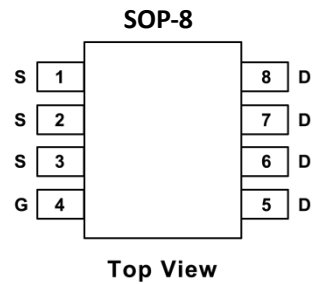


AO4459-HX P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	Q _g (Typ.)	I _D (A) ^{a, e}
-30	0.042 at V _{GS} = -10 V	7nC	-6
	0.072 at V _{GS} = -4.5 V		-6



FEATURES

- TrenchFET[®] Power MOSFET
- 100 % R_g Tested

APPLICATIONS

- Load Switch
- Notebook Adaptor Switch

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)	T _C = 25 °C	I _D	- 6 ^e	A
	T _C = 70 °C		- 6 ^e	
	T _A = 25 °C		- 5.9 ^{b, c}	
	T _A = 70 °C		- 4.7 ^{b, c}	
Pulsed Drain Current		I _{DM}	- 25	A
Continuous Source-Drain Diode Current	T _C = 25 °C	I _S	- 4.2	
	T _A = 25 °C		- 2 ^{b, c}	
Maximum Power Dissipation	T _C = 25 °C	P _D	5	W
	T _C = 70 °C		3.2	
	T _A = 25 °C		2.4 ^{b, c}	
	T _A = 70 °C		1.5 ^{b, c}	
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 ^{b, d}	$t \leq 10$ s	R_{thJA}	42	53	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	19	25	

Notes:

- a. Based on $T_C = 25^\circ\text{C}$.
- b. Surface Mounted on 1" x 1" FR4 board.
- c. $t = 10$ s.
- d. Maximum under Steady State conditions is 85°C/W .
- e. Package Limited.

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

Static						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0$ V, $I_D = -250$ μA	- 30			V
V_{DS} Temperature Coefficient	$\otimes V_{DS}/T_J$	$I_D = -250$ μA		- 19		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\otimes V_{GS(th)}/T_J$			4.4		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250$ μA	- 1.2		- 2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 20$ 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, $T_J = 55^\circ\text{C}$			- 5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5$ V, $V_{GS} = -10$ V	- 25			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10$ V, $I_D = -5.9$ A		0.035	0.042	$\wedge$
		$V_{GS} = -4.5$ V, $I_D = -4.5$ A		0.060	0.072	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15$ V, $I_D = -5.9$ A		10		S

Dynamic ^b						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		590		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			93		
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -5.9\text{ A}$		13.6	21	nC
Gate-Source Charge	Q_{gs}	$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -5.9\text{ A}$		7	11	
Gate-Drain Charge	Q_{gd}			2.3		
Gate Resistance	R_g			3.2		
Gate Resistance	R_g	$f = 1\text{ MHz}$	1	5	10	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 3.2\text{ Ω}$ $I_D \cong -4.7\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ Ω}$		30	45	ns
Rise Time	t_r			25	38	
Turn-Off Delay Time	$t_{d(off)}$			16	24	
Fall Time	t_f			8	16	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 3.2\text{ Ω}$ $I_D \cong -4.7\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ Ω}$		8	16	
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			18	27	
Fall Time	t_f			8	16	

Drain-Source Body Diode Characteristics						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ °C}$			-4.2	A
Pulse Diode Forward Current	I_{SM}				-25	
Body Diode Voltage	V_{SD}	$I_S = -4.7\text{ A}, V_{GS} = 0\text{ V}$		-0.8	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -4.7\text{ A},$ $dI/dt = 100\text{ A/μs},$ $T_J = 25\text{ °C}$		17	26	ns
Body Diode Reverse Recovery Charge	Q_{rr}			9	18	nC
Reverse Recovery Fall Time	t_a			10		ns
Reverse Recovery Rise Time	t_b			7		

Notes:

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

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

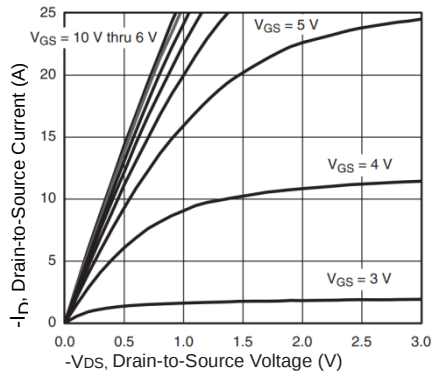


Fig 1. Typical Output Characteristics

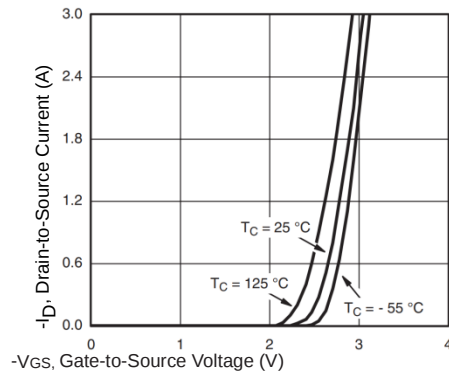


Fig 2. Typical Transfer Characteristics

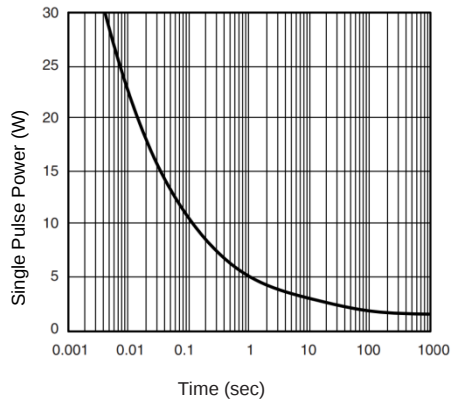


Fig 3. Typical Power Vs. Time

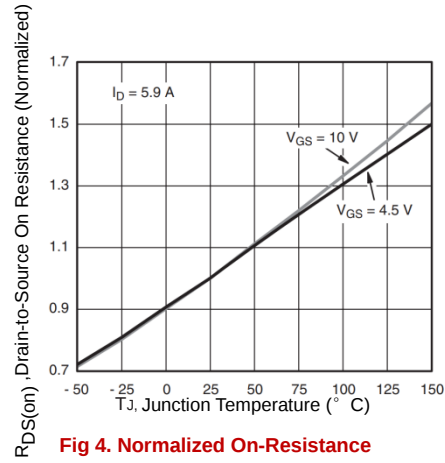


Fig 4. Normalized On-Resistance Vs. Temperature

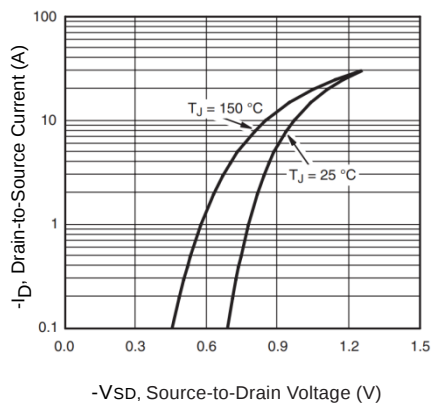


Fig 5. Typical Source-Drain Diode Forward Voltage

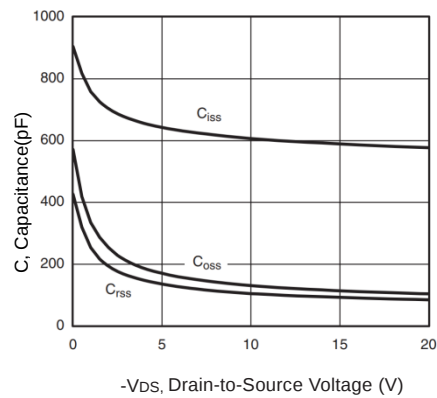


Fig 6. Typical Capacitance Vs. Drain-to-Source Voltage

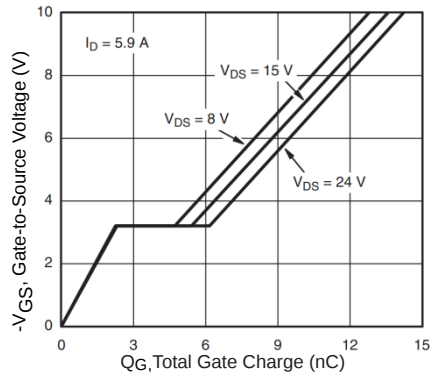


Fig 7. Typical Gate Charge Vs. Gate-to-Source Voltage

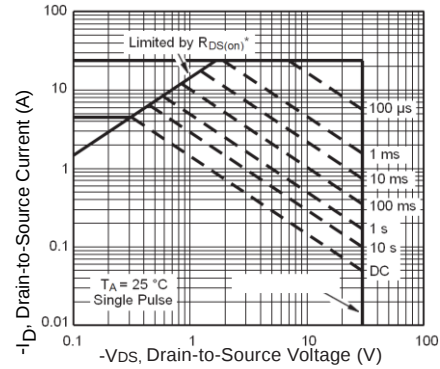


Fig 8. Maximum Safe Operating Area

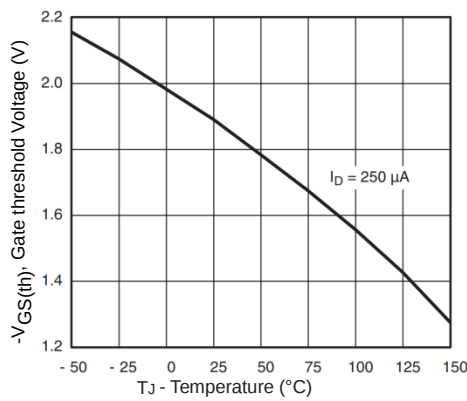


Fig 9. Typical VGS(th) Vs. Junction Temperature

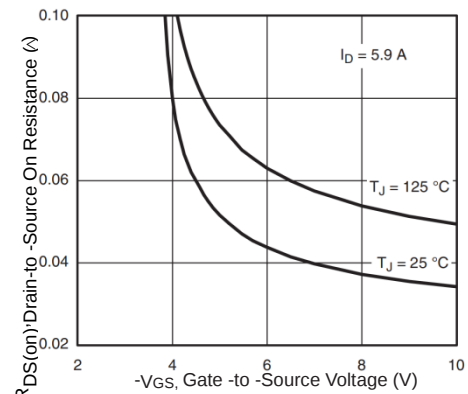


Fig 10. Typical On-Resistance Vs. Gate Voltage

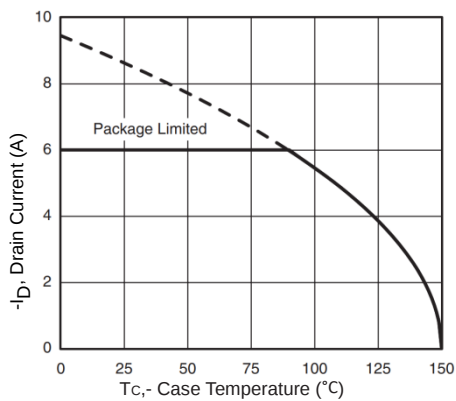


Fig 11. Current Derating*

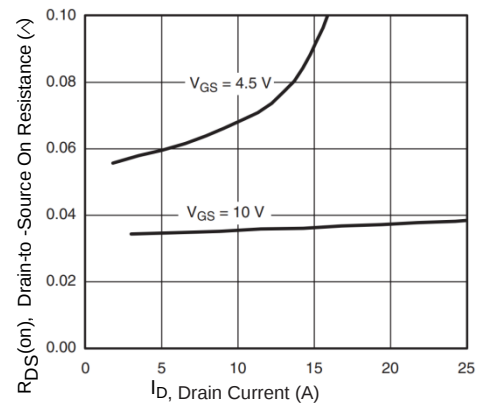


Fig 12. Typical On-Resistance Vs. Drain Current

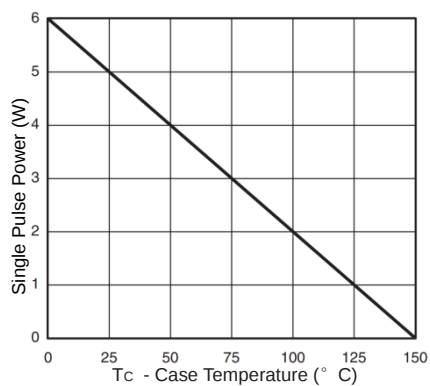


Fig 13. Power, Junction-to-Foot

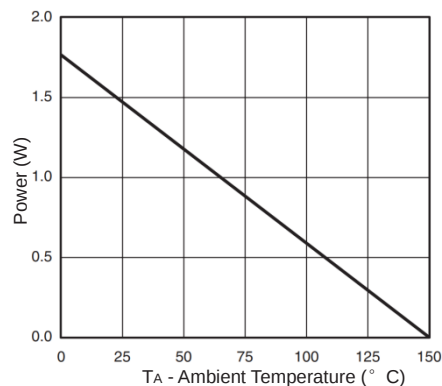


Fig 14. Power, Junction-to-Ambient

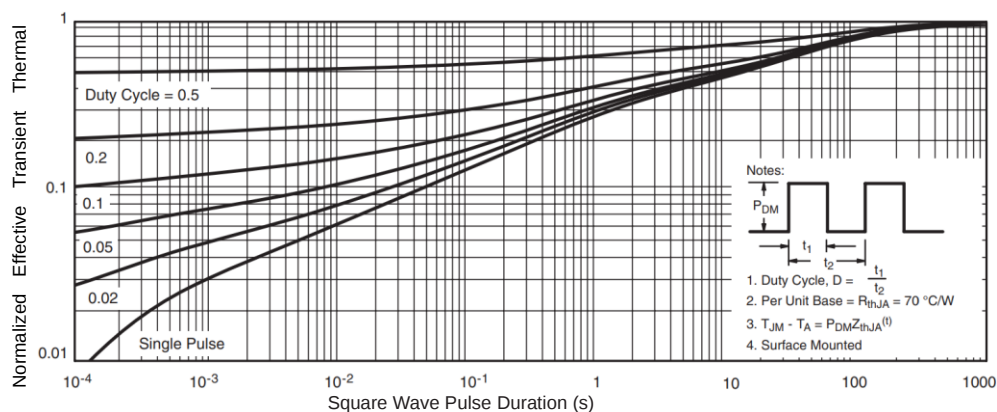


Fig 15. Normalized Thermal Transient Impedance, Junction-to-Ambient

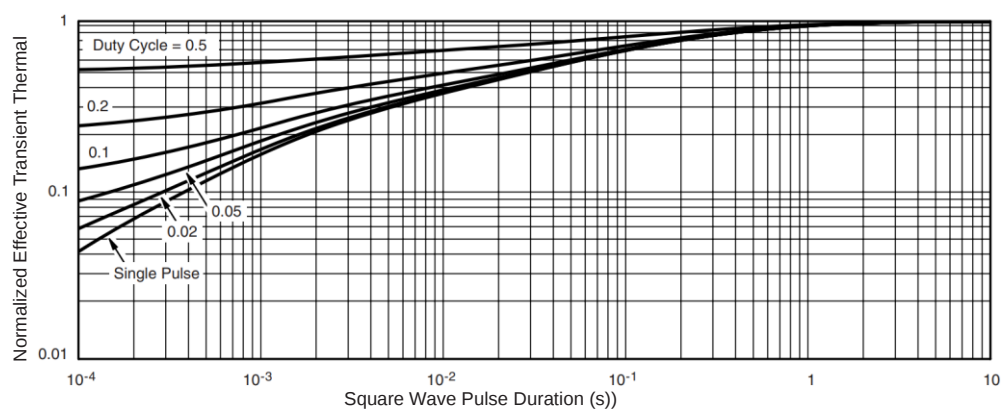
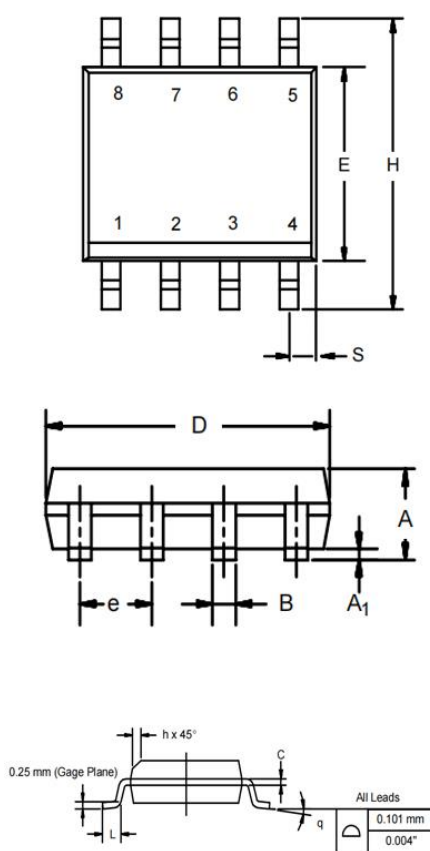


Fig 16. Normalized Thermal Transient Impedance, Junction-to-Foot

* The power dissipation P_D is based on $T_{J(max)} = 150\text{ }^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

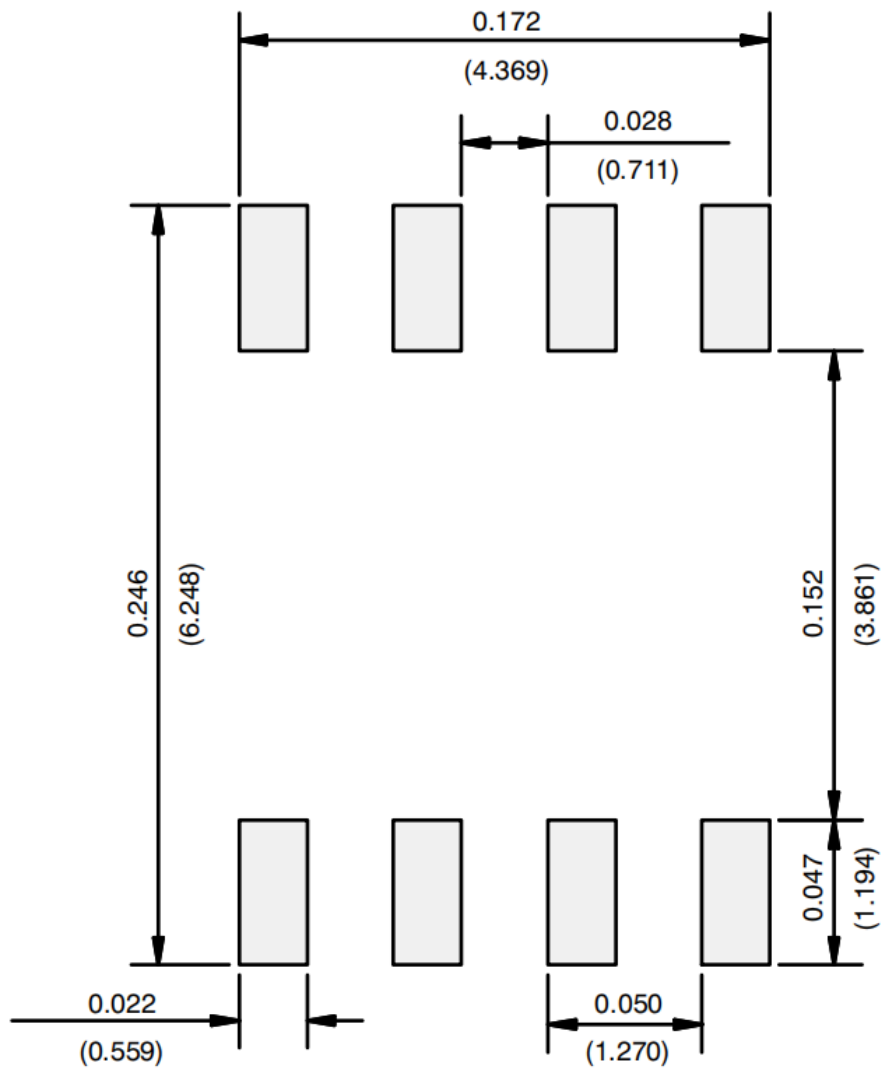
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



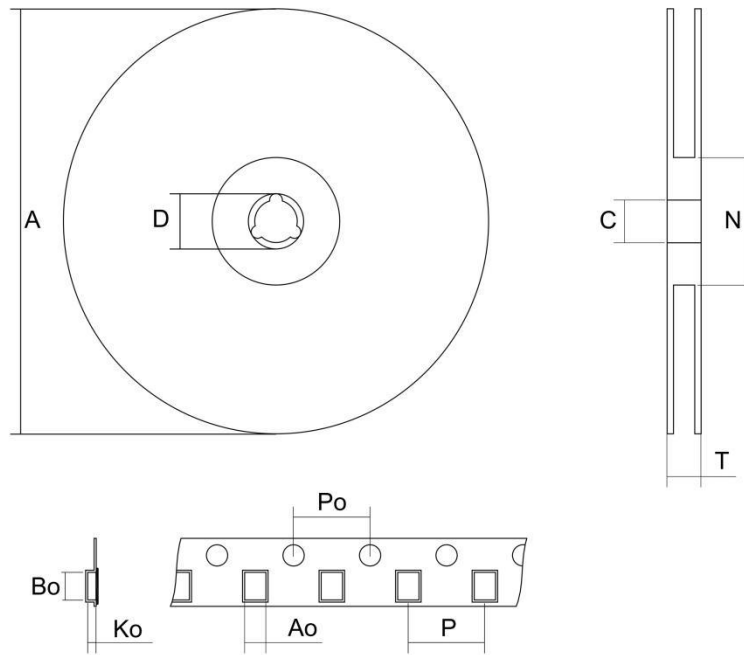
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.007 5	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

RECOMMENDED MINIMUM PADS FOR SOP-8

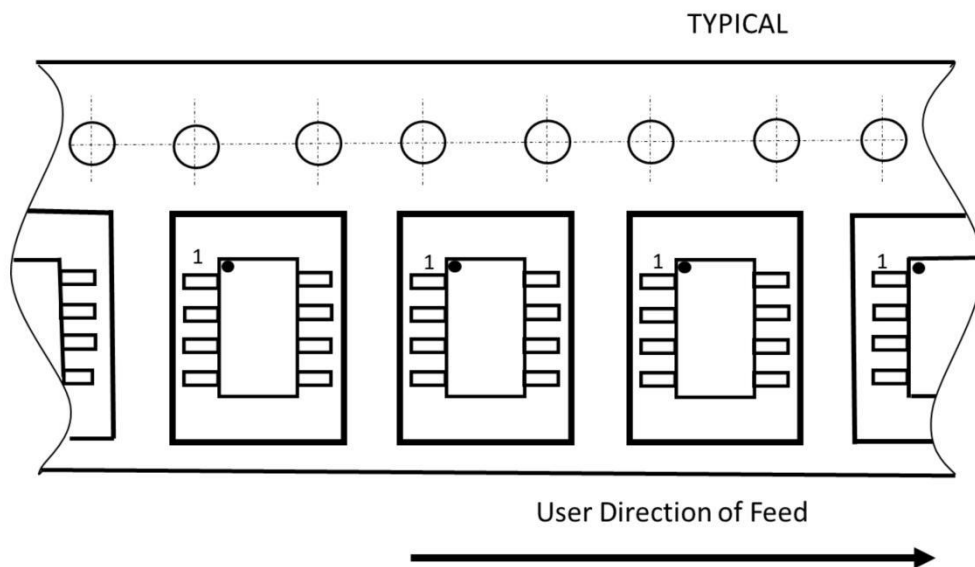


SOP-8 packing information

SOP-8 tape and reel



Tape orientation



Disclaimer

All products due to improve reliability, function or design or for other reasons, product specifications and data are subject to change without notice.

Zhuhai Haixin Electronics Co., Ltd., branches, agents, employees, and all persons acting on its or their representatives (collectively, the "Zhuhai Haixindianzi"), assumes no responsibility for any errors, inaccuracies or incomplete data contained in the table or any other any disclosure of any information related to the product. (www.haixindianzi.com)

Zhuhai Haixin makes no guarantee, representation or warranty on the product for any particular purpose of any goods or continuous production. To the maximum extent permitted by applicable law on Zhuhai Haixin relinquished: (1) any application and all liability arising out of or use of any products; (2) any and all liability, including but not limited to special, consequential damages or incidental ; (3) any and all implied warranties, including a particular purpose, non-infringement and merchantability guarantee.

Statement on certain types of applications are based on knowledge of the product is often used in a typical application of the general product Haixin Zhuhai demand that the Zhuhai Haixin of. Statement on whether the product is suitable for a particular application is non-binding. It is the customer's responsibility to verify specific product features in the products described in the specification is appropriate for use in a particular application. Parameter data sheets and technical specifications can be provided may vary depending on the application and performance over time. All operating parameters, including typical parameters must be made by customer's technical experts validated for each customer application. Product specifications do not expand or modify Zhuhai Haixin purchasing terms and conditions, including but not limited to warranty herein.

Unless expressly stated in writing, Zhuhai Haixin products are not intended for use in medical, life saving, or life sustaining applications or any other application. Wherein Haixin product failure could lead to personal injury or death, use or sale of products used in Zhuhai Haixin such applications using client did not express their own risk. Contact your authorized Zhuhai Haixin people who are related to product design applications and other terms and conditions in writing.

The information provided in this document and the company's products without a license, express or implied, by estoppel or otherwise, to any intellectual property rights granted to the Haixin act or document. Product names and trademarks referred to herein are trademarks of their respective representatives will be all.