μPA2812T1L

P-channel MOS FIELD EFFECT TRANSISTOR

RK-UD-11-0117
Rev.1.00
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Description

The μPA2812T1L is P-channel MOS Field Effect Transistor designed for DC/DC converter and power management applications of portable equipment.

Features

- V_{DSS} −30 V (T_A = 25°C)
- Low on-state resistance
  — $R_{DS(on)}$ = 4.8 mΩ MAX. (V_{GS} = −10 V, I_D = −30 A)
- 4.5 V Gate-drive available
- Small & thin type surface mount package with heat spreader (8-pin HVSON)
- Pb-free and Halogen free

Ordering Information

Part No.	LEAD PLATING	PACKING	Package
μPA2812T1L-E1-AT	Pure Sn	Tape 3000 p/reel	8-pin HVSON (3333) typ. 0.028 g
μPA2812T1L-E2-AT			

Absolute Maximum Ratings (T_A = 25°C)

Item	Symbol	Ratings	Unit
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) (T_C = 25°C)	$I_{D(DC)}$	±30	A
Drain Current (pulse) *1	$I_{D(pulse)}$	±120	A
Total Power Dissipation *2	P_{T1}	1.5	W
Total Power Dissipation (PW = 10 sec) *2	P_{T2}	3.8	W
Total Power Dissipation (T_C = 25°C)	P_{T3}	52	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	−55 to +150	°C
Single Avalanche Current *3	I_{AS}	25	A
Single Avalanche Energy *3	E_{AS}	62	mJ

Thermal Resistance

Channel to Ambient Thermal Resistance *2	$R_{th(ch-A)}$	83.3	°C/W
Channel to Case (Drain) Thermal Resistance	$R_{th(ch-C)}$	2.4	°C/W

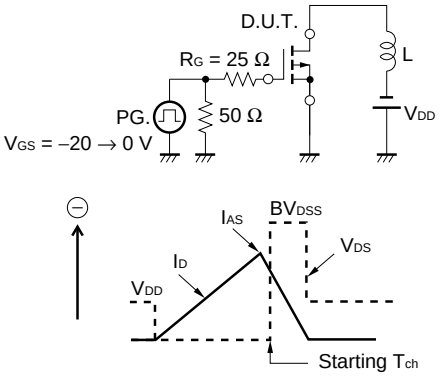
Notes: *1. PW ≤ 10 μs, Duty Cycle ≤ 1%
*2. Mounted on a glass epoxy board of 25.4 mm x 25.4 mm x 0.8 mmt
*3. Starting T_{ch} = 25°C, V_{DD} = −15 V, R_G = 25 Ω, V_{GS} = −20 → 0 V, L = 100 μH

Electrical Characteristics (T_A = 25°C)

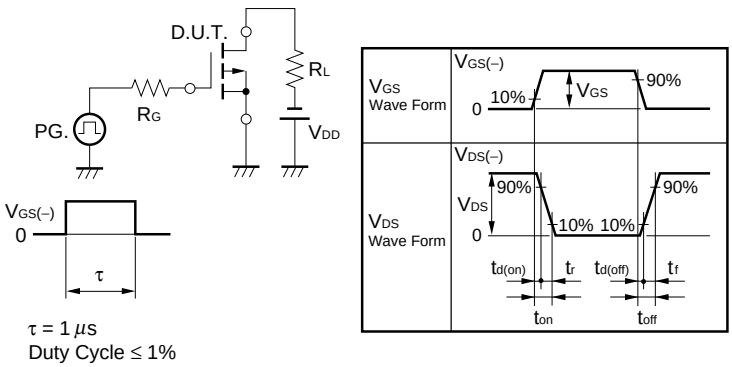
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero Gate Voltage Drain Current	I_{DSS}			−1	μA	V_{DS} = −30 V, V_{GS} = 0 V
Gate Leakage Current	I_{GSS}			±100	nA	V_{GS} = ±20 V, V_{DS} = 0 V
Gate Cut-off Voltage	$V_{GS(off)}$	−1.0		−2.5	V	V_{DS} = −10 V, I_D = −1 mA
Forward Transfer Admittance *1	$\|y_{fs}\|$	8.0			S	V_{DS} = −10 V, I_D = −15 A
Drain to Source On-state Resistance *1	$R_{DS(on)1}$		3.8	4.8	mΩ	V_{GS} = −10 V, I_D = −30 A
	$R_{DS(on)2}$		6.4	9.9	mΩ	V_{GS} = −4.5 V, I_D = −15 A
Input Capacitance	C_{iss}		3740		pF	V_{DS} = −10 V,
Output Capacitance	C_{oss}		1780		pF	V_{GS} = 0 V,
Reverse Transfer Capacitance	C_{rss}		1500		pF	f = 1 MHz
Turn-on Delay Time	$t_{d(on)}$		24		ns	V_{DD} = −15 V, I_D = −15 A,
Rise Time	t_r		53		ns	V_{GS} = −10 V,
Turn-off Delay Time	$t_{d(off)}$		180		ns	R_G = 10 Ω
Fall Time	t_f		250		ns	
Total Gate Charge	Q_G		100		nC	V_{DD} = −24 V,
Gate to Source Charge	Q_{GS}		11		nC	V_{GS} = −10 V,
Gate to Drain Charge	Q_{GD}		48		nC	I_D = −30 A
Body Diode Forward Voltage *1	$V_{F(S-D)}$		0.85		V	I_F = 30 A, V_{GS} = 0 V
Reverse Recovery Time	t_{rr}		196		ns	I_F = 30 A, V_{GS} = 0 V,
Reverse Recovery Charge	Q_{rr}		297		nC	di/dt = 100 A/μs

Note: *1. Pulsed

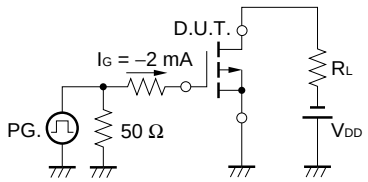
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

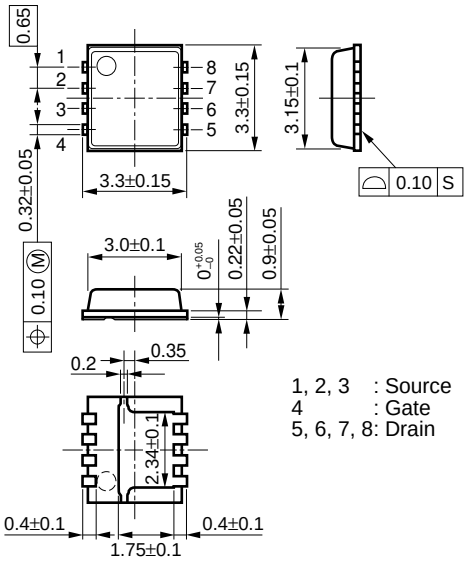


TEST CIRCUIT 3 GATE CHARGE

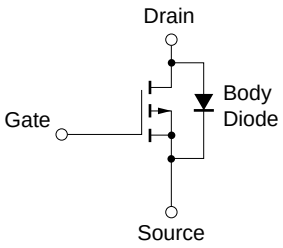


Package Drawings (Unit: mm)

8-pin HVSON (3333)



Equivalent Circuit



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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