



**THE DATASHEET OF
AON4407**





AON4407
12V P-Channel MOSFET

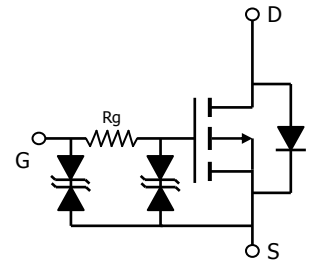
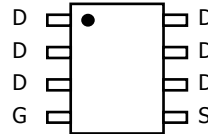
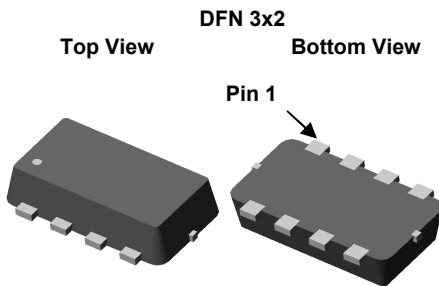
General Description

The AON4407 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch.

Features

V_{DS} (V) = -12V
 I_D = -9 A (V_{GS} = -4.5V)
 $R_{DS(ON)} < 20m\Omega$ (V_{GS} = -4.5V)
 $R_{DS(ON)} < 25m\Omega$ (V_{GS} = -2.5V)
 $R_{DS(ON)} < 31m\Omega$ (V_{GS} = -1.8V)

ESD Protected



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	-9
		$T_A=70^\circ\text{C}$	-7
Pulsed Drain Current ^C	I_{DM}	-60	A
Power Dissipation ^B	P_D	$T_A=25^\circ\text{C}$	2.5
		$T_A=70^\circ\text{C}$	1.6
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	42	50	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^{A,D}				
Maximum Junction-to-Lead	$R_{\theta JL}$	25	30	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-12			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-12\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$T_J=55^\circ\text{C}$			-5	
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 8\text{V}$			± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-0.35	-0.5	-0.85	V
$I_{D(ON)}$	On state drain current	$V_{GS}=-4.5\text{V}$, $V_{DS}=-5\text{V}$	-60			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5\text{V}$, $I_D=-9\text{A}$		16.5	20	m Ω
		$T_J=125^\circ\text{C}$		22	26	
		$V_{GS}=-2.5\text{V}$, $I_D=-8.5\text{A}$		20	25	m Ω
		$V_{GS}=-1.8\text{V}$, $I_D=-7.5\text{A}$		24	31	m Ω
		$V_{GS}=-1.5\text{V}$, $I_D=-7\text{A}$		29	38	m Ω
g_{FS}	Forward Transconductance	$V_{DS}=-5\text{V}$, $I_D=-9\text{A}$		45		S
V_{SD}	Diode Forward Voltage	$I_S=-1\text{A}$, $V_{GS}=0\text{V}$		-0.53	-1	V
I_S	Maximum Body-Diode Continuous Current				-2.5	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=-6\text{V}$, $f=1\text{MHz}$		1740	2100	pF
C_{oss}	Output Capacitance			334		
C_{riss}	Reverse Transfer Capacitance			200		
R_g	Gate resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$		1.3	1.7	k Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS}=-4.5\text{V}$, $V_{DS}=-6\text{V}$, $I_D=-9\text{A}$		19	23	nC
Q_{gs}	Gate Source Charge			4.5		
Q_{gd}	Gate Drain Charge			5.3		
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=-4.5\text{V}$, $V_{DS}=-6\text{V}$, $R_L=0.67\Omega$, $R_{GEN}=3\Omega$		240		ns
t_r	Turn-On Rise Time			580		
$t_{D(off)}$	Turn-Off DelayTime			7		
t_f	Turn-Off Fall Time			4.2		
t_{rr}	Body Diode Reverse Recovery Time	$I_F=-9\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		22	27	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=-9\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		17		nC

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² 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 $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10\text{s}$ junction-to-ambient thermal resistance.

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

D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ 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 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of $T_{J(MAX)}=150^\circ\text{C}$. The SOA curve provides a single pulse rating.

Rev 1: June 2009

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 IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

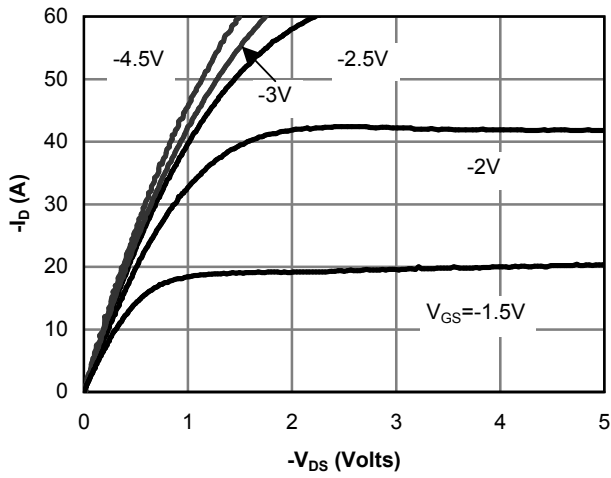


Figure 1: On-Region Characteristics(Note E)

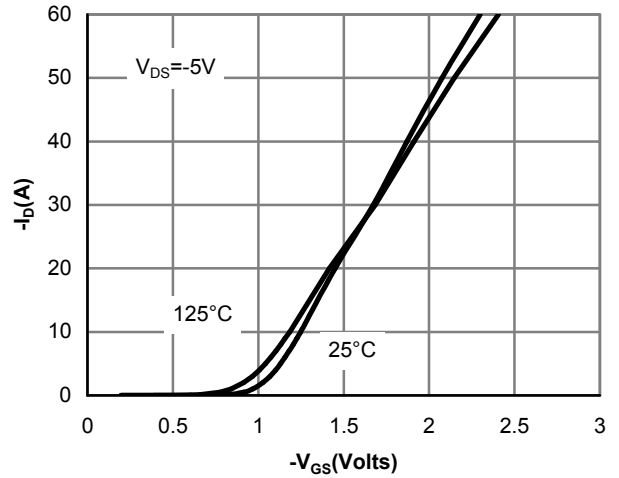


Figure 2: Transfer Characteristics(Note E)

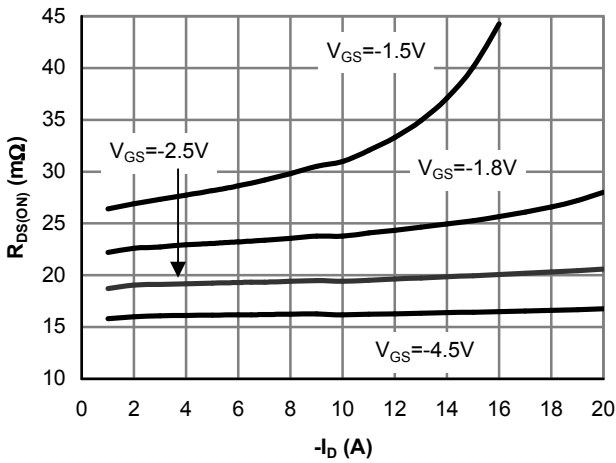


Figure 3: On-Resistance vs. Drain Current and Gate Voltage(Note E)

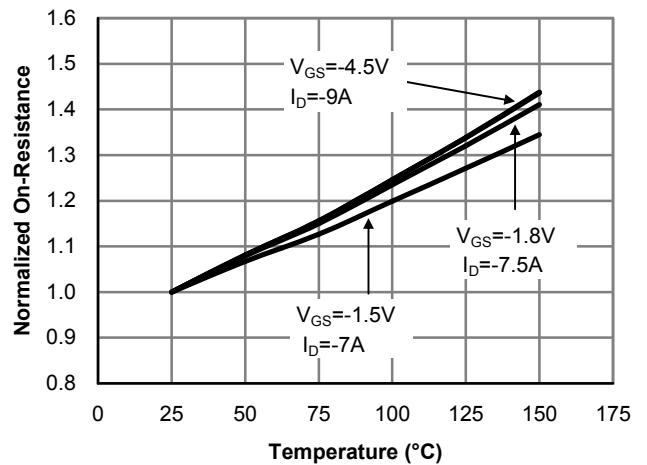


Figure 4: On-Resistance vs. Junction Temperature(Note E)

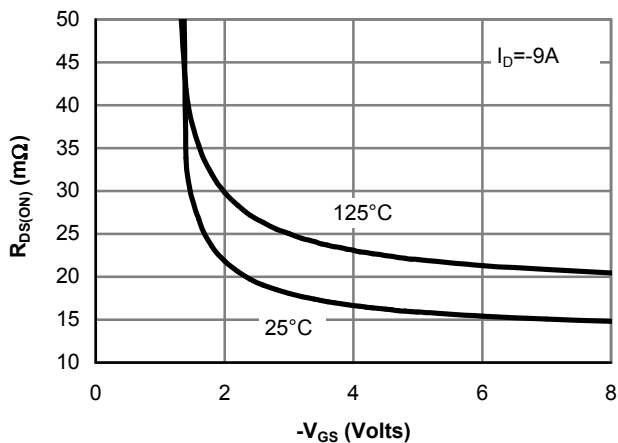


Figure 5: On-Resistance vs. Gate-Source Voltage(Note E)

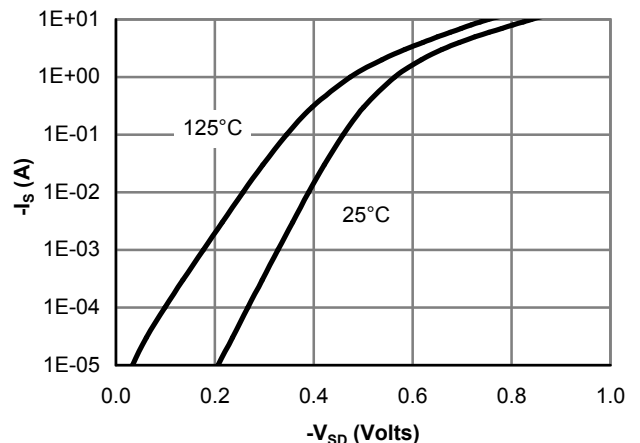


Figure 6: Body-Diode Characteristics(Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

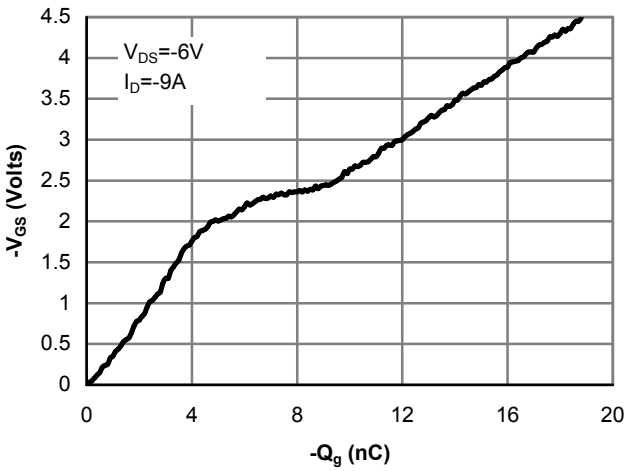


Figure 7: Gate-Charge Characteristics

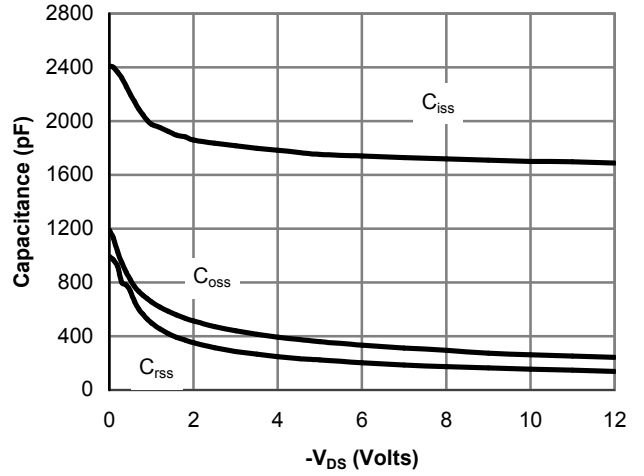


Figure 8: Capacitance Characteristics

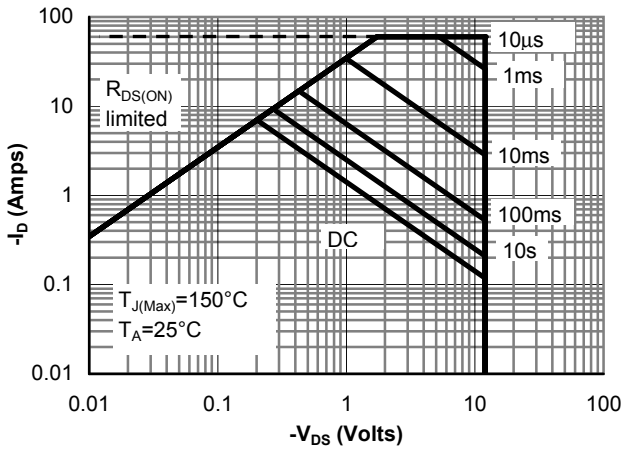


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

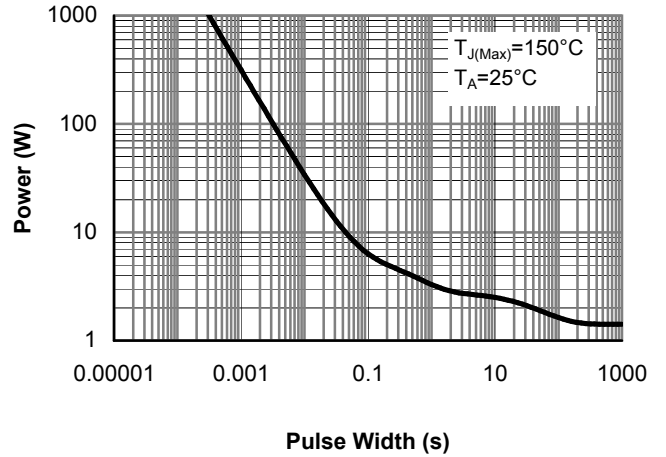


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

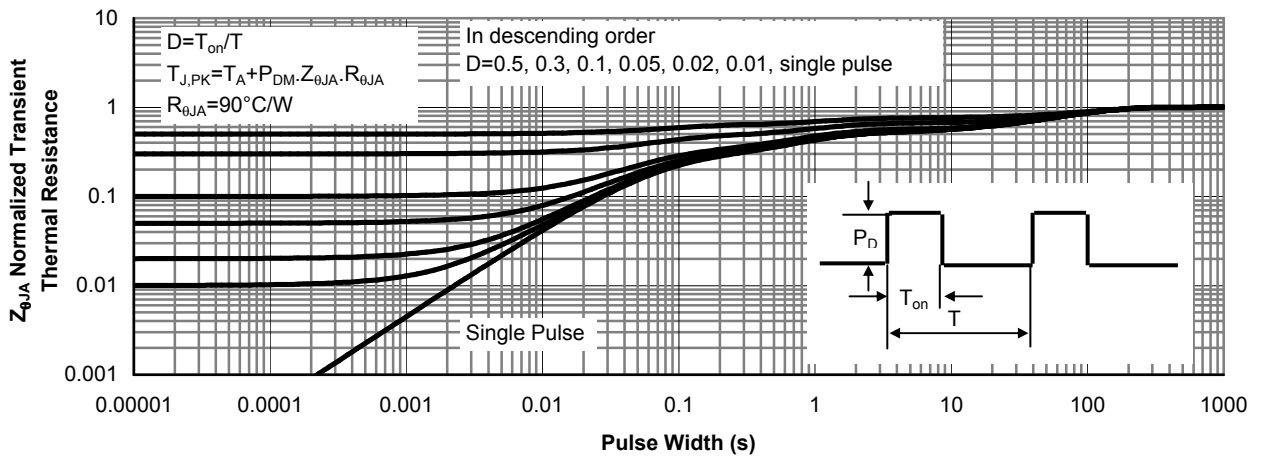
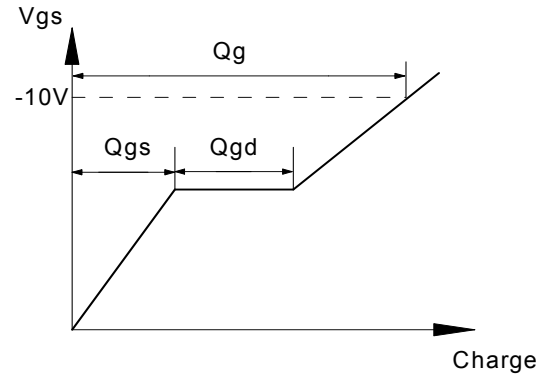
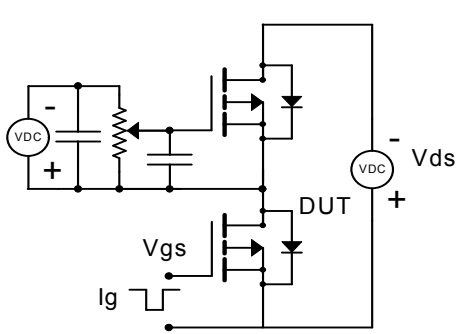
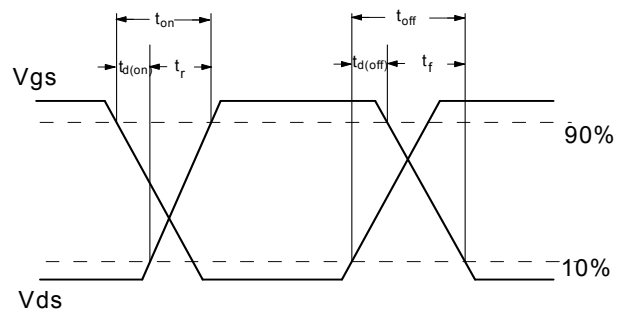
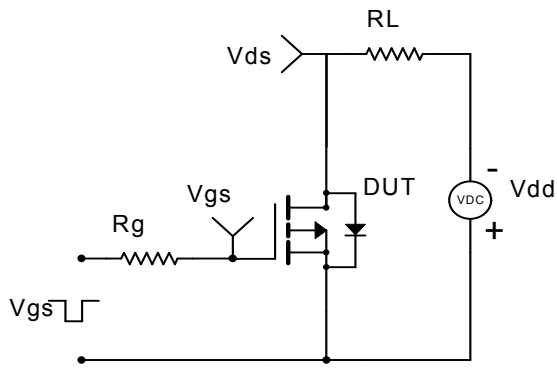


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

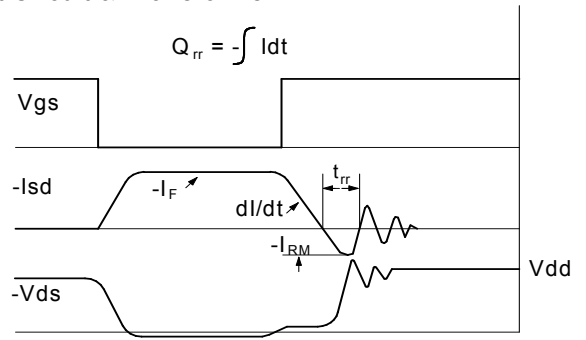
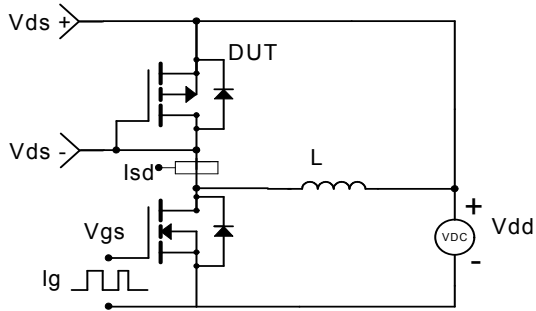
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms



Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View AON4407 on WIN SOURCE](#)
-  [Alpha & Omega Semiconductor Inc. Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management