

## SOT-23 Plastic-Encapsulate MOSFET

### P -Channel MOSFET

#### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| -20V          | 110mΩ@-4.5V     | -2.3A |
|               | 140mΩ@-2.5V     |       |

#### Features

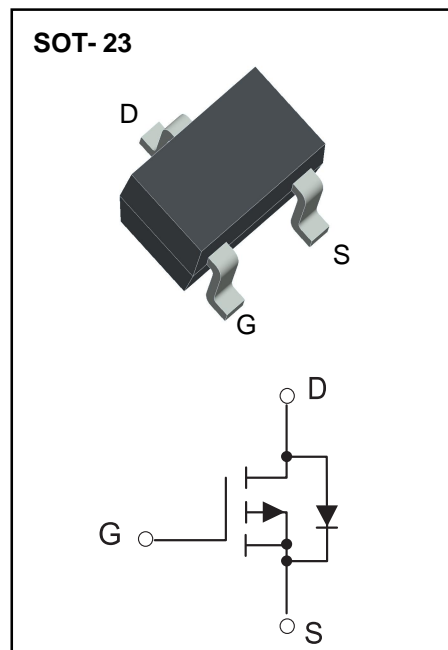
- TrenchFET Power MOSFET
- Excellent  $R_{DS(on)}$  and Low Gate Charge

#### Applications

- Load Switch for Portable Devices
- DC/DC Converter

#### Marking:

- S1



#### Limiting Values (Absolute Maximum Rating)

| Parameter                                   | Symbol    | Value     | Unit |
|---|-----------|-----------|------|
| Drain-Source Voltage                        | $V_{DS}$  | -20       | V    |
| Gate-Source Voltage                         | $V_{GS}$  | ±8        | V    |
| Continuous Drain Current                    | $I_D$     | -2.3      | A    |
| Pulsed Drain Current (t=300μs)              | $I_{DM}$  | -10       | A    |
| Power Dissipation                           | $P_D$     | 0.35      | W    |
| Thermal Resistance from Junction to Ambient | $R_{θJA}$ | 357       | °C/W |
| Junction Temperature                        | $T_J$     | 150       | °C   |
| Storage Temperature                         | $T_{STG}$ | -55~ +150 | °C   |

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

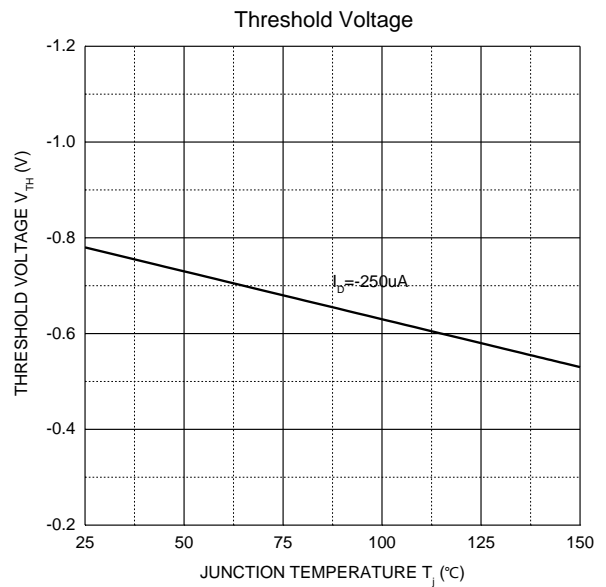
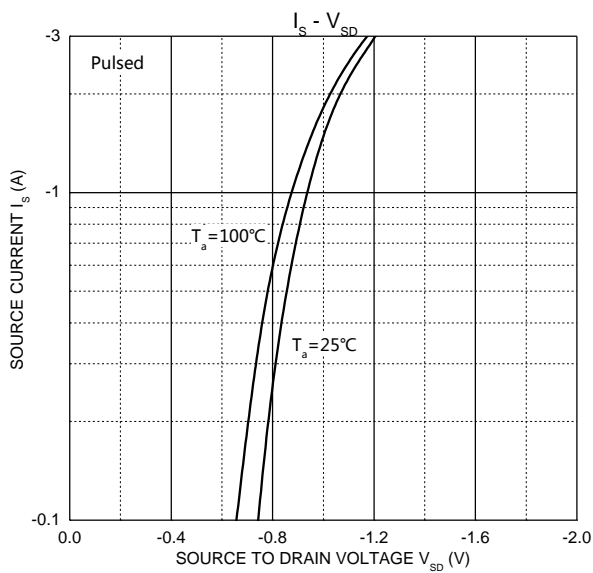
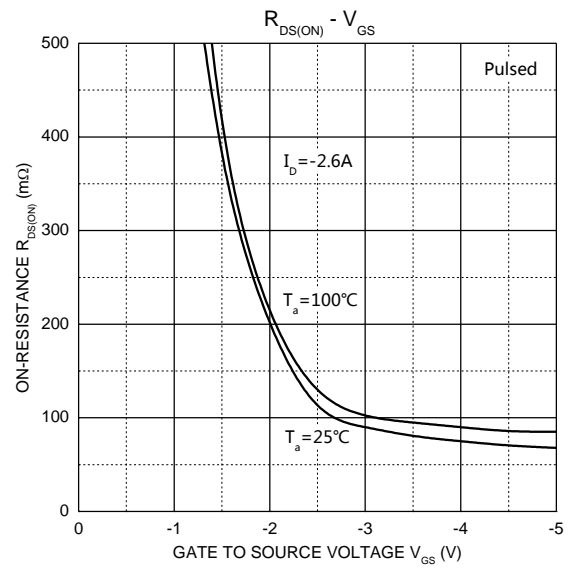
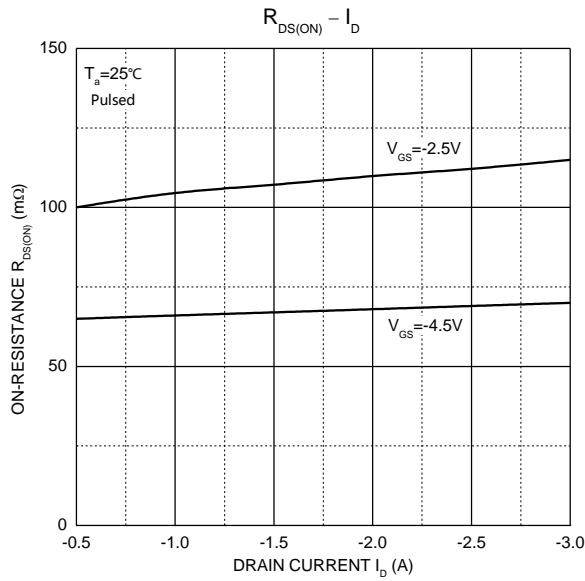
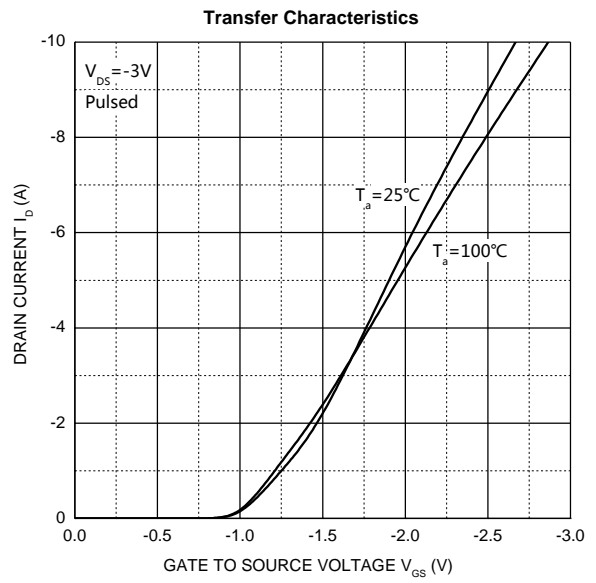
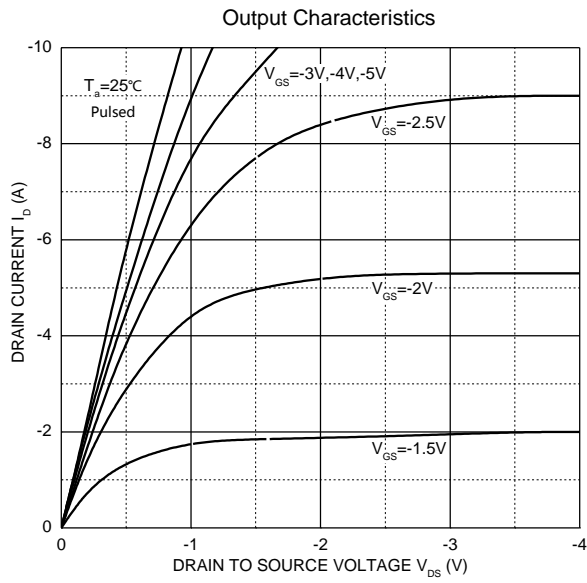
| Parameter                                  | Symbol        | Test Condition   | Min  | Type | Max       | Unit       |
|--|---------------|--|------|------|-----------|------------|
| <b>Static Characteristics</b>              |               |  |      |      |           |            |
| Drain-source breakdown voltage             | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$   | -20  |      |           | V          |
| Zero gate voltage drain current            | $I_{DSS}$     | $V_{DS} = -20V, V_{GS} = 0V$   |      |      | -1        | $\mu A$    |
| Gate-body leakage current                  | $I_{GSS}$     | $V_{GS} = \pm 8V, V_{DS} = 0V$   |      |      | $\pm 100$ | nA         |
| Gate threshold voltage                     | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$   | -0.4 | -0.7 | -1        | V          |
| Drain-source on-resistance <sup>a</sup>    | $R_{DS(on)}$  | $V_{GS} = -4.5V, I_D = -3A$  |      | 70   | 110       | m $\Omega$ |
|  |               | $V_{GS} = -2.5V, I_D = -2A$  |      | 110  | 140       |            |
| Forward transconductance <sup>a</sup>      | $g_{FS}$      | $V_{DS} = -5V, I_D = -2A$  | 5    |      |           | S          |
| <b>Dynamic characteristics<sup>b</sup></b> |               |  |      |      |           |            |
| Input Capacitance                          | $C_{iss}$     | $V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$   |      | 405  |           | pF         |
| Output Capacitance                         | $C_{oss}$     |  |      | 75   |           |            |
| Reverse Transfer Capacitance               | $C_{rss}$     |  |      | 55   |           |            |
| Gate resistance                            | $R_g$         | $f = 1MHz$   |      | 6    |           | $\Omega$   |
| Total Gate Charge                          | $Q_g$         | $V_{DS} = -10V, V_{GS} = -2.5V, I_D = -3A$   |      | 3.3  | 12        | nC         |
| Gate-Source Charge                         | $Q_{gs}$      |  |      | 0.7  |           |            |
| Gate-Drain Charge                          | $Q_{gd}$      |  |      | 1.3  |           |            |
| Turn-on delay time                         | $t_{d(on)}$   | $V_{DD} = -10V, V_{GEN} = -4.5V, I_D = -1A$<br>$R_L = 10\Omega, R_{GEN} = 1\Omega$ |      | 11   |           | ns         |
| Turn-on rise time                          | $t_r$         |  |      | 35   |           |            |
| Turn-off delay time                        | $t_{d(off)}$  |  |      | 30   |           |            |
| Turn-off fall time                         | $t_f$         |  |      | 10   |           |            |
| <b>Source-Drain Diode characteristics</b>  |               |  |      |      |           |            |
| Diode forward current                      | $I_S$         | $T_C = 25^\circ\text{C}$   |      |      | -2.3      | A          |
| Diode pulsed forward current <sup>a</sup>  | $I_{SM}$      |  |      |      | -10       | A          |
| Diode Forward voltage                      | $V_{DS}$      | $V_{GS} = 0V, I_S = -1.3A$   |      |      | -1.2      | V          |

Notes :

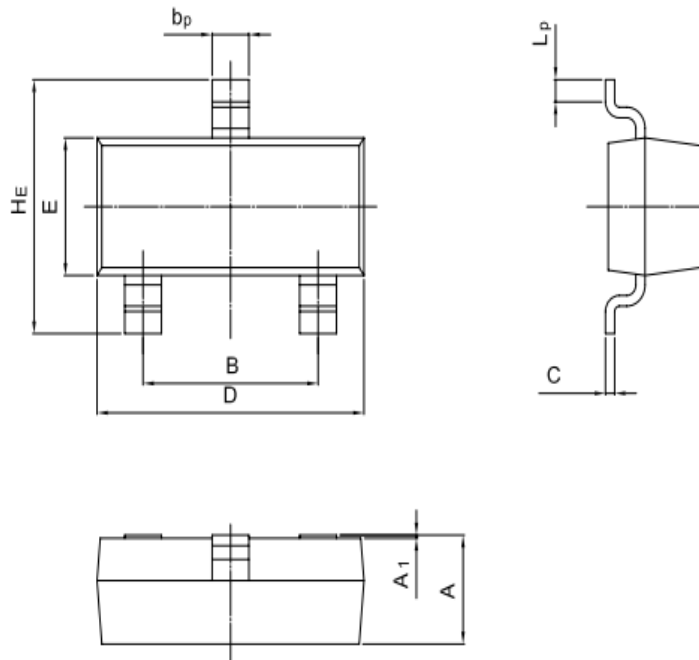
a. Pulse Test : Pulse Width < 300 $\mu$ s, Duty Cycle  $\leq$ 2%.

b. Guaranteed by design, not subject to production testing.

# Typical Characteristics

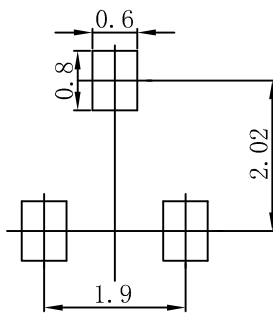


## SOT-23 Package Outline Dimensions



| UNIT | A            | B            | bp           | C            | D            | E            | HE           | A1             | Lp           |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|
| mm   | 1.40<br>0.95 | 2.04<br>1.78 | 0.50<br>0.35 | 0.19<br>0.08 | 3.10<br>2.70 | 1.65<br>1.20 | 3.00<br>2.20 | 0.100<br>0.013 | 0.50<br>0.20 |

## SOT-23 Suggested Pad Layout



**Note:**

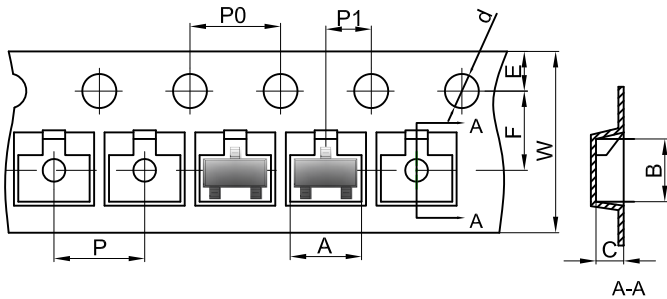
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

**NOTICE**

JSKD reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSKD 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



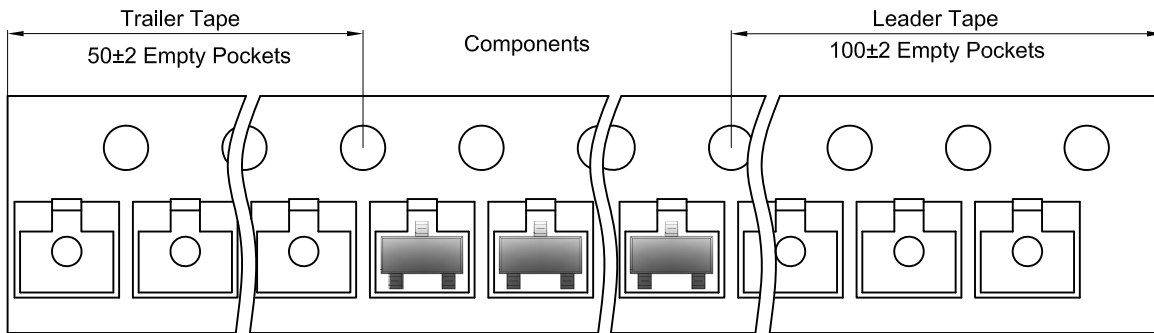
### Packaging Description:

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).

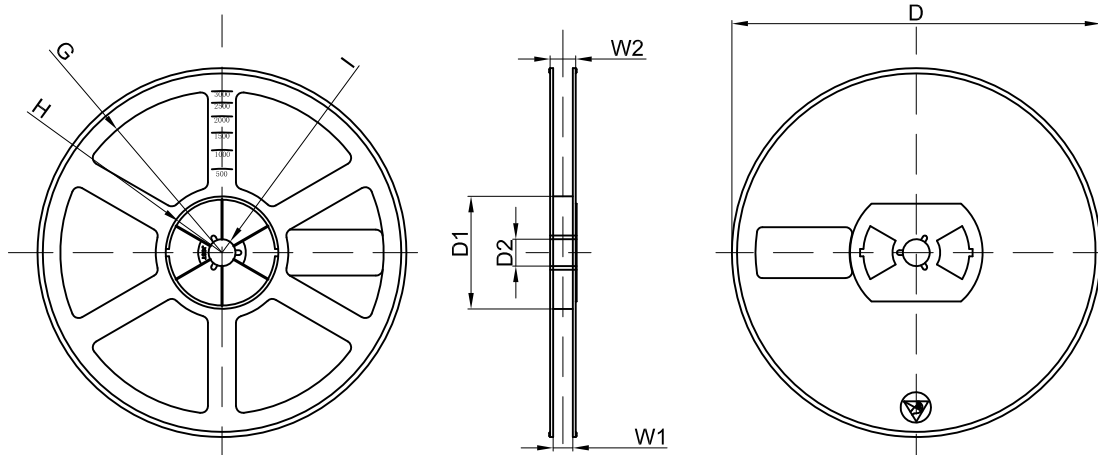
Dimensions are in millimeter

| 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     |          |