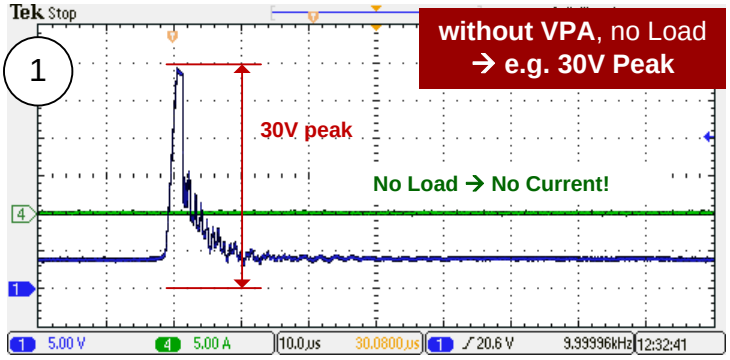
Voltage Peak Absorber

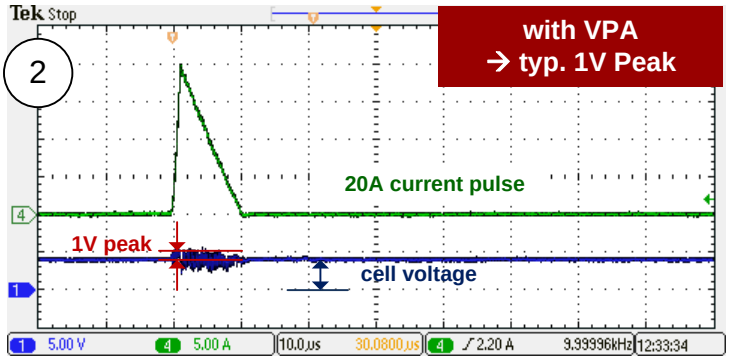
for highdynamic active balancing of BMS with Battery Cell Simulators

for BMS with inductive balancing source

Features

- Voltage controlled current sink
- Pulse frequency 1kHz < f < 100kHz
- Range of rated voltage 2...7V
- Nominal current of load: max. 18A (peak <25A)
- Absorbing pulse duration: 1...40µs
- Absorbing pulse voltage: max. 50V
- Systems are cascadable and parallelisable
- Customized for Battery Cell Simulator
- Activation/deactivation over CAN bus
- Galvanic isolated single channels / VPA probes
- Status monitoring over LED & CAN
- Power supply VPA master 115V/230V





Efficiency, reliability and safety of modern lithium ion batteries for electric vehicle drives strongly depend on the battery management system (BMS) as their electronic control unit**.** A BMS has the purpose to monitor cell voltages of a battery and prevents the cells to drift apart; in this context called „balancing“. Previous balancing-procedures provide a cell voltage compensation by discharging loaded cells to the voltage level of empty cells. Recent developments increasingly use the advantages of active balancing, which enables to transfer energy from loaded to empty cells by inductivity. **Modern BMS chips enable highly-efficient reloading of energy from cell to cell with current-pulses of up to 15A or 20A.**

An active cell balancing BMS with inductive current-pulses requires a very small internal resistance of the battery cells as it is at real batteries. If this BMS, which generates current-pulses by inductivity, could get damaged when it is connected to a simulator/emulator instead of real batteries. The reason is that there is missing a high-dynamic load and therefore higher voltage pulses occur then the typical BMS can deal with (picture 1). The **Voltage Peak Absorber (VPA) developed by comemso** is therefore the solution, which acts as high-dynamic voltage controlled current-sink (picture 2).

The comemso Voltage Peak Absorber (VPA) is fully compatible to the comemso Battery Cell Simulator (BCS). The supplied cell-voltage e.g. from the BCS is detected as rated voltage by the VPA. In this case there is **no need for an additional rated voltage command to the VPA**. Voltage pulses above the supplied cell voltage gets absorbed by the VPA. For higher current values it is possible to connect the VPA probes in parallel. With their galvanic isolation, VPA probes can be applied in the different voltage potentials of a BMS. For a high-dynamically operation of a Battery Cell Simulator it is possible to activate or deactivate the VPA probes particularly over CAN bus. This feature can be prompted over CAN to an user interface and additionally it is shown by a LED. For international use the VPA master **can be supplied with 230V AC as well as 110V AC**.

The VPA enables almost complete validation possibilities in combination with a Battery Cell Simulator and a simultaneously damage-protection for BMS / BMS chips – with active balancing and high current pulses.

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with Battery Cell Simulators

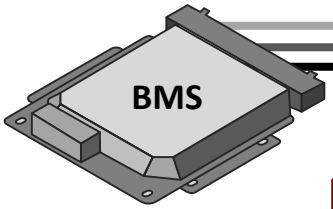
for BMS with inductive balancing source

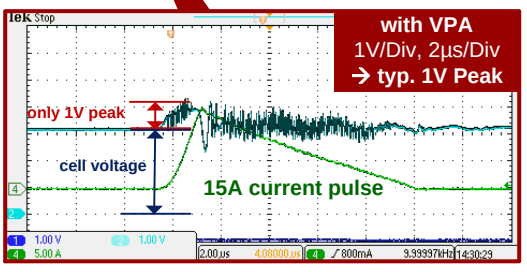
VPA master

high-dynamic
voltage controlled
current sink

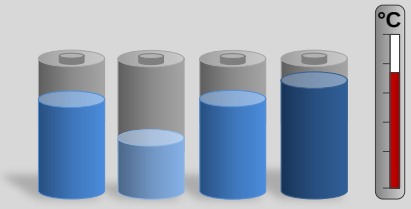
VPA probe

device under test





Battery Cell Simulator



virtual battery cells

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