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Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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MOS FIELD EFFECT TRANSISTOR

2SK2414, 2414-Z

SWITCHING N-CHANNEL POWER MOS FET

DESCRIPTION

The 2SK2414 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

FEATURES

- Low On-Resistance
 $R_{DS(on)1} = 70 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 5.0 \text{ A)}$
 $R_{DS(on)2} = 95 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4 \text{ V, } I_D = 5.0 \text{ A)}$
- Low C_{iss} : $C_{iss} = 860 \text{ pF TYP.}$
- Built-in G-S Gate Protection Diodes
- High Avalanche Capability Ratings

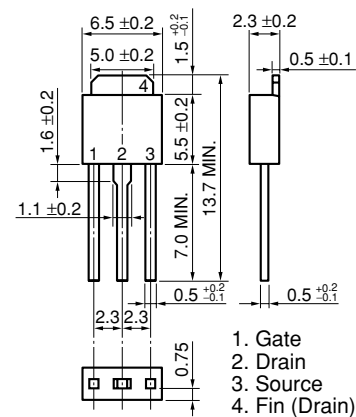
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 10	A
Drain Current (pulse) Note 1	$I_{D(pulse)}$	± 40	A
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_{T1}	20	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T2}	1.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \text{ to } +150$	$^\circ\text{C}$
Single Avalanche Current Note 2	I_{AS}	10	A
Single Avalanche Energy Note 2	E_{AS}	10	mJ

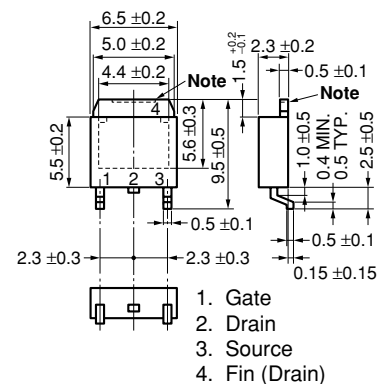
Notes 1 $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

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

<R> PACKAGE DIMENSIONS (Unit: mm)



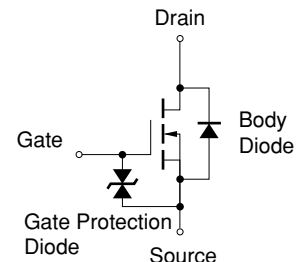
MP-3



Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

MP-3Z (SURFACE MOUNT TYPE)

EQUIVALENT CIRCUIT

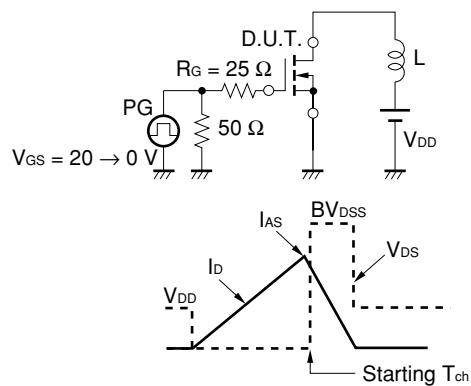


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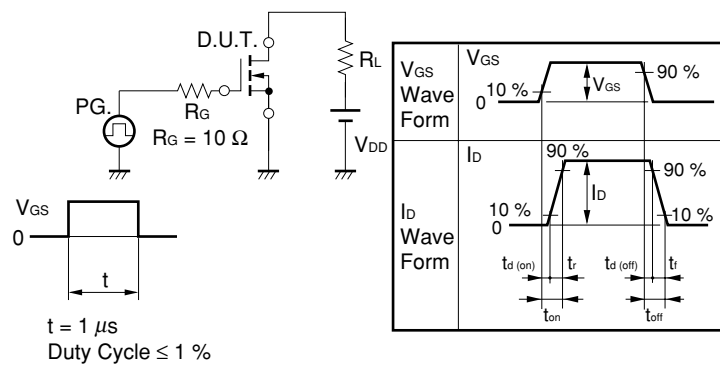
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-Resistance	R _{DS(on)1}		52	70	mΩ	V _{GS} = 10 V, I _D = 5.0 A
Drain to Source On-Resistance	R _{DS(on)2}		68	95	mΩ	V _{GS} = 4 V, I _D = 5.0 A
Gate to Source Cutoff Voltage	V _{GS(off)}	1.0	1.6	2.0	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	7.0	12		S	V _{DS} = 10 V, I _D = 5.0 A
Drain Leakage Current	I _{DSS}			10	μA	V _{DS} = 60 V, V _{GS} = 0 V
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±20 V, V _{DS} = 0 V
Input Capacitance	C _{iss}		860		pF	V _{DS} = 10 V
Output Capacitance	C _{oss}		440		pF	V _{GS} = 0 V
Reverse Transfer Capacitance	C _{rss}		110		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		15		ns	I _D = 5.0 A
Rise Time	t _r		90		ns	V _{GS} = 10 V
Turn-Off Delay Time	t _{d(off)}		75		ns	V _{DD} = 30 V
Fall Time	t _f		35		ns	R _G = 10 Ω
Total Gate Charge	Q _G		24		nC	I _D = 10 A
Gate to Source Charge	Q _{GS}		2.6		nC	V _{DD} = 48 V
Gate to Drain Charge	Q _{GD}		6.0		nC	V _{GS} = 10 V
Body Diode Forward Voltage	V _{F(S-D)}		1.0		V	I _F = 10 A, V _{GS} = 0 V
Reverse Recovery Time	t _{rr}		85		ns	I _F = 10 A, V _{GS} = 0 V
Reverse Recovery Charge	Q _{rr}		220		nC	di/dt = 50 A/μs

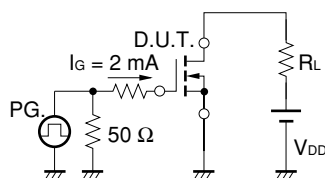
Test Circuit 1 Avalanche Capability



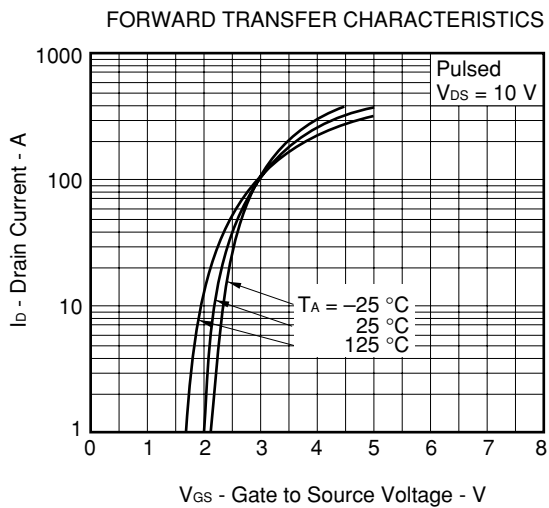
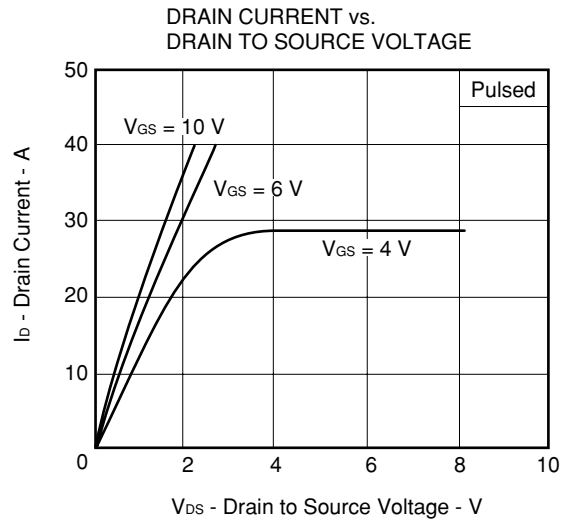
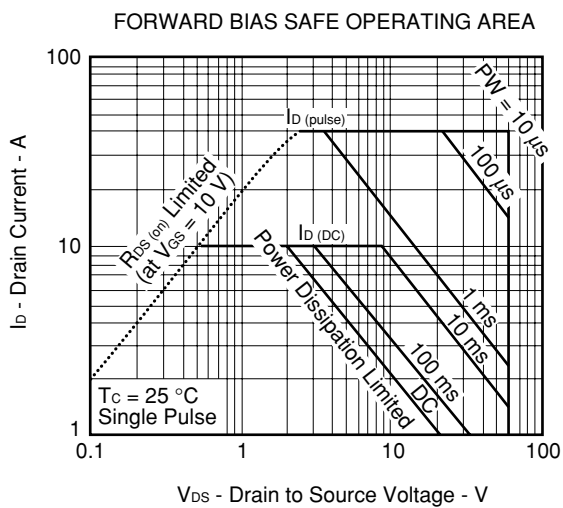
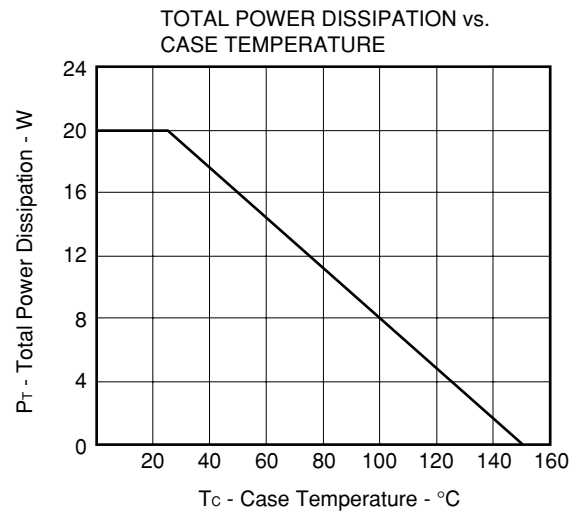
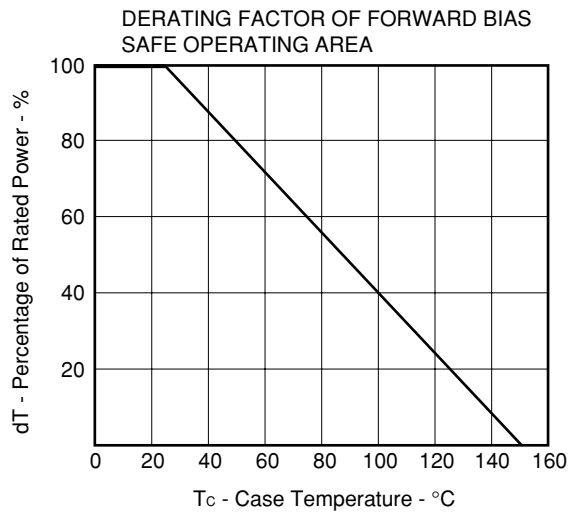
Test Circuit 2 Switching Time



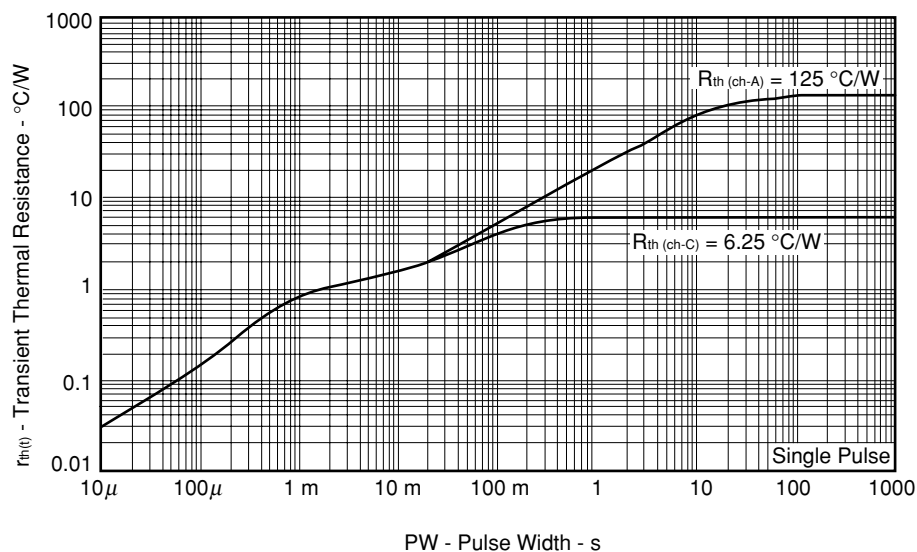
Test Circuit 3 Gate Charge



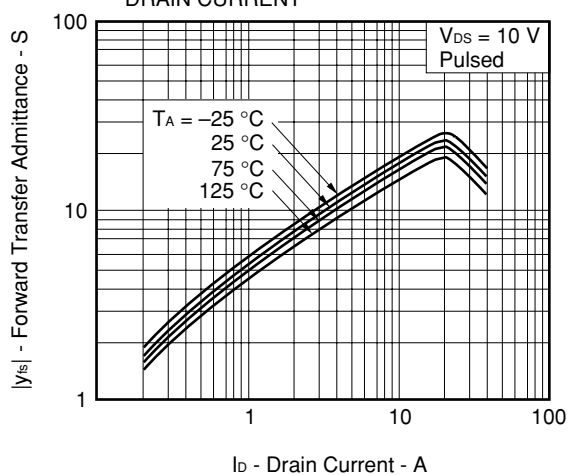
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$)



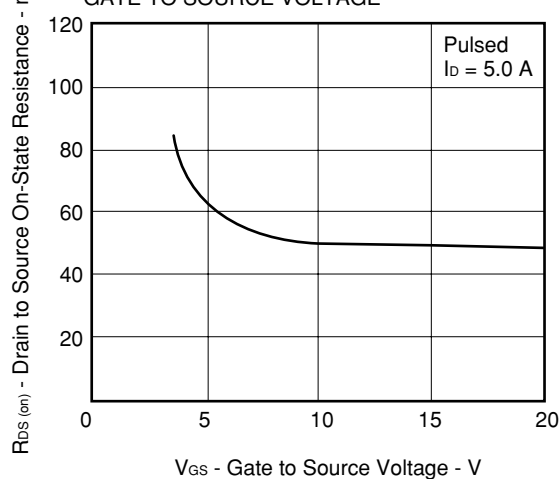
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



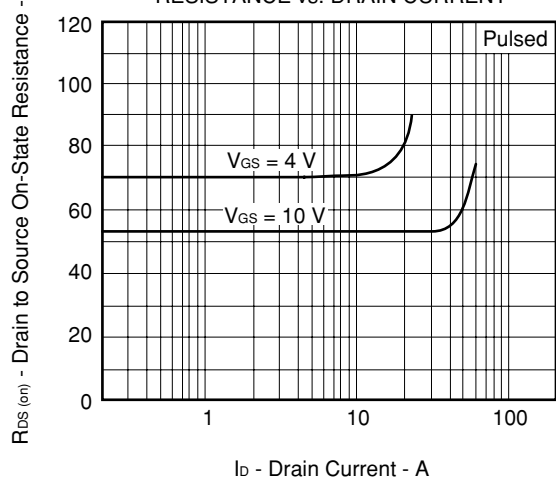
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



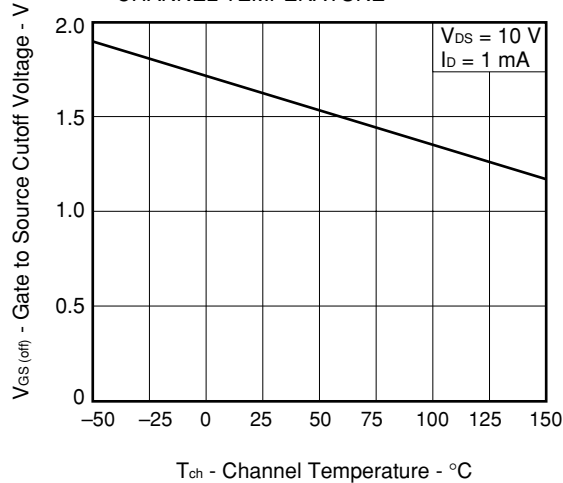
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

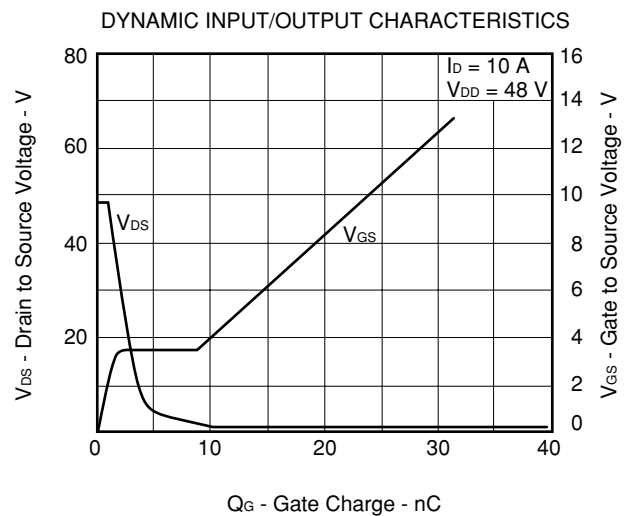
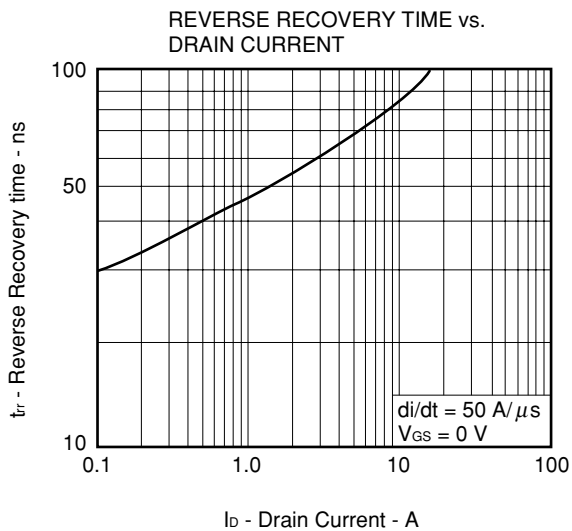
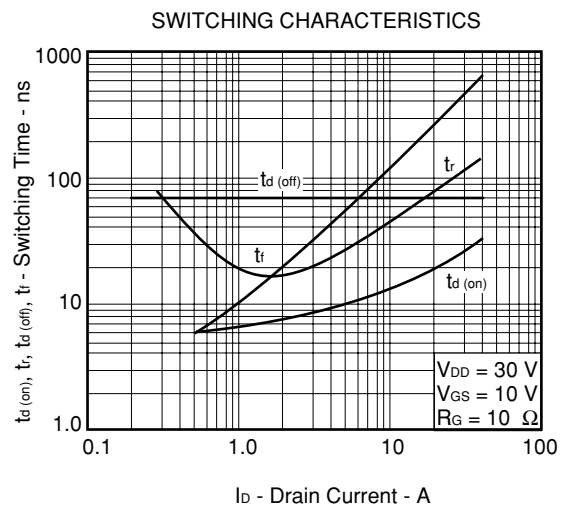
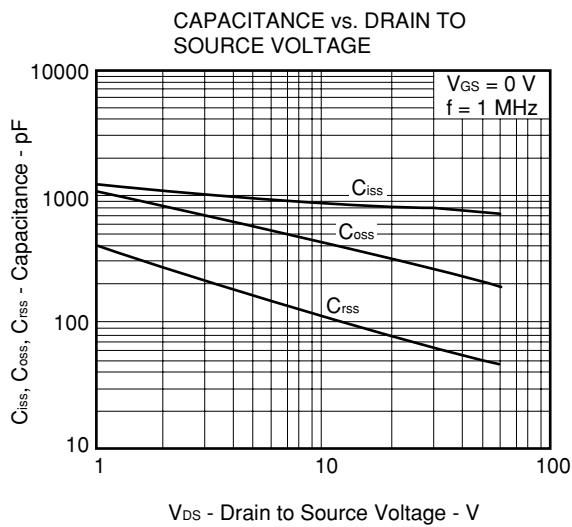
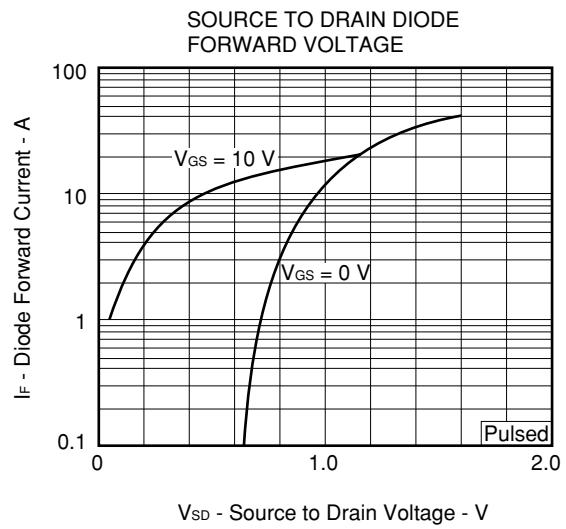
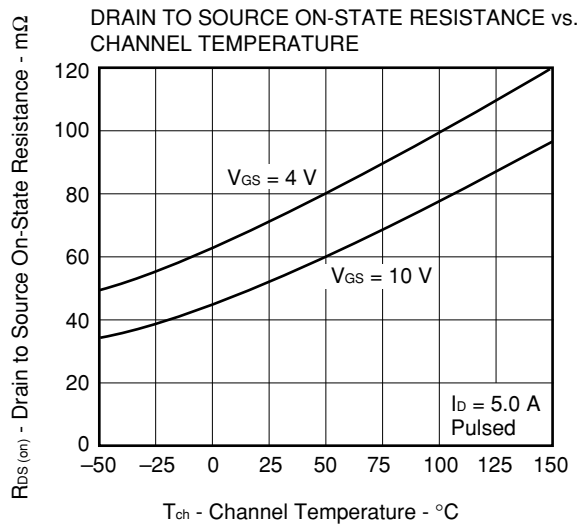


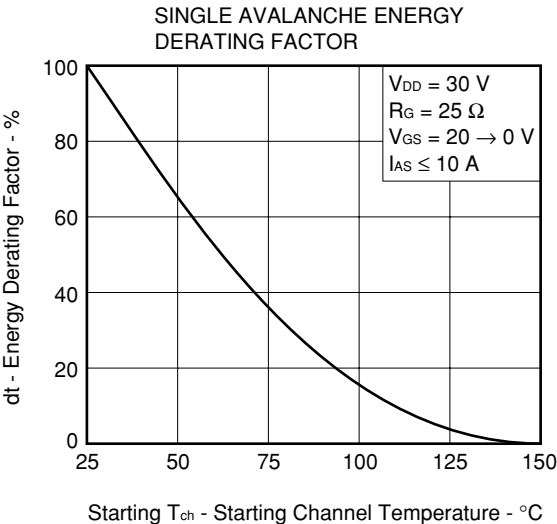
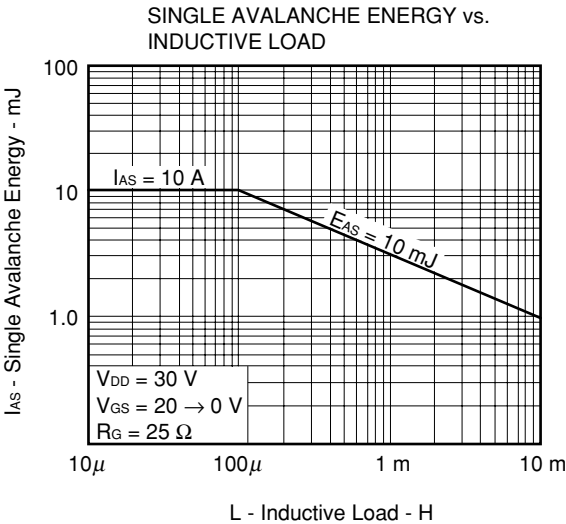
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE







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