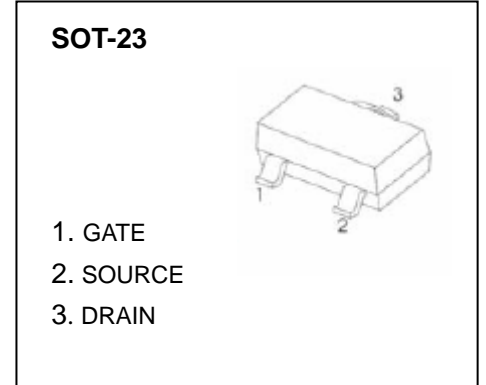




SOT-23 Plastic-Encapsulate MOSFETS

CJ&'' D-channel MOSFET

| V _{(BR)DSS} | R _{DS(on)MAX} | I _D |
|----------------------|------------------------|----------------|
| -12V | 28mΩ@-4.5V | -6A |
| | 32mΩ@-3.7V | |
| | 40mΩ@-2.5V | |
| | 63mΩ@-1.8V | |
| | 150mΩ@-1.5V | |



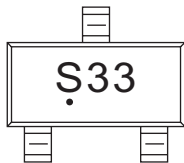
FEATURE

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

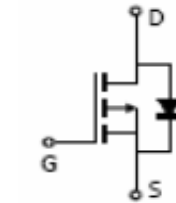
APPLICATION

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

MARKING: S33



S33 = Device code
Solid dot = Green molding compound device.



ABSOLUTE MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------------------------|-------------------|------|
| Drain-Source Voltage | V _{DS} | -12 | V |
| Gate-Source Voltage | V _{GS} | ±8 | V |
| Continuous Drain Current | I _D | -6 ^a | A |
| Pulsed Drain Current (t=300μs) | I _{DM} | -20 | A |
| Power Dissipation | P _D | 0.35 ^b | W |
| | | 1.1 ^a | W |
| Thermal Resistance from Junction to Ambient | R _{θJA} | 357 ^b | °C/W |
| | | 113 ^a | °C/W |
| Operation Junction and Storage Temperature Range | T _J , T _{STG} | -55~ +150 | °C |

- a. Device mounted on FR-4 substrate board, with minimum recommended pad layout, single side.
b. Device mounted on no heat sink.

MOSFET ELECTRICAL CHARACTERISTICS

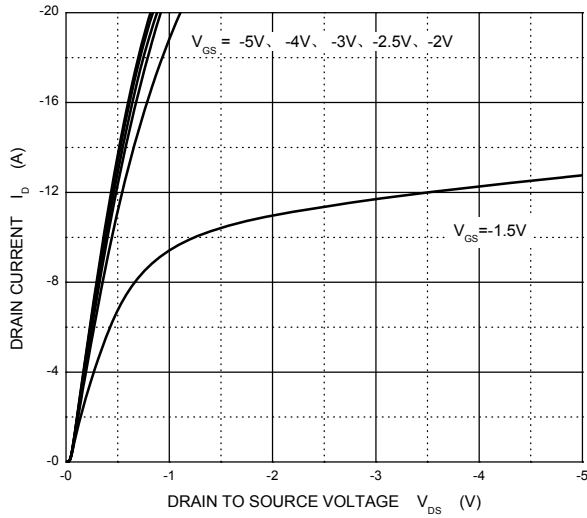
$T_a=25^\circ\text{C}$ unless otherwise specified

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---------------|--|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$ | -12 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = -12V, V_{GS} = 0V$ | | | -1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{GS} = \pm 8V, V_{DS} = 0V$ | | | ± 0.1 | μA |
| Gate threshold voltage (note 1) | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -0.4 | | -1 | V |
| Drain-source on-resistance (note 1) | $R_{DS(on)}$ | $V_{GS} = -4.5V, I_D = -5A$ | | 22 | 28 | m Ω |
| | | $V_{GS} = -3.7V, I_D = -4.6A$ | | 24 | 32 | |
| | | $V_{GS} = -2.5V, I_D = -4.3A$ | | 27 | 40 | |
| | | $V_{GS} = -1.8V, I_D = -1A$ | | 34 | 63 | |
| | | $V_{GS} = -1.5V, I_D = -0.5A$ | | 42 | 150 | |
| Forward transconductance (note 1) | g_{FS} | $V_{DS} = -5V, I_D = -5A$ | | 18 | | S |
| Dynamic characteristics (note 2) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = -6V, V_{GS} = 0V, f = 1MHz$ | | 1275 | | pF |
| Output Capacitance | C_{oss} | | | 255 | | pF |
| Reverse Transfer Capacitance | C_{rss} | | | 236 | | pF |
| Gate resistance | R_g | $f = 1MHz$ | 1.9 | | 19 | Ω |
| Total Gate Charge | Q_g | $V_{DS} = -6V, V_{GS} = -4.5V, I_D = -5A$ | | 14 | 21 | nC |
| Gate-Source Charge | Q_{gs} | | | 2.3 | | nC |
| Gate-Drain Charge | Q_{gd} | | | 3.6 | | nC |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = -6V, V_{GEN} = -4.5V, I_D = -4A$ $R_L = 6\Omega, R_{GEN} = 1\Omega$ | | 26 | 40 | ns |
| Turn-on rise time | t_r | | | 24 | 40 | ns |
| Turn-off delay time | $t_{d(off)}$ | | | 45 | 70 | ns |
| Turn-off fall time | t_f | | | 20 | 35 | ns |
| Source-Drain Diode characteristics | | | | | | |
| Diode forward current | I_S | $T_C = 25^\circ\text{C}$ | | | -1.4 | A |
| Diode pulsed forward current | I_{SM} | | | | -20 | A |
| Diode Forward voltage (note 1) | V_{DS} | $V_{GS} = 0V, I_S = -4A$ | | | -1.2 | V |
| Diode reverse recovery time (note 2) | t_{rr} | $I_F = -4A, di/dt = 100A/\mu s$ | | 24 | 48 | ns |
| Diode reverse recovery charge (note 2) | Q_{rr} | | | | 8 | 16 |

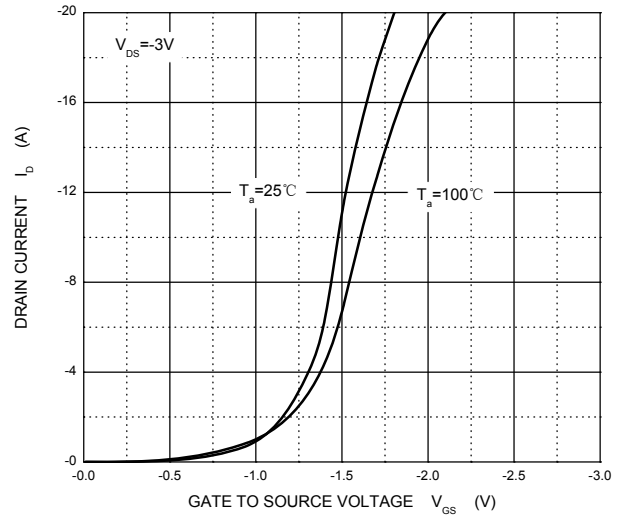
- Notes :**
1. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 2. Guaranteed by design, not subject to production testing.

Typical Characteristics

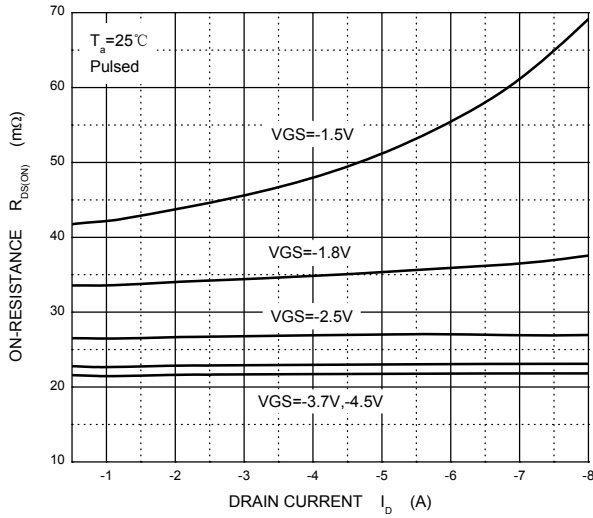
Output Characteristics



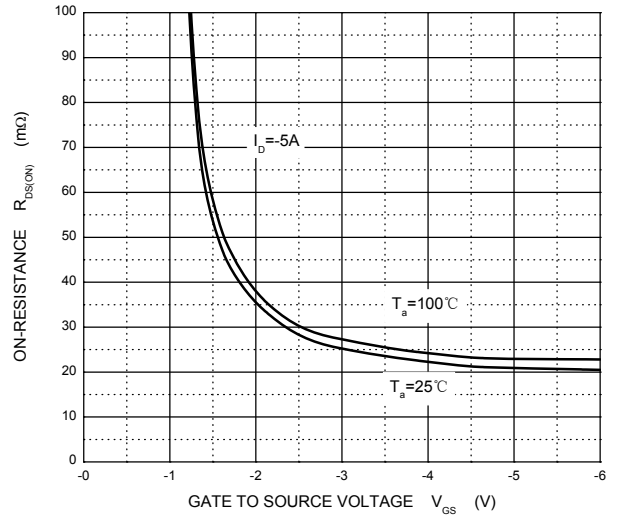
Transfer Characteristics



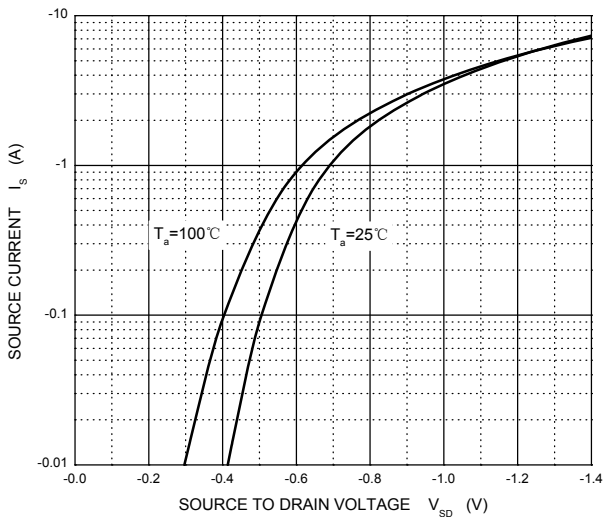
$R_{DS(ON)}$ — I_D



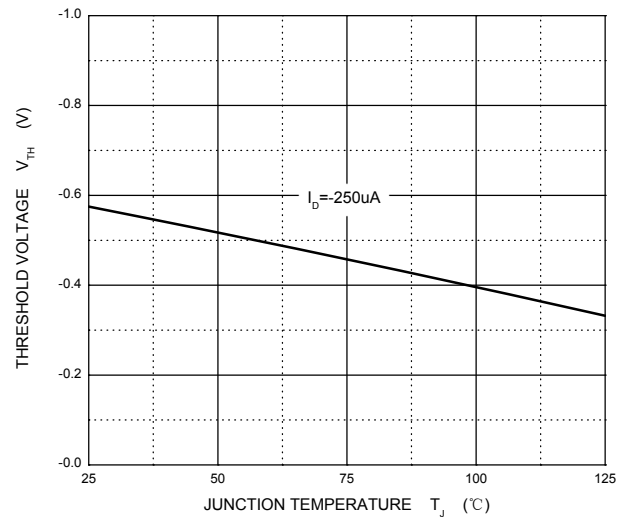
$R_{DS(ON)}$ — V_{GS}



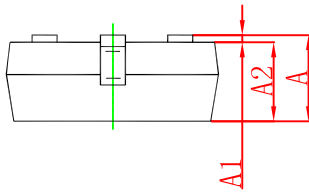
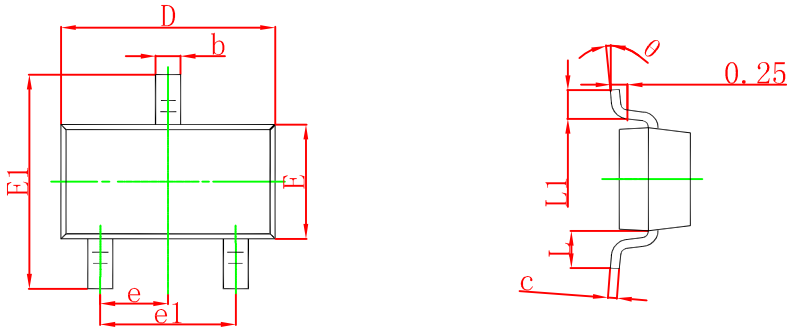
I_S — V_{SD}



Threshold Voltage

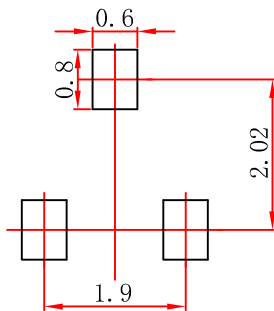


SOT-23 Package Outline Dimensions



| 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:

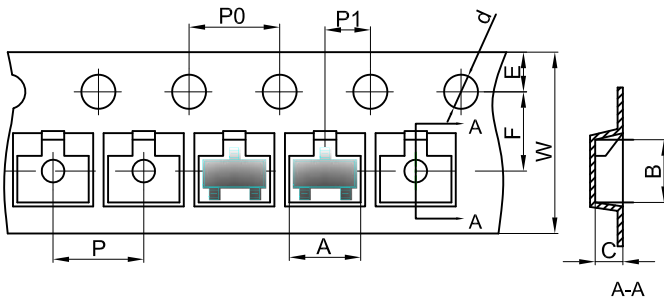
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

NOTICE

JSCJ reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSCJ does not assume any liability arising out of the application or use of any product described herein.

SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape



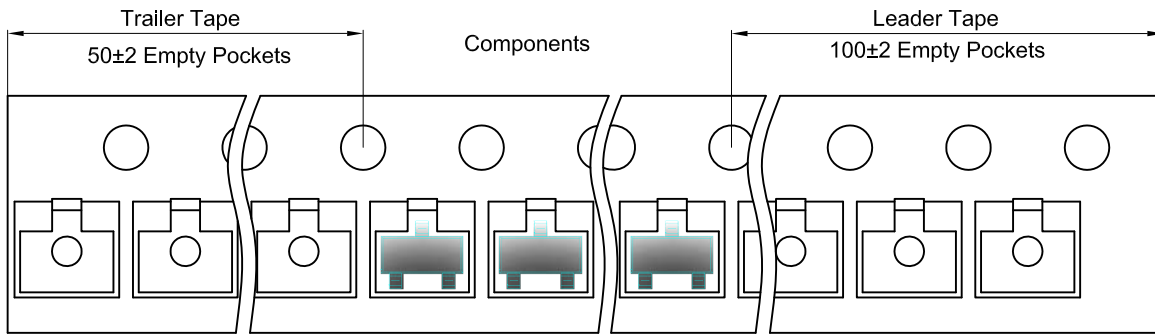
Packaging Description:

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).

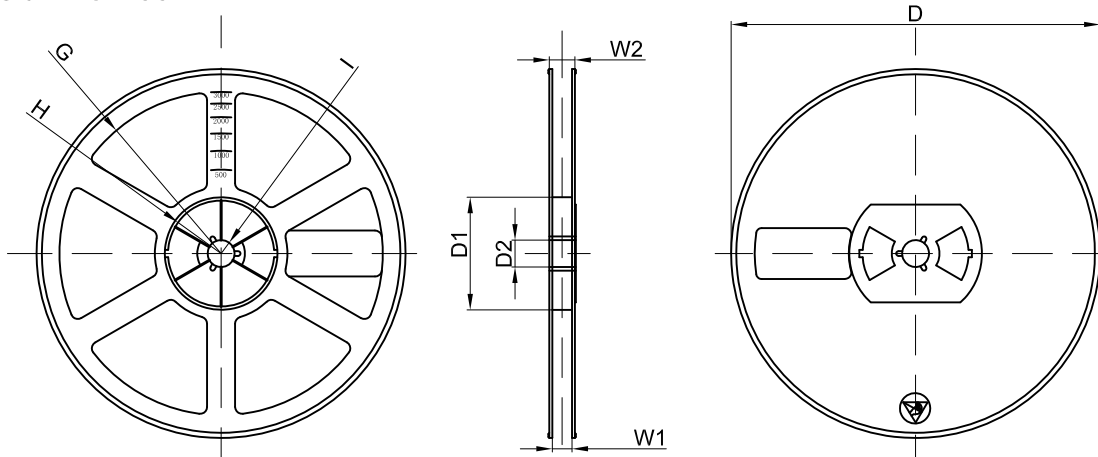
Dimensions are in millimeter

| 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 | 30,000 pcs | 203×203×195 | 120,000 pcs | 438×438×220 | |