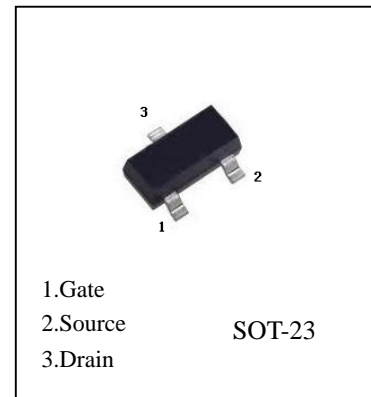
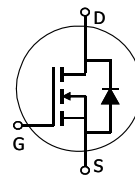


FEATURES

- 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
		$T = 70^\circ\text{C}$	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
		Steady-State	100	125
Maximum Junction-to-Lead ^C	R_{JL}	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	$I_D=250\text{ A}, V_{GS}=0V$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24V, V_{GS}=0V$			1	uA
		$T_J=55^\circ C$			5	
I_{GSS}	Gate-Body leakage current	$V_{DS}=0V, V_{GS}=\pm 12V$			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\text{ A}$	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
		$T_J=125^\circ C$		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	$V_{GS}=10V, V_{DS}=15V, R_L=3.75\ \Omega, R_{GEN}=6$		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	$I_F=4A, dI/dt=100A/\mu s$		12		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=4A, dI/dt=100A/\mu s$		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 $t \leq 10s$ 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

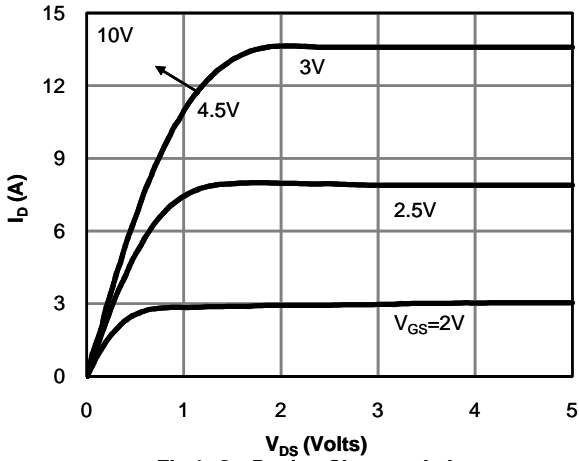


Fig 1: On-Region Characteristics

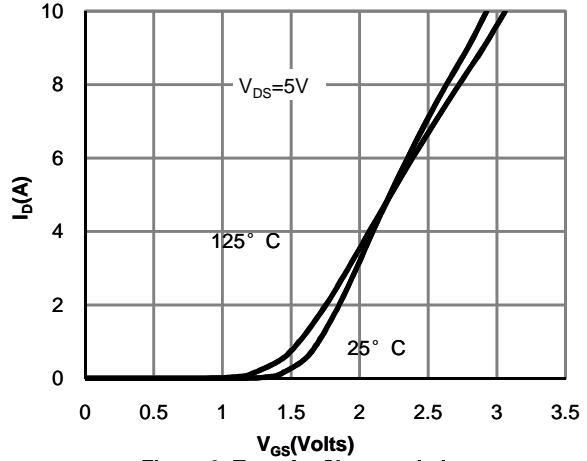


Figure 2: Transfer Characteristics

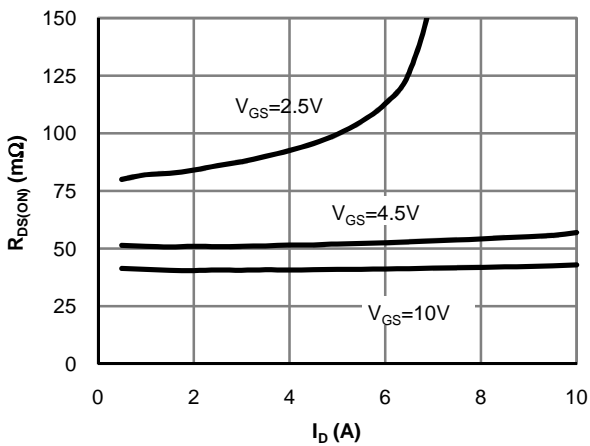


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

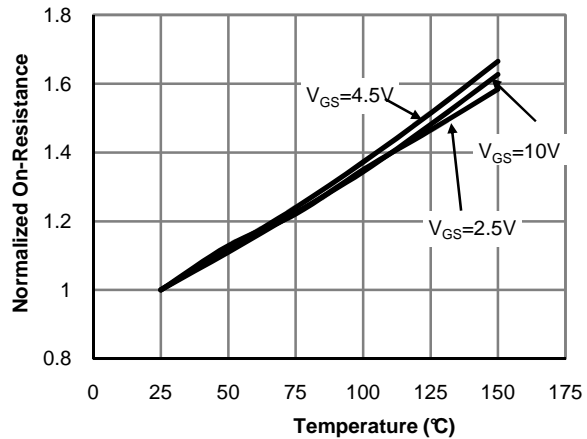


Figure 4: On-Resistance vs. Junction Temperature

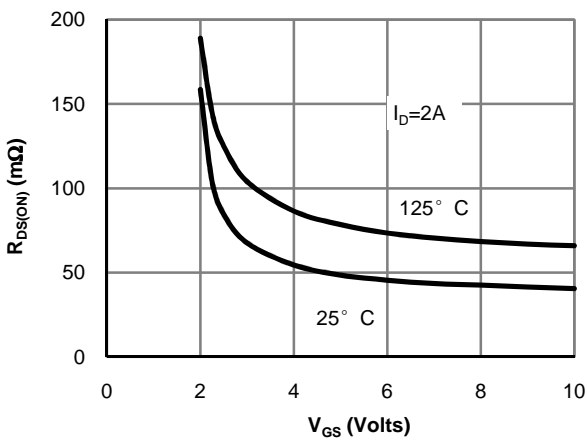


Figure 5: On-Resistance vs. Gate-Source Voltage

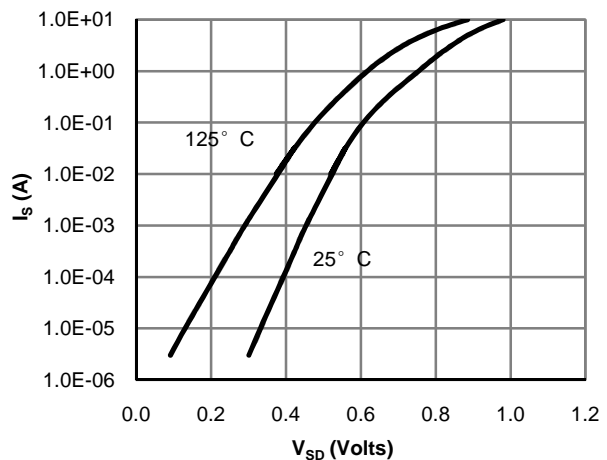


Figure 6: Body-Diode Characteristics

AO3402 Typical Characteristics

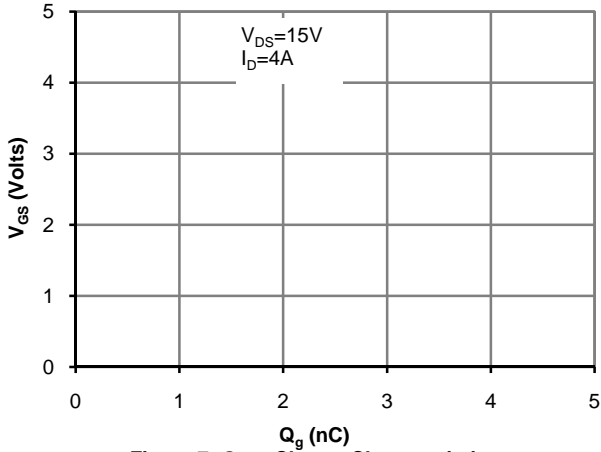


Figure 7: Gate-Charge Characteristics

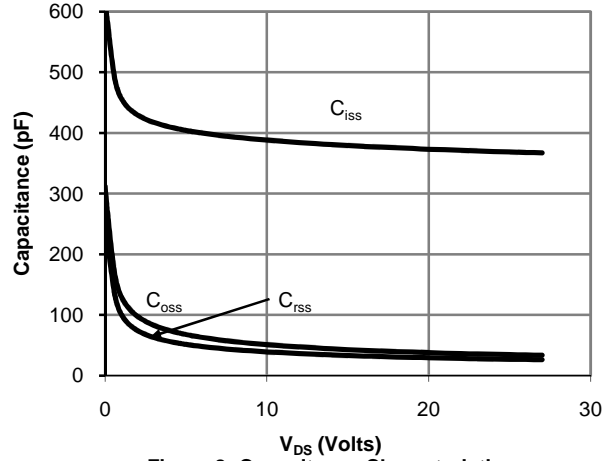


Figure 8: Capacitance Characteristics

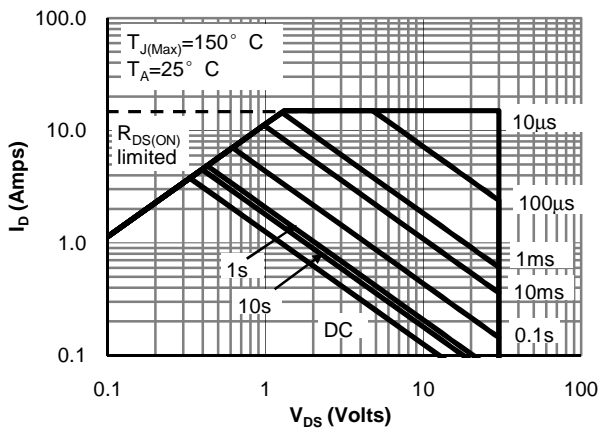


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

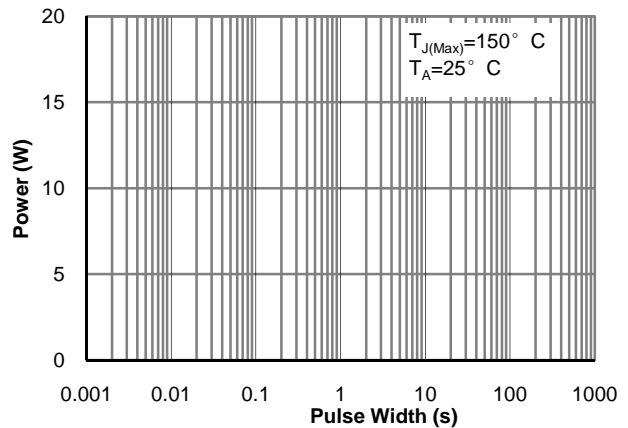


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

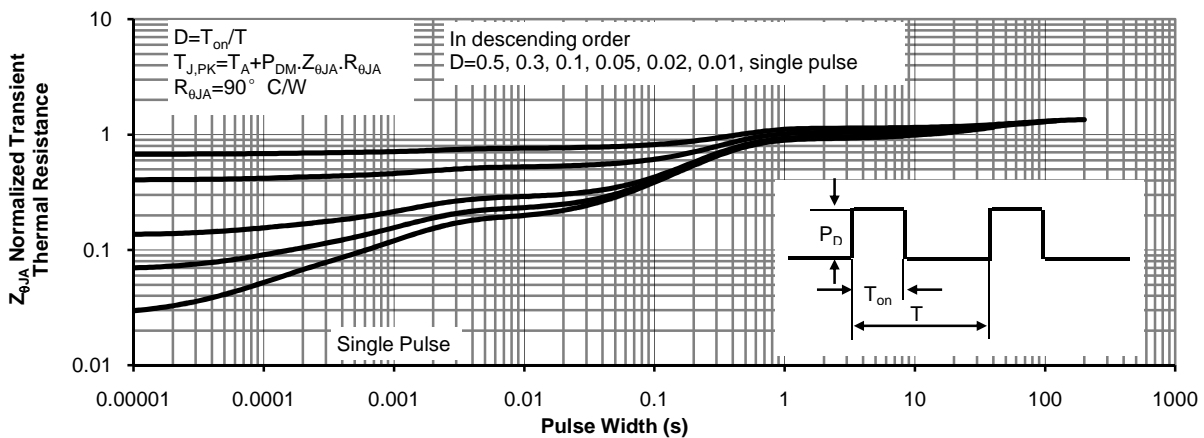


Figure 11: Normalized Maximum Transient Thermal Impedance