

## SOT-23 Plastic-Encapsulate MOSFET

### -100V P-Channel MOSFET

#### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| -100V         | 580mΩ@-10V      | -1.0A |
|               | 650mΩ@-4.5V     |       |

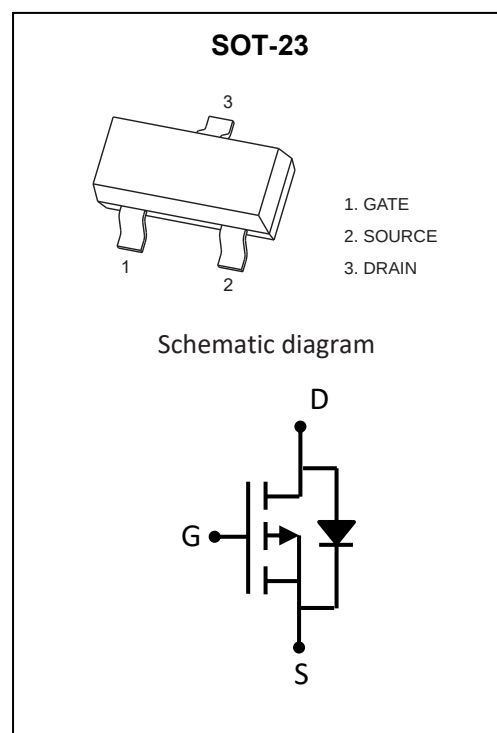
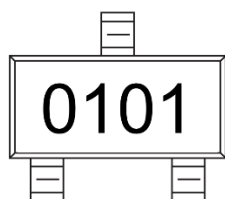
#### Feature

- TrenchFET Power MOSFET
- Excellent  $R_{DS(on)}$
- Low Gate Charge

#### Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

#### MARKING:



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

| Parameter                                                  | Symbol          | Value     | Unit               |
|------------------------------------------------------------|-----------------|-----------|--------------------|
| Drain-Source Voltage                                       | $V_{DS}$        | -100      | V                  |
| Gate-Source Voltage                                        | $V_{GS}$        | $\pm 20$  | V                  |
| Continuous Drain Current <sup>1,2</sup>                    | $I_D$           | -1.0      | A                  |
| Pulsed Drain Current                                       | $I_{DM}$        | -4.0      | A                  |
| Power Dissipation                                          | $P_D$           | 0.77      | W                  |
| Thermal Resistance from Junction to Ambient <sup>1,2</sup> | $R_{\theta JA}$ | 162       | $^\circ\text{C/W}$ |
| Junction Temperature                                       | $T_J$           | 150       | $^\circ\text{C}$   |
| Storage Temperature                                        | $T_{STG}$       | -55~ +150 | $^\circ\text{C}$   |

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

### MOSFET ELECTRICAL CHARACTERISTICS(T<sub>A</sub> 25°C unless otherwise noted)

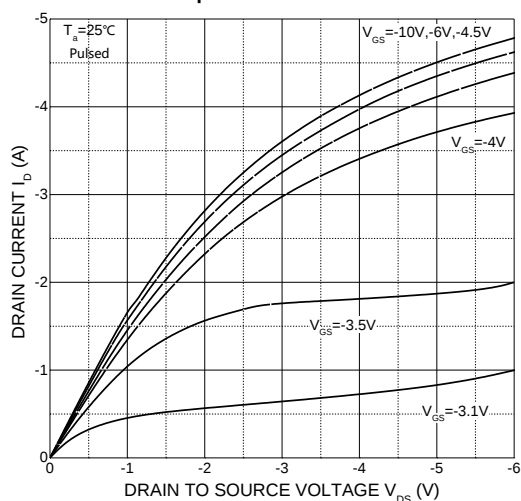
| Parameter                                 | Symbol               | Test Condition                                                                               | Min  | Type | Max  | Unit |
|-------------------------------------------|----------------------|----------------------------------------------------------------------------------------------|------|------|------|------|
| Off Characteristics                       |                      |                                                                                              |      |      |      |      |
| Drain-source breakdown voltage            | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                | -100 |      |      | V    |
| Zero gate voltage drain current           | I <sub>DSS</sub>     | V <sub>DS</sub> = -100V, V <sub>GS</sub> = 0V                                                |      |      | -1   | μA   |
| Gate-body leakage current                 | I <sub>GSS</sub>     | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                 |      |      | ±100 | nA   |
| On Characteristics <sup>3</sup>           |                      |                                                                                              |      |      |      |      |
| Gate threshold voltage                    | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                  | 1.5  | 2.2  | 3.0  | V    |
| Drain-source on-resistance                | R <sub>DS(on)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -1.0A                                               |      | 580  | 800  | mΩ   |
|                                           |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.5A                                              |      | 650  | 1000 |      |
| Dynamic Characteristics                   |                      |                                                                                              |      |      |      |      |
| Input Capacitance                         | C <sub>iss</sub>     | V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V, f = 1MHz                                       |      | 388  |      | pF   |
| Output Capacitance                        | C <sub>oss</sub>     |                                                                                              |      | 19   |      |      |
| Reverse Transfer Capacitance              | C <sub>rss</sub>     |                                                                                              |      | 15   |      |      |
| Switching Characteristics                 |                      |                                                                                              |      |      |      |      |
| Total Gate Charge                         | Q <sub>g</sub>       | V <sub>DS</sub> =-10V, V <sub>GS</sub> =-10V, I <sub>D</sub> = -1A                           |      | 3.2  |      | nC   |
| Gate-Source Charge                        | Q <sub>gs</sub>      |                                                                                              |      | 0.5  |      |      |
| Gate-Drain Charge                         | Q <sub>gd</sub>      |                                                                                              |      | 1.1  |      |      |
| Turn-on delay time                        | t <sub>d(on)</sub>   | V <sub>DD</sub> = -10V, V <sub>G</sub> = -10V, I <sub>D</sub> = -1A<br>R <sub>G</sub> = 2.5Ω |      | 10   |      | ns   |
| Turn-on rise time                         | t <sub>r</sub>       |                                                                                              |      | 32   |      |      |
| Turn-off delay time                       | t <sub>d(off)</sub>  |                                                                                              |      | 28   |      |      |
| Turn-off fall time                        | t <sub>f</sub>       |                                                                                              |      | 9    |      |      |
| Diode Characteristics                     |                      |                                                                                              |      |      |      |      |
| Diode forward current                     | I <sub>S</sub>       | T <sub>A</sub> = 25℃                                                                         |      |      | -1   | A    |
| Diode pulsed forward current <sup>a</sup> | I <sub>SM</sub>      |                                                                                              |      |      | -4   | A    |
| Diode Forward voltage                     | V <sub>DS</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A                                                   |      |      | -1.2 | V    |

Notes :

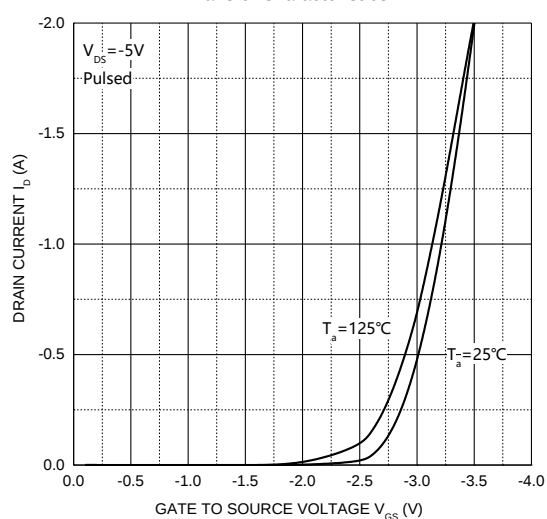
- 1.R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR4 board with 1oz. single side copper, in a still air environment with T<sub>A</sub> = 25°C.
- 2.R<sub>θJA</sub> is measured in the steady state
- 3.Pulse test : Pulse width ≤ 380μs, duty cycle ≤ 2%.

## Typical Characteristics

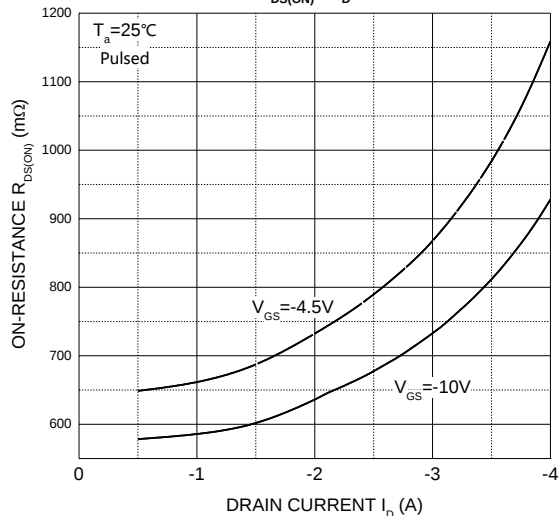
Output Characteristics



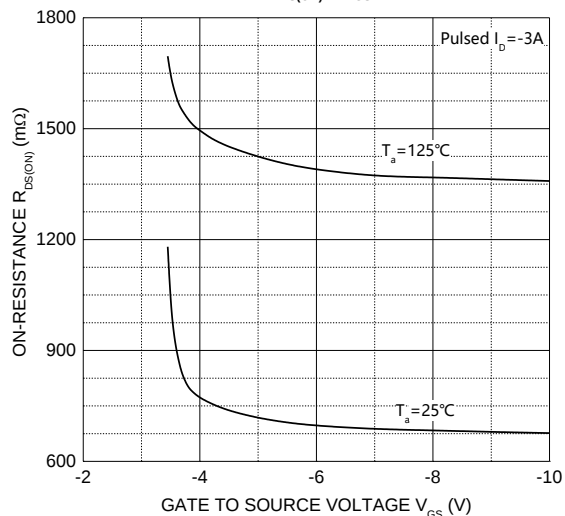
Transfer Characteristics



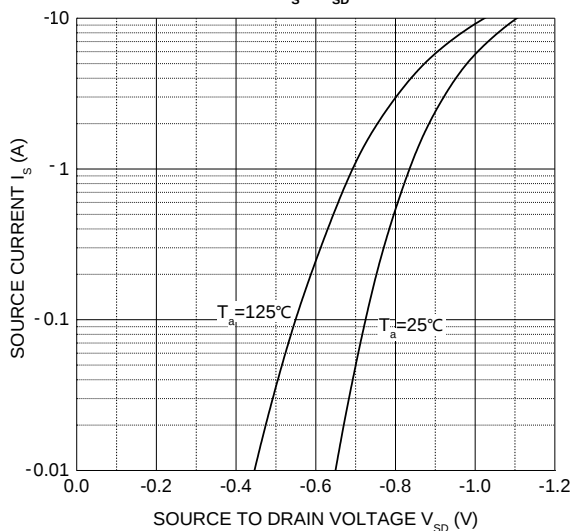
$R_{DS(ON)} - I_D$



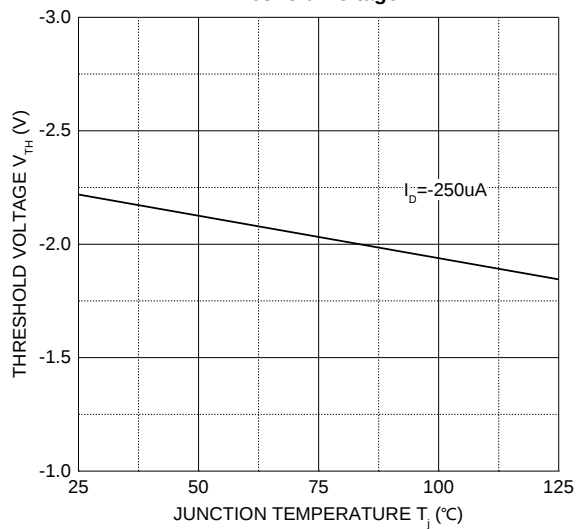
$R_{DS(ON)} - V_{GS}$



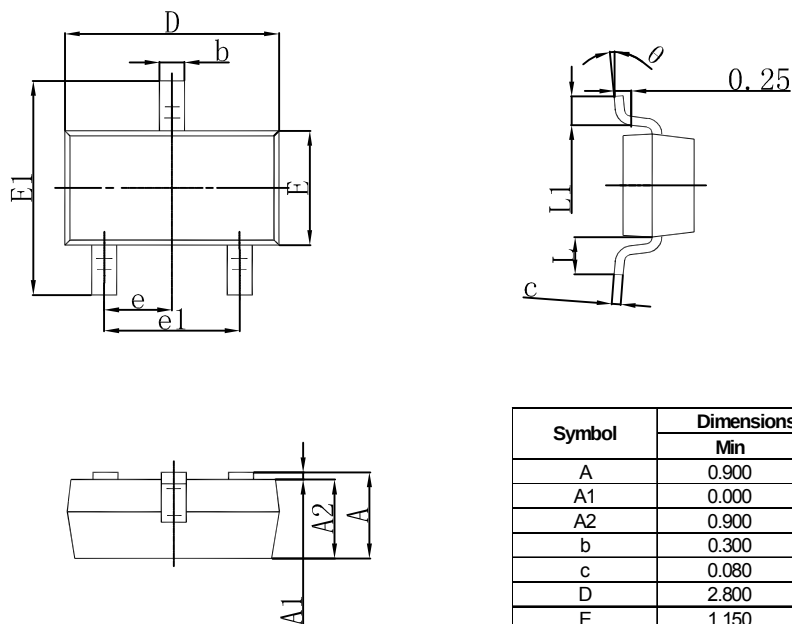
$I_S - V_{SD}$



Threshold Voltage

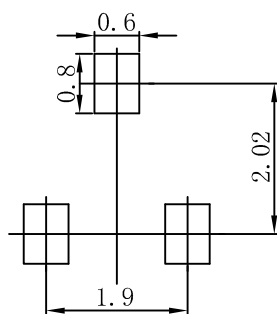


## SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.150                     | 1.500 | 0.045                | 0.059 |
| E1     | 2.250                     | 2.650 | 0.089                | 0.104 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



### Note:

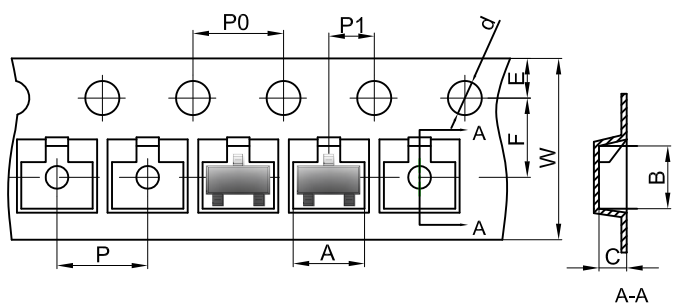
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

JSMD reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSMD does not assume any liability arising out of the application or use of any product described herein.

Reel Taping Specifications For Surface Mount Devices-SOT-23

SOT-23 Embossed Carrier Tape

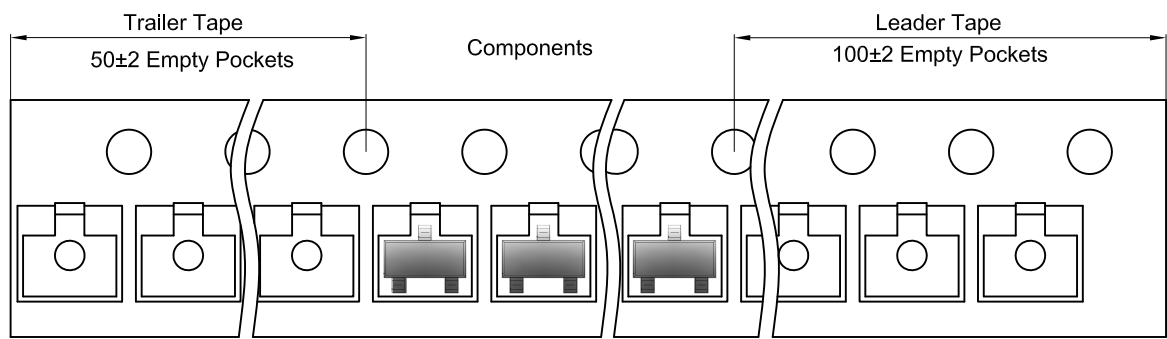


Packaging Description:

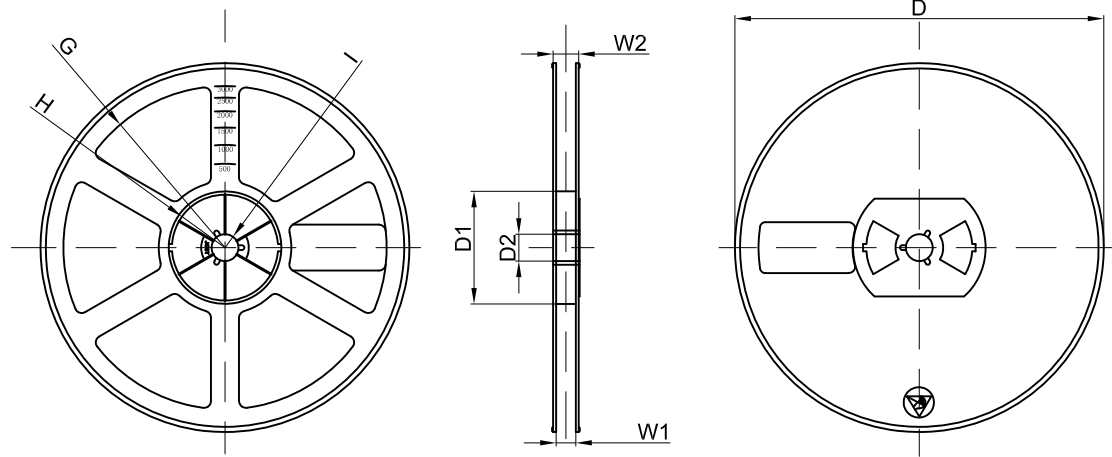
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-23                       | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

SOT-23 Tape Leader and Trailer



SOT-23 Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7"Dia                        | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 inch    | 45,000 pcs | 203×203×195  | 180,000 pcs | 438×438×230     |          |