

SOT-23 Plastic-Encapsulate MOSFETS

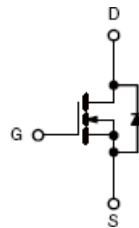
BC2302D N-Channel 20-V(D-S) MOSFET

FEATURE

TrenchFET Power MOSFET

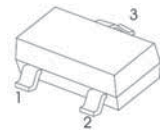
APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter



Equivalent Circuit

SOT-23



1. GATE
2. SOURCE
3. DRAIN

MARKING CODE: "2302" OR "S2D"

Maximum ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|------------|---------------------------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | |
| Continuous Drain Current | I_D | 2.0 | A |
| Continuous Source-Drain Current(Diode Conduction) | I_S | 0.6 | |
| Power Dissipation | P_D | 0.35 | W |
| Thermal Resistance from Junction to Ambient ($t \leq 5s$) | $R_{\theta JA}$ | 357 | $^\circ\text{C}/\text{W}$ |
| Operating Junction | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | |

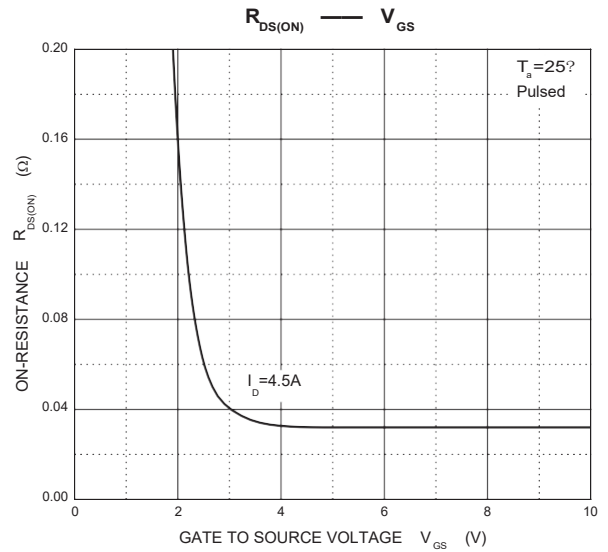
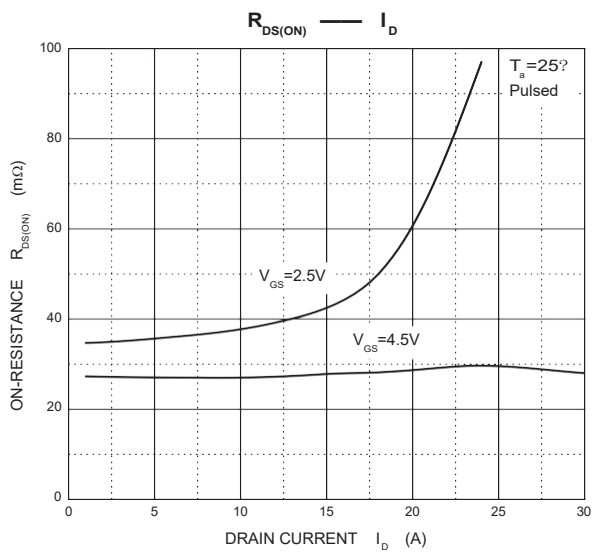
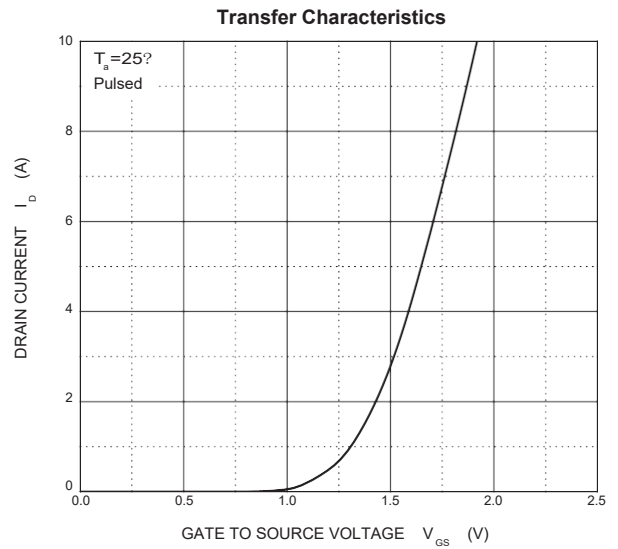
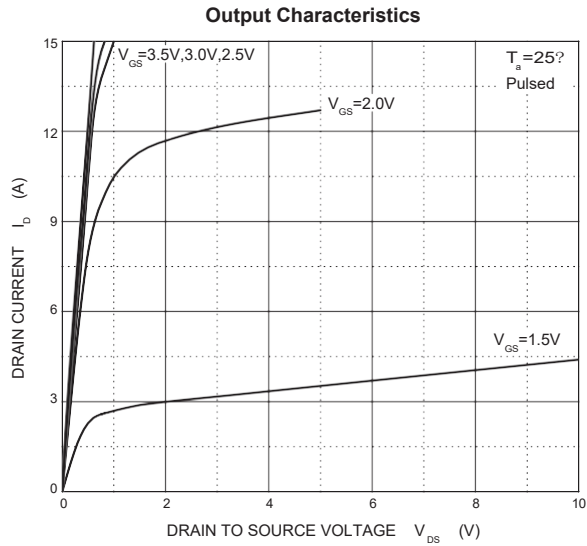
Electrical characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---------------|--|-----|-------|-----------|----------|
| Static | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 10\mu A$ | 20 | | | V |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 50\mu A$ | 0.5 | 0.95 | 1.25 | |
| Gate-body leakage | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 8V$ | | | ± 100 | nA |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 20V, V_{GS} = 0V$ | | | 1 | μA |
| Drain-source on-resistance ^a | $r_{DS(on)}$ | $V_{GS} = 4.5V, I_D = 2.0A$ | | 0.036 | 0.050 | Ω |
| | | $V_{GS} = 2.5V, I_D = 1.0A$ | | 0.046 | 0.080 | |
| Forward transconductance ^a | g_{fs} | $V_{DS} = 5V, I_D = 3.6A$ | | 8 | | S |
| Diode forward voltage | V_{SD} | $I_S = 0.94A, V_{GS} = 0V$ | | 0.76 | 1.2 | V |
| Dynamic | | | | | | |
| Total gate charge | Q_g | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3.6A$ | | 4.0 | | nC |
| Gate-source charge | Q_{gs} | | | 0.65 | | |
| Gate-drain charge | Q_{gd} | | | 1.5 | | |
| Input capacitance ^b | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$ | | 300 | | pF |
| Output capacitance ^b | C_{oss} | | | 120 | | |
| Reverse transfer capacitance ^b | C_{rss} | | | 80 | | |
| Switching^b | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 10V,$ $R_L = 5.5\Omega, I_D \approx 3.6A,$ $V_{GEN} = 4.5V, R_g = 6\Omega$ | | 7 | | ns |
| Rise time | t_r | | | 55 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 16 | | |
| Fall time | t_f | | | 10 | | |

Notes :

- Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- These parameters have no way to verify.

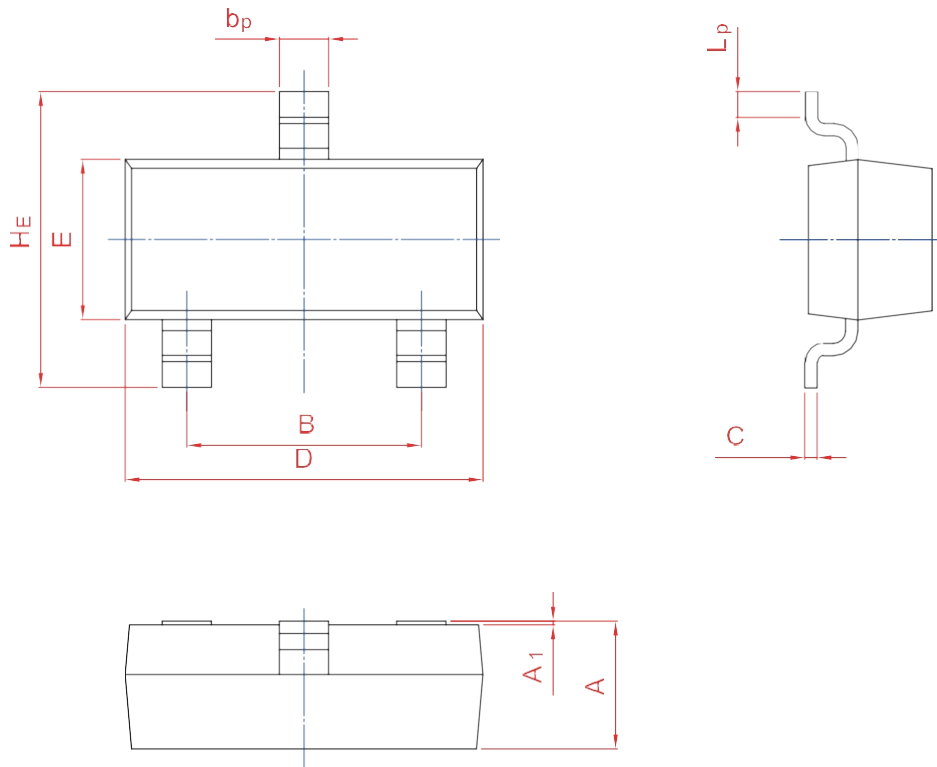
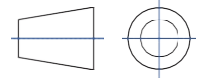
Typical Characteristics



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A | B | b _p | C | D | E | HE | A ₁ | L _p |
|------|------|------|----------------|------|------|------|------|----------------|----------------|
| mm | 1.40 | 2.04 | 0.50 | 0.19 | 3.10 | 1.65 | 3.00 | 0.100 | 0.50 |
| | 0.95 | 1.78 | 0.35 | 0.08 | 2.70 | 1.20 | 2.20 | 0.013 | 0.20 |