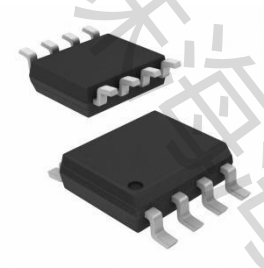
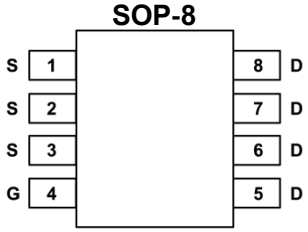
APM4953-HX Dual P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	Qg (Typ.)	I_D (A)
-30	0.018 at V_{GS} = - 10 V	17nC	-7.3
	0.018 at V_{GS} = -0.45 V		-6.3



SOP-8



Top View

FEATURES

- 100 % UIS Tested
- 100 % R_g Tested

APPLICATIONS

- Load Switches

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	-7.1	A
	T_A=70°C		-5.6	
Pulsed Drain Current [C]		I_{DM}	-40	
Avalanche Current [C]		I_{AS}, I_{AR}	-27	A
Avalanche energy L=0.1mH [C]		E_{AS}, E_{AR}	36	mJ
Power Dissipation [B]	T_A=25°C	P_D	2	W
	T_A=70°C		1.3	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	48	62.5	°C/W
Maximum Junction-to-Ambient [A D]	Steady-State		74	90	°C/W
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	32	40	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)						
Symbol	**Parameter**	**Conditions**	**Min**	**Typ**	**Ma**	**Unit**
	STATIC PARAMETERS					
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS}=0V	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V, V_{GS}=0V			-1	μA
		T_J=55°C			-5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}= ±20V			±10	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=-250μA	-1.5	-2.0	-2.5	V
$I_{D(ON)}$	On state drain current	V_{GS}=-10V, V_{DS}=-5V	-40			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-7.1A		17	25	mΩ
		T_J=125°C		24	33	
		V_{GS}=-4.5V, I_D=-5.6A		27	40	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-7.1A		24		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V		-0.7	-1	V
I_S	Maximum Body-Diode Continuous Current				-2.5	A
	DYNAMIC PARAMETERS					
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1MHz		104	125	pF
C_{oss}	Output Capacitance			180		pF
C_{rss}	Reverse Transfer Capacitance			125	175	pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	2	4	6	Ω
	SWITCHING PARAMETERS					
Q_g(10V)	Total Gate Charge	V_{GS}=-10V, V_{DS}=-15V, I_D=-7.1A		19		nC
Q_g(4.5V)	Total Gate Charge			9.6		nC
Q_{gs}	Gate Source Charge			3.6		nC
Q_{gd}	Gate Drain Charge			4.6		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=-10V, V_{DS}=-15V, R_L=2.2Ω, R_{GEN}=3Ω		10		ns
t_r	Turn-On Rise Time			5.5		ns
$t_{D(off)}$	Turn-Off DelayTime			26		ns
t_f	Turn-Off Fall Time			9		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=-7.1A, dI/dt=500A/μs		11		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-7.1A, dI/dt=500A/μs		25		nC

Notes

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation PD is based on $T_{J(MAX)}$=150°C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.

D. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using.

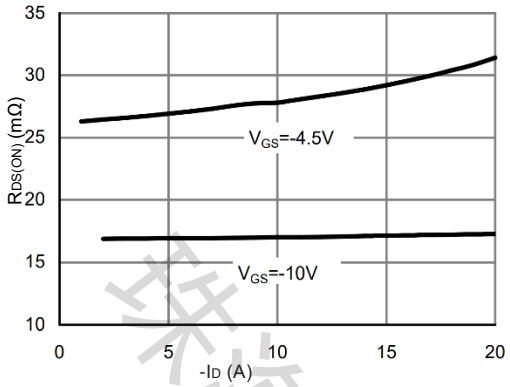


Fig 1. On-Resistance vs. Drain Current and Gate Voltage

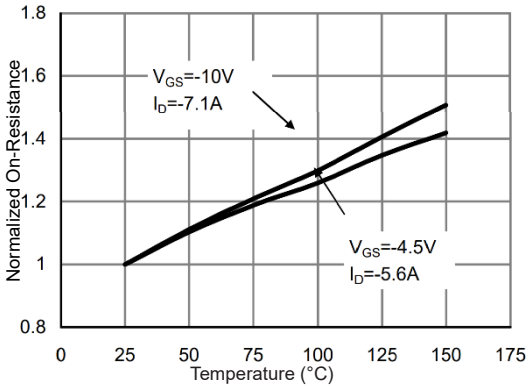


Fig 2. On-Resistance vs. Junction Temperature

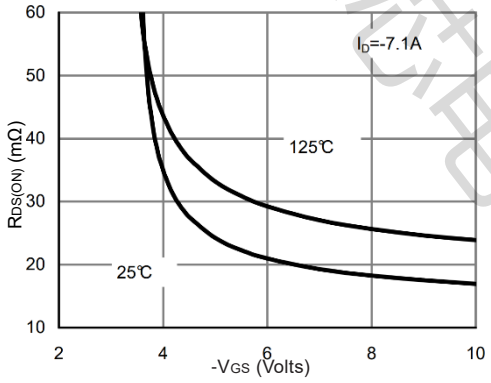


Fig 3. On-Resistance vs. Gate-Source Voltage

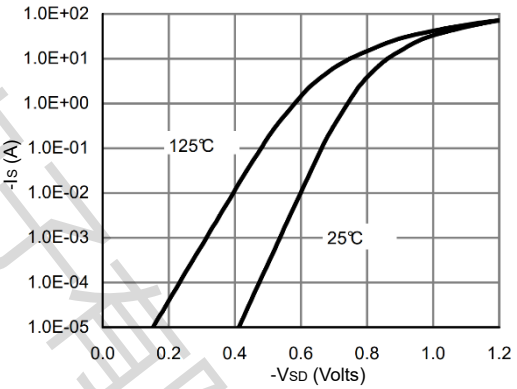


Fig 4. Body-Diode Characteristics

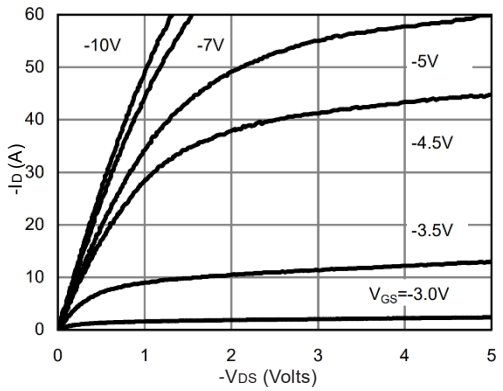


Fig 5. On-Region Characteristics

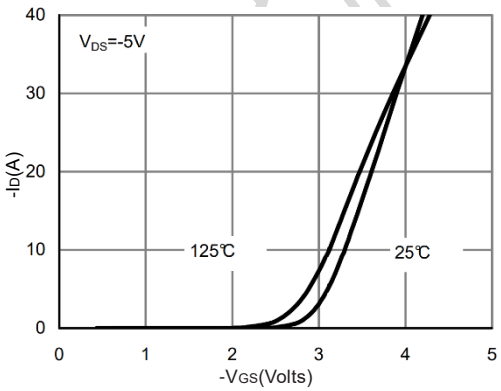


Fig 6. Transfer Characteristics

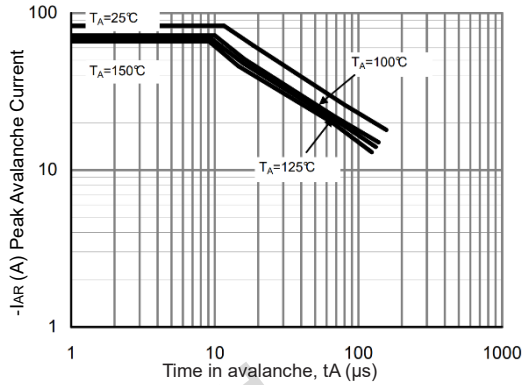


Fig 7. Single Pulse Avalanche capability

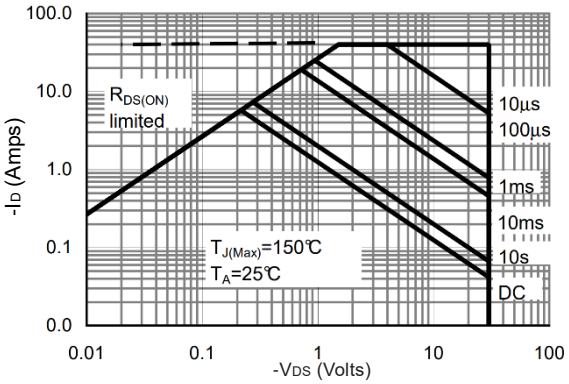


Fig 8. Maximum Forward Biased Safe Operating Area

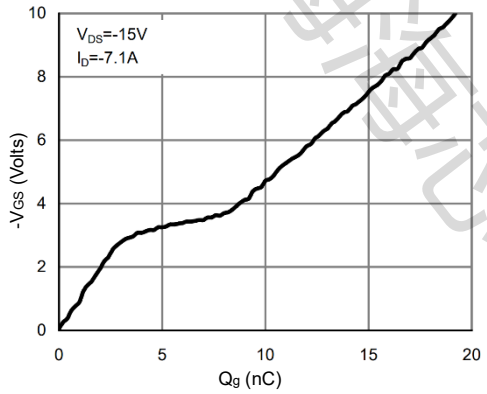


Fig 9. Gate-Charge Characteristics

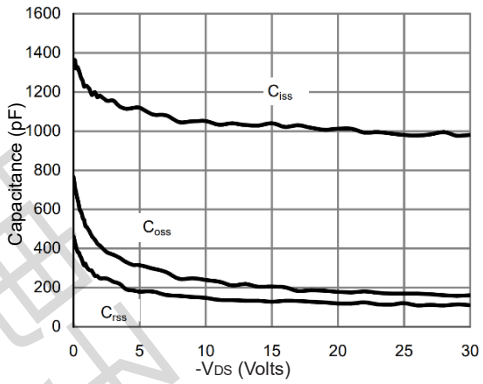


Fig 10. Capacitance Characteristics

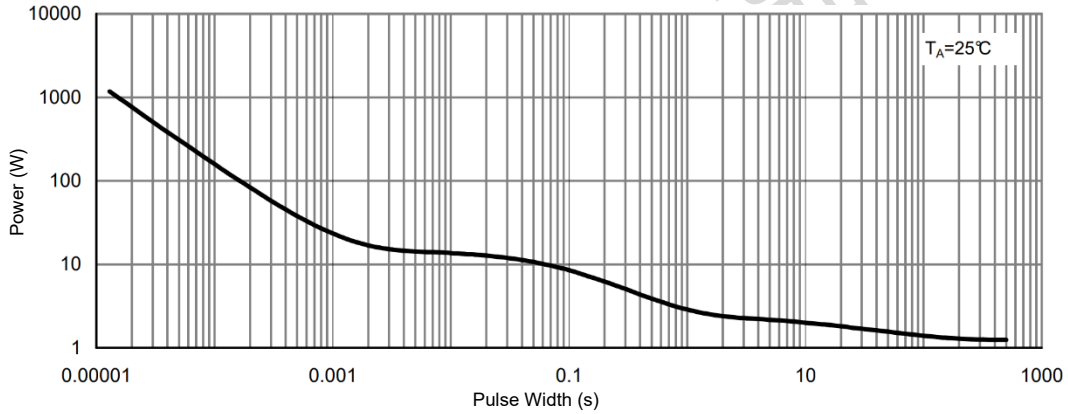


Fig 11. Single Pulse Power Rating Junction-to-Ambient

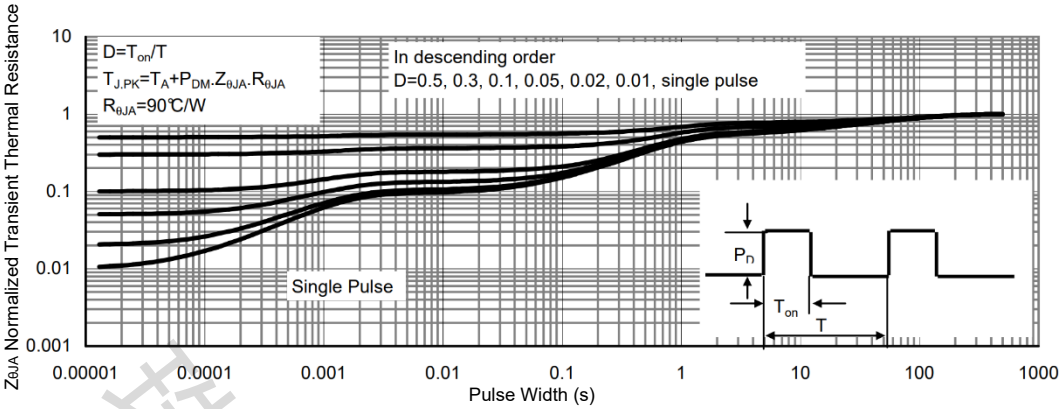
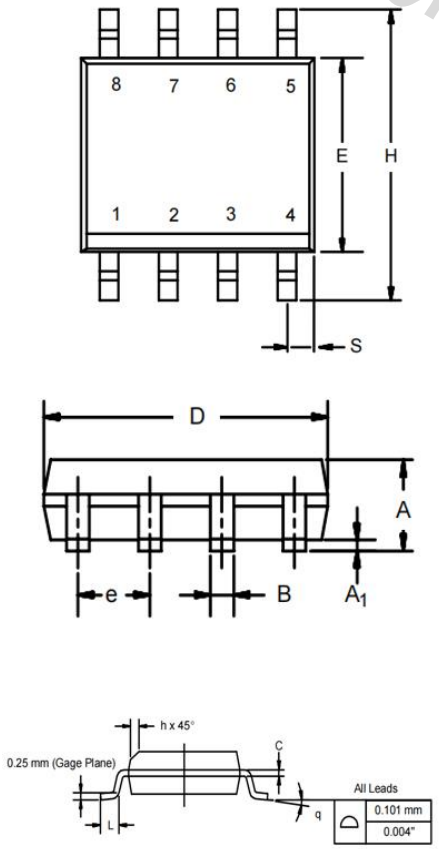


Fig 12. Normalized Maximum Transient Thermal Impedance

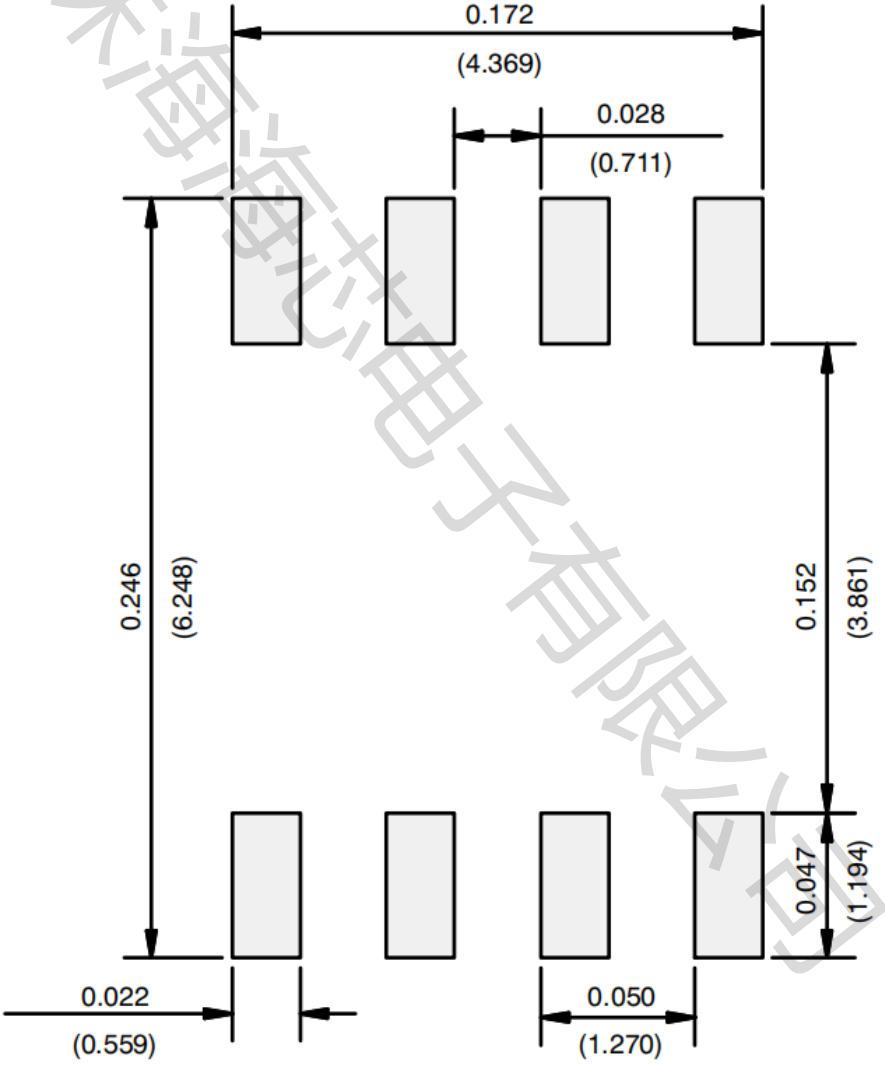
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



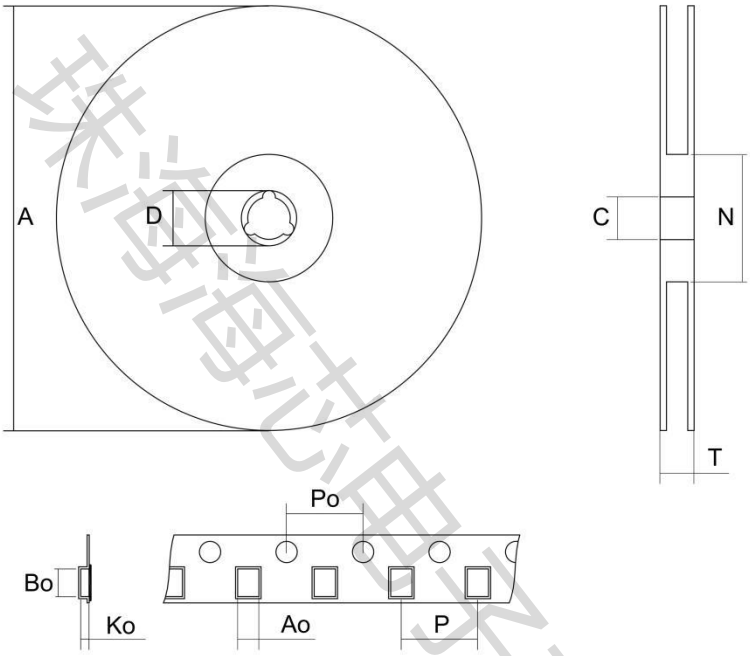
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.007 5	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44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

RECOMMENDED MINIMUM PADS FOR SOP-8

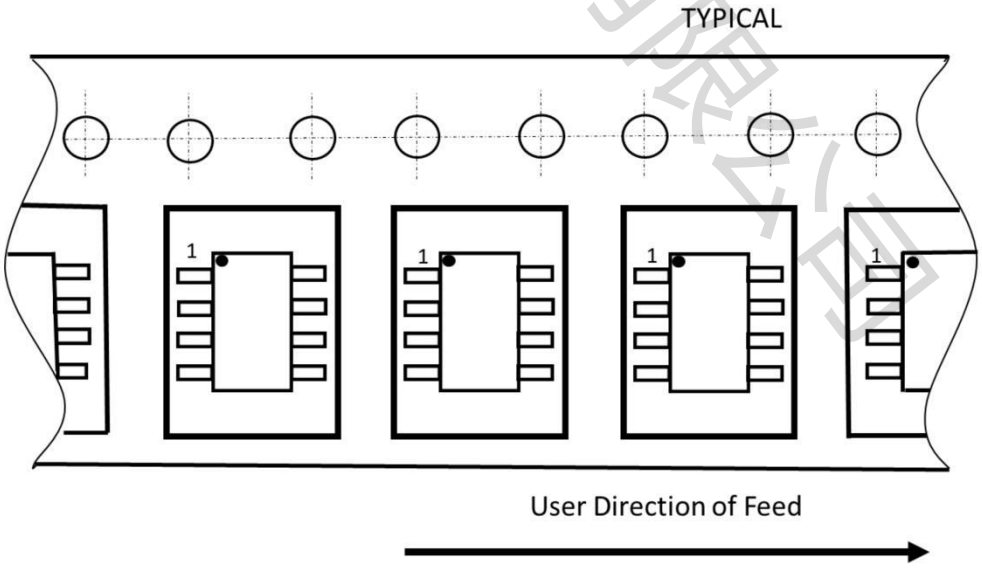


SOP-8 packing information

SOP-8 tape and reel



Tape orientation



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