

Inductors

Ultra high-Q multilayer inductors

- Innovations in both materials and structure improve inductor performance
- High Q factor reduces losses in RF matching circuits

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TDK Corporation presents the new MHQ1005P series of multilayer ceramic inductors with a Q factor that, depending on the type, is as good or much better than comparable, but more expensive, wirewound inductors. The new multilayer ceramic components are thus suitable for use in low-loss RF matching circuits in devices such as smartphones and conventional mobile phones. The MHQ1005P series is already in mass production.

The new series features a Q factor that is at least about the same as the value of a comparable wirewound inductor with the same inductance and the same footprint. For example, the MHQ1005P2N7 type with an inductance of 2.7 nH offers a Q factor of 108 at 2.4 GHz.

The high Q factor achieved by the MHQ1005P series is due to TDK's advanced materials technology and innovations in the internal structure of the inductor. The use of new materials has produced an electrode with a smoother surface, which raises the device's Q factor and lowers the dielectric constant, thus delivering a better self-resonant frequency.

Enhancements to the internal structure of the inductor – including thicker inner electrodes and new L-shape terminals to improve magnetic flux – also help to raise the Q factor of the new multilayer ceramic inductors.

End-product developers can benefit from these innovations and design MHQ1005P inductors into applications such as RF matching circuits to produce an effective, low-loss system. At the same time, they can achieve a lower bill-of-materials cost than with comparable high-Q wirewound inductors.

Multilayer ceramic inductors of the MHQ1005P series are available in 27 inductance values from 1 to 15 nH and in three tolerance levels.

These new inductors are offered in the 1005 case size with a footprint identical to that of 1005 wirewound inductors.

Glossary

- Q: the Q (quality factor) of an inductor is the ratio of its inductive reactance to its resistance at a given frequency, and is a measure of its efficiency. The higher the Q factor of the inductor, the closer it approaches the behavior of an ideal, lossless, inductor.

Main applications

- RF matching circuits in devices such as mobile phones and portable radio terminals.

Main features and benefits

- Enables both cost-effective and high-performance RF circuits by offering the performance of a wirewound inductor with similar inductance and Q factor at a lower component cost.

Key data

Product name	MHQ1005P series
Inductance [nH]	1 to 15
Operating temperature range [°C]	-55 to +125
R _{DC} [Ω]	0.03 to 0.28 (max.)
I _{DC} [mA]	400 to 1200

About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's current product line includes passive components, magnetic application products as well as energy devices, flash memory application devices, and others. TDK today focuses on demanding markets in the areas of information and communication technology and consumer, automotive and industrial electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2011, TDK posted total sales of USD 10.6 billion and employed about 88,000 people worldwide.

About TDK-EPC Corporation

TDK-EPC Corporation, a TDK group company, is a leading manufacturer of electronic components, modules and systems, headquartered in Tokyo, Japan. TDK-EPC was founded in 2009 from the combination of the passive components business of TDK and the EPCOS Group. The portfolio includes ceramic, aluminum electrolytic and film capacitors, ferrites and inductors, magnets, high-frequency components such as surface acoustic wave (SAW) filter products and modules, piezo and protection components, and sensors. The company markets the product brands TDK and EPCOS.

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Further information on the products can be found at www.tdk.co.jp/tefe02/e534_mhq.pdf.

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