

## APPLICATIONS

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

## IEC COMPATIBILITY (EN61000-4)

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

## FEATURES

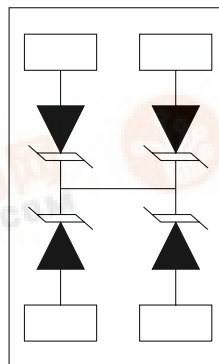
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Multiple Voltage Types Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power Dissipation per Line (8/20 $\mu$ s)
- ✓ Monolithic Structure

## MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0404
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
- ✓ Device Marking On Reel
- ✓ Top Contacts: Solder Bump 0.004" in Height (Nominal)



## CIRCUIT DIAGRAM

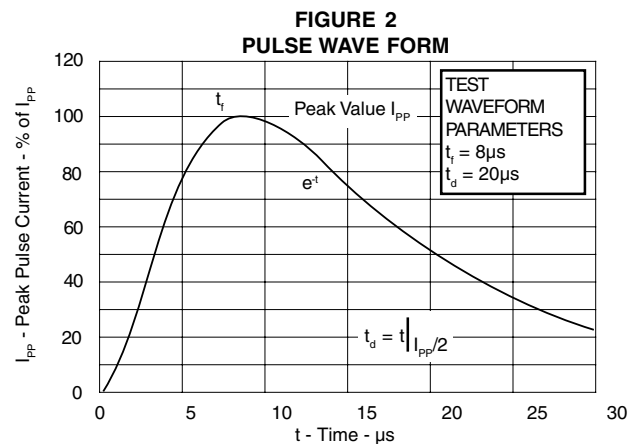
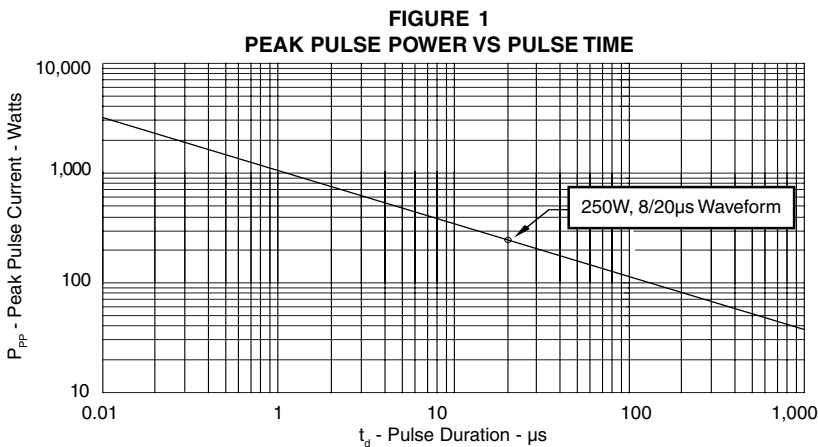


DEVICE CHARACTERISTICS

| 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    |

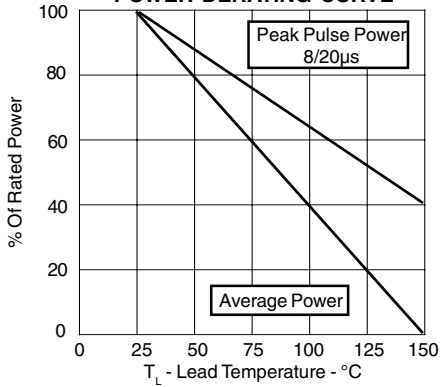
| ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified |                         |                              |  |  |                                |                       |
|---|-------------------------|------------------------------|--|--|--------------------------------|-----------------------|
| PART NUMBER<br>(See Note 1)   | RATED STAND-OFF VOLTAGE | MINIMUM BREAKDOWN VOLTAGE    | MAXIMUM CLAMPING VOLTAGE<br>(See Fig. 2) | MAXIMUM CLAMPING VOLTAGE<br>(See Fig. 2) | MAXIMUM LEAKAGE CURRENT        | TYPICAL CAPACITANCE   |
|   | $V_{WM}$<br>VOLTS       | @ 1mA<br>$V_{(BR)}$<br>VOLTS | @ $I_p = 1A$<br>$V_C$<br>VOLTS           | @ 8/20 $\mu s$<br>$V_C @ I_{PP}$         | @ $V_{WM}$<br>$I_D$<br>$\mu A$ | 0V @ 1 MHz<br>C<br>pF |
| P0404FC3.3C   | 3.3                     | 4.0                          | 7.0                                      | 12.5V @ 20A                              | 75                             | 150                   |
| P0404FC05C  | 5.0                     | 6.0                          | 9.8                                      | 14.7V @ 17A                              | 10                             | 100                   |
| P0404FC08C  | 8.0                     | 8.5                          | 13.4                                     | 19.2V @ 13A                              | 10                             | 75                    |
| P0404FC12C  | 12.0                    | 13.3                         | 19.0                                     | 29.7V @ 9.0A                             | 1                              | 50                    |
| P0404FC15C  | 15.0                    | 16.7                         | 24.0                                     | 35.7V @ 7.0A                             | 1                              | 40                    |
| P0404FC24C  | 24.0                    | 26.7                         | 43.0                                     | 55.0V @ 5.0A                             | 1                              | 30                    |
| P0404FC36C  | 36.0                    | 40.0                         | 64.0                                     | 84.0V @ 3.0A                             | 1                              | 25                    |

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

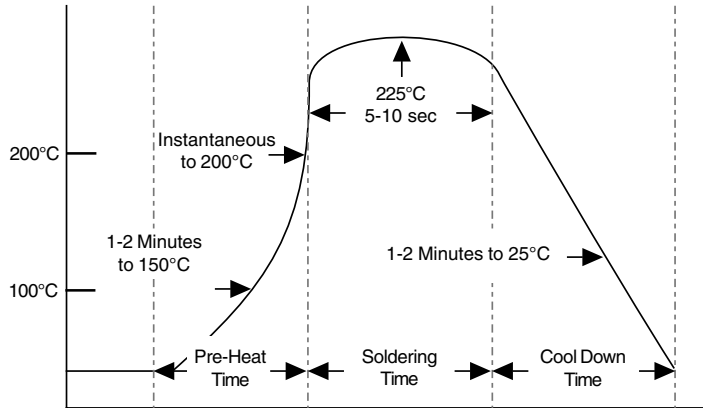


GRAPHS

**FIGURE 3  
 POWER DERATING CURVE**

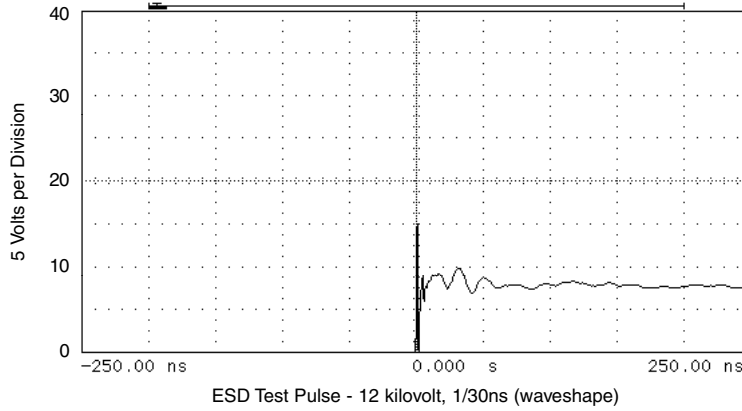


**FIGURE 4  
 REFLOW SOLDER PROFILE**

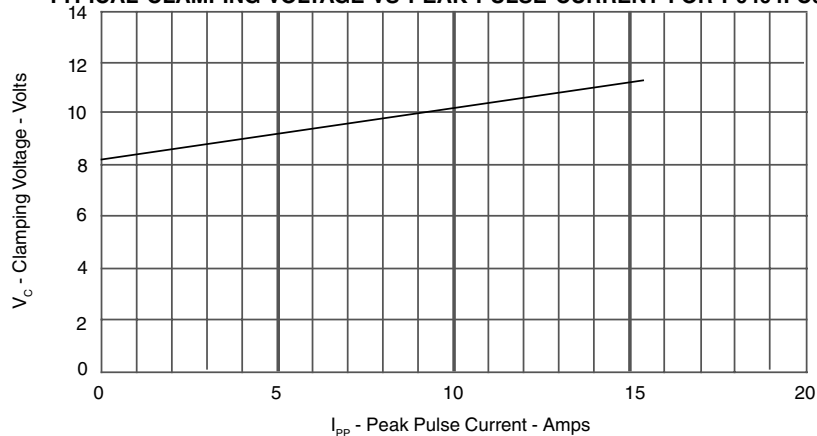


**Note:** This reflow profile does not take into account the printed circuit board (PCB) material heating time. Additional time may be required for the preheat time and cool down time upon the PCB or board material.

**FIGURE 5  
 OVERTHOOT & CLAMPING VOLTAGE FOR P0404FC05C**



**FIGURE 6  
 TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR P0404FC05C**



PACKAGE OUTLINE & DIMENSIONS

|                           |              |  |
|---------------------------|--------------|--|
| <p>PACKAGE OUTLINE</p>    |              | <p>O404</p> <p>Picture Not Available</p> |
| <p>PACKAGE DIMENSIONS</p> |              |  |
| DIM                       | MILLIMETERS  | INCHES                                   |
| A                         | 0.56 NOM     | 0.022 NOM                                |
| B                         | 0.86 NOM     | 0.034 NOM                                |
| C                         | 1.0 ± 0.02   | 0.039 ± 0.001                            |
| E                         | 0.15 SQ      | 0.006 SQ                                 |
| F                         | 1.0 ± 0.0254 | 0.039 ± 0.001                            |
| G                         | 0.15 NOM     | 0.006 NOM                                |
| H                         | 0.127 MAX    | 0.005 MAX                                |
| I                         | 0.076 MIN    | 0.003 MIN                                |
| I                         | 0.406 NOM    | 0.016 NOM                                |

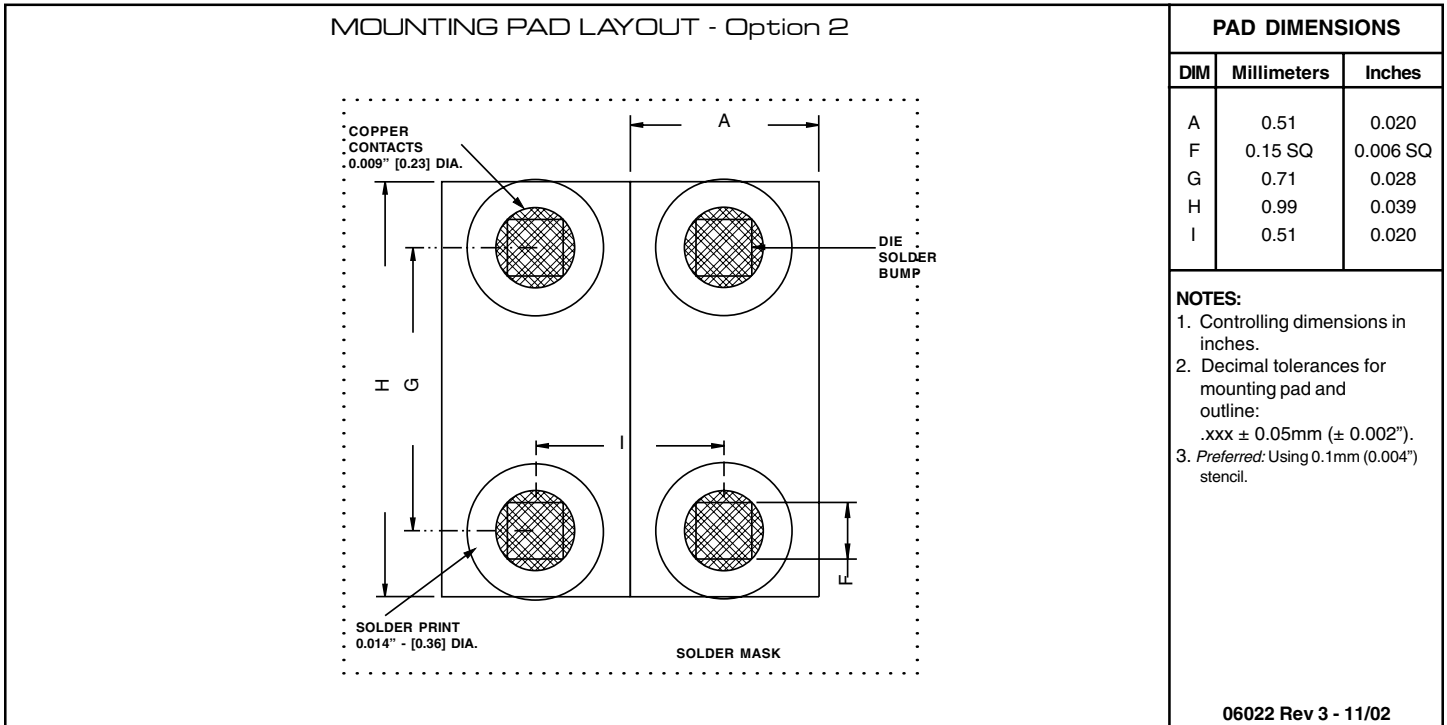
  

| <p>MOUNTING PAD LAYOUT - Option 1</p>  |             | <table border="1" style="margin: auto;"> <thead> <tr> <th colspan="3">PAD DIMENSIONS</th> </tr> <tr> <th>DIM</th> <th>Millimeters</th> <th>Inches</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>0.51</td> <td>0.020</td> </tr> <tr> <td>C</td> <td>0.30</td> <td>0.012</td> </tr> <tr> <td>D</td> <td>0.46</td> <td>0.018</td> </tr> <tr> <td>E</td> <td>0.20</td> <td>0.008</td> </tr> <tr> <td>F</td> <td>0.15 SQ</td> <td>0.006 SQ</td> </tr> <tr> <td>G</td> <td>0.71</td> <td>0.028</td> </tr> <tr> <td>H</td> <td>0.99</td> <td>0.039</td> </tr> <tr> <td>I</td> <td>0.51</td> <td>0.020</td> </tr> </tbody> </table> <p><b>NOTE:</b><br/>                     Preferred: Using 0.1mm (0.004") stencil.</p> | PAD DIMENSIONS |  |  | DIM | Millimeters | Inches | A | 0.51 | 0.020 | C | 0.30 | 0.012 | D | 0.46 | 0.018 | E | 0.20 | 0.008 | F | 0.15 SQ | 0.006 SQ | G | 0.71 | 0.028 | H | 0.99 | 0.039 | I | 0.51 | 0.020 | <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> </ol> |
|--|-------------|---|----------------|--|--|-----|-------------|--------|---|------|-------|---|------|-------|---|------|-------|---|------|-------|---|---------|----------|---|------|-------|---|------|-------|---|------|-------|--|
| PAD DIMENSIONS   |             |   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| DIM  | Millimeters | Inches  |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| A  | 0.51        | 0.020   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| C  | 0.30        | 0.012   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| D  | 0.46        | 0.018   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| E  | 0.20        | 0.008   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| F  | 0.15 SQ     | 0.006 SQ  |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| G  | 0.71        | 0.028   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| H  | 0.99        | 0.039   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| I  | 0.51        | 0.020   |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |
| <p><b>TAPE &amp; REEL ORIENTATION</b></p> <p style="text-align: center;">Dual Die - 0404</p> <p><b>NOTE:</b></p> <ol style="list-style-type: none"> <li>Top view of tape. Solder bumps are face down in tape package.</li> </ol> |             | <p>06022 Rev 3 - 11/02</p>  |                |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |         |          |   |      |       |   |      |       |   |      |       |  |

**TAPE & REEL ORDERING INFORMATION:**

Surface mount product is taped and reeled in accordance with EIA-481.  
 Plastic Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-1 (i.e., P0404FC05C-T75-1).  
 Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., P0404FC05C-T710-2).

PACKAGE OUTLINE & DIMENSIONS



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)

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