

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

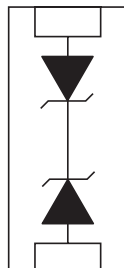
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Voltages Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0402
- ✓ 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



P0402FC3.3C* thru P0402FC36C*

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

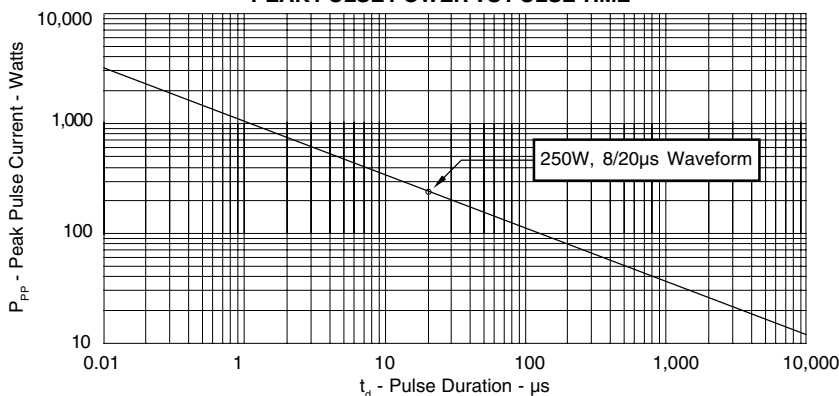
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

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
P0402FC3.3C	3.3	4.0	7.0	12.5V @ 20A	75*	150
P0402FC05C	5.0	6.0	11.0	14.7V @ 17A	10**	100
P0402FC08C	8.0	8.5	13.2	19.2V @ 13A	10***	75
P0402FC12C	12.0	13.3	19.8	29.7V @ 9.0A	1	50
P0402FC15C	15.0	16.7	25.4	35.7V @ 7.0A	1	40
P0402FC24C	24.0	26.7	37.2	55.0V @ 5.0A	1	30
P0402FC36C	36.0	40.0	70.0	84.0V @ 3.0A	1	25

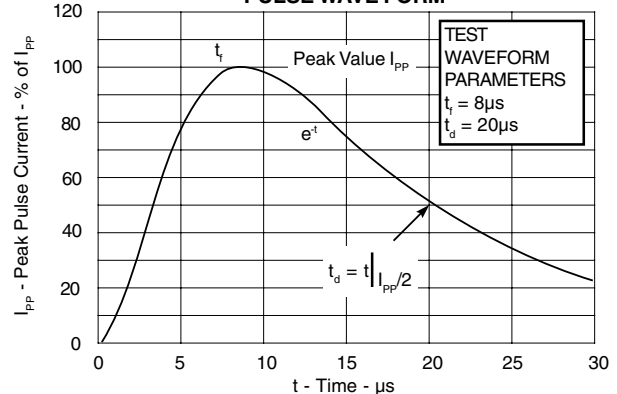
Note 1: All devices are bidirectional. Electrical characteristics apply in both directions.

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**



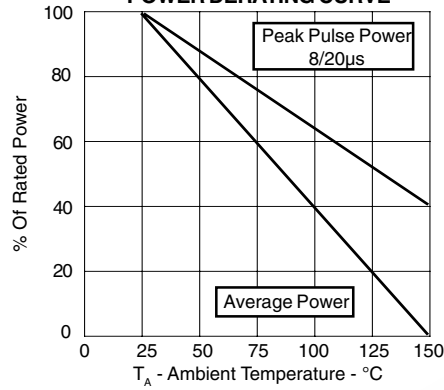
**FIGURE 2
PULSE WAVEFORM**



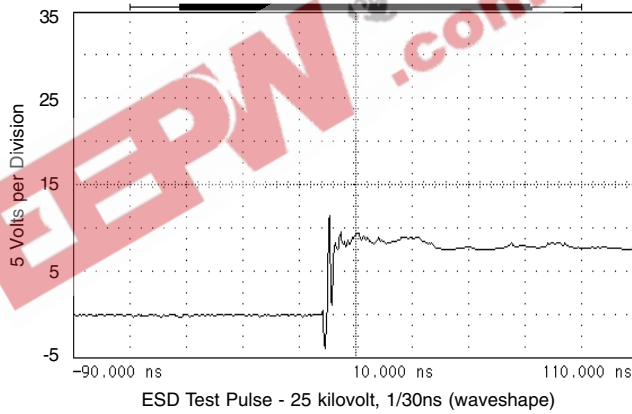
P0402FC3.3C*
thru
P0402FC36C*

GRAPHS

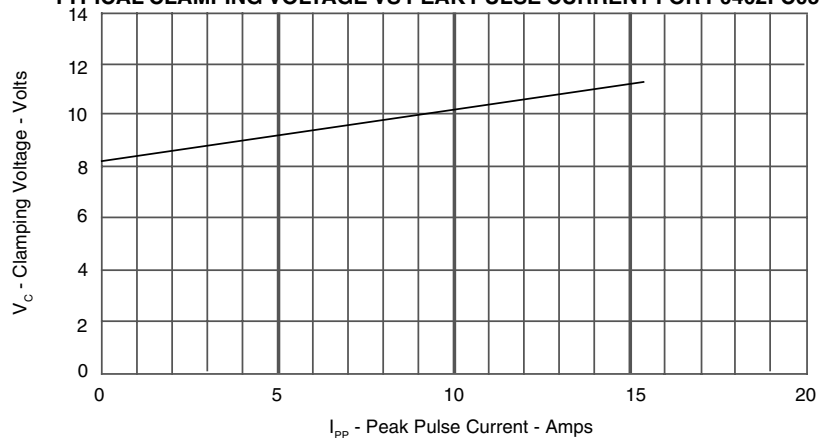
**FIGURE 3
 POWER DERATING CURVE**



**FIGURE 4
 OVERSHOOT & CLAMPING VOLTAGE FOR P0402FC05C**



**FIGURE 5
 TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR P0402FC05C**



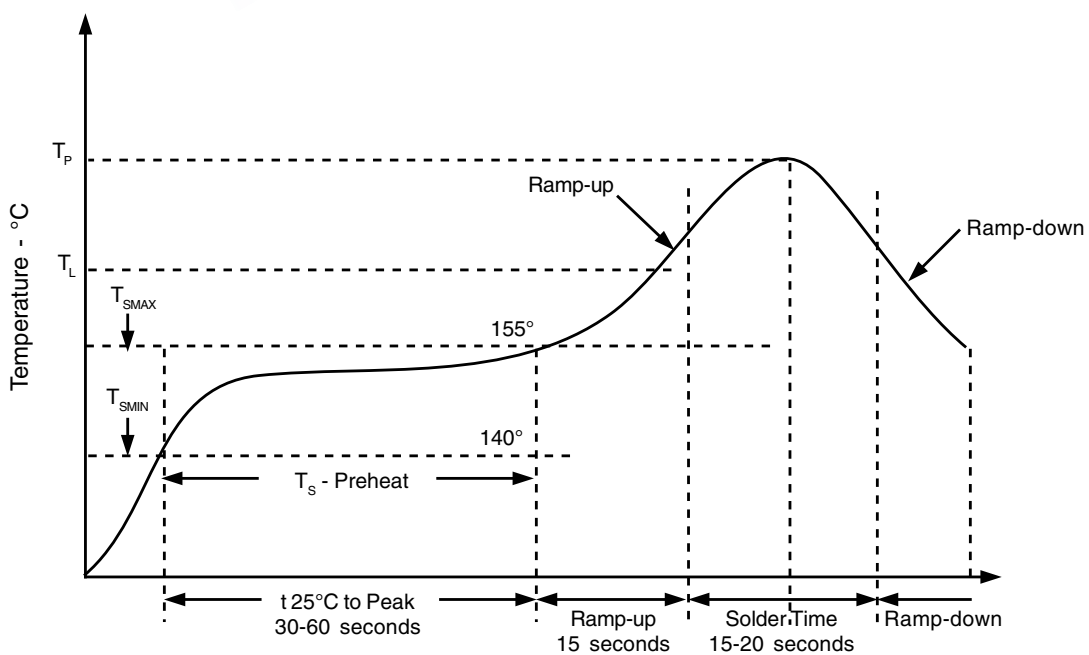
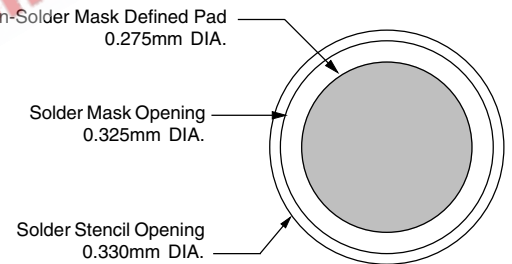
P0402FC3.3C* thru P0402FC36C*

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
Temperature: T_p for Lead-Free (SnAgCu): 260-270°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.

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION



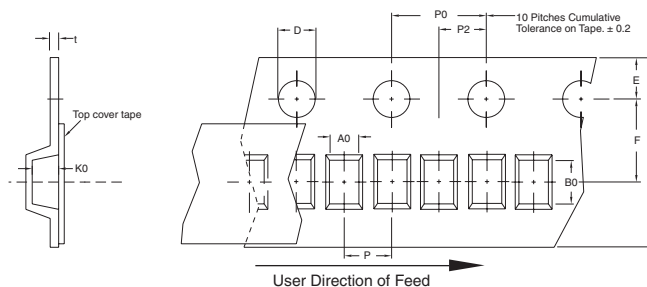
P0402FC3.3C* thru P0402FC36C*

0402 PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE		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		
G	0.20 NOM	0.008 NOM		
H	0.127 MAX	0.005 MAX		
I	0.076 MIN	0.003 MIN		
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				
NOTE: 1. Preferred: Using 0.1mm (0.004") stencil.				
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., P0402FC05C-T75-1). 3. 8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., P0402FC05C-T710-2). 4. Suffix - LF = Lead-Free, i.e., P0402FC05C-LF-T75-1.				
Outline & Dimensions: Rev 3 - 11/02, 06001				

Tape & Reel Specifications (Dimensions in millimeters)

Reel Dia.	Tape Width	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")/330mm(13")	8mm	0.80 ± 0.10	1.20 ± 0.10	0.70 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	2.00 ± 0.10	0.25



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