AON7408
N-Channel Enhancement Mode Field Effect Transistor

General Description

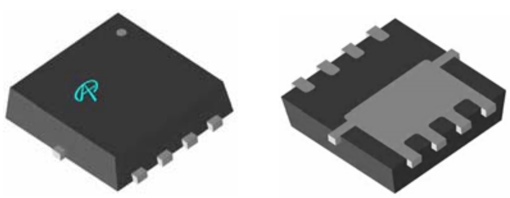
The AON7408 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in general purpose applications. *Standard Product AON7408 is Pb-free (meets ROHS & Sony 259 specifications).*

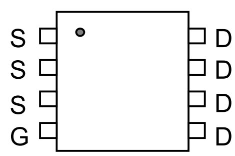
Features

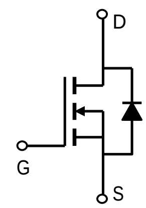
V_{DS} (V) = 30V
I_D = 9A (V$_{GS}$ = 10V)
$R_{DS(ON)}$ < 22mΩ (V_{GS} = 10V)
$R_{DS(ON)}$ < 34mΩ (V_{GS} = 4.5V)

DFN 3x3

Top View Bottom View







Absolute Maximum Ratings T_A=25°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,H]	T_C=25°C	I_D	18	A
	T_C=100°C		15	
Pulsed Drain Current [C]		I_{DM}	50	
Continuous Drain Current [G]	T_A=25°C	I_{DSM}	9	
	T_A=70°C		7	
Power Dissipation [B]	T_C=25°C	P_D	20	W
	T_C=100°C		8.3	
Power Dissipation [A]	T_A=25°C	P_{DSM}	3.1	
	T_A=70°C		2	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Units**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	25	40	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		62	75	°C/W
Maximum Junction-to-Case [D]	Steady-State	$R_{\theta JC}$	5	6	°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	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	µA
		T_J=55°C			5	
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	1.6	3	V
$I_{D(ON)}$	On state drain current	V_{GS}=10V, V_{DS}=5V	50			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=9A		18	22	mΩ
		T_J=125°C		26	32	
		V_{GS}=4.5V, I_D=5A		27	34	
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=9A		24		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V		0.75	1	V
I_S	Maximum Body-Diode Continuous Current				4.3	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz		621	820	pF
C_{oss}	Output Capacitance			118		pF
C_{rss}	Reverse Transfer Capacitance			85		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		0.8	1.5	Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=15V, I_D=9A		6	8	nC
Q_{gs}	Gate Source Charge			2.1		nC
Q_{gd}	Gate Drain Charge			3		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=1.7Ω, R_{GEN}=3Ω		4.5		ns
t_r	Turn-On Rise Time			3.1		ns
$t_{D(off)}$	Turn-Off DelayTime			15.1		ns
t_f	Turn-Off Fall Time			2.7		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=9A, dI/dt=100A/µs		15.5	20	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=9A, dI/dt=100A/µs		7.1		nC

A: The value of $R_{\theta JA}$ 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 $R_{\theta JA}$ is the sum of the thermal impedence from junction to case $R_{\theta JC}$ 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 impedence 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 in^2 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.
Rev0: September 2007

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

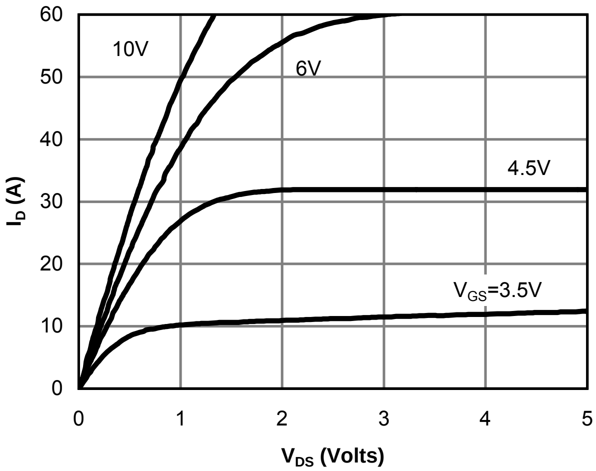


Fig 1: On-Region Characteristics

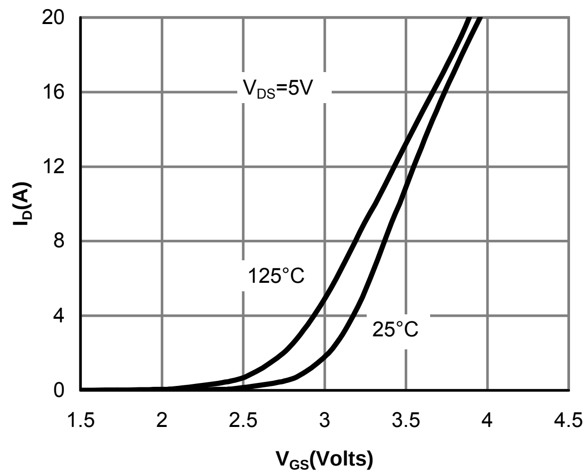


Figure 2: Transfer Characteristics

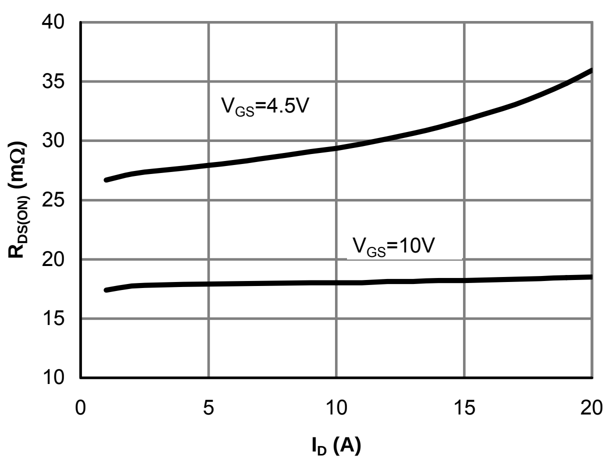


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

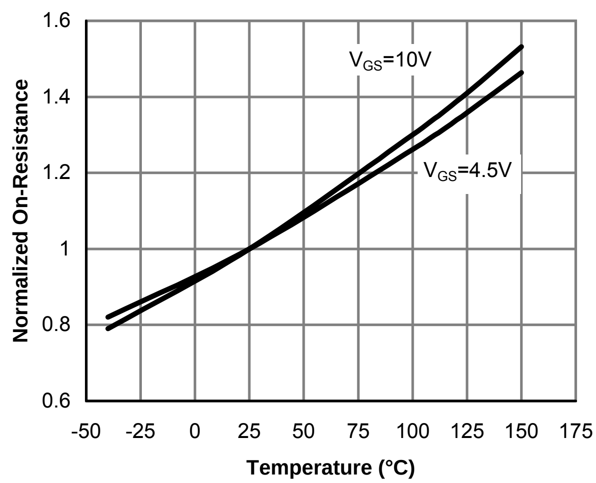


Figure 4: On-Resistance vs. Junction Temperature

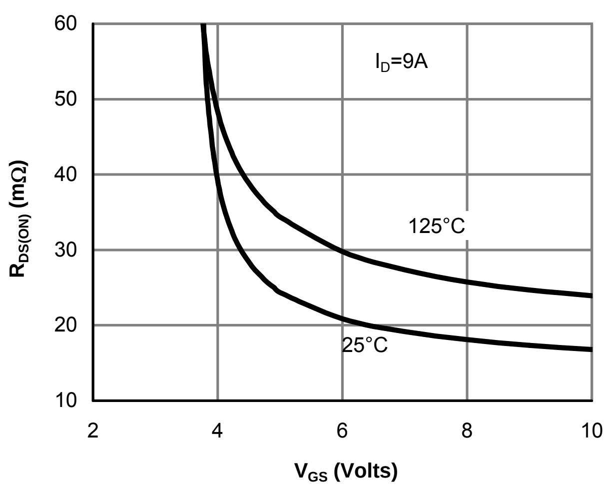


Figure 5: On-Resistance vs. Gate-Source Voltage

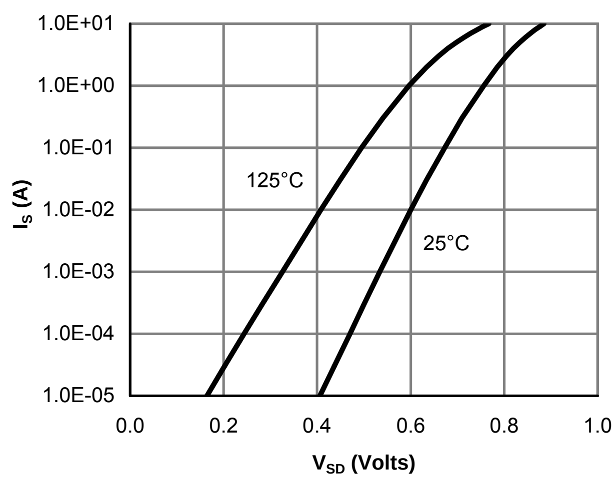


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

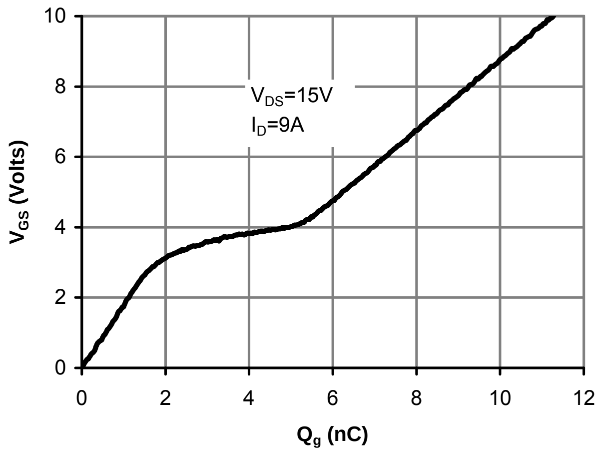


Figure 7: Gate-Charge Characteristics

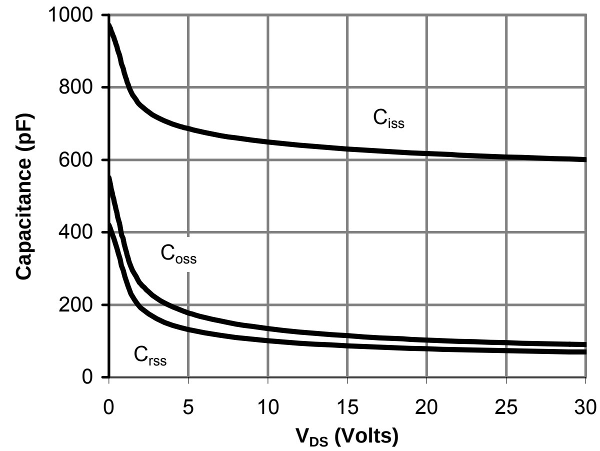


Figure 8: Capacitance Characteristics

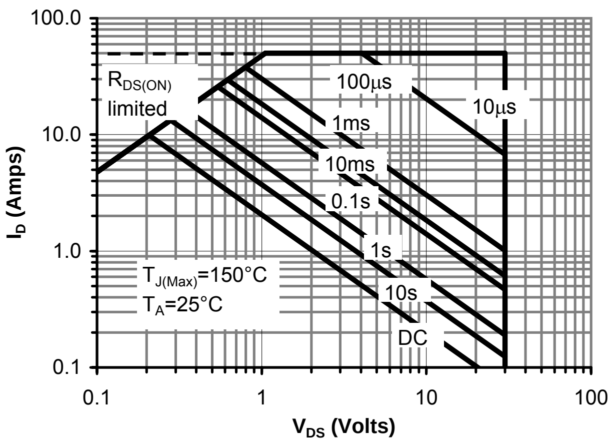


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

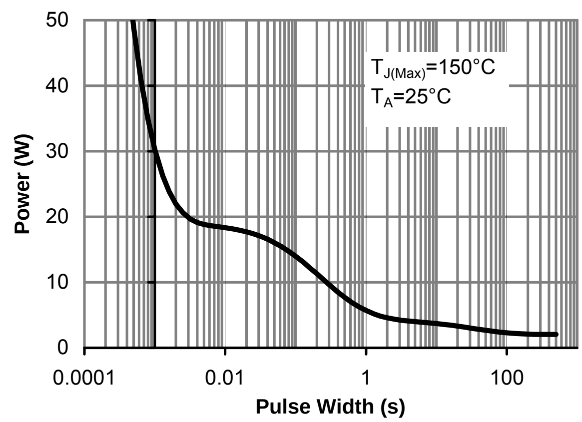


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

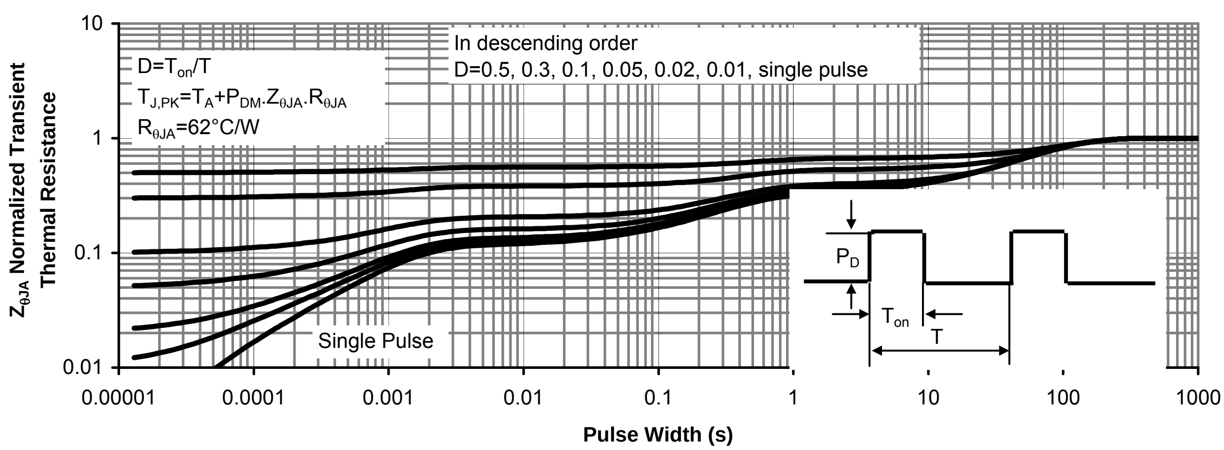


Figure 11: Normalized Maximum Transient Thermal Impedance