

Inductors

Multilayer type in 0603 with world's highest Q

July 23, 2013

TDK Corporation has expanded its portfolio of MHQ-P high Q multilayer inductors with the miniature MHQ0603P in case size IEC 0603. Measuring just 0.65 mm x 0.35 mm x 0.35 mm, the new inductor features the highest Q factor for any multilayer inductor of its size* and is suitable for RF applications such as smartphones, tablet PCs and other mobile devices. Mass production began in July 2013.

The typical Q factor of the 3.9 nH type is 35 at 1 GHz. This value is as good as a comparable, but more expensive, wirewound inductor and 25 percent higher than TDK's existing MLG0603W inductor. The high Q factor and small dimensions achieved by the MHQ0603P multilayer inductor are a result of TDK's advanced materials technology and innovations in the internal structure of the inductor. This enables the electrodes to be produced with a smoother surface, which raises the component's Q factor and lowers the dielectric constant, thus delivering a higher self-resonant frequency.

Thanks to its miniature size and high Q, the new MHQ0603P is designed to make RF circuits in multifunctional devices such as smartphones and tablet PCs more efficient. The new MHQ0603P inductors join the existing components in case size 1005 to form an even more versatile lineup of high Q multilayer inductors.

* As of July 2013, according to TDK data

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

- Smartphones, tablet PCs, Bluetooth and WLAN devices
- RF circuits and modules for mobile communication devices, including PAs, VCOs, and front-end modules

Main features and benefits

- High Q factor contributes to reduced losses in RF circuits
- 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
- Space-saving dimensions of 0.65 mm x 0.35 mm x 0.35 mm

Key data

Type	Inductance [nH]	Q factor	Self-resonant frequency [GHz]	DC resistance [Ω]	Rated current [mA]
MHQ0603P	0.6 to 39	Typ. 30 to 40 (1 GHz) Min. 14 to 16 (500 MHz)	1.6 to 10 (min.)	0.07 to 2.8 (max.)	160 to 1000 (max.)

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 portfolio includes electronic components, modules and systems marketed under the product brands TDK and EPCOS, power supplies, magnetic application products as well as energy devices, flash memory application devices, and others. TDK 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 2013, TDK posted total sales of USD 9.1 billion and employed about 80,000 people worldwide.

About TDK-EPC Corporation

TDK-EPC Corporation, a TDK group company, is the manufacturer of TDK's electronic components, modules and systems and is headquartered in Tokyo, Japan. TDK-EPC was founded on October 1, 2009, from the combination of the electronic components business of TDK and the EPCOS Group. The product portfolio includes ceramic, aluminum electrolytic and film capacitors, ferrites, inductors, high-frequency components such as surface acoustic wave (SAW) filter products and modules, piezo and protection components, and sensors.

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