

MOS FIELD EFFECT TRANSISTOR

2SK3483

SWITCHING

N-CHANNEL POWER MOS FET

DESCRIPTION

The 2SK3483 is N-channel MOS Field Effect Transistor designed for high current switching applications.

FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 52 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 14 \text{ A)}$
 $R_{DS(on)2} = 59 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 14 \text{ A)}$
- Low C_{iss} : $C_{iss} = 2300 \text{ pF TYP.}$
- Built-in gate protection diode
- TO-251/TO-252 package

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage ($V_{GS} = 0\text{V}$)	V_{DSS}	100	V
Gate to Source Voltage ($V_{DS} = 0\text{V}$)	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 28	A
Drain Current (Pulse) ^{Note1}	$I_{D(pulse)}$	± 60	A
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_T	40	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_T	1.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current ^{Note2}	I_{AS}	25	A
Single Avalanche Energy ^{Note2}	E_{AS}	62.5	mJ

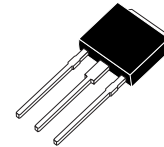
Notes 1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

2. Starting $T_{ch} = 25^\circ\text{C}$, $R_G = 25 \Omega$, $V_{GS} = 20 \rightarrow 0 \text{ V}$

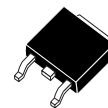
★ ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3483	TO-251 (MP-3)
2SK3483-Z	TO-252 (MP-3Z)

(TO-251)



(TO-252)



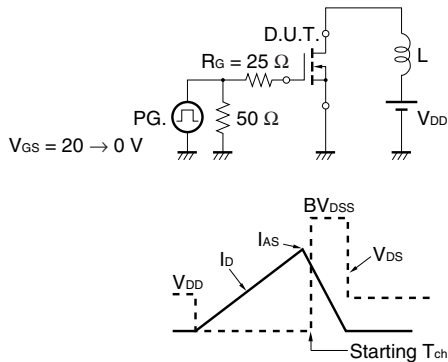
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

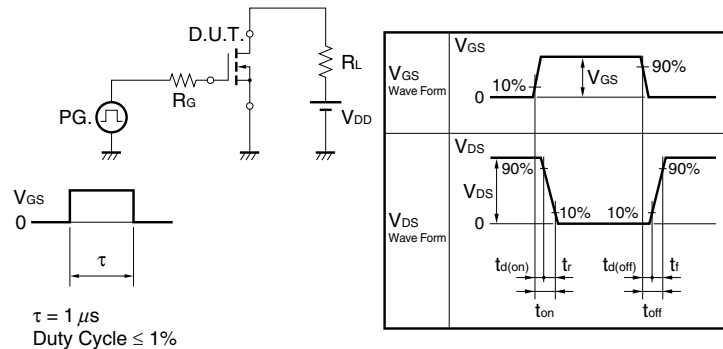
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	1.5	2.0	2.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = 10 V, I _D = 14 A	9.0	18		S
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = 10 V, I _D = 14 A		41	52	mΩ
	R _{DS(on)2}	V _{GS} = 4.5 V, I _D = 14 A		45	59	mΩ
Input Capacitance	C _{iss}	V _{DS} = 10 V		2300		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		230		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		120		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 50 V, I _D = 14 A		12		ns
Rise Time	t _r	V _{GS} = 10 V		9		ns
Turn-off Delay Time	t _{d(off)}	R _G = 0 Ω		53		ns
Fall Time	t _f			5		ns
Total Gate Charge	Q _G	V _{DD} = 80 V		49		nC
Gate to Source Charge	Q _{GS}	V _{GS} = 10 V		7		nC
Gate to Drain Charge	Q _{GD}	I _D = 28 A		13		nC
Body Diode Forward Voltage ^{Note}	V _{F(S-D)}	I _F = 28 A, V _{GS} = 0 V		1.0		V
Reverse Recovery Time	t _{rr}	I _F = 28 A, V _{GS} = 0 V		73		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		175		nC

Note Pulsed

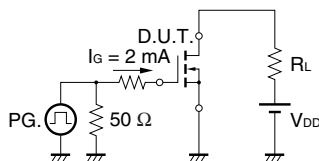
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

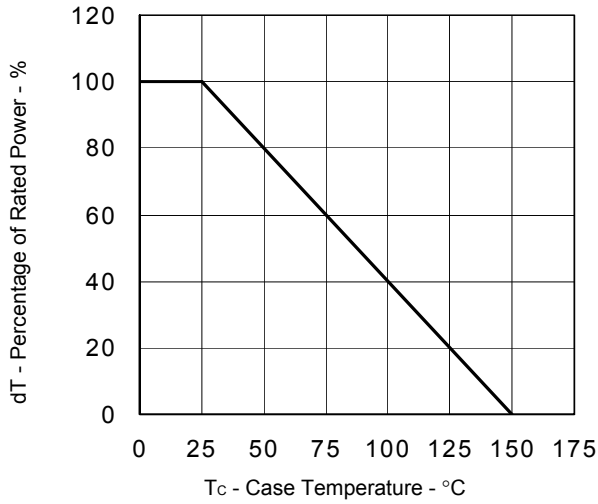


TEST CIRCUIT 3 GATE CHARGE

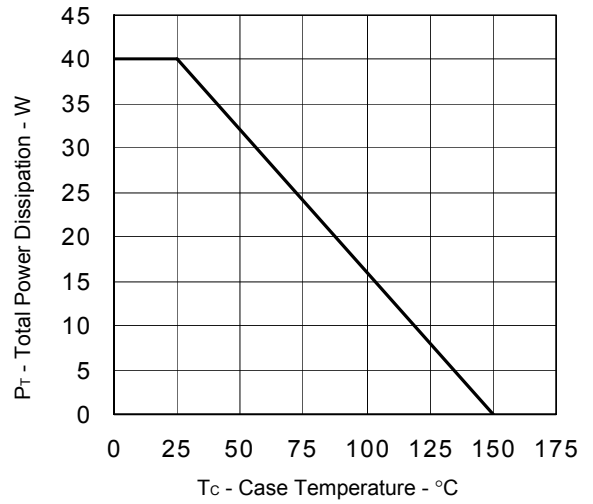


TYPICAL CHARACTERISTICS (T_A = 25°C)

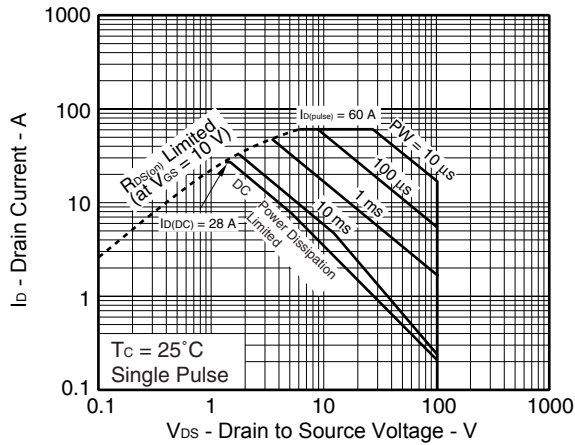
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



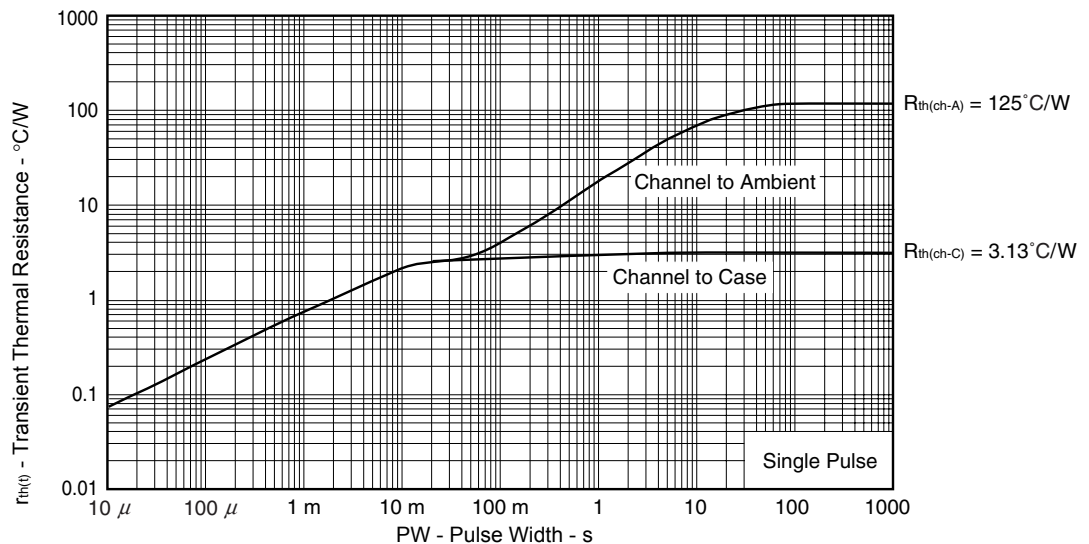
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



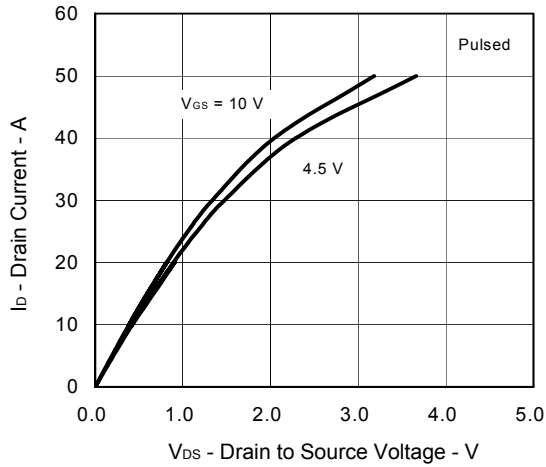
FORWARD BIAS SAFE OPERATING AREA



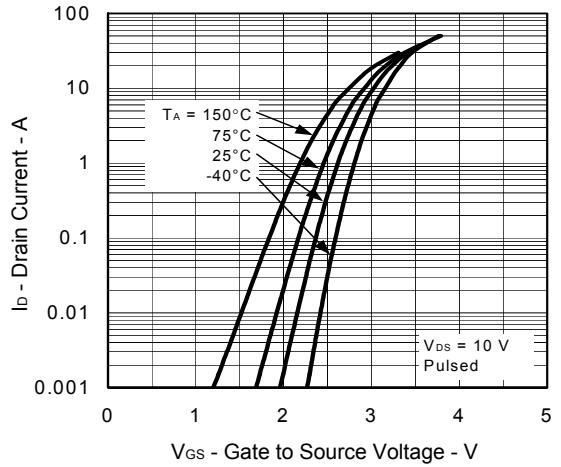
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



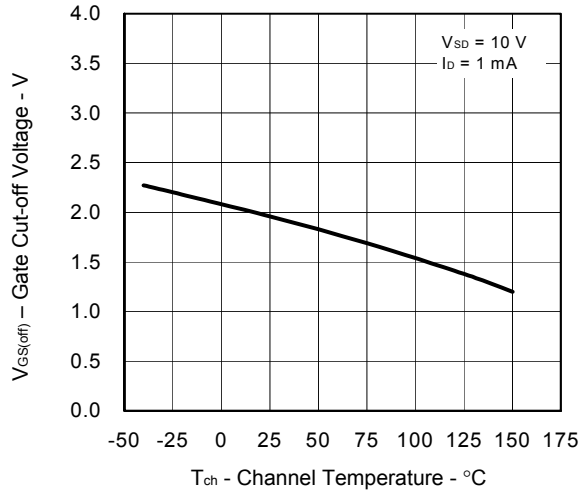
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



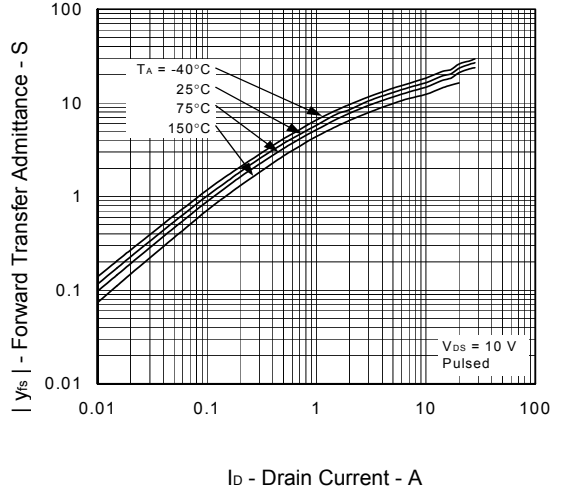
FORWARD TRANSFER CHARACTERISTICS



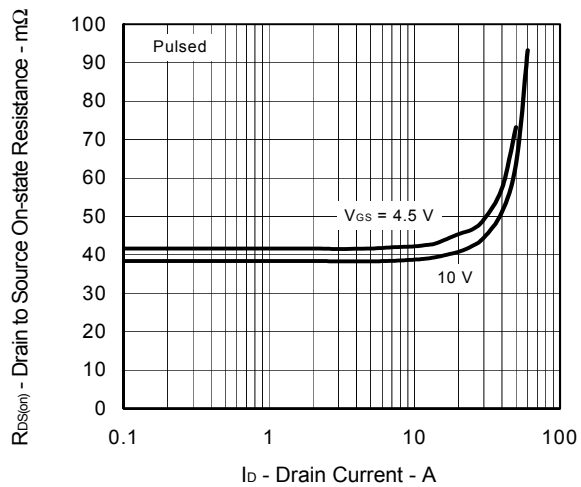
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



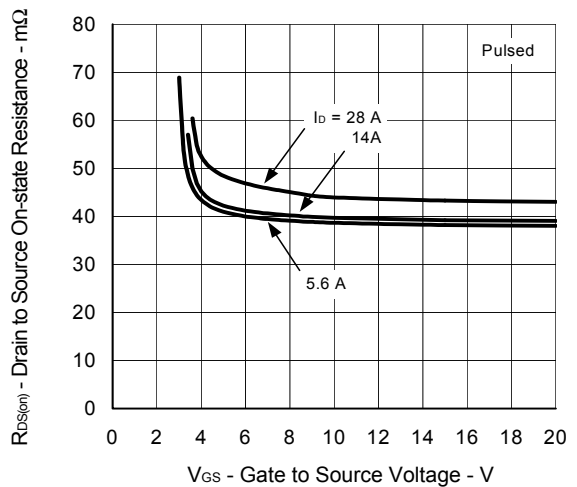
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



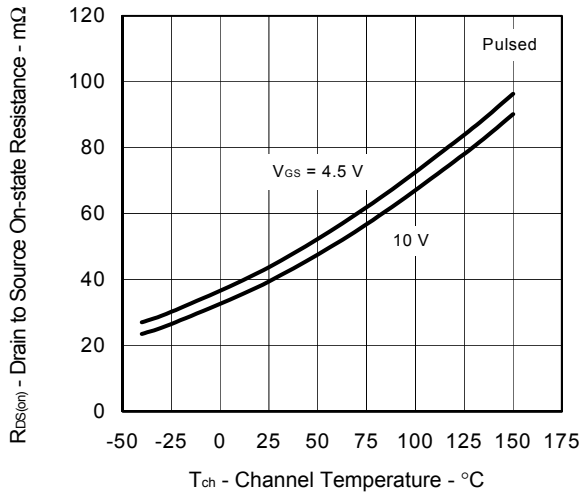
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



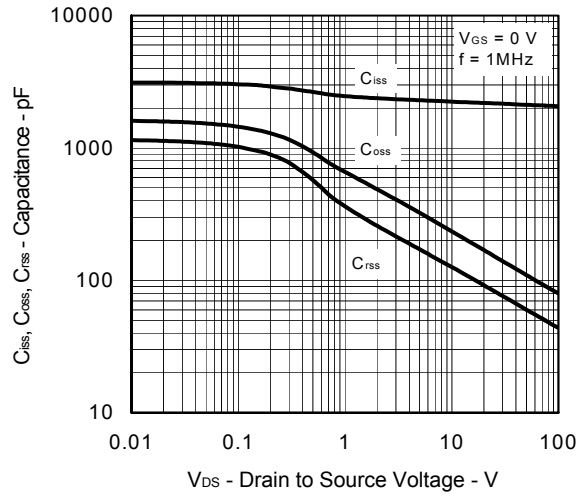
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



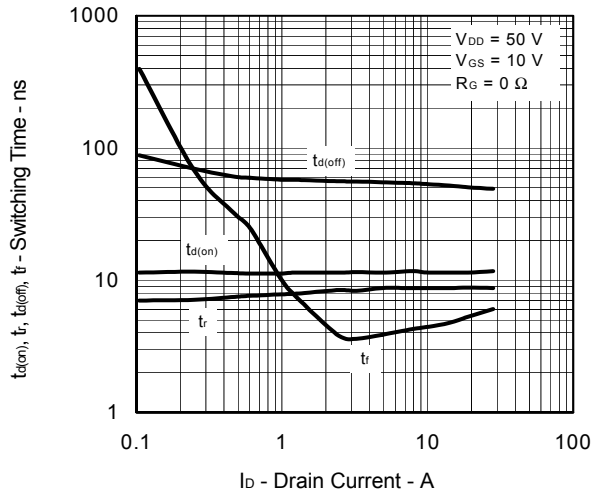
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



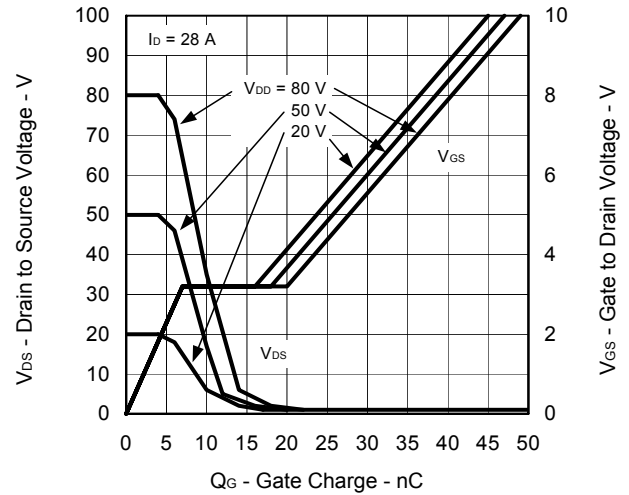
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



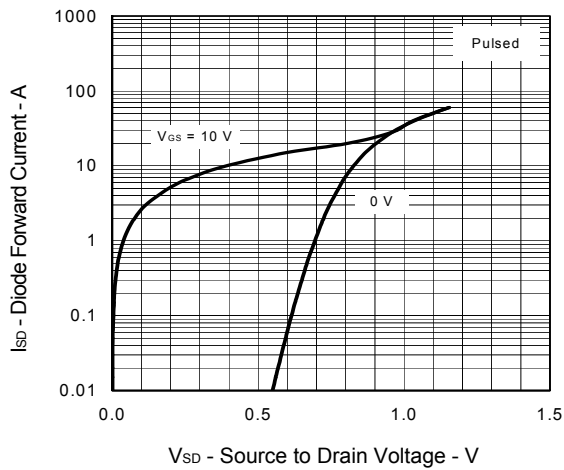
SWITCHING CHARACTERISTICS



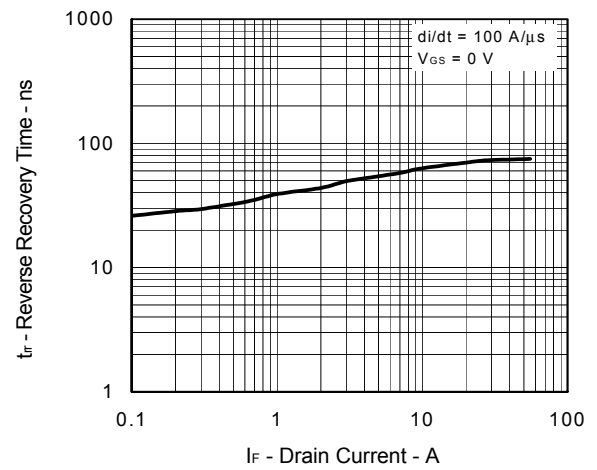
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



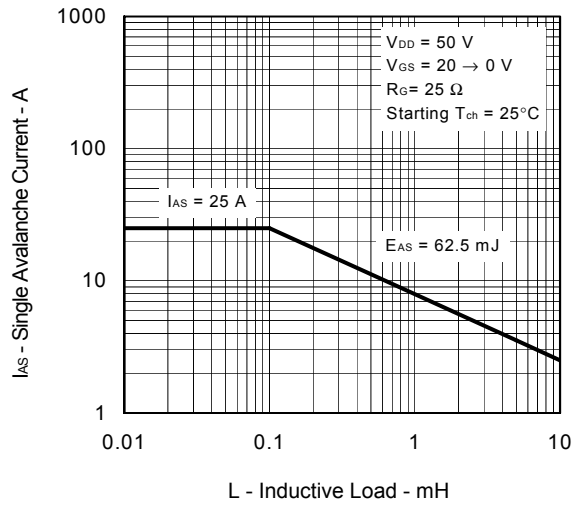
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



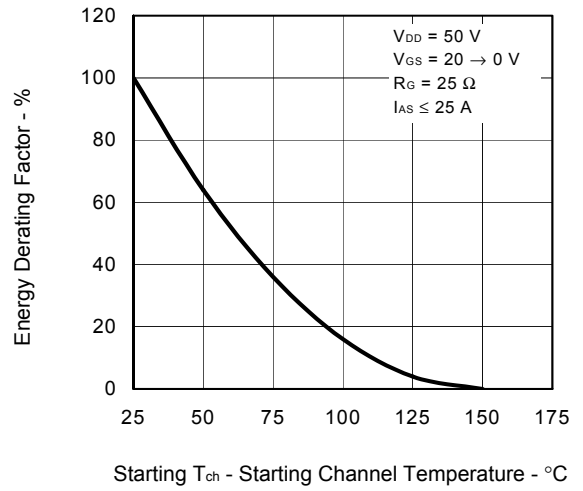
REVERSE RECOVERY TIME vs. DRAIN CURRENT



SINGLE AVALANCHE CURRENT vs. INDUCTIVE LOAD

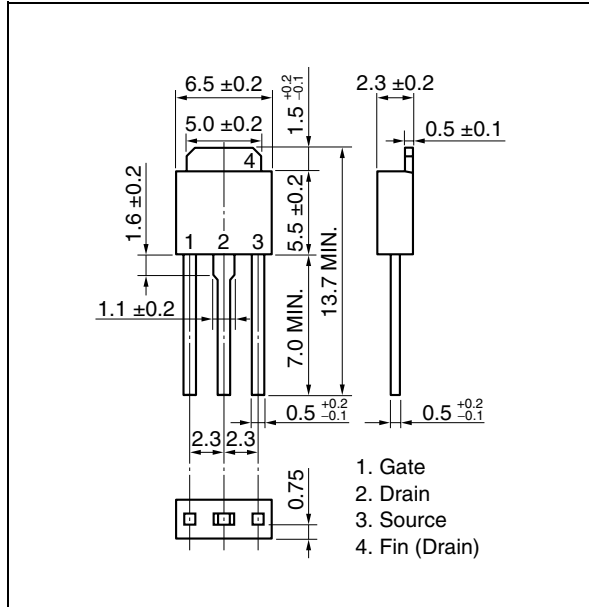


SINGLE AVALANCHE ENERGY DERATING FACTOR

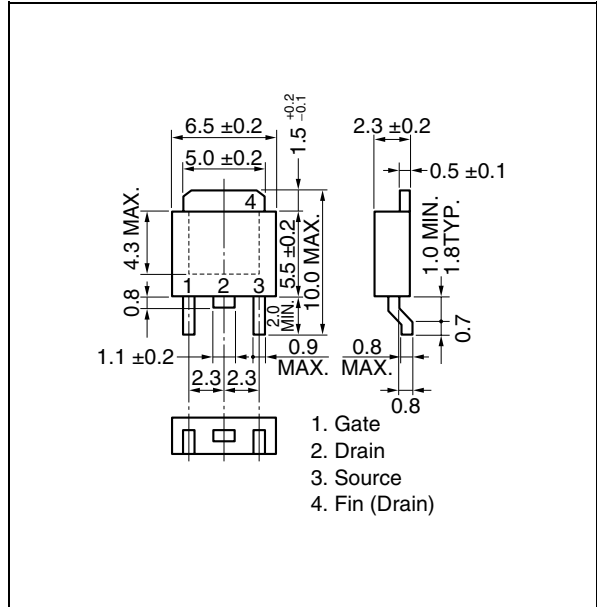


★ PACKAGE DRAWINGS (Unit: mm)

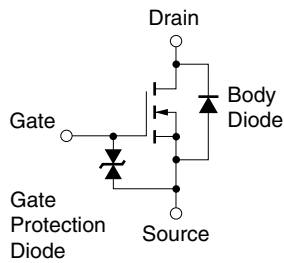
1) TO-251 (MP-3)



2) TO-252 (MP-3Z)



EQUIVALENT CIRCUIT



Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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