eInfochips An Arrow Company | ENRICHING LIVES THROUGH ENGINEERING EXCELLENCE

ARROW

eInfochips DC Fast Charger Reference Design

Intelligent, Connected and Future-Ready Solution

DC Fast charging stations are a backbone to widespread EV adoption due to their ability to charge EV batteries in a matter of minutes. According to IEA, the number of fast chargers increased by 330,000 and accounted for more than 72% share of the global revenue in 2022.

eInfochips DCFC is compact yet powerful and built on the industry's latest technologies and safety standards. It is an ideal choice for small and mid-sized commercial and public EV charging applications such as shopping malls, parking, retail outlets and offices etc.

DCFC's design is equipped to support OCPP1.6 for flexible integration with preferred CMS software, ISO15118 for bi-directional charging support, large HMI display for ease of use and flexible connectivity options such as Wi-Fi, RFID/NFC, Gigabit Ethernet for billing & payments and remote management.

DCFC can be seamlessly integrated and remotely managed via eInfochips EVWER - A cloud-agnostic platform that offers a smart charging mobile app fow EV drivers and a web-based charger management platform for charge point operators/ service providers.

Key Features

- 10" Large HMI Display (1000 NITS) Notifications via LED and Speaker
- Remote Management using EVWER (eInfochips IP)
- Ultra Compact Footprint Energy Metering Support
- Built-in System Safety Mechanisms (i.e., over voltage/current, surge etc.)
- OCPP 1.6J / ISO15118 Support for Smart Charging / V2G Applications
- LED Indications (Power, Fault, Charging) Speaker Output (3W) for User Notifications
- Supported Charging Standards - CCS1/CCS2
- Power Ratings – 30 kW / 60 A

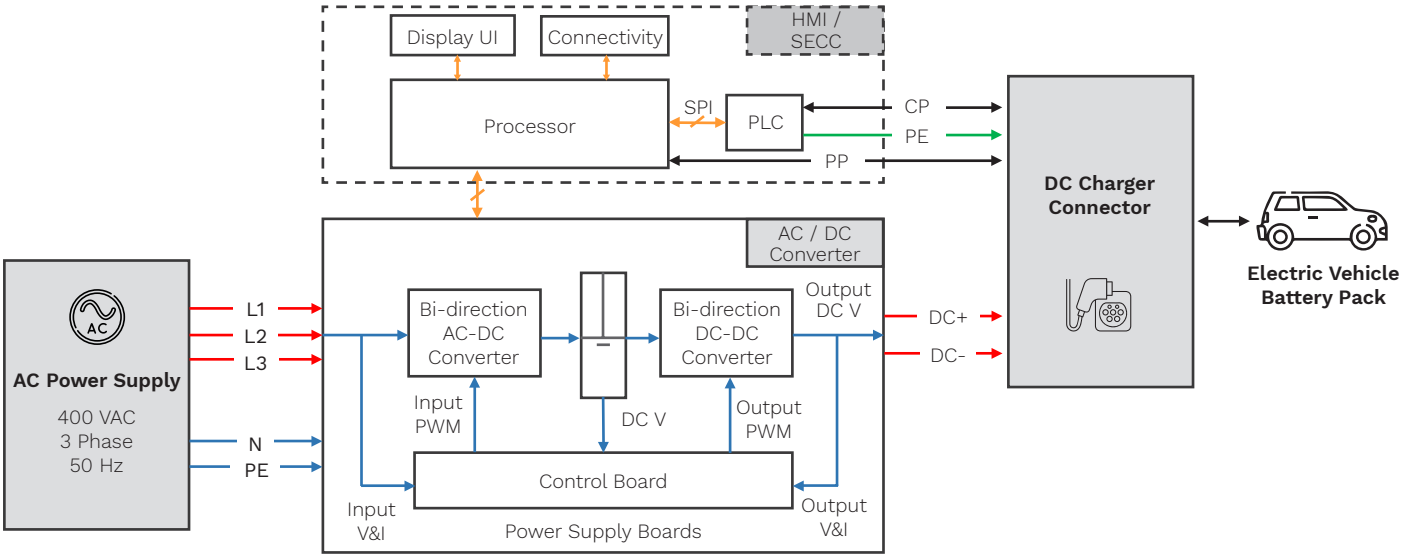
Technical Specifications

Parameters	Min.	Typical	Max.	Unit
AC Side (3 Phase)				
Line Frequency	45	50/60	65	Hz
Line Voltage	340	400	460	V_{L_RMS}
Power Factor (Full load)	-	≥0.95	-	-
I_thd	-	5	-	%
Wires	3 - Phase, 5 - Wire AC (L1, L2, L3, N and PE)			
DC Side				
Power	-	30	-	KW
Output voltage range	350	500	750	V
Voltage ripple	-	10	-	V_{pk_pk}
Current	-	60	TBD	A
Efficiency (Full load)	-	>98	-	%
Number of Guns	1			
Environmental				
Operating Temperature	-30	-	60	°C
Storage Temperature	-40	-	70	°C
Humidity non-condensing	5	-	95	%Rh
Altitude	-	2000	-	m
Cooling	Forced Air Cooling			

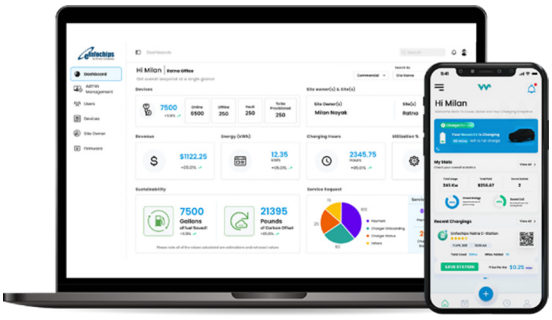
Input Protections	**Output Protections**
Input Under Voltage (UV)	Over temperature (OT)
Input Over Voltage (OV)	Over Current
Over temperature (OT)	DC High Voltage (Input)
Ground Fault	DC High Voltage (Output)
RCD or CCID Device	Galvanic Isolation
Over Current	Electric shock (DC Isolation monitor)
Short circuit	
Surge	
Emergency shutdown	
Communication	
Network Interface	1 Gbps Ethernet, Wi-Fi 5
Network Communication	OCPP 1.6J
Vehicle Communication	ISO15118, IEC 61851-23, -24
Charging Interface	CCS1 / CCS2
Other Features	Energy Metering

Targeted for certifications:

Architecture Diagram



EVWER – Cloud-agnostic EV Charging Digital Platform



EVWER is a cloud-agnostic EV Charging digital platform built using in-house accelerators, services, and reusable functional assets to help customers develop innovative solutions, create differentiation and fast-track go-to-market. It is derived from our in-depth understanding of the EV charging ecosystem and experience gained from end-to-end development of EV charging solutions for e-mobility industry leaders.

EVWER features ready-to-integrate and customizable building blocks for creating EV charging digital platform including the web-based CMS software, smart charging app for Android/iOS, cloud infrastructure and accelerators such as OCPP server and OpenADR integration framework etc.

Key Components

Smart Charging Mobile App

Android/iOS app, Intuitive UI, Advanced charging features, user management, charger onboarding, history, DR push events and alerts management, multi-language support

Charger Management Software

Multi-tenant web application, UX design-based workflows, UI screens, User management, dashboard & reports, service requests, energy consumption, sustainability analytics

Cloud-based backend Infrastructure

IoT platform for device-to-cloud integration/provisioning/ management, Backend services/REST APIs, 3rd Party Integrations, Alerts and push notifications, DevOps, FOTA etc.

OCPP 1.6 Server Assets

OCPP server core profile, Integration testing, Firmware management, smart charging profile, support for use cases defined by OCA, reservation, remote trigger, certification support

OpenADR 2.0b Implementation

OpenADR assessment and planning, x509 security, Polling and reports, Events implementation (Opt In/Out, simple signal, electricity price, load dispatch) Certification testing, document etc.

Success Stories

End-to-End EV Charging platform development

US-based leading provider of EV charging solutions

- Built Azure based cloud platform and cross-platform app based on EVWER
- Advanced features - charger onboarding, scheduling, slot reservation etc.
- 10+ user workflow, 150+ mockups, 275+ test scenarios executed
- OCPP implementation - supported all OCPP use cases defined by OCA, tested with OCPP-compliant charger & simulators
- Efforts saving by 50%, 70% reutilization of EVWER assets

Smart Charging Mobile App and CMS development

European company offering electrical, lighting and EV solutions

- Developed Azure based platform using EVWER to optimize, monitor, and scale EV charging operations over cloud
- Dashboard, role-based access, push notifications and app analytics etc.
- Developed a cloud platform to support up to 24 months of data retention and 300,000 events per day
- Reduced time-to-market by 6 months, 47% reutilization of EVWER assets

Accelerators

- **OCPP Server -** Core profile, FW management, smart charging, reservation, remote trigger
- **Functional Assets -** 250+ test cases, 12+ workflows, app wireframe, branding doc etc.
- **Common Modules -** Mail Service for SendGrid, Keycloak Integration, Rest Client for API call, Message Service for multi-language support
- **OpenADR -** Integration with utilities and aggregators (i.e., AutoGrid, MercuryEdge, Generac)

Key Benefits

- Faster MVP with enterprise-level architecture
- Saves time of up to 4 calendar months
- Faster customer onboarding
- ~30% savings on overall implementation efforts
- Integrated branding & customization for unique CX
- End-to-end Implementation and certification support for OCPP and OpenADR implementation

One Stop EV Charging Solution

Software/Digital Platform Development

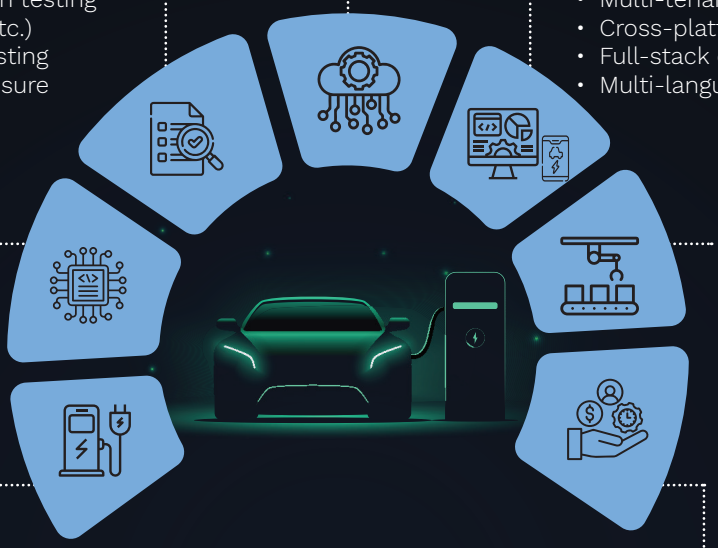
- Cloud-agnostic approach (Azure, AWS, GCP)
- Advanced charging features implementation
- Notifications, push alerts, reports & dashboard
- Data aggregation and analytics

Testing & Certification

- Pre-compliance & certification testing (CE, FCC, UL, RoHS, REACH etc.)
- Functional, EDVT, Thermal testing
- Mechanical (IP67, Shock, Pressure Washing & UV Radiation)
- QA and test automation

Mobile/WebApp Development

- Multi-tenant web-based platform
- Cross-platform Android/iOS mobile app
- Full-stack design, UI/UX, App Analytics
- Multi-language support



Firmware Development

- BSP development/ customization/testing
- OS experience (Linux, RTOS, Android etc.)
- Firmware application, OTA, cybersecurity
- Device Drivers, HAL, Middleware, Libraries

Manufacturing-as-a-Service

- One Stop Solution – design-to-manufacturing
- Design for manufacturing/ assembly
- Components/Supply chain navigation
- 15+ contract manufacturers

Hardware Design

- OCPP compliant next-gen EV charger design
- Embedded, Industrial, Mechanical design
- Components/BoM, Architecture
- PCB schematic, layout, signal integrity
- Board bring-up, prototyping, DFA/DFM

Managed Services

- Product life cycle management
- Legacy modernization
- L1/L2/L3 Support
- 24x7 NOC, SLA management
- DevOps/CloudOp

EV Domain Expertise

- Turnkey EV Charging Solutions
- Battery Management Solutions
- High-Voltage AC-DC Converters and Power Supplies
- EV Charge Controllers
- Energy Management Solutions

Turnkey Development

- Embedded Hardware/ Software
- Connectivity Enablement
- Cloud Platform Development
- Certification/Compliance

Manufacturing

- World class quality and process certifications
- PCBA, Product Assembly
- Validation & Verification
- Quality Assurance

Sustainability

- Sustenance/Obsolescence
- Re-design/Re-engineering
- Legacy Modernization
- Efficiency/Power/Boot Optimization
- Renewable Energy Integration

About eInfochips

eInfochips, an Arrow Electronics company, is a leading provider of digital transformation and product engineering services. eInfochips accelerates time to market for its customers with its expertise in the areas of IoT, AI/ML, security, sensors, wireless, cloud, and power. eInfochips has been recognized as a leader in Engineering R&D services by many top analysts and industry bodies, including Gartner, Zinnov, ISG, IDC, Nasscom and others.

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