NUP4103FC

ESD Protection Diode Array, 4-Channel

This integrated surge protection device is designed for applications requiring transient overvoltage protection. It is intended for use in sensitive portable equipment and other applications. Its integrated design provides very effective and reliable protection for four (4) separate lines using only one package. These devices are ideal for situations where board space is a premium.

Features

- Unidirectional, Quad ESD Protection
- Ultra−small Flip−Chip Packaging (0.95 mm x 1.33 mm)
- Compliance with IEC61000−4−2 (Level 4) Requirements
- Maximum Leakage Current of 100 nA at 3.3 V
- Pb−Free Package is Available*

Benefits

- Protects Four Data Lines from ESD while Reducing Component Count
- Small Package Saves on PCB Real Estate
- Provides Protection for ESD Industry Standards, IEC 61000, HBM and MM
- Low Leakage Capability Minimizes Power Loss in the System

Applications

- ESD Protection for Portable Equipment
- Cell Phones
- MP3 Players
- PDAs

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
ESD Discharge IEC61000−4−2, − Air Discharge − Contact Discharge Human Body Model Machine Model	V_{PP}	 30 30 16 1.6	kV
Junction Temperature	T_J	150	°C
Operating Ambient Temperature Range	T_A	−40 to +85	°C
Storage Temperature Range	T_{STG}	−55 to +150	°C

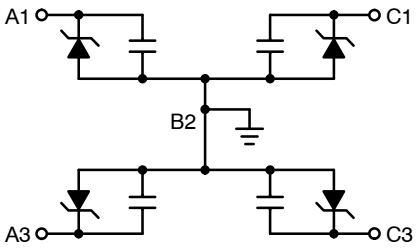
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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www.onsemi.com

CIRCUIT DESCRIPTION



MARKING DIAGRAM



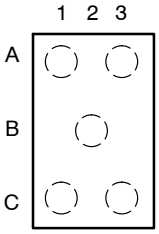
5−PIN FLIP−CHIP CSP
PLASTIC
CASE 766AB



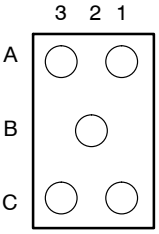
E = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

TOP VIEW (Bumps Down)



BOTTOM VIEW (Bumps Up)



ORDERING INFORMATION

Device	Package	Shipping†
NUP4103FCT1	Flip−Chip	3000/Tape & Reel
NUP4103FCT1G	Flip−Chip (Pb−Free)	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Stand−Off Voltage	V_{RWM}	I_{RWM} = 10 μA (Note 1)			5.5	V
Breakdown Voltage	V_{BR}	I_T = 1.0 mA (Note 2)	6.0	7.0	8.0	V
Leakage Current	I_R	V_{RM} = 3.3 V per line			100	nA
Junction Capacitance	C_J	V_R = 2.5 V, f = 1 MHz		30		pF

1. Surge protection devices are normally selected according to the working peak reverse voltage (V_{RWM}) which should be equal or greater than the DC or continuous peak operating voltage level.
2. V_{BR} is measured at pulse test current I_T.

TYPICAL PERFORMANCE CURVES

(T_J = 25°C unless otherwise specified)

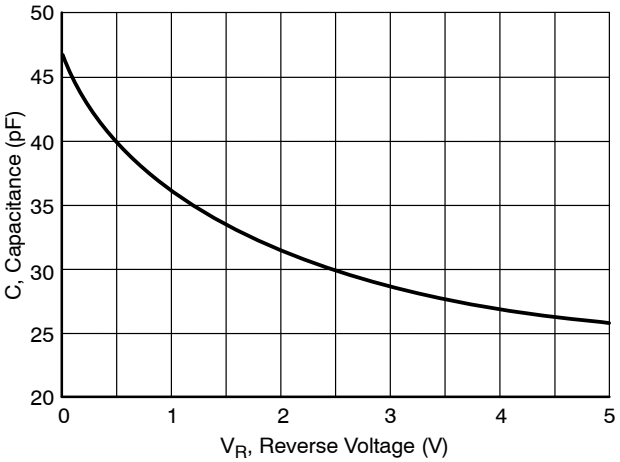


Figure 1. Reverse Voltage vs Junction Capacitance

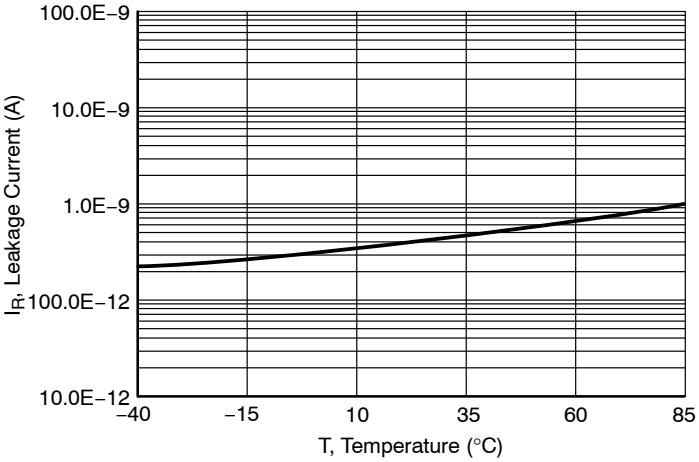


Figure 2. Reverse Leakage Current vs Junction Temperature

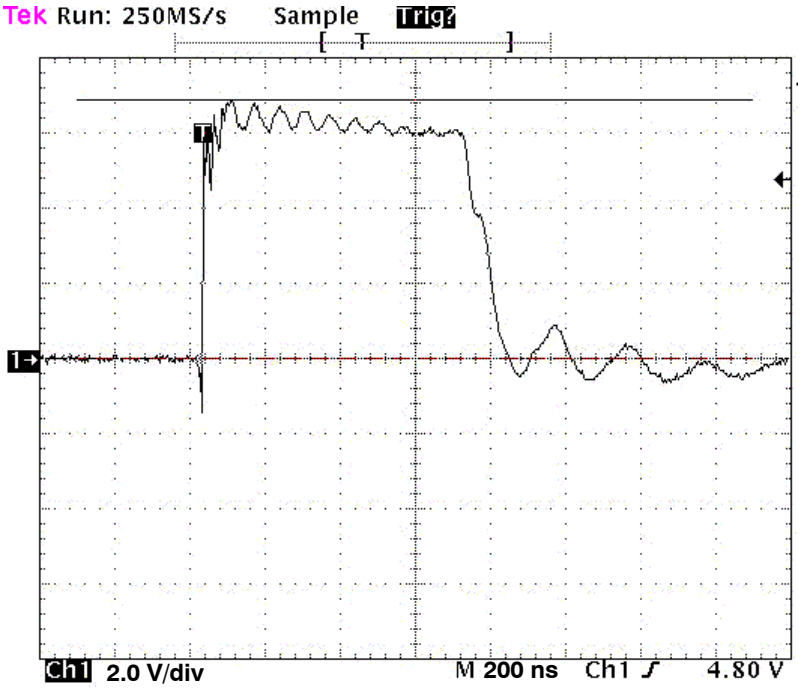


Figure 3. ESD Response for Human Body Model (+8 kV)

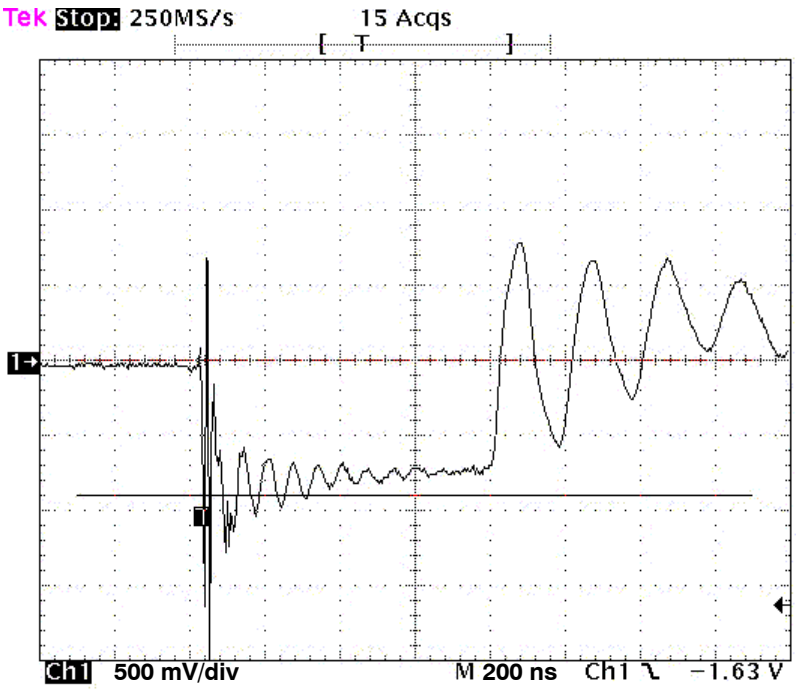


Figure 4. ESD Response for Human Body Model (−8 kV)

Printed Circuit Board Recommendations

Parameter	500 μm Pitch 300 μm Solder Ball
PCB Pad Size	250 μm +25 / −0
Pad Shape	Round
Pad Type	NSMD
Solder Mask Opening	350 μm ±25
Solder Stencil Thickness	125 μm
Stencil Aperture	250 x 250 μm sq.
Solder Flux Ratio	50/50
Solder Paste Type	No Clean Type 3 or Finer
Trace Finish	OSP Cu
Trace Width	150 μm Max

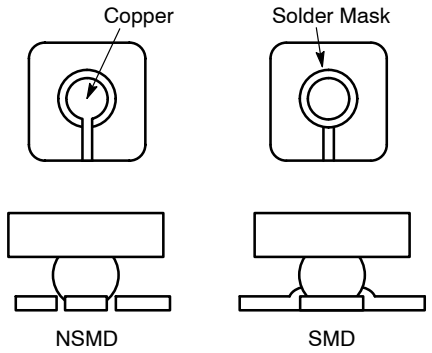


Figure 5. Solder Mask versus Non−Solder Mask Definition

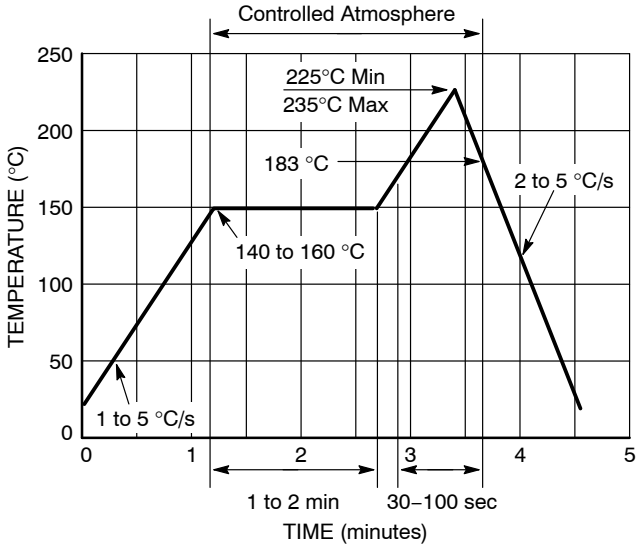
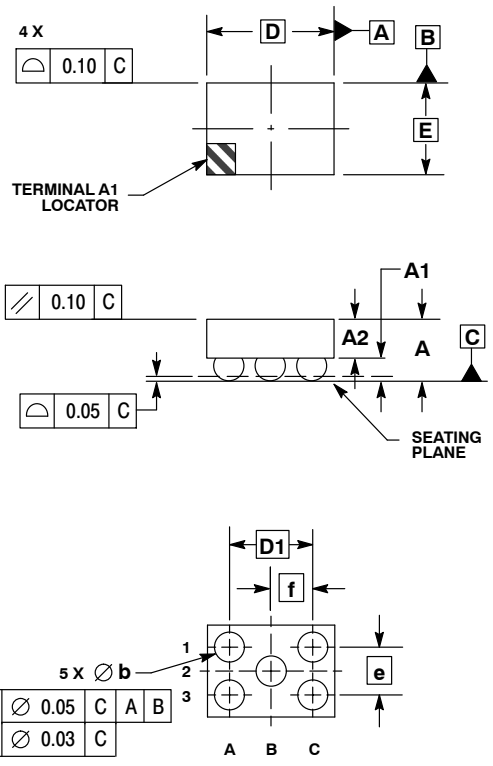


Figure 6. Solder Reflow Profile

5 PIN FLIP−CHIP CSP
CASE 766AB−01
ISSUE O

DATE 04 JUN 2003

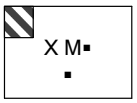
SCALE 4:1



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

	MILLIMETERS	
DIM	MIN	MAX
A	−−−	0.680
A1	0.210	0.270
A2	0.380	0.430
D	1.330 BSC	
E	0.960 BSC	
b	0.290	0.340
e	0.500 BSC	
f	0.433 BSC	
D1	0.866 BSC	

GENERIC MARKING DIAGRAM



X = Specific Device Code
M = Date Code
▪ = Pb−Free Package
(Note: Microdot may be in either location)

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DESCRIPTION:	**5 PIN FLIP−CHIP CSP**		**PAGE 1 OF 1**

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