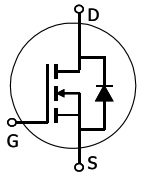
AO3400

N-Channel MOSFET

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.



1.Gate
2.Source
3.Drain

SOT-23

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

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	5.8	A
	T =70°C		4.9	
Pulsed Drain Current [C]		I_{DM}	30	
Power Dissipation [B]	T_A=25°C	P_D	1.4	W
	T_A=70°C		1.0	
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]	t ≤ 10s	$R_{\theta JA}$	70	90	°C/W
Maximum Junction-to-Ambient [A,D]	Steady-State		100	125	°C/W
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	63	80	°C/W

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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℃			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	mΩ
		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 $R_{\theta JA}$ 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° C, using ≤ 10s junction-to-ambient thermal resistance.

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

D. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ 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 impedence 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°C. The SOA curve provides a single pulse rating.

AO3400 Typical Characteristics

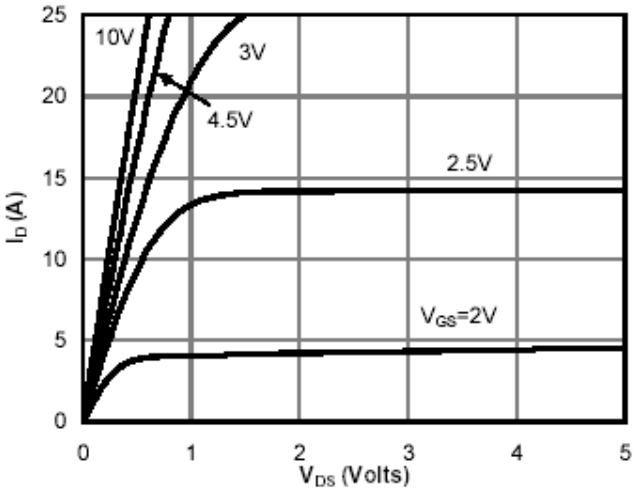

Fig 1: On-Region Characteristics

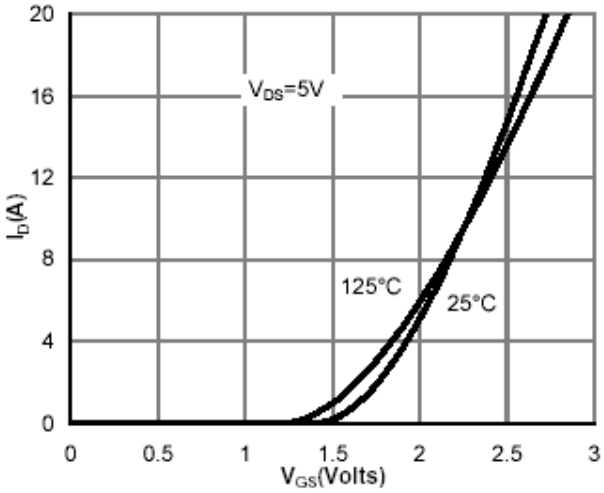

Figure 2: Transfer Characteristics

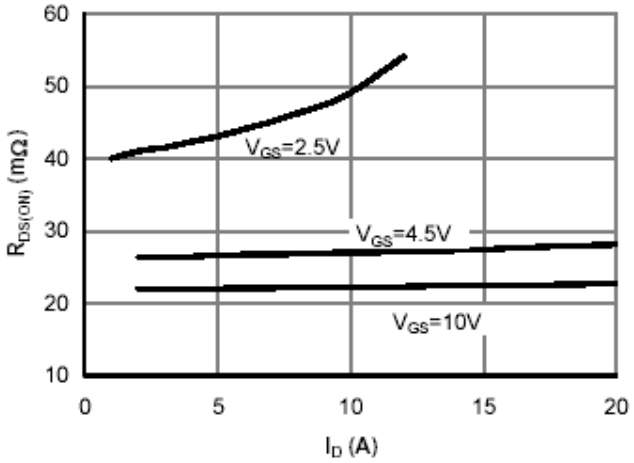

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

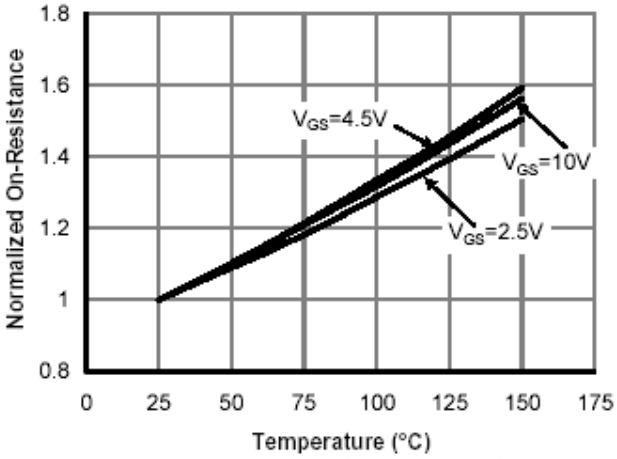

Figure 4: On-Resistance vs. Junction Temperature

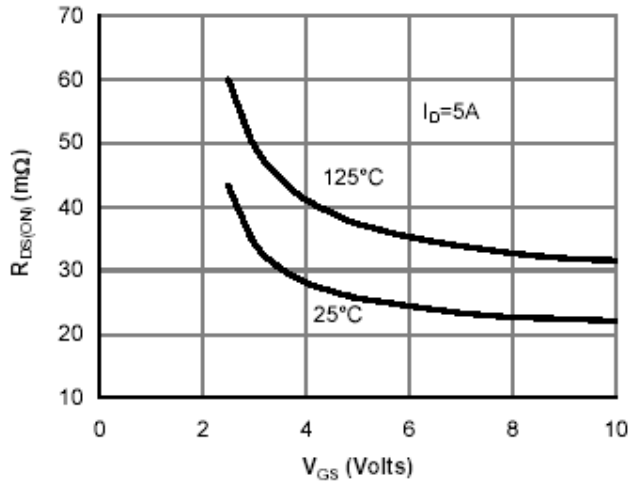

Figure 5: On-Resistance vs. Gate-Source Voltage

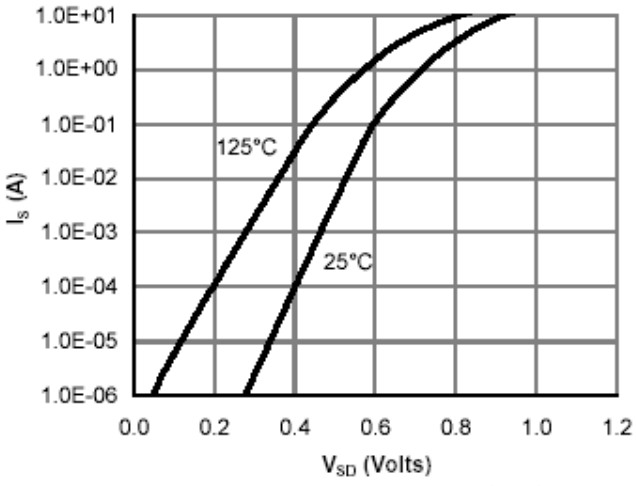

Figure 6: Body-Diode Characteristics

AO3400 Typical Characteristics

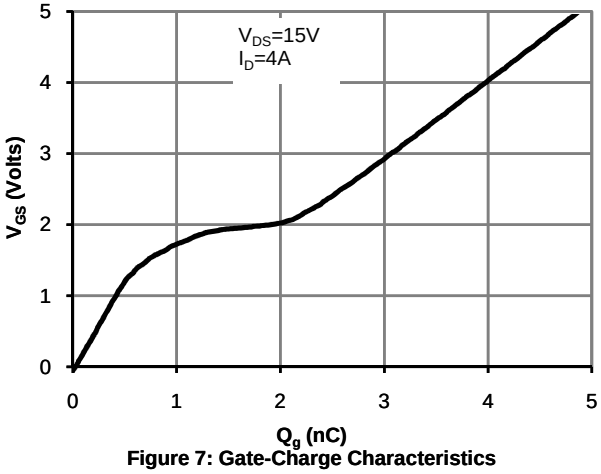

Figure 7: Gate-Charge Characteristics

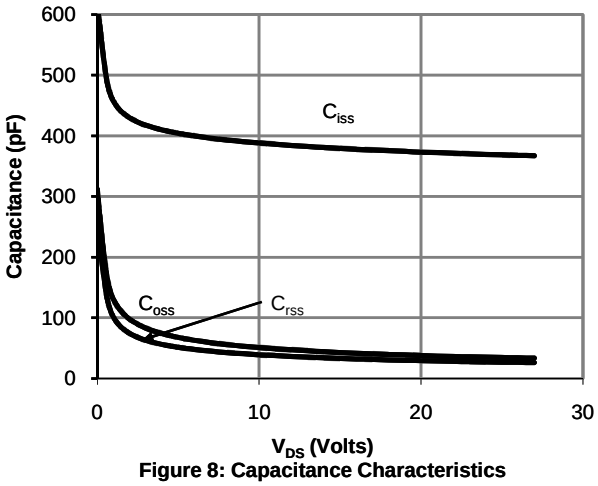

Figure 8: Capacitance Characteristics

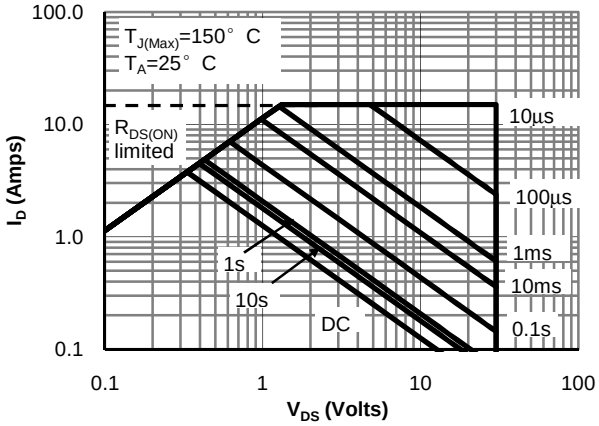

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

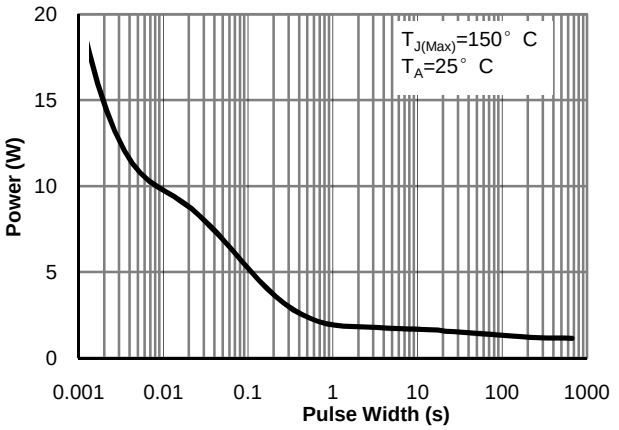

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

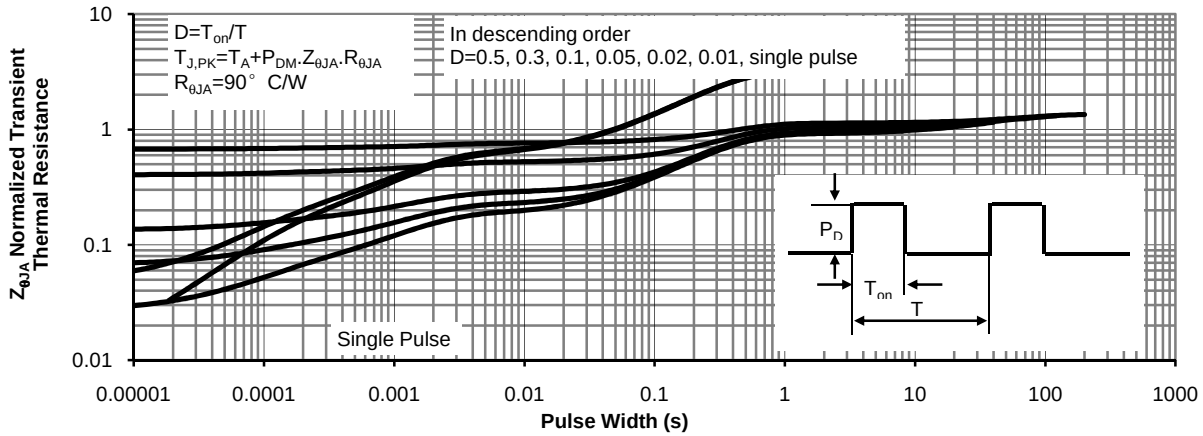

Figure 11: Normalized Maximum Transient Thermal Impedance