

N-CHANNEL MOS FIELD EFFECT TRANSISTOR  
 FOR SWITCHING

DESCRIPTION

The  $\mu$ PA2450 is a switching device which can be driven directly by a 2.5 V power source.

The  $\mu$ PA2450 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  
 $R_{DS(on)1} = 17.5 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 4.0 \text{ A)}$   
 $R_{DS(on)2} = 18.5 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 4.0 \text{ A)}$   
 $R_{DS(on)3} = 22.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 3.1 \text{ V, } I_D = 4.0 \text{ A)}$   
 $R_{DS(on)4} = 27.5 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 4.0 \text{ A)}$
- Built-in G-S protection diode against ESD

ORDERING INFORMATION

| PART NUMBER    | PACKAGE   |
|----------------|-----------|
| $\mu$ PA2450TL | 6PIN VSON |

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

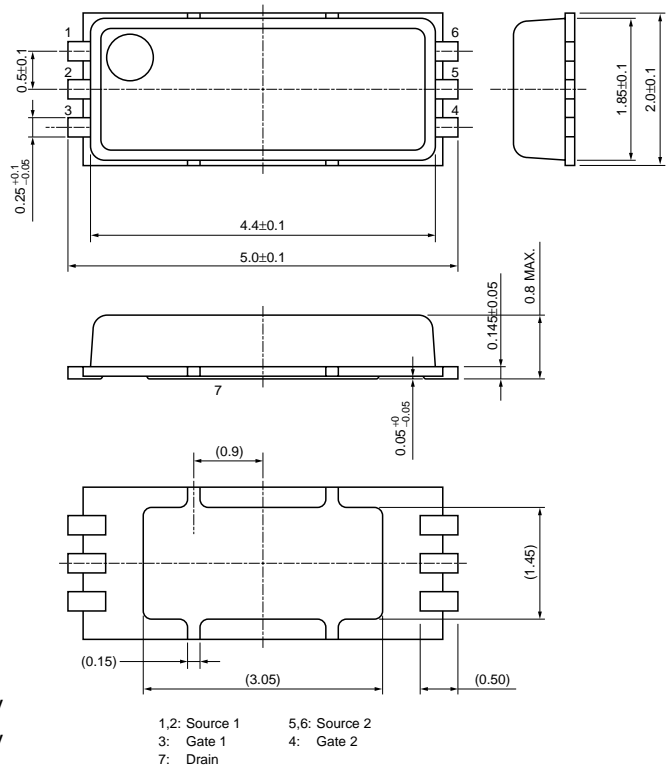
|  |                |             |                  |
|--|----------------|-------------|------------------|
| Drain to Source Voltage ( $V_{GS} = 0 \text{ V}$ ) | $V_{DSS}$      | 20          | V                |
| Gate to Source Voltage ( $V_{DS} = 0 \text{ V}$ )  | $V_{GSS}$      | $\pm 12$    | V                |
| Drain Current (DC) ( $T_C = 25^\circ\text{C}$ )    | $I_{D(DC)}$    | $\pm 8.6$   | A                |
| Drain Current (pulse) <sup>Note1</sup>             | $I_{D(pulse)}$ | $\pm 80$    | A                |
| Total Power Dissipation (2 unit) <sup>Note2</sup>  | $P_{T1}$       | 2.5         | W                |
| Total Power Dissipation (2 unit) <sup>Note3</sup>  | $P_{T2}$       | T.B.D.      | W                |
| Channel Temperature                                | $T_{ch}$       | 150         | $^\circ\text{C}$ |
| Storage Temperature                                | $T_{stg}$      | -55 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.

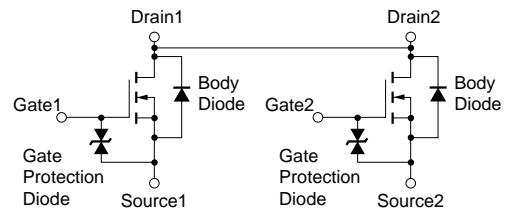
- Remarks 1. The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.  
 2. T.B.D. (To be determined.)

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)



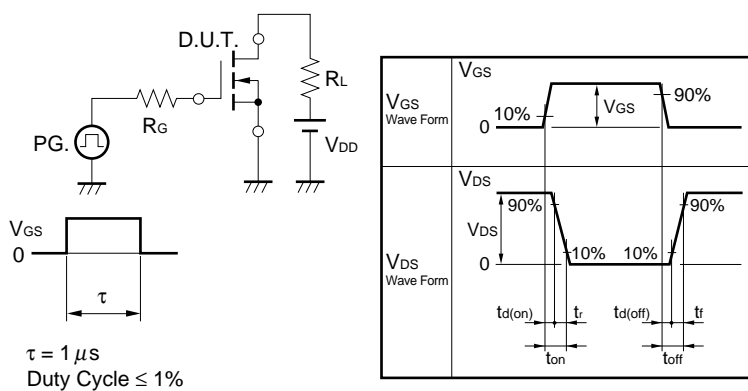
EQUIVALENT CIRCUIT



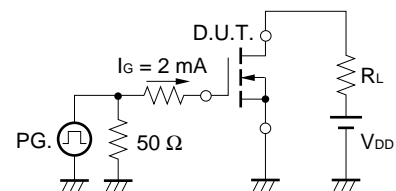
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

| CHARACTERISTICS                     | SYMBOL               | TEST CONDITIONS                                 | MIN. | TYP.   | MAX. | UNIT |
|-------------------------------------|----------------------|---|------|--------|------|------|
| Zero Gate Voltage Drain Current     | I <sub>DSS</sub>     | V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V   |      |        | 10   | μA   |
| Gate Leakage Current                | I <sub>GSS</sub>     | V <sub>GS</sub> = ±12 V, V <sub>DS</sub> = 0 V  |      |        | ±10  | μA   |
| Gate Cut-off Voltage                | V <sub>GS(off)</sub> | V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA   | 0.5  | 1.0    | 1.5  | V    |
| Forward Transfer Admittance         | y <sub>fs</sub>      | V <sub>DS</sub> = 10 V, I <sub>D</sub> = 4.0 A  | 5    |        |      | S    |
| Drain to Source On-state Resistance | R <sub>DS(on)1</sub> | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 4.0 A | 11   | 14     | 17.5 | mΩ   |
|                                     | R <sub>DS(on)2</sub> | V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 4.0 A | 11.5 | 14.5   | 18.5 | mΩ   |
|                                     | R <sub>DS(on)3</sub> | V <sub>GS</sub> = 3.1 V, I <sub>D</sub> = 4.0 A | 12.0 | 16.5   | 22.0 | mΩ   |
|                                     | R <sub>DS(on)4</sub> | V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 4.0 A | 15.3 | 20.5   | 27.5 | mΩ   |
| Input Capacitance                   | C <sub>iss</sub>     | V <sub>DS</sub> = 10 V                          |      | T.B.D. |      | pF   |
| Output Capacitance                  | C <sub>oss</sub>     | V <sub>GS</sub> = 0 V                           |      | T.B.D. |      | pF   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     | f = 1 MHz                                       |      | T.B.D. |      | pF   |
| Turn-on Delay Time                  | t <sub>d(on)</sub>   | V <sub>DD</sub> = 10 V, I <sub>D</sub> = 4.0 A  |      | T.B.D. |      | ns   |
| Rise Time                           | t <sub>r</sub>       | V <sub>GS</sub> = 10 V                          |      | T.B.D. |      | ns   |
| Turn-off Delay Time                 | t <sub>d(off)</sub>  | R <sub>G</sub> = 6 Ω                            |      | T.B.D. |      | ns   |
| Fall Time                           | t <sub>f</sub>       |   |      | T.B.D. |      | ns   |
| Total Gate Charge                   | Q <sub>G</sub>       | V <sub>DD</sub> = 16 V                          |      | T.B.D. |      | nC   |
| Gate to Source Charge               | Q <sub>GS</sub>      | V <sub>GS</sub> = 10 V                          |      | T.B.D. |      | nC   |
| Gate to Drain Charge                | Q <sub>GD</sub>      | I <sub>D</sub> = 8.6 A                          |      | T.B.D. |      | nC   |
| Body Diode Forward Voltage          | V <sub>F(S-D)</sub>  | I <sub>F</sub> = 8.6 A, V <sub>GS</sub> = 0 V   |      | 0.83   |      | V    |
| Reverse Recovery Time               | t <sub>rr</sub>      | I <sub>F</sub> = 8.6 A, V <sub>GS</sub> = 0 V   |      | T.B.D. |      | ns   |
| Reverse Recovery Charge             | Q <sub>rr</sub>      | di/dt = 100 A/μs                                |      | T.B.D. |      | nC   |

**TEST CIRCUIT 1 SWITCHING TIME**



**TEST CIRCUIT 2 GATE CHARGE**



[MEMO]

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