

Power Transistors

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Power Transistors

Power Transistors for High-Frequency Semiconductors (2SAxxxx/2SCxxxx)

V _{CE0} (V) I _C (A)	10/(15)	(18)/20	30	40	45	50
0.2					2SA1483 2SC3803 ()	
0.5						
0.6						
0.8			2SA1426 (§) 2SA1204 2SC2884 ()	2SA1356 2SC3419 (@)		
1			2SC2703 (♣) 2SC3666 (§)			2SA1735 2SC4540 ()
1.2			2SA1734 2SC4539 ()			
1.5	*2SA2058 (⊗)	*2SA2065 *2SC5784 (⊗) *2SA2069 *2SC5819 ()	2SA966 2SC2236 (♣) 2SA1203 2SC2883 ()			
2	2SA1160 2SC2500 (♣) 2SA1430 2SC3670 (§) 2SA1314 2SC2982 () *2SC5755 (⊗) *2SA2066 *2SC5785 ()			2SC3225 (♣) 2SC3673 (§) 2SC3964 (@)		2SA1020 2SC2655 (♣) 2SA1213 2SC2873 () 2SA1241 2SC3076 (◇) 2SA1382 (♣) 2SA1428 2SC3668 (§) 2SA1680 2SC4408 (♣) 2SA1681 2SC4409 () 2SA1891 2SC5028 (□) *2SA2056 (⊗) *2SA2060 ()
2.5		*2SA2061 (⊗)				*2SC5692 (⊗)
3	2SA1802 2SC4681 (◇) 2SC4682 (♣) (15V) 2SC4683 (§) (15V)	*2SA2059 ()		2SA1359 2SC3422 (@)		2SA1761 2SC4604 (♣) 2SA1869 2SC4935 (▲) 2SA1892 2SC5029 (□) 2SA1736 *2SC4541 () *2SC5692 (⊗) 2SC5712 ()
3.5		*2SC5738 (⊗)				
4	2SC4781 (♣) *2SC5713 ()	*2SC5714 ()				*2SC5703 (⊗)
5		2SA1242 (◇) 2SA1357 (@) 2SA1431 (§) 2SA1893 (□) 2SC3072 (◇) 2SC3420 (@) 2SC3671 (§) 2SC4684 (◇) 2SC4685 (@) 2SC5030 (□) *2SA2061 (⊗)				2SA1244 2SC3074 (◇) 2SA1905 2SC5076 (□) 2SA1931 2SC4881 (▲) 2SA1933 2SC5175 (■) *2SC5703 (⊗)
10		2SA1327A (▲)				2SA1887 2SC5000 (▲)
12						2SA1451A 2SC3709A (▲)

(♣) LSTM (§) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM (★) SP (◆) DP
 () TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
 (%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SAxxxx/2SCxxxx: Complementary
 *: New product

VCE0(V) Ic(A)	80	100	120	(140)/150	160
0.05				2SA1145 2SC2705 (♣) 2SA1360 2SC3423 (@) 2SA1200 2SC2880 () 2SA949 2SC2229 (♣)	
0.1					2SC2230 (♣)
0.2					2SC3963 (@)
0.3			*2SA1801 *2SC5468 (@)	2SC4203 (◇) 2SC4439 (@)	
0.4	2SA817A 2SC1627A (♣) 2SA1202 2SC2882 ()				
0.5		2SC4479 (@) 2SC4605 (▲)			
0.8			2SA965 2SC2235 (♣) 2SA1201 2SC2881 () 2SA1425 2SC3665 (§) 2SA1899 2SC5052 (§)		
1			2SA1358 2SC3421 (@)		2SA1013 2SC2383 (♣)
1.5				2SA940A 2SC2073A (▲) 2SA1408 2SC3621 (@)	2SA1225 2SC2983 (◇) 2SC5154 (□)
2	2SA1315 2SC3328 (♣) 2SA1429 2SC3669 (§) 2SC3474 (◇)				
3	2SA1926 (§)				
5	2SA1934 2SC5176 (■) 2SC3303 (◇)				
6	2SA1803 2SC4688 (▼) 2SA1939 2SC5196 (▽)				
8			2SA1804 2SC4689 (▼) 2SA1940 2SC5197 (▽)		
10				2SA1805 2SC4690 (▼) (140V) 2SA1941 2SC5198 (▽) (140V)	
12	2SA1452A 2SC3710A (▲) 2SA1771 (▲)				2SA1942 2SC5199 ()

(♣) LSTM (§) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM (★) SP (◆) DP
(▽) TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
(%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SAxxxx/2SCxxxx: Complementary
*: New product

Power Transistors for High-Frequency Semiconductors (2SAxxx/2SCxxx) (continued)

V _{CE0} (V) I _C (A)	(180)/200	230	250	300	(370)/400
0.05			2SA1321 2SC3334 (♣)	2SC4678 (▲) 2SC4679 (@)	2SC5122 (♣) 2SC5307 ()
0.1	2SC2230A (♣) (180V)			2SA1432 2SC3672 (§) 2SC2482 (♣) 2SC3619 (@) 2SC3620 (@) 2SC3805 (◇) 2SC4544 (▲) 2SC5027 (□) 2SC5173 (■) 2SA1384 2SC3515 ()	
0.15			2SC4448 (▲)	2SC5360 (▲)	
0.5					2SA1923 (◇) 2SA1924 (@) 2SA1925 (□) 2SA1971 () 2SA1972 (♣)
0.8					2SC3075 (◇) 2SC3425 (@) 2SC5208 (□) 2SC5458 (◇)
1		2SA1837 2SC4793 (▲) 2SA1932 2SC5174 (■)			2SA1822 (▲) *2SC5549 (♣) *2SC5550 (@)
1.5					*2SA2034 (◇)
2	2SA1930 2SC5171 (▲) (180V)				2SC3233 (◇) 2SC4754 (○) 2SC5075 (□) 2SC5279 (■) 2SC5548 (◇) (370V) 2SC5548A (◇)
3					2SC5459 (▲)
5					2SC5172 (▲) 2SC5266A (■) 2SC5355 ()
10					2SC5352 (▽)
15		2SA1943 2SC5200 () 2SA1962 2SC5242 (▽) 2SA1986 2SC5358 (▽) 2SA1987 2SC5359 ()			

(♣) LSTM (§) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM (★) SP (◆) DP
 (▽) TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
 (%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SAxxxx/2SCxxxx: Complementary

*: New product

VCE0(V) Ic(A)	450	600	800	1000/(1200)	1500
0.02					*2SC5563 (▲)
0.05		2SC5201 (♣)	2SC5460 (@) 2SC5466 (▲)	2SC4686 (▲) 2SC4686A (▲) (1200V)	
0.5		2SA1937 (◇)			
0.8			2SC3405 (◇) 2SC5465 (◇) *2SC5562 (□)		
2	2SC5351 (□) 2SC5368 (@)				
3			2SC5353 (▲) 2SC5361 (○) 2SC5356 ()		
4			2SC3657 (▽)		
5			2SC5354 (▽)		
8	2SC5439 (▲)				
9					
10	2SC4157 (▽)		2SC3307 ()		

(♣) LSTM (§) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM (★) SP (◆) DP
 (▽) TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
 (%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SAxxxx/2SCxxxx: Complementary

*: New product

Power Transistors for Low-Frequency Semiconductors (2SBxxxx/2SDxxxx)

V _{CE0} (V) I _C (A)	20	30	40	50	60/(65)
1.5		2SD1140 (%) (♣) 2SD1224 (%) (◇) 2SD1508 (%) (@) 2SD1631 (%) (§) 2SD1784 (%) () 2SD2481 (%) (□)			
2	2SD1160 (◇)				2SD1658 (¥) (%) (@) 2SD2088 (¥) (%) (♣) 2SD2352 (▲) 2SD2461 (□)
3			2SB907 2SD1222 (%) (◇)		2SB906 2SD1221 (◇) 2SB1375 2SD2012 (▲) 2SD2462 (□) 2SB1640 2SD2525 (■) 2SD2353 (▲) 2SB1667 (●)
4					2SB1642 2SD2531 (▲) 2SD2130 (¥) (%) (@) 2SD2204 (¥) (%) (▲) (65V)
5					2SD2131 (¥) (%) (▲)
6					2SD2440 ()
7				2SD1412A (▲)	
10					2SD2075A (¥) (▲)

(♣) LSTM (§) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM () SP (◆) DP
 (▽) TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
 (%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SBxxxx/2SDxxxx: Complementary

VCE0(V) Ic(A)	80	100/(120)	140	150/(160)	200
1.5				2SB905 2SD1220 (◇)	
2	2SB1067 2SD1509 (%) 2SD2248 (¥) (%) (♣)	2SB1411 (@) (%) (▲) 2SB1457 2SD2206 (%) (♣) *2SD2206A (%) (♣) (120V) 2SB1617 2SD2480 (%) (□) 2SD2536 (¥) (%) (♣)			
3		2SB1495 2SD2257 (%) (▲) 2SD2092 (▲) 2SD2129 (%) (▲)			
4	2SB908 2SD1223 (%) (◇) 2SD2406 (▲)	2SB1481 2SD2241 (%) (▲)			
5		2SB1381 2SD2079 (%) (▲) 2SB1641 (%) (■) 2SD2526 (%) (■) 2SB1016A 2SD1407A (▲) 2SD2604 (¥) (%) (▲)			
7	2SD2414 (SM) (●) 2SB1018A 2SD1411A (▲)	2SB1020A 2SD1415A (%) (▲) 2SD2584 (%) ()	2SB1555 2SD2384 (%) () 2SB1557 2SD2386 (%) (▽)		
8			2SB1556 2SD2385 (%) () 2SB1558 2SD2387 (%) (▽)	*2SD2636 (%) (▽)	
10		2SD1947A (▲)		2SB1594 2SD2449 (%) () (160V)	
12					2SD2271 (%) (▲)
15		2SD1662 (%) (▽)			
30		2SD1525 (%) ()			

(♣) LSTM (S) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM (★) SP (◆) DP
(▽) TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
(%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SBxxxx/2SDxxxx: Complementary

*: New product

Power Transistors for Low-Frequency Semiconductors (2SBxxxx/2SDxxxx) (continued)

V _{CE0} (V) I _C (A)	250	300	350	400	450	600
3.5						
4						
5						
6	2SD1410A (%) (▲)			2SD1409A (%) (▲)		
7						
8						
10						
15					2SD1314 (%) ()	
25			2SD1313 ()			

(♣) LSTN (§) MSTM (@) TO-126IS (▲) TO-220NIS (○) TO-220FL (●) TO-220SM (★) SP (◆) DP
 (▽) TO-3P(N) (▼) TO-3P(N)IS () TO-3P(L) (□) TPS (■) TPL () PW-MINI (◇) PW-MOLD (⊗) TSM
 (%) Darlington (¥) Built-in zener diode Product number in italic signifies built-in damper diode. 2SBxxxx/2SDxxxx: Complementary

Power Amps

Product No.		I _C (A)	V _{CE0} (V)	P _C (W)	f _r (typ.) (MHz)	TYP.(NPN/PNP)		Application	Package
NPN	PNP					V _{CE} (V)	I _C (A)		
2SC1627A	2SA817A	0.4	80	0.8	100	10	0.01	Driver	TO-92MOD
2SC2235	2SA965	0.8	120	0.9	120	5	0.1	Driver	
2SC3665	2SA1425	0.8	120	1	120	5	0.1	Driver	MSTM
2SC5174	2SA1932	1	230	1.8	100/70	10	0.1	Driver	TPL
2SC3423	2SA1360	0.05	150	5	200	5	0.01	Pre-driver	TO-126(IS)
2SC3421	2SA1358	1	120	10	120	5	0.1	Driver	
2SC2983	2SA1225	1.5	160	15	100	10	0.1	Driver	PW-MOLD
2SC4793	2SA1837	1	230	20	100/70	10	0.1	Driver	TO-220(N)IS
2SC5171	2SA1930	2	180	20	200	5/10	0.3	Driver	TO-220(N)IS
2SC5196	2SA1939	6	80	60	30	5	1	Output (35 W)	TO-3P(N)
2SC5197	2SA1940	8	120	80	30	5	1	Output (50 W)	
2SC5198	2SA1941	10	140	100	30	5	1	Output (70 W)	
2SD2386	2SB1557	7	140	70	30	5	1	Darlington output (60 W)	
2SD2387	2SB1558	8	140	80	30	5	1	Darlington output (70 W)	TO-3P(N)IS
2SC4688	2SA1803	6	80	55	30	5	1	Output (40 W)	
2SC4689	2SA1804	8	120	70	30	5	1	Output (55 W)	
2SC4690	2SA1805	10	140	80	30	5	1	Output (70 W)	
2SC5242	2SA1962	15	230	130	30	5	1	Output (80 W)	TO-3P(N)
2SC5358	2SA1986	15	230	150	30	5	1	Output (100 W)	
2SC5199	2SA1942	12	160	120	30	5	1	Output (80 W)	TO-3P(L)
2SC5200	2SA1943	15	230	150	30	5	1	Output (100 W)	
2SC5359	2SA1987	15	230	180	30	5	1	Output (120 W)	
2SD2384	2SB1555	7	140	100	30	5	1	Darlington output (70 W)	
2SD2385	2SB1556	8	140	120	30	5	1	Darlington output (80 W)	
2SD2449	2SB1594	10	160	150	30	5	1	Darlington output (80 W)	

POWER-MOLD transistors (SC-63/64)

Product No.	Application	Absolute Maximum Ratings (Ta = 25°C)				Complementary Pair	Equivalent Product	Remarks
		VCEO (V)	IC (A)	PC (W)	★PC (W)			
2SA1225	Driver power amplification	-160	-1.5	1.0	15	2SC2983	—	
2SC2983		160	1.5	1.0	15	2SA1225	—	
2SA1241	Power amplification	-50	-2.0	1.0	10	2SC3076	2SA1892	
2SC3076		50	2.0	1.0	10	2SA1241	2SC5029	
2SA1802	Strobe flash power amplification	-10	-3.0	1.0	10	2SC4681	—	
2SC4681		10	3.0	1.0	10	2SA1802	—	
2SA1242	Strobe flash power amplification	-20	-5.0	1.0	10	★★2SC3072	2SA1893	
2SC3072		20	5.0	1.0	10	★★2SA1242	2SC3420	
2SC4684		20	5.0	1.0	10	—	2SC5030	High β
2SA1244	Large-current switching	-50	-5.0	1.0	20	2SC3074	2SA1905	
2SC3074		50	5.0	1.0	20	2SA1244	2SC5076	
2SB905	TV vertical output, TV audio output (B) class	-150	-1.5	1.0	10	2SD1220	2SA1408	
2SD1220		150	1.5	1.0	10	2SB905	2SC3621	
2SB906	Low-frequency power amplification	-60	-3.0	1.0	20	2SD1221	2SB834	
2SD1221		60	3.0	1.0	20	2SB906	2SD880	
2SB907	Switching power amplification	-40	-3.0	1.0	15	2SD1222	—	Darlington type
2SD1222		40	3.0	1.0	15	2SB907	—	Darlington type
2SB908	Switching power amplification	-80	-4.0	1.0	15	2SD1223	—	Darlington type
2SD1223		80	4.0	1.0	15	2SB908	—	Darlington type
2SD1224	Power amplification	30	1.5	1.0	10	—	2SD2481	Darlington type
2SD1160	Motor control	50(VCBO)	2.0	1.0	10	—	—	
2SA1923	High-voltage switching	-400	-0.5	1.0	10	—	2SA1925	
2SC3075	High-voltage switching	400	0.8	1.0	10	—	2SC5208	
2SC3233	High-voltage switching	400	2.0	1.0	20	—	2SC5075	
2SC3303	Switching	80	5.0	1.0	20	—	2SC3258	
2SC3405	High-voltage switching	800	0.8	1.0	20	—	—	
2SC3474	Switching solenoid drive	80	2.0	1.0	20	—	—	
2SC3805	General high withstand-voltage amplification	300	0.1	1.0	10	—	2SC2482	
2SC4203	High-speed switching	150	0.3	1.0	10	—	—	
2SC5458	High-voltage switching	400	0.8	1.0	10	—	—	
2SC5465	High-voltage switching	800	0.8	1.0	20	—	—	
2SC5548	High-voltage switching	370	2	1.0	15	—	—	
2SC5548A	High-voltage switching	400	2	1.0	15	—	—	

★: Tc = 25°C, ★★: hFE value varies.

PW-MINI Transistors (SC-62)

Product No.		Rating				Electrical Characteristics										Marking on Chip		TO-92MOD Equivalent (TO-92)		Remarks/Uses
		Pc (W)	Pc (W)	VCEO (V)	IC (A)	hFE		VCE (sat)			ft									
						MIN	MAX	VCE (V)	IC (mA)	(V) MAX	IC (mA)	IB (mA)	(MHz) TYP.	VCE (V)	IC (mA)					
NPN	PNP														NPN	PNP	NPN	PNP		
2SC2880	2SA1200	0.5	0.8	150	0.05	70	240	5	10	0.5/0.8	10	1	120	30	10	A	B	2SC2229	2SA949	High Voltage Driver
2SC2881	2SA1201	0.5	1.0	120	0.8	80	240	5	100	1.0	500	50	120	5	100	C	D	2SC2235	2SA965	Audio Driver
2SC2882	2SA1202	0.5	1.0	80	0.4	70	240	2	50	0.4	200	20	120/100	10	10	E	F	(2SC1627)	(2SA817)	Audio Driver
2SC2883	2SA1203	0.5	1.0	30	1.5	100	320	2	500	2.0	1500	30	120	2	500	G	H	2SC2236	2SA966	Audio Out
2SC2884	2SA1204	0.5	1.0	30	0.8	100	320	1	100	0.5/0.7	500	20	120	5	10	P	R	(2SC2120)	(2SA950)	Audio Out
2SC2873	2SA1213	0.5	1.0	50	2.0	70	240	2	500	0.5	1000	50	120	2	500	M	N	2SC2655	2SA1020	SW,Power AMP.
2SC2982	2SA1314	0.5	1.0	10	2.0	140	600	1	500	0.5	2000	50	140	1	500	S	T	(2SC3279)	(2SA1300)	Low Saturation
2SC3515	2SA1384	0.5	1.0	300	0.1	30	150	10	20	0.5	20	2	60	10	20	J	I	(2SC2551)	(2SA1091)	High Voltage Driver
2SC3803	2SA1483	0.5	1.0	45	0.2	40	240	1	10	0.3	100	10	200	10	10	V	W	—	—	High Speed SW
2SC4409	2SA1681	0.5	1.0	50	2.0	120	400	2	100	0.5	1000	50	100	2	100	KA	LA	2SC4408	2SA1680	SW,Power AMP.
2SC4539	2SA1734	0.5	1.0	30	1.2	120	400	2	100	0.5	700	35	100	2	100	KB	LB	—	—	SW,Power AMP.
2SC4540	2SA1735	0.5	1.0	50	1.0	120	400	2	100	0.5	500	25	100	2	100	KC	LC	—	—	SW,Power AMP.
2SC4541	2SA1736	0.5	1.0	50	3.0	120	400	2	100	0.5	1500	75	100	2	100	KD	LD	—	—	SW,Power AMP.
2SC5785	—	1.0	2.5	10	2	400	1000	2	200	0.12	600	12	—	—	—	3E	—	—	—	Series regulator
2SC5713	—	1.0	2.5	10	4	400	1000	2	500	0.15	1600	32	—	—	—	2C	—	—	—	DC/DC converter Storobo charge/discharge
2SC5819	—	1.0	2.5	20	1.5	400	1000	2	150	0.12	500	10	—	—	—	3D	—	—	—	Series regulator
2SC5714	—	1.0	2.5	20	4	400	1000	2	500	0.15	1600	32	—	—	—	2E	—	—	—	DC/DC converter Storobo charge/discharge
2SC5712	—	1.0	2.5	50	3	400	1000	2	300	0.14	1000	20	—	—	—	2A	—	—	—	DC/DC converter Storobo charge/discharge
—	2SA2066	1.0	2.5	10	2	200	500	2	200	0.19	600	20	—	—	—	—	4E	—	—	Series regulator
—	2SA2069	1.0	2.5	20	1.5	200	500	2	150	0.14	500	17	—	—	—	—	4D	—	—	DC/DC converter Series regulator
—	2SA2059	1.0	2.5	20	3	200	500	2	500	0.19	1600	53	—	—	—	—	4F	—	—	DC/DC converter Series regulator
—	2SA2060	1.0	2.5	50	2	200	500	2	300	0.20	1000	33	—	—	—	—	4G	—	—	DC/DC converter Series regulator
2SD1784	—	0.5	1.0	30	1.5	4000	—	2	150	1.5	1000	1	—	—	—	XN	—	2SD1140	—	Driver(Darlington)

Note: The hFE classification which appears instead of the shown in the Marking on Chip column will be one of the following: A, B, C, D, O, R or Y, according to the rank.

: Device is mounted on a ceramic PCB (250mm²×0.8t).

: FR4 PCB (Cu area 645mm², glass-epoxy t=1.6mm), mounting time t=10s

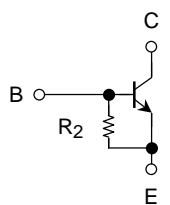
Bias Resister Built-in Transistors (BRTs)

Product No.		Pc (W)	Pc (W)	Vces (V)	Ic (A)	hFE		VCE(SAT) MAX			ft TYP.		Cob TYP.		R (kΩ) TYP.	MARKING		Component Devices				
						MIN	MAX	VCE (V)	Ic (A)	V (V)	Ic (A)	Ib (mA)	(MHz)	VCE (V)		Ic (A)	(pF)	V (V)	NPN	PNP	NPN	PNP
RN5001	RN6001	0.5	1.0	30	2.0	100	320	2	0.5	0.5	1	50	120	2	0.5	40	10	2.0	XA	YA	2SC2873	2SA1213
RN5002	RN6002																		XB	YB		
RN5003	RN6003																		XC	YC		
RN5006	RN6006	0.5	1.0	10	2.0	160	600	1	0.5	0.5	2	50	140	1	0.5	30/55	10	10	XF	YF	2SC2982 +diode	2SA1314 +diode

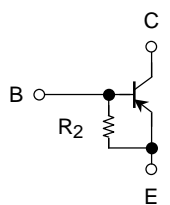
: Device is mounted on a ceramic PCB (250mm²×0.8t)

Equivalent circuit

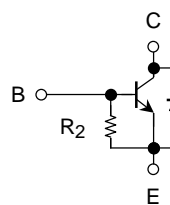
RN5001~RN5003



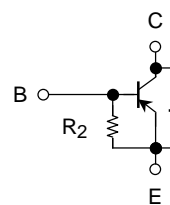
RN6001~RN6003



RN5006



RN6006



TSM Transistors (Thinnest package in the world in SC-59 and SOT-23 class)

Product No.	Rating					hFE				VCE (sat) (V)			Marking	Remarks/Uses
	NPN	V _{CEO} (V)	I _C (A)	I _{CP} (A)	P _C (mW)	P _C (mW) t = 10s	MIN	MAX	VCE (V)	I _C (mA)	MAX	I _C (A)		
2SA2058	-10	-1.5	-2.5	500	750	200	500	-2	-0.2	-0.19	-0.6	-20	WM	Low saturation voltage
2SA2065	-20	-1.5	-2.5	500	750	200	500	-2	-0.15	-0.14	-0.5	-17	WK	Low saturation voltage
2SA2061	-20	-2.5	-4	625	1000	200	500	-2	-0.5	-0.19	-1.6	-53	WE	Low saturation voltage
2SA2056	-50	-2	-3.5	625	1000	200	500	-2	-0.3	-0.20	-1.0	-33	WF	Low saturation voltage
2SC5755	10	2	3.5	500	750	400	1000	2	0.2	0.12	0.6	12	WL	Low saturation voltage
2SC5784	20	1.5	2.5	500	750	400	1000	2	0.15	0.12	0.5	10	WJ	Low saturation voltage
2SC5738	20	3.5	6	625	1000	400	1000	2	0.5	0.15	1.6	32	WD	Low saturation voltage
2SC5692	50	2.5	4	625	1000	400	1000	2	0.3	0.14	1.0	20	WB	Low saturation voltage
2SC5703	50	4	7	800	1250	400	1000	2	0.5	0.12	1.6	32	WA	Low saturation voltage

: Device is mounted on FR4 PCB (Cu area 645mm², glass-epoxy t=1.6mm)

Power Transistors for Switching Power Supply

Transistors for AC-DC Converters

Application	Product No.	Absolute Maximum Ratings (Ta = 25°C)				Package	
		Vcbo(V)	Vce0(V)	Ic(A)	Pc(W) Tc = 25°C ♣ Ta = 25°C		
Switching Regulator	2SC5549	400	400	1	0.9♣	LSTM	
	2SC5550			1	10	TO-126(IS)	
	2SC3075	500		0.8	10	Power MOLD	
	2SC3425			0.8		TO-126(IS)	
	2SC3233	500		2	20	Power MOLD	
	2SC5075					1.3♣	TPS
	2SC5208	600		0.8	1.3♣	TPS	
	2SC5458			0.8	10	Power MOLD	
	2SC5279	600		2	1.8♣	TPL	
	2SC4754			2	20	TO-220FL	
	2SC5459	600		3	25	TO-220(N)IS	
	2SC5266A			5	1.8♣	TPL	
	2SC5355	600		5	25	DP	
	2SC5172			5	25	TO-220(N)IS	
	2SC5352	600		10	80	TO-3P(N)	
	2SC5351			450	2	1.3♣	TPS
	2SC5368	2			10	TO-126IS	
	2SC4157	1000		10	100	TO-3P(N)	
	2SC5439			8	30	TO-220(N)IS	
	2SC3405	900		800	0.8	20	Power MOLD
	2SC5465				0.8	20	Power MOLD
	2SC5353	900		800	3	25	TO-220(N)IS
	2SC5356					25	DP
	2SC5361	900		800	4	40	TO-220FL
	2SC3657					80	TO-3P(N)
	2SC5354	900		800	5	100	TO-3P(N)
2SC3307	10		150		TO-3P(L)		
Series Regulator	2SD2012	60	60	3	25	TO-220(N)IS	

Low Saturation Voltage Transistors (Small surface mounting type packages for Personal equipment)

Package		Product No.	Rating					hFE				VCE (sat) (V)			marking on Chip
			NPN	VCE0 (V)	Ic (A)	ICP (A)	Pc (mW) Note	Pc (mW) Note t = 10s	MIN	MAX	VCE (V)	Ic (A)	MAX	Ic (A)	
TSM (SC-59) (SOT-23)	PNP	2SA2058	-10	-1.5	-2.5	500	750	200	500	-2	-0.2	-0.19	-0.6	-20	WM
		2SA2065	-20	-1.5	-2.5	500	750	200	500	-2	-0.15	-0.14	-0.5	-17	WK
		2SA2061	-20	-2.5	-4	625	1000	200	500	-2	-0.5	-0.19	-1.6	-53	WE
		2SA2056	-50	-2	-3.5	625	1000	200	500	-2	-0.3	-0.20	-1.0	-33	WF
	NPN	2SC5755	10	2	3.5	500	750	400	1000	2	0.2	0.12	0.6	12	WL
		2SC5784	20	1.5	2.5	500	750	400	1000	2	0.15	0.12	0.5	10	WJ
		2SC5738	20	3.5	6	625	1000	400	1000	2	0.5	0.15	1.6	32	WD
		2SC5692	50	2.5	4	625	1000	400	1000	2	0.3	0.14	1.0	20	WB
		2SC5703	50	4	7	800	1250	400	1000	2	0.5	0.12	1.6	32	WA
PW-MINI (SC-62) (SOP-89)	PNP	2SA2066	-10	-2	-3.5	1000	2000	200	500	-2	-0.2	-0.19	-0.6	-20	4E
		2SA2069	-20	-1.5	-2.5	1000	2000	200	500	-2	-0.15	-0.14	-0.5	-17	4D
		2SA2059	-20	-3	-5	1000	2500	200	500	-2	-0.5	-0.19	-1.6	-53	4F
		2SA2060	-50	-2	-3.5	1000	2500	200	500	-2	-0.3	-0.20	-1.0	-33	4G
	NPN	2SC5785	10	2	3.5	1000	2000	400	1000	2	0.2	0.12	0.6	12	3E
		2SC5713	10	4	7	1000	2500	400	1000	2	0.15	0.15	1.6	10	2C
		2SC5819	20	1.5	2.5	1000	2500	400	1000	2	0.15	0.12	0.5	10	3D
		2SC5714	20	4	7	1000	2500	400	1000	2	0.5	0.15	1.6	32	2E
		2SC5712	50	3	5	1000	2500	400	1000	2	0.3	0.14	1	20	2A

Note: Device is mounted on FR4 PCB (Cu area 645mm², glass-epoxy t = 1.6mm)

Power Transistors for Color TVs

Color TV Horizontal-Deflection-Output Transistors (V_{CBO} = 1500 V Series)

Intended Uses for Horizontal-Deflection-Output Transistors (Note 2)				Package / Recommended Alternative Product (for reference)				Maximum Ratings			Generation (Note 1)
Flat-screen TVs and wide-screen TVs		HDTV	Digital TVs	TO-3P (H) IS		TO-3P (LH)		V _{CBO} (V)	I _C (A)	P _C (W) (Note 3)	
525i	525p	1125i	750p/1125i	Built-in damper diode	No built-in damper diode	Built-in damper diode	No built-in damper diode				
15.75 kHz	31.5 kHz	33.75 kHz	45 kHz~								
D1 pin	D2 pin	D3 pin	D4 pin								
Screen size (inches)	Screen size (inches)	Screen size (inches)	Screen size (inches)								
-16				2SD2599				1500	4	40	4
16~20				2SD2586					5	50	4
20~24					2SD2498				6	50	3
20~24					S2000N				8	50	3
20~24				2SD2499					6	50	3
20~24				S2055N					8	50	3
24~28				2SD2539					7	50	3
24~28	20			2SC5339					7	50	4
28~32				2SD2559					8	50	4
28~32	24				2SC5386				8	50	4
28~32	24			2SC5280					8	50	4
28~32	28				2SC5404				9	50	4
28~32					2SD2500				10	50	3
32~36	28	28			2SC5387				10	50	4
36~	32	32	28		2SC5411				14	60	4
36~	32	32	32				2SC5421		15	180	4
36~	36	32	32		2SC5587				17	75	4
36~	36~	36~	32				2SC5589		18	200	4
36~	36~	36~	36~				2SC5445		20	200	4
36~	36~	36~	36~		2SC5717				21	75	5
36~	36~	36~	36~				2SC5695		22	200	5

Note 1: 4th and 5th generation devices are new products.

Note 2: The screen size and frequency quoted for intended use are for reference only.

Note 3: T_c = 25°C

Color TV Horizontal-Deflection-Output Transistors (V_{CBO} = 1700 V Series)

Intended Uses for Color TV Horizontal-Deflection-Output Transistors (Note 2)				Package / Recommended Alternative Product (for reference)				Maximum Ratings			Generation (Note 1)
Flat-screen TVs and wide-screen TVs		HDTV	Digital TVs	TO-3P (H) IS		TO-3P (LH)		V _{CBO} (V)	I _C (A)	P _C (W) (Note 3)	
525i	525p	1125i	750p/1125i	Built-in damper diode	No built-in damper diode	Built-in damper diode	No built-in damper diode				
15.75 kHz	31.5 kHz	33.75 kHz	45 kHz~								
D1 pin	D2 pin	D3 pin	D4 pin								
Screen size (inches)	Screen size (inches)	Screen size (inches)	Screen size (inches)								
16~20				2SD2550				1700	4	50	3
20~24				2SD2551					5	50	3
28~32				2SD2638					7	50	4
28~32				2SD2553					8	50	3
28~32	20	20		2SC5716					8	50	4
32	28	28	24				2SC5422		15	200	4
36	32	32	28		2SC5588				15	75	4
36	32	32	28				2SC5590		16	200	4
36~	36~	36~	32				2SC5446		18	200	4
36~	36~	36~	36				2SC5570		28	220	4

Note 1: 4th and 5th generation devices are new products.

Note 2: The screen size and frequency quoted for intended use are for reference only.

Note 3: T_c = 25°C

Color TV Horizontal-Deflection-Output Transistors (V_{CBO} = 2000 V Series)

Intended Uses for Color TV Horizontal-Deflection-Output Transistors (Note 2)				Package / Recommended Alternative Product (for reference)				Maximum Ratings			Generation (Note 1)
Flat-screen TVs and wide-screen TVs		HDTV	Digital TVs	TO-3P (H) IS		TO-3P (LH)		V _{CBO} (V)	I _C (A)	P _C (W) (Note 3)	
525i	525p	1125i	750p/1125i	Built-in damper diode	No built-in damper diode	Built-in damper diode	No built-in damper diode				
15.75 kHz	31.5 kHz	33.75 kHz	45 kHz~								
D1 pin	D2 pin	D3 pin	D4 pin								
Screen size (inches)	Screen size (inches)	Screen size (inches)	Screen size (inches)								
36~	36~	36~	36			* 2SC5749		2000	16	210	5
36~	36~	36~	36			* 2SC5748			16	210	5
36~	36~	36~	36			2SC5612			22	220	4

Note 1: 4th and 5th generation devices are new products.

Note 2: The screen size and frequency quoted for intended use are for reference only.

Note 3: T_c = 25°C

*: Since this product is under development, its maximum ratings are provisional only.

Power Transistors for Displays

Video Display Horizontal-Deflection-Output Transistors (V_{CBO} = 1500 V Series)

Intended Uses for Video Display Horizontal-Deflection-Output Transistors (Note 2)					Package / Recommended Alternative Product (for reference)				Maximum Ratings		Generation (Note 1)	Remarks
Screen size (in inches) and frequency for reference (Hz)					TO-3P (H) IS		TO-3P (LH)		I _C (A)	P _C (W) (Note 4)		
14inches I _{cp} = 4 A	15inches I _{cp} = 4.5 A	17inches I _{cp} = 5.5 A	19inches I _{cp} = 7 A	21inches I _{cp} = 8 A	Built-in damper diode	No built-in damper diode	Built-in damper diode	No built-in damper diode				
32 k (56 k)					2SC5339				7	50	4	(Note 3)
	32 k (56 k)				2SC5280				8	50	4	(Note 3)
	69 k					2SC5386			8	50	4	
	69 k					2SC5404			9	50	4	
		69 k				2SC5387			10	50	4	
		86 k				2SC5411			14	60	4	
		86 k						2SC5421	15	180	4	
			107 k			2SC5587			17	75	4	
			107 k					2SC5589	18	200	4	
				130 k				2SC5445	20	200	4	
			107 k			2SC5717			21	75	5	
				130 k				2SC5695	22	200	5	

Note 1: 4th and 5th generation devices are new products.

Note 2: The screen size and frequency quoted for intended use are for reference only.

Note 3: If an external damper diode is used, operation at up to 56 kHz is possible.

Note 4: T_c = 25°C

Video Display Horizontal-Deflection-Output Transistors (V_{CBO} = 1700 V Series)

Intended Uses for Video Display Horizontal-Deflection-Output Transistors (Note 2)					Package / Recommended Alternative Product (for reference)				Maximum Ratings		Generation (Note 1)	Remarks
Screen size (in inches) and frequency for reference (Hz)					TO-3P (H) IS		TO-3P (LH)		I _C (A)	P _C (W) (Note 4)		
14inches I _{cp} = 4 A	15inches I _{cp} = 4.5 A	17inches I _{cp} = 5.5 A	19inches I _{cp} = 7 A	21inches I _{cp} = 8 A	Built-in damper diode	No built-in damper diode	Built-in damper diode	No built-in damper diode				
	32 k (56 k)				2SC5716				8	55	4	(Note 3)
			107 k			2SC5588			15	75	4	
		86 k						2SC5422	15	200	4	
			107 k					2SC5590	16	200	4	
				107 k				2SC5446	18	200	4	
				130 k				2SC5570	28	220	4	

Note 1: 4th and 5th generation devices are new products.

Note 2: The screen size and frequency quoted for intended use are for reference only.

Note 3: If an external damper diode is used, operation at up to 56 kHz is possible.

Note 4: T_c = 25°C

Damper Diodes for Color TV & Video Display: VcBO = 2000 V Series

Intended Uses for Video Display Horizontal-Deflection-Output Transistors (Note 2)					Package / Recommended Alternative Product (for reference)				Maximum Ratings		Generation (Note 1)	Remarks
Screen size (in inches) and frequency for reference (Hz)					TO-3P (H) IS		TO-3P (LH)		IC (A)	PC (W) (Note 4)		
14inches Icp = 4 A	15inches Icp = 4.5 A	17inches Icp = 5.5 A	19inches Icp = 7 A	21inches Icp = 8 A	Built-in damper diode	No built-in damper diode	Built-in damper diode	No built-in damper diode				
				32 k (56 k)			* 2SC5749		16	210	5	(Note 3)
				86 k				* 2SC5748	16	210	5	
				86 k				2SC5612	22	220	4	

Note 1: 4th and 5th generation devices are new products.

Note 2: The screen size and frequency quoted for intended use are for reference only.

Note 3: If an external damper diode is used, operation at up to 56 kHz is possible.

Note 4: Tc = 25°C

*: Since this product is under development, its maximum ratings are provisional only.

General-Purpose Power MOSFETs

Power MOSFETs (L²-π-MOS V)

Product No.	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} (Ω)				R _{DS(ON)} (Ω)				Q _g (nC) (typ.)
					typ.	max	V _{GS} (V)	I _D (A)	typ.	max	V _{GS} (V)	I _D (A)	
2SJ511	-30	-2	1.5	POWER-MINI	0.32	0.45	-10	-1	0.55	0.76	-4	-1	5.5
2SJ525	-30	-5	1.3	TPS	0.1	0.12	-10	-2.5	0.17	0.2	-4	-2.5	27
2SJ537	-50	-5	0.9	TO-92MOD	0.15	0.19	-10	-2.5	0.285	0.34	-4	-1.3	18
2SJ360	-60	-1	1.5	POWER-MINI	0.55	0.73	-10	-0.5	0.86	1.2	-4	-0.5	6.5
2SJ507	-60	-1	0.9	TO-92MOD	0.5	0.7	-10	-0.5	0.72	1.0	-4	-0.5	5.6
2SJ482	-60	-5	2.5	SP	0.16	0.19	-10	-2.5	0.24	0.28	-4	-2.5	22
2SJ377	-60	-5	20	POWER-MOLD	0.16	0.19	-10	-2.5	0.24	0.28	-4	-2.5	22
2SJ378	-60	-5	1.3	TPS	0.16	0.19	-10	-2.5	0.24	0.28	-4	-2.5	22
2SJ438	-60	-5	25	TO-220NIS	0.16	0.19	-10	-2.5	0.24	0.28	-4	-2.5	22
2SJ349	-60	-20	35	TO-220NIS	0.033	0.045	-10	-10	0.05	0.09	-4	-10	90
2SJ401	-60	-20	100	TO-220FL/SM	0.033	0.045	-10	-10	0.05	0.09	-4	-10	90
2SJ334	-60	-30	45	TO-220NIS	0.029	0.038	-10	-15	0.046	0.06	-4	-15	110
2SJ402	-60	-30	100	TO-220FL/SM	0.029	0.038	-10	-15	0.046	0.06	-4	-15	110
2SJ508	-100	-1	1.5	POWER-MINI	1.34	1.9	-10	-0.5	1.68	2.5	-4	-0.5	6.3
2SJ509	-100	-1	0.9	TO-92MOD	1.34	1.9	-10	-0.5	1.68	2.5	-4	-0.5	6.3
2SJ380	-100	-12	35	TO-220NIS	0.15	0.21	-10	-6	0.25	0.32	-4	-6	48
2SJ619	-100	-16	75	TFP	0.15	0.21	-10	-6	0.25	0.32	-4	-6	48
2SJ412	-100	-16	60	TO-220FL/SM	0.15	0.21	-10	-6	0.25	0.32	-4	-6	48
2SJ464	-100	-18	45	TO-220NIS	0.064	0.09	-10	-9	0.085	0.12	-4	-9	140
2SJ620	-100	-18	125	TFP	0.064	0.09	-10	-9	0.085	0.12	-4	-9	140
2SK2964	30	2	1.5	POWER-MINI	0.13	0.18	10	1	0.18	0.25	4	1	5.8
2SK2839	30	10	2.5	SP	0.03	0.04	10	5	0.045	0.06	4	5	26
2SK2844	30	35	40	TO-220AB	0.016	0.020	10	18	0.026	0.035	4	18	40
2SK2614	50	20	40	DP	0.034	0.046	10	10	0.055	0.08	4	5	25
2SK2507	50	25	30	TO-220NIS	0.034	0.046	10	12	0.058	0.08	4	6	25
■ 2SK2744	50	45	125	TO-3P(N)	0.015	0.02	10	25	—	—	—	—	68
■ 2SK2550	50	45	100	TO-3P(N)	0.024	0.03	10	25	—	—	—	—	36
■ 2SK3051	50	45	40	TO-220FL/SM	0.024	0.03	10	25	—	—	—	—	36
2SK2886	50	45	40	TO-220NIS	0.014	0.02	10	25	0.027	0.036	4	25	66
2SK2745	50	50	150	TO-3P(N)	0.007	0.0095	10	25	0.011	0.016	4	25	130
■ 2SK2551	50	50	150	TO-3P(N)	0.0072	0.011	10	25	—	—	—	—	130
2SK2615	60	2	1.5	POWER-MINI	0.23	0.3	10	1	0.33	0.44	4	1	6
2SK2961	60	2	0.9	TO-92MOD	0.2	0.27	10	1	0.26	0.38	4	1	5.8
2SK2229	60	5	1.3	TPS	0.12	0.16	10	2.5	0.2	0.3	4	1.3	12
2SK2231	60	5	20	POWER-MOLD	0.12	0.16	10	2.5	0.2	0.3	4	1.3	12
2SK2741	60	5	2.5	SP	0.12	0.16	10	2.5	0.20	0.30	4	2.5	12
2SK2782	60	20	40	DP	0.039	0.055	10	10	0.060	0.090	4	5	25
2SK2232	60	25	35	TO-220NIS	0.036	0.046	10	12	0.057	0.08	4	12	38
2SK2311	60	25	40	TO-220FL/SM	0.036	0.046	10	12	0.057	0.08	4	12	38
2SK2385	60	36	40	TO-220NIS	0.022	0.03	10	18	0.04	0.055	4	15	60
2SK2233	60	45	100	TO-3P(N)	0.022	0.03	10	25	0.04	0.055	4	15	60
2SK2266	60	45	65	TO-220FL/SM	0.022	0.03	10	25	0.04	0.055	4	15	60
2SK2312	60	45	45	TO-220NIS	0.013	0.017	10	25	0.019	0.025	4	25	110
2SK2376	60	45	100	TO-220FL/SM	0.013	0.017	10	25	0.019	0.025	4	25	110
■ 2SK2398	60	45	100	TO-3P(N)	0.022	0.03	10	25	—	—	—	—	60
2SK2173	60	50	125	TO-3P(N)	0.013	0.017	10	25	0.019	0.025	4	25	110
■ 2SK2445	60	50	125	TO-3P(N)	0.014	0.018	10	25	—	—	—	—	110
2SK2267	60	60	150	TO-3P(L)	0.008	0.011	10	30	0.012	0.015	4	30	170
2SK2313	60	60	150	TO-3P(N)	0.008	0.011	10	30	0.012	0.015	4	30	170
2SK2962	100	1	0.9	TO-92MOD	0.5	0.7	10	0.5	0.65	0.95	4	0.5	6.3
2SK2963	100	1	1.5	POWER-MINI	0.5	0.7	10	0.5	0.65	0.95	4	0.5	6.3
2SK2200	100	3	1.3	TPS	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK2201	100	3	20	POWER-MOLD	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK2742	100	3	2.5	SP	0.28	0.35	10	2	0.35	0.45	4	2	13.5
2SK2399	100	5	20	POWER-MOLD	0.17	0.23	10	2.5	0.22	0.3	4	2.5	22
2SK2400	100	5	1.3	TPS	0.17	0.23	10	2.5	0.22	0.3	4	2.5	22
2SK2391	100	20	35	TO-220NIS	0.066	0.085	10	10	0.09	0.13	4	10	50
2SK2314	100	27	75	TO-220AB	0.066	0.085	10	15	0.09	0.13	4	15	50
2SK2789	100	27	60	TO-220FL/SM	0.066	0.085	10	15	0.09	0.13	4	15	50
2SK2882	150	18	45	TO-220NIS	0.08	0.12	10	9	0.09	0.18	4	9	57

■: 10-V drive type

Power MOSFETs (π -MOS V $V_{DSS} = 16\text{ V}$)

Product No.	Absolute Maximum Ratings			Package	R _{ds(ON)} (Ω)				R _{ds(ON)} (Ω)				Q _g (nC) (typ.)
	V _{DSS} (V)	I _D (A)	P _D (W)		typ.	max	V _{GS} (V)	I _D (A)	typ.	max	V _{GS} (V)	I _D (A)	
2SJ465	-16	-2	1.5	POWER-MINI	0.54	0.71	-4	-1	0.86	1	-2.5	-0.5	5
2SJ439	-16	-5	20	POWER-MOLD	0.14	0.2	-4	-2.5	0.18	0.28	-2.5	-2.5	24
2SK2549	16	2	1.5	POWER-MINI	0.22	0.29	4	1	0.29	0.38	2.5	0.5	5
2SK2493	16	5	20	POWER-MOLD	0.07	0.1	4	2.5	0.08	0.12	2.5	2.5	23

Power MOSFETs (π -MOS VI)

Product No.	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{ds(ON)} (Ω)				R _{ds(ON)} (Ω)				Q _g (nC) (typ.)
					typ.	max	V _{GS} (V)	I _D (A)	typ.	max	V _{GS} (V)	I _D (A)	
2SJ537	-50	-5	0.9	TO-92MOD	0.15	0.19	-10	-2.5	0.285	0.34	-4	-1.3	18
2SK2964	30	2	1.5	POWER-MINI	0.13	0.18	10	1	0.18	0.25	4	1	5.8
■ 2SK3089	30	40	50	TO-220FL/SM	0.025	0.03	10	20	—	—	—	—	23
■ 2SK3090	30	45	60	TO-220FL/SM	0.016	0.02	10	25	—	—	—	—	39
■ 2SK3127	30	45	65	TO-220FL/SM	0.0095	0.012	10	25	—	—	—	—	66
■ 2SK3506	30	45	100	TO-3P(N)	0.016	0.02	10	25	—	—	—	—	39
■ 2SK3128	30	60	150	TO-3P(N)	0.0095	0.012	10	30	—	—	—	—	66
■ 2SK3125	30	60	150	TO-3P(N)	0.0053	0.007	10	30	—	—	—	—	130
■ 2SK2928	50	5	0.9	TO-92MOD	0.12	0.15	10	2.5	0.24	0.33	4	1.3	6.5
■ 2SK3129	50	60	150	TO-3P(N)	0.0055	0.007	10	30	—	—	—	—	135

■: 10-V drive type

Power MOSFETs (π -MOS V $V_{DSS} = 200\text{ V}$)

Product No.	Absolute Maximum Ratings			Package	R _{ds(ON)} (Ω)				Q _g (nC) (typ.)
	V _{DSS} (V)	I _D (A)	P _D (W)		typ.	max	V _{GS} (V)	I _D (A)	
2SJ618	-180	-10	130	TO-3P(N)	0.24	0.37	-7	-5	35
2SJ567	-200	-2.5	20	PW-MOLD	1.6	2.0	-10	-2.5	10
2SJ407	-200	-5	30	TO-220(NIS)	0.8	1.0	-10	-2.5	20
2SJ610	-250	-2	20	PW-MOLD	1.85	2.55	-10	-1.0	24
2SJ512	-250	-5	30	TO-220(NIS)	1.0	1.25	-10	-2.5	22
2SJ516	-250	-6.5	35	TO-220(NIS)	0.6	0.8	-10	-3	29
2SK3387	150	18	100	TFP	0.08	0.12	10	9	57
2SK3497	180	10	120	TO-3P(N)	0.09	0.15	7	5	36
2SK2992	200	1	1.5	PW-MINI	2.2	3.5	10	0.5	3
2SK2381	200	5	25	TO-220(NIS)	0.56	0.8	10	2.5	10
2SK2835	200	5	1.3	TPS	0.56	0.8	10	2.5	10
2SK2920	200	5	20	PW-MOLD	0.56	0.8	10	2.5	10
2SK2350	200	8.5	30	TO-220(NIS)	0.26	0.4	10	5	17
2SK2965	200	11	35	TO-220(NIS)	0.15	0.26	10	5.5	30
2SK2382	200	15	45	TO-220(NIS)	0.13	0.18	10	10	40
2SK2401	200	15	75	TO-220FL/SM	0.13	0.18	10	10	40
2SK3176	200	30	150	TO-3P(N)	0.038	0.052	10	15	125
2SK3462	250	3	20	PW-MOLD	1.2	1.7	10	1.5	12
2SK3342	250	4.5	20	PW-MOLD	0.8	1.0	10	2.5	10
2SK2417	250	7.5	30	TO-220(NIS)	0.42	0.5	10	3.5	20
2SK2914	250	7.5	20	TO-220AB	0.42	0.5	10	3.5	20
2SK2508	250	13	45	TO-220(NIS)	0.18	0.25	10	6.5	40
2SK2598	250	13	60	TO-220FL/SM	0.18	0.25	10	6.5	40
2SK2993	250	20	100	TO-220FL/SM	0.082	0.105	10	10	100
2SK3388	250	20	125	TFP	0.082	0.105	10	10	100
2SK2967	250	30	150	TO-3P(N)	0.048	0.068	10	15	132
2SK2995	250	30	90	TO-3P(N)IS	0.048	0.068	10	15	132

Power MOSFETs (π -MOS $V_{DSS} = 500\text{ V}$)

Product No.	Absolute Maximum Ratings			Package	$R_{DS(ON)}$ (Ω)				Qg (nC) (typ.)
	V_{DS} (V)	I_D (A)	P_D (W)		typ.	max	V_{GS} (V)	I_D (A)	
2SK3498	400	1	20	PW-MOLD	4.2	5.5	10	0.5	5.7
2SK2838	400	5	40	TO-220FL/SM	0.84	1.2	10	3	17
2SK2679	400	5.5	35	TO-220NIS	0.84	1.2	10	3	17
2SK2952	400	8.5	40	TO-220NIS	0.4	0.55	10	5	34
2SK2841	400	10	80	TO-220AB	0.4	0.55	10	5	34
2SK2949	400	10	80	TO-220FL/SM	0.4	0.55	10	5	34
2SK3499	400	10	80	TFP	0.4	0.55	10	5	34
2SK3472	450	1	20	PW-MOLD	4	4.6	10	0.5	5
2SK3126	450	10	40	TO-220NIS	0.48	0.65	10	5	35
2SK2998	500	0.5	0.9	TO-92MOD	10	18	10	0.25	3.8
2SK3302	500	0.5	1.3	TPS	10	18	10	0.25	3.8
2SK3471	500	0.5	1.5	PW-MINI	10	18	10	0.25	3.8
2SK2599	500	2	1.3	TPS	2.9	3.2	10	1	9
2SK2862	500	3	25	TO-220NIS	2.9	3.2	10	1	9
2SK2661	500	5	75	TO-220AB	1.35	1.5	10	2.5	17
2SK2662	500	5	35	TO-220NIS	1.35	1.5	10	2.5	17
2SK2991	500	5	50	TO-220FL/SM	1.35	1.5	10	2.5	17
2SK3466	500	5	50	TFP	1.35	1.5	10	2.5	17
# 2SK3417	500	5	50	TO-220FL/SM	1.6	1.8	10	2.5	17
# 2SK3316	500	5	35	TO-220NIS	1.6	1.8	10	2.5	17
2SK2542	500	8	80	TO-220AB	0.75	0.85	10	4	30
2SK2543	500	8	40	TO-220NIS	0.75	0.85	10	4	30
2SK2776	500	8	65	TO-220FL/SM	0.75	0.85	10	4	30
2SK2601	500	10	125	TO-3P(N)	0.75	1.0	10	5	30
2SK2842	500	12	40	TO-220NIS	0.4	0.52	10	6	45
2SK3068	500	12	100	TO-220FL/SM	0.4	0.52	10	6	45
2SK3398	500	12	100	TFP	0.4	0.52	10	6	45
# 2SK3313	500	12	40	TO-220NIS	0.5	0.62	10	6	45
2SK2916	500	14	80	TO-3P(N)IS	0.35	0.4	10	7	58
2SK2698	500	15	150	TO-3P(N)	0.35	0.4	10	7	58
# 2SK3314	500	15	150	TO-3P(N)	0.35	0.49	10	7	58
2SK2917	500	18	90	TO-3P(N)IS	0.21	0.27	10	10	80
2SK2837	500	20	150	TO-3P(N)	0.21	0.27	10	10	80
2SK3117	500	20	150	TO-3P(SM)	0.21	0.27	10	10	80
# 2SK3131	500	50	250	TO-3P(L)	0.085	0.11	10	25	280
2SK3132	500	50	250	TO-3P(L)	0.07	0.095	10	25	280
2SK2836	600	1	2.5	SP	6.4	9.0	10	0.5	9
2SK3371	600	1	2.0	PW-MOLD	6.4	9.0	10	0.5	9
2SK2846	600	2	1.3	TPS	4.2	5.0	10	1	9
2SK2865	600	2	20	PW-MOLD	4.2	5.0	10	1	9
2SK3067	600	2	25	TO-220NIS	4.2	5.0	10	1	9
2SK2750	600	3.5	35	TO-220NIS	1.7	2.2	10	1.8	20
2SK3085	600	3.5	75	TO-220AB	1.7	2.2	10	1.8	20
2SK2544	600	6	80	TO-220AB	0.9	1.25	10	3	30
2SK2545	600	6	40	TO-220NIS	0.9	1.25	10	3	30
2SK2602	600	6	125	TO-3P(N)	0.9	1.25	10	3	30
2SK2777	600	6	65	TO-220FL/SM	0.9	1.25	10	3	30
# 2SK3130	600	6	40	TO-220NIS	1.12	1.55	10	3	30
2SK2843	600	10	45	TO-220NIS	0.54	0.75	10	5	45
2SK2866	600	10	125	TO-220AB	0.54	0.75	10	5	45
2SK2889	600	10	100	TO-220FL/SM	0.54	0.75	10	5	45
2SK2996	600	10	45	TO-220NIS	0.74	1.0	10	5	38
2SK3438	600	10	125	TFP	0.74	1.0	10	5	28
2SK2699	600	12	150	TO-3P(N)	0.5	0.65	10	6	58
2SK2953	600	15	90	TO-3P(N)IS	0.31	0.4	10	8	80
2SK2915	600	16	150	TO-3P(N)	0.31	0.4	10	8	80
YTA830	500	5	75	TO-220AB	1.35	1.5	10	2.5	17
YTA830	500	5	35	TO-220NIS	1.35	1.5	10	2.5	17
YTA840	500	8	80	TO-220AB	0.75	0.85	10	4	30
YTA840	500	8	40	TO-220NIS	0.75	0.85	10	4	30

#: Built-in high speed diode

Power MOSFETs (π -MOS V MACH Series)

Product No.	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} (Ω)				Q _g (nC)
					typ.	max	V _{GS} (V)	I _D (A)	
2SK3443	150	30	125	TFP	0.050	0.055	10	15	45
2SK3444	200	25	125	TFP	0.065	0.082	10	12.5	44
2SK3445	250	20	125	TFP	0.090	0.105	10	10	45
2SK3309	450	10	65	TO-220FL/SM	0.48	0.65	10	5	23
2SK3310	450	10	40	TO-220NIS	0.48	0.65	10	5	23
2SK3403	450	13	100	TO-220FL/SM	0.29	0.4	10	6.5	34
2SK3399	600	10	100	TO-220FL/SM	0.54	0.75	10	5	35
2SK3312	600	6	65	TO-220FL/SM	0.95	1.25	10	3	25
2SK3437	600	10	80	TO-220FL/SM	0.74	1.0	10	5	13

Power MOSFETs (π -MOS III V_{DSS} = 900 V)

Product No.	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} (Ω)				Q _g (nC)
					typ.	max	V _{GS} (V)	I _D (A)	
2SK3453	700	10	80	TO-3P(N)IS	0.72	1.0	10	5	53
2SK2603	800	3	100	TO-220AB	3.0	3.6	10	1.5	25
2SK2883	800	3	75	TO-220FL/SM	3.0	3.6	10	1.5	25
2SK2884	800	5	100	TO-220FL/SM	1.9	2.2	10	3	34
2SK2604	800	5	125	TO-3P(N)	1.9	2.2	10	3	34
2SK2605	800	5	45	TO-220NIS	1.9	2.2	10	3	34
2SK2746	800	7	150	TO-3P(N)	1.3	1.7	10	3.5	55
2SK2606	800	8	85	TO-3P(N)IS	1.0	1.2	10	4	68
2SK2607	800	9	150	TO-3P(N)	1.0	1.2	10	4	68
2SK3301	900	1	20	POWER-MOLD	15	20	10	0.5	15
2SK2845	900	1	40	DP	8.0	9.0	10	0.5	15
2SK2733	900	1	60	TO-220AB	8.0	9.0	10	0.5	15
2SK2718	900	2.5	40	TO-220NIS	5.6	6.4	10	1.5	21
2SK2608	900	3	100	TO-220AB	3.7	4.3	10	1.5	25
2SK2700	900	3	40	TO-220NIS	3.7	4.3	10	1.5	25
2SK2719	900	3	125	TO-3P(N)	3.7	4.3	10	1.5	25
2SK2717	900	5	45	TO-220NIS	2.3	2.5	10	3	45
2SK2610	900	5	150	TO-3P(N)	2.3	2.5	10	3	45
2SK2749	900	7	150	TO-3P(N)	1.6	2.0	10	3.5	55
2SK2847	900	8	85	TO-3P(N)IS	1.1	1.4	10	4	58
2SK3017	900	8.5	90	TO-3P(N)IS	1.05	1.25	10	4	70
2SK2611	900	9	150	TO-3P(N)	1.2	1.4	10	4	58
2SK2968	900	10	150	TO-3P(N)IS	1.05	1.25	10	5	70

High-Speed U-MOS Series for DC-DC Converters

Package	Product No.	Absolute Maximum Ratings		Configuration	R _{DS(ON)} (m Ω) (max)	
		V _{DSS} (V)	I _D (A)		V _{GS} = 4.5 V	V _{GS} = 10 V
TSSOP-8	TPCS8004	200	1.3	Single	—	800
SOP-8	TPC8006-H	30	7		40	27
	TPC8005-H	30	11		27	16
	TPC8009-H	30	13		15	10
	TPC8013-H	30	15		9.5	6.5
	TPC8012-H	200	1.8		—	400
	TPC8104-H	-30	-5		120#	65
	TPC8105-H	-30	-7		60#	40

#: V_{GS} = -4V

TPC8 Series for Lithium Ion Back-up Batteries

Package	Product No.	Absolute Maximum Ratings		Configuration	R _{ds(ON)} (mΩ) (max)		
		V _{DSS} (V)	I _D (A)		V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 10 V
TSSOP-8	TPCS8101	-30	-6	Single	—	40	25
	TPCS8102	-20	-6		38	20	—
	TPCS8205	20	5	Dual	60	45	—
	TPCS8209	20	5		40	30	—
	TPCS8211	20	6		29	24	—
	TPCS8204	20	6		22	17	—
	TPCS8210	20	5	Common drain	40	30	—
	TPCS8212	20	6		29	24	—
	TPCS8208	20	6		22	17	—
SOP-8	TPC8001	30	7	Single	—	30	20
	TPC8002	30	11		—	22	14
	TPC8003	30	13		—	13	7
	TPC8004	30	5		—	80	50
	TPC8109	-30	-10		—	30	20
	TPC8108	-30	-11		—	23	13
	TPC8107	-30	-13		—	15	7
	TPC8201	30	5	Dual	—	80	50
	TPC8208	20	5		70	50	—
	TPC8203	30	6		—	32	21
	TPC8207	20	6		30	20	—
	TPC8303	-30	-4.5		—	65	35

TPC8 Series for Power Management

Package	Product No.	Absolute Maximum Ratings		Configuration	R _{ds(ON)} (mΩ) (max)			Application
		V _{DSS} (V)	I _D (A)		V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 10 V	
TSSOP-8	TPCS8101	-30	-6	Single	—	40	25	Power management switches
	TPCS8102	-20	-6		38	20	—	
	TPCS8302	-20	-5	Dual	60	35	—	
SOP-8	TPC8004	30	5	Single	—	80	50	
	TPC8102	-30	-6		—	70	40	
	TPC8109	-30	-10		—	30	20	
	TPC8108	-30	-11		—	23	13	
	TPC8107	-30	-13		—	15	7	
	TPC8203	30	6	Dual	—	32	21	
	TPC8303	-30	-4.5		—	65	35	

TPC8 Series for Portable Devices

Package	Product No.	Absolute Maximum Ratings		Configuration	R _{ds(ON)} (mΩ) (max)			Application
		V _{DSS} (V)	I _D (A)		V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 10 V	
TSSOP-8	TPCS8101	-30	-6	Single	—	40	25	Power management switches
	TPCS8102	-20	-6		38	20	—	
	TPCS8302	-20	-5	Dual	60	35	—	
SOP-8	TPC8102	-30	-6	Single	—	70	40	
	TPC8109	-30	-10		—	30	20	
	TPC8108	-30	-11		—	23	13	
	TPC8107	-30	-13		—	15	7	
	TPC8301	-30	-3.5		Dual	—	190	
	TPC8302	-20	-3.5	170		120	—	
	TPC8303	-30	-4.5	—		65	35	
	TPC8401	30	6	P/N complementary	—	32	21	
		-30	-4.5		—	65	35	
	TPC8402	30	5	P/N complementary	—	80	50	
		-30	-4.5		—	65	35	
TPC8403	30	6	P/N complementary	—	46★	33		
	-30	-4.5		—	90★	55		

★: V_{GS} = 4.5 V

Power MOS FET TPC6 Series (VS-6)

Package	Product No.	Absolute Maximum Ratings		Configuration	R _{ds(ON)} (mΩ) (max)				Application
		V _{DSS} (V)	I _D (A)		V _{GS} = 2.0 V	V _{GS} = 2.5 V	V _{GS} = 4.5 V	V _{GS} = 10 V	
VS-6	TPC6001	20	6	Single	60	45	30	—	DC/DC
	TPC6002	30	6		—	—	50	30	DC/DC
	TPC6101	-20	-4.5		180	100	60	—	Power management switches
	TPC6102	-30	-4.5		—	—	100	60	Power management switches
	TPC6201	30	2.5	Dual	—	—	145	95	HDD

Power MOSFETs (π -MOS V_{DSS} = 200 V)

Product No.	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{ds(ON)} (Ω)				Y _{fs}		
					typ.	max	V _{GS} (V)	I _D (A)	typ.	V _{DS} (V)	I _D (A)
2SJ313	-180	-1	25	TO-220NIS	2	5	-10	-0.6	0.7	-10	-0.3
2SJ338	-180	-1	20	POWER-MOLD	2	5	-10	-0.6	0.7	-10	-0.3
2SJ440	-180	-9	80	TO-3P(N)IS	0.25	0.83	-10	-6	4	-10	3
2SJ200	-180	-10	120	TO-3P(N)	0.25	0.83	-10	-6	4	-10	-3
2SJ201	-200	-12	150	TO-3P(L)	0.25	0.625	-10	-8	5	-10	-5
2SK2013	180	1	25	TO-220NIS	2.8	5	10	0.6	0.7	10	0.3
2SK2162	180	1	20	POWER-MOLD	2.8	5	10	0.6	0.7	10	0.3
2SK2467	180	9	80	TO-3P(N)IS	0.42	0.83	10	6	4	10	3
2SK1529	180	10	120	TO-3P(N)	0.42	0.83	10	6	4	10	3
2SK1530	200	12	150	TO-3P(L)	0.31	0.625	10	8	5	10	5

Power MOSFETs (U-MOS)

Product No.	Absolute Maximum Ratings			Package	R _{ds(ON)} (Ω)				R _{ds(ON)} (Ω)				Q _g (nC)
	V _{DSS} (V)	I _D (A)	P _D (W)		typ.	max	V _{GS} (V)	I _D (A)	typ.	max	V _{GS} (V)	I _D (A)	
2SK2466	100	30	40	TO-220NIS	0.034	0.046	10	15	0.04	0.07	4	15	68
2SK2987	60	70	150	TO-3P(N)	0.0045	0.0058	10	35	0.0058	0.01	4	35	210
2SK2985	60	45	45	TO-220NIS	0.0045	0.0058	10	25	0.0058	0.01	4	25	210
2SK2986	60	55	100	TO-220FL/SM	0.0045	0.0058	10	35	0.0058	0.01	4	35	210
2SK3236	60	35	30	TO-220NIS	0.0135	0.020	10	18	0.022	0.036	4	18	52
2SK3389	30	75	125	TFP	0.0038	0.005	10	38	—	—	—	—	62
2SK3397	30	70	125	TFP	0.004	0.006	10	35	—	—	—	—	110
2SK3439	30	75	125	TFP	0.0038	0.005	10	38	0.005	0.01	4	38	116
2SK3440	60	50	125	TFP	0.0065	0.008	10	25	—	—	—	—	60
2SK3441	60	75	125	TFP	0.0045	0.0058	10	38	0.0058	0.01	4	38	210
2SK3442	100	45	125	TFP	0.015	0.02	10	23	—	—	—	—	85

Power MOSFETs (L²-π-MOSV/ L²-π-MOSIII)

Product No.	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} (Ω)				R _{DS(ON)} (Ω)				Q(nC)
					typ.	max	V _{GS} (V)	I(A)	typ.	max	V _{GS} (V)	I(A)	
2SJ315	-60	-5	20	POWER-MOLD	0.21	0.25	-10	-2.5	0.31	0.4	-4	-2.5	20
2SJ304	-60	-14	40	TO-220NIS	0.08	0.12	-10	-7	0.13	0.19	-4	-5	45
2SJ312	-60	-14	40	TO-220FL/SM	0.08	0.12	-10	-7	0.13	0.19	-4	-5	45
2SK940	60	0.8	0.9	TO-92MOD	0.4	0.5	10	0.4	0.75	1.1	4	0.4	5.2
2SK1719	60	5	20	POWER-MOLD	0.08	0.11	10	2.5	0.11	0.16	4	2.5	20
2SK2030	60	5	20	POWER-MOLD	0.1	0.14	10	2.5	—	—	—	—	15
2SK2228	60	5	1.3	TPS	0.08	0.11	10	2.5	0.11	0.16	4	2.5	20
2SK1079	100	0.6	1	POWER-MINI	0.95	1.3	10	0.3	1.2	1.8	4	0.3	3.6
2SK941	100	0.6	0.9	TO-92MOD	0.95	1.3	10	0.3	1.2	1.8	4	0.3	3.6
2SK1381	100	50	150	TO-3P(N)	0.025	0.032	10	25	0.031	0.046	4	25	88
2SK1382	100	60	200	TO-3P(L)	0.015	0.02	10	30	0.02	0.029	4	30	176
2SK2146	250	2	25	TO-220NIS	1.2	2	10	1	—	—	—	—	8
2SK2230	250	2	1.3	TPS	1.2	2	10	1	—	—	—	—	7.5
2SK2235	250	2	20	POWER-MOLD	1.2	2	10	1.5	—	—	—	—	8
2SK1486	300	32	200	TO-3P(L)	0.08	0.095	10	16	—	—	—	—	140
2SK1544	500	25	200	TO-3P(L)	0.15	0.2	10	13	—	—	—	—	150
2SK2274	700	5	45	TO-220NIS	1.5	1.7	10	2	—	—	—	—	44
2SK1119	1000	4	100	TO-220AB	3	3.8	10	2	—	—	—	—	60
2SK1930	1000	4	80	TO-220FL/SM	3	3.8	10	2	—	—	—	—	60
2SK1359	1000	5	125	TO-3P(N)	3	3.8	10	2	—	—	—	—	60
2SK1365	1000	7	90	TO-3P(N)IS	1.5	1.8	10	4	—	—	—	—	120
2SK1120	1000	8	150	TO-3P(N)	1.5	1.8	10	4	—	—	—	—	120
2SK1489	1000	12	200	TO-3P(L)	0.8	1	10	6	—	—	—	—	110

Power Transistor & Power MOSFET Modules

S-10 Series (full-mold type, 10-pin SIP)

Product No.	Circuit Configuration	Chip	Absolute Maximum Ratings			Electrical Characteristics					
			V _{CEO} (V)	I _c (A)	P _T (T _a = 25°C) (W)	h _{FE} (min)	V _{CE} (V)	I _c (A)	V _{CE(sat)} (V) max	I _c (A)	I _B (mA)
MP4005	NPN × 2, PNP × 2	Darlington	±80	±4	4	2000	±2	±1	±1.5	±3	±6
MP4006	NPN × 2, PNP × 2	Darlington	±80	±2	4	2000	±2	±1	±1.5	±1	±1
MP4009	PNP × 4	Darlington	-100	-5	4	1000	-3	-3	-2	-3	-12
MP4013	NPN × 4	Darlington	80 ± 10	2	4	2000	2	1	1.5	1	1
MP4015	NPN × 4	Darlington	60 ± 10	5	4	1000	4	3	2	3	10
MP4020	NPN × 4	Darlington	60 ± 10	2	4	2000	2	1	1.5	1	1
MP4021	NPN × 4	Darlington	100 ± 15	2	4	2000	2	1	1.5	1	1
MP4024	NPN × 4	Darlington	100 ± 15	3	4	2000	2	1	1.5	1	V _{BH} = 4.2 V
MP4025	NPN × 4	Darlington	60 ± 10	1.5	4	2000	2	0.7	1.2	0.5	V _{BH} = 4.2 V
MP4101	NPN × 4	Darlington	60 ± 10	4	4	2000	2	1	1.5	3	10
MP4104	NPN × 4	Darlington	100	4	4	2000	2	1.5	1.5	1.5	3

▲: Built-in zener diode between C and B

⚡: Transistor with built-in bias resistance

S-12 Series (full-mold type, 12-pin SIP)

Product No.	Circuit Configuration	Chip	Absolute Maximum Ratings			Electrical Characteristics					
			V _{CEO} (V)	I _c (A)	P _T (T _a = 25°C) (W)	h _{FE} (min)	V _{CE} (V)	I _c (A)	V _{CE(sat)} (V) max	I _c (A)	I _B (mA)
MP4301	NPN × 2, NPN × 2	Darlington	100	3	4.4	2000	2	1.5	1.5	1.5	3
MP4303	NPN × 2, NPN × 2	Darlington	100	2	4.4	2000	2	1	1.5	1	1
MP4304	NPN × 2, NPN × 2	Single	80	3	4.4	600	2	1	0.5	1.5	15
MP4305	PNP × 2, PNP × 2	Darlington	-100	-5	4.4	2000	-5	-3	-1.5	-3	-6
MP6301	PNP × 3, NPN × 3	Darlington	±80	±3	4.4	2000	±2	±1	±1.8	±2	±4

▲: Built-in diode for absorbing flyback voltage

F-12 Series (12-pin SIP with insulated heat sink)

Product No.	Circuit Configuration	Chip	Absolute Maximum Ratings			Electrical Characteristics					
			V _{CEO} (V)	I _c (A)	P _T (T _c = 25°C) (W)	h _{FE} (min)	V _{CE} (V)	I _c (A)	V _{CE(sat)} (V) max	I _c (A)	I _B (mA)
MP4501	NPN × 2, NPN × 2	Darlington	100	3	25	2000	2	1.5	1.5	1.5	3
MP4502	NPN × 4	Darlington	100	3	25	2000	2	1.5	1.5	1.5	3
MP4503	NPN × 2, PNP × 2	Darlington	±80	±4	25	2000	±2	±1	±1.5	±3	±6
MP4504	PNP × 4	Darlington	-100	-5	25	2000	-5	-3	-1.5	-3	-6
MP4506	NPN × 4	Darlington	100	5	25	1000	3	3	2.0	3	12
MP4507	NPN × 2, PNP × 2	Darlington	±100	±5	25	1000	±3	±3	±2.0	±3	±12
MP4508	PNP × 4	Darlington	-100	-5	25	1000	-3	-3	-2.0	-3	-12
MP4513	NPN × 2, NPN × 2	Darlington	100	5	25	1000	3	3	2.0	3	12
MP4514	NPN × 4	Darlington	100	3	25	4000	4	1	1.5	1	1
MP6901	NPN × 3, PNP × 3	Darlington	±80	±4	25	2000	±2	±1	±1.5	±3	±6

: Built-in diode for absorbing flyback voltage.

Power MOSFET Modules

Product No.	Circuit Configuration	Absolute Maximum Ratings			Electrical Characteristics			Package	Remarks
		V _{DSS} (V)	I _D (A)	P _{DT} (T _a = 25°C) (W)	R _{DS(ON)} (Ω) (max)	I _D (A)	V _{GS} (V)		
MP4208	P-ch × 4	-60	-5	4	0.3	-2.5	-10	10-pin SIP (S-10)	4-V drive possible
MP4209	N-ch × 2, N-ch × 2	100	3	4	0.35	2	10	10-pin SIP (S-10)	4-V drive possible
MP4210	N-ch × 2, N-ch × 2	60	5	4	0.16	2.5	10	10-pin SIP (S-10)	4-V drive possible
MP4211	P-ch × 2, P-ch × 2	-60	-5	4	0.19	-2.5	-10	10-pin SIP (S-10)	4-V drive possible
MP4212	N-ch × 2, P-ch × 2	±60	±5	4	0.16/0.19	2.5/-2.5	10/-10	10-pin SIP (S-10)	4-V drive possible
MP4410	N-ch × 2, N-ch × 2	60	5	4.4	0.16	2.5	10	12-pin SIP (S-12)	4-V drive possible
MP4411	N-ch × 2, N-ch × 2	100	3	4.4	0.35	2	10	12-pin SIP (S-12)	4-V drive possible
MP4412	N-ch × 2, N-ch × 2	100	5	4.4	0.23	2.5	10	12-pin SIP (S-12)	4-V drive possible
MP4711	N-ch × 2, N-ch × 2	100	5	36★	0.23	2.5	10	12-pin SIP (S-12)	4-V drive possible
MP6404	N-ch × 3, P-ch × 3	±60	±5	4.4	0.16/0.19	2.5/-2.5	10/-10	12-pin SIP (S-12)	4-V drive possible

★: T_c = 25°C

: Built-in diode for absorbing flyback voltage

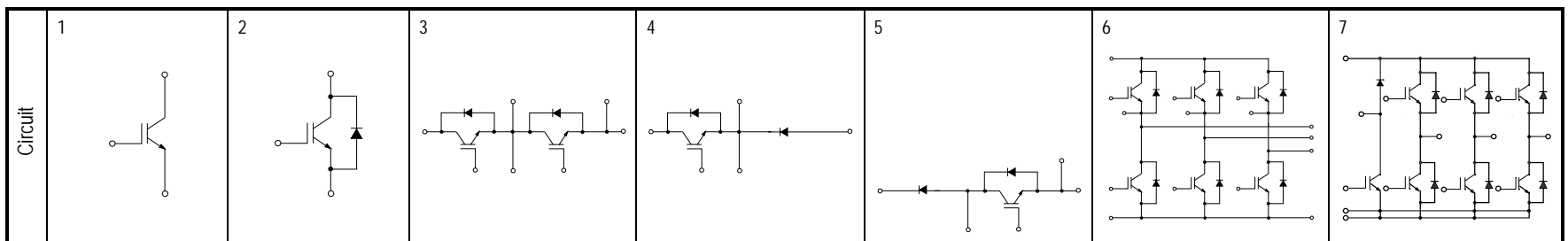
LL Series (11-pin SIP with insulated heat sink)

Product No.	Circuit Configuration	Absolute Maximum Ratings			Electrical Characteristics		
		V _{CES} (V)	I _c (A)	P _c (W)	V _{CE} (sat) (max) (V)	I _c (A)	V _{GE} (V)
MP6759	IGBT × 6, with FRD	600	10	40	2.7	10	15
MP6757	IGBT × 6, with FRD	600	25	72	3.1	25	15

IGBTs

Connection Diagram Reference			Absolute Maximum Ratings										
Circuit	Symbol	VCES (V)	Ic (A)										
			8	15	25	50	75	100	150	200	300	400	600
1	BS	600	▲GT5J121★ (5 A)	GT20J101★ (20 A)	MG25J1BS11 (30 A) GT30J101★ (30 A) ▲GT30J121★ (30 A)	■GT40G121★ (400 V/40 A) MG50J1BS11 GT50J102★ ▲GT50J121★	MG75J1BS11 (80 A) GT80J101A★	MG100J1BS11	MG150J1BS11				
		1000											
		1200		GT15Q102★	MG25Q1BS11 GT25Q102★	MG50Q1BS11 ■GT40T102★ (1500 V / 40 A)	MG75Q1BS11						
2	US	600	GT5J301 (5 A) GT5J311★ (5 A) ▲GT5J321 (5 A) GT10J301★ (10 A) GT10J303 (10 A) GT10J311★ (10 A) GT10J312★ (10 A) ▲GT10J321 (10 A)	GT15J301 GT15J311★ ▲GT15J321 ▲GT15J331★ GT20J301★ (20 A) GT20J311★ (20 A) ▲GT20J321 (20 A)	GT30J301★ (30 A) GT30J311★ (30 A) ■GT30J322 (30 A) ▲GT30J324★ (30 A)	■GT50G321★ (400 V) GT50J301★ ■GT50J322★ ▲GT50J325★	GT60J321★ GT60J322★ (60 A)				MG300J1US51	MG400J1US51	
		1000		■GT15M321 (900 V)			■GT60M302★ ■GT60M303★ (900 V / 60 A) ■GT60N321★ (60 A)						
		1200	GT10Q301★ (10 A)	GT15Q301★	GT25Q301★	■GT40T301★ (1500 V / 40 A)				MG200Q1US41 MG200Q1US51	MG300Q1US41 MG300Q1US51	MG400Q1US41 MG400Q1US51	MG600Q2YS60A MG600Q1US51
		1700							MG240V1US41 (240 A)				
3	YS	600				MG50J2YS50	MG75J2YS50	MG100J2YS50	MG150J2YS50	MG200J2YS50	MG300J2YS50	MG400J2YS60A	MG600J2YS60A MG800J2YS50A (800 A)
		1200				MG50Q2YS40 MG50Q2YS50	MG75Q2YS40 MG75Q2YS42 MG75Q2YS50 MG75Q2YS51	MG100Q2YS40 MG100Q2YS42 MG100Q2YS50 MG100Q2YS51	MG150Q2YS40 MG150Q2YS50 MG150Q2YS51	MG200Q2YS40 MG200Q2YS50 MG200Q2YS60A	MG300Q2YS50 MG300Q2YS60A	MG400Q2YS60A	MG600Q2YS60A
		1700			MG30V2YS40 (30 A)			MG90V2YS40 (90 A) MG120V2YS40 (120 A)					MG400V2YS60A
4	JS	600							MG150J1JS50				
		1200					MG75Q1JS40	MG100Q1JS40		MG200Q1JS40			
5	ZS	600				MG50J1ZS40	MG75J1ZS50	MG100J1ZS40	MG150J1ZS50				
		1200				MG50Q1ZS50	MG75Q1ZS50	MG100Q1ZS40 MG100Q1ZS50		MG200Q1ZS40			
6	ES	600			MG30J6ES50 (30 A)	MG50J6ES50	MG75J6ES50	MG100J6ES50		MG200J6ES60			
		1200											
7	KS	600						MG100J7KS50	MG150J7KS50 MG150J7KS60				

★: Non-isolated type ■: Soft-switching application ▲: High-speed switching application



Strobe Flash IGBTs

Product No.	V _{CES} (V)	I _{CP} (A)	P _c @T _C =25°C (W)	Drive Voltage (min) (V)	V _{CE(sat)} (max) (V)	SW Time (max)			Package	
						V _{GE} / I _c (V) / (A)	t _{on} (μs)	t _{off} (μs)		t _f (μs)
GT5G102/ (LB)*	400	130	20	12	8	12/130	0.9★	2.0★	1.7★	DP/ (LB)
GT5G103/ (LB)	400	130	20	4.5	8	4.5/130	1.1★	2.4★	2.0★	DP/ (LB)
GT8G103/ (LB)	400	150	20	4.5	8	4.5/150	1.4★	2.4★	1.8★	DP/ (LB)
GT8G121/ (LB)*	400	150	20	4.0	7	4.0/150	2.5★	2.1★	1.7★	DP/ (LB)
GT8G131*	400	150	1.1	4	7	4.0/150	1.7★	2.4★	1.9★	SOP-8
GT25G101/ (SM)	400	170	75	20	8	20/170	0.5	7.0	6.0	TO-220 (FL) / (SM)
GT25G102/ (SM)	400	150	75	12	8	12/150	0.5	7.0	6.0	TO-220 (FL) / (SM)

★: Switching time (typ.)

*: New product

Intelligent Power Modules (IPMs)

Product No.	Breakdown Voltage V _{CES} (V)	Current I _c (A)	V _{CE(sat)} (max)		Built-in Functions				
				I _c (A)	OC	SC	UV	OT	BR
MIG50J101H	600	50	2.5	50	○	○	○	○	×
MIG50J201H	600	50	2.5	50	○	○	○	○	○
MIG50J201HC	600	50	2.8	50	○	○	○	○	○
MIG75J101H	600	75	2.5	75	○	○	○	○	×
MIG75J201H	600	75	2.5	75	○	○	○	○	○
MIG100J101H	600	100	2.5	100	○	○	○	○	×
MIG100J201H	600	100	2.5	100	○	○	○	○	○
MIG100J201HC	600	100	2.8	100	○	○	○	○	○
MIG150J202H	600	150	3.0	150	○	○	○	○	○
MIG150J202HC	600	150	3.1	150	○	○	○	○	○
MIG200J201H	600	200	2.5	200	○	○	○	○	○
MIG300J101H	600	300	2.5	300	○	○	○	○	×
MIG400J101H	600	400	2.5	400	○	○	○	○	×
MIG50Q201H	1200	50	3.5	50	○	○	○	○	○
MIG75Q202H	1200	75	3.5	75	○	○	○	○	○
MIG100Q201H	1200	100	3.5	100	○	○	○	○	○
MIG150Q101H	1200	150	3.5	150	○	○	○	○	×
MIG150Q201H	1200	150	3.5	150	○	○	○	○	○
MIG200Q101H	1200	200	3.5	200	○	○	○	○	×
MIG300Q101H	1200	300	3.5	300	○	○	○	○	×
MIG50J7CSB1W	600	50	2.0	50	○	(○)	○	○	○
MIG75J7CSB1W	600	75	2.0	75	○	(○)	○	○	○
MIG100J7CSB1W	600	100	2.0	100	○	(○)	○	○	○
MIG150J7CSB1W	600	150	2.1	150	○	(○)	○	○	○
MIG200J6CMB1W	600	200	2.4	200	○	(○)	○	○	×
MIG300J2CSB1W	600	300	2.3	300	○	(○)	○	○	×
MIG400J2CSB1W	600	400	2.3	400	○	(○)	○	○	×
MIG600J2CMB1W	600	600	2.5	600	○	(○)	○	○	×
MIG50Q7CSA0X	1200	50	2.6	50	○	○	○	○	○
MIG75Q7CSA0X	1200	75	2.6	75	○	○	○	○	○
MIG100Q6CMA0X	1200	100	2.8	100	○	○	○	○	×
MIG150Q6CMB1X	1200	150	2.8	150	○	(○)	○	○	×
MIG200Q2CSA0X	1200	200	2.8	200	○	○	○	○	×
MIG300Q2CMB1X	1200	300	2.8	300	○	(○)	○	○	×
MIG400Q2CMB1X	1200	400	2.8	400	○	(○)	○	○	×

OC: Overcurrent protection

SC: Short-circuit current protection ((○) means that short-circuit protection is covered by over current protection.)

UV: Drive voltage drop protection

OT: Overheating protection

BR: Brake circuit

○: Built-in

×: Not built-in