

# μPA1901

## DESCRIPTION

The μPA1901 is a switching device, which can be driven directly by a 2.5 V power source.

This device 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

- 2.5 V drive available
- Low on-state resistance  
 $R_{DS(on)1} = 39 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 3.5 \text{ A)}$   
 $R_{DS(on)2} = 40 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 3.5 \text{ A)}$   
 $R_{DS(on)3} = 54 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 3.5 \text{ A)}$

## ORDERING INFORMATION

| PART NUMBER | PACKAGE                     |
|-------------|-----------------------------|
| μPA1901TE   | SC-95 (Mini Mold Thin Type) |

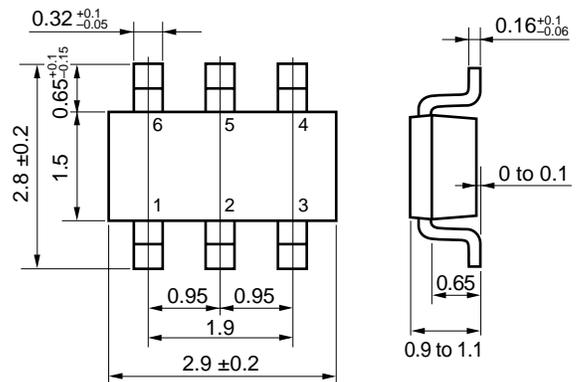
Marking : TQ

## ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

|   |                       |             |    |
|---|-----------------------|-------------|----|
| Drain to Source Voltage (V <sub>GS</sub> = 0 V) | V <sub>DSS</sub>      | 30          | V  |
| Gate to Source Voltage (V <sub>DS</sub> = 0 V)  | V <sub>GSS</sub>      | ±12         | V  |
| Drain Current (DC) (T <sub>A</sub> = 25°C)      | I <sub>D(DC)</sub>    | ±6.5        | A  |
| Drain Current (pulse) <sup>Note1</sup>          | I <sub>D(pulse)</sub> | ±26         | A  |
| Total Power Dissipation                         | P <sub>T1</sub>       | 0.2         | W  |
| Total Power Dissipation <sup>Note2</sup>        | P <sub>T2</sub>       | 2.0         | W  |
| Channel Temperature                             | T <sub>ch</sub>       | 150         | °C |
| Storage Temperature                             | T <sub>stg</sub>      | -55 to +150 | °C |

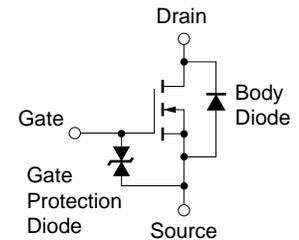
- Notes** 1.  $PW \leq 10 \mu s$ , Duty Cycle  $\leq 1\%$   
 2. Mounted on FR-4 board,  $t \leq 5 \text{ sec.}$

## PACKAGE DRAWING (Unit : mm)



1, 2, 5, 6 : Drain  
 3 : Gate  
 4 : Source

## EQUIVALENT CIRCUIT

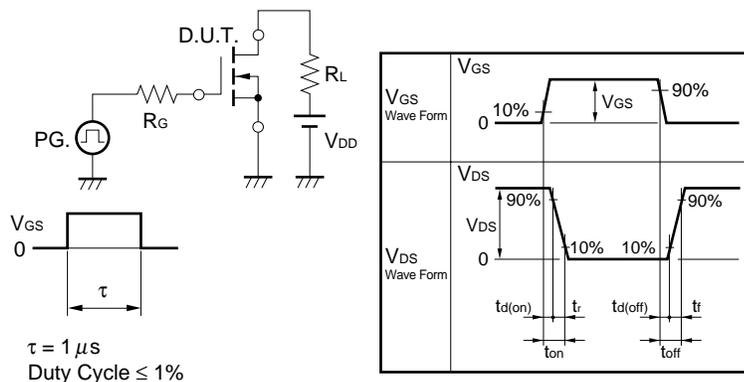


# μPA1901

## 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> = 30 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 to Source Cut-off Voltage      | V <sub>GS(off)</sub> | V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1.0 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> = 3.5 A  | 3.0  | 7.9  |      | S    |
| Drain to Source On-state Resistance | R <sub>DS(on)1</sub> | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 3.5 A |      | 31   | 39   | mΩ   |
|                                     | R <sub>DS(on)2</sub> | V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 3.5 A |      | 32   | 40   | mΩ   |
|                                     | R <sub>DS(on)3</sub> | V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 3.5 A |      | 40   | 54   | mΩ   |
| Input Capacitance                   | C <sub>iss</sub>     | V <sub>DS</sub> = 10 V                          |      | 470  |      | pF   |
| Output Capacitance                  | C <sub>oss</sub>     | V <sub>GS</sub> = 0 V                           |      | 100  |      | pF   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     | f = 1.0 MHz                                     |      | 60   |      | pF   |
| Turn-on Delay Time                  | t <sub>d(on)</sub>   | V <sub>DD</sub> = 10 V, I <sub>D</sub> = 3.5 A  |      | 35   |      | ns   |
| Rise Time                           | t <sub>r</sub>       | V <sub>GS</sub> = 4.0 V                         |      | 110  |      | ns   |
| Turn-off Delay Time                 | t <sub>d(off)</sub>  | R <sub>G</sub> = 10 Ω                           |      | 170  |      | ns   |
| Fall Time                           | t <sub>f</sub>       |   |      | 130  |      | ns   |
| Total Gate Charge                   | Q <sub>G</sub>       | V <sub>DD</sub> = 24 V                          |      | 5.4  |      | nC   |
| Gate to Source Charge               | Q <sub>GS</sub>      | V <sub>GS</sub> = 4.0 V                         |      | 1.1  |      | nC   |
| Gate to Drain Charge                | Q <sub>GD</sub>      | I <sub>D</sub> = 6.5 A                          |      | 2.4  |      | nC   |
| Diode Forward Voltage               | V <sub>F(S-D)</sub>  | I <sub>F</sub> = 6.5 A, V <sub>GS</sub> = 0 V   |      | 0.9  |      | V    |

### TEST CIRCUIT 1 SWITCHING TIME



### TEST CIRCUIT 2 GATE CHARGE

