

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

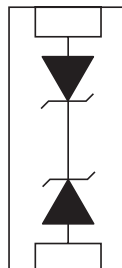
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Multiple Voltage Types Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ RoHS Compliant

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

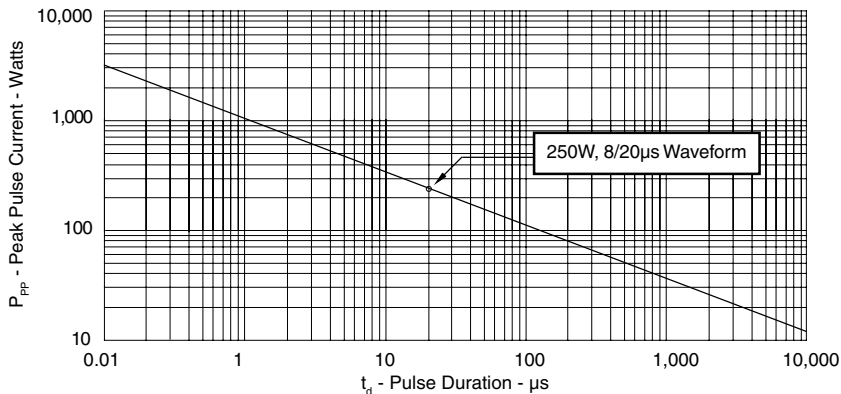
| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified | | | |
|---|-----------|----------------|-------|
| PARAMETER | SYMBOL | VALUE | UNITS |
| Peak Pulse Power ($t_p = 8/20\mu s$) - See Figure 1 | P_{PP} | 250 | Watts |
| Operating Temperature | T_J | -55°C to 150°C | °C |
| Storage Temperature | T_{STG}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

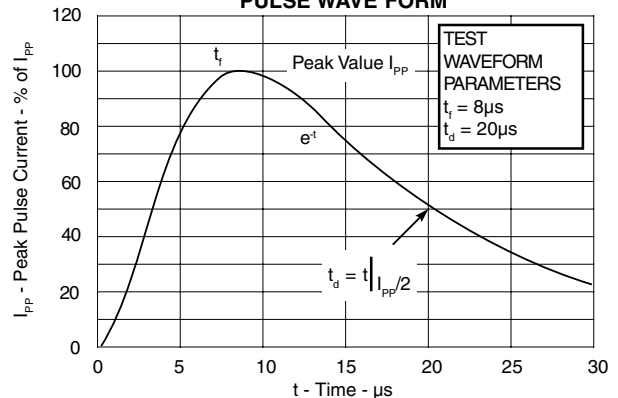
Note 1: All devices are bidirectional. Electrical characteristics apply in both directions.

Note 2: *Maximum leakage current < 5 μA @ 2.8V. **Maximum leakage current < 500nA @ 3.3V. ***Maximum leakage current < 200nA @ 5V.

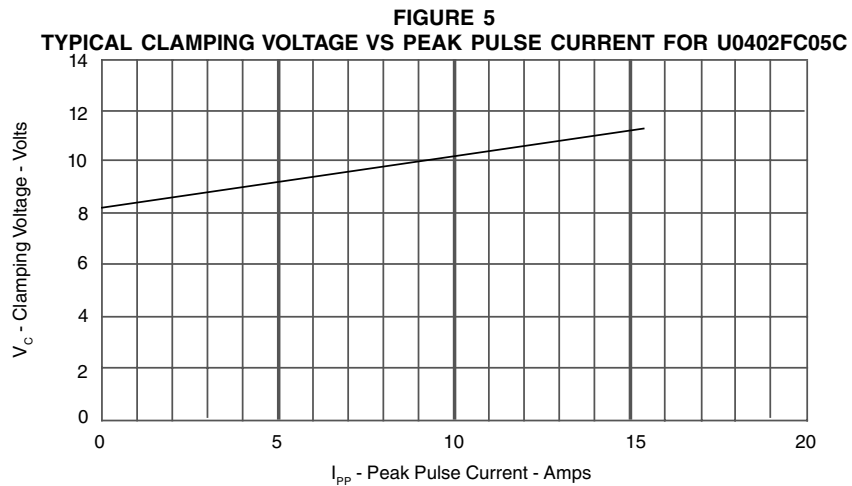
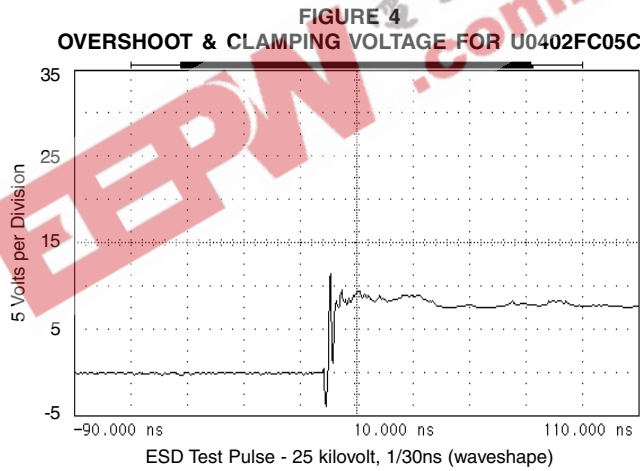
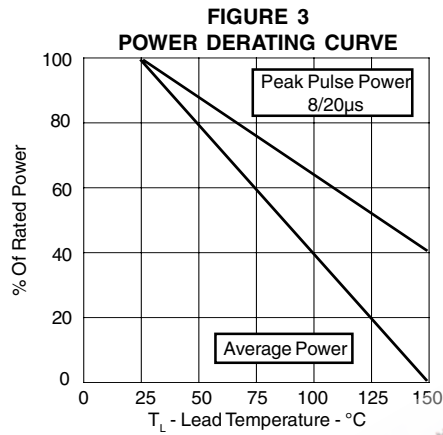
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2
PULSE WAVE FORM**



GRAPHS

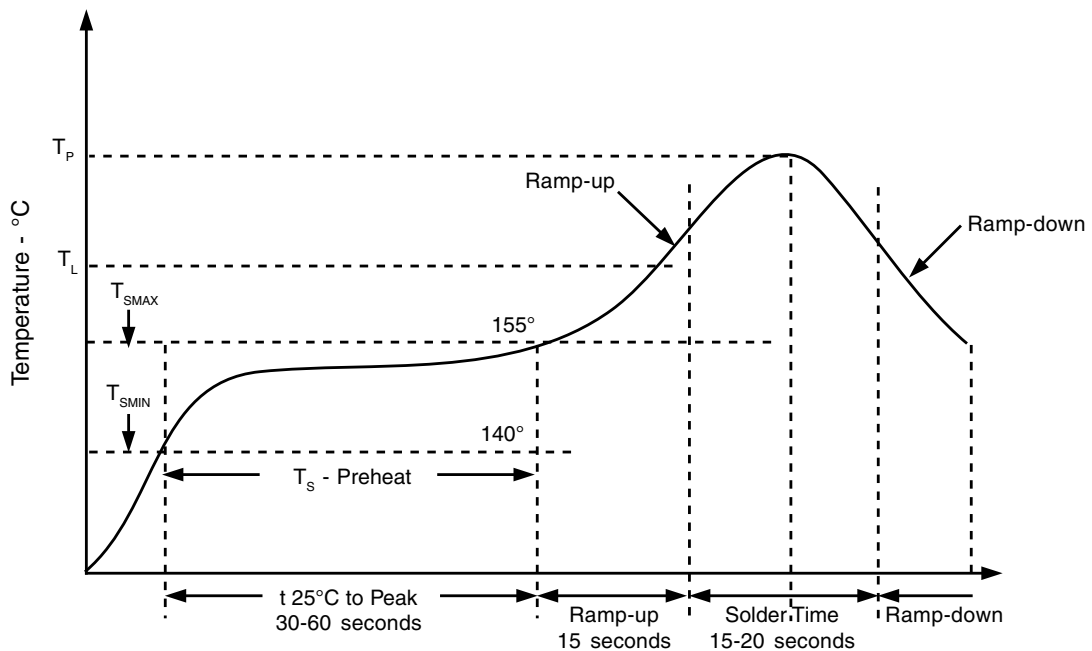
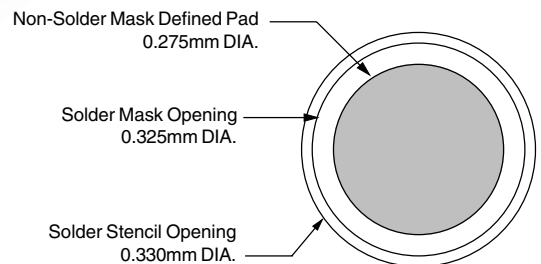


APPLICATION INFORMATION

| 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 |

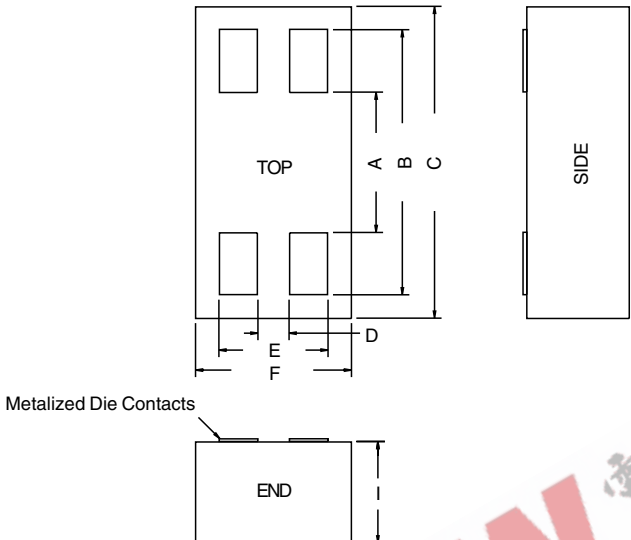

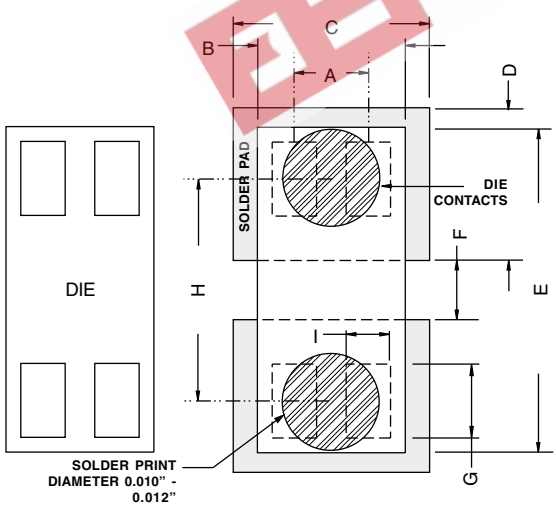
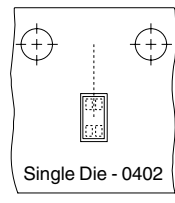
| REQUIREMENTS |
|---|
| <p>Temperature: T_p for Lead-Free (SnAgCu): 260-265°C T_p for Tin-Lead: 240-245°C Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.</p> |

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 | |
| NOTES: 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 | |
| NOTE: 1. Top view of tape. Metal contacts are face down in tape package. | | | |
| TAPE & REEL ORIENTATION | | | |
|  | |  | |
| | | Single Die - 0402 | |
| NOTE: 1. Preferred: Using 0.1mm (0.004") stencil. | | | |
| Outline & Dimensions: Rev 3 - 11/02, 06020 | | | |
| 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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