

MOS FIELD EFFECT TRANSISTORS

2SK2367/2SK2368

SWITCHING

N-CHANNEL POWER MOS FET

INDUSTRIAL USE

DESCRIPTION

The 2SK2367/2SK2368 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-Resistance
2SK2367: $R_{DS(on)} = 0.5 \Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 8.0 \text{ A}$)
2SK2368: $R_{DS(on)} = 0.6 \Omega$ ($V_{GS} = 10 \text{ V}$, $I_D = 8.0 \text{ A}$)
- Low C_{iss} $C_{iss} = 1\,600 \text{ pF TYP.}$
- High Avalanche Capability Ratings

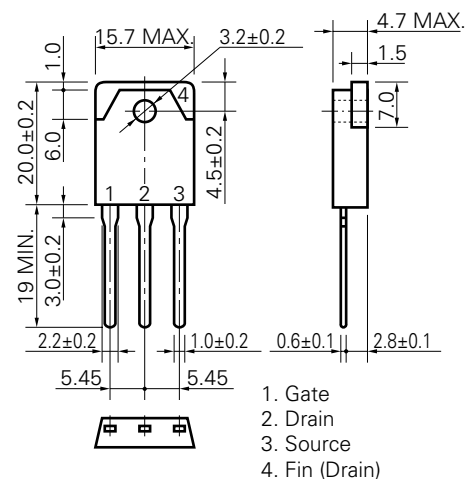
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage (2SK2367/2SK2368)	V_{DS}	450/500	V
Gate to Source Voltage	V_{GS}	± 30	V
Drain Current (DC)	$I_D(\text{DC})$	± 15	A
Drain Current (pulse)*	$I_D(\text{pulse})$	± 60	A
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_{T1}	120	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T2}	3.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \text{ to } +150$	$^\circ\text{C}$
Single Avalanche Current**	I_{AS}	15	A
Single Avalanche Energy**	E_{AS}	161	mJ

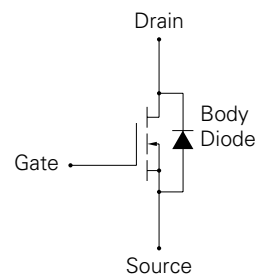
* $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

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

PACKAGE DIMENSIONS (in millimeter)



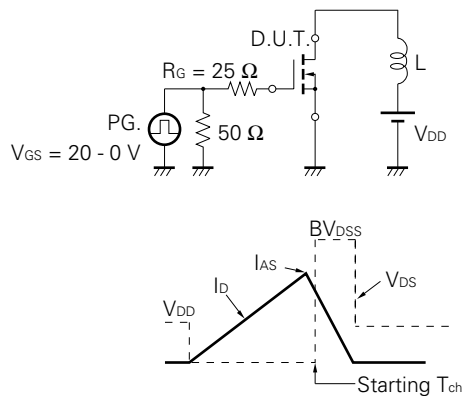
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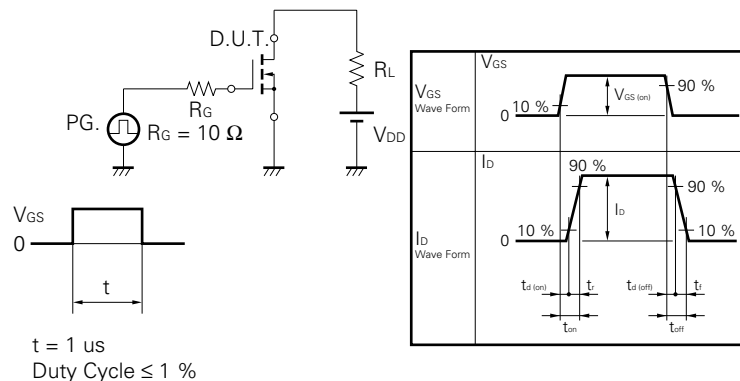
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Drain to Source On-Resistance	R _{DS(on)}		0.4	0.5	Ω	V _{GS} = 10 V	2SK2367
			0.5	0.6		I _D = 8.0 A	2SK2368
Gate to Source Cutoff Voltage	V _{GS(off)}	2.5		3.5	V	V _{DS} = 10 V, I _D = 1 mA	
Forward Transfer Admittance	y _{fs}	5.0			S	V _{DS} = 10 V, I _D = 8.0 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} = ±30 V, V _{DS} = 0	
Input Capacitance	C _{iss}		1 600		pF	V _{DS} = 10 V	
Output Capacitance	C _{oss}		300		pF	V _{GS} = 0	
Reverse Transfer Capacitance	C _{rss}		30		pF	f = 1 MHz	
Turn-On Delay Time	t _{d(on)}		30		ns	I _D = 8.0 A	
Rise Time	t _r		40		ns	V _{GS} = 10 V	
Turn-Off Delay Time	t _{d(off)}		70		ns	V _{DD} = 150 V	
Fall Time	t _f		25		ns	R _G = 10 Ω R _L = 18.8 Ω	
Total Gate Charge	Q _G		43		nC	I _D = 15 A	
Gate to Source Charge	Q _{GS}		10		nC	V _{DD} = 400 V	
Gate to Drain Charge	Q _{GD}		20		nC	V _{GS} = 10 V	
Body Diode Forward Voltage	V _{F(S-D)}		1.0		V	I _F = 15 A, V _{GS} = 0	
Reverse Recovery Time	t _{rr}		400		ns	I _F = 15 A, V _{GS} = 0	
Reverse Recovery Charge	Q _{rr}		1.8		μC	di/dt = 50 A/μs	

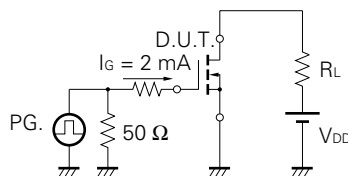
Test Circuit 1 Avalanche Capability



Test Circuit 2 Switching Time

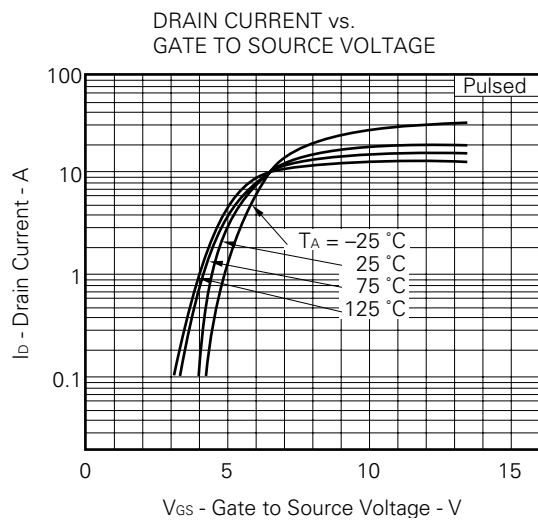
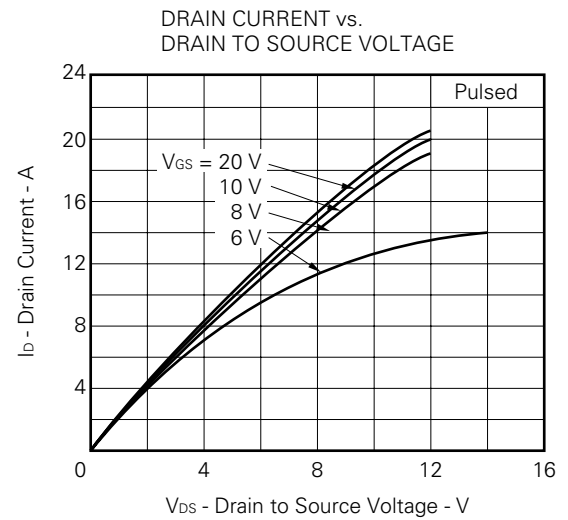
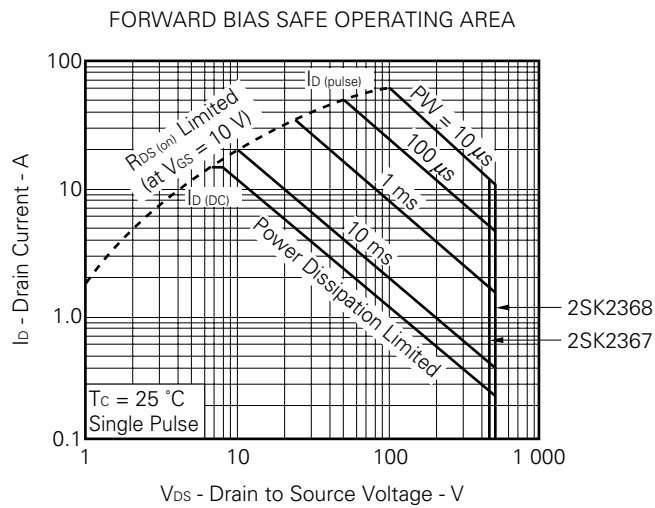
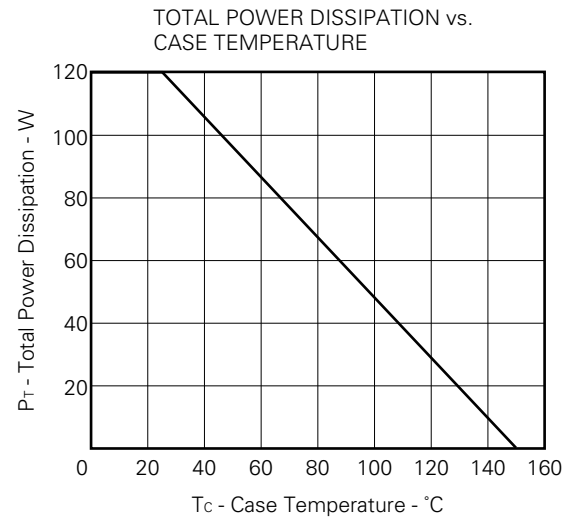
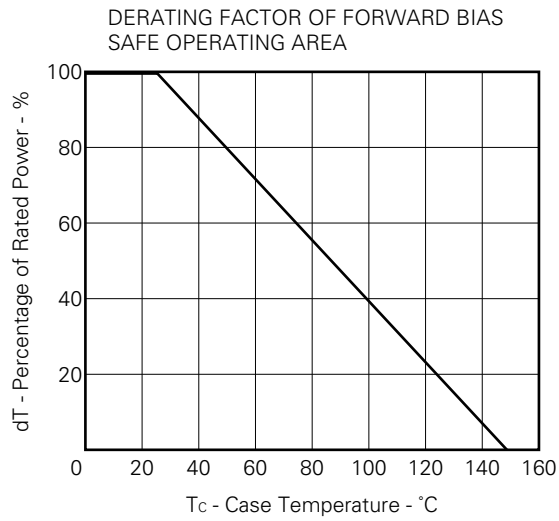


Test Circuit 3 Gate Charge

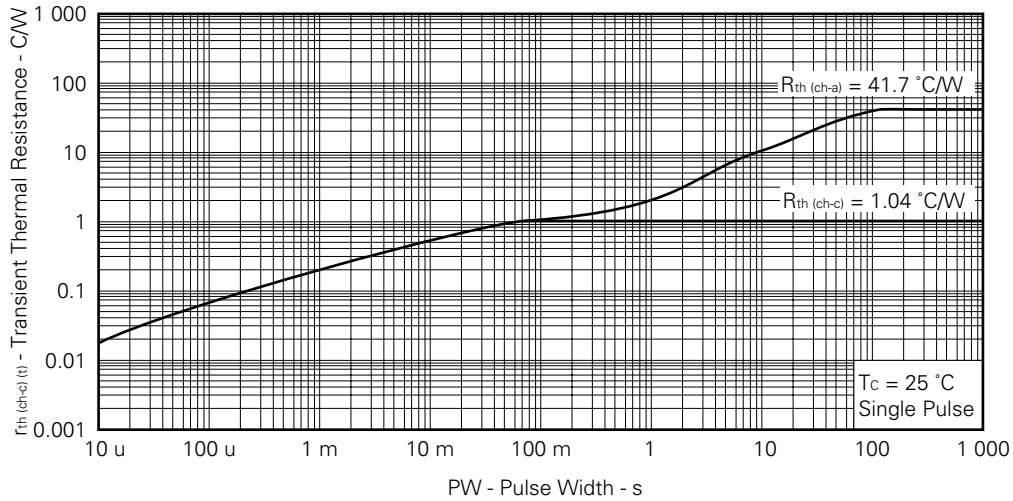


The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

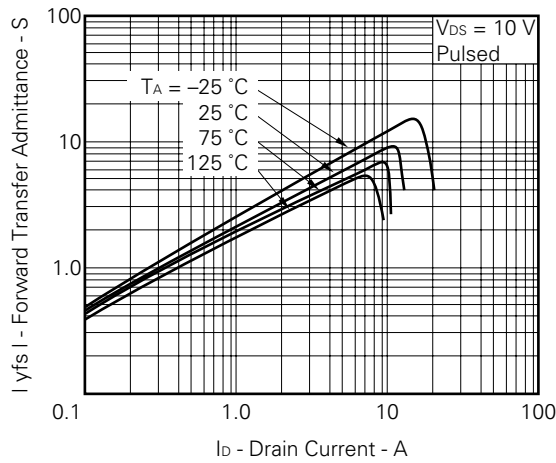
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



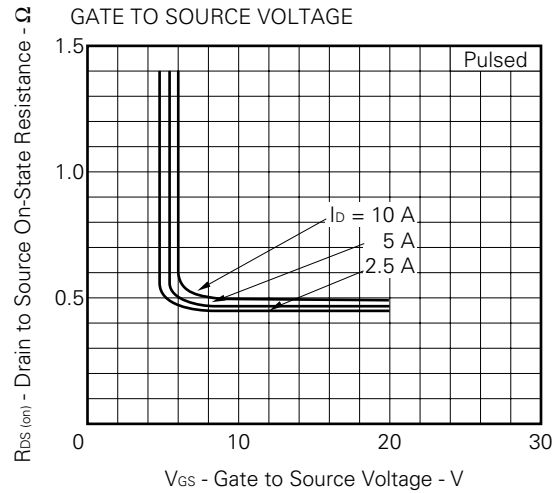
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



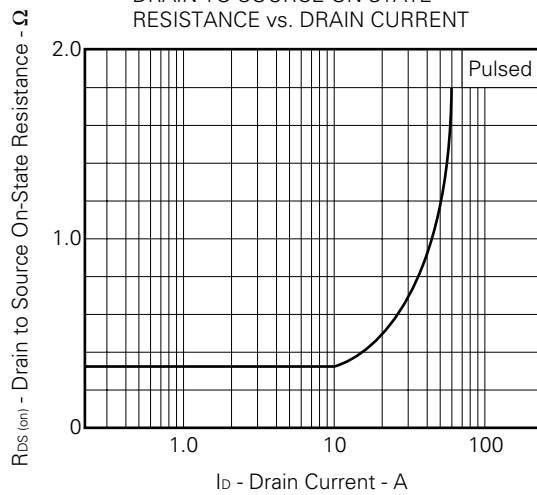
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



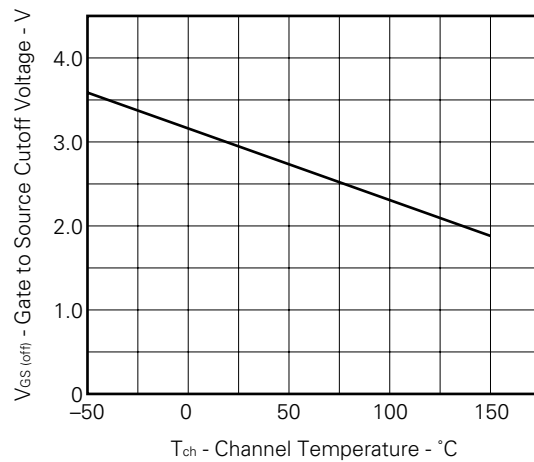
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

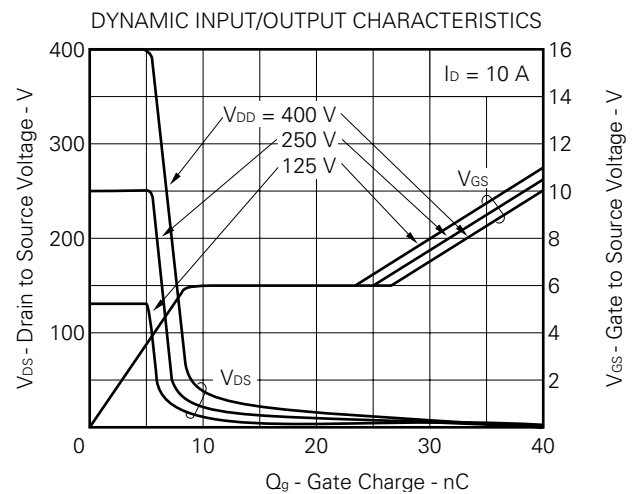
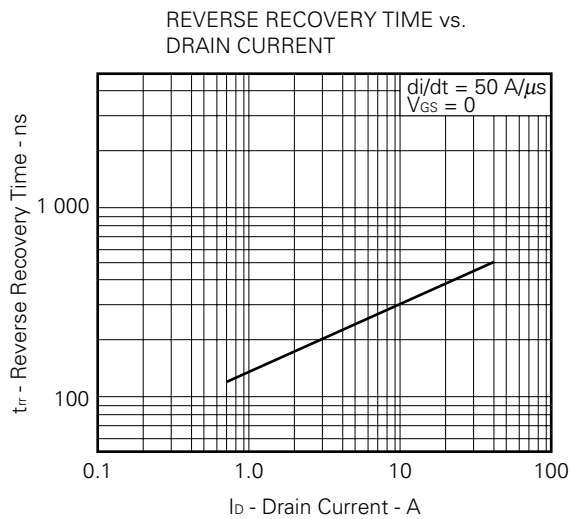
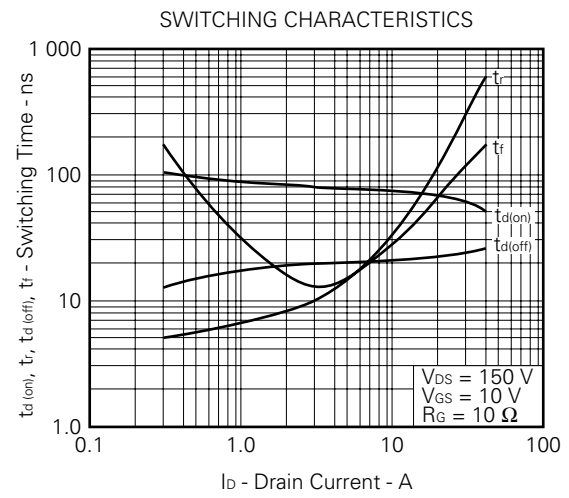
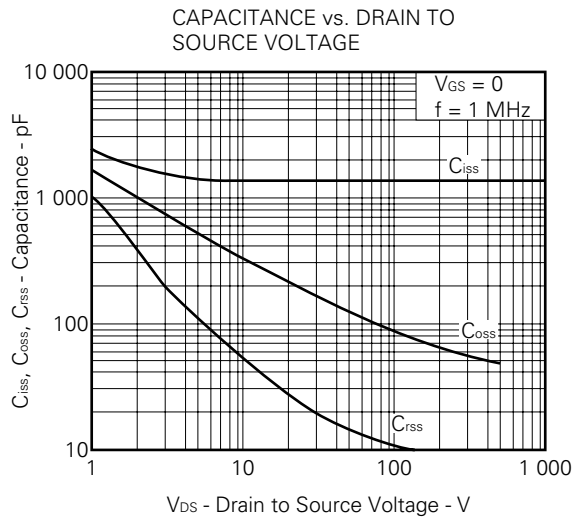
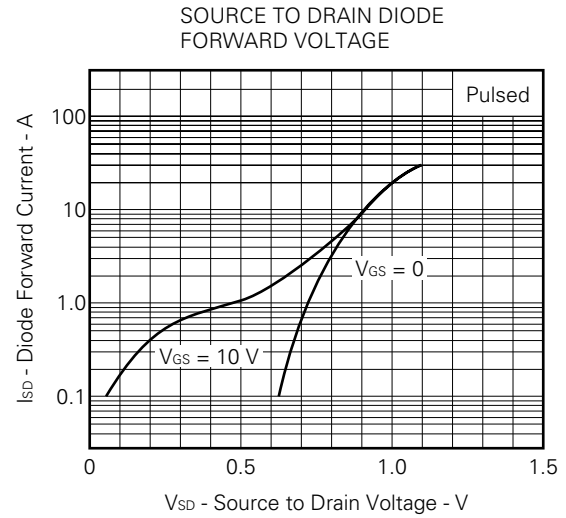
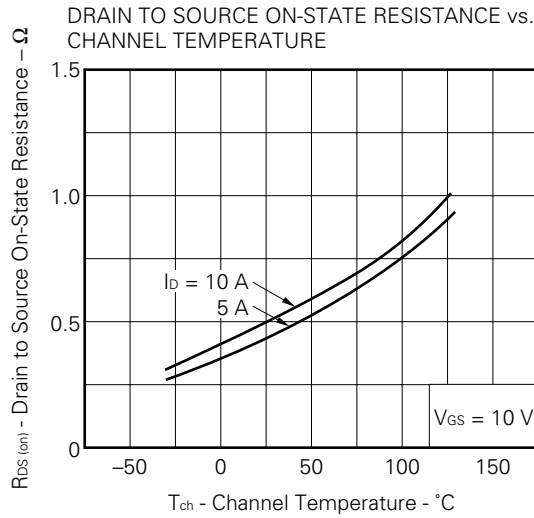


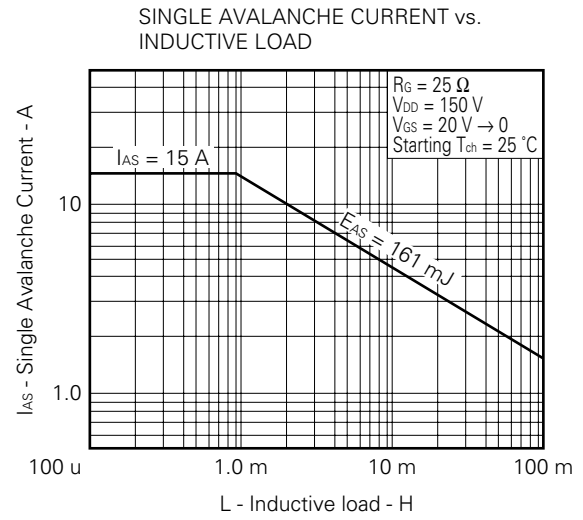
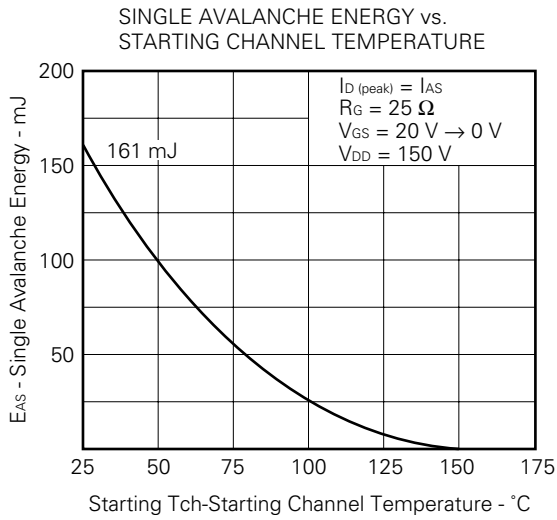
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE







REFERENCE

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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Anti-radioactive design is not implemented in this product.