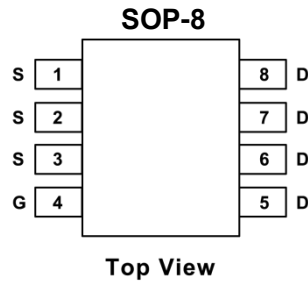
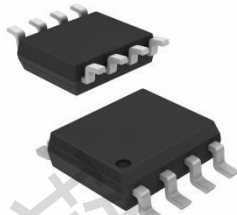


IRF9310TRPBF-HX P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^d	Q_g (Typ.)
- 30	0.011 at $V_{GS} = - 10$ V	- 13.5	29.5 nC
	0.015 at $V_{GS} = - 4.5$ V	- 11.6	



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)	I_D	$T_C = 25$ °C	- 13.5	A
		$T_C = 70$ °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		
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	- 4.1	
		$T_A = 25$ °C	- 2.2 ^{a, b}	
Avalanche Current	I_{AS}	- 20		
Single-Pulse Avalanche Energy	E_{AS}	20	mJ	
Maximum Power Dissipation	P_D	$T_C = 25$ °C	5.0	W
		$T_C = 70$ °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}	R_{thJA}	38	46	°C/W
Maximum Junction-to-Foot	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.

d. Based on $T_C = 25\text{ }^\circ\text{C}$.

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		-34		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		5.3			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.4		-2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 25\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -10\text{ V}, V_{GS} = -10\text{ V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -10\text{ A}$		0.011		Ω
		$V_{GS} = -4.5\text{ V}, I_D = -8\text{ A}$		0.015		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}, I_D = -10\text{ A}$		28		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		2550		pF
Output Capacitance	C_{oss}		455			
Reverse Transfer Capacitance	C_{rss}		390			
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -10\text{ A}$		57	86	nC
				29.5	45	
Gate-Source Charge	Q_{gs}	$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -10\text{ A}$		8		
Gate-Drain Charge	Q_{gd}		22			
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.5	2.2	4.4	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 1.5\text{ }\Omega, I_D = -10\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		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	$t_{d(on)}$		48	80		
Rise Time	t_r		92	16		
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	$T_C = 25\text{ }^\circ\text{C}$			-4.1	A
Pulse Diode Forward Current	I_{SM}				-60	
Body Diode Voltage	V_{SD}	$I_S = -3\text{ A}, V_{GS} = 0\text{ V}$		-0.75	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		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:

- Pulse test; pulse width 300 μs , duty cycle 2 %.
- Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

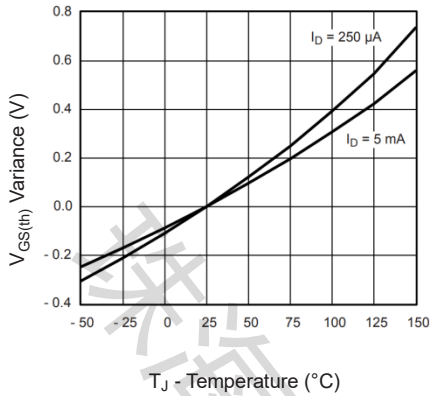


Fig 1. Threshold Voltage

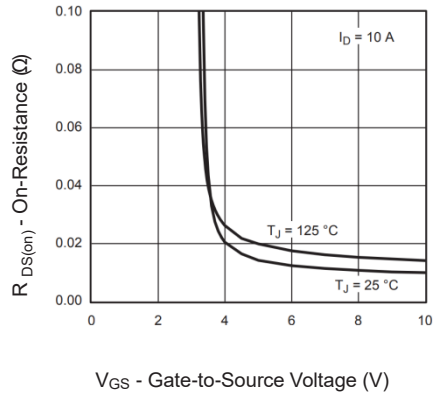


Fig 2. On-Resistance vs. Gate-to-Source Voltage

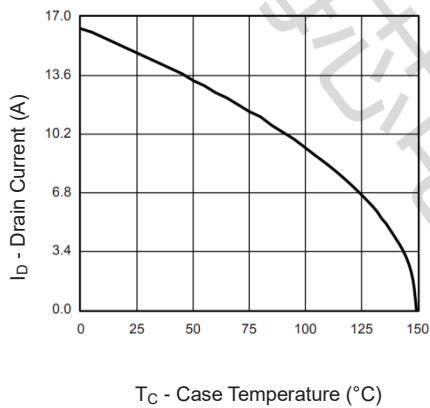


Fig 3. Power, Junction-to-Foot

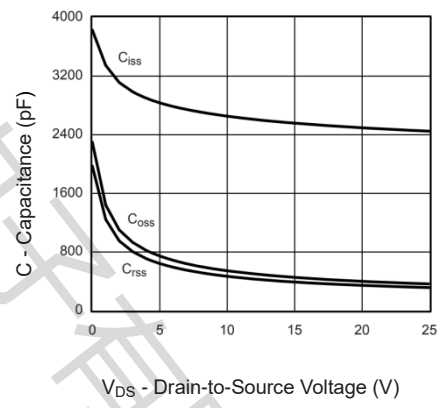


Fig 4. Capacitance

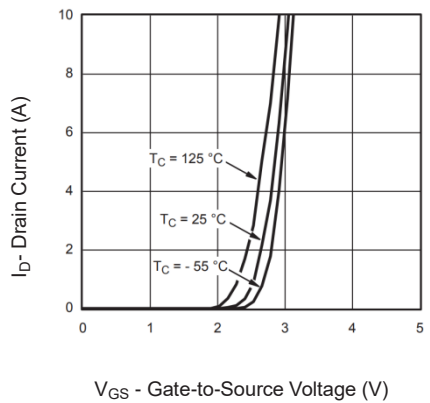


Fig 5. Transfer Characteristics

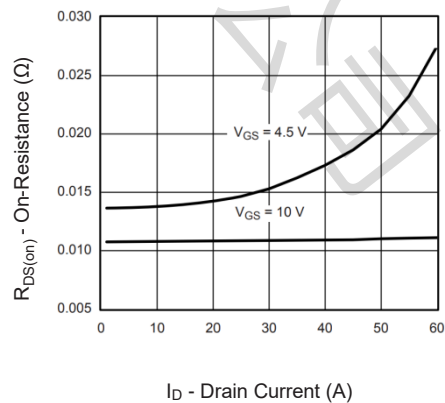


Fig 6. On-Resistance vs. Drain Current

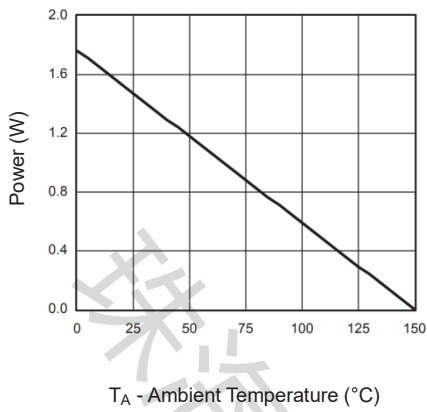


Fig 7. Power Derating, Junction-to-Ambient

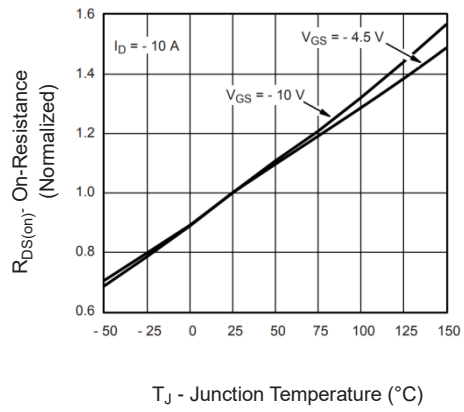


Fig 8. On-Resistance vs. Junction Temperature

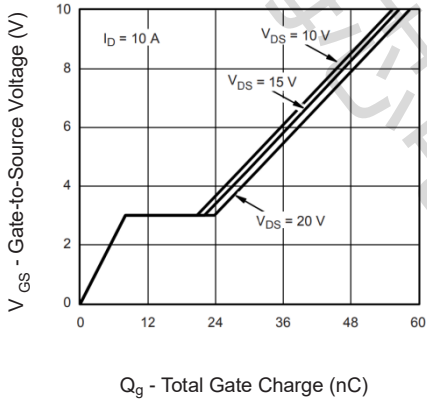


Fig 9. Gate Charge

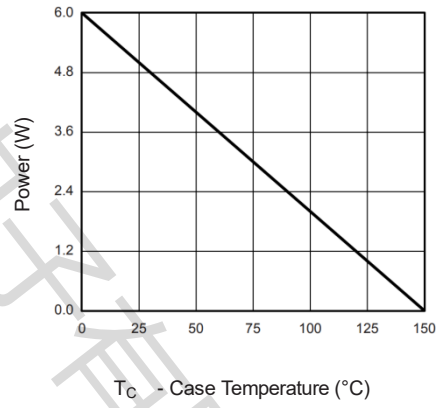


Fig 10. Power, Junction-to-Foot

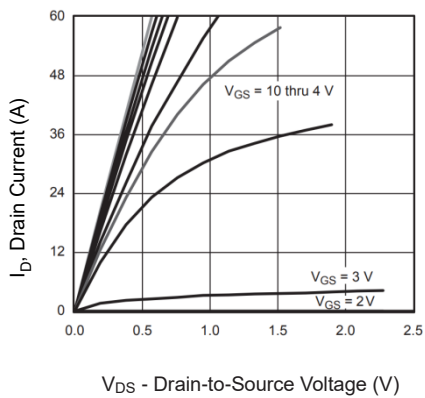


Fig 11. Output Characteristics

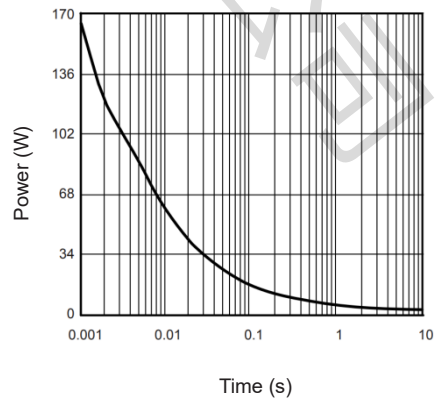


Fig 12. Single Pulse Power, Junction-to-Ambient

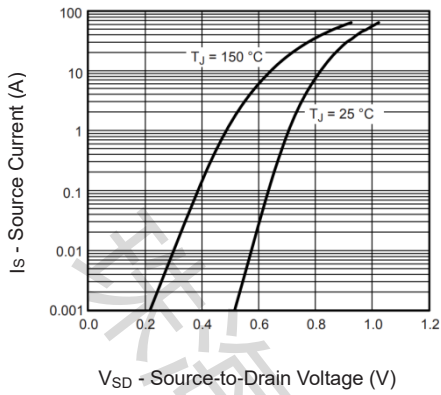
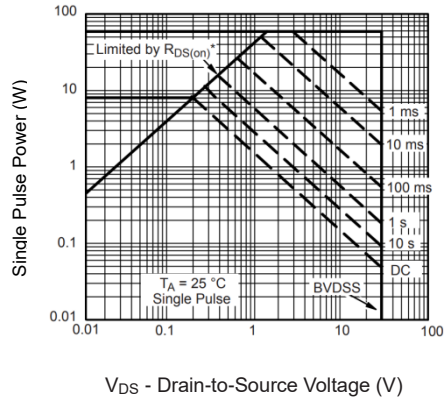


Fig 13. Source-Drain Diode Forward Voltage



* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Fig 14. Safe Operating Area

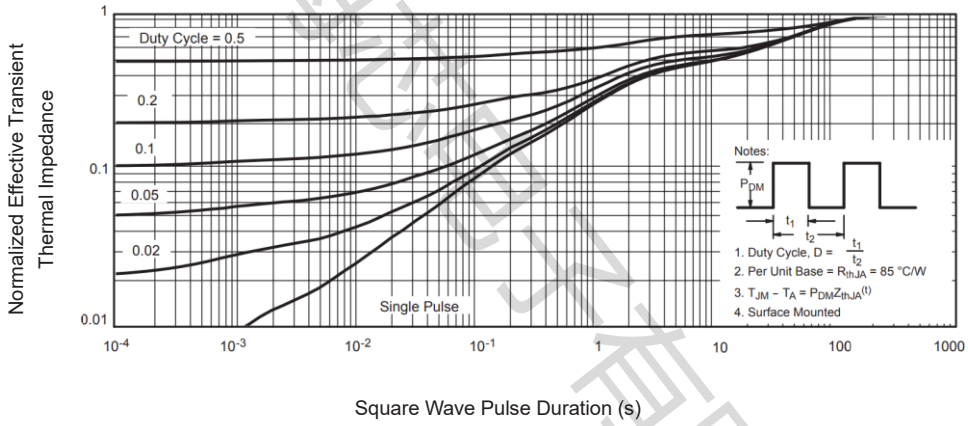


Fig 15. Normalized Thermal Transient Impedance, Junction-to-Ambient

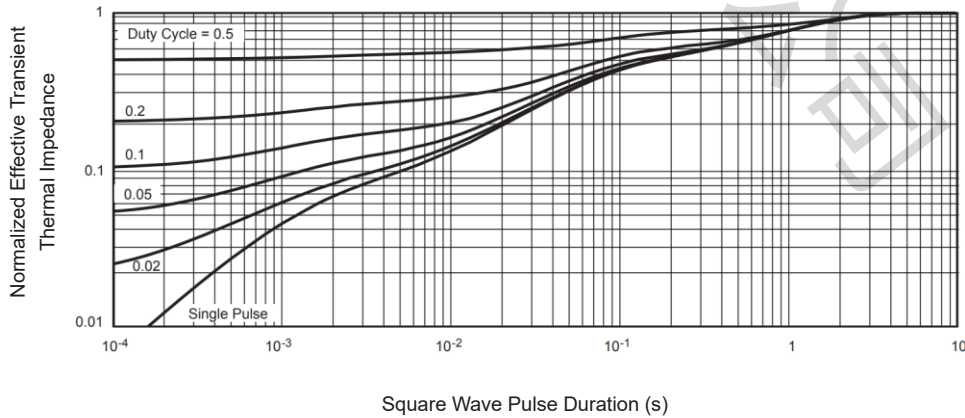
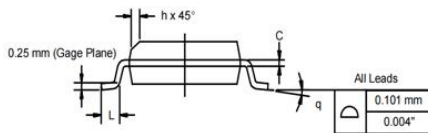
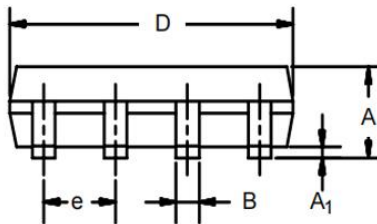
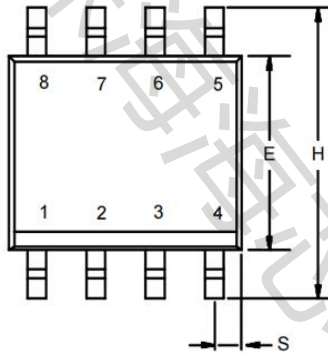


Fig 16. Normalized Thermal Transient Impedance, Junction-to-Foot

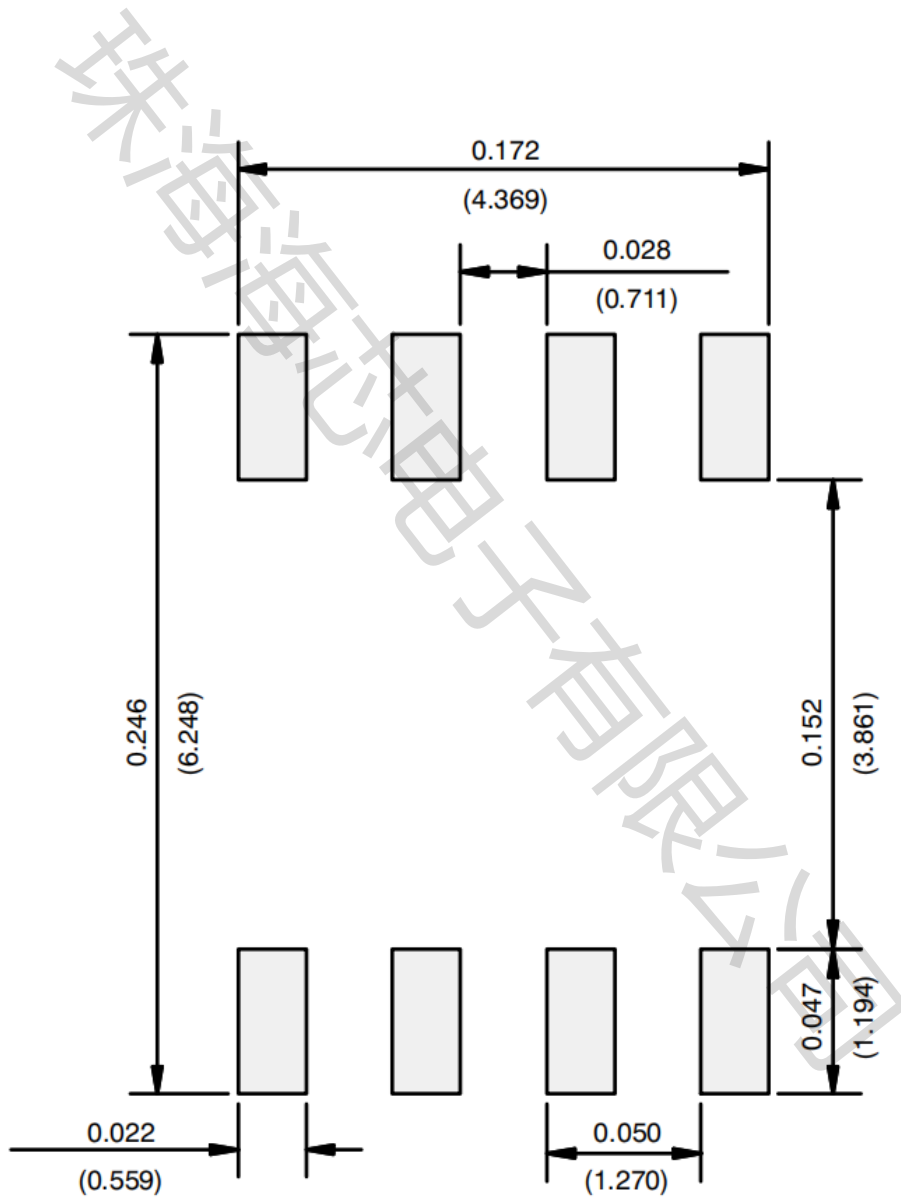
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



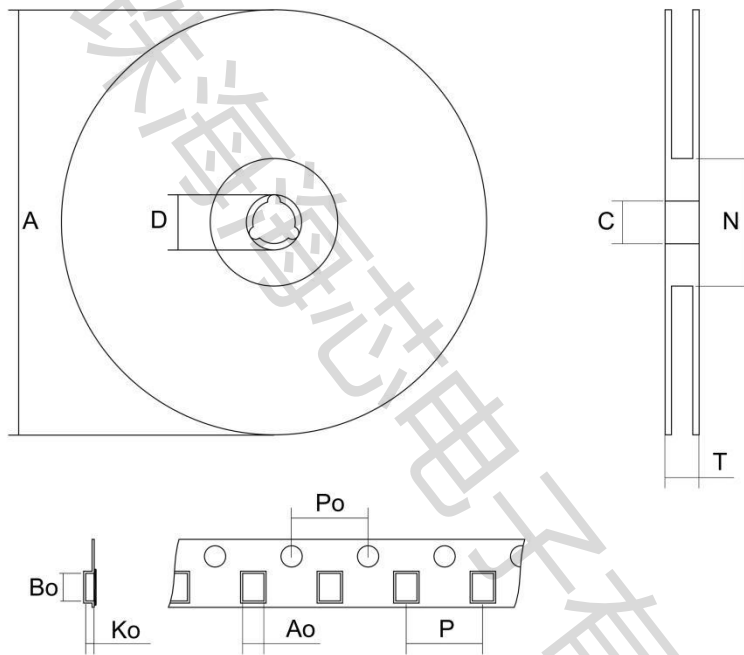
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44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

RECOMMENDED MINIMUM PADS FOR SOP-8



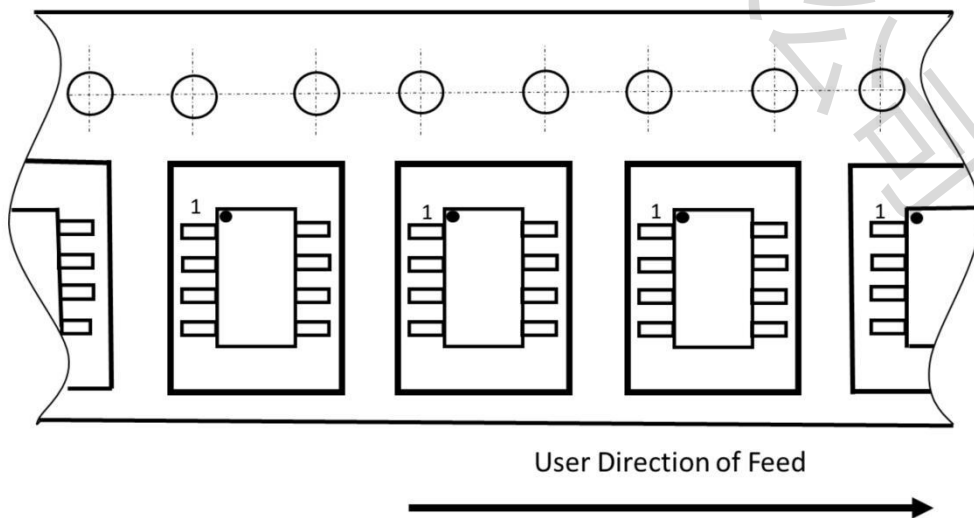
SOP-8 packing information

SOP-8 tape and reel



Tape orientation

TYPICAL



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.