



ALPHA & OMEGA
SEMICONDUCTOR



AON7408 30V N-Channel MOSFET

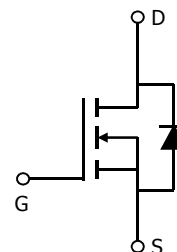
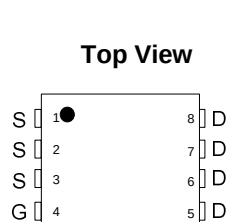
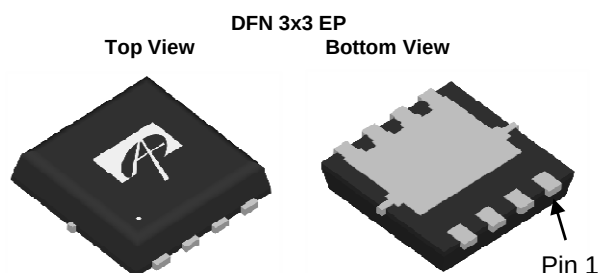
General Description

The AON7408 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in general purpose applications.

Features

V_{DS} (V) = 30V
 I_D = 23A (V_{GS} = 10V)
 $R_{DS(ON)} < 20m\Omega$ (V_{GS} = 10V)
 $R_{DS(ON)} < 32m\Omega$ (V_{GS} = 4.5V)

100% UIS Tested!



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^B	I_D	23	A
$T_C=25^\circ\text{C}$		15	
$T_C=100^\circ\text{C}$	I_{DM}	64	
Pulsed Drain Current ^C		10	
Continuous Drain Current ^A	I_{DSM}	8	W
$T_A=25^\circ\text{C}$		16.7	
$T_A=70^\circ\text{C}$	P_D	7	
Power Dissipation ^B		3.1	
$T_C=25^\circ\text{C}$	P_{DSM}	2	
$T_C=100^\circ\text{C}$			
Power Dissipation ^A			
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	$R_{\theta JA}$	25	40	$^\circ\text{C/W}$
$t \leq 10s$		62	75	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A	$R_{\theta JC}$	6.2	7.5	$^\circ\text{C/W}$
Steady-State				
Maximum Junction-to-Case ^B				

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	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V T _J =55°C			1 5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.5	2.1	2.6	V
I _{D(ON)}	On state drain current	V _{GS} =10V, V _{DS} =5V	64			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =10A T _J =125°C V _{GS} =4.5V, I _D =5A		15.3 23.3 22.7	20 30 32	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =10A		17		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.75	1	V
I _S	Maximum Body-Diode Continuous Current				3.8	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		373	448	pF
C _{oss}	Output Capacitance			67		pF
C _{rss}	Reverse Transfer Capacitance			41		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.8	2.8	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =10A		7.1	8.6	nC
Q _{gs}	Gate Source Charge			1.2		nC
Q _{gd}	Gate Drain Charge			1.6		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =1.5Ω, R _{GEN} =3Ω		4.3		ns
t _r	Turn-On Rise Time			2.8		ns
t _{D(off)}	Turn-Off DelayTime			15.8		ns
t _f	Turn-Off Fall Time			3		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =10A, dI/dt=100A/μs		10.5	12.6	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =10A, dI/dt=100A/μs		4.5		nC

A: The value of R_{θJA} is measured with the device in a still air environment with T_A=25° C. The power dissipation P_{DSM} and current rating I_{DSM} are based on T_{J(MAX)}=150° C, using t ≤ 10s junction-to-ambient thermal resistance.

B: The power dissipation P_D is based on T_{J(MAX)}=150° C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C: Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150° C.

D: The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

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

F: These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150° C. The SOA curve provides a single pulse rating.

G: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C.

H: The maximum current rating is limited by bond-wires.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

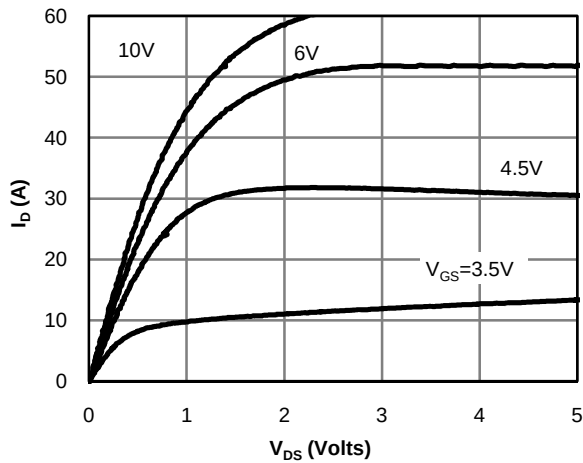


Fig 1: On-Region Characteristics

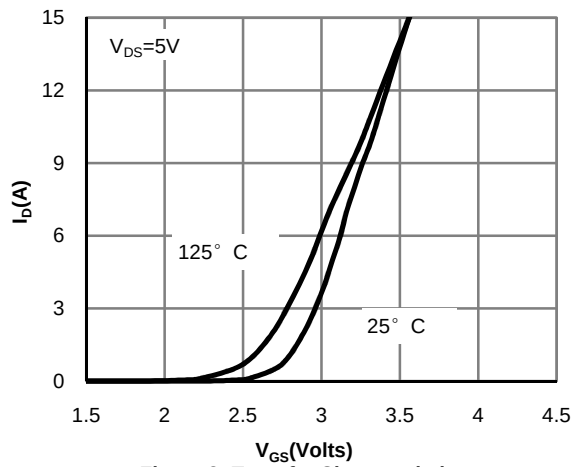


Figure 2: Transfer Characteristics

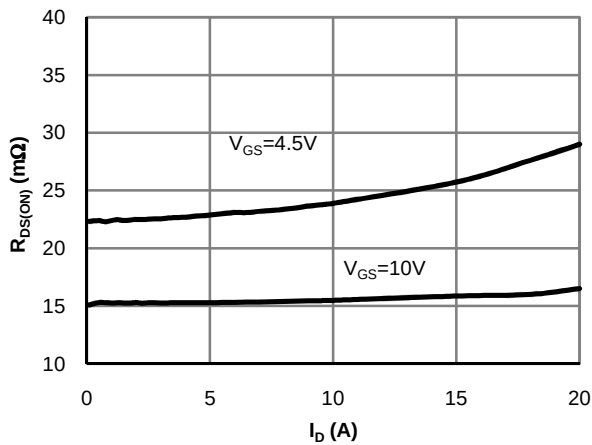


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

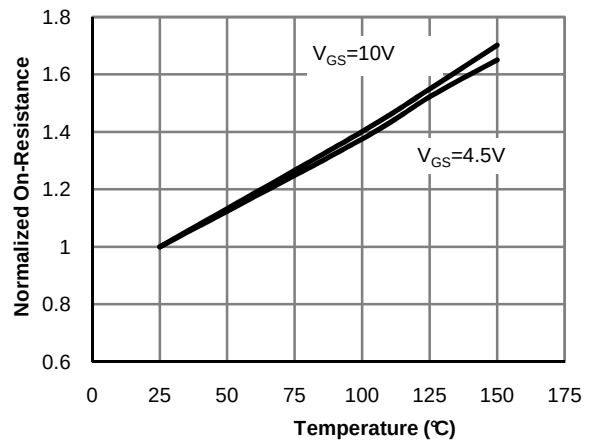


Figure 4: On-Resistance vs. Junction Temperature

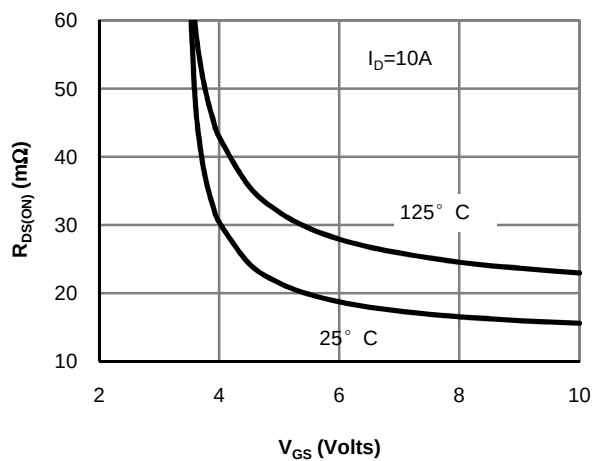


Figure 5: On-Resistance vs. Gate-Source Voltage

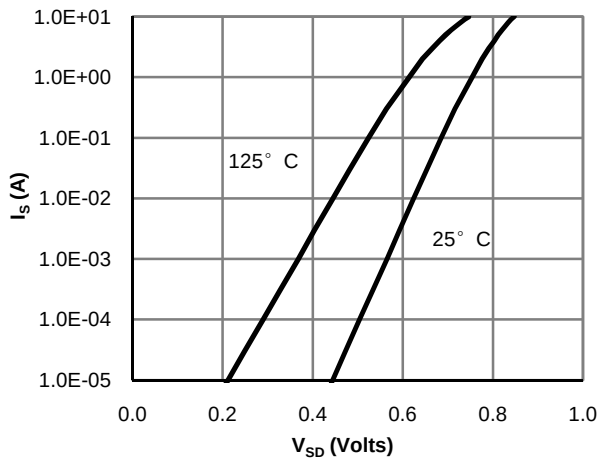


Figure 6: Body-Diode Characteristics

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