

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

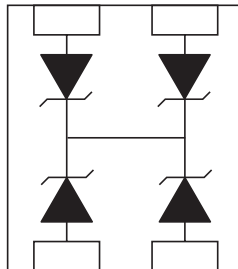
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Voltages Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line ($t_p = 8/20\mu s$)
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 to 3 Lines
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0404
- ✓ 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



P0404FC3.3C* thru P0404FC36C*

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

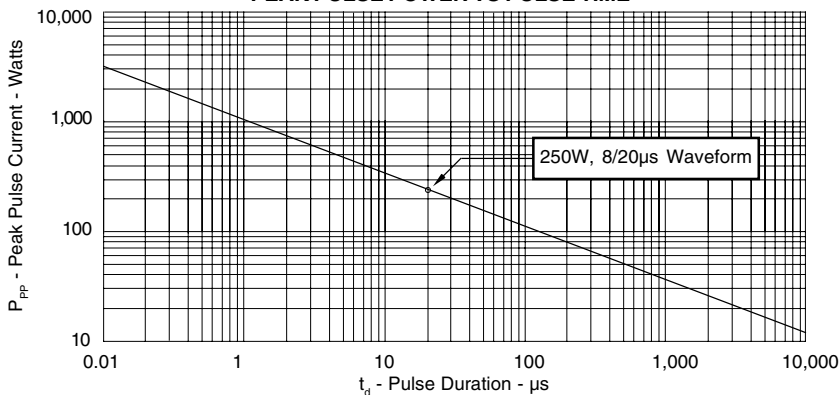
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

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
P0404FC3.3C	3.3	4.0	7.0	12.5V @ 20A	75*	150
P0404FC05C	5.0	6.0	11.0	14.7V @ 17A	10**	100
P0404FC08C	8.0	8.5	13.2	19.2V @ 13A	10***	75
P0404FC12C	12.0	13.3	19.8	29.7V @ 9.0A	1	50
P0404FC15C	15.0	16.7	25.4	35.7V @ 7.0A	1	40
P0404FC24C	24.0	26.7	37.2	55.0V @ 5.0A	1	30
P0404FC36C	36.0	40.0	70.0	84.0V @ 3.0A	1	25

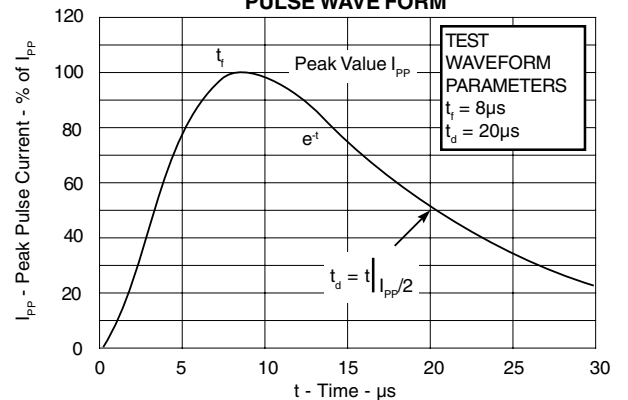
Note 1: All devices are bidirectional. Electrical characteristics apply in both directions.

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**

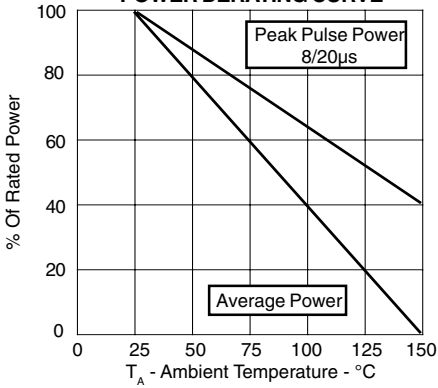


**FIGURE 2
PULSE WAVEFORM**

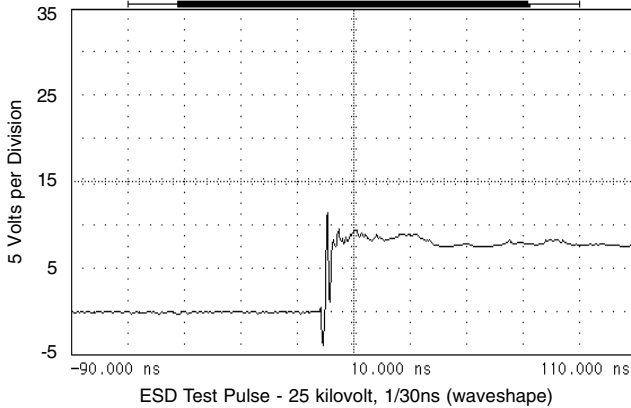


GRAPHS

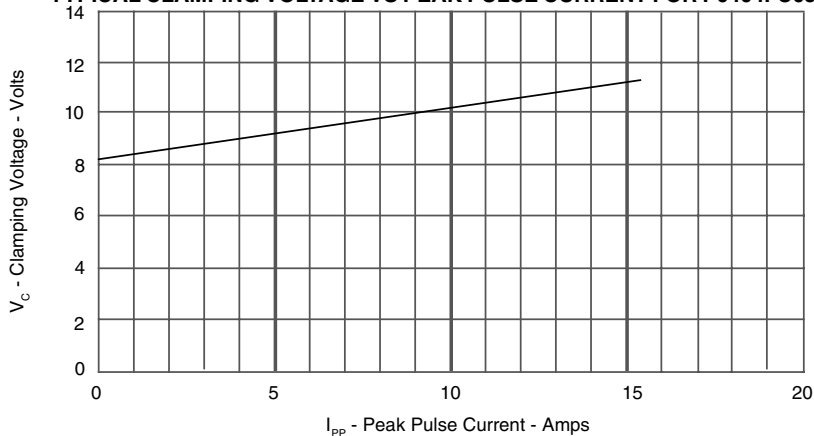
**FIGURE 3
 POWER DERATING CURVE**



**FIGURE 4
 OVERSHOOT & CLAMPING VOLTAGE FOR P0404FC05C**



**FIGURE 5
 TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR P0404FC05C**

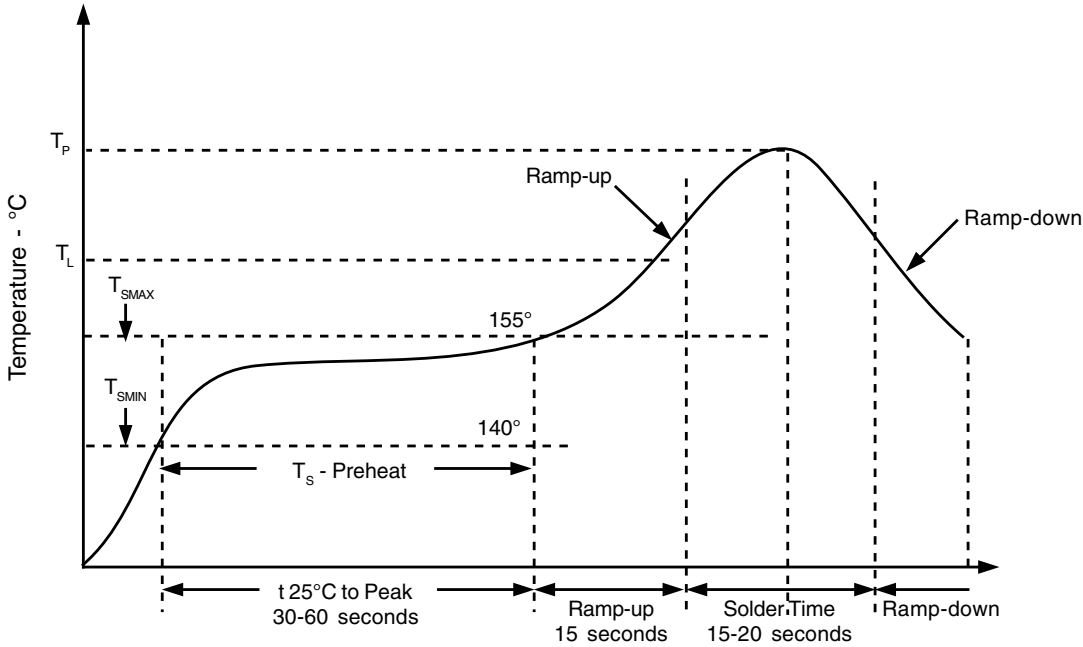
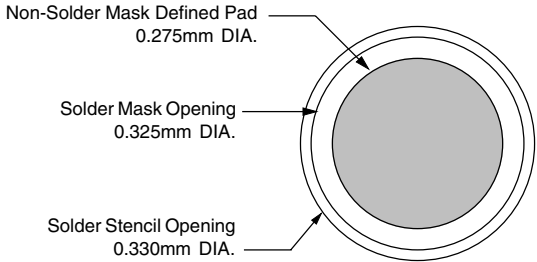


APPLICATION INFORMATION

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

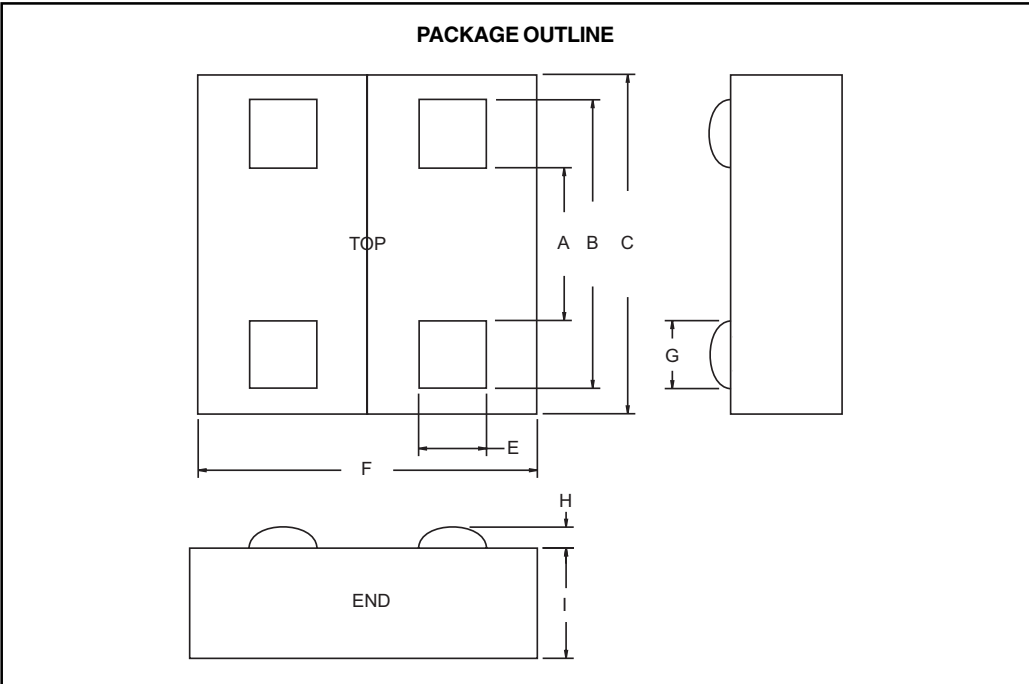
REQUIREMENTS
<p>Temperature:</p> <p>T_p for Lead-Free (SnAgCu): 260-270°C</p> <p>T_p for Tin-Lead: 240-245°C</p> <p>Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.</p>

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION



P0404FC3.3C* thru P0404FC36C*

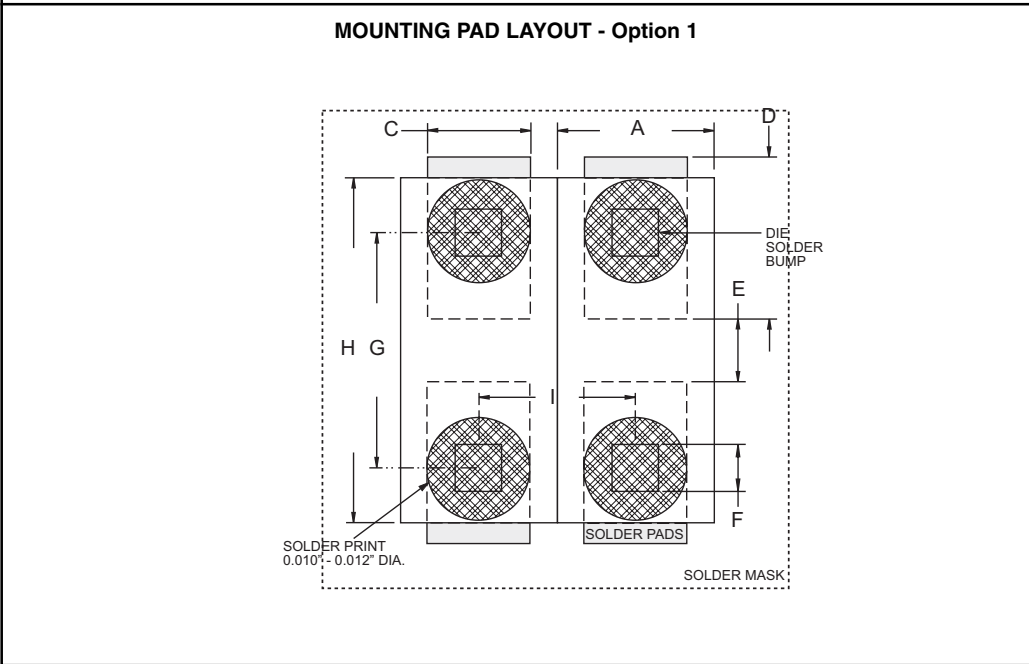
0404 PACKAGE OUTLINE & DIMENSIONS



PACKAGE DIMENSIONS		
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
	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

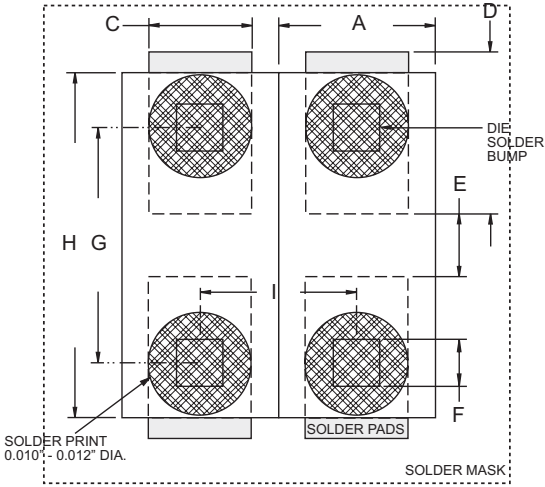
NOTE:

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

P0404FC3.3C* thru P0404FC36C*

0404 PACKAGE OUTLINE & DIMENSIONS

MOUNTING PAD LAYOUT - Option 2



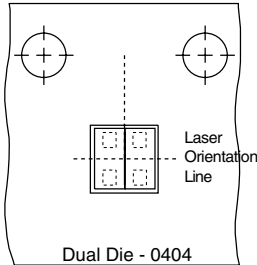
PACKAGE DIMENSIONS

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.

Outline & Dimensions: Rev 4 - 9/04, 06022

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., P0404FC05C-T75-1.
- 8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2, i.e., P0404FC05C-T710-2.
- Suffix - LF = Lead-Free, i.e., P0404FC05C-LF-T710-2.

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