

AO4842

Dual N-Channel Enhancement Mode Field Effect Transistor

General Description

The AO4842 uses advanced trench technology to provide excellent $R_{\rm DS(ON)}$ and low gate charge. The two MOSFETs make a compact and efficient switch and synchronous rectifier combination for use in buck converters. AO4842 is Pb-free (meets ROHS & Sony 259 specifications). AO4842L is a Green Product ordering option. AO4842 and AO4842L are electrically identical.

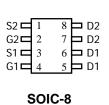
Features

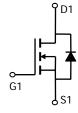
 $V_{DS}(V) = 30V$

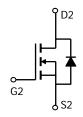
 $I_D = 7.5A$ (V_{GS} = 10V)

 $R_{DS(ON)}$ < 22m Ω (V_{GS} = 10V)

 $R_{DS(ON)}$ < 35m Ω (V_{GS} = 4.5V)







Absolute Maximum Ratings T _A =25°C unless otherwise noted							
Parameter		Symbol	Maximum	Units			
Drain-Source Voltage		V_{DS}	30	V			
Gate-Source Voltage		V_{GS}	±20	V			
Continuous Drain	T _A =25°C		7.5				
Current ^A	T _A =70°C	I_D	6.4	Α			
Pulsed Drain Current ^B		I _{DM}	30]			
	T _A =25°C	P_{D}	2	W			
Power Dissipation	T _A =70°C	□ ' □	1.44] vv			
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	$R_{\scriptscriptstyle{ hetaJA}}$	50	62.5	°C/W				
Maximum Junction-to-Ambient ^A	Steady-State	Γ_{θ} JA	82	110	°C/W				
Maximum Junction-to-Lead ^C	Steady-State	$R_{ heta JL}$	41	50	°C/W				



Electrical Characteristics (T_{.i}=25°C unless otherwise noted)

Symbol	Parameter	Parameter Conditions		Min	Тур	Max	Units
STATIC F	PARAMETERS		•				
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V		30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V			0.004	1	μА
						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	1.65	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 =7.5A			18	22	mΩ
			T _J =125°C		26	31	
		V_{GS} =4.5V, I_D =5A			28	35	mΩ
g _{FS}	Forward Transconductance	V_{DS} =5V, I_D =7.5A		10	24		S
V_{SD}	Diode Forward Voltage	I _S =1A,V _{GS} =0V			0.77	1	V
I_S	Maximum Body-Diode Continuous Current					4.3	Α
DYNAMIC	PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz			621	820	pF
C_{oss}	Output Capacitance				118		pF
C_{rss}	Reverse Transfer Capacitance				85		pF
R_g	Gate resistance	V_{GS} =0V, V_{DS} =0V, f=1MHz			8.0	1.5	Ω
SWITCHI	NG PARAMETERS						
$Q_g(10V)$	Total Gate Charge	-V _{GS} =10V, V _{DS} =15V, I _D =7.5A			12	17	nC
Q _g (4.5V)	Total Gate Charge				6	8	nC
Q_{gs}	Gate Source Charge				2.1		nC
Q_{gd}	Gate Drain Charge				3		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS} =10V, V_{DS} =15V, R_L =2 Ω , R_{GEN} =3 Ω			4.5	6.5	ns
t _r	Turn-On Rise Time				3.1	5	ns
$t_{D(off)}$	Turn-Off DelayTime				15.1	23	ns
t_f	Turn-Off Fall Time				2.7	5	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =7.5A, dI/dt=100A/μs			15.5	20	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I _F =7.5A, dI/dt=100A/μs			7.1	10	nC

A: The value of R $_{0JA}$ 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 $_{\infty}$ 10s thermal resistance rating. B: Repetitive rating, pulse width limited by junction temperature.

Rev 0: May 2006

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.

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 $\,$ μs 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.