
PRODUCT GUIDE

Power MOSFETs



s e m i c o n d u c t o r

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

POWER MOSFETs

Toshiba's power MOSFET devices meet the needs of a wide range of ultra-high-density applications.

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1

Features and Structure

Power MOSFETs

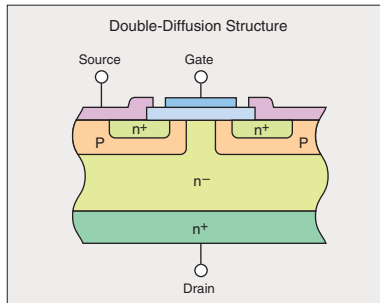
All Power MOSFETs have the following features:

- 1) No carrier storage effect; superior frequency and switching characteristics
- 2) Ruggedness, no current concentration
- 3) Voltage-controlled device, hence low drive power
- 4) Easy parallel connection

■ Toshiba Power MOSFETs have the following additional features:

- 1) Guaranteed avalanche capability..... No absorber circuit required
- 2) Improved functioning of built-in diodes... Greatly expanded circuit design possibilities
- 3) High ruggedness Better margin for circuit design
- 4) High-speed switching Higher speed in end products operation
- 5) Low $R_{(DS)ON}$ Reduced end products power consumption
- 6) Downsized packages Slimmer, more compact end products
- 7) Low drive loss..... Reduced end product's power

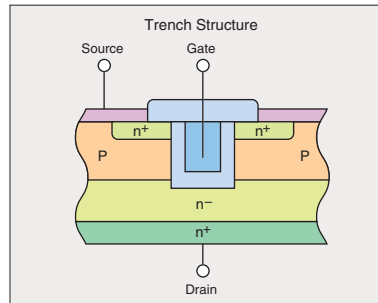
■ Structure of Toshiba Power MOSFETs



● π -MOS

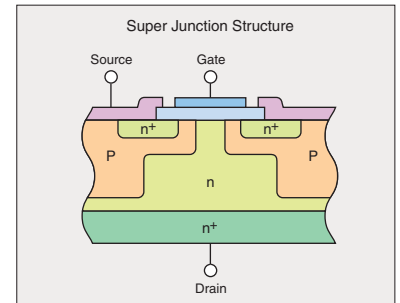
Toshiba Power MOSFETs use a double-diffusion MOS (D-MOS) structure, which produces high-withstand voltage, to form channels. This structure is especially well suited to high-withstand voltage and high-current devices.

A high level of integration yields a high-performance power MOSFET with low ON-resistance and low power loss.



● U-MOS

Higher channel density is achieved by connecting channels vertically to form a U-groove at the gate region, a structure that yields a lower ON-resistance than other MOSFET structures.



● DTMOS

The super junction structure, which has P-type pillar layers as shown above, realizes high withstand voltage and ON-resistance lower than the theoretical limit of silicon.

New Power MOSFET Products

VS and PS Series ($V_{DSS} = 12\text{ V to }40\text{ V}$)

Very compact and thin, the VS and PS Series products are suitable for use in various electronic devices.

■ Applications

- Cell phones
- Notebook PCs
- Portable electronic devices

STP Series ($V_{DSS} = 20\text{ V to }30\text{ V}$)

The STP Series is housed in an ultra-small and thin package and is suitable for use in lithium-ion secondary battery protection circuits in various portable electronic devices.

■ Applications

- Lithium-ion secondary battery protection circuits

SOP Series ($V_{DSS} = 20\text{ V to }60\text{ V}$)

The SOP Series products are compact and thin, and require only a small mounting area. They are suitable for lithium-ion secondary battery protection and for notebook PCs.

■ Applications

- Lithium-ion secondary battery protection circuits
- Notebook PCs
- Portable electronic devices
- DC-DC converters

TO-220SM(W) Series ($V_{DSS} = 40\text{ V to }150\text{ V}$)

The TO-220SM package, which uses Cu connectors and a wide source terminal, realizes low ON-resistance and a high current carrying capability.

■ Applications

- Motor drivers
- Switching power supplies

U-MOSIII Series ($V_{DSS} = 40\text{ V to }100\text{ V}$)

High-integration is achieved using a trench structure technique. Low-voltage driving ($V_{GS} = 4\text{ V}$) is possible due to ultra-low ON-resistance.

■ Applications

- Motor drivers
- Solenoids and lamp drivers

U-MOS Series for Synchronous Rectification ($V_{DSS} = 60\text{ V to }150\text{ V}$)

Fabricated using a trench technology, the U-MOS Series is ideal for synchronous rectification on the secondary side of power supply circuits.

■ Applications

- Switching power supplies
- AC adapters
- Motor drivers

New π -MOSVII Series ($V_{DSS} = 500\text{ V to }600\text{ V}$)

The latest addition to the π -MOS portfolio, the π -MOSVII Series offers reduced capacitances due to optimized chip design and is available with a greatly wider range of electrical characteristics.

■ Applications

- Switching power supplies
- AC adapters

Super-Junction DTMOS Series ($V_{DSS} = 600\text{ V}$)

Achieves low ON-resistance and low gate charge (Qg) due to the use of the latest super junction structure.

■ Applications

- Switching power supplies
- AC adapters
- Motor drivers

High-Speed π -MOS Series ($V_{DSS} = 450\text{ V to }600\text{ V}$)

The new High-Speed π -MOSV Series achieves higher switching speed than the π -MOSV Series, which is currently well established in the market. Two series are available: high-speed switching series and high-speed diode series.

■ Applications

- Inverters
- AC adapters
- Motor drivers
- Switching power supplies

Part Numbering Scheme

■ Multi-Pin Series

TPCM8 0 01 -H

H: High-speed type
None: Low ON-resistance type

Serial number of the products

0: N-channel single
1: P-channel single
2: N-channel dual
3: P-channel dual
4: N-channel and P-channel dual
A: N-channel and SBD
B: P-channel and SBD
J: P-channel and NPN

TPC6: VS-6 Series
TPCF8: VS-8 Series
TPCP8: PS-8 Series
TPCS8: TSSOP-8 Series
TPCM8: TSSOP Advance Series
TPC8: SOP-8 Series
TPCA8: SOP Advance Series
TPCT4: STP Series

■ New Series

TK 55 A 10 J 1

Additional information

1: Low-capacitance type
3: Low ON-resistance type
5: Fast body diode type

Series

C: π -MOSVI K: U-MOSIV
D: π -MOSVII T: DTMOSI
J: U-MOSIII U: DTMOSII

Voltage: 10% of the V_{DSS}

Package

A: TO-220SIS J: TO-3P(N)
D: TO-220(W) N: PW-Mold(SMD)
F: TO-220SM(W) X: TFP

Current

TK: N-channel
TJ: P-channel

■ Conventional Series

2SK****

N-channel MOS

2SJ****

P-channel MOS

V _{DSS} (V) I _D (A)	12	16	20	30	40	50	60	100	150	180	200	250	400	450	500	600	700	800	900	1000	V _{DSS} (V) I _D (A)	
0.5															▲ 2SK2998 (20)② ☆ 2SK3302 (18)② ◇ 2SK3471 (18)②						0.5	
1							◇ 2SJ360 (0.73)④ ▲ 2SJ507 (0.7)⑤	◇ 2SK2963 (0.7)④ ▲ 2SK2962 (0.7)④ ◇ 2SJ508 (1.9)④ ▲ 2SJ509 (1.9)④	▲ 2SK3670 (1.7)	◆ 2SJ313 (5.0) ▼ 2SJ338 (5.0) ◆ 2SK2013 (5.0) ▼ 2SK2162 (5.0)	◇ 2SK2992 (3.5)②		▼ 2SK3498 (5.5)②	▢ 2SK4023 (4.6)② ☆ 2SK3374 (4.6)② ▼ 2SK3472 (4.6)②		▢ 2SK3371 (9)② ▢ 2SK4026 (9)②				■ 2SK2733 (9.0)① ▼ 2SK2845 (9)① ▼ 2SK3301 (20)③	1	
1.3																					1.3	
1.7																					1.7	
1.8																					1.8	
1.9																					1.9	
2							◇ 2SK2615 (0.3)③ ▲ 2SK2961 (0.3)③ ▲ 2SK3658 (0.3)③							▼ 2SJ610 (2.55)②	⊗ 2SK3757 (2.45)③ ⊗ 2SK3766 (2.45)③	☆ 2SK2599 (3.2)② ▢ 2SK3373 (3.2)②	☆ 2SK2846 (5.0)② ▢ 2SK2865 (5.0)② ⊗ 2SK3767 (4.5)③ ▢ 2SK4002 (5)②					2
2.1																					2.1	
2.2																					2.2	
2.5																					2.5	
2.7																					2.7	
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8.5																					8.5	
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10																					10	

Legend **Product series** ①: π-MOSIII ②: π-MOSV ③: π-MOSVI ④: L²-π-MOSV ⑤: L²-π-MOSVI ⑥: U-MOS ⑦: π-MOSVII ⑧: π-MOSIV ⑨: DTMOI ⑩: DTMOII

Package ◇PW-Mini ▽VS-8 ♥VS-6 ♣PS-8 □STP ▲TO-92MOD ▼PW-Mold ▽New PW-Mold ▽New PW-Mold2 ▽DP ☆TPS ◀TSSOP Advance ✕TSSOP-8 ★SOP-8

⊙SOP-8 Lead Clamp ▶SOP Advance ◆TO-220NIS ⊗TO-220SIS ■TO-220AB □TO-220(W) ♣TFP ○TO-220FL/SM ◆TO-220SM(W) □TO-3P(N) ○TO-3P(N)IS ●TO-3P(L)

Notes: () = R_{DS(on)} max \$ = 10-V drive # = 2.5-V drive * = 1.8-V drive ¥ = High-speed diode N = N-ch P = P-ch CN = Complementary N-ch PS = P-ch + SBD CP = Complementary P-ch NS = N-ch + SBD PD = P-ch + Driver (load switch) [] = Under development

V _{oss} (V) I _D (A)	20	30	40	50	60	75	100	150	180	200	250	300	400	450	500	600	700	900/1000	V _{oss} (V) I _D (A)		
11		N★TPC8025 (0.009)Ⓢ N★TPC8021-H (0.017)Ⓢ N★TPC8014 (0.014)Ⓢ P★TPC8111 (0.012)Ⓢ P★TPC8113 (0.01)Ⓢ P★TPC8105 (0.0135)Ⓢ P★TPC8104 (0.012)Ⓢ N★TPC8030 (0.0095) N★TPC8031-H (0.0133)Ⓢ N★TPC8005-H (0.0133)Ⓢ P★TPC8121 (0.012)Ⓢ								◆2SK2965 (0.26)Ⓢ										11	
12		N○TPC8037-H (0.0114)Ⓢ N○TPC8038-H (0.0114)Ⓢ					◆2SJ380 (0.21)Ⓢ			●2SJ201 (0.625) ●2SK1530 (0.625)					○2SK3068 (0.52)Ⓢ ◆2SK3398 (0.52)Ⓢ ⊗TK12A50D (0.52)Ⓢ ▼◆2SK3313 (0.62)Ⓢ	□2SK2699 (0.65)Ⓢ ⊗TK12A60U (0.4)Ⓢ ⊗TK12D60U (0.4)Ⓢ □TK12J60U (0.4)Ⓢ			1000V: ●2SK1489 (1.0)	12	
13		N★TPC8041 (0.007)Ⓢ N★TPC8026 (0.0066)Ⓢ P★TPC8107 (0.007)Ⓢ P○TPC8112 (0.006)Ⓢ P○TPC8118 (0.007)									◆2SK2508 (0.25)Ⓢ ○2SK2598 (0.25)Ⓢ			◆2SK3743 (0.4)Ⓢ ○2SK3403 (0.4)Ⓢ ◆2SK3544 (0.4)Ⓢ	⊗2SK4012 (0.4)Ⓢ ⊗TK13A60D (0.43)Ⓢ ▼⊗2SK4016 (0.5)Ⓢ			900V: □2SK4207 (0.95)		13	
14					◆2SJ304 (0.12) ○2SJ312 (0.12)										○2SK2916 (0.4)Ⓢ	□2SK3903 (0.44)Ⓢ				14	
15		N○TPC8032-H (0.0065)Ⓢ								◆2SK2382 (0.18)Ⓢ ○2SK2401 (0.18)Ⓢ					⊗TK15A50D (0.3)Ⓢ □2SK4107 (0.4)Ⓢ ▼□2SK3314 (0.49)Ⓢ	⊗2SK2953 (0.4)Ⓢ ⊗TK15A60U (0.3)Ⓢ ⊗TK15D60U (0.3)Ⓢ □TK15J60U (0.3)Ⓢ □2SK2915 (0.4)Ⓢ				15	
16		NS★TPC8A02-H (0.0056)Ⓢ					○2SJ412 (0.21)Ⓢ ◆2SJ619 (0.21)Ⓢ														16
17		N○TPC8033-H (0.0053)Ⓢ NS○TPC8A03-H (0.0056)Ⓢ N○TPC8039-H (0.0059)Ⓢ													⊗2SK3935 (0.25)Ⓢ	□2SK3905 (0.31)Ⓢ					17
18		P○TPC8114 (0.0045)Ⓢ N★TPC8027 (0.0027)Ⓢ N★TPC8028 (0.0043)Ⓢ N★TPC8029 (0.0038)Ⓢ N○TPC8034-H (0.0035)Ⓢ N★TPC8042 (0.0034)Ⓢ P○TPC8117 (0.0039)Ⓢ N○TPC8036-H (0.0042)Ⓢ NS○TPC8A04-H (0.0036)Ⓢ					◆2SJ464 (0.12)Ⓢ ◆2SJ620 (0.09)Ⓢ ▶TPC8006-H (0.067)	◆2SK2882 (0.12)Ⓢ ◆2SK3387 (0.12)Ⓢ								○2SK2917 (0.27)Ⓢ					18
19															□2SK3904 (0.26)Ⓢ					19	
20				▽2SK2614 (0.046)Ⓢ	◆2SJ349 (0.045)Ⓢ ○2SJ401 (0.045)Ⓢ ▽2SK2782 (0.055)Ⓢ		◆2SK2391 (0.085)Ⓢ				○2SK2993 (0.105)Ⓢ ◆2SK3445 (0.105)Ⓢ ◆2SK3994 (0.105)Ⓢ					□2SK4108 (0.27)Ⓢ	□2SK3911 (0.32)Ⓢ ⊗TK20A60U (0.19)Ⓢ ⊗TK20D60U (0.19)Ⓢ □TK20J60U (0.19)Ⓢ ▼□2SK3906 (0.33)Ⓢ				20
21		N◀TPC8007-H (0.0129)Ⓢ																			21
22									▶TPC8022-H (0.026)Ⓢ												22
23																□2SK3907 (0.23)Ⓢ ▼□2SK3936 (0.25)Ⓢ				23	
24		N◀TPC8004-H (0.011)Ⓢ N▶TPC8030-H (0.011)Ⓢ N▶TPC8031-H (0.011)Ⓢ																			24
25		P◀TPC8102 (0.0077)Ⓢ N◀TPC8006 (0.007)Ⓢ		◆2SK2507 (0.046)Ⓢ	◆2SK2232 (0.046)Ⓢ ○2SK2311 (0.046)Ⓢ N▶TPC8016-H (0.021)Ⓢ					◆2SK3444 (0.082)Ⓢ ○2SK3625 (0.082)Ⓢ					●2SK1544 (0.2)						25
26			◆2SK3846 (0.016)Ⓢ																		26
27							■2SK2314 (0.085)Ⓢ ○2SK2789 (0.085)Ⓢ														27
30		N▶TPC8018-H (0.0062)Ⓢ N◀TPC8002-H (0.0062)Ⓢ	N▶TPC8014-H (0.009)Ⓢ N▶TPC8027-H (0.010)Ⓢ		◆2SJ334 (0.038)Ⓢ ○2SJ402 (0.038)Ⓢ ⊗TK30A06J3A (0.026)Ⓢ			◆2SK3443 (0.055)Ⓢ		□2SK3176 (0.052)Ⓢ	□2SK2967 (0.068)Ⓢ ⊗2SK2995 (0.068)Ⓢ										30
32			○2SK3847 (0.016)Ⓢ												●2SK1486 (0.095)						32
34		NS▶TPC8A02-H (0.0053)Ⓢ N▶TPC8039-H (0.0055)Ⓢ																			34
35		N▶TPC8012-H (0.0049)Ⓢ N▶TPC8024 (0.0043)Ⓢ	N▶TPC8015-H (0.0054)Ⓢ		◆2SK3662 (0.0125)Ⓢ																35
36					◆2SK2385 (0.03)Ⓢ																36
38		N▶TPC8036-H (0.0038)Ⓢ																			38
40	N▶TPC8011-H (0.0035)Ⓢ	P▶TPC8102 (0.006)Ⓢ P▶TPC8103 (0.0042)Ⓢ P▶TPC8106 (0.0037)Ⓢ N▶TPC8012-H (0.0045)Ⓢ N▶TPC8025 (0.0036)Ⓢ	P▶TPC8108 (0.0095)Ⓢ		P▶TPC8104 (0.016)Ⓢ		⊗TK40D10J1 (0.015)Ⓢ ⊗TK40A10J1 (0.015)Ⓢ												□TK40J60T (0.08)Ⓢ		40
42		NS▶TPC8A04-H (0.0032)Ⓢ																			42
45		□2SK3506 (0.02) N▶TPC8019-H (0.0031)Ⓢ N▶TPC8026 (0.0022)Ⓢ N▶TPC8042 (0.0033)Ⓢ		□2SK2550 (0.03)Ⓢ ◆2SK2886 (0.02)Ⓢ □2SK2744 (0.02)Ⓢ □2SK3051 (0.03)Ⓢ	□2SK2233 (0.03)Ⓢ ○2SK2266 (0.03)Ⓢ ○2SK2376 (0.017)Ⓢ □2SK2398 (0.03)Ⓢ ◆2SK3844 (0.0058)Ⓢ																45
50		N▶TPC8028-H (0.0028)Ⓢ		□2SK2551 (0.011)Ⓢ □2SK2745 (0.0095)Ⓢ	□2SK2173 (0.017)Ⓢ □2SK2445 (0.018)Ⓢ		□2SK1381 (0.032)	◆TK50X15J1 (0.03)Ⓢ ◆TK50F15J1 (0.03)Ⓢ							●2SK3132 (0.09)Ⓢ ▼●2SK3131 (0.11)Ⓢ					50	
55																					55
60				□2SK3129 (0.007)Ⓢ	●2SK2267 (0.011)Ⓢ □2SK2313 (0.011)Ⓢ	⊗TK60D08J1 (0.0078)Ⓢ ⊗TK60A08J1 (0.0078)Ⓢ	●2SK1382 (0.020)														60
70			□TK70J04J3 (0.0038)Ⓢ		□2SK3845 (0.0058)Ⓢ ⊗TK70D06J1 (0.0064)Ⓢ ⊗TK70A06J1 (0.0064)Ⓢ ⊗TJ70A06J3 (0.008)Ⓢ																70
75			◆2SK3843 (0.0035)Ⓢ		◆2SK4034 (0.0058)Ⓢ ◆2SK3842 (0.0058)Ⓢ																75
80																					80
100																					100
120																					120
130																					130
150																					150

Legend Product series ①: π-MOSIII ②: π-MOSV ③: π-MOSVI ④: L²-π-MOSV ⑤: L²-π-MOSVI ⑥: U-MOS ⑦: π-MOSVII ⑧: π-MOSIV ⑨: DTMOI ⑩: DTMOII Package ◊PW-Mini ▶VS-8 ♥VS-6 ♣PS-8 ○STP ▲TO-92MOD ▼PW-Mold ↘New PW-Mold ↗New PW-Mold2 ▽DP ☆TPS ◀TSSOP Advance ✕TSSOP-8 ★SOP-8 ◊SOP-8 Lead Clamp ▶SOP Advance ◆TO-220NIS ⊗TO-220SIS ■TO-220AB ⊞TO-220(W) ♣TFP ○TO-220FL/SM ◆TO-220SM(W) □TO-3P(N) ○TO-3P(N)IS ●TO-3P(L) Notes: () = R_{oss} max \$ = 10-V drive # = 2.5-V drive * = 1.8-V drive ¥ = High-speed diode P = P-ch CN = Complementary N-ch NS = N-ch + SBD PD = P-ch + Driver (load switch) CP = Complementary P-ch [] = Under development

1. Compact Package TPC Series

VS-6 Series ... [Part Number: TPC6xxx]

■ Features

- Ultra-low ON-resistance achieved by employing the U-MOSIII process
- Zener diode between gate and source for all products
- Thin package, with a height as low as 0.85 mm (max) when mounted on a board

■ Product List

Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)					Q _g Typ. (nC)	C _{iss} Typ. (pF)	Marking	Series
	V _{DSS} (V)	I _D (A)		10 V	4.5 V	2.5 V	2.0 V	1.8 V				
TPC6004	20	6	N-ch Single	—	24	32	37	—	17	1400	S2C	U-MOSIII
TPC6003	30	6		24	32	—	—	—	25	1250	S2D	U-MOSIII
TPC6005	30	6		—	28	35	41	—	19	1420	S2E	U-MOSIII
TPC6007-H	30	5		54	79	—	—	—	2.8	240	S2G	U-MOSIII-H
TPC6006-H	40	3.9		75	100	—	—	—	2.4	251	S2F	U-MOSIII-H
TPC6103	-12	-5.5	P-ch Single	—	35	55	—	90	20	1520	S3C	U-MOSIII
TPC6105	-20	-2.7		—	110	160	—	300	6	470	S3E	U-MOSIII
TPC6107	-20	-4.5		—	55	100	180	—	9.8	680	S3G	U-MOSIV
TPC6104	-20	-5.5		—	40	60	—	120	19	1430	S3D	U-MOSIII
TPC6108	-30	-4.5		60	100	—	—	—	13	570	S3H	U-MOSIV
TPC6109-H	-30	-5		59	83	—	—	—	7.2	471	S3J	U-MOSIII-H



VS-8 Series ... [Part Number: TPC8Fxxx]

■ Features

- Ultra-low ON-resistance achieved by employing the U-MOSIII/IV process
- Zener diode between gate and source for all products
- Thin package, with a height as low as 0.85 mm (max) when mounted on a board
- 32% mounting area reduction compared with the VS-6 (TSOP-6) Series, employing a flat package with high cell density
- P_D = 2.5 W @ t = 5 s when the device is mounted on a glass epoxy board

■ Product List

Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)					Q _g Typ. (nC)	C _{iss} Typ. (pF)	Marking	Series
	V _{DSS} (V)	I _D (A)		10 V	4.5 V	2.5 V	2.0 V	1.8 V				
TPCF8001	30	7	N-ch Single	23	31	—	—	—	25.4	1270	F2A	U-MOSIII
TPCF8101	-12	-6	P-ch Single	—	28	40	—	85	18	1600	F3A	U-MOSIII
TPCF8103	-20	-2.7		—	110	160	—	300	6	470	F3C	U-MOSIII
TPCF8102	-20	-6		—	30	41	—	90	19	1550	F3B	U-MOSIII
TPCF8104	-30	-6	N-ch Dual	28	38	—	—	—	34	1760	F3D	U-MOSIV
TPCF8201	20	3		—	49	66	100	—	7.5	590	F4A	U-MOSIII
TPCF8301	-20	-2.7	P-ch Dual	—	110	160	—	300	6	470	F5A	U-MOSIII
TPCF8302	-20	-3		—	59	95	200	—	11	800	F5B	U-MOSIV
TPCF8303	-20	-3		—	58	87	—	250	11	860	F5C	U-MOSIV
TPCF8304	-30	-3.2		72	105	—	—	—	14	600	F5D	U-MOSIV
TPCF8402	30	4	N-ch + P-ch	48	77	—	—	—	10	470	F6B	U-MOSIII
TPCF8A01	-30	-3.2		72	105	—	—	—	14	600	F6A	U-MOSIV
TPCF8A01	20	3.0	N-ch + SBD	—	49	66	100	—	7.5	590	F7A	U-MOSIII
TPCF8B01	-20	-2.7	P-ch + SBD	—	110	160	—	300	6	470	F8A	U-MOSIII



PS-8 Series ... [Part Number: TPCP8xxx]

■ Features

- Mounting area the same as the VS-6 (TSOP-6) Series
- Using flat leads and the latest U-MOS process (U-MOSIV), the PS-8 Series offers a 70% R_{DS(ON)} reduction compared with the VS-6 Series.
- Zener diode between gate and source for all products

■ Product List

Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)				Series
	V _{DSS} (V)	I _D (A)		10 V	4.5 V	2.5 V	1.8 V	
TPCP8002	20	9.1	N-ch Single	—	10	13.7	—	U-MOSIV
TPCP8006	20	9.1		—	10	13.7	—	U-MOSIV
TPCP8001-H	30	7.2		16	25	—	—	U-MOSIII-H
TPCP8004	30	8.3		8.5	14.5	—	—	U-MOSIV
TPCP8005-H	30	11		12.9	15.7	—	—	U-MOSV-H
TPCP8003-H	100	2.2	180	190	—	—	U-MOSIII-H	
TPCP8101	-20	-5.6	P-ch Single	—	30	41	90	U-MOSIII
TPCP8102	-20	-7.2		—	18	30	—	U-MOSIV
TPCP8103-H	-40	-4.8		40	54	—	—	U-MOSIII-H
TPCP8201	30	4.2	N-ch Dual	50	77	—	—	U-MOSIII
TPCP8202	30	5.5		—	23	39	—	U-MOSIV
TPCP8203	40	4.7		40	60	—	—	U-MOSIII
TPCP8301	-20	-5	P-ch Dual	—	31	60	—	U-MOSIV
TPCP8302	-20	-5		—	33*	45	95	U-MOSIV
TPCP8401	20	0.1	N-ch / P-ch Load Switch	—	32.	42	—	π-MOSVI
TPCP8402	-12	-5.5	N-ch + P-ch	—	38	58	103	U-MOSIII
	30	4.2		50	77	—	—	U-MOSIII
TPCP8403	-30	-3.4	N-ch + P-ch	72	105	—	—	U-MOSIV
	40	4.7		40	60	—	—	U-MOSIII
TPCP8J01	-40	-3.4	P-ch + NPN	70	105	—	—	U-MOSIII
	-32	-5.5		35	49*	—	—	U-MOSIV
	50	0.1		—	—	—	—	U-MOSIII

*: V_{GS} = 4 V



STP Series ... [Part Number: TPCTxxx]

Feature of the STP2

- 80% reduction in area ratio compared with the previous STP package contributes to further size reduction of end-products.
- A new chip design using Toshiba U-MOSIV process technology is housed in a pump structured new package. This realizes a small and thin package while offering low ON-resistance.



Product List

Part Number	Package	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)			Q _g Typ. (nC)	C _{iss} Typ. (pF)	Series
		V _{DSS} (V)	I _S (A)		2.5 V	4 V	4.5 V			
TPCT4201	STP	20	6	N-ch Dual	49	32	31	21	1740	U-MOSIII
TPCT4202	STP	30	6		52	39	38	21	1540	U-MOSIII
TPCT4203	STP2	20	6		49	32	31	11	790	U-MOSIV
TPCT4204	STP2	30	6		52	39	38	12	780	U-MOSIV

TSSOP Advance Series ... [Part Number: TPCM8xxx]

Product List

Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)		Q _g Typ. (nC)	C _{iss} Typ. (pF)	Series
	V _{DSS} (V)	I _D (A)		10 V	4.5 V			
TPCM8001-H	30	20	N-ch Single	9.5	14	19	1130	U-MOSIII-H
TPCM8003-H	30	21		12.9	15.7	11	1433	U-MOSV-H
TPCM8004-H	30	24		11	13.4	11	1433	U-MOSV-H
TPCM8006	30	25		7.0	13.5	26	1270	U-MOSIV
TPCM8002-H	30	30	P-ch Single	6.2	8.2	18	2270	U-MOSV-H
TPCM8102	-30	-25		7.7	16*	60	2450	U-MOSV

*: 4 V



TSSOP-8 Series ... [Part Number: TPCS8xxx]

Features

- The TSSOP-8 achieves a 17 mΩ of R_{DS(ON)} for the TPCS8204 by adopting the U-MOSIII design.
- Common-drain types are available:
Ideal for use in lithium-ion battery protections and reverse current prevention circuits

Product List

Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)				Q _g Typ. (nC)	C _{iss} Typ. (pF)	Series
	V _{DSS} (V)	I _D (A)		10 V	4 V	2.5 V	2.0 V			
TPCS8004	200	1.3	N-ch Single	800	—	—	—	12	380	π-MOSV
TPCS8009-H	150	2.1		350	—	—	—	10	600	π-MOSV MACHII
TPCS8007-H	200	1.9		450	—	—	—	10	600	π-MOSV MACHII
TPCS8008-H	250	1.7		580	—	—	—	10	600	π-MOSV MACHII
TPCS8104	-30	-11	P-ch Single	12	18	—	—	107	5710	U-MOSIV
TPCS8105	-30	-11		13.5	19.5	—	—	107	5710	U-MOSIV
TPCS8209	20	5	N-ch Dual	—	30	40	60	15	1280	U-MOSIII
TPCS8210 #	20	5		—	30	40	60	15	1280	U-MOSIII
TPCS8204	20	6		—	17	22	35	22	2160	U-MOSIII
TPCS8208 #	20	6		—	17	22	35	22	2160	U-MOSIII
TPCS8211	20	6		—	24	29	45	20	1590	U-MOSIII
TPCS8212 #	20	6		—	24	29	45	20	1590	U-MOSIII
TPCS8213	20	6		—	13	18	—	49	3140	U-MOSIII
TPCS8214	30	6		—	13.5	18.5	—	42	3240	U-MOSIII
TPCS8302	-20	-6	P-ch Dual	—	35*	60	95	28.5	1590	U-MOSIII
TPCS8303	-20	-5		—	21*	30	80	33	2560	U-MOSIV

#: Common drain *: V_{GS} = 4.5 V

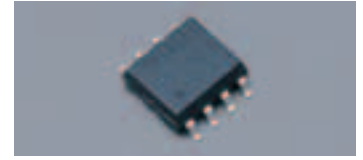


SOP-8 Series ... [Part Number: TPC8xxx]

■ Features

- Low ON-resistance and high-speed switching series are available.
Low ON-resistance series: U-MOSIV/V
High-speed switching series: U-MOSIII-H and U-MOSV-H
- ON-resistance reduction through the use of an Al strap structure

■ Product List



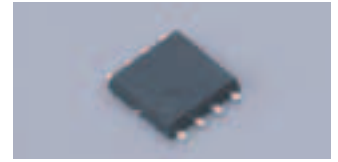
Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)				Q _g Typ. (nC)	C _{iss} Typ. (pF)	Series
	V _{DSS} (V)	I _D (A)		10 V	4.5 V	4 V	2.5 V			
TPC8021-H	30	11	N-ch Single	17	25	—	—	11	640	U-MOSIII-H
TPC8014	30	11		14	22	—	—	39	1860	U-MOSIII
TPC8020-H *	30	13		9	13	—	—	23	1395	U-MOSIII-H
TPC8017-H *	30	15		6.6	9.5	—	—	25	1465	U-MOSIII-H
TPC8018-H *	30	18		4.6	6.2	—	—	38	2265	U-MOSIII-H
TPC8031-H ☆	30	11		13.3	16.1	—	—	11	1433	U-MOSV-H
TPC8037-H *☆	30	12		11.4	13.9	—	—	11	1433	U-MOSV-H
TPC8038-H *☆	30	12		11.4	13.9	—	—	11	1433	U-MOSV-H
TPC8032-H *☆	30	15		6.5	8.6	—	—	17	2270	U-MOSV-H
TPC8033-H *☆	30	17		5.3	7.2	—	—	22	2900	U-MOSV-H
TPC8034-H *☆	30	18		3.5	4.5	—	—	35	4614	U-MOSV-H
TPC8039-H *☆	30	17		5.7	6.6	—	—	18	2600	U-MOSVI-H
TPC8036-H *☆	30	18		4.5	5.1	—	—	26	3500	U-MOSVI-H
TPC8035-H *☆	30	18		3.2	3.6	—	—	44	6000	U-MOSVI-H
TPC8022-H	40	7.5	N-ch Dual	27	35	—	—	11	650	U-MOSIII-H
TPC8012-H	200	1.8		400	—	—	—	11	440	π-MOSV
TPC8208	20	5		—	—	50	70	9.5	780	U-MOSIII
TPC8207	20	6		—	—	20	30	22	2010	U-MOSIII
TPC8211	30	5.5		36	44	—	—	25	1250	U-MOSIII
TPC8212-H	30	6		21	27	—	—	16	840	U-MOSIII-H
TPC8216-H ☆	30	6.4		20	22	—	—	7.6	900	U-MOSVI-H
TPC8210	30	8		15	20	—	—	75	3530	U-MOSIII
TPC8213-H	60	5		50	56	—	—	6	625	U-MOSIII-H
TPC8214-H	100	2.2		180	190	—	—	4.5	360	U-MOSIII-H
TPC8025 ☆	30	11	N-ch Single	9	14.5	—	—	26	1270	U-MOSIV
TPC8030 ☆	30	11		8.5	17	—	—	24	1140	U-MOSIV
TPC8041 *☆	30	13		7	13.5	—	—	27	1270	U-MOSIV
TPC8026 ☆	30	13		6.6	10	—	—	42	1800	U-MOSIV
TPC8028 *☆	30	18		4.3	8	—	—	45	1800	U-MOSIV
TPC8029 *☆	30	18		3.8	7	—	—	49	2200	U-MOSIV
TPC8042 *☆	30	18		3.4	6.5	—	—	56	2900	U-MOSIV
TPC8027 *☆	30	18		2.7	5.5	—	—	113	4200	U-MOSIV
TPC8109	-30	-10	P-ch Single	20	—	30	—	45	2260	U-MOSIII
TPC8119 *☆	-30	-10		13	—	28	—	40	1560	U-MOSV
TPC8121 *☆	-30	-11		12	—	24	—	42	1770	U-MOSV
TPC8111 *	-30	-11		12	—	18	—	107	5710	U-MOSIV
TPC8113 *	-30	-11		10	—	18	—	107	4500	U-MOSIV
TPC8122 *☆	-30	-12		8	—	16.5	—	62	2450	U-MOSV
TPC8107	-30	-13		7	—	15	—	130	5880	U-MOSIII
TPC8118 *☆	-30	-13		7	—	15	—	65	2700	U-MOSV
TPC8112 *	-30	-13		6	—	14	—	130	5880	U-MOSIII
TPC8114 *	-30	-18		4.5	—	6.8	—	180	7480	U-MOSIV
TPC8117 *☆	-30	-18		3.9	—	7.9	—	120	4600	U-MOSV
TPC8115	-20	-10		—	10	—	14	115	9130	U-MOSIV
TPC8110	-40	-8		25	—	35	—	48	2180	U-MOSIII
TPC8116-H	-40	-7.5		30	37	—	—	27	1190	U-MOSIII-H
TPC8405	30	6	N-ch/P-ch Dual	26	33	—	—	27	1240	U-MOSIII
	-30	-4.5		33	42	—	—	40	1540	U-MOSIV
TPC8406-H	40	6.5		27	35	—	—	11	650	U-MOSIII-H
	-40	-6.5		30	37	—	—	27	1190	U-MOSIII-H
TPC8A01	30	6	N-ch/ N-ch + SBD	25	30	—	—	17	940	U-MOSIII
	30	8.5/1		18	21	—	—	49	2295	U-MOSIII
TPC8A02-H *	30	16/1	MOSBD	5.6	8.5	—	—	34	1970	U-MOSIII-H
TPC8A03-H *☆	30	17/1		5.6	7	—	—	19	2640	U-MOSV-H
TPC8A04-H *☆	30	18		3.6	4.5	—	—	TBD	4400	U-MOSV-H

* : Al straps ☆ : No protection zener diode between gate and source

SOP Advance Series ... [Part Number: TPCA8xxx]

■ Features

- Low ON-resistance and high-speed switching series are available.
Low ON-resistance series: UMOSIV/V
High-speed switching series: U-MOSIII-H and U-MOSIV-H
- High current, thin and thermally enhanced package



■ Product List

Part Number	Absolute Maximum Ratings		Circuit Configuration	R _{DS(ON)} Max (mΩ)					Q _g Typ. (nC)	C _{iss} Typ. (pF)	Series
	V _{DSS} (V)	I _D (A)		10 V	4.5 V	4.0 V	2.5 V	1.8 V			
TPCA8011-H	20	40	N-ch Single	—	3.5	—	7.5	—	32	2900	U-MOSIII-H
TPCA8023-H ☆	30	21		12.9	15.7	—	—	—	11	1433	U-MOSV-H
TPCA8030-H ☆☆	30	24		11.0	13.4	—	—	—	83	1433	U-MOSV-H
TPCA8031-H ☆☆	30	24		11.0	13.4	—	—	—	83	1433	U-MOSV-H
TPCA8005-H	30	27		9	13	—	—	—	24	1395	U-MOSIII-H
TPCA8018-H ☆	30	30		6.2	8.2	—	—	—	18	2270	U-MOSV-H
TPCA8039-H ☆☆	30	34		5.7	6.6	—	—	—	19	2600	U-MOSVI-H
TPCA8003-H	30	35		6.6	9.5	—	—	—	25	1465	U-MOSIII-H
TPCA8024 ☆	30	35		4.3	7.8	—	—	—	45	1800	U-MOSIV
TPCA8036-H ☆☆	30	38		4.2	4.8	—	—	—	26	3500	U-MOSVI-H
TPCA8004-H	30	40		4.6	6.2	—	—	—	37	2265	U-MOSIII-H
TPCA8012-H ☆	30	40		4.9	6.8	—	—	—	22	2900	U-MOSV-H
TPCA8025 ☆	30	40		3.5	6.0	—	—	—	49	2200	U-MOSIV
TPCA8042 ☆☆	30	45		3.3	5.7	—	—	—	56	2900	U-MOSIV
TPCA8019-H ☆	30	45		3.1	4.1	—	—	—	34	4614	U-MOSV-H
TPCA8026 ☆	30	45		2.2	4.5	—	—	—	113	4200	U-MOSIV
TPCA8028-H ☆	30	50	2.8	3.2	—	—	—	46	6000	U-MOSVI-H	
TPCA8A01-H	30	36	MOSBD	5.6	8.5	—	—	—	19	1970	U-MOSIII-H
TPCA8A02-H ☆	30	34		5.3	6.7	—	—	—	19	2640	U-MOSV-H
TPCA8A04-H ☆☆	30	42		3.2	4.1	—	—	—	30	4400	U-MOSV-H
TPCA8020-H	40	7.5	N-ch Single	27	35	—	—	—	11	650	U-MOSIII-H
TPCA8014-H	40	30		9	14	—	—	—	22	1365	U-MOSIII-H
TPCA8027-H	40	30		10	—	—	—	—	23	1430	U-MOSIII-H
TPCA8015-H	40	35		5.4	7.9	—	—	—	37	2155	U-MOSIII-H
TPCA8016-H	60	25		21	26	—	—	—	22	1375	U-MOSIII-H
TPCA8006-H	100	18		67	—	—	—	—	12	780	π-MOSVII
TPCA8022-H	100	22		26	—	—	—	—	38	2330	U-MOSIII-H
TPCA8009-H	150	7		350	—	—	—	—	10	600	π-MOSV MACHII
TPCA8010-H	200	5.5		450	—	—	—	—	10	600	π-MOSV MACHII
TPCA8008-H	250	4		580	—	—	—	—	10	600	π-MOSV MACHII
TPCA8105	-12	-6	P-ch Single	—	33	—	51	92	18	1600	U-MOSIV
TPCA8106 ☆	-30	-40		3.7	—	7.8	—	—	120	4600	U-MOSV
TPCA8102	-30	-40		6	—	14	—	—	109	4600	U-MOSIII
TPCA8103	-30	-40		4.2	—	6.8	—	—	184	7880	U-MOSIV
TPCA8107-H	-40	-7.5		30	37	—	—	—	27	1190	U-MOSIII-H
TPCA8108	-40	-40		9.5	—	—	—	—	100	4820	U-MOSIII
TPCA8104	-60	-40		16	—	24	—	—	90	4300	U-MOSIII

*: Al straps ☆: No protection zener diode between gate and source

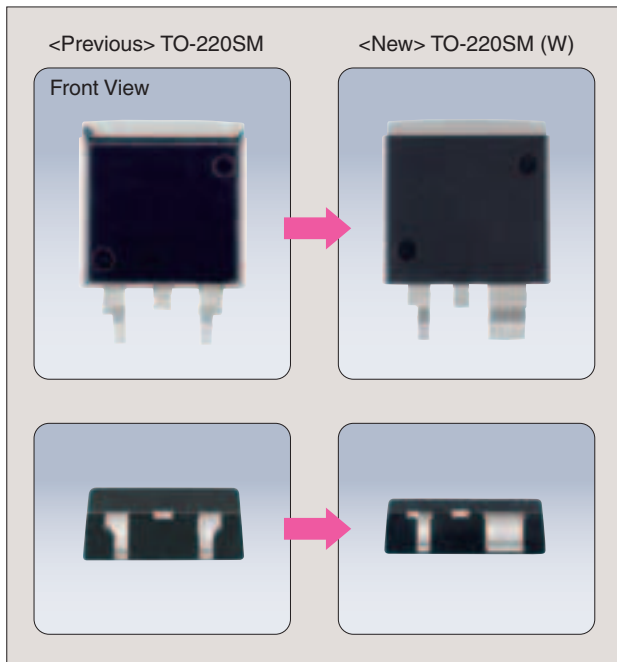
2. TO-220SM(W) Series

The TO-220SM(W) package, which uses Cu connectors and a wide source terminal, realizes low ON-resistance and a high current carrying capability.

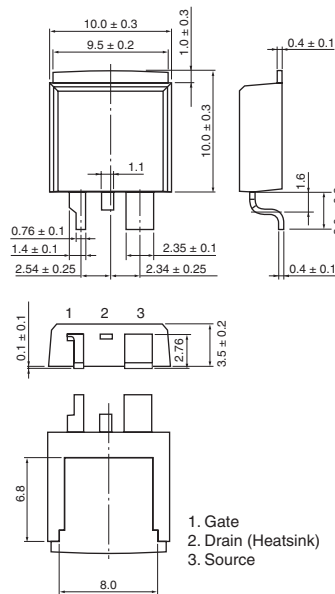
■ Features

- Achieves low ON-resistance, low package inductance and low thermal resistance due to the use of Cu connectors.
- Achieves a high current carrying capability due to the use of a wide source terminal (I_D (DC) = 150 A max)
- AEC-Q101-qualified at a channel temperature (T_{ch}) of 175°C
- Thin package: 3.7-mm (max) thick, much thinner than the previous TO-220SM package with a thickness of 4.7 mm (max)

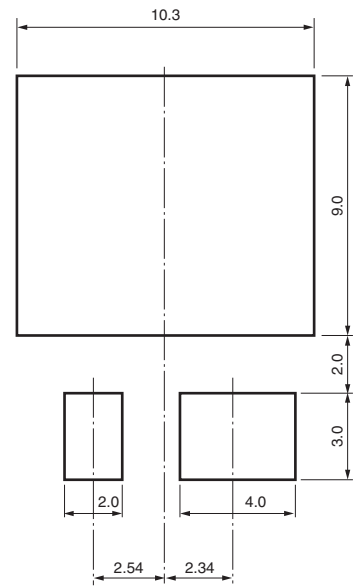
■ Package



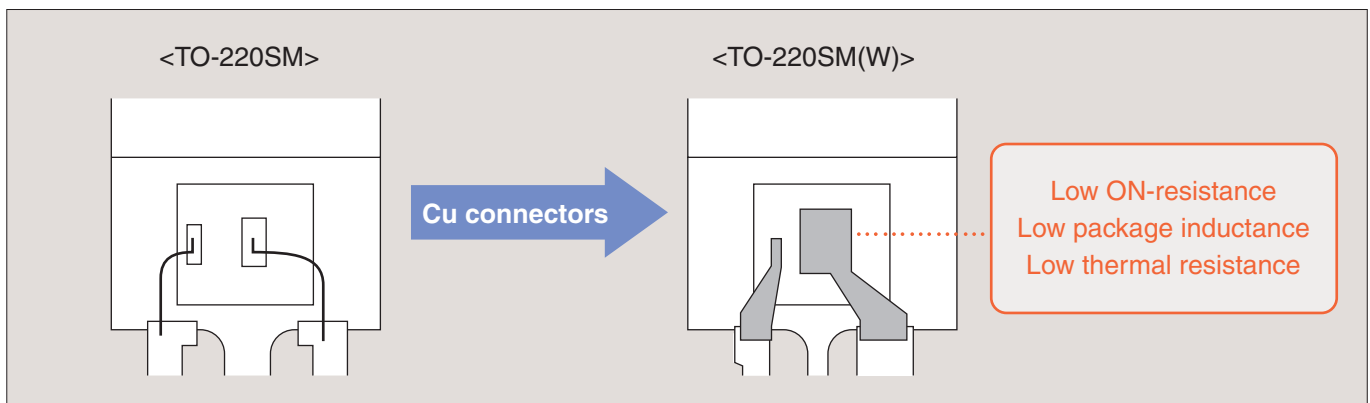
■ Package Dimensions



■ Land Pattern Example



■ Characteristics of the WARP Series

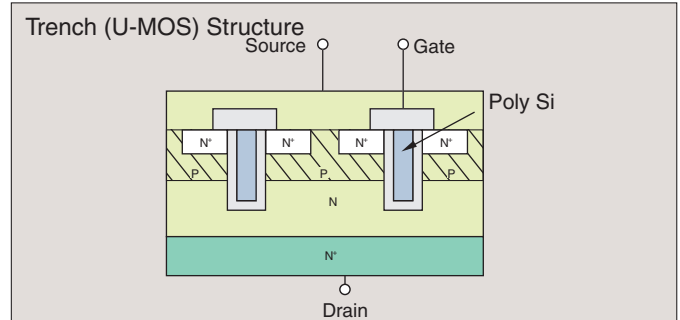
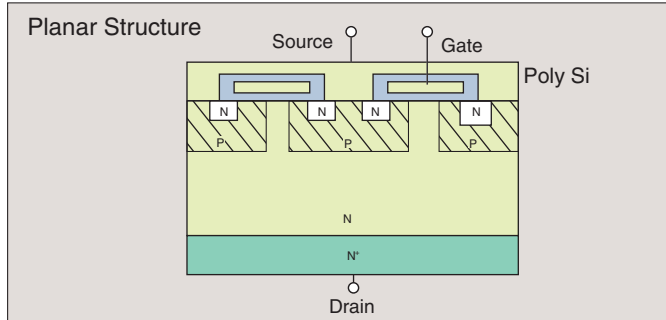


■ Product List

Part Number	Absolute Maximum Ratings		$R_{DS(ON)}$ Max (m Ω)		C_{iss} Typ. (pF)	Q_g Typ. (nC)
	V_{DSS} (V)	I_D (A)	Typ.	Max		
TJ120F06J3	-60	-120	5.5	8.0	11500	258
TK100F04K3	40	100	2.5	3.0	4500	102
TK150F04K3	40	150	1.7	2.1	7500	166
TK100F06K3	60	100	4.0	5.0	4500	98
TK130F06K3	60	130	2.6	3.4	8400	170
TK50F15J1	150	50	22	30	4300	75

3. U-MOSIII (Trench Type) Series

By employing a trench structure, this ultra-low ON-resistance series achieves extremely high integration.



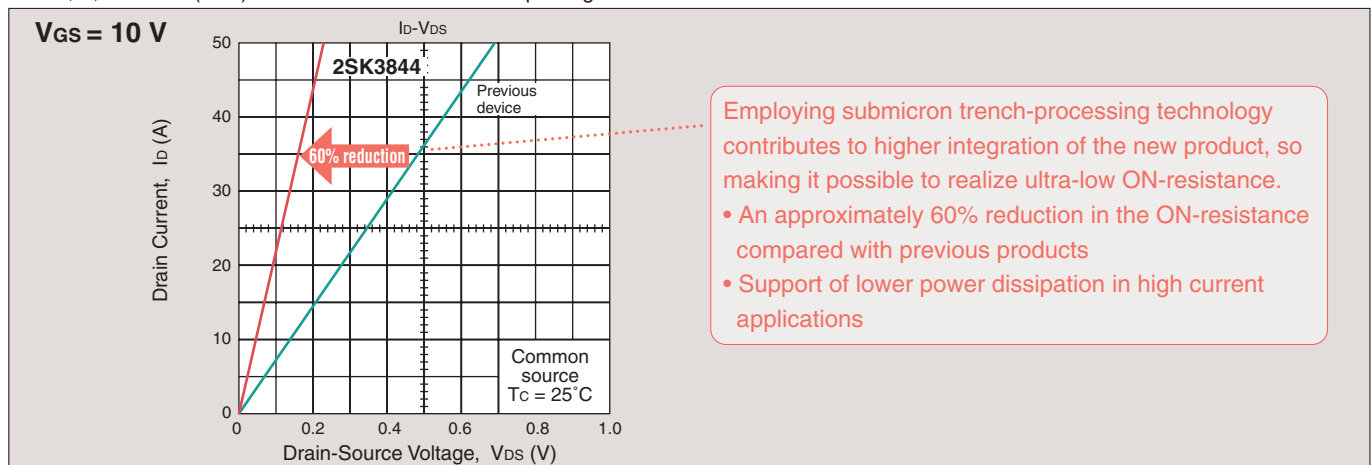
■ Features

- High density through the use of submicron technology
- 60 % $R_{DS(ON)}$ reduced by per unit area (as compared with the maximum $R_{DS(ON)}$ of the $L^2-\pi$ -MOSV)
- Guaranteed avalanche capability and improved in di/dt capability
- Protection zener diode between gate and source

■ Product List

Applications	Part Number	Absolute Maximum Ratings			Package	$R_{DS(ON)}$ Max (m Ω)			$R_{DS(ON)}$ Max (m Ω)			Q_g Typ. (nC)
		V_{DSS} (V)	I_D (A)	P_D (W)		V_{GS} (V)	I_D (A)	V_{GS} (V)	I_D (A)			
Motor drive solenoids Lamp drivers DC-DC converters	2SJ668	-60	-5	20	PW-Mold	170	-10	-2.5	250	-4	-2.5	15
	2SJ681	-60	-5	20	New PW-Mold2	170	-10	-2.5	250	-4	-2.5	15
	2SJ669	-60	-5	1.2	TPS	170	-10	-2.5	250	-4	-2.5	15
	TPCA8104	-60	-40	45	SOP Advance	16	-10	-20	24	-4	-20	90
	TJ120F06J3	-60	-120	300	TO-220SM(W)	8.0	-10	-60	—	—	—	258
	2SK3754	30	5	25	TO-220NIS	89	10	2.5	99	4.5	2.5	2.5
	2SK3846	40	26	25	TO-220NIS	16	10	13	28	4.5	13	40
	2SK3847	40	32	30	TO-220SM	16	10	16	28	4.5	16	40
	2SK3843	40	75	125	TFP	3.5	10	38	8.0	4.5	38	210
	TK70J04J3	40	70	150	TO-3P(N)	3.8	10	35	8.3	4.5	35	210
	2SK4017	60	5	20	New PW-Mold2	100	10	2.5	150	4	2.5	15
	2SK4033	60	5	20	New PW-Mold	100	10	2.5	150	4	2.5	15
	TK30A06J3A	60	30	25	TO-220SIS	26	10	15	35	4.5	15	36
	2SK3662	60	35	35	TO-220NIS	12.5	10	18	19	4	18	91
	2SK3842	60	75	125	TFP	5.8	10	38	—	—	—	196
	2SK4034	60	75	125	TFP	5.8	10	38	10	4.5	38	196
	2SK3844	60	45	45	TO-220NIS	5.8	10	23	—	—	—	196
2SK3845	60	70	125	TO-3P(N)	5.8	10	23	—	—	—	196	
2SK3940	75	70	150	TO-3P(N)	7.0	10	35	—	—	—	200	

■ $R_{DS(ON)} = 5.8 \text{ m}\Omega$ (max) MOSFET housed in TO-220 package



4. U-MOS Series for Synchronous Rectification ($V_{DS} = 60\text{ V to }150\text{ V}$)

Fabricated using a trench technology, the U-MOS Series is ideal for synchronous rectification on the secondary side of power supply circuits.

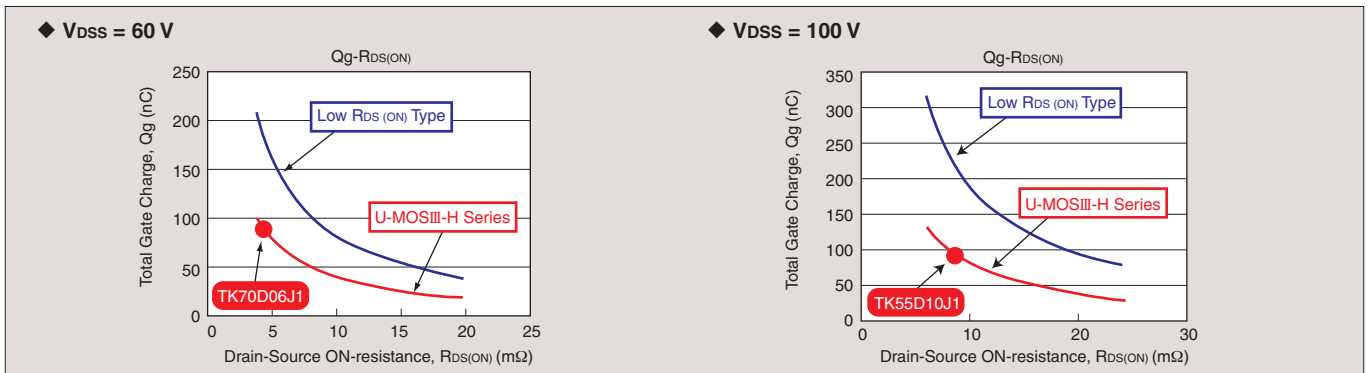
■ Features

- Low ON-resistance achieved by high density through the use of submicron technology
- Guaranteed avalanche capability
- High power dissipation achieved by having the series housed in the TO-220(W) package with an exposed heatsink on the bottom of the package

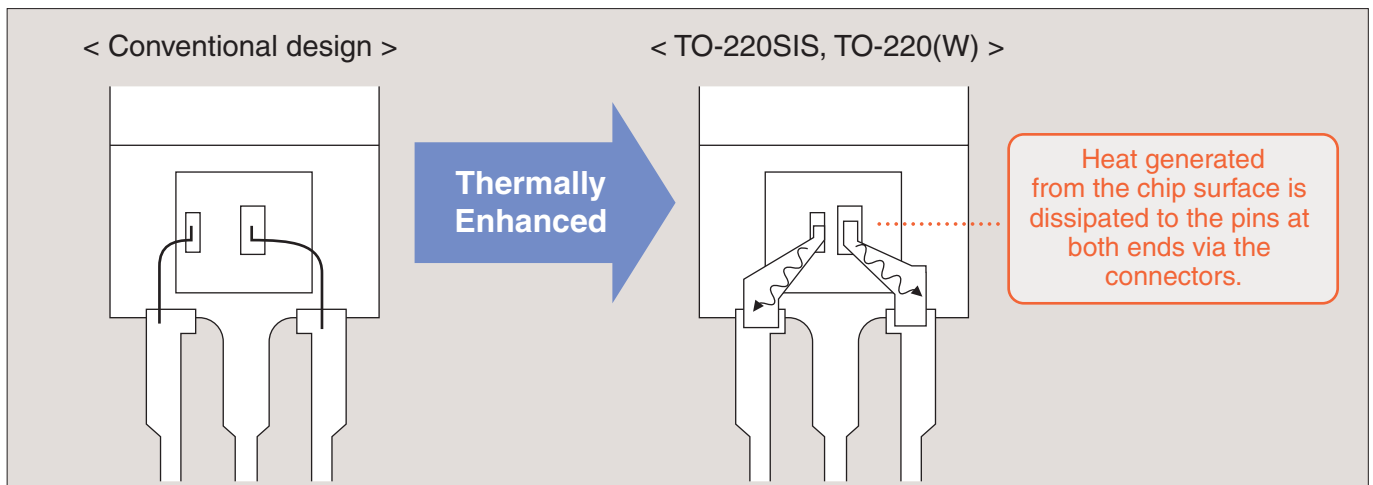
■ Product List

Part Number	Absolute Maximum Ratings			$R_{DS(ON)}$ (m Ω) @ $V_{GS} = 10\text{ V}$		Q_g (nC) Typ.	Q_{sw} (nC) Typ.	Package
	V_{DS} (V)	I_D (A)	P_D (W)	Typ.	Max	$V_{DS} = V_{DS} \times 0.8, I_D = I_D(DC)$		
TK70D06J1	60	70	140	5.1	6.4	87	30	TO-220(W)
TK70A06J1	60	70	45	5.1	6.4	87	30	TO-220SIS
TK60D08J1	75	60	140	6.2	7.8	86	27	TO-220(W)
TK60A08J1	75	60	45	6.2	7.8	86	27	TO-220SIS
TK80D08K3	75	80	100	3.6	4.5	175	80	TO-220(W)
TK80A08K3	75	80	40	3.6	4.5	175	80	TO-220SIS
TK40D10J1	100	40	100	11.5	15	76	25	TO-220(W)
TK40A10J1	100	40	40	11.5	15	76	25	TO-220SIS
TK55D10J1	100	55	140	8.4	10.5	110	33	TO-220(W)
TK55A10J1	100	55	45	8.4	10.5	110	33	TO-220SIS
TK50X15J1	150	50	125	22	30	75	33	TFP

■ Q_g - $R_{DS(ON)}$ Trade-Off



■ Thermally Enhanced Package



5. π -MOSVII Series ($V_{DSS} = 500\text{ V to }600\text{ V}$)

The latest addition to the π -MOS portfolio, the π -MOSVII Series offers reduced capacitances due to optimized chip design and is available with a greatly wider range of electrical characteristics.

■ Features

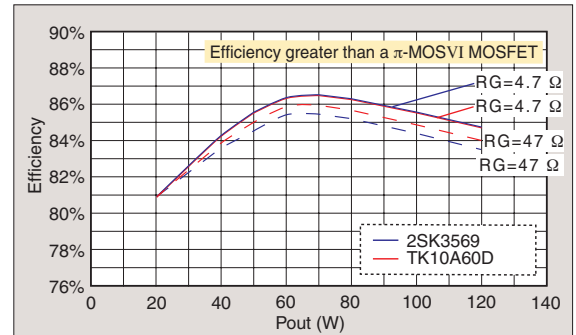
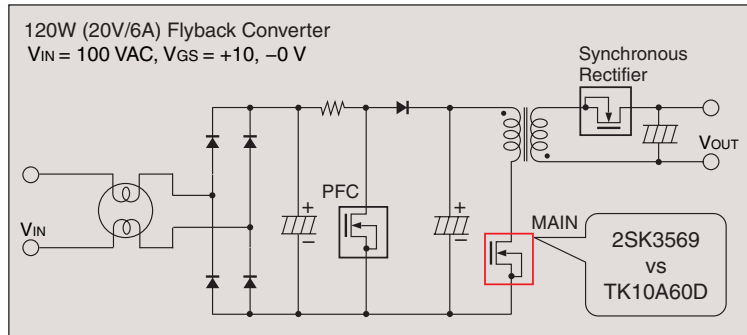
- 15% reduction in Q_g from π -MOSVI due to optimized chip design
- Available at 50-V steps of V_{DSS} and at finer steps of $R_{DS(ON)}$.
- Rated avalanche and reverse recovery current capabilities

■ Performance Comparisons Between π -MOSVII and π -MOSVI Devices (600 V/10 A)

		Series	π -MOSVII	π -MOSVI					
		Part Number	TK10A60D	2SK3569					
		Ratings	600 V/10 A	600 V/10 A					
		Package	TO-220SIS	TO-220SIS					
Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Min	Typ.	Max	Unit
Gate leakage current	$\pm I_{GSS}$	V_{GS} condition ^{*1} , $V_{DS} = 0\text{ V}$	—	—	± 1	—	—	± 10	μA
Drain cut-off current	I_{DSS}	$V_{DS} = 600\text{ V}$, $V_{GS} = 0\text{ V}$	—	—	100	—	—	100	μA
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = +10\text{ mA}$, $V_{GS} = 0\text{ V}$	600	—	—	600	—	—	V
Gate threshold voltage	V_{th}	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$	2.0	—	4.0	2.0	—	4.0	V
Drain-source ON-resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}$, $I_D = 5\text{ A}$	—	—	0.75	—	—	0.75	Ω
Total gate charge	Q_g	$V_{DD} = 400\text{ V}$, $V_{GS} = 10\text{ V}$ $I_D = 10\text{ A}$	—	25	—	—	42	—	nC
Diode forward voltage	V_{DSF}	$I_{DR} = 10\text{ A}$, $V_{GS} = 0\text{ V}$	—	—	-1.7	—	—	-1.7	V

*1: Test conditions: TK10A60D: $V_{GS} = \pm 30\text{ V}$, 2SK3569: $V_{GS} = \pm 25\text{ V}$

■ Efficiency Test Circuit



■ Product List

Part Number	Absolute Maximum Ratings		$R_{DS(ON)}$ (Ω)	Existing Equivalent Part Number	Package
	V_{DSS} (V)	I_D (A)	$V_{GS} = 10\text{ V}$		
TK5A50D *	500	5	1.5	2SK3563	TO-220SIS
TK7A50D *		7	1.2	—	TO-220SIS
TK8A50D		8	0.85	2SK3561	TO-220SIS
TK10A50D *		10	0.7	—	TO-220SIS
TK12A50D		12	0.52	2SK3568	TO-220SIS
TK13A50DA *		12.5	0.47	—	TO-220SIS
TK13A50D *		13	0.4	2SK4012	TO-220SIS
TK15J50D *		15	0.4	2SK4107	TO-3P(N)
TK15A50D		15	0.3	2SK3934	TO-220SIS
TK20J50D *		20	0.27	2SK4108	TO-3P(N)

Part Number	Absolute Maximum Ratings		$R_{DS(ON)}$ (Ω)	Existing Equivalent Part Number	Package
	V_{DSS} (V)	I_D (A)	$V_{GS} = 10\text{ V}$		
TK11A55D *	550	11	0.63	—	TO-220SIS
TK14A55D *		14	0.37	—	TO-220SIS
TK4A60DA *		3.5	2.2	2SK3567	TO-220SIS
TK4A60D *		4	1.7	—	TO-220SIS
TK6A60D	600	6	1.25	2SK3562	TO-220SIS
TK8A60DA *		7.5	1	2SK3667	TO-220SIS
TK10A60D		10	0.75	2SK3569	TO-220SIS
TK11A60D *		11	0.65	—	TO-220SIS
TK12A60D *		12	0.55	—	TO-220SIS
TK13A60D		13	0.43	2SK3797	TO-220SIS

*: Under development

6. Super-Junction DTMOS Series ($V_{DSS} = 600\text{ V}$)

The DTMOS devices employ a new super junction structure that enables an ultra-low ON-resistance with the maximum V_{DSS} rating of 600 V. The DTMOS Series aids in reduction of power consumption and miniaturization of electronics equipment.

■ Features

- Low ON-resistance TK40J60T: 80 mΩ (max) @ $V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$
- Low gate charge TK20A60U: $Q_g = 27\text{ nC typ.}$, 600 V / 20 A
- Avalanche capability guaranteed up to the rated maximum current e.g.) TK20A60U $I_{AR} = 20\text{ A}$ @ $V_{DD} = 90\text{ V}$, $R_g = 25\text{ }\Omega$, $L = 0.63\text{ mH}$
- The rugged internal drain-source diode is not damaged at $di/dt = 500\text{ A}/\mu\text{s}$ (@ $V_{DS} = 400\text{ V}$, 150°C).

■ Product List

Part Number	Absolute Maximum Ratings		$R_{DS(ON)}$ Max (Ω)	Q_g Typ. (nC)	C_{iss} Typ. (pF)	Package	Series
	V_{DSS} (V)	I_D (A)	$V_{GS} = 10\text{ V}$				
TK12A60U	600	12	0.4	14	720	TO-220SIS	DTMOSII
TK12D60U						TO-220(W)	
TK12J60U						TO-3P(N)	
TK15J60T		15	0.3	21	1200	TO-3P(N)	DTMOSI
TK15A60U						TO-220SIS	
TK15D60U		15	0.3	17	950	TO-220(W)	DTMOSII
TK15J60U						TO-3P(N)	
TK20A60T		20	0.19	30	1580	TO-220SIS	DTMOSI
TK20D60T						TO-220(W)	
TK20J60T						TO-3P(N)	
TK20A60U		20	0.19	27	1470	TO-220SIS	DTMOSII
TK20D60U						TO-220(W)	
TK20J60U						TO-3P(N)	
TK40J60T		40	0.08	67	3900	TO-3P(N)	DTMOSI

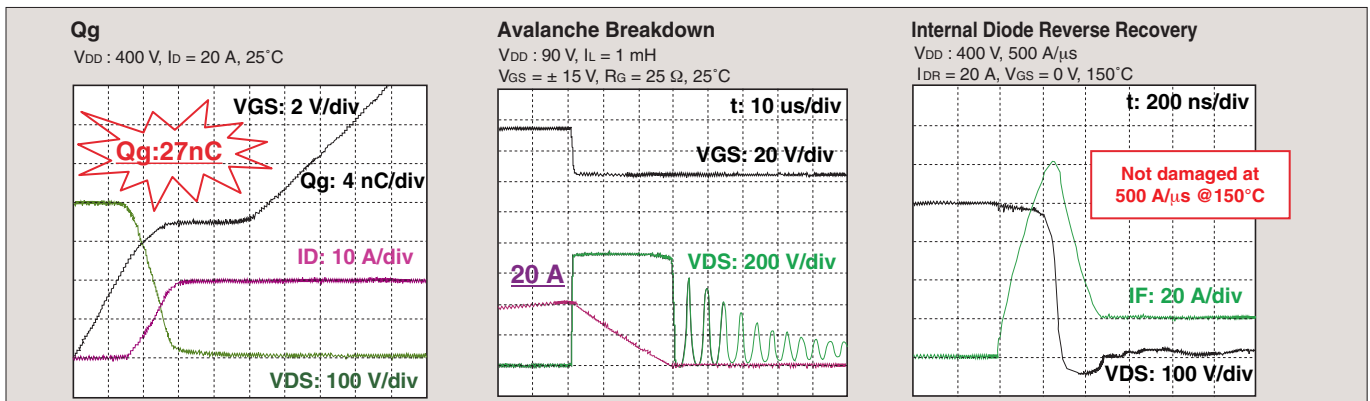
■ Performance Comparisons Between the New DTMOS and Conventional MOSFET (π -MOSVI) Devices (600 V/20 A)

Characteristic	Symbol	Test Conditions	Series			Series			Unit
			DTMOSII			π -MOSVI			
			Min	Typ.	Max	Min	Typ.	Max	
Gate leakage current	$\pm I_{GSS}$	V_{GS} condition ^{*1} , $V_{DS} = 0\text{ V}$	—	—	± 1	—	—	± 10	μA
Drain cut-off current	I_{BSS}	$V_{DS} = 600\text{ V}$, $V_{GS} = 0\text{ V}$	—	—	100	—	—	100	μA
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 10\text{ mA}$, $V_{GS} = 0\text{ V}$	600	—	—	600	—	—	V
Gate threshold voltage	V_{th}	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$	3.0	—	5.0	2.0	—	4.0	V
Drain-source ON-resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$	—	0.165	0.19	—	0.22	0.32	Ω
Total gate charge	Q_g	$V_{DD} = 400\text{ V}$, $V_{GS} = 10\text{ V}$ $I_D = 20\text{ A}$	—	27	—	—	60	—	nC
Diode forward voltage	V_{DSF}	$I_{DR} = 20\text{ A}$, $V_{GS} = 0\text{ V}$	—	—	-1.7	—	—	-1.7	V

*1: Test conditions: TK20J60U: $V_{GS} = \pm 30\text{ V}$, 2SK3911: $V_{GS} = \pm 25\text{ V}$

■ Performance Characteristics of the New DTMOS Series

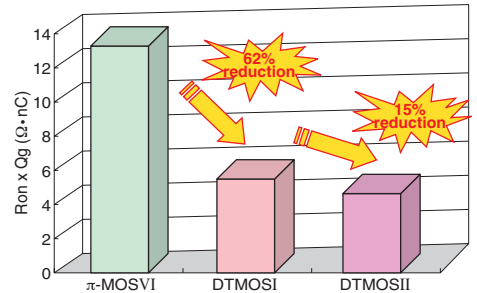
TK20A60U Electrical Characteristics



■ Figure-of-Merit (FOM) Comparison

$R_{on} \times Q_g$, the product of ON-resistance and total gate charge, is reduced by 62%, compared with the conventional MOSFETs with the same chip size.

* $R_{on} \times Q_g$ is a figure-of-merit index for the switching speed of MOSFETs.



7. High-speed π -MOS Series ($V_{DSS} = 450\text{ V to }600\text{ V}$)

To foster the development of high-efficiency equipment, Toshiba has developed two series of high-speed Power MOSFETs: a high-speed switching series for AC adapters and switching power supplies; and a high-speed diode series for motor controllers and inverter circuits.

- MACH Series: Achieves a higher switching speed than the existing π -MOS Series, which is currently well established in the market.
- High-Speed Diode Series: Achieves a higher internal diode speed by using lifetime control.

■ Product List

- MACH Series

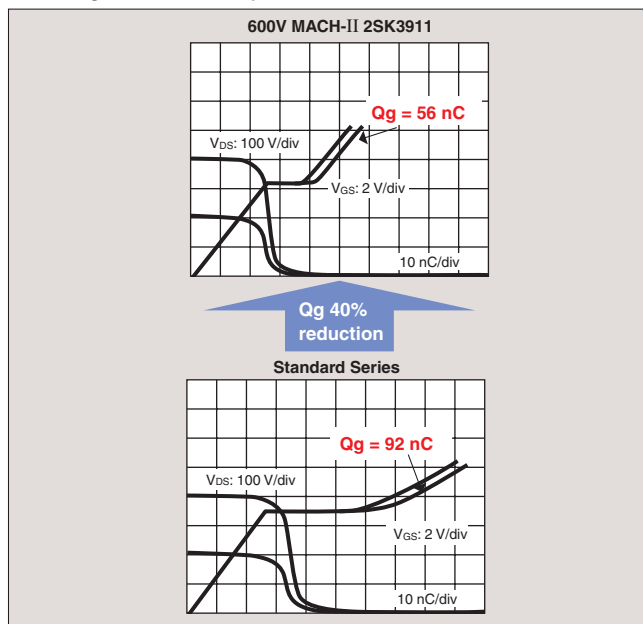
Applications	Part Number	Absolute Maximum Ratings			Package	$R_{DS(ON)}$ Max (Ω)	V_{GS} (V)	I_D (A)	Q_g Typ. (nC)	Standard Type	Series
		V_{DSS} (V)	I_D (A)	P_D (W)							
AC adapters Switching power supplies	2SK3310	450	10	40	TO-220NIS	0.65	10	5	23	2SK3126	MACH-I
	2SK3309	450	10	65	TO-220FL/SM	0.65	10	5	23	—	
	2SK3743	450	13	40	TO-220NIS	0.4	10	6	34	—	
	2SK3403	450	13	100	TO-220FL/SM	0.4	10	6	34	—	
	2SK3312	600	6	65	TO-220FL/SM	1.25	10	3	25	2SK2777	
	2SK3437	600	10	80	TO-220FL/SM	1	10	5	28	2SK2996	
	2SK3399	600	10	100	TO-220FL/SM	0.75	10	5	35	2SK2866	
	2SK3907	500	23	150	TO-3P(N)	0.23	10	11.5	60	—	MACH-II
2SK3911	600	20	150	TO-3P(N)	0.32	10	10	60	—		

- High-Speed Diode Series (HSD Series)

Applications	Part Number	Absolute Maximum Ratings			Package	$R_{DS(ON)}$ Max (Ω)	V_{GS} (V)	I_D (A)	t_{rr} Typ. (ns)	Standard Type
		V_{DSS} (V)	I_D (A)	P_D (W)						
Motor control Inverter Switching power supplies	2SK3868	500	5	35	TO-220SIS	1.7	10	2.5	150	2SK3563
	2SK3417	500	5	50	TO-220FL/SM	1.8	10	2.5	60	2SK2991
	2SK4042	500	8	40	TO-220SIS	0.97	10	4	185	2SK3561
	2SK3313	500	12	40	TO-220NIS	0.62	10	6	90	2SK2842
	2SK3314	500	15	150	TO-3P(N)	0.49	10	7	105	2SK2698
	2SK3131	500	50	250	TO-3P(L)	0.11	10	25	105	2SK3132
	2SK3936	500	23	150	TO-3P(N)	0.25	10	11.5	380	2SK3907
	2SK3947	600	6	40	TO-220SIS	1.4	10	3	150	2SK3562
	2SK4015	600	10	45	TO-220SIS	0.86	10	5	170	2SK3569
	2SK4016	600	13	50	TO-220SIS	0.50	10	6.5	160	2SK3797
2SK3906	600	20	150	TO-3P(N)	0.33	10	10	400	2SK3911	

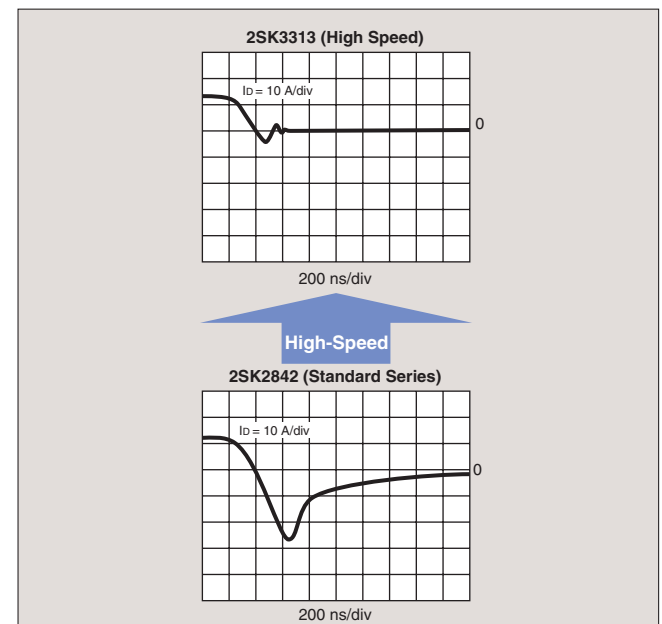
■ Characteristics of MACHII Series

Switching loss reduced by 40%



■ Characteristics of High-Speed Diode Series

Faster internal diode



8. π -MOS Series

■ π -MOSVI Series ($V_{DSS} = 450\text{ V to }600\text{ V}$)

Series	Part Number	Absolute Maximum Ratings		$R_{DS(ON)}$ Max (Ω)		Q_g Typ. (nC)	C_{ISS} Typ. (pF)	Existing Equivalent Part Number	Package
		V_{DSS} (V)	I_D (A)	$V_{GS} = 10\text{ V}$					
π -MOSVI	2SK3757	450	2	2.45	9	330	2SK3543	TO-220SIS	
	2SK3766		2	2.45	8	270	2SK3543	TO-220SIS	
	2SK3869		10	0.68	28	1050	2SK3407	TO-220SIS	
	2SK3935		17	0.25	62	3100	—	TO-220SIS	
	2SK3904		19	0.26	62	3100	—	TO-3P(N)	
	2SK3563		5	1.5	16	550	2SK2662	TO-220SIS	
	2SK3863	500	5	1.5	16	550	—	DP	
	2SK4103		5	1.5	16	550	2SK3863	New Pw-Mold	
	2SK3561		8	0.85	28	1050	2SK2543	TO-220SIS	
	2SK3568		12	0.52	42	1500	2SK2842	TO-220SIS	
	2SK4012		13	0.4	50	2400	—	TO-220SIS	
	2SK3934		15	0.3	62	3100	—	TO-220SIS	
	2SK4107		15	0.4	48	2450	2SK2698	TO-3P(N)	
	2SK3905		17	0.31	62	3100	—	TO-3P(N)	
	2SK4108		20	0.27	70	3400	2SK2837	TO-3P(N)	
	2SK3767		600	2	4.5	9	320	2SK3067	TO-220SIS
	2SK3567			3.5	2.2	17	550	2SK2750	TO-220SIS
	2SK3562			6	1.25	28	1050	2SK2545	TO-220SIS
	2SK3667			7.5	1.0	33	1300	2SK2996	TO-220SIS
	2SK3569			10	0.75	42	1500	2SK2843	TO-220SIS
2SK3797	13	0.43		62	3150	—	TO-220SIS		
2SK3903	14	0.44		62	3100	—	TO-3P(N)		

■ π -MOSIV Series ($V_{DSS} = 800\text{ V to }900\text{ V}$)

Series	Part Number	Absolute Maximum Ratings		$R_{DS(ON)}$ Max (Ω)		Q_g Typ. (nC)	C_{ISS} Typ. (pF)	Existing Equivalent Part Number	Package
		V_{DSS} (V)	I_D (A)	$V_{GS} = 10\text{ V}$					
π -MOSIV	2SK3633	800	7	1.7	35	1500	2SK2746	TO-3P(N)	
	2SK3879		6.5	1.7	35	1500	—	TO-220FL/SM	
	2SK3880		6.5	1.7	35	1500	—	TO-3P(N)IS	
	2SK4013		6	1.7	45	1400	—	TO-220SIS	
	2SK3566		900	2.5	6.4	12	470	2SK2718	TO-220SIS
	2SK3564			3	4.3	17	700	2SK2700	TO-220SIS
	2SK3798	4		3.5	26	800	—	TO-220SIS	
	2SK3565	5		2.5	28	1150	2SK2717	TO-220SIS	
	2SK3742	5		2.5	25	1150	2SK2717	TO-220SIS	
	2SK3700	5		2.5	28	1150	2SK2610	TO-3P(N)	
	2SK4014	6		2.0	45	1400	—	TO-220SIS	
	2SK4115	7		2.0	45	1650	2SK2749	TO-3P(N)	
	2SK3799	8		1.3	60	2200	—	TO-220SIS	
	2SK3473	9		1.6	38	1450	—	TO-3P(N)	
	2SK3878	9		1.3	60	2200	2SK2611	TO-3P(N)	
	2SK4207	13		0.95	45	2790	—	TO-3P(N)	

■ L^2 - π -MOSV, VI Series ($V_{DSS} = 30\text{ V to }100\text{ V}$)

Part Number	V_{DSS} (V)	I_D (A)	P_D (W)	Package	$R_{DS(ON)}$ (Ω)				$R_{DS(ON)}$ (Ω)				Q_g Typ. (nC)
					Typ.	Max	V_{GS} (V)	I_D (A)	Typ.	Max	V_{GS} (V)	I_D (A)	
2SJ537	-50	-5	0.9	LSTM	0.16	0.19	-10	-2.5	0.27	0.34	-4	-1.3	18
2SJ360	-60	-1	0.5	PW-Mini	0.55	0.73	-10	-0.5	0.86	1.2	-4	-0.5	6.5
2SJ507	-60	-1	0.9	LSTM	0.5	0.7	-10	-0.5	0.72	1.0	-4	-0.5	5.6
2SJ438	-60	-5	25	TO-220NIS	0.16	0.19	-10	-2.5	0.24	0.28	-4	-2.5	22
2SJ378	-60	-5	1.2	TPS	0.16	0.19	-10	-2.5	0.24	0.28	-4	-2.5	22
2SJ349	-60	-20	45	TO-220NIS	0.033	0.045	-10	-10	0.05	0.09	-4	-10	90
2SJ401	-60	-20	100	TO-220FL/SM	0.033	0.045	-10	-10	0.05	0.09	-4	-10	90
2SJ334	-60	-30	45	TO-220NIS	0.029	0.038	-10	-15	0.046	0.06	-4	-15	110
2SJ402	-60	-30	100	TO-220FL/SM	0.029	0.038	-10	-15	0.046	0.06	-4	-15	110
2SJ508	-100	-1	1.5	PW-Mini	1.34	1.9	-10	-0.5	1.68	2.5	-4	-0.5	6.3
2SJ509	-100	-1	0.9	LSTM	1.34	1.9	-10	-0.5	1.68	2.5	-4	-0.5	6.3
2SJ380	-100	-12	35	TO-220NIS	0.15	0.21	-10	-6	0.25	0.32	-4	-6	48
2SJ412	-100	-16	60	TO-220FL/SM	0.15	0.21	-10	-6	0.25	0.32	-4	-6	48
2SJ619	-100	-16	75	TFP	0.15	0.21	-10	-6	0.25	0.32	-4	-6	48
2SJ620	-100	-18	25	TFP	0.063	0.09	-10	-9	0.085	0.12	-4	-9	140
2SJ464	-100	-18	45	TO-220NIS	0.064	0.09	-10	-9	0.085	0.12	-4	-9	140
2SK3506	30	45	100	TO-3P(N)	0.016	0.02	10	25	—	—	—	—	39
2SK2989	50	5	0.9	LSTM	0.12	0.15	10	2.5	0.24	0.33	4	1.3	6.5
2SK2614	50	20	40	DP	0.032	0.046	10	10	0.055	0.08	4	5	25
2SK2507	50	25	30	TO-220NIS	0.034	0.046	10	12	0.058	0.08	4	6	25
2SK2886	50	45	40	TO-220NIS	0.014	0.02	10	25	0.027	0.036	4	25	66
2SK3051	50	45	40	TO-220FL/SM	0.024	0.03	10	25	—	—	—	—	36
2SK2744	50	45	125	TO-3P(N)	0.015	0.02	10	25	—	—	—	—	68
2SK2550	50	45	100	TO-3P(N)	0.024	0.030	10	25	—	—	—	—	36
2SK2551	50	50	150	TO-3P(N)	0.0072	0.011	10	25	—	—	—	—	130
2SK2745	50	50	150	TO-3P(N)	0.007	0.0095	10	25	0.011	0.016	4	25	130
2SK3129	50	60	150	TO-3P(N)	0.0055	0.007	10	30	0.008	0.01	4	30	135

Part Number	V _{DSS} (V)	I _D (A)	P _D (W)	Package	R _{DS(ON)} (Ω)				R _{DS(ON)} (Ω)				Qg Typ. (nC)
					Typ.	Max	V _{GS} (V)	I _D (A)	Typ.	Max	V _{GS} (V)	I _D (A)	
2SK2615	60	2	0.5	PW-Mini	0.23	0.3	10	1	0.33	0.44	4	1	6
2SK2961	60	2	0.9	LSTM	0.2	0.27	10	1	0.26	0.38	4	1	5.8
2SK2229	60	5	1.2	TPS	0.12	0.16	10	2.5	0.2	0.3	4	1.3	12
2SK2782	60	20	40	DP	0.039	0.055	10	10	0.06	0.090	4	5	25
2SK2232	60	25	35	TO-220NIS	0.036	0.046	10	12	0.057	0.08	4	12	38
2SK2311	60	25	40	TO-220FL/SM	0.036	0.046	10	12	0.057	0.08	4	12	38
2SK2385	60	36	40	TO-220NIS	0.022	0.03	10	18	0.04	0.055	4	15	60
2SK2233	60	45	100	TO-3P(N)	0.022	0.03	10	25	0.04	0.055	4	15	60
2SK2266	60	45	65	TO-220FL/SM	0.022	0.03	10	25	0.04	0.055	4	15	60
2SK2376	60	45	100	TO-220FL/SM	0.013	0.017	10	25	0.019	0.025	4	25	110
2SK2398	60	45	100	TO-3P(N)	0.022	0.03	10	25	—	—	—	—	60
2SK2173	60	50	125	TO-3P(N)	0.013	0.017	10	25	0.019	0.025	4	25	110
2SK2445	60	50	125	TO-3P(N)	0.014	0.018	10	25	—	—	—	—	110
2SK2267	60	60	150	TO-3P(L)	0.008	0.011	10	30	0.012	0.015	4	30	170
2SK2313	60	60	150	TO-3P(N)	0.008	0.011	10	30	0.012	0.015	4	30	170
2SK2962	100	1	0.9	LSTM	0.5	0.7	10	0.5	0.65	0.95	4	0.5	6.3
2SK2963	100	1	0.5	PW-Mini	0.5	0.7	10	0.5	0.65	0.95	4	0.5	6.3
2SK2200	100	3	1.3	TPS	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK2201	100	3	20	New PW-Mold	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK4018	100	3	20	New PW-Mold2	0.28	0.35	10	2	0.35	0.45	4	2	13.5
2SK2399	100	5	20	New PW-Mold	0.17	0.23	10	2.5	0.22	0.3	4	2.5	22
2SK2400	100	5	1.2	TPS	0.17	0.23	10	2.5	0.22	0.3	4	2.5	22
2SK4019	100	5	20	New PW-Mold2	0.17	0.23	10	2.5	0.22	0.3	4	2.5	22
2SK2391	100	20	35	TO-220NIS	0.068	0.085	10	10	0.09	0.13	4	10	50
2SK2314	100	27	75	TO-220AB	0.066	0.085	10	15	0.09	0.13	4	15	50
2SK2789	100	27	60	TO-220FL/SM	0.066	0.085	10	15	0.09	0.13	4	15	50
2SK3387	150	18	100	TFP	0.08	0.12	10	9	0.09	0.18	4	9	57

■ π-MOSV Series (V_{DSS} = 150 V to 250 V)

Applications	Part Number	Absolute Maximum Ratings			Package	R _{DS(ON)} (Ω)				Qg Typ. (nC)
		V _{DSS} (V)	I _D (A)	P _D (W)		R _{DS(ON)} (Ω)		V _{GS} (V)	I _D (A)	
						Typ.	Max			
DC-DC converters Monitors Motor controllers	2SJ618	-180	-10	130	TO-3P(N)	—	0.37	-10	-5	18
	2SJ407	-200	-5	30	TO-220NIS	0.8	1.0	-10	-2.5	20
	2SJ567	-200	-2.5	20	New PW-Mold	1.6	2.0	-10	-1.5	10
	2SJ676	-200	-2.5	1.3	TPS	1.6	2.0	-10	-1.5	10
	2SJ680	-200	-2.5	20	New PW-Mold2	1.6	2.0	-10	-1.5	10
	2SJ610	-250	-2	20	PW-Mold	1.85	2.55	-10	-1.0	24
	2SJ512	-250	-5	30	TO-220NIS	1.0	1.25	-10	-2.5	22
	2SJ516	-250	-6.5	35	TO-220NIS	0.6	0.8	-10	-3	29
	2SK3670	150	0.67	0.9	LSTM	1.0	1.7	4	0.5	4.6
	2SK3205	150	5	20	PW-Mold	0.36	0.5	10	2.5	12
	2SK2882	150	18	45	TO-220NIS	0.08	0.12	10	9	57
	2SK3443	150	30	125	TFP	0.05	0.055	10	15	45
	2SK3497	180	10	130	TO-3P(N)	—	0.15	10	5	—
	2SK2992	200	1	1.5	PW-Mini	2.2	3.5	10	0.5	3
	2SK2835	200	5	1.3	TPS	0.56	0.8	10	2.5	10
	2SK2381	200	5	25	TO-220NIS	0.56	0.8	10	2.5	10
	2SK2920	200	5	20	New PW-Mold	0.56	0.8	10	2.5	10
	2SK4020	200	5	20	New PW-Mold2	0.52	0.8	10	2.5	10
	2SK2350	200	8.5	30	TO-220NIS	0.26	0.4	10	5	17
	2SK2965	200	11	35	TO-220NIS	0.15	0.26	10	5.5	30
	2SK2382	200	15	45	TO-220NIS	0.13	0.18	10	10	40
	2SK2401	200	15	75	TO-220FL/SM	0.13	0.18	10	10	40
	2SK3625	200	25	100	TO-220FL/SM	0.065	0.082	10	12.5	44
	2SK3444	200	25	125	TFP	0.067	0.082	10	12.5	44
	2SK3176	250	30	150	TO-3P(N)	0.038	0.052	10	15	125
	2SK3462	250	3	20	New PW-Mold	1.2	1.7	10	1.5	12
	2SK4022	250	3	20	New PW-Mold2	1.2	1.7	10	1.5	12
	2SK3342	250	4.5	20	New PW-Mold	0.8	1.0	10	2.5	10
	2SK4021	250	4.5	20	New PW-Mold2	0.8	1.0	10	2.5	10
	2SK2417	250	7.5	30	TO-220NIS	0.42	0.5	10	3.5	20
	2SK2914	250	7.5	20	TO-220AB	0.42	0.5	10	3.5	20
	2SK2508	250	13	45	TO-220NIS	0.18	0.25	10	6.5	40
2SK2598	250	13	60	TO-220FL/SM	0.18	0.25	10	6.5	40	
2SK2993	250	20	100	TO-220FL/SM	0.082	0.105	10	10	100	
2SK3994	250	20	45	TO-220NIS	0.090	0.105	10	10	45	
2SK3388	250	20	125	TFP	0.082	0.105	10	10	100	
2SK3445	250	20	125	TFP	0.09	0.105	10	10	45	
2SK2967	250	30	150	TO-3P(N)	0.048	0.068	10	15	132	
2SK2995	250	30	90	TO-3P(N)IS	0.048	0.068	10	15	132	

■ π -MOSV Series ($V_{DSS} = 400\text{ V to }700\text{ V}$)

Applications	Part Number	Absolute Maximum Ratings			Package	$R_{DS(ON)}$ (Ω)				Qg Typ. (nC)
		V_{DSS} (V)	I_D (A)	P_D (W)		Typ.	Max	V_{GS} (V)	I_D (A)	
AC 115 V switching power supplies Ballast inverters Motor controllers	2SK3498	400	1	20	PW-Mold	4.2	5.5	10	0.5	5.7
	2SK2838	400	5.5	40	TO-220FL/SM	0.84	1.2	10	3	17
	2SK2679	400	5.5	35	TO-220NIS	0.84	1.2	10	3	17
	2SK2952	400	8.5	40	TO-220NIS	0.4	0.55	10	5	34
	2SK2841	400	10	80	TO-220AB	0.4	0.55	10	5	34
	2SK2949	400	10	80	TO-220FL/SM	0.4	0.55	10	5	34
	2SK3499	400	10	80	TFP	0.4	0.55	10	5	34
	2SK3472	450	1	20	New PW-Mold	4.0	4.6	10	0.5	5
	2SK3374	450	1	20	TPS	3.7	4.6	10	5	5
	2SK4023	450	1	20	New PW-Mold2	4.0	4.6	10	0.5	5
	2SK3126	450	10	40	TO-220NIS	0.48	0.65	10	5	35
	2SK3407	450	10	40	TO-220NIS	0.48	0.65	10	5	33
	2SK3544	450	13	100	TFP	0.29	0.4	10	6	34
	2SK2998	500	0.5	0.9	LSTM	10	18	10	0.25	3.8
	2SK3302	500	0.5	1.3	TPS	10	18	10	0.25	3.8
	2SK3471	500	0.5	0.5	PW-Mini	10	18	10	0.25	3.8
	2SK2599	500	2	1.3	TPS	2.9	3.2	10	1	9
	2SK3373	500	2	20	PW-Mold	2.9	3.2	10	1	9
	2SK2862	500	3	25	TO-220NIS	2.9	3.2	10	1	9
	2SK2991	500	5	50	TO-220FL/SM	1.35	1.5	10	2.5	17
	2SK3466	500	5	50	TO-220FL/SM	1.35	1.5	10	2.5	17
	2SK2542	500	8	80	TO-220AB	0.75	0.85	10	4	30
	2SK2776	500	8	65	TO-220FL/SM	0.75	0.85	10	4	30
	2SK3538	500	8	65	TFP	0.75	0.85	10	4	30
	2SK2601	500	10	125	TO-3P(N)	0.56	1.0	10	5	30
	2SK3068	500	12	100	TO-220FL/SM	0.4	0.52	10	6	45
	2SK3398	500	12	100	TFP	0.4	0.52	10	6	45
	2SK2916	500	14	80	TO-3P(N)IS	0.35	0.4	10	7	58
	2SK2917	500	18	90	TO-3P(N)IS	0.21	0.27	10	10	80
	2SK3132	500	50	250	TO-3P(L)	0.07	0.095	10	25	280
	2SK3371	600	1	20	New PW-Mold	6.4	9.0	10	0.5	9
	2SK4026	600	1	20	New PW-Mold2	6.4	9.0	10	0.5	9
	2SK2846	600	2	1.3	TPS	4.2	5.0	10	1	9
	2SK2865	600	2	20	New PW-Mold	4.2	5.0	10	1	9
	2SK4002	600	2	20	New PW-Mold2	4.2	5.0	10	1	9
	2SK4003	600	3	20	New PW-Mold2	1.7	2.2	10	1.5	20
	2SK3975	600	3	20	New PW-Mold	1.7	2.2	10	1.5	20
	2SK3085	600	3.5	75	TO-220AB	1.7	2.2	10	1.8	20
	2SK3130	600	6	40	TO-220NIS	1.26	1.55	10	3	30
	2SK2777	600	6	65	TO-220FL/SM	0.9	1.25	10	3	30
	2SK2602	600	6	125	TO-3P(N)	0.9	1.25	10	3	30
	2SK3312	600	6	65	TO-220FL/SM	0.95	1.25	10	3	22
	2SK2996	600	10	45	TO-220NIS	0.74	1.0	10	5	38
	2SK3438	600	10	80	TFP	0.78	1.0	10	5	28
	2SK2889	600	10	100	TO-220FL/SM	0.54	0.75	10	5	45
2SK2866	600	10	125	TO-220AB	0.54	0.75	10	5	45	
2SK2699	600	12	150	TO-3P(N)	0.5	0.65	10	6	58	
2SK2953	600	15	90	TO-3P(N)IS	0.31	0.4	10	8	80	
2SK2915	600	16	150	TO-3P(N)	0.31	0.4	10	8	80	
2SK3265	700	10	45	TO-220NIS	0.72	1.0	10	5	53	
2SK3453	700	10	80	TO-3P(N)IS	0.72	1.0	10	5	53	

■ π -MOSIII Series ($V_{DSS} = 800\text{ V to }1000\text{ V}$)

Part Number	Absolute Maximum Ratings			Package	$R_{DS(ON)}$ (Ω)				Qg Typ. (nC)
	V_{DSS} (V)	I_D (A)	P_D (W)		Typ.	Max	V_{GS} (V)	I_D (A)	
2SK2603	800	3	100	TO-220AB	3.0	3.6	10	1.5	25
2SK2883	800	3	75	TO-220FL/SM	3.0	3.6	10	15	25
2SK2605	800	5	45	TO-220NIS	1.9	2.2	10	3.0	34
2SK2884	800	5	100	TO-220FL/SM	1.9	2.2	10	3.0	34
2SK2604	800	5	125	TO-3P(N)	1.9	2.2	10	3.0	34
2SK2746	800	7	150	TO-3P(N)	1.3	1.7	10	3.5	55
2SK2606	800	8	85	TO-3P(N)IS	1.0	1.2	10	4.0	68
2SK2607	800	9	150	TO-3P(N)	1.0	1.2	10	4.0	68
2SK3301	900	1	20	PW-Mold	15	20	10	0.5	6
2SK2845	900	1	40	DP	8.0	9.0	10	0.5	15
2SK2733	900	1	60	TO-220AB	8.0	9.0	10	0.5	15
2SK2608	900	3	100	TO-220AB	3.73	4.3	10	1.5	25
2SK2719	900	3	125	TO-3P(N)	3.7	4.3	10	1.5	25
2SK2610	900	5	150	TO-3P(N)	2.3	2.5	10	3.0	45
2SK2847	900	8	85	TO-3P(N)IS	1.05	1.25	10	4.0	58
2SK3017	900	8.5	90	TO-3P(N)IS	1.2	1.4	10	4.0	70
2SK2968	900	10	150	TO-3P(N)	1.05	1.25	10	4	70
2SK2613	1000	8	150	TO-3P(N)	1.4	1.7	10	8.0	65

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
2SJ200	π-MOSII	TO-3P (N)	-180	-10	0.83	—
2SJ201	π-MOSII	TO-3P (L)	-200	-12	0.63	—
2SJ304	L ² -π-MOSIV	TO-220NIS	-60	-14	0.12	—
2SJ312	L ² -π-MOSIV	TO-220FL/SM	-60	-14	0.12	—
2SJ313	π-MOSII	TO-220NIS	-180	-1	5.0	—
2SJ334	L ² -π-MOSV	TO-220NIS	-60	-30	0.038	P 18
2SJ338	π-MOSII	PW-Mold	-180	-1	5.0	—
2SJ349	L ² -π-MOSV	TO-220NIS	-60	-20	0.045	P 18
2SJ360	L ² -π-MOSV	PW-Mold	-60	-1	0.73	P 18
2SJ378	L ² -π-MOSV	TPS	-60	-5	0.19	P 18
2SJ380	L ² -π-MOSV	TO-220NIS	-100	-12	0.21	P 18
2SJ401	L ² -π-MOSV	TO-220FL/SM	-60	-20	0.045	P 18
2SJ402	L ² -π-MOSV	TO-220FL/SM	-60	-30	0.038	P 18
2SJ407	π-MOSV	TO-220NIS	-200	-5	1.0	P 19
2SJ412	L ² -π-MOSV	TO-220FL/SM	-100	-16	0.21	P 18
2SJ438	L ² -π-MOSV	TO-220NIS	-60	-5	0.19	P 18
2SJ440	π-MOSII	TO-3P (N)IS	-180	-9	0.8	—
2SJ464	L ² -π-MOSV	TO-220NIS	-100	-18	0.09	P 18
2SJ507	L ² -π-MOSV	LSTM	-60	-1	0.7	P 18
2SJ508	L ² -π-MOSV	PW-Mini	-100	-1	1.9	P 18
2SJ509	L ² -π-MOSV	LSTM	-100	-1	1.9	P 18
2SJ512	π-MOSV	TO-220NIS	-250	-5	1.25	P 19
2SJ516	π-MOSV	TO-220NIS	-250	-6.5	0.8	P 19
2SJ537	L ² -π-MOSV	LSTM	-50	-5	0.19	P 18
2SJ567	π-MOSV	New PW-Mold	-200	-2.5	2.0	P 19
2SJ610	π-MOSV	PW-Mold	-250	-2	2.55	P 19
2SJ618	π-MOSV	TO-3P (N)	-180	-10	0.37	P 19
2SJ619	L ² -π-MOSV	TFP	-100	-16	0.21	P 18
2SJ620	L ² -π-MOSV	TFP	-100	-18	0.09	P 18
2SJ668	U-MOSIII	New PW-Mold	-60	-5	0.17	P 13
2SJ669	U-MOSIII	TPS	-60	-5	0.17	P 13
2SJ676	π-MOSV	TPS	-200	-2.5	2.0	P 19
2SJ680	π-MOSV	New PW-Mold2	-200	-2.5	2.0	P 19
2SJ681	U-MOSIII	New PW-Mold2	-60	-5	0.17	P 13
2SK1119	π-MOSII.5	TO-220AB	1000	4	3.8	—
2SK1359	π-MOSII.5	TO-3P (N)	100	5	3.8	—
2SK1365	π-MOSII.5	TO-3P (N)IS	1000	7	1.8	—
2SK1381	L ² -π-MOSIII	TO-3P (N)	100	50	0.032	—
2SK1382	L ² -π-MOSIII	TO-3P (L)	100	60	0.02	—
2SK1486	π-MOSIII.5	TO-3P (L)	300	32	0.095	—
2SK1489	π-MOSIII.5	TO-3P (L)	1000	12	1.0	—
2SK1529	π-MOSII	TO-3P (N)	180	10	0.83	—
2SK1530	π-MOSII	TO-3P (N)	200	12	0.63	—
2SK1544	π-MOSIII.5	TO-3P (L)	500	25	0.2	—
2SK1930	π-MOSII.5	TO-220FL/SM	1000	4	3.8	—
2SK2013	π-MOSII	TO-220NIS	180	1	5.0	—
2SK2162	π-MOSII	PW-Mold	180	1	5.0	—
2SK2173	L ² -π-MOSV	TO-3P (N)	60	50	0.017	P 19
2SK2200	L ² -π-MOSV	TPS	100	3	0.35	P 19
2SK2201	L ² -π-MOSV	New PW-Mold	100	3	0.35	P 19

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
2SK2229	L ² -π-MOSV	TPS	60	5	0.16	P 19
2SK2232	L ² -π-MOSV	TO-220NIS	60	25	0.046	P 19
2SK2233	L ² -π-MOSV	TO-3P (N)	60	45	0.03	P 19
2SK2266	L ² -π-MOSV	TO-220FL/SM	60	45	0.03	P 19
2SK2267	L ² -π-MOSV	TO-3P (L)	60	60	0.011	P 19
2SK2274	π-MOSIL5	TO-220NIS	700	5	1.7	—
2SK2311	L ² -π-MOSV	TO-220FL/SM	60	25	0.046	P 19
2SK2313	L ² -π-MOSV	TO-3P (N)	60	60	0.011	P 19
2SK2314	L ² -π-MOSV	TO-220AB	100	27	0.085	P 19
2SK2350	π-MOSV	TO-220NIS	200	8.5	0.4	P 19
2SK2376	L ² -π-MOSV	TO-220FL/SM	60	45	0.017	P 19
2SK2381	π-MOSV	TO-220NIS	200	5	0.8	P 19
2SK2382	π-MOSV	TO-220NIS	200	15	0.18	P 19
2SK2385	L ² -π-MOSV	TO-220NIS	60	36	0.03	P 19
2SK2391	L ² -π-MOSV	TO-220NIS	100	20	0.085	P 19
2SK2398	L ² -π-MOSV	TO-3P (N)	60	45	0.03	P 19
2SK2399	L ² -π-MOSV	New PW-Mold	100	5	0.23	P 19
2SK2400	L ² -π-MOSV	TPS	100	5	0.23	P 19
2SK2401	π-MOSV	TO-220FL/SM	200	15	0.18	P 19
2SK2417	π-MOSV	TO-220NIS	250	7.5	0.5	P 19
2SK2445	L ² -π-MOSV	TO-3P (N)	60	50	0.018	P 19
2SK2467	π-MOSII	TO-3P (N)IS	180	9	0.8	—
2SK2507	L ² -π-MOSV	TO-220NIS	50	25	0.046	P 18
2SK2508	π-MOSV	TO-220NIS	250	13	0.25	P 19
2SK2542	π-MOSV	TO-220AB	500	8	0.85	P 20
2SK2550	L ² -π-MOSV	TO-3P (N)	50	45	0.03	P 18
2SK2551	L ² -π-MOSV	TO-3P (N)	50	50	0.011	P 18
2SK2598	π-MOSV	TO-220FL/SM	250	13	0.25	P 19
2SK2599	π-MOSV	TPS	500	2	3.2	P 20
2SK2601	π-MOSV	TO-3P (N)	500	10	1.0	P 20
2SK2602	π-MOSV	TO-3P (N)	600	6	1.25	P 20
2SK2603	π-MOSIII	TO-220AB	800	3	3.6	P 20
2SK2604	π-MOSIII	TO-3P (N)	800	5	2.2	P 20
2SK2605	π-MOSIII	TO-220NIS	800	5	2.2	P 20
2SK2606	π-MOSIII	TO-3P (N)IS	800	8	1.2	P 20
2SK2607	π-MOSIII	TO-3P (N)	800	9	1.2	P 20
2SK2608	π-MOSIII	TO-220AB	900	3	4.3	P 20
2SK2610	π-MOSIII	TO-3P (N)	900	5	2.5	P 20
2SK2613	π-MOSIII	TO-3P (N)	1000	8	1.7	P 20
2SK2614	L ² -π-MOSV	DP	50	20	0.046	P 18
2SK2615	L ² -π-MOSV	PW-Mini	60	2	0.3	P 19
2SK2679	π-MOSV	TO-220NIS	400	5.5	1.2	P 20
2SK2699	π-MOSV	TO-3P (N)	600	12	0.65	P 20
2SK2719	π-MOSIII	TO-3P (N)	900	3	4.3	P 20
2SK2733	U-MOSIII	TO-220AB	900	1	9.0	P 20
2SK2744	L ² -π-MOSV	TO-3P (N)	50	45	0.02	P 18
2SK2745	L ² -π-MOSV	TO-3P (N)	50	50	0.0095	P 18
2SK2776	π-MOSV	TO-220FL/SM	500	8	0.85	P 20
2SK2777	π-MOSV	TO-220FL/SM	600	6	1.25	P 20
2SK2782	L ² -π-MOSV	DP	60	20	0.055	P 19

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
2SK2789	L ² - π -MOSV	TO-220FL/SM	100	27	0.085	P 19
2SK2835	π -MOSV	TPS	200	5	0.8	P 19
2SK2838	π -MOSV	TO-220FL/SM	400	5.5	1.2	P 20
2SK2841	π -MOSV	TO-220AB	400	10	0.55	P 20
2SK2845	π -MOSIII	DP	900	1	9.0	P 20
2SK2846	π -MOSV	TPS	600	2	5.0	P 20
2SK2847	π -MOSIII	TO-3P (N)IS	900	8	1.4	P 20
2SK2862	π -MOSV	TO-220NIS	500	3	3.2	P 20
2SK2865	π -MOSV	New PW-Mold	600	2	5.0	P 20
2SK2866	π -MOSV	TO-220AB	600	10	0.75	P 20
2SK2882	π -MOSV	TO-220NIS	150	18	0.12	P 19
2SK2883	π -MOSIII	TO-220FL/SM	800	3	3.6	P 20
2SK2884	π -MOSIII	TO-220FL/SM	800	5	2.2	P 20
2SK2886	L ² - π -MOSV	TO-220NIS	50	45	0.02	P 18
2SK2889	π -MOSV	TO-220FL/SM	600	10	0.75	P 20
2SK2914	π -MOSV	TO-220AB	250	7.5	0.5	P 19
2SK2915	π -MOSV	TO-3P (N)	600	16	0.4	P 20
2SK2916	π -MOSV	TO-3P (N)IS	500	14	0.4	P 20
2SK2917	π -MOSV	TO-3P (N)IS	500	18	0.27	P 20
2SK2920	π -MOSV	New PW-Mold	200	5	0.8	P 19
2SK2949	π -MOSV	TO-220FL/SM	400	10	0.55	P 20
2SK2952	π -MOSV	TO-220NIS	400	8.5	0.55	P 20
2SK2953	π -MOSV	TO-3P (N)IS	600	15	0.4	P 20
2SK2961	L ² - π -MOSV	LSTM	60	2	0.27	P 19
2SK2962	L ² - π -MOSV	LSTM	100	1	0.7	P 19
2SK2963	L ² - π -MOSV	PW-Mini	100	1	0.7	P 19
2SK2965	π -MOSV	TO-220NIS	200	11	0.26	P 19
2SK2967	π -MOSV	TO-3P (N)	250	30	0.068	P 19
2SK2968	π -MOSIII	TO-3P (N)	900	10	1.25	P 20
2SK2989	L ² - π -MOSV	LSTM	50	5	0.15	P 18
2SK2991	π -MOSV	TO-220FL/SM	500	5	1.5	P 20
2SK2992	π -MOSV	PW-Mini	200	1	3.5	P 19
2SK2993	π -MOSV	TO-220FL/SM	250	20	0.105	P 19
2SK2995	π -MOSV	TO-3P (N)IS	250	30	0.068	P 19
2SK2996	π -MOSV	TO-220NIS	600	10	1.0	P 20
2SK2998	π -MOSV	LSTM	500	0.5	18	P 20
2SK3017	π -MOSIII	TO-3P (N)IS	900	8.5	1.25	P 20
2SK3051	L ² - π -MOSV	TO-220FL/SM	50	45	0.03	P 18
2SK3068	π -MOSV	TO-220FL/SM	500	12	0.52	P 20
2SK3085	π -MOSV	TO-220AB	600	3.5	2.2	P 20
2SK3126	π -MOSV	TO-220NIS	450	10	0.65	P 20
2SK3129	π -MOSV	TO-3P (N)	50	60	0.007	P 18
2SK3130	π -MOSV	TO-220NIS	600	6	1.55	P 20
2SK3131	π -MOSV (HSD)	TO-3P (L)	500	50	0.11	P 16
2SK3132	π -MOSV	TO-3P (L)	500	50	0.095	P 20
2SK3176	π -MOSV	TO-3P (N)	200	30	0.052	P 19
2SK3205	π -MOSV	PW-Mold	150	5	0.5	P 19
2SK3265	π -MOSV	TO-220NIS	700	10	1.0	P 20
2SK3301	π -MOSIII	PW-Mold	900	1	20	P 20
2SK3302	π -MOSV	TPS	500	0.5	18	P 20

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
2SK3309	MACH	TO-220FL/SM	450	10	0.65	P 17
2SK3310	MACH	TO-220NIS	450	10	0.65	P 17
2SK3312	π -MOSV	TO-220FL/SM	600	6	1.25	P17*20
2SK3313	π -MOSV (HSD)	TO-220NIS	500	12	0.62	P 16
2SK3314	π -MOSV (HSD)	TO-3P (N)	500	15	0.49	P 16
2SK3342	π -MOSV	New PW-Mold	250	4.5	1.0	P 19
2SK3371	π -MOSV	New PW-Mold	600	1	9.0	P 20
2SK3373	π -MOSV	New PW-Mold	500	2	3.2	P 20
2SK3374	π -MOSV	TPS	450	1	4.6	P 20
2SK3387	L ² - π -MOSV	TFP	150	18	0.12	P 19
2SK3388	π -MOSV	TFP	250	20	0.105	P 19
2SK3398	π -MOSV	TFP	500	12	0.52	P 20
2SK3399	MACH	TO-220FL/SM	600	10	0.75	P 17
2SK3403	MACH	TO-220FL/SM	450	13	0.4	P 17
2SK3407	π -MOSV	TO-220NIS	450	10	0.65	P 20
2SK3417	π -MOSV (HSD)	TO-220FL/SM	500	5	1.8	P 17
2SK3437	MACH	TO-220FL/SM	600	10	1.0	P 17
2SK3438	π -MOSV	TFP	600	10	1.0	P 20
2SK3443	π -MOSV	TFP	150	30	0.055	P 19
2SK3444	π -MOSV	TFP	200	25	0.082	P 19
2SK3445	π -MOSV	TFP	250	20	0.105	P 19
2SK3453	π -MOSIV	TO-3P (N)IS	700	10	1.0	P 20
2SK3462	π -MOSV	New PW-Mold	250	3	1.7	P 19
2SK3466	π -MOSV	TFP	500	5	1.5	P 20
2SK3471	π -MOSV	PW-Mini	500	0.5	18	P 20
2SK3472	π -MOSV	PW-Mold	450	1	4.6	P 20
2SK3473	π -MOSIV	TO-3P (N)	900	9	1.6	P 18
2SK3497	π -MOSV	TO-3P (N)	180	10	0.15	P 19
2SK3498	π -MOSV	PW-Mold	400	1	5.5	P 20
2SK3499	π -MOSV	TFP	400	10	0.55	P 20
2SK3506	π -MOSVI	TO-3P (N)	30	45	0.02	P 18
2SK3538	π -MOSV	TFP	500	8	0.85	P 20
2SK3544	π -MOSV	TFP	450	13	0.4	P 20
2SK3561	π -MOSVI	TO-220SIS	500	8	0.85	P 18
2SK3562	π -MOSVI	TO-220SIS	600	6	1.25	P 18
2SK3563	π -MOSVI	TO-220SIS	500	5	1.5	P 18
2SK3564	π -MOSIV	TO-220SIS	900	3	4.3	P 18
2SK3565	π -MOSIV	TO-220SIS	900	5	2.5	P 18
2SK3566	π -MOSIV	TO-220SIS	900	2.5	6.4	P 18
2SK3567	π -MOSVI	TO-220SIS	600	3.5	2.2	P 18
2SK3568	π -MOSVI	TO-220SIS	500	12	0.52	P 18
2SK3569	π -MOSVI	TO-220SIS	600	10	0.75	P 18
2SK3625	π -MOSV	TO-220FL/SM	200	25	0.082	P 19
2SK3633	π -MOSIV	TO-3P (N)	800	7	1.7	P 18
2SK3662	U-MOSIII	TO-220NIS	60	35	0.0125	P 13
2SK3667	π -MOSVI	TO-220SIS	600	7.5	1.0	P 18
2SK3669	π -MOSVII	New PW-Mold	100	10	0.125	-
2SK3670	π -MOSV	LSTM	150	0.67	1.7	P 19
2SK3700	π -MOSIV	TO-3P (N)	900	5	2.5	P 18
2SK3742	π -MOSIV	TO-220SIS	900	5	2.5	P 18

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
2SK3743	MACH	TO-220NIS	450	13	0.6	P 17
2SK3754	U-MOSIII	TO-220NIS	30	5	0.089	P 12
2SK3757	π -MOSVI	TO-220SIS	450	2	2.45	P 18
2SK3766	π -MOSVI	TO-220SIS	450	2	2.45	P 18
2SK3767	π -MOSVI	TO-220SIS	600	2	4.5	P 18
2SK3797	π -MOSVI	TO-220SIS	600	13	0.43	P 18
2SK3798	π -MOSIV	TO-220SIS	900	4	3.5	P 18
2SK3799	π -MOSIV	TO-220SIS	900	8	1.3	P 18
2SK3842	U-MOSIII	TFP	60	75	0.0058	P 13
2SK3843	U-MOSIII	TFP	40	75	0.0035	P 13
2SK3844	U-MOSIII	TO-220NIS	60	45	0.0058	P 13
2SK3845	U-MOSIII	TO-3P (N)	60	70	0.0058	P 13
2SK3846	U-MOSIII	TO-220NIS	40	26	0.018	P 13
2SK3847	U-MOSIII	TO-220SM	40	26	0.018	P 13
2SK3863	π -MOSVI	DP	500	5	1.5	P 18
2SK3868	π -MOSVI (HSD)	TO-220SIS	500	5	1.7	P 17
2SK3869	π -MOSVI	TO-220SIS	450	10	0.68	P 18
2SK3878	π -MOSIV	TO-3P (N)	900	9	1.3	P 18
2SK3879	π -MOSIV	TO-220FL/SM	800	6.5	1.7	P 18
2SK3880	π -MOSIV	TO-3P (N)JS	800	6.5	1.7	P 18
2SK3903	π -MOSVI	TO-3P (N)	600	14	0.44	P 18
2SK3904	π -MOSVI	TO-3P (N)	450	19	0.26	P 18
2SK3905	π -MOSVI	TO-3P (N)	500	17	0.31	P 18
2SK3906	MACH (HSD)	TO-3P (N)	600	20	0.33	P 17
2SK3907	MACH	TO-3P (N)	500	23	0.23	P 17
2SK3911	MACH	TO-3P (N)	600	20	0.32	P 17
2SK3934	π -MOSVI	TO-220SIS	500	15	0.3	P 18
2SK3935	π -MOSVI	TO-220SIS	450	17	0.25	P 18
2SK3936	MACH (HSD)	TO-3P (N)	500	23	0.25	P 17
2SK3947	π -MOSVI (HSD)	TO-220SIS	600	6	1.4	P 17
2SK3975	π -MOSV	New PW-Mold	600	3	2.2	P 20
2SK3994	π -MOSV	TO-220NIS	250	20	0.105	P 19
2SK4002	π -MOSV	New PW-Mold2	600	2	5	P 20
2SK4003	π -MOSV	New PW-Mold2	600	3	2.2	P 20
2SK4012	π -MOSVI	TO-220SIS	500	13	0.4	P 18
2SK4013	π -MOSIV	TO-220SIS	800	6	1.7	P 18
2SK4014	π -MOSIV	TO-220SIS	900	6	2.0	P 17
2SK4015	π -MOSVI (HSD)	TO-220SIS	600	10	0.86	P 17
2SK4016	π -MOSVI (HSD)	TO-220SIS	600	13	0.5	P 17
2SK4017	U-MOSIII	New PW-Mold2	60	5	0.1	P 13
2SK4018	L ² - π -MOSV	New PW-Mold2	100	3	0.35	P 19
2SK4019	L ² - π -MOSV	New PW-Mold2	100	5	0.23	P 19
2SK4020	π -MOSV	New PW-Mold2	200	5	0.8	P 19
2SK4021	π -MOSV	New PW-Mold2	250	4.5	1	P 19
2SK4022	π -MOSV	New PW-Mold2	250	3	1.7	P 19
2SK4023	π -MOSV	New PW-Mold2	450	1	4.6	P 20
2SK4026	π -MOSV	New PW-Mold2	600	1	9	P 20
2SK4033	U-MOSIII	New PW-Mold	60	5	0.1	P 13
2SK4034	U-MOSIII	TFP	60	75	0.0058	P 13
2SK4042	π -MOSVI (HSD)	TO-220SIS	500	8	0.97	P 17

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
2SK4103	π -MOSVI	New PW-Mold	500	5	1.5	P 18
2SK4107	π -MOSVI	TO-3P (N)	500	15	0.4	P 18
2SK4108	π -MOSVI	TO-3P (N)	500	20	0.27	P 18
2SK4115	π -MOSIV	TO-3P (N)	900	7	2	P 18
2SK4207	π -MOSIV	TO-3P(N)	900	13	0.95	P 18
TK6A60D	π -MOSVII	TO-220SIS	600	6	1.25	P 15
TK8A50D	π -MOSVII	TO-220SIS	500	8	0.85	P 15
TK10A60D	π -MOSVII	TO-220SIS	600	10	0.75	P 15
TK12A50D	π -MOSVII	TO-220SIS	500	12	0.52	P 15
TK12A60U	DTMOSII	TO-220SIS	600	12	0.4	P 16
TK12D60U	DTMOSII	TO-220(W)	600	12	0.4	P 16
TK12J60U	DTMOSII	TO-3P (N)	600	12	0.4	P 16
TK13A60D	π -MOSVII	TO-220SIS	600	13	0.43	P 15
TK15A50D	π -MOSVII	TO-220SIS	500	15	0.3	P 15
TK15A60U	DTMOSII	TO-220SIS	600	15	0.3	P 16
TK15D60U	DTMOSII	TO-220(W)	600	15	0.3	P 16
TK15J60T	DTMOSI	TO-3P (N)	600	15	0.28	P 16
TK15J60U	DTMOSII	TO-3P (N)	600	15	0.3	P 16
TK20A60T	DTMOSI	TO-220SIS	600	20	0.19	P 16
TK20A60U	DTMOSII	TO-220SIS	600	20	0.19	P 16
TK20D60T	DTMOSI	TO-220 (W)	600	20	0.19	P 16
TK20D60U	DTMOSII	TO-220 (W)	600	20	0.19	P 16
TK20J60T	DTMOSI	TO-3P (N)	600	20	0.19	P 16
TK20J60U	DTMOSII	TO-3P (N)	600	20	0.19	P 16
TK30A06J3A	U-MOSIII	TO-220SIS	60	30	0.026	P 13
TK40A10J1	U-MOSIII-H	TO-220SIS	100	40	0.015	P 14
TK40D10J1	U-MOSIII-H	TO-220 (W)	100	40	0.015	P 14
TK40J60T	DTMOSI	TO-3P (N)	600	40	0.08	P 16
TK50X15J1	U-MOSIII-H	TFP	150	50	0.03	P 14
TK50F15J1	U-MOSIII	TO-220SM(W)	150	50	0.03	P 12
TK55A10J1	U-MOSIII-H	TO-220SIS	100	55	0.0105	P 14
TK55D10J1	U-MOSIII-H	TO-220 (W)	100	55	0.0105	P 14
TK60A08J1	U-MOSIII-H	TO-220SIS	75	60	0.0078	P 14
TK60D08J1	U-MOSIII-H	TO-220 (W)	75	60	0.0078	P 14
TK70A06J1	U-MOSIII-H	TO-220SIS	60	70	0.0064	P 14
TK70D06J1	U-MOSIII-H	TO-220 (W)	60	70	0.0064	P 14
TK70J04J3	U-MOSIII	TO-3P (N)	40	70	0.0038	P 13
TK80A08K3	U-MOSIV	TO-220SIS	75	80	0.0045	P 14
TK80D08K3	U-MOSIV	TO-220 (W)	75	80	0.0045	P 14
TK100F04K3	U-MOSIV	TO-220SM(W)	40	100	0.003	P 12
TK100F06K3	U-MOSIV	TO-220SM(W)	60	100	0.005	P 12
TK130F06K3	U-MOSIV	TO-220SM(W)	60	130	0.0034	P 12
TK150F04K3	U-MOSIV	TO-220SM(W)	40	150	0.0021	P 12
TPC6003	U-MOSIII	VS-6	30	6	0.024	P 8
TPC6004	U-MOSIII	VS-6	20	6	0.024	P 8
TPC6005	U-MOSIII	VS-6	30	6	0.028	P 8
TPC6006-H	U-MOSIII-H	VS-6	40	3.9	0.075	P 8
TPC6007-H	U-MOSIII-H	VS-6	30	5	0.054	P 8
TPC6103	U-MOSIII	VS-6	-12	-5.5	0.035	P 8
TPC6104	U-MOSIII	VS-6	-20	-5.5	0.04	P 8

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
TPC6105	U-MOSIII	VS-6	-20	-2.7	0.11	P 8
TPC6107	U-MOSIV	VS-6	-20	-4.5	0.055	P 8
TPC6108	U-MOSIV	VS-6	-30	-4.5	0.06	P 8
TPC6109-H	U-MOSIII-H	VS-6	-30	-5	0.059	P 8
TPC6201	U-MOSII	VS-6	30	2.5	0.095	—
TPC8012-H	π -MOSV	SOP-8	200	1.8	0.4	P 10
TPC8014	U-MOSIII	SOP-8	30	11	0.014	P 10
TPC8017-H	U-MOSIII-H	SOP-8	30	15	0.0066	P 10
TPC8018-H	U-MOSIII-H	SOP-8	30	18	0.0046	P 10
TPC8020-H	U-MOSIII-H	SOP-8	30	13	0.009	P 10
TPC8021-H	U-MOSIII-H	SOP-8	30	11	0.017	P 10
TPC8022-H	U-MOSIII-H	SOP-8	40	7.5	0.027	P 10
TPC8025	U-MOSIV	SOP-8	30	11	0.009	P 10
TPC8026	U-MOSIV	SOP-8	30	13	0.0066	P 10
TPC8027	U-MOSIV	SOP-8	30	18	0.0027	P 10
TPC8028	U-MOSIV	SOP-8	30	18	0.0043	P 10
TPC8029	U-MOSIV	SOP-8	30	18	0.0038	P 10
TPC8030	U-MOSIV	SOP-8	30	11	0.0095	P 10
TPC8031-H	U-MOSV-H	SOP-8	30	11	0.0133	P 10
TPC8032-H	U-MOSIV-H	SOP-8	30	15	0.0065	P 10
TPC8033-H	U-MOSIV-H	SOP-8	30	17	0.0053	P 10
TPC8034-H	U-MOSIV-H	SOP-8	30	18	0.0035	P 10
TPC8107	U-MOSIII	SOP-8	-30	-13	0.007	P 10
TPC8109	U-MOSIII	SOP-8	-30	-10	0.02	P 10
TPC8110	U-MOSIII	SOP-8	-40	-8	0.025	P 10
TPC8111	U-MOSIV	SOP-8	-30	-11	0.012	P 10
TPC8112	U-MOSIII	SOP-8	-30	-13	0.006	P 10
TPC8113	U-MOSIV	SOP-8	-30	-11	0.01	P 10
TPC8114	U-MOSIV	SOP-8	-30	-18	0.0045	P 10
TPC8115	U-MOSIV	SOP-8	-20	-10	0.01	P 10
TPC8116-H	U-MOSIII-H	SOP-8	-40	-7.5	0.03	P 10
TPC8117	U-MOSV	SOP-8	-30	-18	0.0039	P 10
TPC8118	U-MOSV	SOP-8	30	13	0.007	P 10
TPC8207	U-MOSIII	SOP-8	20	6	0.02	P 10
TPC8208	U-MOSIII	SOP-8	20	5	0.05	P 10
TPC8210	U-MOSIII	SOP-8	30	8	0.015	P 10
TPC8211	U-MOSIII	SOP-8	30	5.5	0.036	P 10
TPC8212-H	U-MOSIII-H	SOP-8	30	6	0.021	P 10
TPC8213-H	U-MOSIII-H	SOP-8	60	5	0.050	P 10
TPC8214-H	U-MOSIII-H	SOP-8	100	2.2	0.180	P 10
TPC8405	U-MOSIV/U-MOSIII	SOP-8	-30/30	-4.5/6	0.033/0.026	P 10
TPC8406-H	U-MOSIII-H	SOP-8	40	6.5	0.027	P 10
	U-MOSIII-H	SOP-8	-40	-6.5	0.030	P 10
TPC8A01	High-speed U-MOSIII	SOP-8	30	6	0.025	P 10
	U-MOSIII	SOP-8	30	8.5/1	0.018	P 10
TPC8A02-H	U-MOSIII-H	SOP-8	30	16/1	0.0056	P 10
TPC8A03-H	U-MOSV-H	SOP-8	30	17/1	0.0056	P 10
TPCA8003-H	U-MOSIII-H	SOP Advance	30	35	0.0066	P 11
TPCA8004-H	U-MOSIII-H	SOP Advance	30	40	0.0046	P 11
TPCA8005-H	U-MOSIII-H	SOP Advance	30	27	0.009	P 11

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
TPCA8006-H	π -MOSVII	SOP Advance	100	18	0.067	P 11
TPCA8008-H	π -MOSV	SOP Advance	250	4	0.58	P 11
TPCA8009-H	π -MOSV	SOP Advance	150	7	0.35	P 11
TPCA8010-H	π -MOSV	SOP Advance	200	5.5	0.45	P 11
TPCA8011-H	U-MOSIII-H	SOP Advance	20	40	0.0035	P 11
TPCA8012-H	U-MOSV-H	SOP Advance	30	35	0.0049	P 11
TPCA8014-H	U-MOSIII-H	SOP Advance	40	30	0.009	P 11
TPCA8015-H	U-MOSIII-H	SOP Advance	40	35	0.0054	P 11
TPCA8016-H	U-MOSIII-H	SOP Advance	60	25	0.021	P 11
TPCA8018-H	U-MOSV-H	SOP Advance	30	27	0.0062	P 11
TPCA8019-H	U-MOSV-H	SOP Advance	30	40	0.0031	P 11
TPCA8020-H	U-MOSIII-H	SOP Advance	40	7.5	0.027	P 11
TPCA8022-H	U-MOSIII-H	SOP Advance	100	22	0.026	P 11
TPCA8023-H	U-MOSV-H	SOP Advance	30	21	0.0129	P 11
TPCA8024	U-MOSIV	SOP Advance	30	35	0.0043	P 11
TPCA8025	U-MOSIV	SOP Advance	30	40	0.0036	P 11
TPCA8026	U-MOSIV	SOP Advance	30	45	0.0022	P 11
TPCA8027-H	U-MOSIII	SOP Advance	40	30	0.010	P 11
TPCA8028-H	U-MOSVI-H	SOP Advance	30	50	0.0028	P 11
TPCA8101	U-MOSIII	SOP Advance	-30	-40	0.007	—
TPCA8102	U-MOSIII	SOP Advance	-30	-40	0.006	P 11
TPCA8103	U-MOSIV	SOP Advance	-30	-40	0.0042	P 11
TPCA8104	U-MOSIII	SOP Advance	-60	-40	0.016	P 11•13
TPCA8105	U-MOSIII	SOP Advance	-12	-6	0.0033	P 11
TPCA8106	U-MOSV	SOP Advance	-30	-40	0.0037	P 11
TPCA8107-H	U-MOSIII-H	SOP Advance	-40	-7.5	0.030	P 11
TPCA8108	U-MOSIII	SOP Advance	-40	-40	0.0095	P 11
TPCA8A01-H	U-MOSIII-H	SOP Advance	30	36	0.0056	P 11
TPCA8A02-H	U-MOSV-H	SOP Advance	30	34	0.0053	P 11
TPCM8001-H	U-MOSIII-H	TSSOP Advance	30	20	0.0095	P 9
TPCM8002-H	U-MOSV-H	TSSOP Advance	30	30	0.0062	P 9
TPCM8003-H	U-MOSV-H	TSSOP Advance	30	21	0.0129	P 9
TPCS8004	π -MOSV	TSSOP-8	200	1.3	0.8	P 9
TPCS8007-H	π -MOSV	TSSOP-8	200	1.9	0.45	P 9
TPCS8008-H	π -MOSV	TSSOP-8	250	1.7	0.58	P 9
TPCS8009-H	π -MOSV	TSSOP-8	150	2.1	0.35	P 9
TPCS8104	U-MOSIV	TSSOP-8	-30	-11	0.012	P 9
TPCS8105	U-MOSIV	TSSOP-8	-30	-11	0.0135	P 9
TPCS8204	U-MOSIII	TSSOP-8	20	6	0.017	P 9
TPCS8208	U-MOSIII	TSSOP-8	20	6	0.017	P 9
TPCS8209	U-MOSIII	TSSOP-8	20	5	0.03	P 9
TPCS8210	U-MOSIII	TSSOP-8	20	5	0.03	P 9
TPCS8211	U-MOSIII	TSSOP-8	20	6	0.024	P 9
TPCS8212	U-MOSIII	TSSOP-8	20	6	0.024	P 9
TPCS8213	U-MOSIV	TSSOP-8	20	6	0.013	P 9
TPCS8214	U-MOSIV	TSSOP-8	30	6	0.0135	P 9
TPCS8302	U-MOSIII	TSSOP-8	-20	-5	0.0035	P 9
TPCS8303	U-MOSIV	TSSOP-8	-20	-5	0.021	P 9
TPCF8001	U-MOSIII	VS-8	30	7	0.023	P 8
TPCF8101	U-MOSIII	VS-8	-12	-6	0.028	P 8

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
TPCF8102	U-MOSIII	VS-8	-20	-6	0.03	P 8
TPCF8103	U-MOSIII	VS-8	-20	-2.7	0.11	P 8
TPCF8104	U-MOSIII	VS-8	-30	-6	0.028	P 8
TPCF8201	U-MOSIII	VS-8	20	3	0.049	P 8
TPCF8301	U-MOSIII	VS-8	-20	-2.7	0.11	P 8
TPCF8302	U-MOSIII	VS-8	-20	-3	0.059	P 8
TPCF8303	U-MOSIII	VS-8	-20	-3	0.058	P 8
TPCF8304	U-MOSIV	VS-8	-30	-3.2	0.072	P 8
TPCF8402	U-MOSIII	VS-8	-30/30	-3.2/4	0.072/0.05	P 8
TPCF8A01	U-MOSIII	VS-8	20	3	0.049	P 8
TPCF8B01	U-MOSIII	VS-8	-20	-2.7	0.11	P 8
TPCP8001-H	U-MOSIII-H	PS-8	30	7.2	0.016	P 8
TPCP8002	U-MOSIV	PS-8	20	9.1	0.01	P 8
TPCP8003-H	U-MOSIII-H	PS-8	100	2.2	0.19	P 8
TPCP8004	U-MOSIV	PS-8	30	8.3	0.009	P 8
TPCP8005-H	U-MOSV-H	PS-8	30	11	0.0133	P 8

Part Number	Series	Package	Main Characteristics			Page
			V _{DSS} (V)	I _D (A)	R _{DS(ON)} Max (Ω)	
TPCP8101	U-MOSIII	PS-8	-20	-5.6	0.030	P 8
TPCP8102	U-MOSIV	PS-8	-20	-7.6	0.018	P 8
TPCP8103-H	U-MOSIII-H	PS-8	-40	-4.8	0.040	P 8
TPCP8201	U-MOSIII	PS-8	30	4.2	0.05	P 8
TPCP8202	U-MOSIV	PS-8	30	5.5	0.023	P 8
TPCP8203	U-MOSIII	PS-8	40	4.7	0.04	P 8
TPCP8301	U-MOSIV	PS-8	-20	-5	0.031	P 8
TPCP8302	U-MOSIV	PS-8	-20	-5	0.033	P 8
TPCP8401	U-MOSIII	PS-8	-12/20	-5.5/0.1	0.038/3	P 8
TPCP8402	U-MOSIII	PS-8	-30/30	-3.4/4.2	0.048/0.072	P 8
TPCP8403	U-MOSIV/U-MOSIII	PS-8	-40/40	-3.4/4.7	0.170/0.040	P 8
TPCP8J01	U-MOSIV	PS-8	-32/50	-6/0.1	0.035	P 8
TPCT4201	U-MOSIII	STP	20	6	0.031	P 9
TPCT4202	U-MOSIII	STP	30	6	0.038	P 9
TPCT4203	U-MOSIV	STP2	20	6	0.031	P 9
TPCT4204	U-MOSIV	STP2	30	6	0.038	P 9

6

End-of-Life and Obsolete Product List

1. End-of-Life Products

The part numbers in the left-hand column below are end-of-life, final-phase or obsolete products. When ordering, please choose from among the recommended products in the right-hand column.

End-of-Life Products					Replacement Products				
Part Number	Electrical Characteristics			Package	Part Number	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)	
2SJ465	-16	-2	0.71	PW-Mini	TPC6105	-20	-2.7	0.11	VS-6
2SJ511	-30	-2	0.76	PW-Mini	TPC6108	-30	-4.5	0.006	VS-6
2SJ525	-30	-5	0.12	TPS	TPCF8104	-30	-6	0.028	VS-8
2SK1120	1000	8	1.8	TO-3P(N)	2SK2613	1000	8	1.7	TO-3P(N)
2SK2312	60	45	0.017	TO-220NIS	2SK3844	60	45	0.0058	TO-220NIS
2SK2466	100	30	0.046	TO-220NIS	TK55D10J1	100	55	0.0105	TO-220(W)
2SK2543	500	8	0.85	TO-220NIS	2SK3561	500	8	0.85	TO-220SIS
2SK2544	600	6	1.25	TO-220AB	2SK3761	600	6	1.25	TO-220AB
2SK2545	600	6	1.25	TO-220NIS	2SK3562	600	6	1.25	TO-220SIS
2SK2549	16	2	0.29	PW-Mini	TPC6004	20	6	0.024	VS-6
2SK2611	900	9	1.4	TO-3P(N)	2SK3878	900	9	1.3	TO-3P(N)
2SK2661	500	5	1.5	TO-220AB	2SK3758	500	5	1.5	TO-220AB
2SK2662	500	5	1.5	TO-220NIS	2SK3563	500	5	1.5	TO-220SIS
2SK2698	500	15	0.4	TO-3P(N)	2SK4107	500	15	0.4	TO-3P(N)

End-of-Life Products					Replacement Products				
Part Number	Electrical Characteristics			Package	Part Number	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)	
2SK2700	900	3	4.3	TO-220NIS	2SK3564	900	3	4.3	TO-220SIS
2SK2717	900	5	2.5	TO-220NIS	2SK3565	900	5	2.5	TO-220SIS
2SK2718	900	2.5	6.4	TO-220NIS	2SK3566	900	2.5	6.4	TO-220SIS
2SK2746	800	7	1.7	TO-3P(N)	2SK3633	800	7	1.7	TO-3P(N)
2SK2749	900	7	2.0	TO-3P(N)	2SK4115	900	7	2.0	TO-3P(N)
2SK2750	600	3.5	2.2	TO-220NIS	2SK3567	600	3.5	2.2	TO-220SIS
2SK2837	500	20	0.27	TO-3P(N)	2SK4108	500	20	0.27	TO-3P(N)
2SK2842	500	12	0.52	TO-220NIS	2SK3568	500	12	0.52	TO-220SIS
2SK2843	600	10	0.75	TO-220NIS	2SK3569	600	10	0.75	TO-220SIS
2SK2844	30	35	0.02	TO-220AB	TK70D06J1	60	70	0.0064	TO-220(W)
2SK2964	30	2	0.18	PW-Mini	TPC6003	30	6	0.024	VS-6
2SK3067	600	2	5.0	TO-220NIS	2SK3767	600	2	4.5	TO-220SIS
2SK3084	100	30	0.046	TO-220FL/SM	—	—	—	—	—
2SK3089	30	40	0.03	TO-220FL/SM	2SK3847	40	32	0.018	TO-220SM
2SK3090	30	45	0.02	TO-220FL/SM	2SK3847	40	32	0.018	TO-220SM
2SK3125	30	70	0.007	TO-3PSM	2SK3843	40	75	0.0035	TFP
2SK3127	30	45	0.012	TO-220FL/SM	2SK3847	40	32	0.018	TO-220SM
2SK3128	30	60	0.012	TO-3P(N)	2SK3843	40	75	0.0035	TFP
2SK3236	60	35	0.02	TO-220NIS	2SK3662	60	35	0.0125	TO-220NIS
2SK3316	500	5	1.8	TO-220NIS	2SK3868	500	5	1.7	TO-220NIS
2SK3389	30	75	0.005	TFP	2SK3843	40	75	0.008	TFP
2SK3397	30	75	0.006	TFP	2SK3843	40	75	0.0035	TFP
2SK3439	30	75	0.005	TFP	2SK3843	40	75	0.0035	TFP
2SK3440	60	50	0.008	TFP	2SK3842	60	75	0.0058	TFP
2SK3441	60	75	0.0058	TFP	2SK4034	60	75	0.0058	TFP
2SK3442	100	45	0.02	TFP	TK40D10J1	100	40	0.015	TO-220(W)
2SK3543	450	2	2.45	TO-220NIS	2SK3757	450	2	2.45	TO-220SIS
TPC6106	-40	-3.9	0.08	VS-6	—	—	—	—	—
TPC6201	30	2.5	0.095	VS-6	TPCP8202	30	5.5	0.023	PS-8
TPC8301	-30	-3.5	0.12	SOP-8	TPCF8304	-30	3.2	0.105	SOP-8
TPC8303	-30	-4.5	0.035	SOP-8	—	—	—	—	—

2. Final-Phase Products

Part Number	Replacement Product
2SJ239*	2SJ681
2SJ239**	2SJ668
2SJ377*	2SJ681
2SJ377**	2SJ668
2SK851	2SK2967
2SK940	2SK2961
2SK1347	2SK2314
2SK1349	2SK2391
2SK1357	2SK3700
2SK1643	2SK3565
2SK1652	2SK4107
2SK1720	2SK2266
2SK1854	2SK2952
2SK1856	2SK4107
2SK1864	2SK2776
2SK1882	2SK2232
2SK1915	2SK2777
2SK1928	2SK2789
2SK1997	2SK2385
2SK1998	2SK2233

Part Number	Replacement Product
2SK2231*	2SK4017
2SK2231**	2SK4033
2SK2235	2SK3462
2SK2387	2SK2542
2SK2741	2SK4033
2SK2742	2SK2201
2SK2836	2SK3371
2SK2839	TPCF8001
2SK2985	2SK3844
2SK2986	2SK3842
2SK2987	2SK3845
TPC6001	TPC6004
TPC6002	TPC6003
TPC6101	TPC6107
TPC6102	TPC6108
TPC6201	TPCP8202
TPC8003	TPC8017-H
TPC8004	TPC8014
TPC8006-H	TPC8022-H
TPC8009-H	TPC8020-H

Part Number	Replacement Product
TPC8010-H	TPC8021-H
TPC8013-H	TPC8017-H
TPC8015-H	TPC8020-H
TPC8016-H	TPC8018-H
TPC8104-H	TPCS8015
TPC8105-H	TPC8116-H
TPC8108	TPC8111
TPC8203	TPC8212-H
TPC8206	TPC8213-H
TPC8302	TPCP8301
TPC8305	TPCS8303
TPC8401	TPC8405
TPC8402	TPC8405
TPC8403	TPC8405
TPCS8101	TPCS8105
TPCS8102	TPCP8101
TPCS8205	TPCS8210

*: Straight lead **: SMD

3. Obsolete Products

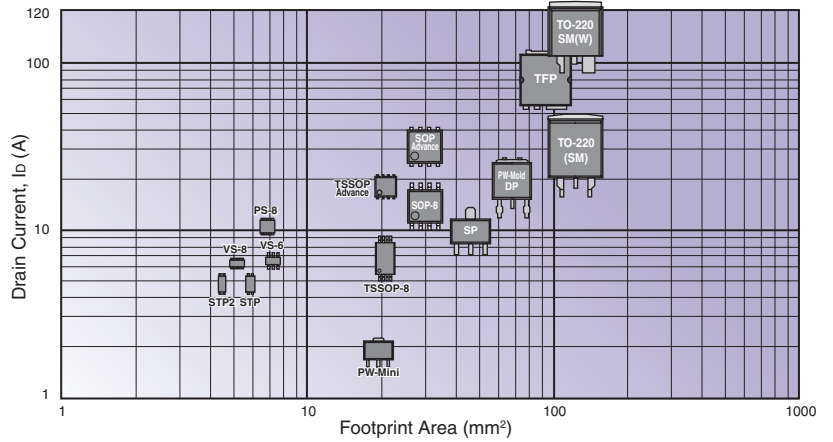
Part Number	Replacement Product
2SJ91	2SJ200
2SJ92	2SJ200
2SJ123	2SJ304
2SJ124	2SJ304
2SJ126	2SJ304
2SJ147	2SJ304
2SJ183	2SJ668/681
2SJ224	2SJ312
2SJ238	2SJ360
2SJ240	2SJ349
2SJ241	2SJ401
2SJ315	2SJ668/681
2SJ359	2SJ378
2SK271	2SK1529
2SK272	2SK1529
2SK324	2SK4107
2SK325	2SK4107
2SK355	2SK387
2SK356	2SK388
2SK357	2SK2381
2SK358	2SK2417
2SK385	2SK4107
2SK386	2SK4107
2SK387	2SK2882
2SK388	2SK2508
2SK405	2SK1529
2SK417	2SK2232
2SK418	2SK3563
2SK419	2SK3563
2SK420	2SK3563
2SK421	2SK3563
2SK422	2SK2961
2SK423	2SK941
2SK442	2SK2232
2SK447	2SK2508
2SK525	2SK2382
2SK526	2SK2417
2SK527	2SK2232
2SK528	2SK3563
2SK529	2SK3563
2SK530	2SK3563
2SK531	2SK3563
2SK532	2SK2232
2SK537	2SK2733
2SK538	2SK2719
2SK539	2SK3700
2SK568	2SK3407
2SK572	2SK2882
2SK573	2SK1641
2SK578	2SK2882
2SK643	2SK2601
2SK644	2SK2601
2SK672	2SK2232
2SK673	2SK2232
2SK674	2SK2232
2SK678	2SK4107
2SK693	2SK4107
2SK694	2SK4107
2SK708	2SK4107
2SK788	2SK4107
2SK789	2SK4107
2SK790	2SK4107
2SK791	2SK2608
2SK792	2SK2608
2SK793	2SK3700

Part Number	Replacement Product
2SK794	2SK3700
2SK849	2SK2233
2SK850	2SK2466
2SK856	2SK2385
2SK857	2SK2233
2SK858	2SK3567
2SK888	2SK2350
2SK889	2SK2314
2SK890	2SK2350
2SK891	2SK2382
2SK892	2SK3563
2SK893	2SK2386
2SK894	2SK2542
2SK895	2SK2601
2SK896	2SK2695
2SK941	2SK2962
2SK942	2SK2232
2SK943	2SK2232
2SK944	2SK2967
2SK945	2SK2599
2SK1029	2SK4107
2SK1078	2SK2615
2SK1079	2SK2963
2SK1112	2SK4017/4033
2SK1113	2SK2201
2SK1114	2SK2232
2SK1115	2SK2232
2SK1116	2SK2314
2SK1117	2SK2544
2SK1118	2SK3562
2SK1124	2SK2233
2SK1213	2SK2602
2SK1251	2SK4017/4033
2SK1252	2SK2201
2SK1333	2SK4107
2SK1344	2SK2232
2SK1345	2SK2232
2SK1346	2SK2232
2SK1348	2SK2391
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2SK1358	2SK3878
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2SK1378	2SK2841
2SK1379	2SK2173
2SK1380	2SK2267
2SK1487	2SK2601
2SK1488	2SK2601
2SK1513	2SK2601
2SK1531	2SK4107
2SK1542	2SK2376
2SK1574	2SK2542
2SK1600	2SK2603
2SK1601	2SK2608
2SK1602	2SK2603
2SK1603	2SK3566
2SK1641	2SK2993
2SK1642	2SK2952
2SK1649	2SK3700
2SK1650	2SK2719
2SK1651	2SK2601

Part Number	Replacement Product
2SK1653	2SK3844
2SK1692	2SK2749
2SK1717	2SK2615
2SK1719	2SK4017/4033
2SK1721	2SK2991
2SK1722	2SK2991
2SK1723	2SK2699
2SK1745	2SK4108
2SK1746	2SK2865
2SK1766	2SK2417
2SK1767	2SK3567
2SK1768	2SK2614
2SK1769	2SK2599
2SK1792	2SK2376
2SK1805	2SK3561
2SK1855	2SK4107
2SK1858	2SK2883
2SK1865	2SK2776
2SK1879	2SK2398
2SK1913	2SK3567
2SK1927	2SK2789
2SK1928	2SK2789
2SK1929	2SK2884
2SK2030	2SK2231
2SK2038	2SK2604
2SK2039	2SK3700
2SK2056	2SK2605
2SK2057	2SK4108
2SK2077	2SK2746
2SK2078	2SK2607
2SK2088	2SK2401
2SK2089	2SK2884
2SK2107	2SK2401
2SK2149	2SK2601
2SK2150	2SK4107
2SK2222	2SK2604
2SK2228	2SK2229
2SK2230	2SK3462
2SK2235	2SK3462
2SK2236	2SK3563
2SK2237	2SK3561
2SK2274	2SK2746
2SK2319	2SK2746
2SK2320	2SK2607
2SK2351	2SK2544
2SK2352	2SK3562
2SK2386	2SK2661
2SK2388	2SK3567
2SK2402	2SK3567
TPC8001	TPC8021-H
TPC8002	TPC8014
TPC8005-H	TPC8021-H
TPC8007-H	TPC8020-H
TPC8102	TPC8109
TPC8103	TPC8111
TPC8106-H	TPC8109
TPC8201	TPC8211
TPC8202	TPC8208
TPC8204	TPC8207
TPCA8101	TPCA8102
TPCS8201	TPCS8209
TPCS8203	TPCS8211
TPCS8206	TPCS8210
TPCS8207	TPCS8212

1. Compact Surface-Mount Packages

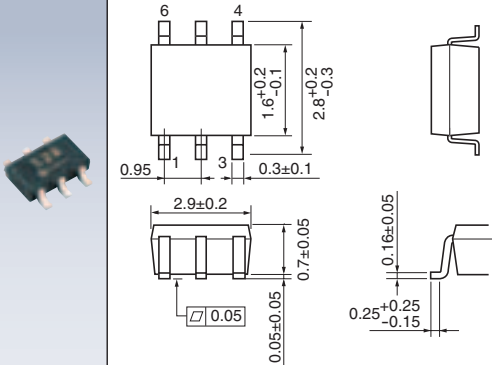
To meet requirements for compact and thin equipment, Toshiba offers various packages with a power dissipation of 1 to 300 W and a drain current of 1 to 120 A.



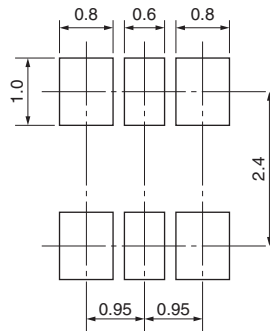
■ VS-6

Unit: mm

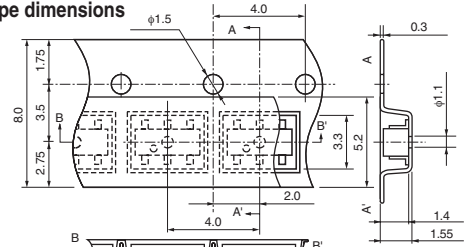
Package dimensions



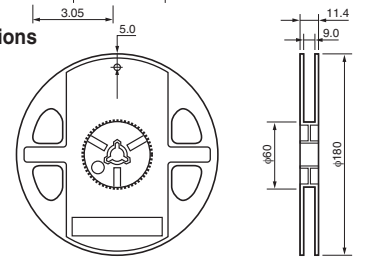
Reference pad dimensions



Tape dimensions



Reel dimensions

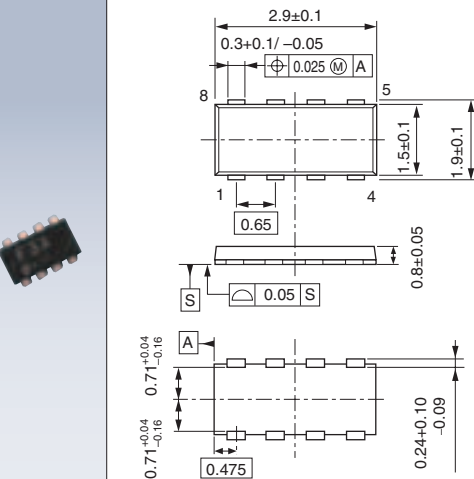


Packing quantity 3000 pcs/reel

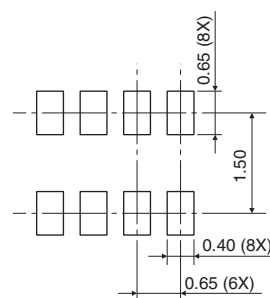
■ VS-8

Unit: mm

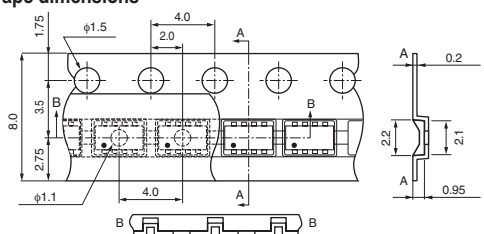
Package dimensions



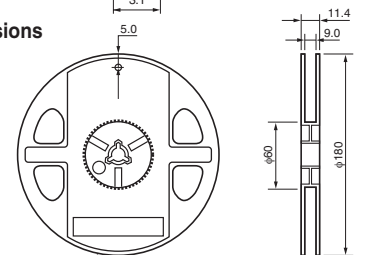
Reference pad dimensions



Tape dimensions



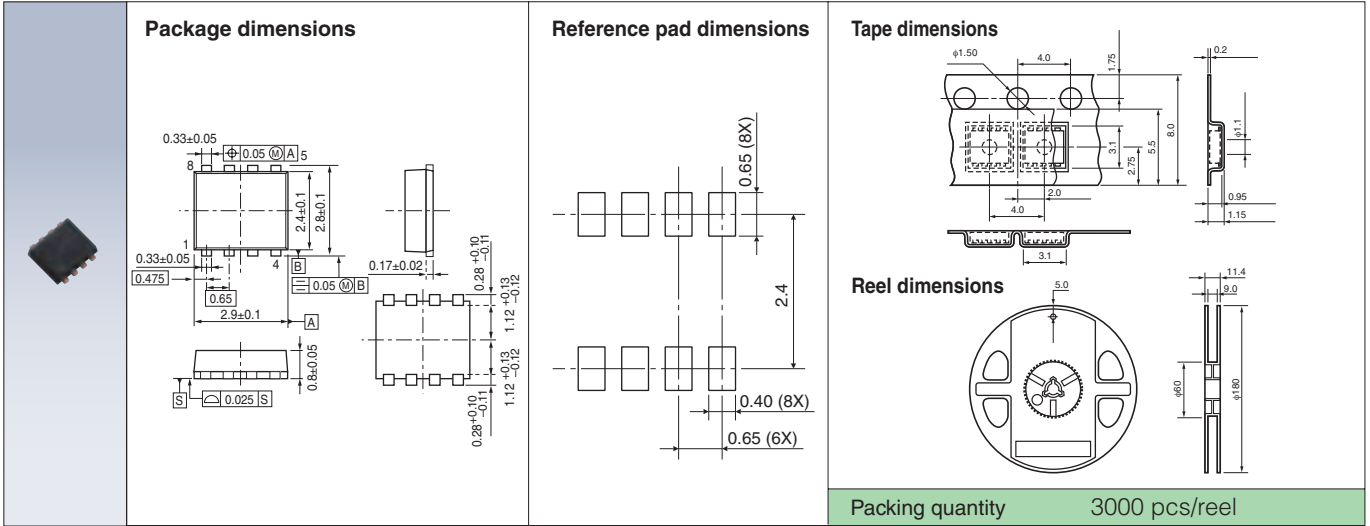
Reel dimensions



Packing quantity 4000 pcs/reel

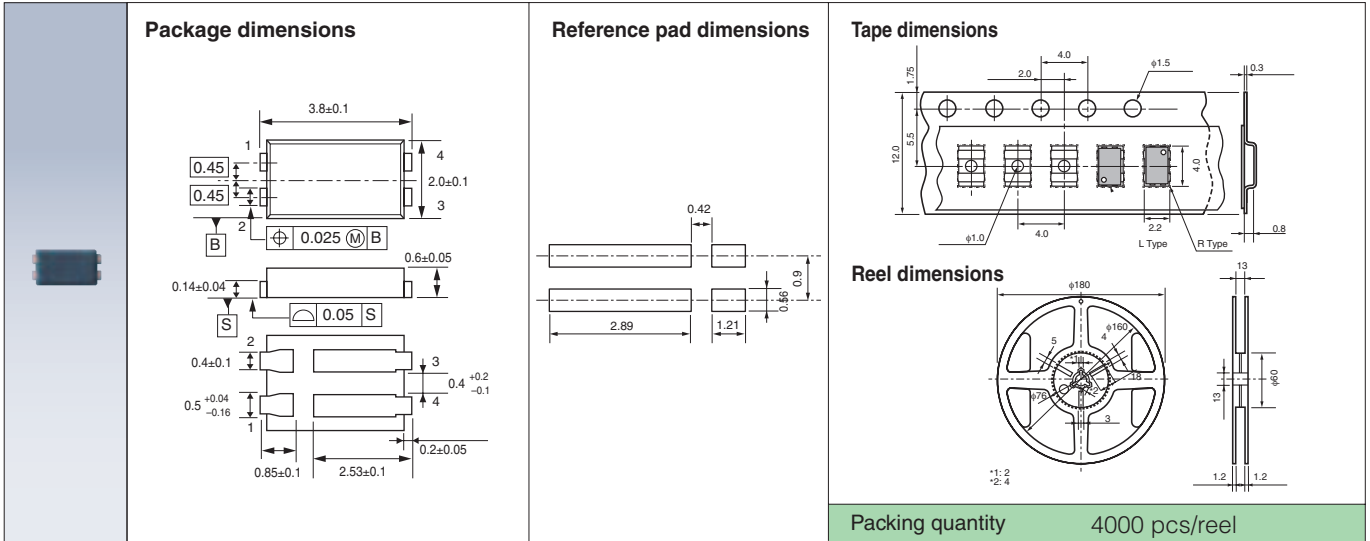
■ PS-8

Unit: mm



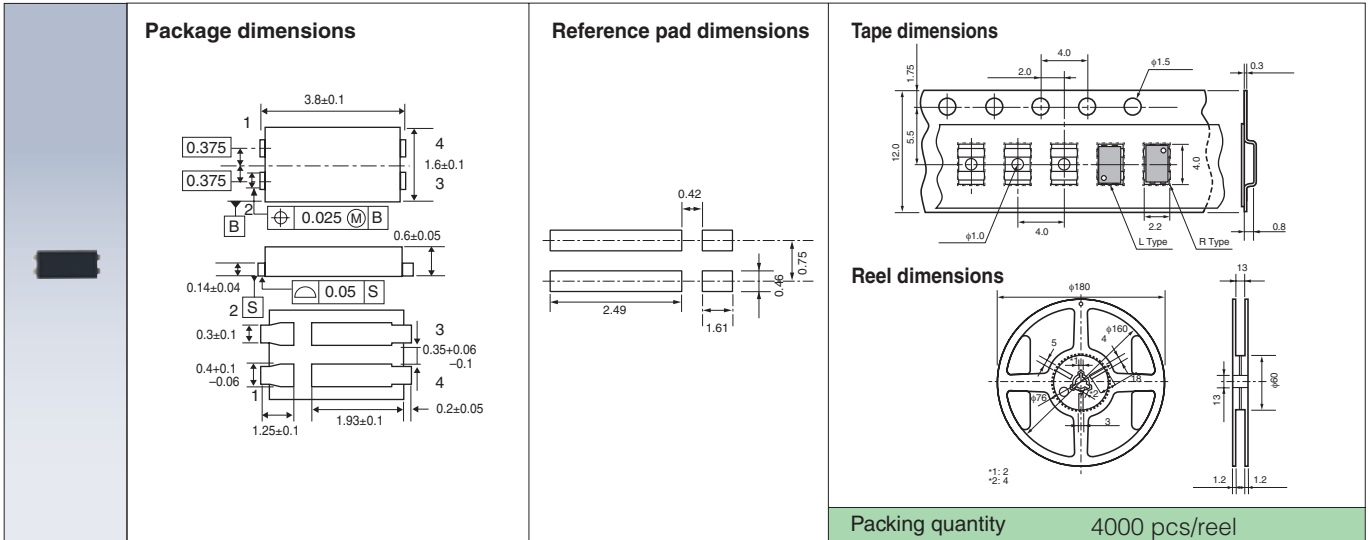
■ STP

Unit: mm



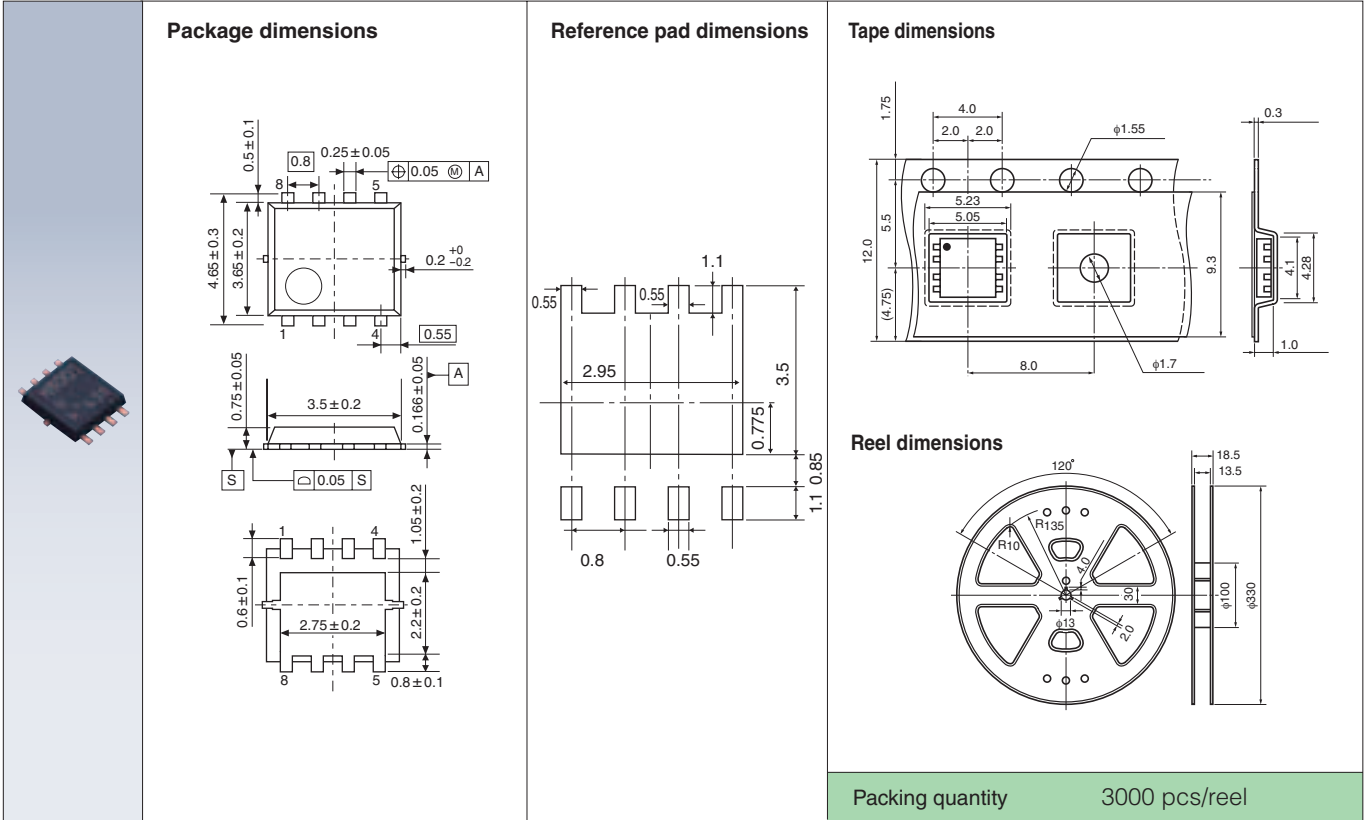
■ STP2

Unit: mm

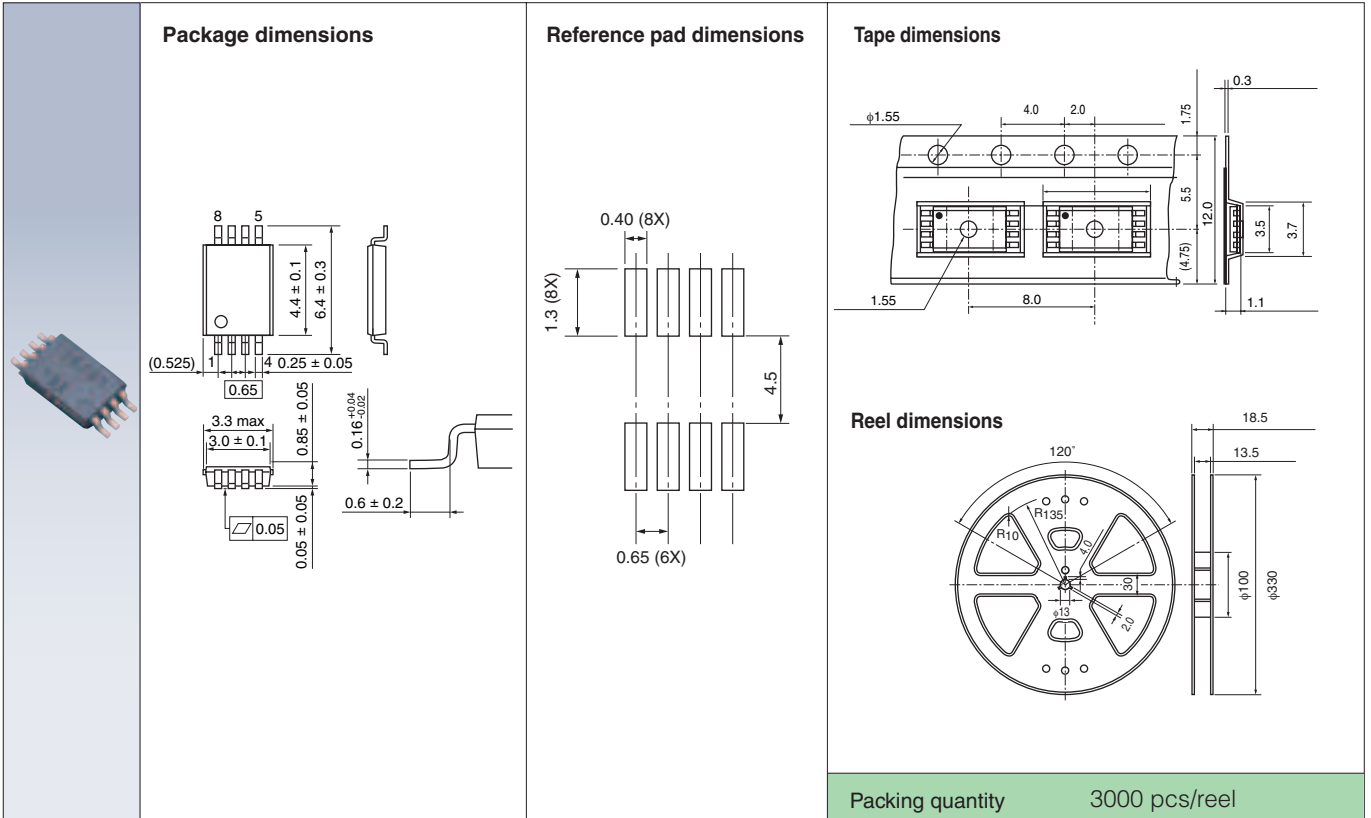


TSSOP Advance

Unit: mm

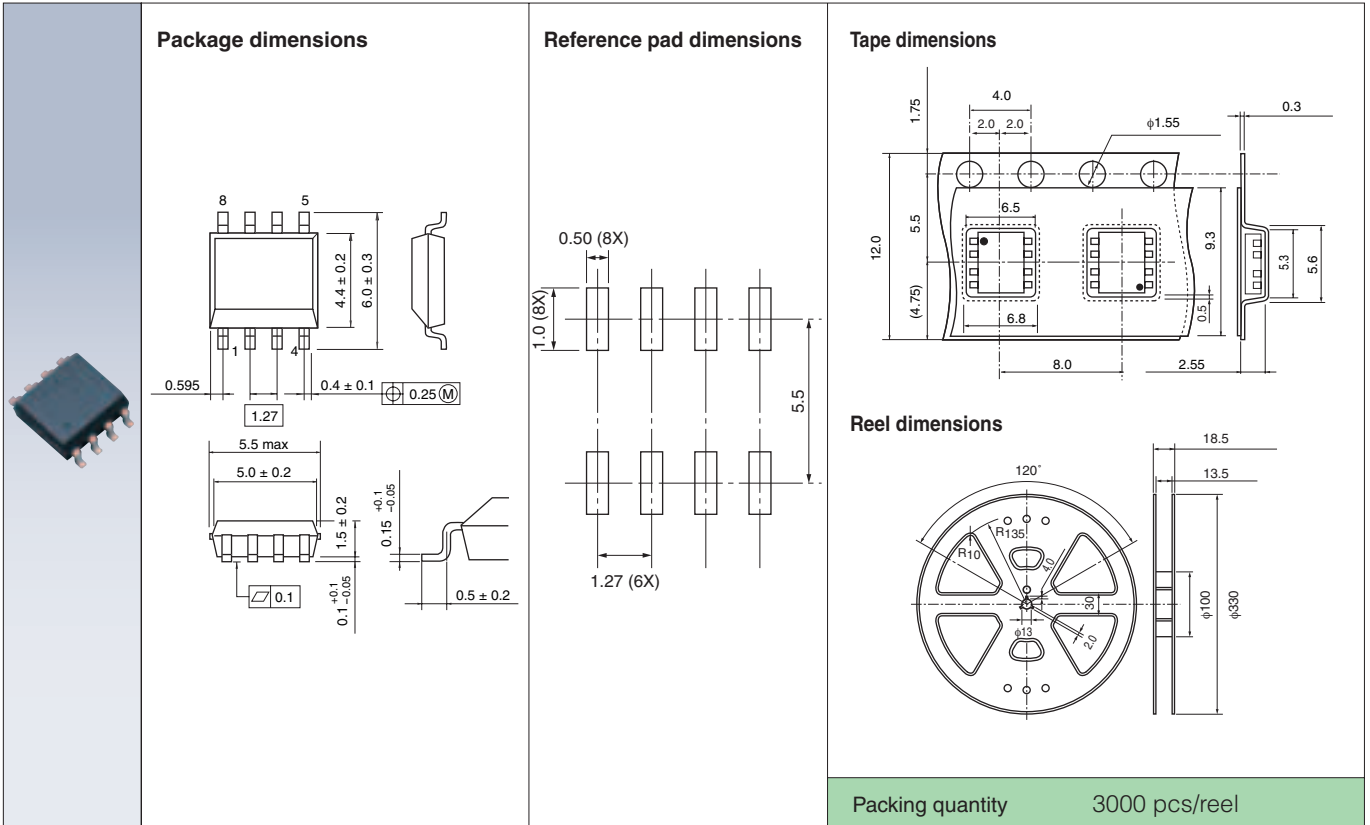


TSSOP-8



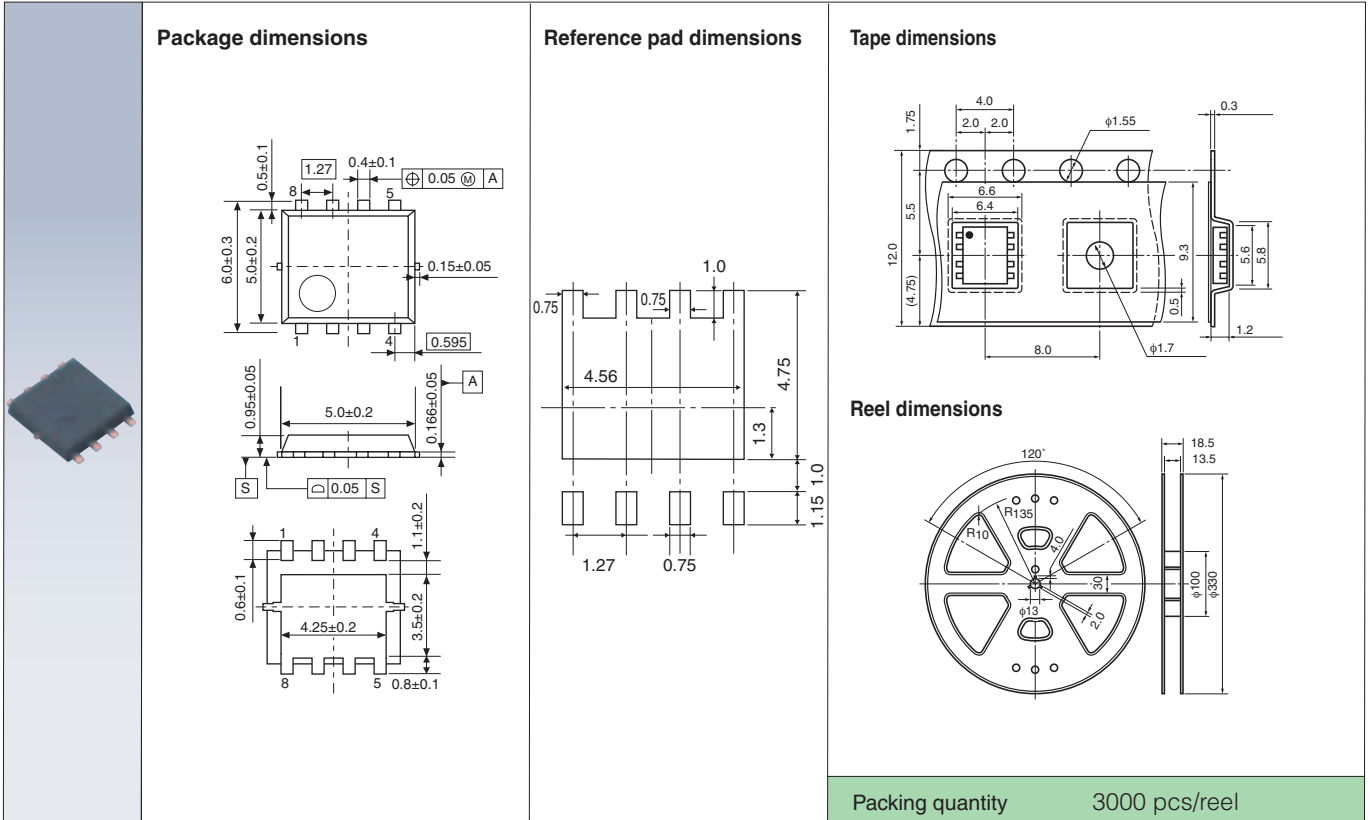
■ SOP-8

Unit: mm



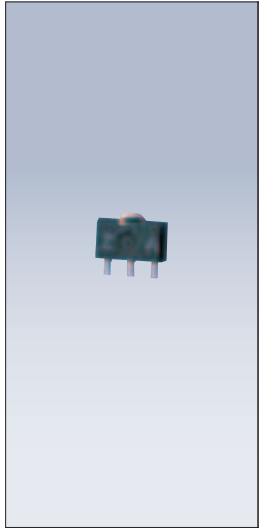
■ SOP Advance

Unit: mm

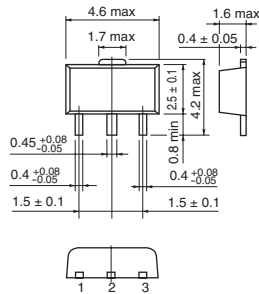


■ PW-Mini

Unit: mm

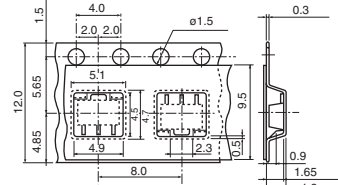


Package dimensions

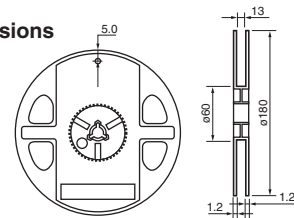


1. Gate
2. Drain (Heatsink)
3. Source

Tape dimensions



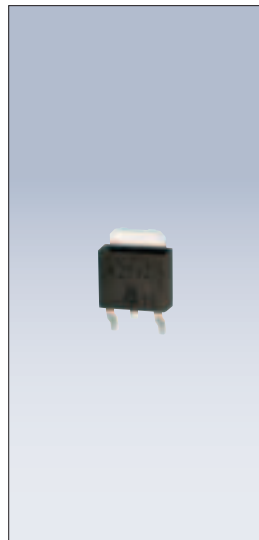
Reel dimensions



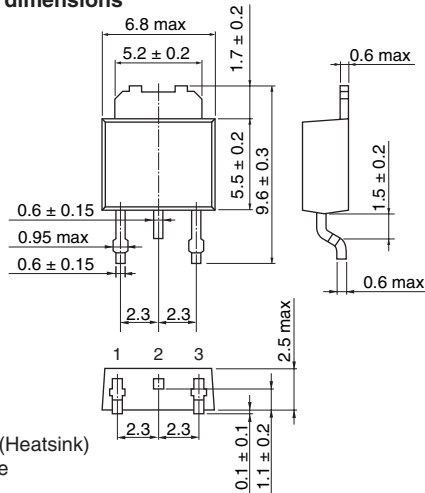
Packing quantity 1000 pcs/reel

■ DP

Unit: mm

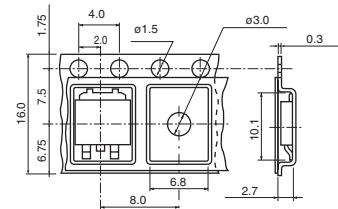


Package dimensions

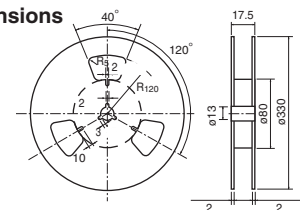


1. Gate
2. Drain (Heatsink)
3. Source

Tape dimensions



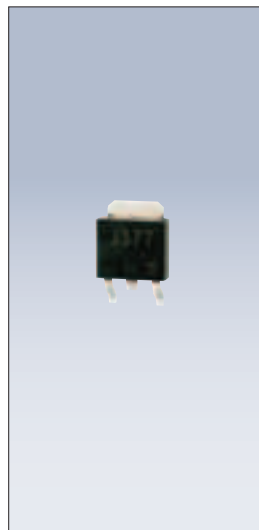
Reel dimensions



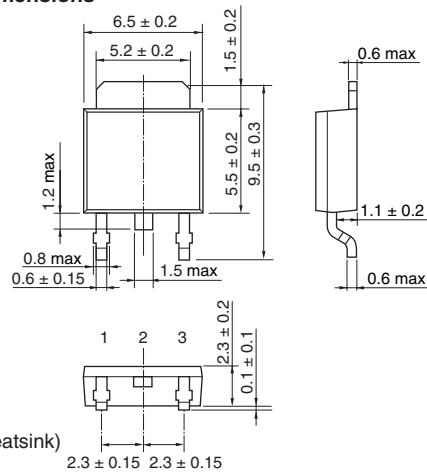
Packing quantity 2000 pcs/reel

■ New PW-Mold

Unit: mm

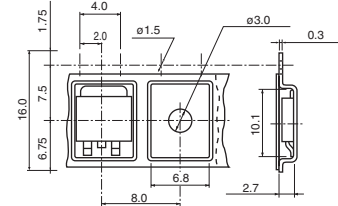


Package dimensions

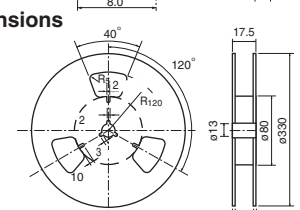


1. Gate
2. Drain (Heatsink)
3. Source

Tape dimensions



Reel dimensions



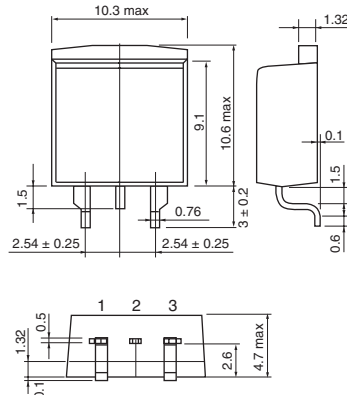
Packing quantity 2000 pcs/reel

■ TO-220SM

Unit: mm

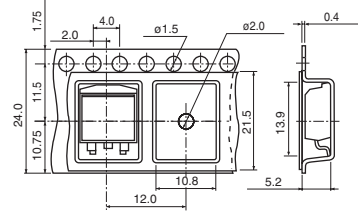


Package dimensions

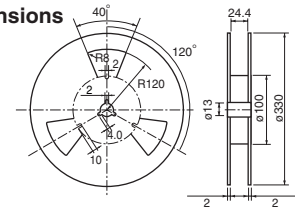


1. Gate
2. Drain (Heatsink)
3. Source

Tape dimensions



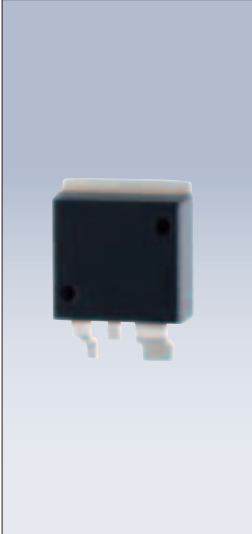
Reel dimensions



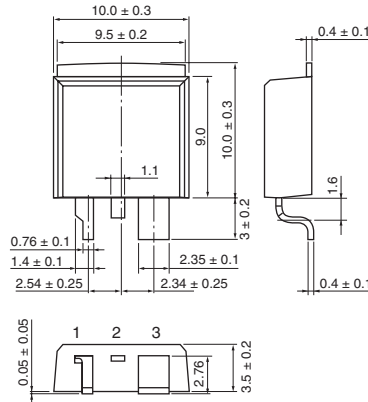
Packing quantity 1000 pcs/reel

■ TO-220SM(W)

Unit: mm

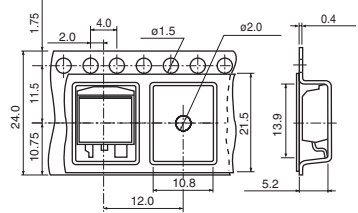


Package dimensions

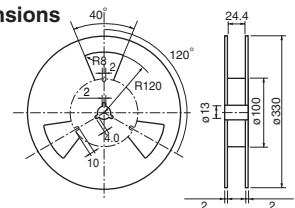


1. Gate
2. Drain (Heatsink)
3. Source

Tape dimensions



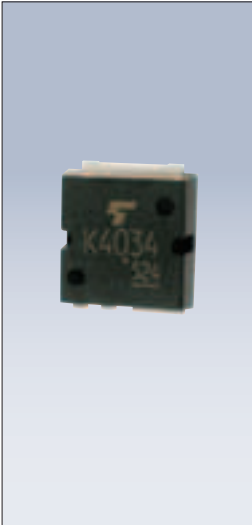
Reel dimensions



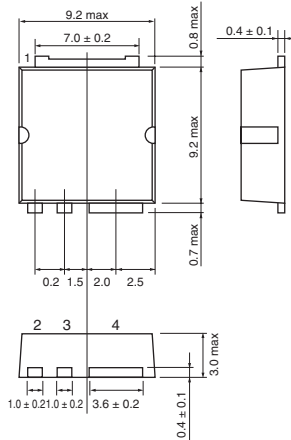
Packing quantity 1000 pcs/reel

■ TFP

Unit: mm

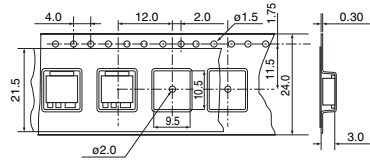


Package dimensions

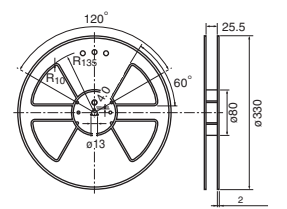


1. Drain (Heatsink)
2. Gate
3. Source1
4. Source2

Tape dimensions



Reel dimensions

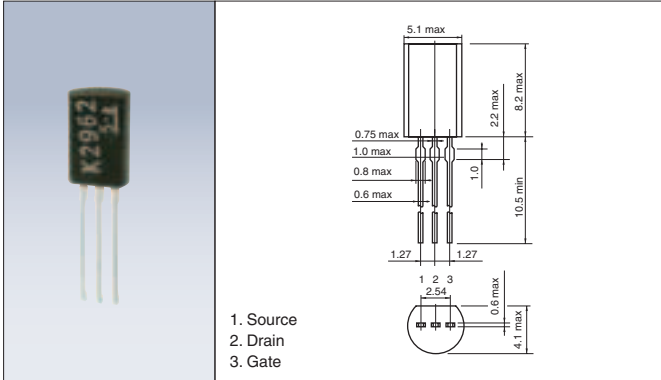


Packing quantity 1500 pcs/reel

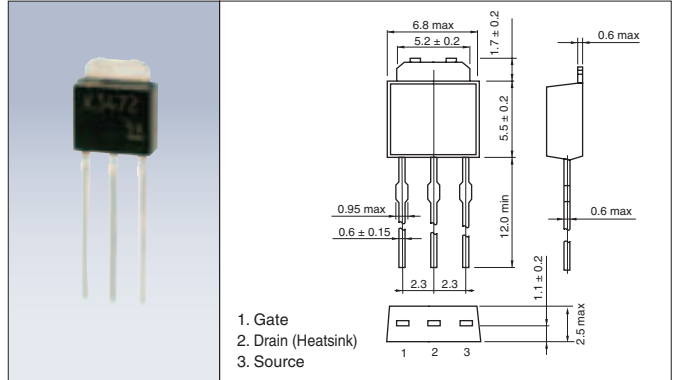
2. Through-Hole Package

Unit: mm

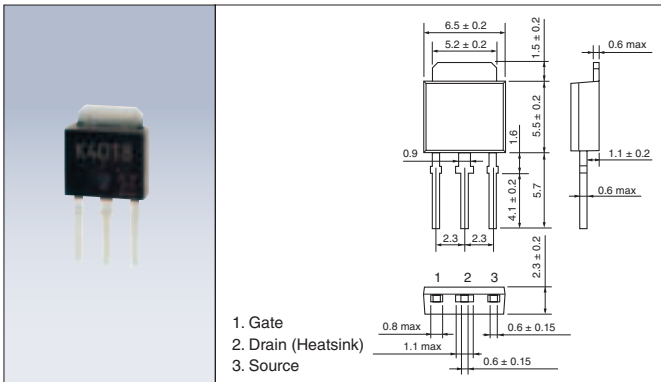
■ LSTM



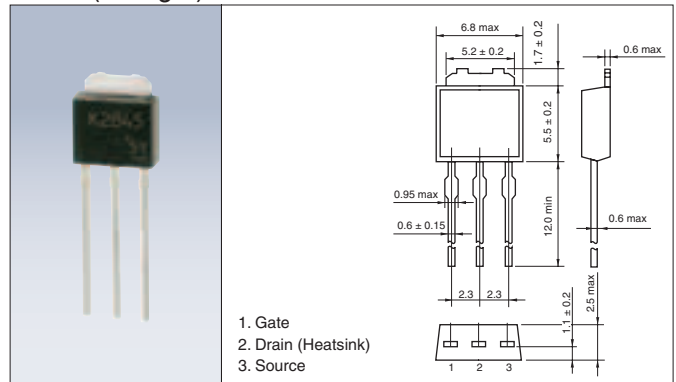
■ PW-Mold (Straight)



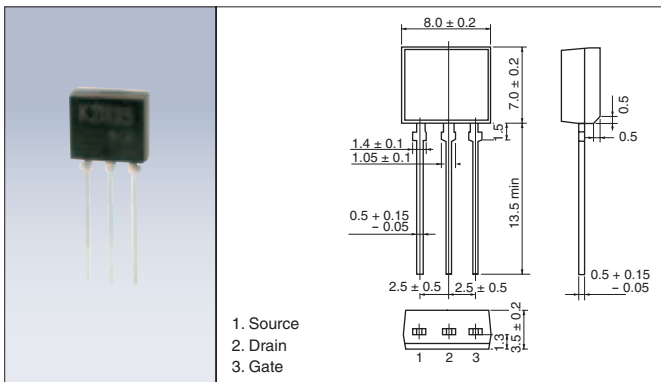
■ New PW-Mold2



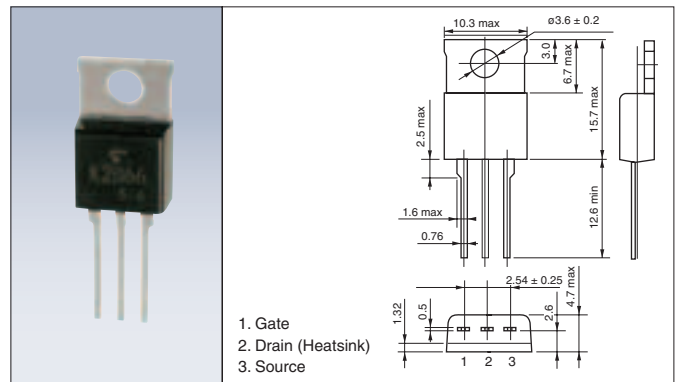
■ DP (Straight)



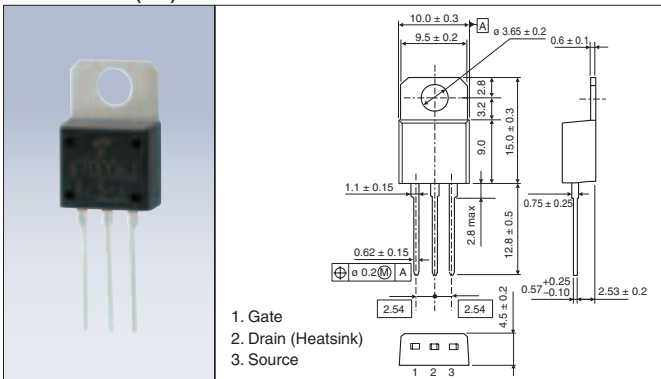
■ TPS



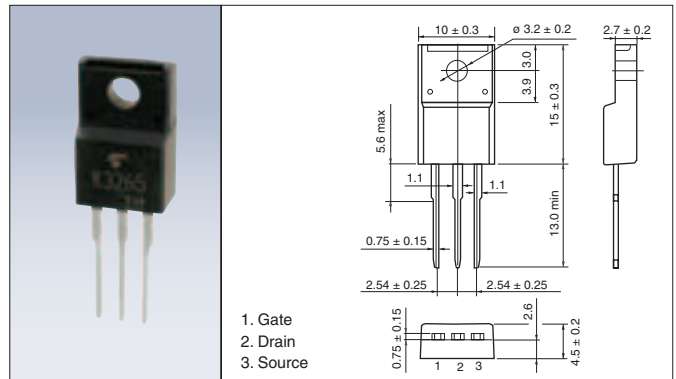
■ TO-220AB



■ TO-220(W)

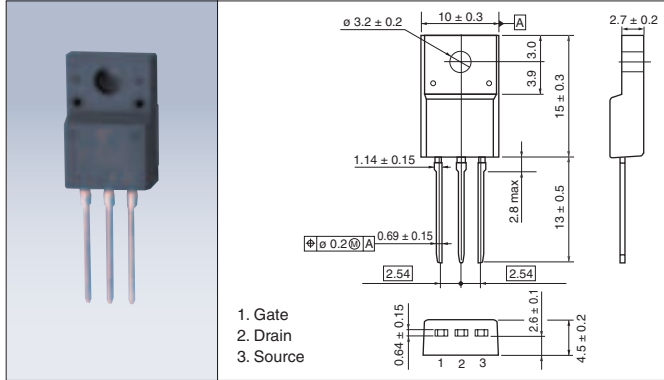


■ TO-220NIS

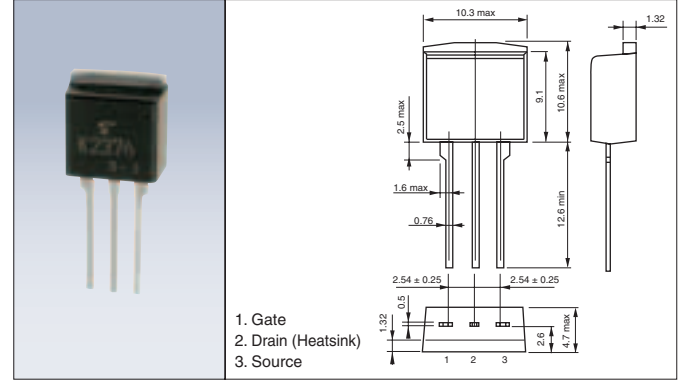


Unit: mm

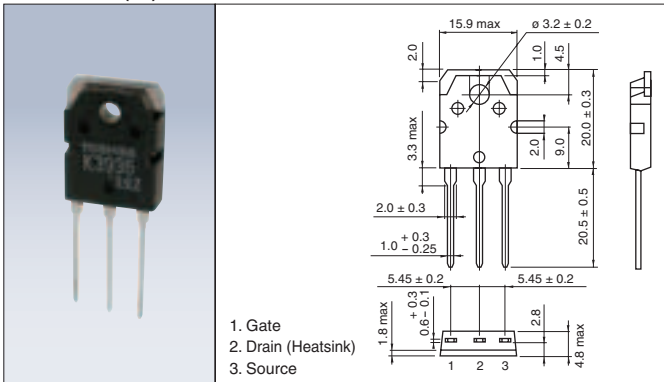
■ TO-220SIS



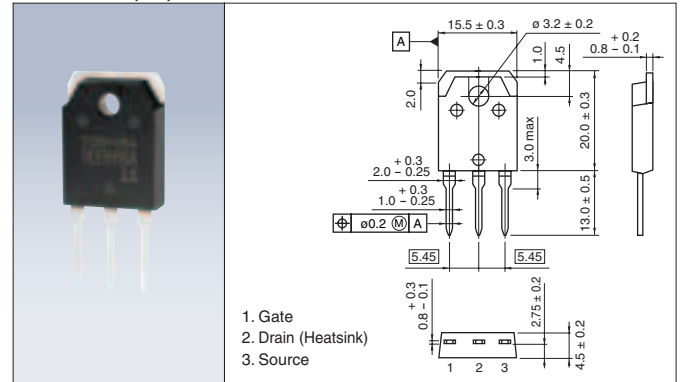
■ TO-220FL



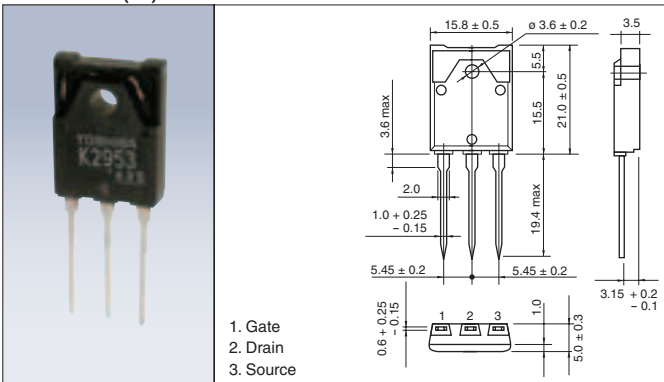
■ TO-3P(N)



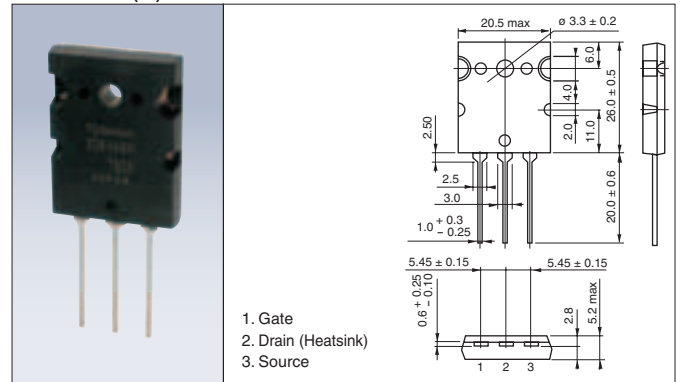
■ TO-3P(W)



■ TO-3P(N)IS



■ TO-3P(L)



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