



**ALPHA & OMEGA**  
SEMICONDUCTOR



## AO4800B, AO4800BL Dual N-Channel Enhancement Mode Field Effect Transistor

### General Description

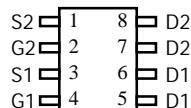
The AO4800B/L uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. The two MOSFETs make a compact and efficient switch and synchronous rectifier combination for use in buck converters. *Standard Product AO4800B/L is Pb-free (meets ROHS & Sony 259 specifications).*

### Features

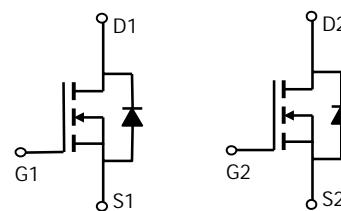
$V_{DS}$  (V) = 30V  
 $I_D$  = 6.9A ( $V_{GS}$  = 10V)  
 $R_{DS(ON)} < 27m\Omega$  ( $V_{GS}$  = 10V)  
 $R_{DS(ON)} < 32m\Omega$  ( $V_{GS}$  = 4.5V)  
 $R_{DS(ON)} < 50m\Omega$  ( $V_{GS}$  = 2.5V)

**UIS TESTED!**

***Rg,Ciss,Coss,Crss Tested!***



**SOIC-8**



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>AF</sup>	$I_D$	6.9	A
$T_A=70^\circ\text{C}$		5.8	
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	40	
Power Dissipation	$P_D$	1.9	W
$T_A=70^\circ\text{C}$		1.2	
Avalanche Current <sup>B</sup>	$I_{AR}$	12	A
Repetitive avalanche energy 0.3mH <sup>B</sup>	$E_{AR}$	22	mJ
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>AF</sup>	$R_{\theta JA}$	55	62.5	°C/W
Maximum Junction-to-Ambient <sup>A</sup>		90	110	°C/W
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	40	48	°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	$I_D=250\mu\text{A}, V_{\text{GS}}=0\text{V}$	30			V
$I_{\text{DSS}}$	Zero Gate Voltage Drain Current	$V_{\text{DS}}=24\text{V}, V_{\text{GS}}=0\text{V}$ $T_j=55^\circ\text{C}$		0.002	1	$\mu\text{A}$
$I_{\text{GSS}}$	Gate-Body leakage current	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}= \pm 12\text{V}$			100	nA
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	0.7	1	1.5	V
$I_{\text{D}(\text{ON})}$	On state drain current	$V_{\text{GS}}=4.5\text{V}, V_{\text{DS}}=5\text{V}$	40			A
$R_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance	$V_{\text{GS}}=10\text{V}, I_D=6.9\text{A}$ $T_j=125^\circ\text{C}$		20	27	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_D=6\text{A}$		25	40	$\text{m}\Omega$
		$V_{\text{GS}}=2.5\text{V}, I_D=5\text{A}$		23	32	$\text{m}\Omega$
$g_{\text{FS}}$	Forward Transconductance	$V_{\text{DS}}=5\text{V}, I_D=5\text{A}$	34	50		$\text{m}\Omega$
$V_{\text{SD}}$	Diode Forward Voltage	$I_S=1\text{A}, V_{\text{GS}}=0\text{V}$		0.71	1	V
$I_S$	Maximum Body-Diode Continuous Current				4.5	A
<b>DYNAMIC PARAMETERS</b>						
$C_{\text{iss}}$	Input Capacitance	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=15\text{V}, f=1\text{MHz}$		900	1100	pF
$C_{\text{oss}}$	Output Capacitance			88		pF
$C_{\text{rss}}$	Reverse Transfer Capacitance			65		pF
$R_g$	Gate resistance	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, f=1\text{MHz}$		0.95	1.5	$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g$	Total Gate Charge	$V_{\text{GS}}=4.5\text{V}, V_{\text{DS}}=15\text{V}, I_D=8.5\text{A}$		10	12	nC
$Q_{\text{gs}}$	Gate Source Charge			1.8		nC
$Q_{\text{gd}}$	Gate Drain Charge			3.75		nC
$t_{\text{D}(\text{on})}$	Turn-On DelayTime	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=15\text{V}, R_L=1.8\Omega, R_{\text{GEN}}=6\Omega$		3.2		ns
$t_r$	Turn-On Rise Time			3.5		ns
$t_{\text{D}(\text{off})}$	Turn-Off DelayTime			21.5		ns
$t_f$	Turn-Off Fall Time			2.7		ns
$t_{\text{rr}}$	Body Diode Reverse Recovery Time	$I_F=5\text{A}, dI/dt=100\text{A}/\mu\text{s}$		16.8	20	ns
$Q_{\text{rr}}$	Body Diode Reverse Recovery Charge	$I_F=5\text{A}, dI/dt=100\text{A}/\mu\text{s}$		8	12	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. The current rating is based on the  $t \leq 10\text{s}$  thermal resistance rating.

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

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

D. The static characteristics in Figures 1 to 6 are obtained using <300 $\mu\text{s}$  pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The SOA curve provides a single pulse rating.

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## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

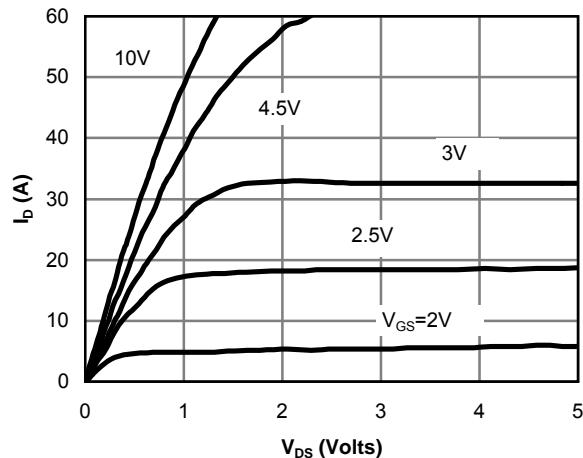


Fig 1: On-Region Characteristics

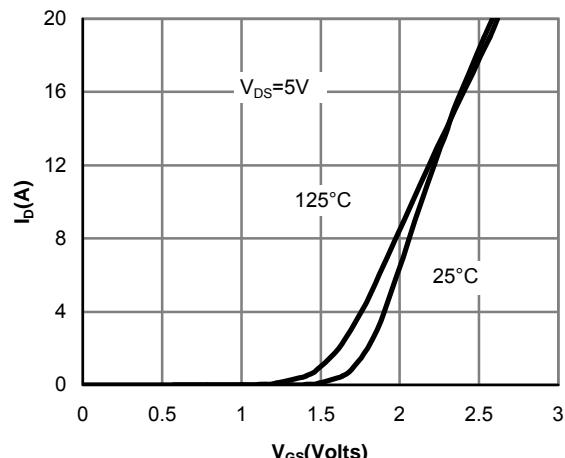


Figure 2: Transfer Characteristics

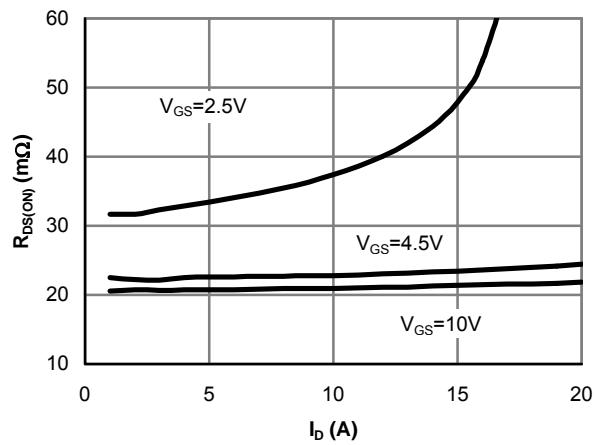


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

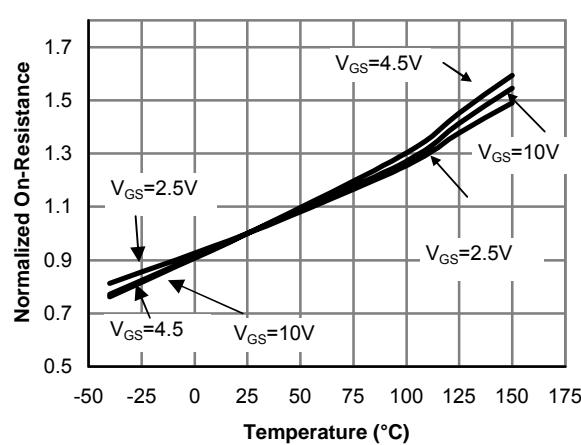


Figure 4: Normalized On-Resistance vs. Junction Temperature

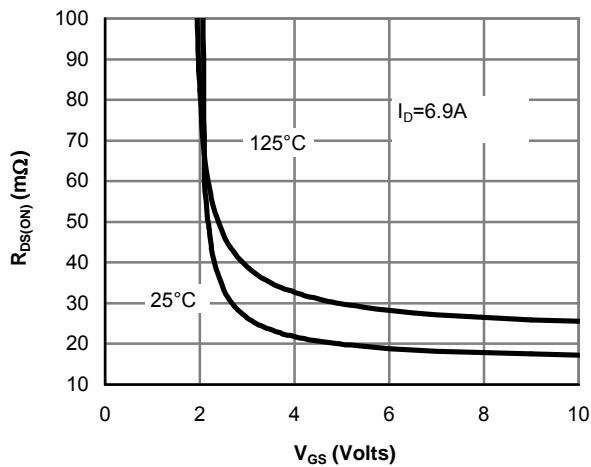


Figure 5: On-Resistance vs. Gate-Source Voltage

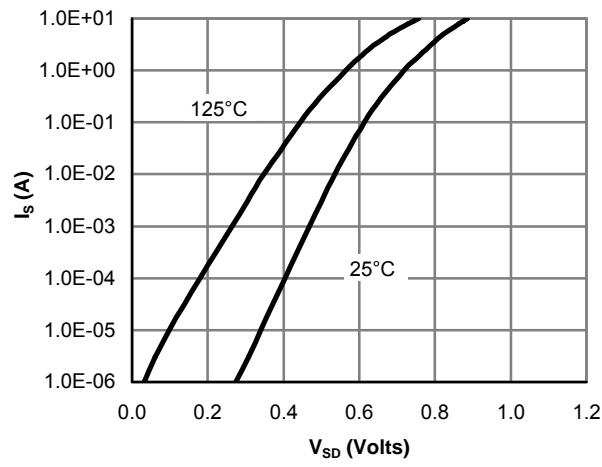


Figure 6: Body-Diode Characteristics

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