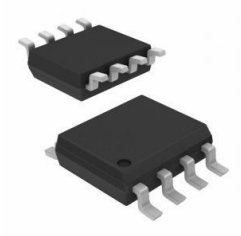
FDS6681Z-HX P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	Qg (Typ.)	I_D (A) [d]
-30	0.005 at V_{GS} = - 10 V	61nC	-29
	0.00775 at V_{GS} = - 4.5 V		-23



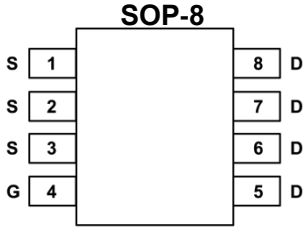
FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested

APPLICATIONS

- Adaptor Switch
- Notebook

SOP-8



Top View

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	- 29	A
	T_C = 70 °C		- 23.5	
	T_A = 25 °C		- 19.7[a, b]	
	T_A = 70 °C		- 15.6[a, b]	
Pulsed Drain Current		I_{DM}	- 70	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 6.5	
	T_A = 25 °C		- 2.9[a, b]	
Avalanche Current	L = 0.1 mH	I_{AS}	- 30	
Single-Pulse Avalanche Energy		E_{AS}	45	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	7.8	W
	T_C = 70 °C		5	
	T_A = 25 °C		3.5[a, b]	
	T_A = 70 °C		2.2[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]	t ≤ 10 s	R_{thJA}	29	35	°C/W
Maximum Junction-to-Foot	Steady State	R_{thJF}	13	16	

Notes

a. Surface mounted on 1" x 1" FR4 board.
b. t = 10 s.
c. Maximum under steady state conditions is 80 °C/W.
d. Based on TC = 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	$\Delta V_{DS}/I_J$	I_D = - 250 µA		- 31		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/I_J$			5.3		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1		- 2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 100	
		V_{DS} = - 20 V, V_{GS} = 0 V			- 75	
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 75 °C			- 10	µA
		V_{DS} = - 20 V, V_{GS} = 0 V, T_J = 75 °C			- 3	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ - 10 V, V_{GS} = - 10 V	- 30			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 15 A		0.0039	0.005	Ω
		V_{GS} = - 4.5 V, I_D = - 10 A		0.0062	0.0077	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 10 V, I_D = - 15 A		24		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		6000		pF
Output Capacitance	C_{oss}			860		
Reverse Transfer Capacitance	C_{rss}			790		
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 20		129	195	nC
		V_{DS} =-15 V, V_{GS} = - 4.5 V, I_D=- 20 A		61	95	
Gate-Source Charge	Q_{gs}			16.5		
Gate-Drain Charge	Q_{gd}			23.5		
Gate Resistance	R_g	f = 1 MHz	0.6	3	6	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 1.5 Ω, V_{GEN} = - 10 V, R_g = 1 Ω		16	30	ns
Rise Time	t_r			16	30	
Turn-Off DelayTime	$t_{d(off)}$			80	150	
Fall Time	t_f			20	40	
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		75	150	
Rise Time	t_r			130	260	
Turn-Off DelayTime	$t_{d(off)}$			60	120	
Fall Time	t_f			40	80	
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I_S	T_C = 25 °C			- 29	A
Pulse Diode Forward Current	I_{SM}				- 70	
Body Diode Voltage	V_{SD}	I_S = - 3 A, V_{GS} = 0 V		- 0.71	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 5 A, dI/dt = 100 A/µs, T_J = 25 °C		67	130	ns
Body Diode Reverse Recovery Charge	Q_{rr}			74	150	nC
Reverse Recovery Fall Time	t_a			22		ns
Reverse Recovery Rise Time	t_b			45		

Notes

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

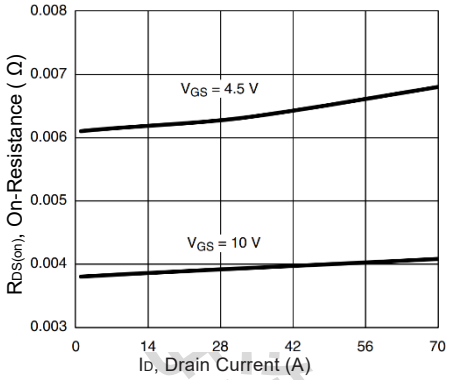


Fig 1. On-Resistance vs. Drain Current

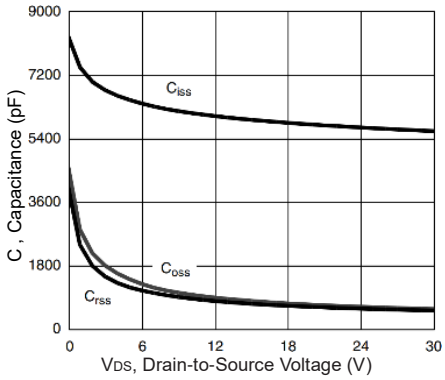


Fig 2. Capacitance

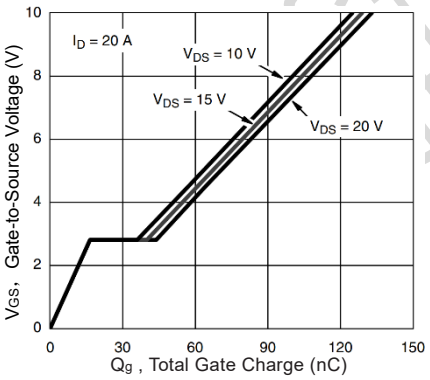


Fig 3. Gate Charge

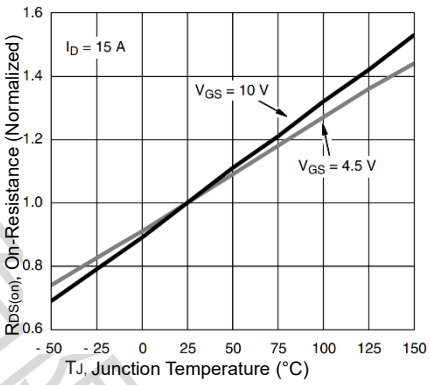


Fig 4. On-Resistance vs. Junction Temperature

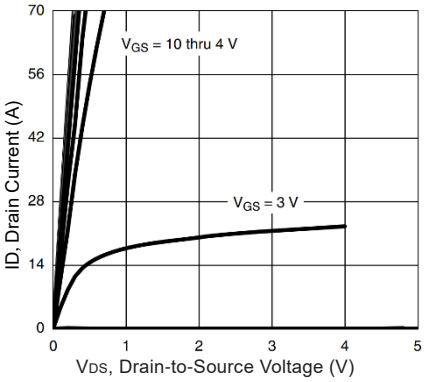


Fig 5. Output Characteristics

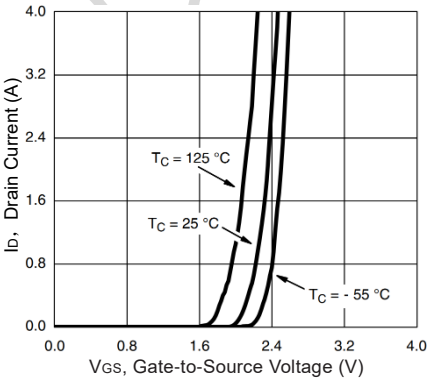


Fig 6. Transfer Characteristics

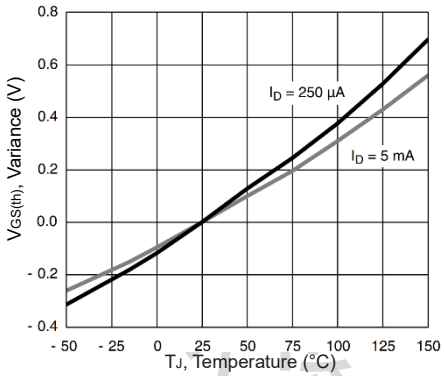


Fig 7. Threshold Voltage

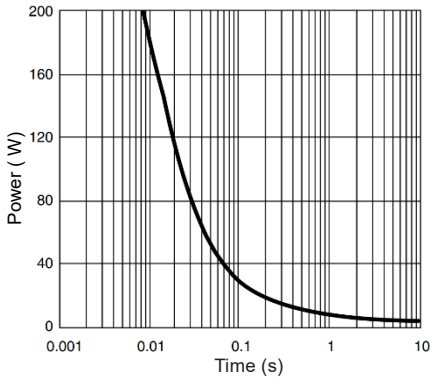


Fig 8. Single Pulse Power, Junction-to-Ambient

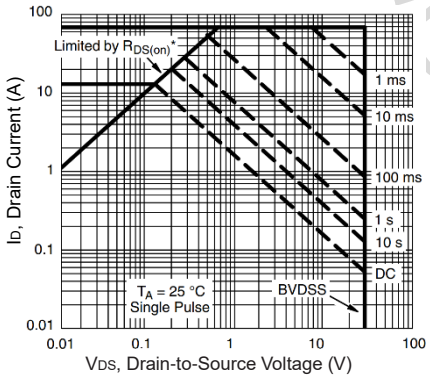


Fig 9. Safe Operating Area

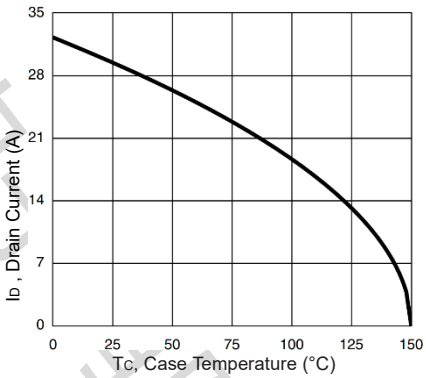


Fig 10. Current Derating

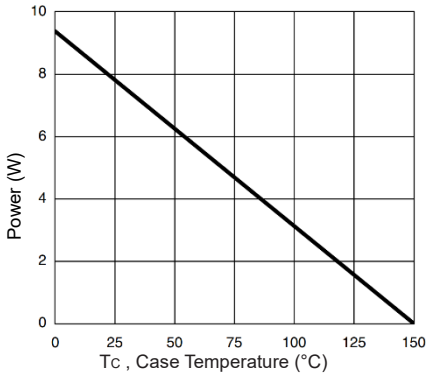


Fig 11. Power, Junction-to-Foot

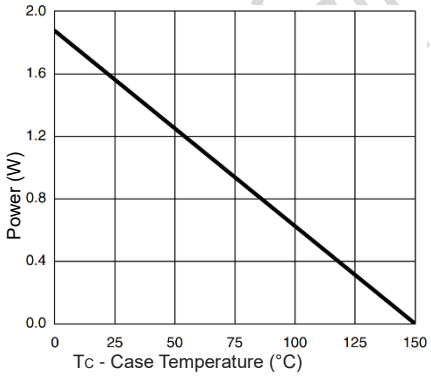


Fig 12. Power Derating, Junction-to-Ambient

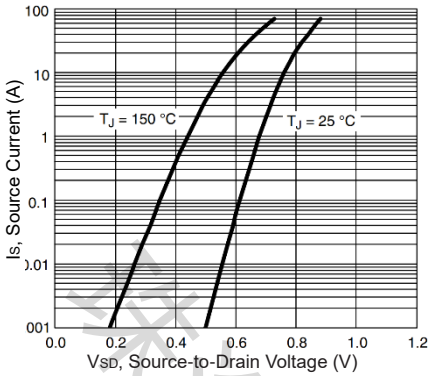


Fig 13. Source-Drain Diode Forward Voltage

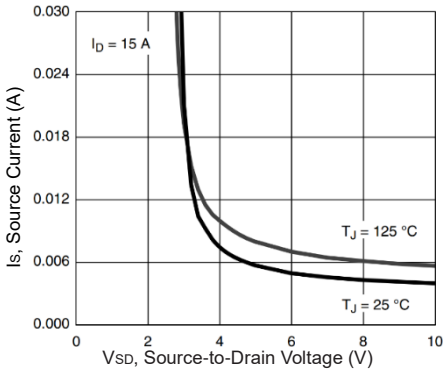


Fig 14. On-Resistance vs. Gate-to-Source Voltage

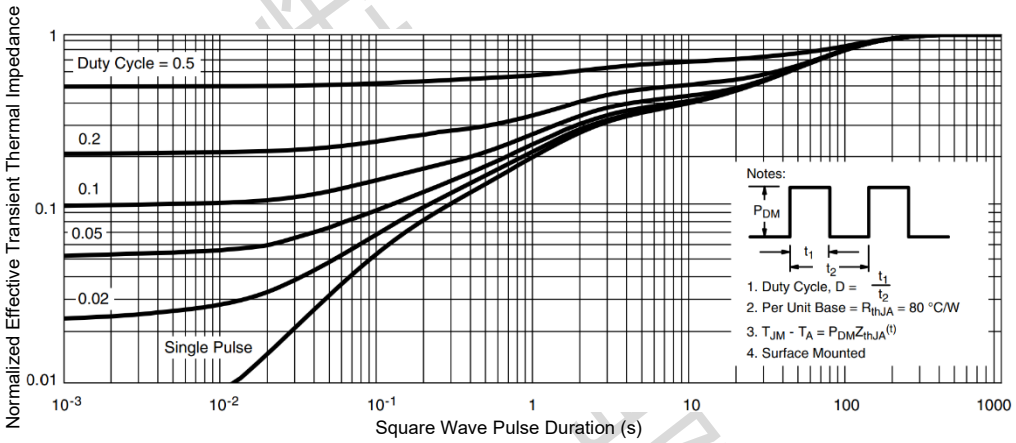


Fig 15. Normalized Thermal Transient Impedance, Junction-to-Ambient

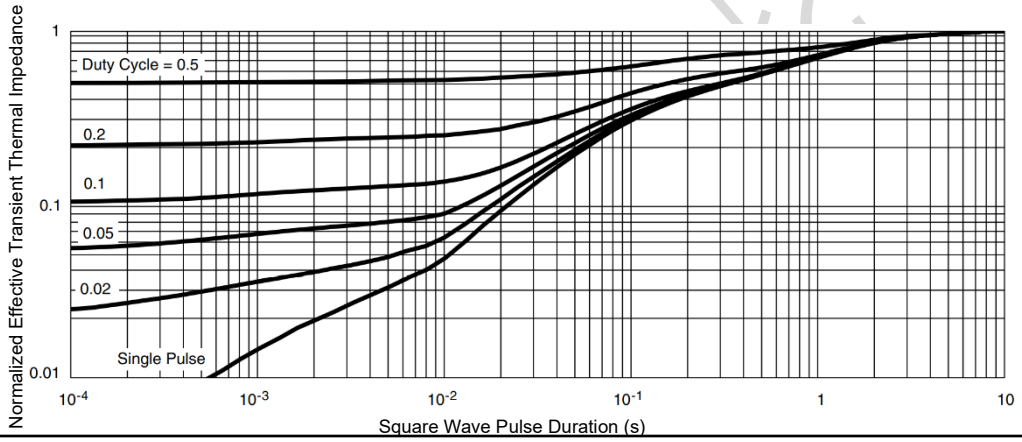
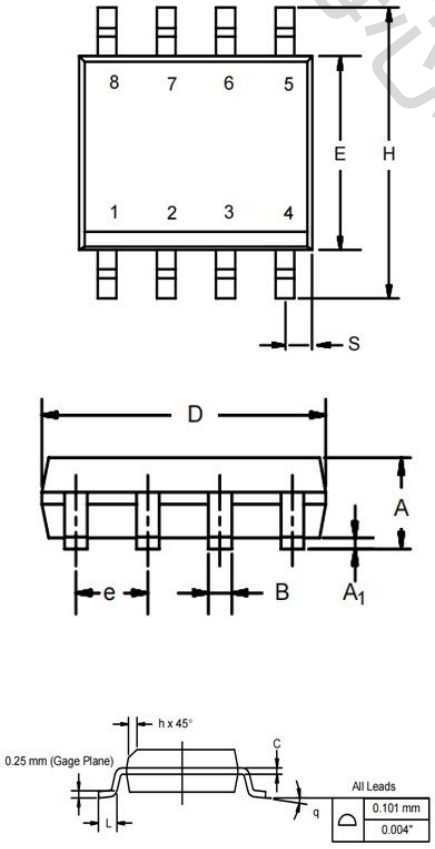


Fig 16. Normalized Thermal Transient Impedance, Junction-to-Foot

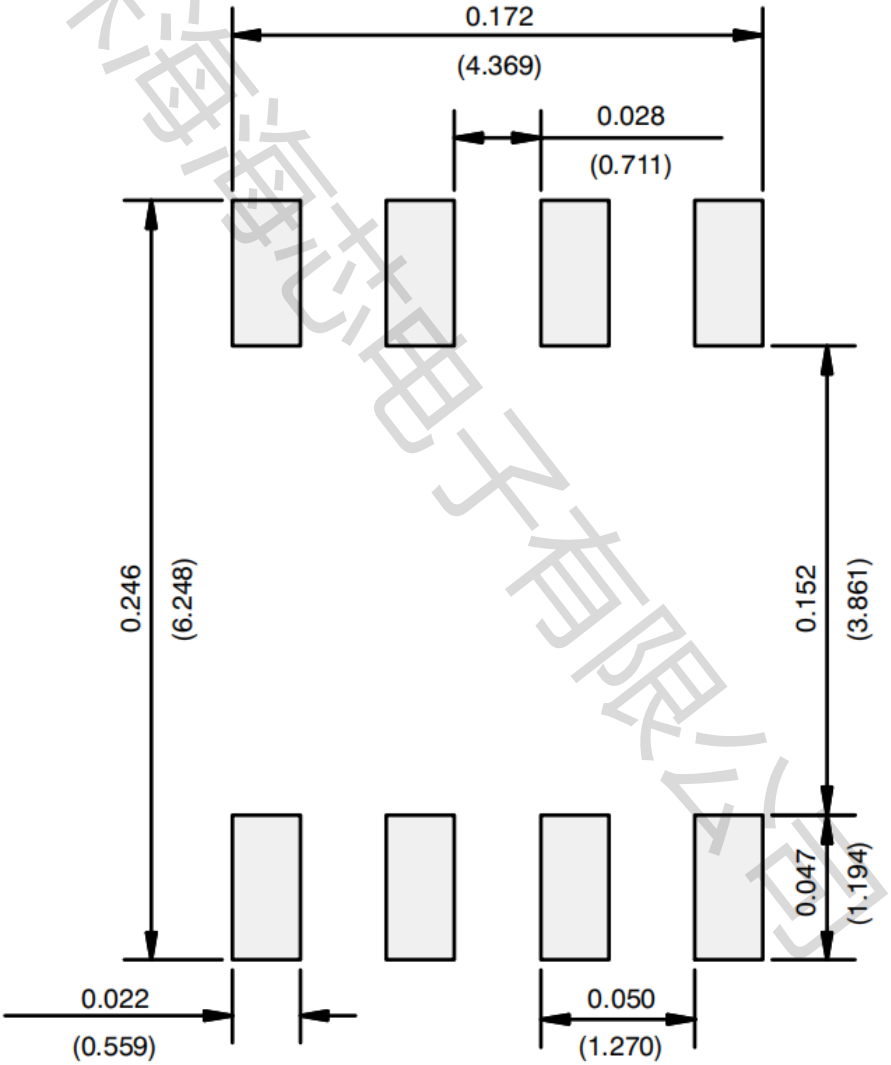
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



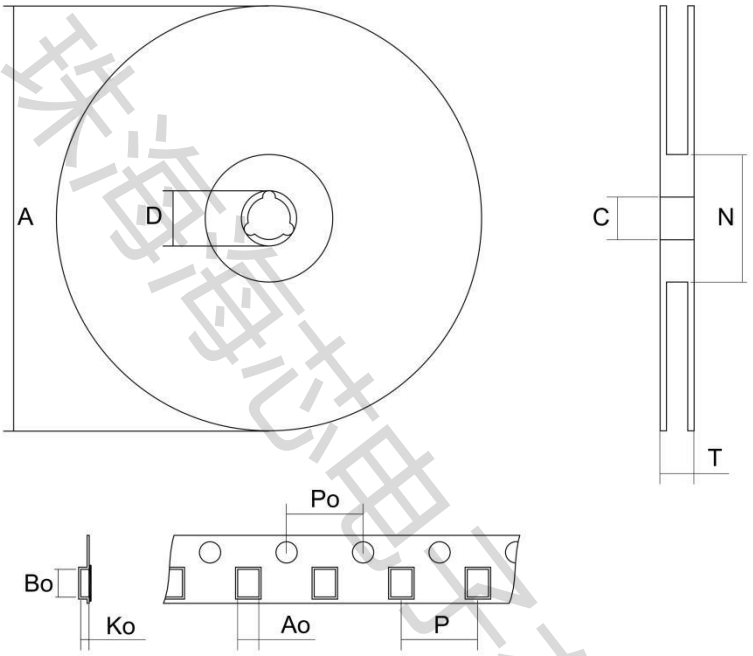
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44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

RECOMMENDED MINIMUM PADS FOR SOP-8

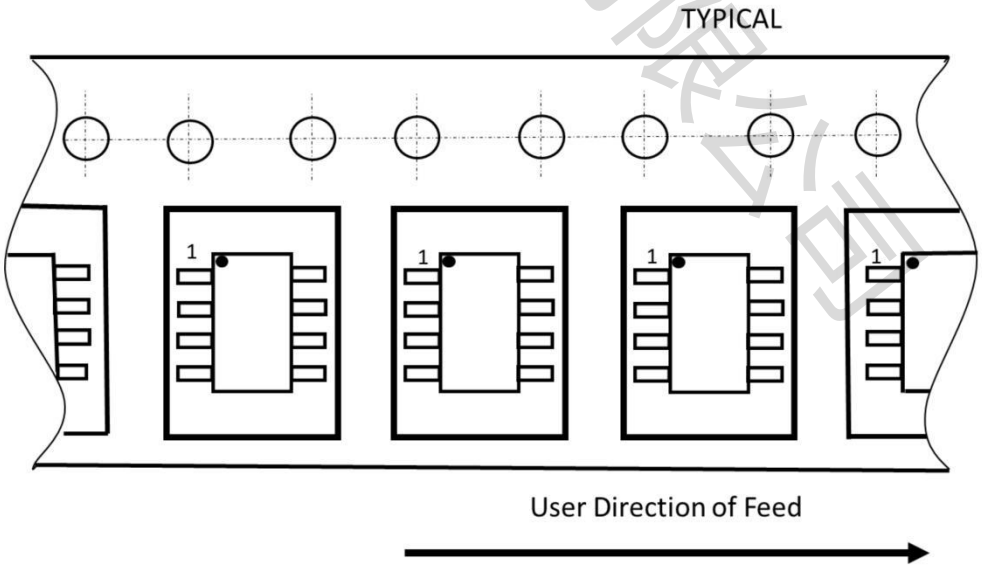


SOP-8 packing information

SOP-8 tape and reel



Tape orientation



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