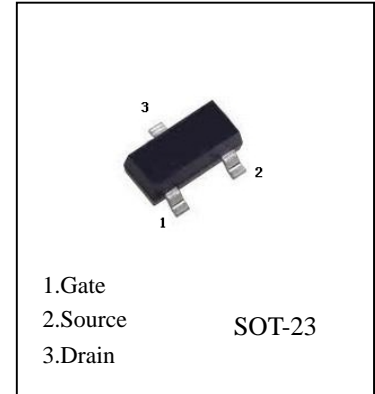
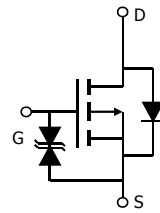


FEATURES

- The AO3415 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch applications.

AO3415

P-Channel MOSFET



Absolute Maximum Ratings (TA=25oC, unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±8	V
Continuous Drain Current	I _D	T _A =25°C	A
Current		T _A =70°C	
Pulsed Drain Current ^c	I _{DM}	-30	
Power Dissipation ^B	P _D	T _A =25°C	W
		T _A =70°C	1
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	R	65	80	°C/W
Maximum Junction-to-Ambient ^{A D}		Steady-State	85	100
Maximum Junction-to-Lead	R _{JL}	43	52	°C/W

AO3415

Electrical Characteristics (TA=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250 A, V _{GS} =0V	-20			V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V			-1	uA
		T _J =55°C			-5	
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±8V			±10	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250	-0.3	-0.57	-0.9	V
I _{D(ON)}	On state drain current	V _{GS} =-4.5V, V _{DS} =-5V	-30			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-4A		34	41	m Ω
		T _J =125°C		49	59	
		V _{GS} =-2.5V, I _D =-4A		42	53	m Ω
		V _{GS} =-1.8V, I _D =-2A		52	65	m Ω
		V _{GS} =-1.5V, I _D =-1A		61		m Ω
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-4A		20		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.64	-1	V
I _S	Maximum Body-Diode Continuous Current				-2	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, f=1MHz	600	751	905	pF
C _{oss}	Output Capacitance		80	115	150	pF
C _{rss}	Reverse Transfer Capacitance		48	80	115	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	6	13	20	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-4A	7.4	9.3	11	nC
Q _{gs}	Gate Source Charge		0.8	1	1.2	nC
Q _{gd}	Gate Drain Charge		1.3	2.2	3.1	nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =-4.5V, V _{DS} =-10V, R _L =2.5 Ω , R _{GEN} =3 Ω		13		ns
t _r	Turn-On Rise Time			9		ns
t _{D(off)}	Turn-Off DelayTime			19		ns
t _f	Turn-Off Fall Time			29		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-4A, dI/dt=500A/ us	20	26	32	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-4A, dI/dt=500A/ us	40	51	62	nC

A. The value of R_{JA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation PD is based on TJ(MAX) =150° C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature TJ(MAX) =150°C. Ratings are based on low frequency and duty cycles to keep initialTJ=25°C.

D. The R_{JA} is the sum of the thermal impedance from junction to lead R_{JL} and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of TJ(MAX) =150°C. The SOA curve provides a single pulse rating.

AO3415 Typical Characteristics

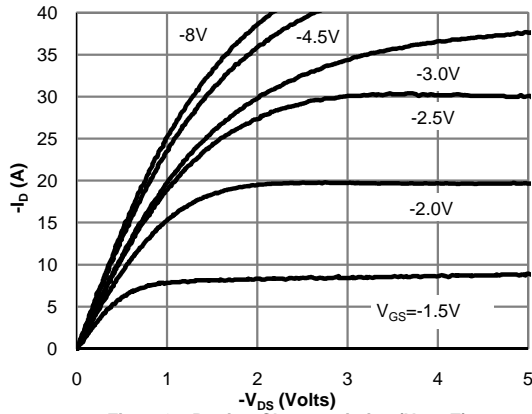


Fig 1: On-Region Characteristics (Note E)

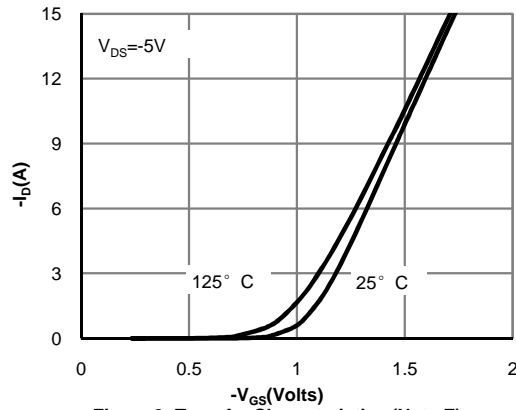


Figure 2: Transfer Characteristics (Note E)

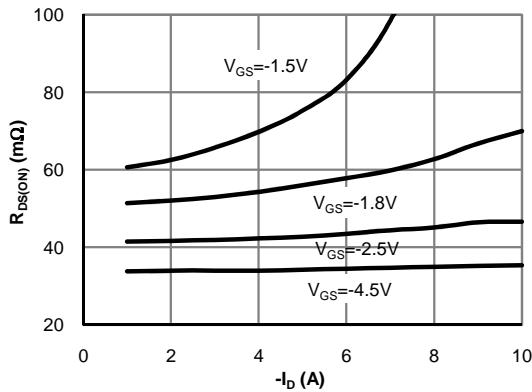


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

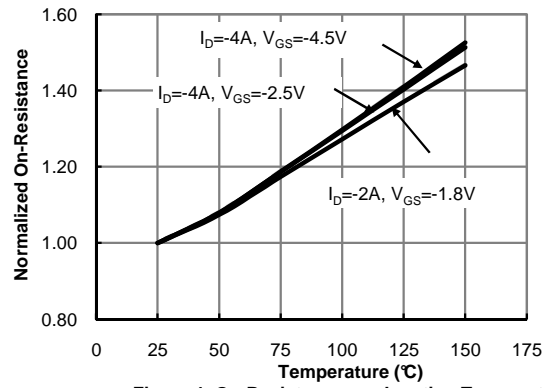


Figure 4: On-Resistance vs. Junction Temperature (Note E)

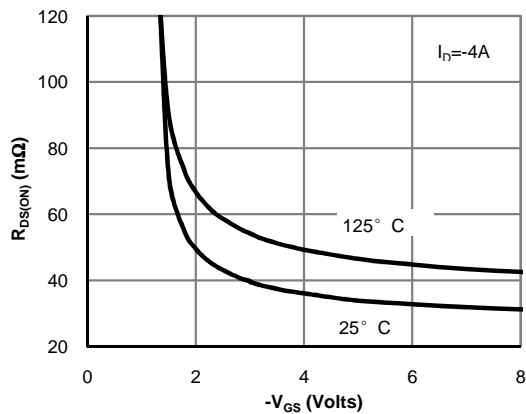


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

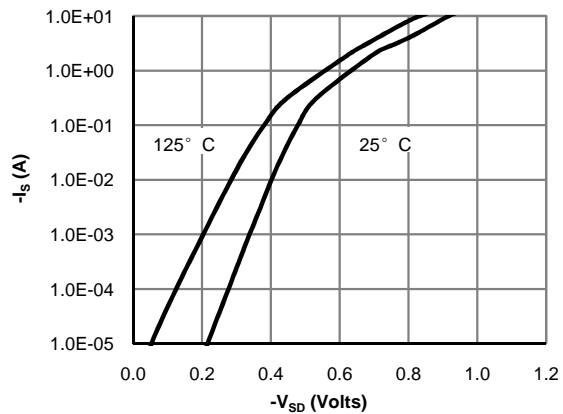


Figure 6: Body-Diode Characteristics (Note E)

AO3415 Typical Characteristics

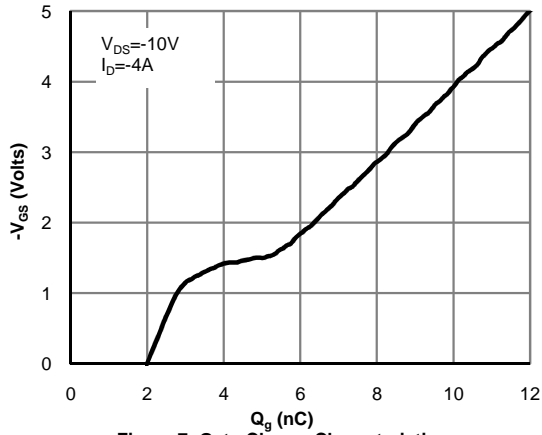


Figure 7: Gate-Charge Characteristics

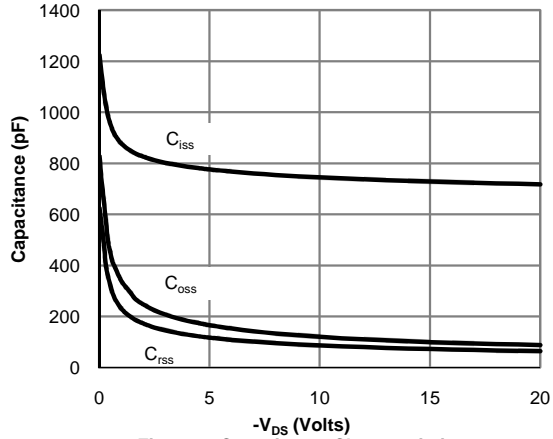


Figure 8: Capacitance Characteristics

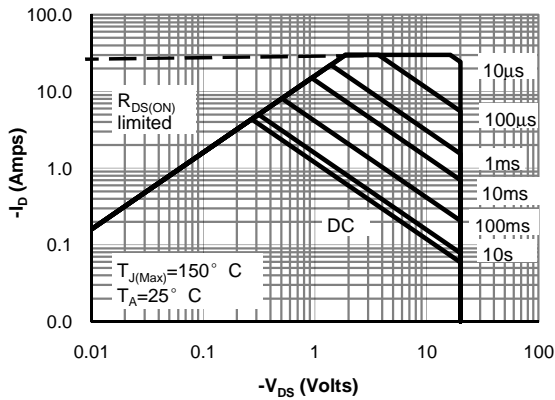


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

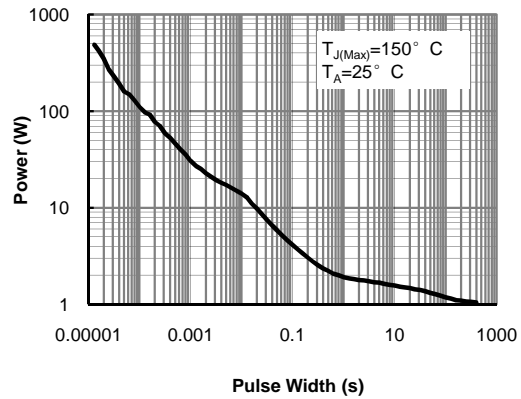


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

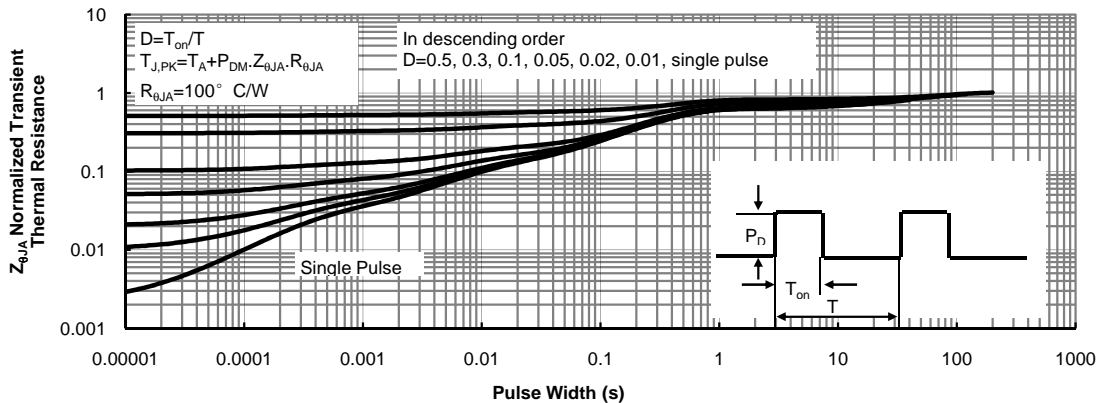


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)