

RF Components

Thin-film capacitors in 0402 with a high Q factor

- Z-match capacitors feature tight tolerances and a high self-resonant frequency

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TDK-EPC, a group company of TDK Corporation, presents the new TDK TFSQ0402 series of thin-film capacitors in a 0402 (EIA 01005) package. Under the product name Z-match the new capacitors are designed for power amplifier circuits and RF matching circuits in smart-phones, mobile phones, wireless LANs and other communication technologies. Mass production started in August 2011.

In order to create the new line of high-frequency components with low ESL and ESR, TDK-EPC applied TDK's advanced thin-film technology know-how that is used to manufacture HDD magnetic heads. The result is a new line of compact, low-profile components with outstanding performance. Thanks to the thin-film process Z-match capacitors achieve an extremely tight tolerance of ± 0.05 pF and a Q factor that is 150 percent higher than that of existing products (2.2 pF at 2 GHz). Furthermore, the new components offer an excellent high self-resonant frequency (SRF) of 6.8 GHz (2.2 pF). With these features, the new series exhibits superior high-frequency characteristics in impedance matching circuits.

The terminations of the Z-match series are located on the bottom surface of the components, and a very exact dicing process ensures that the component dimensions are extremely precise, thus making them especially suitable for mounting on modules.

The components have an operating temperature range of -55 to +125 °C and are designed for use at high frequencies from 2.4 to 6 GHz.

Main applications

- PA circuits, RF matching circuits and RF modules used in mobile phones, smartphones and other devices for wireless LAN, WiMAX, LTE, and other RF communication technologies.

Main features and benefits

- Thin-film technologies developed for the manufacture of HDD heads are applied to achieve low ESL and ESR with narrow tolerances of ± 0.05 pF.

Key data

Type	Z-match TFSQ0402 series
Capacitance range [pF]	0.2 to 3.0 (in 0.1pF increments)
Capacitance tolerance [pF]	±0.05
Operating temperature range [°C]	-55 to +125
Rated voltage [V]	16
Dimensions [mm]	0.4 x 0.2 x 0.2

About TDK-EPC Corporation

TDK-EPC Corporation (TDK-EPC), a TDK group company, is a leading manufacturer of electronic components, modules and systems headquartered in Tokyo, Japan. TDK-EPC has emerged from the combination of the electronic components business of TDK and the EPCOS Group and markets its products under the product brands, TDK and EPCOS.

The product portfolio includes ceramic, aluminum electrolytic and film capacitors, ferrites and inductors, high-frequency components such as surface acoustic wave (SAW) filter products and modules, piezo and protection components, and sensors. With this product spectrum TDK-EPC offers a broad range of products and solutions of outstanding value from a single source and focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has design and manufacturing locations and sales offices in Asia, Europe, and in North and South America.

You can download this text and associated images from www.global.tdk.com/news_center/press/aah35700.htm.

Further information on the products can be found under www.tdk.co.jp/tefe02/e741_filmcap_tfsq0402.pdf.

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