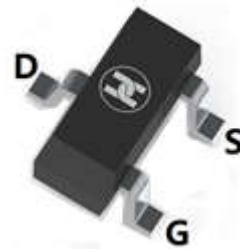
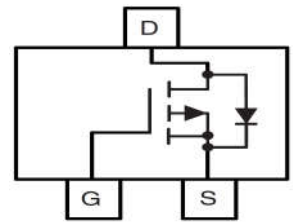


P-CHANNEL MOSFET
FEATURES

- Energy efficient
- Low threshold voltage
- High-speed switching

MECHANICAL DATA

- Case: SOT-23
- Case material: Molded plastic. UL flammability
- Classification rating: 94V-0
- Weight: 0.008 grams (approximate)
- Marking: PD


SOT-23

Equivalent circuit
MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|-----------------|----------|----------------------|
| Drain-source voltage | V_{DS} | -50 | V |
| Gate-source voltage | V_{GS} | ± 20 | V |
| Continuous drain current | I_D | -0.13 | A |
| Pulsed drain current @ $t_p < 10 \mu\text{s}$ (note 1) | I_{DM} | -0.52 | A |
| Power dissipation | P_D | 225 | mW |
| Thermal resistance from junction to ambient (note 2) | $R_{\theta JA}$ | 556 | $^{\circ}\text{C/W}$ |
| 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 specified)

| Parameter | Symbol | Min | Typ. | Max | Unit | Conditions |
|-------------------------------------|---------------|------|------|---------|---------------|--|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | -50 | | | V | $V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$ |
| Zero gate voltage drain current | I_{DSS} | | | -15 | μA | $V_{DS} = -50\text{V}, V_{GS} = 0\text{V}$ |
| | | | | -0.1 | μA | $V_{DS} = -25\text{V}, V_{GS} = 0\text{V}$ |
| Gate-body leakage current | I_{GSS} | | | ± 5 | μA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| Gate threshold voltage (note 3) | $V_{GS(th)}$ | -0.9 | | -2 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| Drain-source on-resistance (note 3) | $R_{DS(on)}$ | | | 10 | Ω | $V_{GS} = -5\text{V}, I_D = -0.1\text{A}$ |
| | | | | 8 | Ω | $V_{GS} = -10\text{V}, I_D = -0.1\text{A}$ |
| Forward transconductance (note 1) | g_{FS} | 50 | | | mS | $V_{DS} = -25\text{V}; I_D = -100\text{mA}$ |
| Input capacitance | C_{iss} | | 30 | | pF | $V_{DS} = 5\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ |
| Output capacitance | C_{oss} | | 10 | | pF | |
| Reverse transfer capacitance | C_{rss} | | 5 | | pF | |
| Turn-on delay time | $t_{d(on)}$ | | 2.5 | | ns | $V_{DD} = -15\text{V}, R_L = 50\Omega, I_D = -2.5\text{A}$ |
| Turn-on rise time | t_r | | 1 | | ns | |
| Turn-off delay time | $t_{d(off)}$ | | 16 | | ns | |
| Turn-off fall time | t_f | | 8 | | ns | |
| Continuous current | I_S | | | -0.13 | A | |
| Pulsed current | I_{SM} | | | -0.52 | A | |
| Diode forward voltage (note 3) | V_{SD} | | | -2.2 | V | $I_S = -0.13\text{A}, V_{GS} = 0\text{V}$ |

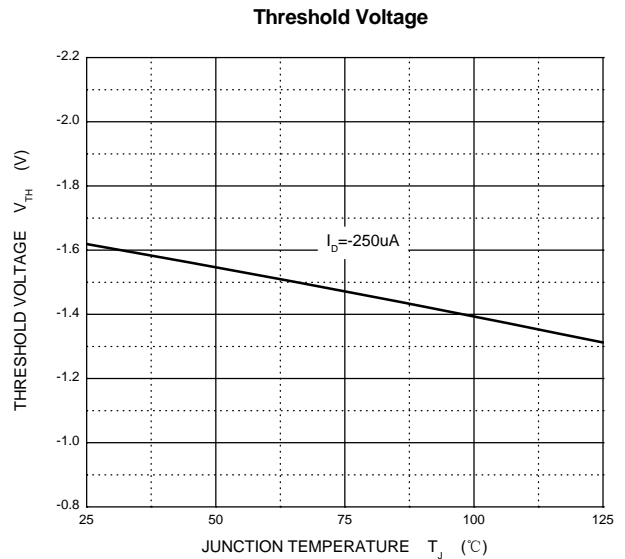
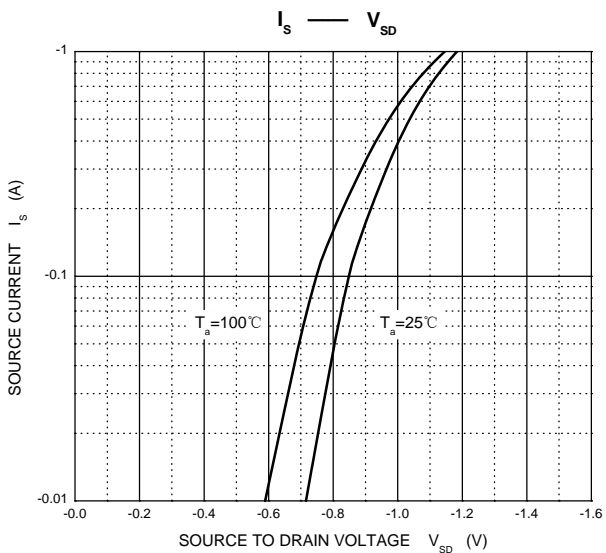
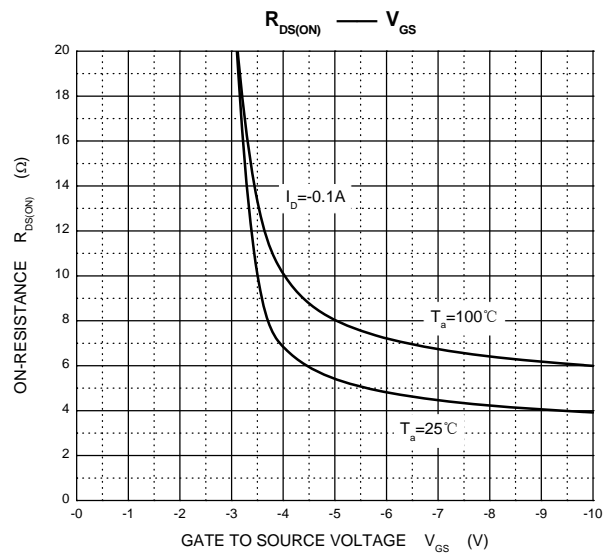
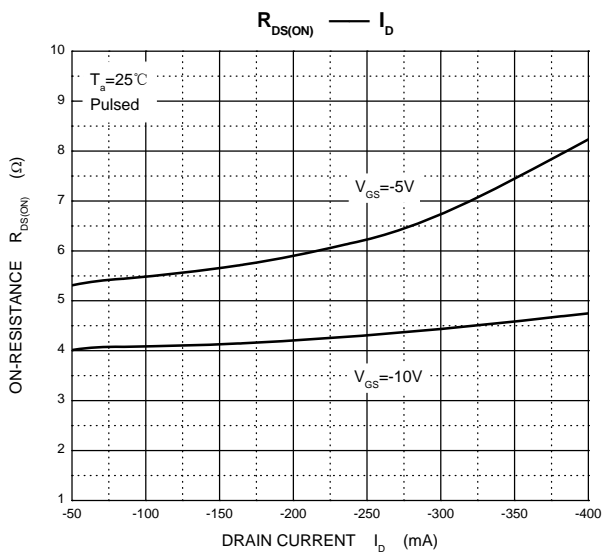
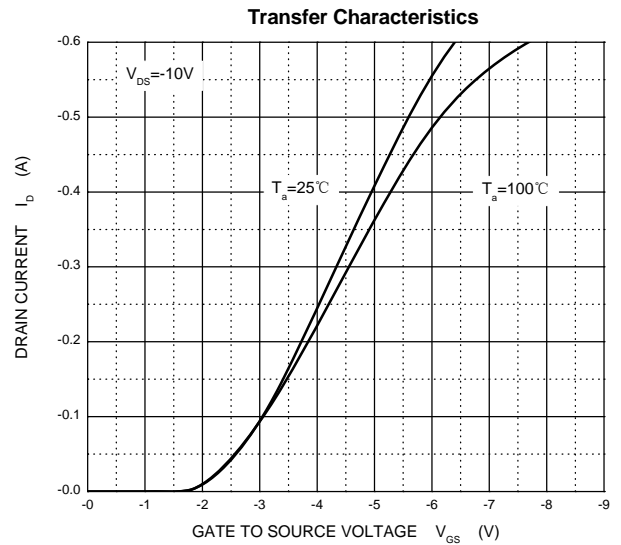
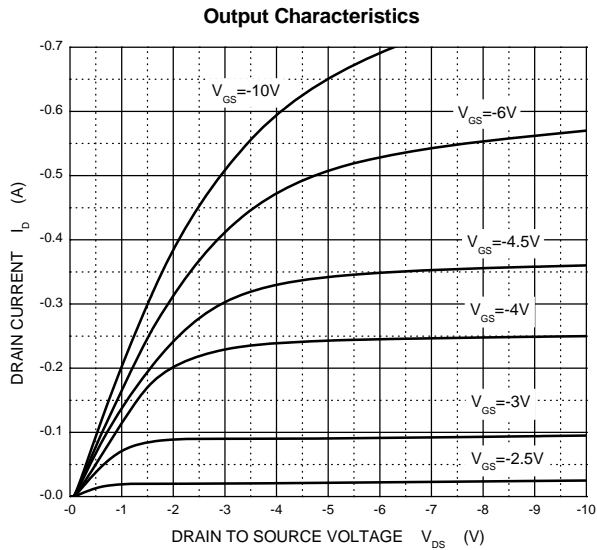
Notes : 1. Repetitive rating : Pulse width limited by junction temperature.

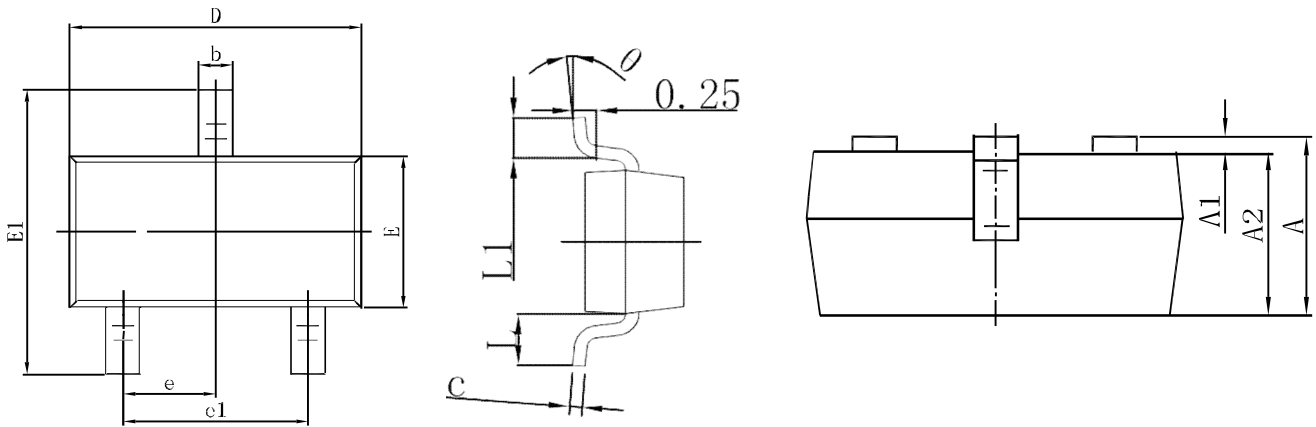
2. Surface mounted on FR4 board , $t \leq 10\text{s}$.

3. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycles $\leq 2\%$.

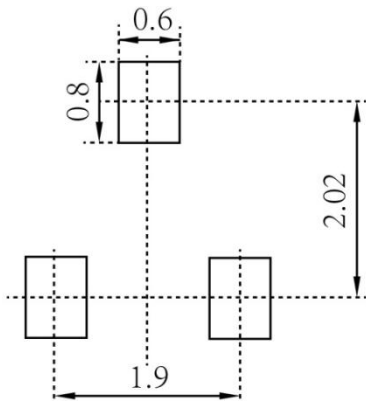
P-CHANNEL MOSFET

TYPICAL CHARACTERISTICS



P-CHANNEL MOSFET
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° |

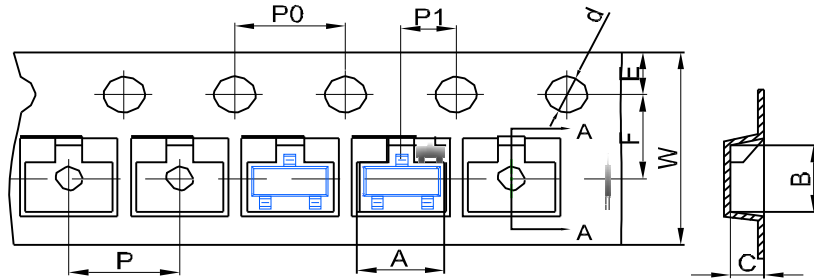
SOT-23 SUGGESTED PAD LAYOUT

Note:

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

P-CHANNEL MOSFET

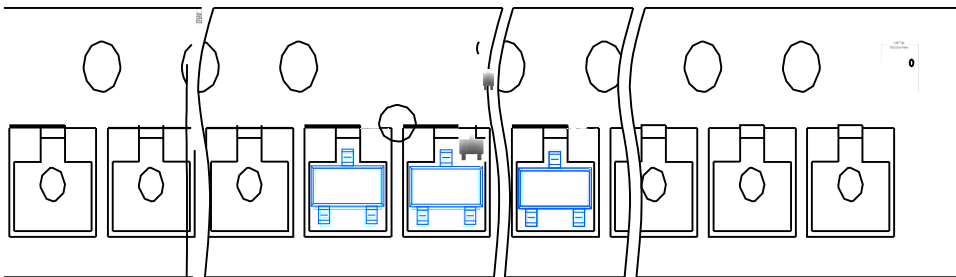
SOT-23 TAPE AND REEL

SOT-23 Embossed Carrier Tape

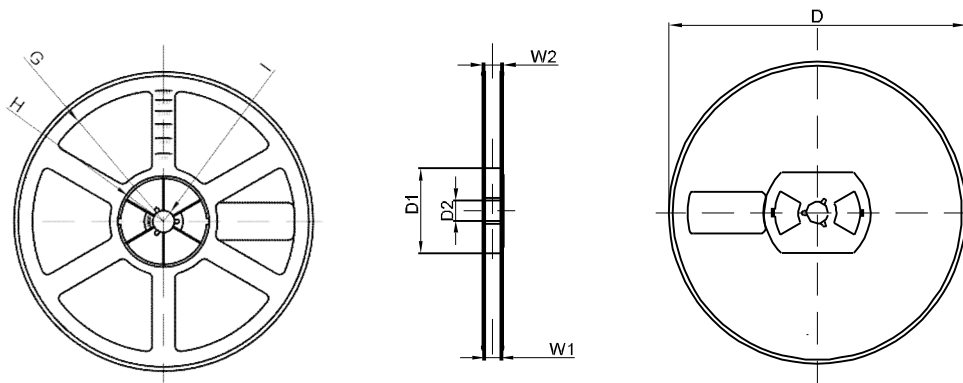


| DIMENSIONS ARE IN MILLIMETER | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| TYPE | A | B | C | d | E | F | P0 | P | P1 | W |
| SOT-23 | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |
| TOLERANCE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

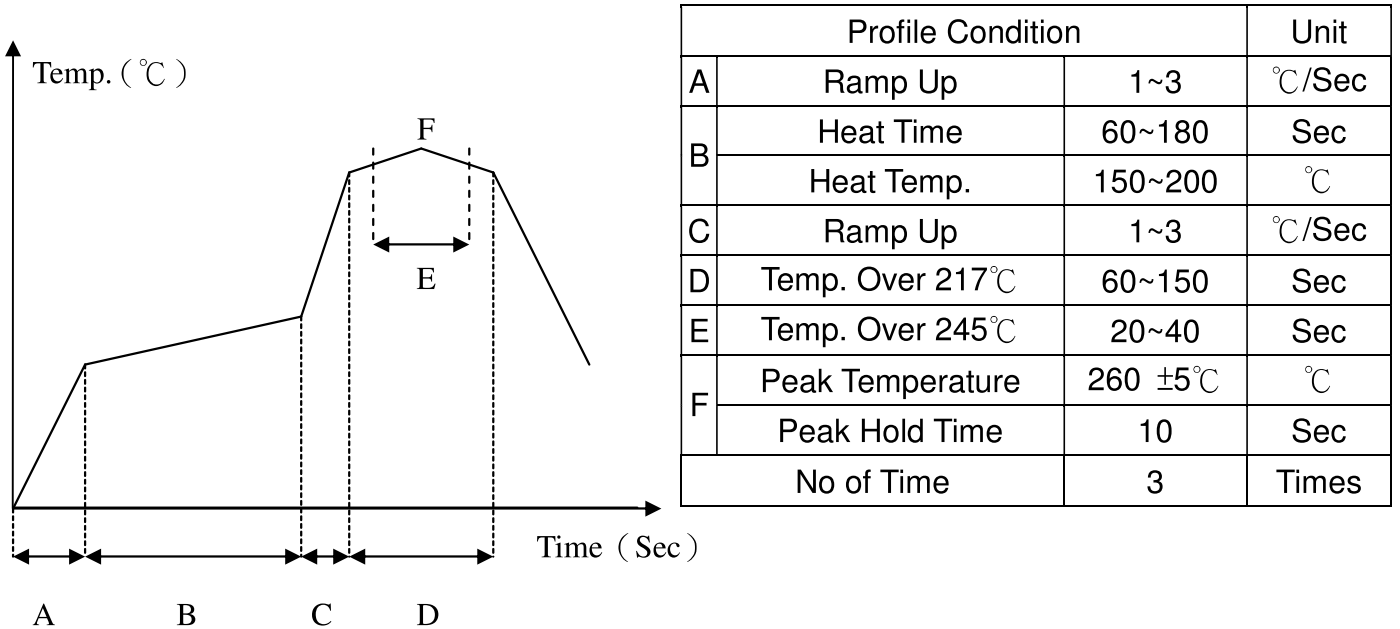


SOT-23 Reel



| 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 |

1.Re-Flow Heat-resisting Temperature Condition



2.Dip Soldering

Flow soldering with bath

Flow soldering condition : 260 +5/-5°C 10±0.5 Sec.

Times: 3 times

3.Hand Soldering

With soldering iron : 380°C 3±0.5 Sec

Times: 2 times