

Abstract

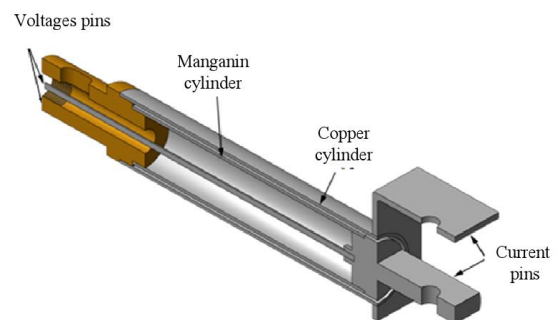
Ziel dieser Arbeit ist der Vergleich unterschiedlicher Strommessverfahren zur Messung von hochfrequenten Strömen in Induktivitäten und ggf. das Design & die Validierung eines eigenen Stromwandlers. Dazu sollen zu Beginn die kommerziell erhältlichen Messsysteme hinsichtlich Bandbreite, Genauigkeit und Maximalwerte evaluiert und ausgewählt werden. Anschließend sollen ausgewählte Messsysteme getestet und verglichen werden. Erreichen die Messsysteme nicht die geforderte Performance soll ein eigener Stromtransformator ausgelegt, aufgebaut und validiert werden.

Zeitplan

- Einarbeitung & Literaturrecherche bzgl. Messsysteme (15%)
- Auswahl der analysierten Probes (5%)
- Simulation, Auslegung und Aufbau eigener Stromtransformator (30%)
- Validierung der Ergebnisse durch Messungen (25%)
- Ausarbeitung & Vortrag(25%)

Vorkenntnisse

- Schaltungs-/Layoutdesign in Altium/Eagle
- Erfahrung in praktischen Aufbauten
- Kenntnisse in FEM und Schaltungs-Simulation



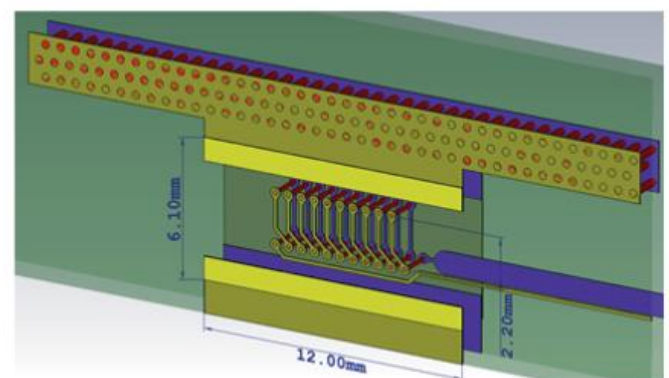
[1] Koaxialer Shunt



[2] Strommesszange



[3] Stromtransformatoren



[4] PCB-Integrierter Stromsensor



English description

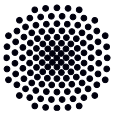
[1] P. Baranov, V. Borikov, and E. I. Tsimbalist, "Measurement of the current transfer function for power transducers of current to voltage," vol. 756, pp. 615–621, 04 2015.

[2] Tektronix. (2017) Tcp0030a datasheet. [Online]. Available: <https://www.tek.com/datasheet/30-ac-dc-current-probe>

[3] Pearson Electronics, "Wideband Current Monitors", [Online]. Available: <http://pearsonelectronics.com/products/wideband-current-monitors>

[4] J. Walter, J. Acuna and I. Kallfass, "Design and Implementation of an Integrated Current Sensor for a Gallium Nitride Half-Bridge," PCIM Europe 2018; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, Nuremberg, Germany, 2018, pp. 1-8.





Abstract

Goal of this work is the comparison of different high-frequency inductor current measurement methods and, if necessary the design & validation of a own current transformer.

As a start commercial current sensors should be compared regarding bandwidth, accuracy and maximum values. Afterwards the most suitable systems should be selected and characterized in a application case.

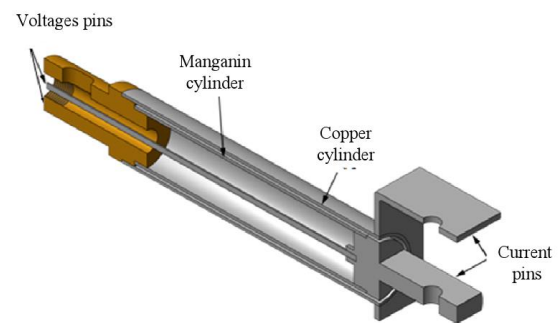
If the results aren't satisfying, a own current sensor should be developed, constructed and tested.

Timetable

- Familiarization & literature search regarding measurement equipment (15 %)
- Selection of analyzed probes (5 %)
- Simulation, design and setup of own current transformer (30 %)
- Validation of results through measurement (25 %)
- Written thesis & presentation (25 %)

Previous knowledge

- Circuit/layout design in Altium/Eagle
- Experience in practical lab work
- Experience in FEM and circuit simulation



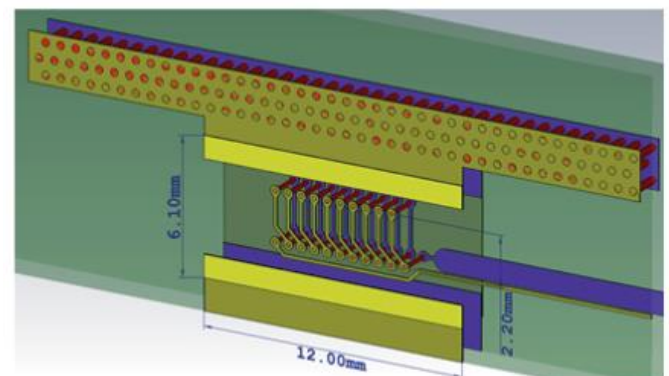
[1] Coax shunt



[2] Current probe



[3] Current transformer



[4] PCB integrated current transformer



[1] P. Baranov, V. Borikov, and E. I. Tsimbalist, "Measurement of the current transfer function for power transducers of current to voltage," vol. 756, pp. 615–621, 04 2015.

[2] Tektronix. (2017) Tcp0030a datasheet. [Online]. Available: <https://www.tek.com/datasheet/30-ac-dc-current-probe>

[3] Pearson Electronics, "Wideband Current Monitors", [Online]. Available: <http://pearsonelectronics.com/products/wideband-current-monitors>

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