

UNBUMPED FLIP CHIP ARRAY

**APPLICATIONS**

- ✓ Cellular Phones
- ✓ MCM Boards
- ✓ Wireless Communication Circuits
- ✓ IR LEDs
- ✓ SMART & PCMCIA Cards

**IEC COMPATIBILITY (EN61000-4)**

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

**FEATURES**

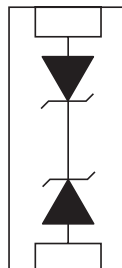
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Multiple Voltage Types Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu s$ )
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ RoHS Compliant

**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**



**DEVICE CHARACTERISTICS**

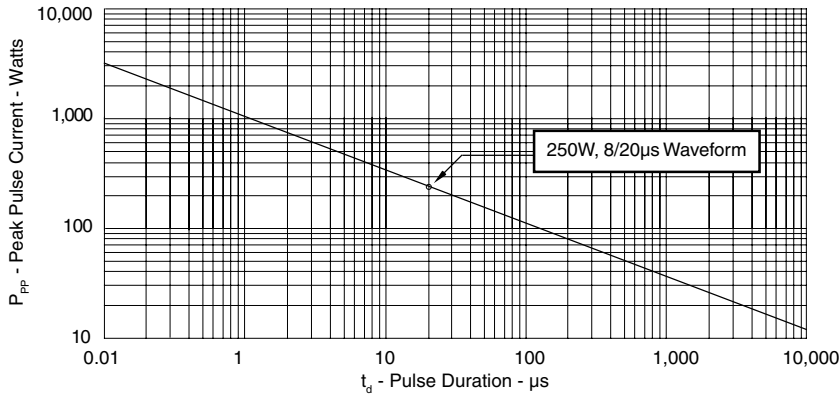
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1	$P_{PP}$	250	Watts
Operating Temperature	$T_J$	-55°C to 150°C	°C
Storage Temperature	$T_{STG}$	-55°C to 150°C	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified						
PART NUMBER (See Note 1)	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE  @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)  @ $I_p = 1A$ $V_C$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)  @ 8/20 $\mu s$ $V_C @ I_{PP}$	MAXIMUM LEAKAGE CURRENT (See Note 2)  @ $V_{WM}$ $I_D$ $\mu A$	TYPICAL CAPACITANCE  @ 0V, 1 MHz C pF
U0402FC05C	5.0	6.0	9.8	14.7V @ 17A	10**	100
U0402FC08C	8.0	8.5	13.4	19.2V @ 13A	10***	75
U0402FC12C	12.0	13.3	19.0	29.7V @ 9.0A	1	50
U0402FC15C	15.0	16.7	24.0	35.7V @ 7.0A	1	40
U0402FC24C	24.0	26.7	43.0	55.0V @ 5.0A	1	30
U0402FC36C	36.0	40.0	64.0	84.0V @ 3.0A	1	25

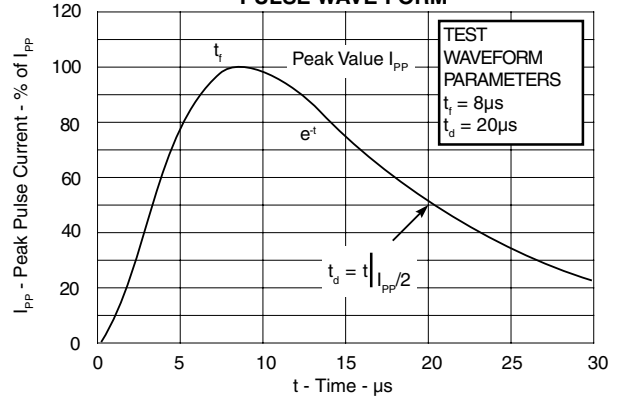
**Note 1:** All devices are bidirectional. Electrical characteristics apply in both directions.

**Note 2:** \*Maximum leakage current < 5 $\mu A$  @ 2.8V. \*\*Maximum leakage current < 500nA @ 3.3V. \*\*\*Maximum leakage current < 200nA @ 5V.

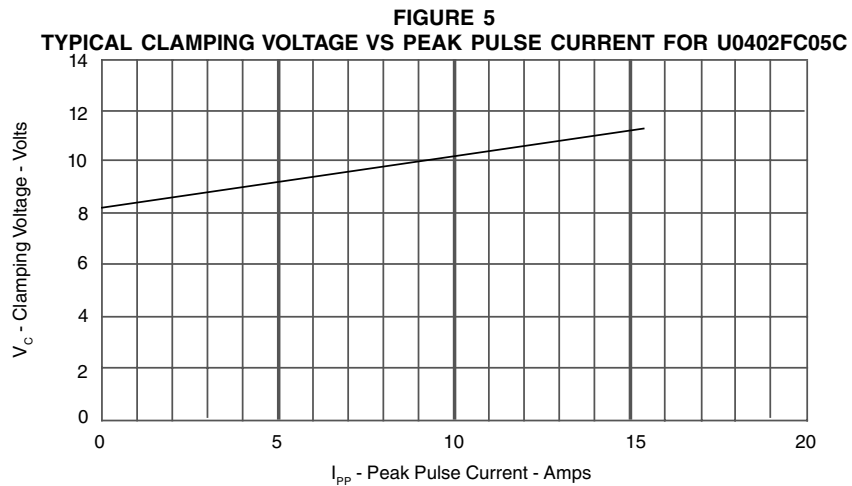
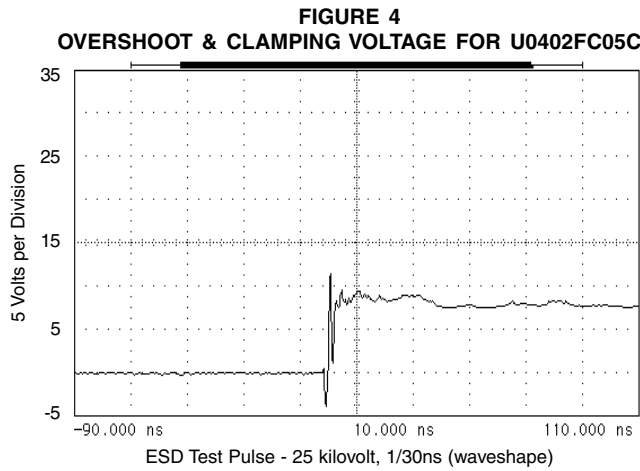
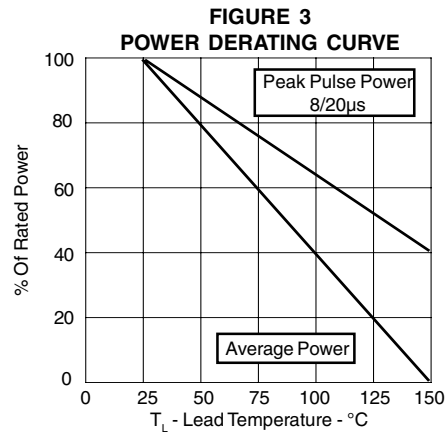
**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2  
PULSE WAVE FORM**



GRAPHS

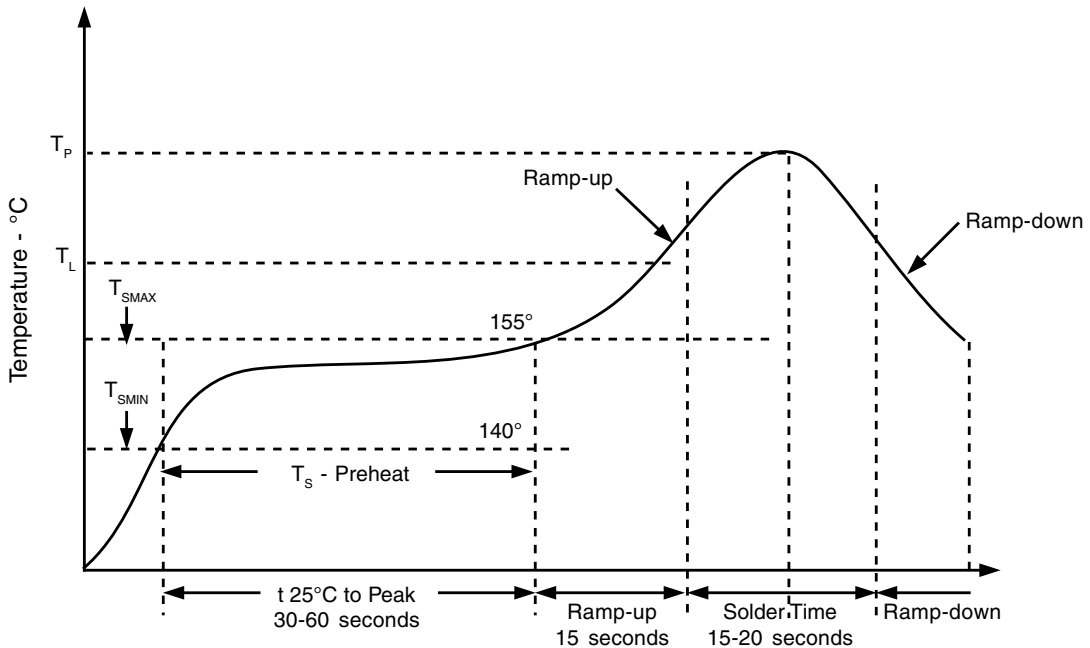
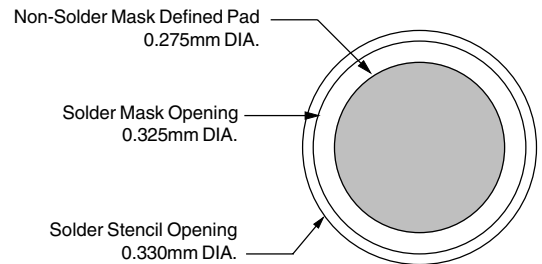


**APPLICATION INFORMATION**

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**



# U0402FC3.3C thru U0402FC36C

## PACKAGE OUTLINE & DIMENSIONS

<p style="text-align: center;">PACKAGE OUTLINE</p> <p style="text-align: center;">TOP</p> <p style="text-align: center;">SIDE</p> <p style="text-align: center;">END</p> <p>Metalized Die Contacts</p>	<p style="text-align: center;">U0402</p> <p style="text-align: center;">PACKAGE DIMENSIONS</p> <table border="1"> <thead> <tr> <th>DIM</th> <th>MILLIMETERS</th> <th>INCHES</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>0.46 NOM</td> <td>0.018 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> <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>	DIM	MILLIMETERS	INCHES	A	0.46 NOM	0.018 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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<p><b>TAPE &amp; REEL ORDERING NOMENCLATURE</b></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., U0402FC05C-T75-1).</li> <li>8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., U0402FC05C-T710-2).</li> </ol>																															

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