



AON7403

P-Channel Enhancement Mode Field Effect Transistor



General Description

The AON7403/L uses advanced trench technology to provide excellent $R_{DS(ON)}$, and ultra-low low gate charge with a 25V gate rating. This device is suitable for use as a load switch or in PWM applications. AON7403 and AON7403L are electrically identical.

-RoHS Compliant

-AON7403L is Halogen Free

Features

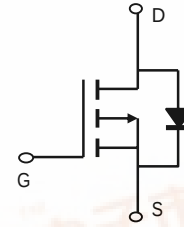
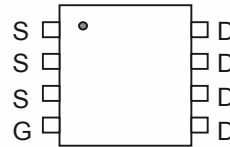
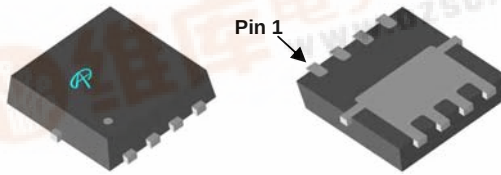
V_{DS} (V) = -30V

I_D = -8A (V_{GS} = -10V)

$R_{DS(ON)}$ < 18m Ω (V_{GS} = -10V)

$R_{DS(ON)}$ < 36m Ω (V_{GS} = -4.5V)

Top View Bottom View



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}	± 25	V
Continuous Drain Current ^{B,G}	I_D	-20	A
Pulsed Drain Current ^C	I_{DM}	-80	A
Continuous Drain Current	I_{DSM}	-8	A
Power Dissipation ^B	P_D	27	W
Power Dissipation ^A	P_{DSM}	1.6	W
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	$R_{\theta JA}$	30	40	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	60	75	$^\circ\text{C/W}$
Maximum Junction-to-Case ^D	$R_{\theta JC}$	4	4.5	$^\circ\text{C/W}$

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} = ±25V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.7	-2.2	-3	V
I _{D(ON)}	On state drain current	V _{GS} =-10V, V _{DS} =-5V	-80			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-8A T _J =125°C		14 20	18 25	mΩ
		V _{GS} =-4.5V, I _D =-6A		26	36	
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-10A		21		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.7	-1	V
I _S	Maximum Body-Diode Continuous Current				-3	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz		1130	1400	pF
C _{oss}	Output Capacitance			240		pF
C _{rss}	Reverse Transfer Capacitance			155		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		5.8	8	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-8A		18	24	nC
Q _{gs}	Gate Source Charge			5.5		nC
Q _{gd}	Gate Drain Charge			3.3		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =-10V, V _{DS} =-15V, R _L =1.8Ω, R _{GEN} =3Ω		8.7		ns
t _r	Turn-On Rise Time			8.5		ns
t _{D(off)}	Turn-Off DelayTime			18		ns
t _f	Turn-Off Fall Time			7		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-8A, dI/dt=500A/μs		12	16	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-8A, dI/dt=500A/μs		26		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 steady state 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 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.

The SOA curve provides a single pulse rating.

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

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

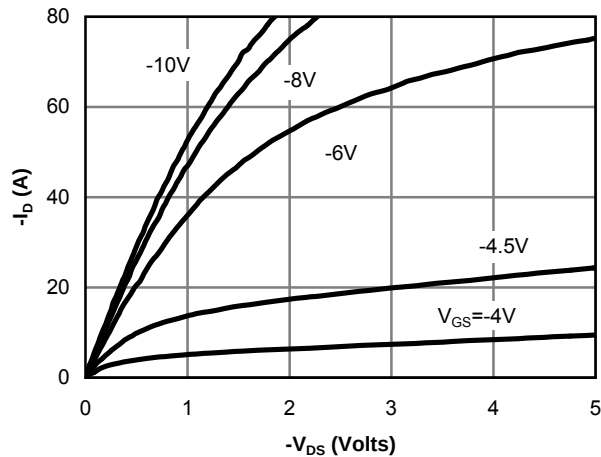


Figure 1: On-Region Characteristics

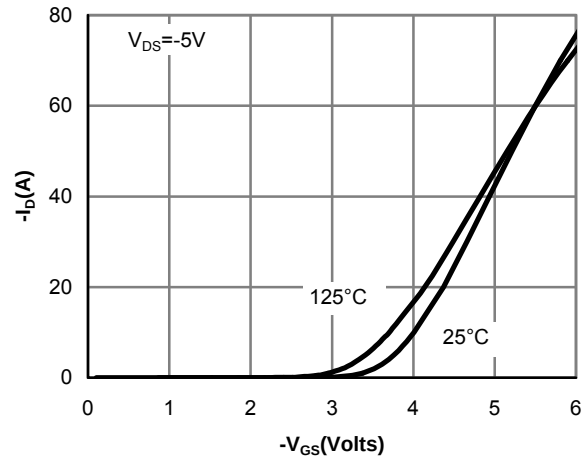


Figure 2: Transfer Characteristics

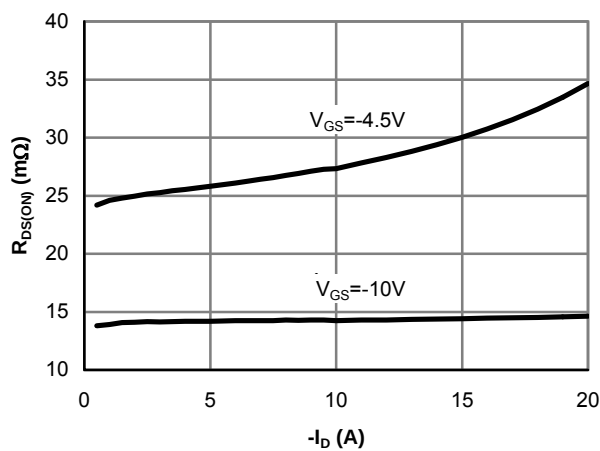


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

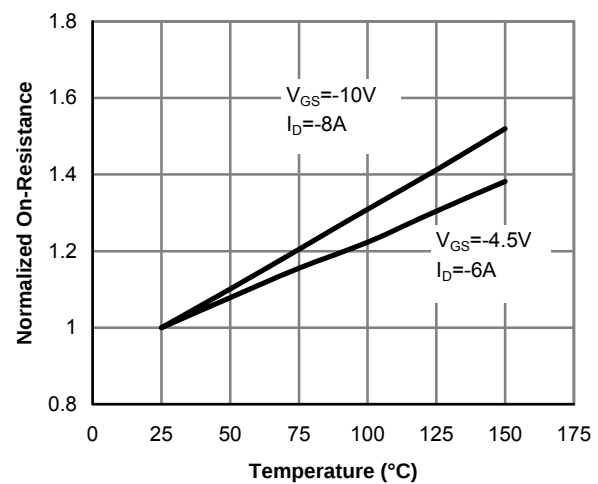


Figure 4: On-Resistance vs. Junction Temperature

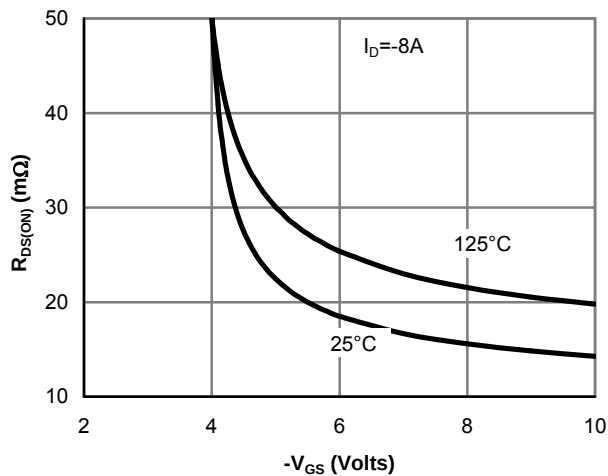


Figure 5: On-Resistance vs. Gate-Source Voltage

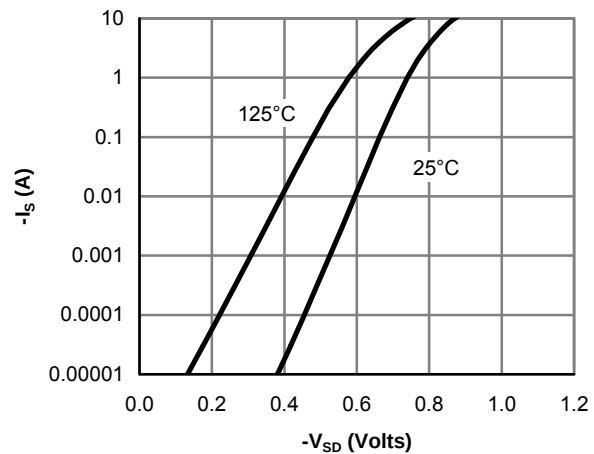


Figure 6: Body-Diode Characteristics

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