



The Multinational Power Electronics Association

PSMA Magnetics Committee Meeting

May 7TH 2025

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

May 7, 2025

- Introductions
- 2026 Workshop Planning
- 2026 Industry Session Planning
- Special Projects
 - Electrical parameters of magnetic materials
 - Core Loss Database
 - Current Driven Core Loss
- Magnetics Forum on PSMA Website
- Open Magnetics
- Power Technology Roadmap
- Next Meeting



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PSMA Magnetics Committee Meeting Agenda – 2026 Workshop Planning

May 7, 2025

- Identify Themes

- Workshop
- Industry Session(s)
- Proposed topics - 55
 - Align proposed topics with topic categories
- Presenter pool
 - Proposed presenters – 15
 - Volunteer presenters - 12

Workshop themes

Converting Measurement Data to Models
Design Basics to Design Automation

Industry Session themes

Manufacturing Challenges and Directions
Magnetic Materials

Industry Session themes

Co-sponsor with Capacitors
Pairing Inductors and Capacitors to Create Better Solutions
Driven by Capacitors subcommittee

- Next steps

- Make post workshop presentation available to workshop attendees – **Completed April 11**
- Submit special projects report – Submit to May PSMA BOD approve during June PSMA BOD meeting
- Identify themes for workshop and industry session – **confirm green items above**
- Coordinate with capacitor committee
 - Parallel workshops
 - Co-sponsored industry session
 - Filtering
 - EMI

PSMA Magnetics Committee Meeting Agenda – 2026 Workshop Planning

May 7, 2025

Related Topics
Subtopics
Industry Session
Tech Demos?

- 1 Process engineering
- 2 Manufacturing processes
- 3 Deep dive on what drives magnetic costs in different applications
- 4 Transformer design for manufacturability DFM or automation
- 5 Safety

Potential
Industry
Session

- 1 Conducted emission suppression
- 2 Common Mode EMI Design

Potential
Co-Sponsored
Industry
Session
With Capacitors

- 1 Magnetics IC do-design
- 2 Discussion on integrating magnetics with capacitors and FETS

- 1 Future Trends
- 2 Magnetics for PDN in data center/server/pCs
- 3 Advanced structures - Matrix integrated transformers
- 4 Planar Magnetics
- 5 Wireless power transfer

PSMA Magnetics Committee Meeting Agenda – Special Project Request
May 7, 2025

PSMA Special Project Nomination Form

Date: May 7, 2025

Committee sponsoring the project: PSMA Magnetics Committee

Project Champion

Individual sponsoring the project: Matt Wilkowski, Co-Chairman; Ed Herbert, Co-Chairman

Team Members identified: George Slama, Mike Ranjram, Andres Arias

Potential Team Members: Rodney Rogers, Mike Arasim, Lukas Mueller

Project Description and Scope: “2026 Power Magnetics @ High Frequency Workshop”

A workshop on High Frequency Magnetics.

PSMA Magnetics Committee Meeting Agenda – Special Project Request
May 7, 2025

What is the budget for this project? Not to exceed \$37,000. We expect to recover all or most of this expense through attendance charge, tentatively \$295 for PSMA members and \$395 for nonmembers (early registration) increasing by \$50 for late registration and \$100 for walk-ins. And Partnership income.

PSMA Magnetics Committee Meeting Agenda – Special Project Request
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Breakdown of expected income.

Description	Estimated Income
Estimated registrations	100
Estimated average fee	\$300
Estimated registration income	\$30,000
Estimated partnership income	\$10,000
Total	\$40,000

PSMA Magnetics Committee Meeting Agenda – Special Project Request

May 7, 2025



Project Milestone Targets

Milestone	Target Date
Workshop	Saturday March 21, <u>2026</u>
Workshop slides and recordings	Saturday April 25, <u>2026</u>



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PSMA Magnetics Committee Meeting Agenda – 2026 Industry Session Planning

May 7, 2025

- Identified theme(s)
 - Magnetic Materials
 - Manufacturing Challenges and Directions
 - Other
- Coordination with Capacitors' Committee
 - Pairing Inductors with Capacitors to Form Better Solutions
 - EMC
 - Input/Output Filters



PSMA Magnetics Committee Meeting Agenda

May 7, 2025

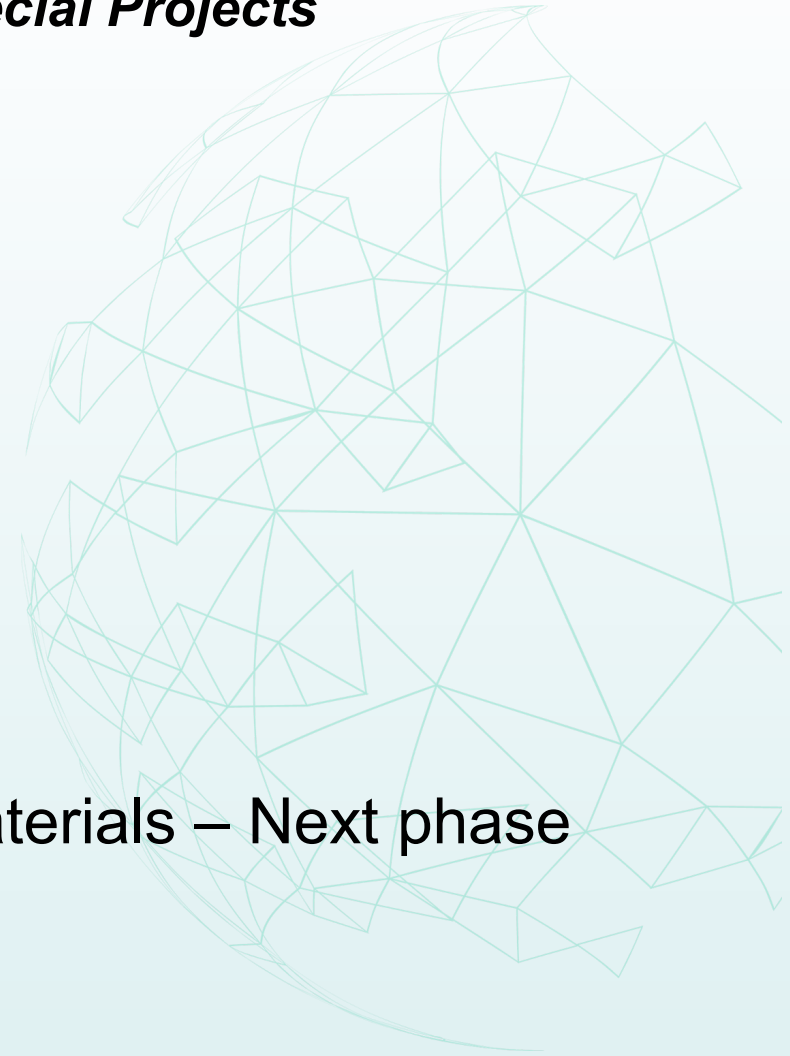
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PSMA Magnetics Committee Meeting Agenda – Special Projects

May 7, 2025

- Special Projects
 - In Process
 - Core Loss Database - active
 - Pending for discussion
 - Current driven core loss testing
 - Steinmetz Like Approximation
 - Spice model
 - Electrical parameters of magnetic materials – Next phase
 - Propagation in magnetic materials



PSMA Magnetics Committee Meeting Agenda – Special Projects

May 7, 2025

Project Nomination Form

- Section 1: Administrative
 - Committee Sponsoring the Project
 - PSMA Champion
 - Project Team Members
 - Project Description and scope: Usual only a few sentences
- Section 2: Relevance to PSMA Mission
 - Describe how the project supports the mission of the PSMA
 - Who will benefit from the project
 - What are the benefits
 - Identify output (report, workshop, award, etc.,) of the project
- Section 3: Budget and Milestones
 - Maximum budget limit
 - Description and cost of expenses
 - Includes time and hardware costs
 - Project Milestones and Schedule
- Section 4: Measure of Success for the Project
 - This needs to be quantifiable

***PSMA Magnetics Committee Meeting Agenda – Special Projects – Core Loss Data Base
May 7, 2025***

- Core Loss Database
 - Database should be on its own website
 - First meeting with PSMA webmaster on April 25
 - Second Meeting with PSMA webmaster on Thursday May 8
 - Receive proposal from PSMA webmaster to cover his costs

PSMA Magnetics Committee Meeting Agenda

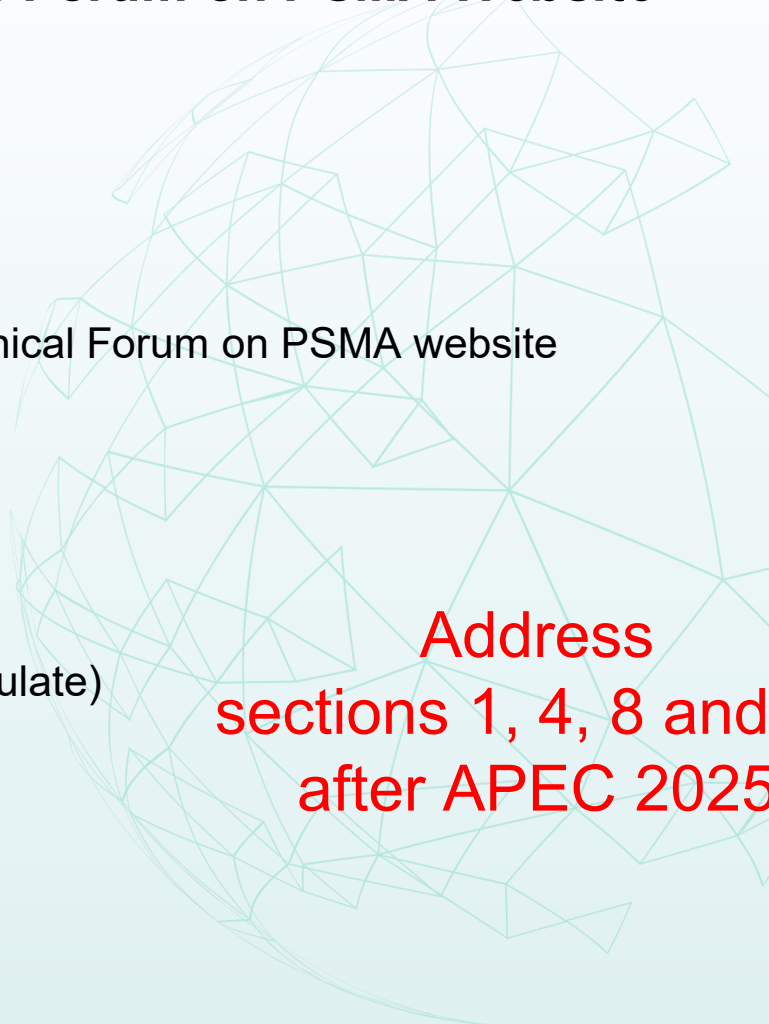
May 7, 2025

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PSMA Magnetics Committee –Magnetics Committee Forum on PSMA Website May 7, 2025


- Completed in 2024
 - Section 1.3 Powdered metal
 - Proposal by Lukas Mueller has been accepted
 - Need to add to HF task force tab under magnetics Technical Forum on PSMA website
- Proposed additions/updates
 - Section 1 Core Materials
 - Sputtered (addition)
 - Electroplated (addition)
 - Section 1.4 Nanocrystalline and amorphous metals (populate)
 - Section 4 Inductors
 - TLVR inductors (addition)
 - Section 8 “Solid state” transformers (populate)
 - Section 12 Fabrication Technology
 - Section 12.3.2 Substrate embedded (populate)
 - Section 12.6 PSiP (populate)
 - Section 12.7 PwrSoc (populate)



**Address
sections 1, 4, 8 and 12
after APEC 2025**

PSMA Magnetics Committee –Magnetics Committee Forum on PSMA Website May 7, 2025

<https://psma.com/technical-forums/magnetics/hf-task-force>



The screenshot shows a web browser window with the address bar displaying "psma.com/technical-forums/magnetics/hf-task-force". The website header includes the PSMA logo and navigation links: News, Publications, Resources, Conferences, Technical Forums, Membership, and About PSMA. On the right side of the header, there are links for "Contact" and "Log in". Below the header is a sub-header for "Magnetics Info & Resources for the Power Electronics Industry." with a navigation menu containing: Introduction, HF Task Force (selected), Magnetics Checklist, Resources, Presentations, Core Loss Studies, Meeting Minutes, Special Projects, and Workshop.

HF Task Force

PSMA Magnetics Committee High Frequency Task Force

January 11, 2015

At the PSMA Planning meeting in September 2013, the PSMA Magnetics Committee was strongly encouraged to do a workshop on high frequency magnetics.

Below is to the working document in which various topics of interest have been identified and grouped. This document will be revised as new topics are suggested and input is received.

For the various topics, we solicit inputs from experts in the related field. White papers, application notes, slide presentation, audio and video files all are welcome. As inputs are received, they will be summarized in the working document, and links will be added to original files.

We have created a LinkedIn group, "PSMA Magnetics Committee High Frequency Task Force." We will open threads on various topics to provide a forum for questions and open discussion.

We encourage engineers to identify problems with magnetics that have hindered their high frequency designs. The more interesting problems may become discussion threads, looking for solutions.

Steve Carlsen
Ed Herbert
Co-Chairmen
PSMA Magnetics Committee

High frequency magnetics

Revision: January 11, 2015

- ▶ 1. Core materials
- ▶ 2. Core geometry and scaling
- ▶ 3. Transformers
- ▶ 4. Inductors
- ▶ 5. Lossy suppressors
- ▶ 6. Magnetic circuits with saturating cores
- ▶ 7. Combination magnetic structures
- ▶ 8. "Solid state" transformers
- ▶ 9. Windings
- ▶ 10. Parasitic impedance
- ▶ 11. Core loss
- ▶ 12. Fabrication technology
- ▶ 13. Near field noise performance
- ▶ 14. Software, design and simulation
- ▶ 15. Test equipment, quality assurance and production testing
- ▶ 16. Reliability
- ▶ Appendix



PSMA
40th
ANNIVERSARY
Celebrating 40 Years in Service
1985-2025
Power Sources
Manufacturers Association

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PSMA Magnetics Committee Meeting Agenda – Open Magnetics
May 7, 2025

- What's next?
 - Proceed to integrate into PSMA webpage
 - April 25 – initial discussions with PSMA webmaster
 - May 8 – feedback from PSMA webmaster



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2025 Edition PSMA Power Technology Roadmap

Magnetics Section

- 2025 Topics (Submitted)
 - Embedded Magnetics
 - Integrated Voltage Regulators (IVR)
 - Fully Integrated Voltage Regulators (FIVR)
 - Hybrid Integrated Voltage Regulators (HIVR)
 - Isolated Signal and Low Power Transformers
 - PwrSoC (Power Supply on Chip)
 - Power Systems in Package (PSiP)
 - Solid State Transformers (SST)
 - Trans-Inductor Voltage Regulators (TLVR)
 - Mother Board Voltage Regulators (MBVR)
 - Lateral Power Delivery (LPD)
 - Vertical Power Delivery (VPD)
 - Dual Phase Power Block (DPPB)
 - ~~Wireless Power Transfer (WPT)~~
 - ~~EV Charging~~
 - Core Loss Measurement Methods & Databases
 - Magnetic Material Alternatives Opportunities and Limitations
- 2026/2027 Cycle Topics (Need to identify)
 - Net Zero Bias TLVR
 - Solid State Transformers (SST)
 - Magnetic Materials
 - TBD
 - TBD
 - TBD

What is publication status of
2025 PSMA PTR

Has a champion been identified for
the next cycle of the PSMA PTR?

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***PSMA Magnetics Committee Meeting Agenda
May 7, 2025 – Next Meeting***

- Thursday June 5 10:00 AM CDT – 11:00 AM CDT Virtual



PSMA Magnetics Committee Meeting
May 7, 2025

Action item:
Update mailing list from
2025 workshop survey results

- Attendance (13)
 - John Horzepa
 - Mike Arasim
 - Andres Arias
 - Hasan Ahmadian Baghbaderani
 - Alan Cooper
 - Jim Cox
 - Doug Eaton
 - Frank Feng
 - Michael Freitag
 - Ed Herbert
 - Bryce Hesterman
 - Alfonso Martinez
 - Frank Oberlitner
 - Paul Ohodnicki
 - Lukas Mueller
 - Mike Ranjram
 - Rodney Rogers
 - Ranajit Sai
 - George Slama
 - JC Sun
 - Jun Wang
 - Ningning Wang
 - Matt Wilkowski

PSMA Magnetics Committee
May 7, 2025

Thank You

