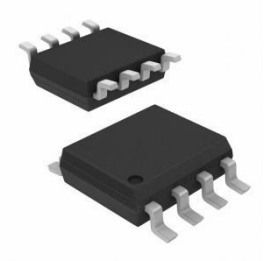
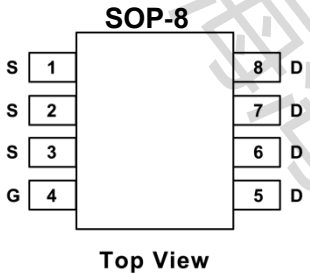
AO4421-HX

P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	-60
$R_{DS(on)}$ (Ω) at V_{GS} = -10 V	0.085
$R_{DS(on)}$ (Ω) at V_{GS} = -4.5 V	0.115
I_D (A)	-4.6





FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g UIS tested

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	-60	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	T_C = 25 °C	I_D	-4.6	A
	T_C = 125 °C		-2.6	
Continuous source current (diode conduction)		I_S	-3.4	
Pulsed drain current [a]		I_{DM}	-18.5	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	-20	
Single pulse avalanche energy		E_{AS}	20	mJ
Maximum power dissipation [a]	T_C = 25 °C	P_D	3.75	W
	T_C = 125 °C		1.25	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to + 175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount [b]	R_{thJA}	100	°C/W
Junction-to-case (drain)		R_{thJF}	40	

Notes

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
b. When mounted on 1" square PCB (FR-4 material)
c. Parametric verification ongoing

SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static							
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = -250 µA		-60			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA		-1.5	-2.0	-2.5	
Gate-source leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V				± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{GS} = 0 V	V_{DS} = -60 V			-1	µA
		V_{GS} = 0 V	V_{DS}= -60 V, T_J = 125 °C			-50	
		V_{GS} = 0 V	V_{DS}=-60 V, T_J = 175 °C			-150	
On-state drain current [a]	$I_{D(on)}$	V_{GS}=-10 V	V_{DS} ≤ -5 V	-12			A
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS}=-4.5 V	I_D = -2.5 A		0.087	0.115	Ω
		V_{GS}=-10 V	I_D = -3.5 A		0.067	0.085	
		V_{GS}=-10 V	I_D = -3.5 A, T_J = 125 °C			0.143	
		V_{GS}=-10 V	I_D = -3.5 A, T_J = 175 °C			0.176	
Forward transconductance [b]	g_{fs}	V_{DS} = -15 V, I_D = -3.5 A			10		S
Dynamic [b]							
Input capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = -30 V, f = 1 MHz		912	1140	pF
Output capacitance	C_{oss}				100	125	
Reverse transfer capacitance	C_{rss}				60	75	
Total gate charge [c]	Q_g	V_{GS}=-10 V	V_{DS} = -30 V, I_D = -4.3 A		26.5	40	nC
Gate-source charge [c]	Q_{gs}				3.8		
Gate-drain charge [c]	Q_{gd}				5.8		
Gate resistance	R_g	f = 1 MHz		3.5	7.1	10.7	Ω
Turn-on delay time [c]	$t_{d(on)}$	V_{DD} = -30 V, R_L = 8.8 Ω I_D ≅ -3.4 A, V_{GEN} = -10 V, R_g = 1 Ω			11	17	ns
Rise time [c]	tr				13	20	
Turn-off delay time [c]	$t_{d(off)}$				36	54	
Fall time [c]	t_f				8	12	
Source-Drain Diode Ratings and Characteristics [b]							
Pulsed current [a]	ISM	I_F = -3 A, V_{GS} = 0 V				-18.5	A
Forward voltage	VSD				-0.84	-1.1	V

Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %

b. Guaranteed by design, not subject to production testing

c. Independent of operating temperature

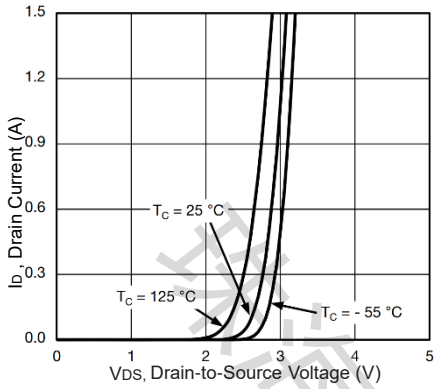


Fig 1. Transfer Characteristics

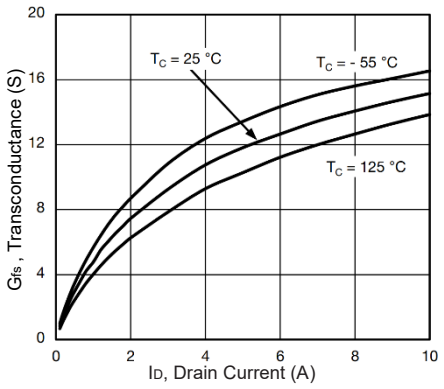


Fig 2. Transconductance

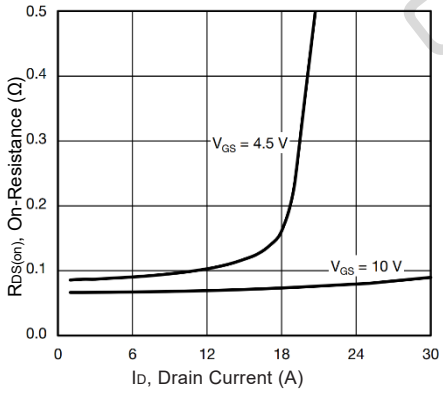


Fig 3. On-Resistance vs. Drain Current

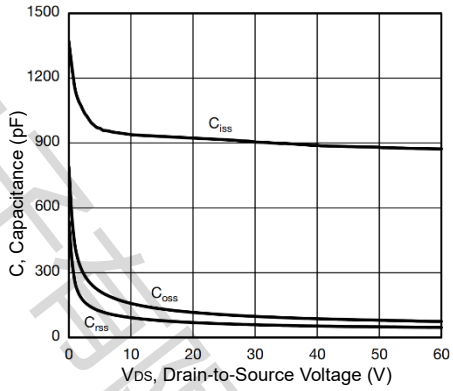


Fig 4. Capacitance

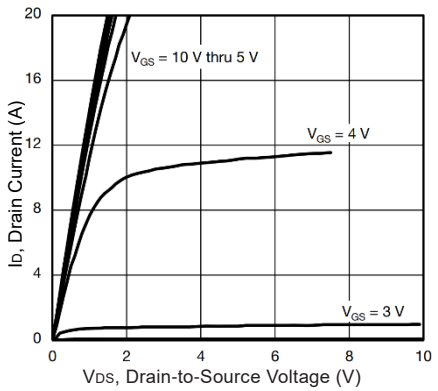


Fig 5. Output Characteristics

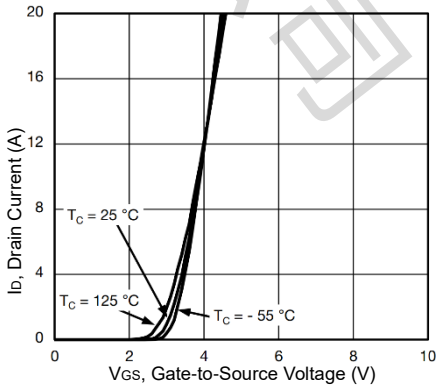


Fig 6. Transfer Characteristics

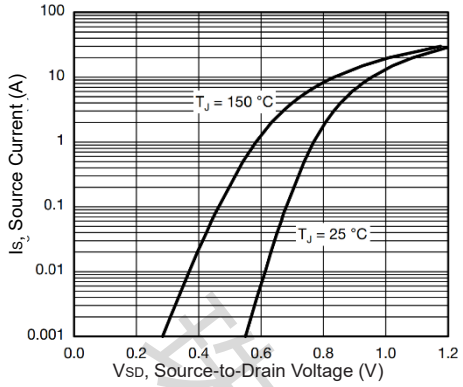


Fig 7. Source Drain Diode Forward Voltage

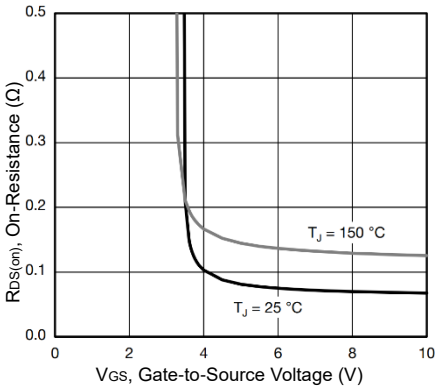


Fig 8. On-Resistance vs. Gate-to-Source

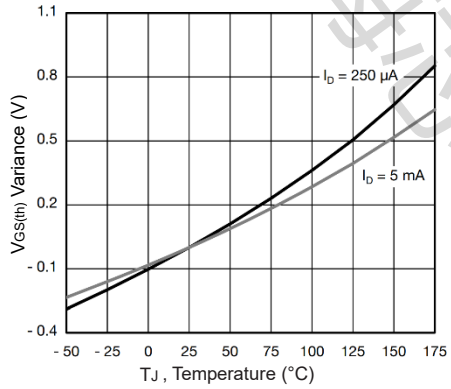


Fig 9. Threshold Voltage

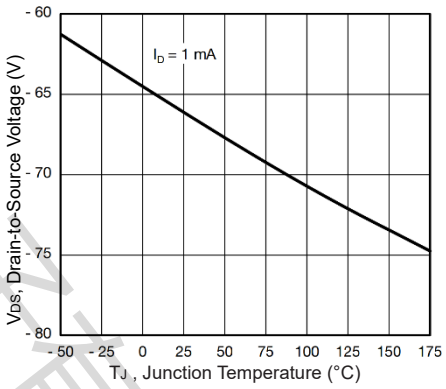


Fig 10. Drain Source Breakdown vs. Junction Temperature

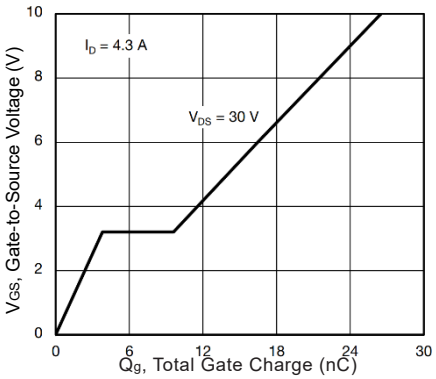


Fig 11. Gate Charge

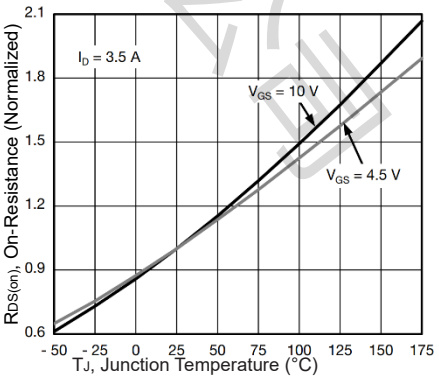


Fig 12. On-Resistance vs. Junction Temperature

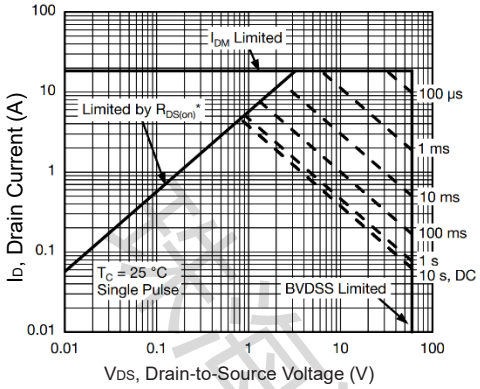


Fig 13. Safe Operating Area

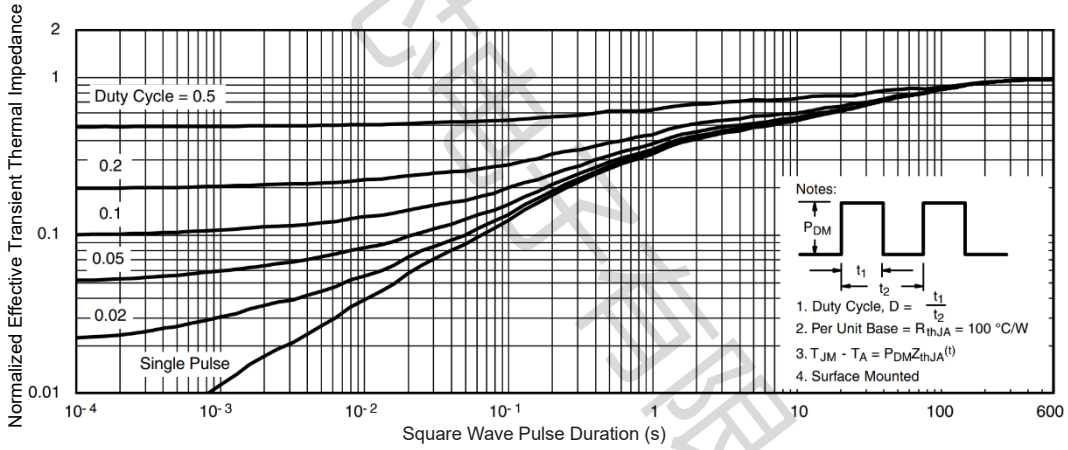


Fig 14. Normalized Thermal Transient Impedance, Junction-to-Ambient

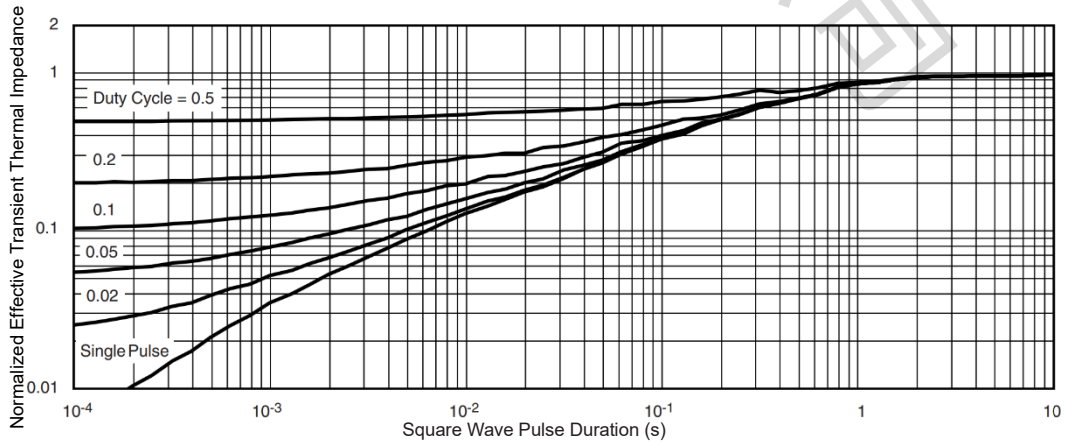
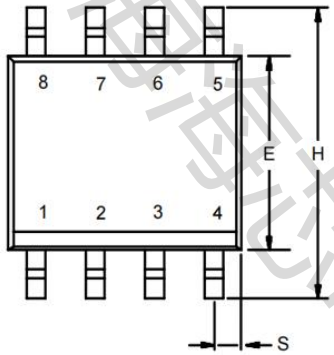
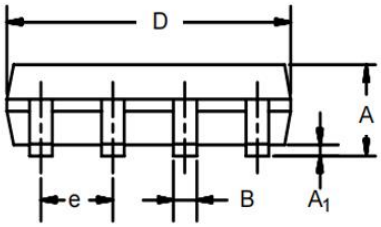


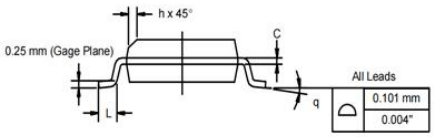
Fig 15. Normalized Thermal Transient Impedance, Junction-to-Foot

SOP-8 Package Outline

Dimensions are shown in millimeters (inches)

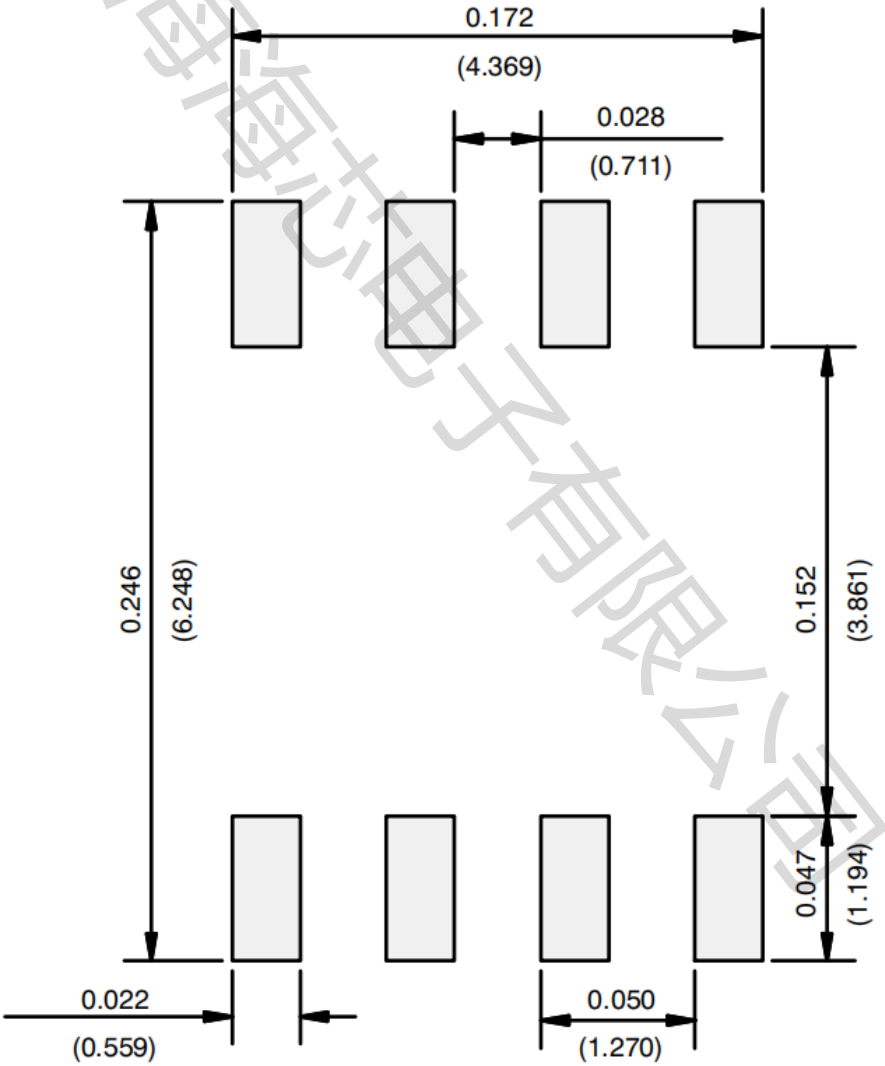






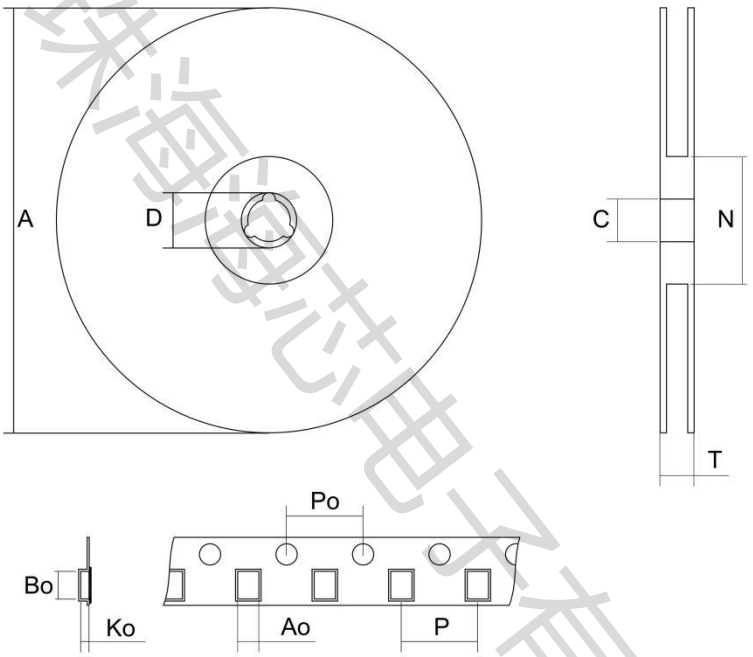
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

RECOMMENDED MINIMUM PADS FOR SOP-8

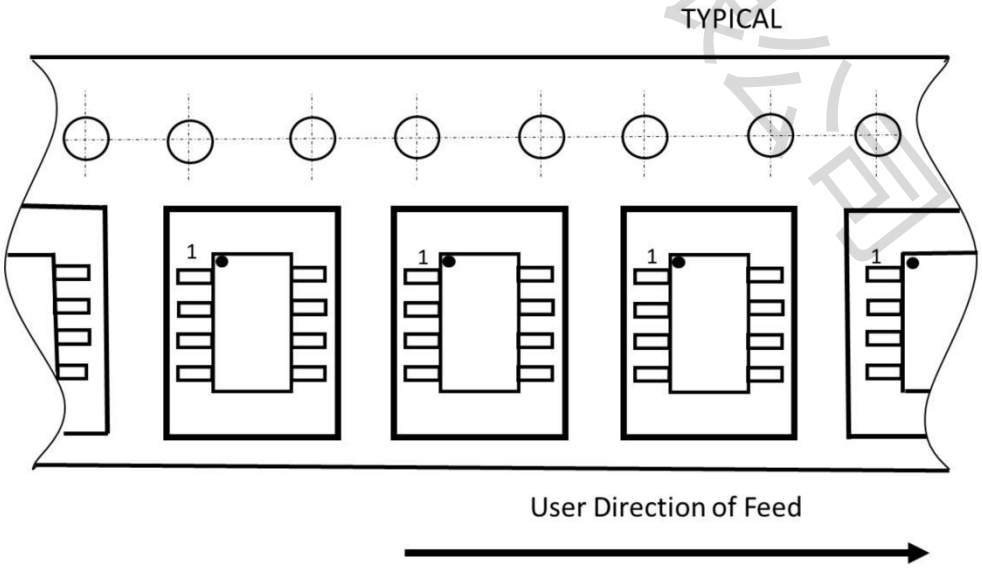


SOP-8 packing information

SO-8 tape and reel



Tape orientation



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