February 4-6, 2010

Hotel Crowne Plaza, Zürich

New SCALE-2 High-voltage Drivers Featuring Direct Paralleling

Heinz Rüedi

CT-Concept Technologie AG

Applications

- Traction main propulsion drives
- Wind power converter
- Statcom
- Pulse power applications
- HV DC
- Power supplies and UPS
- Power quality
- Industrial Drives

New Product Platforms Release 2010

1SP0635 – Plug-and-Play Driver for 1.2kV, 1.7kV and 3.3kV IGBT modules

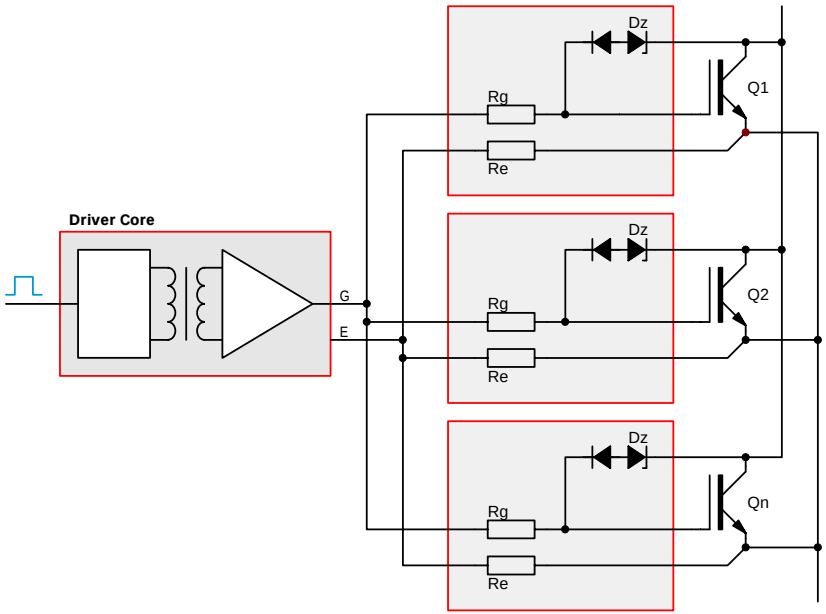
- Driver for single switch IGBT modules in 130x140mm and 190x140mm
- Housing with 32mm creep path

1SP0335 – Plug-and-Play Driver for 3.3kV, 4.5kV and 6.5kV IGBT modules

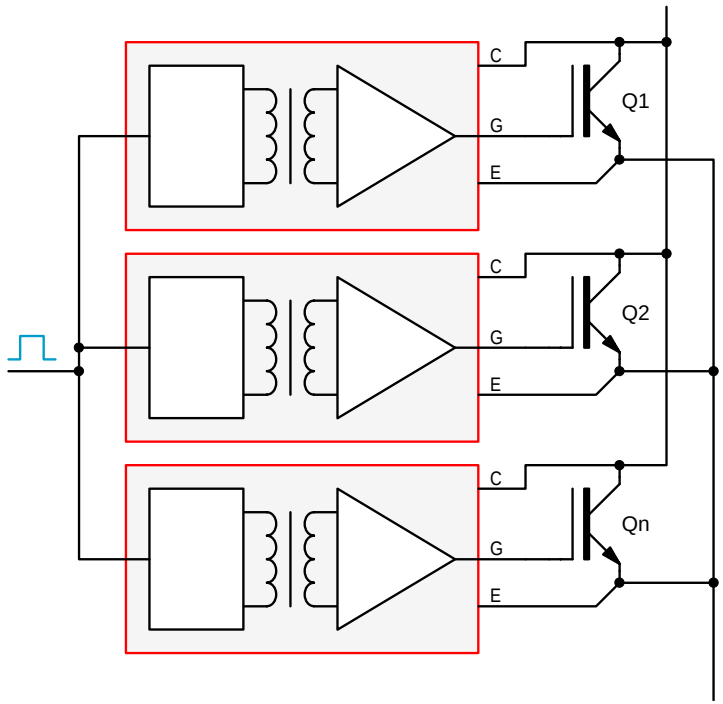
- Driver for single switch IGBT modules in 130x140mm and 190x140mm
- Housing with 65mm creep path

➔ **Both products support direct paralleling!**

Remember...?



- Principle of a central driver extended by active clamping



- Principle of direct paralleling (driving parallel-connected IGBTs with individual drivers)

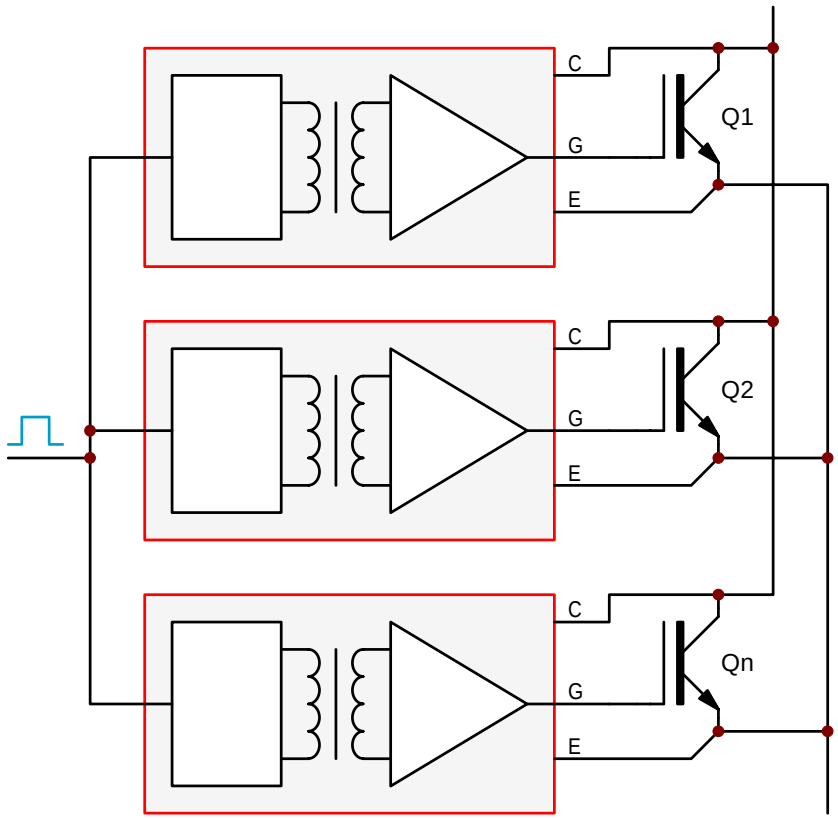
How to Make Direct Paralleling for 3.3kV to 6.5kV?

- We have a perfect working principle of direct paralleling

  ... but ...

- We don't have signal transformers for 3.3kV to 6.5kV
- Multilevel-topologies need even higher isolation voltages
- Mostly, users prefer fiber-optic interfaces for high-voltage

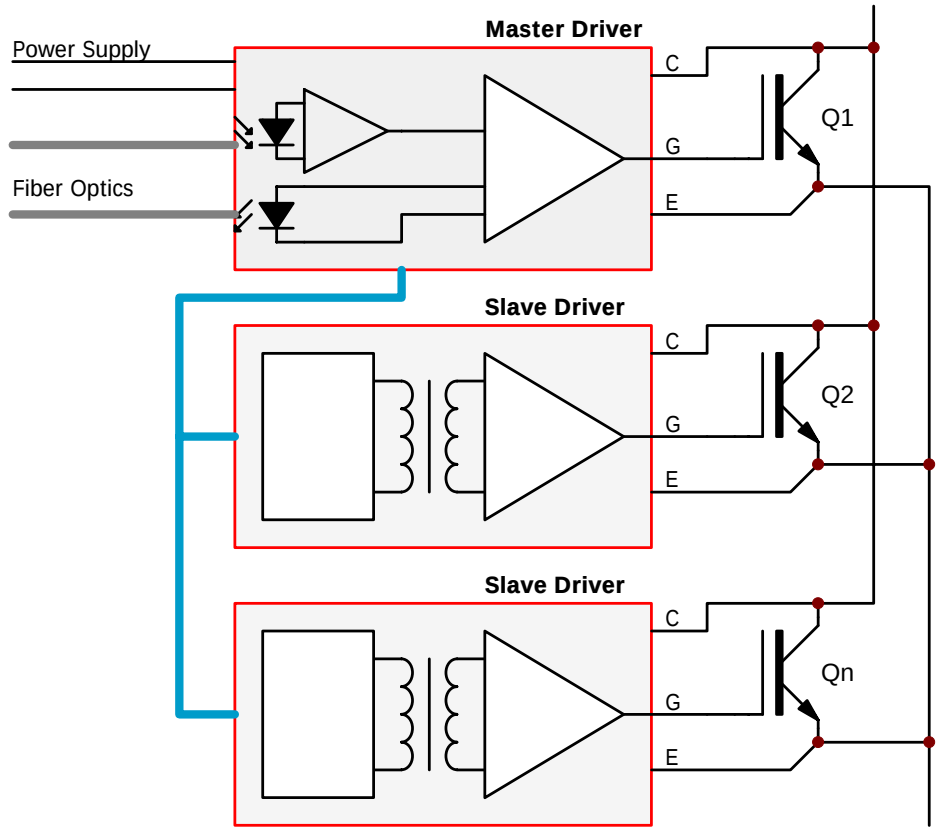
  ... what to do now?...



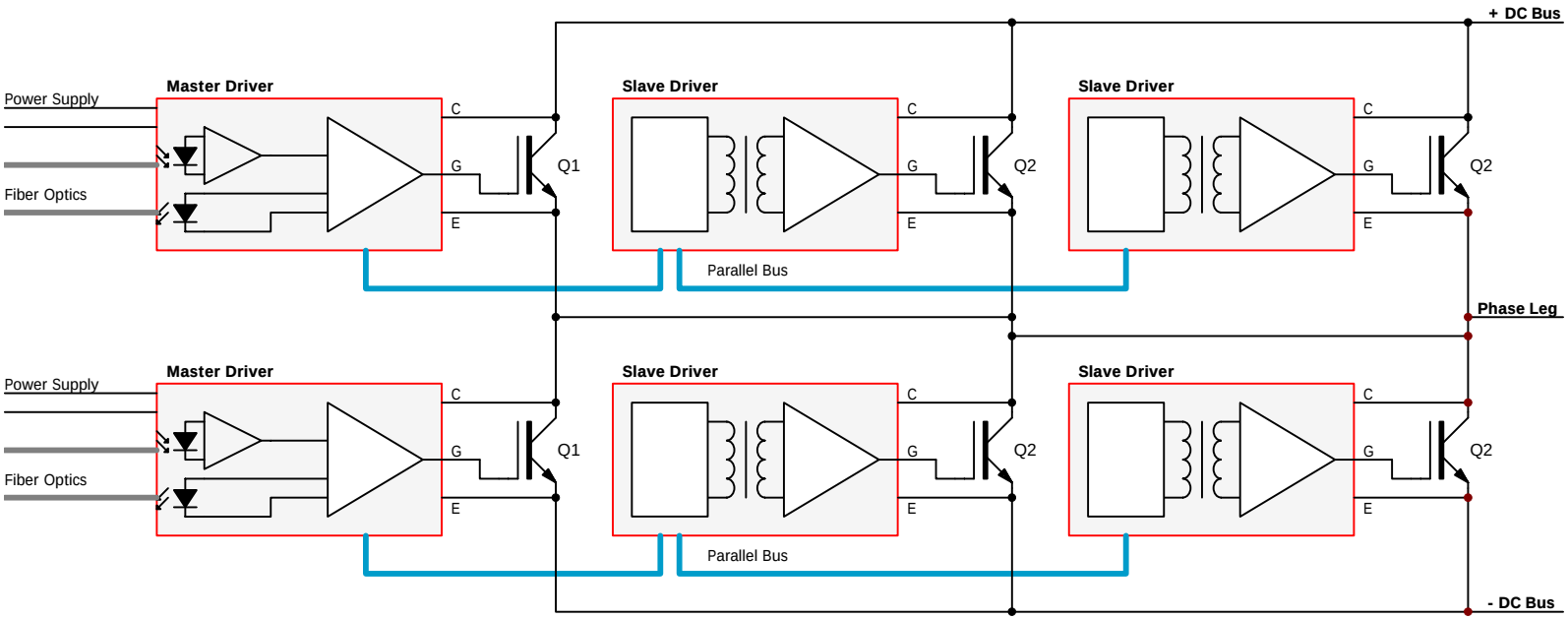
How to Make Direct Paralleling for 3.3kV to 6.5kV?

Let‘s do it together…

- We start with the well known direct paralleling...
- We delete the not usable transformer...
- We add a fiber-optic interface...
- And a high-voltage DC/DC converter
- And we get our master driver
- Finally we connect the slave drivers to the master

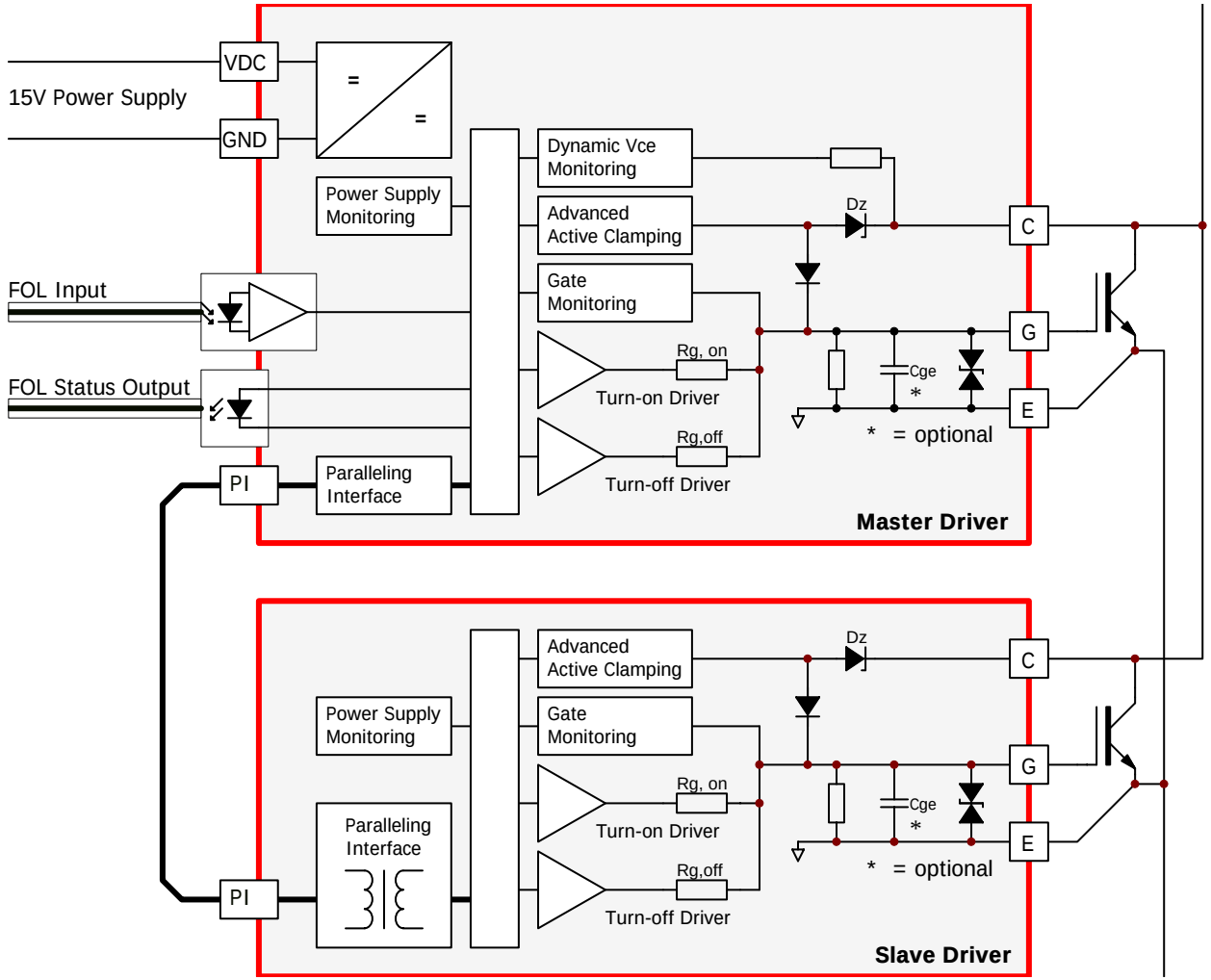


Illustrative Example of a Phase Leg with 3 Modules in Parallel



- Only one fiber optic interface and one power supply per paralleled module group
- Parallel bus cable contains power supply, drive information and monitoring of slaves

Diagram Master and Slave Driver for 1.2kV, 1.7kV and 3.3kV IGBTs



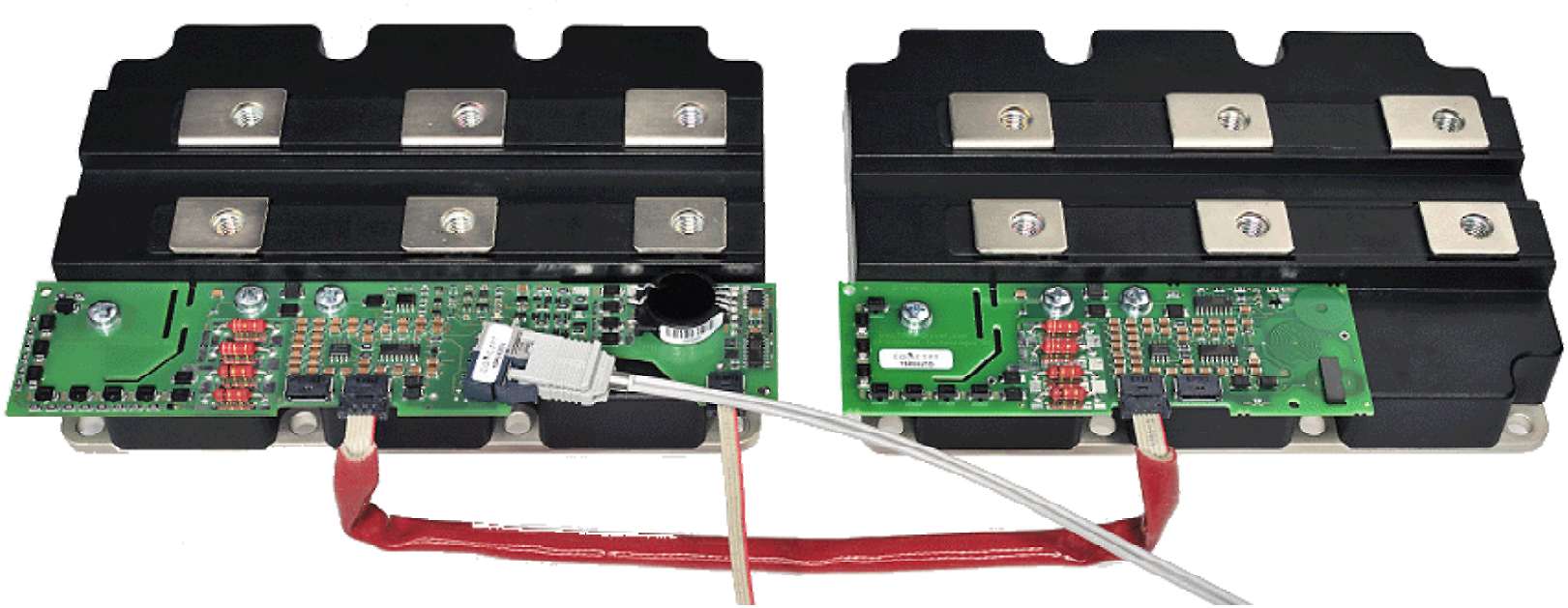
Adaptation for

- ABB
- Dynex
- Fuji
- Hitachi
- Infineon
- Mitsubishi

Key Features: Driver Solution for 1.2kV, 1.7kV and 3.3kV

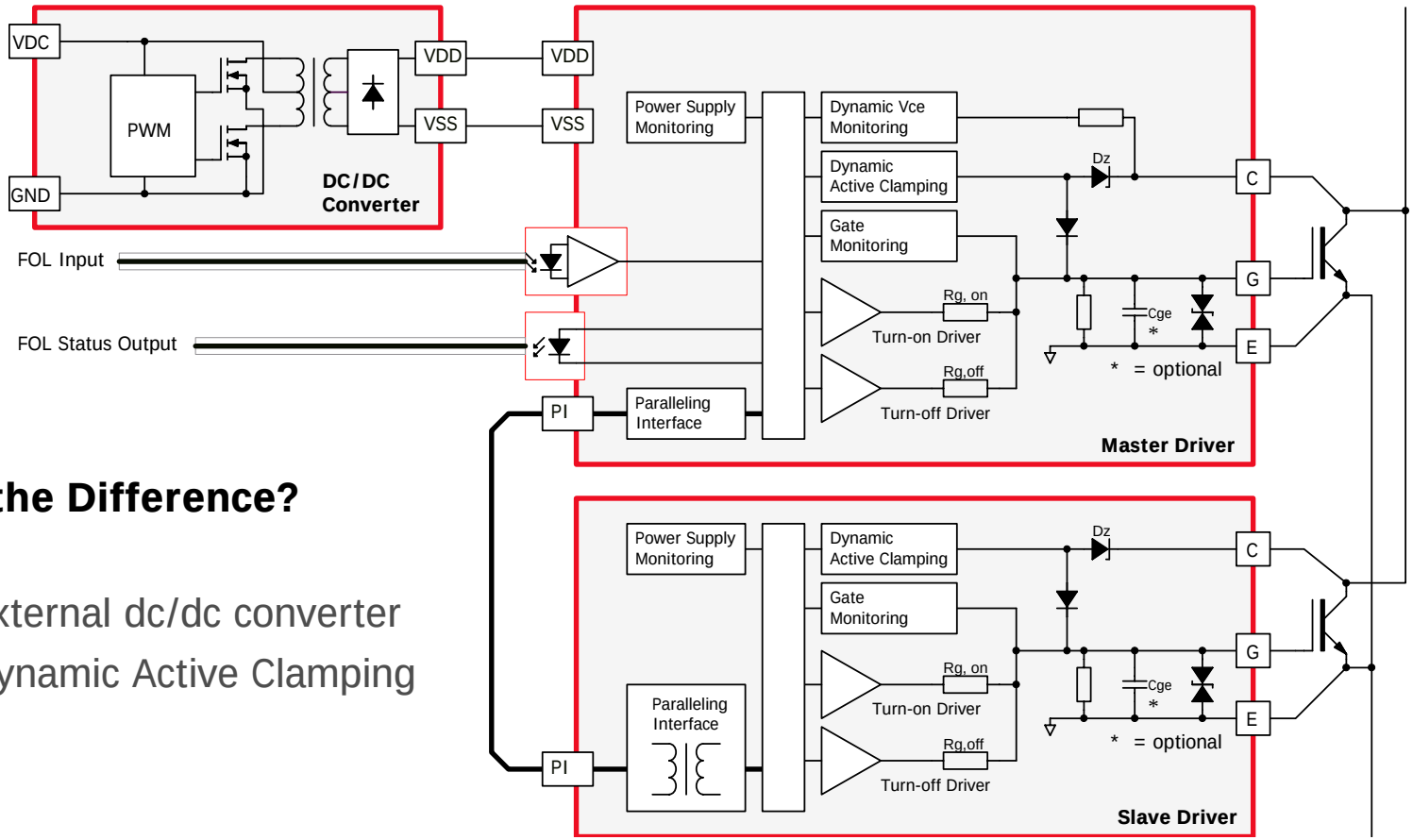
- On-board 10W power supply with 15V input voltage on master driver
- +15V/-10V gate voltage
- 35A gate current (every driver)
- Direct paralleling of 2 to 4 modules
- Gate monitoring on every driver (master and slaves)
- Dynamic Vce monitoring (short-circuit detection) on master driver
- Advanced active clamping on every driver
- Power supply monitoring on every driver
- Reliable design
- Superior EMC

Direct Paralleling Solution for 1.2kV, 1.7kV and 3.3kV



- Master driver (left) and slave driver (right) screwed onto IGBT modules
- Direct paralleling of 2 to 4 modules
- Combined parallel-, 3-level / multi-level-topologies

Master and Slave Driver for 3.3kV, 4.5kV and 6.5kV IGBTs



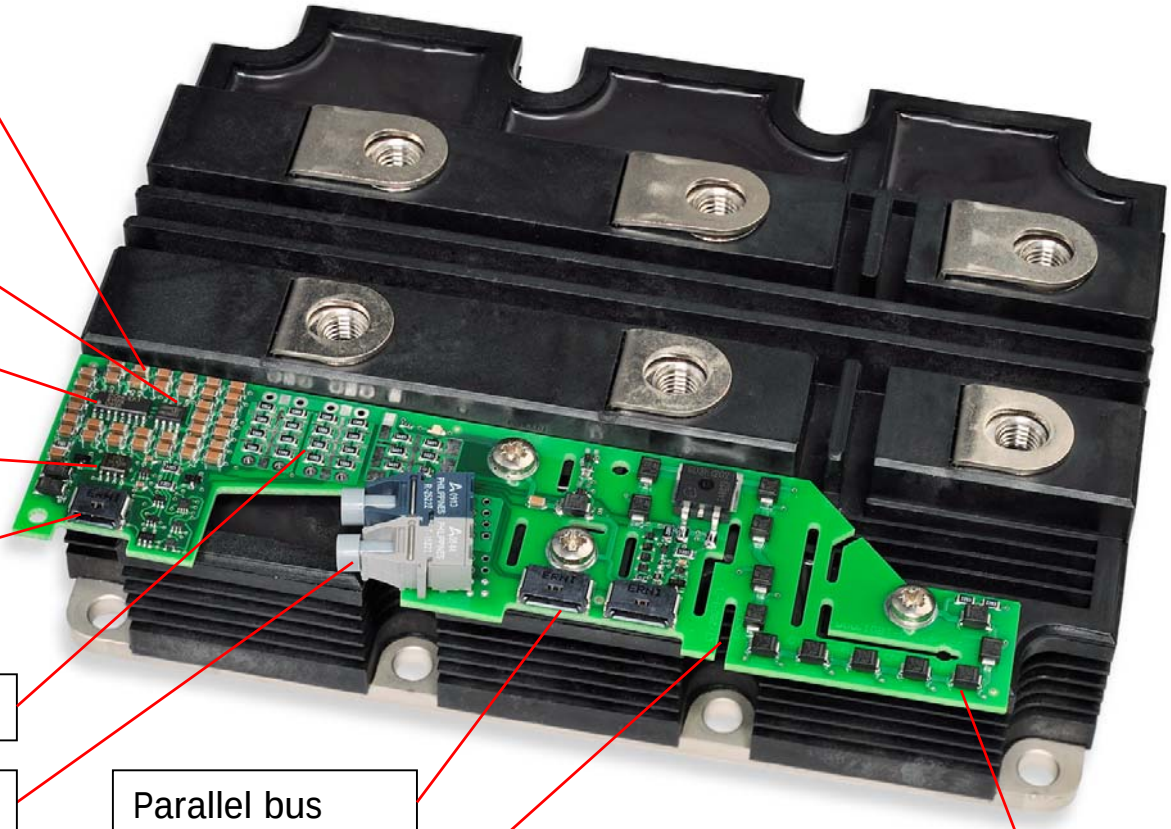
What's the Difference?

- External dc/dc converter
- Dynamic Active Clamping

Key Features: Driver Solution for 3.3kV, 4.5kV and 6.5kV IGBTs

- External 5W power supply with 15V input voltage on master driver
- +15V/-10V gate voltage
- 35A gate current (every driver)
- Direct paralleling of 2 to 4 modules
- Gate monitoring on every driver (master and slaves)
- Dynamic Vce monitoring (short circuit detection) on master driver
- Dynamic active clamping on every driver
- Power supply monitoring on every driver
- Reliable design
- Superior EMC

Plug-and-Play Driver for 3.3kV to 6.5kV IGBT modules (Master)

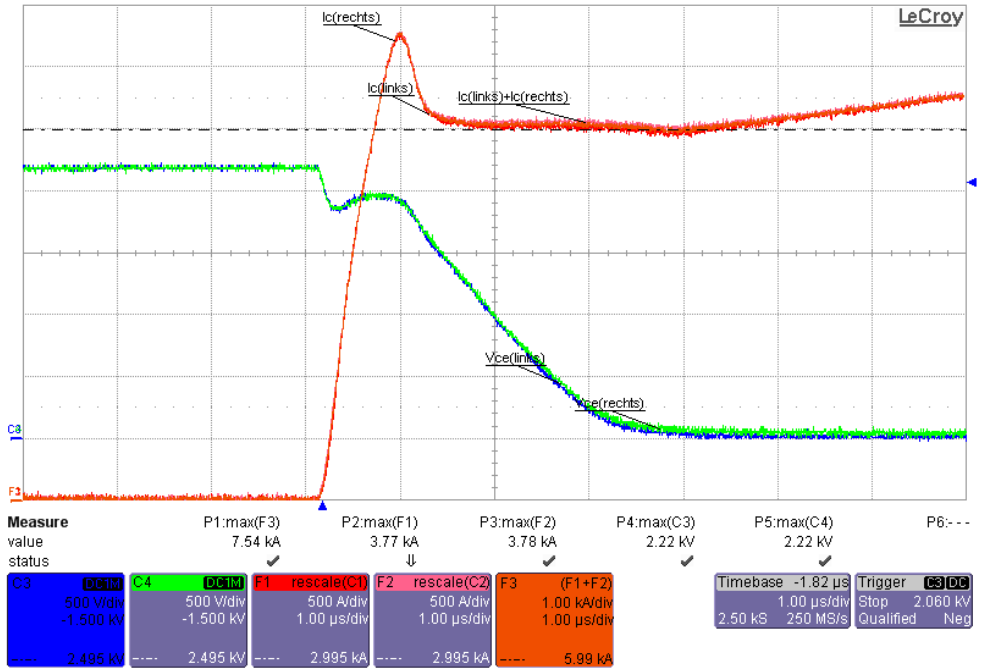


Advantages of the Direct Paralleling Approach

- Both single and parallel-connected modules can be driven
- Simplest scaling of inverter output and drive current
- Uncompromising, safe and reliable concept
- Optimal switching behavior, lowest switching losses
- Detailed diagnosis: every gate is monitored
- No coupling of the gates, thus no mutual oscillations of the IGBTs possible
- No effects of the capacitive equalizing currents via the module baseplate
- No effects of inductive coupling on the gate cabling
- No complex synchronization needed
- Equipment series can be simply extended to parallel connection
- No development effort, no adaptation work
- Simple to set up, no tangle of cables
- Minimal derating and maximum utilization of the IGBT modules
- Use of optimized large-series system components

Measurement with 1SP0635V (Master) and 1SP0635D (Slave)

- 2 modules in parallel
- 2.2kV dc-bus voltage
- 2 x 3kA collector current
- Master 1SP0635V and slave driver 1SP0635D
- Statically and dynamically very symmetrical current distribution
- Modules and construction define the rate of symmetry
- Maximum usage of parallel connected IGBTs



I_C, V_{CE} turn-on characteristics

Availability of the New Drivers

1SP0635 – Plug-and-Play Driver for 1.2kV, 1.7kV and 3.3kV IGBT modules

- Sample orders: Now (Specify requested IGBT type number)
- Target datasheet: Now
- Engineering sample delivery: Now
- Application Manual: Now
- Production start: Q2/2010

1SP0335 – Plug-and-Play Driver for 3.3kV, 4.5kV and 6.5kV IGBT modules

- Prototype testing: Now
- Sample orders: Now (Specify requested IGBT type number)
- Target datasheet: Q2/2010
- Engineering samples: Q2/2010
- Application Manual: Q3/2010
- Production start: Q3/2010

Many Thanks!


IGBT-Driver - Power Electronics: Home
Datei Bearbeiten Ansicht Verlauf Lesezeichen Fenster ?
http://www.igbt-driver.com/
Google
Home Products Support Sales Company
CONCEPT
INTELLIGENT POWER ELECTRONICS
CLEVER
Brand-new SCALE-2 based Plug-and-play Driver for EconoDUAL IGBT Modules
February 2010 2SP0115T is the the ultimate new driver platform for EconoDUAL™ IGBT modules. As a member of the CONCEPT Plug-and-play driver family, it satisfies the requirements for optimized electrical performance and noise immunity. Shortest design cycles are achieved without compromising overall system efficiency in any way. Specifically adapted drivers are available for all module types. A direct paralleling option allows integrated inverter design covering higher power ratings. Finally, the highly integrated SCALE-2 chipset reduces the component count by 80% compared to conventional solutions, thus significantly increasing reliability and reducing cost.
2SP0115T product page - the new driver platform for EconoDUAL
Top News
Advantages of Advanced Active Clamping
Advanced Active Clamping is one of the most important features of a modern driver for high-power IGBTs.
Read our latest cover story from Power Electronic Europe Magazine...
more...
New Products / Datasheets
New Products and Documentations:
more...
Popular pages
2SP0115T - Driver for EconoDUAL
SCALE-2 - the Next Generation
SCALE-2 Plug-and-play Drivers
SCALE-2 Driver Cores
2SC0435T - Low-cost High-power Core
Product Overview
EconoDUAL is a trademark of Infineon Technologies AG, Munich
© 1998-2010 CT-Concept Technologie AG. All Rights Reserved | Terms of Use | Contact Us | |Deutsch|