



Small-Signal MOSFETs

POWER MOSFETs

Toshiba presents a range of small-signal MOSFET (S-MOS) devices developed for various switching and interface applications. The high-current S-MOS Family has been developed principally for high-current switching applications and has been added to the S-MOS product line. The devices which comprise this family exhibit ultra-low ON-resistance ($R_{DS(ON)}$) and are housed in mini packages. Please select the product whose characteristics best suit your needs.

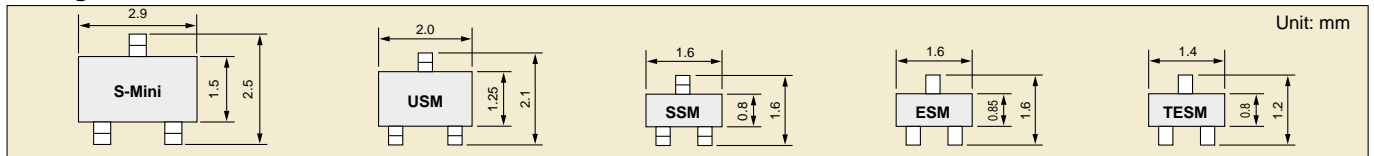
Standard Family single type (0.05 A to 0.4 A class) product line-up

Polarity	Maximum Ratings			Package Type					V _{th} (V)		R _{on} (Ω)		t _{on} (ns)	t _{off} (ns)	
	V _{DS} (V)	V _{GSS} (V)	I _D (mA)	TESM	ESM	SSM	USM (SC-70)	S-MINI (SC-59)	Min	Max	Typ.	Max			@V _{GS} (V)
N-ch	20	10	50	—	—	2SK1830	2SK1829	2SK1828	0.5	1.5	20	40	2.5	140	140
	20	10	100	—	—	2SK2825	2SK2824	2SK2823	0.5	1.0	10	40	1.5	350	200
	20	10	100	—	—	2SK2035	2SK2034	2SK2033	0.5	1.5	8	12	2.5	160	150
	20	10	100	SSM3K03TE	SSM3K03FE	—	—	—	0.7	1.3	4	12	2.5	160	190
	20	10	100	—	—	—	2SK2037	2SK2036	0.5	1.5	3.5	6.0	2.5	280	340
	20	10	100	—	★SSM3K04FE	★SSM3K04FS	★SSM3K04FU	—	0.7	1.3	4	12	2.5	160	190
	20	±10	100	△SSM3K16TE	—	△SSM3K16FS	△SSM3K16FU	—	0.6	1.1	5.2 2.2	4	1.5 2.5	70	125
	20	±12	400	—	—	—	SSM3K05FU	—	0.6	1.1	0.85	1.2	2.5	60	70
	30	±20	100	△SSM3K15TE	—	△SSM3K15FS	△SSM3K15FU	△SSM3K15F	0.8	1.5	4	7	2.5	50	180
	30	±20	200	—	—	—	—	2SK2009	0.5	1.5	1.2	2.0	2.5	60	120
	30	±20	400	—	—	—	SSM3K09FU	—	1.1	1.8	0.8	1.2	4	72	68
	50	10	50	—	—	—	2SK1827	2SK1826	0.8	2.5	20	50	4	110	150
	50	±7	100	—	—	—	△SSM3K17FU	—	0.9	1.5	12	20	4	100	40
60	±20	200	—	—	—	—	2SK1062	2.0	3.5	0.6	1.0	10	14	75	
P-ch	-20	-7	-50	—	—	2SJ347	2SJ346	2SJ345	-0.5	-1.5	20	40	-2.5	150	130
	-20	±12	-100	△SSM3J16TE	—	△SSM3J16FS	△SSM3J16FU	—	-0.6	-1.1	18 8	45 12	-1.5 2.5	130	190
	-20	±12	-200	—	—	—	SSM3J05FU	—	-0.6	-1.1	3.2	4.0	-2.5	70	70
	-30	±20	-100	△SSM3J15TE	—	△SSM3J15FS	△SSM3J15FU	△SSM3J15F	-1.1	-1.7	14	32	-2.5	65	175
	-30	±20	-200	—	—	—	—	2SJ305	-0.5	-1.5	2.4	4.0	-2.5	60	150
	-30	±20	-200	—	—	—	SSM3J09FU	—	-1.1	-1.8	3.3	4.2	-4	85	85
	-50	-7	-50	—	—	—	2SJ344	2SJ343	-0.8	-2.5	20	50	-4	150	130
	-60	±20	-200	—	—	—	—	2SJ168	-2.0	-3.5	1.3	2.0	-10	14	100

★: Built-in R_{GS} = 1MΩ

△: New products

Package list



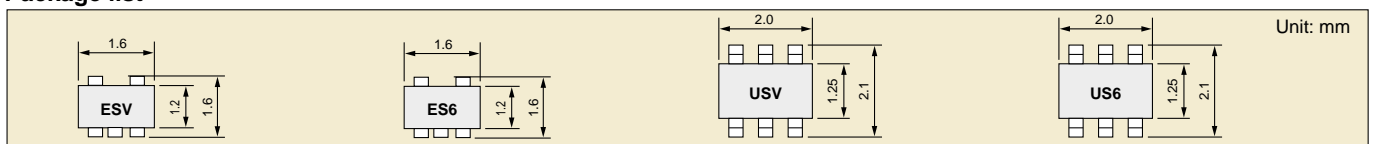
Standard Family dual type (0.05 A to 0.4 A class) product line-up

Polarity	Maximum Ratings			Package Type				Component FETs	V _{th} (V)		R _{ON} (Ω)		@V _{GS} (V)	
	V _{DSS} (V)	V _{GSS} (V)	I _D (mA)	ESV	ES6	USV	US6		Min	Max	Typ.	Max		
N-ch × 2	20	10	50	—	—	—	HN1K02FU	2SK1829 × 2	0.5	1.5	20	40	2.5	
	20	10	100	—	—	HN4K03JU	HN1K03FU	2SK2034 × 2	0.5	1.5	8	12	2.5	
	20	10	100	—	—	—	HN1K05FU	2SK2824 × 2	0.5	1	10	40	1.5	
	20	10	100	—	—	—	HN1K06FU	2SK2037 × 2	0.5	1.5	3.5	6	2.5	
	20	10	100	—	—	—	★SSM6N04FU	SSM3K04FU × 2	0.7	1.3	4	12	2.5	
	20	10	100	SSM5N03FE	SSM6N03FE	—	—	SSM3K03FE × 2	0.7	1.3	4	12	2.5	
	20	±10	100	△SSM5N16FE	△SSM6N16FE	△SSM5N16FU	△SSM6N16FU	SSM3K16FU × 2	0.6	1.1	5.2	15	1.5	
	20	±12	400	—	—	SSM5N05FU	SSM6N05FU	SSM3K05FU × 2	0.6	1.1	0.85	1.2	2.5	
	30	±20	100	△SSM5N15FE	△SSM6N15FE	△SSM5N15FU	△SSM6N15FU	SSM3K15FU × 2	0.8	1.5	4	7	2.5	
	30	±20	400	—	—	—	SSM6N09FU	SSM3K09FU × 2	1.1	1.8	0.8	1.2	4	
P-ch × 2	50	10	50	—	—	—	HN1K04FU	2SK1827 × 2	0.8	2.5	20	50	4	
	50	±7	100	—	—	—	SSM6N17FU	SSM3K17FU × 2	0.9	1.5	12	20	4	
	-20	-7	-50	—	—	—	HN1J02FU	2SJ346 × 2	0.5	-1.5	20	40	-2.5	
	-20	±12	-100	SSM5P16FE*	SSM6P16FE*	SSM5P16FU*	SSM6P16FU*	SSM3J16FU × 2	-0.6	-1.1	18	45	-1.5	
N-ch + P-ch	-20	±12	-200	—	—	—	SSM5P05FU	SSM6P05FU	SSM3J05FU × 2	-0.6	-1.1	3	4	-2.5
	-30	±20	-100	SSM5P15FE*	SSM6P15FE*	SSM5P15FU*	SSM6P15FU*	SSM3J15FU × 2	-1.1	-1.7	14	32	-2.5	
	-30	±20	-200	—	—	—	SSM6P09FU	SSM3J09FU × 2	-1.1	-1.8	3.3	4.2	-4	
	20	10	50	—	—	—	HN1L02FU	2SK1829 + 2SJ346	0.5	1.5	20	40	2.5	
20	-7	-50	—	—	—	—	—	-0.5	-1.5	20	40	-2.5		
50	10	50	—	—	—	HN1L03FU	2SK1827 + 2SJ346	0.8	2.5	20	50	4		
20	-7	-50	—	—	—	—	—	-0.5	-1.5	20	40	-2.5		
20	±12	400	—	—	—	SSM6L05FU	SSM3K05FU	0.6	1.1	0.85	1.2	2.5		
-20	±12	-200	—	—	—	—	SSM3J05FU	-0.6	-1.1	3.2	4	-2.5		
30	±20	400	—	—	—	—	SSM3K09FU	1.1	1.8	0.8	1.2	4		
-30	±20	-200	—	—	—	—	SSM3J09FU	-1.1	-1.8	3.3	4.2	-4		

★: Built-in R_{GS} = 1MΩ

△: New products * : Under development

Package list





High-Current Family (0.6 A to 4.0A class) product line-up

Single Type

Polarity	Maximum Rating			Package Type			V _{th} (V)		R _{DS(ON)} (mΩ)			ton (ns)	toff (ns)	Ciss (pF)
	V _{DS} (V)	V _{GSS} (V)	I _D (A)	US6	TSM	S-MINI	Min	Max	@V _{GS} (V)					
									Typ.	Max	Typ.			
N-ch	20	±12	1.1	SSM6K06FU	—	—	0.6	1.1	160	210	2.5	42	100	125
									120	160	4			
	20	±12	1.6	SSM6K08FU	—	—	0.5	1.2	100	140	2.5	16	15	306
									77	105	4			
	30	±10	1.0	—	—	SSM3K02F	0.6	1.1	180	250	2.5	52	80	115
									140	200	4			
	30	±10	1.3	—	—	SSM3K01F	0.6	1.1	115	150	2.5	45	69	152
									85	120	4			
	30	±20	1.5	SSM6K07FU	—	—	1.1	1.8	170	220	4	46	65	102
105									130	10				
30	±10	2.5	—	SSM3K02T	—	0.6	1.1	180	250	2.5	52	80	115	
								140	200	4				
30	±20	3.0	—	SSM3K12T	—	1.1	1.8	135	175	4	21	16	120	
								78	95	10				
30	±10	3.2	—	SSM3K01T	—	0.6	1.1	115	150	2.5	45	69	152	
								85	120	4				
30	±20	4.0	—	△SSM3K14T	—	1.0	2.5	50	67	4	24	19	460	
								31	39	10				
P-ch	-12	±8	-3.0	—	SSM3J13T	—	-0.45	-1.1	70	95	-2.5	48	120	890
									50	70	-4			
	-20	±12	-0.65	SSM6J06FU	—	—	-0.6	-1.1	550	700	-2.5	27	43	160
									400	500	-4			
	-20	±12	-1.3	△SSM6J08FU	—	—	-0.5	-1.1	200	260	-2.5	33	47	370
									140	180	-4			
	-30	±10	-0.6	—	—	SSM3J02F	-0.6	-1.1	550	700	-2.5	55	52	150
									400	500	-4			
	-30	±10	-0.7	—	—	SSM3J01F	-0.6	-1.1	400	600	-2.5	36	37	240
									300	400	-4			
	-30	±20	-0.8	SSM6J07FU	—	—	-1.1	-1.8	570	800	-4	28	38	130
									350	450	-10			
	-30	±10	-1.5	—	SSM3J02T	—	-0.6	-1.1	550	700	-2.5	55	52	150
400									500	-4				
-30	±10	-1.7	—	SSM3J01T	—	-0.6	-1.1	400	600	-2.5	36	37	240	
								300	400	-4				
-30	±20	-2.7	—	△SSM3J14T	—	-0.8	-2.0	120	170	-4	29	29	413	
								63	85	-10				

△: New product

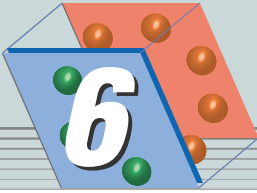
MOSFET + SBD

Polarity	Package Type	MOSFET										SBD						
		V _{DS} (V)	V _{GSS} (V)	I _D (A)	V _{th} (V)		R _{DS(ON)} (mΩ)			ton(ns)	toff(ns)	Ciss(pF)	V _R (V)	I _O (A)	V _F (V)			I _R (μA)
					Min	Max	Typ.	Max	@V _{GS} (V)						Typ.	Max	@I _F (A)	
P-ch + SBD	△SSM5G01TU	-30	±20	-1.0	-0.8	-1.8	0.62	0.80	-4	14	8.5	86	20	0.5	0.4	0.45	0.3	50
							0.32	0.40	-10						0.5	0.55	0.5	
	SSM5G02TU*	-12	±12	-1.0	-0.4	-1.1	0.19	0.30	-2.5	20	32	310	12	0.5	0.3	0.39	0.3	100
							0.12	0.18	-4						0.4	0.43	0.5	

△: New product *: Under development

Package list

UFV	US6 (SC-88)	TSM (t = 0.7 mm)	S-Mini(SC-59)	Unit: mm



Power Modules

POWER MOSFETs



Power modules enable high-density mounting and are the simplest of all multi-chip devices in structural terms. Use of these modules enables the construction of compact power supplies for electronic equipment.

■ S-10M Serues (4in1)

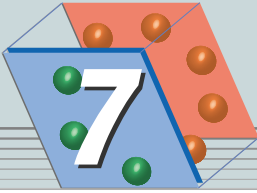
Polarity and Circuit Configuration	Product No.	Maximum Ratings			Electrical Characteristics (Ta = 25°C)				4-V Drive
		V _{bss} (V)	I _D (A)	P _T (Ta = 25°C) (W)	R _{DS(ON)} (Ω)		V _{GS} (V)	I _D (A)	
					(Typ.)	(Max)			
N-ch x 4	MP4210	60	5	4	0.12	0.16	10	2.5	○
	MP4209	100	3	4	0.28	0.35	10	2.0	○
P-ch x 4	MP4211	-60	-5	4	0.16	0.19	-10	-2.5	○
	MP4208	-60	-5	4	0.20	0.30	-10	-2.5	○
N-ch x 2 + P-ch x 2	MP4212	60	5	4	0.12	0.16	10	2.5	○
		-60	-5		0.16	0.19	-10	-2.5	

■ S-12M Serues (4in1, 6in1)

Polarity and Circuit Configuration	Product No.	Maximum Ratings			Electrical Characteristics (Ta = 25°C)				4-V Drive
		V _{bss} (V)	I _D (A)	P _T (Ta = 25°C) (W)	R _{DS(ON)} (Ω)		V _{GS} (V)	I _D (A)	
					(Typ.)	(Max)			
N-ch x 2 + P-ch x 2 with FB-Di	MP4411	100	3	4.4	0.28	0.35	10	2.0	○
	MP4412	100	5	4.4	0.17	0.23	10	2.5	○
N-ch x 4	MP4410	60	5	4.4	0.12	0.16	10	2.5	○
N-ch x 3 + P-ch x 3	MP6404	60	5	4.4	0.12	0.16	10	2.5	○
		-60	-5		0.16	0.19	-10	-2.5	

■ F-12M Serues (4in1, 6in1)

Polarity and Circuit Configuration	Product No.	Maximum Ratings			Electrical Characteristics (Ta = 25°C)				4-V Drive
		V _{bss} (V)	I _D (A)	P _T (Ta = 25°C) (W)	R _{DS(ON)} (Ω)		V _{GS} (V)	I _D (A)	
					(Typ.)	(Max)			
N-ch x 2 + P-ch x 2 with FB-Di	MP4711	100	5	36	0.17	0.23	10	2.5	○



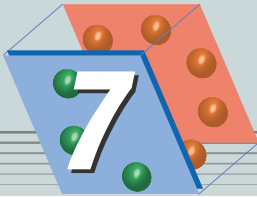
Power MOSFET Product List

POWER MOSFETs



Product No.	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} (Ω)	
2SJ200	π-MOS II	TO-3P(N)	-180	-10	0.83	—
2SJ201	π-MOS II	TO-3P(N)	-200	-12	0.63	—
2SJ304	L ² -π-MOS IV	TO-220(NIS)	-60	-14	0.12	—
2SJ312	L ² -π-MOS IV	TO-220FL/SM	-60	-14	0.12	—
2SJ313	π-MOS II	TO-220(NIS)	-180	-1	5.0	—
2SJ315	L ² -π-MOS IV	PW-MOLD	-60	-5	0.25	—
2SJ334	L ² -π-MOS V	TO-220(NIS)	-60	-30	0.038	P 19
2SJ338	v-MOS II	PW-MOLD	-180	-1	5.0	—
2SJ349	L ² -π-MOS V	TO-220(NIS)	-60	-20	0.045	P 19
2SJ360	L ² -π-MOS V	PW-MINI	-60	-1	0.73	P 19
2SJ377	L ² -π-MOS V	PW-MOLD	-60	-5	0.19	P 19
2SJ378	L ² -π-MOS V	TPS	-60	-5	0.19	P 19
2SJ380	L ² -π-MOS V	TO-220(NIS)	-100	-12	0.21	P 19
2SJ401	L ² -π-MOS V	TO-220FL/SM	-60	-20	0.045	P 19
2SJ402	L ² -π-MOS V	TO-220FL/SM	-60	-30	0.038	P 19
2SJ407	π-MOS V	TO-220(NIS)	-200	-5	1.0	P 21
2SJ412	L ² -π-MOS V	TO-220FL/SM	-100	-16	0.21	P 19
2SJ438	L ² -π-MOS V	TO-220(NIS)	-60	-5	0.19	P 19
2SJ439	π-MOS V	PW-MOLD	-16	-5	0.2	P 21
2SJ440	π-MOS II	TO-3P(N)IS	-180	-9	0.8	—
2SJ464	L ² -π-MOS V	TO-220(NIS)	-100	-18	0.12	P 19
2SJ465	π-MOS V	PW-MINI	-16	-2	0.71	P 21
2SJ507	L ² -π-MOS V	TO-92MOD	-60	-1	0.7	P 19
2SJ508	L ² -π-MOS V	PW-MINI	-100	-1	1.9	P 19
2SJ509	L ² -π-MOS V	TO-92MOD	-100	-1	1.9	P 19
2SJ511	L ² -π-MOS V	PW-MINI	-30	-2	0.45	P 19
2SJ512	π-MOS V	TO-220(NIS)	-250	-5	1.25	P 21
2SJ516	π-MOS V	TO-220(NIS)	-250	-6.5	0.8	P 21
2SJ525	L ² -π-MOS V	TPS	-30	-5	0.12	P 19
2SJ537	L ² -π-MOS V	TO-92MOD	-50	-5	0.19	P 19
2SJ567	π-MOS V	PW-MOLD	-200	-2.5	2.0	P 21
2SJ610	π-MOS V	PW-MOLD	-250	-2	2.55	P 21
2SJ619	L ² -π-MOS V	TFP	-100	-16	0.21	P 14
2SJ620	L ² -π-MOS V	TFP	-100	-18	0.09	P 14
2SK1119	π-MOS II.5	TO-220AB	1000	4	3.8	—
2SK1120	π-MOS II.5	TO-3P(N)	1000	8	1.8	—
2SK1359	π-MOS II.5	TO-3P(N)	100	5	3.8	—
2SK1365	π-MOS II.5	TO-3P(N)IS	1000	7	1.8	—
2SK1381	L ² -π-MOS III	TO-3P(N)	100	50	0.032	—
2SK1382	L ² -π-MOS III	TO-3P(L)	100	60	0.02	—
2SK1486	π-MOS III.5	TO-3P(L)	300	32	0.095	—
2SK1489	π-MOS III.5	TO-3P(L)	1000	12	1.0	—
2SK1529	π-MOS II	TO-3P(N)	180	10	0.83	—
2SK1530	π-MOS II	TO-3P(N)	200	12	0.63	—
2SK1544	π-MOS III.5	TO-3P(L)	500	25	0.2	—
2SK1930	π-MOS II.5	TO-220FL/SM	1000	4	3.8	—
2SK2013	π-MOS II	TO-220(NIS)	180	1	5.0	—
2SK2162	π-MOS II	PW-MOLD	180	1	5.0	—
2SK2173	L ² -π-MOS V	TO-3P(N)	60	50	0.017	P 18
2SK2200	L ² -π-MOS V	TPS	100	3	0.35	P 18
2SK2201	L ² -π-MOS V	PW-MOLD	100	3	0.35	P 18
2SK2229	L ² -π-MOS V	TPS	60	5	0.16	P 18

Product No.	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} (Ω)	
2SK2231	L ² -π-MOS V	PW-MOLD	60	5	0.16	P 18
2SK2232	L ² -π-MOS V	TO-220(NIS)	60	25	0.046	P 18
2SK2233	L ² -π-MOS V	TO-3P(N)	60	45	0.03	P 18
2SK2266	L ² -π-MOS V	TO-220FL/SM	60	45	0.03	P 18
2SK2267	L ² -π-MOS V	TO-3P(L)	60	60	0.011	P 18
2SK2274	π-MOS II.5	TO-220(NIS)	700	5	1.7	—
2SK2311	L ² -π-MOS V	TO-220FL/SM	60	25	0.046	P 18
2SK2312	L ² -π-MOS V	TO-220(NIS)	60	45	0.017	P 18
2SK2313	L ² -π-MOS V	TO-3P(N)	60	60	0.011	P 18
2SK2314	L ² -π-MOS V	TO-220AB	100	27	0.085	P 18
2SK2350	π-MOS V	TO-220(NIS)	200	8.5	0.4	P 21
2SK2376	L ² -π-MOS V	TO-220FL/SM	60	45	0.017	P 18
2SK2381	π-MOS V	TO-220(NIS)	200	5	0.8	P 21
2SK2382	π-MOS V	TO-220(NIS)	200	15	0.18	P 21
2SK2385	L ² -π-MOS V	TO-220(NIS)	60	36	0.03	P 18
2SK2391	L ² -π-MOS V	TO-220(NIS)	100	20	0.085	P 18
2SK2398	π-MOS V	TO-3P(N)	60	45	0.03	P 18
2SK2399	L ² -π-MOS V	PW-MOLD	100	5	0.23	P 18
2SK2400	L ² -π-MOS V	TPS	100	5	0.23	P 18
2SK2401	π-MOS V	TO-220FL/SM	200	15	0.18	P 21
2SK2417	π-MOS V	TO-220(NIS)	250	7.5	0.5	P 21
2SK2445	π-MOS V	TO-3P(N)	60	50	0.018	P 18
2SK2466	U-MOS	TO-220(NIS)	100	30	0.046	P 20
2SK2467	π-MOS II	TO-3P(N)IS	180	9	0.8	—
2SK2493	π-MOS V	PW-MOLD	16	5	0.1	P 21
2SK2507	L ² -π-MOS V	TO-220(NIS)	50	25	0.046	P 18
2SK2508	π-MOS V	TO-220(NIS)	250	13	0.25	P 21
2SK2542	π-MOS V	TO-220AB	500	8	0.85	P 23
2SK2543	π-MOS V	TO-220(NIS)	500	8	0.85	P 23
2SK2544	π-MOS V	TO-220AB	600	6	1.25	P 23
2SK2545	π-MOS V	TO-220(NIS)	600	6	1.25	P 23
2SK2549	π-MOS V	PW-MINI	16	2	0.29	—
2SK2550	L ² -π-MOS V	TO-3P(N)	50	45	0.03	P 18
2SK2551	L ² -π-MOS V	TO-3P(N)	50	50	0.011	P 18
2SK2598	π-MOS V	TO-220FL/SM	250	13	0.25	P 21
2SK2599	π-MOS V	TPS	500	2	3.2	P 23
2SK2601	π-MOS V	TO-3P(N)	500	10	1.0	P 23
2SK2602	π-MOS V	TO-3P(N)	600	6	1.25	P 23
2SK2603	π-MOS III	TO-220AB	800	3	3.6	P 26
2SK2604	π-MOS III	TO-3P(N)	800	5	2.2	P 26
2SK2605	π-MOS III	TO-220(NIS)	800	5	2.2	P 26
2SK2606	π-MOS III	TO-3P(N)IS	800	8.5	1.2	P 26
2SK2607	π-MOS III	TO-3P(N)	800	9	1.2	P 26
2SK2608	π-MOS III	TO-220AB	900	3	4.3	P 26
2SK2610	π-MOS III	TO-3P(N)	900	5	2.5	P 26
2SK2611	π-MOS III	TO-3P(N)	900	9	1.4	P 26
2SK2614	L ² -π-MOS V	DP	50	20	0.046	P 18
2SK2615	L ² -π-MOS V	PW-MINI	60	2	0.3	P 18
2SK2661	π-MOS V	TO-220AB	500	5	1.5	P 23
2SK2662	π-MOS V	TO-220(NIS)	500	5	1.5	P 23
2SK2679	π-MOS V	TO-220(NIS)	400	5.5	1.2	P 23
2SK2698	π-MOS V	TO-3P(N)	500	15	0.4	P 23



Power MOSFET Product List

POWER MOSFETs

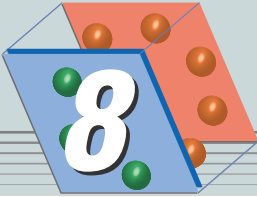
Product No.	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} (Ω)	
2SK2699	π-MOS V	TO-3P(N)	600	12	0.65	P 23
2SK2700	π-MOS III	TO-220(NIS)	900	3	4.3	P 26
2SK2717	π-MOS III	TO-220(NIS)	900	5	2.5	P 26
2SK2718	π-MOS III	TO-220(NIS)	900	2.5	6.4	P 26
2SK2719	π-MOS III	TO-3P(N)	900	3	4.3	P 26
2SK2733	π-MOS III	TO-220AB	900	1	9.0	P 26
2SK2741	L ² -π-MOS V	SP	60	5	0.16	P 18
2SK2742	L ² -π-MOS V	SP	100	3	0.35	P 18
2SK2744	π-MOS V	TO-3P(N)	50	45	0.02	P 18
2SK2745	L ² -π-MOS V	TO-3P(N)	50	50	0.0095	P 18
2SK2746	π-MOS III	TO-3P(N)	800	7	1.7	P 26
2SK2749	π-MOS III	TO-3P(N)	900	7	2.0	P 26
2SK2750	π-MOS V	TO-220(NIS)	600	3.5	2.2	P 23
2SK2776	π-MOS V	TO-220FL/SM	500	8	0.85	P 23
2SK2777	π-MOS V	TO-220FL/SM	600	6	1.25	P 23
2SK2782	L ² -π-MOS V	DP	60	20	0.055	P 18
2SK2789	L ² -π-MOS V	TO-220FL/SM	100	27	0.085	P 18
2SK2835	π-MOS V	TPS	200	5	0.8	P 21
2SK2836	π-MOS V	SP	600	1	9.0	P 23
2SK2837	π-MOS V	TO-3P(N)	500	20	0.27	P 23
2SK2838	π-MOS V	TO-220FL/SM	400	5.5	1.2	P 23
2SK2839	L ² -π-MOS V	SP	30	10	0.04	P 18
2SK2841	π-MOS V	TO-220AB	400	9	0.55	P 23
2SK2842	π-MOS V	TO-220(NIS)	500	12	0.52	P 23
2SK2843	π-MOS V	TO-220(NIS)	600	10	0.75	P 23
2SK2844	L ² -π-MOS V	TO-220AB	30	35	0.02	P 18
2SK2845	π-MOS III	DP	900	1	9.0	P 26
2SK2846	π-MOS V	TPS	600	2	5.0	P 23
2SK2847	π-MOS III	TO-3P(N)IS	900	8	1.4	P 26
2SK2862	π-MOS V	TO-220(NIS)	500	2	3.0	P 23
2SK2865	π-MOS V	PW-MOLD	600	2	5.0	P 23
2SK2866	π-MOS V	TO-220AB	600	10	0.75	P 23
2SK2882	L ² -π-MOS V	TO-220(NIS)	150	18	0.12	P 21
2SK2883	π-MOS III	TO-220FL/SM	800	3	3.6	P 28
2SK2884	π-MOS III	TO-220FL/SM	800	5	2.2	P 26
2SK2886	L ² -π-MOS V	TO-220(NIS)	50	45	0.02	P 18
2SK2889	π-MOS V	TO-220FL/SM	600	10	0.75	P 23
2SK2914	π-MOS V	TO-220AB	250	8.5	0.5	P 21
2SK2915	π-MOS V	TO-3P(N)	600	16	0.4	P 23
2SK2916	π-MOS V	TO-3P(N)IS	500	14	0.4	P 23
2SK2917	π-MOS V	TO-3P(N)IS	500	18	0.27	P 23
2SK2920	π-MOS V	PW-MOLD	500	5	0.8	P 21
2SK2949	π-MOS V	TO-220FL/SM	400	10	0.55	P 23
2SK2952	π-MOS V	TO-220(NIS)	400	8.5	0.55	P 23
2SK2953	π-MOS V	TO-3P(N)IS	600	15	0.4	P 23
2SK2961	L ² -π-MOS V	TO-92MOD	60	2	0.3	P 18
2SK2962	L ² -π-MOS V	TO-92MOD	100	1	0.7	P 18
2SK2963	L ² -π-MOS V	PW-MINI	100	1	0.7	P 18
2SK2964	L ² -π-MOS V	PW-MINI	30	12	0.18	P 18
2SK2965	π-MOS V	TO-220(NIS)	200	11	0.26	P 21
2SK2967	π-MOS V	TO-3P(N)	250	30	0.068	P 21
2SK2968	π-MOS III	TO-3P(N)	900	10	1.25	P 26

Product No.	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} (Ω)	
2SK2985	U-MOS	TO-220(NIS)	60	45	5.8	P 20
2SK2986	U-MOS	TO-220FL/SM	60	55	5.8	P 20
2SK2987	U-MOS	TO-3P(N)	60	70	5.8	P 20
2SK2989	L ² -π-MOS V	TO-92MOD	50	5	0.15	P 18
2SK2991	π-MOS V	TO-220FL/SM	500	5	1.5	P 23
2SK2992	π-MOS V	PW-MINI	200	1	3.5	P 21
2SK2993	π-MOS V	TO-220FL/SM	250	20	0.105	P 21
2SK2995	π-MOS V	TO-3P(N)IS	250	30	0.068	P 21
2SK2996	π-MOS V	TO-220(NIS)	600	10	1.0	P 23
2SK2998	π-MOS V	TO-92MOD	500	0.5	18	P 23
2SK3017	π-MOS III	TO-3P(N)IS	900	8.5	1.25	P 26
2SK3051	L ² -π-MOS V	TO-220FL/SM	60	45	0.03	P 18
2SK3067	π-MOS V	TO-220(NIS)	600	2	5.0	P 23
2SK3068	π-MOS V	TO-220FL/SM	500	12	0.52	P 23
2SK3084	U-MOS	TO-220FL/SM	100	30	0.046	P 20
2SK3085	π-MOS V	TO-220AB	600	3.5	2.2	P 23
2SK3089	L ² -π-MOS V	TO-220FL/SM	30	40	0.03	P 18
2SK3090	L ² -π-MOS V	TO-220FL/SM	30	45	0.02	P 18
2SK3117	π-MOS V	TO-3P(SM)	500	20	0.27	P 23
2SK3125	L ² -π-MOS V	TO-3P(SM)	30	60	0.007	P 18
2SK3126	π-MOS V	TO-220(NIS)	450	10	0.65	P 23
2SK3127	L ² -π-MOS V	TO-220FL/SM	30	45	0.011	P 18
2SK3128	L ² -π-MOS V	TO-3P(N)	30	60	0.011	P 18
2SK3129	π-MOS VI	TO-3P(N)	50	60	0.07	
2SK3130	π-MOS V	TO-220(NIS)	600	6	1.5	P 22
2SK3131	π-MOS V	TO-3P(L)	500	50	0.11	P 22
2SK3132	π-MOS V	TO-3P(L)	500	50	0.095	P 23
2SK3176	π-MOS V	TO-3P(N)	200	30	0.052	P 21
2SK3205	L ² -π-MOS V	PW-MOLD	150	5	0.5	—
2SK3236	U-MOS	TO-220(NIS)	60	45	0.02	P 20
2SK3265	π-MOS V	TO-220(NIS)	700	10	1.0	P 23
2SK3301	π-MOS III	PW-MOLD	900	1	20	P 26
2SK3302	π-MOS V	TPS	500	0.5	18	P 23
2SK3309	π-MOS V	TO-220FL/SM	450	10	0.65	P 22
2SK3310	π-MOS V	TO-220(NIS)	450	10	0.65	P 22
2SK3313	π-MOS V	TO-220(NIS)	500	12	0.62	P 22
2SK3314	π-MOS V	TO-3P(N)	500	15	0.48	P 22
2SK3316	π-MOS V	TO-220(NIS)	500	5	1.8	P 22
2SK3342	π-MOS V	PW-MOLD	250	4.5	1.0	P 21
2SK3371	π-MOS V	PW-MOLD	600	1	9.0	P 23
2SK3373	π-MOS V	PW-MOLD	500	2	3.2	—
2SK3374	π-MOS V	TPS	450	1	4.6	—
2SK3387	L ² -π-MOS V	TFP	150	18	0.08	P 14
2SK3388	π-MOS V	TFP	250	20	0.105	P 14
2SK3389	U-MOS II	TFP	30	75	0.005	P 14
2SK3397	U-MOS II	TFP	60	70	0.06	P 14
2SK3398	π-MOS V	TFP	500	12	0.52	P 14
2SK3399	π-MOS V	TO-220FL/SM	600	10	0.75	P 22
2SK3403	π-MOS V	TO-220FL/SM	450	13	0.4	P 22
2SK3407	π-MOS V	TO-220(NIS)	450	10	0.65	—
2SK3417	π-MOS V	TO-220FL/SM	500	5	1.8	P 22
2SK3437	π-MOS V	TO-220FL/SM	600	10	1.0	P 22



Product No.	Series	Package	Main Characteristics			Page
			V _{BSS} (V)	I _D (A)	R _{DS(ON)} (Ω)	
2SK3439	U-MOS II	TFP	30	75	0.005	P 14
2SK3440	U-MOS II	TFP	60	75	0.008	P 14
2SK3441	U-MOS II	TFP	60	75	0.0058	P 14
2SK3442	U-MOS II	TFP	100	75	0.015	P 14
2SK3443	π-MOS V	TFP	100	30	0.028	P 14
2SK3444	π-MOS V	TFP	200	25	0.055	P 14
2SK3445	π-MOS V	TFP	250	20	0.105	P 14
2SK3453	π-MOS IV	TO-3P(N)IS	700	10	1.0	P 23
2SK3462	π-MOS V	PW-MOLD	250	3	1.7	P 21
2SK3466	π-MOS V	TFP	500	5	1.5	P 14
2SK3471	π-MOS V	PW-MINI	500	0.5	18	P 23
2SK3472	π-MOS V	PW-MOLD	450	1	4.6	P 23
2SK3498	π-MOS V	PW-MOLD	400	1	5.5	P 23
2SK3499	π-MOS V	TFP	400	8.5	0.55	P 14
2SK3506	π-MOS V	TO-3P(N)	30	45	0.02	—
2SK3626	π-MOS V	Slim-TFP	500	8	0.85	P 17
2SK3627	π-MOS V	Slim-TFP	500	5	1.5	P 17
TPC6001	U-MOS II	VS-6	20	6	0.03	P 13
TPC6002	U-MOS II	VS-6	30	6	0.03	P 13
TPC6003	U-MOS III	VS-6	30	6	0.024	P 13
TPC6004	U-MOS III	VS-6	20	6	0.024	P 13
TPC6005	U-MOS III	VS-6	30	6	0.028	P 13
TPC6101	U-MOS II	VS-6	-20	-4.5	0.06	P 13
TPC6102	U-MOS II	VS-6	-30	-4.5	0.06	P 13
TPC6103	U-MOS III	VS-6	-12	-4.5	0.035	P 13
TPC6104	U-MOS III	VS-6	-20	-4.5	0.04	P 13
TPC6105	U-MOS III	VS-6	-20	-2.7	0.11	P 13
TPC6201	U-MOS II	VS-6	30	2.5	0.095	P 13
TPC8001	L ² -π-MOS VI	SOP-8	30	7	0.02	P 10
TPC8003	U-MOS II	SOP-8	30	13	0.007	P 10
TPC8004	L ² -π-MOS VI	SOP-8	30	5	0.05	P 10
TPC8006-H	U-MOS II	SOP-8	30	7	0.027	P 10
TPC8009-H	U-MOS III	SOP-8	30	13	0.01	P 10
TPC8010-H	U-MOS III	SOP-8	30	11	0.016	P 10
TPC8012-H	π-MOS V	SOP-8	200	1.8	0.4	P 10
TPC8013-H	U-MOS III	SOP-8	30	15	0.0065	P 10
TPC8015-H	U-MOS III	SOP-8	30	13	0.0075	P 10
TPC8016-H	U-MOS III	SOP-8	30	15	0.0055	P 10
TPC8014	U-MOS III	SOP-8	30	11	0.014	P 10
TPC8104-H	U-MOS II	SOP-8	-30	-5	0.065	P 10
TPC8105-H	U-MOS II	SOP-8	-30	-7	0.04	P 10
TPC8107	U-MOS III	SOP-8	-30	-13	0.007	P 10

Product No.	Series	Package	Main Characteristics			Page
			V _{BSS} (V)	I _D (A)	R _{DS(ON)} (Ω)	
TPC8108	U-MOS III	SOP-8	-30	-11	0.013	P 10
TPC8109	U-MOS III	SOP-8	-30	-10	0.02	P 10
TPC8111	U-MOS IV	SOP-8	60	7	0.05	P 10
TPC8203	U-MOS II	SOP-8	20	6	0.02	P 10
TPC8206	U-MOS II	SOP-8	20	5	0.05	P 10
TPC8207	U-MOS II	SOP-8	30	5	0.04	P 10
TPC8208	U-MOS II	SOP-8	-30	-3.5	0.12	P 10
TPC8209	U-MOS II	SOP-8	-20	-3.5	0.12	P 10
TPC8301	L ² -π-MOS VI	SOP-8	-30	-4.5	0.035	P 10
TPC8302	π-MOS VI	SOP-8	-20	-5	0.03	P 10
TPC8303	U-MOS II	SOP-8	-30/30	-4.5/6	35/21	P 10
TPC8305	U-MOS II	SOP-8	-30/30	-4.5/5	35/50	P 10
TPC8401	U-MOS II	SOP-8	-30	-11	0.012	P 10
TPC8402	U-MOS II/π-MOS VI	SOP-8	30	6	0.021	P 10
TPC8403	U-MOS II	SOP-8	-30/30	-4.5/6	55/33	P 10
TPC8A01	U-MOS III	SOP-8	30	6/8.5	0.025/0.018	P 10
TPCS8004	π-MOS V	TSSOP-8	200	1.3	0.8	P 10
TPCS8101	U-MOS II	TSSOP-8	-20	-6	0.02	P 10
TPCS8102	U-MOS II	TSSOP-8	-30	-6	0.025	P 10
TPCS8104	U-MOS IV	TSSOP-8	-30	-11	0.012	P 10
TPCS8204	U-MOS III	TSSOP-8	20	6	0.017	P 10
TPCS8205	U-MOS II	TSSOP-8	20	5	0.045	P 10
TPCS8208	U-MOS III	TSSOP-8	20	6	0.017	P 10
TPCS8209	U-MOS III	TSSOP-8	20	5	0.03	P 10
TPCS8210	U-MOS III	TSSOP-8	20	5	0.03	P 10
TPCS8211	U-MOS III	TSSOP-8	20	6	0.024	P 10
TPCS8212	U-MOS III	TSSOP-8	20	6	0.024	P 10
TPCS8302	U-MOS III	TSSOP-8	-20	-5	0.035	P 10
TPCF8001	U-MOS III	VS-8	30	6	0.032	P 13
TPCF8101	U-MOS III	VS-8	-12	-6	0.028	P 13
TPCF8102	U-MOS III	VS-8	-20	-6	0.03	P 13
TPCF8103	U-MOS III	VS-8	-20	-2.7	0.11	P 13
TPCF8104	U-MOS III	VS-8	-30	-6	0.038	P 13
TPCF8201	U-MOS III	VS-8	20	3	0.049	P 13
TPCF8301	U-MOS III	VS-8	-20	-2.7	0.11	P 13
TPCF8302	U-MOS IV	VS-8	-20	-3	0.063	P 13
TPCF8401	U-MOS III	VS-8	1.8 to 8	2.5	0.11	P 13
TPCF8402	U-MOS IV/U-MOS III	VS-8	-30/30	-1.8/2.3	0.105/0.077	P 13
TPCF8A01	U-MOS III	VS-8	20	3	0.049	P 13
TPCF8B01	U-MOS III	VS-8	-20	-2.7	0.11	P 13
TPCP8402	U-MOS IV/U-MOS III	PS-8	-30/30	-3.4/4.2	0.105/0.077	P 13



Power MOSFET Superseded Products

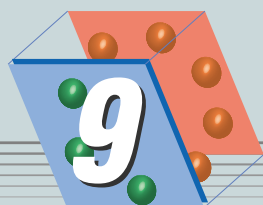
POWER MOSFETs

The product number in the left-hand column below are soon to be superseded. When ordering, please choose from among the recommended products in the right-hand column.

Superseded Products					Recommended Replacement Products				
Product No.	Electrical Characteristics			Package	Recommended Replacement Products	Electrical Characteristics			Package
	V _{DSS} (V)	I _D (A)	R _{Ds(ON)} Max (Ω)			V _{DSS} (V)	I _D (A)	R _{Ds(ON)} Max (Ω)	
2SJ238	-60	-1	0.85	PW-MINI	2SJ360	-60	-1	0.73	PW-MINI
2SJ239	-60	-5	0.25	PW-MOLD	2SJ377	-60	-5	0.19	PW-MOLD
2SJ240	-60	-20	0.045	TO-220NIS	2SJ349	-60	-20	0.045	TO-220NIS
2SJ241	-60	-20	0.045	TO-220FL/SM	2SJ401	-60	-20	0.045	TO-220FL/SM
2SK386	450	10	0.7	TO-3P (L)	2SK2698	500	15	0.4	TO-3P (N)
2SK447	250	15	0.24	TO-3P (L)	2SK2508	250	13	0.25	TO-220NIS
2SK537	900	1	9	TO-220AB	2SK2733	900	1	9	TO-220AB
2SK538	900	3	4.5	TO-3P (N)	2SK2719	900	3	4.5	TO-3P (N)
2SK791	850	3	4.5	TO-220AB	2SK2608	900	3	4.3	TO-220AB
2SK792	900	3	4.5	TO-220AB	2SK2608	900	3	4.3	TO-220AB
2SK794	900	5	2.5	TO-3P (N)	2SK2610	900	5	2.5	TO-3P (N)
2SK850	100	35	0.06	TO-3P (N)	2SK2466	100	30	0.046	TO-220NIS
2SK851	200	30	0.085	TO-3P (N)	2SK2967	250	30	0.07	TO-3P (N)
2SK942	60	25	0.046	TO-220AB	2SK2232	60	25	0.046	TO-220NIS
2SK943	60	25	0.046	TO-220NIS	2SK2232	60	25	0.046	TO-220NIS
2SK945	400	1	5	PW-MOLD	2SK2599	500	2	3	TPS
2SK1078	60	0.8	0.55	PW-MINI	2SK2615	60	2	0.37	PW-MINI
2SK1117	600	6	1.25	TO-220AB	2SK2544	600	6	1.25	TO-220AB
2SK1118	600	6	1.25	TO-220NIS	2SK2545	600	6	1.25	TO-220NIS
2SK1349	100	25	0.058	TO-220NIS	2SK2391	100	20	0.085	TO-220NIS
2SK1356	900	3	4.3	TO-220NIS	2SK2700	900	3	4.3	TO-220NIS
2SK1357	900	5	2.8	TO-3P (N)	2SK2610	900	5	2.5	TO-3P (N)
2SK1358	900	9	1.4	TO-3P (N)	2SK2611	900	9	1.4	TO-3P (N)
2SK1363	900	8	1.4	TO-3P (N) IS	2SK2847	900	8	1.4	TO-3P (N) IS
2SK1377	400	5.5	1.2	TO-220NIS	2SK2679	400	5.5	1.2	TO-220NIS
2SK1488	500	10	1.0	TO-3P (N)	2SK2601	500	10	1.0	TO-3P (N)
2SK1542	60	45	0.020	TO-220AB	2SK2376	60	45	0.017	TO-220FL/SM
2SK1603	900	2.5	6.4	TO-220NIS	2SK2718	900	2.5	6.4	TO-220NIS
2SK1641	250	20	0.23	TO-3P (N)	2SK2993	250	20	0.11	TO-220FL/SM
2SK1642	400	9	0.55	TO-220NIS	2SK2952	400	8.5	0.55	TO-220NIS
2SK1643	900	5	2.8	TO-220AB	2SK2717	900	5	2.5	TO-220NIS
2SK1651	500	8	1	TO-3P (N) IS	2SK2601	500	10	1	TO-3P (N)
2SK1653	60	45	0.020	TO-220NIS	2SK2312	60	45	0.017	TO-220NIS
2SK1692	900	7	2.0	TO-3P (N)	2SK2749	900	7	2.0	TO-3P (N)
2SK1717	60	2	0.37	PW-MINI	2SK2615	60	2	0.37	PW-MINI
2SK1722	500	5	1.5	TO-220FL/SM	2SK2991	500	5	1.5	TO-220FL/SM
2SK1723	600	12	0.65	TO-3P (N)	2SK2699	600	12	0.65	TO-3P (N)
2SK1745	500	18	0.36	TO-3P (N)	2SK2837	500	20	0.27	TO-3P (N)
2SK1766	250	10	0.6	TO-220NIS	2SK2417	250	7.5	0.5	TO-220NIS
2SK1792	60	45	0.02	TO-220FL/SM	2SK2376	60	45	0.017	TO-220FL/SM
2SK1858	800	3	5.0	TO-220FL/SM	2SK2883	800	3	3.6	TO-220FL/SM
2SK1927	100	15	0.1	TO-220FL/SM	2SK2789	100	27	0.85	TO-220FL/SM
2SK1928	100	27	0.085	TO-220FL/SM	2SK2789	100	27	0.85	TO-220FL/SM
2SK2039	900	5	2.5	TO-3P (N)	2SK2610	900	5	2.5	TO-3P (N)
2SK2056	900	4	2.4	TO-220NIS	2SK2605	800	5	2.2	TO-220NIS
2SK2057	500	20	0.34	TO-3P (N)	2SK2837	500	20	0.27	TO-3P (N)
2SK2077	800	7	1.7	TO-3P (N)	2SK2746	800	7	1.7	TO-3P (N)
2SK2078	800	9	1.2	TO-3P (N)	2SK2607	800	9	1.2	TO-3P (N)



Superseded Products					Recommended Replacement Products				
Product No.	Electrical Characteristics			Package	Product No.	Electrical Characteristics			Package
	V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max(Ω)			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max(Ω)	
2SK2107	200	18	0.18	TO-220FL/SM	2SK2401	200	15	0.18	TO-220FL/SM
2SK2150	500	15	0.4	TO-3P (N)	2SK2698	500	15	0.4	TO-3P (N)
2SK2236	500	5	1.6	TO-220NIS	2SK2662	500	5	1.5	TO-220NIS
2SK2237	500	7	0.8	TO-220NIS	2SK2543	500	8	0.85	TO-220NIS
2SK2320	800	8.5	1.2	TO-3P (N) IS	2SK2607	800	9	1.2	TO-3P (N)
2SK2351	600	6	1.25	TO-220AB	2SK2544	600	6	1.25	TO-220AB
2SK2352	600	6	1.25	TO-220NIS	2SK2545	600	6	1.25	TO-220NIS



Power MOSFET Final-Phase and Discontinued Products

POWER MOSFETs

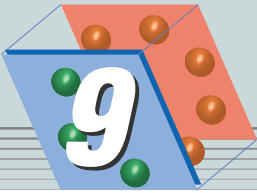


(1) Final-Phase Products

Product No.	Recommended Replacement Products
2SJ147	2SJ304
2SK385	2SK2698
2SK387	2SK2882
2SK388	2SK2508
2SK525	2SK2382
2SK526	2SK2417
2SK528	2SK2662
2SK529	2SK2662
2SK530	2SK2662
2SK531	2SK2662
2SK532	2SK2232
2SK539	2SK2610

Product No.	Recommended Replacement Products
2SK578	2SK2882
2SK944	2SK2967
2SK1347	2SK2314
2SK1362	2SK2610
2SK1378	2SK2841
2SK1600	2SK2603
2SK1652	2SK2698
2SK1720	2SK2266
2SK1769	2SK2599
2SK1854	2SK2952
2SK1856	2SK2698
2SK1864	2SK2776

Product No.	Recommended Replacement Products
2SK1865	2SK2776
2SK1882	2SK2232
2SK1915	2SK2777
2SK1997	2SK2385
2SK1998	2SK2233
2SK2387	2SK2542
2SK2388	2SK2750
TPC8002	TPC8014
TPC8005-H	TPC8010-H
TPC8007-H	TPC8009-H
TPC8102	TPC8105-H
TPC8103	TPC8111/TPC8108
TPC8106-H	TPC8109
TPC8201	TPC8209
TPC8202	TPC8208
TPC8204	TPC8207
TPCS8201	TPCS8209
TPCS8203	TPCS8211
TPCS8206	TPCS8210
TPCS8207	TPCS8212



Power MOSFET Final-Phase and Discontinued Products

POWER MOSFETs



(2) Discontinued Products

Product No.	Recommended Replacement Products
2SJ91	2SJ200
2SJ92	2SJ200
2SJ123	2SJ304
2SJ124	2SJ304
2SJ126	2SJ304
2SJ183	2SJ377
2SJ224	2SJ312
2SK271	2SK1529
2SK272	2SK1529
2SK324	2SK2698
2SK325	2SK2698
2SK355	2SK387
2SK356	2SK388
2SK357	2SK2381
2SK358	2SK2417
2SK405	2SK1529
2SK417	2SK2232
2SK418	2SK2662
2SK419	2SK2662
2SK420	2SK2662
2SK421	2SK2662
2SK422	2SK2961
2SK423	2SK941
2SK442	2SK2232
2SK527	2SK2232
2SK568	—
2SK572	—
2SK573	2SK1641
2SK643	2SK2601
2SK644	2SK2601
2SK672	2SK2232
2SK673	2SK2232
2SK674	2SK2232
2SK678	2SK2698
2SK693	2SK2698
2SK694	2SK2698
2SK708	2SK2698
2SK788	2SK2698
2SK789	2SK2698
2SK790	2SK2698
2SK793	2SK2610
2SK849	2SK2233
2SK856	2SK2385
2SK857	2SK2233
2SK858	2SK2750
2SK888	2SK2350
2SK889	2SK2314
2SK890	2SK2350
2SK891	2SK2382
2SK892	2SK2662
2SK893	2SK2386
2SK894	2SK2542
2SK895	2SK2601

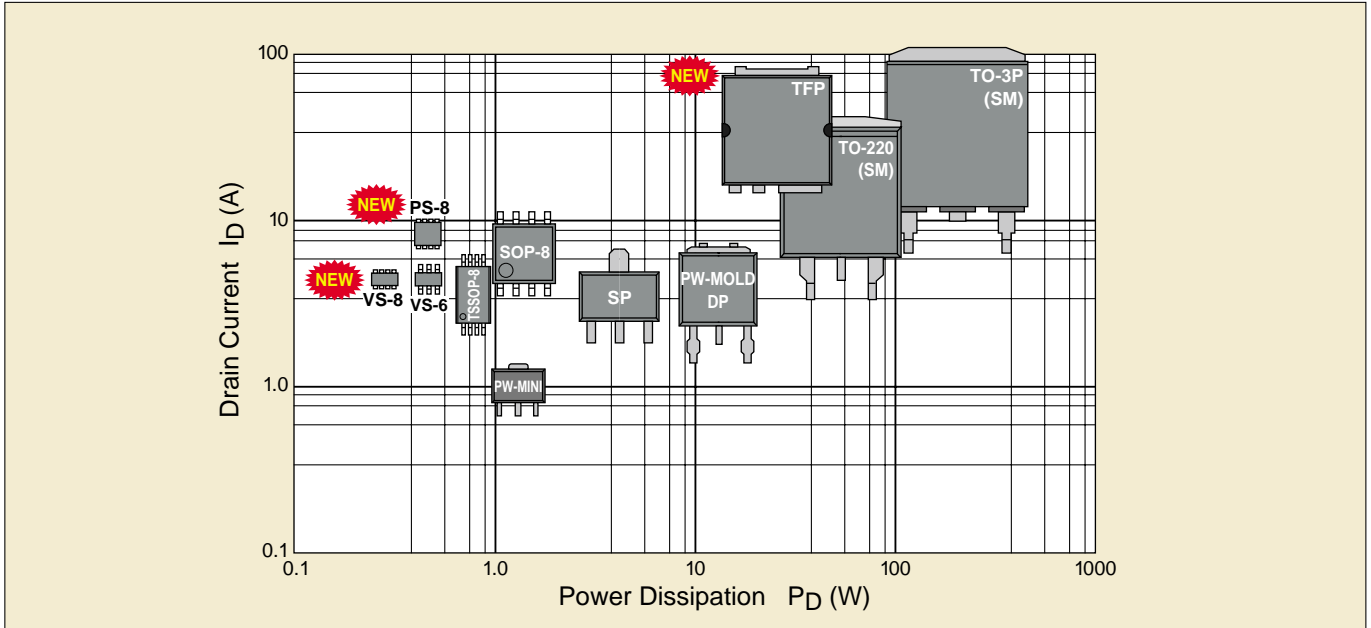
Product No.	Recommended Replacement Products
2SK896	2SK2695
2SK1029	2SK2698
2SK1112	2SK2231
2SK1113	2SK2201
2SK1114	2SK2232
2SK1115	2SK2232
2SK1116	2SK2232
2SK1124	2SK2233
2SK1213	2SK2602
2SK1251	2SK2231
2SK1252	2SK2201
2SK1333	2SK2698
2SK1344	2SK2232
2SK1346	2SK2232
2SK1348	2SK2391
2SK1350	2SK2382
2SK1351	2SK2662
2SK1352	2SK2543
2SK1379	2SK2173
2SK1380	2SK2267
2SK1487	2SK2601
2SK1513	2SK2601
2SK1531	2SK2698
2SK1574	2SK2542
2SK1601	2SK2608
2SK1602	2SK2603
2SK1649	2SK2610
2SK1650	2SK2719
2SK1721	2SK2991
2SK1746	2SK2865
2SK1767	2SK2750
2SK1768	2SK2614
2SK1805	2SK2543
2SK1855	2SK2698
2SK1879	2SK2398
2SK1913	2SK2750
2SK1929	2SK2884
2SK2038	2SK2604
2SK2088	2SK2401
2SK2089	2SK2884
2SK2149	2SK2601
2SK2222	2SK2604
2SK2319	2SK2746
2SK2386	2SK2661
2SK2402	2SK2750



1. Compact Surface-Mount Packages

To meet requirements for compact and thin equipment, Toshiba offers various packages with power dissipation of 1.0 to 150 W and drain current of 1 to 50 A.

In addition, we offer devices housed in the SOP-8 and TSSOP-8 packages. These devices consist of input/output isolated TFP Series MOSFETs and trench MOSFETs with ultra-low ON-resistance.



● VS-6

Unit: mm

Top view dimensions: 6, 4, 1.6^{+0.2}/_{-0.1}, 2.8^{+0.2}/_{-0.3}, 0.95, 1, 3, 0.3 ± 0.1

Side view dimensions: 2.9 ± 0.2, 0.7 ± 0.05, 0.16 ± 0.05, 0.25^{+0.25}/_{-0.15}, 0.05 ± 0.05

Tape dimensions

Top view dimensions: 4.0 ± 0.1, 8.0 ± 0.2, 4.0 ± 0.1, 3.3 ± 0.1, 5.2 ± 0.2

Side view dimensions: 1.4 ± 0.1, 1.55 ± 0.1

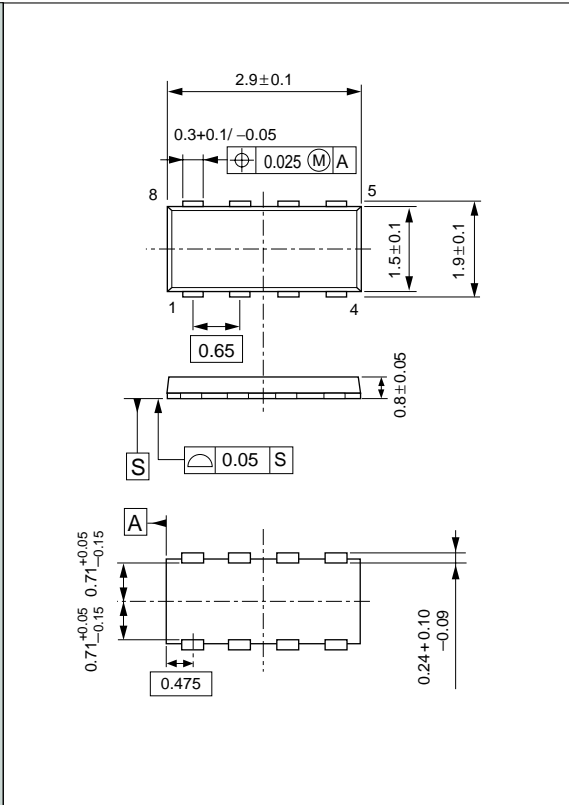
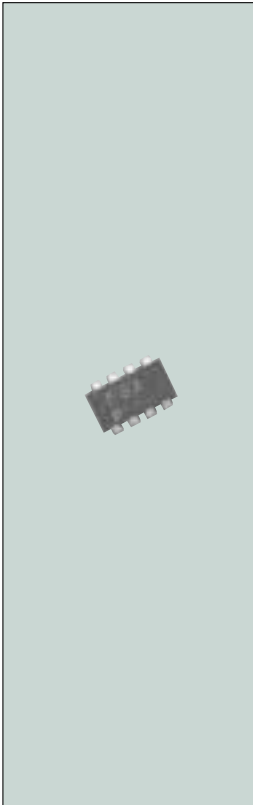
Reel dimensions

Top view dimensions: 9.5, 0.75 ± 0.5, φ178 ± 1.0

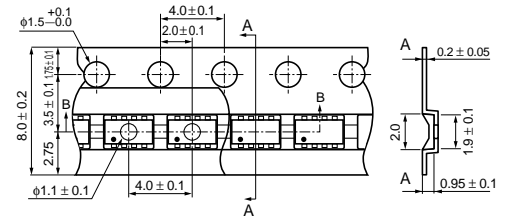
Packing quantity 3000pcs / reel

● VS-8

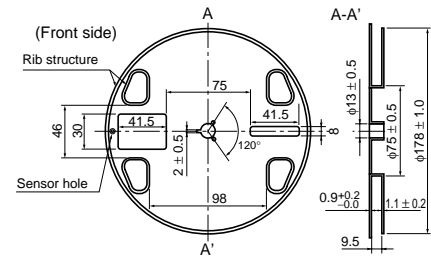
Unit: mm



Tape dimensions



Reel dimensions

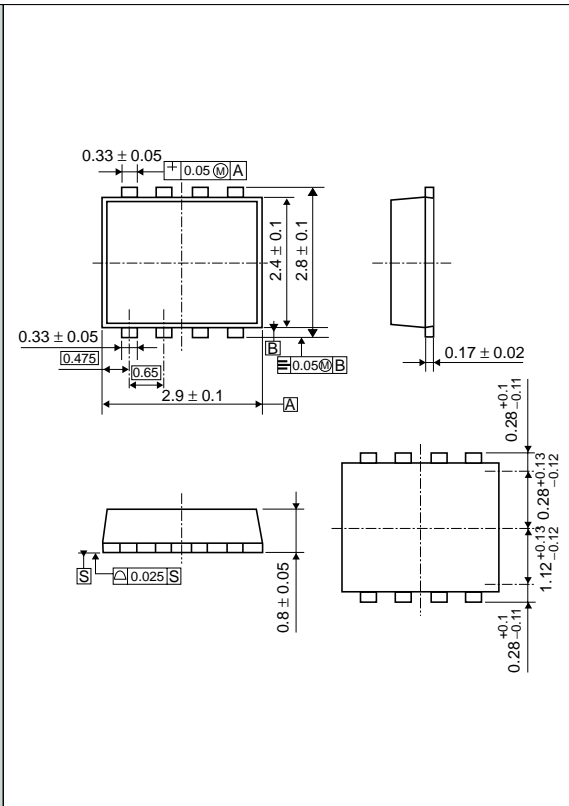
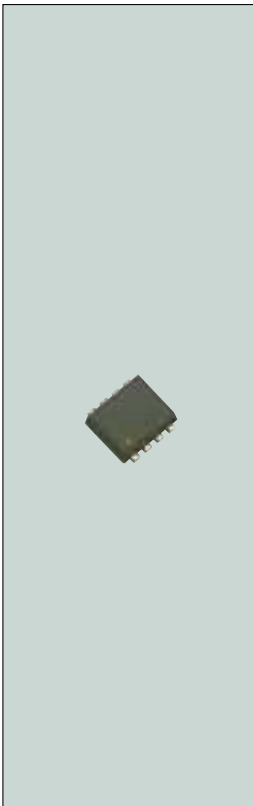


Packing quantity

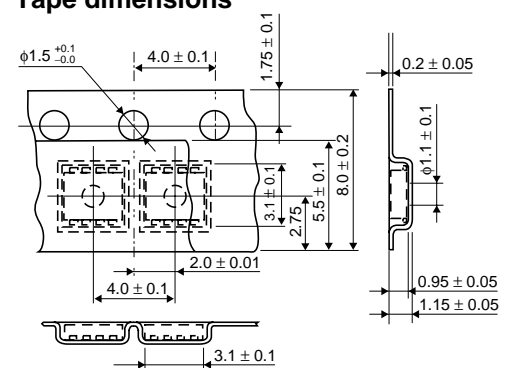
4000pcs / reel

● PS-8

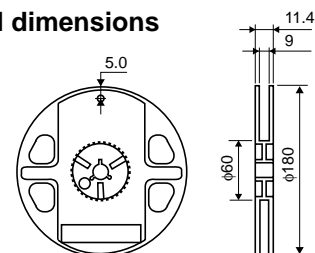
Unit: mm



Tape dimensions



Reel dimensions



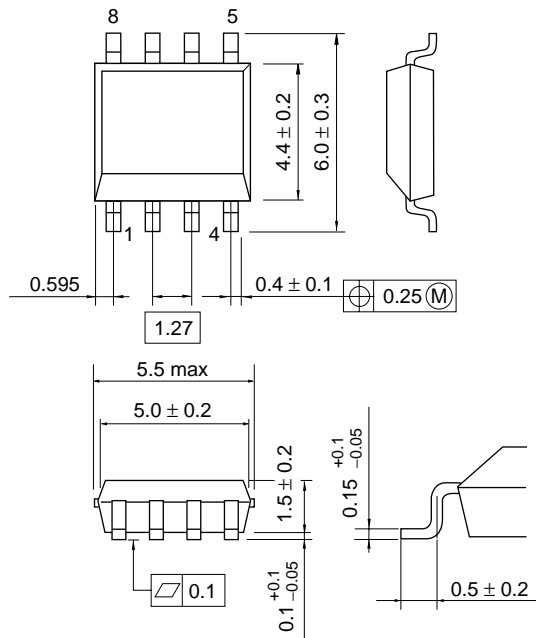
Packing quantity

3000pcs / reel

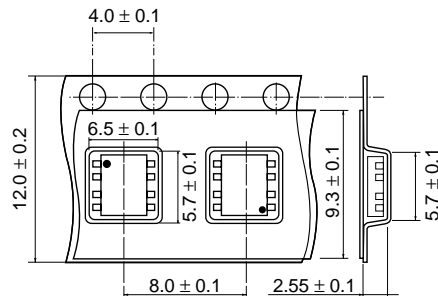


● SOP-8

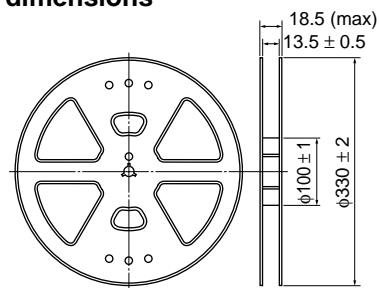
Unit: mm



Tape dimensions



Reel dimensions

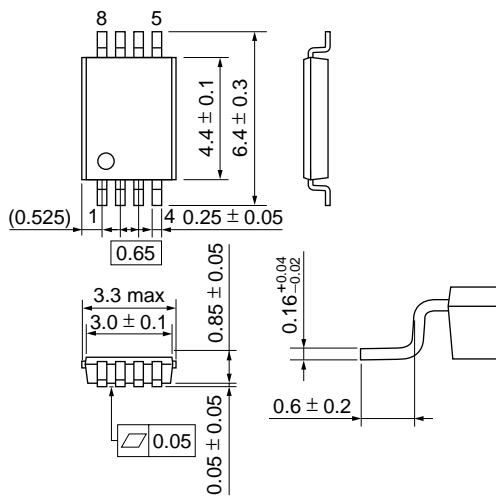


Packing quantity

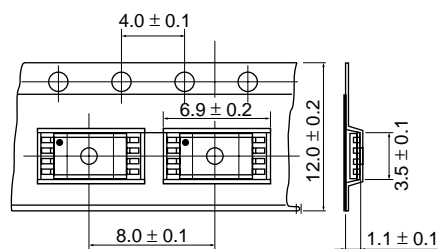
3000pcs / reel

● TSSOP-8

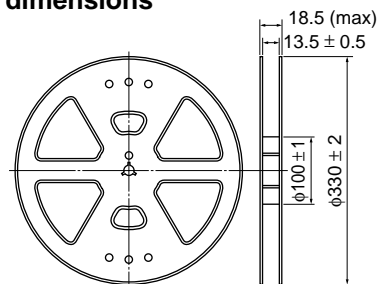
Unit: mm



Tape dimensions



Reel dimensions

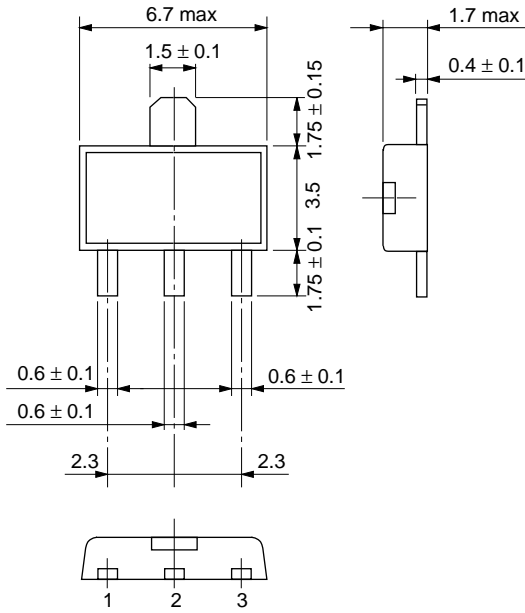


Packing quantity

3000pcs / reel

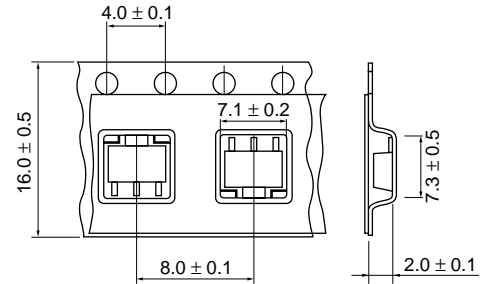
● SP

Unit: mm

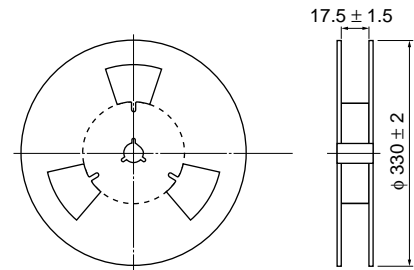


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions

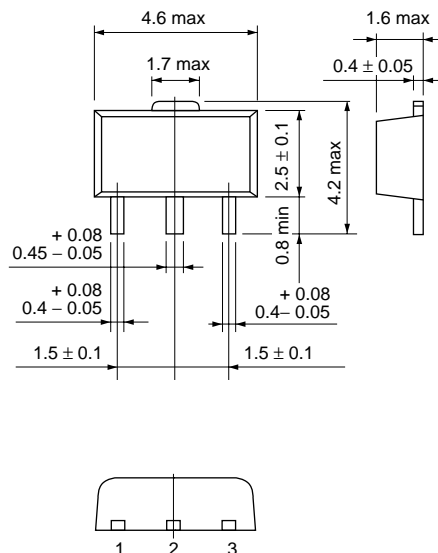


Packing quantity

3000pcs / reel

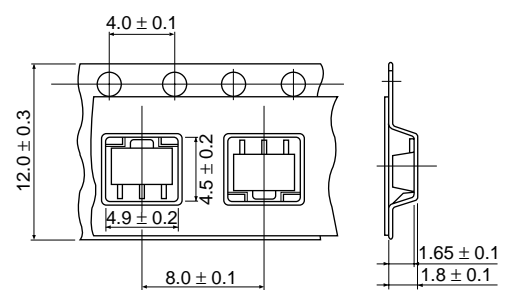
● PW-MINI

Unit: mm

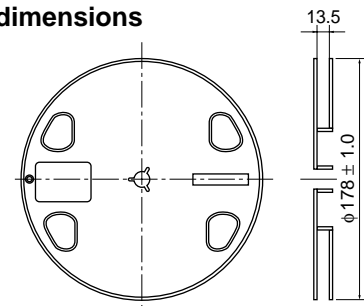


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions



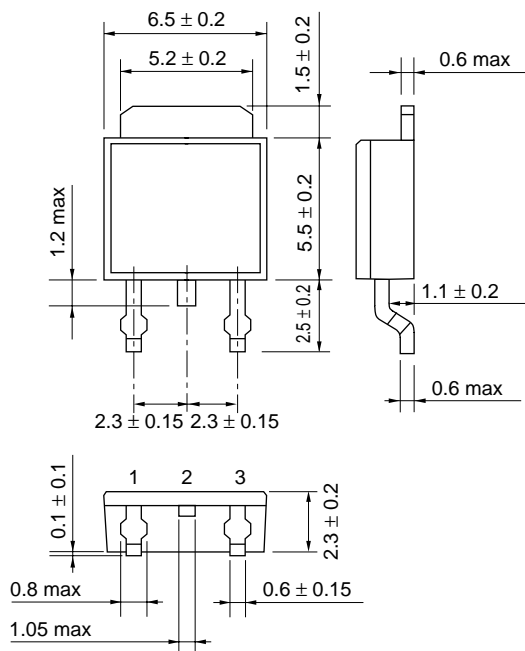
Packing quantity

1000pcs / reel



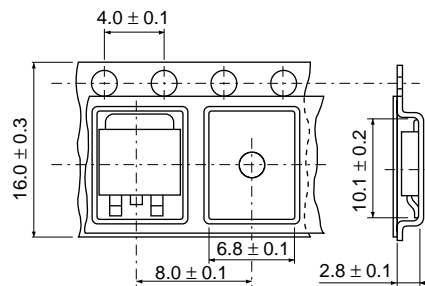
● PW-MOLD

Unit: mm

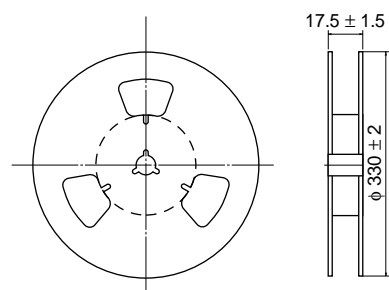


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions

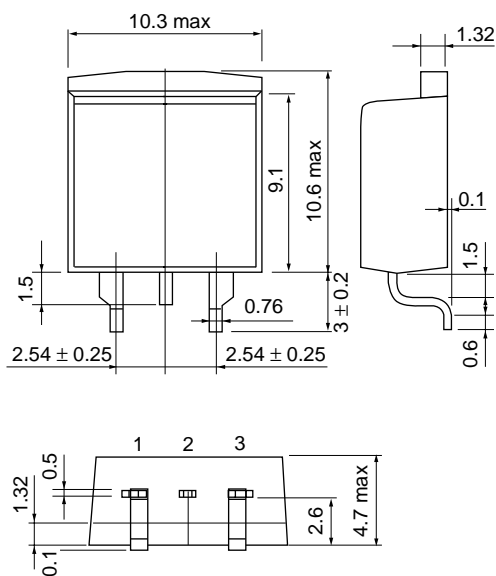


Packing quantity

700pcs / reel

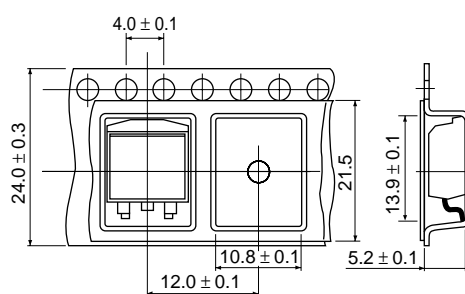
● TO-220SM

Unit: mm

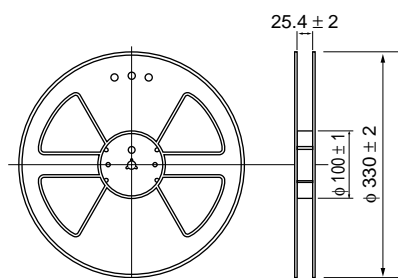


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions

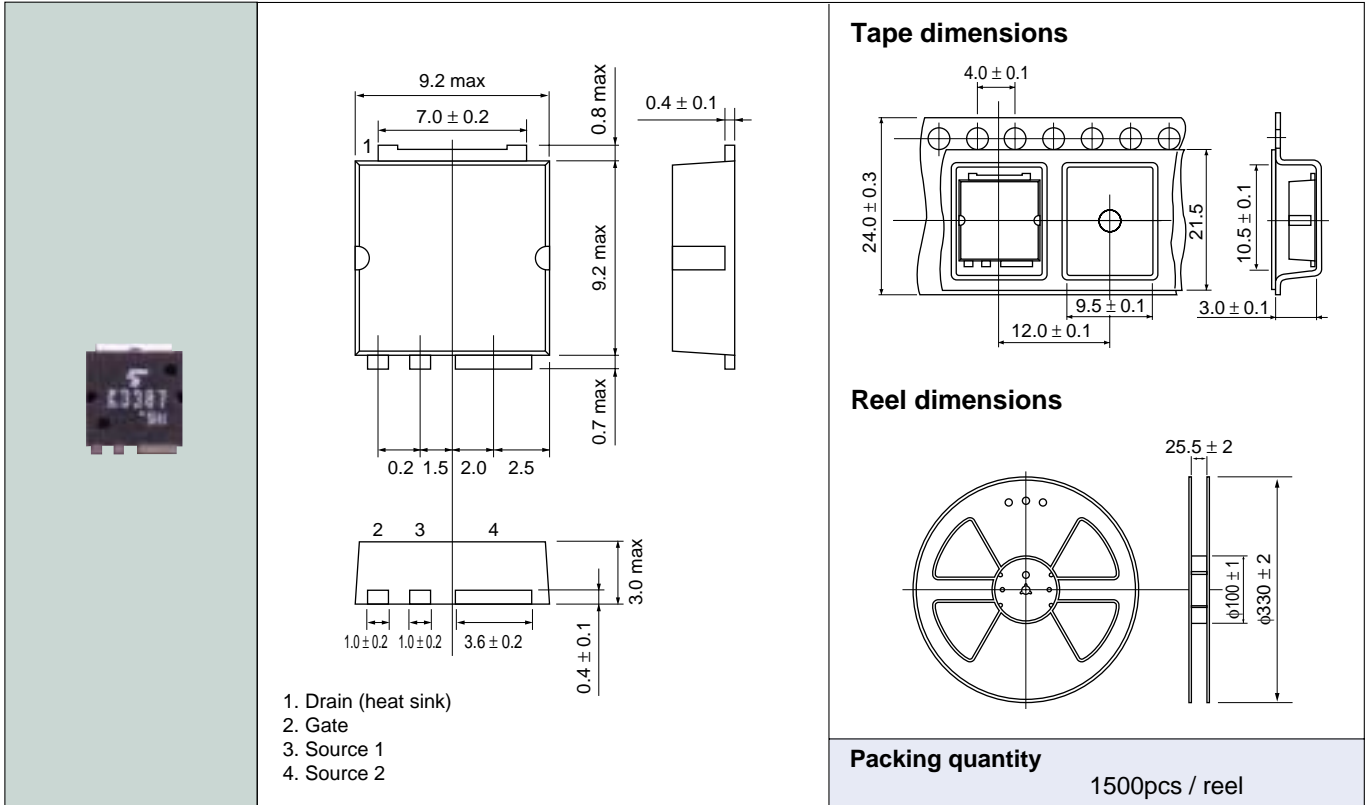


Packing quantity

1000pcs / reel

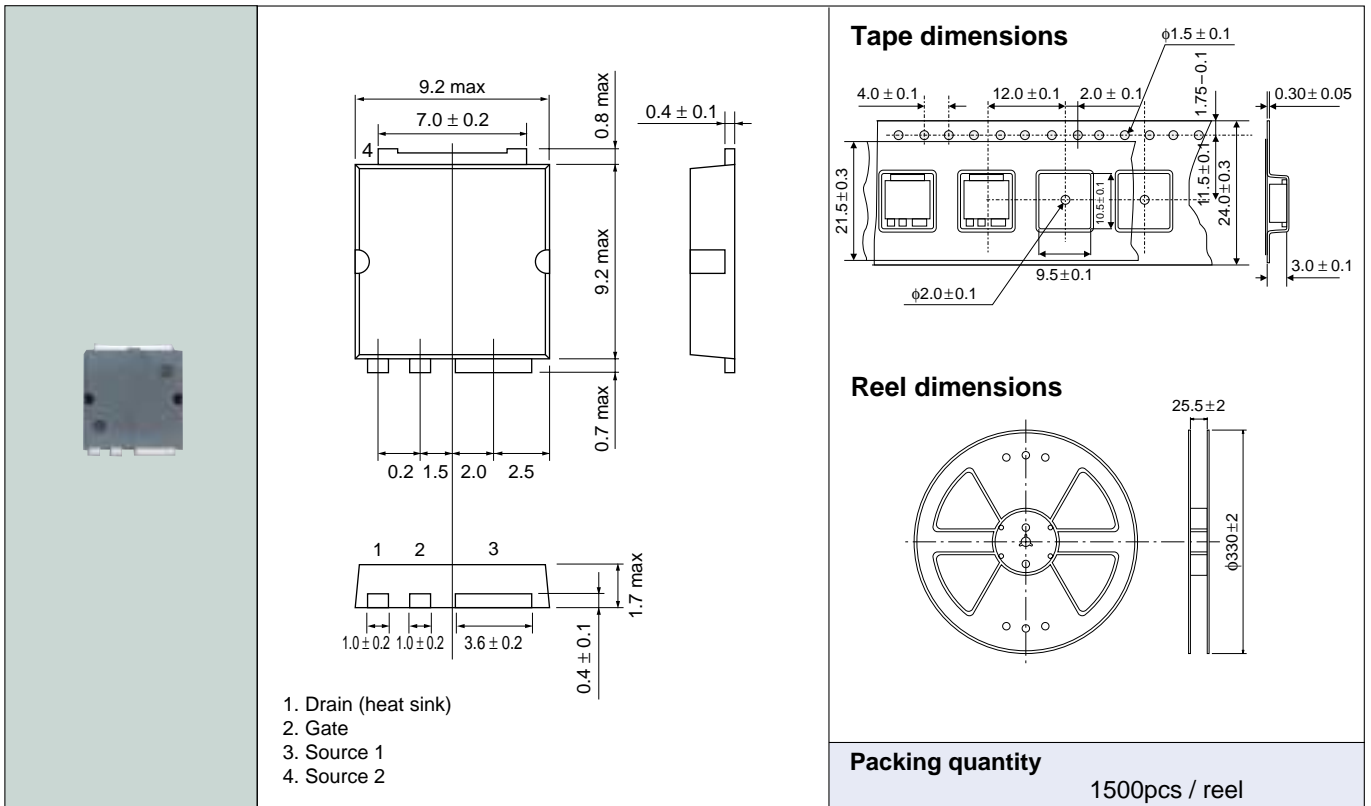
● TFP

Unit: mm



● Slim TFP

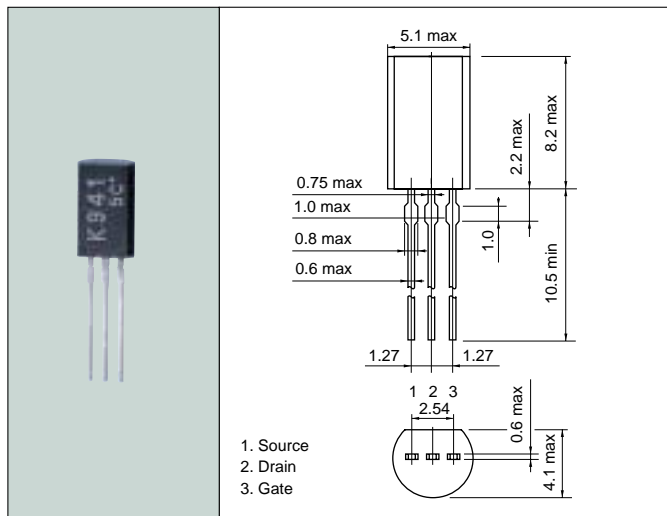
Unit: mm





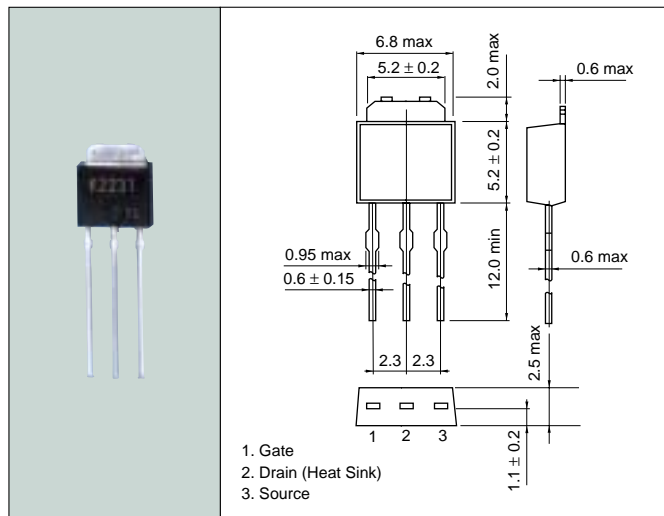
2. Through-Hole Package

● TO92-MOD

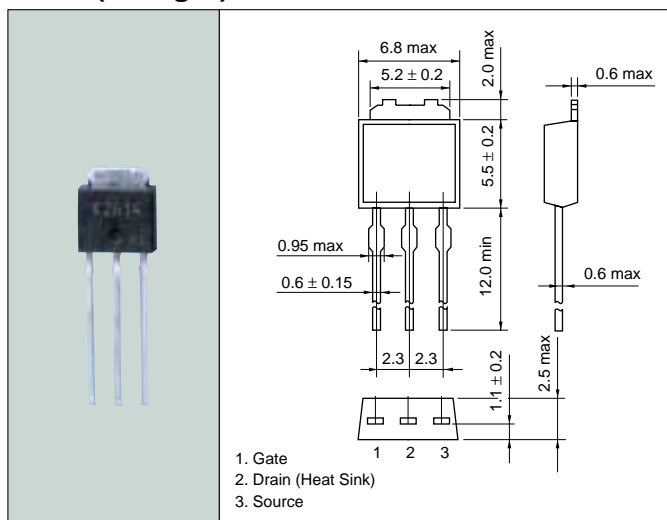


● PW-MOLD (Straight)

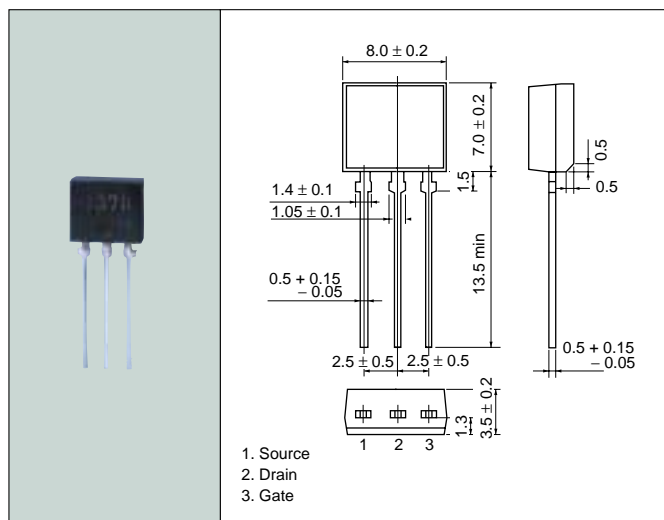
Unit: mm



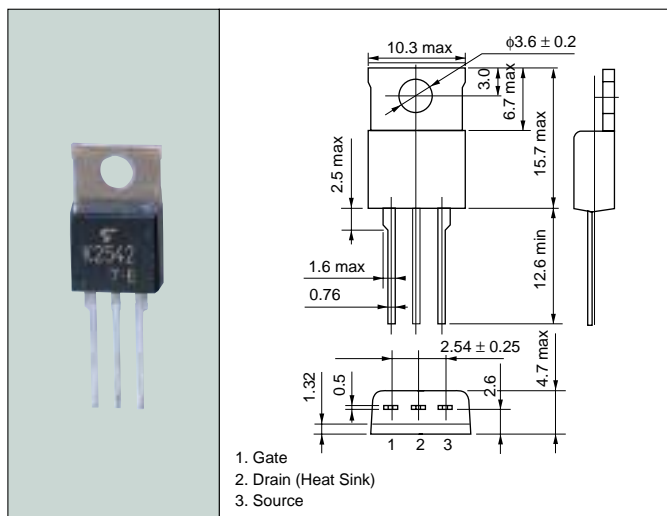
● DP (Straight)



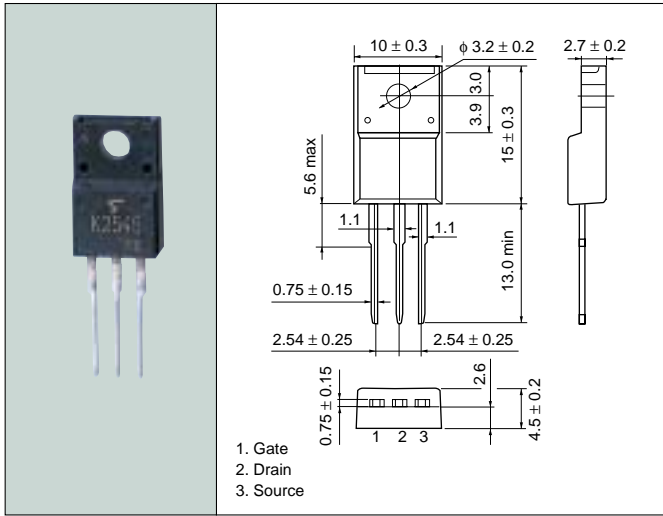
● TPS



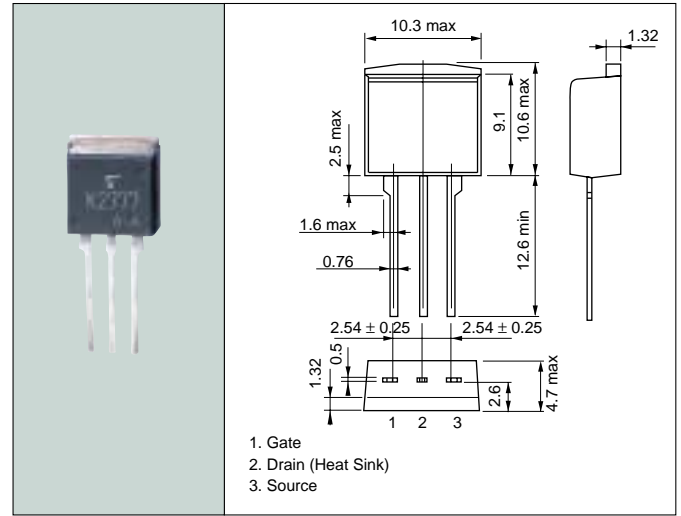
● TO-220AB



● TO-220(NIS)

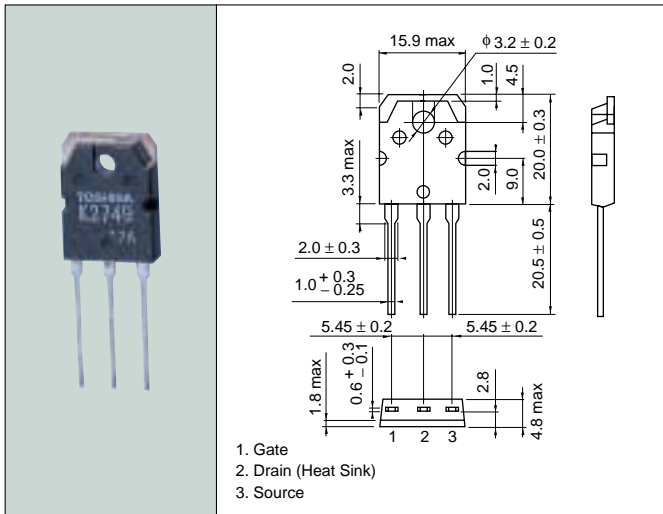


● TO-220FL

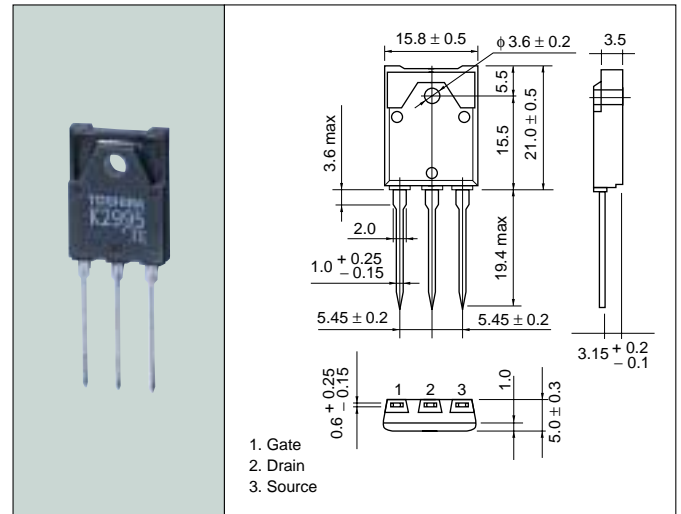


Unit: mm

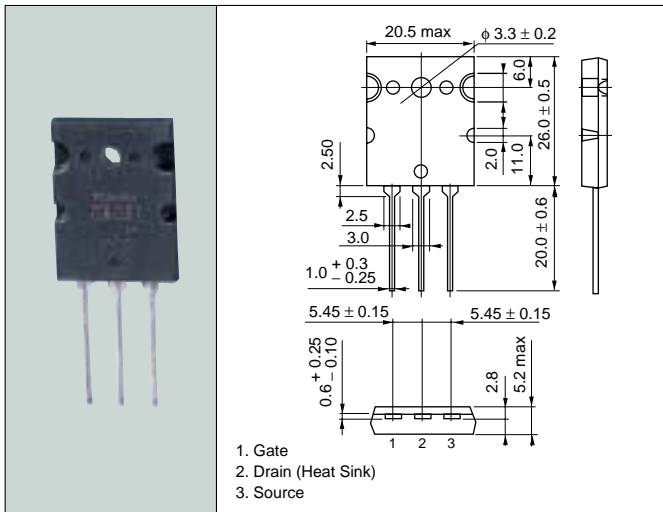
● TO-3P(N)



● TO-3P(N)IS



● TO-3P(L)

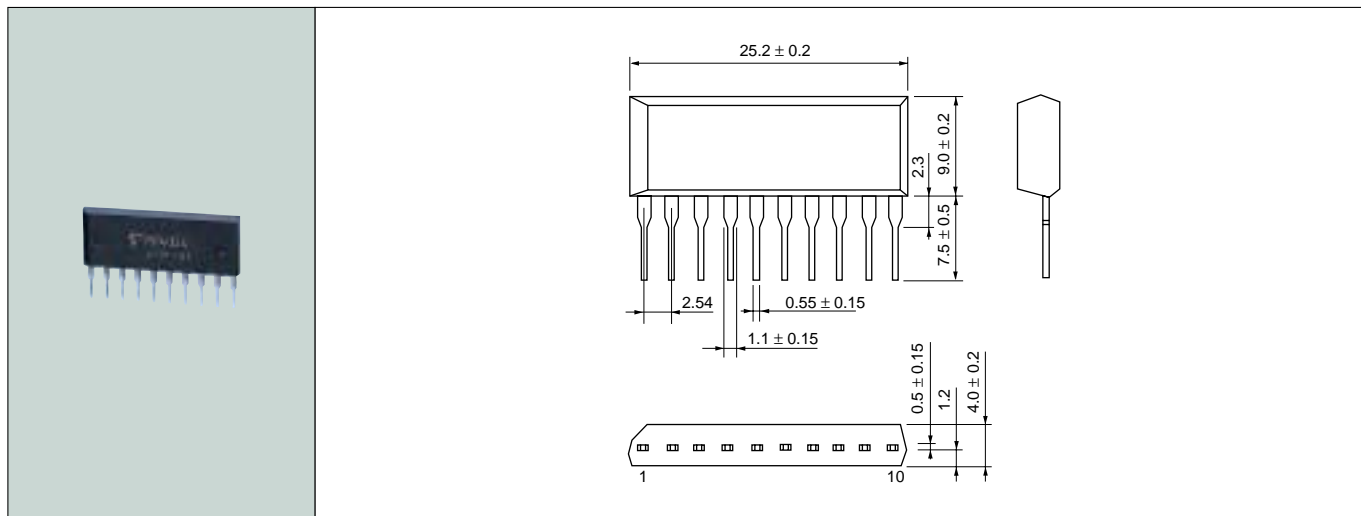




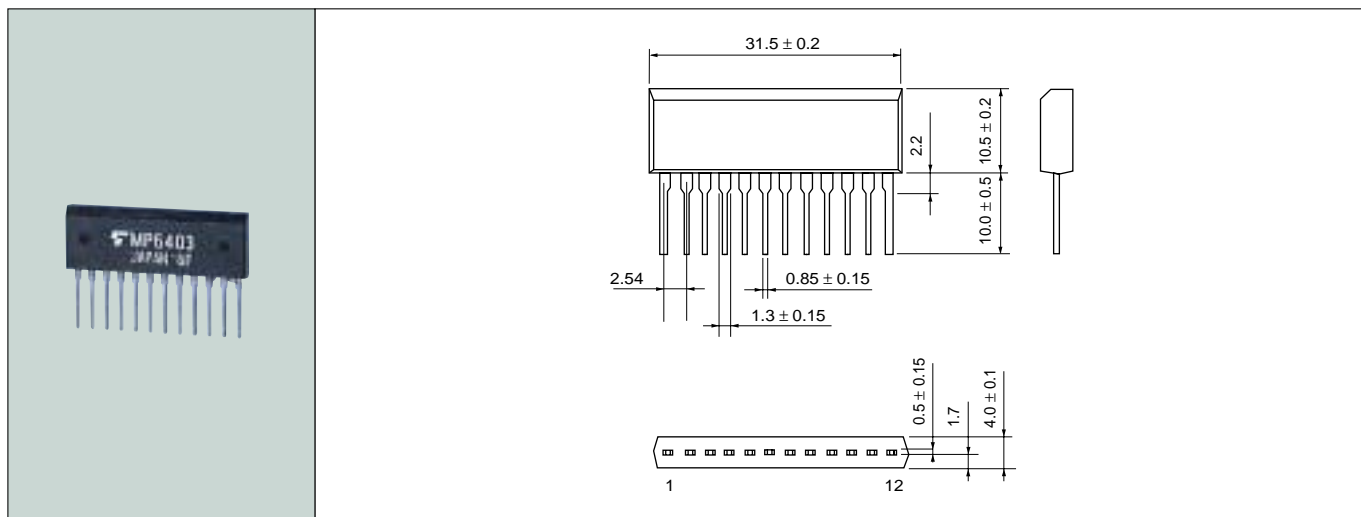
3. Power MOSFET Modules

● S-10M

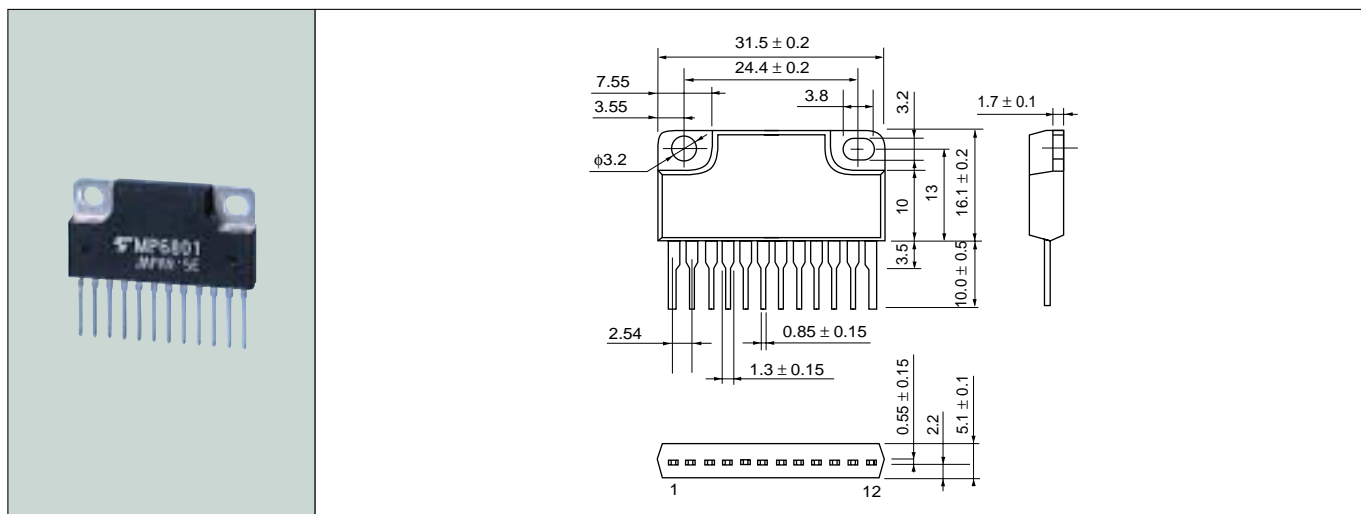
Unit: mm

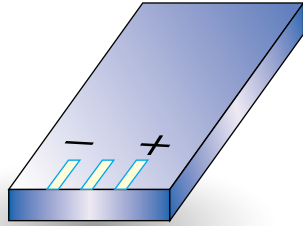


● S-12M



● F-12M





Secondary battery

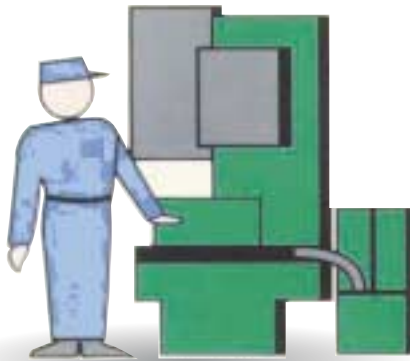


Cellular phones and other portable devices

Portable devices

The MOSFET's low-voltage drive and low power dissipation characteristics allow the construction of equipment which is slim and compact.

Superior performance and a meet needs in various



Switching power supplies

High-speed power switching

Since MOSFETs can operate at high frequencies (200 kHz~500 kHz), they can be used for designing high-precision, high-speed manufacturing equipment.

Notebook computer power supplies



The MOSFET's excellent high-speed characteristics enable the manufacture of products with high levels of efficiency and reliability.

Small, light and slim

Small, light, low power loss



The MOSFET's low-voltage drive and low power dissipation characteristics allow the construction of equipment which is slim and compact.



Fluorescent light inverters

Inverter circuits which incorporate MOSFETs can be used to increase the brightness of lighting systems and reduce flickering.



Bright, high level of efficiency

Automobiles

The MOSFET's low power dissipation allows the construction of highly efficient equipment. In addition, since MOSFETs do not require a heat sink, equipment which incorporates them can be slim and compact.

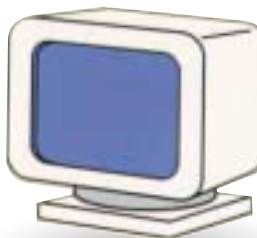


Circuit simplification, miniaturization, high reliability

broad product line combine to application fields.

Other products (monitors, toys)

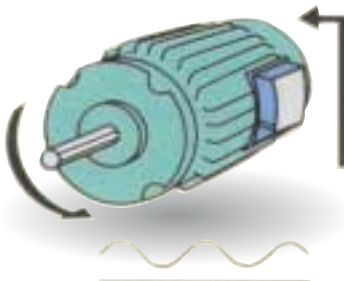
Ultra-high-resolution images



The use of MOSFETs in monitors enables the display of high-definition images.

Motor controls

MOSFETs' excellent high-speed characteristics allow them to be used to regulate motors at audio frequencies (20 kHz~30 kHz). This yields improved regulatory performance and reduced levels of ambient noise.



Reduced noise pollution and improved control performance



Small, highly efficient controls for toys

OVERSEAS SUBSIDIARIES AND AFFILIATES

**Toshiba America
Electronic Components, Inc.**

Headquarters-Irvine, CA
9775 Toledo Way, Irvine, CA 92618, U.S.A.
Tel: (949)455-2000 Fax: (949)859-3963

Boulder, CO (Denver)
3100 Arapahoe #500,
Boulder, CO 80303, U.S.A.
Tel: (303)442-3801 Fax: (303)442-7216

Wellington
PBM 337, #22, 11924 Forest Hill Blvd.,
Wellington, FL 33414, U.S.A.
Tel: (561)733-4949 Fax: (561)753-1489

Deerfield, IL (Chicago)
One Pkwy., North, #500, Deerfield,
IL 60015-2547, U.S.A.
Tel: (847)945-1500 Fax: (847)945-1044

Duluth, GA (Atlanta)
3700 Crestwood Pkwy, #160,
Duluth, GA 30096, U.S.A.
Tel: (770)931-3363 Fax: (770)931-7602

Edison, NJ
2035 Lincoln Hwy, #3000, Edison,
NJ 08817, U.S.A.
Tel: (732)248-8070 Fax: (732)248-8030

Beaverton/Portland, OR
1700 NW 167th Place, #240,
Beaverton, OR 97006, U.S.A.
Tel: (503)629-0818 Fax: (503)629-0827

Raleigh, NC
3120 Highwoods Blvd., #108, Raleigh,
NC 27604, U.S.A.
Tel: (919)859-2800 Fax: (919)859-2898

Richardson, TX (Dallas)
777 East Campbell Rd., #650, Richardson,
TX 75081, U.S.A.
Tel: (972)480-0470 Fax: (972)235-4114

San Jose Engineering Center, CA
1060 Rincon Circle, San Jose, CA 95131, U.S.A.
Tel: (408)526-2400 Fax: (408)526-8910

Wakefield, MA (Boston)
401 Edgewater Place, #360, Wakefield,
MA 01880-6229, U.S.A.
Tel: (781)224-0074 Fax: (781)224-1095

**Toshiba do Brasil, S.A.
Electronics Component Div.**
Estrada dos Alvarengas 5500,
S o Bernardo do Campo, S.P. 09850-550, Brasil
Tel: (011)4358-7144 Fax: (011)4358-7179

Toshiba India Private Ltd.
6F DR. Gopal Das Bhawan 28, Barakhamba Road,
New Delhi, India
Tel: (011)331-8422 Fax: (011)371-4603

**Toshiba Electronics Europe GmbH
Düsseldorf Head Office**

Hansaallee 181, D-40549 D seldorf,
Germany
Tel: (0211)5296-0 Fax: (0211)5296-400

München Office
B ro M nchen Hofmannstrasse 52,
D-81379, M nchen, Germany
Tel: (089)748595-0 Fax: (089)748595-42

Toshiba Electronics France S.A.R.L.
Immeuble Robert Schuman 3 Rue de Rome
F-93561, Rosny-Sous-Bois, C dex, France
Tel: (1)48-12-48-12 Fax: (1)48-94-51-15

Toshiba Electronics Italiana S.R.L.
Centro Direzionale Colleoni,
Palazzo Perseo 3,
I-20041 Agrate Brianza, (Milan), Italy
Tel: (039)68701 Fax: (039)6870205

Toshiba Electronics España, S.A.
Parque Empresarial, San Fernando, Edificio Europa,
1ª Planta, E-28831 Madrid, Spain
Tel: (91)660-6798 Fax: (91)660-6799

Toshiba Electronics (UK) Ltd.
Riverside Way, Camberley Surrey,
GU15 3YA, U.K.
Tel: (01276)69-4600 Fax: (01276)69-4800

Toshiba Electronics Scandinavia A.B.
Gustavslundsv gen 18, 5th Floor,
S-167 15 Bromma, Sweden
Tel: (08)704-0900 Fax: (08)80-8459

**Toshiba Electronics Asia
(Singapore) Pte. Ltd.
Singapore Head Office**
438B Alexandra Road, #06-08/12 Alexandra
Technopark, Singapore 119968
Tel: (6278)5252 Fax: (6271)5155

**Toshiba Electronics Service
(Thailand) Co., Ltd.**
135 Moo 5, Bangkadi Industrial Park, Tivanon Road,
Pathumthani, 12000, Thailand
Tel: (02)501-1635 Fax: (02)501-1638

**Toshiba Electronics Trading
(Malaysia) Sdn. Bhd.
Kuala Lumpur Head Office**
Suite W1203, Wisma Consplant, No.2,
Jalan SS 16/4, Subang Jaya, 47500 Petaling Jaya,
Selangor Darul Ehsan, Malaysia
Tel: (03)5631-6311 Fax: (03)5631-6311

Penang Office
Suite 13-1, 13th Floor, Menara Penang Garden,
42-A, Jalan Sultan Ahmad Shah,
10050 Penang, Malaysia
Tel: (04)226-8523 Fax: (04)226-8515

Toshiba Electronics Philippines, Inc.
26th Floor, Citibank Tower, Valero Street, Makati,
Manila, Philippines
Tel: (02)750-5510 Fax: (02)750-5511

**Toshiba Electronics Asia, Ltd.
Hong Kong Head Office**

Level 11, Tower 2, Grand Century
Place, No.193, Prince Edward Road West,
Mongkok, Kowloon, Hong Kong
Tel: 2375-6111 Fax: 2375-0969

Beijing Office
Room 714, Beijing Fortune Building,
No.5 Dong San Huan Bei-Lu, Chao Yang District,
Beijing, 100004, China
Tel: (010)6590-8796 Fax: (010)6590-8791

Chengdu Office
Suite 403A, Holiday Inn Crown Plaza 31, Zongfu Street,
Chengdu, 610016, Sichuan, China
Tel: (028)8675-1773 Fax: (028)8675-1065

Shenzhen Office
Room 3010-3013, Office Tower Shun Hing Square,
Di Wang Commercial Centre, 5002 ShenNan
East Road, Shenzhen, 518008, China
Tel: (0755)246-3218 Fax: (0755)246-1581

Qingdao Office
Room B707, Full Hope Plaza,
12 Hong Kong Central Road, Qingdao,
Shandong, 266071, China
Tel: (0532)502-8105 Fax: (0532)502-8109

**Toshiba Electronics Korea Corporation
Seoul Head Office**
14F, KEC Building, 275-7 Yangjae-dong,
Seocho-ku, Seoul, 137-739, Korea
Tel: (02)589-4334 Fax: (02)589-4302

Gumi Office
6F, Goodmorning Securities Building,
56 Songjung-dong, Gumi-shi,
Kyeongbuk, 730-090, Korea
Tel: (054)456-7613 Fax: (054)456-7617

Toshiba Electronics (Shanghai) Co., Ltd.
23F, HSBC Tower, 101
Yin Cheng East Road, Pudong New Area, Shanghai,
200120, China
Tel: (021)6841-0666 Fax: (021)6841-5002

**Tsurong Xiamen Xiangyu Trading
Co., Ltd.**
8N, Xiamen SEZ Bonded Goods Market Building,
Xiamen, Fujian, 361006, China
Tel: (0592)562-3798 Fax: (0592)562-3799

**Toshiba Electronics Taiwan
Corporation
Taipei Head Office**
17F, Union Enterprise Plaza Building, 109
Min Sheng East Road, Section 3, Taipei,
105, Taiwan
Tel: (02)2514-9988 Fax: (02)2514-7892

Kaohsiung Office
16F-A, Chung-Cheng Building, 2, Chung-Cheng 3Road,
Kaohsiung, 800, Taiwan
Tel: (07)237-0826 Fax: (07)236-0046

(As of March 18, 2003)

The information contained herein is subject to change without notice. 021023_D

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others. 021023_C

TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the Handling Guide for Semiconductor Devices, or TOSHIBA Semiconductor Reliability Handbook etc. 021023_A

The Toshiba products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Toshiba products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (Unintended Usage). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc. Unintended Usage of Toshiba products listed in this document shall be made at the customer's own risk. 021023_B

TOSHIBA

**TOSHIBA CORPORATION
Semiconductor Company**

Website: <http://www.semicon.toshiba.co.jp/eng>