

MOS FIELD EFFECT TRANSISTOR

μ PA2730TP

SWITCHING

P-CHANNEL POWER MOS FET

DESCRIPTION

The μ PA2730TP which has a heat spreader is P-Channel MOS Field Effect Transistor designed for power management applications of notebook computers and Li-ion battery protection circuit.

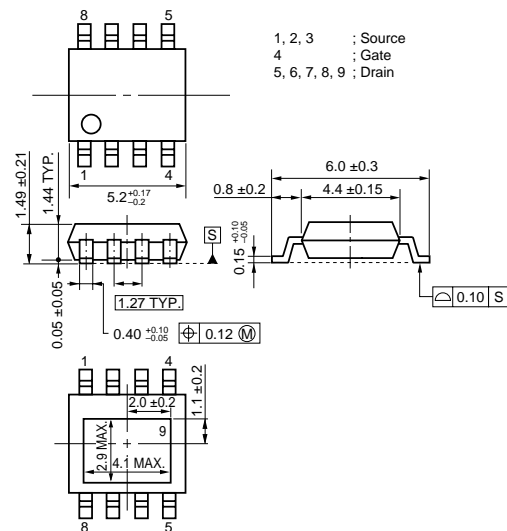
FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 7.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -7.5 \text{ A)}$
 $R_{DS(on)2} = 10.5 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -7.5 \text{ A)}$
 $R_{DS(on)3} = 12.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -7.5 \text{ A)}$
- Low C_{iss} : $C_{iss} = 4670 \text{ pF TYP.}$
- Small and surface mount package (Power HSOP8)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA2730TP	Power HSOP8

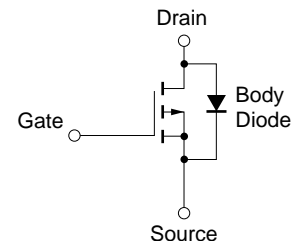
PACKAGE DRAWING (Unit: mm)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, Unless otherwise noted, 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) ($T_C = 25^\circ\text{C}$)	$I_{D(DC)1}$	±42	A
Drain Current (DC) ^{Note1}	$I_{D(DC)2}$	±20	A
Drain Current (pulse) ^{Note2}	$I_{D(pulse)}$	±120	A
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_{T1}	40	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$) ^{Note1}	P_{T2}	3	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to + 150	°C
Single Avalanche Current ^{Note3}	I_{AS}	-15	A
Single Avalanche Energy ^{Note3}	E_{AS}	22.5	mJ

EQUIVALENT CIRCUIT



- Notes**
1. Mounted on a glass epoxy board (1 inch x 1 inch x 0.8 mm), $PW = 10 \text{ sec}$
 2. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$
 3. 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 Strong electric field, when exposed to this device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it once, when it has occurred.

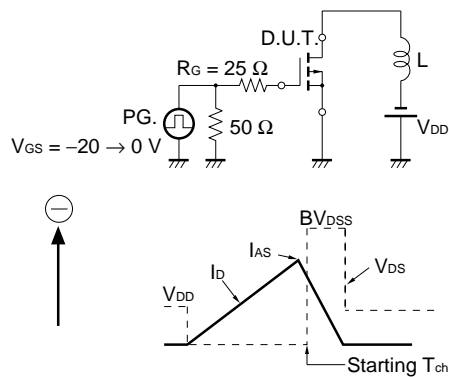
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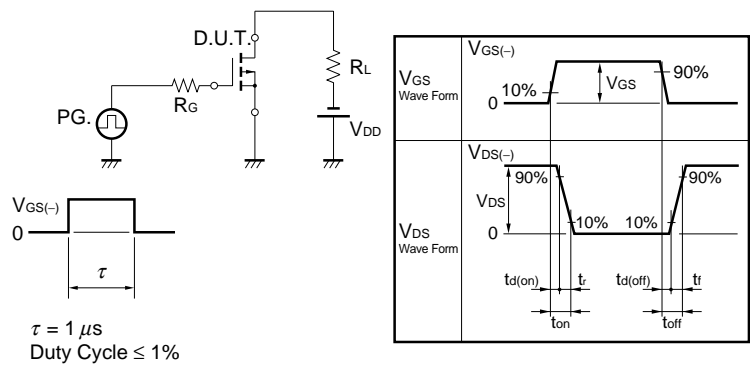
ELECTRICAL CHARACTERISTICS (TA = 25°C, Unless otherwise noted, All terminals are connected.)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			±100	nA
Gate Cut-off Voltage	$V_{GS(off)}$	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$	-1.0		-2.5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = -10\text{ V}, I_D = -7.5\text{ A}$	14	30		S
Drain to Source On-state Resistance	$R_{DS(on)1}$	$V_{GS} = -10\text{ V}, I_D = -7.5\text{ A}$		5.7	7.0	mΩ
	$R_{DS(on)2}$	$V_{GS} = -4.5\text{ V}, I_D = -7.5\text{ A}$		7.7	10.5	mΩ
	$R_{DS(on)3}$	$V_{GS} = -4.0\text{ V}, I_D = -7.5\text{ A}$		8.8	12.0	mΩ
Input Capacitance	C_{iss}	$V_{DS} = -10\text{ V}$		4670		pF
Output Capacitance	C_{oss}	$V_{GS} = 0\text{ V}$		1220		pF
Reverse Transfer Capacitance	C_{rss}	$f = 1\text{ MHz}$		760		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, I_D = -7.5\text{ A}$		20		ns
Rise Time	t_r	$V_{GS} = -10\text{ V}$		28		ns
Turn-off Delay Time	$t_{d(off)}$	$R_G = 10\ \Omega$		190		ns
Fall Time	t_f			110		ns
Total Gate Charge	Q_G	$V_{DD} = -24\text{ V}$		97		nC
Gate to Source Charge	Q_{GS}	$V_{GS} = -10\text{ V}$		10		nC
Gate to Drain Charge	Q_{GD}	$I_D = 15\text{ A}$		32		nC
Body Diode Forward Voltage	$V_{F(S-D)}$	$I_F = 15\text{ A}, V_{GS} = 0\text{ V}$		0.81		V
Reverse Recovery Time	t_{rr}	$I_F = 15\text{ A}, V_{GS} = 0\text{ V}$		65		ns
Reverse Recovery Charge	Q_{rr}	$di/dt = 100\text{ A}/\mu\text{s}$		62		nC

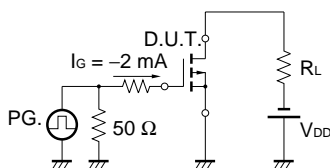
TEST CIRCUIT 1 AVALANCHE CAPABILITY



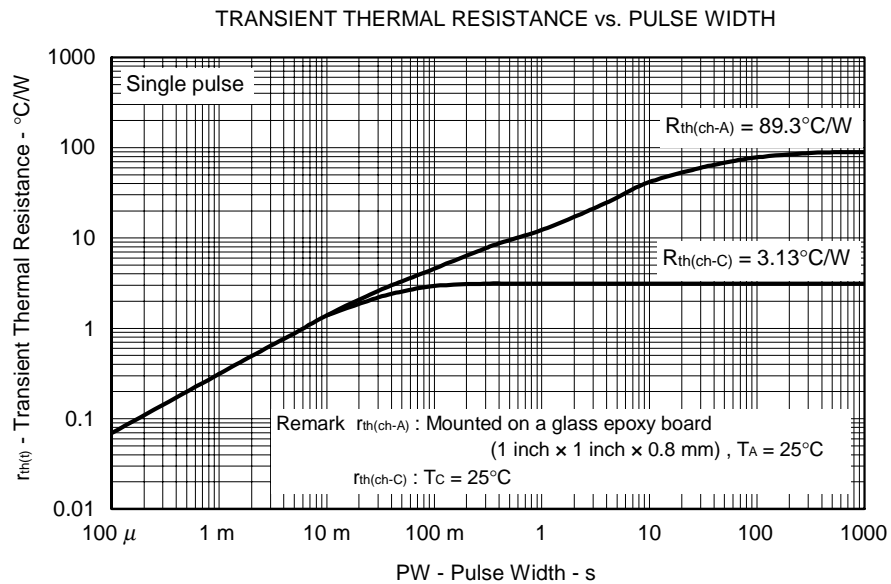
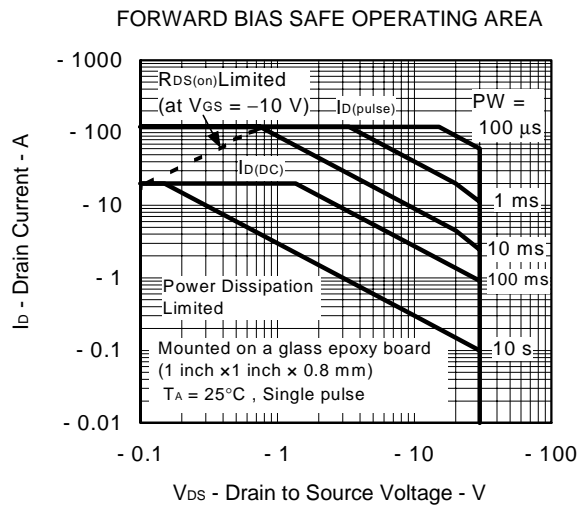
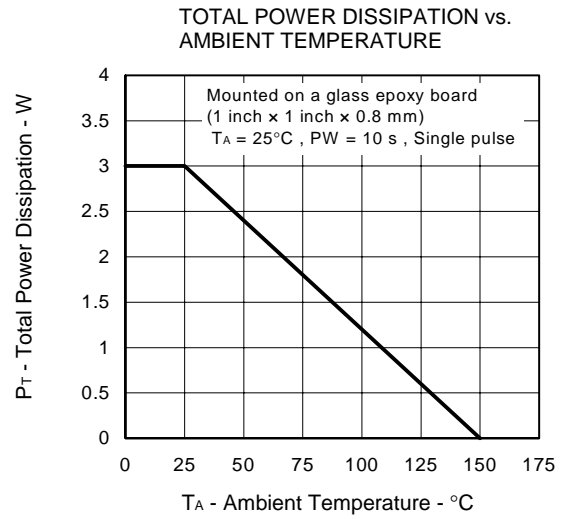
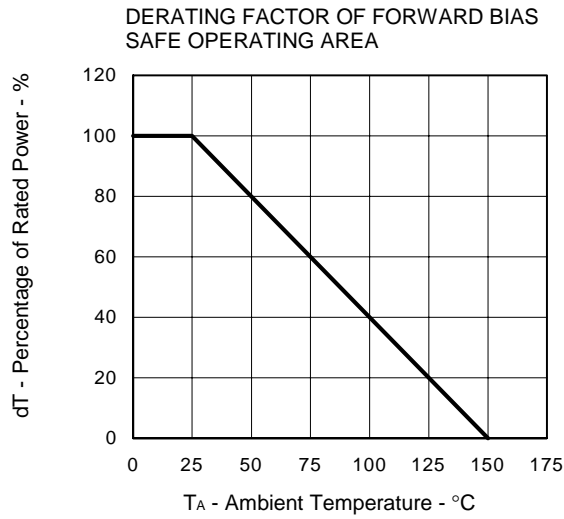
TEST CIRCUIT 2 SWITCHING TIME



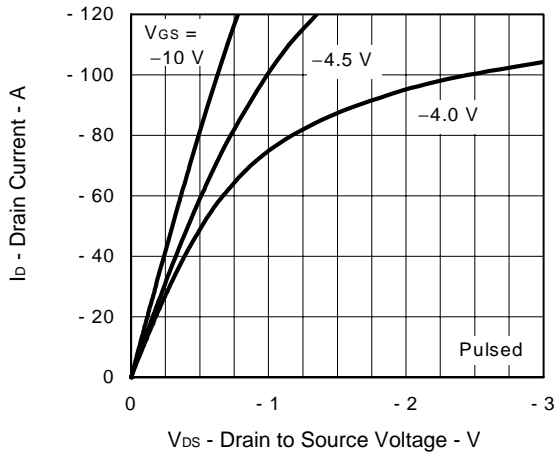
TEST CIRCUIT 3 GATE CHARGE



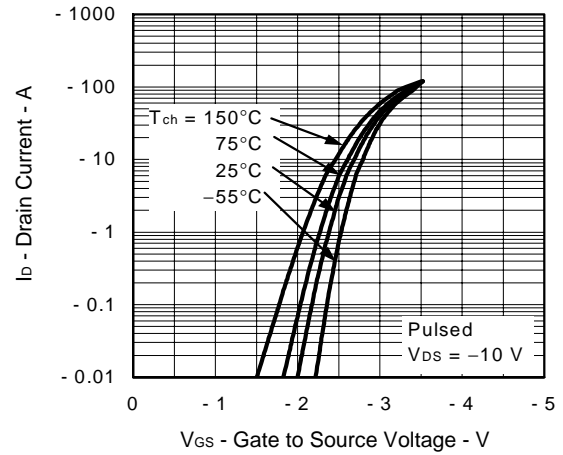
TYPICAL CHARACTERISTICS (T_A = 25°C)



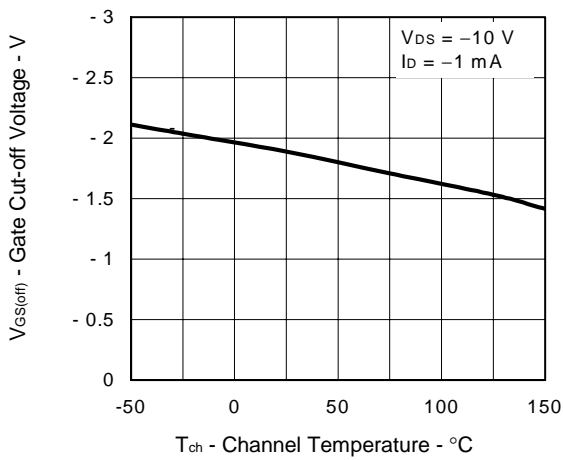
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



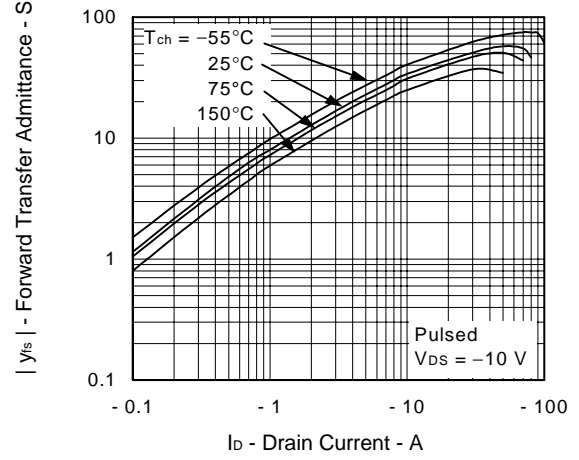
FORWARD TRANSFER CHARACTERISTICS



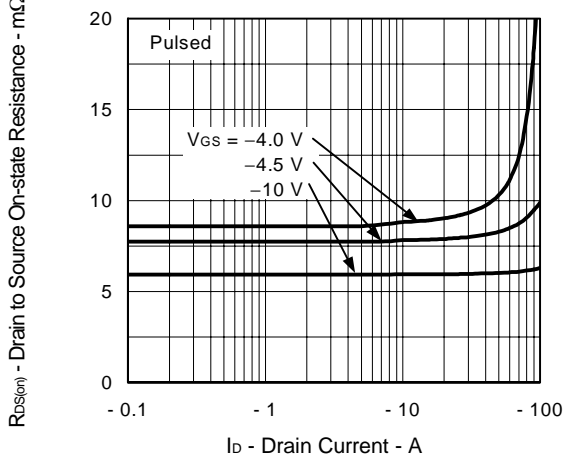
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



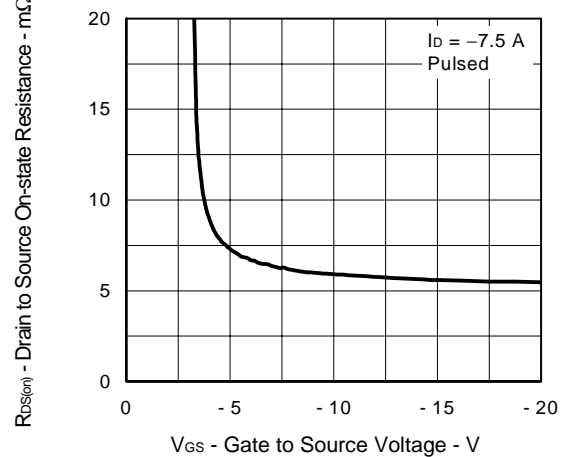
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



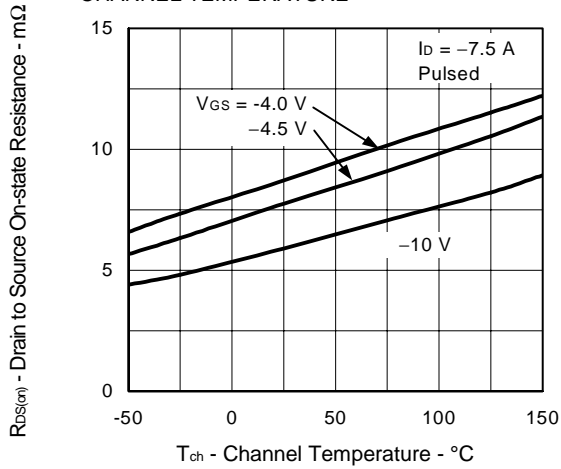
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



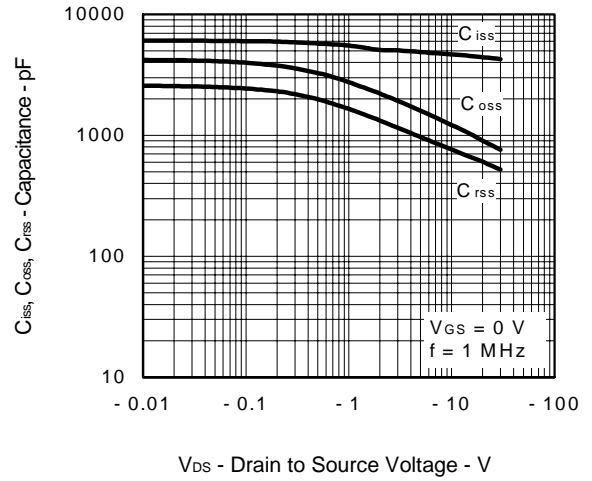
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



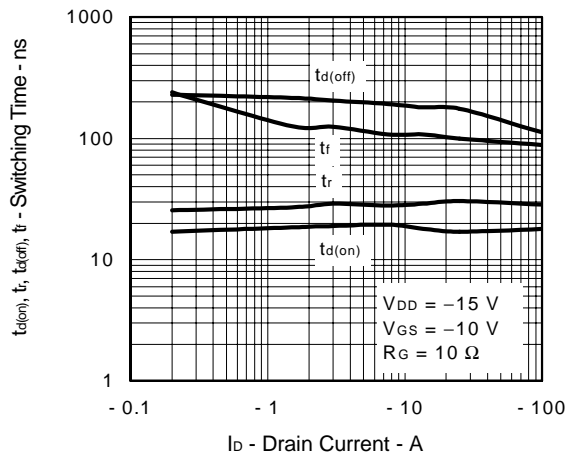
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



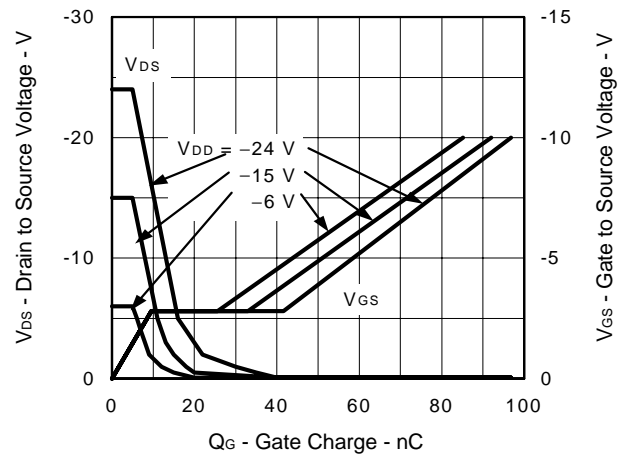
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



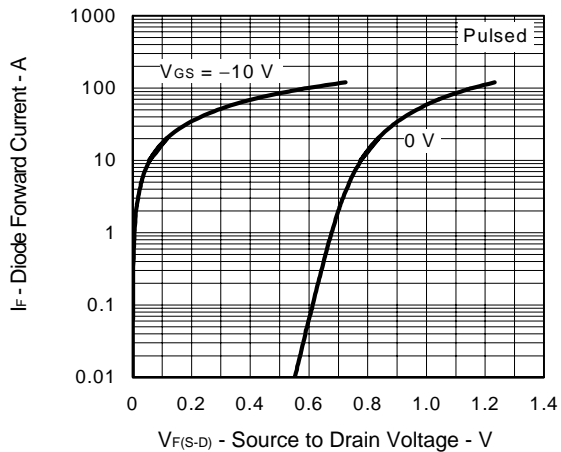
SWITCHING CHARACTERISTICS



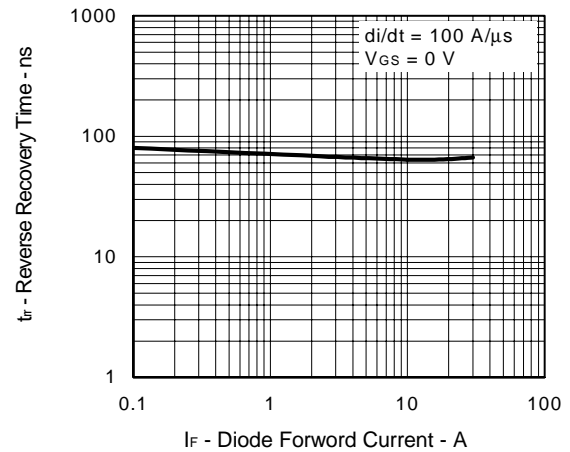
DYNAMIC INPUT/OUTPUT CHARACTERISTICS

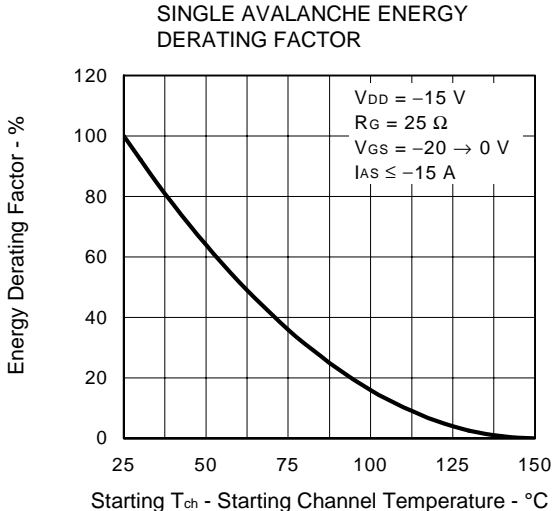
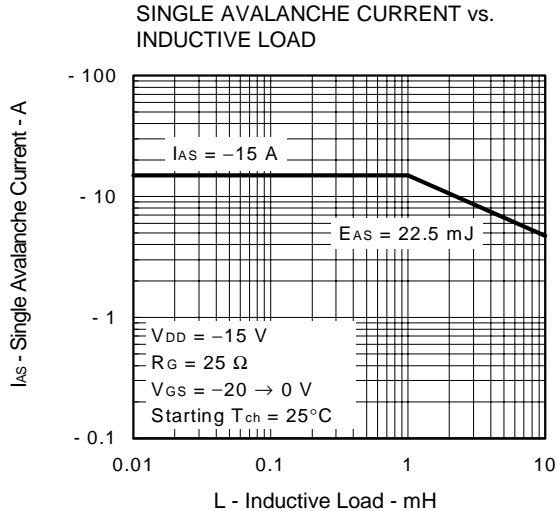


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT





[MEMO]

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