

## UNBUMPED LOW CAPACITANCE FLIP CHIP TVS ARRAY

### DESCRIPTION

The ULLC0408FC05C 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. This low capacitance device is ideally suited for handheld devices, PCMCIA and SMART cards.

The ULLC0408FC05C provides ESD protection greater than 25 kilovolts and features superior clamping performance, low leakage current characteristics and a response time of less than a nanosecond. The 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 Configuration & Monolithic Structure
- Protects 4 Isolated Lines
- Low Capacitance: 6pF
- Low Leakage Current
- RoHS Compliant
- REACH Compliant

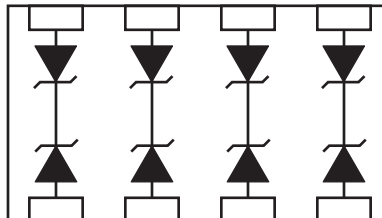
### APPLICATIONS

- Cellular Phones
- Portable Electronics
- SMART Cards

### MECHANICAL CHARACTERISTICS

- Standard EIA Chip Size: 0408
- 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

### 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  @ $V_{WM}$ $I_D$ $\mu A$	TYPICAL CAPACITANCE  @ 0V, 1MHz C pF
ULLC0408FC05C	5.0	6.0	5.0	6

**NOTES**

1. Device is bidirectional.

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 1  
OVERSHOOT & CLAMPING VOLTAGE

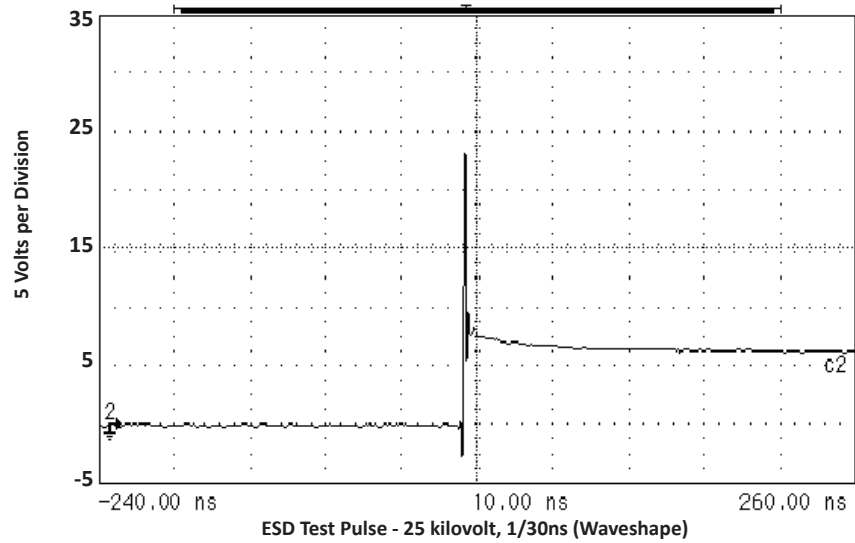
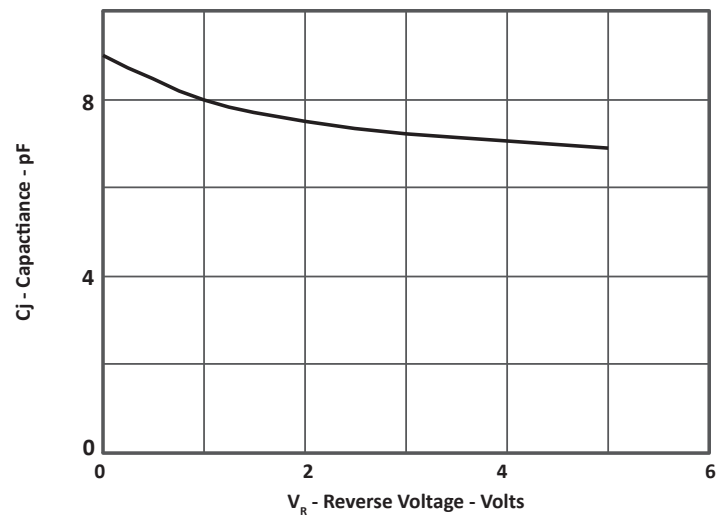


FIGURE 2  
CAPACITANCE VS REVERSE VOLTAGE



## 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

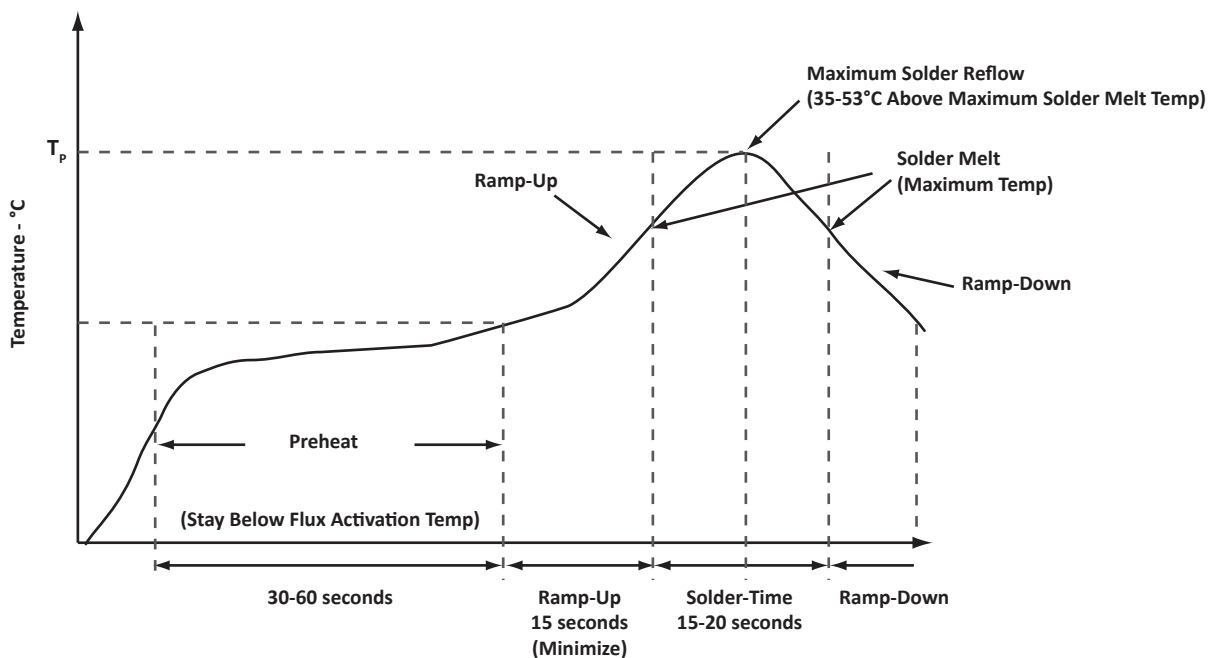
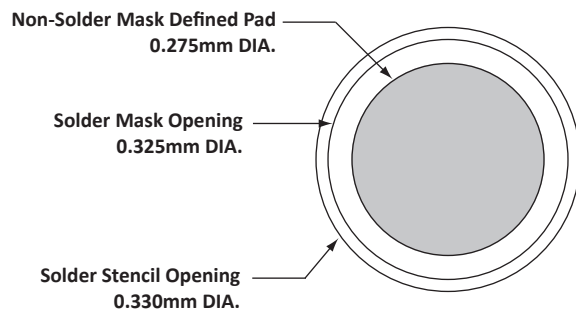
### REQUIREMENTS

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

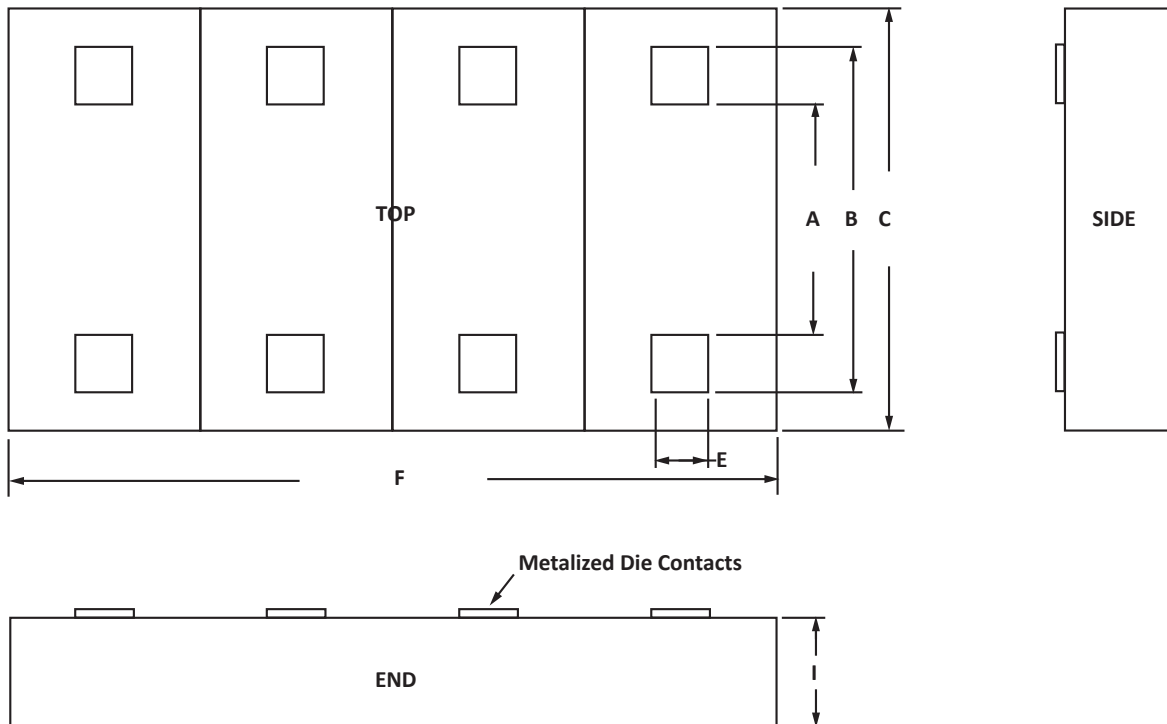


**U0408 PACKAGE INFORMATION**

OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.56		0.022	
B	0.86		0.034	
C	0.98	1.02	0.038	0.040
E	0.15 SQ		0.006 SQ	
F	1.97	2.03	0.078	0.080
I	0.406		0.016	

**NOTES**

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



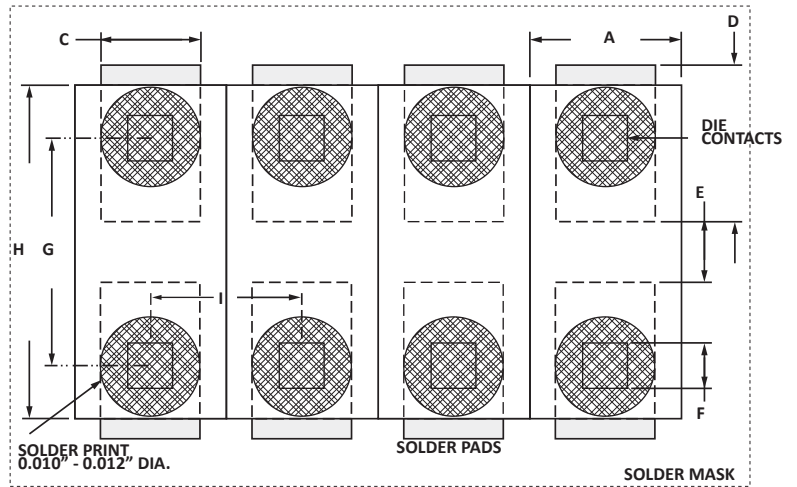
## U0408 PACKAGE INFORMATION

## OPTION 1 - LAYOUT DIMENSIONS

DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.51	0.020
C	0.30	0.012
D	0.46	0.018
E	0.20	0.008
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: Usign 0.1mm (0.004") stencil.

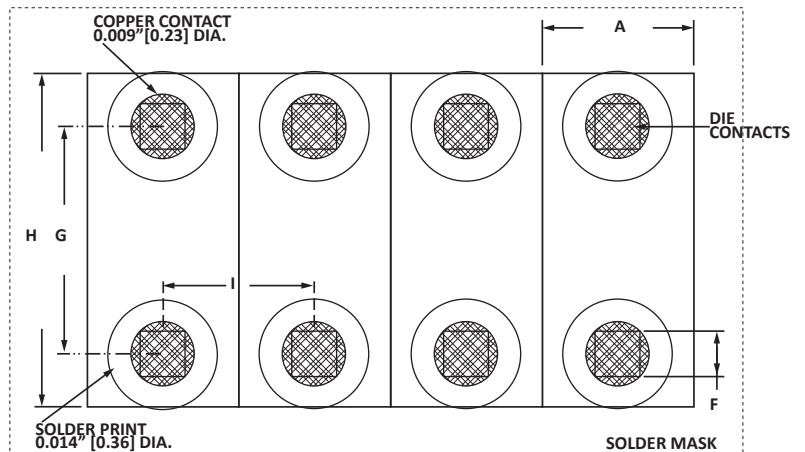


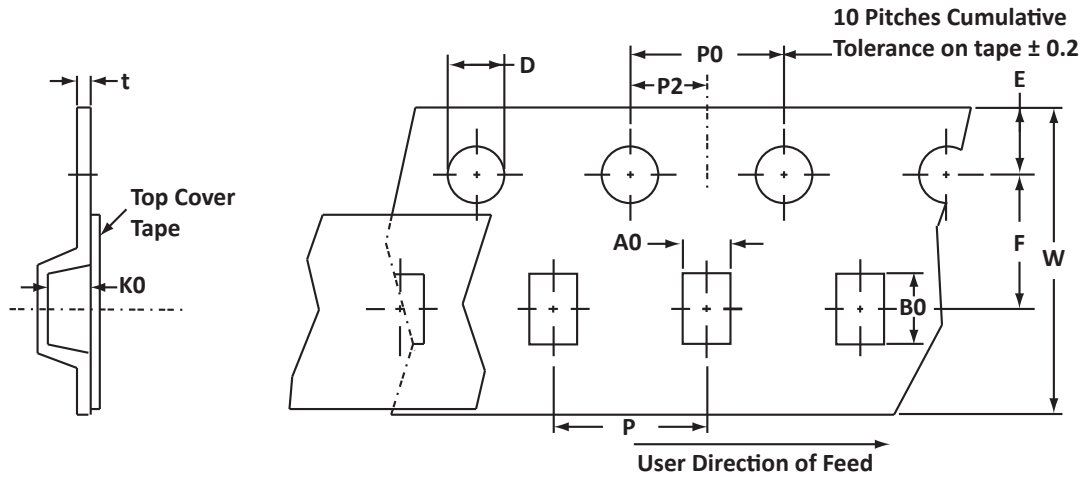
## OPTION 2 - LAYOUT DIMENSIONS

DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
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: Usign 0.1mm (0.004") stencil.

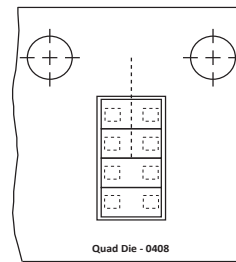


**TAPE AND REEL INFORMATION**

**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 ± 0.20	4.00 ± 0.12	2.00 ± 0.05	2.00 ± 0.10	0.25

**NOTES**

1. Dimensions in millimeters.
2. Top view of tape. Metal contacts 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
6. Marking on reel: Part Number, Date Code and Lot Number.

**TAPE & REEL ORIENTATION**


Package outline, pad layout and tape specifications per document number 06026.R4 9/09.

**ORDERING INFORMATION**

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
ULLC0408FC05C	n/a	-T75-1	5,000	7"	n/a

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