TOSHIBA

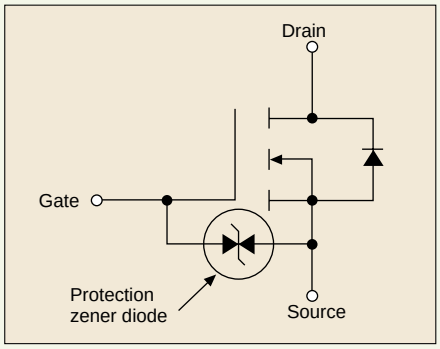
Power MOSFETs

PRODUCT GUIDE

Power MOSFETs

All power MOSFETs have the following features:

1) No carrier storage effect
Superior frequency and switching characteristics
2) Rugged without current concentration
3) Low drive power due to voltage-controlling device
4) Easy parallel connection

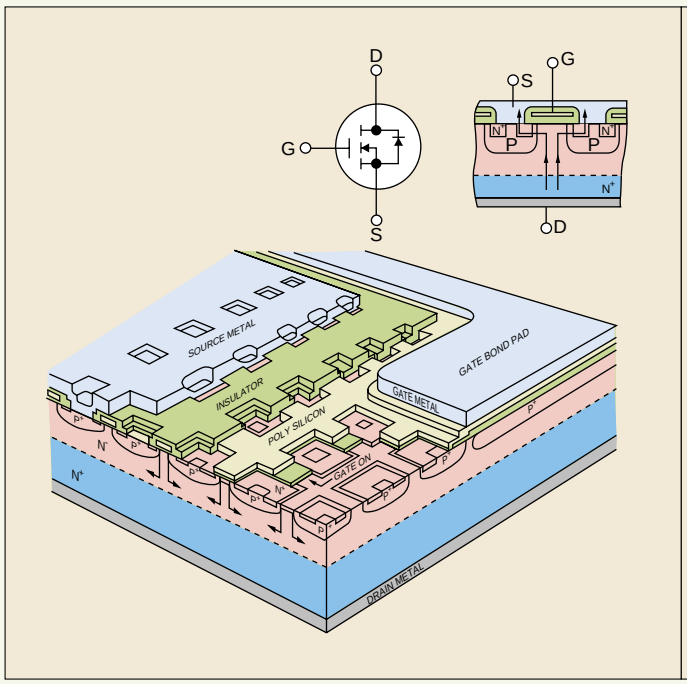


■ Toshiba π-MOS Power MOSFETs have the following additional features:

1) Guaranteed avalanche withstand capability	⩥	No absorber circuit required
2) Withstand capability of parasitic diode improved	⩥	No external diode required
3) Fast switching	⩥	Construction of smaller, thinner and more efficient equipment possible
4) Lower drive current	⩥	Low drive power and simple circuit
5) Built-in zener diode	⩥	Improved electrostatic withstand between gate and source
6) Various surface-mount packages available	⩥	Smaller finished products

■ Structure of Toshiba Power MOSFETs

Toshiba Power MOSFETs use the double-diffusion MOS (D-MOS) structure, which produces a high-withstand voltage, to form channels.
This structure is especially well suited to high-withstad voltage and high-current devices.
A high level of integration yields a high-performance power MOSFET with low ON-resistance and low power loss.



New Power MOSFET Products

All products have a built-in protection zener diode between gate and source.
Avalanche withstand capability in single and series Power MOSFET products.

SOP-8 Series V_{DSS} = 20 V~30 V

SOP-8 Series products are compact and thin, and require only a small mounting area. They are suitable for lithium-ion secondary battery protection circuits and for notebook PCs.

Applications
- Lithium-ion secondary battery protection circuits
- Notebook PCs
- Portable electronic equipment

VS-6 Series V_{DSS} = 20 V~30 V

VS-6 Series products are very compact and thin, and suitable for various items of portable electronic equipment.

Applications
- Portable phones
- Notebook PCs
- Portable electronic equipment

TFP (Thin Flat Package) Series

TFP (Thin Flat Package) Series is comprised of new high-performance devices with a 4-pin structure for separating input and output. TFP Series devices have the same ratings as existing TO-220SM package devices; however, the volume of them occupies only 42% of the volume of TO-220SM package devices.

Applications
- DC-DC converters
- PDP drivers
- Motor drivers

U-MOS (Trench MOS Gate) Series

High-integration is achieved using trench structure technique. Low-voltage driving is possible because of ultra-low ON-resistance.

Applications
- DC-DC converters
- Motor drives
- Solenoids and lamp drives

L^2-π-MOS V Series V_{DSS} = 30 V~100 V

Reduces ON-resistance per unit area to 15% below that of L^2-π-MOSIV by means of micro process technology.
The L^2-π-MOS V Series is comprised of low-voltage devices which exhibit high performance at low cost.

Applications
- DC-DC converters
- Motor drives
- Solenoids and lamp drives

π-MOS V Series V_{DSS} = 150 V~250 V

The π-MOS Series is comprised of low-cost devices which are ideal for, use in monitors, especially for frequency control and S-shape correction.

Applications
- Monitors
- DC-DC converters
- PDP drives

π-MOS V High-Speed Series V_{DSS} = 250 V~600 V

π-MOS V High-Speed Series is new product series and achieves faster switching speed than π-MOS V series which are currently well-established in the marketplace.
Two types of series are available:
High-Speed Switching Series
High-Speed Diode Series

Applications
- Inverters
- Motor drives
- AC adapters
- Switching power supplies

π-MOS V Series V_{DSS} = 400 V~600 V

This Series is comprised of highly integrated, high-performance, high-breakdown-voltage and low-cost products with V_{DSS} in the range 400 V to 600 V which are ideal for use in 100-V AC input-switching power supplies.

Applications
- Switching power supplies
- AC adapters
- Lighting inverters

π-MOS III Series V_{DSS} = 800 V~900 V

This Series is comprised of highly integrated, high-performance, high-breakdown-voltage and low-cost products with V_{DSS} in the range 800 V to 900 V which are ideal for use in 200-V AC input-switching power supplies.

Applications
- Switching power supplies

Power MOSFET Line-up

(V_{DSS} = 12 V to 250 V)

I_D(A) \ V_{DSS}(V)	12	16	20	30	50	60	100	150	180	200	250
1						◇**2SJ360**(0.73) ▲**2SJ507**(0.7)	◇**2SK2963**(0.7) ▲**2SK2962**(0.7) ◇**2SJ508**(1.9) ▲**2SJ509**(1.9)		◆**2SK2013**(5.0) ▼**2SK2162**(5.0) ◆**2SJ313**(5.0) ▼**2SJ338**(5.0)	◇**2SK2992**(3.5) ⧗**TPCS8004**(0.8)1.3A	
2		#◇**2SK2549**(0.29) #◇**2SJ465**(0.71)		◇**2SJ511**(0.45) ◇**2SK2964**(0.17)		◇**2SK2615**(0.3) ▲**2SK2961**(0.27) [◇**S3E34**(0.3)]				▼**2SJ567**(2.0) ★**TPC8012-H**(0.4)1.8A	▼**2SJ610**(2.55)
2.5				N♥**TPC6201**(0.095)							
3							▼**2SK2201**(0.35) ☆**2SK2200**(0.35) △**2SK2742**(0.35)				▼**2SK3462**(1.7)
4											
4.5			P#♥**TPC6101**(0.06) P#[♥**TPC6104**(0.04)]	P♥**TPC6102**(0.06) P★**TPC8303**(0.035) CP★**TPC8402**(0.035) CP★**TPC8401**(0.035) CP★**TPC8403**(0.055)							[◆**2SK2840**(1.0)] ▼**2SK3342**(1.0)
5		#◇**2SK2493**(1.0) #◇**2SJ439**(0.2)	N#★**TPC8208**(0.05) N#⧗**TPCS8209**(0.03) N#⧗**TPCS8205**(0.045) N#◆**TPCS8210**(0.03) P#★**TPC8305**(0.03) P#⧗**TPCS8302**(0.035)	CN★**TPC8402**(0.05) ☆**2SJ525**(0.12) N★**TPC8004**(0.05) P★**TPC8104-H**(0.065) N★**TPC8209**(0.05)	▲**2SK2989**(0.15) ▲**2SJ537**(0.19)	▼**2SK2231**(0.16) ☆**2SK2229**(0.16) △**2SK2741**(0.16) ▼**2SJ377**(0.19) ☆**2SJ378**(0.19) ◆**2SJ438**(0.19) △**2SJ482**(0.19)	▼**2SK2399**(0.23) ☆**2SK2400**(0.23)	[▼**2SK3205**(0.52)]		▼**2SK2920**(0.8) ☆**2SK2835**(0.8) ◆**2SK2381**(0.8) [○**2SK3201**(0.8)] ◆**2SJ407**(1.0)	◆**2SJ512**(1.25)
5.5	P#[♥**TPC6103**(0.035)]										
6			N#♥**TPC6001**(0.03) N#[♥**TPC6004**(0.024)] N#★**TPC8207**(0.02) N#⧗**TPCS8211**(0.024) N#⧗**TPCS8204**(0.017) P#⧗**TPCS8102**(0.02) N#◆**TPCS8212**(0.024) N#◆**TPCS8208**(0.017)	N♥**TPC6002**(0.03) N[♥**TPC6003**(0.024)] N★**TPC8203**(0.021) P⧗**TPCS8101**(0.025) CN★**TPC8401**(0.021) CN★**TPC8403**(0.033) N[♥**TPC6005**(0.028)]							
6.5											◆**2SJ516**(0.8)
7				N★**TPC8001**(0.02) N★**TPC8006-H**(0.027) P★**TPC8105-H**(0.04)		N★**TPC8206**(0.05)				[◆**2SJ515**(0.64)]	
7.5											◆**2SK2417**(0.5) [◆**2SJ514**(0.625)]
8				P★**TPC8110**(0.025)40V N★**TPC8210**(0.015)					○**2SK2467**(0.83)		
8.5										◆**2SK2350**(0.4)	■**2SK2914**(0.5)
9.5										◆**2SJ513**(0.5)	
10				P★**TPC8109**(0.02) △**2SK2839**(0.04)					□**2SK1529**(0.83) ○**2SJ440**(0.83) □**2SJ200**(0.83)		[◆**2SK2966**(0.32)]
11				N[★**TPC8014**(0.014)] N[★**TPC8010-H**(0.016)] P★**TPC8108**(0.013)						◆**2SK2965**(0.26)	
12							◆**2SJ380**(0.21)			●**2SK1530**(0.63) ●**2SJ201**(0.63)	
13				N★**TPC8009-H**(0.01) N[◎**S2Y65**(0.009)] N★**TPC8003**(0.007) P★**TPC8107**(0.007) P[◎**S3C06**(0.005)]							◆**2SK2508**(0.25) ○**2SK2598**(0.25)
15				N★**TC8013-H**(0.0065) N[◎**S3D18**(0.0045)]						◆**2SK2382**(0.18) ○**2SK2401**(0.18)	
16							○**2SJ412**(0.21) ♣**2SJ619**(0.21)				
18							◆**2SJ464**(0.09) ♣**2SJ620**(0.09)	◆**2SK2882**(0.12) ♣**2SK3387**(0.12)			
20					▽**2SK2614**(0.046)	◆**2SJ349**(0.045) ○**2SJ401**(0.045) ▽**2SK2782**(0.055) [▽**2SK3343**(0.02)]	◆**2SK2391**(0.085)				○**2SK2993**(0.105) ♣**2SK3388**(0.105) ♣**2SK3445**(0.105)
25					◆**2SK2507**(0.046)	◆**2SK2232**(0.046) ○**2SK2311**(0.046)				♣**2SK3444**(0.082)	
27							■**2SK2314**(0.085) ○**2SK2789**(0.085)				
30						◆**2SJ334**(0.038) ○**2SJ402**(0.038) [■**2SJ570**(0.038)]	◆**2SK2466**(0.046)	♣**2SK3443**(0.055)		□**2SK3176**(0.052)	□**2SK2967**(0.068) ◎**2SK2995**(0.068)
35				■**2SK2844**(0.02)		[○**2SK3375**(0.02)]					
36						◆**2SK2385**(0.03)					
40				○**2SK3089**(0.03)							
45				○**2SK3090**(0.02) ○**2SK3127**(0.011) $[□**S3C86**(0.02)]	$ □**2SK2550**(0.030) ◆**2SK2886**(0.02) $ □**2SK2744**(0.02)	□**2SK2233**(0.03) ○**2SK2266**(0.03) $ □**2SK2398**(0.03) $ ○**2SK3051**(0.03) ◆**2SK2312**(0.017) ○**2SK2376**(0.017) [■**2SK3208**(0.017)] ◆**2SK2985**(0.0058) [○**2SK3345**(0.03)]					
50					$ □**2SK2551**(0.011) □**2SK2745**(0.0095)	$ ♣**2SK3440**(0.008) □**2SK2173**(0.017) $ □**2SK2445**(0.018)	♣**2SK3442**(0.020)				
55						○**2SK2986**(0.0058)					
60				□**2SK3128**(0.011) ⊙**2SK3125**(0.007)		□**2SK2313**(0.011) ●**2SK2267**(0.011)					
70						□**2SK2987**(0.0058)					
75				$♣**2SK3389**(0.005) ♣**2SK3439**(0.006)		♣**2SK3441**(0.0058)					

Package code ◇PW-MINI △SP ♡VS-8 ♥VS-6 ⧗TSSOP-8 ♠TSSOP-8 common-drain ★SOP-8 ◎SOP-8 Lead clamp ▼PW-MOLD ▽DP ▲TO-92MOD ☆TPS ○TO-220FL/SM ◆TO-220(NIS) ■TO-220AB ♣TFP ◎Slim-TFP ⊙TO-3P(SM) ◎TO-3P(IS) □TO-3P(N) ●TO-3P(L)

Notes: ( ) = $R_{DS(ON)}$ max
$ = 10-V drive
# = 2.5-V drive
¥ = High-speed diode
N = N-ch
P = P-ch
CN = Complementary N-ch
CP = Complementary P-ch
[ ] = Under development

Power MOSFET Line-up

(V_{DSS} = 400 V to 1000 V)

I_D(A) \ V_{DSS}(V)	400	450	500	600	700	800	900	1000
0.5			▲**2SK2998**(18) ☆**2SK3302**(18) ◇**2SK3471**(18)					
1	[▼**2SK3498**(5.5)]	▼**2SK3472**(4.6)		△**2SK2836**(9) ▼**2SK3371**(9)			■**2SK2733**(9.0) ▽**2SK2845**(9.0) ▼**2SK3301**(20)	
1.5		[▼**2SJ611**(7)]				[▽**2SK2997**(8)]		
2			☆**2SK2599**(3.2) ◆**2SK2862**(3.2) [▼**S3C69**(3.2)]	☆**2SK2846**(5) ▼**2SK2865**(5) ◆**2SK3067**(5)				
2.5		[▼**2SK3643**(2.45)] [◆**S3D72**(2.45)]					◆**2SK2718**(6.4)	
3						■**2SK2603**(3.6) ○**2SK2883**(3.6)	◆**2SK2700**(4.3) ■**2SK2608**(4.3) □**2SK2719**(4.3) [○**2SK3088**(4.3)]	
3.5				◆**2SK2750**(2.2) ■**2SK3085**(2.2)				
4								■**2SK1119**(3.8) ○**2SK1930**(3.8)
4.5								
5			◆**2SK2662**(1.5) ○**2SK2991**(1.5) ■**2SK2661**(1.5) ¥◆**2SK3316**(1.8) ♣**2SK3466**(1.5) [¥○**S2Z15**(1.8)]			□**2SK2604**(2.2) ◆**2SK2605**(2.2) ○**2SK2884**(2.2)	□**2SK2610**(2.5) ◆**2SK2717**(2.5)	□**2SK1359**(3.8)
5.5	◆**2SK2679**(1.2) ○**2SK2838**(1.2)							
6				◆**2SK2545**(1.25) ■**2SK2544**(1.25) ○**2SK2777**(1.25) □**2SK2602**(1.25) [○**2SK3312**(1.25)] ¥◆**2SK3130**(1.5)				
6.5								
7						□**2SK2746**(1.7)	□**2SK2749**(2.0)	◎**2SK1365**(1.8)
7.5								
8			◆**2SK2543**(0.85) ■**2SK2542**(0.85) ○**2SK2776**(0.85) [♣**2SK3538**(0.85)] [◎**2SK2600**(0.85)]				◎**2SK2847**(1.4) [□**2SK3473**(1.6)]	□**2SK2613**(1.7)
8.5	◆**2SK2952**(0.55) [♣**2SK3499**(0.55)]					◎**2SK2606**(1.2)	◎**2SK3017**(1.25)	
9						□**2SK2607**(1.2)	□**2SK2611**(1.4)	
10	○**2SK2949**(0.55) ■**2SK2841**(0.55)	◆**2SK3126**(0.65) ○**2SK3309**(0.65) ◆**2SK3310**(0.65) [♣**2SK3544**(0.65)]	□**2SK2601**(1.0)	◆**2SK2996**(1.0) ◆**2SK2843**(0.75) ■**2SK2866**(0.75) ○**2SK2889**(0.75) ♣**2SK3438**(1.0) [○**2SK3437**(1.0)] ○**2SK3399**(0.75)	◆**2SK3265**(1.0)		□**2SK2968**(1.25)	
12			¥◆**2SK3313**(0.62) [¥○**S2Y84**(0.62)] ○**2SK3068**(0.52) ◆**2SK2842**(0.52) ♣**2SK3398**(0.52)	□**2SK2699**(0.65)				●**2SK1489**(1.0)
13		○**2SK3403**(0.4)						
14			◎**2SK2916**(0.4)					
15			□**2SK2698**(0.4) ¥□**2SK3314**(0.49)	◎**2SK2953**(0.4)				
16				□**2SK2915**(0.4)				
18			◎**2SK2917**(0.27)					
20			□**2SK2837**(0.27) ◎**2SK3117**(0.27)					
30								
50			¥●**2SK3131**(0.11) ●**2SK3132**(0.095)					

Package code
◇PW-MINI △SP ⧗TSSOP-8 ♠TSSOP-8 common-drain ★SOP-8 ▼PW-MOLD ▽DP ▲TO-92MOD
☆TPS ○TO-220FL/SM ◆TO-220(NIS) ■TO-220AB ♣TFP ⦿TO-3P(SM) ◎TO-3P(IS) □TO-3P(N) ●TO-3P(L)

Notes: ( ) = $R_{DS(ON)}$ max
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¥ = High-speed diode
N = N-ch
P = P-ch
CN = Complementary N-ch
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[ ] = Under development

1. SOP-8 Series

These SOP series are compact and thin, and require only a small mounting area. They are especially suitable for lithium-ion secondary battery protection circuits and for notebook PCs.

Features

- The trench-structure U-MOS Ⅲ achieved ultra-low ON-resistance ($R_{DS(ON)}$ = 17 mΩ max, TSSOP-8 N-ch dual)
- High-efficiency-type product line based on cell structure optimization (TPC8xxx-H Series)
- Comes with compact and thin, and require only a small mounting area SOP-8 and TSSOP-8 packages
- Built-in protection zener diode between gate and source

● SOP-8 product line-up

Product No.	Maximum Ratings		Polarity and circuit configuration	$R_{DS(ON)}$ Max (mΩ)			Qg (Typ.) (nC)
	V_{DSS}(V)	I_D(A)		V_{GS}= 2.5 V	V_{GS}= 4 V	V_{GS}= 10 V	
TPC8004	30	5	N-ch, Single	—	80	50	16
TPC8001	30	7		—	30	20	40
TPC8006-H	30	7		—	40*	27	16
TPC8014	30	11		—	22	14	27
TPC8010-H	30	11		—	27*	16	18
TPC8003	30	13		—	13	7	90
TPC8009-H	30	13		—	15*	10	29
S2Y65	30	13		—	13*	8	29
TPC8013-H	30	15		—	9.5*	6.5	46
S3D18	30	15		—	7.5*	4.5	46
TPC8012-H	200	1.8		—	—	400	11
TPC8104-H	– 30	– 5	P-ch, Single	—	120	65	17
TPC8105-H	– 30	– 7		—	60	40	32
TPC8109	– 30	– 10		—	30	20	45
TPC8108	– 30	– 11		—	23	13	77
TPC8107	– 30	– 13		—	15	7	130
S3C06	– 30	– 13		—	13	5	130
TPC8110	– 40	– 8		—	35	25	48
TPC8208	20	5	N-ch, Dual	70	50	—	10
TPC8207	20	6		30	20	—	22
TPC8209	30	5		—	80	50	—
TPC8203	30	6		—	32	21	40
TPC8206	60	7		—	75	50	13
TPC8210	30	8		—	20*	15	73
TPC8305	– 20	– 5	P-ch, Dual	50	30*	—	24
TPC8303	– 30	– 4.5		—	65	35	28
TPC8401	– 30/30	– 4.5/6	P-ch/N-ch	—	65/32	35/21	28/40
TPC8402	– 30/30	– 4.5/6		—	65/80	35/50	28/16
TPC8403	– 30/30	– 4.5/6		—	90/46	55/33	18/17

SXXXX: Under development

*: V_{GS} = 4.5 V

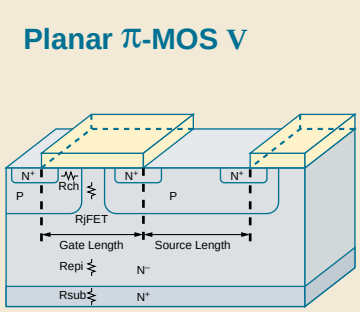
● TSSOP-8 product line-up

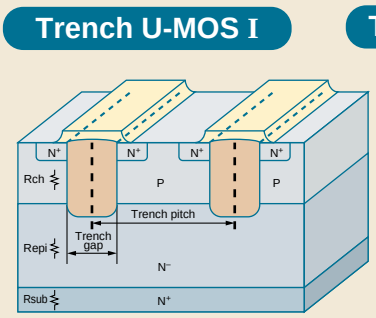
Product No	Maximum Ratings		Polarity and circuit configuration	$R_{DS(ON)}$ Max (mΩ)			Qg (Typ.) (nC)
	V_{DSS}(V)	I_D(A)		V_{GS}=2.5 V	V_{GS}=4 V	V_{GS}=10 V	
TPCS8004	200	1.3	N-ch, Single	—	—	800	12
TPCS8102	– 20	– 6	P-ch, Single	38	20	—	37
TPCS8101	– 30	– 6		—	40	25	37
TPCS8205	20	5	N-ch, Dual	60	45	—	11
TPCS8209	20	5		40	30	—	15
TPCS8210	20	5		40	30	—	15
TPCS8204	20	6		22	17	—	22
TPCS8208	20	6		22	17	—	22
TPCS8211	20	6		29	24	—	20
TPCS8212	20	6		29	24	—	20
TPCS8302	– 20	– 5	P-ch, Dual	60	35*	—	23

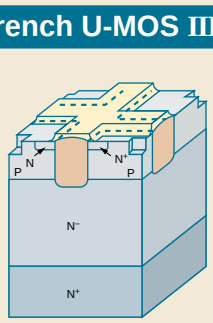
*: V_{GS} = 4.5 V

1-1. U-MOS III Series Features

(1) Structure of trench MOSFETs



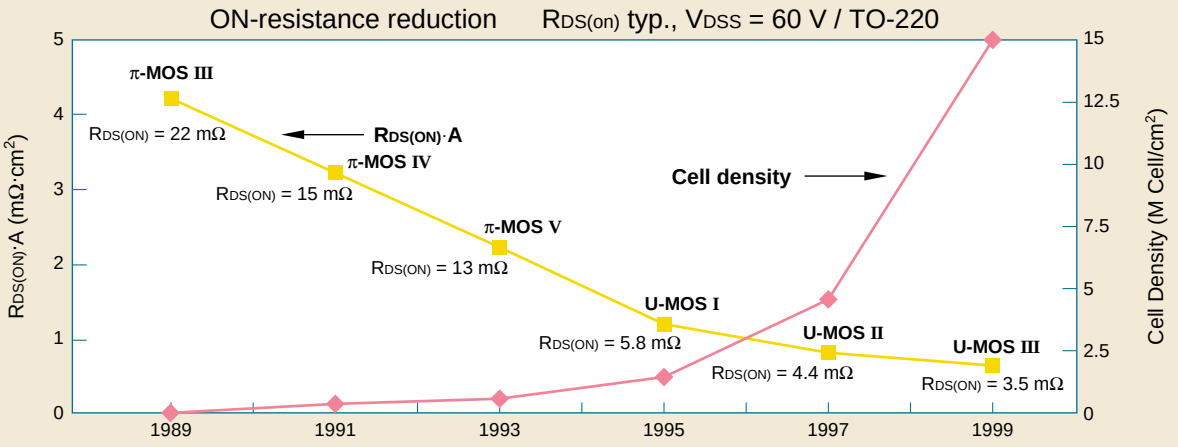




■ U-MOS III Features

1. High level of integration achieved using microtechnology
2. Cell density three times greater than that of previous products achieved using mesh pattern technology
3. ON-resistance per unit area reduced by 30% compared to previous products (U-MOS II)
4. Reduced parasitic j-FET resistance
5. Ultra-low ON-resistance achieved

(2) π-MOS Series cell integration

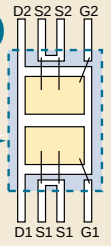


1-2. Features of TPCS8 Series and TSSOP-8 Package

Common-drain series suitable for reverse current prevention in portable equipment and lithium ion secondary battery protection

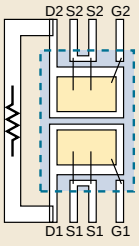
Common-drain type

Total impedance reduced by means of pattern elimination

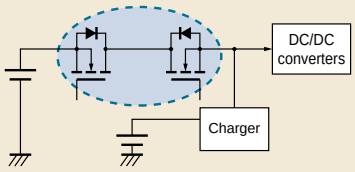


Pattern resistor included

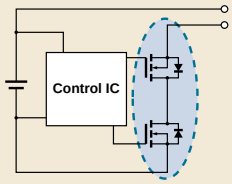
Conventional type



Reverse current prevention



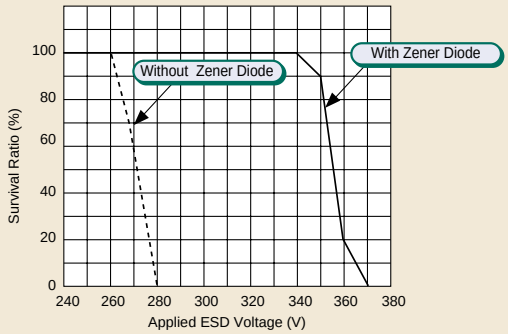
Battery protection



1-3. Static Electricity Breakdown Voltage

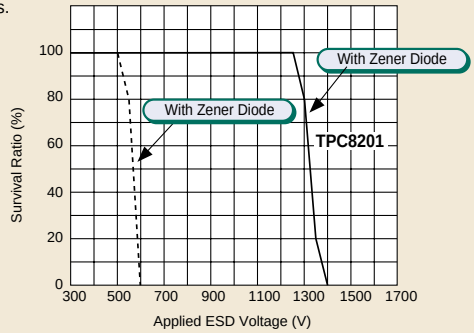
@C = 200 pF, Rg = 0 Ω

Each positive and negative power supply voltage is applied to the capacitor once.



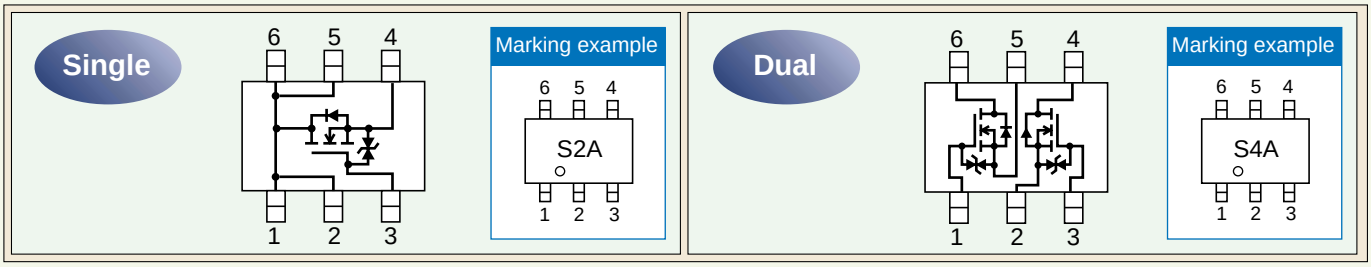
@C = 100 pF, Rg = 1.5 Ω

Each positive and negative power supply voltage is applied to the capacitor three times.



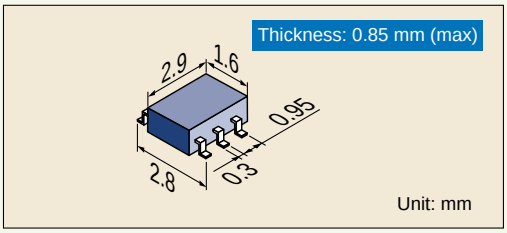
2. VS-6 Series

Circuit configuration



Major applications

- DC / DC converters: Notebook PCs, LCDs and PDAs
- Switches: Portable phones, notebook PCs, USB switches and power management switches
- Motor drives: HDDs



● VS-6 product line-up

Product No.	Maximum Ratings		Polarity and circuit configuration	$R_{DS(ON)}$ Max (mΩ)				Marking
	V_{DSS}(V)	I_D(A)		2.0 V	2.5 V	4.5 V	10 V	
TPC6001	20	6	N-ch, Single	60	45	30	–	S2A
TPC6004	20	6		37	32	24	–	S2C
TPC6002	30	6		–	–	50	30	S2B
TPC6003	30	6		–	–	32	24	S2D
TPC6005	30	6		41	35	28	–	S2E
TPC6201	30	2.5	N-ch, Dual	–	–	145	95	S4A
TPC6103	– 12	– 4.5	P-ch, Single	90*	55	35	–	S3C
TPC6101	– 20	– 4.5		180	100	60	–	S3A
TPC6104	– 20	– 4.5		120*	60	40	–	S3D
TPC6102	– 30	– 4.5		–	–	100	60	S3B

*: V_{GS} = –1.8V

2-1. Package

(1) Ultra-thin package

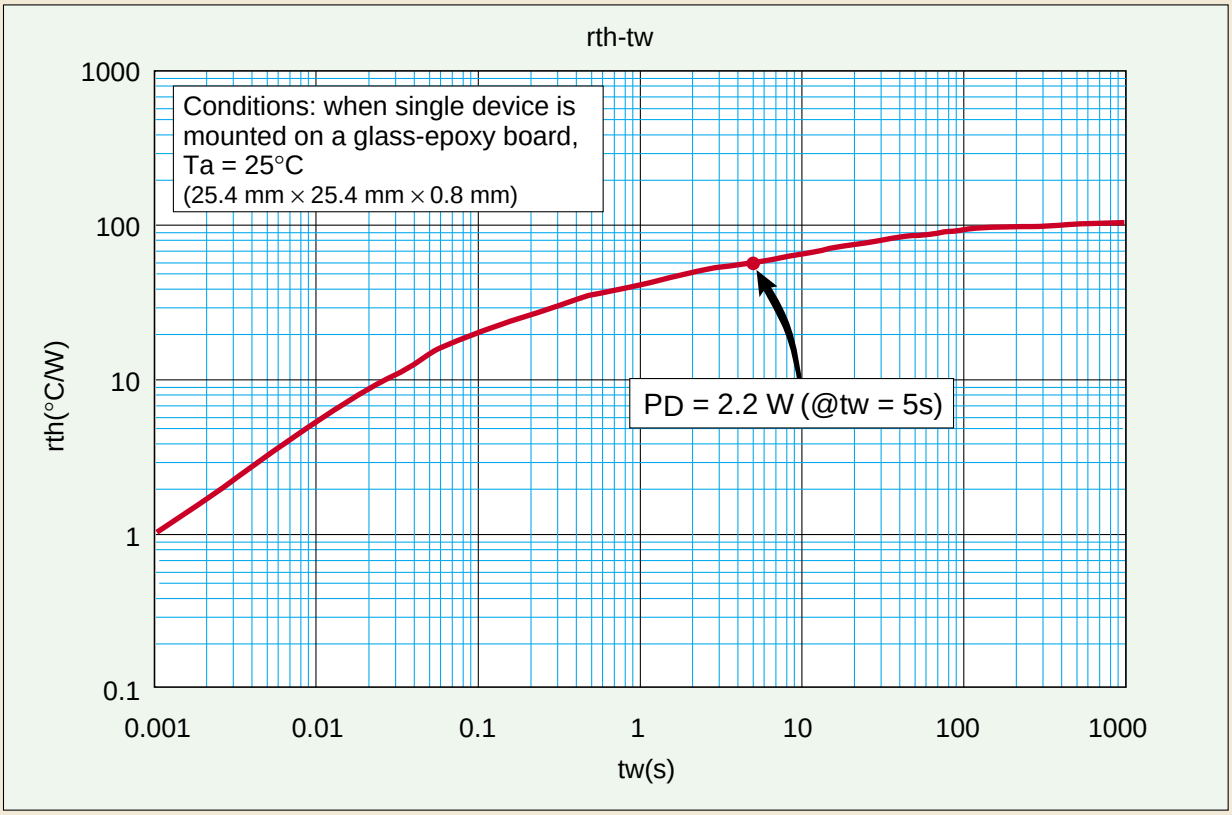
With a thickness of 0.85 mm (max), the VS-6 package is 20%~40% thinner than other 6-pin packages.

(2) Weight

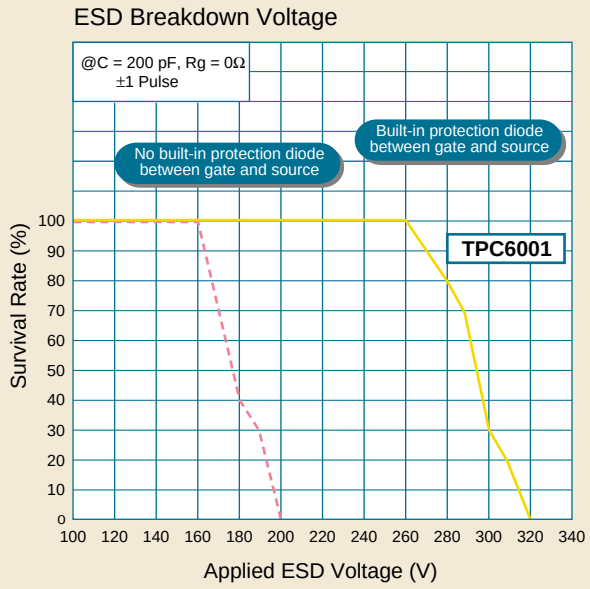
In addition to its slim profile, the package is also 20% lighter than existing compact 6-pin packages. Typical package weight is 11 mg.

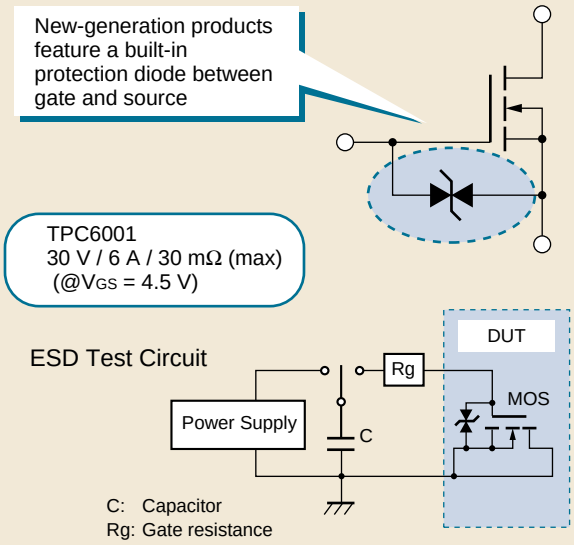
2-2. Thermal Resistance

Irrespective of the package size, P_D = 2.2 W (conditions: single device, board-mounted, tw = 5s)



2-3. Built-in Protection Diode between Gate and Source





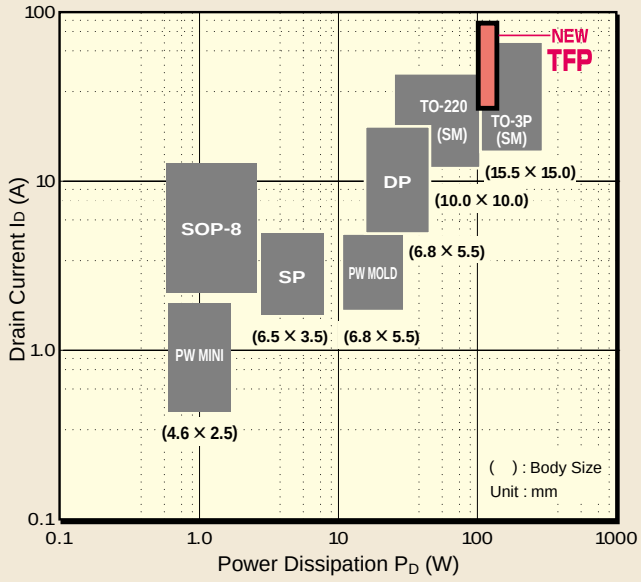
3. TFP (Thin Flat Package) Series

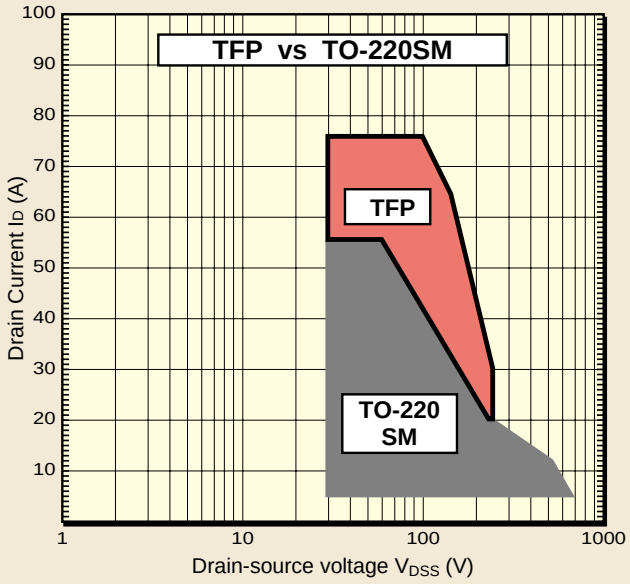
■ Features

TFP ····· Stands for Thin Flat Package

- Thin flat package has a mounting volume 58% less than that of the TO-220SM.
- Separate package inputs and outputs enable stable equipment operation.
- Improved heat dissipation characteristic enables mounting of higher-power devices.

Package range for surface-mount devices





■ Applications

■ DC-DC Converters ■ Motherboards ■ Automotive equipment

■ TFP line-up

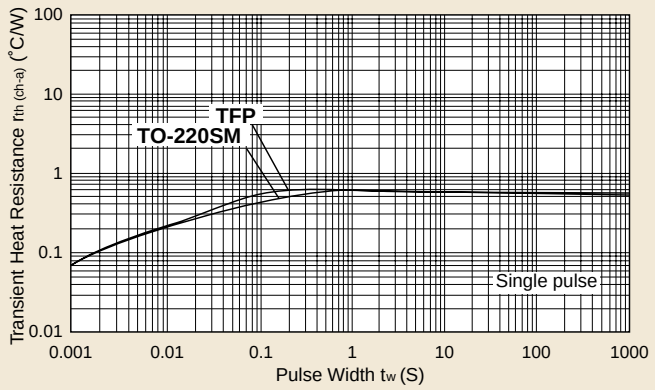
Application	Product No.	Maximum Ratings			$R_{DS(ON)}$ (mΩ)				Vth (V) (I_D = 1 mA)	Equivalent Existing Product
		V_{DSS} (V)	I_D (A)	P_D (W)	Typ.	Max	VGS (V)	I_D (A)		
Information communications devices Automotive equipment	**2SJ619**	–100	–16	75	150	210	–10	–6	–0.8 to –2.0	2SJ412
					250	320	–4	–6		
	2SJ620	–100	–18	125	64	90	–10	–9	–0.8 to –2.0	2SJ464
					85	120	–4	–9		
	2SK3397	30	70	125	4	6	10	35	1.5 to 3.0	Newly developed
	2SK3389	30	75	125	3.8	5	10	38	2.0 to 4.0	Newly developed
	2SK3439	30	75	125	3.8	5	10	38	1.3 to 2.5	Newly developed
					5	10	4	38		
	2SK3440	60	50	125	6.5	8	10	25	2.0 to 4.0	Newly developed
	2SK3441	60	75	125	4.5	5.8	10	38	1.3 to 2.5	2SK2987
					5.8	10	4	38		
	2SK3442	100	45	125	15	20	10	23	2.0 to 4.0	Newly developed
	2SK3387	150	18	100	80	120	10	9	0.8 to 2.0	2SK2882
					90	180	4	9		
	2SK3443	150	30	125	50	55	10	15	3.0 to 5.0	Newly developed
	2SK3444	200	25	125	65	82	10	12.5	3.0 to 5.0	Newly developed
	2SK3388	250	20	125	82	105	10	10	2.0 to 4.0	2SK2993
	2SK3445	250	20	125	90	105	10	10	3.0 to 5.0	Newly developed
	2SK3499	400	8.5	80	400	550	10	5	2.0 to 4.0	2SK2949
	2SK3466	500	5	50	1350	1500	10	2.5	2.0 to 4.0	2SK2991
	***2SK3538**	500	8	80	750	850	10	4	2.0 to 4.0	2SK2776
	2SK3398	500	12	125	400	520	10	6	2.0 to 4.0	2SK3068
	2SK3438	600	10	125	740	1000	10	5	3.0 to 5.0	2SK3437

*: Under development

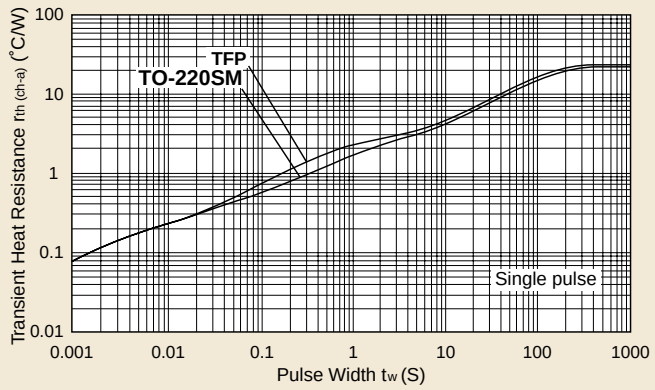
3-1. Heat Dissipation Characteristic

Thermal resistance TFP with mounting area 33% less than that of the TO-220SM offers Rth (ch-c) and Rth (ch-a) almost equivalent to those of the TO-220SM (when mounted on an HIT board).

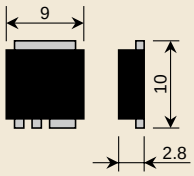
Actural rating / heat resistance between channel and case (with infinite heat dissipation heat sink mounted)



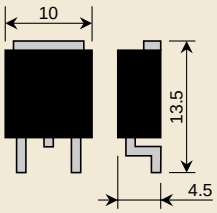
Actural rating / heat resistance between channel and ambient (with 3 cm × 3 cm HIT mounted)



TFP: 2SK3389



TO-220SM: equivalent to 2SK3389

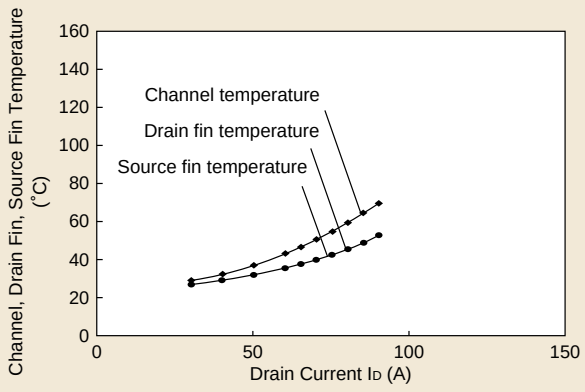


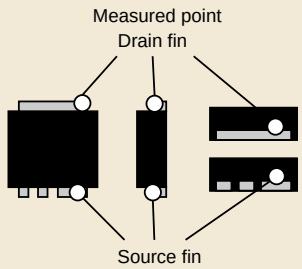
Unit: mm

Application of DC current (with infinite heat dissipation heat sink mounted)

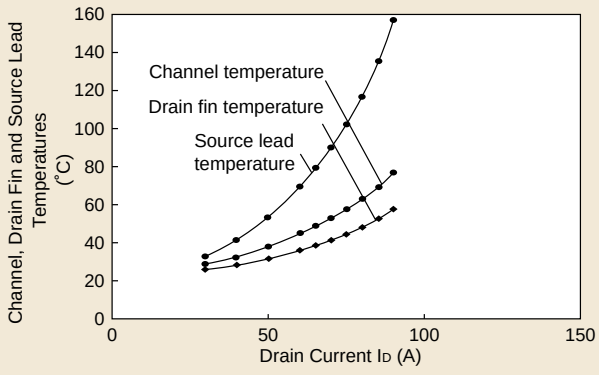
The source fin of the TFP generates less heat than the source lead of the TO-220SM due to the TFP'S efficient heat dissipation.

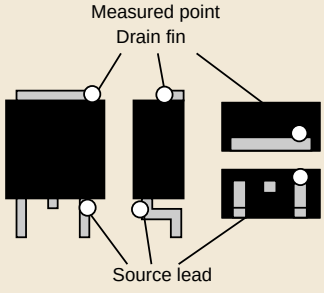
TFP: 2SK3389 30 V, 75 A, 5 mΩ max





TO-220SM: equivalent to 2SK3389

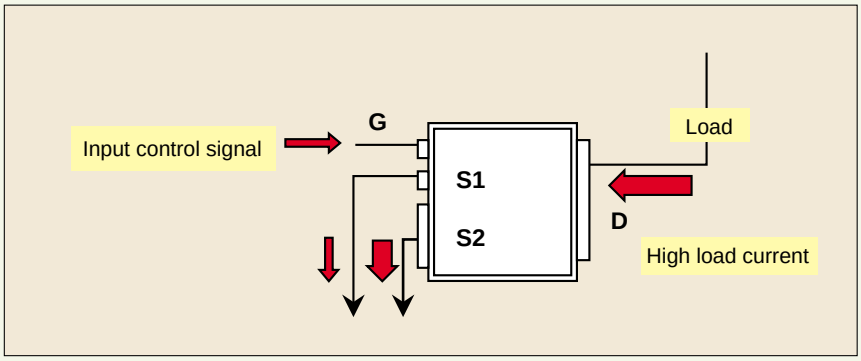




3-2. For Stable Circuit Operation and High-current, High-speed Switching

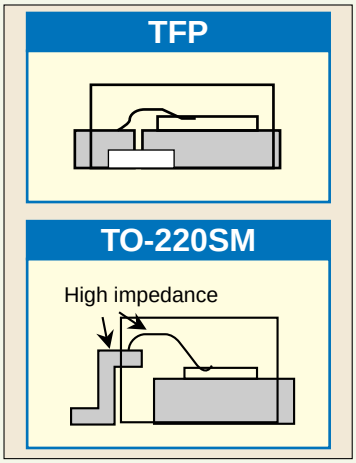
Stable circuit operation

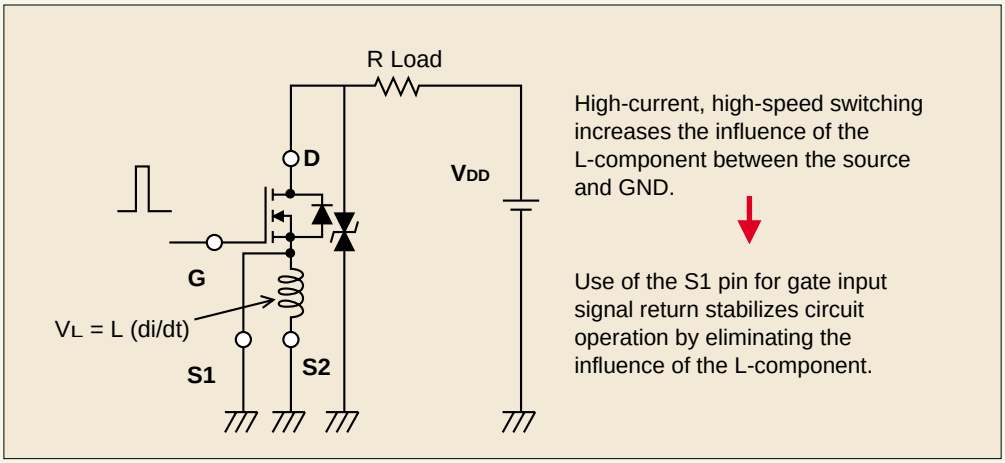
The advantage of MOSFETs is that, because of their high input impedance, they allow high output control with low power drive. However, their disadvantage is that they are susceptible to malfunction due to noise. TFP Series devices have four pins, allowing the input drive to be kept separate from the outputs, thus reducing the risk that the outputs will affect the input.



L-component influence on high-current, high-speed switching

Lead impedance, which causes problems with high-current, high-speed switching in DC/DC converters, is reduced.





High-current, high-speed switching increases the influence of the L-component between the source and GND.

Use of the S1 pin for gate input signal return stabilizes circuit operation by eliminating the influence of the L-component.

Switching waveform

The four-pin structure results in a shorter rise time and more stable switching, all of which help to reduce the risk of abnormal oscillation.

When the S1 pin is not used for input signal return (3 pins):

t_r = 5.4 ns, t_{on} = 25.1 ns
V_{DS} turend on at 40%

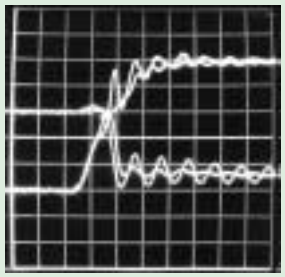
Shorter rise time

Stable circuit operation

When the S1 pin is used for input signal return (4 pins):

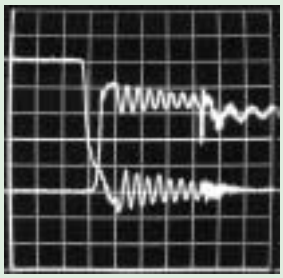
t_r = 4.6 ns, t_{on} = 22.1 ns

3-pin, 4-pin



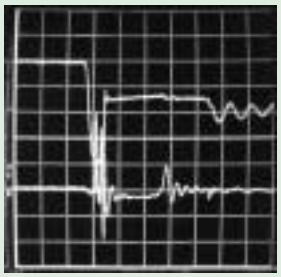
V_{GS} = 2V/div, V_{DS} = 5V/div, t_W = 20ns/div

4-pin



V_{GS} = 2V/div, V_{DS} = 5V/div, t_W = 100ns/div

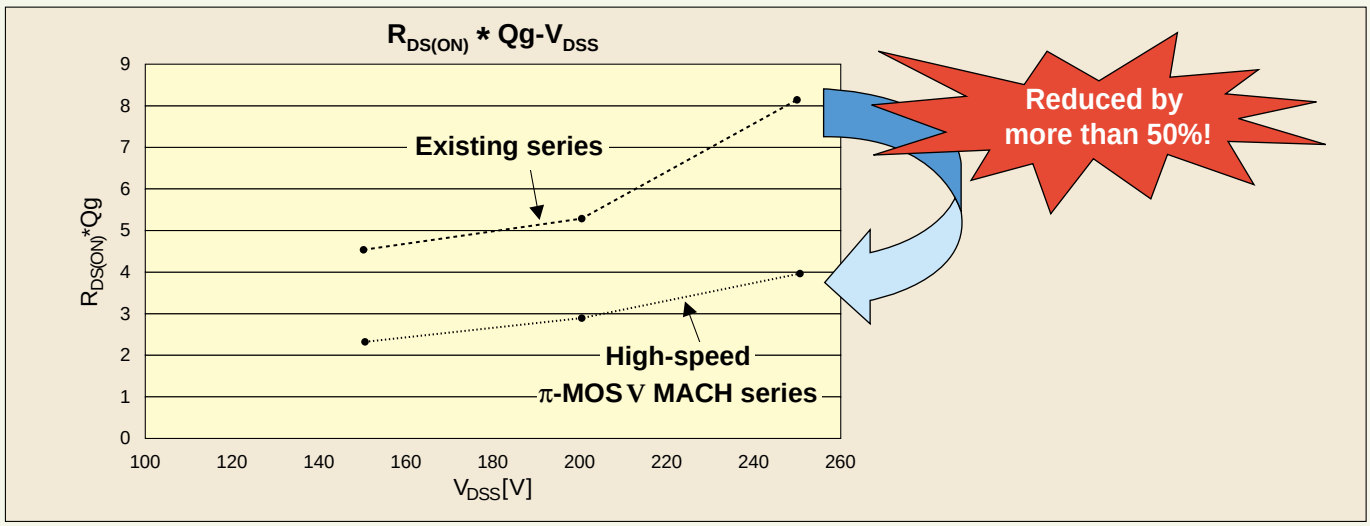
3-pin



V_{GS} = 2V/div, V_{DS} = 5V/div, t_W = 100ns/div

Insert a coil of L = 17 nH between gate and source

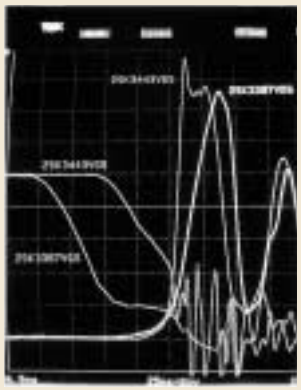
3-3. Features of High-speed Series for DC-DC Converters



High-speed series line-up

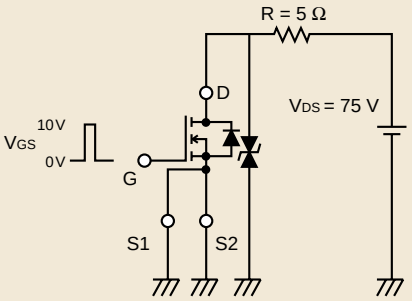
Product No.	Maximum Rating			$R_{DS(ON)}$(mΩ) (typ.)	$R_{DS(ON)}$ (mΩ) (max)	Qg(nC)	$R_{DS(ON)}$*Qg
	V_{DSS} (V)	I_D (A)	P_D (W)	V_{GS}=10 V	V_{GS}=10 V	Typ.	Typ.
2SK3443	150	30	125	50	55	45	2.3
2SK3444	200	25	125	65	82	45	2.9
2SK3445	250	20	125	90	105	45	4

Switching waveform



V_{GS} = 2 V/div, V_{DS} = 25 V/div, t_W = 25 ns/div

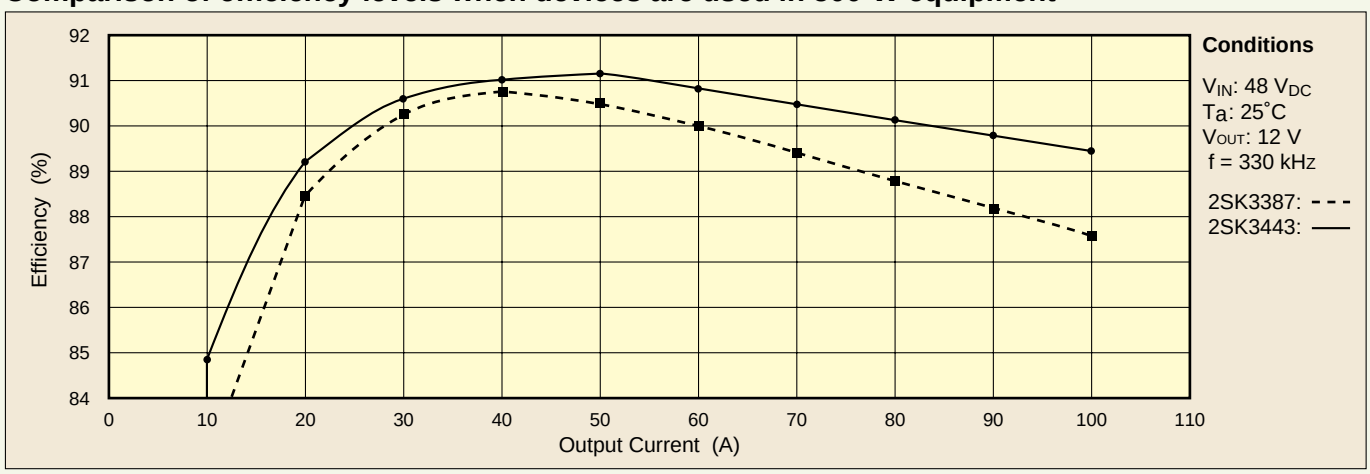
Measurement circuit



Features

t_f of MACH Series (e.g. 2SK3443) is 30% faster than t_f of typical product (e.g. 2SK3387).

Comparison of efficiency levels when devices are used in 500-W equipment



4. L²-π-MOS V Series (V_{GS} = 4-V drive)

High-integration (680 k cells / cm²), ultra-low ON-resistance series based on original technologies

- ON-resistance per unit area reduced by 15% (compared to L² -π-MOS IV, $R_{DS(ON)}$ max)
- Operation at logic level voltage [V_{GS} = 4-V drive] (Vth = 0.8 V to 2.0 V)
- Avalanche withstand capability guaranteed, superior withstand capability of parasitic diode
- Built-in protection zener diode between gate and source

N-ch product line-up

Product No.	V_{DSS} (V)	I_D (A)	P_D (W)	Package Type	$R_{DS(ON)}$ (Ω)				$R_{DS(ON)}$ (Ω)				Qg (Typ.) (nC)
					Typ.	Max	V_{GS} (V)	I_D (A)	Typ.	Max	V_{GS} (V)	I_D (A)	
2SK2964	30	2	1.5	PW-MINI	0.13	0.18	10	1	0.2	0.3	4	1	5.8
2SK2839	30	10	2.5	SP	0.03	0.04	10	5	0.045	0.06	4	5	26
2SK2844	30	35	60	TO-220AB	0.016	0.02	10	18	0.026	0.035	4	18	40
2SK3089	30	40	50	TO-220FL/SM	0.026	0.03	10	20	—	—	—	—	23
2SK3090	30	45	60	TO-220FL/SM	0.016	0.02	10	25	—	—	—	—	39
2SK3127	30	45	65	TO-220FL/SM	0.095	0.011	10	25	—	—	—	—	66
2SK3128	30	60	125	TO-3P (N)	0.095	0.011	10	30	—	—	—	—	66
2SK3125	30	60	50	TO-3P (SM)	0.0053	0.007	10	30	—	—	—	—	130
2SK2989	50	5	0.9	TO-92MOD	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-220 (NIS)	0.034	0.046	10	12	0.055	0.08	4	6	25
2SK2886	50	45	40	TO-220 (NIS)	0.014	0.02	10	25	0.027	0.036	4	25	66
(Note)**2SK3051**	50	45	40	TO-220FL/SM	0.024	0.03	10	25	—	—	—	—	60
(Note)**2SK2744**	50	45	125	TO-3P (N)	0.015	0.02	10	25	—	—	—	—	68
(Note)**2SK2550**	50	45	100	TO-3P (N)	0.024	0.030	10	25	—	—	—	—	36
(Note)**2SK2551**	50	50	150	TO-3P (N)	0.0072	0.0011	10	25	—	—	—	—	130
2SK2745	50	50	150	TO-3P (N)	0.007	0.0095	10	25	0.011	0.016	4	25	130
2SK2961	60	2	0.9	TO-92MOD	0.2	0.27	10	1	0.26	0.38	4	1	5.8
2SK2615	60	2	1.5	PW-MINI	0.23	0.3	10	1	0.33	0.44	4	1	6
2SK2229	60	5	1.3	TPS	0.12	0.16	10	2.5	0.2	0.3	4	1.3	12
2SK2231	60	5	20	PW-MOLD	0.12	0.16	10	2.5	0.2	0.3	4	1.3	12
2SK2741	60	5	2.5	SP	0.12	0.16	10	2.5	0.2	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-220 (NIS)	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-220 (NIS)	0.022	0.03	10	18	0.04	0.055	4	15	60
2SK2233	60	45	100	TO-3P (N)	0.022	0.03	10	25	0.04	0.055	4	15	60
2SK2266	60	45	65	TO-220FL/SM	0.022	0.03	10	25	0.04	0.055	4	15	60
2SK2312	60	45	45	TO-220 (NIS)	0.013	0.017	10	25	0.019	0.025	4	25	110
2SK2376	60	45	100	TO-220FL/SM	0.013	0.017	10	25	0.019	0.025	4	25	110
(Note)**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
(Note)**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	0.013	0.015	4	30	170
2SK2313	60	60	150	TO-3P (N)	0.008	0.011	10	30	0.013	0.015	4	30	170
2SK2962	100	1	0.9	TO-92MOD	0.5	0.7	10	0.5	0.65	0.95	4	0.5	6.3
2SK2963	100	1	1.5	PW-MINI	0.5	0.7	10	0.5	0.65	0.95	4	0.5	6.3
2SK2742	100	3	2.5	SP	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK2200	100	3	1.3	TPS	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK2201	100	3	20	PW-MOLD	0.28	0.35	10	2	0.36	0.45	4	2	13.5
2SK2399	100	5	20	PW-MOLD	0.17	0.23	10	2.5	0.22	0.3	4	2	22
2SK2400	100	5	1.3	TPS	0.17	0.23	10	2.5	0.22	0.3	4	2	22
2SK2391	100	20	35	TO-220 (NIS)	0.066	0.085	10	10	0.09	0.13	4	10	50
2SK2314	100	27	75	TO-220AB	0.066	0.085	10	15	0.09	0.13	4	15	50
2SK2789	100	27	60	TO-220FL/SM	0.066	0.085	10	15	0.09	0.13	4	15	50

Note : 10-V drive

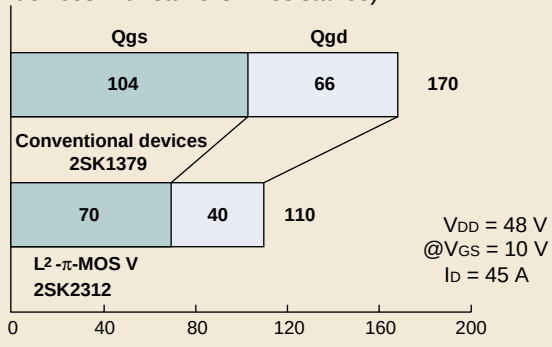
P-ch product line-up

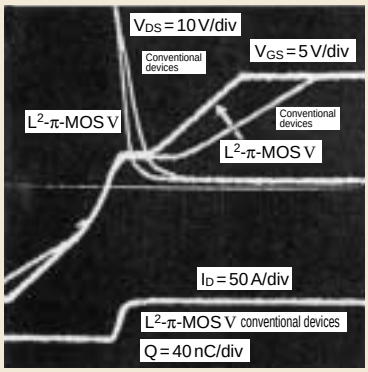
Product No.	V_{DSS} (V)	I_D (A)	P_D (W)	Package Type	$R_{DS(ON)}$ (Ω)								Qg (Typ.) (nC)
					Typ.	Max	V_{GS} (V)	I_D (A)	Typ.	Max	V_{GS} (V)	I_D (A)	
2SJ511	– 30	– 2	1.5	PW-MINI	0.32	0.45	– 10	– 1	0.55	0.76	– 4	– 1	5.5
2SJ525	– 30	– 5	1.3	TPS	0.1	0.12	– 10	– 2.5	0.17	0.2	– 4	– 2.5	27
2SJ537	– 50	– 5	0.9	TO-92MOD	0.15	0.19	– 10	– 2.5	0.27	0.34	– 4	– 1.3	18
2SJ360	– 60	– 1	1.5	PW-MINI	0.55	0.73	– 10	– 0.5	0.86	1.2	– 4	– 0.5	6.5
2SJ507	– 60	– 1	0.9	TO-92MOD	0.5	0.7	– 10	– 0.5	0.72	1.0	– 4	– 0.5	5.6
2SJ482	– 60	– 5	2.5	SP	0.16	0.19	– 10	– 2.5	0.24	0.28	– 4	– 2.5	22
2SJ377	– 60	– 5	20	PW-MOLD	0.16	0.19	– 10	– 2.5	0.24	0.28	– 4	– 2.5	22
2SJ438	– 60	– 5	25	TO-220 (NIS)	0.16	0.19	– 10	– 2.5	0.24	0.28	– 4	– 2.5	22
2SJ378	– 60	– 5	13	TPS	0.16	0.19	– 10	– 2.5	0.24	0.28	– 4	– 2.5	22
2SJ349	– 60	– 20	35	TO-220 (NIS)	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-220 (NIS)	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	TO-92MOD	1.34	1.9	– 10	– 0.5	1.68	2.5	– 4	– 0.5	6.3
2SJ380	– 100	– 12	35	TO-220 (NIS)	0.15	0.21	– 10	– 6	0.25	0.32	– 4	– 6	48
2SJ412	– 100	– 16	60	TO-220FL/SM	0.15	0.21	– 10	– 6	0.25	0.32	– 4	– 6	48
2SJ464	– 100	– 18	45	TO-220 (NIS)	0.064	0.09	– 10	– 9	0.085	0.12	– 4	– 9	140

■ L²-π-MOS V features

[1] Gate charge reduced by 35%

Gate input charge comparison
(for devices with same ON-resistance)

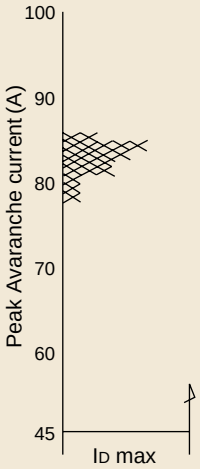


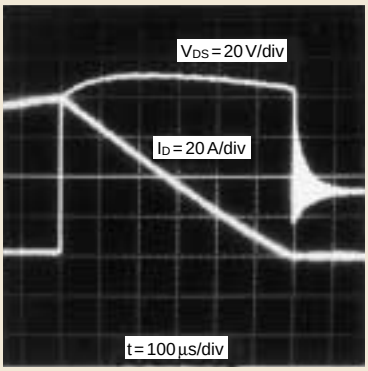


[2] Improved avalanche withstand capability

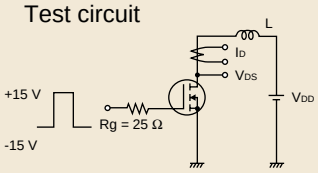
2SK2312

@L = 500 µH
V_{DD} = 50 V





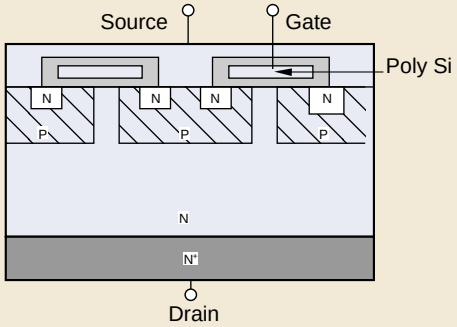
Test circuit



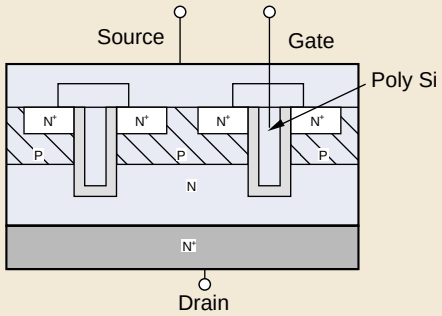
5. U-MOS Series (Trench Type)

A low-voltage drive (4-V drive), ultra-low ON-resistance series with a high level of integration derived from trench-structure technology

☐ Planar structure



☐ Trench (U-MOS) structure



- Highly integrated using micro technology: 1.6 M cells / cm² in Phase I, 4.7 M cells / cm² in Phase II
- ON-resistance reduced by 60% per unit area (compared to L² -π-MOS V $R_{DS(ON)}$ max)
- Operation at logic-level voltage [4-V drive]
- Avalanche withstand capability guaranteed, superior di / dt voltage improved
- Built-in protection zener diode between gate and source

U-MOS product line-up

Applications	Product No.	Maximum Rating			Package Type	$R_{DS(ON)}$ Max (mΩ)	V_{GS}(V)	I_D(A)	$R_{DS(ON)}$ Max (mΩ)	V_{GS}(V)	I_D(A)	Remarks
		V_{DSS}(V)	I_D(A)	P_D(W)								
Motor drives Solenoid drives Lamp drives DC-DC converters	**2SK2466**	100	30	40	TO-220(NIS)	46	10	15	70	4	15	Phase I
	✻**2SK3343**	60	20	30	DP	20	10	10	36	4	10	Consumer electronics
	2SK3236	60	35	30	TO-220(NIS)	20	10	18	36	4	18	Phase II
	2SK2985	60	45	45	TO-220(NIS)	5.8	10	25	10	4	25	
	2SK2986	60	55	100	TO-220FL / SM	5.8	10	35	10	4	35	
	2SK2987	60	70	150	TO-3P(N)	5.8	10	35	10	4	35	

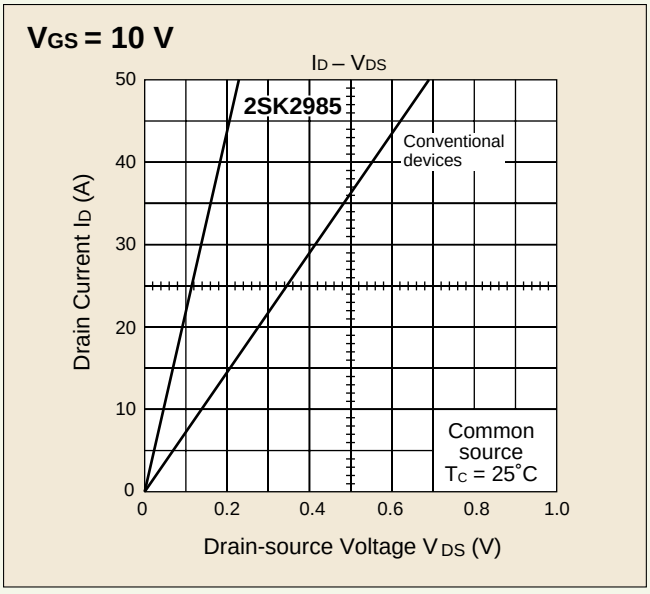
✻: Under development

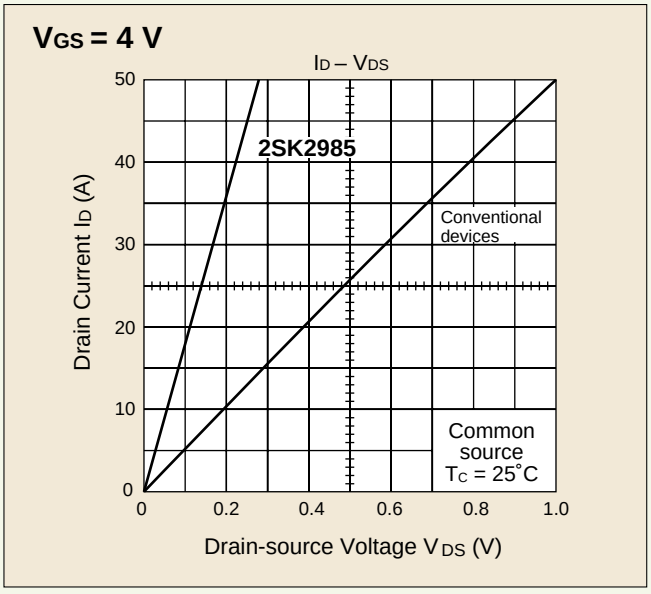
■ 2SK2985 features

ON-resistance reduced by 60% per unit area

■ TO-220 package, $R_{DS(ON)}$ = 5.8 Ωm (max)

■ Operation at logic level voltage (4-V drive)





6. 2.5-V Drive π-MOS V Series

- 2.5-V drive: Gate drive voltage reduced from 4 V to 2.5 V
- Vth = 0.5 V to 1.1 V: Designed to operate at high temperatures with threshold voltage width reduced from 1.2 V to 0.6 V
- Avalanche withstand capability: Built-in protection zener diode between gate and source; cell structure used to improve avalanche withstand capability

● 2.5-V drive π-MOS V Series line-up

Applications	Product No.	Maximum Ratings			Package Type	$R_{DS(ON)}$ Max (Ω)	V_{GS} (V)	I_D (A)	$R_{DS(ON)}$ Max (Ω)	V_{GS} (V)	I_D (A)
		V_{DSS}(V)	I_D(A)	P_D(W)							
Notebook PCs Cellular phones DC switches	**2SJ465**	– 16	– 2	0.5	PW-MINI	1.0	– 2.5	– 0.5	0.71	– 4	– 1.0
	2SJ439	– 16	– 5	20	PW-MOLD	0.28	– 2.5	– 2.5	0.20	– 4	– 2.5
	2SK2549	16	2	0.5	PW-MINI	0.38	2.5	0.5	0.29	4	1.0
	2SK2493	16	5	20	PW-MOLD	0.12	2.5	2.5	0.10	4	2.5

7. π-MOS V Series (V_{DSS} = 200 V to 250 V)

200-V Series for Cs / Cy switching in monitors

- Reduced ON-resistance per unit area
- Chip size smaller than conventional chips and device cost reduced
- Superior breakdown voltage characteristics due to optimized cell structure
- Guaranteed absolute maximum voltage rating between gate and source: V_{GSS} = ±20 V
- Products with V_{DSS} of 200 suitable for resonance capacitance (Cs / Cy)

● π-MOS V Series line-up

Applications	Product No.	Maximum Ratings			Package Type	$R_{DS(ON)}$ (Ω)		V_{GS} (V)	I_D (A)	Qg (Typ.) (nC)
		V_{DSS} (V)	I_D (A)	P_D (W)		Typ.	Max			
DC-DC converters Monitors Motor controllers	**2SJ407**	–200	–5	30	TO-220(NIS)	0.8	1.0	–10	–2.5	20
	2SJ567		–2.5	20	PW-MOLD	1.6	2.0	–10	–1.5	10
	2SJ610	–250	–2	20	PW-MOLD	1.85	2.55	–10	–1.0	12
	2SJ512		–5	30	TO-220(NIS)	1.0	1.25	–10	–2.5	10
	2SJ516		–6.5	35	TO-220(NIS)	0.6	0.8	–10	–3	29
	2SK2992	200	1	1.5	PW-MINI	2.2	3.5	10	0.5	3
	2SK2835		5	1.3	TPS	0.56	0.8	10	2.5	10
	2SK2381		5	25	TO-220(NIS)	0.56	0.8	10	2.5	10
	2SK2920		5	20	PW-MOLD	0.56	0.8	10	2.5	10
	2SK2350		8.5	30	TO-220(NIS)	0.26	0.4	10	5	17
	2SK2965		11	35	TO-220(NIS)	0.15	0.26	10	5.5	30
	2SK2382		15	45	TO-220(NIS)	0.13	0.18	10	10	40
	2SK2401		15	75	TO-220FL/SM	0.13	0.18	10	10	40
	2SK3176		30	150	TO-3P(N)	0.038	0.052	10	15	125
	2SK3462	250	3	20	PW-MOLD	1.2	1.7	10	1.5	12
	2SK3342		4.5	20	PW-MOLD	0.8	1.0	10	2	10
	2SK2417		7.5	30	TO-220(NIS)	0.42	0.5	10	3.5	20
	2SK2914		7.5	50	TO-220AB	0.42	0.5	10	3.5	20
	2SK2508		13	45	TO-220(NIS)	0.18	0.25	10	6.5	40
	2SK2598		13	60	TO-220FL/SM	0.18	0.25	10	6.5	40
	2SK2993		20	100	TO-220FL/SM	0.082	0.105	10	10	100
	2SK2967		30	150	TO-3P(N)	0.048	0.068	10	15	132
	2SK2995		30	90	TO-3P(N)IS	0.048	0.068	10	15	132

8. High-Speed π-MOS V Series (V_{DSS} = 450 V to 600 V)

To allow the development of high-efficiency portable equipment, Toshiba has developed two Series of high-speed Power MOSFET devices. The two series are as follows:
The High-Speed Switching Series for AC adapters and switching power supplies
The High-Speed Switching Series for motor controllers and inverter circuits

■ High-Speed Switching Series: Achieves faster switching speed than the existing π-MOS V Series which are currently well-established in the marketplace (t_{off}-switching is 38% faster).
■ High-Speed Diode Series: Achieves faster parasitic diode speed by using lifetime control (t_{rr} ≒ 100 ns).

● High-speed switching series line-up

Applications	Product No.	Maximum Ratings			Package	$R_{DS(ON)}$ max (Ω)	V_{GS} (V)	I_D (A)	Qg Typ. (nC)	Equivalent Existing Device
		V_{DSS}(V)	I_D(A)	P_D(W)						
AC adapters Switching power supplies	**2SK3310**	450	10	40	TO-220(NIS)	0.65	10	5	23	2SK3126
	2SK3309	450	10	65	TO-220FL/SM	0.65	10	5	23	—
	2SK3403	450	13	100	TO-220FL/SM	0.4	10	6.5	34	—
	✻**2SK3312**	600	6	65	TO-220FL/SM	1.25	10	3	25	2SK2777
	✻**2SK3437**	600	10	80	TO-220FL/SM	1	10	5	13	2SK2996
	2SK3399	600	10	100	TO-220FL/SM	0.75	10	5	35	2SK2866

✻: Under development

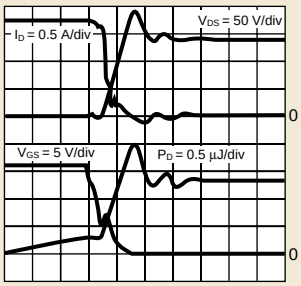
● High-speed diode series (HSD Series) line-up

Applications	Product No.	Maximum Ratings			Package	$R_{DS(ON)}$ max (Ω)	V_{GS} (V)	I_D (A)	trr Typ. (ns)	Equivalent Existing Device
		V_{DSS}(V)	I_D(A)	P_D(W)						
Motor controllers Inverters Switching power supplies	**2SK3316**	500	5	35	TO-220(NIS)	1.8	10	2.5	60	2SK2662
	2SK3313	500	12	45	TO-220(NIS)	0.62	10	5	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
	2SK3130	600	6	40	TO-220(NIS)	1.5	10	3	60	2SK2545

■ Characteristics of high-speed switching series

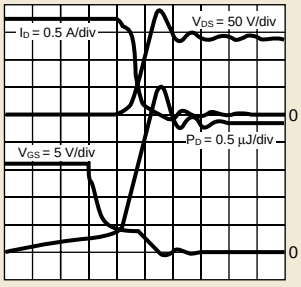
Switching loss reduced by 40%

2SK3310 (high speed)



100 ns/div

2SK3316 (conventional device)

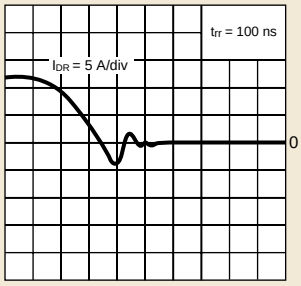


100 ns/div

■ Characteristics of high-speed diode series

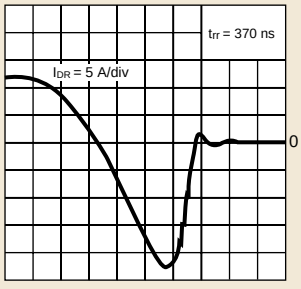
Faster parasitic diode

2SK3313 (HSD)



100 ns/div

2SK2842 (conventional device)



100 ns/div

9. π-MOS V Series (V_{DSS} = 400 V to 700 V)

High-performance series for 100-V AC input-switching power supplies

- Low-drive-power, high-speed (Q_g reduced by 40%, t_f by 30%)
- Guaranteed V_{GSS} = ±30 V for every device in product line
- Avalanche withstand capability guaranteed, superior withstand capability of parasitic diode
- Built-in protection zener diode between gate and source

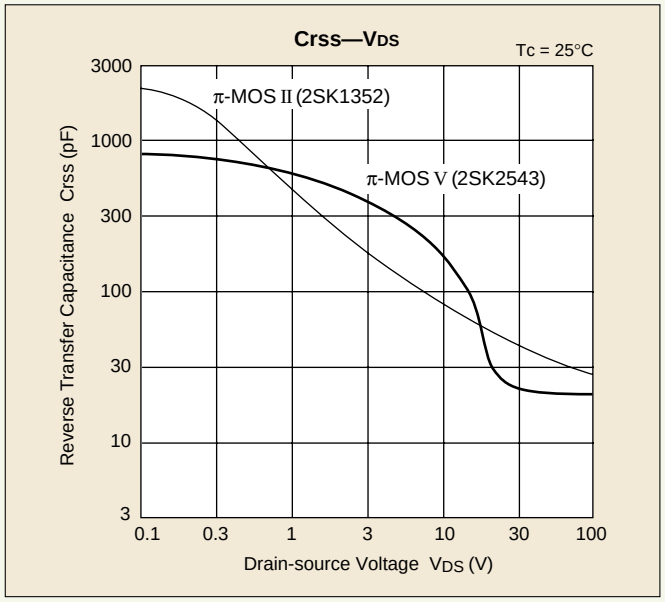
● π-MOS V product line-up

Applications	Product No.	Maximum Ratings			Package	$R_{DS(ON)}$ (Ω)				V_{th} @ I_D = 1mA (V)	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 Ballst inverters Motor controllers	✻ 2SK3498	400	1	20	Pw-Mold	4.0	5.5	10	0.5	2.0 to 4.0	5.7
	2SK2679	400	5.5	35	TO-220(NIS)	0.84	1.2	10	3	2.0 to 4.0	17
	2SK2838	400	5.5	40	TO-220FL/SM	0.84	1.2	10	3	2.0 to 4.0	17
	2SK2952	400	8.5	40	TO-220(NIS)	0.4	0.55	10	5	2.0 to 4.0	34
	2SK2841	400	10	80	TO-220AB	0.4	0.55	10	5	2.0 to 4.0	17
	2SK2949	400	10	80	TO-220FL/SM	0.4	0.55	10	5	2.0 to 4.0	34
	2SK3472	450	1	20	Pw-Mold	4.0	4.6	10	0.5	2.0 to 4.0	5
	✻ 2SJ611	–450	–1.5	20	Pw-Mold	—	7.0	–10	–0.7	–2.0 to 4.0	—
	✻ 2SK3463	450	2.5	20	Pw-Mold	—	2.45	10	1.2	2.0 to 4.0	—
	✻ S3D72	450	2.5	25	TO-220NIS	—	2.45	10	1.2	2.0 to 4.0	—
	2SK3126	450	10	40	TO-220(NIS)	0.48	0.65	10	5	2.0 to 4.0	35
	2SK2998	500	0.5	0.5	TO-92MOD	10	18	10	0.25	2.0 to 4.0	5
	2SK3302	500	0.5	1.3	TPS	10	18	10	0.25	2.0 to 4.0	5
	2SK3471	500	0.5	1.5	Pw-Mini	10	18	10	0.25	2.0 to 4.0	3.8
	2SK2599	500	2	1.3	TPS	2.9	3.2	10	1	2.0 to 4.0	9
	✻ S3C69	500	2	20	Pw-Mold	2.9	3.2	10	1	2.0 to 4.0	9
	2SK2862	500	2	25	TO-220(NIS)	2.9	3.0	10	1	2.0 to 4.0	9
	2SK2661	500	5	75	TO-220AB	1.35	1.5	10	2.5	2.0 to 4.0	17
	2SK2662	500	5	35	TO-220(NIS)	1.35	1.5	10	2.5	2.0 to 4.0	17
	2SK2991	500	5	50	TO-220FL/SM	1.35	1.5	10	2.5	2.0 to 4.0	17
	2SK2542	500	8	80	TO-220AB	0.75	0.85	10	4	2.0 to 4.0	30
	2SK2543	500	8	40	TO-220(NIS)	0.75	0.85	10	4	2.0 to 4.0	30
	2SK2776	500	8	65	TO-220FL/SM	0.75	0.85	10	4	2.0 to 4.0	30
	2SK2601	500	10	125	TO-3P(N)	0.75	1.0	10	5	2.0 to 4.0	30
	2SK2842	500	12	40	TO-220(NIS)	0.4	0.52	10	5	2.0 to 4.0	45
	2SK3068	500	12	100	TO-220FL/SM	0.4	0.52	10	6	2.0 to 4.0	45
	2SK2916	500	14	80	TO-3P(N)IS	0.35	0.4	10	7	2.0 to 4.0	58
	2SK2698	500	15	150	TO-3P(N)	0.35	0.4	10	8	2.0 to 4.0	58
	2SK2917	500	18	90	TO-3P(N)IS	0.21	0.27	10	10	2.0 to 4.0	80
	2SK2837	500	20	150	TO-3P(N)	0.21	0.27	10	10	2.0 to 4.0	80
	2SK3117	500	20	150	TO-3P(SM)	0.21	0.27	10	10	2.0 to 4.0	80
	2SK3132	500	50	250	TO-3P(L)	0.07	0.095	10	25	2.0 to 4.0	280
	2SK2836	600	1	2.5	SP	6.4	9.0	10	0.5	2.0 to 4.0	9
	2SK3371	600	1	20	Pw-Mold	7.3	9.0	10	0.5	2.0 to 4.0	9
	2SK2846	600	2	1.3	TPS	4.2	5.0	10	1	2.0 to 4.0	9
	2SK2865	600	2	20	PW-MOLD	4.2	5.0	10	1	2.0 to 4.0	9
	2SK3067	600	2	25	TO-220(NIS)	4.2	5.0	10	1	2.0 to 4.0	9
	2SK2750	600	3.5	35	TO-220(NIS)	1.7	2.2	10	1.8	2.0 to 4.0	20
	2SK3085	600	3.5	75	TO-220AB	1.7	2.2	10	1.8	2.0 to 4.0	20
	2SK2544	600	6	80	TO-220AB	0.9	1.25	10	3	2.0 to 4.0	30
	2SK2545	600	6	40	TO-220(NIS)	0.9	1.25	10	3	2.0 to 4.0	30
	2SK2777	600	6	65	TO-220FL/SM	0.9	1.25	10	3	2.0 to 4.0	30
	2SK2602	600	6	125	TO-3P(N)	0.9	1.25	10	3	2.0 to 4.0	30
	2SK2996	600	10	45	TO-220(NIS)	0.74	1.0	10	5	2.0 to 4.0	38
	2SK2843	600	10	45	TO-220(NIS)	0.54	0.75	10	5	2.0 to 4.0	45
	2SK2866	600	10	125	TO-220AB	0.54	0.75	10	5	2.0 to 4.0	45
	2SK2889	600	10	100	TO-220FL/SM	0.54	0.75	10	5	2.0 to 4.0	45
	2SK2699	600	12	150	TO-3P(N)	0.5	0.65	10	6	2.0 to 4.0	58
	2SK2953	600	15	90	TO-3P(N)IS	0.31	0.4	10	8	2.0 to 4.0	80
	2SK2915	600	16	150	TO-3P(N)	0.31	0.4	10	8	2.0 to 4.0	80
	2SK3265	700	10	45	TO-220(NIS)	0.72	1.0	10	5	2.0 to 4.0	53

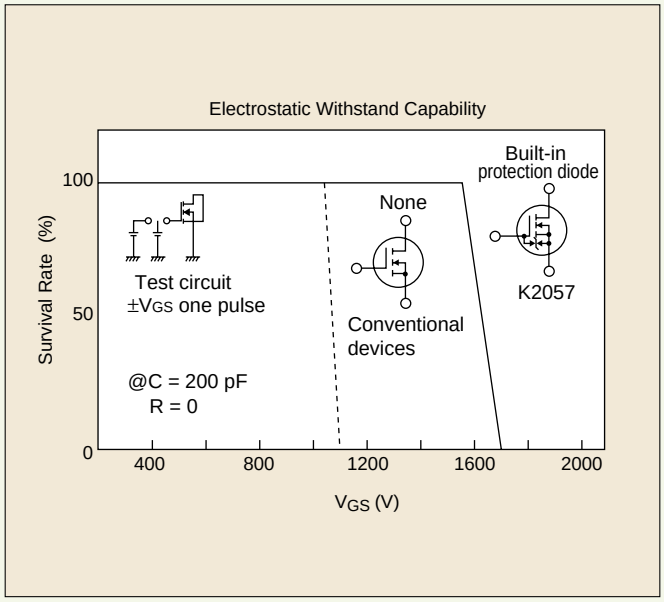
✻: Under development

■ π-MOS V features

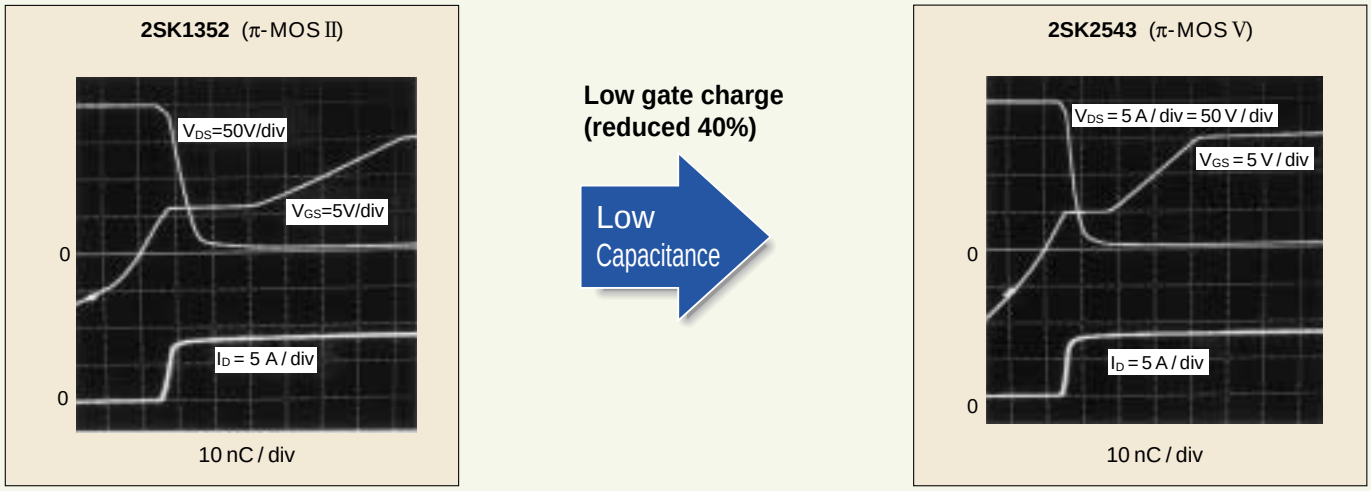
[1] Reduced reverse transfer capacitance (@V_{DS} = 30 V)



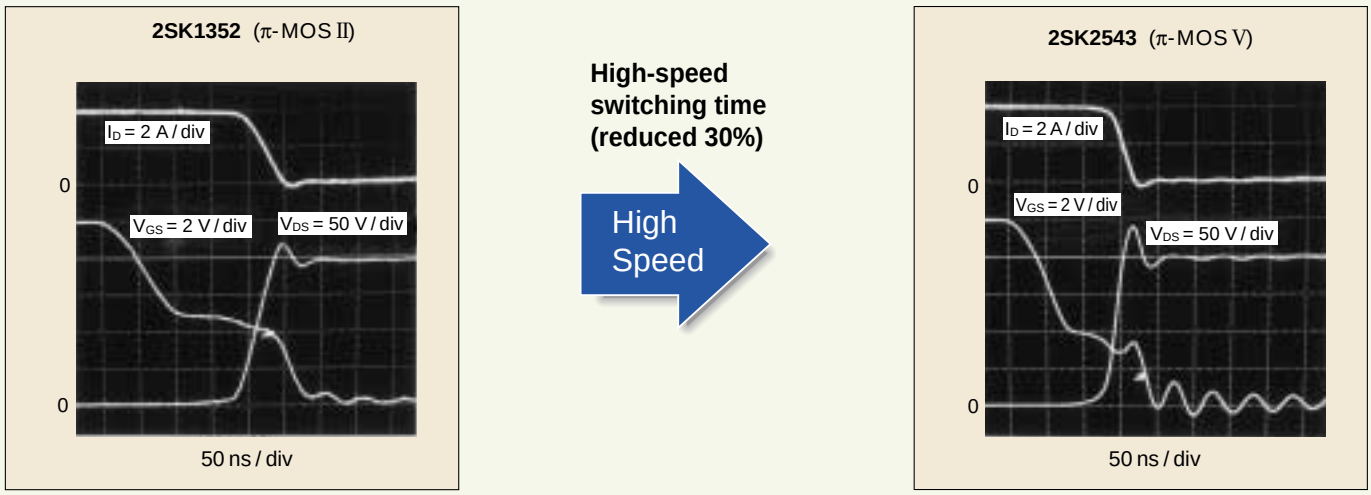
[2] Built-in protection zener diode between gate and source



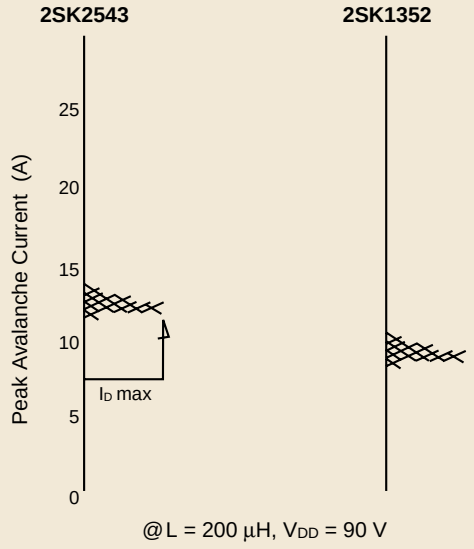
[3] Reduced gate charge (V_{DD} = 200 V, I_D = 8.5 A)



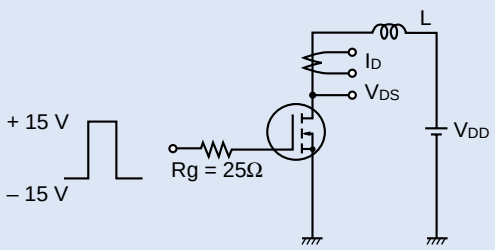
[4] High-speed switching (V_{DD} = 200 V, I_D = 4 A, R_{gs} = 50 Ω)



[5] Improved avalanche withstand capability

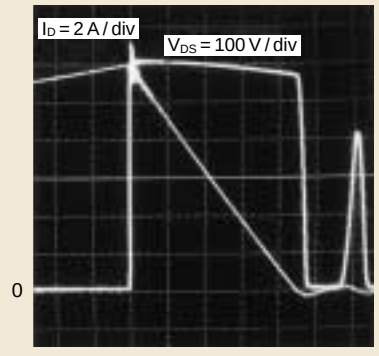


Test circuit



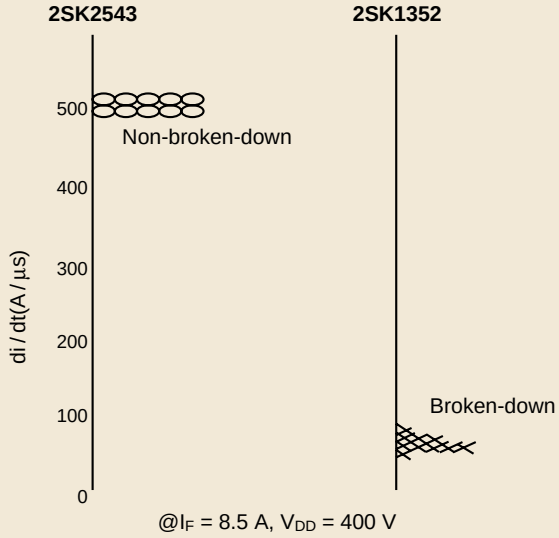
Measured waveforms

2SK2543

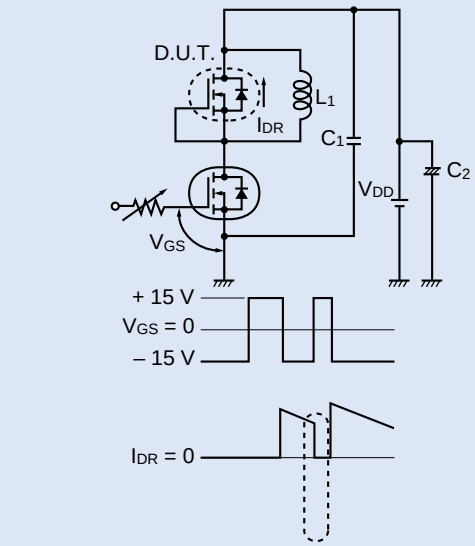


1 µs / div

[6] Improved withstand parasitic diode

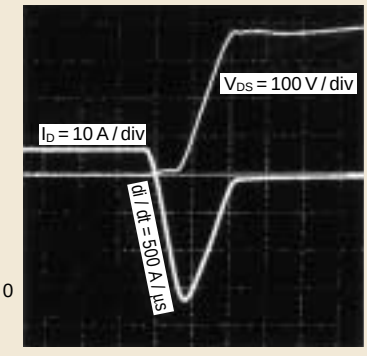


Test circuit



Measured waveforms

2SK2543



100 ns / div

10. π-MOS Ⅲ Series (V_{DSS} = 800 V to 1000 V)

High-performance, high-speed devices for 200-V AC input-switching power supplies

- Low drive-power, high-speed devices (Qg reduced by 60%, t_f reduced by 25%)
- Guaranteed V_{GSS} = ±30 V.
- Avalanche withstand capability guaranteed, superior withstand capability of parasitic diode
- Built-in protection zener diode between gate and source

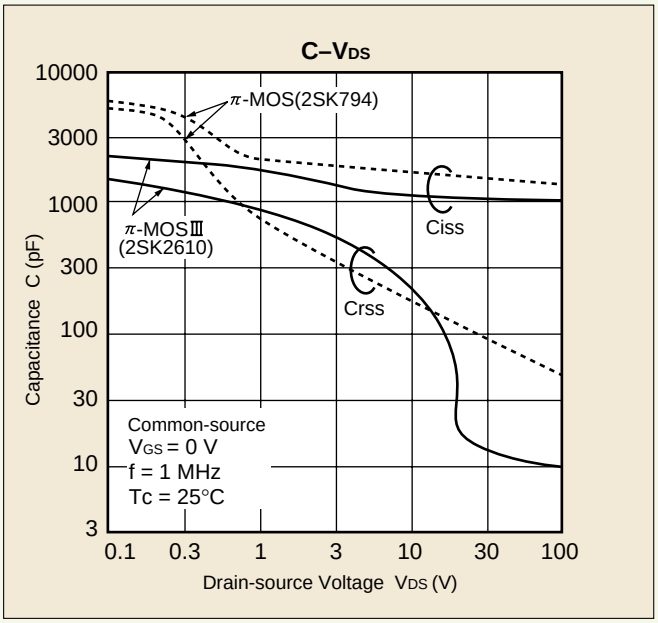
● π-MOS Ⅲ product line-up

Applications	Product No.	Maximum Ratings			Package Type	$R_{DS\ (ON)}$ max (Ω)	V_{th} @I_D = 1 mA (V)	Qg (Typ.) (nC)
		V_{DSS} (V)	I_D (A)	P_D (W)				
220-V/240-V AC input switching power supplies	✻ **2SK2997**	800	1.5	40	DP	8.0	2.0 to 4.0	25
	2SK2603	800	3	100	TO-220AB	3.6	2.0 to 4.0	25
	2SK2883	800	3	75	TO-220FL/SM	3.6	2.0 to 4.0	34
	2SK2604	800	5	125	TO-3P(N)	2.2	2.0 to 4.0	34
	2SK2605	800	5	45	TO-220(NIS)	2.2	2.0 to 4.0	34
	2SK2884	800	5	100	TO-220FL/SM	2.2	2.0 to 4.0	55
	2SK2746	800	7	150	TO-3P(N)	1.7	2.0 to 4.0	68
	2SK2606	800	8.5	85	TO-3P(N)IS	1.2	2.0 to 4.0	68
	2SK2607	800	9	150	TO-3P(N)	1.2	2.0 to 4.0	6
	2SK3301	900	1	20	PW-MOLD	20	2.4 to 3.4	15
	2SK2733	900	1	60	TO-220AB	9.0	2.0 to 4.0	15
	2SK2845	900	1	40	DP	9.0	2.0 to 4.0	21
	2SK2718	900	2.5	40	TO-220(NIS)	6.4	2.0 to 4.0	25
	2SK2608	900	3	100	TO-220AB	4.3	2.0 to 4.0	25
	2SK2700	900	3	40	TO-220(NIS)	4.3	2.0 to 4.0	25
	2SK2719	900	3	125	TO-3P(N)	4.3	2.0 to 4.0	45
	2SK2610	900	5	150	TO-3P(N)	2.5	2.0 to 4.0	45
	2SK2717	900	5	45	TO-220(NIS)	2.5	2.0 to 4.0	55
	2SK2749	900	7	150	TO-3P(N)	2.0	2.0 to 4.0	58
	2SK2847	900	8	85	TO-3P(N)IS	1.4	2.0 to 4.0	70
	2SK3017	900	8.5	90	TO-3P(N)IS	1.25	2.0 to 4.0	58
	2SK2611	900	9	150	TO-3P(N)	1.4	2.0 to 4.0	70
	2SK2968	900	10	150	TO-3P(N)	1.25	2.0 to 4.0	—
	2SK2613	1000	8	150	TO-3P(N)	1.7	2.0 to 4.0	—

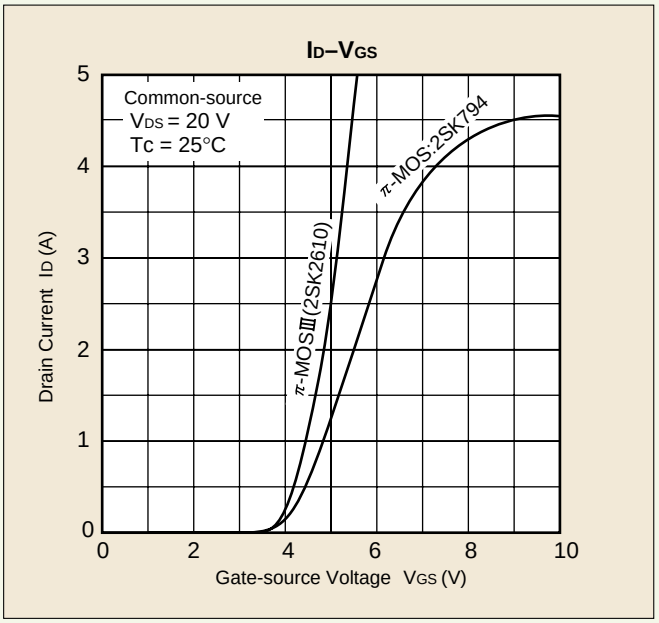
✻: Under development

■ π-MOS Ⅲ features

[1] Reduced reverse transfer capacitance



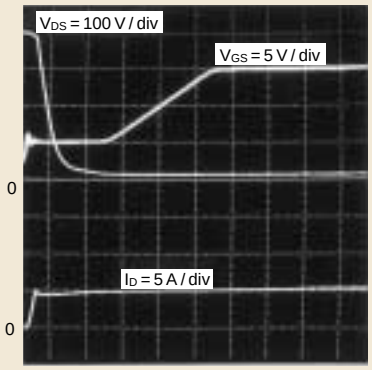
[2] High forward transfer admittance



[3] Reduced gate charge

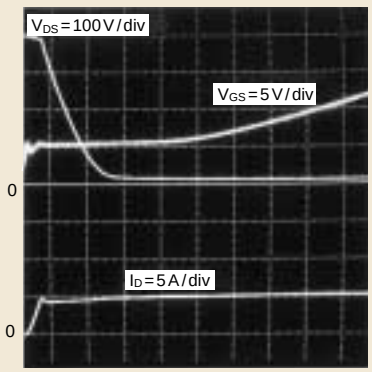
Qg reduced by 60%

π-MOS Ⅲ (2SK2610)



10 nC / div

π-MOS (2SK794)

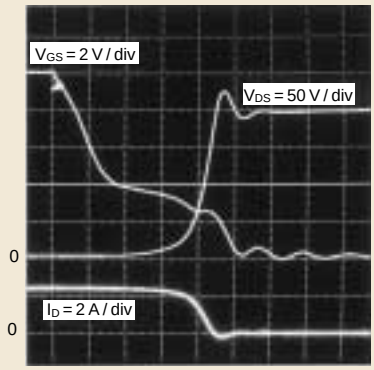


10 nC / div

[4] High-speed switching

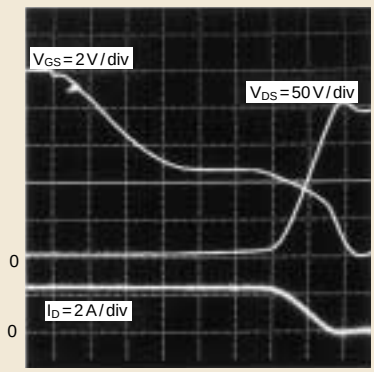
t_f reduced by 25%, t_{off} reduced by 40%

π-MOS Ⅲ (2SK2610)



50 ns / div

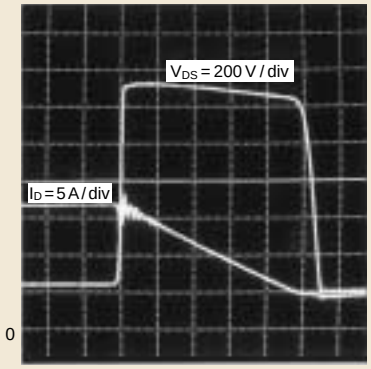
π-MOS (2SK794)



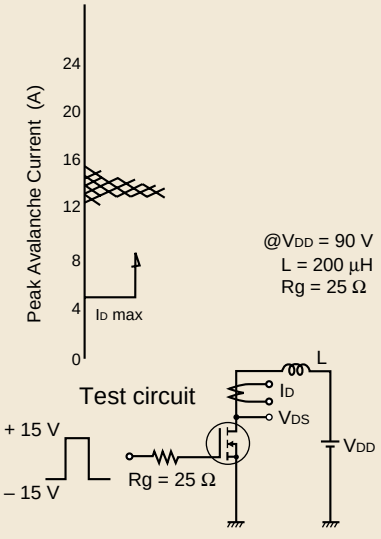
50 ns / div

[5] High Ruggedness

π-MOS Ⅲ (2SK2610)

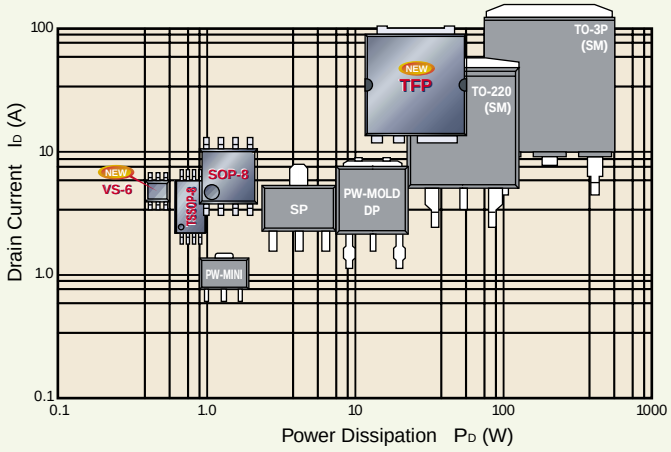


500 ns / div



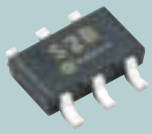
11. Compact Packages

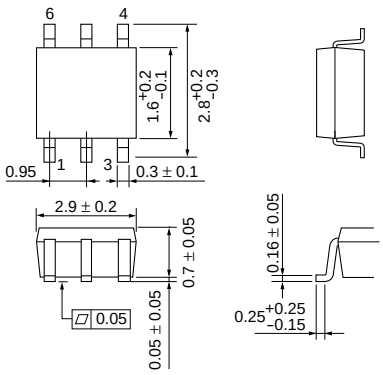
Meet the needs for equipment miniaturization and flatness.
Extensive product line: P_D = 1.0 W to 150 W and I_D = 1 A to 50 A
● TFP: high performance devices with a 4-pin structure for separating input and output
● SOP-8 and TSSOP-8: ultra-low ON-resistance devices using trench structure



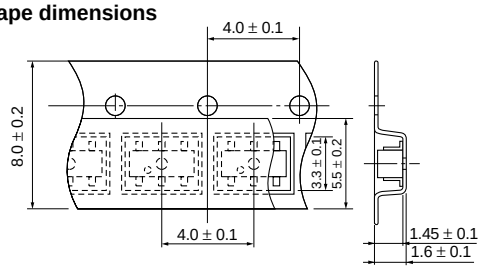
● VS-6

Unit: mm

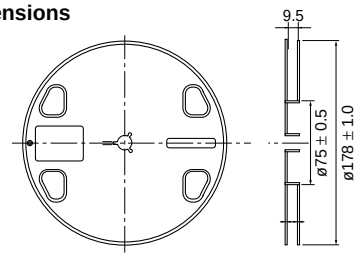




Tape dimensions



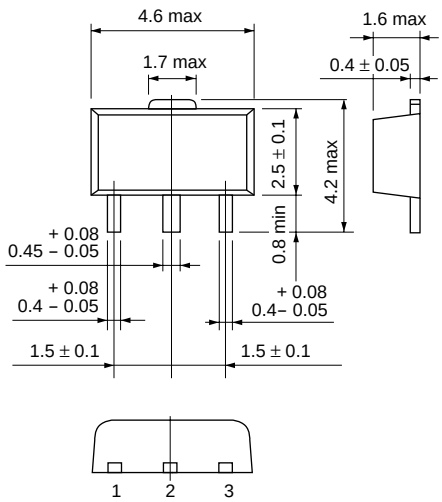
Reel dimensions



Packing quantity
3000/reel

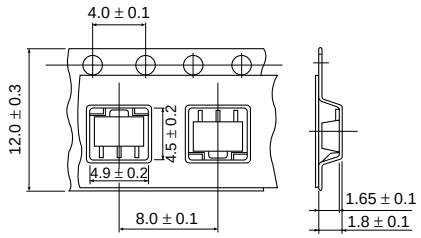
● PW-MINI

Unit: mm

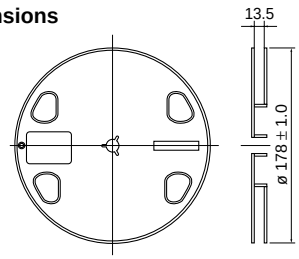


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



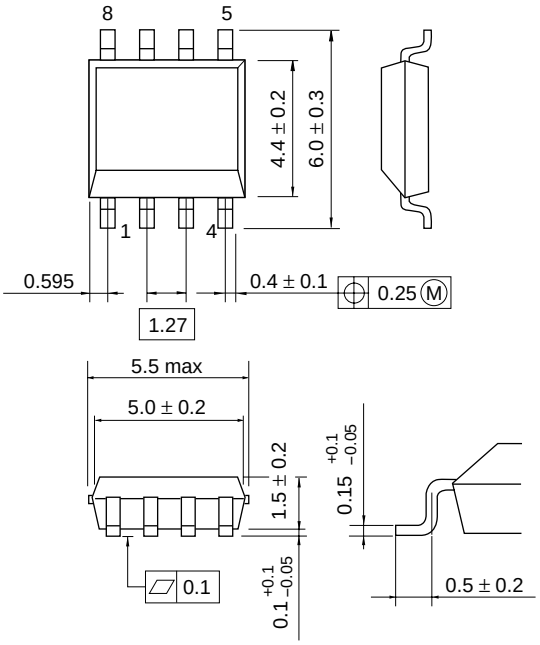
Reel dimensions



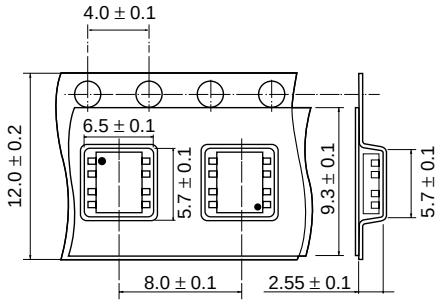
Packing quantity
1000/reel

● SOP-8

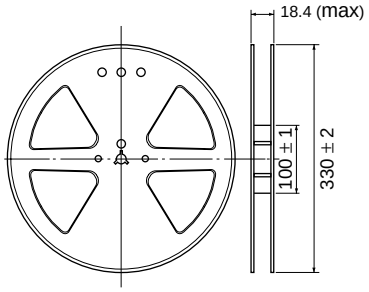
Unit: mm



Tape dimensions



Reel dimensions

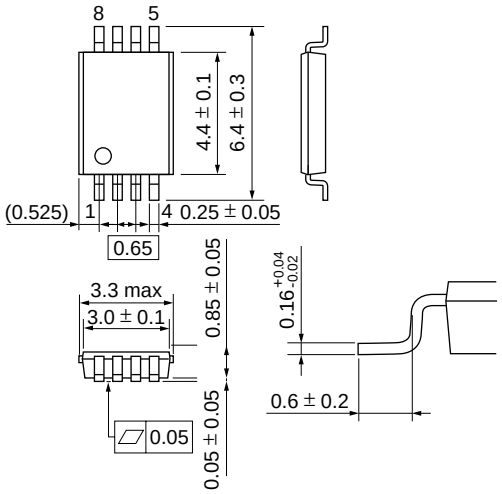


Packing quantity

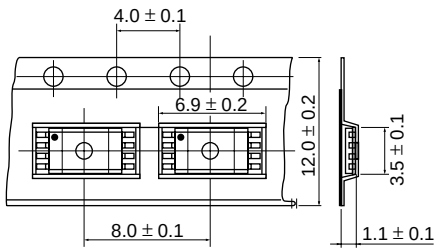
3000/reel

● TSSOP-8

Unit: mm



Tape dimensions



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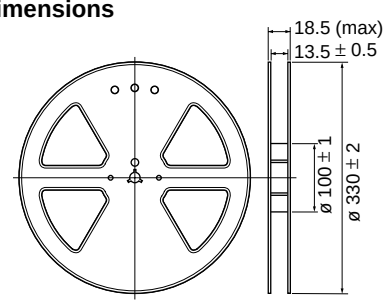
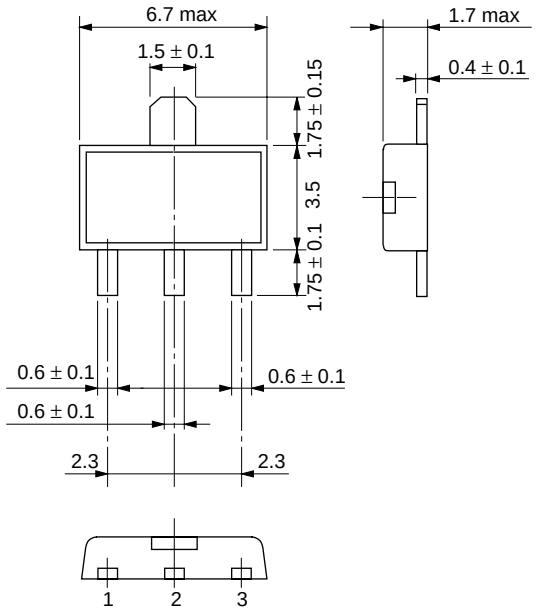


Packing quantity

3000/reel

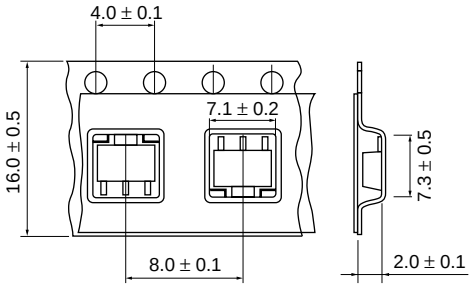
● SP

Unit: mm

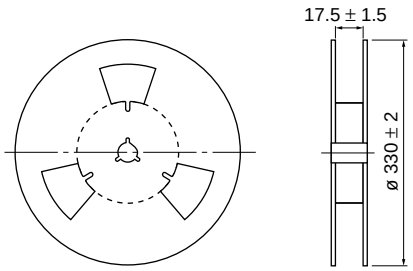


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions

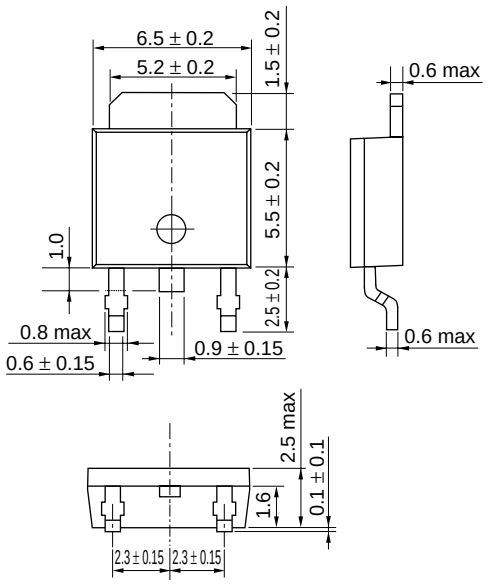


Packing quantity

3000/reel

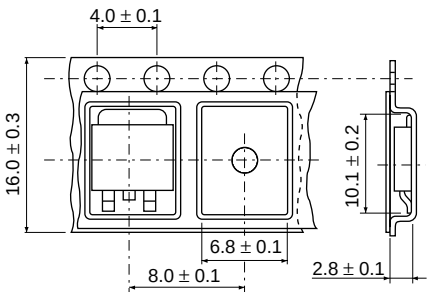
● PW-MOLD

Unit: mm

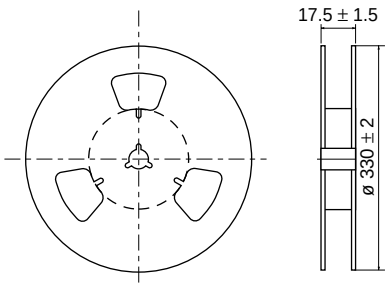


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions

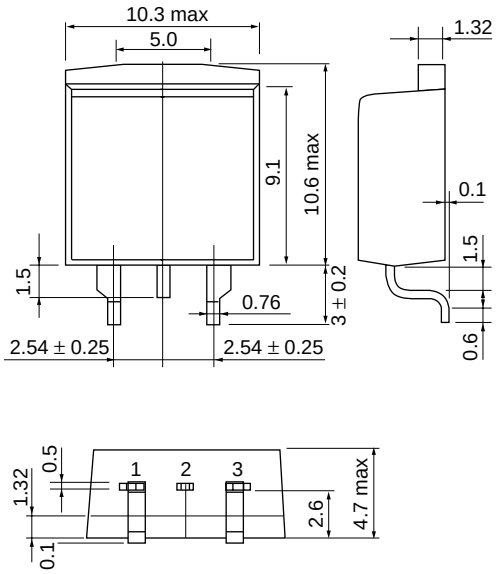


Packing quantity

700/reel

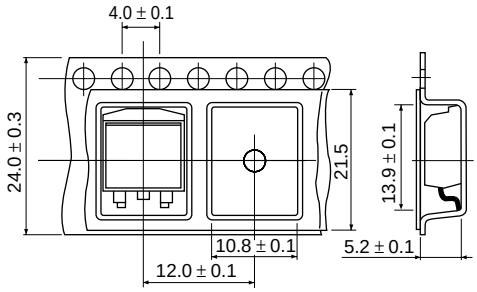
● TO-220SM

Unit: mm

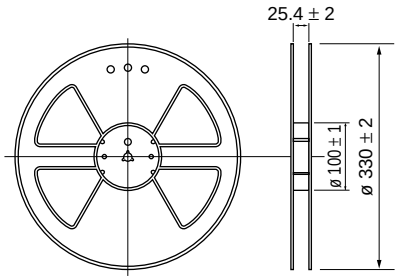


1. Gate
2. Drain (heat sink)
3. Source

Tape dimensions



Reel dimensions

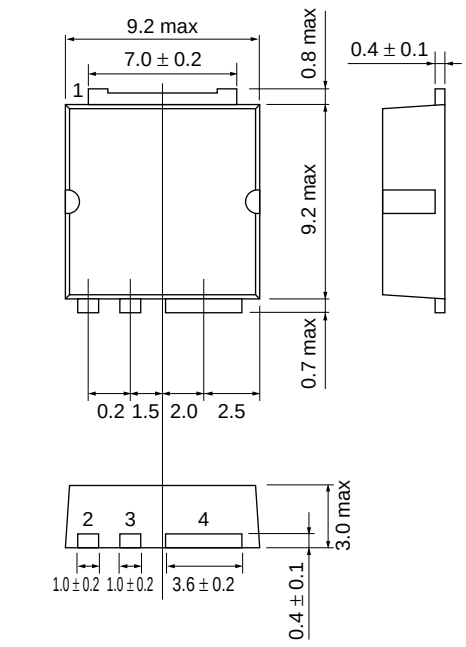


Packing quantity

1000/reel

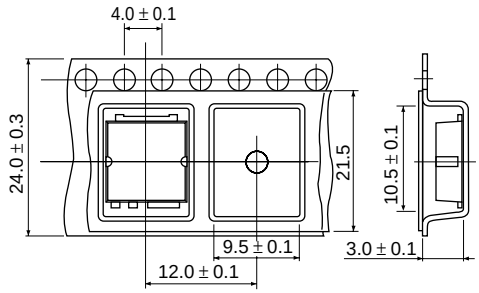
● TFP

Unit: mm

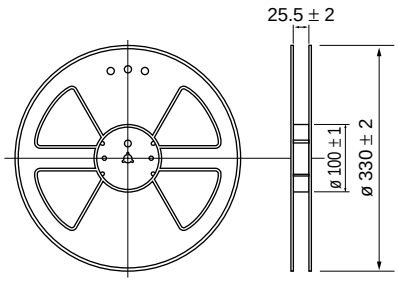


1. Drain (heat sink)
2. Gate
3. Source 1
4. Source 2

Tape dimensions



Reel dimensions



Packing quantity

1500/reel

Small-Signal MOSFETs

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

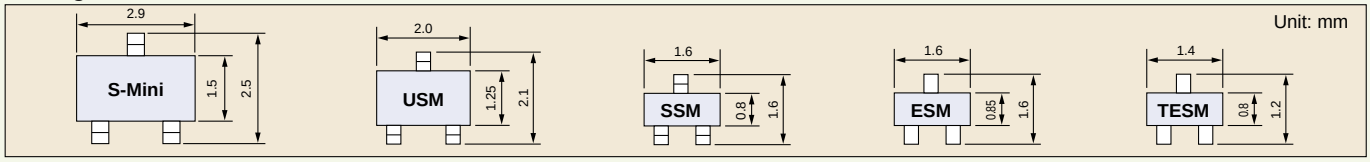
Standard Family single type (0.05 A to 0.4 A class) product line-up

Polarity	Maximum Ratings			Package Type							Vth (V)	Typ.(max)	
	V_{DSS} (V)	V_{GSS} (V)	I_D (mA)	TO-92	MINI	S-MINI (SC-59)	USM (SCS-70)	SSM	ESM	TESM		$R_{DS\ (ON)}$ (Ω)	V_{GSS} (V)
N-ch	50	10	50	—	**2SK1825**	**2SK1826**	**2SK1827**	—	—	—	– 0.8 to 2.5	20(50)	4
P-ch	– 50	– 7	– 50	—	**2SJ342**	**2SJ343**	**2SJ344**	—	—	—	– 0.8 to – 2.5	20(50)	– 4
N-ch	20	10	50	—	—	**2SK1828**	**2SK1829**	**2SK1830**	—	—	0.5 to 1.5	20(40)	2.5
P-ch	– 20	– 7	– 50	—	—	**2SJ345**	**2SJ346**	**2SJ347**	—		– 0.5 to – 1.5	20(40)	– 2.5
N-ch	20	10	100	—	—	**2SK2823**	**2SK2824**	**2SK2825**	—	—	0.5 to 1.0	10(40)	1.5
N-ch	20	10	100	—	—	**2SK2033**	**2SK2034**	**2SK2035**	—	—	0.5 to 1.5	8(12)	2.5
N-ch	20	10	100	—	—	—	—	—	**SSM3K03FE**	**✻SSM3K03TE★**	0.7 to 1.3	4(12)	2.5
P-ch	– 20	– 7	– 100	—	—	—	—	—	**△ SSM3J03FE**	—	– 0.7 to – 1.3	12(25)	– 2.5
N-ch	20	10	100	—	—	—	**SSM3K04FU★**	**SSM3K04FS★**	**SSM3K04FE★**	—	0.7 to 1.3	4(12)	2.5
N-ch	20	10	100	—	—	**2SK2036**	**2SK2037**	—	—	—	0.5 to 1.5	4(6)	2.5
N-ch	60	± 20	200	—	—	**2SK1062**	—	—	—	—	2.0 to 3.5	0.6(1.0)	10
P-ch	– 60	± 20	– 200	**2SK982**	**2SK1061**	**2SJ168**	—	—	—	—	– 2.0 to – 3.5	1.3(2)	– 10
N-ch	30	± 20	200	**2SJ148**	**2SJ167**	**2SK2009**	—	—	—	—	0.5 to 1.5	1.2(2.0)	2.5
P-ch	– 30	± 20	– 200	—	—	**2SJ305**	—	—	—	—	– 0.5 to – 1.5	2.4(4)	– 2.5
N-ch	30	± 20	400	—	—	—	**△ SSM3K09FU**	—	—	—	1.1 to 1.8	0.8(1.2)	4
P-ch	– 30	± 20	– 200	—	—	—	**△ SSM3J09FU**	—	—	—	– 1.1 to – 1.8	3.3(4.2)	– 4
N-ch	20	± 12	400	—	—	—	**SSM3K05FU**	—	—	—	0.6 to 1.1	0.85(1.2)	2.5
P-ch	– 20	± 12	– 200	—	—	—	**SSM3J05FU**	—	—	—	– 0.6 to – 1.1	3.2(4)	– 2.5

★: Built-in R_{GS} = 1MΩ

△: New products ✻: Under development

Package list



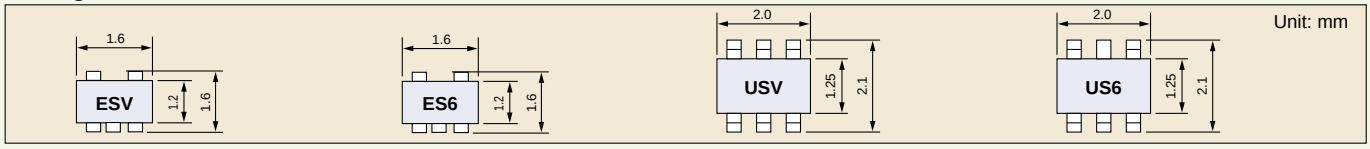
Standard Family dual type (0.05 A to 0.4 A class) product line-up

Polarity	Maximum Ratings			Package Type				Component FETs	Vth (V)	Typ.(max)	
	V_{DSS} (V)	V_{GSS} (V)	I_D (mA)	ESV	ES6	USV	US6			$R_{DS\ (ON)}$ (Ω)	V_{GSS} (V)
N-ch x2	20	10	50				**HN1K02FU**	**2SK1829** x2	0.5 to 1.5	20(40)	2.5
P-ch x2	– 20	– 7	– 50				**HN1J02FU**	**2SJ346** x2	– 0.5 to 1.5	20(40)	– 2.5
N-ch x2	20	10	100			**HN4K03JU**	**HN1K03FU**	**2SK2034** x2	0.5 to 1.5	8(12)	2.5
N-ch+P-ch	20	10	50				**HN1L02FU**	**2SK1829**	0.5 to 1.5	20(40)	2.5
	– 20	– 7	– 50					**+2SJ346**	– 0.5 to 1.5	20(40)	– 2.5
N-ch+P-ch	50	10	50				**HN1L03FU**	**2SK1827**	0.8 to 2.5	20(50)	4
	– 20	– 7	– 50					**+2SJ346**	– 0.5 to 1.5	20(40)	– 2.5
N-ch x2	50	10	50				**HN1K04FU**	**2SK1827** x2	0.8 to 2.5	20(50)	4
N-ch x2	20	10	100				**HN1K05FU**	**2SK2824** x2	0.5 to 1.0	10(40)	1.5
N-ch x2	20	10	100				**HN1K06FU**	**2SK2037** x2	0.5 to 1.5	3.5(6)	2.5
N-ch x2	20	± 12	400			**△ SSM5N05FU**	**△ SSM6N05FU**	**SSM3K05FU** x2	0.6 to 1.1	0.85(1.2)	2.5
P-ch x2	– 20	± 12	– 200			**△ SSM5P05FU**	**△ SSM6P05FU**	**SSM3J05FU** x2	– 0.6 to 1.1	3.2(4)	– 2.5
N-ch+P-ch	20	± 12	400				**△ SSM6L05FU**	**SSM3K05FU**	0.6 to 1.1	0.85(1.2)	2.5
	– 20	± 12	– 200					**+SSM3J05FU**	– 0.6 to – 1.1	3.2(4)	– 2.5
N-ch x2	20	10	100				**△ SSM6N04FU★**	**SSM3K04FU** x2	0.5 to 1.5	4(12)	2.5
N-ch x2	20	10	100	**✻ SSM5N03FE**				**SSM3K03FE** x2	0.7 to 1.3	4(12)	2.5
N-ch x2	20	10	100		**✻ SSM6N03FE**			**SSM3K03FE** x2	0.7 to 1.3	4(12)	2.5
N-ch x2	30	± 20	400				**△ SSM6N09FU**	**SSM3K09FU** x2	1.1 to 1.8	0.8(1.2)	4
P-ch x2	– 30	± 20	– 200				**△ SSM6P09FU**	**SSM3J09FU** x2	– 1.1 to – 1.8	3.3(4.2)	– 4
N-ch+P-ch	30	± 20	400				**△ SSM6L09FU**	**SSM3K09FU+**	1.1 to 1.8	0.8(1.2)	4
	– 30	± 20	– 200					**SSM3J09FU**	–1 .1 to – 1.8	3.3(4.2)	– 4

★: Built-in R_{GS} = 1MΩ

△: New products ✻: Under development

Package list



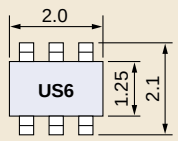
■ High-Current Family (0.6 A to 1.6 A class) product line-up

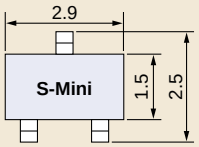
Driving Voltage	Polarity	Package Type		Maximum Rating			$R_{DS(ON)}$ (mΩ)			Vth (V)				t_{on} (ns)	t_{off} (ns)		
		US6	S-MINI	V_{DS} (V)	V_{GSS} (V)	I_D (A)	Typ.	Max	@V_{GS} (V)	Min	Max	@V_{DS} (V)	@I_D (mA)	Typ.	Typ.	@V_{GS} (V)	@I_D (A)
2.5 V	N-ch	—	**SSM3K01F**	30	± 10	1.3	115	150	2.5	0.6	1.1	3	0.1	45	69	2.5	0.5
							85	120	4								
2.5 V	N-ch	—	**SSM3K02F**	30	± 10	1	180	250	2.5	0.6	1.1	3	0.1	52	80	2.5	0.5
							140	200	4								
2.5 V	N-ch	**SSM6K06FU**	—	20	± 12	1.1	160	210	2.5	0.6	1.1	3	0.1	42	100	2.5	0.5
							120	160	4								
2.5 V	N-ch	△ **SSM6K08FU**	—	20	± 12	1.6	100	140	2.5	0.5	1.2	3	0.1	16	15	2.5	0.8
							77	105	4								
2.5 V	P-ch	—	**SSM3J01F**	– 30	± 10	– 0.7	400	600	– 2.5	–0.6	–1.1	– 3	– 0.1	36	37	– 2.5	– 0.3
							300	400	– 4								
2.5 V	P-ch	—	**SSM3J02F**	– 30	± 10	– 0.6	550	700	– 2.5	– 0.6	– 1.1	– 3	– 0.1	55	52	– 2.5	– 0.3
							400	500	– 4								
2.5 V	P-ch	**SSM6J06FU**	—	– 20	± 12	– 0.65	550	700	– 2.5	– 0.6	– 1.1	– 3	– 0.1	27	43	– 2.5	– 0.3
							400	500	– 4								
2.5 V	P-ch	✻ **SSM6J08FU**	—	– 20	± 12	– 1.0	200	260	– 2.5	– 0.5	–1.1	– 3	– 0.1	33	47	– 2.5	– 0.65
							140	180	– 4								
4 V	N-ch	**SSM6K07FU**	—	30	± 20	1.5	170	220	4	1.1	1.8	5	0.1	46	65	4	0.75
							105	130	10								
4 V	N-ch	**SSM6J07FU**	—	– 30	± 20	– 0.8	570	800	– 4	– 1.1	– 1.8	– 5	– 0.1	28	38	– 4	– 0.4
							350	450	– 10								

△: New product ✻: Under development

Package list

Unit: mm





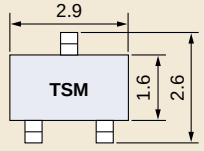
■ High-current Family (housed in TSM package) (0.5 A to 3.2 A class) product line-up

Product No.	Polarity	V_{DSS} (V)	I_D (A)	Vth (V)	$R_{DS(ON)}$ (Ω)	Max @V_{GS} (V)	P_D※ (W)
△ **SSM3K01T**	N-ch	30	3.2	0.6 to 1.1	0.15	2.5	1.25
△ **SSM3J01T**	P-ch	– 30	– 1.7	– 0.6 to – 1.1	0.6	– 2.5	
✻ **SSM3J13T**	P-ch	– 12	– 3	– 0.45 to – 1.1	0.095	– 2.5	
✻ **SSM3K11T**	N-ch	40	0.5	0.8 to 1.4	1.8	2.5	

※ When mounted on FR4 board, tw = 10s △: New products ✻: Under development

Package list

Unit: mm



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

■ Product line-up

Maximum Ratings		Package Type	Full Mold Type Package				Package with a Heat Sink	
		package type	S-10		S-12		F-12	
		lead type	SIP-10		SIP-12		SIP-12	
		number of chips	4-in-1		4-in-1	6-in-1	4-in-1	6-in-1
V_{DSS} (V)	I_D (A)	circuit type / chip type	N × 4 or P × 4	N × 2 + P × 2	N × 4 or P × 4 with FB-Di	N × 3 + P × 3	N × 4 or P × 4 with FB-Di	N × 3 + P × 3
60	5	L^2-π-MOS	**MP4202** **MP4210**	**MP4207**	**MP4410**	**MP6403**		
– 60	– 5	L^2-π-MOS	**MP4203** **MP4211**	**MP4212**		**MP6404**		
– 60	– 5	L^2-π-MOS	**MP4208**					
± 60	± 10	L^2-π-MOS						**MP6801**
100	3	L^2-π-MOS	**MP4209**		**MP4411**			
100	5	L^2-π-MOS			**MP4412**		**MP4711**	
120	3	L^2-π-MOS	**MP4201**					
120	5	L^2-π-MOS			**MP4403**		**MP4703**	

Power MOSFET Product List

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SJ147	π-MOSⅡ	TO-220IS	– 60	– 12	0.2	P 42
2SJ183	L²-π-MOSⅢ	PW-MOLD	– 60	– 5	0.35	P 43
2SJ200	π-MOSⅡ	TO-3P(N)	– 180	– 10	0.83	—
2SJ201	π-MOSⅡ	TO-3P(N)	– 200	– 12	0.63	—
2SJ224	π-MOSⅡ	TO-220FL/SM	– 60	– 12	0.2	P 43
2SJ238	L²-π-MOSⅣ	PW-MINI	– 60	– 1	0.85	P 41
2SJ239	L²-π-MOSⅣ	PW-MOLD	– 60	– 5	0.25	P 41
2SJ240	L²-π-MOSⅣ	TO-220(NIS)	– 60	– 20	0.045	P 41
2SJ241	L²-π-MOSⅣ	TO-220FL/SM	– 60	– 20	0.045	P 41
2SJ304	L²-π-MOSⅣ	TO-220(NIS)	– 60	– 14	0.13	—
2SJ312	L²-π-MOSⅣ	TO-220FL/SM	– 60	– 14	0.13	—
2SJ313	π-MOSⅡ	TO-220(NIS)	– 180	– 1	5.0	—
2SJ315	L²-π-MOSⅣ	PW-MOLD	– 60	– 5	0.25	—
2SJ334	L²-π-MOSⅤ	TO-220(NIS)	– 60	– 30	0.038	P 19
2SJ338	π-MOSⅡ	PW-MOLD	– 180	– 1	5.0	—
2SJ349	L²-π-MOS	TO-220(NIS)	– 60	– 20	0.045	P 19
2SJ359	L²-π-MOSⅣ	TPS	– 60	– 5	0.25	—
2SJ360	L²-π-MOSⅤ	PW-MINI	– 60	– 1	0.73	P 19
2SJ377	L²-π-MOSⅤ	PW-MOLD	– 60	– 5	0.19	P 19
2SJ378	L²-π-MOSⅤ	TPS	– 60	– 5	0.19	P 19
2SJ380	L²-π-MOSⅤ	TO-220(NIS)	– 100	– 12	0.21	P 19
2SJ401	L²-π-MOSⅤ	TO-220FL/SM	– 60	– 20	0.045	P 19
2SJ402	L²-π-MOSⅤ	TO-220FL/SM	– 60	– 30	0.038	P 19
2SJ407	π-MOSⅤ	TO-220(NIS)	– 200	– 5	1.0	P 21
2SJ412	L²-π-MOSⅤ	TO-220FL/SM	– 100	– 16	0.21	P 19
2SJ438	L²-π-MOSⅤ	TO-220(NIS)	– 60	– 5	0.19	P 19
2SJ439	π-MOS Ⅴ	PW-MOLD	– 16	– 5	0.2	P 21
2SJ440	π-MOS Ⅱ	TO-3P(N)IS	– 180	– 9	0.8	—
2SJ464	L²-π-MOSⅤ	TO-220(NIS)	– 100	– 18	0.09	P 19
2SJ465	π-MOSⅤ	PW-MINI	– 16	– 2	0.71	P 21
2SJ482	L²-π-MOSⅤ	SP	– 60	– 5	0.19	P 19
2SJ507	L²-π-MOSⅤ	TO-92MOD	– 60	– 1	0.7	P 19
2SJ508	L²-π-MOSⅤ	PW-MINI	– 100	– 1	1.9	P 19
2SJ509	L²-π-MOSⅤ	TO-92MOD	– 100	– 1	1.9	P 19
2SJ511	L²-π-MOSⅤ	PW-MINI	– 30	– 2	0.45	P 19
2SJ512	π-MOSⅤ	TO-220(NIS)	– 250	– 5	1.25	P 21
2SJ516	π-MOSⅤ	TO-220(NIS)	– 250	– 6.5	0.8	P 21
2SJ525	L²-π-MOSⅤ	TPS	– 30	– 5	0.12	P 19
2SJ537	L²-π-MOSⅤ	TO-92MOD	– 50	– 5	0.19	P 19
2SJ567	π-MOSⅤ	PW-MOLD	– 200	– 2.5	2.0	P 21

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SJ610	π-MOSⅤ	PW-MOLD	– 250	– 2	2.55	P 21
✻**2SJ611**	π-MOSⅤ	PW-MOLD	– 450	– 1.5	7	P 23
2SJ619	TFP	TFP	– 100	– 20	0.21	P 14
2SJ620	L²-π-MOSⅤ	TFP	– 100	– 18	0.12	P 14
2SK357	π-MOS	TO-220AB	150	5	0.9	P 43
2SK358	π-MOS	TO-220AB	250	5	1.0	P 43
2SK385	π-MOS	TO-3P(L)	400	10	0.6	P 42
2SK386	π-MOS	TO-3P(L)	450	10	0.7	P 41
2SK387	π-MOS	TO-3P(L)	150	12	0.18	P 42
2SK388	π-MOS	TO-3P(L)	250	12	0.25	P 42
2SK447	π-MOS	TO-3P(L)	250	15	0.24	P 41
2SK525	π-MOS	TO-220IS	150	10	0.28	P 42
2SK526	π-MOS	TO-220IS	250	10	0.6	P 42
2SK528	π-MOS	TO-220IS	400	2	2.2	P 42
2SK529	π-MOS	TO-220IS	450	2	2.6	P 42
2SK530	π-MOS	TO-220IS	400	5	1.4	P 42
2SK531	π-MOS	TO-220IS	450	5	1.6	P 42
2SK532	π-MOS	TO-220IS	60	12	0.085	P 42
2SK537	π-MOS	TO-220AB	900	1	9.0	P 41
2SK538	π-MOS	TO-3P(N)	900	3	4.5	P 41
2SK539	π-MOS	TO-3P(L)	900	5	2.5	P 42
2SK572	π-MOS	TO-3P(N)	150	15	0.18	P 43
2SK573	π-MOS	TO-3P(N)	250	15	0.32	P 43
2SK578	π-MOS	TO-3P(L)	150	15	0.22	P 42
2SK643	π-MOSⅡ	TO-3P(N)	450	10	0.85	P 43
2SK644	π-MOSⅡ	TO-3P(N)	500	10	1.0	P 43
2SK672	π-MOSⅡ	TO-220AB	60	10	0.2	P 43
2SK673	π-MOSⅡ	TO-220AB	60	15	0.11	P 43
2SK674	π-MOSⅡ	TO-220AB	60	25	0.06	P 43
2SK678	π-MOSⅡ	TO-3P(L)	500	13	0.4	P 43
2SK693	π-MOSⅡ	TO-3P(L)	450	13	0.4	P 43
2SK694	π-MOSⅡ	TO-3P(L)	500	12	0.5	P 43
2SK788	π-MOSⅡ	TO-3P(N)	500	13	0.5	P 43
2SK789	π-MOSⅡ	TO-3P(N)	450	15	0.4	P 43
2SK790	π-MOSⅡ	TO-3P(N)	500	15	0.4	P 43
2SK791	π-MOS	TO-220AB	850	3	4.5	P 41
2SK792	π-MOS	TO-220AB	900	3	4.5	P 41
2SK793	π-MOS	TO-3P(N)	850	5	2.5	P 43
2SK794	π-MOS	TO-3P(N)	900	5	2.5	P 43
2SK849	π-MOSⅡ	TO-3P(N)	60	40	0.038	P 43

✻: Under development

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Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK850	π-MOSⅡ	TO-3P(N)	100	40	0.06	P 41
2SK851	π-MOSⅡ	TO-3P(N)	200	30	0.085	P 41
2SK856	π-MOSⅡ	TO-220AB	60	45	0.03	P 43
2SK858	π-MOSⅡ	TO-220AB	600	2	4.0	P 43
2SK888	π-MOSⅡ	TO-220AB	100	15	0.18	P 43
2SK889	π-MOSⅡ	TO-220AB	100	27	0.085	P 41
2SK890	π-MOSⅡ	TO-220AB	200	10	0.4	P 43
2SK891	π-MOSⅡ	TO-220AB	200	20	0.18	P 42
2SK892	π-MOSⅡ	TO-220AB	500	2.5	3.0	P 43
2SK893	π-MOSⅡ	TO-220AB	500	5	1.5	P 42
2SK894	π-MOSⅡ	TO-220AB	500	8	0.85	P 43
2SK895	π-MOSⅡ	TO-3P(N)	450	12	0.6	P 43
2SK896	π-MOSⅡ	TO-3P(N)	500	12	0.5	P 43
2SK940	L²-π-MOSⅢ	TO-92MOD	60	0.8	0.55	—
2SK941	L²-π-MOSⅢ	TO-92MOD	100	0.6	1.3	—
2SK942	L²-π-MOSⅢ	TO-220AB	60	25	0.046	P 41
2SK943	L²-π-MOSⅢ	TO-220(NIS)	60	25	0.046	P 41
2SK944	π-MOSⅡ	TO-3P(N)	250	22	0.15	P 42
2SK945	π-MOSⅡ	PW-MOLD	400	1	5.0	P 41
2SK1029	π-MOSⅡ	TO-3P(L)	500	10	0.5	P 43
2SK1078	L²-π-MOSⅢ	PW-MINI	60	0.8	0.55	P 41
2SK1079	L²-π-MOSⅢ	PW-MINI	100	0.6	1.3	—
2SK1112	L²-π-MOSⅢ	PW-MOLD	60	5	0.16	P 43
2SK1113	L²-π-MOSⅢ	PW-MOLD	120	3	0.42	P 43
2SK1114	L²-π-MOSⅢ	TO-220AB	60	12	0.07	P 43
2SK1115	L²-π-MOSⅢ	TO-220AB	60	20	0.055	P 43
2SK1116	L²-π-MOSⅢ	TO-220AB	100	25	0.058	P 42
2SK1117	π-MOSⅡ	TO-220AB	600	6	1.25	P 41
2SK1118	π-MOSⅡ	TO-220(NIS)	600	6	1.25	P 41
2SK1119	π-MOSⅡ.5	TO-220AB	1000	4	3.8	—
2SK1120	π-MOSⅡ.5	TO-3P(N)	1000	8	1.8	—
2SK1124	π-MOSⅢ	TO-3P(N)	60	45	0.03	P 43
2SK1213	π-MOSⅡ	TO-3P(N)	600	6	1.25	P 42
2SK1333	π-MOSⅡ	TO-3P(L)	500	15	0.4	P 43
2SK1344	L²-π-MOSⅢ	TO-220(NIS)	60	12	0.07	P 43
2SK1345	L²-π-MOSⅢ	TO-220(NIS)	60	20	0.055	—
2SK1346	π-MOSⅡ	TO-220(NIS)	60	25	0.06	P 43
2SK1347	L²-π-MOSⅢ	TO-220AB	100	20	0.085	P 42
2SK1348	L²-π-MOSⅢ	TO-220(NIS)	100	20	0.085	P 43
2SK1349	L²-π-MOSⅢ	TO-220(NIS)	100	25	0.058	P 41

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK1350	π-MOSⅡ	TO-220(NIS)	200	15	0.18	P 43
2SK1351	π-MOSⅡ	TO-220(NIS)	500	5	1.5	P 43
2SK1352	π-MOSⅡ	TO-220(NIS)	500	7	0.85	P 43
2SK1356	π-MOSⅡ	TO-220(NIS)	900	3	4.3	P 41
2SK1357	π-MOSⅡ.5	TO-3P(N)	900	5	2.8	P 41
2SK1358	π-MOSⅡ.5	TO-3P(N)	900	9	1.4	P 41
2SK1359	π-MOSⅡ.5	TO-3P(N)	1000	5	3.8	—
2SK1360	π-MOS	TO-3(N)IS	900	5	2.5	—
2SK1362	π-MOS	TO-3P(N)IS	900	5	2.5	P 42
2SK1363	π-MOSⅡ.5	TO-3P(N)IS	900	8	1.4	P 41
2SK1365	π-MOSⅡ.5	TO-3P(N)IS	1000	7	1.8	—
2SK1377	π-MOS	TO-220(NIS)	400	5.5	1.2	P 41
2SK1378	π-MOS	TO-220AB	400	10	0.55	P 42
2SK1379	L²-π-MOSⅢ	TO-3P(N)	60	50	0.017	P 43
2SK1380	L²-π-MOSⅢ	TO-3P(L)	60	60	0.011	P 43
2SK1381	L²-π-MOSⅢ	TO-3P(N)	100	50	0.032	—
2SK1382	L²-π-MOSⅢ	TO-3P(L)	100	60	0.02	—
2SK1486	π-MOSⅢ.5	TO-3P(L)	300	32	0.095	—
2SK1487	π-MOSⅢ.5	TO-3P(N)	450	10	1.0	P 43
2SK1488	π-MOSⅢ.5	TO-3P(N)	500	10	1.0	P 43
2SK1489	π-MOSⅢ.5	TO-3P(L)	1000	12	1.0	—
2SK1513	π-MOSⅡ	TO-3P(L)	500	8	0.75	P 43
2SK1529	π-MOSⅡ	TO-3P(N)	180	10	0.83	—
2SK1530	π-MOSⅡ	TO-3P(N)	200	12	0.63	—
2SK1531	π-MOSⅢ.5	TO-3P(N)	500	15	0.45	P 43
2SK1542	L²-π-MOSⅣ	TO-220AB	60	45	0.022	P 41
2SK1544	π-MOSⅢ.5	TO-3P(L)	500	25	0.2	—
2SK1574	π-MOSⅢ.5	TO-220AB	500	8	0.85	P 43
2SK1600	π-MOSⅡ.5	TO-220AB	800	3	5.0	P 42
2SK1601	π-MOSⅡ.5	TO-220AB	900	3	6.4	P 42
2SK1602	π-MOSⅡ.5	TO-220(NIS)	800	2.8	5.0	P 43
2SK1603	π-MOSⅡ.5	TO-220(NIS)	900	2.5	6.4	P 41
2SK1641	π-MOSⅡ	TO-3P(N)	250	20	0.23	P 41
2SK1642	π-MOSⅡ	TO-220(NIS)	400	9	0.55	P 41
2SK1643	π-MOSⅡ.5	TO-220AB	900	5	2.8	P 41
2SK1649	π-MOS	TO-3P(N)	900	6	2.5	P 43
2SK1650	π-MOSⅡ	TO-3P(N)	900	4	4.3	P 43
2SK1651	π-MOSⅢ.5	TO-3P(N)IS	500	8	1.0	P 41
2SK1652	π-MOSⅢ.5	TO-3P(N)IS	500	13	0.45	P 42
2SK1653	L²-π-MOSⅣ	TO-220(NIS)	60	45	0.02	P 41

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK1692	π-MOSⅡ.5	TO-3P(N)	900	7	2.0	P 41
2SK1717	L²-π-MOSⅣ	PW-MINI	60	2	0.37	P 41
2SK1719	L²-π-MOSⅣ	PW-MOLD	60	5	0.11	—
2SK1720	π-MOSⅢ	TO-220FL/SM	60	45	0.03	P 42
2SK1721	π-MOSⅡ	TO-220FL/SM	500	3	3.0	P 42
2SK1722	π-MOSⅡ	TO-220FL/SM	500	5	1.5	P 41
2SK1723	π-MOSⅡ	TO-3P(N)	600	12	0.65	P 41
2SK1745	π-MOSⅢ.5	TO-3P(N)	500	18	0.36	P 41
2SK1746	π-MOSⅡ	TO-220FL/SM	600	2	4.0	P 42
2SK1766	π-MOSⅢ.5	TO-220(NIS)	250	10	0.6	P 42
2SK1767	π-MOSⅢ.5	TO-220(NIS)	600	3.5	2.5	P 43
2SK1768	L²-π-MOSⅢ	NPM	60	12	0.07	P 42
2SK1769	π-MOSⅡ	NPM	600	2	4.0	P 42
2SK1792	L²-π-MOSⅣ	TO-220FL/SM	60	45	0.02	P 42
2SK1805	π-MOSⅢ.5	TO-220(NIS)	500	7	0.85	P 43
2SK1854	π-MOSⅢ.5	TO-220(NIS)	400	6	1.0	P 42
2SK1855	π-MOSⅢ.5	TO-3P(N)	500	12	0.7	P 43
2SK1858	π-MOSⅡ.5	TO-220FL/SM	800	3	5.0	P 42
2SK1864	π-MOSⅢ.5	TO-220FL/SM	500	8	0.85	P 42
2SK1865	π-MOSⅢ.5	TO-220FL/SM	500	12	0.7	P 42
2SK1879	L²-π-MOSⅣ	TO-3P(N)	60	45	0.03	P 43
2SK1882	L²-π-MOSⅣ	TO-220(NIS)	60	25	0.05	P 42
2SK1913	π-MOSⅢ.5	TO-220(NIS)	600	4	1.8	P 43
2SK1915	π-MOSⅡ	TO-220FL/SM	600	6	1.25	P 42
2SK1927	π-MOSⅡ	TO-220FL/SM	100	15	0.18	P 42
2SK1928	π-MOSⅡ	TO-220FL/SM	100	27	0.085	P 42
2SK1929	π-MOSⅡ.5	TO-220FL/SM	900	5	2.8	P 42
2SK1930	π-MOSⅡ.5	TO-220FL/SM	1000	4	3.8	—
2SK1997	L²-π-MOSⅣ	TO-220(NIS)	60	36	0.03	P 42
2SK1998	L²-π-MOSⅣ	TO-3P(N)	60	45	0.03	P 42
2SK2013	π-MOSⅡ	TO-220(NIS)	180	1	5.0	—
2SK2030	L²-π-MOSⅣ	PW-MOLD	60	5	0.14	—
2SK2038	π-MOSⅡ.5	TO-3P(N)	800	5	2.2	P 42
2SK2039	π-MOSⅡ.5	TO-3P(N)	900	5	2.5	P 42
2SK2056	π-MOSⅡ.5	TO-220(NIS)	800	4	2.4	P 42
2SK2057	π-MOSⅣ	TO-3P(N)	500	20	0.34	P 42
2SK2077	π-MOSⅡ.5	TO-3P(N)	800	7	1.7	P 42
2SK2078	π-MOSⅡ.5	TO-3P(N)	800	9	1.2	P 42
2SK2088	π-MOSⅡ	TO-220FL/SM	200	10	0.4	P 42
2SK2089	π-MOSⅡ.5	TO-220FL/SM	800	5	2.4	P 42

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK2107	π-MOSⅡ	TO-220FL/SM	200	18	0.18	P 42
2SK2146	π-MOSⅢ.5	TO-220(NIS)	250	2	2.0	—
2SK2149	π-MOSⅣ	TO-3P(N)	500	10	0.8	P 42
2SK2150	π-MOSⅣ	TO-3P(N)	500	15	0.4	P 42
2SK2162	π-MOSⅡ	PW-MOLD	180	1	5.0	—
2SK2173	L²-π-MOSⅤ	TO-3P(N)	60	50	0.017	P 18
2SK2200	L²-π-MOSⅤ	TPS	100	3	0.35	P 18
2SK2201	L²-π-MOSⅤ	PW-MOLD	100	3	0.35	P 18
2SK2222	π-MOSⅡ.5	TO-3P(N)IS	800	5	2.2	P 42
2SK2228	L²-π-MOSⅣ	TPS	60	5	0.11	—
2SK2229	L²-π-MOSⅤ	TPS	60	5	0.16	P 18
2SK2230	π-MOSⅢ.5	TPS	250	2	2.0	—
2SK2231	L²-π-MOSⅤ	PW-MOLD	60	5	0.16	P 18
2SK2232	L²-π-MOSⅤ	TO-220(NIS)	60	25	0.046	P 18
2SK2233	L²-π-MOSⅤ	TO-3P(N)	60	45	0.03	P 18
2SK2235	π-MOSⅢ.5	PW-MOLD	250	2	2.0	—
2SK2236	π-MOSⅣ	TO-220(NIS)	500	5	1.6	P 42
2SK2237	π-MOSⅣ	TO-220(NIS)	500	8	0.8	P 42
2SK2266	L²-π-MOSⅤ	TO-220FL/SM	60	45	0.03	P 18
2SK2267	L²-π-MOSⅤ	TO-3P(L)	60	60	0.011	P 18
2SK2274	π-MOSⅡ.5	TO-220(NIS)	700	5	1.7	—
2SK2311	L²-π-MOSⅤ	TO-220FL/SM	60	25	0.046	P 18
2SK2312	L²-π-MOSⅤ	TO-220(NIS)	60	45	0.017	P 18
2SK2313	L²-π-MOSⅤ	TO-3P(N)	60	60	0.011	P 18
2SK2314	L²-π-MOSⅤ	TO-220AB	100	27	0.085	P 18
2SK2319	π-MOSⅡ.5	TO-3P(N)IS	800	7	1.7	P 42
2SK2320	π-MOSⅡ.5	TO-3P(N)IS	800	8.5	1.2	P 42
2SK2350	π-MOSⅤ	TO-220(NIS)	200	8.5	0.4	P 21
2SK2351	π-MOSⅣ	TO-220AB	600	6	1.25	P 42
2SK2352	π-MOSⅣ	TO-220(NIS)	600	6	1.25	P 42
2SK2376	L²-π-MOSⅤ	TO-220FL/SM	60	45	0.017	P 18
2SK2381	π-MOSⅤ	TO-220(NIS)	200	5	0.8	P 21
2SK2382	π-MOSⅤ	TO-220(NIS)	200	15	0.18	P 21
2SK2385	L²-π-MOSⅤ	TO-220(NIS)	60	36	0.03	P 18
2SK2386	π-MOSⅣ	TO-220AB	500	5	1.6	P 42
2SK2387	π-MOSⅣ	TO-220AB	500	8	0.8	P 42
2SK2388	π-MOSⅣ	TO-220(NIS)	600	3.5	2.2	P 42
2SK2391	L²-π-MOSⅤ	TO-220(NIS)	100	20	0.085	P 18
2SK2398	π-MOSⅤ	TO-3P(N)	60	45	0.03	P 18
2SK2399	L²-π-MOSⅤ	PW-MOLD	100	5	0.23	P 18

Power MOSFET Product List

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK2400	L²-π-MOSⅤ	TPS	100	5	0.23	P 18
2SK2401	π-MOSⅤ	TO-220FL/SM	200	15	0.18	P 21
2SK2402	π-MOSⅣ	TO-220AB	600	3.5	2.2	P 42
2SK2417	π-MOSⅤ	TO-220(NIS)	250	7.5	0.5	P 21
2SK2445	π-MOSⅤ	TO-3P(N)	60	50	0.018	P 18
2SK2466	U-MOS	TO-220(NIS)	100	30	0.046	P 20
2SK2467	π-MOS Ⅱ	TO-3P(N)IS	180	9	0.8	—
2SK2493	π-MOSⅤ	PW-MOLD	16	5	0.1	P 21
2SK2507	L²-π-MOSⅤ	TO-220(NIS)	50	25	0.046	P 18
2SK2508	π-MOSⅤ	TO-220(NIS)	250	13	0.25	P 21
2SK2542	π-MOSⅤ	TO-220AB	500	8	0.85	P 23
2SK2543	π-MOSⅤ	TO-220(NIS)	500	8	0.85	P 23
2SK2544	π-MOSⅤ	TO-220AB	600	6	1.25	P 23
2SK2545	π-MOSⅤ	TO-220(NIS)	600	6	1.25	P 23
2SK2549	π-MOSⅤ	PW-MINI	16	2	0.29	P 21
2SK2550	L²-π-MOSⅤ	TO-3P(N)	50	45	0.03	P 18
2SK2551	L²-π-MOSⅤ	TO-3P(N)	50	50	0.011	P 18
2SK2598	π-MOSⅤ	TO-220FL/SM	250	13	0.25	P 21
2SK2599	π-MOSⅤ	TPS	500	2	3.2	P 23
2SK2601	π-MOSⅤ	TO-3P(N)	500	10	1.0	P 23
2SK2602	π-MOSⅤ	TO-3P(N)	600	6	1.25	P 23
2SK2603	π-MOSⅢ	TO-220AB	800	3	3.6	P 26
2SK2604	π-MOSⅢ	TO-3P(N)	800	5	2.2	P 26
2SK2605	π-MOSⅢ	TO-220(NIS)	800	5	2.2	P 26
2SK2606	π-MOSⅢ	TO-3P(N)IS	800	8.5	1.2	P 26
2SK2607	π-MOSⅢ	TO-3P(N)	800	9	1.2	P 26
2SK2608	π-MOSⅢ	TO-220AB	900	3	4.3	P 26
2SK2610	π-MOSⅢ	TO-3P(N)	900	5	2.5	P 26
2SK2611	π-MOSⅢ	TO-3P(N)	900	9	1.4	P 26
2SK2613	π-MOSⅢ	TO-3P(N)	1000	8	1.7	P 26
2SK2614	L²-π-MOSⅤ	DP	50	20	0.046	P 18
2SK2615	L²-π-MOSⅤ	PW-MINI	60	2	0.3	P 18
2SK2661	π-MOSⅤ	TO-220AB	500	5	1.5	P 23
2SK2662	π-MOSⅤ	TO-220(NIS)	500	5	1.5	P 23
2SK2679	π-MOSⅤ	TO-220(NIS)	400	5.5	1.2	P 23
2SK2698	π-MOSⅤ	TO-3P(N)	500	15	0.4	P 23
2SK2699	π-MOSⅤ	TO-3P(N)	600	12	0.65	P 23
2SK2700	π-MOSⅢ	TO-220(NIS)	900	3	4.3	P 26
2SK2717	π-MOSⅢ	TO-220(NIS)	900	5	2.5	P 26
2SK2718	π-MOSⅢ	TO-220(NIS)	900	2.5	6.4	P 26

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK2719	π-MOSⅢ	TO-3P(N)	900	3	4.3	P 26
2SK2733	π-MOSⅢ	TO-220AB	900	1	9.0	P 26
2SK2741	L²-π-MOSⅤ	SP	60	5	0.16	P 18
2SK2742	L²-π-MOSⅤ	SP	100	3	0.35	P 18
2SK2744	π-MOSⅤ	TO-3P(N)	50	45	0.02	P 18
2SK2745	L²-π-MOSⅤ	TO-3P(N)	50	50	0.0095	P 18
2SK2746	π-MOSⅢ	TO-3P(N)	800	7	1.7	P 26
2SK2749	π-MOSⅢ	TO-3P(N)	900	7	2.0	P 26
2SK2750	π-MOSⅤ	TO-220(NIS)	600	3.5	2.2	P 23
2SK2776	π-MOSⅤ	TO-220FL/SM	500	8	0.85	P 23
2SK2777	π-MOSⅤ	TO-220FL/SM	600	6	1.25	P 23
2SK2782	L²-π-MOSⅤ	DP	60	20	0.055	P 18
2SK2789	L²-π-MOSⅤ	TO-220FL/SM	100	27	0.085	P 18
2SK2835	π-MOSⅤ	TPS	200	5	0.8	P 21
2SK2836	π-MOSⅤ	SP	600	1	9.0	P 23
2SK2837	π-MOSⅤ	TO-3P(N)	500	20	0.27	P 23
2SK2838	π-MOSⅤ	TO-220FL/SM	400	5.5	1.2	P 23
2SK2839	L²-π-MOSⅤ	SP	30	10	0.04	P 18
2SK2841	π-MOSⅤ	TO-220AB	400	10	0.55	P 23
2SK2842	π-MOSⅤ	TO-220(NIS)	500	12	0.52	P 23
2SK2843	π-MOSⅤ	TO-220(NIS)	600	10	0.75	P 23
2SK2844	L²-π-MOSⅤ	TO-220AB	30	35	0.02	P 18
2SK2845	π-MOSⅢ	DP	900	1	9.0	P 26
2SK2846	π-MOSⅤ	TPS	600	2	5.0	P 23
2SK2847	π-MOSⅢ	TO-3P(N)IS	900	8	1.4	P 26
2SK2862	π-MOSⅤ	TO-220(NIS)	500	2	3.0	P 23
2SK2865	π-MOSⅤ	PW-MOLD	600	2	5.0	P 23
2SK2866	π-MOSⅤ	TO-220(AB)	600	10	0.75	P 23
2SK2883	π-MOSⅢ	TO-220FL/SM	800	3	3.6	P 28
2SK2884	π-MOSⅢ	TO-220FL/SM	800	5	2.2	P 26
2SK2886	L²-π-MOSⅤ	TO-220(NIS)	50	45	0.02	P 18
2SK2889	π-MOSⅤ	TO-220FL/SM	600	10	0.75	P 23
2SK2914	π-MOSⅤ	TO-220AB	250	7.5	0.5	P 21
2SK2915	π-MOSⅤ	TO-3P(N)	600	16	0.4	P 23
2SK2916	π-MOSⅤ	TO-3P(N)IS	500	14	0.4	P 23
2SK2917	π-MOSⅤ	TO-3P(N)IS	500	18	0.27	P 23
2SK2920	π-MOSⅤ	PW-MOLD	200	5	0.8	P 21
2SK2949	π-MOSⅤ	TO-220FL/SM	400	10	0.55	P 23
2SK2952	π-MOSⅤ	TO-220(NIS)	400	8.5	0.55	P 23
2SK2953	π-MOSⅤ	TO-3P(N)IS	600	15	0.4	P 23

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS\ (ON)}$ max (Ω)	
2SK2961	L²-π-MOSⅤ	TO-92MOD	60	2	0.27	P 18
2SK2962	L²-π-MOSⅤ	TO-92MOD	100	1	0.7	P 18
2SK2963	L²-π-MOSⅤ	PW-MINI	100	1	0.7	P 18
2SK2964	L²-π-MOSⅤ	PW-MINI	30	2	0.18	P 18
2SK2965	π-MOSⅤ	TO-220(NIS)	200	11	0.26	P 21
2SK2967	π-MOSⅤ	TO-3P(N)	250	30	0.068	P 21
2SK2968	π-MOSⅢ	TO-3P(N)	900	10	1.25	P 26
2SK2985	U-MOS	TO-220(NIS)	60	45	5.8	P 20
2SK2986	U-MOS	TO-220FL/SM	60	55	5.8	P 20
2SK2987	U-MOS	TO-3P(N)	60	70	5.8	P 20
2SK2989	L²-π-MOSⅤ	TO-92MOD	50	5	0.15	P 18
2SK2991	π-MOSⅤ	TO-220FL/SM	500	5	1.5	P 23
2SK2992	π-MOSⅤ	PW-MINI	200	1	3.5	P 21
2SK2993	π-MOSⅤ	TO-220FL/SM	250	20	0.105	P 21
2SK2995	π-MOSⅤ	TO-3P(N)IS	250	30	0.068	P 21
2SK2996	π-MOSⅤ	TO-220(NIS)	600	10	1.0	P 23
✻**2SK2997**	π-MOSⅢ	DP	800	1.5	8	P 26
2SK2998	π-MOSⅤ	TO-92MOD	500	0.5	18	P 23
2SK3017	π-MOSⅢ	TO-3P(N)IS	900	8.5	1.25	P 26
2SK3051	L²-π-MOSⅤ	TO-220FL/SM	50	45	0.03	P 18
2SK3067	π-MOSⅤ	TO-220(NIS)	600	2	5.0	P 23
2SK3068	π-MOSⅤ	TO-220FL/SM	500	12	0.52	P 23
2SK3085	π-MOSⅤ	TO-220AB	600	3.5	2.2	P 23
2SK3089	L²-π-MOSⅤ	TO-220FL/SM	30	40	0.03	P 18
2SK3090	L²-π-MOSⅤ	TO-220FL/SM	30	45	0.02	P 18
2SK3117	π-MOSⅤ	TO-3P(SM)	500	20	0.27	P 23
2SK3125	L²-π-MOSⅤ	TO-3P(SM)	30	60	0.007	P 18
2SK3126	π-MOSⅤ	TO-220(NIS)	450	10	0.65	P 23
2SK3127	L²-π-MOSⅤ	TO-220FL/SM	30	45	0.011	P 18
2SK3128	L²-π-MOSⅤ	TO-3P(N)	30	60	0.011	P 18
2SK3130	π-MOSⅤ	TO-220(NIS)	600	6	1.5	P 22
2SK3131	π-MOSⅤ	TO-3P(L)	500	50	0.11	P 22
2SK3132	π-MOSⅤ	TO-3P(L)	500	50	0.095	P 23
2SK3176	π-MOSⅤ	TO-3P(N)	200	30	0.052	P 21
2SK3236	U-MOS	TO-220(NIS)	60	45	0.02	P 20
2SK3265	π-MOSⅤ	TO-220(NIS)	700	10	1.0	P 23
2SK3301	π-MOSⅢ	PW-MOLD	900	1	20	P 26
2SK3302	π-MOSⅤ	TPS	500	0.5	18	P 23
2SK3309	π-MOSⅤ	TO-220FL/SM	450	10	0.65	P 22
2SK3310	π-MOSⅤ	TO-220(NIS)	450	10	0.65	P 22

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS\ (ON)}$ max (Ω)	
✻**2SK3312**	π-MOSⅤ	TO-220FL/SM	600	6	1.25	P 22
2SK3313	π-MOSⅤ	TO-220(NIS)	500	12	0.62	P 22
2SK3314	π-MOSⅤ	TO-3P(N)	500	15	0.44	P 22
2SK3316	π-MOSⅤ	TO-220(NIS)	500	5	1.8	P 22
2SK3342	π-MOSⅤ	PW-MOLD	250	4.5	1.0	P 21
✻**2SK3343**	U-MOSⅡ	DP	60	20	0.02	P 20
2SK3371	π-MOSⅤ	PW-MOLD	600	1	9.0	P 23
2SK3387	TFP	TFP	150	18	0.08	P 14
2SK3388	TFP	TFP	250	20	0.105	P 14
2SK3389	TFP	TFP	30	75	0.005	P 14
2SK3397	U-MOSⅡ	TFP	60	70	0.006	P 14
2SK3398	TFP	TFP	500	12	0.52	P 14
2SK3399	π-MOSⅤ	TO-220FL/SM	600	10	0.75	P 22
2SK3403	π-MOSⅤ	TO-220FL/SM	450	13	0.4	P 22
2SK3437	π-MOSⅤ	TO-220FL/SM	600	10	1.0	P 22
2SK3438	TFP	TFP	600	10	0.1	P 14
2SK3439	TFP	TFP	30	75	0.005	P 14
2SK3440	TFP	TFP	60	75	0.008	P 14
2SK3441	TFP	TFP	60	75	0.0058	P 14
2SK3442	TFP	TFP	100	75	0.015	P 14
2SK3443	TFP	TFP	150	30	0.028	P 14 P 17
2SK3444	TFP	TFP	200	25	0.055	P 14 P 17
2SK3445	TFP	TFP	250	20	0.105	P 14 P 17
2SK3462	π-MOSⅤ	PW-MOLD	250	3	1.7	P 21
2SK3466	TFP	TFP	500	5	1.5	P 14
2SK3471	π-MOSⅤ	PW-MINI	500	0.5	18	P 23
2SK3472	π-MOSⅤ	PW-MOLD	450	1	4.6	P 23
✻**2SK3498**	π-MOSⅤ	PW-MOLD	400	1	5.5	P 23
2SK3499	TFP	TFP	400	8.5	0.55	P 14
✻**2SK3538**	π-MOSⅤ	TFP	500	8	0.85	P 14
✻**2SK3643**	π-MOSⅤ	PW-MOLD	450	2.5	2.45	P 23
✻**S2Y65**	U-MOSⅢ	SOP-8	30	13	0.008	P 10
✻**S3C06**	U-MOSⅢ	SOP-8	– 30	– 13	0.005	P10
✻**S3C69**	π-MOSⅤ	PW-MOLD	500	2	3.2	P23
✻**S3D18**	U-MOSⅢ	SOP-8	30	15	0.0045	P10
✻**S3D19**	U-MOSⅢ	SOP-8	30	11	0.014	P10
✻**S3D72**	π-MOSⅤ	TO-220NIS	450	2.5	2.45	P23
✻**S3E22**	U-MOSⅢ	SOP-8	– 30	– 11	0.011	P10
✻**S3E67**	U-MOSⅢ	SOP-8	30	11	0.016	P10
✻**S3E71**	U-MOSⅢ	SOP-8	– 20	– 3.5	0.12	P10

✻ : Under development

Power MOSFET Product List

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS\ (ON)}$ max (Ω)	
✻S3E72	U-MOS Ⅲ	SOP-8	– 30	– 3.5	0.12	P10
✻S3E73	U-MOS Ⅲ	SOP-8	30	5	0.05	P10
TPC6001	U-MOS Ⅱ	VS-6	20	6	0.03	P12
TPC6002	U-MOS Ⅱ	VS-6	30	6	0.03	P12
TPC6003	U-MOS Ⅲ	VS-6	30	6	0.024	P12
TPC6004	U-MOS Ⅲ	VS-6	20	6	0.024	P12
TPC6005	U-MOS Ⅲ	VS-6	30	6	0.028	P12
TPC6101	U-MOS Ⅱ	VS-6	– 20	– 4.5	0.06	P12
TPC6102	U-MOS Ⅱ	VS-6	– 30	– 4.5	0.06	P12
TPC6103	U-MOS Ⅲ	VS-6	– 12	– 4.5	0.035	P12
TPC6104	U-MOS Ⅲ	VS-6	– 20	– 4.5	0.04	P12
TPC6201	U-MOS Ⅱ	VS-6	30	2.5	0.095	P12
TPC8001	L^2-π-MOS Ⅵ	SOP-8	30	7	0.02	P10
TPC8002	L^2-π-MOS Ⅵ	SOP-8	30	11	0.014	P41
TPC8003	U-MOS Ⅱ	SOP-8	30	13	0.007	P10
TPC8004	L^2-π-MOS Ⅵ	SOP-8	30	5	0.05	P10
TPC8005-H	U-MOS Ⅱ	SOP-8	30	11	0.016	P41
TPC8006-H	U-MOS Ⅱ	SOP-8	30	7	0.027	P10
TPC8007-H	U-MOS Ⅱ	SOP-8	30	13	0.01	P41
TPC8009-H	U-MOS Ⅲ	SOP-8	30	13	0.01	P10
TPC8012-H	π-MOS Ⅴ	SOP-8	200	1.8	0.4	P10
TPC8013-H	U-MOS Ⅲ	SOP-8	30	15	0.0065	P10
TPC8102	L^2-π-MOS Ⅵ	SOP-8	– 30	– 6	0.04	P41
TPC8103	U-MOS Ⅱ	SOP-8	– 30	– 11	0.013	P41
TPC8104-H	U-MOS Ⅱ	SOP-8	– 30	– 5	0.065	P10
TPC8105-H	U-MOS Ⅱ	SOP-8	– 30	– 7	0.04	P10
TPC8106-H	U-MOS Ⅱ	SOP-8	– 30	– 10	0.02	P41
TPC8107	U-MOS Ⅲ	SOP-8	– 30	– 13	0.007	P10
TPC8108	U-MOS Ⅲ	SOP-8	– 30	– 11	0.013	P10
TPC8109	U-MOS Ⅲ	SOP-8	– 30	– 10	0.02	P10
TPC8110	U-MOS Ⅲ	SOP-8	– 40	– 8	0.25	P10
TPC8201	L^2-π-MOS Ⅵ	SOP-8	30	5	0.05	P41
TPC8202	π-MOS Ⅵ	SOP-8	20	5	0.05	P41
TPC8203	U-MOS Ⅱ	SOP-8	30	6	0.021	P10
TPC8204	U-MOS Ⅱ	SOP-8	20	6	0.02	P41
TPC8206	U-MOS Ⅱ	SOP-8	60	7	0.05	P10
TPC8207	U-MOS Ⅱ	SOP-8	20	6	0.02	P10
TPC8208	U-MOS Ⅱ	SOP-8	20	5	0.05	P10
TPC8301	L^2-π-MOS	SOP-8	– 30	– 3.5	0.12	P41
TPC8302	π-MOSⅥ	SOP-8	– 20	– 3.5	0.12	P41

Product No.	Series	Package	Main Characteristics			Page
			V_{DSS} (V)	I_D (A)	$R_{DS\ (ON)}$ max (Ω)	
TPC8303	U-MOS Ⅱ	SOP-8	– 30	– 4.5	0.035	P10
TPC8305	U-MOS Ⅱ	SOP-8	– 20	– 5	0.03	P10
TPC8401	U-MOS Ⅱ	SOP-8	– 30/30	– 4.5/6	35/21	P10
TPC8402	U-MOS Ⅱ	SOP-8	– 30/30	– 4.5/5	35/50	P10
TPC8403	U-MOS Ⅱ	SOP-8	– 30/30	– 4.5/6	55/33	P10
TPCS8004	π-MOS Ⅵ	TSSOP-8	200	1.3	0.8	P10
TPCS8101	U-MOS Ⅱ	TSSOP-8	– 20	– 6	0.02	P10
TPCS8102	U-MOS Ⅱ	TSSOP-8	– 30	– 6	0.025	P10
TPCS8201	U-MOS Ⅱ	TSSOP-8	20	5	0.03	P41
TPCS8203	U-MOS Ⅱ	TSSOP-8	20	6	0.024	P41
TPCS8204	U-MOS Ⅲ	TSSOP-8	20	6	0.017	P10
TPCS8205	U-MOS Ⅱ	TSSOP-8	20	5	0.045	P10
TPCS8206	U-MOS Ⅱ	TSSOP-8	20	5	0.03	P41
TPCS8207	U-MOS Ⅱ	TSSOP-8	20	6	0.024	P41
TPCS8208	U-MOS Ⅲ	TSSOP-8	20	6	0.017	P10
TPCS8209	U-MOS Ⅲ	TSSOP-8	20	5	0.03	P10
TPCS8210	U-MOS Ⅲ	TSSOP-8	20	5	0.03	P10
TPCS8211	U-MOS Ⅲ	TSSOP-8	20	6	0.024	P10
TPCS8212	U-MOS Ⅲ	TSSOP-8	20	6	0.024	P10
TPCS8302	U-MOS Ⅲ	TSSOP-8	– 20	– 5	0.035	P10

✻ : Under development

Power MOSFET Superseded Products

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

Superseded Products					Recommended Replacement Products				
Product No.	Electrical Characteristics			Package	Recommended Replacement Products	Electrical Characteristics			Package
	V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SJ238	−60	−1	0.85	PW-MINI	**2SJ360**	−60	−1	0.73	PW-MINI
2SJ239	−60	−5	0.25	PW-MOLD	**2SJ377**	−60	−5	0.19	PW-MOLD
2SJ240	−60	−20	0.045	TO-220 NIS	**2SJ349**	−60	−20	0.045	TO-220NIS
2SJ241	−60	−20	0.045	TO-220FL/SM	**2SJ401**	−60	−20	0.045	TO-220FL/SM
2SK386	450	10	0.7	TO-3PL	**2SK2698**	500	15	0.4	TO-3P(N)
2SK447	250	15	0.24	TO-3P(L)	**2SK2508**	250	13	0.25	TO-220NIS
2SK537	900	1	9	TO-220AB	**2SK2733**	900	1	9	TO-220AB
2SK538	900	3	4.5	TO-3P(N)	**2SK2719**	900	3	4.5	TO-3P(N)
2SK791	850	3	4.5	TO-220AB	**2SK2608**	900	3	4.3	TO-220AB
2SK792	900	3	4.5	TO-220AB	**2SK2608**	900	3	4.3	TO-220AB
2SK850	100	35	0.06	TO-3P(N)	**2SK2466**	100	30	0.046	TO-220NIS
2SK851	200	30	0.085	TO-3P(N)	**2SK2967**	250	30	0.07	TO-3P(N)
2SK889	100	27	0.085	TO-220AB	**2SK2314**	100	27	0.085	TO-220AB
2SK942	60	25	0.046	TO-220AB	**2SK2232**	60	25	0.046	TO-220NIS
2SK943	60	25	0.046	TO-220NIS	**2SK2232**	60	25	0.046	TO-220NIS
2SK945	400	1	5	PW-MOLD	**2SK2599**	500	2	3	TPS
2SK1078	60	0.8	0.55	PW-MINI	**2SK2615**	60	2	0.37	PW-MINI
2SK1117	600	6	1.25	TO-220AB	**2SK2544**	600	6	1.25	TO-220AB
2SK1118	600	6	1.25	TO-220NIS	**2SK2545**	600	6	1.25	TO-220NIS
2SK1349	100	25	0.058	TO-220NIS	**2SK2391**	100	20	0.085	TO-220NIS
2SK1356	900	3	4.3	TO-220NIS	**2SK2700**	900	3	4.3	TO-220NIS
2SK1357	900	5	2.8	TO-3P(N)	**2SK2610**	900	5	2.5	TO-3P(N)
2SK1358	900	9	1.4	TO-3P(N)	**2SK2611**	900	9	1.4	TO-3P(N)
2SK1363	900	8	1.4	TO-3P(N) IS	**2SK2847**	900	8	1.4	TO-3P(N) IS
2SK1377	400	5.5	1.2	TO-220NIS	**2SK2679**	400	5.5	1.2	TO-220NIS
2SK1542	60	45	0.020	TO-220AB	**2SK2376**	60	45	0.017	TO-220FL/SM
2SK1603	900	2.5	6.4	TO-220 NIS	**2SK2718**	900	2.5	6.4	TO-220NIS
2SK1641	250	20	0.23	TO-3P(N)	**2SK2993**	250	20	0.11	TO-220FL/SM
2SK1642	400	9	0.55	TO-220 NIS	**2SK2952**	400	8.5	0.55	TO-220NIS
2SK1643	900	5	2.8	TO-220AB	**2SK2717**	900	5	2.5	TO-220NIS
2SK1651	500	8	1	TO-3P(N) IS	✻**2SK2600**	500	8	0.85	TO-3P(N) IS
2SK1653	60	45	0.020	TO-220NIS	**2SK2312**	60	45	0.017	TO-220NIS
2SK1692	900	7	2.0	TO-3P(N)	**2SK2749**	900	7	2.0	TO-3P(N)
2SK1717	60	2	0.37	PW-MINI	**2SK2615**	60	2	0.37	PW-MINI
2SK1722	500	5	1.5	TO-220FL/SM	**2SK2991**	500	5	1.5	TO-220FL/SM
2SK1723	600	12	0.65	TO-3P(N)	**2SK2699**	600	12	0.65	TO-3P(N)
2SK1745	500	18	0.36	TO-3P(N)	**2SK2837**	500	20	0.27	TO-3P(N)
2SK1766	250	10	0.6	TO-220NIS	**2SK2417**	250	7.5	0.5	TO-220NIS
2SK1792	60	45	0.02	TO-220FL/SM	**2SK2376**	60	45	0.017	TO-220FL/SM
2SK1858	800	3	5.0	TO-220FL/SM	**2SK2883**	800	3	3.6	TO-220FL/SM
2SK1927	100	15	0.1	TO-220FL/SM	**2SK2789**	100	27	0.85	TO-220FL/SM
2SK1928	100	27	0.085	TO-220FL/SM	**2SK2789**	100	27	0.85	TO-220FL/SM
2SK2039	900	5	2.5	TO-3P(N)	**2SK2610**	900	5	2.5	TO-3P(N)
2SK2056	900	4	2.4	TO-220NIS	**2SK2605**	800	5	2.2	TO-220NIS
2SK2057	500	20	0.34	TO-3P(N)	**2SK2837**	500	20	0.27	TO-3P(N)
2SK2077	800	7	1.7	TO-3P(N)	**2SK2746**	800	7	1.7	TO-3P(N)
2SK2078	800	9	1.2	TO-3P(N)	**2SK2607**	800	9	1.2	TO-3P(N)
2SK2150	500	15	0.4	TO-3P(N)	**2SK2698**	500	15	0.4	TO-3P(N)

✻ : Under development

8 Power MOSFET Superseded Products

Superseded Products					Recommended Replacement Products				
Product No.	Electrical Characteristics			Package	Recommended Replacement Products	Electrical Characteristics			Package
	V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)			V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ max (Ω)	
2SK2236	500	5	1.6	TO-220NIS	**2SK2662**	500	5	1.5	TO-220NIS
2SK2237	500	7	0.8	TO-220NIS	**2SK2543**	500	8	0.85	TO-220NIS
2SK2320	800	8.5	1.2	TO-3P(N) IS	**2SK2607**	800	9	1.2	TO-3P(N)
2SK2351	600	6	1.25	TO-220AB	**2SK2544**	600	6	1.25	TO-220AB
2SK2352	600	6	1.25	TO-220NIS	**2SK2545**	600	6	1.25	TO-220NIS
TPC8002	30	11	0.014	SOP-8	✻**S3D19**	30	11	0.014	SOP-8
TPC8005-H	30	11	0.016	SOP-8	✻**TPC8010-H**	30	11	0.016	SOP-8
TPC8007-H	30	13	0.01	SOP-8	**TPC8009-H**	30	13	0.01	SOP-8
TPC8102	– 30	– 6	0.04	SOP-8	**TPC8105-H**	– 30	– 7	0.04	SOP-8
TPC8103	– 30	– 11	0.013	SOP-8	**TPC8108**	– 30	– 11	0.013	SOP-8
TPC8106-H	– 30	– 10	0.02	SOP-8	**TPC8109**	– 30	–10	0.02	SOP-8
TPC8201	30	5	0.05	SOP-8	✻**TPC8209**	30	5	0.05	SOP-8
TPC8202	20	5	0.05	SOP-8	**TPC8208**	20	5	0.05	SOP-8
TPC8204	20	6	0.02	SOP-8	**TPC8207**	20	6	0.02	SOP-8
TPC8301	– 30	– 3.5	0.12	SOP-8	✻**TPC8303**	– 30	–	0.027	SOP-8
TPC8302	– 20	– 3.5	0.12	SOP-8	✻**TPC8305**	– 20	–	0.03	SOP-8
TPCS8201	20	5	0.03	TSSOP-8	**TPCS8209**	20	5	0.03	TSSOP-8
TPCS8203	20	6	0.024	TSSOP-8	**TPCS8211**	20	6	0.024	TSSOP-8
TPCS8206	20	5	0.03	TSSOP-8	**TPCS8210**	20	5	0.03	TSSOP-8
TPCS8207	20	6	0.024	TSSOP-8	**TPCS8212**	20	6	0.024	TSSOP-8

✻ : Under development

9 Power MOSFET Final-Phase and Discontinued Products

(1) Final-Phase Products

Product No.	Recommended Replacement Products
2SJ147	**2SJ304**
2SK385	**2SK2698**
2SK387	**2SK2882**
2SK388	**2SK2508**
2SK525	**2SK2382**
2SK526	**2SK2417**
2SK528	**2SK2662**
2SK529	**2SK2662**
2SK530	**2SK2662**
2SK531	**2SK2662**
2SK532	**2SK2232**
2SK539	**2SK2610**
2SK578	**2SK2882**
2SK891	**2SK2382**
2SK893	**2SK2661**
2SK944	**2SK2967**
2SK1116	**2SK2232**
2SK1213	**2SK2602**
2SK1347	**2SK2314**
2SK1362	**2SK2610**

Product No.	Recommended Replacement Products
2SK1378	**2SK2841**
2SK1600	**2SK2603**
2SK1601	**2SK2608**
2SK1652	**2SK2698**
2SK1720	**2SK2266**
2SK1721	**2SK2991**
2SK1746	**2SK2865**
2SK1768	**2SK2614**
2SK1769	**2SK2599**
2SK1854	**2SK2952**
2SK1864	**2SK2776**
2SK1865	**2SK2776**
2SK1882	**2SK2232**
2SK1915	**2SK2777**
2SK1929	**2SK2884**
2SK1997	**2SK2385**
2SK1998	**2SK2233**
2SK2038	**2SK2604**
2SK2088	**2SK2401**
2SK2089	**2SK2884**

Product No.	Recommended Replacement Products
2SK2107	**2SK2401**
2SK2149	**2SK2601**
2SK2222	**2SK2604**
2SK2319	**2SK2746**
2SK2386	**2SK2661**
2SK2387	**2SK2542**
2SK2388	**2SK2750**
2SK2402	**2SK2750**

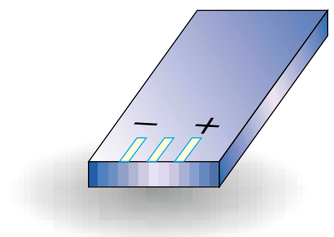
(2) Discontinued Products

Product No.	Recommended Replacement Products
2SJ91	2SJ200
2SJ92	2SJ200
2SJ123	2SJ304
2SJ124	2SJ304
2SJ126	2SJ304
2SJ183	2SJ377
2SJ224	2SJ312
2SK271	2SK1529
2SK272	2SK1529
2SK324	2SK2698
2SK325	2SK2698
2SK355	2SK387
2SK356	2SK388
2SK357	2SK2381
2SK358	2SK2417
2SK405	2SK1529
2SK417	2SK2232
2SK418	2SK2662
2SK419	2SK2662
2SK420	2SK2662
2SK421	2SK2662
2SK422	2SK2961
2SK423	2SK941
2SK442	2SK2232
2SK527	2SK2232
2SK568	—
2SK572	—
2SK573	2SK1641
2SK643	2SK2601
2SK644	2SK2601
2SK672	2SK2232
2SK673	2SK2232
2SK674	2SK2232
2SK678	2SK2698
2SK693	2SK2698
2SK694	2SK2698
2SK708	2SK2698
2SK788	2SK2698
2SK789	2SK2698
2SK790	2SK2698
2SK793	2SK2610
2SK794	2SK2610
2SK849	2SK2233
2SK856	2SK2385
2SK857	2SK2233
2SK858	2SK2750
2SK888	2SK2350
2SK890	2SK2350
2SK892	2SK2662
2SK894	2SK2542
2SK895	2SK2601
2SK896	2SK2695
2SK1029	2SK2698

Product No.	Recommended Replacement Products
2SK1112	2SK2231
2SK1113	2SK2201
2SK1114	2SK2232
2SK1115	2SK2232
2SK1124	2SK2233
2SK1251	2SK2231
2SK1252	2SK2201
2SK1333	2SK2698
2SK1344	2SK2232
2SK1346	2SK2232
2SK1348	2SK2391
2SK1350	2SK2382
2SK1351	2SK2662
2SK1352	2SK2543
2SK1379	2SK2173
2SK1380	2SK2267
2SK1487	2SK2601
2SK1488	2SK2601
2SK1513	2SK2601
2SK1531	2SK2698
2SK1574	2SK2542
2SK1602	2SK2603
2SK1649	2SK2610
2SK1650	2SK2719
2SK1767	2SK2750
2SK1805	2SK2543
2SK1855	2SK2698
2SK1879	2SK2398
2SK1913	2SK2750
YTF150	2SK850
YTF151	2SK2466
YTF152	2SK2466
YTF153	2SK2466
YTF250	✻ 2SK2967
YTF251	✻ 2SK2967
YTF252	✻ 2SK2967
YTF253	✻ 2SK2967
YTF440	2SK2601
YTF441	2SK2601
YTF442	2SK2601
YTF443	2SK2601
YTF450	2SK2698
YTF451	2SK2698
YTF452	2SK2698
YTF453	2SK2698
YTF520	2SK2399
YTF521	2SK2350
YTF522	2SK2350
YTF523	2SK2350
YTF530	2SK2350
YTF531	2SK2350
YTF532	2SK2350
YTF533	2SK2350

Product No.	Recommended Replacement Products
YTF540	2SK2391
YTF541	2SK2391
YTF542	2SK2391
YTF543	2SK2391
YTF610	2SK2381
YTF611	2SK2381
YTF612	2SK2381
YTF613	2SK2381
YTF620	2SK2381
YTF621	2SK2381
YTF622	2SK2381
YTF623	2SK2381
YTF630	2SK2350
YTF631	2SK2350
YTF632	2SK2350
YTF633	2SK2350
YTF640	2SK2382
YTF641	2SK2382
YTF642	2SK2382
YTF643	2SK2382
YTF820	2SK2661
YTF821	2SK2661
YTF822	2SK2661
YTF823	2SK2661
YTF830	2SK2661
YTF831	2SK2661
YTF832	2SK2661
YTF833	2SK2661
YTF840	2SK2542
YTF841	2SK2544
YTF842	2SK2544
YTF843	2SK2544

Portable devices



Secondary battery

Cellular' phones and other portable devices

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

Fluorescent light inverters

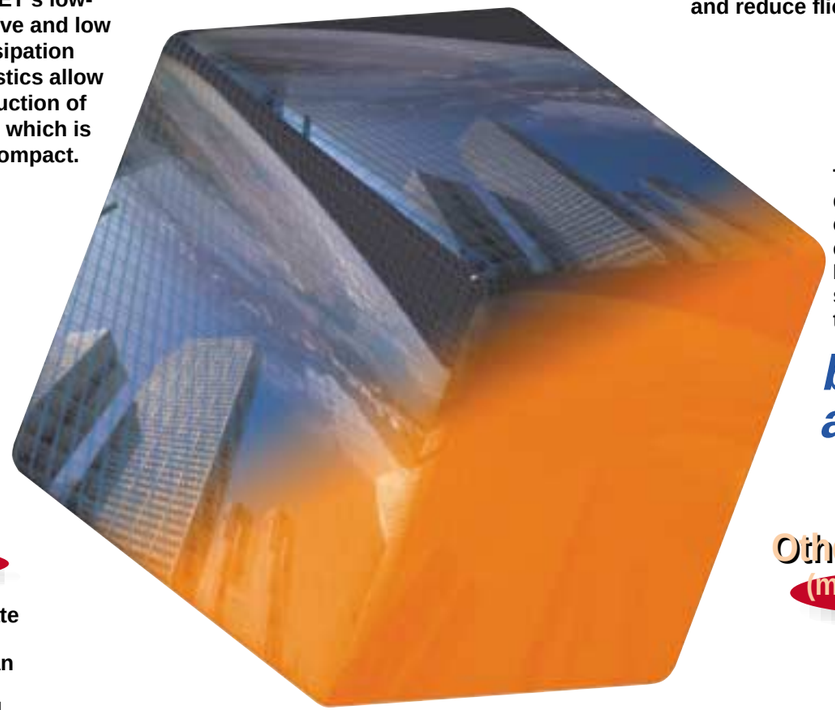
Inverter circuits which incorporate MOSFETs can be used to increase the brightness of lighting systems and reduce flickering.

Bright, high level of efficiency

Automobiles

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

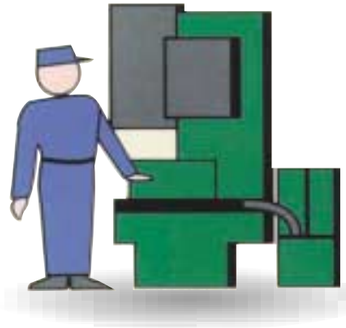
Circuit simplification, miniaturization, high reliability



Superior performance and a broad product line combine to meet needs in various application fields.

High-speed power switching

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



Switching power supplies

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

Small, light and slim

Other products (monitors, toys)

Ultra-high-resolution images

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

Small, highly efficient controls for toys

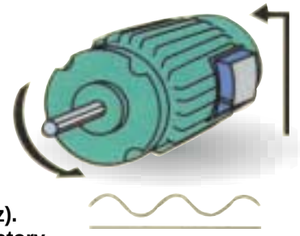
Notebook computer power supplies

Small, light, low power loss

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

Motor controls

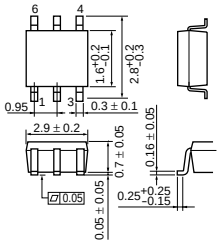
MOSFETs' excellent high-speed characteristics allow them to be used to regulate motors at audio frequencies (20 kHz~30 kHz). This yields improved regulatory performance and reduced levels of ambient noise.



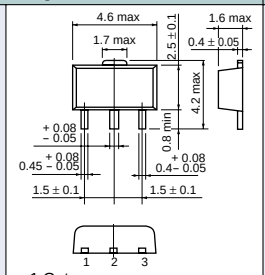
Reduced noise pollution and improved control performance

■ Power MOSFETs

VS-6

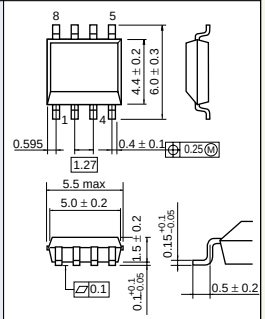


PW-MINI (SOT-89)

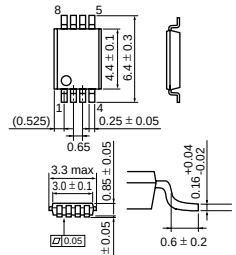


1.Gate
2.Drain (Heat Sink)
3.Source

SOP-8

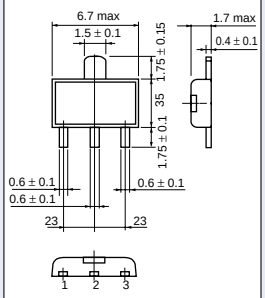


TSSOP-8

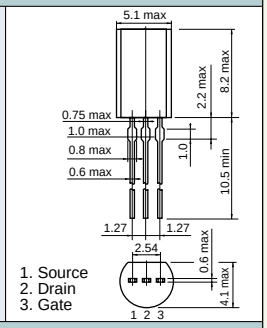


1. Drain
2.3 Source
4. Gate
5. Gate
6.7 Source
8. Drain

SP (SOT-223)

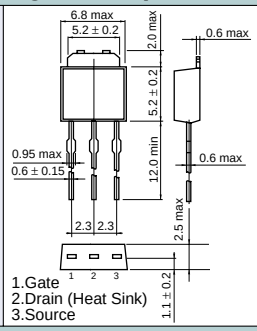


TO92-MOD



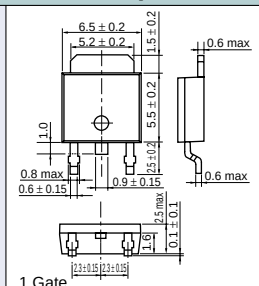
1. Source
2. Drain
3. Gate

PW-MOLD (straight leads)



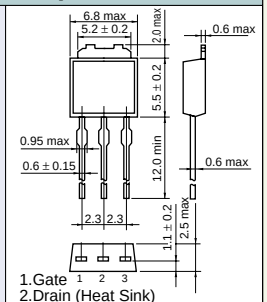
1.Gate
2.Drain (Heat Sink)
3.Source

PW-MOLD (formed leads)



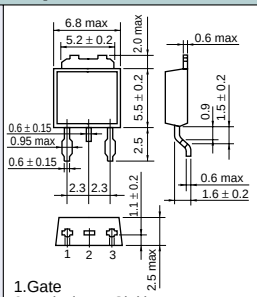
1.Gate
2.Drain (Heat Sink)
3.Source

DP (straight leads)



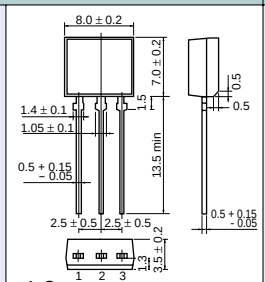
1.Gate
2.Drain (Heat Sink)
3.Source

DP (formed leads)



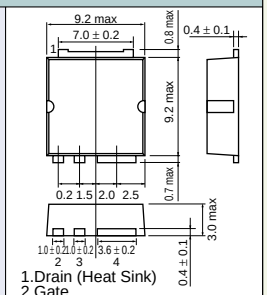
1.Gate
2.Drain (Heat Sink)
3.Source

TPS



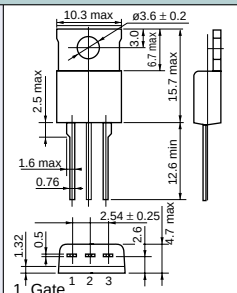
1. Source
2. Drain
3. Gate

TFP



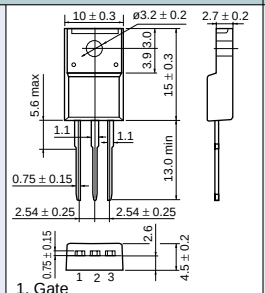
1.Drain (Heat Sink)
2.Gate
3.Source 1
4.Source 2

TO-220AB



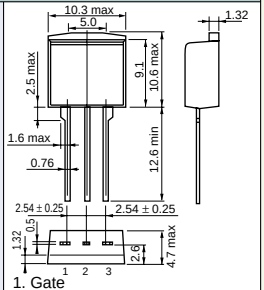
1. Gate
2. Drain (Heat Sink)
3. Source

TO-220 (NIS)



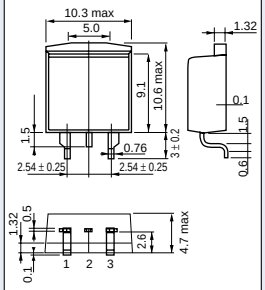
1. Gate
2. Drain
3. Source

TO-220FL



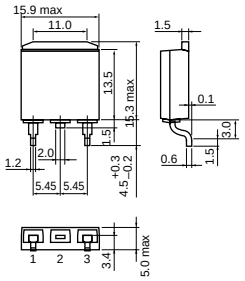
1. Gate
2. Drain (Heat Sink)
3. Source

TO-220SM



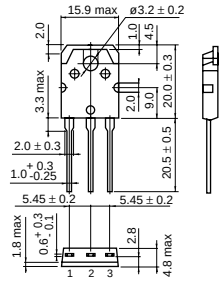
1. Gate
2. Drain (Heat Sink)
3. Source

TO-3P(SM)



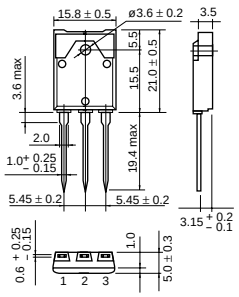
1. Gate
2. Drain (Heat Sink)
3. Source

TO-3P(N)



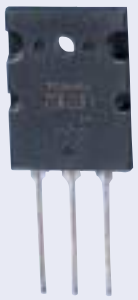
1. Gate
2. Drain (Heat Sink)
3. Source

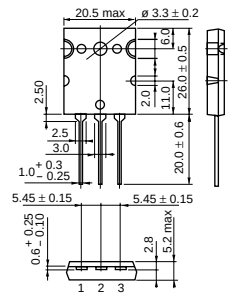
TO-3P(N)IS



1. Gate
2. Drain
3. Source

TO-3P(L)

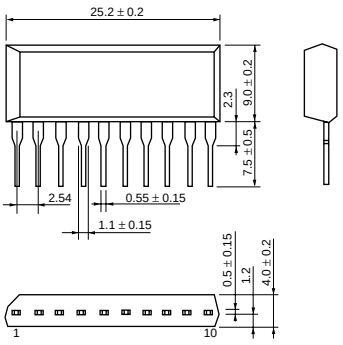




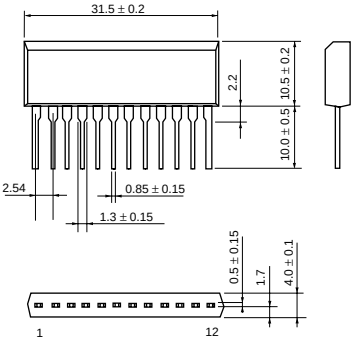
1. Gate
2. Drain (Heat Sink)
3. Source

■ Power Modules

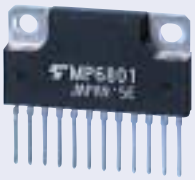
S-10

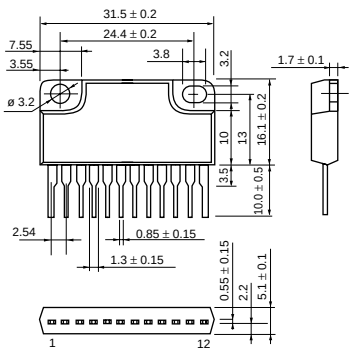


S-12



F-12





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(As of August, 2001)

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