



## Description

### JMT N-channel MOSFET

#### Features

- $V_{DS}=60V, I_D=0.3A$
- $R_{DS(ON)} < 3.6\Omega @ V_{GS} = 5V$   
 $R_{DS(ON)} < 2.8\Omega @ V_{GS} = 10V$
- ESD Rating HBM 2.3KV
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

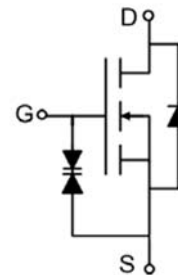
#### Application

- Battery Operated Systems
- Direct logic-level Interface: TTL/CMOS
- Solid-State Relays

#### Package



SOT-23



### Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise specified)

| Symbol          | Parameter                               | Max.                | Units        |
|-----------------|---|---------------------|--------------|
| $V_{DSS}$       | Drain-Source Voltage                    | 60                  | V            |
| $V_{GSS}$       | Gate-Source Voltage                     | $\pm 20$            | V            |
| $I_D$           | Continuous Drain Current                | $T_C = 25^\circ C$  | 0.3          |
|                 |   | $T_C = 100^\circ C$ | 0.24         |
| $I_{DM}$        | Pulsed Drain Current <sup>note1</sup>   | 0.9                 | A            |
| $P_D$           | Power Dissipation                       | $T_C = 25^\circ C$  | 0.35         |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 350                 | $^\circ C/W$ |
| $T_J, T_{STG}$  | Operating and Storage Temperature Range | -55 to +150         | $^\circ C$   |



## Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise specified)

| Symbol  | Parameter   | Test Condition  | Min. | Typ. | Max. | Units |
|---|---|---|------|------|------|-------|
| <b>Off Characteristic</b>                                     |   |   |      |      |      |       |
| V <sub>(BR)DSS</sub>  | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> = 250μA   | 60   | -    | -    | V     |
| I <sub>DSS</sub>  | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =60V, V <sub>GS</sub> = 0V,   | -    | -    | 1    | μA    |
| I <sub>GSS</sub>  | Gate to Body Leakage Current                              | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V   | -    | -    | ±10  | uA    |
| <b>On Characteristics</b>                                     |   |   |      |      |      |       |
| V <sub>GS(th)</sub>   | Gate Threshold Voltage                                    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                    | 1.1  | -    | 2.4  | V     |
| R <sub>DSON</sub>   | Static Drain-Source on-Resistance<br><small>note2</small> | V <sub>GS</sub> =5V, I <sub>D</sub> =0.4A   | -    | -    | 3.6  | Ω     |
|   |   | V <sub>GS</sub> =10V, I <sub>D</sub> =0.5A  | -    | -    | 2.8  |       |
| g <sub>FS</sub>   | Forward Transconductance                                  | V <sub>DS</sub> =10V, I <sub>D</sub> =0.2A  | 0.1  | -    | -    | S     |
| <b>Dynamic Characteristics</b>                                |   |   |      |      |      |       |
| C <sub>iss</sub>  | Input Capacitance   | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                    | -    | 21   | -    | pF    |
| C <sub>oss</sub>  | Output Capacitance  |   | -    | 11   | -    | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                              |   | -    | 4.2  | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge   | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.3A,<br>V <sub>GS</sub> = 4.5V                       | -    | 1.7  | -    | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge  |   | -    | 0.65 | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                               |   | -    | 0.8  | -    | nC    |
| <b>Switching Characteristics</b>                              |   |   |      |      |      |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time  | V <sub>DD</sub> = 30V, I <sub>D</sub> =0.2A,<br>R <sub>GEN</sub> = 10Ω, V <sub>GS</sub> =10V, | -    | 10   | 15   | ns    |
| t <sub>r</sub>  | Turn-on Rise Time   |   | -    | 50   | 85   | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                       |   | -    | 17   | 45   | ns    |
| t <sub>f</sub>  | Turn-off Fall Time  |   | -    | 10   | 20   | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |   |      |      |      |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current  |   | -    | -    | 0.3  | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current      |   | -    | -    | 0.9  | A     |
| V <sub>SD</sub>   | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> = 0V, I <sub>S</sub> =0.2A  | -    | 0.75 | 1.2  | V     |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

## Typical Performance Characteristics

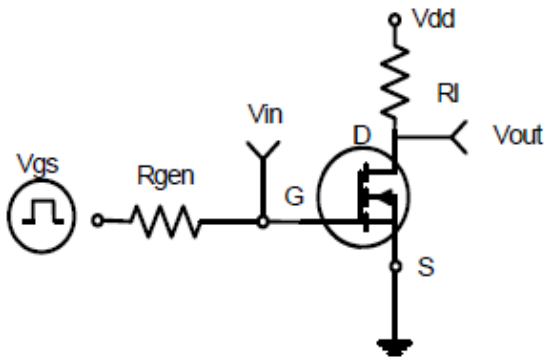


Figure1:Switching Test Circuit

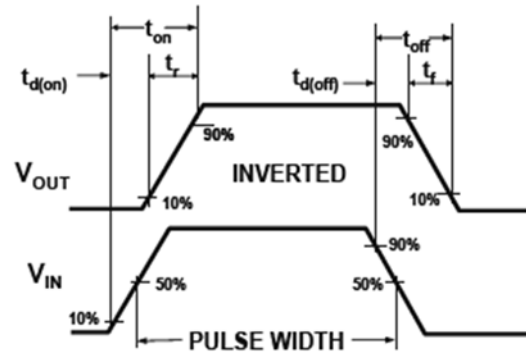
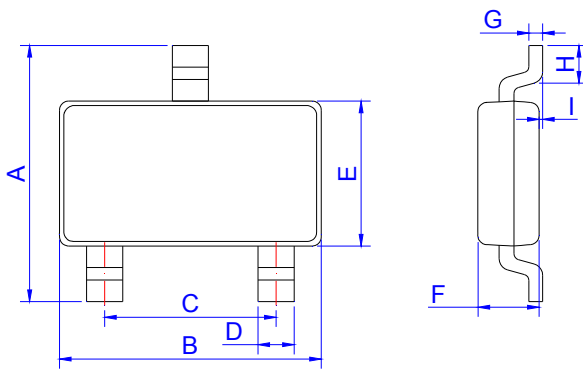


Figure2:Switching Waveforms

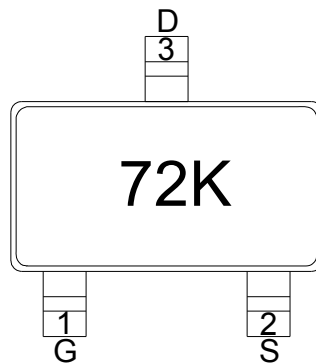
## Package Mechanical Data



SOT-23

| Ref. | Dimensions  |      |      |           |       |       |
|------|-------------|------|------|-----------|-------|-------|
|      | Millimeters |      |      | Inches    |       |       |
|      | Min.        | Typ. | Max. | Min.      | Typ.  | Max.  |
| A    | 2.30        | 2.40 | 2.50 | 0.091     | 0.095 | 0.098 |
| B    | 2.80        | 2.90 | 3.00 | 0.110     | 0.114 | 0.118 |
| C    | 1.90 REF    |      |      | 0.075 REF |       |       |
| D    | 0.35        | 0.40 | 0.45 | 0.014     | 0.016 | 0.018 |
| E    | 1.20        | 1.30 | 1.40 | 0.047     | 0.051 | 0.055 |
| F    | 0.90        | 1.00 | 1.10 | 0.035     | 0.039 | 0.043 |
| G    |             | 0.10 | 0.15 |           | 0.004 | 0.006 |
| H    | 0.20        |      |      | 0.008     |       |       |
| I    | 0           |      | 0.10 | 0         |       | 0.004 |

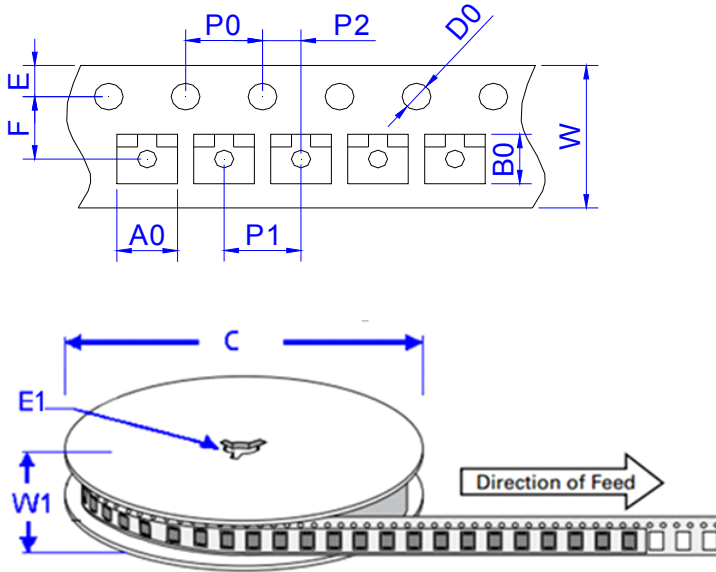
## Marking



72K: Device Code



## Package Information-SOT-23



| Ref. | Dimensions  |               |
|------|-------------|---------------|
|      | Millimeters | Inches        |
| A0   | 3.15 ± 0.3  | 0.124 ± 0.012 |
| B0   | 2.77 ± 0.3  | 0.109 ± 0.012 |
| C    | 178         | 7.0           |
| D0   | 1.50±0.1    | 0.059 ± 0.004 |
| E    | 1.75 ± 0.2  | 0.069 ± 0.008 |
| E1   | 13.3±0.3    | 0.524± 0.012  |
| F    | 3.5 ± 0.2   | 0.138 ± 0.008 |
| P0   | 4.00 ± 0.2  | 0.157 ± 0.008 |
| P1   | 4.00 ± 0.2  | 0.157 ± 0.008 |
| P2   | 2.00 ± 0.2  | 0.079 ± 0.008 |
| W    | 8.00 ± 0.2  | 0.315 ± 0.008 |
| W1   | 11.5±1.0    | 0.453 ± 0.039 |

## Ordering Information-SOT-23

| OUTLINE | PACKAGE TYPE | QUANTITY REEL | DESCRIPTION      |
|---------|--------------|---------------|------------------|
| TAPING  | SOT-23       | 3,000pcs      | 7 inch reel pack |

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