

MOS FIELD EFFECT TRANSISTORS

2SK2359/2SK2360

SWITCHING

N-CHANNEL POWER MOS FET

INDUSTRIAL USE

DESCRIPTION

The 2SK2359, 2SK2359-Z/2SK2360, 2SK2360-Z is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-Resistance
 2SK2359: $R_{DS(on)} = 0.9 \Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 4.0 \text{ A}$)
 2SK2360: $R_{DS(on)} = 1.0 \Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 4.0 \text{ A}$)
- Low C_{iss} $C_{iss} = 1050 \text{ pF TYP.}$
- High Avalanche Capability Ratings

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

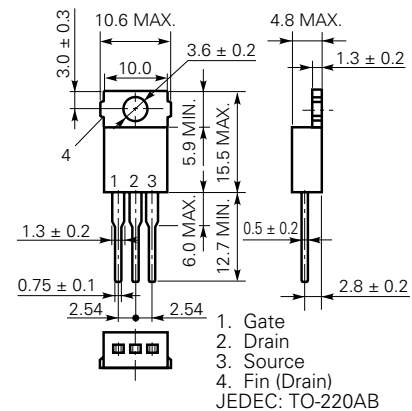
Drain to Source Voltage(2SK2359/2SK2360) V_{DSS}	450/500	V
Gate to Source Voltage V_{GSS}	± 30	V
Drain Current (DC) $I_{D(DC)}$	± 7.0	A
Drain Current (pulse)* $I_{D(pulse)}$	± 28	A
Total Power Dissipation ($T_c = 25^\circ \text{C}$) P_{T1}	75	W
Total Power Dissipation ($T_A = 25^\circ \text{C}$) P_{T2}	1.5	W
Channel Temperature T_{ch}	150	$^\circ \text{C}$
Storage Temperature T_{stg}	-55 to $+150$	$^\circ \text{C}$
Single Avalanche Current** I_{AS}	7.0	A
Single Avalanche Energy** E_{AS}	17	mJ

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

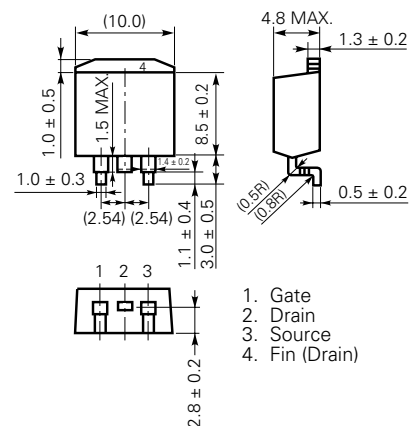
** Starting $T_{ch} = 25^\circ \text{C}$, $R_G = 25 \Omega$, $V_{GS} = 20 \text{ V} \rightarrow 0$

PACKAGE DIMENSIONS

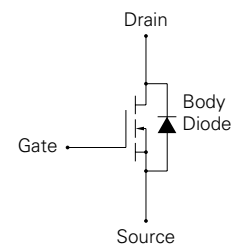
(in millimeters)



MP-25 (TO220)



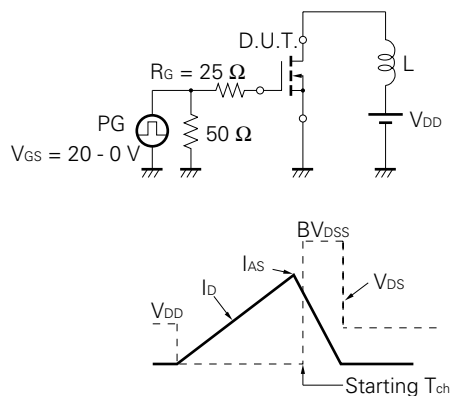
MP-25Z (SURFACE MOUNT TYPE)



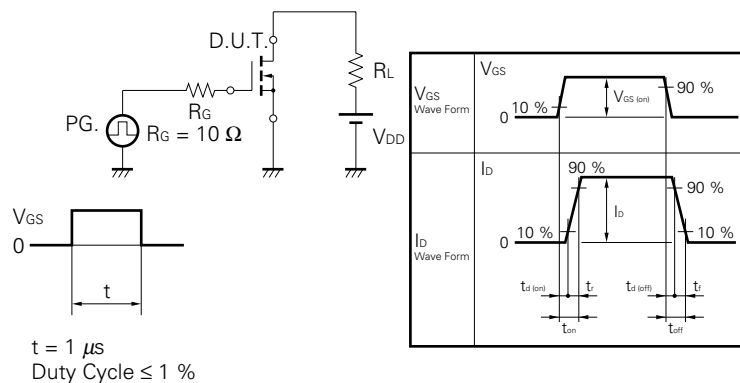
2SK2359/2SK2360 快応高

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Drain to Source On-State Resistance	$R_{DS(on)}$		0.7	0.9	$m\Omega$	$V_{GS} = 10\text{ V}$	2SK2359
			0.8	1.0		$V_D = 4.0\text{ V}$	2SK2360
Gate to Source Cutoff Voltage	$V_{GS(off)}$	2.5		3.5	V	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	
Forward Transfer Admittance	$ y_{fs} $	3.0			S	$V_{DS} = 10\text{ V}, I_D = 4.0\text{ A}$	
Drain Leakage Current	I_{DSS}			100	μA	$V_{DS} = V_{DSS}, V_{GS} = 0$	
Gate to Source Leakage Current	I_{GSS}			± 100	nA	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0$	
Input Capacitance	C_{iss}		1050		pF	$V_{DS} = 10\text{ V}$	
Output Capacitance	C_{oss}		200		pF	$V_{GS} = 0$	
Reverse Transfer Capacitance	C_{rss}		26		pF	$f = 1\text{ MHz}$	
Turn-On Delay Time	$t_{d(on)}$		14		ns	$I_D = 4.0\text{ A}$	
Rise Time	t_r		9		ns	$V_{GS} = 10\text{ V}$	
Turn-Off Delay Time	$t_{d(off)}$		56		ns	$V_{DD} = 150\text{ V}$	
Fall Time	t_f		14		ns	$R_G = 10\ \Omega, R_L = 37.5\ \Omega$	
Total Gate Charge	Q_G		27		nC	$I_D = 7.0\text{ A}$	
Gate to Source Charge	Q_{GS}		5.5		nC	$V_{DD} = 400\text{ V}$	
Gate to Drain Charge	Q_{GD}		12		nC	$V_{GS} = 10\text{ V}$	
Body Diode Forward Voltage	$V_{F(S-D)}$		1.0		V	$I_F = 7.0\text{ A}, V_{GS} = 0$	
Reverse Recovery Time	t_{rr}		300		ns	$I_F = 7.0\text{ A}, V_{GS} = 0$	
Reverse Recovery Charge	Q_{rr}		1.5		μC	$di/dt = 50\text{ A}/\mu\text{s}$	

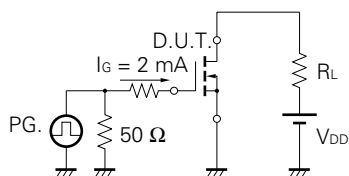
Test Circuit 1 Avalanche Capability



Test Circuit 2 Switching Time



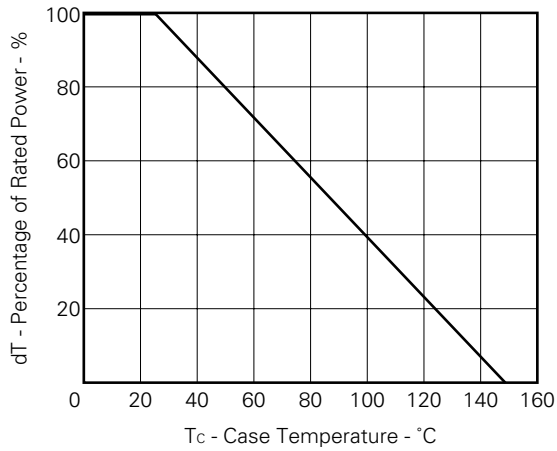
Test Circuit 3 Gate Charge



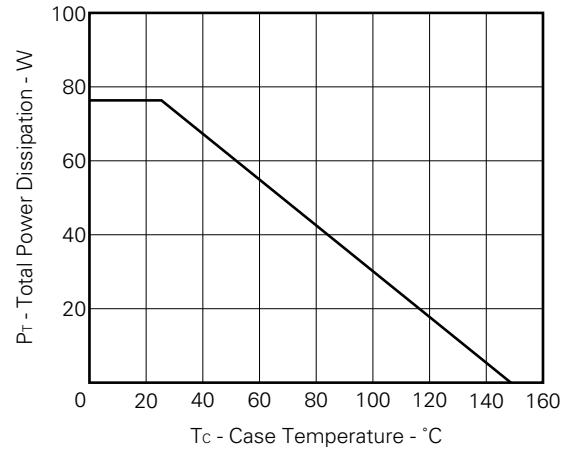
The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

查询"2SK2359"供应商 **CHARACTERISTICS (T_A = 25 °C)**

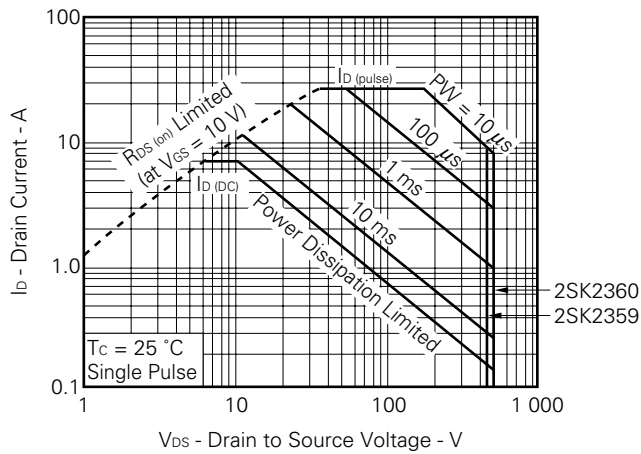
DERATING FACTOR OF FORWARD BIAS
SAFE OPERATING AREA



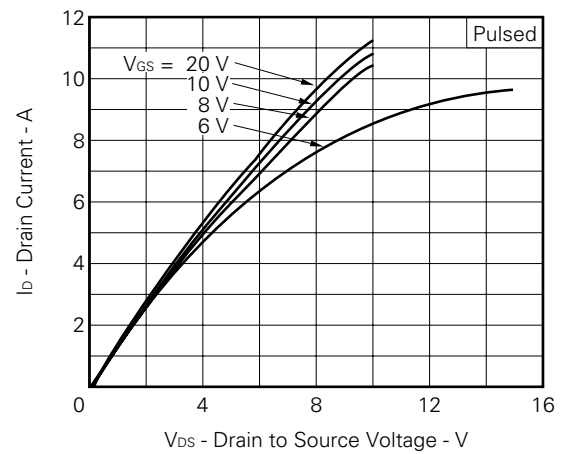
TOTAL POWER DISSIPATION vs.
CASE TEMPERATURE



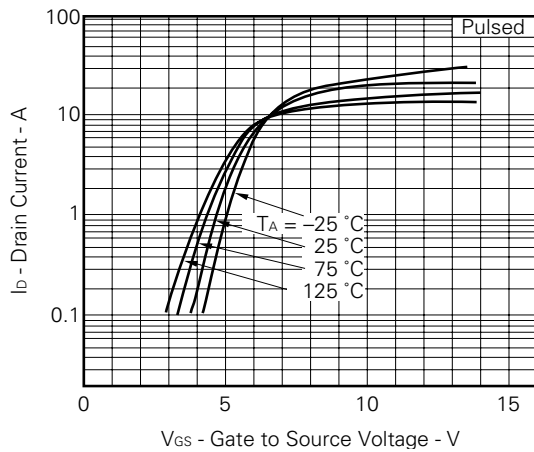
FORWARD BIAS SAFE OPERATING AREA



DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE

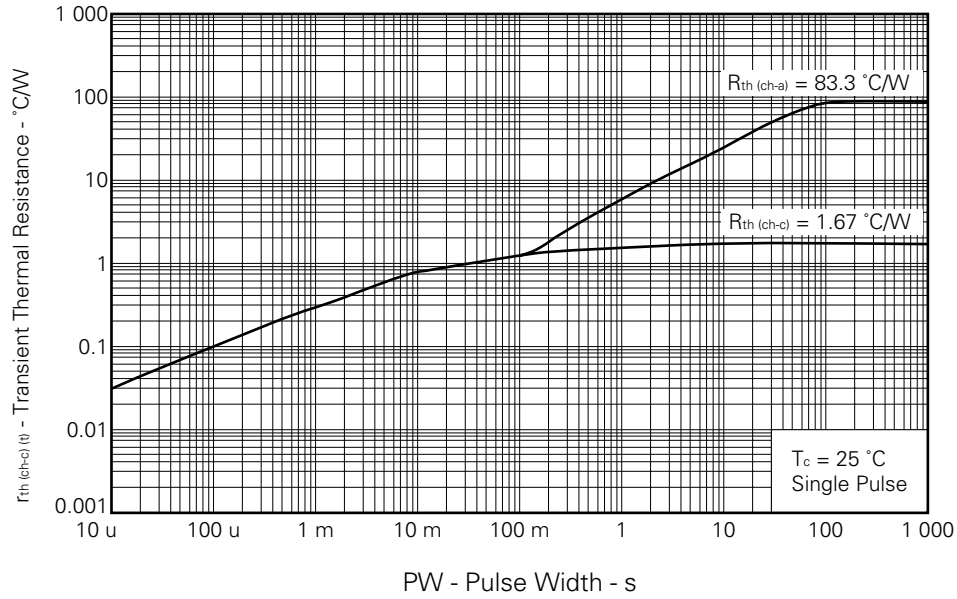


DRAIN CURRENT vs.
GATE TO SOURCE VOLTAGE

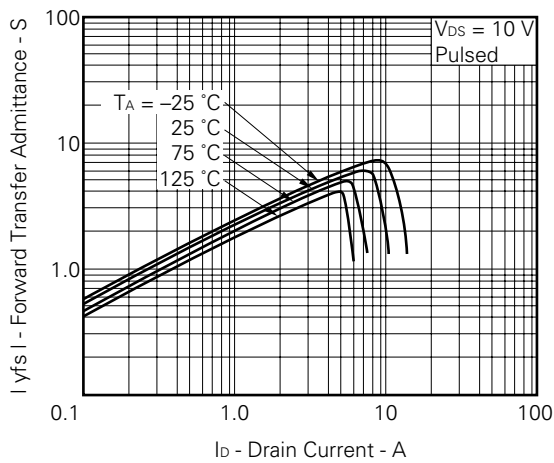


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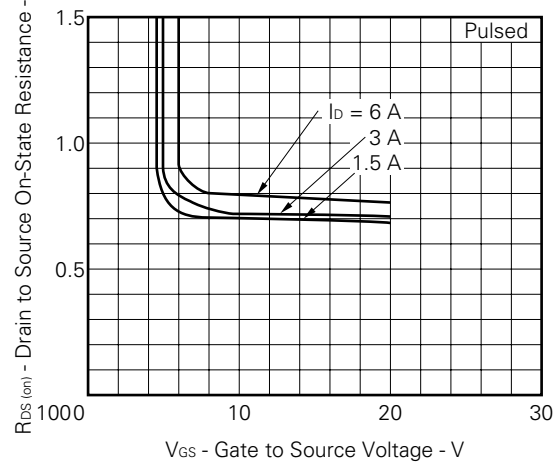
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



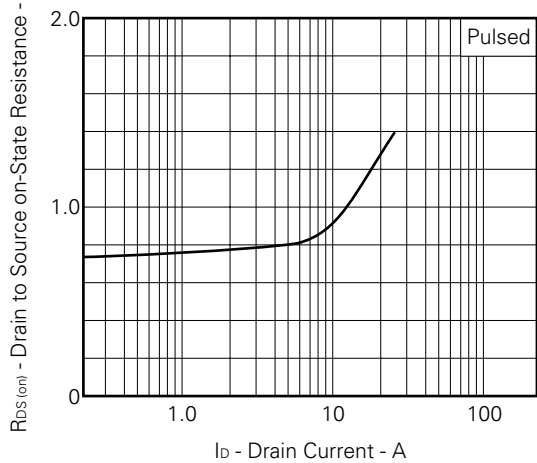
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



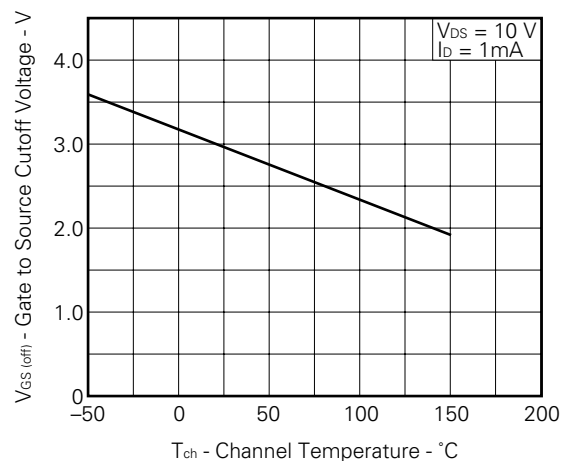
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

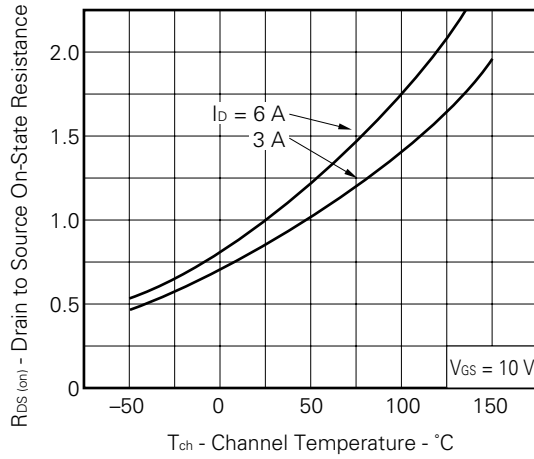
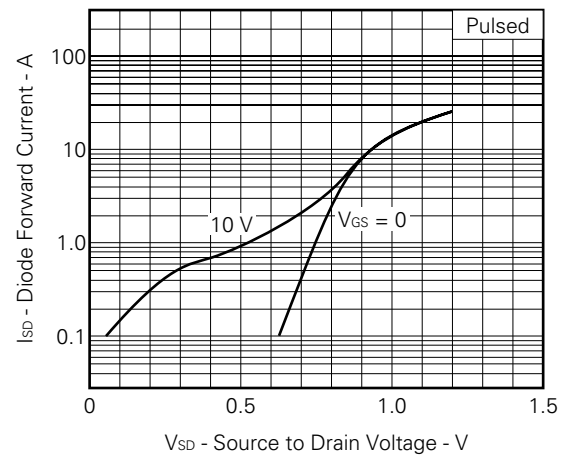
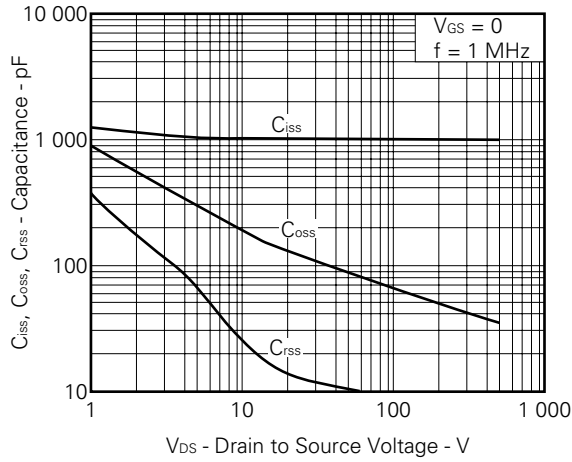


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT

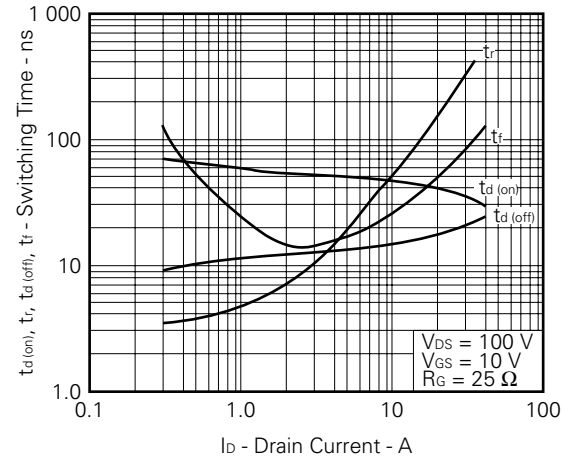
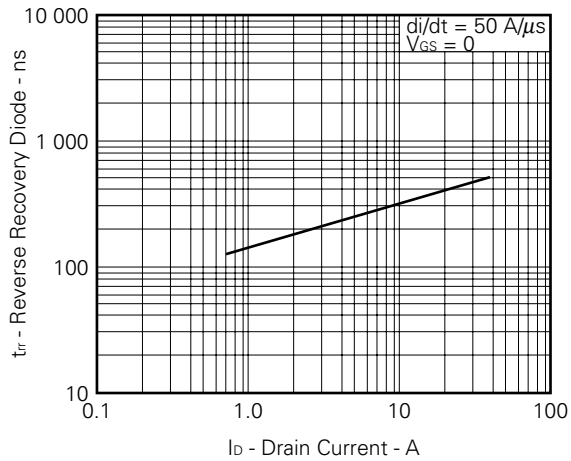


GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE

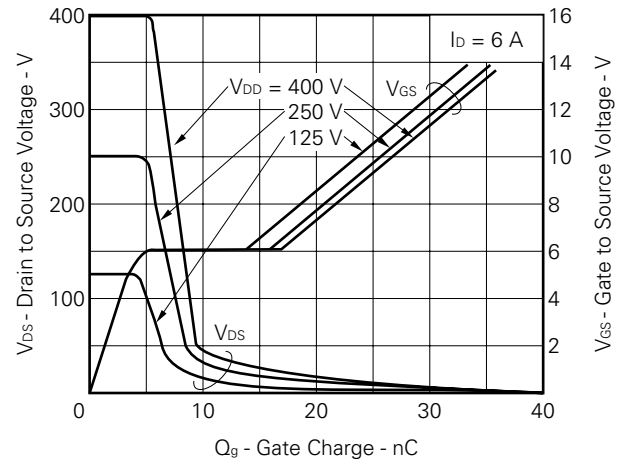


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CHANNEL TEMPERATURESOURCE TO DRAIN DIODE
FORWARD VOLTAGECAPACITANCE vs. DRAIN TO
SOURCE VOLTAGE

SWITCHING CHARACTERISTICS

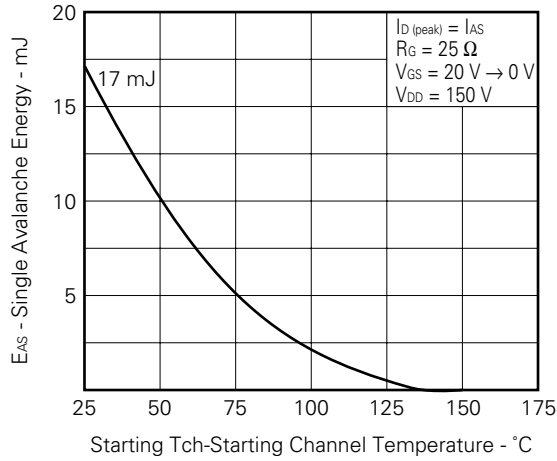
REVERSE RECOVERY TIME vs.
DRAIN CURRENT

DYNAMIC INPUT/OUTPUT CHARACTERISTICS

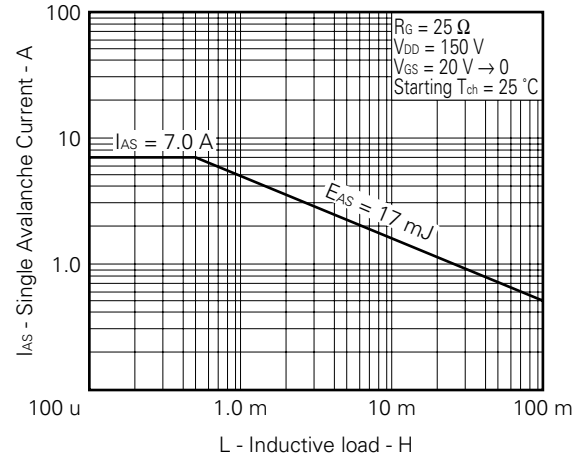


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SINGLE AVALANCHE ENERGY vs.
STARTING CHANNEL TEMPERATURE



SINGLE AVALANCHE CURRENT vs.
INDUCTIVE LOAD



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Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134
Power MOS FET features and application switching power supply.	TEA-1034
Application circuits using Power MOS FET.	TEA-1035
Safe operating area of Power MOS FET.	TEA-1037

The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is 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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