

**MULTI-LINE LOW CAPACITANCE TVS ARRAY****DESCRIPTION**

The SMP6LLCxx-2P Series are high powered multi-line low capacitance transient voltage suppressor arrays that provides board level protection for standard TTL and MOS bus line applications against the damaging effects of ESD, tertiary lightning and switching transients.

The series has a peak pulse power rating of 400 Watts for an 10/1000µs waveshape and meets the IEC 61000-4-2, IEC 61000-4-4 and IEC 61000-4-5 requirements.

**FEATURES**

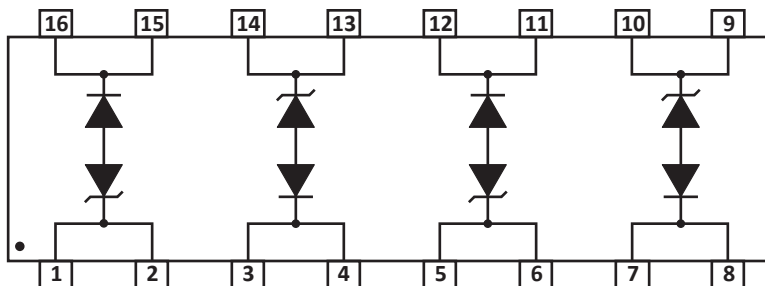
- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 100A
- 100A (2/10µs) per Bellcore GR-1089 (Intra Building)
- 400 Watts Peak Pulse Power per Line (tp = 10/1000µs)
- 3,900 Watts Peak Pulse Power per Line (tp = 8/20µs)
- $ITKU.20 I_{pp}$  @ 40A (5/310µs)
- Bidirectional Configuration
- High Surge Capabilities
- Protects 2 Bidirectional Lines
- Low Capacitance: 5pF
- RoHS Compliant
- REACH Compliant

**APPLICATIONS**

- T1/E1
- Customer Premise Equipment (CPE)
- Telecommunication Equipment
- Wireless Communication Equipment

**MECHANICAL CHARACTERISTICS**

- Molded JEDEC SO-16 Package
- Approximate Weight: 0.15 grams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 16mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

**PIN CONFIGURATION**

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

PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	$T_L$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 2	$P_{PP}$	3,900	Watts
Peak Pulse Power ( $t_p = 10/1000\mu s$ ) - See Figure 2	$P_{PP}$	400	Watts

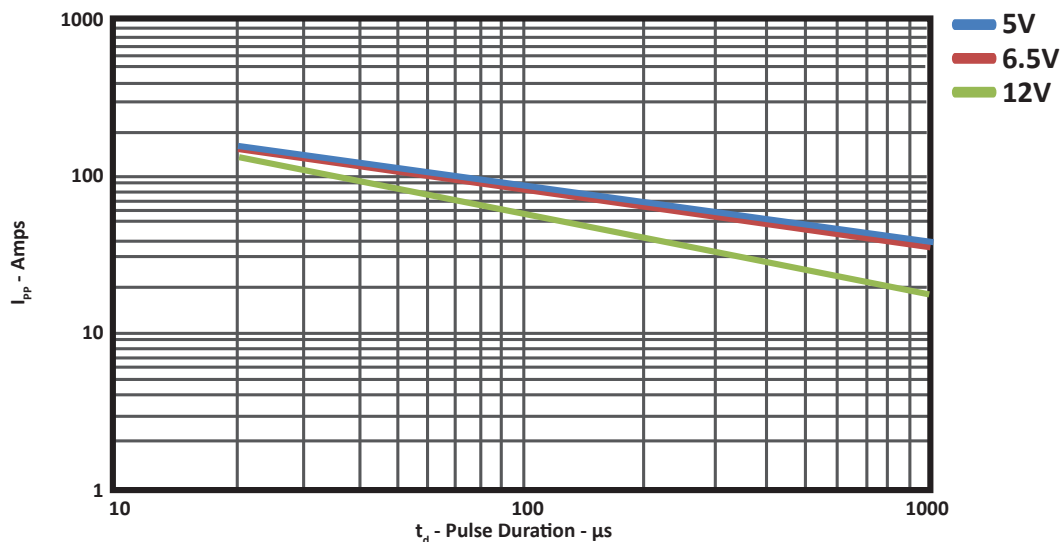
**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

PART NUMBER (Note 1)	RATED STAND-OFF VOLTAGE	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM CLAMPING VOLTAGE (Fig. 3)	MAXIMUM LEAKAGE CURRENT	TYPICAL CAPACITANCE
	$V_{WM}$ VOLTS	@1mA $V_{(BR)}$ VOLTS	@ 8/20 $\mu s$ $V_C @ I_{PP}$	@ $V_{WM}$ $I_D$ $\mu A$	@0V, 1MHz C pF
SMP6LLC05-2P	5.0	6.0	26.0V @ 150.0A	300	5
SMP6LLC6.5-2P	6.5	7.2	28.0V @ 150.0A	300	5
SMP6LLC12-2P	12.0	13.3	35.0V @ 140.0A	2	5

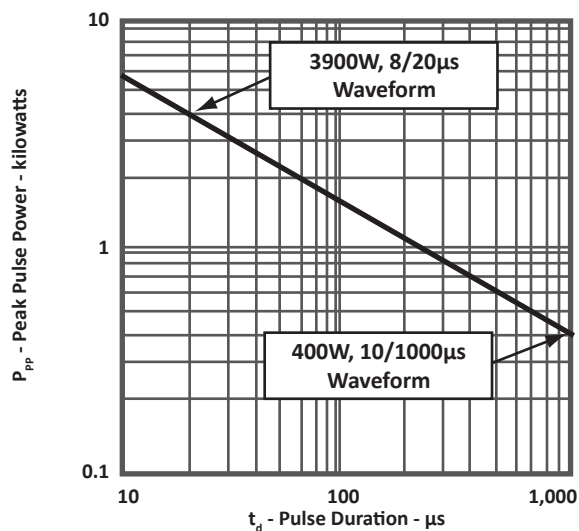
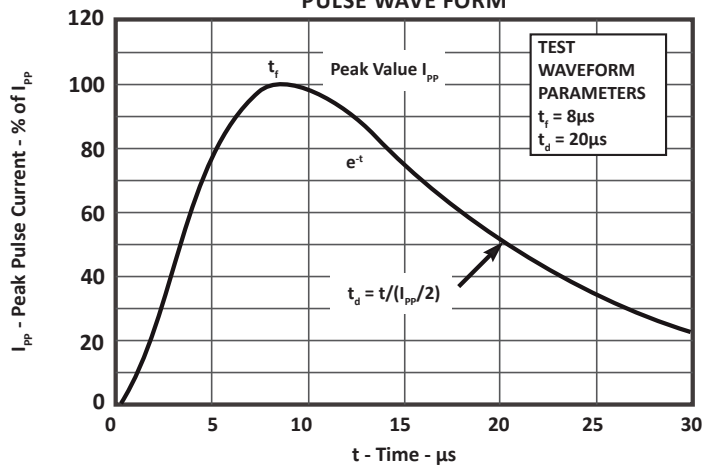
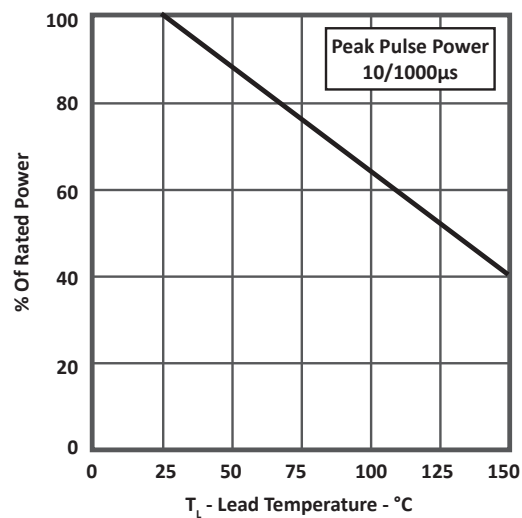
**NOTES**

1. Do not surge from pins 15/16 to 1/2, 3/4 to 13/14, 11/12 to 5/6 and 7/8 to 9/10. PIV typically greater than 100 Volts for each rectifier diode.

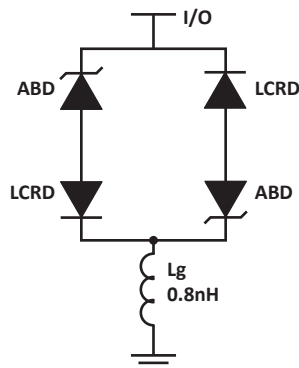
**FIGURE 1**  
**MAXIMUM IPP VS PULSE DURATION BY VOLTAGE**



## TYPICAL DEVICE CHARACTERISTICS

 FIGURE 2  
 PEAK PULSE POWER VS PULSE TIME

 FIGURE 3  
 PULSE WAVE FORM

 FIGURE 4  
 POWER DERATING CURVE


## SPICE MODEL

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


ABD - Avalanche Breakdown Diode (TVS)

LCRD: Low Capacitance Rectifier Diode

Lg - Lead Inductance

**TABLE 1 - SPICE PARAMETERS**

PARAMETER	UNIT	ABD(TVS)	LCRD
BV	V	See Table 2	200
IBV	μA	1	0.01
C <sub>jo</sub>	pF	See Table 2	5
I <sub>s</sub>	A	See Table 2	1E-13
Vj	V	0.6	0.6
M	-	0.33	0.33
N	-	1	1
R <sub>s</sub>	Ohms	See Table 2	0.31
TT	s	1E-8	1E-9
EG	eV	1.11	1.11

**TABLE 2 - ABD SPECIFIC SPICE PARAMETERS**

PART NUMBER	B <sub>v</sub> (VOLTS)	C <sub>jo</sub> (pF)	I <sub>s</sub> (AMPS)	Rs(OHMS)
SMP6LLC05-2P	6.0	3000	1E-11	0.075
SMP6LLC6.5-2P	7.2	2600	1E-11	0.075
SMP6LLC12-2P	13.3	1150	1E-13	0.080

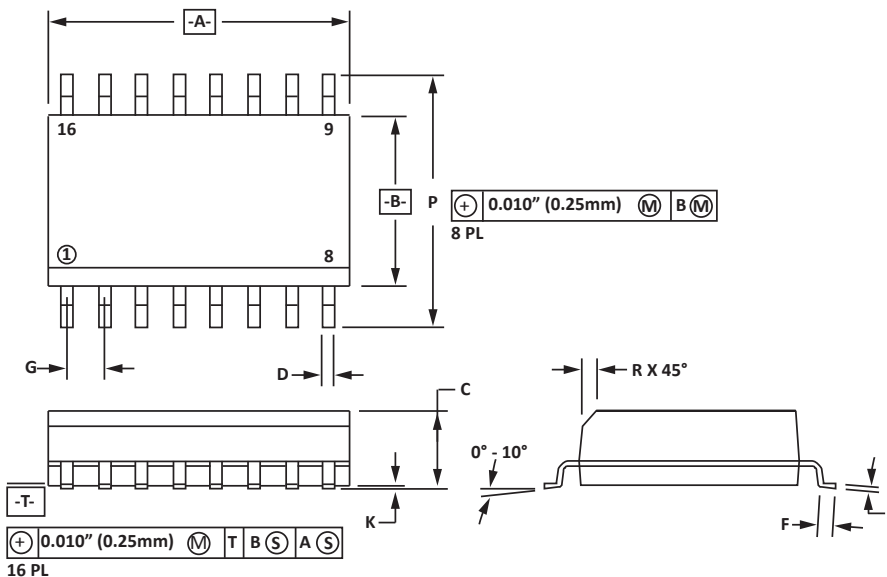
## SO-16 PACKAGE INFORMATION

## OUTLINE DIMENSIONS

DIM	MILLIMETER S		INCHES	
	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.05 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.008
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

## NOTES

1. -T- = Seating plane and datum surface.
2. Dimensions "A" and "B" are datum.
3. Dimensions "A" and "B" do not include mold protrusion.
4. Maximum mold protrusion is 0.015" (0.380mm) per side.
5. Dimensioning and tolerances per ANSI Y14.5M, 1982.
6. Dimensions are exclusive of mold flash and metal burrs.

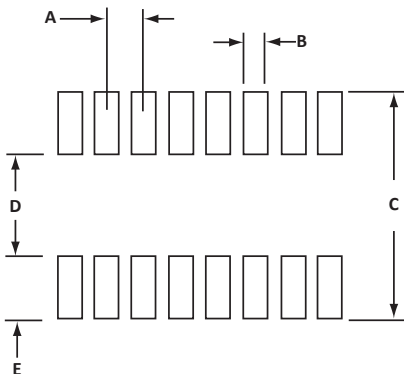


## PAD LAYOUT DIMENSIONS

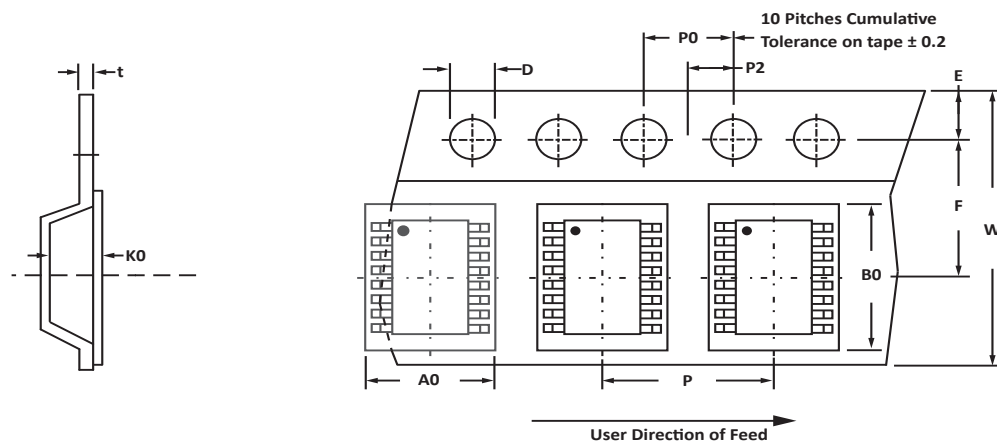
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.14	1.40	0.045	0.055
B	0.64	0.89	0.025	0.035
C	6.22	-	0.245	-
D	3.94	4.17	0.155	0.165
E	1.02	1.27	0.040	0.050

## 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")	16mm	$6.50 \pm 0.10$	$10.30 \pm 0.10$	$2.10 \pm 0.10$	$1.50 \pm 0.10$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$16.00 \pm 0.30$	$4.00 \pm 0.12$	$2.00 \pm 0.10$	$4.00 \pm 0.10$	0.25

## NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 1,000 pieces per 16mm tape.
- Suffix - T13 = 13" Reel - 2,500 pieces per 16mm tape.
- Bulk product shipped in tubes of 48 pieces per tube.
- Marking on Part - part number, date code, logo and pin one defined by dot on top of package.

## ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
SMP6LLCxx-2P	N/A	-T7	1,000	7"	48
SMP6LLCxx-2P	N/A	-T13	2,500	13"	48

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

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 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 high performance interface and linear products. They include analog switches; multiplexers; LED drivers; LED wafer die for ESD protection; audio control ICs; RF and related high frequency products.

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