

TDK Component Library For Agilent ADS

TDK Corporation

October, 2011 (ver. 5.4d)

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< Preface >

"TDK Component Library For Agilent ADS" is a simulation library (design kit) for Agilent ADS, and contains simulation models of TDK electronic components. This library contains models of capacitors, chip beads, inductors, common-mode filters, 3-terminal filters, pulse transformers, and varistors. Using this library, the actual property of electronic components can be considered in circuit simulation.

Attention regarding this library, update information, how to install and use the library, and comparison results between equivalent circuit models and measured data are written in the following. Please read this file before using the library.

< Applicable condition >

The parameters in this library are obtained under the condition of 25°C, no DC bias, and small signal operation. Proper result might not be obtained if your condition is different from the above one.

< Attention >

NOTE THAT THE DATA CONTAINED IN THIS Library IS BEING PROVIDED SOLELY FOR INFORMATIONAL PURPOSES. IN NO WAY SHALL THIS DATA BE CONSTRUED AS A WARRANTY BY TDK OF ANY PRODUCT CHARACTERISTICS AND/OR SPECIFICATIONS. WITHOUT LIMITING THE FOREGOING, TDK MAKES NO WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, RELATING TO THIS DATA, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Please refer to TDK's catalog or specifications for actual product characteristics. Note that any simulation results obtained through use of this data will not reflect the effects of room temperature or other environmental conditions. Accordingly, actual use of TDK's products is recommended as the only accurate means of conducting verification testing.

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The data of this library is the one as of October, 2011. The content of this library is subject to changed without notice.

< Feature of this library >

- The actual property of components can be taken into your circuit simulation because equivalent circuit model that considers inner structure of a part and material property is used.
- Artwork data (recommended pcb pattern) of parts are included
- Easy operation like standard ADS components.
- Both palette list and component library are used to put components.
- Discrete optimize can be used.

< Supported ADS versions >

This library can be used with ADS2004A or latter versions. However, this library might not be used depending on a simulation environment. Please acknowledge it beforehand.

< Contents in this document >

This document is described assuming the following environment.

OS: Windows XP

ADS: ADS2005A and ADS2011.01

On different OS or ADS versions, screen display and/or operation procedure may not correspond to the contents of this document. Please acknowledge it beforehand.

< Summary updates in version 5.4d >

- The models of thin-film capacitors have been newly added.
- The models of multilayer ceramic capacitors (C0402, C0603 High-Q) have been newly added.
- The models of other products also have been added or renewed.

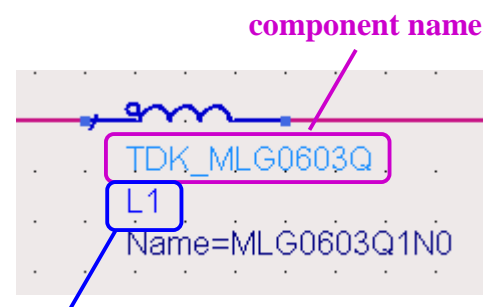
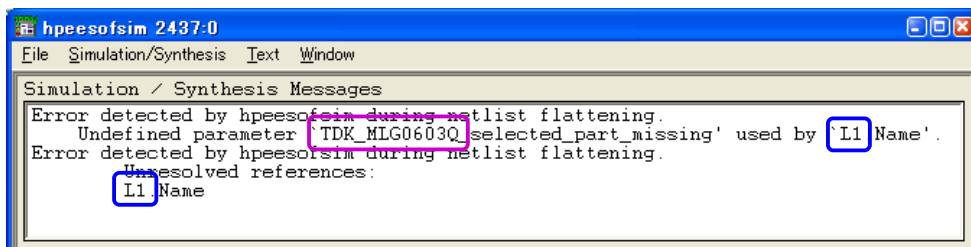
< Contained products in version 5.4d >

- Chip Beads (229 parts)
 - Inductors (1480 parts)
 - Multilayer Ceramic Capacitors (599 parts)
 - 3-terminal Feed Through Multilayer Ceramic Capacitors (25 parts)
 - Thin-film Capacitors (29 parts)
 - 3-Terminal Filters (131 parts)
 - Common Mode Filters (30 parts)
 - Pulse Transformers (5 parts)
 - Varistors (37 parts)
- Total: 2565 parts

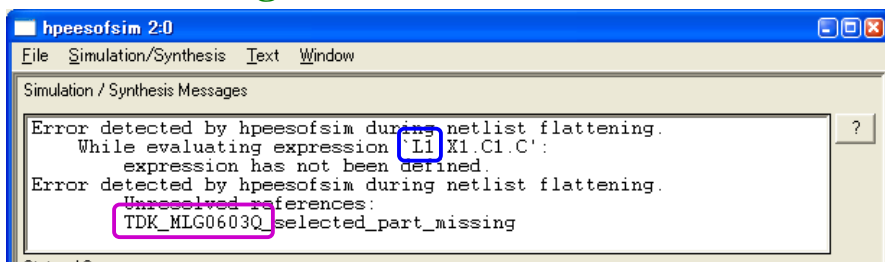
< Caution for users using previous versions (5.2 or less) >

The parts data of some products have been revised from version 5.3. An error shown below may occur if TDK components provided in the old design kit, version 5.2 or less, are used on ADS in which version 5.3 or latter is installed. When the error occurs, double-click on a component that is making the error and select a proper part again.

Error message on ADS2005



Error message on ADS2009



instance name

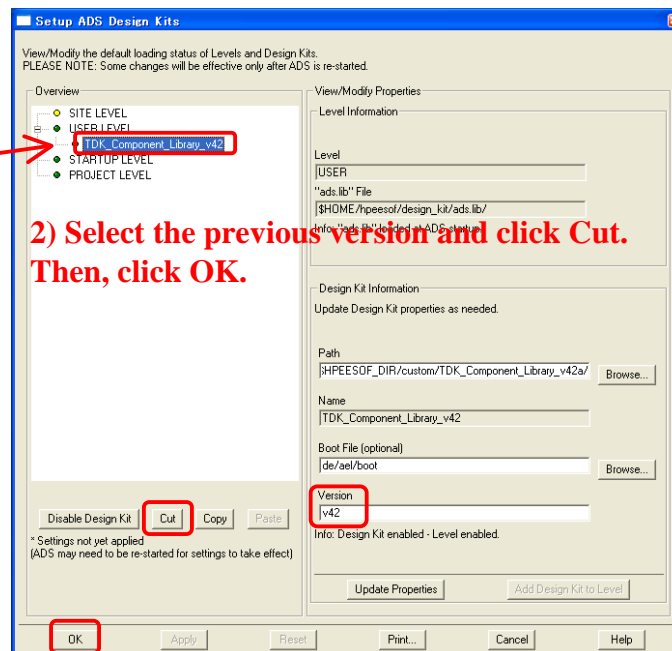
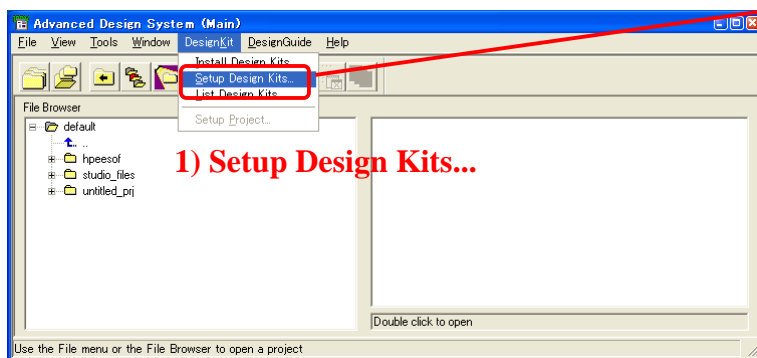
Double-click on a component that is making the error and select a proper part again.

L1, TDK_MLG0603Q, is making an error on the above example.

< Uninstall the previous version >

If previous versions of the library, uninstall it as following steps.

- 1) Select Setup Design Kits... from DesignKit menu of ADS main window, and open Setup ADS Design Kits window.
- 2) Select previous version in Overview and click Cut button. Then close Setup ADS Design Kits window by clicking OK button.
- 3) Quit ADS.
- 4) Delete the folder that previous version is installed.

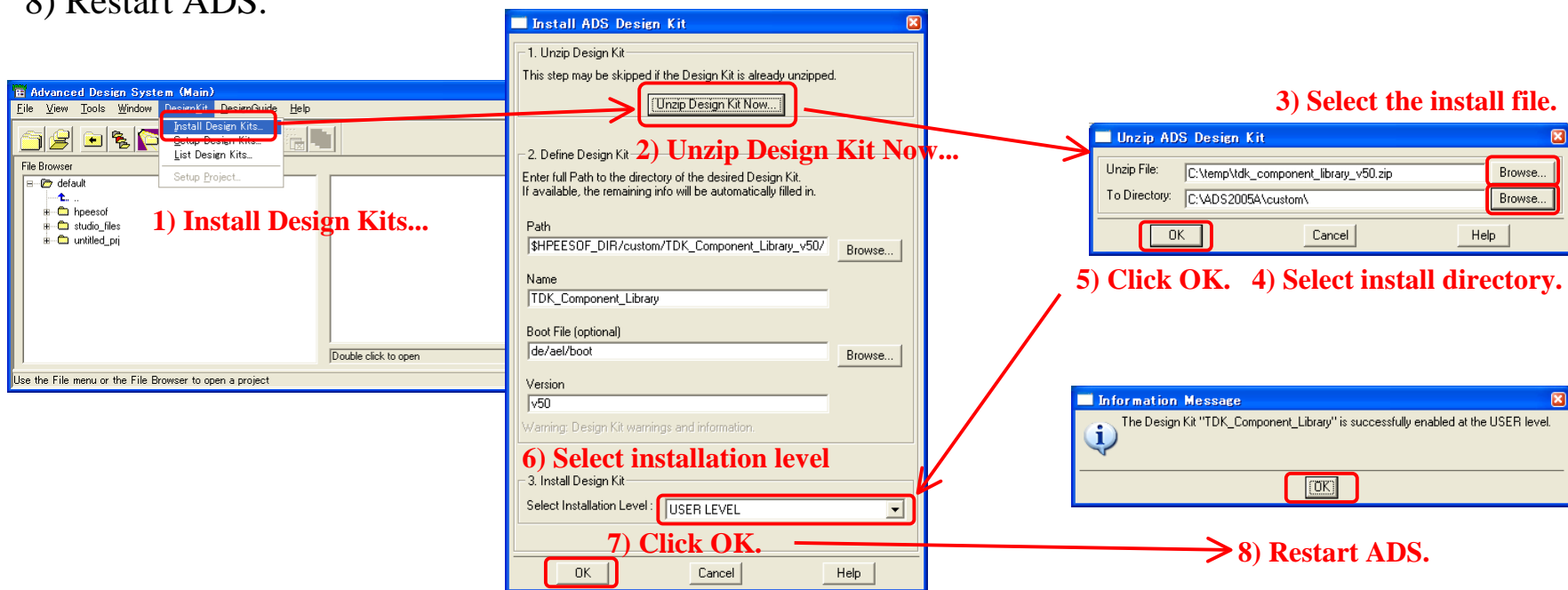


< Preparation of the install file >

Save the installation file (*tdk_component_library_v54d.zip*) in an arbitrary directory (ex. "c:/temp"). A directory which space is used for in path name is impossible. "Desktop" or "My Documents" are impossible.

< Install the library >

- 1) Select Install Design Kits... from DesignKit menu of ADS main window, and open Install ADS Design Kits window.
- 2) Click Unzip Design Kit Now... button and open Unzip ADS Design Kit window.
- 3) Click Browse... button of Unzip file and select the install file.
- 4) Click Browse... button of To Directory and select a directory in which the library is installed (ex."C:/ADS2005A/custom").
- 5) Click OK button then the library is installed in the selected directory.
- 6) Set the installation level.
- 7) Click OK button then a message window comes out. Confirm it and click OK button.
- 8) Restart ADS.



How to set up the library for ADS2011 (1)

< Preparation of the library file >

Unzip the library data file (*tdk_component_library_v54d.zip*) and save it at any directory.

< Adding the library to an existing workspace >

- 1) Open the workspace and select Manage Favorite Design Kits... from DesignKits menu.
- 2) Click the Add Design Kit from Favorite button.
- 3) Put a check mark at the library to be used. If the library is not listed, click the Add User Favorite Library/PDKs and select the *lib.defs* file that is in the unzipped folder.

1) Select Manage Libraries...

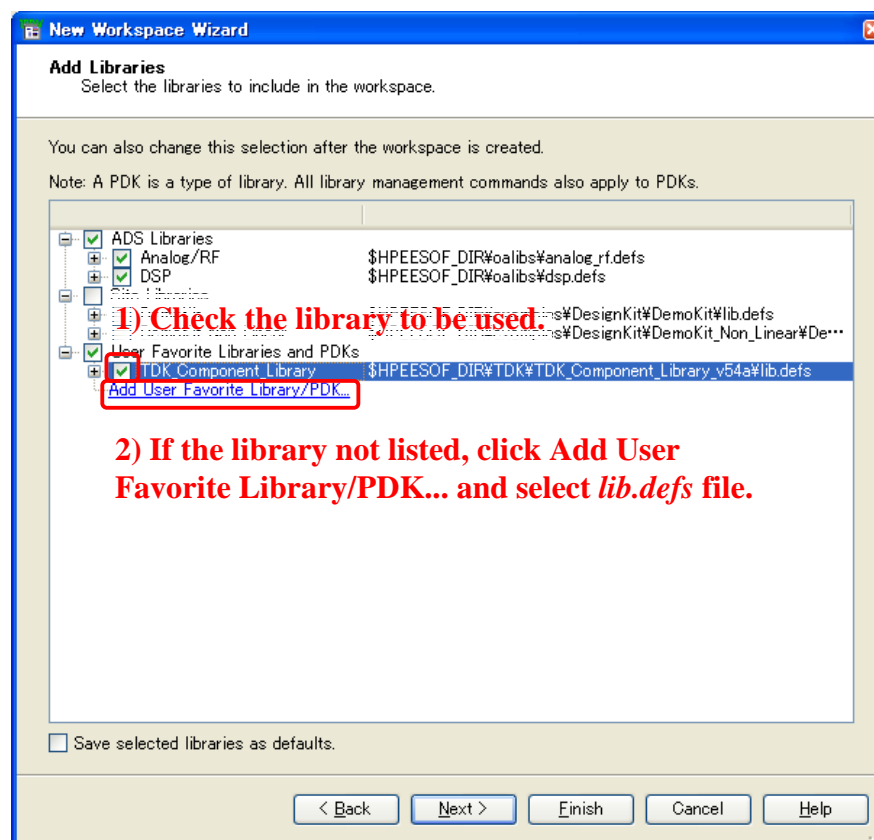
2) Click Add Design Kit from Favorites.

3) Check the library to be used.

If the library not listed, click Add User Favorite Library/PDK... and select lib.defs file.

< Adding the library to an existing workspace >

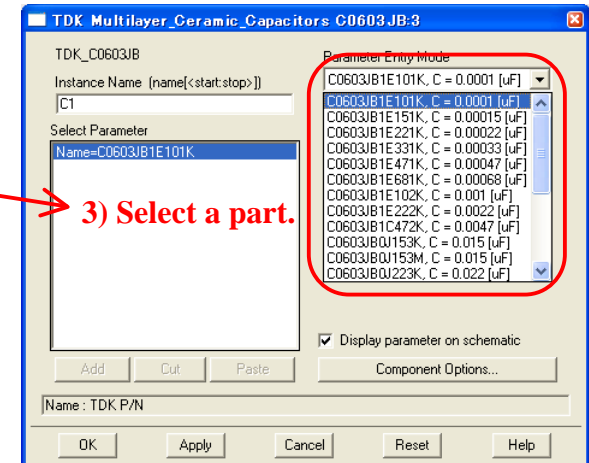
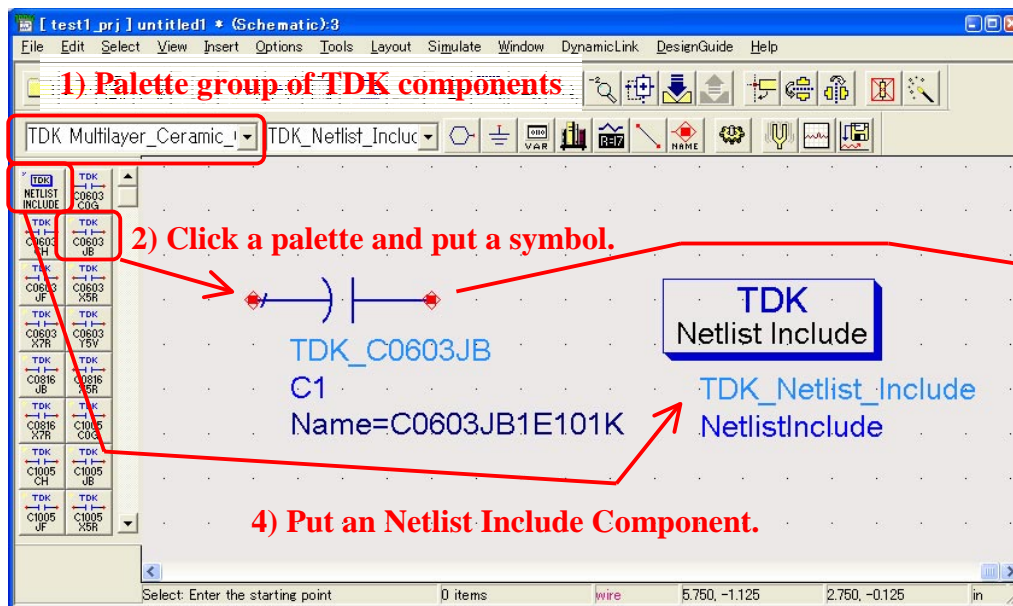
- 1) In the process of making a new workspace, put a check mark at the library to be used
- 2) If the library is not listed, click the Add User Favorite Library/PDKs and select the *lib.defs* file that is in the unzipped folder.



How to use the library (1)

< Putting a component from Palette List >

- 1) Palette group of TDK components is added in component palette list after installation.
- 2) Click a palette of component to be used and put a symbol on the schematic.
- 3) Double-click the symbol of the component and open the component setting window. Select a part on the dropdown list of the setting window.
- 4) An Netlist Include Component is necessary to use TDK components. Click the palette of the Component and put it on the schematic.



How to use the library (2)

< Putting a component from Component Library >

- 1) Click the icon of Display Component Library List and open the Component Library window.
- 2) Click a component to be used and put a symbol on the schematic.
- 3) Double-click the symbol of the component and open the component setting window. Select a part on the dropdown list of the setting window.
- 4) An Netlist Include Component is necessary to use TDK components. Click the palette of the Component and put it on the schematic.

1) Open Component Library

2) Click a palette and put a symbol.

4) Put an Netlist Include Component.

Libraries	Component	Description
All	TDK_C0603COG	TDK Multilayer_Ceramic_Capacitors C0603COG
Sub-networks	TDK_C0603CH	TDK Multilayer_Ceramic_Capacitors C0603CH
Frequently Used Analog/RF Comp	TDK_C0603JB	TDK Multilayer_Ceramic_Capacitors C0603JB
Analog/RF	TDK_C0603JF	TDK Multilayer_Ceramic_Capacitors C0603JF
TDK_Component_Library_v50	TDK_C0603XR	TDK Multilayer_Ceramic_Capacitors C0603XR
Common_Mode_Filters	TDK_C0603Y5V	TDK Multilayer_Ceramic_Capacitors C0603Y5V
Ferite_Beads	TDK_C0816JB	TDK Multilayer_Ceramic_Capacitors C0816JB
Inductors	TDK_C0816X5R	TDK Multilayer_Ceramic_Capacitors C0816X5R
Multilayer_Ceramic_Capacitors	TDK_C0603X7R	TDK Multilayer_Ceramic_Capacitors C0603X7R
Varistors	TDK_C0603Y5V	TDK Multilayer_Ceramic_Capacitors C0603Y5V
Analog Parts Library (No Layout)	TDK_C0816X7F	TDK Multilayer_Ceramic_Capacitors C0816X7F
AP 2 Diode Bridges (No Layout)	TDK_C1005COG	TDK Multilayer_Ceramic_Capacitors C1005COG
AP 4 Diode Bridges (No Layout)	TDK_C1005CH	TDK Multilayer_Ceramic_Capacitors C1005CH
AP Diodes (No Layout)	TDK_C1005JB	TDK Multilayer_Ceramic_Capacitors C1005JB
AP NPN BJTs (No Layout)	TDK_C1005JF	TDK Multilayer_Ceramic_Capacitors C1005JF
AP PNP BJTs (No Layout)	TDK_C1005XR	TDK Multilayer_Ceramic_Capacitors C1005XR
AP Power NPN BJTs (No Layout)	TDK_C1005Y5V	TDK Multilayer_Ceramic_Capacitors C1005Y5V
AP Power PNP BJTs (No Layout)		
AP NMOS Devices (No Layout)		
AP PMOS Devices (No Layout)		
AP NJFET Devices (No Layout)		
AP PJFET Devices (No Layout)		
HF Diode Library		

< Discrete Optimize >

- 1) Select Discrete Optimize setting listed in the last of the dropdown list in the component setting window.
- 2) Set Minimum, Nominal, and Maximum and start simulation.
- 3) A result of optimization is shown with a format of "<instance name>.Name = <index value>" in a status window.
- 4) Instance name corresponds to the one that is shown in a schematic window. Index value of components are shown in left side of the dropdown list in the component setting window. Get TDK part number that corresponds to the index value from the list.

1) Discrete Optimize setting

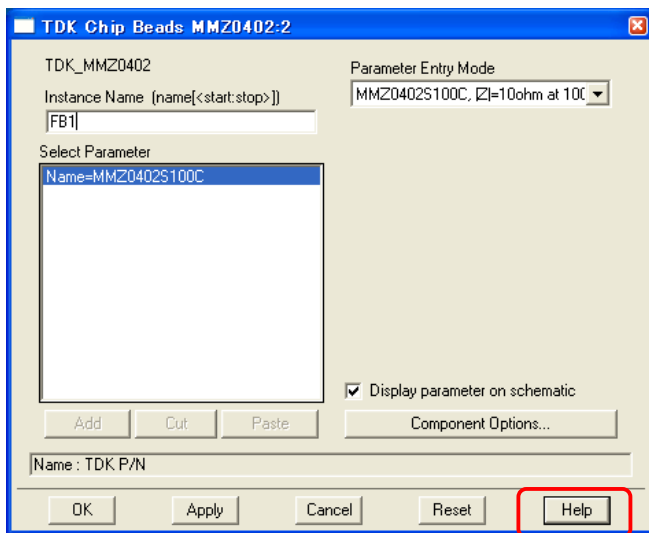
2) Set Nom., Min., and M...

3) Result of optimization
(ex; index value=7)

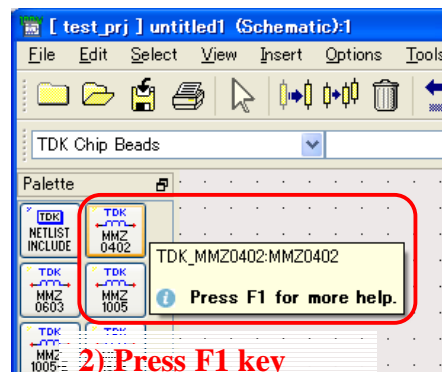
4) Get TDK P/N
(Read TDK P/N that corresponds to index=7)

< Component Help >

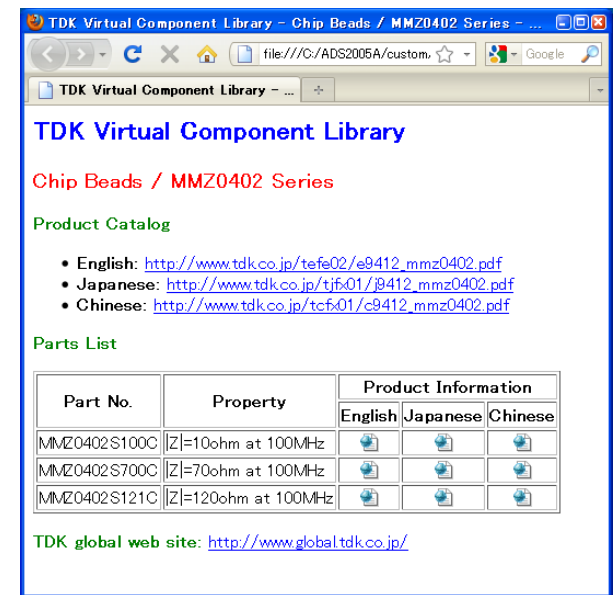
- 1) By clicking the Help button in the property window, links to PDF catalog and detailed information are shown. Internet connection is necessary to see the contents of those links.
- 2) In case of ADS2008 or latter, the information can be shown by pressing the F1 key while the mouse pointer is on the component icon.



1) Click Help



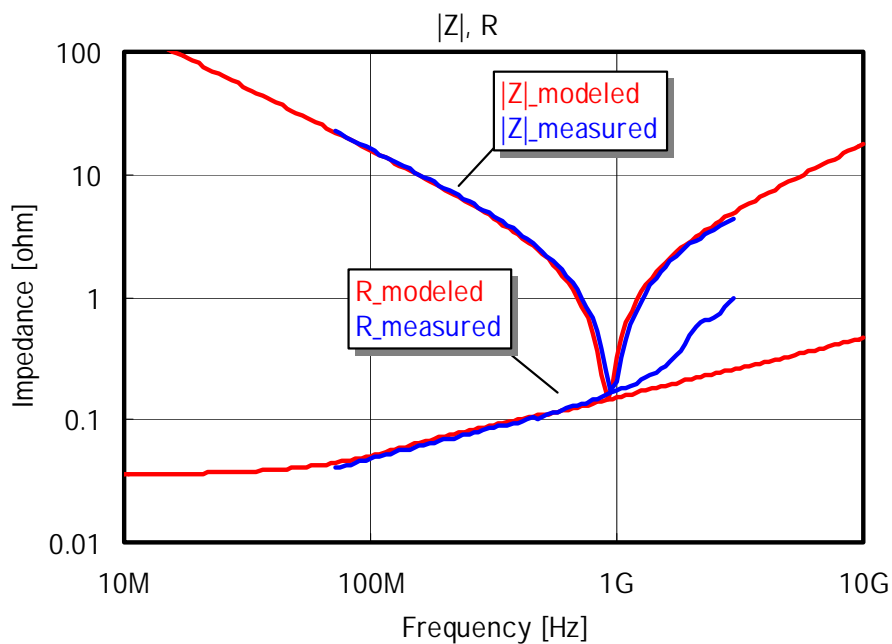
2) Press F1 key
(ADS2008 or latter)



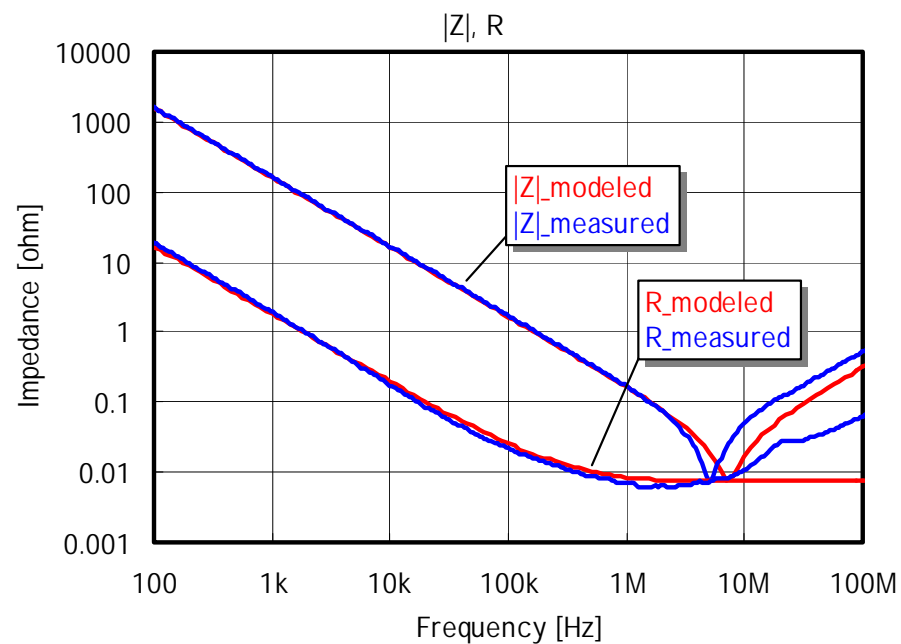
< Comparison between equivalent circuit models and measured data >

Comparison between the equivalent circuit models and measured data are shown in the following. Since the equivalent circuit models well match to measured results as shown in the following pages, simulation result that matches to actual property can be obtained.

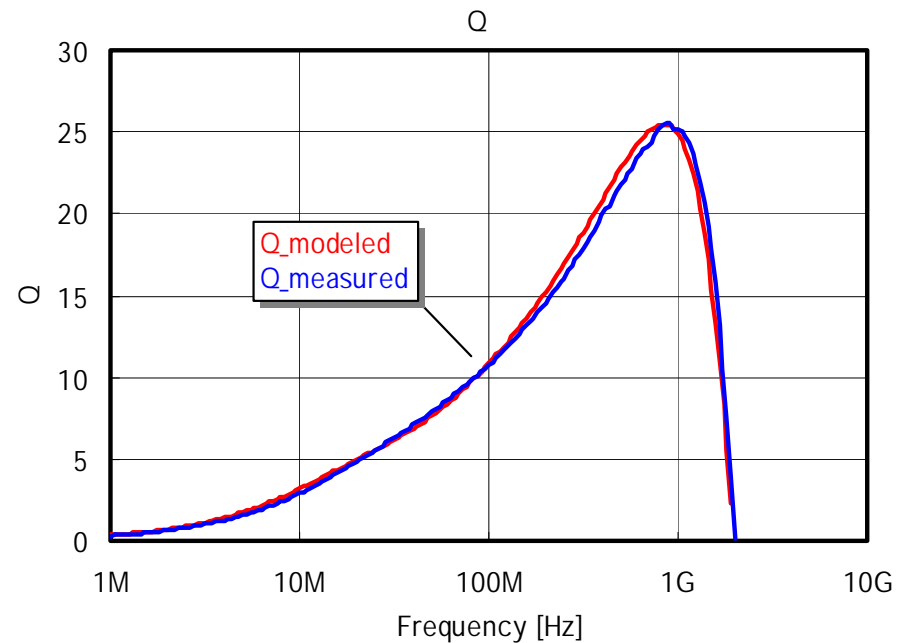
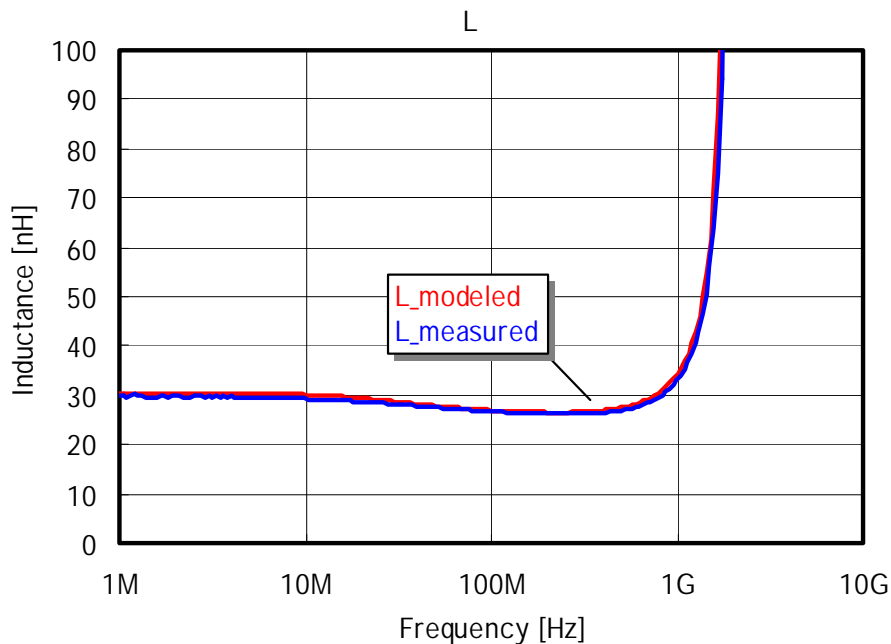
Capacitor "C0603CH1H101J"



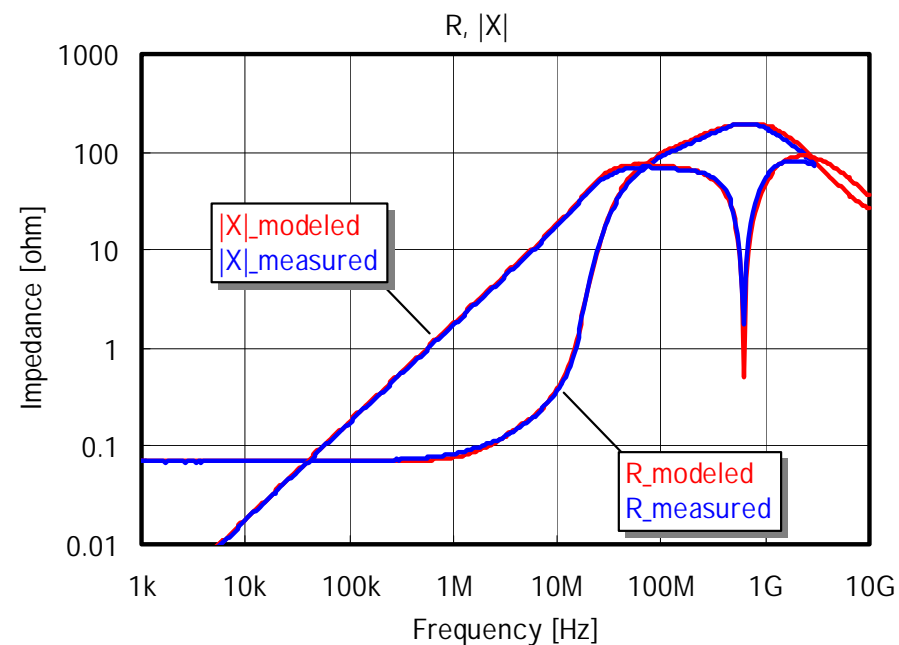
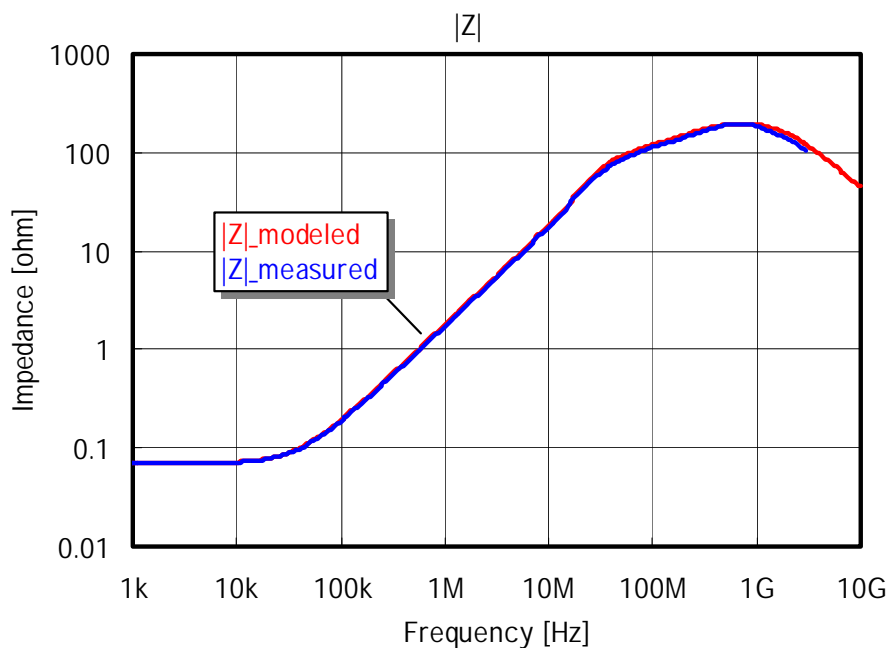
Capacitor "C2012X5R1A105K"



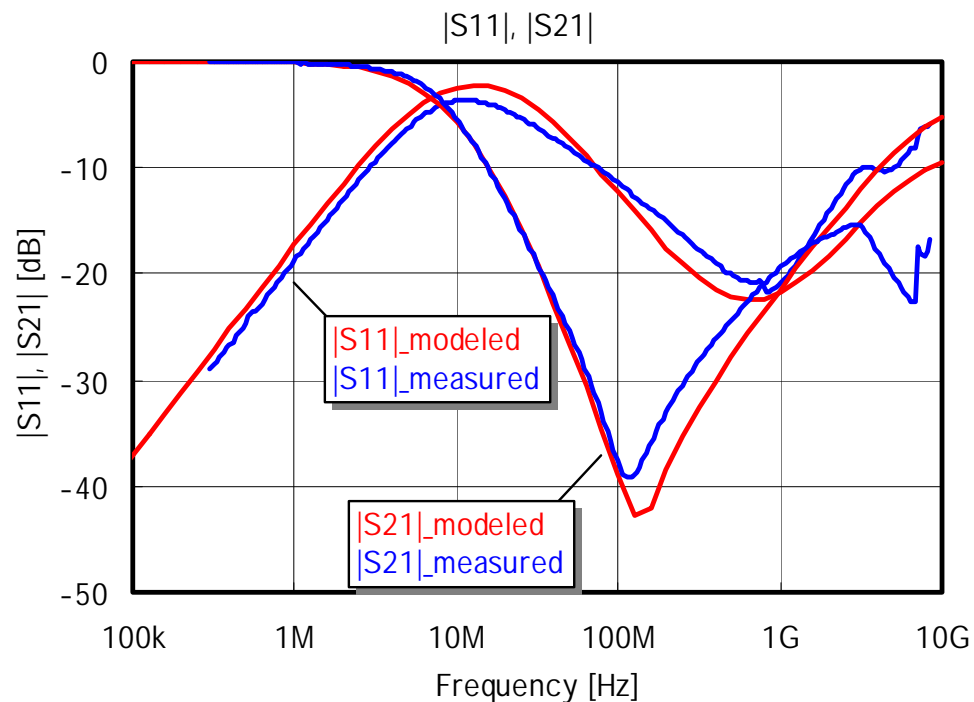
Inductor "MLG1005S27NJ"



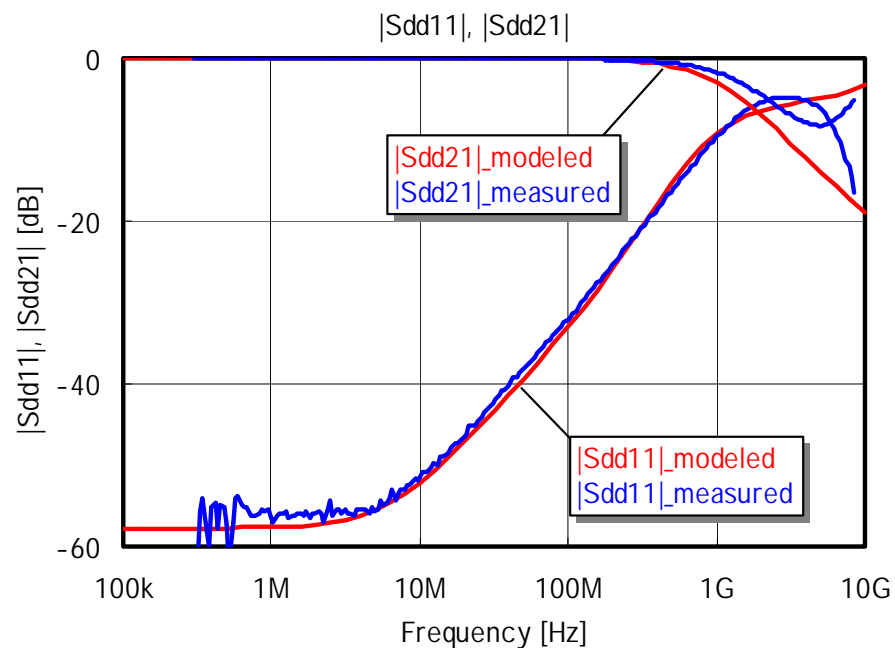
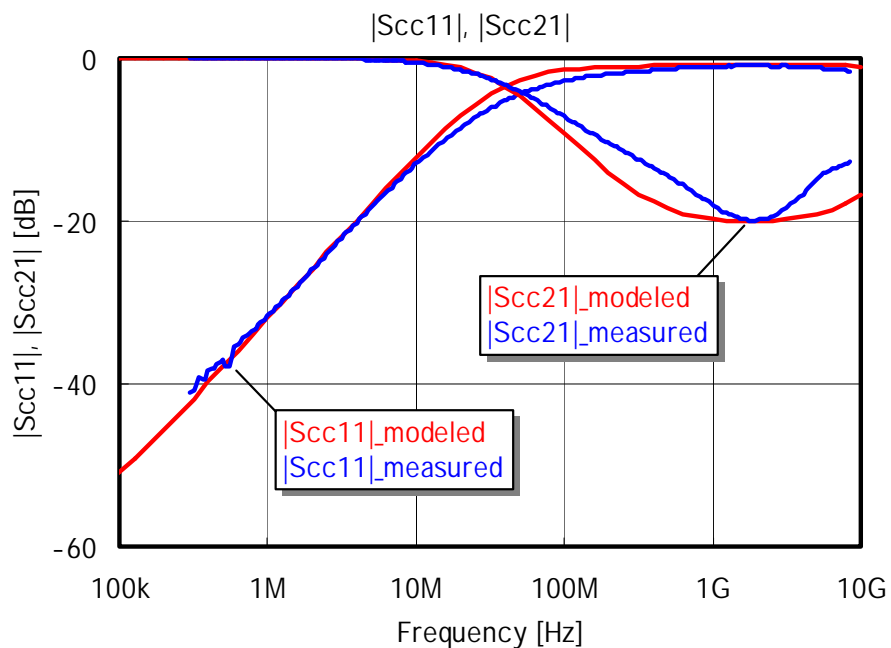
Chip Bead "MMZ1608Y121C"



3-Terminal Filter “ACF321825-102”



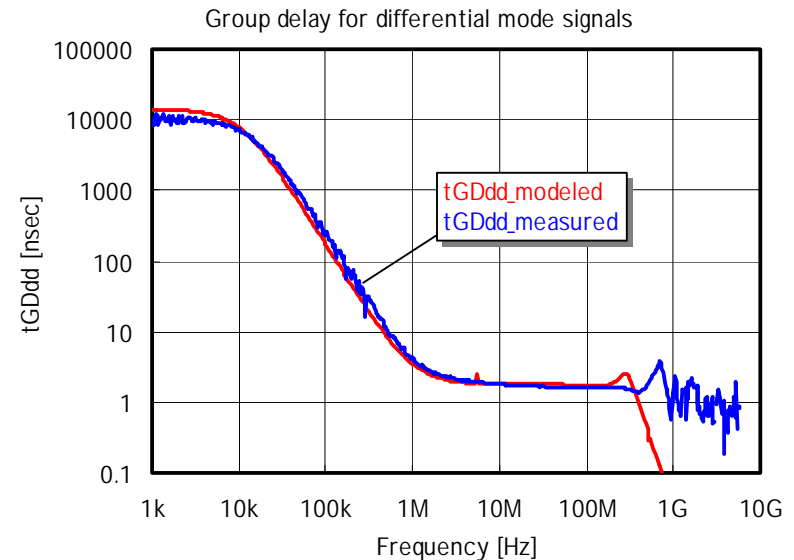
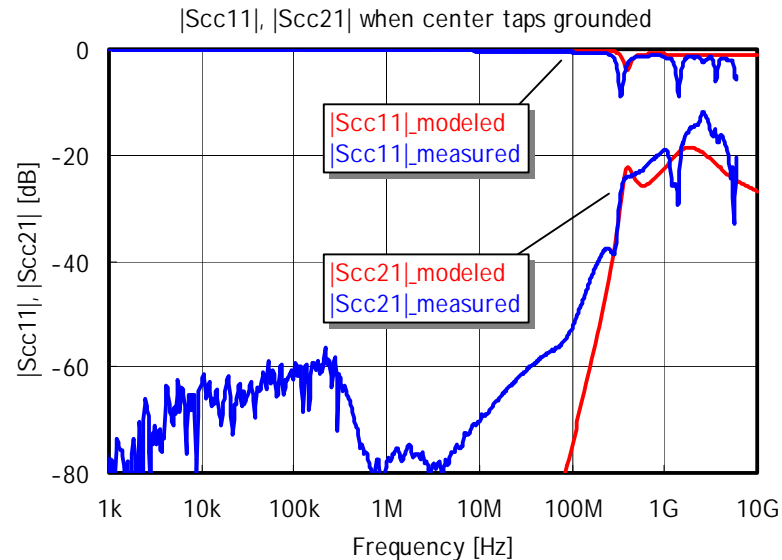
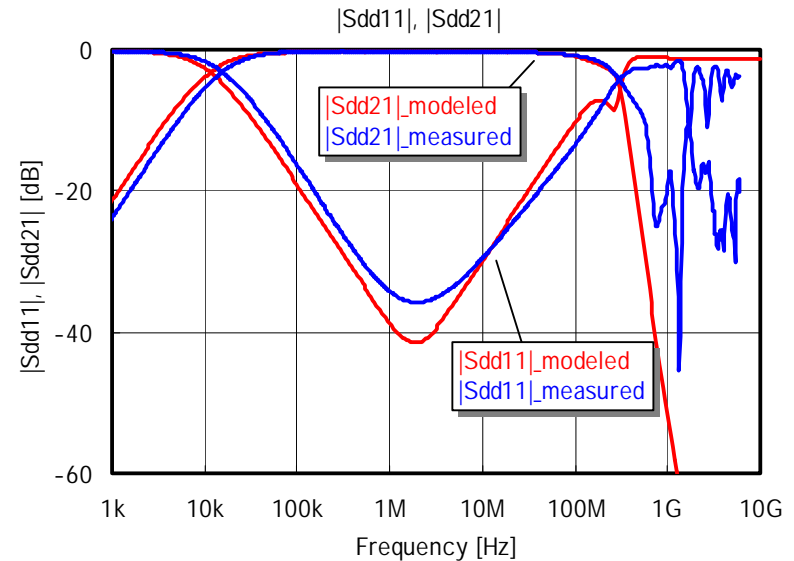
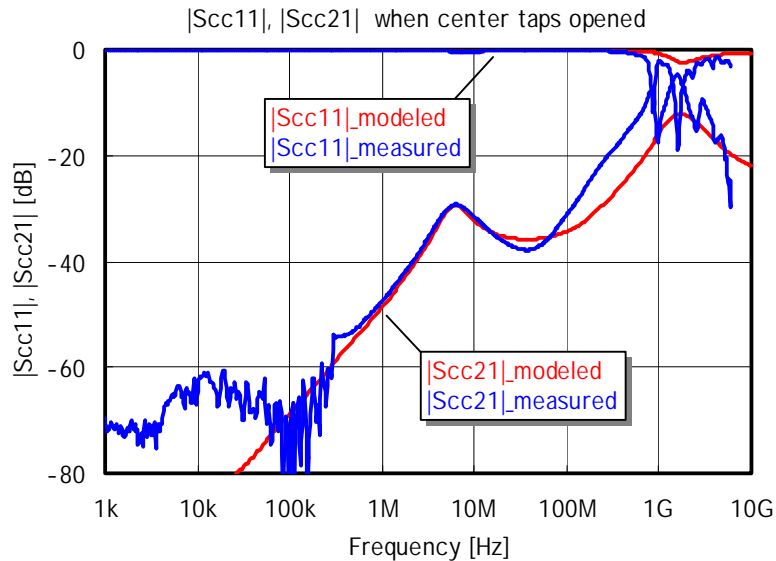
Common-Mode Filter "ACM2012-900-2P"



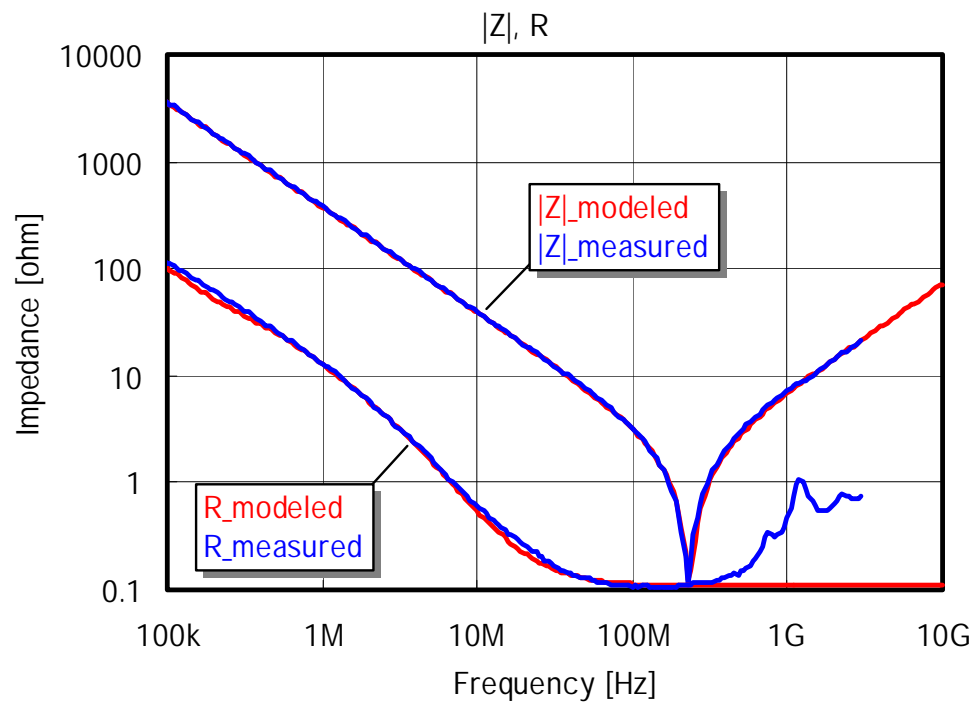
Comparison of modeled and measured property (6)



Pulse Transformer “TLA-6T118LF”



Varistor “AVR-M2012C390KT6AB”



END