DATA SHEET

NEC

MOS FIELD EFFECT TRANSISTOR
μPA2756GR

SWITCHING
N-CHANNEL POWER MOS FET

DESCRIPTION

The μPA2756GR is Dual N-channel MOS Field Effect Transistor designed for switching applications.

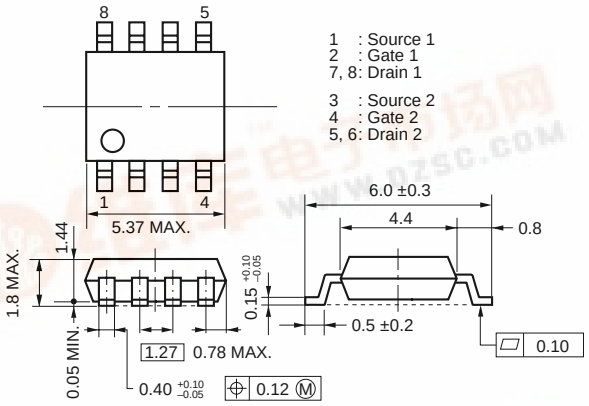
FEATURES

- Low on-state resistance
  $R_{DS(on)1}$ = 105 mΩ MAX. (V_{GS} = 10 V, I_D = 2.0 A)
  $R_{DS(on)2}$ = 150 mΩ MAX. (V_{GS} = 4.0 V, I_D = 2.0 A)
- Low C_{iss}: C_{iss} = 260 pF TYP.
- Built-in G-S protection diode against ESD
- Small and surface mount package (Power SOP8)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA2756GR	Power SOP8

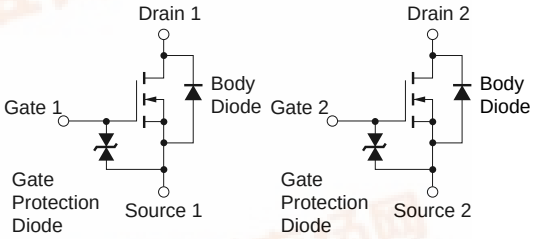
PACKAGE DRAWING (Unit: mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	60	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	±20	V
Drain Current (DC) Note1	$I_{D(DC)}$	±4.0	A
Drain Current (pulse) Note2	$I_{D(pulse)}$	±16	A
Total Power Dissipation (1 unit) Note1	P_{T1}	1.6	W
Total Power Dissipation (2 units) Note1	P_{T2}	2.0	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	−55 to +150	°C
Single Avalanche Current Note3	I_{AS}	4.0	A
Single Avalanche Energy Note3	E_{AS}	1.6	mJ
Repetitive Avalanche Energy Note4	E_{AR}	1.6	mJ

EQUIVALENT CIRCUIT



Notes 1. Mounted on ceramic substrate of 2000 mm² x 2.2 mm
2. PW ≤ 10 μs, Duty Cycle ≤ 1%
3. Starting T_{ch} = 25°C, V_{DD} = 30 V, R_G = 25 Ω, V_{GS} = 20 → 0 V
4. I_{AR} ≤ 4.0 A, T_{ch} ≤ 150°C

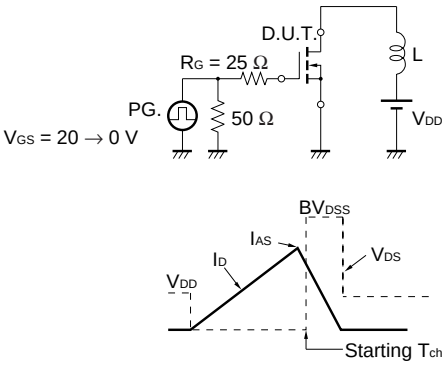
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

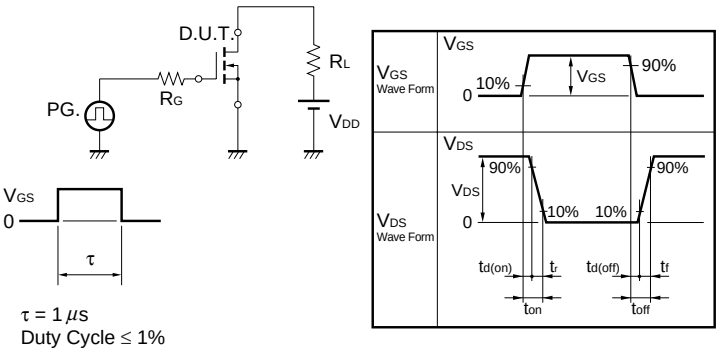
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			10	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±18 V, V_{DS} = 0 V			±10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 10 V, I_D = 1 mA	1.5	2.0	2.5	V
Forward Transfer Admittance **Note**	$\|y_{fs}\|$	V_{DS} = 10 V, I_D = 2.0 A	2.0			S
Drain to Source On-state Resistance **Note**	$R_{DS(on)1}$	V_{GS} = 10 V, I_D = 2.0 A		85	105	mΩ
	$R_{DS(on)2}$	V_{GS} = 4.0 V, I_D = 2.0 A		106	150	mΩ
Input Capacitance	C_{iss}	V_{DS} = 10 V		260		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		65		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		20		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30 V, I_D = 2.0 A		14		ns
Rise Time	t_r	V_{GS} = 10 V		5		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 10 Ω		80		ns
Fall Time	t_f			30		ns
Total Gate Charge	Q_G	V_{DD} = 48 V		6		nC
Gate to Source Charge	Q_{GS}	V_{GS} = 10 V		1		nC
Gate to Drain Charge	Q_{GD}	I_D = 4.0 A		1.5		nC
Body Diode Forward Voltage **Note**	$V_{F(S-D)}$	I_F = 4.0 A, V_{GS} = 0 V		0.9		V
Reverse Recovery Time	t_{rr}	I_F = 4.0 A, V_{GS} = 0 V		24		ns
Reverse Recovery Charge	Q_{rr}	di/dt = 100 A/μs		22		nC

Note Pulsed

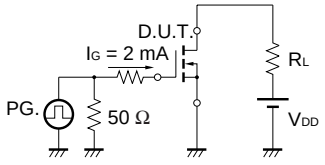
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

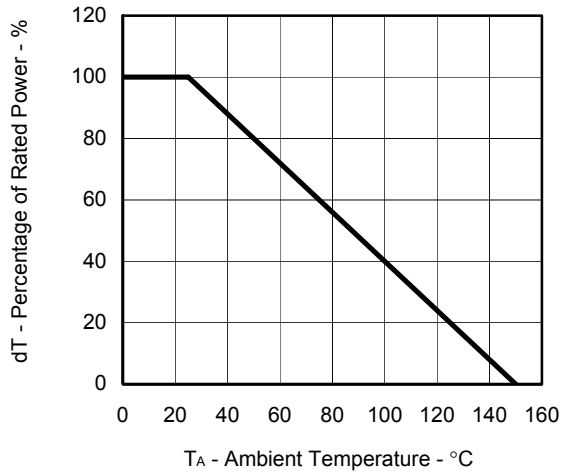


TEST CIRCUIT 3 GATE CHARGE

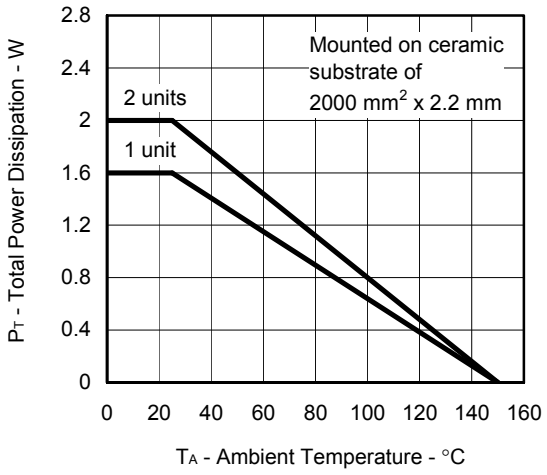


TYPICAL CHARACTERISTICS (T_A = 25°C)

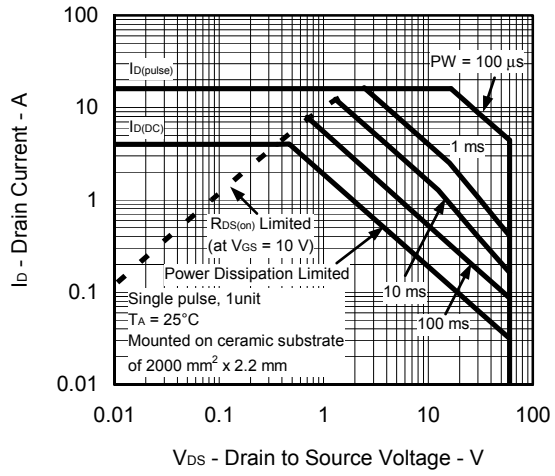
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



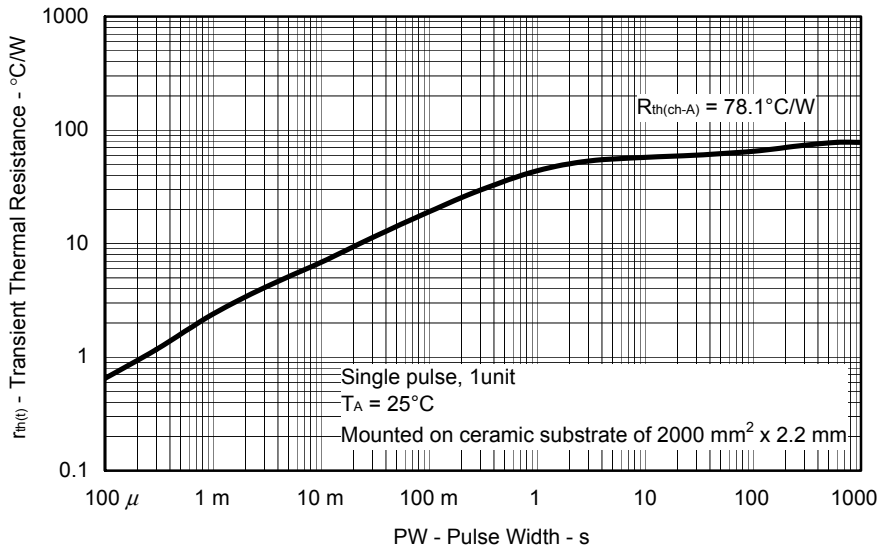
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



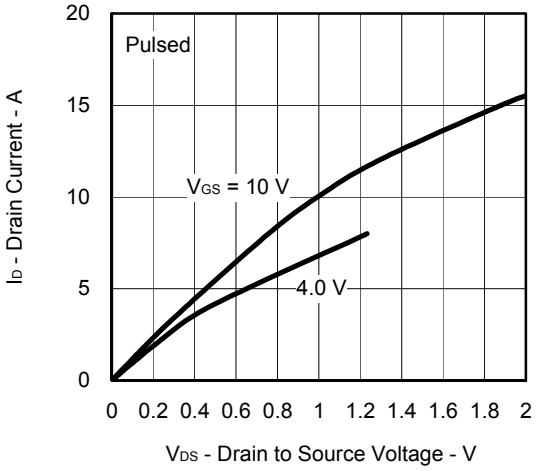
FORWARD BIAS SAFE OPERATING AREA



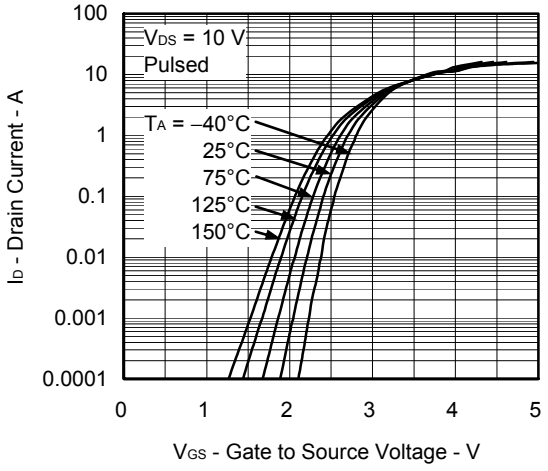
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



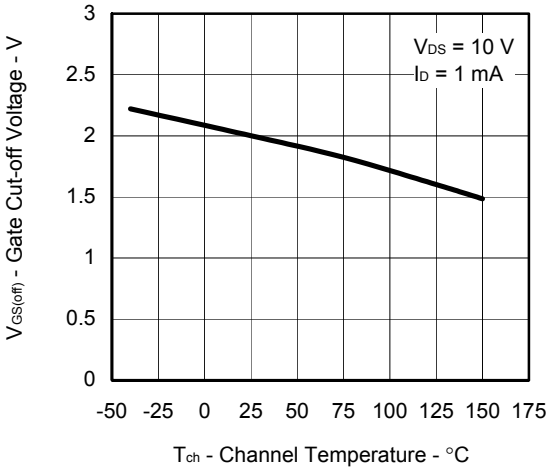
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



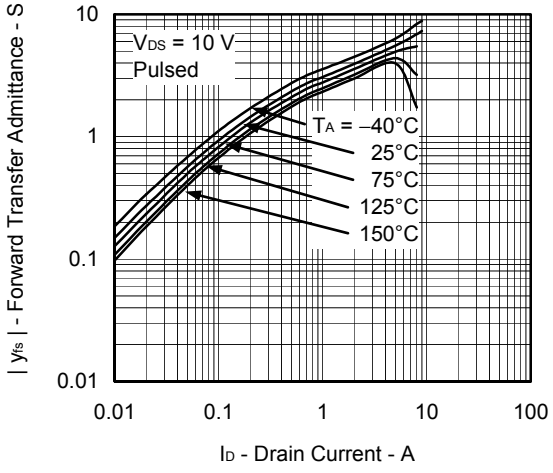
FORWARD TRANSFER CHARACTERISTICS



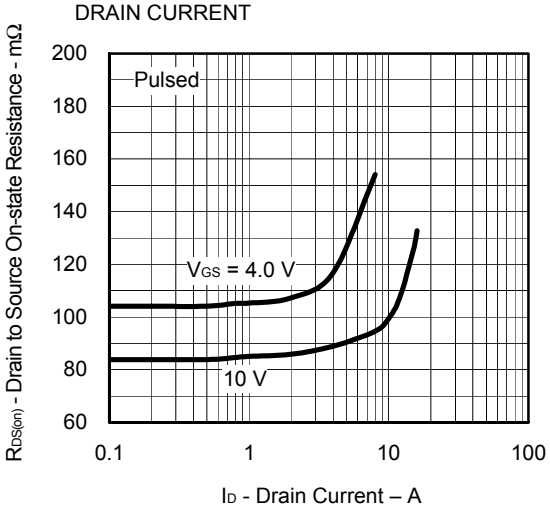
GATE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



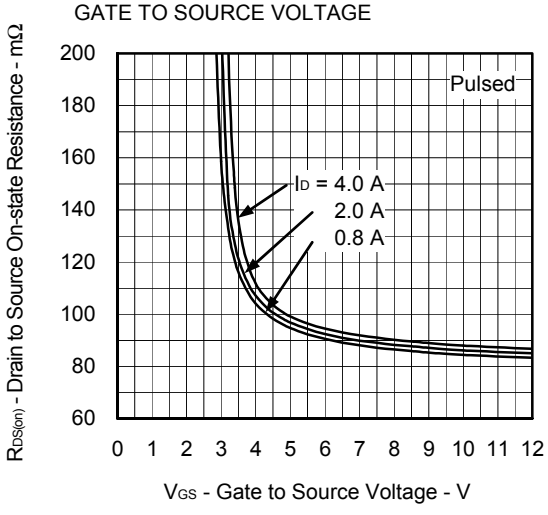
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



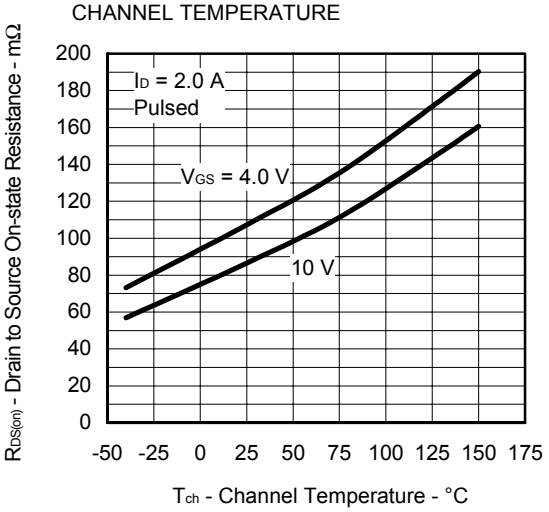
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



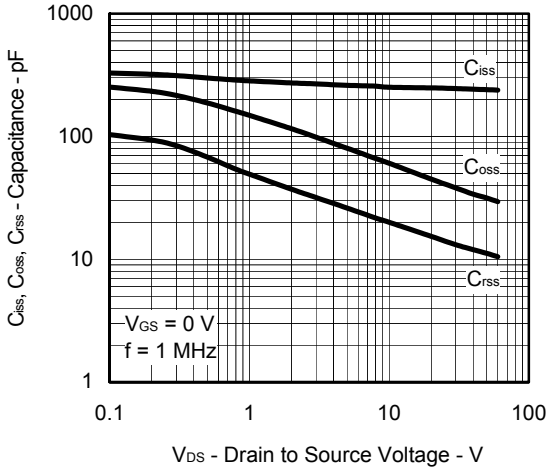
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



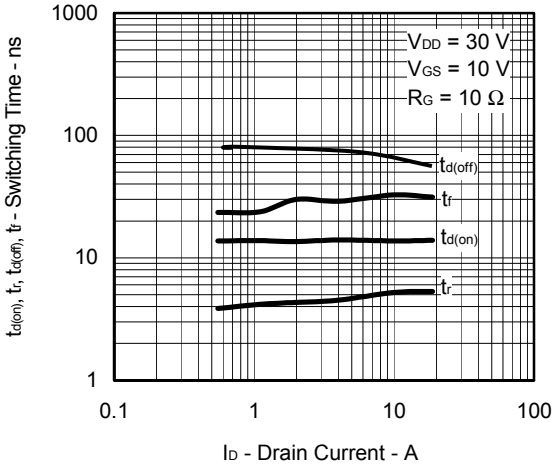
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



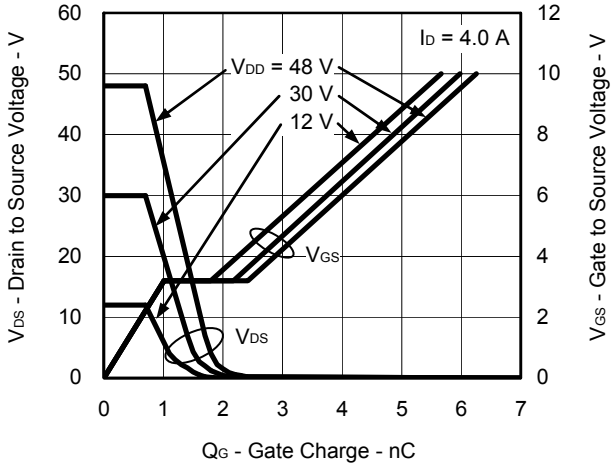
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



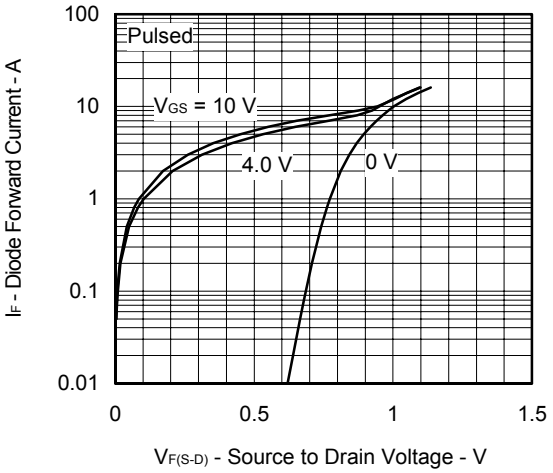
SWITCHING CHARACTERISTICS



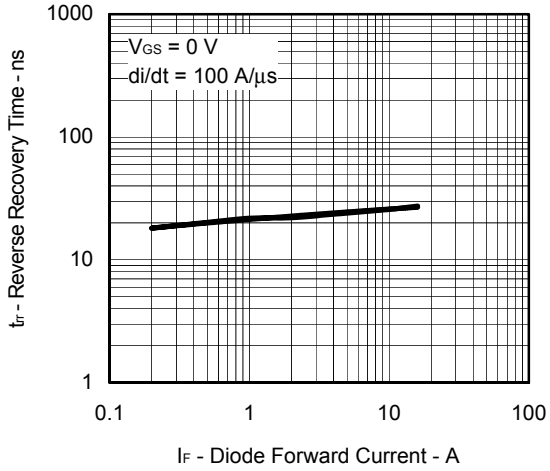
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



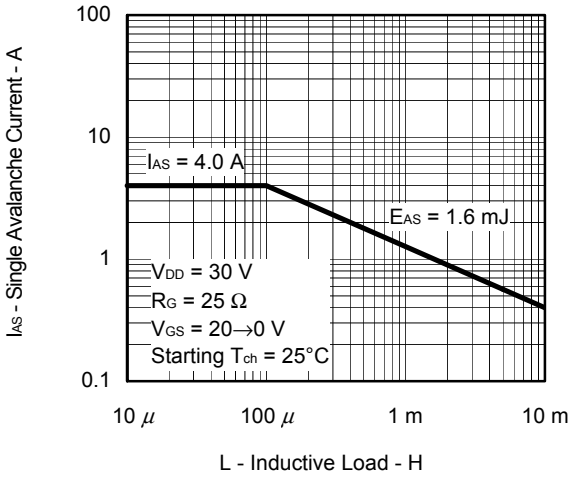
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



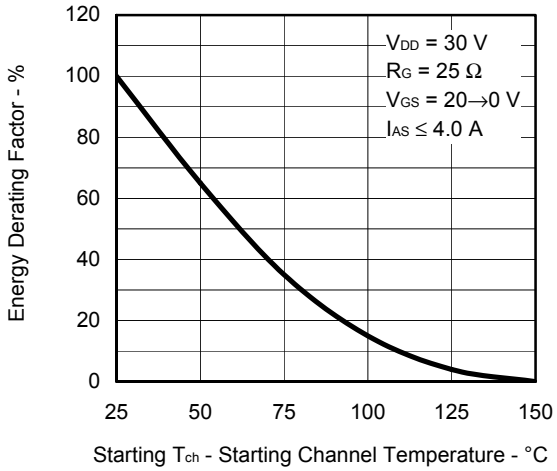
REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



SINGLE AVALANCHE CURRENT vs.
INDUCTIVE LOAD



SINGLE AVALANCHE ENERGY
DERATING FACTOR



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