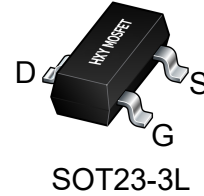




Description

The AO3404 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



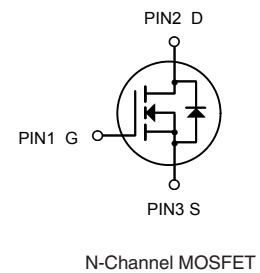
General Features

$V_{DS} = 30V$ $I_D = 5A$

$R_{DS(ON)} < 28m\Omega @ V_{GS}=10V$

Application

Battery protection
Load switch
Uninterruptible power supply



Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|------------|----------|---------|----------|
| AO3404 | SOT23-3L | X4HV | 3000 |

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

| symbol | parameter | limit | unit |
|-------------|---|----------|------|
| V_{DS} | Drain-source voltage | 30 | V |
| V_{GS} | Gate-source voltage | ± 20 | V |
| I_D | Drain current-continuous ^a @Tj=125°C -pulse d^b | 5 | A |
| I_{DM} | | 20 | A |
| I_S | Drain-source Diode forward current | 5 | A |
| P_D | Maximum power dissipation | 1.4 | W |
| T_j | Operating junction Temperature range | -55—150 | °C |
| $R_{th JA}$ | Thermal Resistance junction-to ambient | 100 | °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 =250μA | 30 | - | - | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =30V, V _{GS} =0V | - | - | 1 | μA |
| Gate-body leakage | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | - | - | ±100 | nA |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 0.8 | 1.4 | 2.2 | V |
| Drain-source on-state resistance | R _{DS(ON)} | V _{GS} =10V, I _D =5A | - | 24 | 28 | mΩ |
| | | V _{GS} =4.5V, I _D =4A | - | 26 | 32 | |
| Forward transconductance | g _{fs} | V _{GS} =5V, I _D =5A | - | 33 | - | S |
| Input capacitance | C _{iss} | V _{DS} =15V, V _{GS} =0V f=1.0MHz | - | 255 | - | pF |
| Output capacitance | C _{OSS} | | - | 45 | - | |
| Reverse transfer capacitance | C _{RSS} | | - | 35 | - | |
| Turn-on delay time | t _{D(ON)} | V _{DS} =15V V _{GS} =10V R _L =2.6 ohm R _{GEN} =3ohm | - | 4.5 | - | ns |
| Rise time | t _r | | - | 2.5 | - | |
| Turn-off delay time | t _{D(OFF)} | | - | 14.5 | - | |
| Fall time | t _f | | - | 3.5 | - | |
| Total gate charge | Q _g | V _{DS} =15V, I _D =5.8A V _{GS} =10V | - | 5.2 | - | nC |
| Gate-source charge | Q _{gs} | | - | 0.85 | - | |
| Gate-drain charge | Q _{gd} | | - | 1.3 | - | |
| Diode forward voltage | V _{SD} | V _{GS} =0V, I _S =1A | - | 0.76 | 1.16 | V |

Notes:

- 1、 surface mounted on FR4 board, t≤10sec
- 2、 pulse test: pulse width≤300μs, duty≤2%
- 3、 guaranteed by design, not subject to production testing



Typical Performance Characteristics

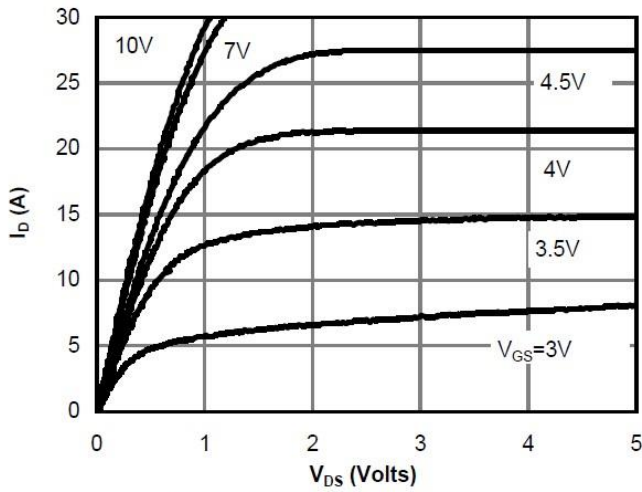


Fig 1: On-Region Characteristics

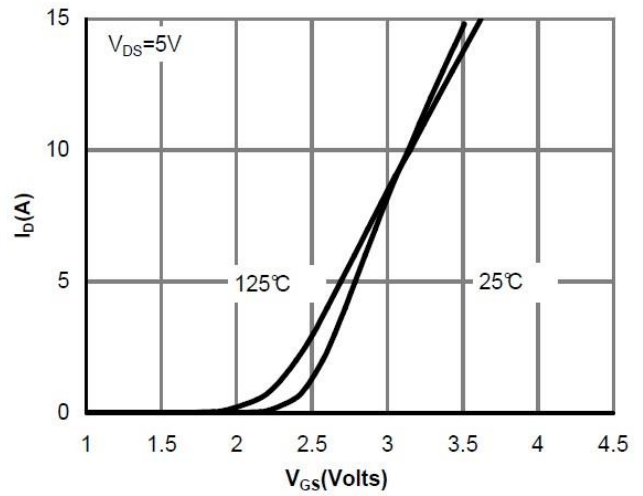


Figure 2: Transfer Characteristics

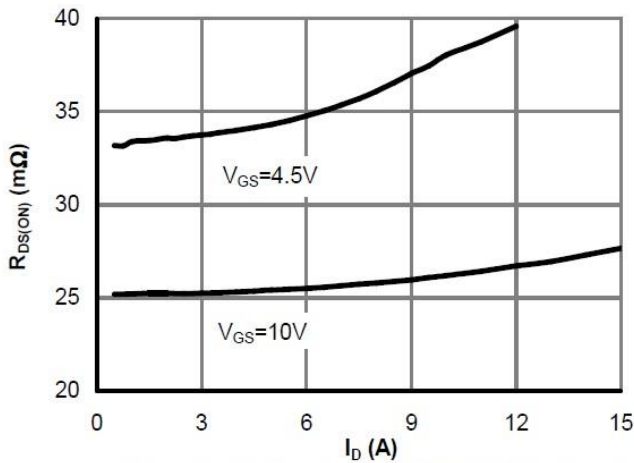


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

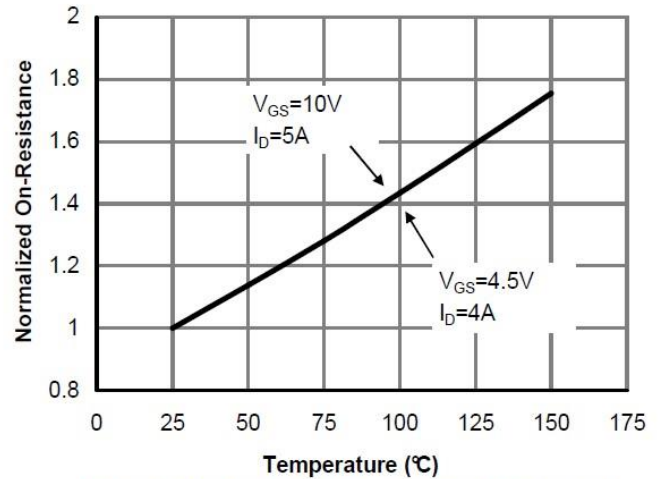


Figure 4: On-Resistance vs. Junction Temperature

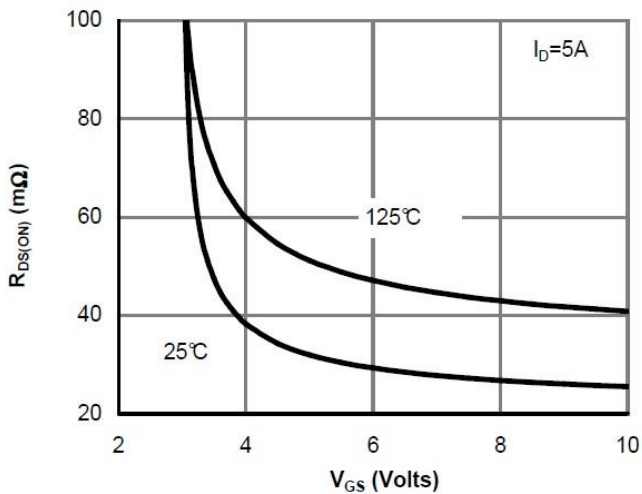


Figure 5: On-Resistance vs. Gate-Source Voltage

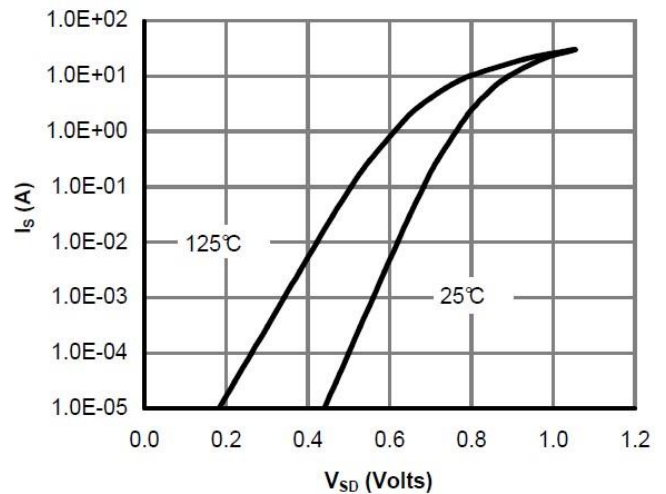


Figure 6: Body-Diode Characteristics

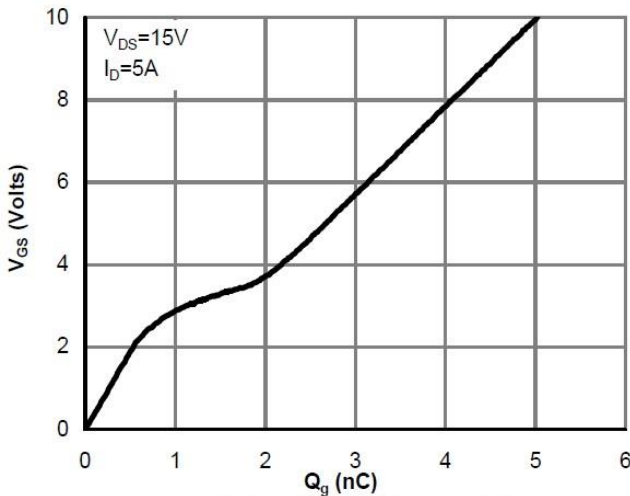


Figure 7: Gate-Charge Characteristics

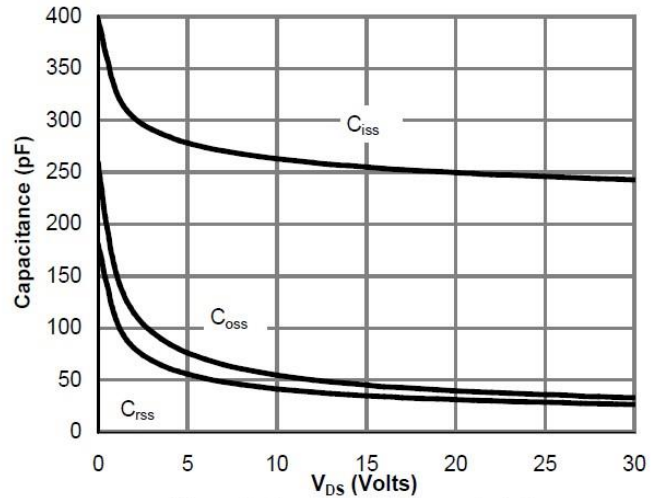


Figure 8: Capacitance Characteristics

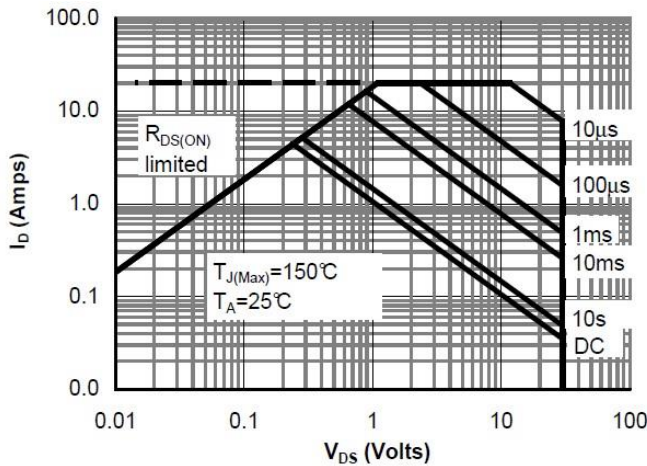


Figure 10: Maximum Forward Biased Safe Operating Area

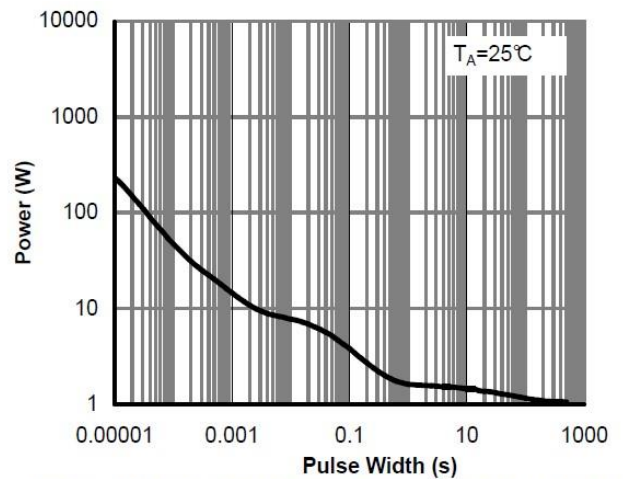


Figure 11: Single Pulse Power Rating Junction-to-Ambient

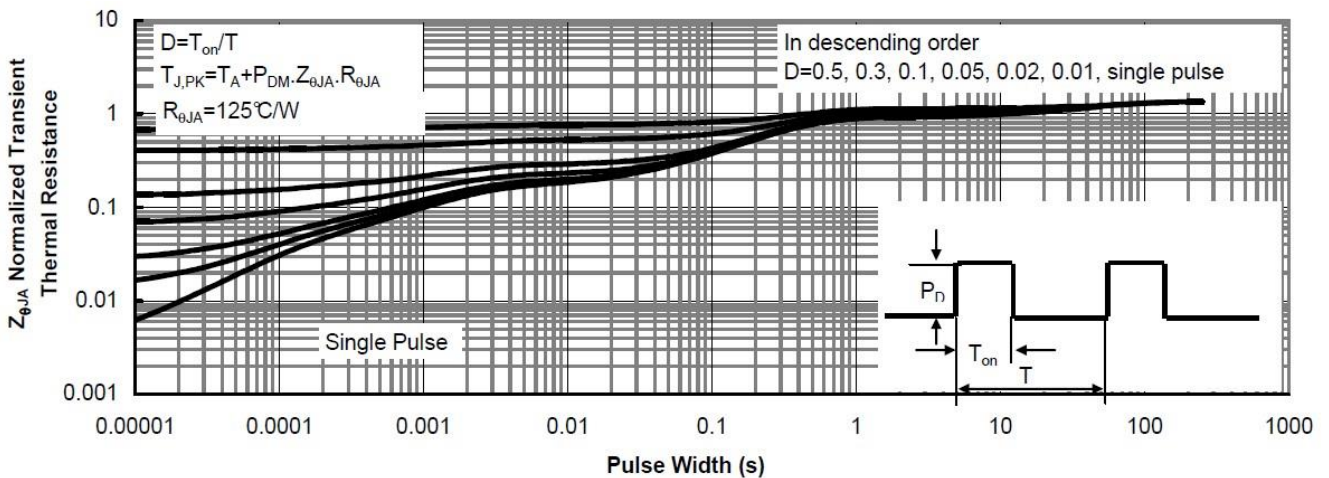
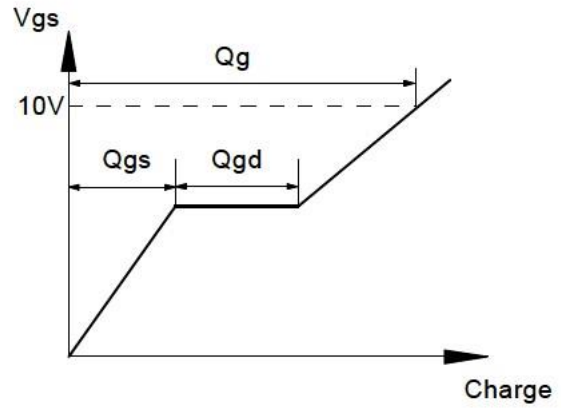
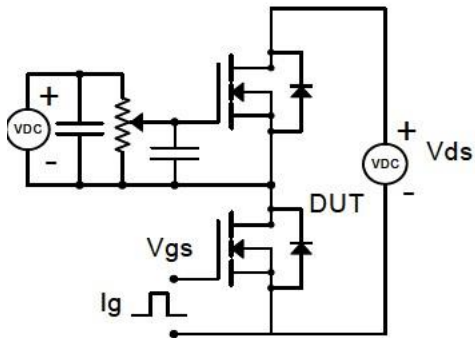


Figure 12: Normalized Maximum Transient Thermal Impedance

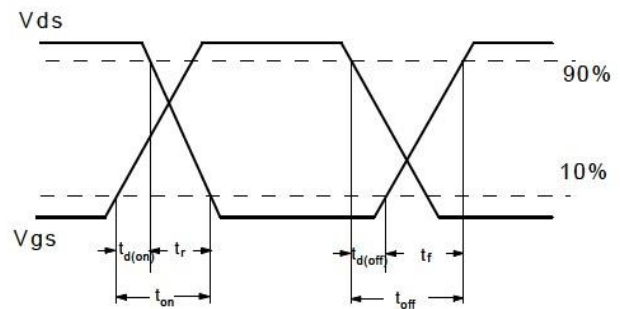
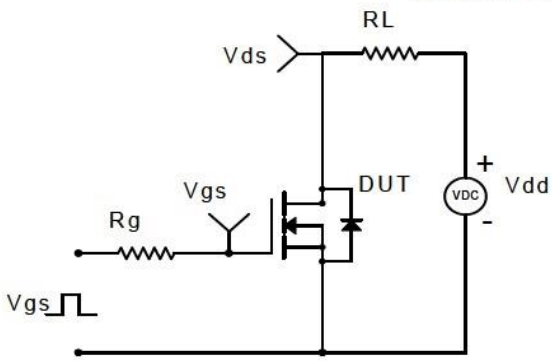


Gate Charge Test Circuit & Waveform

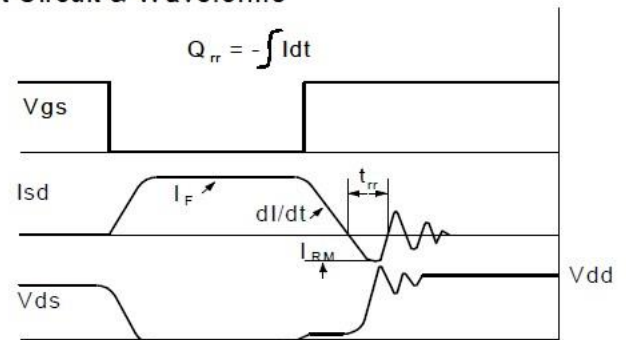
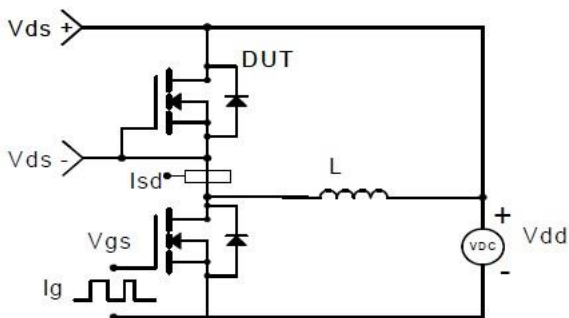


Resistive Switching Test Circuit & Waveforms

Resistive Switching Test Circuit & Waveforms

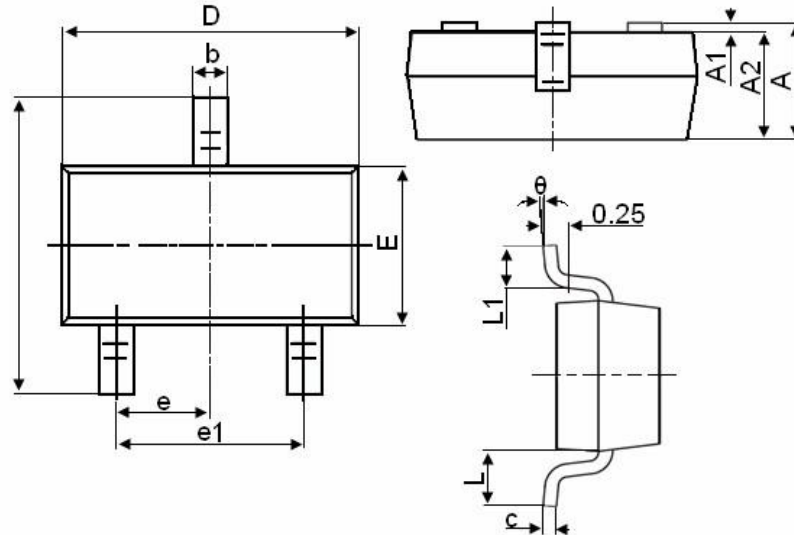


Diode Recovery Test Circuit & Waveforms





SOT23-3L Package Information



| 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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