



ALPHA & OMEGA
SEMICONDUCTOR

AOC2421

8V P-Channel MOSFET

General Description

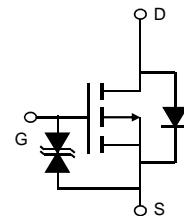
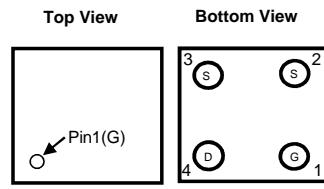
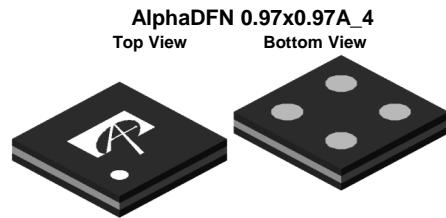
The AOC2421 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.2V while retaining a 5V $V_{GS(MAX)}$ rating.

Product Summary

V_{DS}	-8V
I_D (at $V_{GS}=-2.5V$)	-2.5A
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$)	< 60mΩ
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$)	< 72mΩ
$R_{DS(ON)}$ (at $V_{GS}=-1.5V$)	< 85mΩ
$R_{DS(ON)}$ (at $V_{GS}=-1.2V$)	< 115mΩ

Typical ESD protection

HBM Class 2



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-8	V
Gate-Source Voltage	V_{GS}	± 5	V
Source Current (DC) ^{Note1}	I_D	-2.5	A
Source Current (Pulse) ^{Note2}	I_{DM}	-25	
Power Dissipation ^{Note1}	P_D	0.6	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A $t \leq 10s$	$R_{θJA}$	110	140	°C/W
Maximum Junction-to-Ambient ^{A,D} Steady-State		160	200	°C/W

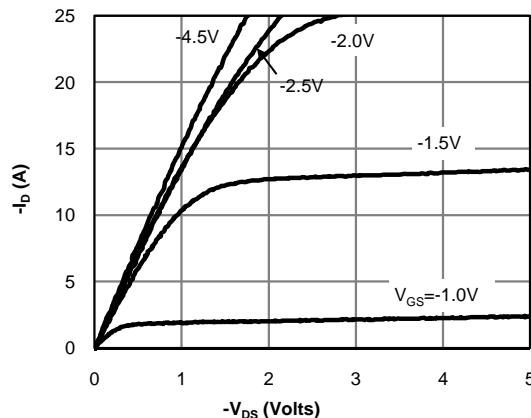
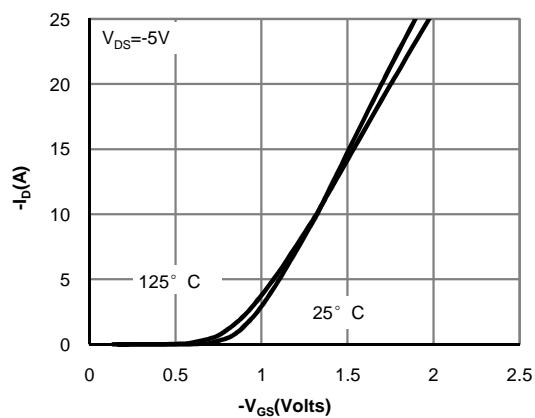
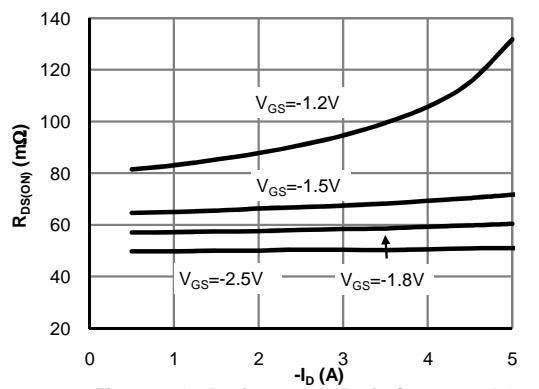
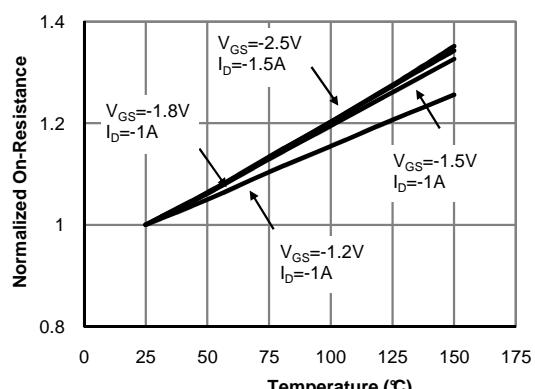
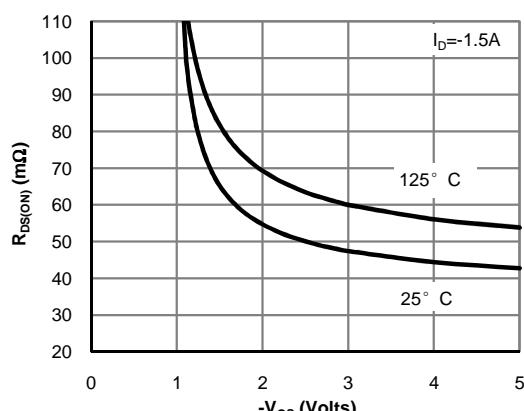
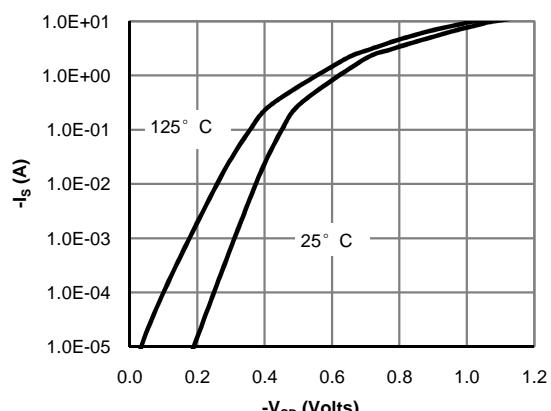
Note 1. Mounted on minimum pad PCB

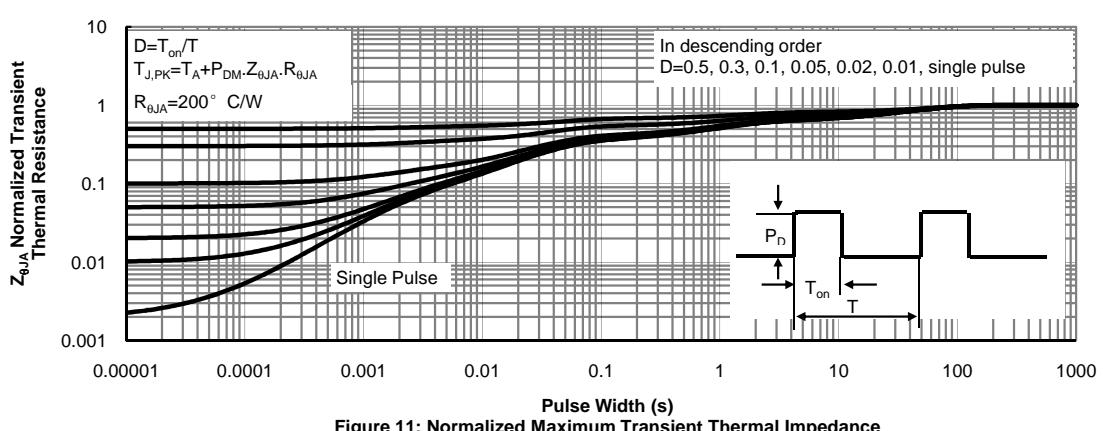
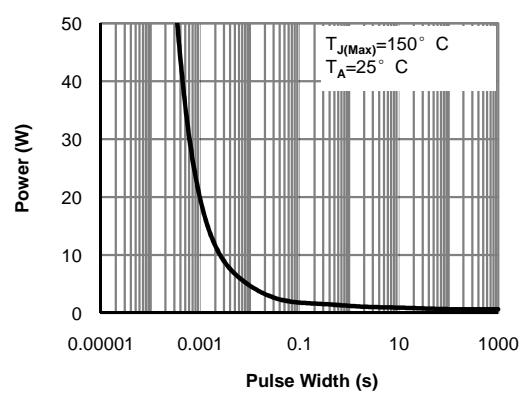
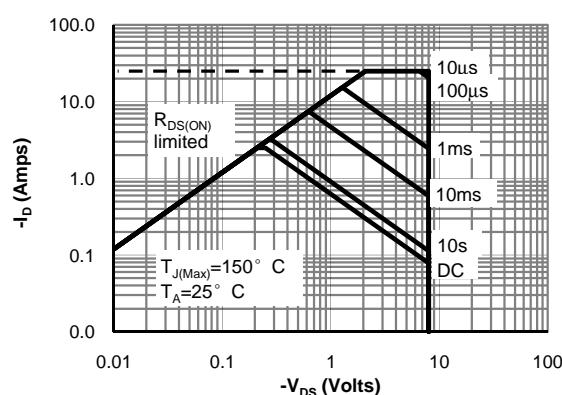
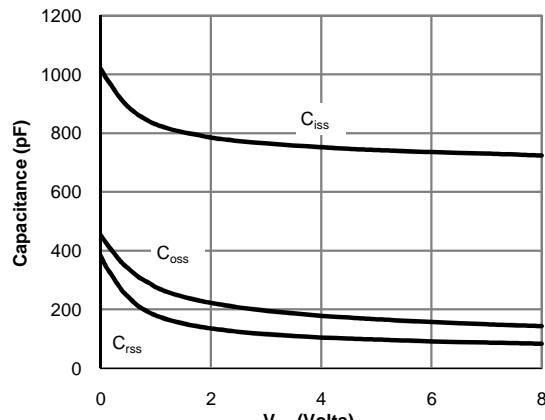
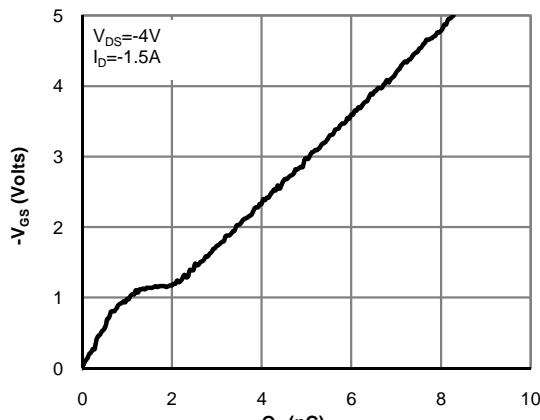
Note 2. PW <300 μs pulses, duty cycle 0.5% max

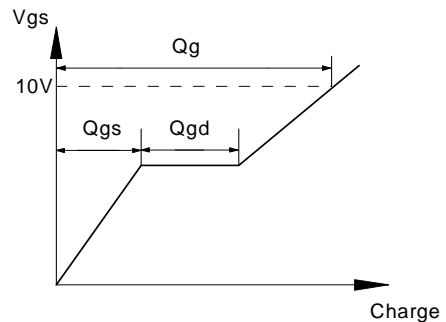
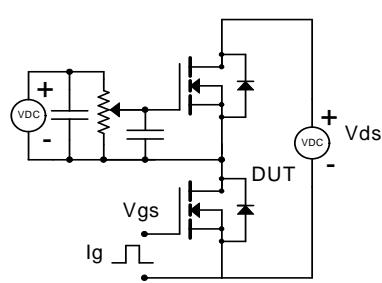
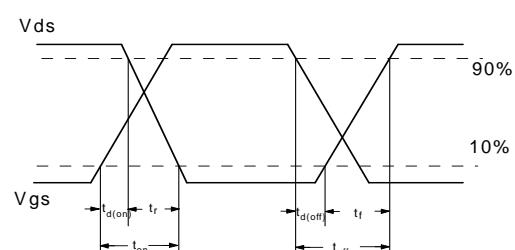
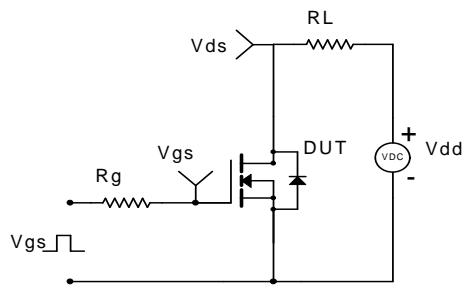
Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=-250\mu\text{A}, V_{GS}=0\text{V}$	-8			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-8\text{V}, V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			-1 -5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 5\text{V}$			± 10	μA
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.2	-0.45	-0.7	V
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{GS}=-2.5\text{V}, I_D=-1.5\text{A}$ $T_J=125^\circ\text{C}$	50	62		$\text{m}\Omega$
		$V_{GS}=-1.8\text{V}, I_D=-1\text{A}$	63.5	79		$\text{m}\Omega$
		$V_{GS}=-1.5\text{V}, I_D=-1\text{A}$	57	72		$\text{m}\Omega$
		$V_{GS}=-1.2\text{V}, I_D=-1\text{A}$	65	85		$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS}=-5\text{V}, I_D=-1.5\text{A}$	83	115		S
V_{SD}	Diode Forward Voltage	$I_S=-1\text{A}, V_{GS}=0\text{V}$	-0.6	-1		V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=-4\text{V}, f=1\text{MHz}$		752		pF
C_{oss}	Output Capacitance			178		pF
C_{rss}	Reverse Transfer Capacitance			104		pF
R_g	Gate resistance	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$		1.6		$\text{k}\Omega$
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS}=-4.5\text{V}, V_{DS}=-4\text{V}, I_D=-1.5\text{A}$		7.5	13	nC
Q_{gs}	Gate Source Charge			1.5		nC
Q_{gd}	Gate Drain Charge			1.0		nC
$t_{\text{D(on)}}$	Turn-On Delay Time	$V_{GS}=-2.5\text{V}, V_{DS}=-4\text{V}, R_L=2.67\Omega, R_{\text{GEN}}=3\Omega$		285		ns
t_r	Turn-On Rise Time			465		ns
$t_{\text{D(off)}}$	Turn-Off Delay Time			1870		ns
t_f	Turn-Off Fall Time			1900		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=-1.5\text{A}, dI/dt=100\text{A}/\mu\text{s}$		12		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=-1.5\text{A}, dI/dt=100\text{A}/\mu\text{s}$		4		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


Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms
