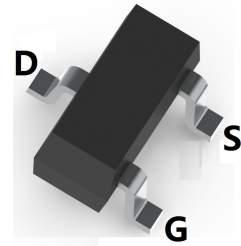
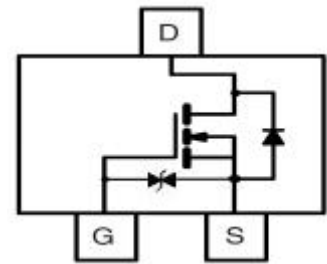


**MOSFET (N-CHANNEL)**
**FEATURES**

- Low on-resistance
- Very fast switching
- Low voltage drive makes this device ideal for Portable equipment
- For Battery management and High speed switch and Low power DC to DC converter applications
- Sub-miniature surface mount package


**SOT-23 (Marking:KN)**

**MECHANICAL DATA**

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.008 grams (approximate)

**MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)**

| Parameter                                   | Symbol                            | Value      | Unit |
|---|-----------------------------------|------------|------|
| Drain-source voltage                        | V <sub>DS</sub>                   | 30         | V    |
| Gate-source voltage                         | V <sub>GS</sub>                   | ±20V       | V    |
| Continuous drain current                    | I <sub>D</sub>                    | 0.1        | A    |
| Power dissipation                           | P <sub>D</sub>                    | 0.35       | W    |
| Thermal resistance from Junction to ambient | R <sub>θJA</sub>                  | 357        | °C/W |
| Junction and Storage temperature            | T <sub>J</sub> , T <sub>STG</sub> | -55 ~ +150 | °C   |

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise specified)**

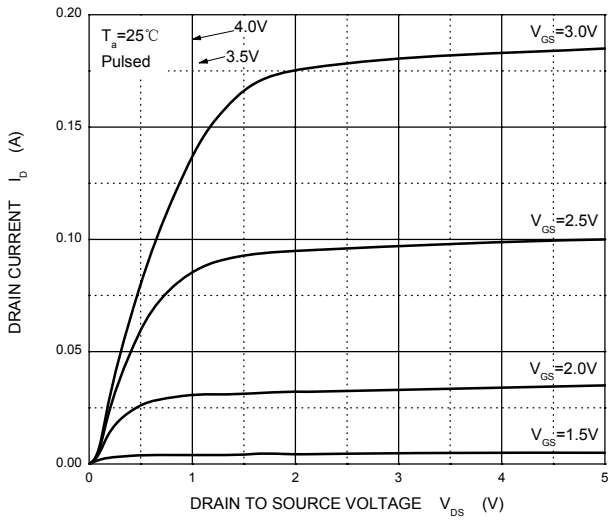
| Parameter                           | Symbol               | Min | Typ | Max | Unit | Conditions  |
|-------------------------------------|----------------------|-----|-----|-----|------|---|
| <b>Off Characteristics</b>          |                      |     |     |     |      |   |
| Drain-Source breakdown voltage      | V <sub>(BR)DSS</sub> | 30  |     |     | V    | V <sub>GS</sub> =0V, I <sub>D</sub> =10μA   |
| Zero gate voltage drain current     | I <sub>DSS</sub>     |     |     | 0.2 | μA   | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V   |
| Gate-body leakage current           | I <sub>GSS</sub>     |     |     | ±2  | μA   | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V  |
| Gate-threshold voltage (note 1)     | V <sub>GS(th)</sub>  | 0.8 |     | 1.5 | V    | V <sub>DS</sub> =3V, I <sub>D</sub> =100μA  |
| Drain-source on-resistance (note 1) | R <sub>DS(ON)</sub>  |     |     | 8   | Ω    | V <sub>GS</sub> =4V, I <sub>D</sub> =10mA   |
|                                     |                      |     |     | 13  | Ω    | V <sub>GS</sub> =2.5V, I <sub>D</sub> =1mA  |
| Forward transconductance (note 1)   | g <sub>FS</sub>      | 20  |     |     | mS   | V <sub>DS</sub> =3V, I <sub>D</sub> =10mA   |
| <b>Dynamic Characteristics</b>      |                      |     |     |     |      |   |
| Input capacitance                   | C <sub>iss</sub>     |     | 13  |     | pF   | V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1MHz  |
| Output capacitance                  | C <sub>oss</sub>     |     | 9   |     | pF   |   |
| Reverse transfer capacitance        | C <sub>rss</sub>     |     | 4   |     | pF   |   |
| <b>Switching Characteristics</b>    |                      |     |     |     |      |   |
| Turn-on delay time                  | t <sub>d(on)</sub>   |     | 15  |     | nS   | V <sub>DD</sub> =5V, V <sub>GS</sub> =5V, I <sub>D</sub> =10mA, R <sub>g</sub> =10Ω, R <sub>L</sub> =500Ω |
| Turn-on rise time                   | t <sub>r</sub>       |     | 35  |     | nS   |   |
| Turn-off delay time                 | t <sub>d(off)</sub>  |     | 80  |     | nS   |   |
| Turn-off fall time                  | t <sub>f</sub>       |     | 80  |     | nS   |   |

Note:1. Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 2% .

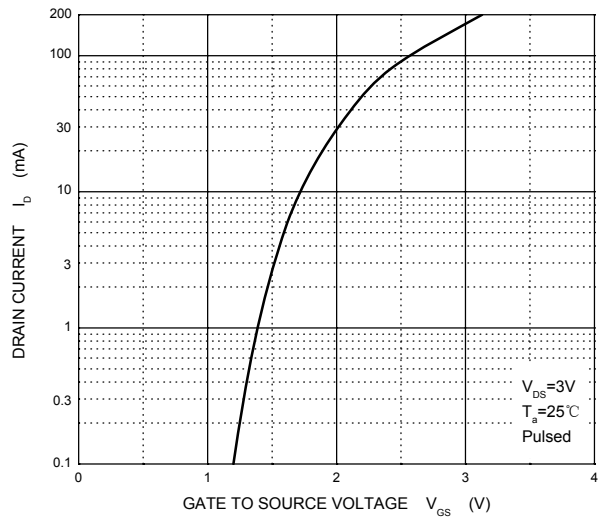
MOSFET (N-CHANNEL)

Typical Characteristics

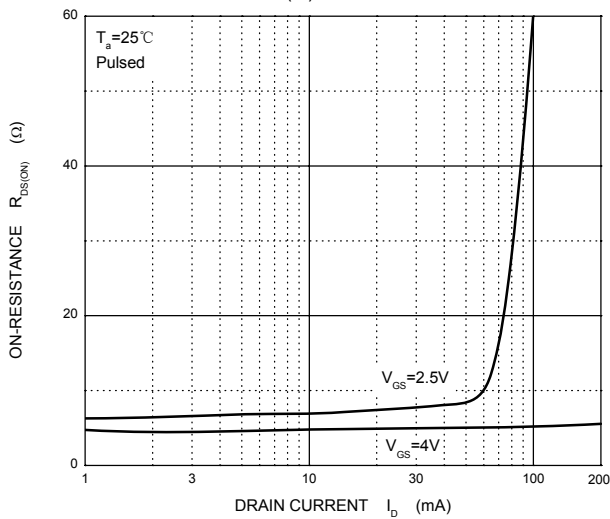
Output Characteristics



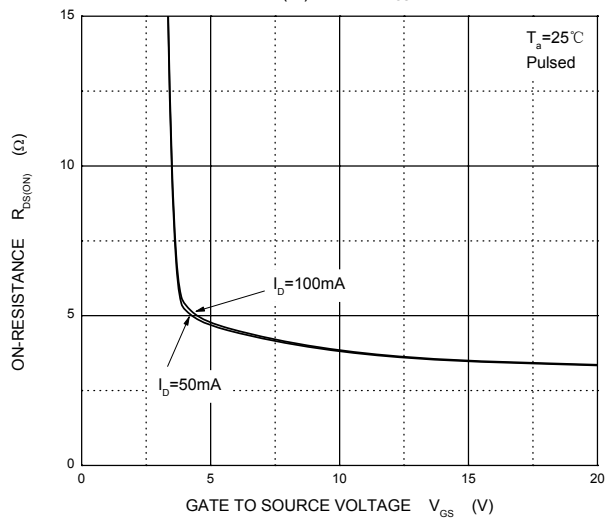
Transfer Characteristics



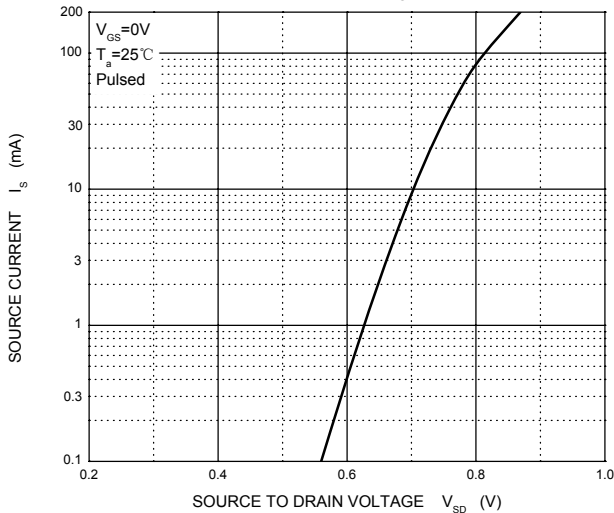
$R_{DS(ON)}$  —  $I_D$



$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$



MOSFET (N-CHANNEL)

**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      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| 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**



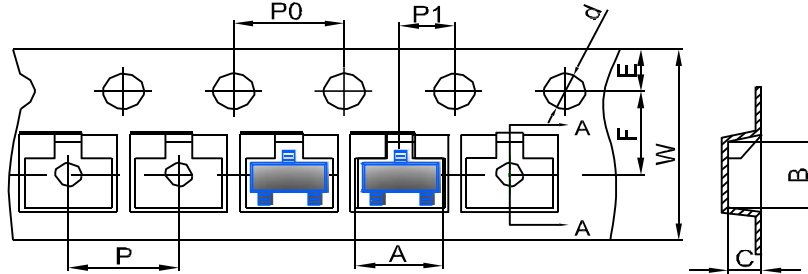
**Note:**

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference purposes only

MOSFET (N-CHANNEL)

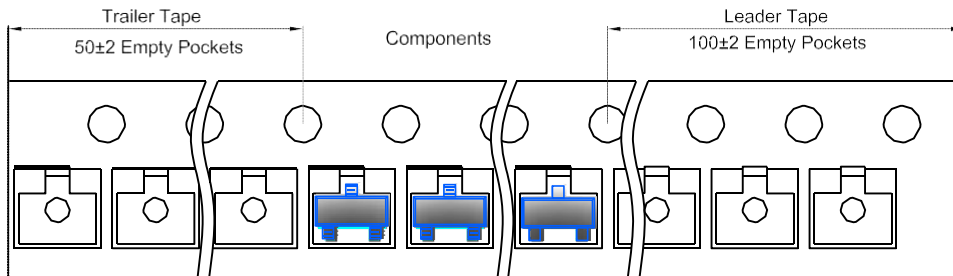
**SOT-23 Tape and Reel**

**SOT-23 Embossed Carrier Tape**

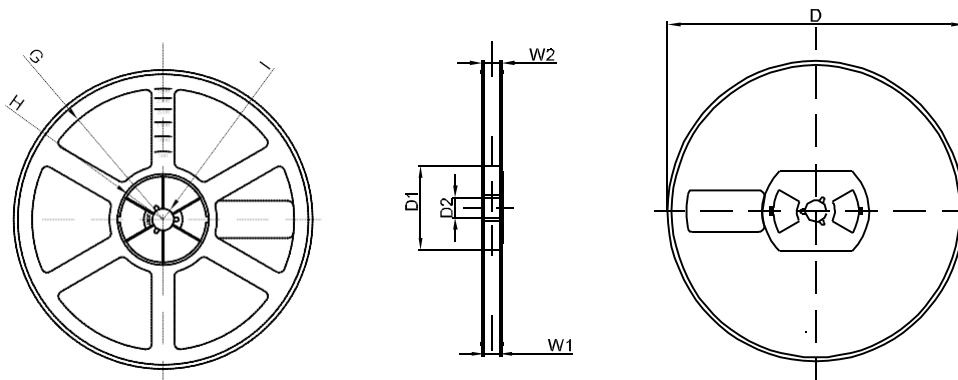


| DIMENSIONS ARE IN MILLIMETER |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| TYPE                         | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-23                       | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |
| TOLERANCE                    | ±0.1 | ±0.1 | ±0.1 | ±0.1  | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 |

**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 | 54.40 | 13.00 | R78 | R25.60 | R6.50 | 9.50 | 12.30 |
| TOLERANCE                    | ±2   | ±1    | ±1    | ±1  | ±1     | ±1    | ±1   | ±1    |