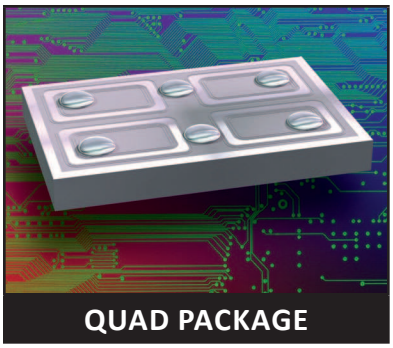
300W FLIP CHIP TVS ARRAY



QUAD PACKAGE

DESCRIPTION

The SFC05-4 is a 5 Volt, flip chip transient voltage suppressor (TVS) array designed to provide protection for power bus, data, control or I/O lines. Rated at 300 Watts peak pulse power for an 8/20µs waveshape, this device protects 4 unidirectional lines.

This device is a type of chip scale package (CSP) that can be mounted onto a printed circuit board or in a connector requiring a limited amount of space and is compatible with "pick and place" equipment for automatic assembly. The SFC05-4 is compatible with IEC 61000-4-2 (ESD), 61000-4-4(EFT) and 61000-4-5(Surge) 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, 8/20µs - Level 2(Line - Gnd) & Level 3 (Line - Line)
- ESD Protection > 25 kilovolts
- 300 Watts Peak Pulse Power per Line (tp = 8/20µs)
- Protects up to 4 Unidirectional Lines
- RoHS Compliant
- REACH Compliant

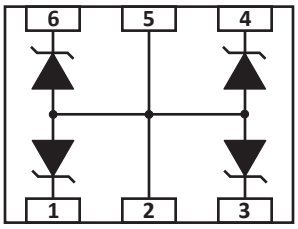
APPLICATIONS

- Cellular Phones
- SMART Phones
- PCMCIA Cards
- Ground Positioning System (GPS)

MECHANICAL CHARACTERISTICS

- Quad Flip Chip Package
- Approximate Weight: 0.73 milligrams
- Lead-Free Plating
- Solder Reflow Temperature:
- Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- Flammability Rating UL 94V-0
- 8mm Tape per EIA Standard 481
- Top Contacts: Solder Bump 0.004" in Height (Nominal)

PIN CONFIGURATION



TOP VIEW

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20µs) - See Figure 1	P_{PP}	300	Watts
Operating Temperature	T_A	-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 CLAMPING VOLTAGE (Fig. 2) @ I_P = 5A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ 8/20µS V_C @ I_{PP}	MAXIMUM LEAKAGE CURRENT @V_{WM} I_D µA	TYPICAL CAPACITANCE @0V, 1MHz C_J pF
SFC05-4	5.0	6.0	9.5	11.0V @ 24.0A	10	150

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

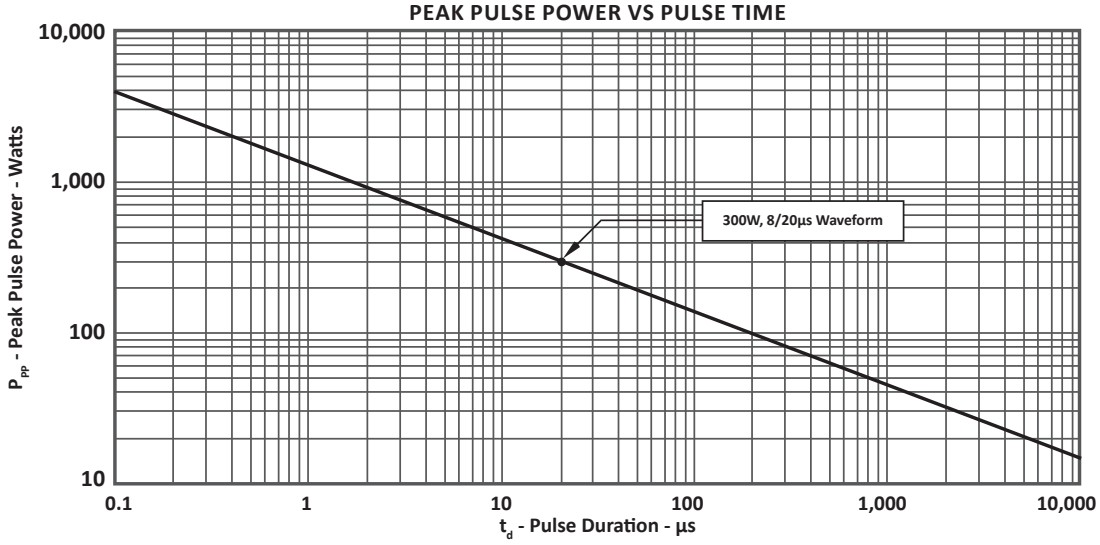


FIGURE 2
PULSE WAVE FORM

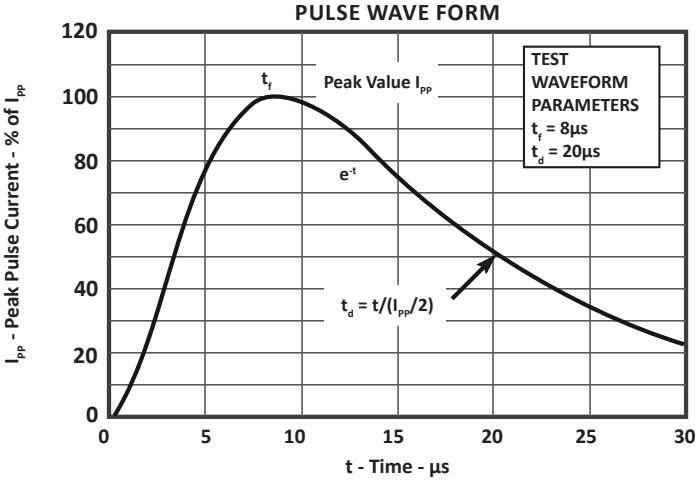
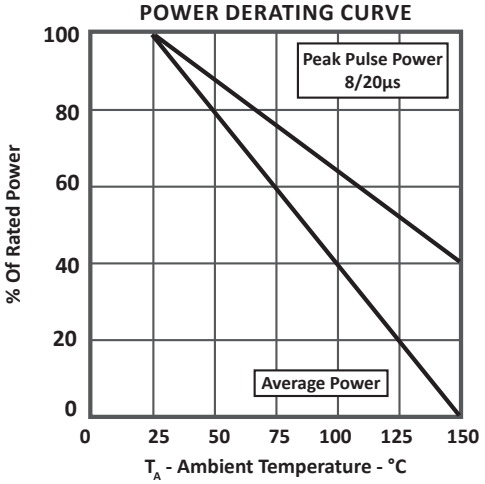
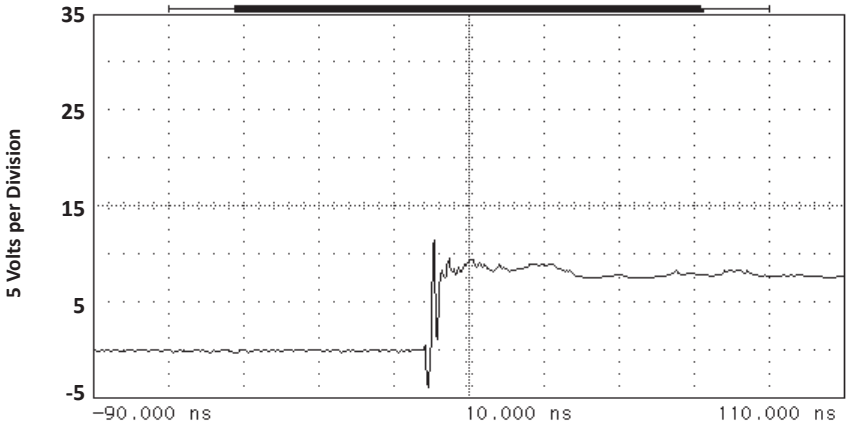


FIGURE 3
POWER DERATING CURVE



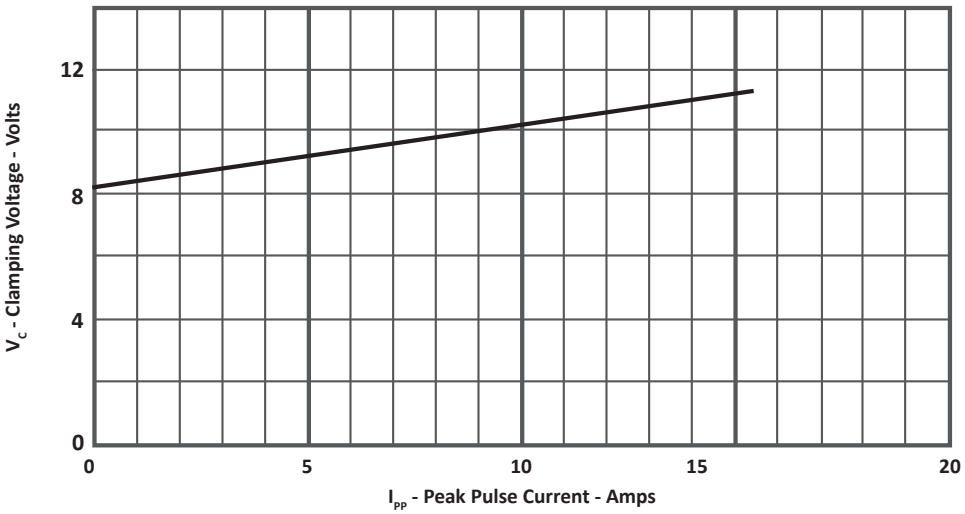
TYPICAL DEVICE CHARACTERISTICS

FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE



ESD Test Pulse - 25 kilovolt, 1/30ns (Waveshape)

FIGURE 5
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT



SPICE MODEL

FIGURE 1
SPICE MODEL FOR

ABD - Avalanche Breakdown Diode (TVS)

TABLE 1 - SPICE PARAMETERS

PARAMETER	UNIT	ABD(TVS)
BV	V	6
IBV	µA	1
C_{jo}	pF	20
I_S	A	1E-12
Vj	V	-
M	-	0.33
N	-	1
R_S	Ohms	0.28
TT	s	1E-8
EG	eV	1.11

SOLDER REFLOW INFORMATION

PRINTED CIRCUIT BOARD RECOMMENDATIONS	
PARAMETER	**VALUE**
Pad Size on PCB	0.275mm
Pad Shape	Round
Pad Definition	Non-Solder Mask Defined Pads
Solder Mask Opening	0.325mm Round
Solder Stencil Thickness	0.150mm
Solder Stencil Aperture Opening (Laser cut, 5% tapered walls)	0.330mm Round
Solder Paste Type	No Clean
Pad Protective Finish	OSP (Entek Cu Plus 106A)
Tolerance - Edge To Corner Ball	±50µm
Solder Ball Side Coplanarity	±20µm
Maximum Dwell Time Above Liquidous (183°C)	60 seconds
Soldering Maximum Temperature	270°C

REQUIREMENTS

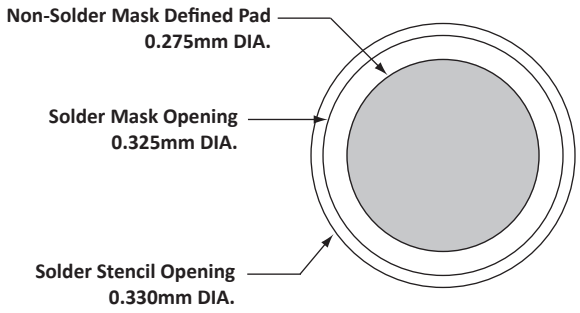
Temperature:

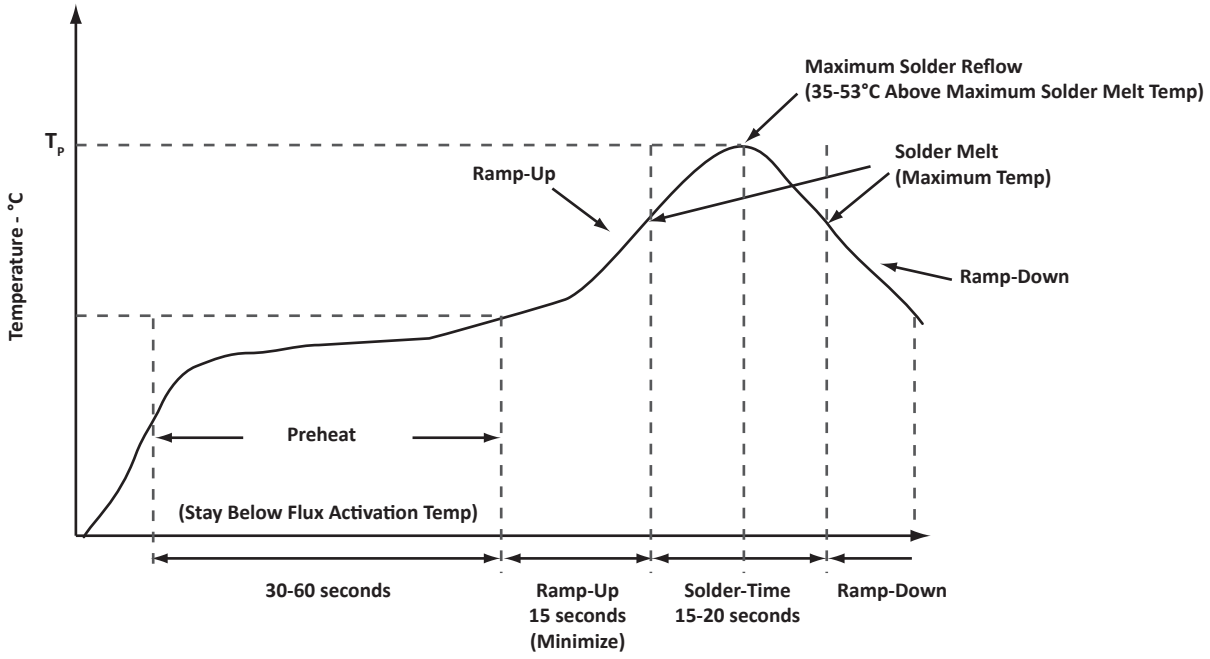
T_P for Lead-Free (Sn/Ag/Cu): 260-270°C

T_P for Tin-Lead: 240-245°C

Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area and plating.

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION

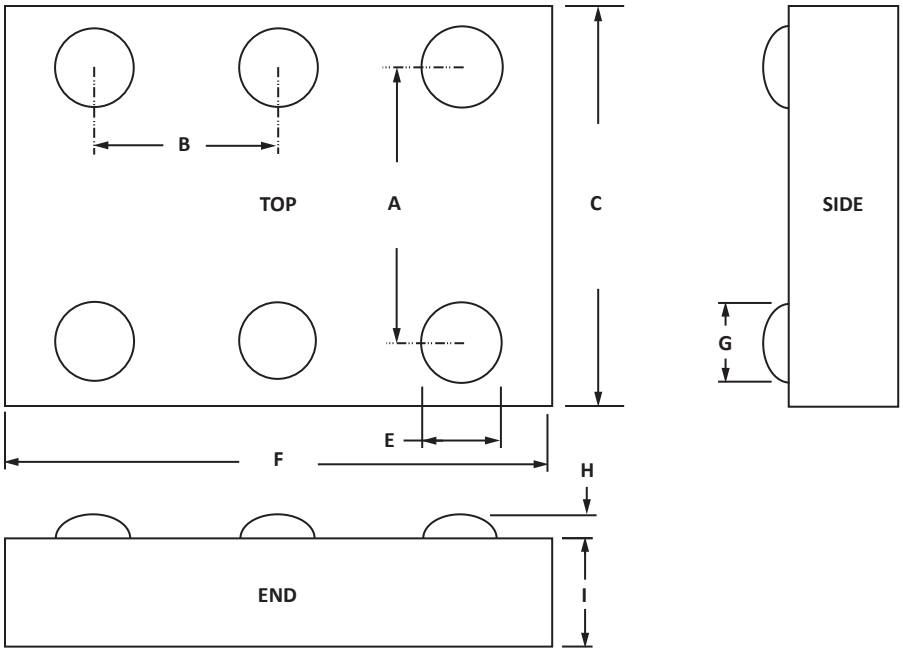




QUAD PACKAGE INFORMATION

OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.510		0.020	
B	0.510		0.020	
C	0.98	1.02	0.038	0.040
E	0.15 SQ		0.006 SQ	
F	1.47	1.53	0.058	0.060
G	0.15		0.006	
H	0.076	0.10	0.003	0.004
I	0.419		0.0165	

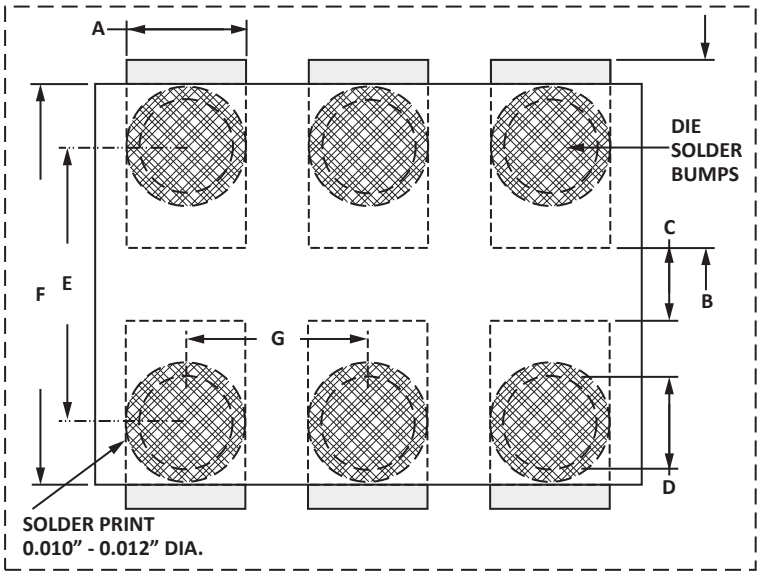
NOTES
1. Controlling dimensions in inches.
2. Decimal tolerance: .xxx ± 0.05mm (0.002").



QUAD PACKAGE INFORMATION

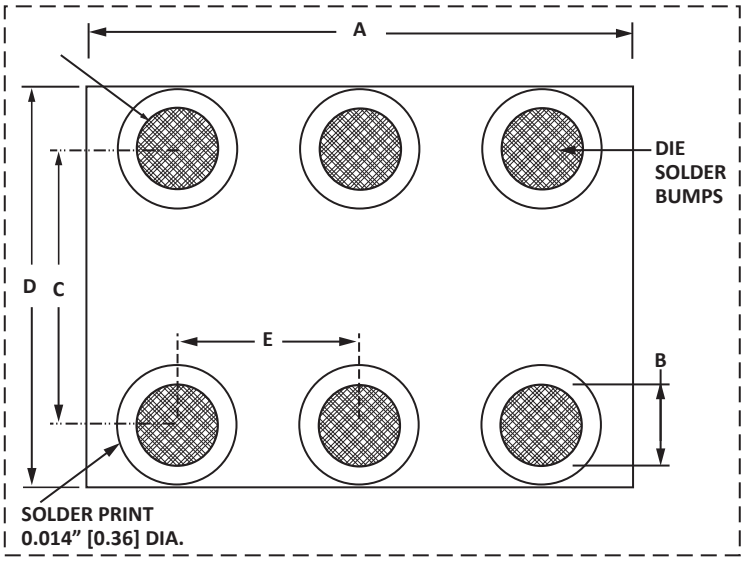
OPTION 1 - LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.305		0.012	
B	0.457		0.018	
C	0.203		0.008	
D	0.254		0.010	
E	0.510		0.020	
F	0.990		0.039	
G	0.510		0.020	

NOTES
1. Controlling dimensions in inches.
2. Decimal tolerance: .xxx ± 0.05mm (0.002").
3. Preferred: Using 0.1mm (0.004") stencil.

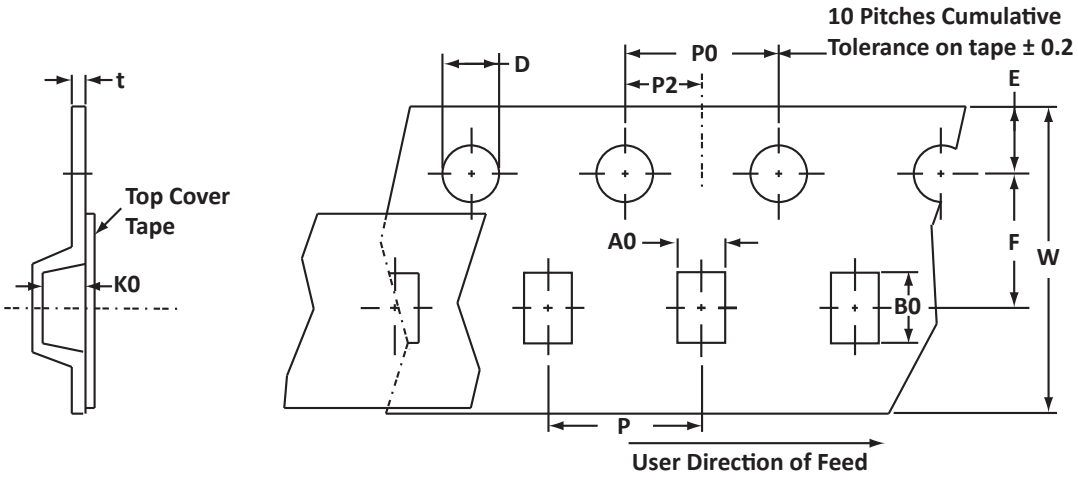


OPTION 2 - LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.51		0.020	
F	0.15 SQ		0.006 SQ	
G	0.71		0.028	
H	0.99		0.039	
I	0.51		0.020	

NOTES
1. Controlling dimensions in inches.
2. Decimal tolerance: .xxx ± 0.05mm (0.002").
3. Preferred: Using 0.1mm (0.004") stencil.



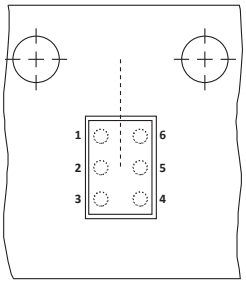
TAPE AND REEL INFORMATION



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178(7")	8	0.80 ± 0.10	1.20 ± 0.10	0.70 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.12	2.00 ± 0.10	4.00 ± 0.10	0.25

NOTES
1. Dimensions in millimeters.
2. Top view of tape. Solder bumps are face down in tape package.
3. Orientation: preferred stencil - 0.1mm (0.004").
4. Surface mount product is taped and reeled in accordance with EIA 481.
5. 8mm plastic tape: 7" Reels - 5,000 pieces per reel.
6. Marking on Reel - part number, date code and lot number.

TAPE & REEL ORIENTATION



Package outline, pad layout and tape specifications per document number 06039.R2 9/09.

ORDERING INFORMATION					
BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
SFC05-4	-LF	-T75-1	5,000	7"	n/a

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

COMPANY INFORMATION

COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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