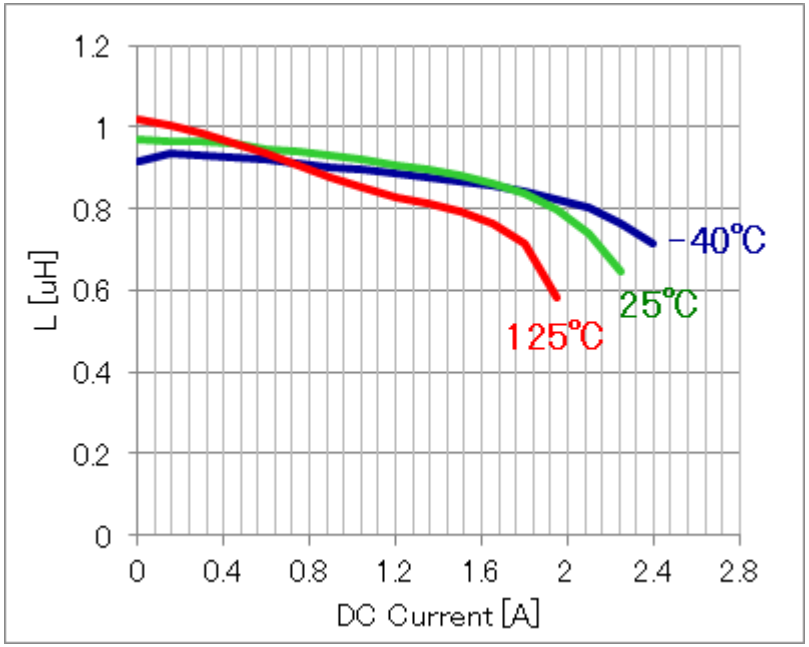
Introduction of Temperature/DC Bias Model
- Inductors -

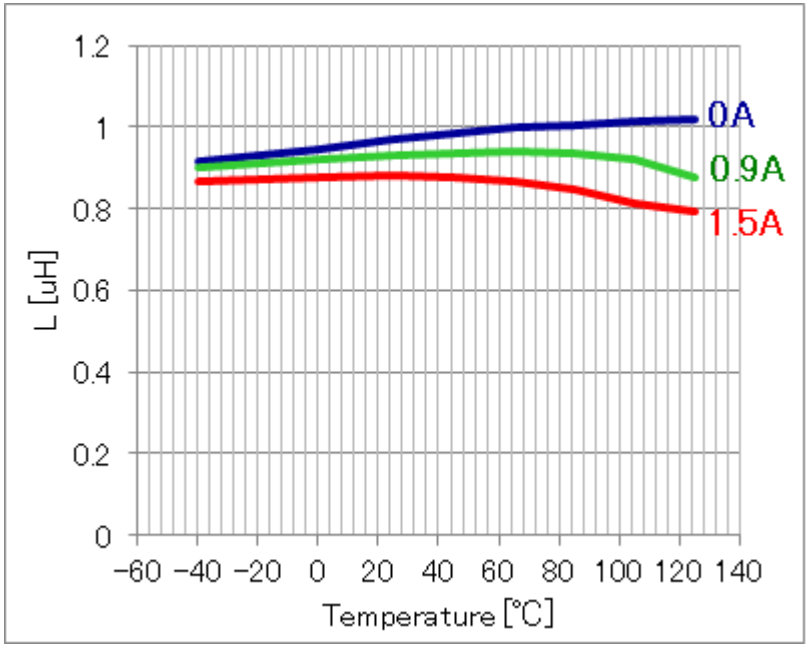
Temperature/DC Bias Characteristics of Inductors

Ferrite Power Inductor 1uH

DC Bias Characteristics (1MHz)



Temperature Characteristics (1MHz)



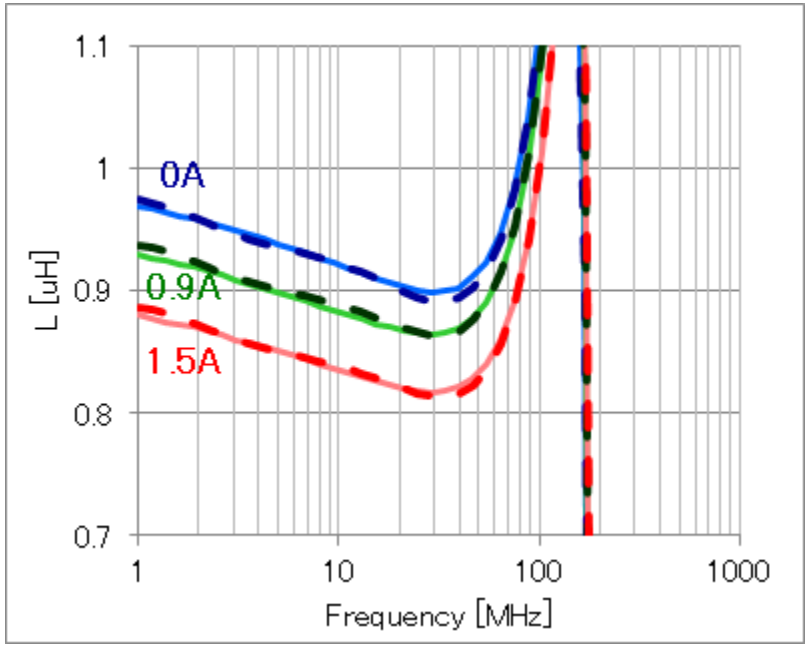
Power Inductors composed of ferrite or metal materials are known to vary their characteristics by temperature and/or DC bias current.

Therefore, temperature-DC-bias-dependent models are needed to perform simulations more precisely in condition that the ambient temperature and/or DC bias current varies.

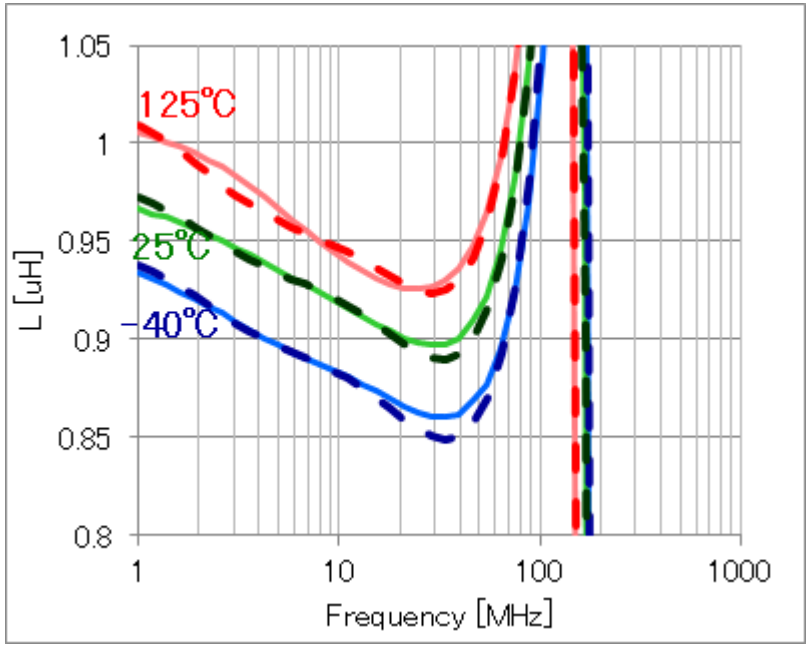
Temperature/DC bias model and measurement data

Ferrite Power Inductor 1uH

Frequency Characteristics (25C)



Frequency Characteristics (0.15A)



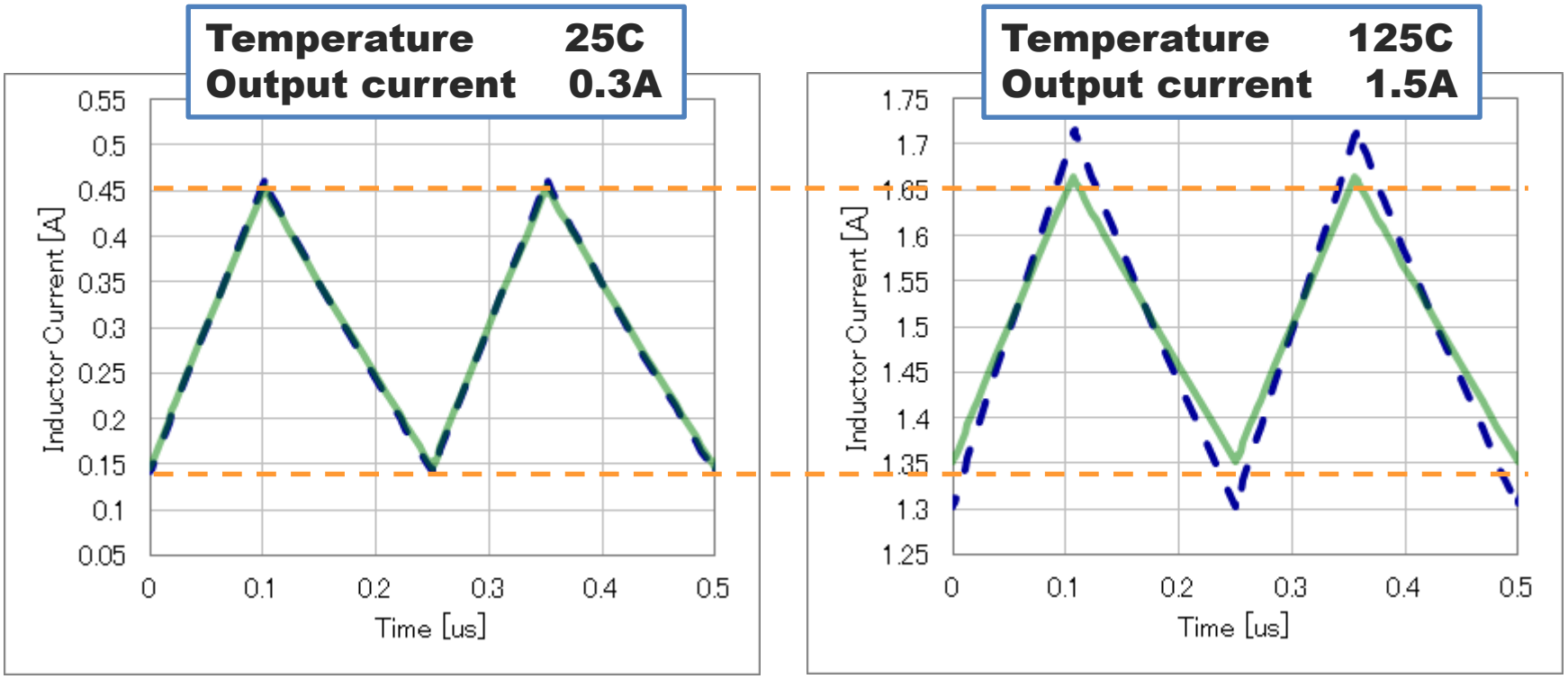
Measurement — — — — Temperature/DC bias model

By using Temperature/DC bias model, you can perform simulations well fitting to actual data dependent on the ambient temperature and DC bias current.

That is first achieved by Temperature/DC bias model, but not realized by the legend model.

Simulation example (DC-DC converter)

Ferrite Power Inductor 1uH



Above figures are inductor waveforms when using Temperature/DC bias model in DC-DC converter circuit. You can find that the waveform of Temperature/DC bias model is more actual as it reflects the reduction of inductance according to DC bias current different from the legend model.

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Also, how-to-install-and-use manuals for Temperature/DC bias model are available from links below.

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