Exhibit K
(Submitted Under Seal)

Jason Kim

1903 South Harvard Blvd.
Los Angeles, CA

(323) 608-3740
the1jasonkim@gmail.com

March 17, 2012

Certificate of Translation

I hereby certify that this Korean to English translation of page
SAMNDCA10890609
of the document with the beginning Bates number SAMNDCA10890609
is an accurate and complete rendering of the contents of the source document to the best of my knowledge, except for the word "TRANSLATION" at the upper right corner of each translated page. I further certify that I translated said document and that I am fluent in both Korean and English with seven years of professional experience in Korean to English translation.

BY:

Jason Kim

Competitor TSP Structure Analysis

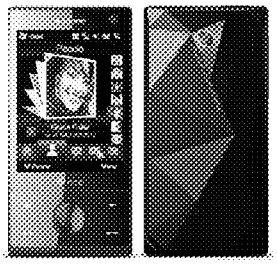
Expert Development Group Visual Part.

경쟁사 TSP 구조 분석

전문개발그룹 Visual Part.

1. HTC Touch Diamond Analysis

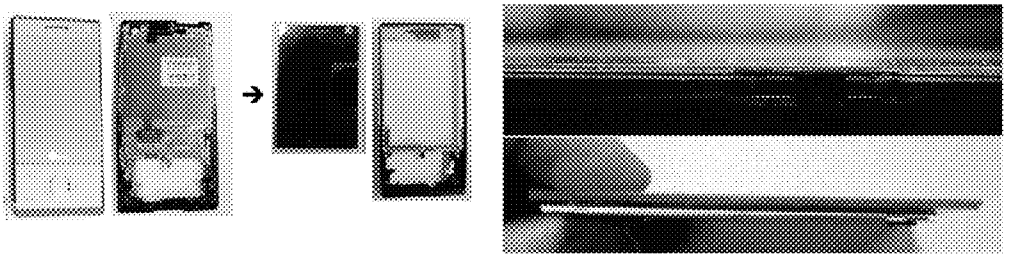
◈ Feature of the LCD, TSP



Phone Size		102 x 51 x 11.5 mm
LCD	Inch & Resolution	TFT, 2.8" VGA (480 x 640) , 262K color
	Size	65.5 (L) x 46.5 (W) x 1.5t (H)
TSP	Size (+0.15t each)	86.7 (L) x 48.27 (W) x 1.72t (H)
	BM	좌/우/상 2.2mm , 하 6.3mm
LCD + TSP Thickness		8.7t * TSP+ LCD 일체형 구조 및 상면 0.4t 기준

◈ Structure of the LCD+ TSP's Ass'y

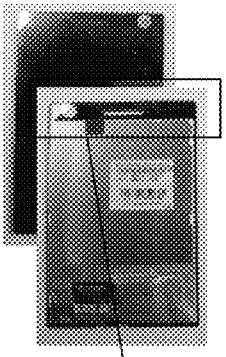
* TSP + LCD : 일체형 구조, OCA로 접착



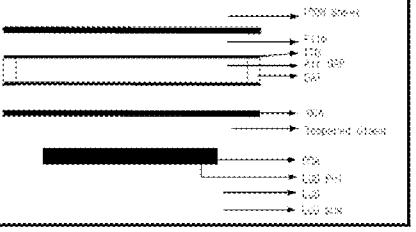
對外秘

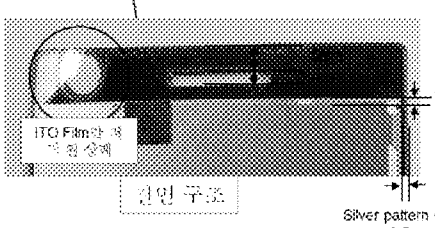
2. Touch Diamond – TSP Structure

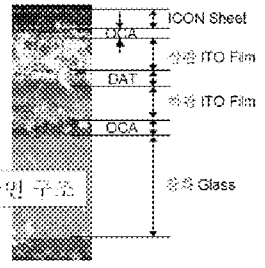
◈ TSP 구조 및 치수



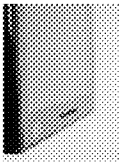
전면 치수	Dot Spacer 간격		1.0mm (#투명사 중심과 투명)
	Silver ~ V/A		0.5mm (#투명사 Spec 0.5mm)
	Silver ~ Edge		0.5mm (#투명사 Spec 0.5mm)
	TSP BM		좌/우/상 2.6mm , 하 6.3mm
단면 치수	ICON Sheet	0.13t	
	OCA	0.05t	
	상판+DAT+하판	0.5t	
	OCA	0.08t	
	강화 Glass	0.75t	
	OCA	0.7t	
	pol+LCD+sus	1.5t	
	total	3.7t	







커구와 TSP 면
: 단차 없음.



對外秘

3. Touch Diamond – TSP Feature

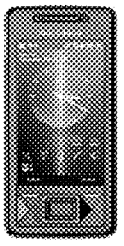
광학 특성	TSP control IC	MSM7200A
	반 사 율	12% (예상치)
	투 과 율	88% (예상치)
	색차 (ΔE)	3% 이만 (예상치)
동작하중		

	Center	Center 부				Edge 부			
Pt	1	2	3	4	5	6	7	8	9
gf	49.4	27.1	25.1	29	28.9	63.3	87	66.5	62.3

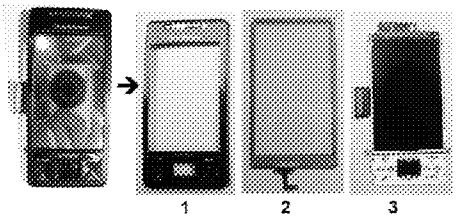
특 징	● TSP 구조 : FPG 의 형상 - 동작하중 개선을 위해. ICON Sheet 0.125mm 사용. ● TSP 와 LCD 결합 : 광학 특성이 우수한 일체형 구조 - A/S 등에 해결 방안 ?

4. SonyEricsson XPERIA X1 Analysis

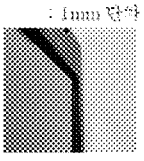
◈ Feature of the LCD, TSP



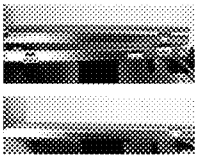
Phone Size		110.5 x 52.6 x 17 mm
LCD	Inch & Resolution	TFT, 3.0" WVGA (480 x 800) , 262K color
	Size	74.70 (L) x 44.2 (W) x 1.75t (H)
TSP	Size (추가 여유 size)	74.89 (L) x 44.5 (W) x 0.38t (H)
	BM	좌/우/상 2.27mm , 하 6.2mm
LCD + TSP Thickness		2.9t # LCD + TSP GAP : 0.3t → 2.9t # 접착 GAP 1mm 포함



기구와 TSP 간
: 1mm 단차



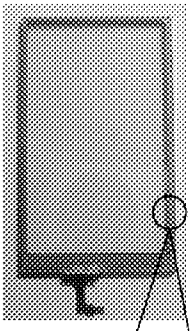
TSP와 LCD와 결합



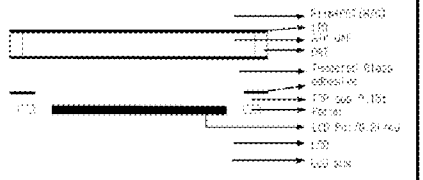
對外秘

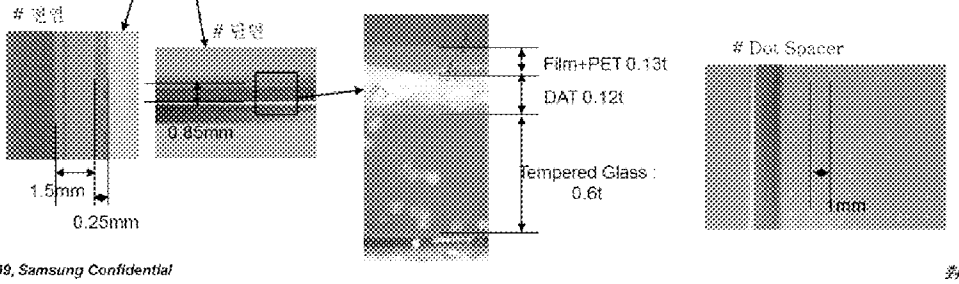
5. XPERIA X1 – TSP Structure

◈ TSP 구조 및 치수



전면 치수	Dot Spacer 간격		1.0mm
	Silver ~ V/A		0.5mm (±공정치 Spec. 0.3mm)
	Silver ~ Edge		0.25mm (±공정치 Spec. 0.5mm)
	TSP BM		좌/우/상 2.00mm, 하 6.2mm
단면 치수	Film+PET	0.13t	
	DAT	0.12t	
	Tempered Glass	0.6t	
	양면tape	0.05t	
	TSP sus	0.15t	
	Air-Gap	0.3t	
	pol+LCD+sus	1.75t	
	total	2.90t	





對外秘

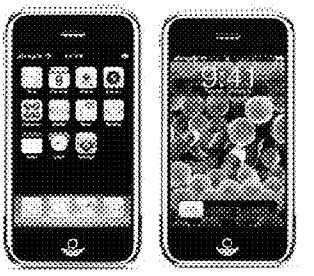
6. XPERIA X1 – TSP Feature

광학 특성	TSP Control	EPSON D771081 or MSM7200A
	반사율	20% (예상치)
	투과율	83% (예상치)
	색차 (ΔE)	3% 이하 (예상치)
특 징		- TSP 구조 : normal TSP 구조로 강화된 Glass 위에 ITO 및 상판 ITO (125um) 가 위치함. 별도의 Icon-Sheet가 없으며, 기구 Upper케이 TSP가 1mm 안다운 됨. - TSP 하단부 구조 : 육이구조, TSP와 Chassis를 결합하고 LCD Module 과 결합한 구조임. LCD 와 TSP 사이 Air Gap은 0.3mm. # LCD 두께 : 1.75t (WVGA, Pol 까지 높이)

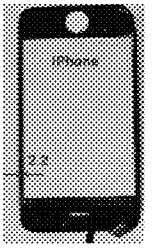
7. APPLE I-PHONE 2G Analysis

◎ Feature of the LCD, TSP

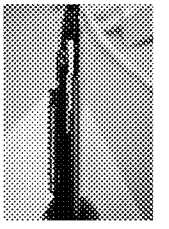
Phone Size		115.5 x 62.1 x 12.3 mm
Weight		133g
LCD	Inch & Resolution	TFT, 3.5" HVGA (320 x 480) 16M color
	Size	55.05(가로) x 85.85(세로)
TSP	Size	55.20(가로) x 86.00(세로)
	BM	좌/우/상 2.0mm
LCD + TSP Thickness		2.70t (LCM 1.90t + TSP 0.8t)



LCD 구조



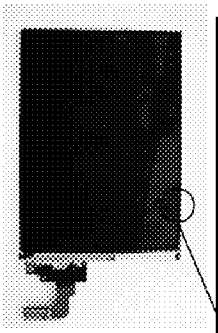
TSP와 LCD 결합



對外秘

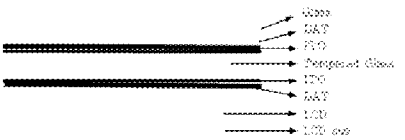
8. I-PHONE 2G – TSP Structure

◈ TSP 구조 및 치수



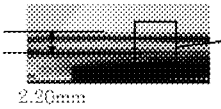
전면 치수	Dot Spacer 간격	1.0mm
	Silver ~ V/A	1.0mm (수주상사 Spec 1mm)
	Silver ~ Edge	0.5mm (수주상사 Spec 0.5mm)
	TSP BM	좌/우/상 2.0mm

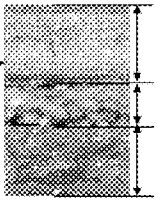
단면 치수		
	Glass	1.00t
	DAT	0.20t
	Tempered Glass	0.80t
	DAT	0.20t
	LCD Module	1.90t
	LCD sus	0.30t
	total	4.40t



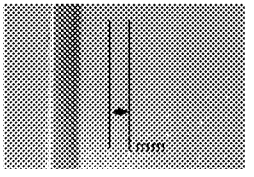
Touch Panel 구조

단면





Dot Spacer



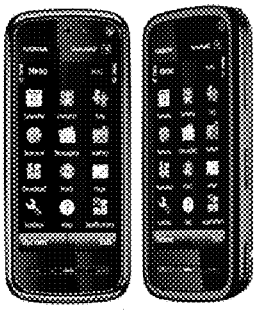
對外秘

9. I-PHONE 2G – TSP Feature

TSP Control IC		Broadcom IC (Apple 단독 사용)
OS 사양		Mac OS X v10.4.10
광학특성	반사율	4~6% (예상치)
	투과율	95% 이상 (예상치)
	색좌 (ΔE)	2% 이내 (예상치)
특 징		● TSP 구조 - LCD Panel과 Window(TSP포함)와의 Gap이 없이 설계. - 일반적으로 Gap에 의한 투과율 손실 (6%)이 없음. - 장점 : 선명한 화질 구현 가능. - 단점 : 습기에 취약, Water Mark등 예상. ● LTPS Panel 사용 - a-Si Panel 대비, 라인 폭 감소로 개구율 향상. - a-Si Panel 대비 15 ~ 20% 밝기 향상. ● 고휘도 LED 사용 - LED 수 : 6개 - LED 품명 : Nichia NSSW006, 3.8x1.2x0.6 - LED IF 전류는 20mA 이상 사용된 것으로 파악.

對外秘

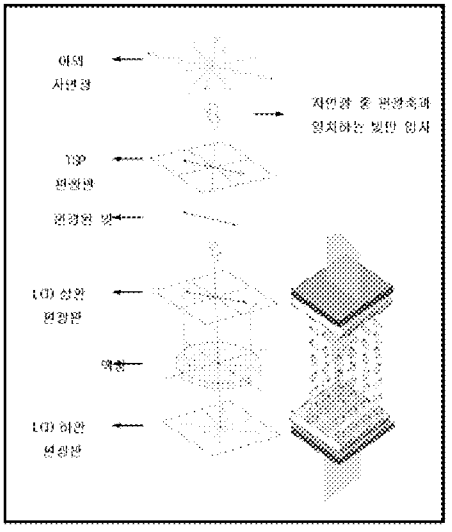
10. XpressMusic_제품사양

Front Design	ITEM	Description	Reference
	Manufacturer	Nokia	
	Model Name	5800 Xpress Music	Full Touch Screen
	Product Size	111 x 51.7 x 15.5mm	109g
	Released date	2008. November	Europe, Asia
	LCD info	3.2inch (360x640)	qHD
	TSP maker	Nissha	Japan
	TSP Size	46.3 x 106mm	
	V/A Size	40.3 x 71.3mm	
	Film	Polarized Film, PC ITO Film	Upper ITO Film : PET → PC
	TSP Type	R-type / FFFP	Substrate : PC → PMMA

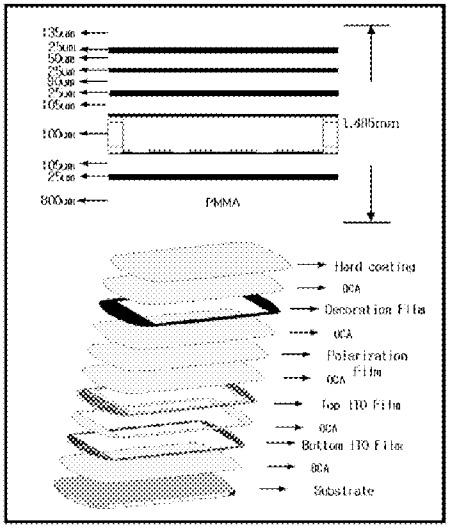
11. XpressMusic_TSP Structure

편광 TSP 원리 및 구조

[편광 TSP 원리]



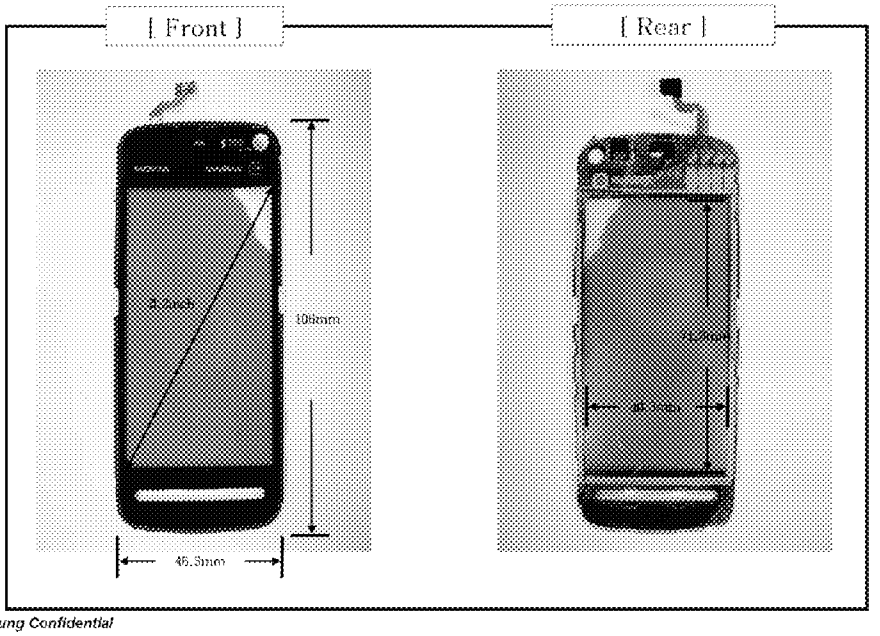
[편광 TSP 구조]



對外秘

12. XpressMusic_TSP Structure

Outline Design

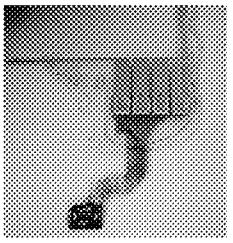


對外秘

13. XpressMusic_TSP Structure

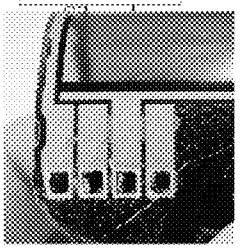
Detail Design 분석

[Bottom Silver]



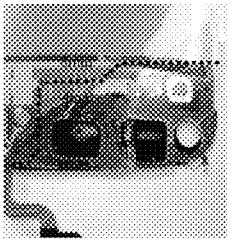
- X-axis
- 3 O'clock
- 9 O'clock

[Upper



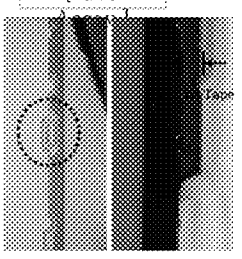
- Y-axis
- 6 O'clock
- 12 O'clock

[Substrate]



- Material : PMMA
- Thickness : 8mm
- Flange Type
  - Max : 8mm
  - Min : 4mm

[TSP



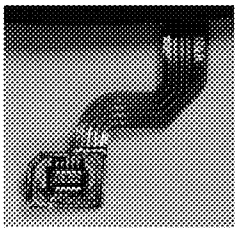
- Upper : In-mold
- Bottom :
  Substrate Hook
- Cushion Tape : 1.2mm

對外秘

14. XpressMusic_TSP Structure

Detail Design 분석

[Connector]

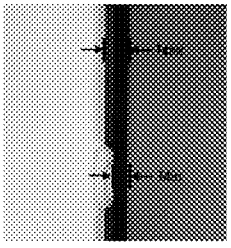


- Connector type : B to B
- Number of Pin : 10pin
- Used pins : 4pin
- Dummy Pins : 6pin

[Holes]

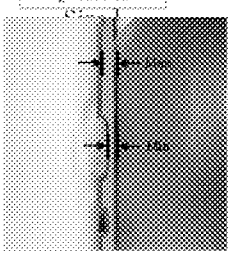
- Speaker Hole
- Light Sensor Hole
- Proximity Sensor Hole
  - Blue Smoke Printing
- Camera Hole

[BM Size]



- Max : 3.0mm
- Min : 1.85mm

[Silver]



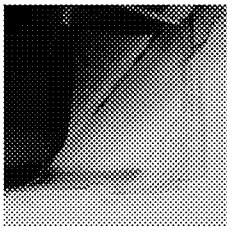
- Max : 1.8mm
- Min : 1.0mm

對外秘

15. XpressMusic_TSP Structure

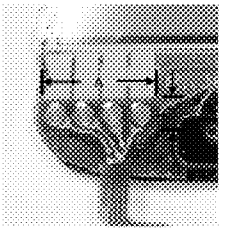
Detail Design 분석

[ITO Film]



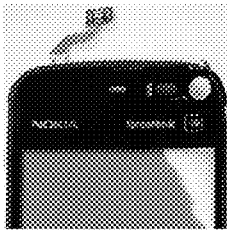
- Film Material : PC
- Film Thickness : 105um
- Bottom ITO Film : Clear Type

[FPC Bonding]



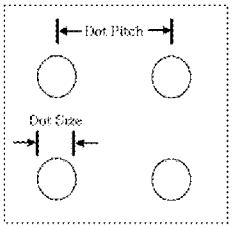
- Dome Type Bonding
- A Length : 16.3mm
- B Length : 3.9mm
- Bonding Thickness : 0.35mm

[Printing]



- Printing : Hologram

[Dot Spacer]



- Dot Pitch : 1.5mm
- Dot Size : Φ40um

對外秘

15. XpressMusic_ TSP Feature

TSP Control IC		
OS 사양		Symbian OS v9.4, Series 60 rel. 5
광학특성	반사율	6.2%
	투과율	36.3%
	색차 (ΔE)	7.16%
특 징		● TSP 구조 - 반강화유리를 사용(반사율을 현격하게 낮춤)하여 야외 시인성 개선. - PC 대신에 PMMA를 사용하여 환경에 인해 낮아지는 투과율을 보상. -> PMMA의 특성상 PC보다 잘 깨짐. - upper case 위쪽에서 TSP를 삽입하는 구조로 외부로부터의 이물이나 습기 유입에 강함. - 삽입 가능한 구조로 TSP 외곽 부 구성. -> PC , PMMA에서 가능 Glass의 경우 가공 어려움.

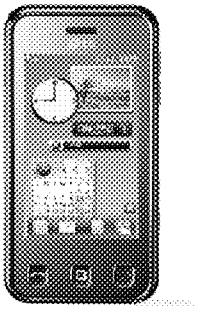
16. XpressMusic_비교자료

비교사진	ITEM	I-900	Xpress Music	Reference
	TSP Type	FFP	FFFP	• Polarized Film is added
	TSP Maker	J-Touch Moreens	Nissha	
	TSP Thickness	1.45mm	1.485mm	• Without Bottom Attach Tape
	Icon Sheet	188um 1 Layer	210um 2 Layer	• 2 Layer 장점 : 문자부분 형광 가능 / 색상 적용
	Upper Film	0.188mm PET	0.105mm PC	• PC가 PET 보다 Hard 함 : 평탄도 향상 우월
	Polarized Film	X	○	• 야외시인성 개선 효과 • LCD 상판 POL과 편광 각도 동일 설계 필요
	Bottom Film	ANR Film	Clear Film	• ANR 처리시 야외시인성, b*, Haze 저하됨
	Substrate	0.8t PC	0.8t PMMA	• PMMA 가 PC보다 투과율 약 5% 높음 • PMMA 사용시 가공 hole 부분 깨짐 취약

※b* : Yellow를 나타내는 척도

17. Renoir– TSP Structure

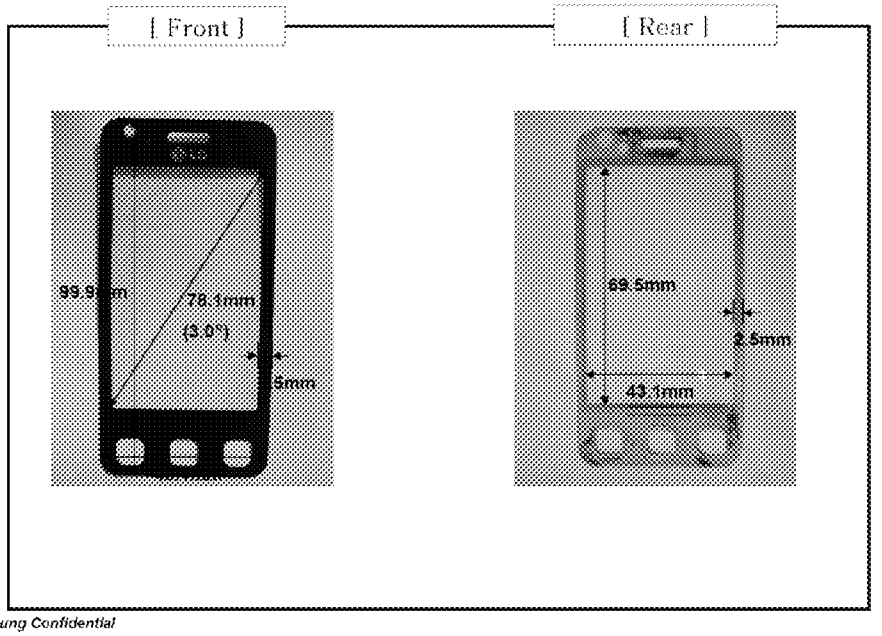
◈ TSP 구조 및 형태



전원 차수	Dot Spacer 간격		3.5mm
	Silver – V/A		1.2mm(설계상 Spec 1mm)
	Silver – Edge		1.0mm(설계상 Spec 0.8mm)
	TSP BM		좌,우 : 3.5mm / 상 : 18.1mm / 하 : 20.2mm
단일 차수	Icon Sheet	0.188T	
	상판 ITO	0.188T	
	상하판 사이 Gap	0.08T	
	하판 ITO	0.188T	
	PC 두께	0.8T	
	LCD 모듈 두께	2.2T	
	total	3.62T	

18. Renoir– TSP Structure

Outline Design

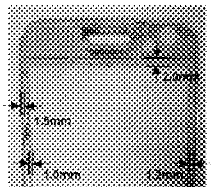


對外秘

19. Renoir– TSP Structure

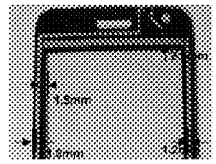
Detail Design 분석

[Bottom Silver & BM]



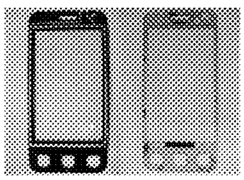
- X-axis
- 3 O'clock
- 9 O'clock
- Silver-[illegible] : 1.5mm
- Silver-[illegible] : 1.0mm
- Silver폭 :
  상측 – 2.0mm
  좌우측 – 1.2mm

[Upper Silver & BM]



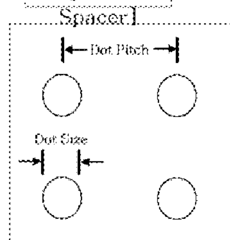
- Y-axis
- 6 O'clock
- 12 O'clock

[Silver Pattern 설계]



- [illegible]

[DOT Spacer]

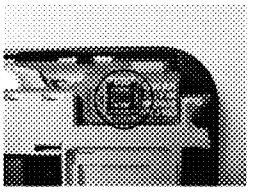


- Dot Pitch : 1.5mm
- Dot Size : Φ40um

20. Renoir– TSP Structure

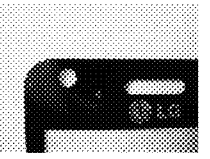
Detail Design 분석

[Connector]



- Connector type : B to B
- Number of Pin : 16pin
- Used pins : 4pin
- Dummy Pins : 6pin

[Holes]



- Speaker Hole
- Proximity Sensor Hole
  - Blue Smoke Printing
- Camera Hole

21. Renoir_ TSP Feature

TSP Control IC		-
OS 사양		-
광학특성	반사율	16.2%
	투과율	81.2%
	색차 (ΔE)	2.2
특 징		● TSP 특징 - FFP 구조. - Icon Sheet : 188um 사용. - 상, 하판 ITO Film 188um 사용. - 하판 : Clear type ITO Film 사용. - ESD등 보호하기 위해 V/A을 제외한 부분에 Insulation 적용. - Dummy등 사용하여 전면을 둘러싸는 형태로 Silver Pattern 설계(상, 하판 同).