

Medium Power Bipolar Transistors (0.5W-1.2W)

Package	MPT3		CPT3		V _{CEO} (V)	I _c (A)	MPT3	CPT3	h _{FE} ^{*2}
	P _c (W) (Ta=25°C)								
Item	PNP	NPN	PNP	NPN					
Application	PNP		NPN						
Driver	-	2SD2167	-	-	31±4	2	0.5	-	56to270
	2SB1132	2SD1644	-	-	32	1	0.5	-	82to390
	2SB1188	2SD1766	2SB1182	2SD1758	32	2	0.5	1	82to390
	2SA1900	2SC5053	-	-	50	1	0.5	-	120to390
	-	-	2SB1184	2SD1760	50	3	-	1	82to390
	2SB1189	2SD1767	-	-	80	0.7	0.5	-	82to390
	2SB1260	2SD1898	2SB1181	2SD1733	80	1	0.5	1	82to390
	-	2SC4132	-	-	120	1.5	0.5	-	82to390
	-	2SD2211	2SB1275	2SD1918	160	1.5	0.5	1	82to390
	-	BCX53	BCX56	-	-	80	1	0.5	-
Low V _{CE} (sat)	2SB1424	2SD2150	-	-	20	3	0.5	-	120to560
	2SB1308	2SD1963	-	-	20	3	0.5	-	82to390
	2SB1386	2SD2098	2SB1412	2SD2118	20	5	0.5	1	82to390
	-	-	2SA1834	2SC5001	20	10	-	1	120to560
	2SA1797	2SC4672	-	-	50	2	0.5	-	82to270
	2SB1561	2SD2391	-	-	60	2	0.5	-	120to270
	-	-	2SA1952	2SC5103	60	5	-	1	82to270
High h _{FE}	-	2SD2537	-	-	25	1.2	0.5	-	82to2700
	2SB1427	-	-	-	20	2	0.5	-	390to820
	-	2SD2153	-	-	25	2	0.5	-	560to2700
High voltage SW	-	-	-	2SD2318	60	3	-	1	560to1800
	2SA1759	2SC4505	-	-	400	0.1	0.5	1	82to270
	-	-	-	2SD2568	400	0.2	-	1	82to270
	2SA1812	-	2SA1727	-	400	0.5	0.5	1	82to270
High voltage-High speed SW	-	-	-	-	400	2	-	1	25to50
	-	-	2SB1183	2SD1759	40(V _{CE} R)	2	-	1	1kto200k
Darlington ^{*3}	-	2SD1834	-	-	60(V _{CE} S)	1	0.5	-	2kto
	-	2SD2212	-	2SD2143	60±10	2	0.5	1	1kto10k
	-	-	2SB1474	-	80	4	-	1	1kto10k
	-	2SD2170	-	-	90+20/-10	2	0.5	-	1kto10k
	2SB1580	2SD2195	2SB1316	2SD1980	100	2	0.5	1	1kto10k

Notes: [1] *¹ When mounted on 1.7mm thick PCB having collector foil dimensions 1cm² or more [2] *² For h_{FE}, see the data sheet. [3] For internal circuit, see the data sheet. [4] PNP [-] symbol omitted.

Package Line-up

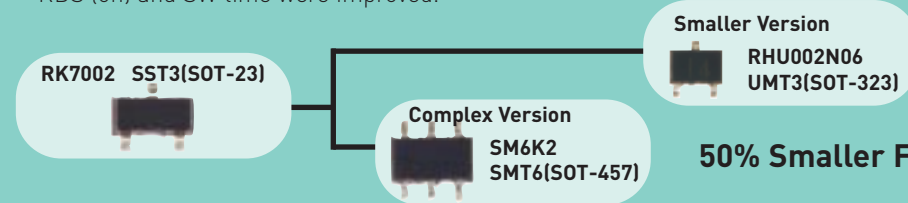
VMT3	EMT3	EMT5	EMT6	UMT3	UMT5	UMT6
SST3	SMT3	SMT5	SMT6	MPT3	CPT3	PSD3
SOP8						

The products listed in this catalogue are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electrical toys). Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative first.

Small signal type MOSFET RHU002N06 SM6K2

Description

- We line-up Smaller version and Complex version of RK7002.
- RDS (on) and SW time were improved.



	RK7002	RHU002N06	SM6K2
Package	SST3	UMT3	SMT6
V _{DSS}	60V		
V _{GSS}	±20V		
ID	115mA	200mA	
RDS(on)	Typ. 2.2Ω	Typ. 1.6Ω	
t(on)	Typ. 19ns	Typ. 11ns	
t(off)	Typ. 112ns	Typ. 102ns	
Type	Single	Single	Dual

Features:

- Gate drive voltage down to 2.5V
- Direct drive from suitable IC on logic level input
- Low gate charge allows high speed switching
- Low RDs on allows high current
- Can be used with automatic placement machines

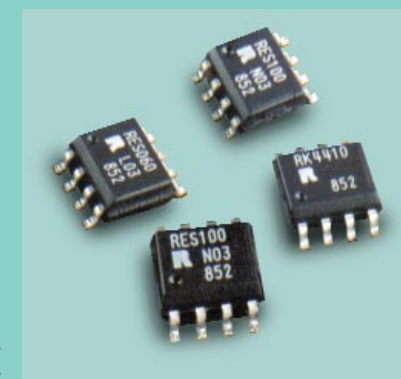
SOP8 Series

Package	Application	Part No.	V _{DS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} Typ.(mΩ)		Q _g (nC)	Configurate
						V _{GS} =4V	V _{GS} =10V		
SOP8	Switching	RK4410	30	10	2	15	9	44	Nch Single
		RK9410	30	7	2	33	18	20	Nch Single
		RK4936	30	6	2	40	22	21	Nch Dual
		RES100N03	30	10	2	16	10	28	Nch Single
		RES070N03	30	7	2	38	19	12	Nch Single
		RES060L03	30	6	2	42	24	14	Nch Dual
		RDS070N03	30	7	2.5	38*	23	14	Nch Single
RDS035L03	30	3.5	2	105*	62	6	Nch Dual		

Note: *V_G=4.5V.

Small Signal MOS FET 2.5 Volts series

Package	Application	Part No.	V _{DS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} Typ.(Ω)	
						V _{GS} =2.5V	V _{GS} =4V
EMT3	Switching	2SK3019	30	0.1	0.15	7	5
UMT3		2SK3018	30	0.1	0.2	7	5
UMT5		UM5K1N	30	0.1	0.15	7	5
UMT6		UM6K1N	30	0.1	0.15	7	5
MPT3	DC-DC Converter /Motor Drive	2SK3065	60	2	0.5	0.35	0.25



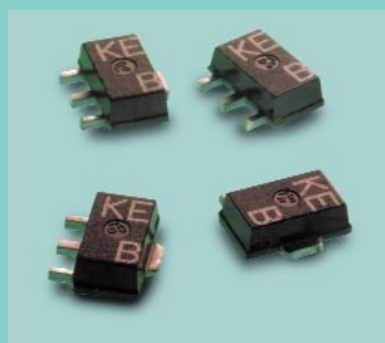
4 Volt series

Package	Application	Part No.	V _{DS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} Typ.(Ω)	
						V _{GS} =4V	V _{GS} =10V
SMT3	Switching	2SK2731	30	0.2	0.2	2.8	1.5
SST3		RK7002	60	0.115	0.225* ¹	-	2.2
MPT3	DC-DC Converter /Motor Drive	28K2103	30	2	0.5	0.38	0.25

Note: *When using 1x0.75x0.062 inch glass epoxy substrates.

Power MOS FET

Package	Application	Part No.	V _{DS} (V)	I _D (A)	P _D (W) (T _C =25°C)	R _{DS(on)} Typ.(Ω)	
						V _{GS} =4V	V _{GS} =10V
CPT3	Switching	29K2094	60	2	20	0.4	0.3
		2SK2503	60	5	20	0.17	0.11
		RK3055E	60	8	20	-	0.15Max.
		2SK2504	100	5	20	0.25	0.18
		2SK2887	200	3	20	-	0.7
		2SK2715	500	2	20	-	3
		2SK3050	600	2	24	-	4.4



Small Signal Bipolar Transistors (up to 0.6W)

Package Item	VMT3		EMT3 Flat lead		EMT3		UMT3		SMT3		V _{CE0} (V)	I _c (A)	P _c (W) (T _a =25°C)	h _{FE} *2	
	-	-	-	-	-	-	-	-	-	-					
Application	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN					
General Purpose Amplification	2SA2029	2SC5658	2SA1774H**	2SC4617H**	2SA1774	2SC4617	2SA1576A	2SC4081	2SA1037AK	2SC2412K	50	0.15	0.15	0.2	120to560
	-	-	-	-	-	-	2SA1579	2SC4102	2SA1514K	2SC3906K	120	0.05	-	0.2	180to560
	-	-	-	-	-	2SC5274	-	-	-	-	150	0.05	0.15	-	56to120
Driver	2SA2030	2SC5663	2SA2018H**	2SC5585H**	2SA2018	2SC5585	-	-	-	-	12	0.5	0.15	-	270to680
	-	-	-	-	-	-	-	-	2SB1590K	2SD2444K	15	1	-	0.2	120to390
	-	-	-	-	-	-	2SA1577	2SC4097	2SA1036K	2SC2411K	32	0.5	-	0.2	82to560
	-	-	-	-	-	-	-	-	2SB1197K	2SD1781K	32	0.8	-	0.2	120to390
	-	-	-	-	-	-	-	-	2SD1949	2SD1484K	50	0.5	-	0.2	120to390
	-	-	-	-	-	-	-	-	2SB1198K	2SD1782K	80	0.5	-	0.2	120to390
Low V _{CE} (sat)	-	-	-	-	-	-	-	-	2SD1757K	-	15	0.5	-	0.2	120to560
	-	-	-	-	-	-	2SB1689	2SD2652	-	-	12	1.5	-	0.2	270to680
	-	-	-	-	-	-	-	-	2SB1690K	2SD2653K	12	2	-	0.2	270to680
High h _{FE}	-	-	-	-	-	-	-	-	2SD2114K	-	20	0.5	-	0.2	56to2700
	-	-	-	-	-	-	2SD2654	2SD2351	2SD2226K	50	0.15	0.15	0.2	820to2700	
FM IF . AM RF	-	2SC5659	-	2SC4818H**	-	2SC4618	-	2SC4098	-	2SC2413K	25	0.05	0.15	f _r =300MHz*5	56to270
TV Tuner	-	2SC5662	-	2SC4726H**	-	2SC4726	-	2SC4083	-	2SC3838K	11	0.05	0.15	f _r =300MHz*5	56to180
Mix. Osc.	-	2SC5661	-	2SC4725H**	-	2SC4725	-	2SC4082	-	2SC3837K	18	0.05	0.15	f _r =1500MHz*5	56to180
RF SW	-	-	-	-	-	-	-	2SC4774	-	2SC4713K	6	0.05	-	f _r =800MHz*5	270to560
	-	-	-	-	-	2SC4997	-	2SC4998*3	-	-	10	0.1	0.15	f _r =250MHz*5	180to560
Darlington*4	-	-	-	-	-	-	-	-	2SD2142K	-	32	0.3	-	0.2	5kto
	-	-	-	-	-	-	-	-	2SB852K	2SD1383K	32	0.3	-	0.2	5kto

Notes: [1] *1 With recommended land installed. [2] *2 for h_{FE}, see the data sheet. [3] *3 For specifications, see the data sheet. [4] ** EMT3 of flat lead is identified by the 'H' following P/N. [5] PNP (-) symbol omitted. [6] *5 P_c=0.2(W). [7] *6 For internal circuit, see the data sheet.

Small Signal Bipolar Transistors (up to 0.6W)

Package Item	UMT3		SMT3/SST3		V _{CE0} (V)	I _c (A)	P _c (W) (T _a =25°C)	h _{FE} *1
	-	-	-	-				
Application	PNP	NPN	PNP	NPN				
General Purpose Amplification	-	-	-	-	25	0.1	-	250to500
	BC858BW	BC848BW	BC858B	BC848B.C	30	0.1	0.2	110to800
	-	-	BCW30	BCW31.32.33	32	0.1	0.2	110to800
	-	-	SST6839*3	SST6838*3	40	0.2	0.2	100to
	-	-	BC857B*3	BC847B.C*3	45	0.1	0.2	110to800
	-	-	BC817-25*3	-	45	0.8	0.2	160to400
	-	-	MMST5087	MMST5088	50	0.2	0.2	250to900
	-	-	MMST8598	MMST8098	60	0.2	0.2	100to300
Driver	-	-	BCX19*3	BCX19*3	45	0.5	0.2	100to600
	-	-	SSTA56*3	SSTA06*3	80	0.5	0.2	100to
	-	-	MMSTA56	MMSTA06	80	0.5	0.2	100to
RF amplifier	-	-	-	MMST918	15	0.05	f _r =600MHz*5	20to
	-	-	-	BFS17*3	15	0.05	f _r =1000MHz*3	20to150
	-	-	-	SST8245*3	20	0.05	f _r =600MHz*1	60to150
Switching	-	-	MMST4126	MMST4124	25	0.2	0.2	120to360
	UMT3906	UMT3904	SST3906*3	SST3904*3	40	0.2	0.2	100to300
	-	-	MMST3906	MMST3904	40	0.2	0.2	100to300
	-	-	SST4403*3	SST4401*3	40	0.6	0.2	100to300
	-	-	MMST4403	MMST4401	40	0.6	0.2	100to300
	-	UMT2222A	-	SST2222A*3	40	0.6	0.2	100to300
Pre Amp	UMT2907A	-	SST2907A*3	-	60	0.6	0.2	100to300
	-	-	MMST2907A	-	60	0.6	0.2	100to300
	-	-	BCW61C*3	BCW60C.D*3	32	0.2	0.2	180to630
Darlington*4	-	-	BCW69.70*3	BCW71.72*3	45	0.1	0.2	110to500
	-	-	BCX71H.J*3	BCX70J.K*3	45	0.2	0.2	110to630
Darlington*4	-	-	-	SST6427*3	40	0.5	0.2	20kto200k
	-	-	-	SSTA13*3	30	0.5	0.2	5kto
	-	-	-	MMSTA13	30	0.5	0.2	5kto
	-	-	MMSTA64	SSTA14*3	30	0.5	0.2	10kto
Darlington*4	-	-	-	MMSTA14	30	0.5	0.2	10kto
	-	-	-	SSTA28*3	80	0.5	0.2	10kto
Darlington*4	-	-	-	MMSTA28	80	0.5	0.2	10kto
	-	-	-	MMSTA28	80	0.5	0.2	10kto

Notes: [1] *1 For h_{FE}, see the data sheet. [2] *2 For specifications, see the data sheet. [3] *3 SST3 package. [4] ** Will be shipped to any country other than Japan. [5] *5 P_c=0.2(W). [6] PNP (-) symbol omitted. [7] *7 For internal circuit see the data sheet.

Complex Bipolar Transistors

Configuration	Package Item	Equivalent circuit diagram	EMT5/EMT6		UMT5/UMT6		SMT5/SMT6		V _{CE0} (V)	I _c (mA)	h _{FE}
			-	-	-	-	-	-			
Application	Application	Equivalent circuit diagram	Part No.			Part No.					
PNPX2	Pre Amp		EMT1	UMT1N	IMT1A	-50	-150	120to			
			-	-	IMT17	-50	-500	120to390			
			EMT18	UMT18N	-	-12	-500	270to680			
		EMT2	UMT2N	IMT2A	-50	-150	120to				
		EMT3	-	IMT3A	-50	-150	120to				
		-	-	IMT4	-120	-50	180to				
NPNX2	Pre Amp		EMX1	UMX1N	IMX1	50	150	120to			
			-	-	IMX9	20	500	560to2700			
			-	-	IMX17	50	500	120to390			
			EMX18	UMX18N	-	12	500	270to680			
			EMX2	UMX2N	IMX2	50	150	120to			
	TV Tuner Mix. Osc.		EMX3	UMX3N	IMX3	50	150	120to			
			-	-	IMX8	120	50	180to			
			EMX4	UMX4N	IMX4	18	50	56to180			
			EMX5	UMX5N	IMX5	11	50	56to180			
			EMY1	UMY1N	FMY1A	-50	-150	120to			
PNP+NPN	Amplifier		-	-	FMY5	50	150	120to			
			-	-	FMY5	-120	-50	180to			
	Inverter Driver		-	UMY4N	FMY4A	120	50	180to			
			-	UMY4N	FMY4A	-50	-150	120to			
	Pre Amp		EMZ1	UMZ1N	IMZ1A	-50	-150	120to			
			-	-	IMZ4	50	150	120to			
			-	-	IMZ4	-32	-500	120to560			
			EMZ7	UMZ7N	-	32	500	120to560			
			-	-	-	12	500	270to680			
			EMZ8	UMZ8N	-	12	-500	270to680			
PNP+Di	DC/DC Converter		-	UML4N	-	-12	-500	270to680			
			-	-	FML9	30	200	-			
			-	-	FML9	-12	-1500	270to680			
			-	-	FML9	20	700	-			
NPN+Di	DC/DC Converter		-	UML2N	-	50	150	120to			
			-	UML2N	-	80	100	-			
PNP+DTR	Power Management		-	UMF4N	IMF4	12	500	270to680			
			-	UMF4N	IMF4	50	100	20to			
			-	UMF5N	IMF5	-12	-500	270to680			
PNP+N-ch MOS	Power Management		-	UMF6N	IMF6	50	30	68to			
			-	UMF6N	IMF6	-12	-500	270to680			
NPN+DTR	Power Management		-	UMF7N	IMF7	12	500	270to680			
			-	UMF7N	IMF7	50	100	20to			
			-	UMF8N	IMF8	12	500	270to680			
NPN+N-ch MOS	Power Management		-	UMF8N	IMF8	50	30	68to			
			-	UMF9N	IMF9	12	500	270to680			
NPN+N-ch MOS	Power Management		-	UMF9N	IMF9	30	100	-			
			-	UMF9N	IMF9	30	100	-			

Bipolar with Integral Diode (UML Series)

Applications

Cellular phones, Power management & Portable devices

