To our customers,

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

EOL announced Product

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

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EOL announced product

RENESAS

MOS FIELD EFFECT TRANSISTOR
2SK2415,2415-Z

SWITCHING
N-CHANNEL POWER MOS FET

EOL announced Product

Description

The 2SK2415 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

Features

- Low on-state resistance
  $R_{DS(on)1}$ = 0.10 Ω MAX. (V_{GS} = 10 V, I_D = 4.0 A)
  $R_{DS(on)2}$ = 0.15 Ω MAX. (V_{GS} = 4 V, I_D = 4.0 A)
- Low C_{iss}: C_{iss} = 570 pF TYP.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

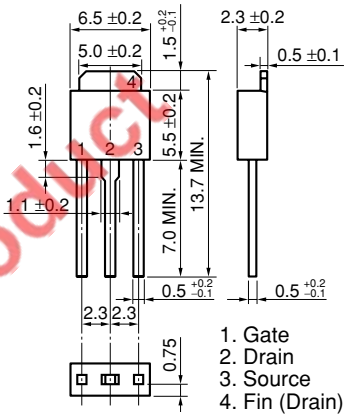
Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC)	$I_{D(DC)}$	±8.0	A
Drain Current (pulse) Note 1	$I_{D(pulse)}$	±32	A
Total Power Dissipation (T_C = 25°C)	P_{T1}	20	W
Total Power Dissipation (T_A = 25°C)	P_{T2}	1.0	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C
Single Avalanche Current Note 2	I_{AS}	8.0	A
Single Avalanche Energy Note 2	E_{AS}	6.4	mJ

Notes 1 PW ≤ 10 μs, Duty Cycle ≤ 1%

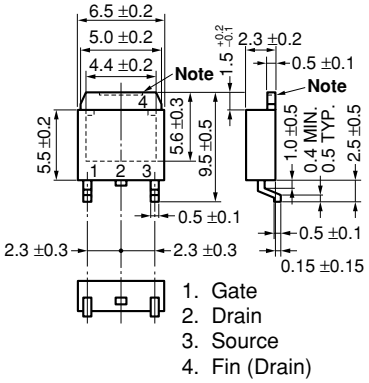
2 Starting T_{ch} = 25°C, R_G = 25 Ω, V_{GS} = 20 → 0 V

PACKAGE DRAWINGS (Unit: mm)

TO-251 (MP-3)

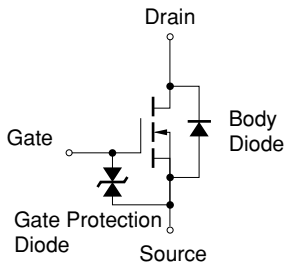


<R> **TO-252 (MP-3Z)**



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

EQUIVALENT CIRCUIT



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The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what." field.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	$R_{DS(on)1}$		0.07	0.10	Ω	V_{GS} = 10 V, I_D = 4.0 A
	$R_{DS(on)2}$		0.10	0.15	Ω	V_{GS} = 4 V, I_D = 4.0 A
Gate Cut-off Voltage	$V_{GS(off)}$	1.0	1.6	2.0	V	V_{DS} = 10 V, I_D = 1 mA
Forward Transfer Admittance	$\|y_{fs}\|$	5.0	8.4		S	V_{DS} = 10 V, I_D = 4.0 A
Zero Gate Voltage Drain Current	I_{DSS}			10	μA	V_{DS} = 60 V, V_{GS} = 0 V
Gate Leakage Current	I_{GSS}			±10	μA	V_{GS} = ±20 V, V_{DS} = 0 V
Input Capacitance	C_{iss}		570		pF	V_{DS} = 10 V
Output Capacitance	C_{oss}		290		pF	V_{GS} = 0 V
Reverse Transfer Capacitance	C_{rss}		75		pF	f = 1 MHz
Turn-On Delay Time	$t_{d(on)}$		5		ns	I_D = 4.0 A
Rise Time	t_r		60		ns	V_{GS} = 10 V
Turn-Off Delay Time	$t_{d(off)}$		75		ns	V_{DD} = 30 V
Fall Time	t_f		40		ns	R_G = 10 Ω
Total Gate Charge	Q_G		21		nC	I_D = 8.0 A
Gate to Source Charge	Q_{GS}		2.0		nC	V_{DD} = 48 V
Gate to Drain Charge	Q_{GD}		6.5		nC	V_{GS} = 10 V
Body Diode Forward Voltage	$V_{F(S-D)}$		1.0		V	I_F = 8.0 A, V_{GS} = 0 V
Reverse Recovery Time	t_{rr}		85		ns	I_F = 8.0 A, V_{GS} = 0 V
Reverse Recovery Charge	Q_{rr}		200		nC	di/dt = 100 A/μs

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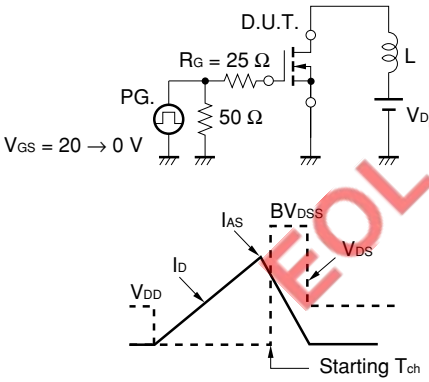
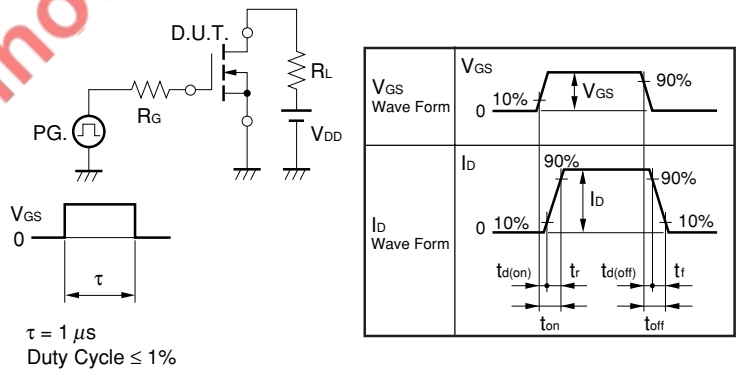
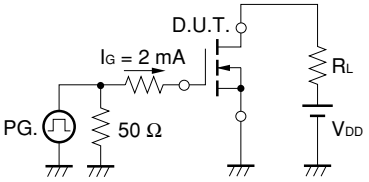
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

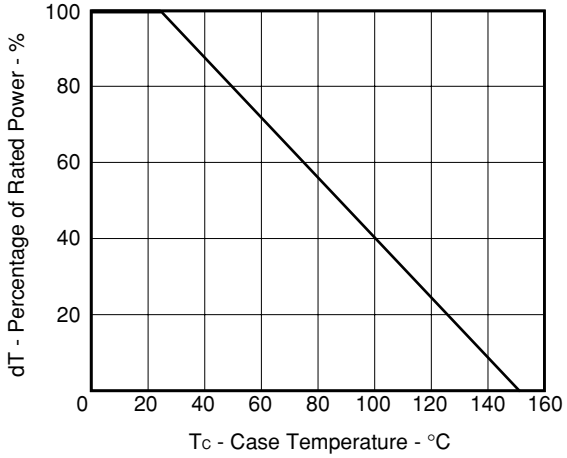


TEST CIRCUIT 3 GATE CHARGE

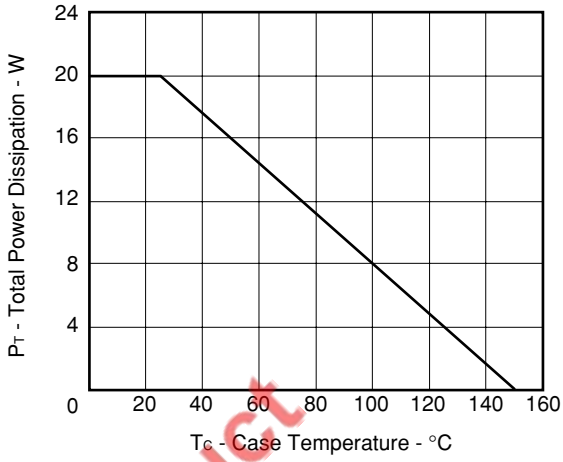


TYPICAL CHARACTERISTICS (T_A = 25°C)

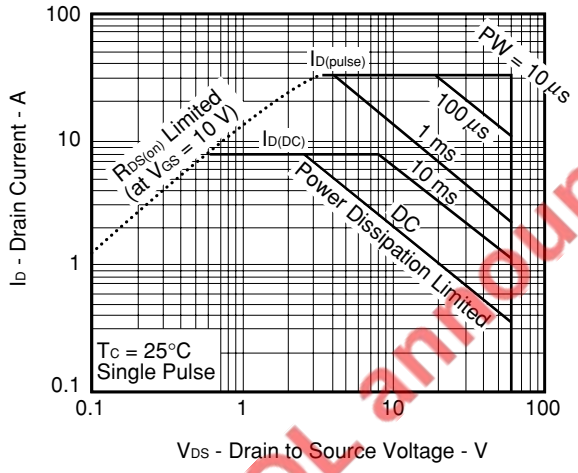
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



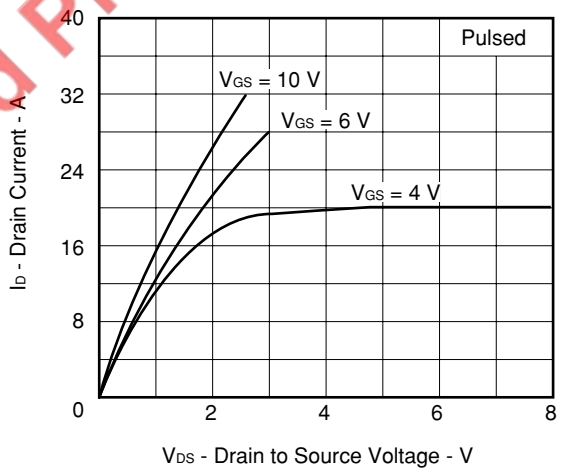
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



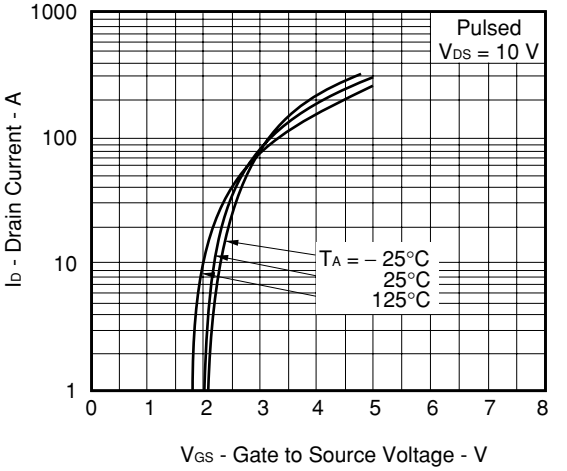
FORWARD BIAS SAFE OPERATING AREA



DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



FORWARD TRANSFER CHARACTERISTICS



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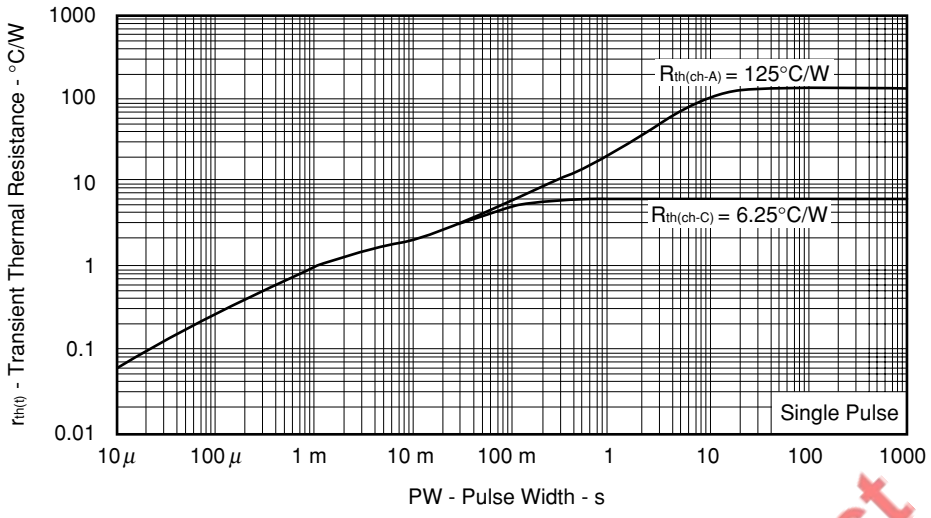
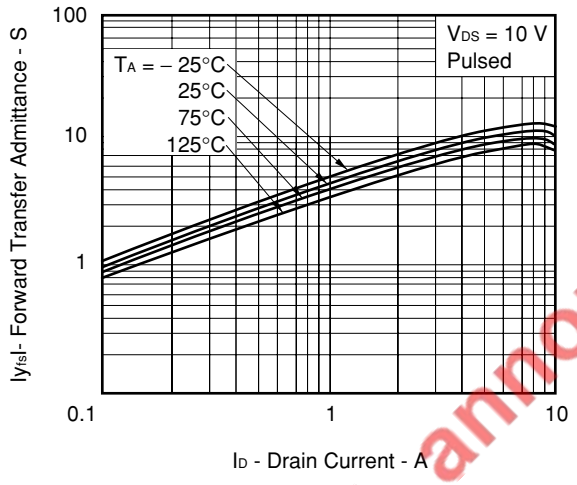
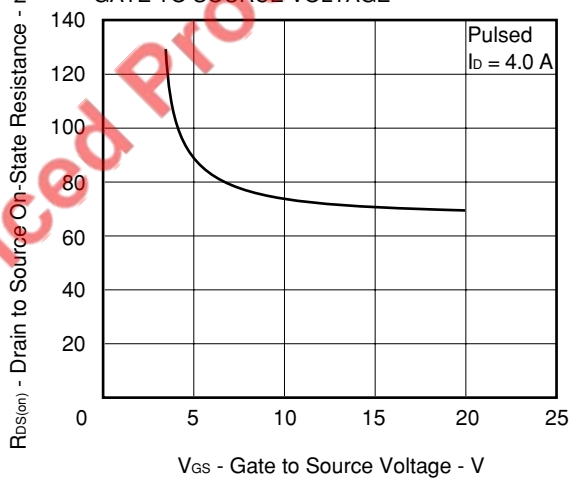
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



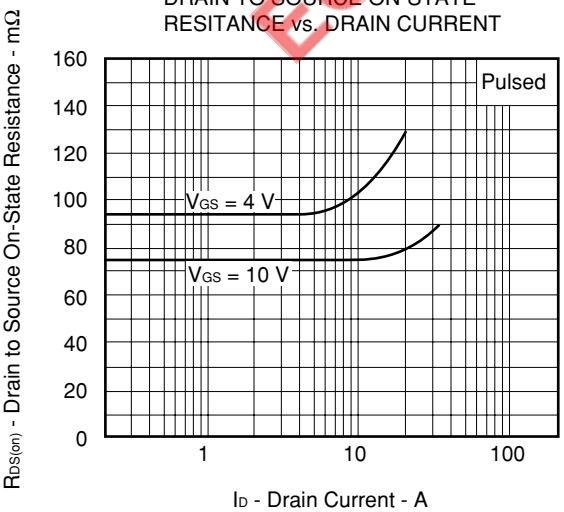
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



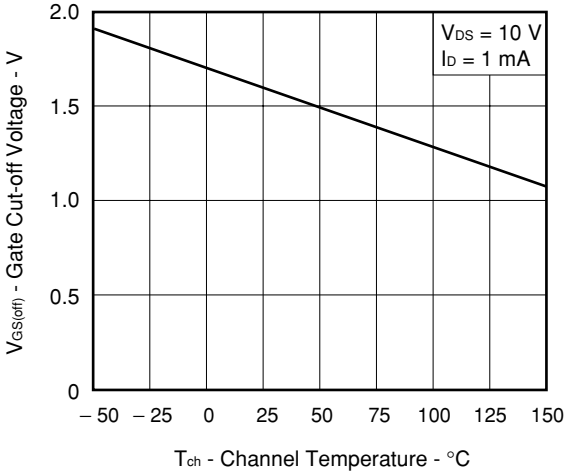
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



DRAIN TO SOURCE ON-STATE RESITANCE vs. DRAIN CURRENT



GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



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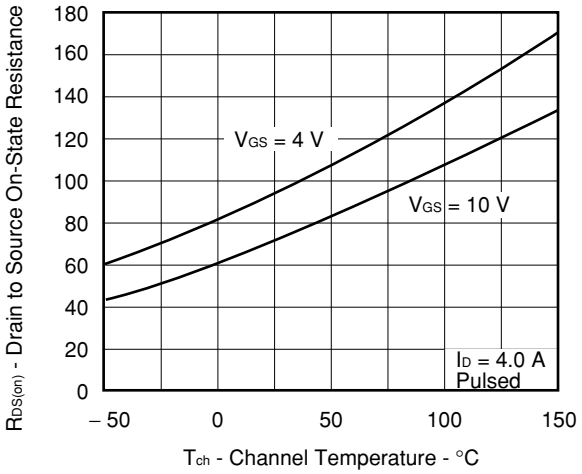
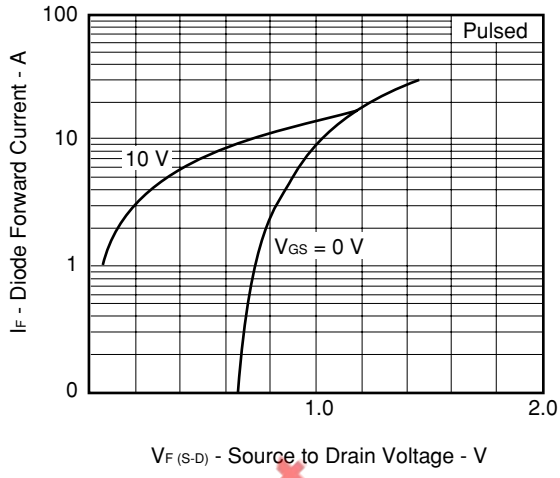
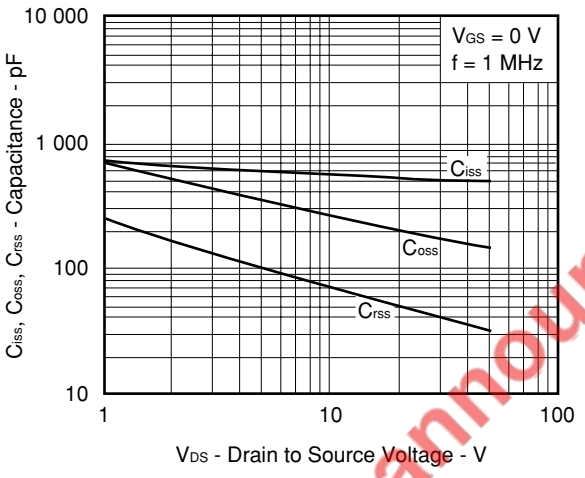
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



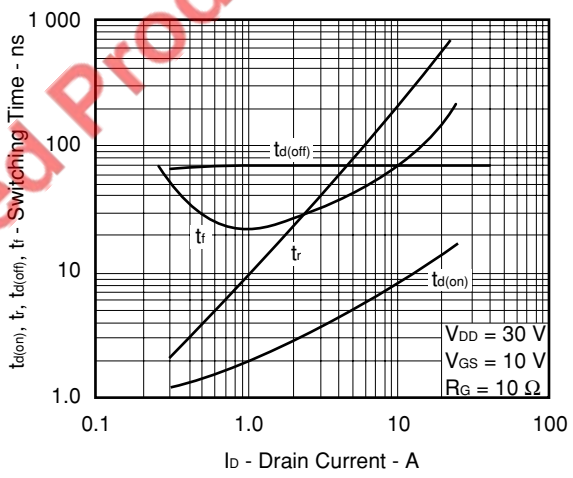
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



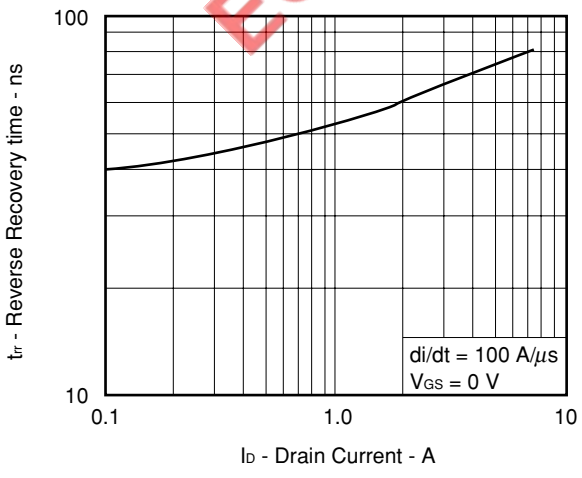
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



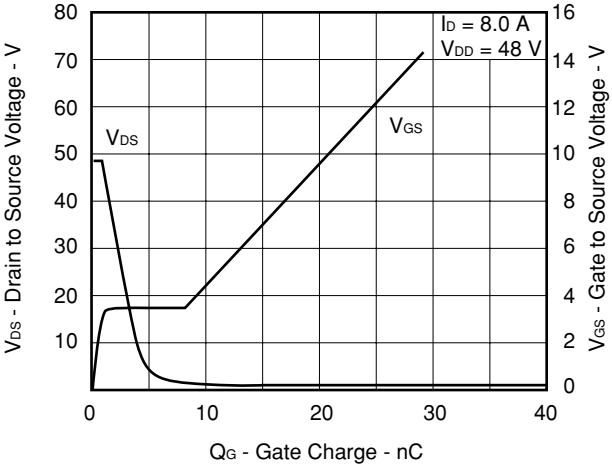
SWITCHING CHARACTERISTICS



REVERSE RECOVERY TIME vs. DRAIN CURRENT



DYNAMIC INPUT/OUTPUT CHARACTERISTICS



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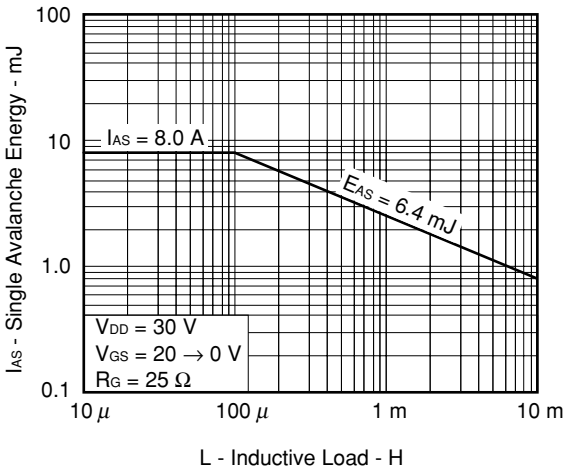
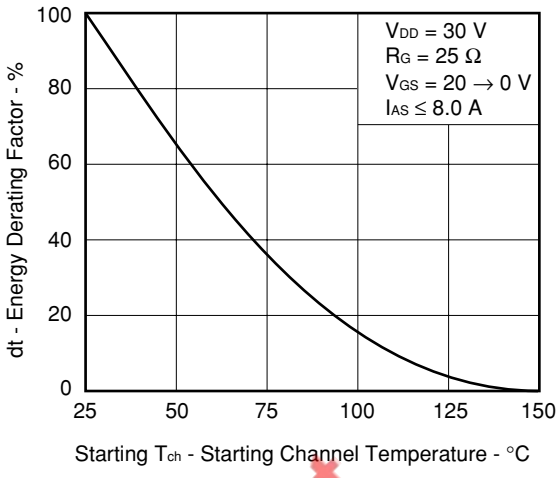
SINGLE AVALANCHE ENERGY vs.
INDUCTIVE LOAD



SINGLE AVALANCHE ENERGY
DERATING FACTOR



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