

< >

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1.

2.

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R&D TREND

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1.

2.

- LCD
- PDP
- OLED

.

< >

2005. 11

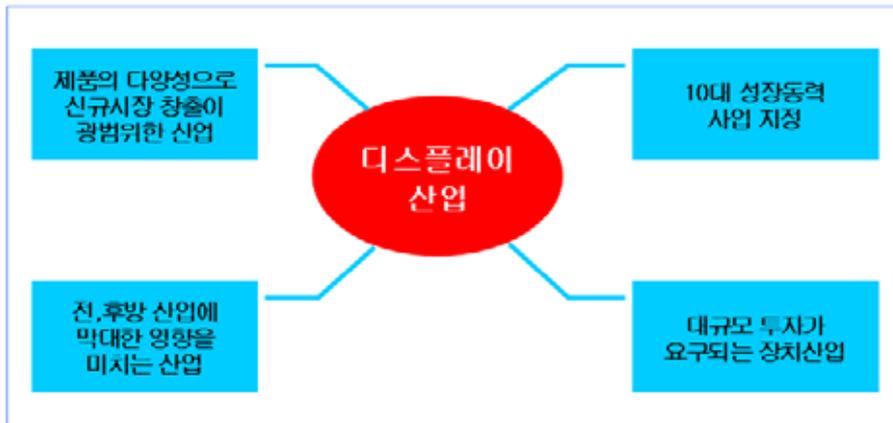
[www.rndbiz.com](http://www.rndbiz.com)



전자부품연구원  
Korea Electronics Technology Institute

1.

가 , 가 , 가  
 가 CRT LCD  
 1 , PDP  
 가



[ ]

, 1 CRT LCD, PDP, OLED 2  
 (FPD : Flat Panel Display)

가 3

2.

가 CRT, LCD, PDP, OLED, VFD, FD(Flexible Display),  
 , TV, ,



LCD CRT 가 가  
 , PC , TV,  
 LCD가 가 가  
 LCD LCD 가 .

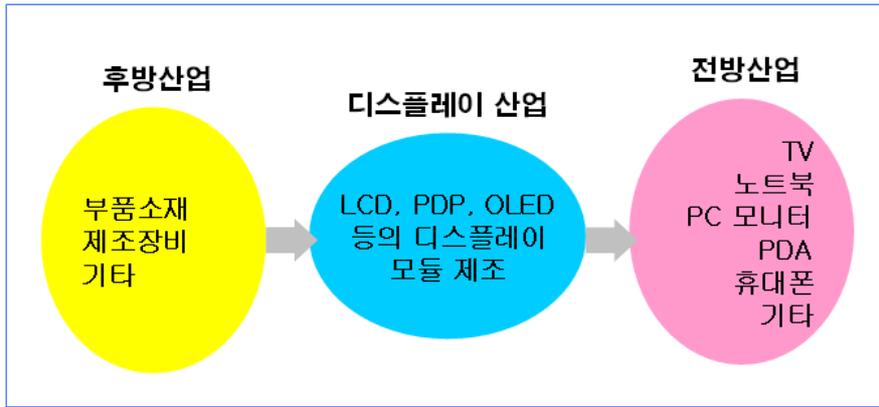
LCD ,  
 - . .  
 - CCFL( ) FFL( ) 가  
 - TFT-LCD  
 - 82 TV LCD LCD TV 가  
 - S-PVA 178 °  
 -  
 , , 가 , PDP  
 가 R&D .

PDP ,  
 30%  
 20% 가 TV 가 , 70 가  
 Full HD 50~63 PDP  
 PDP 가 , 102 PDP TV

OLED 가 가  
 ' FPD 2005 ' 40  
 OLED , FPD 가 OLED  
 OLED ,  
 OLED 30 OLED TV 가

1.

IC,



[ ]

가가 , 가

1

40% , LCD 35% , PDP , IC , 가

Supply Chain

2.

가  
LCD, PDP, OLED

가. LCD

LCD 3  
(Back Light)  
LSI 가 PCB  
(Printed Circuit Board)  
3 LCD  
TV, LCD

		LCD
		, , 3 가 가
		가
	(seal)	TFT
		가
Reflector		
		case
		가

		LCD
		LCD
	PCB	가
	TAB	LSI ( COB, COF, COG )
	LDI	TFT LSI(DDI )
	ACF	TAB LCD
		,

[ LCD ]



LCD 가 TFT-LCD , TFT  
, CF(Color Filter) , Cell  
. , , , , ,  
가 .  
TFT( ) ,  
(Photo Resister) , CF  
CF , Cell TFT CF  
2 . Cell  
,  
Glass Glass  
. Glass  
가 가 ,  
.  
(color filter) TFT-LCD .  
,  
TFT-LCD 가  
Glass, Black Matrix, Color Layer, Layer,  
(ITO) Layer, Column Spacer(Optional) .

(Au, Pt) (SiO, SiO<sub>2</sub>)  
(Polyimide )

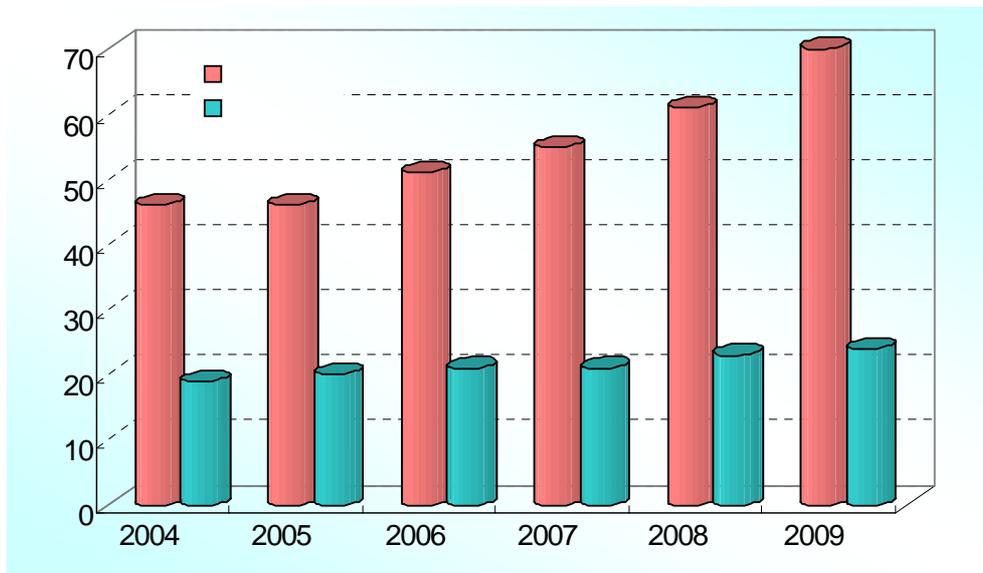
(Spacer) , Contrast, 가  
Glass

Glass Spacer Plastic Spacer

가  
LCD 가

Smectic, Cholesteric, Nematic 가  
, Nematic

	2004	2005	2006	2007	2008	2009	CAGR
	46	46	51	55	61	70	8.6%
	19	20	21	21	23	24	5.3%
	65	66	72	76	84	94	7.7%



: Large TFT-LCD Key Component Industry Trend, DisplayBank

가

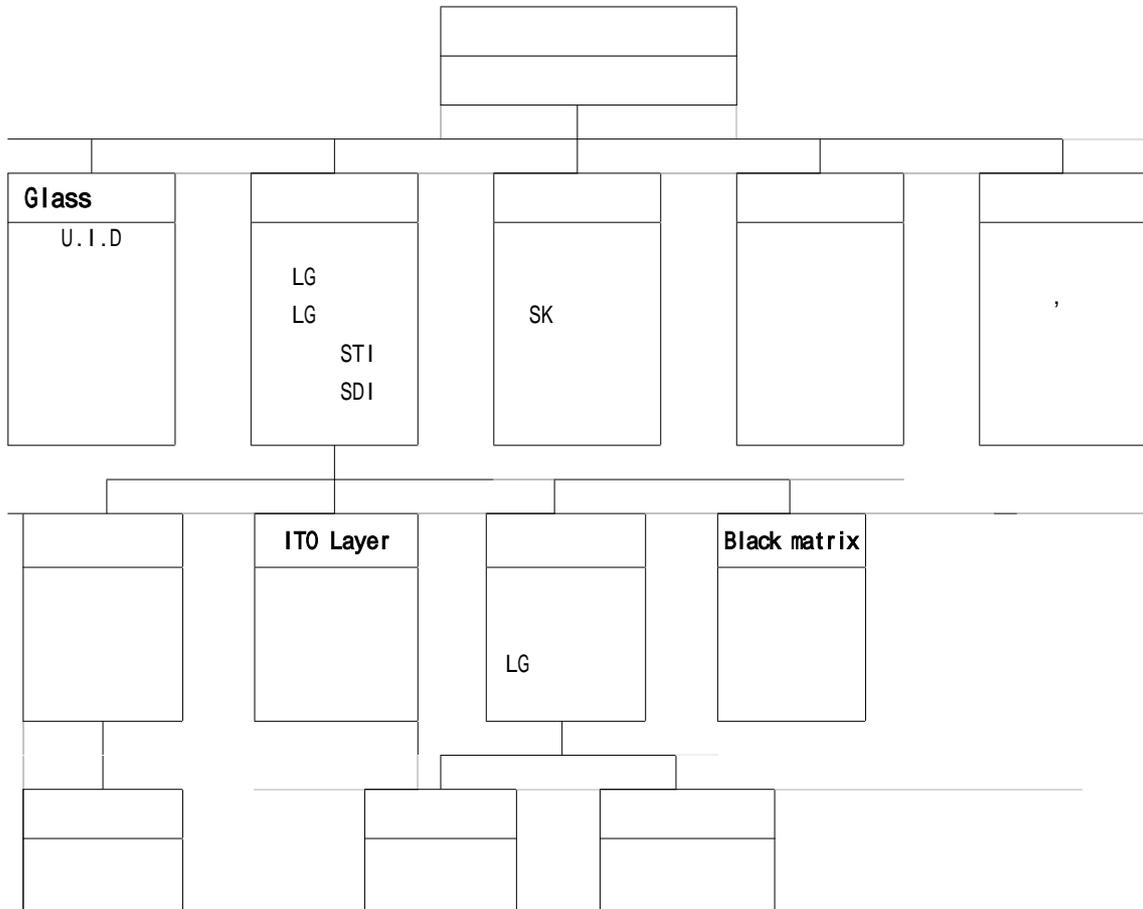
CAGR 8.6%,  
2004

CAGR 5.3%  
14.1%, 2005

13.6%

, LCD

.1)



: R&DBiZ

[

Chain ]

, LCD

가

가  
Glass

가

가

ITO Layer

가  
가 LCD

1) 7p.



LCD PDP, OLED

가 ( )

가  
(BLU)

BLU

(CCFL : Cold Cathode Fluorescent Lamp) CCFL

Reflector

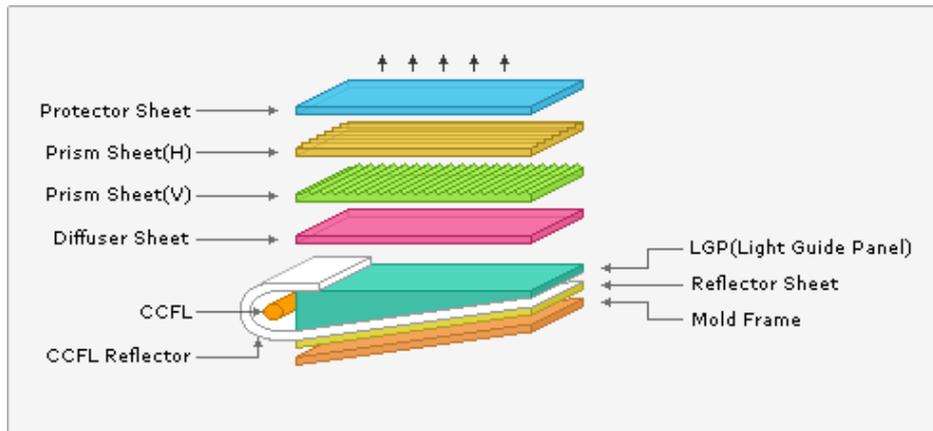
Reflector

PMMA

Pattern 가

(Light Guide Plate),

Sheet



[ BLU(Back Light Unit) ]

BLU

(CCFL)가

, LED, OLED

BLU

CCFL

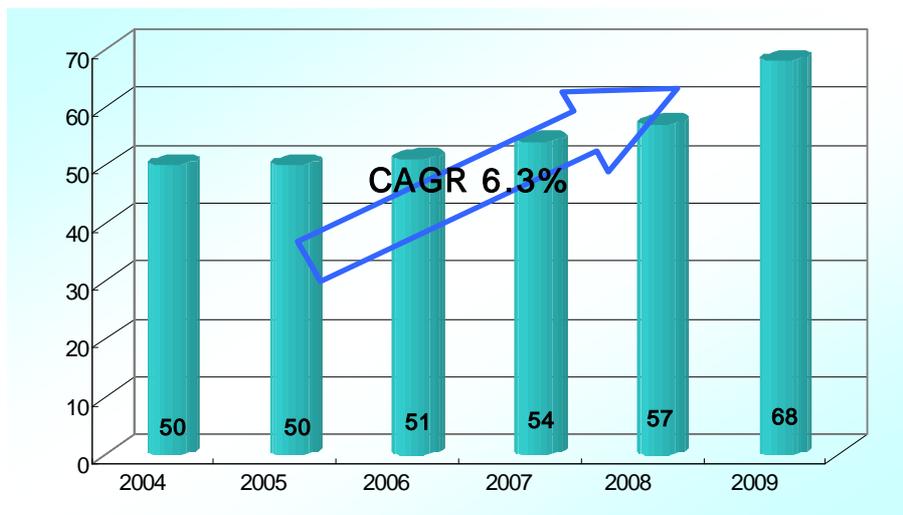
LCD

LCD

가

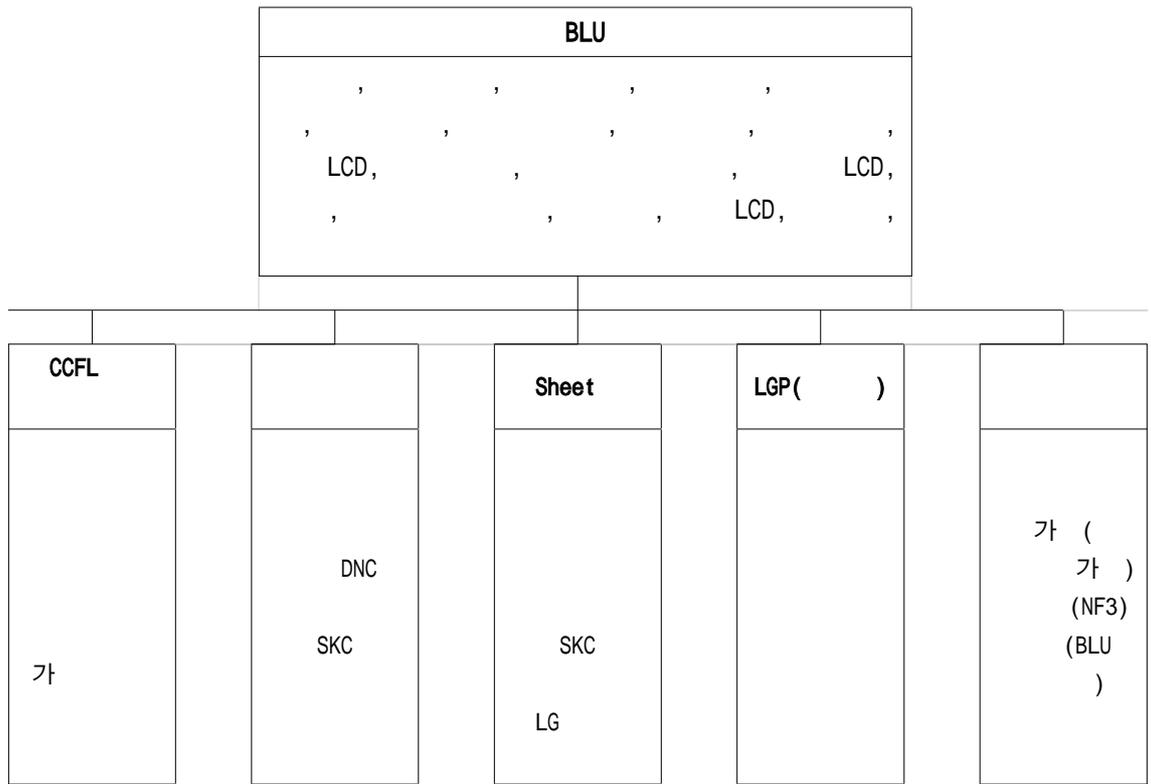
BLU

가 LCD 가 BLU  
 LED  
 LED BLU  
 EEFL( ) CCFL 가 60%  
 HCFL( ) (Philips)가 'Aptura'  
 LCD 가  
 ( ) TV 가 가  
 가  
 TFT-LCD BLU 2004 50 2009 68  
 CAGR 6.3% LCD  
 BLU 1



: Large TFT-LCD Key Component Industry Trend, DisplayBank

[ TFT-LCD BLU ]



: R&DBiZ

[ Chain ]

BLU , BLU  
 BLU BLU  
 BLU , LG LCD , Reflector  
 DNC, 가 SKC가 ,  
 Sheet 가 (Sheet 3M  
 ) BLU



LCD Driver IC 가 LCD

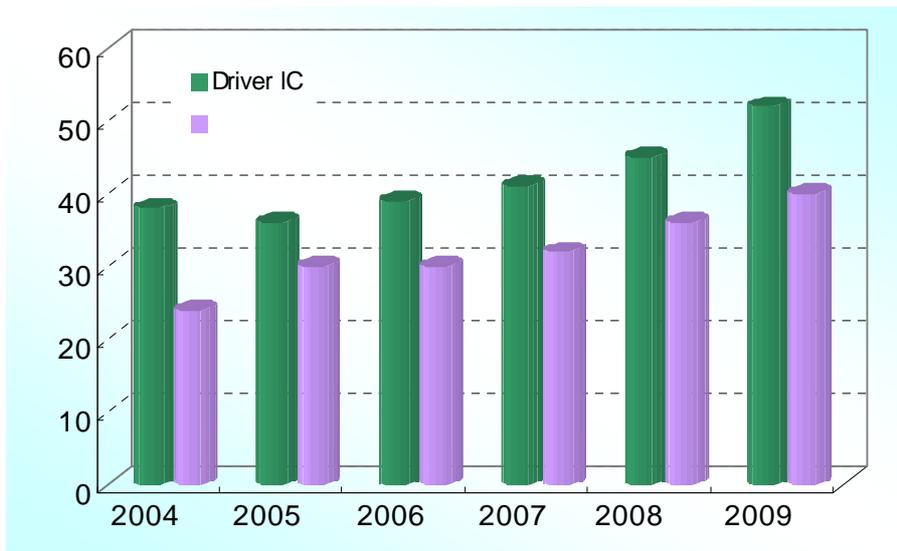
PCB

SMT(Surface Mounting Technology)

**Driver IC** DDI(Display Driver IC) 가  
 LCD Driver IC LDI(LCD Driver IC)가 LCD LDI  
 LCD COB(Chip on Board), COG(Chip on Glass),  
 COF(Chip on Film), TAB(Tape Automated Bonding) 가  
 Segment LCD lead 가  
 LDI가 PCB, Board lead HSC(Heat Seal Connector)  
 Elastomeric Connector  
 lead LDI 가  
 TAB, LDI Carrier Tape

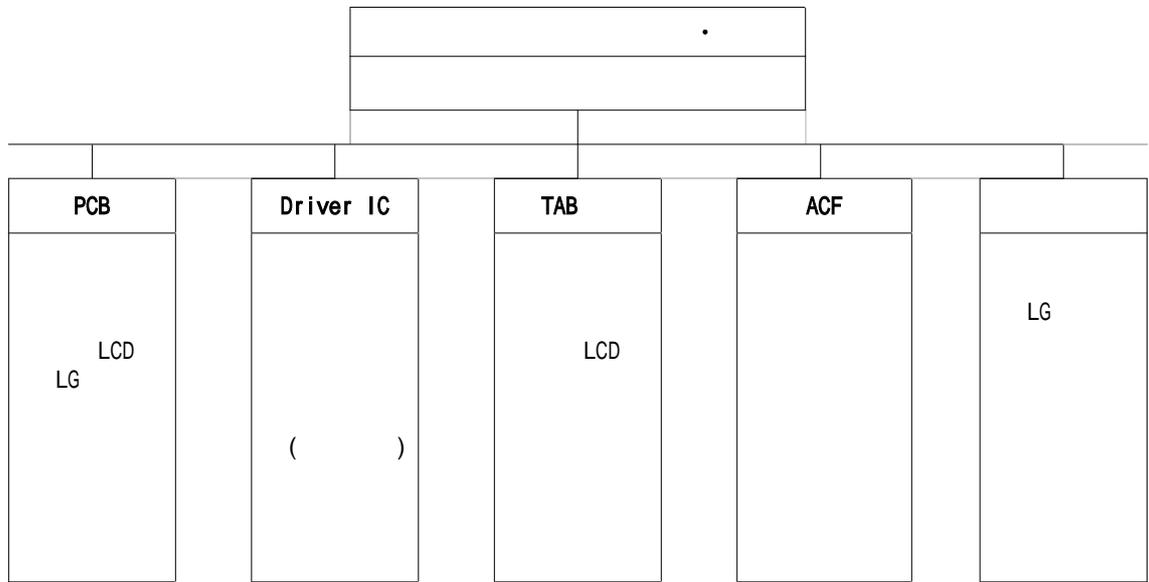
(polarizer) PVA( ) 2  
 , TAC 가

	2004	2005	2006	2007	2008	2009	CAGR
Driver IC	38	36	39	41	45	52	6.5%
	24	30	30	32	36	40	10.8%



: Large TFT-LCD Key Component Industry Trend, DisplayBank  
 [ Driver IC ]

LDI , 2004 38  
 2009 52 CAGR 6.5%  
 가  
 LDI 가 1  
 가 가  
 가  
 2004 24 2009 40 CAGR  
 10.8%  
 LG 2006 1 , 가



: R&DBiZ

[ Chain ]

LDI 가 가 , 가  
 가 Bumping . 가  
 LCD PCB( )  
 , TAB LCD ACF( )  
 ,

· PDP

PDP DC AC

가

DC

가

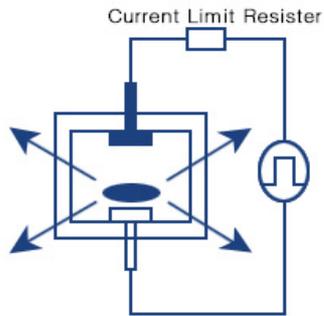
가

AC

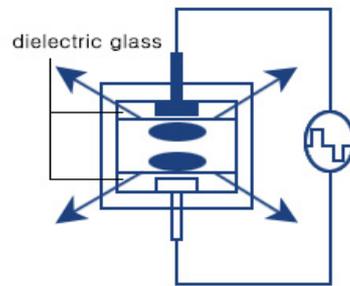
2

가

가



< DC형 구조 모식도 >



< AC형 구조 모식도 >

[ DC AC

]

⚡ DC

R, G, B 가

Seal

Driver IC Module

가

⚡ AC

AC

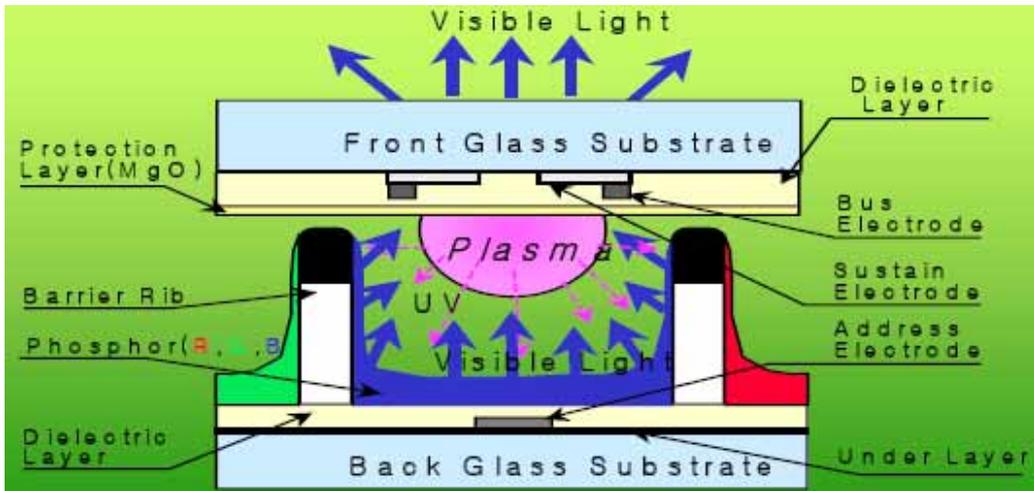
Line

Bus

R, G, B 3

가

DC



: PDP , KISTI

[ PDP ]

	Ag , Frit Glass,	
Black Stripe	Frit Glass, Black	
	Frit Glass	
	Frit Glass, Filter & pigment	
	MgO single Crystal	
DFR	ITO ,	
	Filter	
	Frit Glass, Filter & pigment	
Preformed Glass	Frit Glass, Filter	
가	Penning Gas	
Seal	Frit Glass, Filter	
	Frit Glass	
	DRiver IC, ACF, FPC	

[ PDP ]

PDP , 가 LCD PDP  
 가 . 가 가  
 , PDP  
 LG PDP SDI ,  
 가 , 가

	' 02	' 03	' 04	' 05	' 06
	10,511	16,445	25,096	38,954	58,546
	8,600	13,445	20,533	31,872	47,902
	3,085	4,784	7,301	11,332	17,032
	956	1,495	2,281	3,541	5,322
	4,778	7,475	11,407	17,706	26,612
	3,583	5,606	8,555	13,280	19,959
Filter	14,333	22,426	34,222	53,119	79,836
Seal	4,778	7,475	11,407	17,706	26,612
	2,102	3,289	5,019	7,791	11,709
	956	1,495	2,281	3,541	5,322
	<b>53,682</b>	<b>83,935</b>	<b>128,102</b>	<b>198,842</b>	<b>298,852</b>

: 2003, PDP (KETI)  
 [ PDP ]

PDP Filter, ,  
 , 가 2002  
 53,682 2006 298,852 CAGR 53.6%



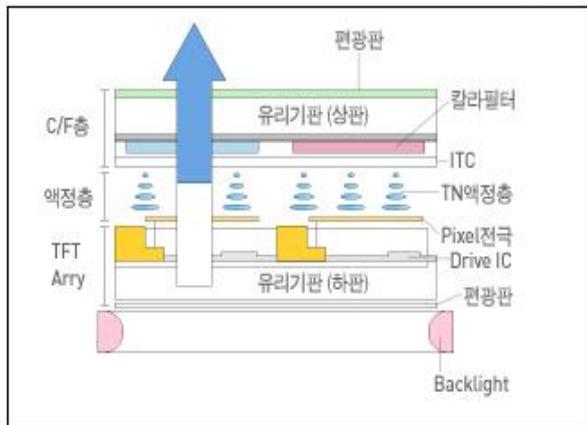
PDP  
PDP  
PDP  
2) PDP  
PDP

81.8% 가

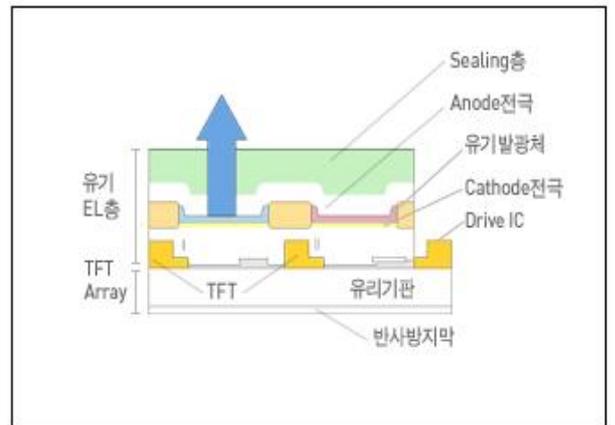
**. OLED**

OLED(Organic Electro Luminescent Display Diode)

, PDA, , ,  
Full 가  
(PM:Passive Matrix Type) OLED  
(AM:Active Matrix Type) OLED  
Full 가 가 TV  
OLED 가 가 ,



TFT-LCD의 구조



OLED의 구조

[ TFT-LCD OLED ]

: SDI

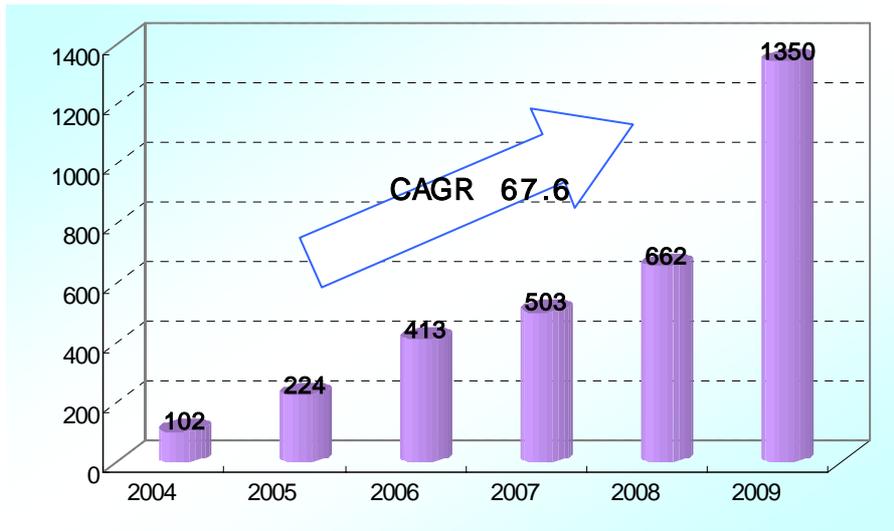
	CBP, Alq3	OLED
	DCJTb, C545T	
	LiF/Al, Mg/Ag	
	Alq3	
	Balq, BCP	
	CuPc, PEDOT	
Encapsulation	Cap Glass, Getter	
	RF	

[ OLED ]

Full

가

가



: DisplaySearch, KETI

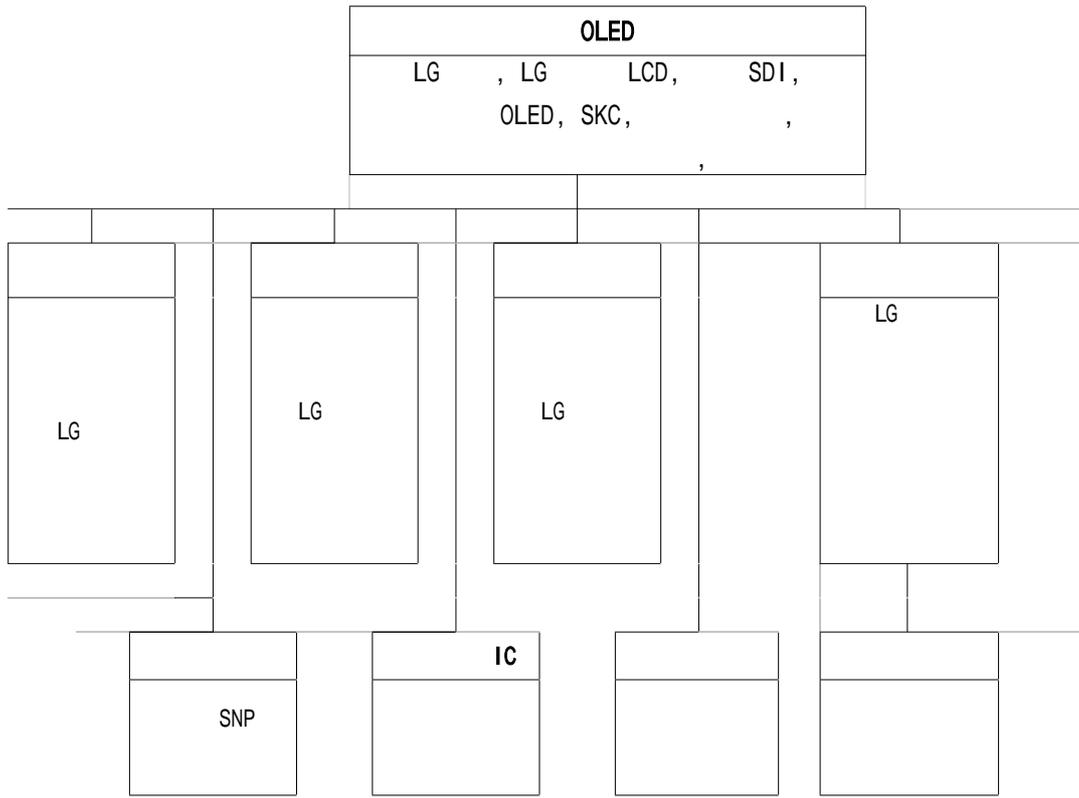
KISTI

[ OLED

]

(EIC)

OLED 2004 102 2009 1,350  
 CAGR 67.6%  
 OLED 95% , LG  
 OLED



: R&DBiZ

[ OLED

Chain ]

OLED  
 가 ,  
 LG 가 OLED  
 가 OLED , , ,  
 가 OLED  
 OLED

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220,000

2002~2012

10

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가

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IT

, IT

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LCD

1

, PDP

가

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가

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가가

가

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가

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1. , , KISTI, 2004
2. OLED , KISTI, 2004.11
3. , KETI, 2004.1.16
4. , ,
5. , , 가
6. , Plasma Display Panel , , EIC
7. , [www.displaycenter.org](http://www.displaycenter.org)
8. , [www.kodemia.or.kr](http://www.kodemia.or.kr)
9. , [new.edirak.org](http://new.edirak.org)
10. SDI, [www.samsungsdi.co.kr](http://www.samsungsdi.co.kr)
- 11.
- 12.