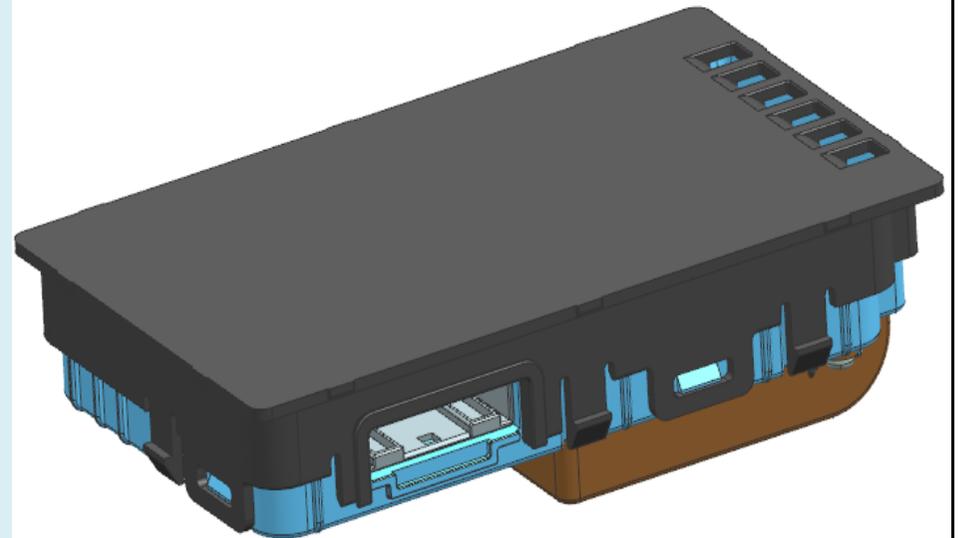


# • APTIV •

DOCUMENT NAME: WPC User Manual

I



## Introduction

The Wireless Phone Charger is a Confort systems used to provide battery charging capability to commercial compatible Smartphones.

Phones not equipped with wireless charging receivers can often be supplemented with a shell that makes wireless charging possible.

The Wireless Charger can act as a NFC reader to communicate with a NFC tag.

The general performance of WPC is listed as follow,

Wireless operating frequency : 120KHz ( 127.7KHz for all mobile of Apple ) ; Wireless maximum transmitted power : 10W

Maximum transmit power value: 120kHz : 9.411 dBμA/m @10m

127.7kHz : -2.612 dBμA/m @10m

NFC operating frequency : 13.56MHz, field strength -5.136 dBμA/m @10m, detection distance<2cm

Function	Items	Detail Description
Environment Performance	WCM Normal Voltage	DC 9-16V
	Working Temperature	T <sub>min</sub> : -40°C T <sub>max</sub> : +85°C
	Storage Temperature	T <sub>min</sub> : -40°C T <sub>max</sub> : +85°C
	Humidity	20%~80%
	CAN Voltage	DC 7-18V
Charging ability	WPC STD	Qi WPC1.2
	BAT to BAT efficiency	≥60%(with Qi standard Rx)
	Coil Number	3
	Max Receiver Power	MAX 10W
	Max Receiver Current	MAX 2A at 5V
	Charging Distance	3-10mm( the distance between Tx Coil to Rx Coil)
	WCM Typical Power	12W
	WCM Typical Voltage	12V
	Max WCM Current	1A
	WCM Standby Current	≤100mA
	WCM Dark Current	<1mA
FAN ability	Nosie	It must be 30dB or less when noise is measured from 200mm above the cover. Even after completing the attached durability test, the performance and noise standard of the FAN shall be satisfied.
	Output mode	Be able to control FAN speed using PWM according to vehicle speed
	Error Detect	Apply the power cut-off function by detecting an error an error such as FAN stop due to short circuit or other external force

## Connections

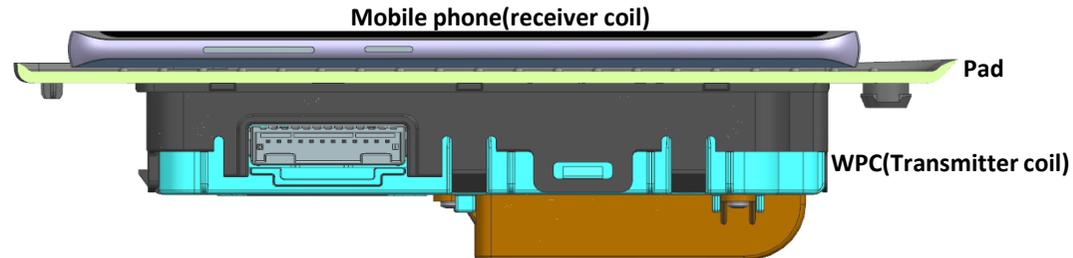
The WPC has a single connector that only fits in one position with the Vehicle Harness. This connector powers to the unit by a 12-wire connection and provides as well communication with the main Systems of the vehicle.

The WPC communicates the charging status and other useful information through the vehicle network to be used by other systems.

As this product is powered externally, the Module shall be powered from the an external power supply in compliance with clause 2.5 of the IEC 60950-1 standard and the operating conditions described in the technical specification of this product.

### ***Vehicle Mounting location***

The WPC is located in the center tunnel console of the vehicle. The WPC is located in such way that the compatible device (phone) can be placed and removed easily from the end user. The charging face (coil face) of the WPC is facing the A pad area where the phone is placed.



### ***Getting Started***

The WPC is able to start charging once following conditions are met:

- a) The WPC is correctly connected and energized.
- b) The vehicle is at least in ACC or Engine ON.
- c) the Compatible device (Phone) is placed in the charging area.
- d) The Multimedia System (Radio head unit) enables the WPC for start charging.

### ***Compatible Devices that WPC can charge***

As previously said, the WPC is designed to charge wirelessly compatible devices (Smart phones). A Smart Phone can be considered a compatible device for the WPC if it contains the Qi Technology for charging. This technology involves coils placed strategically on the rear side of the housing (or plate) phone.

### ***Charging the Compatible device***

Once the conditions are set is just a matter of placing the compatible device in the charging area and no later than 5 seconds the Compatible device shall indicate that charging is started. Radio Head Unit may display as well (depending of the configuration of the Head Unit) that there is a device placed and is charging.

## Charging Area

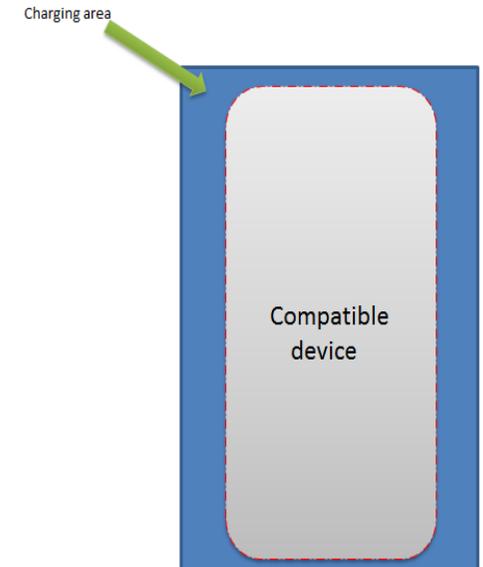
1. The Smart Phone (Compatible Device) shall be placed as much centered as can be in the charging area to initiate the charging, however the WPC has three coils (up-center-down) to start the charging even the device is not completely centered.

The charging area surface shall be parallel to the rear face of the Compatible device.

2. We control the 3 coils through the enable signal of coil top, coil center and coil bottom. Once the cellphone is put on the WPC surface, the WPC will detect and then choose only one coil from 3 coils (top, bottom, center) to charge for cellphone.

The selection of coil depends on the location of cellphone on WPC surface.

Coil center	Coil bottom	Coil top	Coil selection
0	0	1	Top coil enable
0	1	0	Bottom coil enable
1	0	0	Center coil enable
0	0	0	No coil selected



## Maintenance

As the WPC is not in the A surface of the vehicle and is considered a Slave in the network, there is no maintenance required for this product.

## Cautions and Restrictions

the WPC has the ability to stop charging if there is a foreign object between the phone and the charging surface area. Most of these objects are identified by the WPC but in general any object (specially ferromagnetic Objects) between the charging area and the Compatible device shall be avoided for the WPC to work normally.

Due to the wireless energy transferred is ok if the Phone and the charging surface may get hotter than the ambient temperature but the combined temperature registered by the WPC shall be less than 75°C. if this temperature is reached, the WPC will stop charging and will change back again when this combined temperature is below 60°C.

**This product is intended to be installed in a restricted access location to the end user and there is an additional Pad where the compatible device (phone) is placed. With this, product cannot be in contact directly with the end user.**

**There is an FAN module designed for WPC for lowering temperature when in charging mode. And the noise of FAN must be 30dB or less when noise is measured from 200mm above the cover.**

**Even after completing the attached durability test, the performance and noise standard of the FAN shall be satisfied.**

**The dark current of WPC is <1mA.**

### ***Troubleshooting guide***

Compatible Device not Charging -----Vehicle's engine not in the correct state.

Radio Head Unit does not enables WPC to start charging (Refer to the Vehicle Owners Manual for more information).

Phone is not a compatible device (Refer to the Phone user's manual).

Compatible Device not placed within the charging area.

The Ambient temperature in the vehicle interior is higher than 75°C.

**Charging distance: 3-10mm(the distance between Tx Coil to Rx Coil).**

Charging starts, then stops----- There is an object between the Compatible Device and the charging area mat.

Compatible device reached the 100% of charge.

The Ambient temperature in the vehicle interior is higher than 75°C.

**Charging distance: 3-10mm(the distance between Tx Coil to Rx Coil).**

The driver's door is opened while the car is running.

## **FCC/IC Regulatory notices**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### **RF exposure statement**

This equipment complies with radio frequency exposure limits set forth by the FCC for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20 cm between the device and the user or bystanders.

This device must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with radio frequency exposure limits set forth by the Innovation, Science and Economic Development Canada for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20 cm between the device and the user or bystanders.

This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiofréquences définies par la Innovation, Sciences et Développement économique Canada pour un environnement non contrôlé.

Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre le dispositif et l'utilisateur ou des tiers.

Ce dispositif ne doit pas être utilisé à proximité d'une autre antenne ou d'un autre émetteur.

***Other***

Importer Name: \_\_\_\_\_

Importer Address: \_\_\_\_\_