DATA SHEET

MOS FIELD EFFECT TRANSISTOR
μPA2743T1A

SWITCHING
N-CHANNEL POWER MOSFET

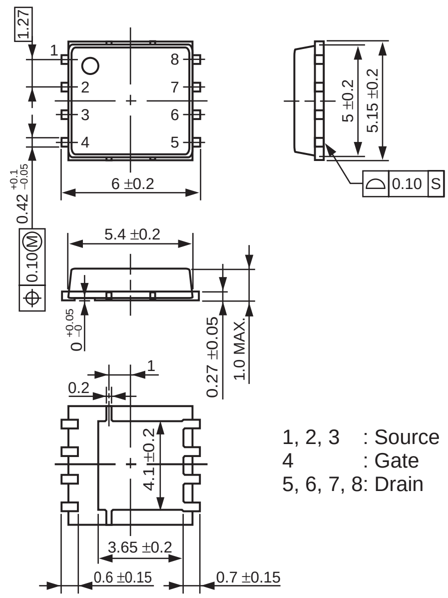
DESCRIPTION

The μPA2743T1A is N-channel MOS Field Effect Transistor designed for power management applications of a notebook computer.

FEATURES

- Low on-state resistance
  $R_{DS(on)1}$ = 3.3 mΩ MAX. (V_{GS} = 10 V, I_D = 15 A)
  $R_{DS(on)2}$ = 4.6 mΩ MAX. (V_{GS} = 4.5 V, I_D = 15 A)
- Built-in gate protection diode
- Thin type surface mount package with heat spreader (8-pin HVSON (6051))
- RoHS Compliant

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)	$I_{D(DC)}$	±29	A
Drain Current (pulse) Note1	$I_{D(pulse)}$	±170	A
Total Power Dissipation Note2	P_{T1}	1.5	W
Total Power Dissipation (PW = 10 sec) Note2	P_{T2}	4.6	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C
Single Avalanche Current Note3	I_{AS}	29	A
Single Avalanche Energy Note3	E_{AS}	84.1	mJ

THERMAL RESISTANCE

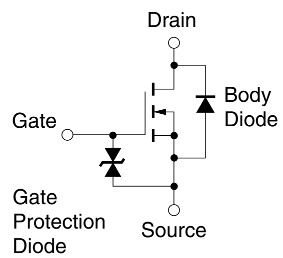
Channel to Ambient Thermal Resistance Note2	$R_{th(ch-A)}$	83.3	°C/W
Channel to Case (Drain) Thermal Resistance	$R_{th(ch-C)}$	1.5	°C/W

Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%

2. Mounted on a glass epoxy board of 25.4 mm x 25.4 mm x 0.8 mmt

3. Starting T_{ch} = 25°C, V_{DD} = 15 V, R_G = 25 Ω, V_{GS} = 20 → 0 V, L = 100 μH

EQUIVALENT CIRCUIT



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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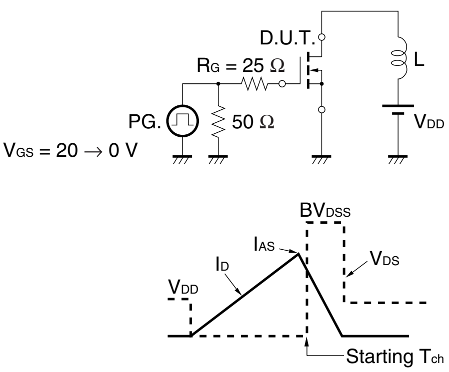
Document No. G19790EJ1V0DS00 (1st edition)
Date Published May 2009 NS
Printed in Japan

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

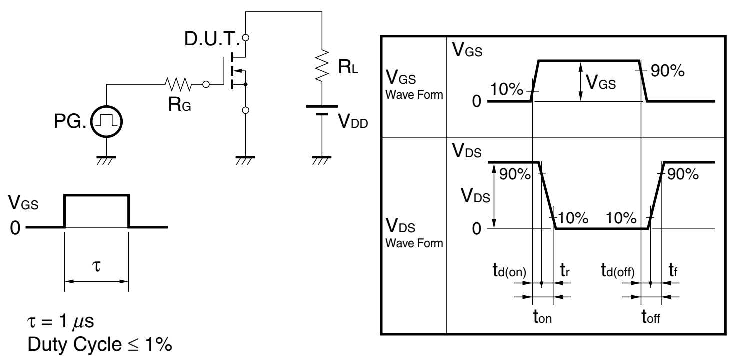
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			10	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0 V			±10	μA
Gate to Source Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 10 V, I_D = 1 mA	1.0		2.5	V
Forward Transfer Admittance Note	$\| y_{fs} \|$	V_{DS} = 10 V, I_D = 15 A	13			S
Drain to Source On-state Resistance Note	$R_{DS(on)1}$	V_{GS} = 10 V, I_D = 15 A		2.1	3.3	mΩ
	$R_{DS(on)2}$	V_{GS} = 4.5 V, I_D = 15 A		3.7	4.6	mΩ
Input Capacitance	C_{iss}	V_{DS} = 15 V,		5080		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V,		650		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		380		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15 V, I_D = 15 A,		28		ns
Rise Time	t_r	V_{GS} = 10 V,		29		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 10 Ω		109		ns
Fall Time	t_f			32		ns
Total Gate Charge	Q_G	V_{DD} = 15 V,		39		nC
Gate to Source Charge	Q_{GS}	V_{GS} = 5 V,		16		nC
Gate to Drain Charge	Q_{GD}	I_D = 29 A		17		nC
Body Diode Forward Voltage Note	$V_{F(S-D)}$	I_F = 29 A, V_{GS} = 0 V		0.79	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 29 A, V_{GS} = 0 V,		38		ns
Reverse Recovery Charge	Q_{rr}	di/dt = 100 A/μs		39		nC

Note Pulsed

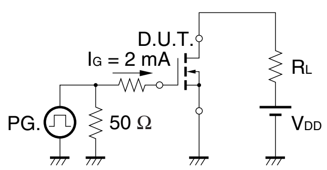
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

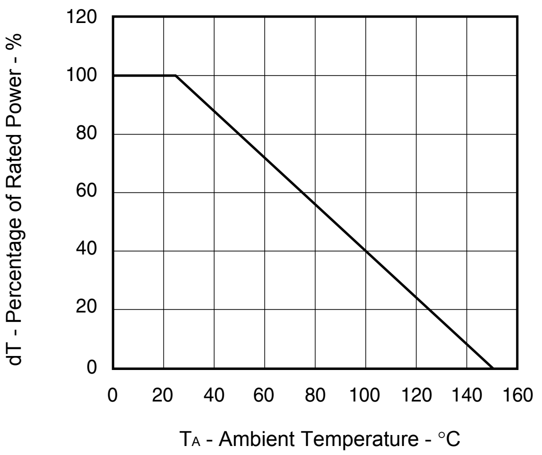


TEST CIRCUIT 3 GATE CHARGE

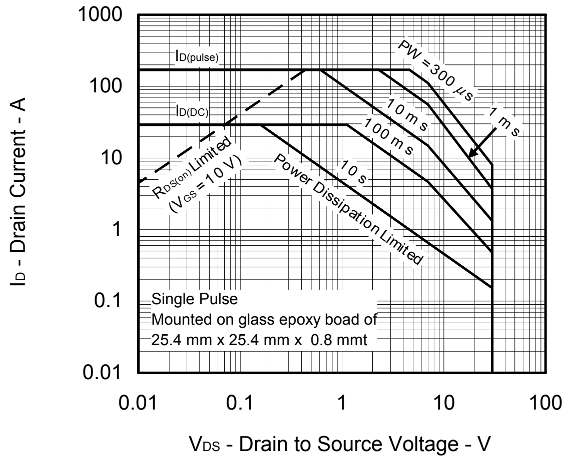


TYPICAL CHARACTERISTICS (T_A = 25°C)

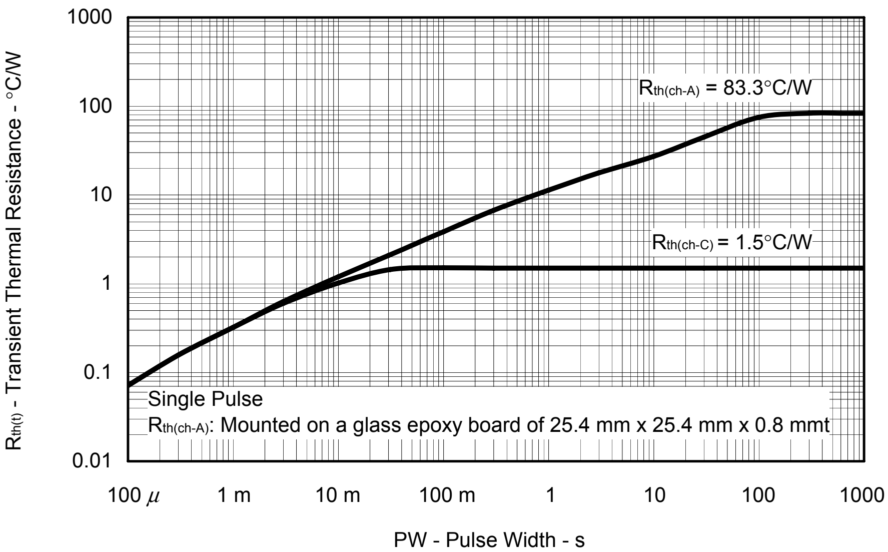
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



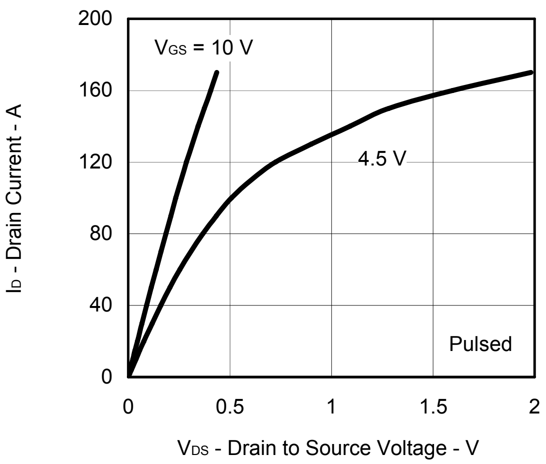
FORWARD BIAS SAFE OPERATING AREA



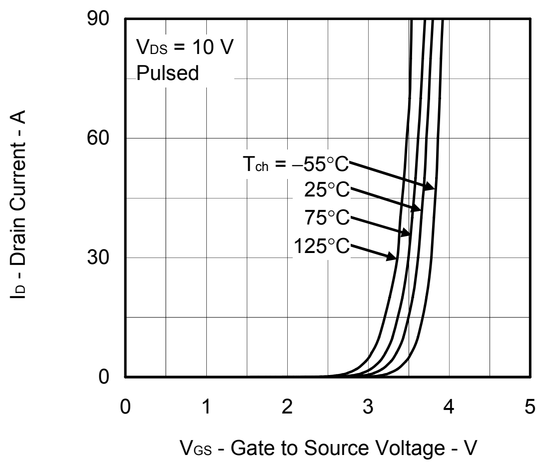
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



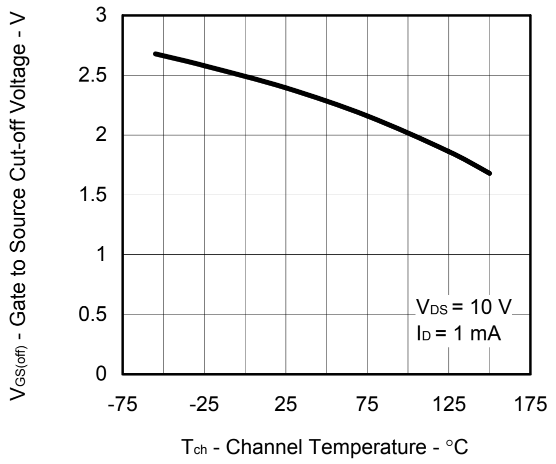
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



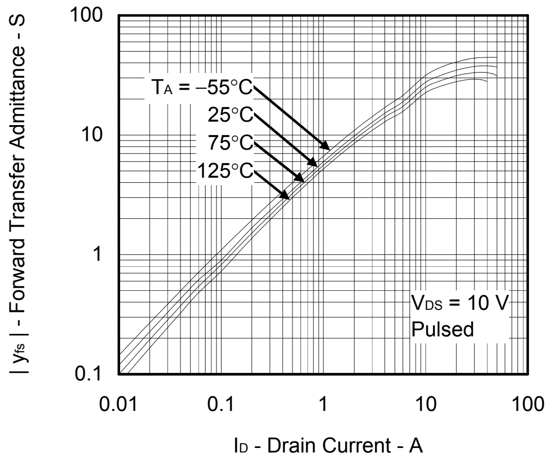
FORWARD TRANSFER CHARACTERISTICS



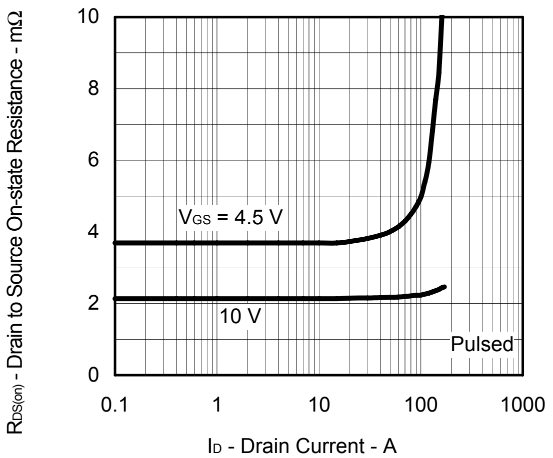
GATE TO SOURCE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



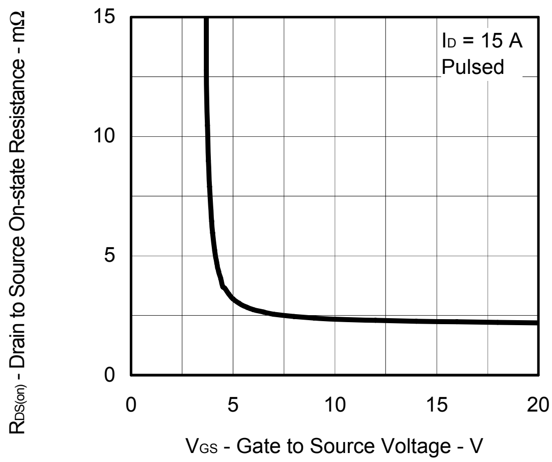
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



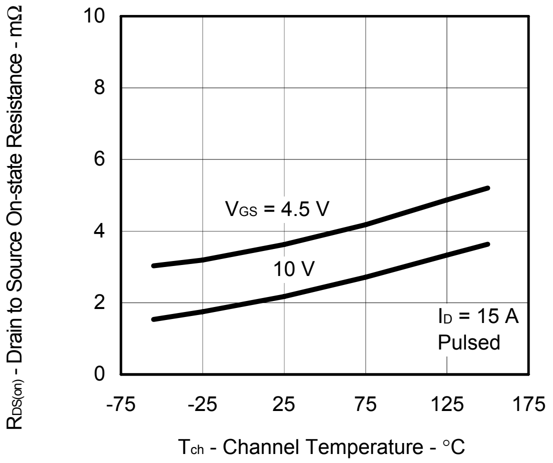
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



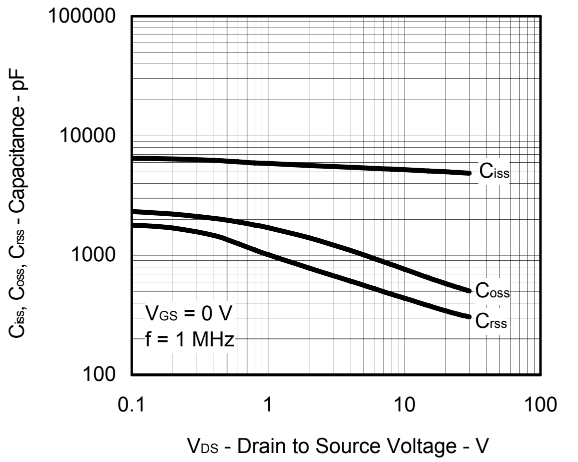
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



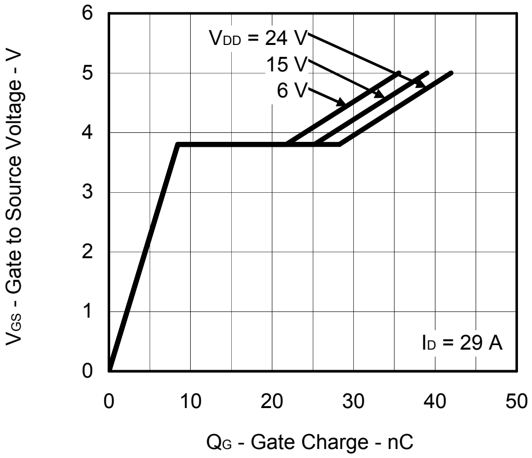
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
CHANNEL TEMPERATURE



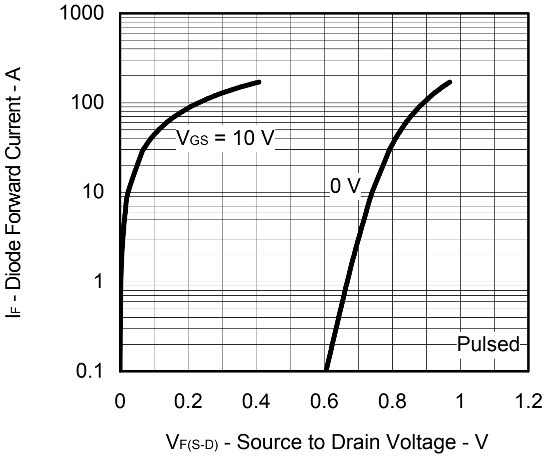
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



ORDERING INFORMATION

PART NUMBER	LEAD PLATING	PACKING	PACKAGE
μPA2743T1A-E1-AY Note	Pure Sn	Tape 3000 p/reel	8-pin HVSON (6051) 0.10 g TYP.
μPA2743T1A-E2-AY Note			

Note Pb-free (This product does not contain Pb in the external electrode.)