

LOW CAPACITANCE FLIP CHIP ARRAY

APPLICATIONS

- ✓ Cellular Phones
- ✓ Personal Digital Assistant (PDA)
- ✓ Notebook Computers
- ✓ SMART Cards

IEC COMPATIBILITY (EN61000-4)

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

FEATURES

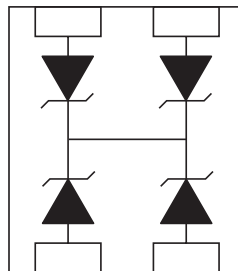
- ✓ ESD Protection > 25 kilovolts
- ✓ Available in Voltages Ranging From 3.3V to 36V
- ✓ 200 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ✓ Low Clamping Voltage
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 to 3 Lines
- ✓ **LOW CAPACITANCE**
- ✓ **LOW LEAKAGE CURRENT**
- ✓ RoHS Compliant in Lead-Free Versions

MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0404
- ✓ 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



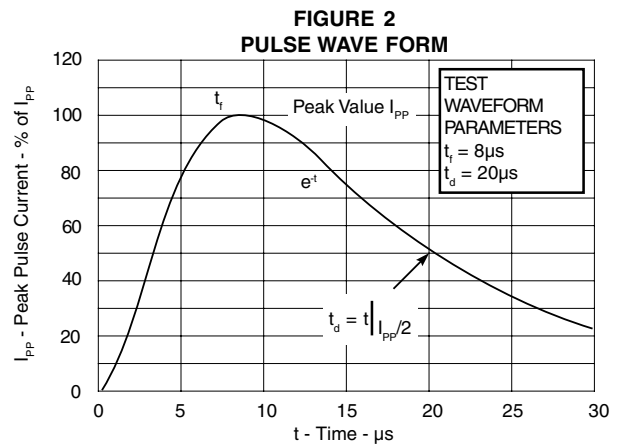
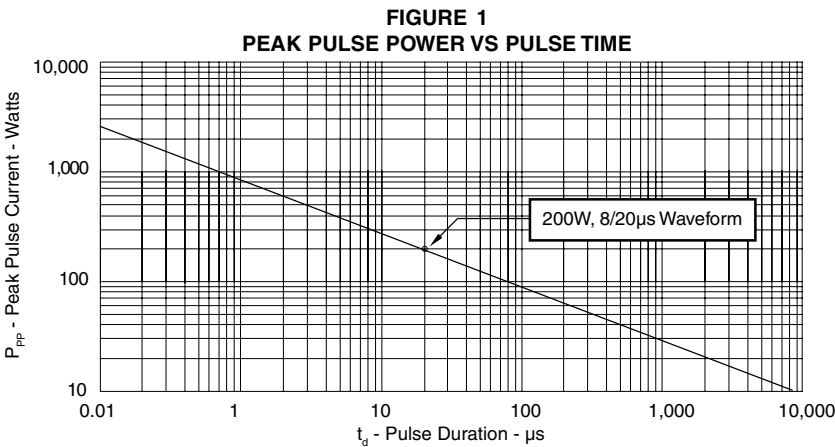
DEVICE CHARACTERISTICS

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}	200	Watts
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C

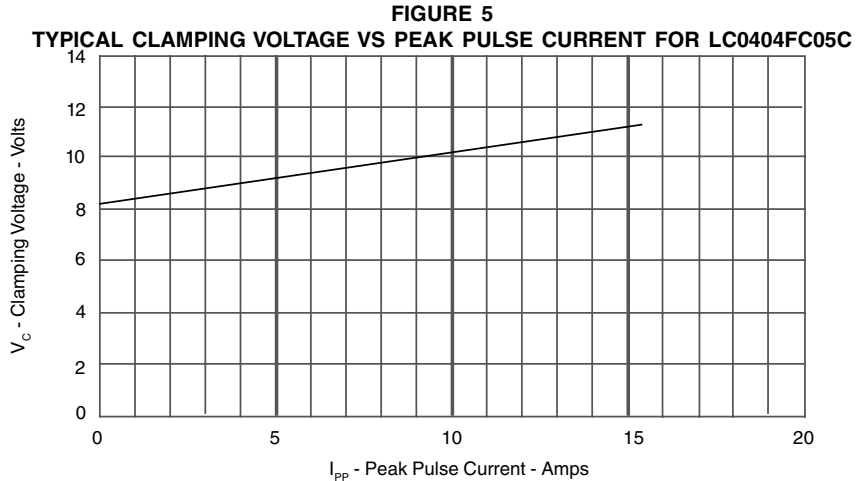
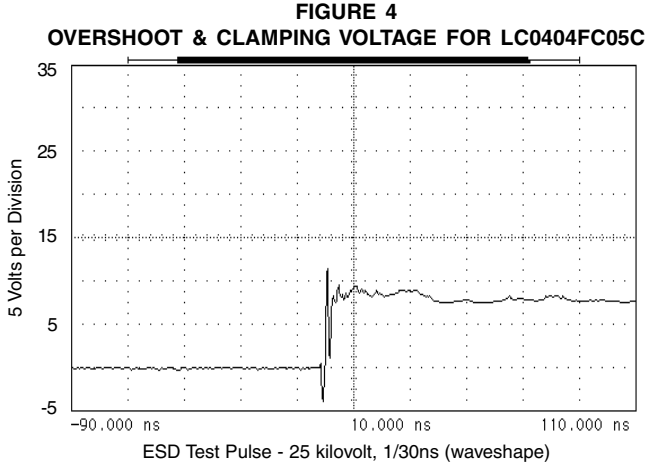
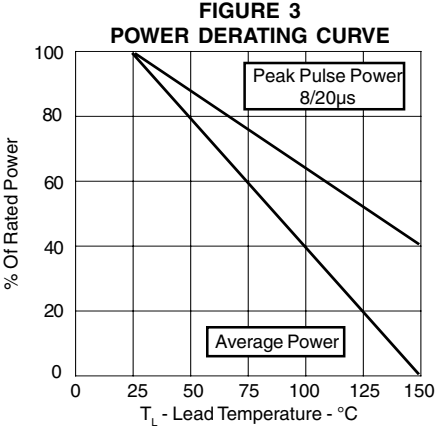
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified						
PART NUMBER (See Note 1)	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM LEAKAGE CURRENT (See Note 2)	TYPICAL CAPACITANCE @0V, 1 MHz C pF
		@ 1mA $V_{(BR)}$ VOLTS	@ $I_p = 1A$ V_C VOLTS	@ 8/20 μs $V_C @ I_{PP}$	@ V_{WM} I_D μA	
LC0404FC3.3C	3.3	4.0	7.0	12.5V @ 16A	75*	70
LC0404FC05C	5.9	6.0	11.0	13V @ 15A	10**	35
LC0404FC08C	8.0	8.5	13.2	18V @ 11A	1	32
LC0404FC12C	12.0	13.3	19.8	26.9V @ 7.4A	1	30
LC0404FC15C	15.0	16.7	25.4	34.5V @ 5.8A	1	25
LC0404FC24C	24.0	26.7	37.2	50.6V @ 4A	1	20
LC0404FC36C	36.0	40.0	70.0	80.0V @ 2.5A	1	18

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

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



GRAPHS

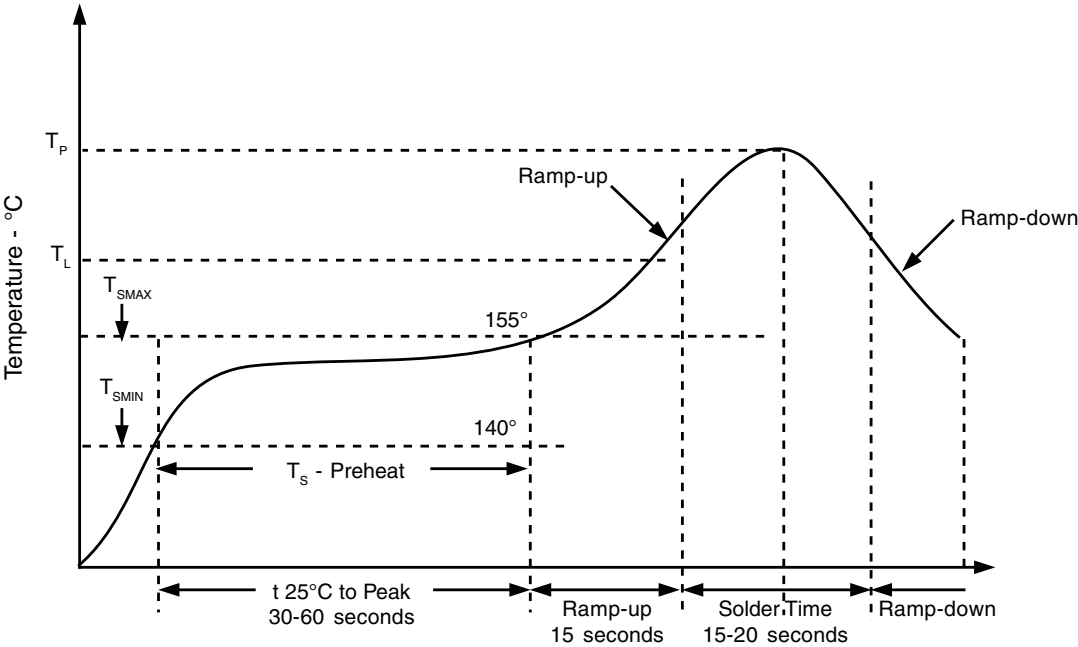
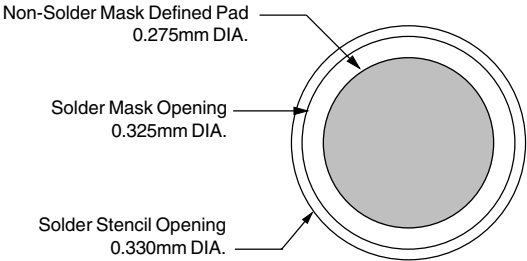


APPLICATION INFORMATION

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

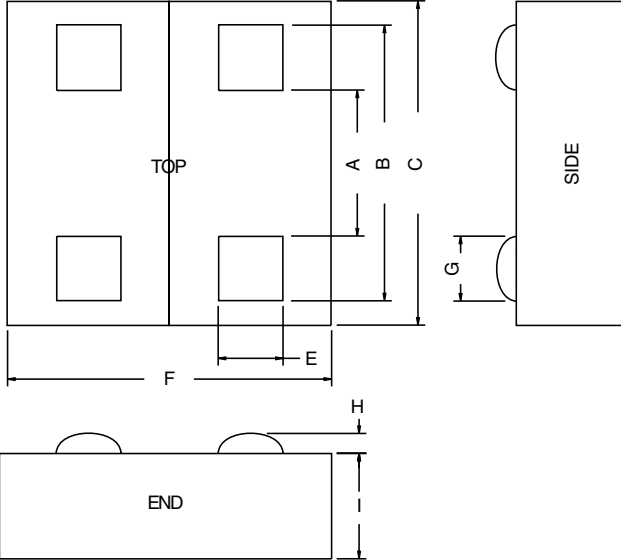
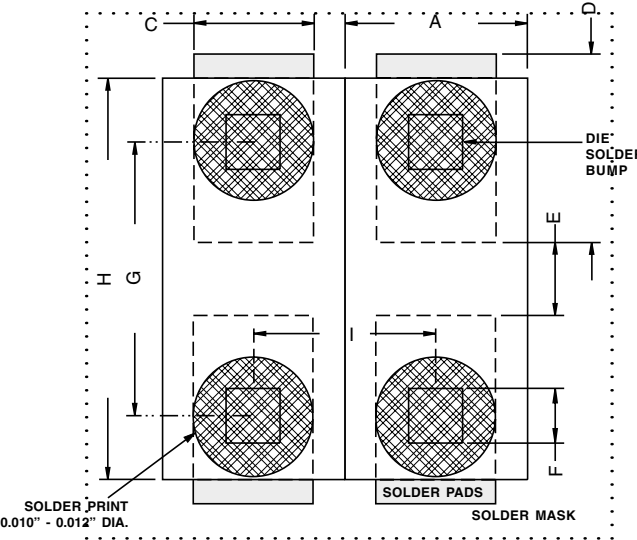
REQUIREMENTS
<p>Temperature:</p> <p>T_p for Lead-Free (SnAgCu): 260-265°C</p> <p>T_p for Tin-Lead: 240-245°C</p> <p>Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.</p>

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION



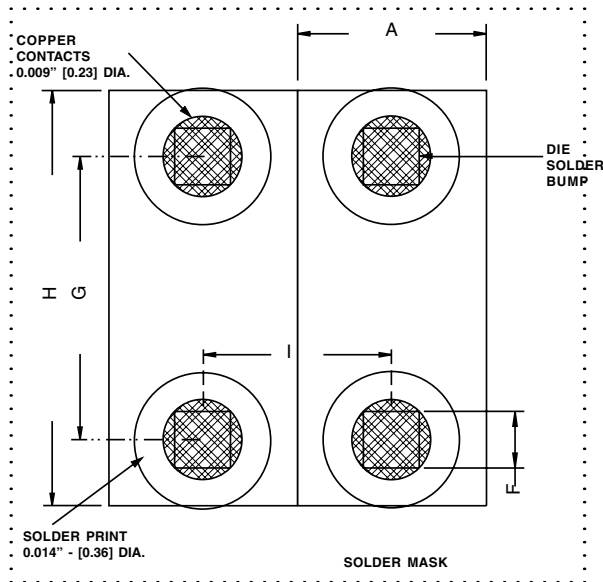
LC0404FC3.3C thru LC0404FC36C

PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE		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 0.076 MIN	0.005 MAX 0.003 MIN			
I	0.406 NOM	0.016 NOM			
<p>NOTES:</p> <ol style="list-style-type: none"> Controlling dimensions in inches. Decimal tolerances for mounting pad and outline: .xxx ± 0.05mm (± 0.002"). 					
MOUNTING PAD LAYOUT - 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			
<p>NOTE:</p> <ol style="list-style-type: none"> <i>Preferred:</i> Using 0.1mm (0.004") stencil. 					
<p>Outline & Dimensions: Rev4 - 9/04, 06022</p>					

PACKAGE OUTLINE & DIMENSIONS

MOUNTING PAD LAYOUT - Option 2



PACKAGE DIMENSIONS

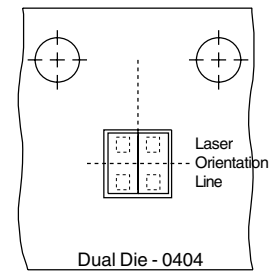
DIM	MILLIMETERS	INCHES
A	0.51	0.020
F	0.15 SQ	0.006 SQ
G	0.71	0.028
H	0.99	0.039
I	0.51	0.020

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: Rev4 - 9/04, 06022

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., LC0404FC05C-T75-1).
3. 8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering Suffix: -T710-2 (i.e., LC0404FC05C-T710-2).
4. Suffix - LF = Lead-Free, i.e., LC0404FC05C-LF-T710-2.

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