

## 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

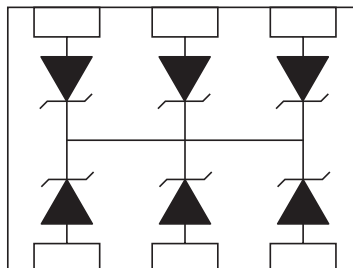
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Multiple Voltage Types Ranging From 3.3V to 36V
- ✓ 250 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu s$ )
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 3 to 5 Lines
- ✓ RoHS in Lead-Free Versions

## MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0406
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Available in Tin-Lead or Lead-Free Plating
- ✓ Solder Reflow Temperature:
  - Tin-Lead - Sn/Pb, 85/15: 240-245°C
  - Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- ✓ 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

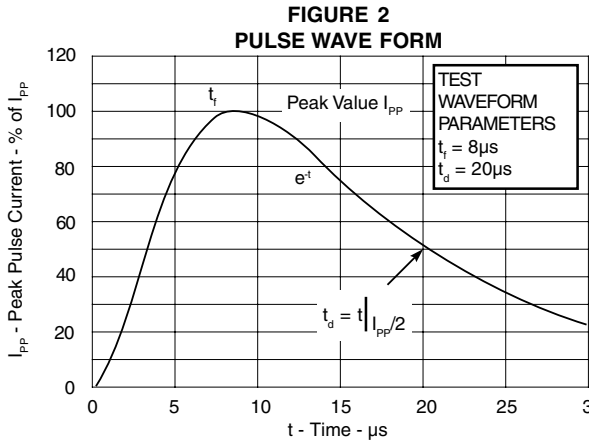
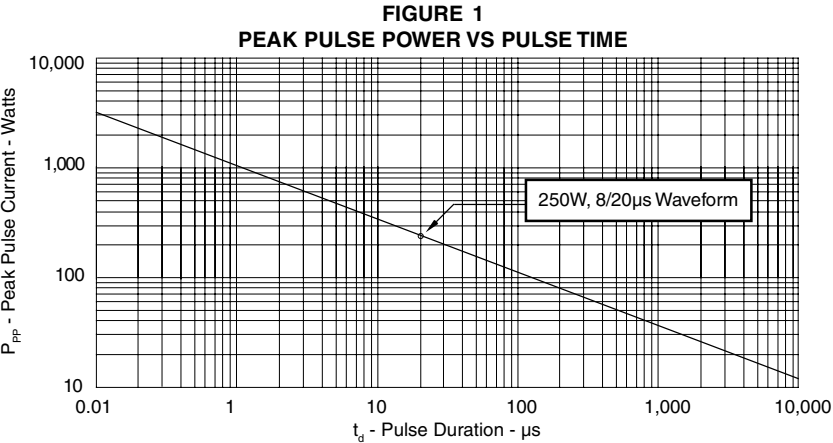


**DEVICE CHARACTERISTICS**

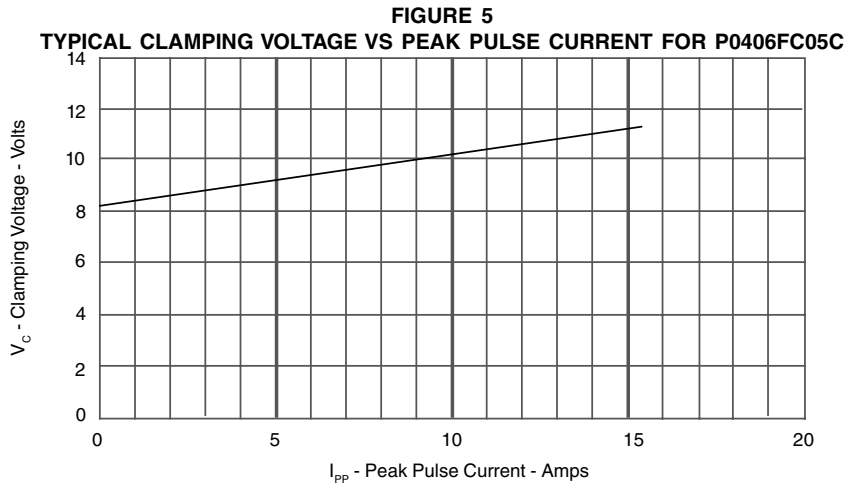
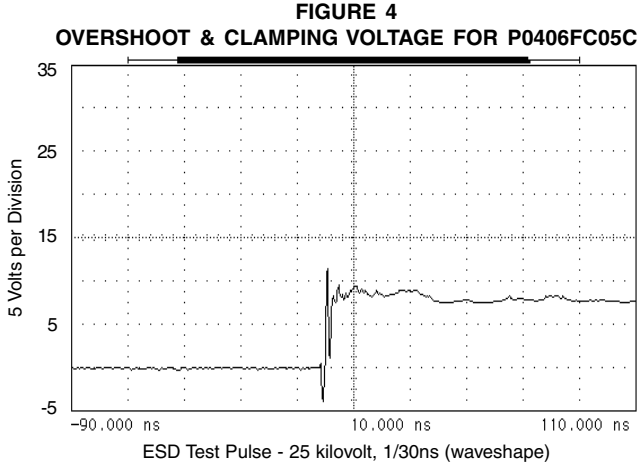
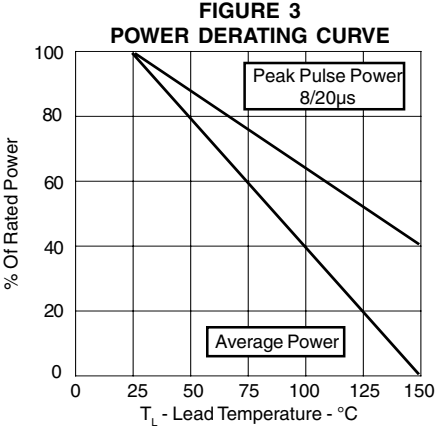
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1	$P_{PP}$	250	Watts
Operating Temperature	$T_J$	-55°C to 150°C	°C
Storage Temperature	$T_{STG}$	-55°C to 150°C	°C

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
		@ 1mA $V_{(BR)}$ VOLTS	@ $I_p = 1A$ $V_C$ VOLTS	@ 8/20 $\mu s$ $V_C @ I_{PP}$	@ $V_{WM}$ $I_D$ $\mu A$	@ 0V, 1 MHz C pF
P0406FC3.3C	3.3	4.0	7.0	12.5V @ 20A	75*	150
P0406FC05C	5.0	6.0	9.8	14.7V @ 17A	10**	100
P0406FC08C	8.0	8.5	13.4	19.2V @ 13A	10***	75
P0406FC12C	12.0	13.3	19.0	29.7V @ 9.0A	1	50
P0406FC15C	15.0	16.7	24.0	35.7V @ 7.0A	1	40
P0406FC24C	24.0	26.7	43.0	55.0V @ 5.0A	1	30
P0406FC36C	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 $\mu A$  @ 2.8V. \*\*Maximum leakage current < 500nA @ 3.3V. \*\*\*Maximum leakage current < 200nA @ 5V.



GRAPHS

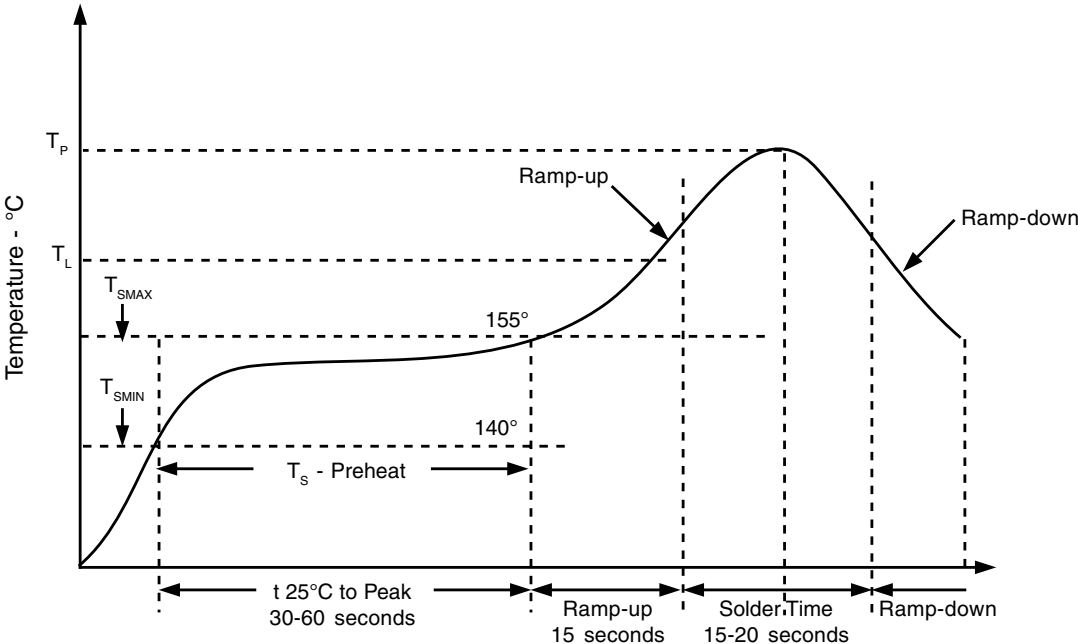
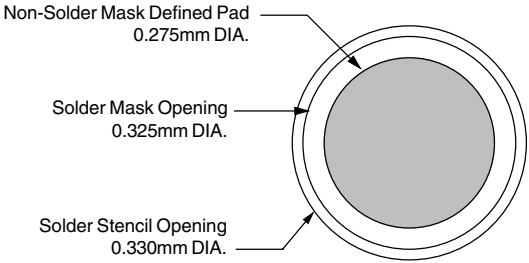


**APPLICATION INFORMATION**

<b>PRINTED CIRCUIT BOARD RECOMMENDATIONS</b>	
<b>PARAMETER</b>	<b>VALUE</b>
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

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

**RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION**



# P0406FC3.3C\* thru P0406FC36C\*

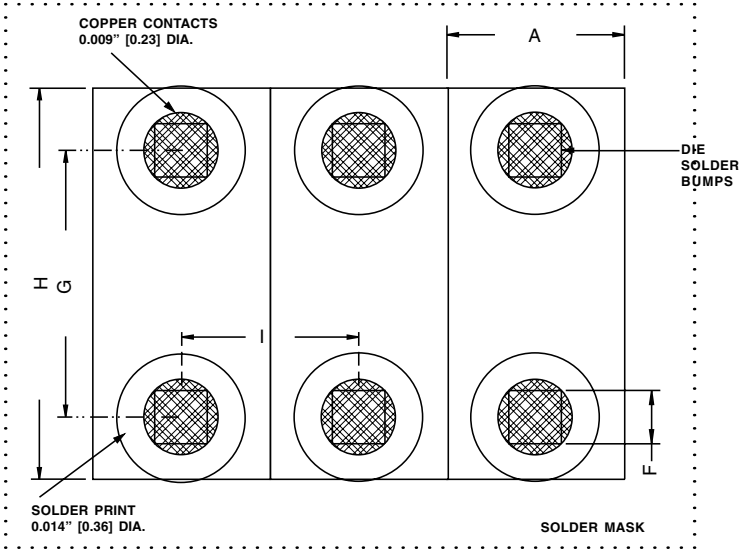
## PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE		PACKAGE DIMENSIONS		
		<b>DIM</b>	<b>MILLIMETERS</b>	<b>INCHES</b>
A	0.56 NOM	0.022 NOM		
B	0.86 NOM	0.034 NOM		
C	$0.99 \pm 0.0254$	$0.039 \pm 0.001$		
E	0.15 SQ	0.006 SQ		
F	$1.5 \pm 0.0254$	$0.059 \pm 0.001$		
G	0.15 NOM	0.006 NOM		
H	0.127 MAX 0.076 MIN	0.005 MAX 0.003 MIN		
I	0.406 NOM	0.016 NOM		
<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: <math>.xxx \pm 0.05\text{mm}</math> (<math>\pm 0.002</math>").</li> </ol>				
MOUNTING PAD LAYOUT - Option 1		PAD DIMENSIONS		
		<b>DIM</b>	<b>MILLIMETERS</b>	<b>INCHES</b>
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>NOTE:</b></p> <ol style="list-style-type: none"> <li><i>Preferred:</i> Using 0.1mm (0.004") stencil.</li> </ol>				
<b>Outline &amp; Dimensions: Rev 3 - 11/02, 06023</b>				

# P0406FC3.3C\* thru P0406FC36C\*

## PACKAGE OUTLINE & DIMENSIONS

MOUNTING PAD LAYOUT - Option 2



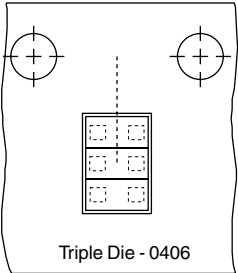
PACKAGE DIMENSIONS

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

Outline & Dimensions: Rev 3 - 11/02, 06023

TAPE & REEL ORIENTATION



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

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., P0406FC05C-T75-1).
3. 8mm Paper Tape: 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-2 (i.e., P0406FC05C-T75-2).
4. Suffix - LF = Lead-Free, i.e., P0406FC05C-LF-T75-2.

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