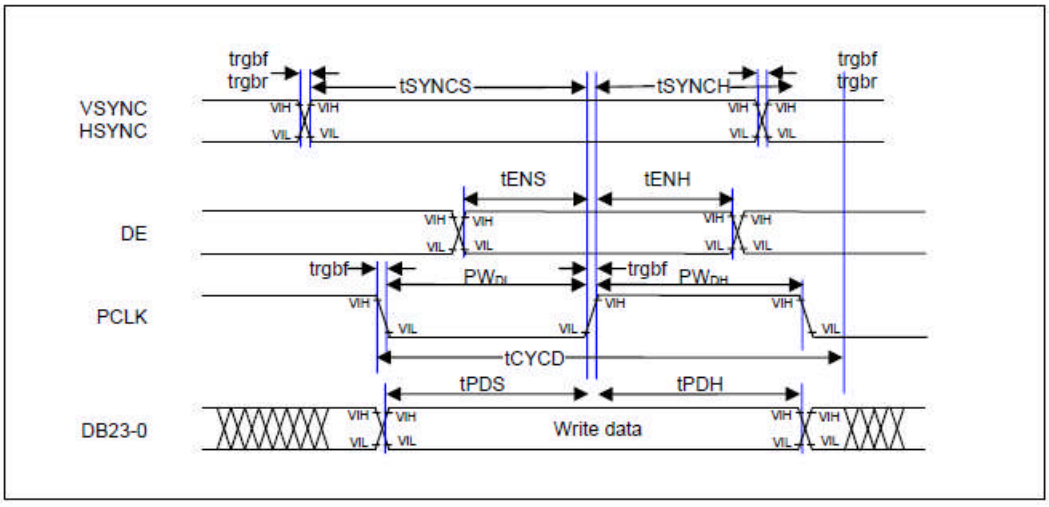
3-3 RGB_IF



Data				備考
PCLK		27	MHz	Duty=50%
Horizontal	HS	2	clk	-
	HBP	28	clk	-
	HDISP	480	clk	-
	HFP	2	clk	-
	HPT	512	clk	-
Vertical	VS	2	Line	-
	VBP	10	Line	-
	VDISP	800	Line	-
	VFP	2	Line	-
	VPT	814	Line	-

3-4 RGB_IF AC Characteristics

Item	Symbol	Unit	Min	Typ	Max
VSYNC/HSYNC setup time	tSYNCS	ns	10	-	-
VSYNC/HSYNC hold time	tSYNCH	ns	10	-	-
DE setup time	tENS	ns	10	-	-
DE hold time	tENH	ns	10	-	-
PCLK "Low" level pulse width	PWDL	ns	13	-	-
PCLK "High" level pulse width	PWDH	ns	13	-	-
PCLK cycle time	tCYCD	ns	26	-	-
Data setup time	tPDS	ns	10	-	-
Date hold time	tPDH	ns	10	-	-
PCLK, VSYNC, HSYNC, DE rise/fall time	trgbr, trgbf	ns	-	-	13



4. Power on/off sequence

4-1 Power on sequence

No.	Register	Value	Contents
Power ON			
Reset LOW			
Wait Until Power Stabilization			
Delay(10ms)			
Reset High			
Delay(20ms)			
1	20h	-	Display Inversion Off
2	3Ah	0x70	DPIPF=111 24bitPixelMode
3	B1h	0x06	RGB Interface Setting Vsync、Hsync、DE Mode
		0x1E	HBP=1Eh(30)
		0x0C	VBP=0Ch(12)
4	B2h	0x10	Panel Characteristic Setting
		0xC8	VRS=C8h(200x4＝800)
5	B3h	0x00	Panel Drive Setting Column Inversion
6	B4h	0x04	DITH=1(Truncation)
7	B5h	0x10	Display Control 1 SDT=10h(16)
		0020	SHPN=20h(32)
		0x20	ENGND=20h(32)
		0x00	SHIZ=00h
		0x00	SLT=0
8	B6h	0x01	Display Control 2 ASG=0,SDM=0,FHN=1
		0x18	CLW=18h(24)
		0x02	GTO=02h=2Frame
		0x40	GNO=40h(64)
		0x10	FTI=10h(16)
		0x40	GPM=40h(64)
9	C3h	0x03	<Power Control 3> STMODE[2:0]=011
		0x04	DC1[2:0]=100
		0x03	DC2[2:0]=011
		0x03	DC3[2:0]=011
		0x03	DCPFM[2:0]=011
10	C4h	0x12	Power Control 4 OPB=0,BMB=1,BDC[2:0]=010
		0x22	GDC[2:0]=010,AP[2:0]=010
		0x10	VRH1[4:0]=10000
		0x0C	VRH2[4:0]=01100
		0x03	REGPD=0,SELOPA=0,BT[2:0]=011
		0x6C	VBS[2:0]=110,VREF[3:0]=1100
11	C5h	0x76	Power Control 5(VCOM OUTPUT LV) VCM=76h
12	F9h	0x40	OTP Read Control VCOMSEL[1:0]=01
13	C6h	0x23	Power Control 6 RI[2:0]=010,RV[2:0]=011
		0x50	RESET[2:0]=101,RCONT[2:0]=000

Gamma Collection			
14	D0h	0x00	Positive Red PKP1=0,PKP0=0
		0x44	PKP3=4,PKP2=4
		0x44	PKP5=4,PKP4=4
		0x16	PRP1=1,PRP0=6
		0x00	VRPO=00h
		0x03	VRP1=03h
		0x61	PFP1=6,PFP0=1
		0x16	PFP3=1,PFP2=6
		0x03	PMP=3
15	D1h	0x00	Negative Red PKN1=0,PKN0=0
		0x44	PKN3=4,PKN2=4
		0x44	PKN5=4,PKN4=4
		0x16	PRP1=1,PRP0=6
		0x00	VRPO=00h
		0x03	VRP1=03h
		0x61	PFN1=6,PFN0=1
		0x16	PFN3=1,PFN2=6
		0x03	PMN=3
16	D2h	0x00	Positive Green PKP1=0,PKP0=0
		0x44	PKP3=4,PKP2=4
		0x44	PKP5=4,PKP4=4
		0x16	PRP1=1,PRP0=6
		0x00	VRPO=00h
		0x03	VRP1=03h
		0x61	PFP1=6,PFP0=1
		0x16	PFP3=1,PFP2=6
		0x03	PMP=3
17	D3h	0x00	Negative Green PKN1=0,PKN0=0
		0x44	PKN3=4,PKN2=4
		0x44	PKN5=4,PKN4=4
		0x16	PRP1=1,PRP0=6
		0x00	VRPO=00h
		0x03	VRP1=03h
		0x61	PFN1=6,PFN0=1
		0x16	PFN3=1,PFN2=6
		0x03	PMN=3
18	D4h	0x00	Positive Blue PKP1=0,PKP0=0
		0x44	PKP3=4,PKP2=4
		0x44	PKP5=4,PKP4=4
		0x16	PRP1=1,PRP0=6
		0x00	VRPO=00h
		0x03	VRP1=03h
		0x61	PFP1=6,PFP0=1
		0x16	PFP3=1,PFP2=6
		0x03	PMP=3

19	D5h	0x00	Negative bBue PKN1=0,PKN0=0
		0x44	PKN3=4,PKN2=4
		0x44	PKN5=4,PKN4=4
		0x16	PRP1=1,PRP0=6
		0x00	VRPO=00h
		0x03	VRP1=03h
		0x61	PFN1=6,PFN0=1
		0x16	PFN3=1,PFN2=6
		0x03	PMN=3
20	29h	-	Display ON
21	11h	-	Sleep Out

4-2 Power off sequence

No.	Register	Value	Contents
1	28h	-	Display OFF
2	10h	-	SLEEP IN SLP=1
Delay(150ms)			
RGB_IF Disable			
Delay(150ms)			
3	C1h	0x01	SEL_OPA=0,REDPD=0
Delay(10ms)			
Reset Low			
Power OFF			

4-3 Deep stadby on sequence

No.	Register	Value	Contents
1	28h	-	Display OFF
2	10h	-	SLEEP IN SLP=1
Delay(150ms)			
RGB_IF Disable			
Delay(150ms)			
3	C1h	0x01	SEL_OPA=0,REDPD=0

4-4 Deep stadby off sequence

No.	Register	Value	Contents
1	-	-	2 Times /CS pin toggle
Delay(2ms)			
2	-	-	4 Times /CS pin toggle
3	-	-	INItialization(Power ON No.1-21)

No.1-2 or H/W RESET

5. Electrical Characteristics

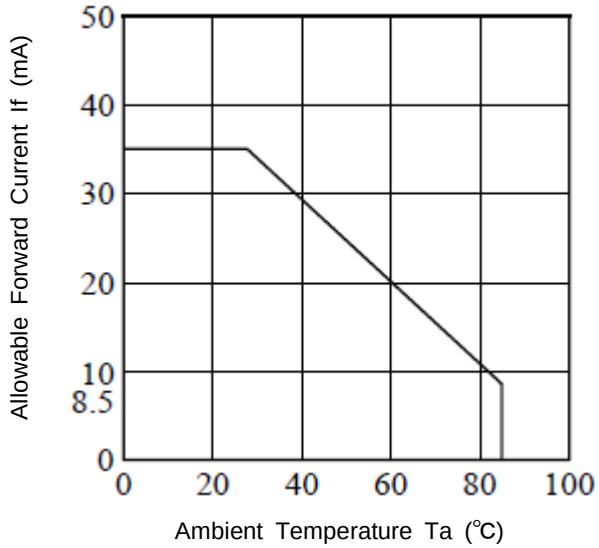
5-1 Absolute Maximum Rating

GND=0V

Item		Symbol	Standard	Unit	Remark
Supply Voltage		VCI,VDD	-0.3 to +4.5	V	-
Input Voltage		Vin	-0.3 to VDD+0.3	V	-
Backlight LED	DC forward current	If	35	mA	*1,*2
	Reverse voltage	Vr	5	V	*2
	Power dissipation	Pd	123	mW	*2

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 6 LEDs.

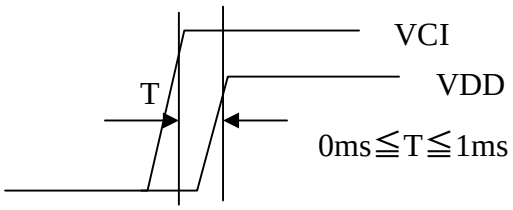


5-2 Power supply voltage

VSS=0V

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Operating Voltage	VDD	1.7	1.8	1.9	V	*1
	VCI	2.70	2.80	2.90	V	

*1: VCI ≧ VDD



Power ON Timing

5-3 Electrical Characteristics

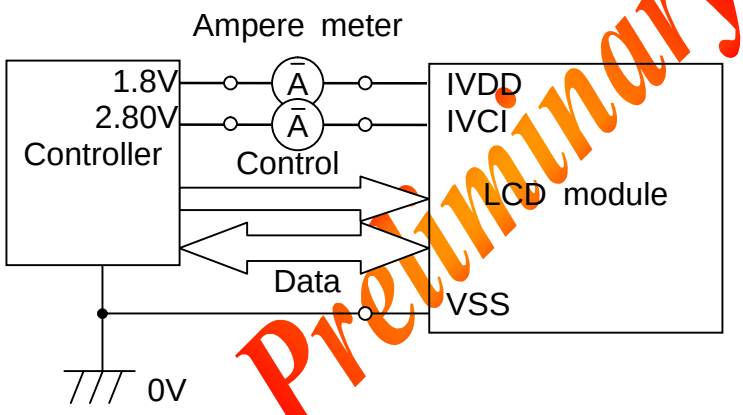
VSS=0V, VDD=1.8V,VCI=2.80 V, Ta=25 degree C

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Current Consumption	Operating (All on:White)	IVDD	-	-	(15)	uA	-
		IVCI		(35)	(50)	mA	
	Operating (Checker)	IVDD	-	-	-	uA	Test pattern
		IVCI	-	(65)	(100)	mA	
	Standby Deep standby	IVDD	-	-	(15)	μA	*1
		$IVCI_l$	-	-	(15)	μA	
Input high-level voltage		Vih	0.8VDD	-	VDD	V	-
Input low-level voltage		Vil	-0.3	-	0.2VDD	V	
Output low voltage		Voh	0.8VDD	-	-	V	
Output high voltage		Vol	-	-	0.2VDD	V	

*1 RGB_IF is Disable

Refer to LG4573 data sheet for AC and other DC characteristics

Test circuit

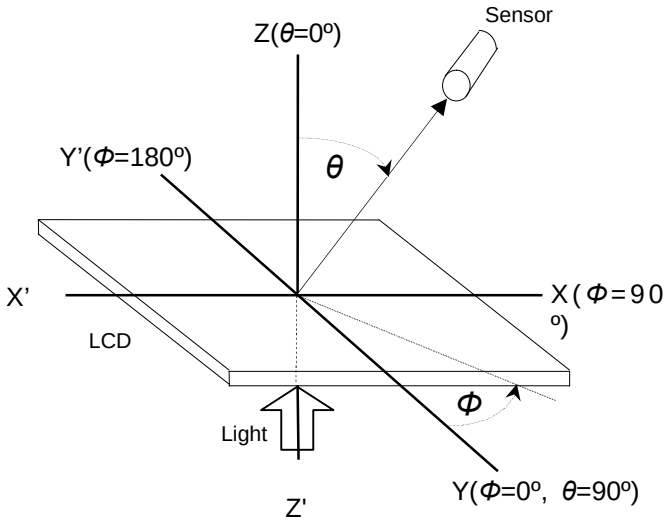


6. LCD Characteristics

LCD Optical Characteristics

VSS=0V, VDD=1.8V,VCI=2.80V

Item		Symbol	Condition		Min.	Typ.	Max.	Unit
contrast ratio		C	θ=0°, φ=0°	25°C	(500)	(800)	-	-
Range of Viewing angle (θ:6h–12h)		θ(6h) - θ(12h)	C≥10	25°C	-	(80)	-	degree
Range of Viewing angle (θ:3h–9h)		θ(3h) - θ(9h)	C≥10	25°C	-	(80)	-	degree
Color	White	x	BM-7 (TOPCON) θ=0°, φ=0°	25°C	(0.260)	(0.310)	(0.360)	-
		y			(0.280)	(0.330)	(0.380)	-
	Red	x		25°C	(0.590)	(0.640)	(0.690)	-
		y			(0.295)	(0.345)	(0.395)	-
	Green	x		25°C	(0.280)	(0.330)	(0.380)	-
		y			(0.580)	(0.630)	(0.680)	-
	Blue	x		25°C	(0.100)	(0.150)	(0.200)	-
		y			(0.035)	(0.085)	(0.135)	-
NTSC ratio		-	↑	25°C	-	(67)	-	%
B/W Response time		Ton +Toff	θ=0°, φ=0°	25°C	-	35	-	msec
		Ton +Toff	θ=0°, φ=0°	-20°C	-	(240)	-	



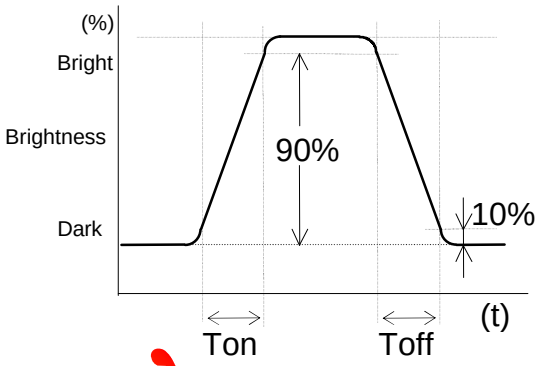
*Definition of contrast C

The contrast ratio is defined as follows:

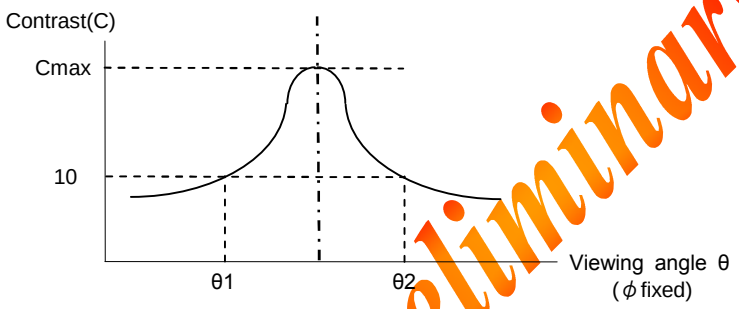
$$C = \frac{\text{Brightness of selected position(white)}}{\text{Brightness of unselected position(black)}}$$

*Definition of response time (Ton, Toff)

The response time is defined as the following figure.



*Definition of viewing angle θ1 and θ2



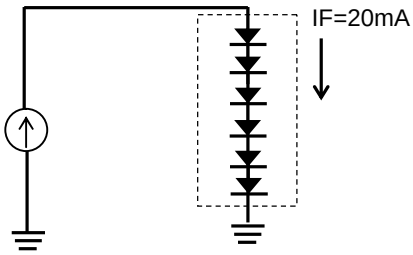
Note: Angle of optimized contrast with naked eye and viewing angle θ at Cmax above are not always the same.

7. LED Backlight Characteristics

VSS=0V, VDD=1.8V,VCI=2.80V

Item	Symbol	Condition	Min.	Typ.	Max.	unit
Brightness *1 *2 *3	Bp	Ta=25ºC±3ºC 30-80%RH	(240)	(300)	-	cd/m^2
Uniformity *1 *2 *4	Δ Bp		(70)	-	-	%

Note 1: The data is measured using the constant current (If=20mA) power supply.



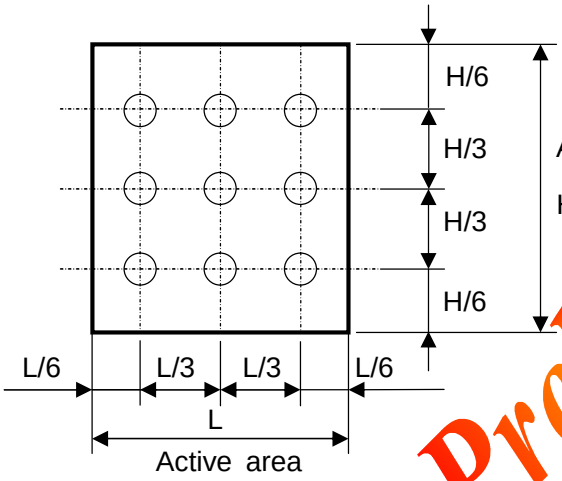
*1 The data is measured after LEDs are turned on for 5 minutes.

*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)
$\Delta B_P = B_P$ (Min.) / B_P (Max.) x 100[%]
B_P (max.) = Maximum brightness in 9 measurement spots (refer to below chart).
B_P (Min.) = Minimum brightness in 9 measurement spots (refer to below chart).

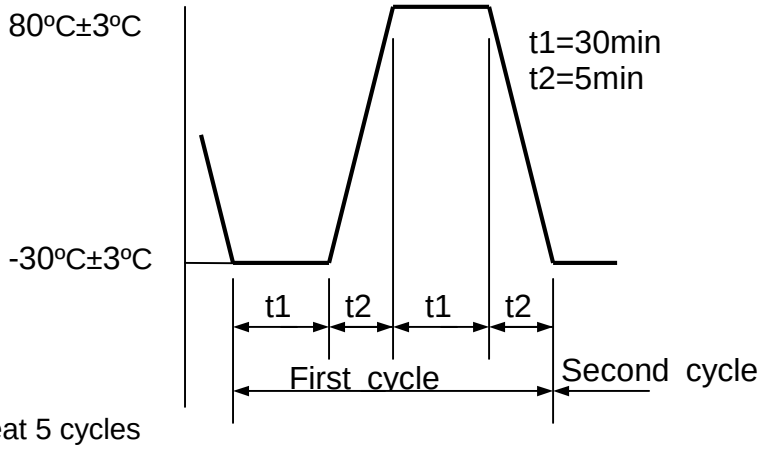
Measurement spots（9spots）



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	+80ºC±3ºC, for 240 hours *Measure after 12hours left at normal temperature and humidity.
Low temperature storage	-30ºC±3ºC for 240 hours *Measure after 12hours left at normal temperature and humidity.
Operation at high temperature	+70ºC±3ºC, 30%RH max for 240 hours *Measure after 12hours left at normal temperature and humidity.
Operation at low temperature	-20ºC±3ºC, for 240 hours *Measure after 12hours left at normal temperature and humidity.
Operation at high temperature and high humidity	+40ºC±3ºC, 90%+2%/-3%RH max. (no condensation) for 240 hours * Measure after 12 hours left at normal temperature and humidity
Temperature cycle strage	 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	Machine model: 150V, Capacity: 200pF, Resistance: 0ohm Human body mode: 2000V, Capacity: 100pF, Resistance: 1500 ohm

8-2 Criteria

(1) Functional characteristics: No abnormalities.
(2) Display characteristics: Satisfy the original standard.
(3) Electrical characteristics: Satisfy the original standard.
(4) Appearance: No abnormalities.
(5) Brightness: 50% of the original standard.

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 +5~+25 degree C, low humidity (50%RH or less). **DO NOT** store the products in an atmosphere containing organic solvents or corrosive gases.

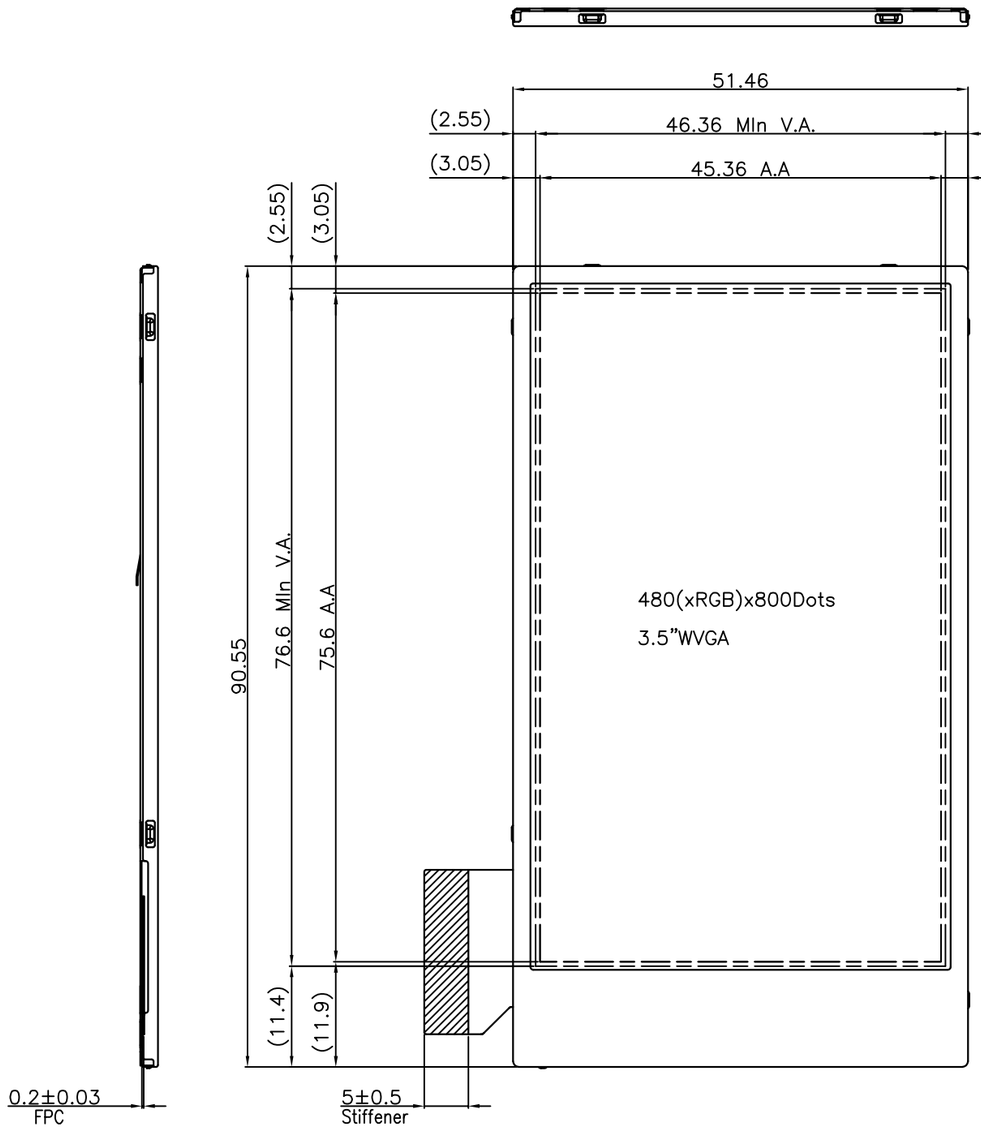
9-6 Cleaning

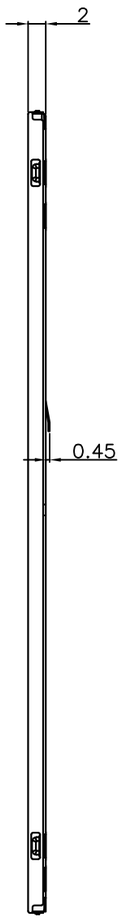
(1) **DO NOT** wipe the polarizer with dry cloth, as it might cause scratch.
(2) Wipe the polarizer with a soft cloth soaked with petroleum IPA, other chemical might damage.

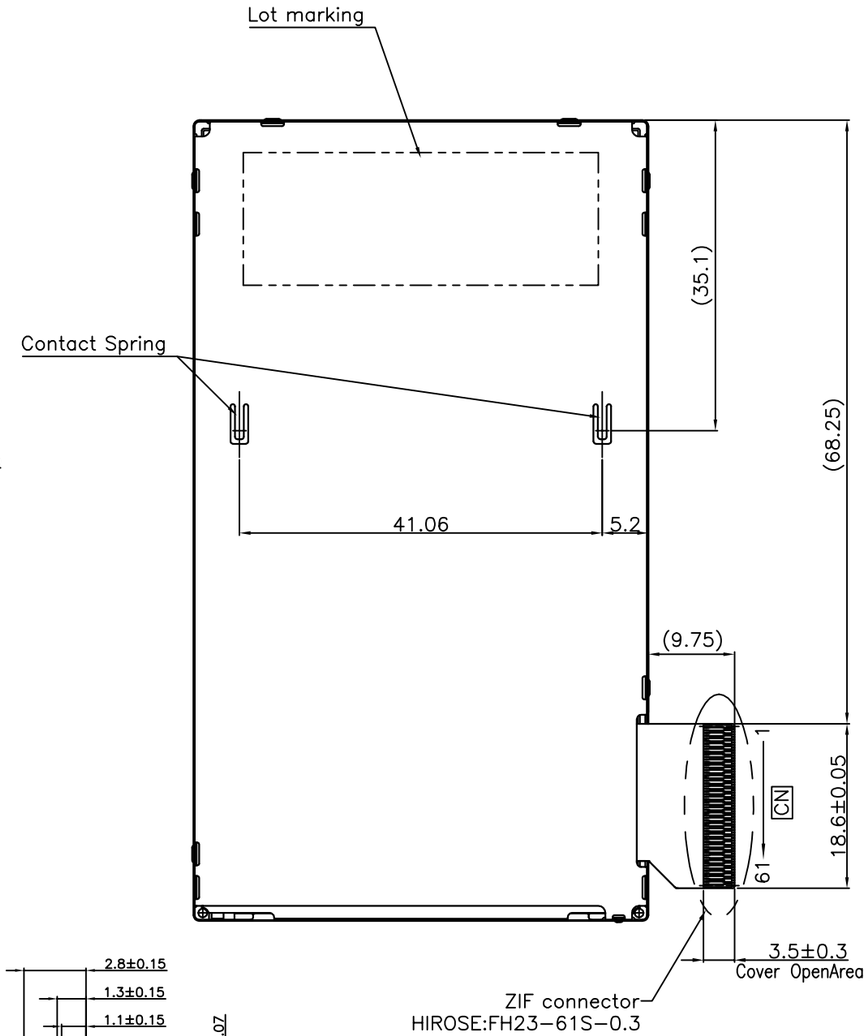
9-7 Waste

When dispose of LCD module, manage it as the production waste.

General tolerance ±0.2

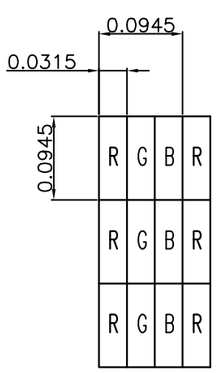




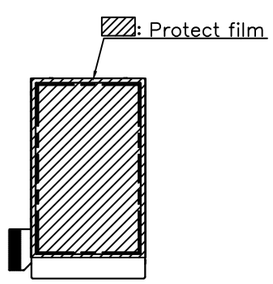


CN

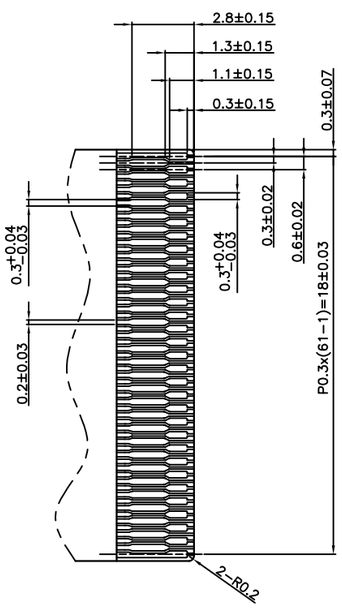
Pin No.	Signal
1	LED−
2	LED+
3	NC
4	NC
5	NC
6	NC
7	VCI
8	IOVCC
9	BLU_PWM
10	BLU_EN
11	IM0
12	IM1
13	IM2
14	IM3
15	/RESET
16	DB21(R5/R5)
17	DB20(R4/R4)
18	DB19(R3/R3)
19	DB18(R2/R2)
20	DB17(R1/R1)
21	DB16(R0/R0)
22	DB23(✱/R7)
23	DB22(✱/R6)
24	DB13(G5/G5)
25	DB12(G4/G4)
26	DB11(G3/G3)
27	DB10(G2/G2)
28	DB9(G1/G1)
29	DB8(G0/G0)
30	DB15(✱/G7)
31	DB14(✱/G6)
32	DB5(B5/B5)
33	DB4(B4/B4)
34	DB3(B3/B3)
35	DB2(B2/B2)
36	DB1(B1/B1)
37	DB0(B0/B0)
38	DB7(✱/B7)
39	DB6(✱/B6)
40	/RD
41	/WR/SCK
42	RS
43	/CS
44	SDI
45	SDO
46	VSYNC
47	HSYNC
48	DE
49	DOTCLK
50	NC
51	GND
52	NC
53	NC
54	GND
55	NC
56	NC
57	GND
58	NC
59	NC
60	GND
61	VCC



Dots detail(200/1)



Protect film (S=1/2)
Cover BEZEL OPEN Area



CN Detail(5/1)

					MATERIAL	
					TREATMENT	
					PART NUMBER (1)	SCALE 2/1
					UNIT 1=1mm	DATE 23.Jun,2010
					CAL.	35WVF0HZ2
					TITLE	Assembly drawing
					REV.	a
ST10-156	a	Setup for Sample			DRAWING No.	35WVF0HZ2 1A
					PAGE	1
CHIEF	LEADER	DESIGNED	DRAWN	CHECKED		
M.Seimiya	S.Sato	A.Takenezawa	A.Takenezawa	T.Hosokawa		

Seiko Instruments Inc.

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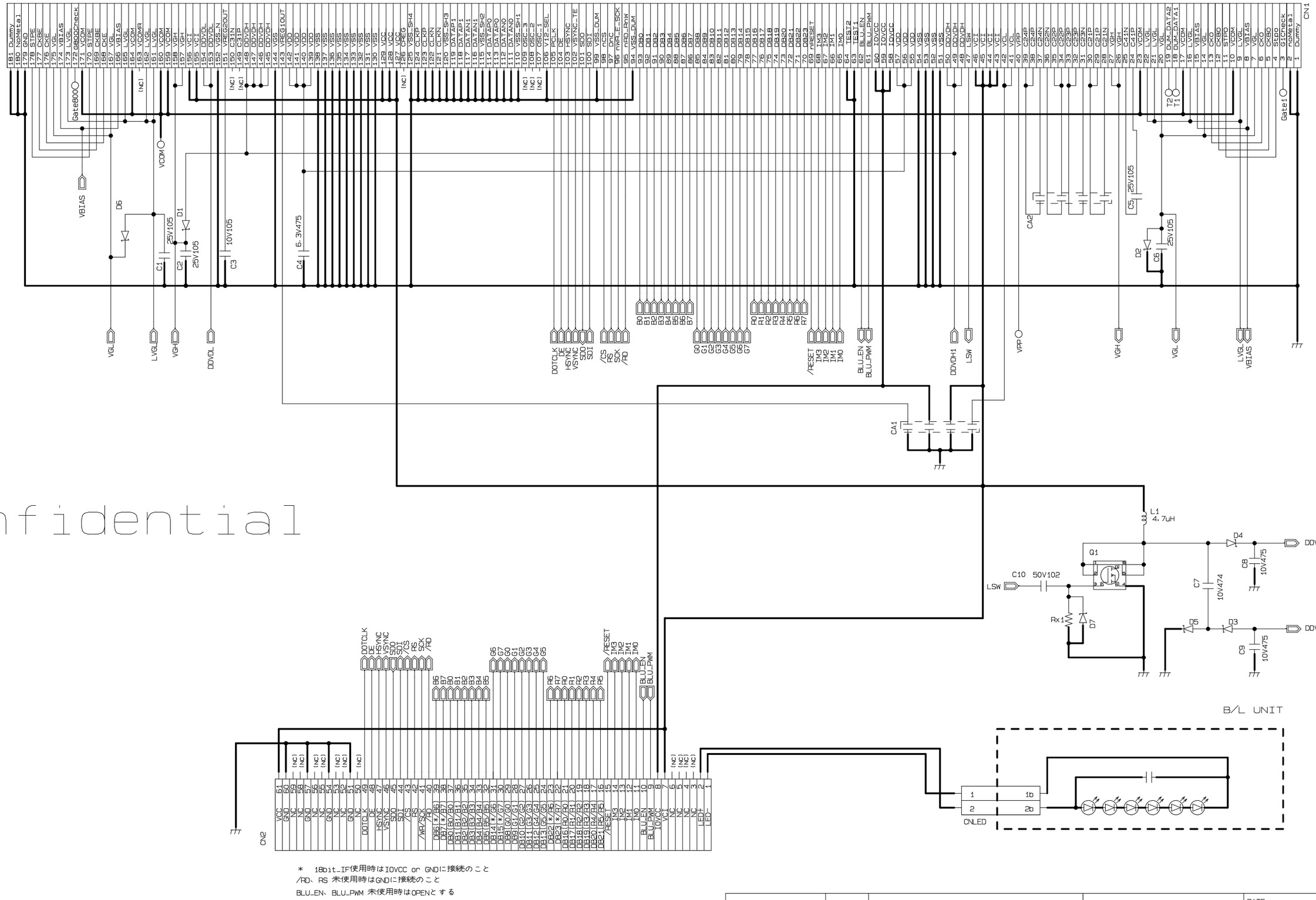
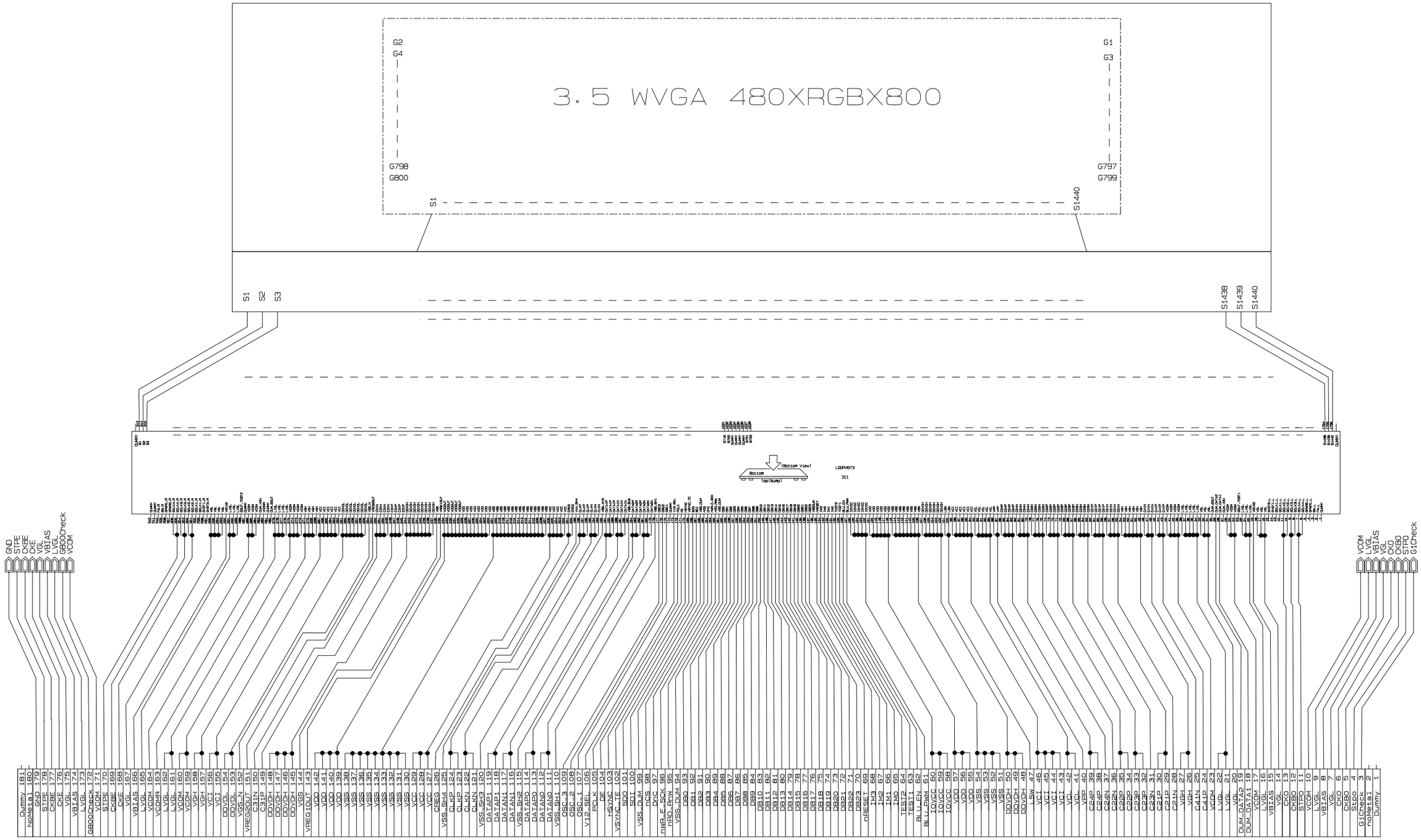


* 18bit_IF使用時はIOVCC or GNDに接続のこと
/RD、RS 未使用時はGNDに接続のこと
BLU_EN、BLU_PWM 未使用時はOPENとする

					DATE	2010.6.18
ST10-144	1	Setup for massproduction			CAL.	35WVFOH-O
ST10-019	a	Setup for sample				
CHIEF	LEADER	DESIGNED	DRAWIN	CHECKED	TITLE CIRCUIT DIAGRAM(FPC)	REV. 1
M. Seimiya	K. Tanigawa	M. Kuwahara	M. Kuwahara	K. Tanigawa	DRAWING NO. 35WVFOH-O 6A	PAGE 4
					Seiko Instruments Inc.	

HISTORY

ST10-019 a 35WVFOHZO	2009.12.25	Setup for sample
ST10-144 1 35WVFOH-O	2010. 6.18	Setup for massproduction



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						DATE 2010. 6. 18
ST10-144	1	Setup for massproduction				CAL. 35WVF0H-0
ST10-019	a	Setup for sample				
CHIEF	LEADER	DESIGNED	DRAWIN	CHECKED	TITLE CIRCUIT DIAGRAM(LCD)	REV. 1
M. Seimiya	K. Tanigawa	M. Kuwahara	M. Kuwahara	K. Tanigawa	DRAWING NO. 35WVF0H-0 6B	PAGE 5
					Seiko Instruments Inc.	

HISTORY

ST10-019 a 35WVF0HZ0 2010. 1. 15 Setup for sample

ST10-144 1 35WVF0H-0 2010. 6. 18 Setup for massproduction