

AO8802

Common-Drain Dual N-Channel Enhancement Mode Field Effect Transistor

General Description

The AO8802 uses advanced trench technology to provide excellent $R_{\text{DS(ON)}}$, low gate charge and operation with gate voltages as low as 1.8V while retaining a 12V $V_{\text{GS(MAX)}}$ rating. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

Features

 $V_{DS}(V) = 20V$

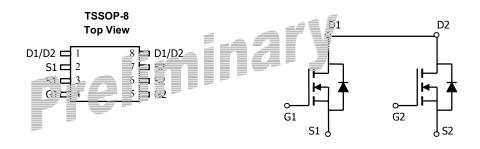
 $I_D = 7.5A$

 $R_{DS(ON)}$ < 14m Ω (V_{GS} = 10V)

 $R_{DS(ON)}$ < 16m Ω (V_{GS} = 4.5V)

 $R_{DS(ON)}$ < 22m Ω (V_{GS} = 2.5V)

 $R_{DS(ON)} < 30 \text{m}\Omega \text{ (V}_{GS} = 1.8 \text{V)}$



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	T _A =25°C		7.5					
Current ^A	T _A =70°C	I_D	6.3	Α				
Pulsed Drain Current ^B		I _{DM}	30					
	T _A =25°C	P_{D}	1.5	W				
Power Dissipation A	T _A =70°C		1.08	VV				
Junction and Storage Temperature Range		T_J , T_{STG}	-55 to 150	°C				

Thermal Characteristics								
Parameter	Symbol	Тур	Тур Мах					
Maximum Junction-to-Ambient A	t ≤ 10s	$R_{ heta JA}$	64	83	°C/W			
Maximum Junction-to-Ambient ^A	Steady-State	$\kappa_{\theta JA}$	89	120	°C/W			
Maximum Junction-to-Lead ^C	Steady-State	$R_{\theta JL}$	53	70	°C/W			

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

Symbol	Parameter	Parameter Conditions		Тур	Max	Units			
STATIC PARAMETERS									
BV _{DSS}	Drain-Source Breakdown Voltage	I_D =250 μ A, V_{GS} =0 V	20			V			
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V			10				
		T _J =55°C	:		25	μΑ			
I_{GSS}	Gate-Body leakage current	V_{DS} =0V, V_{GS} =±12V			100	nA			
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_{D}=250\mu A$	0.5	0.75	1	V			
$I_{D(ON)}$	On state drain current	V_{GS} =4.5V, V_{DS} =5V	30			Α			
	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =7.5A		11.6	14	m0			
R _{DS(ON)}		T _J =125°C	;			mΩ			
		V _{GS} =4.5V, I _D =5A		13.3	16	mΩ			
		V _{GS} =2.5V, I _D =4A		17.4	22	mΩ			
		V _{GS} =1.8V, I _D =3A		24.4	30	mΩ			
g _{FS}	Forward Transconductance					S			
V_{SD}	Diode Forward Voltage I _s =1A,V _{GS} =0V			0.73	1	V			
I _S	Maximum Body-Diode Continuous Current				2.4	Α			
DYNAMIC	PARAMETERS								
C _{iss}	Input Capacitance			1690		pF			
C _{oss}	Output Capacitance	V _{GS} =0V, V _{DS} =10V, f=1MHz		230		pF			
C _{rss}	Reverse Transfer Capacitance			184		pF			
R_g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.6		Ω			
SWITCHII	NG PARAMETERS		•			•			
Q_g	Total Gate Charge			17.8		nC			
Q_{gs}	Gate Source Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =7.5A		1.76		nC			
Q_{gd}	Gate Drain Charge			5		nC			
$t_{D(on)}$	Turn-On DelayTime			3.3		ns			
t _r	Turn-On Rise Time	V_{GS} =10V, V_{DS} =10V, R_{L} =1.3 Ω ,		5.9		ns			
$t_{D(off)}$	Turn-Off DelayTime	R_{GEN} =3 Ω		44		ns			
t _f	Turn-Off Fall Time			7.7		ns			
t _{rr}	Body Diode Reverse Recovery Time	I _F =7.5A, dI/dt=100A/μs		22		ns			
Q_{rr}	Body Diode Reverse Recovery Charge	I _F =7.5A, dI/dt=100A/μs		9.8		nC			

A: The value of R_{BJA} 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 a 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 $_{\theta JA}$ 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 6,12,14 are obtained using $80\mu s$ 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.