

# NUF6106FCT1

## 6 Channel EMI Pi-Filter Array with ESD Protection

This device is a 6 channel EMI filter array for data lines. Greater than -20 dB attenuation is obtained at frequencies from 800 MHz to 2.2 GHz. It also offers ESD protection – clamping transients from static discharges to protect delicate data line circuitry.

### Features

- EMI Filtering and ESD Protection for Data Lines
- Integration of 30 Discretes Offers Cost and Space Savings
- Exceeds IEC61000-4-2 (Level 4) Specifications
- Low Profile Flip-Chip Packaging
- MSL 1

### Typical Applications

- EMI Filtering and ESD Protection for Data Lines
- Cell Phones
- Handheld Portables
- Notebook Computers
- MP3 Players

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

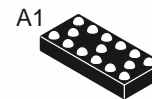
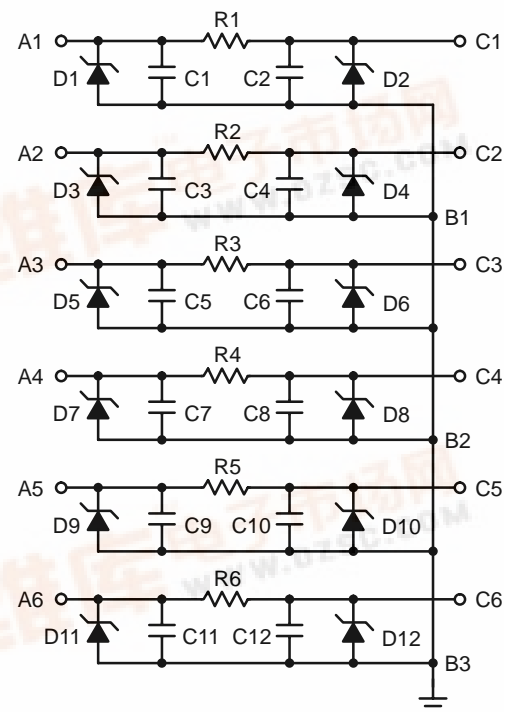
| Rating  | Symbol    | Value            | Unit             |
|---|-----------|------------------|------------------|
| ESD Discharge IEC61000-4-2,<br>– Contact Discharge<br>Human Body Model<br>Machine Model | $V_{PP}$  | 8.0<br>16<br>1.6 | kV               |
| DC Power per Resistor   | $P_R$     | 100              | mW               |
| DC Power per Package  | $P_T$     | 600              | mW               |
| Junction Temperature  | $T_J$     | 150              | $^\circ\text{C}$ |
| Operating Temperature Range   | $T_{Op}$  | -40 to +85       | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{stg}$ | -55 to +150      | $^\circ\text{C}$ |



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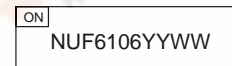
<http://onsemi.com>

### CIRCUIT DESCRIPTION



FLIP-CHIP  
CASE 499D  
PLASTIC

### DEVICE MARKING



NUF6106= Specific Device Code  
YY = Year  
WW = Work Week

### ORDERING INFORMATION

| Device      | Package   | Shipping†        |
|-------------|-----------|------------------|
| NUF6106FCT1 | Flip-Chip | 3000/Tape & Reel |

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



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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Symbol            | Characteristic                             | Min | Typ | Max | Unit |
|-------------------|--|-----|-----|-----|------|
| V <sub>BR</sub>   | I <sub>Z</sub> = 10 mA                     | 6.0 | 7.0 | 8.0 | V    |
| I <sub>R</sub>    | V <sub>RM</sub> = 3.3 V per line           | –   | –   | 0.1 | μA   |
| R <sub>I/O</sub>  | I <sub>R</sub> = 20 mA                     | 80  | 100 | 120 | Ω    |
| C <sub>line</sub> | V <sub>R</sub> = 2.5 V, f = 1 MHz (Note 1) | –   | 21  | 23  | pF   |

1. Measured from Input/Output Pins to Ground

## TYPICAL PERFORMANCE CURVES

(T<sub>A</sub> = 25°C unless otherwise specified)

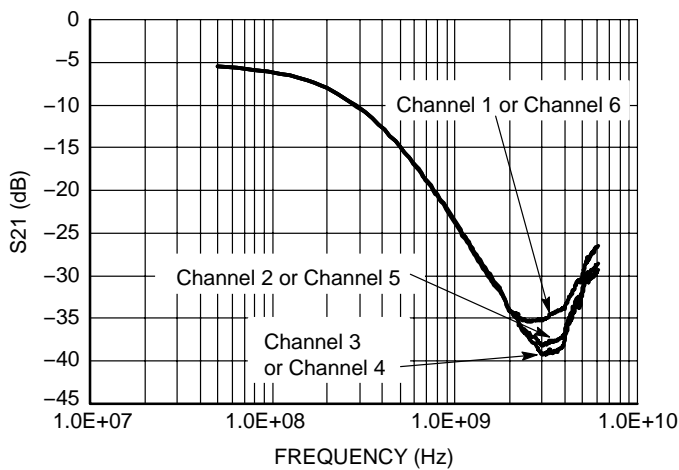


Figure 1. Insertion Loss Characteristics (S21 Measurement)

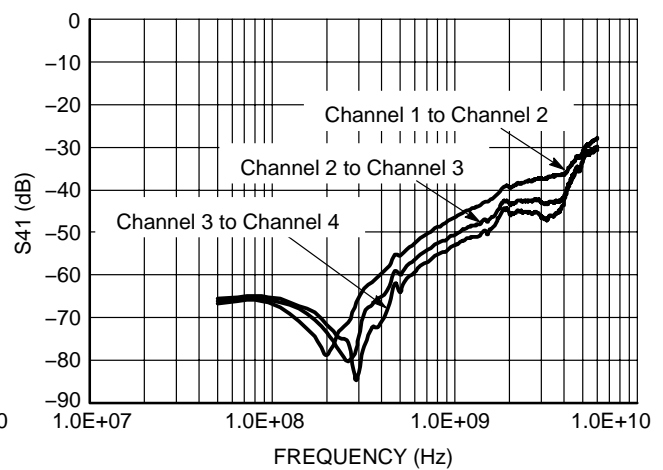


Figure 2. Analog Crosstalk Curve (S41 Measurement)

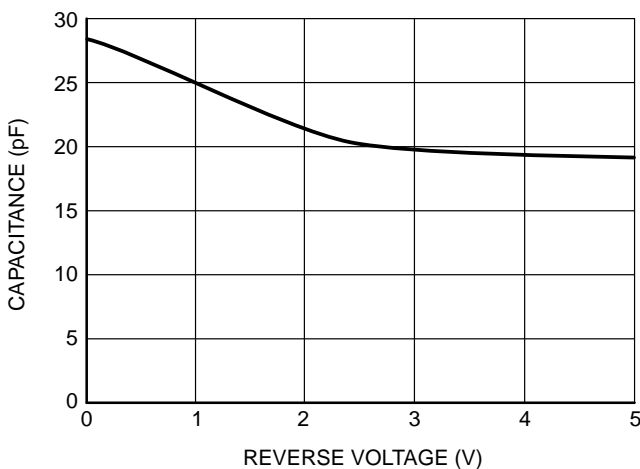


Figure 3. Typical Line Capacitance vs. Reverse Bias Voltage

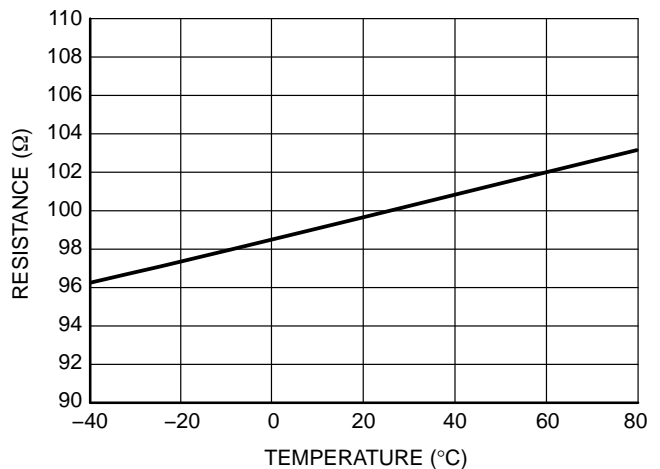


Figure 4. Typical Resistance Over Temperature

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## Printed Circuit Board Recommendations

| Parameter                | 500 $\mu\text{m}$ Pitch<br>300 $\mu\text{m}$ Solder Ball |
|--------------------------|--|
| PCB Pad Size             | 250 $\mu\text{m}$ +25<br>-0                              |
| Pad Shape                | Round  |
| Pad Type                 | NSMD   |
| Solder Mask Opening      | 350 $\mu\text{m}$ $\pm$ 25                               |
| Solder Stencil Thickness | 125 $\mu\text{m}$  |
| Stencil Aperture         | 250 x 250 $\mu\text{m}$ sq.                              |
| Solder Flux Ratio        | 50/50  |
| Solder Paste Type        | No Clean Type 3 or Finer                                 |
| Trace Finish             | OSP Cu   |
| Trace Width              | 150 $\mu\text{m}$ Max                                    |

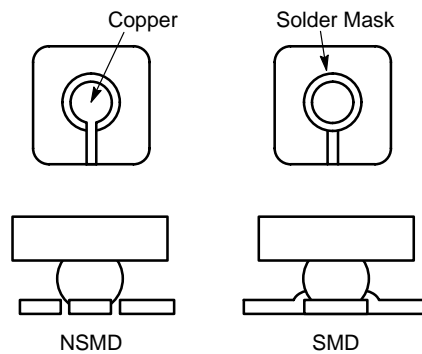


Figure 5. Solder Mask versus Non-Solder Mask Definition

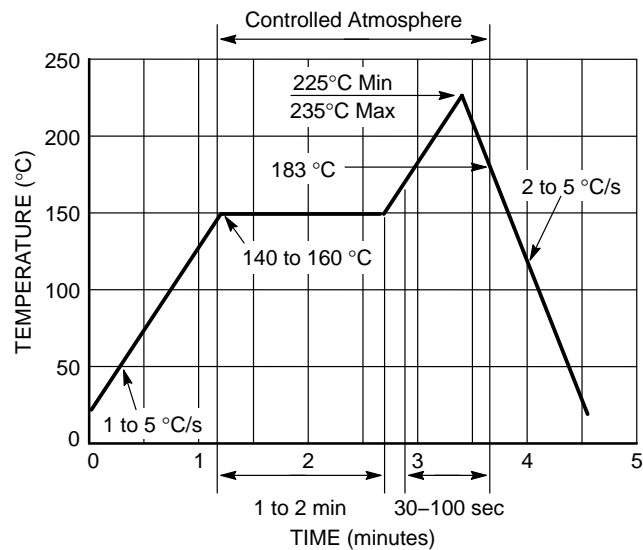
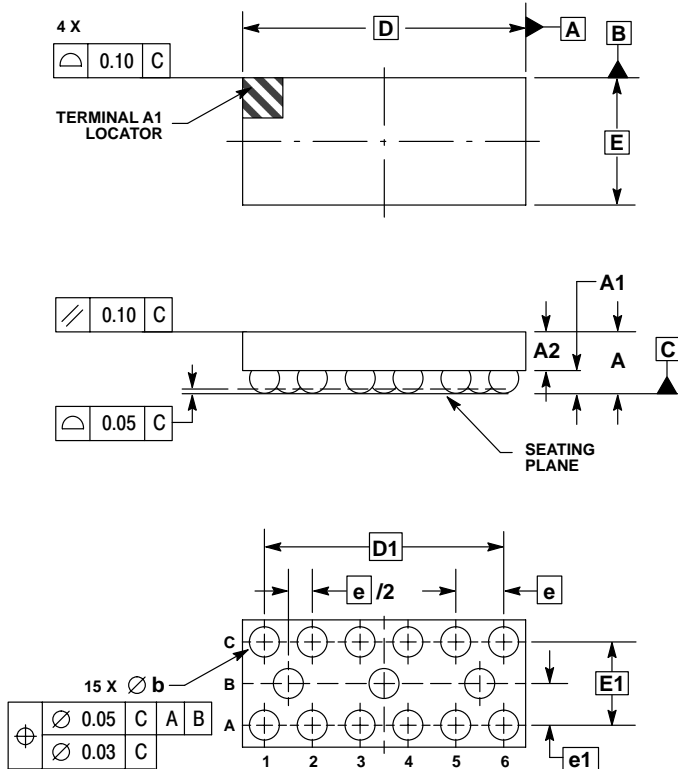


Figure 6. Solder Reflow Profile

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## PACKAGE DIMENSIONS


### 15 PIN FLIP-CHIP CSP CASE 499D-01 ISSUE O



#### NOTES:

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

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | ---         | 0.700 |
| A1  | 0.210       | 0.270 |
| A2  | 0.380       | 0.430 |
| D   | 2.960 BSC   |       |
| E   | 1.330 BSC   |       |
| b   | 0.290       | 0.340 |
| e   | 0.500 BSC   |       |
| e1  | 0.435 BSC   |       |
| D1  | 2.500 BSC   |       |
| E1  | 0.870 BSC   |       |

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