AO4264

60V N-Channel AlphaMOS

General Description

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

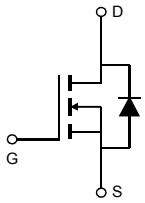
Applications

- Synchronus Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

Product Summary

V_{DS}	60V
I_D (at V_{GS}=10V)	12A
$R_{DS(ON)}$ (at V_{GS}=10V)	< 11mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	< 13.5mΩ

100% UIS Tested
100% Rg Tested



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AO4264	SO-8	Tape & Reel	3000

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	12	A
	T_A=70°C		9	
Pulsed Drain Current [C]		I_{DM}	48	
Avalanche Current [C]		I_{AS}	36	A
Avalanche energy	L=0.1mH [C]	E_{AS}	65	mJ
V_{DS} Spike	10µs	V_{SPIKE}	72	V
Power Dissipation [B]	T_A=25°C	P_D	3.1	W
	T_A=70°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 [A]	t ≤ 10s	$R_{\theta JA}$	31	40	°C/W
Maximum Junction-to-Ambient [A D]	Steady-State		59	75	°C/W
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	16	24	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V			1	μA
		T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±20V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=$V_{GS,}$ I_D=250μA	1.4	1.9	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=12A		9.2	11	mΩ
		T_J=125°C		15.6	19	
		V_{GS}=4.5V, I_D=10A		10.8	13.5	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=12A		50		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V		0.72	1	V
I_S	Maximum Body-Diode Continuous Current				4	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, f=1MHz		2007		pF
C_{oss}	Output Capacitance			177		pF
C_{rss}	Reverse Transfer Capacitance			12.5		pF
R_g	Gate resistance	f=1MHz	0.6	1.2	1.8	Ω
SWITCHING PARAMETERS						
Q_g(10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=12A		25.5	40	nC
Q_g(4.5V)	Total Gate Charge			11	20	nC
Q_{gs}	Gate Source Charge			5.5		nC
Q_{gd}	Gate Drain Charge			2.5		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=1.25Ω, R_{GEN}=3Ω		8.5		ns
t_r	Turn-On Rise Time			3.5		ns
$t_{D(off)}$	Turn-Off DelayTime			27		ns
t_f	Turn-Off Fall Time			3		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=12A, dI/dt=500A/μs		15		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=12A, dI/dt=500A/μs		55		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

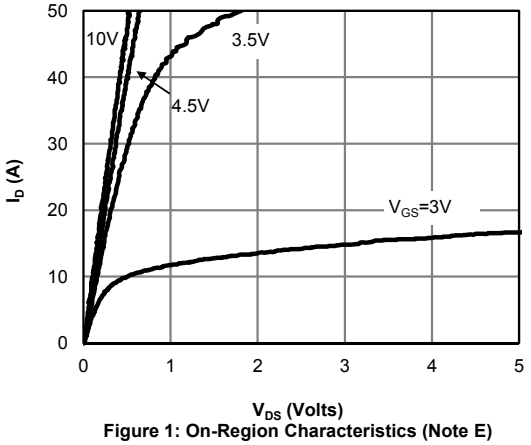


Figure 1: On-Region Characteristics (Note E)

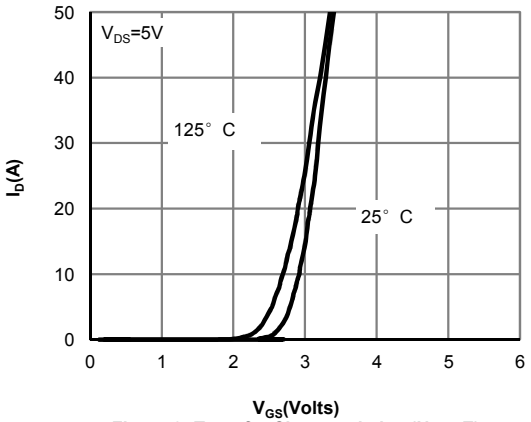


Figure 2: Transfer Characteristics (Note E)

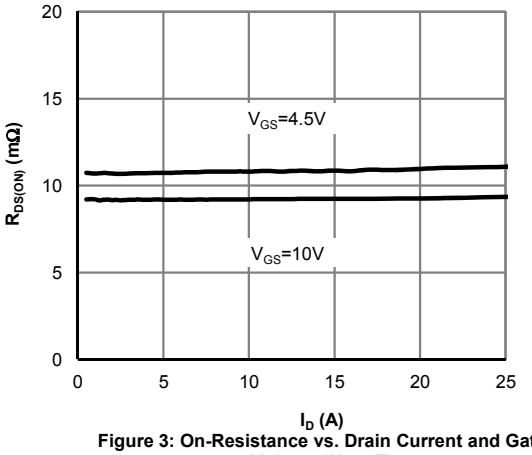


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

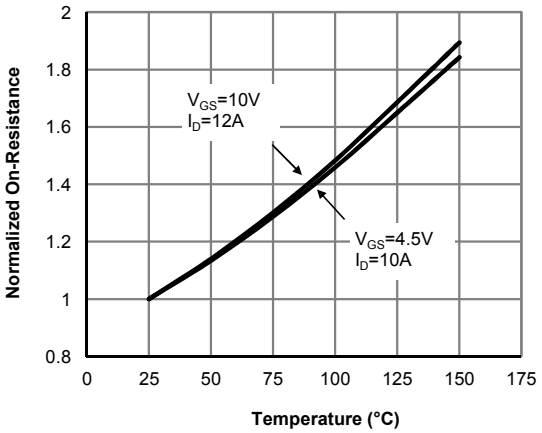


Figure 4: On-Resistance vs. Junction Temperature (Note E)

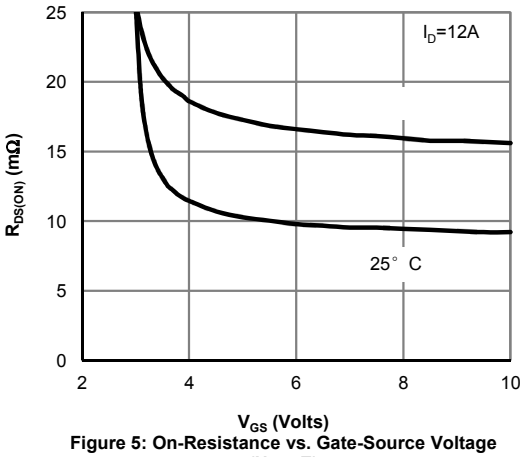


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

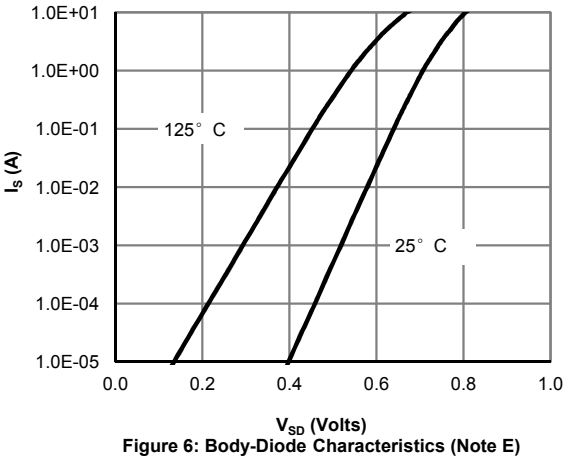


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

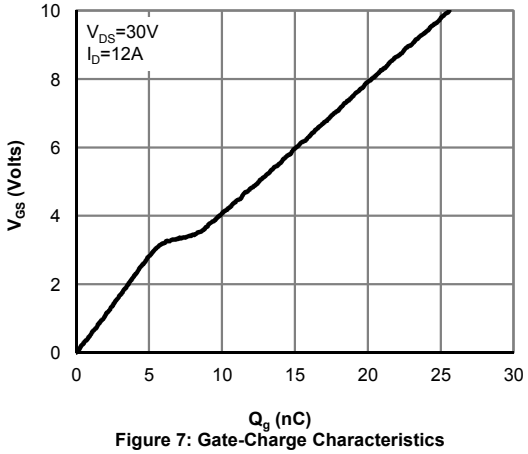


Figure 7: Gate-Charge Characteristics

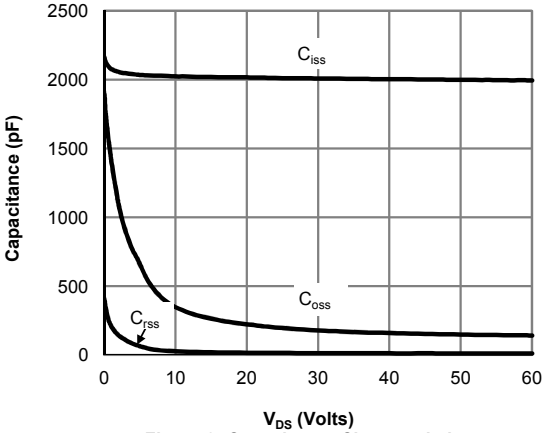


Figure 8: Capacitance Characteristics

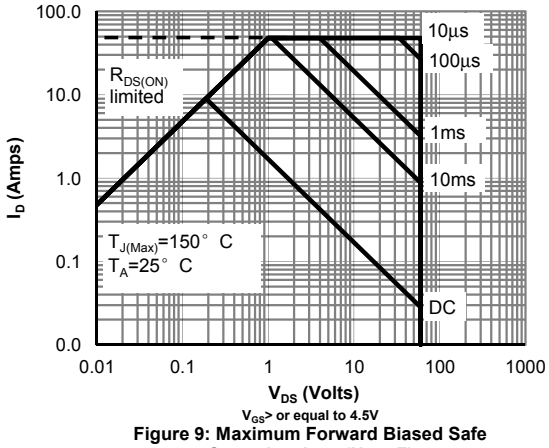


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

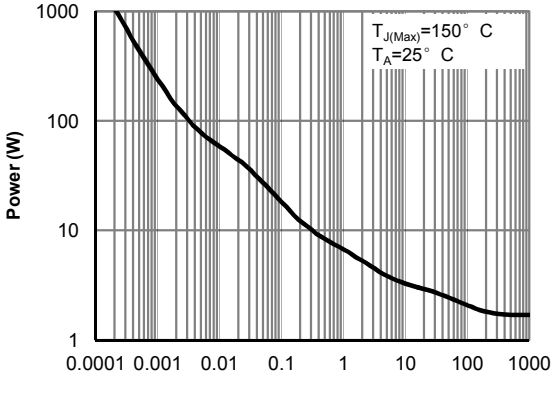


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

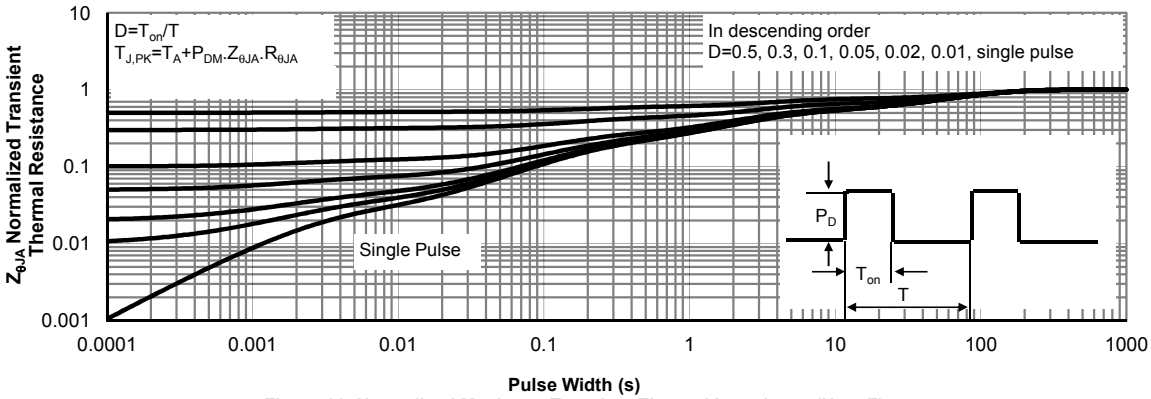
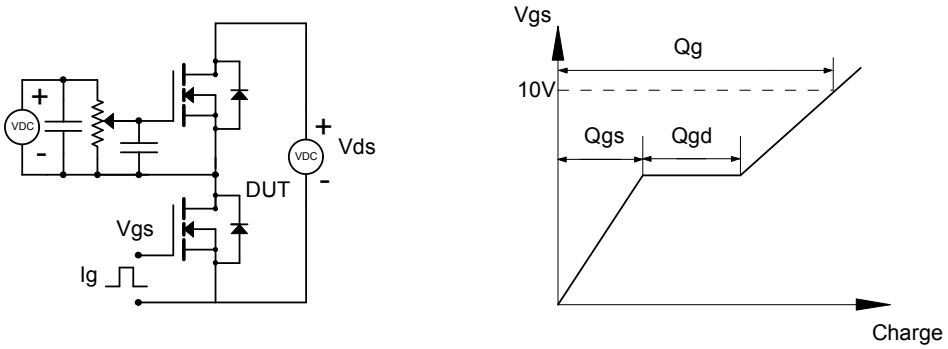
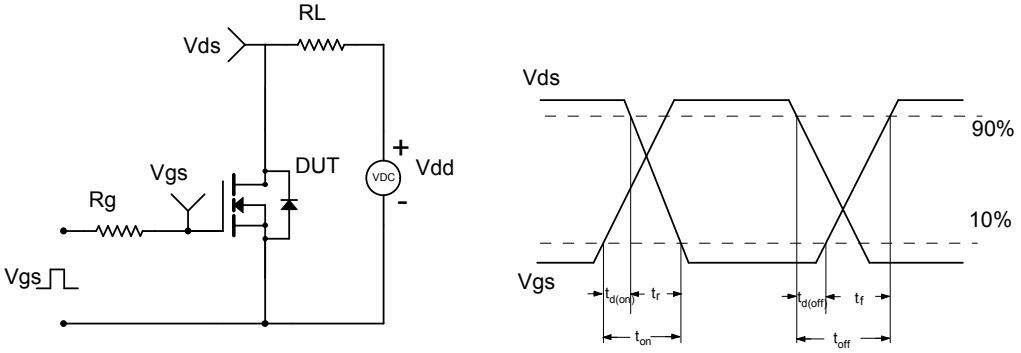


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

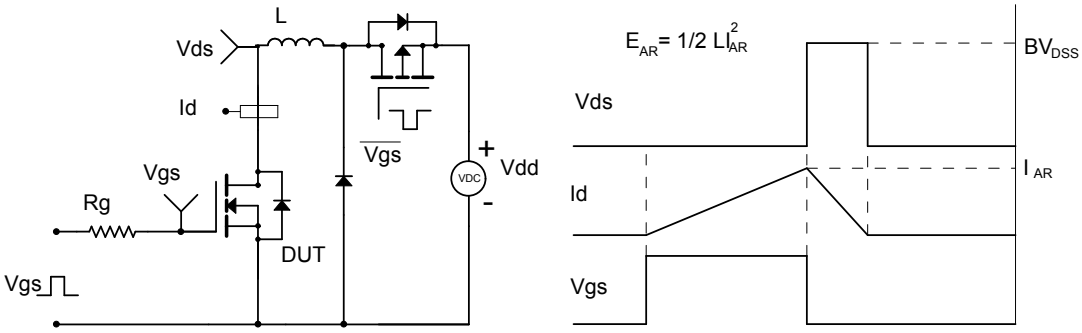
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms