

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**

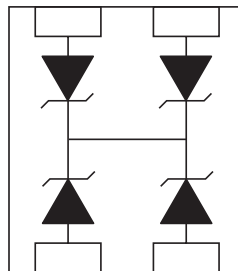
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Voltages Ranging From 3.3V to 36V
- ✓ 200 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ✓ Low Clamping Voltage
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 to 3 Lines
- ✓ **LOW CAPACITANCE**
- ✓ **LOW LEAKAGE CURRENT**
- ✓ RoHS Compliant

**MECHANICAL CHARACTERISTICS**

- ✓ Standard EIA Chip Size: 0404
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Solder Reflow Temperature:
  - Tin-Lead: 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**



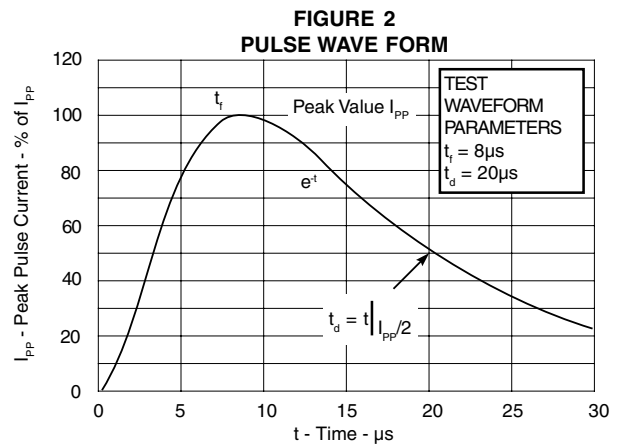
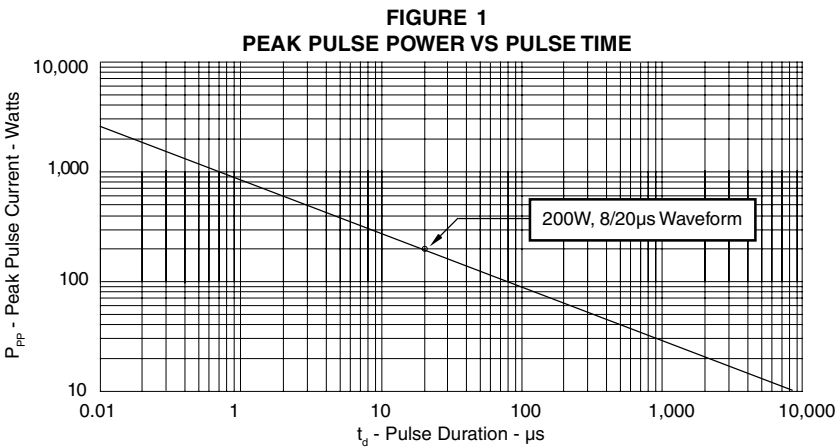
## DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1	$P_{PP}$	200	Watts
Operating Temperature	$T_J$	-55°C to 150°C	°C
Storage Temperature	$T_{STG}$	-55°C to 150°C	°C

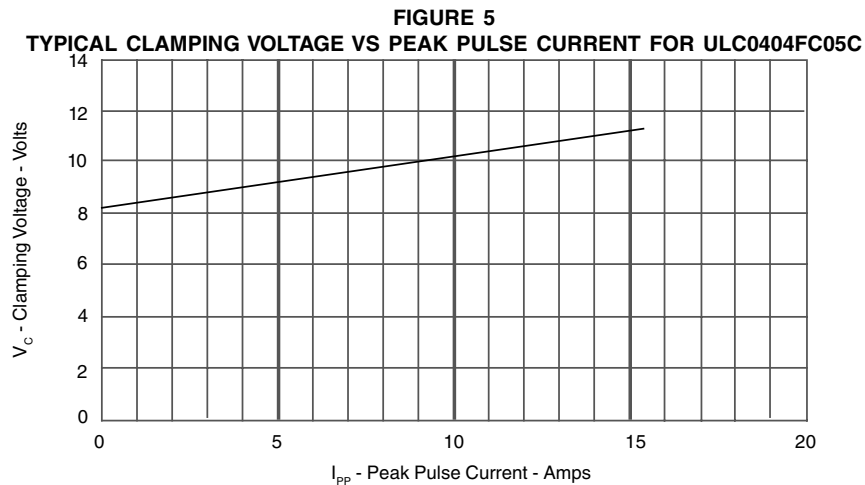
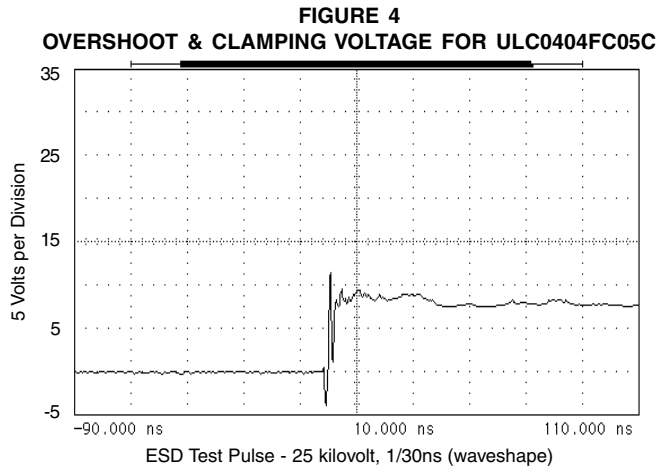
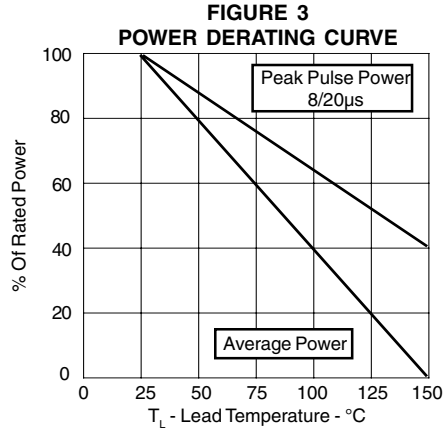
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified						
PART NUMBER (See Note 1)	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM LEAKAGE CURRENT (See Note 2)	TYPICAL CAPACITANCE
		@ 1mA $V_{(BR)}$ VOLTS	@ $I_p = 1A$ $V_C$ VOLTS	@ 8/20 $\mu s$ $V_C @ I_{PP}$	@ $V_{WM}$ $I_D$ $\mu A$	@ 0V, 1 MHz C pF
ULC0404FC3.3C	3.3	4.0	7.0	12.5V @ 16A	75*	70
ULC0404FC05C	5.9	6.0	11.0	13V @ 15A	10**	35
ULC0404FC08C	8.0	8.5	13.2	18V @ 11A	1	32
ULC0404FC12C	12.0	13.3	19.8	26.9V @ 7.4A	1	30
ULC0404FC15C	15.0	16.7	25.4	34.5V @ 5.8A	1	25
ULC0404FC24C	24.0	26.7	37.2	50.6V @ 4A	1	20
ULC0404FC36C	36.0	40.0	70.0	80.0V @ 2.5A	1	18

**Note 1:** All devices are bidirectional. Electrical characteristics apply in both directions.

**Note 2:** \*Maximum leakage current < 5 $\mu A$  @ 2.8V. \*\*Maximum leakage current < 500nA @ 3.3V.



GRAPHS

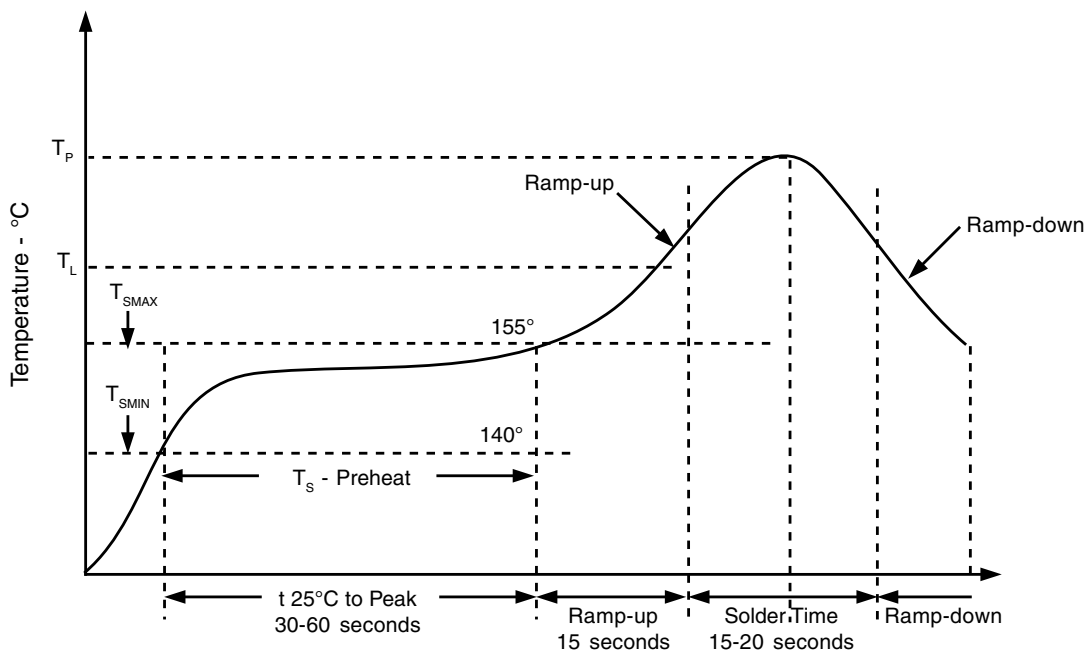
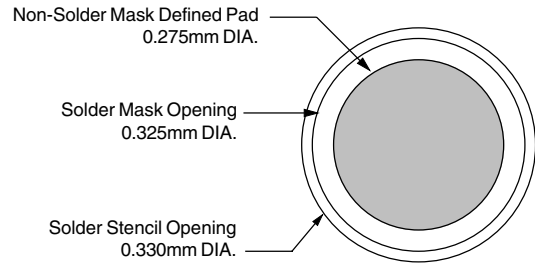


**APPLICATION INFORMATION**

<b>PRINTED CIRCUIT BOARD RECOMMENDATIONS</b>	
<b>PARAMETER</b>	<b>VALUE</b>
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

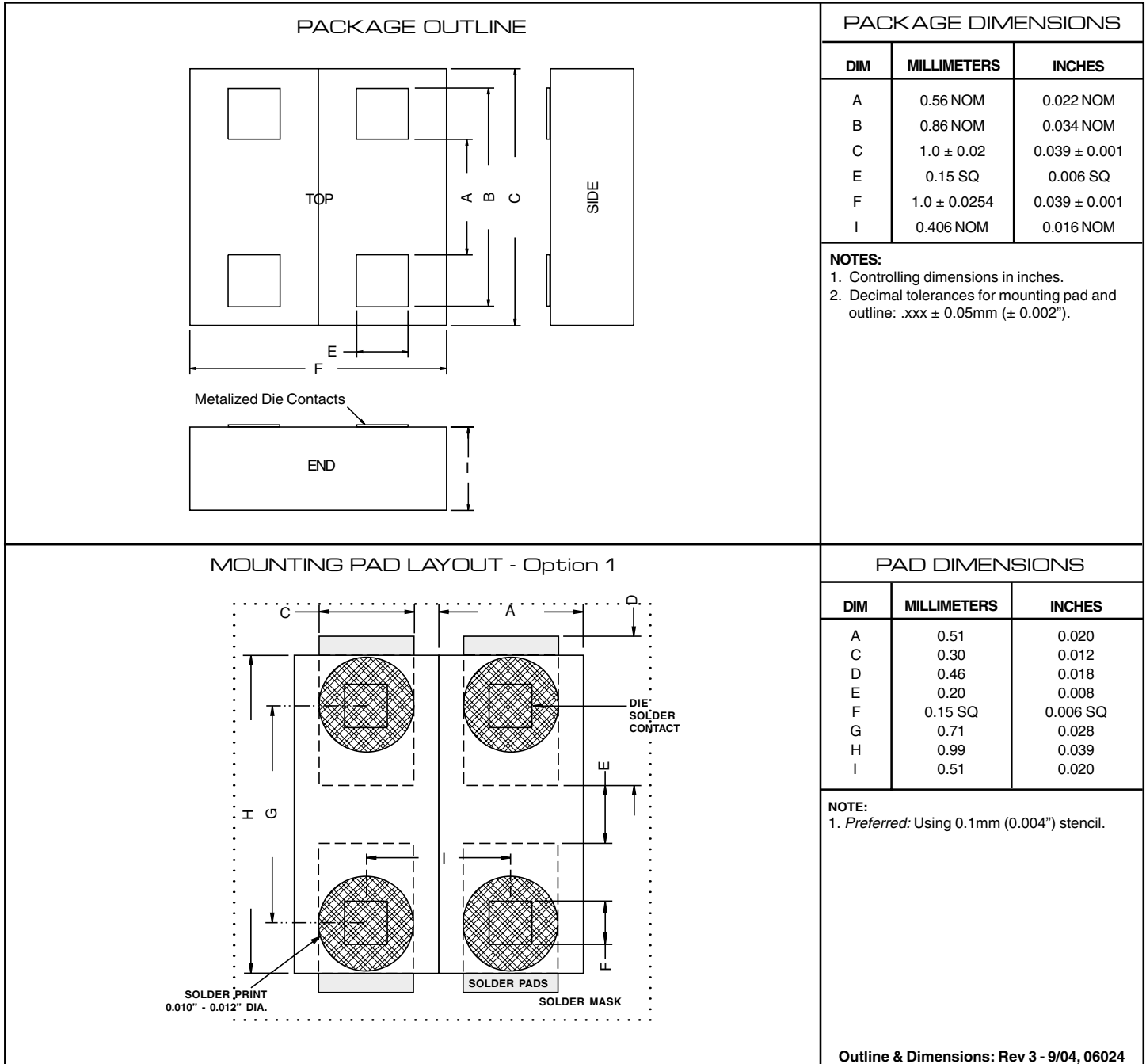
<b>REQUIREMENTS</b>
<p><b>Temperature:</b>  <math>T_p</math> for Lead-Free (SnAgCu): 260-265°C  <math>T_p</math> for Tin-Lead: 240-245°C                      Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area &amp; plating.</p>

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



# ULC0404FC3.3C thru ULC0404FC36C

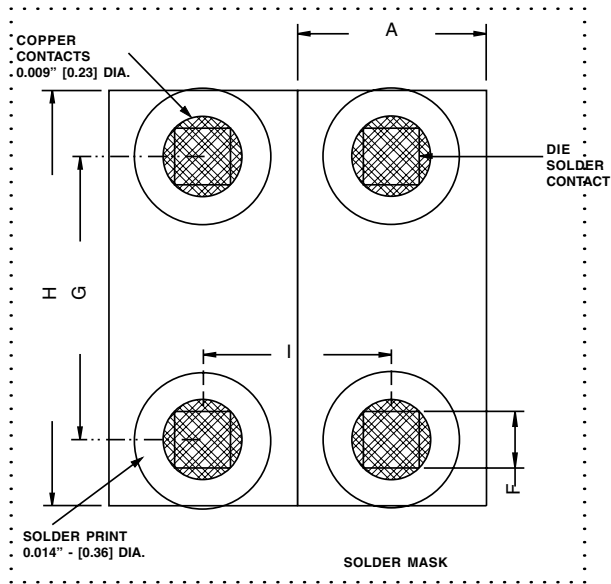
## PACKAGE OUTLINE & DIMENSIONS



# ULC0404FC3.3C thru ULC0404FC36C

## PACKAGE OUTLINE & DIMENSIONS

MOUNTING PAD LAYOUT - Option 2



### PACKAGE DIMENSIONS

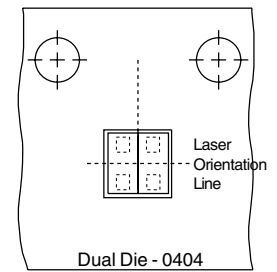
DIM	MILLIMETERS	INCHES
A	0.51	0.020
F	0.15 SQ	0.006 SQ
G	0.71	0.028
H	0.99	0.039
I	0.51	0.020

#### NOTES:

1. Controlling dimensions in inches.
2. Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002").
3. Preferred: Using 0.1mm (0.004") stencil.

Outline & Dimensions: Rev 3 - 9/04, 06024

### TAPE & REEL ORIENTATION



#### NOTE:

1. Top view of tape. Solder bumps are face down in tape package.

### TAPE & REEL ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA 481.
2. 8mm Plastic Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-1 (i.e., ULC0404FC05C-T75-1).
3. 8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., ULC0404FC05C-T710-2).

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)