



Visteon Wireless Charging System (WCS)

Product Description

The device being submitted, the Wireless Charging System (WCS) is a transmitter base designed to be used as an OEM installed wireless charger in a motor vehicle and uses magnetic inductive coupling to transfer energy from itself to a compatible, portable receiving device, such as a cellular phone. The transmitting device is based upon the Powermat Dual Mode wireless charging consumer product, but will work with both Powermat and WPC (Wireless Power Consortium) compliant receivers. The receiver is a passive transponder that does not produce power on its own. The WCS is designed to work in close proximity to the receiving device (7 mm gap between coils and 12 mm offset between coil centers). The gap between transmitter and receiver coils will be occupied by housing or vehicle plastic material.

The Wireless Charging System (WCS) charges a consumer device by using an electromagnetic field to transfer energy. By varying the current in the primary induction coil in the WCS, an alternating electromagnetic field is generated from within a charging base station. A second induction coil in the receiver of the handheld device takes power from the electromagnetic field and converts it back into electrical current to charge the device battery. The two induction coils in proximity combine to form an electrical transformer.

Load detection is performed via a low amplitude pulse. The transmitter primary coil voltage/current is monitored to detect a change in the amplitude, indicating the presence of an object in proximity to the charging surface. Once an object is detected, an identification burst of energy is radiated to charge the circuit in the receiver and a response is queried to determine if the object is a compatible device to be charged.

Client registration is determined and established either by WPC protocol for WPC compliant devices, or by recognition of response signature from Powermat compatible devices. Communication is achieved by modulation of the reflected impedance by the receiver circuit. Upon confirmation of compatible object, charging commences until the device terminates the charging mode or is removed. Power transfer is controlled through the receiver monitoring the voltage across the load and sending control error values (WPC) or power change requests (PM).

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The charging pad enters standby upon application of 12V input power and the absence of a device on the charging surface. The presence of a compatible device and input power will initiate charging mode.

Charging completion is determined via an End of Charge message from the receiver to the transmitter. The receivers monitor the charge state via different methods/algorithms depending on WPC or Powermat architecture and OEM design. The charging power is variable, depending on the control point error message or power change request from the device.