TOSHIBA
Leading Innovation

SEMICONDUCTOR GENERAL CATALOG

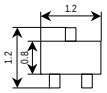
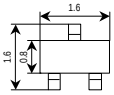
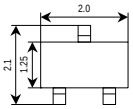
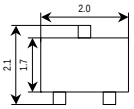
Transistors

Bipolar Small-Signal Transistors
Junction FETs
Combination Products of Different Type Devices
MOSFETs
Bipolar Power Transistors
Radio-Frequency Bipolar Small-Signal Transistors
Radio-Frequency Small-Signal FETs
Radio-Frequency Power MOSFETs
IGBTs
Phototransistors

2011/9 SCE0004L

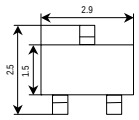
Bipolar Small-Signal Transistors

General-Purpose Transistors (Single)

Classification	V_{CEO} (V) Max	I_C (mA) Max	(Surface-Mount Type)									
			CST3  (mm)		VESM  (mm)		SSM  (mm)		USM  (mm)		UFM  (mm)	
			NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
General-purpose	50	100	2SC6026CT	2SA2154CT								
		150			2SC6026MFV	2SA2154MFV	2SC4738	2SA1832	**TTC4116***	**TTA1586***		
	30	500							**2SC4118**	**2SA1588**		
	50	500										
Low noise	120	100							**2SC4117**	**2SA1587**		
High current	12	400			2SC5376FV	2SA1955FV	2SC5376	2SA1955				
	12	500							2SC5233	2SA1954		
	15	800										
	25	800										
	30	800										
	10	2000										
	20	2000										
	20	1500										
	20	2500									2SC6133*	2SA2214*
	30	3000										2SA2215*
	50	1000									2SC6134*	
	50	1700									2SC6135*	
	50	2500										2SA2195*
Strobe	10	5000 (3000)									2SC6100*	
High breakdown voltage	80	300										
High h_{FE}	50	150										
Muting	20	300							2SC4213			
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.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any com

S-MINI

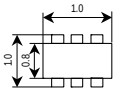
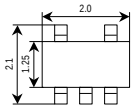
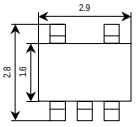


(mm)

NPN	PNP
2SC2712	**2SA1162**
2SC2859	**2SA1182**
2SC3325	**2SA1313**
2SC2713	**2SA1163**
2SC3324	2SA1312
2SC5232	2SA1953
	2SA1362
2SC3265	**2SA1298**
	2SA1621
	2SA1620
2SC3326	
2SC3138	
2SC4497	2SA1721

*: New product

General-Purpose Transistors (Dual)

Classification	V_{CEO} (V) Max	I_C (mA) Max	Dual Type									
			CST6  (mm)	fS6  (mm)			ESV  (mm)	USV  (mm)		SMV  (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										
	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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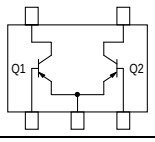
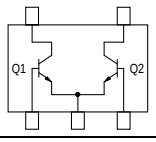
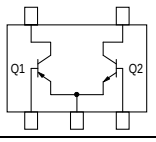
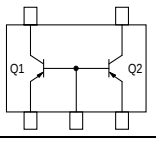
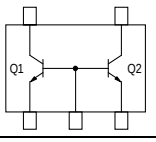
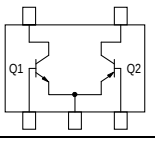
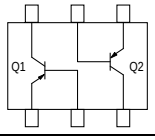
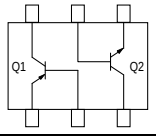
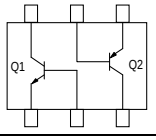
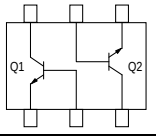
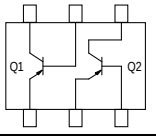
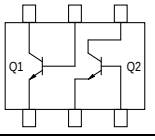
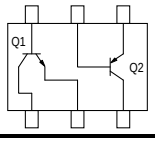
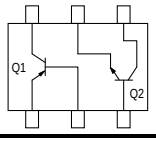
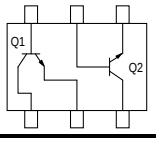
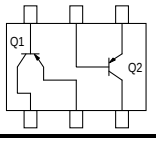
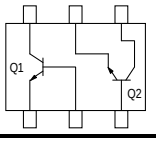
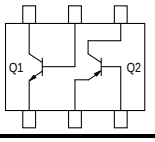
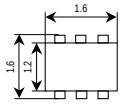
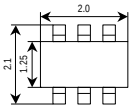
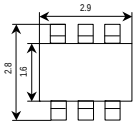
♦Internal Connections

Number of Pins	▲1	▲2	▲3	▲4	▲5	▲6
5						
	▲7	▲8	▲9	▲10	▲11	▲12
6						
	▲13	▲14	▲15	▲16	▲17	▲18
6						

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

ES6			US6			SM6		
 (mm)			 (mm)			 (mm)		
NPN	PNP	PNP + NPN	NPN	PNP	PNP + NPN	NPN	PNP	PNP + NPN
HN1C01FE (▲10) HN2C01FE (▲12) HN3C67FE (▲17)	HN1A01FE (▲7) HN2A01FE (▲11)	HN1B04FE (▲9)	**HN1C01FU** (▲10) HN2C01FU (▲12) HN3C56FU (▲15)	**HN1A01FU** (▲7) HN2A01FU (▲11)	HN1B01FU (▲8) **HN1B04FU** (▲9) HN3B02FU (▲14)	**HN1C01F** (▲10)	**HN1A01F** (▲7) HN3A56F (▲16)	**HN1B01F** (▲8) **HN3B01F** (▲13)
								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													
	V_{CEO}(V)	20					50						
	I_C(mA)	50					100						
Internal Resistors (kΩ)		CST3 (mm)		CST6 (mm)			CST3 (mm)		VESM (mm)		ESM (mm)		
R1	R2	NPN	PNP	NPN	PNP	NPN + PNP	NPN	PNP	NPN	PNP	NPN	PNP	
4.7	4.7	RN1101CT	RN2101CT	RN1961CT	RN2961CT		RN1101ACT	RN2101ACT	RN1101MFV	RN2101MFV	RN1101F	RN2101F	
10	10	RN1102CT	RN2102CT	RN1962CT	RN2962CT		RN1102ACT	RN2102ACT	RN1102MFV	RN2102MFV	RN1102F	RN2102F	
22	22	RN1103CT	RN2103CT	RN1963CT	RN2963CT		RN1103ACT	RN2103ACT	RN1103MFV	RN2103MFV	RN1103F	RN2103F	
47	47	RN1104CT	RN2104CT	RN1964CT	RN2964CT		RN1104ACT	RN2104ACT	RN1104MFV	RN2104MFV	RN1104F	RN2104F	
2.2	47	RN1105CT	RN2105CT	RN1965CT	RN2965CT		RN1105ACT	RN2105ACT	RN1105MFV	RN2105MFV	RN1105F	RN2105F	
4.7	47	RN1106CT	RN2106CT	RN1966CT	RN2966CT	RN49P2ACT	RN1106ACT	RN2106ACT	RN1106MFV	RN2106MFV	RN1106F	RN2106F	
10	47	RN1107CT	RN2107CT	RN1967CT	RN2967CT		RN1107ACT	RN2107ACT	RN1107MFV	RN2107MFV	RN1107F	RN2107F	
22	47	RN1108CT	RN2108CT	RN1968CT	RN2968CT		RN1108ACT	RN2108ACT	RN1108MFV	RN2108MFV	RN1108F	RN2108F	
47	22	RN1109CT	RN2109CT	RN1969CT	RN2969CT		RN1109ACT	RN2109ACT	RN1109MFV	RN2109MFV	RN1109F	RN2109F	
4.7	∞	RN1110CT	RN2110CT	RN1970CT	RN2970CT		RN1110ACT	RN2110ACT	RN1110MFV	RN2110MFV	RN1110F	RN2110F	
10	∞	RN1111CT	RN2111CT	RN1971CT	RN2971CT		RN1111ACT	RN2111ACT	RN1111MFV	RN2111MFV	RN1111F	RN2111F	
22	∞	RN1112CT	RN2112CT	RN1972CT	RN2972CT		RN1112ACT	RN2112ACT	RN1112MFV	RN2112MFV	RN1112F	RN2112F	
47	∞	RN1113CT	RN2113CT	RN1973CT	RN2973CT		RN1113ACT	RN2113ACT	RN1113MFV	RN2113MFV	RN1113F	RN2113F	
1	10								RN1114MFV	RN2114MFV	RN1114F	RN2114F	
2.2	10								RN1115MFV	RN2115MFV	RN1115F	RN2115F	
4.7	10								RN1116MFV	RN2116MFV	RN1116F	RN2116F	
10	4.7								RN1117MFV	RN2117MFV	RN1117F	RN2117F	
47	10								RN1118MFV	RN2118MFV	RN1118F	RN2118F	
1	—								RN1119MFV	RN2119MFV			
100	100								RN1130MFV	RN2130MFV	RN1130F	RN2130F	
100	∞								RN1131MFV	RN2131MFV	RN1131F	RN2131F	
200	∞								RN1132MFV	RN2132MFV	RN1132F	RN2132F	

- 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
	V_{CEO}(V)	50		20
	I_C(mA)	800		300
Internal Resistors (kΩ)		S-MINI (mm)		S-MINI (mm)
R1	R2	NPN	PNP	NPN
1	1	RN1421	RN2421	
2.2	2.2	RN1422	RN2422	
4.7	4.7	RN1423	RN2423	
10	10	RN1424	RN2424	
0.47	10	RN1425	RN2425	
1	10	RN1426	RN2426	
2.2	10	RN1427	RN2427	
5.6	∞			RN1441
10	∞			RN1442
22	∞			RN1443
2.2	∞			RN1444

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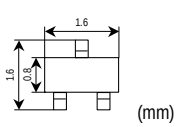
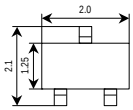
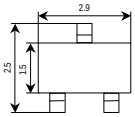
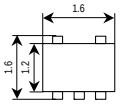
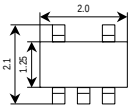
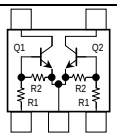
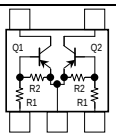
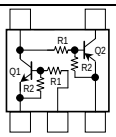
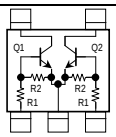
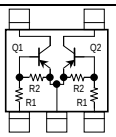
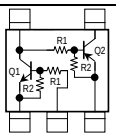
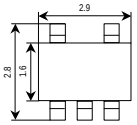
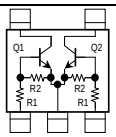
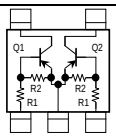
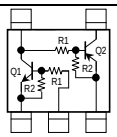
	50					
	100					
	SSM  (mm)		USM  (mm)		S-MINI  (mm)	
	NPN	PNP	NPN	PNP	NPN	PNP
	RN1101	RN2101	**RN1301**	**RN2301**	**RN1401**	**RN2401**
	RN1102	RN2102	**RN1302**	**RN2302**	**RN1402**	**RN2402**
	RN1103	RN2103	**RN1303**	**RN2303**	**RN1403**	**RN2403**
	RN1104	RN2104	**RN1304**	**RN2304**	**RN1404**	**RN2404**
	RN1105	RN2105	**RN1305**	**RN2305**	**RN1405**	**RN2405**
	RN1106	RN2106	**RN1306**	**RN2306**	**RN1406**	**RN2406**
	RN1107	RN2107	**RN1307**	**RN2307**	**RN1407**	**RN2407**
	RN1108	RN2108	**RN1308**	**RN2308**	**RN1408**	**RN2408**
	RN1109	RN2109	**RN1309**	**RN2309**	**RN1409**	**RN2409**
	RN1110	RN2110	**RN1310**	**RN2310**	**RN1410**	**RN2410**
	RN1111	RN2111	**RN1311**	**RN2311**	**RN1411**	**RN2411**
	RN1112	RN2112	RN1312	RN2312	RN1412	RN2412
	RN1113	RN2113	RN1313	RN2313	RN1413	RN2413
	RN1114	RN2114	RN1314	RN2314	RN1414	RN2414
	RN1115	RN2115	RN1315	RN2315	RN1415	RN2415
	RN1116	RN2116	RN1316	RN2316	RN1416	RN2416
	RN1117	RN2117	RN1317	RN2317	RN1417	RN2417
	RN1118	RN2118	RN1318	RN2318	RN1418	RN2418

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

Classification	Absolute Maximum Ratings		Internal Resistors				ESV			USV		
	V_{CEO}	I_C	Q1 (kΩ)		Q2 (kΩ)		 (mm)			 (mm)		
							NPN x 2	PNP x 2	NPN + PNP	NPN x 2	PNP x 2	NPN + PNP
												
	(V)	(mA)	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	10	10	4.7	10			RN47A7JE			
	Q2: 12	Q2: 100 (Lowsat)										
	Q1: 50	Q1: 100	10	10	10	47			RN47A8JE			
	Q2: 30	Q2: 100 (High h_{FE})										
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		

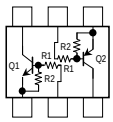
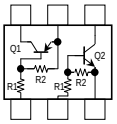
The internal connection diagrams only show the general configurations of the circuits.

(Dual, General-Purpose (6 Pin))

Classification	fS6																	
	Absolute Maximum Ratings		Internal Resistors				NPN	PNP	PNP + NPN	Absolute Maximum Ratings		Internal Resistors				NPN x 2	PNP x 2
	V_{CEO} (V)	I_C (mA)	Q1 (kΩ) R1	Q1 (kΩ) R2	Q2 (kΩ) R1	Q2 (kΩ) R2				V_{CEO} (V)	I_C (mA)	Q1 (kΩ) R1	Q1 (kΩ) R2	Q2 (kΩ) R1	Q2 (kΩ) R2		
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	RN1901FS	RN2901FS
			10	10	10	10	RN1902AFS	RN2902AFS	RN4982AFS			10	10	10	10	RN1902FS	RN2902FS
			22	22	22	22	RN1903AFS	RN2903AFS	RN4983AFS			22	22	22	22	RN1903FS	RN2903FS
			47	47	47	47	RN1904AFS	RN2904AFS	RN4984AFS			47	47	47	47	RN1904FS	RN2904FS
			2.2	47	2.2	47	RN1905AFS	RN2905AFS	RN4985AFS			2.2	47	2.2	47	RN1905FS	RN2905FS
			4.7	47	4.7	47	RN1906AFS	RN2906AFS	RN4986AFS			4.7	47	4.7	47	RN1906FS	RN2906FS
			10	47	10	47	RN1907AFS	RN2907AFS	RN4987AFS			10	47	10	47	RN1907FS	RN2907FS
			22	47	22	47	RN1908AFS	RN2908AFS	RN4988AFS			22	47	22	47	RN1908FS	RN2908FS
			47	22	47	22	RN1909AFS	RN2909AFS	RN4989AFS			47	22	47	22	RN1909FS	RN2909FS
			4.7	—	4.7	—	RN1910AFS	RN2910AFS	RN4990AFS			4.7	—	4.7	—	RN1910FS	RN2910FS
			10	—	10	—	RN1911AFS	RN2911AFS	RN4991AFS			10	—	10	—	RN1911FS	RN2911FS
			22	—	22	—	RN1912AFS	RN2912AFS	RN4992AFS			22	—	22	—	RN1912FS	RN2912FS
			47	—	47	—	RN1913AFS	RN2913AFS	RN4993AFS			47	—	47	—	RN1913FS	RN2913FS
			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		
			47	47	4.7	47						47	47	4.7	47		
General -purpose (Hiβ)	40 (–30)	100	4.7	—	4.7	—				40 (–30)	100	4.7	—	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		

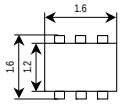
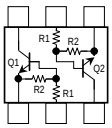
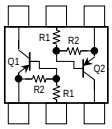
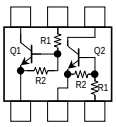
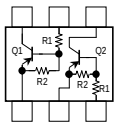
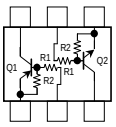
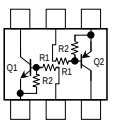
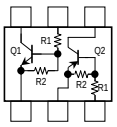
- For the PNP transistors, the minus sign (–) indicating a negative voltage is omitted.
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(mm)

NPN + PNP	Absolute Maximum Ratings		Internal Resistors				NPN + PNP
	V_{CEO}	I_C	Q1 (kΩ)		Q2 (kΩ)		
			R1	R2	R1	R2	
	(V)	(mA)					
RN4981FS	50	50	4.7	4.7	4.7	4.7	
RN4982FS			10	10	10	10	
RN4983FS			22	22	22	22	
RN4984FS			47	47	47	47	RN49J2AFS
RN4985FS			2.2	47	2.2	47	
RN4986FS			4.7	47	4.7	47	
RN4987FS			10	47	10	47	
RN4988FS			22	47	22	47	
RN4989FS			47	22	47	22	
RN4990FS			4.7	—	4.7	—	
RN4991FS			10	—	10	—	
RN4992FS			22	—	22	—	
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	
RN49A6FS			47	47	4.7	47	
	40 (−30)	100	4.7	—	4.7	—	
			10	—	10	—	
			22	—	22	—	
	50 (−12)	100 (−500)	10	47	2.0	10	

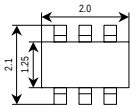
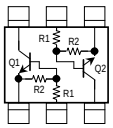
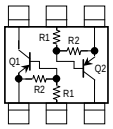
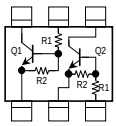
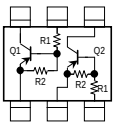
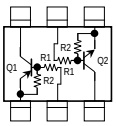
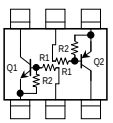
The internal connection diagrams only show the general configurations of the circuits.

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

Classification	Absolute Maximum Ratings		Internal Resistors				ES6						
	V_{CEO}	I_C	Q1		Q2		 (mm)						
							NPN x 2	PNP x 2	NPN x 2	PNP x 2	PNP + NPN	NPN + PNP	NPN + PNP
			(kΩ)		(kΩ)								
	(V)	(mA)	R1	R2	R1	R2							
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	—							

- 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.

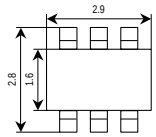
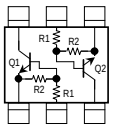
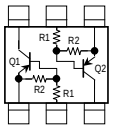
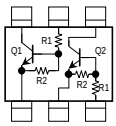
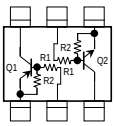
The internal connection diagrams only show the general configurations of the circuits.

Classification	Absolute Maximum Ratings		Internal Resistors				US6					
	V_{CEO}	I_C	Q1		Q2		 (mm)					
			(kΩ)		(kΩ)		NPN x 2	PNP x 2	NPN x 2	PNP x 2	PNP + NPN	NPN + PNP
			R1	R2	R1	R2						
	(V)	(mA)										
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	—						

- 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}	I_C	Q1		Q2		 (mm)			
			(kΩ)		(kΩ)		NPN x 2	PNP x 2	NPN x 2	PNP + NPN
			R1	R2	R1	R2				
	(V)	(mA)								
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	—				

- 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.

Junction FETs

Junction FETs (Surface-Mount Type)

Classification	V_{GDS} (V) Max	I_G (mA) Max	I_{DSS} (mA)	$\|Yfs\|$ (mS) Min	Package			
					S-MINI (SC-59) (mm)		USM (SC-70) (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 (μA)	$\|Yfs\|$ (mS) Min	Ciss (pF) Typ.	Package VESM (mm)
High gain Low THD Low Noise Small Ciss	−20	10	A = 80 to 200 B = 170 to 300	0.55	3.6	2SK3582MFV
High gain Low THD Small Ciss	−20	10	A = 140 to 240 B = 210 to 350	0.9	3.5	2SK3857MFV
High gain Small Ciss	−20	10	A = 140 to 240 AK = 100 to 250 B = 210 to 350 BK = 210 to 400 C = 320 to 500	1.35	4.0	2SK4059MFV
Very Low Noise Small Ciss	−20	10	A = 140 to 240 B = 210 to 350	0.9	1.8	TTK101MFV *

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

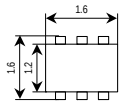
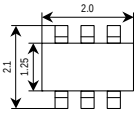
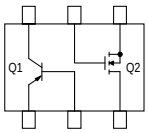
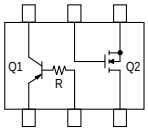
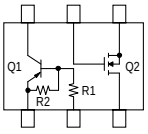
Junction FETs (Dual) (Surface-Mount Type)

Classification	V_{GDS} (V)	I_G (mA)	I_{DSS} (mA)	$\|Yfs\|$ (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	—	Q1 Q2

- 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.

Combination Products of Different Type Devices

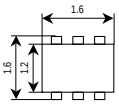
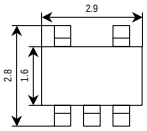
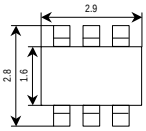
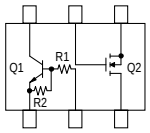
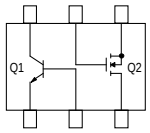
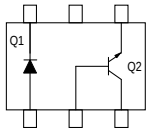
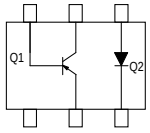
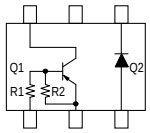
Combination Products of Different Type Devices (5-Pin Packages (SMV), 6-Pin Packages (ES6, US6, SM6))

Internal Connections	Part Number		Component Devices		Ratings				Features
	ES6 Package  (mm)	US6 Package  (mm)			Breakdown Voltage (V)		Current (mA)		
PNP + Nch 	—	**HN7G01FU**	Q1	2SA1955	V_{CEO}	−12	I_C	−400	PNP Low $V_{CE(SAT)}$, suitable for power supply switches
			Q2	2SK1829	V_{DS}	20	I_D	50	2.5-V gate drive (Vth = 1.5 V max), Ron = 20 Ω typ.
	HN7G01FE	—	Q1	2SA1955	V_{CEO}	−12	I_C	−400	PNP Low $V_{CE(SAT)}$, suitable for power supply switches
			Q2	SSM3K03FE	V_{DS}	20	I_D	50	2.5-V gate drive (Vth = 1.3 V max), Ron = 4 Ω typ.
	—	HN7G03FU	Q1	2SA1955	V_{CEO}	−12	I_C	−400	PNP Low $V_{CE(SAT)}$, suitable for power supply switches
			Q2	SSM3K04FU	V_{DS}	20	I_D	100	Internal 1-MΩ resistor (R_{GS}) 2.5-V gate drive (Vth = 1.3 V max), Ron = 4 Ω typ.
PNP (BRT) + Nch 	—	HN7G02FU	Q1	RN2310	V_{CEO}	−50	I_C	−100	PNP (Internal resisters), R = 4.7 kΩ
			Q2	2SK1829	V_{DS}	20	I_D	50	2.5-V gate drive (Vth = 1.5 V max), Ron = 20 Ω typ.
	HN7G02FE	—	Q1	RN2310	V_{CEO}	−50	I_C	−100	PNP (Internal resisters), R = 4.7 kΩ
			Q2	SSM3K03FE	V_{DS}	20	I_D	50	2.5-V gate drive (Vth = 1.3 V max), Ron = 4 Ω typ.
PNP (BRT) + Nch 	—	HN7G05FU	Q1	RN2101	V_{CEO}	−50	I_C	−100	PNP (Internal resisters), R1 = 4.7 kΩ, R2 = 4.7 kΩ
			Q2	2SK1830	V_{DS}	20	I_D	50	2.5-V gate drive (Vth = 1.5 V max), Ron = 20 Ω typ.

- 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.

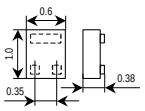
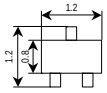
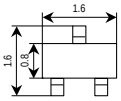
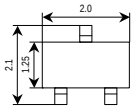
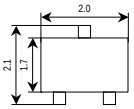
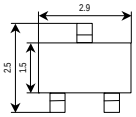
Combination Products of Different Type Devices (5-Pin Packages (SMV), 6-Pin Packages (ES6, US6, SM6)) (Continued)

Internal Connections	Part Number			Component Devices		Ratings				Features
	ES6 Package  (mm)	SMV Package  (mm)	SM6 Package  (mm)			Breakdown Voltage (V)		Current (mA)		
NPN (BRT) + Nch 	HN7G09FE	—	—	Q1	RN1104F	V_{CEO}	50	I_C	100	NPN (Internal resisters), R1 = 47 kΩ, R2 = 47 kΩ
				Q2	SSM3K15FS	V_{DS}	30	I_D	100	2.5-V gate drive (Vth = 1.5 V max), Ron = 4 Ω typ..
NPN + Nch 	HN7G10FE	—	—	Q1	2SC5376F	V_{CEO}	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 (Vth = 1.3 V max), Ron = 4 Ω typ.
Independent small-signal diode + NPN 	—	—	HN2E01F	Q1	1SS352	V_R	80	I_O	100	Standard high-speed switching
				Q2	2SC4666	V_{CEO}	50	I_C	150	High-h_{FE}-type NPN
			HN2E02F	Q1	1SS352	V_R	80	I_O	100	Standard high-speed switching
				Q2	2SC4116	V_{CEO}	50	I_C	150	General-purpose NPN transistor
Independent PNP + small-signal diode 	—	—	HN2E04F	Q1	2SA1587	V_{CEO}	−120	I_C	−100	High breakdown voltage PNP
				Q2	1SS352	V_R	80	I_O	100	Standard high-speed switching
Independent BRT (PNP) + small-signal diode 	—	HN2E05J	—	Q1	RN2304	V_{CEO}	−50	I_C	−100	PNP (Internal resisters), R1 = 47 kΩ, R2 = 47 kΩ
				Q2	1SS352	V_R	80	I_O	100	Standard high-speed switching

- 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.

MOSFETs

Small-Signal MOSFETs (Single-Type)

Polarity	Absolute Maximum Ratings			Package					
	V_{DDS} (V)	V_{GSS} (V)	I_D (mA)	CST3  (mm)	VESM  (mm)	SSM  (mm)	USM (SC-70)  (mm)	UFM  (mm)	S-MINI (SC-59)  (mm)
N-ch	20	±10	200	SSM3K37CT *		SSM3K37FS *			
	20	±10	250		SSM3K37MFV *				
	20	±10	100				SSM3K16FU		
	20	±10	180	SSM3K35CT	SSM3K35MFV	SSM3K35FS			
	20	±10	500		SSM3K36MFV	SSM3K36FS		SSM3K36TU	
	20	±10	500			SSM3K43FS #*			
	30	±20	100						SSM3K15F
	30	±20	100	SSM3K15ACT *	SSM3K15AMFV *	SSM3K15AFS *	SSM3K15AFU *		
	30	±20	100		SSM3K44MFV # *	SSM3K44FS #*			
	30	±20	200						2SK2009
	30	±20	400				SSM3K09FU		
	50	±7	100				SSM3K17FU		
	60	±20	200				SSM3K7002AFU		SSM3K7002AF
	60	±20	200			SSM3K7002BFS *	SSM3K7002BFU *		SSM3K7002BF *
	60	±20	200						2SK1062
P-ch	−20	±8	−330		SSM3J36MFV	SSM3J36FS		SSM3J36TU	
	−20	±10	−100	SSM3J16CT	SSM3J16FV	SSM3J16FS	SSM3J16FU		
	−20	±10	−100	SSM3J35CT	SSM3J35MFV	SSM3J35FS			
	−30	±20	−100	SSM3J15CT	SSM3J15FV	SSM3J15FS	SSM3J15FU		SSM3J15F
	−30	±20	−200						2SJ305
	−30	±20	−200				SSM3J09FU		
	−50	−7	−50				2SJ344		2SJ343
	−60	±20	−200						2SJ168

#: High ESD protection

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

Vth (V)		Ron (Ω)			ton (ns) Typ.	toff (ns) Typ.
Min	Max	Typ.	Max	@VGS (V)		
0.35	1.0	3.07	5.6	1.5	18	36
0.35	1.0	3.07	5.6	1.5	18	36
0.6	1.1	5.2	15	1.5	70	125
0.4	1.0	5	20	1.2	115	300
0.35	1.0	0.95	1.52	1.5	30	75
0.35	1.0	0.95	1.52	1.5	30	75
0.8	1.5	4	7	2.5	50	180
0.8	1.5	3.5	6.0	2.5	5.5	35
0.8	1.5	4.0	7.0	2.5	50	200
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
1.0	2.5	1.8	3.3	4.5	3	7
1.5	3.1	2.1	3.3	4.5	3.3	14.5
2.0	3.5	0.6	1.0	10	14	75
−0.3	−1.0	2.23	3.60	−1.5	90	200
−0.6	−1.1	18	45	−1.5	130	190
−0.4	−1.0	11	44	−1.2	175	251
−1.1	−1.7	14	32	−2.5	65	175
−0.5	−1.5	2.4	4.0	−2.5	60	150
−1.1	−1.8	3.3	4.2	−4	85	85
−0.8	−2.5	20	50	−4	150	130
−2.0	−3.5	1.3	2.0	−10	14	100

*: New product

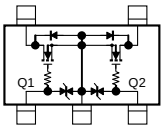
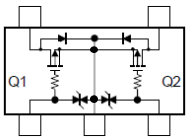
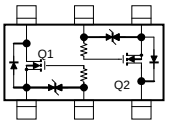
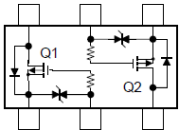
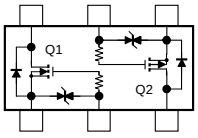
Small-Signal MOSFETs (Dual Type)

Polarity	Absolute Maximum Ratings			Package					Internal FETs	Vth (V)		R_{on} (Ω)		
	V_{DDS} (V)	V_{GSS} (V)	I_D (mA)	ESV (mm)	ES6 (mm)	USV (mm)	US6 (mm)	UF6 (mm)		Min	Max	Typ.	Max	@V_{GS} (V)
N-ch x 2	20	±10	100	SSM5N16FE ▲1		SSM5N16FU ▲1			SSM3K16FU x 2	0.6	1.1	5.2	15	1.5
	20	±10	250		SSM6N37FE		SSM6N37FU *		SSM3K37MFV x 2	0.35	1.0	3.07	5.6	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	±10	500				SSM6N43FU ▲1		SSM3K43FS x 2	0.35	1.0	0.95	1.52	1.5
	30	±20	100	SSM5N15FE ▲1		SSM5N15FU ▲1			SSM3K15FU x 2	0.8	1.5	4	7	2.5
	30	±20	100		SSM6N15AFE *		SSM6N15AFU *		SSM3K15AMFV x 2	0.8	1.5	3.5	6.0	2.5
	30	±20	100		SSM6N44FE ▲1		SSM6N44FU ▲1		SSM3K44FS x 2	0.8	1.5	4.0	7.0	2.5
	30	±20	400				SSM6N09FU ▲1		SSM3K09FU x 2	1.1	1.8	0.8	1.2	4
	50	±7	100				SSM6N17FU ▲1		SSM3K17FU x 2	0.9	1.5	22	40	2.5
	60	±20	200				SSM6N7002AFU ▲1		SSM3K7002AFU x 2	1.0	2.5	1.8	3.3	4.5
	60	±20	200		SSM6N7002BFE ▲1 *		SSM6N7002BFU ▲1 *		SSM3K7002BF x 2	1.5	3.1	2.1	3.3	4.5
P-ch x 2	−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
	−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
N-ch + P-ch	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
	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

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

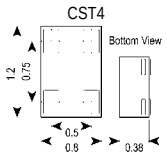
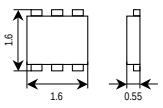
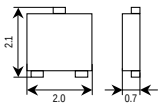
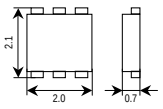
*: New product

♦Internal Connections

Number of Pins	▲1	▲2	▲3
5-pin ESV/USV			
6-pin ES6/US6/UF6			

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

$V_{DSS} \leq 60$ V (Power MOSFETs) (N-ch MOSFETs)

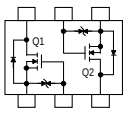
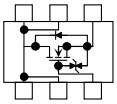
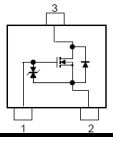
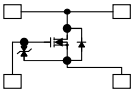
Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)				Ciss (pF)	Internal FETs	Internal Connections
							V_{GS} = 1.5 V	V_{GS} = 1.8 V	V_{GS} = 2.5 V	V_{GS} = 4.0 V			
CST4  (mm)	N-ch	SSM4K27CT	20	±12	0.5	0.4	—	390	260	205	174	—	(4)
ES6  (mm)	N-ch	SSM6K211FE	20	±10	3.2	0.5	118	82	59	47(@4.5 V)	510	—	(2)
		SSM6K202FE	30	±12	2.3	0.5	—	145	101	85	270	—	(2)
		SSM6K204FE	20	±10	2.0	0.5	307	214	164	126	195	—	(2)
		SSM6K208FE	30	±12	1.9	0.5	—	296	177	133	123	—	(2)
		SSM6K210FE	30	±20	1.4	0.5	—	—	—	371	57	—	(2)
		SSM6K30FE	20	±20	1.2	0.5	—	—	—	420	60	—	(2)
		SSM6K31FE	20	±20	1.2	0.5	—	—	—	540	36	—	(2)
	N-ch x 2	SSM6N42FE *	20	±10	0.8	0.15	600	450	330	240 (@4.5 V)	90	—	(1)
UFM  (mm)	N-ch	SSM3K123TU	20	±10	4.2	0.5	66	43	32	28	1010	—	(3)
		SSM3K121TU	20	±10	3.2	0.5	140	93	63	48	400	—	(3)
		SSM3K119TU	30	±12	2.5	0.5	—	134	90	74	270	—	(3)
		SSM3K116TU	30	±12	2.2	0.5	—	—	135	100 (@4.5 V)	245	—	(3)
		SSM3K122TU	20	±10	2.0	0.5	304	211	161	123	195	—	(3)
		SSM3K127TU	30	±12	2.0	0.5	—	286	167	123	123	—	(3)
		SSM3K131TU	30	±20	6.0	0.5	—	—	—	41.5 (@4.5 V)	450	—	(3)
		SSM3K124TU	30	±20	2.4	0.5	—	—	—	120	180	—	(3)
		SSM3K106TU	20	±20	1.2	0.5	—	—	—	530	36	—	(3)
UF6  (mm)	N-ch	SSM6K403TU	20	±10	4.2	0.5	66	43	32	28	1050	—	(2)
		SSM6K411TU *	20	±12	10	0.5	—	—	23.8	12(@4.5 V)	710	—	(2)
		SSM6K404TU	20	±10	3.0	0.5	147	100	70	55	400	—	(2)
		SSM6K405TU	20	±10	2.0	0.5	307	214	164	126	195	—	(2)
		SSM6K406TU	30	±20	4.4	0.5	—	—	—	38.5 (@4.5 V)	490	—	(2)
		SSM6K34TU	30	±20	3.0	0.5	—	—	—	77 (@4.5 V)	470	—	(2)
		SSM6K407TU	60	±20	2.0	0.5	—	—	—	440	150	—	(2)
	N-ch x 2	SSM6N39TU	20	±10	1.6	0.5	247	190	139	119	260	—	(1)
		SSM6N24TU	30	±12	0.5	0.5	—	—	180	145 (@4.5 V)	245	SSM6K24FE x 2	(1)
		SSM6N40TU	30	±20	1.6	0.5	—	—	—	182	180	—	(1)

#: High ESD protection

*: New product

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

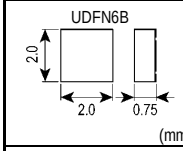
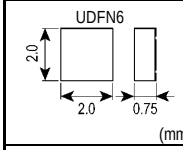
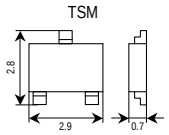
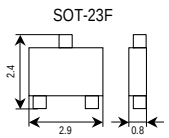
♦Internal Connections

(1)	(2)	(3)	(4)
			

Note: Some MOSFETs do not have a Zener diode between gate and source.

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

$V_{DSS} \leq 60$ V (Power MOSFETs) (N-ch MOSFETs) (Continued)

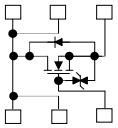
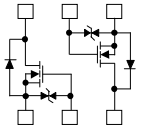
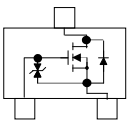
Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)							Ciss (pF)	Qg (nC) (typ.)	Internal Connections
							V_{GS} = 1.5 V	V_{GS} = 1.8 V	V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 10 V			
	N-ch	SSM6K504NU **	30	±20	9	2	—	—	—	—	—	30	650	650	5	(1)
	N-ch x 2	SSM6N55NU **	30	±20	4	2	—	—	—	—	—	64	43	270	2.5	(2)
	N-ch	SSM3K310T	20	±10	5.0	0.7	66	43	—	32	28	—	—	1120	14.8	(3)
		SSM3K309T	20	±12	4.7	0.7	—	47	—	35	31	—	—	1020	—	(3)
		SSM3K301T	20	±12	3.5	0.7	—	110	—	74	56	—	—	320	4.8	(3)
		SSM3K316T	30	±12	4.0	1.25	—	131	—	87	—	65	53	270	4.3	(3)
		SSM3K320T	30	±20	4.2	1.4	—	—	—	—	—	77	50	190	4.6	(3)
		SSM3K318T *	60	±20	2.5	0.7	—	—	—	—	—	145	107	235	7	(3)
	N-ch	SSM3K329R *	30	±12	3.5	2	—	289	—	170	—	126	—	123	—	(3)
		SSM3K333R *	30	±20	6	2	—	—	—	42	—	28	—	436	—	(3)
		SSM3K335R *	30	±20	6	2	—	—	—	—	—	57	35	340	2.6	(3)
		SSM3K336R **	30	±20	4	2	—	—	—	—	—	140	110	110	1	(3)

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

*: New product

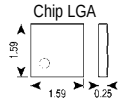
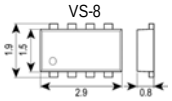
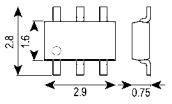
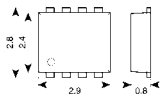
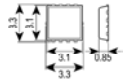
**: Under development

♦ Internal Connections

(1)	(2)	(3)
		

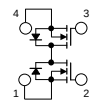
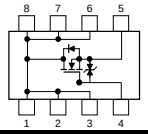
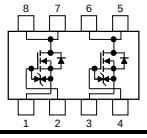
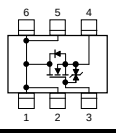
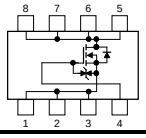
Note: Some MOSFETs do not have a Zener diode between gate and source.

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

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)					Qg (nC) (typ.)	Internal Connections
							V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 10 V		
Chip LGA  (mm)	N-ch Dual	TPCL4201	20	±12	6	1.65	—	52	33	31	—	11.5	(1)
		TPCL4203	24	±12	6	1.65	—	55	38	36	—	10	(1)
		TPCL4202	30	±12	6	1.65	—	64	42	40	—	10	(1)
VS-8  (mm)	N-ch Single	TPCF8003	20	±12	7	2.5	—	34	—	18	—	9.5	(2)
		TPCF8002	30	±20	7	2.5	—	—	—	32	21	11.5	(2)
	N-ch Dual	TPCF8201	20	±12	3	1.35	100	66	—	49	—	7.5	(3)
VS-6  (mm)	N-ch Single	TPC6012	20	±12	6	2.2	—	38	—	20	—	9	(4)
		TPC6008-H	30	±20	5.9	2.2	—	—	—	74	60	4.8	(4)
		TPC6011	30	±20	6	2.2	—	—	—	32	20	14	(4)
		TPC6009-H	40	±20	5.3	2.2	—	—	—	98	81	4.7	(4)
		TPC6010-H	60	±20	6.1	2.2	—	—	—	63	59	12	(4)
PS-8  (mm)	N-ch Single	TPCP8006	20	±12	9.1	1.68	—	13.7	—	10	—	22	(5)
		TPCP8008-H	30	±20	8	1.68	—	—	—	23	20	14.7	(5)
		TPCP8004	30	±20	8.3	1.68	—	—	—	14	8.5	26	(5)
		TPCP8005-H	30	±20	11	1.68	—	—	—	15.7	12.9	20	(5)
		TPCP8007-H	60	±20	5	1.68	—	—	—	64	57	11	(5)
	N-ch Dual	TPCP8204	30	±20	4.2	1.48	—	—	—	77	50	4.6	(3)
		TPCP8205-H	30	±20	6.5	1.48	—	—	—	29	26	13.8	(3)
		TPCP8203	40	±20	4.7	1.48	—	—	—	60	40	16	(3)
TSON Advance  (mm)	N-ch Single	TPCC8007	20	±12	27	30	—	8.7	—	4.6	—	26	(5)
		TPCC8061-H	30	±20	8	15	—	—	—	29	26	11	(5)
		TPCC8067-H	30	±20	9	15	—	—	—	33	25	9.5	(5)
		TPCC8066-H	30	±20	11	17	—	—	—	19	15	15	(5)
		TPCC8003-H	30	±20	13	22	—	—	—	19.3	16.9	17	(5)
		TPCC8065-H	30	±20	13	18	—	—	—	14.5	11.4	20	(5)
		TPCC8064-H	30	±20	19	30	—	—	—	10.6	8.2	23	(5)
		TPCC8074	30	±20	20	30	—	—	—	8.5	6.3	25	(5)
		TPCC8006-H	30	±20	22	27	—	—	—	9.3	8	27	(5)
		TPCC8009	30	±20	24	27	—	—	—	—	7	26	(5)
		TPCC8005-H	30	±20	26	30	—	—	—	7.4	6.4	35	(5)
		TPCC8062-H	30	±20	27	39	—	—	—	7.1	5.6	34	(5)
		TPCC8073	30	±20	27	39	—	—	—	5.9	4.5	37	(5)
		TPCC8008	30	±25	25	30	—	—	—	13	6.8	30	(5)
		TPCC8084	33	±20	21	32	—	—	—	9	6.7	27	(5)
		TPCC8076	33	±20	27	39	—	—	—	6.2	4.6	34	(5)

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

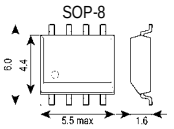
♦Internal Connections

(1)	(2)	(3)	(4)	(5)
				

Note: Some MOSFETs do not have a Zener diode between gate and source.

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

$V_{DSS} \leq 60$ V (Power MOSFETs) (N-ch MOSFETs) (Continued)

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)					Qg (nC) (typ.)	Internal Connections
							V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 10 V		
SOP-8  (mm)	N-ch Single	TPC8061-H	30	±20	8	1.9	—	—	—	29	26	11	(1)
		TPC8067-H	30	±20	9	1.9	—	—	—	33	25	9.5	(1)
		TPC8066-H	30	±20	11	1.9	—	—	—	19	16	15	(1)
		TPC8037-H	30	±20	12	1.9	—	—	—	13.9	11.4	21	(1)
		TPC8038-H	30	±20	12	1.9	—	—	—	13.9	11.4	21	(1)
		TPC8065-H	30	±20	13	1.9	—	—	—	14.7	11.6	20	(1)
		TPC8040-H	30	±20	13	1.9	—	—	—	11.1	9.7	24	(1)
		TPC8032-H	30	±20	15	1.9	—	—	—	8.6	6.5	33	(1)
		TPC8064-H	30	±20	16	1.9	—	—	—	10.8	8.4	23	(1)
		TPC8063-H	30	±20	17	1.9	—	—	—	8.9	7	27	(1)
		TPC8039-H	30	±20	17	1.9	—	—	—	6.9	6	36	(1)
		TPC8033-H	30	±20	17	1.9	—	—	—	7.2	5.3	42	(1)
		TPC8062-H	30	±20	18	1.9	—	—	—	7.3	5.8	34	(1)
		TPC8036-H	30	±20	18	1.9	—	—	—	5.1	4.5	49	(1)
		TPC8059-H	30	±20	18	1.9	—	—	—	5	4	41	(1)
		TPC8060-H	30	±20	18	1.9	—	—	—	4.2	3.7	65	(1)
		TPC8034-H	30	±20	18	1.9	—	—	—	4.5	3.5	68	(1)
		TPC8058-H	30	±20	18	1.9	—	—	—	4	3.2	51	(1)
		TPC8035-H	30	±20	18	1.9	—	—	—	3.6	3.2	82	(1)
		TPC8057-H	30	±20	18	1.9	—	—	—	3.4	2.8	61	(1)
		TPC8056-H	30	±20	18	1.9	—	—	—	2.9	2.4	74	(1)
		TPC8055-H	30	±20	18	1.9	—	—	—	2.5	2.1	91	(1)
		TPC8041	30	±20	13	1.9	—	—	—	13.5	7	27	(1)
		TPC8092	30	±20	15	1.9	—	—	—	11.1	9	25	(1)
		TPC8074	30	±20	17	1.9	—	—	—	8.7	6.5	25	(1)
		TPC8086	30	±20	17	1.9	—	—	—	8.5	6.4	26	(1)
		TPC8073	30	±20	18	1.9	—	—	—	6.1	4.7	37	(1)
		TPC8085	30	±20	18	1.9	—	—	—	6.1	4.7	37	(1)
		TPC8028	30	±20	18	1.9	—	—	—	8	4.3	45	(1)
		TPC8082	30	±20	18	1.9	—	—	—	5	4	41	(1)
		TPC8029	30	±20	18	1.9	—	—	—	7	3.8	49	(1)
		TPC8042	30	±20	18	1.9	—	—	—	6.5	3.4	56	(1)
		TPC8081	30	±20	18	1.9	—	—	—	4	3.2	51	(1)
		TPC8080	30	±20	18	1.9	—	—	—	3.4	2.8	61	(1)
		TPC8027	30	±20	18	1.9	—	—	—	5.5	2.7	113	(1)
		TPC8088	30	±20	18	1.9	—	—	—	2.9	2.4	74	(1)
		TPC8087	30	±20	18	1.9	—	—	—	2.5	2.1	91	(1)
		TPC8084	33	±20	17	1.9	—	—	—	9.2	6.9	27	(1)
		TPC8076	33	±20	18	1.9	—	—	—	6.5	4.9	34	(1)
		TPC8075	33	±20	18	1.9	—	—	—	3.3	2.6	70	(1)
		TPC8078	33	±20	18	1.9	—	—	—	2.8	2.2	90	(1)
		TPC8052-H	40	±20	12	1.9	—	—	—	13.3	11.5	25	(1)
		TPC8047-H	40	±20	16	1.9	—	—	—	8.8	7.6	43	(1)
		TPC8046-H	40	±20	18	1.9	—	—	—	6.6	5.7	57	(1)
		TPC8045-H	40	±20	18	1.9	—	—	—	4.4	3.9	90	(1)
		TPC8053-H	60	±20	9	1.9	—	—	—	24.2	22.5	25	(1)
		TPC8050-H	60	±20	11	1.9	—	—	—	15.6	14.5	41	(1)
		TPC8049-H	60	±20	13	1.9	—	—	—	11.5	10.7	56	(1)
		TPC8048-H	60	±20	16	1.9	—	—	—	7.4	6.9	87	(1)

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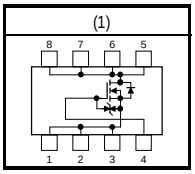
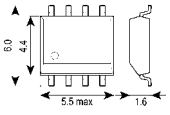
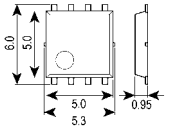
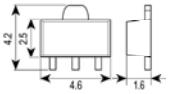
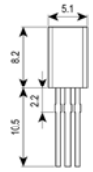
♦Internal Connections

(1)



Note: Some MOSFETs do not have a Zener diode between gate and source.

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

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)					Qg (nC) (typ.)	Internal Connections
							V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 10 V		
SOP-8  (mm)	N-ch Dual	TPC8221-H	30	±20	6	1.5	—	—	—	29	25	12	(1)
		TPC8224-H	30	±20	8	1.6	—	—	—	34	26	9.5	(1)
		TPC8223-H	30	±20	9	1.5	—	—	—	21	17	17	(1)
SOP Advance  (mm)	N-ch Single	TPCA8011-H	20	±12	40	45	—	7.5	—	3.5	—	32	(2)
		TPCA8063-H	30	±20	22	35	—	—	—	8.7	6.8	27	(2)
		TPCA8040-H	30	±20	23	30	—	—	—	10.8	9.4	23	(2)
		TPCA8065-H	30	±20	16	25	—	—	—	14.5	11.4	20	(2)
		TPCA8030-H	30	±20	24	30	—	—	—	13.4	11	21	(2)
		TPCA8031-H	30	±20	24	30	—	—	—	13.4	11	21	(2)
		TPCA8064-H	30	±20	20	32	—	—	—	10.6	8.2	23	(2)
		TPCA8062-H	30	±20	28	42	—	—	—	7.1	5.6	34	(2)
		TPCA8059-H	30	±20	32	45	—	—	—	4.8	3.8	41	(2)
		TPCA8039-H	30	±20	34	45	—	—	—	6.6	5.7	36	(2)
		TPCA8058-H	30	±20	38	52	—	—	—	3.8	3	51	(2)
		TPCA8036-H	30	±20	38	45	—	—	—	4.8	4.2	50	(2)
		TPCA8057-H	30	±20	42	57	—	—	—	3.2	2.6	61	(2)
		TPCA8060-H	30	±20	45	45	—	—	—	3.9	3.4	66	(2)
		TPCA8056-H	30	±20	48	63	—	—	—	2.7	2.2	74	(2)
		TPCA8028-H	30	±20	50	45	—	—	—	3.2	2.8	88	(2)
		TPCA8055-H	30	±20	56	70	—	—	—	2.3	1.9	91	(2)
		TPCA8082	30	±20	32	45	—	—	—	4.8	3.8	41	(2)
		TPCA8024	30	±20	35	45	—	—	—	7.8	4.3	45	(2)
		TPCA8081	30	±20	38	52	—	—	—	3.8	3	51	(2)
		TPCA8025	30	±20	40	45	—	—	—	6	3.5	49	(2)
		TPCA8080	30	±20	42	57	—	—	—	3.2	2.6	61	(2)
		TPCA8026	30	±20	45	45	—	—	—	4.5	2.2	113	(2)
		TPCA8042	30	±20	45	45	—	—	—	5.7	3.3	56	(2)
		TPCA8088	30	±20	48	63	—	—	—	2.7	2.2	74	(2)
		TPCA8087	30	±20	56	70	—	—	—	2.3	1.9	91	(2)
		TPCA8052-H	40	±20	20	30	—	—	—	13.1	11.3	25	(2)
		TPCA8047-H	40	±20	32	45	—	—	—	8.5	7.3	43	(2)
		TPCA8046-H	40	±20	38	45	—	—	—	6.3	5.4	55	(2)
		TPCA8045-H	40	±20	46	45	—	—	—	4.1	3.6	90	(2)
		TPCA8053-H	60	±20	15	30	—	—	—	24	22.3	25	(2)
		TPCA8050-H	60	±20	24	45	—	—	—	15.3	14.2	41	(2)
		TPCA8049-H	60	±20	28	45	—	—	—	11.2	10.4	55	(2)
PW-Mini  (mm)	N-ch Single	2SK2615	60	—	2	1.5	—	—	440	—	300	6	
		2SK3658	60	—	2	1.5	—	—	440	—	300	5	
LSTM  (mm)	N-ch Single	2SK2989	50	—	5	0.9	—	—	330	—	150	6.5	
		2SK2961	60	—	2	0.9	—	—	380	—	270	5.8	

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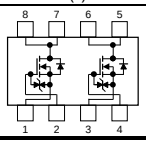
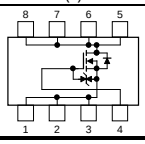
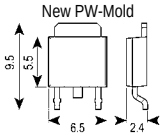
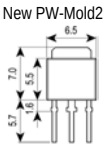
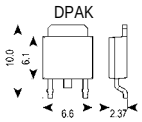
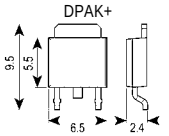
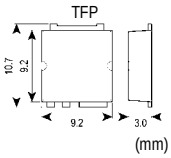
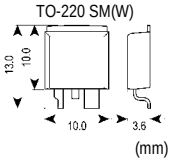
♦Internal Connections

(1)	(2)
	

Note: Some MOSFETs do not have a Zener diode between gate and source.

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

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

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)						Qg (nC) (typ.)	Internal Connections
							V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 6 V	V_{GS} = 10 V		
	N-ch Single	2SK2493	16	—	5	20	—	120	100	—	—	—	23	
		2SK4033	60	—	5	20	—	—	150	—	—	100	15	
	N-ch Single	2SK4017	60	—	5	20	—	—	150	—	—	100	15	
	N-ch Single	TK40P03M1	30	±20	40	40	—	—	—	14.4	—	10.8	9.4	
		TK45P03M1	30	±20	45	39	—	—	—	12	—	9.7	13	
		TK50P03M1	30	±20	50	60	—	—	—	9.8	—	7.5	13.3	
		TK60P03M1	30	±20	60	63	—	—	—	7.8	—	6.4	21	
		TK20P04M1	40	±20	20	27	—	—	—	34	—	29	7.6	
		TK40P04M1	40	±20	40	60	—	—	—	13.4	—	11	15	
		TK50P04M1	40	±20	50	60	—	—	—	10.2	—	8.7	20	
	N-ch Single	TK10S04K3L	40	±20	10	25	—	—	—	—	54	28	10	
		TK20S04K3L	40	±20	20	38	—	—	—	—	26	14	18	
		TK35S04K3L	40	±20	35	58	—	—	—	—	15	10.3	28	
		TK65S04K3L	40	±20	65	88	—	—	—	—	7.9	4.5	63	
		TK80S04K3L	40	±20	80	100	—	—	—	—	4.8	3.1	87	
		TK8S06K3L	60	±20	8	25	—	—	—	—	80	54	10	
		TK20S06K3L	60	±20	20	38	—	—	—	—	40	29	18	
		TK30S06K3L	60	±20	30	58	—	—	—	—	30	18	28	
		TK60S06K3L	60	±20	60	88	—	—	—	—	12.3	8	60	
		TK80S06K3L	60	±20	80	100	—	—	—	—	7.8	5.5	85	
	N-ch Single	TK70X04K3	40	±20	70	80	—	—	—	—	—	5.6	62	
		TK70X04K3Z	40	±20	70	80	—	—	—	—	—	5.6	62	
		TK80X04K3	40	±20	80	125	—	—	—	—	—	3.5	100	
		TK80X04K3L	40	±20	80	125	—	—	—	—	4.2	3.5	105	
		TK70X06K3	60	±20	70	80	—	—	—	—	—	8	62	
		2SK3842	60	±20	75	125	—	—	—	—	—	5.8	196	
		2SK4034	60	±20	75	125	—	—	—	10	—	5.8	196	
	N-ch Single	TK100F04K3	40	±20	100	200	—	—	—	—	—	3	102	
		TK100F04K3L	40	±20	100	200	—	—	—	—	4.5	3	105	
		TK150F04K3	40	±20	150	300	—	—	—	—	—	2.1	166	
		TK150F04K3L	40	±20	150	300	—	—	—	—	3.2	2.1	190	
		TK100F06K3	60	±20	100	200	—	—	—	—	—	5	98	
		TK130F06K3	60	±20	130	300	—	—	—	—	—	3.4	170	

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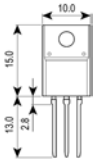
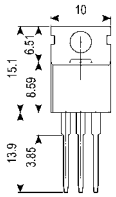
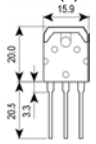
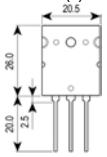
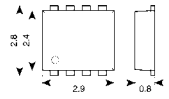
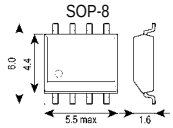
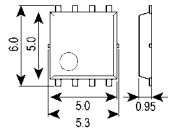
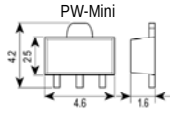
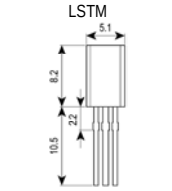
Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)					Qg (nC) (typ.)	Internal Connections
						V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 10 V		
TO-220SIS  (mm)	N-ch Single	TK50A04K3	40	50	42	—	—	—	—	3.5	102	
		TK30A06J3A	60	30	25	—	—	—	35	26	36	
		TK75A06K3	60	75	35	—	—	—	—	5.5	85	
TO-220  (mm)	N-ch Single	TK25E06K3	60	25	64	—	—	—	—	18	29	
		TK50E06K3A	60	50	104	—	—	—	—	8.5	54	
		TK80E06K3A	60	80	125	—	—	—	—	5.8	90	
TO-3P(N)  (mm)	N-ch Single	TK70J04K3Z	40	70	125	—	—	—	—	3.9	100	
		TK75J04K3Z	40	75	150	—	—	—	—	3.0	190	
		TK70J06K3	60	70	125	—	—	—	—	6	98	
TO-3P(L)  (mm)	N-ch Single	2SK2267	60	60	150	—	—	15	—	11	170	

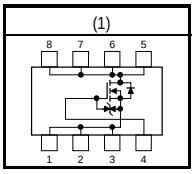
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

60 V < V_{DSS} ≤ 300 V (Power MOSFETs) (N-ch MOSFETs)

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)							Qg (nC) (typ.)	Internal Connections
							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		
PS-8  (mm)	N-ch Single	TPCP8003-H	100	±20	2.2	1.68	—	—	—	—	190	—	180	7.5	(1)
SOP-8  (mm)	N-ch Single	TPC8051-H	80	±20	13	1.9	—	—	—	—	10.1	—	9.7	85	(1)
		TPC8012-H	200	±20	1.8	1.9	—	—	—	—	—	—	400	11	(1)
SOP Advance  (mm)	N-ch Single	TPCA8070-H	80	±25	12	45	—	—	—	—	—	—	35	21	(1)
		TPCA8051-H	80	±20	28	45	—	—	—	—	9.8	—	9.4	91	(1)
		TPCA8006-H	100	±20	18	45	—	—	—	—	—	—	67	12	(1)
		TPCA8009-H	150	±20	7	45	—	—	—	—	—	—	350	10	(1)
		TPCA8010-H	200	±20	5.5	45	—	—	—	—	—	—	450	10	(1)
		TPCA8008-H	250	±20	4	45	—	—	—	—	—	—	580	10	(1)
PW-Mini  (mm)	N-ch Single	2SK2963	100	—	1	1.5	—	—	—	950	—	—	700	6.3	
		2SK2992	200	—	1	1.5	—	—	—	—	—	—	3500	3	
LSTM  (mm)	N-ch Single	2SK2962	100	—	1	0.9	—	—	—	950	—	—	700	6.3	
		2SK3670	150	—	0.67	0.9	—	—	—	1700	—	—	—	4.6	

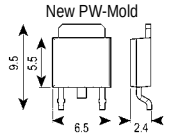
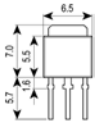
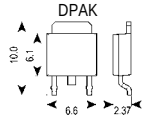
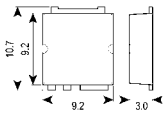
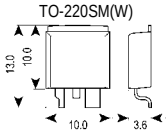
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

♦Internal Connections



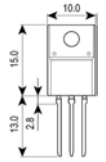
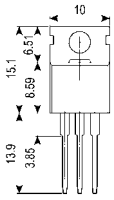
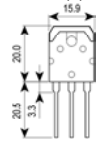
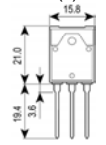
Note: Some MOSFETs do not have a Zener diode between gate and source.

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

Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)							Qg (nC) (typ.)	Internal Connections
						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		
New PW-Mold  (mm)	N-ch Single	2SK2201	100	3	20	—	—	—	450	—	—	350	13.5	
		2SK2399	100	5	20	—	—	—	300	—	—	230	22	
		2SK3669	100	10	20	—	—	—	—	—	—	125	8.0	
		2SK3205	150	5	20	—	—	—	750	—	—	500	12	
		2SK2162	180	1	20	—	—	—	—	—	—	5000	—	
		2SK2920	200	5	20	—	—	—	—	—	—	800	10	
		2SK3462	250	3	20	—	—	—	—	—	—	1700	12	
		2SK3342	250	4.5	20	—	—	—	—	—	—	1000	10	
New PW-Mold2  (mm)	N-ch Single	2SK4018	100	3	20	—	—	—	450	—	—	350	13.5	
		2SK4019	100	5	20	—	—	—	300	—	—	230	22	
		2SK4020	200	5	20	—	—	—	—	—	—	800	10	
		2SK4022	250	3	20	—	—	—	—	—	—	1700	12	
		2SK4021	250	4.5	20	—	—	—	—	—	—	1000	10	
DPAK  (mm)	N-ch Single	TK8P25DA	250	7.5	55	—	—	—	—	—	—	500	16	
		TK13P25D	250	13	96	—	—	—	—	—	—	250	25	
TFP  (mm)	N-ch Single	TK40X10J1	100	40	125	—	—	—	—	—	—	20	59	
		TK50X15J1	150	50	125	—	—	—	—	—	—	30	75	
		2SK3444	200	25	125	—	—	—	—	—	—	82	44	
		2SK3388	250	20	125	—	—	—	—	—	—	105	100	
		2SK3445	250	20	125	—	—	—	—	—	—	105	45	
TO-220SM(W)  (mm)	N-ch Single	TK40F08K3	75	40	107	—	—	—	—	—	—	8.5	80	
		TK80F08K3	75	80	300	—	—	—	—	—	—	4.3	175	
		TK50F15J1	150	50	300	—	—	—	—	—	—	30	75	

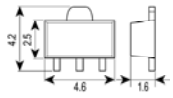
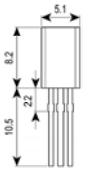
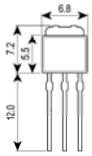
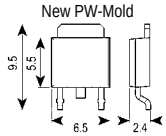
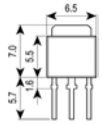
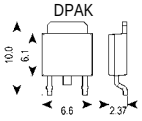
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

60 V < V_{DSS} ≤ 300 V (Power MOSFETs) (N-ch MOSFETs) (Continued)

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)							Qg (nC) (typ.)	Internal Connections
							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		
TO-220SIS  (mm)	N-ch Single	TK40A08K3	75	±20	40	42	—	—	—	—	—	—	9	80	
		TK60A08J1	75	±20	60	45	—	—	—	—	9.3	—	7.8	86	
		TK80A08K3	75	±20	80	40	—	—	—	—	—	—	4.5	175	
		TK8A10K3	100	±20	8	18	—	—	—	—	—	—	120	12.9	
		TK12A10K3	100	±20	12	20	—	—	—	—	—	—	80	18	
		TK25A10K3	100	±20	25	25	—	—	—	—	—	—	40	34	
		TK40A10J1	100	±20	40	40	—	—	—	—	17	—	15	76	
		TK40A10K3	100	±20	40	40	—	—	—	—	—	—	15	85	
		TK55A10J1	100	±20	55	45	—	—	—	—	12	—	10.5	110	
		TK9A20DA	200	±20	8.5	30	—	—	—	—	—	—	400	14	
		TK15A20D	200	±20	15	35	—	—	—	—	—	—	180	26	
		TK8A25DA	250	±20	7.5	30	—	—	—	—	—	—	500	16	
		TK13A25D	250	±20	13	35	—	—	—	—	—	—	250	25	
		TK20A25D	250	±20	20	45	—	—	—	—	—	—	100	55	
TO-220  (mm)	N-ch Single	TK50E08K3	75	±20	50	104	—	—	—	—	—	—	12	55	
		TK60E08K3	75	±20	60	128	—	—	—	—	—	—	9	75	
		TK18E10K3	100	±20	18	71	—	—	—	—	—	—	42	33	
		TK40E10K3	100	±20	40	147	—	—	—	—	—	—	15	84	
		TK13E25D	250	±20	13	102	—	—	—	—	—	—	250	25	
TO-3P(N)  (mm)	N-ch Single	2SK3940	75	—	70	150	—	—	—	—	—	—	7	200	
		2SK3497	180	—	10	130	—	—	—	—	—	150	—	36	
		TK40J20D	200	±20	40	260	—	—	—	—	—	—	44	100	
		TK70J20D	200	±20	70	410	—	—	—	—	—	—	30	160	
		TK30J25D	250	±20	30	260	—	—	—	—	—	—	60	100	
		TK60J25D	250	±20	60	410	—	—	—	—	—	—	38	160	
		TK50J30D	300	±20	50	410	—	—	—	—	—	—	52	160	
TO-3P(N)IS  (mm)	N-ch Single	2SK2995	250	—	30	90	—	—	—	—	—	—	68	132	

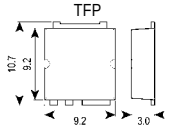
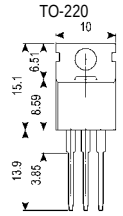
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

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

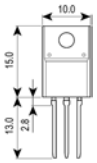
Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (Ω) V_{GS} = 10 V	Qg (nC) (typ.)	Internal Connections
PW-Mini  (mm)	N-ch Single	2SK3471	500	0.5	1.5	18	3.8	
LSTM  (mm)	N-ch Single	2SK2998	500	0.5	0.9	18	3.8	
PW-Mold  (mm)	N-ch Single	2SK3373	500	2	20	3.2	9	
New PW-Mold  (mm)	N-ch Single	TK2P60D	600	2	60	4.3	7	
New PW-Mold2  (mm)	N-ch Single	2SK4023	450	1	20	4.6	5	
		2SK4026	600	1	20	9.0	9	
		TK2Q60D	600	2	60	4.3	7	
		2SK4003	600	3	20	2.2	15	
DPAK  (mm)	N-ch Single	TK3P50D	500	3	60	3.0	7	
		TK4P50D	500	4	80	2.0	9	
		TK5P50D	500	5	80	1.5	11	
		TK7P50D	500	7	100	1.22	12	
		TK5P53D	525	5	80	1.5	11	
		TK6P53D	525	6	100	1.3	12	
		TK4P55DA	550	3.5	80	2.45	9	
		TK4P55D	550	4	80	1.88	11	
		TK4P60DA	600	3.5	80	1.7	11	
		TK4P60DB	600	3.7	80	2.0	11	

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

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

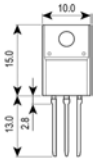
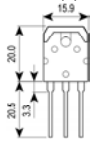
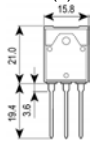
Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (Ω) V_{GS} = 10 V	Qg (nC) (typ.)	Internal Connections
TFP  (mm)	N-ch Single	TK10X40D	400	10	125	0.55	20	
		2SK3544	450	13	100	0.4	34	
		2SK3466	500	5	50	1.5	17	
		2SK3538	500	8	65	0.85	30	
		TK12X53D	525	12	150	0.58	25	
		2SK3438	600	10	80	1.0	28	
		TK12X60U	600	12	100	0.4	14	
		TK15X60U	600	15	125	0.3	17	
		TK20X60U	600	20	150	0.19	27	
TO-220  (mm)	N-ch Single	TK12E60U	600	12	144	0.4	14	
		TK15E60U	600	15	170	0.3	17	
		TK20E60U	600	20	190	0.19	27	

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

Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (Ω) V_{GS} = 10 V	Qg (nC) (typ.)	Internal Connections
TO-220SIS  (mm)	N-ch Single	2SK3757	450	2	30	2.45	9	
		2SK3766	450	2	30	2.45	8	
		TK5A45DA	450	4.5	30	1.75	9	
		TK6A45DA	450	5.5	35	1.35	11	
		TK7A45DA	450	6.5	35	1.2	11	
		TK8A45DA	450	7.5	35	1.1	12	
		TK8A45D	450	8	35	0.9	16	
		TK9A45D	450	9	40	0.77	16	
		TK11A45D	450	11	40	0.62	20	
		TK12A45D	450	12	45	0.52	24	
		TK13A45D	450	13	45	0.46	25	
		TK14A45DA	450	13.5	45	0.41	28	
		TK14A45D	450	14	45	0.34	38	
		TK16A45D	450	16	50	0.27	40	
		TK19A45D	450	19	50	0.25	45	
		TK4A50D	500	4	30	2.0	9	
		TK5A50D	500	5	35	1.5	11	
		TK6A50D	500	6	35	1.4	11	
		TK7A50D	500	7	35	1.22	12	
		TK8A50DA	500	7.5	35	1.04	16	
		TK8A50D	500	8	40	0.85	16	
		TK10A50D	500	10	45	0.72	20	
		TK11A50D	500	11	45	0.6	38	
		TK12A50D	500	12	45	0.52	25	
		TK13A50DA	500	12.5	45	0.47	28	
		TK13A50D	500	13	45	0.4	32	
		TK15A50D	500	15	50	0.3	40	
		TK18A50D	500	18	50	0.27	45	
		TK4A53D	525	4	35	1.7	11	
		TK5A53D	525	5	35	1.5	11	
		TK6A53D	525	6	35	1.3	12	
		TK12A53D	525	12	45	0.58	25	
		TK4A55DA	550	3.5	30	2.45	9	
		TK4A55D	550	4	35	1.88	11	
		TK5A55D	550	5	35	1.7	11	
		TK6A55DA	550	5.5	35	1.48	12	
		TK7A55D	550	7	35	1.25	16	
		TK8A55DA	550	7.5	40	1.07	16	
		TK9A55DA	550	8.5	40	0.86	20	
		TK10A55D	550	10	45	0.72	24	
		TK11A55D	550	11	45	0.63	25	
		TK12A55D	550	12	45	0.57	28	
		TK13A55DA	550	12.5	45	0.48	38	
		TK14A55D	550	14	50	0.37	40	
		TK16A55D	550	16	50	0.33	45	
		TK3A60DA	600	2.5	30	2.8	9	
		TK4A60DA	600	3.5	35	2.2	11	
		TK4A60DB	600	3.7	35	2	11	

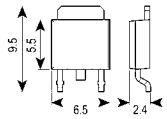
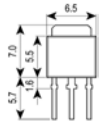
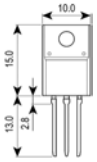
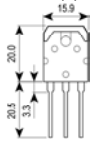
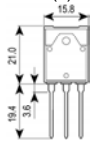
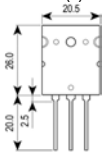
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

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

Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (Ω) V_{GS} = 10 V	Qg (nC) (typ.)	Internal Connections
TO-220SIS  (mm)	N-ch Single	TK4A60D	600	4	35	1.7	12	
		TK5A60D	600	5	35	1.43	16	
		TK6A60D	600	6	40	1.25	16	
		TK8A60DA	600	7.5	45	1.0	20	
		TK9A60D	600	9	45	0.83	24	
		TK10A60D	600	10	45	0.75	25	
		TK11A60D	600	11	45	0.65	28	
		TK12A60D	600	12	45	0.55	38	
		TK12A60U	600	12	35	0.4	14	
		TK13A60D	600	13	40	0.43	40	
		TK15A60D	600	15	50	0.37	45	
		TK15A60U	600	15	40	0.3	17	
		TK18A60V	600	18	40	0.19	39	
		TK20A60U	600	20	45	0.19	27	
		TK2A65D	650	2	30	3.26	9	
		TK3A65DA	650	2.5	35	2.51	11	
		TK3A65D	650	3	35	2.25	11	
		TK4A65DA	650	3.5	35	1.9	12	
		TK5A65DA	650	4.5	35	1.67	16	
		TK5A65D	650	5	40	1.43	16	
		TK6A65D	650	6	45	1.11	20	
		TK7A65D	650	7	45	0.98	24	
		TK8A65D	650	8	45	0.84	25	
		TK11A65D	650	11	45	0.7	38	
		TK12A65D	650	12	50	0.54	40	
		TK13A65D	650	13	50	0.47	45	
		TK13A65U	650	13	40	0.38	17	
		TK17A65U	650	17	45	0.26	27	
TO-3P(N)  (mm)	N-ch Single	2SK2601	500	10	125	1.0	30	
		TK15J50D	500	15	210	0.4	32	
		TK20J50D	500	20	280	0.27	45	
		TK12J55D	550	12	190	0.57	28	
		TK16J55D	550	16	250	0.37	40	
		TK19J55D	550	19	280	0.33	45	
		2SK2602	600	6	125	1.25	30	
		2SK2699	600	12	150	0.65	58	
		TK12J60U	600	12	144	0.4	14	
		TK15J60U	600	15	170	0.3	17	
		TK20J60U	600	20	190	0.19	27	
		TK40J60U	600	40	320	0.08	55	
		TK50J60U	600	50	400	0.065	67	
		TK13J65U	650	13	170	0.38	17	
		TK17J65U	650	17	190	0.26	27	
TO-3P(N)IS  (mm)	N-ch Single	2SK2917	500	18	90	0.27	80	
		2SK2953	600	15	90	0.4	80	
		TK40M60U	600	40	90	0.08	55	
		2SK3453	700	10	80	1.0	53	

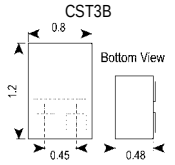
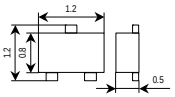
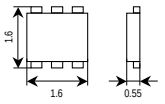
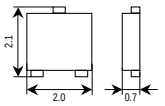
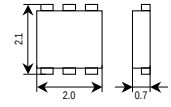
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

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

Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (Ω) V_{GS} = 10 V	Qg (nC) (typ.)	Internal Connections
New PW-Mold  (mm)	N-ch Single	TK1P90A	900	1	20	9.0	13	
New PW-Mold2  (mm)	N-ch Single	TK1Q90A	900	1	20	9.0	13	
TO-220SIS  (mm)	N-ch Single	2SK4013	800	6	45	1.7	45	
		2SK3566	900	2.5	40	6.4	12	
		2SK3564	900	3	40	4.3	17	
		2SK3798	900	4	40	3.5	26	
		2SK3565	900	5	45	2.5	28	
		2SK3742	900	5	45	2.5	25	
		2SK4014	900	6	45	2.0	45	
		2SK3799	900	8	50	1.3	62	
TO-3P(N)  (mm)	N-ch Single	2SK3633	800	7	150	1.7	35	
		2SK2607	800	9	150	1.2	68	
		2SK2719	900	3	125	4.3	25	
		2SK3700	900	5	150	2.5	28	
		2SK4115	900	7	150	2.0	45	
		2SK3473	900	9	150	1.6	38	
		2SK3878	900	9	150	1.3	62	
		2SK2968	900	10	150	1.25	70	
		2SK4207	900	13	150	0.95	45	
		2SK1359	1000	5	125	3.8	60	
		2SK2613	1000	8	150	1.7	65	
TO-3P(N)IS  (mm)	N-ch Single	2SK3880	800	6.5	80	1.7	35	
		2SK2606	800	8	85	1.2	68	
		2SK2847	900	8	85	1.4	58	
		2SK3017	900	8.5	90	1.25	70	
		2SK1365	1000	7	90	1.8	120	
TO-3P(L)  (mm)	N-ch Single	2SK1489	1000	12	200	1.0	110	

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

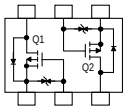
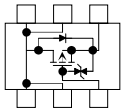
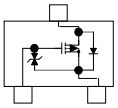
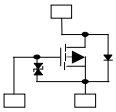
|VDSS| ≤ 250 V (Power MOSFETs) (P-ch MOSFETs)

Package	Polarity	Part Number	VDSS (V)	VGSS (V)	ID (A)	RDS(ON) Max (mΩ) VGS = −1.2 V	VGS = −1.5 V	VGS = −1.8 V	VGS = −2.5 V	VGS = −4.0 V	VGS = −4.5 V	Ciss (pF)	Internal FET	Internal Connections
CST3B  (mm)	Pch	SSM3J46CTB *	−20	±8	−2	—	250	178	133	—	103	290	—	(4)
VESM  (mm)	Pch	SSM3J56MFV *	−20	±8	−0.8	4000	900	660	480	—	390	100	—	(3)
ES6  (mm)	Pch	SSM6J212FE *	−20	±8	−4.0	—	94	65.4	49	—	40.7	970	—	(2)
		SSM6J215FE *	−20	±8	−3.4	—	154	104	79	—	59	630	—	(2)
		SSM6J214FE *	−30	±12	−3.6	—	—	149.6	77.6	—	57	560	—	(2)
		SSM6J213FE *	−20	±8	−2.6	—	250	178	133	—	103	290	—	(2)
		SSM6J207FE	−30	±20	−1.4	—	—	—	—	491	—	137	—	(2)
	Pch + Pch	SSM6P41FE *	−20	±8	−0.72	—	1040	670	440	—	300	110	—	(1)
UFM  (mm)	Pch	SSM3J132TU *	−12	±6	−5.4	94	39	29	21	—	17	2700	—	(3)
		SSM3J130TU *	−20	±8	−4.4	—	63.2	41.1	31.0	—	25.8	1800	—	(3)
		SSM3J129TU *	−20	±8	−4.6	—	137	88	62	—	46	640	—	(3)
		SSM3J113TU	−20	±12	−1.7	—	—	449 (@−2.0 V)	249	169	—	370	—	(3)
		SSM3J133TU *	−20	±8	−5.5	—	88.4	56.0	39.7	—	29.8	840	—	(3)
		SSM3J134TU *	−20	±8	−3.2	—	240	168	123	—	93	290	—	(3)
		SSM3J135TU *	−20	±8	−3.0	—	260	180	132	—	103	270	—	(3)
		SSM3J117TU	−30	±20	−2.0	—	—	—	—	225	—	280	—	(3)
		SSM3J118TU	−30	±20	−1.4	—	—	—	—	480	—	137	—	(3)
		SSM3J112TU	−30	±20	−1.1	—	—	—	—	790	—	86	—	(3)
UF6  (mm)	Pch	SSM6J409TU *	−20	±8	−9.5	—	72.3	46.3	30.2	—	22.1	1100	—	(2)
		SSM6J412TU *	−20	±8	−4.0	—	99.6	67.8	51.4	—	42.7	840	—	(2)
		SSM6J50TU	−20	±10	−2.5	—	—	205 (@−2.0 V)	100	—	64	800	—	(2)
		SSM6J401TU	−30	±20	−2.5	—	—	—	—	145	—	730	—	(2)
		SSM6J402TU	−30	±20	−2.0	—	—	—	—	225	—	280	—	(2)
		SSM6J410TU *	−30	±20	−2.1	—	—	—	—	393	—	120	—	(2)
	Pch x 2	SSM6P54TU	−20	±8	−1.2	—	555	350	228	—	—	331	—	(1)
		SSM6P39TU	−20	±8	−1.5	—	—	430	294	213	—	250	—	(1)
		SSM6P25TU	−20	±12	−0.5	—	—	—	430	260	—	218	SSM6J25FE x 2	(1)
		SSM6P40TU	−30	±20	−1.4	—	—	—	—	403	—	120	—	(1)

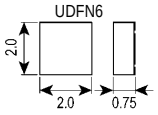
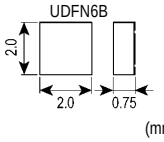
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

*: New product

♦Internal Connections

(1)	(2)	(3)	(4)
			

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

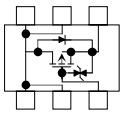
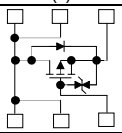
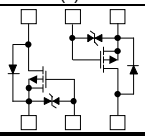
Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	$R_{DS(ON)}$ Max (mΩ)					Ciss (pF)	Internal FET	Internal Connections
						V_{GS} = −1.2 V	V_{GS} = −1.5 V	V_{GS} = −1.8 V	V_{GS} = −2.5 V	V_{GS} = −4.5 V			
UDFN6  (mm)	Pch x 2	SSM6P47NU *	−20	±8	−4	—	242	170	125	95	290	—	(3)
		SSM6P49NU *	−20	±12	−4	—	—	157	76	56	480	—	(3)
UDFN6B  (mm)	Pch	SSM6J505NU **	−12	±6	−10	70	23	20	15	10	3000	—	(2)
		SSM6J501NU *	−20	±8	−10	—	43	26.5	19	15.3	2600	—	(2)
		SSM6J502NU *	−20	±8	−6	—	60.5	38.4	28.3	23.1	1800	—	(2)
		SSM6J503NU *	−20	±8	−6	—	89.6	57.9	41.7	32.4	840	—	(2)

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

*: New product

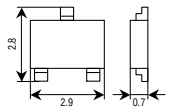
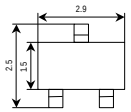
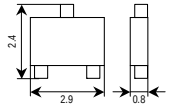
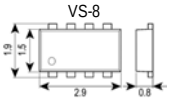
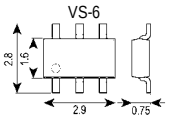
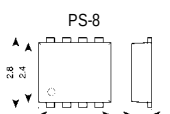
**: Under development

♦Internal Connections

(1)	(2)	(3)
		

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

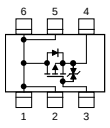
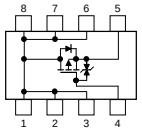
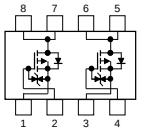
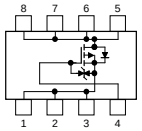
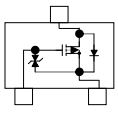
|VDSS| ≤ 250 V (Power MOSFETs) (P-ch MOSFETs) (Continued)

Package	Polarity	Part Number	VDSS (V)	VGSS (V)	ID (A)	PD (W)	RDS(ON) Max (mΩ) VGS= −1.5V	VGS= −1.8V	VGS= −2.0V	VGS= − 2.5V	VGS= −4V	VGS= − 4.5V	VGS= − 7V	VGS= − 10V	Ciss (pF)	Qg (nC) (typ.)	Internal Connections
TSM  (mm)	Pch	SSM3J326T *	−30	±12	−5.6	1.25	—	115	—	62.5	—	45.7	—	—	650	9.3	(6)
		SSM3J314T	−30	±20	−3.5	0.7	—	—	—	—	100	—	—	—	505	11.5	(6)
		SSM3J306T	−30	±20	−2.4	0.7	—	—	—	—	225	—	—	—	280	2.5	(6)
		SSM3J305T	−30	±20	−1.7	0.7	—	—	—	—	477	—	—	—	137	1.3	(6)
S-MINI  (mm)	Pch	SSM3J325F *	−20	±8	−2	1.2	311	231	—	179	—	150	—	—	270	4.6	(6)
SOT-23F  (mm)	Pch	SSM3J328R *	−20	±8	−6	2	88.4	56	—	39.7	—	29.8	—	—	840	12.8	(6)
		SSM3J331R *	−20	±8	−4	2	150	100	—	75	—	55	—	—	630	4.7	(6)
		SSM3J327R *	−20	±8	−3.9	2	240	168	—	123	—	93	—	—	290	4.6	(6)
		SSM3J332R *	−30	±12	−6	2	—	144	—	72	—	50	—	47	560	8.2	(6)
		SSM3J334R *	−30	±20	−4	2	—	—	—	—	—	105	—	71	280	5.9	(6)
VS-8  (mm)	Pch Single	TPCF8101	−12	±8	−6	2.5	—	85	—	40	—	28	—	—	—	18	(2)
		TPCF8103	−20	±8	−2.7	2.5	—	300	—	160	—	110	—	—	—	6	(2)
		TPCF8105	−20	±12	−6	2.5	—	100	—	41	—	30	—	—	—	17	(2)
		TPCF8108	−20	±12	−7	2.5	—	95	—	37	—	26	—	—	1320	19	(2)
		TPCF8107	−30	−25/+20	−6	2.5	—	—	—	—	—	38	—	28	970	22	(2)
	Pch Dual	TPCF8301	−20	±8	−2.7	1.35	—	300	—	160	—	110	—	—	—	6	(3)
		TPCF8305	−20	±12	−4	1.35	—	265	160	83	—	58	—	—	680	9.2	(3)
		TPCF8304	−30	±20	−3.2	1.35	—	—	—	—	—	105	—	72	—	14	(3)
VS-6  (mm)	Pch Single	TPC6130	−20	±12	−2.8	2.2	—	—	—	164	—	106	—	—	360	5.1	(1)
		TPC6103	−12	±8	−5.5	2.2	—	90	—	55	—	35	—	—	—	20	(1)
		TPC6105	−20	±8	−2.7	2.2	—	300	—	160	—	110	—	—	—	6	(1)
		TPC6113	−20	±12	−5	2.2	—	—	—	85	—	55	—	—	690	10	(1)
		TPC6111	−20	±8	−5.5	2.2	—	80	—	57	—	40	—	—	—	10	(1)
		TPC6110	−30	−25/+20	−4.5	2.2	—	—	—	—	—	77	—	56	—	14	(1)
		TPC6109-H	−30	±20	−5	2.2	—	—	—	—	—	83	—	59	—	12.3	(1)
PS-8  (mm)	Pch Single	TPCP8101	−20	±8	−5.6	1.68	—	90	—	41	—	30	—	—	—	19	(4)
		TPCP8105	−20	±12	−5.2	1.68	—	60	45	23	—	17	—	—	2280	28	(4)
		TPCP8102	−20	±12	−7.2	1.68	—	—	80	30	—	18	—	—	—	33	(4)
		TPCP8106	−30	−25/+20	−7.2	1.68	—	—	—	—	—	44	—	33	870	19	(4)
		TPCP8103-H	−40	±20	−4.8	1.68	—	—	—	—	—	54	—	40	—	19	(4)
	Pch Dual	TPCP8303	−20	±8	−3.8	1.48	144	90	—	60	—	46	—	—	—	10	(3)
		TPCP8306	−20	±12	−4	1.48	—	265	160	83	—	58	—	—	680	9.2	(3)
		TPCP8305	−20	±12	−6	1.48	—	—	—	42	—	30	—	—	1500	21.5	(3)

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

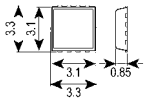
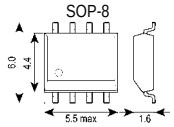
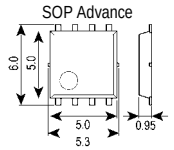
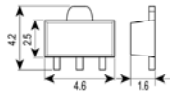
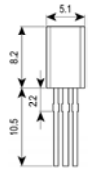
*: New product

♦Internal Connections

(1)	(2)	(3)	(4)	(6)
				

Note: Some MOSFETs do not have a Zener diode between gate and source.

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

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)							Qg (nC) (typ.)	Internal Connections
							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		
TSON Advance  (mm)	Pch Single	TPCC8131	−30	−25/+20	−10	20	—	—	—	—	23	—	17.6	40	(1)
		TPCC8102	−30	±20	−15	26	—	—	—	33.2	—	—	18.9	26	(1)
		TPCC8103	−30	±20	−18	27	—	—	—	25	—	—	12	38	(1)
		TPCC8104	−30	−25/+20	−20	27	—	—	—	—	12.4	—	8.8	58	(1)
		TPCC8105	−30	−25/+20	−23	30	—	—	—	—	10.4	—	7.8	76	(1)
SOP-8  (mm)	Pch Single	TPC8129	−30	−25/+20	−9	1.9	—	—	—	—	22	—	28	39	(1)
		TPC8119	−30	±20	−10	1.9	—	—	—	28	—	—	13	40	(1)
		TPC8125	−30	−25/+20	−10	1.9	—	—	—	—	17	—	13	64	(1)
		TPC8121	−30	±20	−10	1.9	—	—	—	24	—	—	12	42	(1)
		TPC8126	−30	−25/+20	−11	1.9	—	—	—	—	14	—	10	56	(1)
		TPC8123	−30	−25/+20	−11	1.9	—	—	—	—	12.5	—	9	68	(1)
		TPC8122	−30	±20	−12	1.9	—	—	—	16.5	—	—	8	62	(1)
		TPC8118	−30	±20	−13	1.9	—	—	—	15	—	—	7	65	(1)
		TPC8127	−30	−25/+20	−13	1.9	—	—	—	—	8.9	—	6.5	92	(1)
		TPC8128	−30	−25/+20	−16	1.9	—	—	—	—	6.9		5	115	(1)
		TPC8117	−30	±20	−18	1.9	—	—	—	7.9	—	—	3.9	130	(1)
		TPC8120	−30	−25/+20	−18	1.9	—	—	—	—	4.2	—	3.2	180	(1)
		TPC8134	−40	−25/+20	−5	1.9	—	—	—	—	66	—	52	20	(1)
		TPC8132	−40	−25/+20	−7	1.9	—	—	—	—	33	—	25	34	(1)
		TPC8133	−40	−25/+20	−9	1.9	—	—	—	—	18	—	15	64	(1)
		TPC8124	−40	−25/+20	−12	1.9	—	—	—	—	10	—	8	104	(1)
SOP Advance  (mm)	Pch Single	TPCA8105	−12	±8	−6	20	92	—	51	—	33	—	—	18	(1)
		TPCA8109	−30	−25/+20	−12	30	—	—	—	—	13	—	9	56	(1)
		TPCA8128	−30	−25/+20	−34	45	—	—	—	—	6.7	—	4.8	115	(1)
		TPCA8106	−30	±20	−40	45	—	—	—	7.8	—	—	3.7	130	(1)
		TPCA8120	−30	−25/+20	−45	45	—	—	—	—	4.0	—	3.0	190	(1)
		TPCA8107-H	−40	±20	−7.5	30	—	—	—	—	37	—	30	27	(1)
		TPCA8108	−40	±20	−40	45	—	—	—	—	—	—	9.5	100	(1)
		TPCA8104	−60	±20	−40	45	—	—	—	24	—	—	16	90	(1)
PW-Mini  (mm)	Pch Single	2SJ360	−60	—	−1	1.5	—	—	—	1200	—	—	730	6.5	
		2SJ508	−100	—	−1	1.5	—	—	—	2500	—	—	1900	6.3	
LSTM  (mm)	Pch Single	2SJ537	−50	—	−5	0.9	—	—	—	340	—	—	190	18	
		2SJ507	−60	—	−1	0.9	—	—	—	1000	—	—	700	5.6	
		2SJ509	−100	—	−1	0.9	—	—	—	2500	—	—	1900	6.3	

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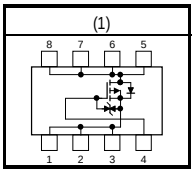
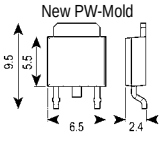
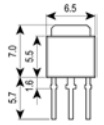
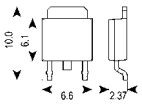
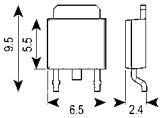
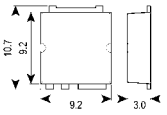
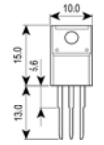
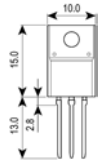
♦Internal Connections



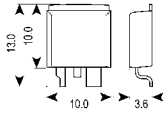
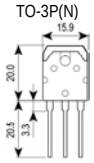
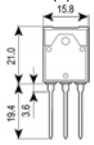
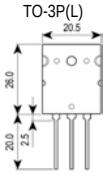
Note: Some MOSFETs do not have a Zener diode between gate and source.

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

|VDSS| ≤ 250 V (Power MOSFETs) (P-ch MOSFETs) (Continued)

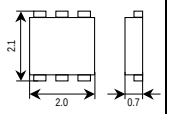
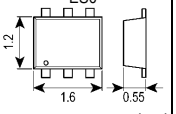
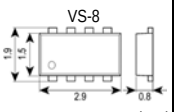
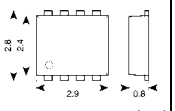
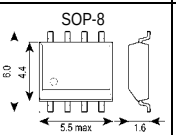
Package	Polarity	Part Number	VDSS (V)	VGSS (V)	ID (A)	PD (W)	RDS(ON) Max (mΩ) VGS= −1.8 V	VGS= − 2.0 V	VGS= −2.5 V	VGS= −4 V	VGS= −4.5 V	VGS = −6 V	VGS = −7 V	VGS= −10 V	Qg (nC) (typ.)	Internal Connections
New PW-Mold  (mm)	Pch Single	2SJ439	−16	—	−5	20	—	—	280	200	—	—	—	—	24	
		2SJ668	−60	±20	−5	20	—	—	—	250	—	—	—	170	15	
		2SJ338	−180	—	−1	20	—	—	—	—	—	—	—	5000	—	
		2SJ567	−200	—	−2.5	20	—	—	—	—	—	—	—	2000	10	
		2SJ610	−250	—	−2	20	—	—	—	—	—	—	—	2550	24	
New PW-Mold2  (mm)	Pch Single	2SJ681	−60	—	−5	20	—	—	—	250	—	—	—	170	15	
		2SJ680	−200	—	−2.5	20	—	—	—	—	—	—	—	2000	10	
DPAK  (mm)	Pch Single	TJ15P04M3	−40	±20	15	29	—	—	—	—	48	—	—	36	26	
DPAK+  (mm)	Pch Single	TJ10S04K3L	−40	+10/−20	−10	27	—	—	—	—	—	62	—	44	19	
		TJ20S04K3L	−40	+10/−20	−20	41	—	—	—	—	—	32	—	22.2	37	
		TJ40S04K3L	−40	+10/−20	−40	68	—	—	—	—	—	13	—	9.1	83	
		TJ60S04K3L	−40	+10/−20	−60	90	—	—	—	—	—	9.4	—	6.3	125	
		TJ80S04K3L	−40	+10/−20	−80	100	—	—	—	—	—	7.9	—	5.2	158	
		TJ8S06K3L	−60	+10/−20	−8	27	—	—	—	—	—	130	—	104	19	
		TJ15S06K3L	−60	+10/−20	−15	41	—	—	—	—	—	63	—	50	36	
		TJ30S06K3L	−60	+10/−20	−30	68	—	—	—	—	—	28	—	21.8	80	
		TJ50S06K3L	−60	+10/−20	−50	90	—	—	—	—	—	17.4	—	13.8	124	
		TJ60S06K3L	−60	+10/−20	−60	100	—	—	—	—	—	7.9	—	3.2	156	
TFP  (mm)	Pch Single	TJ80X04M3L	−40	+10/−20	−80	150	—	—	—	—	—	5.9	—	3.9	250	
		TJ80X06M3L	−60	+10/−20	−80	150	—	—	—	—	—	11.4	—	7.6	250	
		2SJ619	−100	—	−16	75	—	—	—	320	—	—	—	210	48	
		2SJ620	−100	—	−18	125	—	—	—	120	—	—	—	90	140	
TO-220NIS  (mm)	Pch Single	2SJ438	−60	—	−5	25	—	—	—	280	—	—	—	190	22	
		2SJ313	−180	—	−1	25	—	—	—	—	—	—	—	5000	—	
TO-220SIS  (mm)	Pch Single	TJ70A06J3	−60	—	−70	54	—	—	—	—	10	—	—	8	246	
		TJ9A10M3	−100	±20	−9	19	—	—	—	—	—	—	—	170	47	
		TJ11A10M3	−100	±20	−11	24	—	—	—	—	—	—	—	130	69	
		TJ20A10M3	−100	±20	−20	35	—	—	—	—	—	—	—	90	120	

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

Package	Polarity	Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)								Qg (nC) (typ.)	Internal Connections
						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}= −6 V	V_{GS}= −7 V	V_{GS}= −10 V		
TO-220SM(W)  (mm)	Pch Single	TJ100F04M3L	−40	−100	250	—	—	—	—	—	5.4	—	3.6	250	
		TJ150F04M3L	−40	−150	300	—	—	—	—	—	4.2	—	2.8	390	
		TJ100F06M3L	−60	−100	250	—	—	—	—	—	10.7	—	7.1	250	
		TJ120F06J3	−60	−120	300	—	—	—	—	—	—	—	8	258	
		TJ150F06M3L	−60	−150	300	—	—	—	—	—	6.1	—	5.6	420	
TO-3P(N)  (mm)	Pch Single	2SJ200	−180	−10	120	—	—	—	—	—	—	—	830	—	
		2SJ618	−180	−10	130	—	—	—	—	—	—	370	—	35	
TO-3P(N)IS  (mm)	Pch Single	2SJ440	−180	−9	80	—	—	—	—	—	—	—	830	—	
TO-3P(L)  (mm)	Pch Single	2SJ201	−200	−12	150	—	—	—	—	—	—	—	625	—	

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

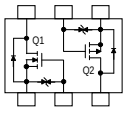
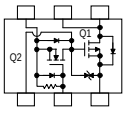
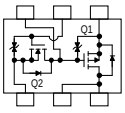
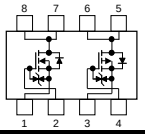
|VDSS| ≤ 60 V (Power MOSFETs) (Complementary MOSFETs)

Package	Polarity	Part Number	VDSS (V)	VGSS (V)	ID (A)	RDS(ON) Max (mΩ) |VGS| = 1.5 V	|VGS| = 1.8 V	|VGS| = 2.5 V	|VGS| = 4.0 V	|VGS| = 4.5 V	|VGS| = 10 V	Ciss (pF)	Qg (nC) (typ.)	Internal FET	Internal Connections
UF6  (mm)	N-ch + P-ch	SSM6L39TU	20	±10	1.6	247	190	139	119	—	—	265		SSM6N39TU + SSM6P39TU	(1)
			−20	±8	−1.5	—	430	294	213	—	—	250			
		SSM6L12TU	30	±12	0.5	—	—	180	145	—	—	245		SSM6K24FE + SSM6J25FE	(1)
			−20	±12	−0.5	—	—	430	260			218			
		SSM6L40TU	30	±20	1.6	—	—	—	182	—	—	180		SSM6N40TU + SSM6P40TU	(1)
			−30	±20	−1.4	—	—	—	403	—	—	120			
		SSM6E03TU	20	±10	0.1	15 Ω	—	4.0 Ω	3.0 Ω	—	—	9.3		SSM3K16FU	(3)
			−20	±8	−1.8	—	335	180	144	—	—	335		SSM3J109TU	
		SSM6E02TU	20	±10	0.1	15 Ω	—	4.0 Ω	3.0 Ω	—	—	9.3		SSM3K16FU	(3)
			−20	±8	−1.8	364	204	136	—	—	—	568		—	
		SSM6E01TU	20	±10	0.05	—	—	10 Ω	—	—	—	11		SSM3K04FE	(2)
			−12	±12	−1	—	—	240	160	—	—	310		—	
ES6  (mm)	N-ch + P-ch	SSM6L14FE *	20	±10	0.8	600	450	330	—	240	—	90	2.0	SSM6N42FE	(1)
			−20	±8	−0.72	1040	670	440	—	300	—	110	1.76	SSM6P41FE	(1)
VS-8  (mm)	N-ch + P-ch	TPCF8402	30	±20	4	—	—	—	77	—	50	—	10	—	(4)
			−30	±20	−3.2	—	—	—	105	—	72	—	14	—	(4)
PS-8  (mm)	N-ch + P-ch	TPCP8404	30	±20	4	—	—	—	—	80	50	—	4.6	—	(4)
			−30	±20	−4	—	—	—	—	80	50	—	13	—	
		TPCP8403	40	±20	4.7	—	—	—	—	60	40	—	16	—	(4)
			−40	±20	−3.4	—	—	—	—	105	70	—	15	—	
		TPCP8405	30	±20	6.5	—	—	—	—	29	26	—	13.8	—	(4)
			−30	±20	−6	—	—	—	—	42	31.3	—	24.1	—	
		TPCP8406	40	±20	6	—	—	—	—	36	32	—	13.7	—	(4)
			−40	±20	−5	—	—	—	—	53.4	43.2	—	24.2	—	
SOP-8  (mm)	N-ch + P-ch	TPCP8407	30	±20	9	—	—	—	—	21	17	1190	17	—	(4)
			−30	±20	−7.4	—	—	—	—	23	29	1650	39	—	
		TPCP8408	40	±20	6.1	—	—	—	—	43.2	32	850	14	—	(4)
			−40	±20	−5.3	—	—	—	—	53.4	36	1105	24	—	

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

*: New product

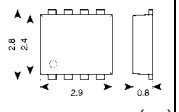
♦Internal Connections

(1)	(2)	(3)	(4)
			

Note: Some MOSFETs do not have a Zener diode between gate and source.

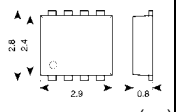
♦The internal connection diagrams only show the general configurations of the circuits.

(Load SW)

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)								Ciss (pF)	Qg (nC) (typ.)	Internal Connections
							$\|V_{GS}\|$ = 1.5 V	$\|V_{GS}\|$ = 1.8 V	$\|V_{GS}\|$ = 2.0 V	$\|V_{GS}\|$ = 2.5 V	$\|V_{GS}\|$ = 4V	$\|V_{GS}\|$ = 4.5 V	$\|V_{GS}\|$ = 7V	$\|V_{GS}\|$ = 10 V			
PS-8  (mm)	Load SW	TPCP8401	−12	±8	−5.5	1.96	—	103	—	58	—	38	—	—	—	20	(1)

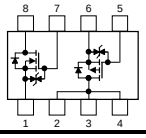
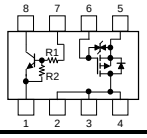
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(MOSFET + BipTr)

Package	Polarity	Part Number	V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)								Ciss (pF)	Qg (nC) (typ.)	Internal Connections
							V_{GS} = −1.5 V	V_{GS} = −1.8 V	V_{GS} = −2.0 V	V_{GS} = −2.5 V	V_{GS} = −4V	V_{GS} = −4.5 V	V_{GS} = −7V	V_{GS} = −10 V			
PS-8  (mm)	P-ch + BipTr	TPCP8J01	−32	±20	−5.5	2.14	—	—	—	—	49	—	—	35	—	34	(2)

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

♦Internal Connections

(1)	(2)
	

Note: Some MOSFETs do not have a Zener diode between gate and source.

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

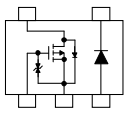
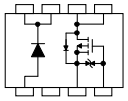
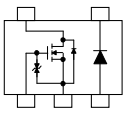
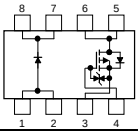
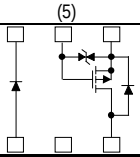
(MOSFET + SBD)

Package	Polarity	Part Number	MOSFET											SBD						Qg (nC) (typ.)	Internal Connections
			V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)						Ciss (pF)	V_R (V)	I_O (A)	V_F Max (V)					
							$\|V_{GS}\|$= 1.8 V	$\|V_{GS}\|$= 2.0 V	$\|V_{GS}\|$= 2.5 V	$\|V_{GS}\|$= 4.0 V	$\|V_{GS}\|$= 4.5 V	$\|V_{GS}\|$= 10 V				I_F = 1.0 A	I_F = 0.5 A	I_F = 0.3 A	I_F = 0.1 A		
UFV (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	0.39	—	—	(1)
		SSM5G02TU	−12	±12	−1	—	—	—	240	160	—	—	310	12	0.5	—	0.43	0.39	—	—	(1)
		SSM5G11TU	−30	±20	−1.4	—	—	—	—	403	—	226	120	30	0.7	—	0.41	—	—	—	(1)
UDFN6 (mm)		SSM6G18NU *	−20	±8	−2	2	194	—	152	—	122	—	270	30	1	0.58	0.45	—	—	3.6	(5)
VS-8 (mm)		TPCF8B01	−20	±8	−2.7	1.35	300	—	160	—	110	—	—	20	1	0.49	—	—	—	6	(4)
PS8 (mm)		TPCP8BA1	−20	±12	−1.3	—	—	—	260	180	—	—	370	25	0.7	—	0.41	—	—	—	(2)
UFV (mm)	Nch + SBD	SSM5H10TU	20	±10	1.6	—	190	—	139	119	—	—	260	20	0.7	—	0.39	—	—	—	(3)
		SSM5H08TU	20	±12	1.5	—	—	—	220	160	—	—	125	20	0.5	—	—	0.45	—	—	(3)
		SSM5H11TU	30	±20	1.6	—	—	—	—	182	—	122	180	30	0.7	—	0.41	—	—	—	(3)
		SSM5H16TU	30	±12	1.9	—	296	—	177	133	—	—	123	30	0.8	—	0.45	—	0.36	—	(3)
		SSM5H01TU	30	±20	1.4	—	—	—	—	450	—	200	106	20	0.5	—	—	0.45	—	—	(3)
		SSM5H07TU	20	±20	1.2	—	—	—	—	540	—	300	36	12	0.5	—	0.43	0.39	—	—	(3)
SMV (mm)		SSM5H14F	30	±12	3	—	138	—	94	78	—	—	270	45	0.1	—	—	—	0.6	—	(3)

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

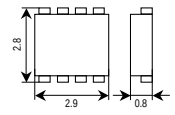
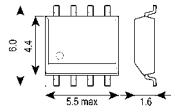
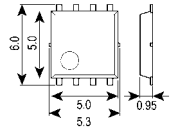
*: New product

♦Internal Connections

(1)	(2)	(3)	(4)	(5)
				

Note: Some MOSFETs do not have a Zener diode between gate and source.

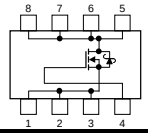
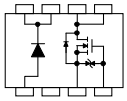
♦The internal connection diagrams only show the general configurations of the circuits.

Package	Polarity	Part Number	MOSFET											SBD						Qg (nC) (typ.)	Internal Connections
			V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)						Ciss (pF)	V_R (V)	I_O (A)	V_F Max (V)					
							$\|V_{GS}\|$ =1.8V	$\|V_{GS}\|$ =2.0 V	$\|V_{GS}\|$ =2.5 V	$\|V_{GS}\|$ =4.0 V	$\|V_{GS}\|$ =4.5 V	$\|V_{GS}\|$ =10 V				I_F = 1.0 A	I_F = 0.5 A	I_F = 0.3 A	I_F = 0.1 A		
PS8  (mm)	N-ch + SBD	TPCP8AA1	20	±12	1.6	—	—	—	140	105	—	—	306	25	0.7	—	0.41	—	—	—	(2)
		TPCP8A05-H	30	±20	8	1.68	—	—	—	—	21.9	17.5	1300	—	—	—	—	—	—	16	(1)
SOP-8  (mm)		TPC8A05-H	30	±20	10	1.9	—	—	—	—	17.6	13.3	—	—	—	—	—	—	—	15	(1)
		TPC8A06-H	30	±20	12	1.9	—	—	—	—	12.9	10.1	1400	—	—	—	—	—	—	19	(1)
		TPC8A03-H	30	±20	17	1.9	—	—	—	—	7	5.6	—	—	—	—	—	—	—	36	(1)
		TPC8A04-H	30	±20	18	1.9	—	—	—	—	4.5	3.6	—	—	—	—	—	—	—	56	(1)
SOP Advance  (mm)		TPCA8A05-H	30	±20	20	30	—	—	—	—	17.2	12.9	—	—	—	—	—	—	—	15	(1)
		TPCA8A02-H	30	±20	34	45	—	—	—	—	6.7	5.3	—	—	—	—	—	—	—	36	(1)
		TPCA8A08-H	30	±20	38	45	—	—	—	—	5.3	4.2	3500	—	—	—	—	—	—	48	(1)
		TPCA8A04-H	30	±20	44	45	—	—	—	—	4.1	3.2	—	—	—	—	—	—	—	59	(1)

: Monolithic

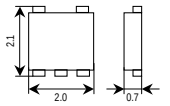
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

♦Internal Connections

(1)	(2)
	

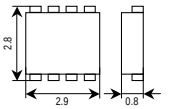
♦The internal connection diagrams only show the general configurations of the circuits.

(MOSFET + Switching Diodes)

Package	Polarity	Part Number	MOSFET											Di						Qg (nC) (typ.)	Internal Connections
			V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)						Ciss (pF)	V_R (V)	I_O (A)	trr (ns)	V_F Max (V)				
							V_{GS} = 1.5 V	V_{GS} = 1.8 V	V_{GS} = 2.5 V	V_{GS} = 4.0 V	V_{GS} = 4.5 V	V_{GS} = 10 V					I_F = 1 mA	I_F = 10 mA	I_F = 0.1 A		
UFV  (mm)	N-ch + Switching diodes	SSM5H90TU	20	±10	2.4	—	157	110	80	65	—	—	400	80	0.1	1.6	—	—	1.2	—	(1)

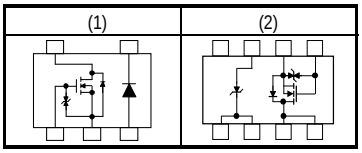
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(MOSFET + Zener Diodes)

Package	Polarity	Part Number	MOSFET											Ze-Di							Qg (nC) (typ.)	Internal Connections
			V_{DSS} (V)	V_{GSS} (V)	I_D (A)	P_D (W)	$R_{DS(ON)}$ Max (mΩ)						Ciss (pF)	V_Z (V)		I_R (μA)	V_F Max (V)				
							V_{GS} = 1.8 V	V_{GS} = 2.0 V	V_{GS} = 2.5 V	V_{GS} = 4.0 V	V_{GS} = 4.5 V	V_{GS} = 10 V			@I_Z (mA)	@V_R (V)	I_F = 1.0 A	I_F = 0.5 A	I_F = 0.3 A		
PS8  (mm)	N-ch + Zener diodes	TPCP8R01	60	±20	2.0	—	—	—	—	440	—	300	140	43	2	0.5	33	—	—	—	—	(2)

- 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.

Bipolar Power Transistors

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

V_{CEO} (V) / I_C(A)	10/(15)	(18)/20	(25)/30	40/(45)	50/(60)
0.2				2SA1483 ( ) (45 V)	
0.8			2SA1426 (§) 2SA1204 2SC2884 ( )		
1	TPC6D02 (&)( ) (15 V)		HN4B101J (M)(V) (NPN: 1.2 A)		2SA2070 ( ) TPC6701 (W)( ) 2SC5810 ( ) TPC6901A (M)( ) (PNP: 0.7 A) TPCP8901 (M)(P) (PNP: 0.8 A) TTA007 * TTC007 * (♠) TPC6604 * TPC6504 * ( )
1.2		TPC6D03 (&)( )	2SA1734 ( ) TPCP8801 (W)(P)		
1.5	2SA2058 (♠)	2SA2065 (♠) 2SC5784 (♠) 2SA2069 ( ) 2SC5819 ( ) TPC6503 ( ) S3F56 ++ ( )	**2SA966 2SC2236** (♣) 2SA1203 ( )		
2	**2SA1160** (♣) 2SA1430 2SC3670 (§) 2SA2066 ( ) 2SC5755 (♠) 2SC5785 ( ) TPC6501 ( ) TPC6602 ( ) TPCP8504 (P)		TPCP8902 (M)(P) (NPN+PNP) TPC6902 (M)( ) (NPN+PNP) : PNP-1.7A HN4B102J (M)(V) (NPN+PNP)	2SC3673 (§)	**2SA1020 2SC2655** (♣) 2SA1241 2SC3076 ( ) 2SA1382 (♣) 2SA2056 (♠) TPC6601 ( ) TPCP8701 (W)(P) 2SA2060 ( ) 2SA1428 2SC3668 (§) **2SA1680 2SC4408** (♣)
2.5		2SA2061 (♠)			2SC5692 (♠) 2SC6033 (♠) TPCP8602 (P)
3	2SC4682 (♣) (15 V) 2SC4683 (§) (15 V)	2SA2059 ( ) TPCP8F01 ($)(P) TPC6603 ( ) TPCP8G01 * ($)(P)	2SC5976 (♠) TPCP8H02 ($)(P)	2SC3422 (@)	2SA1761 2SC4604 (♣) 2SA1869 2SC4935 (▲) 2SC5712 ( ) TPC6502 ( ) TPCP8505 (P) 2SC6126 ( ) TPCP8511 * (P)
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

++: Being planned

Legend

Package			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

V_{CEO} (V) / I_C(A)	10/(15)	(18)/20	(25)/30	40/(45)	50/(60)
4	2SC5713 ( ) S3F61 ++ ( )	2SC5714 ( ) 2SC6125 ( ) S3F62 ++ ( ) TPCP8601 (P)	2SC5906 (♠)		2SC5703 (♠)
5		2SA1242 ( ) 2SA1431 (§) 2SC3072 ( ) 2SC3671 (§) 2SC6052 ( )	2SC6062 (♠)		2SA1244 2SC3074 ( ) 2SA1931 2SC4881 (▲) 2SA2097 ( ) 2SC5886 ( ) 2SC5886A ( ) TPCP8H01 ($)(P) S3H32 ++ ( )
7					2SC6000 ( )

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

++: Being planned

Legend

Package			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

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

V_{CEO} (V) / I_C(A)	80		100	120	(140)/150	160
0.05					**2SA1145** (♣) 2SA1360 2SC3423 (@) **2SA949** **2SC2229** (♣)	
0.1						**2SC2230** (♣)
0.4	**2SA817A** (♣) 2SA1202 2SC2882 ( )					
0.8				**2SA965** **2SC2235** (♣) 2SA1425 2SC3665 (§)		
1				TPCP8603 TPCP8507 (P) TPCP8510 * (P) 2SC6061 (♠)		**2SA1013** **2SC2383** (♣)
1.5					2SC2073A (▲)	2SA1225 ( ) 2SA2219 * 2SC6139 * (§) TTA004 * TTC004 * (@)
2	**2SA1315** **2SC3328** (♣) 2SA1429 2SC3669 (§) 2SC6079 (§) 2SA2206 2SC6124 ( )		TPCP8501 (P)			
3	2SA1926 (§) TTA003 ( ) 2SC6076 ( ) TTC009 * (▲)					
5	2SC3303 ( )					
6	2SC4688 (▼) **2SC5196** ( )					
8				2SC4689 (▼) 2SC5197 ( )		
10					2SC4690 (▼) (140 V) **2SA1941** **2SC5198** ( ) (140 V)	
12	2SA1452A 2SC3710A (▲)					2SA1942 2SC5199 ( )
18						TTA0001 * TTC0001 * ( ) TTA0002 * TTC0002 * ( )

- 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

Legend

Package			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

V_{CEO} (V) / I_C (A)	(180)/200	230	300	(370)/400
0.05				**2SC5122** (♣) 2SC5307 ( )
0.1	2SC2230A (♣) (180 V)		2SA1432 2SC3672 (§) **2SC4544** (▲) 2SA1384 2SC3515 ( )	
0.3				TPCP8604 (P)
0.5				TTC013 * ( ) (350 V) 2SA1971 ( ) **2SA1972** (♣)
0.8				2SC5458 ( )
1		**2SA1837** **2SC4793** (▲) TTC011 * (@)	**2SC5930** (§) (285 V) **2SC6010** (§) (285 V) **2SC6034** (§) (285 V) TTC005 * ( ) (285 V)	2SC5549 (♣) **2SC6042** (§) (375 V) 2SC6040 (§) (410 V) TPCP8508 ++ (P) (375 V)
1.5			TTC008 * ( ) (285 V)	2SC6142 ( ) (375 V) TTC003 * ( ) TTC13003L * (♣)
2	**2SC5171** (▲) (180 V)			2SC5548 ( ) (370 V) 2SC5548A ( ) 2SA2034 TTC012 * ( ) (375 V)
3				2SC5459 (▲)
5				2SC5172 (▲) 2SC6138 ++ ( ) (375 V)
10				2SC5352 ( )
12	2SA2120 2SC5948 ( )			
15	2SA2121 2SC5949 ( )	2SA1943 2SC5200 ( ) **2SA1962** **2SC5242** ( ) 2SA1986 2SC5358 ( ) 2SA1987 2SC5359 ( ) TTA1943 * TTC5200 * ( )		

- 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

++: Being planned

Legend

Package			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

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

V_{CEO} (V) / I_C (A)	(550)/600	800	1000/(1200)
0.05	2SC5201 (♣)	2SC5460 (@) 2SC5466 (▲) 2SC6127 ( )	2SC4686 (▲) 2SC4686A (▲) (1200 V)
0.5	2SA2142 ( )		
0.8		2SC3405 ( )	
1	2SA2184 ( ) (550 V)		
3		**2SC5353** (▲)	
5		2SC5354 ( )	
10		2SC3307 ( )	

- 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.

Legend

Package			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

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

V_{CEO} (V) / I_C (A)	30	40	60/(65)
0.8			2SD2719 (#)(%)(♠)
1			*2SD2686* (#)(%)( )
1.5	2SD1140 (%)(♣) 2SD1631 (%)(§)		
2			***2SD2088*** (#)(%)(♣) **2SD2695** (#)(%)(♣) 2SD2352 (▲)
3		*2SB907* (%)( )	2SB906 2SD1221 ( ) **2SB1375** **2SD2012** (▲) TTB001 * (♥) TTB002 * ( )
4			*2SD2204* (#)(%)(▲) (65 V)
5			*2SD2131* (#)(%)(▲)

- 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			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

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

V_{CEO} (V) / I_C (A)	80	100	120	150/(160)	450
0.9			**TPCP8L01(1)** (&)(P)		
1.5				2SB905 2SD1220 ( )	
2	*2SB1067* *2SD1509* (%)(@)	***2SB1457*** ***2SD2206*** (%)(♣) *2SD2536* (#)(%)(♣)			
3		*2SB1495* *2SD2257* (%)(▲) *2SD2092* (▲) *2SD2129* (%)(▲)			
4	*2SB908* *2SD1223* (%)( )	*2SB1481* *2SD2241* (%)(▲)			
5		*2SD2079* (%)(▲) ***2SD2604*** (#)(%)(▲)			
7		*2SB1020A* *2SD1415A* (%)(▲)			
8				2SD2636 (%)( ) (160 V)	
15		*2SD1662* (%)( )			2SD1314 (%)( )
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.

Legend

Package			Other Remarks
Through-Hole Package	Ammo Packaging	Surface-Mount Package	
(♣) LSTM	○	(♠) TSM	(%) Darlington
(§) MSTM	○	( ) PW-Mini	(#) Built-in zener diode
(@) TO-126	×	( ) PW-Mold	Part number in italic signifies built in Freewheel diode.
(▲) TO-220NIS	×	( ) VS-6	2SA****/2SC****: Complementary
( ) PW-Mold	×	(P) PS-8	(&) 2-in-1 (transistor + diode)
( ) TO-3P(N)	×	(V) SMV	($) 2-in-1 (transistor + S-MOS)
(▼) TO-3P(N)IS	×	(♥) TFP	(W) 2-in-1 (NPN (or PNP) × 2)
( ) TO-3P(L)	×		(M) 2-in-1 (NPN + PNP)

Transistors for Power Amps (Drive Stage)

Part Number		I_C (A)	V_{CEO} (V)	P_C (W) Tc = 25°C (♣Ta = 25°C)	f_T (MHz) Typ. (NPN/PNP)	V_{CE} (V)	I_C (A)	Package
NPN	PNP							
2SC2235	2SA965	0.8	120	♣ 0.9	120	5	0.1	LSTM
2SC3665	2SA1425	0.8	120	♣ 1	120	5	0.1	MSTM
2SC6139 *	2SA2219 *	1.5	160	♣ 1	100	10	0.1	
2SC3423	2SA1360	0.05	150	5	200	5	0.01	TO-126
TTC004 *	TTA004 *	1.5	160	10	100	10	0.1	
2SC4793	2SA1837	1	230	20	100/70	10	0.1	TO-220NIS

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

*: New product

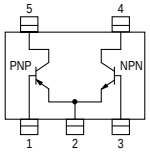
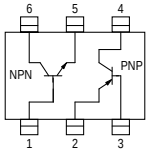
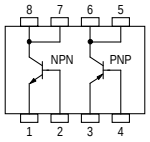
(Output Stage)

Part Number		I_C (A)	V_{CEO} (V)	P_C (W) Tc = 25°C	f_T (MHz) Typ. (NPN/PNP)	V_{CE} (V)	I_C (A)	Package
NPN	PNP							
2SC5198	2SA1941	10	140	100	30	5	1	TO-3P(N)
TTC0001 *	TTA0001 *	18	160	150	30	10	1	
2SC5242	2SA1962	15	230	130	30	5	1	
2SC5358	2SA1986	15	230	150	30	5	1	
2SC5948	2SA2120	12	200	200	30/25	5	1	
2SC5199	2SA1942	12	160	120	30	5	1	TO-3P(L)
TTC0002 *	TTA0002 *	18	160	180	30	10	1	
2SC5200	2SA1943	15	230	150	30	5	1	
TTC5200 *	TTA1943 *	15	230	150	30	5	1	
2SC5359	2SA1987	15	230	180	30	5	1	
2SC5949	2SA2121	15	200	220	30/25	5	1	

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

*: New product

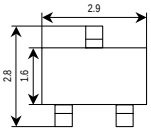
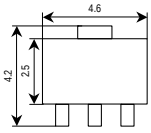
Transistors for MOS Gate Drivers/Compact Motor Drivers (2-in-1 Transistors)

Part Number	Polarity	Absolute Maximum Ratings				h_{FE}				$V_{CE(sat)}$			Package	Circuit Configuration (Top View)
		V_{CEO} (V)	I_C (A)	I_{CP} (A)	P_C (Note 1) (mW)	Min	Max	V_{CE} (V)	I_C (A)	(V) Max	I_C (A)	I_B (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	−1.7	−8	700	200	500	−2	−0.2	−0.2	−0.6	−20		
	NPN	30	2	8	700	200	500	2	0.2	0.14	0.6	20		
TPCP8901	PNP	−50	−0.8	−5	830	200	500	−2	−0.1	−0.2	−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.
Copper thickness: 35 μm for the TPC6901A and 70 μm for the other transistors

- 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			h_{FE}		V_{CE}	I_C	$V_{CE(sat)}$ (V)	I_C	I_B	Complementary	Package	Remarks
		V_{CEO} (V)	I_C (A)	P_C (Note 1) (mW)	Min	Max	(V)	(A)	Max	(A)	(mA)			
2SA2058	PNP	−10	−1.5	500	200	500	−2	−0.2	−0.19	−0.6	−20	2SC5755	TSM  (mm)	
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		
TTA007 *		−50	−1	700	200	500	−2	−0.1	−0.2	−0.3	−10	TTC007 *		
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		
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	—		(Note 2)
TTC007 *		50	1	700	400	1000	2	0.1	0.12	0.3	6	TTA007 *		
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	PW-Mini  (mm)	
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	−0.20	−0.3	−10	2SC5810		
2SA2060		−50	−2	1000	200	500	−2	−0.3	−0.20	−1.0	−33	2SC5712		
2SC5785	NPN	10	2	1000	400	1000	2	0.2	0.12	0.6	12	2SA2066		
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	0.18	1	33	—		(Note 2)

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

*: New product

Note 2: Ultra-high-speed using by the Super Hi-Met process and Low $V_{CE(sat)}$ products.

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

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

Part Number	Applications	Absolute Maximum Ratings (Ta = 25°C)				Package
		V_{CBO} (V)	V_{CEO} (V)	I_C (A)	Pc (W) Tc = 25°C (♣ Ta = 25°C)	
2SC5930	Switching regulator	600	285	1	1♣	MSTM
2SC6010				1	1♣	MSTM
2SC6034				1	1♣	MSTM
TTC008 *				1.5	1.1♣	PW-Mold
2SC5548			370	2	15	PW-Mold
2SC5548A			400	2	15	PW-Mold
2SC5458				0.8	10	PW-Mold
TTC003 *				1.5	1.1♣	PW-Mold
2SC5459				3	25	TO-220NIS
2SC5172				5	25	TO-220NIS
2SC5352				10	80	TO-3P(N)
2SC6042		800	375	1	1♣	MSTM
2SC6040			410	1	1♣	MSTM
2SC6142			375	1.5	1.1♣	PW-Mold
TTC012 *				2	1.1♣	PW-Mold
2SC5353		900	800	3	25	TO-220NIS
2SC5354				5	100	TO-3P(N)
2SC3307				10	150	TO-3P(L)

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

*: New product

Current Control Transistors for LED Backlighting

Part Number	Absolute Maximum Ratings			h_{FE}		V_{CE}	I_C	$V_{CE(sat)}$ (V)	I_C	I_B	Package
	V_{CEO} (V)	I_C (A)	P_C (W)	Min	Max	(V)	(A)	Max	(A)	(mA)	
TTC005 *	285	1	1.1 (Note 1)	100	200	5	0.1	1	0.6	75	PW-Mini
TTC011 *	230	1	10 (Note 2)	100	320	5	0.2	1	0.3	30	TO-126
TTC013 *	350	0.5	1 (Note 1)	100	200	5	0.05	0.3	0.16	20	PW-Mini

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm^2, glass-epoxy, t = 1.6 mm).

*: New product

Note 2: Tc = 25°C

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

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

Part Number	Absolute Maximum Ratings				hFE				$V_{CE\ (sat)}$ (V)			Package
	V_{CEX} (V)	V_{CEO} (V)	I_C (A)	P_C (W)	Min	Max	V_{CE} (V)	I_C (A)	Max	I_C (A)	I_B (mA)	
2SC6061	150	120	1	0.625 (Note 1)	120	300	2	0.1	0.14	0.3	10	TSM
TPCP8510 *	150	120	1	1.1 (Note 1)	120	300	2	0.1	0.14	0.3	10	PS-8
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
TTC009 *	160	80	3	15 (Note 2)	100	200	2	0.5	0.5	1	100	TO-220NIS
2SC6079	160	80	2	1 (Note 3)	180	450	2	0.5	0.5	1	100	MSTM

Note 1: The rating applies when the transistor is mounted on an FR4 board (Cu area = 645 mm^2, glass-epoxy, t = 1.6 mm). *: New product

Note 2: Tc = 25°C

Note 3: Ta = 25°C

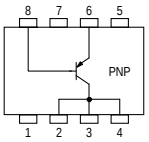
- Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

(Transistors for Droppers)

Part Number	Absolute Maximum Ratings			hFE				$V_{CE\ (sat)}$ (V)			Package
	V_{CEO} (V)	I_C (A)	P_C (W) Tc = 25°C	Min	Max	V_{CE} (V)	I_C (A)	Max	I_C (A)	I_B (mA)	
2SB906	−60	−3	20	60	200	−5	−0.5	−1.7	−3	−300	PW-Mold
TTB001 *	−60	−3	36	100	250	−5	−0.5	−1.7	−3	−300	TFP
TTB002 *	−60	−3	25	100	250	−5	−0.5	−1.7	−3	−300	PW-Mold

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

(High-Voltage Transistors)

Part Number	Absolute Maximum Ratings			Package	Circuit Configuration (Top View)	Remarks
	V_{CEO} (V)	I_C (A)	P_C (W)			
2SA1972	−400	−0.5	0.9	LSTM	TPCP8604  	
2SA1971	−400	−0.5	1	PW-Mini		
TPCP8604	−400	−0.3	1	PS-8		SMD
2SA2184	−550	−1	1	PW-Mold		SMD only
2SA2142	−600	−0.5	10	PW-Mold		SMD only
2SC5122	400	0.05	0.9	LSTM		
2SC5307	400	0.05	1	PW-Mini		
2SC5201	600	0.05	0.9	LSTM		
2SC6127	800	0.05	10	PW-Mold		SMD only
2SC5460	800	0.05	10	TO-126		
2SC5466	800	0.05	10	TO-220NIS		
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.
- 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				$V_{CE\ (sat)}$ (V)			Marking	Package
		V_{CEO} (V)	I_C (A)	I_{CP} (A)	Pc (mW) (Note 1)	Pc (mW) (Note 1) t = 10 s	Min	Max	V_{CE} (V)	I_C (A)	Max	I_C (A)	I_B (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	
TTA007 *		−50	−1	−2	700	1100	200	500	−2	−0.1	−0.2	−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	
TTC007 *		50	1	2	700	1100	400	1000	2	0.1	0.12	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	SMV
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	−0.2	−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	0.18	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	—	
TPC6504 *		50	1	2	800	1600	400	1000	2	0.1	0.17	0.3	6	H2D	
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	—	
TPC6604 *		−50	−1	−2	800	1600	200	500	−2	−0.1	−0.23	−0.3	−10	H3D	
TPC6701	NPN/dual	50	1	2	660 (Note2)	—	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	−1.7/2	±8	700	1000	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

*: New product

++: Being planned

- 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) (Continued)

Part Number	Configuration	Absolute Maximum Ratings					hFE				$V_{CE\ (sat)}$ (V)			Marking	Package
		V_{CEO} (V)	I_C (A)	I_{CP} (A)	Pc (mW) (Note 1)	Pc (mW) (Note 1) t = 10 s	Min	Max	V_{CE} (V)	I_C (A)	Max	I_C (A)	I_B (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	
TTA003 *		-80	−3	−5	10 (Note 3)	—	100	200	−2	−0.5	−0.5	−1	−100	A003	
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	
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	
TPCP8510 *		120	1	2	1100	2250	120	300	2	0.1	0.14	0.3	10	8510	
TPCP8511 *		50	3	5	1250	3000	250	400	2	0.3	0.18	1	33	8511	
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	3	5	940	1770	400	1000	2	0.3	0.14	1	20	8701	
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)		30	3	5	1000	2000	250	400	2	0.3	0.14	1	33	8H02	
TPCP8F01 (Note 2)	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	
TPCP8L01 (Note 4)	NPN Darlington + HED	120	0.9	2	900	—	2000	9000	2	1	1.5	1	1	8L01	
TPCP8G01 (Note 5) *	PNP + Pch	−20	−3	−5	940	1770	200	500	−2	−0.5	−0.19	−1.6	−53	8G01	

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, V_{RRM} = 30 V, I_O = 0.7 A, V_F = 0.4 V (MAX)@I_F = 0.5 A, I_R = 100 μA (MAX)@V_R = 10 V

Note 3: T_C = 25°C

Note 4: Built-in HED, V_{RRM} = 200 V, $I_{F(AV)}$ = 1 A

Note 5: Pch MOS V_{DSS} = −20 V, I_D = −2 A, R_{ON} = 130 mΩ Max

*: 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	—	—	
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	
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_{CBO} = 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	
TTB002 *		−60	−3.0	1.0	30	—	—	
TTA003 *		−80	−3.0	—	10	—	—	
2SB907	Switching, power amplification	−40	−3.0	1.0	15	—	—	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
2SC3303	Switching	80	5.0	1.0	20	—	2SC3258	
2SA2034	High-voltage switching	−400	−2	1.0	15	—	—	
2SA2184		−550	−1	—	10	—	—	
2SA2142		−600	−0.5	—	15	—	—	
2SC5458		400	0.8	1.0	10	—	—	
2SC5548		370	2	1.0	15	—	—	
2SC5548A		400	2	1.0	15	—	—	
2SC6127		800	0.05	1.0	10	—	—	
2SC3405		800	0.8	1.0	20	—	—	
2SC6142		375	1.5	1.1	—	—	—	
TTC003 *		400	1.5	1.1	—	—	—	
TTC008 *		285	1.5	1.1	—	—	—	
TTC012 *		375	2	1.1	—	—	—	
2SC6000	High-speed switching	50	7	1.0	20	—	—	
2SC6052		20	5	1.0	10	—	—	

★: Tc = 25°C

*: New product

★★: h_{FE} 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)	Pc (W)	V_{CEO} (V)	I_C (A)	hFE		V_{CE}	I_C	$V_{CE\ (sat)}$ (V)	I_C	I_B	f_T (MHz)	V_{CE}	I_C					
NPN	PNP		(Note 1)	(Note 2)			Min	Max	(V)	(mA)	Max	(mA)	(mA)	Typ.	(V)	(mA)	NPN	PNP	NPN	PNP	
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
—	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
—	2SA1483	0.5	1.0	—	45	0.2	40	240	1	10	0.3	100	10	200	10	10	V□	W□	—	—	Low saturation
—	2SA1971	0.5	1.0	—	−400	−0.5	140	400	−5	−100	−1.0	−100	−10	35	−5	−50	—	AL	—	2SA1972	High-voltage
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	1600	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	−0.2	−300	−10	—	—	—	—	4C	—	—	Low saturation
2SD2686	—	—	—	1	60±10	1	2000	—	2	1000	1.5	1000	1	—	—	—	3H	—	—	—	Darlington
2SC6124	2SA2206	—	—	1	80	2	100	200	2	500	0.5	1000	100	150/100	2	500	4J	4K	—	—	Low saturation
TTC005 *	—	—	—	1.1	285	1	100	200	5	100	1.0	600	75	—	—	—	4N	—	—	—	LED backlight
TTC013 *	—	—	—	1	350	0.5	100	200	5	50	0.3	160	20	—	—	—	4R	—	—	—	LED backlight

Note: The h_{FE} 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 mm^2 x 0.8 mm).

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

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

(TSM Transistors)

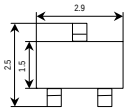
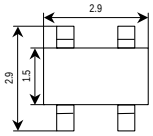
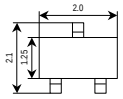
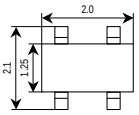
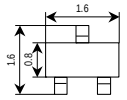
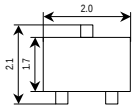
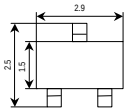
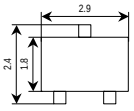
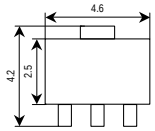
Part Number	Absolute Maximum Ratings					hFE				$V_{CE\ (sat)}$ (V)			Marking	Remarks/ Applications
NPN	V_{CEO} (V)	I_C (A)	I_{CP} (A)	Pc (mW) (Note1)	Pc (mW) (Note 1) t = 10s	Min	Max	V_{CE} (V)	I_C (A)	Max	I_C (A)	I_B (mA)		
2SA2058	−10	−1.5	−2.5	500	750	200	500	−2	−0.2	−0.19	−0.6	−20	WM	Low saturation
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
TTA007 *	−50	−1	−2	700	1100	200	500	−2	−0.1	−0.2	−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
TTC007 *	50	1	2	700	1100	400	1000	2	0.1	0.12	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 mm^2, glass-epoxy, t = 1.6 mm). *: New product

- 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
			V_{CEO} (V)	I_C (mA)	P_C (mW)	T_j (°C)			
2SC2714	S-MINI 	FM-band radio-frequency amps	30	20	150	125	Q□	**2SC1923**	f_T = 550 MHz
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
2SC5106		VHF/UHF-band oscillators	10	30	150	125	MF□	—	f_T = 6 GHz
2SC5087	SMQ 	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 = 8 GHz
MT4S03A		VHF/UHF-band low-voltage operation, low phase noise	5	40	150	125	MR	—	f_T = 10 GHz
2SC4215	USM 	FM-band radio-frequency amps	30	20	100	125	Q□	2SC1923	f_T = 550 MHz
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
2SC5095		VHF/UHF-band low-noise amps	10	15	100	125	ME□	—	f_T = 10 GHz
2SC5107		VHF/UHF-band oscillators	10	30	100	125	MF□	—	f_T = 6 GHz
MT3S16U		UHF-band low-voltage oscillators and amps	5	60	100	125	T4	—	f_T = 4 GHz
2SC5088	USQ 	VHF/UHF-band low-noise amps	12	80	100	125	MC□	—	f_T = 7 GHz
MT4S23U *		VHF/UHF-band low-noise amps	5	40	170 (Note 2)	150	MT	—	f_T = 16 GHz
MT4S03BU *		VHF/UHF-band low-noise amps	5	40	175 (Note 2)	150	MR	—	f_T = 12 GHz
MT4S24U *		VHF/UHF-band low-noise amps	5	50	175 (Note 2)	150	R8	—	f_T = 14.5 GHz
2SC4915	SSM 	FM-band radio-frequency amps	30	20	100	125	Q□	**2SC1923**	f_T = 550 MHz
2SC5066		VHF/UHF-band low-noise amps	12	30	100	125	M1/M2	—	f_T = 7 GHz
2SC5086		VHF/UHF-band low-noise amps	12	80	100	125	M5/M6	—	f_T = 7 GHz
2SC5096		VHF/UHF-band low-noise amps	10	15	100	125	M9/MA	—	f_T = 10 GHz
2SC5108		VHF/UHF-band oscillators	10	30	100	125	MB/MC	—	f_T = 6 GHz
MT3S11CT	CST3 	VHF/UHF-band low-voltage operation, low noise	6	40	105 (Note 1)	125	08	—	f_T = 6 GHz
MT3S15TU *	UFM 	VHF/UHF-band low-noise amps, low-distortion amps	6	80	900 (Note 2)	150	T3	—	f_T = 11.5 GHz
MT3S19TU *		VHF/UHF-band low-noise amps, low-distortion amps	6	80	900 (Note 2)	150	T6	—	f_T = 11 GHz
MT3S20TU *		VHF/UHF-band low-noise amps, low-distortion amps	12	80	900 (Note 2)	150	MU	—	f_T = 7 GHz
MT3S19 *	S-MINI 	VHF/UHF-band low-noise amps, low-distortion amps	6	80	800 (Note 2)	150	T6	—	f_T = 12 GHz
MT3S19R *	SOT-23F 	VHF/UHF-band low-noise amps, low-distortion amps	6	80	320 (Note 1)	150	T6	—	f_T = 13.5 GHz
MT3S20R *		VHF/UHF-band low-noise amps, low-distortion amps	12	80	320 (Note 1)	150	MU	—	f_T = 7.5 GHz
MT3S20P *	Pw-Mini 	VHF/UHF-band low-noise amps, low-distortion amps	12	80	1800 (Note 2)	150	MU	—	f_T = 7 GHz
MT3S21P *		VHF/UHF-band low-noise amps, low-distortion amps	6	80	1800 (Note 2)	150	T2	—	f_T = 9 GHz
MT3S22P *		VHF/UHF-band low-noise amps, low-distortion amps	6	80	1800 (Note 2)	150	T5	—	f_T = 8.5 GHz

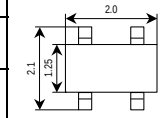
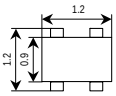
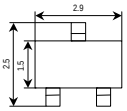
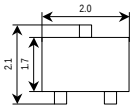
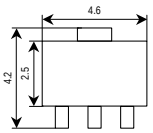
□: Denotes a h_{FE} class. *: New product

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.

SiGe HBT

Part Number	Package	Applications	Absolute Maximum Ratings (Ta = 25°C)				Marking	Remarks
			V_{CEO} (V)	I_C (mA)	P_C (mW)	T_j (°C)		
MT4S102U	USQ 	UHF/SHF-band low-noise amps	3	20	60	150	P8	f_T = 24 GHz
MT4S300U *		UHF/SHF-band low-noise amps	4	50	100	150	P3	f_T = 26.5 GHz, high ESD immunity
MT4S301U *		UHF/SHF-band low-noise amps	4	35	100	150	P4	f_T = 27.5 GHz, high ESD immunity
MT4S102T	TESQ 	UHF/SHF-band low-noise amps	3	20	60	150	P8	f_T = 25 GHz
MT4S300T *		UHF/SHF-band low-noise amps	4	50	100	150	P3	f_T = 26.5 GHz, high ESD immunity
MT4S301T *		UHF/SHF-band low-noise amps	4	35	100	150	P4	f_T = 27.5 GHz, high ESD immunity
MT3S111 *	S-MINI 	VHF/UHF-band low-voltage operation, low-noise amps	6	100	700 (Note 2)	150	R5	f_T = 11.5 GHz
MT3S113 *		VHF/UHF-band low-voltage operation, low-noise amps	5.3	100	800 (Note 2)	150	R7	f_T = 12.5 GHz
MT3S111TU *	UFM 	VHF/UHF-band low-voltage operation, low-noise amps	6	100	800 (Note 2)	150	R5	f_T = 10 GHz
MT3S113TU *			5.3	100	900 (Note 2)	150	R7	f_T = 11.2 GHz
MT3S111P *	Pw-Mini 	VHF/UHF-band low-voltage operation, low-noise amps	6	100	1000 (Note 2)	150	R5	f_T = 8 GHz
MT3S113P *			5.3	100	1600 (Note 2)	150	R7	f_T = 7.7 GHz

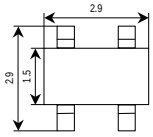
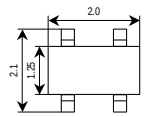
Note 2: Mounted on a ceramic board

*: 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.

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)	|Yfs| (mS) Typ.		
3SK291	SMQ 	UHF-band radio-frequency amps	12.5	30	150	0 to 0.1	26	UF	—
3SK292		VHF/UHF-band radio-frequency amps	12.5	30	150	0 to 0.1	23.5	UV	—
3SK293	USQ 	UHF-band radio-frequency amps	12.5	30	100	0 to 0.1	26	UF	—
3SK294		VHF/UHF-band 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 Power MOSFETs

Radio-Frequency Power MOSFETs

Part Number	Package	Applications	Absolute Maximum Ratings (Tc = 25°C)			Po (W)			
						Min	Test Conditions		
			V_{DSS} (V)	P_D (W)	I_D (A)		V_{DD} (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
RFM12U7X	PW-X		20	20	4	11.5	7.2	520	1.0
RFM01U7P *	PW-MINI		20	3	1	1.0	7.2	520	0.1
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
RFM04U6P *	PW-MINI	GMRS	16	7	2	3.5	6.0	470	0.2
2SK4037	PW-X		12	20	3	3.55	6.0	470	0.3
2SK2854	PW-MINI	UHF/VHF Professional radios	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	0.001
RFM03U3CT *	RF-CST3	GMRS	16	7	2.5	2.3	3.6	520	0.1
RFM00U7U	USQ	Driver	20	0.25	0.1	0.1	7.2	520	0.01

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

*: New product

IGBTs

IGBTs (Discrete IGBTs)

Part Number	Applications	Features	Absolute Maximum Ratings (Ta = 25°C)					Package		Circuit Configuration (Note)	$V_{CE(sat)}$ Typ. @Ta = 25°C			tf Typ. @Ta = 25°C		Remarks
			V_{CES} (V)	Ic		Pc										
				DC (A)	Pulsed (A)	Ta = 25°C (W)	Tc = 25°C (W)		Type		(V)	Ic (A)	V_{GE} (V)	(μs)	Test Conditions	
GT30J121	Power supplies (and UPS/PFC/Motor)	High-speed switching	600	30	60	—	170	TO-3P(N)	Through-hole	(1)	2.0	30	15	0.05	Inductive load	
GT30J126				30	60	—	90	TO-3P(N)IS	Isolation, Through-hole	(1)	1.95	30	15	0.05		
GT30J324				30	60	—	170	TO-3P(N)	Through-hole	(2)	2.0	30	15	0.05		
GT50J121				50	100	—	240	TO-3P(LH)	Through-hole	(1)	2.0	50	15	0.05		
GT50J325				50	100	—	240	TO-3P(LH)	Through-hole	(2)	2.0	50	15	0.05		
GT10Q101	Motor drives (and UPS/PFC)	High ruggedness	1200	10	20	—	140	TO-3P(N)	Through-hole	(1)	2.1	10	15	0.16		
GT10Q301				10	20	—	140	TO-3P(N)	Through-hole	(2)	2.1	10	15	0.16		
GT15Q102				15	30	—	170	TO-3P(N)	Through-hole	(1)	2.1	15	15	0.16		
GT15Q301				15	30	—	170	TO-3P(N)	Through-hole	(2)	2.1	15	15	0.16		
GT25Q102				25	50	—	200	TO-3P(LH)	Through-hole	(1)	2.1	25	15	0.16		
GT25Q301				25	50	—	200	TO-3P(LH)	Through-hole	(2)	2.1	25	15	0.16		
GT10J301		High ruggedness	600	10	20	—	90	TO-3P(N)	Through-hole	(2)	2.1	10	15	0.15		
GT20J101				20	40	—	130	TO-3P(N)	Through-hole	(1)	2.1	20	15	0.15		
GT20J301				20	40	—	130	TO-3P(N)	Through-hole	(2)	2.1	20	15	0.15		
GT30J101				30	60	—	155	TO-3P(N)	Through-hole	(1)	2.1	30	15	0.15		
GT30J301				30	60	—	155	TO-3P(N)	Through-hole	(2)	2.1	30	15	0.15		
GT50J102				50	100	—	200	TO-3P(LH)	Through-hole	(1)	2.1	50	15	0.15		
GT30J122	Power factor correction	Low frequency switching		30	100	—	75	TO-3P(N)IS	Isolation, Through-hole	(1)	2.1	50	15	0.25	Resistive load	Partial switching converter
GT30J122A				30	100	—	120	TO-3P(N)	Through-hole	(1)	1.7	50	15	0.2		
GT40J121 *				40	100	—	80	TO-3P(N)IS	Isolation, Through-hole	(1)	1.45	40	15	0.2		
GT30J322	IH rice cookers, IH cooktops, Microwave ovens, Induction heating equipment AC 200 V	Current resonance		30	100	—	75	TO-3P(N)IS	Isolation, Through-hole	(2)	2.1	50	15	0.25		
GT35J321				37	100	—	75	TO-3P(N)IS	Isolation, Through-hole	(2)	1.9	50	15	0.19		
GT40J321				40	100	—	120	TO-3P(N)	Through-hole	(2)	2.0	40	15	0.11		Fast switching
GT40J322				40	100	—	120	TO-3P(N)	Through-hole	(2)	1.7	40	15	0.20		
GT40J323				40	100	—	170	TO-3P(N)	Through-hole	(2)	2.0	40	15	0.06		Fast switching
GT40J325 *				40	100	—	80	TO-3P(N)IS	Isolation, Through-hole	(2)	1.45	40	15	0.2		6th generation
GT50J322				50	100	—	130	TO-3P(LH)	Through-hole	(2)	2.1	50	15	0.25		
GT50J322H				50	100	—	130	TO-3P(LH)	Through-hole	(2)	2.2	50	15	0.11		Fast switching
GT50J327				50	100	—	140	TO-3P(N)	Through-hole	(2)	1.9	50	15	0.19		
GT50J341 *				50	100	—	200	TO-3P(N)	Through-hole	(2)	1.6	50	15	0.15		6th generation, Tj = 175°C
GT50J328				50	120	—	140	TO-3P(N)	Through-hole	(2)	2.0	50	15	0.1		Fast switching
GT60J321				60	120	—	200	TO-3P(LH)	Through-hole	(2)	1.55	60	15	0.30		Low $V_{CE\ (sat)}$
GT60J323				60	120	—	170	TO-3P(LH)	Through-hole	(2)	1.9	60	15	0.16		
GT60J323H				60	120	—	170	TO-3P(LH)	Through-hole	(2)	2.1	60	15	0.12		Fast switching

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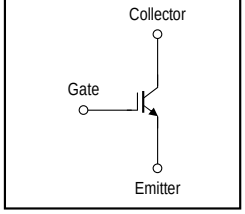
*: New product

Note)

(1) Typical



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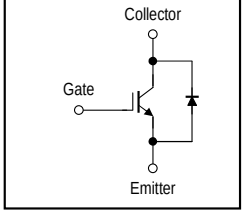
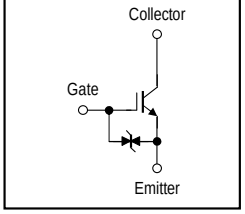


(3) Built-in Zener diode



IGBTs (Discrete IGBTs) (Continued)

Part Number	Applications	Features	Absolute Maximum Ratings (Ta = 25°C)					Package		Circuit Configuration (Note)	$V_{CE(sat)}$ Typ. @Ta = 25°C			tf Typ. @Ta = 25°C		Remarks
			V_{CES} (V)	Ic DC (A)	Ic Pulsed (A)	Pc Ta = 25°C (W)	Pc Tc = 25°C (W)		Type		(V)	Ic (A)	V_{GE} (V)	(μs)	Test Conditions	
GT15M321	IH rice cookers, IH cooktops, Microwave ovens, Induction heating equipment AC100 V	Voltage resonance	900	15	30	—	55	TO-3P(N)IS	Isolation, Through-hole	(2)	1.8	15	15	0.20	Resistive load	For small power
GT35MR21 *				35	100	—	82	TO-3P(N)IS	Isolation, Through-hole	(2)	1.6	35	15	0.20		6.5th generation
GT50M322				50	120	—	156	TO-3P(N)	Through-hole	(2)	2.1	60	15	0.25		
GT50MR21 *				50	100	—	230	TO-3P(N)	Through-hole	(2)	1.7	50	15	0.18		6.5th generation, Tj = 175°C
GT60M324				60	120	—	254	TO-3P(N)	Through-hole	(2)	1.7	60	15	0.11		6th generation, Tj = 175°C
GT50N322A			1000	50	120	—	156	TO-3P(N)	Through-hole	(2)	2.2	60	15	0.1		Fast switching
GT50N324				50	120	—	150	TO-3P(N)	Through-hole	(2)	1.9	60	15	0.11		6th generation
GT60N321				60	120	—	170	TO-3P(LH)	Through-hole	(2)	2.3	60	15	0.25		
GT50NR21 *			1050	50	100	—	230	TO-3P(N)	Through-hole	(2)	1.8	50	15	0.2		6.5th generation Tj = 175°C
GT40QR21 *	IH rice cookers, IH cooktops, Microwave ovens, Induction heating equipment AC200 V		1200	40	80	—	230	TO-3P(N)	Through-hole	(2)	1.9	40	15	0.2		6.5th generation, Tj = 175°C
GT40T321 *			1500	40	80	—	230	TO-3P(N)	Through-hole	(2)	2.15	40	15	0.24		6th generation, Tj = 175°C
GT5G133 *	Digital still cameras, cell phone	Strobe flash (dimming control)	400	—	130	0.83	—	TSON-8	SMD	(3)	3.0	130	2.5	1.5		I_{CP} = 130 A @V_{GE} = 2.5V gate drive
GT8G151 *				—	150	0.83	—	TSON-8	SMD	(3)	2.65	150	2.5	1.5		I_{CP} = 150 A @V_{GE} = 2.5V gate drive
GT8G132	Digital still cameras, single lens reflex cameras			—	150	1.1	—	SOP-8	SMD	(3)	2.3	150	4.0	1.6		I_{CP} = 150 A @V_{GE} = 2.5V gate drive
GT10G131				—	200	1.9	—	SOP-8	SMD	(3)	2.3	200	4.0	1.8		I_{CP} = 200 A @V_{GE} = 4.0V gate drive
GT30F124	PDP-TV	PDP sustain, energy recovery and separation circuits	300	—	200	—	25	TO-220SIS	Isolation, Through-hole	(1)	2.3	120	15	0.15		6th generation
GT45F127			300	—	200	—	26	TO-220SIS	Isolation, Through-hole	(1)	1.6	120	15	0.27		6th generation
GT30F125 *			330	—	200	—	25	TO-220SIS	Isolation, Through-hole	(1)	1.9	120	15	0.15		6th generation
GT45F128 *			330	—	200	—	26	TO-220SIS	Isolation, Through-hole	(1)	1.45	120	15	0.27		6th generation
GT30F131 *			360	—	200	—	140	TO-220SM (MXN)	SMD	(1)	1.9	120	15	0.17		6th generation
GT30G124			430	—	200	—	25	TO-220SIS	Isolation, Through-hole	(1)	2.5	120	15	0.23		6th generation
GT30G125 *				—	200	—	25	TO-220SIS	Isolation, Through-hole	(1)	2.1	120	15	0.16		6th generation
GT45G127				—	200	—	26	TO-220SIS	Isolation, Through-hole	(1)	1.7	120	15	0.37		6th generation
GT45G128 *				—	200	—	26	TO-220SIS	Isolation, Through-hole	(1)	1.55	120	15	0.41		6th generation
GT30J124			600	—	200	—	26	TO-220SIS	Isolation, Through-hole	(1)	2.4	120	15	0.25		5th generation

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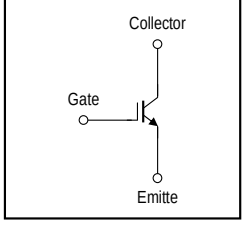
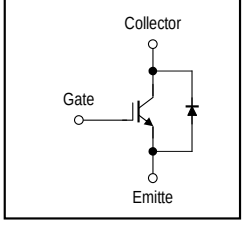
*: New product

Note)

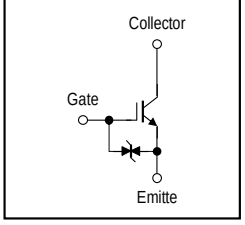
(1) Typical



(2) Built-in FRD



(3) Built-in Zener diode



Phototransistors

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)	V_{CE} (V)				
TPS601A(F)	—	TO-18CAN with lens	100	—	0.1	0.2	30	800	±10	—	Optoelectronic switches
	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(B,F)		34	85							
	TPS615(C,F)		60	150							
	TPS615(BC,F)		34	150							
TPS616(F)	—	ϕ3	10	75	0.1	0.1	24	900	±30	•	
	TPS616(B,F)		17	42.5							
	TPS616(C,F)		30	75							
	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; V_{CE} = collector-emitter voltage

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

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