

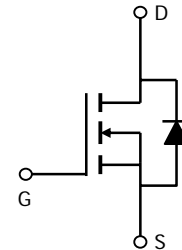
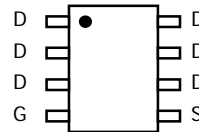
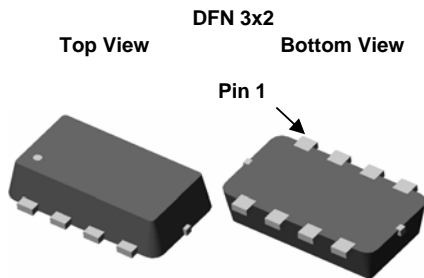
AON4420L
N-Channel Enhancement Mode Field Effect Transistor
General Description

The AON4420L combines advanced trench MOSFET technology with a small footprint package to provide low $R_{DS(ON)}$ per unit area. This device is ideal for load switch and high speed switching applications.

- RoHS Compliant
- Halogen Free

Features

V_{DS} (V) = 30V
 I_D = 10A ($V_{GS} = 10V$)
 $R_{DS(ON)} < 19m\Omega$ ($V_{GS} = 10V$)
 $R_{DS(ON)} < 25m\Omega$ ($V_{GS} = 4.5V$)


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
Pulsed Drain Current ^C	I_{DM}	50	
Continuous Drain Current ^A	I_D	$T_A=25^\circ\text{C}$	10
		$T_A=70^\circ\text{C}$	8
Power Dissipation ^A	P_D	$T_A=25^\circ\text{C}$	1.6
		$T_A=70^\circ\text{C}$	1
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	$R_{\theta JA}$	$t \leq 10s$	34	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A		Steady-State	66	$^\circ\text{C/W}$
Maximum Junction-to-Lead ^B	$R_{\theta JL}$	20	25	$^\circ\text{C/W}$

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	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1 5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.4	1.9	2.5	V
$I_{D(ON)}$	On state drain current	$V_{GS} = 10\text{V}, V_{DS} = 5\text{V}$	50			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{V}, I_D = 10\text{A}$ $T_J = 125^\circ\text{C}$ $V_{GS} = 4.5\text{V}, I_D = 8\text{A}$		16 27	20 26	$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{V}, I_D = 10\text{A}$		30		S
V_{SD}	Diode Forward Voltage	$I_S = 1\text{A}, V_{GS} = 0\text{V}$		0.75	1	V
I_S	Maximum Body-Diode Continuous Current				3	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1\text{MHz}$	440	550	660	pF
C_{oss}	Output Capacitance		80	110	140	pF
C_{rss}	Reverse Transfer Capacitance		35	55	80	pF
R_g	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$	2	4	6	Ω
SWITCHING PARAMETERS						
$Q_g(10\text{V})$	Total Gate Charge (10V)	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, I_D=10\text{A}$	8	9.8	12	nC
$Q_g(4.5\text{V})$	Total Gate Charge (4.5V)		4	4.6	5.5	nC
Q_{gs}	Gate Source Charge		1.5	1.8	2.2	nC
Q_{gd}	Gate Drain Charge		1.3	2.2	3	nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, R_L=1.5\Omega,$ $R_{GEN}=3\Omega$		5		ns
t_r	Turn-On Rise Time			3.2		ns
$t_{D(off)}$	Turn-Off DelayTime			24		ns
t_f	Turn-Off Fall Time			6		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=10\text{A}, dI/dt=300\text{A}/\mu\text{s}$	8	11	14	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=10\text{A}, dI/dt=300\text{A}/\mu\text{s}$	11	13	16	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: Repetitive rating, pulse width limited by junction temperature.

C: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

D: The static characteristics in Figures 1 to 6 are obtained using $t \leq 300\mu\text{s}$ pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The SOA curve provides a single pulse rating.

F: The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

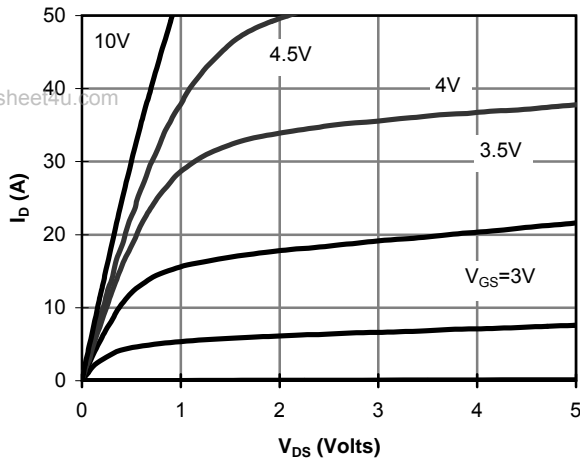


Figure 1: On-Region Characteristics

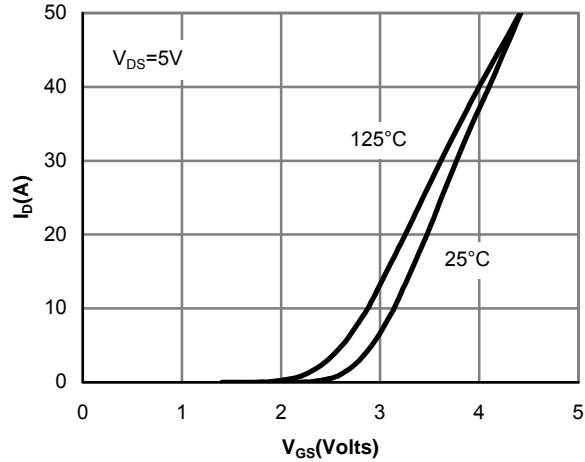


Figure 2: Transfer Characteristics

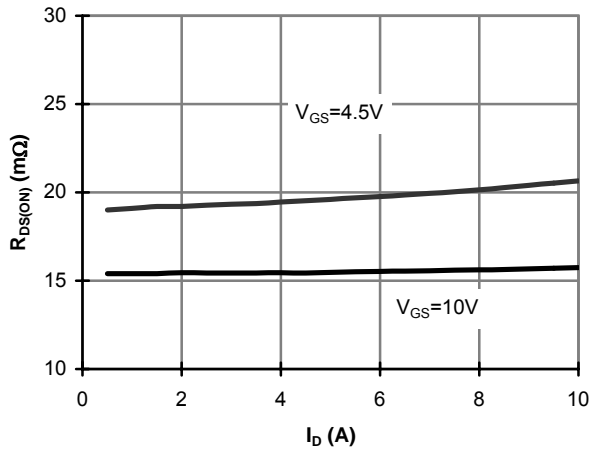


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

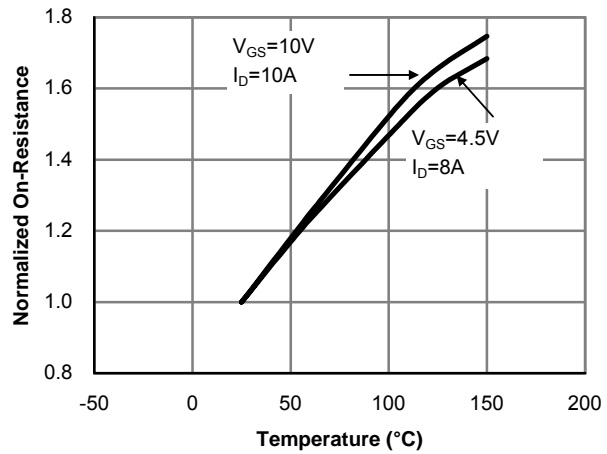


Figure 4: On-Resistance vs. Junction Temperature

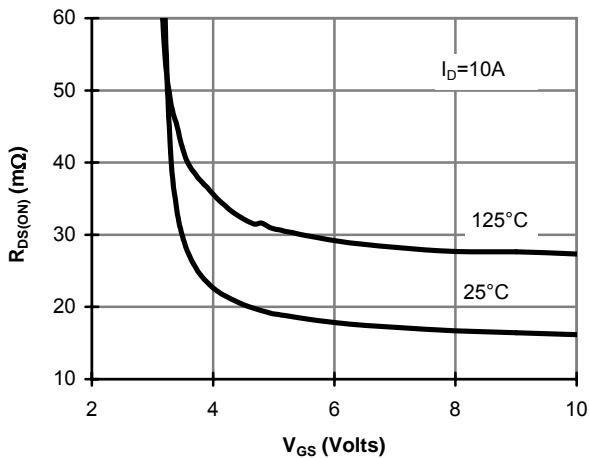


Figure 5: On-Resistance vs. Gate-Source Voltage

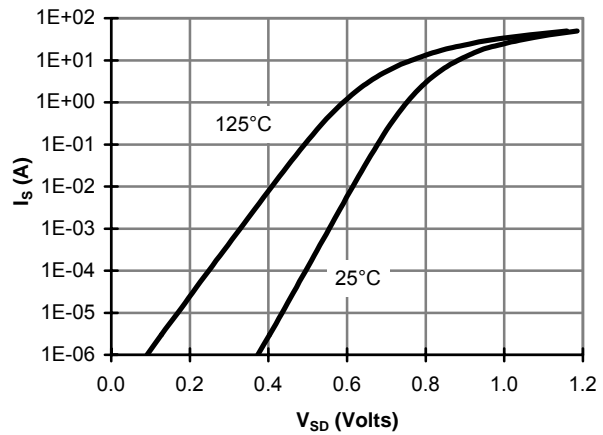


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

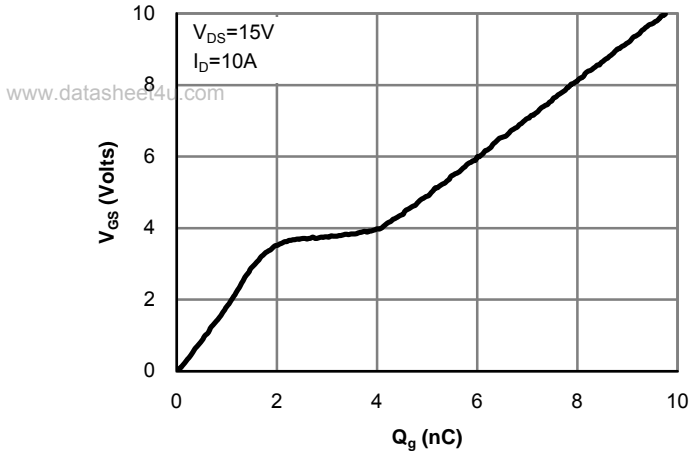


Figure 7: Gate-Charge Characteristics

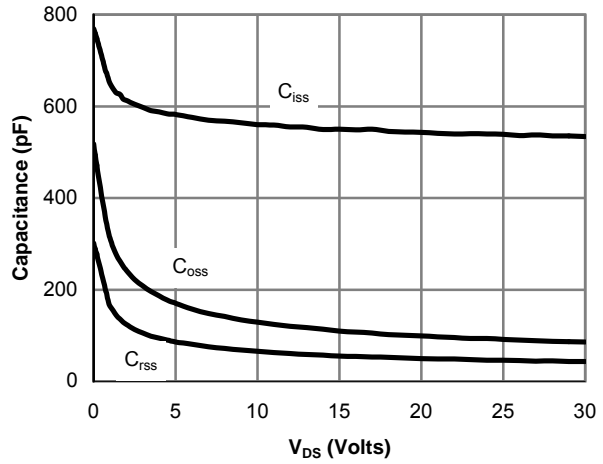


Figure 8: Capacitance Characteristics

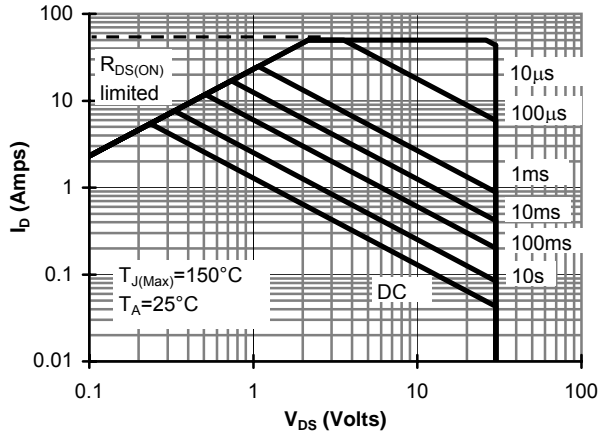


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

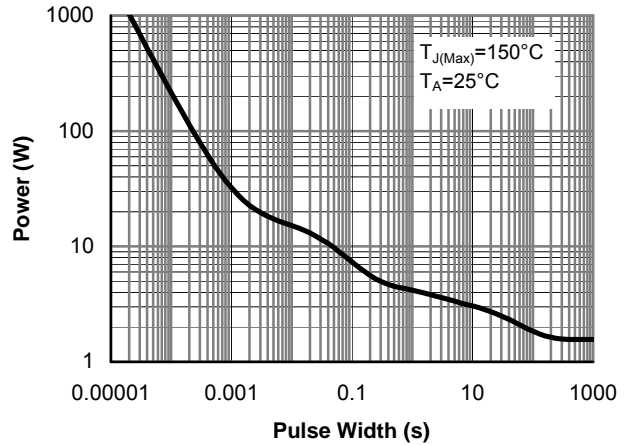


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

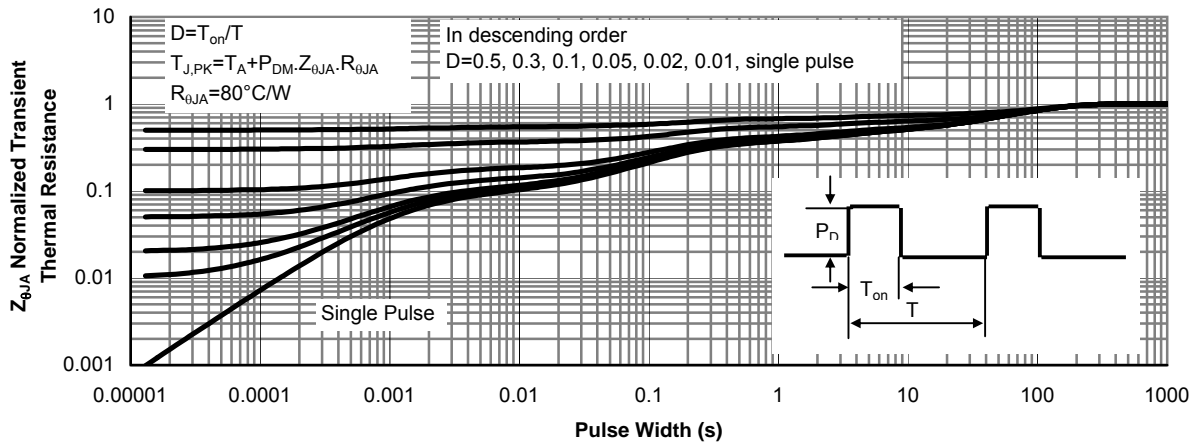
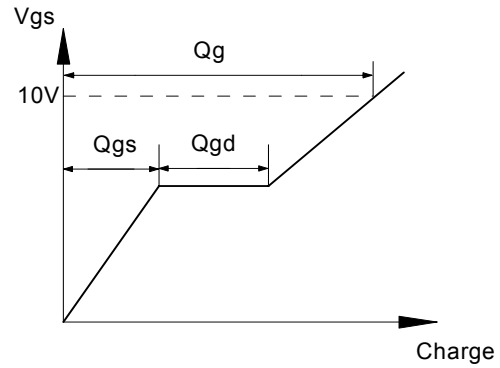
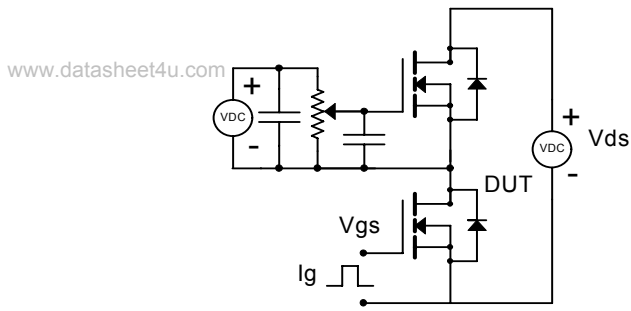
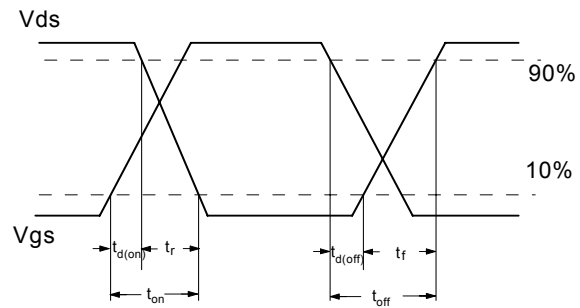
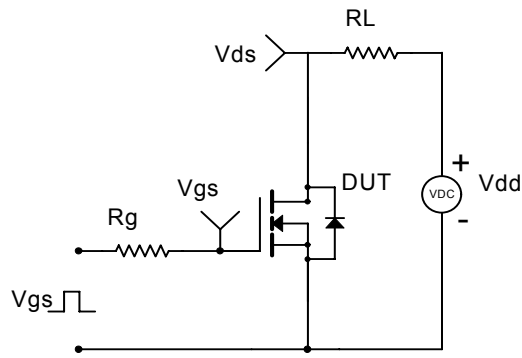


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

