

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

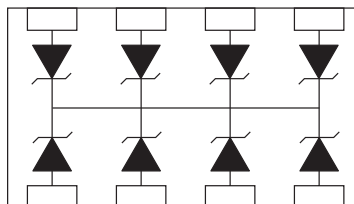
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Voltages Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 4 to 7 Lines
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0408
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Available in Lead-Free Plating
- ✓ Solder Reflow Temperature:
 Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- ✓ Consult Factory for Leaded Device Availability
- ✓ 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)



PIN CONFIGURATION



P0408FC3.3C* thru P0408FC36C*

DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER | SYMBOL | VALUE | UNITS |
|---|------------------|------------|-------|
| Peak Pulse Power (tp = 8/20µs) - See Figure 1 | P _{PP} | 250 | Watts |
| Operating Temperature | T _A | -55 to 150 | °C |
| Storage Temperature | T _{STG} | -55 to 150 | °C |

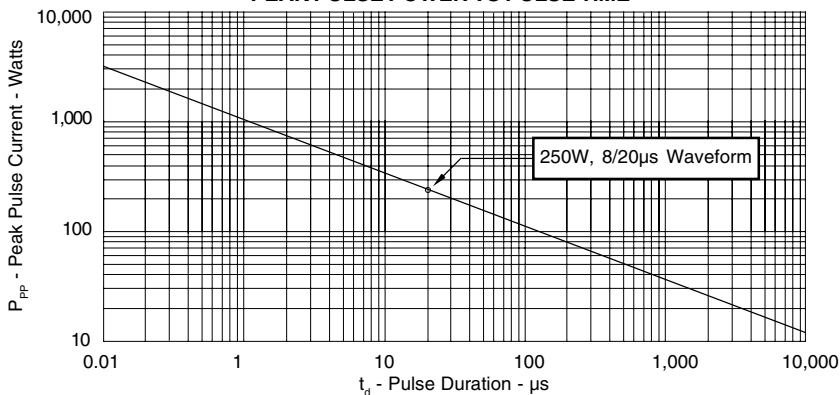
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| 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) @ 8/20µs V _C @ I _{PP} | MAXIMUM LEAKAGE CURRENT (See Note 2) @ V _{WM} I _D µA | TYPICAL CAPACITANCE @ 0V, 1 MHz C pF |
|-----------------------------|---|--|--|--|--|---|
| P0408FC3.3C | 3.3 | 4.0 | 7.0 | 12.5V @ 20A | 75* | 150 |
| P0408FC05C | 5.0 | 6.0 | 11.0 | 14.7V @ 17A | 10** | 100 |
| P0408FC08C | 8.0 | 8.5 | 13.2 | 19.2V @ 13A | 10*** | 75 |
| P0408FC12C | 12.0 | 13.3 | 19.8 | 29.7V @ 9.0A | 1 | 50 |
| P0408FC15C | 15.0 | 16.7 | 25.4 | 35.7V @ 7.0A | 1 | 40 |
| P0408FC24C | 24.0 | 26.7 | 37.2 | 55.0V @ 5.0A | 1 | 30 |
| P0408FC36C | 36.0 | 40.0 | 70.0 | 84.0V @ 3.0A | 1 | 25 |

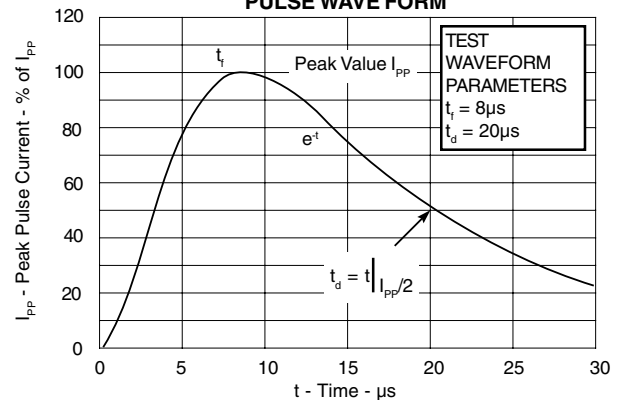
Note 1: All devices are bidirectional. Electrical characteristics apply in both directions.

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

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

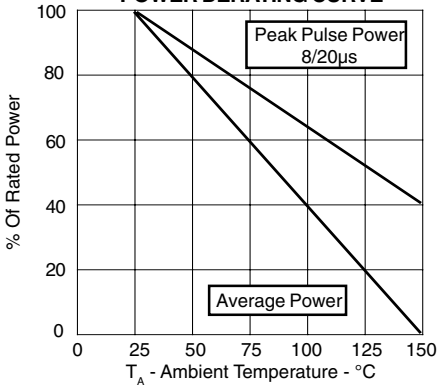


**FIGURE 2
PULSE WAVEFORM**

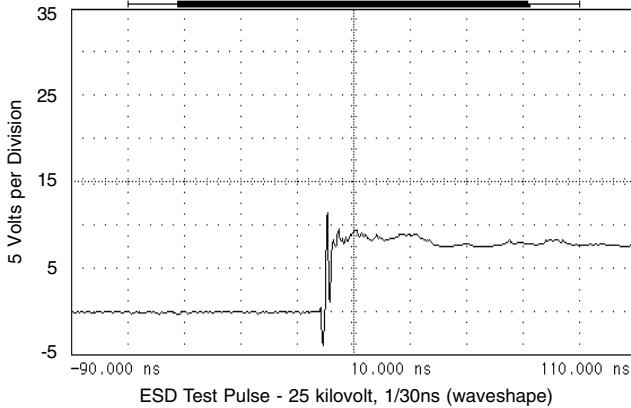


GRAPHS

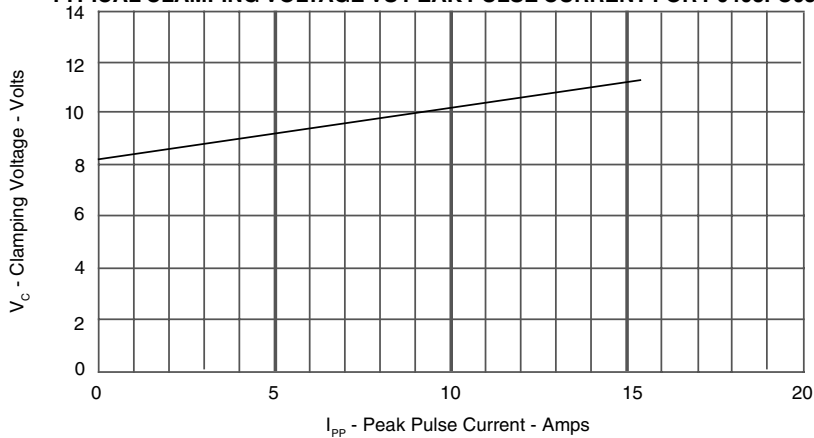
**FIGURE 3
 POWER DERATING CURVE**



**FIGURE 4
 OVERSHOOT & CLAMPING VOLTAGE FOR P0408FC05C**



**FIGURE 5
 TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR P0408FC05C**

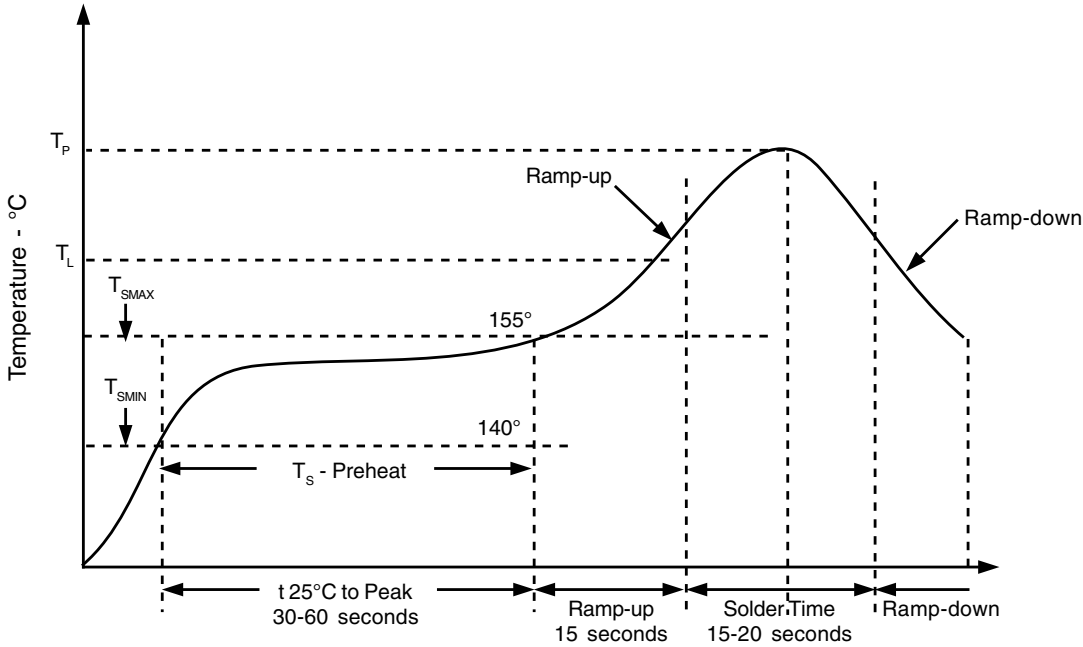
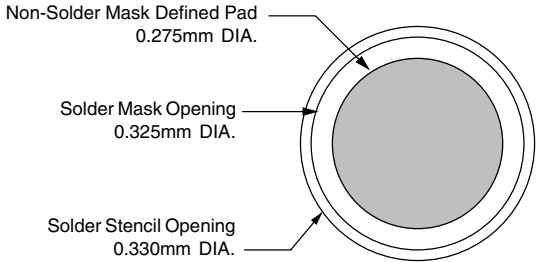


APPLICATION INFORMATION

| 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 |

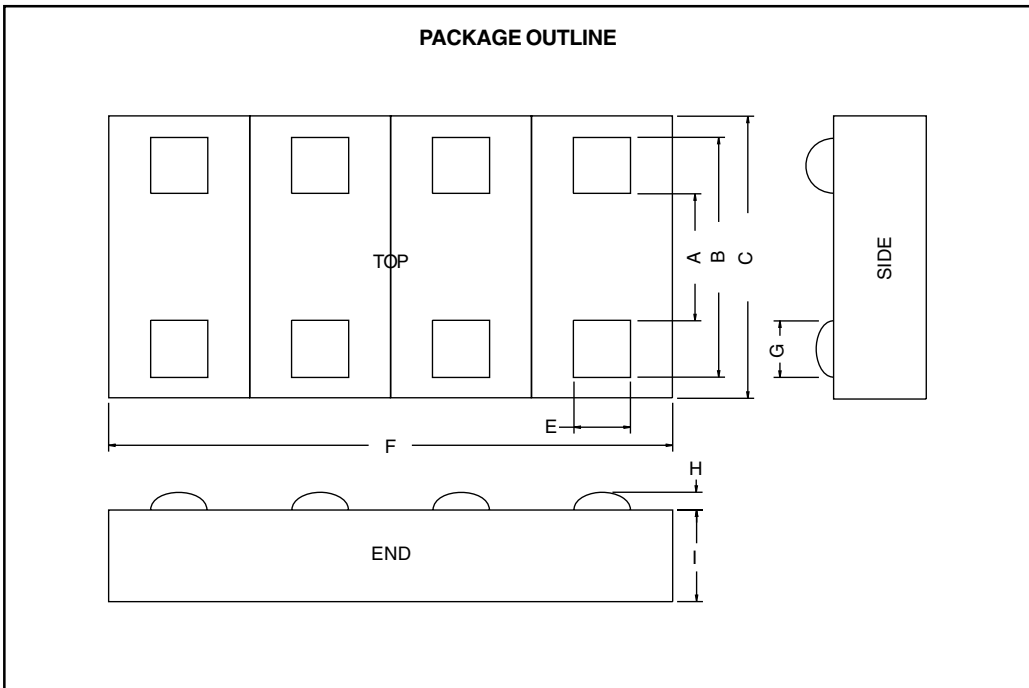
| REQUIREMENTS |
|--|
| <p>Temperature:</p> <p>T_p for Lead-Free (SnAgCu): 260-270°C</p> <p>T_p for Tin-Lead: 240-245°C</p> <p>Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.</p> |

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION



P0408FC3.3C* thru P0408FC36C*

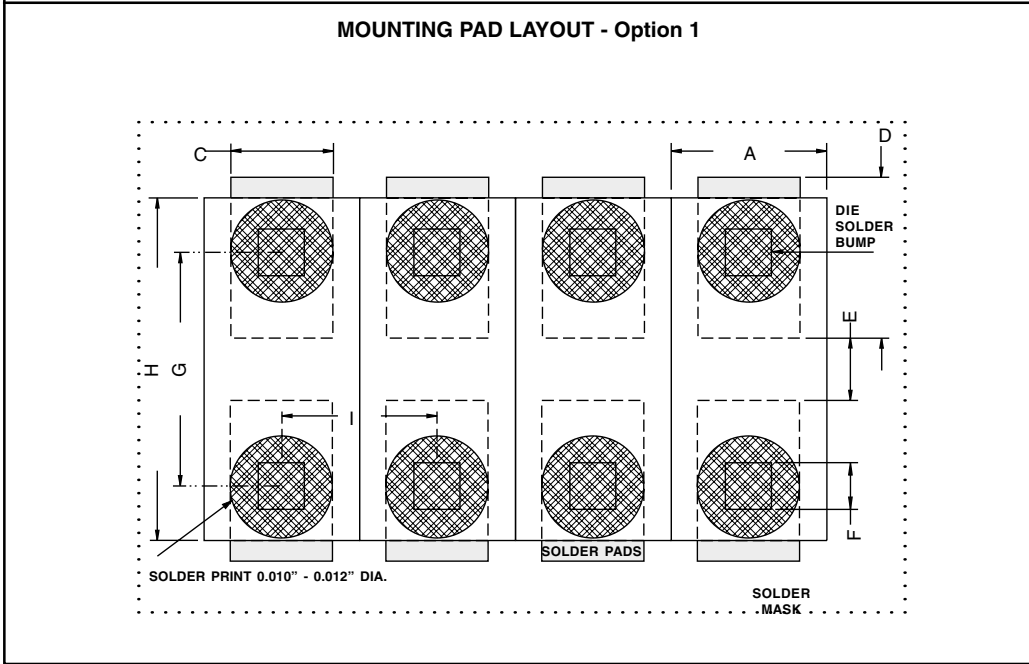
0408 PACKAGE OUTLINE & DIMENSIONS



| PACKAGE DIMENSIONS | | |
|--------------------|---------------|---------------|
| DIM | MILLIMETERS | INCHES |
| A | 0.56 NOM | 0.022 NOM |
| B | 0.86 NOM | 0.034 NOM |
| C | 0.99 ± 0.0254 | 0.039 ± 0.001 |
| E | 0.15 SQ | 0.006 SQ |
| F | 2.0 ± 0.0254 | 0.079 ± 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 |

NOTES:

- Controlling dimensions in inches.
- Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002").



| 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 |

NOTE:

- Preferred:* Using 0.1mm (0.004") stencil.

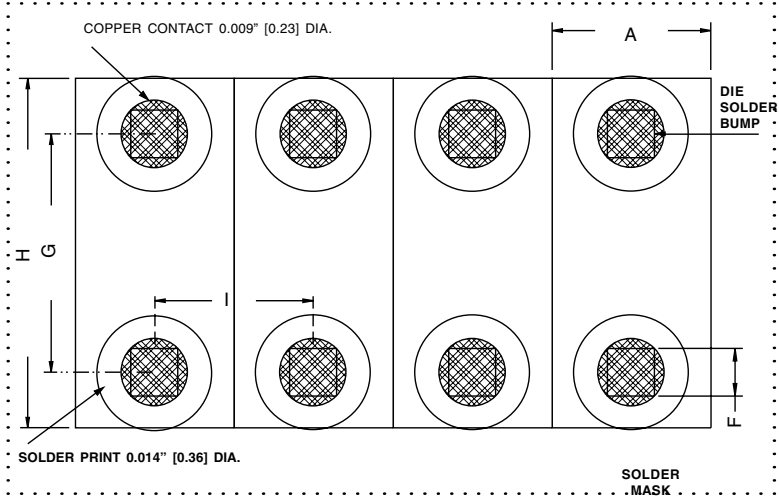
P0408FC3.3C*

thru

P0408FC36C*

0408 PACKAGE OUTLINE & DIMENSIONS

MOUNTING PAD LAYOUT - Option 2

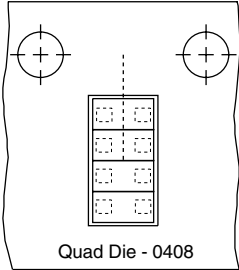


PACKAGE DIMENSIONS

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

TAPE & REEL ORIENTATION



- NOTE:**
- Top view of tape. Solder bumps are face down in tape package.

TAPE & REEL ORDERING NOMENCLATURE

- Surface mount product is taped and reeled in accordance with EIA 481.
- 8mm Plastic Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-1, i.e., P0408FC05C-T75-1.
- 8mm Paper Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-2, i.e., P0408FC05C-T75-2.
- Suffix - LF = Lead-Free, i.e., P0408FC05C-LF-T75-1.

Outline & Dimensions: Rev 4 - 2/04, 06021

COPYRIGHT © ProTek Devices 2007

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
 Web Site: www.protekdevices.com