

N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

The μ PA2451 is a switching device which can be driven directly by a 2.5 V power source.

The μ PA2451 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

- Can be driven by a 2.5 V power source
- Low on-state resistance
 - $R_{DS(on)1} = 23 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 4.0 \text{ A)}$
 - $R_{DS(on)2} = 24 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 4.0 \text{ A)}$
 - $R_{DS(on)3} = 29 \text{ m}\Omega \text{ MAX. (} V_{GS} = 3.1 \text{ V, } I_D = 4.0 \text{ A)}$
 - $R_{DS(on)4} = 37 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 4.0 \text{ A)}$
- Built-in G-S protection diode against ESD

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA2451TL	6PIN VSON

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

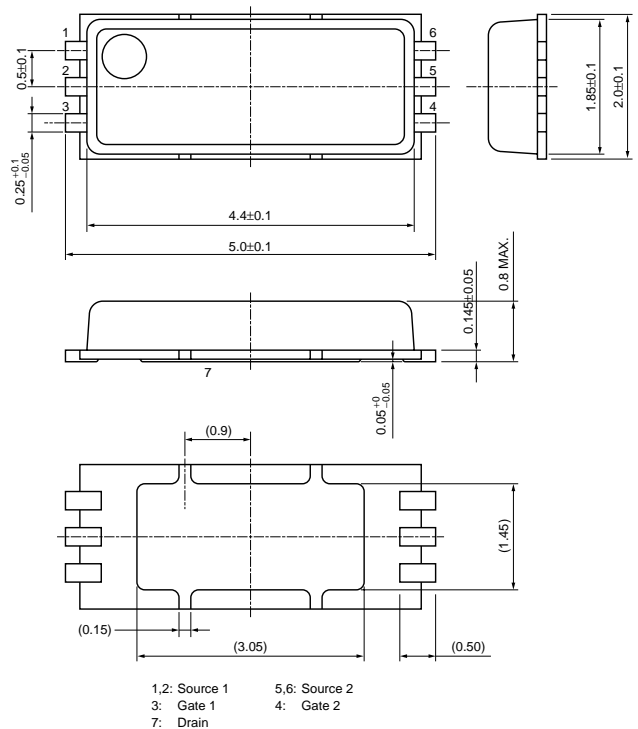
Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 12	V
Drain Current (DC) ($T_C = 25^\circ\text{C}$)	$I_{D(DC)}$	± 8.2	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	± 80	A
Total Power Dissipation (2unit) ^{Note2}	P_{T1}	2.5	W
Total Power Dissipation (2unit) ^{Note3}	P_{T2}	T.B.D.	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \text{ to } +150$	$^\circ\text{C}$

- Notes**
1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$
 2. $T_A = 25^\circ\text{C}$ Mounted on ceramic board
 3. $T_C = 25^\circ\text{C}$ Mounted on ceramic board

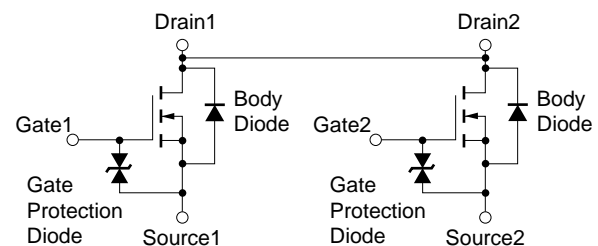
- Remarks**
1. The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.
 2. T.B.D. (To be determined.)

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

PACKAGE DRAWING (Unit : mm)



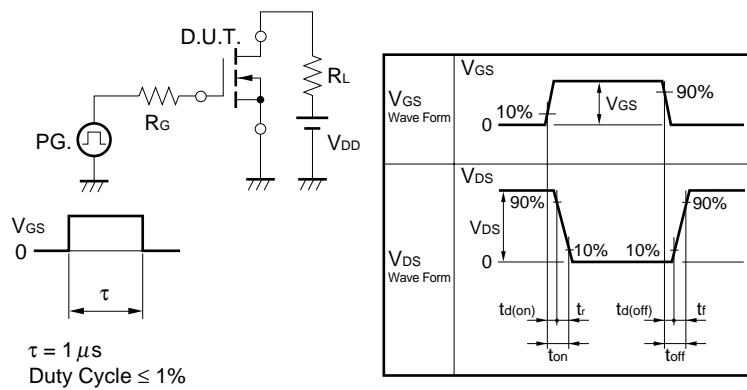
EQUIVALENT CIRCUIT



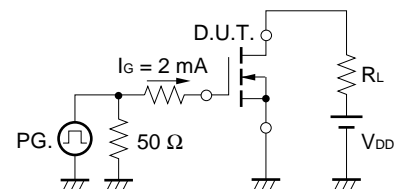
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

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} = ±12 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.5	1.0	1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 4.0 A	T.B.D.			S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 4.5 V, I _D = 4.0 A	13.8	18.5	23	mΩ
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 4.0 A	14.2	19	24	mΩ
	R _{DS(on)3}	V _{GS} = 3.1 V, I _D = 4.0 A	16	21.5	29	mΩ
	R _{DS(on)4}	V _{GS} = 2.5 V, I _D = 4.0 A	17.8	27.5	37	mΩ
Input Capacitance	C _{iss}	V _{DS} = 10 V		T.B.D.		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		T.B.D.		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		T.B.D.		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 10 V, I _D = 4.0 A		T.B.D.		ns
Rise Time	t _r	V _{GS} = 10 V		T.B.D.		ns
Turn-off Delay Time	t _{d(off)}	R _G = 6 Ω		T.B.D.		ns
Fall Time	t _f			T.B.D.		ns
Total Gate Charge	Q _G	V _{DD} = 24 V		T.B.D.		nC
Gate to Source Charge	Q _{GS}	V _{GS} = 10 V		T.B.D.		nC
Gate to Drain Charge	Q _{GD}	I _D = 8.2 A		T.B.D.		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 8.2 A, V _{GS} = 0 V		T.B.D.		V
Reverse Recovery Time	t _{rr}	I _F = 8.2 A, V _{GS} = 0 V		T.B.D.		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		T.B.D.		nC

TEST CIRCUIT 1 SWITCHING TIME



TEST CIRCUIT 2 GATE CHARGE



[MEMO]

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