CHILISIN ELECTRONICS CORP.
Total Solution Provider for Power, EMI and RF.

FERROXCUBE

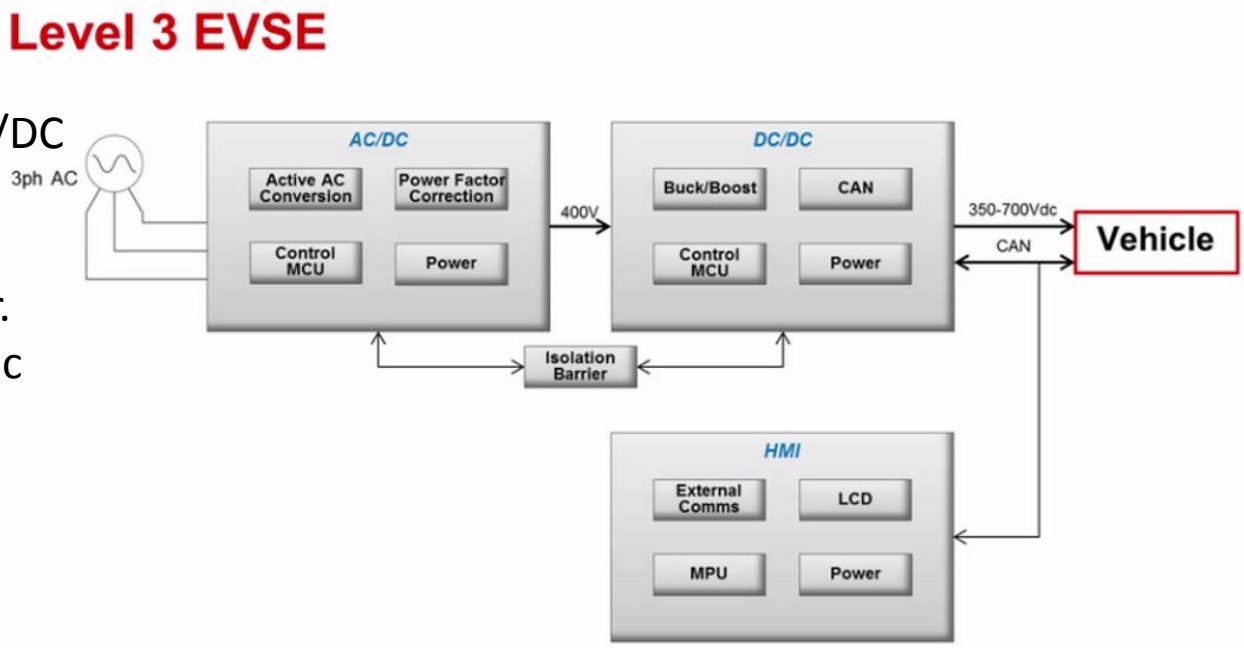
Ferrites for Stationary Chargers

June 2020

DC Stationary charger Schematic

System is split in 2 units:

- PFC: carries out the AC/DC initial conversion and ensures low EMI and maximum power factor. May implement galvanic isolation
- DC/DC: adjusts PFC voltage to the level required by each car. There is galvanic isolation

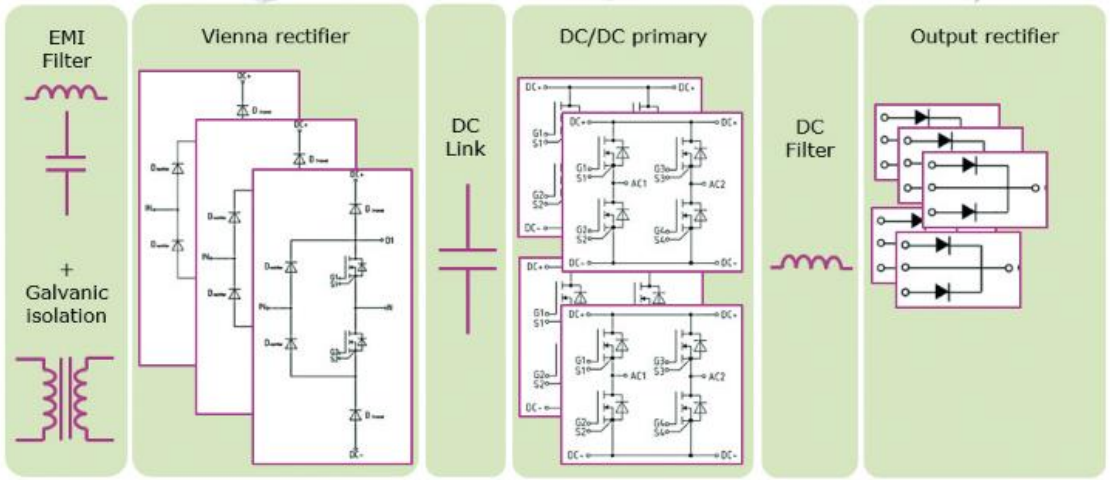


Info from Texas Instruments and Infineon

Topologies

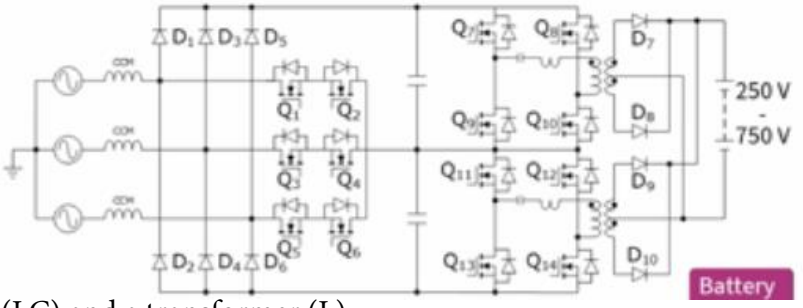
PFC operates at relatively low freq (ca. 40 kHz).
Topologies:

- Vienna rectifier: very commonly used
- Multipulse rectifier



DC/DC converter: can work up to 150-200 kHz.
Resonant topologies to allow switching at Zero Volt / Zero Amp

- LLC Resonant tank with a capacitor and a inductor (LC) and a transformer (L)
- Phase Shift Full Bridge



Ferrite/Inductive Functions

Common mode choke: big toroid ferrite cores in 3Nx or more expensive Nanocrystalline

Inductor for PFC with large gap ferrite core or Powder cores

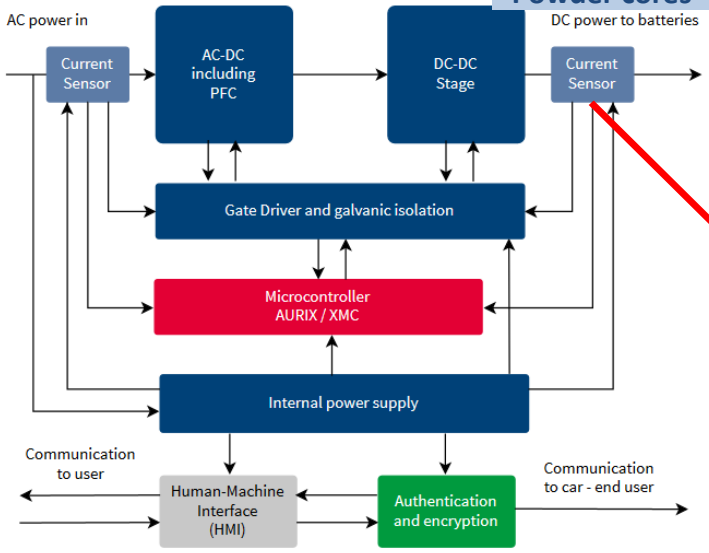
Transformer for gate driver EP7 ferrite cores

Power transformer. Large shapes E71, E100 stacked

Resonant inductor with gap / multigap ferrite cores or Powder cores

Common mode choke: big toroid ferrite cores in 3Nx or more expensive Nanocrystalline

Transformer for gate driver EP7 ferrite cores



Gapped ferrite for Hall effect sensor Common: nanoC

Some funtions are made with other materials (nanocrystalline, powder cores…) than ferrite, but still ferrite would be possible.

Low chance for ferrite: dark back

High chance: light background

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Thank you!