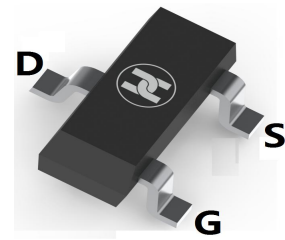
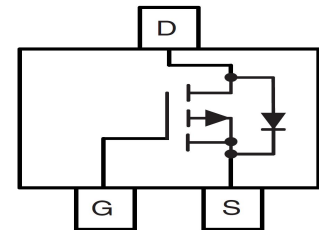


LOW VOLTAGE MOSFET (P-CHANNEL)
FEATURES

- $V_{DS}=-20V, R_{DS(ON)} \leq 57m\Omega @ V_{GS}=-4.5V, I_D=-2.9A$
- Low on-resistance
- For DC to DC converter and Load switch applications
- Surface Mount device


SOT-23

MECHANICAL DATA

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.008 grams (approximate)

MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------|--------------------|--------------|
| Drain-source voltage | V_{DS} | -20 | V |
| Gate-source voltage | V_{GS} | ± 8 | V |
| Continuous drain current ($T_J = 150^\circ C$) | I_D | $T_A = 25^\circ C$ | -2.9 |
| | | $T_A = 70^\circ C$ | -2.3 |
| Pulsed drain current | I_{DM} | -12 | A |
| Continuous Source-Drain Diode current | I_S | -0.59 | A |
| Power dissipation | P_D | $T_A = 25^\circ C$ | 0.71 |
| | | $T_A = 70^\circ C$ | 0.45 |
| Thermal resistance from Junction to ambient | $R_{\theta JA}$ | 175 | $^\circ C/W$ |
| Junction temperature | T_J | 150 | $^\circ C$ |
| Storage temperature | T_{STG} | -55 ~ +150 | $^\circ C$ |

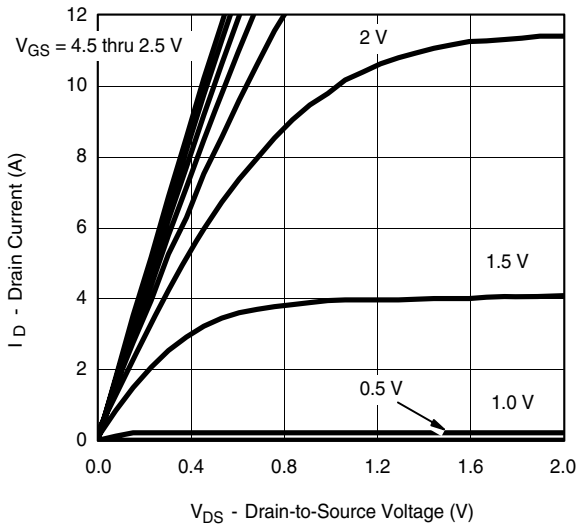
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$ unless otherwise specified)

| Parameter | Symbo | Min | Typ | Max | Unit | Conditions |
|--------------------------------------|---------------|------|-----|-----------|------------|--|
| Drain-Source breakdown voltage | $V_{(BR)DSS}$ | -20 | | | V | $V_{GS}=0V, I_D=-10\mu A$ |
| Zero gate voltage drain current | I_{DSS} | | | -1 | μA | $V_{DS}=-16V, V_{GS}=0V$ |
| | | | | -10 | μA | $V_{DS}=-16V, V_{GS}=0V, T_J = 55^\circ C$ |
| Gate-body leakage current | I_{GSS} | | | ± 100 | nA | $V_{DS}=0V, V_{GS}=\pm 8V$ |
| Gate-threshold voltage(note 1) | $V_{GS(th)}$ | -0.4 | | -0.9 | V | $V_{DS}=V_{GS}, I_D=-250\mu A$ |
| Drain-source on-resistance (note 1) | $R_{DS(ON)}$ | | 44 | 57 | m Ω | $V_{GS}=-4.5V, I_D=-3.3A$ |
| | | | 61 | 76 | m Ω | $V_{GS}=-2.5V, I_D=-2.8A$ |
| | | | 84 | 110 | m Ω | $V_{GS}=-1.8V, I_D=-2.3A$ |
| Forward transconductance (note 1) | g_{FS} | | 3 | | S | $V_{DS}=-5V, I_D=-3.3A$ |
| Input capacitance(note 1) | C_{iss} | | 715 | | pF | $V_{DS}=-6V, V_{GS}=0V, f=1MHz$ |
| Output capacitance(note 1) | C_{oss} | | 170 | | pF | |
| Reverse transfer capacitance(note 1) | C_{rss} | | 120 | | pF | |
| Turn-on delay time(note 1) | $t_{d(on)}$ | | 15 | 25 | nS | $V_{DD}=-15V, I_D=-1A, V_{GEN}=-4.5V, R_g=6\Omega$ |
| Turn-on rise time(note 1) | t_r | | 35 | 55 | nS | |
| Turn-off delay time(note 1) | $t_{d(off)}$ | | 60 | 90 | nS | |
| Turn-off fall time(note 1) | t_f | | 40 | 60 | nS | |
| Total gate charge(note 1) | Q_g | | 8 | 13 | nC | $V_{DS}=-6V, V_{GS}=-4.5V, I_D=-3.3A$ |
| Gate-source charge(note 1) | Q_{gs} | | 1.2 | | nC | |
| Gate-drain charge(note 1) | Q_{gd} | | 2.2 | | nC | |
| Diode forward voltage (note 1) | V_{SD} | | | -1.2 | V | $I_S=-1.6A, V_{GS}=0V$ |

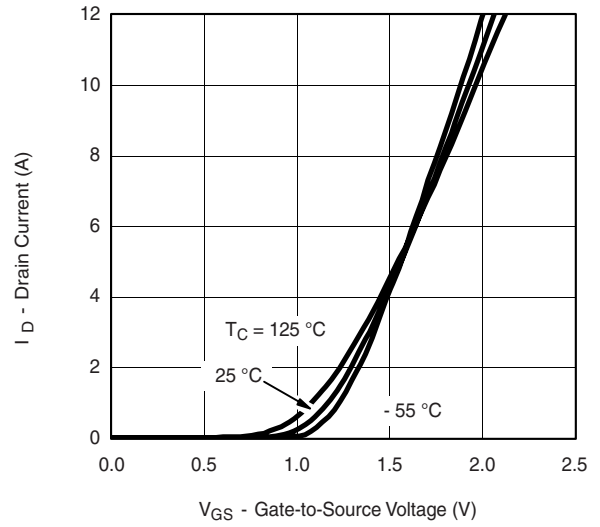
Note:1. Pulse test ; Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

LOW VOLTAGE MOSFET (P-CHANNEL)

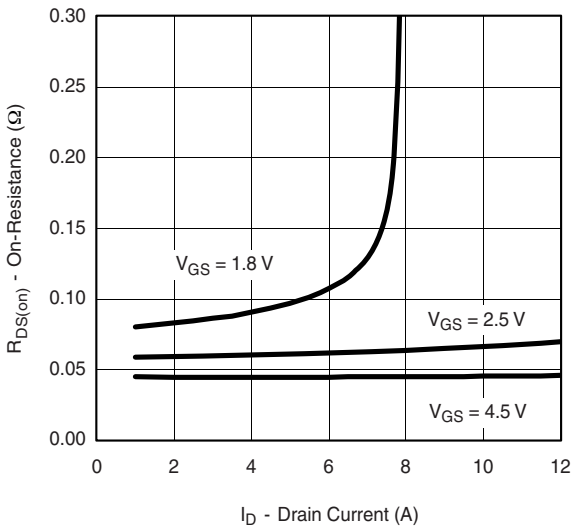
Typical Characteristics



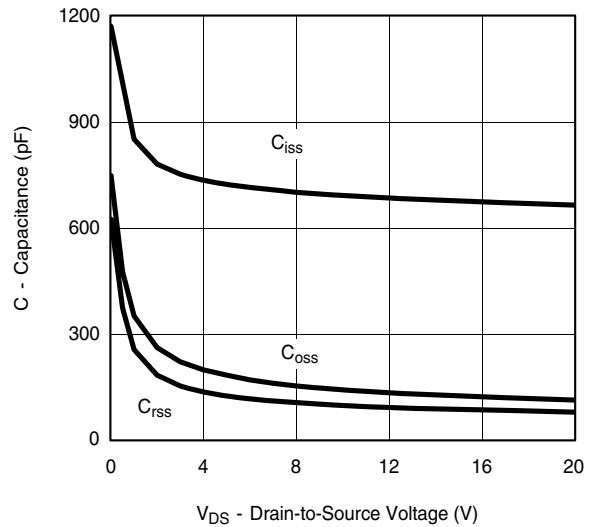
Output Characteristics



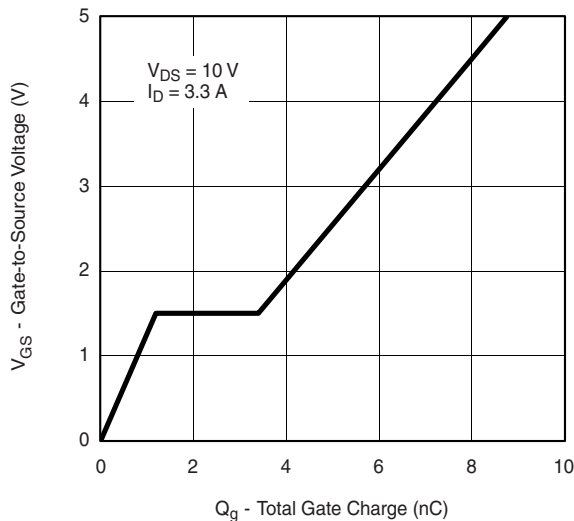
Transfer Characteristics



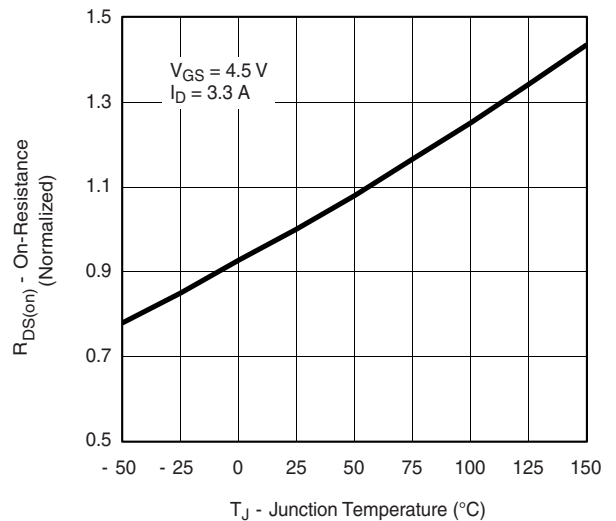
On-Resistance vs. Drain Current



Capacitance

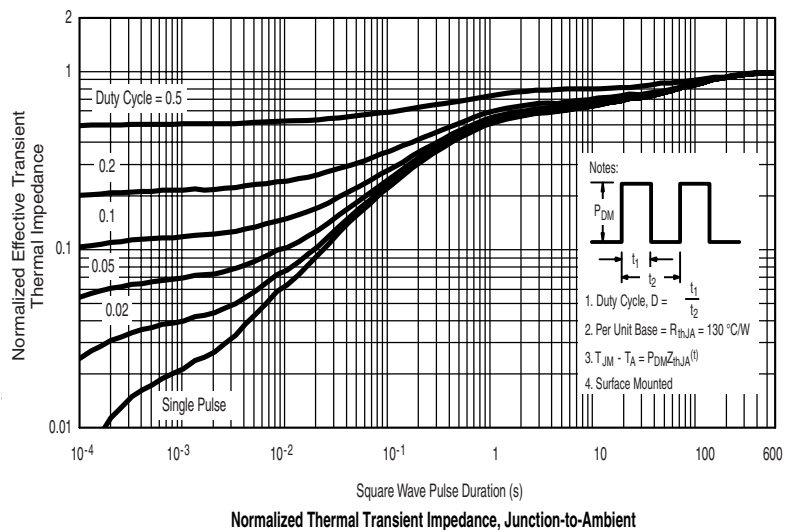
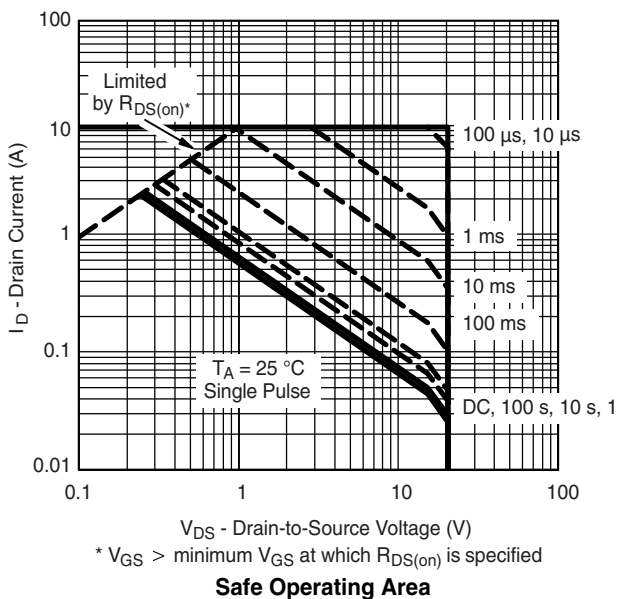
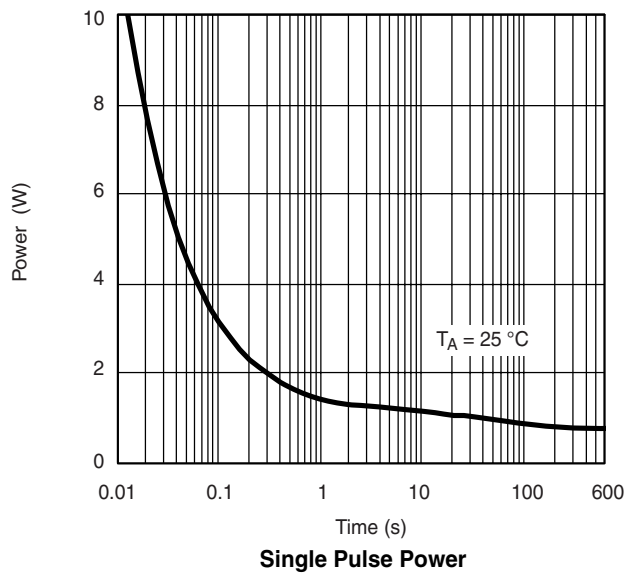
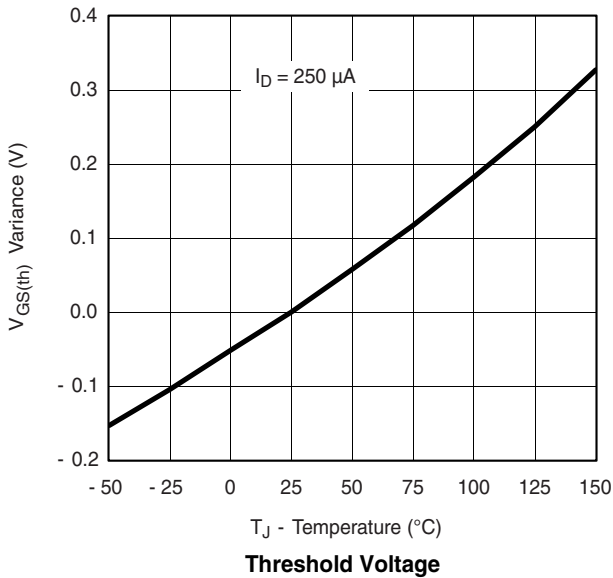
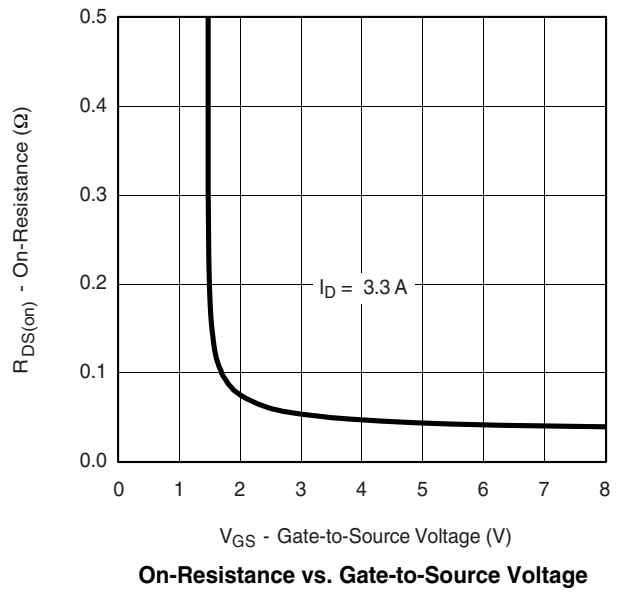
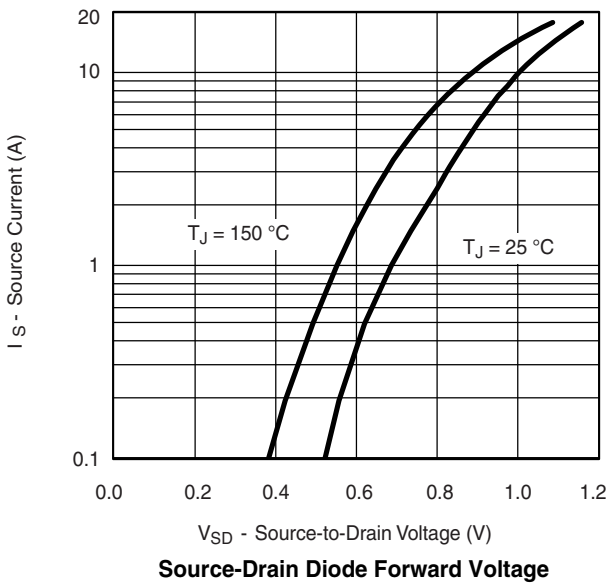


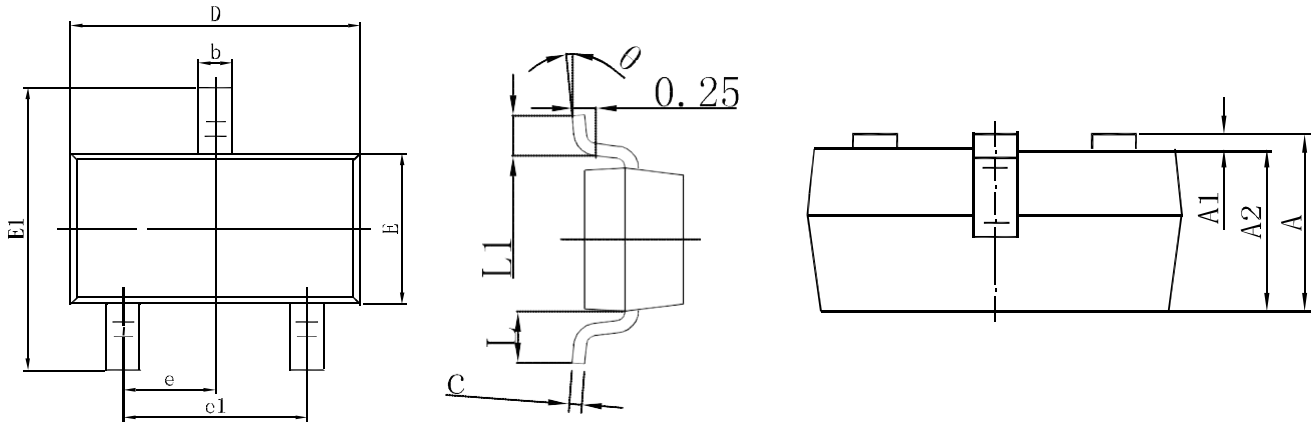
Gate Charge



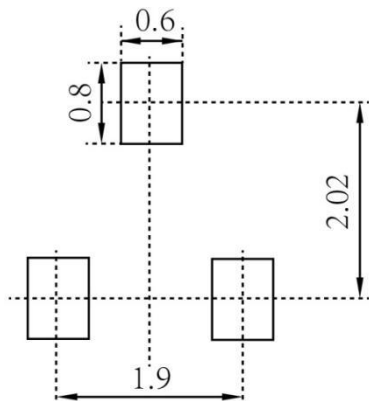
Normalized On-Resistance vs. Junction Temperature

LOW VOLTAGE MOSFET (P-CHANNEL)



LOW VOLTAGE MOSFET (P-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° |

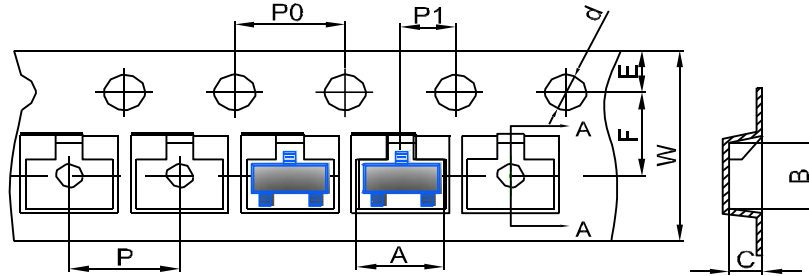
SOT-23 Suggested Pad Layout

Note:

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

LOW VOLTAGE MOSFET (P-CHANNEL)

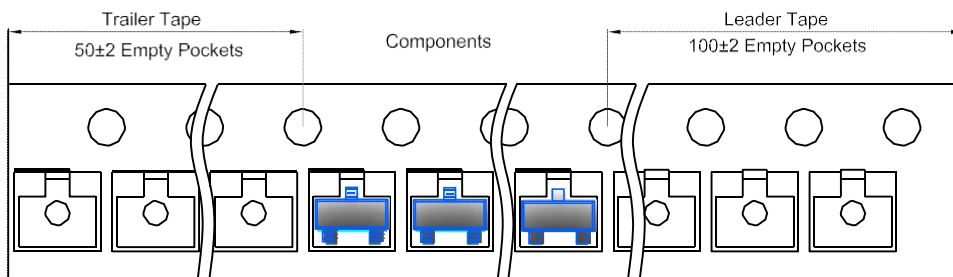
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

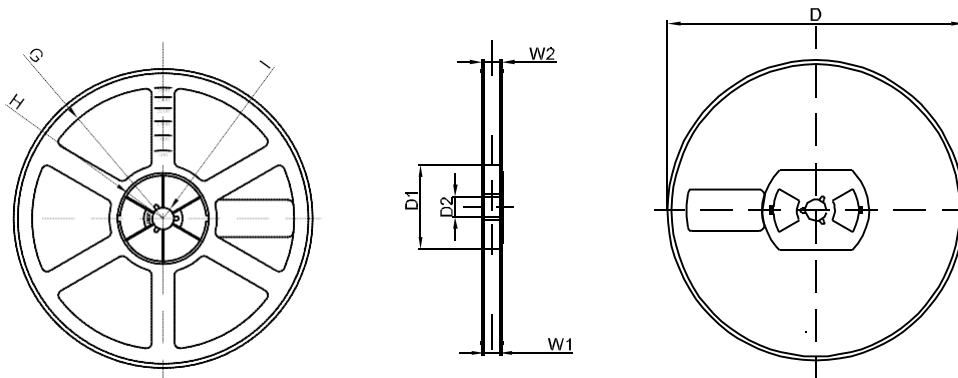


| DIMENSIONS ARE IN MILLIMETER | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| TYPE | A | B | C | d | E | F | P0 | P | P1 | W |
| SOT-23 | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |
| TOLERANCE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