

## ESD PROTECTION FOR IN-VEHICLE NETWORKS



### DESCRIPTION

The PAM2IVN24 is an ESD protection device in a small SOT-23 surface mount package that is designed to protect automotive in-vehicle bus lines from the damage caused by Electrostatic Discharge (ES) and other transients.

### FEATURES

- *AEC-Q101 Qualified*
- Compatible with IEC 61000-4-2 (ESD): Air  $\pm 30\text{kV}$ , Contact  $\pm 30\text{kV}$
- Compatible with IEC 61000-4-4 (EFT)
- Compatible with IEC 61000-4-5 (Surge): 5A
- Bidirectional Configuration
- Low Clamping Voltage
- Ultra Low Leakage Current: 0.8nA @ 27°C (Typical)
- RoHS Compliant
- REACH Compliant

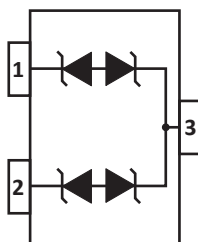
### APPLICATIONS

- CANBus
- LINBus
- FlexRay
- SENT

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SOT-23 Package
- Approximate Weight: 8 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- Flammability Rating UL 94V-0
- 8mm Tape and Reel per EIA Standard 481

### PIN CONFIGURATION



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

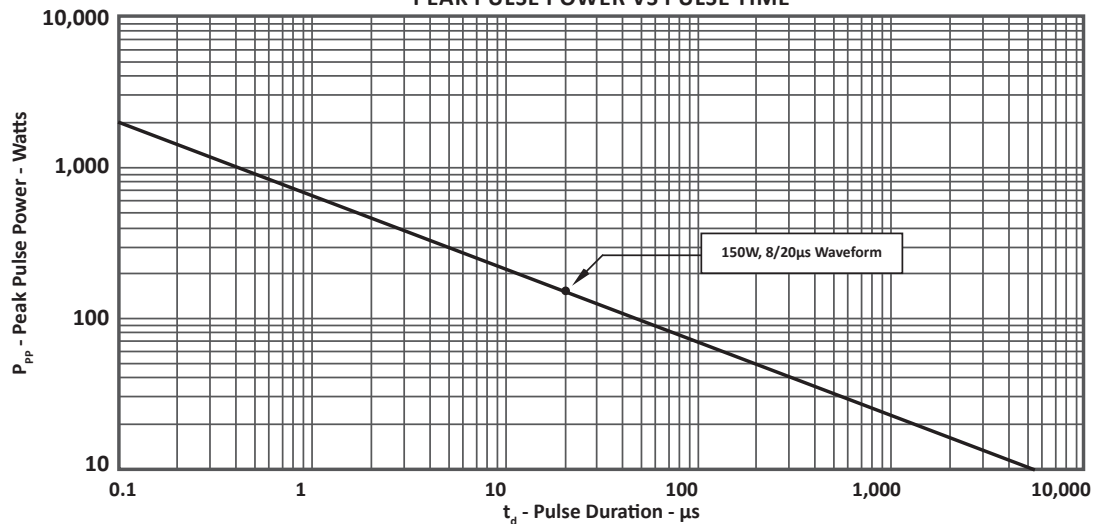
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Current, $t_p = 8/20\mu s$	$I_{PPM}$	5.0	Amps
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1	$P_{PP}$	150	Watts
Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-65 to 150	°C
Ambient Temperature	$T_A$	-55 to 150	°C
ESD Voltage Rating per IEC 61000-4-2 (Air and Contact)	$V_{ESD}$	±30	kV

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

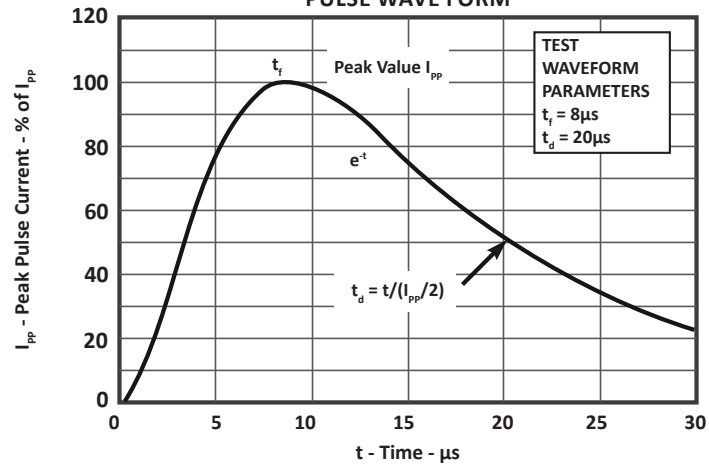
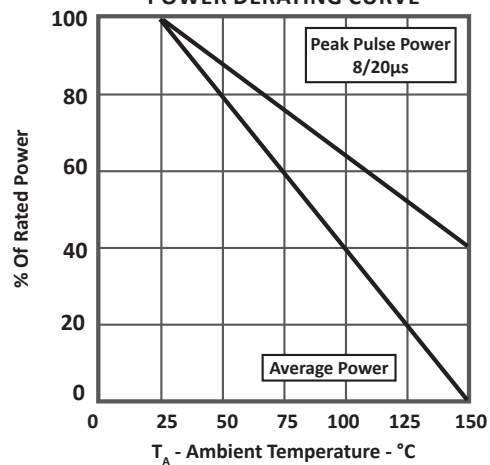
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	BREAKDOWN VOLTAGE  @ 1mA $V_{(BR)}$ VOLTS			CLAMPING VOLTAGE (Fig. 2)  @ $I_p = 3.5A$ $V_c$ VOLTS		LEAKAGE CURRENT  @ $V_{WM}$ 27°C $I_D$ nA		MAXIMUM LEAKAGE CURRENT (See Note 1)  @ $V_{WM}$ 125°C $I_D$ nA	CAPACITANCE (See Note 1-2)  @ 5V, 250KHz/1MHz C pF	
			MIN	TYP	MAX	TYP	MAX	TYP	MAX		TYP	MAX
PAM21VN24	24V	24.0	25.5	27.0	30.3	38	42	0.8	5	10	20	25

**NOTES**

- Guaranteed by design.
- Capacitance difference between two channels is < 5%.

**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**


## TYPICAL DEVICE CHARACTERISTICS

**FIGURE 2**  
**PULSE WAVE FORM**

**FIGURE 3**  
**POWER DERATING CURVE**


## TYPICAL DEVICE CHARACTERISTICS

FIGURE 4  
PEAK CURRENT VS CLAMPING VOLTAGE

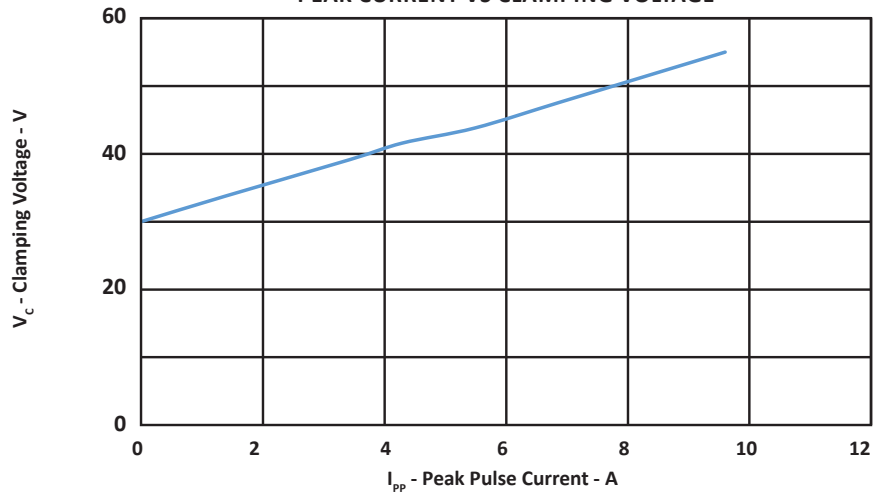
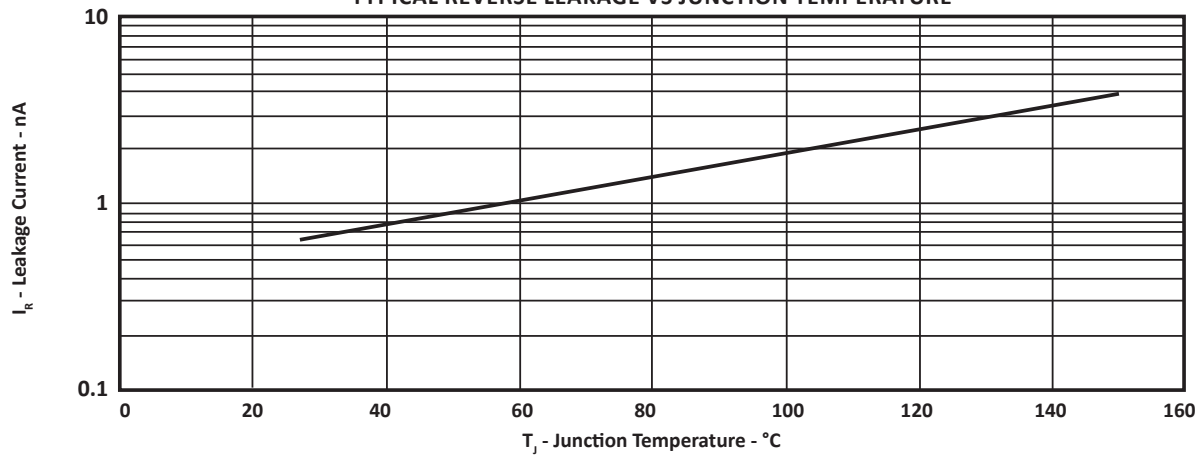


FIGURE 5  
TYPICAL REVERSE LEAKAGE VS JUNCTION TEMPERATURE



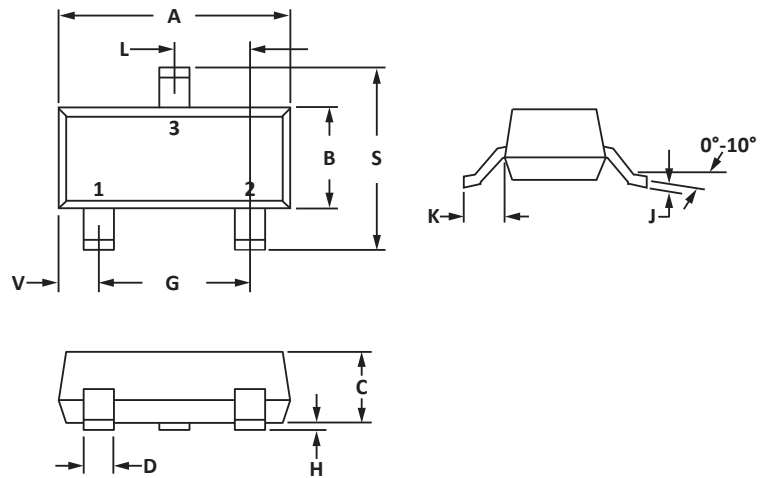
## SOD-323 PACKAGE INFORMATION

## OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.89	1.11	0.035	0.044
D	0.37	0.50	0.015	0.020
G	1.78	2.04	0.070	0.081
H	0.013	0.100	0.001	0.004
J	0.085	0.177	0.003	0.007
K	0.45	0.60	0.018	0.024
L	0.89	1.02	0.035	0.040
S	2.10	2.50	0.083	0.098
V	0.45	0.60	0.018	0.024

## NOTES

1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Pin 3 is the cathode (Unidirectional Only)
4. Dimensions are exclusive of mold flash and metal burrs.

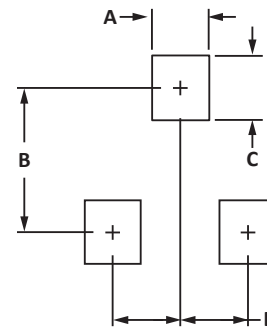


## PAD LAYOUT DIMENSIONS

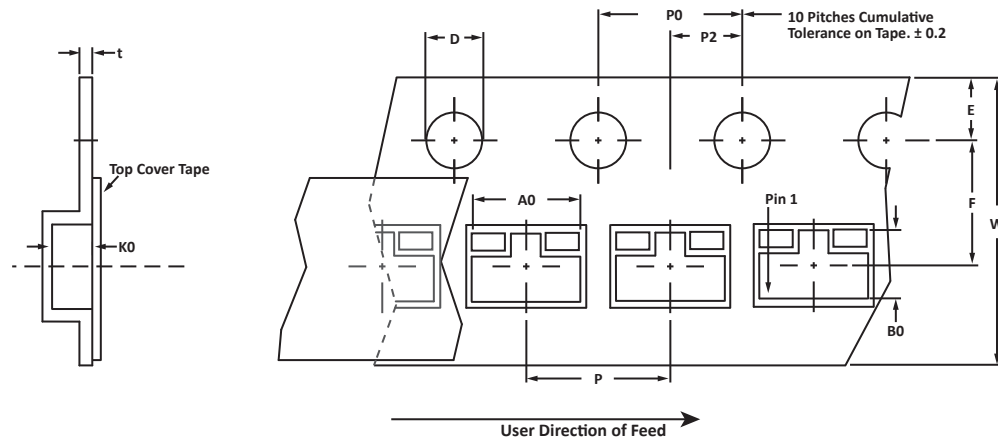
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

## NOTES

1. Controlling dimension: inches.



## TAPE AND REEL



## SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	3.15 ± 0.10	2.77 ± 0.10	1.30 ± 0.10	1.55 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	0.228

## NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Marking on Part - marking code (see page 2).

## ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PAM2IVN24	N/A	-T73	3000	7"	N/A

This device is only available in a Lead-Free configuration.

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 30 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection that include Transient Voltage Suppressor (TVS) Arrays, Steering Diode Array Hybrids, High-power Components and Modules, as well as Steering Diodes, EMI Filter/TVS Arrays and Thyristor Surge Suppressors. These components deliver circuit protection in electronic systems from numerous overvoltage events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices is an ISO 9001 certified company.

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