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S P E C I F I C A T I O N

REV.NO : 3.0

REV. DATE : 2015.04.21

MODEL NAME : TSTD-DR03A

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SPECIFICATIONS FOR APPROVAL

PRODUCT NAME : Touch Sensor Module with Control Board (32")

LGIT MODEL NAME : TSTD-DR03A

Customer P/N :

APPROVAL		
LG Innotek Co., Ltd.		
Drafter	Quality Team Agreement	Final Approver

Appendix



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1. General Description

1-1. General Feature

	Item	Spec	Remark
Window Glass	Viewing Area	701.4mm x 395.9mm	
	Out Dimension Size	735.6mm x 443.5mm	
	Thickness	3.2mm	
	Material	Sodalime	Thermal Strengthened
	Deco Printing	Black	
	Printing Hole	-	
	AG coating	Yes	90~130unit
	Chamfer	C0.6±0.2	
	Protection Film	-	
	Logo	-	
	Silk	-	
Touch Sensor	Type	GFF, 2 mesh sensor(PET)	
	Sensor Size	720.98mm X 422.19mm	
	Thickness	0.365mm	without Protect Film
	Sensing Type	Mutual Capacitance 2 layer	
	Channel No.	Rx(Top) : 103 Tx(Bottom) : 59	Trace single routing
	Protection Film	Yes (0.050t or 0.075t)	
Control Board	Response Time	16ms	1~10point 기준 / CH141*78 / Repot rate 240Hz)
	Accuracy	±1.5mm	
	Separation	Min20mm	2-Point간 거리
FPCB	Type	COB Type	
	Connector	ZIF Type	FH30 Series
	Size	Rx : 207.51mm x 78.2mm Tx : 240.86mm x 47.4mm	
	Layer	Single Layer	

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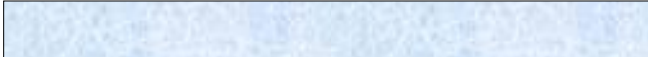




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1. General Description

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)	32"

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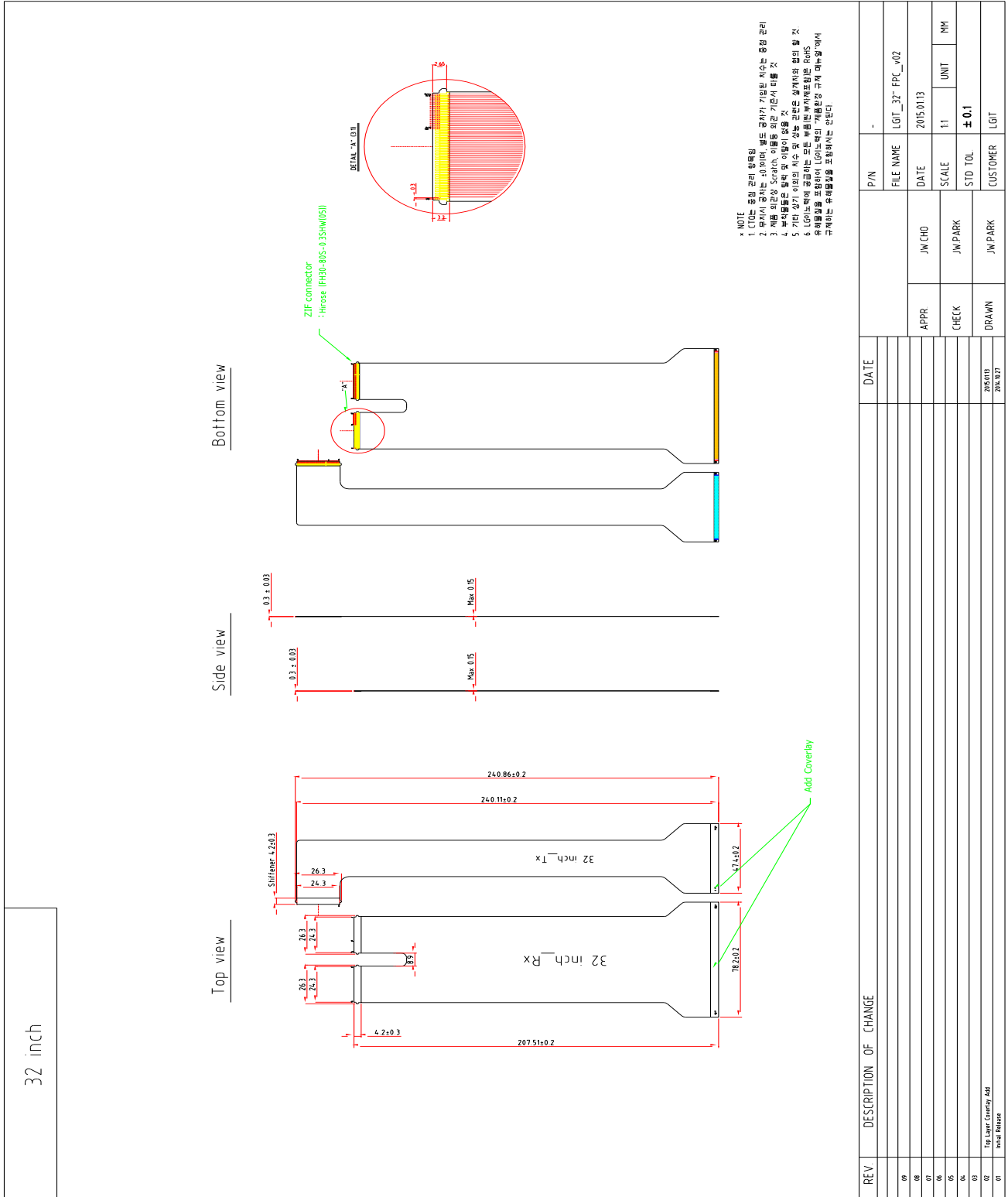
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3. Outline Dimension

3-2. FPCB



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4. Inspection & Reliability Test Standard

4-1. Reliability Test

시험 항목		시험 조건	시험 시간 /Cycle	정기 신뢰성시험					비고
				항상 배치	평가 항목				
					외관	전기적 특성	투과율	Haze	
보존	고온	80℃	96시간	3	○	○	○	○	상온 2시간 방치 후 평가
	저온	-20℃	96시간	3	○	○	○	○	
	고온 고습	60℃, 90%RH	96시간	3	○	○	○	○	
	열충격	-30℃(30min) ↔ 65℃(30min)	10Cycle	3	○	○	○	○	
ESD		HBM 300Ω 150pF ±15kV@Air	5회			○			Center, Corner 4 points
Ball Drop		500g / 1m	1회		○				

[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. Inspection & Reliability Test Standard

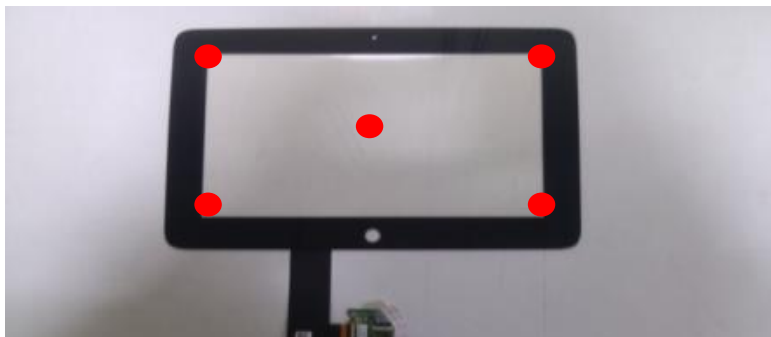
4-2. ESD Test

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

*** Test Condition**

구분	조건
Discharge Imp.	300 Ω /150pF
방전 회수	전압 별 \pm 각 10회
Discharge Speed	1초 이상 간격
온습도 및 기압	15~35 $^{\circ}C$ /30~60%/ 860~1,060mbar
방전방식 (시료배분: 각50%)	Only 기중(Air) 방전
기중(Air) 방전 방법	약 20Cm에서 빠르게 접근

Voltage	판정 항목	판정 제외 항목
Air $\pm 15kV$ 이상	<ul style="list-style-type: none"> 기능손실 및 성능 저하 	<ul style="list-style-type: none"> 외관 불량발생 - Pattern Burnt (기능 및 성능은 정상) - ESD로 인한 관련 외관 불량



● Test Point
(5 times at each points)

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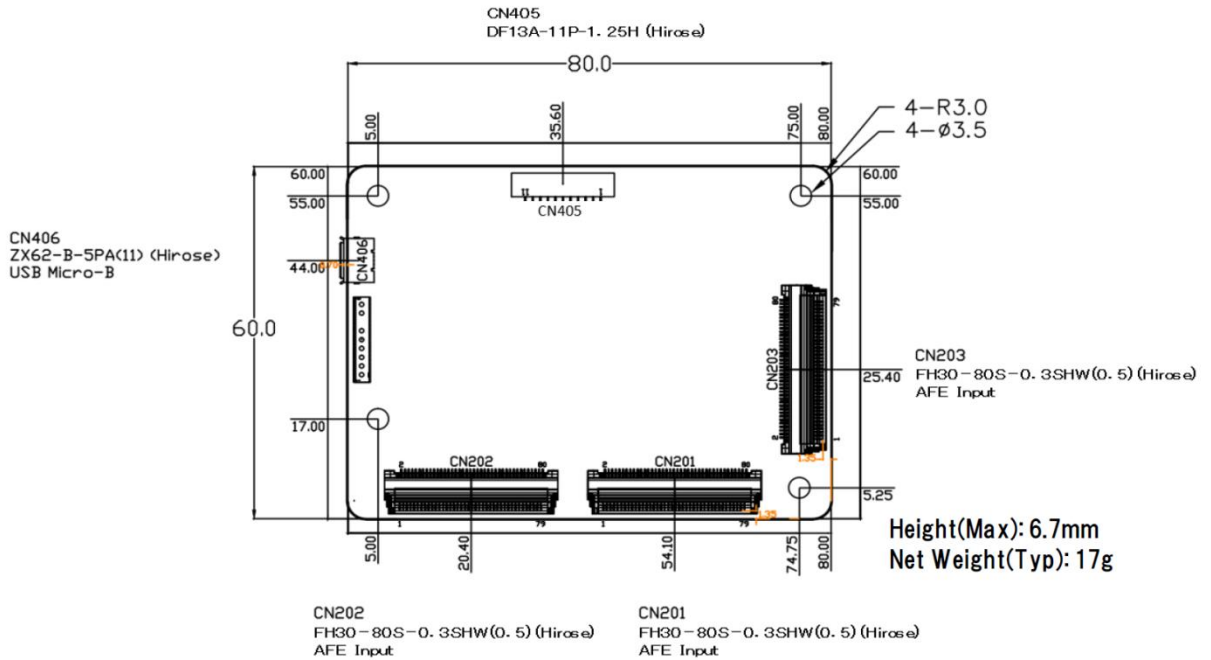
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5. Control Board

5-1. Outline Dimension



Material Construction

			unit: mm
	Material	thickness(Typ)	
solder resist	solder resist	0.020	
L1 Conductor	copper + copper plating	0.035	
L1-L2 Adhesive	prepreg	0.130	
L2 Conductor	base + copper	0.018	
L2-L3 base		0.600	
L3 Conductor		0.018	
L3-L4 Adhesive	prepreg	0.130	
L4 Conductor	copper + copper plating	0.035	
solder resist	solder resist	0.020	
Final thickness		1.006 ± 10%	

3D view

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5. Control Board

5-2. Reliability

Test Items	Condition	
High Temp Storage	Ta = 70 °C	96hrs
Low Temp Storage	Ta = -20 °C	96hrs
High Temp & High Humi Storage	Ta = 40 °C, 90%RH	96hrs
High Temp Operation	Ta = 50 °C	96hrs
High Temp & High Humi Operation	Ta = 40 °C, 90%RH	96hrs
Heat Shock	Ta = -20 °C ↔ 70 °C each 30 min	

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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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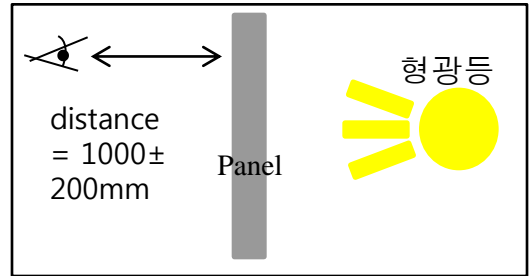
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6. Inspection Standard

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	32인치	비고
Circular defect ($D = (L + W) / 2$)	Active/Print	Ignore	$D \leq 0.7$ (결점간 거리 무시)	
		OK	$0.7 < D \leq 1.0\text{mm}$: 10ea (결점간 거리 10mm 이상)	
		NG	$D > 1.0\text{mm}$	
Linear defect	Active/Print	Ignore	$W \leq 0.2\text{mm}$ and $L \leq 25\text{mm}$ (결점간 거리 무시)	
		OK	$0.2 < W \leq 0.3\text{mm}$ and $25 < L \leq 50\text{mm}$: 10ea (결점간 거리 10mm 이상)	
		NG	$W > 0.3\text{mm}$ or $L > 50\text{mm}$	
Circular defect (translucent_반투명) ($D = (L + W) / 2$)	Active/Print	Ignore	$D \leq 0.7$	Bubble 포함
		OK	$0.7 < D \leq 1.8\text{mm}$: 10ea	
		NG	$D > 1.8\text{mm}$: NG	
Chipping (Corner, Side)	Print/Edge	OK	$D \leq 0.5\text{mm}$: OK	
		NG	$D > 0.5\text{mm}$: NG	
Dent (찍힘, 눌림)	Active/Print	OK	정면 검사 시 미시인 (Should not be viewed from the front, during inspection)	
Window Stain	Active/Print		지워지는 얼룩 무시	
인쇄 번짐/뜯김/Scratch	Glass out of edge	OK	L : Ignore, $W \leq 2.0\text{mm}$	
핀 홀	Print	Ignore	$\leq 0.2\text{mm}$	페인트 마카펜 재생 허용
		OK	$0.2\text{mm} < \text{Pin hole} \leq 0.6\text{mm}$: 13pcs (결점간 거리 10mm 이상)	
		NG	$> 0.6\text{mm}$	
Protect film			Protect film defect Ignore	

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7. Packing & Lot marking

7-1 Packing

Packing Information

- Out Box Size : 846 x 448 x 556mm
- Inside Box Size : 830.6 x 433 x 541
- PE Form : 4pcs / 1-Box
- 10pcs / 1 Box

Box Label

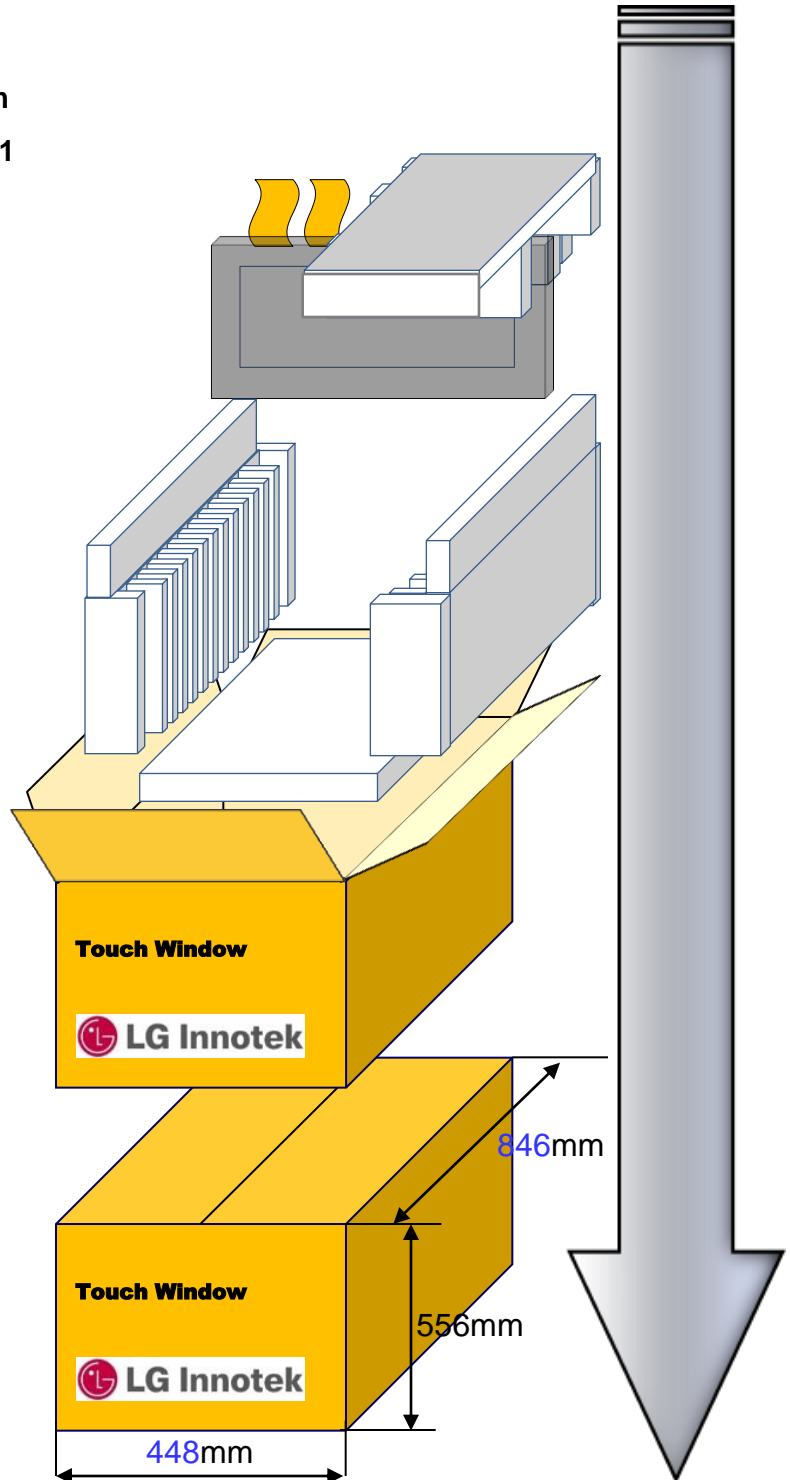
1. Model :

2. Quantity : (e.g. 500pcs)



3. Shipment Date :

4. 제작업체 :



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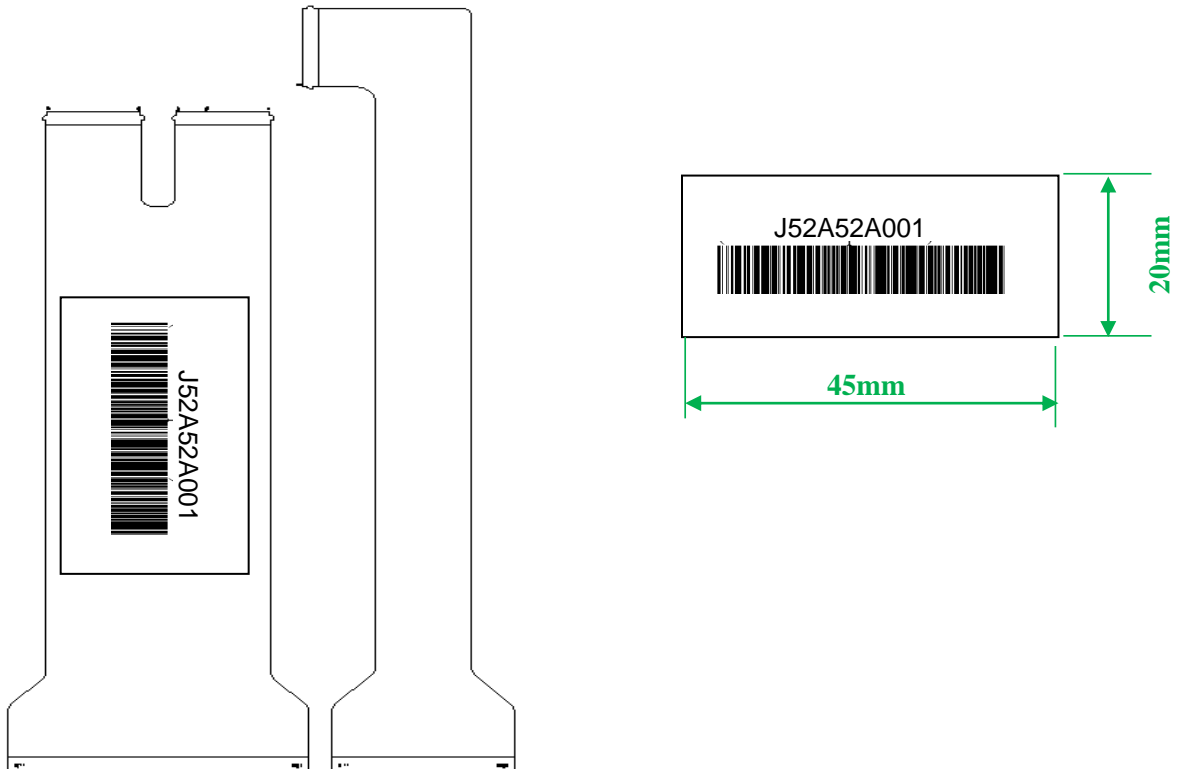
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7-2. Lot marking

※ Lot Marking 위치 : FPCB 전면(RX위)



LGIT		
구분	적용	설명
(1)	업체코드	Ex) 희성전자 : H, EKD : E, Trais : T J&T : J
(2)	투입 年	해당 년의 뒷 1자리 표기, Ex) 2013 → 3
(3)	투입 月	제조 월 표기, Ex) 1월: 1, 10월: A, 11월:B 12월: C
(4)	투입 日	제조일 표기, Ex) 1일: 1, 10일: A, 31일: X (o,i 는 제외)
(5)	Window 제작일	해당 년의 뒷 1자리 표기, Ex) 2013 → 3
(6)		제조 월 표기, Ex) 1월: 1, 10월: A, 11월:B 12월: C
(7)		제조일 표기, Ex) 1일: 1, 10일: A, 31일: X (o,i 는 제외)
(8)	S/N	TSM Serial Number
(9)		
(10)		

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Cautions & Warranty

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

1) Storage

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

- Store the TSPs in a dark place. Do not expose the TSPs 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 TSP'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 TSP with protection film attached is stored for a long time, sometimes there remains a small amount of glue still on the TSP'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 TSP'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 TSP 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 TSP'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 TSP.
- 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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