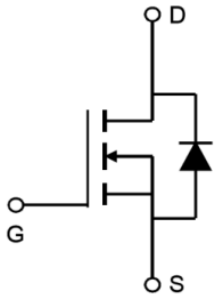
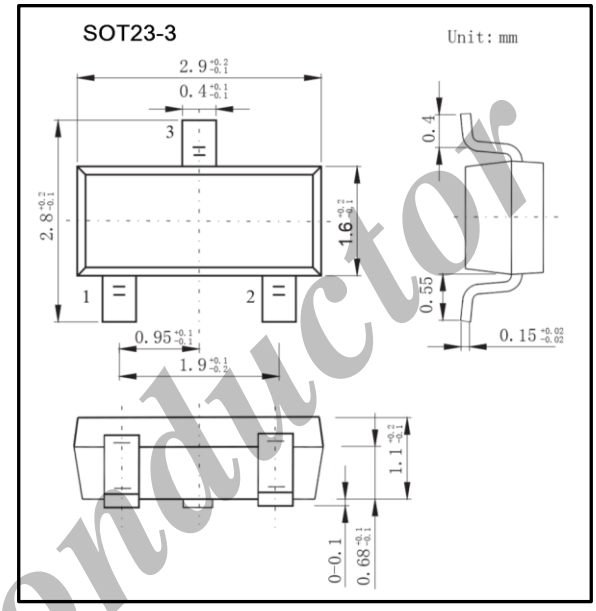
# AP2302B
## 20V N-Channel Enhancement Mode MOSFET

- **General Description**

AP2302B combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load-switch or PWM applications.

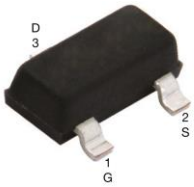



- **Applications**

- DC/DC converter for portable devices
- Load switch

Top View




- **Product Summary**

| | |
|---|---|
| $V_{DS}$ | 20V |
| $I_D$ (at $V_{GS}$ = 4.5V) | 2.8A |
| $R_{DS(ON)}$ (at $V_{GS}$ = 4.5V) | < 85mΩ |
| $R_{DS(ON)}$ (at $V_{GS}$ = 2.5V) | < 115mΩ |

Pb-Free

RoHS COMPLIANT

- **Absolute Maximum Ratings (Ta = 25℃ unless noted)**

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±8 | |
| Continuous Drain Current *b | $I_D$ (Ta = 25°C) | 2.8 | A |
| | $I_D$ (Ta = 70°C) | 2.2 | |
| Pulsed Drain Current *a | $I_{DM}$ | 10 | |
| Power Dissipation *b | $P_D$ (Ta = 25°C) | 1.25 | W |
| | $P_D$ (Ta = 70°C) | 0.8 | |
| Thermal Resistance. Junction-to-Ambient | $R_{\theta JA}$ *b | 100 | °C/W |
| | $R_{\theta JA}$ *c | 166 | |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 to 150 | |

Notes
*a Pulse width limited by maximum junction temperature
*b Surface Mounted on FR4 Board, t ≤ 5s.
*c Surface Mounted on FR4 Board.

- **Electrical Characteristics (Ta = 25°C unless noted)**

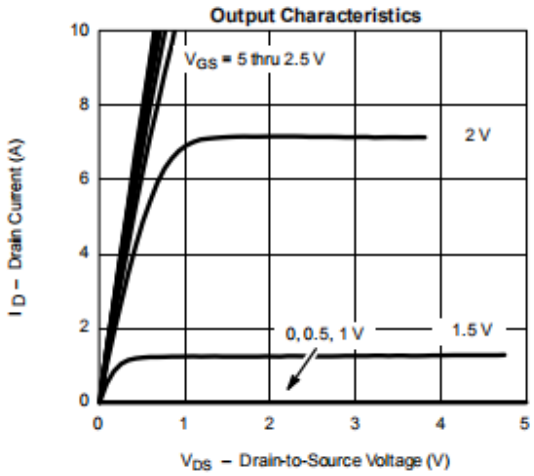
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | | | 1 | μA |
| | | $V_{DS}$=20V, $V_{GS}$=0V, $T_J$=55°C | | | 10 | |
| Gate-Body leakage current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±8V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 0.62 | 0.95 | 1.9 | V |
| Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=4.5V, $I_D$=3.6A | | 45 | 85 | mΩ |
| | | $V_{GS}$=2.5V, $I_D$=3.1A | | 70 | 115 | |
| Forward Transconductance *d | $g_{FS}$ | $V_{DS}$=5V, $I_D$=3.6A | | 8 | | S |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=10V, f=1MHz | | 300 | | pF |
| Output Capacitance | $C_{oss}$ | | | 120 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 80 | | |
| Total Gate Charge | $Q_g$ | $V_{GS}$=4.5V, $V_{DS}$=10V, $I_D$=3.6A | | 4 | 10 | nC |
| Gate Source Charge | $Q_{gs}$ | | | 0.65 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 1.5 | | |
| Turn-On Delay Time | $t_{D(on)}$ | $V_{GS}$=4.5V, $V_{DS}$=10V, $I_D$=3.6A, $R_L$=5.5Ω, $R_{GEN}$=6Ω | | 7 | 15 | ns |
| Turn-On Rise Time | $t_r$ | | | 55 | 80 | |
| Turn-Off Delay Time | $t_{D(off)}$ | | | 16 | 60 | |
| Turn-Off Fall Time | $t_f$ | | | 10 | 25 | |
| Continuous Source Current (Diode Conduction) | $I_S$ | | | 1.6 | | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1.6A, $V_{GS}$=0V | | 0.76 | 1.2 | V |

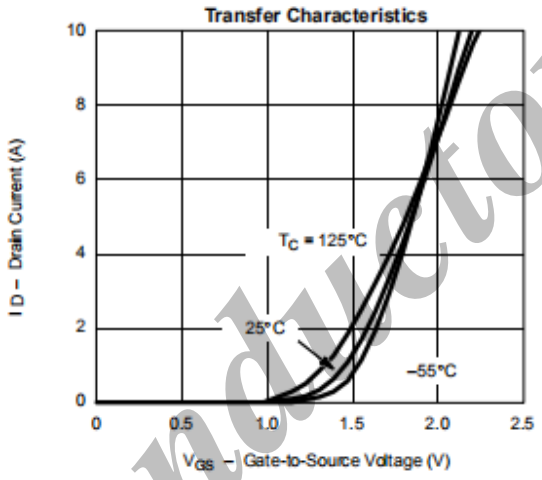
Note
*d Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

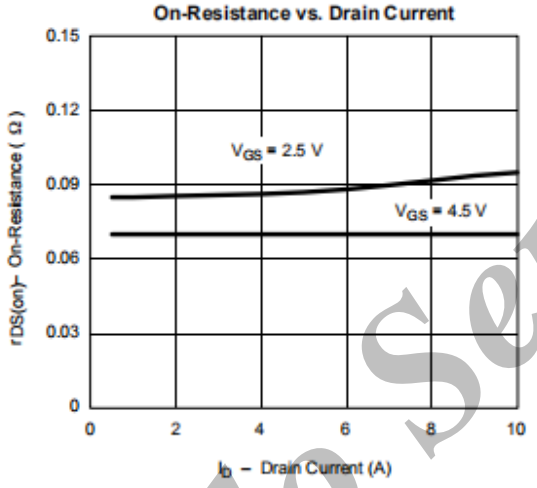
- **Ordering Information**

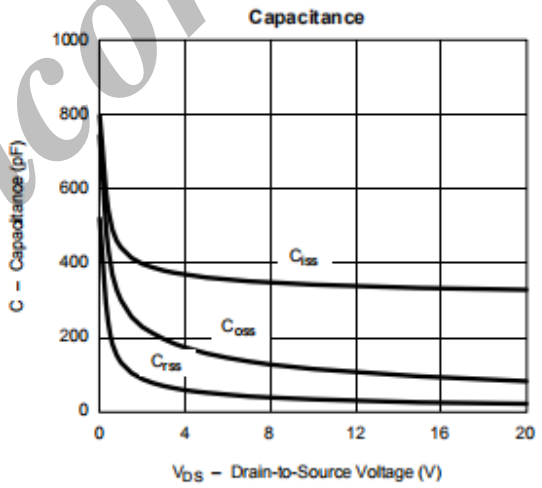
| Ordering Part Number | Package | MOQ |
|---|---|---|
| AP2302B | SOT23-3 | 3,000 pcs / reel |

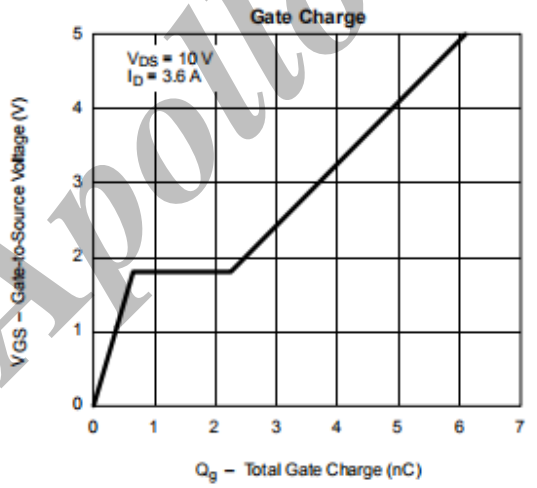
- **Typical Characteristics (25℃ unless noted)**

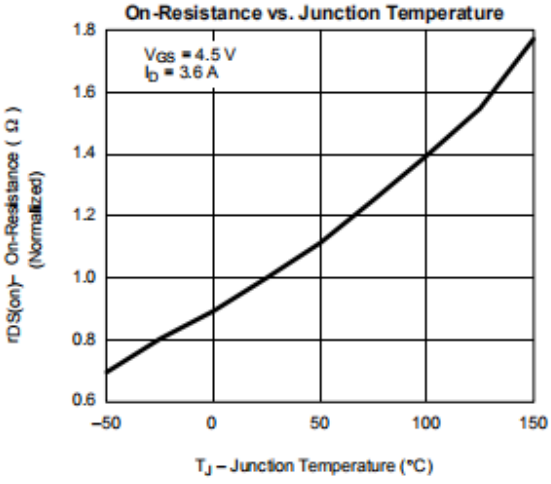


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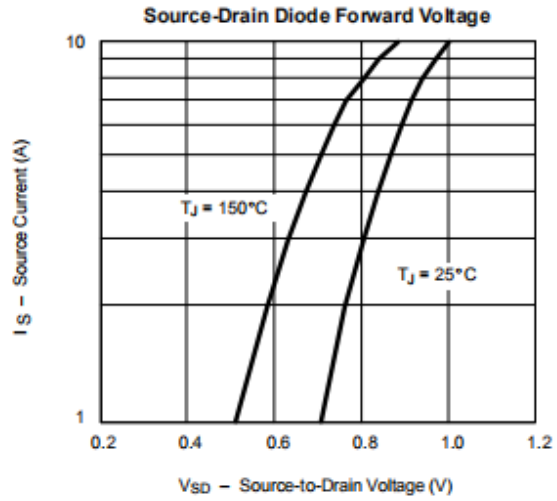


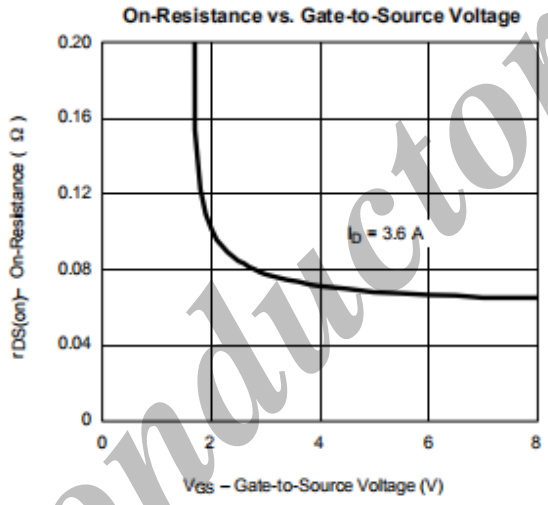


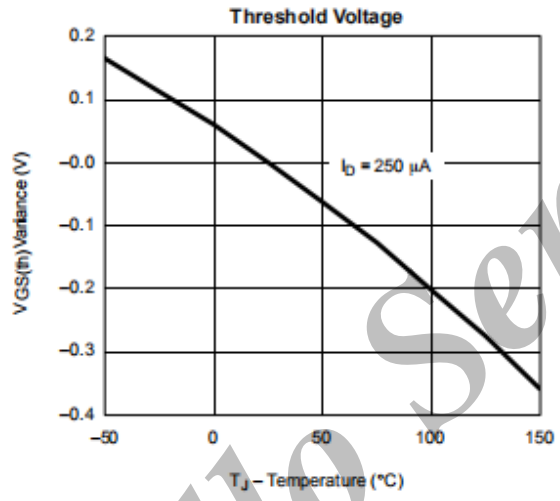


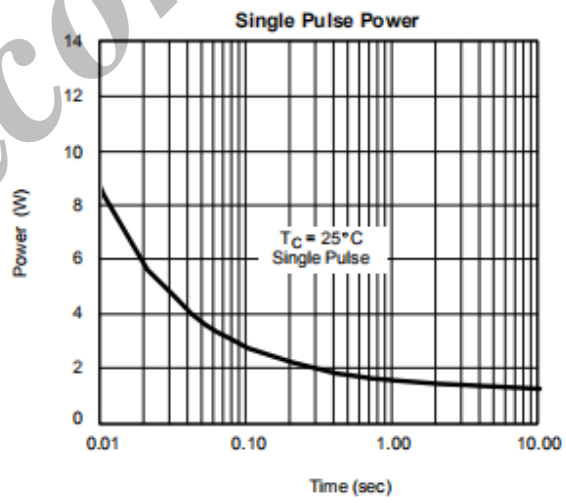


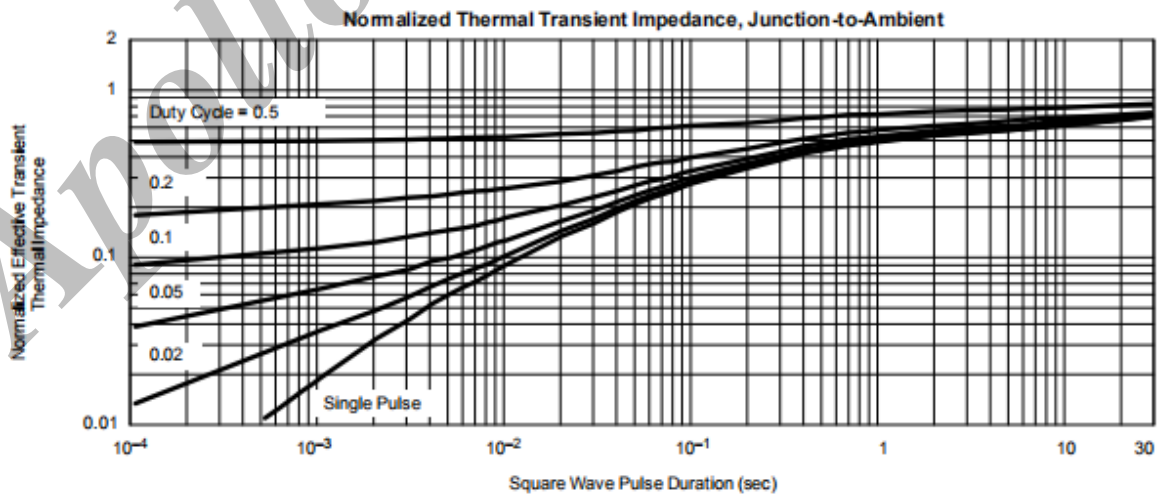

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