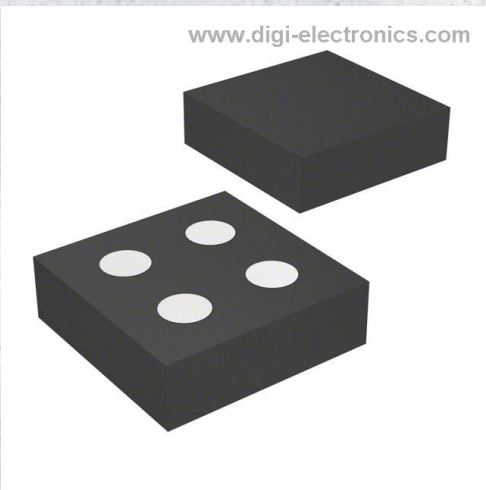
AOC2421 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	AOC2421-DG
Manufacturer	Alpha & Omega Semiconductor Inc.
Manufacturer Product Number	AOC2421
Description	MOSFET P-CH 8V 2.5A 4ALPHADFN
Detailed Description	P-Channel 8 V 2.5A (Ta) 600mW (Ta) Surface Mount 4-AlphaDFN (0.97x0.97)

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
AOC2421	Alpha & Omega Semiconductor Inc.
Series:	Product Status:
-	Active
FET Type:	Technology:
P-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
8 V	2.5A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
1.2V, 2.5V	62mOhm @ 1.5A, 2.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
700mV @ 250µA	13 nC @ 4.5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±5V	752 pF @ 4 V
FET Feature:	Power Dissipation (Max):
-	600mW (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
4-AlphaDFN (0.97x0.97)	4-SMD, No Lead
Base Product Number:	
AOC24	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

ALPHA & OMEGA SEMICONDUCTOR

AOC2421

8V P-Channel MOSFET

General Description

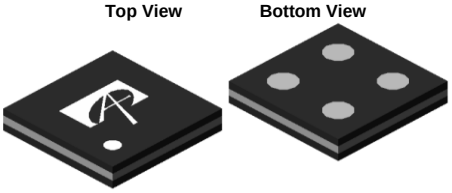
The AOC2421 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.2V while retaining a 5V $V_{GS(MAX)}$ rating.

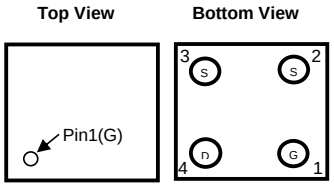
Product Summary

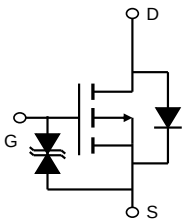
V_{DS}	-8V
I_D (at V_{GS}=-2.5V)	-2.5A
$R_{DS(ON)}$ (at V_{GS}=-2.5V)	< 60mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.8V)	< 72mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.5V)	< 85mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.2V)	< 115mΩ
Typical ESD protection	**HBM Class 2**

Green Product

AlphaDFN 0.97x0.97A_4







Absolute Maximum Ratings T_A=25°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	T_A=25°C	I_D	-2.5	A
Source Current (Pulse) Note2		I_{DM}	-25	
Power Dissipation Note1	T_A=25°C	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 ≤ 10s	$R_{\theta JA}$	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°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	-8			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-8V, V_{GS}=0V			-1	µA
		T_J=55°C			-5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±5V			±10	µA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=-250µA	-0.2	-0.45	-0.7	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-2.5V, I_D=-1.5A		50	62	mΩ
		T_J=125°C		63.5	79	
		V_{GS}=-1.8V, I_D=-1A		57	72	mΩ
		V_{GS}=-1.5V, I_D=-1A		65	85	mΩ
		V_{GS}=-1.2V, I_D=-1A		83	115	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-1.5A		12		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V		-0.6	-1	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-4V, f=1MHz		752		pF
C_{oss}	Output Capacitance			178		pF
C_{rss}	Reverse Transfer Capacitance			104		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.6		KΩ
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-4V, I_D=-1.5A		7.5	13	nC
Q_{gs}	Gate Source Charge			1.5		nC
Q_{gd}	Gate Drain Charge			1.0		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=-2.5V, V_{DS}=-4V, R_L=2.67Ω, R_{GEN}=3Ω		285		ns
t_r	Turn-On Rise Time			465		ns
$t_{D(off)}$	Turn-Off DelayTime			1870		ns
t_f	Turn-Off Fall Time			1900		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=-1.5A, dI/dt=100A/µs		12		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-1.5A, dI/dt=100A/µs		4		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

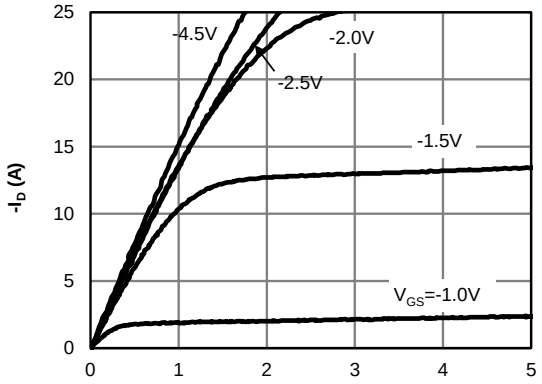


Fig 1: On-Region Characteristics

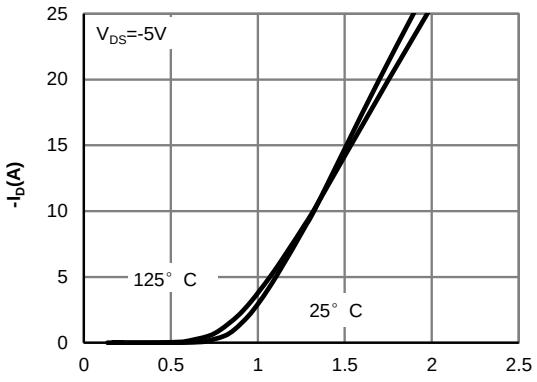


Figure 2: Transfer Characteristics

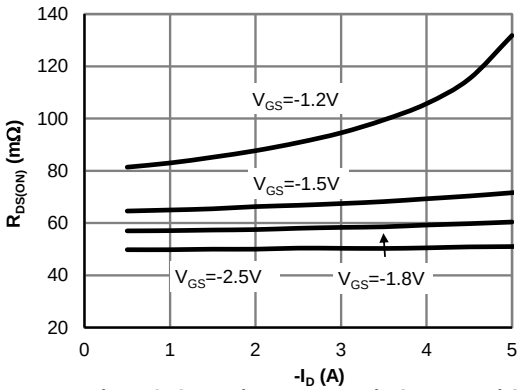


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

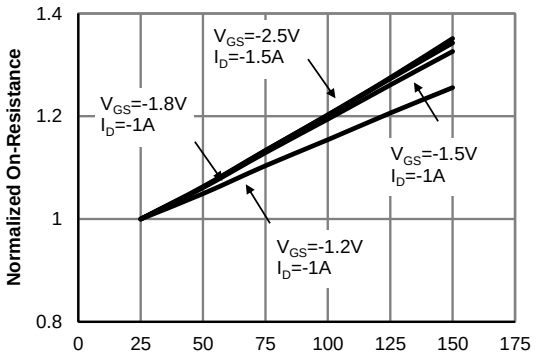


Figure 4: On-Resistance vs. Junction Temperature (Note E)

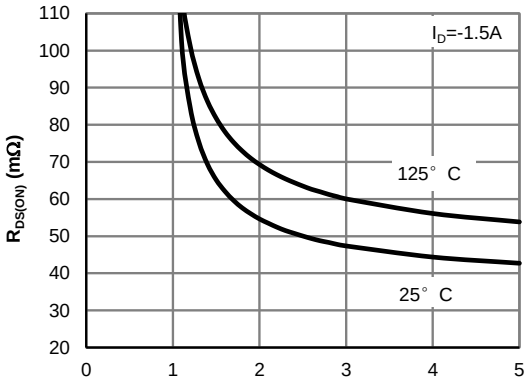


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

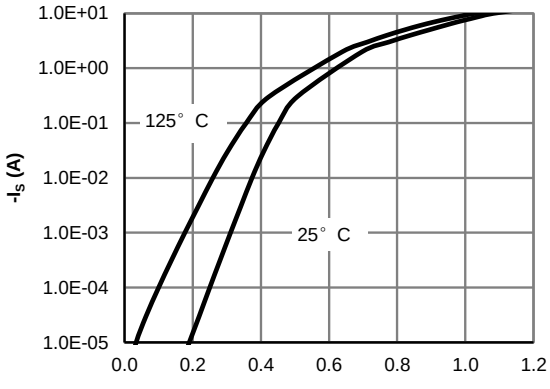


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

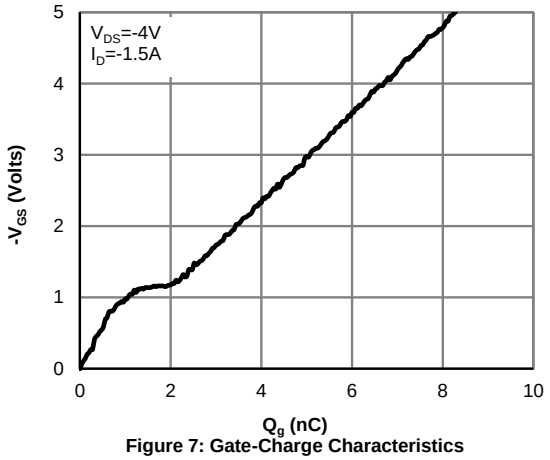


Figure 7: Gate-Charge Characteristics

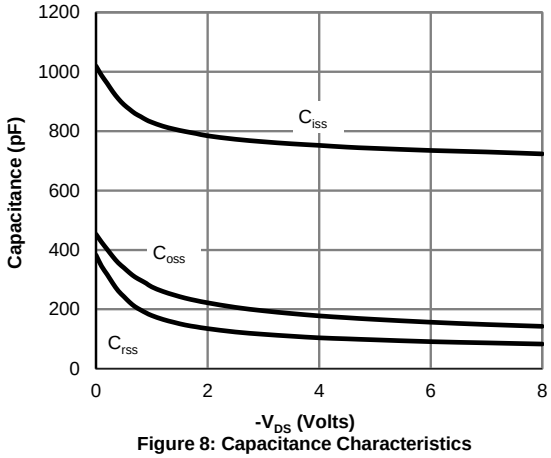


Figure 8: Capacitance Characteristics

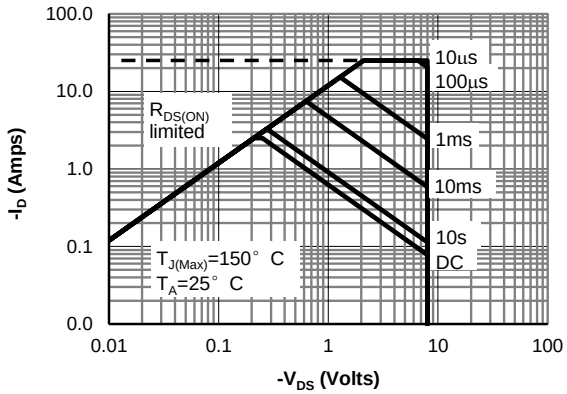


Figure 9: Maximum Forward Biased Safe Operating Area

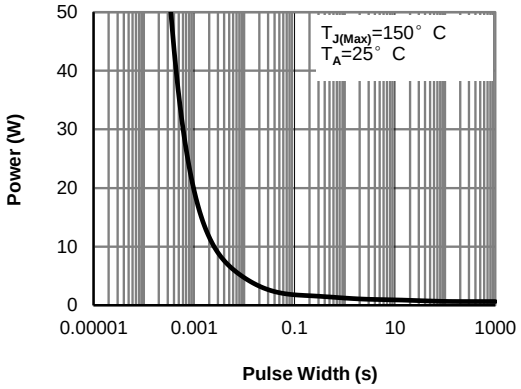


Figure 10: Single Pulse Power Rating Junction-to-Ambient

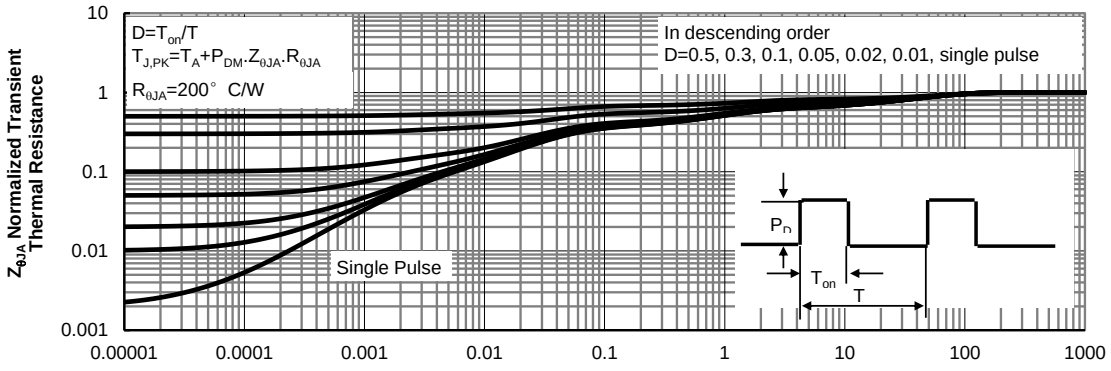
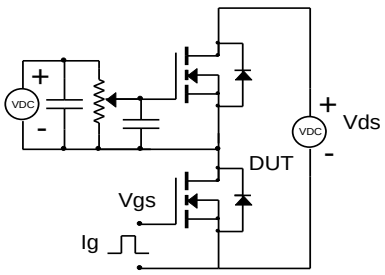
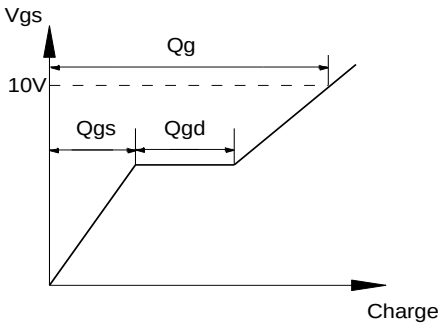


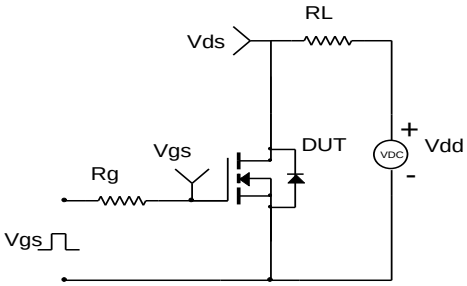
Figure 11: Normalized Maximum Transient Thermal Impedance

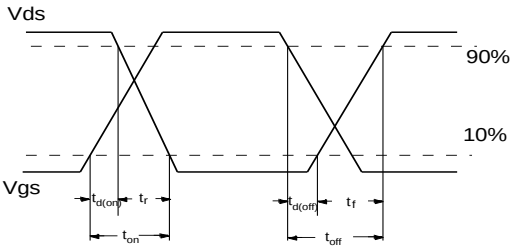
Gate Charge Test Circuit & Waveform



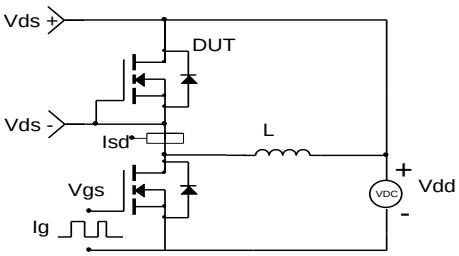


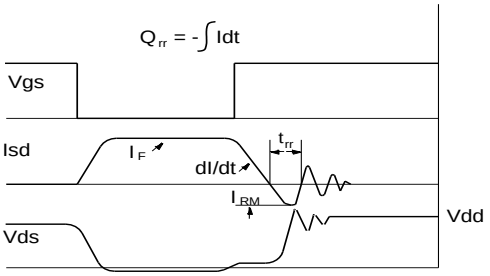
Resistive Switching Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





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