

# Thin-Film Low Pass Filter



## LP0603 Lead-Free LGA Type

### GENERAL DESCRIPTION

The LP0603 ITF (Integrated Thin Film) Lead-Free LGA Low Pass Filter is based on thin-film multilayer technology. The technology provides a miniature part with excellent high frequency performance and rugged construction for reliable automatic assembly.

The ITF Low Pass Filters are offered in a variety of frequency bands compatible with various types of high frequency wireless systems.

### FEATURES

- Miniature Size: 0603
- Frequency Range: 900MHz -2.4GHz
- Characteristic Impedance: 50 Ohm
- Operating/Storage Temperature: -40°C to +85°C
- Power Rating: 3W Continuous
- Low Profile
- Rugged Construction
- Lead Free
- Taped and Reeled

### APPLICATIONS

- Mobile communications
- Satellite TV receivers
- GPS
- Vehicle location systems
- Wireless LANs
- RFID

### LAND GRID ARRAY ADVANTAGES

- Inherent Low Profile
- Self Alignment during Reflow
- Excellent Solderability
- Low Parasitics
- Better Heat Dissipation

### HOW TO ORDER

|                |                     |                       |                         |                 |                                                                            |                           |
|----------------|---------------------|-----------------------|-------------------------|-----------------|----------------------------------------------------------------------------|---------------------------|
| <b>LP</b><br>T | <b>0603</b><br>T    | <b>A</b><br>T         | <b>XXXX</b><br>T        | <b>A</b><br>T   | <b>N</b><br>T                                                              | <b>TR</b><br>T            |
| <b>Style</b>   | <b>Size</b><br>0603 | <b>Type</b><br>A or N | <b>Frequency</b><br>MHz | <b>Sub-Type</b> | <b>Termination</b><br>LGA<br>**Ni/Lead Free Solder<br><br>**RoHS Compliant | <b>Taped &amp; Reeled</b> |

### FINAL QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C, IR, 4 hours

### TERMINATION

Nickel/Lead-Free Solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

4



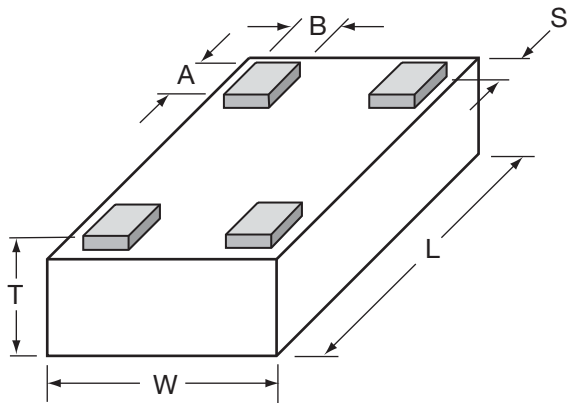
Please select correct termination style

# Thin-Film Low Pass Filter

## LP0603 Lead-Free LGA Type

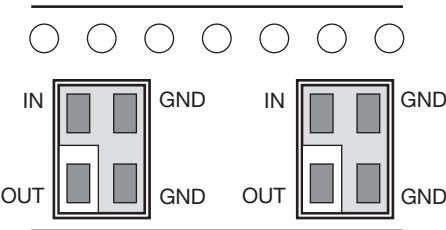


### DIMENSIONS: millimeters (inches) (Bottom View)

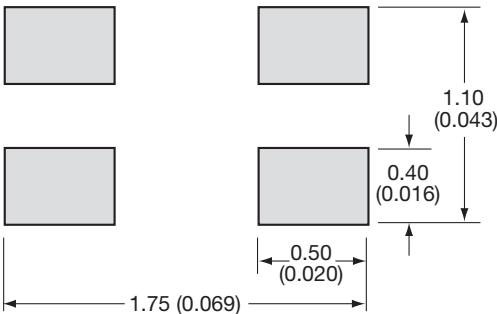


|   |                           |   |                            |
|---|---------------------------|---|----------------------------|
| L | 1.6±0.1<br>(0.063±0.004)  | A | 0.25±0.05<br>(0.010±0.002) |
| W | 0.84±0.1<br>(0.033±0.004) | B | 0.20±0.05<br>(0.008±0.002) |
| T | 0.60±0.1<br>(0.024±0.004) | S | 0.05±0.05<br>(0.002±0.002) |

### TERMINALS AND ORIENTATION IN TAPE (Top View)



### RECOMMENDED PAD LAYOUT (mm)



### ELECTRICAL CHARACTERISTICS

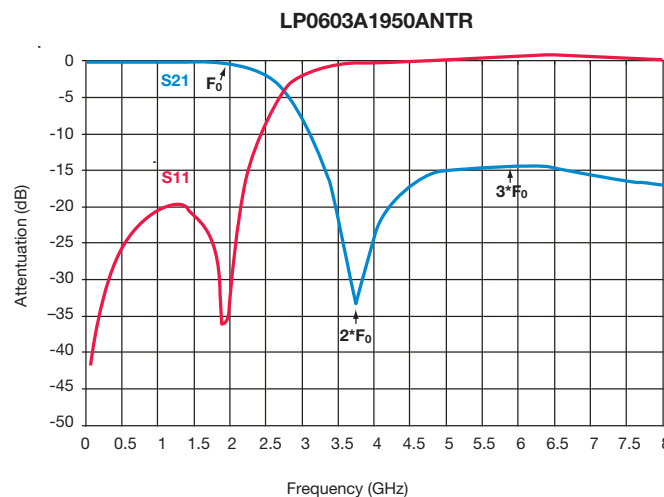
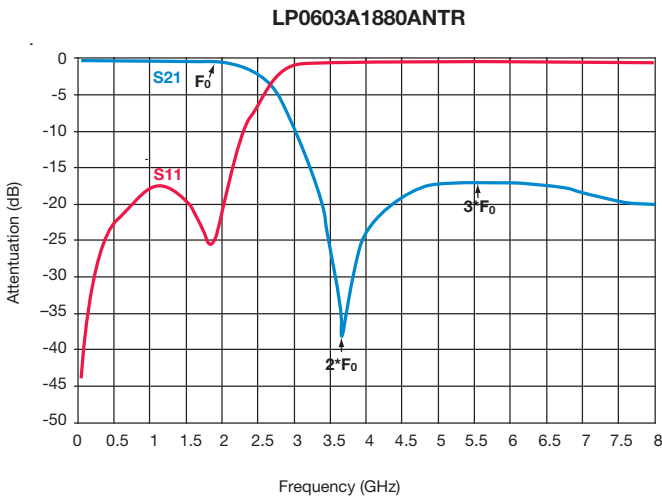
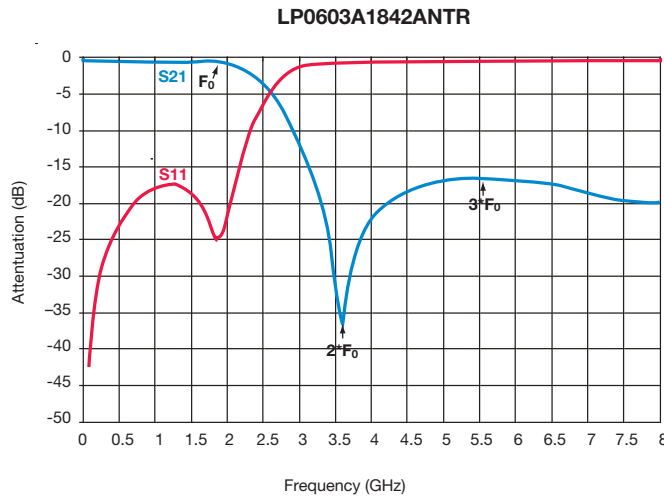
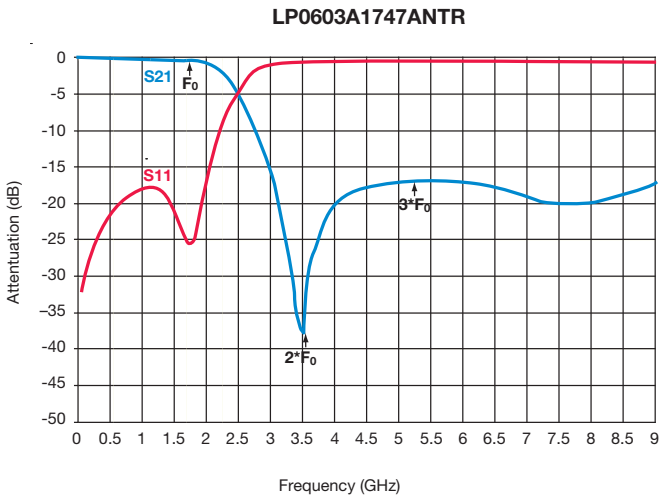
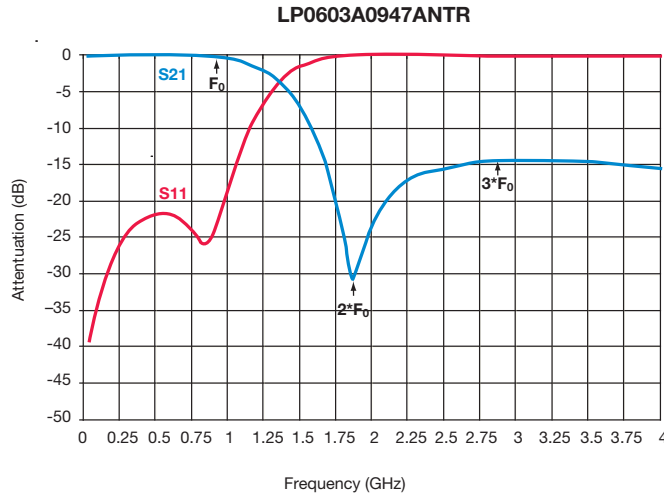
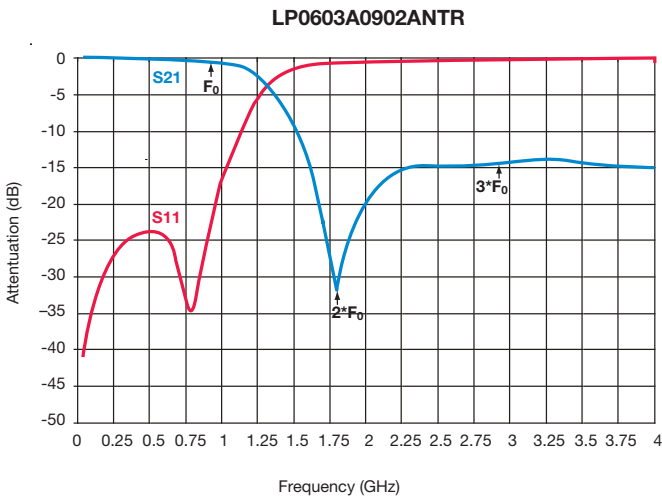
(Guaranteed over -40°C to +85°C Operating Temperature Range)

| P/N             | Frequency Band [MHz] | I. Loss [dB]           | VSWR max [dB] | Attenuation typ. [dB]                          |
|-----------------|----------------------|------------------------|---------------|------------------------------------------------|
| LP0603A0902ANTR | 890-915              | 0.35 typ<br>(0.5 max)  | 1.4           | 25 @ 2xF <sub>0</sub><br>14 @ 3xF <sub>0</sub> |
| LP0603A0947ANTR | 935-960              | 0.35 typ<br>(0.5 max)  | 1.4           | 25 @ 2xF <sub>0</sub><br>17 @ 3xF <sub>0</sub> |
| LP0603A1747ANTR | 1710-1785            | 0.3 typ<br>(0.5 max)   | 1.4           | 25 @ 2xF <sub>0</sub><br>17 @ 3xF <sub>0</sub> |
| LP0603A1842ANTR | 1805-1880            | 0.3 typ<br>(0.5 max)   | 1.4           | 27 @ 2xF <sub>0</sub><br>15 @ 3xF <sub>0</sub> |
| LP0603A1880ANTR | 1840-1920            | 0.3 typ<br>(0.5 max)   | 1.4           | 25 @ 2xF <sub>0</sub><br>17 @ 3xF <sub>0</sub> |
| LP0603A1950ANTR | 1920-1980            | 0.3 typ<br>(0.5 max)   | 1.4           | 27 @ 2xF <sub>0</sub><br>15 @ 3xF <sub>0</sub> |
| LP0603A2140ANTR | 2110-2170            | 0.3 typ<br>(0.5 max)   | 1.4           | 27 @ 2xF <sub>0</sub><br>17 @ 3xF <sub>0</sub> |
| LP0603A2442ANTR | 2412-2472            | 0.3 typ<br>(0.5 max)   | 1.4           | 25 @ 2xF <sub>0</sub><br>17 @ 3xF <sub>0</sub> |
| LP0603N3500ANTR | 3400-3600            | -0.3 typ.<br>-0.5 max. | 1.4           | 30 @ 2xF <sub>0</sub><br>20 @ 3xF <sub>0</sub> |
| LP0603N5200ANTR | 5050-5350            | -0.2 typ.<br>-0.5 max. | 1.4           | 30 @ 2xF <sub>0</sub><br>20 @ 3xF <sub>0</sub> |
| LP0603N5500ANTR | 5350-5650            | -0.2 typ.<br>-0.5 max. | 1.4           | 30 @ 2xF <sub>0</sub><br>20 @ 3xF <sub>0</sub> |

Note: additional frequencies available upon request

# Thin-Film Low Pass Filter

## LP0603 Lead-Free LGA Type Test Jig



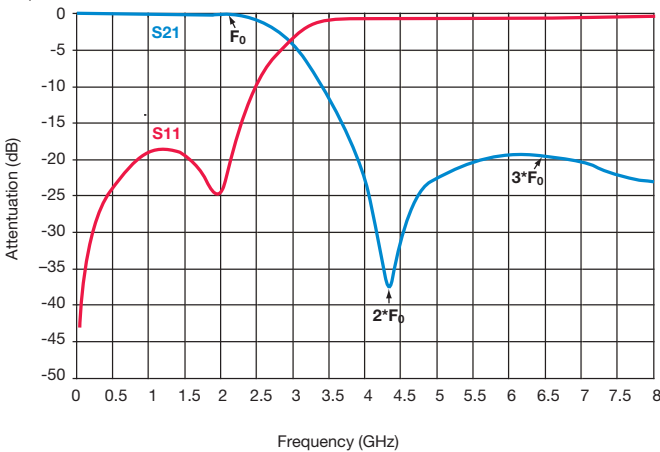
# Thin-Film Low Pass Filter

## LP0603 Lead-Free LGA Type Test Jig

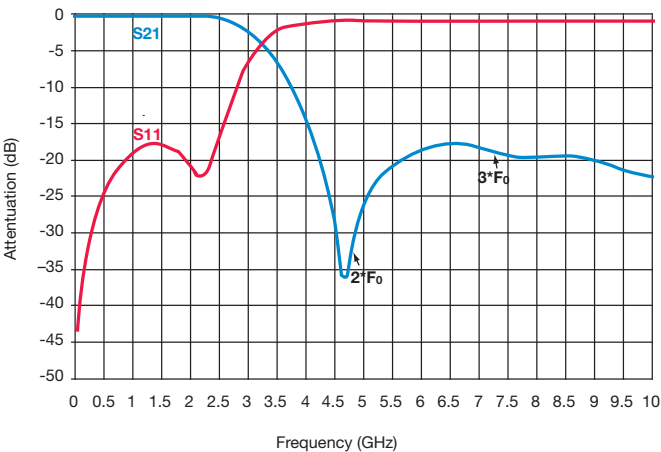


4

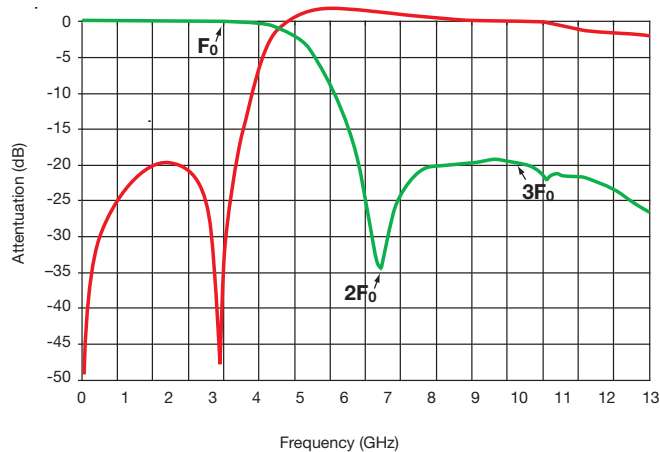
LP0603A2140ANTR



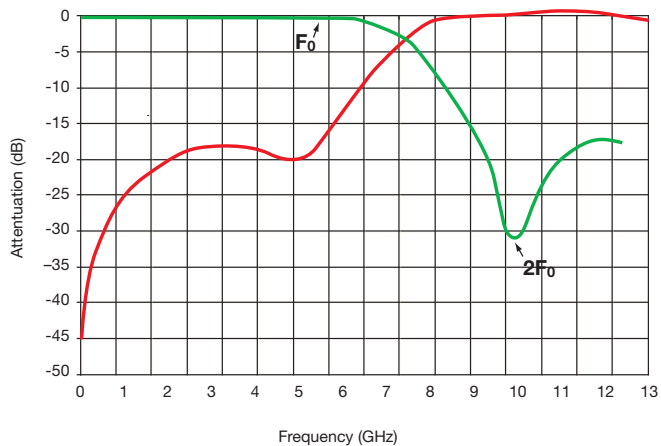
LP0603A2442ANTR



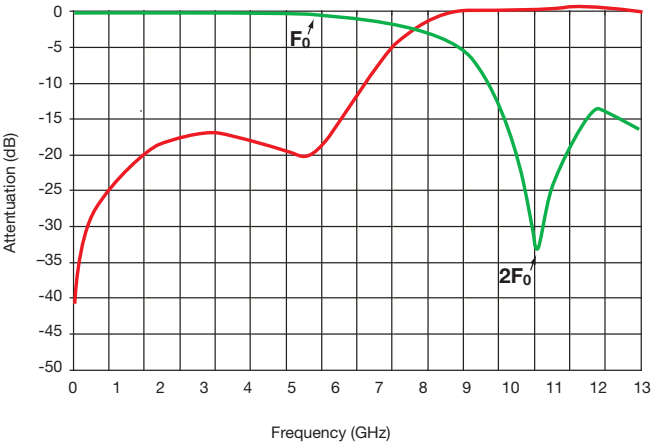
LP0603N3500ANTR



LP0603N5200ANTR



LP0603N5500ANTR



# Thin-Film Low Pass Filter

## LP0603 Lead-Free LGA Type Test Jig

### TEST JIG FOR LP0603 LEAD-FREE LGA LOW PASS FILTER

#### GENERAL DESCRIPTION

These jigs are designed for testing the LP0603 LGA Low Pass Filters using a Vector Network Analyzer.

They consist of a dielectric substrate, having 50Ω microstrips as conducting lines and a bottom ground plane located at a distance of 0.127mm from the microstrips.

The substrate used is Neltec's NH9338ST0127C1BC (or similar).

The connectors are SMA type (female), 'Johnson Components Inc.' Product P/N: 142-0701-841 (or similar).

Both a measurement jig and a calibration jig are provided.

The calibration jig is designed for a full 2-port calibration, and consists of an open line, short line and through line. LOAD calibration can be done by a 50Ω SMA termination.

#### MEASUREMENT PROCEDURE

Follow the VNA's instruction manual and use the [calibration jig](#) to perform a full 2-Port calibration in the required bandwidths.

Solder the filter to the [measurement jig](#) as follows:

Input (Filter) ➡ Connector 1 (Jig)      GND (Filter) ➡ GND (Jig)

Output (Filter) ➡ Connector 2 (Jig)      GND (Filter) ➡ GND (Jig)

Set the VNA to the relevant frequency band. Connect the VNA using a 10dB attenuator on the jig terminal connected to port 2 (using an RF cable).

