

A06808

20V Dual N-Channel MOSFET

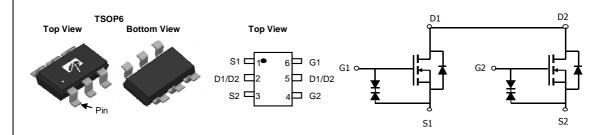
General Description

The AO6808 uses advanced trench technology to provide excellent $R_{\rm DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch. It is ESD protected.

Product Summary

 $\begin{array}{l} V_{DS} = 20V \\ I_D = 6A & (V_{GS} = 4.5V) \\ R_{DS(ON)} = 19m\Omega \; (typical) & (V_{GS} = 4.5V) \\ R_{DS(ON)} = 20m\Omega \; (typical) & (V_{GS} = 4.0V) \\ R_{DS(ON)} = 21m\Omega \; (typical) & (V_{GS} = 3.1V) \\ R_{DS(ON)} = 23m\Omega \; (typical) & (V_{GS} = 2.5V) \end{array}$





Absolute Maximum Ratings T_A=25℃ unless otherwise noted

Parameter		Symbol	10 Sec	Steady State	Units	
Drain-Source Voltage		V_{DS}	20		V	
Gate-Source Voltage		V_{GS}	±12		V	
Continuous Drain Current ^A	T _A =25℃		6	4.6		
	T _A =70℃	I _D	4.6	3.7	Α	
Pulsed Drain Current ^B		I _{DM}	60			
Power Dissipation ^A	T _A =25℃	P_{D}	1.3	0.8	W	
	T _A =70℃	L D	0.8	0.5	VV	
Junction and Storage Temperature Range		T_J , T_{STG}	-55 to 150		$\mathcal C$	

Thermal Characteristics								
Parameter			Тур	Max	Units			
Maximum Junction-to-Ambient ^A	t ≤ 10s	t ≤ 10s		95	℃/W			
Maximum Junction-to-Ambient A	Steady State	Steady State R _{eJA}		150	℃/W			
Maximum Junction-to-Lead ^C	Steady State	$R_{\theta JL}$	54	68	℃/W			



Electrical Characteristics (T_{.j}=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Тур	Max	Units
STATIC P	PARAMETERS					
BV _{DSS}	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	20			V
I _{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 20V, V_{GS} = 0V$			1	μΑ
I _{GSS}	Gate-Body leakage current	$V_{DS} = 0V, V_{GS} = \pm 10V$			5 ±10	μΑ
	Gate Threshold Voltage	$V_{DS} = V_{GS} I_{D} = 250 \mu A$	0.5	0.75	1	V
V _{GS(th)}	On state drain current	$V_{GS} = 4.5V, V_{DS} = 5V$	60	0.70	'	A
R _{DS(ON)}	On state drain current	$V_{GS} = 4.5V, V_{DS} = 6.0A$	15	19	23	
		T _{.J} =125℃	21	27	33	mΩ
	Static Drain-Source On-Resistance	$V_{GS} = 4.0V, I_D = 5.5A$	15	20	25	mΩ
		$V_{GS} = 3.1V, I_D = 5A$	16	21	27	mΩ
		$V_{GS} = 2.5V, I_D = 2A$	17	23	30	mΩ
g _{FS}	Forward Transconductance	$V_{DS} = 5V, I_{D} = 6.0A$		34		S
V_{SD}	Diode Forward Voltage	$I_S = 1A, V_{GS} = 0V$		0.65	1	V
Is	Maximum Body-Diode Continuous Curre			1.3	Α	
DYNAMIC	PARAMETERS					
C _{iss}	Input Capacitance			620	780	pF
C _{oss}	Output Capacitance	V _{GS} =0V, V _{DS} =10V, f=1MHz		125		pF
C _{rss}	Reverse Transfer Capacitance] [64		pF
SWITCHII	NG PARAMETERS					
Q _g (10V)	Total Gate Charge			16.2	21	nC
Q _g (4.5V)	Total Gate Charge	V_{GS} = 10V, V_{DS} = 10V, I_{D} = 6A		7.7	10	nC
Q_{gs}	Gate Source Charge	VGS- 10V, VDS- 10V, ID- OA		1.5		nC
Q_{gd}	Gate Drain Charge] [2.7		nC
t _{D(on)}	Turn-On DelayTime			236		ns
t _r	Turn-On Rise Time	V_{GS} =10V, V_{DS} =10V, R_L =1.7 Ω ,		448		ns
$t_{D(off)}$	Turn-Off DelayTime	$R_{GEN}=3\Omega$		9.5		μs
t _f	Turn-Off Fall Time			4.1		μs
t _{rr}	Body Diode Reverse Recovery Time	I _F =6A, dI/dt=100A/μs		25	33	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I _F =6A, dI/dt=100A/μs	-	9		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 $^\circ$ C. in any given application depends on the user's specific board design. The current rating is based on the t ≤10s thermal resistance rating.

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

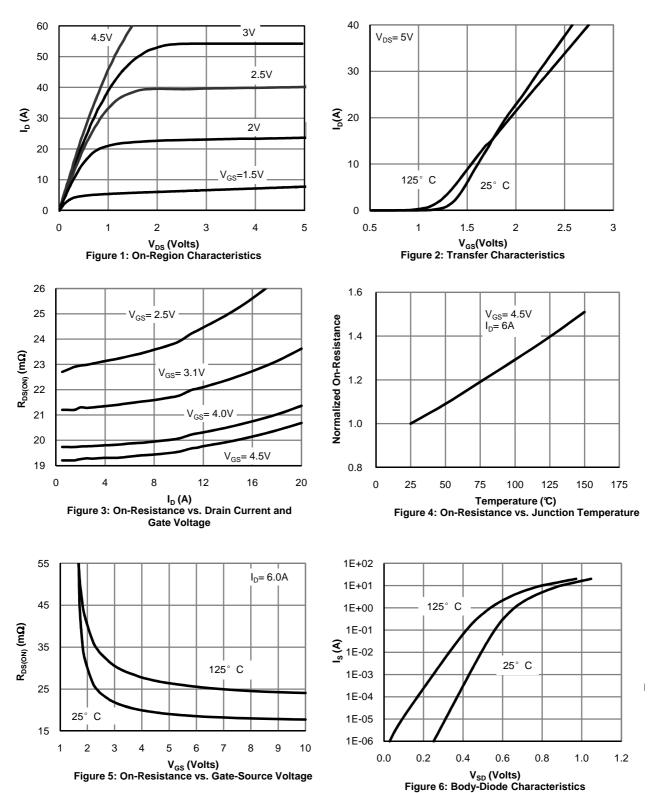
C. The R $_{\theta JA}$ is the sum of the thermal impedence from junction to lead R $_{\theta JL}$ and lead to ambient.

D. The static characteristics in Figures 1 to 6 are obtained using < 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.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS





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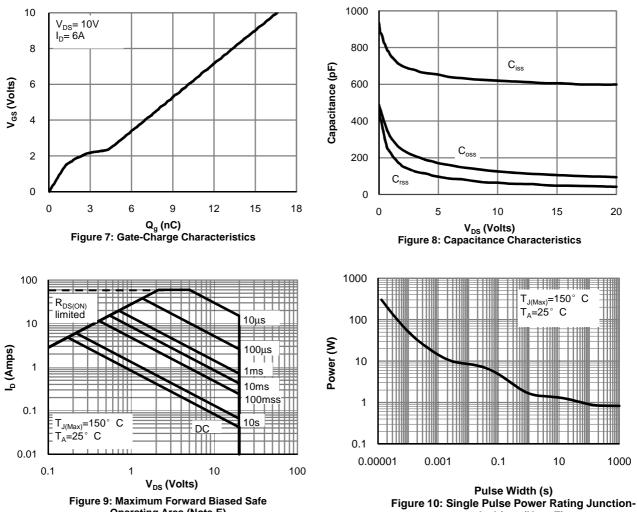


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

to-Ambient (Note E)

I

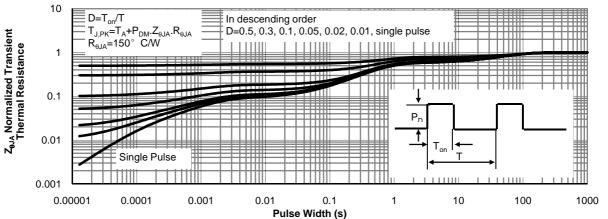
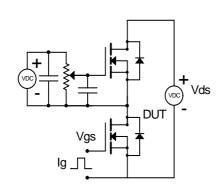


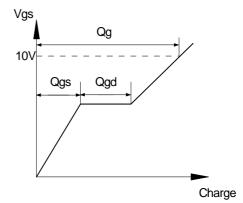
Figure 11: Normalized Maximum Transient Thermal Impedance(Note E)

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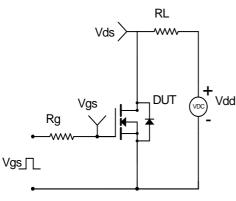


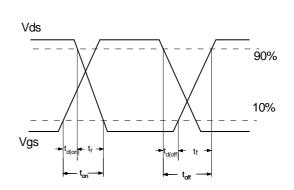
Gate Charge Test Circuit & Waveform



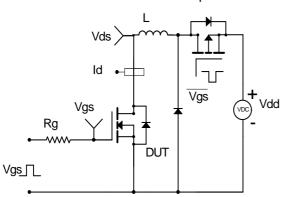


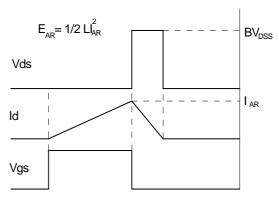
Resistive Switching Test Circuit & Waveforms



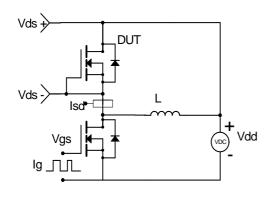


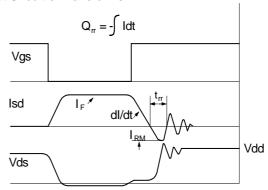
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





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