

SOT-23 Plastic-Encapsulate MOSFET

60V P-Channel MOSFET

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| -60V | 120mΩ@-10V | -1.6A |
| | 160mΩ@-4.5V | |

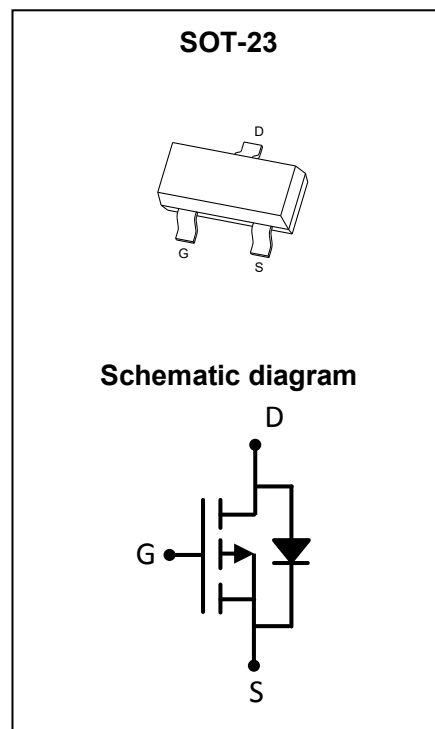
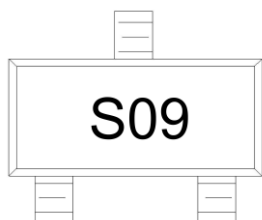
Feature

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance

Application

- DC/DC Converter
- Power Management

MARKING:



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

| Parameter | Symbol | Value | Unit |
|--|-----------------|-----------|---------------------------|
| Drain - Source Voltage | V_{DS} | -60 | V |
| Gate - Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ^{1,5} | I_D | -1.6 | A |
| Pulsed Drain Current ² | I_{DM} | -8.0 | A |
| Power Dissipation ⁵ | P_D | 0.7 | W |
| Thermal Resistance from Junction to Ambient ⁵ | $R_{\theta JA}$ | 180 | $^\circ\text{C}/\text{W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55~ +150 | $^\circ\text{C}$ |

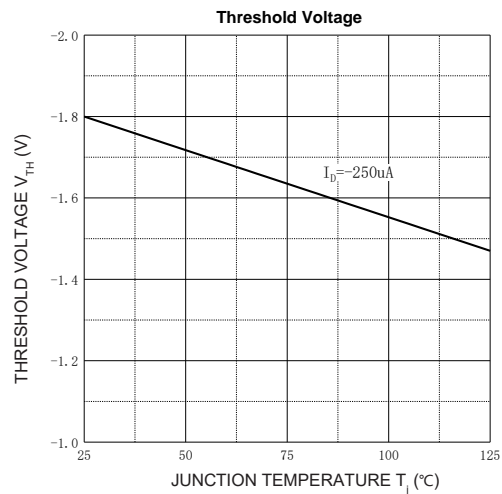
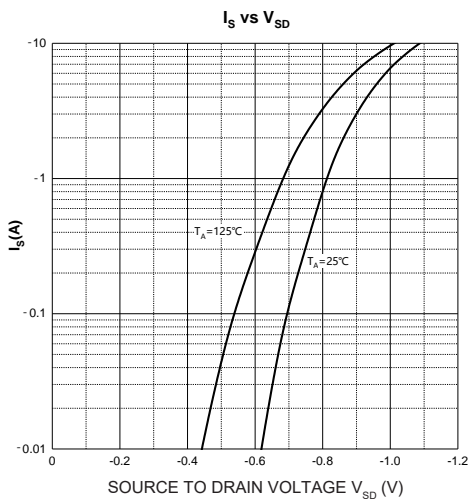
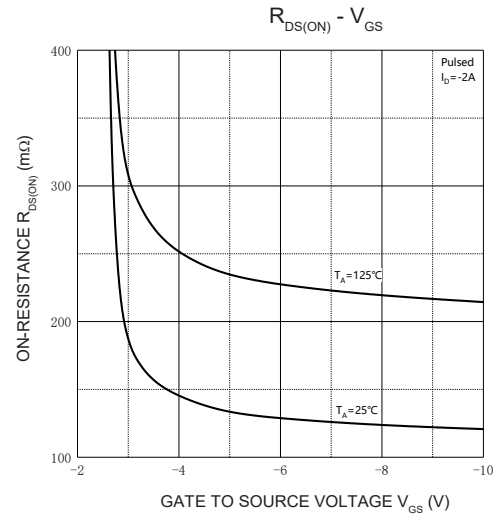
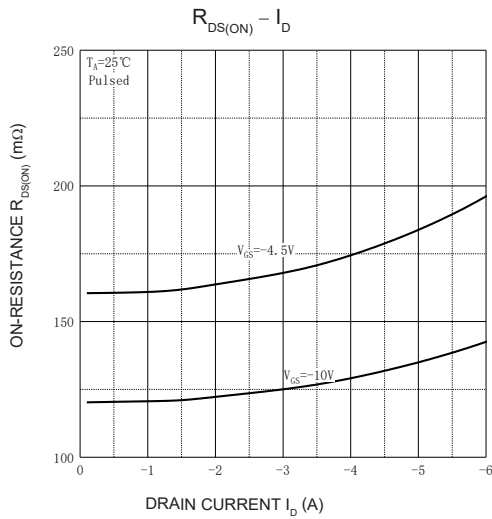
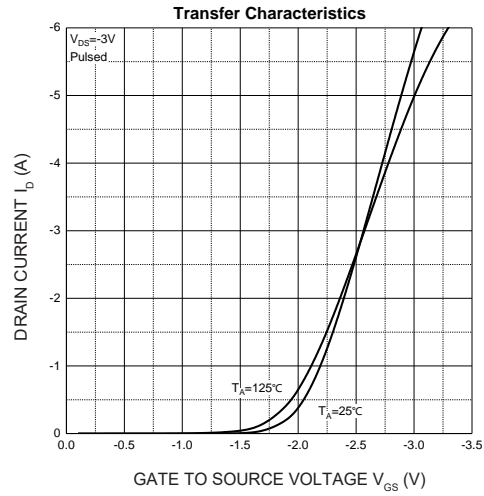
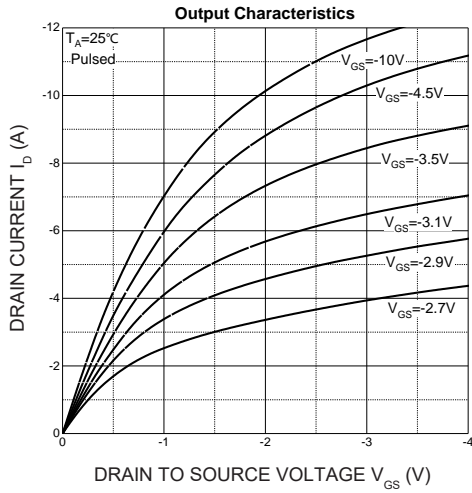
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---------------|--|-----|------|-----------|------------|
| Off Characteristics | | | | | | |
| Drain - Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$ | -60 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = -48V, V_{GS} = 0V$ | | | -1 | μA |
| Gate - Body Leakage Current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | | | ± 100 | nA |
| On Characteristics³ | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -1 | -1.8 | -3.0 | V |
| Drain-source On-resistance | $R_{DS(on)}$ | $V_{GS} = -10V, I_D = -1.5A$ | | 120 | 160 | m Ω |
| | | $V_{GS} = -4.5V, I_D = -1.0A$ | | 160 | 240 | |
| Forward Transconductance | g_{FS} | $V_{DS} = -10V, I_D = -1.5A$ | 2 | | | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = -30V, V_{GS} = 0V, f = 1MHz$ | | 350 | | pF |
| Output Capacitance | C_{oss} | | | 32 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 26 | | |
| Gate Resistance | R_g | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$ | | 5 | | Ω |
| Switching Characteristics | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = -30V, V_{GS} = -10V, I_D = -2.0A$ | | 7 | | nC |
| Gate-source Charge | Q_{gs} | | | 2.2 | | |
| Gate-drain Charge | Q_{gd} | | | 3 | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = -30V, V_{GS} = -10V,$ $R_L = 15\Omega, R_G = 3\Omega$ | | 7 | | ns |
| Turn-on Rise Time | t_r | | | 6 | | |
| Turn-off Delay Time | $t_{d(off)}$ | | | 12 | | |
| Turn-off Fall Time | t_f | | | 7 | | |
| Source - Drain Diode Characteristics | | | | | | |
| Diode Forward Voltage ³ | V_{SD} | $V_{GS} = 0V, I_S = -2.0A$ | | | -1.2 | V |

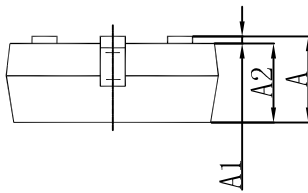
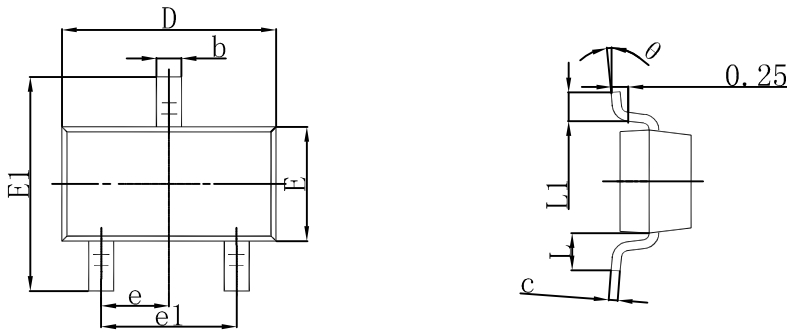
Notes :

- 1.The maximum current rating is limited by Chip.
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.
- 5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Characteristics

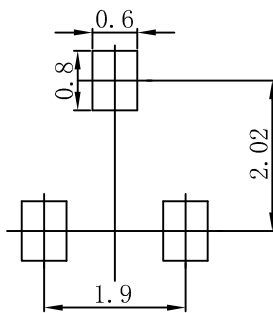


SOT-23 Package Outline Dimensions



| 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:

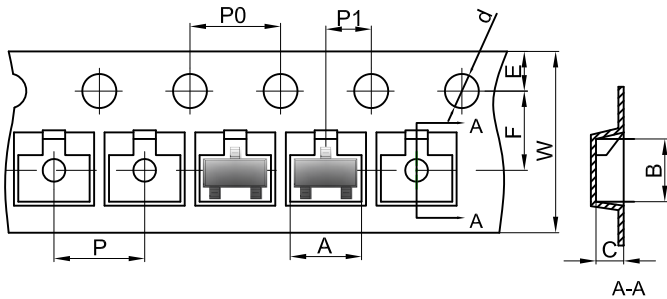
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

NOTICE

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Reel Taping Specifications For Surface Mount Devices-SOT-23

SOT-23 Embossed Carrier Tape



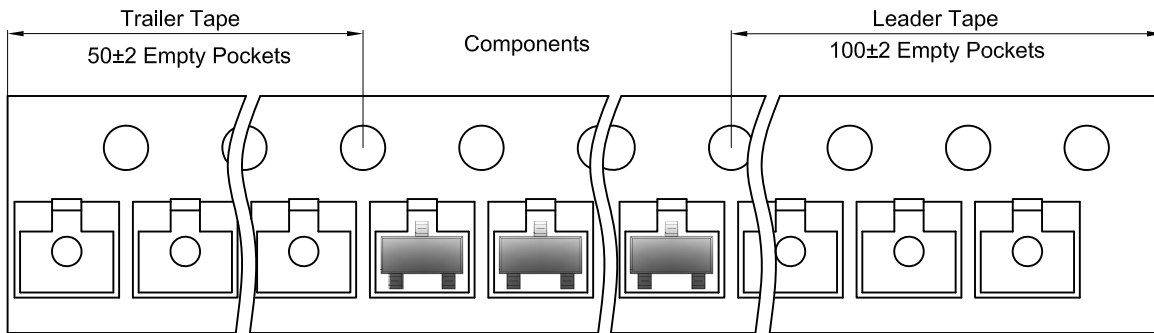
Packaging Description:

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).

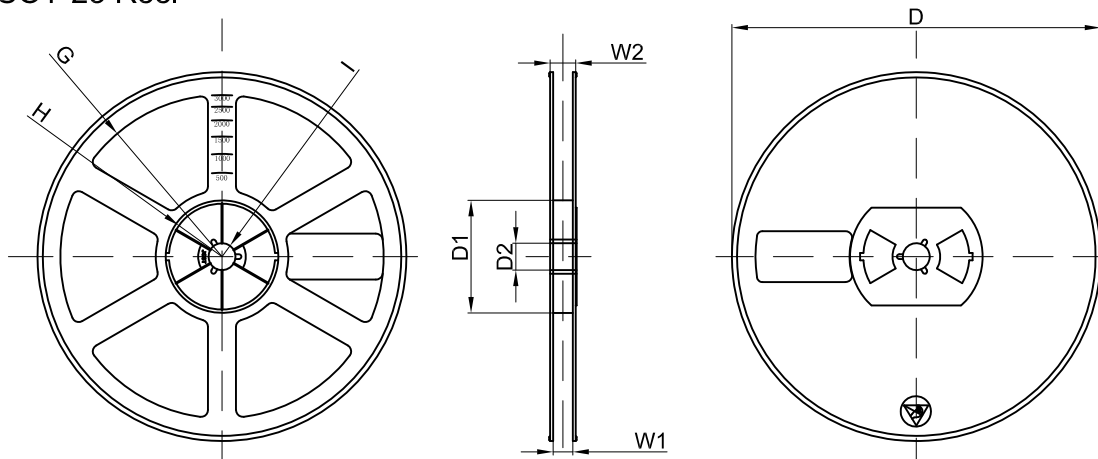
Dimensions are in millimeter

| 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 | |

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