

## POWER ELECTRONICS Tuesday, June 19, 2001

### Room Paris

9:00 – 9:20

**Official Opening of the PCIM 2001 Conference for all PCIM participants**

9:20 – 10:05

**KEY-NOTE Paper for all PCIM participants**

### **POWER ELECTRONICS SOLUTIONS FOR DISTRIBUTED POWER GENERATION**

R. W. Zehringer, P. Joerg, M. Suter, ABB Corp. Research Ltd. SWITZERLAND

Recently there has been a lot of attention in the media and in the industrial circles on the issue of deregulation of power distribution markets. At the same time power shortages often caused by the insufficient transmission capacity together with increasing power quality problems prompted the search for a solution in the form of distributed power generation.

There are several competing technologies in the distributed power generation arena that are believed to offer a solution for many of the today's power quality problems and that fit well in the vision of the deregulated power distribution markets. Some of the most promising technologies in this arena are microturbines, fuel cells, wind power systems and photovoltaic plants. However, in order to utilize the full potential of these technologies a power electronic solution in the form of power conditioning system (PCS) is required almost without an exception.

Therefore, this paper will make a survey for power electronics solutions that quite naturally serve a combined function of an interface to power utility grid, fault protection function and can be configured to serve various power quality functions. In addition, power electronics based PCS systems can be remotely controlled and monitored to allow a real time optimization of power generation and can allow aggregation of distributed power generation resources into a so called "Virtual Utility". Finally, this paper will emphasize new opportunities in application of power electronics solutions that arise from the natural synergy of power electronics systems with the information technologies.

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10:05 – 10:25

Coffee Break and moving of conference participants to different sessions

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### Room Paris

**KEY-NOTE Paper for POWER ELECTRONICS**

10:25 – 11:00

**SYSTEM DESIGN USING POWER PROCESSING CELLS**

I.D. Jitaru, Rompower Inc, USA

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11:05

Starting oral sessions PC 1, PC 2, PC 3 running parallel in different rooms

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### Room Paris

**Session PC 1**

### **SEMICONDUCTOR COMPONENTS - HIGH-POWER SYSTEMS**

Chairman: A. Rufer, EPFL, SWITZERLAND

11:05 - 11:30

**6.5KV PRESS PACK IGBT**

O. Schilling, D. Scholz, H. Seidelmann, eupec, J. Bauer, A. Porst, Infineon Technologies, GERMANY

11:30 - 11:55

**DEVELOPMENT IN 4.5 KV PRESS PACK IEGT FOR HIGH POWER ELECTRONICS APPLICATIONS**

K. Murakami, H. Matsumura, N. Yamano, Toshiba Corp, JAPAN, G. Tchouangue, Toshiba Electronics, GERMANY

## POWER ELECTRONICS Tuesday, June 19, 2001

11:55 - 12:20 **SELF-PROTECTED HIGH-POWER THYRISTOR**  
H.-J.Schulze, F.-J. Niedernostheide, Infineon Technologies,  
U. Kellner-Werdehausen, eupec, GERMANY

**Room**  
**Amsterdam**

**Session PC 2**

### CONVERTER TOPOLOGIES

Chairman: D. Grafham, APT, USA

11:05 - 11:30 **SMC: STACKED MULTICELL CONVERTER**  
L. Delmas, T.A. Meynard, H. Foch, G. Gateau, LEEI, FRANCE

11:30 - 11:55 **DEVELOPMENT OF THE ENERGY EFFICIENT DEFENCE  
CIRCUITS FOR TRACTION HIGH-VOLTAGE CONVERTER**  
S.I. Volsky, D.V. Chuev, Joint-Stock Company SpecRemont, RUSSIA,  
E.A. Lomonova, Delft University of Technology, NETHERLANDS

11:55 - 12:20 **A 3KW ISOLATED BI-DIRECTIONAL DC/DC CONVERTER FOR  
FUEL CELL ELECTRIC VEHICLE (EV) APPLICATION**  
F.P. Flett, L.Z. Xingyi Xu, Ecostar, USA

**Room Dublin**

**Session PC 3**

### ADVANCED PASSIVE COMPONENTS - part I

Chairman: E. Dede, GH Electrotermia, SPAIN

11:05 - 11:30 **THE PRESENT AND FUTURE OF FERRITE MATERIALS FOR  
POWER APPLICATIONS**  
R. Lucke, S. Ahne, S. Plützer, J. Wrba, EPCOS AG, GERMANY

11:30 - 11:55 **DESIGNING WITH MAGNETIC CORES AT HIGH  
TEMPERATURES**  
R.H. Coit, Magnetics, USA

11:55 - 12:20 **THE GENERALIZED SWITCHED INDUCTOR MODEL:  
ACCOUNTING FOR CONDUCTION LOSSES**  
I. Zafrany, S. Ben-Yaakow, Ben-Gurion University of the Negev, ISRAEL

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12:20 – 2:00 Lunch, Restaurant CCN West first floor

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2:00 – 3:00 **Poster / Dialogue Presentations, CCN West second floor**

Chairman: Pierre Aloïsi, Consultant, FRANCE

PC-D1 **THERMALLY CONDUCTIVE SHEET / CERAMIC-FILLED-  
SILICONE DESIGNED TO PROVIDE SUPERIOR THERMAL  
PROPERTIES**  
H. Sawa, T. Kawasaki, M. Kawano, Denki Kagaku Kogyo K.K., JAPAN

## POWER ELECTRONICS Tuesday, June 19, 2001

- PC-D2      **RELIABILITY RULES FOR HIGH VOLTAGE HIGH CURRENT MATRIX SWITCHES**  
D. Chatroux, Y. Lausenaz, j.-F. Villard, CEA Valrho, L. Garnier, R. Milly, Enertronic, D. Lafore, CEGEMA, FRANCE
- PC-D3      **POSSIBLE FAILURE SCENARIOS TO EBG - RESISTORS IN CIRCUITS WITH AN INDUCTANCE (COIL)**  
G. Klauser, A. Klein, EBGmbH, AUSTRIA
- PC-D4      **COMPACT "LOW-COST" HIGH POWER INVERTER WITH "TRENCH GATE MOSFETS" FOR BRUSHLESS-DC MOTORS**  
R. Bellu, P. Salvati, F. Brucchi, Semikron Italia, ITALY
- PC-D5      **IMPROVED STABILITY PROPERTIES OF BOOST AND BUCK-BOOST CONVERTERS USING IMC-BASED CONTROLLER**  
I. Gadoura, Helsinki University of Technology, FINLAND
- PC-D6      **THEORETICAL AND EXPERIMENTAL ANALYSIS THE HUMIDITY-PROTECTIV UNITS OF ELECTROLYTIC AND THIN-FILM CAPACITORS**  
V. Royzman, A. Lebed, Technological University of Podillia, UKRAINE
- PC-D7      **A SIMPLE PROCEDURE FOR THE MATHEMATICAL MODELLING OF THE HYSTERESIS CURVES OF MAGNETIC MATERIALS**  
A. Nicolaide, Transilvania University, Brasov, ROMANIA
- PC-D8      **DIGITAL FREQUENCY SYNTHESIS IN POWER ELECTRONIC CONVERTER CONTROL**  
A. Rafoth, H. Cordt, University of Rostock, J. Petzoldt, Technical University of Illmenau, GERMANY

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3:00      Starting oral sessions PC 4, PC 5, PC 6 running parallel in different rooms

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**Room Paris      Session PC 4**

**ADVANCED SiC COMPONENTS AND IMPROVED DEVICES**

Chairman: B. Taylor, Brightone Consulting, UK

- 3:00 - 3:30      **SIC SCHOTTKY DIODES: A MILESTONE IN HARD SWITCHING APPLICATIONS**  
H. Kapels, R. Rupp, L. Lorenz, I. Zverev, Infineon Technologies, GERMANY
- 3:30 - 4:00      **BENEFITS OF SILICON CARBIDE SCHOTTKY DIODES IN BOOST APFC OPERATING IN CCM**  
S. Ben-Yaakow, I. Zeltser, Ben-Gurion University of the Negev, ISRAEL
- 4:00 - 4:30      **COOLMOS C3 - A FURTHER STEP TOWARDS THE IDEAL SWITCH**  
G. Deboy, D. Ahlers, E. Griebel, L. Lorenz, Infineon Technologies, GERMANY

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4:30 - 4:50      Coffee Break

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- 4:50 - 5:20      **HIGH VOLTAGE MDMESH MOSFETS AND POWER MESH TM IGBTs OPTIMIZE HIGH INTENSITY DISCHARGE LAMPS (HID)**  
F. Di Giovanni, R. Scollo, M. Laudanni, STMicroelectronics, ITALY
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## POWER ELECTRONICS Tuesday, June 19, 2001

- 5:20 - 5:50 **POWER LOSSES OF AN ULTRA-FAST COOLMOS/SIC-DIODE DEVICE-SET IN PFC-APPLICATION: SIMULATION AND MEASUREMENT**  
J.Petzoldt, Illmenau Technical University, T. Reimann, M. Scherf, ISLE, Illmenau, I. Zverev, Infineon Technologies, GERMANY
- 5:50 - 6:20 **EXPERIMENTAL ANALYSIS OF THE APPLICATION OF LATEST SIC DIODE AND COOLMOS POWER TRANSISTOR TECHNOLOGY IN A 10KW THREE-PHASE PWM (VIENNA) RECTIFIER**  
F. Stögerer, Technical University Vienna, AUSTRIA

Room  
Amsterdam

Session PC 5

### SIMULATION and CONTROL

Chairman: P. Bauer, Delft Uni of Technology, The NETHERLANDS

- 3:00 - 3:25 **PARAMETERIZATION OF SEMICONDUCTOR MODELS USING THE FEATURE OF VERSATILE SIMULATION SYSTEMS**  
T. Barucki, Simec GmbH, GERMANY
- 3:25 - 3:50 **NEW QUADRATIC PWM DC-DC CONVERTERS**  
D. Lascu, Politehnica University Timisoara, ROMANIA, P. J. van Duijsen, Simulation Research, THE NETHERLANDS
- 3:50 - 4:15 **DESIGN OF DIFFERENTIAL MODE POWER LINE FILTERS - A TIGHT LINK BETWEEN SIMULATION AND MEASUREMENTS**  
G. Sauerländer, Philips, GERMANY

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4:15 - 4:35 Coffee Break

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- 4:35 - 5:00 **ANIMATION OF POWER ELECTRONICS AND ELECTRICAL DRIVES**  
P. J. van Duijsen, Simulation Research, THE NETHERLANDS, D. Lascu, Politehni University Timisoara, ROMANIA
- 5:00 - 5:25 **A DSP CONTROLLED, ISOLATED POWER FACTOR CORRECTED AC/DC CONVERTER**  
R. Morrison, D. Power, PEI Technologies, IRELAND, F. Moynihan, Analog Devices, USA, M. Egan, U.C.C., IRELAND
- 5:25 - 5:50 **COMPARISON OF PWM VOLTAGE AND CURRENT MODE CONTROL SCHEMES VS. IMPROVED HYSTERETIC MODE CONTROL IN SWITCH MODE POWER SUPPLIES (SMPS)**  
M. Zimnik, Texas Instruments, GERMANY
- 5.50 - 6:15 **BEHAVIORAL MODEL ANALYZES IGBT LOSSES IN SINUSOIDAL CIRCUITS**  
R. H. Randall, Intersil, USA

## POWER ELECTRONICS Tuesday, June 19, 2001

Room Dublin **Session PC 6**

### ADVANCED PASSIVE COMPONENTS - part II

Chairman: F. Sarrus, Ferraz Shawmut, FRANCE

- 3:00 - 3:25 **ACOUSTIC EMISSION OF COMPOUNDED CERAMIC CAPACITORS DURING THEIR THERMOCYCLING**  
V. Royzman, E. Nester, Technological University of Podillia, UKRAINE
- 3:25 - 3:50 **FUSING IGBT-BASED INVERTERS**  
F. Abrahamsen, F. Blaabjerg, Aalborg University, K. Ries, H. Rasmussen, P. Bjornaa, Cooper Bussmann, DENMARK
- 3:50 - 4:15 **PROPERTIES OF NEW CURRENT TRANSDUCERS TECHNOLOGY**  
H.D. Huber, S. Guex, P. Cattaneo, LEM Components, SWITZERLAND
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- 4:15 - 4:35 Coffee Break
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- 4:35 - 4:50 **HIGH PERFORMANCE DOUBLE-LAYER CAPACITOR FOR POWER ELECTRONIC APPLICATIONS**  
V.Hermann, A. Schneuwly, R.Gallay, montena components SA, Rossens, SWITZERLAND
- 4:50 - 5:15 **DIFFERENTIAL CURRENT SENSOR: A USEFUL SOLUTION FOR PARALLELING**  
D. Lafore, P. Mestre, CEGEMA-ESIM, Marseille, FRANCE
- 5:15 - 5:40 **PRACTICAL ASPECTS OF ROGOWSKI CURRENT TRANSDUCER PERFORMANCE**  
B. Ray, Power Electronic Measurements, UK
- 5:40 - 6:05 **TURBO HEAT SINKS (THS): THE INNOVATIVE HIGH POWER, LARGE CURRENT, AIR-COOLED HERMETIC MODULES**  
M. Checchetti, MicrOptronics, ITALY

The PCIM Exhibition runs the whole day from 9:00 – 5:00, ground floor, Hall 12. Make your personal time schedule for the day and reserve time for visiting this worldwide leading PCIM and POWER QUALITY Exhibition.

## POWER ELECTRONICS Wednesday, June 20, 2001

### Room Paris

8:30 – 9:15

#### KEY-NOTE Paper for all PCIM participants

##### **CONTROL SYSTEM PROTOTYPING, PRODUCTIONIZING AND TESTING WITH MODERN TOOLS**

H. Hanselmann, F. Schütte, dSpace, GERMANY

Tools for the rapid development of control systems have found strong acceptance in certain industries, especially in the automotive industry. Penetration of tool usage seems to be much weaker in the areas of drives, motion control systems and power electronics. There may be reasons for sticking to more traditional development processes, but one reason should not be the cause - lack of awareness.

This presentation shows what modern tools can do today in the development process, why the automotive industry is so keen on using them and driving their further development, and how early adopters of such new tools and methodologies in the drives, motion control and power electronics industry successfully apply them.

The areas covered are simulation and rapid control prototyping, automatic production code generation and hardware-in-the-loop testing. Automatic production code generation is considered of high potential for complex developments and will receive particular attention.

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9:15 – 9:30

Coffee Break and moving of conference participants to different sessions

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### Room Paris

#### KEY-NOTE Paper for POWER ELECTRONICS

9:30 – 10:10

##### **AUTOMOTIVE REQUIREMENTS FOR POWER ELECTRONIC CONVERTERS IN TRACTION ADVANCED CONTROL SYSTEM**

J. Laeuffer, PSA Peugeot Citroen, FRANCE

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10:15

Starting oral sessions PC 7, PC 8, PC 9 running parallel in different rooms

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### Room Paris

#### Session PC 7

##### **COMPONENTS and DRIVE**

Chairman: U. Kirchenberger, STMicroelectronics, GERMANY

10:15 - 10:40

##### **NEW STEALTH SOFT RECOVERY DIODE REDUCES SMPS-IGBT TURN ON SWITCHING LOSS**

S. Shekhawat, J. Gladish, P. Shenoy, B. Wood, M. Rinehimer, Intersil Corp., Mountaintop, USA

10:40 - 11:05

##### **NEW COMPONENT FOR INRUSH CURRENT FUNCTION**

B. Peron, STMicroelectronics, FRANCE

11:05 - 11:30

##### **IMPROVED POWER MOSFET'S AND SPECIAL-PURPOSE DIODES BOOST EFFICIENCY IN PFC CIRCUITS**

D.R. Grafham, Advanced Power Technology, FRANCE

11:30 - 11:55

##### **DESIGN PROPOSAL FOR LOW POWER DRIVES**

K. Kanelis, L. Lorenz, Infineon Technologies, GERMANY

11:55 - 12:20

##### **NEW TRENCH POWER MOSFETS IN ISOLATED PACKAGES**

A. Lindemann, IXYS Semiconductor, GERMANY

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## POWER ELECTRONICS Wednesday, June 20, 2001

Room  
Amsterdam

### Session PC 8

#### CONTROL

Chairman: I.D. Jitaru, Rompower, USA

- 10:15 - 10:45 **PERFORMANCE COMPARISON BETWEEN FUZZY AND LINEAR CONTROL OF A STEP-DOWN DC/DC REGULATOR**  
A. Bellini, G. Franceschini, C. Tassoni, University of Parma, ITALY
- 10:45 - 11:15 **UP CONTROL OF SINGLE-PHASE PFC BOOST CONVERTER SUPPLYING THREE-PHASE PWM INVERTER USING SINGLE MICROCONTROLLER**  
B. Grzesik, D. Ligus, Silesian University of Technology, POLAND,  
B. Strzalkowski, Infineon Technologies, GERMANY
- 11:15 - 11:45 **CONTROL INTEGRATED CIRCUITS IN POWER ELECTRONICS: MODELING; DESIGN; SIMULATION AND EXPERIMENTAL VALIDATION OF A FULLY DIGITAL CONTROLLER FOR AN ACTIVE POWER FILTER**  
A. Labbe, P. Poure, F. Aubépart, F. Braun, Laboratoire LEPSI, FRANCE
- 11:45 - 12:15 **MOSFET TECHNOLOGY ADVANCES DC-DC CONVERTER EFFICIENCY FOR PROCESSOR POWER**  
N. Thapar, R. Sodhi, K. Dierberger, G. Stojcic, C. Blake, D. Kinzer, International Rectifier, USA

Room Dublin

### Session PC 9

#### AUTOMOTIVE ELECTRONICS

Chairman: J. Laueffer, PSA Peugeot-Citroen, FRANCE

- 10:15 - 10:40 **SMART POWER SYSTEM ICS FOR AUTOMOTIVE AND INDUSTRIAL APPLICATIONS - THE MULTICHANNEL SWITCH FAMILY**  
M. Glavanovics, H. Estl, A. Bachofner, Infineon Technologies, GERMANY
- 10:40 - 11:05 **A NEW CLASS OF HYBRID VERTICAL POWER IC'S INCLUDING ALSO HIGH VOLTAGE FUNCTIONS IN THE CONTROL PART**  
A. Torres, D. Patti, R. Letor, STMicroelectronics, ITALY
- 11:05 - 11:30 **A NEW HIGH RELIABILITY 80V 400A POWER MOSFET MODULE IN TRENCH GATE TECHNOLOGY FOR 42V POWERNET**  
K. Nishitani, J. Onodera, Toshiba Corp., JAPAN,  
G.Tchouangue, Toshiba Electronics, GERMANY
- 11:30 - 11:55 **NOVEL VARIANTS OF THE TO220 PACKAGE FOR AUTOMOTIVE APPLICATIONS**  
H. Richard, D. Butchers, International Rectifier, UK
- 11:55 - 12:20 **A NEW HIGH VOLTAGE INTERCONNECTION TECHNIQUE WITH LOW-DOPED ISOLATION REGION FOR HVIC'S**  
S.-L. Kim, C.-K Jeon, C.-S. Song, Fairchild Semiconductor, KOREA

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12:20 - 1:30 Lunch, Restaurant CCN West first floor

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## POWER ELECTRONICS Wednesday, June 20, 2001

1:30 – 2:30

### Poster / Dialogue Presentations, CCN West second floor

Chairman: Pierre Aloïsi, Consultant, FRANCE

- PC-D9      **CONTROL SYSTEM FOR THE PWM RECTIFIER BASED ON PREDICTIVE CURRENT CONTROLLER WITH NEURAL NETWORK**  
Z. Krzeminski, D. Wojciechowski, Technical University of Gdansk, POLAND
- PC-D10     **TECHNICAL PERFORMANCE AND APPLICATION OF THE AUTONOMOUS INVERTER WITH ENERGY DOSING**  
N. D. Madgarov, Technical University of Gabrovo, BULGARIA
- PC-D11     **RESONANT DRIVING CIRCUIT WITH A COMPLEMENTARY PAIR OF POWER BIPOLAR TRANSISTORS**  
F. Saya, R. Scollo, STMicroelectronics, ITALY
- PC-D12     **EFFICIENCY CONSIDERATION OF SOFT-SWITCHING PWM INVERTER**  
P. Flajzik, V. Racek, M. Hypky, University of Trencin, SLOVAK REPUBLIC
- PC-D13     **SLIDING MODE - CONTROLLED DIGITAL CONTROLLER**  
Z. Puklus, Széchenyi István University of Applied Sciences, HUNGARY,  
K. Biro, Technical University Cluj-Napoca, ROMANIA,  
P. Korondi, Technical University of Budapest, HUNGARY
- PC-D14     **A NOVEL MULTI-CELL DC/AC CONVERTER FOR APPLICATIONS IN RENEWABLE ENERGY SYSTEMS**  
H. Ertl, J.W. Kolar, F. C. Zach, Technical University Vienna, AUSTRIA
- PC-D15     **RESONANT CONVERTER FOR A HIGH PRESSURE SODIUM LAMP BALLAST APPLICATION**  
S. Stefanescu, M. Chindris, A. Cziker, Technical University of Cluj, ROMANIA
- PC-D16     **DESIGN CHALLENGES FOR BATTERY OPERATED POWER MANAGEMENT SYSTEMS**  
G. Moxey, Vishay Siliconix, UK
- PC-D17     **650V BCD PROCESS WITH HIGHLY RELIABLE CHARACTERISTICS**  
J. J. Kim, M.M. Kim, M.S. Kang Fairchild Semiconductor, KOREA
- PC-D18     **800V/1A, 1-CHIP PROCESS FOR BATTERY CHARGER IC**  
C.K. Jeon, J.J. Kim, Y.S. Choi, M.H. Kim, S.L. Kim, H.S. Kang, C.S. Song,  
Fairchild Semiconductor, KOREA
- PC-D19     **DESIGN CHALLENGES FOR BATTERY OPERATED POWER MANAGEMENT SYSTEMS**  
G. Moxey, Vishay Siliconix, UK
- PC-D20     **THE USE OF A CALORIMETRIC MEASUREMENT FACILITY TO CALIBRATE IN-SITU JUNCTION TEMPERATURE**  
A. J. Brown, P. H. Mellor, F. Flett, University of Bristol, UK

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2:30      Starting oral sessions PC 10, PC 11, PC 12 running parallel in different rooms

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## POWER ELECTRONICS Wednesday, June 20, 2001

Room Paris

Session PC 10

### HIGH POWER IGBTs

Chairman: L. Lorenz, Infineon Technologies, GERMANY

2:30 - 3:00

#### INTERSIL SMPS II IGBTs OFFER HIGH UIS RATING; LOW GATE CHARGES AND LOW TURN-ON-LOSS

J. Yedinak, P. Shenoy, B. Wood, D. Lange, Intersil Corp., USA

3:00 - 3:30

#### NEW LOW COST IGBT MODULES

K. Kanelis, L. Lorenz, T. Stolze, P. Wallmeier, Infineon Technologies, GERMANY

3:30 - 4:00

#### STATIC AND TRANSIENT RESISTANCE OF ADVANCED POWER MODULES

U. Hecht, U. Scheuermann, Semikron, GERMANY

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4:00 - 4:30

Coffee Break

4:30 - 5:00

#### A NEW MINIATURE PACKAGE DIP-IPM WITH OPTIMISED EMI-PERFORMANCE FOR HOME APPLIANCES

H. Iwamoto, T. Iwagami, N. Iwasaki, Mitsubishi Electric, JAPAN,  
M. Honsberg, Mitsubishi Electric Europe, GERMANY

5:00 - 5:30

#### MODULAR SCALE DRIVER SOLUTION FOR ECONOL PACK+

H. Rüedi, CT-Concept Technologie AG, SWITZERLAND

5:30 - 6:00

#### SKIIP3

Ch. Göbl, Semikron Elektronik, GERMANY

Room

Amsterdam

Session PC 11

### CONVERTER TOPOLOGIES

Chairman: E. Carroll, ABB Semiconductors, SWITZERLAND

2:30 - 2:55

#### STEP-DOWN CONVERTER WITH INDUCTIVE INPUT

L.L. Erhartt, Technical University Vienna, AUSTRIA

2:55 - 3:20

#### HIGH FREQUENCY INVERTER FOR CONTACTLESS ENERGY TRANSMISSION

R. Mecke, Institut für Automation und Kommunikation, Magdeburg,  
GERMANY

3:20 - 3:45

#### A NEW AGE IN POWER ELECTRONICS: THE UNIVERSITY CONVERTER

G. Papst, American Superconductor, GERMANY

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3:45 - 4:15

Coffee Break

4:15 - 4:40

#### ISOLATED THREE-PHASE SINGLE-STAGE SINGLE-SWITCH POWER FACTOR CORRECTION AC/DC CUK CONVERTER IN MULTI-DISCONTINUOUS CONDUCTION MODE

P. Banuelos-Sanchez, D. Sadarnac, Supelec, FRANCE

## POWER ELECTRONICS Wednesday, June 20, 2001

- 4:40 - 5:05 **RESONANT CONVERTER WITH MULTIPLE OUTPUT LOADS AND CONTROLLED RESONANT INDUCTANCE**  
A. Jansen, NMB Technologies, USA, M. Schlenk, NMB-Minebea, GERMANY
- 5:05 - 5:30 **ENABLING SPACE REDUCTION AND SIMPLICITY IN MULTIPHASE CONVERTERS**  
J. Lambert, International Rectifier, USA
- 5:30 - 5:55 **SOLAR POWER INVERTER STRUCTURE WITH IMPROVED OUTPUT CURRENT RIPPLE**  
K.H. Edelmoser, Technical University Vienna, AUSTRIA

### Room Dublin **Session PC 12**

#### **ADVANCES in SWITCH MODE POWER SUPPLIES**

Chairman: M. Hierholzer, eupec, GERMANY

- 2:30 - 3:00 **HIGH FREQUENCY, HIGH EFFICIENCY; COST EFFECTIVE POWER SWITCHING IN OFF LINE SWITCHED MODE POWER SUPPLIES**  
B. E. Taylor, STMicroelectronics, UK
- 3:00 - 3:30 **GREEN CHIP II (TEA1507) - A NOVEL QUASI RESONANT FLYBACK SMPS CONTROL IC**  
E. Seinen, A. Strijker & T. Mober, Philips Semiconductor, THE NETHERLANDS
- 3:30 - 4:00 **ZERO LOAD INPUT POWER MINIMIZATION IN LOW POWER OFF LINE SMPS**  
A. Bailly, A. Russo, STMicroelectronics, ITALY

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4:00 - 4:30 Coffee Break

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- 4:30 - 5:00 **A NEW MULTI MODE QUASI-RESONANT POWER IC'S AND IT'S NEW CONTROL TECHNOLOGIES FOR SWITCHING MODE POWER SUPPLIES**  
K. Koike, T. Yamada, K. Okada, M. Ueki, N. Aoike, Sanken Electric, JAPAN
- 5:00 - 5:30 **STARPLUG FAMILY - TEA152X**  
E. Kluter, Philips Semiconductor, THE NETHERLANDS
- 5:30 - 6:00 **ADVANCES IN INTEGRATED FUNCTIONALITY**  
D. Staffire, Energenius, USA

### 6:00 **Get Together Party**

**The PCIM Exhibition runs the whole day from 9:00 – 5:00, ground floor, Hall 12. Make your personal time schedule for the day and reserve time for visiting this worldwide leading PCIM and POWER QUALITY Exhibition.**

## POWER ELECTRONICS Thursday, June 21, 2001

### Room Paris

8:30 – 9:15

#### KEY-NOTE Paper for all PCIM participants

#### KEY DEVELOPMENTS FOR SUPERCAPACITIVE ENERGY STORAGE: POWER ELECTRONIC CONVERTERS, SYSTEMS AND CONTROL

A. Rufer, Laboratoire d'Electronique Industrielle LEI, EPFL, SWITZERLAND

Supercapacitors represent one of the newest innovations in the field of electrical energy storage, and will find their place in many applications where energy storage is needed, and can help to the smoothing of strong and short time power solicitations of a distribution network. Other system developments are going on, opening new fields in engineering sciences, based on new possibilities in the field of electrical energy storage.

In comparison with classical capacitors, these new components allow a much more higher energy density, together with a high power density. Even if the energy density is not comparable with that one of electrochemical accumulators, the possible energy amount and storage time is compatible with many industrial requirements. In transportation systems, as a first example, the energy needed to relay two bus-stations can easily be transferred from a fixed supercapacitive storage device to another mobile one placed on the bus during passenger transfer time, allowing so the use of electrical propulsion without trolleys. Many other systems for better share of energy and instantaneous power amounts will soon appear as industrial products.

This contribution shows some actual research and development projects, running at university level, but in connection with specialists from the corresponding application field. Innovative and promising solutions and technologies are investigated, which need of course clarification of their actual industrial and economical compatibility, they can also be seen as future solutions for next decades, in relation with the tendency of getting weaker distribution of electrical energy.

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9:15 – 9:40 Coffee Break and moving of conference participants to different sessions

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9:40 Starting oral sessions PC 13, PC 14, PC 15 running parallel in different rooms

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### Room Paris

#### Session PC 13

#### LOW and MEDIUM IGBTs

Chairman: M. Bairanzade, ON Semiconductors, FRANCE

9:40 - 10:05

#### 1700 V TRENCH IGBT MODULES

R. Mallwitz, eupec, M. Pfaffenlehner, Infineon Technologies, GERMANY

10:05 - 10:30

#### DEVELOPMENT OF MODULAR HIGH-POWER IGBT STACKS

H. Rüedi, CT-Concept Technologie AG, D. Tollik, econoStack AG, SWITZERLAND

10:30 - 10:55

#### SOFT-PUNCH-THROUGH (SPT) 1700V IGBT

S. Dewar, ABB Semiconductors, SWITZERLAND

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10:55 – 11:10 Coffee Break

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## POWER ELECTRONICS Thursday, June 21, 2001

- 11:10 - 11:35 **CHARACTERISING IGBT MODULES FOR QUASI-RESONANT CONVERTER**  
C. Chamund, Dynex Semiconductor, UK
- 11:35 - 11:50 **A NEW 1700V-IGBT SERIES FOR 690V LINE VOLTAGE**  
H. Iwamoto, M. Tabata, Mitsubishi Electric Corp, JAPAN,  
K. Mochizuki, Fukuryo Semiconductor, JAPAN,  
E. Thal, I. Merfert, Mitsubishi Electric, GERMANY
- 11:50 - 12:15 **"POSITIVE ONLY" GATE DRIVE IGBT'S CREATED BY CRES MINIMIZATION**  
R. Francis, P. Wood, A. Alderman, International Rectifier, USA

### Room

Amsterdam

Session PC 14 Part I

### CONVERTERS

Chairman: F. Zach, University of Vienna, AUSTRIA

- 9:40 - 10:05 **ECONOMAC THE FIRST ALL-IN-ONE IGBT MODULE FOR MATRIX CONVERTERS**  
M. Hornkamp, M. Loddenkötter, M. Münzer, eupec, O. Simon,  
M. Bruckmann, Siemens A&D, GERMANY
- 10:05 - 10:30 **MAKE YOUR CIRCUIT'S PASSIVE COMPONENTS WORK IN YOUR FAVOUR**  
B. E. Taylor, STMicroelectronics, UK
- 10:30 - 10:55 **A 3KW HIGH VOLTAGE - SOFT SWITCHING CONVERTER FOR EV BATTERY CHARGER**  
I.D. Jitaru, Rompower Inc, USA

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10:55 - 11:10 Coffee Break

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- 11:10 - 11:35 **SINGLE INDUCTOR BUCK PROVIDES MULTIPLE OUTPUT VOLTAGES**  
R. Lenk, Fairchild Semiconductor, USA
- 11:35 - 12:00 **A NEW SELF-OSCILLATING CONVERTER TOPOLOGY TO DRIVE COMPACT FLUORESCENT LAMPS USING VIPOWER DEVICES**  
N. Aiello, G. Di Stefano, STMicroelectronics, SPAIN
- 12:00 - 12:25 **DYNAMIC SYSTEM MODELING AND ANALYSIS FOR MULTILoop OPERATION OF PARALLELED DC/DC CONVERTERS**  
I. Gadoura, Helsinki University of Technology, FINLAND

## POWER ELECTRONICS Thursday, June 21, 2001

Room Dublin **Session PC 15**

### ISOLATION MATERIALS and NEW PACKAGING CONCEPTS

Chairman: B. Carsten, Bruce Carsten Assoc., USA

- 9:40 - 10:05 **A NOVEL APPROACH OF HIGH RELIABILITY CERAMIC SUBSTRATE FOR HIGH POWER MODULE**  
T. Miyao, K. Furukuwa, T. Hirakawa, K. Sugai, H. Matsumoto, Kyocera Corp., JAPAN
- 10:05 - 10:30 **NET SHAPE CAPABILITIES OF AISIC TO SOLVE THERMAL MANAGEMENT ISSUES IN POWER ELECTRONICS**  
B. Sonuparla, M. Reback, M. Anderson, M. Anderson, Advanced Forming Technology, USA
- 10:30 - 10:55 **A NEW INSULATED METAL SUBSTRATE WITH ALUMINIUM CONDUCTOR**  
N. Yonemura, Denki Kagaku Kogyo K.K., JAPAN

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10:55 – 11:10 Coffee Break

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- 11:10 - 11:35 **AISIC BASEPLATES FOR POWER IGBT MODULES: DESIGN, PERFORMANCE AND RELIABILITY**  
M.A. Occionero, G.J. Sundberg, R.W. Adams, K.P. Fennessy, Ceramics Process Systems, USA
- 11:35 - 12:00 **FAILURE ANALYSIS ON DIRECT BONDED COPPER SUBSTRATES AFTER THERMAL CYCLE IN DIFFERENT MOUNTING CONDITIONS**  
J. J. Mikkelsen, Aalborg University, DENMARK
- 12:00 - 12:25 **DIRECTFET - A PROPRIETARY NEW SOURCE MOUNTED POWER PACKAGE FOR BOARD MOUNTED POWER**  
A. Sawle, M. Standing, T. Sammon, A. Woodworth, International Rectifier, UK

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12:25 – 1:45 Lunch, Restaurant CCN West first floor

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1:45 Starting oral sessions PC 14 part II and PC 15 running parallel in different rooms

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Room Amsterdam **Session PC 14 Part II**

### CONVERTERS

Chairman: F. Zach, University of Vienna, AUSTRIA

- 1:45 - 2:10 **A FIVEFOLD INCREASE IN CELL DENSITY SETS THE NEW MILESTONE IN TRENCHFET DEVICE PERFORMANCE**  
G. Moxey, Vishay Siliconix, UK

## **POWER ELECTRONICS Thursday, June 21, 2001**

- 2:10 - 2:35     **HIGH EFFICIENCY HALF BRIDGE DC TO DC CONVERTER WITH SECONDARY SYNCHRONOUS RECTIFICATION**  
J. Brown, Vishay Siliconix, UK
- 2:35 - 3:00     **BI-DIRECTIONAL FLIPFET MOSFET'S FOR CELL PHONE BATTERY PROTECTION CIRCUITS**  
M. Pavier, H. Schofield, T. Sammon, International Rectifier, THE NETHERLANDS, A. Arzumanyan, R. Sodhi, D. Kinzer, International Rectifier, USA
- 3:00 - 3:25     **A MULTIPHASE DC/DC CONVERTER FOR AUTOMOTIVE DUAL VOLTAGE POWER SYSTEMS**  
A. Consoli, F. Gennaro, G. Scarcella, University of Catania, G. Giannetto, A. Testa, University of Messina, ITALY

**The PCIM Exhibition runs the whole day from 9:00 – 5:00, ground floor, Hall 12. Make your personal time schedule for the day and reserve time for visiting this worldwide leading PCIM and POWER QUALITY Exhibition.**