

PSMA Magnetic Committee Minutes

June 7, 2022 @ 10:00 am CDT

Attendees

Matt Wilkowski
George Slama
Ed Herbert
Chuck Wild
Rodney Rogers
Doug Eaton
Mark Swihart
John Horzempa
Joe Horzempa
Hasan Ahmadian Baghbaderani – Tyndall
Victor Boyadzhyan
Len Crane
Khurram Afridi

Agenda

Workshop banner
Proposals for presentation for PSMA PTR webinar series
2023 Industry Session Planning
2023 Workshop Planning
Dartmouth Core Loss Studies
PSMA articles for How2Power

Discussion

1. Banner proposal #4 and banner proposal #5 are the two preferred proposals
 - a. Consider a different shade of green
 - b. Green of the logo should match the green of the border
 - c. Black font is preferred since is clear
 - d. 2022 should be 2023
2. Power technology Roadmap webinar series
 - a. Topics that complement the 2023 workshop
 - i. Solid state transformers
 - ii. Wafer level magnetics
 - b. Topics that have reach beyond magnetics
 - i. Wireless charging

- ii. Magnetics for transportation electrification
 - c. Mechanism of core loss – Hasan Baghbaderani (Tyndall)
- 3. Industry session
 - a. Looking to add a new slant since core loss has been a topic of multiple past workshops and industry sessions
 - b. Is audience more interested
 - i. Core loss testing
 - 1. or
 - ii. Use of core loss data
 - iii. add a survey to the 2023 industry session so we can obtain sense of the audience and their preferences
 - 1. Note for the past several years we relied on the survey of the magnetics workshop to choose a topic of the industry session
- 4. Workshop
 - a. Presentation proposals:
 - i. Challenges of magnetics in capacitive wireless charging for material handling equipment – Khurram Afridi
 - ii. Implantables– Chuck Wild to provide potential presenter
 - iii. Insulation (3M) – chuck wild to provide potential presenter
 - iv. Transportation Electrification – 7 kilowatt planar transformer and planar inductor for airplane on board power
 - v. Wireless power charging for electric vehicles, novel insulation system – Bryce Hesterman
 - vi. Phase Shifted Full Bridge test – Sotirios Zorbaa
- 5. Link to download Dartmouth data was sent by Ed Herbert on June 6

Action Items

- a. Ed to submit special project proposal for 2023 Power Magnetics at High Frequency workshop
 - a. Matt to contact Lisa regarding financials of 2022 magnetics workshop
- b. George to update banner proposals
- c. All think about potential technology roadmap presentation
- d. All think about proposals to magnetics committee articles of How2Power

Next Meeting

July 6 @ 10:00 am CDT



The Multinational Power Electronics Association

PSMA Magnetics Committee Meeting

June 7th 2022

George Slama, Matt Wilkowski
Committee Chairs

PSMA Magnetics Committee Meeting Agenda

June 7, 2022

- Introductions
- Banner proposals for 2023 Power Magnetics at High Frequency Workshop
- Proposals for Magnetics Committee Contributions to Power Technology Roadmap Webinars
- 2023 Industry Session Planning
- 2023 Workshop Planning
- Other Items
 - Dartmouth Core Loss Data
 - PSMA Magnetics Committee articles for How2Power
 - PSMA Magnetics Committee on PSMA Website



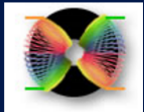
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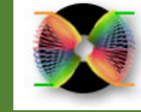


Power Magnetics at High Frequency Workshop Banner Proposals



Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA



Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA



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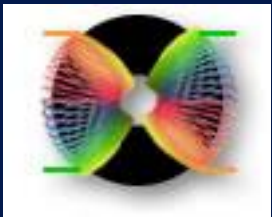
Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA



Proposals 4 & 5 are the preferred proposals
Modify the shade of green
Green of logo should match green of the border
Black font clearer to read
Correct the year from 2022 to 2023

Power Magnetics at High Frequency Workshop Banner Proposal #1

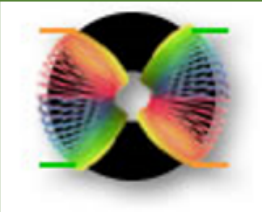


Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA



Power Magnetics at High Frequency Workshop Banner Proposal #2



Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA

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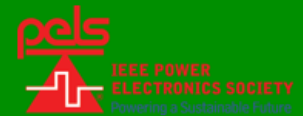
Power Magnetics at High Frequency Workshop Banner Proposal #3



Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA

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Power Magnetics at High Frequency Workshop Banner Proposal # 4



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Power Magnetics at High Frequency Workshop Banner Proposal #5



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Power Magnetics at High Frequency Workshop Banner Proposal #6



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Power Magnetics at High Frequency Workshop Banner Proposal #7



Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 18 March 2022, Orlando FL USA



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2023 PSMA PTR Webinar Series

Contributions from the Magnetics Committee

- ETH – Johann Kolar, Jonas Huber
 - Soft-Switched Bridge-Leg Topologies
 - (2L and 3L TCM, ARCP)
- EnaChip – Matt Wilkowski
 - Wafer Level Magnetics
- Tyndall – TBD
 - Wafer Level Magnetics
- Tyndall – Hasan Baghbaderani
 - Core Loss Mechanisms – Note also a potential topic for industry session
- Magnetics for Wireless Charging
- Magnetics for Transportation Electrification
- Sustainable Magnetics
- Magnetic Materials
- Insulation Materials
- Core Loss Data Bases
 - More likely a candidate for 2023



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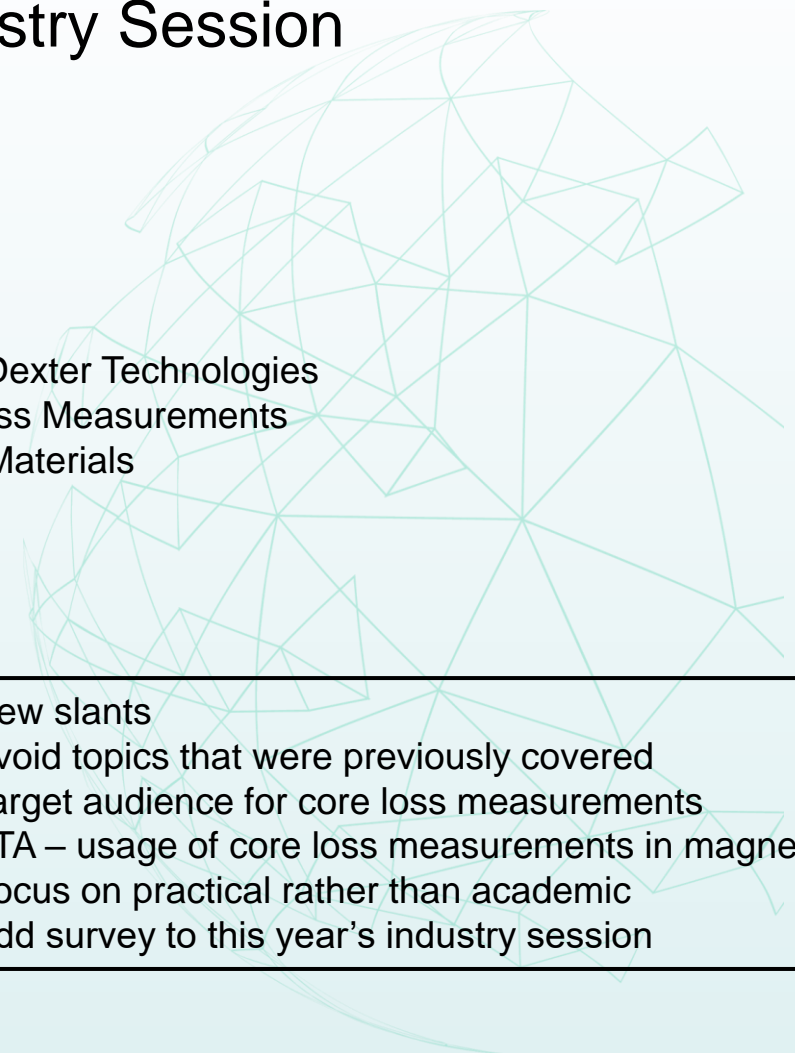


2023 PSMA Magnetics Industry Session

- Theme: Measurement of Core Loss

- Organization

- Core loss measurements for
 - Powder cores
 - Ferrite cores
 - Amorphous and nanocrystalline cores
- Low frequency Vs High frequency
 - High frequency (≥ 1 MHz)
- Power level measurements
 - High power (≥ 1 kilowatt Vs low power ≤ 1 milliwatt)
- Arbitrary waveforms
 - Generating waveforms
 - Measuring waveforms
- Accuracy and resolution
- Calorimetric Measurements
- Non-Evasive Stability Measurements (NISM)
- Mechanisms of power losses
 - Trade-off core design versus coil design
 - Eddy current Vs hysteresis loss Vs anomalous loss
- Databases



Dominic Heye – Dexter Technologies
Practical Core Loss Measurements
Across Different Materials

New slants

Avoid topics that were previously covered

Target audience for core loss measurements

TTA – usage of core loss measurements in magnetics design

Focus on practical rather than academic

Add survey to this year's industry session

PSMA Magnetics Committee Meeting Agenda

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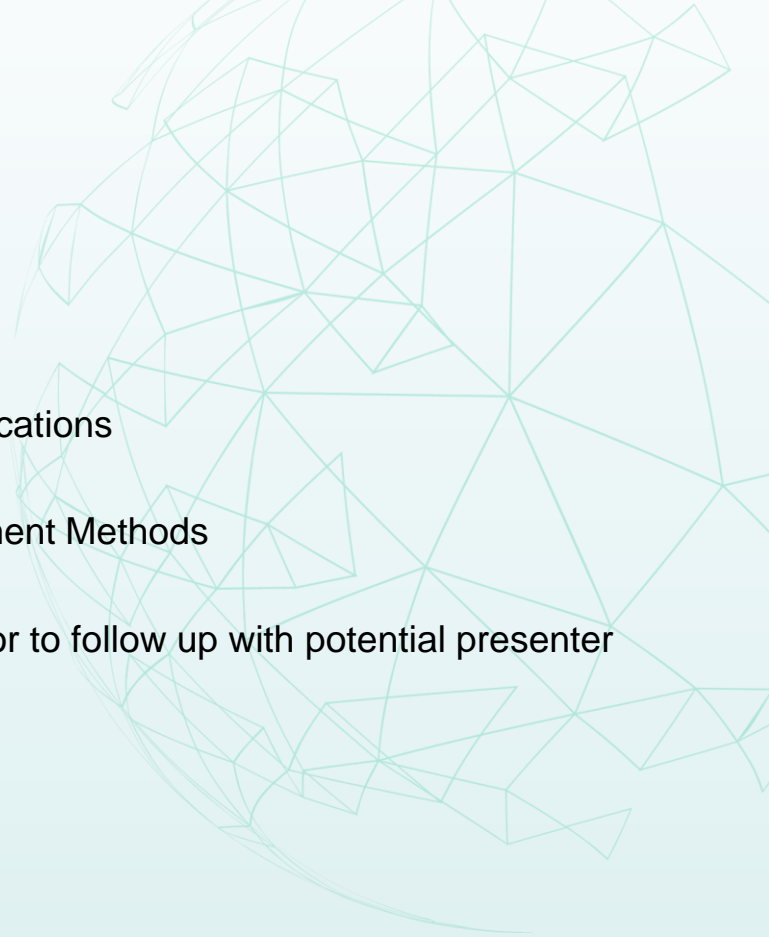


2023 Power Magnetics at High Frequency Workshop -1

- Theme: Magnetic Component Design Across Applications from Milliwatts to Megawatts
- Presenters
 - Keynote Presenter – Candidates
 - Scott Sudhoff – Purdue – Multi Objective Design Approach
 - Victor Quinn – Lessons Learned from the Trenches of Practical Product Design
 - Other
 - Lecture Presenters
 - Solid State Transformers
 - Kolar, Ohodnicki, Other?
 - CLLLC Dual Active bridge With Novel Insulation Approach for SST Applications
 - » <https://ieeexplore.ieee.org/document/9487105>
 - Wireless Charging
 - Implantable – follow up with Chuck Wild for potential presenter
 - Mobile devices –
 - » Khurram Afridi – challenges of magnetics in capacitive wireless charging – material handling equipment
 - Electric vehicles
 - » Three-Phase Unfolding Based Soft-DC-Link Converter Topologies for AC-DC Applications
 - » <https://digitalcommons.usu.edu/etd/8015/>
 - Transportation Electrification
 - 7 kilo-Watt Planar Transformer and Inductor
 - Wearables
 - IVR
 - Servers
 - IoT

2023 Power Magnetics at High Frequency Workshop -2

- Theme: Magnetic Component Design Across Applications from Milliwatts to Megawatts
- Presenters
 - Special Topics (afternoon session)
 - Insulation
 - Corona
 - 3M or DuPont?
 - Encapsulation processes & encapsulation materials
 - Technology Demonstrations
 - Moien Mohamadi – University of Illinois Chicago – Charging Applications
 - Mike Arasim – Fair Rite – Manufacturing Test Equipment
 - Arturo Mediano – HF Magic Lab – Near Magnetic Field Measurement Methods
 - Test equipment
 - Battery charging – higher voltage – safety equipment – Victor to follow up with potential presenter
 - Hazardous magnetic fields
 - Magnetic materials and structure



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PSMA Magnetism Committee Web Page

<https://www.psmas.com/technical-forums/magnetism>

Magnetism Forum | PSMA

psma.com/technical-forums/magnetism




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The multinational power electronics association

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Magnetism Forum

 **Magnetism Info & Resources**
for the Power Electronics Industry.

Introduction HF Task Force Magnetism Checklist Resources Presentations Core Loss Studies Meeting Minutes Workshop

Introduction

The PSMA Magnetism Committee is a group of volunteers knowledgeable about power magnetism. Members include people from power supply companies, wound components producers, core manufacturers, and leading consultants in the field. The aim of the group is to support industry in a sometimes arcane area. We recognize that magnetism is often unfamiliar, for even the most experienced electronics designers. The committee is involved in republishing classic textbooks; making fundamental design papers available; education; and design tools. The members and their companies can be excellent resources for designers and users of magnetic devices.

Please send any suggestions for improvements to power@psma.com.

News

- Welcome to the PSMA
- New Product Announcements
- Members in the News
- Other News of Interest
- Calendar of Events
- Meeting Schedule

Publications

- Currently Available from PSMA
- Members Order Form
- Non-members Order Form
- EPSMA Publications

Resources

- Industry Information
- Industry Links
- Industry Resources
- Standards Organizations
- Standards Updates
- University Resources
- Job Postings
- Student Resumes

Conferences

- APEC
- CPSS
- EnerHarv
- IWIPP
- 3D-PEIM
- PwrSoC
- WiPDA

Technical Forums

- Capacitor
- Education
- Energy Harvesting
- Energy Management
- Energy Storage
- Magnetism
- Packaging & Manufacturing
- Power Technology Roadmap
- Reliability
- Safety & Compliance
- Semiconductor
- Transportation Power Electronics

Membership


- Benefits of PSMA
- Membership
- Joining Information
- Application form
- Members, A - Z
- Power Supplies
- Components
- Service Related
- By Market Segment
- Members Only
- Pay Your Membership Dues

About PSMA

- Purpose
- Mission
- Industry Leadership Organization
- Association Office
- Advisory Council
- Board of Directors
- Meeting Information
- Bylaws
- Working Committees
- Aims & Objectives of the EPSMA

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