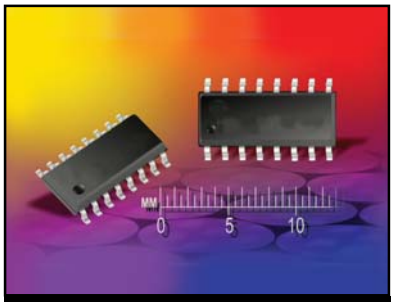
PROTEK DEVICES

SMLC6.5C-2 thru SMLC12C-2

LOW CAPACITANCE TVS ARRAY



SO-16

APPLICATIONS

✔ T1/E1
✔ RS-422, RS-423 & RS-485
✔ SDH/SONET, ATM Equipment & Systems
✔ Industrial Controls & Monitoring
✔ Cable Modem Intra-Building Protection
✔ Customer Premise Equipment (CPE)

IEC COMPATIBILITY (EN61000-4)

✔ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
✔ 61000-4-4 (EFT): 40A - 5/50ns
✔ 61000-4-5 (Surge): 8/20µs - 100A

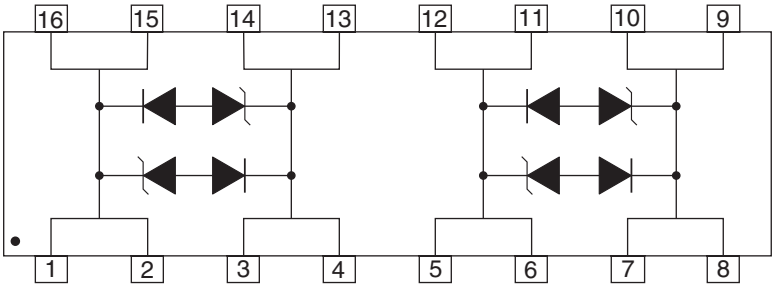
FEATURES

✔ 3,600 Watts Peak Pulse Power per Line (tp=8/20µs)
✔ 600 Watts Peak Pulse Power per Line (tp=10/1000µs)
✔ 100A (2/10µs) per Bellcore GR-1089 (Intra-Building)
✔ ITUK.20 I_{PP} @ 100A (5/310µs)
✔ Bidirectional Configuration
✔ High Surge Capability
✔ Available in 2 Voltages: 6.5V & 12V
✔ Protects Two (2) Bidirectional Lines
✔ Low Capacitance: < 30pF per Line Pair
✔ RoHS Compliant

MECHANICAL CHARACTERISTICS

✔ Molded JEDEC SO-16 Package
✔ Weight 0.15 grams (Approximate)
✔ Available in Lead-Free Pure-Tin Plating(Annealed)
✔ Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
✔ Consult Factory for Leaded Device Availability
✔ Flammability Rating UL 94V-0
✔ 16mm Tape and Reel per EIA Standard 481
✔ Marking: Logo, Part Number, Date Code & Pin One Defined By Dot on Top of Package

PIN CONFIGURATION



DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	**SYMBOL**	**VALUE**	**UNITS**
Peak Pulse Power (t_p = 8/20µs)	P_{PP}	3600	Watts
Peak Pulse Power (t_p = 10/1000µs) - See Figure 1	P_{PP}	600	Watts
Operating Temperature	T_L	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified					
PART NUMBER	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D µA	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ I_{PP} = 10A V_C VOLTS	TYPICAL CAPACITANCE @0V, 1MHz C pF
SMLC6.5C-2	6.5	7.2	300	12.4	30
SMLC12C-2	12.0	13.3	2	19.9	30

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

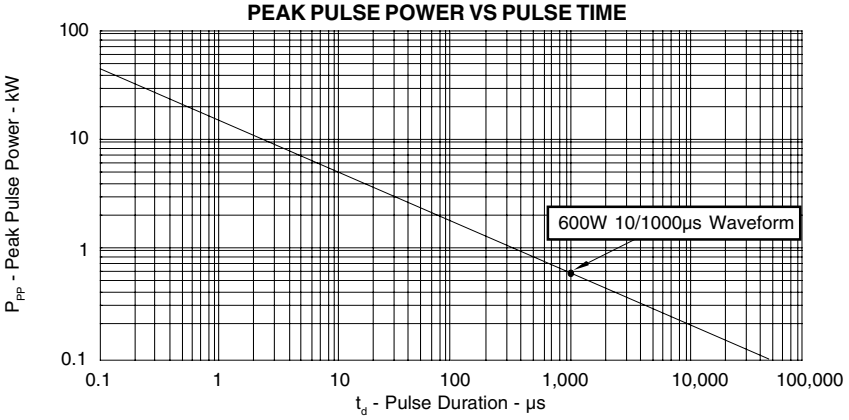
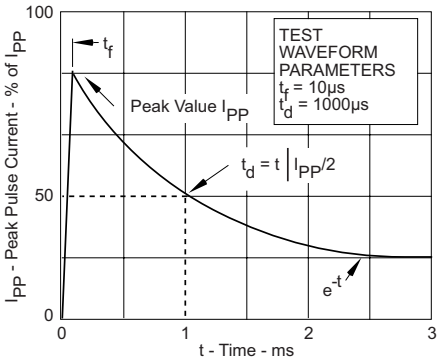


FIGURE 2
PULSE WAVE FORM



GRAPHS

FIGURE 3
POWER DERATING CURVE

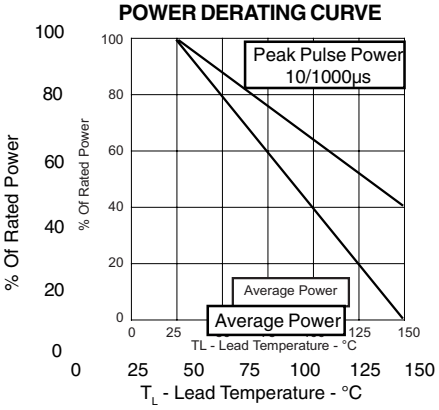
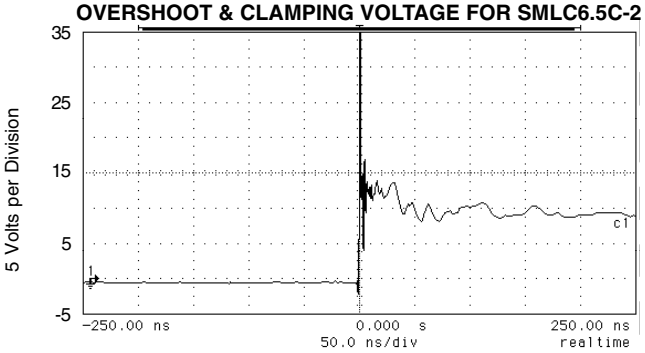


FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR SMLC6.5C-2



ESD Test Pulse: 5 kilovolt, 1/30ns (waveform)

FIGURE 5
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR SMLC6.5C-2

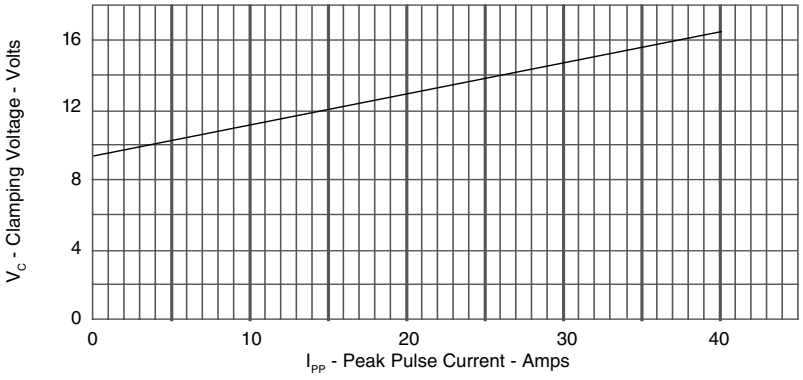


FIGURE 6
INSERTION LOSS - SMLC6.5C-2

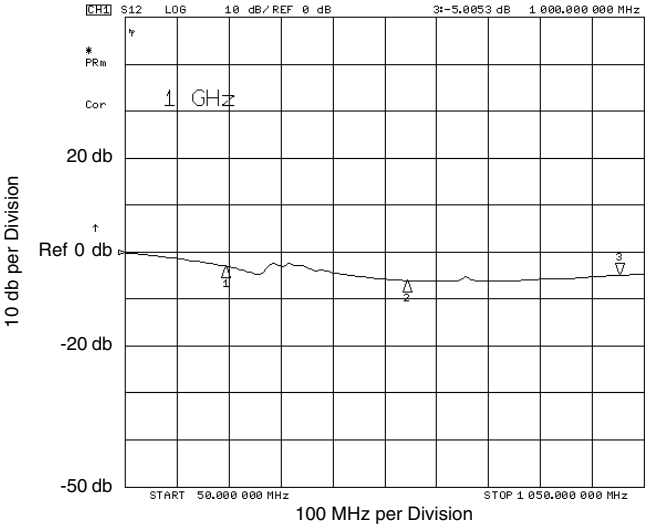
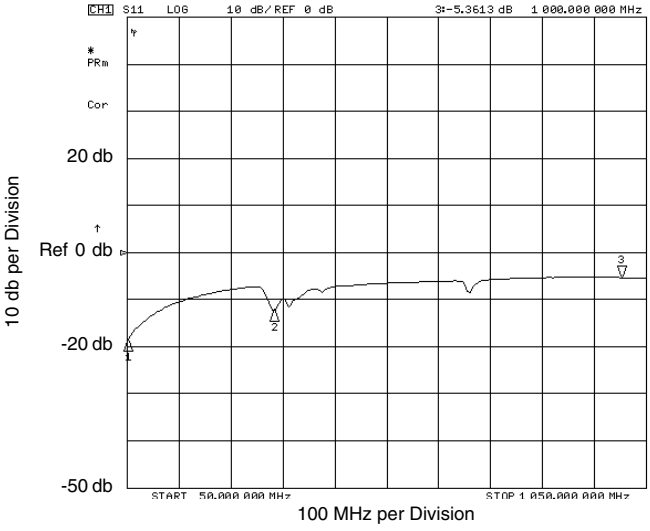


FIGURE 7
RETURN LOSS - SMLC6.5C-2



APPLICATION NOTE

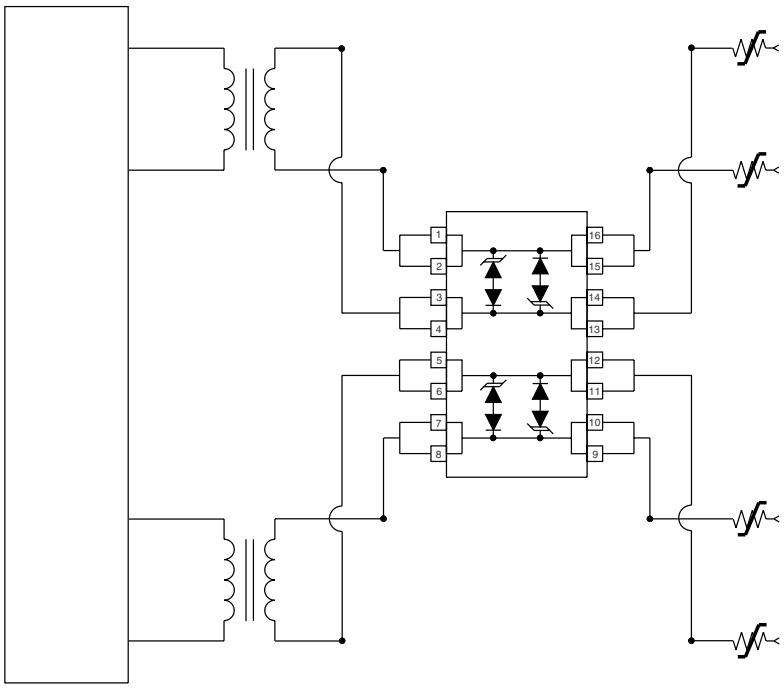
The SMLCxxC-2 Series are low capacitance, bidirectional TVS arrays that are designed to protect I/O or high speed data lines from the damaging effects of ESD or EFT. This product series has a surge capability of 600 Watts P_{PP} per line for an 10/1000µs waveform and ESD protection > 40kV.

BIDIRECTIONAL DIFFERENTIAL-MODE CONFIGURATION(Figure 1)

Ideal for use multimode transceiver I/O lines, telecommunications and wireless circuits, the SMLCxxC-2 Series provides up to two (2) line pairs of protection in a differential-mode T1/E1 application as depicted in Figure 1.

Circuit connectivity is as follows:
- ✔ Line 1 is connected to Pins 1, 2, 15 & 16.
- ✔ Line 2 is connected to Pins 3, 4, 13 & 14.
- ✔ Line 3 is connected to Pins 5, 6, 11, & 12.
- ✔ Line 4 is connected to Pins 7, 8, 9 & 10.

Figure 1. Differential-Mode Protection For T1/E1 Applications



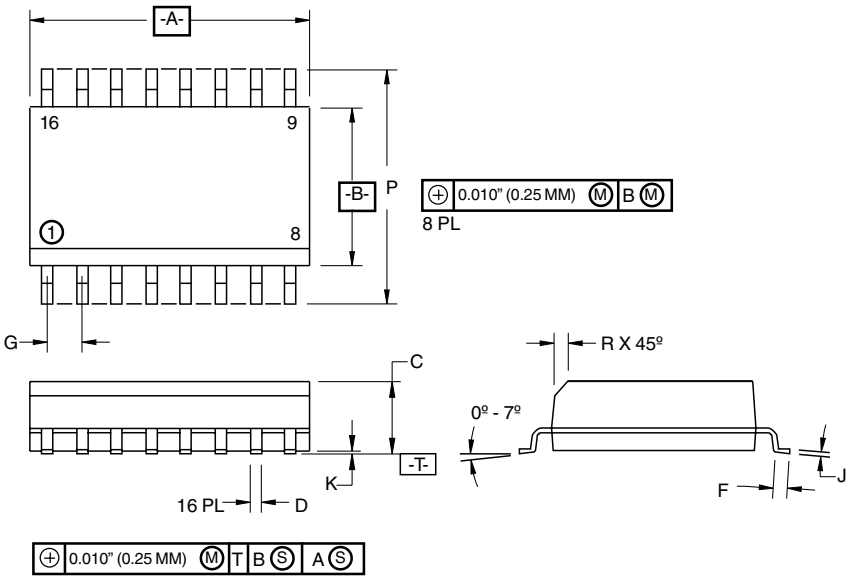
CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Circuit board layout is critical for Electromagnetic Compatibility (EMC) protection. The following guidelines are recommended:

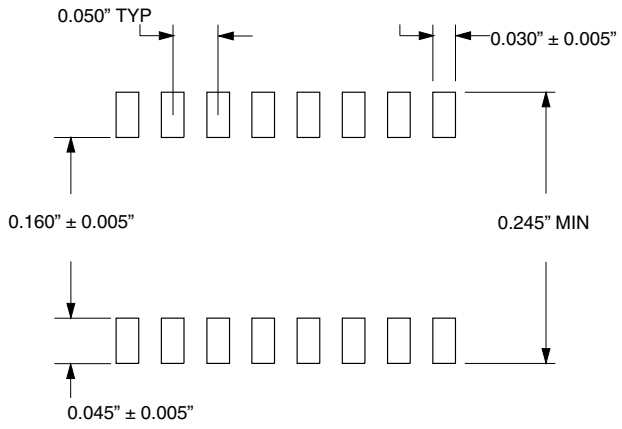
- ✔ The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- ✔ The path length between the TVS device and the protected line should be minimized.
- ✔ All conductive loops including power and ground loops should be minimized.
- ✔ The transient current return path to ground should be kept as short as possible to reduce parasitic inductance.
- ✔ Ground planes should be used whenever possible. For multilayer PCBs, use ground vias.

SO-16 PACKAGE OUTLINE & DIMENSIONS

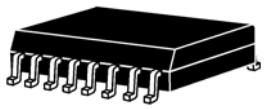
PACKAGE OUTLINE



MOUNTING PAD



SO-16



PACKAGE DIMENSIONS

DIM	MILLIMETERS		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	1.27 BSC	0.05 BSC	0.05 BSC
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
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” (0.380 mm) per side.
5. Dimensioning and tolerances per ANSI Y14.5M, 1982.
6. Dimensions are exclusive of mold flash and metal burrs.

TAPE & REEL/BULK ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. Suffix-T7 = 7 Inch Reel - 1,000 pieces per 16mm tape, *i.e. SMLC6.5C-2-T7.*
3. Suffix-T13 = 13 Inch Reel - 2,500 pieces per 16mm tape, *i.e. SMLC6.5C-2-T13.*
4. Suffix - LF = Lead-Free, Pure-Tin Plating, *i.e. SMLC6.5C-2-LF-T7.*
5. No Suffix = Product Shipped in Tubes of 48 pcs per Tube.

Outline & Dimensions: Rev 1 - 11/01, 06007

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