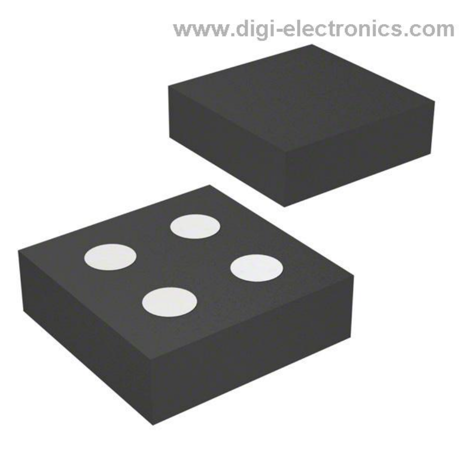
AOC2413 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	AOC2413-DG
Manufacturer	Alpha & Omega Semiconductor Inc.
Manufacturer Product Number	AOC2413
Description	MOSFET P-CH 8V 3.5A 4ALPHADFN
Detailed Description	P-Channel 8 V 3.5A (Ta) 550mW (Ta) Surface Mount 4-AlphaDFN (1.57x1.57)

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
AOC2413	Alpha & Omega Semiconductor Inc.
Series:	Product Status:
-	Obsolete
FET Type:	Technology:
P-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
8 V	3.5A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
1.2V, 2.5V	28mOhm @ 1.5A, 2.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
650mV @ 250µA	27 nC @ 4.5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±5V	1935 pF @ 4 V
FET Feature:	Power Dissipation (Max):
-	550mW (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
4-AlphaDFN (1.57x1.57)	4-SMD, No Lead
Base Product Number:	
AOC24	

Environmental & Export classification

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

ALPHA & OMEGA
SEMICONDUCTOR

AOC2413

8V P-Channel MOSFET

General Description

The AOC2413 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.

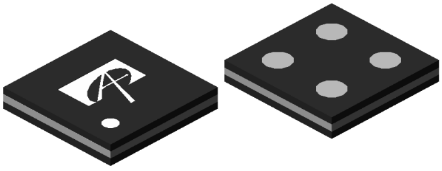
Product Summary

V_{DS}	-8V
I_D (at V_{GS}=-2.5V)	-3.5A
$R_{DS(ON)}$ (at V_{GS}=-2.5V)	< 28mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.8V)	< 32mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.5V)	< 37mΩ
$R_{DS(ON)}$ (at V_{GS}=-1.2V)	< 47mΩ

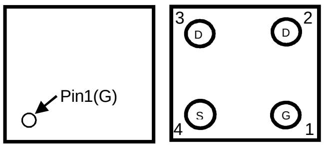
Typical ESD protection **HBM Class 3A**

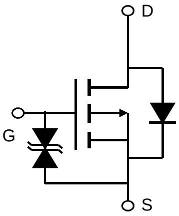
AlphaDFN 1.57x1.57_4

Top View **Bottom View**



Top View **Bottom View**





Absolute Maximum Ratings T_A=25℃ 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℃	I_D	-3.5	A
Source Current (Pulse) Note2		I_{DM}	-50	
Power Dissipation Note1	T_A=25℃	P_D	0.55	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	℃

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Units**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	140	170	℃/W
Maximum Junction-to-Ambient [A D]	Steady-State		190	230	℃/W

Note 1. Mounted on minimum pad PCB

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

Electrical Characteristics (T_J=25℃ 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℃			-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	-0.15	-0.42	-0.65	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-2.5V, I_D=-1.5A		22.5	28	mΩ
		T_J=125℃		29.5	37	
		V_{GS}=-1.8V, I_D=-1A		25	32	mΩ
		V_{GS}=-1.5V, I_D=-1A		28	37	mΩ
		V_{GS}=-1.2V, I_D=-1A		34	47	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-1.5A		14		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V		-0.52	-1	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-4V, f=1MHz		1935		pF
C_{oss}	Output Capacitance			475		pF
C_{rss}	Reverse Transfer Capacitance			240		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.7		KΩ
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-4V, I_D=-1.5A		19	27	nC
Q_{gs}	Gate Source Charge			7.5		nC
Q_{gd}	Gate Drain Charge			3.5		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=-2.5V, V_{DS}=-4V, R_L=2.67Ω, R_{GEN}=3Ω		1.6		µs
t_r	Turn-On Rise Time			2.8		µs
$t_{D(off)}$	Turn-Off DelayTime			2.7		µs
t_f	Turn-Off Fall Time			6.2		µs
t_{rr}	Body Diode Reverse Recovery Time	I_F=-1.5A, dI/dt=100A/µs		17		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-1.5A, dI/dt=100A/µs		9		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

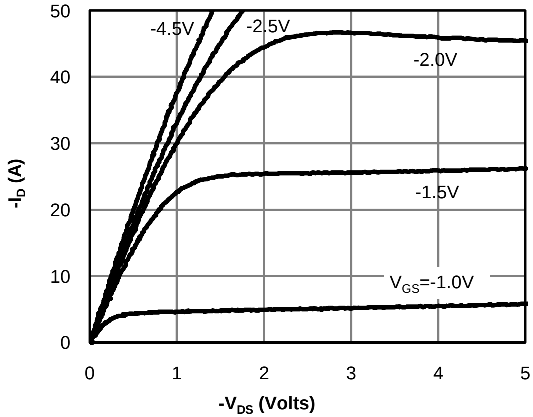


Fig 1: On-Region Characteristics

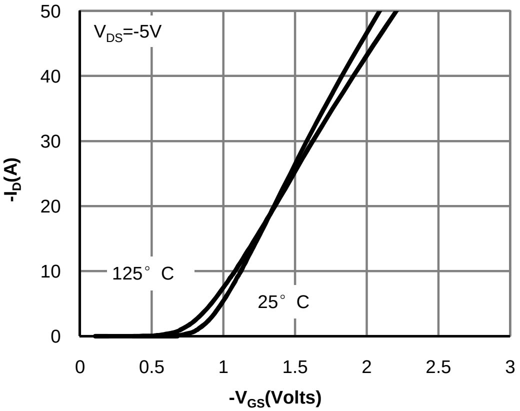


Figure 2: Transfer Characteristics

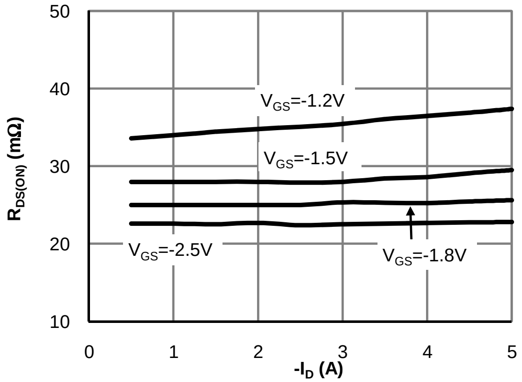


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

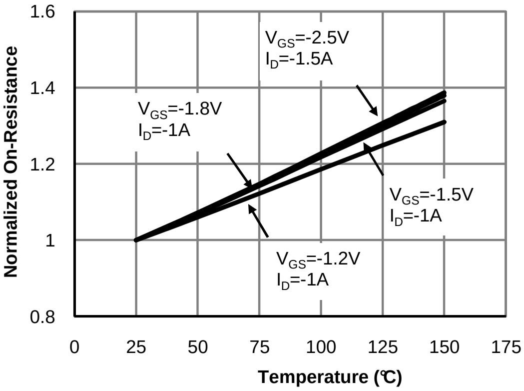


Figure 4: On-Resistance vs. Junction Temperature (Note E)

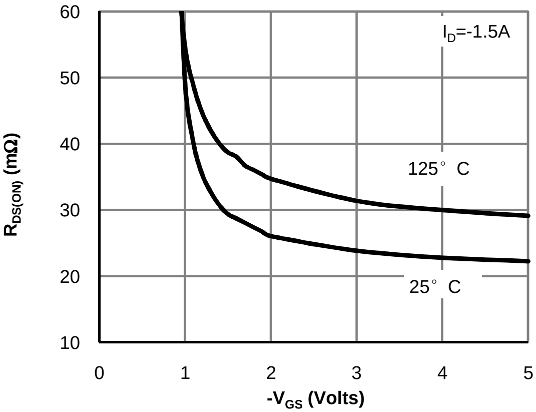


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

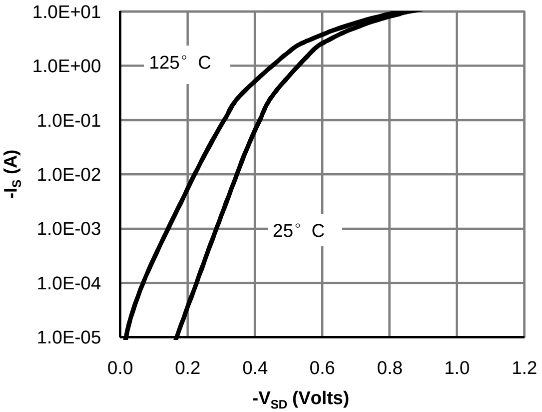


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

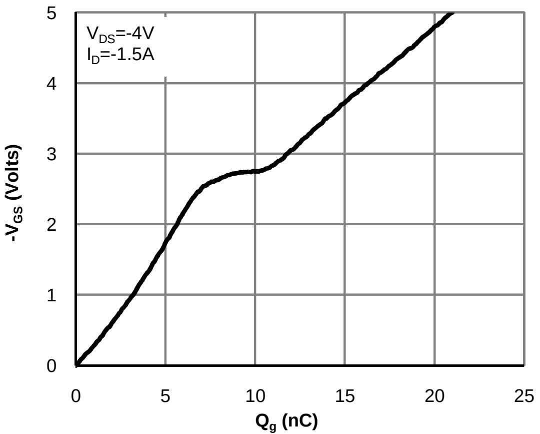


Figure 7: Gate-Charge Characteristics

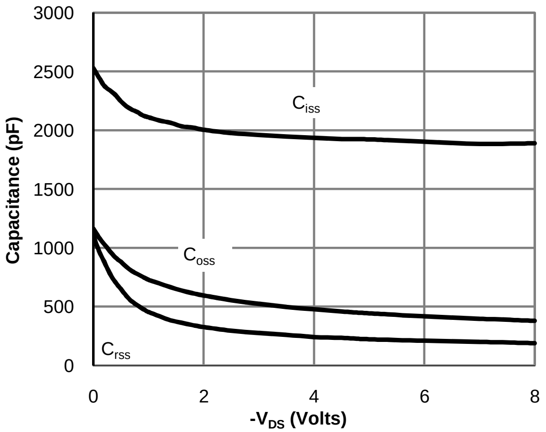


Figure 8: Capacitance Characteristics

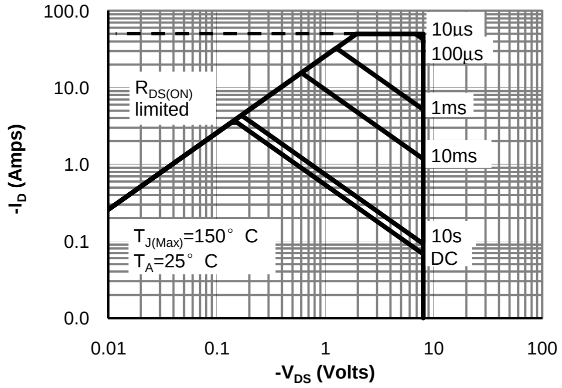


Figure 9: Maximum Forward Biased Safe Operating Area

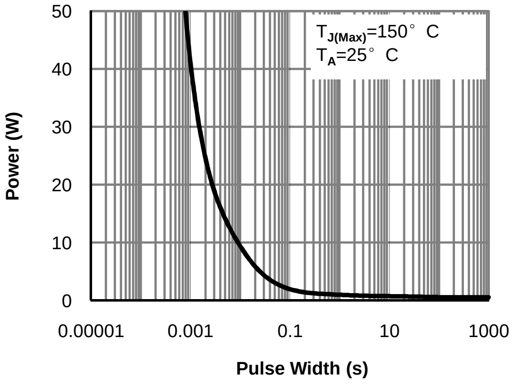


Figure 10: Single Pulse Power Rating Junction-to-Ambient

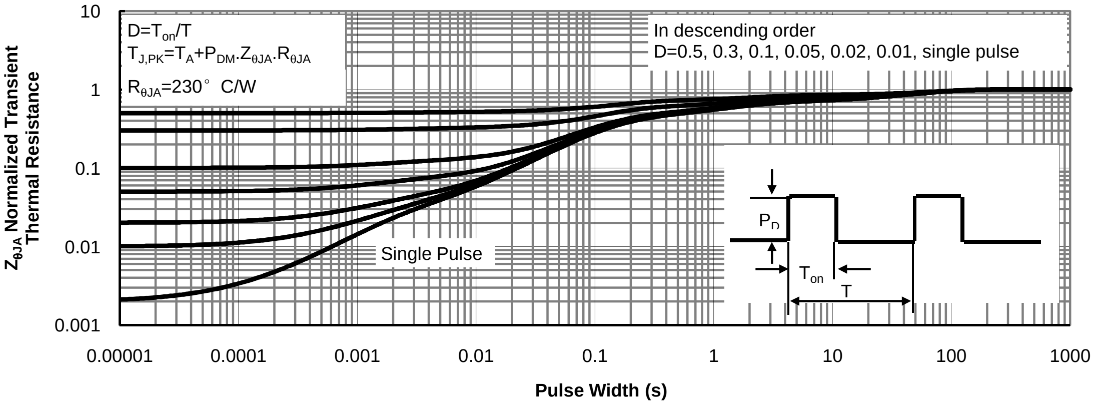
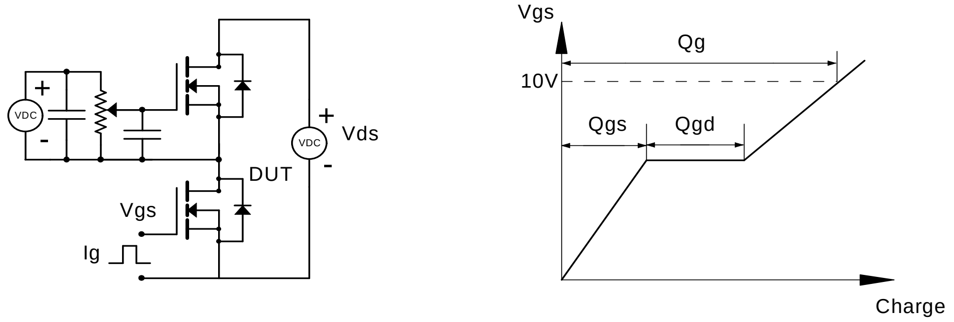
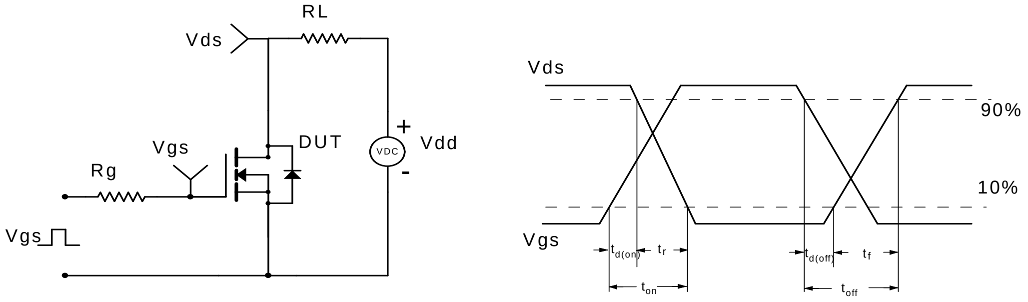


Figure 11: Normalized Maximum Transient Thermal Impedance

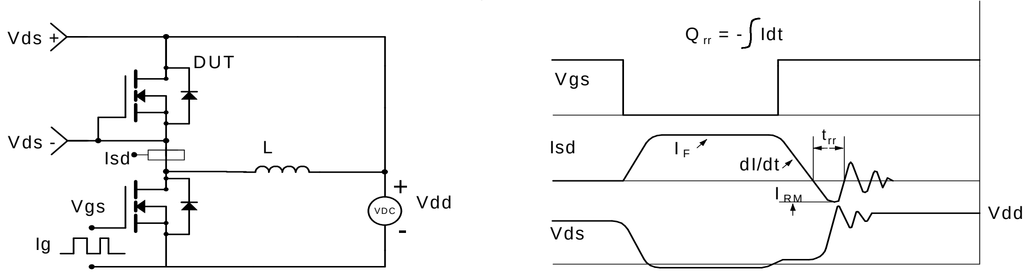
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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