



Technical User Manual Version 5.0

23.07.2020

Harman Becker Automotive Systems GmbH

Wireless Charging Module

CPM-Ferrari

1.1. Contents

2.	Introduction Wireless Charging Module.....	4
2.1.	Intended usage	4
2.2.	Key Features	8
2.3.	User Guide	8
2.4.	Voltage Operating mode	9
2.5.	Frequencies and maximum radio-frequency power.....	9
3.	Picture of Wireless Charging Module.....	10
4.	Declaration of Conformity (DoC in short form)	12
4.1.	English:.....	12
4.2.	Bulgarian:.....	12
4.3.	Spanish:.....	12
4.4.	Czech:	12
4.5.	Danish:	12
4.6.	German:.....	12
4.7.	Estonian:.....	13
4.8.	Greek:.....	13
4.9.	French:	13
4.10.	Croatian:.....	13
4.11.	Italian:.....	13
4.12.	Latvian:.....	13
4.13.	Lithuanian:	13
4.14.	Hungarian:	13
4.15.	Maltese:.....	14
4.16.	Dutch:.....	14
4.17.	Polish:.....	14
4.18.	Portuguese:.....	14
4.19.	Romanian:.....	14
4.20.	Slovak:.....	14
4.21.	Slovenian:.....	14
4.22.	Finnish:.....	15
4.23.	Swedish:	15
4.24.	USA & Canada.....	15
4.25.	Manufacturer.....	17
5.	Certification information for other target markets	18
5.1.	Target market Argentina.....	18

CPM-Ferrari

5.2.	Target market BRAZIL	18
5.3.	Target market Israel	18
5.4.	Target market Korea.....	19
5.5.	Target market Malaysia	19
5.6.	Target market Russian Federation.....	20
5.7.	Target market South Africa	20
5.8.	Target market UKRAINE	20
5.9.	Target market Indonesia.....	21
5.10.	Target market Mexico	21
5.11.	Target market Oman	22
5.12.	Target market Philippines.....	22
5.13.	Target market Singapore	23
5.14.	Target market Thailand.....	23
5.15.	Target market Taiwan.....	24

Disclaimer

The information contained in this document is the proprietary information of Harman Becker Automotive Systems GmbH (HBAS) in the Connected Car Division of HARMAN.

HBAS makes every effort to ensure the quality of the information it makes available. Notwithstanding the foregoing, HBAS does not make any warranty as to the information contained herein, and does not accept any liability for any injury, loss or damage of any kind incurred by use of or reliance upon the information.

HBAS disclaims any and all responsibility for the application of the devices characterized in this document, and notes that the application of the device must comply with the SAFETY standards of the applicable country, and where applicable, with the relevant wiring rules.

HBAS reserves the right to make modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to programs and/or equipment at any time and without notice. Such changes will, nevertheless be incorporated into new editions of this document.

2. Introduction Wireless Charging Module

2.1. Intended usage

The WCM is an automotive wireless charger that provides all the basic functions of a Qi- compliant.



Figure 1 Example of WCM, isometric view

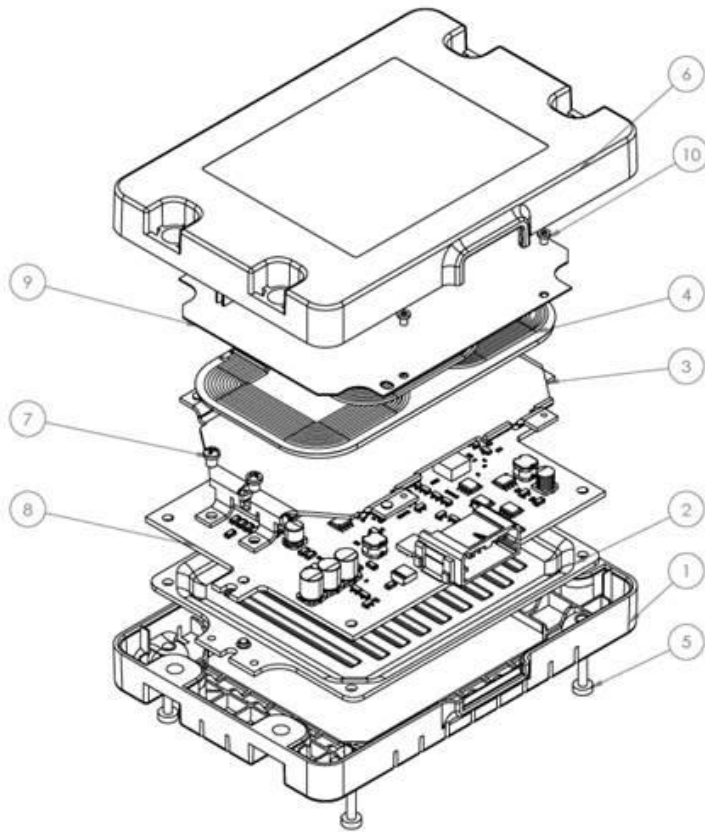


Figure 2 Example of WCM, exploded view

The WCM is composed by only one piece with the following components:

- No. 1 Cover
- No. 1 Heatsink
- No. 1 Coil with Coil support
- No. 1 Connector Molex type – 8 pins
- HW and SW with features described in the following paragraphs

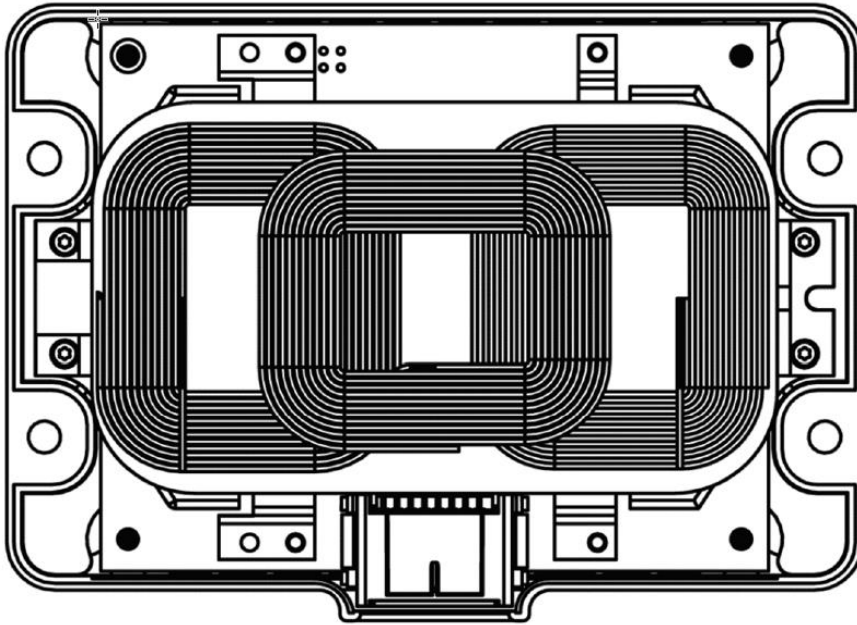


Figure 4 Internal Layout of the product (coils)

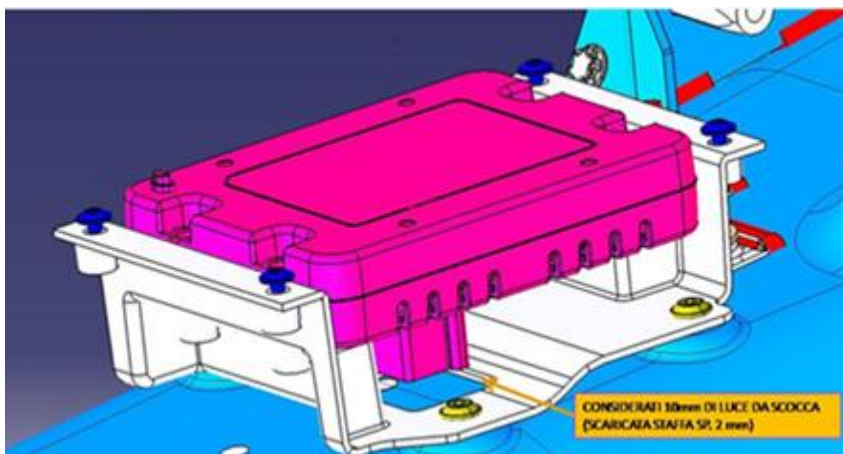


Figure 6 F169 Tunnel Integration

CPM-Ferrari

Suggested installation

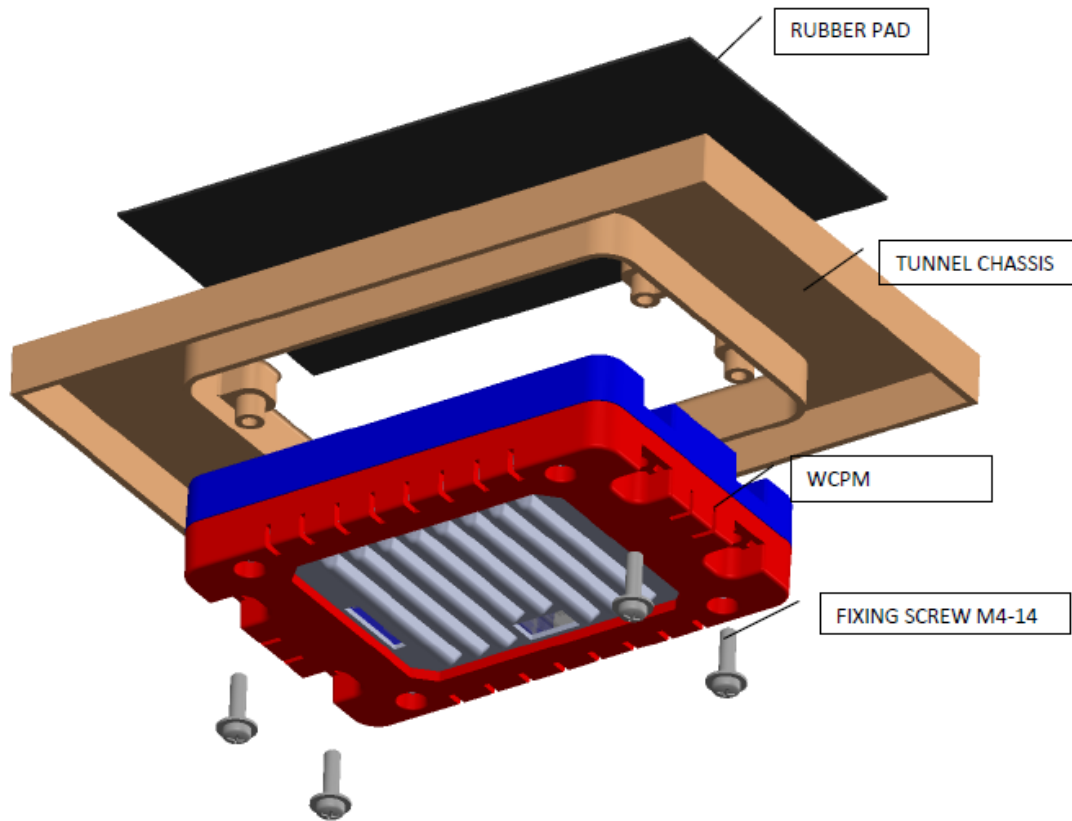


Figure 5 – Installation layout


- The board has three transmitting coils for the best transmitter - receiver coupling and position freedom. It embeds a smart interface that communicates with the most common automotive buses, continuously monitoring the charging status. It also features advanced Foreign Object Detection (FOD).
- The board is compatible with both low power (5W) and medium power (15W) WPC Qi standards yet supporting the most popular fast charge proprietary algorithms (Apple, Samsung).
- The wireless charger module is designed to work inside the car environment. The board combines the 15W wireless Qi position free transmitter, a rugged input power management circuit, fully compliant with the automotive standards, LED indicators (option only not implemented), and common vehicle communication buses in a single-compact printed-circuit board (PCB, 4 layers).

2.2 Key Features

- Free positioning with a three-array power transfer coils
- MP-A13 Qi Transmitter topology
- Enhanced Foreign Object Detection (FOD) with “open FOD”, detecting object before the power transfer, through coils Q-factor measurements.
- Customized charging profile depending on phone manufacturer:
- Samsung Fast Charge official compatibility (up to 10W)
- Apple Fast Charge (up to 7.5W)
- 15W charging capabilities (WPC mid-power)
- Wide input operating voltage (6-16V)
- Enhanced power supply management to ensure wireless charging during crank
- Unique Hardware Receiver ID detection for user recognition without NFC
- CISPR-25 Class 3 Compliance (15W), Class 4 (5W)
- Fixed frequency operation for the best compatibility with the vehicle

2.3 User Guide

- Place a supported mobile device on the charger. If your mobile device does not support wireless charging, attach the wireless charging cover to your mobile device.
- When the mobile device is fully charged, remove the mobile from wireless charger.

 Please use the Wireless Charger Module at a distance greater than 20 cm from human body

2.4 Voltage Operating mode

Accordingly to Supply Battery Voltage level the WCM shall activate the following features:

CPM-Ferrari

Voltage level	Communication	Wireless Charging
VBAT < 3V	Disabled	Disabled
3V < VBAT < 6V	Active	Disabled
6V < VBAT < 16V	Active	Active
VBAT > 16V	Disabled	Disabled

Loads Management :

Parameter	Condition	Min	Typ	Max	Unit
Input Voltage		6	12	18	V
Sleep mode current	VIN=12V		30	100	mA
Stand by current	VIN=12V			2	mA
Ping current	VIN=12V			182	mA
Average current	VIN=12V		73		mA
15W Charging	VIN=12V		1.75	2	A
Start-up peak current	VIN=12V			2.56	A

2.5 Frequencies and maximum radio-frequency power

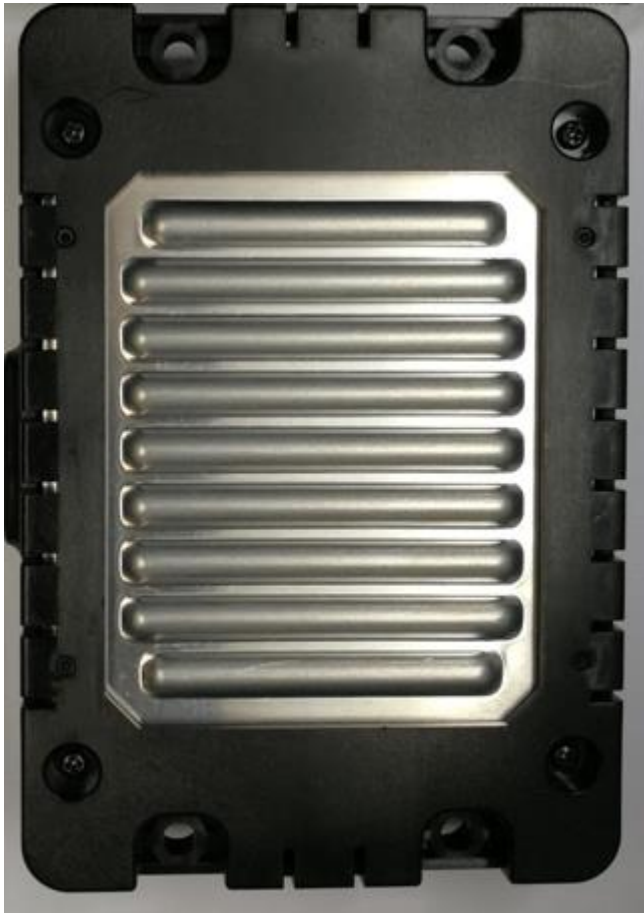
Frequency band(s) in which the radio equipment operates:

No	Frequency Range
1	120kHz
2	127.7 kHz

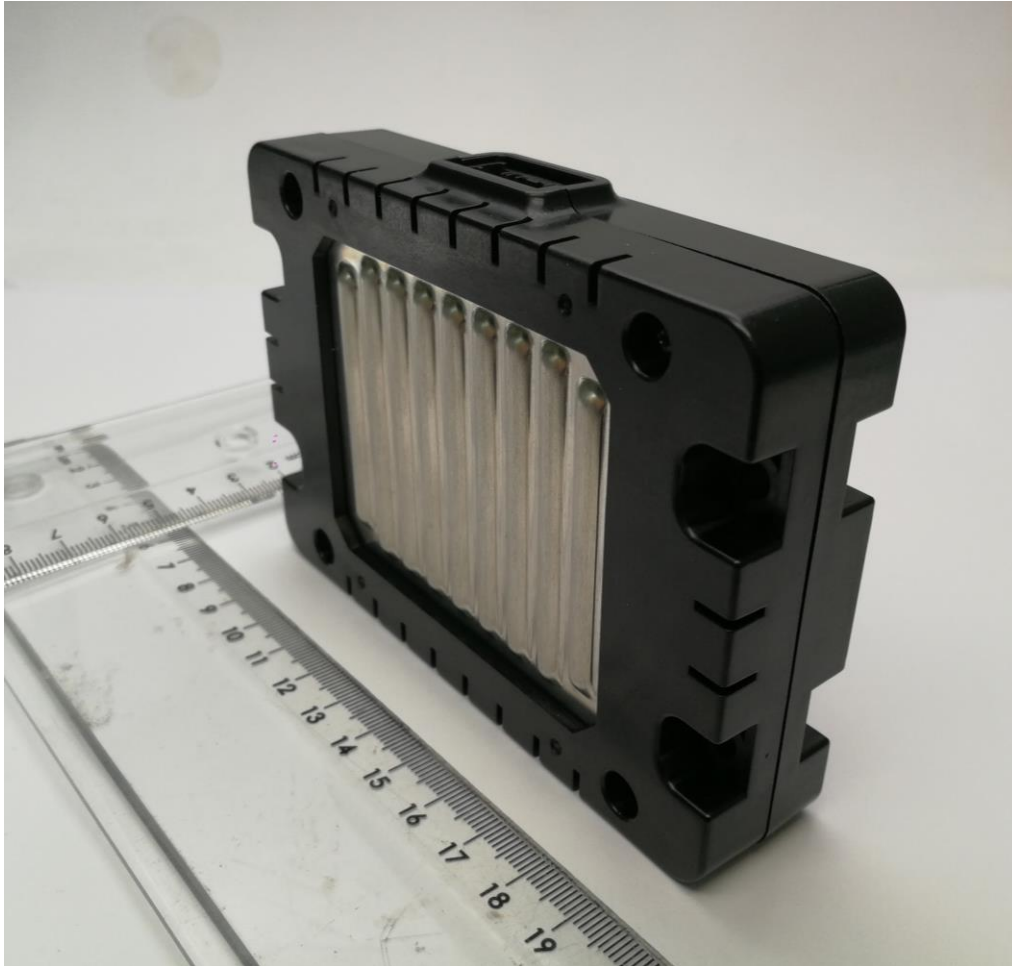
Maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates:

Frequency Range	
120kHz	15W
127.7 kHz	7.5W

3. Picture of Wireless Charging Module



CPM-Ferrari



4. Declaration of Conformity (DoC in short form)

All language versions of the EU



4.1. English:

Hereby, Harman Becker Automotive Systems GmbH declares that the radio equipment type **Wireless Charging Module** is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet Address: (*1)

4.2. Bulgarian:

С настоящото Harman Becker Automotive Systems GmbH декларира, че този тип радиосъоръжение **Wireless Charging Module** е в съответствие с Директива 2014/53/ЕС. Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес: (*1)

4.3. Spanish:

Por la presente, Harman Becker Automotive Systems GmbH declara que el tipo de equipo radioeléctrico **Wireless Charging Module** es conforme con la Directiva 2014/53/UE. El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente: (*1)

4.4. Czech:

Tímto Harman Becker Automotive Systems GmbH prohlašuje, že typ rádiového zařízení **Wireless Charging Module** je v souladu se směrnicí 2014/53/EU. Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese: (*1)

4.5. Danish:

Hermed erklærer Harman Becker Automotive Systems GmbH, at radioudstyrstypen **Wireless Charging Module** er i overensstemmelse med direktiv 2014/53/EU. EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse: (*1)

4.6. German:

Hiermit erklärt Harman Becker Automotive Systems GmbH, dass das Gerät mit Funkfunktion **Wireless Charging Module** der Richtlinie 2014/53/EU entspricht. Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar: (*1)

CPM-Ferrari

4.7. Estonian:

Käesolevaga deklareerib Harman Becker Automotive Systems GmbH, et käesolev raadioseadme tüüp **Wireless Charging Module** vastab direktiivi 2014/53/EL nõuetele. ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil: (*1)

4.8. Greek:

Με την παρούσα ο/η Harman Becker Automotive Systems GmbH, δηλώνει ότι ο ραδιοεξοπλισμός **Wireless Charging Module** πληροί την οδηγία 2014/53/ΕΕ. Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο: (*1)

4.9. French:

Le soussigné, Harman Becker Automotive Systems GmbH, déclare que l'équipement radioélectrique du type **Wireless Charging Module** est conforme à la directive 2014/53/UE. Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante: (*1)

4.10. Croatian:

Harman Becker Automotive Systems GmbH ovime izjavljuje da je radijska oprema tipa **Wireless Charging Module** u skladu s Direktivom 2014/53/EU. Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi: (*1)

4.11. Italian:

Il fabbricante, Harman Becker Automotive Systems GmbH, dichiara che il tipo di apparecchiatura radio **Wireless Charging Module** è conforme alla direttiva 2014/53/UE. Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet: (*1)

4.12. Latvian:

Ar šo Harman Becker Automotive Systems GmbH deklarē, ka radioiekārta **Wireless Charging Module** atbilst Direktīvai 2014/53/ES. Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē: (*1)

4.13. Lithuanian:

Aš, Harman Becker Automotive Systems GmbH, patvirtinu, kad radijo įrenginių tipas **Wireless Charging Module** atitinka Direktyvą 2014/53/ES. Visas ES atitikties deklaracijos teksto prieinamas šiuo interneto adresu: (*1)

4.14. Hungarian:

CPM-Ferrari

Harman Becker Automotive Systems GmbH igazolja, hogy a **Wireless Charging Module** típusú rádióberendezés megfelel a 2014/53/EU irányelvnek. Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen: 2014.5.22. L 153/104 Az Európai Unió Hivatalos Lapja HU: (*1)

4.15. Maltese:

B'dan, Harman Becker Automotive Systems GmbH, niddikjara li dan it-tip ta' tagħmir tar-radju **Wireless Charging Module** huwa konformi mad-Direttiva 2014/53/UE. It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej: (*1)

4.16. Dutch:

Hierbij verklaar ik, Harman Becker Automotive Systems GmbH, dat het type radioapparatuur **Wireless Charging Module** conform is met Richtlijn 2014/53/EU. De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres: (*1)

4.17. Polish:

Harman Becker Automotive Systems GmbH niniejszym oświadcza, że typ urządzenia radiowego **Wireless Charging Module** jest zgodny z dyrektywą 2014/53/UE. Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym: (*1)

4.18. Portuguese:

O(a) abaixo assinado(a) Harman Becker Automotive Systems GmbH declara que o presente tipo de equipamento de rádio **Wireless Charging Module** está em conformidade com a Diretiva 2014/53/UE. O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet: (*1)

4.19. Romanian:

Prin prezenta, Harman Becker Automotive Systems GmbH declară că tipul de echipamente radio **Wireless Charging Module** este în conformitate cu Directiva 2014/53/UE. Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet: (*1)

4.20. Slovak:

Harman Becker Automotive Systems GmbH týmto vyhlasuje, že rádiové zariadenie typu **Wireless Charging Module** je v súlade so smernicou 2014/53/EÚ. Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese: (*1)

4.21. Slovenian:

Harman Becker Automotive Systems GmbH potrjuje, da je tip radijske opreme **Wireless Charging Module** skladen z Direktivo 2014/53/EU. Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu: (*1)

CPM-Ferrari

4.22. Finnish:

Harman Becker Automotive Systems GmbH vakuuttaa, että radiolaitetyyppi **Wireless Charging Module** on direktiivin 2014/53/EU mukainen. EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa: (*1)

4.23. Swedish:

Härmed försäkras Harman Becker Automotive Systems GmbH att denna typ av radioutrustning **Wireless Charging Module** överensstämmer med direktiv 2014/53/EU. Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress: (*1)

4.24. USA & Canada

Modification statement

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Avertissement: les changements ou modifications apportés à cet appareil ne sont pas expressément approuvés par la partie responsable de la conformité pourrait annuler le droit de l'utilisateur à utiliser l'équipement.

Interference statement (if it is not placed in the device)

FCC ID: T8GWCME125

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.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

CPM-Ferrari

Déclaration d'interférence (si elle n'est pas placée dans l'appareil)

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Wireless notice

This device complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the ISED radio frequency (RF) Exposure rules. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Caution: To maintain the compliance with the RF exposure guideline, place the unit at least 10 cm from nearby persons.

Le présent appareil est conforme à l'exposition aux radiations FCC / ISED définies pour un environnement non contrôlé et répond aux directives d'exposition de la fréquence de la FCC radiofréquence (RF) et RSS-102 de la fréquence radio (RF) ISED règles d'exposition. L'émetteur ne doit pas être colocalisé ni fonctionner conjointement avec à autre antenne ou autre émetteur.

Attention: Pour maintenir la conformité aux directives d'exposition aux RF, placez l'appareil à au moins 10 cm de personnes proches.

FCC Class B digital device notice

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.

CPM-Ferrari

CAN ICES-3 (B) / NMB-3 (B)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de classe B est conforme à la norme canadienne ICES-003.

4.25. **Manufacturer**

Harman Becker Automotive Systems GmbH

Becker-Goering-Strasse 16
76307 Karlsbad,
Germany

5. Certification information for other target markets

5.1. Target market Argentina



CNC ID: XX-99999

5.2. Target market BRAZIL



Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário. Para maiores informações, consulte o site da ANATEL – www.anatel.gov.br

5.3. Target market Israel

אסוף להחליף את האנטנה המקורית של המכשיר, ולא לעשות בו כל שינוי טכני אחר
 מספר אישור אלחוטי של משרד התקשורת הוא XX-XXXXX

5.4. Target market Korea

사용자 안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

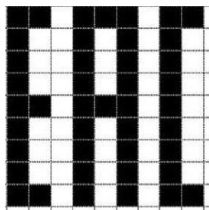


5.5. Target market Malaysia

CPM-Ferrari



5.6. Target market Russian Federation



5.7. Target market South Africa



5.8. Target market UKRAINE



5.9. Target market Indonesia

[certificate no.]
[PLG. ID no.]



Dilarang melakukan perubahan spesifikasi yang dapat menimbulkan gangguan fisik dan/atau elektromagnetik terhadap lingkungan sekitarnya

5.10. Target market Mexico

The user manual must be written in Spanish and contains sufficient, clear and true information and must not confuse the consumer in terms of Article 32 of the Federal Law of Consumer Protection (LFPC).

Article 32 of LFPC: The information or advertising for goods or services that are disseminated by any means or form, must be truthful, verifiable and free of texts, dialogues, sounds, images and other descriptions that lead or could lead to misleading or confusing to be incorrect.

According to the Mexican Official Standard 'NOM-024-SCFI-2013, Commercial Information for packaging, instructive and warranties of electronic, electrical and household appliances

CPM-Ferrari

products', which establishes requirements for products sold to the the final consumer, the user manual must include the following information in Spanish:

- a) Statement requesting the reading of the user's manual before to install or use the equipment (Leer el manual antes de instalar u operar)
- b) Name, address and contact telephone of the importer or Mexican manufacturer
- c) Brand name and model name of the equipment.
- d) Any warnings applicable to the installation and operation of the product and needed to protect the safety and health of the users.
- e) Clear instructions about the installation and operation of the equipment
- f) Electrical specifications: (voltage) Vca or Vcc, (frequency) Hz, (current) A, (power) W.

As a part of the user's manual or in a separate sheet, the supplier must provide to the users the warranty of the product which must comply with the Federal law for Protection of the Consumers (Ley Federal de Protección del Consumidor) and NOM-024-SCFI-2013. The warranty sheet must include the following minimum information:

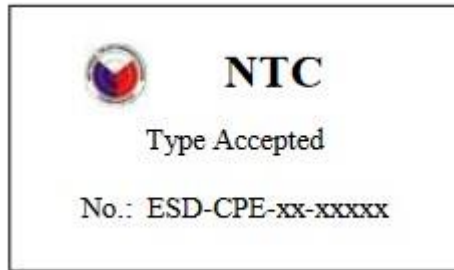
- a) Name and address of the importer or Mexican manufacturer responsible for the product.
- b) Brand name and model name of the product
- c) Name and address of the places where the warranty can be served.
- d) Name and address of the places where to acquire spare parts, consumables and accessories.
- e) Warranty period (not less than three months for electrical and electronic products and one year for electrical appliances)
- f) Items covered by the warranty and its possible limitations or exceptions
- g) Warranty procedure

5.11. Target market Oman

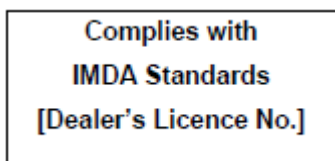


5.12. Target market Philippines

CPM-Ferrari



5.13. Target market Singapore



5.14. Target market Thailand

'เครื่องโทรคมนาคมและอุปกรณ์นี้มีความสอดคล้องตามมาตรฐานหรือข้อกำหนดทางเทคนิคของ กสทช.'



เครื่องวิทยุคมนาคมนี้ ได้รับยกเว้น ไม่ต้องได้รับ
ใบอนุญาตให้มี ใช้ซึ่งเครื่องวิทยุคมนาคม
หรือตั้งสถานีวิทยุคมนาคมตามประกาศ กสทช.
เรื่อง เครื่องวิทยุคมนาคม และสถานีวิทยุ
คมนาคมที่ได้รับยกเว้นไม่ต้องได้รับใบอนุญาต
วิทยุคมนาคม ตามพระราชบัญญัติวิทยุ
คมนาคม พ.ศ. 2498



nab. | โทรคมนาคม
กำกับดูแลเพื่อประชาชน
Call Center 1200 (Inswร้)

5.15. Target market Taiwan

第十二條： 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更通原計之特性及功能。

第十四條： 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。