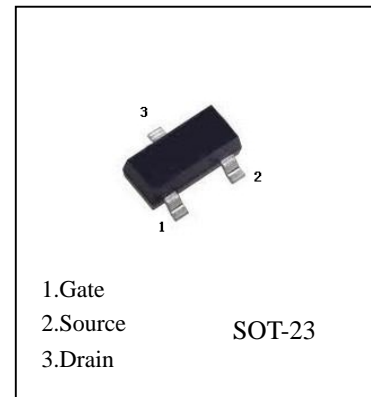
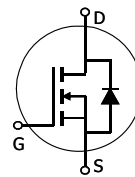


FEATURES

- The AO3402 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch applications.

AO3402
N-Channel MOSFET

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

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current ^A	I_D	$T_A=25^\circ\text{C}$	4
		$T_A=70^\circ\text{C}$	3.4
Pulsed Drain Current ^B	I_{DM}	15	A
Power Dissipation ^A	P_D	$T_A=25^\circ\text{C}$	1.4
		$T_A=70^\circ\text{C}$	1
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit	
Maximum Junction-to-Ambient ^A	R_{JA}	t = 10s	70	90	°C/W
Maximum Junction-to-Ambient ^A		Steady-State	100	125	°C/W
Maximum Junction-to-Lead ^C	R_{JL}	Steady-State	63	80	°C/W

AO3402

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250 A, V _{GS} =0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V			1	uA
		T _J =55°C			5	
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±12V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D =250 A	0.6	1	1.4	V
I _{D(ON)}	On state drain current	V _{GS} =4.5V, V _{DS} =5V	10			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =4A		45	55	m
		T _J =125°C		66	80	
		V _{GS} =4.5V, I _D =3A		55	70	m
		V _{GS} =2.5V, I _D =2A		83	110	m
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =4A		8		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.8	1	V
I _S	Maximum Body-Diode Continuous Current				2.5	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		390		pF
C _{oss}	Output Capacitance			54.5		pF
C _{rss}	Reverse Transfer Capacitance			41		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		3		
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =4A		4.34		nC
Q _{gs}	Gate Source Charge			0.6		nC
Q _{gd}	Gate Drain Charge			1.38		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =3.75 Ω, R _{GEN} =6		3.3		ns
t _r	Turn-On Rise Time			1		ns
t _{D(off)}	Turn-Off DelayTime			21.7		ns
t _f	Turn-Off Fall Time			2.1		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =4A, dI/dt=100A/ us		12		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =4A, dI/dt=100A/ us		6.3		nC

A: The value of R_{JA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with TA=25°C. The value in any a 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_{JA} is the sum of the thermal impedance from junction to lead R_{JL} and lead to ambient.

D. The static characteristics in Figures 1 to 6,12,14 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 TA=25°C. The SOA curve provides a single pulse rating

AO3402 Typical Characteristics

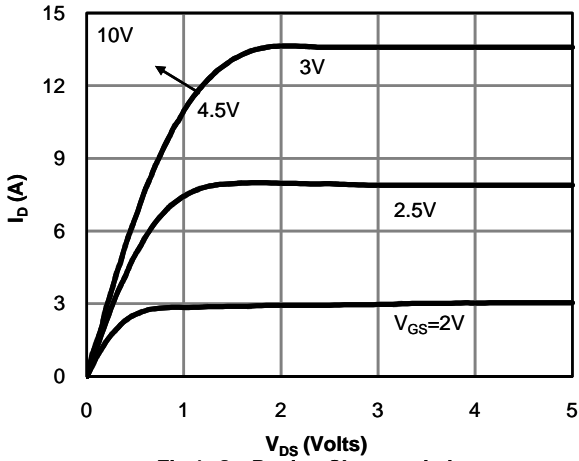


Fig 1: On-Region Characteristics

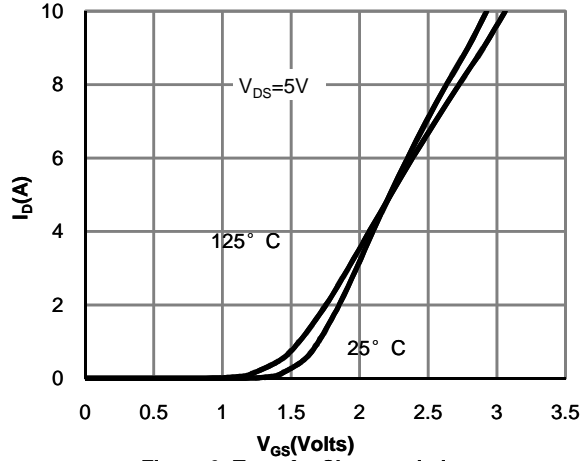


Figure 2: Transfer Characteristics

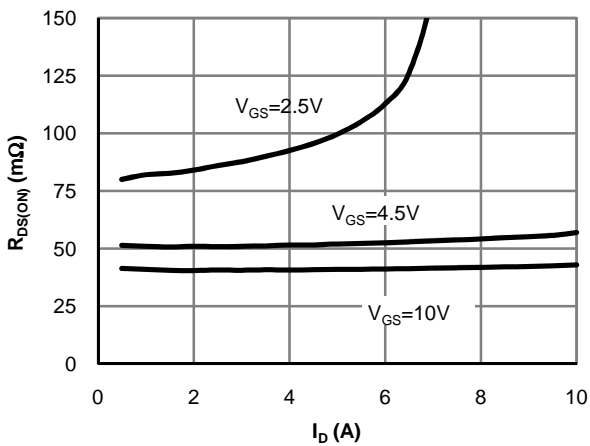


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

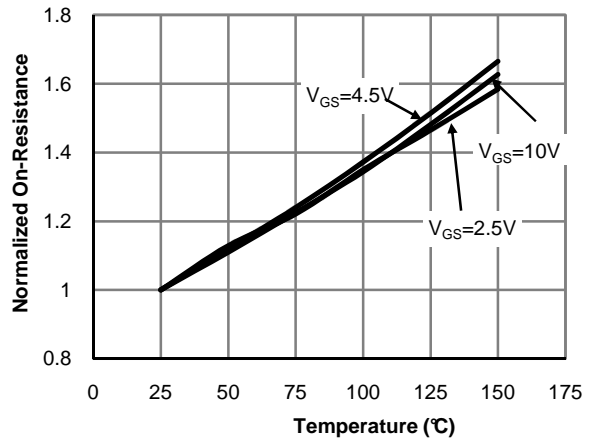


Figure 4: On-Resistance vs. Junction Temperature

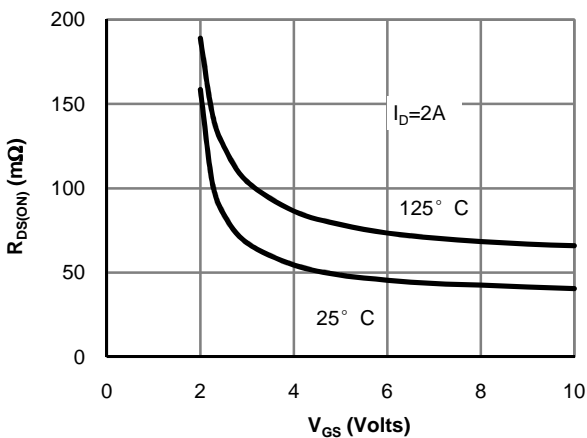


Figure 5: On-Resistance vs. Gate-Source Voltage

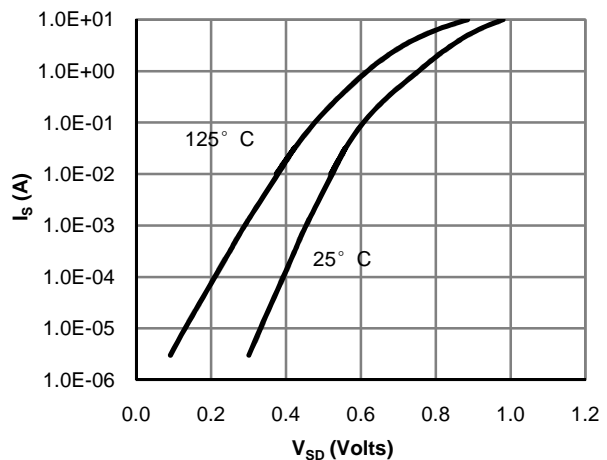


Figure 6: Body-Diode Characteristics

AO3402 Typical Characteristics

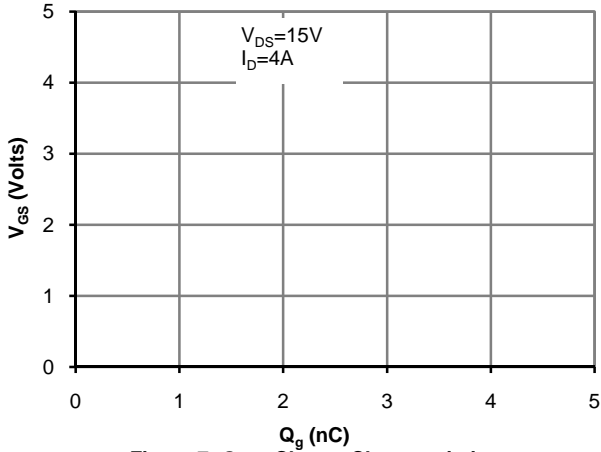


Figure 7: Gate-Charge Characteristics

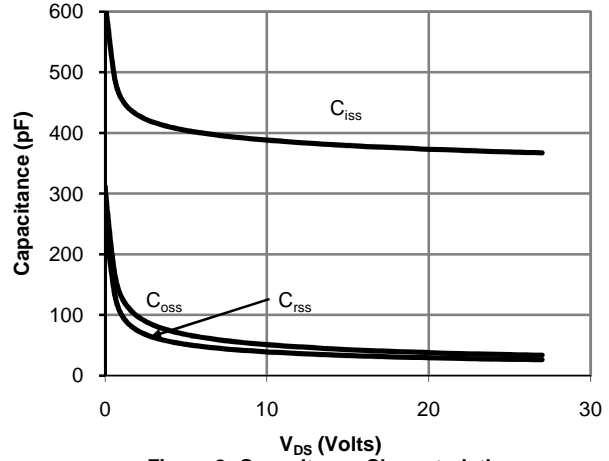


Figure 8: Capacitance Characteristics

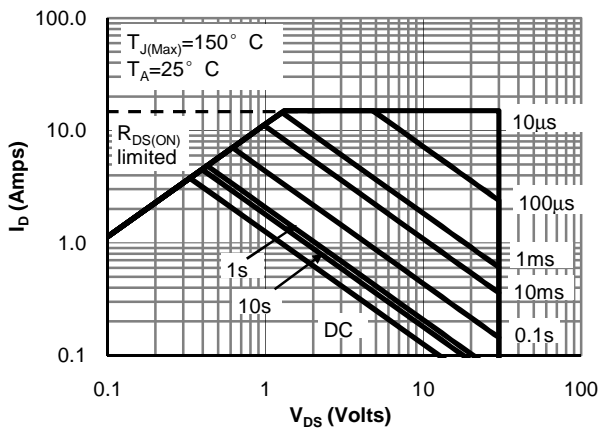


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

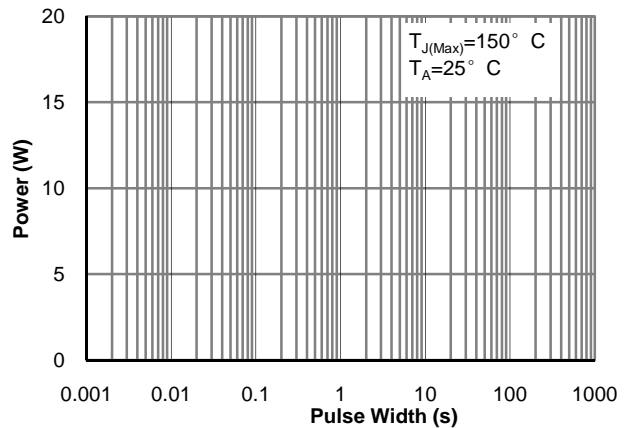


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

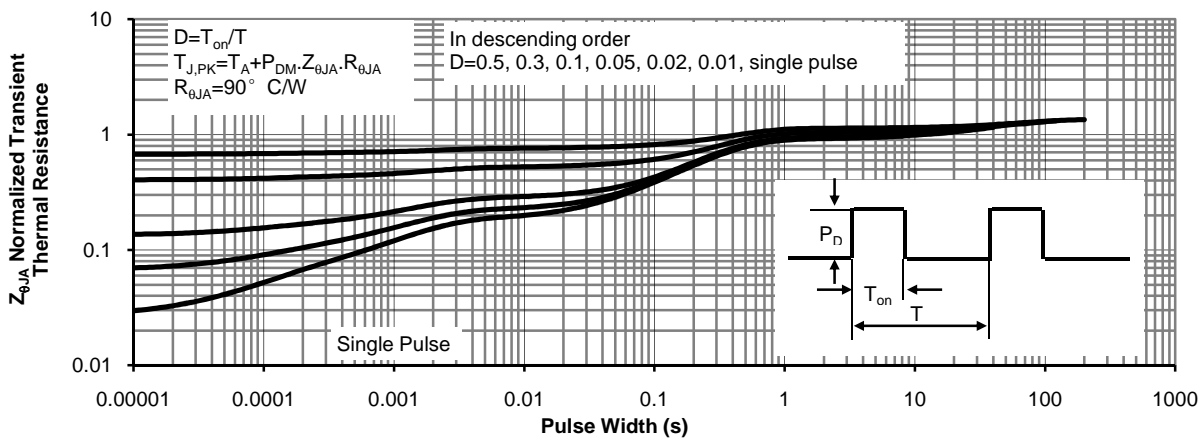


Figure 11: Normalized Maximum Transient Thermal Impedance