
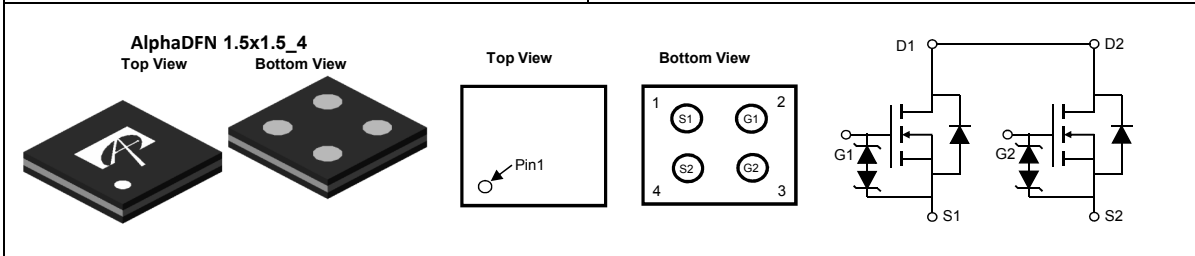


| | | | | | | | | | | | | | |
|--|---|----------|-----|----------------------------------|--------|----------------------------------|--------|----------------------------------|--------|----------------------------------|--------|----------------------------------|--------|
| <p>General Description</p> <ul style="list-style-type: none"> • Trench Power AlphaMOS (αMOS LV) technology • Low $R_{SS(ON)}$ • Fully protected AlphaDFN package • With ESD protection to improve battery performance and safety • Common drain configuration for design simplicity • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Battery protection switch • Mobile device battery charging and discharging | <p>Product Summary</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">V_{SS}</td> <td style="text-align: right;">20V</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=4.5V$)</td> <td style="text-align: right;">< 34mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=4.0V$)</td> <td style="text-align: right;">< 38mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=3.7V$)</td> <td style="text-align: right;">< 40mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=3.1V$)</td> <td style="text-align: right;">< 45mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=2.5V$)</td> <td style="text-align: right;">< 56mΩ</td> </tr> </table> <p>Typical ESD protection HBM Class 3A</p> <div style="text-align: right;">  </div> | V_{SS} | 20V | $R_{SS(ON)}$ (at $V_{GS}=4.5V$) | < 34mΩ | $R_{SS(ON)}$ (at $V_{GS}=4.0V$) | < 38mΩ | $R_{SS(ON)}$ (at $V_{GS}=3.7V$) | < 40mΩ | $R_{SS(ON)}$ (at $V_{GS}=3.1V$) | < 45mΩ | $R_{SS(ON)}$ (at $V_{GS}=2.5V$) | < 56mΩ |
| V_{SS} | 20V | | | | | | | | | | | | |
| $R_{SS(ON)}$ (at $V_{GS}=4.5V$) | < 34mΩ | | | | | | | | | | | | |
| $R_{SS(ON)}$ (at $V_{GS}=4.0V$) | < 38mΩ | | | | | | | | | | | | |
| $R_{SS(ON)}$ (at $V_{GS}=3.7V$) | < 40mΩ | | | | | | | | | | | | |
| $R_{SS(ON)}$ (at $V_{GS}=3.1V$) | < 45mΩ | | | | | | | | | | | | |
| $R_{SS(ON)}$ (at $V_{GS}=2.5V$) | < 56mΩ | | | | | | | | | | | | |



| Orderable Part Number | Package Type | Form | Minimum Order Quantity |
|-----------------------|--------------------|-------------|------------------------|
| AOC2804B | AlphaDFN 1.5x1.5_4 | Tape & Reel | 3000 |

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

| Parameter | Symbol | Rating | Units |
|--|----------------|------------|------------------|
| Source-Source Voltage | V_{SS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 12 | V |
| Source Current(DC) ^{Note1} | I_S | 6 | A |
| Source Current(Pulse) ^{Note2} | I_{SM} | 60 | |
| Power Dissipation ^{Note1} | P_D | 1.3 | W |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Typ | Units |
|-----------------------------|-----------------|-----|--------------------|
| Maximum Junction-to-Ambient | $R_{\theta JA}$ | 85 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Ambient | | 96 | $^\circ\text{C/W}$ |

Note 1. I_S rated value is based on bare silicon. Mounted on 70mmx70mm FR-4 board.
Note 2. PW <10 μs pulses, duty cycle 1% max.

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|-----------------------------|--|--|------|------|--------|-------|
| STATIC PARAMETERS | | | | | | |
| BV _{SSS} | Source-Source Breakdown Voltage | I _S =250μA, V _{GS} =0V Test Circuit 6 | 20 | | | V |
| I _{SSS} | Zero Gate Voltage Source Current | V _{SS} =20V, V _{GS} =0V Test Circuit 1 T _J =55°C | | | 1 5 | μA |
| I _{GSS} | Gate leakage current | V _{SS} =0V, V _{GS} =±10V Test Circuit 2 | | | ±10 | μA |
| V _{GS(th)} | Gate Threshold Voltage | V _{SS} =V _{GS} , I _S =250μA Test Circuit 3 | 0.5 | 0.9 | 1.3 | V |
| R _{SS(ON)} | Static Source to Source On-Resistance | V _{GS} =4.5V, I _S =3A Test Circuit 4 T _J =125°C | 20 | 28 | 34 | mΩ |
| | | | 27 | 38.5 | 47 | |
| | | V _{GS} =4.0V, I _S =3A Test Circuit 4 | 22 | 30.5 | 38 | mΩ |
| | | V _{GS} =3.7V, I _S =3A Test Circuit 4 | 23 | 32 | 40 | mΩ |
| | | V _{GS} =3.1V, I _S =3A Test Circuit 4 | 25 | 35 | 45 | mΩ |
| | V _{GS} =2.5V, I _S =3A Test Circuit 4 | 30 | 42.5 | 56 | mΩ | |
| g _{FS} | Forward Transconductance | V _{SS} =5V, I _S =3A Test Circuit 3 | | 20 | | S |
| V _{FSS} | Forward Source to Source Voltage | I _S =1A, V _{GS} =0V Test Circuit 5 | | 0.72 | 1 | V |
| DYNAMIC PARAMETERS | | | | | | |
| R _g | Gate resistance | f=1MHz | | 2 | | KΩ |
| SWITCHING PARAMETERS | | | | | | |
| Q _g | Total Gate Charge | V _{G1S1} =4.5V, V _{SS} =10V, I _S =3A | | 9.5 | | nC |
| t _{D(on)} | Turn-On DelayTime | V _{G1S1} =4.5V, V _{SS} =10V, R _L =3.3Ω, R _{GEN} =3Ω Test Circuit8 | | 0.85 | | μs |
| t _r | Turn-On Rise Time | | | 2.2 | | μs |
| t _{D(off)} | Turn-Off DelayTime | | | 2.0 | | μs |
| t _f | Turn-Off Fall Time | | | 4.3 | | μs |

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

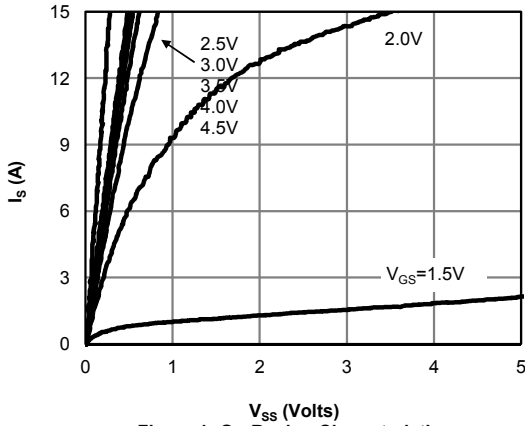


Figure 1: On-Region Characteristics

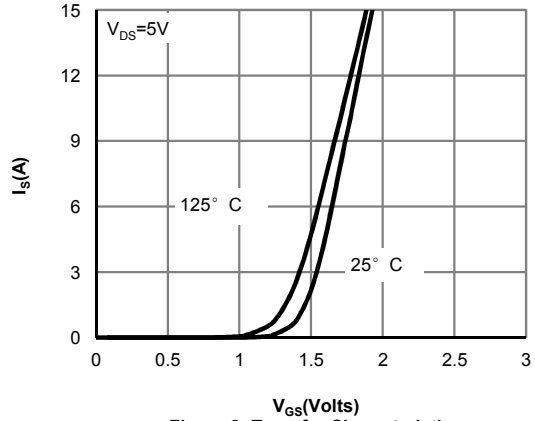


Figure 2: Transfer Characteristics

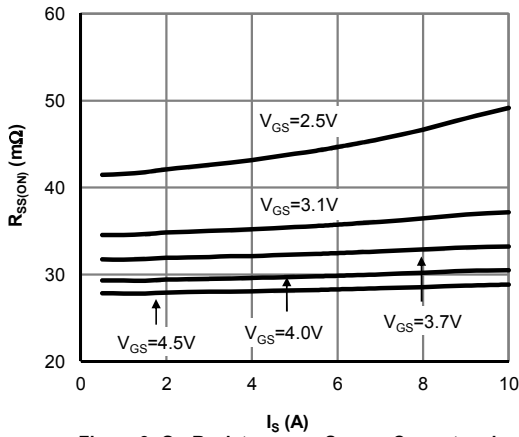


Figure 3: On-Resistance vs. Source Current and Gate Voltage

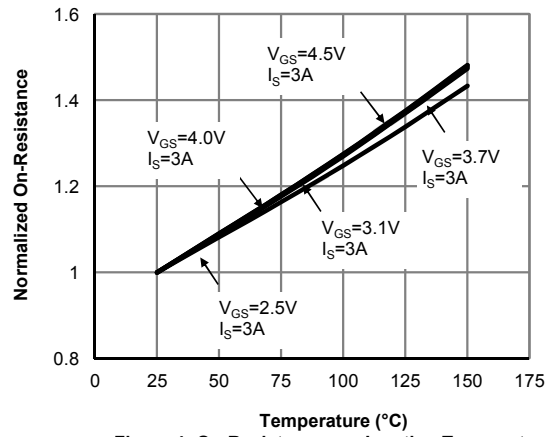


Figure 4: On-Resistance vs. Junction Temperature

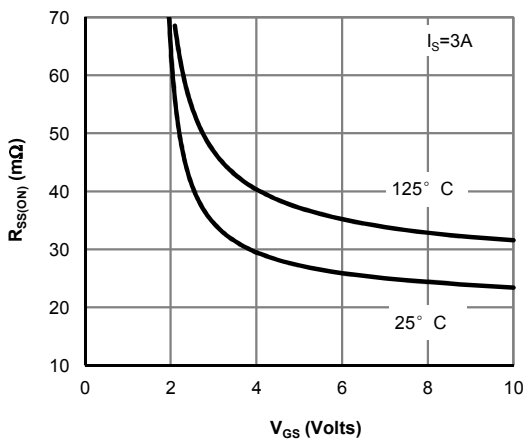


Figure 5: On-Resistance vs. Gate-Source Voltage

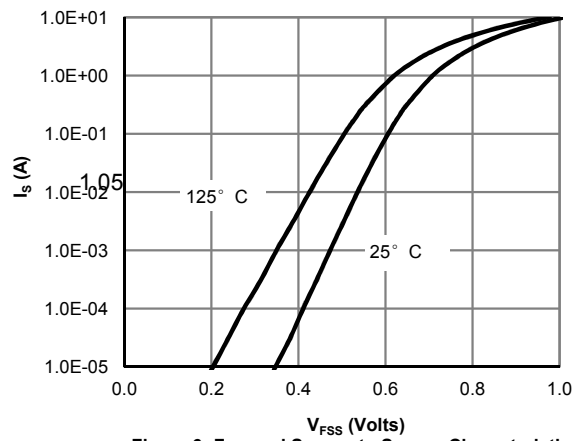


Figure 6: Forward Source to Source Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

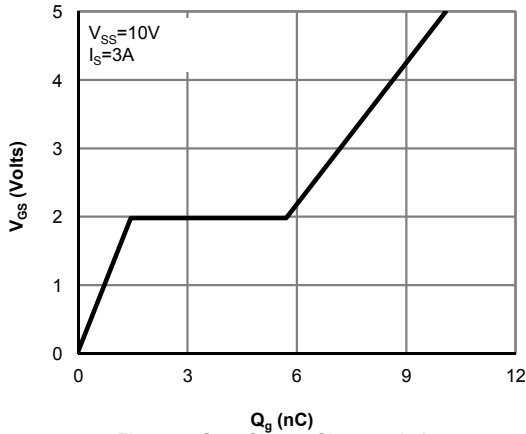


Figure 7: Gate-Charge Characteristics

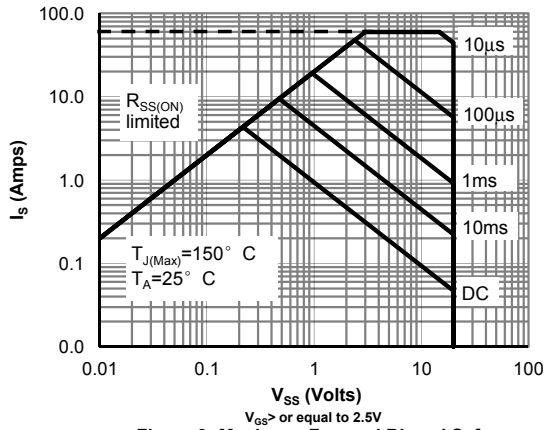


Figure 9: Maximum Forward Biased Safe Operating Area (Note1)

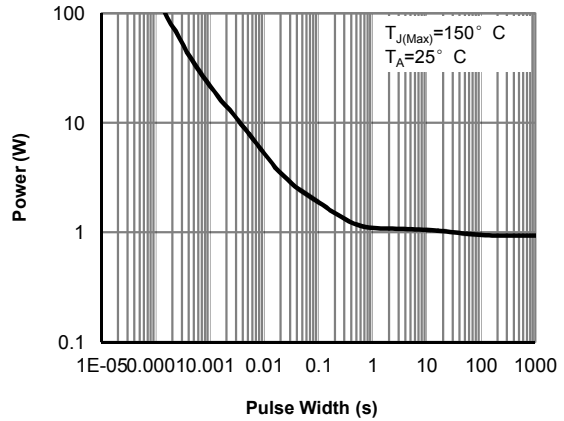


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note1)

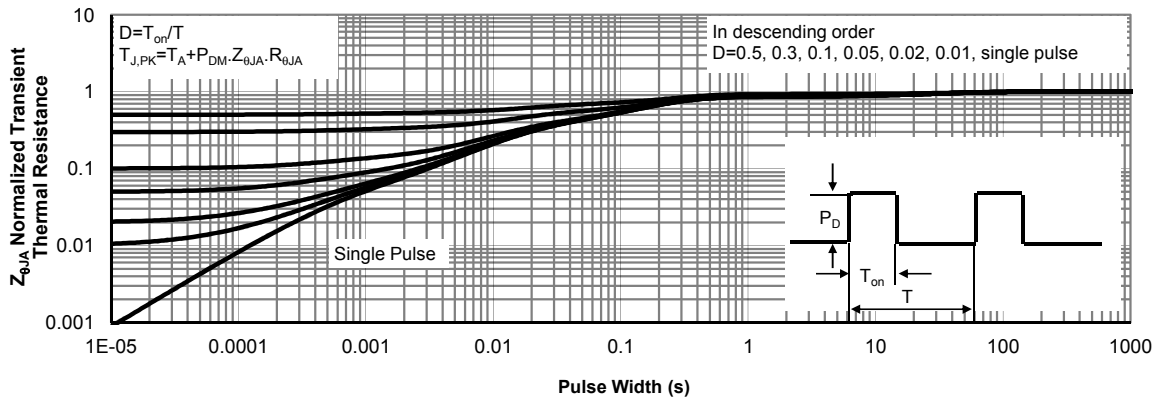


Figure 11: Normalized Maximum Transient Thermal Impedance (Note1)

