

# NUF2441FC

## Integrated Passive Filter with ESD Protection

This device is designed for cell phone applications requiring Headset and Speaker Phone, EMI Filtering and ESD Protection. This device offers an integrated solution in a small package reducing PCB space and cost.

### Features:

- Provides EMI Filtering and ESD Protection
- Single IC Offers Cost Savings by Replacing 2 Inductors, 4 Capacitors, and 4 TVS Diodes
- Compliance with IEC61000-4-2, (Level 4) 30 kV (Contact), 30 kV (air)
- Flip-Chip Package
- Moisture Sensitivity Level 1
- ESD Ratings: Machine Model = C  
Human Body Model = 3B
- Pb-Free Package is Available\*

### Benefits:

- Flip-Chip Package Minimizes PCB Space
- Integrated Circuit Increases System Reliability versus Discrete Component Implementation
- TVS Devices Provide ESD Protection That is Better than a Discrete Implementation because the Small IC minimizes Parasitic Inductances

### Typical Applications:

- Cell Phones
- Communication Circuits

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

| Rating                                                           | Symbol    | Value       | Unit             |
|------------------------------------------------------------------|-----------|-------------|------------------|
| ESD Discharge IEC61000-4-2<br>Contact Discharge<br>Air Discharge | $V_{pp}$  | 30<br>30    | kV               |
| Operating Temperature Range                                      | $T_J$     | -40 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range                                        | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |
| Lead Solder Temperature<br>(10 second duration)                  | $T_L$     | 260         | $^\circ\text{C}$ |

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.

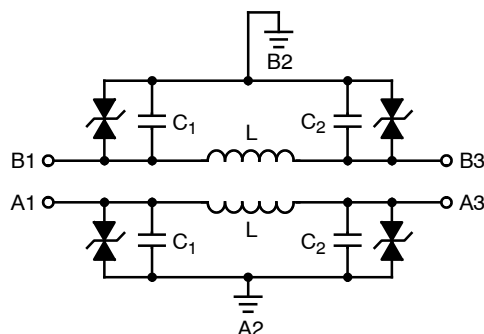
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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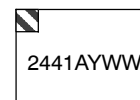
### CIRCUIT DESCRIPTION



### MARKING DIAGRAM

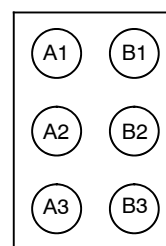


Flip-Chip  
CASE 499J



2441 = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week

### PIN CONFIGURATION



(Bump View)

### ORDERING INFORMATION

| Package      | Device                 | Shipping†        |
|--------------|------------------------|------------------|
| NUF2441FCT1  | Flip-Chip              | 3000/Tape & Reel |
| NUF2441FCT1G | Flip-Chip<br>(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 Specification Brochure, BRD8011/D.

# NUF2441FC

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Device       | Device Marking | $V_{RWM}$<br>(Volts) | $V_{BR}$ @<br>1 mA<br>(Volts) |      | Max $I_R$ @<br>$V_{RWM} = 12\text{ V}$<br>I/O Pin<br>( $\mu\text{A}$ ) | Typical<br>Capacitance<br>$C_1 + C_2$ (pF)<br>(Notes 1, 3, 4) | Typical<br>Pass-Band<br>Inductance<br>L (nH) | Equivalent<br>Series Resistance<br>$R_S$ ( $\Omega$ ) (Note 2) |      |
|--------------|----------------|----------------------|-------------------------------|------|------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------|------|
|              |                |                      | Min                           | Max  |                                                                        |                                                               |                                              | Typ                                                            | Max  |
| NUF2441FCT1G | 2441           | 12                   | 13.7                          | 17.7 | 0.1                                                                    | 250                                                           | 2.9                                          | 0.28                                                           | 0.35 |

1. Measured at  $25^\circ\text{C}$ ,  $V_R = 0$ ,  $f = 1\text{ MHz}$ , Source A1, GND A2, Open A3.
2. Measured at room temperature.
3. Tolerance =  $\pm 20\%$ .
4. Measured under zero light conditions.

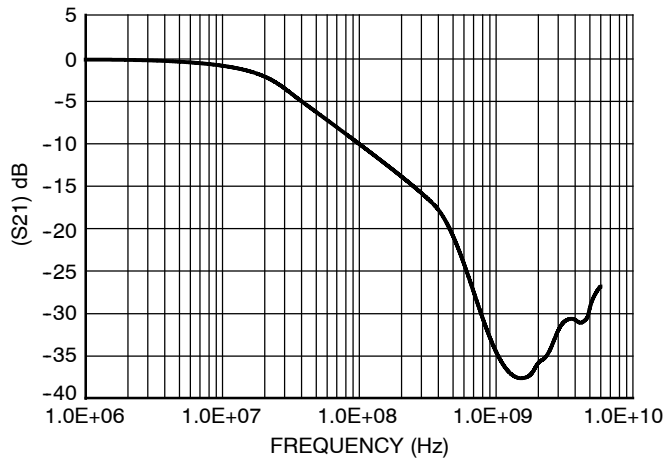


Figure 1. Insertion Loss Characteristic

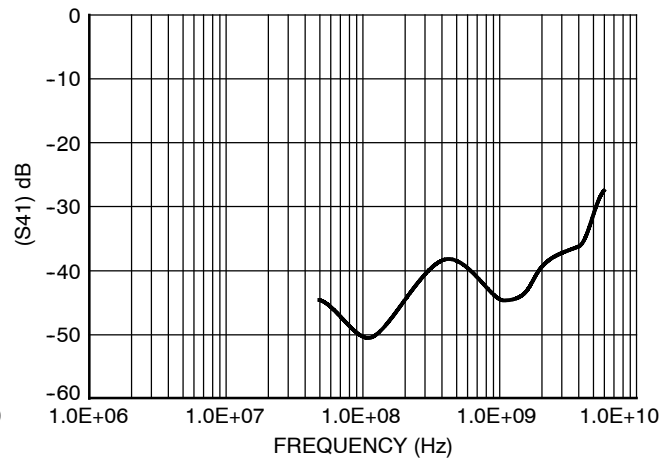


Figure 2. Analog Crosstalk

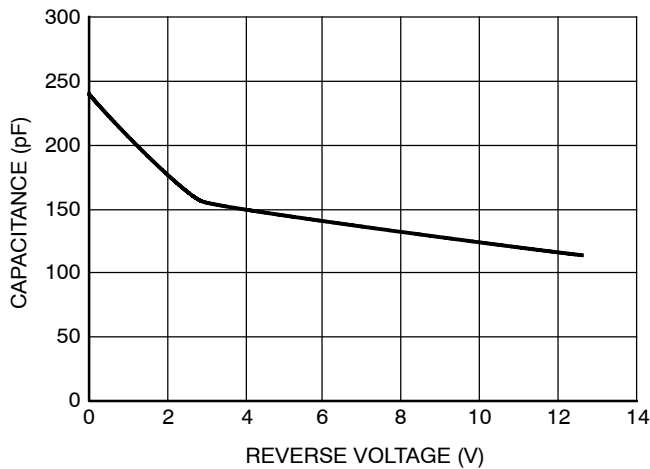


Figure 3. Typical Line Capacitance vs. Reverse Bias Voltage

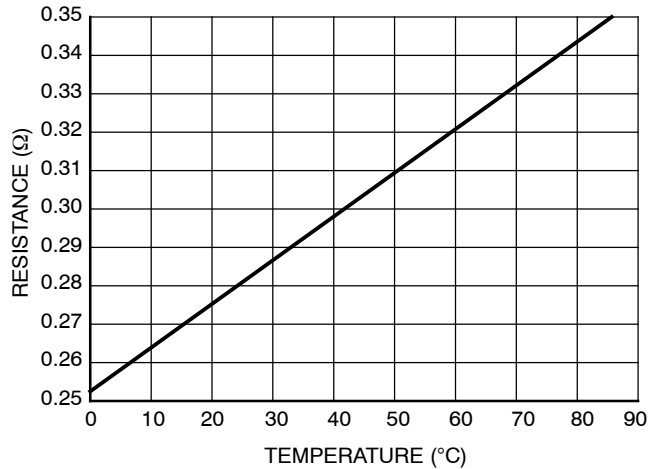


Figure 4. Typical Resistance vs. Temperature

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

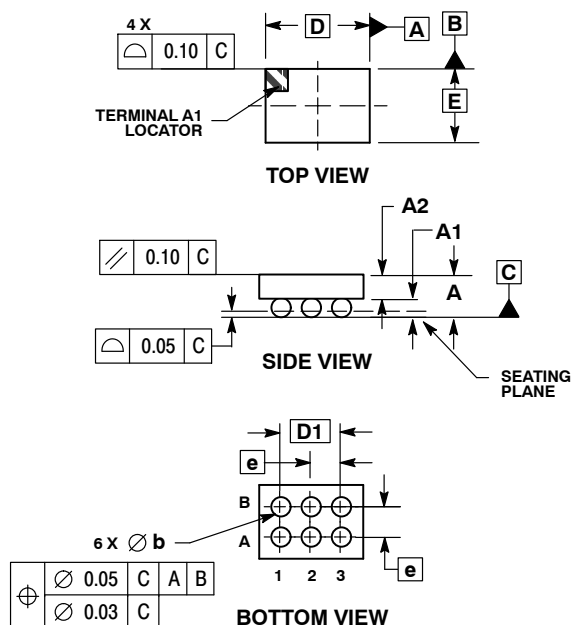
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SCALE 4:1

**6 PIN FLIP-CHIP**  
**1.72x1.22mm, 0.5 PITCH**  
CASE 499J-01  
ISSUE O

DATE 05 FEB 2004



### 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           | ---       | 0.700 |
| A1          | 0.210     | 0.270 |
| A2          | 0.380     | 0.430 |
| D           | 1.720 BSC |       |
| E           | 1.220 BSC |       |
| b           | 0.290     | 0.340 |
| e           | 0.500 BSC |       |
| D1          | 1.000 BSC |       |

### GENERIC MARKING DIAGRAM\*



xx = Specific Device Code  
A = Assembly Location  
WL, L = Wafer Lot  
YY, Y = Year  
WW, W = Work Week

\*This information is generic. Please refer to device data sheet for actual part marking.

|                         |                                                |                                                                                                                                                                                  |
|-------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>6 PIN FLIP-CHIP, 1.72x1.22mm, 0.5 PITCH</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                               |

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