

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

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

**IEC COMPATIBILITY (EN61000-4)**

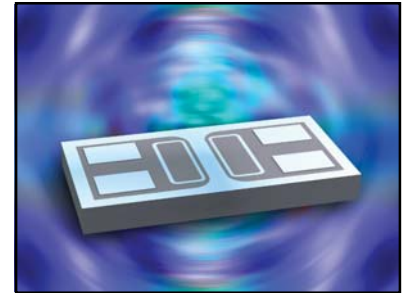
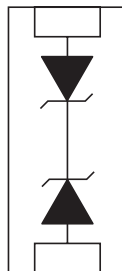
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

**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

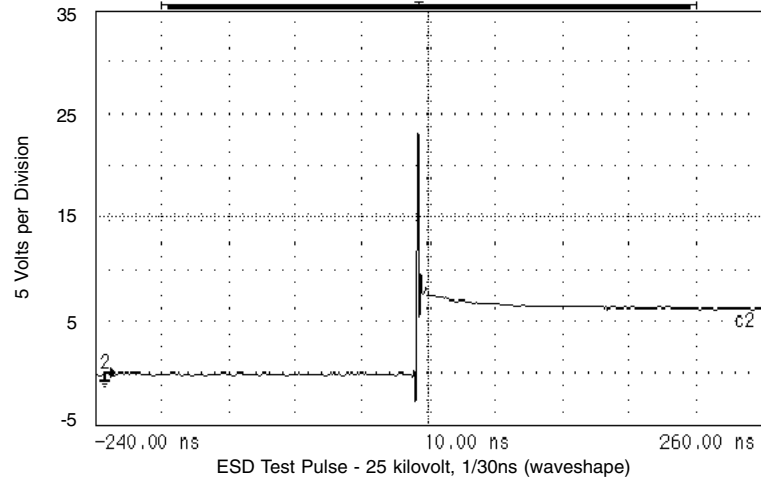
### ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

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

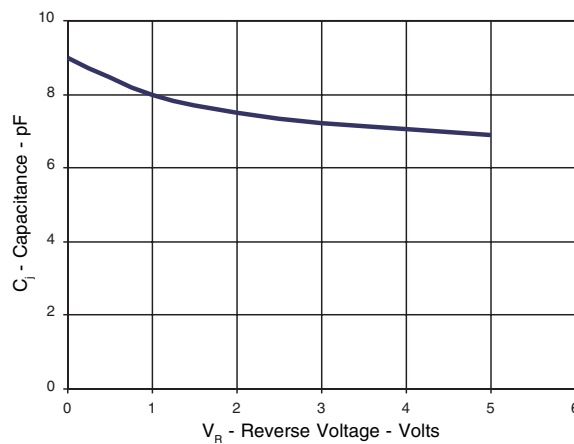
**Note 1:** Device is bidirectional.

## GRAPHS

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



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

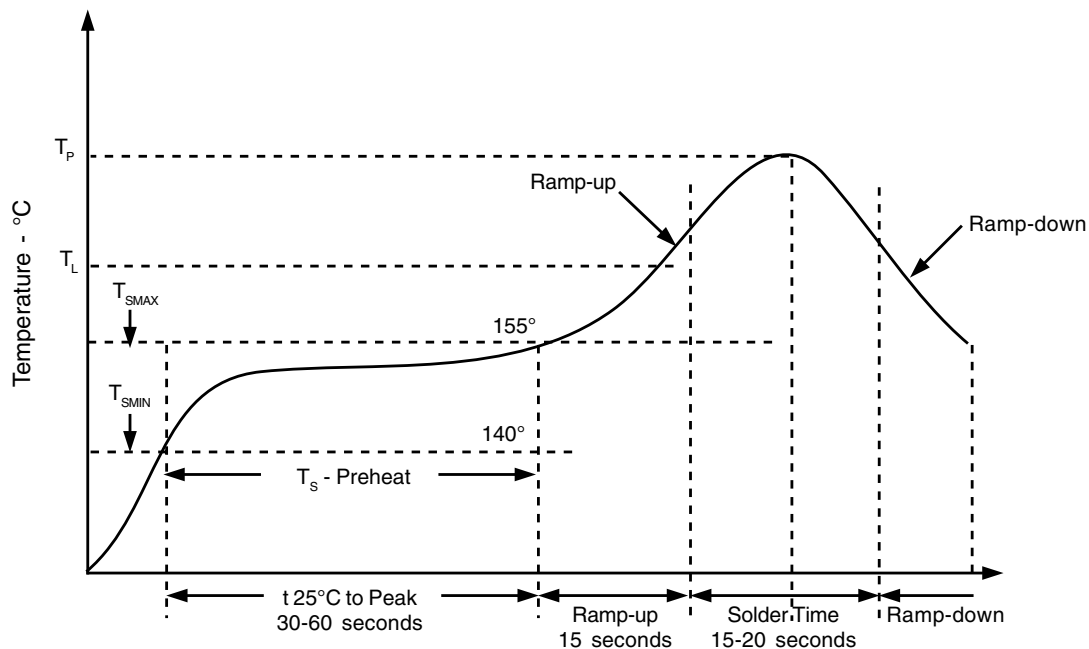
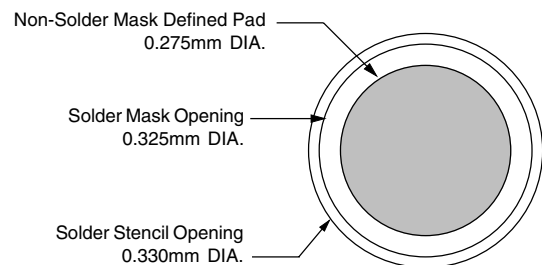


## APPLICATION INFORMATION

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

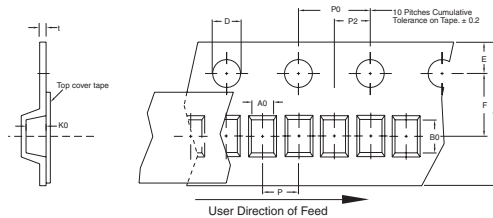
REQUIREMENTS
Temperature: $T_p$ for Lead-Free (SnAgCu): 260-270°C $T_p$ for Tin-Lead: 240-245°C Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.

### RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION



## U0402 PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE		PACKAGE DIMENSIONS										
		<b>DIM</b>	<b>MILLIMETERS</b>	<b>INCHES</b>								
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										
<b>NOTES:</b> 1. Controlling dimensions in inches. 2. Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002"). 3. Maximum chip size: 1.02 (0.040") by 0.51(0.020").												
MOUNTING PAD		PAD DIMENSIONS										
		<b>DIM</b>	<b>MILLIMETERS</b>	<b>INCHES</b>								
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										
<b>NOTE:</b> 1. Top view of tape. Metal contacts are face down in tape package.												
TAPE & REEL ORIENTATION												
<p>Single Die - 0402</p>												
<b>NOTE:</b> 1. Preferred: Using 0.1mm (0.004") stencil. <b>Outline &amp; Dimensions: Rev 4 - 10/05, 6020</b>												
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



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