



**ALPHA & OMEGA**  
SEMICONDUCTOR

**AON2802**

**30V Dual N-Channel MOSFET**

### General Description

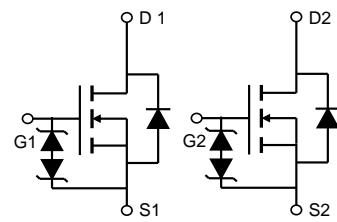
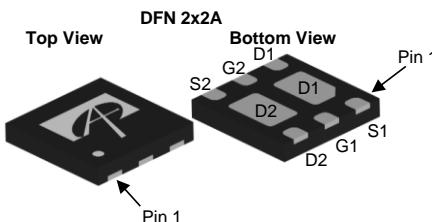
The AON2802 combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

### Product Summary

$V_{DS}$	30V
$I_D$ (at $V_{GS}=10V$ )	2A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 60mΩ
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	< 68mΩ
$R_{DS(ON)}$ (at $V_{GS}=2.5V$ )	< 88mΩ

Typical ESD protection

HBM Class 3A



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>G</sup>	$I_D$	2	A
$T_A=70^\circ C$		1.6	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	8	
Power Dissipation <sup>B</sup>	$P_D$	2.1	W
$T_A=70^\circ C$		1.3	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	50	60	°C/W
Maximum Junction-to-Ambient <sup>A,D</sup> Steady-State		80	100	°C/W

**Electrical Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	30			V
$I_{\text{DS}}^{\text{SS}}$	Zero Gate Voltage Drain Current	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1 5	$\mu\text{A}$
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 10\text{V}$			$\pm 10$	$\mu\text{A}$
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.7	1.05	1.5	V
$I_{D(\text{ON})}$	On state drain current	$V_{GS}=10\text{V}, V_{DS}=5\text{V}$	8			A
$R_{DS(\text{ON})}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=2\text{A}$ $T_J=125^\circ\text{C}$	49	60		$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=1\text{A}$	77	94		$\text{m}\Omega$
		$V_{GS}=2.5\text{V}, I_D=1\text{A}$	54	68		$\text{m}\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS}=5\text{V}, I_D=2\text{A}$		12		S
$V_{SD}$	Diode Forward Voltage	$I_S=1\text{A}, V_{GS}=0\text{V}$		0.75	1	V
$I_S$	Maximum Body-Diode Continuous Current				1.5	A
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1\text{MHz}$		245		pF
$C_{oss}$	Output Capacitance			35		pF
$C_{rss}$	Reverse Transfer Capacitance			20		pF
$R_g$	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$		5		$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, I_D=2\text{A}$		5.7	10	nC
$Q_g(4.5\text{V})$	Total Gate Charge			2.6	5	nC
$Q_{gs}$	Gate Source Charge			0.5		nC
$Q_{gd}$	Gate Drain Charge			1.0		nC
$t_{D(\text{on})}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, R_L=7.5\Omega, R_{\text{GEN}}=3\Omega$		2		ns
$t_r$	Turn-On Rise Time			3.5		ns
$t_{D(\text{off})}$	Turn-Off Delay Time			22		ns
$t_f$	Turn-Off Fall Time			3.5		ns
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=2\text{A}, dI/dt=100\text{A}/\mu\text{s}$		2		ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=2\text{A}, dI/dt=100\text{A}/\mu\text{s}$		3		nC

A. The value of  $R_{\text{DJA}}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

B. The power dissipation  $P_D$  is based on  $T_{J(\text{MAX})}=150^\circ\text{C}$ , using  $\leq 10\text{s}$  junction-to-ambient thermal resistance.

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

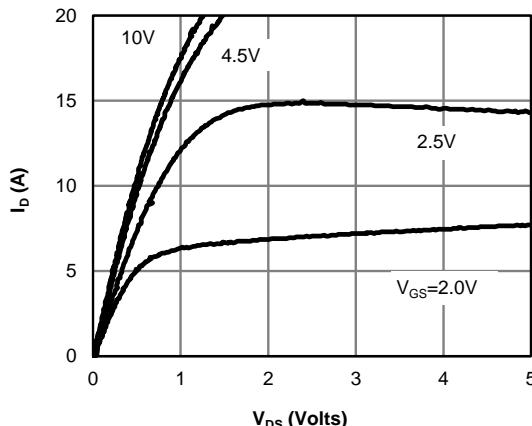
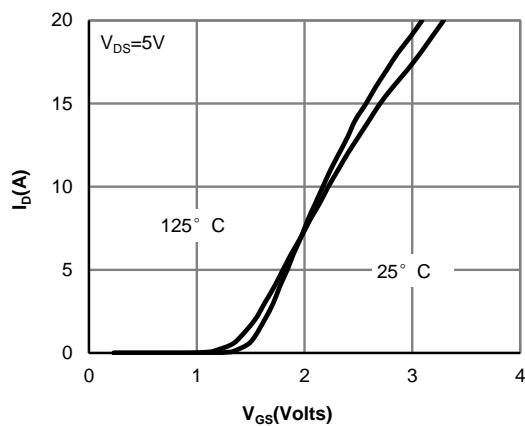
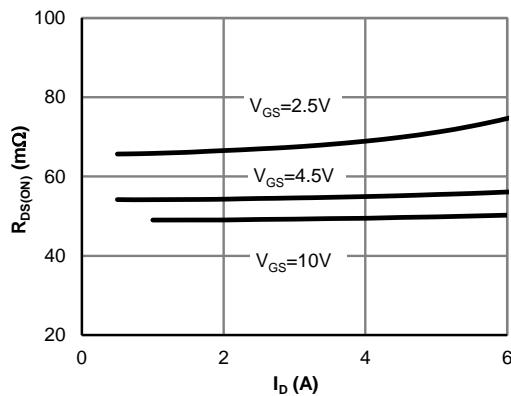
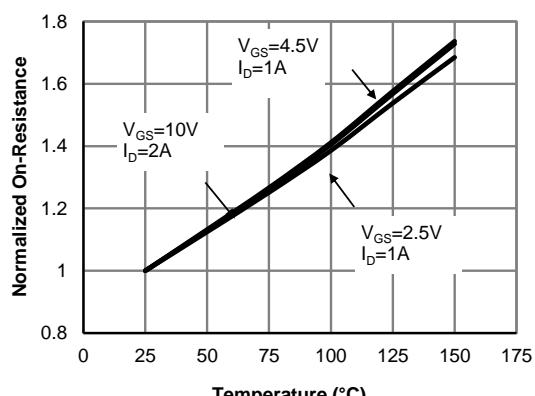
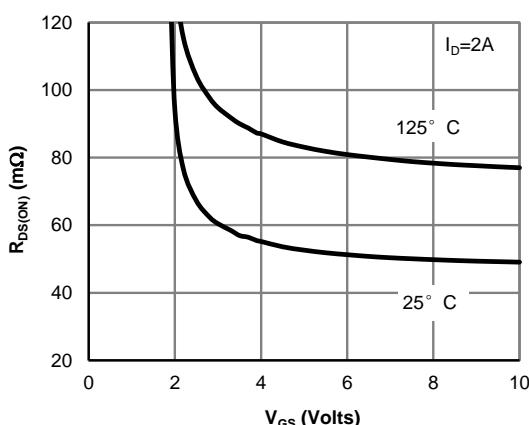
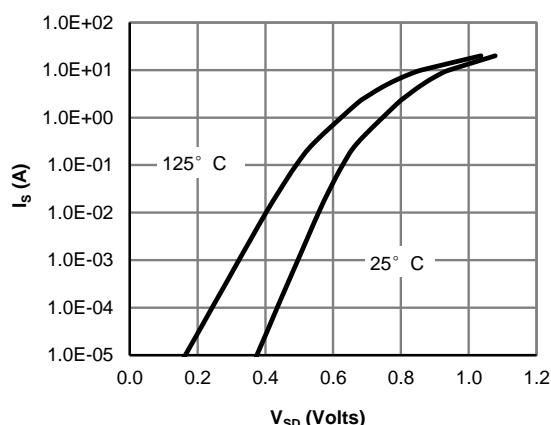
D. The  $R_{\text{DJA}}$  is the sum of the thermal impedance from junction to lead  $R_{\text{JUL}}$  and lead to ambient.

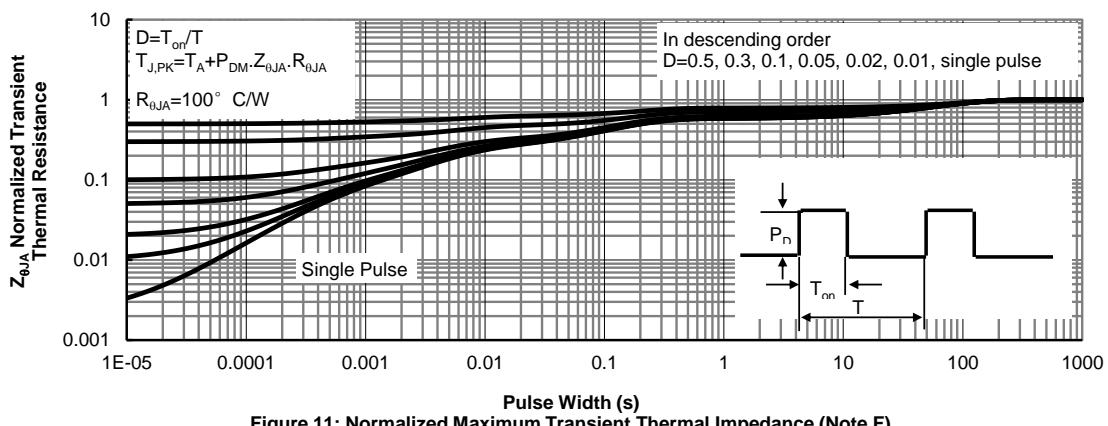
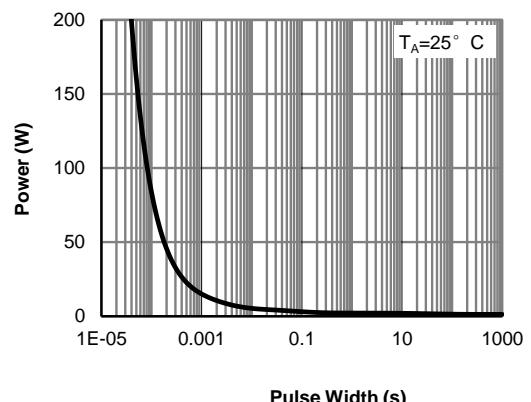
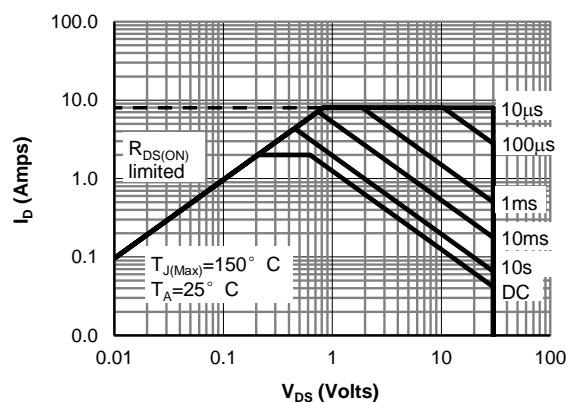
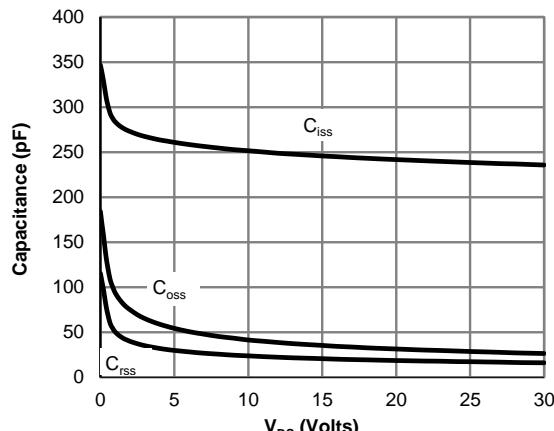
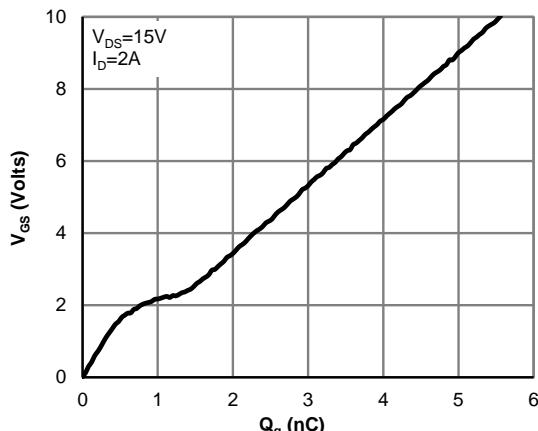
E. The static characteristics in Figures 1 to 6 are obtained using  $<300\mu\text{s}$  pulses, duty cycle 0.5% max.

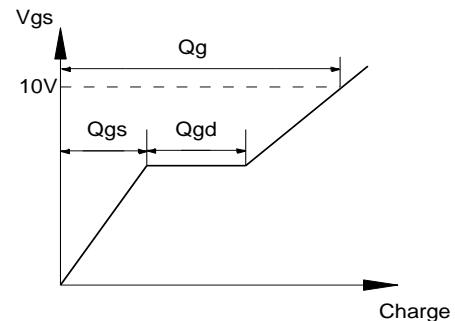
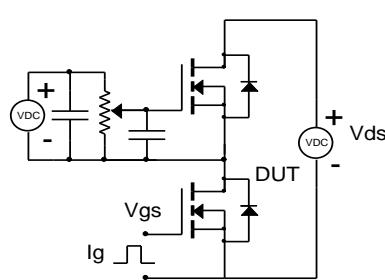
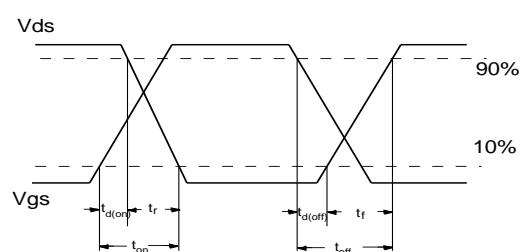
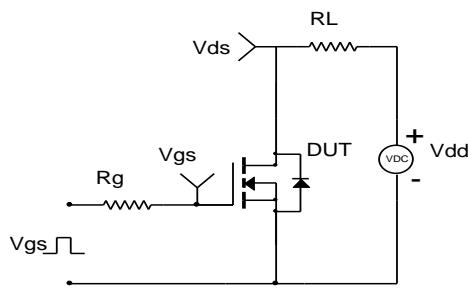
F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, assuming a maximum junction temperature of  $T_{J(\text{MAX})}=150^\circ\text{C}$ . The SOA curve provides a single pulse rating. G. The maximum current rating is package limited.

APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO MAKE CHANGES TO PRODUCT SPECIFICATIONS WITHOUT NOTICE. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO EVALUATE SUITABILITY OF THE PRODUCT FOR THEIR INTENDED APPLICATION. CUSTOMER SHALL COMPLY WITH APPLICABLE LEGAL REQUIREMENTS, INCLUDING ALL APPLICABLE EXPORT CONTROL RULES, REGULATIONS AND LIMITATIONS.

AOS' products are provided subject to AOS' terms and conditions of sale which are set forth at:  
[http://www.aosmd.com/terms\\_and\\_conditions\\_of\\_sale](http://www.aosmd.com/terms_and_conditions_of_sale)

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

**Fig 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**


**Gate Charge Test Circuit & Waveform**

**Resistive Switching Test Circuit & Waveforms**

**Diode Recovery Test Circuit & Waveforms**
