*Coaxial*

# Low Pass Filter

## NBLP-933

50Ω Flat Time Delay DC to 560 MHz

### Maximum Ratings

| | |
|---|---|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| RF Power Input | 0.5W max. |

### Features

- flat group delay for low pulse distortion
- rugged shielded case
- other NBLP models available with wide selection of cut-off frequencies

### Applications

- linear modulation techniques
- voice transmission applications
- digital communications

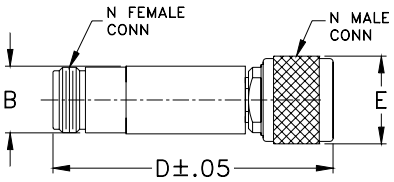
CASE STYLE: FF57

| Connectors | Model | Price | Qty. |
|---|---|---|---|
| **N-Type** | NBLP-933 | Contact Sales Dept. | |

### Low Pass Filter Electrical Specifications

| PASSBAND (MHz) (loss <1.2 dB) Min. | fco, MHz Nom. (loss 3 dB) | STOPBAND (MHz) (loss > 10 dB) | STOPBAND (MHz) (loss > 20 dB) | VSWR (:1) DC-0.2fco $\bar{X}$ | VSWR (:1) DC-0.6fco $\bar{X}$ | GROUP DELAY VARIATION (nsec) DC-fco $\bar{X}$ | GROUP DELAY VARIATION (nsec) DC-2fco $\bar{X}$ | GROUP DELAY VARIATION (nsec) DC-2.67fco $\bar{X}$ |
|---|---|---|---|---|---|---|---|---|
| DC-560 | 933 | 1866-2490 | 2490 | 1.3:1 | 2.2:1 | 0.09 | 0.2 | 0.28 |

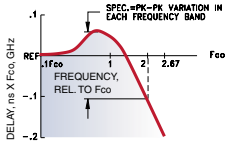
### Outline Drawing



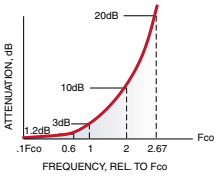

### Outline Dimensions (inch / mm)

| B | D | E | wt |
|---|---|---|---|
| .67 | 2.90 | .82 | grams |
| 17.02 | 73.66 | 20.83 | 90.0 |

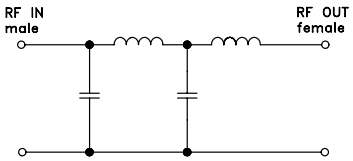
TYPICAL GROUP DELAY




TYPICAL FREQUENCY RESPONSE INSERTION LOSS



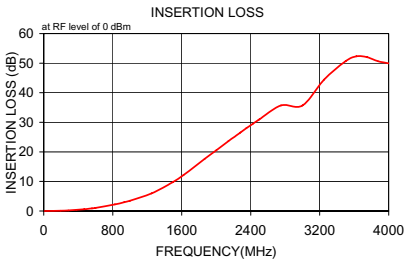

### Electrical Schematic



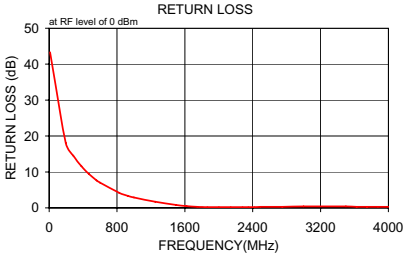

### Typical Performance Data

| Frequency (MHz) | Insertion Loss (dB) $\bar{x}$ | Insertion Loss (dB) σ | Return Loss (dB) | Frequency (MHz) | Group Delay (nsec) |
|---|---|---|---|---|---|
| 10.0 | 0.01 | 0.1 | 43.3 | 10.0 | 0.568 |
| 195.0 | 0.11 | 0.1 | 18.1 | 105.0 | 0.594 |
| 285.0 | 0.21 | 0.1 | 14.5 | 195.0 | 0.591 |
| 380.0 | 0.38 | 0.1 | 11.6 | 285.0 | 0.593 |
| 470.0 | 0.59 | 0.1 | 9.4 | 380.0 | 0.577 |
| 560.0 | 0.88 | 0.1 | 7.6 | 470.0 | 0.596 |
| 600.0 | 1.05 | 0.1 | 7.0 | 560.0 | 0.594 |
| 825.0 | 2.24 | 0.1 | 4.2 | 600.0 | 0.626 |
| 933.0 | 3.00 | 0.1 | 3.3 | 715.0 | 0.584 |
| 1000.0 | 3.49 | 0.1 | 2.9 | 825.0 | 0.654 |
| 1250.0 | 5.97 | 0.1 | 1.7 | 933.0 | 0.591 |
| 1495.0 | 9.72 | 0.1 | 0.8 | 1000.0 | 0.609 |
| 1620.0 | 12.16 | 0.2 | 0.5 | 1125.0 | 0.610 |
| 1745.0 | 14.88 | 0.2 | 0.3 | 1250.0 | 0.645 |
| 1866.0 | 17.63 | 0.3 | 0.2 | 1375.0 | 0.601 |
| 2000.0 | 20.52 | 0.3 | 0.2 | 1495.0 | 0.606 |
| 2140.0 | 23.58 | 0.3 | 0.2 | 1620.0 | 0.510 |
| 2280.0 | 26.55 | 0.2 | 0.2 | 1745.0 | 0.528 |
| 2350.0 | 28.00 | 0.2 | 0.2 | 1866.0 | 0.423 |
| 2420.0 | 29.40 | 0.2 | 0.2 | 2000.0 | 0.462 |
| 2490.0 | 30.81 | 0.3 | 0.3 | 2070.0 | 0.422 |
| 2500.0 | 30.99 | 0.3 | 0.3 | 2140.0 | 0.338 |
| 2750.0 | 35.70 | 0.5 | 0.3 | 2210.0 | 0.404 |
| 3000.0 | 35.69 | 1.0 | 0.4 | 2280.0 | 0.430 |
| 3250.0 | 44.45 | 2.1 | 0.4 | 2350.0 | 0.336 |
| 3500.0 | 50.66 | 4.7 | 0.4 | 2420.0 | 0.364 |
| 3625.0 | 52.33 | 4.9 | 0.3 | 2490.0 | 0.310 |
| 3750.0 | 52.01 | 3.4 | 0.3 | 2500.0 | 0.366 |
| 3875.0 | 50.70 | 2.2 | 0.3 | 2625.0 | 0.392 |
| 4000.0 | 49.92 | 2.5 | 0.3 | 2750.0 | 0.519 |

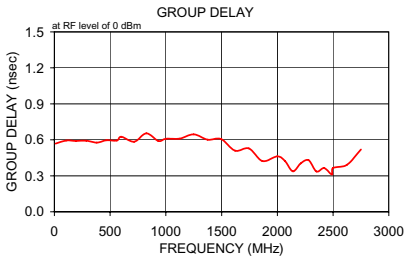
INSERTION LOSS




RETURN LOSS




GROUP DELAY



# Coaxial Low Pass Filter (Flat Time Delay) NBLP-933

*Typical Performance Data*

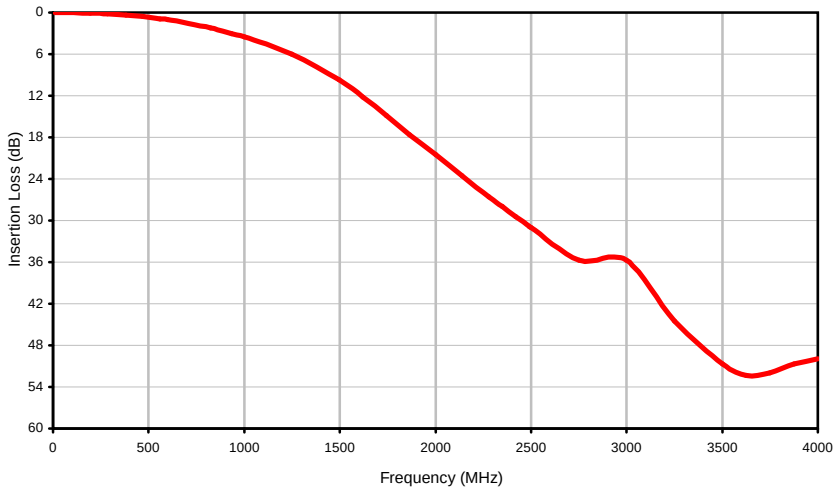
| FREQUENCY (MHz) | INSERTION LOSS (dB) | RETURN LOSS (dB) |
|---|---|---|
| 10.0 | 0.01 | 43.30 |
| 195.0 | 0.11 | 18.10 |
| 285.0 | 0.21 | 14.50 |
| 380.0 | 0.38 | 11.60 |
| 470.0 | 0.59 | 9.40 |
| 560.0 | 0.88 | 7.60 |
| 600.0 | 1.05 | 7.00 |
| 825.0 | 2.24 | 4.20 |
| 933.0 | 3.00 | 3.30 |
| 1000.0 | 3.49 | 2.90 |
| 1250.0 | 5.97 | 1.70 |
| 1495.0 | 9.72 | 0.80 |
| 1620.0 | 12.16 | 0.50 |
| 1745.0 | 14.88 | 0.30 |
| 1866.0 | 17.63 | 0.20 |
| 2000.0 | 20.52 | 0.20 |
| 2140.0 | 23.58 | 0.20 |
| 2280.0 | 26.55 | 0.20 |
| 2350.0 | 28.00 | 0.20 |
| 2420.0 | 29.40 | 0.20 |
| 2490.0 | 30.81 | 0.30 |
| 2500.0 | 30.99 | 0.30 |
| 2750.0 | 35.70 | 0.30 |
| 3000.0 | 35.69 | 0.40 |
| 3250.0 | 44.45 | 0.40 |
| 3500.0 | 50.66 | 0.40 |
| 3625.0 | 52.33 | 0.30 |
| 3750.0 | 52.01 | 0.30 |
| 3875.0 | 50.70 | 0.30 |
| 4000.0 | 49.92 | 0.30 |

| FREQUENCY (MHz) | GROUP DELAY (nsec) |
|---|---|
| 10.0 | 0.568 |
| 105.0 | 0.594 |
| 195.0 | 0.591 |
| 285.0 | 0.593 |
| 380.0 | 0.577 |
| 470.0 | 0.596 |
| 560.0 | 0.594 |
| 600.0 | 0.626 |
| 715.0 | 0.584 |
| 825.0 | 0.654 |
| 933.0 | 0.591 |
| 1000.0 | 0.609 |
| 1125.0 | 0.610 |
| 1250.0 | 0.645 |
| 1375.0 | 0.601 |
| 1495.0 | 0.606 |
| 1620.0 | 0.510 |
| 1745.0 | 0.528 |
| 1866.0 | 0.423 |
| 2000.0 | 0.462 |
| 2070.0 | 0.422 |
| 2140.0 | 0.338 |
| 2210.0 | 0.404 |
| 2280.0 | 0.430 |
| 2350.0 | 0.336 |
| 2420.0 | 0.364 |
| 2490.0 | 0.310 |
| 2500.0 | 0.366 |
| 2625.0 | 0.392 |
| 2750.0 | 0.519 |

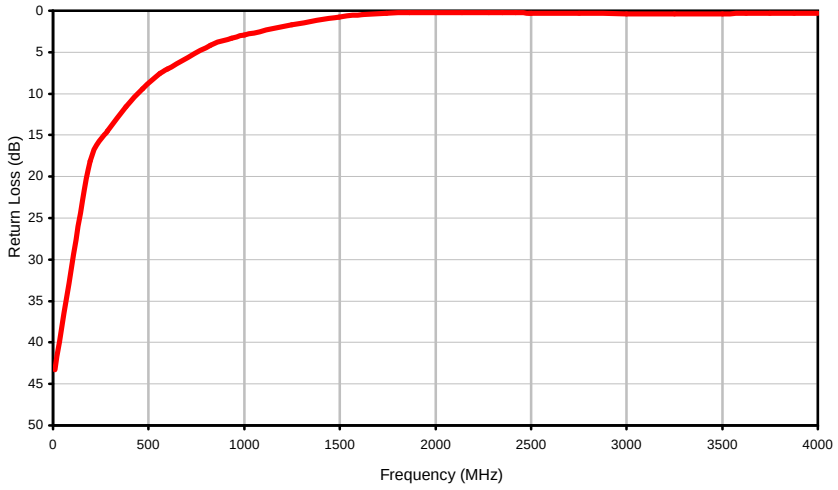
# Coaxial Low Pass Filter (Flat Time Delay) NBLP-933

## *Typical Performance Curves*

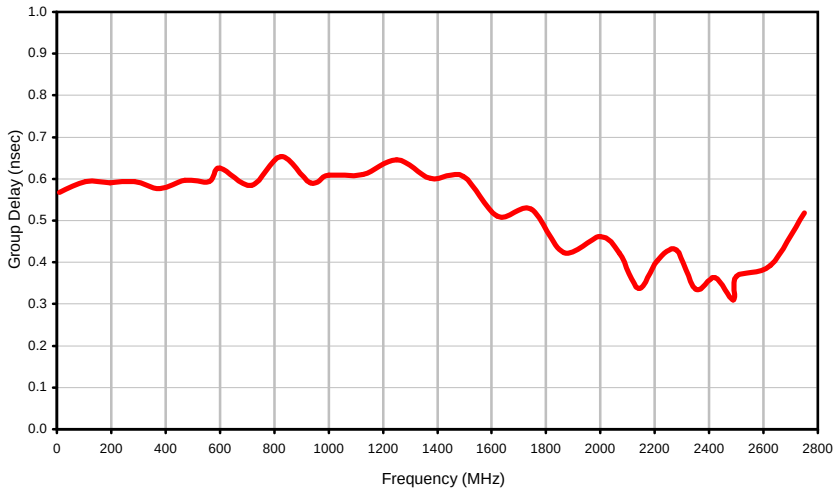
**Insertion Loss**




**Return Loss**



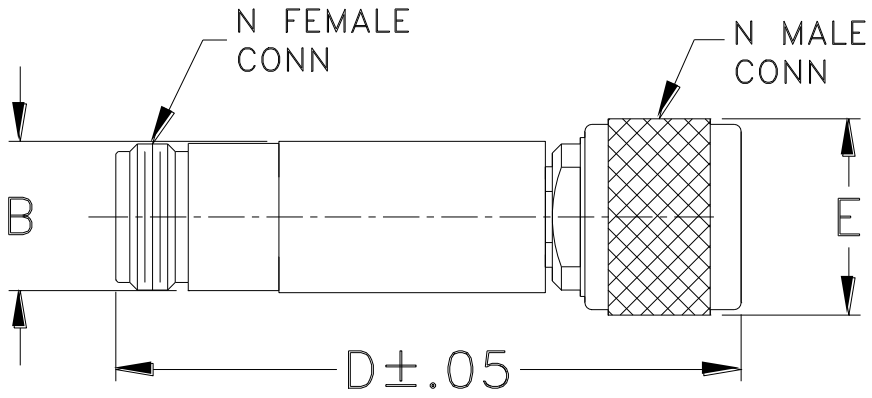

**Group Delay**



# Case Style FF

**FF57**

## Outline Dimensions




| CASE #. | A | B | C | D | E | WT GRAMS |
|---|---|---|---|---|---|---|
| FF57 | --<br>-- | .70<br>(17.78) | --<br>-- | 2.90<br>(73.66) | .82<br>(20.83) | 90.0 |

**Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015**

**Note:**

1. Case material: Stainless steel.

Mini-Circuits

# Environmental Specifications ENV28

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|---|---|---|
| Operating Temperature | -55° to 100°C<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |
| Barometric Pressure | 100,000 Feet | MIL-STD-202, Method 105, Condition D |
| Humidity | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103 |
| Thermal Shock | -65° to 125°C, 5 cycles | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18) | MIL-STD-202, Method 213, Condition I |