

## Features

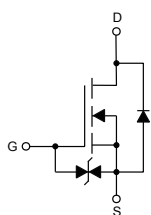
- High Density Cell Design for Low  $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

- Operating Junction Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Storage Temperature:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Thermal Resistance:  $625^{\circ}\text{C/W}$  Junction to Ambient

| Parameter                | Symbol   | Rating   | Unit |
|--------------------------|----------|----------|------|
| Drain-Source Voltage     | $V_{DS}$ | 60       | V    |
| Gate-Source Voltage      | $V_{GS}$ | $\pm 20$ | V    |
| Drain Current-Continuous | $I_D$    | 0.34     | A    |
| Power Dissipation        | $P_D$    | 0.20     | W    |

## Internal Structure

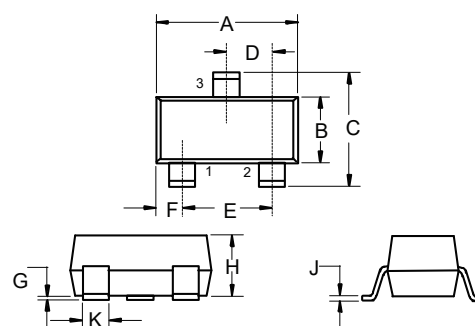


1. GATE
2. SOURCE
3. DRAIN

**Marking: 72K**

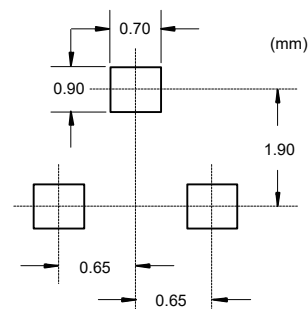
## N-Channel MOSFET

## SOT-323



| DIM | INCHES |       | MM   |      | NOTE |
|-----|--------|-------|------|------|------|
|     | MIN    | MAX   | MIN  | MAX  |      |
| A   | 0.071  | 0.087 | 1.80 | 2.20 |      |
| B   | 0.045  | 0.053 | 1.15 | 1.35 |      |
| C   | 0.083  | 0.096 | 2.10 | 2.45 |      |
| D   | 0.026  |       | 0.65 |      | TYP. |
| E   | 0.047  | 0.055 | 1.20 | 1.40 |      |
| F   | 0.012  | 0.016 | 0.30 | 0.40 |      |
| G   | 0.000  | 0.004 | 0.00 | 0.10 |      |
| H   | 0.035  | 0.044 | 0.90 | 1.10 |      |
| J   | 0.002  | 0.010 | 0.05 | 0.25 |      |
| K   | 0.006  | 0.016 | 0.15 | 0.40 |      |

### Suggested Solder Pad Layout



**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)**

| Parameter                                   | Symbol               | Test conditions                                                                                               | Min   | Typ | Max | Unit |
|---------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------|-------|-----|-----|------|
| Static Characteristics                      |                      |                                                                                                               |       |     |     |      |
| Drain-Source Breakdown Voltage              | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                                    | 60    |     |     | V    |
| Gate-Threshold Voltage <sup>(1)</sup>       | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA                                                        | 1.0   |     | 2.5 | V    |
| Zero Gate Voltage Drain Current             | I <sub>DSS</sub>     | V <sub>DS</sub> =48V, V <sub>GS</sub> =0V                                                                     |       |     | 1.0 | μA   |
| Gate-Body Leakage Current                   | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                                    |       |     | ±10 | μA   |
| Drain-Source On-Resistance <sup>(1)</sup>   | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =500mA                                                                   |       |     | 5.0 | Ω    |
|                                             |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA                                                                  |       |     | 5.3 |      |
| Diode Forward Voltage                       | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =300mA                                                                    |       |     | 1.5 | V    |
| Recovered Charge                            | Q <sub>r</sub>       | V <sub>GS</sub> =0V, I <sub>S</sub> =300mA,V <sub>R</sub> =25V<br>dl/dt=-100A/μs                              |       | 30  |     | nC   |
| Dynamic Characteristics                     |                      |                                                                                                               |       |     |     |      |
| Input Capacitance <sup>(2)</sup>            | C <sub>iss</sub>     | V <sub>DS</sub> =10V,V <sub>GS</sub> =0V, f=1MHz                                                              |       |     | 40  | pF   |
| Output Capacitance <sup>(2)</sup>           | C <sub>oss</sub>     |                                                                                                               |       |     | 30  |      |
| Reverse Transfer Capacitance <sup>(2)</sup> | C <sub>rss</sub>     |                                                                                                               |       |     | 10  |      |
| Switching Characteristics                   |                      |                                                                                                               |       |     |     |      |
| Turn-On Delay Time <sup>(2)</sup>           | t <sub>d(on)</sub>   | V <sub>DD</sub> =50V,V <sub>GS</sub> =10V,R <sub>L</sub> =250Ω,<br>R <sub>GS</sub> =50Ω,R <sub>GEN</sub> =25Ω |       |     | 10  | ns   |
| Turn-Off Delay Time <sup>(2)</sup>          | t <sub>d(off)</sub>  |                                                                                                               |       |     | 15  |      |
| Reverse Recovery Time                       | t <sub>rr</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =300mA,V <sub>R</sub> =25V,<br>dl/dt=-100A/μs                             |       | 30  |     |      |
| Gate-Source Zener Diode                     |                      |                                                                                                               |       |     |     |      |
| Gate-Source Breakdown Voltage               | BV <sub>GSO</sub>    | I <sub>GS</sub> =±1mA (Open Drain)                                                                            | ±21.5 |     | ±30 | V    |

Note: 1. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

2. These Parameters Have No Way to Verify.

## Curve Characteristics

Fig. 1 - Output Characteristics

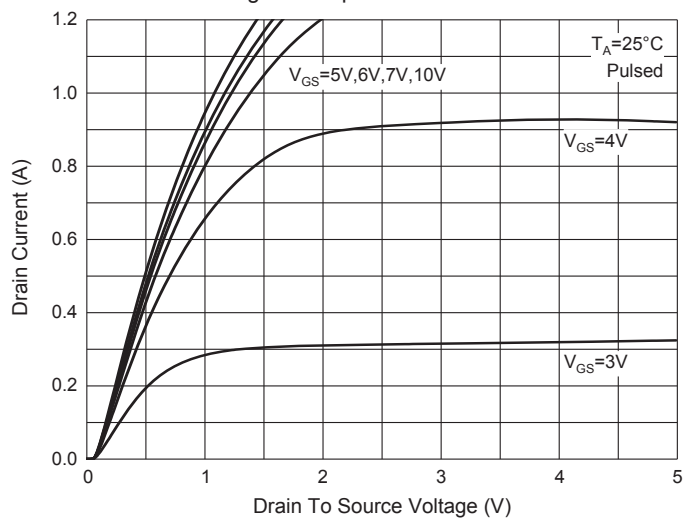


Fig. 2 - Transfer Characteristics

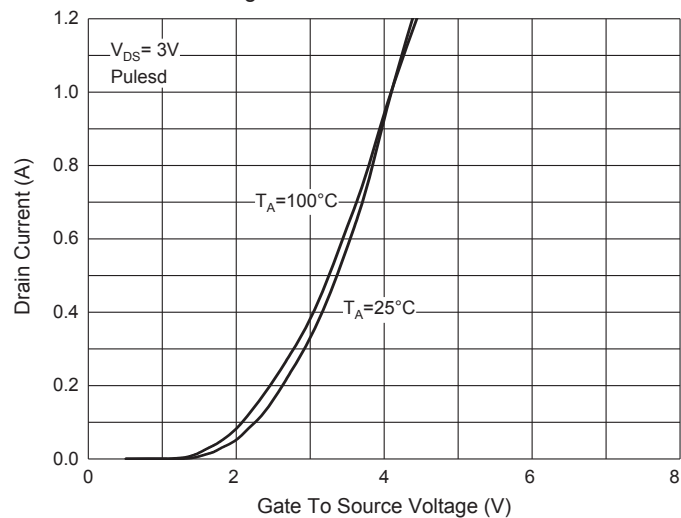


Fig. 3 -  $R_{DS(ON)} - I_D$

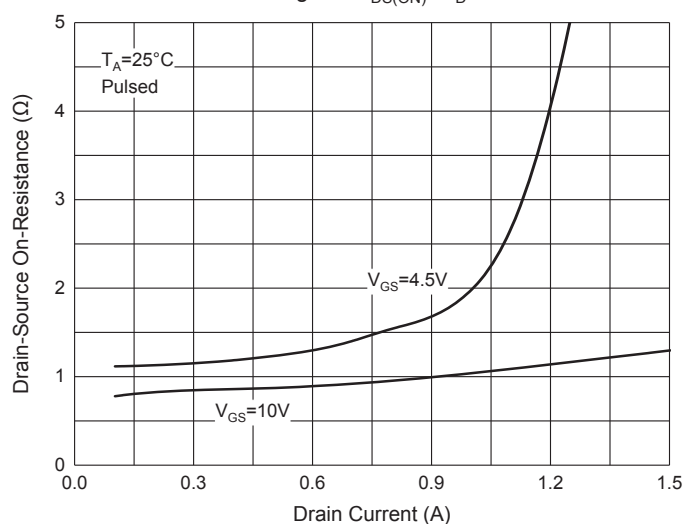


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

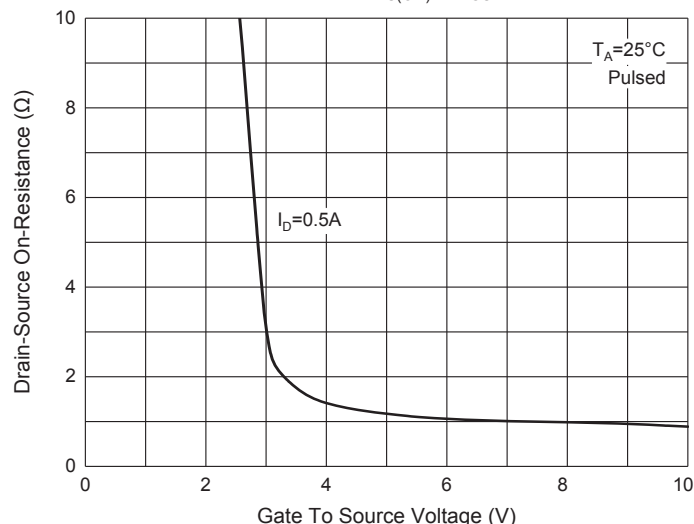


Fig. 5 -  $I_S - V_{SD}$

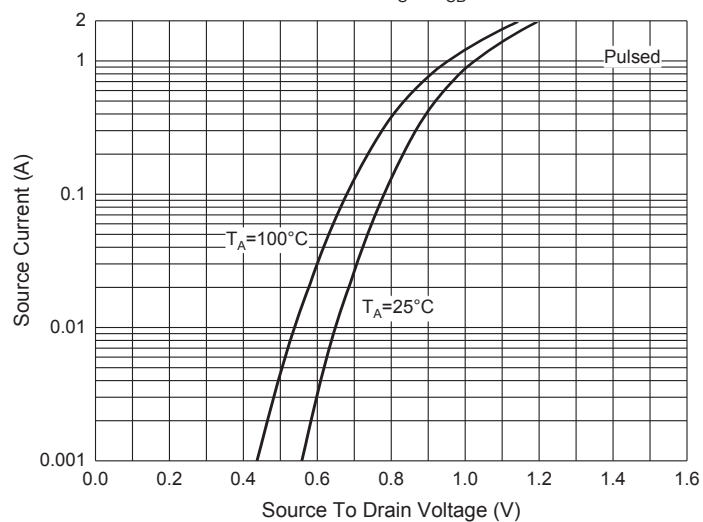
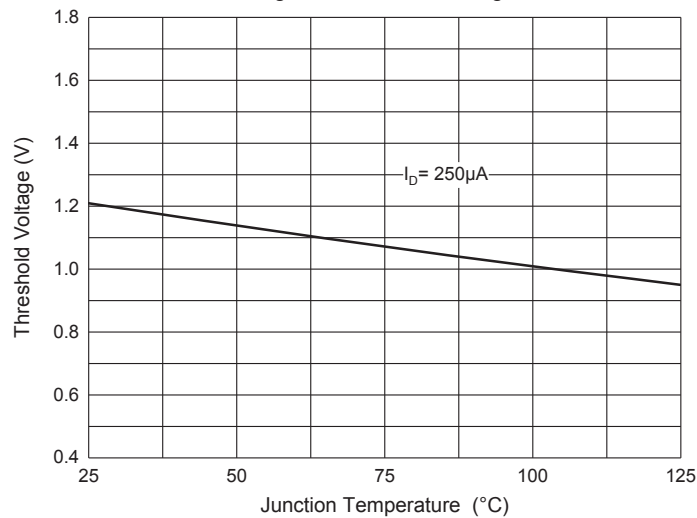


Fig. 6 - Threshold Voltage



## Ordering Information

| Device         | Packing              |
|----------------|----------------------|
| Part Number-TP | Tape&Reel:3Kpcs/Reel |

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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