

General Description

The AOC2423 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating.

Product Summary

V_{DS}	-20V
I_D (at $V_{GS}=-10V$)	-2A
$R_{DS(ON)}$ (at $V_{GS}=-10V$)	< 80m Ω
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	< 95m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$)	< 120m Ω

Typical ESD protection

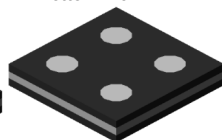
HBM Class2



MCSP 0.97x0.97A_4

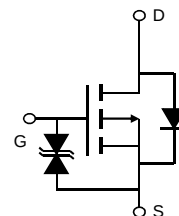
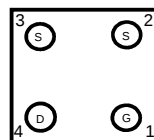
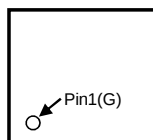
Top View

Bottom View



Top View

Bottom View



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}	± 12	V
Source Current (DC) ^{Note1}	I_D	-2	A
Source Current (Pulse) ^{Note2}	I_{DM}	-20	
Power Dissipation ^{Note1}	P_D	0.6	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	110	140	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^{A D}		160	200	$^\circ\text{C/W}$

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}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _j =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±12V			±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.85	-1.2	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-1A T _j =125°C		65 86.5	80 107	mΩ
		V _{GS} =-4.5V, I _D =-1A		74	95	mΩ
		V _{GS} =-2.5V, I _D =-1A		92	120	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-1A		6.5		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.74	-1	V
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, f=1MHz		470		pF
C _{oss}	Output Capacitance			92		pF
C _{rss}	Reverse Transfer Capacitance			60		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		12.5		Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =-10V, V _{DS} =-10V, I _D =-1A		10		nC
Q _g (4.5V)	Total Gate Charge			5		nC
Q _{gs}	Gate Source Charge			2		nC
Q _{gd}	Gate Drain Charge			0.5		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =-10V, V _{DS} =-10V, R _L =10Ω, R _{GEN} =3Ω		7.5		ns
t _r	Turn-On Rise Time			10		ns
t _{D(off)}	Turn-Off DelayTime			50		ns
t _f	Turn-Off Fall Time			24		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-1A, dI/dt=100A/μs		8.5		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-1A, dI/dt=100A/μs		3		nC

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

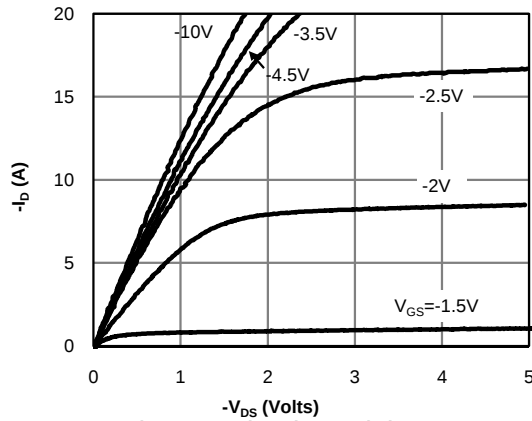


Fig 1: On-Region Characteristics

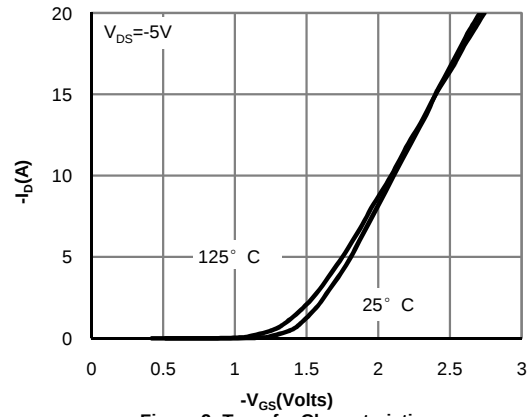


Figure 2: Transfer Characteristics

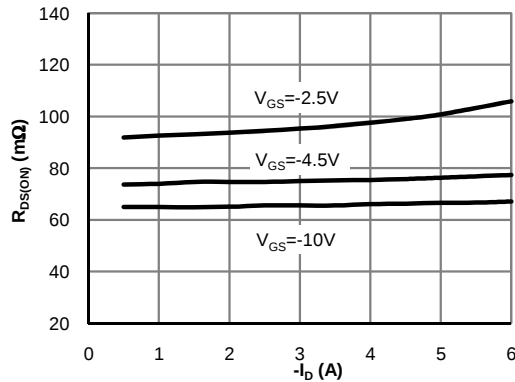


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

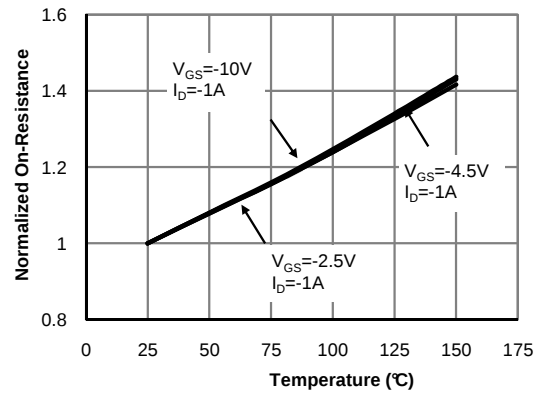


Figure 4: On-Resistance vs. Junction Temperature (Note E)

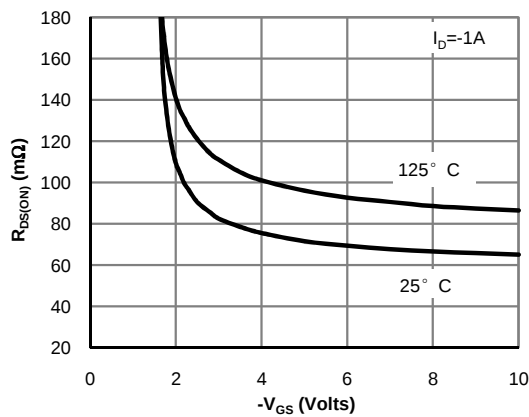


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

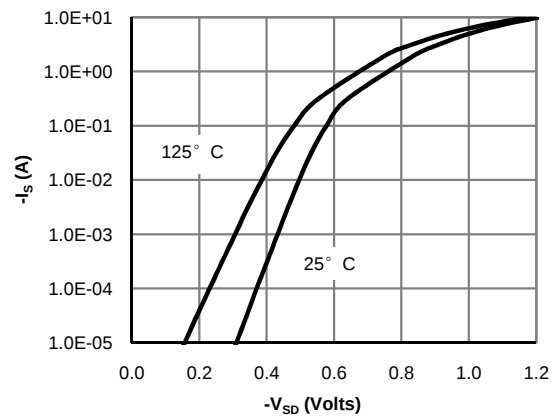


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

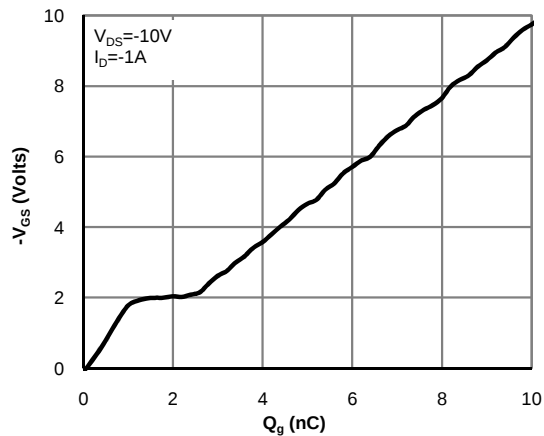


Figure 7: Gate-Charge Characteristics

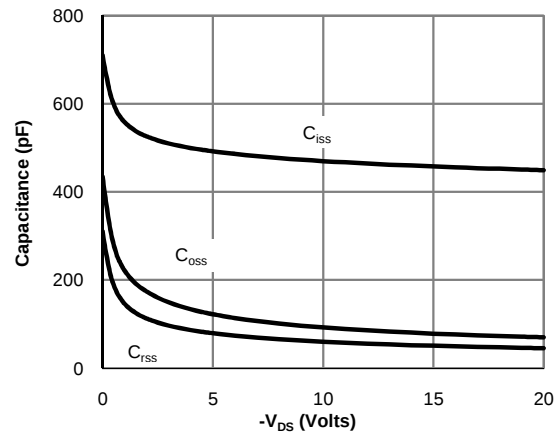


Figure 8: Capacitance Characteristics

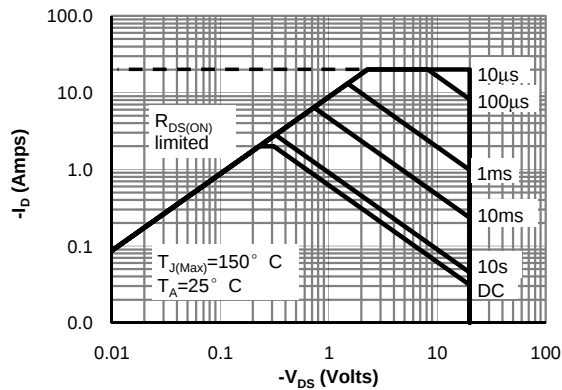


Figure 9: Maximum Forward Biased Safe Operating Area

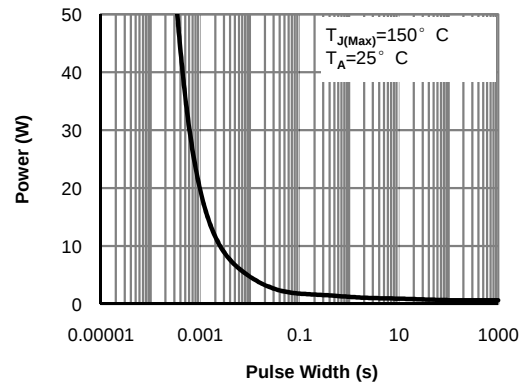


Figure 10: Single Pulse Power Rating Junction-to-Ambient

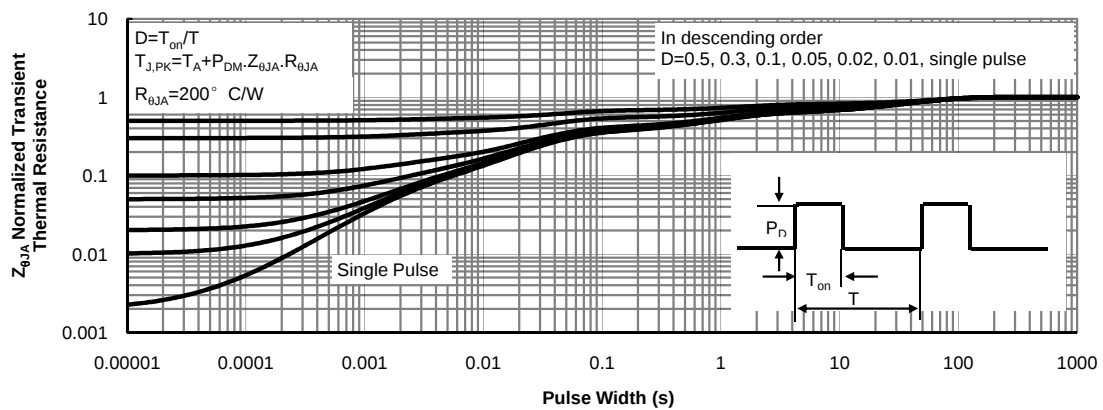
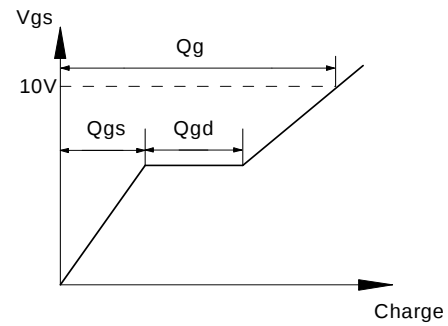
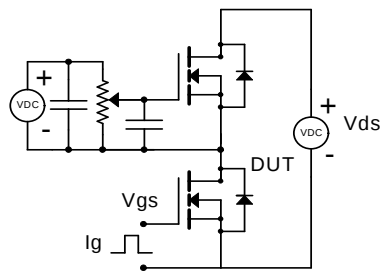
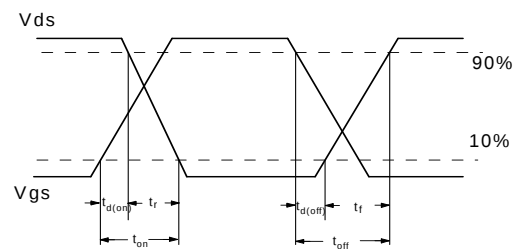
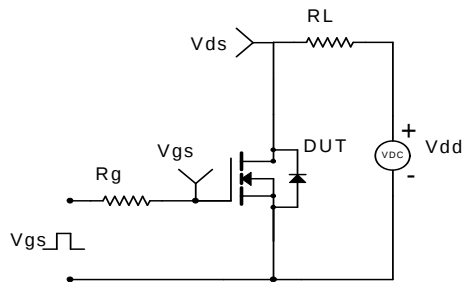


Figure 11: Normalized Maximum Transient Thermal Impedance

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

