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AON7408

30V N-Channel MOSFET

General Description

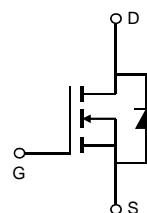
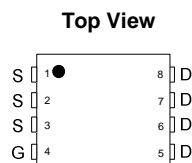
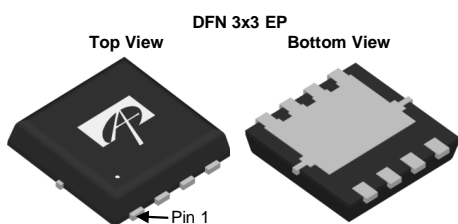
- The AON7408 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in general purpose applications.

- RoHS and Halogen-Free Compliant

Product Summary

V_{DS}	30V
I_D (at $V_{GS}=10V$)	18A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 20m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	< 32m Ω

100% UIS Tested
100% R_g Tested



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}	± 20	V
Continuous Drain Current ^B	$T_C=25^\circ C$	18	A
	$T_C=100^\circ C$	11.5	
Pulsed Drain Current ^C	I_{DM}	64	
Continuous Drain Current ^A	$T_A=25^\circ C$	10	A
	$T_A=70^\circ C$	8	
Power Dissipation ^B	$T_C=25^\circ C$	11	W
	$T_C=100^\circ C$	4.5	
Power Dissipation ^A	$T_A=25^\circ C$	3.1	W
	$T_A=70^\circ C$	2	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	25	40	$^\circ C/W$
Maximum Junction-to-Ambient ^A		Steady-State	62	75
Maximum Junction-to-Case ^B	$R_{\theta JC}$	8.8	11	$^\circ C/W$

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 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		15.3	20	mΩ
		V _{GS} =4.5V, I _D =5A		22.7	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				12	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	0.6	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
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_{DSSM} and current rating I_{DSSM} 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

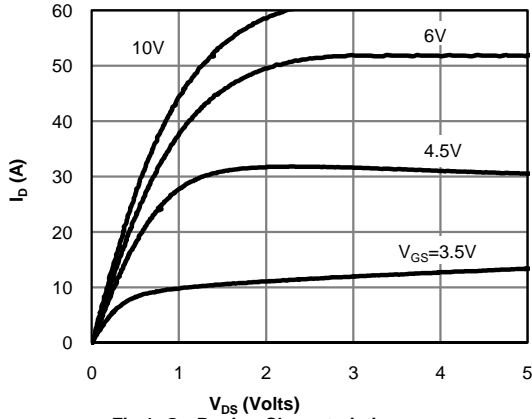


Figure 1: On-Region Characteristics

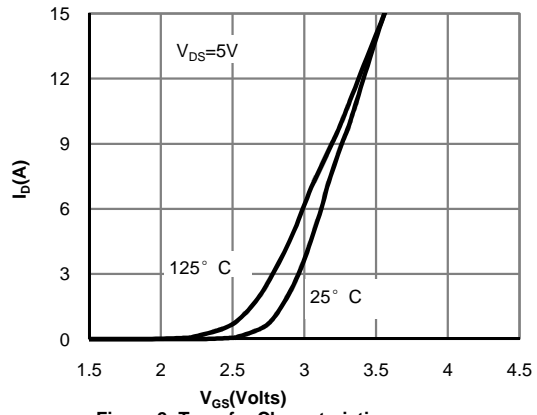


Figure 2: Transfer Characteristics

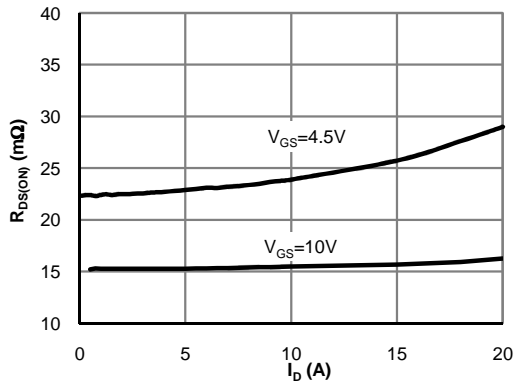


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

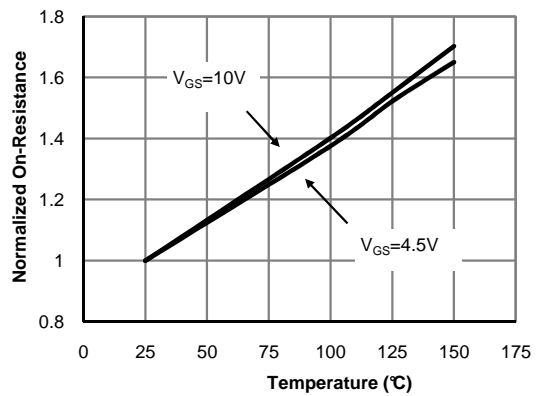


Figure 4: On-Resistance vs. Junction Temperature

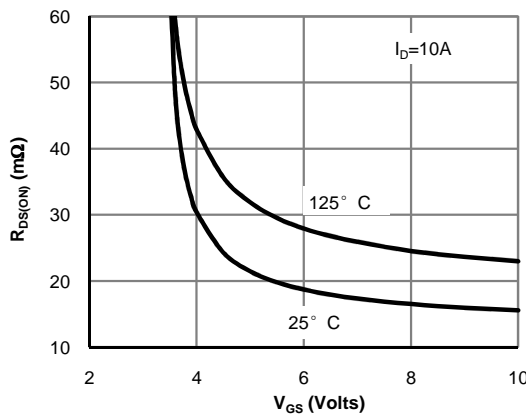


Figure 5: On-Resistance vs. Gate-Source Voltage

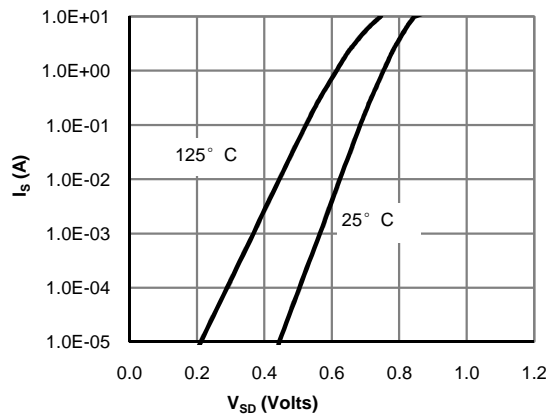


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

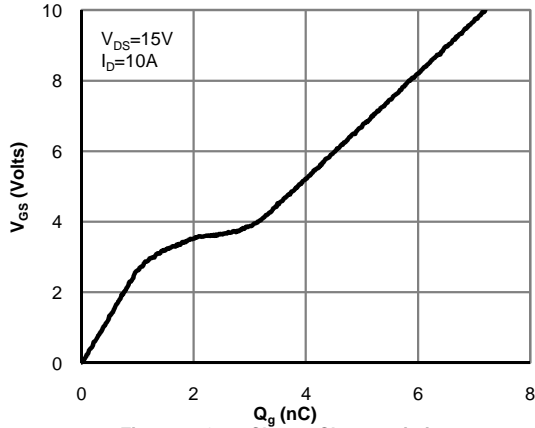


Figure 7: Gate-Charge Characteristics

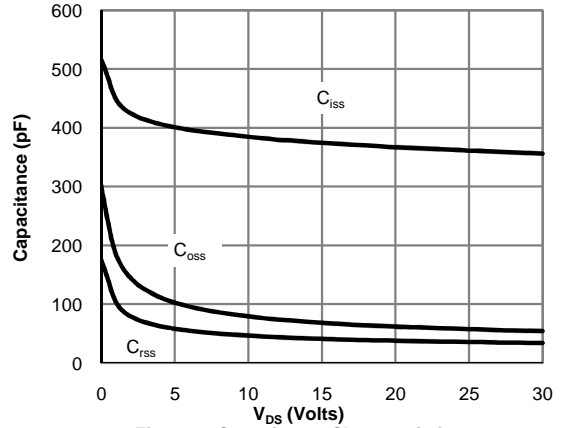


Figure 8: Capacitance Characteristics

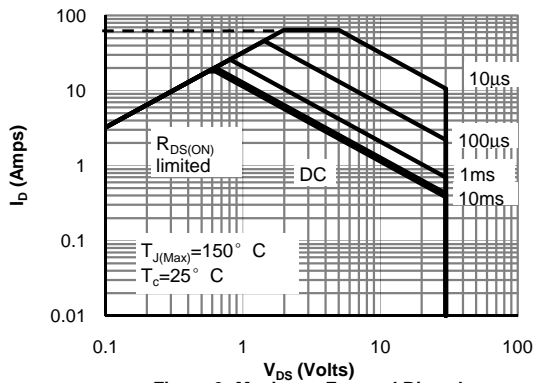


Figure 9: Maximum Forward Biased Safe Operating Area (Note H)

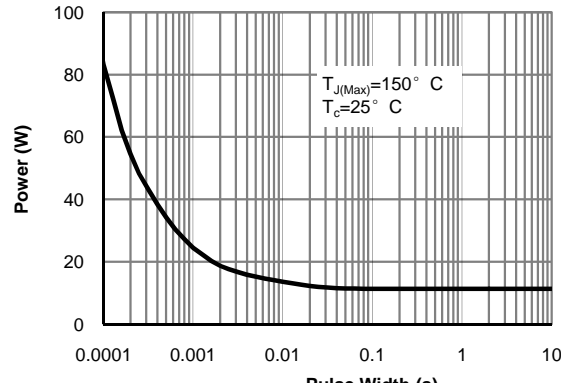


Figure 10: Single Pulse Power Rating Junction-to-Cz (Note F)

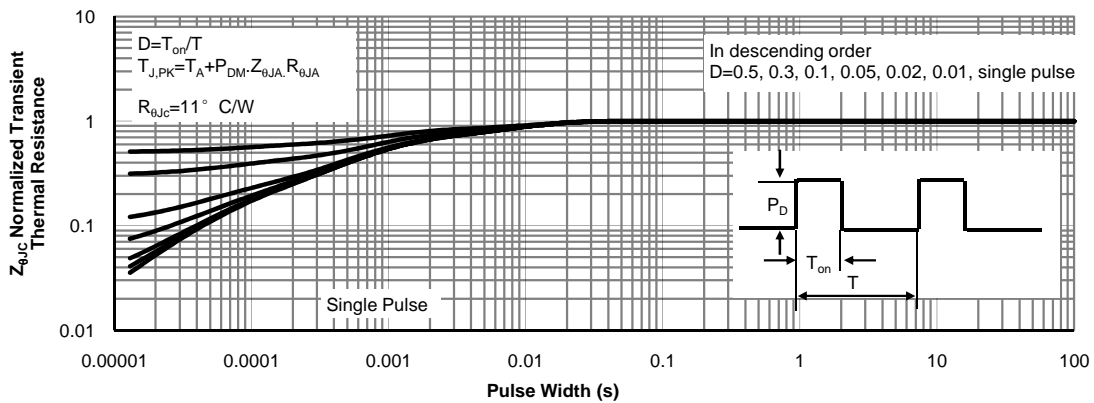


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

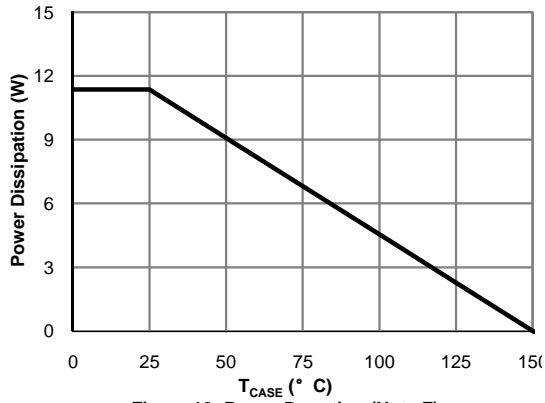


Figure 12: Power De-rating (Note F)

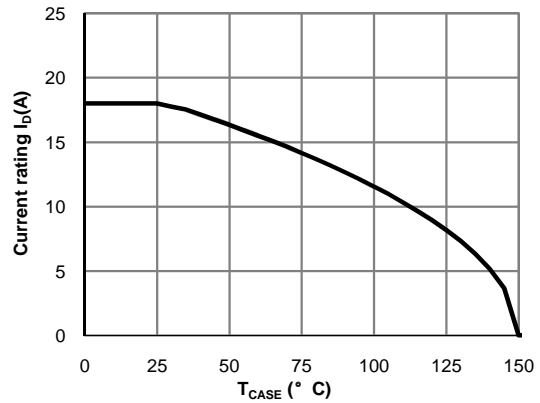


Figure 13: Current De-rating (Note F)

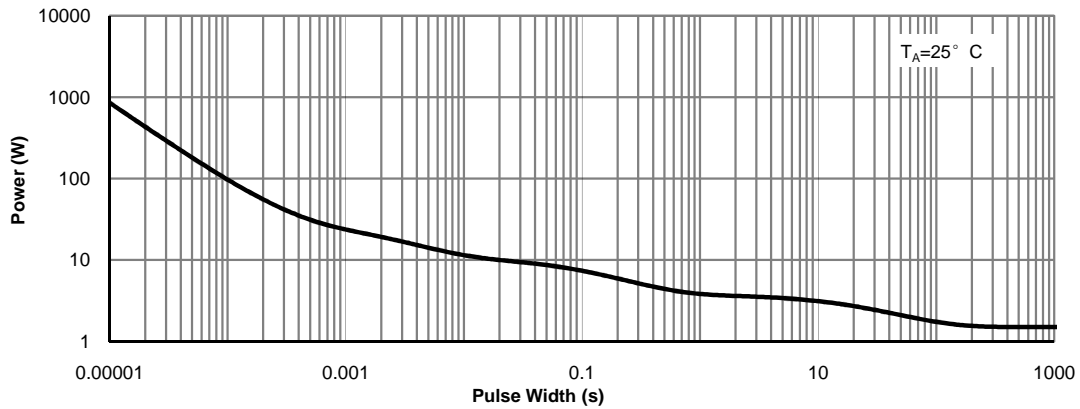


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

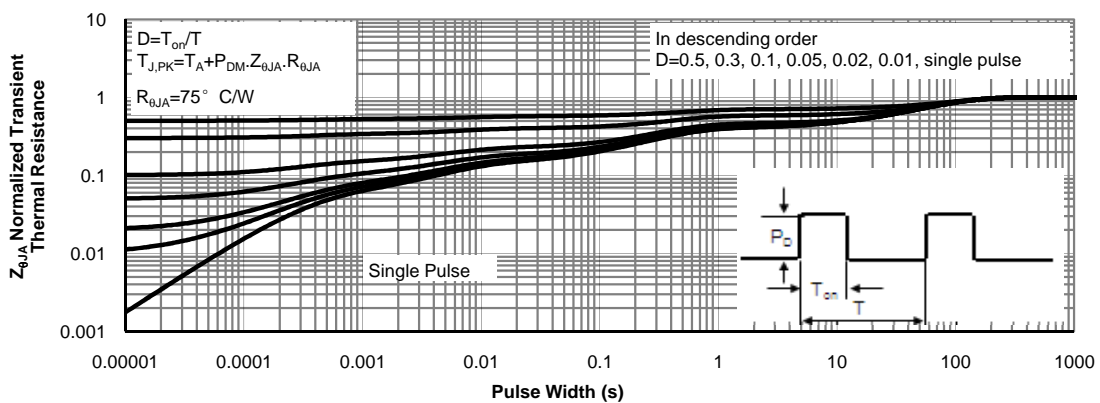
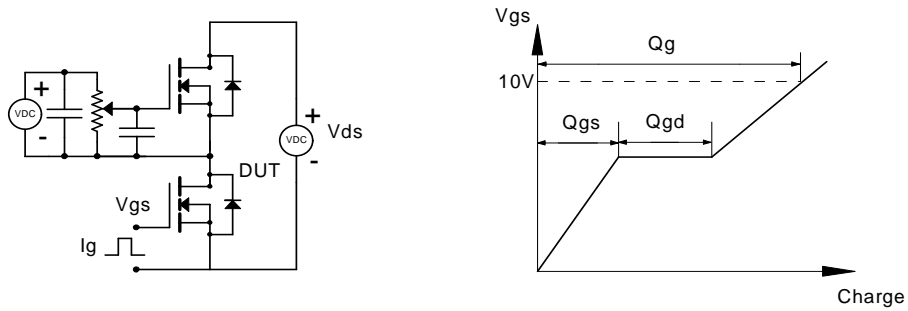
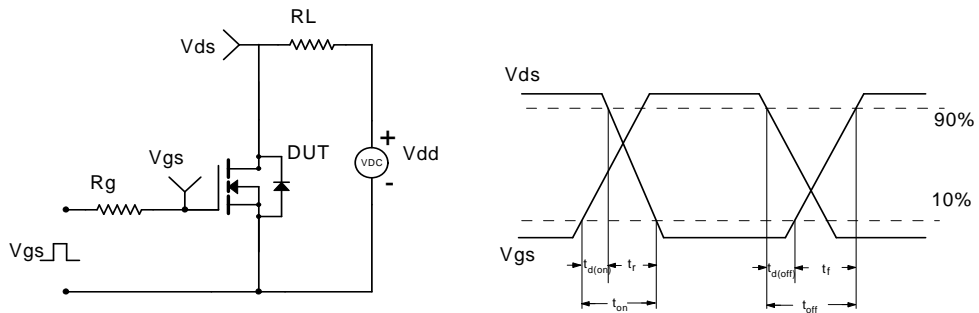


Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

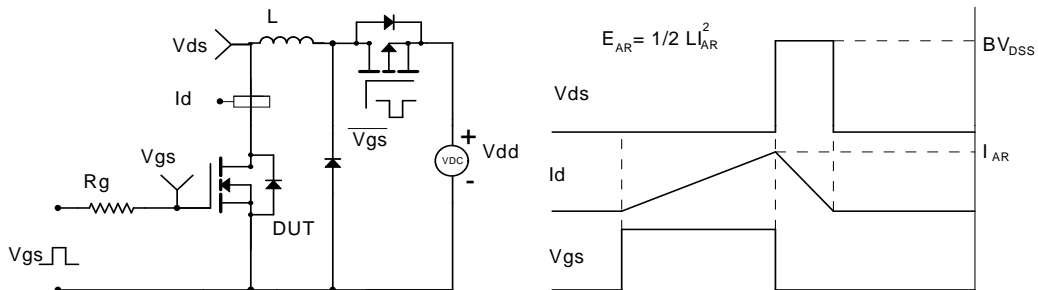
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

