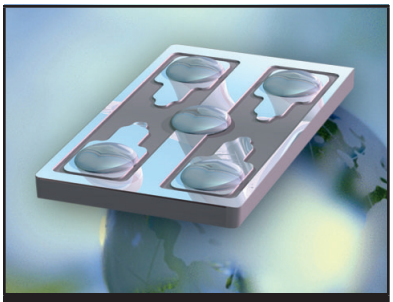
LOW CAPACITANCE FLIP CHIP TVS ARRAY



5 BUMP PACKAGE

DESCRIPTION

The ESD4-LFC is a low capacitance flip chip transient voltage suppressor array, designed to protect portable devices from the effects of Electrostatic Discharge (ESD) and Electrical Fast Transients (EFT). This series meets the IEC 61000-4-2 and 61000-4-4 requirements. This device is ideally suited for portable devices, PCMCIA and SMART phones.

The ESD4-LFC features superior clamping performance, low leakage current characteristics and a response time of less than a nanosecond. Their low inductance virtually eliminates overshoot voltage due to package inductance.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- ESD Protection > 25 kilovolts
- Unidirectional Configuration
- Low Capacitance: 15pF
- Protection for 4 Data Lines
- RoHS Compliant
- REACH Compliant

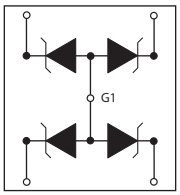
APPLICATIONS

- SMART Phones
- I/O Port Interfaces
- Portable Devices
- Ground Positioning Systems (GPS)
- SMART Cards

MECHANICAL CHARACTERISTICS

- 5 Bump 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

CIRCUIT DIAGRAM



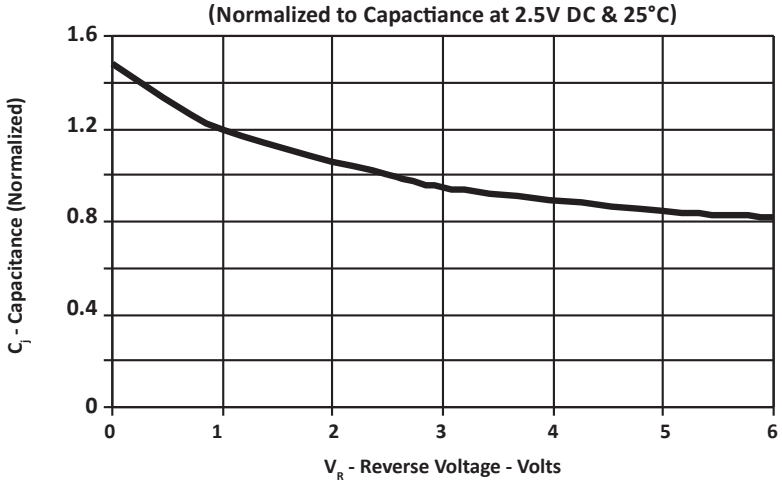
TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
DC Power Rating	P	200	mW
Operating Temperature	T_A	-40 to 85	°C
Storage Temperature	T_{STG}	-55 to 150	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified							
PART NUMBER	MARKING CODE	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE @ I_P = 10mA V_C VOLTS	TYPICAL FORWARD VOLTAGE @ 10mA V_F VOLTS	MAXIMUM LEAKAGE CURRENT @ 3.3V I_D µA	TYPICAL CAPACITANCE PER LINE (Note 1) @2.5V, 1MHz C pF
ESD4-LFC	4L	5.0	6.0	8	0.8	0.1	15

NOTES
1. ±20% tolerance.

FIGURE 1
CAPACITANCE VS REVERSE VOLTAGE
(Normalized to Capactiance at 2.5V DC & 25°C)



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

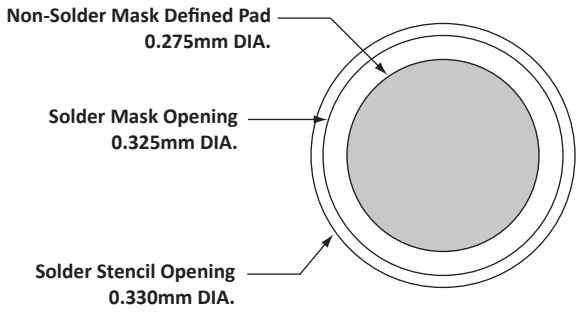
Temperature:

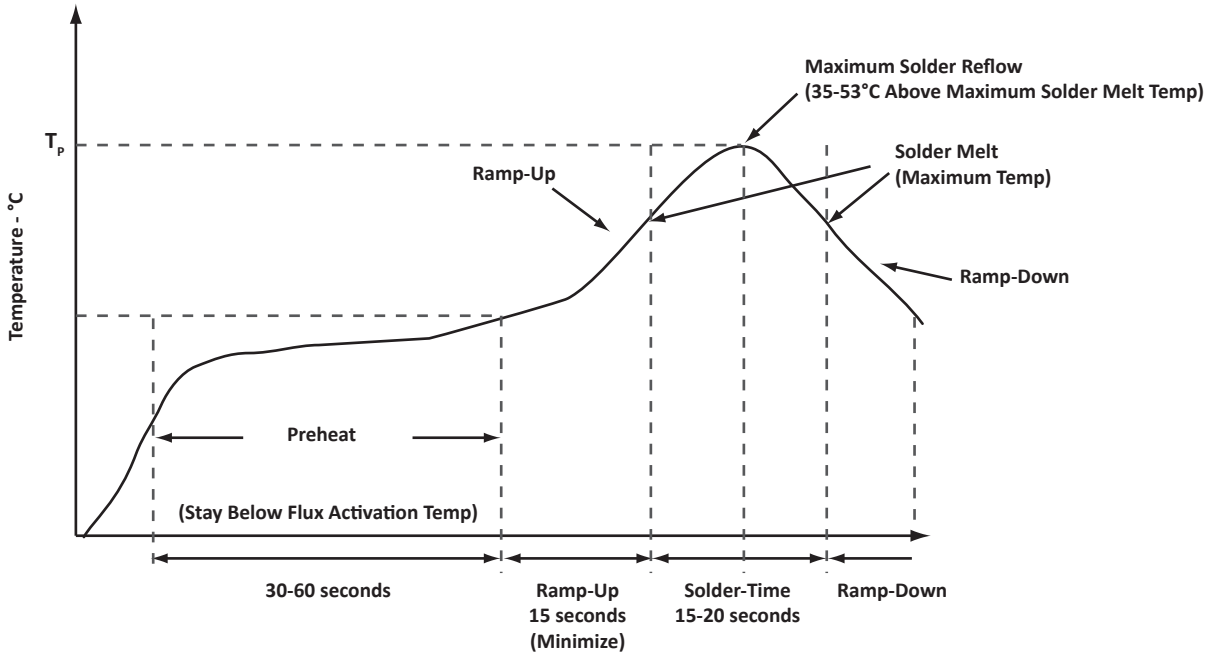
T_P for Lead-Free (Sn/Ag/Cu): 260-270°C

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

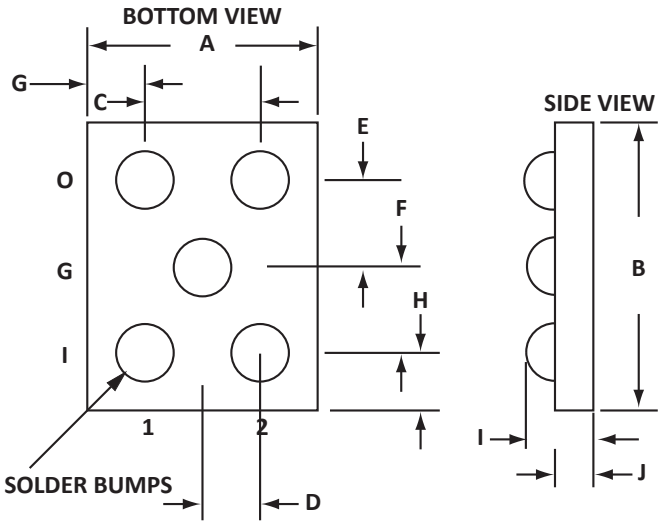




5 BUMP PACKAGE INFORMATION

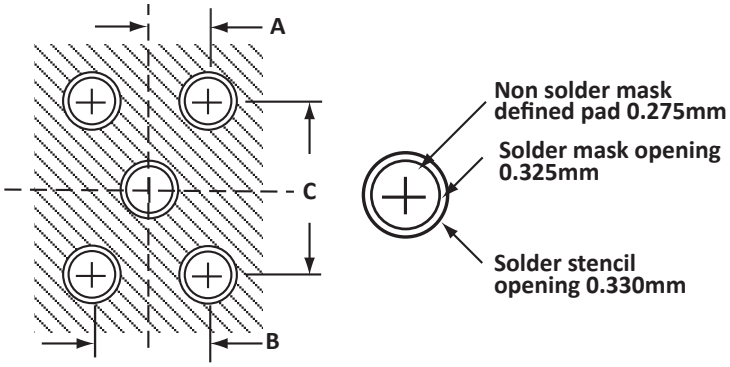
OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.914	1.016	0.036	0.040
B	1.285	1.375	0.0506	0.0541
C	0.495	0.505	0.0195	0.0199
D	0.245	0.255	0.0096	0.0100
E	0.430	0.440	0.0169	0.0173
F	0.430	0.440	0.0169	0.0173
G	0.180	0.280	0.0071	0.0110
H	0.180	0.280	0.0071	0.0110
I	0.432	0.559	0.017	0.022
J	0.330	0.457	0.013	0.018

NOTES
1. Controlling dimensions in millimeters.
2. Solder bumps (63/67 Sn/Pb) 0.30 dia.

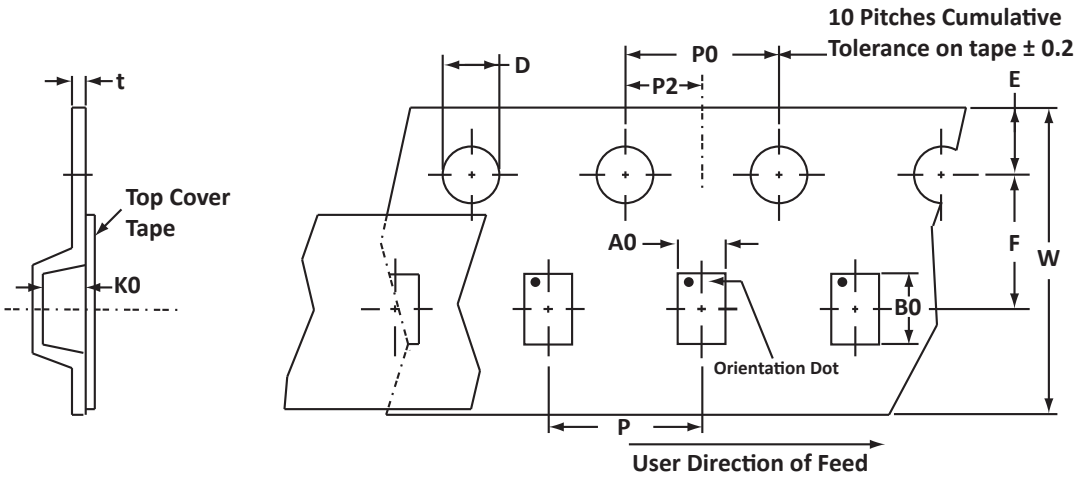


LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.25	0.25	0.010	0.010
B	0.50	0.50	0.020	0.020
C	0.86	0.86	0.034	0.034

NOTES
1. Controlling dimensions in millimeters



TAPE AND REEL INFORMATION



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	Tmax
178(7")	8	1.08±0.05	1.60±0.05	0.72 ± 0.05	1.50 ± 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	0.20±0.025

NOTES
1. Dimensions in millimeters.
2. Top view of tape. Solder bumps are face down in tape package.
3. Surface mount product is taped and reeled in accordance with EIA 481.
4. 8mm plastic tape: 7" Reels - 3,000 pieces per reel.

Package outline, pad layout and tape specifications per document number 06055.R2 9/09.

ORDERING INFORMATION					
BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
ESD4-LFC	-LF	-T73	3,000	7"	n/a

COMPANY INFORMATION

COMPANY PROFILE

ProTek Devices, based in Tempe, Arizona USA, is a manufacturer of Transient Voltage Suppression (TVS) products designed specifically for the protection of electronic systems from the effects of lightning, Electrostatic Discharge (ESD), Nuclear Electromagnetic Pulse (NEMP), inductive switching and EMI/RFI. With over 25 years of engineering and manufacturing experience, ProTek designs TVS devices that provide application specific protection solutions for all electronic equipment/systems.

ProTek Devices Analog Products Division, also manufactures analog interface, control, RF and power management products.

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PATENT INFORMATION: This device is patented under U.S. Patent No. Des. "D456,367S".