

UNBUMPED LOW CAPACITANCE FLIP CHIP ARRAY

**APPLICATIONS**

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

**IEC COMPATIBILITY (EN61000-4)**

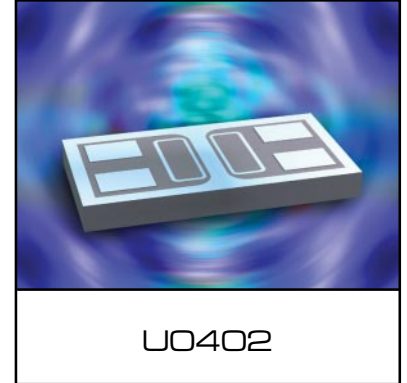
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

**FEATURES**

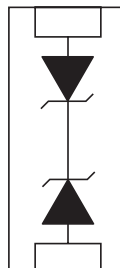
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Six Voltage Types Ranging From 3.3V to 24V
- ✓ Low ESD Overshoot Voltage
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ **LOW CAPACITANCE: 6pF**
- ✓ **LOW LEAKAGE CURRENT**
- ✓ RoHS Compliant

**MECHANICAL CHARACTERISTICS**

- ✓ Standard EIA Chip Size: 0402
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Solder Reflow Temperature:
  - Tin-Lead - Sn/Pb: 240-245°C
  - Lead-Free: 260-270°C
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
- ✓ Device Marking On Reel



**PIN CONFIGURATION**



# ULLC0402FC3.3C\* thru ULLC0402FC24C\*

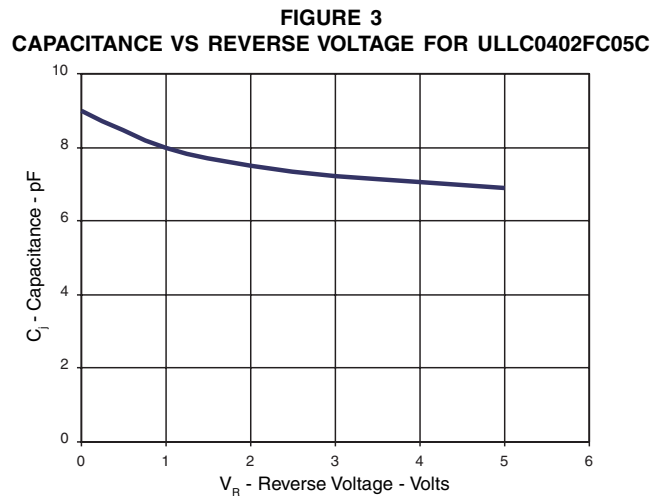
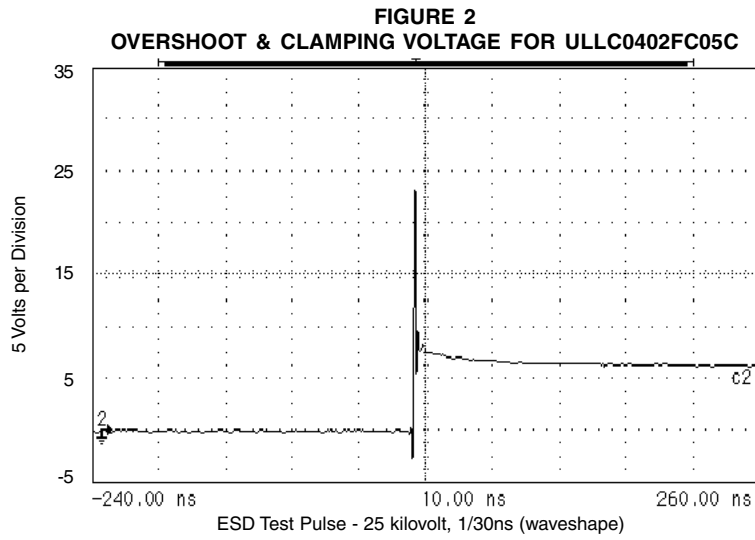
## DEVICE CHARACTERISTICS

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 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, 1 MHz C pF
ULLC0402FC3.3C	3.3	4.0	75	6
ULLC0402FC05C	5.0	6.0	1.0	6
ULLC0402FC08C	8.0	8.5	0.1	6
ULLC0402FC12C	12.0	13.3	0.1	6
ULLC0402FC15C	15.0	16.7	0.1	6
ULLC0402FC24C	24.0	26.7	0.1	6

**Note 1:** All devices are bidirectional.

GRAPHS

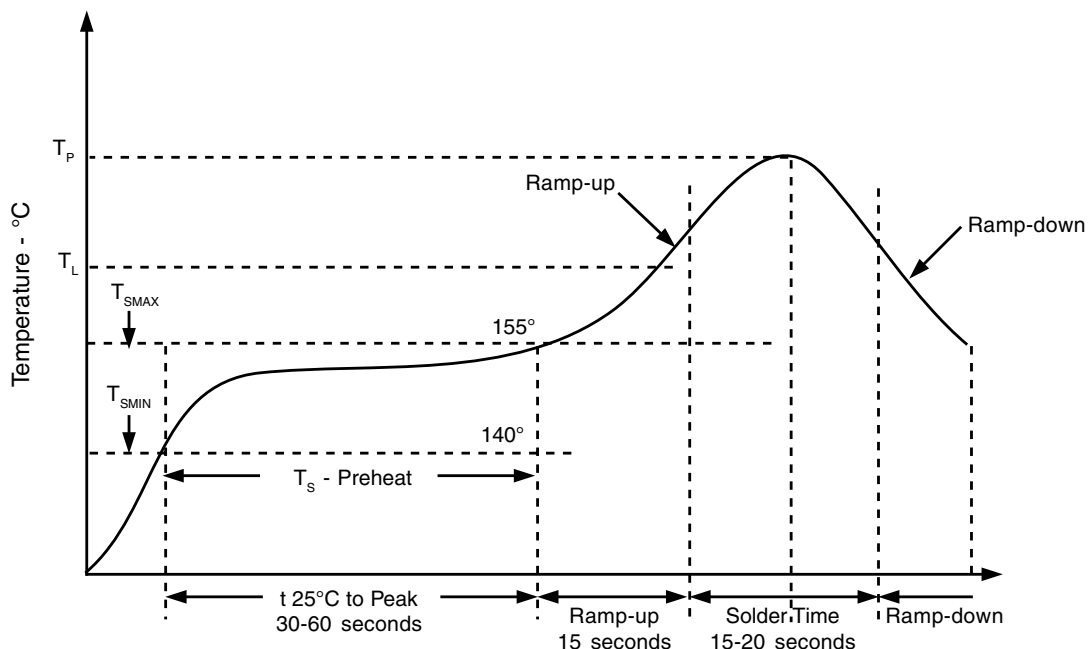
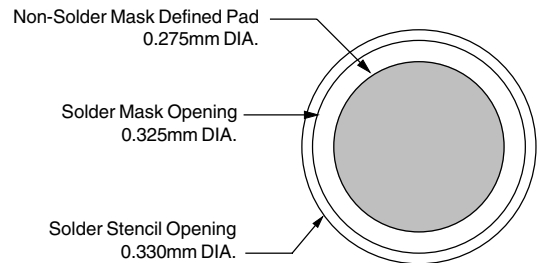


**APPLICATION INFORMATION**

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

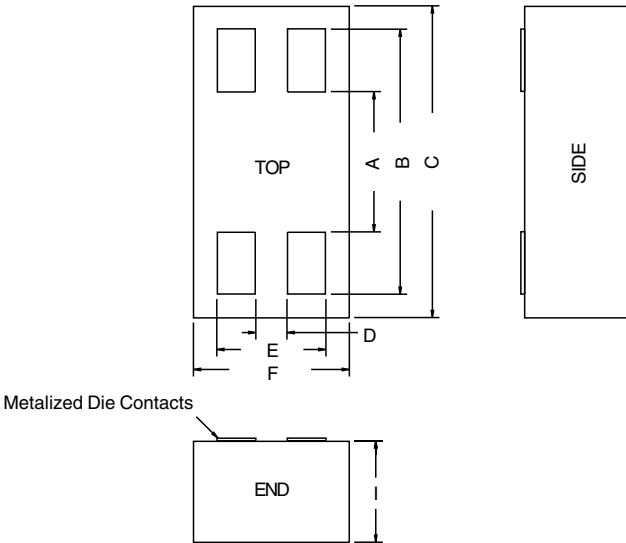

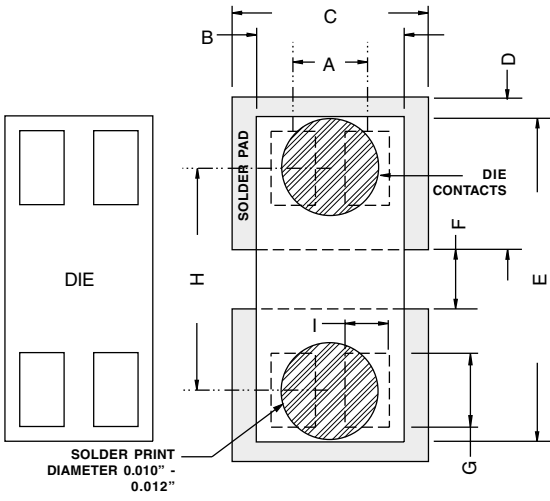
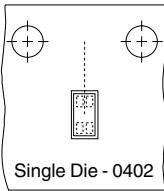
REQUIREMENTS
<p><b>Temperature:</b>  <math>T_p</math> for Lead-Free (SnAgCu): 260-265°C  <math>T_p</math> for Tin-Lead: 240-245°C                      Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area &amp; plating.</p>

**RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION**



# ULLC0402FC3.3C\* thru ULLC0402FC24C\*

## PACKAGE OUTLINE & DIMENSIONS

<p style="text-align: center;">PACKAGE OUTLINE</p>  <p style="text-align: center;">Metalized Die Contacts</p>	<p style="text-align: center;">U0402</p> 		
	<p style="text-align: center;">PACKAGE DIMENSIONS</p>		
	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
	<p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>Controlling dimensions in inches.</li> <li>Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002").</li> <li>Maximum chip size: 1.02 (0.040") by 0.51(0.020").</li> </ol>		
<p style="text-align: center;">MOUNTING PAD</p>  <p style="text-align: center;">SOLDER PRINT DIAMETER 0.010" ± 0.012"</p>	<p style="text-align: center;">PAD DIMENSIONS</p>		
	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
	<p><b>NOTE:</b></p> <ol style="list-style-type: none"> <li>Top view of tape. Metal contacts are face down in tape package.</li> </ol>		
<p style="text-align: center;">TAPE &amp; REEL ORDERING NOMENCLATURE</p> <ol style="list-style-type: none"> <li>Surface mount product is taped and reeled in accordance with EIA 481.</li> <li>8mm Plastic Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-1 (i.e., ULLC0402FC05C-T75-1).</li> <li>8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., ULLC0402FC05C-T710-2).</li> </ol>	<p style="text-align: center;">TAPE &amp; REEL ORIENTATION</p>  <p style="text-align: center;">Single Die - 0402</p> <p><b>NOTE:</b></p> <ol style="list-style-type: none"> <li>Preferred: Using 0.1mm (0.004") stencil.</li> </ol> <p style="text-align: center;"><b>Outline &amp; Dimensions: Rev 4 - 10/05, 06020</b></p>		

COPYRIGHT © ProTek Devices 2005

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)