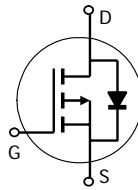


CURRENT 4.2 Ampere  
 VOLTAGE RANG 30 Volts

**AO3401**

**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.



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

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current <sup>A</sup>	I	T <sub>A</sub> =25°C	-4.2
		T =70°C	-3.5
Pulsed Drain Current <sup>B</sup>	I <sub>DM</sub>	-30	A
Power Dissipation <sup>A</sup>	P <sub>D</sub>	T <sub>A</sub> =25°C	1.4
		T <sub>A</sub> =70°C	1
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

**Thermal Characteristics**

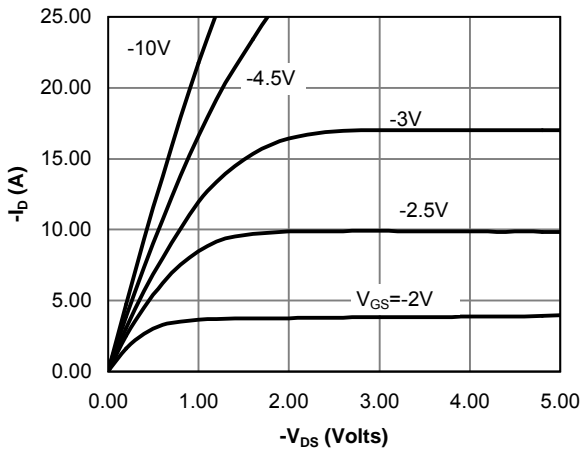
Parameter	Symbol	Typ	Max	Unit	
Maximum Junction-to-Ambient <sup>A</sup>	R <sub>JA</sub>	t 10s	65	90	°C/W
Maximum Junction-to-Ambient <sup>A</sup>		Steady-State	85	125	°C/W
Maximum Junction-to-Lead <sup>C</sup>	R <sub>JL</sub>	Steady-State	43	60	°C/W

CURRENT 4.2 Ampere  
VOLTAGE RANG 30 Volts

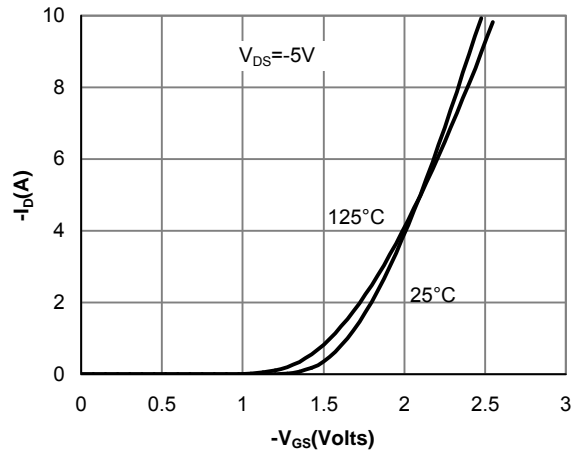
**AO3401**

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

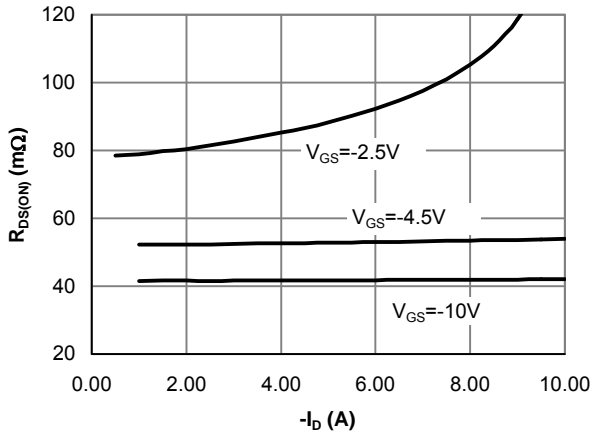
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			-1	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250μA	-0.7	-1	-1.3	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-25			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.2A T <sub>J</sub> =125°C		42	50	m
					75	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A		53	65	m
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A		80	120	m
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A	7	11		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.75	-1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				-2.2	A
I <sub>SM</sub>	Pulsed Body-Diode Current <sup>B</sup>				-30	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		954		pF
C <sub>oss</sub>	Output Capacitance			115		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			77		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		6		
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4A		9.4		nC
Q <sub>gs</sub>	Gate Source Charge			2		nC
Q <sub>gd</sub>	Gate Drain Charge			3		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =3.6 Ω, R <sub>GEN</sub> =6		6.3		ns
t <sub>r</sub>	Turn-On Rise Time			3.2		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			38.2		ns
t <sub>f</sub>	Turn-Off Fall Time			12		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =-4A, dI/dt=100A/μs		20.2		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =-4A, dI/dt=100A/μs		11.2		nC



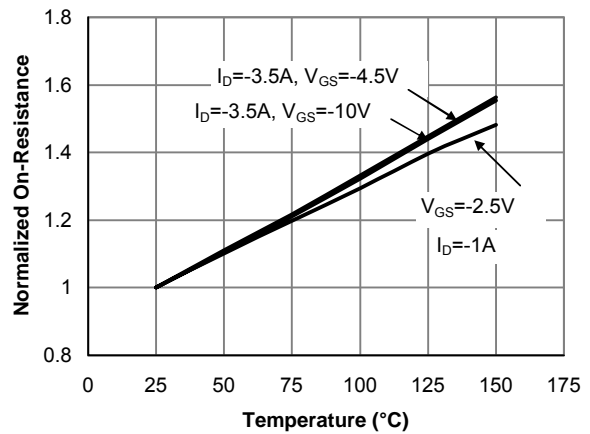
**Fig 1: On-Region Characteristics**



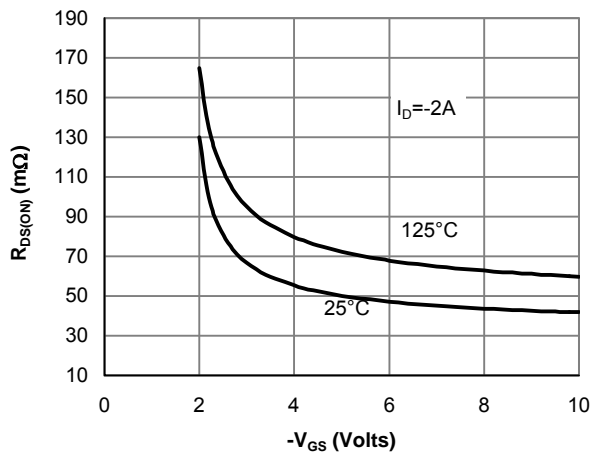
**Figure 2: Transfer Characteristics**



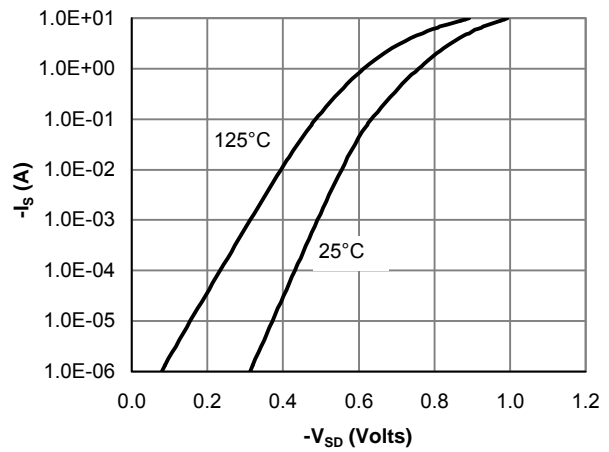
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**



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



**Figure 6: Body-Diode Characteristics**

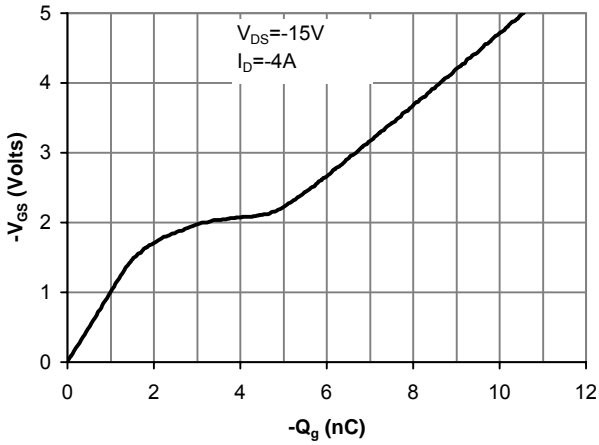


Figure 7: Gate-Charge Characteristics

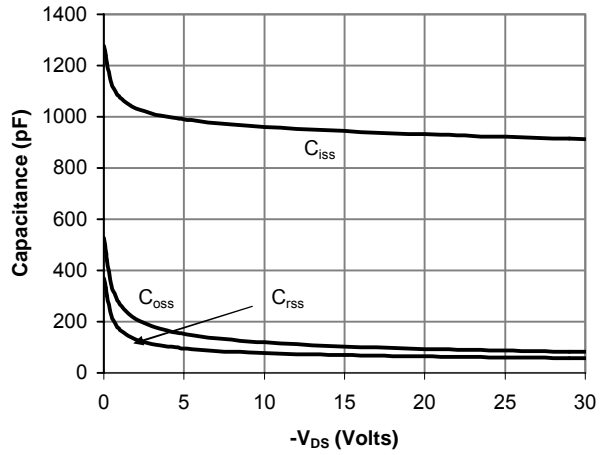


Figure 8: Capacitance Characteristics

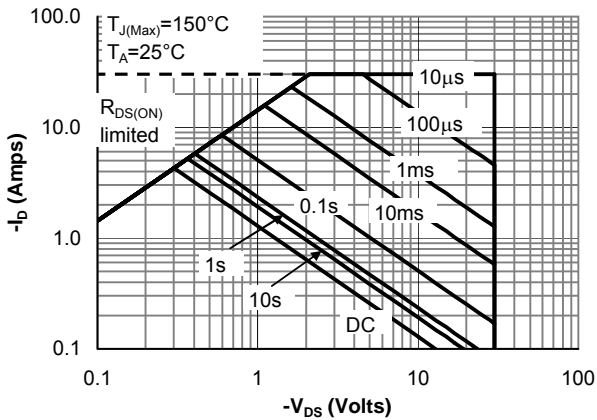


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

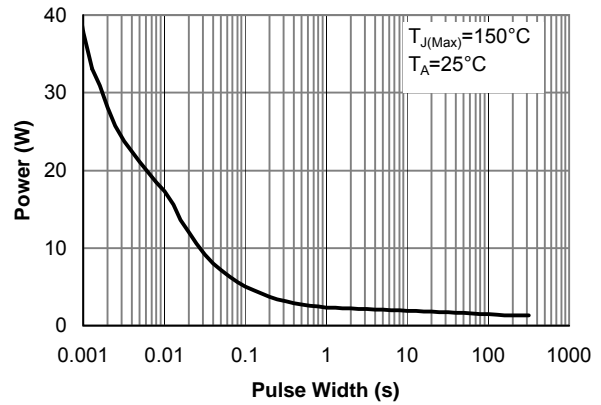


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

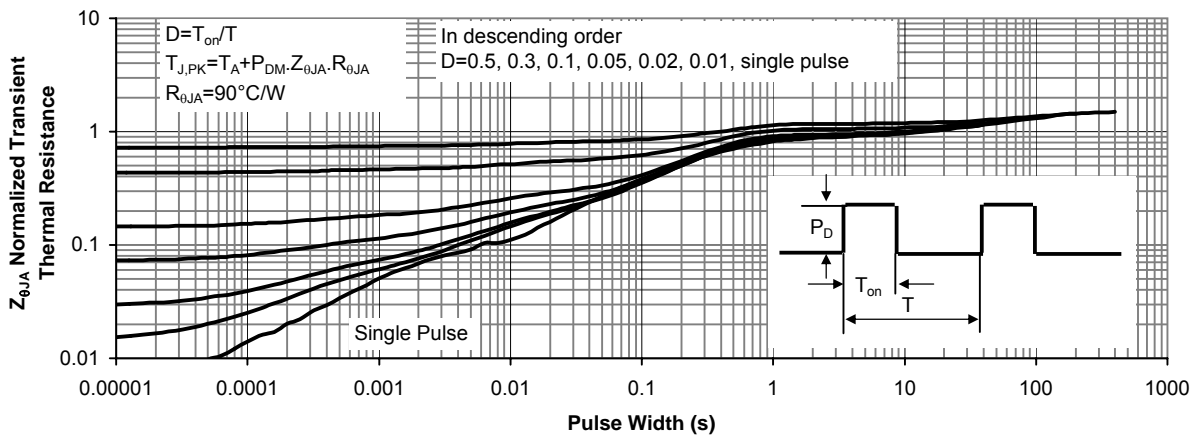


Figure 11: Normalized Maximum Transient Thermal Impedance