

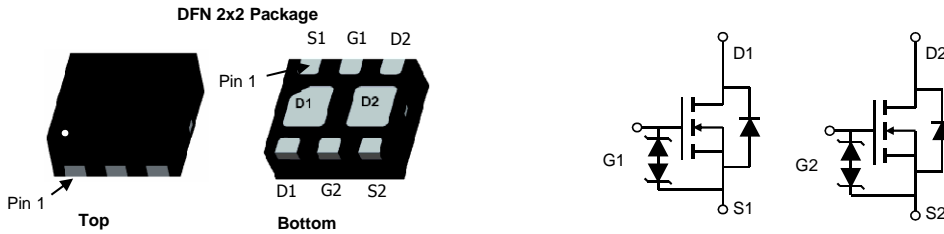
General Description

The AON2800 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 $V_{GS}=4.5V$)	4.5A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	< 47m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	< 65m Ω

ESD Protected



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	$T_A=25^\circ C$	4.5
		$T_A=70^\circ C$	3.8
Pulsed Drain Current ^C	I_{DM}	24	A
Power Dissipation ^B	P_D	$T_A=25^\circ C$	1.5
		$T_A=70^\circ C$	0.95
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 $t \leq 10s$	$R_{\theta JA}$	35	45	$^\circ C/W$
Maximum Junction-to-Ambient ^A Steady-State		65	85	$^\circ C/W$
Maximum Junction-to-Ambient ^B $t \leq 10s$	$R_{\theta JA}$	120	155	$^\circ C/W$
Maximum Junction-to-Ambient ^B Steady-State		175	235	$^\circ C/W$

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			20	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.4	0.8	1.2	V
I _{D(ON)}	On state drain current	V _{GS} =4.5V, V _{DS} =5V	24			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =4A T _J =125°C		37 55	47 70	mΩ
		V _{GS} =2.5V, I _D =3A		47	65	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =4A		14		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.7	1	V
I _S	Maximum Body-Diode Continuous Current				1.5	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, f=1MHz	285	360	435	pF
C _{oss}	Output Capacitance		45	65	85	pF
C _{riss}	Reverse Transfer Capacitance		30	50	70	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	1.7	3.5	5.3	Ω
SWITCHING PARAMETERS						
Q _{g(4.5V)}	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =4A		4.15	6	nC
Q _{gs}	Gate Source Charge		0.55		nC	
Q _{gd}	Gate Drain Charge		1.15		nC	
t _{D(on)}	Turn-On DelayTime	V _{GS} =4.5V, V _{DS} =10V, R _L =2.5Ω, R _{GEN} =3Ω		9.5		ns
t _r	Turn-On Rise Time		43		ns	
t _{D(off)}	Turn-Off DelayTime		26		ns	
t _f	Turn-Off Fall Time		39		ns	
t _{rr}	Body Diode Reverse Recovery Time	I _F =4A, di/dt=100A/μs		11		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =4A, di/dt=100A/μs		3		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 Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it to.

B. The value of R_{θJA} is measured with the device mounted on a minimum pad board with 2oz. Copper, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it to.

C. The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case 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° C. The SOA curve provides a single pulse rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

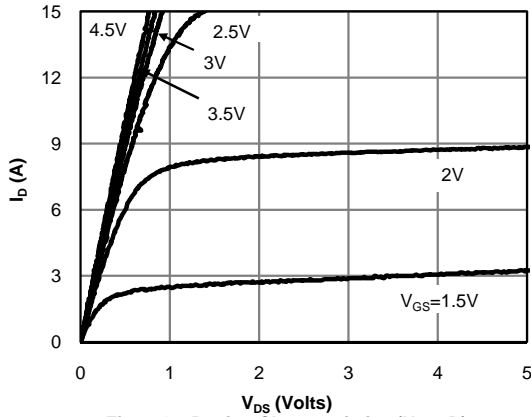


Figure 1: On-Region Characteristics (Note D)

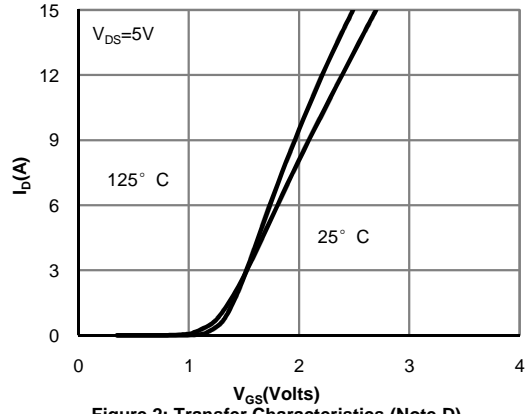


Figure 2: Transfer Characteristics (Note D)

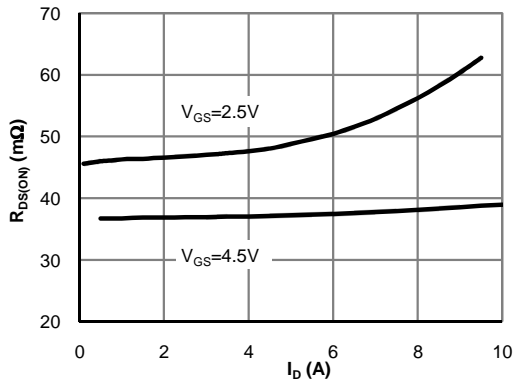


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)

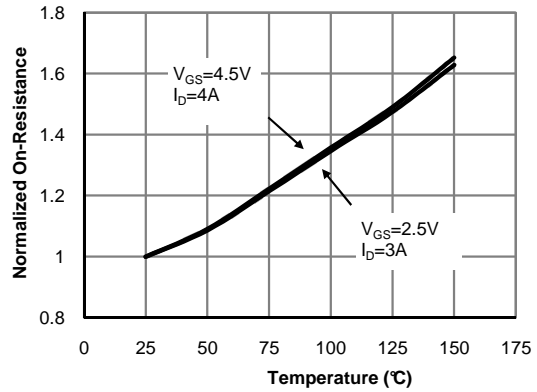


Figure 4: On-Resistance vs. Junction Temperature (Note D)

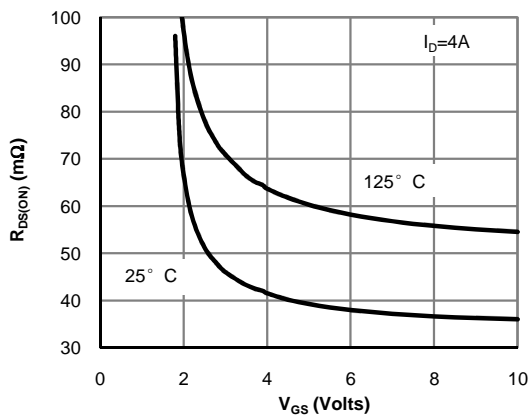


Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)

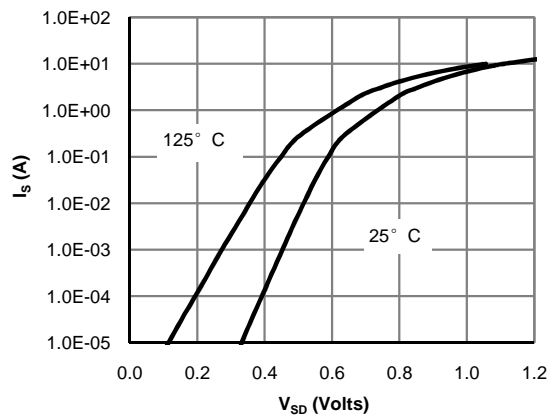


Figure 6: Body-Diode Characteristics (Note D)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

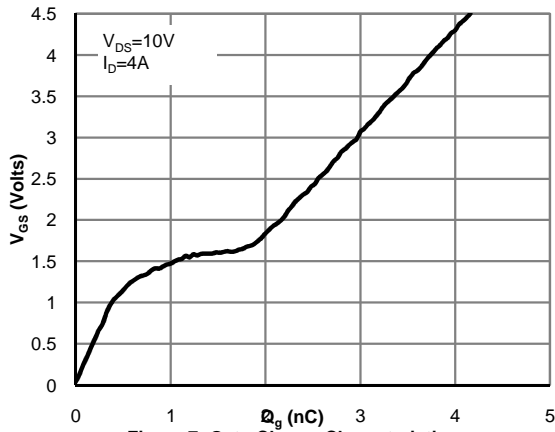


Figure 7: Gate-Charge Characteristics

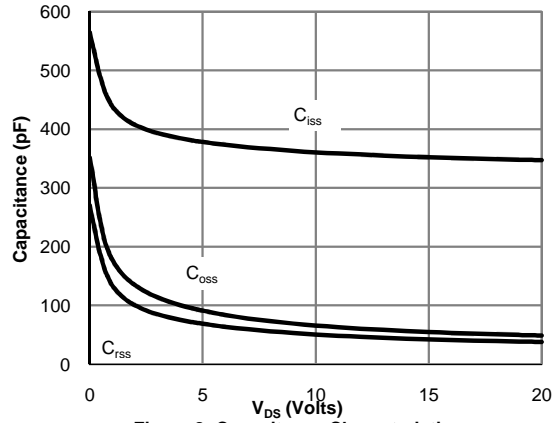


Figure 8: Capacitance Characteristics

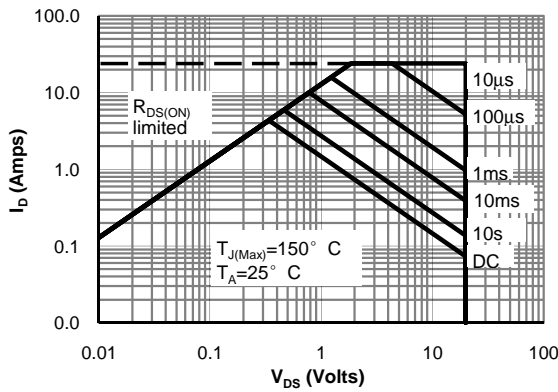


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

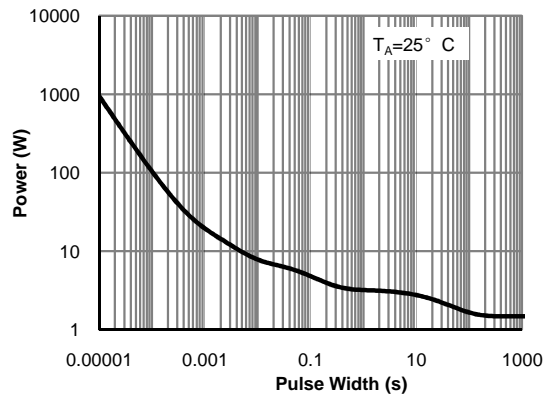


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

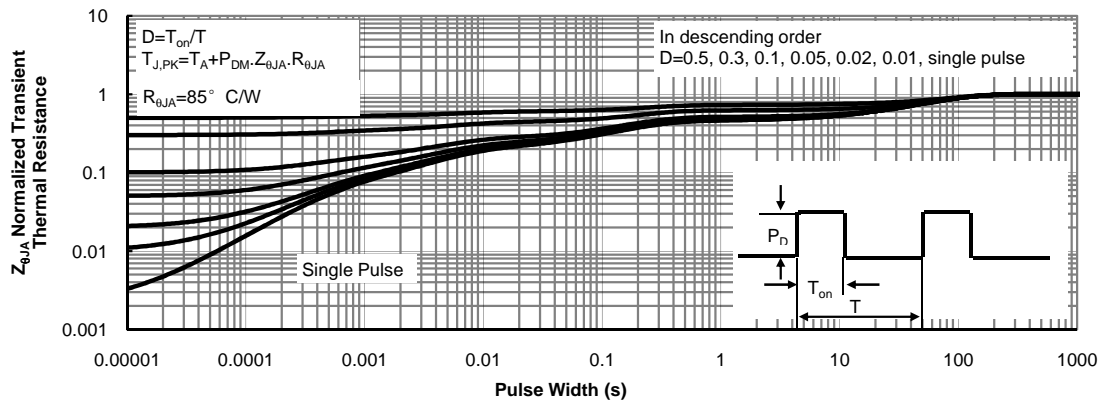
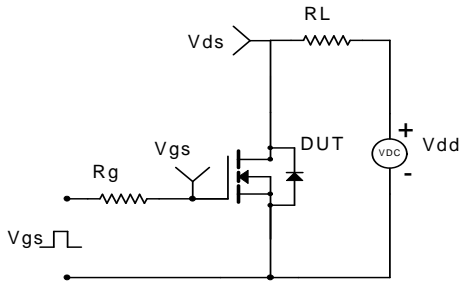


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

