Company Presentation

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ESTEC/ESA, Noordwijk, The Netherlands

SPACE IC GmbH
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Managing Directors:
Volodymyr Burkhay • Uwe Gieselmann • Marko Reuter • André Rocke
Register: Hannover • Amtsgericht Hannover • HRB 210911
Company

- Foundation of SPACE IC in 2014 by experts from the TELEFUNKEN IC product development
- SPACE IC exclusively takes over development and manufacturing of rad-hard IC products from TELEFUNKEN

Founder Team & Management Board:

- V. Burkhay
- U. Gieselmann
- M. Reuter
- A. Rocke

Headquarter:
SICAN Technology Park in the Northwest of Hannover, Germany
Overview

SPACE IC

Technical and Application Focus
• Space-Grade Analog and Mixed-Signal Integrated Circuits for Power Management and Robust Data Interfaces

IC Product Development
Chip Development:
• IC Spec
• IC Design
• Package Design
• Prototyping

Testing:
• Screening
• Evaluation
• Qualification

Manufacturing:
• Chip Foundry
• Wafer Test
• Dicing
• Assembly
• Screening
• Qualification Testing

Service:
• Mixed-Signal ASIC Service
• Manufacturing Service
Technical Focus

SPACE IC develops and manufactures ICs for space:
high-reliability · radiation-hard · analog and mixed-signal · ITAR/EAR-free

Power Management

DC power conversion, conditioning and protection:
• DC/DC Regulators
• LU Protection
• HV Gate Driver

Interfaces

Robust data interfaces:
• Extended Common-Mode LVDS (for SpaceWire)
• CAN Bus Line I/O
• CAN System IC
Power Management Evolution

Power Distribution Evolution:

- Modular approach with standard intermediate power busses & standard power interfaces
- Highly efficient & accurate power conversion at point-of-load
- Weight & volume of few power rails; lower current
Power Management Products

Modular Secondary Power Distribution

- PWM
- Flyback DC/DC
- POL
- Hi-POL
- V-Clamp

POWER CONDITIONING UNIT

12V DC/DC

±5V
3.3V
1.1V
Versatile monolithic POL converter:

- 8A, 3.3V - 40V
- Adjustable current limit & frequency
- Load sharing capability, frequency sync
- >90% efficiency

**Buck mode:**

**Boost mode:**

**Buck-Boost mode:**
TRP Activity
Voltage Clamp IC

- 10A shunt regulator, up to 10V adjustable clamp voltage
- >18W power dissipation capability (10ms)
- Protection of payload electronics against EOS
- Suitable for power conversion and distribution systems
- Can be used as voltage regulator

Voltage clamp:  
POL protection:  
Voltage regulator:
European Integrated Power Switch ASIC for small DC/DC converters

- Isolated and non-isolated flyback converter topologies
- Up to 15W output power from 18V - 105V input power bus
- DC/DC converter design effort limited to magnetic components, diodes and passives
- SPACE IC SPPWM120RH inside - cooperation project with ARC POWER, Switzerland
400Mbps quad LVDS line translators

- Extended common-mode capability: -7V to +12V
- Best in market signal performance
- Suitable for **SpaceWire** networks
- Passed biased TID testing >50krad

LVDS signal:
- 400Mbps
- PRBS23
Product Roadmap

- **POL** switching regulator (power distribution) SPPL12420RH
- **LVDS** ext. CM transceiver family (datacom) SPLVDS031/032/104RH
- **Hi-POL** next generation POL product SPPL14065RH
- **VC** voltage clamp (power distribution) SPVC1010RH
- **PWM** switching regulator (power distribution) SPPWM120RH
- **CAN** bus transceiver family (datacom) SPCANxxxxRH
Everybody is talking about NewSpace:

- **High cost pressure!**
- **High volume?**

**TRADE-OFF**

- Component reliability?
- Product assurance?

Cost saving options:

**COTS**

- Reasonable for circuits, that are either not critical or protected by rad-hard monitoring & power supply
- NOT reasonable for critical circuits, e.g. power management or LU protection of COTS components
- Definition of risk classes for component types!

**HIREL**

- High volume
- Low-cost package? → Lead finishing?
- Low-level evaluation, no certification? “European NewSpace Parts List”?
- Low-level lot acceptance?
- Low-level screening?
Thank you for your attention!

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