Qualcomm

Qualcomm® Automotive Powerline Communication (PLC) Solutions

87-41918-1

Qualcomm Automotive Powerline Communication Solutions

Robust. Reliable. Energy-efficient.

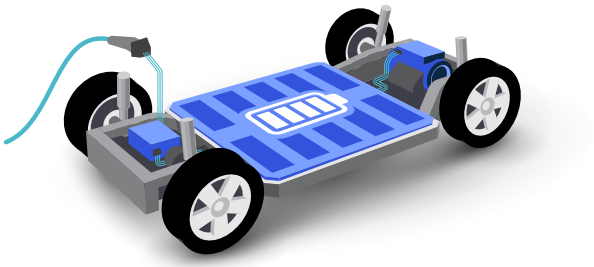
According to analysis from Deloitte[1], electric vehicles (EVs) will be a third of all new car sales by 2030, bringing the total number of EVs sold in a single year to 31.1 million globally—10 million more than previously forecasted. To meet this growing demand, many global automakers and suppliers turn to Qualcomm Technologies: a leading PLC HPGP device supplier for Combined Charging System (CCS) EVs, infrastructure, and accessories. We provide a wide range of PLC HPGP devices that fit CCS standard requirements, which is a leading global standard for automotive DC charging. Our PLC HPGP solutions are used for several defined applications worldwide, including vehicles, smart grid infrastructure, public charging stations, in-home charger units, EV accessories, and adapters.

1 "Worldwide roads on course for 31.1 million electric vehicle milestone by 2030," Deloitte Press Release; July 27, 2020

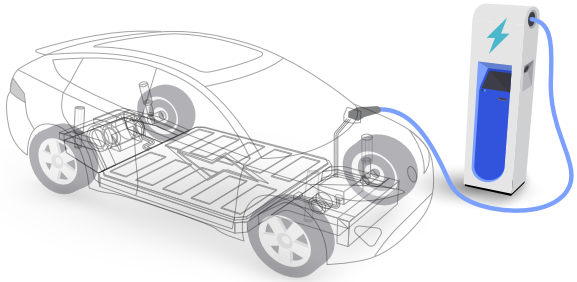
PLC HPGP use cases for Automotive & Smart Grid applications

Compelling solution to enable an integrated EV + Smart Grid Ecosystem

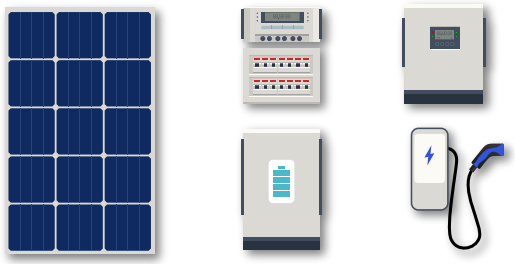
On-Board Conductive Charging systems (OBCs)



Off Board Conductive Charging systems (EVSEs, Home Chargers)



Converters, accessories & smart/solar home applications (often tied with EV @ home charging)



Bi-directional V2H & V2G communication

V1G: Unidirectional controlled charging
Vehicles or charging infrastructure adjust their rate of charging

V2G: Vehicle-to-grid
Smart grid controls vehicle charging and returns electricity to the grid

V2H/B: Vehicle-to-home/-building
Vehicles will act as supplement power suppliers to the home

Benefits of PLC HPGP Charging Applications (CCS)

- Developed and matured over the last 10 years by leading automotive and infrastructure providers
- PLC HPGP-based communication supports smart-grid applications
- CharIN leading the charge to establish CCS as a preferred worldwide EV charging solution
- Strong supply base with multiple device manufacturers committed to the market

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Qualcomm PLC HPGP solutions

	Qualcomm® QCA7000-AL3C	Qualcomm® QCA7000-AL3B	Qualcomm® QCA7005-AL33	Qualcomm® QCA70106AQ
Direction	HPGP single chip MAC/PHY	HPGP single chip MAC/PHY	HPGP single chip MAC/PHY	HPGP single chip MAC/PHY HPAV single chip MAC/PHY
Digital Interfaces	SPI	SPI	SPI	SPI, Ethernet
Quality Level	Commercial	Industrial	Enhanced Industrial*	Automotive Grade 2
Operating Ambient Temp. Range	0°C to +70°C	-40°C to +85°C	-40°C to +85°C	-40°C to +105°C
Case Temperature	0°C to +105°C	-40°C to +110°C	-40°C to +110°C	-40°C to +110°C
Package	QFN68 0.4mm pin pitch	QFN68 0.4mm pin pitch	QFN68 0.4mm pin pitch with wettable flanks	QFN68 0.4mm pin pitch with wettable flanks

- PLC HPGP modem device compliant with PLC HPGP MAC/PHY specifications
- QoS as required for PLC HPGP home area network
- Robust, reliable, and power-efficient networking solution as per PLC HPGP specs
- Efficient bill of material (BOM) to enable PLC HPGP communication

New QCA7006AQ

All-in-one, automotive-grade PLC HPGP solution

Note: Size of depicted blocks is not indication of silicon size of IP cells.

Operational overview

- Compliant with both HPGP and HPAV specifications
- Compliant with ISO 15118 (part 1, part 2, part 3) specifications
- Fully interoperable with IEEE 1901 family specifications
- Meets CCS type 1 and type 2 requirements

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Key value-adds

Main hardware and software features

- 100Base-T Ethernet PHY interface
- HPGP and HPAV modes supported
- Ethernet interface enabled by QCA7006AQ-based software products
- Digital interface (ETH, SPI) configurable through PIB configuration file

QCA7006AQ

- Seamless upgrade from QCA7000/QCA7005 to QCA7006AQ
- Footprint and pinout compatibility with QCA7000 and QCA7005 devices
- Interoperable with QCA7000 and QCA7005 devices
- Operational with QCA7006AQ-based software products

Qualcomm Automotive PLC Communication advantages

Innovation & Experience

- 20+ years of automotive industry experience
- 150+ million vehicles using Qualcomm Automotive solutions[2]
- #1 in telematics, Bluetooth®, and Wi-Fi for Automotive[2]
- #1 in premium, next-gen cockpit design wins for production vehicles starting 2020[2]

PLC Leadership

- Leading PLC device supplier for the CCS EV, Infrastructure, and Accessories markets
- Strong market share driven by 10+ years in EV segment
- Stable HW platform and mature HPGP SW for CCS applications

OEM & Governmental Support

- Majority of EV OEMs use Qualcomm® 700X devices
- Government agencies—such as the California Energy Commission—are actively driving the build out of CCS-enabled EVSE infrastructure from 2022 to 2030 to accelerate EV adoption and smart grid integration.

[2]Source: Qualcomm internal sales data

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qualcomm.com/automotive