

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

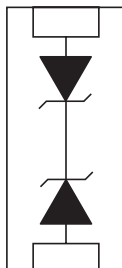
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Six Voltage Types Ranging From 3.3V to 24V
- ✓ Low ESD Overshoot Voltage
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ **LOW CAPACITANCE: 6pF**
- ✓ **LOW LEAKAGE CURRENT**
- ✓ RoHS Compliant

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*

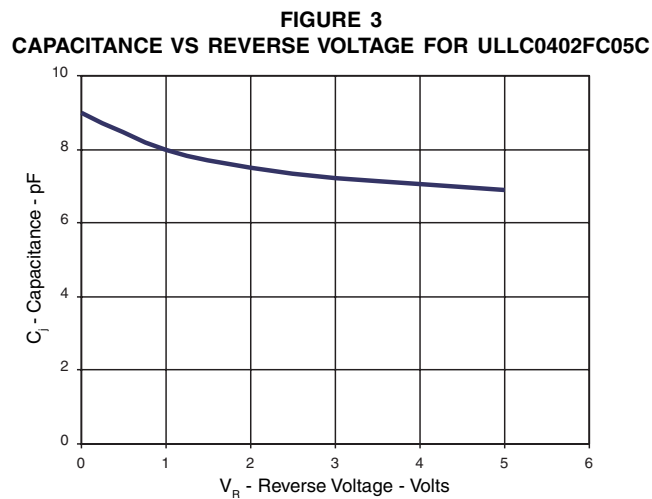
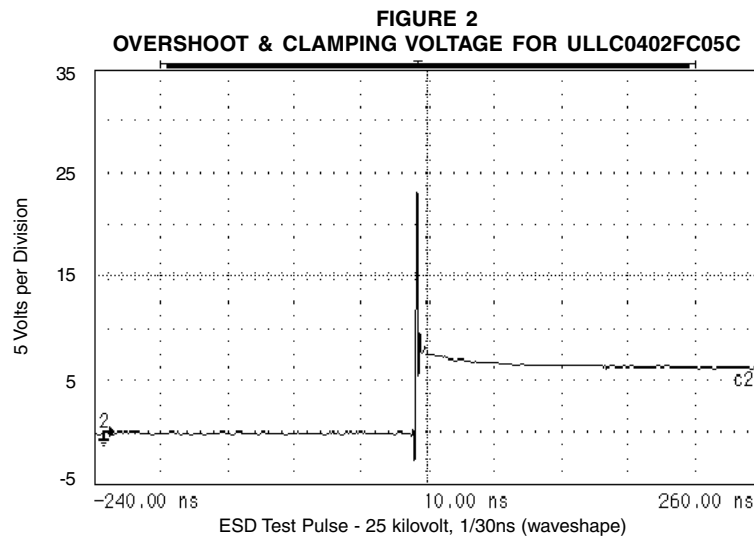
DEVICE CHARACTERISTICS

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 μA	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	$\pm 50\mu\text{m}$
Solder Ball Side Coplanarity	$\pm 20\mu\text{m}$
Maximum Dwell Time Above Liquidous (183°C)	60 Seconds
Soldering Maximum Temperature	270°C

REQUIREMENTS

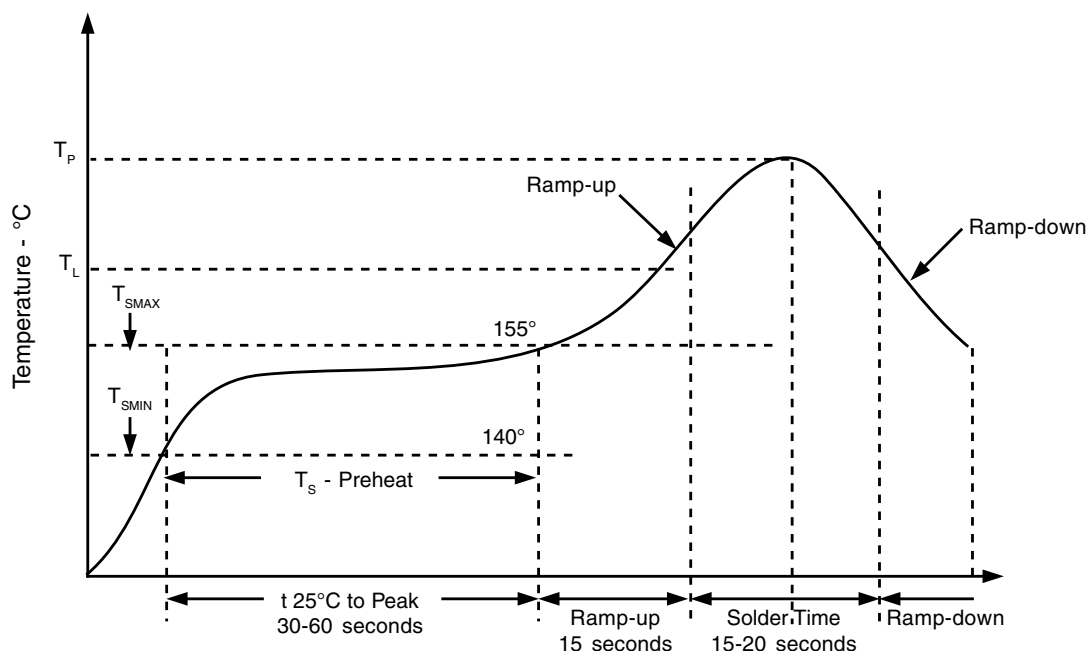
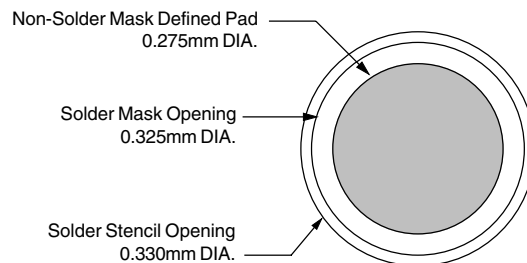
Temperature:

T_p for Lead-Free (SnAgCu): 260-265°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

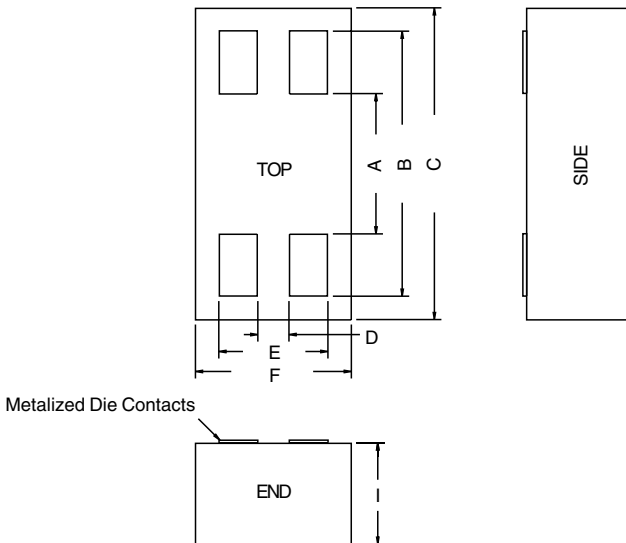

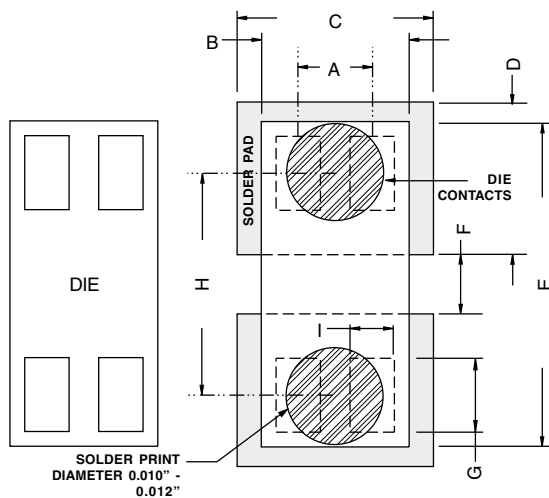
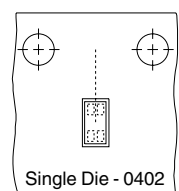


ULLC0402FC3.3C*

thru

ULLC0402FC24C*

PACKAGE OUTLINE & DIMENSIONS

<div>PACKAGE OUTLINE</div> <div></div> <div>Metalized Die Contacts</div>	<div>U0402</div> <div></div> <div>PACKAGE DIMENSIONS</div> <table><thead><tr><th>DIM</th><th>MILLIMETERS</th><th>INCHES</th></tr></thead><tbody><tr><td>A</td><td>0.61 NOM</td><td>0.024 NOM</td></tr><tr><td>B</td><td>0.86 NOM</td><td>0.034 NOM</td></tr><tr><td>C</td><td>0.99 ± 0.0254</td><td>0.039 ± 0.001</td></tr><tr><td>D</td><td>0.10 NOM</td><td>0.004 NOM</td></tr><tr><td>E</td><td>0.35 NOM</td><td>0.014 NOM</td></tr><tr><td>F</td><td>0.483 ± 0.0254</td><td>0.019 ± 0.001</td></tr><tr><td>I</td><td>0.406 NOM</td><td>0.016 NOM</td></tr></tbody></table> <div>NOTES:</div> <div><div>1. Controlling dimensions in inches.</div><div>2. Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002").</div><div>3. Maximum chip size: 1.02 (0.040") by 0.51(0.020").</div></div>	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						
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<div>MOUNTING PAD</div> <div></div> <div>SOLDER PRINT DIAMETER 0.010" - 0.012"</div> <div>TAPE & REEL ORDERING NOMENCLATURE</div> <div><div>1. Surface mount product is taped and reeled in accordance with EIA 481.</div><div>2. 8mm Plastic Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-1 (i.e., ULLC0402FC05C-T75-1).</div><div>3. 8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., ULLC0402FC05C-T710-2).</div></div>	<div>PAD DIMENSIONS</div> <table><thead><tr><th>DIM</th><th>MILLIMETERS</th><th>INCHES</th></tr></thead><tbody><tr><td>A</td><td>0.23</td><td>0.009</td></tr><tr><td>B</td><td>0.48</td><td>0.019</td></tr><tr><td>C</td><td>0.69</td><td>0.027</td></tr><tr><td>D</td><td>0.46</td><td>0.018</td></tr><tr><td>E</td><td>0.99</td><td>0.039</td></tr><tr><td>F</td><td>0.20</td><td>0.008</td></tr><tr><td>G</td><td>0.20</td><td>0.008</td></tr><tr><td>H</td><td>0.66</td><td>0.026</td></tr><tr><td>I</td><td>0.13</td><td>0.005</td></tr></tbody></table> <div>NOTE:</div> <div><div>1. Top view of tape. Metal contacts are face down in tape package.</div></div> <div>TAPE & REEL ORIENTATION</div> <div></div> <div>Single Die - 0402</div> <div>NOTE:</div> <div><div>1. Preferred: Using 0.1mm (0.004") stencil.</div></div> <div>Outline & Dimensions: Rev 4 - 10/05, 06020</div>	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
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