



**ALPHA & OMEGA**  
SEMICONDUCTOR

**AO4482**

**100V N-Channel MOSFET**

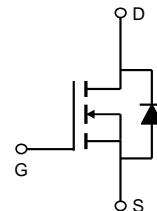
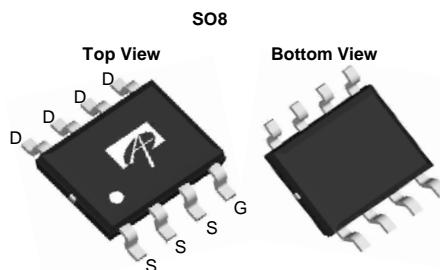
### General Description

The AO4482 combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

### Product Summary

$V_{DS}$	100V
$I_D$ (at $V_{GS}=10V$ )	6A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 37mΩ
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$ )	< 42mΩ

100% UIS Tested  
100%  $R_g$  Tested



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>A</sup>	$I_D$	6	A
$T_A=70^\circ C$		5	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	42	
Avalanche Current <sup>C</sup>	$I_{AS}, I_{AR}$	35	A
Avalanche energy $L=0.1mH$ <sup>C</sup>	$E_{AS}, E_{AR}$	61	mJ
Power Dissipation <sup>B</sup>	$P_D$	3.1	W
$T_A=25^\circ C$		2	
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
Maximum Junction-to-Ambient <sup>A,D</sup>		59	75	°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	16	24	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	100			V
$I_{\text{DSS}}$	Zero Gate Voltage Drain Current	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1 5	$\mu\text{A}$
$I_{\text{GSS}}$	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			100	nA
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.6	2.1	2.7	V
$I_{\text{D(ON)}}$	On state drain current	$V_{GS}=10\text{V}, V_{DS}=5\text{V}$	42			A
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=6\text{A}$ $T_J=125^\circ\text{C}$	30	37		$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=5\text{A}$	60	72		
			33	42		$\text{m}\Omega$
$g_{\text{FS}}$	Forward Transconductance	$V_{DS}=5\text{V}, I_D=6\text{A}$		35		S
$V_{\text{SD}}$	Diode Forward Voltage	$I_S=1\text{A}, V_{GS}=0\text{V}$		0.7	1	V
$I_S$	Maximum Body-Diode Continuous Current				4	A
<b>DYNAMIC PARAMETERS</b>						
$C_{\text{iss}}$	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=50\text{V}, f=1\text{MHz}$	1300	1630	2000	pF
$C_{\text{oss}}$	Output Capacitance		70	100	130	pF
$C_{\text{rss}}$	Reverse Transfer Capacitance		30	50	70	pF
$R_g$	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$	0.3	0.75	1.1	$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=50\text{V}, I_D=6\text{A}$	28	36	44	nC
$Q_g(4.5\text{V})$	Total Gate Charge		14	18	22	nC
$Q_{gs}$	Gate Source Charge		4	5	6	nC
$Q_{gd}$	Gate Drain Charge		5	9	13	nC
$t_{\text{D(on)}}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=50\text{V}, R_L=8.3\Omega, R_{\text{GEN}}=3\Omega$		7		ns
$t_r$	Turn-On Rise Time			7		ns
$t_{\text{D(off)}}$	Turn-Off Delay Time			28		ns
$t_f$	Turn-Off Fall Time			7		ns
$t_{\text{rr}}$	Body Diode Reverse Recovery Time	$I_F=6\text{A}, dI/dt=500\text{A}/\mu\text{s}$	17.5	25	33	ns
$Q_{\text{rr}}$	Body Diode Reverse Recovery Charge	$I_F=6\text{A}, dI/dt=500\text{A}/\mu\text{s}$	90	130	170	nC

A. The value of  $R_{\text{0JA}}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . 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  $\leq 10\text{s}$  junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature  $T_{J(\text{MAX})}=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .

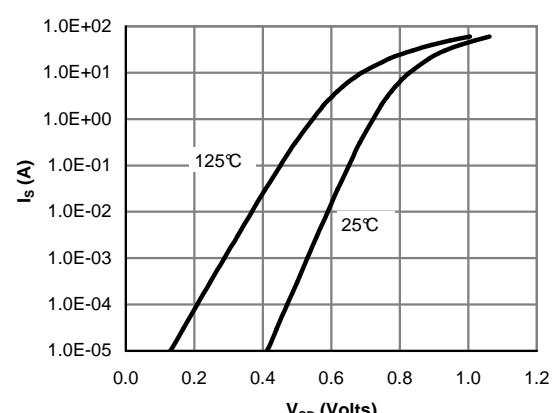
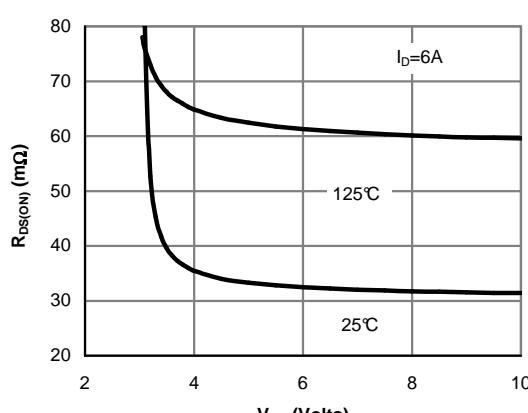
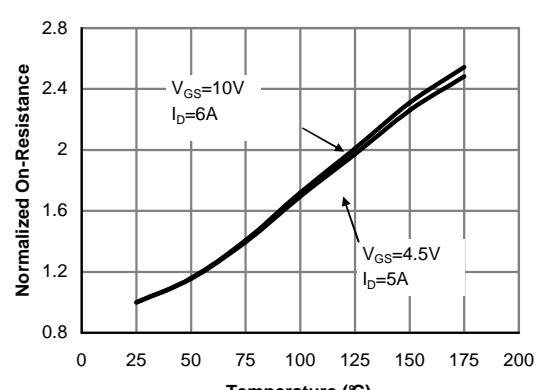
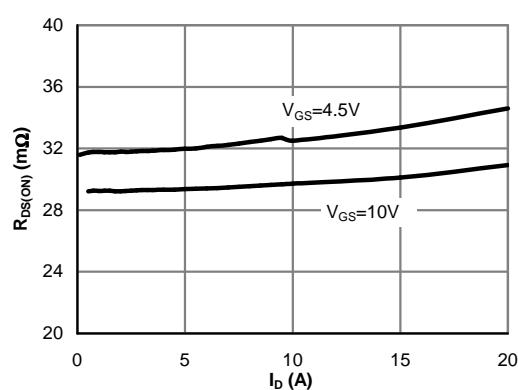
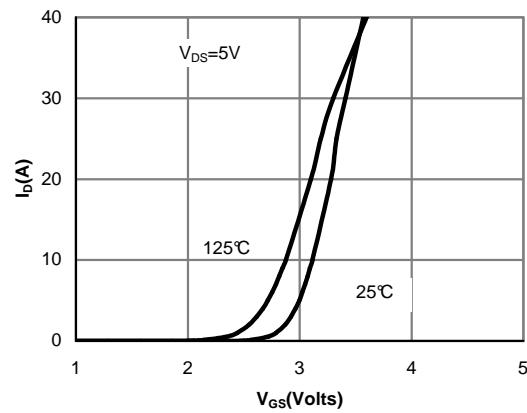
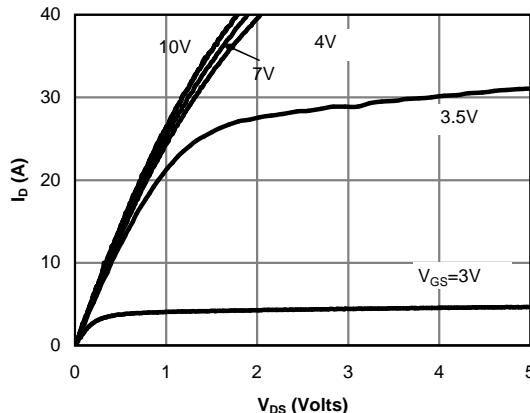
D. The  $R_{\text{0JA}}$  is the sum of the thermal impedance from junction to lead  $R_{\text{0UL}}$  and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300 $\mu\text{s}$  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  $T_{J(\text{MAX})}=150^\circ\text{C}$ . The SOA curve provides a single pulse rating.

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## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



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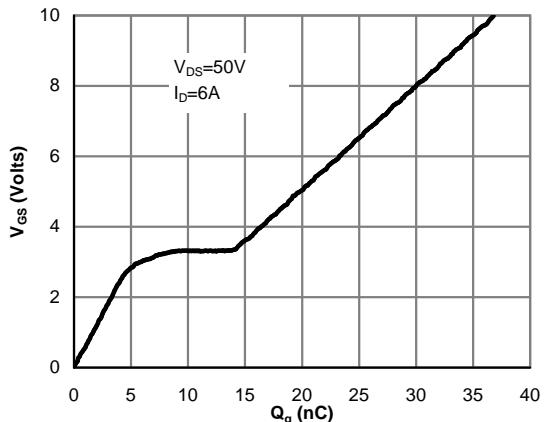


Figure 7: Gate-Charge Characteristics

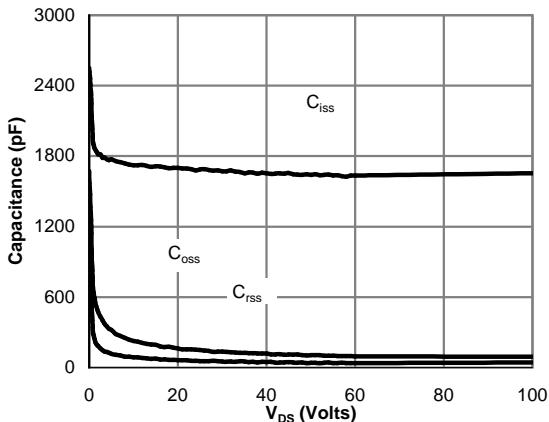


Figure 8: Capacitance Characteristics

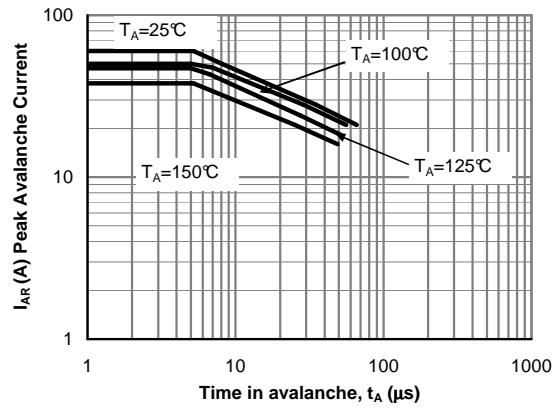


Figure 9: Single Pulse Avalanche capability (Note C)

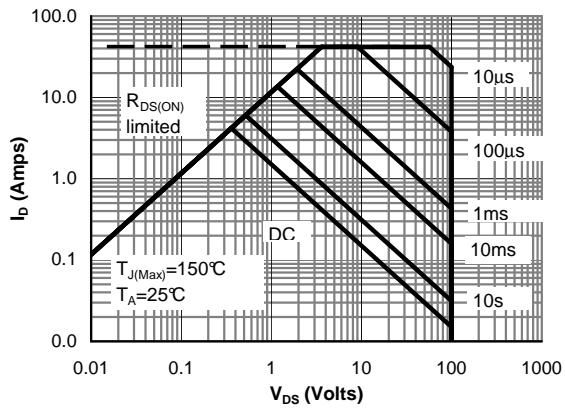


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

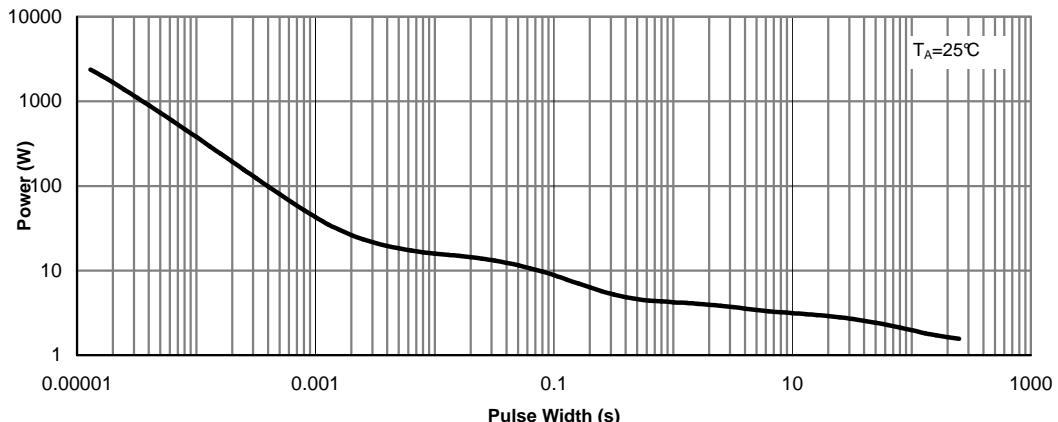


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

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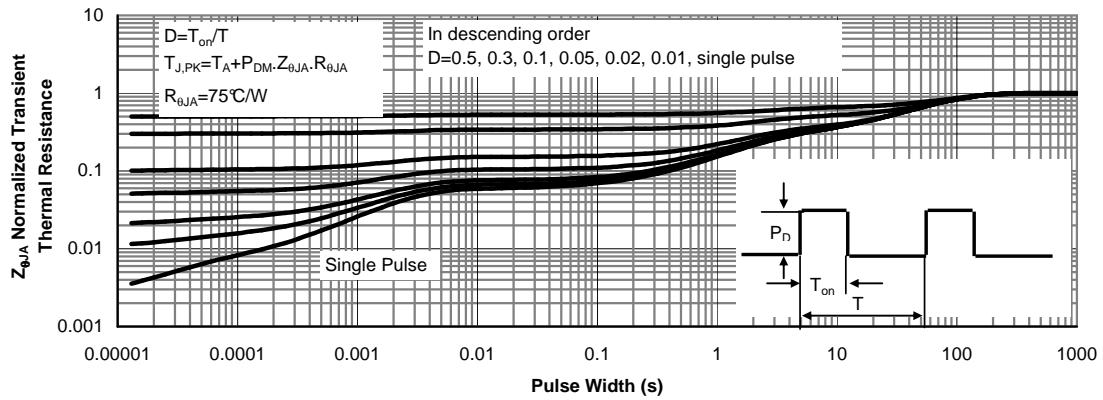
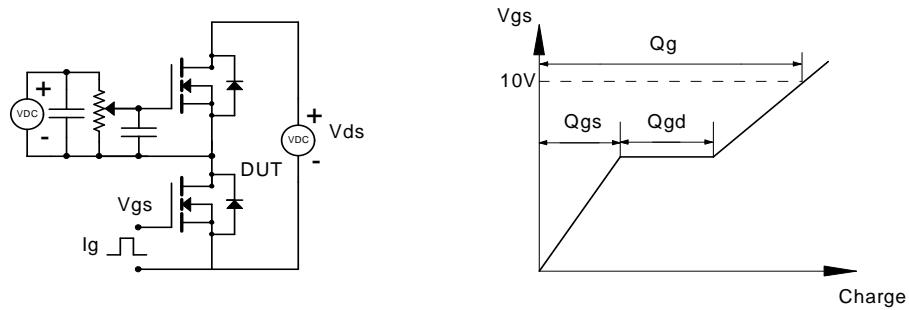
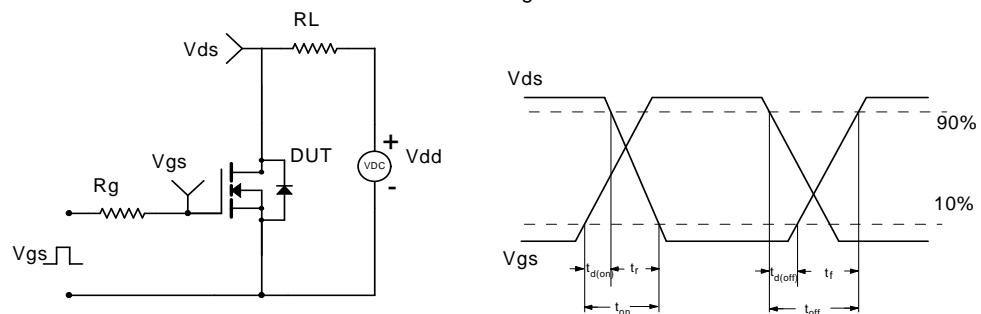


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

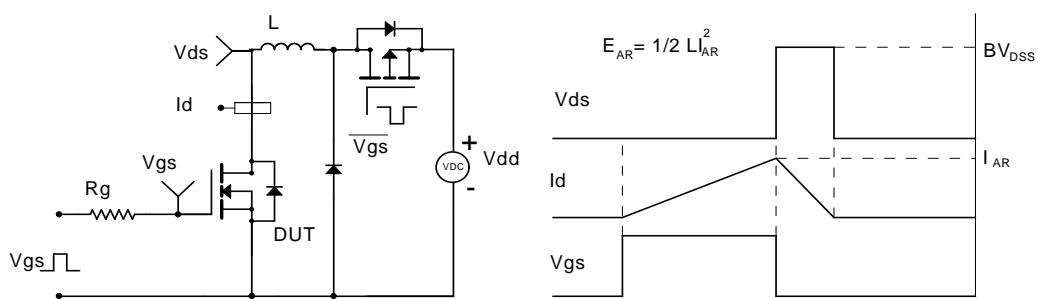
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

