

**General Description**

- Trench Power MOSFET technology
- Low  $R_{SS(ON)}$
- ESD protection
- Common drain configuration for design simplicity
- RoHS and Halogen-Free Compliant

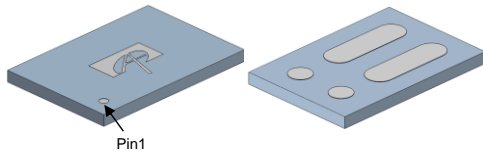
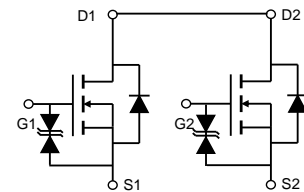
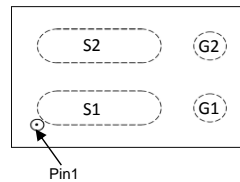
**Applications**

- Battery protection switch
- Type C - PD load switch

**Product Summary**

$V_{SS}$	30V
$R_{SS(ON)}$ (at $V_{GS}=10V$ )	< 18m $\Omega$
$R_{SS(ON)}$ (at $V_{GS}=8V$ )	< 19m $\Omega$
$R_{SS(ON)}$ (at $V_{GS}=4.5V$ )	< 24m $\Omega$

**Typical ESD protection**
**HBM Class 2**

**AlphaDFN™ 1.90x1.30A\_4**  
 Top View Bottom View

**Top View**


Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOCA32301	AlphaDFN™ 1.90x1.30A_4	Tape & Reel	8000

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

Parameter	Symbol	Rating	Units
Source-Source Voltage	$V_{SS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 16$	V
Source Current(DC) <sup>Note1</sup>	$I_S$	9	A
Source Current(Pulse) <sup>Note2</sup>	$I_{SM}$	50	
Power Dissipation <sup>Note1</sup>	$P_D$	1.9	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	$R_{\theta JA}$	55	$^\circ\text{C/W}$
Maximum Junction-to-Ambient		65	$^\circ\text{C/W}$

**Note 1.**  $I_S$  rated value is based on bare silicon. Mounted on 70mmx70mm FR-4 board.

**Note 2.** PW < 10  $\mu\text{s}$  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	30			V
I <sub>SSS</sub>	Zero Gate Voltage Source Current	V <sub>SS</sub> =30V, 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> =±16V 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	1.1	1.5	1.9	V
R <sub>SS(ON)</sub>	Static Source to Source On-Resistance	V <sub>GS</sub> =10V, I <sub>S</sub> =4A Test Circuit 4	10	14.5	18	mΩ
		T <sub>J</sub> =125°C	14	21	26	
		V <sub>GS</sub> =8V, I <sub>S</sub> =4A Test Circuit 4	11	15.2	19	mΩ
		V <sub>GS</sub> =4.5V, I <sub>S</sub> =4A Test Circuit 4	13	18.6	24	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>SS</sub> =5V, I <sub>S</sub> =4A Test Circuit 3		22		S
V <sub>FSS</sub>	Forward Source to Source Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V Test Circuit 5		0.7	1	V
<b>DYNAMIC PARAMETERS</b>						
R <sub>g</sub>	Gate resistance	f=1MHz		1.5		Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS1</sub> =10V, V <sub>SS</sub> =15V, I <sub>S</sub> =4A		24.5		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS1</sub> =10V, V <sub>SS</sub> =15V, R <sub>L</sub> =3.75Ω, R <sub>GEN</sub> =3Ω Test Circuit8		9		ns
t <sub>r</sub>	Turn-On Rise Time			23		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			30.5		ns
t <sub>f</sub>	Turn-Off Fall Time			13		ns

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

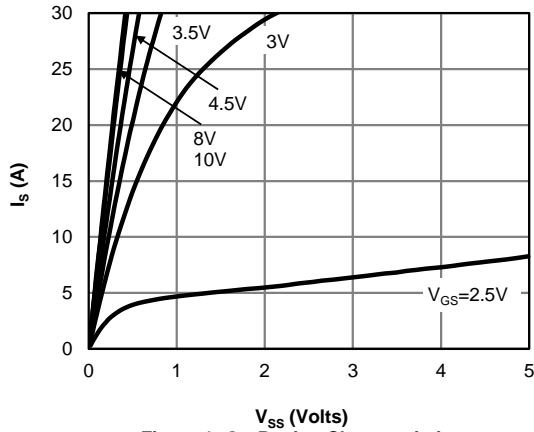


Figure 1: On-Region Characteristics

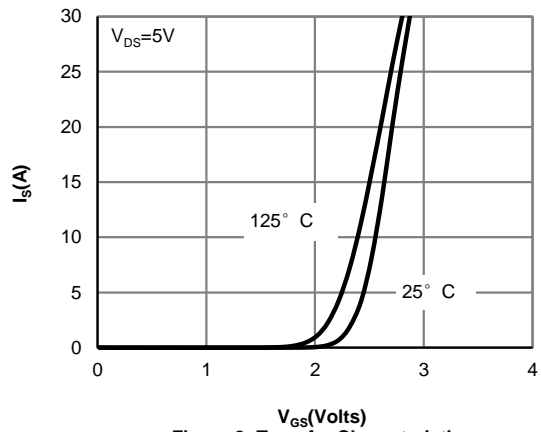


Figure 2: Transfer Characteristics

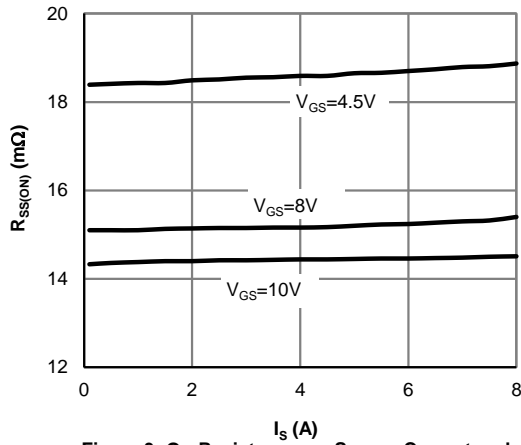


Figure 3: On-Resistance vs. Source Current and Gate Voltage

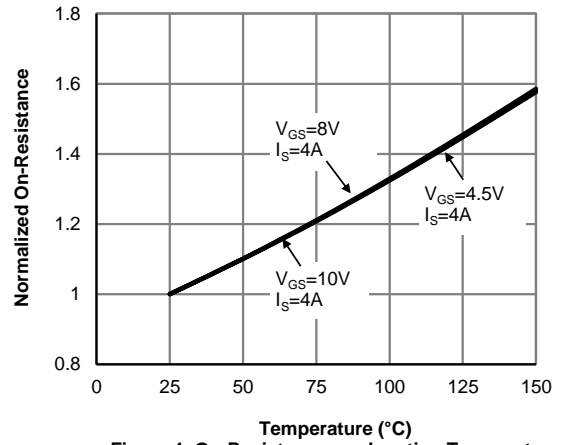


Figure 4: On-Resistance vs. Junction Temperature

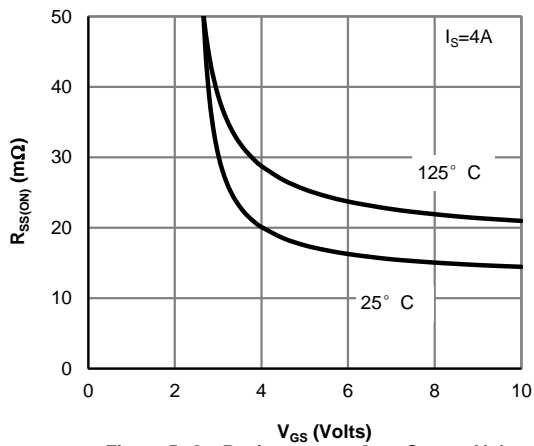


Figure 5: On-Resistance vs. Gate-Source Voltage

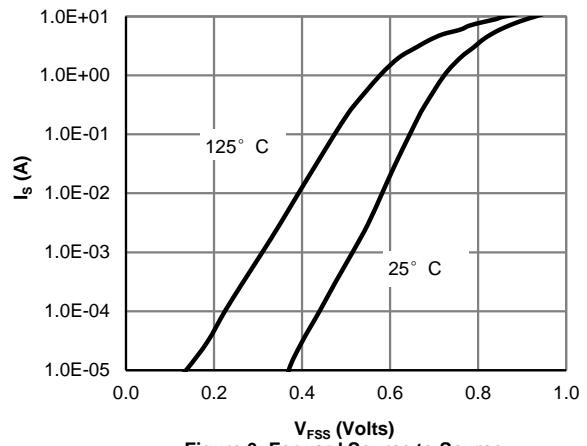


Figure 6: Forward Source to Source Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

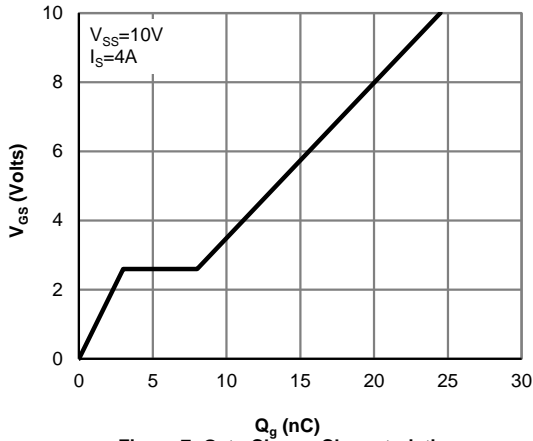


Figure 7: Gate-Charge Characteristics

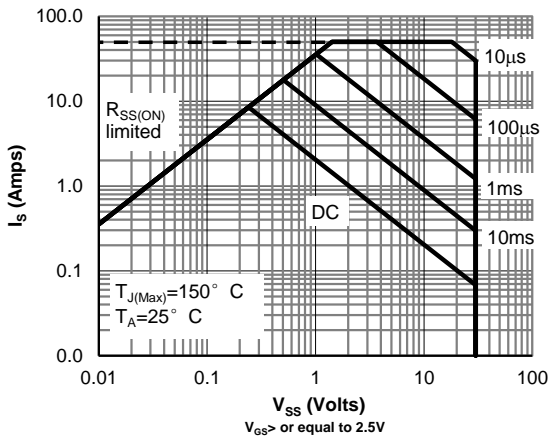


Figure 8: Maximum Forward Biased Safe Operating Area (Note1)

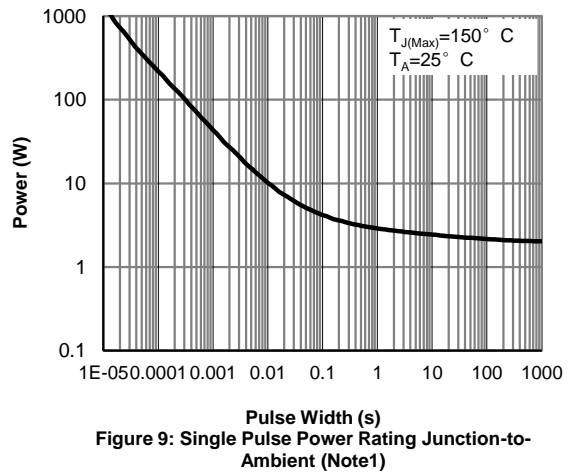


Figure 9: Single Pulse Power Rating Junction-to-Ambient (Note1)

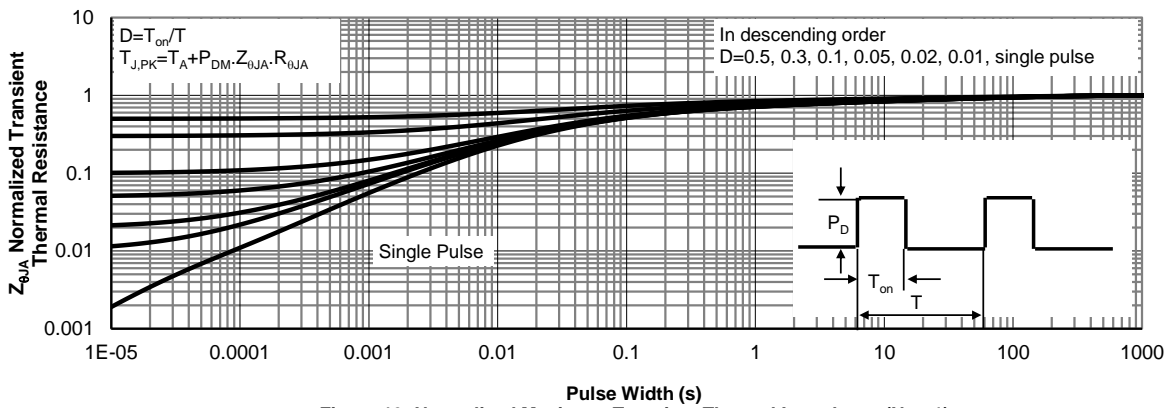


Figure 10: Normalized Maximum Transient Thermal Impedance (Note1)

