

MOS FIELD EFFECT TRANSISTOR μ PA2718AGR

SWITCHING P-CHANNEL POWER MOS FET

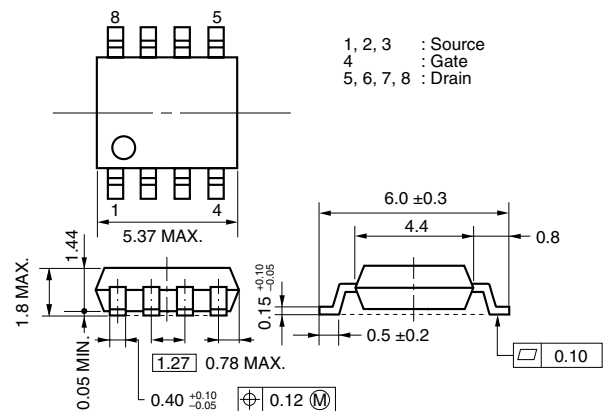
DESCRIPTION

The μ PA2718AGR is P-Channel MOS Field Effect Transistor designed for power management applications of notebook computers and Lithium-Ion battery protection circuit.

FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 9.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -6.5 \text{ A)}$
 $R_{DS(on)2} = 14.5 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -6.5 \text{ A)}$
- Low input capacitance
 $C_{iss} = 2810 \text{ pF TYP.}$
- Built-in gate protection diode
- Small and surface mount package (Power SOP8)

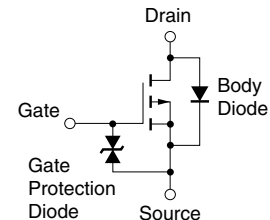
PACKAGE DRAWING (Unit: mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, All terminals are connected.)

Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	-30	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	± 20	V
Drain Current (DC)	I _{D(DC)}	± 13	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	± 130	A
Total Power Dissipation ^{Note2}	P _{T1}	2	W
Total Power Dissipation ^{Note3}	P _{T2}	2	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C
Single Avalanche Current ^{Note4}	I _{AS}	-13	A
Single Avalanche Energy ^{Note4}	E _{AS}	16.9	mJ

EQUIVALENT CIRCUIT



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

2. Mounted on ceramic substrate of 1200 mm² x 2.2 mm
3. Mounted on glass epoxy board of 25.4 mm x 25.4 mm x 0.8 mm, PW = 10 sec
4. Starting T_{ch} = 25°C, V_{DD} = -15 V, R_G = 25 Ω , L = 100 μH , V_{GS} = -20 \rightarrow 0 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.

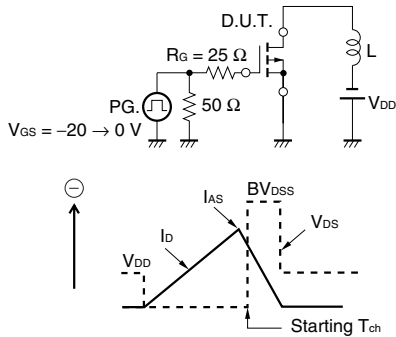
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ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

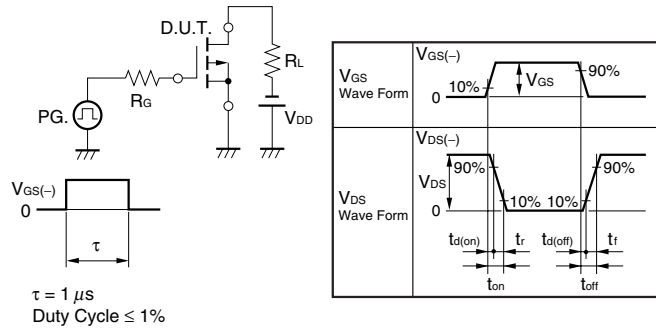
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-1.0		-2.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = -10 V, I _D = -6.5 A	9			S
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = -10 V, I _D = -6.5 A		7.2	9.0	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -6.5 A		9.9	14.5	mΩ
	R _{DS(on)3}	V _{GS} = -4.0 V, I _D = -6.5 A		11.8	18.2	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		2810		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		710		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		460		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15 V, I _D = -6.5 A		13		ns
Rise Time	t _r	V _{GS} = -10 V		18		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		510		ns
Fall Time	t _f			310		ns
Total Gate Charge	Q _G	V _{DD} = -24 V		67		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -10 V		6.5		nC
Gate to Drain Charge	Q _{GD}	I _D = -13 A		19		nC
Body Diode Forward Voltage ^{Note}	V _{F(S-D)}	I _F = 13 A, V _{GS} = 0 V		0.84		V
Reverse Recovery Time	t _{rr}	I _F = 13 A, V _{GS} = 0 V		180		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 50 A/μs		14		nC

Note Pulsed

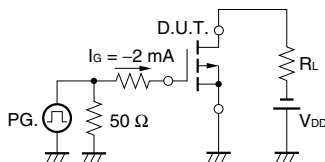
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

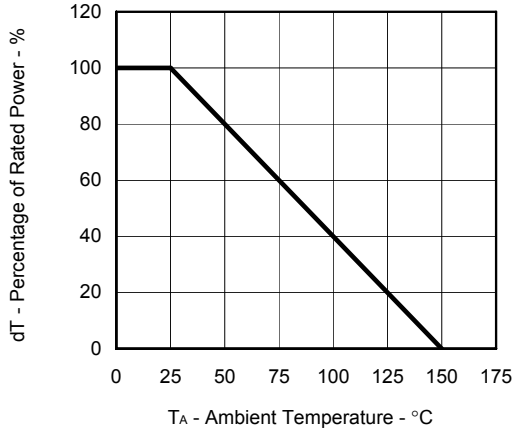


TEST CIRCUIT 3 GATE CHARGE

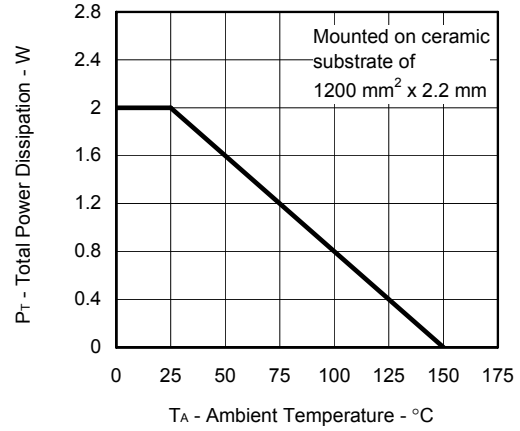


ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

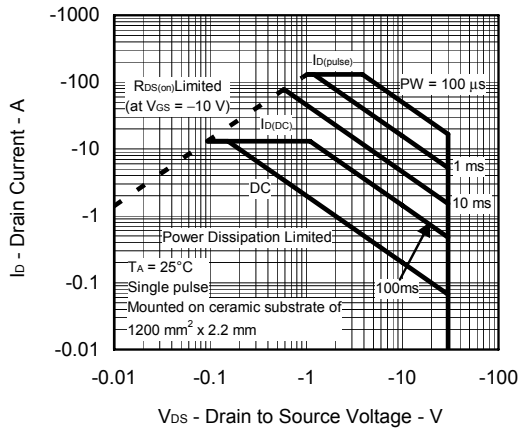
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



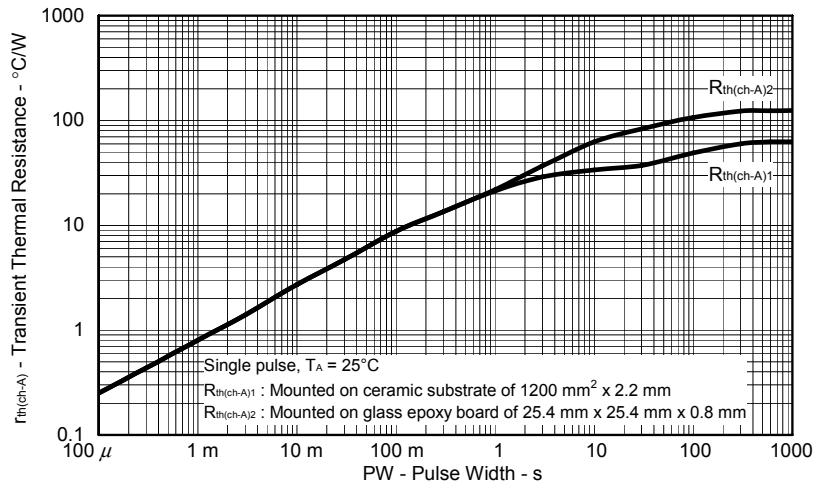
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



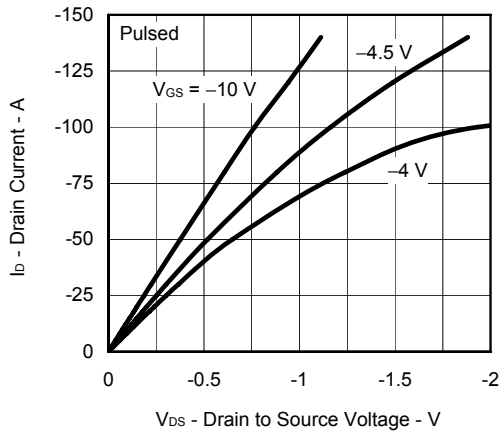
FORWARD BIAS SAFE OPERATING AREA



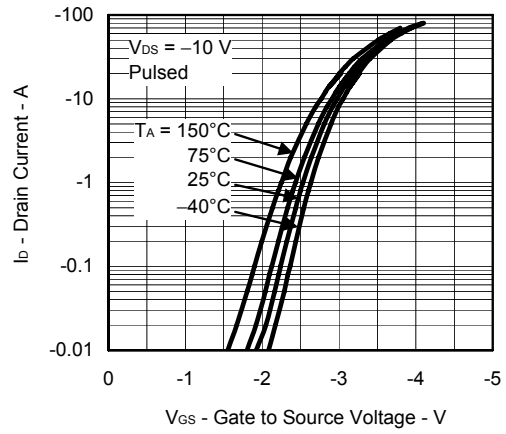
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



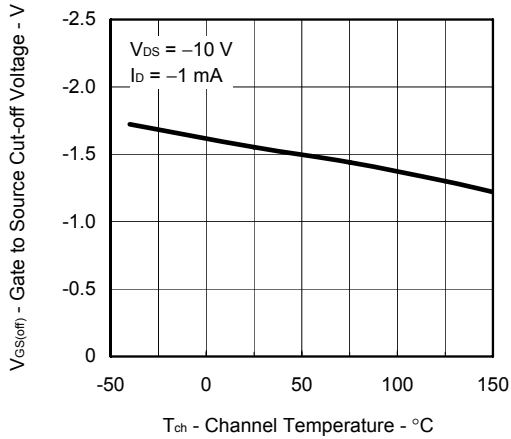
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



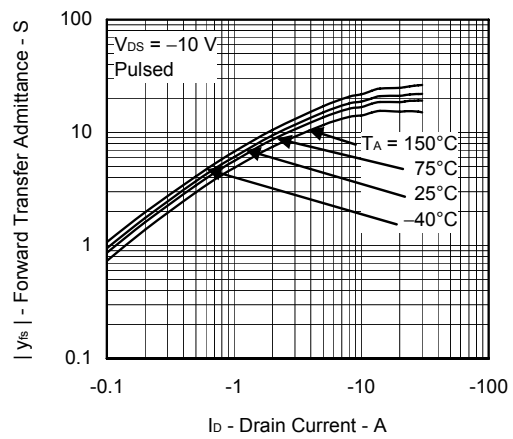
FORWARD TRANSFER CHARACTERISTICS



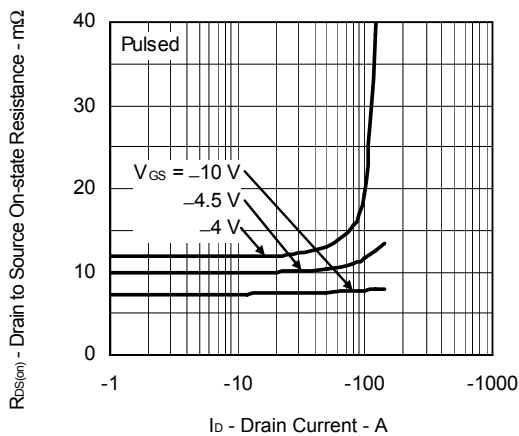
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



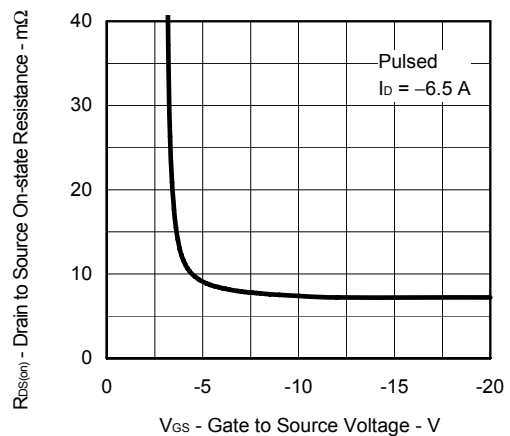
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



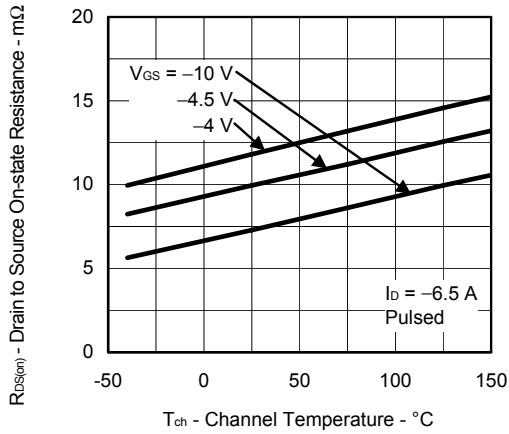
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



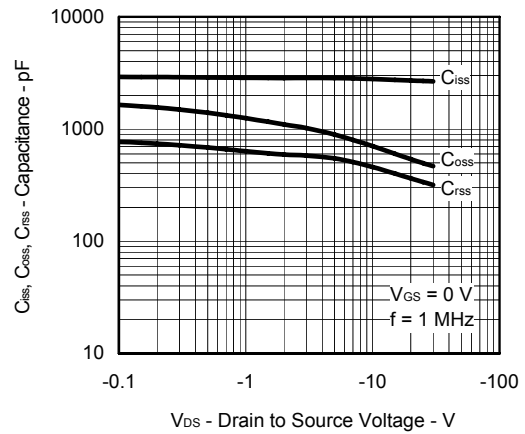
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



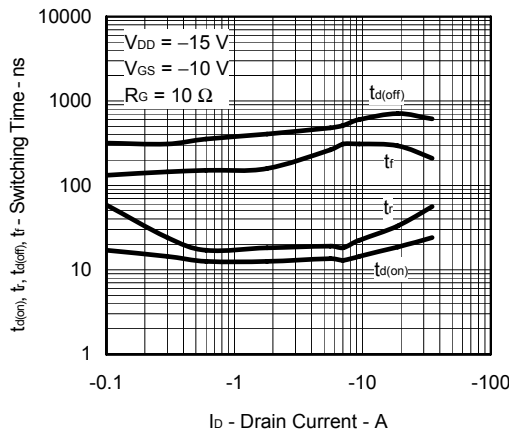
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



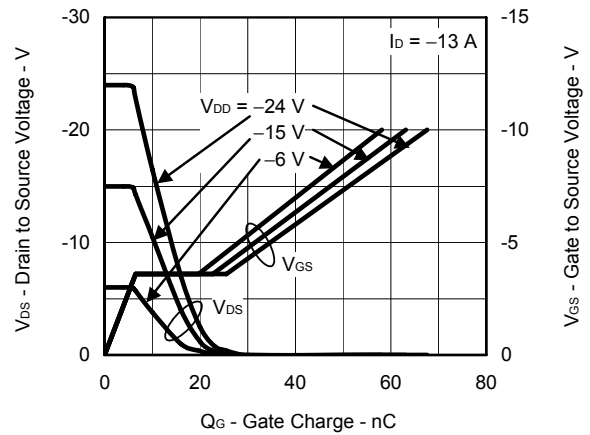
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



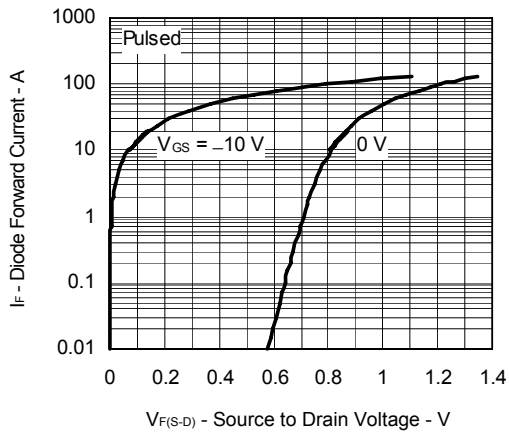
SWITCHING CHARACTERISTICS



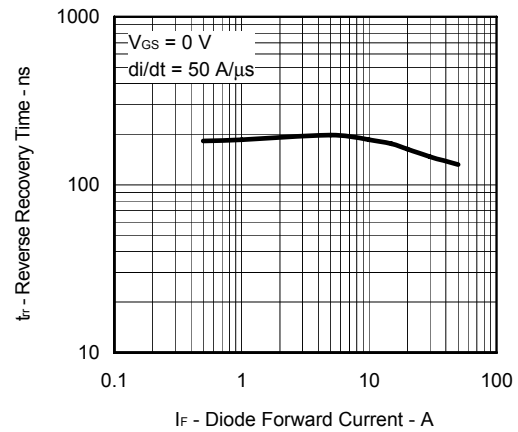
DYNAMIC INPUT/OUTPUT CHARACTERISTICS

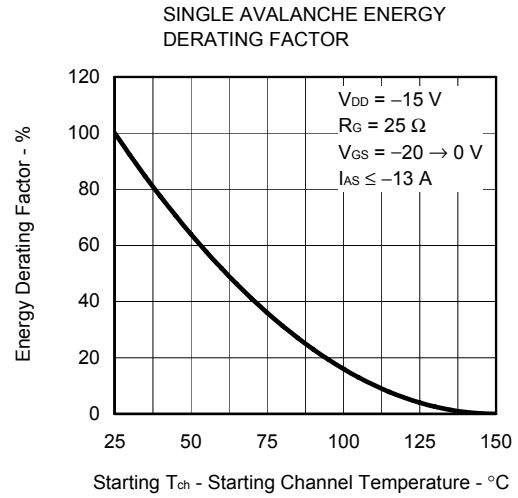
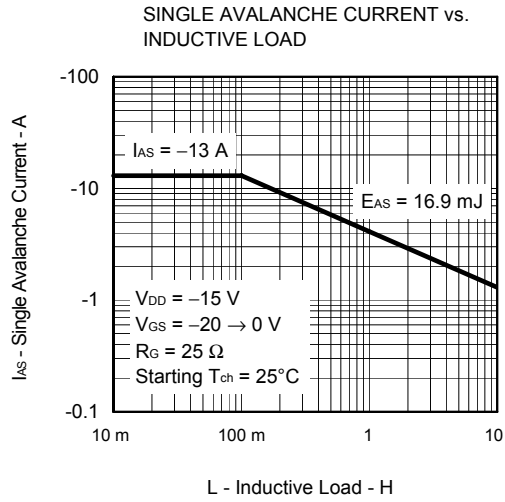


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT





ORDERING INFORMATION

PART NUMBER	LEAD PLATING	PACKING	PACKAGE
μ PA2718AGR-E1-AT ^{Note}	Pure Sn (Tin)	Tape 2500 p/reel	Power SOP8
μ PA2718AGR-E2-AT ^{Note}			0.08 g TYP.

Note Pb-free (This product does not contain Pb in external electrode and other parts.)

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