

DATA SHEET

NEC

MOS FIELD EFFECT TRANSISTOR μ PA2719AGR

SWITCHING P-CHANNEL POWER MOS FET

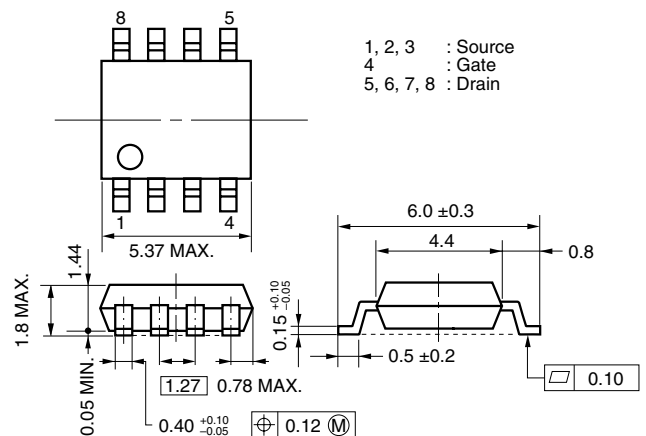
DESCRIPTION

The μ PA2719AGR 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
 $R_{DS(on)1} = 13 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -5.0 \text{ A)}$
 $R_{DS(on)2} = 20.9 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -5.0 \text{ A)}$
- Low input capacitance
 $C_{iss} = 2010 \text{ pF TYP.}$
- Built-in gate protection diode
- Small and surface mount package (Power SOP8)

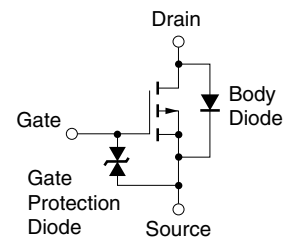
PACKAGE DRAWING (Unit: mm)



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

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	-30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	∓ 10	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	∓ 100	A
Total Power Dissipation ^{Note2}	P_{T1}	2	W
Total Power Dissipation ^{Note3}	P_{T2}	2	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current ^{Note4}	I_{AS}	-10	A
Single Avalanche Energy ^{Note4}	E_{AS}	10	mJ

EQUIVALENT CIRCUIT



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

2. Mounted on ceramic substrate of $1200 \text{ mm}^2 \times 2.2 \text{ mm}$
3. Mounted on glass epoxy board of $25.4 \text{ mm} \times 25.4 \text{ mm} \times 0.8 \text{ mm}$, $PW = 10 \text{ sec}$
4. Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = -15 \text{ V}$, $R_G = 25 \Omega$, $L = 100 \mu\text{H}$, $V_{GS} = -20 \rightarrow 0 \text{ V}$

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.

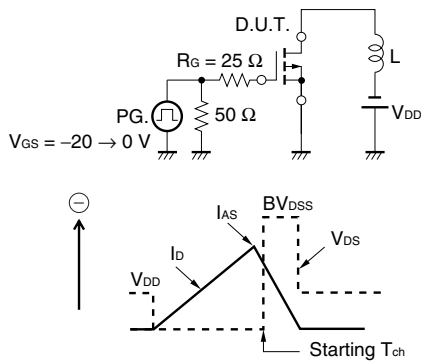
The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
 Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.

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

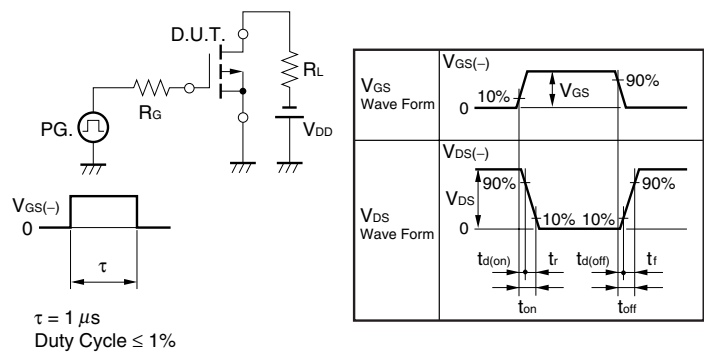
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-1.0		-2.5	V
Forward Transfer Admittance Note	y _{fs}	V _{DS} = -10 V, I _D = -5.0 A	8			S
Drain to Source On-state Resistance Note	R _{DS(on)1}	V _{GS} = -10 V, I _D = -5.0 A		10.6	13	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -5.0 A		14.2	20.9	mΩ
	R _{DS(on)3}	V _{GS} = -4.0 V, I _D = -5.0 A		16.6	25.5	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		2010		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		460		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		350		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15 V, I _D = -5.0 A		12		ns
Rise Time	t _r	V _{GS} = -10 V		15		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		290		ns
Fall Time	t _f			180		ns
Total Gate Charge	Q _G	V _{DD} = -24 V		43		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -10 V		5.5		nC
Gate to Drain Charge	Q _{GD}	I _D = -10 A		12		nC
Body Diode Forward Voltage Note	V _{F(S-D)}	I _F = 10 A, V _{GS} = 0 V		0.84		V
Reverse Recovery Time	t _{rr}	I _F = 10 A, V _{GS} = 0 V		105		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 50 A/μs		6.7		nC

Note Pulsed

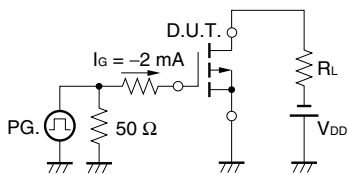
TEST CIRCUIT 1 AVALANCHE CAPABILITY



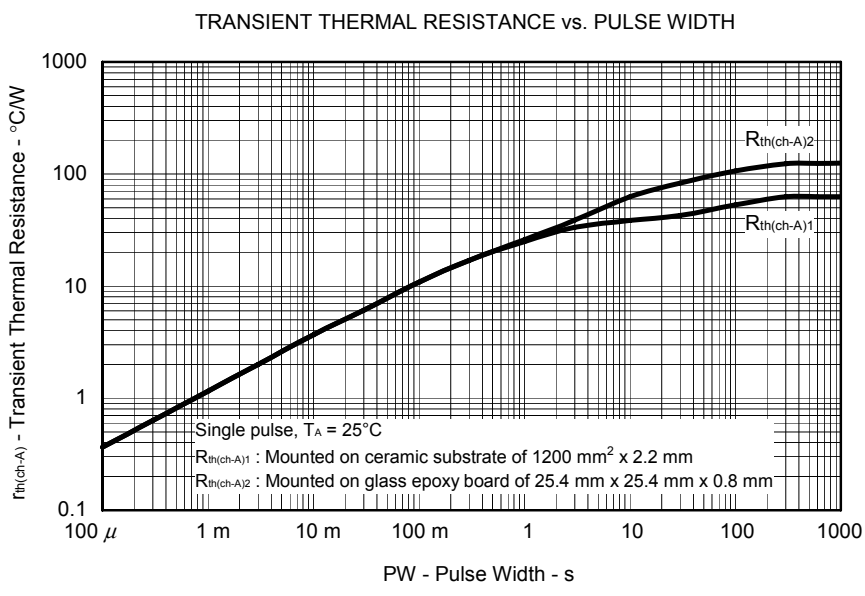
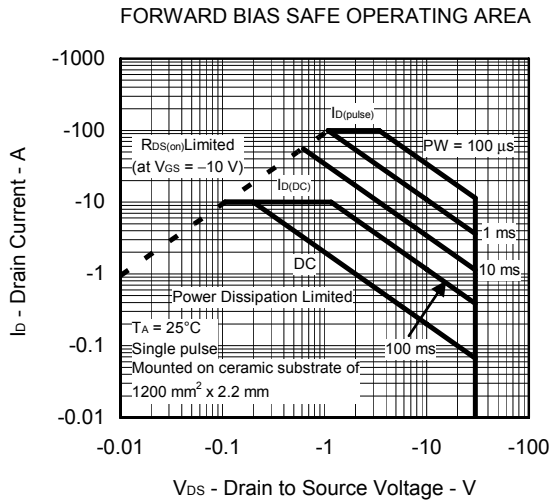
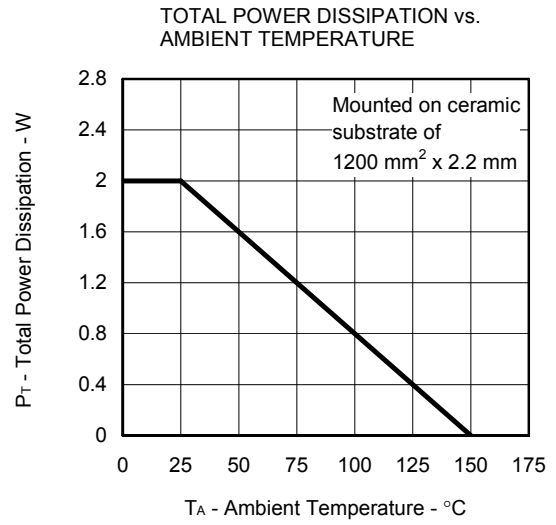
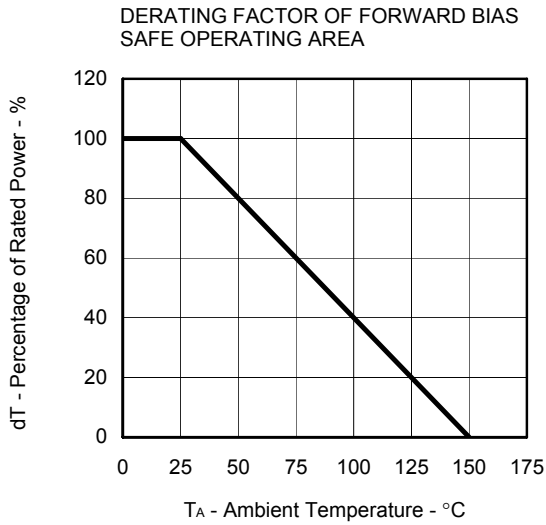
TEST CIRCUIT 2 SWITCHING TIME



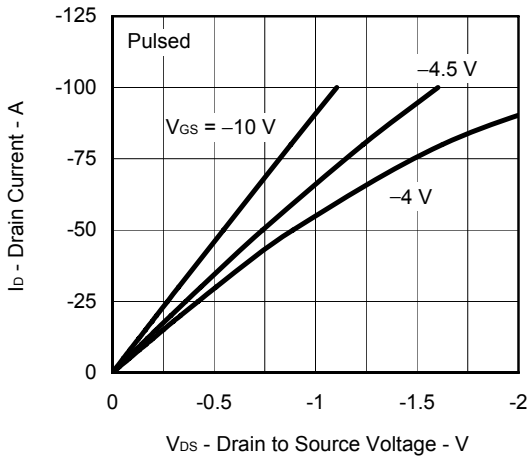
TEST CIRCUIT 3 GATE CHARGE



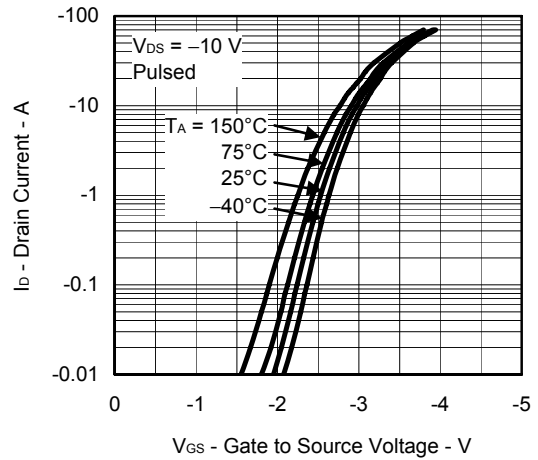
ELECTRICAL CHARACTERISTICS (T_A = 25°C)



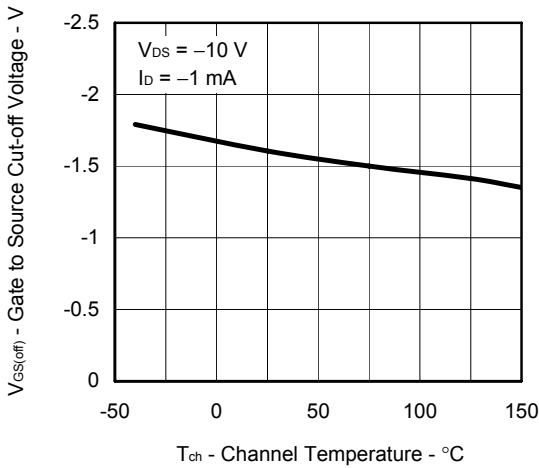
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



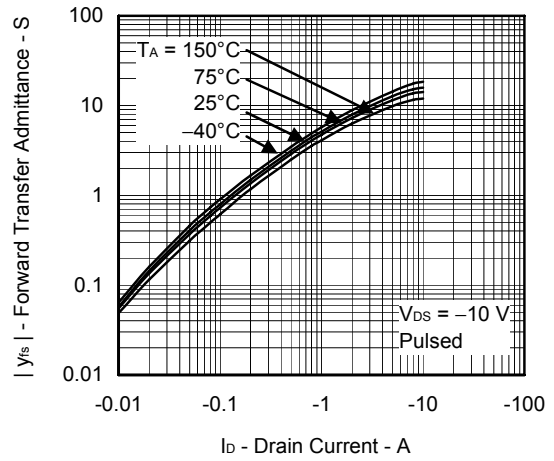
FORWARD TRANSFER CHARACTERISTICS



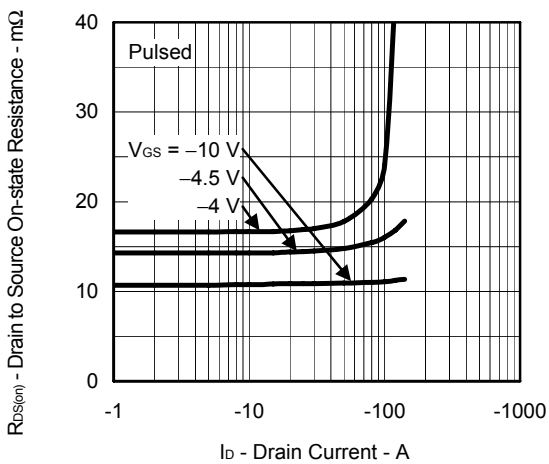
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



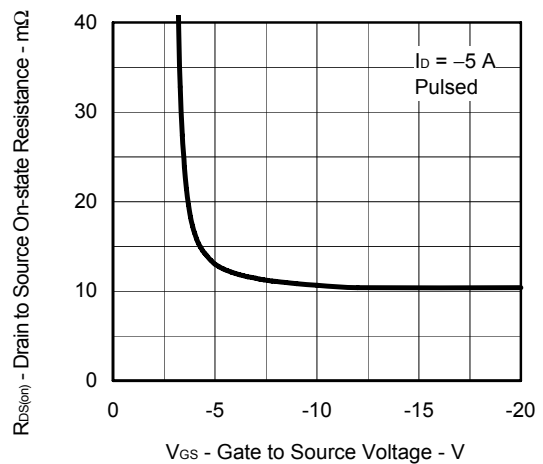
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



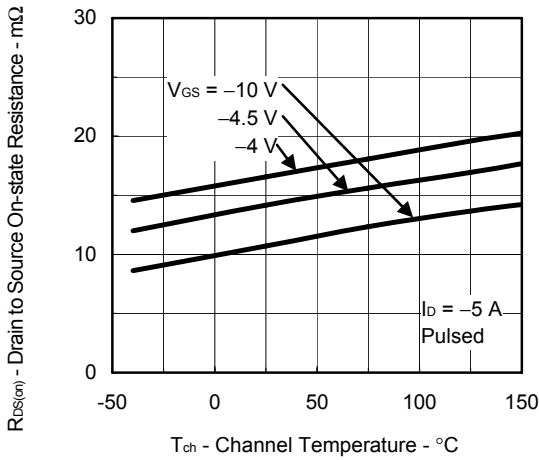
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



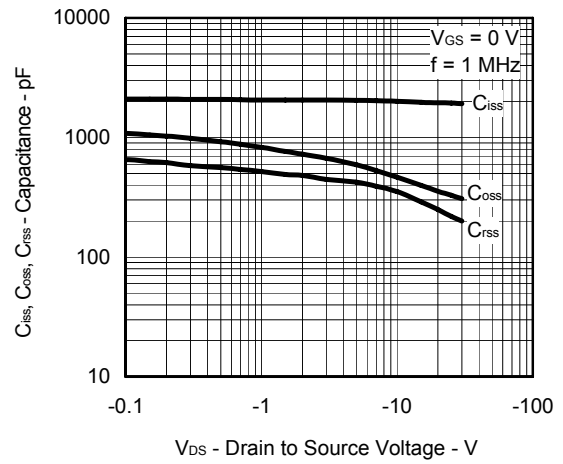
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



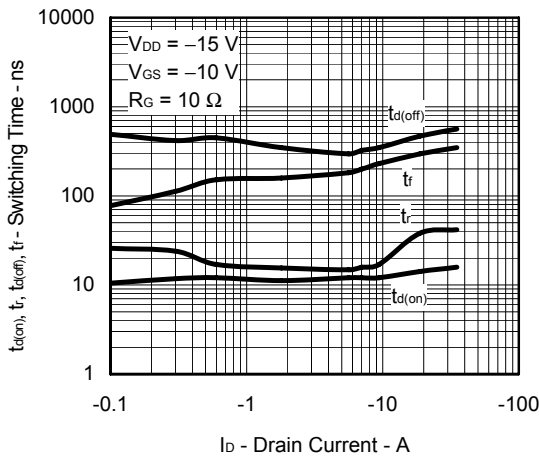
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



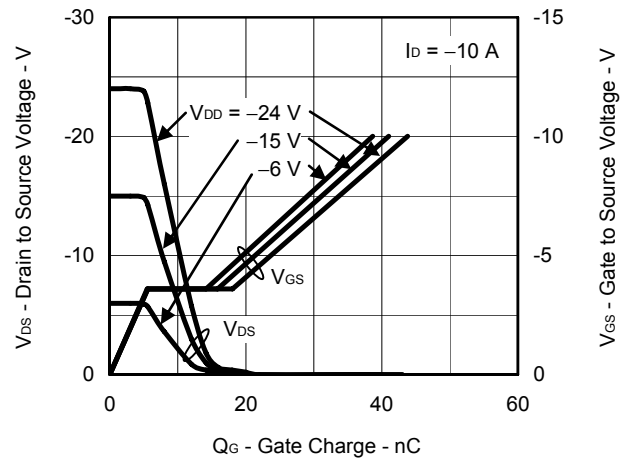
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



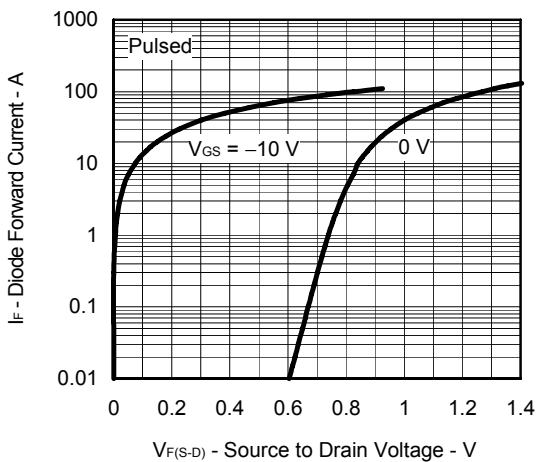
SWITCHING CHARACTERISTICS



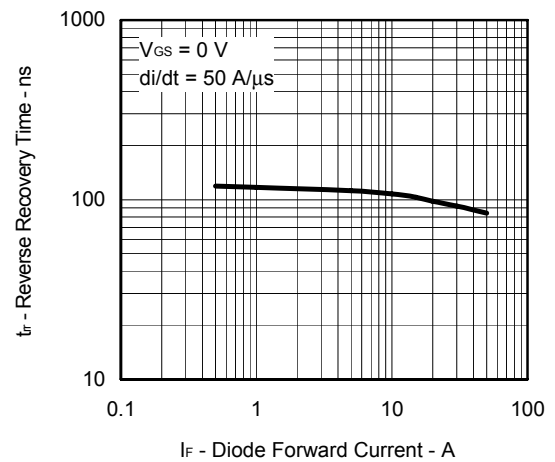
DYNAMIC INPUT/OUTPUT CHARACTERISTICS

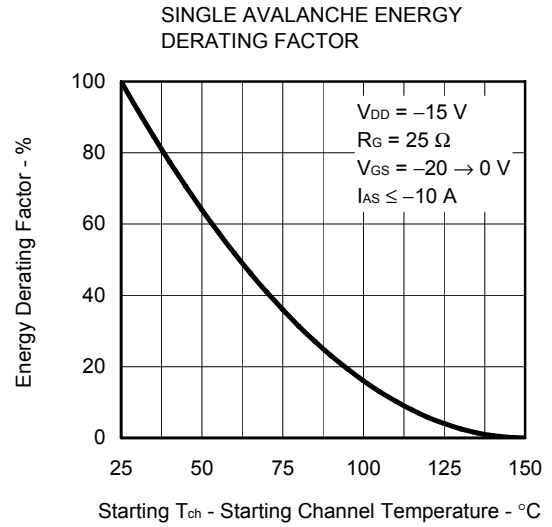
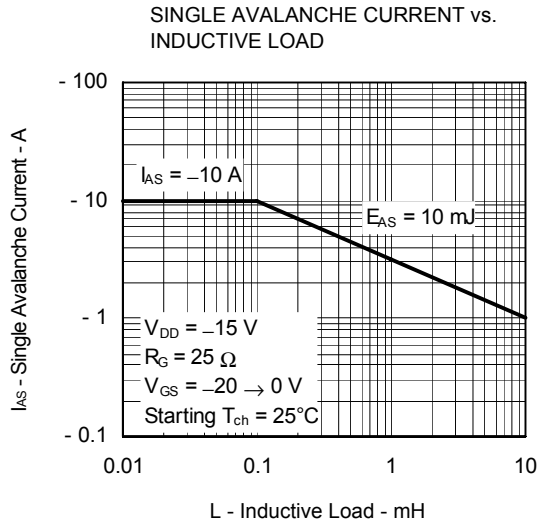


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT





ORDERING INFORMATION

PART NUMBER	LEAD PLATING	PACKING	PACKAGE
μ PA2719AGR-E1-AT ^{Note}	Pure Sn (Tin)	Tape 2500 p/reel	Power SOP8
μ PA2719AGR-E2-AT ^{Note}			0.08 g TYP.

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