Description

The AO4421 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

SOP-8

General Features

V_{DS} = -60V I_D = -6A

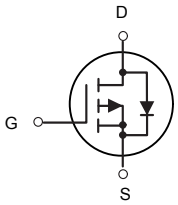
$R_{DS(ON)}$ < 63mΩ@ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AO4421	SOP-8	4421 XXXX	3000

Absolute Maximum Ratings (Tc=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Drain Current[3], V_{GS} @ 10V	-6	A
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 10V	-4.8	A
I_{DM}	Pulsed Drain Current[1]	-40	A
P_D@T_A=25℃	Total Power Dissipation	3.1	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	40	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-48V, V_{GS}=0V			-1	uA
		V_{DS}=-48V, V_{GS}=0V, T_J=55℃			-5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} ,I_D=-250μA	-1		-3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6.2A		53	63	mΩ
		V_{GS}=-10V, I_D=-6.2A T_J=125℃		75	87	
		V_{GS}=-4.5V, I_D=-5A		55		
On state drain current	$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5V	-40			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-6.2A		18		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-30V, f=1MHz		2417	2900	pF
Output Capacitance	C_{oss}			179		
Reverse Transfer Capacitance	C_{rss}			120		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.9	2.3	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=-10V, V_{DS}=-30V, I_D=-6.2A		46.5	55	nC
Total Gate Charge (4.5V)				22.7		
Gate Source Charge	Q_{gs}			9.1		
Gate Drain Charge	Q_{gd}			9.2		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-30V, R_L=4.7Ω, R_{GEN}=3Ω		9.8		ns
Turn-On Rise Time	t_r			6.1		
Turn-Off DelayTime	$t_{d(off)}$			44		
Turn-Off Fall Time	t_f			12.7		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-6.2A, dI/dt=100A/us		34	42	
Body Diode Reverse Recovery Charge	Q_{rr}			47		nC
Maximum Body-Diode Continuous Current	I_S				-4.2	A
Diode Forward Voltage	V_{SD}	I_S=-1A,V_{GS}=0V			-1	V

Note : The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

Typical Characterisitics

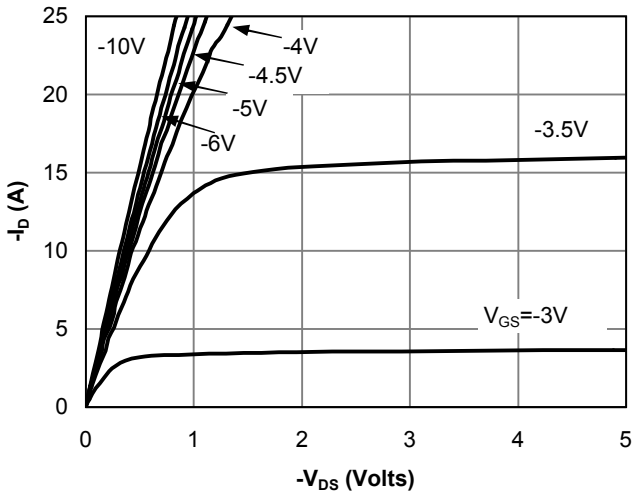


Fig 1: On-Region Characteristics

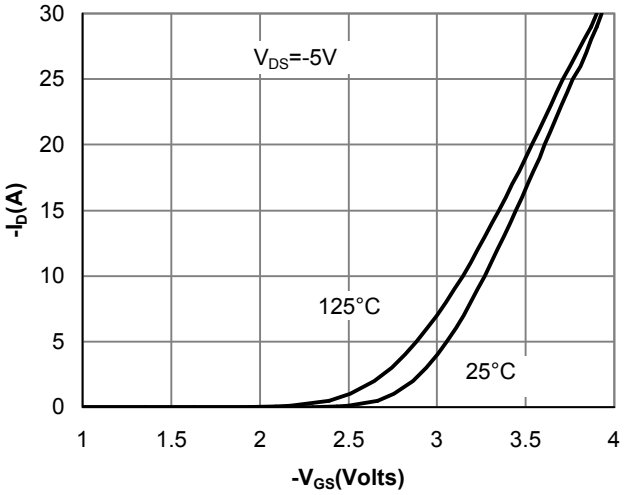


Figure 2: Transfer Characteristics

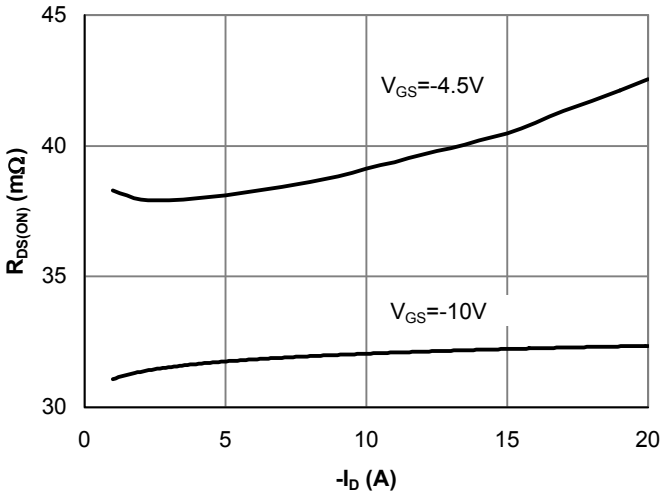


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

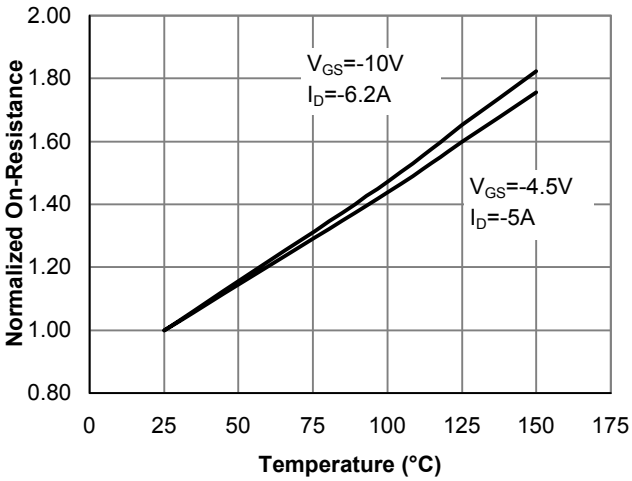


Figure 4: On-Resistance vs. Junction Temperature

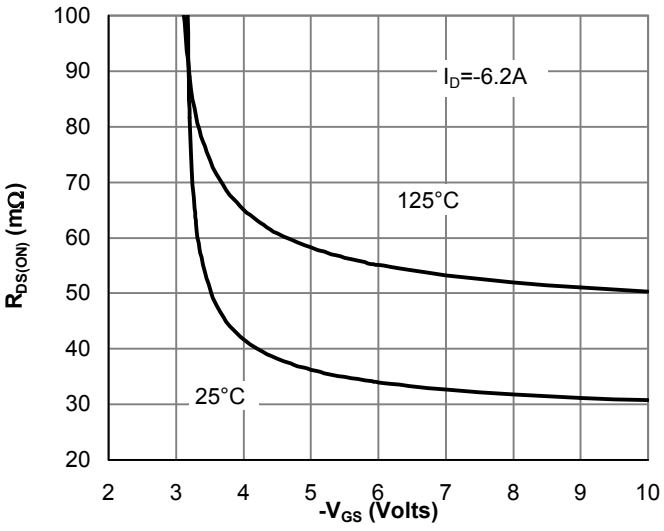


Figure 5: On-Resistance vs. Gate-Source Voltage

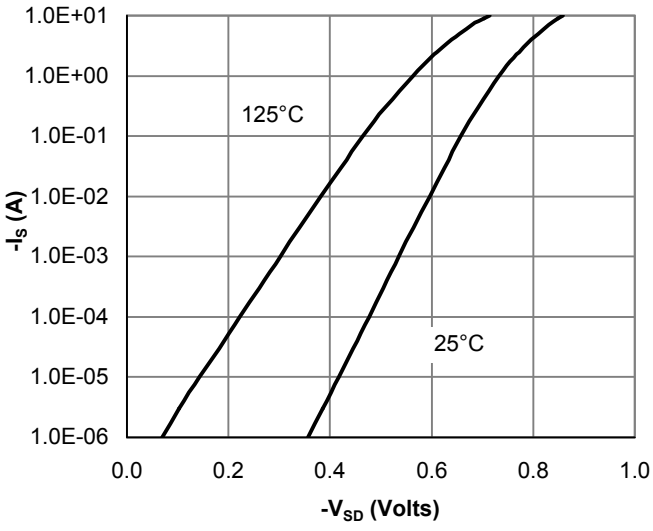


Figure 6: Body-Diode Characteristics

Typical Characterisitics

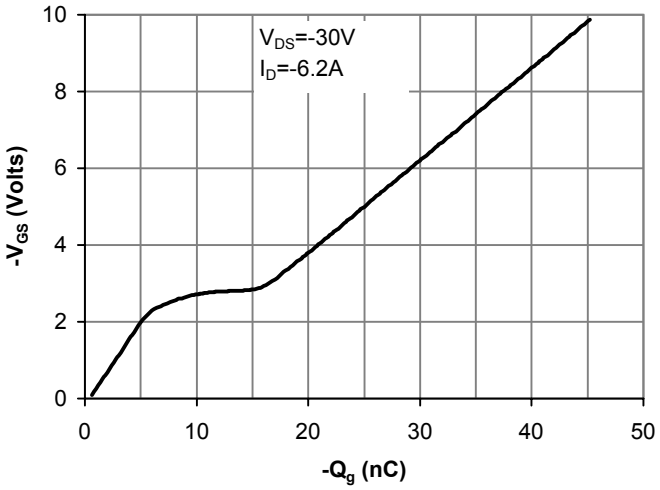


Figure 7: Gate-Charge Characteristics

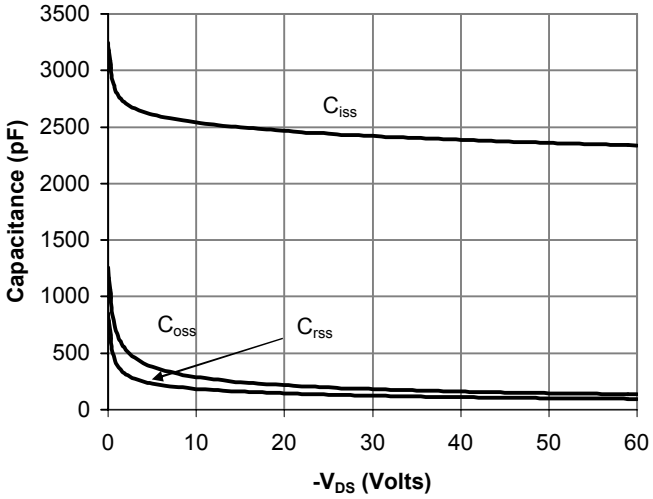


Figure 8: Capacitance Characteristics

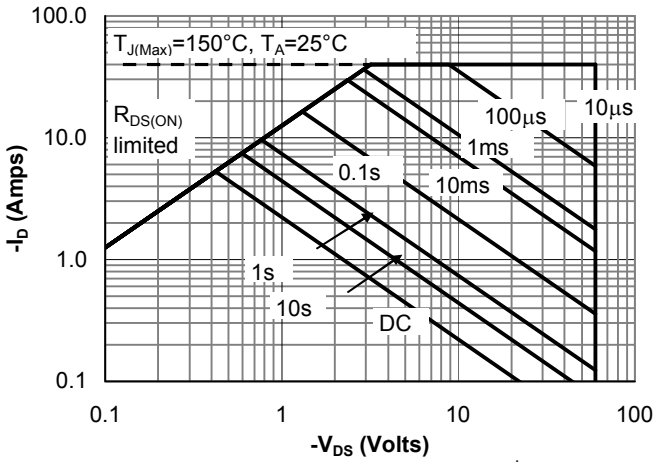


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

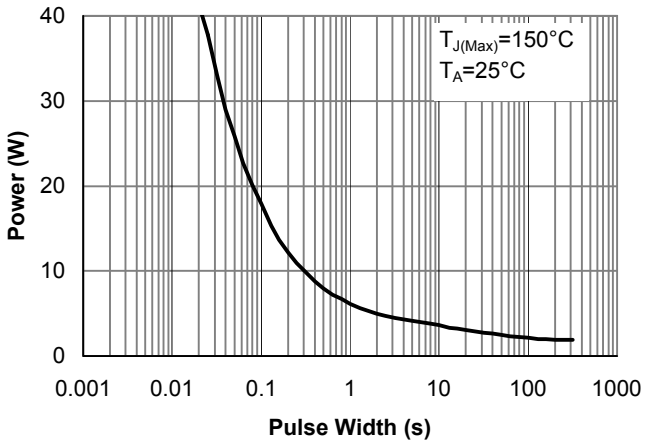


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

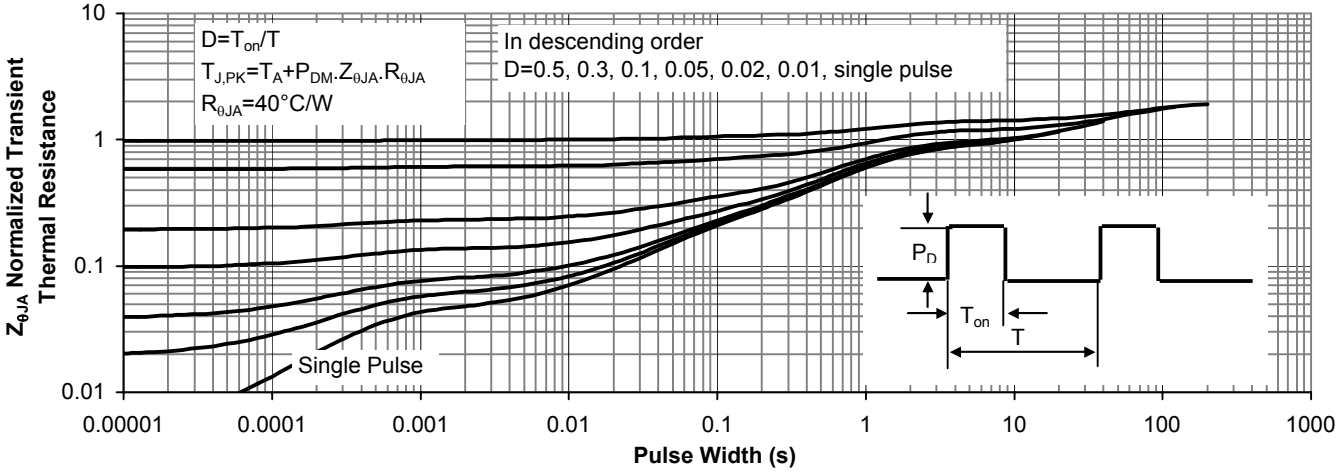
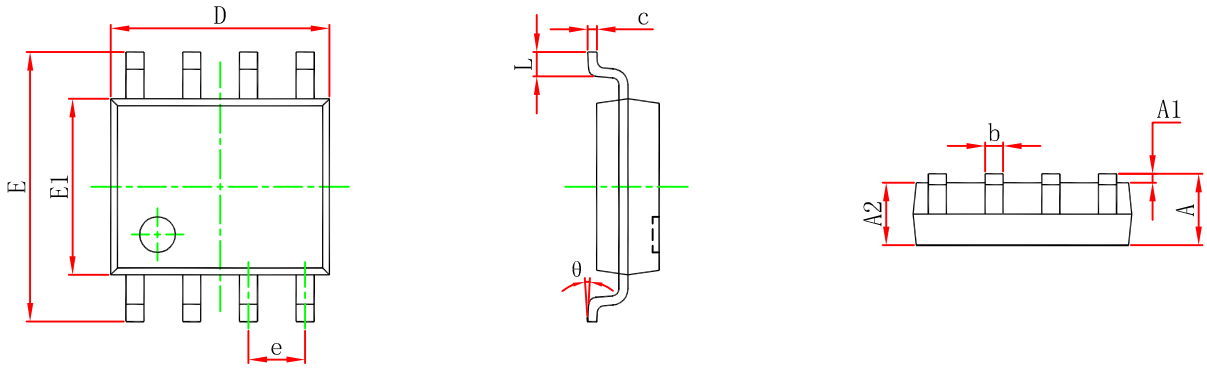
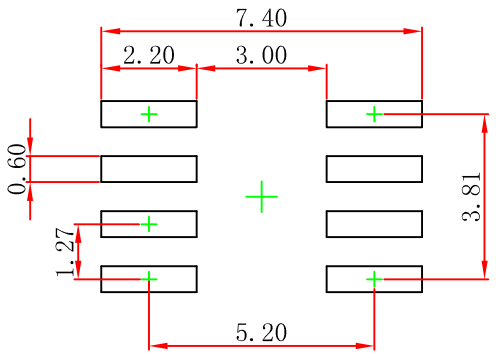


Figure 11: Normalized Maximum Transient Thermal Impedance

SOP-8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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