NUP4103FC

Four Channel ESD Array

This integrated transient voltage suppressor device (TVS) 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

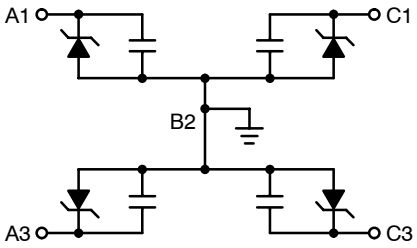
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

ON Semiconductor®

http://onsemi.com

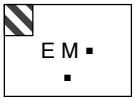
CIRCUIT DESCRIPTION





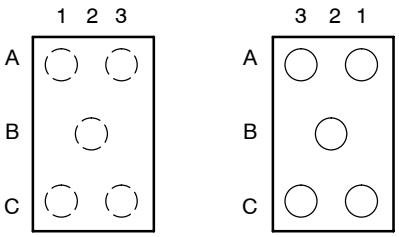
5−PIN FLIP−CHIP CSP
PLASTIC
CASE 766AB

MARKING DIAGRAM



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

(Note: Microdot may be in either location)



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.

© Semiconductor Components Industries, LLC, 2006

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. TVS 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)

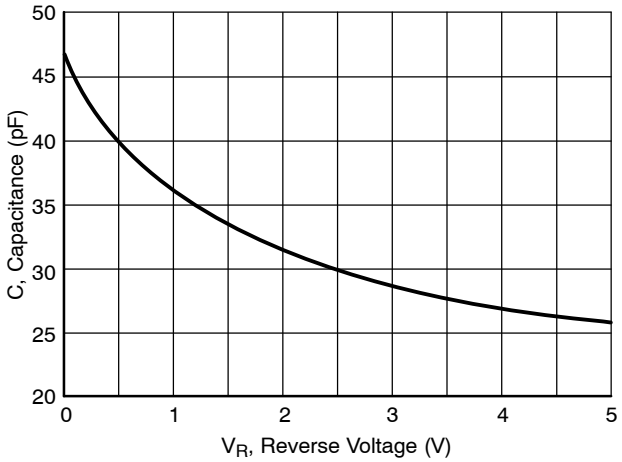


Figure 1. Reverse Voltage vs Junction Capacitance

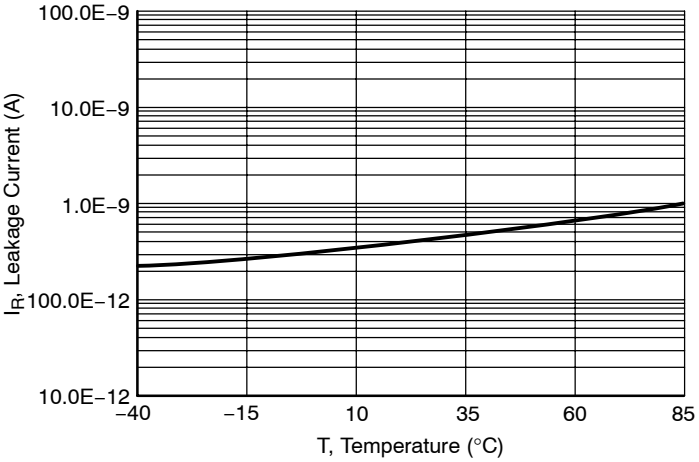


Figure 2. Reverse Leakage Current vs Junction Temperature

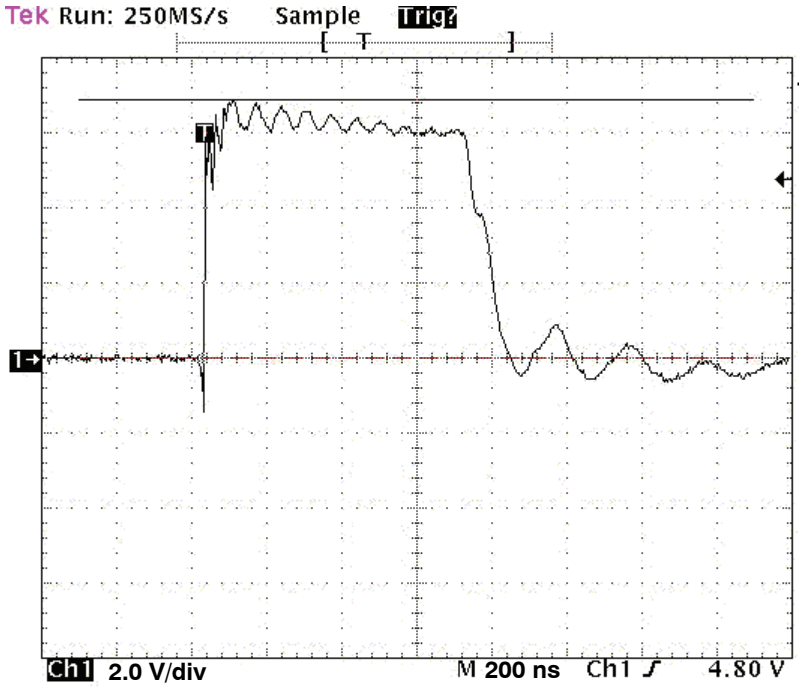


Figure 3. ESD Response for Human Body Model (+8 kV)

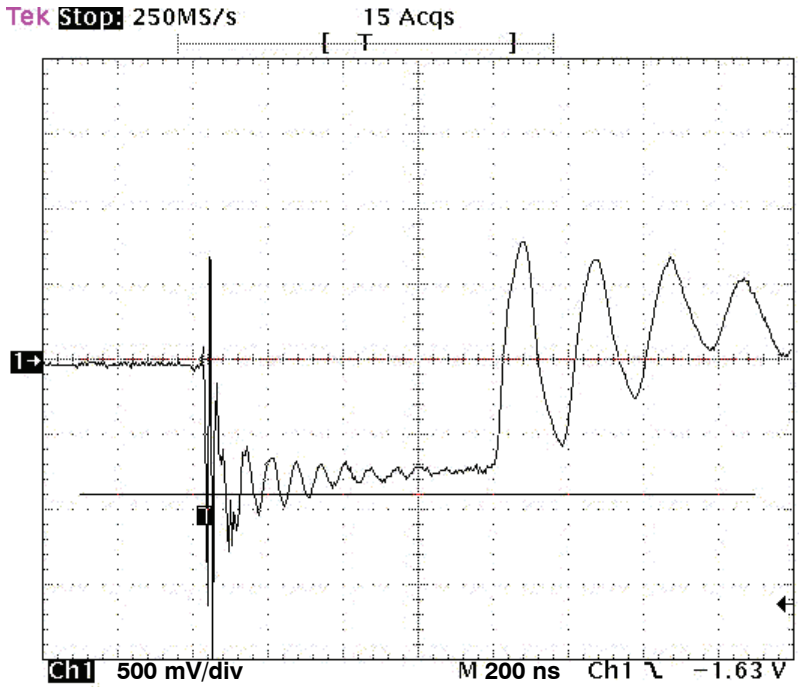


Figure 4. ESD Response for Human Body Model (−8 kV)

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

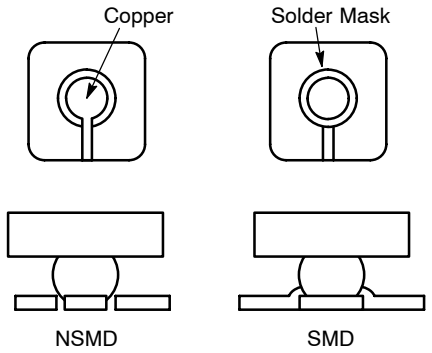


Figure 5. Solder Mask versus Non−Solder Mask Definition

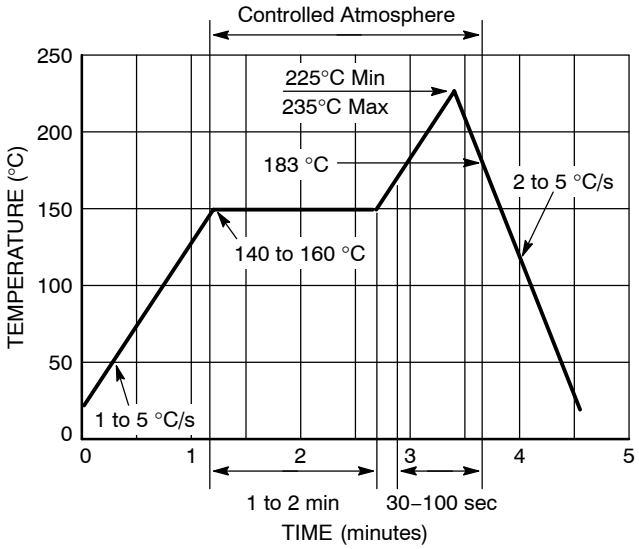
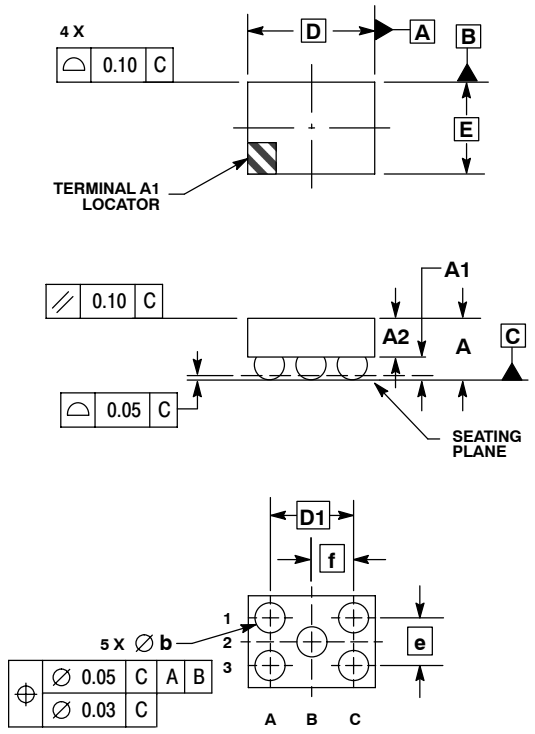


Figure 6. Solder Reflow Profile

PACKAGE DIMENSIONS

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



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	

ON Semiconductor and ON are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. “Typical” parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.