

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**

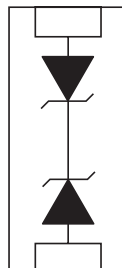
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Multiple Voltage Types Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ RoHS Compliant

**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

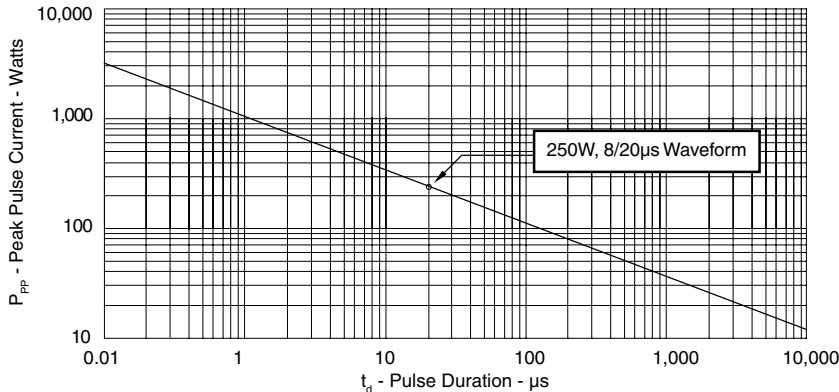
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1	$P_{PP}$	250	Watts
Operating Temperature	$T_J$	-55°C to 150°C	°C
Storage Temperature	$T_{STG}$	-55°C to 150°C	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified						
PART NUMBER (See Note 1)	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM LEAKAGE CURRENT (See Note 2)	TYPICAL CAPACITANCE  @0V, 1 MHz C pF
		@ 1mA $V_{(BR)}$ VOLTS	@ $I_p = 1A$ $V_C$ VOLTS	@ 8/20 $\mu s$ $V_C @ I_{PP}$	@ $V_{WM}$ $I_D$ $\mu A$	
U0402FC3.3C	3.3	4.0	7.0	12.5V @ 20A	75*	150
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

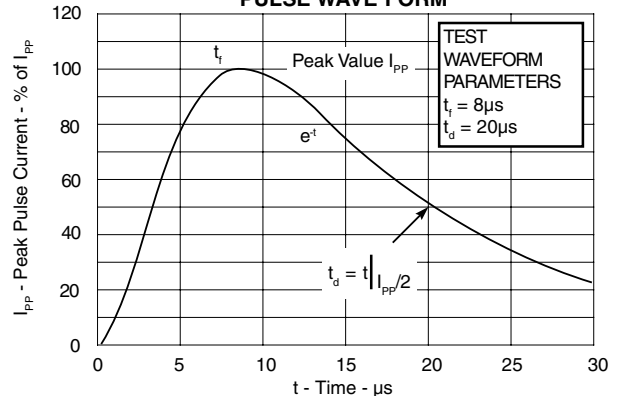
**Note 1:** All devices are bidirectional. Electrical characteristics apply in both directions.

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

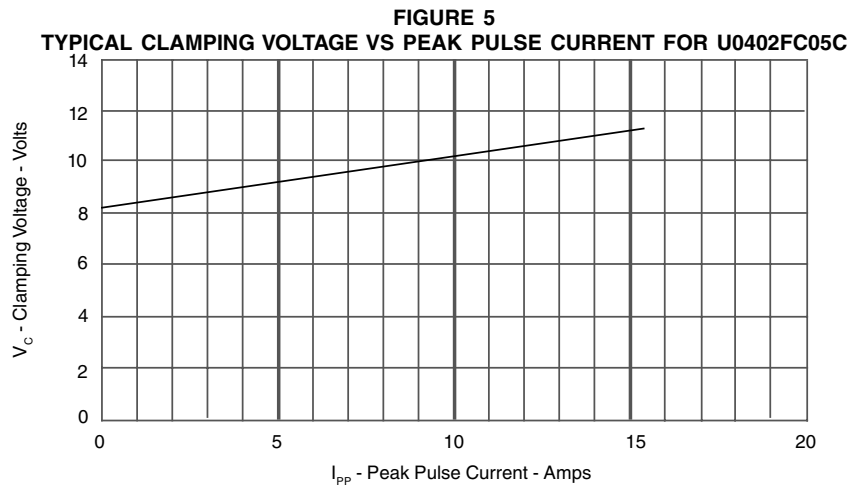
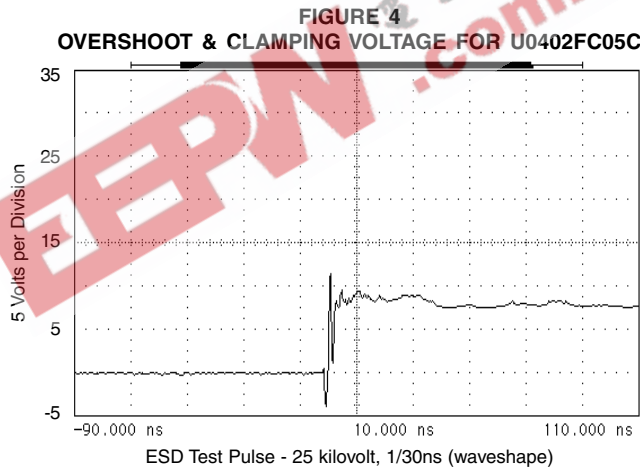
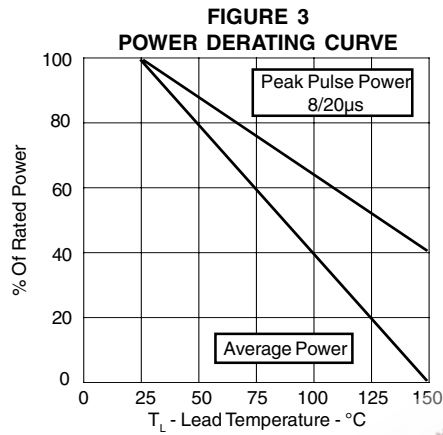
**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2  
PULSE WAVE FORM**



GRAPHS

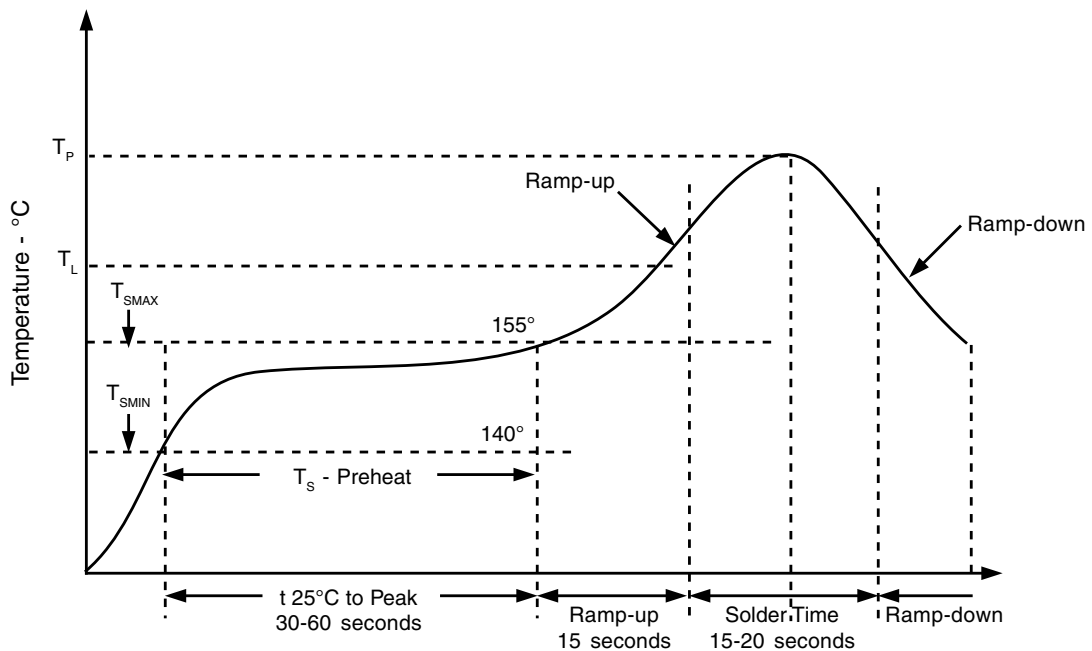
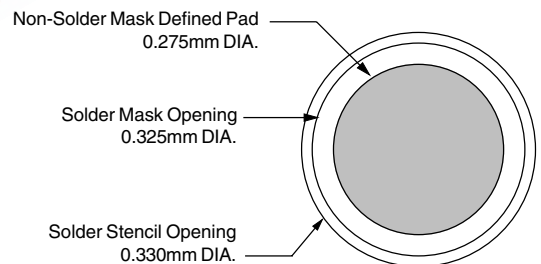


**APPLICATION INFORMATION**

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

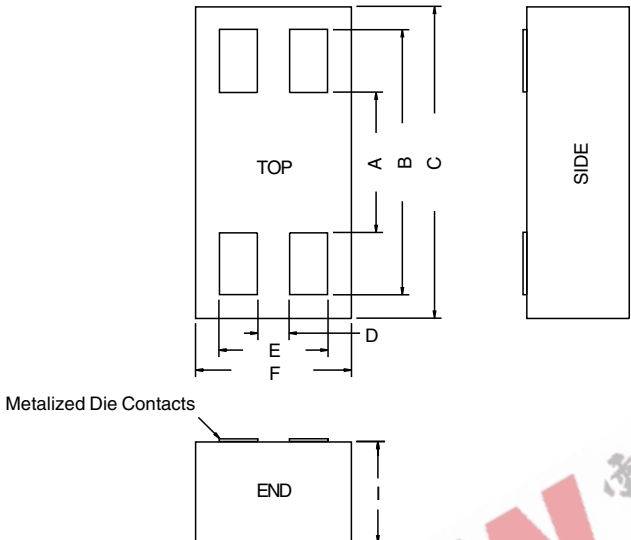

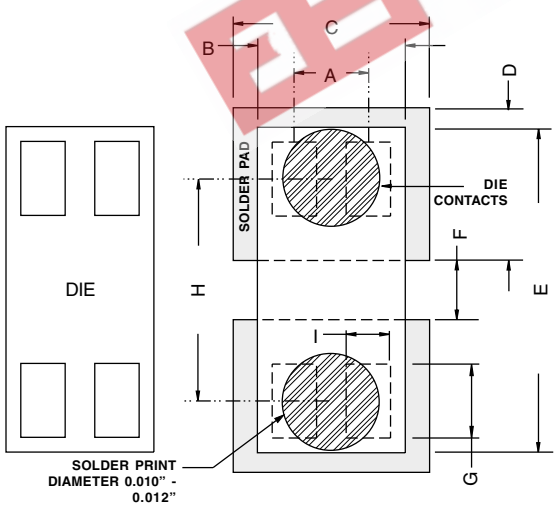
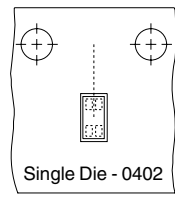
REQUIREMENTS
<p><b>Temperature:</b>  <math>T_p</math> for Lead-Free (SnAgCu): 260-265°C  <math>T_p</math> for Tin-Lead: 240-245°C                      Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area &amp; plating.</p>

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



# U0402FC3.3C thru U0402FC36C

## PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE		U0402	
			
		PACKAGE DIMENSIONS	
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	
<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	
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	
<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 3 - 11/02, 06020</b>			
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., U0402FC05C-T75-1). 3. 8mm Paper Tape: 7 Inch Reels -10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., U0402FC05C-T710-2).			

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