



*The Multinational Power Electronics Association*

# PSMA Magnetics Committee Meeting

September 11<sup>TH</sup> 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***

- Introductions
- 2026 Workshop Planning
- 2026 Industry Session Planning
- Special Projects
  - Core Loss Database
  - Current Driven Core Loss
  - Electrical Parameters of Magnetic Materials – phase 2
- Magnetics Forum on PSMA Website
- Open Magnetics
- Power Technology Roadmap
- Next Meeting



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# PSMA Magnetics Committee Meeting Agenda – 2026 Workshop Planning

- ✓ Identify Themes
  - Overall Theme: Measurements and Data Trends to Achieve Better Analytic Models and Simulation Models Towards Improved Design Tools
  - AM Theme: Developing Analytic and Simulation Models from Measurement Data
  - PM Theme: Starting with Design Basics to Achieve Design Automation
- ✓ PSMA Special Projects Request
  - Approved by PSMA BOD on May 16, 2025
- ✓ 2026 Magnetics Workshop Banner
  - Draft available – May 20, 2025
    - Use for PSMA 2025 Q2 Newsletter article
- ✓ 2025 PSMA 3 Quarter Newsletter
  - Article published – September 9, 2025
- ☐ Next Steps (June 2025 thru August 2025)
  - Identify – Invite – Confirm Keynote presenters
  - Identify – Invite – Confirm Lecture presenters
  - Identify – Invite – Confirm Technology Demonstrations



# PSMA Magnetics Committee Meeting Agenda – 2026 Workshop Banner



## Power Magnetics @ High Frequency Workshop

PSMA Magnetics Committee - 21 March 2026, San Antonio, TX USA

**PSMA**



# PSMA Magnetics Committee Meeting Agenda – Milestone Schedule



AI #	Description	Target Date	Actual date	Comments
1	Compile post workshop survey results	3/17/2025	3/17/2025	
2	Identify themes for workshop	4/9/2025	4/9/2025	
3	Post final presentations from previous workshop to attendees only URL	4/11/2025	4/10/2025	
4	Identify theme for industry session	5/7/2025	5/7/2025	
5	Approve expenses for previous workshop	5/1/2025	5/1/2025	
6	Establish budget	5/5/2025	5/6/2025	
7	Create banner for the workshop	5/15/2025	5/20/2025	
8	2ND quarter PSMA newsletter article	5/23/2025	5/27/2025	
9	Submit workshop proposal to PSMA BOD	6/1/2025	5/14/2025	Approved PSMA BOD on 5/16/2025
10	Identify target keynote presenters	6/18/2025		
11	Identify lecture presenters	6/18/2025		
12	Identify technology demonstrators	6/18/2025		
13	Solicit keynote presenters	6/30/2025		
14	Solicit lecture presenters	6/30/2025		
15	Solicit tech demonstrators	6/30/2025		
16	Solicit workshop partners	7/1/2025		
17	Confirm keynote presenter	8/1/2025		
18	Confirm lecture presenters	8/1/2025		
19	Confirm technology demonstrators	8/21/2025		
20	Submit 3RD quarter PSMA newsletter article	8/22/2025		
21	Identify poster presenters	9/12/2025		
22	Solicit poster presenters	9/30/2025		
23	Confirm poster presenters	10/15/2025		
24	Confirm partners	10/15/2025		
25	Publish final presentations from previous workshop to public PSMA URL	10/15/2025		
26	Tour facilities in conjunction with pre-APEC meeting	10/15/2025		
27	Post tentative agenda on website	10/22/2025		
28	Open registration	10/24/2025		

# PSMA Magnetics Committee Meeting Agenda – Magnetics Workshop - AM Session Presenters

## ❑ AM Theme: Developing Analytic and Simulation Models from Measurement Data

### ➤ Keynote:

- Who – Helen Cui (University of Tennessee) or Maeve Duffy (University of Galway Ireland)
  - Analytic Models

### ➤ Lecture presenter 2:

- Lucas Pniak – SAFRAN Research and Technology Center – Industry
  - Planar Transformers Electromagnetic Modelling Considering Capacitive Couplings Up to 100 MHz

### ➤ Lecture presenter 3:

- Miroslav Vasic/Danile Rios Linares – University of Madrid – Academia
  - Artificial Neural networks (ANN) and Digital Twin to optimize DAB transformer design

### ➤ Lecture presenter 4:

- Reddy Andapally Bharadwaj – CBMM – Industry
  - Data collection and analysis to Create accurate Material Models for FEA Simulation

### ➤ Lecture presenter 5:

- Thomas Guillod – Dartmouth – Research
  - Qualifying measurement data, eliminating bias

# ***PSMA Magnetics Committee Meeting Agenda – Magnetics Workshop PM Session Presenters***

## □ PM Theme: Applying Design Basics to Achieve Design Automation

### ➤ Keynote:

- Iosu Aizpuru Larrañaga – University of Mondragon – Academia
  - Core loss from the aspect of physics-based modelling

### ✓ Lecture presenter 6:

- Alfonso Martinez – Würth Elektronik
  - Analytical models for leakage and stray inductance

### ✓ Lecture presenter 7:

- TBD – SIMPLIS Technologies – Industry
  - Simulation models

### ➤ Lecture presenter 8:

- TBD – Frenetic – Industry
  - Excel spreadsheets to AI



# PSMA Magnetics Committee Meeting Agenda – Magnetics Workshop – Tech Demo Presenters

## ❑ Technology Demonstration Presenters

### ➤ Presenter 1:

- Who – Rohde & Schwarz – Industry
  - VNA – S-Parameters

### ➤ Presenter 2:

- Who - Hioki – Industry
  - Power analyzer, LCR meter, Impedance Analyzer

### ➤ Presenter 3:

- Who - Affiliation – Industry
  - Dielectric Withstanding Voltage/Insulation resistance

### ➤ Presenter 4:

- Who – PE Systems – Industry
  - Double Pulse Set

### ➤ Presenter 5:

- Joaquim Tristan - UPITT – Academic
  - Automated Test Systems

### ➤ Presenter 6:

- Who - Affiliation – Industry
  - Partial Discharge

### ➤ Presenter 7:

- Marcin Kacki/Student - Hitachi Energy/University of Madrid – Industry/Academia collaboration
  - Impact of unequal flux distribution on power loss (potential poster)

### ➤ Presenter 8:

- Jun Wang - Bristol – Academic
  - TPT

### ➤ Presenter 9:

- Alfonso Martinez – Würth – Industry
  - Core Loss Data Base

### ➤ Presenter 10:

- Lukas Mueller - Micrometals – Industry/Academic
  - Current Driven Core Loss

### ➤ Presenter 11:

- Michael Freitag - Yageo – Industry
  - TBD

### ➤ Presenter 12:

- JC Sun/Tobias Trupp – BsT/Magnetec – Industry
  - TBD

# ***PSMA Magnetism Committee Meeting Agenda – Magnetism Workshop – Student Posters***

- **Presenter 1:**
  - Nick Kirkby – ASU
    - NIST Standards – Error Analysis
- **Presenter 2:**
  - Who - Affiliation
    - TBD
- **Presenter 3:**
  - Who - Affiliation
    - TBD
- **Presenter 4:**
  - Who – Affiliation
    - TBD



# *PSMA Magnetics Committee Meeting Agenda*

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# PSMA Magnetics Committee Meeting Agenda – 2026 Industry Session Planning

## ❑ Previous Industry Sessions

- Presentations from industry sessions of 2023, 2024 and 2025 are not indicated on “Presentations” tab of the Magnetics Technical Forum
- Action Item: John Horzepa to check with APEC Industry Session chairs if we can restart the practice of making the APEC industry session presentations available on the “Presentation” tab of the Magnetics Technical Forum of the PSMA website if we wait one year after each APEC to place the presentations of the technical forum.

# PSMA Magnetics Committee Meeting Agenda – 2026 Industry Session Planning

## ✓ Identify Themes

- Manufacturing Challenges and Directions
- Magnetic Materials for Existing and Emerging Applications
- Pairing Capacitors with Inductors to Create Better Solutions

## ☐ Next Steps (June 2025 thru July 2025 for August Submission to APEC)

- Identify – Invite – Confirm presenters
- Strategy 50/50 mix of industry and research presenters
- PSMA to identify ten (10) industry sessions to sponsors other will need to be submitted outside of PSMA umbrella
- APEC 2026 Industry Session Proposal submission deadline is August 15, 2025

# PSMA Magnetics Committee Meeting Agenda – Industry Session Planning

## Addressing Technical Manufacturing Challenges and Directions to Meet Emerging Market Demands

### ➤ Presenter 1:

- Marcin Kacki - Hitachi Energy/University of Madrid – Industry/Research collaboration
  - Experimental data confirming analytical calculations and simulations to address challenges of transformer design for DAB

### ✓ Presenter 2:

- Claudio Canete-Cabeza – Würth – Industry
  - Transformers for 400V/48V scalable to 800V/48V power conversion for AI data centers

### ➤ Presenter 3:

- Rudy Geisler – National Magnetics – Industry
  - Custom magnetic cores to meet Advanced technical requirements

### ➤ Presenter 4:

- Peter Weiner - Norwe – Industry
  - 3D Printing and or Laser Direct Structuring

### ➤ Presenter 5:

- Martin Kuo – ITG Electronics – Industry
  - Robotics factory to Improve Efficiency of Magnetics

### ➤ Presenter 6:

- Chris Riccardella – Standex – Industry
  - Automation Planar Magnetics

### ➤ Presenter 7:

- Peter Guo – DMEG – Industry
  - New magnetic materials and production automation

### ➤ Backup Presenter:

- Who - Affiliation – Industry
  - Molded versus Pressed versus Sintered cores

### ➤ Backup presenter:

- Martin Kuo – ITG – Industry
  - Solutions for High Power Motor Drives

### ➤ Backup presenter:

- Alex Lang – Würth – Industry
  - Voltage Ratings for Transformers and Inductors

# PSMA Magnetics Committee Meeting Agenda – Industry Session Planning

## Magnetic Materials for Existing and Emerging Applications

### □ Part 1

#### ➤ Presenter 1:

- Lukas Ressenweber – Coburg University – Research
- Peter Zacharius – University of Kassel - Research
  - Overview of relevant magnetic material properties for existing and emerging applications

#### ✓ Presenter 2:

- Sai Pranesh Amiriseti – University of Florida (Gainesville) – Research
  - Electroplated Nanocomposite Magnetic Material

#### ➤ Presenter 3:

- Toshio Hiraoka - Taiyo Yuden – Industry
  - Magnetic material for IVR applications

#### ➤ Presenter 4:

- Dale Huber/Jason Neely - Sandia – Research
  - Super Magnetism Nano Particles for Power Applications

### □ Part 2

#### ✓ Presenter 5:

- Abraham Solis MK Magnetics – Industry
  - Tape Wound Amorphous Cores

#### ✓ Presenter 6:

- Tobias Trupp - Magnetec – Industry
  - Nanocrystalline Cores for EMI applications

#### ✓ Presenter 7:

- Michael Freitag – Yageo – Industry
  - Nanocrystalline Cores for Power Applications

#### ✓ Presenter 8:

- Reddy Andapally Bharadwaj – CBMM– Industry
  - Embedded Actives to Improve Performance of Nanocrystalline Core

#### ➤ Backup Presenter:

- Hideki Oyama – Ajinomoto Fine-Techno – Industry
  - Magnetic powders and films

# PSMA Magnetics Committee Meeting Agenda – Industry Session Planning

## □ Pairing Capacitors with Inductors to Create Better Solutions

### ➤ Presenter 1:

- ✓ Simon Reuing – Yageo – Industry
  - A Practical Guide for Power Conversion

### ➤ Presenter 2:

- ✓ Symon Pasko – Schaffner – Industry
  - The importance of magnetic and capacitive components in emc filters

### ➤ Presenter 3:

- ✓ Jared Quinzer – Würth Elektronik – Industry
  - Best practices for defining inductors for emi filters

### ➤ Presenter 4:

- ✓ Bryce Hestermann – Utah State University – Academia
  - ✓ Performance of Common-Mode Chokes with Enhanced Differential-Mode Inductance in EMI Filters including Capacitive Interactions

### ➤ Presenter 5 (alternative):

- Arturo Mediano – HF Labs - Research
  - Shielding, Filter Locations



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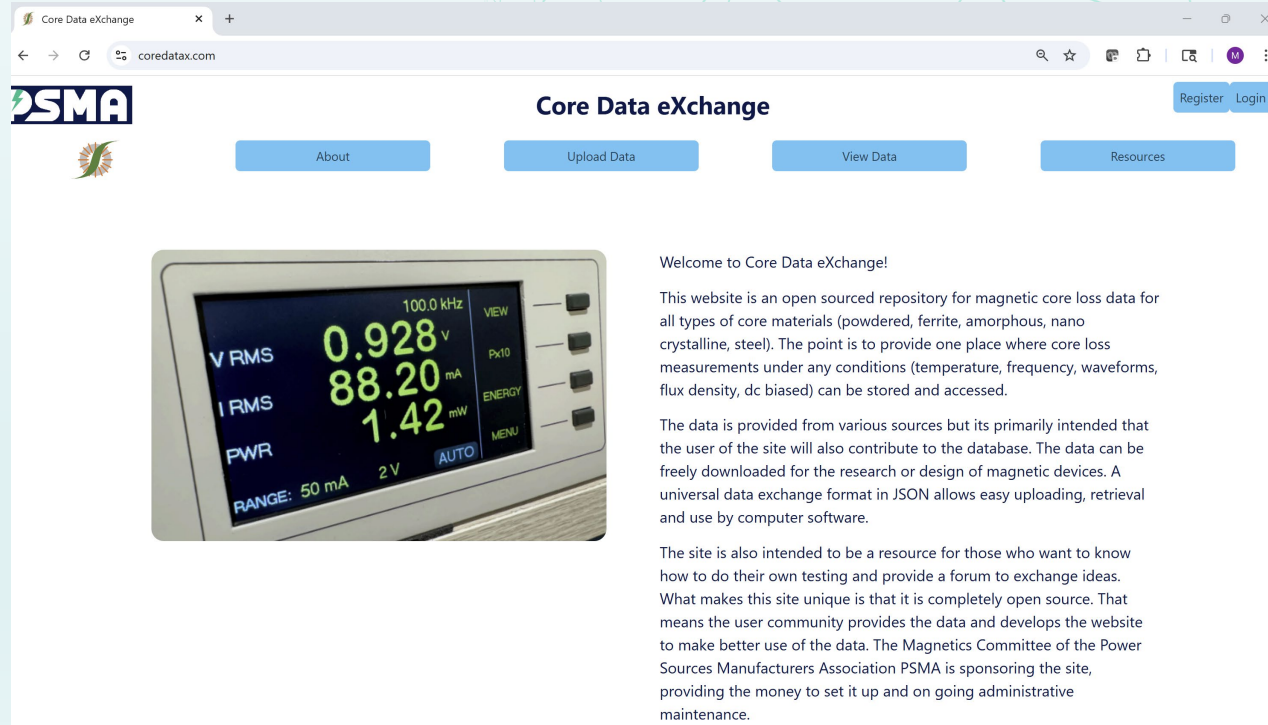
# PSMA Magnetics Committee Meeting Agenda – Special Projects – In Process

- Core Loss Database

- on-line needs formatting/styling

- URL: [coredataX.com](http://coredataX.com)

- URL: <https://www.pσμα.com/magdb-test>



Core Data eXchange

Register Login

About Upload Data View Data Resources

Welcome to Core Data eXchange!

This website is an open sourced repository for magnetic core loss data for all types of core materials (powdered, ferrite, amorphous, nano crystalline, steel). The point is to provide one place where core loss measurements under any conditions (temperature, frequency, waveforms, flux density, dc biased) can be stored and accessed.

The data is provided from various sources but its primarily intended that the user of the site will also contribute to the database. The data can be freely downloaded for the research or design of magnetic devices. A universal data exchange format in JSON allows easy uploading, retrieval and use by computer software.

The site is also intended to be a resource for those who want to know how to do their own testing and provide a forum to exchange ideas. What makes this site unique is that it is completely open source. That means the user community provides the data and develops the website to make better use of the data. The Magnetics Committee of the Power Sources Manufacturers Association PSMA is sponsoring the site, providing the money to set it up and on going administrative maintenance.

## ***PSMA Magnetics Committee Meeting Agenda – Special Projects – In Process***

- Current driven core loss testing –
  - Approved by PSMA BOD June 20, 2025
  - Project can start upon receipt of 50% upfront gift payment
    - PSMA to submit gift form
    - Payment to University of Nebraska care of Jun Wang
  - 50% final payment after approval of final report

Payment from PSMA has been approved but not received by University of Nebraska  
Student has been hired and project to start next week

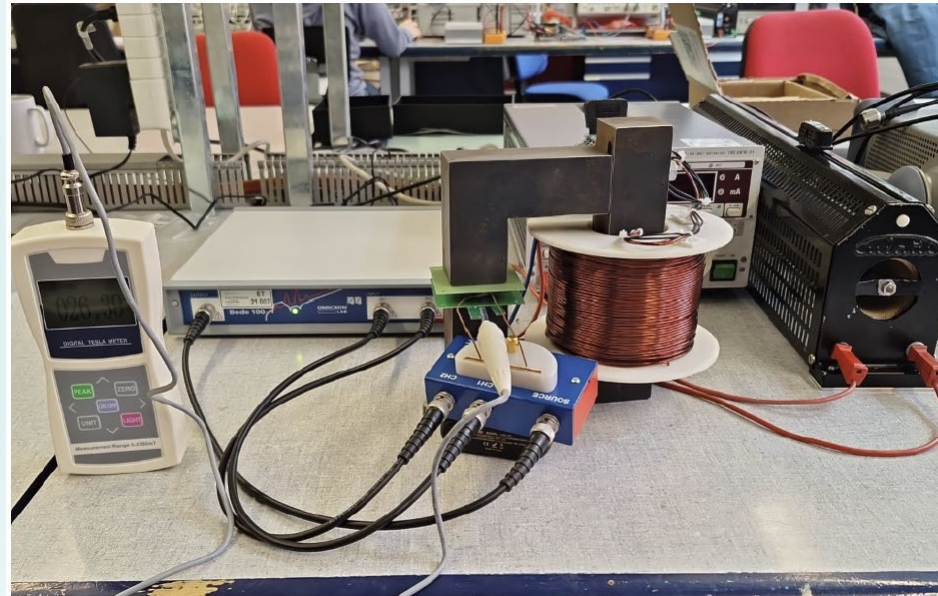
# PSMA Magnetics Committee Meeting Agenda – Special Projects – In Process

- Electrical parameters of magnetic materials – phase 2
  - Final report available
  - Approved payment with additional contingency expenses
  - Need invoice from HSLU
  - Place accepted report on special projects tab of Magnetics technical forum
    - Add link to IEEE Xplore for associated APEC 2025 paper
  - KPIs
    - Data
    - Methodology

## Action items

Invoice – Approved need to verify payment

Final report on website



# PSMA Magnetics Committee Meeting Agenda – Special Projects Pending

## – Pending

- Steinmetz like approximation
- Spice model
- Propagation in magnetic materials

Address after APEC 2026 planning meeting in October

Potential special project

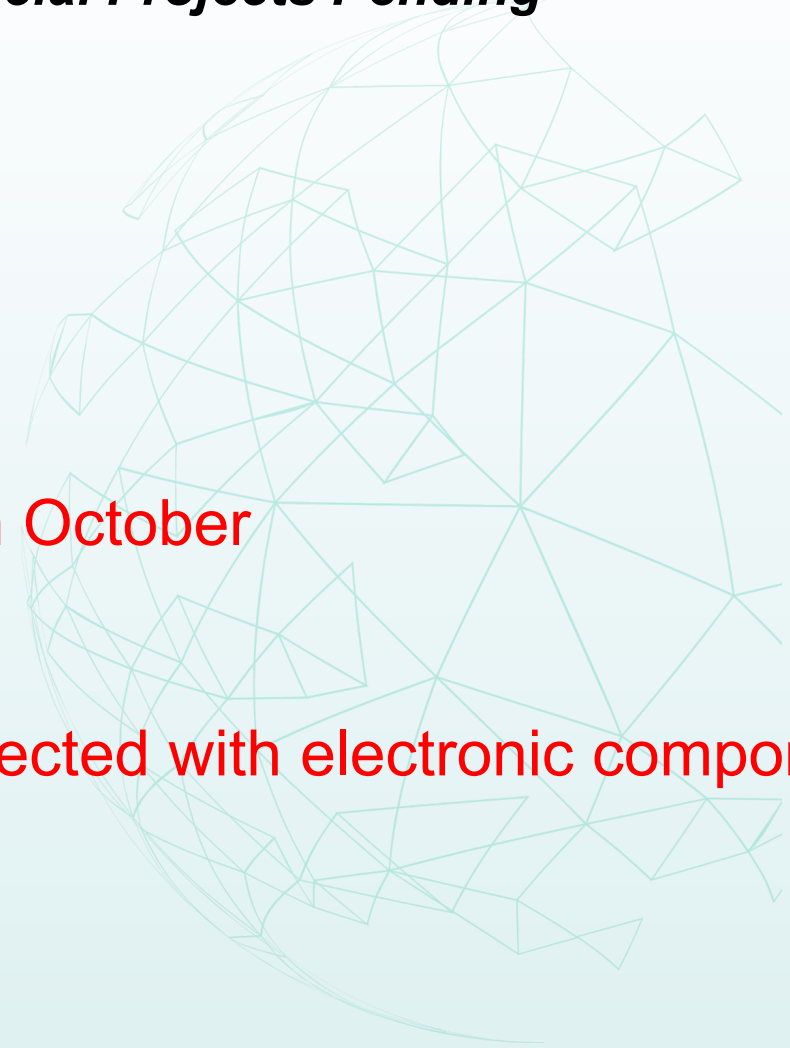
European - Scholarship grant to 15 PhD connected with electronic components

- Magnetic materials
- Modelling
- Holistic design

Hitachi 3 students

Identify some preliminary ideas

Link students with specific magnetic committee members



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# PSMA Magnetics Committee –Magnetics Committee Forum on PSMA Website

- 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 2026 workshop  
and industry sessions  
are finalized

**High frequency magnetics**

Add paragraph regarding definition of high  
frequency dependent on applications

# PSMA Magnetism Committee –Magnetism Committee Forum on PSMA Website

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

psma.com/technical-forums/magnetism/hf-task-force

**PSMA** News Publications Resources Conferences Technical Forums Membership About PSMA Contact Log in

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

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

## HF Task Force

### PSMA Magnetism Committee High Frequency Task Force

January 11, 2015

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

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 Magnetism 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 magnetism 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 Magnetism Committee

#### High frequency magnetism

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**



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# PSMA Magnetics Committee Meeting Agenda – Open Magnetics

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

The screenshot displays the PSMA website's navigation bar with links for News, Publications, Resources, Conferences, Technical Forums, Membership, and About PSMA. Below the navigation is the 'Magnetics DB test page' header. The main content area features a dark-themed interface for the 'OpenMagnetics design tool'. A 'Steps' sidebar on the left lists: Welcome, Design Req., Op. Points, Tool Selector, Continue, and Tool menu. The main text area contains a 'Welcome' message and three paragraphs explaining the tool's workflow: 1) defining requirements for components like inductors or transformers; 2) defining excitation (voltage, current) for ports; and 3) choosing the desired output (report, COTS core, or manual design). A footer menu lists various website sections like News, Publications, Resources, Conferences, Technical Forums, Membership, and About PSMA.

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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
  - EV Charging
  - TBD
  - TBD

2025 PSMA PTR Released June 2025

Still in process of identifying chairs for the next cycle of the PSMA PTR?

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# ***PSMA Magnetics Committee Meeting Agenda***

## ***– Next Meeting***

- Thursday October 9 11 10:00 AM CDT – 11:00 AM CDT Virtual



# ***PSMA Magnetics Committee Meeting Attendance (18)***

John Horzepa  
Kamyar Ahmadi  
Mike Arasim  
Andres Arias  
Hasan Ahmadian Baghbaderani  
Alan Cooper  
Jim Cox  
Doug Eaton  
Frank Feng  
Michael Freitag  
Ed Herbert  
Bryce Hesterman  
Marcin Kacki  
Mohammed Khodadadi  
Alfonso Martinez  
Jonas Multhahaler  
Frank Oberlitner  
Paul Ohodnicki

Lukas Mueller  
Mike Ranjram  
Rodney Rogers  
Ranjit Sai  
George Slama  
JC Sun  
Tobias Trupp  
Jun Wang – Bristol  
Jun Wang - Nebraska  
Ningning Wang  
Matt Wilkowski  
Fritz Wohlrath  
Sebastin Bachman

**Thank You**

