

Electric Vehicle (EV) Charger Market

Forecasted to grow from \$24.3 Bn in 2023 to \$185.9 Bn in 2030.
A CAGR of 33.7%



Description

- Electric vehicle (EV) chargers are installed in many locations such as home, work, roadside, parking areas, and in charging stations.
- Home chargers supply AC power to the EVs with the vehicle's onboard AC-DC converter used to create the DC power necessary to charge the battery. These chargers are often simple; however, they may have advanced features such as Wi-Fi connectivity for monitoring and control from a mobile device.
- EV chargers in public spaces such as the roadside, parking areas and charging stations often have a few additional features including contactless payment (NFC), Wi-Fi, 5G connectivity, advertisement display, and an AC-DC converter if it has a DC output. Chargers with DC output are often known as “rapid chargers” with the fastest charging times.
- EV chargers usually consist of the following parts:
 - **Power Conversion Unit** - AC to DC converter.
 - **Control Unit** – Regulates the charging process to prevent overcharging.
 - **Display Interface** – Displays charging information and allows user control.
 - **Communication module** – Connects the EV charger to the internet for remote diagnostics, software updating, power monitoring, and set prices remotely.
 - **User Connectivity** – For wireless connection to Smart Phones via Wi-Fi and RFID (NFC).
 - **GNSS circuit** – For EV charger position information.

Drivers

- Increasing number of EVs is creating demand for chargers.
- Growing competition is driving faster charge times, higher reliability, and the introduction of advanced features.

Customer Challenges and Opportunities

- The AMSLA high power density stacked inductors can support high power efficiency designs.
- Abracon's auto-graded solutions offer a high reliability in extreme weather conditions.
- Combo antennas with GNSS and 5G/4G LTE can reduce the complexity of EV chargers with a ready-optimized antenna solution and fewer parts in assembly.

Abracon Series to Consider for Electric Vehicle Chargers

Description & Requirements	Frequency Control & Timing	RF & Antenna	Power & Magnetics
Power Supply (AC-DC converter)	<p><u>MHz Crystal</u> ABM8AIG (Auto.3.2 x 2.5mm)</p> <p><u>Crystal Oscillator</u> ASEAIG (Auto. 3.2 x 2.5mm)</p>	N/A	<p><u>Power Inductor</u> AMSLA (Stacked inductor) ASPI-F (Molded Flat Wire) ASPIAIG-F (Molded Flat Wire) ASPIAIG-S (Resin Shielded) AMPLA (Molded Round Wire) AMDLA (Molded Round Wire) ASPIAIG-Q (Molded Flat Wire)</p> <p><u>Supercapacitor</u> ADCM (Module)</p>
Control Unit	<p><u>32.768kHz Crystal</u> ABS06 (2.0 x 1.6mm) ABS07AIG (Auto. 3.2 x 2.5mm)</p> <p><u>MHz Crystal</u> ABM10AIG (Auto. 2.5 x 2.0mm)</p>	N/A	<p><u>Power Inductor</u> AMDLA (Molded Roundwire) AOTA (Mini Molded) ASMPH (Metal Alloy Multilayer) ASMPM (Metal Alloy Multilayer) ASPIAIG-S (Resin Shielded)</p>
Display Interface	<p><u>MHz Crystal</u> ABM10W (2.5 x 2.0mm) ABM8AIG (Auto. 3.2 x 2.5mm)</p> <p><u>32.768kHz Crystal</u> ABS05 (1.6mm x 1.0mm)</p> <p><u>Crystal Oscillator</u> ASDDV (Continuous voltage oscillator)</p> <p><u>Ceramic Resonator</u> AWSCR (ceramic resonator)</p>	N/A	<p><u>Power Inductor</u> AMDLA (Molded Round Wire) AOTA (Mini Molded) ASMPH (Metal Alloy Multilayer) ASMPM (Metal Alloy Multilayer) ASPIAIG-S (Resin Shielded)</p>
Communication Module (Wi-Fi and combo)	<p><u>MHz Crystal</u> ABM10 (2.5 x 2.0mm) ABM11 (2.0 x 1.6mm) ABM10AIG (Auto. 2.5 x 2.0mm)</p>	<p><u>WiFi</u> ACAR0301-SW2 (chip)</p> <p>Combo – WiFi & GNSS AEACBK046014-C2WG (puck)</p> <p><u>UWB</u> AFAC120050-U6G (flexible PCB)</p>	<p><u>RF Inductor</u> AIMC (Ceramic Multilayer) ATFC (Thin Film Multilayer) AISC (RF Wirewound)</p>
User Connectivity	<p><u>MHz Crystal</u> ABM10 (2.5 x 2.0mm) ABM11 (2.0 x 1.6mm) ABM10AIG (Auto. 2.5 x 2.0mm)</p>	<p><u>NFC Antenna</u> AFAR3026-SN (NFC PCB antenna with IPEX(F))</p>	<p><u>Common Mode Chokes (CMCs)</u> ACMS (Signal Line SMD)</p>
GNSS positioning	<p><u>TCXO</u> ATXAIG-11 (Auto. 3.2 x 2.5mm) ATXAIG-12 (Auto. 2.5 x 2.0mm) ATXAIG-13 (Auto. 2.0 x 1.6mm)</p>	<p><u>GNSS Antenna</u> APRA1804G3Z (Multi-GNSS patch antenna with thru-hole pin). AFS14A04-1575.42-T3 (Ultra-miniature GPS SAW filter surface mount)</p>	<p><u>RF Inductor</u> AIMC (Ceramic Multilayer) ATFC (Thin Film Multilayer) AISC (RF Wirewound)</p>