

**BIDIRECTIONAL UNBUMPED LOW CAPACITANCE FLIP CHIP**
**APPLICATIONS**

- ✓ Cellular Phones
- ✓ Handheld Electronics
- ✓ Personal Digital Assistants (PDAs)
- ✓ Notebook Computers
- ✓ SMART Cards

**IEC COMPATIBILITY (EN61000-4)**

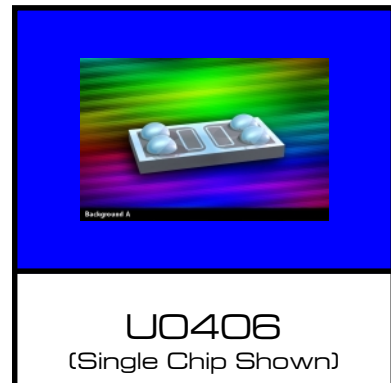
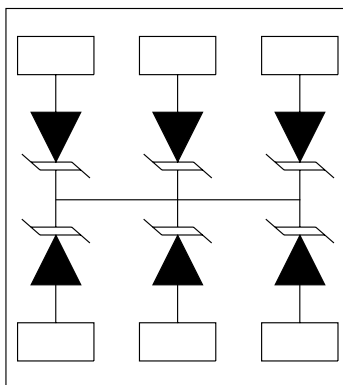
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

**FEATURES**

- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Six Voltage Types Ranging From 3.3V to 24V
- ✓ 200 Watts Peak Pulse Power per Line (8/20 $\mu$ s)
- ✓ Low Clamping Voltage
- ✓ Monolithic Structure
- ✓ **LOW CAPACITANCE**
- ✓ **LOW STANDBY CURRENT**

**MECHANICAL CHARACTERISTICS**

- ✓ Standard EIA Chip Size: 0406
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
- ✓ Device Marking On Reel


**CIRCUIT DIAGRAM**


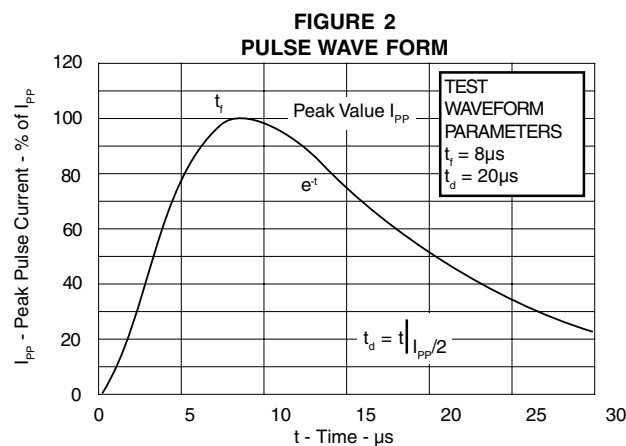
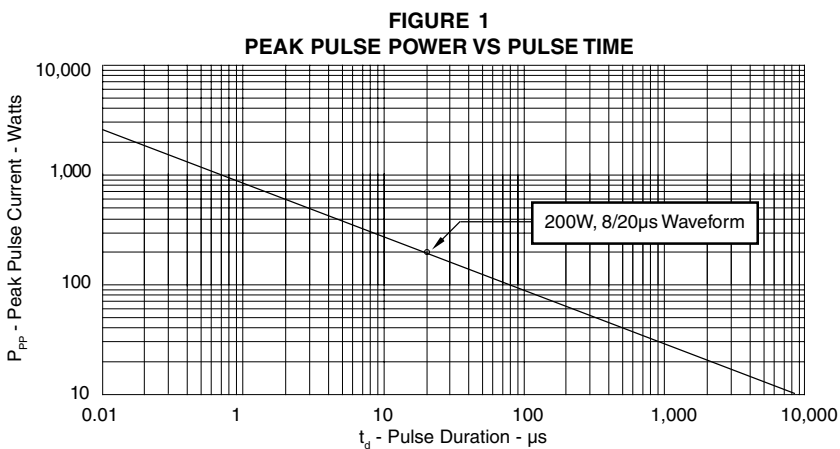
# ULC0406FC3.3C thru ULC0406FC24C

## 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	$P_{PP}$	200	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	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM LEAKAGE CURRENT	TYPICAL CAPACITANCE
	$V_{WM}$ VOLTS	@ 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
ULC0406FC3.3C	3.3	4.0	7.0	12.5V @ 16A	75	70
ULC0406FC05C	5.9	6.0	11.0	13V @ 15A	10	35
ULC0406FC08C	8.0	8.0	13.2	18V @ 11A	1	32
ULC0406FC12C	12.0	13.3	19.8	26.9V @ 7.4A	1	30
ULC0406FC15C	15.0	16.7	25.4	34.5V @ 5.8A	1	25
ULC0406FC24C	24.0	26.7	37.2	50.6V @ 4A	1	20

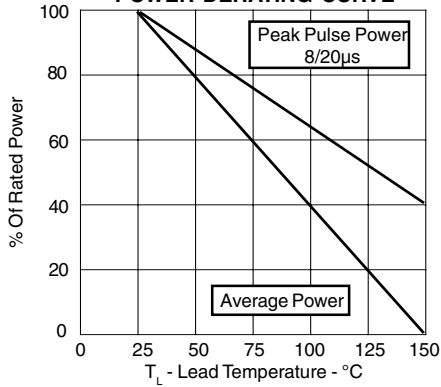
**Note 1:** All devices are bidirectional. Electrical characteristics apply in both directions. Electrical characteristics for 3V, 8V, 12V, 15V and 24V devices are preliminary.



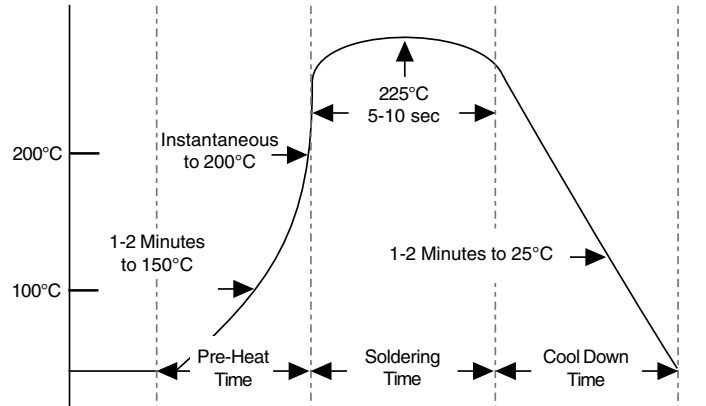
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## GRAPHS

**FIGURE 3  
POWER DERATING CURVE**

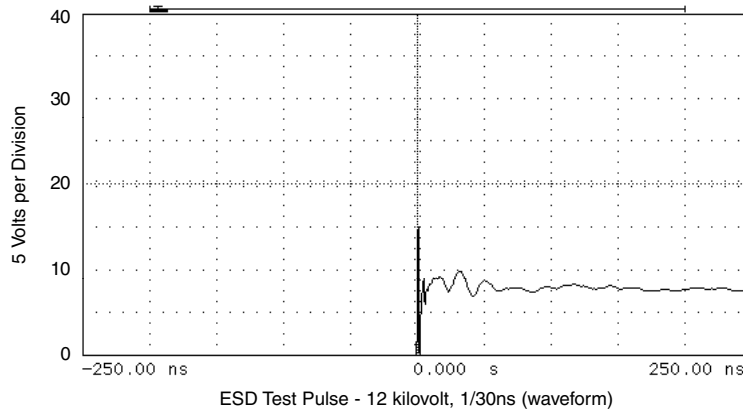


**FIGURE 4  
REFLOW SOLDER PROFILE**

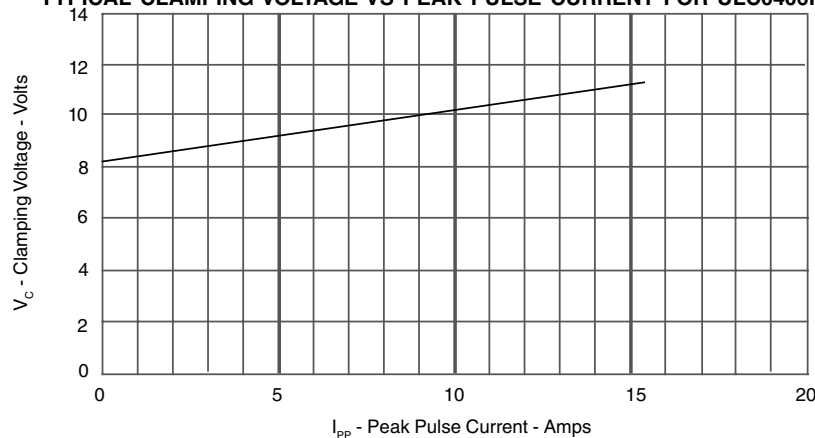


**Note:** This reflow profile does not take into account the printed circuit board (PCB) material heating time. Additional time may be required for the preheat time and cool down time upon the PCB or board material.

**FIGURE 5  
OVERSHOOT & CLAMPING VOLTAGE FOR ULC0406FC05C**



**FIGURE 6  
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR ULC0406FC05C**



# ULC0406FC3.3C thru ULC0406FC24C

## PACKAGE OUTLINE & DIMENSIONS

### PACKAGE OUTLINE

Metalized Die Contacts

END

U0406

Picture Not Available

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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	1.5 ± 0.0254	0.059 ± 0.001
I	0.406 NOM	0.016 NOM

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### MOUNTING PAD - Option 1

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.

**NOTES:**

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

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### 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., ULC0406FC05C-T75-1).

*Paper Tape:* 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-2 (i.e., ULC0406FC05C-T75-2).

### TAPE & REEL ORIENTATION

Triple Die - 0406

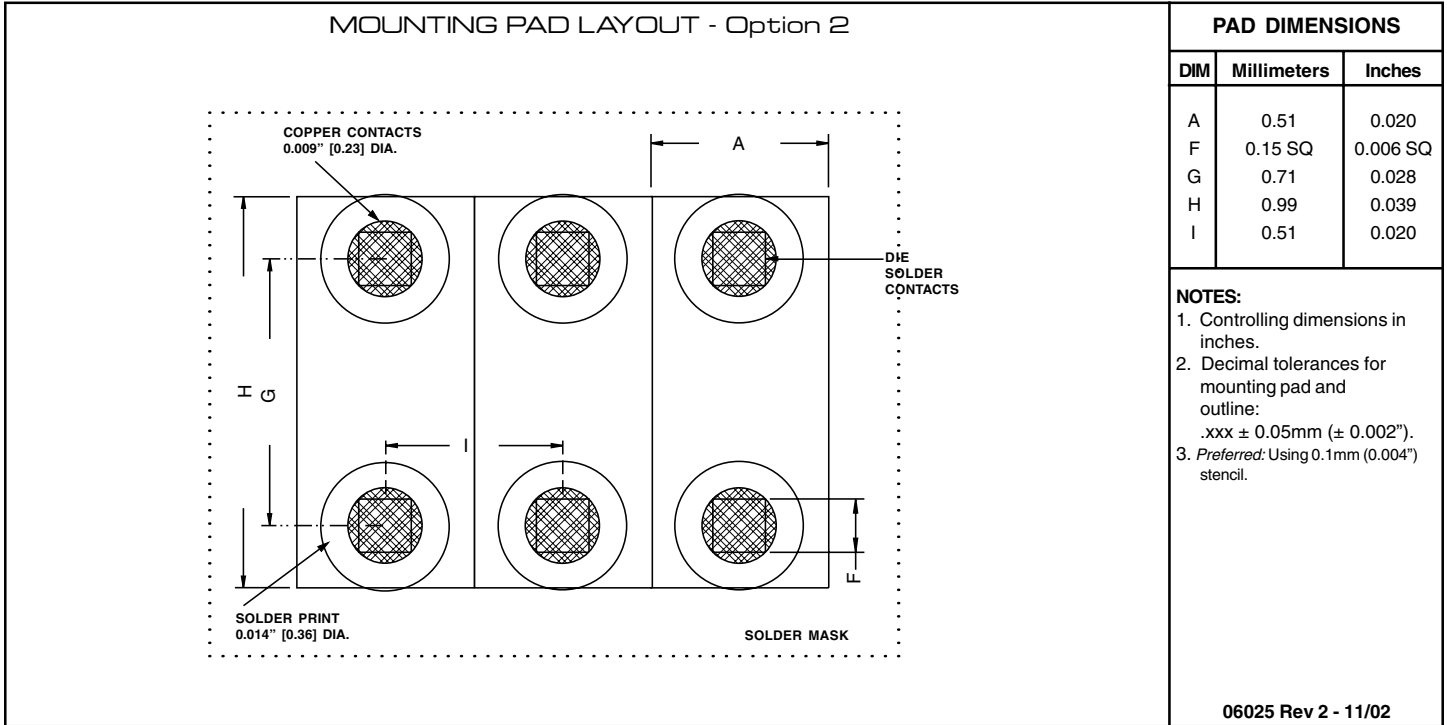
**NOTE:**

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

**06025 Rev 2 - 11/02**

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## PACKAGE OUTLINE & DIMENSIONS



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