

AO4812

Dual N-Channel Enhancement Mode Field Effect Transistor

General Description

The AO4812 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. AO4812 is Pb-free (meets ROHS & Sony 259 specifications). AO4812L is a Green Product ordering option. AO4812 and AO4812L are electrically identical.

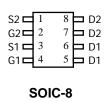
Features

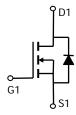
 $V_{DS}(V) = 30V$

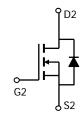
 $I_D = 6.9A \ (V_{GS} = 10V)$

 $R_{DS(ON)}$ < 28m Ω (V_{GS} = 10V)

 $R_{DS(ON)}$ < 42m Ω (V_{GS} = 4.5V)







Absolute Maximum Ratings T _A =25°C unless otherwise noted							
Parameter Drain-Source Voltage		Symbol	Maximum	Units			
		V_{DS}	30	V			
Gate-Source Voltage		V_{GS}	±20	V			
Continuous Drain	T _A =25°C		6.9				
Current ^A	T _A =70°C	I _D	5.8	А			
Pulsed Drain Current B		I _{DM}	30				
	T _A =25°C	D	2	10/			
Power Dissipation	T _A =70°C	$-P_{D}$	1.44	W			
Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C			

Thermal Characteristics									
Parameter	Symbol	Тур	Max	Units					
Maximum Junction-to-Ambient ^A	t ≤ 10s	$R_{ heta JA}$	48	62.5	°C/W				
Maximum Junction-to-Ambient A	Steady-State	IN _θ JA	74	110	°C/W				
Maximum Junction-to-Lead ^C	Steady-State	$R_{ heta JL}$	35	40	°C/W				



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

Symbol	Parameter Conditions		Min	Тур	Max	Units				
STATIC PARAMETERS										
BV _{DSS}	Drain-Source Breakdown Voltage	$I_D=250\mu A, V_{GS}=0V$	30			V				
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V		0.004	1	μА				
		T _J =55°0	2		5					
I_{GSS}	Gate-Body leakage current	V_{DS} =0V, V_{GS} =±20V			100	nA				
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_{D}=250\mu A$	1	1.9	3	V				
$I_{D(ON)}$	On state drain current	V_{GS} =4.5V, V_{DS} =5V	20			Α				
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =6.9A		22.5	28	mΩ				
		T _J =125°0	C	31.3	38	11122				
		V_{GS} =4.5V, I_D =5.0A		34.5	42	mΩ				
g _{FS}	Forward Transconductance	V_{DS} =5V, I_D =6.9A	10	15.4		S				
V_{SD}	Diode Forward Voltage	I _S =1A		0.76	1	V				
I _S	Maximum Body-Diode Continuous Current				3	Α				
DYNAMIC	PARAMETERS									
C _{iss}	Input Capacitance			680	820	pF				
C _{oss}	Output Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		102		pF				
C _{rss}	Reverse Transfer Capacitance			77		pF				
R_g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		3	3.6	Ω				
SWITCHI	NG PARAMETERS									
$Q_g(10V)$	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =6.9A		13.84	17	nC				
Q _g (4.5V)	Total Gate Charge			6.74	8.1	nC				
$\overline{Q_gs}$	Gate Source Charge			1.82		nC				
Q_{gd}	Gate Drain Charge			3.2		nC				
t _{D(on)}	Turn-On DelayTime			4.6	7	ns				
t _r	Turn-On Rise Time	V_{GS} =10V, V_{DS} =15V, R_L =2.2 Ω ,		4.1	6.2	ns				
t _{D(off)}	Turn-Off DelayTime	R_{GEN} =3 Ω		20.6	30	ns				
t _f	Turn-Off Fall Time			5.2	7.5	ns				
t _{rr}	Body Diode Reverse Recovery Time	I _F =6.9A, dI/dt=100A/μs		16.5	20	ns				
Q_{rr}	Body Diode Reverse Recovery Charge	I _F =6.9A, dI/dt=100A/μs		7.8	10	nC				

A: The value of $R_{\theta JA}$ 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.

Rev 4: Sept 2005

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

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

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

D. The static characteristics in Figures 1 to 6 are obtained using $80\mu s$ 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.