



REG. DATE : 2015.07.21

SPECIFICATION

REV.NO : 1.0

REV. DATE : 2015.07.21

SPECIFICATIONS FOR APPROVAL

PRODUCT NAME : Touch Sensor Module with Control Board (46")

LGIT MODEL NAME : TSTD-DR01A

Customer P/N :

APPROVAL	REMARK

APPENDIX

	Designed	QA Checked	Approved
LG INNOTEK Approval			



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1. General Description

1-1. General Feature

Item		Spec	Remark
Window Glass	Viewing Area	1023.5mm x 577.5mm	View Area 46 inch
	Out Dimension Size	1062.3mm x 629.0mm	
	Thickness	5.0mm	
	Material	Sodalime	Thermal Strengthened
	Deco Printing	Black	
	Printing Hole	-	
	AG coating	Yes	Gloss 90~130unit
	Chamfer	C0.8±0.2	
	Protection Film	-	
Touch Sensor	Type	GFF, 2 mesh sensor(PET)	
	Sensor Size	1046.384mm X 606.816mm	
	Thickness	0.365mm	Without Protect Film
	Sensing Type	Mutual Capacitance 2 layer	
	Channel No.	Rx(Top) : 127 Tx(Bottom) : 72	Trace Single Routing
	Protection Film	Yes (0.050t or 0.075t)	
Control Board	Response Time	16ms	1~10Point Basis / CH141*78 / Repot rate 240Hz
	Accuracy	±1.5mm	
	Separation	Min20mm	Distance Between 2Points
	Power Consumption	Max 2.5W (5V±10%, 450mA)	
FPCB	Type	COB Type	
	Connector	ZIF Type	FH30 Series
	Size	Rx : 257.49mm x 95.0mm Tx : 290.84mm x 56.5mm	
	Layer	Single Layer	



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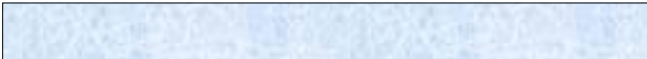
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1. General Description

1-2. Stack up

No	Structure	Feature
1		Window Glass
2		Top OCA
3		Top Sensor
4		Bottom OCA
5		Bottom Sensor



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2. Specification

2-1. Electrical Specification

- Drawing Test

2-2. Optical Specification

Feature	Specification
Transmittance (%)	Typ. 83% (Min 81%)
Haze	Typ. 4% (Max 6%)

2-3. Reference LCD Condition

Feature	Specification
Resolution	1920 x 1080 (FHD)
LCD Active Area(Size)	46"

2-4. Operating Environmental Condition

Feature		Specification
Temperature	Operating	5 to 60 °C
	Storage	-20 to 60°C
Humidity	Operating	8 to 85%
	Storage	8 to 90%

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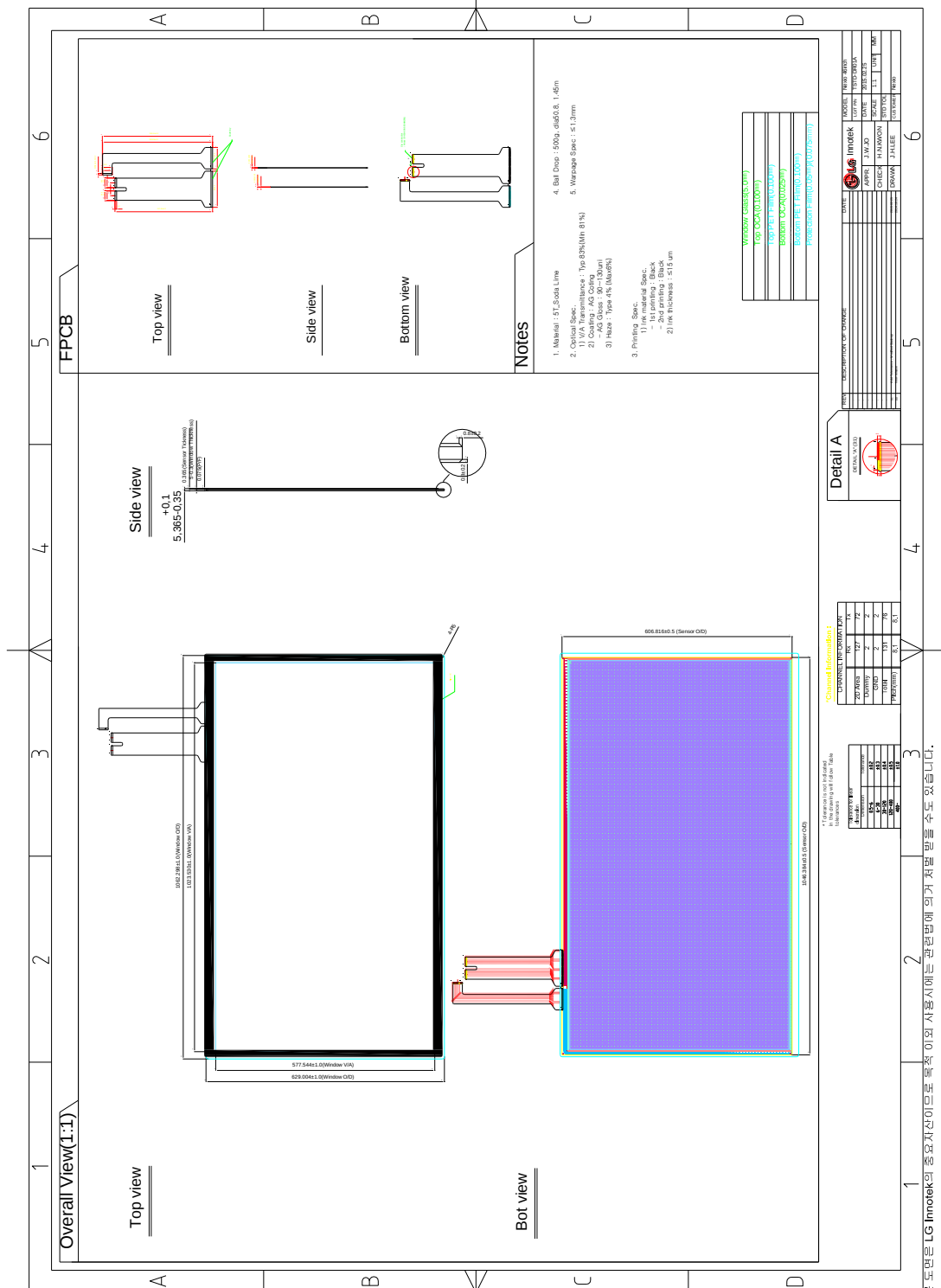
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3. Outline Dimension

3-1. Touch Panel



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REV	DESCRIPTION OF CHANGE		DATE	P/N	3PCE02006A
09				FILE NAME	LGIT_46inch Rx FPC_v01
08				DATE	2014.10.27
07				APPR	조성진
06				CHECK	JW/PARK
05				SCALE	1:1
04				STD TOL	± 0.1
03				DRAWN	JW/PARK
02			2014.10.27	CUSTOMER	LGIT
01	Initial Release				



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4. Reliability Test Standard

4-1. Reliability Test

				Reliability Test							
				Sample	Test Item						
					Appearance	Electronic Test	Transmittance	Haze			
Test ITEM		Test Condition		Test Time /Cycle						비고	
Storage	High	80℃		96hr		3	O	O	O	O	Evaluate sample after keeping at room temperature
	Low	-20℃		96hr		3	O	O	O	O	
	High Humidity	60℃, 90%RH		96hr		3	O	O	O	O	
	Thermal Shock	-30℃(30min) ↔ 65℃(30min)		10Cycle		3	O	O	O	O	
ESD		HBM 300Ω 150pF ±15kV@Air		5times				O			Center, Corner 4 points
Ball Drop		500g / 1m		1times			O				

[Note]

- In this standard condition, there shall be no practical problems that may affect the Touch Screen function.
- Touch Screen Panel should be at room temperature for 2 hours after the reliability test and then measured.



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4. Reliability Test Standard

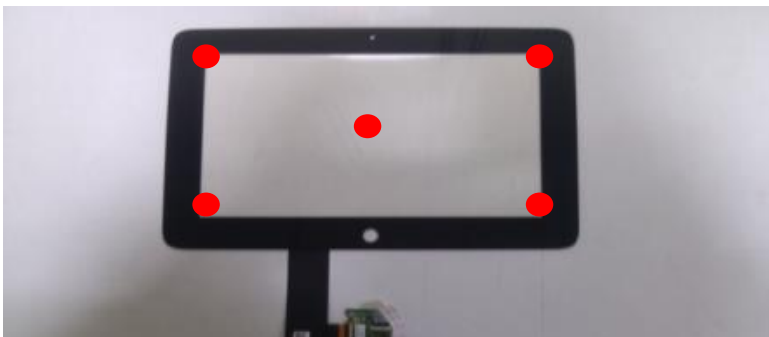
4-2. ESD Test

Item	Test Condition	Remarks
ESD	HBM Air Contact ($\pm 15\text{kV}$) Center 1point Corner 4points (5 times at each points)	-

* Test Condition

Item	Condition
Discharge Imp.	330 Ω /150pF
Discharge	Voltage $\pm$ Each 10times
Discharge Speed	More than 10min interval
Humidity and pressure	15~35 $^{\circ}\text{C}$ /30~60%/ 860~1,060mbar
Discharge Method (Sample allocation: Each50%)	Only Air Discharge
Air Discharge Method	Quick access from approximately 20cm

Voltage	Judgment	Except judgment
Air $\pm 15\text{kV}$	▪ Loss of function	▪ Take place appearance defect - Pattern Burnt (function Performance OK) - Appearance defects due to ESD



● Test Point
(5 times at each points)



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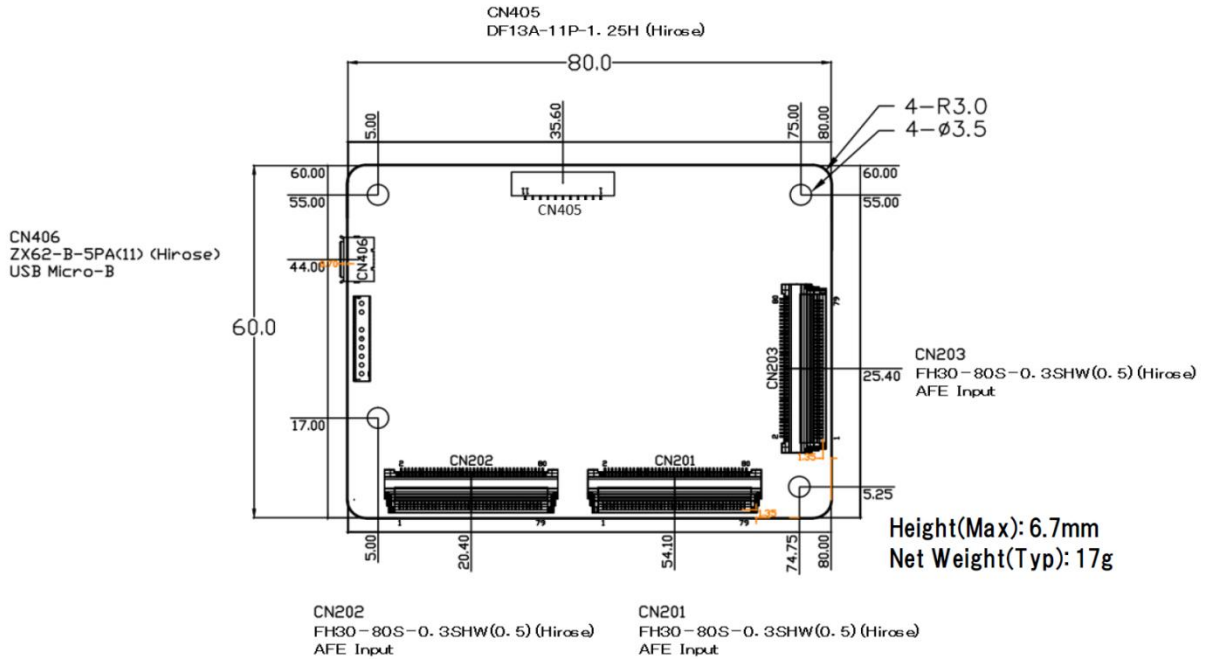
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5. Control Board

5-1. Outline Dimension



5-1-1. Connector Description & Pin Name

CN 201		CN 202		CN 203		CN 405		CN 406	
RX 2nd		RX 1st		TX		HSYNC		Micro USB	
Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name
1	Dummy	1	GND	1	GND	1	GND	1	VBUS
2	Rx 78	2	Rx 0	2	Tx 77	2	HSYNC	2	D-
3	Rx 79	3	Rx 1	3	Tx 76	3 ~ 11	DNC	3	D+
~		~		~				4	GND
19	Rx 95	23	Rx 21	23	Tx 56			5	GND
20	Rx 96	24	Rx 22	24	Tx 55				
21	Rx 97	25	Rx 23	25	Tx 54				
66	Rx 142	26	Rx 24	26	Tx 53				
67	GND	27	Rx 25	27	Tx 52				
68	GND	28	Rx 26	28	Tx 51				
~		~		~					
78	GND	78	Rx 76	78	Tx 1				
79	GND	79	Rx 77	79	Tx 0				
80	GND	80	Dummy	80	GND				



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5. Control Board

5-2. Reliability

Test Items	Condition	
High Temp. Storage	Ta = 70℃	96hrs
Low Temp. Storage	Ta = -20℃	96hrs
High Temp. & High Humidity Storage	Ta = 40℃, 90%RH	96hrs
High Temp. Operation	Ta = 60℃	96hrs
High Temp. & High Humidity Operation	Ta = 40℃, 90%RH	96hrs
Heat Shock	Ta = -20℃ ↔ 70℃ each 30 min	5cycles



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5-3. Sharp Touch controller support OS(via USB)

	OS	Support	Driver	Remark
Windows	Windows 7	√	Windows USB/HID driver	
	Windows 8/8.1	√	Windows USB/HID driver	
Linux	Ubuntu 12.04	√	Linux USB/HID driver	-Kernel version 3.8 or above -Driver configuration might be modified to attach appropriate driver module.
	Ubuntu 13.04	√	Linux USB/HID driver	-Kernel version 3.8 or above -Driver configuration might be modified to attach appropriate driver module.
	Others			Contact us
Android	Gingerbread (2.3)	√	Available with custom HID driver provided by SHARP	
	Ice Cream Sandwich (4.0)	√	Android USB/HID driver	Driver configuration might be modified to attach appropriate driver module.
	Jelly Bean (4.3)	√	Android USB/HID driver	Driver configuration might be modified to attach appropriate driver module.
	KitKat (4.4)	√	Android USB/HID driver	Driver configuration might be modified to attach appropriate driver module.



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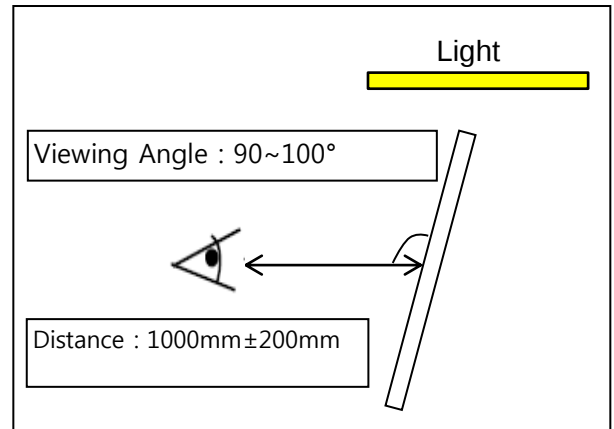
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6. Inspection Standard

6-1. Cosmetic Inspection Condition

- Luminance : 600 ± 200 lux (diffused light source)
- Distance(With the unaided eye) : 1000 ± 200mm
- Light source : D65 (White-6,500K)
- Measurement method : With the unaided eye or the magnifying glass
- Viewing Angle : 90° (vertical)
- Duration : Up to 30 ~ 45sec



6-2. Cosmetic Inspection Standard

Item	Area	Judgment	46 Inch	Remark
Circular defect ($D = (L + W) / 2$)	Active/Print	Ignore	$D \leq 0.8$ (Ignore the distance between defects)	
		OK	$0.8 < D \leq 1.0\text{mm} : 10\text{ea}$ (Distance between defects $\geq 10\text{mm}$)	
		NG	$D > 1.0\text{mm}$	
Linear defect	Active/Print	Ignore	$W \leq 0.2\text{mm}$ (Ignore the distance between defects)	
		OK	$0.2 < W \leq 0.3\text{mm}$ and $25 < L \leq 50\text{mm} : 10\text{ea}$ (Distance between defects $\geq 10\text{mm}$)	
		NG	$W > 0.3\text{mm}$ or $L > 50\text{mm}$	
Circular defect (translucent) ($D = (L + W) / 2$)	Active/Print	Ignore	$D \leq 0.8$	Include Bubble
		OK	$0.8 < D \leq 1.8\text{mm} : 10\text{ea}$	
		NG	$D > 1.8\text{mm} : \text{NG}$	
Chipping (Corner, Side)	Print/Edge	OK	$D \leq 0.5\text{mm} : \text{OK}$	
		NG	$D > 0.5\text{mm} : \text{NG}$	
Dent	Active/Print	OK	Should not be viewed from the front, during inspection	
Window Stain	Active/Print		Allowed if removable	
Paint Bleed/Peel/Scratch	Print	Ignore	$W \leq 0.2\text{mm}$ and $L \leq 25\text{mm}$ (Ignore the distance between defects)	Allowed paint marker pen
		OK	$0.2 < W \leq 0.3\text{mm}$ or $25 < L \leq 50\text{mm} : 10\text{ea}$ (Distance between defects $\geq 10\text{mm}$)	
		NG	$W > 0.3\text{mm}$ or $L > 50\text{mm}$	
Pin-holes	Print	Ignore	$\leq 0.2\text{mm}$	
		OK	$0.2\text{mm} < \text{Pin hole} \leq 0.6\text{mm} : 13\text{pcs}$ (Distance between defects $\geq 10\text{mm}$)	
		NG	$> 0.6\text{mm}$	
Protect film			Ignore protect film defect	



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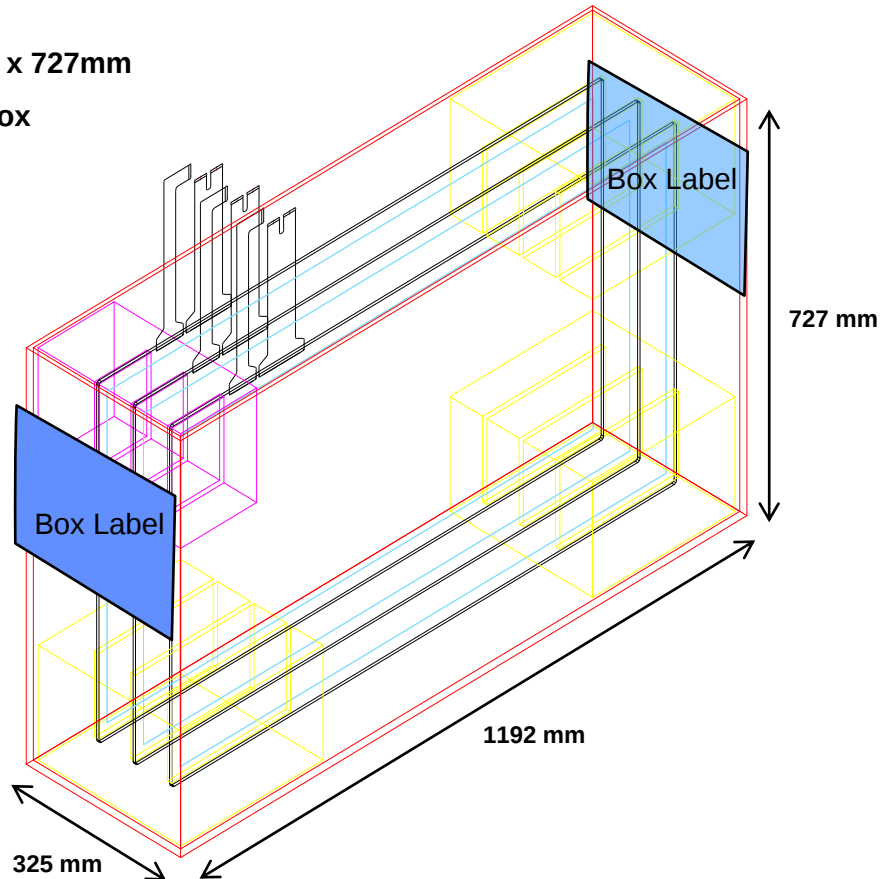
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7. Packing

7-1. Packing Box

Packing Information

- Box Size : 1192x 325 x 727mm
- PE Form : 4pcs / 1-Box
- 3pcs / 1 Box

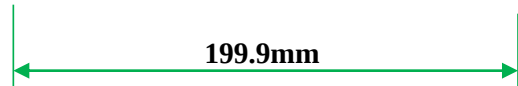


< Box Label Standard >

	Items	Description
1	LGIT P/N	LGIT Part No.: TSTD-DR01A
2	L/NO	Shipping Date - Category - Box No.
3	Q'TY	Quantity / Box
4	Supplier	LG Innotek

< Box Label Example >

46" Touch Sensor Module	
LGIT P/N	TSTD-DR01A
L/NO	150611-TSM-1
Q'TY	3 PCS
Supplier	LG Innotek



< Package Dimension >



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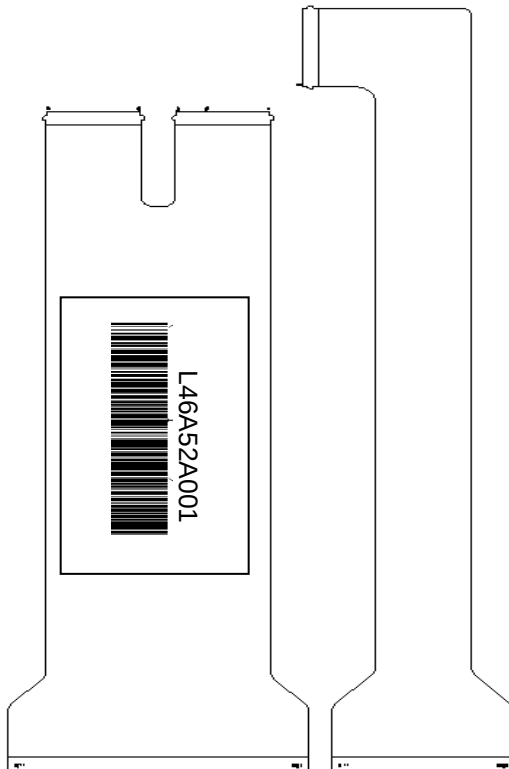
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7-2. Lot marking

※ Lot Marking : FPCB Front Side (Attach RX top)



LGIT		
Item	Contents	Description
(1)	Company Code	L
(2)	inch	4
(3)		6
(4)	Year	Ex) 2015 → 5
(5)	Month	Ex) 1month: 1, 10month: A, 11 month : B 12month: C
(6)	Day	Ex) 1day: 1, 10day: A, 31day: X (o,i 는 제 외)
(7)	S/N	TSM Serial Number
(8)		
(9)		



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Cautions & Warranty

⚠ Please pay attention to the following when you use this Touch Sensor Panel.

1) Storage

When storing the TSM(Touch Sensor Panel)s as spares for a long time, the following precautions are necessary.

- Store the TSMs in a dark place. Do not expose the TSMs to sunlight. Keep the temperature between 5℃ and 30℃ at normal humidity.

2) Protection Film

- When the protection film is peeled off, static electricity is generated between the protection film and the TSM's transparent electrical film(Ag Mesh PET film). This should be peeled off slowly and carefully by people who are electrically grounded and the well ion-blower equipment or in such a condition, etc.
- When the TSM with protection film attached is stored for a long time, sometimes there remains a small amount of glue still on the TSM's transparent electrical film(Ag Mesh PET film) after the protection film is peeled off.
- You can remove the glue easily. When the glue remains on the TSM's transparent electrical film(Ag Mesh PET film) surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with ethyl-acetate.

3) Electrostatic Discharge Control

- Since the TSM is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc.

4) Installing and Assembling

- Do not touch, push or rub the exposed TSM's film with glass, tweezers or anything harder than 3H pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of film for bare hand or greasy cloth. (Some cosmetics deteriorate the film.)
- When the surface becomes dusty, please wipe gently with absorbent cotton or other soft material like chamois soaked with ethyl-acetate. Do not use acetone and toluene.
- Do not put a heavy, hard or sharp objects on the TSM.
- Do not apply excessive forces to the FPCB.

⚠ Warranty

Touch Sensor Panel products shall be warranted for one year after shipping from LG Innotek Co. Ltd.
(Storage condition : Between 5℃ and 30℃ at normal humidity)

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