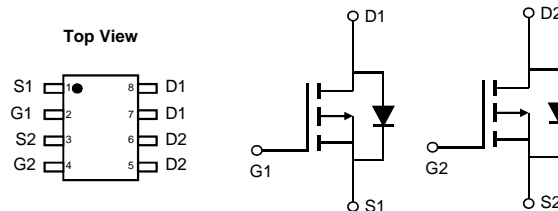


General Description

The AON4803 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

Product Summary

V_{DS}	-20V
I_D (at $V_{GS}=-4.5V$)	-3.4A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	< 90m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$)	< 120m Ω
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$)	< 165m Ω



Absolute Maximum Ratings $T_A=25^{\circ}C$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	$T_A=25^{\circ}C$	-3.4
		$T_A=70^{\circ}C$	-2.7
Pulsed Drain Current ^C	I_{DM}	-15	A
Power Dissipation ^B	P_D	$T_A=25^{\circ}C$	1.7
		$T_A=70^{\circ}C$	1.1
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	51	75	$^{\circ}C/W$
Maximum Junction-to-Ambient ^{A,D}		Steady-State	88	110
Maximum Junction-to-Lead	$R_{\theta JL}$	28	35	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _J =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±8V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.65	-1	V
I _{D(ON)}	On state drain current	V _{GS} =-10V, V _{DS} =-5V	-15			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-3.4A T _J =125°C		65 90	90 125	mΩ
		V _{GS} =-2.5V, I _D =-2.5A		80	120	mΩ
		V _{GS} =-1.8V, I _D =-1.5A		100	165	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-3.4A		12		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.7	-1	V
I _S	Maximum Body-Diode Continuous Current				-2	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, f=1MHz		560	745	pF
C _{oss}	Output Capacitance		80		pF	
C _{rss}	Reverse Transfer Capacitance		70		pF	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		15	23	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-3.4A		6.1	8	nC
Q _{gs}	Gate Source Charge		0.6		nC	
Q _{gd}	Gate Drain Charge		1.6		nC	
t _{D(on)}	Turn-On DelayTime	V _{GS} =-4.5V, V _{DS} =-10V, R _L =2.9Ω, R _{GEN} =3Ω		10		ns
t _r	Turn-On Rise Time		12		ns	
t _{D(off)}	Turn-Off DelayTime		44		ns	
t _f	Turn-Off Fall Time		22		ns	
t _{rr}	Body Diode Reverse Recovery Time	I _F =-3.4A, di/dt=100A/μs		21		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-3.4A, di/dt=100A/μs		7.5		nC

A. The value of R_{θJA} is measured with the device mounted on 1in² 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.

B. The power dissipation P_D is based on T_{J(MAX)}=150° C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150° C. Ratings are based on low frequency and duty cycles to keep initial T_J=25° C.

D. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T_{J(MAX)}=150° C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

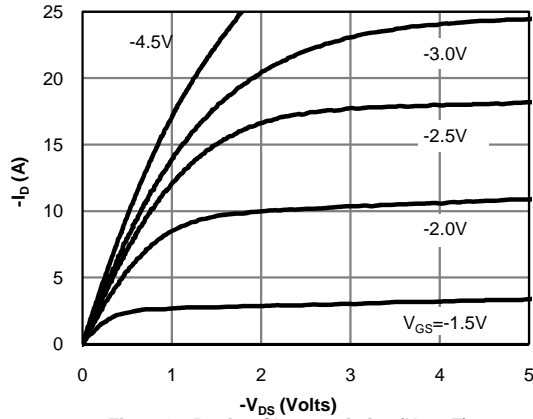


Figure 1: On-Region Characteristics (Note E)

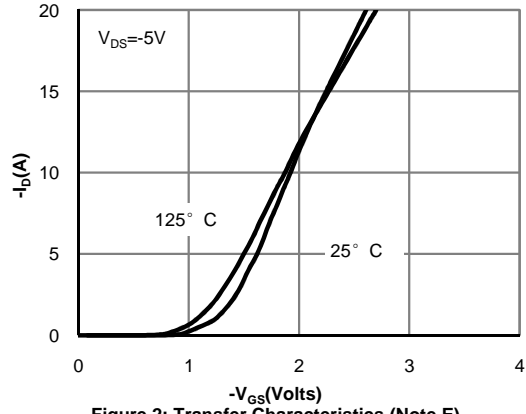


Figure 2: Transfer Characteristics (Note E)

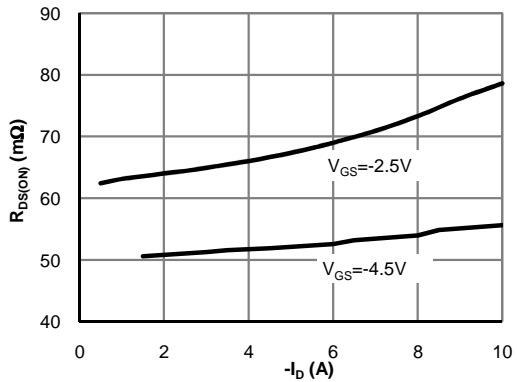


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

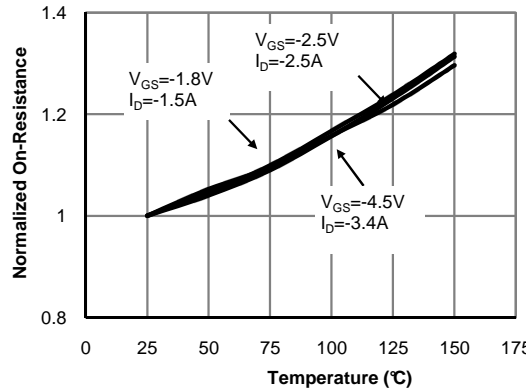


Figure 4: On-Resistance vs. Junction Temperature (Note E)

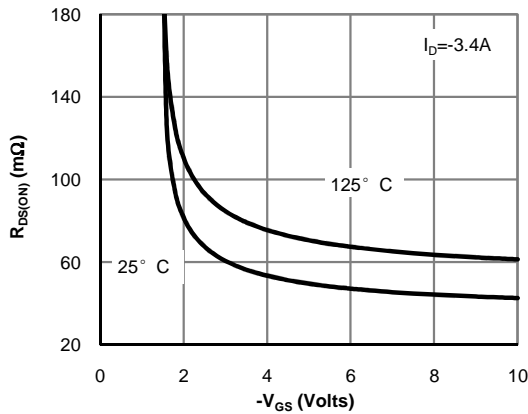


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

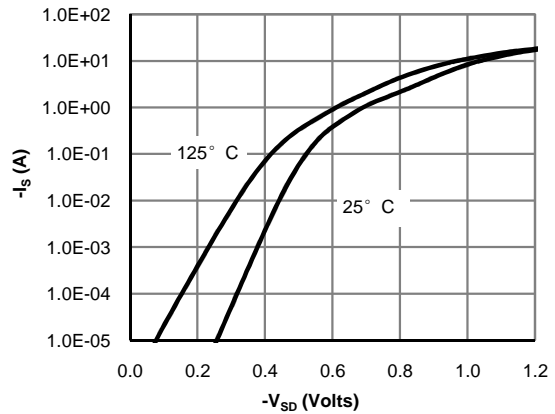


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

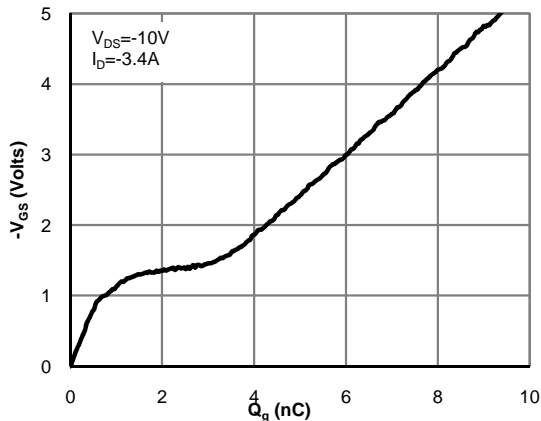


Figure 7: Gate-Charge Characteristics

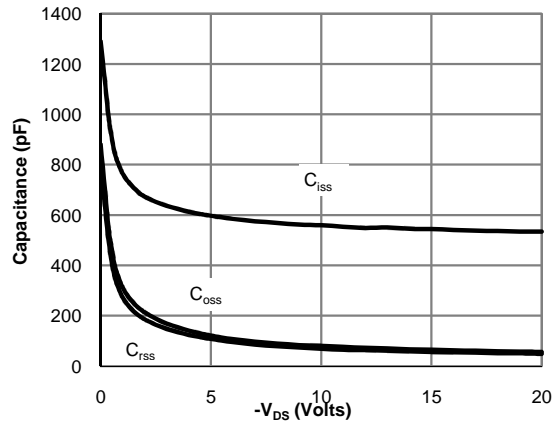


Figure 8: Capacitance Characteristics

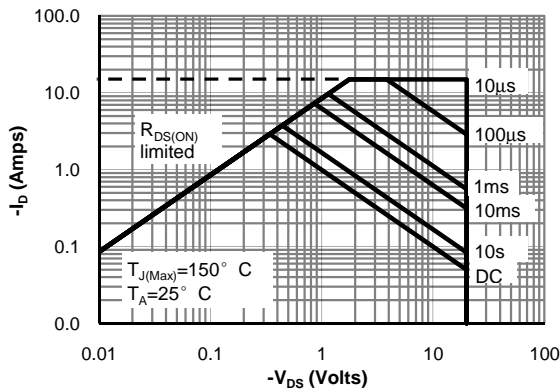


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

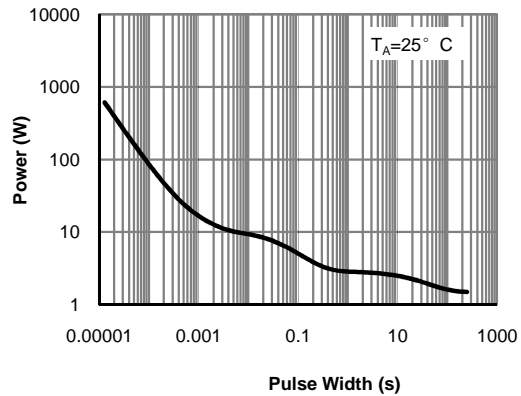


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

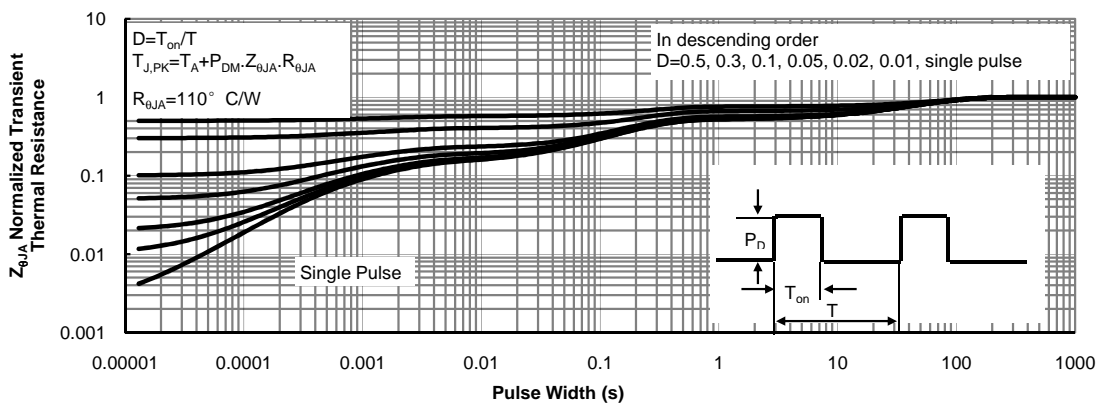
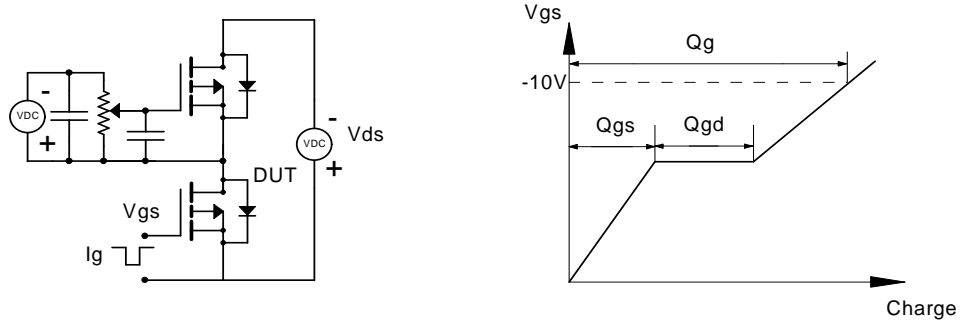
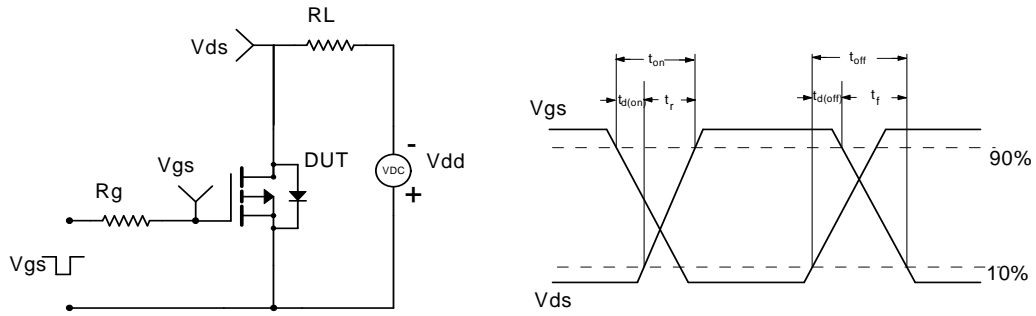


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

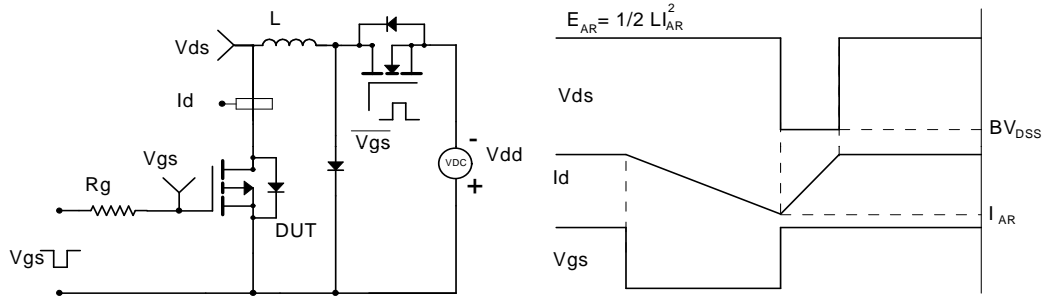
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

