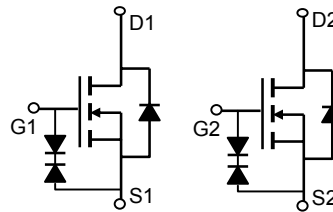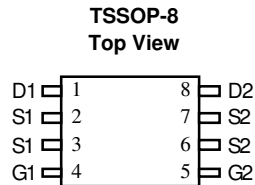# ALPHA & OMEGA SEMICONDUCTOR

AO8808A
Dual N-Channel Enhancement Mode Field Effect Transistor

Pb Free

General Description

The AO8808A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V while retaining a 12V $V_{GS(MAX)}$ rating. It is ESD protected. Standard Product AO8808A is Pb-free (meets ROHS & Sony 259 specifications).

Features

V_{DS} (V) = 20V
I_D = 7.9A (V_{GS} = 10V)
$R_{DS(ON)}$ < 14mΩ (V_{GS} = 10V)
$R_{DS(ON)}$ < 15mΩ (V_{GS} = 4.5V)
$R_{DS(ON)}$ < 20mΩ (V_{GS} = 2.5V)
$R_{DS(ON)}$ < 28mΩ (V_{GS} = 1.8V)
ESD Rating: 2000V HBM

TSSOP-8
Top View

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current [A]	T_A=25°C	I_D	7.9	A
	T_A=70°C		6.3	
Pulsed Drain Current [B]		I_{DM}	30	
Power Dissipation [A]	T_A=25°C	P_D	1.4	W
	T_A=70°C		0.9	
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	$R_{\theta JA}$	73	90	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		96	125	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	63	75	°C/W

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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		20			V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=16V, V$_{GS}$=0V				10	µA
			T$_J$=55°C			25	
I$_{GSS}$	Gate-Body leakage current	V$_{DS}$=0V, V$_{GS}$=±10V				10	µA
BV$_{GSO}$	Gate-Source Breakdown Voltage	V$_{DS}$=0V, I$_G$=±250uA		±12			V
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$ I$_D$=250µA		0.5	0.75	1	V
I$_{D(ON)}$	On state drain current	V$_{GS}$=4.5V, V$_{DS}$=5V		30			A
R$_{DS(ON)}$	Static Drain-Source On-Resistance	V$_{GS}$=10V, I$_D$=8A			10.6	14	mΩ
			T$_J$=125°C		14.2	18	mΩ
		V$_{GS}$=4.5V, I$_D$=5A			11.7	15	mΩ
		V$_{GS}$=2.5V, I$_D$=4A			15.2	20	mΩ
		V$_{GS}$=1.8V, I$_D$=3A			21.5	28	mΩ
g$_{FS}$	Forward Transconductance	V$_{DS}$=5V, I$_D$=8A			36		S
V$_{SD}$	Diode Forward Voltage	I$_S$=1A,V$_{GS}$=0V			0.6	1	V
I$_S$	Maximum Body-Diode Continuous Current					2.4	A
DYNAMIC PARAMETERS							
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=10V, f=1MHz			1810		pF
C$_{oss}$	Output Capacitance				232		pF
C$_{rss}$	Reverse Transfer Capacitance				200		pF
R$_g$	Gate resistance	V$_{GS}$=0V, V$_{DS}$=0V, f=1MHz			1.6		Ω
SWITCHING PARAMETERS							
Q$_g$	Total Gate Charge	V$_{GS}$=4.5V, V$_{DS}$=10V, I$_D$=8A			17.9		nC
Q$_{gs}$	Gate Source Charge				1.5		nC
Q$_{gd}$	Gate Drain Charge				4.7		nC
t$_{D(on)}$	Turn-On DelayTime	V$_{GS}$=10V, V$_{DS}$=10V, R$_L$=1.2Ω, R$_{GEN}$=3Ω			2.5		ns
t$_r$	Turn-On Rise Time				7.2		ns
t$_{D(off)}$	Turn-Off DelayTime				49		ns
t$_f$	Turn-Off Fall Time				10.8		ns
t$_{rr}$	Body Diode Reverse Recovery Time	I$_F$=8A, dI/dt=100A/µs			20.2		ns
Q$_{rr}$	Body Diode Reverse Recovery Charge	I$_F$=8A, dI/dt=100A/µs			8		nC

A: The value of R$_{θJA}$ is measured with the device mounted on 1in^2 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. The current rating is based on the t ≤ 10s thermal resistance rating.

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

C. The R$_{θJA}$ is the sum of the thermal impedence from junction to lead R$_{θJL}$ and lead to ambient.

D. The static characteristics in Figures 1 to 6,12,14 are obtained using <300µs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T$_A$=25°C. The SOA curve provides a single pulse rating.

Rev 1: Sept 2005

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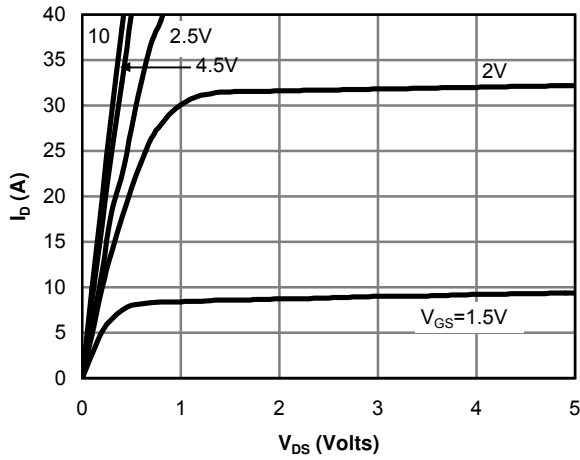## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

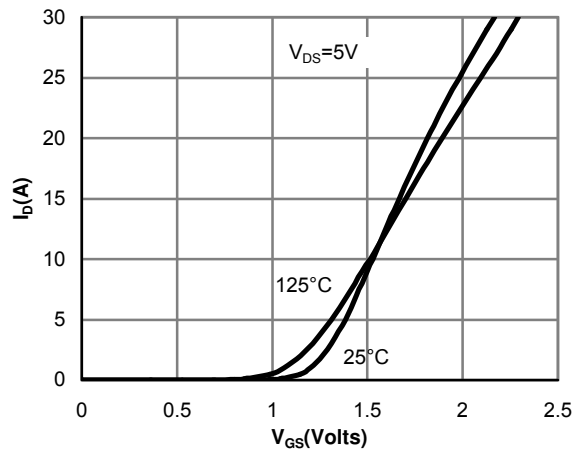**Fig 1: On-Region Characteristics**

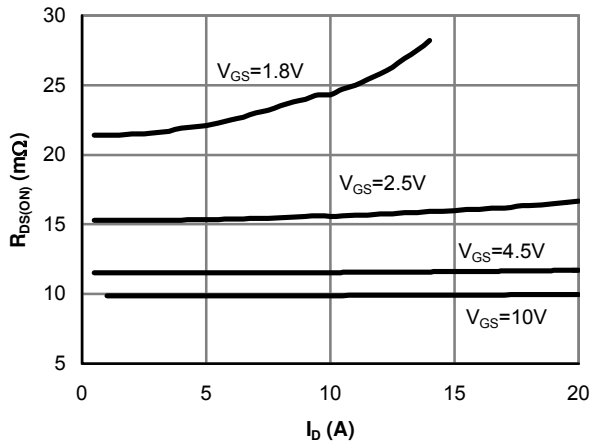**Figure 2: Transfer Characteristics**

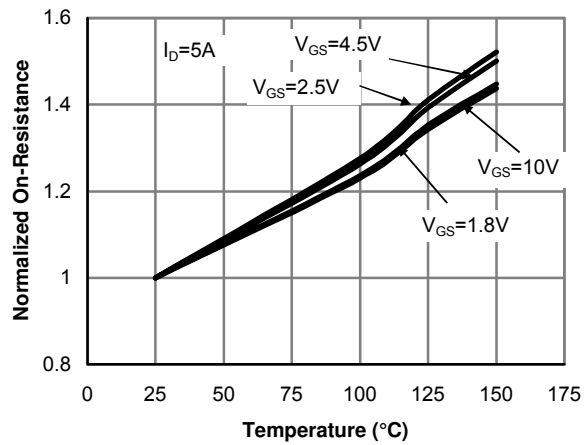**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**

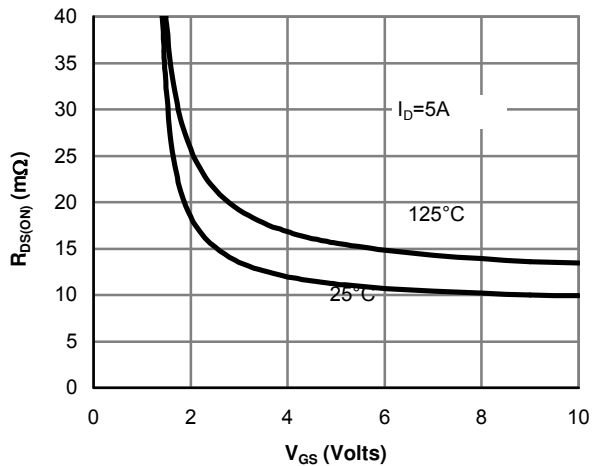**Figure 4: On-Resistance vs. Junction Temperature**
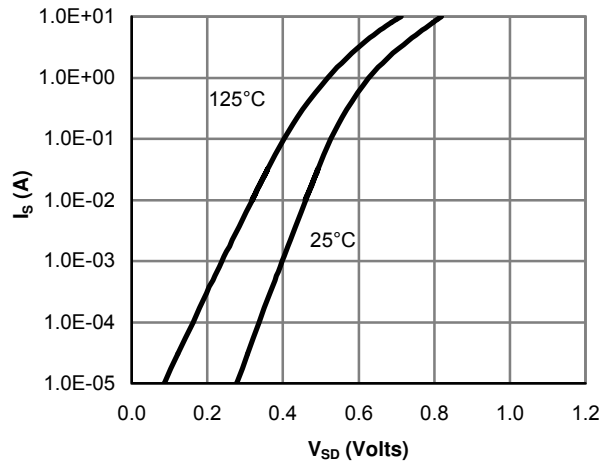
Figure 5: On-Resistance vs. Gate-Source Voltage

Figure 6: Body-Diode Characteristics

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7: Gate-Charge Characteristics
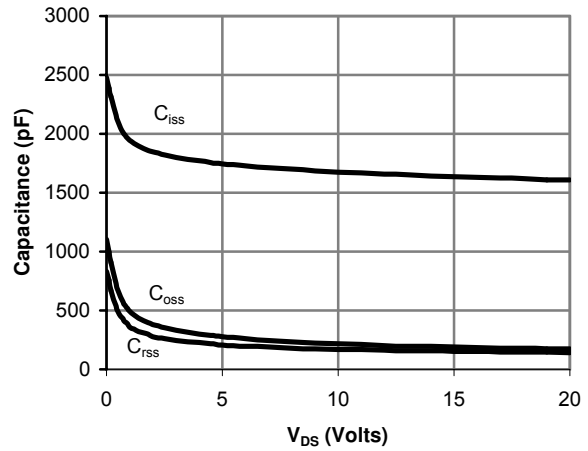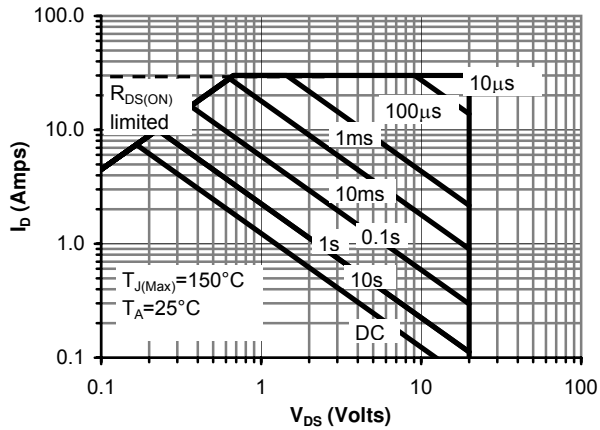

Figure 8: Capacitance Characteristics

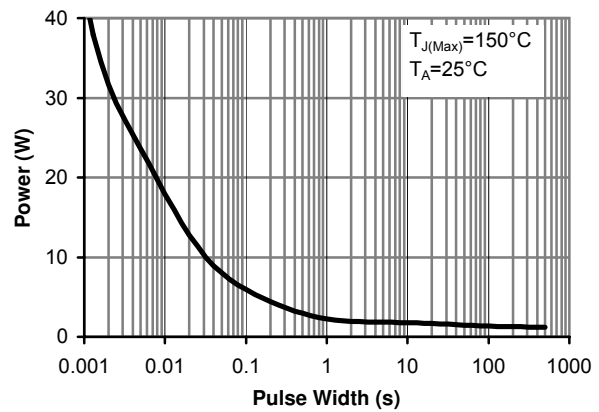Figure 9: Maximum Forward Biased Safe
Operating Area (Note E)

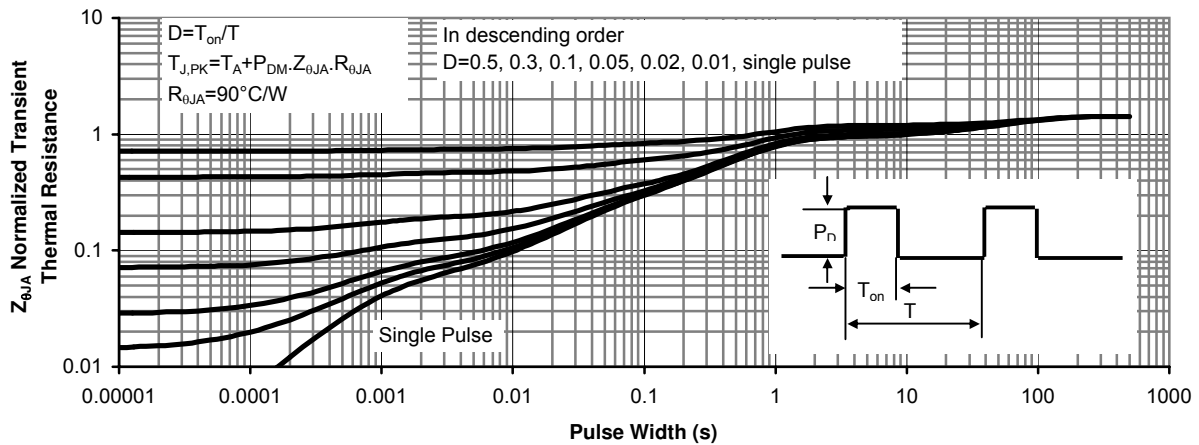Figure 10: Single Pulse Power Rating Junction-to-
Ambient (Note E)

Figure 11: Normalized Maximum Transient Thermal Impedance

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