

Product Summary

| V _{(BR)DSS} | R _{DS(on)TYP} | I _D |
|----------------------|------------------------|----------------|
| 20V | 26mΩ@4.5V | 4.0A |
| | 33mΩ@2.5V | |
| | 49mΩ@1.8V | |

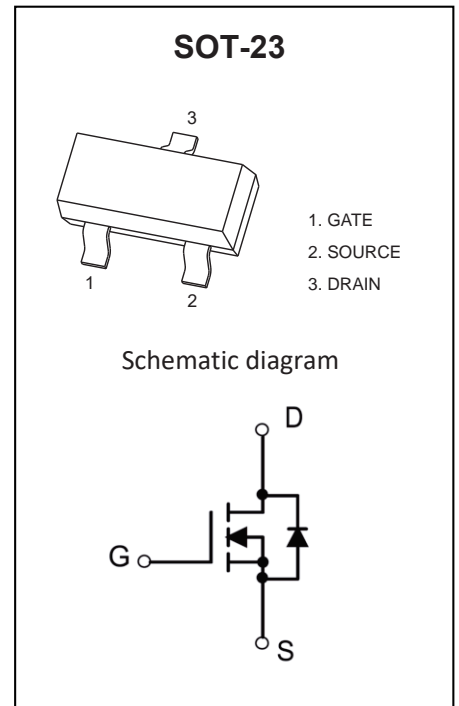
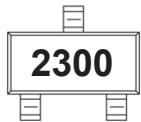
Feature

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

Application

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

MARKING:



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

| Parameter | Symbol | Value | Unit |
|--|------------------|-----------|------|
| Drain-Source Voltage | V _{DS} | 20 | V |
| Gate-Source Voltage | V _{GS} | ±12 | V |
| Continuous Drain Current | I _D | 4.0 | A |
| Pulsed Drain Current ⁽¹⁾ | I _{DM} | 16.0 | A |
| Power Dissipation | P _D | 0.35 | W |
| Thermal Resistance from Junction to Ambient ⁽²⁾ | R _{θJA} | 357 | °C/W |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{STG} | -55~ +150 | °C |

MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^\circ\text{C}$ unless otherwise noted)

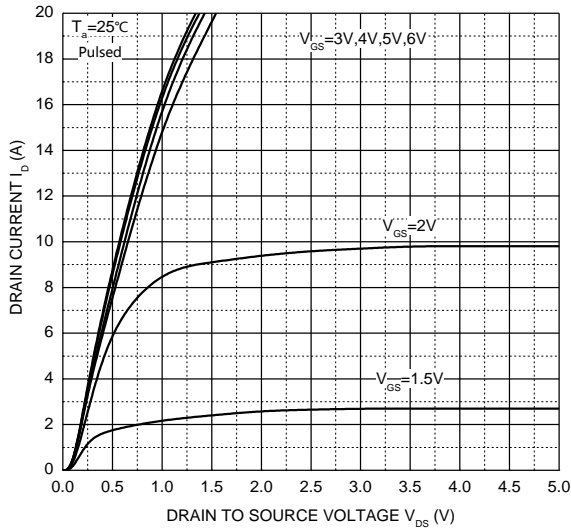
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---------------|---|------|------|-----------|------------|
| STATIC CHARACTERISTICS | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 20 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 20V, V_{GS} = 0V$ | | | 1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{GS} = \pm 12V, V_{DS} = 0V$ | | | ± 100 | nA |
| Gate threshold voltage ⁽³⁾ | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 0.45 | 0.75 | 1 | V |
| Drain-source on-resistance ⁽³⁾ | $R_{DS(on)}$ | $V_{GS} = 4.5V, I_D = 3A$ | | 26 | 34 | m Ω |
| | | $V_{GS} = 2.5V, I_D = 2A$ | | 33 | 45 | |
| | | $V_{GS} = 1.8V, I_D = 2A$ | | 49 | 70 | |
| Forward transconductance ⁽³⁾ | g_{FS} | $V_{DS} = 10V, I_D = 6A$ | 1 | | | S |
| DYNAMIC CHARACTERISTICS ⁽⁴⁾ | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 8V, V_{GS} = 0V, f = 1MHz$ | | 523 | | pF |
| Output Capacitance | C_{oss} | | | 99 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 75 | | |
| SWITCHING CHARACTERISTICS ⁽⁴⁾ | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS} = 4.5V, V_{DS} = 10V,$ $I_D = 1A, R_{GEN} = 6\Omega$ | | 10.5 | 21 | ns |
| Turn-on rise time | t_r | | | 4.5 | 9 | |
| Turn-off delay time | $t_{d(off)}$ | | | 27.5 | 55 | |
| Turn-off fall time | t_f | | | 4.3 | 8.6 | |
| Total gate charge | Q_g | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 6A$ | | 6.4 | 8.2 | nC |
| Gate-source charge | Q_{gs} | | | 1.8 | 2.3 | |
| Gate-drain charge | Q_{gd} | | | 1.3 | 1.9 | |
| SOURCE-DRAIN DIODE CHARACTERISTICS | | | | | | |
| Body Diode Voltage ⁽³⁾ | V_{SD} | $I_S = 1.7A, V_{GS} = 0V$ | | 0.8 | 1.2 | V |
| Continuous Source-Drain Diode Current | I_S | $T_C = 25^\circ\text{C}$ | | | 1.7 | A |

Notes:

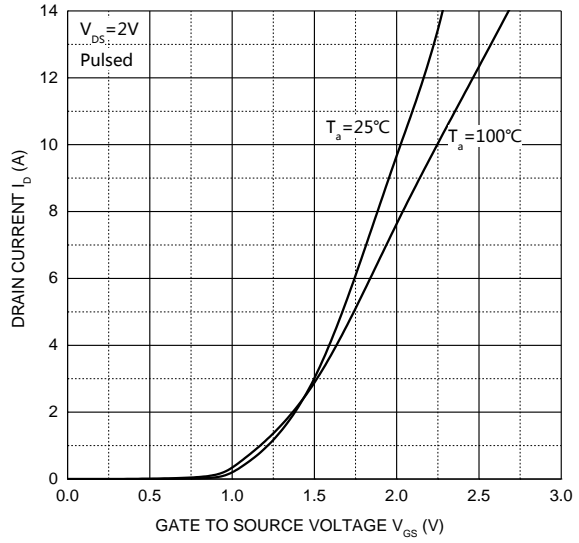
1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board , $t_s \leq 10s$.
3. Pulse Test : Pulse Width $\leq 80\mu s$, Duty Cycle $\leq 0.5\%$.
4. Guaranteed by design, not subject to producing.

Typical Electrical and Thermal Characteristics

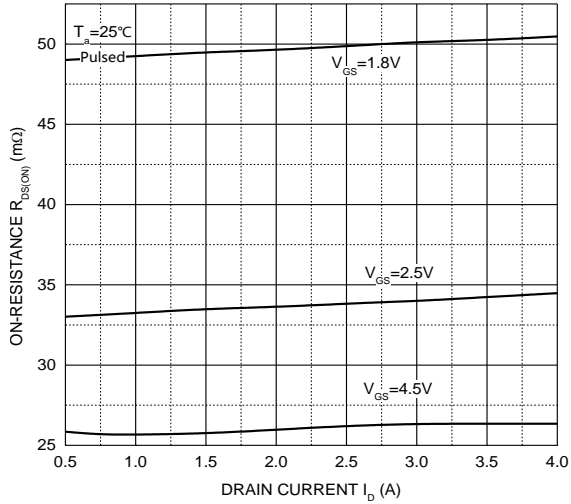
Output Characteristics



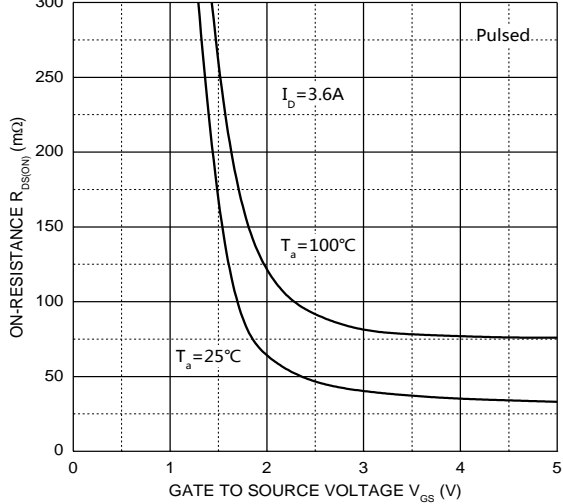
Transfer Characteristics



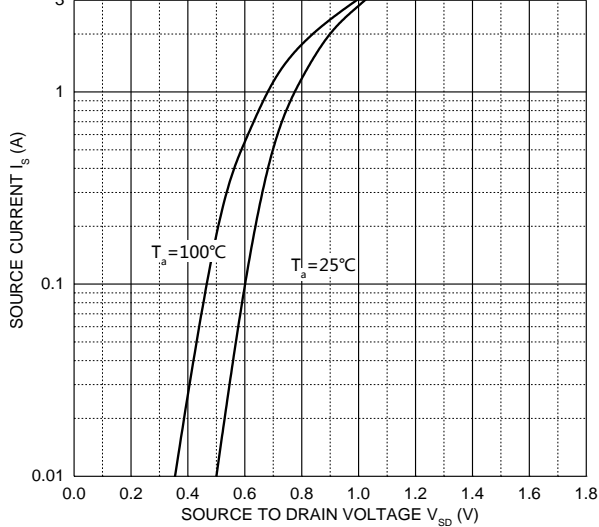
$R_{DS(ON)} - I_D$



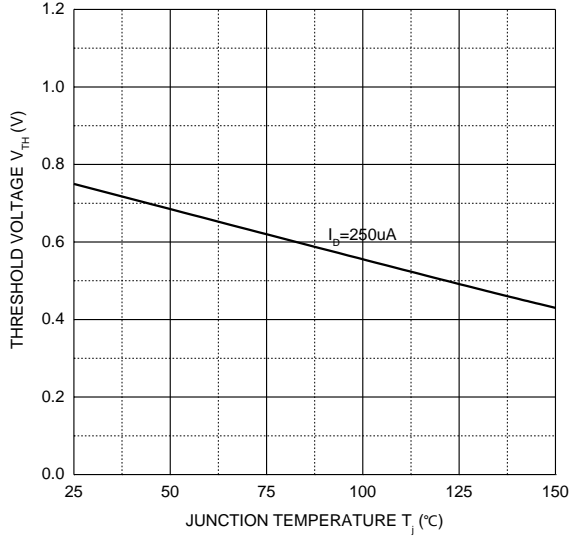
$R_{DS(ON)} - V_{GS}$

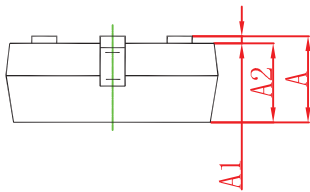
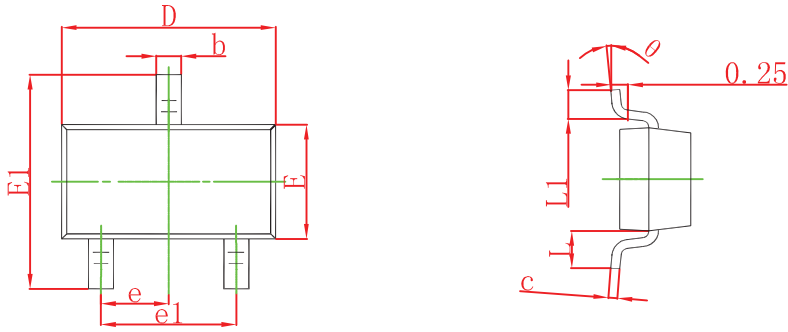


$I_s - V_{SD}$



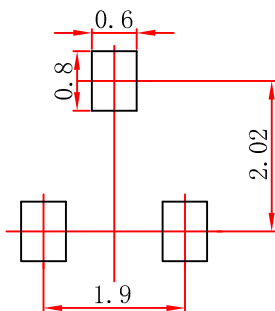
Threshold Voltage





| 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.