
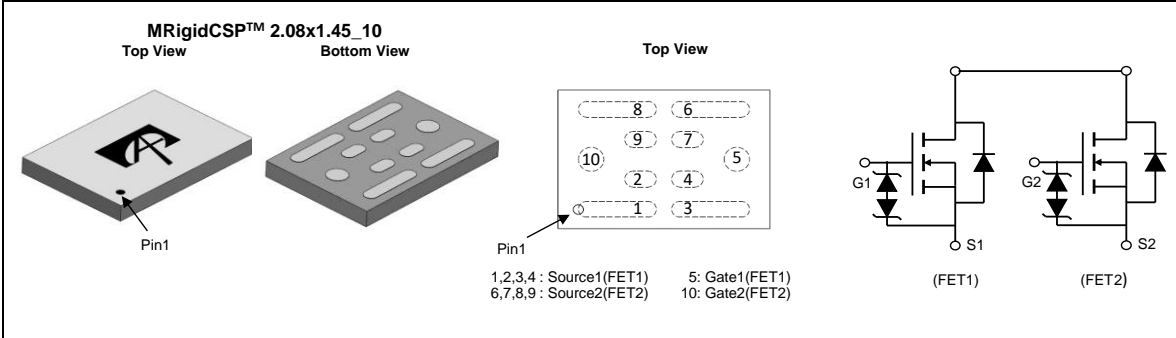


<p>General Description</p> <ul style="list-style-type: none"> Trench Power MOSFET technology Ultra low $R_{SS(ON)}$ With ESD protection to improve battery performance and safety Common drain configuration for design simplicity RoHS 2.0 and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> Battery protection switch Mobile device battery charging and discharging 	<p>Product Summary</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">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;">< 3mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=3.8V$)</td> <td style="text-align: right;">< 3.4mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=3.1V$)</td> <td style="text-align: right;">< 4.2mΩ</td> </tr> <tr> <td>$R_{SS(ON)}$ (at $V_{GS}=2.5V$)</td> <td style="text-align: right;">< 5.8mΩ</td> </tr> </table> <p>Typical ESD protection HBM Class 2</p> <div style="text-align: right; margin-top: 10px;">  </div>	V_{SS}	12V	$R_{SS(ON)}$ (at $V_{GS}=4.5V$)	< 3m Ω	$R_{SS(ON)}$ (at $V_{GS}=3.8V$)	< 3.4m Ω	$R_{SS(ON)}$ (at $V_{GS}=3.1V$)	< 4.2m Ω	$R_{SS(ON)}$ (at $V_{GS}=2.5V$)	< 5.8m Ω
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Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOCR33105E	MRigidCSP™ 2.08x1.45_10	Tape & Reel	6000

Absolute Maximum Ratings $T_A=25^\circ C$ 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	30	A
Source Current(Pulse) ^{Note2}			
Power Dissipation ^{Note1}	P_D	3.1	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typical	Units
Maximum Junction-to-Ambient	$R_{\theta JA}$	30	$^\circ C/W$
Maximum Junction-to-Ambient		40	$^\circ C/W$

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						
B _{VSSS}	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 T _J =55°C			1 5	μA
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	0.9	1.3	V
R _{SS(ON)}	Static Source to Source On-Resistance	V _{GS} =4.5V, I _S =5A Test Circuit 4 T _J =125°C	1.6 2.3	2.3 3.3	3 4	mΩ
		V _{GS} =3.8V, I _S =5A Test Circuit 4	1.7	2.5	3.4	mΩ
		V _{GS} =3.1V, I _S =5A Test Circuit 4	2.1	3	4.2	mΩ
		V _{GS} =2.5V, I _S =5A Test Circuit 4	2.8	4	5.8	mΩ
g _{FS}	Forward Transconductance	V _{SS} =5V, I _S =5A Test Circuit 3		50		S
V _{FSS}	Forward Source to Source Voltage	I _S =1A, V _{GS} =0V Test Circuit 5		0.65	1	V
DYNAMIC PARAMETERS						
R _g	Gate resistance	f=1MHz		1.6		KΩ
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{G1S1} =4.5V, V _{SS} =6V, I _S =5A		21		nC
t _{D(on)}	Turn-On DelayTime	V _{G1S1} =4.5V, V _{SS} =6V, R _L =1.2Ω, R _{GEN} =3Ω Test Circuit8		1.8		μs
t _r	Turn-On Rise Time			3.6		μs
t _{D(off)}	Turn-Off DelayTime			3.5		μs
t _f	Turn-Off Fall Time			6.6		μs

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

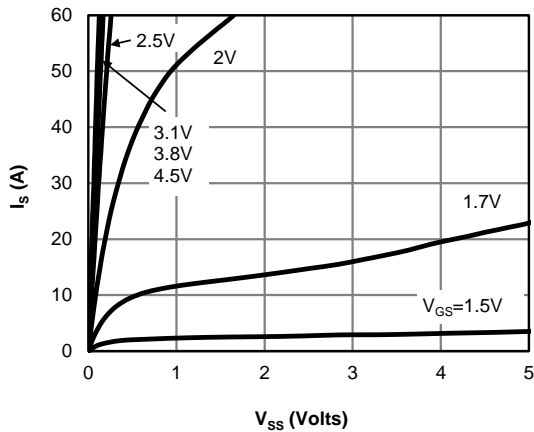


Figure 1: On-Region Characteristics

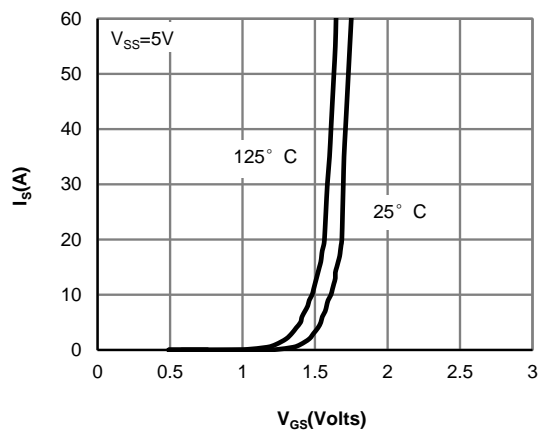


Figure 2: Transfer Characteristics

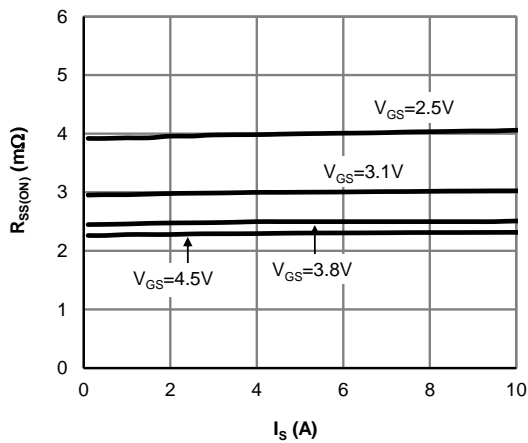


Figure 3: On-Resistance vs. Source Current and Gate Voltage

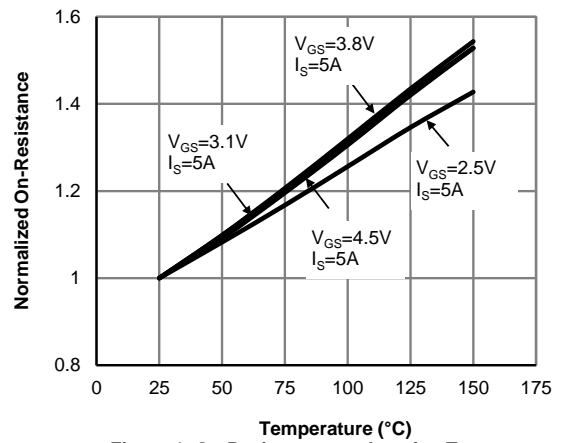


Figure 4: On-Resistance vs. Junction Temperature

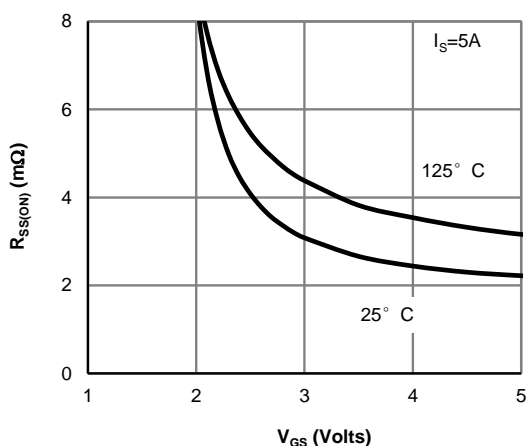


Figure 5: On-Resistance vs. Gate-Source Voltage

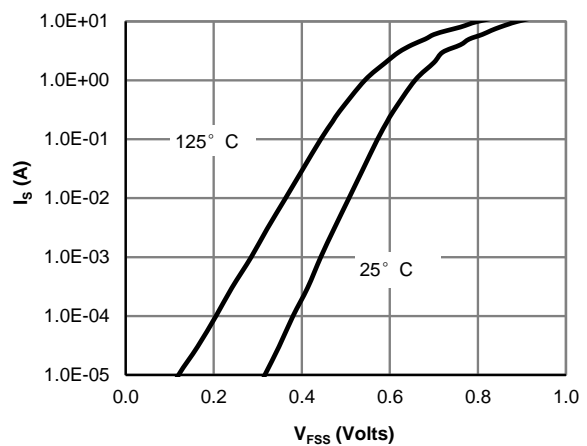


Figure 6: Forward Source to Source Characteristics

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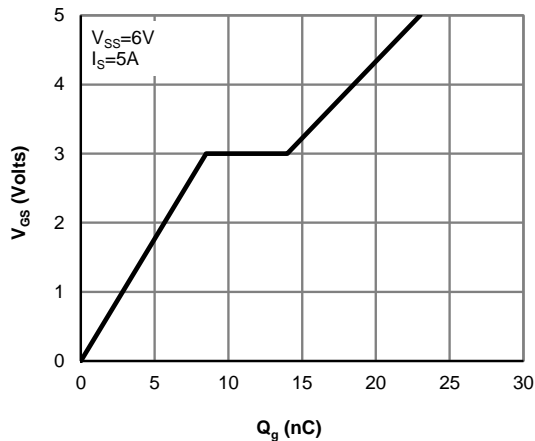


Figure 7: Gate-Charge Characteristics

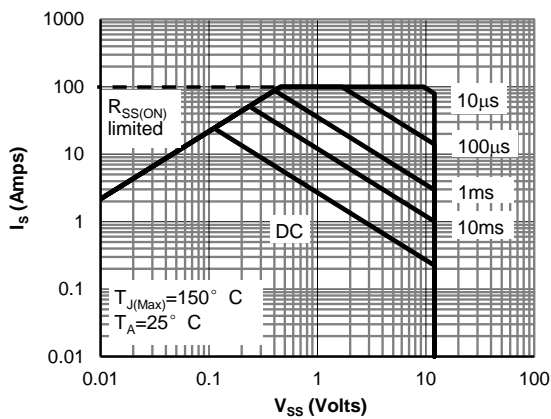


Figure 8: Maximum Forward Biased Safe Operating Area (Note1)

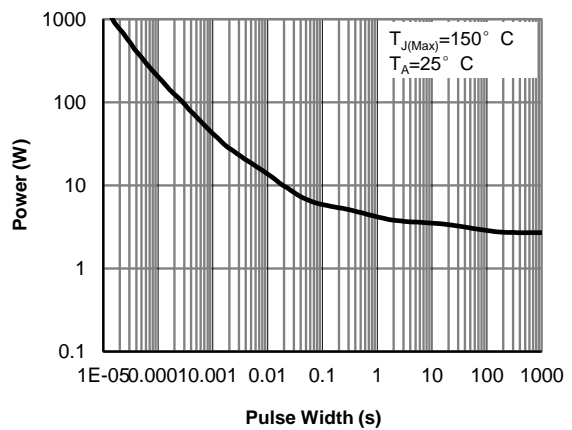


Figure 9: Single Pulse Power Rating Junction-to-Ambient (Note1)

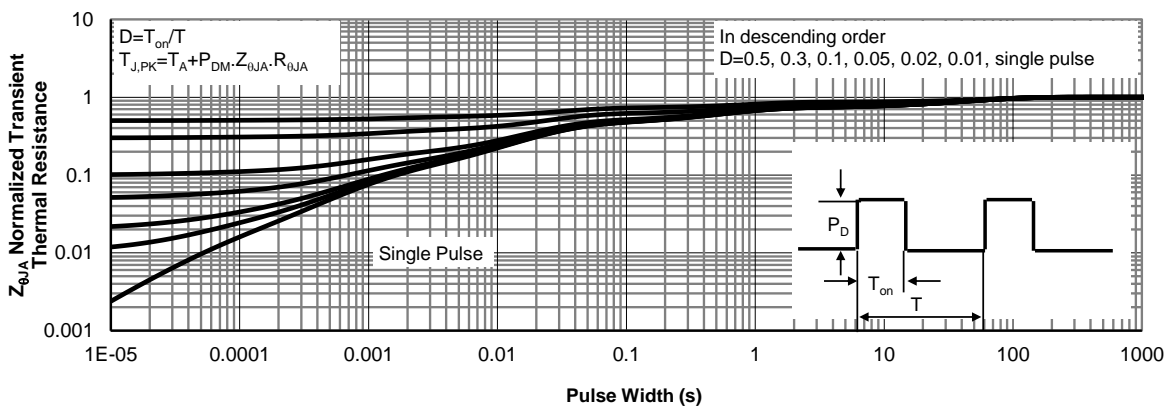


Figure 10: Normalized Maximum Transient Thermal Impedance (Note1)

