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August 01, 2018

## Integrated E-Bike Charger for Battery Vehicles

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### Recommended Citation

Schwaiger, Verena, "Integrated E-Bike Charger for Battery Vehicles", Technical Disclosure Commons, (August 01, 2018)  
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# INTEGRATED E-BIKE CHARGER FOR BATTERY VEHICLES (BEV)

## **Technical Task:**

At the moment, there are no in-vehicle chargers specifically for e-bikes on the market. The offered chargers are externally operated devices, which can be connected via a cigarette lighter or USB port in the vehicle. The chargers supplied by the manufacturers (Bosch, Conti, Yamaha) can only be operated on a 230V household socket. Charging the battery in the vehicle is thereby not anticipated.

## **Initial Situation:**

Due to the connections in the vehicle (USB / cigarette lighter), the charging power is very low, resulting in a long charging time. In addition, the efficiency of the entire charging chain by the interposition of a charger is low. Furthermore, there are more losses.

## **Solution:**

The invention disclosure includes an in-vehicle charger for electric vehicles. This is arranged in the interior and thus used independently of a bicycle rack.

The charger includes a DCDC converter, which directly generates a galvanically isolated voltage of for instance 36V from the high-voltage electrical system of electric vehicles. The interface can be tapped for example in the vehicle trunk or by an externally accessible location. The customer can only recharge their e-bike battery directly with a cable or, if necessary, connect the bike with the battery installed next to the vehicle.

The performance of the integrated charging system should be possible for at least 3 to 4 parallel battery charges. In addition, the charger is bidirectional designed so that a power supply of the e-bike battery is possible in the vehicle..

## **Advantages:**

- No external power supply needed for the customer.
- Improved efficiency for total load chain.
- Ensuring the fastest, mobile charging of the e-bike battery.
- Possibility of a maximum charging power of up to 500W DC.
- Possibility of parallel charging of multiple batteries (e.g., family).

Technical innovation

Sample Topology for Bidirectional eBike Charger

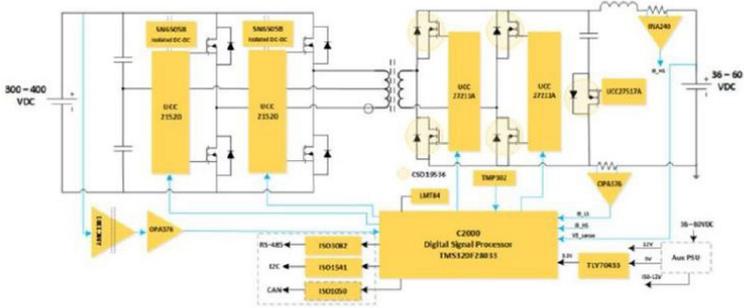


Figure 3: Block diagram of the isolated bi-directional DC-DC converter

Efficiency Curve Bidirectional Charger.

