



The Multinational Power Electronics Association

PSMA Magnetics Committee Meeting

September 11TH 2023

Ed Herbert, George Slama, Matt Wilkowski
Committee Chairs



PSMA is a not-for-profit organization and a CO-SPONSOR OF APEC



PSMA Magnetics Committee Meeting Agenda September 11, 2023

- Introductions
- 2024 Workshop Planning
- 2024 Industry Session Planning
- Power Technology Roadmap
- Special Projects
 - Core Loss Database
 - Need to rank and identify champion
 - Electrical parameters of magnetic materials
 - Steinmetz Like Approximation
 - Propagation in magnetic materials
 - Current driven core loss testing
 - Spice model
- Magnetics Committee Forum on PSMA Website



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PSMA Magnetics Committee Meeting Agenda – Workshop Planning

September 11, 2023

- Workshop Themes
 - Overall: Design of Optimal Magnetics Across Applications and Environments
 - Morning Session: Design and Optimization of Magnetics for Different Applications
 - Afternoon Session: Thermal design and other special issues such as insulation, partial discharge, etc.,
 - Tech Demos
- Industry Session Theme
 - Circuit and Construction Simulation and Modelling of Magnetic Components
- Propose not to cover core loss modelling for the 2024 workshop due to
 - Survey results requesting core loss modelling was based on a survey on Saturday March 18 however there were two PSMA Magnetics Committee related activities at APEC 2023 after the survey
 - George Slama Professional Education Seminar on Sunday March 19 – Core Loss Data for Everyone
 - Magnetics Committee Industry Session on Tuesday March 21 – Core Loss Measurements For Different Materials and Excitations
 - MagNet Activities will may results in some presentation and sessions on core loss modelling at APEC 2024
 - May have some tech demos related to MagNet

PSMA Magnetics Committee Meeting Agenda – Workshop Planning

September 11, 2023


- When does registration open?
- Workshop on PSMA Website
- Workshop on APEC website
- Tentative Agenda - Update



PSMA Magnetics Committee Meeting Agenda – Workshop Planning

September 11, 2023

- From Workshop URL: <https://www.pdma.com/technical-forums/magnetics/workshop>



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The multinational power electronics association

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PSMA / Technical Forums / Magnetics / Workshop

Magnetics Forum


Magnetics Info & Resources for the Power Electronics Industry.

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

Workshop



Power Magnetics @ High Frequency Workshop
PSMA Magnetics Committee - 24 February 2024, Long Beach, CA USA






Registration for the 2024 Power Magnetics @ High Frequency Workshop on Saturday February 24, 2024 at the Long Beach Convention Center in Long Beach, CA will open soon. [Click here to be notified by email when opens.](#)

REGISTRATION




Partnership Opportunities available. [Sign up to be a Workshop Partner](#) Please contact the organizing committee through via e-mail to power@psma.com for more information. [Click here for the pricing and benefits:](#)

2023 Workshop Partners:


Platinum Partners



Gold Partners



Media Partner



To encourage student participation, the registration fee will be waived for up to four students for the Power Magnetics @ High Frequency workshop Saturday March 18, 2023 in Orlando, FL.

The application deadline was Friday January 6, 2023. The selection of the recipients will be by the workshop committee, and their decision is final. Applicants will be notified by email by January 20, 2023. Recipients must register by January 27, 2023 to receive the fee waiver.

Update once 2024 pool of partners is identified

Need to update 4 dates to 2024 dates



PSMA Magnetism Committee Meeting Agenda – Workshop Planning

September 11, 2023

- From Workshop URL: <https://www.pdma.com/technical-forums/magnetism/workshop>


The image shows a screenshot of the PSMA website. The header is dark blue with the PSMA logo on the left and navigation links (News, Publications, Resources, Conferences, Technical Forums, Membership, About PSMA) in the center. On the right of the header are links for Contact, Log in, and a search icon. The main content area is white. It features a section titled "Power Magnetism @ High Frequency" with the date "Saturday March 18 2023", the location "Prior to APEC 2023", and the venue "Orange County Convention Center, Orlando, FL 32819". To the right of this section is a red text annotation: "Need to replace with 2024 Q3 PSMA newsletter articles". Below the title section, there are three paragraphs of text. The first paragraph states that the PSMA Magnetism Committee, along with IEEE PELS, will hold the eighth "Power Magnetism @ High Frequency" Workshop on Saturday, March 18, 2023, at the Orange County Convention Center in Orlando, Florida. The second paragraph describes the workshop's purpose: to identify the latest improvements in magnetic materials, coil design, construction, fabrication, evaluation, and characterization techniques, and modelling and simulation tools. The third paragraph lists the target audiences, including designers of power magnetic components, those responsible for implementing advanced power magnetic components, people in the supply chain, manufacturers of magnetic materials and structures, fabricators of magnetic components, providers of modelling and simulation software, and manufacturers of test and characterization equipment. The final paragraph mentions that the morning technical session will include a keynote presentation, four lecture-style presentations, a brief Q&A period, and two panel discussions.


PSMA Magnetics Committee Meeting Agenda – Workshop Planning

September 11, 2023

- From APEC URL: <https://apec-conf.org/>

🔒 apec-conf.org

Attendees ▾ Speakers ▾ Exhibitors/Partners ▾ News ▾ Travel Information ▾ About ▾ Contact ▾ 🔍 Search



APEC 2024


IEEE Applied Power Electronics Conference and Exposition


Long Beach, CA
February 25-29, 2024

[About APEC](#)

Join Us At The Beach!

APEC 2023 was a smashing success with record attendance! Start making your plans now to join us at APEC 2024 in Long Beach, California.





We Are Hard At Work Preparing The APEC 2024 Program

APEC 2024 would like to thank everyone who submitted a digest for the Technical Sessions, a proposal for an Industry Session, or a proposal for Professional Education Seminar. APEC 2024 is no longer accepting submissions and the review process is underway. The program chairs and program committee members are hard at work reviewing the submissions and organizing the APEC 2024 program.

Stay tuned for announcements. Registration for APEC 2024 will open in the middle of October so start making your travel plans now.


Latest News

Partnership Opportunities For APEC 2024 Exhibitors Now Available

Monday, Aug 14, 2023

[Read More](#)

[See All](#)



PSMA Workshop: Power Magnetics At High Frequency

While not an official part of APEC, the PSMA magnetics workshop, held the Saturday before APEC starts, is a well established tradition. The PSMA has announce the 2024 workshop, "Power Magnetics At High Frequency". The theme of the 2024 Power Magnetics At High Frequency will be the design of optimal magnetics across applications and environments.

[Learn More About The PSMA Magnetics Workshop](#)

PSMA Magnetics Committee Meeting Agenda – Workshop Planning

September 11, 2023

- From APEC URL: <https://apec-conf.org/conference/special-events/psma-magnetics/>

 apec-conf.org/conference/special-events/psma-magnetics/



While not part of the official APEC Program the PSMA Magnetics Workshop, held the Saturday before APEC begins, has become an established tradition. The 2024 workshop, titled 'Power Magnetics At High Frequency', will be held on Saturday, February 24, 2024, at the Long Beach Convention Center.

The purpose and focus of this workshop are to identify the latest improvements in magnetic materials, coil (winding) design, construction and fabrication, evaluation and characterization techniques and modelling and simulation tools. This is to target the advancements that are deemed necessary by the participants for power magnetics to meet the technical expectations and requirements of new market applications for higher operating frequencies and emerging topologies that are being driven by continuous advances in circuits topologies and semi-conductor devices.

The target audiences for the 2024 Power Magnetics At High Frequency workshop include the designers of power magnetic components for use in electronic power converters responsible to implement the most technologically advanced power magnetic components that are necessary to achieve higher power densities, specific physical aspect ratios such as low profile, higher power efficiencies and improved thermal performance. The target audiences also include people involved in the supply chain for the power magnetics industry ranging from manufacturers of magnetic materials and magnetic structures, fabricators of magnetic components, providers of modelling and simulation software as well as manufacturers of test and characterization equipment.

The theme of the 2024 Power Magnetics At High Frequency will be the design of optimal magnetics across applications and environments. A number of recognized experts have already confirmed their presentations for the workshop.

The workshop will open with a keynote presentation by Johan Kolar and Jannik Schafer of ETH Zentrum covering the opportunities for new magnetics designs to address a broad range of market driven technology trends across automotive and data center applications. The morning session will consist of lecture presentations by Jonas Muehlethaler of Frenetic addressing design and optimization of magnetics for different applications, Qiang Li of CPES addressing magnetics for VRM applications and Lukas Mueller of Mircometals addressing optimizing inductors based on choice of magnetic materials.

During lunch, breakfast, and the networking hour at the end of the workshop there will be an interactive session of tabletop technology demonstrations, each addressing specific technical disciplines and capabilities consistent with the workshop agenda. Workshop attendees typically spend ten to fifteen minutes at each technology demonstration station viewing informal interactive presentations. Interaction between the attendees and the presenters is highly encouraged during this portion of agenda as a segue from the morning technical presentation sessions to the afternoon lecture presentation session. Technology demonstrations are confirmed by JC Sun of Bs&T, Mike Arasim of Fair Rite, Arturo Mediano of HF Magic Labs, Lukas Mueller of Micrometals, Juris Vencels of Trafolo and Tom Wilson of Simplis. Additional technology demonstrations are pending. If anyone is interested to present a technology demonstration, they are encouraged to contact the workshop organizing committee via e-mail to power@psma.com.

The afternoon session will begin with a keynote presentation by Charles Sullivan of Dartmouth addressing special design issues ranging from thermal design, dielectric design, and insulation design. The keynote presentation will be followed by lecture presentations by Roman Jamy of Yageo addressing multi-dimensional optimization relative to electrical, thermal, and commercial objectives, Zhicheng Guo of Arizona State University addressing partial discharge characterization for high frequency transformers and Subhashish Bhattacharya of North Carolina University addressing thermal design issues for solid state transformers.

Registration for this workshop is separate from the registration for the APEC conference.

Registration for the workshop is limited and will open soon. Please visit the workshop's page (<https://www.psma.com/technical-forums/magnetics/workshop>) for updates on registration.

PSMA Magnetics Committee Meeting Agenda – Workshop Planning

September 11, 2023

- From Tentative Agenda Workbook

Time	Event	Presenter	Affiliation	
7:00 AM - 8:00 AM	Breakfast Plus Technology Demonstrations			
8:00 AM - 8:05AM	Opening Remarks	Ed Herbert	PSMA	
8:05 AM - 8:45 AM	Keynote Speaker Power Magnetics Design - Design and Optimization of Magnetics for Different Applications - Intro <i>Opportunities for new magnetics designs to address a broad range of market driven technology trends across automotive and data center applications</i>	George Slama Johan Kolar	Wurth Elektronik ETH	Confirmed
8:45 AM - 9:20 AM	Technical Session - Design and Optimization of Magnetics for Different Applications <i>Overview of Different Optimization Effort</i>	Jonas Muhlethaler	Frenetic	Confirmed
9:20 AM - 9:40 AM	Q&A		Kolar, Muhlethaler	
9:40 AM - 10:00 AM	Break			
	Technical Session - Design and Optimization of Magnetics for Different Applications - Part 2			
10:00 AM - 10:35 AM	<i>Magnetics for VRM Applications</i>	Qiang Li	Virginia Tech - CPES	Accepted
10:35 AM - 11:10 AM	<i>Inductor Optimization Based on Choice of Different Magnetic Materials</i>	Lukas Mueller	Micrometals	Accepted
11:10 AM - 11:45 AM	<i>Optimizing Trade-Offs Between Capacitors and Inductors</i>	David Zawacki	Cornell Dublier	Accepted
11:45 AM - 12:00 Noon	Panel Q & A		Kolar, Muhlethaler, Li, Mueller, Zawacki	

2:00 PM - 2:50 PM	Keynote Speaker Addressing Thermal Design and other special issues as partial discharge, insulation, etc., Intro <i>Overview of special issues for the design of magnetics</i>	George Slama Charlers Sullivan	Wurth Elektronik Dartmouth College Sullivan	Accepted
	Q & A			
	Technology Session - Thermal Design and other special issues as partial discharge, insulation, etc., - Part 1			
	Opening Remarks	George Slama	Wurth Elektronik	
2:50 PM - 3:15 PM	<i>Leading Edge Power Magnetics design - multi -physical, multi-dimensional Optimization Relative to Electrical, Thermal and Commercial Objectives</i>	Roman Jamy	Yageo - Kemet	Accepted
3:15 PM - 3:40 PM	<i>Characterization of Partial Discharges in High-frequency Transformer under PWM Pulses</i>	Zhicheng Guo	Arizona State University	Accepted
3:40 PM - 4:00 PM	Break			
	Technology Session - Thermal Design and other special issues as partial discharge, insulation, etc., - Part 2			
4:00 PM - 4:25 PM	<i>Thermal Issues with Power Magnetics</i>	Subhashish Bhattacharya	NCSU	Accepted
4:25 PM - 4:45 PM	Panel Q & A		Sullivan, Roman, Guo, Bhattacharya	
	Closing Remarks			
4:45 PM - 5:00 PM	<i>Best of the Best</i> Survey	Alex Gerfer George Slama	Wurth Elektronik PSMA	Accepted Accepted
5:15 PM - 6:30 PM	Networking Hour			

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12:00 Noon - 2:00 PM	Technology Demonstration Session	George Slama	Würth Elektronik	
	Oscilloscope	George Slama	LeCroy, Keysight or Tektronix, Pico	Pending
	Near field measurements useful techniques for electronics engineers	Arturo Mediano	HF Magic Labs	Accepted
	Computer Aided Inductor Optimization	Lukas Mueller	Micrometals	Accepted
	Magnetics for Energy Harvesting Applications	Sergiy Tykhonov	Fraba Ubito	Invited (Responded)
	Power Factor Correction Chokes or Other?	Jim Hodahl	Würth Elektronik	Invited
	Core Loss Correlations Across Equipment and Different Core Materials	George Slama	Würth Elektronik	Pending
	Capacitor/Inductor Filter	Frank Puhane	Würth Elektronik	Invited
	High-Q SMD measurements of various components (low ESR and ESL measurements)	Frank Puhane	Zurich Instruments	Invited
	Circuit Simulation of Magnetic Components	Tom Wilson	SIMPLIS Technologies	Accepted
		Aminul Mehedi	CMM	Invited
	Nanocrystalline-based CMC filters for EV – reducing footprint	Bharadwaj Reddy Andapally	CBMM	Accepted
	3D FEM-based software for low-frequency electromagnetic behavior in transformers and inductors	Juris Vencels	Trafo	
		Naomichi Nao Miyari	Hioki	Invited
	Non Linearity of metal alloyed powdered core with micro Pulse 2.0	JC Sun	Bs&T	Accepted
		Dominic Heye	Dexter	Invited
		Mike Araim	Fair Rite	Accepted
	Emerging Magnetic Materials and Magnetic Structures	TBD	Miles Platt	Pending
	Posters			
	Regroup for Next Session	-	-	-


PSMA Magnetics Committee Meeting Agenda – Workshop Planning September 11, 2023

- Other Considerations
 - Technology Demonstrations
 1. Dielectric Withstanding Voltage, Partial Discharge – Hipotronics – Matt Weintraub



shop_partnership

- ## shop_partnership



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The multinational power electronics association

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2024 Workshop Partnership

Saturday Feb 24, 2024
Long Beach Convention Center, Long Beach, CA

Please complete the information below to sign up as a partner for the Power Magnetics @ High Frequency Workshop.

Platinum Partner
\$2,500

- Company logo in web page linked to URL of choice
- Company recognition at entrance
- Company logo on daily introduction and break slides
- Company recognition in 'blast e-mail' announcing registration
- Company logo on social media promotion
- One free registration
- Additional registrations at preferred PSMA rate
- Company supplied logo can be displayed within workshop
- Company exhibit table by registration desk onsite
- Company may provide branded lanyards for participants (~150 pcs)

Gold Partner
\$1,500

- Company logo in web page linked to URL of choice
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Partnership level*

☐ Platinum Partner

☐ Gold Partner

Need to highlight this item
in yellow



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PSMA Magnetics Committee Meeting Agenda – Industry Session Planning September 11, 2023

- Simulation (magnetic & circuit) & modelling
 - Proposal Uploaded to APEC website on Thursday August 10
 - Invitation Sent
 1. Simulation including material data – Minjie Chen Princeton - **ACCEPTED**
 - a) Or High frequency material simulation tools – Minjie Chen Princeton
 2. 2D Vs 3D FEA for magnetics – Mark Christini Ansys - **Accepted**
 3. Circuit Simulation Tools – Tom Wilson/Andrija Supas SIMPLS Technologies - **ACCEPTED**
 4. Near Magnetic Fields – Arturo Mediano HF Magic Labs - **ACCEPTED**
 5. Impedance Over Wide Frequency Ranges for Emi Filtering – Fang Luo Stoney Brook University - **ACCEPTED**
 6. Coupling – Bryce Hesterman Utah State University – **ACCEPTED**
 7. Thermal Modeling of Magnetic Components - Juris Vencels Trafolo – **Accepted**
 - Potential Backups
 7. 2D Vs 3D FEA for Magnetics Anderson Hoke formerly of Dartmouth
 8. 2D Vs 3D FEA for Magnetics Jonathan Kimball Missouri University of Science & Technology
 9. Near Magnetic Fields – Matt Wilkowski EnaChip

**7 of 7 slots
confirmed**

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2022/2023/2024 PSMA PTR Webinar Series

Potential Contributions from the Magnetics Committee


- Tyndall – Ranajit Sai
 - Core Loss Mechanisms
 - Second Half 2023
 - Connected with Dhaval and Conor
- Utah State University – Reebal Nimri
 - High Power (1 MW) Charging
 - 2023 Q1/Q2
 - Confirmed 8/16/23
- Fraunhofer – Florian Ziegler (Powder MEMS Micromagnets - Technology for innovative magnetic MEMS)
 - MEMS
 - Fall 2023
 - Confirmed 8/18/23
- CBMM - Bharadwaj Reddy Andapally (Technology Roadmap for Nanocrystalline Cores)
 - New magnetic materials
 - Fall 2023/Spring 2024
 - Confirmed: 9/1/23

Potential Source of Info Inter Mag
Japan
Presentations
Measurement Techniques
New Materials

PSMA Magnetics Committee Meeting Agenda

September 11, 2023

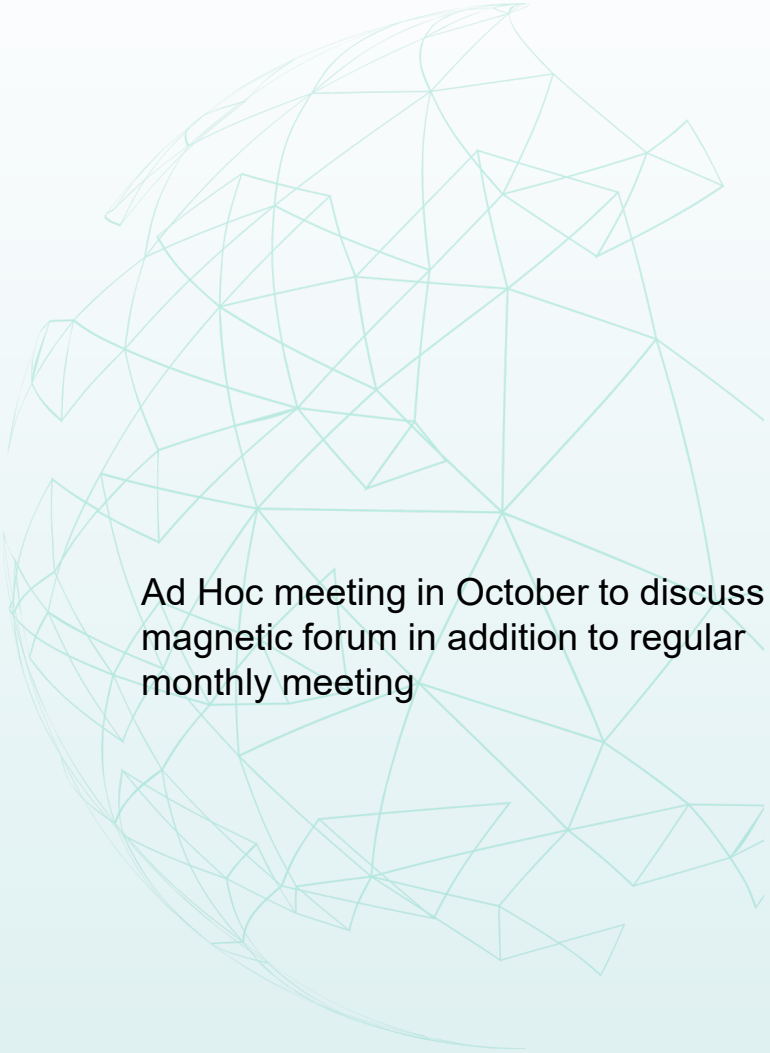
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Ad Hoc meeting on October 18 to discuss special projects in addition to regular monthly meeting

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Ad Hoc meeting in October to discuss magnetic forum in addition to regular monthly meeting

PSMA Magnetics Committee Meeting

September 11, 2023

- Attendance (12)
 - John Horzepa
 - Joe Horzepa
 - Mike Arasim
 - Doug Eaton
 - Ed Herbert
 - Bryce Hesterman
 - Lukas Mueller
 - George Slama
 - Rodney Rogers
 - Matt Wilkowski



Thank You

