



## Description

### JMT N-channel MOSFET

#### Features

- $V_{DS}=100V$ ,  $I_D=3A$   
 $R_{DS(ON)}=110m\Omega$  @  $V_{GS} = 10V$   
 $R_{DS(ON)}=160m\Omega$  @  $V_{GS} =4.5V$
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

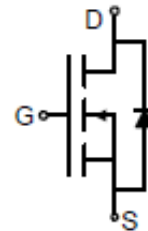
#### Application

- Battery Protection
- Load Switch
- Power Management

#### Package



SOT-23



## Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

| Symbol                            | Parameter                               | Max.                   | Units |
|-----------------------------------|---|------------------------|-------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                    | 100                    | V     |
| V <sub>GSS</sub>                  | Gate-Source Voltage                     | ±20                    | V     |
| I <sub>D</sub>                    | Continuous Drain Current                | T <sub>C</sub> = 25°C  | 3     |
|                                   |   | T <sub>C</sub> = 100°C | 2.4   |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>note1</sup>   | 12                     | A     |
| P <sub>D</sub>                    | Power Dissipation                       | T <sub>C</sub> = 25°C  | 1.2   |
| R <sub>θJA</sub>                  | Thermal Resistance, Junction to Ambient | 104                    | °C/W  |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Temperature Range | -55 to +150            | °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   | 100  | -    | -    | V     |
| I <sub>DSS</sub>  | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =100V, 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   | -    | -    | ±100 | nA    |
| <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                                | 1.0  | 1.8  | 3.0  | V     |
| R <sub>DSON</sub>   | Static Drain-Source on-Resistance<br><small>note2</small> | V <sub>GS</sub> =10V, I <sub>D</sub> =3A  | -    | 110  | 140  | mΩ    |
|   |   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A   | -    | 160  | 300  |       |
| <b>Dynamic Characteristics</b>                                |   |   |      |      |      |       |
| C <sub>iss</sub>  | Input Capacitance   | V <sub>DS</sub> =50V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                 | -    | 206  | -    | pF    |
| C <sub>oss</sub>  | Output Capacitance  |   | -    | 29   | -    | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                              |   | -    | 1.4  | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge   | V <sub>DS</sub> =50V, I <sub>D</sub> =3A,<br>V <sub>GS</sub> =10V                         | -    | 4.3  | -    | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge  |   | -    | 1.5  | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                               |   | -    | 1.1  | -    | nC    |
| <b>Switching Characteristics</b>                              |   |   |      |      |      |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time  | V <sub>DD</sub> =50V, I <sub>D</sub> =3A,<br>R <sub>GEN</sub> = 2Ω, V <sub>GS</sub> =10V, | -    | 14.7 | -    | ns    |
| t <sub>r</sub>  | Turn-on Rise Time   |   | -    | 3.5  | -    | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                       |   | -    | 20.9 | -    | ns    |
| t <sub>f</sub>  | Turn-off Fall Time  |   | -    | 2.7  | -    | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |   |      |      |      |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current  |   | -    | -    | 3    | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current      |   | -    | -    | 12   | A     |
| t <sub>rr</sub>   | Reverse recovery time                                     | I <sub>S</sub> =3A, di/dt=100 A/μs  | -    | 32   | -    | ns    |
| Q <sub>rr</sub>   | Reverse recovery charge                                   |   | -    | 39   | -    | nC    |

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

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

## Typical Performance Characteristics

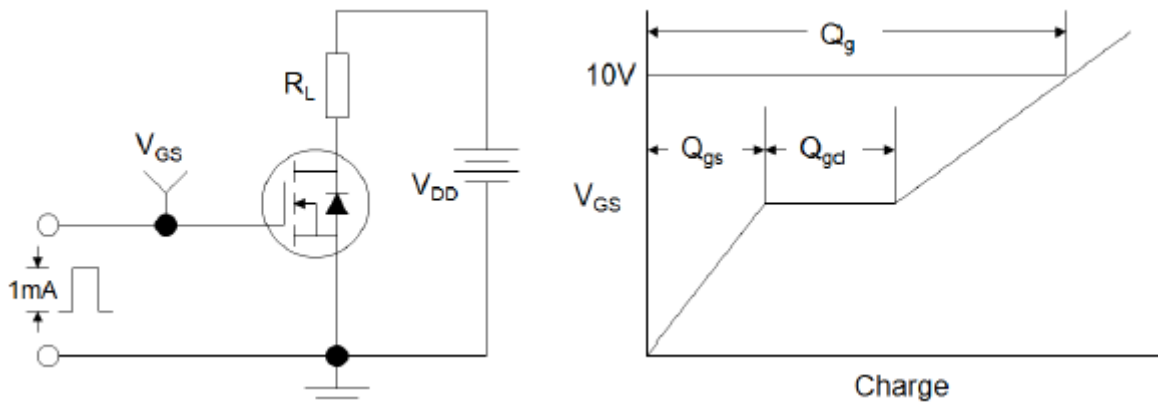


Figure1:Gate Charge Test Circuit & Waveform

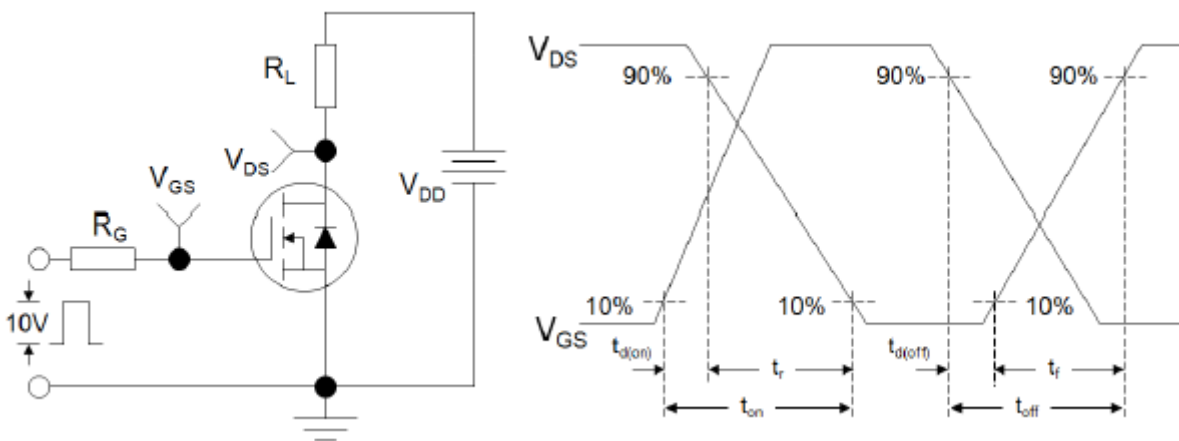


Figure 2: Resistive Switching Test Circuit & Waveforms

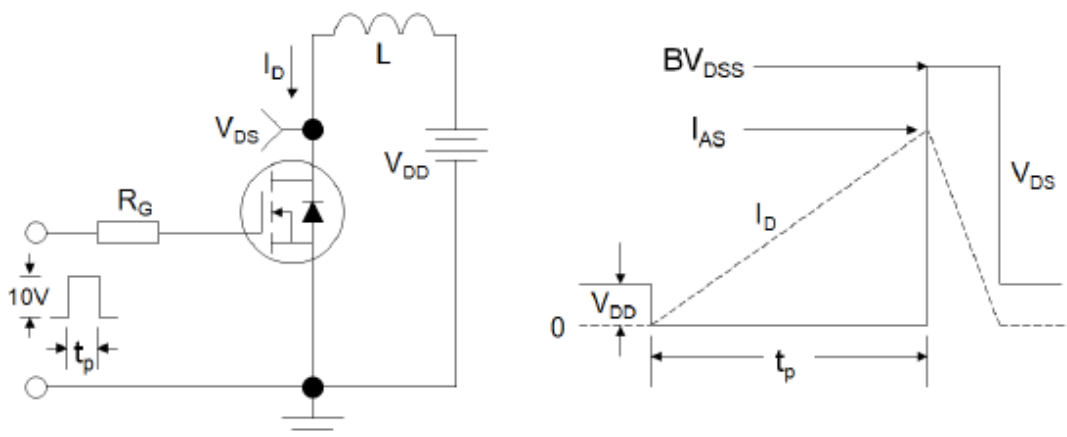


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

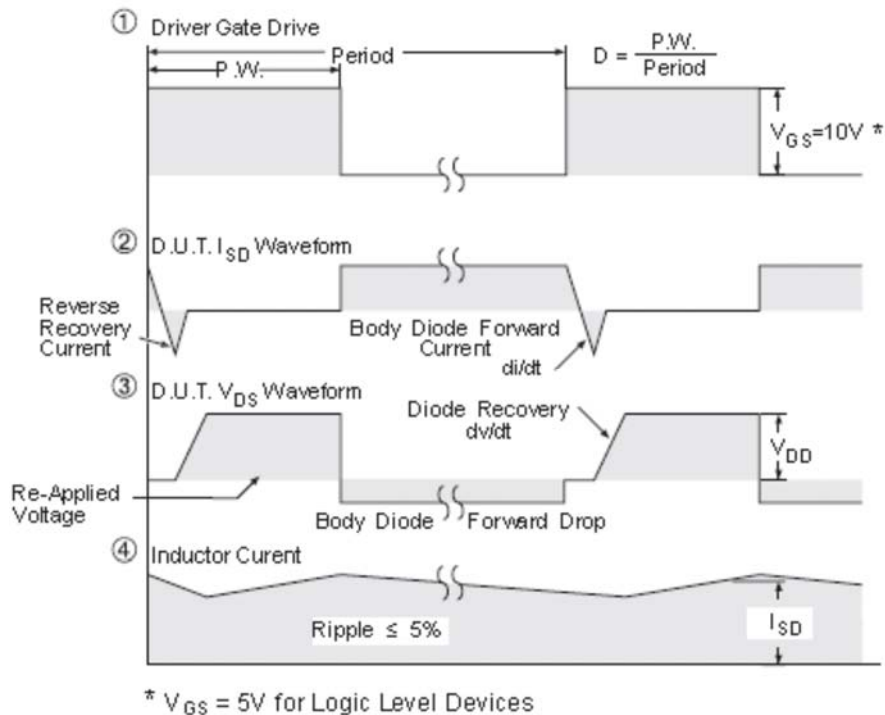
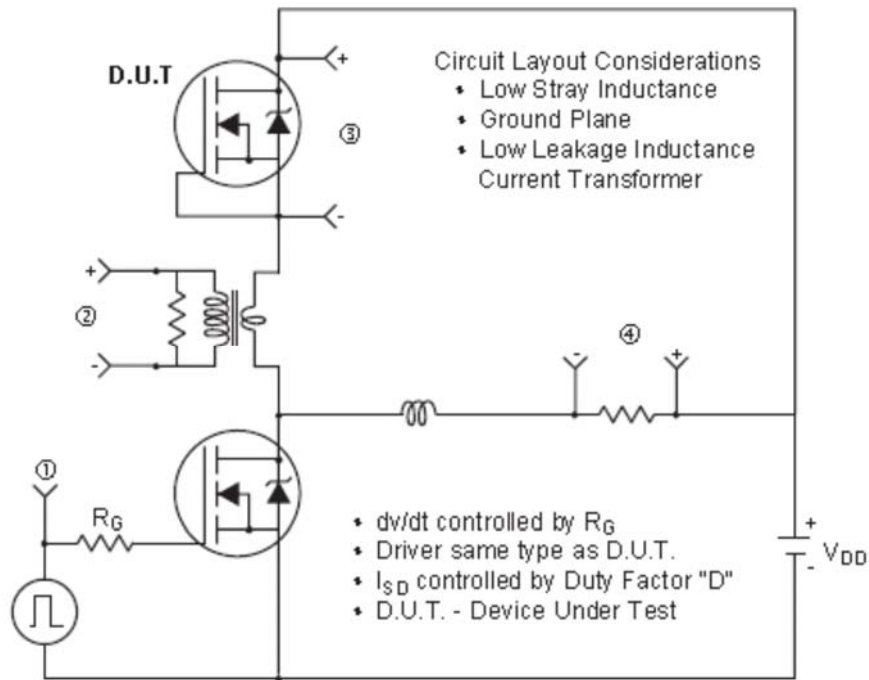
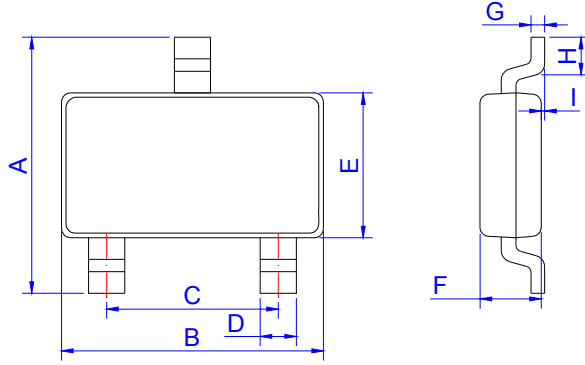


Figure 4: Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)

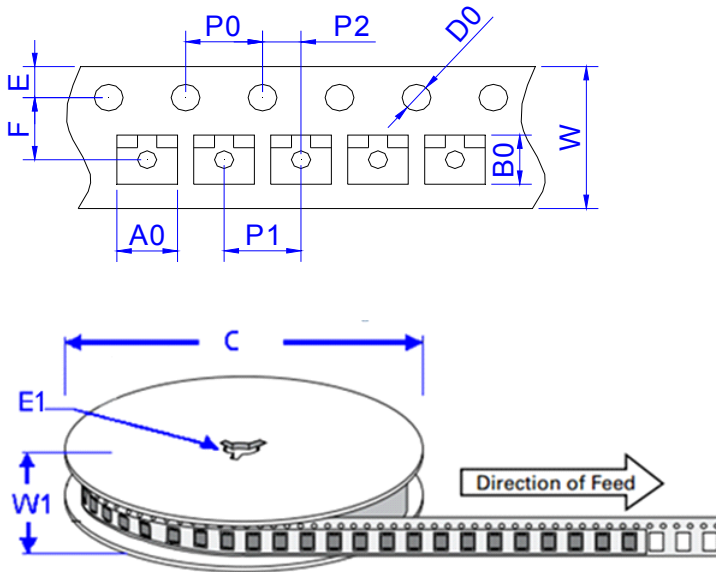
## Package Mechanical Data



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 |

## 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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