

# CPSS & PSMA Joint Workshop, CPSSC, Shanghai Nov'17

## Speech Information

### Topic 1: New energy, New energy vehicles, Energy storage

#### CPSS Presenter:



Dr. Haffee Luo

Director of IGBT MC, Doctor

Times Electric Co., Ltd Semiconductor Business Unit (Enterprise Member of CPSS)

#### Speech Title:

CRRC IGBT Technology and Application in New Energy

#### Abstract:

Through years' development, CRRC IGBT has been formed to be a complete IDM pattern. IGBT products cover the voltage range of 650V-6500V, it has been applied to track railway, smart grid, Electric Vehicle, new energy and other fields. According to the technical specifications and trends of application in new energy, the report frame as following:

- New energy field summary and application demands
- CRRC new energy application IGBT wafer specification
- CRRC new energy application IGBT module technical specification
- CRRC new energy application IGBT developing trend

#### Bio of the Speaker:

In 2010, Haffee Luo was sent to the UK to research and develop high voltage and High power IGBT wafer and trench IGBT key technology as the first batch of main Technical skeleton. He led his team to build whole 8-inch IGBT process platform, And finished development of 1700V-6500V high voltage and high power IGBT and matched FRD, the performance achieve international advanced level. Finished building the platform of trench IGBT and develop 650V-3300V trench IGBT wafer and matched FRD series.

Published more than 20 articles, 10 of them had been collected into SCI and EI. Applied almost 30 patents, 8 of them already been authorized. Won 4 prizes of science and technology, and 3 identifications of scientific and technological achievements of Hunan province.

## **Topic 1: New energy, New-Energy Vehicles, Energy storage**

### **PSMA Presenter:**



Eric Persson

Chairman of the PSMA, and Global GaN Applications Engineering for Infineon

### **Speech Title:**

Wide bandgap semiconductors for renewable energy applications

### **Abstract:**

There is much recent discussion about the role of wide bandgap semiconductors improving the efficiency of renewable energy applications like wind, solar, electric automobile as well as energy storage applications. This presentation will address both GaN and SiC semiconductors: what are the characteristics of each technology that makes one a better match for one application or another? Is the quality and reliability of these devices up to the challenges of renewable energy applications with the long lifetime requirements and severe environmental conditions of these applications? This presentation will address the performance, quality and reliability aspects of wide bandgap semiconductors for renewable energy markets.

### **Bio of the Speaker:**

Eric Persson is a 37-year veteran of the power electronic industry. His career spans 20 years of hands-on power converter and inverter design, followed by 17 years in applications engineering in the semiconductor industry at International Rectifier, now Infineon Technologies. He is presently responsible for GaN Applications at Infineon.

Eric has presented more than 85 tutorials and papers at various international conferences. He is a regular lecturer, presenting short courses and tutorials at UW Madison, the University of Minnesota and Purdue University. He is also Chairman, Board of Directors of the Power Source Manufacturers Association (PSMA), and General Chairman for APEC 2018. Mr. Persson holds 13 patents, and is a recipient of the IEEE Third Millennium Medal.

## **Topic 2: Data center, IT equipment power supply**

### **CPSS Presenter:**



Dr. Longqiang Yi  
Vice Manager of R&D Department  
KEHUA Corporate (Co-Chair Member of CPSS)

### **Speech Title:**

Research on Reliability Hotspot of Uninterruptible Power System for Data Center

### **Abstract:**

Ensuring the reliability of uninterruptible power system is one of the basic conditions for the safe operation of data center equipment, several tens of milliseconds of power system flashing may cause data center server downtime, and even lead to equipment failure. The report analyzes the hot issues of the data center uninterrupted power system, including uninterruptible power supply equipment how to enhance the reliability of power supply system, the reliability analysis and conclusion of the uninterrupted power system, and the relationship between reliability and availability of data center, etc.. This report is used for reader to re-understanding the data center's uninterrupted power system reliability and eliminating some industry misunderstandings from another perspective.

The main contents:

1. Reliability overview of data center uninterrupted power system
2. Uninterrupted power equipment how to enhance the reliability of power supply system
3. Analysis and conclusion of reliability model of data center power architecture
4. Relationship of data center reliability and availability
5. Conclusion

### **Bio of the Speaker:**

Yi Longqiang received an M.S. and Ph.D. degree in Circuits and Systems from Hunan University, Hunan, China, in 2003 and 2007 respectively.

He joined R&D Department in KEHUA Corporate in 2013 as Vice Manager as well as Manager of Advanced Research Department, responsible for the research and development of power electronic products digital control technology, production and management. He has published more than 30 papers, is the holder of more than 30 China patents, and among them has more than 20 invention patents. His major research interests include the analysis and control of power electronics circuits, the digital control theory and application for the digitizing power product, and photovoltaic inverter etc., and the research and application of data center Uninterruptible Power System, electric energy metering and power quality analysis.

## **Topic 2: Data center, IT equipment power supply**

### **PSMA Presenter:**



Dr. Conor Quinn

Director of the PSMA

Senior Director, Worldwide Technical Marketing, Artesyn Embedded Technologies

### **Speech Title:**

Architectural Shifts in Information Technology and Datacenter Equipment

### **Abstract:**

New applications and uses drive the continued evolution of the networks behind the internet. The hardware that supports these implementations also evolves and with that power architectures must adapt. In this presentation, we will look at ongoing changes in architectures that address the need to efficiently distribute and convert the power used to make the networks run. Examples of different architectures will be provided, along with justification for their structure and implementation.

### **Bio of the Speaker:**

Conor Quinn is a Senior Director with responsibility for worldwide Technical Marketing at Artesyn Embedded Technologies. His career in the power electronics industry spans 25 in design, management and marketing roles. Conor holds a BE in Electrical Engineering from University College Cork in Ireland, a PhD from the University of Minnesota and has been awarded 3 patents in the field of power electronics and control. He serves on the Board of Directors for the Power Sources Manufacturers Association (PSMA), is co-chair of the Power Technology Roadmap committee, and is the Industry Session co-chair for APEC. Conor has been actively involved in specification and roadmap activities of industry groups beyond PSMA. He led technical committees for PMBus™ (Power Management Bus), and served on the Board of Directors for 6 years. Conor also led technical committees for PICMG (PCI Industrial Computers Manufacturers Group).

### **Topic 3: Consumer AC-DC: smartphone, laptop, TV, etc.**

#### **CPSS Presenter:**



Dr. Alpha Zhang

Vice President of CPSS

Director of Delta (Shanghai) R&D Center (Co-Chair Member of CPSS)

#### **Speech Title:**

Adapter Power Trend and Technology Development

#### **Abstract:**

Based on the market trend analysis of ac adapter for laptop and consumer products, the author will discuss the key technology trends and challenges, and finally will introduce in details of design of the world smallest adapter in the presentation.

#### **Bio of the Speaker:**

Dr. Zhang received his Ph. D degree from Zhejiang University in 1991, since then he joined Zhejiang University as an associate professor in Electrical Engineering Department from 1991 to 1997. He was a visit professor at CPES in 1995 and 1998. He joined Delta Electronics (Shanghai) Co. limited since 1999 and had been as assistant director of Delta Power Electronics Center from 1999 to 2003. He has been as the director of Delta Shanghai Design Center since 2002 and he has been as the director of Delta Hangzhou Design Center since 2007. He has been as a vice-Chairman of China Power Supply Society since 2011.

### Topic 3: Consumer AC-DC: smartphone, laptop, TV, etc.

#### PSMA Presenter:



Stephen Oliver

President of the PSMA, and VP Sales & Marketing, Navitas Semiconductor

#### Speech Title:

High-Frequency Eco-System Drives New Applications, New Solutions

#### Abstract:

The consumer market demands high-performance (high efficiency, small size, fast time-to-market) while changing specifications (e.g. Euro CoC Tier 2, USB Type-C / PD, Quick Charge, etc.) and always with constant cost pressure. A new eco-system of high-frequency semiconductor powertrains, controllers, capacitors and magnetic materials has emerged to meet this challenge. In addition, the new materials are the catalyst for new topologies and emerging markets and applications.

The presentation will review:

1. Design challenges (legal, consumer, schedule, cost)
2. New high-frequency materials
  - a. Semiconductors
  - b. Magnetics
3. Example high-frequency solutions
  - a. Chargers, adapters for smartphone, laptops, drones
  - b. Wireless charging
  - c. LiDAR
  - d. SMPS for TV and monitor

#### Bio of the Speaker:

Stephen Oliver is VP Sales & Marketing for Navitas Semiconductor. He has over 25 years' experience in the power semiconductor and power supply industries in computing, industrial, automotive and telecom markets with Motorola and Philips (NXP) in the UK, and International Rectifier and Vicor in the USA. He holds a B.Eng (Hons) in Electrical & Electronic Engineering from Manchester University, UK and an MBA in Global Marketing & Strategy from UCLA, USA. Stephen holds several patents in power semiconductors, is a Chartered Engineer and is currently President of the Power Sources Manufacturers' Association (PSMA).