

## 600 WATT TVS ARRAY - ASYMMETRICAL DATA LINE PROTECTOR



**SOT-23 PACKAGE**

### DESCRIPTION

The PSM712 is an asymmetrical transient voltage suppressor (TVS) array, designed specifically for RS-485 applications. This device provides protection against ESD, tertiary lightning and switching transients.

The PSM712 has a peak pulse power of 600 Watts for an 8/20 $\mu$ s waveshape and is available in SOT-23 package configuration. This device meets the IEC 61000-4-2, 61000-4-4 and IEC 61000-4-5 requirements.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 24A, 8/20 $\mu$ s - Level 2 (Line-Ground) & Level 3 (Line-Line)
- 600 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu$ s)
- RoHS Compliant
- REACH Compliant

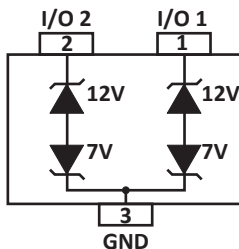
### APPLICATIONS

- RS-485 Transceivers
- Network Interfaces
- Wireless Systems
- Portable Electronics

### 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

### CIRCUIT DIAGRAM



## TYPICAL DEVICE CHARACTERISTICS

### MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs) - See Figure 1	P <sub>PP</sub>	600	Watts
Operating Temperature	T <sub>L</sub>	-55 to 150	°C
Storage Temperature	T <sub>STG</sub>	-55 to 150	°C

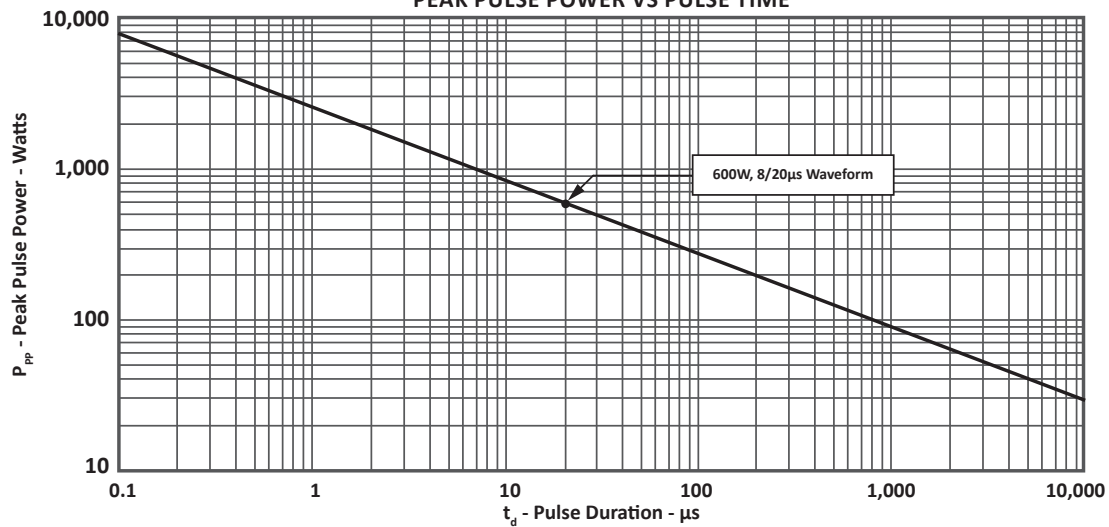
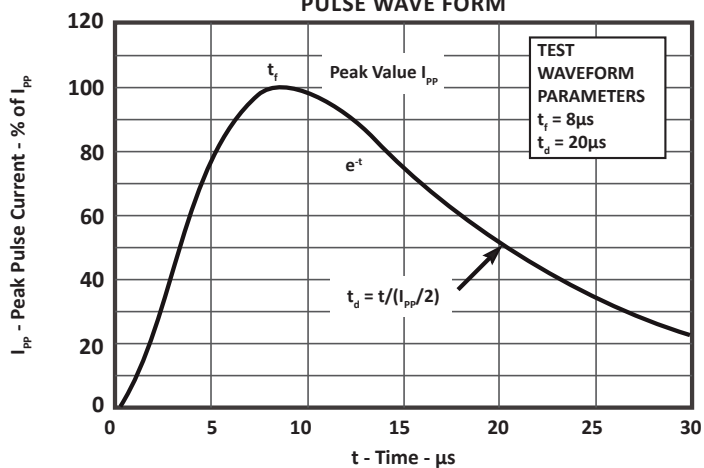
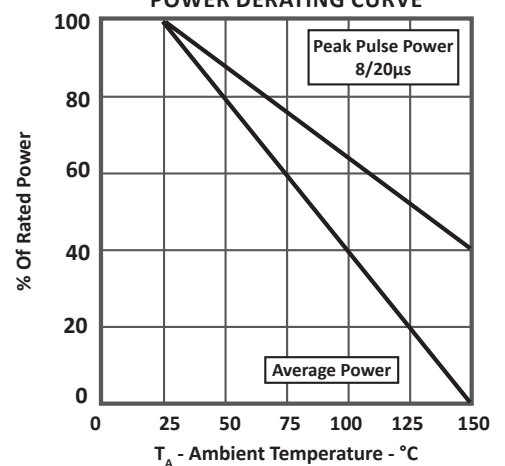
### ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Note 1)	DEVICE MARKING	RATED STAND-OFF VOLTAGE  V <sub>WM</sub> VOLTS	MINIMUM BREAKDOWN VOLTAGE  @ 1mA V <sub>(BR)</sub> VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I <sub>p</sub> = 1A V <sub>c</sub> VOLTS	MAXIMUM LEAKAGE CURRENT  @ V <sub>WM</sub> I <sub>D</sub> μA	TYPICAL CAPACITANCE  @ 0V, 1MHz C pF
Pin 3-1 & Pin 3-2	712	7.0	7.5	11.0	20	75
Pin 1-3 & Pin 2-3	712	12.0	13.3	19.0	1	75

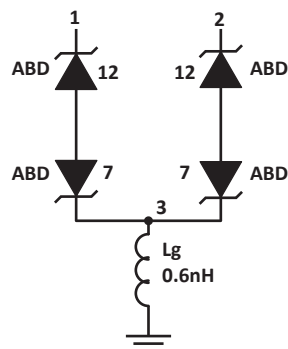
#### NOTES

1. For 7V, pin 3 is positive. For 12V, pins 1 and 2 are positive.
2. Marking code applies to same device.

## TYPICAL DEVICE CHARACTERISTICS

 FIGURE 1  
 PEAK PULSE POWER VS PULSE TIME

 FIGURE 2  
 PULSE WAVE FORM

 FIGURE 3  
 POWER DERATING CURVE


## SPICE MODEL

**FIGURE 1**  
**SPICE MODEL**


ABD - Avalanche Breakdown Diode (TVS)  
 Lg - Lead Inductance

**TABLE 1 - SPICE PARAMETERS**

PARAMETER	UNIT	ABD(TVS)
BV	V	See Table 2
IBV	$\mu\text{A}$	See Table 2
$C_{jo}$	pF	See Table 2
$I_s$	A	See Table 2
Vj	V	0.6
M	-	0.33
N	-	1
$R_s$	Ohms	See Table 2
TT	s	1E-8
EG	eV	1.11

**TABLE 2 - ABD SPECIFIC SPICE PARAMETERS**

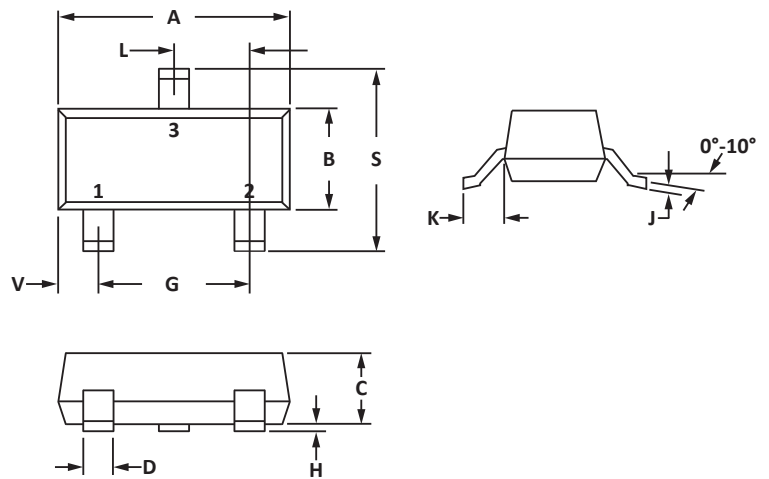
PART NUMBER	$B_V$ (VOLTS)	IBV( $\mu\text{A}$ )	$C_{jo}$ (pF)	$I_s$ (AMPS)	Rs(OHMS)
PSM712 - 7V	7.5	20	146	1E-11	0.28
PSM712 - 12V	13.3	1	123	1E-13	0.40

**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**

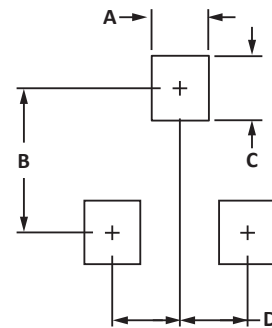
1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Pin 3 is the cathode (Unidirectional Only)
4. Dimensions are exclusive of mold flash and metal burrs.


**PAD LAYOUT DIMENSIONS**

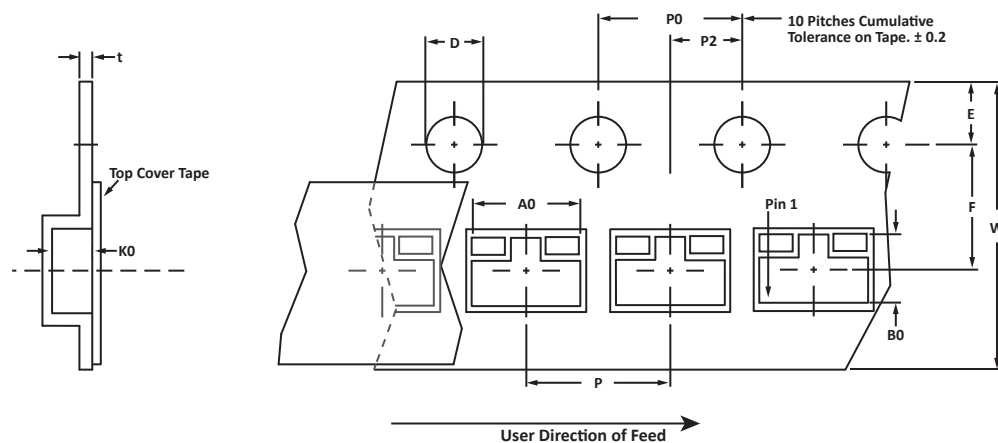
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

**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

1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Suffix - T7 = 7" Reel - 3,000 pieces per 8mm tape.
4. Suffix - T13 = 13" Reel - 10,000 pieces per 8mm tape.
5. Marking on Part - marking code (see page 2) and date code.

## ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PSM712	-LF	-T7	3000	7"	n/a
PSM712	-LF	-T13	10,000	13"	n/a

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

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is ISO 9001:2015 certified.

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