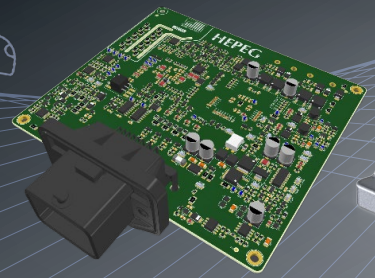
HEPEG ENGINEERING CONSULTING SERVICES

Highly Efficient Power Electronics Generation

# DC Fast Charging Junction Box

# EVCC + CCS (ISO 15118)





## State-of-the-Art Design for the EV Market

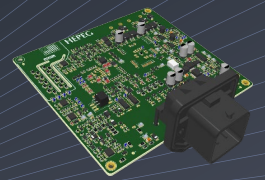
**Designed in California, USA**



Rev. 5

# HIGHLIGHTS

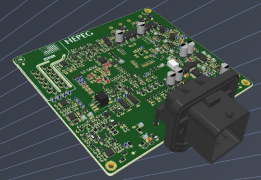
HEPEG offers vertical integration for custom-made hardware and CCS Software solution for Bi-directional (V2G) DC Fast Charging (EVCC) Junction Box  to charge any electric vehicle high-voltage battery system.



# Why HEPEG?

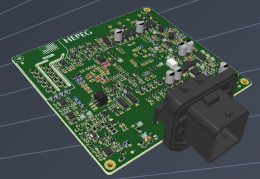
Using solution by HEPEG will help to cut down building costs and avoid dependency from other suppliers.

- **EXPERIENCE**
  HEPEG has successfully delivered DC FCJB (EVCC) for production
- **BENEFITS**
  HEPEG can provide all design manufacturing files to EV OEM
- **FAMILIARITY**
  HEPEG knows EV US/EU charging standards, systems and equipment
- **HISTORY**
  HEPEG has collaborated successfully with EV OEMs in the past
- **RESPONSIVENESS**
  HEPEG can adapt quickly and respond to EV costumers needs



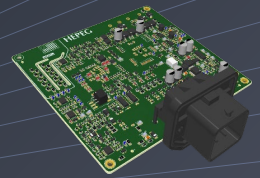
# DC FCJB(EVCC) key Hardware Features

- Configurable EVCC (Electric Vehicle Charge Controller) PCB
- Supported charging standards are SAE J1772 L1 / L2 and CCS1 / CCS2 over the PLC
- Dual contactor drive
- High Voltage Contactor weld detection
- Single ended high voltage measurements
- AC input voltage detection for NACS safe operation
- Eight temperature reading points: 3 for inlet, 4 for busbars and 1 for PCB
- Up to 1000V powertrain system
- Up to 600A charging current
- Wide auxiliary voltage operating range from 9V-36V
- Reverse battery and transient voltage protection
- HVIL detection
- Two independent 1 Mbps CAN communication interface
- Wakeup over CAN or J1772 pilot
- Multi color LED drive
- Inlet Lock actuator drive with feedback
- Two extra programmable I/O interfaces
- IP67 waterproof aluminum enclosure
- Passive cooling with ambient operation range -40C to +55C
- Minimum 10 Meg insulation resistance with chasse ground



# DC FCJB(EVCC) key Software Features

- Configurable EVCC (Electric Vehicle Charge Controller) PCB
- CCS software framework that allows integrators to simply develop custom EVCC hardware that interacts with DIN 70121 and ISO 15118 compliant EVSEs.
- Standards Compliance
  - ISO 15118
  - DIN 70121
  - SAE J1772
  - IEC 61851
  - IEC 62196
- PLC Driver Management
  - Complete driver for QCA7005 PLC PHY
  - Boot-from-host capability
  - SLAC management
  - PLC monitoring and diagnostics
  - PSD calibration and tuning
- Pilot Line Decoding
  - Interprets J1772 Pilot and Proximity inputs
  - Provides non-CCS J1772 AC charging
- TCP/IP and Security
  - Abstract TCP/IP and crypto interfaces
  - Recommended TCP/IP stack: lwIP
  - Recommended security stack: mbedTLS
  - Able to integrate with any TCP/IP stack with IPv6 capability
  - Recommended stacks selected for commercially compliant licensing, reliability, and community trust
- Message Serialization
  - Custom tooling generates embedded C EXI codecs for any V2G schema
  - – DIN 70121: urn:din:70121:2012
  - – ISO 15118-2: urn:iso:15118:2:2013
  - – ISO 15118-20: urn:iso:15118:2:2016 (Optional)
  - Deterministic on-target EXI serialization and deserialization
  - Development tooling including V2G message dissectors
- Application State Management
  - Clean C async API provides simple abstracted access to the CCS stack
  - CCS software efficiently handles state flow through SLAC and the V2G state machine.
  - - (UDS) Unified Diagnostic Service (Optional)



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# Let's Do Something Unique and Valuable


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## Thank You !