

# Thin-Film RF/Microwave Filters

## Low Pass – Harmonic Lead-Free

### LP0402N Series – LGA Termination



#### RFAP TECHNOLOGY

The LP0402N Series Harmonic Low Pass Filter is based on the proprietary RFAP Thin-Film multilayer technology. The technology provides a miniature part with excellent high frequency performance and rugged construction for reliable automatic assembly.

The RFAP Harmonic Low Pass Filter is offered in a variety of frequency bands compatible with various types of high frequency wireless systems.

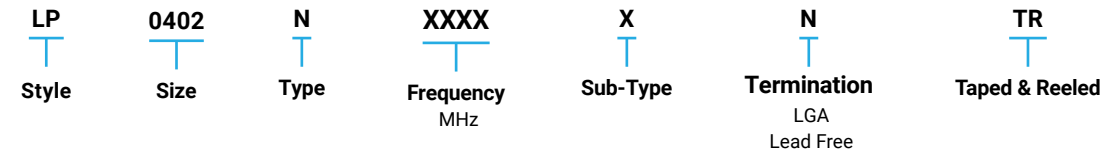
#### APPLICATIONS

- Wireless communications
- Wireless LAN's
- GPS
- WiMAX

#### LAND GRID ARRAY ADVANTAGES

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

#### HOW TO ORDER



#### 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.



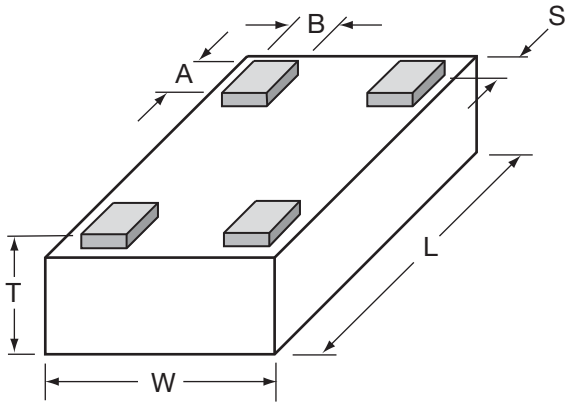
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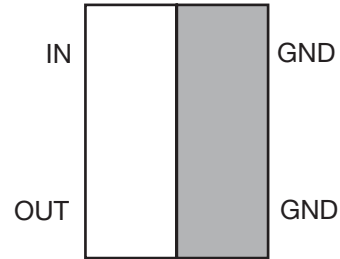


## DIMENSIONS: millimeters (inches) (Bottom View)

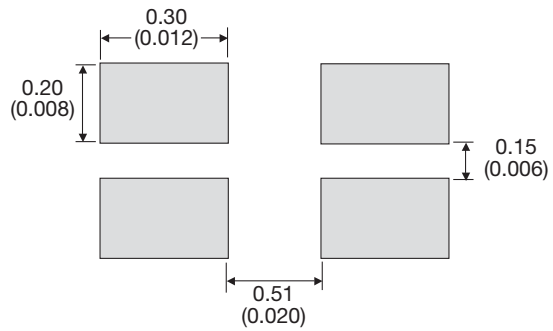


<b>L</b>	1.0±0.05 (0.040±0.002)	<b>A</b>	0.20±0.06 (0.008±0.002)
<b>W</b>	0.58±0.04 (0.023±0.002)	<b>B</b>	0.18±0.05 (0.007±0.002)
<b>T</b>	0.35±0.5 (0.014±0.002)	<b>S</b>	0.05±0.05 (0.002±0.002)

## TERMINALS (TOP VIEW)



## RECOMMENDED PAD LAYOUT (MM)



## ELECTRICAL CHARACTERISTICS

(Guaranteed over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Operating Temperature Range)

P/N	Frequency Band [MHz]	I. Loss [dB]	R. Loss [dB]	Attenuation @ $2x F_0$ [dB]	Attenuation @ $3x F_0$ [dB]
LP0402N2442ANTR	2400-2484	0.35 typ 0.5 max	20	30	17
LP0402N2690ANTR	2640-2740	0.35 typ 0.5 max	20	30	20
LP0402N3500ANTR	3400-3600	0.3 typ 0.5 max	19	30	20
LP0402N5200ANTR	5500-5350	0.2 typ 0.5 max	19	30	20
LP0402N5500ANTR	5350-5650	0.2 typ 0.5 max	15	30	-
LP0402N5800ANTR	5600-6000	0.2 typ 0.5 max	16	25	-

NOTE: Additional Frequencies Available Upon Request



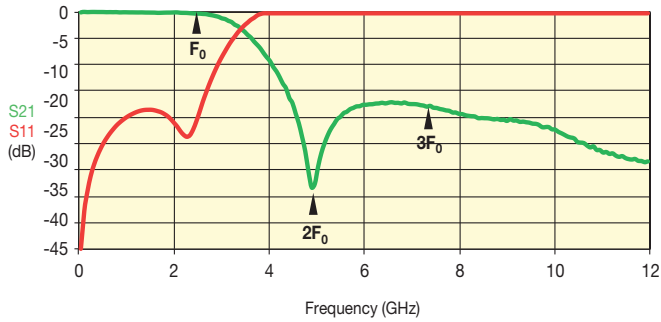
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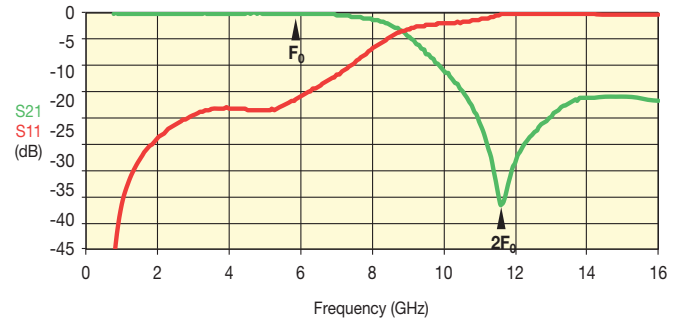
### LP0402N Series – LGA Termination



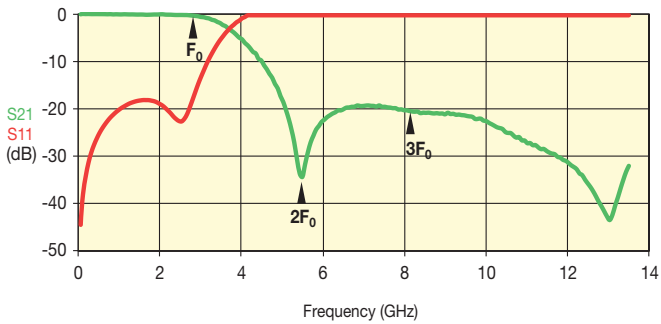
LP0402N2442ANTR



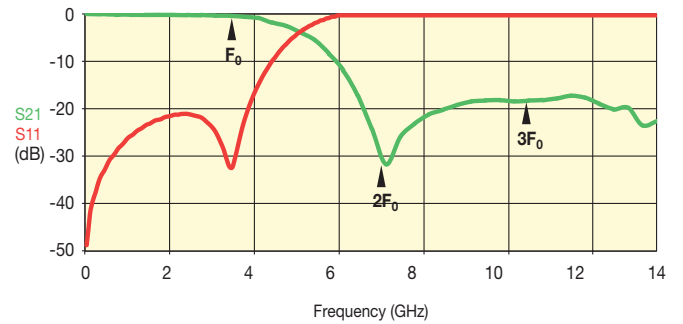
LP0402N5800ANTR



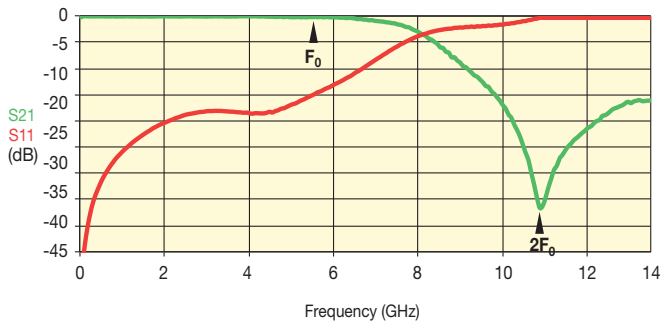
LP0402N2690ANTR



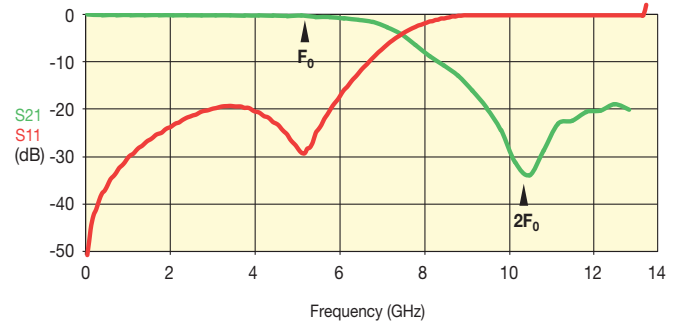
LP0402N3500ANTR



LP0402N5500ANTR



LP0402N5200ANTR



# Thin-Film RF/Microwave Filters

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### LP0402N Series – Test Jig

#### TEST JIG FOR LP0402 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

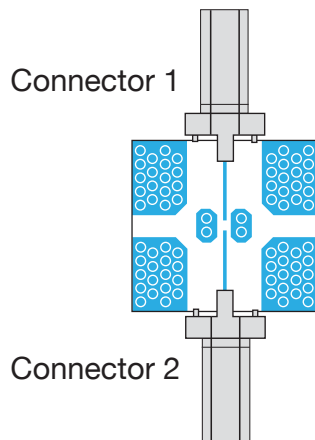
Follow the VNA's instruction manual and use the [calibration jig](#) to perform a full 2-Port calibration in the required bandwidths.

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).

**Measurement**



**Calibration Jig**

