

UNBUMPED LOW CAPACITANCE FLIP CHIP ARRAY**APPLICATIONS**

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

IEC COMPATIBILITY (EN61000-4)

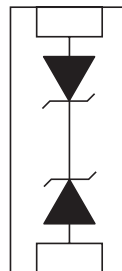
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

FEATURES

- ✓ ESD Protection > 25 kilovolts
- ✓ Low ESD Overshoot Voltage
- ✓ Bidirectional Configuration & Monolithic Structure
- ✓ Protects 1 Line
- ✓ Low Capacitance: 6pF
- ✓ Low Leakage Current
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Standard EIA Chip Size: 0402
- ✓ Weight 0.73 milligrams (Approximate)
- ✓ Solder Reflow Temperature:
Lead-Free: 260-270°C
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
- ✓ Device Marking On Reel

**PIN CONFIGURATION**

ULLC0402FC05C

DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
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 Notes 1)	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_b μA	TYPICAL CAPACITANCE 0V @ 1 MHz C pF
ULLC0402FC05C	5.0	6.0	1.0	6

Note 1: Device is bidirectional.

GRAPHS

FIGURE 1
OVERSHOOT & CLAMPING VOLTAGE

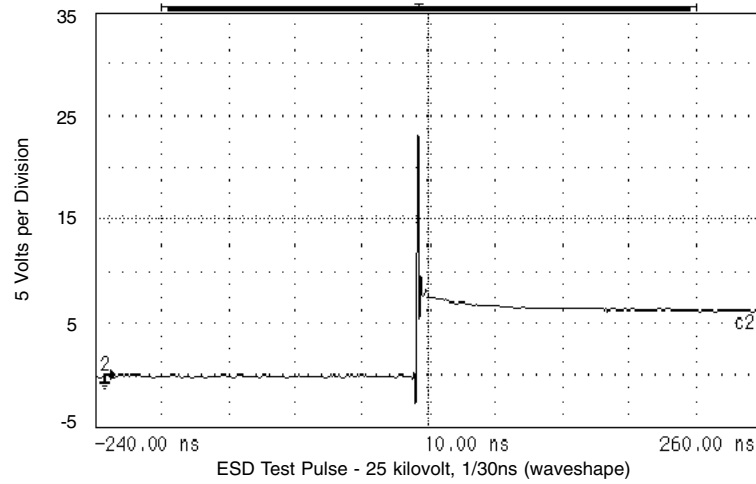
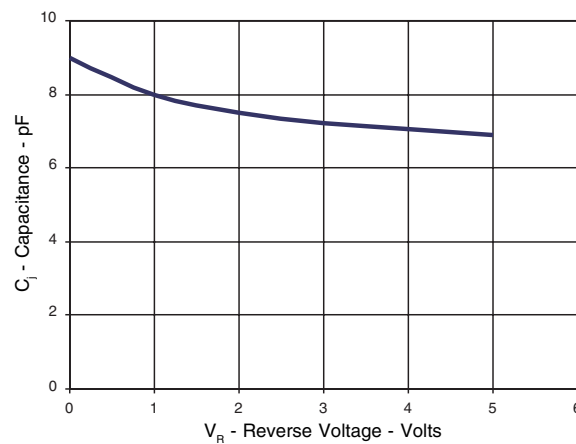


FIGURE 2
CAPACITANCE VS REVERSE VOLTAGE

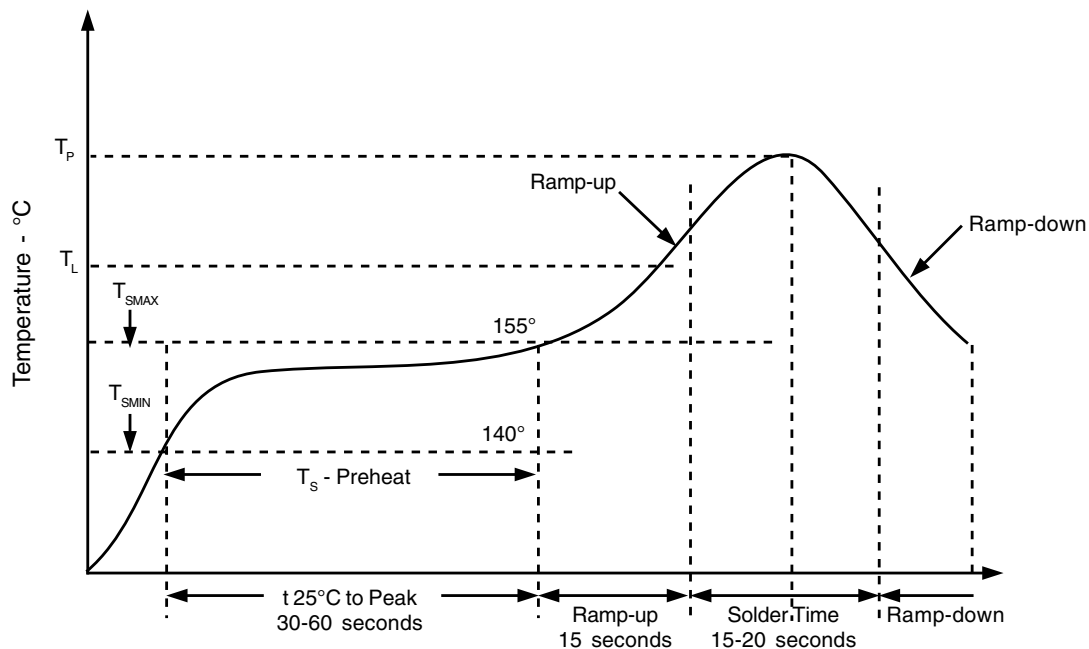
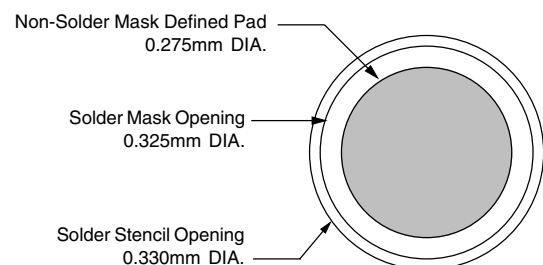


APPLICATION INFORMATION

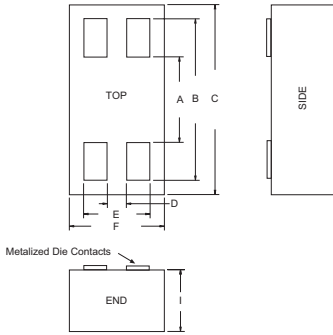
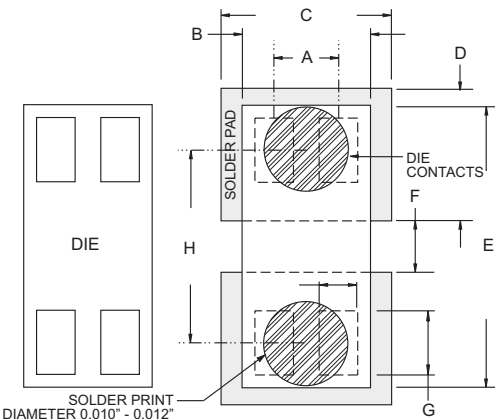
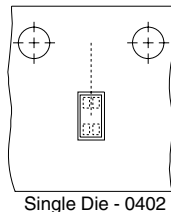
PRINTED CIRCUIT BOARD RECOMMENDATIONS	
PARAMETER	VALUE
Pad Size on PCB	0.275mm
Pad Shape	Round
Pad Definition	Non-Solder Mask Defined Pads
Solder Mask Opening	0.325mm Round
Solder Stencil Thickness	0.150mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.330mm Round
Solder Paste Type	No Clean
Pad Protective Finish	OSP(Entek Cu Plus 106A)
Tolerance - Edge To Corner Ball	$\pm 50\mu\text{m}$
Solder Ball Side Coplanarity	$\pm 20\mu\text{m}$
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



U0402 PACKAGE OUTLINE & DIMENSIONS

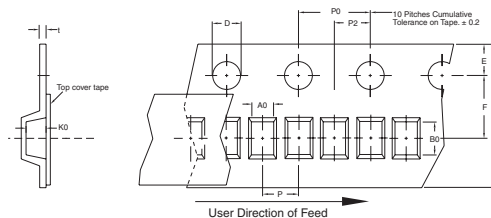
PACKAGE OUTLINE	PACKAGE DIMENSIONS		
	DIM	MILLIMETERS	INCHES
 TOP SIDE END Metalized Die Contacts	A	0.61 NOM	0.024 NOM
	B	0.86 NOM	0.034 NOM
	C	0.99 ± 0.0254	0.039 ± 0.001
	D	0.10 NOM	0.004 NOM
	E	0.35 NOM	0.014 NOM
	F	0.483 ± 0.0254	0.019 ± 0.001
	I	0.406 NOM	0.016 NOM
NOTES: 1. Controlling dimensions 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
 DIE SOLDER PAD DIE CONTACTS SOLDER PRINT DIAMETER 0.010" - 0.012"	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			
 Single Die - 0402			
NOTE: 1. Preferred: Using 0.1mm (0.004") stencil.			
Outline & Dimensions: Rev 4 - 10/05, 6020			

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., ULLC0402FC05C-T75-1.
- 8mm Paper Tape: 7 Inch Reels - 10,000 pieces per reel. Ordering suffix: -T710-2, i.e., ULLC0402FC05C-T710-2.

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



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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