

### General Description

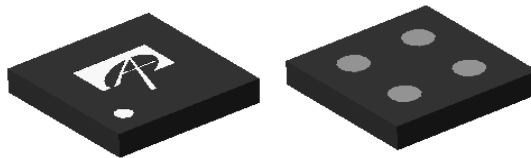
The AOC2403 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 1.5V while retaining a 8V  $V_{GS(MAX)}$  rating.

### Product Summary

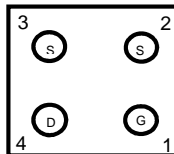
V <sub>ds</sub>	-20V
I <sub>D</sub> (at V <sub>GS</sub> =-4.5V)	-1.8A
R <sub>DS(ON)</sub> (at V <sub>GS</sub> =-4.5V)	< 95mΩ
R <sub>DS(ON)</sub> (at V <sub>GS</sub> =-2.5V)	< 115mΩ
R <sub>DS(ON)</sub> (at V <sub>GS</sub> =-1.8V)	< 150mΩ
R <sub>DS(ON)</sub> (at V <sub>GS</sub> =-1.5V)	< 200mΩ



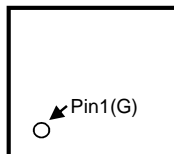
AlphaDFN 0.97x0.97\_4



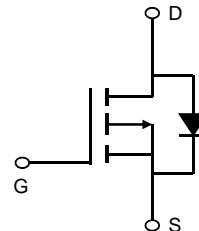
Bottom View



Top View



Equivalent Circuit



### Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Source Current (DC) <sup>Note1</sup>	$I_D$	-1.8	A
Source Current (Pulse) <sup>Note2</sup>			
Power Dissipation <sup>Note1</sup>	$P_D$	0.45	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

**Note 1.** Mounted on minimum pad PCB

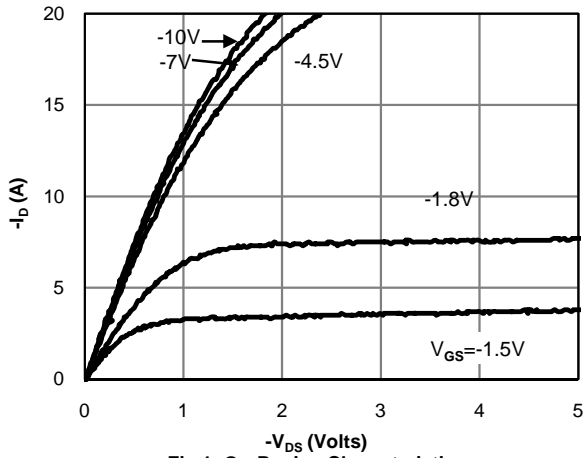
**Note 2.** PW <300  $\mu\text{s}$  pulses, duty cycle 0.5% max

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

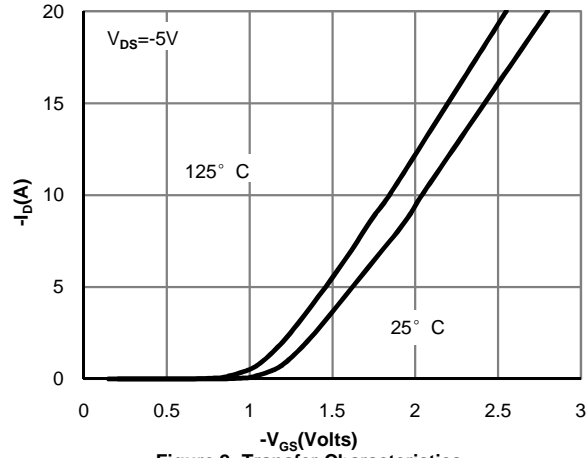
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Source-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			-1 -5	μA
I <sub>GSS</sub>	Gate leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.3	-0.65	-1	V
R <sub>DS(ON)</sub>	Static Source to Source On-Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A T <sub>J</sub> =125°C		76	95	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A		91	115	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.5A		107	150	
		V <sub>GS</sub> =-1.5V, I <sub>D</sub> =-0.5A		130	200	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-1A		7		S
V <sub>FSD</sub>	Diode Forward Voltage	I <sub>D</sub> =-1A, V <sub>GS</sub> =0V,		-0.73	-1	V
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, f=1MHz,		405		pF
C <sub>oss</sub>	Output Capacitance			75		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			45		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		26		Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A		4.8		nC
Q <sub>gs</sub>	Gate Source Charge			0.8		nC
Q <sub>gd</sub>	Gate Drain Charge			1		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, R <sub>L</sub> =10Ω, I <sub>D</sub> =-1A, R <sub>GEN</sub> =6Ω		7.5		ns
t <sub>r</sub>	Turn-On Rise Time			8.5		
t <sub>D(off)</sub>	Turn-Off DelayTime			95		
t <sub>f</sub>	Turn-Off Fall Time			30		
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =-1A, di/dt=100A/μs		22		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =-1A, di/dt=100A/μs		8.5		nC

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE

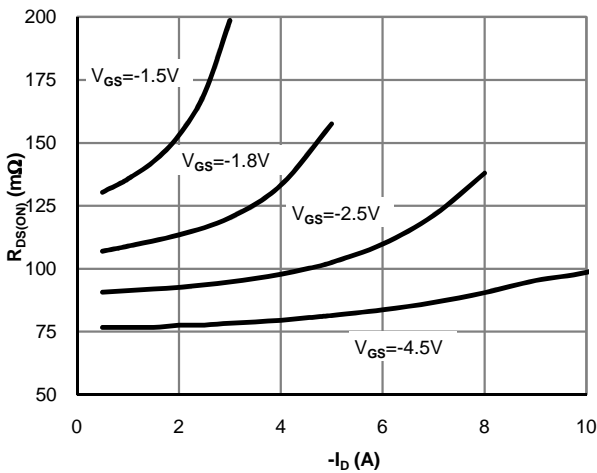
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



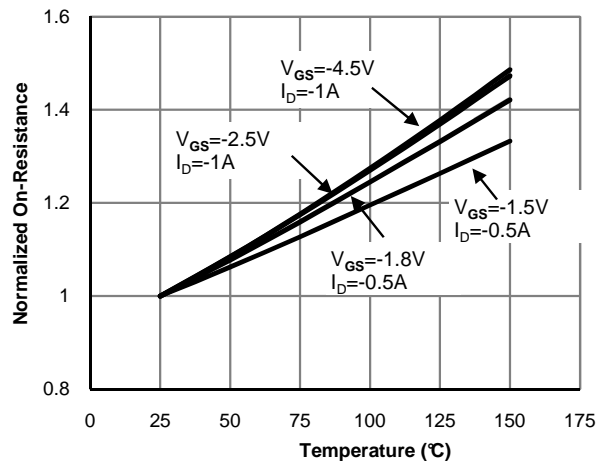
**Fig 1: On-Region Characteristics**



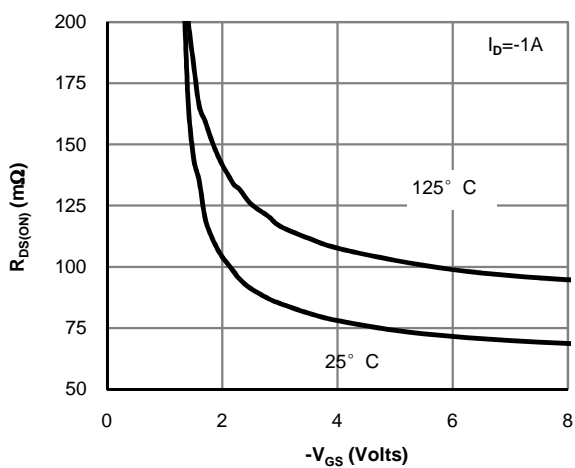
**Figure 2: Transfer Characteristics**



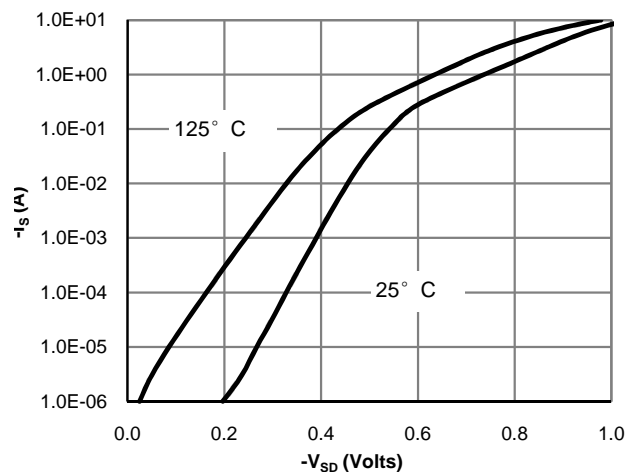
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



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

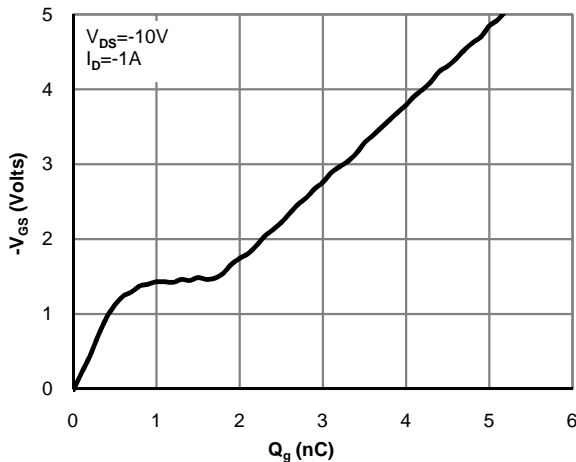


**Figure 5: On-Resistance vs. Gate-Source Voltage**

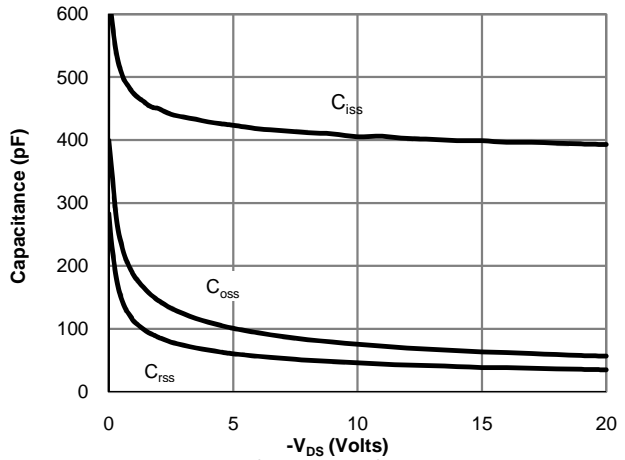


**Figure 6: Body-Diode Characteristics**

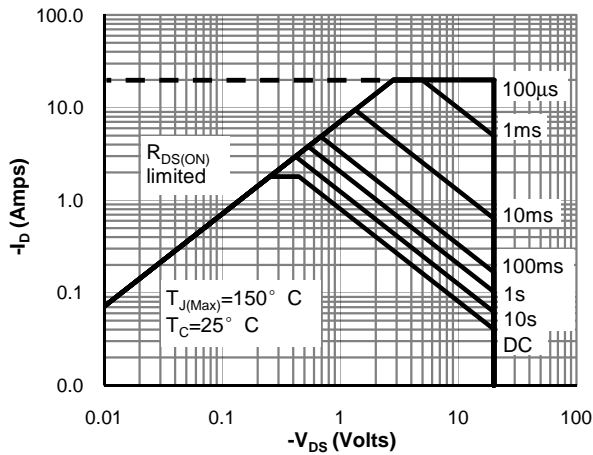
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



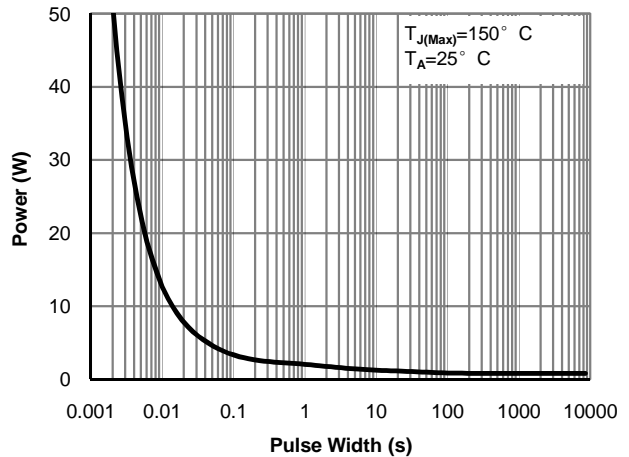
**Figure 7: Gate-Charge Characteristics**



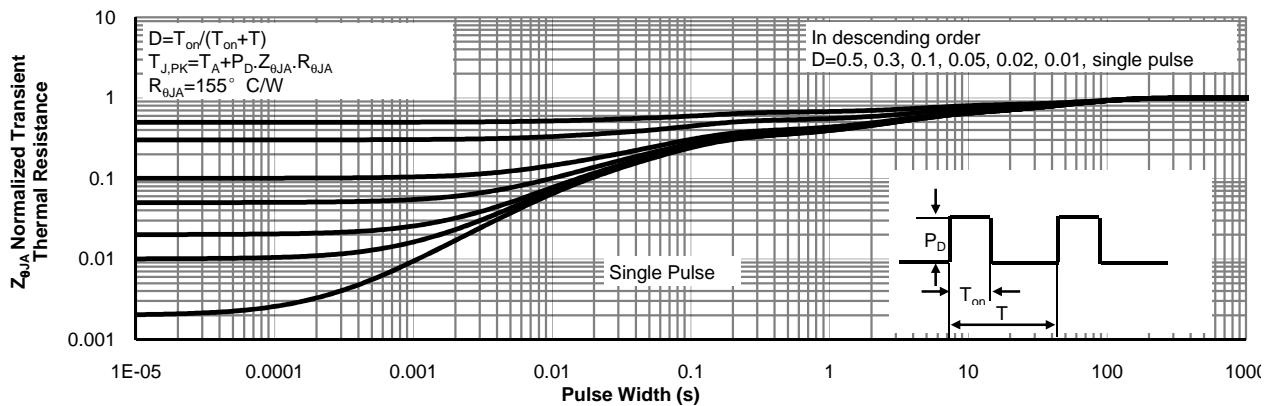
**Figure 8: Capacitance Characteristics**



**Figure 9: Maximum Forward Biased Safe Operating Area**



**Figure 10: Single Pulse Power Rating Junction-to-Ambient**



**Figure 11: Normalized Maximum Transient Thermal Impedance**