

SWITCHING
 N-CHANNEL POWER MOS FET

DESCRIPTION

The μ PA2756GR is Dual N-channel MOS Field Effect Transistor designed for switching applications.

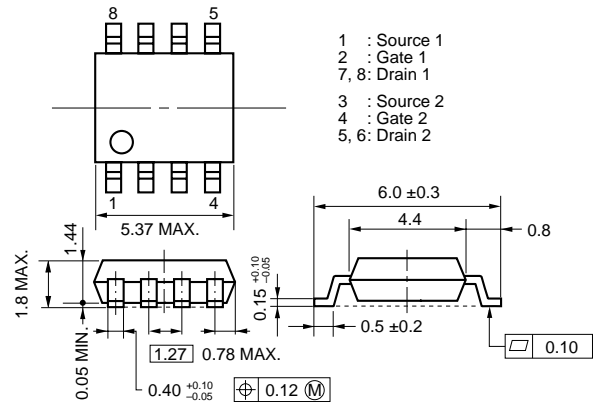
FEATURES

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

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA2756GR	Power SOP8

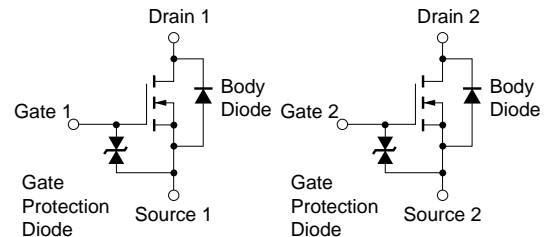
PACKAGE DRAWING (Unit: mm)



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

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	60	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	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	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \text{ to } +150$	$^\circ\text{C}$
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 $2000 \text{ mm}^2 \times 2.2 \text{ mm}$
 2. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$
 3. Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = 30 \text{ V}$, $R_G = 25 \Omega$, $V_{GS} = 20 \rightarrow 0 \text{ V}$
 4. $I_{AR} \leq 4.0 \text{ A}$, $T_{ch} \leq 150^\circ\text{C}$

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.

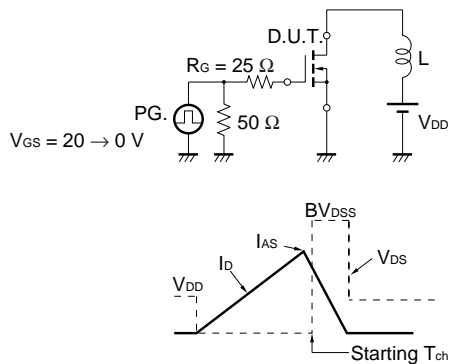
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ELECTRICAL CHARACTERISTICS (TA = 25°C)

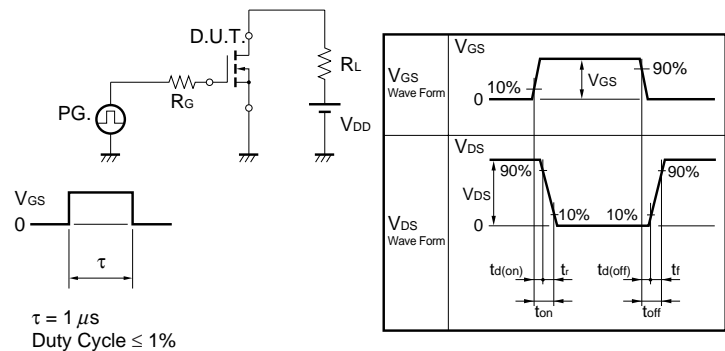
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			10	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 18\text{ V}, V_{DS} = 0\text{ V}$			± 10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	$V_{DS} = 10\text{ V}, I_D =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

Note Pulsed

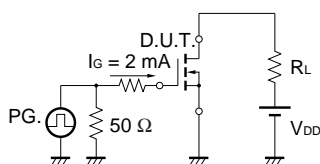
TEST CIRCUIT 1 AVALANCHE CAPABILITY



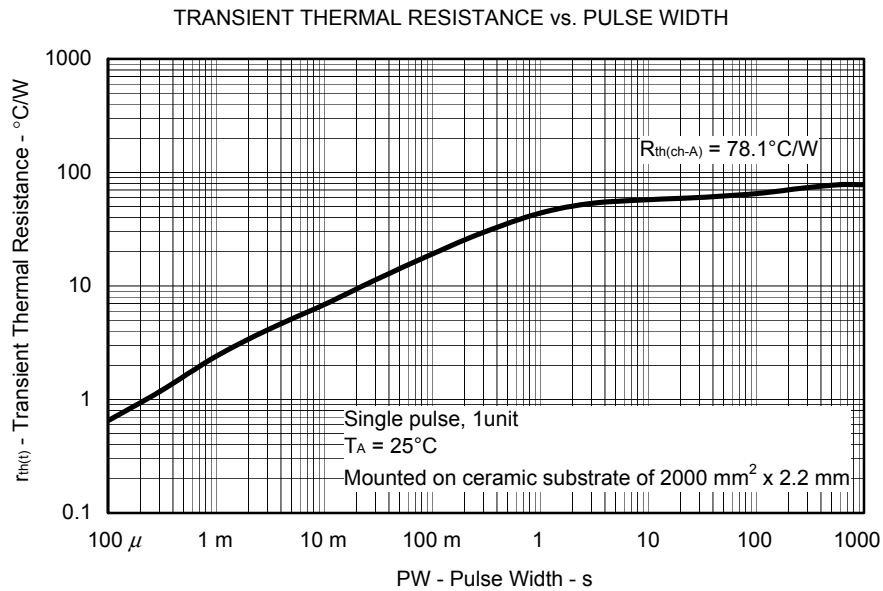
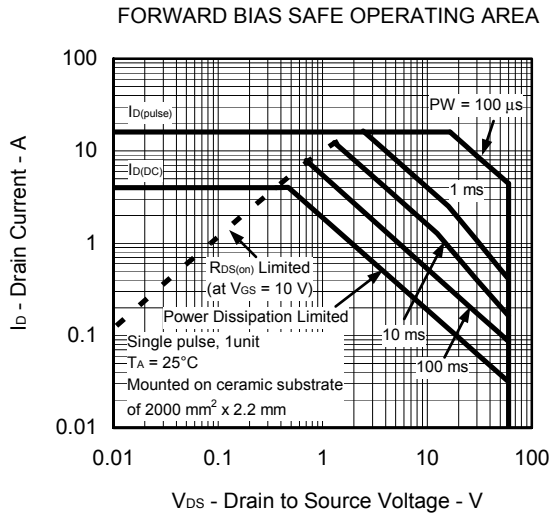
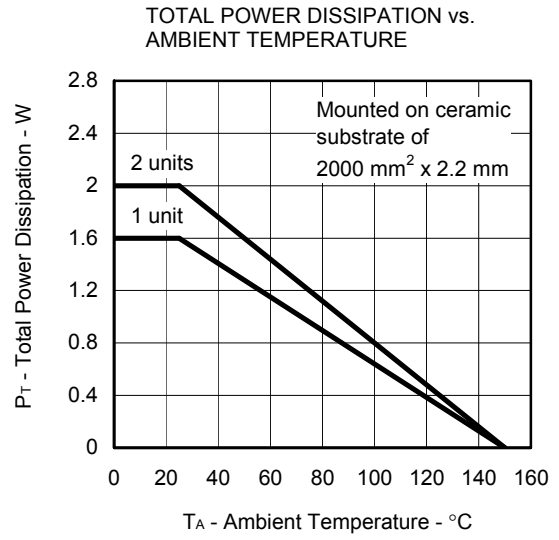
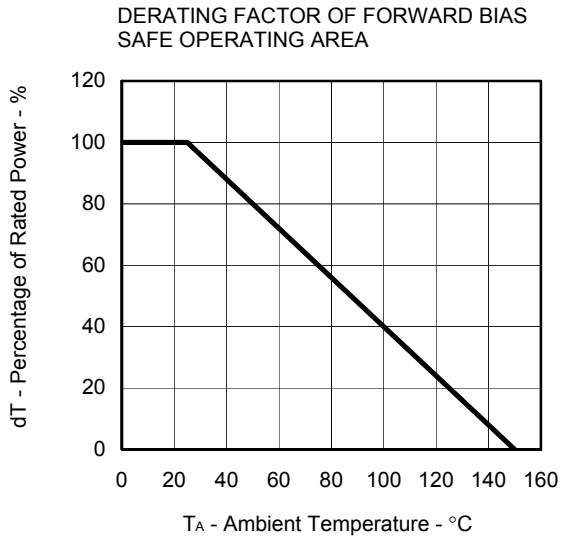
TEST CIRCUIT 2 SWITCHING TIME



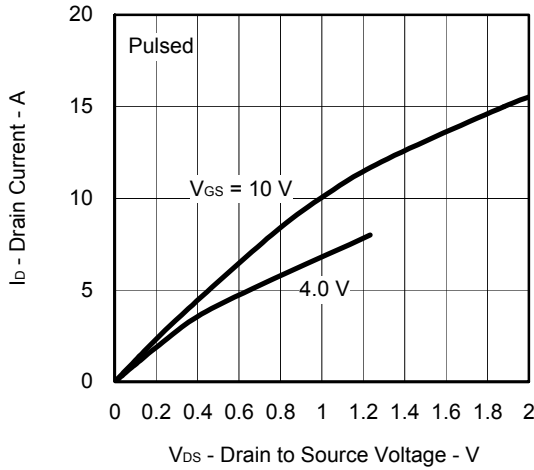
TEST CIRCUIT 3 GATE CHARGE



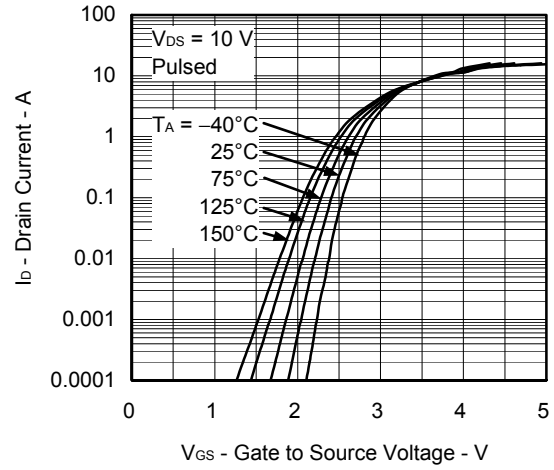
TYPICAL CHARACTERISTICS (T_A = 25°C)



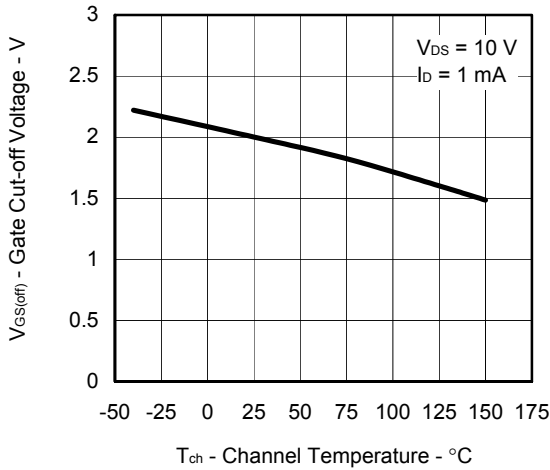
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



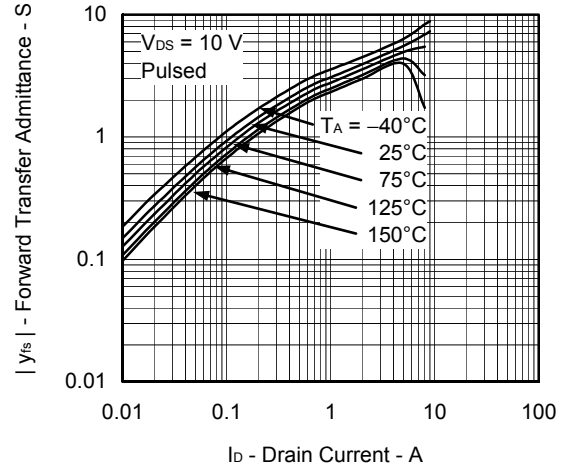
FORWARD TRANSFER CHARACTERISTICS



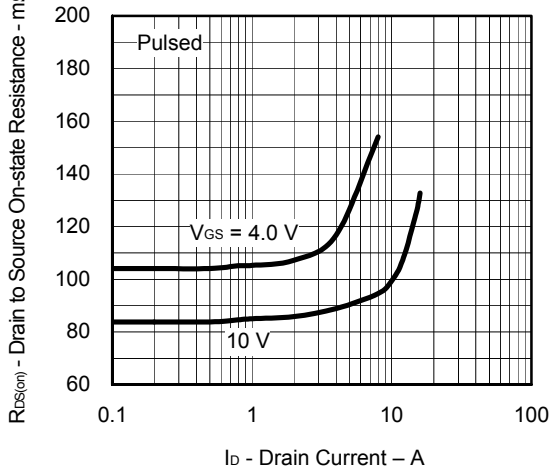
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



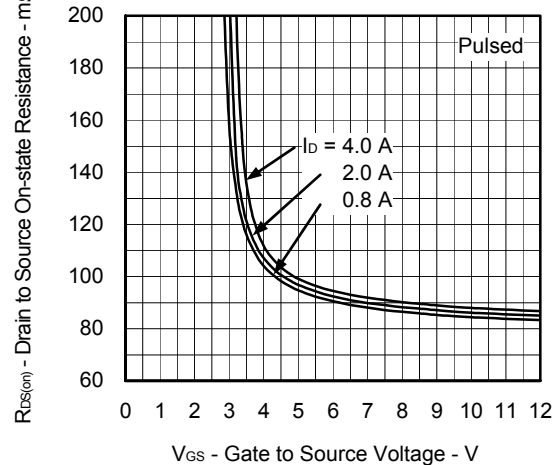
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



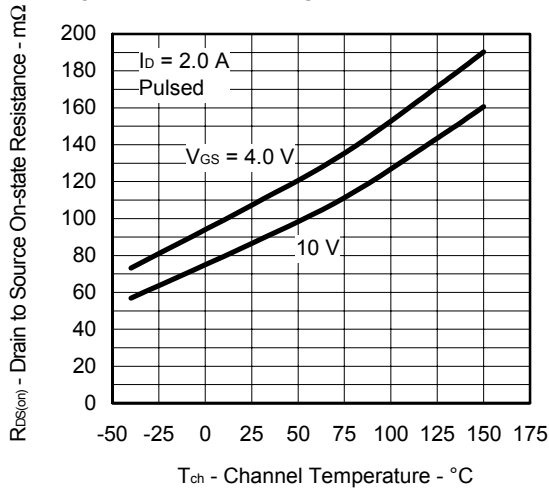
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



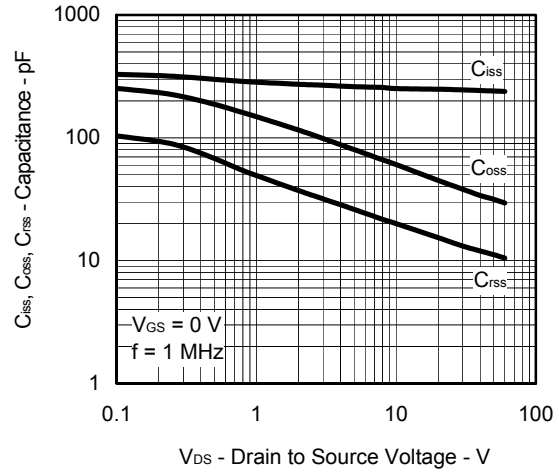
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



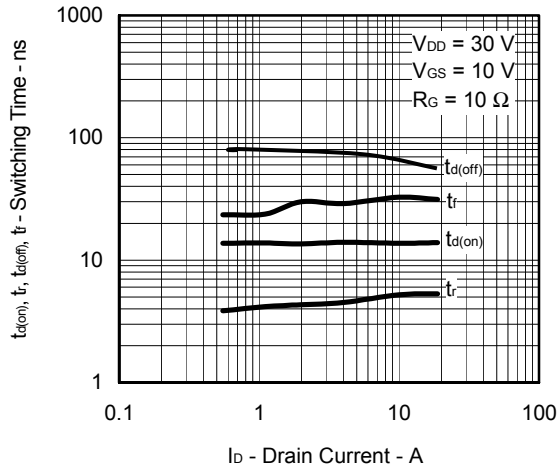
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



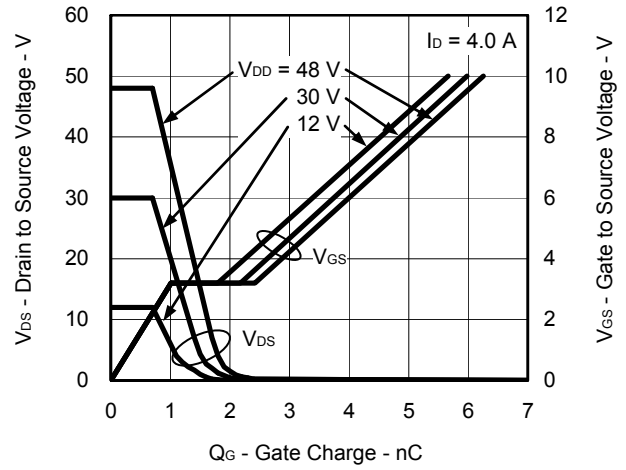
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



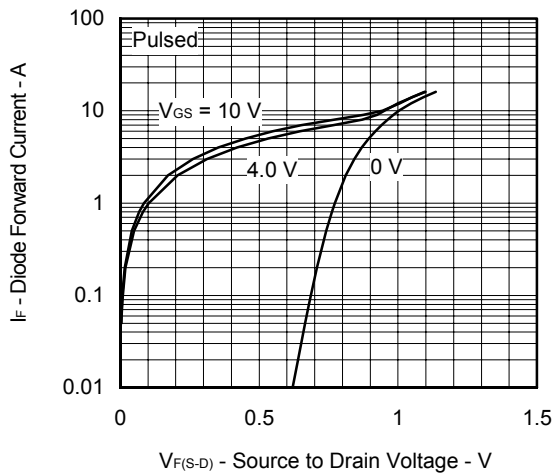
SWITCHING CHARACTERISTICS



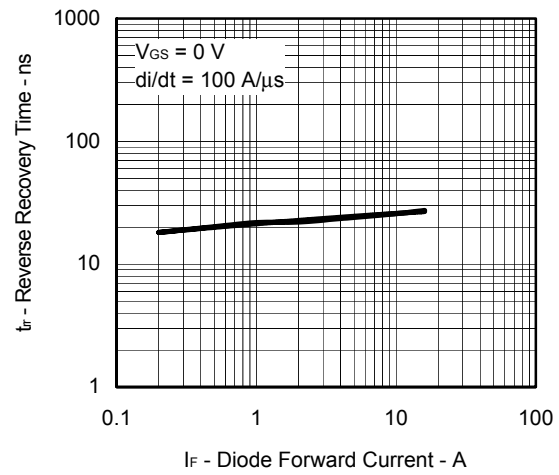
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



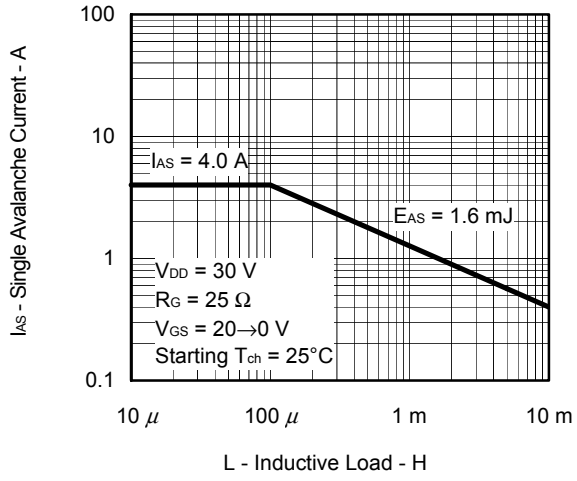
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



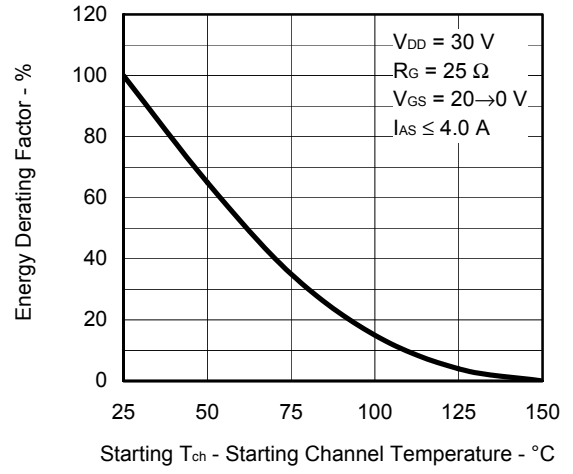
REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



SINGLE AVALANCHE CURRENT vs. INDUCTIVE LOAD



SINGLE AVALANCHE ENERGY DERATING FACTOR



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