Effect of a Local Ground and Probe Radiation on the Microwave Characterization of Integrated Inductors

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Measurement Model for Integrated Inductors

- **Schematic of 2-port S-Parameter Measurement of 2-Terminal Device**
- **Test Structures used for this Study**
- **Measurement model for two-terminal device**
- **Cross section of coaxial cable inside RF probe**
- **Isolation and Thru test device structures for deembedding**

Results using conventional meas. methods

- **2-port S-Parameter Measurements:**
  - HP (Agilent) 8510 VNA
  - Infinity Probe GS 200µm
  - LRM Calibration

Results after deembedding

- **Considerably less variability**
- **Almost independent from used ground patch**
- **Note: High resistance contact (possible particle) observed in L2a**

Conclusions

- **S-Parameter measurements of integrated inductors depends on local ground patch**
- **Parasitic asymmetric currents causes unexpected ripple**
- **A model to analyze the effect of ground structure and asymmetric currents was developed**
- **Model was verified by experimental measurements of spiral inductors with different ground patches**
- **De-embedding technique developed and applied**
- **De-embedded results almost independent from used ground patch**