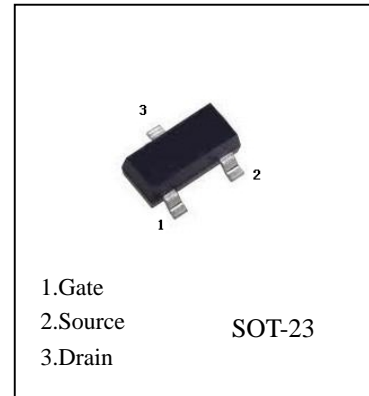
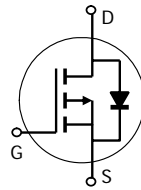


FEATURES

- The AO3401 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 or in PWM applications.

AO3401

P-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	T _A =25°C	-4.2
		T =70°C	-3.5
Pulsed Drain Current ^B	I _{DM}	-30	A
Power Dissipation ^A	P _D	T _A =25°C	1.4
		T _A =70°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	65	90	°C/W
Maximum Junction-to-Ambient ^A		Steady-State	85	125	°C/W
Maximum Junction-to-Lead ^C	R _{JL}	Steady-State	43	60	°C/W

AO3401

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=-250\mu A, V_{GS}=0V$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$ $T_J=55^\circ C$			-1	μA
					-5	
I_{GSS}	Gate-Body leakage current	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7	-1	-1.3	V
$I_{D(ON)}$	On state drain current	$V_{GS}=-4.5V, V_{DS}=-5V$	-25			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-4.2A$ $T_J=125^\circ C$		42	50	m
					75	
				53	65	m
		$V_{GS}=-2.5V, I_D=-1A$		80	120	m
g_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-5A$	7	11		S
V_{SD}	Diode Forward Voltage	$I_S=-1A, V_{GS}=0V$		-0.75	-1	V
I_S	Maximum Body-Diode Continuous Current				-2.2	A
I_{SM}	Pulsed Body-Diode Current ^B				-30	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-15V, f=1MHz$		954		pF
C_{oss}	Output Capacitance			115		pF
C_{rss}	Reverse Transfer Capacitance			77		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		6		
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A$		9.4		nC
Q_{gs}	Gate Source Charge			2		nC
Q_{gd}	Gate Drain Charge			3		nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=-10V, V_{DS}=-15V, R_L=3.6 \Omega, R_{GEN}=6$		6.3		ns
t_r	Turn-On Rise Time			3.2		ns
$t_{D(off)}$	Turn-Off DelayTime			38.2		ns
t_f	Turn-Off Fall Time			12		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=-4A, dI/dt=100A/\mu s$		20.2		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=-4A, dI/dt=100A/\mu s$		11.2		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 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

AO3401 Typical Characteristics

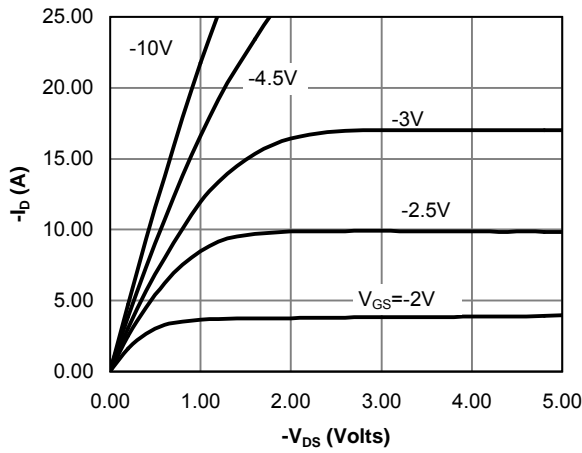


Fig 1: On-Region Characteristics

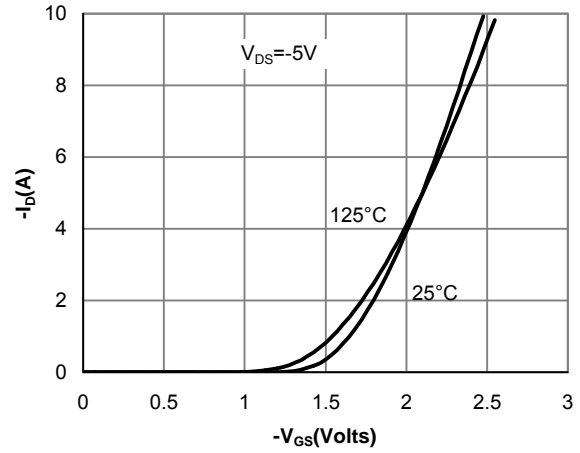


Figure 2: Transfer Characteristics

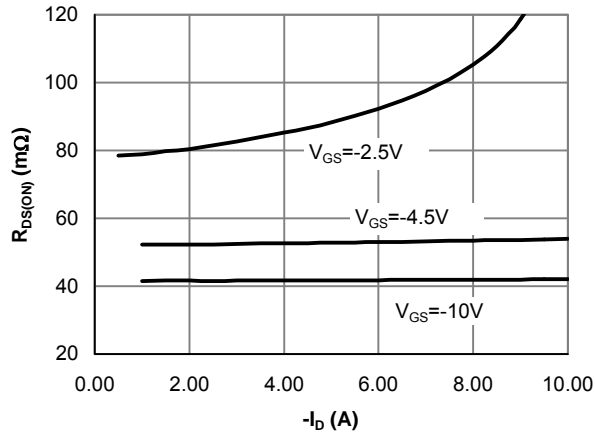


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

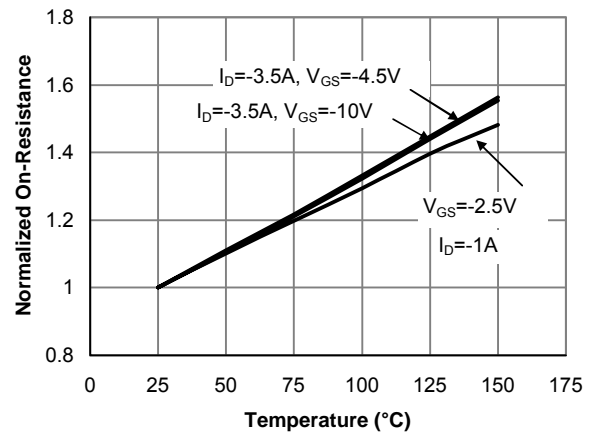


Figure 4: On-Resistance vs. Junction Temperature

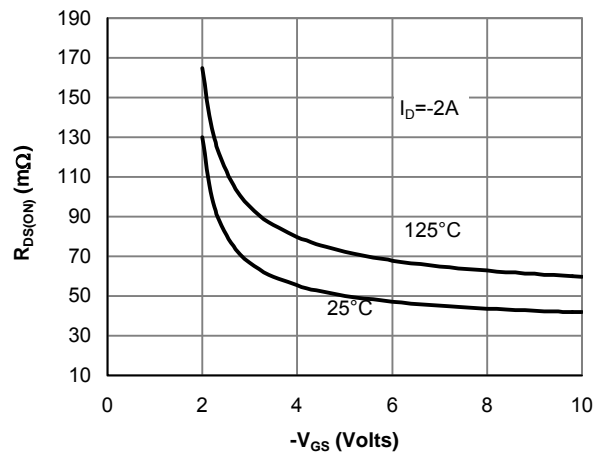


Figure 5: On-Resistance vs. Gate-Source Voltage

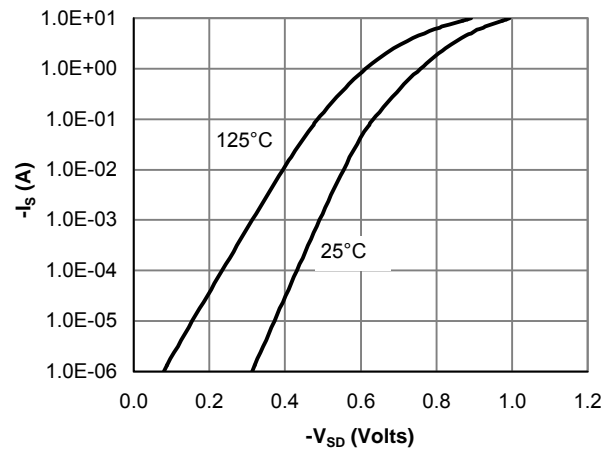


Figure 6: Body-Diode Characteristics

AO3401 Typical Characteristics

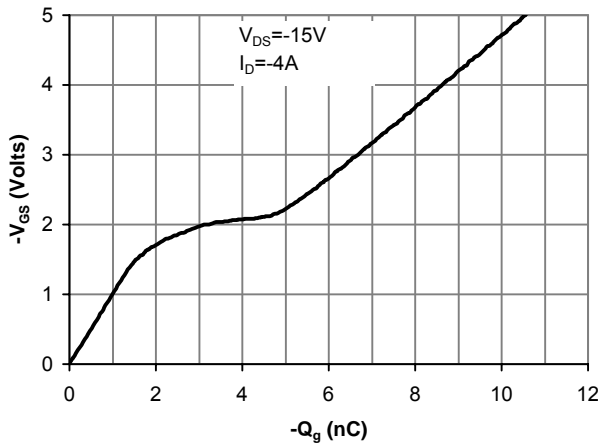


Figure 7: Gate-Charge Characteristics

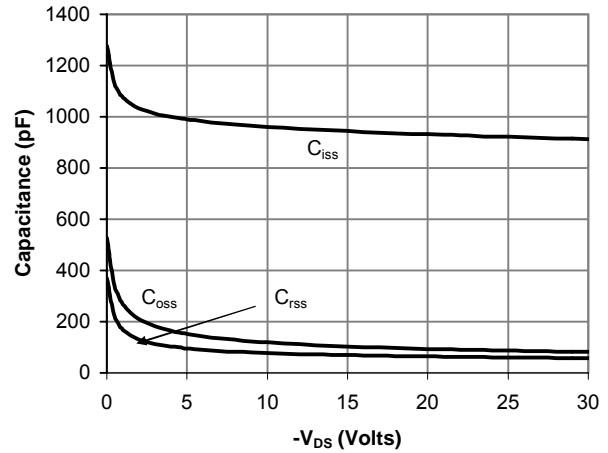


Figure 8: Capacitance Characteristics

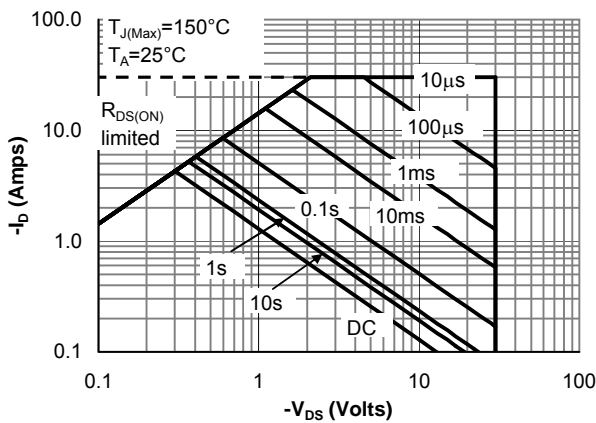


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

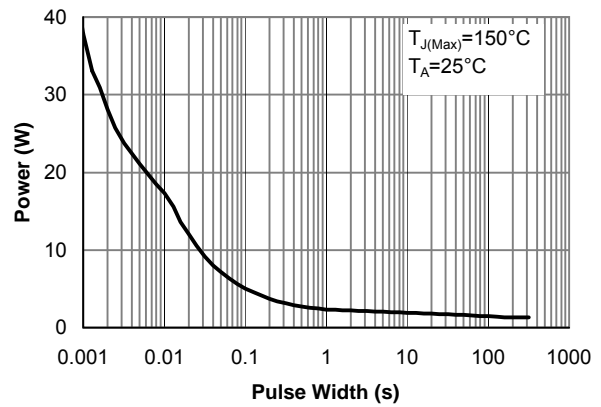


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

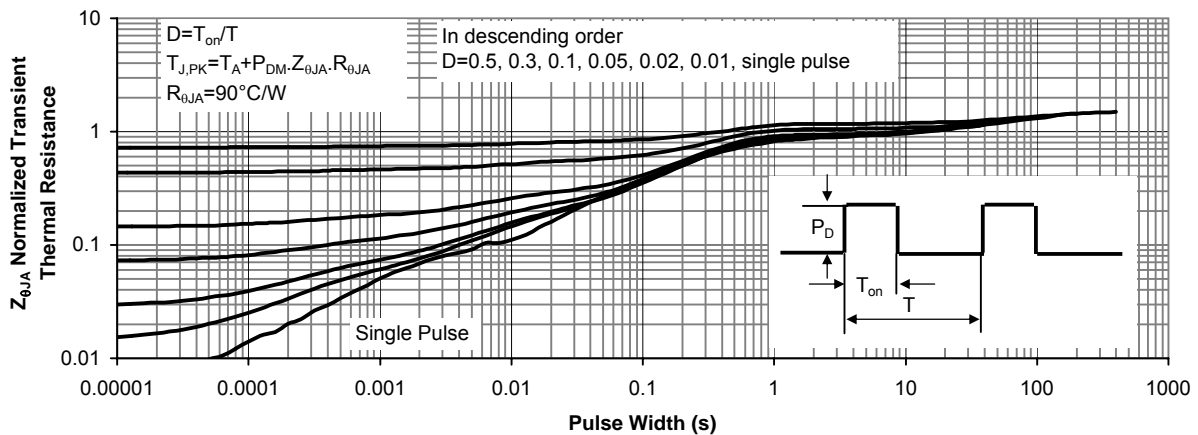


Figure 11: Normalized Maximum Transient Thermal Impedance