AON2800

20V Dual N-Channel MOSFET

General Description

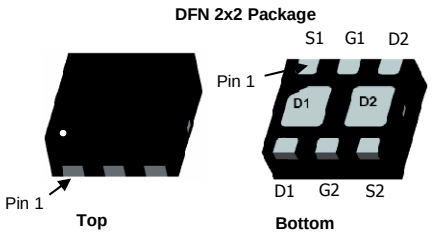
The AON2800 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

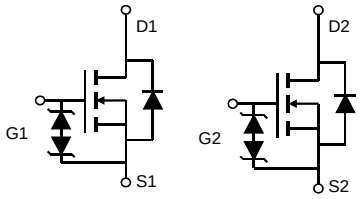
Features

V_{DS}	20V
I_D (at V_{GS}=4.5V)	4.5A
$R_{DS(ON)}$ (at V_{GS}=4.5V)	< 47mΩ
$R_{DS(ON)}$ (at V_{GS}=2.5V)	< 65mΩ

Green Product

DFN 2x2 Package





Absolute Maximum Ratings T_A=25℃ unless otherwise noted				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current	T_A=25℃	I_D	4.5	A
	T_A=70℃		3.8	
Pulsed Drain Current [C]		I_{DM}	24	
Power Dissipation [B]	T_A=25℃	P_D	1.5	W
	T_A=70℃		0.95	
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	$R_{\theta JA}$	35	45	℃/W
Maximum Junction-to-Ambient [A]	Steady-State		65	85	℃/W
Maximum Junction-to-Ambient [B]	t ≤ 10s	$R_{\theta JA}$	120	155	℃/W
Maximum Junction-to-Ambient [B]	Steady-State		175	235	℃/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	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V			1	µA
		T_J=55℃			5	
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		37	47	mΩ
		T_J=125℃		55	70	
		V_{GS}=2.5V, I_D=3A		47	65	mΩ
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_{rss}	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 $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ 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 $R_{\theta JA}$ 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 $R_{\theta JA}$ 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 $R_{\theta JA}$ is the sum of the thermal impedence from junction to case $R_{\theta JC}$ 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.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

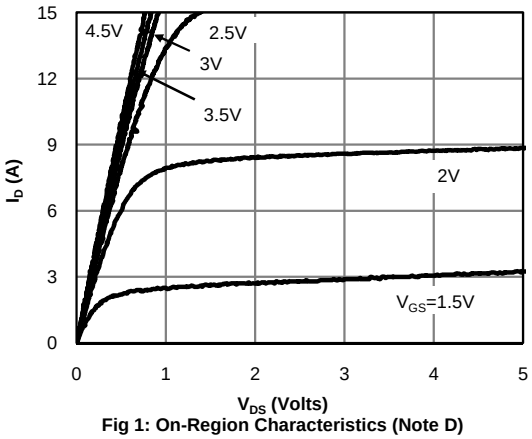


Fig 1: On-Region Characteristics (Note D)

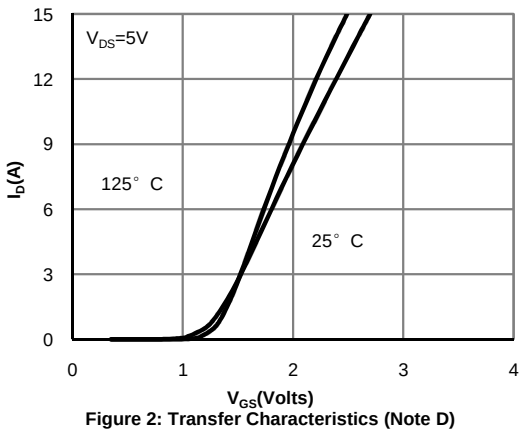


Figure 2: Transfer Characteristics (Note D)

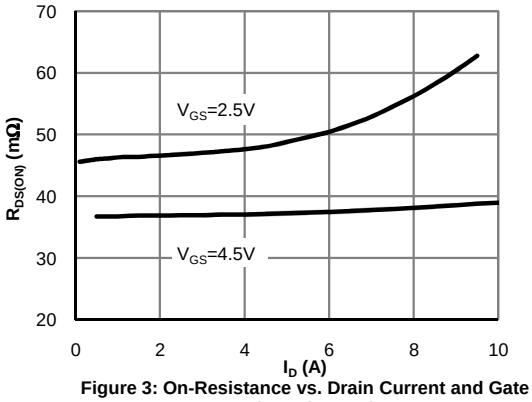


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)

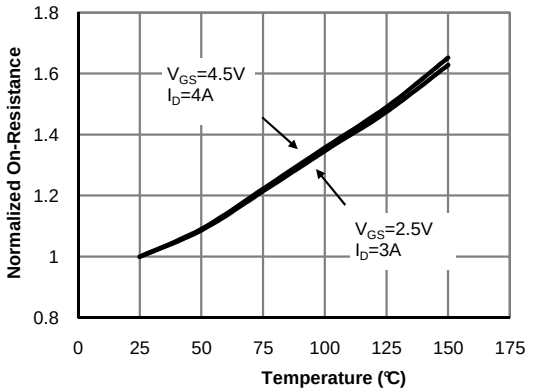


Figure 4: On-Resistance vs. Junction Temperature (Note D)

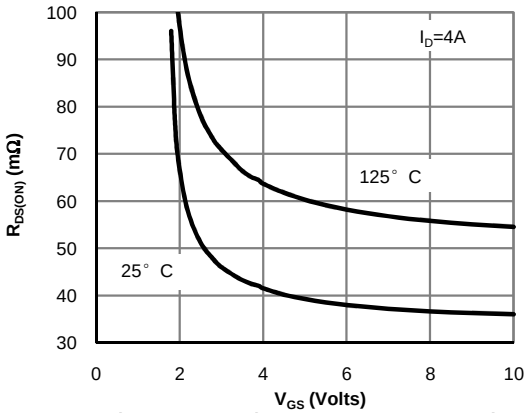


Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)

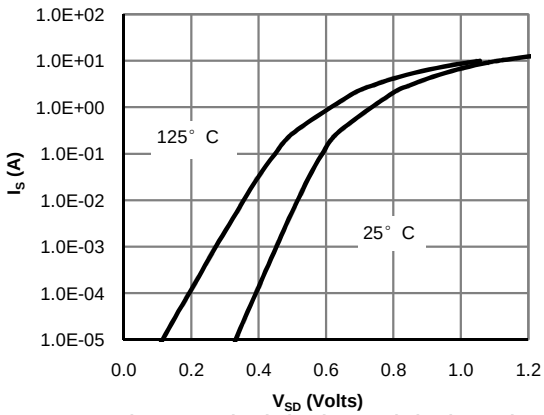


Figure 6: Body-Diode Characteristics (Note D)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

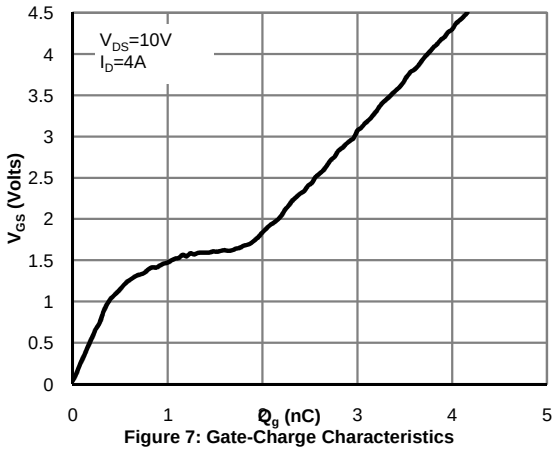


Figure 7: Gate-Charge Characteristics

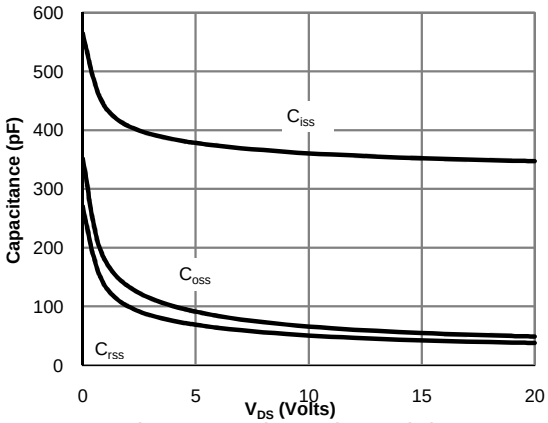


Figure 8: Capacitance Characteristics

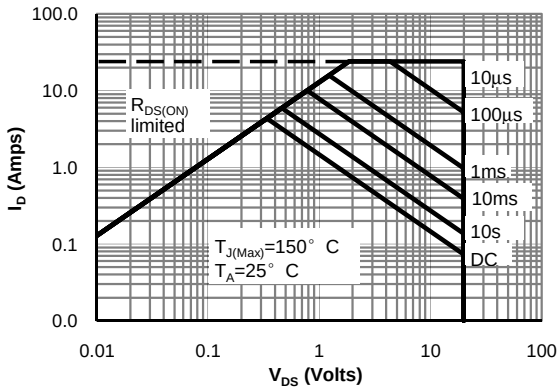


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

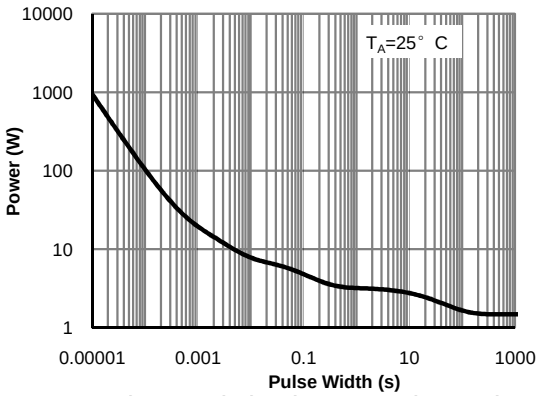


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

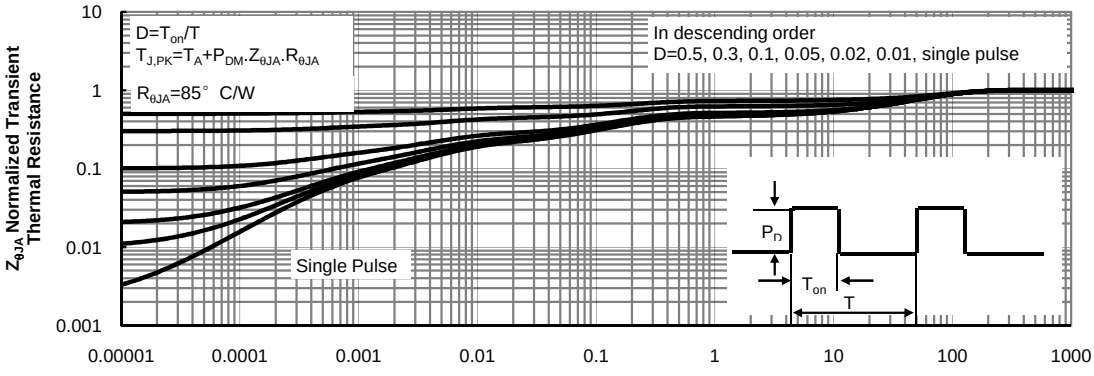
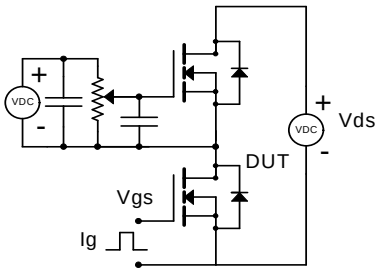
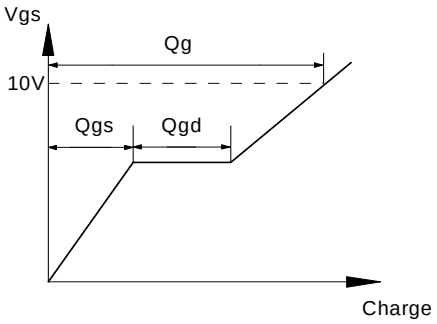


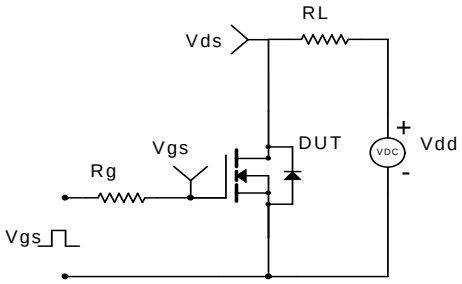
Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

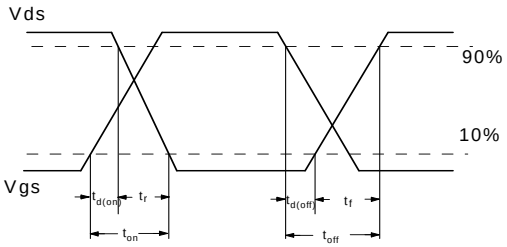
Gate Charge Test Circuit & Waveform





Resistive Switching Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms