AON5802B

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

General Description

The AON5802B/L uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

AON5802B and AON5802BL are electrically identical.

-RoHs Compliant

-AON5802BL is Halogen Free

Features

V_{DS} (V) = 30V

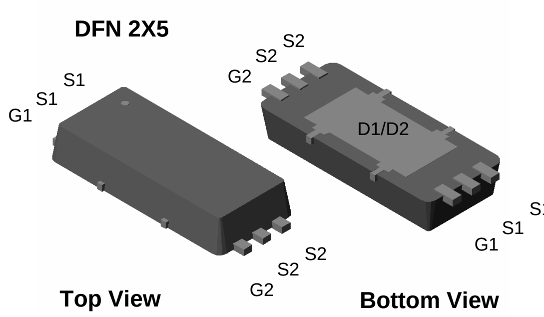
I_D = 7.2A (V_{GS} = 4.5V)

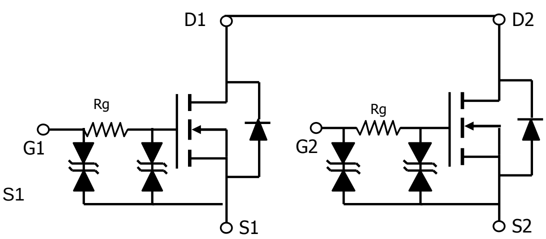
$R_{DS(ON)}$ < 19 mΩ (V_{GS} = 4.5V)

$R_{DS(ON)}$ < 20 mΩ (V_{GS} = 4.0V)

$R_{DS(ON)}$ < 23 mΩ (V_{GS} = 3.1V)

$R_{DS(ON)}$ < 30 mΩ (V_{GS} = 2.5V)





Absolute Maximum Ratings T_A=25℃ unless otherwise noted				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±12	
Continuous Drain Current [A]	T_A=25℃	I_D	7.2	A
	T_A=70℃		5.6	
Pulsed Drain Current [B]		I_{DM}	55	
Power Dissipation [A]	T_A=25℃	P_{DSM}	1.6	W
	T_A=70℃		1.0	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	℃

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Units**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	30	40	℃/W
Maximum Junction-to-Ambient [A]	Steady-State		61	75	℃/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	4.5	6	℃/W

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ	Max	Units
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250µA, V_{GS}=0V		30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V				1	µA
			T_J=55℃			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±10V				10	µA
BV_{GSO}	Gate-Source Breakdown Voltage	V_{DS}=0V, I_G=±250uA		±12			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250µA		0.6	1.1	1.5	V
$I_{D(ON)}$	On state drain current	V_{GS}=4.5V, V_{DS}=5V		55			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V, I_D=7A		12	15.5	19	mΩ
			T_J=125℃	19	23.5	29	
		V_{GS}=4.0V, I_D=5A		13	16	20	
		V_{GS}=3.1V, I_D=5A		14	18	23	
		V_{GS}=2.5V, I_D=4A		17	23	30	
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=7A			32		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V			0.71	0.9	V
I_S	Maximum Body-Diode Continuous Current					2.5	A
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz			920	1150	pF
C_{oss}	Output Capacitance				105		pF
C_{rss}	Reverse Transfer Capacitance				52		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz			1.7	2.5	kΩ
SWITCHING PARAMETERS							
Q_g(10V)	Total Gate Charge	V_{GS}=10V, V_{DS}=15V, I_D=7A			17.5	24	nC
Q_g(4.5V)	Total Gate Charge				7.5	10	nC
Q_{gs}	Gate Source Charge				2.9		nC
Q_{gd}	Gate Drain Charge				2.5		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=2.1Ω, R_{GEN}=3Ω			320	420	ns
t_r	Turn-On Rise Time				550		ns
$t_{D(off)}$	Turn-Off DelayTime				4.35		µs
t_f	Turn-Off Fall Time				2.4		µs
t_{rr}	Body Diode Reverse Recovery Time	I_F=7A, dI/dt=100A/µs			21.6	26	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=7A, dI/dt=100A/µs			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℃. The value in any given application depends on the user's specific board design. The current rating is based on the steady state 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 are obtained using <300 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℃. The SOA curve provides a single pulse rating.
Rev5: July2011

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

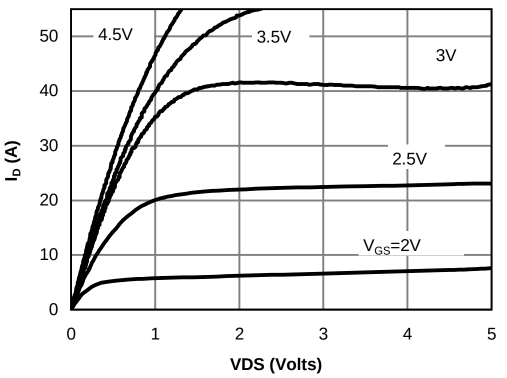


Fig 1: On-Region Characteristics

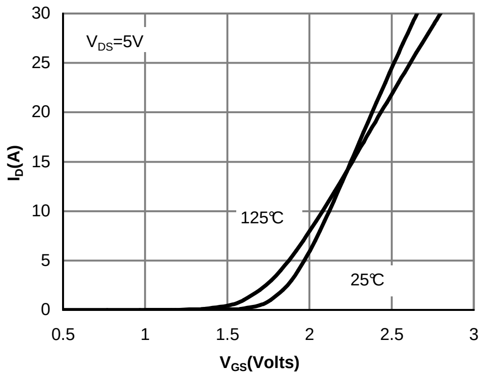


Figure 2: Transfer Characteristics

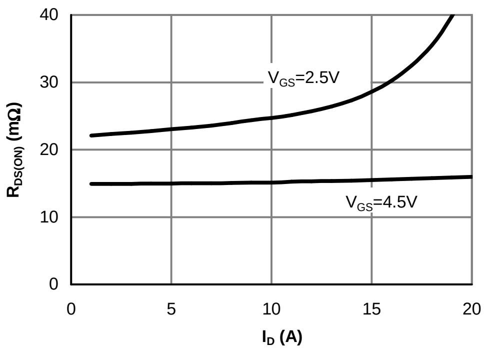


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

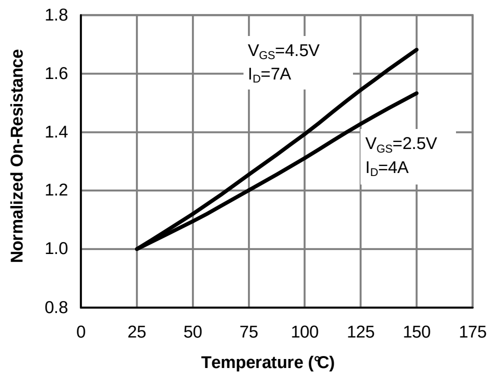


Figure 4: On-Resistance vs. Junction Temperature

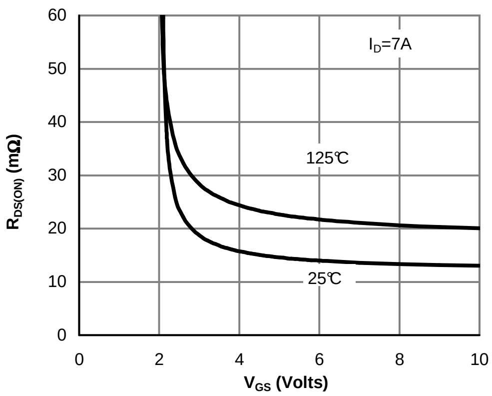


Figure 5: On-Resistance vs. Gate-Source Voltage

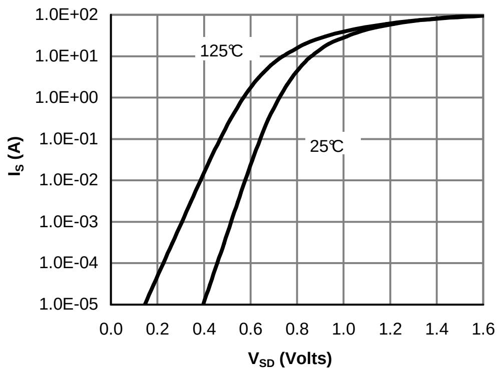


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

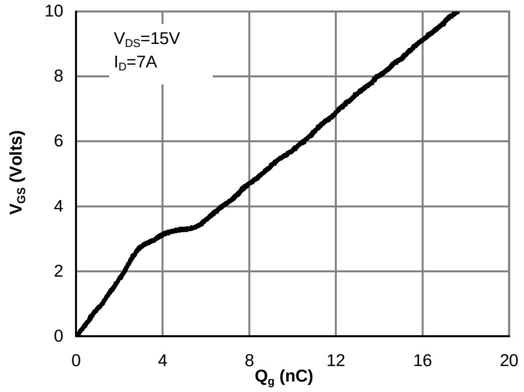


Figure 7: Gate-Charge Characteristics

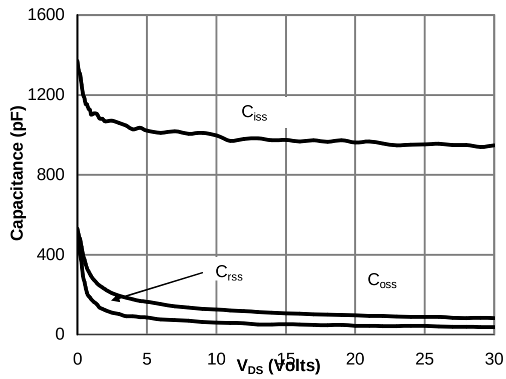


Figure 8: Capacitance Characteristics

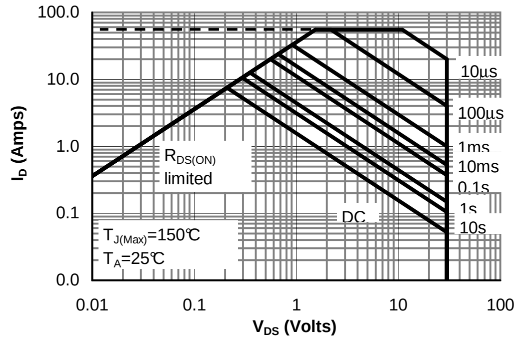


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

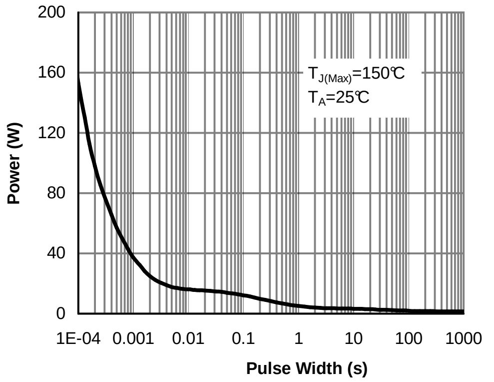


Figure 10: Single Pulse Power Rating Junction-to-Case (Note E)

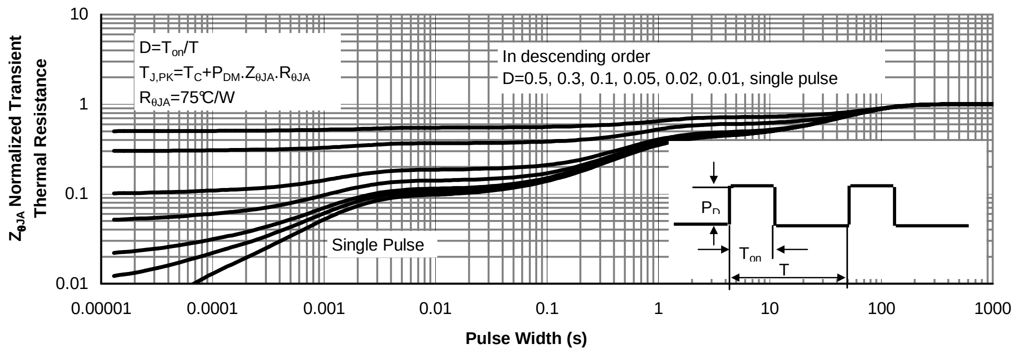
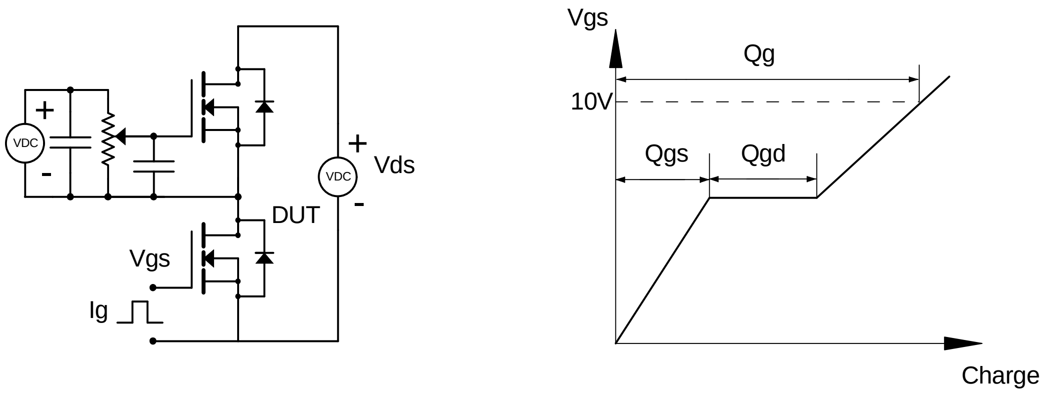
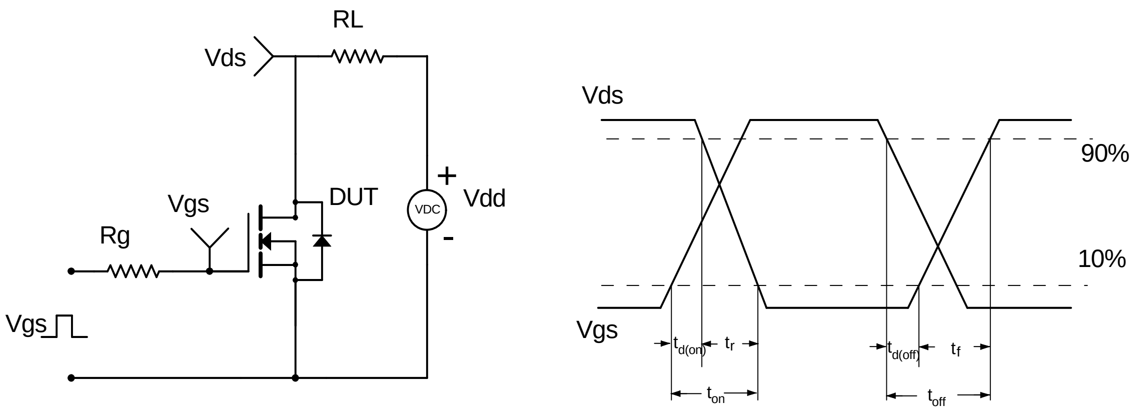


Figure 11: Normalized Maximum Transient Thermal Impedance

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms