ENGINEERING WHITE PAPER

800V EV Charging Systems

Requirements for On-Board Chargers, DC Fast-Charging Infrastructure, and the Power Magnetics That Enable Them

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High-Performance Magnetic Solutions for EV Power Electronics

About This White Paper

This white paper is written for power-electronics engineers, hardware architects, and sourcing teams who design or specify on-board chargers (OBC), DC fast-charging equipment, and their magnetic components for 800V-class electric vehicles. It consolidates system-level requirements, topology and device trade-offs, flagship-vehicle benchmarks, magnetic design parameters and methodology, and the applicable international standards into a single engineering reference.

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> Scope and accuracy. Vehicle data are synthesized from public sources and vary by model year and market. Magnetic-component parameters are typical reference design targets for an 800V OBC platform, not the measured specification of a single production part; final values are always set by the customer’s topology, bus voltage, switching frequency, thermal design and safety grade. PROMAGTECH provides measured reports (inductance/DCR, loss and temperature-rise curves, hi-pot records) with customized parts.

Contents

1. Executive Summary

The migration from 400V to 800V-class traction systems is the defining architectural change of this EV generation. Doubling the pack voltage halves the current for the same power, which cuts conduction loss, cable mass and charging time — but it forces a redesign of every element in the energy path.

- **Semiconductors:** the OBC's PFC and DC/DC stages migrate from 650V silicon to 1200V SiC MOSFETs, enabling >97% efficiency and switching frequencies of 65–300 kHz across the stages.
- **Magnetics:** higher frequency permits roughly 30% smaller inductors and transformers — but only if core material, winding structure (flat wire / planar) and the insulation system keep pace. Reinforced isolation at the 4 kV-class hi-pot level becomes a hard requirement.
- **Compatibility:** an 800V vehicle must still charge from the 400V installed base, via OBC AC-side boost or a DC-side traction-inverter / dedicated booster — two distinct power paths.
- **Infrastructure:** DC fast-charging modules widen to 200–1000V output; 480–600A ultra-fast currents mandate liquid-cooled guns and cables; stations add dynamic power allocation and continuous insulation monitoring.
- **Compliance:** design sign-off now spans IEC 61851 / 62196, ISO 6469-3 / 17409, IEC 60664-1 insulation coordination, CISPR 25 EMC and AEC-Q200 component qualification.

> **The thesis of this paper:** in the 800V transition, power magnetics are not a passive commodity but the component that converts SiC's theoretical advantage into delivered system efficiency, power density and safety. Teams that specify magnetics early — against frequency, withstand voltage and thermal targets — avoid the most common late-stage redesigns.

2. The Industry Shift to 800V

2.1 Why voltage, not current

Charging power is the product of voltage and current ($P = V \times I$). Raising current increases conduction loss with its square ($P\text{-loss} = I^2R$) and demands heavier copper; raising voltage does not. At 350 kW, a 400V-class system must carry roughly 875 A, while an 800V-class system needs about 437 A — half the current, one quarter of the resistive loss in the same conductor, and a dramatically lighter, cooler cable. This single relationship explains the industry's direction.

2.2 The enabler: silicon carbide

800V systems became commercially practical only when 1200V silicon-carbide MOSFETs reached automotive maturity. SiC combines the voltage headroom needed above an 800V bus with switching losses low enough to run PFC stages at 65–100 kHz and resonant DC/DC stages at 200–300 kHz — the frequencies at which magnetic components shrink meaningfully.

2.3 Adoption status

Porsche's Taycan introduced mass-production 800V in 2019. Since then, Chinese platforms have driven volume adoption — XPeng (G9, X9), Zeekr (001, 007, 7X), Li Auto, NIO and others — alongside Hyundai-Kia's E-GMP, Lotus' EPA and premium European platforms. In parallel, charging networks have deployed 480–600 kW liquid-cooled ultra-fast stations, and megawatt-class charging (MCS) is being standardized for commercial vehicles. The 800V ecosystem is no longer an early-adopter niche; it is the platform baseline for new flagship EVs.

3. System Comparison: 400V vs 800V

Attribute	400V-class system	800V-class system
Typical pack voltage	300–450 V nominal	~600–900 V nominal (ISO 21498 voltage class B)
Current at 150 kW	≈ 375 A	≈ 187 A
Current at 350 kW	≈ 875 A (impractical to sustain)	≈ 437 A (manageable with liquid cooling)
Cable / connector	Heavy air-cooled cable at high power	Slimmer cable; liquid cooling above ~480 A
Main OBC switches	650V Si / SiC MOSFETs	1200V SiC MOSFETs (mandatory headroom)
OBC efficiency (typical)	94–96%	96.5–97.5%+
Magnetics insulation	Basic/reinforced at 2.5–3 kV-class hi-pot	Reinforced at 4 kV-class hi-pot; wider creepage
DC charging compatibility	Native at most stations	Needs 1000V-capable stations, or onboard boost from 400V stations

Currents are illustrative (P/V) at the stated power; real systems vary with pack state of charge and derating.

4. On-Board Charger Requirements for 800V

4.1 Architecture overview

A modern 800V OBC is a two-stage isolated converter: an EMI input filter, a bridgeless PFC front end that shapes grid current and builds a regulated DC link, and an isolated resonant DC/DC stage that spans the isolation barrier to the battery. Bidirectional variants (V2L/V2G) use symmetric topologies in both stages. Integration is deepening: OBC, auxiliary DCDC and power distribution increasingly share one housing, one cold plate and one control domain ("X-in-1" power modules).

4.2 PFC stage topology choices

Criterion	Totem-pole PFC (SiC)	Vienna rectifier	Interleaved boost
Efficiency potential	Highest (no line diode drop)	High	Moderate
Bidirectional (V2G)	Yes — native	No (unidirectional)	No
Device count / cost	Low count, SiC cost	More devices, 650V class OK	Simple, cheap
Typical use	New 800V OBC designs	High-power unidirectional	Legacy 400V designs

The SiC totem-pole PFC has become the default for 800V OBCs: it is the only mainstream front end that is simultaneously high-efficiency and natively bidirectional.

4.3 Isolated DC/DC stage topology choices

Criterion	LLC resonant	CLLC resonant	DAB (dual active bridge)
Bidirectional	Limited (asymmetric)	Yes — symmetric gain both ways	Yes
Soft switching	ZVS primary, ZCS secondary	ZVS both directions	ZVS (load-range dependent)

Criterion	LLC resonant	CLLC resonant	DAB (dual active bridge)
Magnetics demand	Transformer + resonant L	Transformer + resonant L both sides	Transformer + series inductor
Control complexity	Low–moderate	Moderate	Higher (phase-shift control)
Typical use	Unidirectional OBC	Bidirectional OBC (mainstream)	High-power / wide-range designs

4.4 Power device comparison

Attribute	Si (IGBT / SJ MOSFET)	SiC MOSFET (1200V)	GaN HEMT (650V)
Fit for 800V bus	No (650V class) / IGBT slow	Yes — the 800V workhorse	No direct (voltage class); used in 400V / multilevel
Switching frequency	20–60 kHz practical	65–300 kHz	300 kHz–1 MHz+
Switching loss	High	Low	Very low
Relative cost	Low	Moderate, falling	Moderate
Role in 800V OBC	Legacy only	PFC + DC/DC main switches	Niche / future multilevel stages

4.5 Magnetics: the twin test of frequency and withstand

SiC lifts switching frequency, allowing the OBC's **power inductors and isolation transformers** to adopt low-loss high-frequency materials and shrink on the order of 30% at equal power. The insulation bar rises in lockstep: winding-to-core and primary-to-secondary withstand, creepage and clearance all tighten, and reinforced isolation with 4 kV-class hi-pot becomes a hard requirement (Section 7 details parameters and method).

> **Key cause and effect:** SiC does not shrink the magnetics by itself. It raises frequency, which opens room to shrink them — provided core material, winding structure and insulation process keep up. If they do not, high-frequency loss and temperature rise consume the entire benefit.

4.6 Charging an 800V car from 400V infrastructure

- **AC side (the OBC's core job):** the OBC reconfigures its topology into a boost converter, stepping the input up to the 800V-class DC link before feeding the pack.
- **DC side (not the OBC):** at 400V DC stations, vehicles use traction-inverter "motor-reuse boost" (Zeekr) or a dedicated onboard booster (Porsche, ~50 kW standard / up to 150 kW optional). This is a separate power path and should not be conflated with the AC OBC rating.

4.7 Isolation, EMC and functional safety

- Creepage and clearance per IEC 60664-1 insulation coordination, corrected for pollution degree and altitude; PCB layout margins tighten accordingly.
- Digital isolators and gate drivers need high common-mode transient immunity (CMTI ≥ 100 V/ns class) to survive SiC edge rates.
- EMI design must meet CISPR 25 conducted/radiated limits; the common-mode choke and Y-capacitor network are co-designed with the PFC edge rates.

- Insulation monitoring (IMD) and HV interlock are mandatory vehicle-side safety layers per ISO 6469-3.

5. DC Fast-Charging Infrastructure Requirements

5.1 Power modules: 200–1000V output window

The station's core power module must span both legacy 400V packs and new 800V packs: output windows widen from 200–500V to 200–1000V, with mainstream modules rated 1000V/30A or 1000V/40A (30–40 kW per module). Wide-output resonant topologies and SiC devices dominate new module designs; PFC inductors, resonant transformers and output chokes inside these modules face the same frequency-and-withstand escalation described in Section 7.

5.2 Liquid cooling at 480–600 A

At ultra-fast currents of 480–600 A, air-cooled cables become too heavy and hot for one-handed use. 480–600 kW-class stations therefore adopt liquid-cooled guns and cables: coolant circulates inside the cable assembly, carrying heat back to the cabinet and allowing a conductor cross-section far below what air cooling would require.

5.3 Dynamic power allocation (flexible charging matrix)

An 800V flagship and a 400V legacy car will charge side by side for years. Modern stations pool their power modules and reconfigure them per session — series/parallel matrix switching that delivers a precise 800V or 400V at the requested current per the vehicle BMS — so no cabinet capacity idles.

5.4 Safety: continuous insulation monitoring and DC protection

A 1000V DC leak is life-threatening. Stations perform insulation-resistance checks before energizing and continuously during charging (per IEC 61851-23), and the DC contactors and fuses upstream of the gun must be rated for full-voltage arc quenching. Cell-temperature-aware derating and welded-contact detection complete the protection chain.

5.5 Outlook: megawatt charging

For heavy commercial vehicles, the CharIN Megawatt Charging System (MCS) targets up to 1250 V / 3000 A. Every trend described above — higher voltage class, liquid cooling, wide-window modules, insulation monitoring — extends directly into the MCS era, which further raises the bar for magnetic components in the station power chain.

6. Flagship 800V OBC Benchmark: XPeng, Porsche, Lotus, Zeekr

Model / Brand	AC Power	Core Topology	Power Devices	What Stands Out
XPeng (G9/X9)	11 kW	Bidirectional totem-pole PFC + CLLC (V2L)	Full 1200V SiC	Deep OBC+DCDC+PDU integration; volume compression and cost focus
Porsche Taycan	11/22 kW	Three-phase full-bridge PFC + full-bridge LLC	1200V SiC (early units partly HV Si)	Native to European three-phase grids; onboard 400V-DC booster (~50 kW std / up to 150 kW)

Model / Brand	AC Power	Core Topology	Power Devices	What Stands Out
Lotus (Eletre/Emeya)	22 kW	Interleaved 3-phase PFC + bidirectional CLLC (V2L/V2G)	1200V SiC (top-side cooling)	Track-grade bidirectional OBC; top-side cooling cuts thermal resistance
Zeekr (001/007/7X)	11 kW	Totem-pole PFC + bidirectional LLC (motor-reuse boost)	Full 1200V SiC	Cross-domain power/drivetrain fusion; motor-reuse boost for 400V DC stations

Figures synthesized from public sources; production configurations vary by model year and market. Porsche's 50 kW / up-to-150 kW figures refer to onboard boost / DC charging at 400V DC stations (a DC path), not the AC OBC rating.

Reading the benchmark

- **XPeng — affordable 800V through extreme integration.** 11 kW is sufficient for home AC charging; the engineering budget goes into X-in-1 integration and SiC-enabled magnetics shrink, freeing frunk space and cutting cost.
- **Porsche — the 22 kW AC benchmark.** First mass-produced 800V platform (2019), natively matched to European three-phase grids; the onboard DC booster solved early 800V-station scarcity.
- **Lotus — a native-800V bidirectional energy node.** Standard 22 kW bidirectional OBC with top-side-cooled SiC: the die contacts the cooling lid directly, sharply lowering thermal resistance for sustained charge/discharge cycling.
- **Zeekr — cross-domain fusion.** Power electronics and drivetrain share one oil-cooling loop; at legacy 400V DC stations the traction inverter and motor windings form a boost stage to 800V.

> Sourcing signal: all four platforms converge on 1200V SiC plus resonant isolated topologies — which means their magnetics converge on the same demand profile: 65–300 kHz operation, 4 kV-class reinforced isolation, flat-wire or planar windings, and automotive-grade process control (AEC-Q200 logic).

7. Power Magnetics for the 800V OBC: Parameters and Design Method

7.1 Component roles in the power chain

- **EMI common-mode choke:** first line of CISPR 25 compliance; blocks common-mode noise generated by SiC edge rates.
- **PFC boost inductor:** shapes grid current at 65–100 kHz; the largest single magnetic by stored energy.
- **Resonant inductor (Lr):** sets the resonant tank frequency and gain curve; often integrated as controlled transformer leakage.
- **CLLC/LLC isolation transformer:** spans the safety barrier at 200–300 kHz; simultaneously the main isolation element and a resonant component.

7.2 Reference design parameters

Magnetic component	Core design parameters (typical / reference targets)	Process focus & challenge
PFC boost inductor (totem-pole)	• Inductance: 200–350 µH/phase (80–150 µH if interleaved) • Rated current: 16 A rms/phase @11 kW (32 A/phase @22 kW); peak ≈ 1.5× incl. HF ripple	• Powder-core loss at HF and inductance roll-off under DC bias (verify %L

Magnetic component	Core design parameters (typical / reference targets)	Process focus & challenge
	• Switching frequency: 65–100 kHz (SiC totem-pole) • Core: low-loss powder (Sendust / High-Flux) or gapped ferrite • Winding: edge-wound flat wire; temp rise ≤ 40 K at full load • DCR: ≤ 8–15 mΩ; Hi-pot (winding–core): ≥ 3.0 kVAC / 1 min	at I-peak) • Edge-wound consistency, interlayer insulation, temp-rise control
CLLC / LLC isolation transformer	• Power: 11 kW (modular, parallelable); frequency: 200–300 kHz • Turns ratio: matched to bus/battery window; peak flux Bmax ≤ 180 mT • Core: low-loss ferrite (PC95 / DMR grade), PQ/ER or planar • Winding: litz / flat wire / planar copper • Primary–secondary Hi-pot: ≥ 4.0 kVAC / 1 min (reinforced); creepage ≥ 8 mm • Controlled leakage used as Lr: 10–40 µH; temp rise ≤ 45 K	• Inherent tension between reinforced isolation and low-leakage / high-coupling • HF copper loss (skin / proximity) — winding structure must be optimized
Resonant inductor Lr	• Inductance: 10–40 µH per resonant-network design; tolerance ±5–8% • Frequency: same as transformer; integrated as leakage or discrete	Unit-to-unit consistency of L directly sets the resonant point and gain curve
EMI common-mode choke	• Common-mode inductance: 1–10 mH; core: nanocrystalline • Rated current: 16–32 A/phase; target CISPR 25 class limits	Balance anti-saturation at high current with broadband CM impedance

Typical / reference design targets for an 800V OBC platform, not the measured specification of any single production part. Final values follow the customer's topology, bus voltage, switching frequency, packaging/thermal design and safety grade (IEC 61851 / IEC 62368, AEC-Q200, pollution degree, altitude).

7.3 Design methodology — how these numbers are set

Step 1 — Electrical definition

Fix topology, power, bus and battery voltage windows, switching frequency and ripple targets. For the PFC inductor, inductance follows from allowed HF ripple (typically 30–40% of peak current); for the CLLC transformer, turns ratio follows from the bus-to-battery voltage windows and the resonant tank (Lr, Cr, Lm) from the required gain curve.

Step 2 — Core selection

Select core material by frequency and loss: powder cores (Sendust, High-Flux) for the PFC inductor where DC bias dominates; low-loss ferrite (PC95-class) for 200–300 kHz transformers. Size the core by area product or energy method, then verify flux density: keep Bmax ≤ ~180 mT for ferrite at 250 kHz to control core loss, and verify powder-core %saturation at peak current, not rated current.

Step 3 — Winding design

At 100 kHz+, skin depth in copper is ~0.2 mm, so conductor geometry decides copper loss. Edge-wound flat wire maximizes cross-section utilization and lowers DCR for high-current inductors; litz or planar copper controls proximity loss in transformers. Interleaving primary/secondary layers cuts leakage and proximity loss — but must be traded against the reinforced-isolation barrier.

Step 4 — Insulation system

Define the insulation concept before winding layout: functional vs basic vs reinforced barriers, triple-insulated wire or margin-tape construction, creepage/clearance per IEC 60664-1 with pollution degree and altitude corrections, and the hi-pot and partial-discharge test plan. On 800V platforms this step is the most common source of late redesigns.

Step 5 — Thermal and validation

Estimate core loss (Steinmetz/iGSE) plus AC/DC copper loss; verify temperature rise against the cooling concept (cold plate, potting, airflow). Validate with measured loss and temperature-rise curves, inductance/DCR distribution, hi-pot records and, for automotive programs, AEC-Q200-aligned qualification.

7.4 Why flat wire wins at high current

- Higher window utilization: rectangular cross-section fills the core window more completely than round wire, raising effective copper area for the same size.
- Lower DCR and temperature rise: more copper in the same window directly cuts I^2R loss at 16–32 A-class currents.
- Better thermal path: flat conductors present broad, flat surfaces toward the core and cold plate, improving heat extraction in potted assemblies.
- Repeatable automation: edge-winding is a controlled, automatable process — critical for automotive PPAP-level consistency.

8. Reference Design Snapshot (11 kW, Totem-Pole PFC + CLLC)

The snapshot below illustrates how the Section 7 method lands on one coherent magnetics set for a representative 11 kW bidirectional 800V OBC (single module; two modules parallel for 22 kW).

Item	PFC boost inductor	CLLC transformer (+ integrated Lr)
Electrical point	250 µH, 16 A rms, ripple ~35%	11 kW, 250 kHz, ratio ≈ 1 : 1 (800V-class pack)
Core	Sendust block/toroid, distributed gap	PC95-class ferrite, PQ/planar ER
Winding	Edge-wound flat wire 4 × 1 mm	Interleaved litz / flat wire, margin + TIW barrier
Key verified values	%L ≥ 80% at 24 A peak; DCR ≈ 10 mΩ	Lm per gain plan; leakage as Lr 18 µH ± 7%
Insulation	Winding–core ≥ 3.0 kVAC	Pri–sec ≥ 4.0 kVAC reinforced; creepage ≥ 8 mm
Thermal result (target)	ΔT ≈ 38 K at full load on cold plate	ΔT ≤ 45 K at full load, potted

Illustrative reference values assembled for this white paper to show the method end-to-end; not a catalogue part. PROMAGTECH engineers the equivalent set to each customer's exact topology and safety file, delivered with measured reports.

9. Standards and Compliance Landscape

Standard	Scope in the 800V context	Applies mainly to
IEC 61851-1 / -23	EV conductive charging system; -23 covers DC charging station safety incl. insulation monitoring	Station, vehicle interface

Standard	Scope in the 800V context	Applies mainly to
IEC 62196 / GB/T 20234 / SAE J3400 (NACS)	Plugs, socket-outlets and connectors for AC/DC charging; regional connector families	Connector, gun, inlet
ISO 6469-3	Electrically propelled vehicles — electrical safety of the HV system	Vehicle HV architecture, OBC
ISO 17409	Connection of vehicle to external electric power supply — safety requirements	Vehicle charging interface
ISO 21498-1	Voltage classes and electrical test requirements for voltage class B components	All HV components incl. magnetics
IEC 60664-1	Insulation coordination — creepage/clearance vs working voltage, pollution degree, altitude	Magnetics, PCB, isolation design
IEC 62368-1	Safety of electronic equipment — reinforced insulation concepts referenced in charger design	OBC / station power supplies
CISPR 25	EMC limits and measurement for vehicle components	OBC, EMI filter, CM choke
AEC-Q200	Stress qualification of passive components for automotive	Inductors, transformers, chokes
CharIN MCS	Megawatt Charging System (up to 1250 V / 3000 A) for commercial vehicles	Next-generation stations

The table is an orientation map, not a substitute for the applicable standard text; program-specific safety files govern.

10. Engineering Checklist for Magnetics Specification

Ten questions that prevent the most common 800V magnetics redesigns. Put them in the RFQ.

- 1. Topology and frequency: which stage, what switching frequency and what ripple/gain plan does the part serve?
- 2. Voltage windows: bus and battery ranges, worst-case working voltage across the isolation barrier?
- 3. Peak vs rated current: is inductance roll-off (%L) specified at true peak current including ripple?
- 4. Insulation class: functional / basic / reinforced — with what hi-pot level, creepage, clearance, pollution degree, altitude?
- 5. Leakage / resonant tolerance: if leakage doubles as Lr, what unit-to-unit tolerance keeps the gain curve inside spec?
- 6. Loss budget: what core-loss and copper-loss split at the thermal design point, and how is it measured?
- 7. Thermal interface: cold plate, potting or air — and what ΔT target at which ambient?
- 8. EMC role: what CM impedance profile must the choke hold across the CISPR 25 bands, at rated current?
- 9. Qualification: AEC-Q200 alignment, PPAP level, and which measured reports ship with each lot?
- 10. Compatibility path: does the platform charge from 400V infrastructure via AC boost or DC boost — and which magnetics does that path stress?

11. Frequently Asked Questions

Q: Does an 800V OBC have to use silicon carbide (SiC)?

A: Essentially yes. A 650V silicon MOSFET cannot survive an 800V bus, so PFC and DC/DC stages move to 1200V SiC to combine voltage withstand, low switching loss and >97% efficiency.

Q: What dielectric withstand does an 800V isolation transformer need?

A: Typically primary-to-secondary hi-pot ≥ 4.0 kVAC / 1 min (reinforced isolation) with creepage generally ≥ 8 mm, corrected for pollution degree and altitude; final values follow the program safety file.

Q: Why do 800V ultra-fast stations use liquid cooling?

A: At 480–600 A, air-cooled cables become too heavy for one-handed use; liquid cooling carries heat away in the cable assembly, keeping it slim — standard on 480 kW-plus stations.

Q: LLC or CLLC for the isolation stage?

A: If the OBC must be bidirectional (V2G/V2L), CLLC is the mainstream choice: its symmetric tank gives equivalent gain in both directions. Unidirectional designs can stay with LLC for simplicity.

Q: What advantages do flat-wire inductors have over round wire?

A: Higher window utilization and lower DCR, hence lower temperature rise at high current; broad flat surfaces also improve the thermal path — the mainstream choice for 800V OBC / DC-DC magnetics.

Q: Can PROMAGTECH customize magnetics for an 800V OBC or charging module?

A: Yes. PROMAGTECH engineers flat-wire power inductors and planar / isolation transformers to the customer's topology and safety grade — PFC inductors, CLLC transformers, resonant inductors and common-mode chokes — delivered with measured reports (inductance/DCR, loss and temperature-rise curves, hi-pot records).

12. Glossary

Term	Definition
800V architecture	EV platform with ~600–900V nominal traction voltage (ISO 21498 class B); halves current vs 400V at equal power.
OBC	On-Board Charger — converts AC grid power to isolated DC battery power; sets AC charging speed.
SiC	Silicon carbide, a wide-bandgap semiconductor; 1200V SiC MOSFETs are the 800V workhorse switch.
Totem-pole PFC	Bridgeless power-factor-correction front end; with SiC it is high-efficiency and natively bidirectional.
LLC / CLLC	Resonant isolated DC/DC topologies; CLLC is symmetric and supports V2G power flow.
V2L / V2G	Vehicle-to-Load / Vehicle-to-Grid — discharging the pack to external loads or the grid via a bidirectional OBC.
Hi-pot	Dielectric withstand test applying high voltage across an insulation barrier for a defined time.
Creepage / clearance	Shortest insulation distance along a surface / through air between conductive parts (IEC 60664-1).
Reinforced isolation	Single insulation system equivalent to double insulation; required across the OBC safety barrier.
Flat wire (edge-wound)	Rectangular conductor wound on its edge; maximizes copper utilization and lowers DCR at high current.

Term	Definition
Planar transformer	Transformer built from flat copper layers (PCB or stamped) on low-profile cores; excellent repeatability and thermal behavior.
MCS	Megawatt Charging System — CharIN standard targeting up to 1250 V / 3000 A for commercial vehicles.

13. About PROMAGTECH

> SHENZHEN PROMAGTECH CO.,LTD. (深圳市谱磁科技有限公司), founded in 2013 and based in Guangming District, Shenzhen, specializes in the R&D and manufacture of high-performance magnetic components — High-Performance Magnetic Solutions.

- **Product lines:** flat-wire power inductors, planar / isolation transformers, common-mode chokes, PFC inductors, energy-storage inductors, SMD flat-wire inductors, amorphous-core reactors.
- **Applications:** EV on-board chargers (OBC), DC-DC converters, 20–60 kW DC charging modules, solar inverters, energy-storage converters (PCS), industrial power, 5G power, AI-server power.
- **Engineering support:** joint specification against topology and safety files, prototypes with measured reports (inductance/DCR, loss and temperature-rise curves, hi-pot records), and volume manufacturing with automated edge-winding.
- **Contact:** www.promagtech.com · No. 22 Dongkeng Road, Fenghuang Street, Guangming District, Shenzhen, China

Revision history

Version	Date	Changes
1.0	July 2026	First public release.

Sources and further reading

Porsche Newsroom — Taycan Charging; TaycanForum — On-Board 150 kW/400V DC Charger; Bourns — Modeling of High Power Inductors Based on Solid Flat Wires; Bourns/Mouser — Advantages of Flat Wire Inductors for High Frequency, High Current Designs; CharIN — Megawatt Charging System.