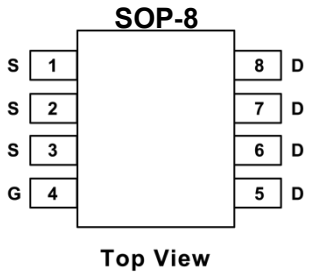
SI4401DDY-T1-GE3-HX P-Channel 40-V(D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	Qg (Typ.)	I_D (A)
-40	0.010 at V_{GS} = - 10 V	33nC	-16.1
	0.014 at V_{GS} = - 4.5 V		-13.3



FEATURES

- 100 % UIS Tested
- 100 % R_g Tested

APPLICATIONS

- Load Switch
- POL

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	-40	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -10V	-10.5	A
I_D @ T_A= 70°C	Continuous Drain Current, V_{GS} @ -10V	-8.6	
I_{DM}	Pulsed Drain Current ①	-43	
P_D @T_A = 25°C	Power Dissipation ③	2.5	W
P_D @T_A = 70°C	Power Dissipation ③	1.6	
	Linear Derating Factor	20	mW/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	50	°C/W

Electrical Characteristics @ TJ = 25° C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-40			V	V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		-0.025		V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance			0.015	Ω	V_{GS} = -10V, I_D = -10.5A ②
				0.025		V_{GS} = -4.5V, I_D = -8.4A ②
$V_{GS(th)}$	Gate Threshold Voltage	-1.0		-3.0	V	V_{DS} = V_{GS}, I_D = -250μA
g_{fs}	Forward Transconductance	17			S	V_{DS} = -10V, I_D = -10.5A
I_{DSS}	Drain-to-Source Leakage Current			-15	μA	V_{DS} = -32V, V_{GS} = 0V
				-25		V_{DS} = -32V, V_{GS} = 0V, T_J = 70°C
I_{GSS}	Gate-to-Source Forward Leakage			-100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage			100		V_{GS} = 20V
Q_g	Total Gate Charge		73	110	nC	ID=-10.5A
Q_{gs}	Gate-to-Source Charge		31	47		VDS= -20V
Q_{gd}	Gate-to-Drain ("Miller") Charge		17	26		VGS = -10V
$t_{d(on)}$	Turn-On Delay Time		52		ns	V_{DD} = -20V ②
t_r	Rise Time		490			I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time		210			R_G = 6.0Ω
t_f	Fall Time		97			V_{GS} = -10V
C_{iss}	Input Capacitance		9250		pF	VGS=0V
C_{oss}	Output Capacitance		580			VDS= -25V
C_{rss}	Reverse Transfer Capacitance		520			f = 1.0kHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current(Body Diode)			-2.5	A	
I_{SM}	Pulsed Source Current(Body Diode) ①			-43		
V_{SD}	Diode Forward Voltage			-1.2	V	T_J = 25°C, I_S = -2.5A, V_{GS} = 0V②
t_{rr}	Reverse Recovery Time		43	65	ns	T_J = 25°C, I_F = -2.5A
Q_{rr}	Reverse Recovery Charge		75	110	nC	di/dt = -100A/μs ②

Notes:

①Repetitive rating; pulse width limited by max. junction temperature.

②Pulse width ≤ 400μs; duty cycle ≤ 2%.

③Surface mounted on 1 in square Cu board, t ≤ 5sec.

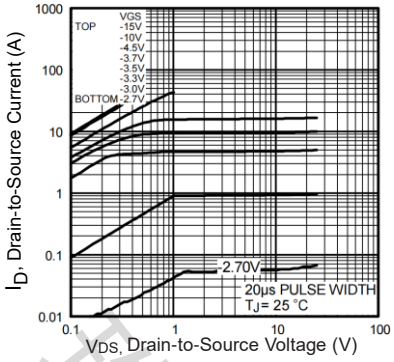


Fig 1. Typical Output Characteristics

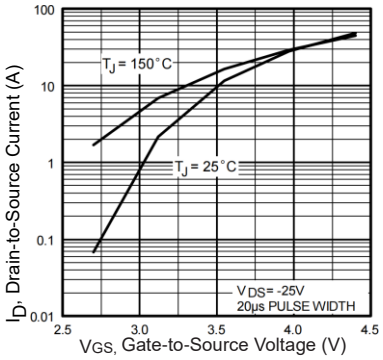


Fig 2. Typical Transfer Characteristics

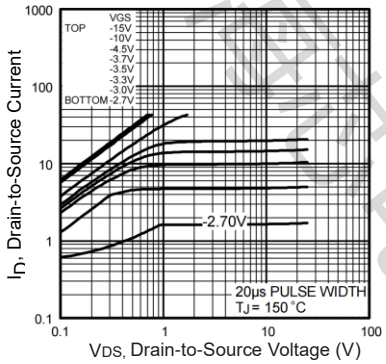


Fig 3. Typical Output

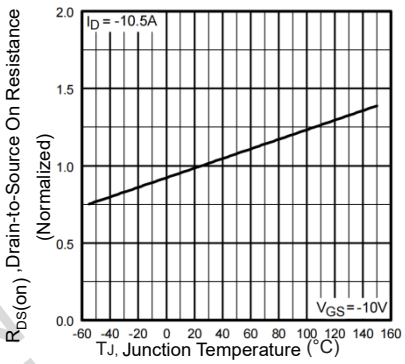


Fig 4. Normalized On-Resistance Vs. Temperature

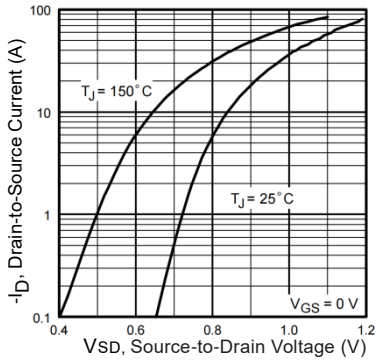


Fig 5. Typical Source-Drain Diode Forward Voltage

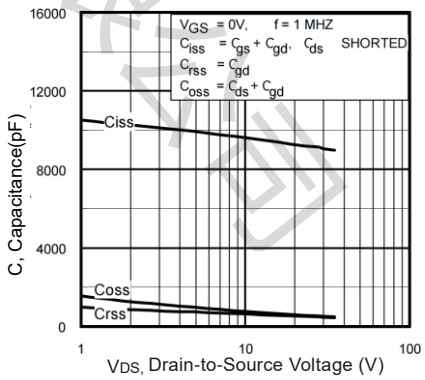


Fig 6. Typical Capacitance Vs. Drain-to-Source Voltage

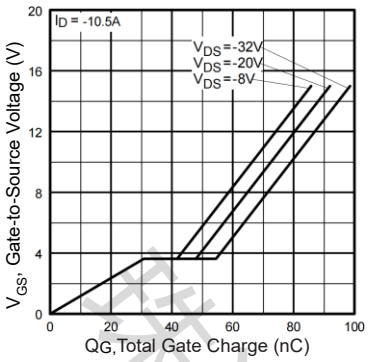


Fig 7. Typical Gate Charge Vs. Gate-to-Source Voltage

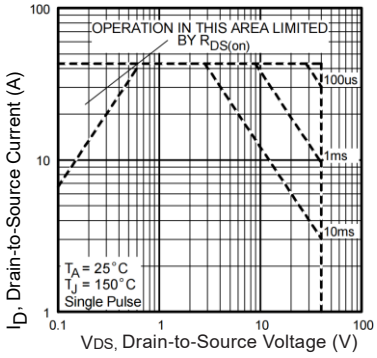


Fig 8.Maximum Safe Operating Area

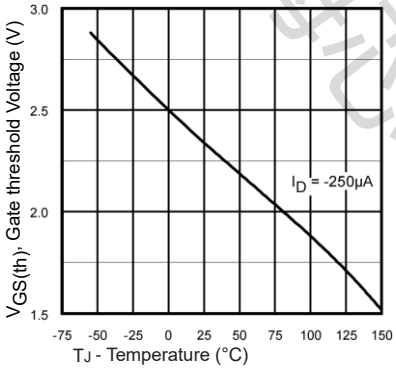


Fig 9. Typical Vgs(th) Vs. Junction Temperature

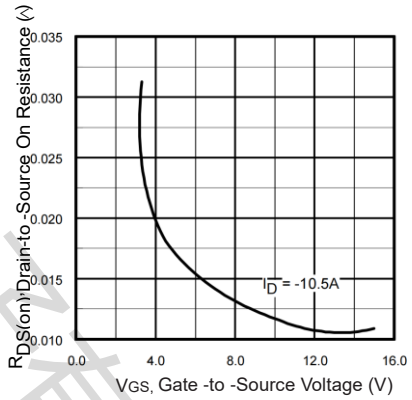


Fig 10. Typical On-Resistance Vs. Gate Voltage

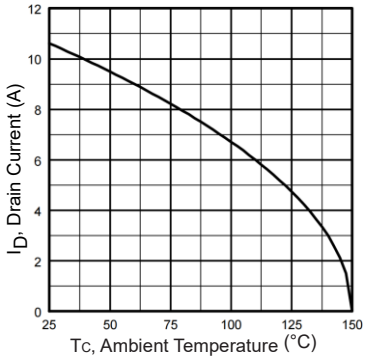


Fig 11. Maximum Drain Current Vs. Case Temperature

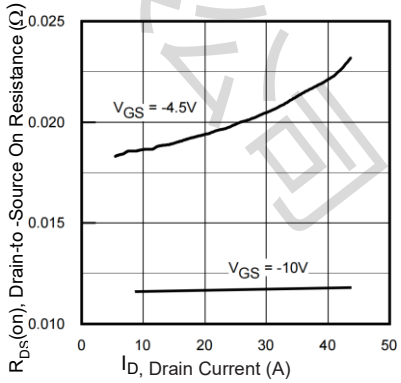


Fig 12. Typical On-Resistance Vs. Drain Current

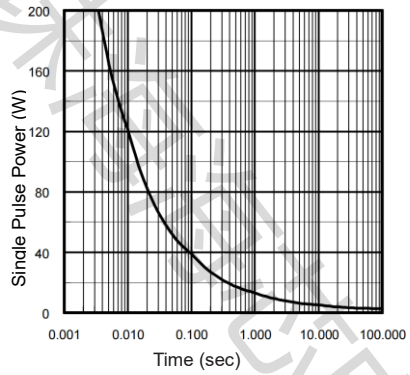


Fig 13. Typical Power Vs. Time

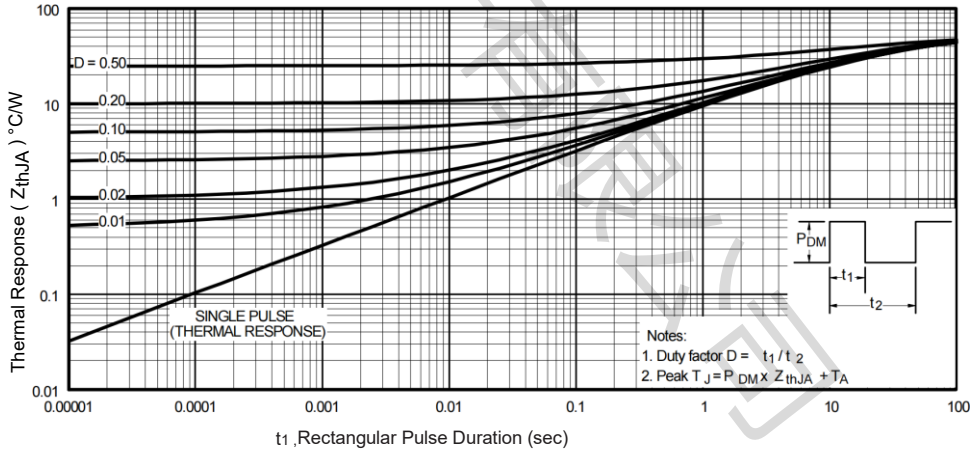
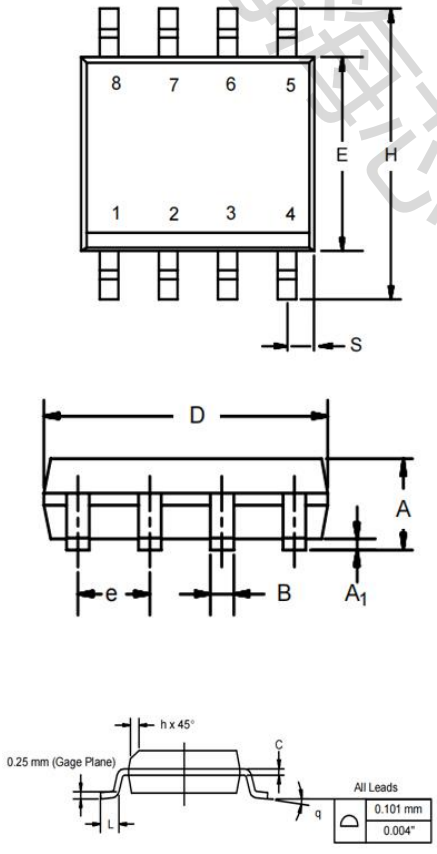


Fig 14. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

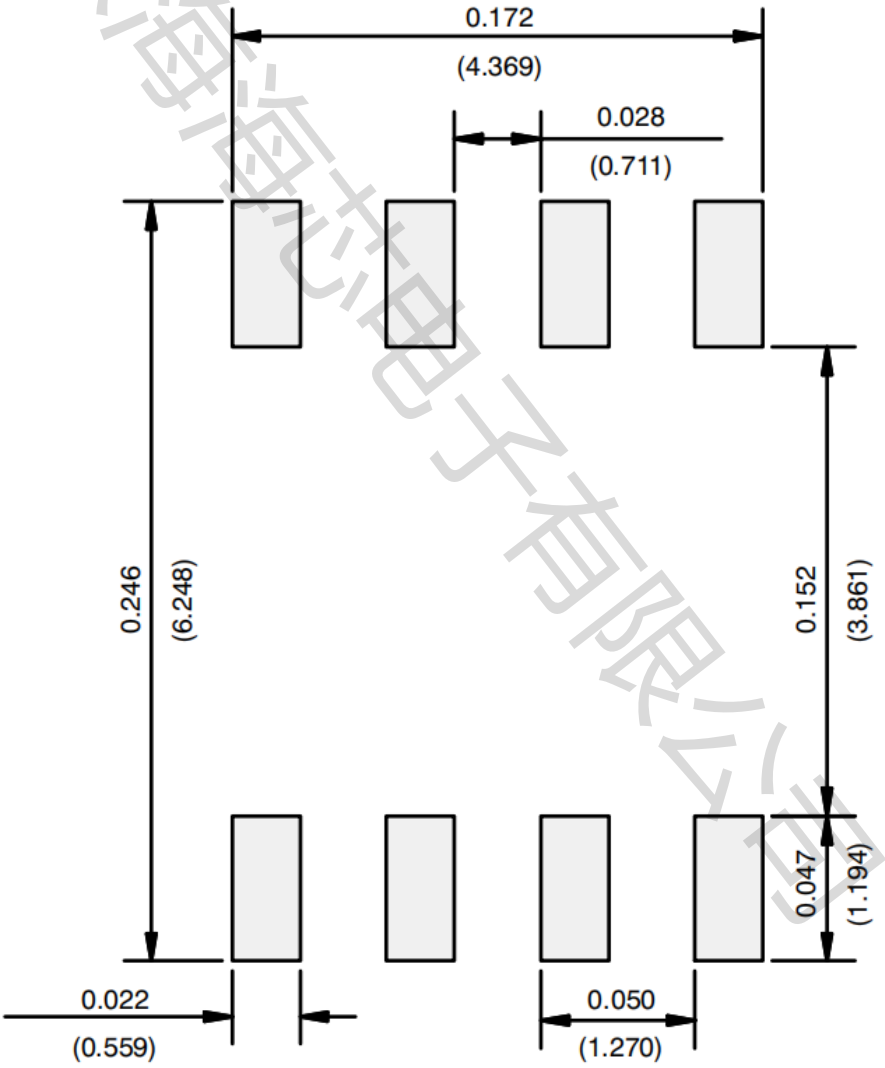
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



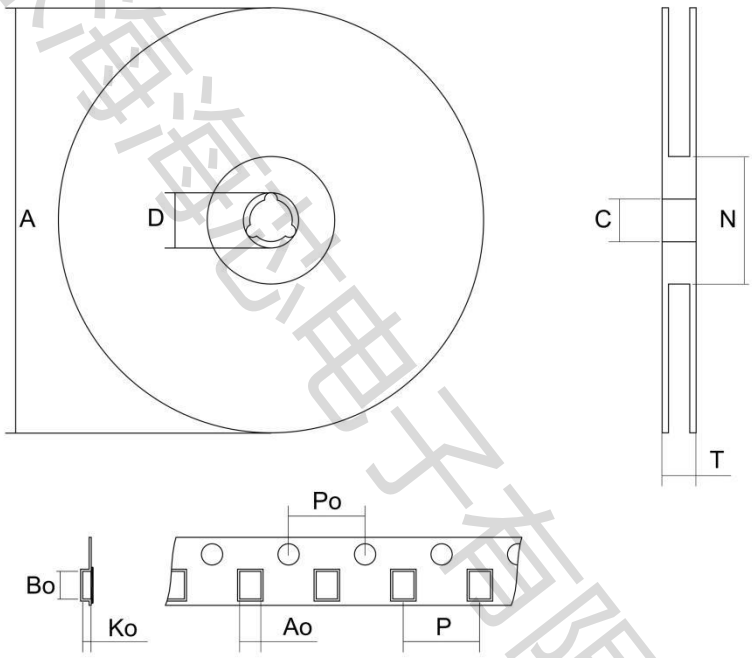
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.007 5	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

RECOMMENDED MINIMUM PADS FOR SOP-8

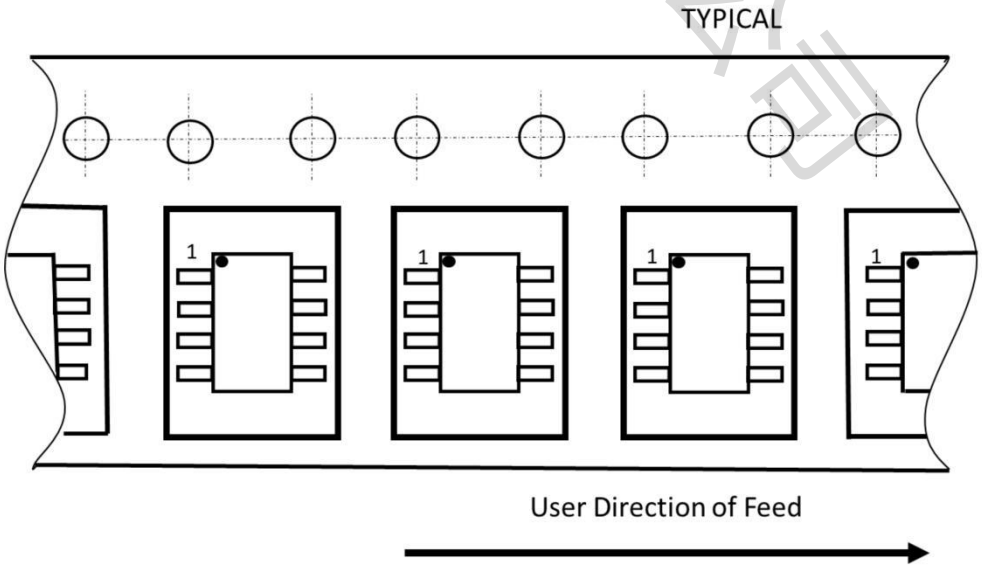


SOP-8 packing information

SOP-8 tape and reel



Tape orientation



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