PHOENIX DISPLAY INTERNATIONAL, INC.

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SPECIFICATION FOR LCD MODULE

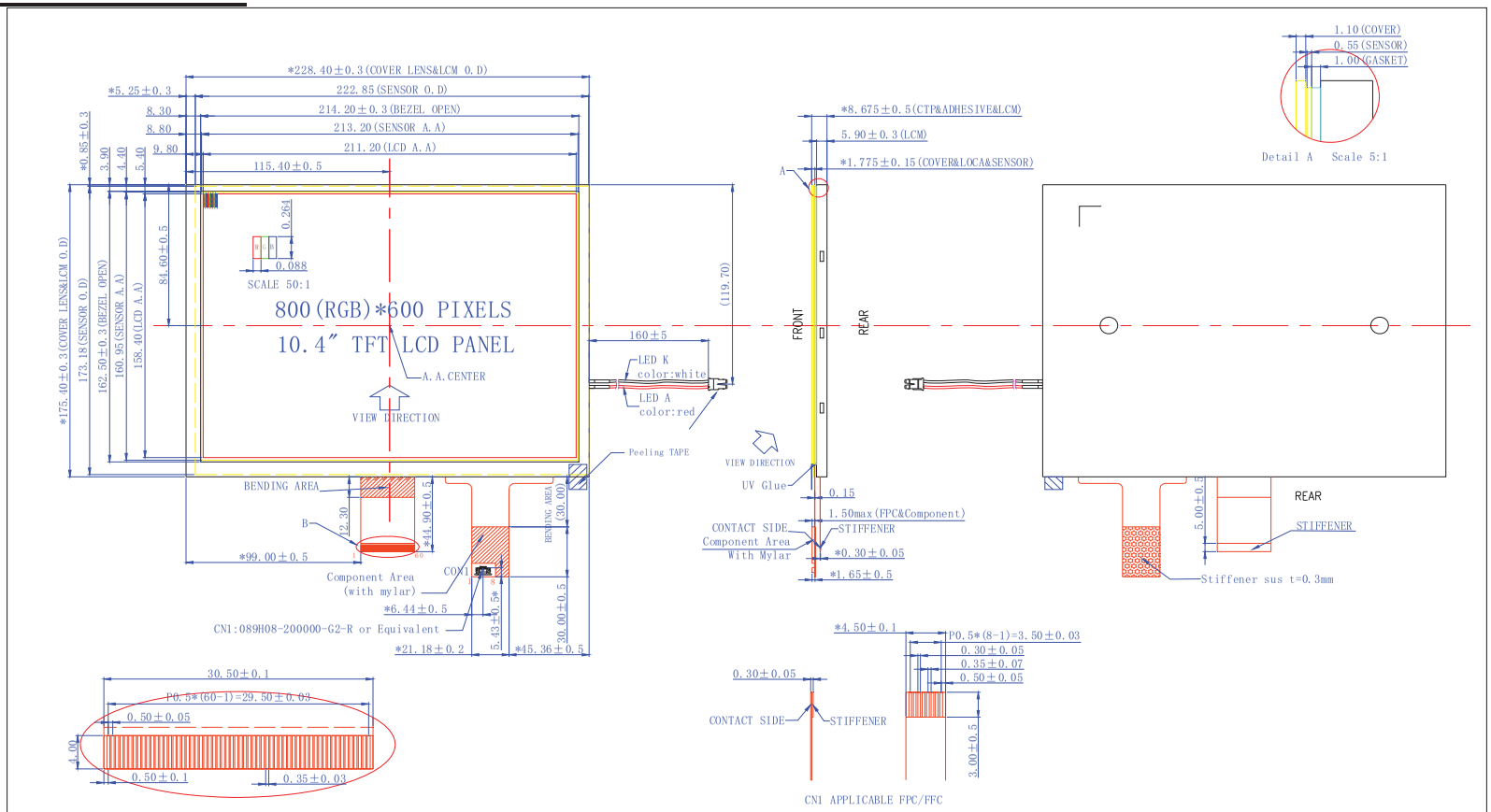
CUSTOMER	
PART NUMBER	PDI80060006G(R)-KT6L1-VK
DESCRIPTION	10.4" TFT 800 x 600
VERSION	
ISSUE DATE	

COMPANY ADDRESS：
Phoenix Display International, Inc.
6150 W. Gila Springs Place, Unit 2
Chandler, AZ 85226
USA
www.phoenixdisplay.com
(630) 359-5700 office
(630) 359-5701 fax

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1.LCM DRAWING



REVISIONS							DRAWN	CHECK	APPROVE	PART NO.	80060006G(R)-KT6L1-VK		
MARK	DATE	DESCRIPTION	DRAWN	CHECK	APPROVE	NAME	LIChangXing			DWG NO.	G80060006G(R)-WX-VK		
										SUB-DWG NO.	4		
						DATE	2015.05.07			PAGE	1-1	UNIT	mm
						UNLESS OTHERWISE NOTED TOLERANCES : ±0.5							

2. GENERAL DESCRIPTION

ITEM	CONTENT	UNIT
SCREEN SIZE	10.4”	
DISPLAY TYPE	TFT-NEGATIVE-TRANSMISSIVE, Normally White	
VIEWING DIRECTION	6:00	O’CLOCK
CONTROLLER(CTP)	ILI2303	
OPEATING TEMPERATURE	-10~+50	℃
STORAGE TEMPERATURE	-20~+60	℃
BACKLIGHT TYPE	LED,WHITE	
INTERFACE TYPE(LCM&CTP)	RGB & IIC	
DISPLAY FORMAT	800RGB*600	DOTS
MODULE DIMENSION	228.4(w) x 175.4(h) x 8.675(t)	mm
ACTIVE AREA(CTP)	213.2(w) x 160.95(h)	
ACTIVE AREA(LCM)	211.2(w)*158.4(h)	mm
PIXEL PITCH	0.264(w)*0.264(h)	mm

3. ELECTRO-OPTICAL CHARACTERISTICS

T=25℃

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Response time		Tr	Viewing normal angle Θ=Ψ=0, Center of Display	-	5	10	ms	Note:3
		Tf		-	15	20	ms	
Contrast ratio		CR		300	500	-	-	Note:4
Color Chromaticity	White	Wx		0.26	0.31	0.36	-	Note:5
		Wy		0.28	0.33	0.38		
	Red	Rx		0.523	0.573	0.623		
		Ry		0.300	0.350	0.400		
	Green	Gx		0.286	0.336	0.386		
		Gy		0.547	0.597	0.647		
	Blue	Bx		0.102	0.152	0.202		
		By		0.062	0.112	0.162		
Viewing Angle	Hor.	ΘR	CR≧10	60	70	-	Degree	Note:1
		ΘL		60	70	-		
	Ver.	ΦT		40	50	-		
		ΦB		50	60	-		
Brightness (With TFT)		-	-	200	250	-	Cd/m^2	Note:6
Uniformity					80		%	Note:7

Note 1: Definition of viewing angle range

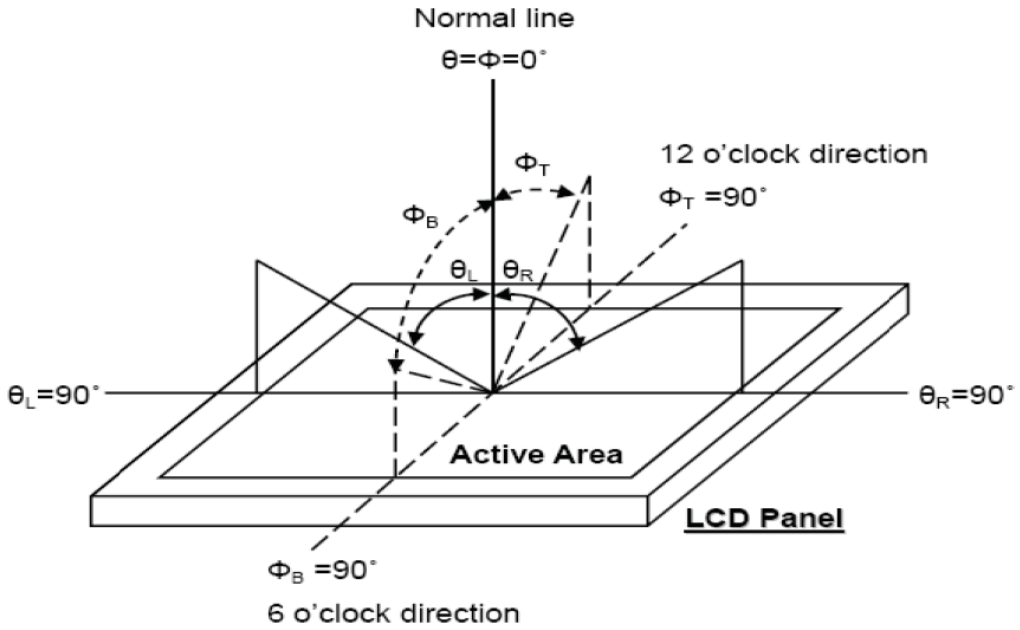


Fig.10-1 Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature and ILED=280mA for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7A luminance meter 1.0° field of view at a distance of 50cm and normal direction.

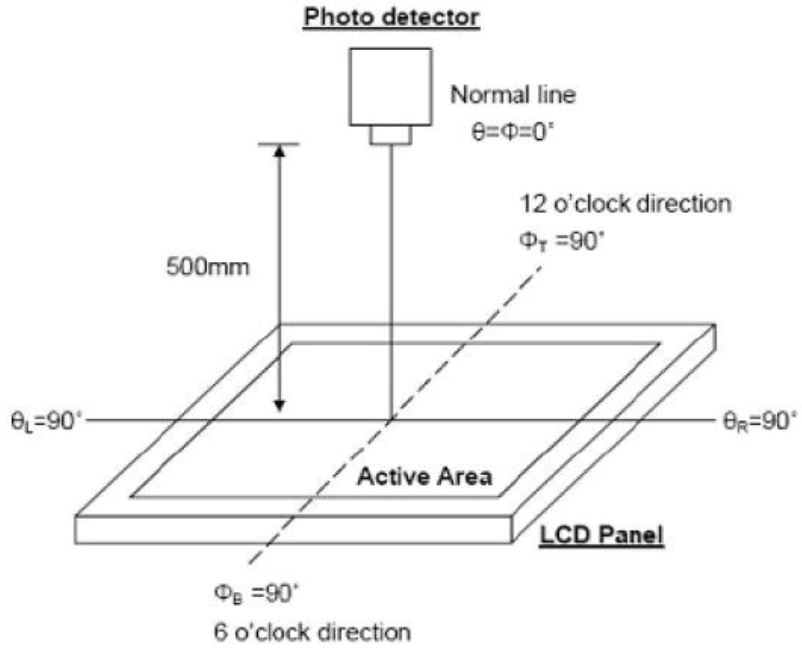


Fig. 10-2 Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between and "Black" state. Rise time, Tr, is the time between photo detector output intensity changed from 90% to 10%. And fall time, Tf, is the time between photo detector output intensity changed from 10% to 90%.

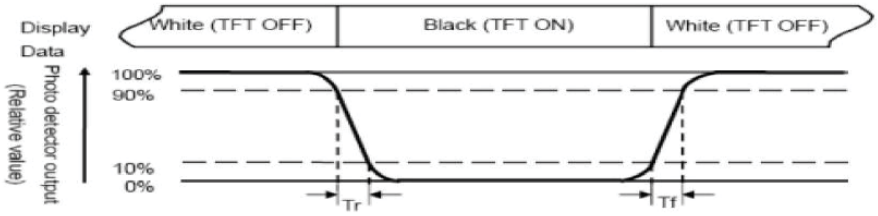


Fig 10-3 Definition of response tim

Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

$$CR = \frac{\text{Luminance measured when LCD on the "white" state}}{\text{Brightness measured when LCD on the "black" state}}$$

Note 5: Definition of color chromaticity (CIE 1931)

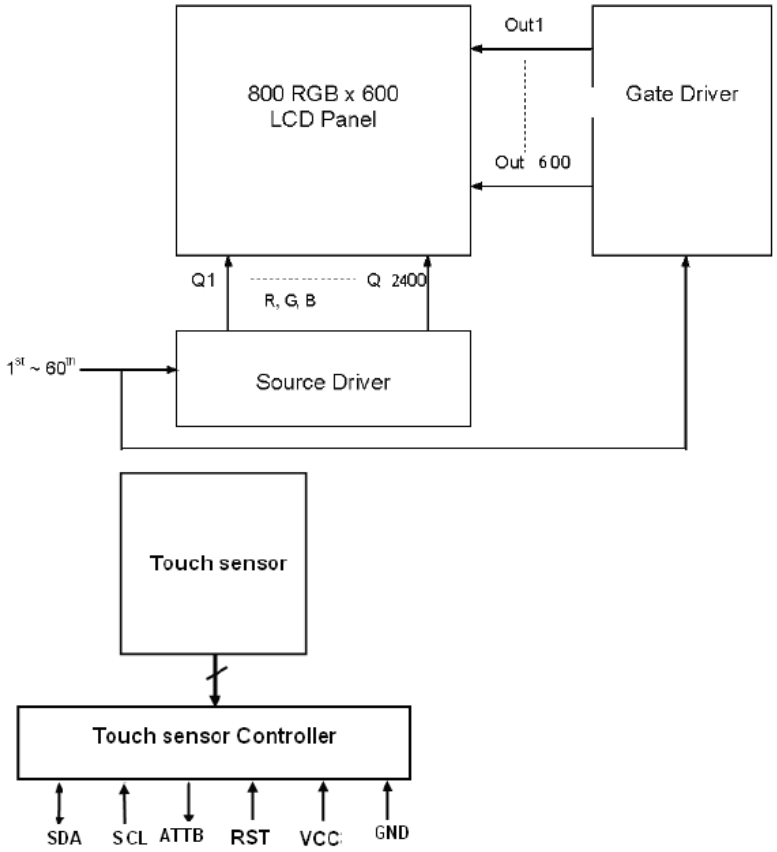
Color coordinates measured at the center point of LCD

Note 6: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 7:

$$\text{Uniformity} = \frac{\text{Brightness(min)}}{\text{Brightness(max)}} \times 100\%$$

4.BLOCK DIAGRAM



5. PINS DESCRIPTION

PIN DESCRIBTION					
PIN NO.	SYMBOL	DESCRIBTION	PIN NO.	SYMBOL	DESCRIBTION
1	GND	Power Ground	32	MODE	H:DE Mode(Default) L:SYNC Mode
2	AVDD	Anglog Input Voltage	33	NC	No Connect(Please Leave it Open)
3	VCC	Digital Input Voltage	34	NC	No Connect(Please Leave it Open)
4	R0	Red Data Input	35	NC	No Connect(Please Leave it Open)
5	R1	Red Data Input	36	VCC	Digital Input Voltage
6	R2	Red Data Input	37	NC	No Connect(Please Leave it Open)
7	R3	Red Data Input	38	GND	Power Ground
8	R4	Red Data Input	39	GND	Power Ground
9	R5	Red Data Input	40	AVDD	Anglog Input Voltage
10	R6	Red Data Input	41	VCOM	VCOM DC Input
11	R7	Red Data Input	42	DITH	Dithering Function Setting H:Disable Dithering Function L:Enable Dithering Function
12	G0	Green Data Input			
13	G1	Green Data Input			
14	G2	Green Data Input	43	NC	No Connect(Please Leave it Open)
15	G3	Green Data Input	44	VCOM OUT	Connect a Capacitor
16	G4	Green Data Input	45	NC	No Connect(Please Leave it Open)
17	G5	Green Data Input	46	NC	No Connect(Please Leave it Open)
18	G6	Green Data Input	47	NC	No Connect(Please Leave it Open)
19	G7	Green Data Input	48	NC	No Connect(Please Leave it Open)
20	B0	Blue Data Input	49	NC	No Connect(Please Leave it Open)
21	B1	Blue Data Input	50	NC	No Connect(Please Leave it Open)
22	B2	Blue Data Input	51	NC	No Connect(Please Leave it Open)
23	B3	Blue Data Input	52	NC	No Connect(Please Leave it Open)
24	B4	Blue Data Input	53	NC	No Connect(Please Leave it Open)
25	B5	Blue Data Input	54	NC	No Connect(Please Leave it Open)
26	B6	Blue Data Input	55	NC	No Connect(Please Leave it Open)
27	B7	Blue Data Input	56	VGH	TFT Turn On Voltage
28	CLK	Dot Clock Input	57	VCC	Digital Input Voltage
29	DE	Data Enable Signal	58	VGL	TFT Turn Off Voltage
30	HSD	HSYNC Signal	59	GND	Power Ground
31	VSD	VSYNC Signal	60	NC	No Connect(Please Leave it Open)

CTP PIN DESCRIBTION(CON1)		
PIN NO.	SYMBOL	DESCRIBTION
1	VCC	Power, VCC=3.0V(Typ)
2	GND	Power Ground
3	RST	Input reset signal. Low active reset.
4	SCL	Input clock signal of I2C.
5	SDA	Output data signal of I2C.
6	ATTB	Output interrupt signal for host controller.
7	NC	No Connect
8	NC	No Connect

DRIVE IC:ILI2303

6.ELECTRONIC CHARACTERISTICS

6.1 MAXIMUM VALUES

Parameter	Symbol	Condition	MIN.	MAX.	Unit	Remark
Power voltage	VCC	GND=0	-0.3	5	V	-
	AVDD	GND=0	-0.3	15	V	-
	VGH	GND=0	-0.3	+42	V	-
	VGL	GND=0	VGH-42	+0.3	V	-

Note 1: All of voltages listed above are with respective to GND=0V
Note 2: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

6.2. DC CHARACTERISTICS

6.2.1 Operating Conditions:

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Note
Digital Power Supply Voltage	VCC	3.0	3.3	3.6	V	
Digital Supply Current Consumption	IVCC	24	30	45	mA	Black Pattern
Analog Power Supply Voltage	AVDD	10.3	10.5	10.7	V	
Analog Supply Current Consumption	IAVDD	32	40	60	mA	Black Pattern
Gate Driver Positive Supply Voltage	VGH	-	18	-	V	
Gate Driver Positive Supply Current	IVGH		TBD		mA	Black Pattern
Gate Driver Negative Supply Voltage	VGL	-	-7	-	V	
Gate Driver Negative Supply Current	IVGL		TBD		mA	Black Pattern
Common Electrode Driving Voltage	VCOM	-	4.45	-	V	Black Pattern

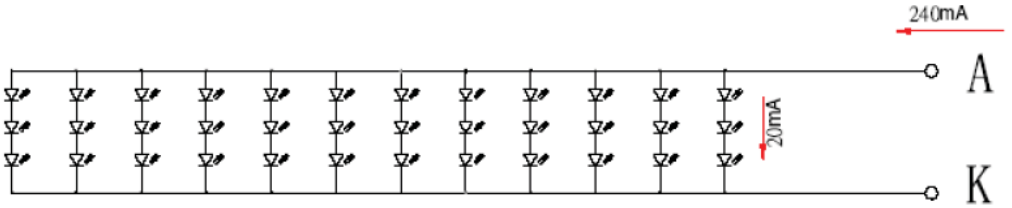
6.2.2Parameter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Low level input voltage	VIL	0	-	0.3VCC	V	
High level input voltage	VIH	0.7VCC	-	VCC	V	

6.3 BL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I_{LED}	-	240	-	mA	Note 1
LED voltage	V_{LED}	-	9.6	10.5	V	Note 3
LED Dice Life time	-	10,000	-	-	Hr	Note 2

Note 1: There are 12 Groups LED shown as below, V_{LED} =9.6V



Note 2: Brightness to be decreased to 50% of the initial value that the ambient temperature is 18℃~28℃ and LED dice current=20mA.
Note 3: VLED=LEDA-LEDK

6.4 . TIMING CHARACTERISTICS

6.4.1 Data Input format

Horizontal Timing

Parameter	Symbol	Spec			Unit
		Min.	Typ.	Max.	
Horizontal Display Area	thd		800		CLK
CLK Frequency	fclk	-	40	50	MHz
One Horizontal Line	th	862	1056	1200	CLK
HS Pulse Width	thpw	1	-	40	CLK
HS Back Porch	thb		46		CLK
HS Front Porch	thfp	16	210	354	CLK

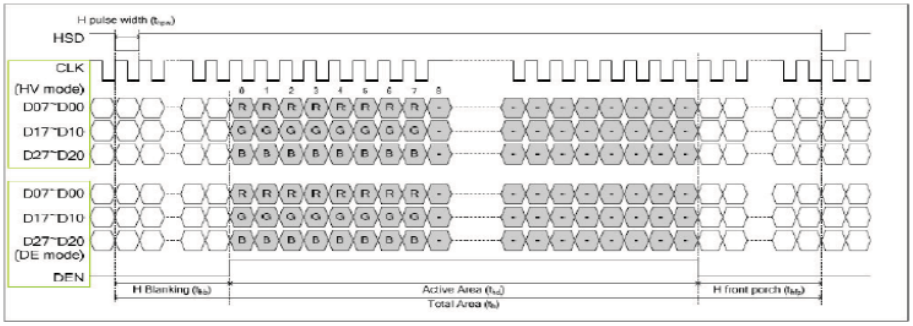
Vertical Timing

Parameter	Symbol	Spec			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd		600		th
VS Period Time	tv	624	635	700	th
VS Pulse Width	tvpw	1	-	20	th
VS Back Porch	tvb	23	23	23	th
VS Front Porch	tvfp	1	12	77	th

Note:

Suggest using frame rate 60Hz to have better performance

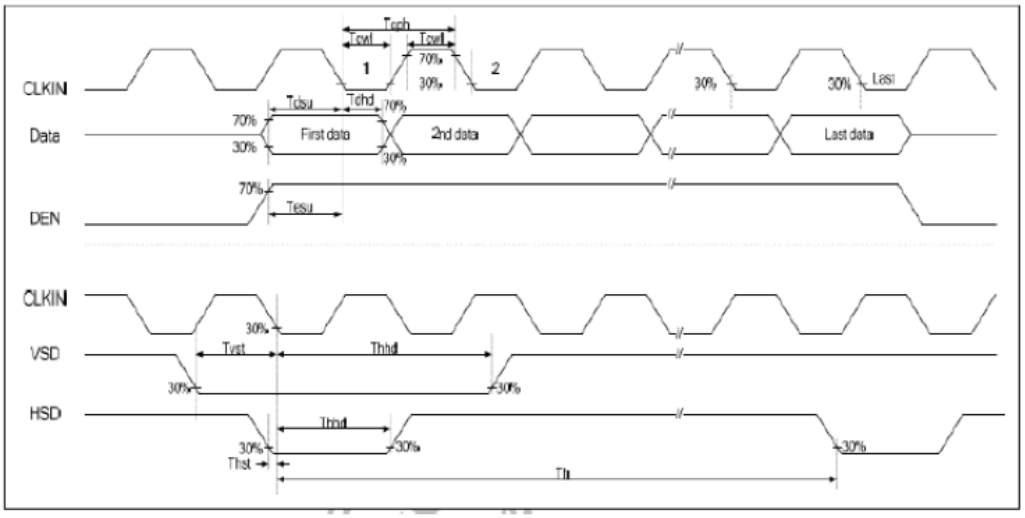
Horizontal Timing



6.4.2 AC Electrical characteristic

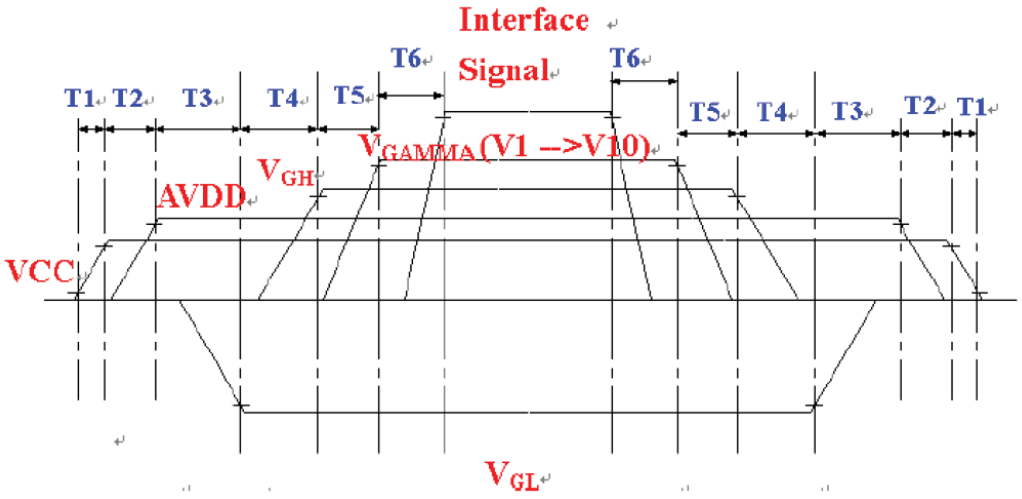
Parameter	Symbol	Spec.			Unit
		Min.	Typ	Max	
HS setup time	T_{hst}	8	-	-	ns
HS hold time	T_{hhd}	8	-	-	ns
VS setup time	T_{vst}	8	-	-	ns
VS hold time	T_{vhd}	8	-	-	ns
Data setup time	T_{dsu}	8	-	-	ns
Data hold time	T_{dhd}	8	-	-	ns
DE setup time	T_{esu}	8	-	-	ns
DE hold time	T_{ehd}	8	-	-	ns
VDD Power On Slew Rate	T_{POR}	-	-	20	ms
RSTB pulse width	T_{Rst}	10	-	-	us
CLKIN cycle time	T_{cph}	20	-	-	ns
CLKIN pulse duty	T_{cwh}	40	50	60	%
Output stable time	T_{sst}	-	-	6	ns
Re air OPA Out ut Stable time	T_{Rsst}	-	-	6	ns

6.4.3 Input Clock and Data Timing Diagram



6.4.4 power ON/OFF sequence:

The LCD panel power ON/OFF sequence is as below



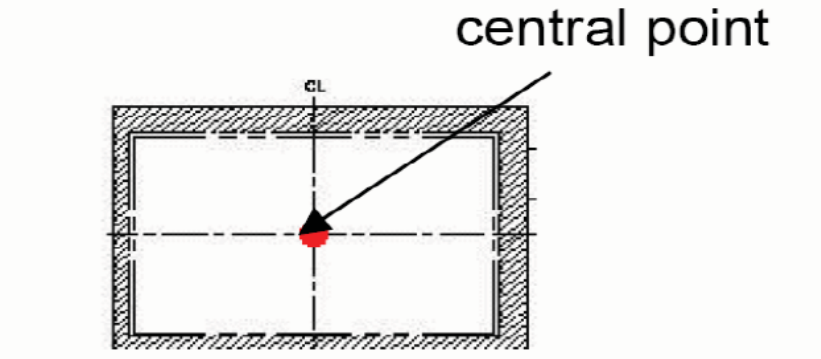
	Min.	Typ.	Max.	Unit
T1	-	-	20	ms
T2	16	-	-	ms
T3	> 0			ms
T4	>0			ms
T5	>0			ms
T6	>0			ms

7. CTP SPECIFICATIONS

7.1 GENERAL SPECIFICATIONS

Item	Specification	Unit
Type	Transparent type projected capacitive touch panel	
Input mode	Human's finger	
Finger	(10)	
Resolution	800*600	dots
Interface	I^2C	
Outline Dimension	228.4(W) x 175.4(H) x 1.775(D)	mm
Sensor Active area	213.2(W) x 160.9(H)	mm
Weight	T.B.D	g
Report rate	100	Hz
Point hitting life time	1,000,000 times min.	Note 1

Note 1: Use 8 mm diameter silicon rubber/force 3N to knock on central point twice per second (no-operating), function pass after test.



7.2 ELECTRICAL CHARACTERISTICS

7.2.1 ABSOLUTE MAXIMUM RATINGS

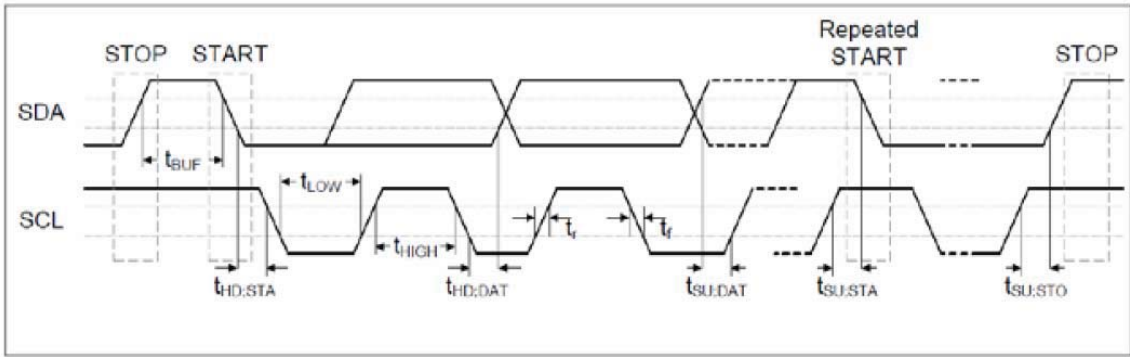
Symbol	Description	Min	Max	Unit	Notes
VCC	Power Supply voltage	-0.3	3.3	V	
Top	Operating temperature	-20	70	°C	
Tst	Storage temperature	-30	80	°C	

7.2.2 DC Characteristic

Symbol	Description	Min	Typ.	Max	Unit	Notes
VCC	Power Supply voltage	2.7	3.0	3.3	V	
I_{VCC}	Active Current	-	60	-	mA	
Iidle	Idle Current		40		mA	
V_{IH}	Input H voltage	0.65VCC	-	VCC+0.5	V	
V_{IL}	Input L voltage	-0.5	-	0.3VCC	V	

7.3TIMING SPECIFICATIONS

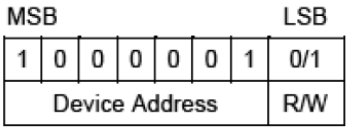
7.3.1 I2C Bus Timing



Parameter	Symbol	Conditions	Specification		
			MIN	MAX.	UNIT
SCL clock frequency	fSCL		-	1000	kHz
hold time (repeated) START condition	tHD;STA	After this period, the first clock pulse is generated.	0.26	-	us
LOW period of the SCL clock	tLOW		0.5		us
High period of the SCL clock	tHIGH		0.26	-	us
Set-up time for a repeated START condition	tSU;STA		0.26	-	us
data hold time	tHD;DAT	I2C-bus devices	0	-	us
rise time of both SDA and SCL signals	tr		-	120	ns
fall time of both SDA and SCL signals	tf		20×(VDD / 5.5 V)	120	ns
set-up time for STOP condition	tSU;STO		0.26		us
bus free time between a STOP and START condition	tBUF		0.5		us
capacitive load for each bus line	Cb		0.5		us
data valid time	tVD;DAT			0.45	us

7.3.2 Device Address

The device addresses are 7-binary bits long and are conventionally expressed as 4 bits followed by 3 bits followed by the letter ‘b’, 1000 001b. These addresses occupy the high seven bits of an eight-bit field on the bus.



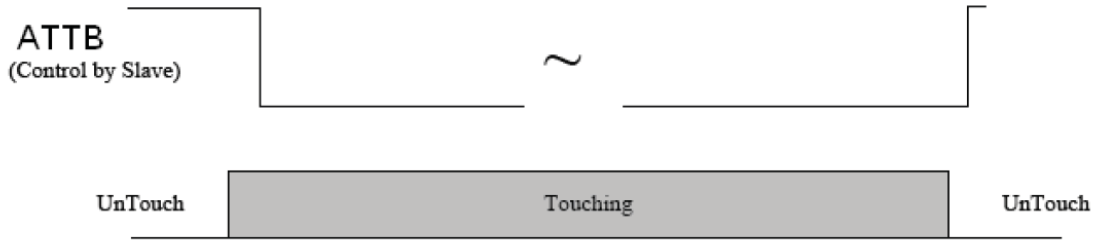
7-bit Device Address: 0x41
8-bit Device Read Address:0x83
8-bit Device Write Address:0x82

I^2C Device Address

7.3.3 Interrupt Pin (ATTB) Control

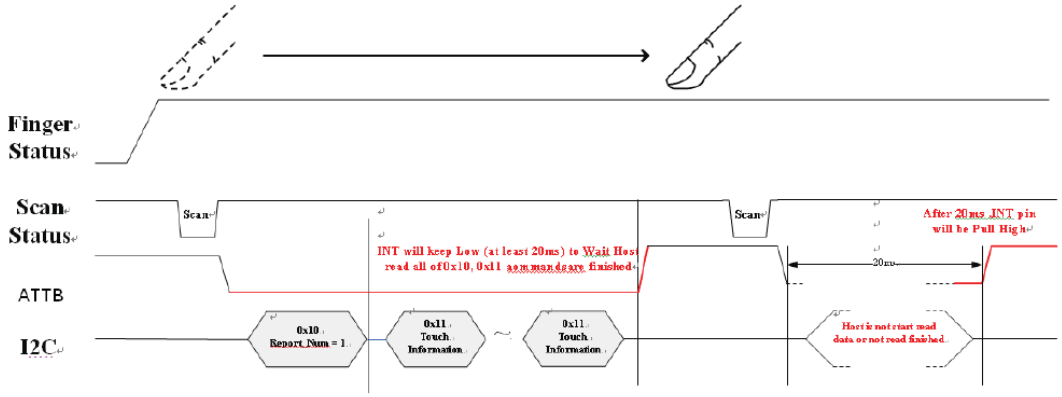
ILI Touch device uses interrupt pin to signal the host when detecting touch events on the sensor. When a finger touches on the sensor surface, the INT pin will be pull low. ILI Touch device supports two different type control method.

Method 1: The ATTB will continue to be low until the finger leaves the sensor surface.

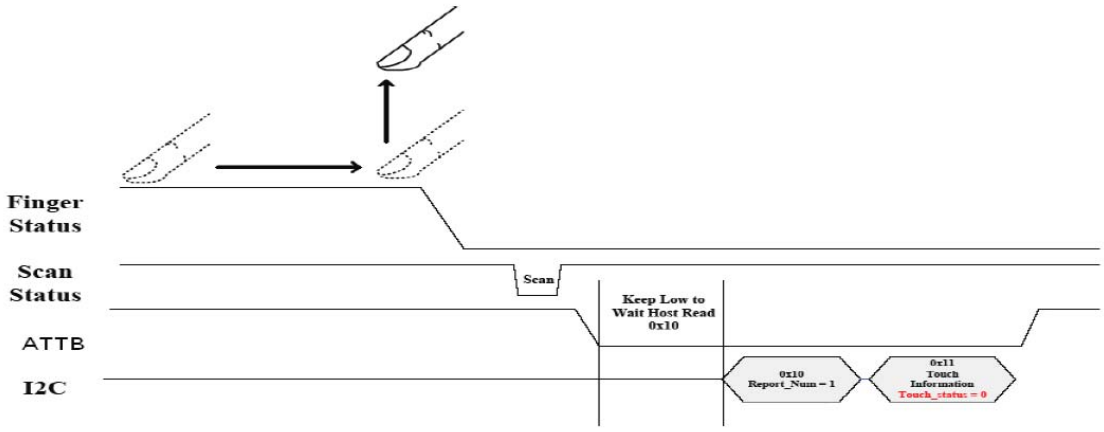


Method 1:ATTB Pin Control Diagram (Finger Touch)

Method 2: The ATTB will continue to be pull low until host read 0x10 command

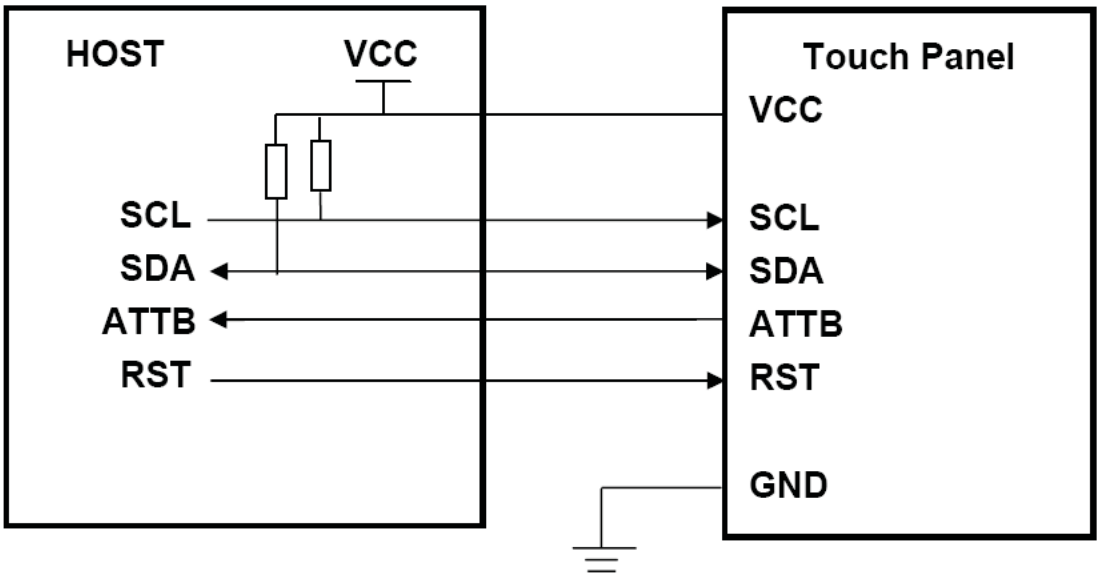


Method 2:ATTB Pin Control Diagram (Finger Touch)



Method 2: ATTB Pin Control Diagram (Finger Release)

7.4 BLOCK DIAGRA



8. INSTRUCTION DESCRIPTION (LCM)

NO

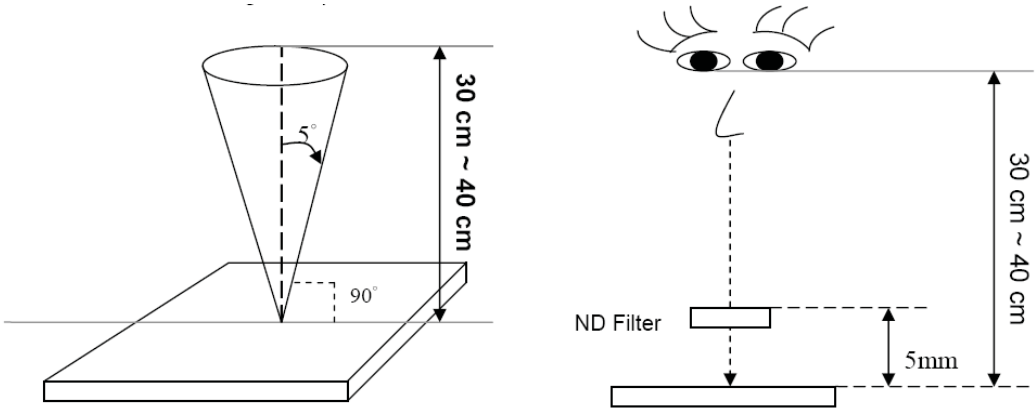
9. Product Quality & Reliability

9.1 Inspection conditions

9.1.1 Inspection Distance : 30 ± 5 cm

9.1.2 View Angle :

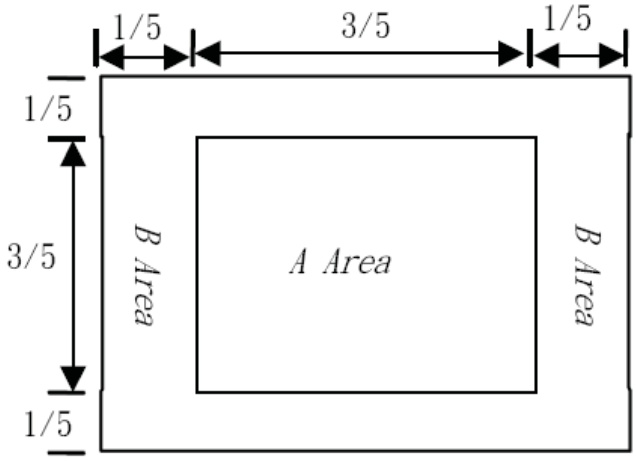
View Angle : Inspection under test condition : ±5



9.1.3 Environment conditions :

Ambient Temperature :		**25±5℃**
Ambient Humidity :		**65±5%**
Ambient Illumination	Functional Inspection	**300~ 500 lux**

9.1.4 Definition of applicable Zones:

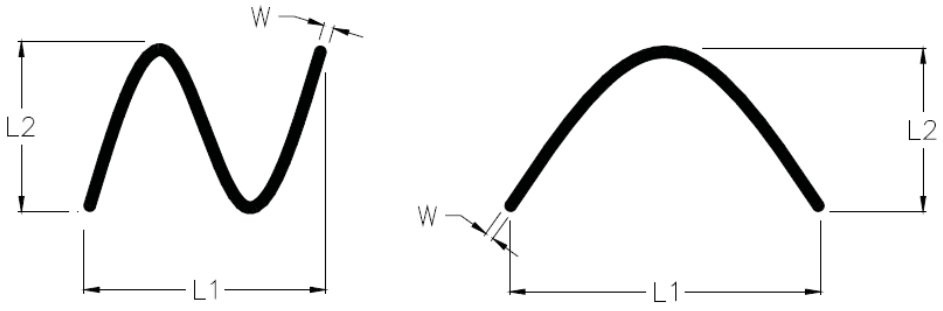


9.2 Inspection Condition

<table>
<tr><th>No.</th><th>Parameter</th><th>Criteria</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Operating</td><td>Display function: No Display malfunction (Major)
Contrast ratio (Black, White):
Does not meet specified range in the spec. (Major) (Note:3)
Line Defect: No obvious Vertical and Horizontal line defect in bright, dark and colored. (Major) (Note:1)
Point Defect (Red, green, blue, dark): Active area ≤ 4 dots (Minor)(Note:1)
<table>
<tr><th rowspan="2">Item</th><th>Acceptable number</th><th rowspan="2">Total</th></tr>
<tr><th>Active Area</th></tr>
<tr><td>Bright</td><td>2</td><td rowspan="2">4</td></tr>
<tr><td>Dark</td><td>3</td></tr>
</table>
Non-uniformity: Visible through 6%ND filter. (Minor)
Foreign material in Black or White spots shape (W>1/4L)
<table>
<tr><th>Zone / Dimension</th><th>Acceptable number</th><th>Class Of Defects</th><th>AQL Level</th></tr>
<tr><td>D> 0.5</td><td>0</td><td rowspan="3">Minor</td><td rowspan="3">1.5</td></tr>
<tr><td>0.3 ≤ D ≤ 0.5</td><td>4</td></tr>
<tr><td>D ≤ 0.3</td><td>*</td></tr>
</table>
D = (Long + Short) / 2 ＊ : Disregard
Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4)
<table>
<tr><th>L (mm) / Zone W(mm)</th><th>Acceptable number</th><th>Class Of Defects</th><th>AQL Level</th></tr>
<tr><td>L >3</td><td>W>0.1</td><td>0</td><td rowspan="3">Minor</td><td rowspan="3">1.5</td></tr>
<tr><td>0.5 < L ≤ 3</td><td>0.05 < W≤0.1</td><td>4</td></tr>
<tr><td>L ≤0.5</td><td>W≤0.05</td><td>*</td></tr>
</table>
L : Length W : Width ＊ : Disregard</td></tr>
<tr><td>2</td><td>External Inspection (non-operating)</td><td>Dimension: Outline (Major)
Bezel appearance: uneven (Minor)
Scratch on the polarize: (Note:2)
<table>
<tr><th>L (mm) / Zone W(mm)</th><th>Acceptable number</th><th>Class Of Defects</th><th>AQL Level</th></tr>
<tr><td>L >10</td><td>W>0.1</td><td>0</td><td rowspan="2">Minor</td><td rowspan="2">1.5</td></tr>
<tr><td>L ≤ 10</td><td>W≤0.1</td><td>4</td></tr>
</table>
L : Length W : Width ＊ : Disregard
Dent or bubble on the polarize (Note:2)
<table>
<tr><th>Zone / Dimension</th><th>Acceptable number</th><th>Class Of Defects</th><th>AQL Level</th></tr>
<tr><td>D≤0.3</td><td>*</td><td rowspan="2">Minor</td><td rowspan="2">1.5</td></tr>
<tr><td>D≤0.5</td><td>4</td></tr>
</table>
D = (Long + Short) / 2 ＊ : Disregard</td></tr>
</table>

Class of defects		AQL 0.65%	**Definition** It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
		AQL 1.5%	It is a defect that will not result in functioning problem with deviation classified.

Note:1.(a)Bright point defect is defined as point defect of R,G,B with area >1/2 dot respectively
(b)Dark point defect is defined as visible in full white pattern.
(c)Definition of distribution of point defect is as follows:
-minumum separation between dark point defects should be larger than 5mm.
-minumum separation between bright point defects should be larger than 5mm.
(d)Definition of joined bright point defect and joined dark point defect are as follows:
-Two or more joined bright point defects must be nil.
-Three joined dark point defects must be nil.
-Coupling of one dark and one bright point in junction is counted as one dark and bright spot with 1 pa maximum.
-Two Joined dark point is counted as two dark point with 2 pair maxmum.
Note:2 The external inspection should be conducted at the distance 35± 5cm between the eyes of inspctor and the panel .
Note:3 Luminance measurement for contrast ratio is at the distance 50± 5cm between the detective head and the panel with ambient illuminance less than 1 lux. Contrast ratio is obtained at optimum view angle.
Note:4 W-Width in mm , L-length of Max.(L1,L2) in mm.



9.3 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

Sampling type: normal inspection, single sampling

Sampling table: MIL-STD-105E

Inspection level: Level II

Class of defects	Definition		
	Major	AQL 0.65%	It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
	Minor	AQL 1.5%	It is a defect that will not result in functioning problem with deviation classified.

9.4. QUALITY ASSURANCE

9.4.1 Test Condition

9.4.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25± 5 ℃

Humidity : 65± 5%

9.4.1.2 Operation

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

9.4.1.3 Container

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

9.4.1.4 Test Frequency

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

9.4.1.5 Test Method

Reliability Test Item & Level		Test Level
No.	Test Item	
1	High Temperature Storage Test	Ta=60℃, Dry 240hrs
2	Low Temperature Storage Test	Ta=-20℃, Dry 240hrs
3	High Temperature Operation Test	Ta=50℃, Dry 240hrs
4	Low Temperature Operation Test	Ta=-10℃, Dry 240hrs
5	High Temperature and High Humidity Operation Test	Ta=50℃,80%RH,240hrs
6	Electro Static Discharge Test (No operation)	150pF, 330Ω, ±6KV(Contact)/±8KV(Air),
7	Thermal Cycling Test (No operation)	-20℃ → +25℃, →60℃ 100 Cycles 30 min 5 min 30 min
8	Vibration Test (No operation)	Sine wave, 10~500Hz, 1.5G, 0.37oct/min 3axis, 1 hour/axis
9	Mechanical Shock Test (No operation)	Gravity: 180g; Time: 2ms 3 axis: for all six faces Every face for one time

* Ta= Ambient Temperature

Note 1: The test samples have recovery time for 4 hours at room temperature before the function check. In the standard conditions, there is no display function NG issue occurred.

Note 2: All the cosmetic specifications are judged before the reliability stress.

10.PRECAUTIONS IN USING

1. ASSEMBLY PRECAUTIONS

(1) Since Touch Panel is consist of glass,please be careful your hands to be injured during handing. You must wear gloves during handing.
(2) Do not touch, push or rub the exposed touch panel, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
(3) Do not stack the touch panels together.Do not put heavy objects on touch panel.
(4) Please do not take a CTP to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
(5) Please excessive force or strain to the panel or tail is prohibited, Do not lift touch panel by cable(FPC).
(6) Use clean sacks or glove to prevent fingerprints and/or stains left on the panel. Extra attention and carefulness should be taken while handling the glass edge.
(7) Please pay attention for the matters stated below at mounting design of touch panel enclosure.

Enclosure support to fix touch panel must be out of active area.(do not design enclosure presses the active area to protect from miss put)

2 .OPERATING PRECAUTIONS

(1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
(2) Please do not change variable resistance settings in CTP. They are adjusted to the most suitable value. If they are changed, it might happen CTP does not satisfy the characteristics specification
(3) Be careful for condensation at sudden temperature change. Condensation makes damage to snesor or electrical contacted parts.
(4) CTP has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
(5) Touch the panel with your finger or stylus only to assure normal operation. Any sharp edged or hard objects are prohibited.
(6) Operate the panel in a steady environment. Abrupt variation on temperature and humidity may cause malfunction of the panel.

3. ELECTROSTATIC DISCHARGE CONTROL

(1) The operator should be grounded whenever he/she comes into contact with the CTP. Never
(2) The CTP 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.

4. STORAGE PRECAUTIONS

(1) When you store touch panel for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
(2) Please do not leave touch panel in the environment of high humidity and high temperature such as 60°C 90%RH
(3) Please do not leave touch panel in the environment of low temperature; below -20°C.

5. OTHERS

For the packaging box, please pay attention to the followings:

a. Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
b. Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
c. Packing box and inner case for CTP are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

11. APPLICATION

11.1 REFERENCE CIRCUIT

TBD…

11.2 APPENDIX

NO

……..TO YOUR CODE

13. HISTORY OF VERSION

REVISIONS					
No.	DATE	DESCRIPTION	ORGANIZED BY	CHECKED BY	APPROVED BY
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					