

General Description

The AO4484 uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. This is an all purpose device that is suitable for use in a wide range of power conversion applications.

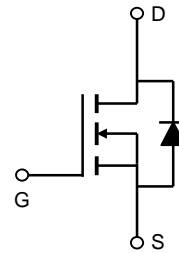
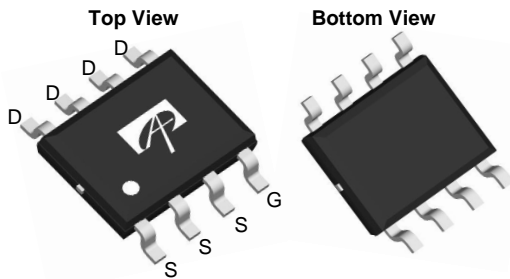
Product Summary

V_{DS} (V) = 40V
 I_D = 10A (V_{GS} = 10V)
 $R_{DS(ON)}$ < 10m Ω (V_{GS} = 10V)
 $R_{DS(ON)}$ < 12m Ω (V_{GS} = 4.5V)

100% UIS Tested
 100% Rg Tested



SOIC-8



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

Parameter	Symbol	10 Sec	Steady State	Units	
Drain-Source Voltage	V_{DS}	40		V	
Gate-Source Voltage	V_{GS}	± 20		V	
Continuous Drain Current ^A	I_D	$T_A=25^\circ\text{C}$	13.5	10	A
		$T_A=70^\circ\text{C}$	10.8	8	
Pulsed Drain Current ^B	I_{DM}	120			
Avalanche Current ^G	I_{AR}	23			
Repetitive avalanche energy $L=0.3\text{mH}$ ^G	E_{AR}	79		mJ	
Power Dissipation ^A	P_D	$T_A=25^\circ\text{C}$	3.1	1.7	W
		$T_A=70^\circ\text{C}$	2.0	1.1	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150		$^\circ\text{C}$	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	31	40	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A		Steady State	59	75
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	16	24	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
B _V DSS	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	40			V
I _D DSS	Zero Gate Voltage Drain Current	V _{DS} = 40V, V _{GS} = 0V T _J = 55°C			1 5	μA
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	1.7	2.2	3	V
I _{D(ON)}	On state drain current	V _{GS} = 10V, V _{DS} = 5V	120			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10V, I _D = 10A T _J = 125°C		8.2 12.5	10 16	mΩ
		V _{GS} = 4.5V, I _D = 8A		10	12.5	
g _{FS}	Forward Transconductance	V _{DS} = 5V, I _D = 10A		75		S
V _{SD}	Diode Forward Voltage	I _S = 1A, V _{GS} = 0V		0.72	1	V
I _S	Maximum Body-Diode Continuous Current				2.5	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz		1500	1950	pF
C _{oss}	Output Capacitance			215		pF
C _{rss}	Reverse Transfer Capacitance			135		pF
R _g	Gate resistance	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz	2	3.5	5	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} = 10V, V _{DS} = 20V, I _D = 10A		27.2	37	nC
Q _g (4.5V)	Total Gate Charge			13.6	18	nC
Q _{gs}	Gate Source Charge			4.5		nC
Q _{gd}	Gate Drain Charge			6.4		nC
t _{D(on)}	Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 20V, R _L = 2Ω, R _{GEN} = 3Ω		6.4		ns
t _r	Turn-On Rise Time			17.2		ns
t _{D(off)}	Turn-Off Delay Time			29.6		ns
t _f	Turn-Off Fall Time			16.8		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F = 10A, dI/dt = 100A/μs		30	40	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F = 10A, dI/dt = 100A/μs		19		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

D: The static characteristics in Figures 1 to 6 are obtained using t ≤ 300μs pulses, duty cycle 0.5% max.

E: 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°C. The SOA curve provides a single pulse rating.

F: The current rating is based on the t ≤ 10s thermal resistance rating.

G: E_{AR} and I_{AR} ratings are based on low frequency and duty cycles to keep T_J = 25°C.

Rev1: Nov. 2010

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

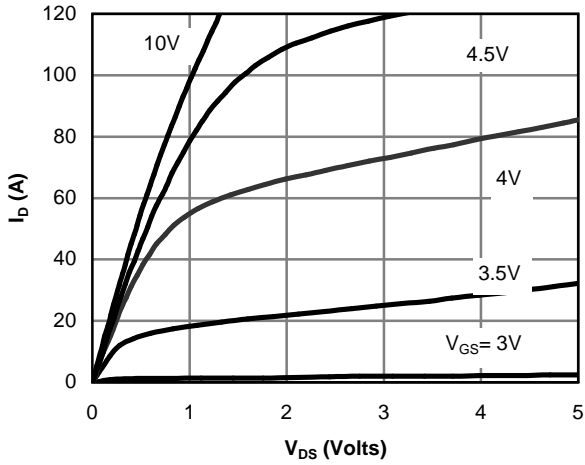


Figure 1: On-Region Characteristics

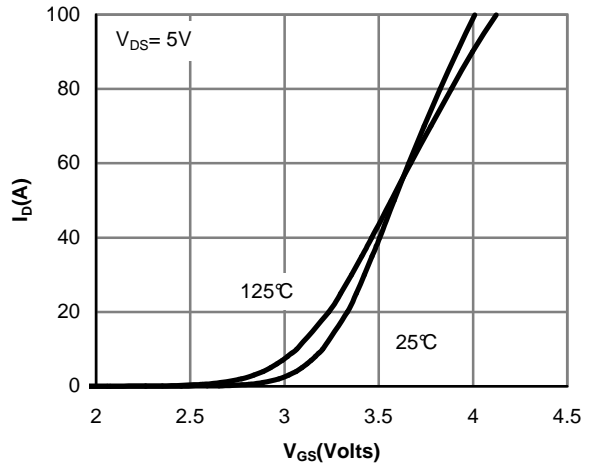


Figure 2: Transfer Characteristics

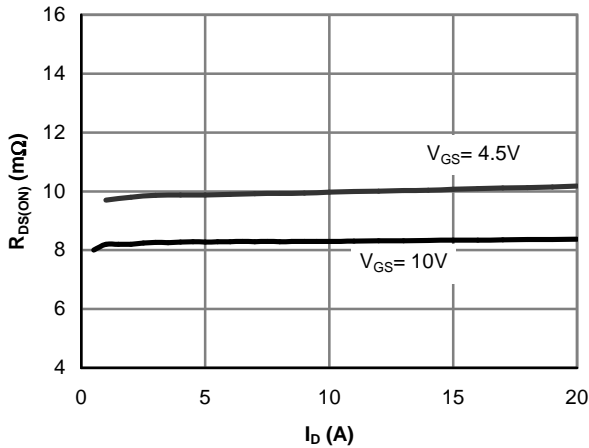


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

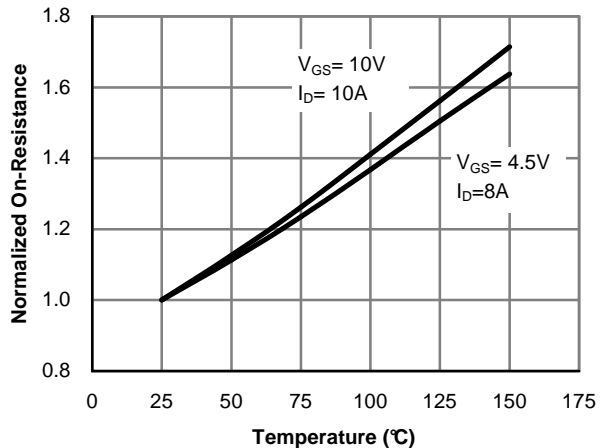


Figure 4: On-Resistance vs. Junction Temperature

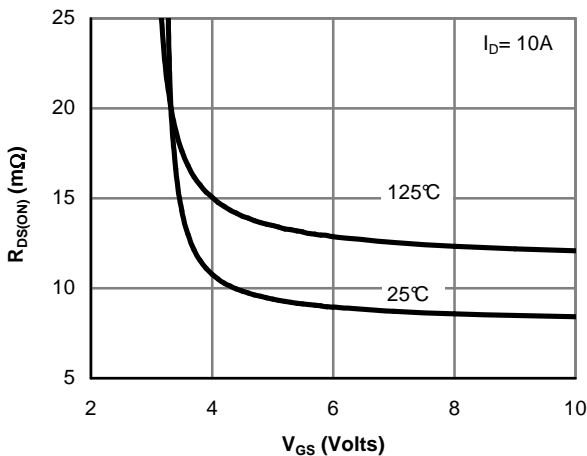


Figure 5: On-Resistance vs. Gate-Source Voltage

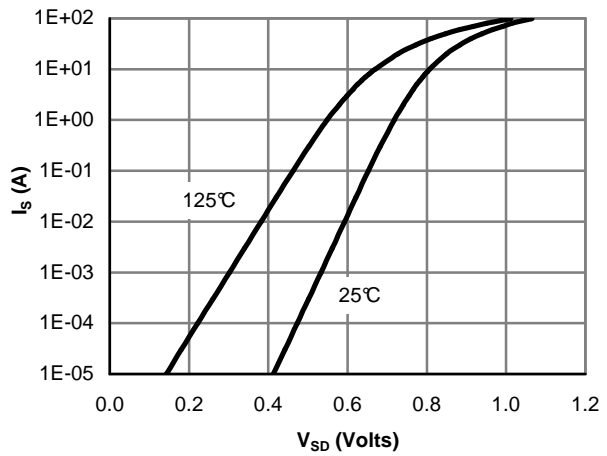


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

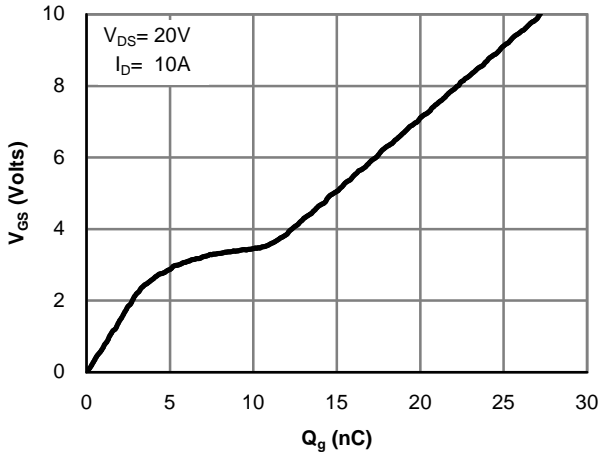


Figure 7: Gate-Charge Characteristics

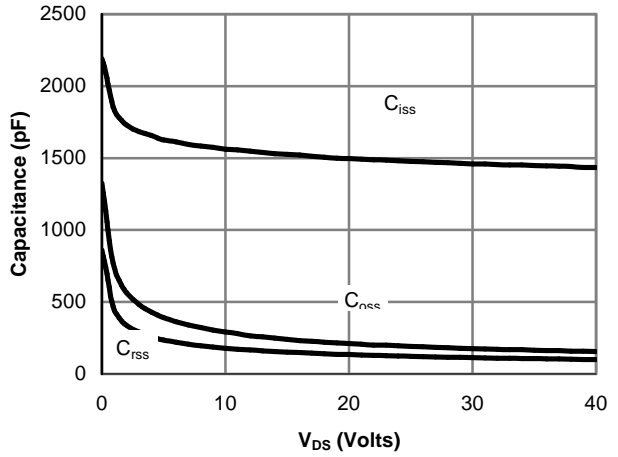


Figure 8: Capacitance Characteristics

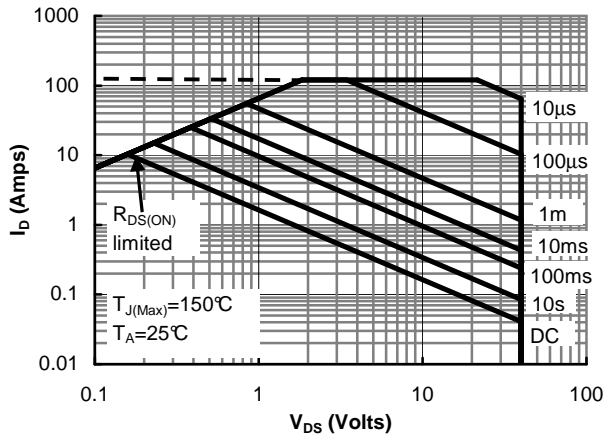


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

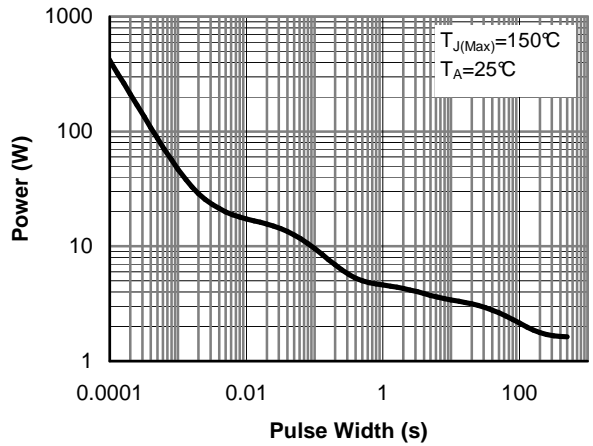


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

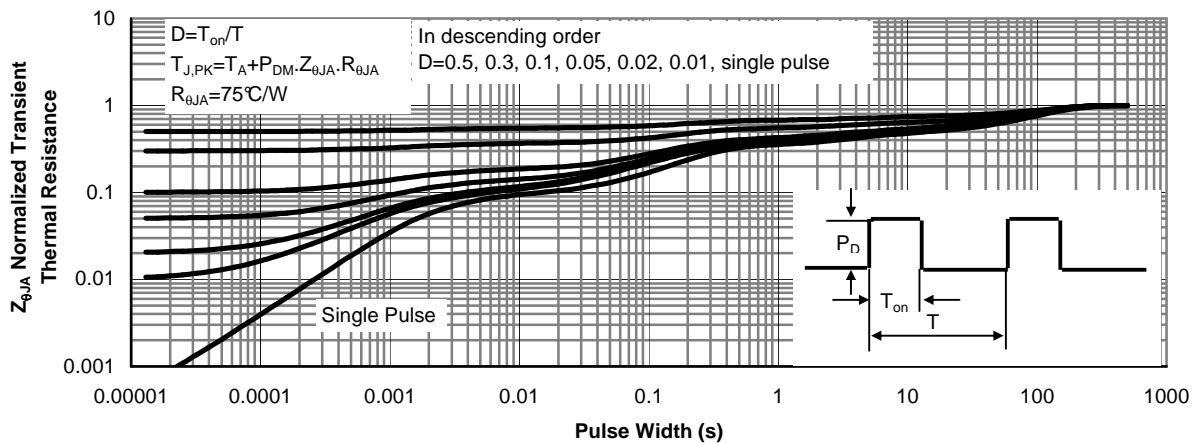


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)