WP5: Technology Consulting for SMEs

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Baltic Sea Region

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EUROPEAN REGIONAL DEVELOPMENT FUND

Company #1 (name confidential)

Consultation by

Institute of Materials Science of Kaunas University of Technology

- www.materials.ktu.edu
- sigitas.tamulevicius@ktu.lt

Duration: 2018 - January 2019

Consultation and recommendations for the increase of sensing of advanced stationary and mobile navigation systems

The consultation is based on the mechanical and physical characterisation of housing materials used for automatic navigation of robotic systems. Recommendations for the selection of housing materials with increased durability and sensing ability have been formulated.

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Company #2 (name confidential)

Consultation by

Institute of Materials Science of Kaunas University of Technology

- www.materials.ktu.edu
- sigitas.tamulevicius@ktu.lt

Duration: 2018 - January 2019

Consultation on testing of Power inverter for solar panel system

The company has been advised on developing harsh laboratory environment conditions required for the performance and technical parameters determination as well as the evaluation of DC/AC converters during cyclic operational tests in aggressive environments. Including increased humidity, variety of acid and alkali vapours. After performance testing, the most reliable converters with the best technical economics characteristics and their suppliers were identified.

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Company #3 (name confidential)

Consultation by

RISE, Sweden

- www.ri.se
- mietek.bakowski@ri.se

Duration: April 2018

Building know-how and testing the reliability of SiC MOSFETs for the selection and adoption in converters for heavy-duty vehicles

An application to the Swedish F&I program for vehicle technology was submitted and approved. The project started in autumn 2018.
Goal: to establish test methods and generic models adapted to the demands of automotive applications for the evaluation of SiC technology and the establishment of SiC standards.

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Company #4 (name confidential)

Consultation by

RISE, Sweden

- www.ri.se
- mietek.bakowski@ri.se

Duration: January 2018

Evaluation of the possibility to integrate SiC in the company's products

The company decided to adopt SiC MOSFETs and plans to develop a dedicated SiC MOSFET driver with their own specifications.
The consultation led to a long-term collaboration which will further elaborate the scope of competences of the company.

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Company #5 (name confidential)

Consultation by

RISE, Sweden

- www.ri.se
- mietek.bakowski@ri.se

Duration: September 2018

WBG in automotive industry - intensifying collaboration with Swedish experts

The company participated in a Green PE workshop in Gothenburg, Sweden 2017 where it discussed needs and goals of the integration of WBG. Further discussions at the *Vehicle Electronics & Connected Services* 2017 and 2018 led to a greater involvement of the company in relevant events and networks in Sweden (SCAPE 2018, WBG Power Center). The company supported a diploma work on SiC and electric motor drive at Chalmers University of Technology, Gothenburg and participated in the industrial reference group in one of RISE and KTH (Royal Institute of Technology, Stockholm) projects (2018-2021) funded from Energy Efficient Vehicles program by the Swedish Energy Authority.

Company #6 (name confidential)

Consultation by

University of Latvia, Institute of Chemical Physics

- https://www.lu.lv/en/

Duration: September 2018

SiC and GaN semiconductors in custom power supplies for lighting equipment

Consultations concerning new technologies, materials and components in the field of power electronics. Presentation about possibilities and improvements that can be achieved in product improvement was provided.

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Company #7 (name confidential)

Consultation by

University of Latvia, Institute of Chemical Physics

- https://www.lu.lv/en/

Duration: March - August 2018

SiC and GaN semiconductors in lighting equipment

The specifics of the company's needs were analysed and based on them one visit to the company as well as a consultation was provided in order to suggest the possible improvements in power electronic devices.

Company #8 (name confidential)

Consultation by

University of Southern Denmark in Sønderborg

- www.sdu.dk/en/om_sdu/institutter_centre/mci_mads_clausen
- rubahn@mci.sdu.dk

Duration: 2018 - February 2019

Recycling the energy of old batteries

The case focused on both the commercial and technical aspects related to recycling battery energy via smart electronic solutions. The goal was to understand basic technical processes, develop and test the demonstrator and make a scalability analysis along with market and business analysis of the device.

Company #9 (name confidential)

Consultation by

University of Southern Denmark in Sønderborg

- www.sdu.dk/en/om_sdu/institutter_centre/mci_mads_clausen
- rubahn@mci.sdu.dk

Duration: February 2019

GaN semiconductors in PE

The case focused on how GaN might be used in PE equipment for electrical linear actuators for specific applications. The consultation resulted besides evaluation of the GaN case in further business development opportunities. The company might start using GaN in their product portfolio in the coming future.

Company #10 (name confidential)

Consultation by

University of Southern Denmark in Sønderborg

- www.sdu.dk/en/om_sdu/institutter_centre/mci_mads_clausen
- rubahn@mci.sdu.dk

Duration: November 2018

Remote Electrical Fences

The case focused on how to improve efficiency of remotely solar powered electrical fences using modern electronics. Most fences operate with a relatively high voltage which is send into the fence as voltage pulses meaning constant transformation of voltage from the batteries to the fence and back into the batteries. This results in heavy power losses. Implementing APE on the basis of GaN can reduce significantly losses.

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Company #11 (name confidential)

Consultation by

University of Tartu

- https://www.fi.ut.ee/en
- Toomas.Plank@ut.ee

Duration: February 2019

A cost-benefit calculation of a solar energy station in Harjumaa

Calculations showed that a solar energy station in Harjumaa will pay back in approx. 10 years. After the lifetime of today bought inverters expires, we suggest to buy an already new generation of WBG-inverters for replacement. The company is considering the options to build the station, but a decision is not made yet. The company can use the consultation example also for their future work in the field of building engineering consultations.

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Company #12 (name confidential)

Consultation by

University of Tartu

- https://www.fi.ut.ee/en
- Toomas.Plank@ut.ee

Duration: February 2019

A cost-benefit calculation of a solar energy station in Tartumaa

Calculations showed that a solar energy station in Tartumaa will pay back in approx. 8-9 years. We explained also the benefits and possible weaknesses of WBG-based new generation inverters. The company is considering the options to build the station, but has not decided yet. The company is interested, beforehand, to have a renewable energy support for solar panel investments. We discussed the conditions of this support.

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Company #13 (name confidential)

Consultation by

Warsaw University of Technology, Institute of Control and Industrial Electronics

- www.isep.pw.edu.pl
- sebastian.stynski@ee.pw.edu.pl

Duration: December 2018 - February 2019

Development of a Voltage Oriented Control (VOC) algorithm for an AC-DC active converter based on high-frequency SiC transistors with minimised passive components

The main goal is the development of a grid impedance estimator and a current controllers gain selection. A phase-locked loop was developed to ensure the correct phase synchronisation at disturbed and distorted voltage of the grid – both input filter and grid inductance form a voltage divider. In result, the voltage generated by the converter strongly deforms the voltage in point of common coupling.

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Company #14 (name confidential)

Consultation by

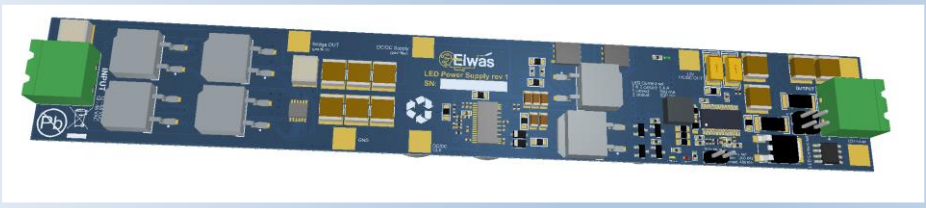
Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, Poland

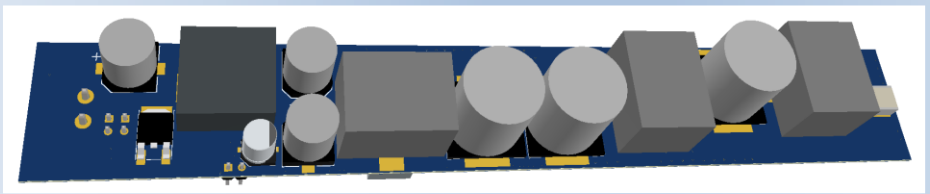
- www.imio.pw.edu.pl
- msochack@elka.pw.edu.pl

Duration: August - September 2018

Power supplies for LED lighting applications

The team of the Warsaw University of Technology designed and manufactured a prototype power system for 12-48 VDC input voltage dedicated to portable LED lighting systems by implementation of SiC power devices.





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Company #15 (name confidential)

Consultation by

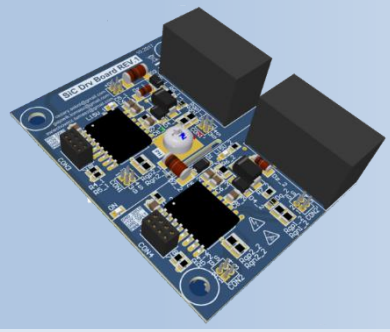
Warsaw University of Technology, Institute of Control and Industrial Electronics, Poland

- www.isep.pw.edu.pl
- mariusz.malinowski@ee.pw.edu.pl

Duration: November 2018 - February 2019

Development of a gate driver with safety protections dedicated for SiC MOSFET transistors

The main goal is the development of a gate driver for SiC MOSFET transistors which fulfils safety requirements.
Recommendations for the selection of electronic components and the design of safety protections were formulated. Next, electrical schemes of the gate driver were developed. Further, a PCB board layout and 3D visualisation of the driver was prepared.



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