SPECIFICATIONS

LCD Module Graphic 128 x 088 Dots
Reflective extended Temperature I2C

SD12888-FRE-06-00A

Version March 2011

REVISION RECORD (MODEL NO.: SD12888-FRE-06-00A)

Revision	Revision Date	Page	Contents
A	2011/03/03		Initial Release and Issue Full Specification.

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| MODEL | SD12888-FRE-06-00A | | PRODUCT SPECIFICATIONS | |

1. FEATURES

The features of LCD are as follows

* Display mode : FSTN, Positive, Reflective

* Color : Display dot : Black

 Background: White

* Display Format : 128 X 88 Dots

* IC : UltraChip UC1617S

* Interface Input Data : **2-Wire I^{2}C**

* Driving Method : 1/88 Duty, 1/10 Bias

* Viewing Direction : 6 O'clock

* Backlight : N / A

* LCM technological conditions: **RoHS**

2. MECHANICAL SPECIFICATIONS

Item	Specification	Unit
Module Size	46.7(W) x 83.46(H) x 2.1(T)	mm
Viewing Area	42.7MIN(W) x 32.46MIN(H)	mm
Effective Display Area	39.025(W) x 29.465(H)	mm
Character Font	128 x 88 Dots	-
Dot Size	0.29(W) X 0.32(H)	mm
Dot Pitch	0.305(W) X 0.335(H)	mm

3. ELECTRICAL SPECIFICATIONS

3-1. Absolute Maximum Ratings (Vss=0V)

Item	Symbol	Standard Value			Unit
		Min.	Typ.	Max.	
Supply Voltage For Logic	$V_{DD}-V_{SS}$	-0.3	-	+4.0	V
Supply Voltage For LCD Drive	V_0-V_{ss}	-0.3	-	+19.8	V
Input Voltage	V_{IN}	-0.4	-	V_{DD}+0.5	V
Operating Temp.	T_{OP}	-20	-	+70	°C
Storage Temp.	T_{ST}	-30	-	+80	°C

3. ELECTRICAL SPECIFICATIONS (Continued)

3-2. Electrical Characteristics (Vss=0V)

Item		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage		$V_{DD} - V_{SS}$	Ta=0~ 50°C	2.6	3.3	3.45	V
LCD Positive Drive Voltage (Recommended Voltage)		$V_{OP}=V_0-V_{SS}$	Ta=25°C	13.2	13.5	13.8	V
Input Voltage	"H" Level	V_{IH}	V_{DD}=3.3V±5%	-	-	$0.2V_{DD}$	V
	"L" Level	V_{IL}		0.8 V_{DD}	-	-	V
Output Voltage	"H" Level	V_{OH}	V_{DD}=3.3V±5%	-	-	$0.2V_{DD}$	V
	"L" Level	V_{OL}		0.8 V_{DD}	-	-	V
Current Consumption		IDD	V_{DD}-V_{SS}=3.3V	-	2.1	3.0	mA

NOTE: 1) Duty Ratio=1/88, Bias Ratio=1/10

2) Measuring in Dots ON-state

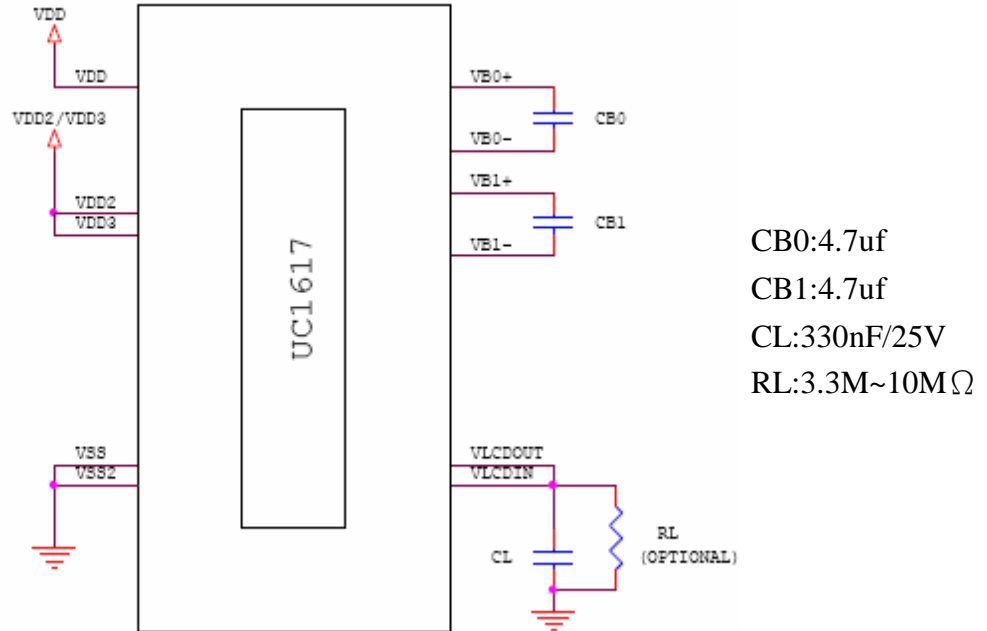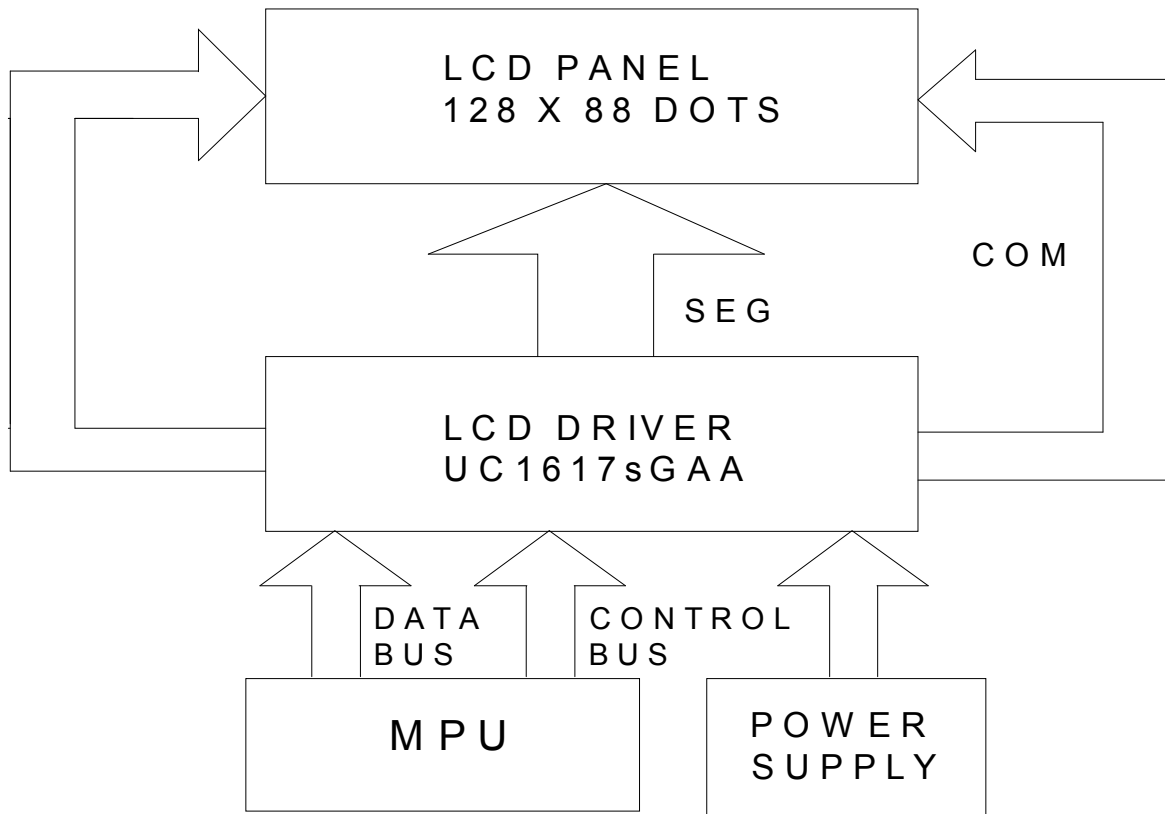| MODEL | SD12888-FRE-06-00A | | PRODUCT SPECIFICATIONS | |

4. POWER SUPPLY AND BLOCK DIAGRAM

4-1.Power Supply

CB0:4.7uf
CB1:4.7uf
CL:330nF/25V
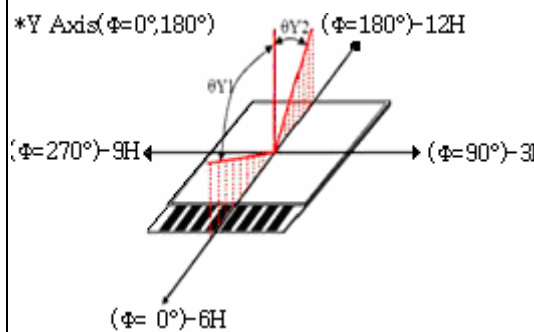RL:3.3M~10MΩ

4-2.Block Diagram

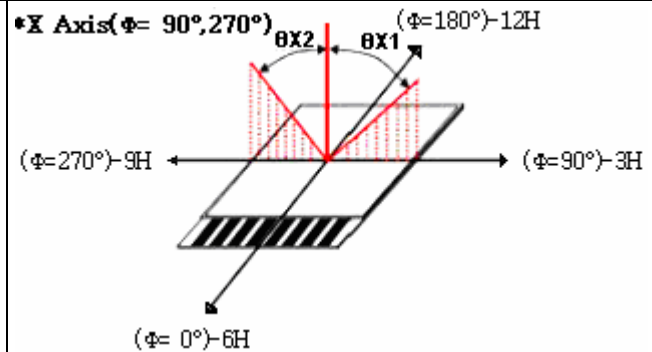| MODEL | SD12888-FRE-06-00A | | PRODUCT SPECIFICATIONS | |

5. ELECTRO – OPTICAL CHARACTERISTICS

Item		Symbol	Temp.	Min.	Typ.	Max.	Unit	Conditions	Note
Viewing Angle Cr$\geq$2	Φ=0°	Θ1	25℃	--	35	--	Deg.	-	1,2
	Φ=180°	Θ2		--	33	--			
	Φ=90°	Θ3		--	33	--			
	Φ=270°	Θ4		--	35	--			
Viewing Direction		6 O'clock							
Contrast Ratio		Cr	25℃	2.0	5.68	6.13	-	Θ=0° Φ=0°	3
Response Time(rise)		Tr	25℃	-	141	250	ms	Θ=0° Φ=0°	4
			0℃	-	950	1150			
Response Time(fall)		Tf	25℃	-	198	250	ms	Θ=0° Φ=0°	4
			0℃	-	950	1150			

Note1. Definition of Angle ΘY1&ΘY2	Note2. Definition of Viewing Angle ΘX1&ΘX2
*Y Axis(Φ=0°,180°) θY2 (Φ=180°)-12H θY1 (Φ=270°)-9H (Φ=90°)-3H (Φ=0°)-6H	•X Axis(Φ= 90°,270°) θX2 θX1 (Φ=180°)-12H (Φ=270°)-9H (Φ=90°)-3H (Φ= 0°)-6H
Note3. Definition of Contrast Cr	Note4. Definition of Optical Response
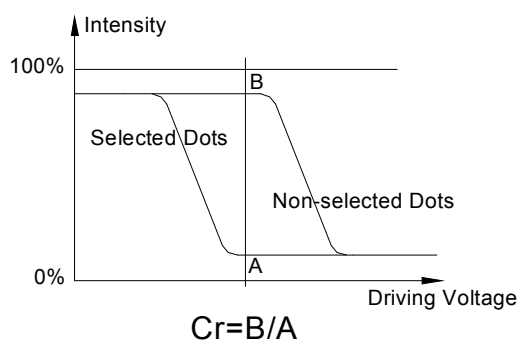
Note3 figure:
Intensity
100%
B
Selected Dots
Non-selected Dots
A
0%
Driving Voltage
Cr=B/A

Note4 figure:
Voltage Wave Form
Luminance
OFF | ON | OFF
90%
10%
Tr   Tf   T
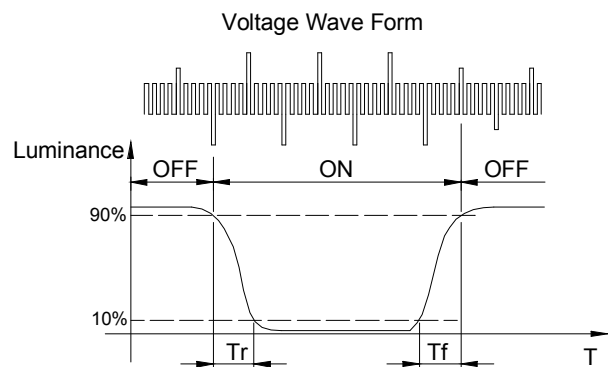
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6. PIN FUNCTION

| Pin NO.	Symbol	I / O	Functions
1	SCK (D0)	I/O	In serial modes, connect D[0] to SCK, D[3] to SDA.
2	SDA (D3)	I/O	
3	RST	I	When RST="L" all control registers are re-initialized by their default states Since UC1617 has built-in Power-ON Reset and Software Reset command , RST pin is not required for proper chip operation. An RC Filter has been included on-chip .There is on need for external RC noise filter. When RST is not used, connect the pin to VDD.
4	TST4	I / HV	Test control. This pin has on-chip pull-up resistor. Leave it open during normal operation.
5	VSS	GND	Ground. Connect V_{SS} and V_{SS2} to the shared GND pin Minimize the trace resistance for is node
6	VDD	PWR	V_{DD} is the digital power supply and it should be connected to a voltage source that is no higher than V_{DD2}/V_{DD3}.V_{DD2}/V_{DD3} is the analog power supply and it should be connected to the same power source.
7	VB0+	PWR	LCD Bias Voltages. These are the voltage sources to provide SEG driving currents . These voltages are generated internally .Connect capacitors of C_{BX} value between V_{BX} +and V_{BXL}. The resistance of these traces directly affects the driving strength of SEG electrodes and impacts the image of the LCD Module. Minimize the trace resistance is critical in achieving high quality image.
8	VB1+		
9	VB1-		
10	VB0-		
11	VLCD	PWR	High voltage LCD Power Supply .Connect these pins together By-pass capacitor C_L is optional .It can be connected between V_{LCD} and V_{SS}. When C_L is used, keep the trace resistance under 50Ω

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7.AC CHARACTERISTICS

Serial bus timing characteristics (for I²C)
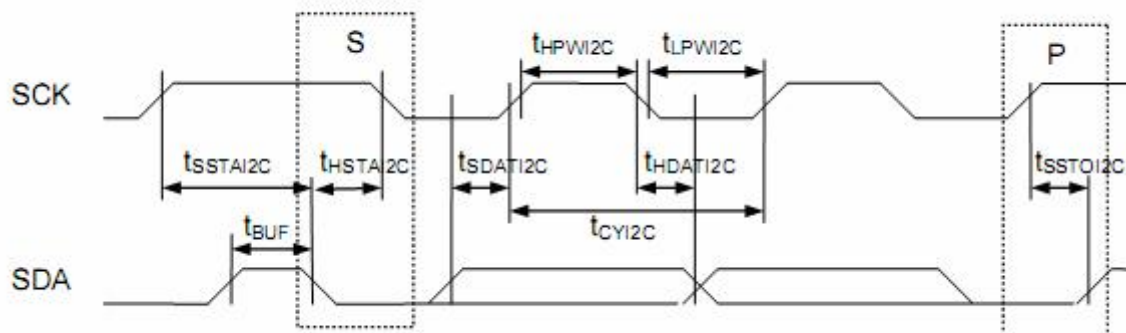
(2.5V ≤ V$_{DD}$ < 3.465V, Ta= −30 to +85°C)

Symbol	Signal	Description	Condition	Min.	Max.	Units
t$_{CYI2C}$		SCK cycle time (read) (write)	tr+tf ≤ 100nS	580 275	–	nS
t$_{LPWI2C}$	SCK	Low pulse width (read) (write)		290 137	–	nS
t$_{HPWI2C}$		High pulse width (read) (write)		290 137	–	nS
tr, tf		Rise time and fall time		–	–	nS
t$_{SSDAI2C}$		Data setup time		28	–	nS
t$_{HDAI2C}$		Data hold time		11	–	nS
t$_{SSTAI2C}$	SCK SDA	START Setup time		28	–	nS
t$_{HSTAI2C}$		START Hold time		28	–	nS
t$_{SSTOI2C}$		STOP setup time		28	–	nS
T$_{BUF}$		Bus Free time between STOP and START condition		165	–	nS

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8.COMMAND LIST

The following is a list of host commands supported by UC1617

C/S: 0: control   1:Data

W/R: 0: Write Cycle   1:Read Cycle

\#   Useful Data bits

-     Don't Care

	Command	C/D	W/R	D7	D6	D5	D4	D3	D2	D1	D0	Active	Default
1	Write Data Byte	1	0	#	#	#	#	#	#	#	#	Write 1 byte	N/A
2	Read Data Byte	1	1	#	#	#	#	#	#	#	#	Read 1 byte	N/A
3	Get Status	0	1	1	MX	MY	WA	DE	WS	MD	MS	Get{ Status, Ver, PMO, Product Code, PID,MID}	N/A
				Ver			PMO[5:0]						
				Product Code				PID		MID			
4	Set Page_ C Address	0	0	0	0	0	#	#	#	#	#	Set CA [4:0]	0H
5	Set Temp. Compensation	0	0	0	0	1	0	0	1	#	#	Set TC [1:0]	00b
6	Set Panel Loading	0	0	0	0	1	0	1	0	#	#	Set PC[1:0]}	10b
7	Set Pump Control	0	0	0	0	1	0	1	1	#	#	Set PC [3:2]	11b
8	Set Adv. Product Control (double-byte command)	0	0	0	0	1	1	0	0	R	R	Set APC[R][7:0], R=0,1,or 2	N/A
		0	0	#	#	#	#	#	#	#	#		
9	Set Scroll Line LSB	0	0	0	1	0	0	#	#	#	#	Set SL [3:0]	0H
	Set Scroll Line MSB	0	0	0	1	0	1	-	#	#	#	Set SL [6:4]	0H
10	Set Row Address LSB	0	0	0	1	1	0	#	#	#	#	Set RA[3:0]	00H
	Set Row Address MSB	0	0	0	1	1	1	-	#	#	#	Set RA[6:4]	00H
11	Set VBIAS Potentiometer (Double-byte command)	0 0	0 0	1 #	0 #	0 #	0 #	0 #	0 #	0 #	1 #	Set PM [7:0]	4EH
12	Set Partial Display Control	0	0	1	0	0	0	0	1	#	#	Set LC[9:8]	00b: Disable
13	Set RAM Address Control	0	0	1	0	0	0	1	#	#	#	Set AC [2:0]	001b
14	Set Fixed Lines	0	0	1 #	0 #	0 #	1 #	0 #	0 #	0 #	0 #	Set {FLT,FLB}	0
15	Set Lines Rate	0	0	1	0	1	0	0	0	#	#	Set LC[4:3]	00b
16	Set All-Pixel-ON	0	0	1	0	1	0	0	1	0	#	Set DC [1]	0b
17	Set Inverse Display	0	0	1	0	1	0	0	1	1	#	Set DC [0]	0b
18	Set Display Enable	0	0	1	0	1	0	1	1	#	#	Set DC [3:2]	10b
19	Set LCD Mapping Control	0	0	1	1	0	0	0	#	#	#	Set LC[2:0]	000b

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	Command	C/D	W/R	D7	D6	D5	D4	D3	D2	D1	D0	Active	Default
20	Set N-Line Inversion	0	0	1 -	1 -	0 -	0 -	1 #	0 #	0 #	0 #	Set NIV[3:0]	6H
21	Set LCD Gray Shade	0	0	1	1	0	1	0	#	#	#	Set LC [7:5]	001b
22	System Rest	0	0	1	1	1	0	0	0	1	0	System Rest	N/A
23	NOP	0	0	1	1	1	0	0	0	1	1	No operation	N/A
24	Set Test Control (double byte command)	0 0	0 0	1 #	1 #	1 #	0 #	0 #	1 #	TT #	 #	For testing only. Do not use,	N/A
25	Set LCD Bias Ration	0	0	1	1	1	0	1	0	#	#	Set BR[1:0]	11b:11
26	Rest Cursor Update Mode	0	0	1	1	1	0	1	1	1	0	AC[3]=0,CA=CR	AC[3]=0
27	Set Cursor Update Mode	0	0	1	1	1	0	1	1	1	1	AC[3]=1,CR=CA	AC[3]=1
28	Set COM End	0 0	0 0	1 -	1 #	1 #	1 #	0 #	0 #	0 #	1 #	Set CEN[6:0]	127
29	Set Partial Display Start	0 0	0 0	1 -	1 #	1 #	1 #	0 #	0 #	1 #	0 #	Set DST[6:0]	0
30	Set Partial Display End	0 0	0 0	1 -	1 #	1 #	1 #	0 #	0 #	1 #	1 #	Set DEN[6:0]	127
31	Set Window Program Starting Page_ C Address	0 0	0 0	1 -	1 -	1 -	1 #	0 #	1 #	0 #	0 #	Set WPC0[4:0]	0
32	Set Window Programming Starting Row Address	0 0	0 0	1 -	1 #	1 #	1 #	0 #	1 #	0 #	1 #	Set WPC0[6:0]	0
33	Set Window Programming Ending Page _C Address	0 0	0 0	1 -	1 -	1 -	1 #	0 #	1 #	1 #	0 #	Set WPC1[4:0]	31
34	Set Window Programming Ending Row Address	0 0	0 0	1 -	1 #	1 #	1 #	0 #	1 #	1 #	1 #	Set WPP1[6:0]	127
35	Enable window program	0	0	1	1	1	1	1	0	0	#	Set AC[4]	0:Display
36	Set MTP operation control	0 0	0 0	1 -	0 -	1 #	1 #	1 #	0 #	0 #	0 #	Set MTPC[5:0]	10H
37	Set MTP write Mask	0 0	0 0	1 #	0 #	1 #	1 #	1 #	0 #	0 #	1 #	Set MTPM[7:0]	0
38	Set V$_{MTP1}$ Potentiometer	0 0	0 0	1 #	1 #	1 #	1 #	0 #	1 #	0 #	0 #	Shared with Window Programming commands	N/A
39	Set V$_{MTP2}$ Potentiometer	0 0	0 0	1 #	1 #	1 #	1 #	0 #	1 #	0 #	1 #		
40	Set MTP Write Timer	0 0	0 0	1 #	1 #	1 #	1 #	0 #	1 #	1 #	0 #		
41	Set MTP Read Timer	0 0	0 0	1 #	1 #	1 #	1 #	0 #	1 #	1 #	1 #		

9. QUALITY SPECIFICATIONS

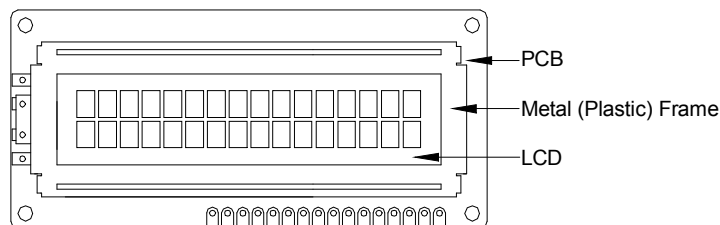9 - 1. LCM Appearance and Electric inspection Condition

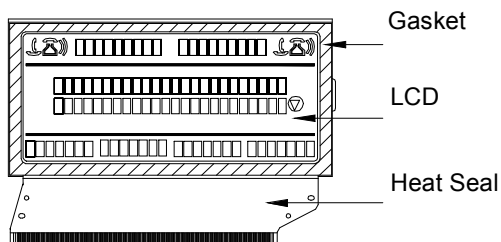   1. Inspection will be done by placing LCM 30cm away from inspector's eyeballs under normal illumination.
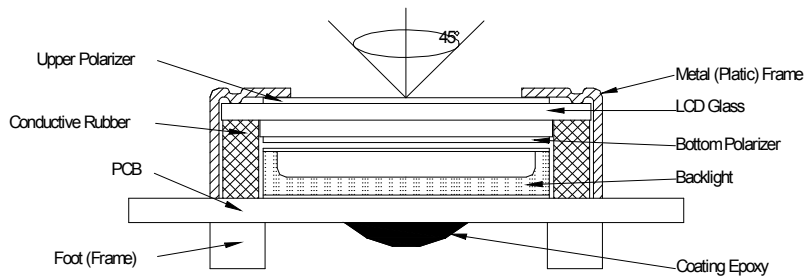
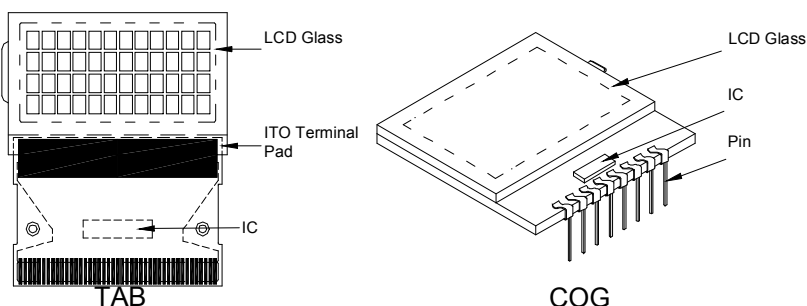   2. View Angle: with in 45°around perpendicular line.

9 - 2. Definition

   1. COB

   2. Heat Seal

   3. TAB and COG

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9. QUALITY SPECIFICATIONS (Continued)

9-3. Sampling Plan and Acceptance

1. Sampling Plan

MIL - STD - 105E (‖) ordinary single inspection is used.

2. Acceptance

Major defect: AQL = 0.25
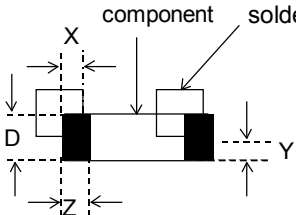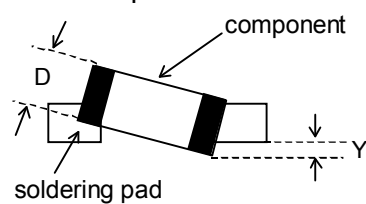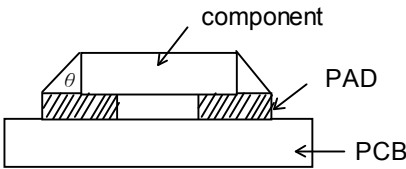
Minor defect: AQL = 0.65

9-4. Criteria

1. COB

Defect	Inspection Item	Inspection Standards	
Major	PCB copper flakes peeling off	Any copper flake in viewing Area should be greater than $1.0mm^2$	Reject
Major	Height of coating epoxy	Exceed the dimension of drawing	Reject
Major	Void or hole of coating epoxy	Expose bonding wire or IC	Reject
Major	PCB cutting defect	Exceed the dimension of drawing	Reject

2. SMT

Defect	Inspection Item	Inspection Standards	
Minor	Component marking not readable		Reject
Minor	Component height	Exceed the dimension Of drawing	Reject
Major	Component solder defect (missing , extra, wrong component or wrong orientation		Reject
Minor	Component position shift	$X < 3/4Z$ $Y > 1/3D$	Reject Reject
Minor	Component tilt	$Y > 1/3D$	Reject
Minor	Insufficient solder	$\theta \leq 20°$	Reject

9. QUALITY SECIFICATIONS (Continued)

9-4. Criteria (Continued)

3. Metal (Plastic) Frame

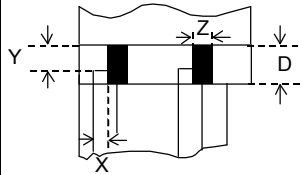| Defect	Inspection Item	Inspection Standards		
Major	Crack / breakage	Anywhere		Reject
Minor	Frame Scratch	W	L	Acceptable of Scratch
		w<0.1mm	Any	Ignore
		0.1≤w<0.2mm	L≤5.0mm	2
		0.2≤w<0.3mm	L≤3.0mm	1
		w≥0.3mm	Any	0
		Note : 1. Above criteria applicable to scratch lines with distance greater than 5mm. 2. Scratch on the back side of frame (not visible) can be ignored .		
Minor	Frame Dent , Prick $\Phi = \dfrac{L + W}{2}$			Acceptable of Dents / Pricks
		$\Phi \le 1.0mm$		2
		$1.0 < \Phi \le 1.5mm$		1
		$1.5mm < \Phi$		0
		Note : 1. Above criteria applicable to any two dents / pricks with distance greater than 5mm 2. Dent / prick on the back side of frame (not visible) can be ignored		
Minor	Frame Deformation	Exceed the dimension of drawing		
Minor	Metal Frame Oxidation	Any rust		

4. Flexible Film Connector (FFC)

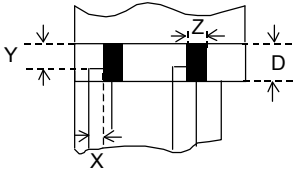| Defect	Inspection Item		Inspection Standards	
Minor	Tilted soldering		Within the angle +5°	Acceptable
Minor	Uneven solder joint /bump			Reject
Minor	Hole	$\Phi = \dfrac{L + W}{2}$	Expose the conductive line	Reject
			$\Phi > 1.0mm$	Reject
Minor	Position shift		$Y > 1/3D$	Reject
			$X > 1/2Z$	Reject

9. QUALITY SPECIFICATIONS (Continued)

9-4. Criteria (Continued)

5. Screw

Defect	Inspection Item	Inspection Standards	
Major	Screw missing/loosen		Reject
Minor	Screw oxidation	Any rust	Reject
Minor	Screw deformation	Difficult to accept screw driver	Reject

6. Heat seal 、TCP 、FPC

Defect	Inspection Item		Inspection Standards	
Major	Scratch expose conductive layer			Reject
Minor	HS Hole	$\Phi = \dfrac{L+W}{2}$	$\Phi > 0.5mm$	Reject
Major	Adhesion strength		Less than the specification	Reject
Minor	Position shift		$Y > 1/3D$	Reject
			$X > 1/2Z$	Reject
Major	Conductive line break			Reject

7. LED Backing Protective Film and Others

Defect	Inspection Item	Inspection Standards	
Minor	LED dirty, prick	Acceptable number of units	
		$\Phi \leq 0.10mm$	Ignore
		$0.10 < \Phi \leq 0.15mm$	2
		$0.15 < \Phi \leq 0.2mm$	1
		$\Phi > 0.2mm$	0
		The distance between any two spots should be $\geq 5mm$ Any spot/dot/void outside of viewing area is acceptable	
Minor	Protective film tilt	Not fully cover LCD	Reject
Major	COG coating	Not fully cover ITO circuit	Reject

8. Electric Inspection

Defect	Inspection Item	Inspection Standards	
Major	Short		Reject
Major	Open		Reject

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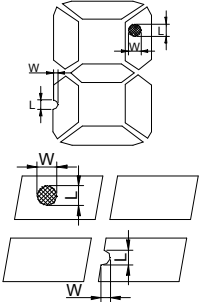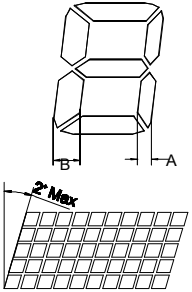
9. QUALITY SPECIFICATIONS (Continued)

9-4. Criteria (Continued)

9. Inspection Specification of LCD

Defect	Inspect Item		Inspection Standards			
Minor	Linear Defect	∗ Glass Scratch ∗ Polarizer Scratch ∗ Fiber and Linear material	W	W≤0.03	0.03<W≤0.05	W>0.05
			L	L<5	L<3	Any
			ACC. NO.	1	1	Reject
			Note	L is the length and W is the width of the defect		
Minor	Black Spot and Polarizer Pricked	∗ Foreign material between glass and polarizer or glass and glass ∗ Polarizer hole or protuberance by external force	Φ	Φ≤0.1	0.1<Φ≤0.15	0.15<Φ≤0.2	Φ>0.2
			ACC. NO.	3EA / 100mm²	2	1	0
			Note	Φ is the average diameter of the defect. Distance between two defects > 10mm.			
Minor	White Spot and Bubble in polarizer	∗ Unobvious transparant foreign material between glass and glass or glass and polarizer ∗ Air protuberance between polarizer and glass	Φ	Φ≤0.3	0.3<Φ≤0.5	0.5<Φ
			ACC. NO.	3EA / 100mm²	1	0
			Note	Φ is the average diameter of the defect. Distance between two defects > 10mm.		

Defect	Inspect Item		Inspection Standards				
Minor	Segment Defect		Φ	Φ≤0.10	0.10<Φ≤0.20	0.20<Φ≤0.25	Φ>0.25
			ACC. NO.	3EA / 100mm²	2	1	0
			Note	W is more than 1/2 segment width			Reject
				$\Phi = \dfrac{L + W}{2}$ Distance between two defect is 10mm			

Defect	Inspect Item		Inspection Standards				
Minor	Protuberant Segment	 Φ = (L + W) / 2	Φ	Φ≤0.10	0.10<Φ≤0.20	0.20<Φ≤0.25	Φ>0.25
			W	Glue	W≤1/2 Seg W≤0.2	W≤1/2 Seg W≤0.2	Ignore
			ACC. NO.	3EA / 100mm²	2	1	0

Defect	Inspect Item		Inspection Standards			
Minor	Assembly Mis-alignment		1. Segment			
			B	B≤0.4mm	0.4<B≤1.0mm	B>1.0mm
			B-A	B-A<1/2B	B-A<0.2	B-A<0.25
			Judge	Acceptable	Acceptable	Acceptable
			2. Dot Matrix			
			Deformation>2°			Reject
Minor	Stain on LCD Panel Surface		Accept when stains can be wiped lightly with a soft cloth or a similar one. Otherwise, judged according to the above items: "Black spot" and "White Spot"			

MODEL	SD12888-FRE-06-00A	PRODUCT SPECIFICATIONS	

10. RELIABILITY

NO.	Item	Condition	Criterion
1	High Temperature Operating	70℃, 96Hrs	No defect in cosmetic and operational function allowable. Total current Consumption should be below double of initial value.
2	Low Temperature Operating	-20℃, 96Hrs	
3	High Humidity	60℃, 90%RH, 96Hrs	
4	High Temperature Storage	80℃, 96Hrs	
5	Low Temperature Storage	-30℃, 96Hrs	
6	Vibration	Random wave 10 ~ 100Hz Acceleration: 2G **60 Minute**	
7	Thermal Shock	0℃ to 25℃ to 50℃ (60Min) (15Min) (60Min) 10Cycles	
8	ESD Testing	Contract Discharge Voltage: +1 ~ 8kV and –1 ~ –8kV Air Discharge Voltage: +1 ~ 10kV and –1 ~ -10kV	There will be discharged ten times at every discharging voltage cycle. The voltage gap is 1kV.

Note: 1) Above conditions are suitable for Swissdis standard products.

2) For restrict products, the test conditions listed as above must be revised.

11. HANDLING PRECAUTIONS

(1) Mounting Method

The panel of the LCD Module consists of two thin glass plates with polarizers which easily get damaged since the Module is fixed by utilizing fitting holes in the printed circuit board. Extreme care should be taken when handling the LCD Modules.

(2) Caution of LCD handling & cleaning

When cleaning the display surface, use soft cloth with solvent (recommended below) and wipe lightly.

- Isopropyl alcohol

- Ethyl alcohol

- Trichlorotrifloroethane

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water

- Ketone

- Aromatics

(3) Caution against static charge

The LCD Module use C-MOS LSI drivers, so we recommend that you connect any unused input terminal to VDD or VSS, do not input any signals before power is turned on. And ground your body, Work/assembly table. And assembly equipment to protect against static electricity.

(4) Packaging

- Modules use LCD elements, and must be treated as such. Avoid intense shock and falls from a height.

- To prevent modules from degradation. Do not operate or store them exposed directly to sunshine or high temperature/humidity.

(5) Caution for operation

- It is indispensable to drive LCD's within the specified voltage limit since the higher voltage than the limit shorten LCD life. An electrochemical reaction due to direct current causes LCD deterioration, Avoid the use of direct current drive.

| MODEL | SD12888-FRE-06-00A | | PRODUCT SPECIFICATIONS | |

11. HANDLING PRECAUTIONS (Continued)

- Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show dark color in them.

However those phenomena do not mean malfunction or out of order with LCD's. Which will come back in the specified operating temperature range.

- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the relative condition of 40°C, 80%RH or less is required.

(6) Storage

In the case of storing for a long period of time (for instance ,for years) for the purpose or replacement use, The following ways are recommended.

- Storage in a polyethylene bag with sealed so as not to enter fresh air outside in it, And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light is. Keeping temperature in the specified storage temperature range.
- Storing with no touch on polarizer surface by the anything else. (It is recommended to store them as they have been contained in the inner container at the time of delivery)

(7) Safety

- It is recommendable to crash damaged or unnecessary LCD into pieces and wash off liquid crystal by using solvents such as acetone and ethanol.

Which should be burned up later.

- When any liquid crystal leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water.

| MODEL | SD12888-FRE-06-00A | | PRODUCT SPECIFICATIONS | |

12. OUTLINE DIMENSION

PIN FUNCTION

NO.	SYMBOL
1	SCK(D0)
2	SDA(D3)
3	RST
4	TST4
5	VSS
6	VDD
7	VB0+
8	VB1+
9	VB1-
10	VB0-
11	VLCD

REVISION RECORD

REV		DATE	APPROVED	NAME
	A TO B CHANGE THE LCD/V.A/A.A WIDTH			
	B TO C CHANGE THE LCD WIDTH			

PANEL 128*88

COM128
COM42
SEG128S
UC1617S
LAYOUT
SEG1
COM41
COM127
CONTACT SIDE (Au plating)
STIFFENER
PROTECT TAPE
SILICONE
UV
BACK
FRONT

2.1MAX.
0.7±0.07
0.7±0.07
4-0.5±0.5
0.3±0.05

43.66
35.46
32.46 V.A.(min.)
29.465 A.A.
1.5
3
39.8±0.5

46.7
42.7 V.A.(min.)
39.025 A.A.
1MAX.

DOTS 128*88
6 O'CLOCK VIEWING DIRECTION

12.7325MIN. 10MAX.

P0.5*(11-1)=5(W:0.3±0.05)
1
11
6
4±0.5
6±1

DOT DETAIL SCALE 10X
0.305
0.29
0.32
0.335

NOTES:
1. DISPLAY TYPE:FSTN
2. VIEWING DIRECTION:6 O'CLOCK
3. POLARIZER MODE: REFLECTIVE/POSITIVE
4. DRIVE METHOD:1/88 DUTY 1/10 BIAS
5. LCD DRIVE VOLTAGE:13.5V
6. LOGIC POWER SUPPLY VOLTAGE:3.3V
7. OPERATING TEMP:-20° C-+70° C
8. STORAGE TEMP:-30° C-+80° C
9. DRIVER/CONTROLLER IC:UC1617S
10. CONNECTION TYPE:FPC
11. MCU INTERFACE:IIC(A2:A3=0:0)
12. OTHER TOLERANCE:± 0.2

TOLERANCE ±0.2
MATERIAL
FINISH
MODEL NAME
UNIT mm
NO. 1/1
TITLE
VERSION C
SCALE
DRAWN
FILE NAME
APPROVED CHECKED
DATE 2011.01.12
APPROVED
???

SGD®
Display the World

MODEL	SD12888-FRE-06-00A		PRODUCT SPECIFICATIONS

SAMPLE OUTGOING INSPECTION REPORT (LCM)

Customer	Product NO.	Driving Voltage	Testing Condition	Quantity
Swissdis	SD12888-FRE-06-00A	V_{OP} = 13.5V	25 ℃	

Inspection Result

Items	Specification			
Display Mode	●W / B Mode ○B / W Mode	○ Yellow Mode	○ Blue Mode	○ Gray Mode
Polarizer Type	● Reflective	○Transflective		○Transmissive
Viewing direction	○ 3 O'clock	● 6 O'clock	○ 9 O'clock	○ 12 O'clock

Electrical / Appearance

Item	Inspection Method	Specification	Inspection Result	
Appearance	Spot Gauge Caliper	Final Inspection Criteria	● OK	○ NG
Electrical	LCM Tester	Product Specification	● OK	○ NG
Pattern	LCM Tester	Drawing	● OK	○ NG

Dimension / Supply Current

Item	Spec.(mm)	NO.1	NO.2	NO.3	NO.4	NO.5	Result		Fig.
L1	46.7+0.2	46.88	46.80	46.75	46.86	46.81	● OK	○ NG	
L2	6+0.2	5.97	5.93	5.98	5.96	5.91	● OK	○ NG	
W1	43.66+0.2	43.60	43.68	43.70	43.65	43.61	● OK	○ NG	
W2	39.8+0.5	40.13	40.26	40.21	40.16	40.23	● OK	○ NG	
T	2.1mmMAX	1.99	1.99	1.98	1.96	1.98	● OK	○ NG	
IDD	3.0mA MAX	2.10	2.10	2.10	2.10	2.10	● OK	○ NG	

DOTS 128*88
6 O'CLOCK VIEWING DIRECTION

Designed	Joan	Checked	/	Approved	Wallace