



**THE DATASHEET OF
AO6420**

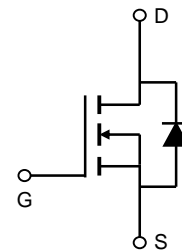
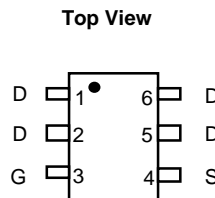
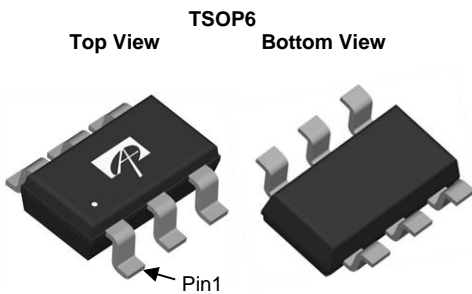


General Description

The AO6420 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

Product Summary

V_{DS} (V) = 60V
 I_D = 4.2A (V_{GS} = 10V)
 $R_{DS(ON)}$ < 60m Ω (V_{GS} = 10V)
 $R_{DS(ON)}$ < 75m Ω (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}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{A,F}	I_D	$T_A=25^\circ\text{C}$	4.2
		$T_A=70^\circ\text{C}$	3.4
Pulsed Drain Current ^B	I_{DM}	20	A
Power Dissipation	P_D	$T_A=25^\circ\text{C}$	2.00
		$T_A=70^\circ\text{C}$	1.28
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	$R_{\theta JA}$	$t \leq 10\text{s}$	48	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A		Steady-State	74	$^\circ\text{C/W}$
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	35	40	$^\circ\text{C/W}$

N Channel 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	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, 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	2.3	3	V
I _{D(ON)}	On state drain current	V _{GS} =10V, V _{DS} =5V	20			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =4.2A T _J =125°C		50 85	60	mΩ
		V _{GS} =4.5V, I _D =3A		60	75	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =4.2A		13		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.78	1	V
I _S	Maximum Body-Diode Continuous Current				3	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, f=1MHz		450	540	pF
C _{oss}	Output Capacitance			60		pF
C _{rss}	Reverse Transfer Capacitance			25		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.65	2	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =4.2A		9.5	11.5	nC
Q _g (4.5V)	Total Gate Charge			4.3	5.5	nC
Q _{gs}	Gate Source Charge			1.6		nC
Q _{gd}	Gate Drain Charge			2.2		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =30V, R _L =7Ω, R _{GEN} =3Ω		5.1	7	ns
t _r	Turn-On Rise Time			2.6	4	ns
t _{D(off)}	Turn-Off DelayTime			15.9	20	ns
t _f	Turn-Off Fall Time			2	3	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =4.2A, dI/dt=100A/μs		25.1	35	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =4.2A, dI/dt=100A/μs		28.7		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

D: The static characteristics in Figures 1 to 6 are obtained using <300 μs 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° C. The SOA curve provides a single pulse rating.

F: The current rating is based on the t ≤ 10s thermal resistance rating.

APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO MAKE CHANGES TO PRODUCT SPECIFICATIONS WITHOUT NOTICE. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO EVALUATE SUITABILITY OF THE PRODUCT FOR THEIR INTENDED APPLICATION. CUSTOMER SHALL COMPLY WITH APPLICABLE LEGAL REQUIREMENTS, INCLUDING ALL APPLICABLE EXPORT CONTROL RULES, REGULATIONS AND LIMITATIONS.

AOS' products are provided subject to AOS' terms and conditions of sale which are set forth at:

http://www.aosmd.com/terms_and_conditions_of_sale

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS: N-CANNEL

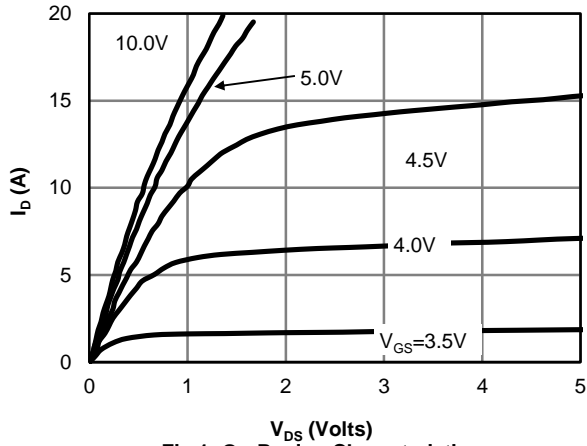


Fig 1: On-Region Characteristics

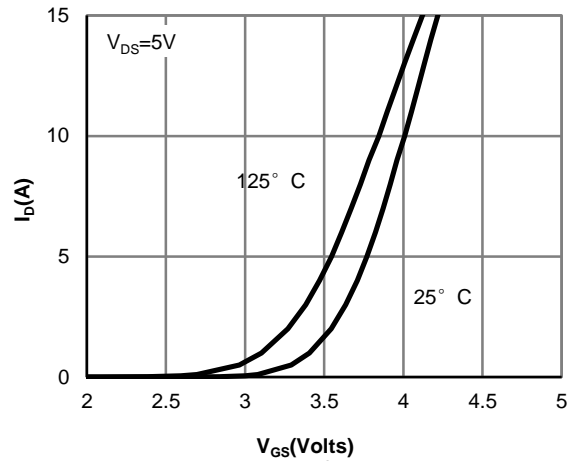


Figure 2: Transfer Characteristics

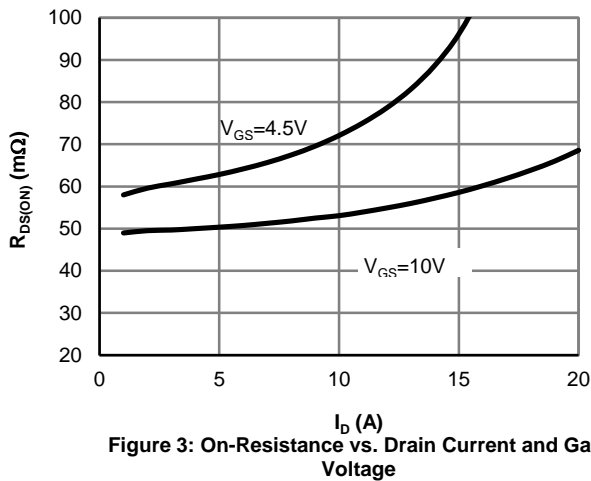


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

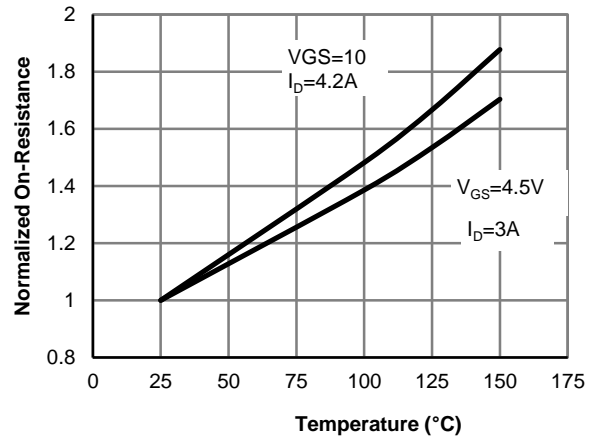


Figure 4: On-Resistance vs. Junction Temperature

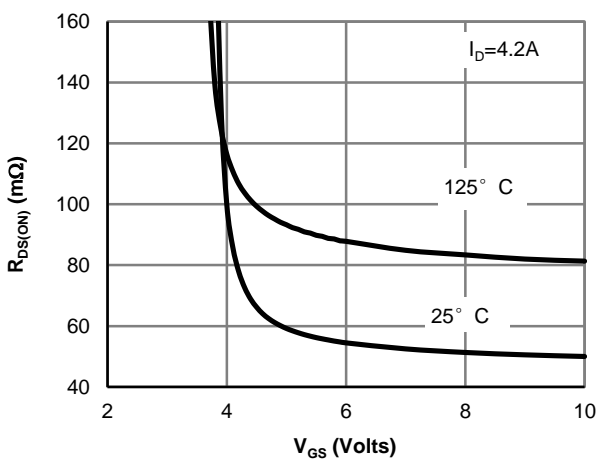


Figure 5: On-Resistance vs. Gate-Source Voltage

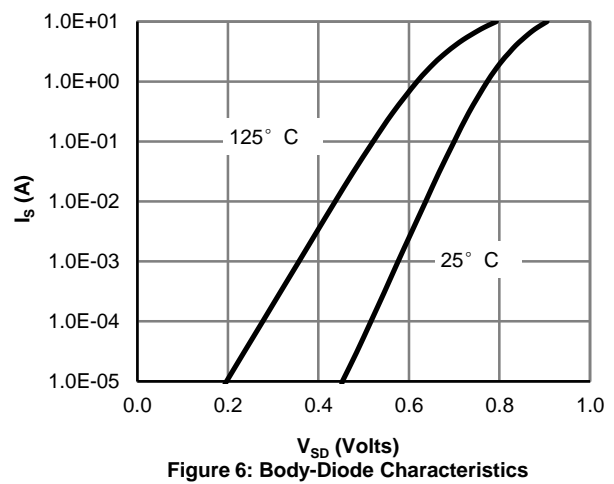


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS: N-CHANNEL

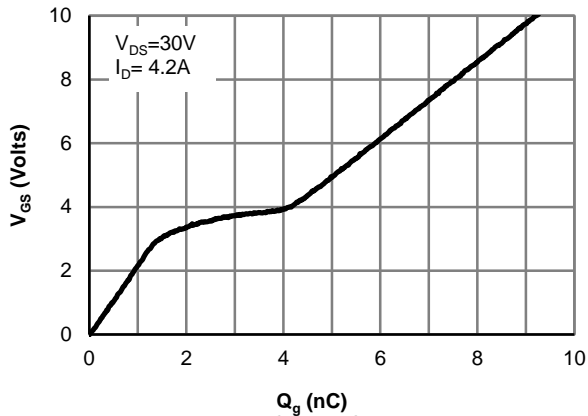


Figure 7: Gate-Charge Characteristics

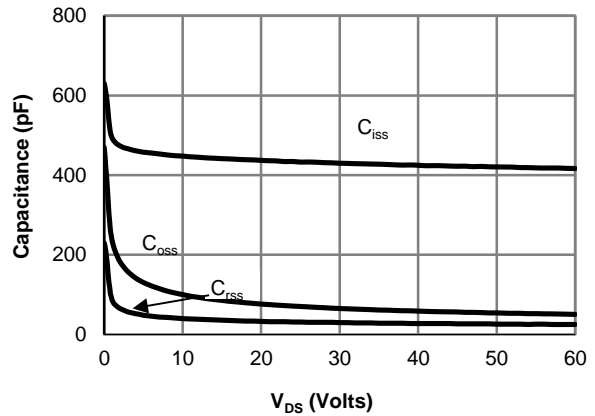


Figure 8: Capacitance Characteristics

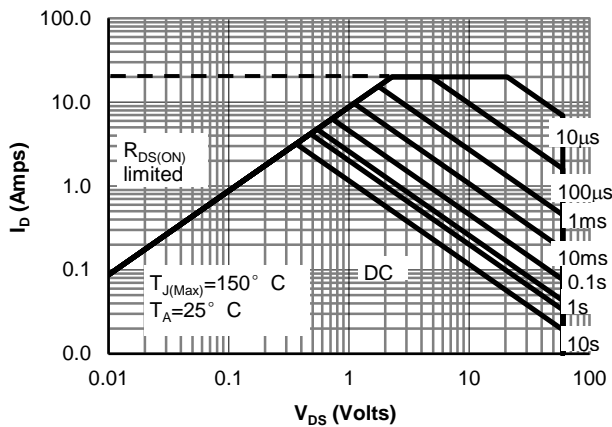


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

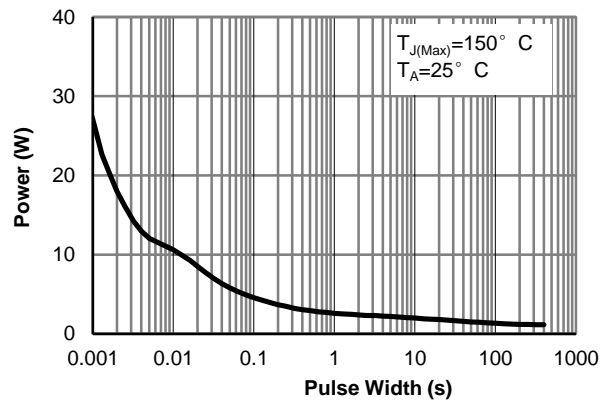


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

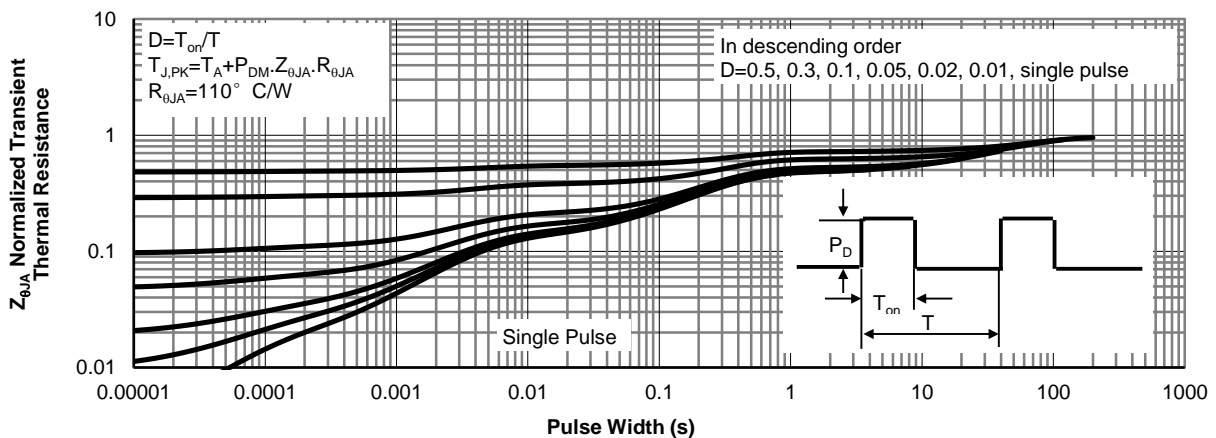










Figure 11: Normalized Maximum Transient Thermal Impedance

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View AO6420 on WIN SOURCE](#)
-  [Alpha & Omega Semiconductor Inc. Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management