

TFT-PCAP-Modul Datenblatt

Modell SCF0403434GGC01

Kurzdaten

Hersteller	Data Image
Diagonale	4,3" / 10,9 cm
Format	wide
Auflösung	480 x 272
Backlight	LED / 375 cd/m ²
Interface	RGB
Touchscreen	ja
Temperatur	-20... +70°C (Betrieb)



DATA IMAGE CORPORATION

TFT Module Specification

Preliminary

ITEM NO.: SCF0403434GGC01

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Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	JACK	JOE	GARY	KEN
Approved by	Version:	Issued Date:	Sheet Code:	Total Pages:
	1	22/MAR/11'		21

3. FEATURE

- 64 gray level with 2 bit dithering function to realize 16M colors

4. GENERAL SPECIFICATIONS

Parameter	Specifications	Unit
Display resolution	480X R.G.B x 272	dot
Active area	99.12(W) x 57.92(H)	mm
Screen size	4.3(Diagonal)	inch
Dot pitch	0.066 x 0.198	mm
Color configuration	R.G.B. Stripe	
Overall dimension	115.1(L)X73.9(W)X5.025(H)	mm
Weight	TBD	g
Surface treatment	Glare	
View Angle direction	6 o'clock	
Our components and processes are compliant to RoHS standard		

5. ELECTRICAL CHARACTERISTICS

GND=0V, Ta=25°C

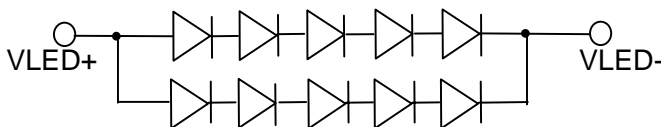
Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage	V _{DD}	3.0	3.3	3.6	V	Note1
Power Supply Current	I _{DD}		15	21.5	mA	V _{DD} =3.3V
"H" level logical input voltage	V _{IH}	0.7V _{DD}	--	V _{DD}	V	
"L" level logical input voltage	V _{IL}	0	--	0.3V _{DD}	V	
"H" level logical Output voltage	V _{OH}	V _{DD} -0.4	--	--	V	
"L" level logical Output voltage	V _{OL}	GND	--	GND+0.4	V	
Operating temperature	Topa	-20	--	70	°C	Ambient temperature
Storage temperature	Tstg	-30	--	80	°C	Ambient temperature

Note1: VDD Absolute Maximum Ratings -0.3V~+4.5V

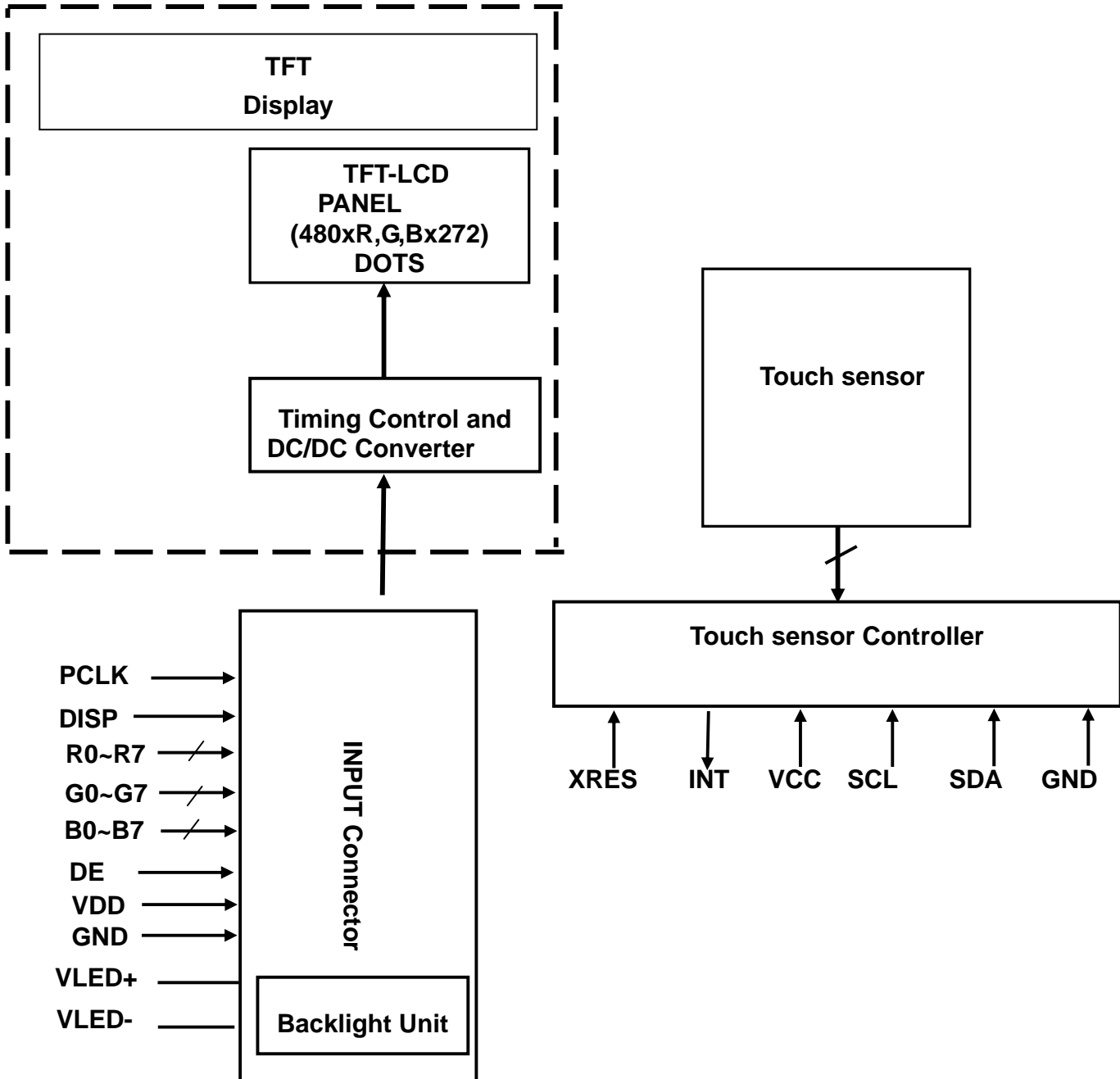
5.1 Backlight driving for power conditions

Ta= 25 °C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I _L	--	40	--	mA	
VLED voltage	V _L	15	16.5	18	V	I _L =40 mA
Power Consumption	P _{LED}	--	660	--	mW	



6. BLOCK DIAGRAM



7. PIN CONNECTIONS

7.1 Input Pins Connection

Pin No	Symbol	Function	Remark
1	VLED-	LED Power Supply Negative	
2	VLED+	LED Power Supply Positive	
3	GND	Ground	
4	VDD	Power Supply : +3.3V	
5	R0	Digital data input. R0 is LSB and R7 is MSB	
6	R1		
7	R2		
8	R3		
9	R4		
10	R5		
11	R6		
12	R7		
13	G0	Digital data input. G0 is LSB and G7 is MSB	
14	G1		
15	G2		
16	G3		
17	G4		
18	G5		
19	G6		
20	G7		
21	B0	Digital data input. B0 is LSB and B7 is MSB	
22	B1		
23	B2		
24	B3		
25	B4		
26	B5		
27	B6		
28	B7		
29	GND	Ground	
30	PCLK	clock signal to sample each data	
31	DISP	Display ON/OFF Control ON=H(VCC), OFF=L(GND)	
32	NC	No Connection	
33	NC	No Connection	
34	DE	Data Enable Control	
35	NC	No Connection	
36	GND	Ground	
37	NC	No Connection	
38	NC	No Connection	
39	NC	No Connection	
40	NC	No Connection	

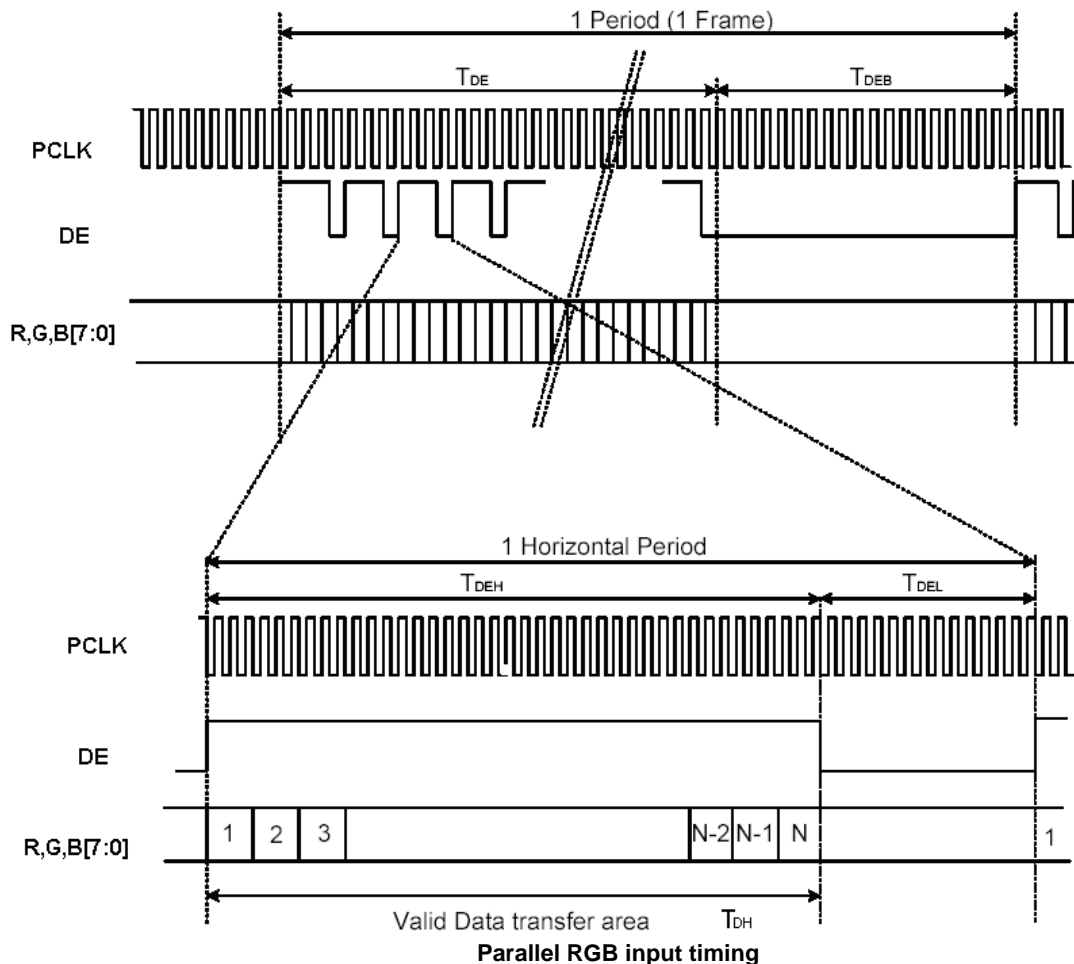
8. AC CHARACTERISTICS

8.1 Input Timing Requirement

(480RGBx272, $T_a = 25^\circ\text{C}$, $V_{DD} = 3.3\text{V}$ $GND = 0\text{V}$)

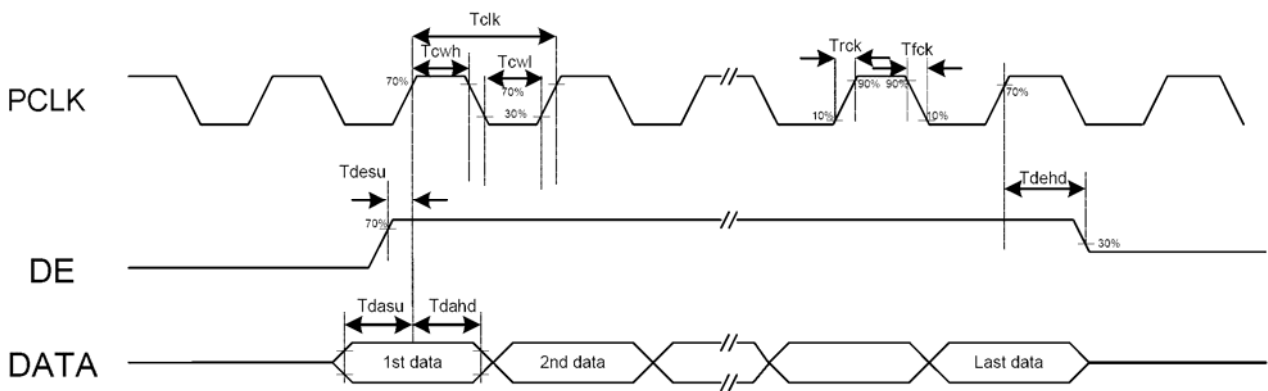
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Clock cycle	$f_{CLK(1)}$	5	9	12	MHz
Horizontal Signal					
Horizontal cycle	th	520	525	800	PCLK
Horizontal display period	thd	480	480	480	PCLK
Horizontal front porch	thfp	4	5	65	PCLK
Horizontal back porch	thbp	36	40	255	PCLK
Vertical Signal					
Vertical cycle	tv	277	288	400	$H_{(1)}$
Vertical display period	tvd	272	272	272	$H_{(1)}$
Vertical front porch	tvf	2	8	93	$H_{(1)}$
Vertical back porch	tvb	3	8	31	$H_{(1)}$

Note: Unit: $\text{CLK} = 1/f_{CLK}$, $H = \text{th}$,



8.2 Clock and Data Input Waveforms

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
PCLK clock low period	Tcwl	40	-	60	%	
PCLK clock high period	Tcwh	40	-	60	%	
Clock rising time	Trck	9	-	-	ns	
Clock falling time	Tfck	9	-	-	ns	
Data setup time	Tdasu	12	-	-	ns	
Data hold time	Tdahd	12	-	-	ns	
DE setup time	Tdesu	12	-	-	ns	
DE hold time	Tdehd	12	-	-	ns	



9. Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time	Tr+Tf	$\theta=0^\circ$	-	25	-	ms	Note 4
Contrast ratio	CR	At optimized viewing angle	--	350	--		Note 5
Viewing angle	Top	CR \geq 10	50	60	-	Deg.	Note 6
	Bottom		60	70	-		
	Left		60	70	-		
	Right		60	70	-		
Luminance of white		$\theta=0^\circ$	300	375	--	cd/m ²	Note 7
Uniformity			70	--		%	Note 8; Note 9
White chromaticity	X	$\theta=0^\circ$	0.313	0.353	0.393		Note 7
	y		0.329	0.369	0.409		

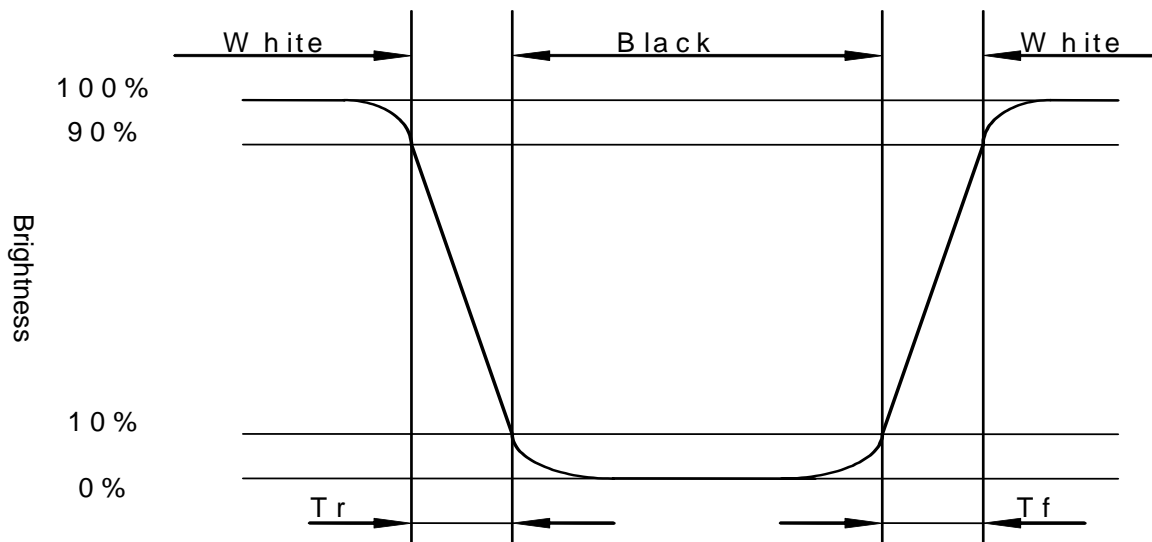
Note 1: Ambient temperature =25°C. LED current I_L= 40mA.

Note 2: To be measured in the dark room.

Note 3: To be measured on the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7A, after 2 minutes operation.

Note 4: Definition of response time:

The output signals of photo-detector are measured when the input signals are changed from “white” to “black”(rising time) and from “black” to “white”(falling time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as shown below.



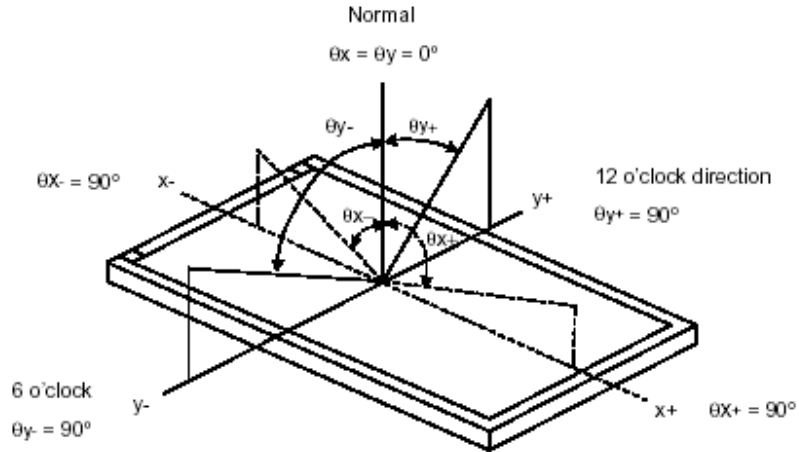
Note5: Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Photo-detector output when LCD is at "White" state}}{\text{Photo-detector output when LCD is at "Black" state}}$$

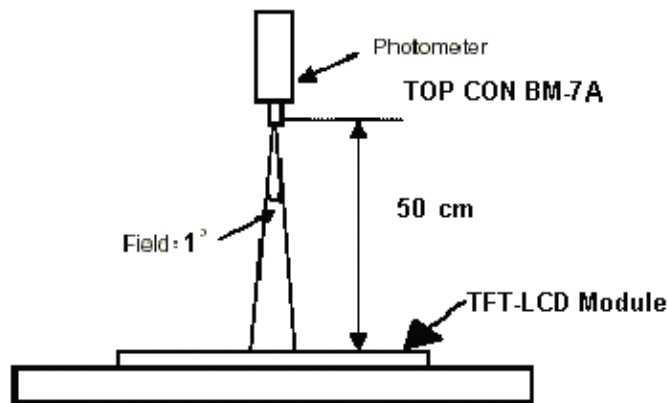
Note 6: Definition of viewing angle:

Refer to figure as below.

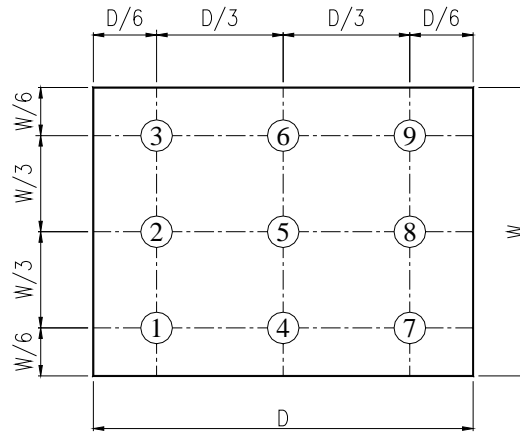


Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 8: The method of optical measurement:



Note 9 Definition of Brightness Uniformity (B-uni):



$$B\text{-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9points}} \quad (\text{Note 9})$$

10. CTP GENERAL SPECIFICAYIONS

10.1 CTP main feature

Item	Specification	Unit
Type	Transparent type projected capacitive touch panel	
Input mode	Human's finger	
Resolution	Up to 2048 x 2048 (Configurable)	
Report rate	40 ~ 100	Points/sec
Response time	25 (typ.)	ms

10.2 CTP Absolute Maximum Rating

Symbol	Description	MIN	TYP	MAX	Unit	Notes
VCC	Supply voltage	-0.5	-	6.0	V	
Vio	DC input voltage	GND-0.5	-	VCC+0.5	V	
Imio	Maximum input current	-25	-	50	mA	
ESD	Electrostatic discharge voltage	T.B.D	-	-	V	

10.3 CTP Electrical Characteristic

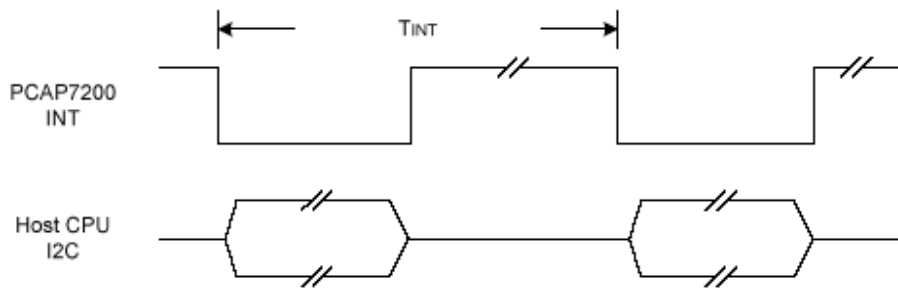
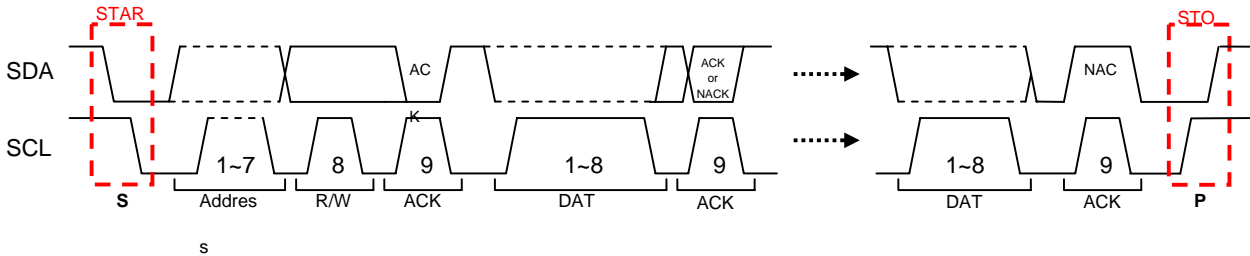
Symbol	Description	MIN	TYP	MAX	Unit	Notes
VCC	Supply voltage	3.0	3.3	3.6	V	

10.4 CTP Pin Connections

No.	Name	I/O	Description
1	GND	P	Ground
2	SDA	I/O	I ² C Data
3	SCL	I	I ² C Clock
4	VCC	P	Power supply Voltage
5	INT	O	Interrupt active low, asserted to request start a new transaction
6	XRES (RST)	I	Active high external reset with internal pull down. Minimum of Pulse Width is 10us

10.5 CTP Interface and Data Format (Slave address is 0x0AH)

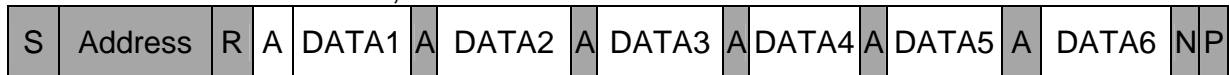
Communication protocol: I²C
 Clock frequency: 100kHz
 Report Rate: 60Hz



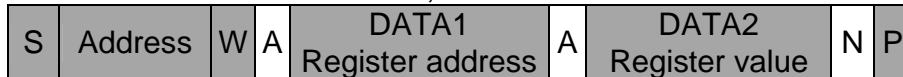
Report rate = 1 / T_{INT}, it depends on properties of touch screen such as resistive value, channel number, thickness and material of cover lens, etc.

10.6 Protocol

Read mode: Master-receiver, slave-transmitter.



Write mode: Master-transmitter, slave-receiver



	From Master to Slave
	From Slave to Master

S	START condition
P	STOP condition
R	Data direction READ (SDA HIGH)
W	Data direction WRITE (SDA LOW)
A	Acknowledge (SDA LOW)
N	Not acknowledge (SDA HIGH)
Address	7-bit (0Ah)
DATA	8-bit

10.7 Report Packet

	MSB							LSB
Byte1	1	Reserved						Status
Byte2	0	0	0	0	A10	A9	A8	A7
Byte3	0	A6	A5	A4	A3	A2	A1	A0
Byte4	0	0	0	0	B10	B9	B8	B7
Byte5	0	B6	B5	B4	B3	B2	B1	B0
Byte6	0	P6	P5	P4	P3	P2	P1	P0

Status: Indicates the touch status: 1 for touch down and 0 for touch up.

A10 – A0: 11 bits of 1st direction raw data

B10 – B0: 11 bits of 2nd direction raw data

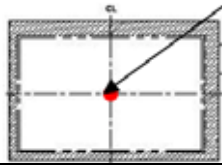
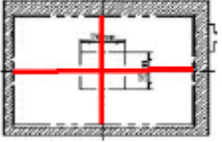
P6 – P0: 7 bits of finger pressure

Please be aware that A and B just represent 2 resolution directions of the touch panel. The reported coordinates are (0~2047, 0~2047), the bottom left is (0, 0).

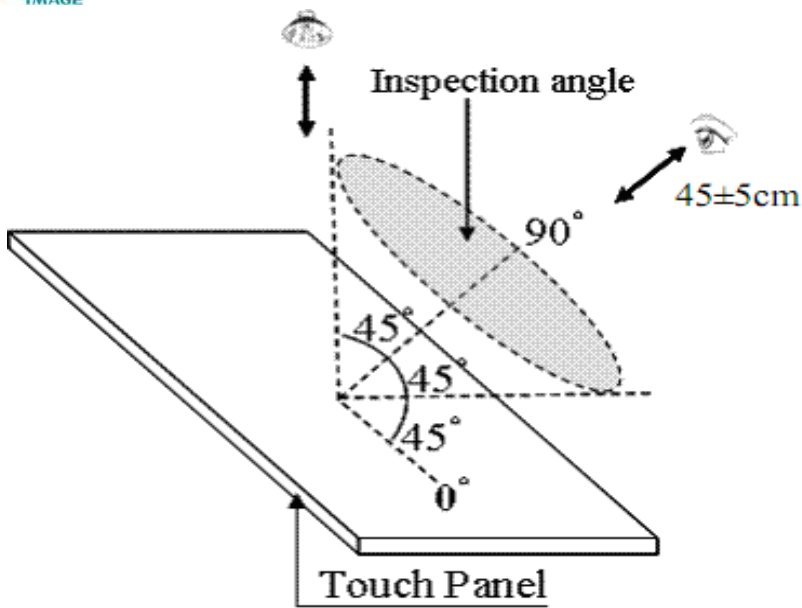
10.8 Operating Mode Register

Register Address	Register Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Default	
0x07	Operating Mode	Wakeup and Sleep									
		0	0	0	0	0	0	0	0	Wakeup / Sleep	0x01
		Single touch and Multi touch gesture									
		0	0	0	1	0	Slide	Rotate	Zoom		0x10
0x07	Operating Mode	Get firmware version									
		0	1	0	0	0	1	0	0		

10.9 CTP Life Test

1	Point hitting life (no contact CTP)	> 1,000,000 ; Use 11mm diameter/copper column to knock on the same point twice per second under system operating.	
2	Line Drawing life (no contact CTP)	> 100,000 ; Use 11mm diameter/copper column to draw straight lines back and forth as the following red lines at the speed of 100mm/sec under system operating.	

11. APPEARANCE SPECIFICATION



11.1 Environment : 22 ± 3 , Inspection distance : 45 ± 5 cm.


11.2 Angle of Visual : $90^\circ \pm 45^\circ$.

11.3 Light illumination: 800 Lux.

11.4 Inspection top side and bottom side view area duration : 5s

11.5 Inspection four edge ink area duration: 2s

11.6 Specification

Item	Specification	
Circular Defects	Diameter(mm)	Spec
	D 0.2mm	No quantity limit
	0.2<D 0.4 mm	Max 5 defect
	0.4 mm<D	Reject
	The minimum distance of defects must be above 10mm. The particle will be ignored when it is removable by cleaning.	
Bubble Defects	Diameter(mm)	Spec
	D 0.1mm	No quantity limit
	0.1<D 0.2 mm	Max 5 defect
	0.2 mm<D	Reject
	The minimum distance of defects must be above 10mm.	
Linear Object	Width(W)/Length(L)(mm)	Spec
	W 0.08 mm ,L 2.0 mm	No quantity limit
	W 0.08 mm ,L 8.0 mm	Max 3 defect
	W 0.2mm ,L 2.0 mm	Max 3 defect
	The minimum distance of defects must be above 10mm. The liner object will be ignored when it is removable by cleaning.	
Scratch	Width(W)/Length(L)(mm)	Spec
	W 0.05, L 10.0mm	No quantity limit
	0.05<W 0.1mm,L 10.0mm	Max 5 defect
	0.1 mm < W, 10.0 mm < L	Reject
	The minimum distance of defects must be above 10mm.	
Pin hole (Ink Area)	Diameter(mm)	Spec
	D 0.1mm	No quantity limit
	0.1<D 0.2 mm	Max 5 defec
	0.2mm<D	Reject
	The minimum distance of defects must be above 10mm.	
UV Glue extension (Bottom View)	Width(W) (mm)	
	D 2mm	
		
< Remark > D=Diameter W=Width L=Length		

12. QUALITY ASSURANCE

12.1 Test Condition

12.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : $25 \pm 5^{\circ}\text{C}$

Humidity : $65 \pm 5\%$

12.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

12.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

12.1.4 Test Frequency

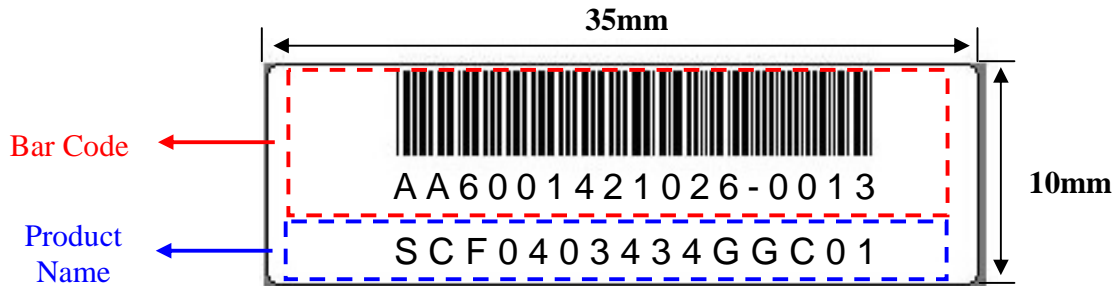
In case of related to deterioration such as shock test. It will be conducted only once.

12.1.5 Test Method

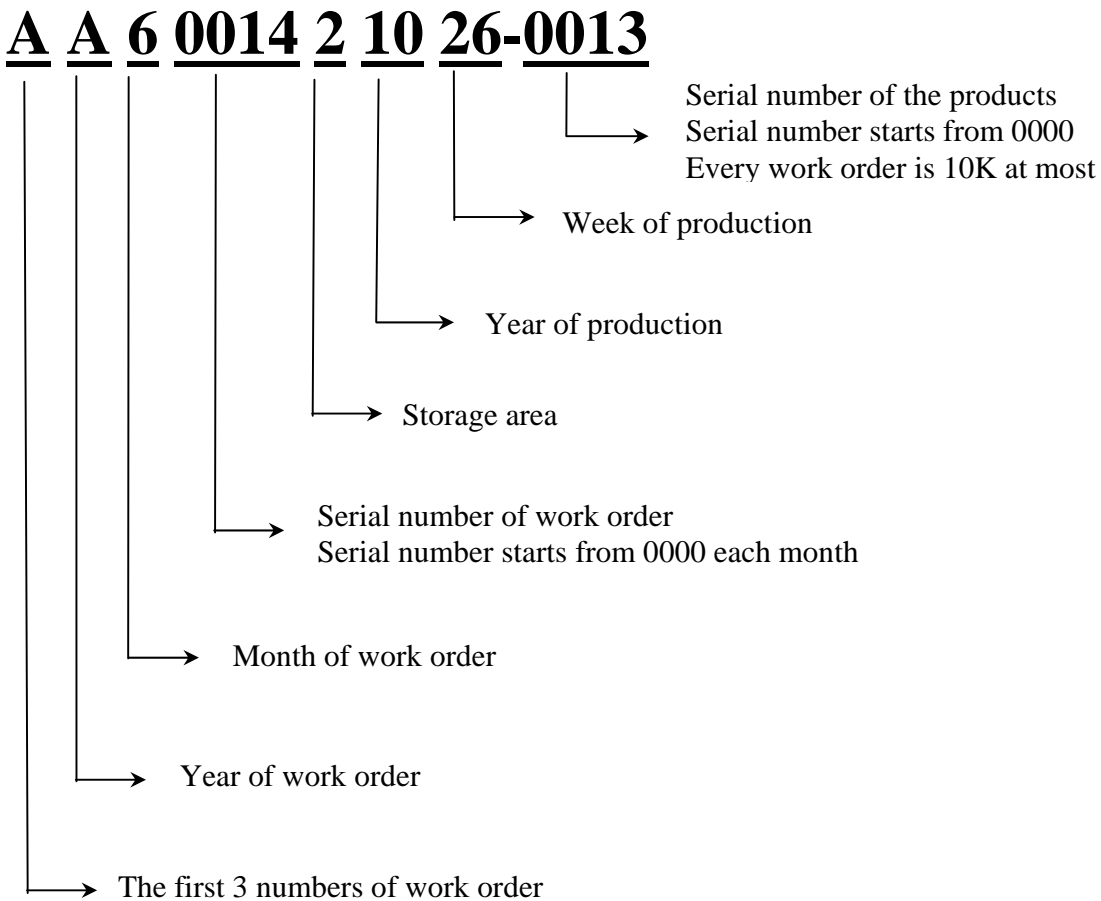
No.	Reliability Test Item & Level	Test Level
1	High Temperature Storage Test	T=80°C,240hrs
2	Low Temperature Storage Test	T=-30°C,240hrs
3	High Temperature Operation Test	T=70°C,240hrs
4	Low Temperature Operation Test	T=-20°C,240hrs
5	High Temperature and High Humidity Operation Test	T=60°C,90% RH,240hrs
6	Thermal Cycling Test (No operation)	-30°C → +25°C → +80°C,10Cycles 30 min 5min 30 min
8	Electrostatic Discharge Test (No operation)	HBM +/-2KV

13. CTP LCM PRODUCT LABEL DEFINE

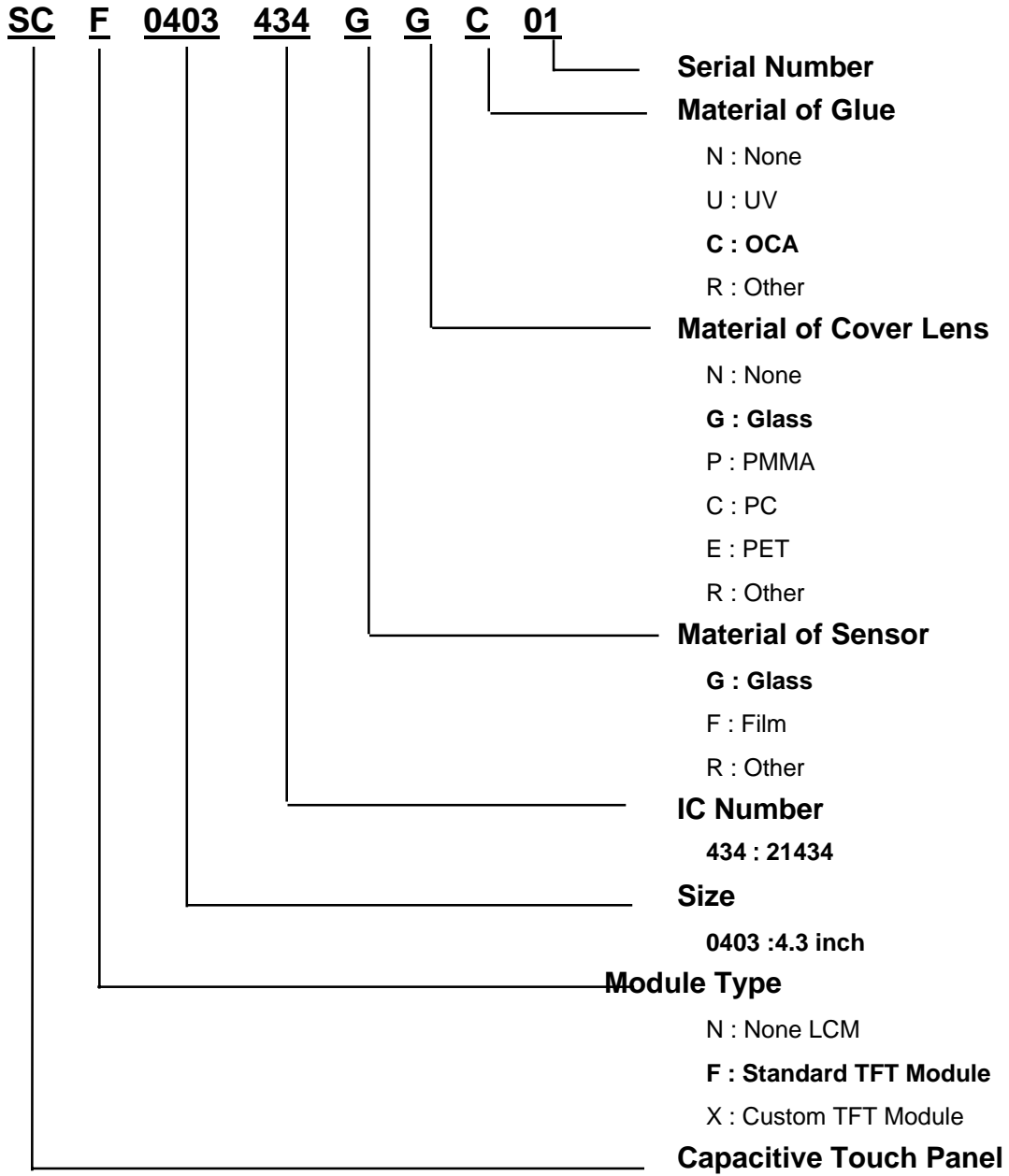
CTP LCM Product Label style:



Barcode Define:



Product Name Define:



14. PRECAUTIONS IN USE LCM

1. LIQUID CRYSTAL DISPLAY (LCD)

LCD is made up of glass, organic sealant, organic fluid, and polymer based polarizers. The following precautions should be taken when handling,

- (1). Keep the temperature within range of use and storage. Excessive temperature and humidity could cause polarization degradation, polarizer peel off or bubble.
- (2). Do not contact the exposed polarizers with anything harder than an HB pencil lead. To clean dust off the display surface, wipe gently with cotton, chamois or other soft material soaked in petroleum benzin.
- (3). Wipe off saliva or water drops immediately. Contact with water over a long period of time may cause polarizer deformation or color fading, while an active LCD with water condensation on its surface will cause corrosion of ITO electrodes.
- (4). Glass can be easily chipped or cracked from rough handling, especially at corners and edges.
- (5). Do not drive LCD with DC voltage.

2. Liquid Crystal Display Modules

2.1 Mechanical Considerations

LCM are assembled and adjusted with a high degree of precision. Avoid excessive shocks and do not make any alterations or modifications. The following should be noted.

- (1). Do not tamper in any way with the tabs on the metal frame.
- (2). Do not modify the PCB by drilling extra holes, changing its outline, moving its components or modifying its pattern.
- (3). Do not touch the elastomer connector, especially insert an backlight panel (for example, EL).
- (4). When mounting a LCM make sure that the PCB is not under any stress such as bending or twisting. Elastomer contacts are very delicate and missing pixels could result from slight dislocation of any of the elements.
- (5). Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels.

2.2. Static Electricity

LCM contains CMOS LSI's and the same precaution for such devices should apply, namely

- (1). The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- (2). The modules should be kept in antistatic bags or other containers resistant to static for storage.
- (3). Only properly grounded soldering irons should be used.
- (4). If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.

- (5) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended.
- (6). Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.

2.3 Soldering

- (1). Solder only to the I/O terminals.
- (2). Use only soldering irons with proper grounding and no leakage.
- (3). Soldering temperature : $280^{\circ}\text{C} \pm 10^{\circ}\text{C}$
- (4). Soldering time: 3 to 4 sec.
- (5). Use eutectic solder with resin flux fill.
- (6). If flux is used, the LCD surface should be covered to avoid flux spatters. Flux residue should be removed after wards.

2.4 Operation

- (1). The viewing angle can be adjusted by varying the LCD driving voltage V0.
- (2). Driving voltage should be kept within specified range; excess voltage shortens display life.
- (3). Response time increases with decrease in temperature.
- (4). Display may turn black or dark blue at temperatures above its operational range; this is (however not pressing on the viewing area) may cause the segments to appear "fractured".
- (5). Mechanical disturbance during operation (such as pressing on the viewing area) may cause the segments to appear "fractured".

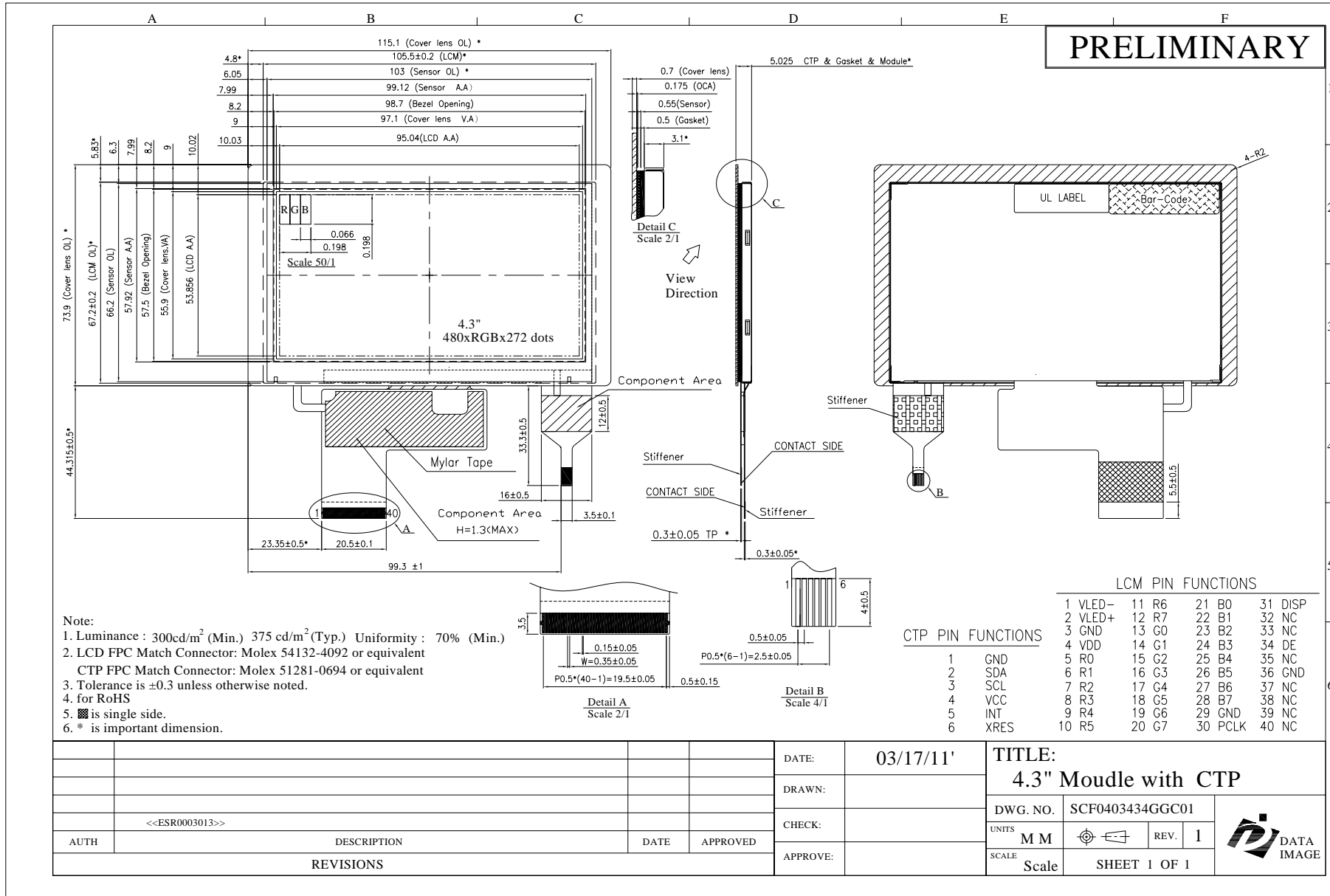
2.5 Storage

If any fluid leaks out of a damaged glass cell, wash off any human part that comes into contact with soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all the time.

2.6 Limited Warranty

Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not responsible for any subsequent or consequential events.

15. OUTLINE DRAWING



16. PACKAGE INFORMATION

T.B.D