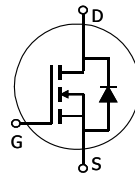
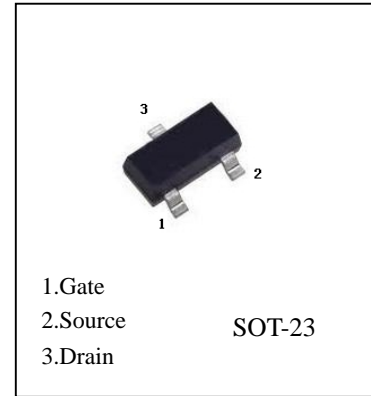


FEATURES

- The AO3400 is the N-Channel logic enhancement mode power field effect transistor is produced using high cell density, DMOS trench technology.

This high-density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other batter powered circuits where high side switching.

**AO3400**  
N-Channel MOSFET



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>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>A</sub> =25°C	A
		T =70°C	
Pulsed Drain Current <sup>C</sup>	I <sub>DM</sub>	30	
Power Dissipation <sup>B</sup>	P <sub>D</sub>	T <sub>A</sub> =25°C	W
		T <sub>A</sub> =70°C	
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>	70	90	°C/W
Maximum Junction-to-Ambient <sup>A,D</sup>		Steady-State	100	
Maximum Junction-to-Lead	R <sub>JL</sub>	63	80	°C/W

## AO3400

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	30			V
Gate Threshold Voltage	VGS(th)	VDS=VGS, ID=250uA	0.7		1.4	V
Gate Leakage Current	IGSS	VDS=0V, VGS=±20V			±100	nA
Zero Gate Voltage Drain Current	IDSS	VDS=24V, VGS=0V			1	uA
		VDS=24V, VGS=0V TJ=55°C			5	
On-State Drain Current	ID(on)	VDS ≤ 5V, VGS=4.5V	5.8			A
Drain-source On-Resistance	RDS(on)	VGS=10V, ID=5.8A		33	38	m
		VGS=4.5V, ID=5.0A		37	42	
		VGS=2.5V, ID=4.0A		47	55	
Diode Forward Voltage	VSD	IS=1.0A, VGS=0V		0.7	1.1	V
Dynamic						
Total Gate Charge	Qg	VDS=15V, VGS=4.5V ID 5.8A		9.7	12	nC
Gate-Source Charge	Qgs			1.6		
Gate-Drain Charge	Qgd			3.1		
Turn-On Time	td(on)	VGS=10V, VDS=10V, RL=2.7Ω, VGEN=4.5V		3.3	5	nS
	tr			4.8	7	
Turn-Off Time	td(off)			26.3	40	
	tf			4.1	6	

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 given application depends on the user's specific board design.

B. The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^\circ\text{C}$ , using  $\leq 10\text{s}$  junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .

D. The  $R_{JA}$  is the sum of the thermal impedance from junction to lead  $R_{JL}$  and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300uS 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 1in2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of  $T_{J(MAX)}=150^\circ\text{C}$ . The SOA curve provides a single pulse rating.

**AO3400** Typical Characteristics

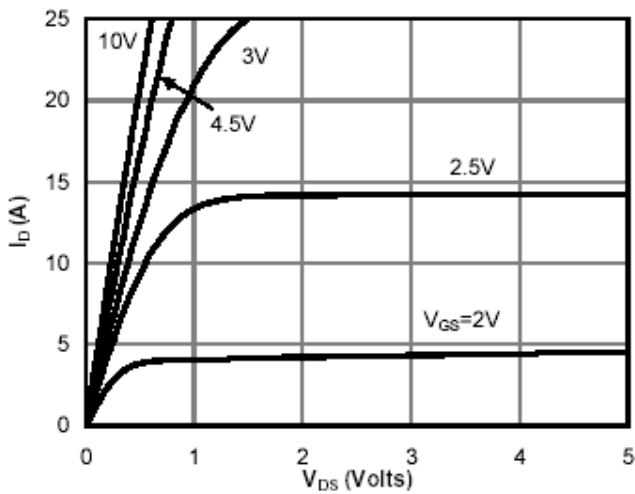


Fig 1: On-Region Characteristics

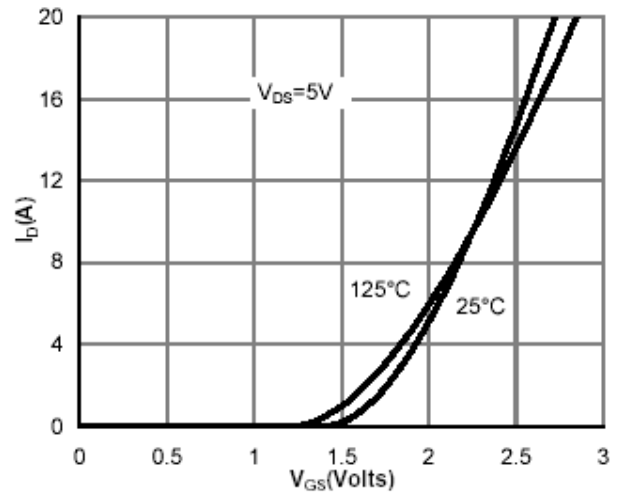


Figure 2: Transfer Characteristics

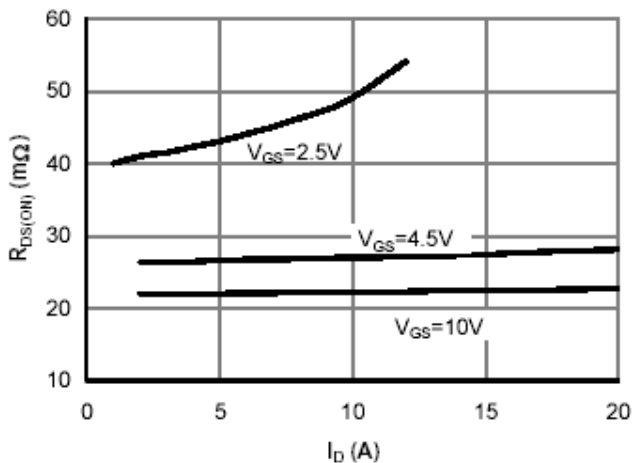


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

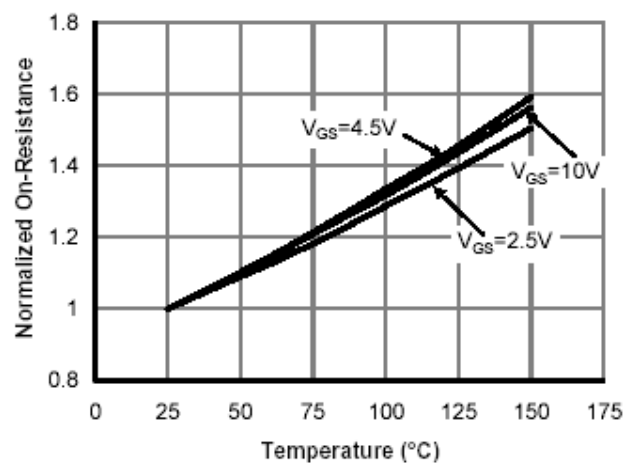


Figure 4: On-Resistance vs. Junction Temperature

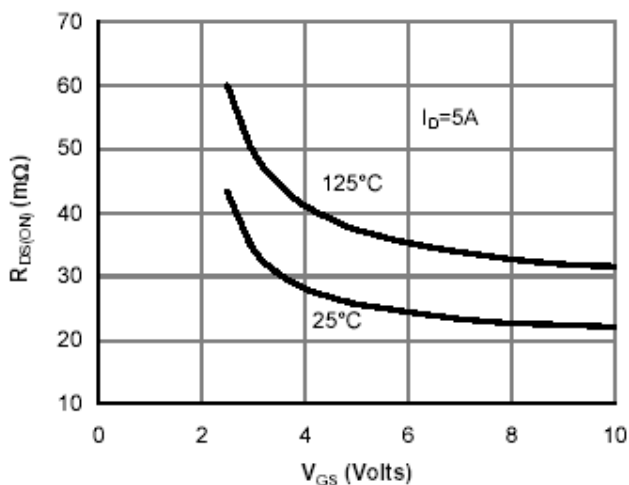


Figure 5: On-Resistance vs. Gate-Source Voltage

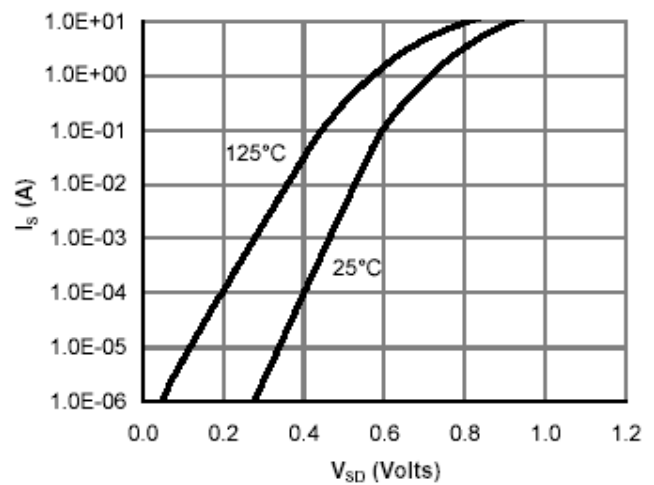


Figure 6: Body-Diode Characteristics

**AO3400** Typical Characteristics

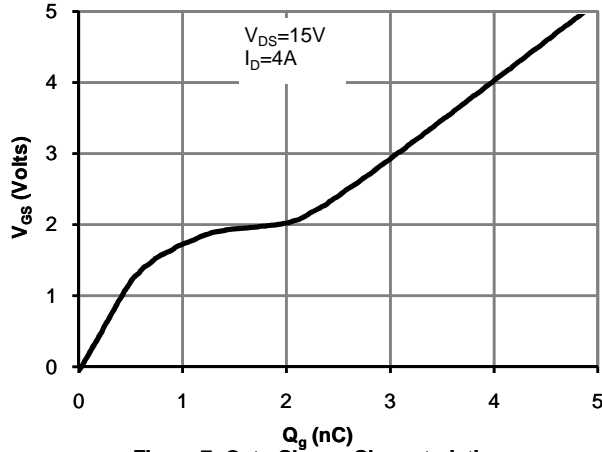


Figure 7: Gate-Charge Characteristics

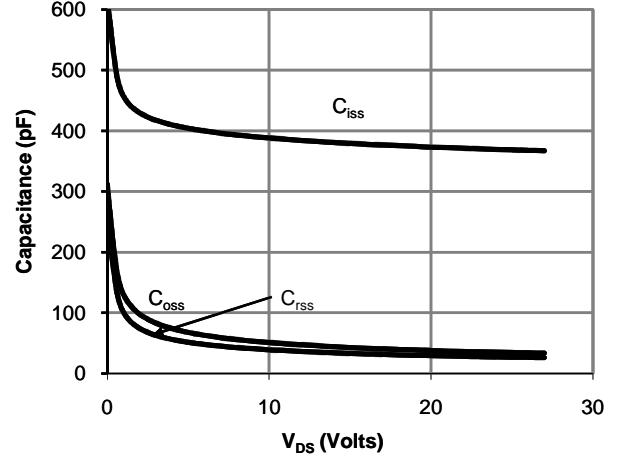


Figure 8: Capacitance Characteristics

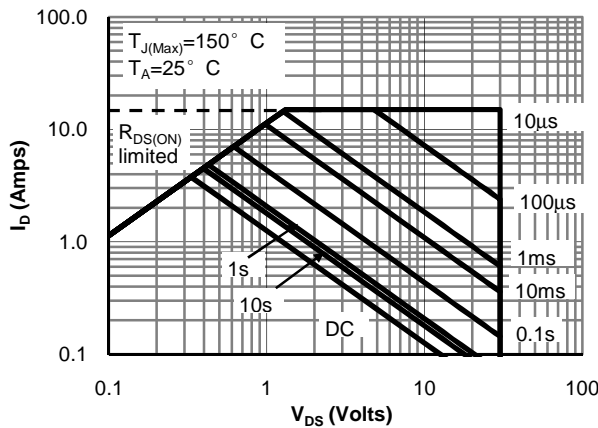


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

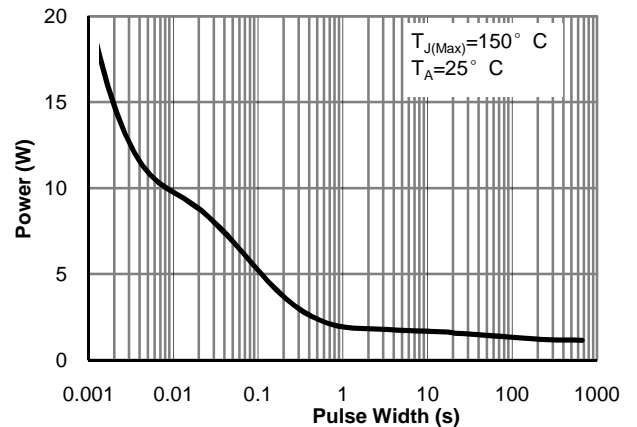


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

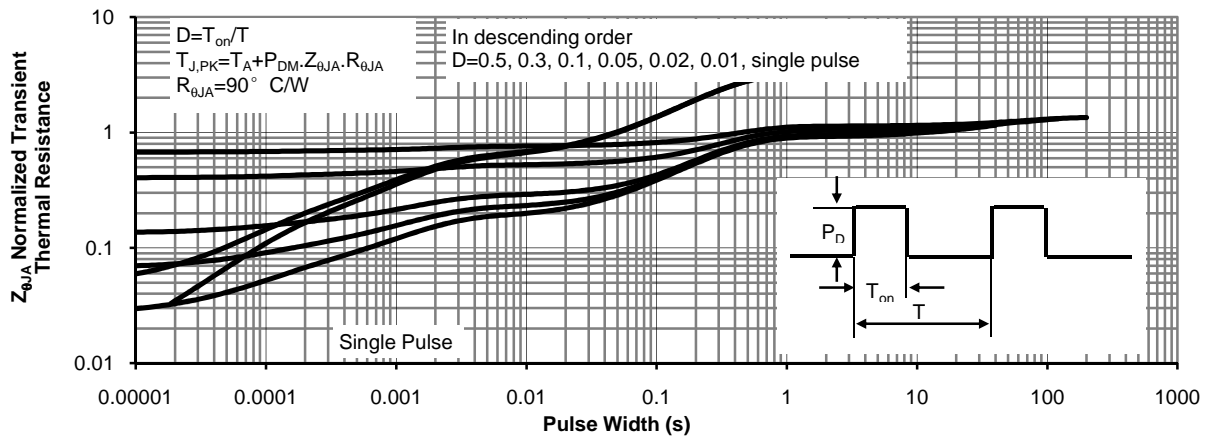


Figure 11: Normalized Maximum Transient Thermal Impedance