

**UNBUMPED LOW CAPACITANCE FLIP CHIP ARRAY**
**APPLICATIONS**

- ✓ Cellular Phones
- ✓ Personal Digital Assistant (PDA)
- ✓ Notebook Computers
- ✓ SMART Cards

**IEC COMPATIBILITY (EN61000-4)**

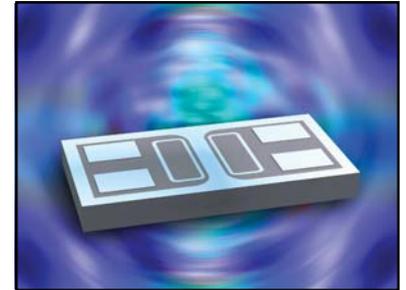
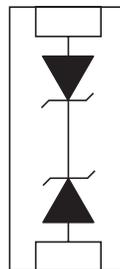
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

**FEATURES**

- ✓ ESD Protection > 25 kilovolts
- ✓ Low ESD Overshoot Voltage
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ Low Capacitance: 6pF
- ✓ Low Leakage Current
- ✓ RoHS Compliant

**MECHANICAL CHARACTERISTICS**

- ✓ Standard EIA Chip Size: 0402
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Solder Reflow Temperature:  
Lead-Free: 260-270°C
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
- ✓ Device Marking On Reel


**U0402**
**PIN CONFIGURATION**


# ULLC0402FC05C

## DEVICE CHARACTERISTICS

### MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	$T_J$	-55°C to 150°C	°C
Storage Temperature	$T_{STG}$	-55°C to 150°C	°C

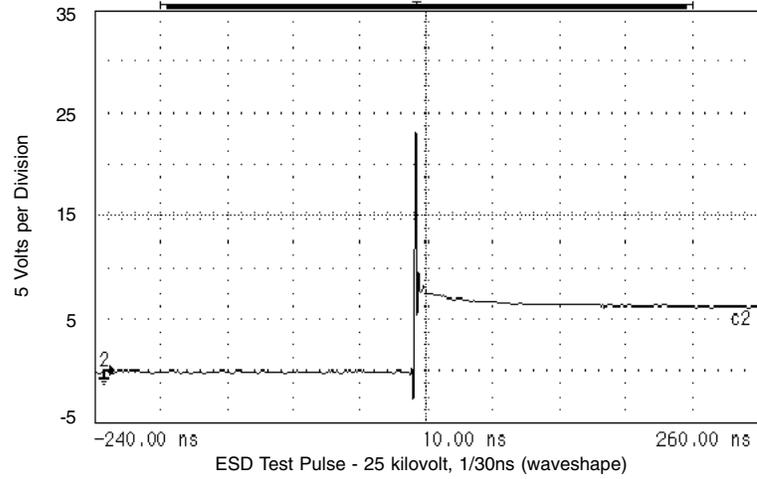
### ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (See Notes 1)	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE  @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM LEAKAGE CURRENT  @ $V_{WM}$ $I_b$ $\mu A$	TYPICAL CAPACITANCE  0V @ 1 MHz C pF
ULLC0402FC05C	5.0	6.0	1.0	6

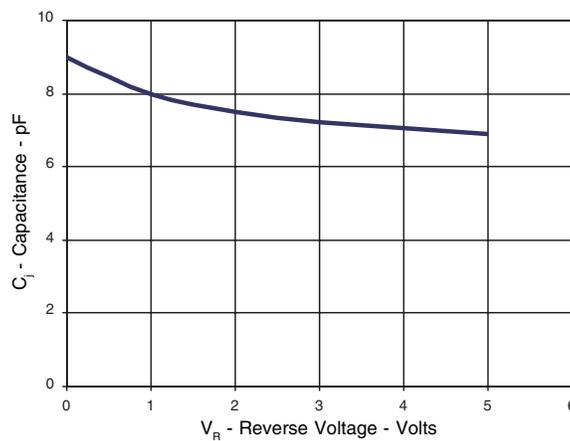
**Note 1:** Device is bidirectional.

## GRAPHS

**FIGURE 1**  
**OVERSHOOT & CLAMPING VOLTAGE**



**FIGURE 2**  
**CAPACITANCE VS REVERSE VOLTAGE**

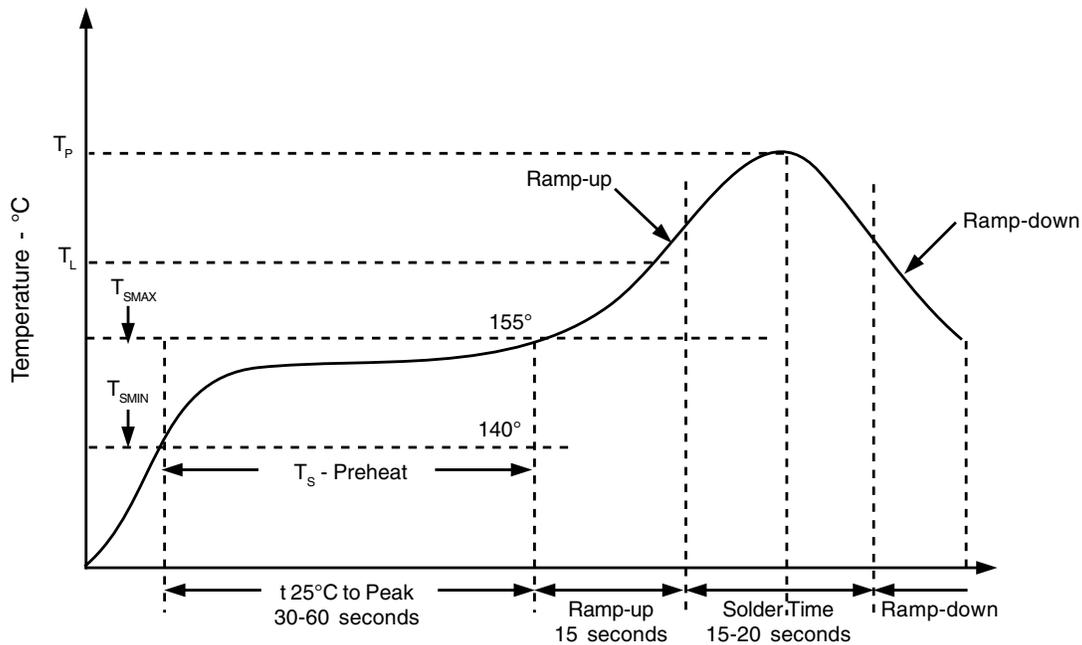
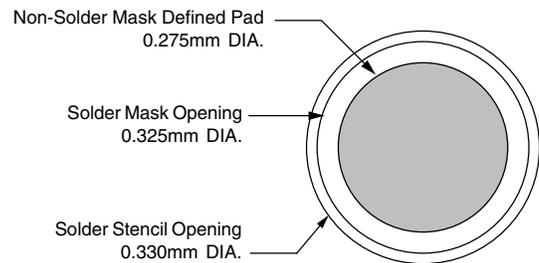


## APPLICATION INFORMATION

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 (SnAgCu): 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 & plating.

### RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION



# ULLC0402FC05C

## U0402 PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE		PACKAGE DIMENSIONS	
DIM	MILLIMETERS	INCHES	
A	0.61 NOM	0.024 NOM	
B	0.86 NOM	0.034 NOM	
C	0.99 ± 0.0254	0.039 ± 0.001	
D	0.10 NOM	0.004 NOM	
E	0.35 NOM	0.014 NOM	
F	0.483 ± 0.0254	0.019 ± 0.001	
I	0.406 NOM	0.016 NOM	

**NOTES:**

- Controlling dimensions in inches.
- Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002").
- Maximum chip size: 1.02 (0.040") by 0.51(0.020").

MOUNTING PAD		PAD DIMENSIONS	
DIM	MILLIMETERS	INCHES	
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	

**NOTE:**

- Top view of tape. Metal contacts are face down in tape package.

**TAPE & REEL ORIENTATION**

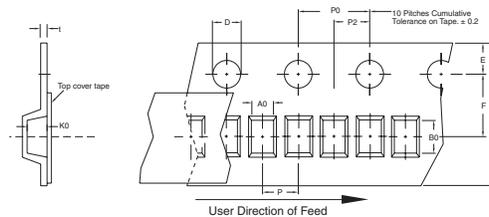
**NOTE:**

- Preferred: Using 0.1mm (0.004") stencil.

**Outline & Dimensions: Rev 4 - 10/05, 6020**

### Tape & Reel Specifications (Dimensions in millimeters)

Reel Dia.	Tape Width	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")/330mm(13")	8mm	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 ±0.10	2.00 ±0.05	2.00 ±0.10	0.25



**COPYRIGHT © ProTek Devices 2006**

**SPECIFICATIONS:** ProTek reserves the right to change the electrical and or mechanical characteristics described herein without notice (except JEDEC).

**DESIGN CHANGES:** ProTek reserves the right to discontinue product lines without notice, and that the final judgement concerning selection and specifications is the buyer's and that in furnishing engineering and technical assistance, ProTek assumes no responsibility with respect to the selection or specifications of such products.

**ProTek Devices**  
 2929 South Fair Lane, Tempe, AZ 85282  
 Tel: 602-431-8101 Fax: 602-431-2288  
 E-Mail: [sales@protekdevices.com](mailto:sales@protekdevices.com)  
 Web Site: [www.protekdevices.com](http://www.protekdevices.com)