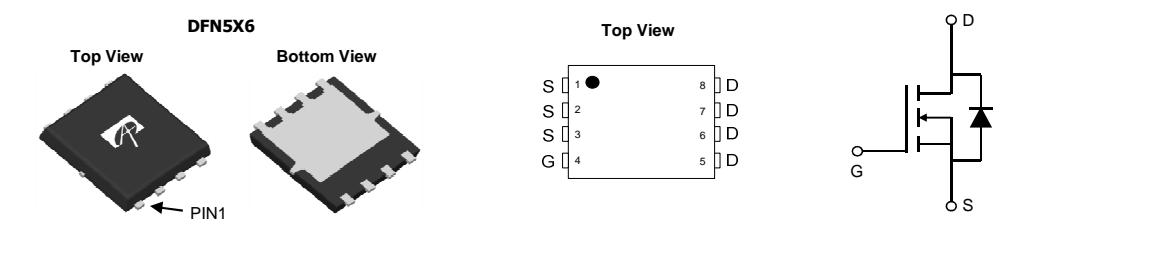


General Description	Product Summary
<ul style="list-style-type: none"> Latest Trench Power AlphaMOS (αMOS LV) technology Very Low RDS(on) at 4.5V_{GS} Low Gate Charge High Current Capability RoHS and Halogen-Free Compliant 	V _{DS} 30V I _D (at V _{GS} =10V) 32A R _{DS(ON)} (at V _{GS} =10V) < 3.2mΩ R _{DS(ON)} (at V _{GS} = 4.5V) < 5mΩ
Application <ul style="list-style-type: none"> DC/DC Converters in Computing, Servers, and POL Isolated DC/DC Converters in Telecom and Industrial 	100% UIS Tested 100% R _g Tested 


Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^G	I _D	32	A
T _C =100°C		25	
Pulsed Drain Current ^C	I _{DM}	128	
Continuous Drain Current	I _{DSM}	29	A
T _A =70°C		23	
Avalanche Current ^C	I _{AS}	46	A
Avalanche energy L=0.05mH ^C	E _{AS}	53	mJ
V _{DS} Spike	V _{SPIKE}	36	V
Power Dissipation ^B	P _D	41	W
T _C =100°C		16	
Power Dissipation ^A	P _{DSM}	4.2	W
T _A =70°C		2.7	
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	R _{θJA}	24	30	°C/W
Maximum Junction-to-Ambient ^{A,D}		53	64	°C/W
Maximum Junction-to-Case	R _{θJC}	2.6	3	°C/W

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1 5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			100	nA
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.4	1.8	2.2	V
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=20\text{A}$ $T_J=125^\circ\text{C}$		2.6 3.6	3.2 4.5	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=20\text{A}$		3.6	5	$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS}=5\text{V}, I_D=20\text{A}$		105		S
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}, V_{GS}=0\text{V}$		0.7	1	V
I_S	Maximum Body-Diode Continuous Current				48	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1\text{MHz}$		2010		pF
C_{oss}	Output Capacitance			898		pF
C_{rss}	Reverse Transfer Capacitance			124		pF
R_g	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$	0.9	1.8	2.7	Ω
SWITCHING PARAMETERS						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, I_D=20\text{A}$		36	49	nC
$Q_g(4.5\text{V})$	Total Gate Charge			17	23	nC
Q_{gs}	Gate Source Charge			6		nC
Q_{gd}	Gate Drain Charge			8		nC
$t_{\text{D(on)}}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, R_L=0.75\Omega, R_{\text{GEN}}=3\Omega$		7.5		ns
t_r	Turn-On Rise Time			4.0		ns
$t_{\text{D(off)}}$	Turn-Off Delay Time			37.0		ns
t_f	Turn-Off Fall Time			7.5		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20\text{A}, dI/dt=500\text{A}/\mu\text{s}$		14		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=20\text{A}, dI/dt=500\text{A}/\mu\text{s}$		20.3		nC

A. The value of R_{0JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on R_{0JA} and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on $T_{J(\text{MAX})}=150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Single pulse width limited by junction temperature $T_{J(\text{MAX})}=150^\circ\text{C}$.

D. The R_{0JA} is the sum of the thermal impedance from junction to case R_{0JC} and case to ambient.

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

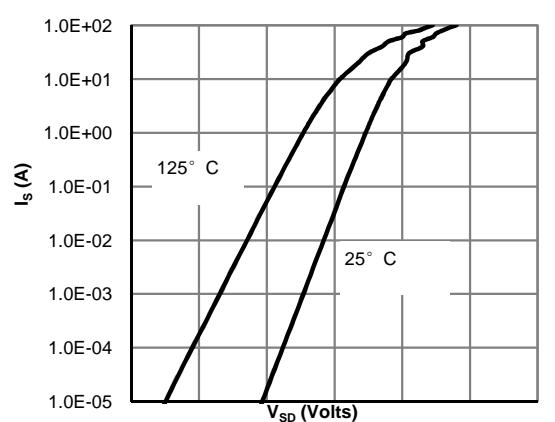
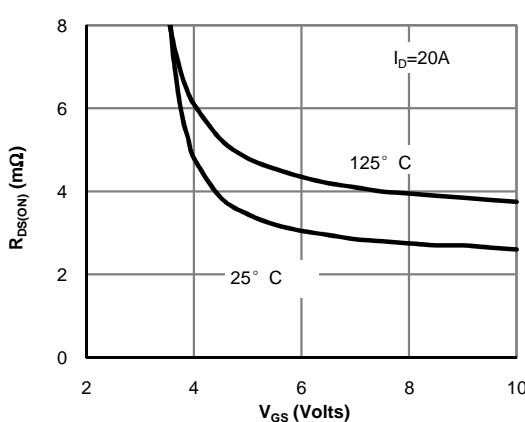
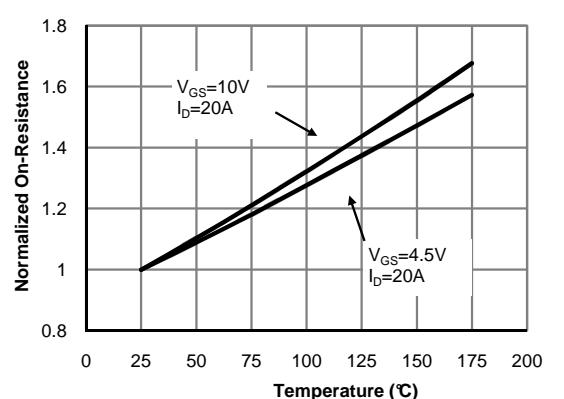
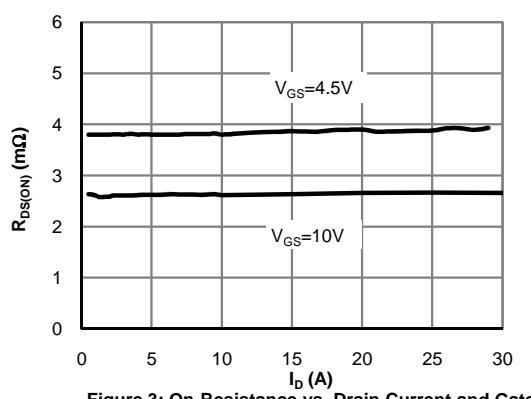
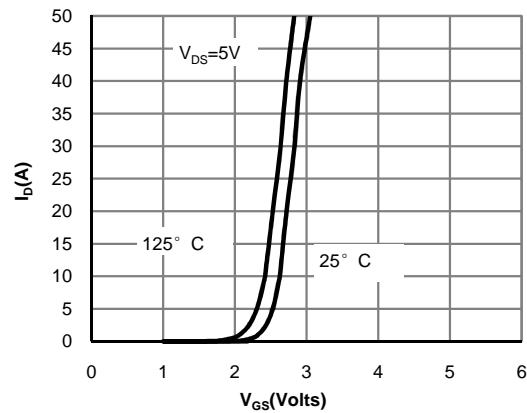
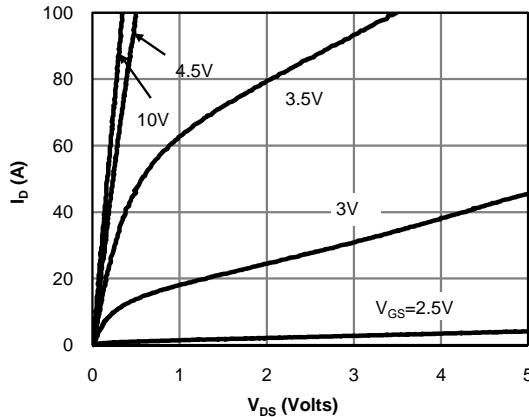
F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(\text{MAX})}=150^\circ\text{C}$. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

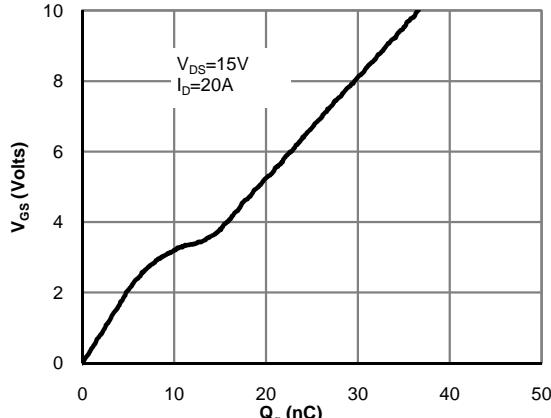


Figure 7: Gate-Charge Characteristics

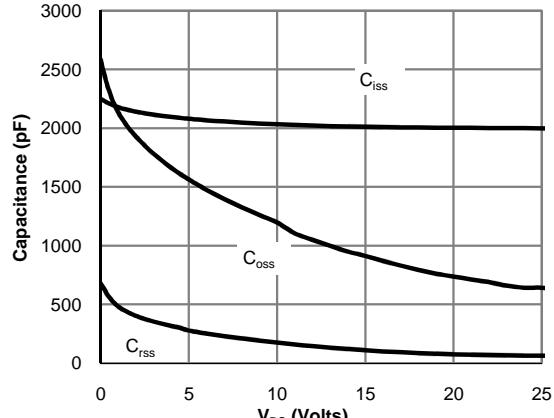


Figure 8: Capacitance Characteristics

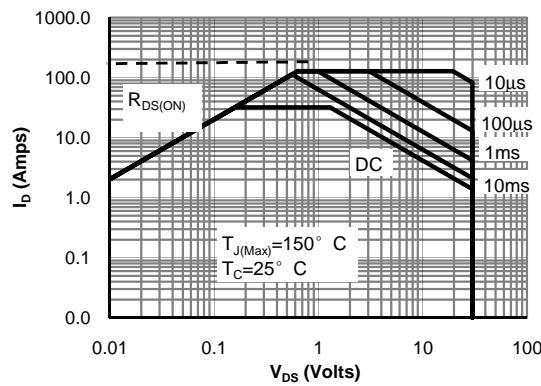


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

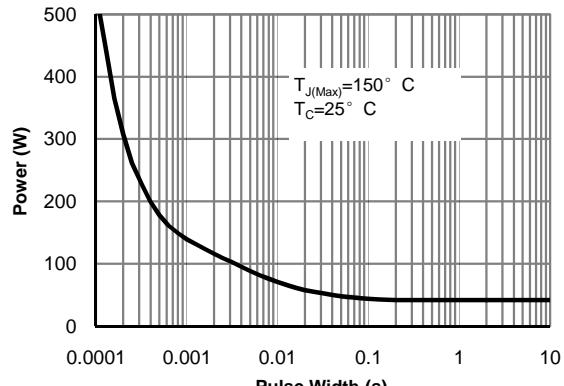


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

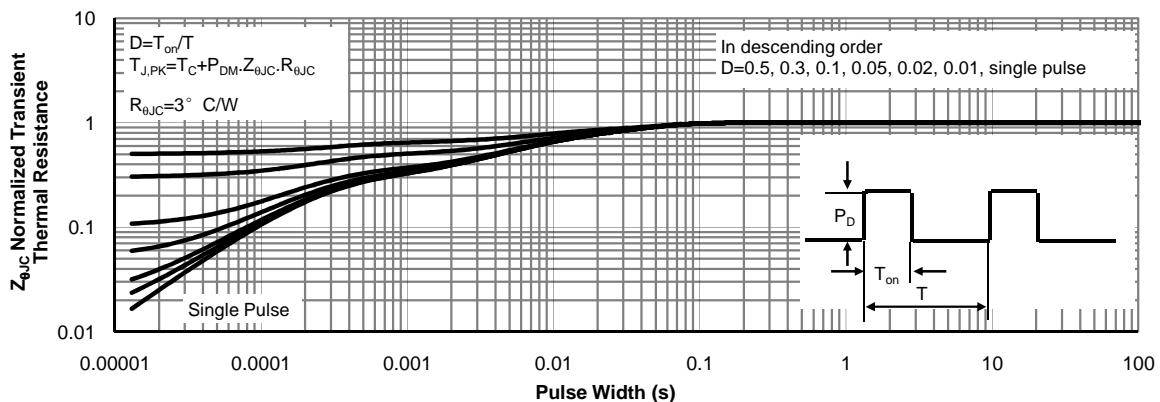


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

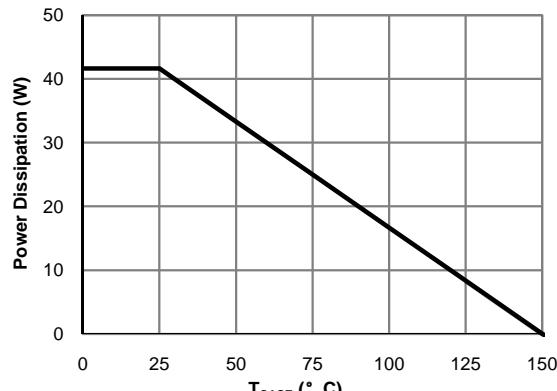


Figure 12: Power De-rating (Note F)

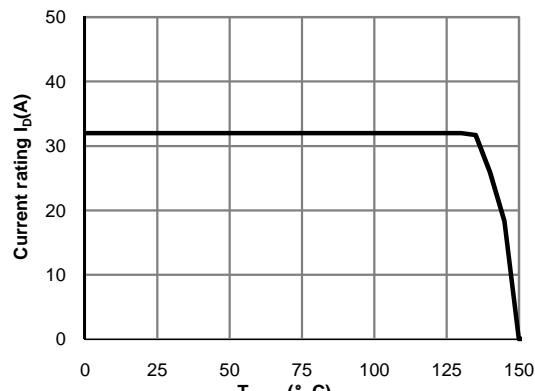


Figure 13: Current De-rating (Note F)

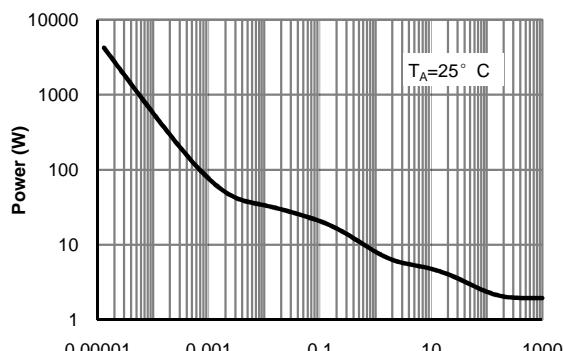


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

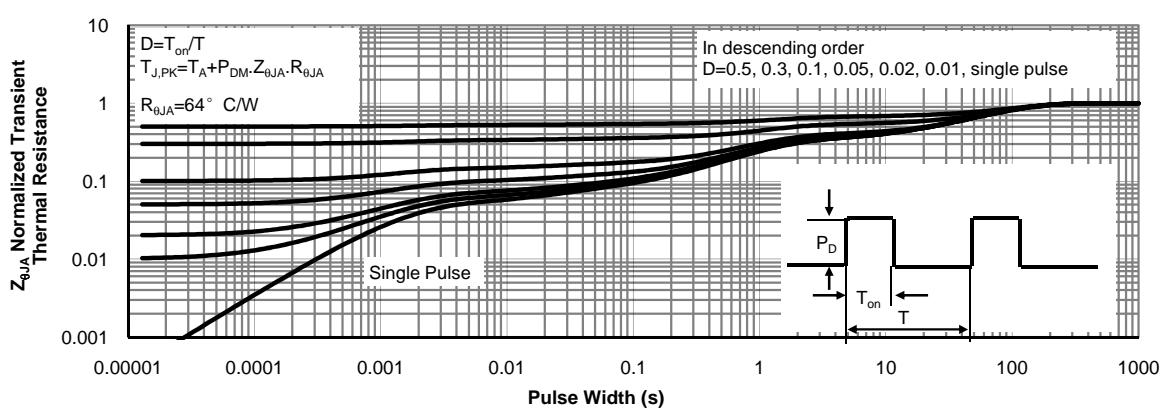
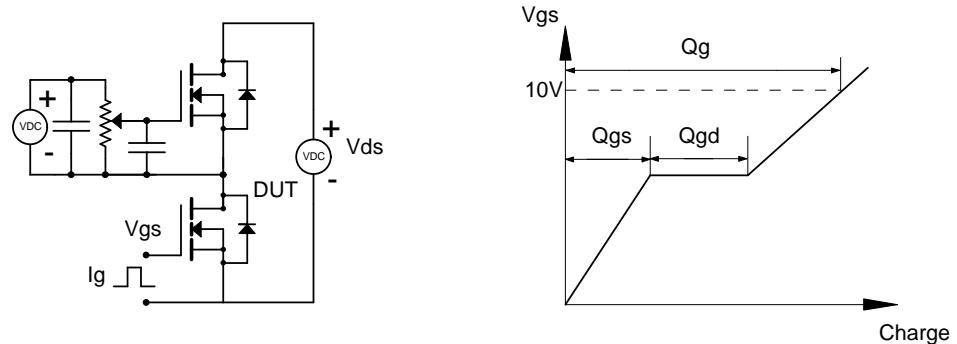
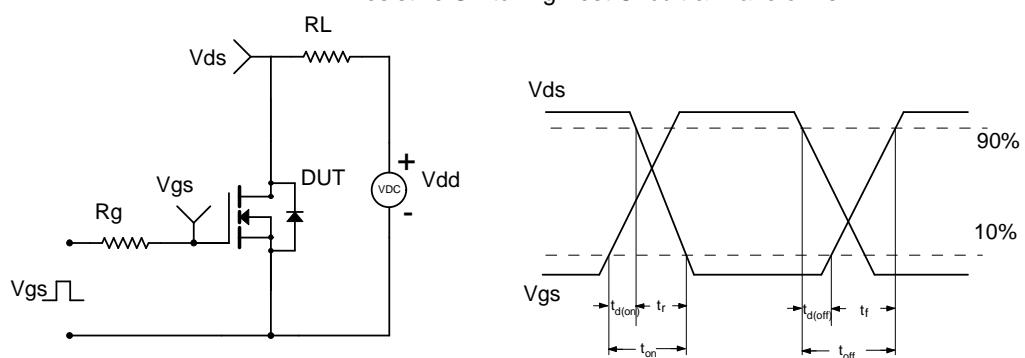


Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

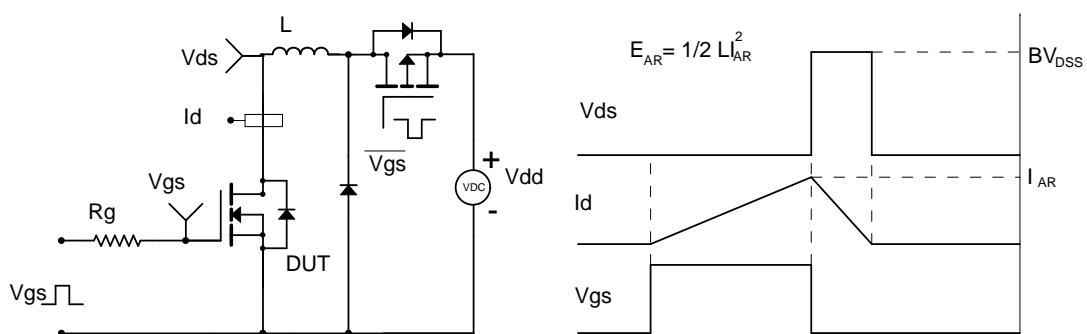
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

