
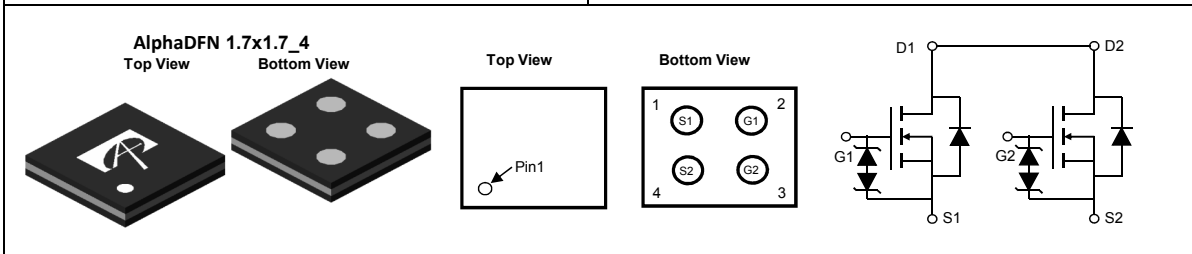


<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Trench Power AlphaMOS (αMOS LV) technology</li> <li>• Low <math>R_{SS(ON)}</math></li> <li>• Fully protected AlphaDFN package</li> <li>• With ESD protection to improve battery performance and safety</li> <li>• Common drain configuration for design simplicity</li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Battery protection switch</li> <li>• Mobile device battery charging and discharging</li> </ul>	<p><b>Product Summary</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;"><math>V_{SS}</math></td> <td style="text-align: right;">20V</td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=4.5V</math>)</td> <td style="text-align: right;">&lt; 11.9mΩ</td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=4.0V</math>)</td> <td style="text-align: right;">&lt; 12.5mΩ</td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=3.7V</math>)</td> <td style="text-align: right;">&lt; 14mΩ</td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=3.1V</math>)</td> <td style="text-align: right;">&lt; 15.5mΩ</td> </tr> <tr> <td><math>R_{SS(ON)}</math> (at <math>V_{GS}=2.5V</math>)</td> <td style="text-align: right;">&lt; 20mΩ</td> </tr> </table> <p><b>Typical ESD protection</b> <span style="float: right;"><b>HBM Class 3A</b></span></p> <div style="text-align: right;">  </div>	$V_{SS}$	20V	$R_{SS(ON)}$ (at $V_{GS}=4.5V$ )	< 11.9mΩ	$R_{SS(ON)}$ (at $V_{GS}=4.0V$ )	< 12.5mΩ	$R_{SS(ON)}$ (at $V_{GS}=3.7V$ )	< 14mΩ	$R_{SS(ON)}$ (at $V_{GS}=3.1V$ )	< 15.5mΩ	$R_{SS(ON)}$ (at $V_{GS}=2.5V$ )	< 20mΩ
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Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOC2870	AlphaDFN 1.7x1.7_4	Tape & Reel	3000

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

Parameter	Symbol	Maximum	Units
Source-Source Voltage	$V_{SS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Source Current(DC) <sup>Note1</sup>	$I_S$	10	A
Source Current(Pulse) <sup>Note2</sup>	$I_{SM}$	50	
Power Dissipation <sup>Note1</sup>	$P_D$	1.4	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Typical	Units
Maximum Junction-to-Ambient	$R_{\theta JA}$	81	$^\circ\text{C/W}$
Maximum Junction-to-Ambient		90	$^\circ\text{C/W}$

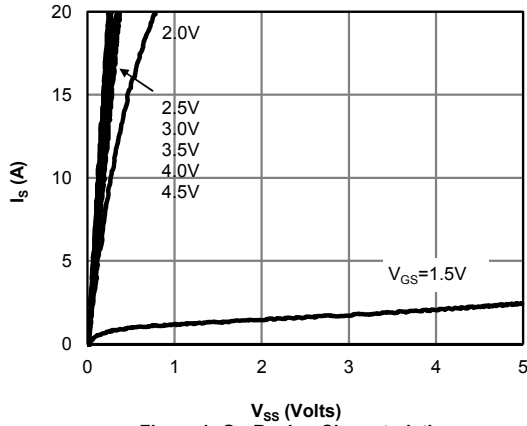
**Note 1.**  $I_S$  rated value is based on bare silicon. Mounted on 70mmx70mm FR-4 board.  
**Note 2.** PW <10 μs pulses, duty cycle 1% max.

**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

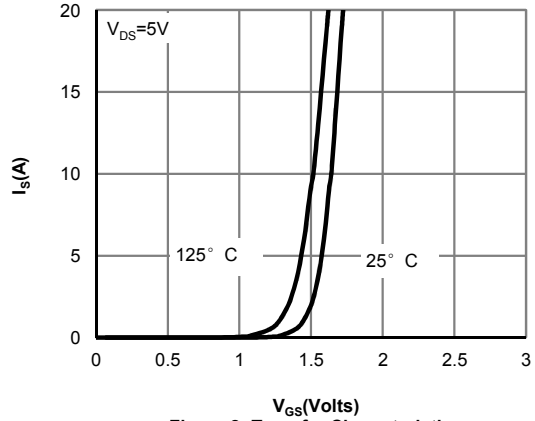
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>SSS</sub>	Source-Source Breakdown Voltage	I <sub>S</sub> =250μA, V <sub>GS</sub> =0V Test Circuit 6	20			V
I <sub>SSS</sub>	Zero Gate Voltage Source Current	V <sub>SS</sub> =20V, V <sub>GS</sub> =0V Test Circuit 1			1	μA
		T <sub>J</sub> =55°C			5	
I <sub>GSS</sub>	Gate leakage current	V <sub>SS</sub> =0V, V <sub>GS</sub> =±10V Test Circuit 2			±10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>SS</sub> =V <sub>GS</sub> , I <sub>S</sub> =250μA Test Circuit 3	0.5	0.9	1.3	V
R <sub>SS(ON)</sub>	Static Source to Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>S</sub> =3A Test Circuit 4	7.0	9.4	11.9	mΩ
		T <sub>J</sub> =125°C	9.8	13.2	16.8	
		V <sub>GS</sub> =4.0V, I <sub>S</sub> =3A Test Circuit 4	7.2	9.8	12.5	mΩ
		V <sub>GS</sub> =3.7V, I <sub>S</sub> =3A Test Circuit 4	7.4	10.2	14.0	mΩ
		V <sub>GS</sub> =3.1V, I <sub>S</sub> =3A Test Circuit 4	8.0	11.1	15.5	mΩ
		V <sub>GS</sub> =2.5V, I <sub>S</sub> =3A Test Circuit 4	8.6	13.0	20	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>SS</sub> =5V, I <sub>S</sub> =3A Test Circuit 3		30		S
V <sub>FSS</sub>	Forward Source to Source Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V Test Circuit 5		0.68	1	V
<b>DYNAMIC PARAMETERS</b>						
R <sub>g</sub>	Gate resistance	f=1MHz		2		KΩ
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>G1S1</sub> =4.5V, V <sub>SS</sub> =10V, I <sub>S</sub> =3A		11.5		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>G1S1</sub> =4.5V, V <sub>SS</sub> =10V, R <sub>L</sub> =3.3Ω, R <sub>GEN</sub> =3Ω Test Circuit8		1.5		μs
t <sub>r</sub>	Turn-On Rise Time			3.0		μs
t <sub>D(off)</sub>	Turn-Off DelayTime			2.0		μs
t <sub>f</sub>	Turn-Off Fall Time			6.0		μs

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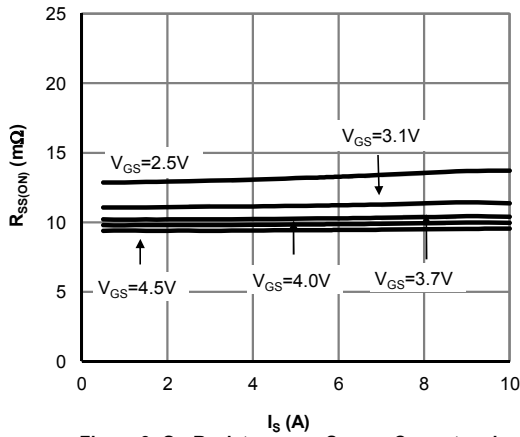
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



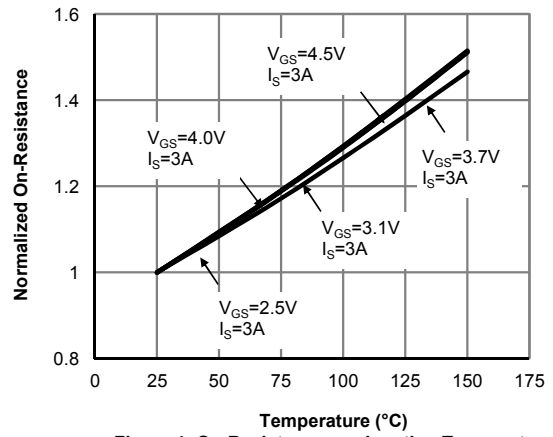
**Figure 1: On-Region Characteristics**



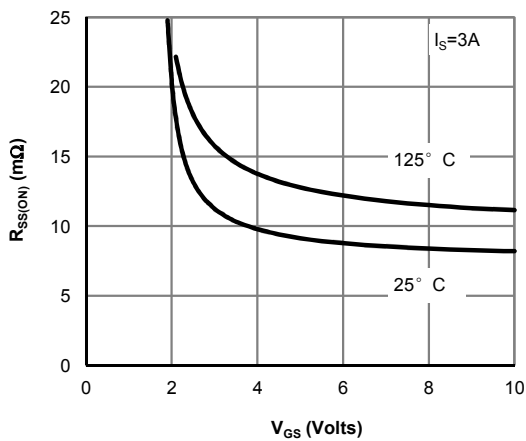
**Figure 2: Transfer Characteristics**



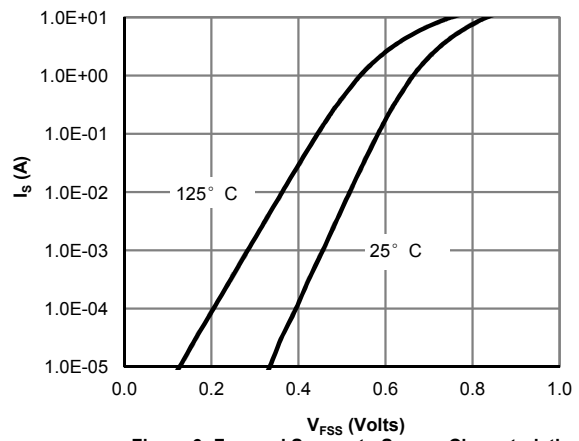
**Figure 3: On-Resistance vs. Source Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**

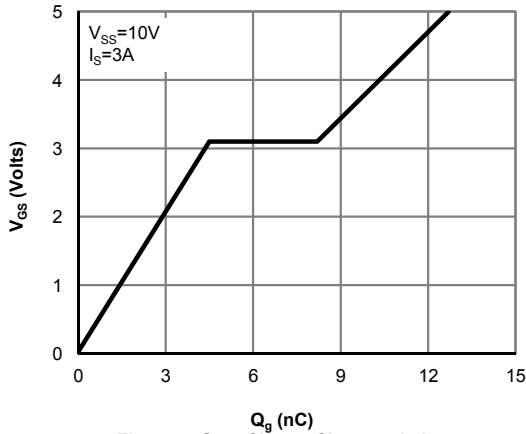


**Figure 5: On-Resistance vs. Gate-Source Voltage**

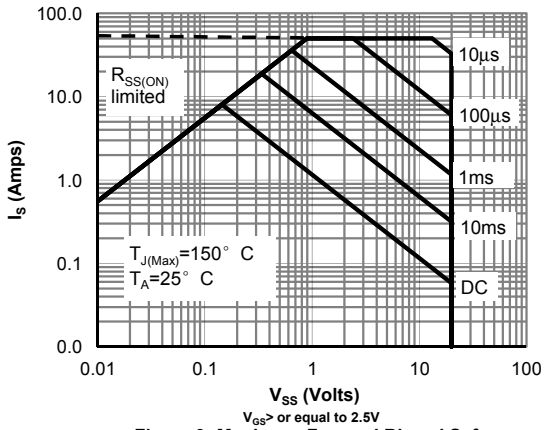


**Figure 6: Forward Source to Source Characteristics**

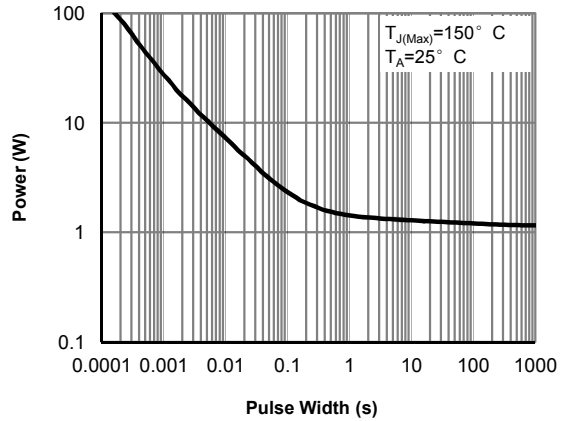
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



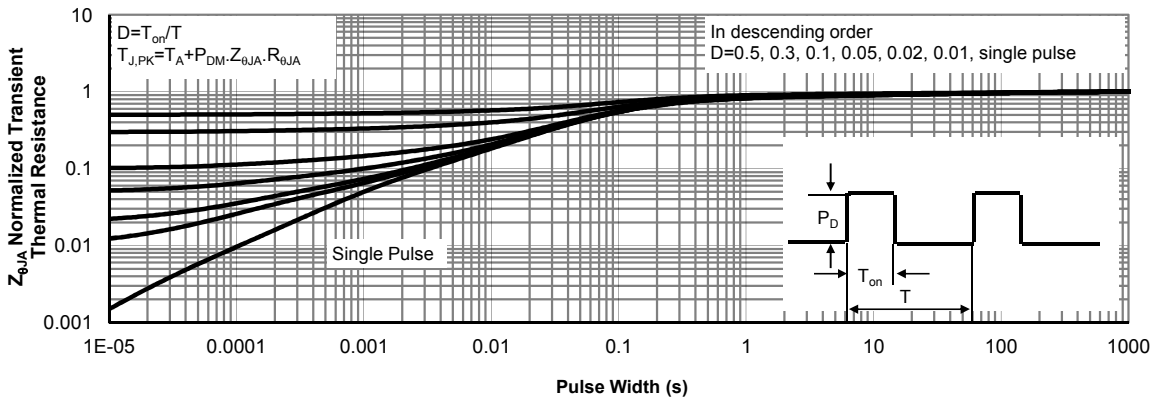
**Figure 7: Gate-Charge Characteristics**



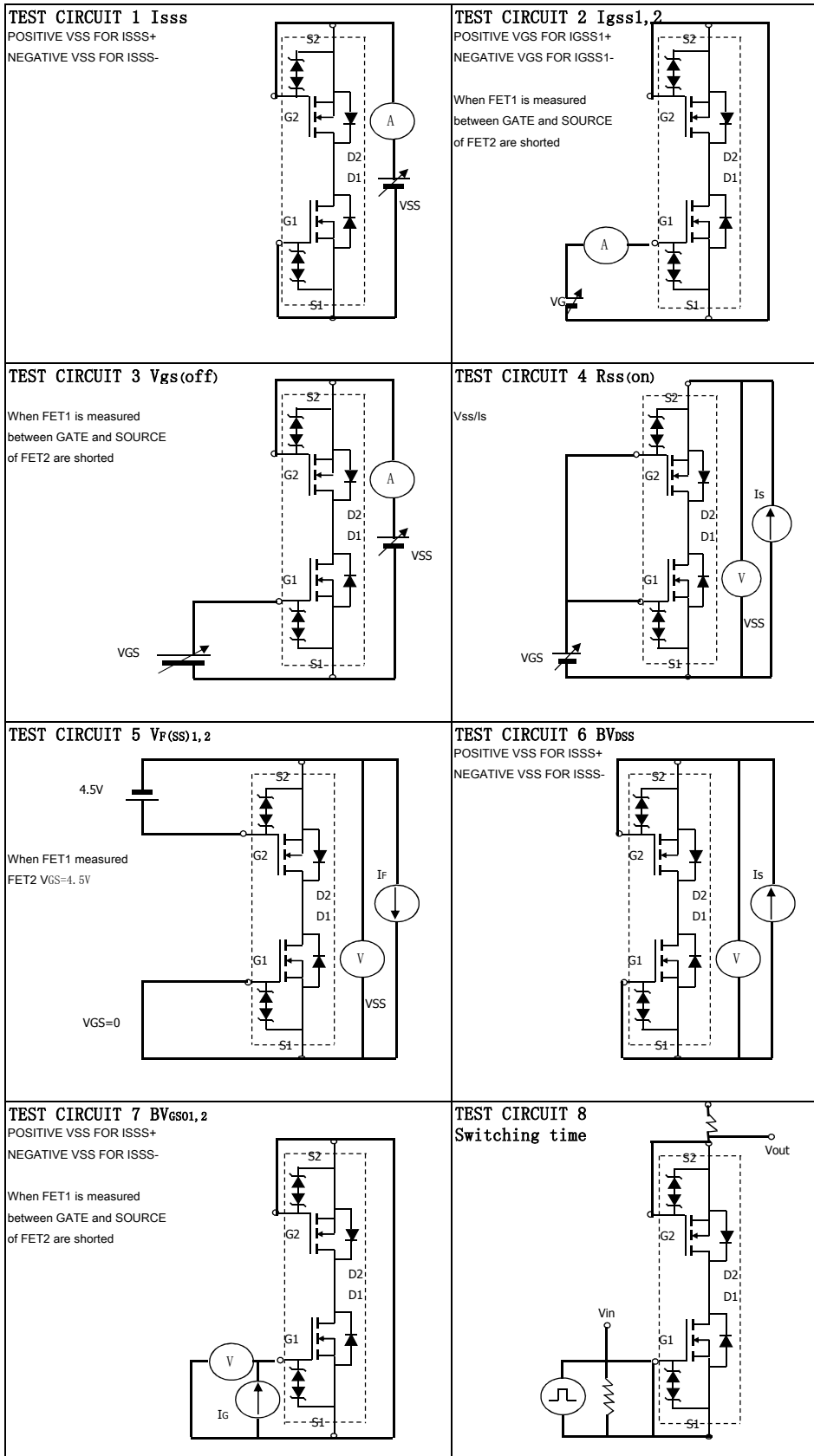
**Figure 9: Maximum Forward Biased Safe Operating Area (Note1)**



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



**Figure 11: Normalized Maximum Transient Thermal Impedance (Note1)**



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