

### General Description

- Trench Power AlphaMOS (αMOS MV) technology
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications
- RoHS and Halogen-Free Compliant

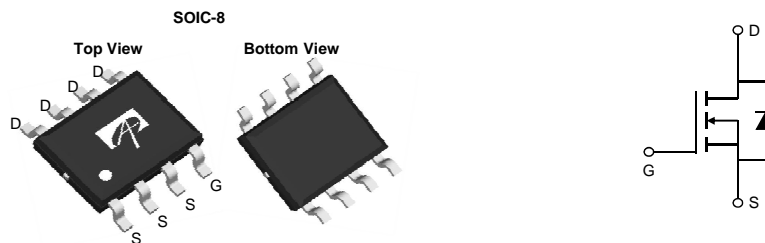
### Applications

- Synchronous Rectification in DC/DC and AC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial

### Product Summary

$V_{DS}$	100V
$I_D$ (at $V_{GS}=10V$ )	8A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 23mΩ
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	< 33mΩ

100% UIS Tested  
 100% Rg Tested



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AO4292	SO-8	Tape & Reel	3000

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	8	A
		$T_A=25^\circ\text{C}$	
	$T_A=70^\circ\text{C}$	6.2	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	32	A
Avalanche Current <sup>C</sup>	$I_{AS}$	15	A
Avalanche energy $L=0.1\text{mH}$ <sup>C</sup>	$E_{AS}$	11	mJ
$V_{DS}$ Spike	$V_{SPIKE}$	120	V
Power Dissipation <sup>B</sup>	$P_D$	3.1	W
		$T_A=25^\circ\text{C}$	
	$T_A=70^\circ\text{C}$	2.0	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	31	40	°C/W
		$t \leq 10\text{s}$		
Maximum Junction-to-Ambient <sup>A,D</sup>	$R_{\theta JL}$	59	75	°C/W
		Steady-State		
Maximum Junction-to-Lead	$R_{\theta JL}$	16	24	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units	
<b>STATIC PARAMETERS</b>							
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	100			V	
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			1 5	μA	
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.6	2.15	2.7	V	
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =8A T <sub>J</sub> =125°C		18 32.5	23 42	mΩ	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		24	33		mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =8A		30		S	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.72	1	V	
I <sub>S</sub>	Maximum Body-Diode Continuous Current				4	A	
<b>DYNAMIC PARAMETERS</b>							
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =50V, f=1MHz		1190		pF	
C <sub>oss</sub>	Output Capacitance				95		pF
C <sub>rss</sub>	Reverse Transfer Capacitance				7		pF
R <sub>g</sub>	Gate resistance	f=1MHz	0.5	1.1	1.7	Ω	
<b>SWITCHING PARAMETERS</b>							
Q <sub>g(10V)</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =8A		16.5	25	nC	
Q <sub>g(4.5V)</sub>	Total Gate Charge			7	12	nC	
Q <sub>gs</sub>	Gate Source Charge			4.5		nC	
Q <sub>gd</sub>	Gate Drain Charge			2.5		nC	
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, R <sub>L</sub> =6.25Ω, R <sub>GEN</sub> =3Ω		7		ns	
t <sub>r</sub>	Turn-On Rise Time			3		ns	
t <sub>D(off)</sub>	Turn-Off DelayTime			20		ns	
t <sub>f</sub>	Turn-Off Fall Time			3		ns	
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =8A, dI/dt=500A/μs		20		ns	
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =8A, dI/dt=500A/μs		90		nC	

A. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub> =25° C. The value in any given application depends on the user's specific board design.

B. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150° C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150° C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub>=25° C.

D. The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T<sub>J(MAX)</sub>=150° C. The SOA curve provides a single pulse rating.

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**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

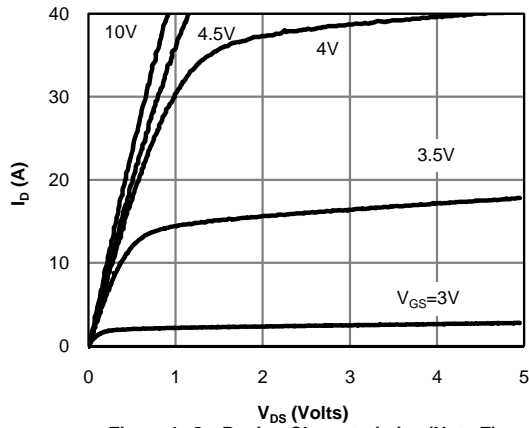


Figure 1: On-Region Characteristics (Note E)

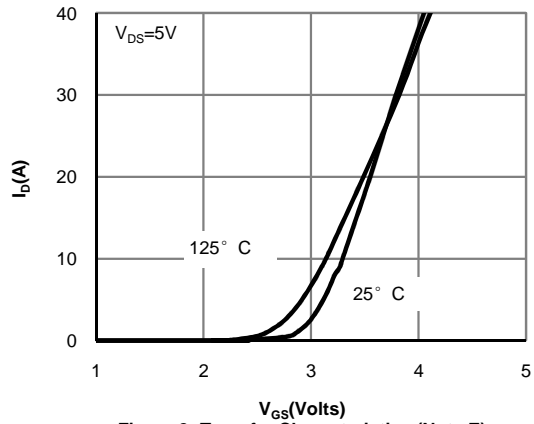


Figure 2: Transfer Characteristics (Note E)

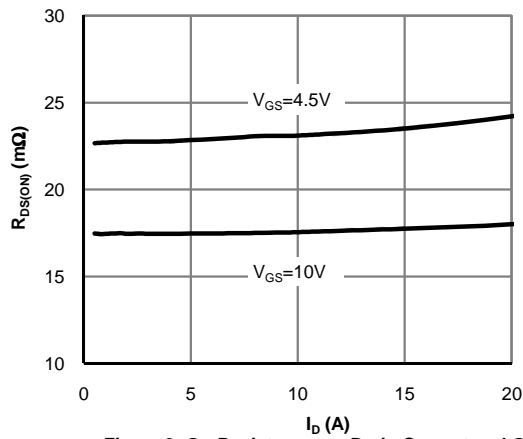


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

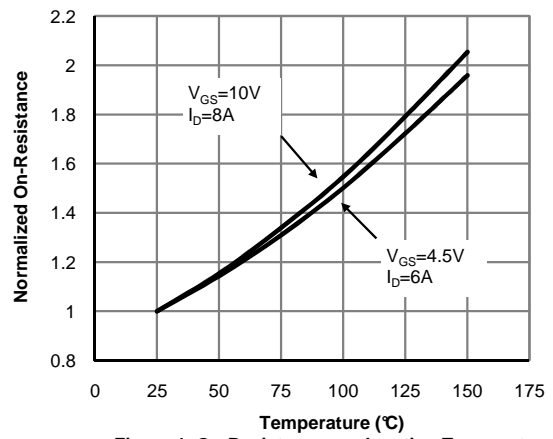


Figure 4: On-Resistance vs. Junction Temperature (Note E)

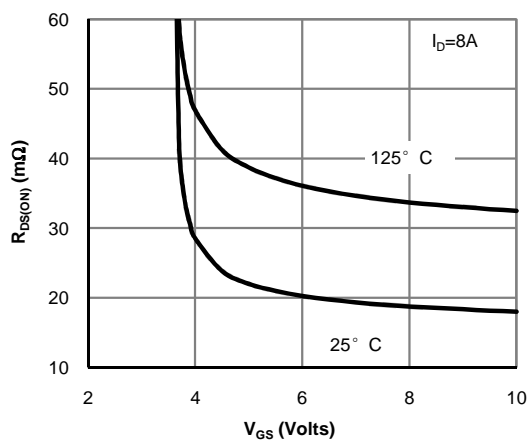


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

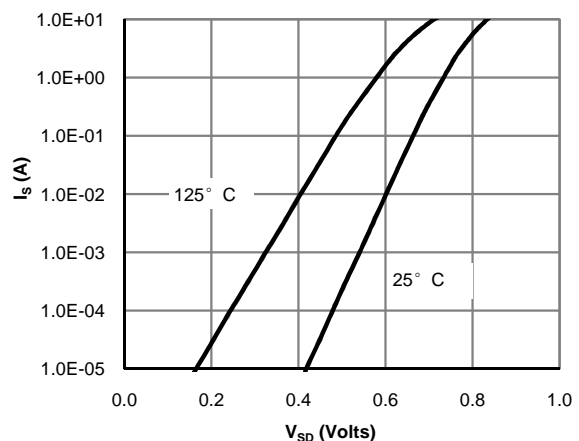
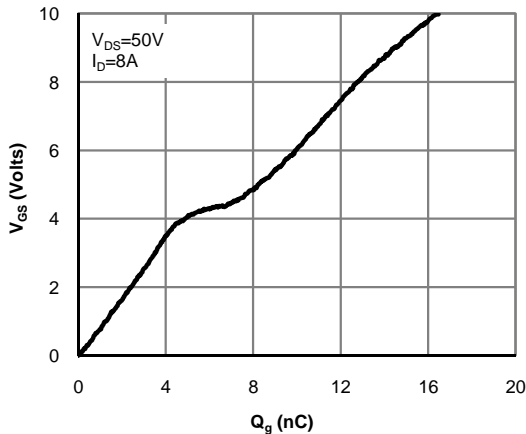
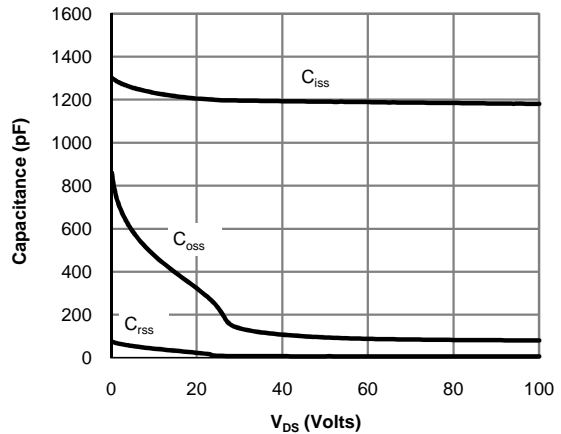


Figure 6: Body-Diode Characteristics (Note E)

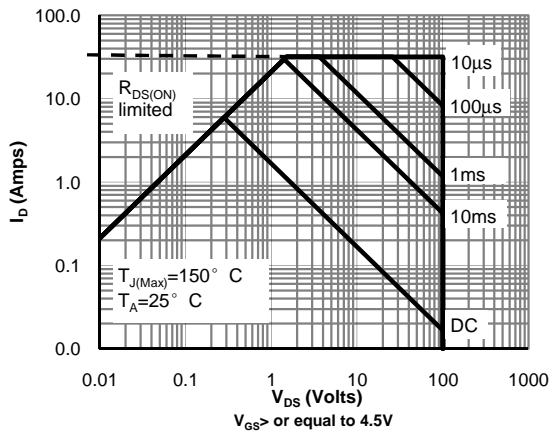
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



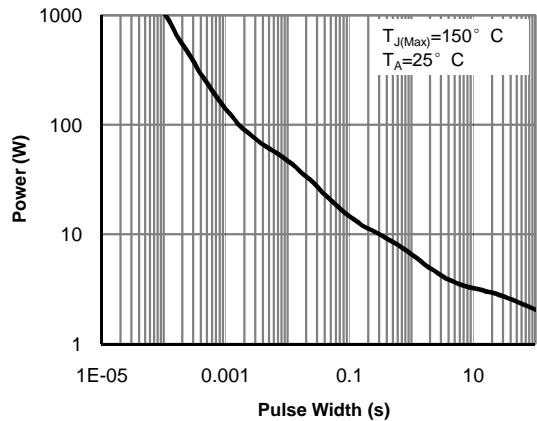
**Figure 7: Gate-Charge Characteristics**



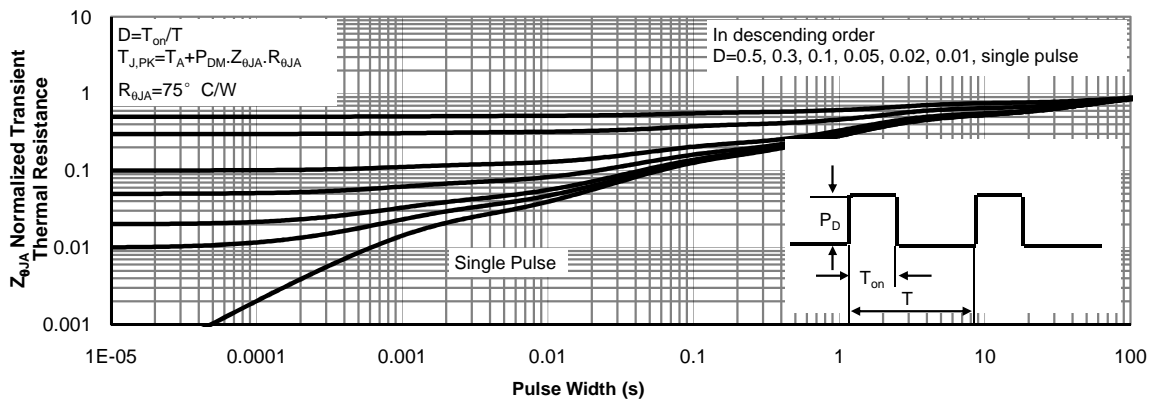
**Figure 8: Capacitance Characteristics**



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

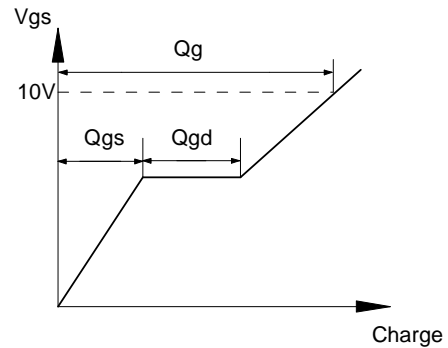
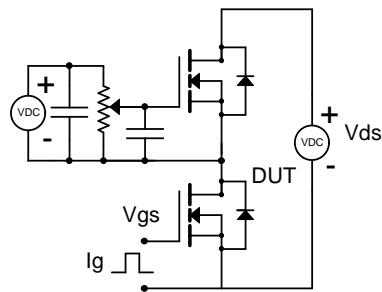


**Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)**

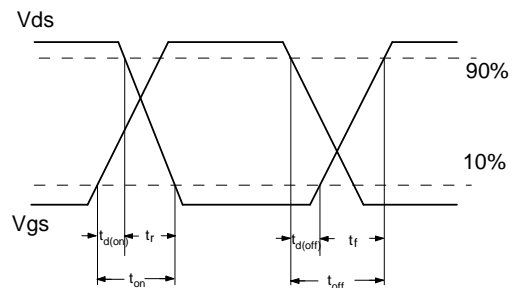
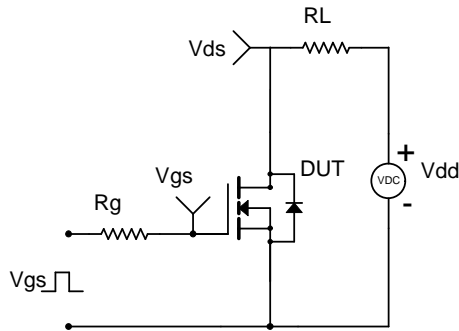


**Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)**

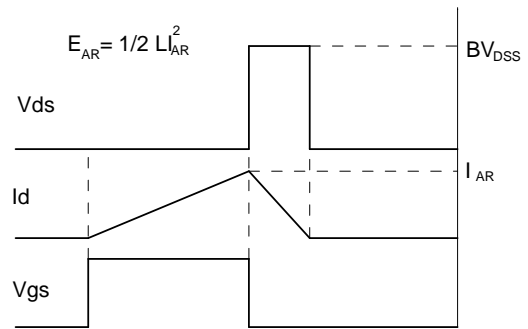
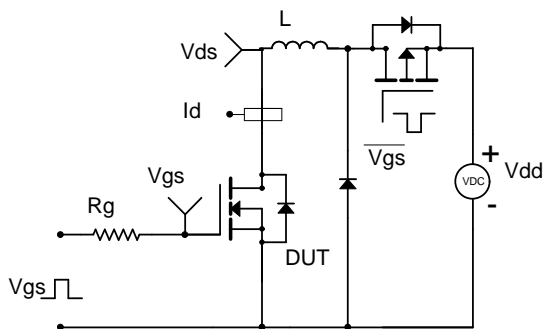
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

