
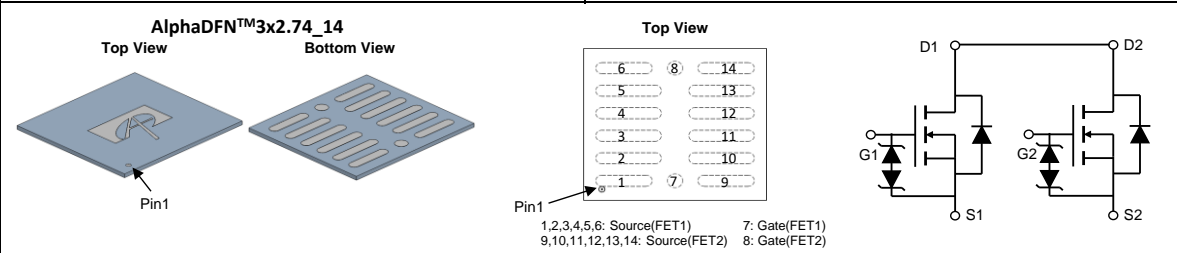


<p>General Description</p> <ul style="list-style-type: none"> Trench Power MOSFET technology Ultra low $R_{SS(ON)}$ Common drain configuration for design simplicity RoHS 2.0 and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> Battery protection switch Mobile device battery charging and discharging 	<p>Product Summary</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">V_{SS}</td> <td style="text-align: right;">12V</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=4.5V$)</td> <td style="text-align: right;">< 1.4mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=3.8V$)</td> <td style="text-align: right;">< 1.5mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=3.1V$)</td> <td style="text-align: right;">< 1.8mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=2.5V$)</td> <td style="text-align: right;">< 2.2mΩ</td> </tr> </table> <p>Typical ESD protection HBM Class 2</p> <div style="text-align: right;">  </div>	V_{SS}	12V	$R_{SS(ON)}$ (at $V_{GS}=4.5V$)	< 1.4m Ω	$R_{SS(ON)}$ (at $V_{GS}=3.8V$)	< 1.5m Ω	$R_{SS(ON)}$ (at $V_{GS}=3.1V$)	< 1.8m Ω	$R_{SS(ON)}$ (at $V_{GS}=2.5V$)	< 2.2m Ω
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Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOCA33102E	AlphaDFN™3x2.74_14	Tape & Reel	8000

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

Parameter	Symbol	Rating	Units
Source-Source Voltage	V_{SS}	12	V
Gate-Source Voltage	V_{GS}	± 8	V
Source Current(DC) ^{Note1}	I_S	50	A
Source Current(Pulse) ^{Note2}	I_{SM}	110	
Power Dissipation ^{Note1}	P_D	4.2	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	$R_{\theta JA}$	20	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient		30	$^\circ\text{C}/\text{W}$

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	12			V
I _{SSS}	Zero Gate Voltage Source Current	V _{SS} =12V, V _{GS} =0V Test Circuit 1			1	μA
		T _J =55°C			5	
I _{GSS}	Gate leakage current	V _{SS} =0V, V _{GS} =±8V Test Circuit 2			±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{SS} =V _{GS} , I _S =250μA Test Circuit 3	0.5	0.85	1.3	V
R _{SS(ON)}	Static Source to Source On-Resistance	V _{GS} =4.5V, I _S =5A Test Circuit 4	0.75	1.1	1.4	mΩ
		T _J =125°C	1	1.5	1.9	
		V _{GS} =3.8V, I _S =5A Test Circuit 4	0.8	1.15	1.5	mΩ
		V _{GS} =3.1V, I _S =5A Test Circuit 4	0.9	1.25	1.8	mΩ
		V _{GS} =2.5V, I _S =5A Test Circuit 4	1	1.5	2.2	mΩ
g _{FS}	Forward Transconductance	V _{SS} =5V, I _S =5A Test Circuit 3		60		S
V _{FSS}	Forward Source to Source Voltage	I _S =1A, V _{GS} =0V Test Circuit 5		0.6	1	V
DYNAMIC PARAMETERS						
R _g	Gate resistance	f=1MHz		1.5		KΩ
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{G1S1} =4.5V, V _{SS} =6V, I _S =5A		68		nC
t _{D(on)}	Turn-On DelayTime	V _{G1S1} =4.5V, V _{SS} =6V, R _L =1.2Ω, R _{GEN} =3Ω Test Circuit8		4.5		μs
t _r	Turn-On Rise Time			9.2		μs
t _{D(off)}	Turn-Off DelayTime			3		μs
t _f	Turn-Off Fall Time			19.5		μs

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

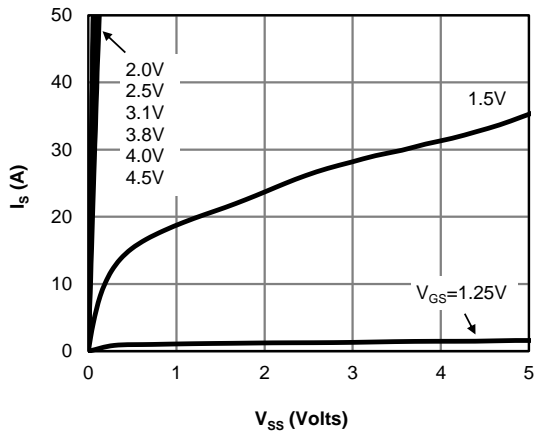


Figure 1: On-Region Characteristics

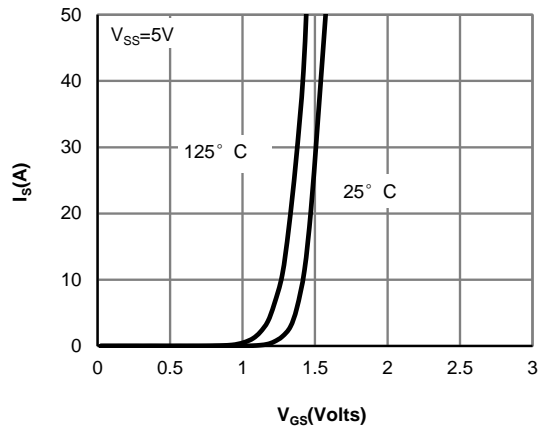


Figure 2: Transfer Characteristics

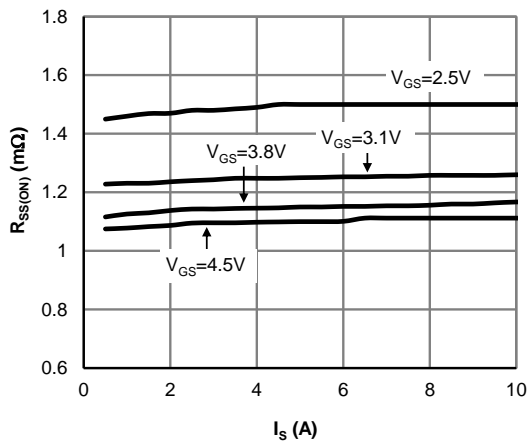


Figure 3: On-Resistance vs. Source Current and Gate Voltage

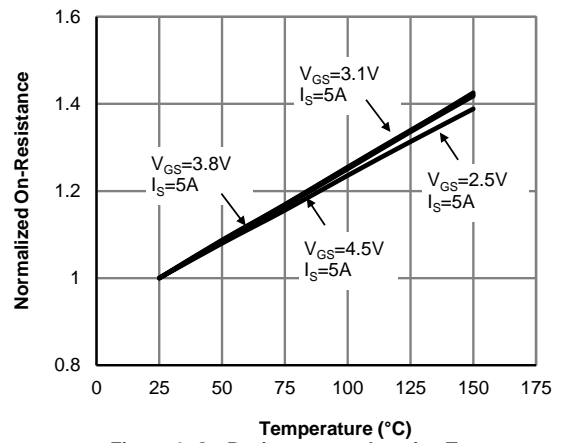


Figure 4: On-Resistance vs. Junction Temperature

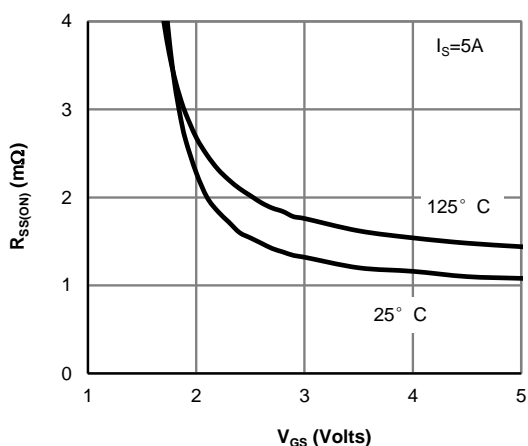


Figure 5: On-Resistance vs. Gate-Source Voltage

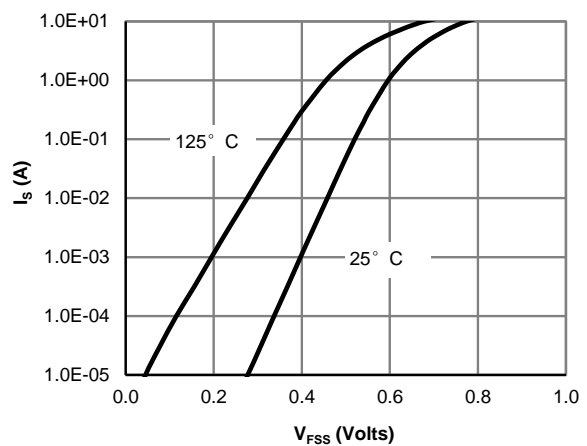


Figure 6: Forward Source to Source Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

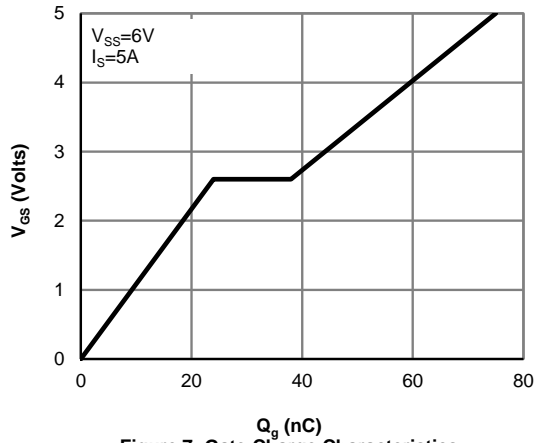


Figure 7: Gate-Charge Characteristics

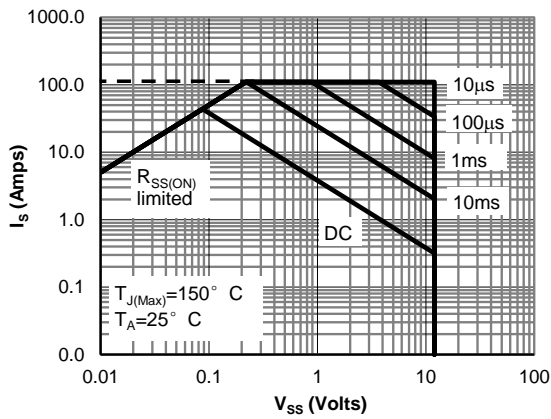


Figure 8: Maximum Forward Biased Safe Operating Area (Note1)

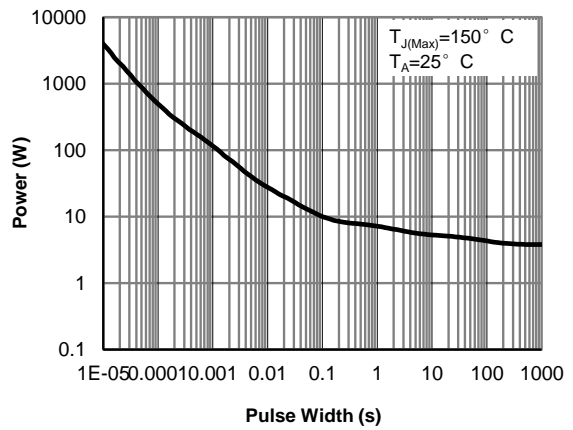


Figure 9: Single Pulse Power Rating Junction-to-Ambient (Note1)

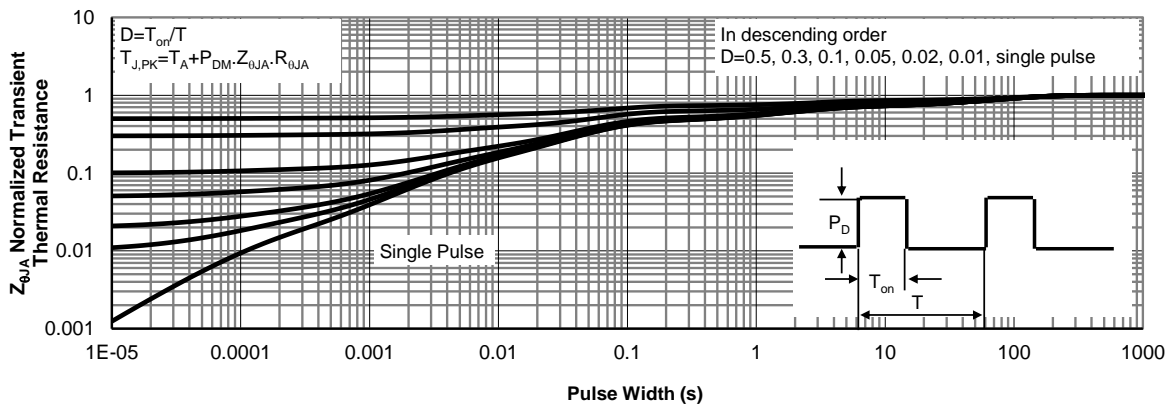
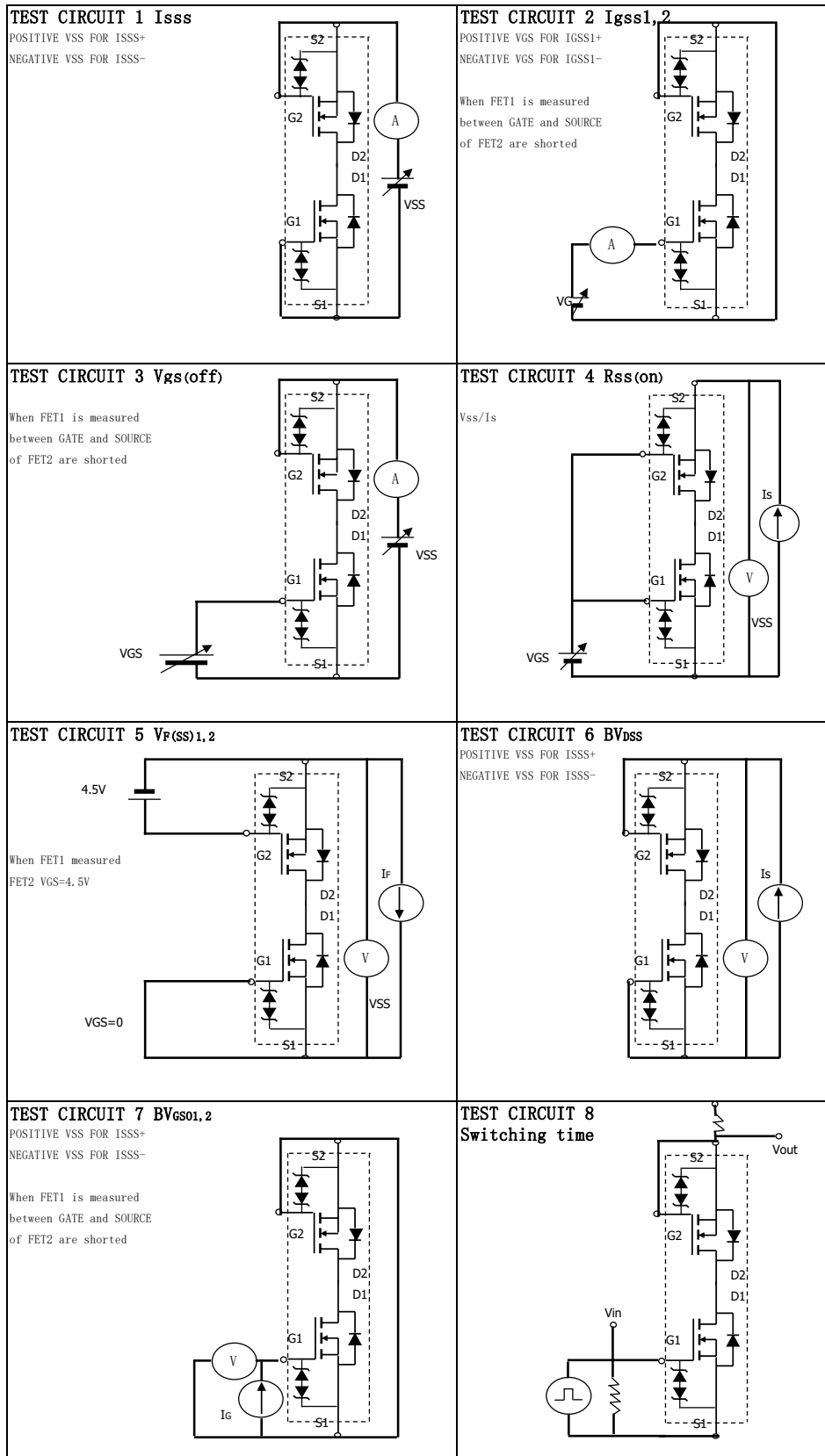
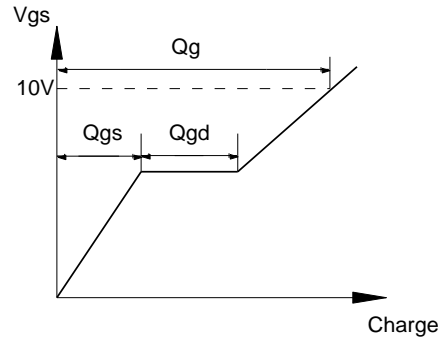
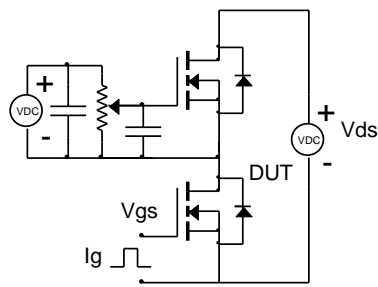


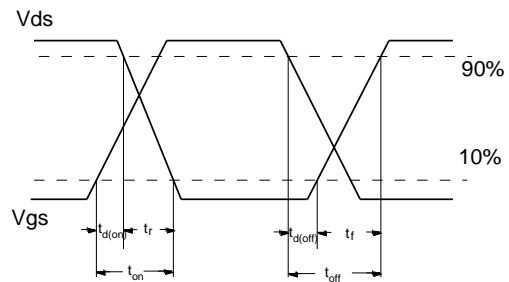
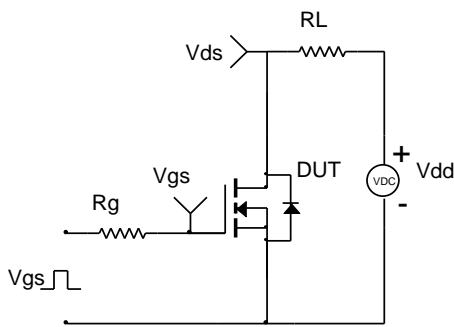
Figure 10: Normalized Maximum Transient Thermal Impedance (Note1)



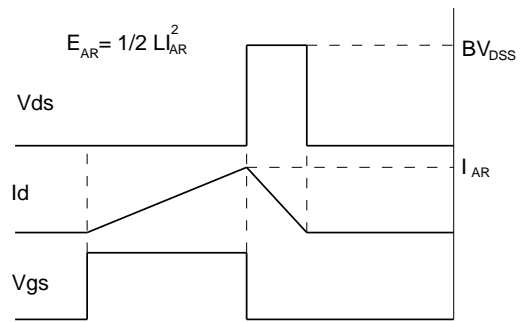
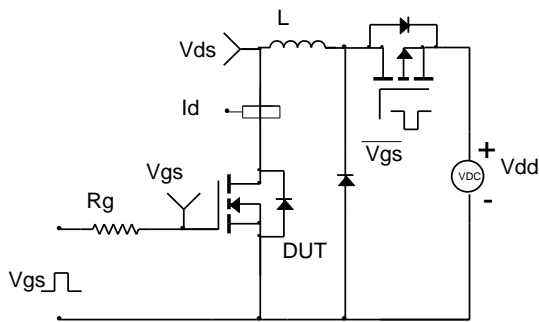
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

