

Product Specification

XBLW AO3416A

N-Channel Enhancement Mode MOSFET

WEB | www.xinboleic.com



Description

The AO3416A uses advanced trench technology to provide excellent RDS(ON) , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

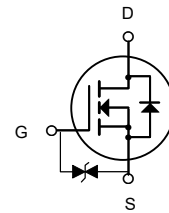
General Features

- VDS = 20V ID =6.5A
- RDS(ON) < 22mΩ @ VGS=4.5V
- ESD=2500HBM



Application

- Battery protection
- Load switch
- Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

| Product Model | Package Type | Marking | Packing | Packing Qty |
|---------------|--------------|---------|---------|--------------|
| XBLW AO3416A | SOT-23-3L | AGBV | Tape | 3000Pcs/Reel |
| | | | | |
| | | | | |
| | | | | |

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|-----------------------------------|---|------------|------|
| V _{DS} | Drain-Source Voltage | 20 | V |
| V _{GS} | Gate-Source Voltage | ±12 | V |
| I _D | Drain Current-Continuous | 6.5 | A |
| I _{DM} | Drain Current-Pulsed ^(Note 1) | 30 | A |
| P _D | Maximum Power Dissipation | 1.4 | W |
| T _J , T _{STG} | Operating Junction and Storage Temperature Range | -55 To 150 | °C |
| R _{θJA} | Thermal Resistance, Junction-to-Ambient ^(Note 2) | 89 | °C/W |

Electrical Characteristics (TA=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|--------------|---|------|-----|----------|------------|
| Drain-Source Breakdown Voltage | BV_{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} | $V_{GS}=\pm 10V, V_{DS}=0V$ | - | - | ± 10 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.45 | 0.7 | 1.0 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=6.5A$ | - | 14 | 22 | m Ω |
| | | $V_{GS}=2.5V, I_D=5.5A$ | - | 17 | 26 | m Ω |
| | | $V_{GS}=1.8V, I_D=5A$ | - | 28 | 40 | m Ω |
| Forward Transconductance | g_{FS} | $V_{DS}=5V, I_D=6.5A$ | 8 | - | - | S |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$ | - | 660 | - | PF |
| Output Capacitance | C_{oss} | | - | 160 | - | PF |
| Reverse Transfer Capacitance | C_{rss} | | - | 87 | - | PF |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=10V, R_L=1.5\Omega$ $V_{GS}=5V, R_{GEN}=3\Omega$ | - | 0.5 | | nS |
| Turn-on Rise Time | t_r | | - | 1 | | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 12 | | nS |
| Turn-Off Fall Time | t_f | | - | 4 | | nS |
| Total Gate Charge | Q_g | $V_{DS}=10V, I_D=6.5A,$ $V_{GS}=4.5V$ | - | 8 | | nC |
| Gate-Source Charge | Q_{gs} | | - | 2.5 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 3 | - | nC |
| Diode Forward Voltage ^(Note 3) | V_{SD} | $V_{GS}=0V, I_S=6.5A$ | - | - | 1.2 | V |
| Diode Forward Current ^(Note 2) | I_S | | - | - | 6.5 | A |

Notes:

Repetitive Rating: Pulse width limited by maximum junction temperature.
 Surface Mounted on FR4 Board, $t \leq 10$ sec.
 Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
 Guaranteed by design, not subject to production

Typical Characteristics

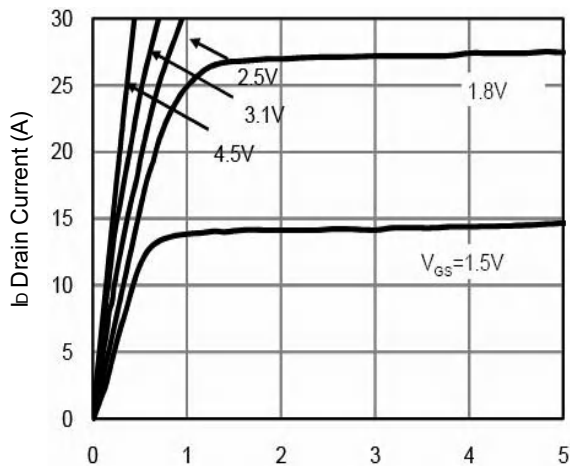


Fig.1 Typical Output Characteristics

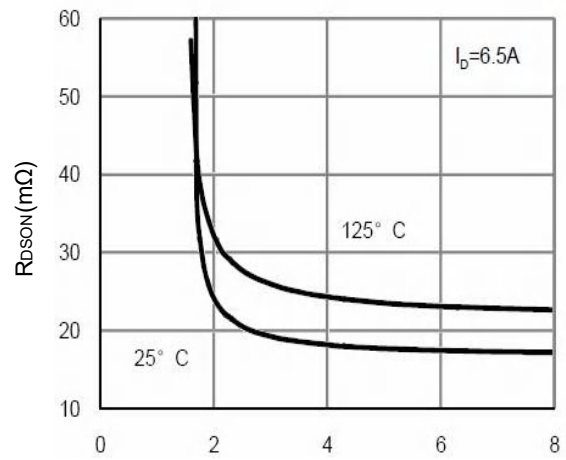


Fig.2 On-Resistance vs. Gate-Source

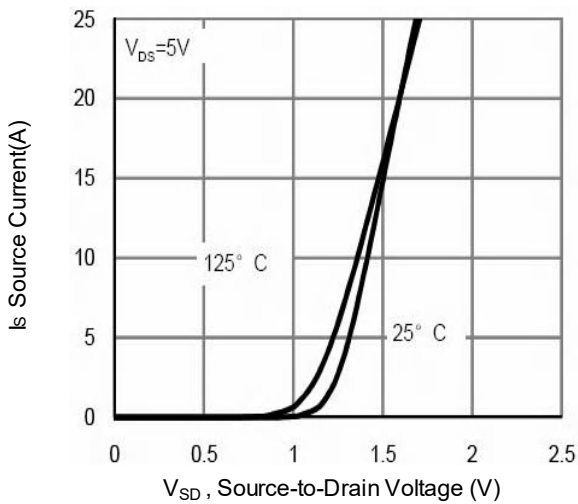


Fig.3 Forward Characteristics of Reverse

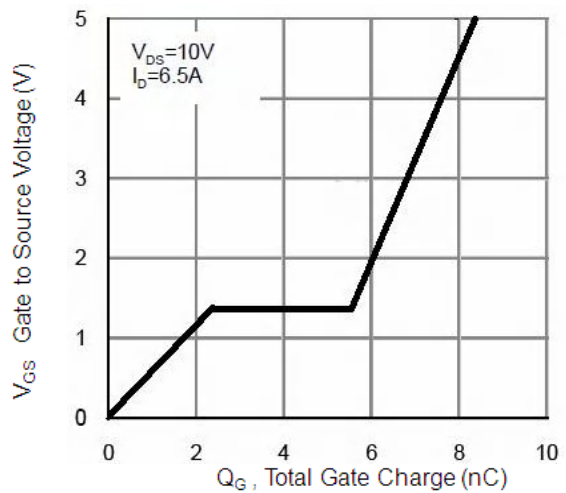


Fig.4 Gate-Charge Characteristics

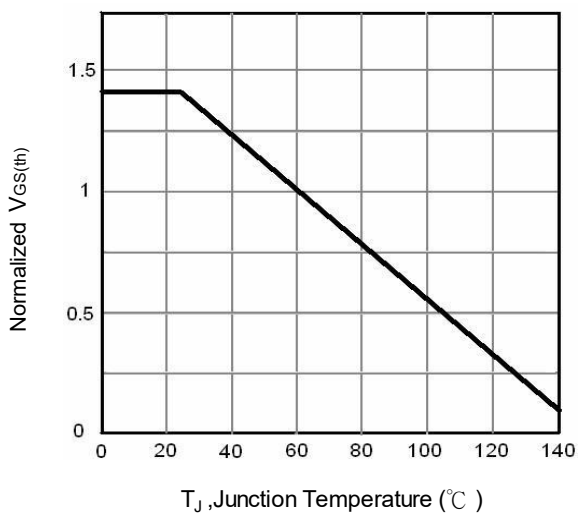


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

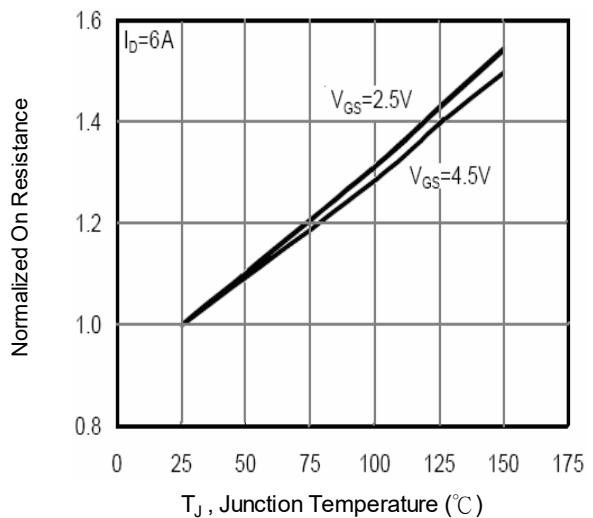


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

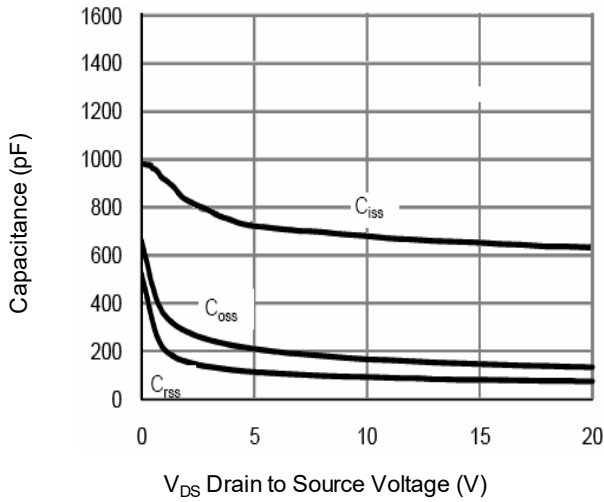


Fig.7 Capacitance

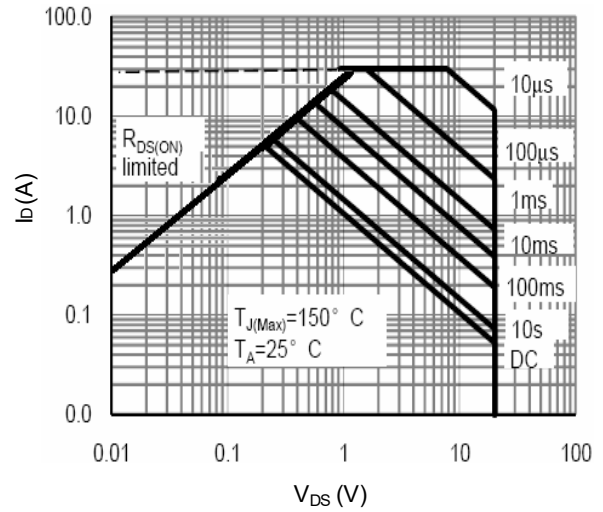


Fig.8 Safe Operating Area

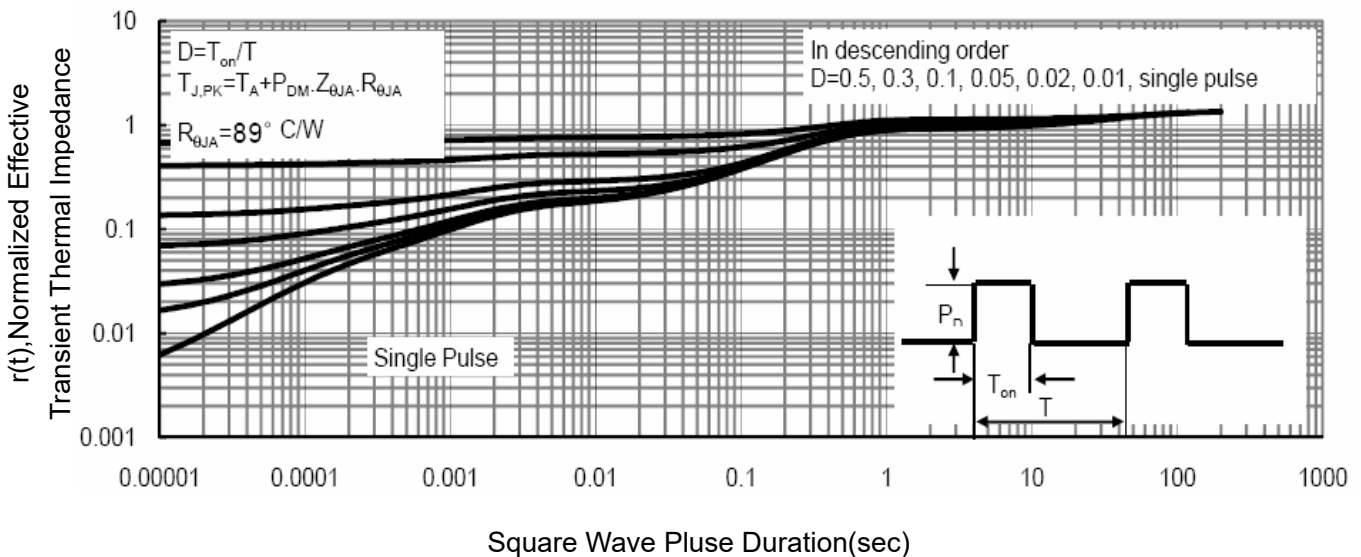


Fig.9 Normalized Maximum Transient Thermal Impedance

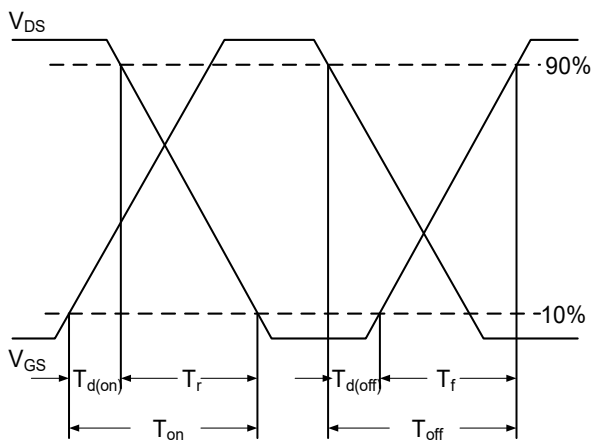


Fig.10 Switching Time Waveform

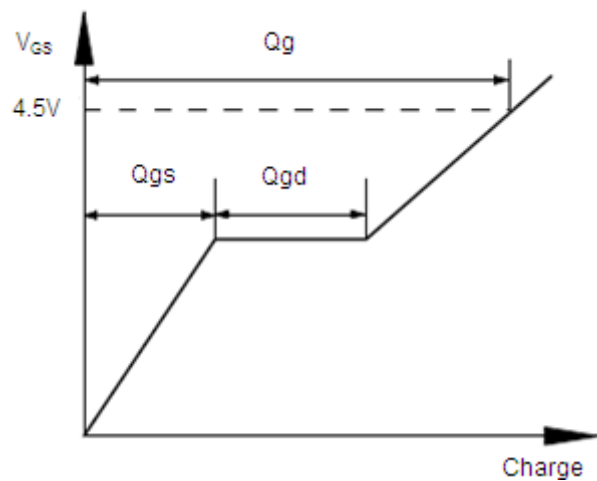
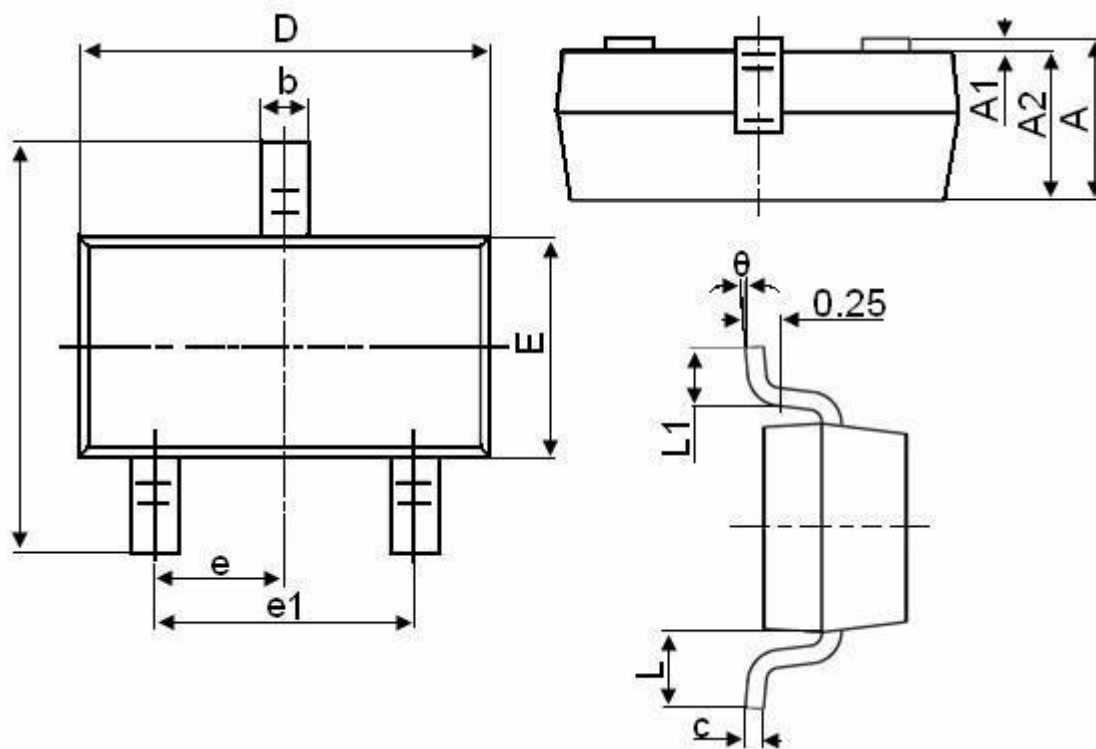


Fig.11 Gate Charge Waveform

Package Information

SOT23 3L



| Symbol | Dimensions in Millimeters | |
|----------|---------------------------|-------|
| | MIN. | MAX. |
| A | 1.050 | 1.250 |
| A1 | 0.000 | 0.100 |
| A2 | 1.050 | 1.150 |
| b | 0.300 | 0.500 |
| c | 0.100 | 0.200 |
| D | 2.800 | 3.000 |
| E | 1.500 | 1.700 |
| E1 | 2.650 | 2.950 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.600 |
| θ | 0° | 8° |

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