ALPHA & OMEGA SEMICONDUCTOR

AOC2403

20V P-Channel MOSFET

General Description

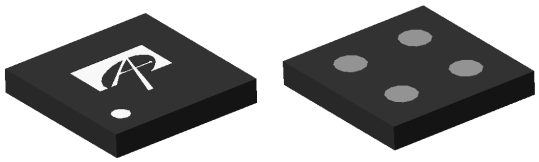
The AOC2403 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.5V while retaining a 8V $V_{GS(MAX)}$ rating.

Product Summary

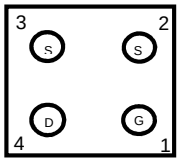
Vds	-20V
I_D (at V_{GS}=-4.5V)	-1.8A
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	< 95mΩ
$R_{DS(ON)}$ (at V_{GS}=-2.5V)	< 115mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.8V)	< 150mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.5V)	< 200mΩ

Green Product

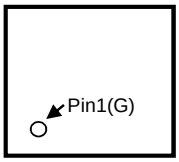
MCSP 0.97x0.97_4



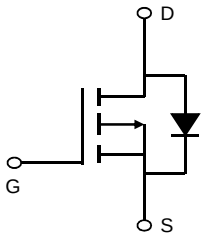
Bottom View



Top View



Equivalent Circuit



Absolute Maximum Ratings T_A=25℃ unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	V
Source Current (DC) Note1	T_A=25℃	I_D	-1.8	A
Source Current (Pulse) Note2		I_{DM}	-20	
Power Dissipation Note1	T_A=25℃	P_D	0.45	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	℃

Note 1. Mounted on minimum pad PCB

Note 2. PW <300 µs pulses, duty cycle 0.5% max

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Source-Source Breakdown Voltage	I_D=-250µA, V_{GS}=0V	-20			V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS}=-20V, V_{GS}=0V			-1	µA
		T_J=55°C			-5	
I_{GSS}	Gate leakage current	V_{DS}=0V, V_{GS}=±8V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250µA	-0.3	-0.65	-1	V
$R_{DS(ON)}$	Static Source to Source On-Resistance	V_{GS}=-4.5V, I_D=-1A		76	95	mΩ
		T_J=125°C		105	132	
		V_{GS}=-2.5V, I_D=-1A		91	115	
		V_{GS}=-1.8V, I_D=-0.5A		107	150	
		V_{GS}=-1.5V, I_D=-0.5A		130	200	
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-1A		7		S
V_{FSD}	Diode Forward Voltage	I_D=-1A,V_{GS}=0V,		-0.73	-1	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-10V, f=1MHz,		405		pF
C_{oss}	Output Capacitance			75		pF
C_{rss}	Reverse Transfer Capacitance			45		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		26		Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-10V, ID=-1A		4.8		nC
Q_{gs}	Gate Source Charge			0.8		nC
Q_{gd}	Gate Drain Charge			1		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=-4.5V, V_{DS}=-10V, R_L=10Ω, ID=-1A, R_{GEN}=6Ω		7.5		ns
t_r	Turn-On Rise Time			8.5		
$t_{D(off)}$	Turn-Off DelayTime			95		
t_f	Turn-Off Fall Time			30		
t_{rr}	Body Diode Reverse Recovery Time	I_F=-1A, dI/dt=100A/µs		22		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-1A, dI/dt=100A/µs		8.5		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

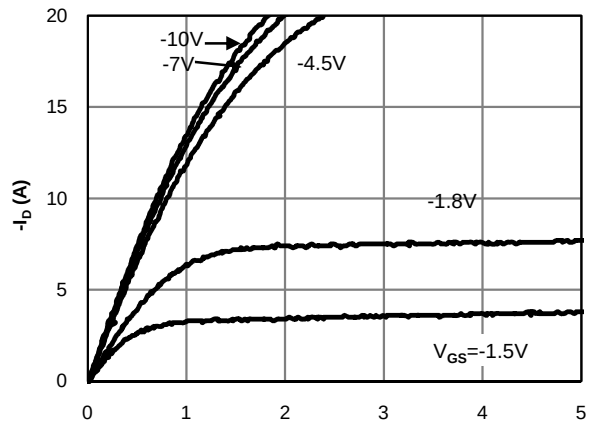


Fig 1: On-Region Characteristics

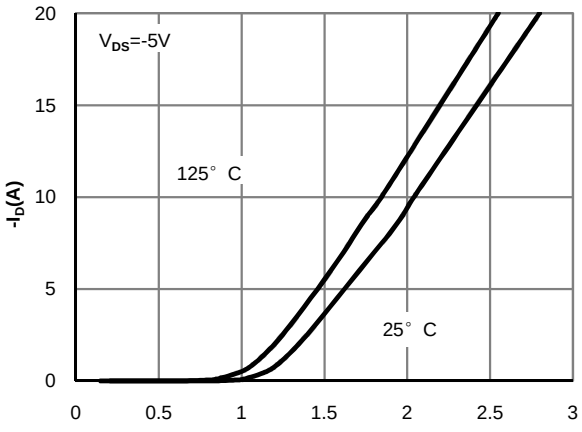


Figure 2: Transfer Characteristics

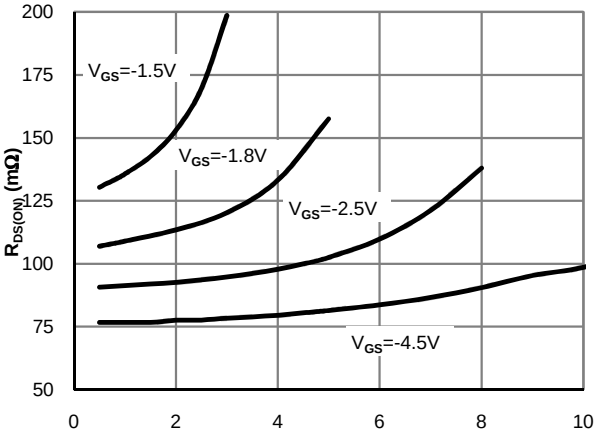


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

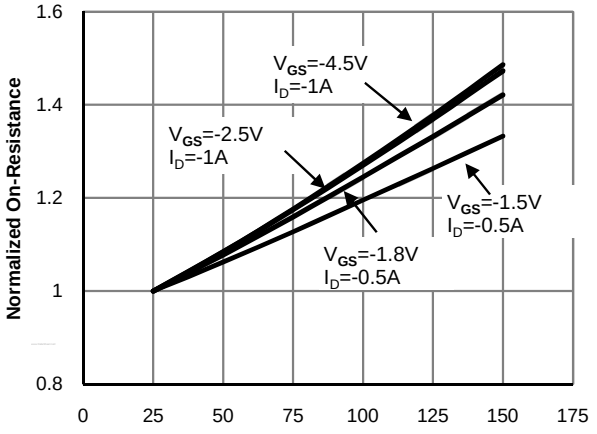


Figure 4: On-Resistance vs. Junction Temperature

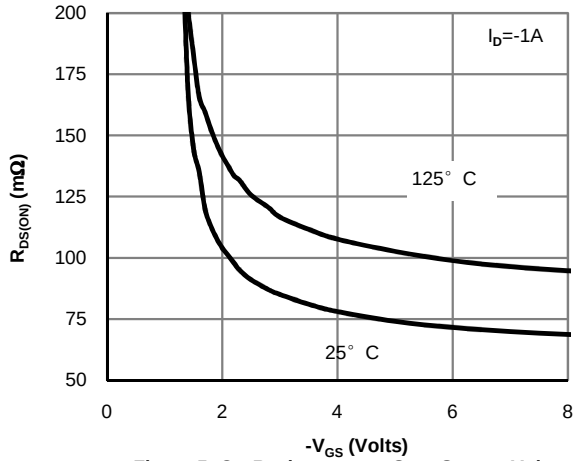


Figure 5: On-Resistance vs. Gate-Source Voltage

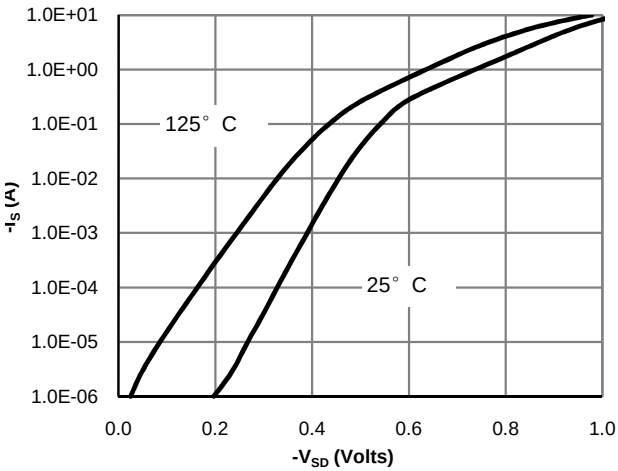


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

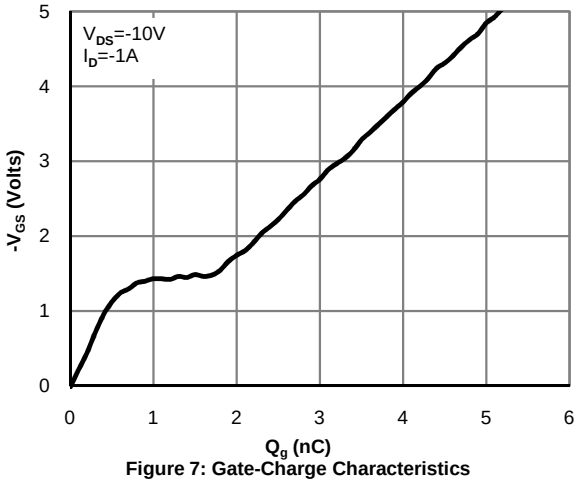


Figure 7: Gate-Charge Characteristics

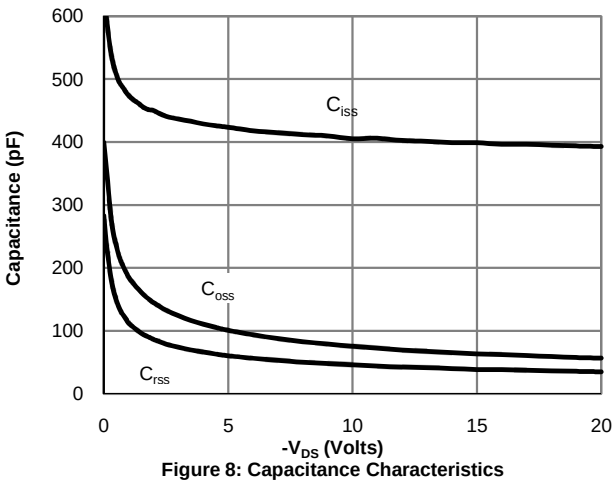


Figure 8: Capacitance Characteristics

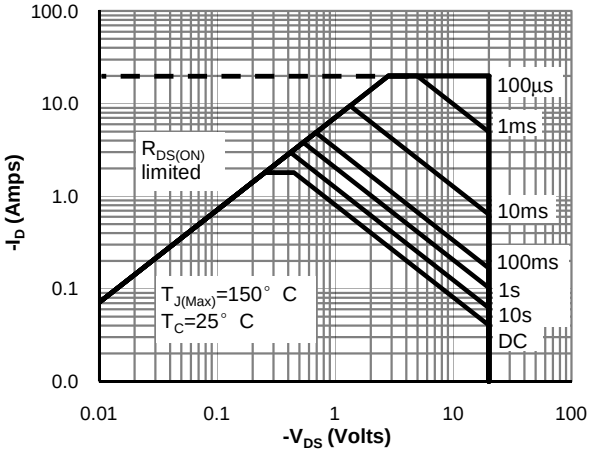


Figure 9: Maximum Forward Biased Safe Operating Area

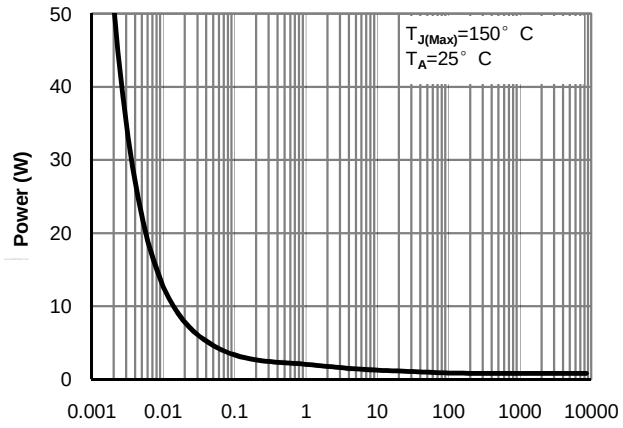


Figure 10: Single Pulse Power Rating Junction-to-Ambient

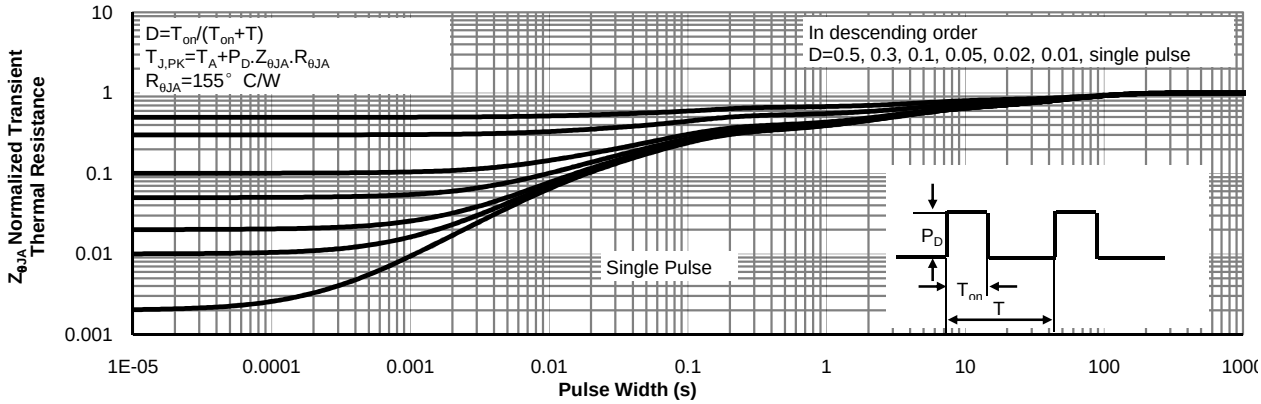


Figure 11: Normalized Maximum Transient Thermal Impedance