

LOW CAPACITANCE UNBUMPED FLIP CHIP TVS ARRAY

DESCRIPTION

The ULLC0402FC05C Flip Chip employs advanced silicon P/N junction technology for unmatched board-level transient voltage protection against Electrostatic Discharge (ESD) and Electrical Fast Transients (EFT). Developed specifically for high-density circuit protection, this series meets the IEC 61000-4-2 and 61000-4-4 requirements. These devices are ideally suited for handheld devices, PCMCIA and SMART cards.

This low capacitance device provides ESD protection greater than 25 kilovolts with a peak pulse power dissipation of 200 Watts per line for an 8/20 μ s waveform. In addition, the ULLC0402FC05C 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
- Low ESD Overshoot Voltage
- Bidirectional and Monolithic Structure
- Protection for 1 Line
- Low Capacitance: 6pF
- Low Leakage Current
- RoHS Compliant
- REACH Compliant

APPLICATIONS

- SMART Phones
- Portable Electronics
- SMART Cards

MECHANICAL CHARACTERISTICS

- Standard EIA Chip Size: 0402
- Approximate Weight: 0.73 milligrams
- Lead-Free Plating
- Flammability Rating UL 94V-0
- 8mm Plastic Tape per EIA Standard 481

PIN CONFIGURATION



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

PARAMETER	SYMBOL	VALUE	UNITS
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 (Note 1)	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D μA	TYPICAL CAPACITANCE @ 0V, 1MHz C pF
ULLC0402FC05C	5.0	6.0	1.0	6

NOTES

1. Device is bidirectional.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
OVERSHOOT & CLAMPING VOLTAGE

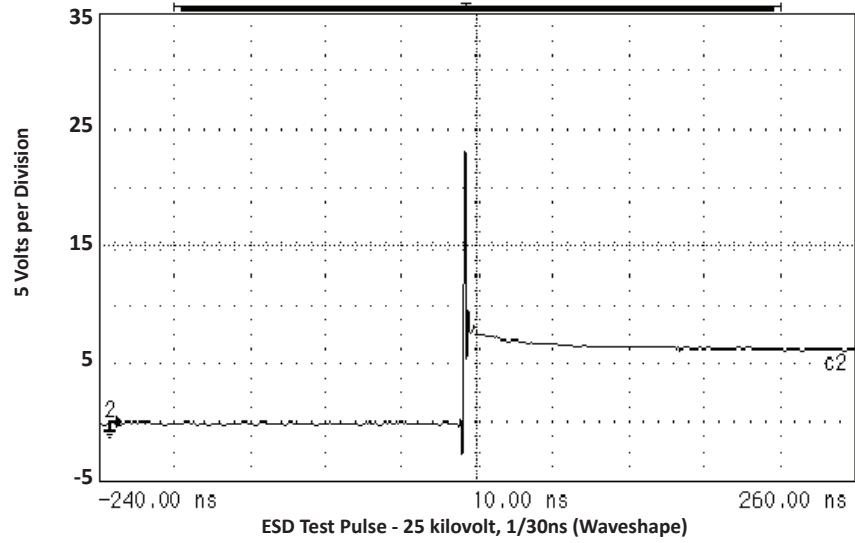
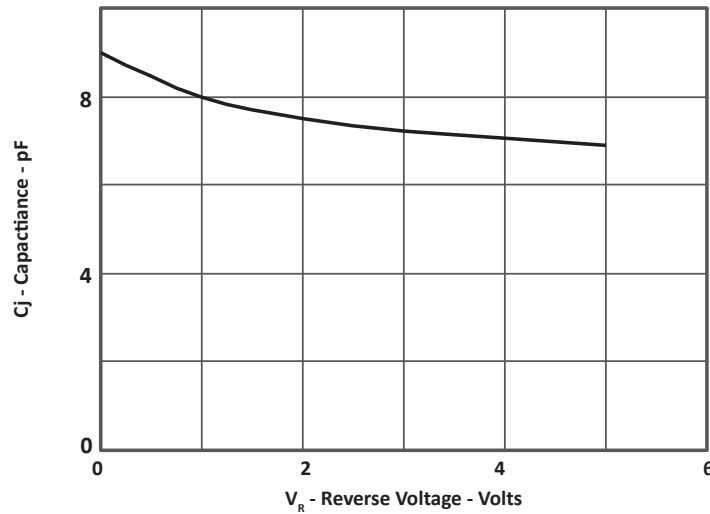


FIGURE 2
CAPACITANCE VS REVERSE VOLTAGE



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 (Only applies to bumped devices)	±20µm
Maximum Dwell Time Above Liquidous (183°C)	60 seconds
Soldering Maximum Temperature	270°C

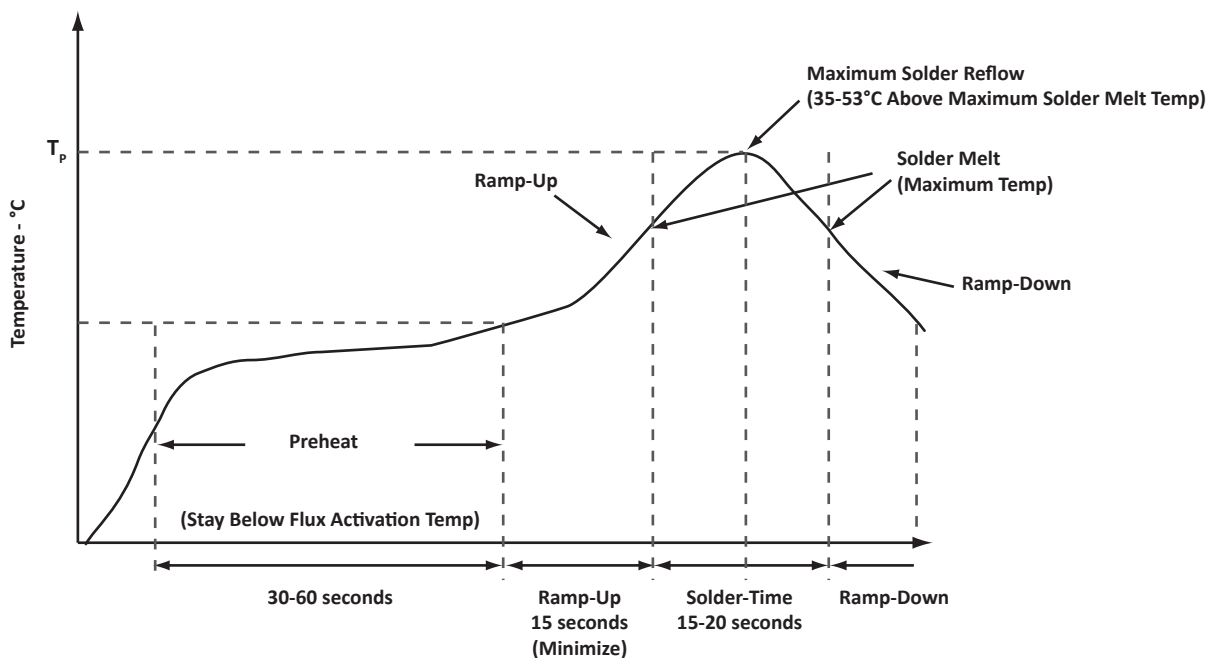
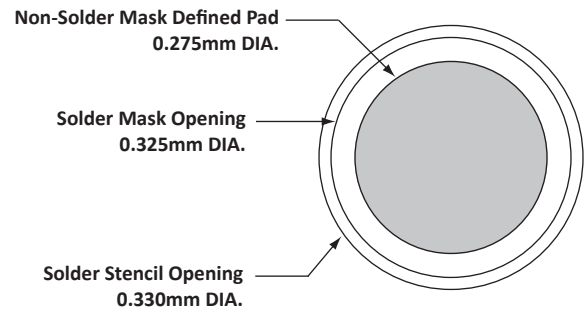
REQUIREMENTS

Temperature:

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

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

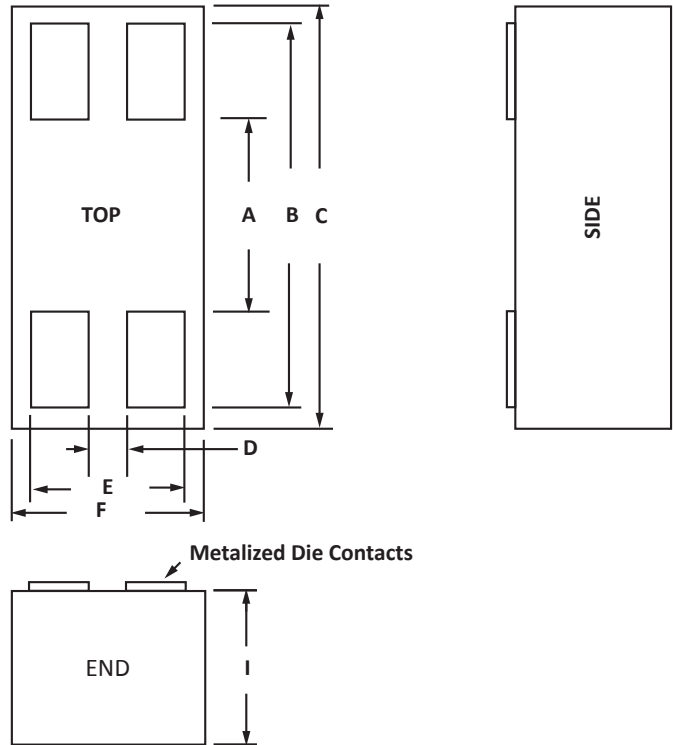


U0402 PACKAGE INFORMATION

OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.61		0.024	
B	0.86		0.034	
C	0.98	1.02	0.038	0.040
D	0.10		0.004	
E	0.35		0.014	
F	0.458	0.508	0.018	0.020
I	0.406		0.016	

NOTES

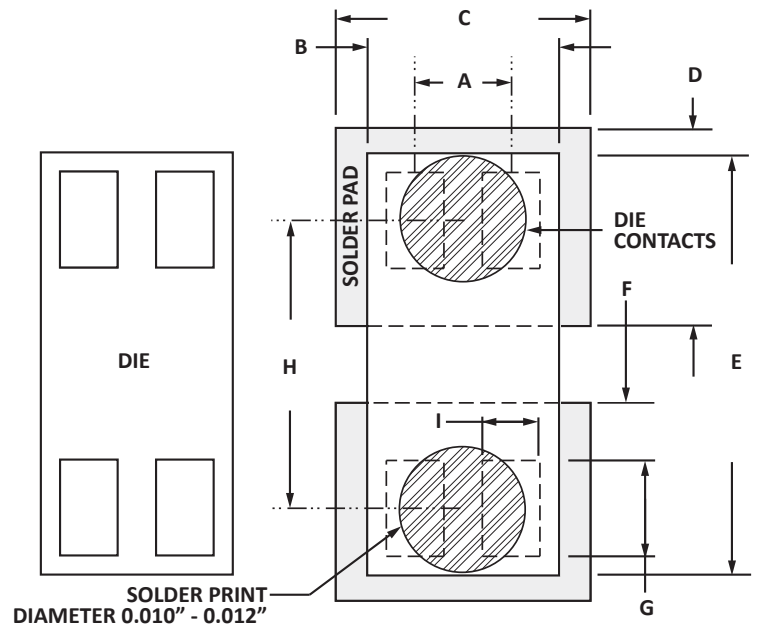
- Controlling dimensions in inches.
- Decimal tolerance: .xxx ± 0.05mm (0.002").
- Maximum chip size: 1.02mm (0.040") by 0.51mm (0.020").



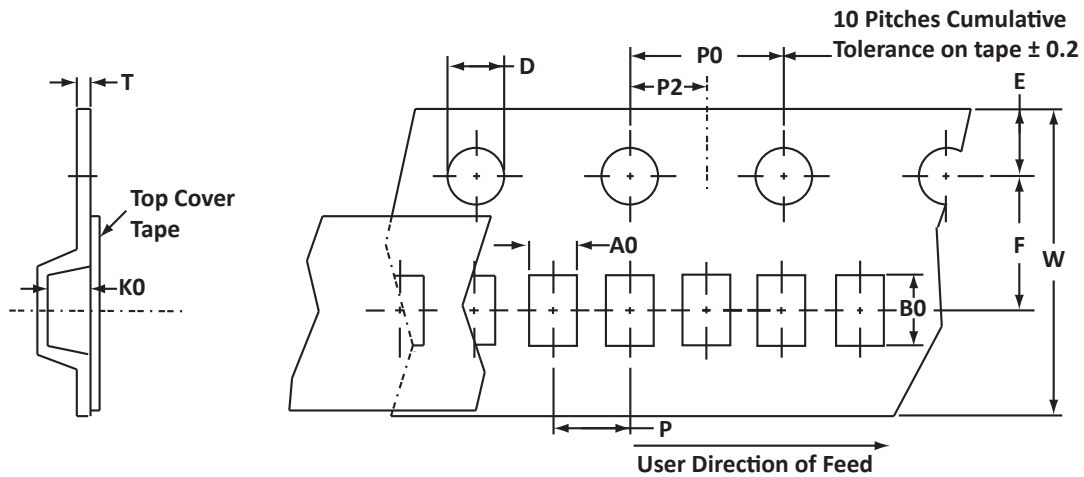
LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.23	0.009
B	0.48	0.019
C	0.69	0.027
D	0.46	0.018
E	0.99	0.039
F	0.20	0.008
G	0.20	0.008
H	0.66	0.026
I	0.13	0.005

NOTES

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



TAPE AND REEL INFORMATION



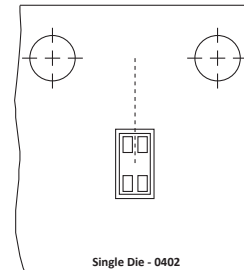
SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	Tmax
178(7")	8	0.70 ± 0.05	1.15 ± 0.10	0.56 ± 0.05	1.55 ± 0.05	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.20	4.00 ± 0.05	2.00 ± 0.05	2.00 ± 0.05	0.25

NOTES

- Dimensions in millimeters.
- Top view of tape. Metal contacts are face down in tape package.
- Orientation: preferred stencil - 0.1mm (0.004").
- Surface mount product is taped and reeled in accordance with EIA 481.
- 8mm plastic tape: 7" Reels - 5,000 (pocket under hole skipped) pieces per reel.
- Marking on Reel - part number, date code and lot number.

TAPE & REEL ORIENTATION



Package outline, pad layout and tape specifications per document number 06020.R6 8/12.

ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
ULLC0402FC05C	-n/a	-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.

CONTACT US

Corporate Headquarters

2929 South Fair Lane
Tempe, Arizona 85282
USA

By Telephone

General: 602-431-8101
Sales & Marketing: 602-414-5109
Customer Service: 602-414-5114
Product Technical Support: 602-414-5107

By Fax

General: 602-431-2288

By E-mail:

Sales: sales@protekdevices.com
Customer Service: service@protekdevices.com
Technical Support: support@protekdevices.com

ProTek Devices (Asia Pacific) Pte. Ltd.

8 Ubi Road 2, #06-19
Zervex
Singapore - 408538
Tel: +65-67488312
Fax: +65-67488313

Web

www.protekdevices.com

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PATENT INFORMATION: This device is patented under U.S. Patent No. Des. "6,867,436".