



First Silicon 제품소개

구분	Regulator			DC-DC Converter			Voltage Detector	Voltage Reference	OP-Amp	Comparator	Logic
	일반 Type (3V)	Quasi (1.2V)	LDO (0.2V)	승압형	강압형	Control					
Bipolar IC	FR78xx(1A)	FR1117(1A)	FR78Rxx (1A)			FAC 34063A	FA70xxA	FA431Z (2/1/0.5%)	FA358	FA393	
	FR78Lxx (0.1A)	FR223(0.5A)			FAC2596 (3A)			FA432	FA4558		
	FR317(1A)	FR1084(5A)			(9개 Item)				FA324	FA339	
		FR3480(0.1A)									
CMOS IC	<div style="background-color: yellow; padding: 5px;"> MP3 H/P DSC PMP Navigation DMB 전자사전 Bluetooth </div>		FC62 (일반)	FC63 (PFM)	FC8016/7 (PWM)		FC61 (L Active)				FC74UL (Single gate)
			FC6201 (일반)	FC65 (PWM)	FC8410 (PWM)		FC6101 (H Active)				
			FC6204 FC6209 (Enable)	FC9266 (PWM)	FC3406/7 (PWM)		FC6102 (Inverter)				FC74WL (Dual gate)
			FC6206S (저소모전력)	FC1565 (PWM, 5CH)							
Discrete	Bipolar Transistor										
	BRT (Built in resistor transistor)										
	Bipolar junction FET (Application for Microphone)										
	Power MOSFET										
	Diode (Switching/ Zener/ Shottky/ FRD/ Recti/ Bridge)										
	기타(ESD Protector/ LED Driver)										



Bipolar IC 제품소개

3 Terminal Regulator

Item	Input Voltage	Output Voltage	Output Current (Max.)	Drop Voltage (Typ.)	Package
FR78XX	35/40V	5 ~ 24V	1A	2V	TO-220AB/IS, TO-252/ 263
FR78LXX	30/35/40V	5 ~ 24V	0.1A	2V	TO-92, SOT-89
FR317	40V	Adj.	1A	2V	TO-220AB, TO-252/ 263
FR317L	40V	Adj.	0.1A	2V	TO-92, SOT-89
FR1117	15V	Adj. 1.25 ~ 5V	1A	1.2V	TO-220AB, SOT-223, TO-252
FR233	15V	1.25 ~ 5V	0.5A	1.2V	TO-92, SOT-223
FR1084	12V	1.25 ~ 5V	5A	1.2V	TO-220AB, TO-252/ 263
FR1085	12V	1.25 ~ 5V	3A	1.2V	TO-220AB, TO-252/ TO-263
FR3480	30V	3.3V, 5V	0.1A	1.2V	TO-92, SOT-89

DC-DC Converter Control

Item	Output Voltage	Output Current	Freq. (KHz)	Input Voltage	Package
FAC34063A	Adj.	1.5A	100	3 ~ 40V	DIP-8, FLP-8



Bipolar IC 제품소개

Switching Regulator (Step down)

Item	Output Voltage	Output Current	Freq. (KHz)	Input Voltage	Package
FAC2576	3.3V/5.0V/ADJ	3A	52	45V	TO-220/263
FAC2596	3.3V/5.0V/ADJ	3A	150	45V	TO-220/263
FAC1507	5.0V/ADJ	3A	150	45V	TO-252
FAC1509	5.0V/ADJ	2A	150	45V	SOP-8
FAC1410	ADJ	2A	380	20V	SOP-8
FAC1410C	ADJ	1.5A	380	20V	SOP-8
FAC1583	ADJ	3A	380	28V	SOP-8
FAC1591	ADJ	2A	380	32V	SOP-8
FAC1513	ADJ	2A	380	20V	SOP-8

Bipolar IC 제품소개

Shunt Regulator (Programmable Voltage Reference)

Item	Vref	Sink Current	Package
FA431Z	2.5 ~ 40V	0.1 ~ 100mA	TO-92, SOT-23, SOT-89
FA432	1.24 ~ 16V	0.1 ~ 20mA	TO-92, SOT-23, SOT-89

Voltage Detector (Reset)

Item	Supply Voltage	VDET	Package
FA70xxA	-0.3 ~ 15V	2.1 ~ 4.5V	TO-92, SOT-89

OP Amp & Comparator

Item	Type	Package
FA358	Dual OP-Amp	DIP-8, SOP-8
FA4558	Dual OP-Amp	DIP-8, SOP-8, SIP-8
FA324	Quad OP-Amp	DIP-14, SOP-14
FA393	Dual Comparator	DIP-8, SOP-8
FA339	Quad Comparator	DIP-14, SOP-14



CMOS IC 제품소개

Voltage Regulator line up

	ITEM	CE Type			Package			비고
Regulator	FC62 Series	-			SOT-23-3 SOT-89-3			1.1~6.0V 0.1V Step
LDO	FC6206S Series		Vout(V)	Iq(uA)	Vin(V)	Io(mA)	1.5~5.0V 0.1V Step Low ESR	
		62	1.1~6	3.3	10	250		
		6206S	1.5~5	1.0	6	350		
High Speed LDO	FC6204 Series	Active High (Built in Pull Down Resistor)			SOT-23-5 SOT-89-5			1.5~6.0V 0.05V Step Enable Low ESR
		Active High						
		Active Low (Built in Pull Up Resistor)						
		Active Low						
	FC6209 Series		Speed	Vout(V)	Iq(uA)	Vin(V)	Io(mA)	
		6204	X2	1.5~6	70	10	400	
	6209	X1	1.5~5	25	10	400		

Voltage Detector Line up

	ITEM	Output Type	Package	비고
Voltage Detector	FC61 Series	CMOS	SOT-23-3 SOT-89-3	Active Low
		Open Drain		1.1~6.0V 0.1V Step
	FC6101	CMOS		Active High
		Open Drain		1.1~6.0V 0.1V Step



CMOS IC 제품소개

DC DC Converter Line up

구분	ITEM	SW TR	CE	VDD Pin	FB Pin	Package	비고	
DC-DC Converter	FC63 Series (Step up)	FC63A	Build-in	No	No	No	SOT-23-3 SOT-89-3	Vout:: 2.7/3.0/3.3/5.0V PFM/150mA
		FC63B	Extenal	No	No	No		
		FC63C	Build-in	Yes	No	No	SOT-23-5 SOT-89-5	
		FC63D	Extenal	Yes	No	No		
		FC63E	Build-in	No	Yes	No		
		FC63F	Build-in	No	Yes	Yes		
	*FC65 Series (Step up)	상동						Vout:: 3.0/3.3/5.0V PWM/150mA
	*FC9266 (Step Up)						SOT-26 SOT-89-5	Adjustable PWM/300mA
	FC3406 (Step Down)						SOT-25	1.5/1.8/Adj PWM/PFM/600mA
	*FC1565 (Step Up/Down)						QFP-32	Fix: 3.3V Adj: 2.7~5.5V PWM/5CH/600mA
	FC8016	Vin =2.5~6V, Vo=Adj/ 1.2/ 1.8/ 3.3V, Io=1A, DFN-6L(2X2)						
	*FC8017	Vin=2.5~6V, Vo=Adj/Adj, 3.3/1.2, 3.3/1.8, 2.5/1.8V (Dual), Io=1/1A, DFN-12L (3X3)						
*FC8410	Vin =2.5~6V, Vo=Adj/ 1.2/ 1.8/ 3.3V, Io=2A, DFN-10L(3X3)							

* : 개발중



CMOS IC 제품소개

구분	Name	Feature	Package	비고	
CMOS Logic	FC74UL Series	FC74UL00	2-input NAND (Unbuffered)	SOT-25	Single Gate (8)
		FC74UL02	2-input NOR (Unbuffered)		
		FC74UL04	Inverter (Unbuffered)		
		FC74UL08	2-input AND (Unbuffered)		
		FC74UL32	2-input OR (Unbuffered)		
		FC74UL34	Buffer		
		FC74UL86	2-input Exclusive-OR Gate		
		FC74UL4066	Analog Switch		
	FC74WL Series	FC74WL00	Dual 2-input NAND Gate (Unbuffered)	MSOP-8	Dual Gate (22)
		FC74WL02	Dual 2-input NOR Gate (Unbuffered)		
		FC74WL04	Triple Inverter (Unbuffered)		
		FC74WL08	Dual 2-input AND Gate (Unbuffered)		
		FC74WL32	Dual 2-input OR Gate (Unbuffered)		
		FC74WL34	Dual Buffer		
		FC74WLAB	NAND Gate (Unbuffered) & NOR Gate(Unbuffered)		
		FC74WLAC	NAND Gate (Unbuffered) & Inverter(Unbuffered)		
		FC74WLAD	NAND Gate (Unbuffered) & AND Gate(Unbuffered)		
		FC74WLAE	NAND Gate (Unbuffered) & OR Gate(Unbuffered)		
		FC74WLAF	NAND Gate (Unbuffered) & Buffer		
		Fc74WLBC	NOR Gate (Unbuffered) & Inverter(Unbuffered)		
		FC74WLBD	NOR Gate (Unbuffered) & AND Gate(Unbuffered)		
		FC74WLBE	NOR Gate (Unbuffered) & OR Gate(Unbuffered)		
		FC74WLBF	NOR Gate (Unbuffered) & Buffer		
		FC74WLCD	Inverter (Unbuffered) & AND Gate(Unbuffered)		
		FC74WLCE	Inverter (Unbuffered) & OR Gate(Unbuffered)		
		FC74WLCF	Inverter (Unbuffered) & Buffer		
		FC74WLDE	AND Gate (Unbuffered) & OR Gate(Unbuffered)		
		FC74WLDF	AND Gate (Unbuffered) & Buffer		
		FC74WLEF	OR Gate (Unbuffered) & Buffer		
		FC74WL86A	Dual 2-input Exclusive-OR Gate		



TRANSISTOR 제품소개

SOT-23 (2913)Surface Mount General Purpose Transistor

ITEM	Complementary	Max. Ratings		hFE		VCE(sat)		fT (MHz) Typ
		VCEO (V)	IC (mA)	Min/Max	IC(mA)/Vce(V)	Max (V)	IC(mA)/Vce(V)	
FTA1036K	FTC2411K	-32	-500	80/390	10/3	0.4	100/10	200
FTA1037AK	FTC2412K	-50	-150	120/560	1/6	0.5	50/5	140
FTA8550H	FTC8050S	-25	-1.5A	120/600	100/1	0.5	800/80	-
FTB1197K	FTD1781K	-32	-800	120/390	100/3	0.5	500/50	200
FTC2411K	FTA1036K	32	500	82/390	10/3	0.4	500/50	250
FTC2412K	FTA1037AK	50	150	120/560	1/6	0.4	50/5	180
FTC8050H	FTA8550S	25	1.5A	120/600	100/1	0.5	800/80	-
FTC9012	FTC9013	-20	-500	100/600	50/1	-		100
FTC9013	FTC9012	20	500	100/600	50/1	-		100
FTD1781K	FTB1197K	32	800	120/390	100/3	0.4	500/50	150
FTD2114K	-	20	500	800/2700	10/3	0.4	500/20	350
MMBTA05	MMBTA55	60	500	100/	10/1	0.25	100/10	100(Min)
MMBTA06	MMBTA56	80	500	100/	10/1	0.25	100/10	100(Min)
MMBTA42	MMBTA92	300	500	40/	30/10	0.5	20/2	50(Min)
MMBTA43	-	200	500	40/	30/10	0.5	20/2	50(Min)
MMBTA55	MMBTA05	-60	-500	100/	10/1	0.25	100/10	50(Min)
MMBTA56	MMBTA06	-80	-500	100/	10/1	0.25	100/10	50(Min)
MMBTA92	MMBTA42	-300	-500	25/	30/10	0.5	20/2	50(Min)
MMBTA94	-	-400	-150	75/200	10/	-		-



TRANSISTOR 제품소개

SOT-23 (2913)Surface Mount General Purpose Transistor

ITEM	Complementary	Max. Ratings		hFE		VCE(sat)		fT (MHz) Typ
		VCEO (V)	IC (mA)	Min/Max	IC(mA)/Vce(V)	Max (V)	IC(mA)/Vce(V)	
2N2222AS	2N2907AS	40	600	40/	500/10	0.3	150/15	300(Min)
2N2907AS	2N2222AS	-60	-600	100/	10/1	0.4	150/15	200(Min)
2N3904S	2N3906S	40	200	100/300	10/1	0.3	50/5	300(Min)
2N3906S	2N3904S	-40	-200	100/300	10/1	0.4	50/5	250(Min)
2N4401	2N4403	40	600	80/	10/1	0.4	150/15	250(Min)
2N4403	2N4401	-40	-600	100/	10/1	0.4	150/15	200(Min)
BC807S	BC817S	-45	-500	100/600	100/1	0.7	500/50	100(min)
BC817S	BC807S	45	500	100/600	100/1	0.7	500/50	100(min)
BC846S	BC856S	65	100	110/450	2/5	0.6	100/5	100(Min)
BC847S	BC857S	45	100	110/800	2/5	0.6	100/5	100(Min)
BC848S	BC858S	30	100	110/800	2/5	0.6	100/5	100(Min)
BC856S	BC846S	-65	-100	125/475	2/5	0.6	100/5	100(Min)
BC857S	BC847S	-45	-100	125/800	2/5	0.6	100/5	100(Min)
BC858S	BC848S	-35	100	125/800	2/5	0.6	100/5	100(Min)



TRANSISTOR 제품소개

SOT-323(2012) Surface Mount General Purpose Transistor

ITEM	Complementary	Max. Ratings		hFE		VCE(sat)		fT (MHz) Typ
		VCEO (V)	IC (mA)	Min/Max	IC(mA)/Vce(V)	Max (V)	IC(mA)/Vce(V)	
FTA1576	FTC4081	-50	-150	120/560	1/6	0.5	50/5	140
FTC4081	FTA1576	50	150	120/560	1/6	0.4	50/5	150
FTC4097	-	32	500	180/390	100/3	0.4	500/50	250
2N2222U	2N2907U	40	600	100/	150/10	0.3	150/15	300(Min)
2N2907U	2N2222U	-60	-600	100/	150/	0.4	150/15	200(Min)
2N3904U	2N3906U	40	200	100/300	10/1	0.2	10/1	300
2N3906U	2N3904U	-40	-200	100/300	10/1	0.25	10/1	250
BC807U	BC817U	-45	-500	250/600	100/1	0.7	500/50	100(Min)
BC817U	BC807U	45	500	250/600	100/1	0.7	500/50	100(Min)
BC846U	BC856U	65	100	110/800	2/5	0.6	100/5	100(Min)
BC847U	BC857U	45	100	110/800	2/5	0.6	100/5	100(Min)
BC848U	BC858U	30	100	110/800	2/5	0.6	100/5	100(Min)
BC856U	BC846U	-65	100	125/800	2/5	0.65	100/5	100(Min)
BC857U	BC847U	-45	100	125/800	2/5	0.65	100/5	100(Min)
BC858U	BC848U	-30	100	125/800	2/5	0.65	100/5	100(Min)

TRANSISTOR 제품소개

SC-89(1608) Surface Mount General Purpose Transistor

ITEM	Complementary	Max. Ratings		hFE		VCE(sat)		fT (MHz) Typ
		VCEO (V)	IC (mA)	Min/Max	IC(mA)/Vce(V)	Max (V)	IC(mA)/Vce(V)	
FTA1774	FTC4617	-50	-150	120/560	1/6	0.5	50/5	140
FTC4617	FTA1774	50	150	120/560	1/6	0.4	50/5	180
2N2222E	-	40	600	100/	150/10	0.3	150/15	300(Min)
2N3904E	2N3906E	40	200	100/300	10/1	0.2	10/1	300
2N3906E	2N3904E	-40	-200	100/300	10/1	0.25	10/1	250

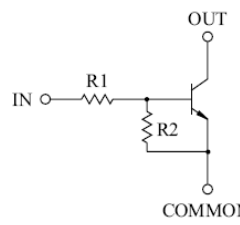
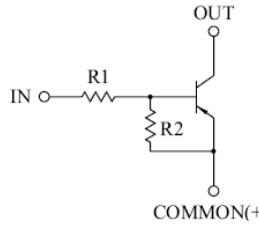
SOT-723(1208) Surface Mount General Purpose Transistor

ITEM	Complementary	Max. Ratings		hFE		VCE(sat)		fT (MHz) Typ
		VCEO (V)	IC (mA)	Min/Max	IC(mA)/Vce(V)	Max (V)	IC(mA)/Vce(V)	
FTA2029	FTC5658	-50	-150	120/560	1/6	0.5	50/5	140
FTC5658	FTA2029	50	150	120/560	1/6	0.4	50/5	180
2N2907V	-	-60	-600	75/	1/10	0.4	150/15	200(Min)
BC846V	BC856V	65	100	200/450	2/5	0.25	10/0.5	-
BC847V	-	45	100	200/800	2/5	0.25	10/0.5	100(Min)
BC856V	-	-65	100	220/475	2/5	0.3	10/0.5	-



BRT 제품소개

Resistor		SOT-23(2913)		SOT-323(2012)		SC-89(1608)		SOT-723(1208)		Max. Ratings	
R1 (K Ω)	R2 (K Ω)	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	VCEO (V)	IC (mA)
4.7	4.7	DTC101	DTA201	DTC301	DTA401	DTC501	DTA601	DTC701	DTA801	50	100
10	10	DTC102	DTA202	DTC302	DTA402	DTC502	DTA602	DTC702	DTA802	50	100
22	22	DTC103	DTA203	DTC303	DTA403	DTC503	DTA603	DTC703	DTA803	50	100
47	47	DTC104	DTA204	DTC304	DTA404	DTC504	DTA604	DTC704	DTA804	50	100
2.2	47	DTC105	DTA205	DTC305	DTA405	DTC505	DTA605	DTC705	DTA805	50	100
4.7	47	DTC106	DTA206	DTC306	DTA406	DTC506	DTA606	DTC706	DTA806	50	100
10	47	DTC107	DTA207	DTC307	DTA407	DTC507	DTA607	DTC707	DTA807	50	100
22	47	DTC108	DTA208	DTC308	DTA408	DTC508	DTA608	DTC708	DTA808	50	100
47	22	DTC109	DTA219	DTC309	DTA409	DTC509	DTA609	DTC709	DTA809	50	100
4.7	-	DTC110	DTA210	DTC310	DTA410	DTC510	DTA610	DTC710	DTA810	50	100
10	-	DTC111	DTA211	DTC311	DTA411	DTC511	DTA611	DTC711	DTA811	50	100
100	-	DTC112	DTA212	DTC312	DTA412	DTC512	DTA612	DTC712	DTA812	50	100
47	-	DTC114	DTA214	DTC314	DTA414	DTC514	DTA614	DTC714	DTA814	50	100
1	10	DTC116	DTA216	DTC316	DTA416	DTC516	DTA616	DTC716	DTA816	50	100
2.2	2.2	DTC117	DTA217	DTC317	DTA417	DTC517	DTA617	DTC717	DTA817	50	100
2.2	10	DTC118	DTA218							50	500
4.7	10	DTC119	DTA219	DTC319	DTA419	DTC519	DTA619	DTC719	DTA819	50	100
10	4.7	DTC120	DTA220	DTC320	DTA420	DTC520	DTA620	DTC720	DTA820	50	100
100	100	DTC122	DTA222	DTC322	DTA422	DTC522	DTA622	DTC722	DTA822	50	100
1	1	DTC123	DTA223	DTC323	DTA423					50	100
2.2	2.2	DTC137								50	500
2.2	-	DTC124								50	100
10	10		DTA230							50	500



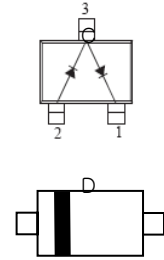
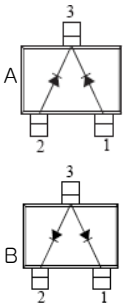
J-FET/ Diode 제품소개

Bipolar Junction FET(Condenser Microphone)

ITEM	Max. Ratings		IDSS		GV (dB)					Package
	VGDO (V)	IG (mA)	Max (uA)	VDS (V)	Typ	Max (V)	Cg (PF)	RL (KΩ)	f (KHz)	
FTK3857T/ L	-20	10	320	5.0	-3	4.5	15	1	1	SOT-923 LLP-923

Switching Diode

ITEM	Marking	Max. Ratings		VF		IR		trr (ns)	Type	Package
		VR (V)	IF (mA)	Max (V)	I F (mA)	Max (uA)	VR (V)			
FDS181	A3	80	100	0.71	10	0.5	80	4	B	SOT-23
FDS184	B3	80	100	0.72	10	0.5	80	4	A	SOT-23
FDS226	C3	80	100	0.71	10	0.5	80	4	C	SOT-23
FDS160	A	80	100	1.2	100	0.1	80	4	D	USC/SC-76
FDS160E	A	90	100	1.2	100	0.1	80	4	D	ESC/SC-79
FDS160F	3	80	100	1.2	100	0.1	80	4	D	SOD-723



Zener Diode

Item	Zener Voltage Vz(V)	Tolerance (%)	Package
FDZxx	2.4 ~ 75	5	SOD-323/SC-76/USC
FDZxxV	2.1 ~ 36	2	SOD-323/SC-76/USC
FDZxxE	2.4 ~75	5	SOD-523/SC-79/ESC
FDZxxEV	3.6 ~ 36	2	SOD-523/SC-79/ESC
FDZSxx	2.7 ~ 30	5	SOT-23

Diode 제품소개

Shottkey Diode (Lead Type)

(A) ^(V)	20	25	30	35	40	45	50	60	90	100	150	200	
7.5				MBR735		MBR745	MBR750 Vf<0.75V	MBR760					TO-220AC
10			SBL1030 Vf<0.6V	MBR1035	SBL1040 Vf<0.6V	MBR1045	MBR1050 Vf<0.8V	MBR1060	MBR1090 Vf<0.8V	MBR10100			TO-220AC
10			SBL1030CT Vf<0.55V		SBL1040CT Vf<0.55V				MBR1090CT Vf<0.85V	MBR10100CT	MBR10150CT		TO-220AB
15				MBR1535CT		MBR1545CT	MBR1550CT Vf<0.75V	MBR1560CT					TO-220AB
16				MBR1635 Vf<0.63V		MBR1645 Vf<0.63V	MBR1650 Vf<0.75V	MBR1660					TO-220AC
16			SBL1630CT Vf<0.56V		SBL1640CT Vf<0.56V								TO-220AB
20			SBL2030CT Vf<0.6V	MBR2035CT	SBL2040CT Vf<0.6V	MBR2045CT	MBR2050CT Vf<0.8V	MBR2060CT Vf<0.8V	MBR2090CT Vf<0.8V	MBR20100CT	MBR20150CT Vf<0.9V	MBR20200CT Vf<0.81V	TO-220AB
25	SBL5L20CT	SBL25L25CT	SBL25L30CT	MBR2535CT		MBR2545CT	MBR2550CT Vf<0.75V	MBR2560CT					TO-220AB
30				MBR3035CT Vf<0.6V		MBR3045CT Vf<0.6V					MBR30150CT Vf<0.9V		TO-220AB

☞ TO-220IS, TO-263 Type도 있음



Diode 제품소개

Shottkey Diode (SMD Type)

(A) ^(V)	20	25	30	35	40	45	50	60	70	80	90	100	Package
1	SK12		SK13		SK14		SK15	SK16	SK17	SK18	SK19	SK1B	SMA
	Vf<0.5V		Vf<0.5V		Vf<0.5V		Vf<0.7V		Vf<0.7V				
	SL12		SL13		SL14								SMA
	Vf<0.385V		Vf<0.385V		Vf<0.4V								
2	SK22		SK23		SK24		SK25	SK26	SK27	SK28	SK29	SK2B	SMB
	Vf<0.5V		Vf<0.5V		Vf<0.5V		Vf<0.7V		Vf<0.79V				
	SK22A		SK23A		SK24A		SK25A	SK26A					SMA
	Vf<0.5V		Vf<0.5V		Vf<0.5V		Vf<0.7V						
	SL22		SL23		SL24								SMB
Vf<0.385V		Vf<0.385V		Vf<0.4V									
3	SK32		SK33		SK34		SK35	SK36	SK37	SK38	SK39	SK3B	SMC
	Vf<0.5V		Vf<0.5V		Vf<0.5V		Vf<0.7V		Vf<0.79V				
	SK32A		SK33A		SK34A		SK35A	SK36A					SMA
	Vf<0.5V		Vf<0.5V		Vf<0.5V		Vf<0.7V						
	SL32		SL33		SL34								SMC
Vf<0.38V		Vf<0.38V		Vf<0.4V									



Diode 제품소개

Rectifiers (SMD Type)

(V) (A)	50	100	200	300	400	500	600	800	1000	Package
1	GN1A	GN1B	GN1D		GN1G		GN1J	GN1K	GN1M	SMA
	Vf<1.1V				Vf<1.1V		Vf<1.1V			
1.5	GNOA	GNOB	GNOD		GNOG		GNOJ	GNOK	GNOM	SMB
	Vf<1.15V				Vf<1.15V		Vf<1.15V			
	GNOAA	GNOBA	GNODA		GNOGA		GNOJA	GNOKA	GNOMA	SMA
	Vf<1.15V				Vf<1.15V		Vf<1.15V			
3	GN3A	GN3B	GN3D		GN3G		GN3J	GN3K	GN3M	SMC
	Vf<1.15V				Vf<1.15V		Vf<1.15V			



Diode 제품소개

Fast Recovery Rectifier (SMD Type)

(V)	50	100	200	400	600	800	1000	Package
(A)	Vf<1.3V Trr<150ns				Vf<1.3V Trr<150ns	Vf<1.3V Trr<150ns		
1	GR1A	GR1B	GR1D	GR1G	GR1J	GR1K	GR1M	SMA
1.5	GROA	GROB	GROD	GROG	GROJ	GROK	GROM	SMB
	GROAA	GROBA	GRODA	GROGA	GROJA	GROKA	GROMA	SMA
3	GR3A	GR3B	GR3D	GR3G	GR3J	GR3K	GR3M	SMC
	GR3AB	GR3BB	GR3DB	GR3GB	GR3JB	GR3KB	GR3MB	SMB



Diode 제품소개

Super Fast Recovery Rectifier (SMD Type)

(V)	50	100	150	200	300	400	600	800	1000	Package
(A)	Vf<0.95V Trr<35ns				Vf<1.3V Trr<35ns		Vf<1.7V Trr<35ns			
1	ES1A	ES1B	ES1C	ES1D	ES1F	ES1G	ES1J	ES1K	ES1M	SMA
				MURS120 Vf<0.875V Trr<25ns		MURS140 MURS160 Vf<1.25V Trr<50ns				SMB
2	ES2A	ES2B	ES2C	ES2D	ES2F	ES2G	ES2J	ES2K	ES2M	SMB
	ES2AA	ES2BA	ES2CA	ES2DA	ES2FA	ES2GA	ES2JA	ES2KA	ES2MA	SMA
	Vf<0.92V Trr<25ns				Vf<1.25V Trr<25ns		Vf<1.7V Trr<25ns			
3	ES3A	ES3B	ES3C	ES3D	ES3F	ES3G	ES3J	ES3K	ES3M	SMC
	ES3A	ES3B	ES3C	ES3D	ES3F	ES3G	ES3J	ES3K	ES3M	SMB
	Vf<0.92V Trr<25ns				Vf<1.25V Trr<25ns		Vf<1.7V Trr<25ns			



MOSFET 제품소개

Power MOSFET

ITEM	Polarity	Max. Ratings		RDS(ON)		VGS (th)		Switching Time (nS)				Package
		VDSS (V)	ID (A)	Max (Ω)	I D (A)	Min (V)	Max (V)	td (on)	tr	td (off)	tf	
FTK630P/F	N-CH	200	9	0.85	5.0	2.0	4.0	30	50	50	40	TO-220/F
FTK730P/F	N-CH	400	5.5	1.0	3.0	2.0	4.0	10	20	35	15	TO-220/F
FTK830P/F	N-CH	500	4.5	1.5	2.5	2.0	4.0	10	15	33	16	TO-220/F
FTK840P/F	N-CH	500	8	0.85	4.4	2.0	4.0	15	21	50	20	TO-220/F
FTK1N60I/T/L	N-CH	600	1.2	9.3	0.6	2.0	4.0	2	25	7	25	TO-251 TO-92/L
FTK2N60I/F	N-CH	600	2	3.8	1.0	2.0	4.0	10	25	20	25	TO-251 TO-220F
FTK4N60P/F	N-CH	600	4	2.5	2.2	2.0	4.0	13	45	25	35	TO-220/F
FTK7N60P/F	N-CH	600	7.4	1.0	3.7	2.0	4.0	70	170	140	130	TO-220/F
FTK380P/F	N-CH	800	3	4.8	0.85	2.0	3.5	16	26	46	24	TO-220/F
FTK75N75	N-CH	75	75	0.015	37.5	2.0	4.0	12	79	80	52	TO-220
FTK70N06	N-CH	60	70	0.015	35	2.0	4.0	12	79	80	52	TO-220
FTK50N06P/F	N-CH	60	50	0.023	25	2.0	4.0	40	100	90	80	TO-220/F
FTK2301	P-CH	-20	-2.3	0.15	-2.0	-0.45	-0.95					SOT-23
FTK2302	N-CH	20	2.3	0.115	2.0	0.65	1.2					SOT-23



MOSFET 제품소개

Trench Power MOSFET

ITEM	Polarity	Max. Ratings		RDS(ON)		VGS (th)		Switching Time (nS)				Package
		VDSS(V)	ID (A)	Max (Ω)	I D (A)	Min (V)	Max (V)	td(on)	tr	td(off)	tf	
FTK2306	N-CH	30	5	0.035	5.0	0.5	1.2	6	20	20	3	SOT-23
FTK2312	N-CH	20	4.5	0.04	4.5	0.5	1.2	20	18	60	28	SOT-23
FTK3401	P-CH	-30	-4.2	0.065	4	-0.7	-2	6.3	3.2	38.5	12	SOT-23
FTK9435	P-CH	-30	-5.3	0.053	-5.3	-1	-3	19	9	74	36	SOP-8
FTK4703	P-CH	-20	-3.4	0.09	-3.4	-0.45	-1	10	12	44	22	DFN3X2-BL
FTK6401	P-CH	-12	-4.3	0.085	2.5	-0.5	-1	11	32	250	210	SOT-23
FTK4414	N-CH	30	8.5	0.04	5	1.0	3.0	4.5	4.2	20	4.9	SOP-8
FTK3014	N-CH	60	60	0.014	30	2.0	4.0	14.6	14.2	40	7.3	TO-220
FTK6808	N-CH	55	110	0.008	68	2	4	18.2	15.6	70.5	13.8	TO-220
FTK7510	N-CH	75	75	0.01	40	2	4	18.2	15.6	70.5	13.8	TO-220
FTK3022	N-CH	100	60	0.022	30	2.0	4.0	18.2	15.6	70.5	13.8	TO-220
FTK8205A	N-CH DUAL	20	6	0.0275	4.5	0.5	1.2	10	11	35	30	TSSOP-8
FTK8822	N-CH DUAL	20	7	0.021	7	0.5	1	5.7	11.5	31.5	9.7	TSSOP-8
FTK4953	P-CH DUAL	-30	-4.9	0.053	-4.9	-1	-2	12	3	22	4	SOP-8
SMOS FET												
FTK84	P-CH	-50	-0.1	10	-0.1	0.8	2	2.5	1	16	8	SOT-23
FTK123	N-CH	100	0.17	6	0.1	0.8	2.8	20		40		SOT-23
FTK138	N-CH	50	0.2	3.5	0.2	0.5	1.5	20		20		SOT-23
FTK7002	N-CH	60	0.115	7.5	0.0005	1	2.5	20		40		SOT-23
FTK7002E	N-CH	60	0.115	7.5	0.0005	1	2.5	20		40		SOT-23

LED Driver

ITEM	Vin (V)	Io (mA)	Frequency (MHz)	Dimming	Package
FC1350	7 ~ 32	350 Adj.	1	DC, PWM	SOT-23-5
FC4115	8 ~ 30	1200 Adj.	1	DC, PWM	SOT-89-5 SOP-8
FC9910B	8 ~ 450	외부 소자	0.3	DC, PWM	SOP-8 SOP-16

ESD Protector (Multilayer Poltmer ESD Suppressor)

ITEM	Operating Voltage (V)	Trigger Voltage (V)	Clamping Voltage(V)	Capacitance (pF)
	Max.	Typ.	Typ.	Typ.
PE08A-2510	8	300	15	0.15
PE12A-0402	12	300	20	0.15
PE24B-0603	24	500	36	0.05
PE12A-1206A4	12	300	20	0.15



Bipolar IC

Conversion List

	ITEM	KEC	FSC	ONSEMI	STM	NJRC
REGULATOR	FR78xxP	KIA78xxAPI	MC78xxCT	MC78xx		
	FR78xxD	KIA78xxAF	MC78xxCDT			NJM78xxDLA
	FR78xxDD					
	FR78Lxx	KIA78SxxP		MC78LxxP		
	FR78LxxF	KIA78LxxF				
	FR1117Sxx	KIA1117Sxx	AN1117ASxx		LD1117S	
	FR1117Dxx	KIA1117Fxx	AN1117ADxx		LD1117DT	
	FR1117Fxx					
	FR1117Pxx	KIA1117Pxx	AN1117ATxx		LD1117V	
	FR223Sxx					
	FR1084Pxx					
	FR1084DDxx					
	FR3480xx					
	FR3480Fxx					
	FR317P	KIA317PI	LM317T	LM317T		
	FR317D	KIA317F				
	FR317DD		LM317D2T	LM317D		
	FR317L					
	FR317LF					
	FAC2576P5xx	KIA2576Plxx		LM2575T		
	FAC2576DD5xx	KIA2576FPxx		LM2575D2		
	FAC2596P5xx	KIA2596Plxx				
	FAC2596DD5xx	KIA2596FPxx				
	FAC34063AP	KIA34063A	MC34063AP	MC34063AP	MC34063ABN	NJM22360AD
	FAC34063AF	KIA34063AF	MC34063AD	MC34063AD	MC34063ABD	NJM22360AM
Vol. Det.	FA70xxA	KIA70xxAP				
	FA70xxAF	KIA70xxAF				
Ref	FA431Z	KIA431P		TL431		
	FA431ZS	KIA431M				
	FA431ZF	KIA431F				
OP AMP	FA358P	KIA358P		LM358		NJM2904D
	FA358F	KIA358F				NJM2904M
	FA4558P	KIA4558P	MC4558P	MC4558	MC4558N	NJM4558D
	FA4558F	KIA4558F	MC4558D		MC4558D	NJM4558M
	FA4558S					
	FA324P	KIA324P	LM324N	LM324N	LM324N	NJM2902N
FA324F	KIA324F	LM324M	LM324D	LM324D	NJM2902M	
Comparator	FA393P	KIA393P		LM393N	LM393N	NJM2901D
	FA393F	KIA393F		LM393D	LM393D	NJM2901M
	FA339P	KIA339P		LM339N	LM339N	NJM2903D
	FA339F	KIA339F		LM339D	LM339D	NJM2903M

Conversion List

CMOS IC

	ITEM	FS	Torex	ROCOH	SII	Microchip	KEC	Remark
Voltage Detector	FC61		XC61C	Rx5Vxx	S-807/8	MCP111/2		Active Low 1.1 ~ 7.1V 0.1V Step
	FC6102							Active Low Invert Type
	FC6101							Active High
Regulator	FC62		XC62FP	Rx5Rx	S-812x	MCP1700T		1.1 ~ 6.0V 0.1V Step
	FC6201		XC6201				KIC3201	Different Pin Layout
High Speed LDO	FC6204		XC6204				KIC3210	Enable
	FC6209		XC6209					Enable Low ESR
LDO	FC6206S		XC6206					Low ESR
DC-DC Converter	FC63		XC6381					PFM/150mA
	FC65		XC6371					PWM/150mA
	FC9266 (Step Up)							PWM/300mA
	FC3406 (Step Down)							PWM/PFM 600mA
	FC1565 (Step Up)							PWM/5CH 600mA
CMOS Logic	FC74UL		XC74UL				KIC7SZ	Single Gate
	FC74WL		XC74WL				KIC7WZ	Dual Gate



Coersion List

Bipolar Transistor

ITEM	Maker	FS	ITEM	Maker	FS	ITEM	Maker	FS
2N2222/A	ONSEMI	2N2222S/AS	2SB1218A	Panasonic	FTA1576	KTA1298	KEC	FTB1197K
2N2906	ONSEMI	2N3906	2SC1623	NEC	FTC2412K	KTA1504S	KEC	FTA1037AK
2N3906	ONSEMI	2N3906	2SC2411K	Rohm	FTC2411K	KTA1505S	KEC	FTA1036K
2N2907/A	ONSEMI	2N2907S/AS	2SC2412K	Rohm	FTC2412K	KTA2014	KEC	FTA1576
2N3904	ONSEMI	2N3904	2SC2462	Renesas	FTC2412K	KTA2014E	KEC	FTA1774
2SA812	NEC	FTA1037AK	2SC2618	Renesas	FTC2411K	KTA2014V	KEC	FTA2029
2SA813	NEC	FTA1037AK	2SC2712	Toshiba	FTC2412K	KTA8550S	KEC	FTA8550S
2SA1036K	Rohm	FTA1036K	2SC2812	Sanyo	FTC2412K	KTC3265	KEC	FTD1781K
2SA1037K	Rohm	FTA1037AK	2SC2859	Toshiba	FTC2411K	KTC3875S	KEC	FTC2412K
2SA1037AK	Rohm	FTA1037AK	2SC3134	Sanyo	FTC2412K	KTC3876S	KEC	FTC2411K
2SA1121	Renesas	FTA1036K	2SC3938	Panasonic	FTC4097	KTC4075	KEC	FTC4081
2SA1162	Toshiba	FTA1037AK	2SC4097	Rohm	FTC4097	KTC4075E	KEC	FTC4617
2SA1179	Sanyo	FTA1037AK	2SC4081	Rohm	FTC4081	KTC4075V	KEC	FTC5658
2SA1182	Toshiba	FTA1036K	2SC4116	Toshiba	FTC4081	KTC4076	KEC	FTC4097
2SA1235	Renesas	FTA1037AK	2SC4118	Toshiba	FTC4097	KTC8050S	KEC	FTC8050S
2SA1252	Sanyo	FTA1037AK	2SC4154	Renesas	FTC4081	BC807	ONSEMI	BC807
2SA1338	Sanyo	FTA1036K	2SC4155	Renesas	FTC4081	BC816	ONSEMI	BC816
2SA1362	Toshiba	FTB1197K	2SC4177	NEC	FTC4081	BC846	ONSEMI	BC846
2SA1366	Rohm	FTA1037AK	2SC4181	NEC	FTC4081	BC847	ONSEMI	BC847
2SA1576	Rohm	FTA1576	2SC4211	Sanyo	FTC2412K	BC848	ONSEMI	BC848
2SA1577	Rohm	FTA1576	2SC4413	Sanyo	FTC4081	BC856	ONSEMI	BC856
2SA1603	Renesas	FTA1576	2SC4555	Sanyo	FTC4097	BC857	ONSEMI	BC857
2SA1611	NEC	FTA1576	2SC4617	Rohm	FTC4617	BC858	ONSEMI	BC858
2SA1774	Rohm	FTA1774	2SC4617H	Rohm	FTC4617	BCW68	ONSEMI	BCW68
2SA1774H	Rohm	FTA1774	2SC4738	Toshiba	FTC4617	BCW70	ONSEMI	BCW70
2SA1832	Toshiba	FTA1774	2SC4738F	Toshiba	FTC4617	MMBTA05	ONSEMI	MMBTA05
2SA1832F	Toshiba	FTA1774	2SC4738FT	Toshiba	FTC5658	MMBTA06	ONSEMI	MMBTA06
2SA1832FT	Toshiba	FTA2029	2SC5658	Rohm	FTC5658	MMBTA42	ONSEMI	MMBTA42
2SA2029	Rohm	FTA2029	2SD601	Panasonic	FTC2412	MMBTA43	ONSEMI	MMBTA43
2SB624	NEC	FTB1197K	2SD602	Panasonic	FTC2411	MMBTA55	ONSEMI	MMBTA55
2SB709A	Panasonic	FTA1037AK	2SD1781K	Rohm	FTD1781	MMBTA56	ONSEMI	MMBTA56
2SB710	Panasonic	FTA1036K	2SD1819A	Panasonic	FTC4081	MMBTA92	ONSEMI	MMBTA92
2SB815	Sanyo	FTB1197K	2SD1820	Panasonic	FTC4097	MMBTA93	ONSEMI	MMBTA93
2SB1197K	Rohm	FTB1197K	2SD2114K	Rohm	FTD2114			
2SB1218	Panasonic	FTA1037AK	2SD2228	NEC	FTC4097			

Coersion List

Digital Transistor (BRT)

Rohm	NEC	Toshiba	Phillips	Panasonic	Renesas	KEC	FS
DTA113ZKA	FN1A3Q	RN2414				KRA116S	DTA216
DTA114EE		RN2102/F				KRA302E	DTA802
DTA114EK	FN1A4M	RN2402	PDTA114EK	UN2111	RT1P141C	KRA102S	DTA202
DTA114EM		RN2102FT				KRA302V	DTA802
DTA114EU	GN1A4M	RN2302	PDTA114EU	UN5111		KRA302	DTA402
DTA114TK	FN1A4Z	RN2411	PDTA114TK	UN2115	RT1P140C	KRA111S	DTA211
DTA114TM		RN2111FT				KRA311V	DTA811
DTA114TU	GN1A4Z	RN2311	PDTA114TU	UN5115		KRA311	DTA411
DTA114WKA		RN2417				KRA120S	DTA220
DTA114YK	FN1A4P	RN2407		UN2114	RT1P144C	KRA107S	DTA207
DTA114YM		RN2107FT				KRA307V	DTA807
DTA114YU	GN1A4P	RN2307		UN5114		KRA307	DTA407
DTA115TM						KRA312V	DTA812
DTA123EM						KRA317V	DTA817
DTA123JE		RN2105/F				KRA305E	DTA605
DTA123JK		RN2405		UN211M		KRA105S	DTA205
DTA123JM		RN2105FT				KRA305V	DTA805
DTA123JU		RN2305		UN511M		KRA305	DTA205
DTA123YKA		RN2415		UN211H		KRA118S	DTA21S
DTA124EE		RN2103/F				KRA303E	DTA603
DTA124EK	FN1F4M	RN2403	PDTA124EK	UN2112	RT1P241C	KRA103S	DTA203
DTA124EM		RN2103FT				KRA303V	DTA803
DTA124EU	GN1F4M	RN2303	PDTA124EU	UN5112		KRA303	DTA403
DTA124XK	FN1F4N	RN2408				KRA108S	DTA208
DTA124XM		RN2108FT				KRA308V	DTA808
DTA124XU	GN1F4N	RN2308		UN511T		KRA308	DTA408
DTA143EE		RN2101/F				KRA301E	DTA601
DTA143EK	FN1L3M	RN2401	PDTA143EK	UN211L		KRA101S	DTA201
DTA143EM		RN2101FT				KRA301V	DTA801
DTA143EU	GN1L3M	RN2301	PDTA143EU	UN511L		KRA301	DTA401
DTA143TK		RN2410		UN2116	RT1P430C	KRA110S	DTA210
DTA143TM		RN2110FT				KRA310V	DTA810
DTA143ZK		RN2406		UN211N		KRA106S	DTA206
DTA144EK		RN2404	PDTA144EK	UN2113		KRA104S	DTA204
DTA144EM		RN2104FT				KRA304V	DTA804



Coersion List

Transistor (BRT)

Rohm	NEC	Toshiba	Philips	Panasonic	Renesas	KEC	FS
DTA144EU	GN1L4M	RN2304	PDTA144E U	UN5113		KRA304	DTA404
DTA144TM		RN2113FT				KRA314V	DTA814
DTA155EM						KRA322V	KRA822
DTC113ZKA	FA1A3Q	RN1414				KRC116S	DTC116
DTC114EE		RN1102/F				KRC402E	DTC502
DTC114EK	FA1A4M	RN1402	PDTC114E K	UN2211	RT1N141C	KRC102S	DTC102
DTC114EM		RN1102FT				KRC402V	DTC702
DTC114EU	GA1A4M		PDTC114E U	UN5211		KRC402	DTC302
DTC114TK	FA1A4Z	RN1411	PDTC114TK	UN2215	RT1N140C	KRC111S	DTC111
DTC114TM		RN1111FT				KRC411V	DTC711
DTC114TU	GA1A4Z		PDTC114T U	UN5215		KRC411	DTV311
DTC114YK	FA1A4P	RN1407		UN2214	RT1N144C	KRC107S	DTC107
DTC114YM		RN1107FT				KRC407V	DTC707
DTC114YU	GA1A4P			UN5214		KRC407	DTC307
DTC114UA						KRC422	DTC322
DTC115TK		-				KRC112S	DTC112
DTC123EKA		-				KRC117S	DTC117
DTC123EM						KRC417V	DTC717
DTC123JE		RN1105/F				KRC405E	DTC505
DTC123JK		RN1405		UN221M		KRC105S	DTC105
DTC123JM		RN1105FT				KRC405V	DTC705
DTC123YKA		RN1415		UN221H		KRC118S	DTC118
DTC124EE		RN1103/F				KRC403E	DTC503
DTC124EK	FA1F4M	RN1403	PDTC124E K	UN2212	RT1N241C	KRC103S	DTC103
DTC124EM		RN1103FT				KRC403V	DTC703
DTC124EU	GA1F4M		PDTC124E U	UN5212		KRC403	DTC303
DTC124XK	FA1F4N	RN1408				KRC108S	DTC108
DTC124XM		RN1108FT				KRC408V	DTC708
DTC143EE		RN1101/F				KRC401E	DTC501
DTC143EK	FA1L3M	RN1401	PDTC143E K	UN221L		KRC101S	DTC101
DTC143EM		RN1101FT				KRC401V	DTC701
DTC143TK	FA1L3Z	RN1410		UN2216	RT1N430C	KRC110S	DTC110
DTC143TM		RN1110FT				KRC410V	DTC710
DTC143TU	GA1L3Z			UN5216		KRC410	DTC310

Coersion List

Digital Transistor (BRT)

Rohm	NEC	Toshiba	Philips	Panasonic	Renesas	KEC	FS
DTC143XKA	FA1L3N	RN1416		UN221F		KRC119S	DTC119
DTC143ZK		RN1406		UN221N		KRC106S	DTC106
DTC143ZU				UN521N		KRC406	DTC306
DTC144EE		RN1104/F				KRC404E	DTC504
DTC144EK	FA1L4M	RN1404	PDTC144E K	UN2213	RT1N441C	KRC104S	DTC104
DTC144EM		RN1104FT				KRC404V	DTC704
DTC144EU	GA1L4M		PDTC144E U	UN5213		KRC404	DTC304
DTC144TK	FA1L4Z	RN1413		UN2210		KRC114S	DTC114
DTC144TM		RN1113FT				KRC414V	DTC714
DTC144WK	FA1L4L	RN1409		UN221E		KRC109S	DTC109
DTC155EM						KRC422V	DTC722

Diode

Rohm	NEC	Toshiba	Sanyo	Panasonic	Renesas	KEC	FS
DAP202K	1S2836	1SS181	DCA010	MA151WA	HSM2836	KDS181	FDS181
DAN202K	1S2838	1SS184	DCB010	MA151WK	HSM2838	KDS184	FDS184
DA204K	1SS123	1SS226	DCC010		HSM123	KDS226	FDS226
1SS355						KDS160	FDS160
1SS400						KDS160E	FDS160E
						KDS160F	FDS160F

NOTE. What are described in the data may be changed without any prior notice to reflect new technical development.



Item별 주요 Application

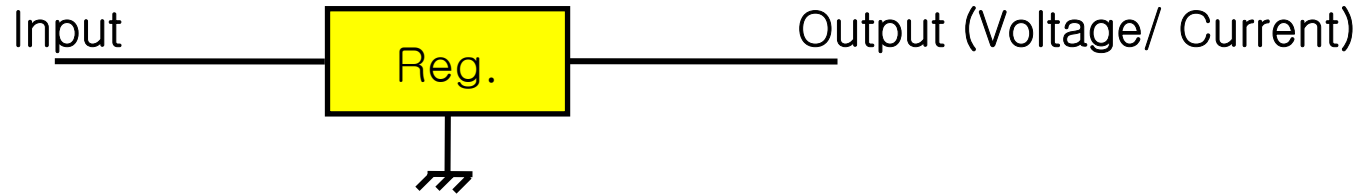
Item	Function	P't	Competitor	Application
FR78xx	1A Regulator	1-2	KEC, FKS	공기청정기, 비데, 전기밥솥, RD, GPS, PDP, SMPS, LCD-TV SMPS, STB, DVD
FR317	1A Adjustable	1	FC, STM, NS	LCD-TV, STB
FR317L	0.1A Adjustable	1	FKS	RD, GPS
FR1117-xx	1A LDO	(1)	STM, AME	Charger, Adapter, Modem, DVR, DAB, GPS, LCD-TV, CAR-Audio, AMP, STB
FR1084	5A LDO	1	STM, FC etc	PDP, LCD-TV, STB, DVD
FA70xx	Voltage Detector	1	KEC, FKS	에어컨, 세탁기, 비데, 전기밥솥, GPS, CAR-Audio, AMP, STB, DVD
FA431Z	Voltage Reference	1	HTC, KEC	Navi, SMPS, BLU, STB, DVD
FA3051	CC-CV	1	Rohm, BCD, AUK, ST	Charger, Navi
FAC2576	3A Switching Regulator	1	Onsemi, LTC	DAB, DMB, Navi, SMPS
FAC2596	3A Switching Regulator	1		LCD-TV
FAC34063AD	DC-DC converter	1	FKS, TI	RD, SMPS, BLU
FA358/324	OP-Amp	1	BCD, AUK, KEC	RD, Charger, Adapter, 김치냉장고, 에어컨, 공기청정기, 비데 전기밥솥, SMPS
FA339/393	Comparator	1	BCD, AUK	Charger, Adapter, 전기밥솥, SMPS, BLU
FA4558	OP-Amp	3	KEC, NJRC, AUK	CAR-Audio, AMP, STB, DVD
FD62003	TR-Array	1	Toshiba, KEC	김치냉장고, 에어컨, 세탁기, 공기청정기, 비데
FD62083/84	TR-Array	1	Toshiba, KEC	김치냉장고, 에어컨, 세탁기, 공기청정기, 비데



Application별 주요 Maker

Application	Customer
Charger (Mobile)	동양ENP/ H&T/ 알에프텍/ 동원/ 드림텍/ 유니드론/ 선린/ 동도/ 베스트/ 테라/ 새미칩스 등
Adapter	알트코리아/ 플래닛 등
김치냉장고	위니아만도 50K/ 광주삼성/ LGE/ DWE
세탁기	LGE/ 광주삼성/ DWE
에어컨	LGE 350K/ 광주삼성/ DWE/ 위니아만도 / 캐리어
압력밥솥	쿠쿠 200K /부방 30K/ 노비타/ 웅진
공기청정기	청풍 50K/ 한국샤프/ 웅진 /SEC/ LGE
비데	삼흥테크/ 노비타/ 동양매직/ 대림/ 웅진/ 린나이
DVR	아이디스 30K/ 성광전자/ 아구스 / 성진씨엔씨/ 피카소정보통신
DAB	기룡전자 100K/휴맥스 70K
RD	백금정보 100K/ 라덱스/ 헤드라인
GPS	네비우스 30K /J-COM/ 오토웍스 20K/ 기타 130K
Navigation	팅크웨어 50K/ 카포인트 30K/ Autonet / 기타 100K
PDP용 Power Module	삼성전기 200K/ 동양ENP 150K/ 단암 100K/ LGE/ 희성전자등
LCD TV/MNT용 BLU	삼성전기/ 희성전자/ DSLCD/ 우영/ 한솔LCD/ 태산LCD/ 삼진LND / 동양ENP 등
Car-audio	Nansung 100K/ DAT 80K/ Autonet/ 대성엘텍/ KRS/ 세진/ 동성
STB	Humax 400K/Homecast 200K/ Handan 150K /Gaon 150K/ Topfield 150K/ SEC 150K Digipia 100K/ Opentech 80K/ Arion 80K/ Celron 130K/ HDT 70K
STB용 SMPS	동양ENP 800K/ 인성 700K/ 오리엔텍 300K

Linear Regulator



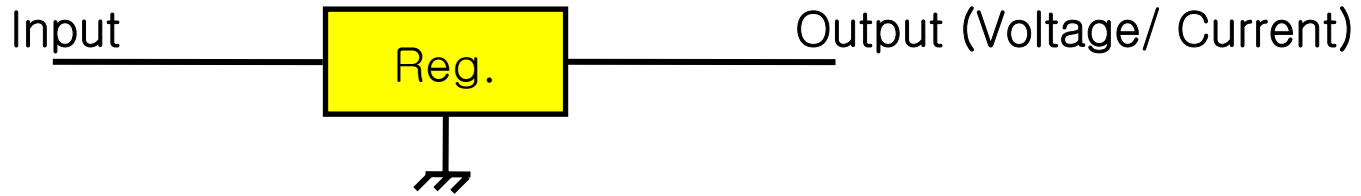
Drop Voltage(V_{drop}) = $V(\text{input}) - V(\text{output})$

소비전력(W) = $V_{drop} \times I_{out} \Rightarrow$ 발열

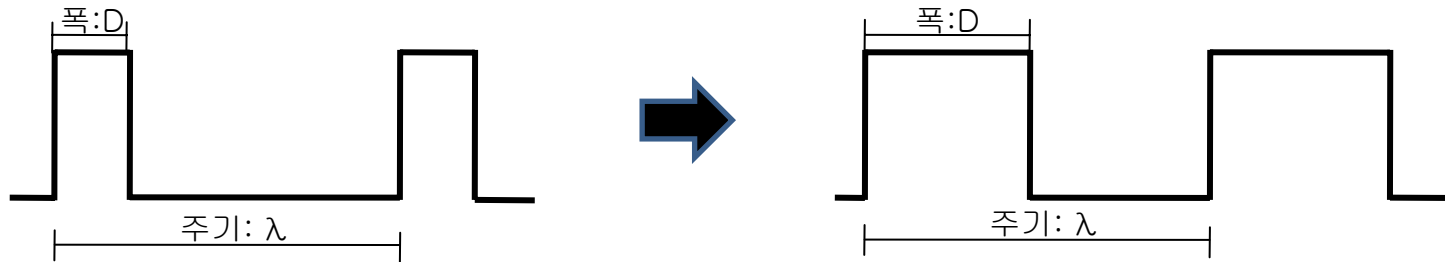
결론 : 입출력간 전압차(V_{drop})는 가능한 적게 설계

(일반Type: 3V, Quasi Type: 1.5V, LDO Type: 0.5V)

Switching Regulator

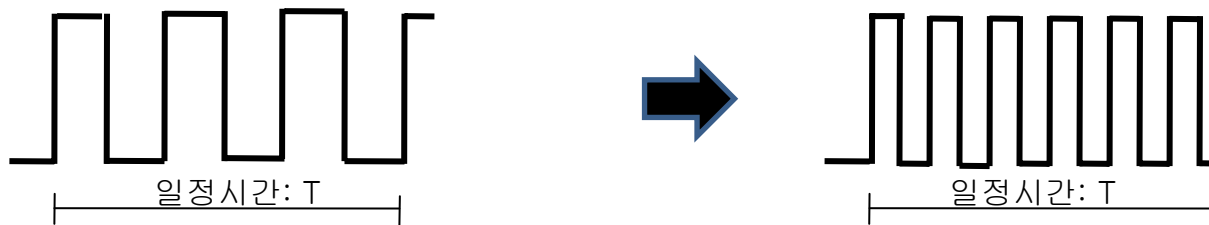


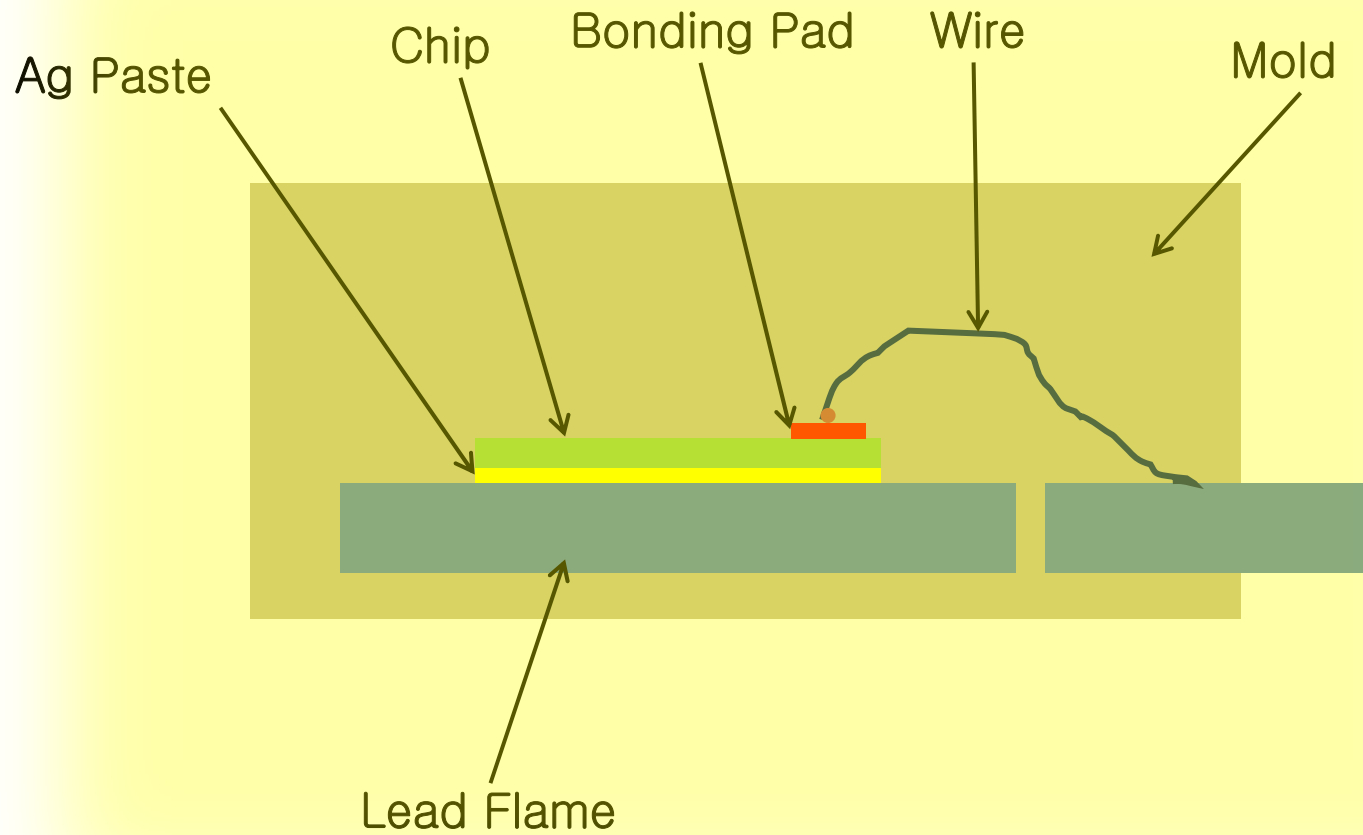
PWM(Pulse Width Modulation)방식: 주파수 고정, Pulse폭 제어



$$\text{Duty Ratio}(\%) = D/\lambda \times 100$$

PFM(Pulse Frequency Modulation)방식: 주파수 제어





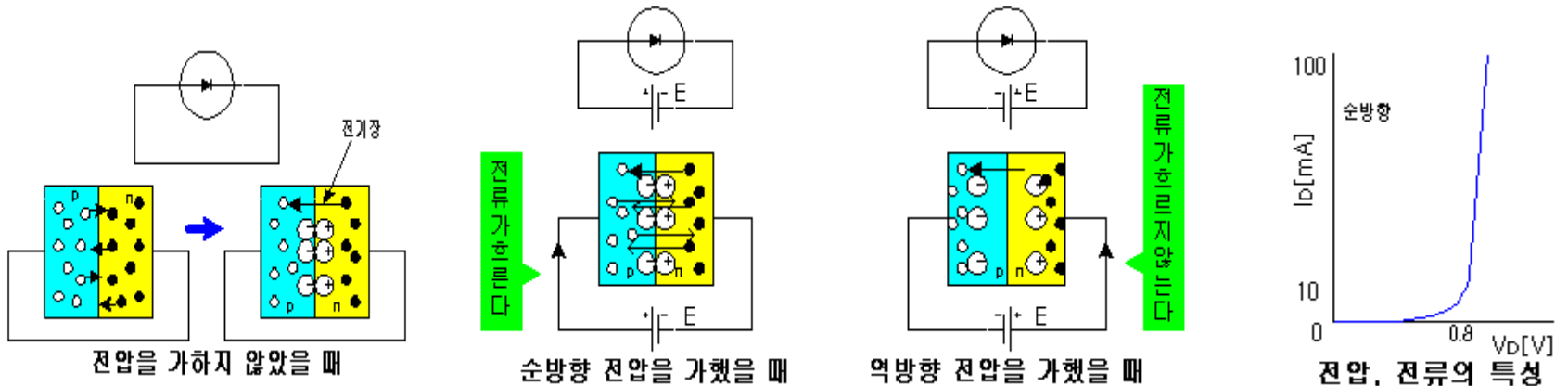
▶ 반도체란?

1. 도체 : 금, 구리, 철등 금속
2. 부도체 : 나무, 플라스틱
3. 반도체 : 실리콘, 게르마늄등

(1) 다이오드의 구조와 동작

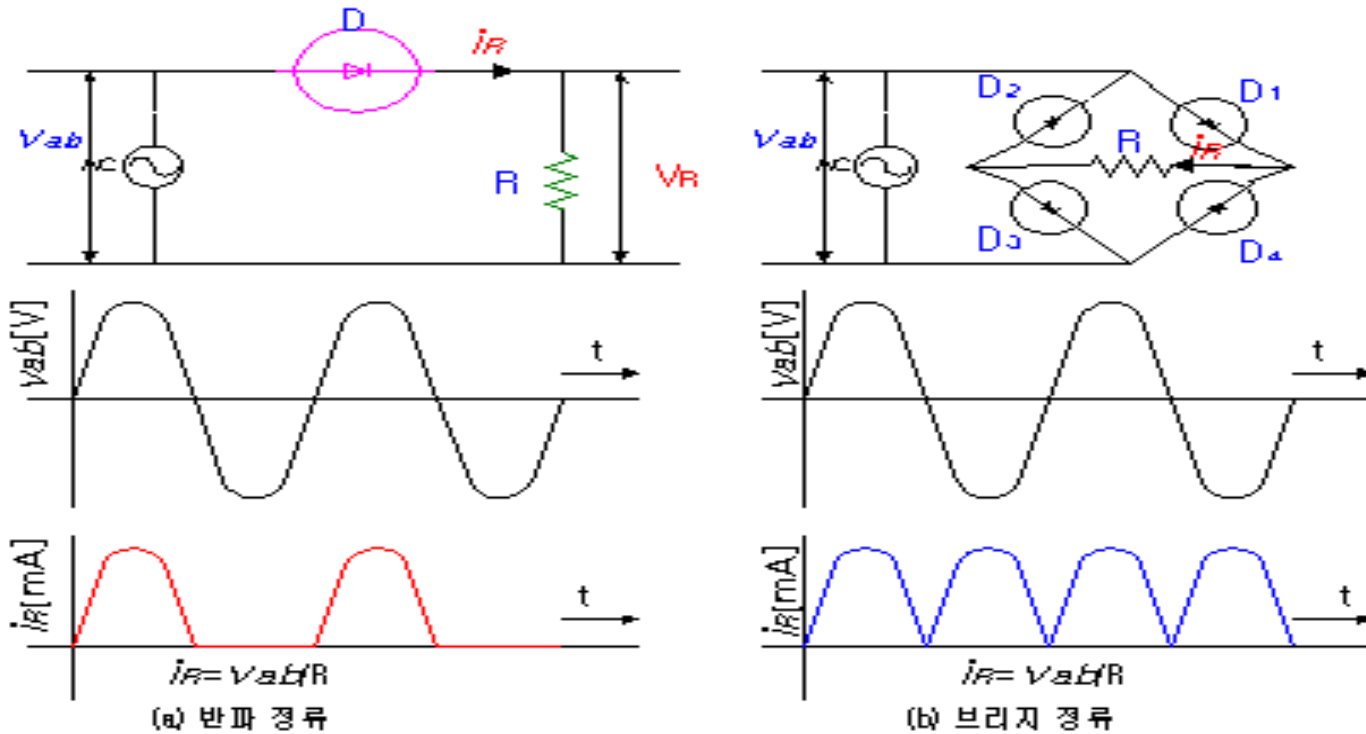
다이오드 :

- "+"의 전기를 띤 p형 물질과 "-"의 전기를 띤 n형 물질을 접합하여 만든 것,
- 한쪽 방향으로 쉽게 전자를 통과시키지만 다른 방향으로 통과시키지 않는 특성을 가지고 있다.
- p는 인듐(In)이나 갈륨(Ga)과 같은 물질을 규소에 합성하여 "+"성분(hole:정공)이 많게 만든 물질
- n은 비소(As)나 안티몬(Sb)과 같은 물질을 규소에 합성하여 "-"성분(electron:전자)이 많도록 만든 물질



정류 작용 : 한방으로만 전류를 흐르게 함.

정류 : 교류를 직류로 변환



정류 회로

반파 정류 회로

$v_{ab} > 0$ (순전압) $\rightarrow D=0$ (short) $\rightarrow i_R = v_{ab}/R$

$v_{ab} < 0$ (역전압) $\rightarrow D=\infty$ (open) $\rightarrow i_R = 0$

브리지 정류 회로

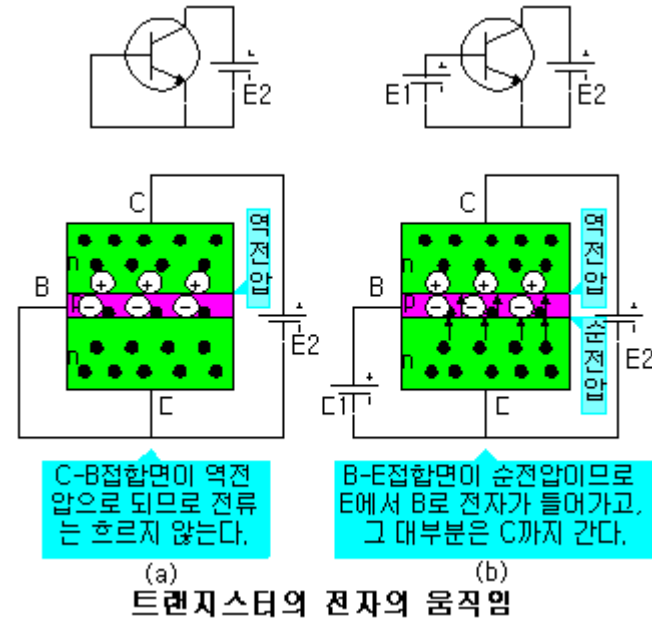
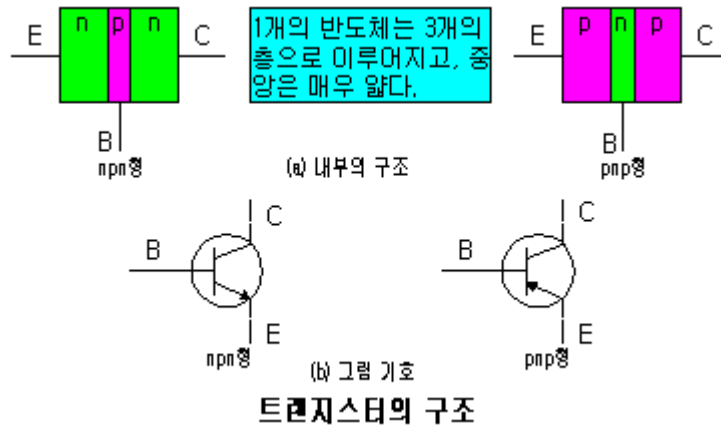
$v_{ab} > 0 \rightarrow D_1, D_3$: 순전압 $\rightarrow i_R = v_{ab}/R$

D_2, D_4 : 역전압 $\rightarrow i_R = 0$

$v_{ab} < 0 \rightarrow D_2, D_4$: 순전압 $\rightarrow i_R = v_{ab}/R$

D_1, D_3 : 역전압 $\rightarrow i_R = 0$

(2) 트랜지스터의 구조와 동작



- C-B간 역전압이 가해져 있는 것만으로는 전류가 흐르지 않는다.
(단, C-B 접합면 가까이에 는 전기장이 있다.)
- B-E간에 순전압을 가하면, 이미터에서 베이스로 많은 전자가 흘러 들어가고, 그 전자의 대부분은 베이스가 대단히 얇으므로 바로 C-B접합면 가까이에 도달.
- C-B 접합면까지 도달한 전자는 그 접합면 가까이에 있는 전기장에 끌려 컬렉터 속으로 들어간다.

(a) 이미터 전류 I_E :

B-E 간에 가해진 순전압 V_{BE} 때문에 이미터에서 속으로 들어간 전자의 양에 상당하는 전류

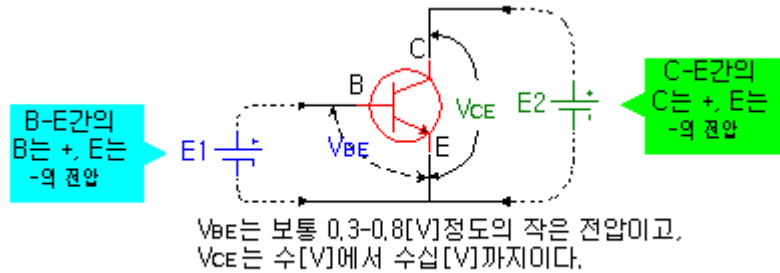
(b) 베이스 전류 I_B :

베이스 속으로 들어간 전자 중에서 C-B 접합면까지 도달하지 않은 전자의 양에 상당하는 전류

(c) 컬렉터 전류 I_C :

베이스 속으로 들어간 전자 중에서 C-B 접합면까지 도달하고 이어서 컬렉터 속으로 끌려 들어간 전자의 양에 상당하는 전류

(가) 전압을 가하는 방법



트랜지스터에 전압을 가하는 방법

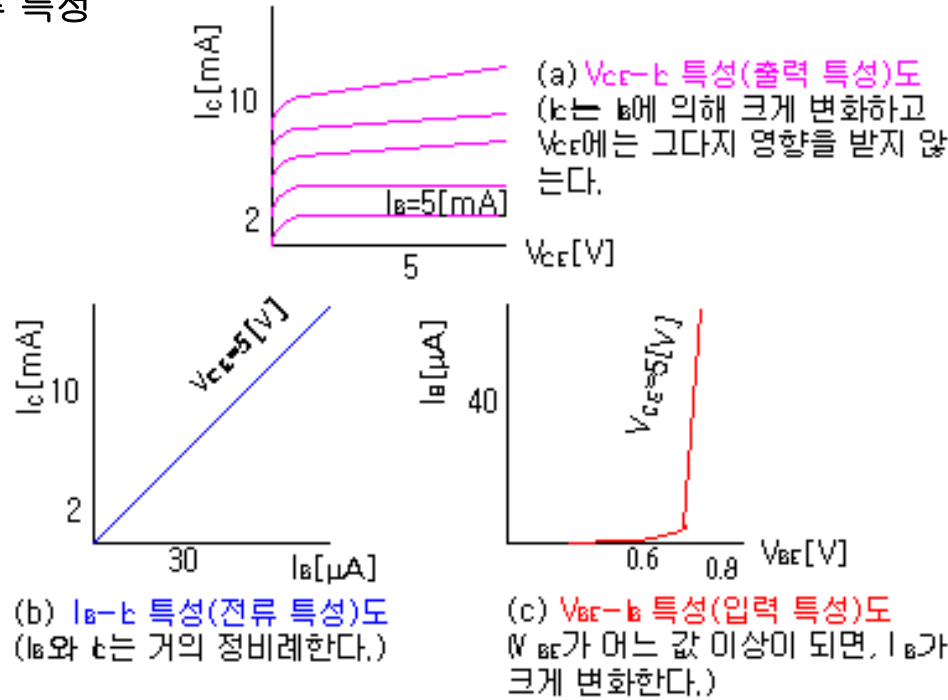
- B와 E간의 pn접합면 ... $V_{BE} \Rightarrow$ 순방향 전압
- C와 B간의 pn접합면 ... $V_{CB} = V_{CE} - V_{BE} \Rightarrow$ 역방향 전압

EBJ	CBJ	상태	응용
순방향	역방향	능동 상태	증폭 작용
역방향	역방향	차단 상태	스위칭 작용
순방향	순방향	포화 상태	

(나) 전류의 흐름

- I_C 는 I_B 에 의해 크게 변화
- I_B 는 V_{BE} 에 의해 크게 변화
- I_C 는 V_{CE} 에 의해 크게 변화 않는다.
- $I_E = I_B + I_C$

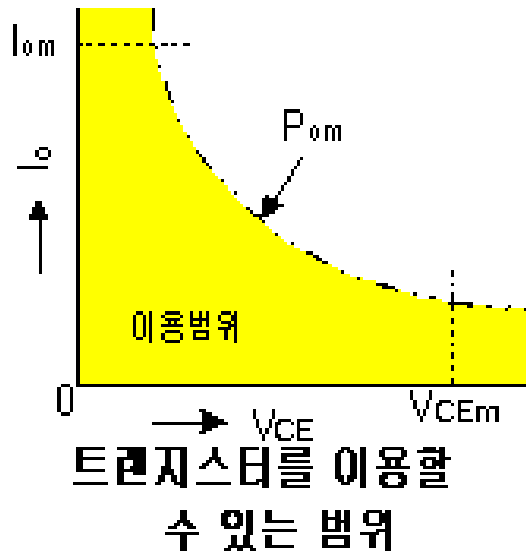
(다) 전압-전류 특성



트랜지스터의 특성도

- I_B 를 일정하게 유지했을 때의 V_{CE} 와 I_C 의 관계를 그래프로 그린 것
 $V_{CE}-I_C$ 특성(출력 특성)도 : I_C 는 I_B 에 의해 크게 변화하고 V_{CE} 에는 그다지 영향을 받지 않는다.
- V_{CE} 를 일정하게 유지했을 때의 I_B 와 I_C 의 관계를 그래프로 그린 것
 I_B-I_C 특성(전류 특성)도 : I_B 와 I_C 는 거의 정비례한다.
- V_{CE} 를 일정하게 유지했을 때의 V_{BE} 와 I_B 의 관계를 그래프로 그린 것
 $V_{BE}-I_B$ 특성(입력 특성)도 : V_{BE} 가 어느 값 이상이 되면 I_B 가 크게 변화한다.
- I_B 를 일정하게 유지했을 때의 V_{CE} 와 V_{BE} 의 관계를 그래프로 그린 것
 $V_{CE}-V_{BE}$ 특성(전압 특성)도

(라) 최대정격(MAXIMUM RATING): 전압/ 전류/ 전력/ 온도

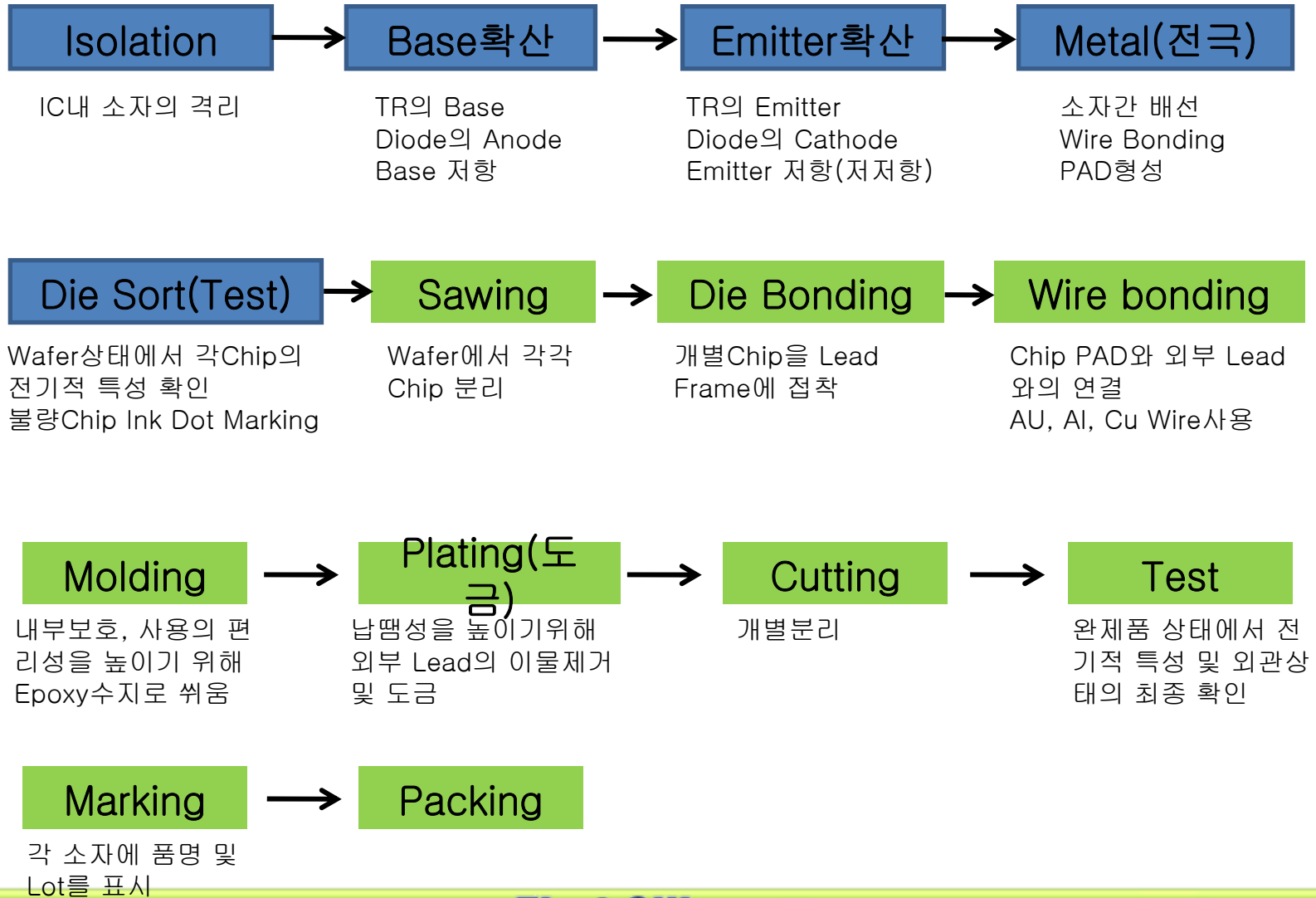


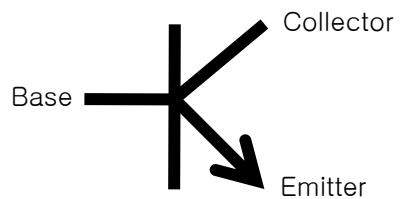
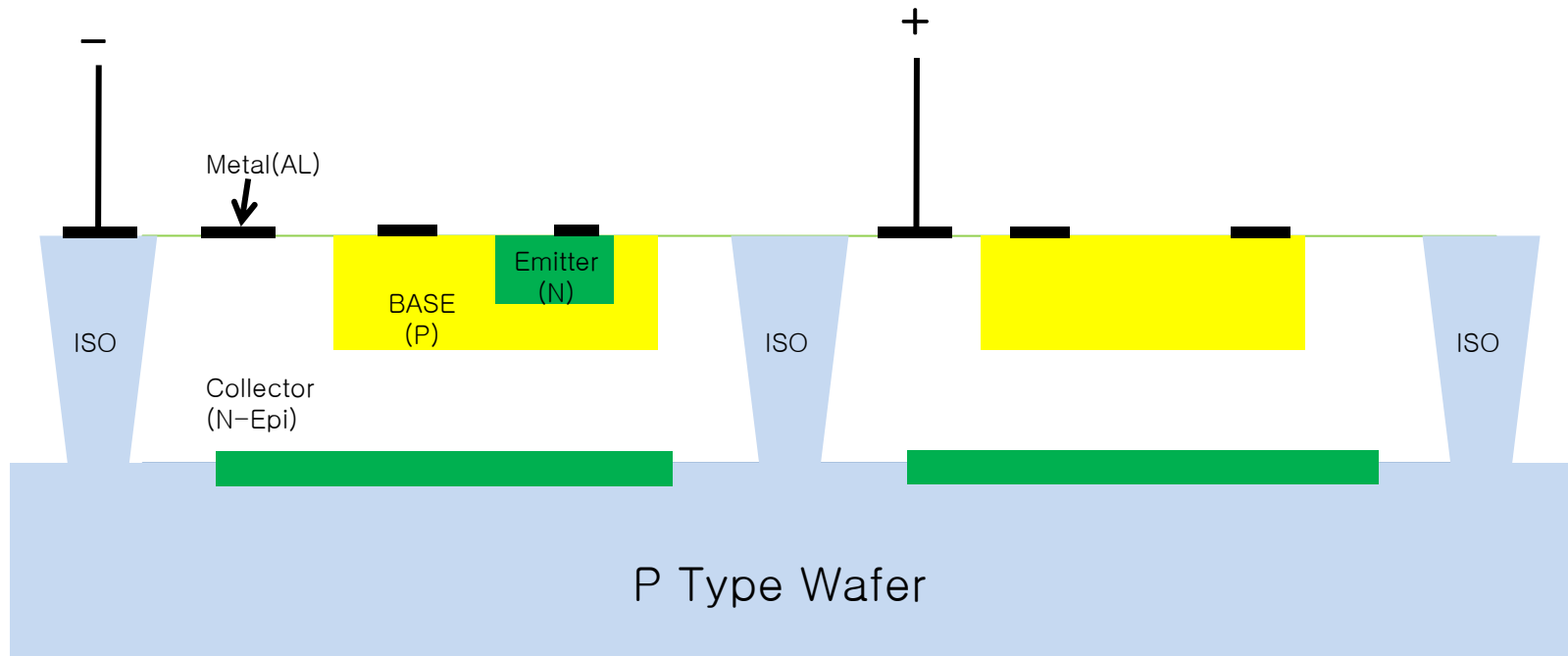
- ① 트랜지스터에 가할 수 있는 최대 전압, 흘릴 수 있는 최대 전류를 최대 정격이라 한다.
- ② V_{CE} 나 I_C 가 최대 정격값 이내라도 $P_C = V_{CE} I_C$ 가 컬렉터 손실 PCM 이내라야 한다.



Transistor/ Diode 소자 사용

(마)반도체 공정 : Fabrication & Assembly





NPN TRASISTOR



RESISTOR

IC 구조