



# RF Chip Inductor Guide

Wire Wound and Multi-Layer - 0402, 0603, 0805, 1008



Pulse Electronics - leading supplier of magnetics for consumer applications

# RF CHIP INDUCTORS

Pulse Electronics Networking's range of chip technology based products include inductors, chokes and suppression beads in a variety of materials, sizes and values providing the optimum performance fit for todays challenging circuit designs.

This short selection guide provides a starting point in the design process for choosing the right sized product and solution for common and differential noise filtering and EMI suppression on signal, data and power lines.

The products are split in to the following main family categories:

## RF Inductors:

The ceramic core "CD" wire wound series offers four sizes for use filtering at High RF Frequency with high Q and are available in either +/-5% or +/-2% tolerances bands. Available in a selection of values from 1.0nH to 4.7uH and a wide operating temperature range from -40°C to +125°C.

The ferrite core "FT" wire wound series offers three sizes with higher inductance in each size than both the ceramic and multi-layer families and support a +/-5% tolerance band. Available in a selection of values from 22nH to 68.0uH and a wide operating temperature range from -40°C to +125°C.

## Multi-Layer Inductors:

The "CL" monolithic ceramic series offers four sizes with low DC resistance and high Q, in the case of the "0402CL" series. This series supports a wider operating temperature range from -55°C to +125°C and are available in selected inductance values from 1.0nH to 6.3nH or 6.8nH to 120nH in +/-0.3nH and +/-5% tolerances bands respectively.

The larger "CLH" series are a magnetically shielded, ceramic monolithic range and offer low DC resistance for higher DC bias current handling for Power Lines and Point of Load Inductors. Available in a selection of values from 0.47uH to 4.7uH and operating temperature range -40°C to +125°C.



Multi-Layer Chip Inductors



Wire Wound Chip Inductors

## PART NUMBER LEGEND

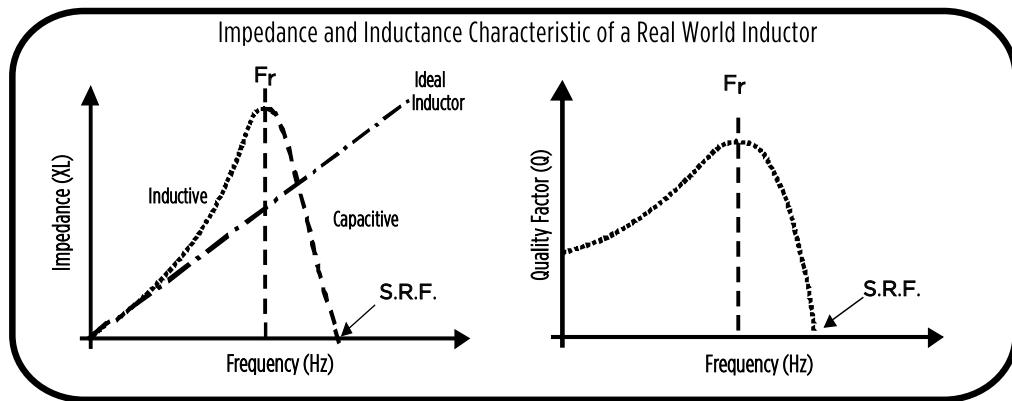
PE —	0805	CD	121	K	T	T	
PACKAGE STYLE	(0402, 0603, 0805, 1008)		INDUCTANCE (μH)	Representative of the inductance value			TERMINATION
CORE MATERIAL			TOLERANCE				T or S = <b>TIN PLATING</b>
CD	= Ceramic (Alumina) Standard Range		G = ±2%				
FT	= Ferrite (High Inductance) Range		J = ±5%				
CL	= Multi-Layer (Unshielded) Range		K = ±10%				
CLH	= Multi-Layer (Shielded) Range		S = 0.3nH or ±20%				
			Note: depends on the size and construction				
			Size	0402	0603	0805	1008
			PCs/Reel	3000	2000	2000	1600

# RF CHIP INDUCTORS

## PRODUCT APPLICATIONS

Wire wound RF inductors are designed on miniature ceramic or ferrite core bases and are used for applications with frequencies mainly >50MHz. They exhibit low inductance and high Q values, or on ferrite cores, for lower frequencies, the flux linkage between the turns of the coil dramatically increase the inductance value for the same size.

Inductors at low frequencies conform to the idea path - see the curves below, but then soon migrate as the reactance (**XL**) increases much faster than the inductance until it reaches its parallel resonant frequency (**Fr**). Above **Fr** and the component behaves in a capacitive manor and reactance drops sharply. This can also be seen in the published performance curves for Q versus frequency. They also gives an indication to suppression performance, since Q factor is the ratio of Reactance (XL) over series resistance (**Rs**)



When selecting an RF inductor for real life applications the working or central frequency (**Fc**) should be a magnitude of 10 below the listed SFR and preferably not more then half the **Fr** value. Another key factor when selecting RF or miniature power line inductors, is the current handling capability as the inductance drops or "derates" with increasing current and is dissipated as heat which may cause unexpected performance issues over time. These parts can also be used for suppression as well as filtering as they exhibit high impedances at 100MHz

Full Data sheets containing the whole range can be downloaded by clicking on the highlighted links in the table below

### INDUCTANCE RANGE SELECTOIN FOR CERAMIC, FERRITE AND MULTI-LAYER SERIES INDUCTORS

Part Number	Size	Construction	Inductance Range	Inductance (xH)						
<a href="#">PE-0402CD</a>	0402	Wirewound Ceramic	1.0 to 120	1 n	10 n	100 n	1 u	10 u	100 u	1 m
<a href="#">PE-0402FT</a>	0402	Wirewound Ferrite	22 to 560							
<a href="#">PE-0603CD</a>	0603	Wirewound Ceramic	1.7 to 390							
<a href="#">PE-0603FT</a>	0603	Wirewound Ferrite	47 to 22,000							
<a href="#">PE-0805CD</a>	0805	Wirewound Ceramic	3.3 to 1,200							
<a href="#">PE-0805FT</a>	0805	Wirewound Ferrite	1,000 to 68,000							
<a href="#">PE-1008CD</a>	1008	Wirewound Ceramic	10 to 4,700							
<a href="#">PE-0402CL</a>	0402	Multi-layer Ceramic	1.0 to 120							
<a href="#">PE-0603CLH</a>	0603	Multi-layer Ceramic	220 to 2,200							
<a href="#">PE-0805CLH</a>	0805	Multi-layer Ceramic	470 to 4,700							
<a href="#">PE-1008CLH</a>	1008	Multi-layer Ceramic	470 to 4,700							

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## For More Information:

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