

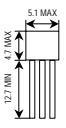


Transistors

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Bipolar Small-Signal Transistors






General-Purpose Transistors (Leaded Type)

Classification	V _{CEO} (V) Max	I _c (A) Max	h _{FE}	V _{CE(sat)} (V) Max	Package	
					TO-92 (SC-43)	
						
					NPN	PNP
General-purpose	50	0.15	70 to 700	0.25	2SC1815	
	-50	-0.15	70 to 400	-0.3		2SA1015
	120	0.1	200 to 700	0.3	2SC2240	
	-120	-0.1	200 to 700	-0.3		2SA970
Low noise	50	0.15	70 to 700	0.25	2SC1815(L)	
	-50	-0.15	70 to 400	-0.3		2SA1015(L)
	50	0.15	200 to 700	0.3	2SC732TM	—
	30	0.5	70 to 400	0.25	2SC1959	
Audio drivers	-30	-0.5	70 to 240	-0.25		2SA562TM
	80	0.3	70 to 240	0.5	2SC1627	
High current	-80	-0.3	70 to 240	-0.4		2SA817
	30	0.8	100 to 320	0.5	2SC2120	
	-30	-0.8	100 to 320	-0.7		2SA950
	20	2	120 to 700	0.5	2SC3266	
	-20	-2	120 to 400	-0.5		2SA1296
	10	2	140 to 600	0.5	2SC3279	
	-10	-2	140 to 600	-0.5		2SA1300
	10	5	700 to 2000	0.25	2SC5853	—
	10	5	450 to 700	0.27	2SC5854	—
	10	5	450 to 700	0.3	—	—
Darlington	80	1.2	100 to 200	0.09	2SC6132	**
	40	0.3	10000 min	1.3	2SC982TM	—
Muting	20	0.3	200 to 1200	0.1	2SC2878	—
High breakdown voltage	300	0.1	30 to 150	0.5	2SC2551	
	-300	-0.1	30 to 150	-0.5		2SA1091
	250	0.05	50 min	1.5	2SC3333	
	-250	-0.05	50 min	-1.5		2SA1320
High-speed switching	15	0.2	40 to 240	0.3	2SC752(G)TM	—
High h _{FE}	50	0.15	600 to 3600	0.25	2SC3112	—

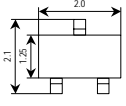
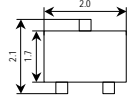
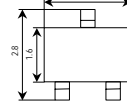
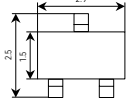
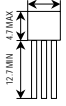
- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

** : Under development

General-Purpose Transistors (Single)

Classification	V _{CEO} (V) Max	I _C (mA) Max	(Surface-Mount Type)									
			CST3		fSM		VESM		ESM		SSM	
												
(mm)		(mm)		(mm)		(mm)		(mm)				
			NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
General-purpose	50	100	2SC6026CT	2SA2154CT	2SC6026	2SA2154						
		150					2SC6026MFV	2SA2154MFV	2SC4738F	2SA1832F	2SC4738	2SA1832
	30	500										
	50	500										
Low noise	120	100										
High current	12	400	2SC5376CT	2SA1955CT			2SC5376FV	2SA1955FV	2SC5376F	2SA1955F	2SC5376	2SA1955
	12	500										
	15	800										
	25	800										
	30	800										
	10	2000										
	20	2000										
	20	1500										
	20	2500										
	30	3000										
	50	1000										
	50	1700										
50	2500											
Strobe	10	5000 (3000)										
High breakdown voltage	80	300										
High h _{FE}	50	150										
Muting	20	300										
High-speed switching	15	200										
High-voltage switching	200	50										
High breakdown voltage	250	50										
	300	100										
Darlington	40	300										




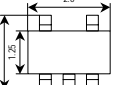
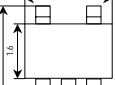
- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
- The products shown in bold are also manufactured in offshore fabs.
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USM  (mm)				UFM  (mm)		TSM  (mm)		S-MINI  (mm)		Leaded Type TO-92  (mm)	
NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
2SC4116	2SA1586					2SC2712	2SA1162	2SC1815	2SA1015		
2SC4118	2SA1588					2SC2859	2SA1182	2SC1959	2SA562TM		
						2SC3325	2SA1313				
2SC4117	2SA1587					2SC2713	2SA1163	2SC2240	2SA970		
						2SC3324	2SA1312				
2SC5233	2SA1954					2SC5232	2SA1953				
							2SA1362				
						2SC3265	2SA1298				
						2SC4210	2SA1621	2SC2120	2SA950		
								2SC3279	2SA1300		
								2SC3266	2SA1296		
		2SC6133 **	2SA2214 **								
			2SA2215 **								
		2SC6134 **									
		2SC6135 **									
			2SA2195 **								
		2SC6100 **									
				(2SC5766)						2SC5853	
										2SC5471	
										2SC5854	
										2SC6067 *	
						2SC4209	2SA1620	2SC1627	2SA817		
2SC4666						2SC3295		2SC3112			
2SC4213						2SC3326		2SC2878			
2SC4667						2SC3437		2SC752(G)TM			
						2SC3138	2SA1255				
								2SC3333	2SA1320		
						2SC4497	2SA1721	2SC2551	2SA1091		
						2SC2532		2SC982TM			

*: New product

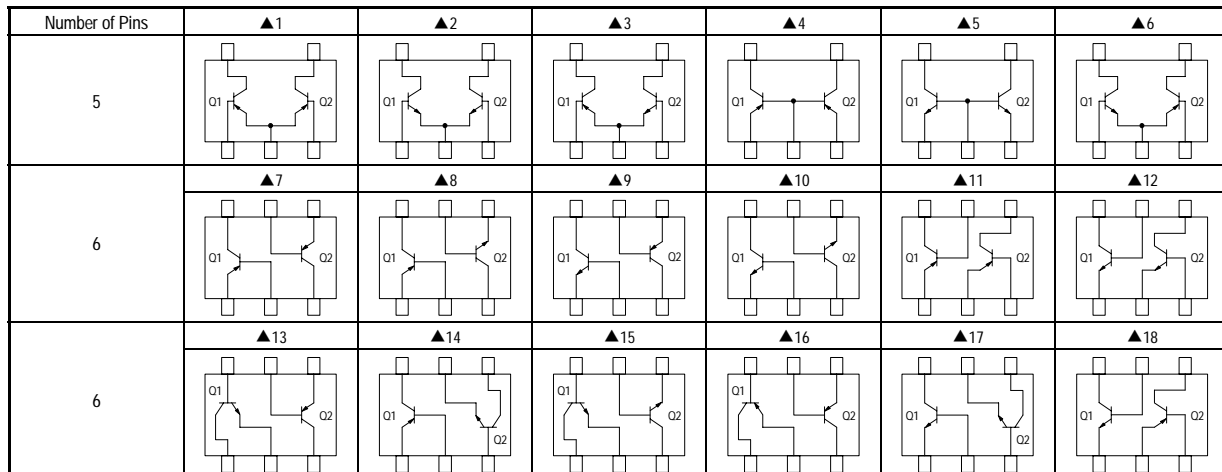
** : Under development

General-Purpose Transistors (Dual)

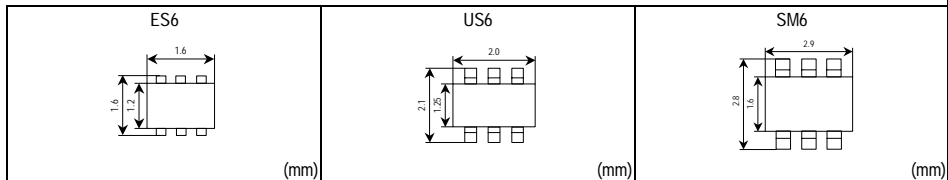
Classification	V _{CEO} (V) Max	I _C (mA) Max	Dual Type									
			CST6		fS6		ESV	USV		SMV		
												
(mm)		(mm)		(mm)	(mm)		(mm)					
			NPN + PNP	NPN	PNP	NPN + PNP	PNP + NPN	NPN	PNP	NPN	PNP	PNP + NPN
General-purpose	50	150 (100)	(HN2B26CT) (▲18) **	(HN1C26FS) (▲10) (HN2C26FS) (▲12)	(HN1A26FS) (▲7) (HN2A26FS) (▲11)	(HN1B26FS) (▲9)	HN4B01JE (▲6)	2SC4944 (▲2)	2SA1873 (▲1) HN4A56JU (▲4)	2SC4207 (▲2)	2SA1618 (▲1)	
	30	500										HN4B04J (▲3) *
	50	500										
Low noise	120	100								HN4C06J (▲2) HN4C51J (▲5)	HN4A06J (▲1) HN4A51J (▲4)	HN4B06J (▲3)
High current	12	400						HN4C05JU (▲2)				
	12	500										
	15	800										
	25	800								HN4C08J (▲2)	HN4A08J (▲1)	
	30	800										
	10	2000										
20	2000											
Strobe	10	5000										
High breakdown voltage	80	300										
High h _{FE}	50	150										
Muting	20	300										
High-speed switching	15	200										
High-voltage switching	200	50										
High breakdown voltage	250	50										
	300	100										
Darlington	40	300										

- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
- The ratings enclosed in parenthesis are for those devices whose part numbers are enclosed in parentheses.
- The products shown in bold are also manufactured in offshore fabs.
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◆Internal Connections



◆The internal connection diagrams only show the general configurations of the circuits.



ES6 (mm)			US6 (mm)			SM6 (mm)		
NPN	PNP	PNP + NPN	NPN	PNP	PNP + NPN	NPN	PNP	PNP + NPN
HN1C01FE (▲10)	HN1A01FE (▲7)		HN1C01FU (▲10)	HN1A01FU (▲7)	HN1B01FU (▲8)		HN1A01F (▲7)	HN1B01F (▲8)
HN2C01FE (▲12)	HN2A01FE (▲11)	HN1B04FE (▲9)	HN2C01FU (▲12)	HN2A01FU (▲11)	HN1B04FU (▲9)	HN1C01F (▲10)	HN3A56F (▲16)	HN3B01F (▲13)
HN3C67FE (▲17)			HN3C56FU (▲15)		HN3B02FU (▲14)			HN1B04F (▲8)
						HN1C07F (▲10)	HN1A07F (▲7)	
						HN3C51F (▲15)	HN3A51F (▲16)	
HN1C05FE (▲10)								
							HN1A02F (▲7)	
			HN1C03FU (▲10)			HN1C03F (▲10)		
			HN3C61FU (▲15)					

*: New product
 **: Under development

Bias Resistor Built-in Transistors (Single, General-Purpose)

Ratings		20							50				
		50							100				
Internal Resistors (kΩ)		FSM		CST3		CST6			CST3		VESM		
R1	R2	NPN		PNP		NPN		PNP	NPN + PNP	NPN	PNP	NPN	PNP
4.7	4.7	RN1101FS	RN2101FS	RN1101CT	RN2101CT	RN1961CT	RN2961CT			RN1101ACT	RN2101ACT	RN1101MFV	RN2101MFV
10	10	RN1102FS	RN2102FS	RN1102CT	RN2102CT	RN1962CT	RN2962CT			RN1102ACT	RN2102ACT	RN1102MFV	RN2102MFV
22	22	RN1103FS	RN2103FS	RN1103CT	RN2103CT	RN1963CT	RN2963CT			RN1103ACT	RN2103ACT	RN1103MFV	RN2103MFV
47	47	RN1104FS	RN2104FS	RN1104CT	RN2104CT	RN1964CT	RN2964CT			RN1104ACT	RN2104ACT	RN1104MFV	RN2104MFV
2.2	47	RN1105FS	RN2105FS	RN1105CT	RN2105CT	RN1965CT	RN2965CT			RN1105ACT	RN2105ACT	RN1105MFV	RN2105MFV
4.7	47	RN1106FS	RN2106FS	RN1106CT	RN2106CT	RN1966CT	RN2966CT	RN49P2ACT		RN1106ACT	RN2106ACT	RN1106MFV	RN2106MFV
10	47	RN1107FS	RN2107FS	RN1107CT	RN2107CT	RN1967CT	RN2967CT			RN1107ACT	RN2107ACT	RN1107MFV	RN2107MFV
22	47	RN1108FS	RN2108FS	RN1108CT	RN2108CT	RN1968CT	RN2968CT			RN1108ACT	RN2108ACT	RN1108MFV	RN2108MFV
47	22	RN1109FS	RN2109FS	RN1109CT	RN2109CT	RN1969CT	RN2969CT			RN1109ACT	RN2109ACT	RN1109MFV	RN2109MFV
4.7	∞	RN1110FS	RN2110FS	RN1110CT	RN2110CT	RN1970CT	RN2970CT			RN1110ACT	RN2110ACT	RN1110MFV	RN2110MFV
10	∞	RN1111FS	RN2111FS	RN1111CT	RN2111CT	RN1971CT	RN2971CT			RN1111ACT	RN2111ACT	RN1111MFV	RN2111MFV
22	∞	RN1112FS	RN2112FS	RN1112CT	RN2112CT	RN1972CT	RN2972CT			RN1112ACT	RN2112ACT	RN1112MFV	RN2112MFV
47	∞	RN1113FS	RN2113FS	RN1113CT	RN2113CT	RN1973CT	RN2973CT			RN1113ACT	RN2113ACT	RN1113MFV	RN2113MFV
1	10											RN1114MFV	RN2114MFV
2.2	10											RN1115MFV	RN2115MFV
4.7	10											RN1116MFV	RN2116MFV
10	4.7											RN1117MFV	RN2117MFV
47	10											RN1118MFV	RN2118MFV
1	—											RN1119MFV	RN2119MFV
100	100											RN1130MFV	RN2130MFV
100	∞											RN1131MFV	RN2131MFV
200	∞											RN1132MFV	RN2132MFV

- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
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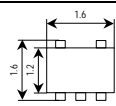
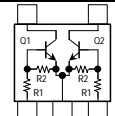
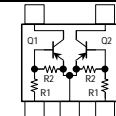
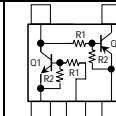
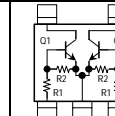
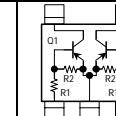
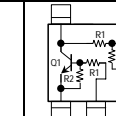
(Single, High-Current/Muting Switch)

Ratings		High Current				Muting	
		12		50		20	
Internal Resistors (kΩ)		500		800		300	
R1	R2	NPN		PNP		NPN	
1	1	RN1321A	RN2321A	RN1421	RN2421		
2.2	2.2	RN1322A	RN2322A	RN1422	RN2422		
4.7	4.7	RN1323A	RN2323A	RN1423	RN2423		
10	10	RN1324A	RN2324A	RN1424	RN2424		
0.47	10	RN1325A	RN2325A	RN1425	RN2425		
1	10	RN1326A	RN2326A	RN1426	RN2426		
2.2	10	RN1327A	RN2327A	RN1427	RN2427		
5.6	∞						RN1441
10	∞						RN1442
22	∞						RN1443
2.2	∞						RN1444

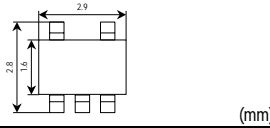
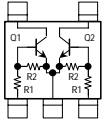
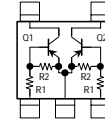
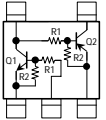
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50									
100									
ESM		SSM		USM		S-MINI		TO-92	
NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
RN1101F	RN2101F	RN1101	RN2101	RN1301	RN2301	RN1401	RN2401	RN1001	RN2001
RN1102F	RN2102F	RN1102	RN2102	RN1302	RN2302	RN1402	RN2402	RN1002	RN2002
RN1103F	RN2103F	RN1103	RN2103	RN1303	RN2303	RN1403	RN2403	RN1003	RN2003
RN1104F	RN2104F	RN1104	RN2104	RN1304	RN2304	RN1404	RN2404	RN1004	RN2004
RN1105F	RN2105F	RN1105	RN2105	RN1305	RN2305	RN1405	RN2405	RN1005	RN2005
RN1106F	RN2106F	RN1106	RN2106	RN1306	RN2306	RN1406	RN2406	RN1006	RN2006
RN1107F	RN2107F	RN1107	RN2107	RN1307	RN2307	RN1407	RN2407	RN1007	RN2007
RN1108F	RN2108F	RN1108	RN2108	RN1308	RN2308	RN1408	RN2408	RN1008	RN2008
RN1109F	RN2109F	RN1109	RN2109	RN1309	RN2309	RN1409	RN2409	RN1009	RN2009
RN1110F	RN2110F	RN1110	RN2110	RN1310	RN2310	RN1410	RN2410	RN1010	RN2010
RN1111F	RN2111F	RN1111	RN2111	RN1311	RN2311	RN1411	RN2411	RN1011	RN2011
RN1112F	RN2112F	RN1112	RN2112	RN1312	RN2312	RN1412	RN2412		
RN1113F	RN2113F	RN1113	RN2113	RN1313	RN2313	RN1413	RN2413		
RN1114F	RN2114F	RN1114	RN2114	RN1314	RN2314	RN1414	RN2414		
RN1115F	RN2115F	RN1115	RN2115	RN1315	RN2315	RN1415	RN2415		
RN1116F	RN2116F	RN1116	RN2116	RN1316	RN2316	RN1416	RN2416		
RN1117F	RN2117F	RN1117	RN2117	RN1317	RN2317	RN1417	RN2417		
RN1118F	RN2118F	RN1118	RN2118	RN1318	RN2318	RN1418	RN2418		
RN1130F	RN2130F								
RN1131F	RN2131F								
RN1132F	RN2132F								

Bias Resistor Built-in Transistors (Dual, General-Purpose (5 Pin))

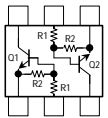
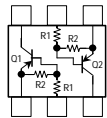
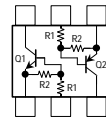
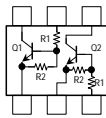
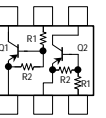
Classification	Absolute Maximum Ratings		Internal Resistors				ESV			USV			
	V _{CEO} (V)	I _c (mA)	Q1		Q2								
			(kΩ)		(kΩ)		(mm)						
			R1	R2	R1	R2							
						Common emitter	Common emitter	Collector-base connection	Common emitter	Common emitter	Collector-base connection		
General-purpose	50	100	4.7	4.7	4.7	4.7	RN1701JE	RN2701JE		RN1701	RN2701		
			10	10	10	10	RN1702JE	RN2702JE	RN47A3JE	RN1702	RN2702	RN47A3	
			22	22	22	22	RN1703JE	RN2703JE	RN47A2JE	RN1703	RN2703	RN47A2	
			47	47	47	47	RN1704JE	RN2704JE		RN1704	RN2704		
			2.2	47	2.2	47	RN1705JE	RN2705JE		RN1705	RN2705		
			4.7	47	4.7	47	RN1706JE	RN2706JE		RN1706	RN2706		
			10	47	10	47	RN1707JE	RN2707JE		RN1707	RN2707		
			22	47	22	47	RN1708JE	RN2708JE		RN1708	RN2708		
			47	22	47	22	RN1709JE	RN2709JE		RN1709	RN2709		
			4.7	—	4.7	—	RN1710JE	RN2710JE	RN47A1JE	RN1710	RN2710	RN47A1	
			10	—	10	—	RN1711JE	RN2711JE		RN1711	RN2711		
			22	—	22	—		RN2712JE					
			47	—	47	—		RN2713JE					
			1	10	1	10						RN2714	
			2.2	10	2.2	10							
			4.7	10	4.7	10							
			10	4.7	10	4.7							
			47	10	47	10							
			47	47	10	47					RN47A4JE		RN47A4
			47	47	4.7	10					RN47A5JE		RN47A5
			100	100	100	100							RN47A6
			10	10	47	10							RN47A7
				Q1: 50	Q1: 100								
	Q2: 12	Q2: 100 (Lowsat)	10	10	4.7	10				RN47A7JE			
	Q1: 50	Q1: 100											
	Q2: 30	Q2: 100 (High hFE)	10	10	10	47				RN47A8JE			
Muting	20	300	2.2	—	2.2	—							

- For the PNP transistors, the minus sign (–) indicating a negative voltage is omitted.
- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

SMV		
 (mm)		
NPN x 2	PNP x 2	NPN + PNP
 Common emitter	 Common emitter	 Collector-base connection
RN1501	RN2501	
RN1502	RN2502	
RN1503	RN2503	
RN1504	RN2504	
RN1505	RN2505	
RN1506	RN2506	
RN1507	RN2507	
RN1508	RN2508	
RN1509	RN2509	
RN1510	RN2510	
RN1511	RN2511	
RN1544		

The internal connection diagrams only show the general configurations of the circuits.

(Dual, General-Purpose (6 Pin))

Classification		IS6																
		Absolute Maximum Ratings		Internal Resistors				NPN	PNP	PNP + NPN	Absolute Maximum Ratings		Internal Resistors		NPN x 2	PNP x 2		
		V _{CEO}	I _c	Q1		Q2					V _{CEO}	I _c	Q1		Q2			
(V)	(mA)	(kΩ)		(kΩ)					(V)	(mA)	(kΩ)		(kΩ)					
General-purpose	50	80	4.7	4.7	4.7	4.7	RN1901AFS *	RN2901AFS *	RN4981AFS *	20	50	4.7	4.7	4.7	4.7	RN1961FS *	RN2961FS *	
			10	10	10	10	RN1902AFS *	RN2902AFS *	RN4982AFS *			10	10	10	10	RN1962FS *	RN2962FS *	
			22	22	22	22	RN1903AFS *	RN2903AFS *	RN4983AFS *			22	22	22	22	RN1963FS *	RN2963FS *	
			47	47	47	47	RN1904AFS *	RN2904AFS *	RN4984AFS *			47	47	47	47	RN1964FS *	RN2964FS *	
			2.2	47	2.2	47	RN1905AFS *	RN2905AFS *	RN4985AFS *			2.2	47	2.2	47	RN1965FS *	RN2965FS *	
			4.7	47	4.7	47	RN1906AFS *	RN2906AFS *	RN4986AFS *			4.7	47	4.7	47	RN1966FS *	RN2966FS *	
			10	47	10	47	RN1907AFS *	RN2907AFS *	RN4987AFS *			10	47	10	47	RN1967FS *	RN2967FS *	
			22	47	22	47	RN1908AFS *	RN2908AFS *	RN4988AFS *			22	47	22	47	RN1968FS *	RN2968FS *	
			47	22	47	22	RN1909AFS *	RN2909AFS *	RN4989AFS *			47	22	47	22	RN1969FS *	RN2969FS *	
			4.7	—	4.7	—	RN1910AFS *	RN2910AFS *	RN4990AFS *			4.7	—	4.7	—	RN1970FS *	RN2970FS *	
			10	—	10	—	RN1911AFS *	RN2911AFS *	RN4991AFS *			10	—	10	—	RN1971FS *	RN2971FS *	
			22	—	22	—	RN1912AFS *	RN2912AFS *	RN4992AFS *			22	—	22	—	RN1972FS *	RN2972FS *	
			47	—	47	—	RN1913AFS *	RN2913AFS *	RN4993AFS *			47	—	47	—	RN1973FS *	RN2973FS *	
			1	10	1	10						1	10	1	10			
			2.2	10	2.2	10						2.2	10	2.2	10			
			4.7	10	4.7	10						4.7	10	4.7	10			
			10	4.7	10	4.7						10	4.7	10	4.7			
			47	10	47	10						47	10	47	10			
			2.2	47	22	47						2.2	47	22	47			
			2.2	47	47	47						2.2	47	47	47			
			22	22	10	10						22	22	10	10			
			10	10	10	—						10	10	10	—			
			47	47	4.7	47						47	47	4.7	47			
			General-purpose (H _{FB})	40 (-30)	100	4.7	—	4.7	—						40 (-30)	100	4.7	—
			10	—	10	—						10	—	10	—			
			22	—	22	—						22	—	22	—			
Power SW	50 (-12)	100 (-500)	10	47	2.0	10				50 (-12)	100 (-500)	10	47	2.0	10			

- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

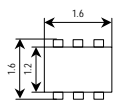
(mm)

NPN x 2	PNP x 2	NPN + PNP	NPN + PNP	NPN + PNP	NPN + PNP	Absolute Maximum Ratings		Internal Resistors				NPN + PNP
						V _{CEO} (V)	I _c (mA)	Q1		Q2		
								R1 (kΩ)	R2 (kΩ)	R1 (kΩ)	R2 (kΩ)	
RN1901FS *	RN2901FS *	RN4981FS *						4.7	4.7	4.7	4.7	
RN1902FS *	RN2902FS *	RN4982FS *						10	10	10	10	
RN1903FS *	RN2903FS *	RN4983FS *						22	22	22	22	
RN1904FS *	RN2904FS *	RN4984FS *			RN49J2FS	RN49J7FS		47	47	47	47	RN49J2AFS
RN1905FS *	RN2905FS *	RN4985FS *						2.2	47	2.2	47	
RN1906FS *	RN2906FS *	RN4986FS *						4.7	47	4.7	47	
RN1907FS *	RN2907FS *	RN4987FS *						10	47	10	47	
RN1908FS *	RN2908FS *	RN4988FS *						22	47	22	47	
RN1909FS *	RN2909FS *	RN4989FS *						47	22	47	22	
RN1910FS *	RN2910FS *	RN4990FS *						4.7	—	4.7	—	
RN1911FS *	RN2911FS *	RN4991FS *						10	—	10	—	
RN1912FS *	RN2912FS *	RN4992FS *						22	—	22	—	
RN1913FS *	RN2913FS *	RN4993FS *						47	—	47	—	
								1	10	1	10	
								2.2	10	2.2	10	
								4.7	10	4.7	10	
								10	4.7	10	4.7	
								47	10	47	10	
								2.2	47	22	47	
								2.2	47	47	47	
								22	22	10	10	
								10	10	10	—	
		RN49A6FS						47	47	4.7	47	
								4.7	—	4.7	—	
								10	—	10	—	
								22	—	22	—	
								10	47	2.0	10	

*: New product

The internal connection diagrams only show the general configurations of the circuits.

(Dual, General-Purpose (6 Pin)) (Continued)

Classification	Absolute Maximum Ratings		Internal Resistors				ES6						
	V _{CEO}	I _c	Q1		Q2		 (mm)						
			(kΩ)		(kΩ)								
	(V)	(mA)	R1	R2	R1	R2	NPN x 2	PNP x 2	NPN x 2	PNP x 2	PNP + NPN	NPN + PNP	NPN + PNP
General-purpose	50	100	4.7	4.7	4.7	4.7	RN1901FE	RN2901FE	RN1961FE	RN2961FE	RN4901FE	RN4981FE	
			10	10	10	10	RN1902FE	RN2902FE	RN1962FE	RN2962FE	RN4902FE	RN4982FE	RN4962FE
			22	22	22	22	RN1903FE	RN2903FE	RN1963FE	RN2963FE	RN4903FE	RN4983FE	
			47	47	47	47	RN1904FE	RN2904FE	RN1964FE	RN2964FE	RN4904FE	RN4984FE	
			2.2	47	2.2	47	RN1905FE	RN2905FE	RN1965FE	RN2965FE	RN4905FE	RN4985FE	
			4.7	47	4.7	47	RN1906FE	RN2906FE	RN1966FE	RN2966FE	RN4906FE	RN4986FE	
			10	47	10	47	RN1907FE	RN2907FE	RN1967FE	RN2967FE	RN4907FE	RN4987FE	
			22	47	22	47	RN1908FE	RN2908FE	RN1968FE	RN2968FE	RN4908FE	RN4988FE	
			47	22	47	22	RN1909FE	RN2909FE	RN1969FE	RN2969FE	RN4909FE	RN4989FE	
			4.7	—	4.7	—	RN1910FE	RN2910FE	RN1970FE	RN2970FE	RN4910FE	RN4990FE	
			10	—	10	—	RN1911FE	RN2911FE	RN1971FE	RN2971FE	RN4911FE	RN4991FE	
			22	—	22	—							
			47	—	47	—							
			1	10	1	10							
			2.2	10	2.2	10							
			4.7	10	4.7	10							
			10	4.7	10	4.7							
			47	10	47	10							
			2.2	47	22	47					RN49A1FE		
			2.2	47	47	47							
22	22	10	10										
10	10	10	—										
General-purpose (H _{FE})	40 (-30)	100	4.7	—	4.7	—			RN1970HFE	RN2970HFE		RN4990HFE	
			10	—	10	—			RN1971HFE	RN2971HFE		RN4991HFE	
			22	—	22	—			RN1972HFE	RN2972HFE		RN4992HFE	
Power SW	50 (-12)	100 (-500)	10	47	2.0	10							

- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
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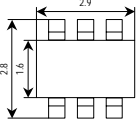
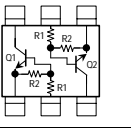
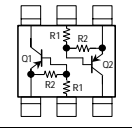
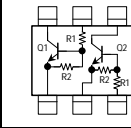
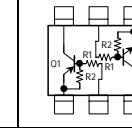
The internal connection diagrams only show the general configurations of the circuits.

Classification	Absolute Maximum Ratings		Internal Resistors				US6					
	V _{CEO} (V)	I _c (mA)	Q1		Q2		 (mm)					
			(kΩ)		(kΩ)							
			R1	R2	R1	R2						
						NPN x 2	PNP x 2	NPN x 2	PNP x 2	PNP + NPN	NPN + PNP	
General purpose	50	100	4.7	4.7	4.7	4.7	RN1901	RN2901	RN1961	RN2961	RN4901	RN4981
			10	10	10	10	RN1902	RN2902	RN1962	RN2962	RN4902	RN4982
			22	22	22	22	RN1903	RN2903	RN1963	RN2963	RN4903	RN4983
			47	47	47	47	RN1904	RN2904	RN1964	RN2964	RN4904	RN4984
			2.2	47	2.2	47	RN1905	RN2905	RN1965	RN2965	RN4905	RN4985
			4.7	47	4.7	47	RN1906	RN2906	RN1966	RN2966	RN4906	RN4986
			10	47	10	47	RN1907	RN2907	RN1967	RN2967	RN4907	RN4987
			22	47	22	47	RN1908	RN2908	RN1968	RN2968	RN4908	RN4988
			47	22	47	22	RN1909	RN2909	RN1969	RN2969	RN4909	RN4989
			4.7	—	4.7	—	RN1910	RN2910	RN1970	RN2970	RN4910	RN4990
			10	—	10	—	RN1911	RN2911	RN1971	RN2971	RN4911	RN4991
			22	—	22	—						
			47	—	47	—			RN1973			
			1	10	1	10						
			2.2	10	2.2	10				RN2975		
			4.7	10	4.7	10						
			10	4.7	10	4.7						
			47	10	47	10						
			2.2	47	22	47					RN49A1	
			2.2	47	47	47					RN49A2	
22	22	10	10									
10	10	10	—									
General purpose (H _{FE})	40 (-30)	100	4.7	—	4.7	—						
			10	—	10	—						
			22	—	22	—						
Power SW	50 (-12)	100 (-500)	10	47	2.0	10					RN49A5	

- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

The internal connection diagrams only show the general configurations of the circuits.

(Dual, General-Purpose (6 Pin)) (Continued)

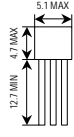
Classification	Absolute Maximum Ratings		Internal Resistors				SM6			
	V _{CEO} (V)	I _C (mA)	Q1		Q2		 (mm)			
			(kΩ)		(kΩ)					
			R1	R2	R1	R2	 NPN x 2	 PNP x 2	 NPN x 2	 PNP + NPN
General-purpose	50	100	4.7	4.7	4.7	4.7	RN1601	RN2601		RN4601
			10	10	10	10	RN1602	RN2602		RN4602
			22	22	22	22	RN1603	RN2603		RN4603
			47	47	47	47	RN1604	RN2604		RN4604
			2.2	47	2.2	47	RN1605	RN2605		RN4605
			4.7	47	4.7	47	RN1606	RN2606		RN4606
			10	47	10	47	RN1607	RN2607		RN4607
			22	47	22	47	RN1608	RN2608		RN4608
			47	22	47	22	RN1609	RN2609		RN4609
			4.7	—	4.7	—	RN1610	RN2610		RN4610
			10	—	10	—	RN1611	RN2611		RN4611
			22	—	22	—				RN4612
			47	—	47	—			RN1673	
			1	10	1	10				
			2.2	10	2.2	10				
			4.7	10	4.7	10				
			10	4.7	10	4.7				
			47	10	47	10				
			2.2	47	22	47				
			2.2	47	47	47				
22	22	10	10				RN46A1			
10	10	10	—							
General-purpose (H _{FB})	40 (-30)	100	4.7	—	4.7	—				
			10	—	10	—				
			22	—	22	—				
Power SW	50 (-12)	100 (-500)	10	47	2.0	10				

- For the PNP transistors, the minus sign (-) indicating a negative voltage is omitted.
- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

The internal connection diagrams only show the general configurations of the circuits.

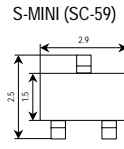
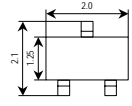
Small-Signal FETs

Junction FETs (Single) (Leaded Type)

Classification	V _{GDS} (V) Max	I _G (mA) Max	I _{DSS} (mA)	Y _{fs} (mS) Min	Package	
					TO-92 (SC-43)	
					 (mm)	
Nch		Pch				
General-purpose	-50	10	1.2 to 14	1.5	2SK246	—
	50	-10	-1.2 to -14	1	—	2SJ103
	-50	10	1.2 to 14	4	2SK117	—
	-50	10	1.2 to 14	5	2SK362	—
	-40	10	5 to 30	25	2SK363	—
Low noise	-40	10	2.6 to 20	12	2SK364	—
	-50	10	0.3 to 6.5	1.2	2SK30ATM	—
	-40	10	2.6 to 20	—	2SK170	—
	-40	10	2.6 to 20	25	2SK369	—

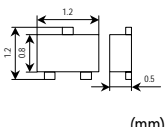
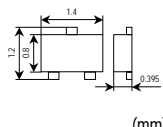
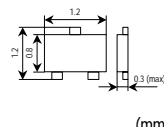
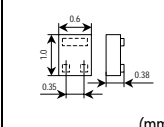
- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(Surface-Mount Type)

Classification	V _{GDS} (V) Max	I _G (mA) Max	I _{DSS} (mA)	Y _{fs} (mS) Min	Package			
					S-MINI (SC-59)		USM (SC-70)	
					 (mm)		 (mm)	
Nch		Pch		Nch		Pch		
General-purpose	-50	10	0.3 to 6.5	1.2	2SK208	—	2SK879	—
	50	-10	-1.2 to -14	1	—	2SJ106	—	2SJ144
	-50	10	1.2 to 14	4	2SK209	—	2SK880	—

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

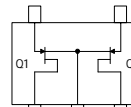
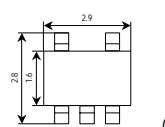
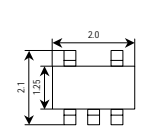
(Surface-Mount Type) (Electret Condense Microphone)

Characteristics	V _{GDS} (V) Max	I _G (mA) Max	I _{DSS} Rank (μ A)	Y _f s (mS) Min	C _{iss} (pF) Typ.	Package			
						VESM  (mm)	TESM3  (mm)	VESM2  (mm)	CST3  (mm)
High gain Low THD Low Noise Small C _{iss}	-20	10	A = 80 to 200 B = 170 to 300	0.55	3.6	2SK3582MFV *	2SK3582TK	2SK3582TV	2SK3582CT
High gain Low THD Low Noise Small C _{iss}	-20	10	A = 140 to 240 B = 210 to 350	0.9	3.5	2SK3857MFV *	2SK3857TK	2SK3857TV	2SK3857CT
High gain Small C _{iss}	-20	10	A = 140 to 240 B = 210 to 350 BK = 210 to 400 C = 320 to 500	1.35	4.0	2SK4059MFV *	2SK4059TK	2SK4059TV	2SK4059CT

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

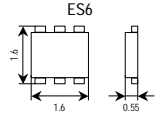
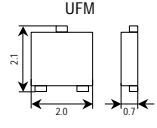
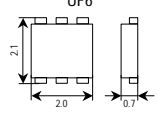
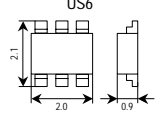
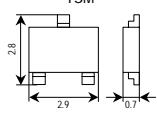
Junction FETs (Dual) (Surface-Mount Type)

Classification	V _{GDS} (V)	I _G (mA)	I _{DSS} (mA)	Y _f s (mS) Min	Package				◆ Internal Connections 
					SMV  (mm)		USV  (mm)		
					Nch x 2	Pch x 2	Nch x 2	Pch x 2	
General-purpose	-50	10	1.2 to 14	4	2SK2145	—	2SK3320	—	

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

◆ The internal connection diagrams only show the general configurations of the circuits.

Small-Signal MOSFETs (High Current Series Single Type Pch)

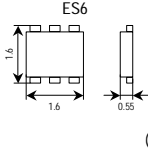
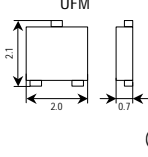
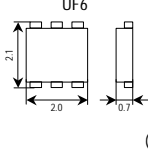
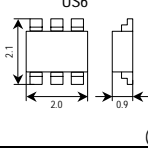
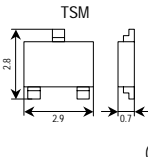
Package	Part Number	V _{DS} (V)	V _{GS} (V)	I _D (A)	R _{DS(ON)} Max (mΩ)				C _{iss} (pF)
					V _{GS} = 1.5 V	V _{GS} = 1.8 V	V _{GS} = 2.5 V	V _{GS} = 4.0 V	
 <p>ES6 (mm)</p>	SSM6J53FE	-20	±8	-1.8	364	204	136	—	400
	SSM6J206FE	-20	±8	-2.0	—	320	186	130	335
	SSM6J205FE	-20	±8	-0.8	—	460	306	234	250
	SSM6J26FE	-20	±8	-0.5	—	980	330	230	250
	SSM6J23FE	-12	±8	-1.2	—	—	210	160	420
	SSM6J25FE	-20	±12	-0.5	—	—	430	260	218
	SSM6J207FE	-30	±20	-1.4	—	—	—	491	137
 <p>UFM (mm)</p>	SSM3J120TU	-20	±8	-4.0	140	78	49	38	1484
	SSM3J115TU	-20	±8	-2.2	353	193	125	98	568
	SSM3J110TU	-12	±8	-2.3	—	240	145	94	550
	SSM3J109TU	-20	±8	-2.0	—	300	172	130	335
	SSM3J108TU	-20	±8	-1.8	—	363	230	158	250
	SSM3J113TU	-20	±12	-1.7	—	449 (@2.0 V)	249	169	370
	SSM3J111TU	-20	±12	-1.0	—	—	680	480	160
	SSM3J117TU	-30	±20	-2.0	—	—	—	225	280
	SSM3J118TU	-30	±20	-1.4	—	—	—	480	137
SSM3J112TU	-30	±20	-1.1	—	—	—	790	86	
 <p>UF6 (mm)</p>	SSM6J51TU	-12	±8	-4.0	150	85	54	—	1700
	SSM6J21TU	-12	±12	-3.0	—	—	88	50	1300
	SSM6J50TU	-20	±10	-2.5	—	205 (@2.0 V)	100	64 (@4.5 V)	800
	SSM6J401TU	-30	±20	-2.5	—	—	—	145	730
	SSM6J402TU	-30	±20	-2.0	—	—	—	225	280
 <p>US6 (mm)</p>	SSM6J08FU	-20	±12	-1.3	—	460 (@2.0 V)	260	180	370
	SSM6J06FU	-20	±12	-0.65	—	—	700	500	160
	SSM6J07FU	-30	±20	-0.8	—	—	—	800	130
 <p>TSM (mm)</p>	SSM3J13T	-12	±8	-3	—	180 (@2.0 V)	95	70	890
	SSM3J312T	-12	±8	-2.7	—	237	142	91	550
	SSM3J304T	-20	±8	-2.3	—	297	169	127	335
	SSM3J317T *	-20	±8	-3.6	—	306	144	107 (@4.5 V)	395
	SSM3J313T	-20	±8	-1.6	—	640	396	268	170
	SSM3J307T **	-20	±8	-5.0	83	—	—	—	1170
	SSM3J01T	-30	±10	-1.7	—	—	600	400	240
	SSM3J02T	-30	±10	-1.5	—	—	700	500	150
	SSM3J314T	-30	±20	-3.5	—	—	—	100	505
	SSM3J14T	-30	±20	-2.7	—	—	—	170	413
SSM3J306T	-30	±20	-2.4	—	—	—	225	280	
SSM3J305T	-30	±20	-1.7	—	—	—	477	137	

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

** : Under development

(High Current Series Single Type Nch)

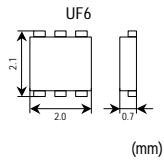
Package	Part Number	V _{DSS} (V)	V _{GS} (V)	I _D (A)	R _{DS(ON)} Max (mΩ)				C _{ISS} (pF)
					V _{GS} = 1.5 V	V _{GS} = 1.8 V	V _{GS} = 2.5 V	V _{GS} = 4.0 V	
 <p>ES6 (mm)</p>	SSM6K203FE	20	±10	2.8	153	106	76	61	400
	SSM6K202FE	30	±12	2.3	—	132	95	85	270
	SSM6K204FE	20	±10	2.0	307	214	164	126	195
	SSM6K208FE *	30	±12	1.9	—	296	177	133	123
	SSM6K25FE	30	±12	0.5	—	395	190	145 (@4.5 V)	268
	SSM6K24FE	30	±12	0.5	—	—	180	145	245
	SSM6K22FE	20	±12	1.4	—	—	230	170	125
	SSM6K30FE	20	±20	1.2	—	—	—	420	60
	SSM6K31FE	20	±20	1.2	—	—	—	540	36
 <p>UFM (mm)</p>	SSM6K210FE	30	±20	1.4	—	—	—	371	57
	SSM3K123TU	20	±10	4.2	66	43	32	28	1010
	SSM3K121TU	20	±10	3.2	140	93	63	48	400
	SSM3K104TU	20	±12	3.0	—	110	74	56	320
	SSM3K119TU	30	±12	2.5	—	122	85	80	270
	SSM3K102TU	20	±12	2.6	—	154	99	71	268
	SSM3K116TU	30	±12	2.2	—	—	135	100	245
	SSM3K122TU	20	±10	2.0	307	214	164	126	195
	SSM3K101TU	20	±12	2.2	—	230	138	103	125
	SSM3K127TU	30	±12	2.0	—	286	167	123	123
	SSM3K126TU	30	±20	3.9	—	—	—	43	800
	SSM3K124TU	30	±20	2.4	—	—	—	120	180
	SSM3K105TU	30	±20	2.1	—	—	—	200	102
	SSM3K107TU	20	±20	1.5	—	—	—	410	60
SSM3K128TU	30	±20	1.5	—	—	—	360	57	
SSM3K106TU	20	±20	1.2	—	—	—	530	36	
 <p>UF6 (mm)</p>	SSM6K403TU	20	±10	3.7	72	50	39	35	1050
	SSM6K18TU	20	±12	4.0	—	—	54	40	1100
	SSM6K404TU	20	±10	3.0	147	100	70	55	400
	SSM6K405TU	20	±10	2.0	304	211	161	123	195
	SSM6K406TU **	30	±20	4.3	—	—	—	39 (@4.5 V)	490
	SSM6K34TU	30	±20	3.0	—	—	—	77 (@4.5 V)	470
	SSM6K32TU	60	±20	2.0	—	—	—	440	140
SSM6K407TU	60	±20	2.0	—	—	—	440	150	
 <p>US6 (mm)</p>	SSM6K08FU	20	±12	1.6	—	210 (@2.0 V)	140	105	306
	SSM6K06FU	20	±12	1.1	—	—	210	160	125
	SSM6K07FU	30	±20	1.5	—	—	—	220	102
 <p>TSM (mm)</p>	SSM3K310T	20	±10	5.0	66	43	32	28	1120
	SSM3K309T	20	±12	4.7	—	47	35	31	1020
	SSM3K301T	20	±12	3.5	—	110	74	56	320
	SSM3K302T	30	±12	3.0	—	131	87	71	270
	SSM3K316T *	30	±12	4.0	—	131	87	65 (@4.5 V)	270
	SSM3K01T	30	±10	3.2	—	—	150	120	152
	SSM3K02T	30	±10	2.5	—	—	250	200	115
	SSM3K311T	30	±20	4.6	—	—	—	43	910
	SSM3K14T	30	±20	4.0	—	—	—	67	460
	SSM3K303T	30	±20	2.9	—	—	—	120	180
SSM3K12T	30	±20	3.0	—	—	—	175	120	

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

** : Under development

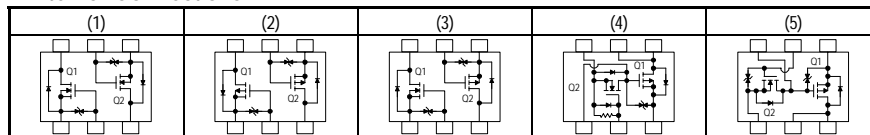
(High Current Series Dual Type)

Package	Polarity	Part Number	V _{DS} (V)	V _{GS} (V)	I _D (A)	R _{DS(ON)} Max (mΩ)				C _{ISS} (pF)	Internal FETs	Internal Connection Diagrams
						V _{GS} = 1.5 V	V _{GS} = 1.8 V	V _{GS} = 2.5 V	V _{GS} = 4.0 V			
 (mm)	Nch x 2	SSM6N39TU *	20	±10	1.6	247	190	139	119	260	—	(1)
		SSM6N29TU	20	±12	0.8	—	235	178	143	268	SSM3K102TU x 2	
		SSM6N25TU	20	±12	0.5	—	395	190	145	268	SSM6K25FE x 2	
		SSM6N24TU	30	±12	0.5	—	—	180	145	245	SSM6K24FE x 2	
		SSM6N40TU *	30	±20	1.6	—	—	—	182	180	—	
	Pch x 2	SSM6P54TU	-20	±8	-1.2	555	350	228	—	331	—	(2)
		SSM6P39TU *	-20	±8	-1.5	—	430	294	213	250	—	
		SSM6P28TU	-20	±8	-0.8	—	460	306	234	250	SSM3J108TU x 2	
		SSM6P26TU	-20	±8	-0.5	—	980	330	230	250	SSM6J26FE x 2	
		SSM6P25TU	-20	±12	-0.5	—	—	430	260	218	SSM6J25FE x 2	
		SSM6P40TU *	-30	±20	-1.4	—	—	—	403	120	—	
	Nch + Pch	SSM6L39TU *	20	±10	1.6	247	190	139	119	260	SSM6N39TU + SSM6P39TU	(3)
			-20	±8	-1.5	—	430	294	213	250	—	
		SSM6L13TU	20	±12	0.8	—	235	178	143	268	SSM3K102TU + SSM3J108TU	
			-20	±8	-0.8	—	460	306	234	250	—	
		SSM6L10TU	20	±12	0.5	—	395	190	145	268	SSM6K25FE + SSM6J26FE	
			-20	±8	-0.5	—	980	330	230	250	—	
		SSM6L11TU	20	±12	0.5	—	395	190	145	268	SSM6K25FE + SSM6J25FE	
			-20	±12	-0.5	—	—	430	260	218	—	
		SSM6L12TU	30	±12	0.5	—	—	180	145	245	SSM6K24FE + SSM6J25FE	
			-20	±12	-0.5	—	—	430	260	218	—	
	SSM6L40TU *	30	±20	1.6	—	—	—	182	180	SSM6N40TU + SSM6P40TU		
		-30	±20	-1.4	—	—	—	403	120	—		
	Nch + Pch	SSM6E03TU	20	±10	0.1	15000	—	4000	3000	9.3	SSM3K16FU	(5)
-20			±8	-1.8	—	320	186	130	335	SSM3J109TU		
SSM6E01TU		20	±10	0.05	—	—	10000	—	11	SSM3K04FE	(4)	
	-12	±12	-1	—	—	240	160	310	—			

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

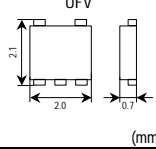
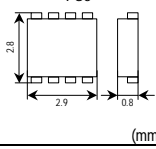
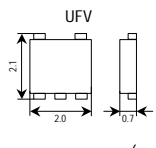
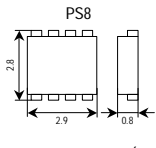
*: New product

◆ Internal Connections



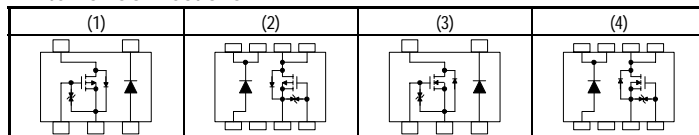
◆ The internal connection diagrams only show the general configurations of the circuits.

(High Current Series MOSFET + SBD)

Package	Polarity	Part Number	MOSFET						SBD				Internal Connection Diagrams	
			V _{DSS} (V)	V _{GSS} (V)	I _D (A)	R _{DS(ON)} Max (mΩ)			C _{iss} (pF)	V _R (V)	I _R (V)	V _F Max (V)		
						V _{GS} = 1.8 V	V _{GS} = 2.5 V	V _{GS} = 4.0 V				I _F = 0.5 A		I _F = 0.3 A
 (mm)	Pch + SBD	SSM5G10TU	-20	±8	-1.5	430	294	213	250	20	0.7	0.39	—	(1)
		SSM5G09TU	-12	±8	-1.5	—	200	130	550	12	0.5	0.43	—	
		SSM5G02TU	-12	±12	-1	—	240	160	310	12	0.5	0.43	—	
		SSM5G04TU	-12	±12	-1	—	420	240	170	12	0.5	0.43	—	
		SSM5G11TU	-30	±20	-1.4	—	—	403	120	30	0.7	0.41	—	
		SSM5G01TU	-30	±20	-1	—	—	800	86	20	0.5	—	0.45	
 (mm)		TPCP8BA1	-20	±12	-1.3	—	260	180	370	25	0.7	0.41	—	(2)
 (mm)	Nch + SBD	SSM5H10TU	20	±10	1.6	190	139	119	260	20	0.7	0.39	—	(3)
		SSM5H05TU	20	±12	1.5	—	220	160	125	12	0.5	0.43	—	
		SSM5H08TU	20	±12	1.5	—	220	160	125	20	0.5	—	0.45	
		SSM5H03TU	12	±12	1.4	—	—	300	125	12	0.5	0.43	—	
		SSM5H11TU	30	±20	1.6	—	—	182	180	30	0.7	0.41	—	
		SSM5H12TU	30	±12	2.0	286	167	123	123	30	0.7	0.41	—	
		SSM5H01TU	30	±20	1.4	—	—	450	106	20	0.5	—	0.45	
 (mm)		TPCP8AA1	20	±12	1.6	—	140	105	306	25	0.7	0.41	—	(4)

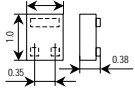


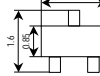
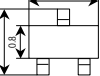
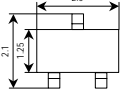
• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

◆ Internal Connections



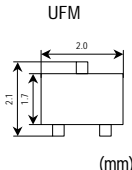
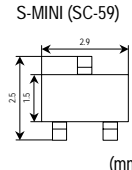
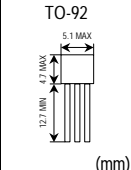
◆ The internal connection diagrams only show the general configurations of the circuits.

(Standard Family Single Type)

Polarity	Absolute Maximum Ratings			Package					
	V _{DS} (V)	V _{GSS} (V)	I _D (mA)	CST3	VESM	TESM	ESM	SSM	USM (SC-70)
				 (mm)	 (mm)	 (mm)	 (mm)	 (mm)	 (mm)
Nch	20	10	50					2SK1830	2SK1829
	20	10	100					2SK2825	2SK2824
	20	10	100					2SK2035	2SK2034
	20	10	100		SSM3K03FV	SSM3K03TE	SSM3K03FE		
	20	10	100						2SK2037
	20	10	100		SSM3K04FV ★		SSM3K04FE ★	SSM3K04FS ★	SSM3K04FU ★
	20	±10	100	SSM3K16CT	SSM3K16FV	SSM3K16TE		SSM3K16FS	SSM3K16FU
	20	±10	180	SSM3K35CT *	SSM3K35MFV *			SSM3K35FS *	
	20	±10	500		SSM3K36MFV *			SSM3K36FS *	
	20	±12	400						SSM3K05FU
	30	±20	100	SSM3K15CT	SSM3K15FV	SSM3K15TE		SSM3K15FS	SSM3K15FU
	30	±20	200						
	30	±20	400						SSM3K09FU
	50	±7	100						SSM3K17FU
	50	10	50						2SK1827
	60	±20	200						SSM3K7002FU
60	±20	200						SSM3K7002AFU	
Pch	-20	-7	-50					2SJ347	2SJ346
	-20	±8	-330		SSM3J36MFV *			SSM3J36FS *	
	-20	±12	-200						SSM3J05FU
	-20	±10	-100	SSM3J16CT	SSM3J16FV	SSM3J16TE		SSM3J16FS	SSM3J16FU
	-20	±10	-100	SSM3J35CT *	SSM3J35MFV *			SSM3J35FS *	
	-30	±20	-100	SSM3J15CT	SSM3J15FV	SSM3J15TE		SSM3J15FS	SSM3J15FU
	-30	±20	-200						
	-30	±20	-200						SSM3J09FU
	-50	-7	-50						2SJ344
-60	±20	-200							

★: Internal 1-MΩ resistor (R_{CS})

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

	UFM  (mm)	S-MINI (SC-59)  (mm)	TO-92  (mm)	Vth (V)		Ron (Ω)		@VGS (V)	ton (ns) Typ.	toff (ns) Typ.
				Min	Max	Typ.	Max			
		2SK1828		0.5	1.5	20	40	2.5	140	140
		2SK2823		0.5	1.0	15	50	1.2	350	200
		2SK2033		0.5	1.5	8	12	2.5	160	150
				0.7	1.3	4	12	2.5	160	190
		2SK2036		0.5	1.5	3.5	6.0	2.5	280	340
				0.7	1.3	4	12	2.5	160	190
				0.6	1.1	5.2	15	1.5	70	125
				0.4	1.0	5	20	1.2	115	300
		SSM3K36TU *		0.35	1.0	0.95	1.52	1.5	30	75
				0.6	1.1	0.85	1.2	2.5	60	70
		SSM3K15F		0.8	1.5	4	7	2.5	50	180
		2SK2009		0.5	1.5	1.2	2.0	2.5	60	120
				1.1	1.8	0.8	1.2	4	72	68
				0.9	1.5	22	40	2.5	100	40
		2SK1826		0.8	2.5	20	50	4	110	150
		SSM3K7002F		1.0	2.5	2.2	3.3	4.5	2.4	26
		SSM3K7002AF		1.0	2.5	1.8	3.3	4.5	3	7
		2SK1062	2SK982	2.0	3.5	0.6	1.0	10	14	75
		2SJ345		-0.5	-1.5	20	40	-2.5	150	130
		SSM3J36TU *		-0.3	-1.0	2.23	3.60	-1.5	90	200
				-0.6	-1.1	3.2	4.0	-2.5	70	70
				-0.6	-1.1	18	45	-1.5	130	190
				-0.4	-1.0	11	44	-1.2	175	251
		SSM3J15F		-1.1	-1.7	14	32	-2.5	65	175
		2SJ305		-0.5	-1.5	2.4	4.0	-2.5	60	150
				-1.1	-1.8	3.3	4.2	-4	85	85
		2SJ343		-0.8	-2.5	20	50	-4	150	130
		2SJ168	2SJ148	-2.0	-3.5	1.3	2.0	-10	14	100

*: New product

Small-Signal MOSFETs (Dual) (Standard Family Dual Type)

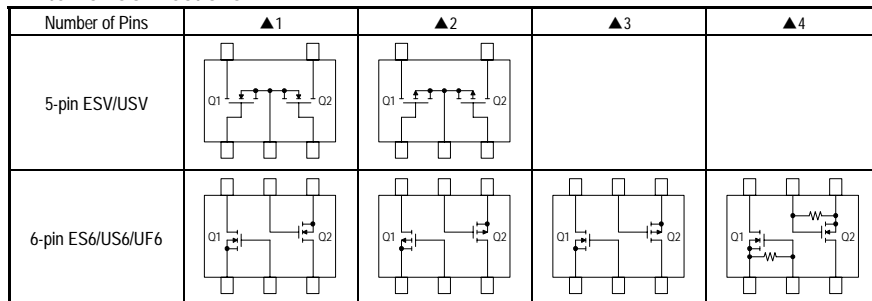
Polarity	Absolute Maximum Ratings			Package					Internal FETs	Vth (V)		Ron (Ω)		
	Vds (V)	Vgss (V)	Id (mA)	ESV	ES6	USV	US6	UF6		Min	Max	Typ.	Max	@VGS (V)
				(mm)	(mm)	(mm)	(mm)	(mm)						
Nch x 2	20	10	50				HN1K02FU ▲1		2SK1829 x 2	0.5	1.5	20	40	2.5
	20	10	100				HN4K03JU ▲1	HN1K03FU ▲1	2SK2034 x 2	0.5	1.5	8	12	2.5
	20	10	100					HN1K05FU ▲1	2SK2824 x 2	0.5	1	15	50	1.2
	20	10	100					HN1K06FU ▲1	2SK2037 x 2	0.5	1.5	3.5	6	2.5
	20	10	100					SSM6N04FU ★▲4	SSM3K04FU x 2	0.7	1.3	4	12	2.5
	20	10	100	SSM5N03FE ▲1	SSM6N03FE ▲1				SSM3K03FE x 2	0.7	1.3	4	12	2.5
	20	±10	100	SSM5N16FE ▲1	SSM6N16FE ▲1	SSM5N16FU ▲1	SSM6N16FU ▲1		SSM3K16FU x 2	0.6	1.1	5.2	15	1.5
	20	±10	180		SSM6N35FE ▲1		SSM6N35FU ▲1		SSM3K35MFV x 2	0.4	1.0	5	20	1.2
	20	±10	500		SSM6N36FE ▲1 *			SSM6N36TU ▲1 *	SSM3K36TU x 2	0.35	1.0	0.95	1.52	1.5
	20	±12	400			SSM5N05FU ▲1	SSM6N05FU ▲1		SSM3K05FU x 2	0.6	1.1	0.85	1.2	2.5
	30	±20	100	SSM5N15FE ▲1	SSM6N15FE ▲1	SSM5N15FU ▲1	SSM6N15FU ▲1		SSM3K15FU x 2	0.8	1.5	4	7	2.5
	30	±20	400				SSM6N09FU ▲1		SSM3K09FU x 2	1.1	1.8	0.8	1.2	4
	50	10	50				HN1K04FU ▲1		2SK1827 x 2	0.8	2.5	20	50	4
	50	±7	100				SSM6N17FU ▲1		SSM3K17FU x 2	0.9	1.5	2.2	40	2.5
	60	±20	200				SSM6N7002FU ▲1		SSM3K7002FU x 2	1.0	2.5	2.2	3.3	4.5
60	±20	200				SSM6N7002AFU ▲1		SSM3K7002AFU x 2	1.0	2.5	1.8	3.3	4.5	
Pch x 2	-20	-7	-50				HN1J02FU ▲2		2SJ346 x 2	-0.5	-1.5	20	40	-2.5
	-20	±10	-100	SSM5P16FE ▲2	SSM6P16FE ▲2	SSM5P16FU ▲2	SSM6P16FU ▲2		SSM3J16FU x 2	-0.6	-1.1	18	45	-1.5
	-20	±10	-100		SSM6P35FE ▲2 *		SSM6P35FU ▲2 *		SSM3J35FU x 2	-0.4	-1.0	11	44	-1.2
	-20	±8	-330		SSM6P36FE ▲2 *			SSM6P36TU ▲2 *	SSM3J36TU x 2	-0.3	-1.0	2.23	3.6	-1.5
	-20	±12	-200			SSM5P05FU ▲2	SSM6P05FU ▲2		SSM3J05FU x 2	-0.6	-1.1	3.2	4	-2.5
	-30	±20	-200				SSM6P09FU ▲2		SSM3J09FU x 2	-1.1	-1.8	3.3	4.2	-4
	-30	±20	-100	SSM5P15FE ▲2	SSM6P15FE ▲2	SSM5P15FU ▲2	SSM6P15FU ▲2		SSM3J15FU x 2	-1.1	-1.7	14	32	-2.5
Nch + Pch	20	10	50				HN1L02FU ▲3		2SK1829	0.5	1.5	20	40	2.5
	-20	-7	-50						+ 2SJ346	-0.5	-1.5	20	40	-2.5
	50	10	50				HN1L03FU ▲3		2SK1827	0.8	2.5	20	50	4
	-20	-7	-50						+ 2SJ346	-0.5	-1.5	20	40	-2.5
	20	±10	100						SSM3K16FS	0.6	1.1	5.2	15	1.5
	-20	±10	-100		SSM6L16FE ▲3				SSM3J16FS	-0.6	-1.1	18	45	-1.5
	20	±10	180		SSM6L35FE ▲3 *		SSM6L35FU ▲3 *		SSM3K35FU	0.4	1.0	5	20	1.2
	-20	±10	-100						+ SSM3J35FU	-0.4	-1.0	11	4.4	-1.2
	20	±10	500		SSM6L36FE ▲3 *			SSM6L36TU ▲3 *	SSM3K36TU	0.35	1.0	0.95	1.52	1.5
	-20	±8	-330						+ SSM3J36TU	-0.3	-1.0	2.23	3.6	-1.5
	20	±12	400					SSM6L05FU ▲3	SSM3K05FU	0.6	1.1	0.85	1.2	2.5
	-20	±12	-200						SSM3J05FU	-0.6	-1.1	3.2	4	-2.5
30	±20	400					SSM6L09FU ▲3	SSM3K09FU	1.1	1.8	0.8	1.2	4	
-30	±20	-200						SSM3J09FU	-1.1	-1.8	3.3	4.2	-4	

★: Internal 1-MΩ resistor (Rcs)

*: New product

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

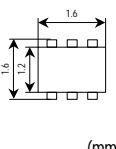
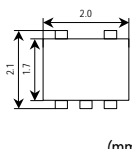
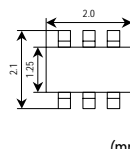
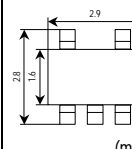
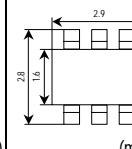
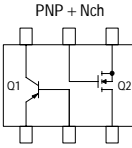
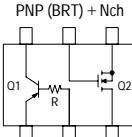
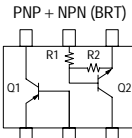
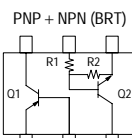
◆Internal Connections



◆The internal connection diagrams only show the general configurations of the circuits.

Combination Products of Different Type Devices

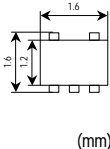
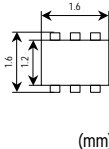
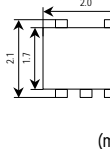
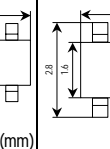
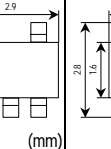
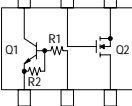
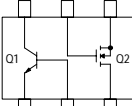
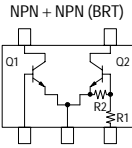
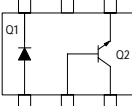
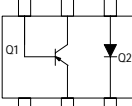
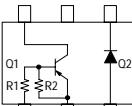
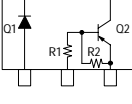
Combination Products of Different Type Devices (5-Pin Packages (UFV, SMV), 6-Pin Packages (ES6, US6, SM6))

Internal Connections	Part Number					Component Devices	Ratings			Features
	ES6 Package  (mm)	UFV Package  (mm)	US6 Package  (mm)	SMV Package  (mm)	SM6 Package  (mm)		Breakdown Voltage (V)	Current (mA)		
	—	—	HN7G01FU	—	—	Q1 2SA1955 Q2 2SK1829	V _{CEO} 20 V _{DS} 12	I _C 50 I _D -400	PNP Low V _{CE(SAT)} , suitable for power supply switches 2.5-V gate drive (V _{th} = 1.5 V max), Ron = 20 Ω typ.	
	HN7G01FE	—	—	—	—	Q1 2SA1955 Q2 SSM3K03FE	V _{CEO} 20 V _{DS} 12	I _C 50 I _D -400	PNP Low V _{CE(SAT)} , suitable for power supply switches 2.5-V gate drive (V _{th} = 1.3 V max), Ron = 4 Ω typ.	
	—	—	HN7G03FU	—	—	Q1 2SA1955 Q2 SSM3K04FU	V _{CEO} 20 V _{DS} 12	I _C 100 I _D -400	PNP Low V _{CE(SAT)} , suitable for power supply switches Internal 1-MΩ resistor (R _{GS}) 2.5-V gate drive (V _{th} = 1.3 V max), Ron = 4 Ω typ.	
	—	—	—	—	—	Q1 RN2310 Q2 2SK1829	V _{CEO} 20 V _{DS} 12	I _C 50 I _D -100	PNP (Internal resistors), R = 4.7 kΩ 2.5-V gate drive (V _{th} = 1.5 V max), Ron = 20 Ω typ.	
	—	—	HN7G02FU	—	—	Q1 RN2310 Q2 SSM3K03FE	V _{CEO} 20 V _{DS} 12	I _C 50 I _D -100	PNP (Internal resistors), R = 4.7 kΩ 2.5-V gate drive (V _{th} = 1.3 V max), Ron = 4 Ω typ.	
	HN7G02FE	—	—	—	—	Q1 RN2310 Q2 SSM3K03FE	V _{CEO} 20 V _{DS} 12	I _C 50 I _D -100	PNP (Internal resistors), R = 4.7 kΩ 2.5-V gate drive (V _{th} = 1.3 V max), Ron = 4 Ω typ.	
	—	—	HN7G04FU	—	—	Q1 2SA1955 Q2 RN1307	V _{CEO} 50 V _{DS} 12	I _C 100 I _D -400	PNP Low V _{CE(SAT)} , suitable for power supply switches NPN (Internal resistors), R1 = 10 kΩ, R2 = 47 kΩ	
	—	—	—	—	—	Q1 RN2101 Q2 2SK1830	V _{CEO} 20 V _{DS} 12	I _C 50 I _D -100	PNP (Internal resistors), R1 = 4.7 kΩ, R2 = 4.7 kΩ 2.5-V gate drive (V _{th} = 1.5 V max), Ron = 20 Ω typ.	
	HN7G06FE *	—	HN7G06FU	—	—	Q1 2SA1955 Q2 RN1104	V _{CEO} 50 V _{DS} 12	I _C 100 I _D -400	PNP Low V _{CE(SAT)} , suitable for power supply switches NPN (Internal resistors), R1 = 47 kΩ, R2 = 47 kΩ	
	HN7G08FE	—	—	—	—	Q1 2SA1955 Q2 RN1306	V _{CEO} 50 V _{DS} 12	I _C 100 I _D -400	PNP Low V _{CE(SAT)} , suitable for power supply switches NPN (Internal resistors), R1 = 4.7 kΩ, R2 = 47 kΩ	
	—	—	HN7G07FU	—	—	Q1 2SC5376 Q2 RN1115	V _{CEO} 50 V _{DS} 12	I _C 400 I _D 100	NPN Low V _{CE(SAT)} , suitable for power supply switches NPN (Internal resistors), R1 = 2.2 kΩ, R2 = 10 kΩ	
	—	—	—	—	—	Q1 2SC5376 Q2 RN1115	V _{CEO} 50 V _{DS} 12	I _C 400 I _D 100	NPN Low V _{CE(SAT)} , suitable for power supply switches NPN (Internal resistors), R1 = 2.2 kΩ, R2 = 10 kΩ	

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product
The internal connection diagrams only show the general configurations of the circuits.

Combination Products of Different Type Devices (5-Pin Packages (UFV, SMV), 6-Pin Packages (ES6, US6, SM6)) (Continued)

Internal Connections	Part Number						Component Devices	Ratings			Features	
	ESV Package  (mm)	ES6 Package  (mm)	UFV Package  (mm)	USV Package  (mm)	SMV Package  (mm)	SM6 Package  (mm)		Breakdown Voltage (V)	Current (mA)			
	—	HN7G09FE	—	—	—	—	Q1 RN1104F	V_{CE0}	50	I_C	100	NPN (Internal resistors), $R_1 = 47\text{ k}\Omega$, $R_2 = 47\text{ k}\Omega$
	—	—	—	—	—	—	Q2 SSM3K15FS	V_{DS}	30	I_D	100	2.5-V gate drive ($V_{th} = 1.5\text{ V max}$), $R_{on} = 4\ \Omega\text{ typ.}$
	—	HN7G10FE	—	—	—	—	Q1 2SC5376F	V_{CE0}	12	I_C	400	NPN Low $V_{CE(SAT)}$, suitable for power supply switches
	—	—	—	—	—	—	Q2 SSM3K03FE	V_{DS}	20	I_D	50	2.5-V gate drive ($V_{th} = 1.3\text{ V max}$), $R_{on} = 4\ \Omega\text{ typ.}$
	—	—	—	—	HN4G01J	—	Q1 2SC4116	V_{CE0}	50	I_C	150	General-purpose NPN transistor
	—	—	—	—	—	—	Q2 RN1303	V_{CE0}	50	I_C	100	NPN (Internal resistors), $R_1 = 22\text{ k}\Omega$, $R_2 = 22\text{ k}\Omega$
	—	—	—	—	—	HN2E01F	Q1 1SS352	V_R	80	I_O	100	Standard high-speed switching
	—	—	—	—	—	—	Q2 2SC4666	V_{CE0}	50	I_C	150	High-hFE-type NPN
	—	—	—	—	—	HN2E02F	Q1 1SS352	V_R	80	I_O	100	Standard high-speed switching
	—	—	—	—	—	—	Q2 2SC4116	V_{CE0}	50	I_C	150	General-purpose NPN transistor
	—	—	—	—	—	HN2E04F	Q1 2SA1587	V_{CE0}	-120	I_C	-100	High breakdown voltage PNP
	—	—	—	—	—	—	Q2 1SS352	V_R	80	I_O	100	Standard high-speed switching
	—	—	—	—	HN2E05J	—	Q1 RN2304	V_{CE0}	-50	I_C	-100	PNP (Internal resistors), $R_1 = 47\text{ k}\Omega$, $R_2 = 47\text{ k}\Omega$
	—	—	—	—	—	—	Q2 1SS352	V_R	80	I_O	100	Standard high-speed switching
	HN2E07JE	—	—	—	—	—	Q1 1SS417	V_R	40	I_O	100	Schottky barrier diodes
	—	—	—	—	—	—	Q2 RN2104MFV	V_{CE0}	-50	I_C	100	PNP (Internal resistors), $R_1 = 47\text{ k}\Omega$, $R_2 = 47\text{ k}\Omega$

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

The internal connection diagrams only show the general configurations of the circuits.

Bipolar Power Transistors

Radio-Frequency Switching Power Transistors (2SA/2SC Series)

V _{CEO} (V) I _c (A)	10/(15)	(18)/20	(25)/30	40/(45)	50/(60)
0.2				2SA1483 2SC3803 (⊙) (45 V) (45 V)	
0.8			2SA1426 (S) 2SA1204 (⊙) 2SC2884 (S) 2SC2703 (S) 2SC3666 (S) HN4B101J (M)(V) (NPN: 1.2 A)	2SA1356 2SC3419 (@)	
1	TPC6D02 (15 V) (&)(Δ)				2SA2070 (⊙) TPC6701 (W)(Δ) 2SC5810 (⊙) TPC6901A * (M)(Δ) (PNP: 0.7 A) TPCP8901 (M)(P) (PNP: 0.8 A) S3C83 ++ (♣) S3C82 ++ (♣) S3F57 ++ (Δ) S3F59 ++ (Δ)
1.2		TPC6D03 (&)(Δ)	2SA1734 (⊙) TPCP8801 (W)(P)		
1.5	2SA2058 (♣)	2SA2065 (♣) 2SC5784 (♣) 2SA2069 (⊙) 2SC5819 (⊙) TPC6503 (Δ) S3F56 ++ (Δ)	2SA966 (♣) 2SC2236 (♣) 2SA1203 2SC2883 (⊙)		
2	2SA1160 2SC2500 (♣) 2SA1430 2SC3670 (S) 2SA2066 (⊙) 2SC5755 (♣) 2SC5785 (⊙) TPC6501 (Δ) TPC6602 (Δ) TPCP8504 (P)		TPCP8902 * (M)(P) (NPN+PNP) TPC6902 * (M)(Δ) (NPN+PNP) HN4B102J * (M)(V) (NPN+PNP)	2SC3225 (♣) 2SC3673 (S) 2SC3964 (@)	2SA1020 2SC2655 (♣) 2SA1241 2SC3076 (◇) 2SA1382 (♣) 2SA2056 (♣) TPC6601 (Δ) TPCP8701 (W)(P) 2SA2060 (⊙) 2SA1428 2SC3668 (S) 2SA1680 2SC4408 (♣) 2SA1891 2SC5028 (□)
2.5		2SA2061 (♣)			2SC5692 (♣) 2SC6033 (♣) TPCP8602 (P)
3	2SC4682 (15 V) (♣) 2SC4683 (15 V) (S)	2SA2059 (⊙) TPCP8F01 (S)(P) TPC6603 (Δ)	2SC5976 (♣) TPCP8H02 (S)(P)	2SA1359 2SC3422 (@)	2SA1761 2SC4604 (♣) 2SA1869 2SC4935 (♣) 2SA1892 2SC5029 (□) 2SC5712 (⊙) TPC6502 (Δ) TPCP8505 (P) 2SA2217 (60 V) ** 2SC6126 * (⊙)
3.5		2SC5738 (♣)			

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

- *: New product
- ** : Under development
- ++: Being planned

Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(♣) LSTW	○ Available	(♣) TSM	(%) Darlington
(S) MSTW	○ Available	(⊙) PW-Mini	(#) Built-in zener diode
(□) TPS	⊙ Available only in tape packaging	(◇) PW-Mold	Part number in italic signifies built in Freewheel diode.
(@) TO-126	× Not available	(‡) DP	2SA****/2SC****: Complementary
(■) TPL	⊙ Available only in tape packaging	(●) TO-220SM	(&) 2-in-1 (transistor + diode)
(▲) TO-220NIS	× Not available	(Δ) VS-6	(S) 2-in-1 (transistor + S-MOS)
(○) TO-220FL	× Not available	(P) PS-8	(W) 2-in-1 (NPN (or PNP) × 2)
(◇) PW-Mold	× Not available	(V) SMV	(M) 2-in-1 (NPN + PNP)
(‡) DP	× Not available		
(▽) TO-3P(N)	× Not available		
(▼) TO-3P(N)IS	× Not available		
(※) TO-3P(L)	× Not available		
(〒) TO-220SIS	× Not available		
(◆) TO-92	⊙ Available only in tape packaging		

Radio-Frequency Switching Power Transistors (2SA/2SC Series) (Continued)

V _{CEO} (V) I _c (A)	10/(15)	(18)/20	(25)/30	40/(45)	50/(60)
4	2SC4781 (♣) 2SC5713 (⊙) S3F61 ++ (Δ) TPCP8601	2SC5714 (⊙) 2SC6125 * (⊙) S3F62 ++ (Δ) (P)	2SC5906 (♣)		2SC5703 (♣)
5		2SA1242 (◇) 2SA1357 (@) 2SA1431 (S) 2SC3072 (◇) 2SC3420 (@) 2SC3671 (S) 2SC4684 (◇) 2SC4685 (@) 2SC5030 (□) 2SC6052 (◇)	2SA2218 ** 2SC6062 * (♣)		2SA1244 (◇) 2SC3074 (◇) 2SA1905 (□) 2SC5076 (□) 2SA1931 (▲) 2SC4881 (▲) 2SA1933 (■) 2SC5175 (■) 2SA2097 (◇) 2SC5886 (◇) 2SC5886A (◇) TPCP8H01 (S)(P) S3H32 ++ (◇) 2SA2183 (T) (60 V)
7					2SC6000 (◇)
10		2SA1327A (▲)			2SA1887 (▲) 2SC5000 (▲)
12					2SA1451A (▲) 2SC3709A (▲)

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*: New product
**: Under development
++: Being planned

Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(♣) LSTM	○ Available	(♣) TSM	(%) Darlington
(S) MSTM	○ Available	(⊙) PW-Mini	(#) Built-in zener diode
(□) TPS	⊙ Available only in tape packaging	(◇) PW-Mold	Part number in <i>italic</i> signifies built in Freewheel diode.
(@) TO-126	× Not available	(‡) DP	2SA****/2SC****: Complementary
(■) TPL	⊙ Available only in tape packaging	(●) TO-220SM	(&) 2-in-1 (transistor + diode)
(▲) TO-220NIS	× Not available	(Δ) VS-6	(\$) 2-in-1 (transistor + S-MOS)
(○) TO-220FL	× Not available	(P) PS-8	(W) 2-in-1 (NPN (or PNP) × 2)
(◇) PW-Mold	× Not available	(V) SMV	(M) 2-in-1 (NPN + PNP)
(‡) DP	× Not available		
(▽) TO-3P(N)	× Not available		
(▼) TO-3P(N)IS	× Not available		
(※) TO-3P(L)	× Not available		
(T) TO-220SIS	× Not available		
(◆) TO-92	⊙ Available only in tape packaging		

V _{CEO} (V) I _c (A)	80	100	120	(140)/150	160
0.05				2SA1145 2SC2705 (♣) 2SA1360 2SC3423 (@) 2SA949 2SC2229 (♣)	
0.1					2SC2230 (♣)
0.2					2SC3963 (@)
0.4	2SA817A 2SC1627A (♣) 2SA1202 2SC2882 (◎)				
0.8			2SA965 2SC2235 (♣) 2SA1425 2SC3665 (S)		
1			TPCP8501 (P) TPCP8603 (P) 2SC6061 (♣) 2SA1358 2SC3421 (@)		2SA1013 2SC2383 (♣)
1.5				2SA1408 2SC2073A (▲) 2SC3621 (@)	2SA1225 2SC2983 (◇) 2SC5154 (□) 2SA2219 * 2SC6139 * (S) 2SA2220 * 2SC6140 * (■)
2	2SA1315 2SC3328 (♣) 2SA1429 2SC3669 (S) 2SC3474 (◇) 2SC6079 (S) 2SA2206 * 2SC6124 * (◎)	TPCP8501 (P)			
2.5					2SC6075 * (□) 2SC6087 * (□)
3					2SC6076 * (◇) 2SC6077 * (■) 2SC6078 * (■)
5	2SA1934 2SC5176 (■) 2SC3303 (◇)				
6	2SC4688 (▼) 2SA1939 2SC5196 (▽)				
8			2SC4689 (▼) 2SA1940 2SC5197 (▽)		
10				2SC4690 (▼) (140 V) 2SA1941 2SC5198 (▽) (140 V)	
12	2SA1452A 2SC3710A (▲) 2SA1771 (▲)				2SA1942 2SC5199 (※)

• The products shown in bold are also manufactured in offshore fabs.

*: New product

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(♣) LSTW (S) MSTW (□) TPS (@) TO-126 (■) TPL (▲) TO-220NIS (○) TO-220FL (◇) PW-Mold (‡) DP (▽) TO-3P(N) (▼) TO-3P(N)IS (※) TO-3P(L) (⎓) TO-220SIS (◆) TO-92	○ Available ○ Available ◎ Available only in tape packaging × Not available ◎ Available only in tape packaging × Not available × Not available × Not available × Not available × Not available × Not available × Not available × Not available × Not available ◎ Available only in tape packaging	(♣) TSM (◎) PW-Mini (◇) PW-Mold (‡) DP (●) TO-220SM (Δ) VS-6 (P) PS-8 (V) SMV	(%) Darlington (#) Built-in zener diode Part number in italic signifies built in Freewheel diode. 2SA****/2SC****: Complementary (&) 2-in-1 (transistor + diode) (S) 2-in-1 (transistor + S-MOS) (W) 2-in-1 (NPN (or PNP) × 2) (M) 2-in-1 (NPN + PNP)

Radio-Frequency Switching Power Transistors (2SA/2SC Series) (Continued)

V _{CEO} (V)	I _c (A)	(180)/200	230	300	(370)/400	450
0.05					2SC5122 (★) 2SC5307 (◎)	
0.1		2SC2230A (★) (180 V)		2SA1432 2SC3672 (S) 2SC2482 (★) 2SC3619 (@) 2SC3620 (@) 2SC4544 (▲) 2SC5027 (□) 2SA1384 2SC3515 (◎)		
0.3					TPCP8604 * (P)	
0.5					2SA1923 (◇) 2SA1924 (@) 2SA1925 (□) 2SA1971 (◎) 2SA1972 (★)	
0.8				2SC6136 * (◆) (285 V/0.7 A)	2SC3075 (◇) 2SC3425 (@) 2SC5208 (□) 2SC5458 (◇)	
1			2SA1837 2SC4793 (▲) 2SA1932 2SC5174 (■) 2SA2182 2SC6060 (〒)	2SC5930 (S) (285 V) 2SC6010 (S) (285 V) 2SC6034 (S) (285 V)	2SC5549 (★) 2SC5550 (@) 2SC6042 (S) (375 V) 2SC6040 (S) (410 V) TPCP8508 ++ (P) (375 V)	
1.5					2SC6142 * (◇) (375 V 1.5 A)	
2		2SA1930 2SC5171 (▲) (180 V) (180 V) 2SA2190 2SC6072 (〒) (180 V) (180 V)			2SC5075 (□) 2SC5548 (◇) (370 V) 2SC5548A (◇) 2SA2034 (◇)	2SC5351 (□) 2SC5368 (@)
3					2SC5459 (▲)	
5					2SC5172 (▲) 2SC5266A (■) 2SC5355 (‡) 2SC6138 ++ (◇) (375 V)	
8						2SC5439 (▲)
10					2SC5352 (▽)	
12		2SA2120 * 2SC5948 * (▽)				
15		2SA2121 * 2SC5949 * (※)	2SA1943 2SC5200 (※) 2SA1962 2SC5242 (▽) 2SA1986 2SC5358 (▽) 2SA1987 2SC5359 (※)			

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*: New product
++: Being planned

Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(★) LSTM	○ Available	(▲) TSM	(%) Darlington
(S) MSTM	○ Available	(◎) PW-Mini	(#) Built-in zener diode
(□) TPS	◎ Available only in tape packaging	(◇) PW-Mold	Part number in italic signifies built in Freewheel diode.
(@) TO-126	× Not available	(‡) DP	2SA****/2SC****: Complementary
(■) TPL	◎ Available only in tape packaging	(●) TO-220SM	(&) 2-in-1 (transistor + diode)
(▲) TO-220NIS	× Not available	(△) VS-6	(S) 2-in-1 (transistor + S-MOS)
(○) TO-220FL	× Not available	(P) PS-8	(W) 2-in-1 (NPN (or PNP) × 2)
(◇) PW-Mold	× Not available	(V) SMV	(M) 2-in-1 (NPN + PNP)
(‡) DP	× Not available		
(▽) TO-3P(N)	× Not available		
(▼) TO-3P(N)IS	× Not available		
(※) TO-3P(L)	× Not available		
(〒) TO-220SIS	× Not available		
(◆) TO-92	◎ Available only in tape packaging		

V _{CEO} (V) I _c (A)	(550)/600	800	1000/(1200)	1500
0.02				2SC5563 (▲)
0.05	2SC5201 (✱) TPCP8503 (P)	2SC5460 (@) 2SC5466 (▲) 2SC6127 * (◇)	2SC4686 (▲) 2SC4686A (▲) (1200 V)	
0.5	2SA1937 (◇) 2SA2142 (◇)			
0.8		2SC3405 (◇) 2SC5465 (◇) 2SC5562 (□) 2SC5684 (■)		
1	2SA2184 (◇) (550 V)			
3		2SC5353 (▲) 2SC5361 (○) 2SC5356 (‡)		
5		2SC5354 (▽)		
10		2SC3307 (※)		

• The products shown in bold are also manufactured in offshore fabs.

*: New product

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Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(✱) LSTM	○ Available	(▲) TSM	(%) Darlington
(§) MSTM	○ Available	(⊙) PW-Mini	(#) Built-in zener diode
(□) TPS	⊙ Available only in tape packaging	(◇) PW-Mold	Part number in italic signifies built in Freewheel diode.
(@) TO-126	× Not available	(‡) DP	2SA****/2SC****: Complementary
(■) TPL	⊙ Available only in tape packaging	(●) TO-220SM	(&) 2-in-1 (transistor + diode)
(▲) TO-220NIS	× Not available	(Δ) VS-6	(\$) 2-in-1 (transistor + S-MOS)
(○) TO-220FL	× Not available	(P) PS-8	(W) 2-in-1 (NPN (or PNP) × 2)
(◇) PW-Mold	× Not available	(V) SMV	(M) 2-in-1 (NPN + PNP)
(‡) DP	× Not available		
(▽) TO-3P(N)	× Not available		
(▼) TO-3P(N)IS	× Not available		
(※) TO-3P(L)	× Not available		
(⎓) TO-220SIS	× Not available		
(◆) TO-92	⊙ Available only in tape packaging		

Low-Frequency Power Transistors (2SB/2SD Series)

V _{CEO} (V) I _c (A)	20	30	40	50	60(65)
0.8					2SD2719 (#)(%)(▲)
1					2SD2686 (#)(%)(◎)
1.5		2SD1140 (%)(♣) 2SD1224 (%)(◇) 2SD1508 (%)(@) 2SD1631 (%)(§) 2SD1784 (%)(◎) 2SD2481 (%)(□)			
2	2SD1160 (◇)				2SD1658 (#)(%)(@) 2SD2088 (#)(%)(♣) 2SD2695 (#)(%)(♣) 2SD2352 (▲)
3			2SB907 2SD1222 (%)(◇)		2SD2461 (□) 2SD1221 (◇) 2SD2012 (▲) 2SD2462 (□) 2SD2525 (■) 2SD2353 (▲) 2SB1667 (●)
4					2SD2130 (#)(%)(@) 2SD2204 (#)(%)(▲) (65 V) 2SD2131 (#)(%)(▲)
5					
7				2SD1412A (▲)	

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- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(♣) LSTM	○ Available	(▲) TSM	(%) Darlington
(§) MSTM	○ Available	(◎) PW-Mini	(#) Built-in zener diode
(□) TPS	◎ Available only in tape packaging	(◇) PW-Mold	Part number in italic signifies built in Freewheel diode.
(@) TO-126	× Not available	(‡) DP	2SB****/2SD****: Complementary
(■) TPL	◎ Available only in tape packaging	(●) TO-220SM	(&) 2-in-1 (transistor + diode)
(▲) TO-220NIS	× Not available	(Δ) VS-6	(\$) 2-in-1 (transistor + S-MOS)
(○) TO-220FL	× Not available	(P) PS-8	(W) 2-in-1 (NPN (or PNP) × 2)
(◇) PW-Mold	× Not available	(V) SMV	(M) 2-in-1 (NPN + PNP)
(‡) DP	× Not available		
(▽) TO-3P(N)	× Not available		
(▼) TO-3P(N)IS	× Not available		
(※) TO-3P(L)	× Not available		
(⎓) TO-220SIS	× Not available		
(◆) TO-92	◎ Available only in tape packaging		

V _{CEO} (V) I _c (A)	80	100	120	150(160)	200
0.9			TPCP8L01(1) (&)(P)		
1.5				2SB905 2SD1220 (◇)	
2	2SB1067 2SD1509 (%)(@)	2SB1411 (%) (▲) 2SB1457 2SD2206 (%) (♣) 2SB1617 2SD2480 (%) (□) 2SD2536 (#) (%) (♣)			
3		2SB1495 2SD2257 (%) (▲) 2SD2092 (▲) 2SD2129 (%) (▲)			
4	2SB908 2SD1223 (%) (◇) 2SD2406 (▲)	2SB1481 2SD2241 (%) (▲)			
5		2SD2079 (%) (▲) 2SD2526 (%) (■) 2SB1016A 2SD1407A (▲) 2SD2604 (#) (%) (▲)			
7	2SD2414(SM) (●) 2SB1018A 2SD1411A (▲)	2SB1020A 2SD1415A (%) (▲) 2SD2584 (%) (‡)			
8				2SB1682 2SD2636 (%) (▽) (160 V)	
10		2SD1947A (▲)			
12					2SD2271 (%) (▲)
15			2SD1662 (%) (▽)		
30			2SD1525 (%) (※)		

(1) NPN + HED (200 V/1 A)

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

V _{CEO} (V) I _c (A)	250	400	450
6	2SD1410A (%) (▲)	2SD1409A (%) (▲)	
15			2SD1314 (%) (※)

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Legend

Package		Surface-Mount Package	Other Remarks
Through-Hole Package	Ammo Packaging		
(♣) LSTM	○ Available	(♣) TSM	(%) Darlington
(\$) MSTM	○ Available	(◎) PW-Mini	(#) Built-in zener diode
(□) TPS	◎ Available only in tape packaging	(◇) PW-Mold	Part number in italic signifies built in Freewheel diode.
(@) TO-126	× Not available	(‡) DP	2SB****/2SD****: Complementary
(■) TPL	◎ Available only in tape packaging	(●) TO-220SM	(&) 2-in-1 (transistor + diode)
(▲) TO-220NIS	× Not available	(Δ) VS-6	(\$) 2-in-1 (transistor + S-MOS)
(○) TO-220FL	× Not available	(P) PS-8	(W) 2-in-1 (NPN (or PNP) × 2)
(◇) PW-Mold	× Not available	(V) SMV	(M) 2-in-1 (NPN + PNP)
(‡) DP	× Not available		
(▽) TO-3P(N)	× Not available		
(▼) TO-3P(N)IS	× Not available		
(※) TO-3P(L)	× Not available		
(⎓) TO-220SIS	× Not available		
(◆) TO-92	◎ Available only in tape packaging		

Transistors for Power Amps

Part Number		Ic (A)	VCE0 (V)	Pc (W) Tc = 25°C (* Ta = 25°C)	fr (MHz)	Typ. (NPN/PNP)		Applications	Package
NPN	PNP					VCE (V)	Ic (A)		
2SC1627A	2SA817A	0.4	80	♣ 0.8	100	10	0.01	Driver	LSTM
2SC2235	2SA965	0.8	120	♣ 0.9	120	5	0.1	Driver	
2SC3665	2SA1425	0.8	120	♣ 1	120	5	0.1	Driver	MSTM
2SC6139 *	2SA2219 *	1.5	160	1	100	10	0.1	Driver	
2SC5174	2SA1932	1	230	♣ 1.8	100/70	10	0.1	Driver	TPL
2SC6140 *	2SA2220 *	1.5	160	1	100	10	0.1	Driver	
2SC3423	2SA1360	0.05	150	5	200	5	0.01	Pre-driver	TO-126
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-220NIS
2SC6060	2SA2182	1	230	20	100/80	10	0.1	Driver	TO-220SIS
2SC5171	2SA1930	2	180	20	200	5/10	0.3	Driver	TO-220NIS
2SC6072	2SA2190	2	180	20	200	5	0.3	Driver	TO-220SIS
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)	
2SD2636	2SB1682	8	160	100	30	5	1	Darlington output (80 W)	TO-3P(N)
2SC5242	2SA1962	15	230	130	30	5	1	Output (80 W)	
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)	
2SC5948	2SA2120	12	200	200	30/25	5	1	Output (130 W)	TO-3P(N)
2SC5949	2SA2121	15	200	220	30/25	5	1	Output (140 W)	TO-3P(L)

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

Transistors for MOS Gate Drivers/Compact Motor Drivers (2-in-1 Transistors)

Part Number	Polarity	Absolute Maximum Ratings				hFE		VCE(sat)			Package	Circuit Configuration (Top View)		
		VCE0 (V)	IC (A)	ICP (A)	PC (Note1) (mW)	Min	Max	VCE (V)	IC (A)	Max			IC (A)	IB (mA)
HN4B101J	PNP	-30	-1.0	-5	550	200	500	-2	-0.12	-0.2	-0.4	-13	SMV	
	NPN	30	1.2	5	550	200	500	2	0.12	0.17	0.4	13		
HN4B102J *	PNP	-30	-1.8	-8	750	200	500	-2	-0.2	-0.2	-0.6	-20		
	NPN	30	2	8	750	200	500	2	0.2	0.14	0.6	20		
TPC6901A *	PNP	-50	-0.7	-5	400	200	500	-2	-0.1	-0.23	-0.3	-10	VS-6	
	NPN	50	1	5	400	400	1000	2	0.1	0.17	0.3	6		
TPC6902 *	PNP	-30	-2	-8	400	200	500	-2	-0.2	-0.2	-0.6	-20		
	NPN	30	2	8	400	200	500	2	0.2	0.14	0.6	20		
TPCP8901	PNP	-50	-0.8	-5	830	200	500	-2	-0.1	-0.21	-0.3	-10	PS-8	
	NPN	50	1	5	830	400	1000	2	0.1	0.17	0.3	6		
TPCP8902 *	PNP	-30	-2	-8	890	200	500	-2	-0.2	-0.2	-0.6	-20		
	NPN	30	2	8	890	200	500	2	0.2	0.14	0.6	20		

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm², glass-epoxy, t = 1.6 mm) and is in single-device operation.

*: New product

Thickness of cu: 70 μm for SMV/PS-8, 35 μm for VS-6

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(1-in-1 Transistors)

Part Number	Polarity	Absolute Maximum Ratings			hFE		VCE(sat)			Complementary	Package	Remarks		
		VCE0 (V)	IC (A)	PC (Note1) (mW)	Min	Max	VCE (V)	IC (A)	Max				IC (A)	IB (mA)
2SA2058	PNP	-10	-1.5	500	200	500	-2	-0.2	-0.19	-0.6	-20	2SC5755		(Note 2)
2SA2065		-20	-1.5	500	200	500	-2	-0.15	-0.14	-0.5	-17	2SC5784		
2SA2061		-20	-2.5	625	200	500	-2	-0.5	-0.19	-1.6	-53	2SC5735		
2SA2218 **		-30	-5	800	250	400	-2	-0.5	TBD	-1.6	-53	2SC6062		
S3C83 ++		-50	-1	500	200	500	-2	-0.1	-0.18	-0.3	-10	S3C82 ++		
2SA2056		-50	-2	625	200	500	-2	-0.3	-0.20	-1.0	-33	2SC5692		
2SC5755	NPN	10	2	500	400	1000	2	0.2	0.12	0.6	12	2SA2058		(Note 2)
2SC5784		20	1.5	500	400	1000	2	0.15	0.12	0.5	10	2SA2065		
2SC5738		20	3.5	625	400	1000	2	0.5	0.15	1.6	32	2SA2061		
2SC6062		30	5	800	250	400	2	0.5	0.12	1.6	53	S3P84		
S3C82 ++		50	1	500	400	1000	2	0.1	0.17	0.3	6	S3C83 ++		
2SC5692		50	2.5	625	400	1000	2	0.3	0.14	1.0	20	2SA2056		
2SA2066	PNP	-10	-2	1000	200	500	-2	-0.2	-0.19	-0.6	-20	2SC5785		(Note 2)
2SA2069		-20	-1.5	1000	200	500	-2	-0.15	-0.14	-0.5	-17	2SC5819		
2SA2059		-20	-3	1000	200	500	-2	-0.5	-0.19	-1.6	-53	2SC5714		
2SA2070		-50	-1	1000	200	500	-2	-0.1	-0.18	-0.3	-10	2SC5810		
2SA2060		-50	-2	1000	200	500	-2	-0.3	-0.20	-1.0	-33	2SC5712		
2SA2217 **		-60	-3	1000	250	400	-2	-0.3	TBD	-1	-33	2SC6126		
2SC5785	NPN	10	2	1000	400	1000	2	0.2	0.12	0.6	12	2SA2066		(Note 2)
2SC5819		20	1.5	1000	400	1000	2	0.15	0.12	0.5	10	2SC2069		
2SC5714		20	4	1000	400	1000	2	0.5	0.15	1.6	32	2SA2059		
2SC5810		50	1	1000	400	1000	2	0.1	0.17	0.3	6	2SA2070		
2SC5712		50	3	1000	400	1000	2	0.3	0.14	1	20	2SA2060		
2SC6126 *		50	3	1000	250	400	2	0.3	0.2	1	33	2SA2217 **		

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm², t = 1.6 mm).

Note 2: Ultra-high-speed using by the Super HI-Met process and Low VCE(sat) products.

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

** : Under development

++ : Being planned

Transistors for Switching Power Supplies (For AC/DC Converters)

Part Number	Applications	Absolute Maximum Ratings (Ta = 25°C)				Package		
		VcBo (V)	VcEO (V)	Ic (A)	Pc (W) Tc = 25°C (♣ Ta = 25°C)			
2SC3425	Switching regulator	500	400	0.8	10	TO-126		
2SC5075				2	1.3♣	TPS		
2SC5930		600	285	1	1♣	MSTM		
2SC6010				1	1♣	MSTM		
2SC6034				1	1♣	MSTM		
2SC6138 *				5	15	PW-Mold		
2SC5548				370	2	15	PW-Mold	
2SC5548A				400	370	2	15	PW-Mold
2SC5208						0.8	1.3♣	TPS
2SC5458						0.8	10	PW-Mold
2SC4917						2	10	TO-126
2SC5459						3	25	TO-220NIS
2SC5266A		5	1.8♣			TPL		
2SC5355		5	25			DP		
2SC5172		5	25			TO-220NIS		
2SC5352		10	80	TO-3P(N)				
2SC5351		450	2	1.3♣	TPS			
2SC5368		800	375	2	10	TO-126		
2SC6042				1	1♣	MSTM		
2SC6040				1	1♣	MSTM		
2SC6142 *		900	375	1.5	15	PW-Mold		
2SC5465				0.8	20	PW-Mold		
2SC5562		900	800	0.8	1.3♣	TPS		
2SC5353				3	25	TO-220NIS		
2SC5356				3	25	DP		
2SC5361				3	40	TO-220FL		
2SC5354				5	100	TO-3P(N)		
2SC3307				10	150	TO-3P(L)		
2SC5439				1000	450	8	30	TO-220NIS

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

Transistors for High-Voltage Power Supplies (For DC/DC Converters)

Part Number	Absolute Maximum Ratings				hFE				VCE (sat) (V)			Package
	VCEX (V)	VCEO (V)	Ic (A)	Pc (W)	Min	Max	VCE (V)	Ic (A)	Max	Ic (A)	Ib (mA)	
2SC6061	150	120	1	0.625 (Note 1)	120	300	2	0.1	0.14	0.3	10	TSM
TPCP8507	150	120	1	1.25 (Note 1)	120	300	2	0.1	0.14	0.3	10	PS-8
2SC6076	160	80	3	10 (Note 2)	180	450	2	0.5	0.5	1	100	PW-Mold
2SC6124	160	80	2	1 (Note 1)	100	200	2	0.5	0.5	1	100	PW-Mini
2SC6079	160	80	2	1 (Note 3)	180	450	2	0.5	0.5	1	100	MSTM
2SC6075	160	80	2.5	1.3 (Note 3)	180	450	2	0.5	0.5	1	100	TPS
2SC6087	160	80	2.5	1.3 (Note 3)	100	200	2	0.5	0.5	1	100	TPS
2SC6077	160	80	3	1.8 (Note 3)	180	450	2	0.5	0.5	1	100	TPL
2SC6078	160	80	3	1.8 (Note 3)	100	200	2	0.5	0.5	1	100	TPL

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm², glass-epoxy, t = 1.6 mm).

Note 2: Tc = 25°C

Note 3: Ta = 25°C

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(Transistors for Droppers)

Part Number	Absolute Maximum Ratings			hFE				VCE (sat) (V)			Package
	VCEO (V)	Ic (A)	Pc (W) Tc = 25°C	Min	Max	VCE (V)	Ic (A)	Max	Ic (A)	Ib (mA)	
2SB906	-60	-3	20	60	200	-5	-0.5	-1.7	-3	-300	PW-Mold
2SB1667	-60	-3	25	60	300	-5	-0.5	-1.7	-3	-300	TO-220SM
2SA2183	-60	-5	20	200	500	-2	-0.5	-1	-1.6	-53	TO-220SIS

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(High-Voltage Transistors)

Part Number	Absolute Maximum Ratings			Package	Circuit Configuration (Top View)	Remarks
	VCEO (V)	Ic (A)	Pc (W)			
2SA1972	-400	-0.5	0.9	LSTM		
2SA1971	-400	-0.5	1	PW-Mini		
TPCP8604	-400	-0.3	1	PS-8		SMD
2SA1925	-400	-0.5	1.2	TPS		
2SA1923	-400	-0.5	10	PW-Mold		
2SA2184	-550	-1	1	PW-Mold		SMD only
2SA1937	-600	-0.5	1	PW-Mold		Through-hole only
2SA2142	-600	-0.5	10	PW-Mold		SMD only
2SC5122	400	0.05	0.9	LSTM		
2SC5307	400	0.05	1	PW-Mini		
TPCP8503	600	0.05	1.1	PS-8		SMD
2SC5201	600	0.05	0.9	LSTM		
2SC6127 *	800	0.05	10	PW-Mold		SMD only
2SC5465	800	0.8	20	PW-Mold		
2SC4686A	1200	0.05	10	TO-220NIS		
2SC5563	1500	0.02	10	TO-220NIS		

The circuit configuration diagrams only show the general configurations of the circuits.

*: New product

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Low Saturation Voltage Transistors (Small Surface-Mount Packages for Personal Equipments)

Part Number	Configuration	Absolute Maximum Ratings					hFE				VCE (sat) (V)			Marking	Package
		VCE0 (V)	IC (A)	ICP (A)	Pc (mW) (Note 1)	Pc (mW) (Note 1) t = 10 s	Min	Max	VCE (V)	IC (A)	Max	IC (A)	IB (mA)		
2SA2058	PNP single	-10	-1.5	-2.5	500	750	200	500	-2	-0.2	-0.19	-0.6	-20	WM	TSM (equivalent to SC-59 SOT-23)
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	
S3C83		-50	-1	-2	500	750	200	500	-2	-0.1	-0.18	-0.3	-10	WH	
2SA2056		-50	-2	-3.5	625	1000	200	500	-2	-0.3	-0.20	-1.0	-33	WF	
2SC5755	NPN single	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	
2SC5976		30	3	5	625	1000	250	400	2	0.3	0.14	1.0	33	WW	
2SC5906		30	4	7	800	1250	200	500	2	0.5	0.2	1.6	53	WP	
2SC6062 *		30	5	10	800	1250	250	400	2	0.5	0.12	1.6	53	WR	
S3C82		50	1	2	500	750	400	1000	2	0.1	0.17	0.3	6	WG	
2SC5692		50	2.5	4	625	1000	400	1000	2	0.3	0.14	1.0	20	WB	
2SC6033		50	2.5	5	625	1000	250	400	2	0.3	0.18	1.0	33	WX	
2SC5703		50	4	7	800	1250	400	1000	2	0.5	0.12	1.6	32	WA	
2SC6061 *		120	1	2	625	1000	120	300	2	0.1	0.14	0.3	10	WN	
HN4B101J		PNP + NPN	±30	-1/1.2	±5	550	850	200	500	±2	±0.12	-0.2/0.17	±0.4	13	5K
HN4B102J *	±30		-1.8/2	±8	750	750	200	500	±2	±0.2	-0.2/0.14	±0.6	±20	5L	
2SA2066	PNP single	-10	-2	-3.5	1000	2000	200	500	-2	-0.2	-0.19	-0.6	-20	4E	PW-Mini (equivalent to SC-62 SOP-89)
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	
2SA2070		-50	-1	-2	1000	2000	200	500	-2	-0.1	-0.18	-0.3	-10	4C	
2SA2060		-50	-2	-3.5	1000	2500	200	500	-2	-0.3	-0.20	-1.0	-33	4G	
2SA2206 *		-80	-2	-4	1000	2500	100	200	-2	-0.5	-0.5	-1.0	-100	4K	
2SC5785	NPN single	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	0.5	0.15	1.6	32	2C	
2SC5819		20	1.5	2.5	1000	2000	400	1000	2	0.15	0.12	0.5	10	3D	
2SC6125 *		20	4	8	1000	2500	180	390	2	0.5	0.2	1.6	53	4L	
2SC5714		20	4	7	1000	2500	400	1000	2	0.5	0.15	1.6	32	2E	
2SC5810		50	1	2	1000	2000	400	1000	2	0.1	0.17	0.3	6	3C	
2SC6126 *		50	3	6	1000	2500	250	400	2	0.3	0.2	1.0	33	4M	
2SC5712		50	3	5	1000	2500	400	1000	2	0.3	0.14	1	20	2A	
2SC6124 *		80	2	4	1000	2500	100	200	2	0.5	0.5	1.0	100	4J	
TPC6501	NPN single	10	2	3.5	800	1600	400	1000	2	0.2	0.12	0.6	12	H2A	VS-6 (equivalent to TSOP-6)
TPC6502		50	3	5	800	1600	400	1000	2	0.3	0.14	1	20	H2B	
TPC6503		20	1.5	2.5	800	1600	400	1000	2	0.15	0.12	0.5	10	H2C	
S3F61 ++	10	4	6	800	1600	400	1000	2	0.5	0.15	1.6	32	—		
S3F62 ++	20	4	6	800	1600	400	1000	2	0.5	0.15	1.6	32	—		
S3F59 ++	50	1	2	800	1600	400	1000	2	0.1	0.17	0.3	6	—		
TPC6601	PNP single	-50	-2	-3.5	800	1600	200	500	-2	-0.3	-0.20	-1.0	-33	H3A	
TPC6602		-10	-2	-3.5	800	1600	200	500	-2	-0.2	-0.19	-0.6	-20	H3B	
TPC6603		-20	-3	-5	800	1600	200	500	-2	-0.5	-0.19	-1.6	-53	H3C	
S3F56 ++		-20	-1.5	-2.5	800	1600	200	500	-2	-0.15	-0.14	-0.5	-17	—	
S3F57 ++		-50	-1	-2	800	1600	200	500	-2	-0.1	-0.18	-0.3	-10	—	
TPC6701	NPN/dual	50	1	2	660 (Note 2)	—	400	1000	2	0.1	0.17	0.3	6	H4A	
TPC6901A *	PNP + NPN	±50	-0.7/1.0	±5	400	500	200/400	500/1000	±2	±0.1	-0.23/0.17	±0.3	-10/6	H6B	
TPC6902 *		±30	±2	±8	400	TBD	200	500	2	0.2	-0.2/0.14	±0.6	±20	H6C	

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm², glass-epoxy, t = 1.6 mm).

Note 2: Total loss of dual-device operation

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

++: Being planned

Part Number	Configuration	Absolute Maximum Ratings					hFE				VCE (sat) (V)			Marking	Package	
		VCE0 (V)	IC (A)	ICP (A)	Pc (mW) (Note 1)	Pc (mW) (Note 1) t = 10 s	Min	Max	VCE (V)	IC (A)	Max					
											IC (A)	IB (mA)				
2SA2097	PNP single	-50	-5	-10	20 (Note 3)	—	200	500	-2	-0.5	-0.27	-1.6	-53	A2097	PW-Mold SC-63	
2SA1241		-50	-2	-3	10 (Note 3)	—	70	240	-2	-0.5	-0.5	-1	-50	A1241		
2SA1244		-50	-5	-8	20 (Note 3)	—	70	240	-1	-1	-0.4	-3	-150	A1244		
2SC6076	NPN single	80	3	5	10 (Note 3)	—	180	450	2	0.5	0.5	1	100	C6076		
2SC5886		50	5	10	20 (Note 3)	—	400	1000	2	0.5	0.22	1.6	32	C5886		
2SC5886A		50	5	10	20 (Note 3)	—	400	1000	2	0.5	0.22	1.6	32	C5886A		
2SC3076		50	2	3	10 (Note 3)	—	70	240	2	0.5	0.5	1	50	C3076		
2SC3474		80	2	3	20 (Note 3)	—	500	—	1	0.4	0.5	0.3	1	C3474		
2SC6052		20	5	7	10 (Note 3)	—	180	390	2	0.5	0.2	1.6	53	C6052		
2SC3074		50	5	8	20 (Note 3)	—	70	240	1	1	0.4	3	150	C3074		
S3H32		++	50	5	7	20 (Note 3)	—	200	500	2	0.5	0.2	1.6	53		
2SC3303		80	5	8	20 (Note 3)	—	70	240	1	1	0.4	3	150	C3303		
2SC6000		50	7	10	20 (Note 3)	—	250	400	2	2.5	0.18	2.5	83	C6000		
TPCP8501	NPN single	100	2	4	1300	3300	100	300	2	0.3	0.2	1	33	8501		PS-8
TPCP8507		120	1	2	1250	3000	120	300	2	0.1	0.14	0.3	10	8507		
TPCP8505		50	3	5	1250	3000	400	1000	2	0.3	0.14	1	20	8505		
TPCP8504	10	2	3.5	1200	2800	400	1000	2	0.2	0.12	0.6	12	8504			
TPCP8601	PNP single	-20	-4	-7	1300	3300	200	500	-2	-0.6	-0.19	-2	-67	8601		
TPCP8603		-120	-1	-2	1250	3000	120	300	-2	-0.1	-0.2	-0.3	-10	8603		
TPCP8602		-50	-2.5	-4	1250	3000	200	500	-2	-0.3	-0.2	-1	-33	8602		
TPCP8701	NPN/dual	50	2	3	940	1770	400	1000	2	0.3	0.14	1	20	8701		
TPCP8801	++	-30	-1.2	-2	830	1480	200	500	-2	-0.12	-0.30	-0.4	-13	8801		
TPCP8H01 (Note 2)	NPN + S-MOS	50	5	7	1000	2000	250	400	2	0.5	0.13	1.6	53	8H01		
TPCP8H02 (Note 2)	S-MOS	30	3	5	1000	2000	250	400	2	0.3	0.14	1	33	8H02		
TPCP8F01	PNP + S-MOS	-20	-3	-5	1000	—	200	500	-2	-0.5	-0.19	-1.6	-53	8F01		
TPCP8901	PNP + NPN	±50	-0.8/1.0	±5	830	1480	200/400	500/1000	±2	±0.1	-0.2/0.17	±0.3	-10/6	8901		
TPCP8902		*	±30	±2	±8	890	1670	200	500	2	0.2	-0.2/0.14	±0.6	±20	8902	

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm², glass-epoxy, t = 1.6 mm).

Note 2: Built-in SBD, VRRM = 30 V, IO = 0.7 A, VF = 0.4 V (MAX)@IF = 0.5 A, IR = 100 μA (MAX)@VR = 10 V

Note 3: Tc = 25°C

*: New product

++: Being planned

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(Power-Mold Transistors (SC-63/64))

Part Number	Applications	Absolute Maximum Ratings (Ta = 25°C)				Complementary	Equivalent Product	Remarks
		V _{CEO} (V)	I _c (A)	P _c (W)	★P _c (W)			
2SA1225	Power amplification for driver	-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	
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	High-current switching	-50	-5.0	1.0	20	2SC3074	2SA1905	
2SC3074		50	5.0	1.0	20	2SA1244	2SC5076	
2SA2097		-50	-5.0	1.0	20	—	—	High β
2SC5886		50	5.0	1.0	20	—	—	High β
2SC5886A		50	5	1.0	20	—	—	High β, V _{CEO} = 120 V
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
2SC6076		80	3	—	10	—	—	
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 (V _{CEO})	2.0	1.0	10	—	—	
2SC3474	Switching, solenoid drive	80	2.0	1.0	20	—	—	
2SC3303	Switching	80	5.0	1.0	20	—	2SC3258	
2SA1923	High-voltage switching	-400	-0.5	1.0	10	—	2SA1925	
2SA2034	High-voltage switching	-400	-2	1.0	15	—	—	
2SA2184 *	High-voltage switching	-550	-1	—	10	—	—	
2SA2142	High-voltage switching	-600	-0.5	—	15	—	—	
2SC3075	High-voltage switching	400	0.8	1.0	10	—	2SC5208	
2SC5458	High-voltage switching	400	0.8	1.0	10	—	—	
2SC5548	High-voltage switching	370	2	1.0	15	—	—	
2SC5548A	High-voltage switching	400	2	1.0	15	—	—	
2SC6127 *	High-voltage switching	800	0.05	1.0	10	—	—	
2SC3405	High-voltage switching	800	0.8	1.0	20	—	—	
2SC5465	High-voltage switching	800	0.8	1.0	20	—	—	

★: T_c = 25°C

*: New product

★★: hFE classification varies

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(PW-Mini Transistors (SC-62))

Part Number		Absolute Maximum Ratings					Electrical Characteristics										Marking		Equivalent to TO-92MOD (TO-92)		Remarks/Applications
		Pc (W)	Pc (W) (Note1)	Pc (W) (Note2)	V _{CEO} (V)	I _c (A)	hFE		V _{CE} (sat)			f _r		NPN	PNP	NPN			PNP		
							Min	Max	V _{CE} (V)	I _c (mA)	(V)	I _c (mA)	I _B (mA)							(MHz) Typ.	
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)	Low saturation
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 driver
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)	Low saturation
2SC3515	2SA1384	0.5	1.0	—	300	0.1	30	150	10	20	0.5	20	2	60	10	20	I□	J□	(2SC2551)	(2SA1091)	Low saturation
2SC3803	2SA1483	0.5	1.0	—	45	0.2	40	240	1	10	0.3	100	10	200	10	10	V□	W□	—	—	Low saturation
—	2SA1734	0.5	1.0	—	30	1.2	120	400	2	100	0.5	700	35	100	2	100	—	LB	—	—	Low saturation
2SD1784	—	0.5	1.0	—	30	1.5	4000	—	2	150	1.5	1000	1	—	—	—	XN	—	2SD1140	—	Driver (Darlington)
2SC5785	—	—	—	1	10	2	400	1000	2	200	0.12	600	12	—	—	—	3E	—	—	—	Low saturation
—	2SA2066	—	—	1	-10	-2	200	500	-2	-200	-0.19	-600	-20	—	—	—	—	4E	—	—	Low saturation
2SC5713	—	—	—	1	10	4	400	1000	2	500	0.15	1600	32	—	—	—	2C	—	—	—	Low saturation
2SC5819	—	—	—	1	20	1.5	400	1000	2	150	0.12	500	10	—	—	—	3D	—	—	—	Low saturation
—	2SA2069	—	—	1	-20	-1.5	200	500	-2	-150	-0.14	-500	-17	—	—	—	—	4D	—	—	Low saturation
2SC6125 *	—	—	—	1	20	4	180	390	2	500	0.20	1800	53	—	—	—	4L	—	—	—	High-speed switching
2SC5714	—	—	—	1	20	4	400	1000	2	500	0.15	1600	32	—	—	—	2E	—	—	—	Low saturation
—	2SA2059	—	—	1	-20	-3	200	500	-2	-500	-0.19	-1600	-53	—	—	—	—	4F	—	—	Low saturation
2SC6126 *	—	—	—	1	50	3	250	400	2	300	0.18	1000	33	—	—	—	4M	—	—	—	High-speed switching
2SC5712	—	—	—	1	50	3	400	1000	2	300	0.14	1000	20	—	—	—	2A	—	—	—	Low saturation
—	2SA2060	—	—	1	-50	-2	200	500	-2	-300	-0.20	-1000	-33	—	—	—	—	4G	—	—	Low saturation
2SC5810	—	—	—	1	50	1	400	1000	2	100	0.17	300	6	—	—	—	3C	—	—	—	Low saturation
—	2SA2070	—	—	1	-50	-1	200	500	-2	-100	-0.18	-300	-10	—	—	—	—	4C	—	—	Low saturation
2SD2686	—	—	—	1	60±10	1	2000	—	2	1000	1.5	1000	1	—	—	—	—	3H	—	—	Darlington
2SC6124 *	—	—	—	1	80	2	100	200	2	500	0.5	1000	100	—	—	—	—	4J	—	—	Low saturation
—	2SA2206 *	—	—	1	-80	-2	100	200	-2	-500	-0.5	-1000	-100	—	—	—	—	4K	—	—	Low saturation

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

*: New product

Note 1: The rating applies when the transistor is mounted on a ceramic board (250 mm² x 0.8 mm).

Note 2: The rating applies when the transistor is mounted on a glass-epoxy board (645 mm² x 1.6 mm).

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(TSM Transistors)

Part Number	Absolute Maximum Ratings					hFE				V _{CE} (sat) (V)			Marking	Remarks/Applications
	NPN	V _{CEO} (V)	I _c (A)	I _{CP} (A)	Pc (mW) (Note 1)	Min	Max	V _{CE} (V)	I _c (A)	Max	I _c (A)	I _B (mA)		
2SA2058	-10	-1.5	-2.5	500	750	200	500	-2	-0.2	-0.19	-0.6	-20	WM	Low saturation
2SA2065	-20	-1.5	-2.5	500	750	200	500	-2	-0.15	-0.14	-0.5	-17	WK	Low saturation
2SA2061	-20	-2.5	-4	625	1000	200	500	-2	-0.5	-0.19	-1.6	-53	WE	Low saturation
S3C83 ++	-50	-1	-2	500	750	200	500	-2	-0.1	-0.18	-0.3	-10	WH	Low saturation
2SA2056	-50	-2	-3.5	625	1000	200	500	-2	-0.3	-0.20	-1.0	-33	WF	Low saturation
2SC5755	10	2	3.5	500	750	400	1000	2	0.2	0.12	0.6	12	WL	Low saturation
2SC5784	20	1.5	2.5	500	750	400	1000	2	0.15	0.12	0.5	10	WJ	Low saturation
2SC5738	20	3.5	6	625	1000	400	1000	2	0.5	0.15	1.6	32	WD	Low saturation
2SC5976	30	3	5	625	1000	250	400	2	0.3	0.14	1.0	33	WW	Ultra-high-speed switching Low saturation voltage
2SC5906	30	4	7	800	1250	200	500	2	0.5	0.2	1.6	53	WP	Ultra-high-speed switching Low saturation voltage
2SC6062 *	30	5	10	800	1250	250	400	2	0.5	0.12	1.6	53	WR	Ultra-high-speed switching Ultra-low saturation voltage
S3C82 ++	50	1	2	500	750	400	1000	2	0.1	0.17	0.3	6	WG	Low saturation
2SC5692	50	2.5	4	625	1000	400	1000	2	0.3	0.14	1.0	20	WB	Low saturation
2SC6033	50	2.5	5	625	1000	250	400	2	0.3	0.18	1.0	33	WX	Ultra-high-speed switching Low saturation voltage
2SC5703	50	4	7	800	1250	400	1000	2	0.5	0.12	1.6	32	WA	Low saturation
2SD2719 *	60±10	0.8	3	800	1250	2000	—	2	1.0	1.5	1	1	WV	Darlington
2SC6061 *	120	1	2	625	1000	120	300	2	0.1	0.14	0.3	10	WN	Low saturation

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm², glass-epoxy, t = 1.6 mm).

*: New product

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

++: Being planned

Power MOSFETs

$V_{DS} \leq 30\text{ V}$ (N-ch Power MOSFETs)

Part Number	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(on)} Max (Ω)					Q _g (nC) (Typ.)
					V _{GS} = 2.0 V	V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 4.5 V	V _{GS} = 10 V	
2SK2493	16	5	20	PW-Mold	—	0.12	0.1	—	—	23
TPCF8201	20	3	1.35	VS-8	0.1	0.066	—	0.049	—	7.5
TPCF8A01	20	3	1.35	VS-8	0.1	0.066	—	0.049	—	7.5
TPCS8209	20	5	1.1	TSSOP-8	—	0.04	0.03	—	—	15
TPCS8210 ©	20	5	1.1	TSSOP-8	—	0.04	0.03	—	—	15
TPC8208	20	5	1.5	SOP-8	—	0.07	0.05	—	—	9.5
TPCT4203	20	6	1.47	STP2	—	0.049	0.032	0.031	—	12
TPCT4201	20	6	1.7	STP	—	0.049	0.032	0.031	—	21
TPCS8211	20	6	1.1	TSSOP-8	—	0.029	0.024	—	—	20
TPCS8212 ©	20	6	1.1	TSSOP-8	—	0.029	0.024	—	—	20
TPCS8204	20	6	1.1	TSSOP-8	—	0.022	0.017	—	—	22
TPCS8208 ©	20	6	1.1	TSSOP-8	—	0.022	0.017	—	—	22
TPCS8213	20	6	1.1	TSSOP-8	0.018	0.013	—	—	—	49
TPC8207	20	6	1.5	SOP-8	—	0.03	0.02	—	—	22
TPC6004	20	6	2.2	VS-6	0.037	0.032	—	0.024	—	17
TPCP8002	20	9.1	1.68	PS-8	—	0.0137	—	0.01	—	48
TPCP8006	20	9.1	1.68	PS-8	—	0.0137	—	0.01	—	22
TPCA8011-H	20	40	45	SOP Advance	—	0.0075	—	0.0035	—	32
TPCP8201	30	4.2	1.48	PS-8	—	—	—	0.077	0.05	10
TPC6007-H	30	5	2.2	VS-6	—	—	—	0.079	0.054	4.6
TPC8211	30	5.5	1.5	SOP-8	—	—	—	0.044	0.036	25
TPCP8202	30	5.5	1.48	PS-8	—	0.039	—	0.023	—	28
TPCT4202	30	6	1.7	STP	—	0.052	0.039	0.038	—	21
TPCT4204	30	6	1.47	STP2	—	0.052	0.039	0.038	—	12
TPC8212-H	30	6	1.5	SOP-8	—	—	—	0.027	0.021	16
TPCS8214	30	6	1.1	TSSOP-8	—	0.0185	0.0135	0.013	—	42
TPC8A01	30	6/8.5	1.5	SOP-8	—	—	—	0.03/0.021	0.025/0.018	17/49
TPC6003	30	6	2.2	VS-6	—	—	—	0.032	0.024	25
TPC6005	30	6	2.2	VS-6	0.041	0.035	—	0.028	—	19
TPCF8001	30	7	2.5	VS-8	—	—	—	0.031	0.023	25
TPC8210	30	8	1.5	SOP-8	—	—	—	0.02	0.015	75
TPCP8001-H	30	7.2	1.68	PS-8	—	—	—	0.025	0.016	11
TPCP8004	30	8.3	1.68	PS-8	—	—	—	0.014	0.0085	26
TPCP8005-H	30	11	1.68	PS-8	—	—	—	0.0161	0.0133	20
TPC8021-H	30	11	1.9	SOP-8	—	—	—	0.025	0.017	11
TPC8031-H	30	11	1.9	SOP-8	—	—	—	0.0161	0.0133	21
TPC8014	30	11	1.9	SOP-8	—	—	0.022	—	0.014	39
TPC8030	30	11	1.9	SOP-8	—	—	—	0.017	0.009	24
TPC8025	30	11	1.9	SOP-8	—	—	—	0.0145	0.009	26
TPC8020-H	30	13	1.9	SOP-8	—	—	—	0.013	0.009	23
TPC8024-H	30	13	1.9	SOP-8	—	—	—	0.013	0.009	23
TPC8026	30	13	1.9	SOP-8	—	—	—	0.01	0.0066	42
TPC8041	30	13	1.9	SOP-8	—	—	—	0.0135	0.007	27
TPC8017-H	30	15	1.9	SOP-8	—	—	—	0.0095	0.0066	25
TPC8032-H	30	15	1.9	SOP-8	—	—	—	0.0086	0.0065	33
TPC8A02-H	30	16	1.9	SOP-8	—	—	—	0.0085	0.0056	34
TPC8033-H	30	17	1.9	SOP-8	—	—	—	0.0072	0.0053	42
TPC8A03-H	30	17	1.9	SOP-8	—	—	—	0.007	0.0056	36
TPC8018-H	30	18	1.9	SOP-8	—	—	—	0.0062	0.0046	38
TPC8028	30	18	1.9	SOP-8	—	—	—	0.008	0.0043	45
TPC8029	30	18	1.9	SOP-8	—	—	—	0.007	0.0038	49
TPC8027	30	18	1.9	SOP-8	—	—	—	0.0055	0.0027	113
TPCM8001-H	30	20	30	TSSOP Advance	—	—	—	0.014	0.0095	19
TPC8034-H	30	20	1.9	SOP-8	—	—	—	0.0045	0.0035	68
TPCM8003-H	30	21	30	TSSOP Advance	—	—	—	0.0157	0.0129	21
TPCA8023-H	30	21	30	SOP Advance	—	—	—	0.0157	0.0129	21
TPCA8005-H	30	27	45	SOP Advance	—	—	—	0.013	0.009	24
TPCA8021-H	30	27	45	SOP Advance	—	—	—	0.013	0.009	23
TPCM8002-H	30	30	30	TSSOP Advance	—	—	—	0.0082	0.0062	34
TPCA8018-H	30	30	45	SOP Advance	—	—	—	0.0082	0.0062	34

©: Common-drain type

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)					Q _g (nC) (Typ.)
					V _{GS} = 2.0 V	V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 4.5 V	V _{GS} = 10 V	
TPCA8A02-H	30	34	45	SOP Advance	—	—	—	0.0067	0.0053	36
TPCA8003-H	30	35	45	SOP Advance	—	—	—	0.0095	0.0066	25
TPCA8024	30	35	45	SOP Advance	—	—	—	0.0078	0.0043	45
TPCA8A01-H	30	36	45	SOP Advance	—	—	—	0.0085	0.0056	19
TPCA8004-H	30	40	45	SOP Advance	—	—	—	0.0062	0.0046	37
TPCA8012-H	30	40	45	SOP Advance	—	—	—	0.0068	0.0049	42
TPCA8025	30	40	45	SOP Advance	—	—	—	0.006	0.0035	49
TPCA8019-H	30	45	45	SOP Advance	—	—	—	0.0041	0.0031	66
TPCA8026	30	45	45	SOP Advance	—	—	—	0.0045	0.0022	113
2SK3506	30	45	100	TO-3P(N)	—	—	—	—	0.02	39
TPCA8028-H	30	50	45	SOP Advance	—	—	—	0.0032	0.0028	88
TPCF8402 Δ	30/–30	4/–3.2	1.35	VS-8	—	—	0.077/0.105	—	0.048/0.072	10/14
TPCP8402 Δ	30/–30	4.2/–3.4	1.48	PS-8	—	—	—	0.077/0.105	0.05/0.072	10/14
TPC8405 Δ	30/–30	6/–4.5	1.5	SOP-8	—	—	—	0.033/0.042	0.026/0.033	27/40

Δ : Complementary (N- and P-Channel) MOSFET

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

30 V < V_{DSS} ≤ 60 V (N-ch Power MOSFETs)

Part Number	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)		Q _g (nC) (Typ.)
					V _{GS} = 4 V	V _{GS} = 10 V	
TPC6006-H	40	3.9	2.2	VS-6	0.1♣	0.075	4.4
TPCP8203	40	4.7	1.48	PS-8	0.06♣	0.04	16
TPC8022-H	40	7.5	1.9	SOP-8	0.035♣	0.027	11
TPCA8020-H	40	7.5	30	SOP Advance	0.035♣	0.027	11
2SK3846	40	26	25	TO-220NIS	0.028♣	0.018	40
TPCA8014-H	40	30	45	SOP Advance	0.014♣	0.009	22
TPCA8027-H	40	30	45	SOP Advance	—	0.01	23
2SK3847	40	32	30	TO-220FL/SM	0.028♣	0.018	40
TPCA8015-H	40	35	45	SOP Advance	0.0079♣	0.0054	37
2SK3843	40	75	125	TFP	0.008♣	0.0035	210
TK70J04J3	40	70	150	TO-3P(N)	0.0083♣	0.0038	210
TK80X04K3	40	80	125	TFP	—	0.0035	100
TPCP8403 △	40/-40	4.7/-3.4	1.48	PS-8	0.077/0.105♣	0.05/0.072	16/15
TPC8406-H △	40/-40	6.5/-6.5	1.5	SOP-8	0.035/0.037♣	0.027/0.030	11/27
2SK2989	50	5	0.9	LSTM	0.33	0.15	6.5
2SK2614	50	20	40	DP	0.08	0.046	25
2SK2507	50	25	30	TO-220NIS	0.08	0.046	25
2SK2886	50	45	40	TO-220NIS	0.036	0.02	66
2SK3051	50	45	40	TO-220FL/SM	—	0.03	36
2SK2550	50	45	100	TO-3P(N)	—	0.03	36
2SK2744	50	45	125	TO-3P(N)	—	0.02	68
2SK2745	50	50	150	TO-3P(N)	0.016	0.0095	130
2SK2551	50	50	150	TO-3P(N)	—	0.011	130
2SK3129	50	60	150	TO-3P(N)	—	0.007	135
2SK2961	60	2	0.9	LSTM	0.38	0.27	5.8
2SK2615	60	2	1.5	PW-Mini	0.44	0.3	6
2SK3658	60	2	1.5	PW-Mini	0.44	0.3	5.0
2SK2229	60	5	1.3	TPS	0.3	0.16	12
TPC8213-H	60	5	1.5	SOP-8	0.056♣	0.050	6
2SK4017	60	5	20	New PW-Mold2	0.15	0.1	15
2SK4033	60	5	20	PW-Mold	0.15	0.1	15
2SK2782	60	20	40	DP	0.09	0.055	25
2SK2232	60	25	35	TO-220NIS	0.08	0.046	38
2SK2311	60	25	40	TO-220FL/SM	0.08	0.046	38
TPCA8016-H	60	25	45	SOP Advance	0.026♣	0.021	22
TK30A06J3A	60	30	25	TO-220SIS	0.035♣	0.026	36
2SK3662	60	35	35	TO-220NIS	0.019	0.0125	91
2SK2385	60	36	40	TO-220NIS	0.055	0.03	60
2SK3844	60	45	45	TO-220NIS	—	0.0058	196
2SK2266	60	45	65	TO-220FL/SM	0.055	0.03	60
2SK2233	60	45	100	TO-3P(N)	0.055	0.03	60
2SK2376	60	45	100	TO-220FL/SM	0.025	0.017	110
2SK2398	60	45	100	TO-3P(N)	—	0.03	60
2SK2173	60	50	125	TO-3P(N)	0.025	0.017	110
2SK2445	60	50	125	TO-3P(N)	—	0.018	110
2SK3440	60	50	125	TFP	—	0.008	55
2SK2267	60	60	150	TO-3P(L)	0.015	0.011	170
2SK2313	60	60	150	TO-3P(N)	0.015	0.011	170
2SK3845	60	70	125	TO-3P(N)	—	0.0058	196
TK70D06J1	60	70	140	TO-220(W)	0.0076♣	0.0064	87
TK70A06J1	60	70	45	TO-220SIS	0.0076♣	0.0064	87
2SK3842	60	75	125	TFP	—	0.0058	196
2SK4034	60	75	125	TFP	0.01♣	0.0058	196

♣: V_{GS} = 4.5 V

△: Complementary (N- and P-Channel) MOSFET

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

60 V < V_{DSS} ≤ 150 V (N-ch Power MOSFETs)

Part Number	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)		Q _g (nC) (Typ.)
					V _{GS} = 4 V	V _{GS} = 10 V	
TK60D08J1	75	60	140	TO-220(W)	0.0093♣	0.0078	86
TK60A08J1	75	60	45	TO-220SIS	0.0093♣	0.0078	86
2SK3940	75	70	150	TO-3P(N)	—	0.007	200
TK80A08K3	75	80	40	TO-220SIS	—	0.0045	175
TK80D08K3	75	80	100	TO-220(W)	—	0.0045	175
2SK2962	100	1	0.9	LSTM	0.95	0.7	6.3
2SK2963	100	1	1.5	PW-Mini	0.95	0.7	6.3
TPC8214-H	100	2.2	1.5	SOP-8	0.190♣	0.180	7.5
TPCP8003-H	100	2.2	1.68	PS-8	0.19♣	0.18	7.5
2SK2200	100	3	1.3	TPS	0.45	0.35	13.5
2SK2201	100	3	20	PW-Mold	0.45	0.35	13.5
2SK4018	100	3	20	New PW-Mold2	0.45	0.35	13.5
2SK2400	100	5	1.3	TPS	0.3	0.23	22
2SK2399	100	5	20	PW-Mold	0.3	0.23	22
2SK4019	100	5	20	New PW-Mold2	0.3	0.23	22
TK05N10J1	100	5	20	New PW-Mold	—	0.225	6.6
2SK3669	100	10	20	PW-Mold	—	0.125	8.0
TPCA8006-H	100	18	45	SOP Advance	—	0.067	12
2SK2391	100	20	35	TO-220NIS	0.13	0.085	50
TPCA8022-H	100	22	45	SOP Advance	—	0.026	38
2SK2789	100	27	60	TO-220FL/SM	0.13	0.085	50
2SK2314	100	27	75	TO-220AB	0.13	0.085	50
TK40D10J1	100	40	100	TO-220(W)	0.017♣	0.015	76
TK40A10J1	100	40	40	TO-220SIS	0.017♣	0.015	76
2SK1381	100	50	150	TO-3P(N)	0.046	0.032	88
TK55D10J1	100	55	140	TO-220(W)	0.012♣	0.0105	110
TK55A10J1	100	55	45	TO-220SIS	0.012♣	0.0105	110
2SK1382	100	60	200	TO-3P(L)	0.029	0.02	176
2SK3670	150	0.67	0.9	LSTM	1.7	—	4.6
TPCS8009-H	150	2.1	1.5	TSSOP-8	—	0.35	10
2SK3205	150	5	20	PW-Mold	0.75	0.5	12
TPCA8009-H	150	7	45	SOP Advance	—	0.35	10
2SK2882	150	18	45	TO-220NIS	0.18	0.12	57
2SK3387	150	18	100	TFP	—	0.12	57
2SK3443	150	30	125	TFP	—	0.055	45
TK50X15J1	150	50	125	TFP	—	0.03	75

♣: V_{GS} = 4.5 V

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

150 V < V_{DSS} ≤ 250 V (N-ch Power MOSFETs)

Part Number	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)			Q _g (nC) (Typ.)
					V _{GS} = 4 V	V _{GS} = 7 V	V _{GS} = 10 V	
2SK2162	180	1	20	PW-Mold	—	—	5	—
2SK2013	180	1	25	TO-220NIS	—	—	5	—
2SK2467	180	9	80	TO-3P(N)IS	—	—	0.83	—
2SK1529	180	10	120	TO-3P(N)	—	—	0.83	—
2SK3497	180	10	130	TO-3P(N)	—	0.15	—	36
2SK2992	200	1	1.5	PW-Mini	—	—	3.5	3
TPCS8004	200	1.3	1.5	TSSOP-8	—	—	0.8	12
TPC8012-H	200	1.8	1.9	SOP-8	—	—	0.4	11
TPCS8007-H	200	1.9	1.5	TSSOP-8	—	—	0.45	10
2SK2835	200	5	1.3	TPS	—	—	0.8	10
2SK2920	200	5	20	PW-Mold	—	—	0.8	10
2SK4020	200	5	20	New PW-Mold2	—	—	0.8	10
2SK2381	200	5	25	TO-220NIS	—	—	0.8	10
TPCA8010-H	200	5.5	45	SOP Advance	—	—	0.45	10
2SK2350	200	8.5	30	TO-220NIS	—	—	0.4	17
2SK2965	200	11	35	TO-220NIS	—	—	0.26	30
2SK1530	200	12	150	TO-3P(L)	—	—	0.625	—
2SK2382	200	15	45	TO-220NIS	—	—	0.18	40
2SK2401	200	15	75	TO-220FL/SM	—	—	0.18	40
2SK3444	200	25	125	TFP	—	—	0.082	44
2SK3625	200	25	125	TO-220FL/SM	—	—	0.082	44
2SK3176	200	30	150	TO-3P(N)	—	—	0.052	125
TPCS8006	250	1.1	1.5	TSSOP-8	—	—	1.0	11
TPCS8008-H	250	1.7	1.5	TSSOP-8	—	—	0.58	10
2SK3462	250	3	20	PW-Mold	—	—	1.7	12
2SK4022	250	3	20	New PW-Mold2	—	—	1.7	12
TPCA8008-H	250	4	45	SOP Advance	—	—	0.58	10
2SK3342	250	4.5	20	PW-Mold	—	—	1	10
2SK4021	250	4.5	20	New PW-Mold2	—	—	1	10
2SK2914	250	7.5	20	TO-220AB	—	—	0.5	20
2SK2417	250	7.5	30	TO-220NIS	—	—	0.5	20
2SK2508	250	13	45	TO-220NIS	—	—	0.25	40
2SK2598	250	13	60	TO-220FL/SM	—	—	0.25	40
2SK2993	250	20	100	TO-220FL/SM	—	—	0.105	100
2SK3388	250	20	125	TFP	—	—	0.105	100
2SK3445	250	20	125	TFP	—	—	0.105	45
2SK3994	250	20	45	TO-220NIS	—	—	0.105	45
2SK2995	250	30	90	TO-3P(N)IS	—	—	0.068	132
2SK2967	250	30	150	TO-3P(N)	—	—	0.068	132

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

250 V < V_{DSS} ≤ 500 V (N-ch Power MOSFETs)

Part Number	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)	Q _g (nC) (Typ.)
					V _{GS} = 10 V	
2SK1486	300	32	200	TO-3P(L)	0.095	140
2SK3498	400	1	20	PW-Mold	5.5	5.7
2SK2679	400	5.5	35	TO-220NIS	1.2	17
2SK2838	400	5.5	40	TO-220FL/SM	1.2	17
2SK2952	400	8.5	40	TO-220NIS	0.55	34
2SK2841	400	10	80	TO-220AB	0.55	34
2SK2949	400	10	80	TO-220FL/SM	0.55	34
2SK3499	400	10	80	TFP	0.55	34
2SK3374	450	1	1.3	TPS	4.6	5
2SK3472	450	1	20	PW-Mold	4.6	5
2SK4023	450	1	20	New PW-Mold2	4.6	5
2SK3757	450	2	30	TO-220SIS	2.45	9
2SK3766	450	2	30	TO-220SIS	2.45	8
2SK3310	450	10	40	TO-220NIS	0.65	23
2SK3407	450	10	40	TO-220NIS	0.65	35
2SK3869	450	10	40	TO-220SIS	0.68	28
2SK3309	450	10	65	TO-220FL/SM	0.65	23
2SK3403	450	13	100	TO-220FL/SM	0.4	34
2SK3743	450	13	40	TO-220NIS	0.4	34
2SK3544	450	13	100	TFP	0.4	34
2SK3935	450	17	50	TO-220SIS	0.25	62
2SK3904	450	19	150	TO-3P(N)	0.26	62
2SK2998	500	0.5	0.9	LSTM	18	3.8
2SK3302	500	0.5	1.3	TPS	18	3.8
2SK3471	500	0.5	1.5	PW-Mini	18	3.8
2SK2599	500	2	1.3	TPS	3.2	9
2SK3373	500	2	20	PW-Mold	3.2	9
2SK2862	500	3	25	TO-220NIS	3.2	9
2SK3863	500	5	35	DP	1.5	16
2SK4103	500	5	40	New PW-Mold	1.5	16
2SK3563	500	5	35	TO-220SIS	1.5	16
2SK3868 #	500	5	35	TO-220SIS	1.7	16
2SK2991	500	5	50	TO-220FL/SM	1.5	17
2SK3417	500	5	50	TO-220FL/SM	1.8	17
2SK3466	500	5	50	TFP	1.5	17
2SK3561	500	8	40	TO-220SIS	0.85	28
2SK4042	500	8	40	TO-220SIS	0.97	28
2SK2776	500	8	65	TO-220FL/SM	0.85	30
2SK2542	500	8	80	TO-220AB	0.85	30
2SK3538	500	8	65	TFP	0.85	30
2SK2601	500	10	125	TO-3P(N)	1.0	30
2SK3568	500	12	40	TO-220SIS	0.52	42
2SK3313 #	500	12	40	TO-220NIS	0.62	45
2SK3068	500	12	100	TO-220FL/SM	0.52	45
2SK3398	500	12	100	TFP	0.52	45
2SK4012	500	13	45	TO-220SIS	0.4	50
2SK2916	500	14	80	TO-3P(N)IS	0.4	58
2SK3934	500	15	50	TO-220SIS	0.3	62
2SK4107	500	15	150	TO-3P(N)	0.4	48
2SK3314	500	15	150	TO-3P(N)	0.49	58
2SK3905	500	17	150	TO-3P(N)	0.31	62
2SK2917	500	18	90	TO-3P(N)IS	0.27	80
2SK3117	500	20	150	TO-3P(SM)	0.27	80
2SK4108	500	20	150	TO-3P(N)	0.27	62
2SK3907	500	23	150	TO-3P(N)	0.24	60
2SK3936	500	23	150	TO-3P(N)	0.25	60
2SK1544	500	25	200	TO-3P(L)	0.2	150
2SK3131	500	50	250	TO-3P(L)	0.11	280
2SK3132	500	50	250	TO-3P(L)	0.095	280

#: HSD type

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

500 V < V_{DSS} ≤ 700 V (N-ch Power MOSFETs)

Part Number	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)	Q _g (nC) (Typ.)
					V _{GS} = 10 V	
2SK3371	600	1	20	PW-Mold	9.0	9
2SK4026	600	1	20	New PW-Mold2	9.0	9
2SK2846	600	2	1.3	TPS	5.0	9
2SK2865	600	2	20	PW-Mold	5.0	9
2SK3767	600	2	25	TO-220SIS	4.5	9
2SK4002	600	2	20	New PW-Mold2	5.0	9
2SK4003	600	3	20	New PW-Mold2	2.2	15
2SK3567	600	3.5	35	TO-220SIS	2.2	16
2SK3085	600	3.5	75	TO-220AB	2.2	20
2SK3562	600	6	40	TO-220SIS	1.25	28
2SK3947 #	600	6	40	TO-220SIS	1.4	28
2SK2777	600	6	65	TO-220FL/SM	1.25	30
2SK2602	600	6	125	TO-3P(N)	1.25	30
2SK3312	600	6	65	TO-220FL/SM	1.25	22
2SK3667	600	7.5	45	TO-220SIS	1.0	33
2SK3569	600	10	45	TO-220SIS	0.75	42
TK10A60D	600	10	45	TO-220SIS	0.75	25
2SK3438	600	10	80	TFP	1.0	28
2SK3437	600	10	80	TO-220FL/SM	1.0	28
2SK2889	600	10	100	TO-220FL/SM	0.75	45
2SK3399	600	10	100	TO-220FL/SM	0.75	35
2SK2866	600	10	125	TO-220AB	0.75	45
2SK4015 #	600	10	45	TO-220SIS	0.86	42
2SK2699	600	12	150	TO-3P(N)	0.65	58
2SK3797	600	13	50	TO-220SIS	0.43	62
2SK4016 #	600	13	50	TO-220SIS	0.5	62
2SK3903	600	14	150	TO-3P(N)	0.44	62
2SK2953	600	15	90	TO-3P(N)IS	0.4	80
TK15A60U	600	15	40	TO-220SIS	0.30	17
TK15J60T	600	15	170	TO-3P(N)	0.30	21
2SK2915	600	16	150	TO-3P(N)	0.4	80
2SK3911	600	20	150	TO-3P(N)	0.30	60
2SK3906 #	600	20	150	TO-3P(N)	0.33	60
TK20A60T	600	20	45	TO-220SIS	0.19	30
TK20D60T	600	20	190	TO-220(W)	0.19	30
TK20J60T	600	20	190	TO-3P(N)	0.19	30
TK40J60T	600	40	400	TO-3P(N)	0.08	67
2SK3265	700	10	45	TO-220NIS	1.0	53
2SK3453	700	10	80	TO-3P(N)IS	1.0	53

#: HSD type

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

700 V < VDSS (N-ch Power MOSFETs)

Part Number	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} Max (Ω)	Q _g (nC) (Typ.)
					V _{GS} = 10 V	
2SK2883	800	3	75	TO-220FL/SM	3.6	25
2SK2603	800	3	100	TO-220AB	3.6	25
2SK2605	800	5	45	TO-220NIS	2.2	34
2SK2884	800	5	100	TO-220FL/SM	2.2	34
2SK2604	800	5	125	TO-3P(N)	2.2	34
2SK4013	800	6	45	TO-220SIS	1.7	45
2SK3633	800	7	150	TO-3P(N)	1.7	35
2SK3879	800	6.5	80	TO-220SM	1.7	35
2SK3880	800	6.5	80	TO-3P(N)IS	1.7	35
2SK2606	800	8	85	TO-3P(N)IS	1.2	68
2SK2607	800	9	150	TO-3P(N)	1.2	68
2SK3301	900	1	20	PW-Mold	20	6
2SK2845	900	1	40	DP	9.0	15
2SK2733	900	1	60	TO-220AB	9.0	15
2SK3566	900	2.5	40	TO-220SIS	6.4	12
2SK3564	900	3	40	TO-220SIS	4.3	17
2SK2608	900	3	100	TO-220AB	4.3	25
2SK2719	900	3	125	TO-3P(N)	4.3	25
2SK3798	900	4	40	TO-220SIS	3.5	26
2SK3565	900	5	45	TO-220SIS	2.5	28
2SK3742	900	5	45	TO-220SIS	2.5	25
2SK3700	900	5	150	TO-3P(N)	2.5	28
2SK4014	900	6	45	TO-220SIS	2.0	45
2SK4115	900	7	150	TO-3P(N)	2.0	45
2SK2847	900	8	85	TO-3P(N)IS	1.4	58
2SK3799	900	8	50	TO-220SIS	1.3	62
2SK3017	900	8.5	90	TO-3P(N)IS	1.25	70
2SK3473	900	9	150	TO-3P(N)	1.6	38
2SK3878	900	9	150	TO-3P(N)	1.3	62
2SK2968	900	10	150	TO-3P(N)	1.25	70
2SK4207	900	13	150	TO-3P(N)	0.95	45
2SK1930	1000	4	80	TO-220FL/SM	3.8	60
2SK1119	1000	4	100	TO-220AB	3.8	60
2SK1359	1000	5	125	TO-3P(N)	3.8	60
2SK1365	1000	7	90	TO-3P(N)IS	1.8	120
2SK2613	1000	8	150	TO-3P(N)	1.7	65
2SK1489	1000	12	200	TO-3P(L)	1.0	110

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(P-ch Power MOSFETs)

Part Number	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(on)} Max (Ω)							Q _g (nC) (Typ.)
					V _{GS} = 1.8 V	V _{GS} = 2.0 V	V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 4.5 V	V _{GS} = 7 V	V _{GS} = 10 V	
TPC6103	-12	-5.5	2.2	VS-6	0.09	—	0.055	—	0.035	—	—	20
TPCP8401	-12	-5.5	1.96	PS-8	0.103	—	0.058	—	0.038	—	—	20
TPCF8101	-12	-6	2.5	VS-8	0.085	—	0.04	—	0.028	—	—	18
TPCA8105	-12	-6	20	SOP Advance	0.092	—	0.051	—	0.033	—	—	18
2SJ439	-16	-5	20	PW-Mold	—	—	0.28	0.2	—	—	—	24
TPCF8301	-20	-2.7	1.35	VS-8	0.3	—	0.16	—	0.11	—	—	6
TPCF8B01	-20	-2.7	1.35	VS-8	0.3	—	0.16	—	0.11	—	—	6
TPCF8103	-20	-2.7	2.5	VS-8	0.3	—	0.16	—	0.11	—	—	6
TPC6105	-20	-2.7	2.2	VS-6	0.3	—	0.16	—	0.11	—	—	6
TPCF8302	-20	-3	1.35	VS-8	0.2	—	0.095	—	0.059	—	—	11
TPCF8303	-20	-3	1.35	VS-8	0.25	—	0.087	—	0.058	—	—	11
TPC6107	-20	-4.5	2.2	VS-6	—	0.18	0.1	—	0.055	—	—	12
TPCS8302	-20	-5	1.1	TSSOP-8	—	0.095	0.06	0.035	—	—	—	28.5
TPCS8303	-20	-5	1.1	TSSOP-8	—	0.08	0.03	—	0.021	—	—	33
TPCP8301	-20	-5	1.48	PS-8	—	—	0.06	—	0.031	—	—	20
TPCP8302	-20	-5	1.48	PS-8	0.095	—	0.045	0.033	—	—	—	20
TPC6104	-20	-5.5	2.2	VS-6	—	0.12	0.06	—	0.04	—	—	19
TPCP8101	-20	-5.6	1.68	PS-8	0.09	—	0.041	—	0.03	—	—	19
TPCF8102	-20	-6	2.5	VS-8	0.09	—	0.041	—	0.03	—	—	19
TPCP8102	-20	-7.2	1.68	PS-8	—	0.08	0.03	—	0.018	—	—	33
TPC8115	-20	-8	1.9	SOP-8	0.03	—	0.014	—	0.01	—	—	115
TPCF8304	-30	-3.2	1.35	VS-8	—	—	—	—	0.105	—	0.072	14
TPC6108	-30	-4.5	2.2	VS-6	—	—	—	—	0.1	—	0.06	13
TPC6109-H	-30	-5	2.2	VS-6	—	—	—	—	0.083	—	0.059	12.6
TPCF8104	-30	-6	2.5	VS-8	—	—	—	—	0.038	—	0.028	34
TPC8109	-30	-10	1.9	SOP-8	—	—	—	0.03	—	—	0.02	45
TPCS8105	-30	-10	1.1	TSSOP-8	—	—	—	0.0195	—	—	0.0135	107
TPC8119	-30	-10	1.9	SOP-8	—	—	—	0.028	—	—	0.013	40
TPCS8104	-30	-11	1.1	TSSOP-8	—	—	—	0.018	—	—	0.012	107
TPC8113	-30	-11	1.9	SOP-8	—	—	—	0.018	—	—	0.01	107
TPC8111	-30	-11	1.9	SOP-8	—	—	—	0.018	—	—	0.012	107
TPC8121	-30	-11	1.9	SOP-8	—	—	—	0.024	—	—	0.012	42
TPC8122	-30	-12	1.9	SOP-8	—	—	—	0.0165	—	—	0.008	62
TPC8107	-30	-13	1.9	SOP-8	—	—	—	0.015	—	—	0.007	130
TPC8118	-30	-13	1.9	SOP-8	—	—	—	0.015	—	—	0.007	65
TPC8112	-30	-13	1.9	SOP-8	—	—	—	0.014	—	—	0.006	130
TPC8114	-30	-18	1.9	SOP-8	—	—	—	0.0068	—	—	0.0045	180
TPC8117	-30	-18	1.9	SOP-8	—	—	—	0.0079	—	—	0.0039	130
TPCM8102	-30	-25	30	TSSOP Advance	—	—	—	0.016	—	—	0.0077	60
TPCA8102	-30	-40	45	SOP Advance	—	—	—	0.014	—	—	0.006	109
TPCA8103	-30	-40	45	SOP Advance	—	—	—	0.0068	—	—	0.0042	184
TPCA8106	-30	-40	45	SOP Advance	—	—	—	0.0078	—	—	0.0037	130
TPCP8J01	-32	-5.5	2.14	PS-8	—	—	—	0.049	—	—	0.035	34
TPCP8103-H	-40	-4.8	1.68	PS-8	—	—	—	—	0.054	—	0.04	19
TPC8116-H	-40	-7.5	1.9	SOP-8	—	—	—	—	0.037	—	0.030	27
TPC8110	-40	-8	1.9	SOP-8	—	—	—	0.035	—	—	0.025	48
TPCA8107-H	-40	-7.5	30	SOP Advance	—	—	—	—	0.037	—	0.030	27
TPCA8108	-40	-40	45	SOP Advance	—	—	—	—	—	—	0.0095	100
2SJ537	-50	-5	0.9	LSTM	—	—	—	0.34	—	—	0.19	18
2SJ507	-60	-1	0.9	LSTM	—	—	—	1.0	—	—	0.7	5.6
2SJ360	-60	-1	1.5	PW-Mini	—	—	—	1.2	—	—	0.73	6.5
2SJ378	-60	-5	1.3	TPS	—	—	—	0.28	—	—	0.19	22
2SJ669	-60	-5	1.2	TPS	—	—	—	0.25	—	—	0.17	15
2SJ668	-60	-5	20	PW-Mold	—	—	—	0.25	—	—	0.17	15
2SJ438	-60	-5	25	TO-220NIS	—	—	—	0.28	—	—	0.19	22
2SJ304	-60	-14	40	TO-220NIS	—	—	—	0.19	—	—	0.12	45
2SJ312	-60	-14	40	TO-220FL/SM	—	—	—	0.19	—	—	0.12	45
2SJ349	-60	-20	35	TO-220NIS	—	—	—	0.09	—	—	0.045	90
2SJ401	-60	-20	100	TO-220FL/SM	—	—	—	0.09	—	—	0.045	90
2SJ334	-60	-30	45	TO-220NIS	—	—	—	0.06	—	—	0.038	110
2SJ402	-60	-30	100	TO-220FL/SM	—	—	—	0.06	—	—	0.038	110
TPCA8104	-60	-40	45	SOP Advance	—	—	—	0.024	—	—	0.016	90
TJ120F06J3	-60	-120	300	TO-220SM(W)	—	—	—	—	—	—	0.008	258

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	V _{DS} (V)	I _D (A)	P _D (W)	Package	R _{DS(on)} Max (Ω)							Q _g (nC) (Typ.)
					V _{GS} = 1.8 V	V _{GS} = 2.0 V	V _{GS} = 2.5 V	V _{GS} = 4 V	V _{GS} = 4.5 V	V _{GS} = 7 V	V _{GS} = 10 V	
2SJ509	-100	-1	0.9	LSTM	—	—	—	2.5	—	—	1.9	6.3
2SJ508	-100	-1	1.5	PW-Mini	—	—	—	2.5	—	—	1.9	6.3
2SJ380	-100	-12	35	TO-220NIS	—	—	—	0.32	—	—	0.21	48
2SJ412	-100	-16	60	TO-220FL/SM	—	—	—	0.32	—	—	0.21	48
2SJ619	-100	-16	75	TFP	—	—	—	0.32	—	—	0.21	48
2SJ464	-100	-18	45	TO-220NIS	—	—	—	0.12	—	—	0.09	140
2SJ620	-100	-18	125	TFP	—	—	—	0.12	—	—	0.09	140
2SJ338	-180	-1	20	PW-Mold	—	—	—	—	—	—	5	—
2SJ313	-180	-1	25	TO-220NIS	—	—	—	—	—	—	5	—
2SJ440	-180	-9	80	TO-3P(N)IS	—	—	—	—	—	—	0.83	—
2SJ200	-180	-10	120	TO-3P(N)	—	—	—	—	—	—	0.83	—
2SJ618	-180	-10	130	TO-3P(N)	—	—	—	—	—	—	0.37 (7 V)	35
2SJ567	-200	-2.5	20	PW-Mold	—	—	—	—	—	—	2	10
2SJ407	-200	-5	30	TO-220NIS	—	—	—	—	—	—	1	20
2SJ201	-200	-12	150	TO-3P(L)	—	—	—	—	—	—	0.625	—
2SJ680	-200	-2.5	20	New PW-Mold2	—	—	—	—	—	—	2	10
2SJ610	-250	-2	20	PW-Mold	—	—	—	—	—	—	2.55	24
2SJ512	-250	-5	30	TO-220NIS	—	—	—	—	—	—	1.25	22
2SJ516	-250	-6.5	35	TO-220NIS	—	—	—	—	—	—	0.8	29

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Power Transistor Modules

Power Transistor Modules (Full-Mold Type S-10)

Part Number	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 x 2, PNP x 2	Darlington	±80	±4	4	2000	±2	±1	±1.5	±3	±6
MP4006	NPN x 2, PNP x 2	Darlington	±80	±2	4	2000	±2	±1	±1.5	±1	±1
MP4009	PNP x 4	Darlington	-100	-5	4	1000	-3	-3	-2	-3	-12
MP4013	NPN x 4	Darlington	80 ± 10	2	4	2000	2	1	1.5	1	1
MP4015	NPN x 4	Darlington	60 ± 10	5	4	1000	4	3	2	3	10
MP4020	NPN x 4	Darlington	60 ± 10	2	4	2000	2	1	1.5	1	1
MP4021	NPN x 4	Darlington	100 ± 15	2	4	2000	2	1	1.5	1	1
MP4024	NPN x 4	Darlington	100 ± 15	3	4	2000	2	1	1.5	1	V _{BH} = 4.2 V
MP4025	NPN x 4	Darlington	60 ± 10	1.5	4	2000	2	0.7	1.2	0.5	V _{BH} = 4.2 V
MP4101	NPN x 4	Darlington	60 ± 10	4	4	2000	2	1	1.5	3	10
MP4104	NPN x 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

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Power Transistor Modules (Full-Mold Type S-12)

Part Number	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 x 2, NPN x 2	Darlington	100	3	4.4	2000	2	1.5	1.5	1.5	3
MP4303	NPN x 2, NPN x 2	Darlington	100	2	4.4	2000	2	1	1.5	1	1
MP4304	NPN x 2, NPN x 2	Single	80	3	4.4	600	2	1	0.5	1.5	15
MP4305	PNP x 2, PNP x 2	Darlington	-100	-5	4.4	2000	-5	-3	-1.5	-3	-6
MP6301	NPN x 3, PNP x 3	Darlington	±80	±3	4.4	2000	±2	±1	±1.8	±2	±4

▲: Built-in diode for absorbing flyback voltage

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Power MOSFET Modules (Full-Mold Types S-10 and S-12)

Part Number	Circuit Configuration	Absolute Maximum Ratings			Electrical Characteristics			Package	Remarks
		V _{DSS} (V)	I _D (A)	P _T (T _a = 25°C) (W)	R _{DS(ON)} (Ω) Max	I _D (A)	V _{GS} (V)		
MP4208	P-ch x 4	-60	-5	4	0.3	-2.5	-10	SIP10 (S-10)	4-V drive possible
MP4209	N-ch x 2, N-ch x 2	100	3	4	0.35	2	10	SIP10 (S-10)	4-V drive possible
MP4210	N-ch x 2, N-ch x 2	60	5	4	0.16	2.5	10	SIP10 (S-10)	4-V drive possible
MP4211	P-ch x 2, P-ch x 2	-60	-5	4	0.19	-2.5	-10	SIP10 (S-10)	4-V drive possible
MP4212	N-ch x 2, P-ch x 2	±60	±5	4	0.16/0.19	2.5/-2.5	10/-10	SIP10 (S-10)	4-V drive possible
MP4410	N-ch x 2, N-ch x 2	▲ 60	5	4.4	0.16	2.5	10	SIP12 (S-12)	4-V drive possible
MP4411	N-ch x 2, N-ch x 2	▲ 100	3	4.4	0.35	2	10	SIP12 (S-12)	4-V drive possible
MP4412	N-ch x 2, N-ch x 2	▲ 100	5	4.4	0.23	2.5	10	SIP12 (S-12)	4-V drive possible
MP6404	N-ch x 3, P-ch x 3	±60	±5	4.4	0.16/0.19	2.5/-2.5	10/-10	SIP12 (S-12)	4-V drive possible

▲: Built-in diode for absorbing flyback voltage

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Radio-Frequency Bipolar Small-Signal Transistors

Radio-Frequency Bipolar Transistors

Part Number	Package	Applications	Absolute Maximum Ratings (Ta = 25°C)				Marking	TO-92 Equivalent Product	Remarks (Mini Transistors)
			V _{CEO} (V)	I _C (mA)	P _C (mW)	T _J (°C)			
2SC2714		FM-band radio-frequency amps	30	20	100	125	Q□	2SC1923	2SC2668
2SC2715		AM frequency converter, FM IF amps	30	50	150	125	R□	2SC380TM	2SC2669
2SC2716		AM radio-frequency amps	30	100	150	125	F□	2SC941TM	2SC2670
2SC3123		VHF TV frequency converters	20	50	150	125	HE	2SC3136	f _T = 1.4 GHz
2SC5064		VHF/UHF-band low-noise amps	12	30	150	125	MA□	—	f _T = 7 GHz
2SC5084		VHF/UHF-band low-noise amps	12	80	150	125	MC□	—	f _T = 7 GHz
2SC5089		VHF/UHF-band low-noise amps	10	40	150	125	MD□	—	f _T = 10 GHz
2SC5094		VHF/UHF-band low-noise amps	10	15	150	125	ME□	—	f _T = 10 GHz
2SC5106		VHF/UHF oscillators	10	30	150	125	MF□	—	f _T = 6 GHz
2SC5109		VHF/UHF oscillators	10	60	150	125	MG□	—	f _T = 5 GHz
MT3S03A		VHF/UHF band, low voltage operation, low phase noise	5	40	150	125	MR	—	f _T = 10 GHz
MT3S04A		VHF/UHF band, low voltage operation, low phase noise	5	40	150	125	AE	—	f _T = 7 GHz
MT3S106		VHF/UHF band low noise, low distortion amps	6	80	700 (Note 1)	150	R2	—	f _T = 13 GHz
2SC5087		VHF/UHF-band low-noise amps	12	80	150	125	C□	—	f _T = 7 GHz
2SC5087R	VHF/UHF-band low-noise amps	12	80	150	125	ZP	—	f _T = 7 GHz	
2SC5092	VHF/UHF-band low-noise amps	10	40	150	125	D□	—	f _T = 10 GHz	
2SC5097	VHF/UHF-band low-noise amps	10	15	150	125	E□	—	f _T = 10 GHz	
MT4S03A	VHF/UHF band, low voltage operation, low phase noise	5	40	150	125	MR	—	f _T = 10 GHz	
MT4S04A	VHF/UHF band, low voltage operation, low phase noise	5	40	150	125	AE	—	f _T = 7 GHz	
MT4S06	VHF/UHF band, low voltage operation, low noise	5	15	150	125	AC	—	f _T = 10 GHz	
MT4S07	VHF/UHF band, low voltage operation, low noise	5	25	150	125	AD	—	f _T = 12 GHz	
2SC4215		FM-band radio-frequency amps	30	20	100	125	Q□	2SC1923	f _T = 550 MHz
2SC4250		VHF TV frequency converters	20	50	100	125	HE	2SC3136	f _T = 1.4 GHz
2SC5065		VHF/UHF-band low-noise amps	12	30	100	125	MA□	—	f _T = 7 GHz
2SC5085		VHF/UHF-band low-noise amps	12	80	100	125	MC□	—	f _T = 7 GHz
2SC5090		VHF/UHF-band low-noise amps	10	40	100	125	MD□	—	f _T = 10 GHz
2SC5095		VHF/UHF-band low-noise amps	10	15	100	125	ME□	—	f _T = 10 GHz
2SC5107		VHF/UHF oscillators	10	30	100	125	MF□	—	f _T = 6 GHz
2SC5110		VHF/UHF oscillators	10	60	100	125	MG□	—	f _T = 5 GHz
2SC5463		VHF/UHF-band low-noise amps	12	60	100	125	MX/MY	—	f _T = 7 GHz
MT3S03AU		VHF/UHF band, low voltage operation, low phase noise	5	40	100	125	MR	—	f _T = 10 GHz
MT3S04AU		VHF/UHF band, low voltage operation, low phase noise	5	40	100	125	AE	—	f _T = 7 GHz
MT3S16U		UHF-band, low-voltage oscillators and amplifiers	5	60	100	125	T4	—	f _T = 4 GHz

□: Denotes a hFE class.

Note 1: Mounted on a ceramic board

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Radio-Frequency Bipolar Transistors (Continued)

Part Number	Package	Applications	Absolute Maximum Ratings (Ta = 25°C)				Marking	TO-92 Equivalent Product	Remarks	
			V _{CEO} (V)	I _C (mA)	P _C (mW)	T _J (°C)				
2SC5088		VHF/UHF-band low-noise amps	12	80	100	125	MC□	—	f _r = 7 GHz	
2SC5093		VHF/UHF-band low-noise amps	10	40	100	125	MD□	—	f _r = 10 GHz	
2SC5098		VHF/UHF-band low-noise amps	10	15	100	125	ME□	—	f _r = 10 GHz	
2SC5319		VHF/UHF-band low-noise amps	5	20	100	125	MT	—	f _r = 16 GHz	
MT4S03AU		VHF/UHF band, low voltage operation, low phase noise	5	40	100	125	MR	—	f _r = 10 GHz	
MT4S04AU		VHF/UHF band, low voltage operation, low phase noise	5	40	100	125	AE	—	f _r = 7 GHz	
MT4S06U		VHF/UHF band, low voltage operation, low noise	5	15	60	125	AC	—	f _r = 10 GHz	
MT4S07U		VHF/UHF band, low voltage operation, low noise	5	25	100	125	AD	—	f _r = 12 GHz	
MT4S32U		VHF/UHF band, low voltage operation, low noise	4.5	15	67.5	125	U4	—	f _r = 16 GHz	
2SC4915			FM-band radio-frequency amps	30	20	100	125	Q□	2SC1923	f _r = 550 MHz
2SC5066	VHF/UHF-band low-noise amps		12	30	100	125	M1/M2	—	f _r = 7 GHz	
2SC5086	VHF/UHF-band low-noise amps		12	80	100	125	M5/M6	—	f _r = 7 GHz	
2SC5091	VHF/UHF-band low-noise amps		10	40	100	125	M7/M8	—	f _r = 10 GHz	
2SC5096	VHF/UHF-band low-noise amps		10	15	100	125	M9/MA	—	f _r = 10 GHz	
2SC5108	VHF/UHF oscillators		10	30	100	125	MB/MC	—	f _r = 6 GHz	
2SC5111	VHF/UHF oscillators		10	60	100	125	MD/ME	—	f _r = 5 GHz	
2SC5322	VHF/UHF-band low-noise amps		5	10	100	125	MU	—	f _r = 15.5 GHz	
2SC5464	VHF/UHF-band low-noise amps		12	60	100	125	MX/MY	—	f _r = 7 GHz	
MT3S03AS	VHF/UHF band, low voltage operation, low phase noise		5	40	100	125	MR	—	f _r = 10 GHz	
MT3S04AS	VHF/UHF band, low voltage operation, low phase noise		5	40	100	125	AE	—	f _r = 7 GHz	
MT3S06S	VHF/UHF band, low voltage operation, low noise		5	15	60	125	AC	—	f _r = 10 GHz	
MT3S07S	VHF/UHF band, low voltage operation, low noise		5	25	100	125	AD	—	f _r = 12 GHz	
2SC4250FV			VHF TV frequency converters	20	50	150	125	HE	2SC3136	f _r = 1.4 GHz
MT3S03AFS			VHF/UHF band, low voltage operation, low phase noise	5	40	85 (Note 1)	125	00	—	f _r = 10 GHz
MT3S04AFS		VHF/UHF band, low voltage operation, low phase noise	5	40	85 (Note 1)	125	01	—	f _r = 7 GHz	
MT3S05FS		VHF/UHF band, low voltage operation, low phase noise	5	40	85 (Note 1)	125	02	—	f _r = 4.5 GHz	
MT3S06FS		VHF/UHF band, low voltage operation, low noise	5	15	85 (Note 1)	125	03	—	f _r = 10 GHz	
MT3S07FS		VHF/UHF band, low voltage operation, low noise	5	25	85 (Note 1)	125	04	—	f _r = 12 GHz	
MT3S11FS		VHF/UHF band, low voltage operation, low phase noise	6	40	85 (Note 1)	125	08	—	f _r = 6 GHz	
MT3S12FS		VHF/UHF band, low voltage operation, low phase noise	6	40	85 (Note 1)	125	09	—	f _r = 7 GHz	
MT3S14FS		VHF/UHF band, low voltage operation, low noise	2.5	30	85 (Note 1)	125	0H	—	f _r = 11 GHz	
MT3S16FS		UHF-band, low-voltage oscillators and amplifiers	5	60	85 (Note 1)	125	0K	—	f _r = 4 GHz	
MT3S35FS		VHF/UHF band, low voltage operation, low noise	4.5	24	100 (Note 1)	150	20	—	f _r = 20 GHz	
MT3S36FS		VHF/UHF band, low voltage operation, low noise	4.5	36	100 (Note 1)	150	21	—	f _r = 19 GHz	
MT3S37FS		VHF/UHF band, low voltage operation, low noise	4.5	50	100 (Note 1)	150	22	—	f _r = 19 GHz	
MT3S41FS	VHF/UHF band, low voltage operation, low noise	4.5	80	100 (Note 1)	150	26	—	f _r = 15 GHz		
MT3S11CT		VHF/UHF band, low voltage operation, low phase noise	6	40	105 (Note 1)	125	08	—	f _r = 6 GHz	
MT3S15TU *		VHF/UHF-band low-noise amps	6	80	900 (Note 2)	150	T3	—	f _r = 11.5 GHz	
MT3S19TU *		VHF/UHF-band low-noise amps	6	80	900 (Note 2)	150	T6	—	f _r = 11 GHz	
MT3S20TU *		VHF/UHF-band low-noise amps	12	80	900 (Note 2)	150	MU	—	f _r = 7 GHz	
MT3S20P *		VHF/UHF-band low-noise amps	12	80	1800 (Note 2)	150	MU	—	f _r = 7 GHz	
MT3S21P *		VHF/UHF-band low-noise amps	6	80	1800 (Note 2)	150	T2	—	f _r = 9 GHz	
MT3S22P *		VHF/UHF-band low-noise amps	6	80	1800 (Note 2)	150	T5	—	f _r = 8.5 GHz	

□: Denotes a hFE class.

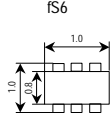
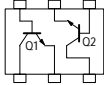
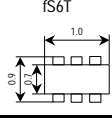
*: New product

Note 1: When mounted on a glass-epoxy PCB board

Note 2: Mounted on a ceramic board

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Dual Radio-Frequency Bipolar Transistor

Part Number	Package	Absolute Maximum Ratings (Ta = 25°C)			Structure (Q1/Q2)	fr (Q1/Q2) (GHz)	Internal Connections	Marking	
		VCE0 (Q1/Q2) (V)	Ic (Q1/Q2) (mA)	Pc★ (mW)					
MT6L63FS		5/6	25/40	110 (Note 1)	MT3S07FS/MT3S11FS	12/4.5		18	
MT6L64FS		4.5/6	24/40	110 (Note 1)	MT3S35FS/MT3S11FS	19.5/6		19	
MT6L65FS		4.5/6	36/40	110 (Note 1)	MT3S36FS/MT3S11FS	20/6		1F	
MT6L67FS *		4.5/6	36/80	110 (Note 1)	MT3S36FS/MT3S106FS	20/8.5		1J	
MT6L68FS		5/6	15/40	110 (Note 1)	MT3S06FS/MT3S11FS	10/4.5		1K	
MT6L70FS		4.5/6	20/80	110 (Note 1)	MT3S107FS/MT3S106FS	16.5/8.5		1U	
MT6L71FS		5/6	25/40	105 (Note 1)	MT3S07FS/MT3S11AFS	12/4.5		1W	
MT6L72FS		4.5/6	36/40	105 (Note 1)	MT3S36FS/MT3S11AFS	19/4.5		1X	
MT6L75FS *		5/6	25/80	110 (Note 1)	MT3S07FS/MT3S106FS	12/8.5		52	
MT6L76FS *		5/6	15/80	110 (Note 1)	MT3S06FS/MT3S106FS	10/8.5		53	
MT6L77FS *		6/6	40/80	110 (Note 1)	MT3S11FS/MT3S106FS	6/8.5		54	
MT6L78FS		6/6	40/40	105 (Note 1)	MT3S11FS/MT3S11AFS	6/6		55	
MT6L77FST *			6/6	40/80	140	MT3S11FS/MT3S106FS		6/8.5	54

★Pc: Total power dissipation

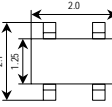
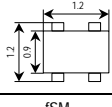
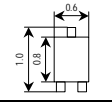
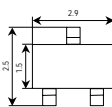
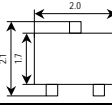
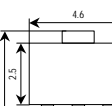
*: New product

Note 1: When mounted on a glass-epoxy PCB board

◆The internal connection diagrams only show the general configurations of the circuits.

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

SiGe HBTs

Part Number	Package	Applications	Absolute Maximum Ratings (Ta = 25°C)				Marking	Remarks
			VCE0 (V)	Ic (mA)	Pc (mW)	Tj (°C)		
MT4S100U		VHF/UHF band, low voltage operation, low noise	3	15	100	150	P6	fr = 22 GHz
MT4S101U		VHF/UHF band, low voltage operation, low noise	3	10	100	150	P7	fr = 21 GHz
MT4S102U *		UHF/SHF band, low voltage operation, low noise	3	20	100	150	P8	fr = 24 GHz
MT4S104U *		UHF/SHF band, low voltage operation, low noise	3	10	100	150	P1	fr = 23 GHz
MT4S200U *		UHF/SHF band, low voltage operation, low noise	4	35	140 (Note 1)	150	P2	fr = 30 GHz
MT4S100T		VHF/UHF band, low voltage operation, low noise	3	15	100	150	P6	fr = 23 GHz
MT4S101T		VHF/UHF band, low voltage operation, low noise	3	10	100	150	P7	fr = 23 GHz
MT4S102T *		UHF/SHF band, low voltage operation, low noise	3	20	100	150	P8	fr = 25 GHz
MT4S104T *		UHF/SHF band, low voltage operation, low noise	3	10	100	150	P1	fr = 25 GHz
MT4S200T *		UHF/SHF band, low voltage operation, low noise	4	35	100	150	P2	fr = 30 GHz
MT3S106FS *		UHF/SHF band, low voltage operation, low noise	6	80	100 (Note 1)	150	41	fr = 8.5 GHz
MT3S107FS *		UHF/SHF band, low voltage operation, low noise	4.5	20	100 (Note 1)	150	42	fr = 16.5 GHz
MT3S111 *		VHF/UHF band, low noise, low distortion	6	100	700 (Note 1)	150	R5	fr = 11.5 GHz
MT3S111TU *		VHF/UHF band, low noise, low distortion	6	100	800 (Note 1)	150	R5	fr = 10 GHz
MT3S111P *		VHF/UHF band, low noise, low distortion	6	100	1000 (Note 1)	150	R5	fr = 8 GHz

Note 1: When mounted on a glass-epoxy PCB board

*: New product

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Radio-Frequency Small-Signal FETs

Radio-Frequency MOSFETs

Part Number	Package	Applications	Electrical Characteristics (Ta = 25°C)					Marking	Equivalent Product (Leaded Type)
			V _{DS} (V)	I _D (mA)	P _D (mW)	I _{DSS} (mA)	Y _{fs} (mS) Typ.		
3SK232		TV UHF radio-frequency amps	12.5	30	150	0 to 0.1	21	UO	—
3SK291		TV UHF radio-frequency amps	12.5	30	150	0 to 0.1	26	UF	—
3SK292		TV VHF/UHF radio-frequency amps	12.5	30	150	0 to 0.1	23.5	UV	—
3SK249		TV UHF radio-frequency amps	12.5	30	100	0 to 0.1	21	UO	
3SK293		TV UHF radio-frequency amps	12.5	30	100	0 to 0.1	26	UF	
3SK294		TV VHF/UHF radio-frequency amps	12.5	30	100	0 to 0.1	23.5	UV	

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Radio-Frequency Junction FETs

Part Number	Package	Applications	Electrical Characteristics (Ta = 25°C)					Marking	Equivalent Product (Leaded Type)
			V _{GDO} V _{GDS} ◊ (V)	I _G (mA)	P _D (mW)	I _{DSS} (mA)	Y _{fs} (mS) Typ.		
2SK210		FM radio-frequency amps	-18	10	100	3.0 to 24	7	Y□	
2SK211		FM radio-frequency amps	-18	10	150	1.0 to 10	9	K□	
2SK711		AM radio-frequency amps	-20 ◊	10	150	6 to 32	25	RB□	2SK709
2SK1875		AM radio-frequency amps	-20 ◊	10	100	6 to 32	25	RB□	2SK709

□: Denotes a loss class.

- The products shown in bold are also manufactured in offshore fabs.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Radio-Frequency Power MOSFETs

Radio-Frequency Power MOSFETs

Part Number	Package	Applications	Absolute Maximum Ratings (Tc = 25°C)			Min	Po (W)		
			Vbss (V)	Pb (W)	Ib (A)		Test Conditions		
							VDD (V)	f (MHz)	Pi (W)
RFM08U9X *	PW-X	UHF/VHF Professional radios	36	20	5	7.5	9.6	520	0.5
2SK3075	PW-X		30	20	5	7.5	9.6	520	0.5
2SK3074	PW-MINI		30	3	1	0.63	9.6	520	0.02
2SK3476	PW-X		20	20	3	7.0	7.2	520	0.5
2SK3475	PW-MINI		20	3	1	0.63	7.2	520	0.02
2SK4037	PW-X	GMRS	12	20	3	3.55	6.0	470	0.3
2SK2855	PW-MINI	UHF/VHF Professional radios	10	0.5	1.0	1.26	6.0	849	0.2
2SK2854	PW-MINI		10	0.5	0.5	0.2	6.0	849	0.02
2SK3079A	PW-X	FRS/GMRS	10	20	3	2.24	4.5	470	0.1
2SK3756	PW-MINI		7.5	3	1	1.26	4.5	470	0.1
2SK3078A	PW-MINI		10	3	0.5	0.63	4.5	470	0.1
2SK3077	USQ		Driver	10	0.25	0.1	0.032	4.8	915
2SK3656	PW-MINI	FRS/GMRS	5	3	0.5	0.50	3.6	470	0.02

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

Radio-Frequency Bipolar Power Transistors

Part Number	Package	Applications	Absolute Maximum Ratings (Tc = 25°C)			Min	Po (W)		
			Vcbo (V)	Pc (W)	Ic (A)		Test Conditions		
							Vcc (V)	f (MHz)	Pi (W)
2SC2782A	2-13C1A	175 MHz Marine radios Professional radios Amateur radios	36	220	20	80	12.5	175	18

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Part Number	Package	Applications	Absolute Maximum Ratings (Tc = 25°C)			Max	Pi (WPEP)		
			Vcbo (V)	Pc (W)	Ic (A)		Test Conditions		
							Vcc (V)	f (MHz)	Po (WPEP)
2SC2510A	2-13B1A	27 to 50 MHz CB radios Amateur radios	60	250	20	9	28	28	150
2SC2879A	2-13B1A		45	250	25	10	12.5	28	100
2SC2290A	2-13B1A		45	175	20	4	12.5	28	60

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

IGBTs

IGBTs (Discrete IGBTs)

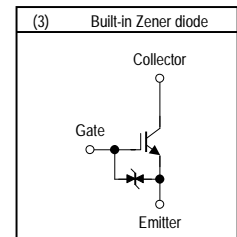
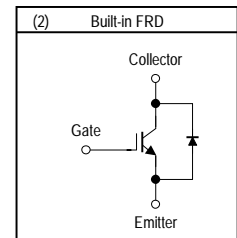
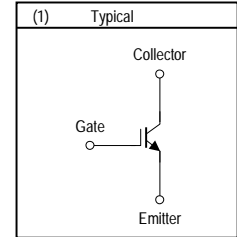
Part Number	Applications		Features	Absolute Maximum Ratings (Ta = 25°C)								
				V _{CEs} (V)	I _c		P _c					
	AC Voltage	DC (A)			Pulse (A)	Ta = 25°C (W)	Tc = 25°C (W)					
GT10J321	Inverter power supplies (UPS/PFC/motor)		High-speed switching	600	10	20	—	29				
GT15J321					15	30	—	30				
GT15J331					15	30	—	70				
GT20J321					20	40	—	45				
GT30J121					30	60	—	170				
GT30J324					30	60	—	170				
GT50J121					50	100	—	240				
GT50J325					50	100	—	240				
GT10Q101	High ruggedness			1200	10	20	—	140				
GT10Q301					10	20	—	140				
GT15Q102					15	30	—	170				
GT15Q301					15	30	—	170				
GT25Q102					25	50	—	200				
GT25Q301					25	50	—	200				
GT5J301	Motor drives (UPS/PFC)		High ruggedness	600	5	10	—	28				
GT5J311					5	10	—	45				
GT10J301					10	20	—	90				
GT10J303					10	20	—	30				
GT10J312					10	20	—	60				
GT15J301					15	30	—	35				
GT15J311					15	30	—	70				
GT20J101					20	40	—	130				
GT20J301					20	40	—	130				
GT30J101					30	60	—	155				
GT30J301					30	60	—	155				
GT50J102					50	100	—	200				
GT50J301					50	100	—	200				
GT30J122					Power factor correction	Low V _{CE(sat)}		30	100	—	75	
GT40G121					IH rice cookers, IH cooktops, Microwave ovens, Induction heating equipment	AC100 V	Current resonance	400	40	80	—	100
GT50G321									50	100	—	130
GT30J322	30	60	—	75								
GT35J321	37	100	—	75								
GT40J321 *	40	100	—	110								
GT40J322	40	100	—	110								
GT50J122	50	120	—	156								
GT50J322	50	100	—	130								
GT50J322H *	50	100	—	130								
GT50J327	50	100	—	140								
GT50J328 *	50	120	—	140								
GT60J321	60	120	—	200								
GT60J323	60	120	—	170								
GT60J323H *	60	120	—	170								
GT50M322 *	50	120	—	150								
GT15M321	15	30	—	55								
GT60M323	60	120	—	200								
GT60M303	60	120	—	170								
GT50N321	50	120	—	156								
GT50N322A *	50	120	—	156								
GT60N321	60	120	—	170								
GT60N322	57	120	—	200								
GT40Q321	AC200 V	Voltage resonance	1200	40	80	—	170					
GT5G131	Digital still cameras, single lens reflex cameras		Strobe flash (dimming control)	400	—	130	1.1	—				
GT8G132					—	150	1.1	—				
GT8G133					—	150	0.6	—				
GT8G134 *					—	150	0.6	—				
GT8G136 *					—	150	0.6	—				
GT10G131					—	200	1.1	—				
GT30F122	PDP-TV		PDP sustain, energy recovery and separation circuits	300	—	120	2.0	25				
GT45F122 *					—	200	2.0	25				
GT45F123 *					—	200	2.0	26				
GT45F124 *					—	200	2.0	29				
GT45F125 *					—	200	2.0	29				
GT30G122					—	120	2.0	25				
GT45G122 *				—	200	2.0	25					
GT45G123 *				—	200	2.0	26					
GT45G124 *				—	200	2.0	29					
GT45G125 *				—	200	2.0	29					

★: IEGT: Injection Enhanced Gate Transistor

• Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Package	Circuit Configuration (Note)	V _{CE(sat)} Typ. @Ta = 25°C			tr Typ. @Ta = 25°C		Remarks	
		Type	(V)	@I _C (A)	@V _{GE} (V)	(μs)		Test Conditions
TO-220NIS	Isolation, Through-hole	(2)	2.0	10	15	0.05	NPT design	
TO-220NIS	Isolation, Through-hole	(2)	1.9	15	15	0.03	NPT design	
TO-220SM	SMD	(2)	1.75	15	15	0.10	Low V _{CE(sat)} , NPT design	
TO-220NIS	Isolation, Through-hole	(2)	2.0	20	15	0.04	NPT design	
TO-3P(N)	Through-hole	(1)	2.0	30	15	0.05	NPT design	
TO-3P(N)	Through-hole	(2)	2.0	30	15	0.05	NPT design	
TO-3P(LH)	Through-hole	(1)	2.0	50	15	0.05	NPT design	
TO-3P(LH)	Through-hole	(2)	2.0	50	15	0.05	NPT design	
TO-3P(N)	Through-hole	(1)	2.1	10	15	0.16	NPT design	
TO-3P(N)	Through-hole	(2)	2.1	10	15	0.16	NPT design	
TO-3P(N)	Through-hole	(1)	2.1	15	15	0.16	NPT design	
TO-3P(N)	Through-hole	(2)	2.1	15	15	0.16	NPT design	
TO-3P(LH)	Through-hole	(1)	2.1	25	15	0.16	NPT design	
TO-3P(LH)	Through-hole	(2)	2.1	25	15	0.16	NPT design	
TO-220NIS	Isolation, Through-hole	(2)	2.1	5	15	0.15	Induction load	
TO-220SM	SMD	(2)	2.1	5	15	0.15		
TO-3P(N)	Through-hole	(2)	2.1	10	15	0.15		
TO-220NIS	Isolation, Through-hole	(2)	2.1	10	15	0.15		
TO-220SM	SMD	(2)	2.1	10	15	0.15		
TO-220NIS	Isolation, Through-hole	(2)	2.1	15	15	0.15		
TO-220SM	SMD	(2)	2.1	15	15	0.15		
TO-3P(N)	Through-hole	(1)	2.1	20	15	0.15		
TO-3P(N)	Through-hole	(2)	2.1	20	15	0.15		
TO-3P(N)	Through-hole	(1)	2.1	30	15	0.15		
TO-3P(N)	Through-hole	(2)	2.1	30	15	0.15		
TO-3P(LH)	Through-hole	(1)	2.1	50	15	0.15		
TO-3P(LH)	Through-hole	(2)	2.1	50	15	0.15		
TO-3P(N)IS	Isolation, Through-hole	(1)	2.1	50	15	0.25		
TO-220AB	Through-hole	(1)	1.8	40	15	0.30		
TO-3P(LH)	Through-hole	(2)	1.8	50	15	0.30		
TO-3P(N)IS	Isolation, Through-hole	(2)	2.1	50	15	0.25		
TO-3P(N)IS	Isolation, Through-hole	(2)	1.9	50	15	0.19		
TO-3P(N)	Through-hole	(2)	2.1	40	15	0.15		High speed, Mount the GT50J322H chip
TO-3P(N)	Through-hole	(2)	1.7	40	15	0.20		Mount the GT50J322 chip
TO-3P(N)	Through-hole	(1)	1.9	60	15	0.16		
TO-3P(LH)	Through-hole	(2)	2.1	50	15	0.25		
TO-3P(N)	Through-hole	(2)	2.2	50	15	0.16	High speed	
TO-3P(N)	Through-hole	(2)	1.9	50	15	0.19		
TO-3P(N)	Through-hole	(2)	2.0	50	15	0.11	High speed, Mount the GT60J323H chip	
TO-3P(LH)	Through-hole	(2)	1.55	60	15	0.30	Low V _{CE(sat)}	
TO-3P(LH)	Through-hole	(2)	1.9	60	15	0.16		
TO-3P(LH)	Through-hole	(2)	2.1	60	15	0.12	High speed	
TO-3P(N)	Through-hole	(2)	2.1	60	15	0.25	Mount the GT60M303 chip	
TO-3P(N)IS	Isolation, Through-hole	(2)	1.8	15	15	0.20	For small power	
TO-3P(LH)	Through-hole	(2)	2.3	60	15	0.09	High speed	
TO-3P(LH)	Through-hole	(2)	2.1	60	15	0.25		
TO-3P(N)	Through-hole	(2)	2.5	60	15	0.25		
TO-3P(N)	Through-hole	(2)	2.2	60	15	0.1	High speed	
TO-3P(LH)	Through-hole	(2)	2.3	60	15	0.25		
TO-3P(LH)	Through-hole	(2)	2.4	60	15	0.11	High speed	
TO-3P(N)	Through-hole	(2)	2.8	40	15	0.41	IEGT ★	
SOP-8	SMD	(3)	2.2	130	3.0	1.5	I _{CP} = 130 A@V _{GE} = 3.0-V gate drive	
SOP-8	SMD	(3)	2.3	150	4.0	1.6	I _{CP} = 150 A@V _{GE} = 4.0-V gate drive	
TSSOP-8	SMD	(3)	2.9	150	4.0	1.7	I _{CP} = 150 A@V _{GE} = 4.0-V gate drive	
TSSOP-8	SMD	(3)	3.4	150	2.5	1.2	I _{CP} = 150 A@V _{GE} = 2.5-V gate drive	
TSSOP-8	SMD	(3)	3.5	150	3.0	1.6	I _{CP} = 150 A@V _{GE} = 3.0-V gate drive	
SOP-8	SMD	(3)	2.3	200	4.0	1.8	I _{CP} = 200 A@V _{GE} = 4.0-V gate drive	
TO-220SIS	Isolation, Through-hole	(1)	2.4	120	15	0.21		
TO-220SIS	Isolation, Through-hole	(1)	2.2	120	15	0.2		
TO-220SIS	Isolation, Through-hole	(1)	1.95	120	15	0.2		
TO-220SIS	Isolation, Through-hole	(1)	1.7	120	15	0.22		
TO-220SIS	Isolation, Through-hole	(1)	1.5	120	15	0.4		
TO-220SIS	Isolation, Through-hole	(1)	2.6	120	15	0.25		
TO-220SIS	Isolation, Through-hole	(1)	2.4	120	15	0.28		
TO-220SIS	Isolation, Through-hole	(1)	2.1	120	15	0.23		
TO-220SIS	Isolation, Through-hole	(1)	1.9	120	15	0.27		
TO-220SIS	Isolation, Through-hole	(1)	1.6	120	15	0.5		

Note)



Induction load

Resistance load

*: New product

Phototransistors (for Optical Sensors)

Part Number	Part Number with Rank	Package	Electrical/Optical Characteristics (Ta = 25°C)							Applications	
			Light Current			Dark Current		Peak Sensitive Wavelength (nm)	Half-Value Angle (°)		Impermeable to Visible Light
			Min (μA)	Max (μA)	E (mW/cm ²)	Max (μA)	VCE (V)				
TPS601A(F)	—	TO-18CAN with lens	100	—	0.1	0.2	30	800	±10	—	
	TPS601A(A,F)		100	300							
	TPS601A(B,F)		200	600							
	TPS601A(C,F)		400	1200							
TPS610(F)	—	φ5	100	—	0.1	0.1	24	800	±8	—	
TPS611(F)	—	φ5	30	—	0.1	0.1	24	900	±8	●	
TPS615(F)	—	φ3	20	150	0.1	0.1	24	800	±30	—	
	TPS615(A,F)		20	50							
	TPS615(B,F)		34	85							
	TPS615(C,F)		60	150							
	TPS615(AB,F)		20	85							
	TPS615(BC,F)		34	150							
TPS616(F)	—	φ3	10	75	0.1	0.1	24	900	±30	●	
	TPS616(A,F)		10	25							
	TPS616(B,F)		17	42.5							
	TPS616(C,F)		30	75							
	TPS616(AB,F)		10	42.5							
	TPS616(BC,F)		17	75							
TPS622(F)	—	Small side-view package	27	—	0.1	0.1	24	870	±15	●	
	TPS622(A,F)		27	80							
	TPS622(B,F)		55	165							

Note: E = radiant incidence; VCE = collector-emitter voltage

- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.