TDK SPICE Netlist Library

~models for inductor products~

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Type of models

3 types of SPICE models are provided for inductor(coil) products.

Type of Model	Simple Model	Precise Model	DC Superimposition Model
Contents of Model	Simple equivalent circuit model that models only the inductance, the resistance at DC, and the self resonance of an inductor.	Equivalent circuit model that models the frequency dependence of impedance property of an inductor.	Equivalent circuit model that models the change of inductance by DC superimposition current. The frequency dependence of impedance property is modeled, too.
Scope of Products	・Inductors for High Frequency Circuits ・Inductors for Standard Circuits ・Inductors for Decoupling Circuits ・Inductors for Power Circuits	・Inductors for High Frequency Circuits ・Inductors for Standard Circuits ・Inductors for Decoupling Circuits ・Inductors for Power Circuits	・Inductors for Power Circuits

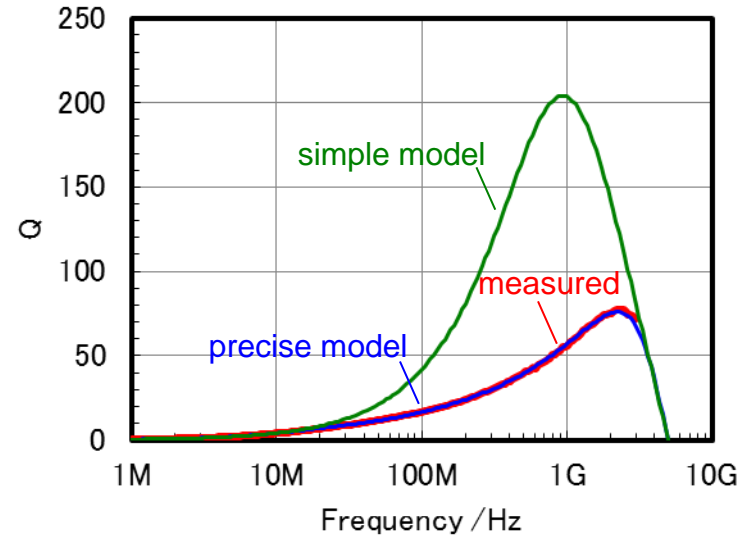The comparison among these models are shown in the following pages.

Please use an appropriate model according to the purpose of the simulation.

measurement vs. model ~inductor for RF circuits~

⬥TDK

Part No.: MHQ1005P10NGT000
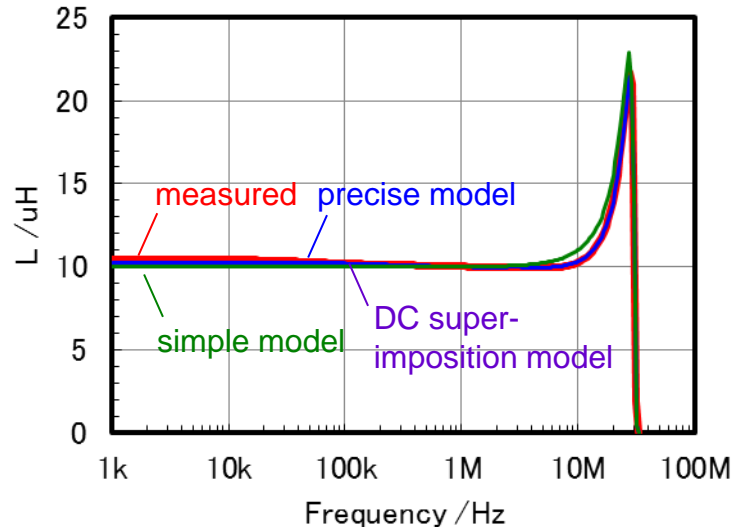
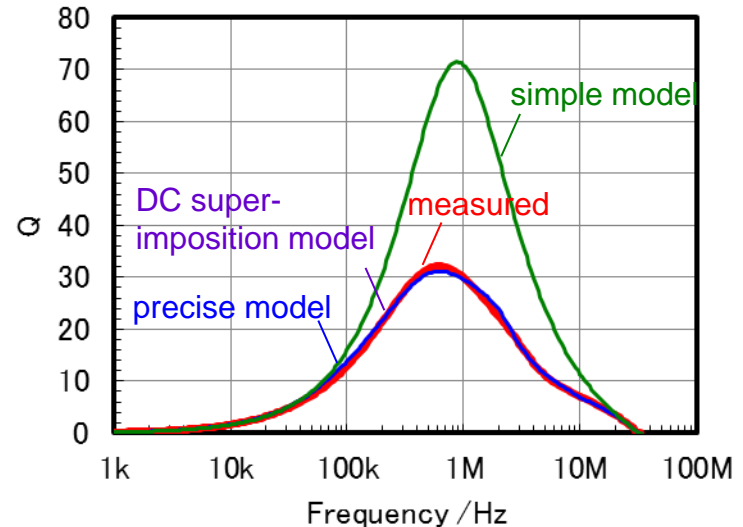**frequency dependence of inductance**
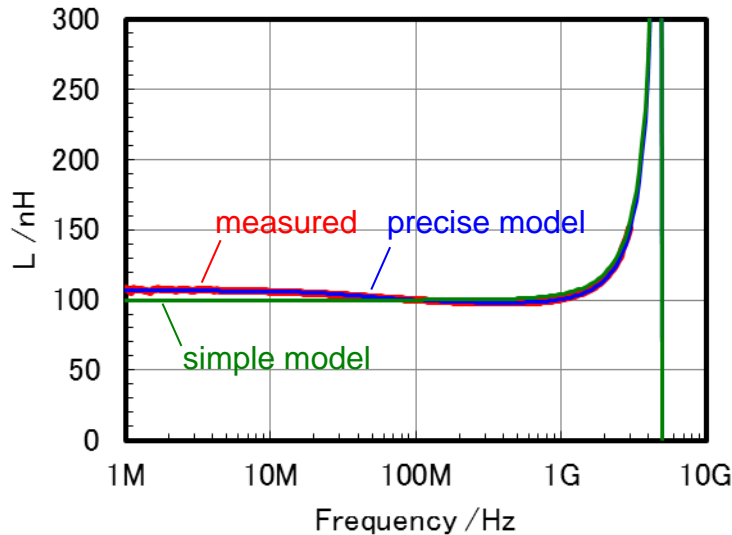
frequency dependence of Q

○ The **precise model** corresponds to the measured value about both inductance and Q.

○ The **simple model** may not correspond to the measured value about Q.

○ Use the **precise model** if <u>loss is evaluated</u>.

measurement vs. model ~inductor for power circuits~ ⯃TDK

Part No.: VLS3010ET-100M

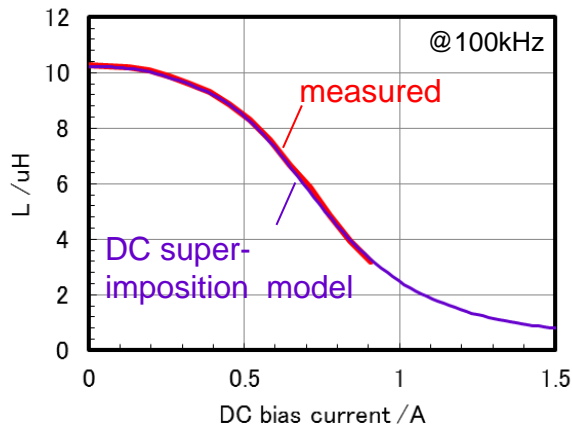**frequency dependence of inductance without DC superimposition current**

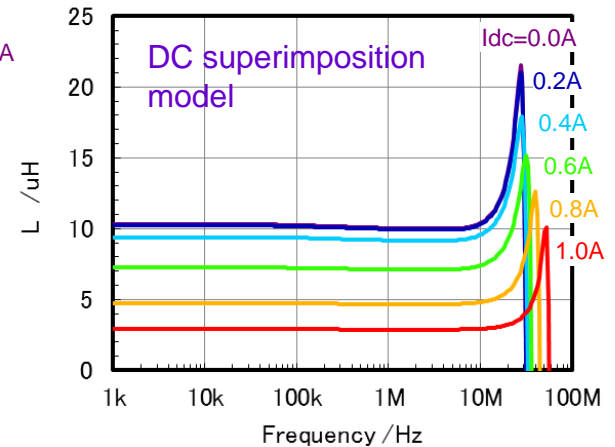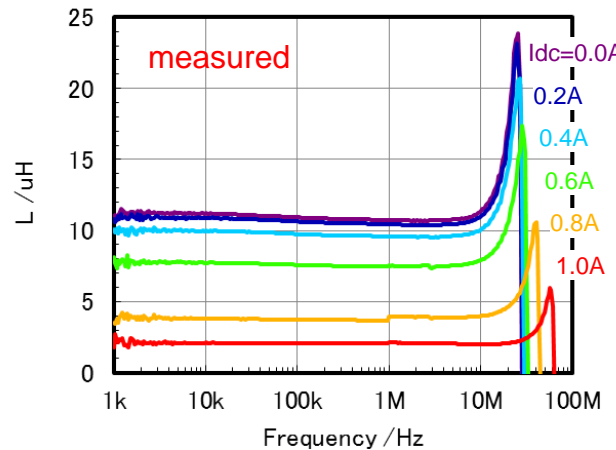**frequency dependence of Q without DC superimposition current**

○ The **precise model** and the **DC superimposition model** correspond to the measured value about both inductance and Q. (In these graphs, the results of the **precise model** is completely the same as that of the **DC superimposition model**.)

○ The **simple model** may not correspond to the measured value about Q.

○ Use the **precise model** or the **DC superimposition model** if <u>loss is evaluated</u>.

○ Note that the change of characteristics by the DC superimposition current is not modeled in the **simple model** and the **precise model**.

measurement vs. model ~inductor for power circuits~ ⨷TDK

Part No.: VLS3010ET-100M

inductance vs. DC superimposition current	frequency dependence of inductance for various values of DC superimposition current

- ○ The change of inductance by DC superimposition current is modeled in the **DC imposition model**.
- ○ In the **DC superimposition model**, the frequency dependence of impedance is also modeled.
- ○ Use the **DC superimposition model** if the effect of DC imposition current is considered.

< Applicable condition >

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

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