

SWITCHING
DUAL P-CHANNEL POWER MOS FET

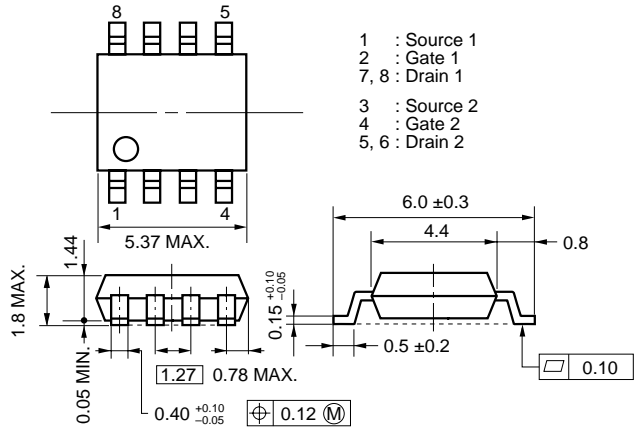
DESCRIPTION

The μ PA1774 is Dual P-channel MOS Field Effect Transistor.

FEATURES

- Dual chip type
- Low on-state resistance
 $R_{DS(on)1} = 250 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -2.0 \text{ A)}$
 $R_{DS(on)2} = 300 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -2.0 \text{ A)}$
 $R_{DS(on)3} = 330 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -2.0 \text{ A)}$
- Low input capacitance
 $C_{iss} = 420 \text{ pF TYP.}$
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

PACKAGE DRAWING (Unit: mm)



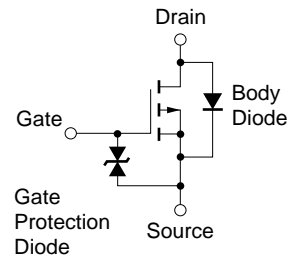
ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA1774G	Power SOP8

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, All terminals are connected.)

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) ($T_c = 25^\circ\text{C}$)	$I_{D(DC)}$	±2.8	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	±18	A
Total Power Dissipation (1 unit) ^{Note2}	P_T	0.6	W
Total Power Dissipation (2 unit) ^{Note2}	P_T	0.8	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to 150	°C
Single Avalanche Current ^{Note3}	I_{AS}	-2.8	A
Single Avalanche Energy ^{Note3}	E_{AS}	0.78	mJ

EQUIVALENT CIRCUIT
(1/2 circuit)



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

2. Mounted on Glass Epoxy Board of $1600 \text{ mm}^2 \times 1.6 \text{ mm}$. Drain pad size: $264 \text{ mm}^2 \times 35 \mu\text{m}$, $T_A = 25^\circ\text{C}$

3. Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = -30 \text{ V}$, $R_G = 25 \Omega$, $V_{GS} = -20 \rightarrow 0 \text{ V}$

Remark

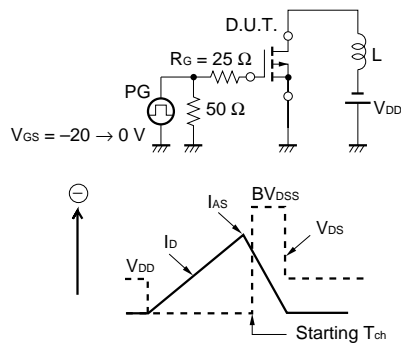
The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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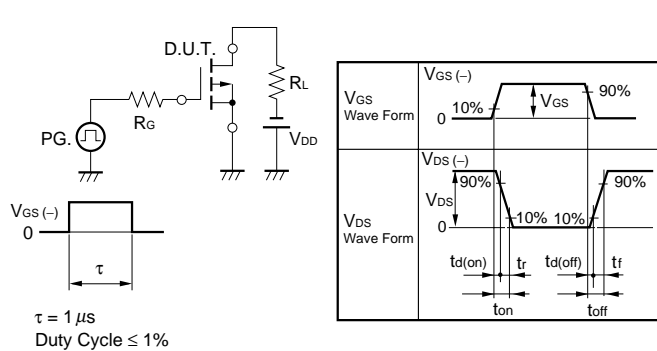
ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

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} = ±16 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	y _{fs}	V _{DS} = -10 V, I _D = -2.0 A	2.5	4.3		S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = -10 V, I _D = -2.0 A		200	250	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -2.0 A		230	300	mΩ
	R _{DS(on)3}	V _{GS} = -4.0 V, I _D = -2.0 A		240	330	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		420		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		80		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		30		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -30 V, I _D = -2.0 A		8		ns
Rise Time	t _r	V _{GS} = -10 V		5		ns
Turn-off Delay Time	t _{d(off)}	R _G = 0 Ω		35		ns
Fall Time	t _f			8		ns
Total Gate Charge	Q _G	V _{DD} = -48 V		10		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -10 V		1.7		nC
Gate to Drain Charge	Q _{GD}	I _D = -2.8 A		2.2		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 2.8 A, V _{GS} = 0 V		0.89		V
Reverse Recovery Time	t _{rr}	I _F = 2.8 A, V _{GS} = 0 V		45		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		65		μC

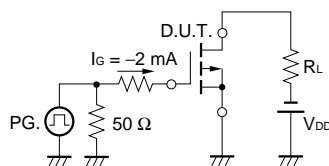
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

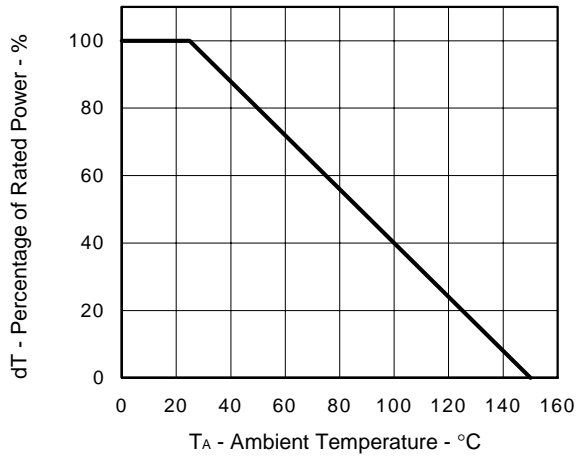


TEST CIRCUIT 3 GATE CHARGE

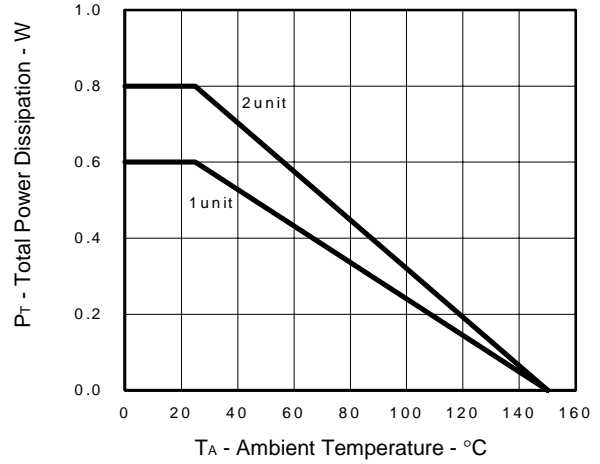


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

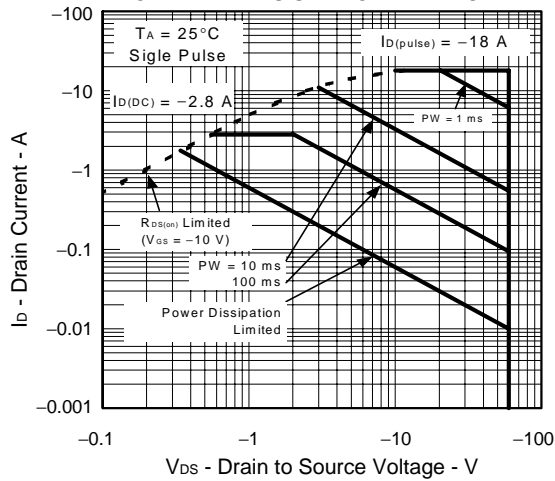
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



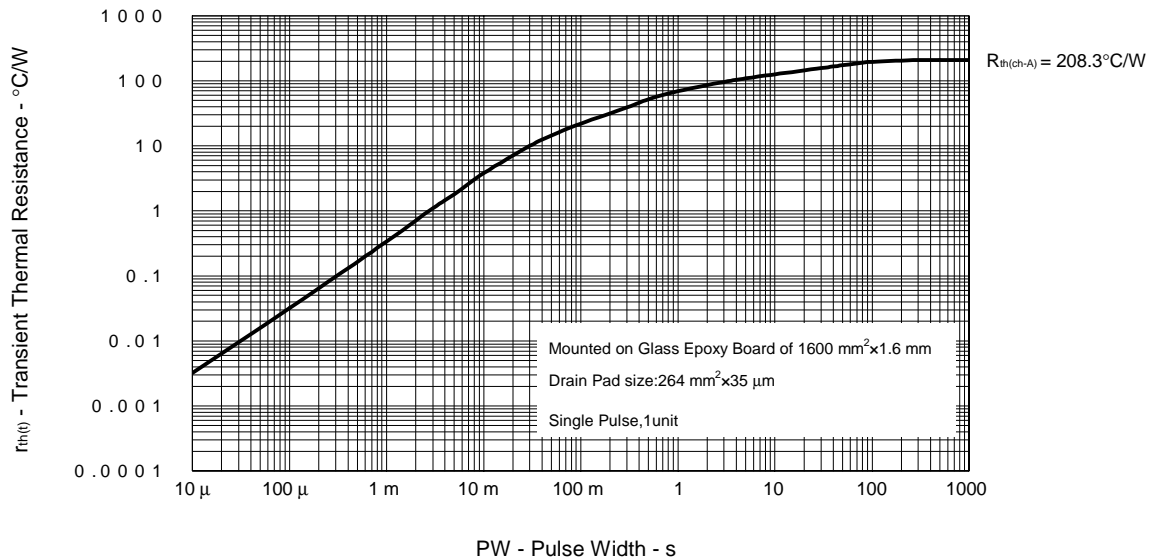
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE

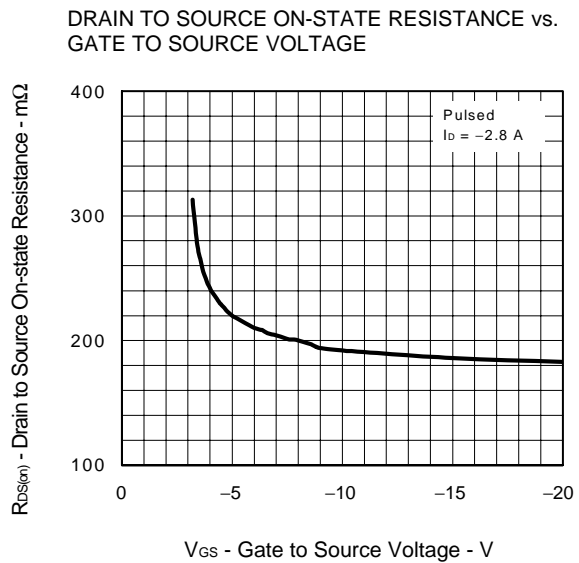
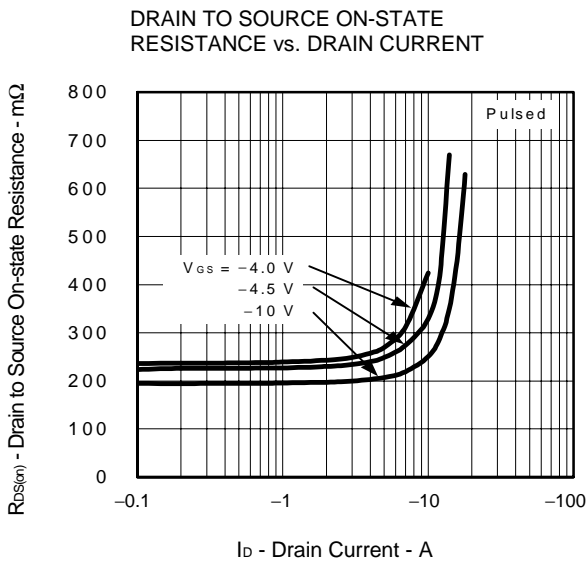
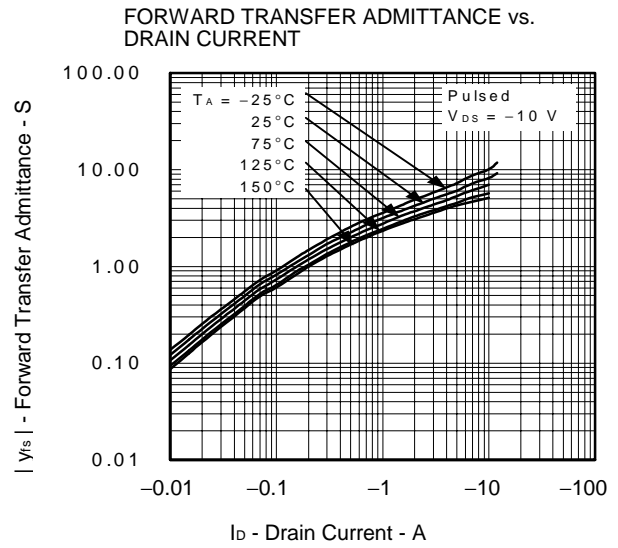
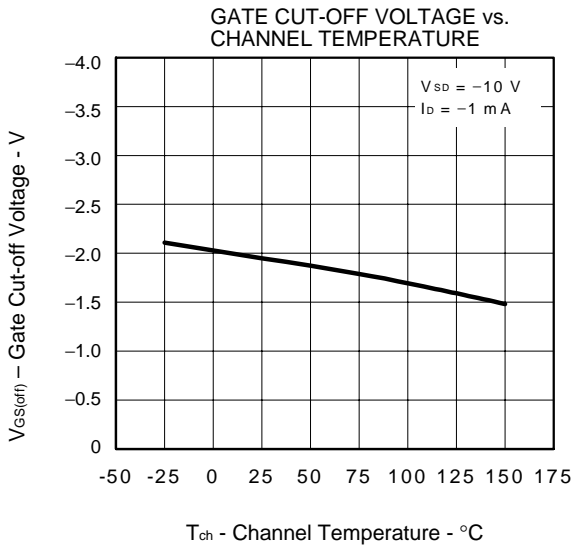
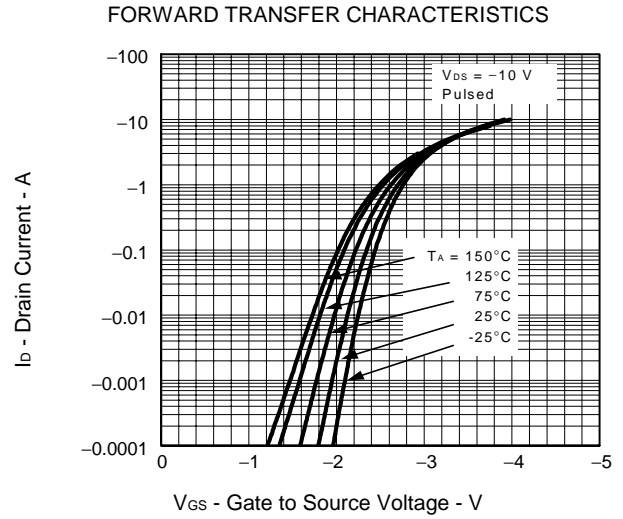
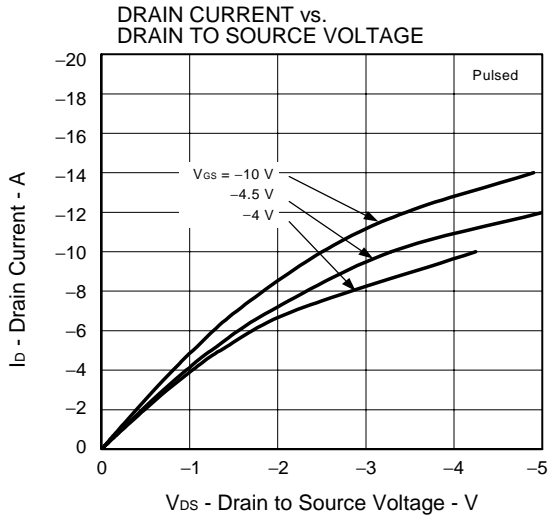


FORWARD BIAS SAFE OPERATING AREA

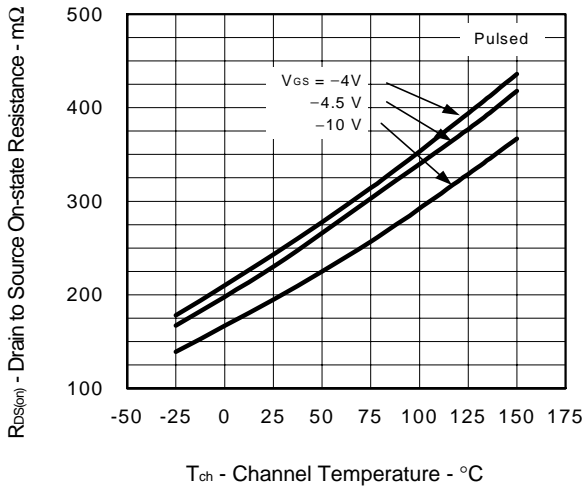


TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH

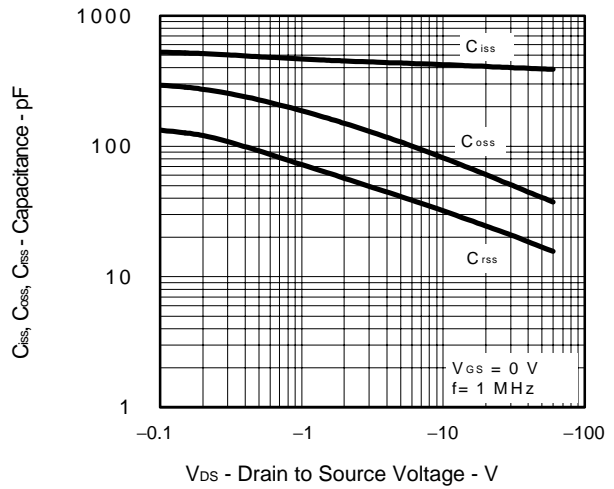




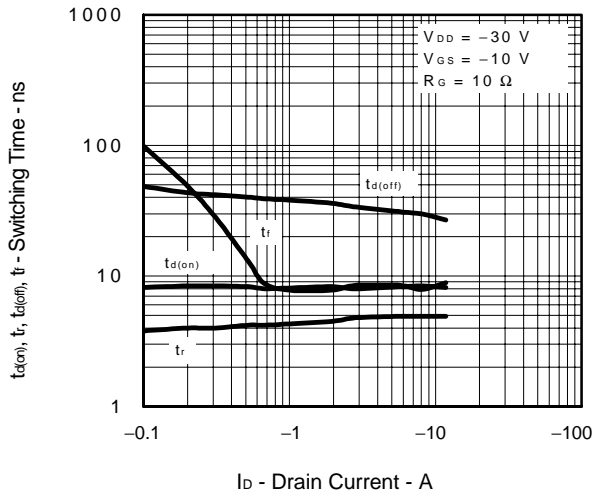
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



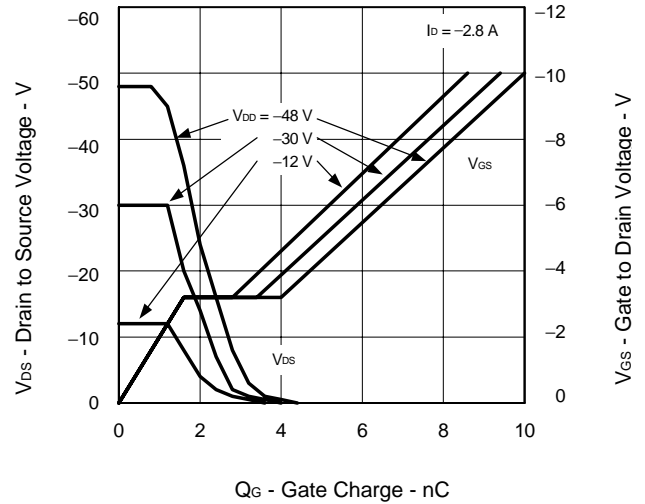
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



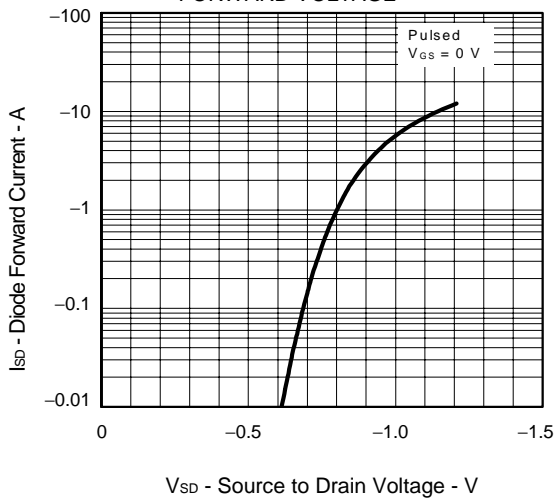
SWITCHING CHARACTERISTICS



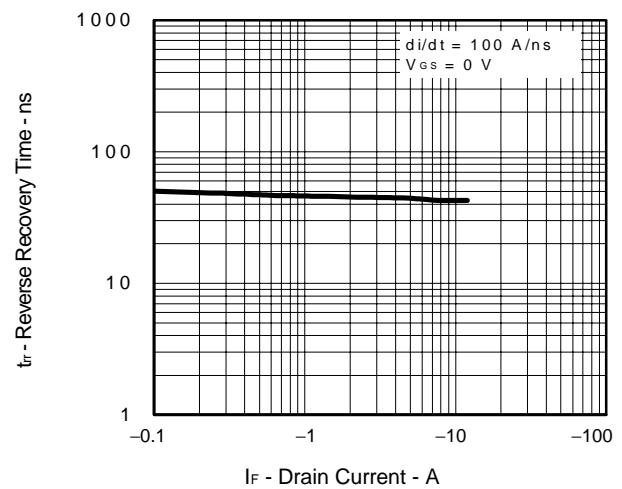
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



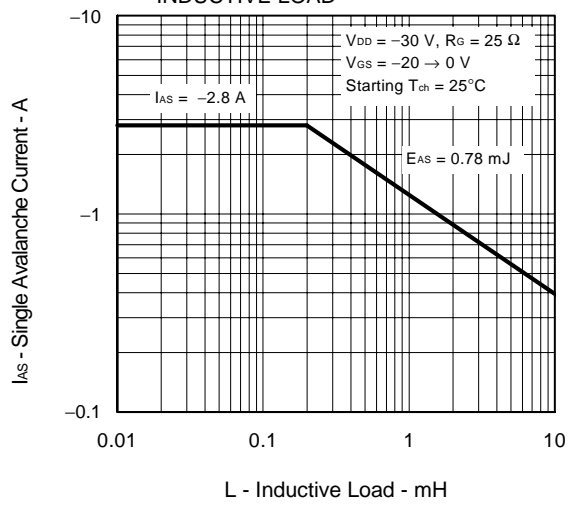
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



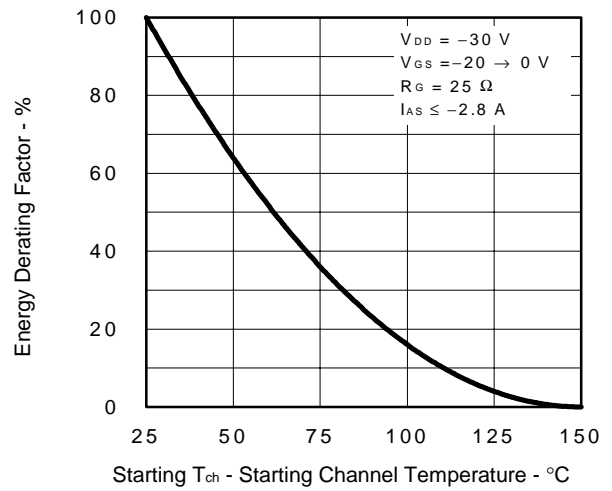
REVERSE RECOVERY TIME vs. DRAIN CURRENT



SINGLE AVALANCHE CURRENT vs. INDUCTIVE LOAD



SINGLE AVALANCHE ENERGY DERATING FACTOR



[MEMO]

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