



*The Multinational Power Electronics Association*

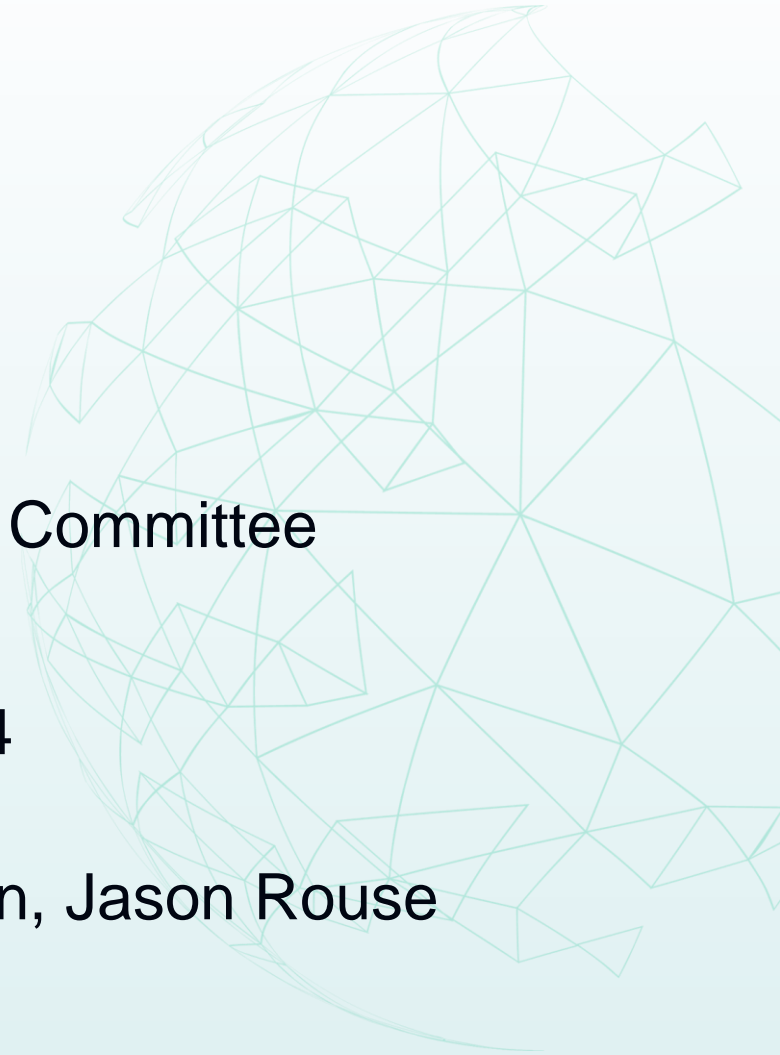
PSMA

Packaging/Manufacturing Committee

May 14th, 2024

John Bultitude, Brian Narveson, Jason Rouse

Co-chairman



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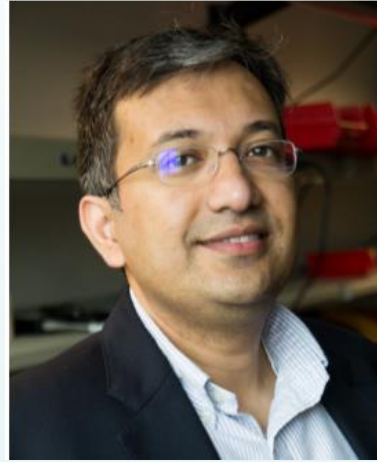


# Meeting Agenda

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- **3D-PEIM 2025 Update**
  - **3D-PEIM Organizing Committee – Update**
  - **3D-PEIM Technical Committee Update**
- **IWIPP 2025 Update**
- **Pwr Soc 2025 Update**
- **Power Technology Report on Embedded and Integrated Magnetics- Update**
- **APEC 2024 Industry Session Summary**
- **APEC 2025**
  - **Speaker Recruitment**

# 3D-PEIM 2025



3D-PEIM is held every 2 years to bring together technologists interested in merging of power packaging, circuits, components and manufacturing to create high performance power solutions using 3D packaging technology and manufacturing techniques.

## 3D-PEIM

- **Dr. Faisal Khan Chief Researcher/Scientist NREL – General Chairman**
- **July 8-10, 2025 Sheraton West Denver**
- In-person Conference
- Connect with world's top Power Packaging and Manufacturing experts
- PSMA sole Financial Sponsor, IEEE EPS Technical Sponsor

# 3D-PEIM 2025 Technical Co-chairs Chairs

**Sreekant Narumanchi, Ph.D.,**

ASME Fellow

Group Manager, Advanced Power Electronics and  
Electric Machines Group

Center for Integrated Mobility Sciences

National Renewable Energy Laboratory, MS 1633

Email: [sreekant.narumanchi@nrel.gov](mailto:sreekant.narumanchi@nrel.gov)

**Jason Rouse Ph.D.,**

Manager Strategic Growth & Ventures

Taiyo America Inc.

Email: [jhrouse@taiyo-america.com](mailto:jhrouse@taiyo-america.com)

## • Technical Committee

- Faisal Khan (General Chair)
- Matt Wilkowski
- Brian Narveson
- John Bultitude
- Doug Hopkins
- Jong Eun Ryu
- Jared Hornberger
- Patrick McCluskey
- G.-Q. Lu
- Brian Rowden
- Tim McDonald
- Cian O'Mathuna
- Przemek Gromala
- Raj Pulugurtha
- Thomas Gottwald
- Katsuaki Suganuma
- Eric Dede
- Chris Kapusta
- Adam Wilson

## • Proposed Sessions

- Session 1 - Inverter/Converter Integration, Manufacturing and Assembly
- Session 2 - Thermal Management
- Session 3 - Reliability
- Session 4 - Module Integration
- Session 5 - Passive Components
- Session 6 - Partner Presentations
- Session 7 - Poster, Benchtop and Exhibit Session
- Session 8 - Materials – Attachments, Interconnects, Substrates, Heat Exchangers
- Session 9 - Advanced Modeling Techniques (including AI and ML)

# IWIPP 2025

- IWIPP International Workshop on Integrated Power Packaging is a biennial IEEE event dedicated to advancing the state of the art in power semiconductor packaging, which is widely recognized as one of the critical factors influencing the performance and reliability of today's power electronics
- **IWIPP April 8-10, 2025**
- **Dr. Andy Lemon – General Chairman**
- In-person Conference
- University of Alabama, **Tuscaloosa, Alabama**
- Connect with world's top power, device, integrations and system researchers
- PSMA Board Approved Sponsorship at January 2024 Meeting



IWIPP is Sponsored By:



# PwrSoC 2025

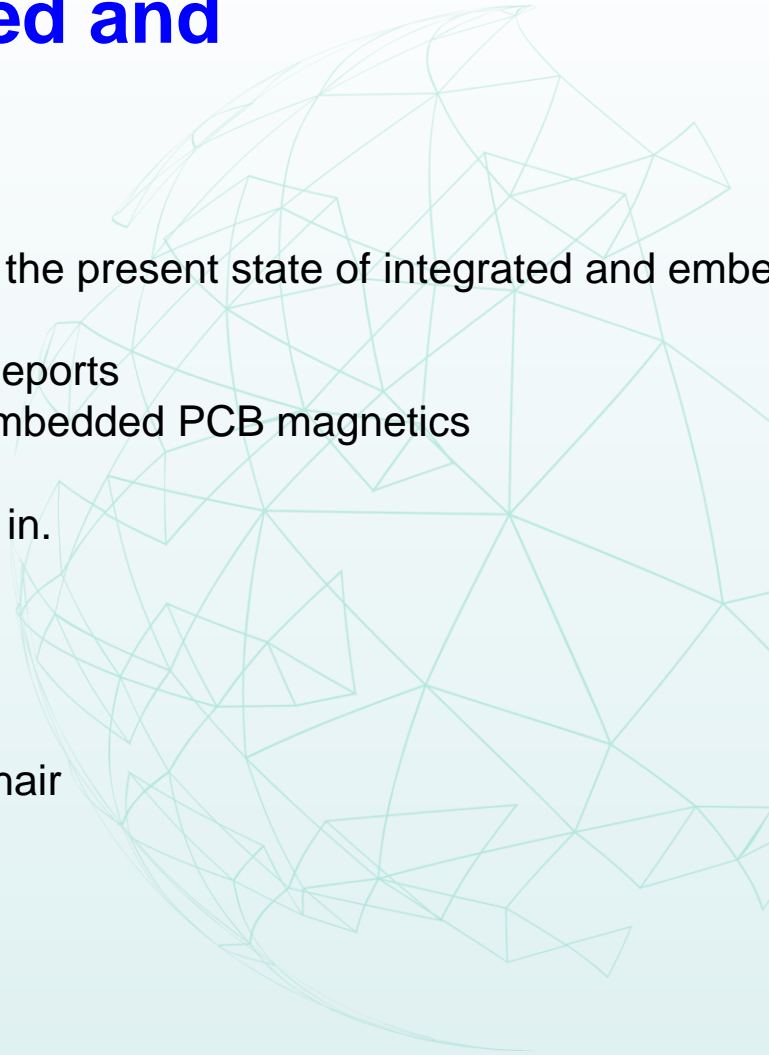
- The Packaging Committee supports PwrSoC
- Steering Committee approved a proposal from Prof. Jaeha Kim, Seoul National University.
- Exact Date TBD Sept/Oct 2025

Sponsors



# Power Technology Report on Embedded and Integrated Magnetics

- Purpose
  - To provide and up to date reference for member companies on the present state of integrated and embedded magnetics.
  - The report will follow the format of the previous 3 Technology Reports
  - The report will deep dive into the explosion of integrated and embedded PCB magnetics
  - The report would look at
    - What's available today and the applications they are used in.
    - What is in the pipeline for the next 2-3 years.
    - Potential roadmap for the future.
    - What the main roadblocks are.
  - Supported by the Packaging and Magnetics Committee
    - Brian Narveson – Subcommittee Chair – Pkg Committee Co-Chair
    - John Bultitude – Yageo – Pkg Committee Co-chair
    - Cian O Manthuna –Tyndall – Pkg Committee
    - Matt Wilkowski – Würth– Pkg and Magnetics Committee
    - George Salma – Würth – Magnetics Committee
    - Justin Henspeter – IBM – Packaging Committee
    - Dr. PM Raj – Florida International University – Packaging Committee
  - RFP Sent, responses due May 17<sup>th</sup>
  - 4 organizations have indicated they provide a response
  - Next Sub-committee meeting Thursday May 23rd
  - Target Publication APEC 2025



# APEC 2024 Industry Session - Wednesday February 28

## IS10 Advances in 3D-Packaging Technology for Power Electronics

### Focus:

The PSMA Packaging Committee is organizing and proposing an Industry Session for APEC 2024 that is focused on advances in 3D-Packaging Technology for power electronics, such as embedding, with a range of different applications of AI higher power systems. The latest developments in onshoring of packaging will also be presented. This session will bring together leading academic and industrial researchers in this area.

- **APEC 2024 was well attended**
- **Presentation attendees in range 30-80**

Attendance in RED

Start	Finish	ID	Presentation Title	Presenter	Title/Affiliation
8:30 AM	8:55 AM	IS 10.1	Common Mode Noise and Minimizing Emissions through Packaging Technology	Douglas C. Hopkins	Professor in Electrical and Computer Engineering, Director of the Laboratory for Packaging Research in Electronic Energy Systems (PREES), NC State, USA
8:55 AM	9:20 AM	IS 10.2	Packaging for IoT Device Energy Harvesting Solutions – Roadmap and Considerations	Mike Hayes / Brian Zahnstecher	Head of Group ICT for Energy Efficiency, Tyndall National Institute, County Cork, Ireland  / Founder & Principal, PowerRox, Niantic, CT, USA
9:20 AM	9:45 AM	IS 10.3	Efficiency improvements for power conversion units by means of PCB embedding technology for fast switching devices like SiC and GaN	Thomas Gottwald	Vice President Technology Schweizer Electronic AG, Germany
9:45 AM	10:10 AM	IS 10.4	Innovation and Collaboration in Power Module Packaging and HVM in the fast-changing world	Thomas Wang	Director of ASE Corporate R&D, ASE, Taiwan
10:10 AM	10:40AM	<b>BREAK</b>			
10:40 AM	11:05 AM	IS 10.5	On-Shoring Power Packaging	Charles Woychik	Enhanced Semiconductor, Inc. formerly Sr. Director Advanced Packaging Platforms at Skywater Technology Foundry, Kissimmee, Florida, USA
11:05 AM	11:30 AM	IS 10.6	Chiplets and Integration in Power Distribution Networks	Siddarth Ravichandran	Chipletz, Austin, TX, USA
11:30 AM	11:55 AM	IS 10.7	AI-Driven Reliability of Solar Power Inverters	Patrick McCluskey	Professor and Director of Undergraduate Studies Dept. of Mechanical Engineering University of Maryland, College Park, MD USA



# APEC 2025 Topic Brainstorm – **Speaker Recruitment Discussion**

- The following high level topics were discussed with the goal of Improving attendance at our APEC Session to this audience as well as promoting our Packaging & Manufacturing workshops
  - Manufacturing
  - Speaker from DARPA to present industry challenges
  - System house to discuss power packaging challenges
  - Packaging alternatives for AI processors or processor boards
  - SiC & GaN Power Packaging
  - Cooling AI power
  - Packaging of power solution for AI requiring 1000A art 1V.

# APEC 2025 Topic Brainstorm – **Speaker Recruitment Actions**

- Following our discussions we decided to focus on 2 key Power Packaging Areas; Auto/Vehicle and AI
- The following actions were identified to recruit potential speakers (7) for our session at APEC 2025 that will be held at Georgia World Congress Center Atlanta, GA March 09-13, 2025:

Speaker / Organization	Packing (Manufacturing) Subject	Committee Contact	Response
Brig Singh / John Deere	Vehicle Power	Douglas C. Hopkins	
Vicor	AI	Andy Mackie	
Peter Friedrichs / Infineon	Vehicle Power / AI	John Bultitude	
Caresoft Global	Vehicle Power teardowns	Jason Rouse	
AEC	Vehicle Power reliability standards	Jason Rouse	
Qing Lui	AI	GQ	
Nvidia	AI power and packaging	Jason Rouse	

# Thank You

**Next Committee Meeting**  
**Tuesday June 5th, 11 am Central Time**



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