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OZip Intelligent Power Module
SOLUTION BRIEF

OZip Intelligent Power Module

The building block for custom power conversion: flexible DC-DC, AFE/GTI, and Motor-Drive in one platform.

"Validated at 100 kW in AFE configuration with customer demos."

Stop reinventing the power stage. Use a proven platform and focus on your system.

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PROBLEM

According to the IEA (International Energy Agency), battery demand is set to climb multi-fold by 2030 with EVs, utility-scale storage, and behind-the-meter systems driving a surge in deployments (In 2023, the power sector added ~42 GW of new battery capacity, more than doubling year-over-year). Moreover, BESS market is projected to grow from $7.8B (2024) to $25.6B (2029) at a 26.9% CAGR. With Lithium - ion battery pack prices falling, the pace of programs is accelerating further.

What this means for power-electronics teams?

- **Time-to-market squeeze:** DC-DC, grid-tie/AFE, and motor-drive stages must be validated faster across more SKUs and power levels.
- **Integration complexity:** controls/firmware, thermal design, protections, and compliance must be tuned as a system, not as parts.
- **Compliance pressure:** grid-facing designs face tighter harmonics and power-factor expectations (e.g., IEEE-519 at the PCC).
- **Resource strain:** scarce engineering hours disappear into re-building the conversion core instead of differentiation and features.

APPLICATION AREAS

- Solar and battery energy systems
- Grid-tied power systems
- High-speed turbines and generators
- Industrial or transportation power systems

BENEFITS AT A GLANCE

- Scale across products and programs with one configurable platform.
- Shorten development timelines and accelerate integration with OEM-ready controls.
- Maintain design ownership while avoiding custom power-stage re-invention.
- Reduce program risk with proven hardware, screening, protection, and monitoring.

SOLUTION

Power-electronics teams spend months rebuilding the same conversion core. OZip Intelligent Power Modules let you stop doing that, so your team can focus on system integration, performance tuning, and product differentiation, not power stage bring-up. The result? Customization at scale.

It gives OEM teams a pre-engineered, software-configurable power stage that drops into your architecture, so you keep design ownership while shipping faster with less risk. On a common hardware base, choose DC-DC, AFE/GTI, or Motor-Drive firmware, match the thermal/mechanical fit with air- or liquid-cooled variants, and rely on a rugged, ESS-screened build with embedded protections and real-time monitoring.

A rugged, ESS-screened design with localized protection and real-time monitoring underpins reliability in demanding environments; multiple hardware options plus software-defined functions deliver versatility; and the OEM-ready interfaces (e.g., CAN/RS-485, application-optimized I/O) streamline system integration. You're backed by technical support for configuration and operation, on-site training for operators, and compliance/certification guidance to reduce program risk.

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APPLICATIONS

DC/DC Converter
A smart, rugged power module designed to efficiently convert one DC voltage to another: either stepping it up or down depending on the application.

- **Bidirectional buck/boost:** Raises or lowers voltage in either direction for seamless pack↔bus interfacing.
- **Clean output, less stress:** 3-phase interleaved design minimizes ripple and electrical noise.
- **Flexible control:** Run voltage or current control modes to match system requirements.
- **Safe start-up:** Integrated pre-charge manages inrush for high-voltage links and big capacitors.
- **Easy to integrate:** Configure/monitor from a PC, PLC, or your controller over CAN or RS-485.
- **Rugged by design:** IP55 option for harsh environments; choose forced-air or liquid-cooled variants.

AFE / Grid-Tie Inverter
A configurable three-phase inverter that runs as an Active Front End (AFE) to regulate the DC link and enable regen/low harmonics, or as a Grid-Tie Inverter (GTI) to control real/reactive power to and from the grid.

- **Grid-friendly power quality:** Low AC current harmonics (IEEE 519) and improved power factor.
- **Flexible control:** DC-link, current, or power control modes for fast commissioning.
- **Voltage boost & safe start:** Bus boost capability plus pre-charge for high-voltage systems.
- **Integration-ready:** Configure/monitor via CAN/RS-485; IP55 air or liquid-cooled options.
- **Easy configuration:** PC/PLC or proprietary controller over CAN/RS-485 with live telemetry.

Motor Drive
Converts a DC bus into variable-frequency, variable-voltage 3-phase AC to run AC induction or permanent-magnet motors with speed/torque control—and recovers energy via regenerative braking.

- **Precise machine control:** Run motors from a DC link with adjustable speed/torque (V/Hz)
- **Energy recovery:** Bidirectional power flow returns braking energy to the DC source to improve system efficiency.
- **Easy to commission:** Configure & monitor via CAN/RS-485 (PC, PLC, or your controller) with live telemetry for tuning.
- **Integration-ready:** Protections and thermal monitoring built-in; fits alongside DC-DC/AFE on a common platform.

AFE10APA
100 kW, bidirectional grid interface for DC systems Open-frame Active Front End that manages AC↔DC power flow at 100 kW, regulating the DC link while enabling regen/export.

- **Grid-friendly power quality:** Low harmonics (IEEE 519) and near-unity power factor for clean interconnection.
- **Bidirectional & regulated:** Rectifier/inverter operation with stable DC-link voltage under changing loads.
- **Integration-ready:** Compact, rugged open frame with built-in cooling/switchgear; configured via Power Studio™.

