

TFT-Display Datenblatt

Modell SCF100132UGGU01

Kurzdaten

Hersteller	Data Image
Diagonale	10,1" / 25,6cm
Format	16:9
Auflösung	1024x600
Backlight	LED / 170cd/m ²
Interface	LVDS
Touchscreen	ja
Temperatur	0...+50°C (Betrieb)



DATA IMAGE CORPORATION

TFT Module Specification PRELIMINARY

ITEM NO.: SCF100132UGGU01

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	JACK	JOE	GARY	KEN
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	1	23/FEB/11'		26

3. General Descriptions

3.1 Introduction

The SCF100132UGGU01 is a color active matrix thin film transistor (TFT) liquid crystal display(LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a projected Capacitive Touch Panel ,a timing controller, voltage reference, common voltage, column driver, and row driver circuit. This TFT LCD has a 10.1-inch diagonally measured active display area with WSVGA resolution (1,024vertical by 600 horizontal pixel array). This touch panel module is a transparent type projected capacitive touch panel, which uses SITO glass as the sensing devices. This product is composed of a cover lens, touch panel with COF and adhesive on total module.

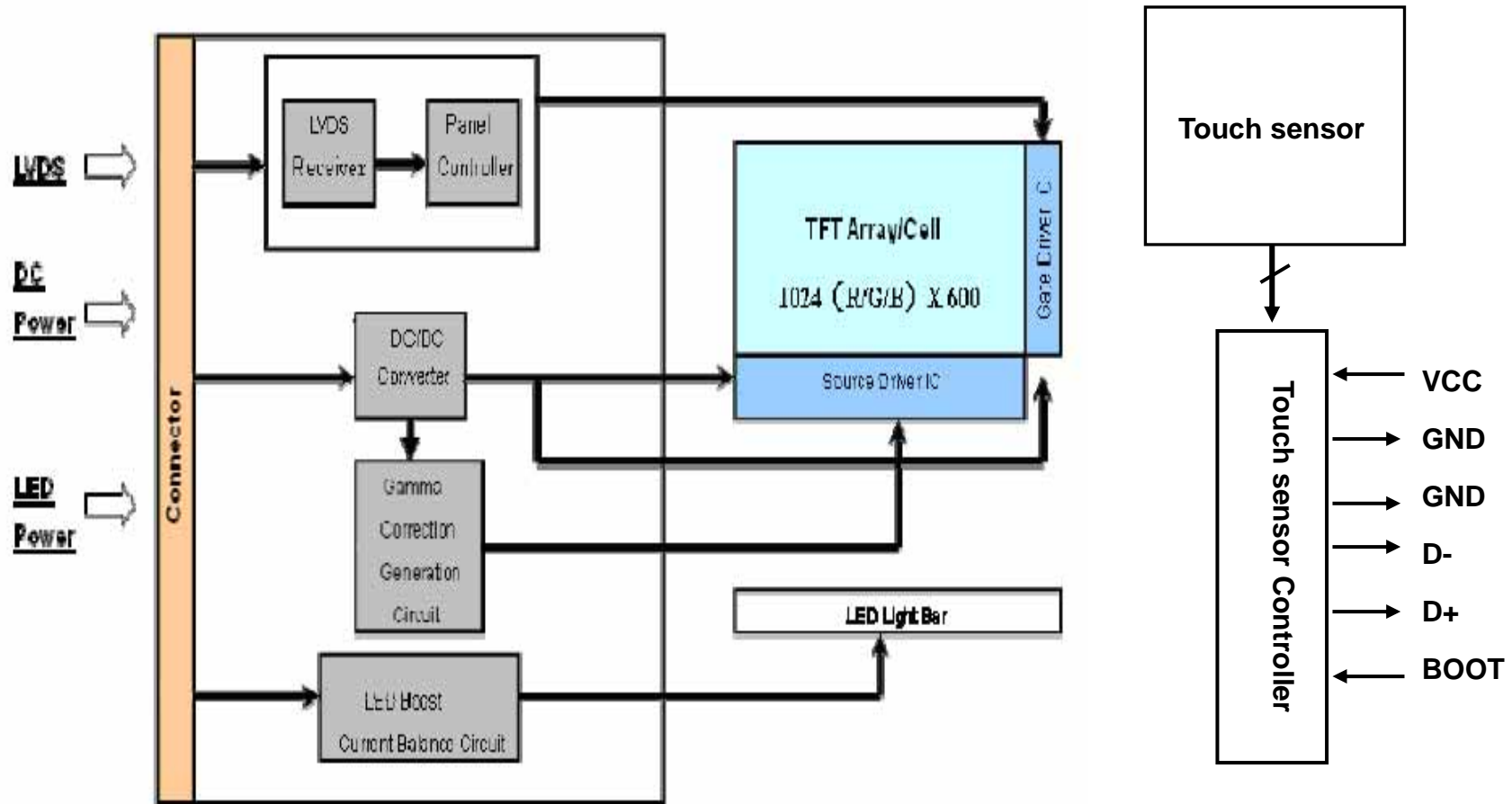
3.2 Features

- 10.1" TFT LCD Panel
- LED Light-bar Backlight System
- Composition: 10.1inch WSVGA resolution display with a projected Capacitive Touch Panel (CTP).
Interface : LVDS Interface for panel and USB (6 wire, 2.0 Full speed) for the CTP.
- Supported WSVGA (V:1024 lines, H:600 pixels) Resolution
- Compatible with RoHS Standard
- Dual Gate

3.3 Product Summary

Items	Specifications	Unit
Screen Diagonal	10.1	Inch
Active Area	222.72(H) x 125.28(V)	mm
Pixels H x V	1,024 (x3)x 600	-
Pixel Pitch	0.2175(H)x0.2088(V)	mm
Pixel Arrangement	R.G.B. Vertical Stripe	-
Display Mode	Normally White	-
White Luminance	170 (Typ.) 5 points average	cd/m ² (20mA of per LED)
Contrast Ratio	400 (Typ.)	-
Response Time	LCM 16 (Typ.)	ms
View Angle(L/R/U/D)	45/45/15/35(Typ.)	-
Input Voltage	LCM +3.3 (Typ.)	V
Power Consumption	LCM 2.8(Max)	Watt
Module Weight	T.B.D	g
Outline Dimension	271.6*174.6*6.95	mm
Electrical Interface (Logic)	LVDS	-
Support Color	262 K	-
Color Gamut	45%(Typ.)	-
Optimum Viewing Direction	6 o'clock	-
Surface Treatment	T.B.D	-

3.4 Functional Block Diagram



4. Absolute Maximum Ratings

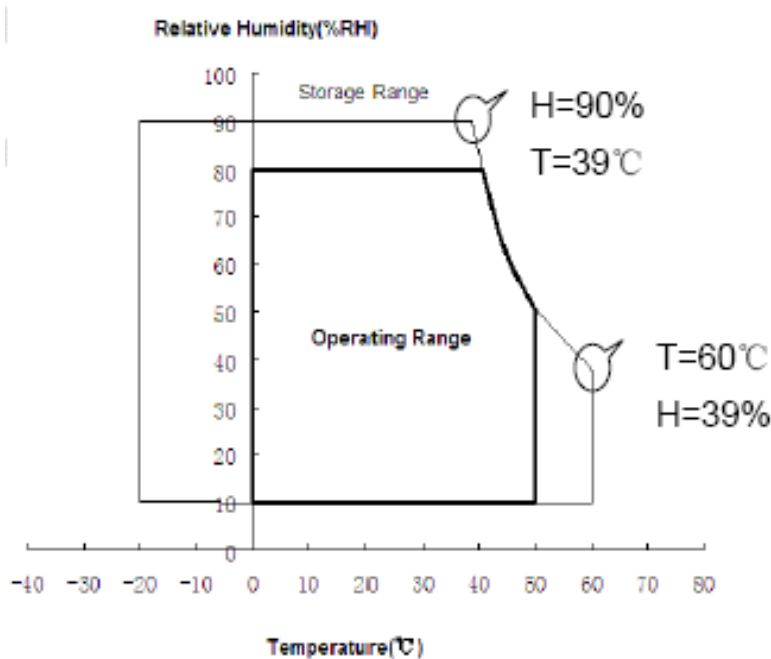
LCM Absolute Maximum Rating

Item	Symbol	Min	Max	Unit	Conditions
Supply Voltage	VDD	-0.3	4.0	V	Typ.=3.3V
Input Signal		-0.3	2.7	V	LVDS signals
Operating Temperature	TOP	0	50	°C	(Note 3)
Operating Humidity	HOP	10	80	% RH	(Note 3)
Storage Temperature	TST	-20	60	°C	(Note 3)
Storage Humidity	HST	10	90	% RH	(Note 3)
Vibration			1.5G	G	30min for X, Y, Z axis
			10~500Hz	Hz	
Shock			220	G	Half sign wave
			2	mS	
LED Current	I-LED		(20)	mA	per LED

Table 1

Note:

- (1) Maximum Wet-Bulb should be 39°C. No condensation.
- (2) When you apply the LCD module for OA system. Please make sure to keep the temperature of LCD module is less than 60°C.
- (3) Storage /Operating temperature



6. Optical Characteristics

The optical characteristics are measured under stable conditions as following notes

Item	Conditions		Specification			
			Min	Typ.	Max	Note
Viewing Angle [degrees] K=Contrast Ratio>10	Horizontal	Left	-	45	-	A, B
		Right	-	45	-	
	Vertical	Up	-	15	-	
		Down	-	35	-	
Contrast ratio	Center		TBD	400	-	A, C
Response Time [ms]	Rising + Falling		-	16	-	A, D
Color Chromaticity (CIE1931)	Red	x	Typ. -0.03	TBD	Typ. +0.03	A,
	Red	y		TBD		A,
	Green	x		TBD		A,
	Green	y		TBD		A,
	Blue	x		TBD		A,
	Blue	y		TBD		A,
	White	x	0.263	0.313	0.365	A,
	White	y	0.279	0.329	0.379	A,
White Luminance [cd/m ²]	I-LED=20mA		TBD	170	-	5 point A, E
Luminance Uniformity [%]	I-LED=20mA , 13points		62.5	-	-	A, F
	I-LED=20mA , 5points		80.0	-	-	

Table 2 Optical Characteristics

Note: A. Measurement Setup:

The LCD module should be stabilized at given temperature for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

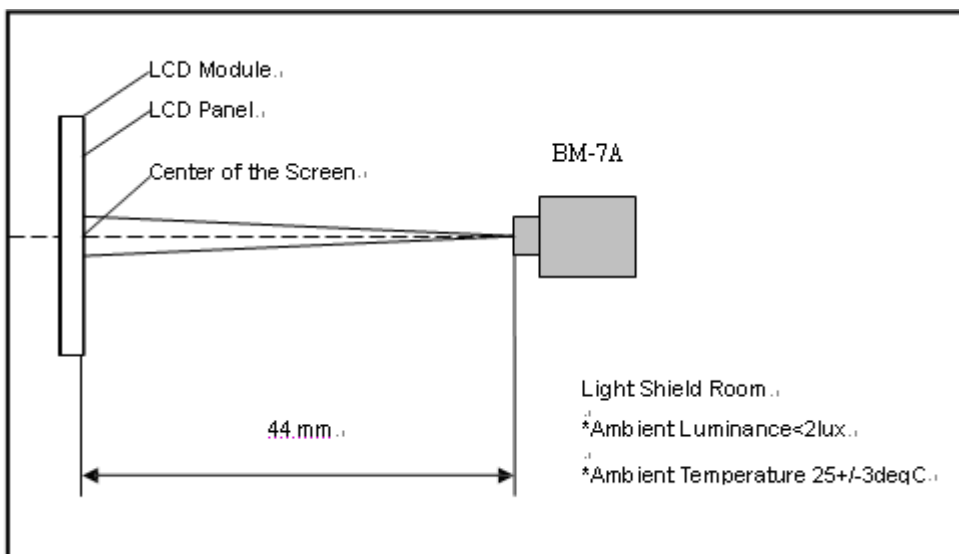


Figure 3 Measurement Setup

B. Definition of Viewing Angle

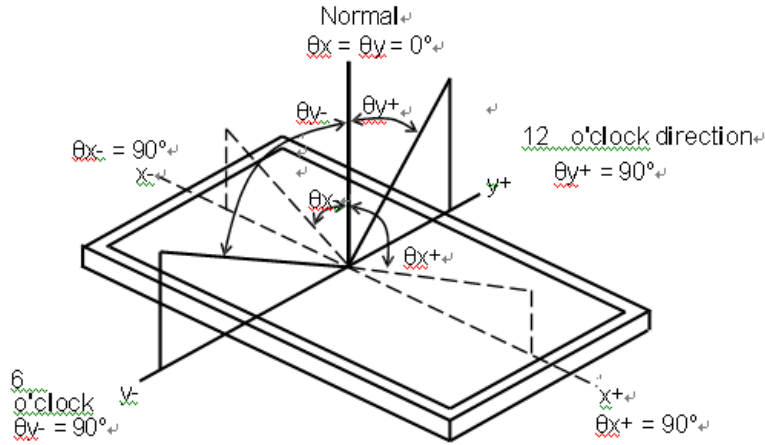


Figure 4 Definition of Viewing Angle

C. Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

$$\text{Contrast Ratio (CR)} = L63 / L0$$

L63: Luminance of gray level 63, L0: Luminance of gray level 0

D. Definition of Response Time (T_R, T_F)

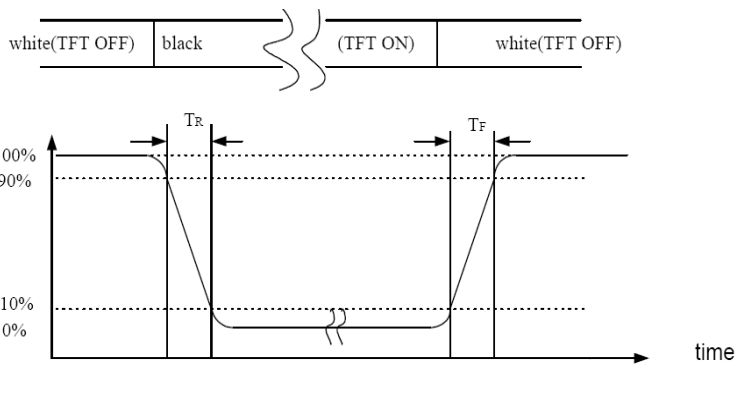


Figure 5 Definition of Response Time

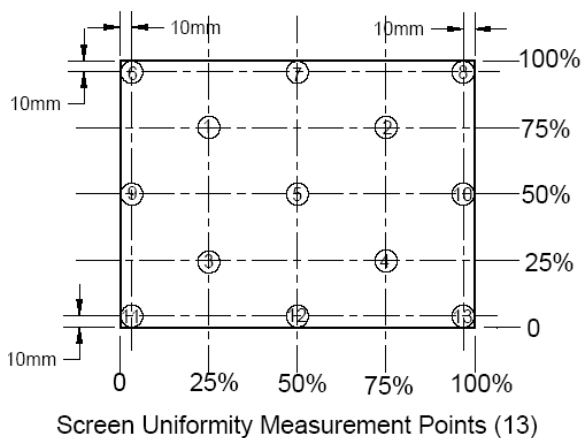


Figure 6 Measurement Locations of 13 Points

E. Definition of Luminance White

Measure the luminance of gray level 63 at center point and 5 points.

Center of Luminance = Y1

$$\text{Average Luminance of 5 points} = \frac{Y1+Y2+Y3+Y4+Y5}{5}$$

F. Definition of Luminance Uniformity (Variation)

Measure the luminance of gray level 63 at 13 points.

$$\text{Uniformity of 13 points} = \frac{\text{Min Luminance of Y1~Y13}}{\text{Max Luminance of Y1~Y13}} \times 100\%$$

$$\text{Uniformity of 5 points} = \frac{\text{Min Luminance of Y1~Y5}}{\text{Max Luminance of Y1~Y5}} \times 100\%$$

7. Backlight Characteristics

7.1 Parameter Guideline of LED Backlight

Symbol	Parameter		Min.	Typ.	Max.	Units	Condition
V _L	LED Light bar Driving (Row output)		9.0	-	10.2	[V]	Ta=25[deg C] Note A
I _L	LED Current		TBD	160	TBD	[mA]	Ta=25[deg C]
V _{LED}	LED input		5	12	21	[V]	Ta=25[deg C]
LT	LED Life Time		10,000	-	-	Hours	Ta=25[deg C] Note C
VPWM_EN	PWM Signal Voltage	High	2.0	3.3	3.6	V	-
		Low	0	-	0.5	V	
FPWM	Output PWM frequency		-	200	1K	Hz	-
VLED_EN	LED enable Voltage	High	2.0	3.3	3.6	V	-
		Low	0	-	0.5		
PWM	PWM Duty ratio		TBD	--	100	%	-

Table 3 Parameter Guideline for LED Backlight

Note A: I_{LED}=20 mA (Per LED)

Note B: Calculator value for LED chip specification.

Note C: The LED life time define as the estimated time to 50% degradation of initial luminous.

8. ELECTRICAL CHARACTERISTICS

8.1 Interface Connector

Manufacturer	UJU (or equivalent)
Type / Part Number	IS050-L40B-C10

Table 4 Connector Name / Designation

Table 5 Signal Pin Assignment

Pin #	Signal Name	Description	Remarks
1	GND	Ground	
2	VDD	Power supply 3.3V(Typ.)	
3	VDD	Power supply 3.3V(Typ.)	
4	VEDID	EDID +3.3V Power	
5	BIST	Bist Mode	Reserve for Aging
6	CLK_EDID	EDID Clock Input	
7	DAT_EDID	EDID Data Input	
8	Rin0-	- LVDS differential data input(R0-R5,G0)	
9	Rin0+	+ LVDS differential data input(R0-R5,G0)	
10	GND	Ground	
11	Rin1-	- LVDS differential data input(G1-G5,B0-B1)	
12	Rin1+	+ LVDS differential data input(G1-G5,B0-B1)	
13	GND	Ground	
14	Rin2-	- LVDS differential data input(B2-B5,HS,VS,DE)	
15	Rin2+	+ LVDS differential data input(B2-B5,HS,VS,DE)	
16	GND	Ground	
17	CLKN-	- LVDS differential clock input	
18	CLKN+	+ LVDS differential clock input	
19	NC	Not connected(Reserve)	
20	NC	Not connected(Reserve)	
21	NC	Not connected(Reserve)	
22	GND	Ground-Shield	
23	NC	Not connected(Reserve)	
24	NC	Not connected(Reserve)	
25	GND	Ground-Shield	
26	NC	Not connected(Reserve)	
27	NC	Not connected(Reserve)	
28	GND	Ground-Shield	
29	NC	Not connected(Reserve)	
30	NC	Not connected(Reserve)	
31	VLED_GND	LED Ground	
32	VLED_GND	LED Ground	
33	VLED_GND	LED Ground	
34	NC	Not connected(Reserve)	
35	VPWM_EN	System PWM Logic Input Level	
36	VLED_EN	LED enable Input Level(+3.3V)	
37	NC	Not connected(Reserve)	
38	VLED	LED Power Supply 5+/-0.5V	
39	VLED	LED Power Supply 5+/-0.5V	
40	VLED	LED Power Supply 5+/-0.5V	

All input signals shall be low or Hi-Z state when VDD is 0

8.2 LVDS Receiver

8.2.1 Signal Electrical Characteristics for LVDS Receiver

The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

Parameter	Symbol	Min	Typ.	Max	Unit	Conditions
Differential Input High Threshold	V _{th}	-	-	+100	mV	V _{cm} =+1.2V
Differential Input Low Threshold	V _{tl}	-100	-	-	mV	V _{cm} =+1.2V
Magnitude Differential Input Voltage	V _{id}	100	-	600	mV	
Common Mode Voltage	V _{cm}	0.9	1.2	1.5	V	
Common Mode Voltage Offset	ΔV _{cm}	-	-	50	mV	V _{cm} =+1.2V

Table 6 LVDS Receiver Electrical Characteristics

Note:

- A. Input signals shall be low or Hi-Z state when VDD is off.
- B. All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

Parameter	Symbol	Min	Typ.	Max	Unit	Conditions	Note
Clock Frequency	F _c	TBD	50.4	TBD	MHz		

Table 7 Timing Requirements

Note: All values are at VDD=3.3V, T_a=25 °C. degree C.

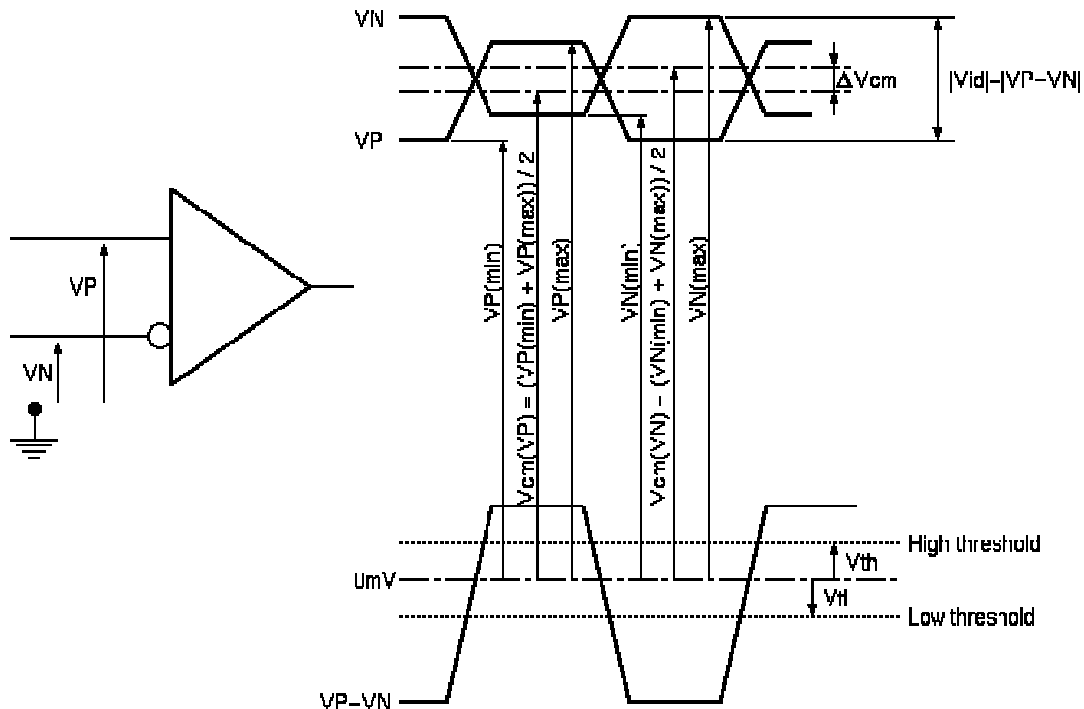


Figure 7 Voltage Definitions

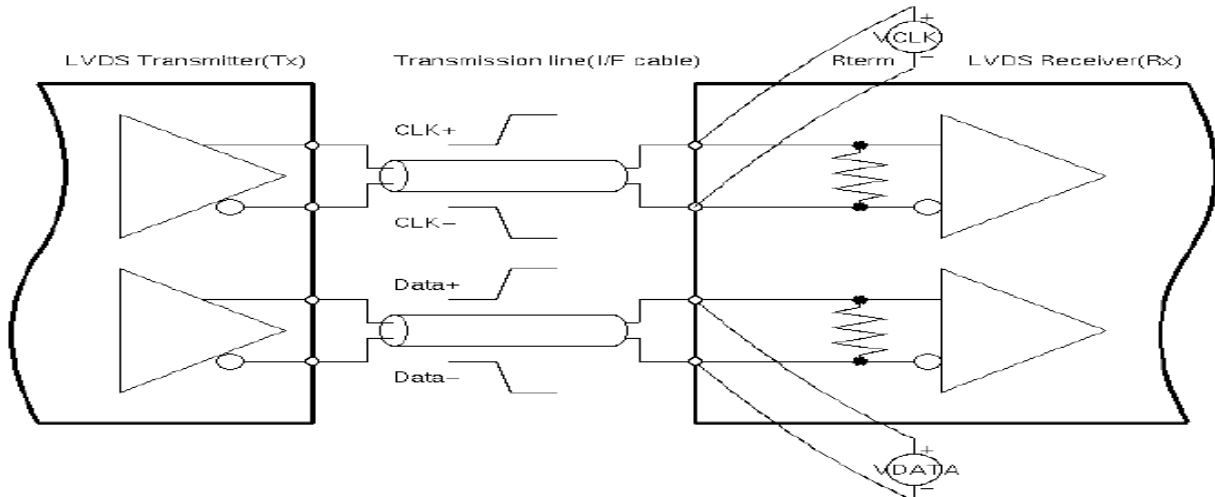


Figure 8 Measurement System

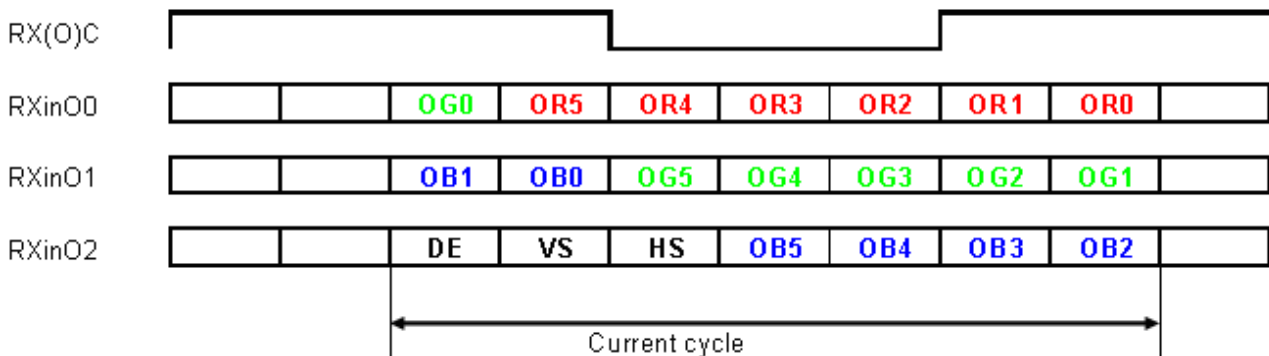


Figure 9 Data mapping

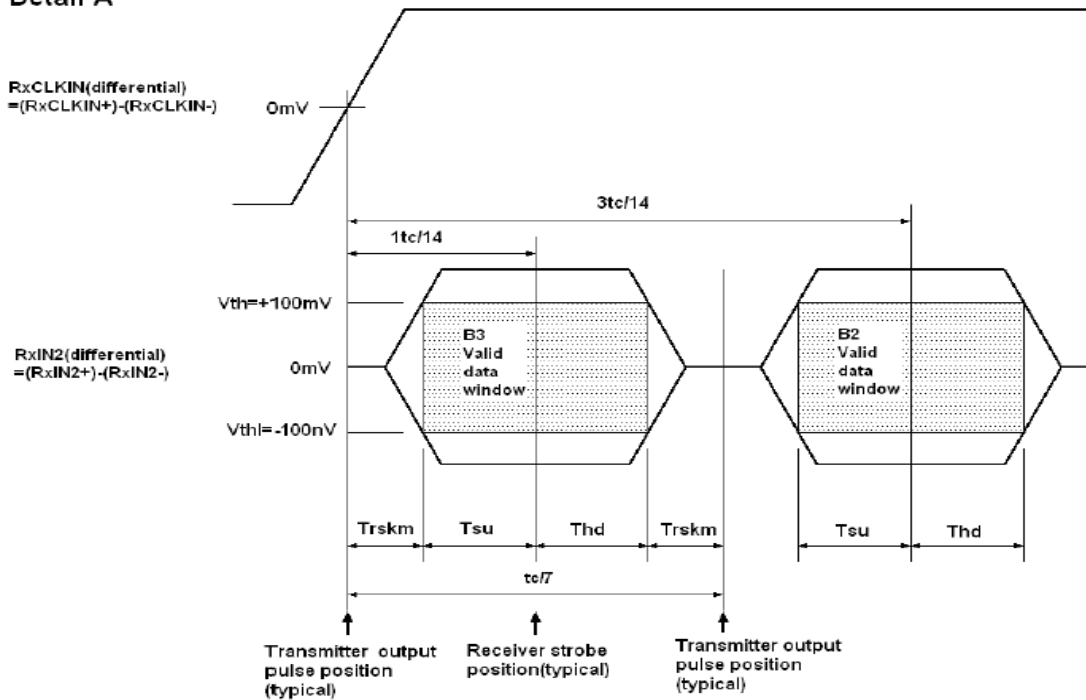
Detail A


Figure 10 Timing Definition

Note: T_{su} and T_{hd} is internal data sampling window of receiver. $Trskm$ is the system skew margin; i.e., the sum of cable skew, source clock jitter, and other inter-symbol interference, shall be less than $Trskm$.

8.2.2 LVDS Receiver Internal Circuit

Figure 11 LVDS Receiver Internal Circuit shows the internal block diagram of the LVDS receiver. This LCD module equips termination resistors for LVDS link.

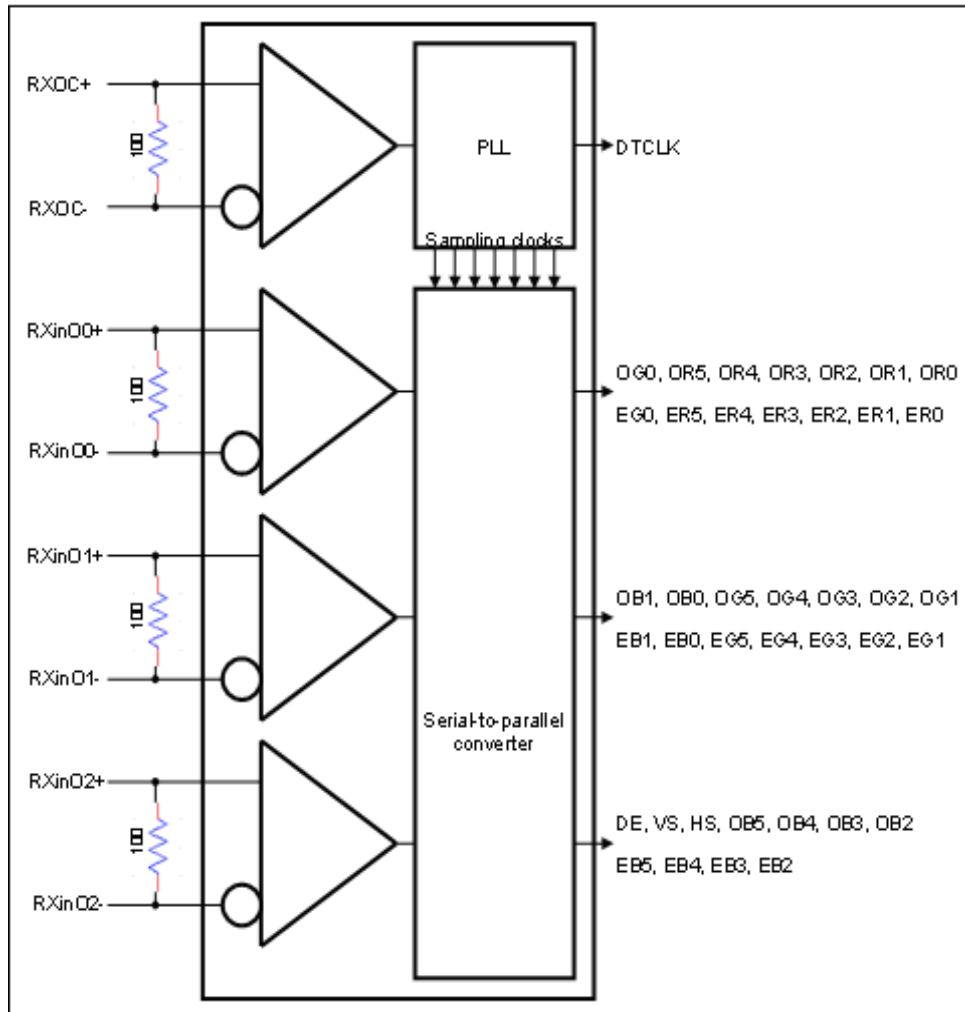


Figure 11 LVDS Receiver Internal Circuit

9. Interface Timings

9.1 Timing Characteristics

Parameter	Symbol	Unit	min	Typ.	Max
LVDS Clock Frequency(single)	Fdck	MHz	TBD	50.4	TBD
H Total Time	Htotal	clocks	TBD	1344	TBD
H Active Time	Hac	clocks	1024	1024	1024
V Total Time	Vtotal	lines	TBD	625	TBD
V Active Time	Vac	lines	600	600	600
Frame Rate	Vsync	Hz	55	60	65

Table 8 Interface Timings

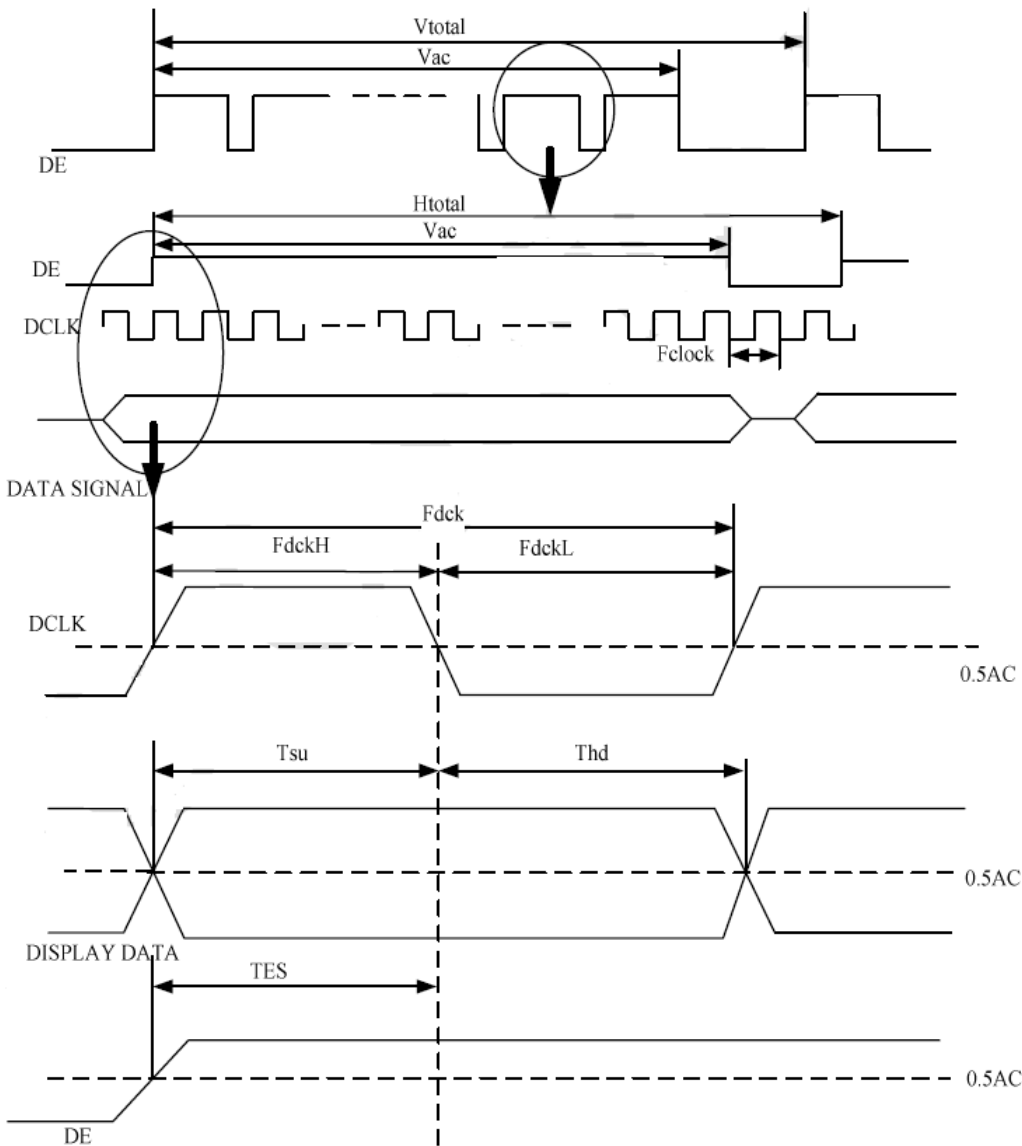
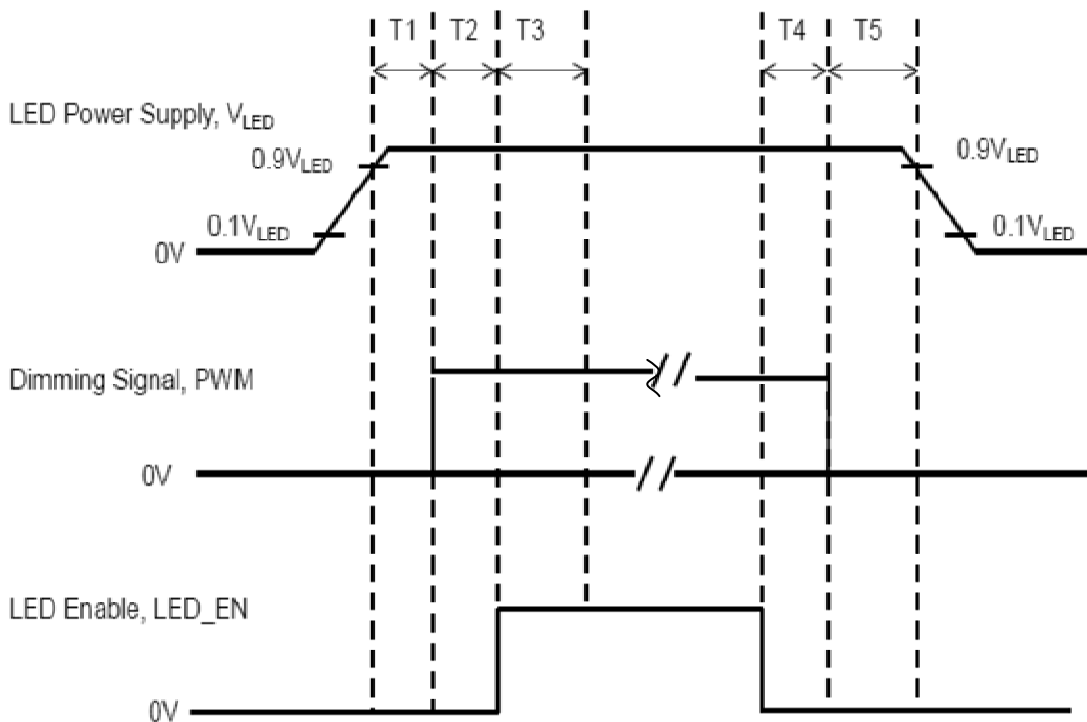


Figure 12 Timing Characteristics

Note: TES is data enable signal setup time.

9.2 LED Power Sequence

LED ON/OFF is as follows. Interface signals are also shown in the chart.



Symbol	Values			Unit
	Min	Typ	Max	
T1	10	--	--	ms
T2	10	--	--	
T3	50	--	--	
T4	0	--	--	
T5	10	--	--	

Note: The duty of LED dimming signal should be more than 20% in T2 and T3.

10. Power Consumption

Input power specifications are as follows.

Symbol	Parameter	Min	Typ.	Max	Units	Condition
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[V]	
IDD	VDD Current	--	TBD	TBD	[A]	All black pattern, 60Hz
PDD	VDD Power	--	--	TBD	[W]	Max pattern, 60Hz
Irush	Rush Current	--	--	2	[A]	
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	--	--	300	[mVp-p]	

Table 9 Power Consumption

Power ON/OFF Sequence

VDD power, interface signals, and lamp on/off sequence are shown in Figure 13. Signals shall be Hi-Z state or low level when VDD is off.

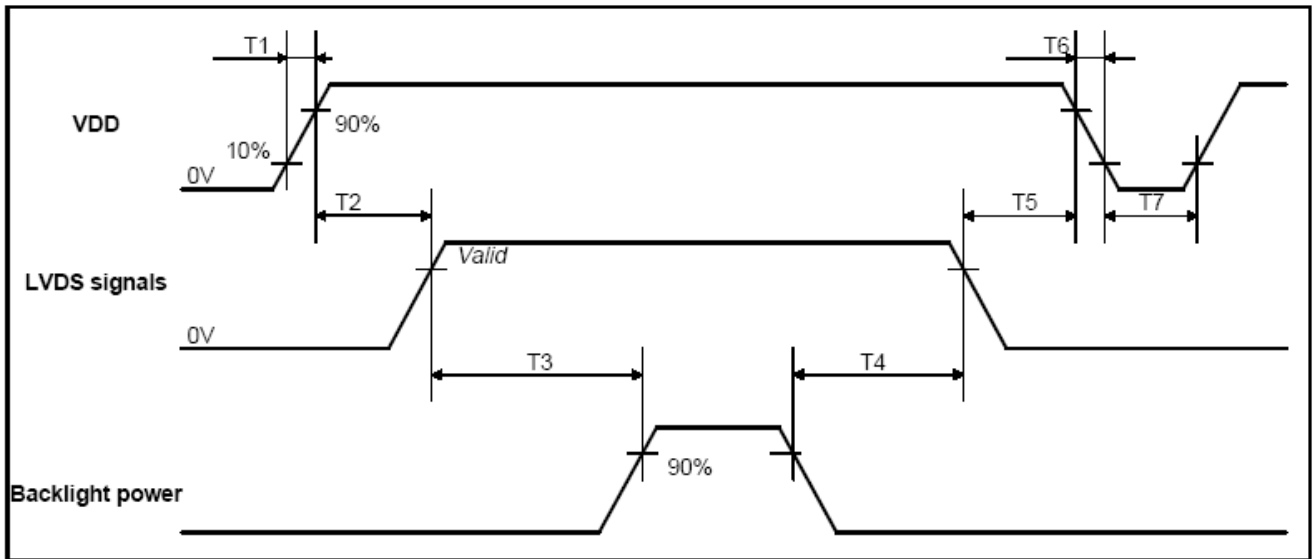


Figure 13 Power Sequence

Parameter	Symbol	min	Typ.	max	Unit
VDD Rise Time	T1	0.5	--	10	ms
VDD Good to Signal Valid	T2	0	--	50	ms
Signal Valid to Backlight On	T3	200	--	--	ms
Backlight Off to Signal Disable	T4	200	--	--	ms
Signal Disable to Power Down	T5	0	--	50	ms
VDD Fall Time	T6	0	--	10	ms
Power Off	T7	400	--	--	ms

Table 10 Power Sequencing Requirements

11. CTP General specifications

11.1 CTP main feature

Item	Specification	Unit
Type	Transparent type projected capacitive touch panel	
Input mode	Human's finger	
Active area	223.72(H)(typ.) X 125.78 (V) (typ.)	mm
Resolution	Up to 1024 x 600	
Transparency	>90 (TYP) .AT550nm	%
Haze	<2	%
Hardness	3H (min) [by JISK 5600 (750g)]	Pencil hardness
Report rate	Max. 75 (Single Touch)	Points/sec

11.2 CTP Absolute Maximum Rating

Symbol	Description	Min	Typ	Max	Unit	Notes
VCC	Supply voltage	-0.3	5	TBD	V	
Vio	DC input voltage	-0.3	TBD	TBD	V	
Imio	Maximum input current	-	-	TBD	mA	
ESD	Electrostatic discharge voltage	TBD	-	-	V	

11.3 CTP Electrical Characteristic

Symbol	Description	Min	Typ	Max	Unit	Notes
VCC	Supply voltage	-	5	-	V	
I	Supply current		60		mA	At VCC=5V

11.4 CTP Pin Connections

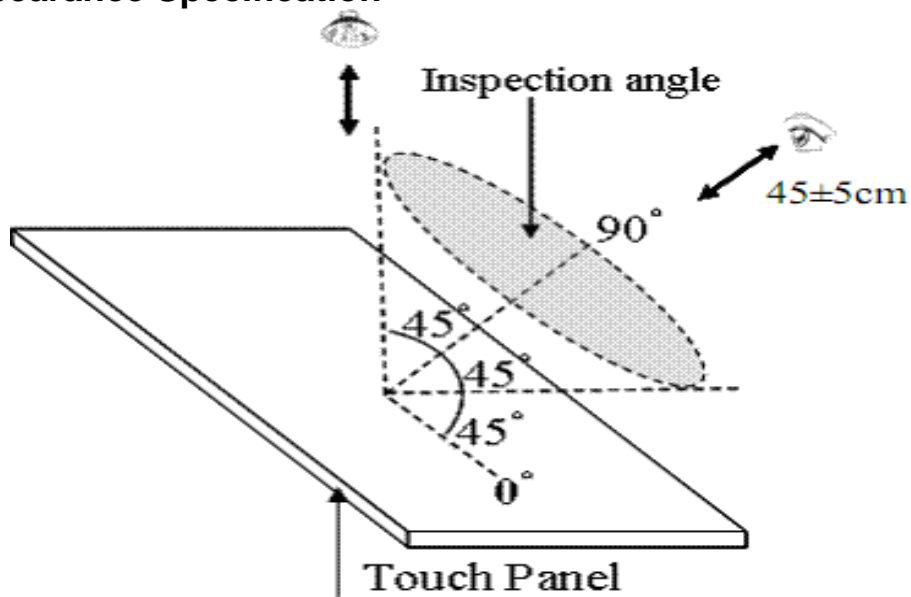
Pin	Symbol	Type	Description
1	Vcc	Power	Supply Voltage
2	D-	Signal	USB Signal
3	D+	Signal	USB Signal
4	GND	Power	Ground
5	GND	Power	Ground
6	Boot		Bios

Note :

d. Connector Part No : Kyocera 6298 or equivalent

11.5 CTP Life Test

1	Point hitting life (no contact CTP)	TBD	
2	Line Drawing life (no contact CTP)	TBD	

12. Appearance Specification


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

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

12.3 Light illumination: 800 Lux.

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

12.5 Inspection four edge ink area duration:

12.6 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 5mm. The particle will be ignored when it is removable by cleaning.	
Bubble Defects	Diameter(mm)	Spec
	D 0.2mm	No quantity limit
	0.2<D 0.3 mm	Max 5 defect
	0.3 mm<D	Reject
	The minimum distance of defects must be above 5mm.	
Linear Object	Width(W)/Length(L)(mm)	Spec
	W 0.05 mm ,L 3.0 mm	No quantity limit
	0.05<W 0.1 mm ,L 3.0 mm	Max 5 defect
	0.1mm W , 3.0 mm L	Reject
	The minimum distance of defects must be above 5mm. The liner object will be ignored when it is removable by cleaning.	
Scratch	Width(W)/Length(L)(mm)	Spec
	W 0.05, L 3.0mm	No quantity limit
	0.05<W 0.1mm,L 3.0mm	Max 5 defect
	0.1 mm < W, 3.0 mm < L	Reject
	The minimum distance of defects must be above 5mm.	
Pin hole (Ink Area/Logo Area)	Diameter(mm)	Spec
	D 0.1mm	No quantity limit
	0.1<D 0.2 mm	Max 3 defect
	0.2mm<D	Reject
	The minimum distance of defects must be above 5mm.	
UV Glue spill	Width(W) (mm)	Spec
	D 2mm	No quantity limit
	2mm<W, 0.55mm<L	Reject
< Remark > D=Diameter W=Width L=Length		

13. QUALITY ASSURANCE

13.1 Test Condition

13.1.1 Temperature and Humidity(Ambient Temperature)

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

Humidity : $65 \pm 5\%$

13.1.2 Operation

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

13.1.3 Container

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

13.1.4 Test Frequency

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

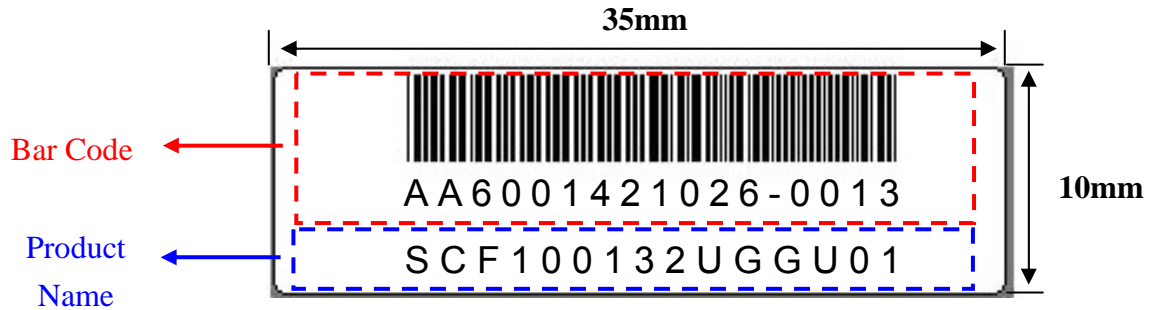
13.1.5 Test Method

Reliability Test Item & Level		Test Level
No.	Test Item	
1.	High Temperature Storage Test	T= 70 ,120hrs after 1 hrs at room temperature and test.
2.	Low Temperature Storage Test	T= -30 ,120hrs after 1 hrs at room temperature and test.
3.	High Temperature and High Humidity Operation Test	T= 40 ,80%RH,120hrs after 24 hrs at room temperature and test.
4.	Thermal Cycling Test (No operation)	-20 °C 30min ~ 60 °C 30 min , 10 Cycles after 24 hrs at room temperature and test.
5.	Vibration Test (No operation)	Frequency :10 ~ 55 Hz Amplitude :1.5 mm Sweep time : 11 mins Test Period: 6 Cycles for each direction of X, Y, Z
6.	ESD TEST	Air Discharge : TBD KV charge & discharge Contact Discharge : TBDKV charge & discharge

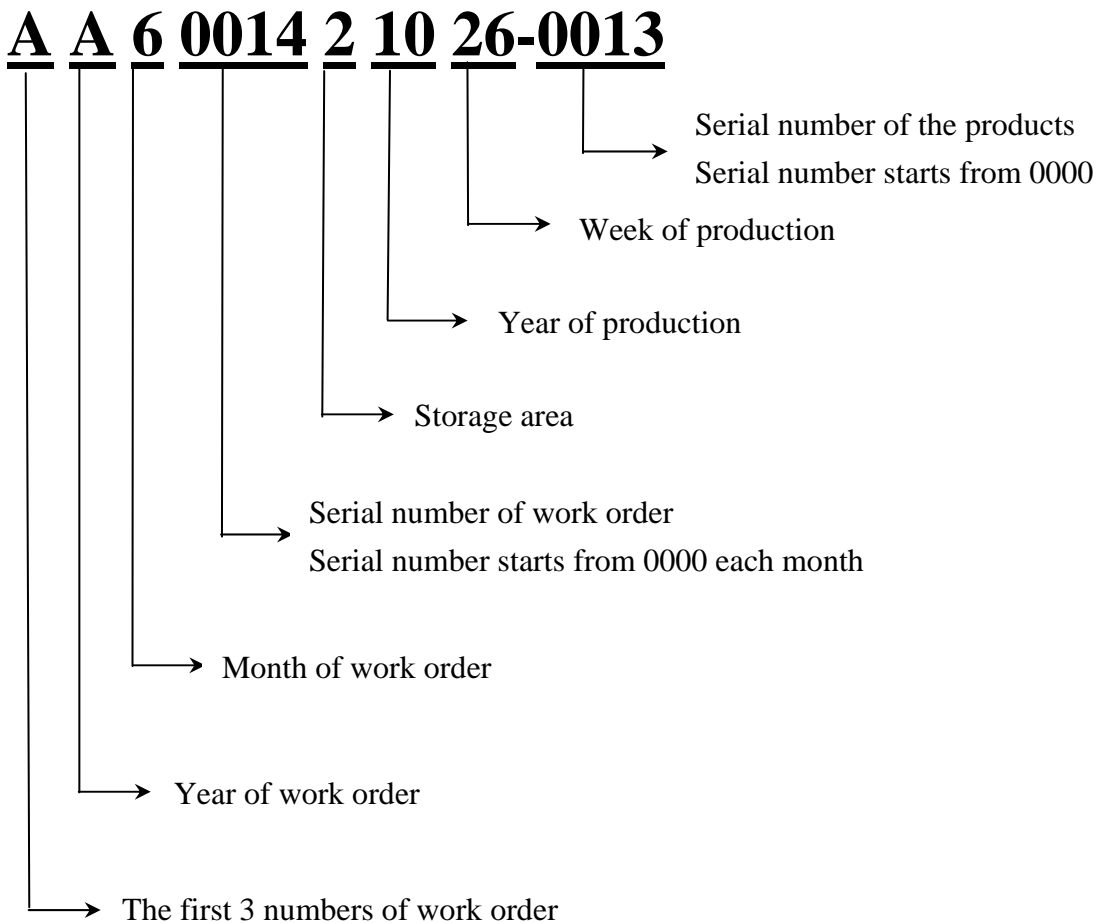
Note : The test samples have recovery time for 4 hours at room temperature before the function check. In the standard conditions, there is no any touch panel function NG issue occurred.

14. CTP LCM PRODUCT LABEL DEFINE

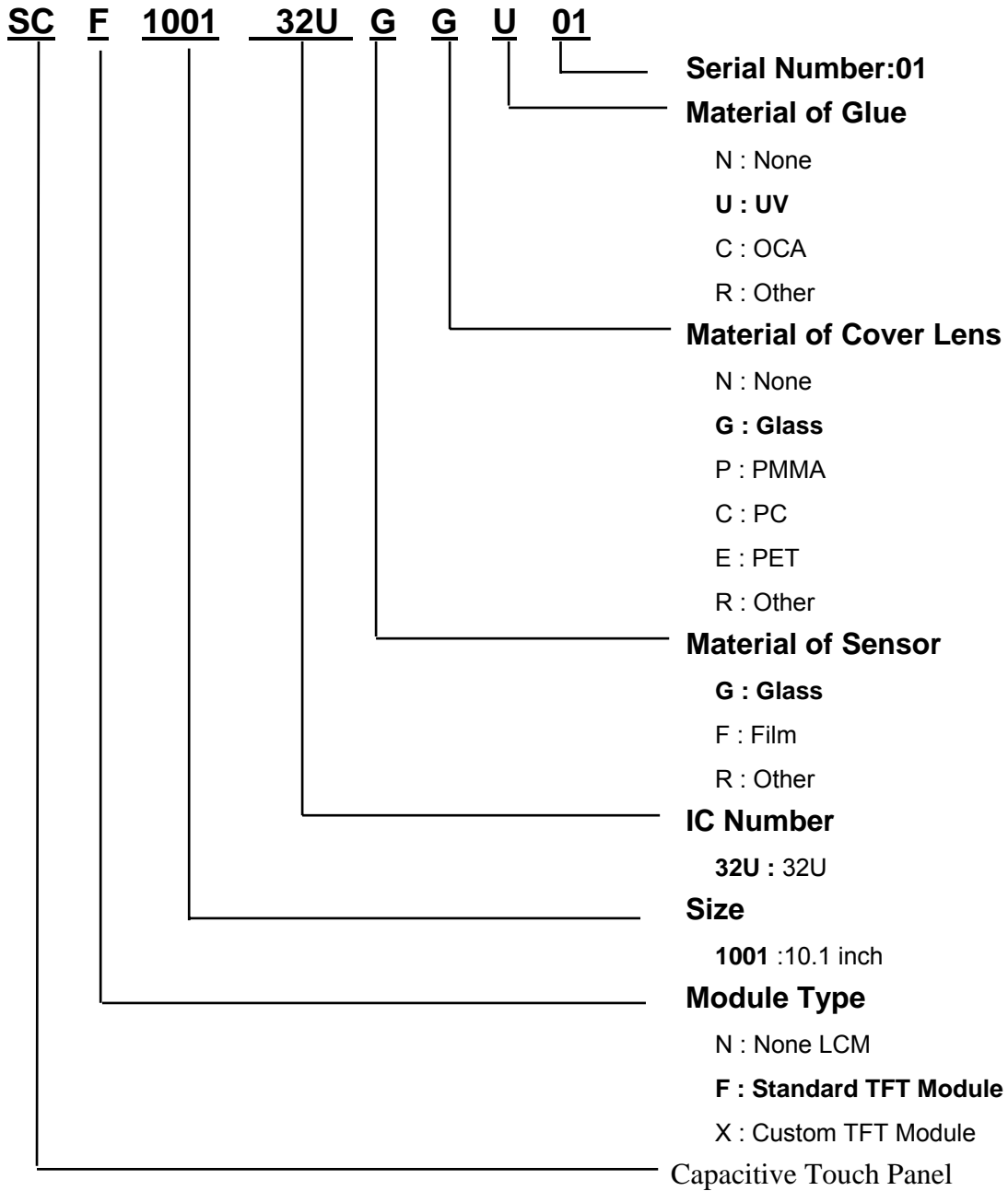
CTP LCM Product Label style:



BarCode Define:



Product Name Define:



15. 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 benzine.
- (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 a 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 afterwards.

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".

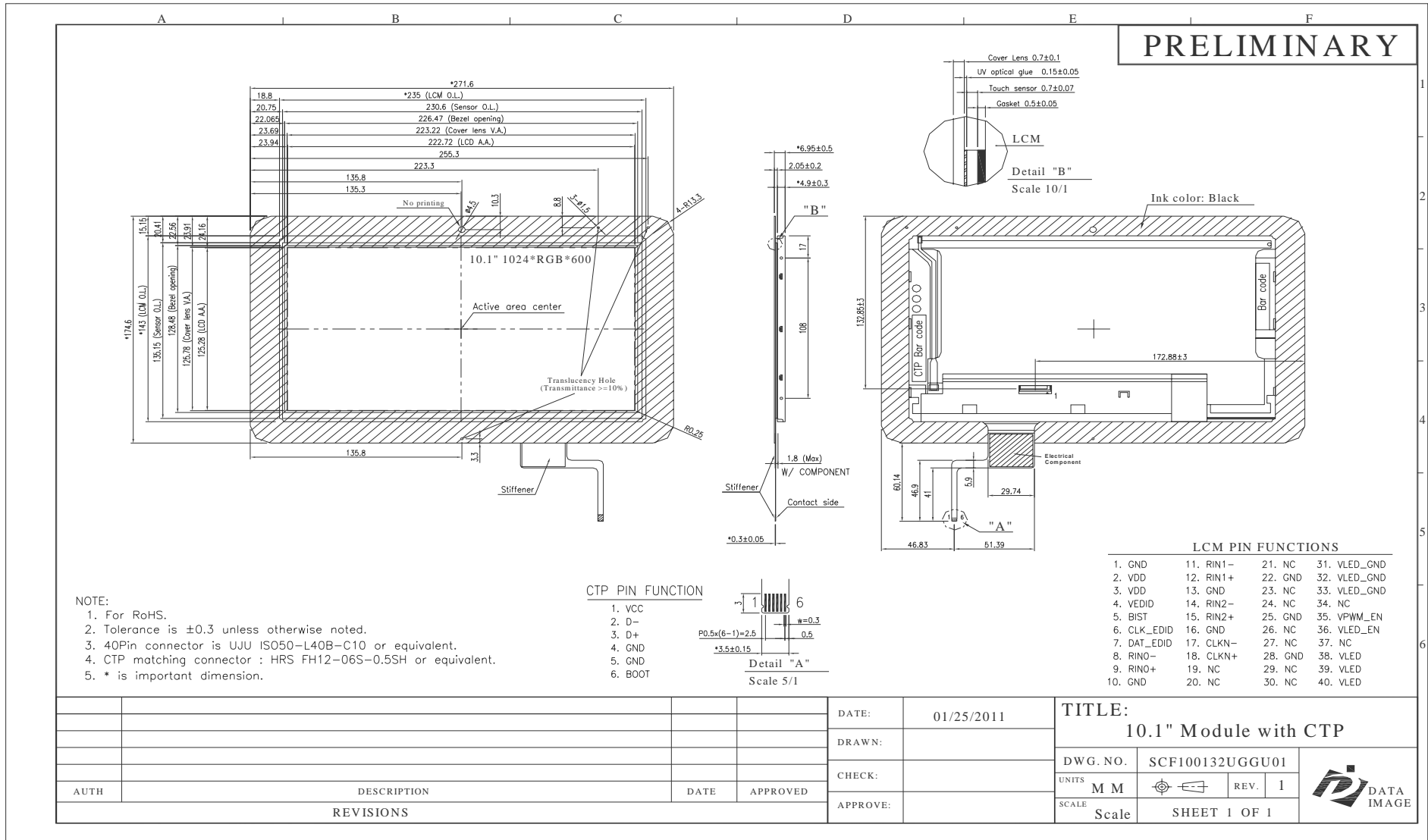
2.5 Storage

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 be responsible for any subsequent or consequential events.

16.OUTLINE DRAWING





Confidential Document

17.PACKAGE INFORMATION

TBD