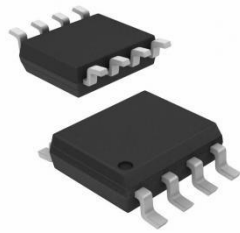


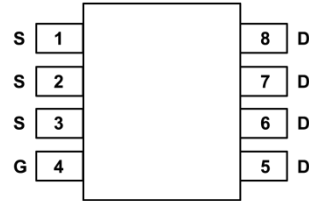
AO4409-HX P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)
-30	0.011at V _{GS} = -10 V	-13.5	29.5nC
	0.015 at V _{GS} = -4.5V	-11.6	



SOP-8



Top View

FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g Tested

APPLICATIONS

- Load Switch
- Set Top Box

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain- Source Voltage	V _{DS}	30	V
Gate- Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	- 13.5
		T _C = 70 °C	- 11.9
		T _A = 25 °C	- 10.9 _{a, b}
		T _A = 70 °C	- 8.6 _{a, b}
Pulsed Drain Current	I _{DM}	- 50	A
Continuous Source- Drain Diode Current	I _S	T _C = 25 °C	
		T _A = 25 °C	
Single Pulse Avalanche Current	I _{AS}	- 20	
Single Pulse Avalanche Energy	E _{AS}	20	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	5.0
		T _C = 70 °C	3.2
		T _A = 25 °C	2.7 _{a, b}
		T _A = 70 °C	1.7 _{a, b}
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction- to- Ambient _{a, c, d}	R _{thJA}	38	46	°C/W
Maximum Junction-to-Foot (Drain)	R _{thJF}	20	25	

Notes

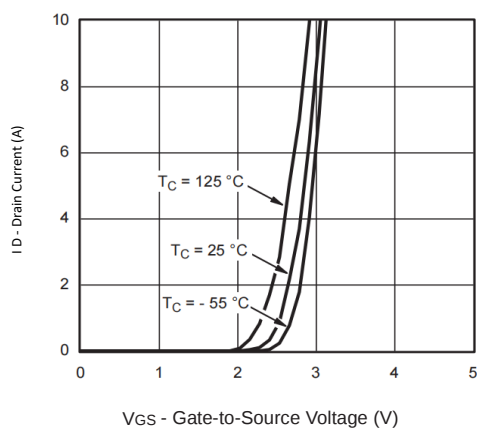
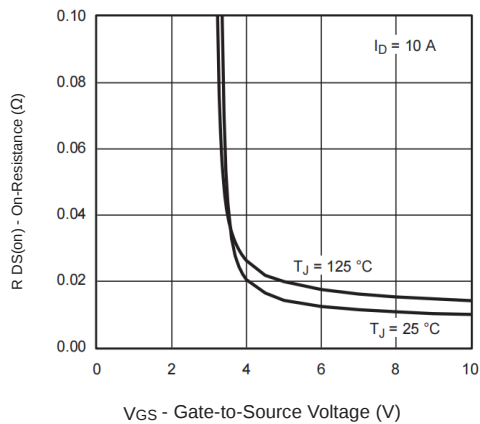
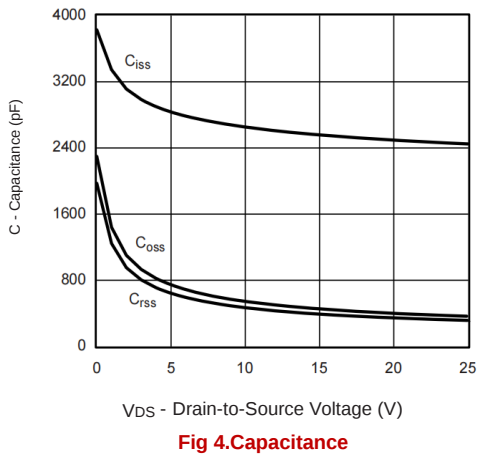
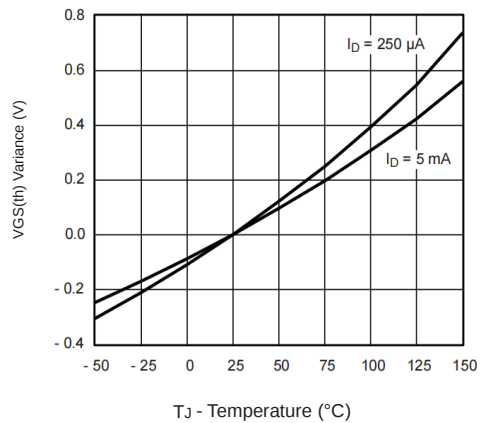
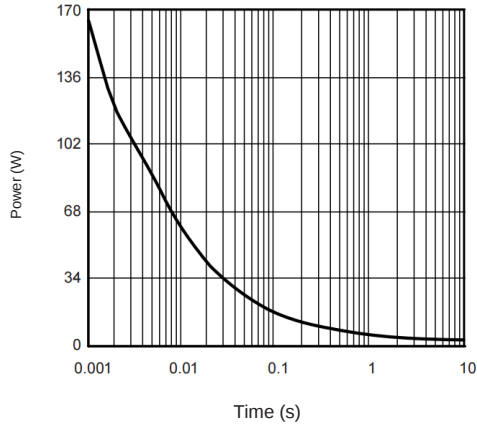
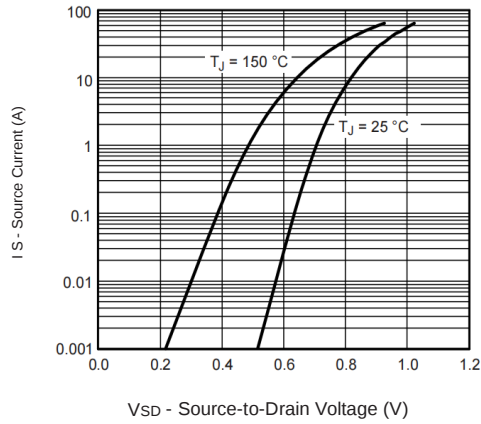
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under Steady State conditions is 85 °C/W.
- Based on T_C = 25 °C.

SPECIFICATIONS T _J = 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	- 30			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 34		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			5.3		
Gate- Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.4		- 2.5	V
Gate- Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 25 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 30 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 30 V, V _{GS} = 0 V, T _J = 55 °C			- 5	
On- State Drain Current ^a	I _{D(on)}	V _{DS} ≥ - 10 V, V _{GS} = - 10 V	- 30			A
Drain- Source On- State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 10 A		0.011		Ω
		V _{GS} = - 4.5 V, I _D = - 8 A		0.015		
Forward Transconductance ^a	g _{fs}	V _{DS} = - 10 V, I _D = - 10 A		28		S
Dynamics ^b						
Input Capacitance	C _{iss}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		2550		pF
Output Capacitance	C _{oss}			455		
Reverse Transfer Capacitance	C _{rss}			390		
Total Gate Charge	Q _g	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 10 A		57	18	nC
				29.5	15	
Gate- Source Charge	Q _{gs}	V _{DS} = - 15 V, V _{GS} = - 4.5 V, I _D = - 10 A		8	8	
Gate- Drain Charge	Q _{gd}			22	2	
Gate Resistance	R _g	f= 1 MHz	0.5	2.2	4.4	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 15 V, R _L = 1.5 Ω I _D = - 10 A, V _{GEN} = - 10 V,R _g = 1 Ω		13	25	ns
Rise Time	t _r			12	24	
Turn-Off Delay Time	t _{d(off)}			40	70	
Fall Time	t _f			9	18	
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 15 V, R _L = 1.5 Ω I _D = - 10 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		48	80	
Rise Time	t _r			92	160	
Turn-Off Delay Time	t _{d(off)}			34	60	
Fall Time	t _f			19	35	
Drain- Source Body Diode Characteristics						
Continuous Source- Drain Diode Current	I _S	T _C = 25 °C			- 4.1	A
Pulse Diode Forward Current	I _{SM}				- 60	
Body Diode Voltage	V _{SD}	I _S = -3 A, V _{GS} = 0 V		- 0.75	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = -10 A, dI/dt = 100 A/μs, T _J = 25 °C		27	45	ns
Body Diode Reverse Recovery Charge	Q _{rr}			16	27	nC
Reverse Recovery Fall Time	t _a			12		ns
Reverse Recovery Rise Time	t _b			15		

Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS $25\text{ }^{\circ}\text{C}$, unless otherwise noted



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

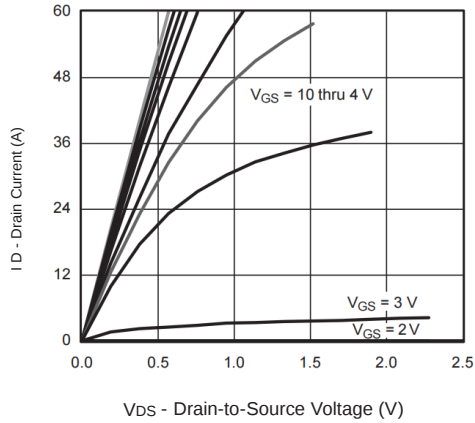


Fig 7. Output Characteristics

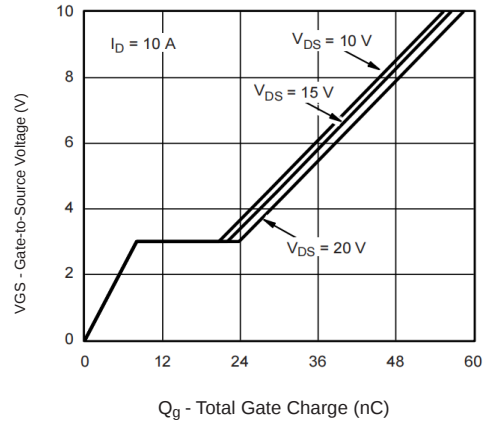


Fig 8. Gate Charge

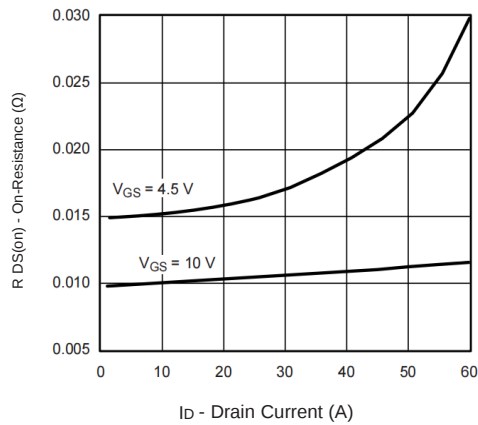
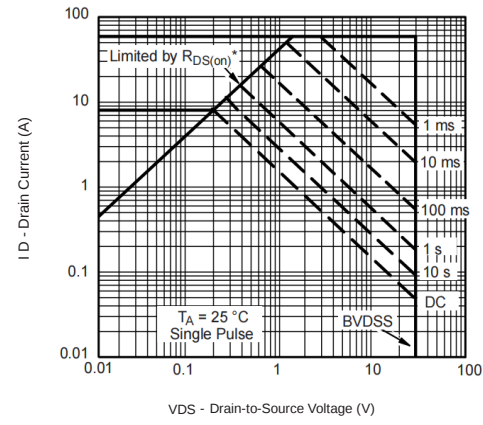


Fig 9. On-Resistance vs. Drain Current



* VGS > minimum VGS at which RDS(on) is specified

Fig 10. Safe Operating Area

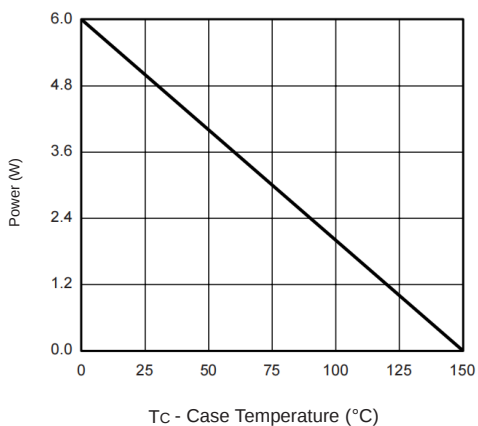


Fig 11. Power, Junction-to-Foot

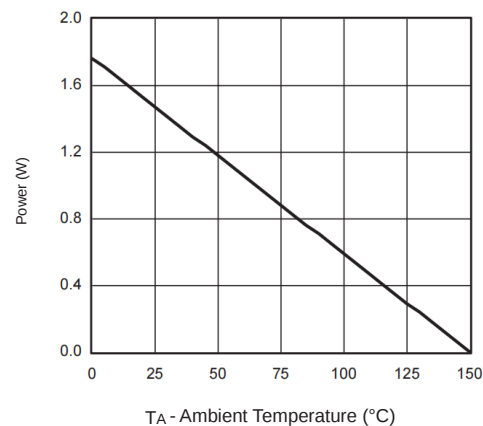
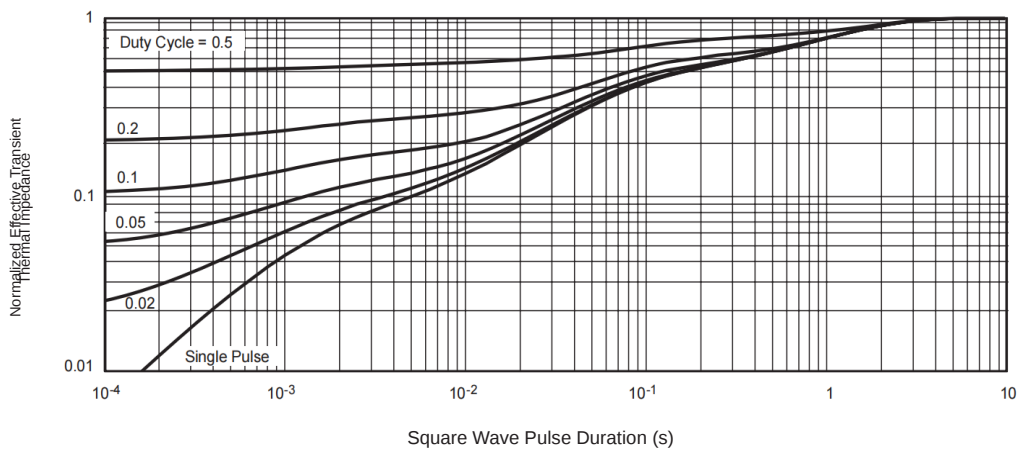
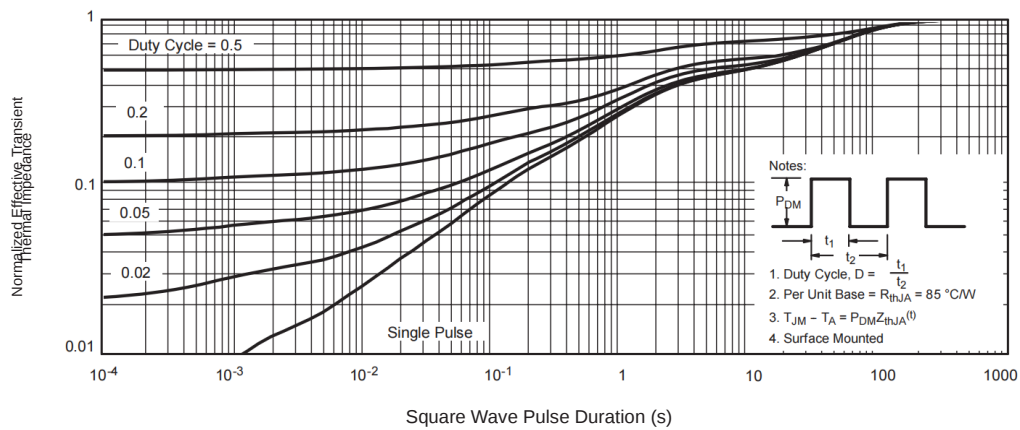
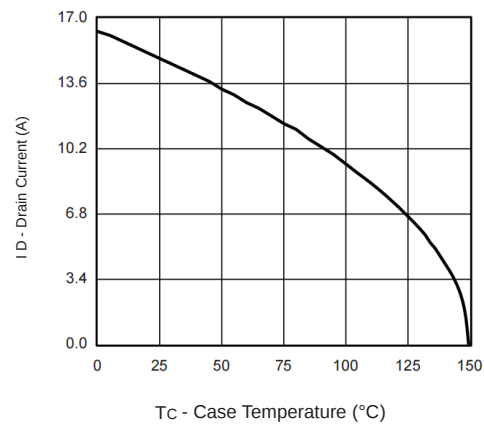
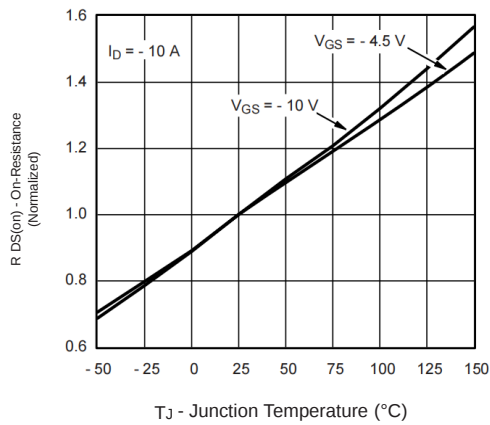


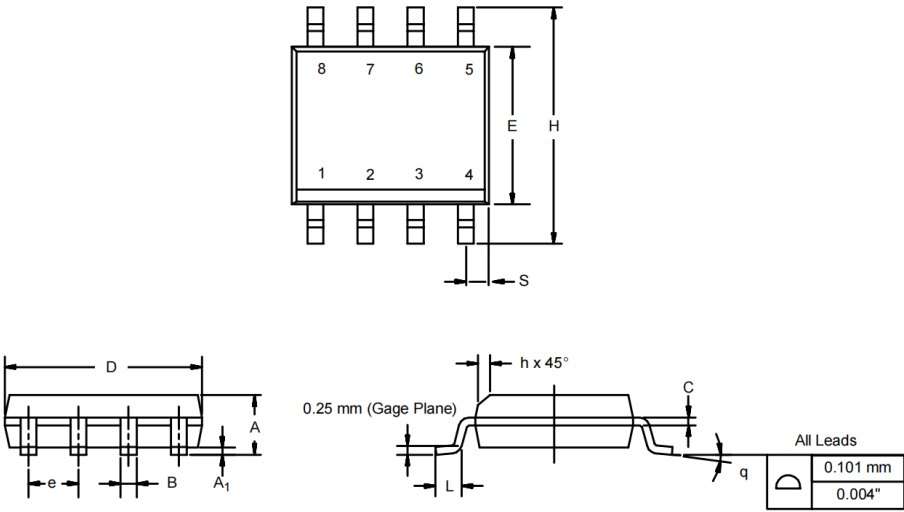
Fig 12. Power, Junction-to-Ambient

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



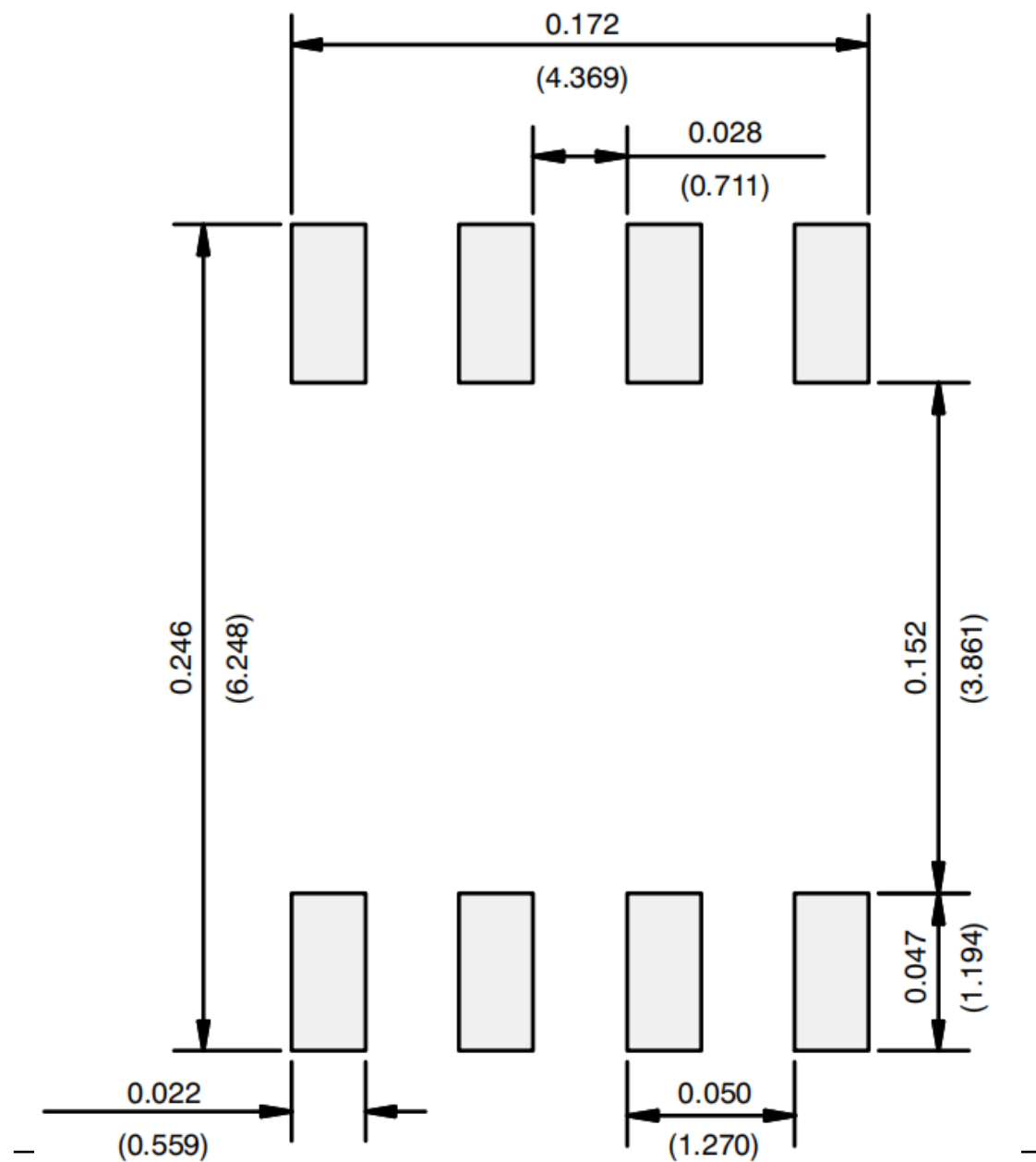
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



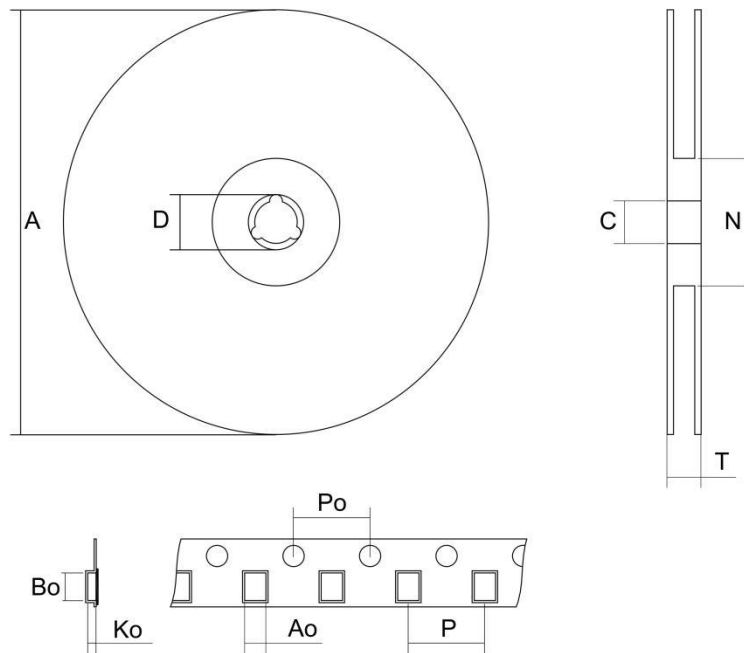
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

RECOMMENDED MINIMUM PADS FOR SOP-8



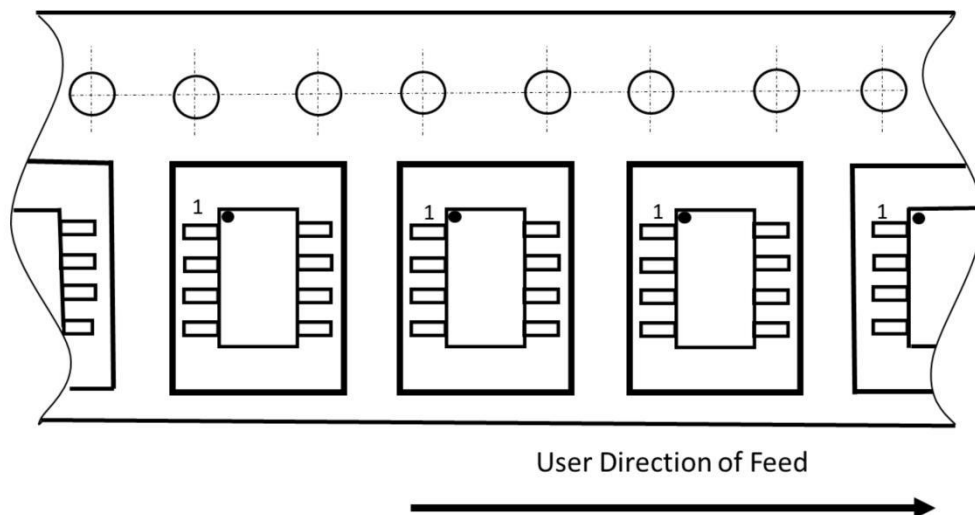
SOP-8 packing information

SOP-8 tape and reel



Tape orientation

TYPICAL



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