

AOC3864

20V Common-Drain Dual N-Channel AlphaMOS

General Description

- 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

Applications

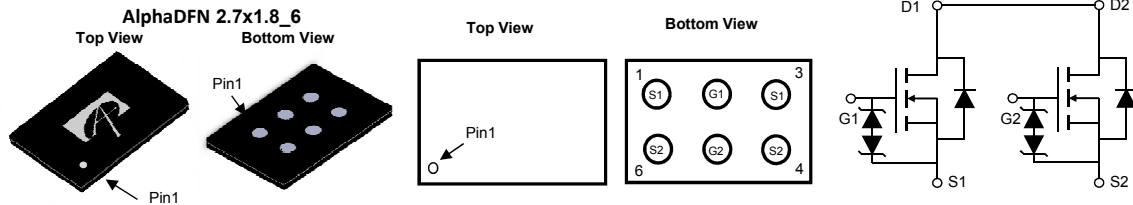
- Battery protection switch
- Mobile device battery charging and discharging

Product Summary

V_{SS}	20V
$R_{SS(ON)}$ (at $V_{GS}=4.5V$)	< 5.7mΩ
$R_{SS(ON)}$ (at $V_{GS}=4.0V$)	< 5.8mΩ
$R_{SS(ON)}$ (at $V_{GS}=3.7V$)	< 6mΩ
$R_{SS(ON)}$ (at $V_{GS}=3.1V$)	< 7.5mΩ
$R_{SS(ON)}$ (at $V_{GS}=2.5V$)	< 9mΩ

Typical ESD protection

HBM Class 2



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOC3864	AlphaDFN 2.7x1.8_6	Tape & Reel	5000

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

Parameter	Symbol	Rating	Units
Source-Source Voltage	V_{SS}	20	V
Gate-Source Voltage	V_{GS}	±8	V
Source Current(DC) ^{Note1}	I_S	19	A
Source Current(Pulse) ^{Note2}	I_{SM}	80	
Power Dissipation ^{Note1}	P_D	2.4	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typical	Units
Maximum Junction-to-Ambient $t \leq 10s$	$R_{\theta JA}$	43	°C/W
Maximum Junction-to-Ambient Steady-State		52	°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} =±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 =4A Test Circuit 4 T _J =125°C	3.4	4.5	5.7	mΩ
			4.7	6.2	7.9	
		V _{GS} =4.0V, I _S =4A Test Circuit 4	3.5	4.6	5.8	mΩ
		V _{GS} =3.7V, I _S =4A Test Circuit 4	3.6	4.7	6.0	mΩ
		V _{GS} =3.1V, I _S =4A Test Circuit 4	3.7	5.2	7.5	mΩ
		V _{GS} =2.5V, I _S =4A Test Circuit 4	3.8	5.9	9.0	mΩ
g _{FS}	Forward Transconductance	V _{SS} =5V, I _S =4A Test Circuit 3		55		S
V _{FSS}	Forward Source to Source Voltage	I _S =1A, V _{GS} =0V Test Circuit 5		0.60	1	V
DYNAMIC PARAMETERS						
R _g	Gate resistance	f=1MHz		1		KΩ
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS1} =4.5V, V _{SS} =10V, I _S =4A		27	38	nC
t _{D(on)}	Turn-On DelayTime	V _{GS1} =4.5V, V _{SS} =10V, R _L =2.5Ω, R _{GEN} =3Ω Test Circuit8		1.2		μs
t _r	Turn-On Rise Time			2.2		μs
t _{D(off)}	Turn-Off DelayTime			5.5		μs
t _f	Turn-Off Fall Time			6.5		μs

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

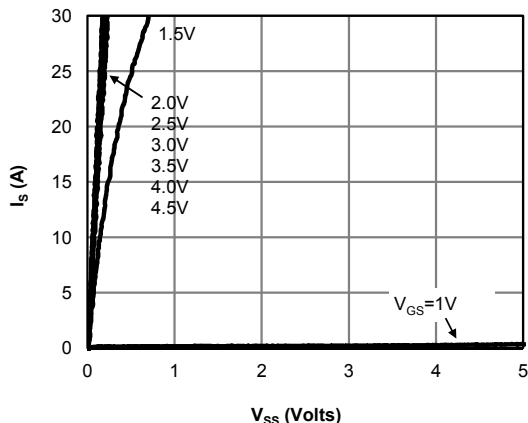


Figure 1: On-Region Characteristics

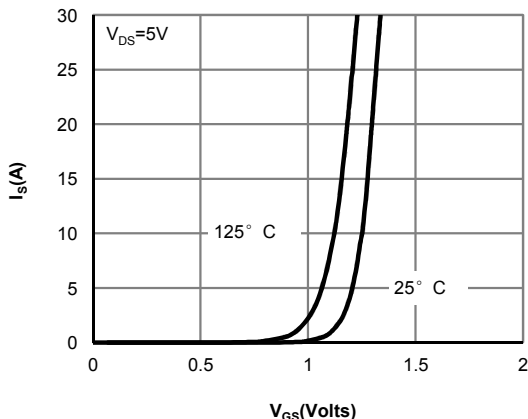


Figure 2: Transfer Characteristics

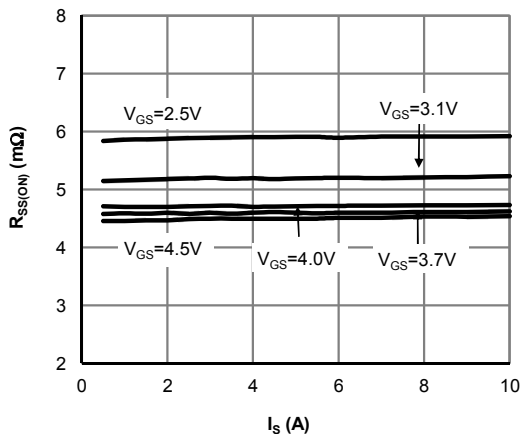


Figure 3: On-Resistance vs. Source Current and Gate Voltage

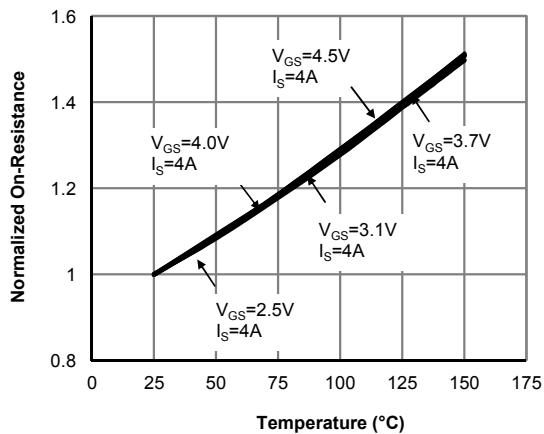


Figure 4: On-Resistance vs. Junction Temperature

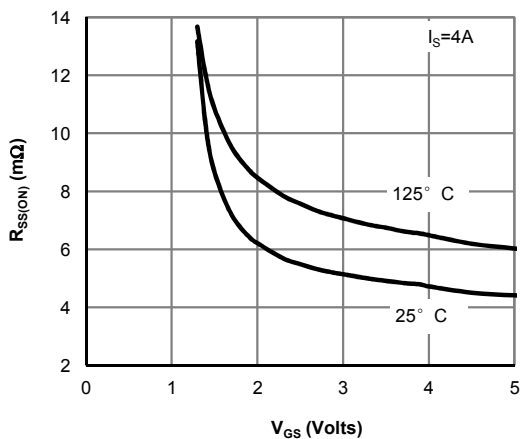


Figure 5: On-Resistance vs. Gate-Source Voltage

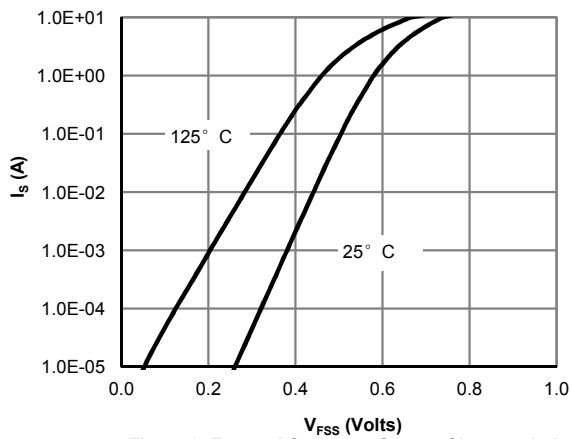


Figure 6: Forward Source to Source Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

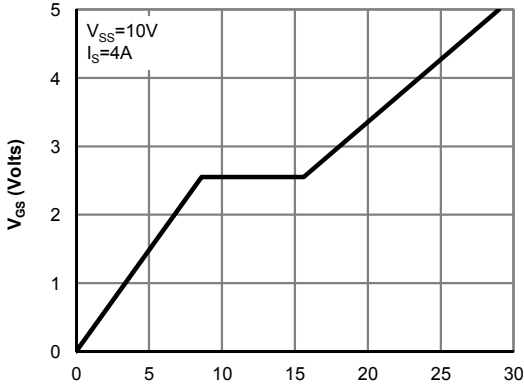


Figure 7: Gate-Charge Characteristics

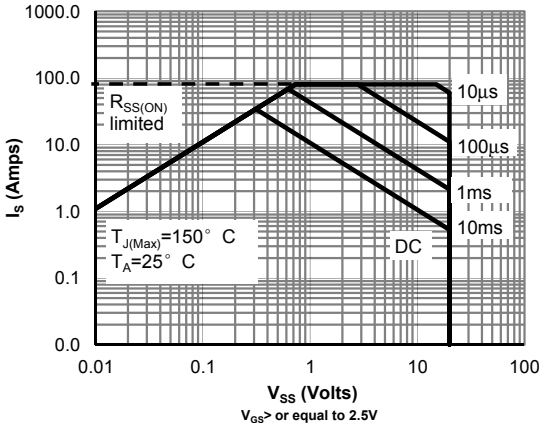


Figure 9: Maximum Forward Biased Safe Operating Area (Note1)

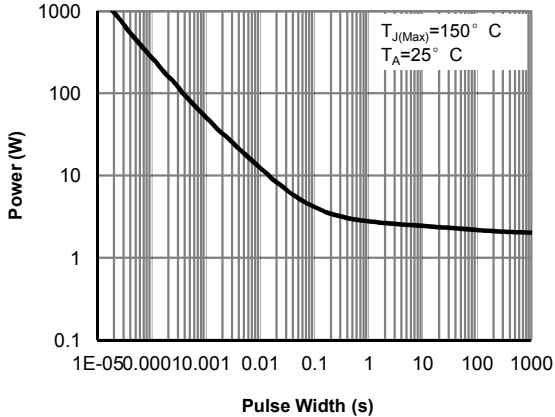


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note1)

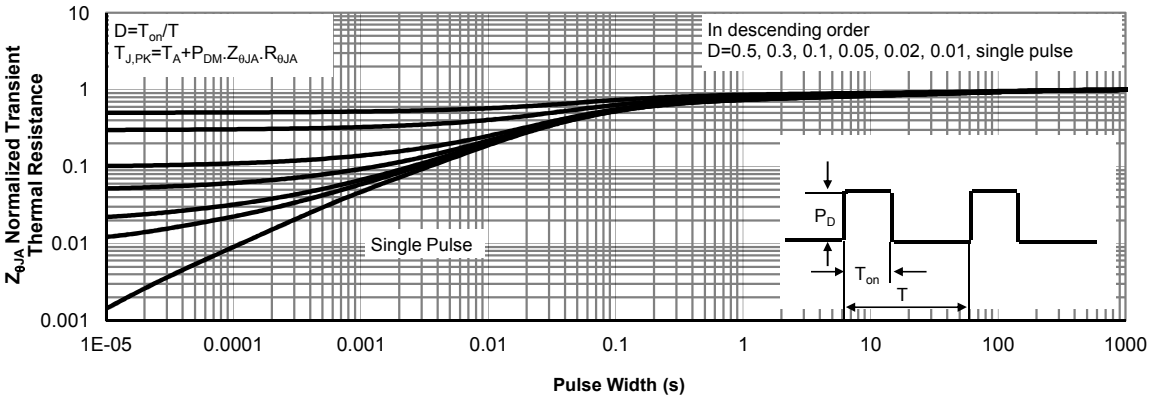


Figure 11: Normalized Maximum Transient Thermal Impedance (Note1)

