

Multilayer ceramic chip capacitors

Dynamic DC Bias Model for accurate circuit simulation

- First tool for the dynamic simulation of DC bias characteristics of MLCCs
- More accurate power supply circuit simulation when used together with TDK technical support tools for inductors
- More efficient electronic circuit design

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TDK Corporation has expanded its technical support tools for MLCCs: The new DC Bias Model enables designers to simulate DC bias characteristics of MLCCs, even when the DC bias applied to the MLCCs varies. Thanks to TDK's advanced electronic component model, the capacitance in the simulation changes dynamically with a changing DC bias voltage, an industry first*. Until now, the available simulation libraries only offered models for one specific DC bias voltage at a time. The new DC Bias Model is available in the HSPICE, LTspice and PSpice formats for the most commonly used circuit simulator software and can be downloaded free of charge from the TDK Product Center at product.tdk.com/en/technicalsupport/tvcl/general/mlcc.html.

With its existing technical support tools for MLCCs, TDK already provides data that enable the simulation of frequency characteristics. Because the effective capacitance of high-permittivity MLCCs (Class 2) changes when a DC voltage is applied, the accurate simulation of these MLCCs in circuits must also reflect their behavior when DC bias voltage is applied. For this reason, TDK's dynamic electronic component model is designed to simulate both the frequency and DC bias characteristics of MLCCs. Used together with the DC Superimposition Model, which enables the simulation of both frequency and DC superimposition characteristics of TDK inductors, the new MLCC tool enhances the accuracy of circuit simulation for power supply circuits. Designers thus benefit from a further increased efficiency of electronic circuit design.

* As of July 2014, according to data compiled by TDK

Glossary

- Electronic component model: Expresses the electrical characteristics of an electronic component. Electronic component models enable circuit simulation results that accurately reflect the actual characteristics of the component.

Main applications

- Electronic circuit design using commonly available simulation tools.

Main features and benefits

- Accurate circuit simulation based on both the frequency and DC bias characteristics of MLCCs.
- More accurate power supply circuit simulation when used together with the DC Superimposition Model for inductors, which enables the simulation of both frequency and DC superimposition characteristics of TDK inductors

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 2014, TDK posted total sales of USD 9.6 billion and employed about 83,000 people worldwide.

* 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.

You can download this text and associated images from www.global.tdk.com/news_center/press/201407081367.htm.

The new DC Bias Model and other TDK technical support tools for MLCCs can be downloaded product.tdk.com/en/technicalsupport/tvcl/general/mlcc.html.

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