

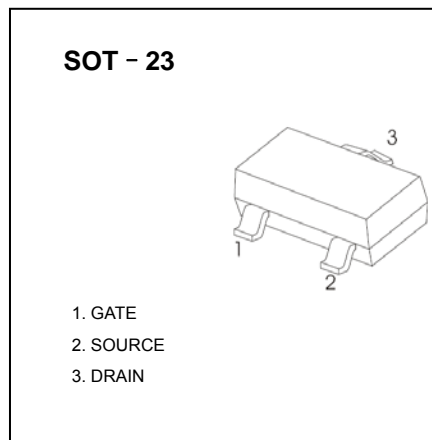


**THE DATASHEET OF  
AO3403A**

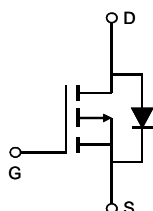


■ Features

- $V_{DS} (V) = -30V$
- $I_D = -2.6A$  (at  $V_{GS} = -10V$ )
- $R_{DS(ON)} < 75 m\Omega$  (at  $V_{GS} = -10V$ )
- $R_{DS(ON)} < 85 m\Omega$  (at  $V_{GS} = -4.5V$ )



**Equivalent Circuit**



**Absolute Maximum Ratings**  $T_A = 25^\circ C$  unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	$T_A = 25^\circ C$	A
		$T_A = 70^\circ C$	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-13	
Power Dissipation <sup>B</sup>	$P_D$	$T_A = 25^\circ C$	W
		$T_A = 70^\circ C$	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$

**Thermal Characteristics**

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	70	90	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A D</sup>		Steady-State	100	125
Maximum Junction-to-Lead	$R_{\theta JL}$	63	80	$^\circ C/W$

**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<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> =-30V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			-1 -5	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	-0.6	-1	-1.4	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-13			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.6A			75	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A			85	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.6A		8		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.78	-1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				-1.5	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		260	315	pF
C <sub>oss</sub>	Output Capacitance			37		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			20		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	4	8	12	Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g(10V)</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-2.6A		5.9	7.2	nC
Q <sub>g(4.5V)</sub>	Total Gate Charge			2.8	3.5	nC
Q <sub>gs</sub>	Gate Source Charge			0.7		nC
Q <sub>gd</sub>	Gate Drain Charge			1		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =5.76Ω, R <sub>GEN</sub> =3Ω		6		ns
t <sub>r</sub>	Turn-On Rise Time			3.5		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			20		ns
t <sub>f</sub>	Turn-Off Fall Time			5		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =-2.6A, dI/dt=100A/μs		11.5	15	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =-2.6A, dI/dt=100A/μs		4.5		nC

A. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The value in any given application depends on the user's specific board design.

B. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150° C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150° C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub>=25° C.

D. The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> 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 1in<sup>2</sup> FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T<sub>J(MAX)</sub>=150° C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

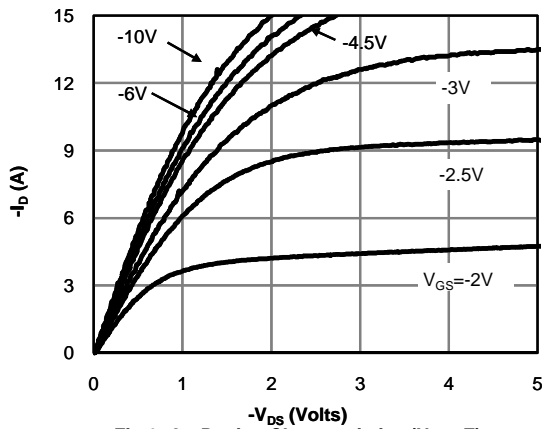


Fig 1: On-Region Characteristics (Note E)

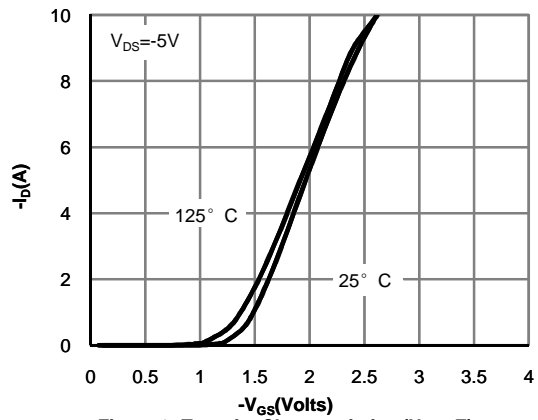


Figure 2: Transfer Characteristics (Note E)

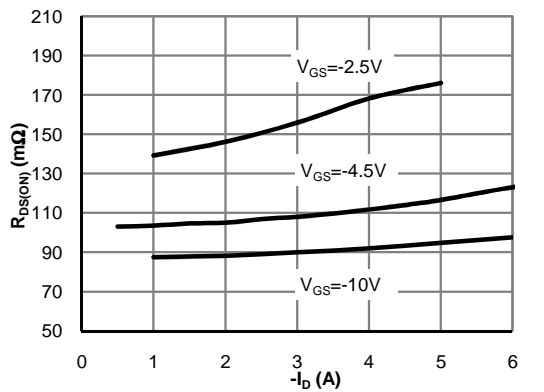


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

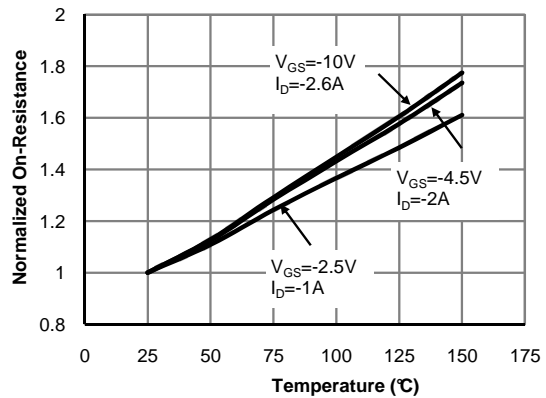


Figure 4: On-Resistance vs. Junction Temperature (Note E)

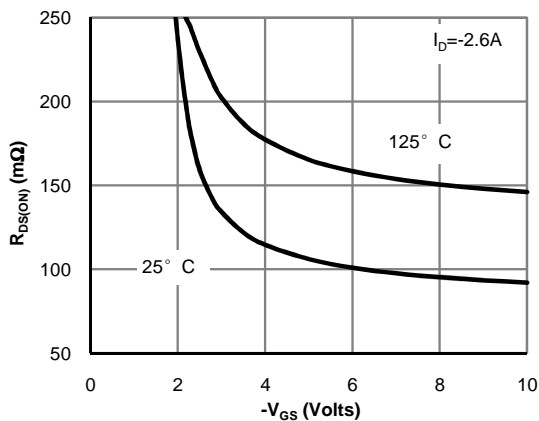


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

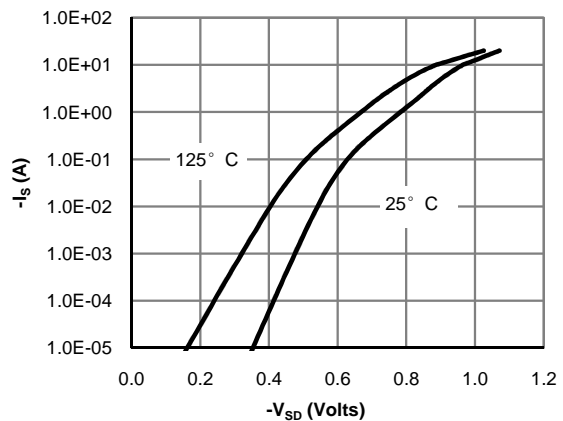


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

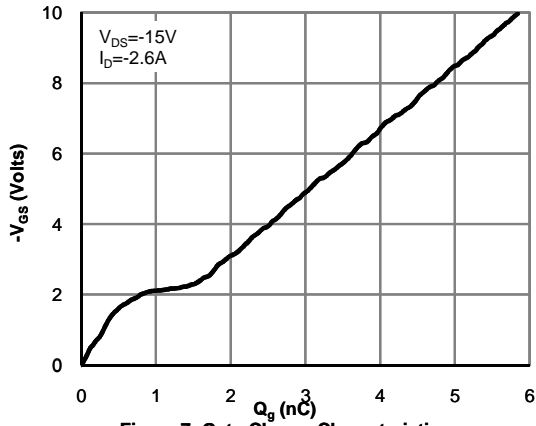


Figure 7: Gate-Charge Characteristics

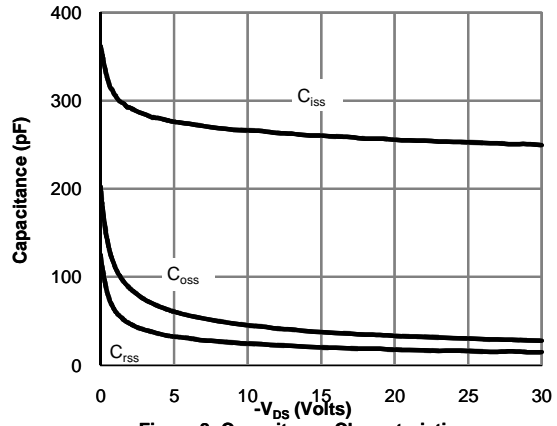


Figure 8: Capacitance Characteristics

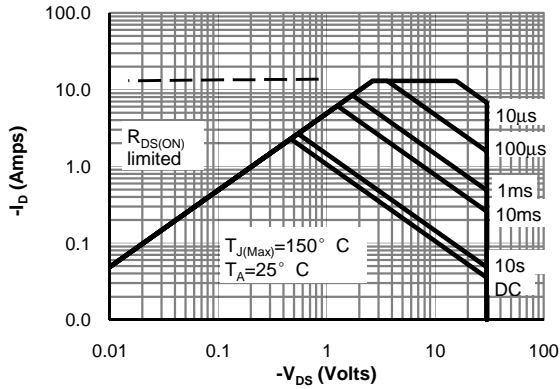


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

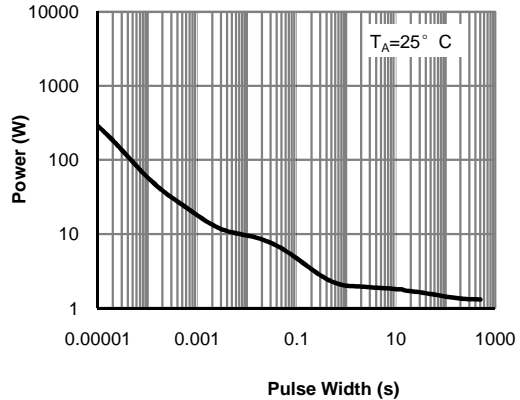


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

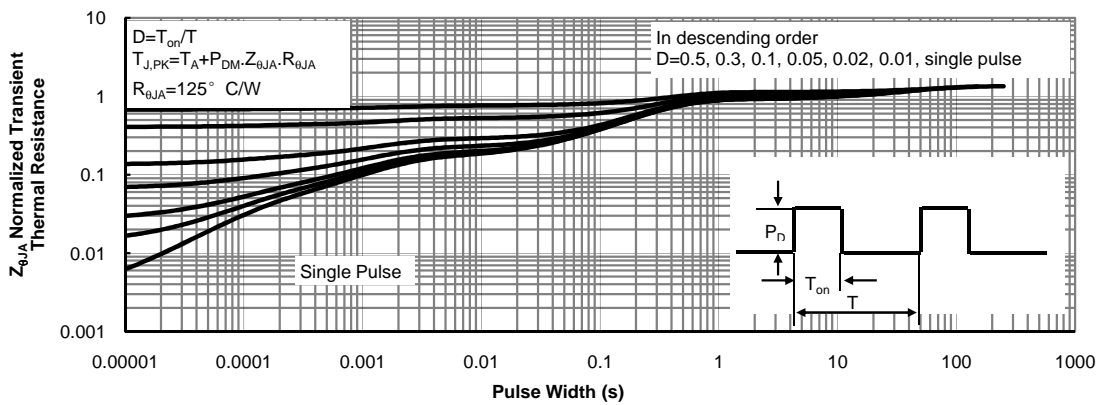
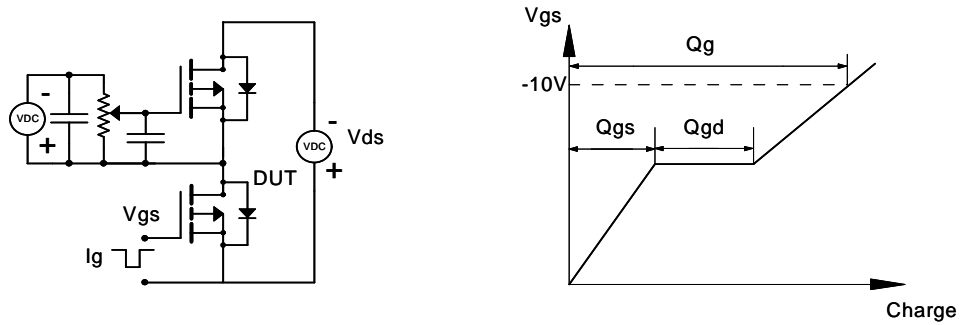
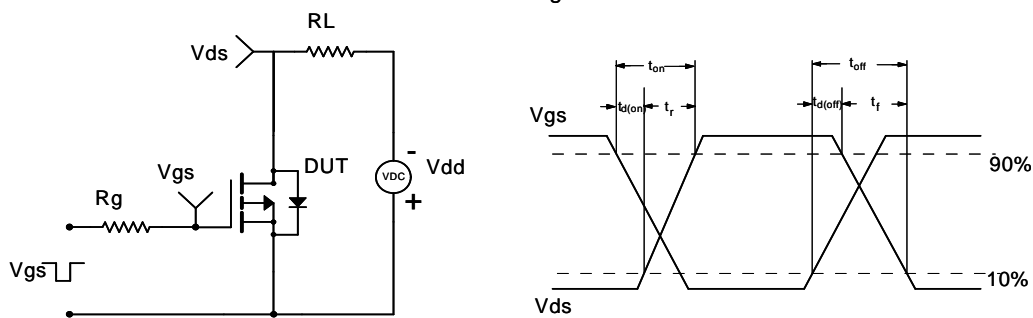


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

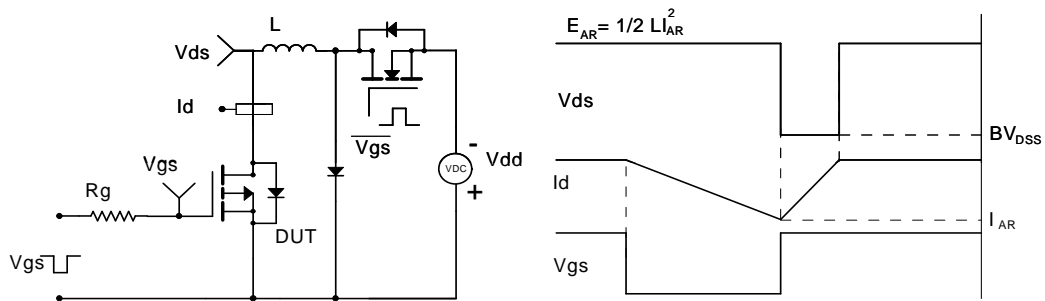
Gate Charge Test Circuit & Waveform



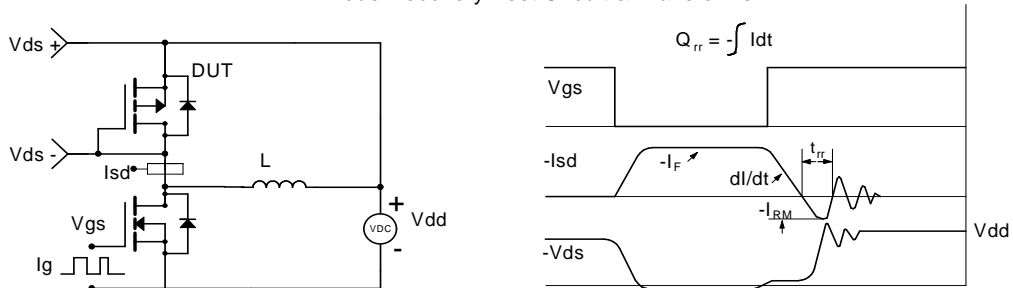
Resistive Switching Test Circuit & Waveforms



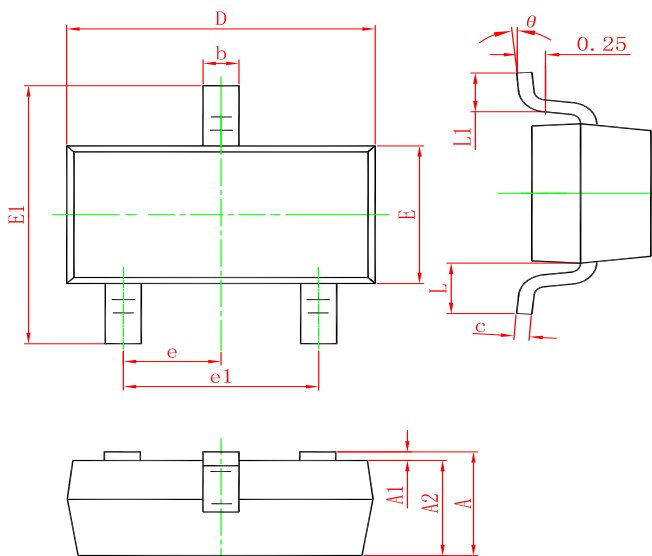
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

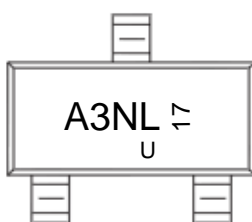


SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking





Ordering information

Order code	Package	Baseqty	Deliverymode
UMW AO3403A	SOT-23	3000	Tape and reel

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