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VERSION： V1.0

NAME：Model-Wireless charging

PRODUCT MODEL：WPC-15SN-21493

PRODUCTCODE：21493

FILE TYPE： ☐HW ☐SW ☐STRU■OTHER

☐TEST DOCUMENT ☐DESIGN DOCUMENT

SECRECY： ☐INTERNAL ■EXTERNAL ☐NO ALL

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APPROVE BY：ZHANGJUNYONG DATE： 2022-03-10

Document revision of resume

Num.	Ver.	Content	Date	Make BY	Remark
1	V1.0	first edition	2022/03/10	HUCHENG	

目录

1 Overview

1.1 Background

The content described in this document applies to Geely Auto V216 (WNSM) project。

1.2 Product function description

This product can provide charging service for wireless charger receiver that supports Qi standard, and starting the vehicle with NFC.

1.3 Product index function parameter

Num.	Technical index function	Design parameter value identification	Remark
1	Input voltage	9-16V	
2	Input current	2.5A(max)@12V	
3	output voltage	12V/5V	Output voltage: The output voltage at the receiving end
4	output current	1.25A（12V）	
		1A（5V）	
5	output power	15W(max)	Compatible with 5 w
6	Standby current	≤110mA(average current)	You can charge your phone by putting it on
7	Sleep current	＜0.1mA	
8	static current	NA	Is not a normal power supply does not do the requirement
9	System conversion efficiency	≥70%	Coil distance 4mm test
10	Effective charging distance	3～10mm	The distance is the distance between the transmitter coil and the receiver coil
11	Effective charging range	70*20mm	（Distance between transmitting and receiving coils7mm）
12	WPC Working frequency	127.7±10KHZ	65.69 dBuA/m @10m
13	NFC Working frequency	13.56MHz±10%	42 dBuA/m @10m
14	Working temperature	-35℃～+85℃	
15	Storage temperature	-40℃～+90℃	
16	Protection grade	IP52	
17	Qi certification	QI 1.2.4	
18	NFC communication protocol	ISO14443A	

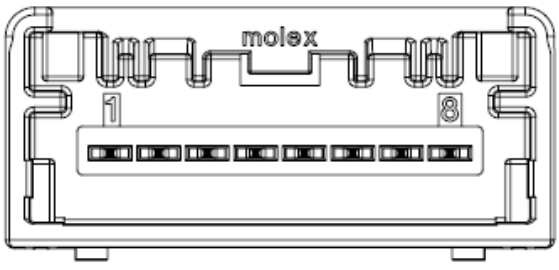
19	Protection function	Over temperature protection, over current protection, over voltage protection and under-voltage protection and other protection functions	

1.4 Connector model and interface definition

PCBConnector model	brand	Type of wire end connector	Brand
34793-0080	Molex	34791-0180	Molex

PINNum.	definition	Operating voltage	Operating current	Input/output	signal source
1	BAT-	GND	3A(max)	Input	Battery
2	CAN_H	2~4.5V	0.1A	I/O	Car
3	CAN_L	0.5~3V	0.1A	I/O	Car
4	NA	NA	NA	NA	
5	NA	NA	NA	NA	
6	NA	NA	NA	NA	
7	NA	NA	NA	NA	
8	BAT+	9～16V	3A(max)	Input	Battery

Connector diagram



1.5 Product design reference materials

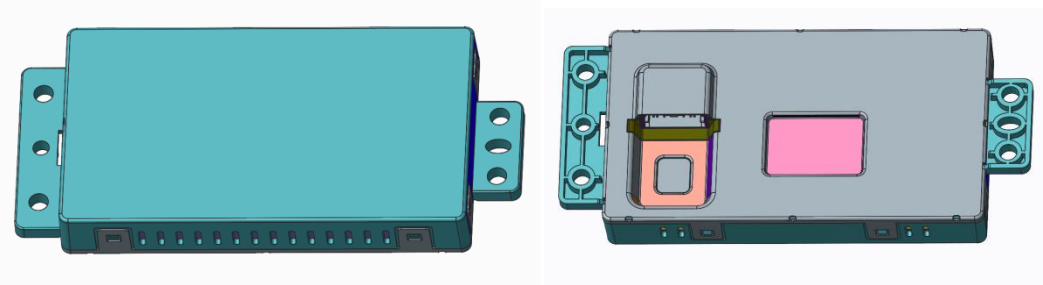
Normative reference documents	
Standard no.	name of the standard

ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
ISO 11452-1:2005/Amd.1:2009	Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 1: General principles and terminology
CISPR 25 3rd Ed	Limits and methods of measurement of radio disturbance characteristics for the protection of receivers used on board vehicles
SAE J551-5 Rev JAN2004	Performance Levels and Methods of Measurements of Magnetic and Electric Field Strength from Electric Vehicles, Broadband, 9 kHz To 30 MHz.
SAE J551-5 Rev MAY2012	Performance Levels and Methods of Measurements of Magnetic and Electric Field Strength from Electric Vehicles,Broadband, 150 kHz To 30 MHz.
MIL-STD-461F	United States Department of Defense Interface Standard, Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
ISO 11452-1-2005 and Amd 1:2008	Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 1: General principles and terminology
ISO 11452-2-2004	Road vehicles, Electrical disturbances by narrowband radiated electromagnetic energy - Component test methods Part 2 - Absorber-lined shielded enclosure
ISO 11452-4-2011	Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 4: Harness excitation methods
ISO 11452-8-2007	Road vehicles -- Component test methods for electrical disturbances from narrowband radiated electromagnetic energy -- Part 8: Immunity to magnetic fields
ISO 11452-9-2012	Road vehicles -- Component test methods for electrical disturbances from narrowband radiated electromagnetic energy -- Part 9: Portable transmitters
ISO 7637-1-2002 and Amd 1:2008	Road vehicles, Electrical disturbance by conduction and coupling Part 1 -Definitions and general considerations
ISO 7637-3-2007	Road vehicles, Electrical disturbance by conduction and coupling Part 3: Electrical transient transmission by capacitive and inductive coupling
ISO 10605-2008 and Cor 1:2010	Road vehicles - Test methods for electrical disturbances from electrostatic discharge
ISO 16750-4-2010	Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 4: Climatic loads

2 Product function description

2.1 Description of product structure

2.1.1 Appearance and requirements



The appearance should be clean and tidy, and there should be no dents, obvious scratches, cracks, deformations, burrs, mildew and other defects on the surface. Surface coating should not bubble, crack, fall off; Parts should be fastened without looseness.

2.1.2 Structural dimension/material/weight composition

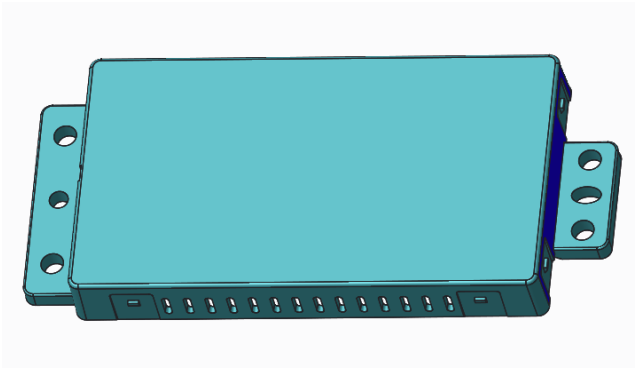
The main size of the wireless charging module (excluding the mounting foot and connector bulge) : 130*73*20mm (length * width * height).Overall size (including mounting feet and connector protrations) : 161*73*20mm (length * width * height).

The material, weight and quantity of materials used in the structure are shown in the following table:

NO.	name	material	weight (g)	quantity
1	Top cabinet	PC+ABS	34	1
2	Lower sink	SGCC	53	1
3	PCBA	Components	75	1
4	Shield	AL5052	29	1
5	Dam-board	PC+ABS	1	1
6	Triangle screw	C1018	1.5	4
7	Heat-conducting silica gel sheet	Thermal conductive silicone	2	2
Total weigh t	About200g			

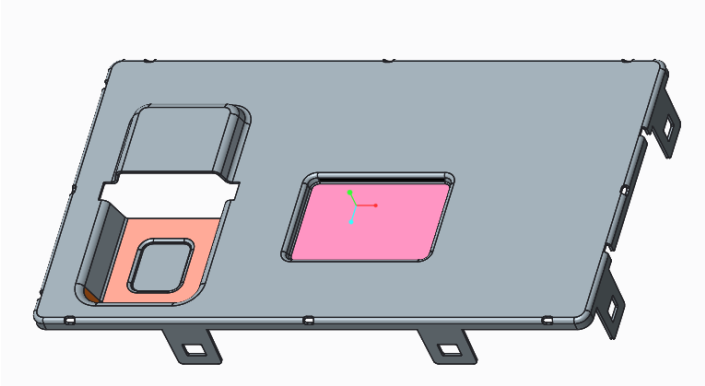
2.1.3 Top cabinet

PC+ABS material, matched with the lower shell to protect the internal structure of wireless charging.



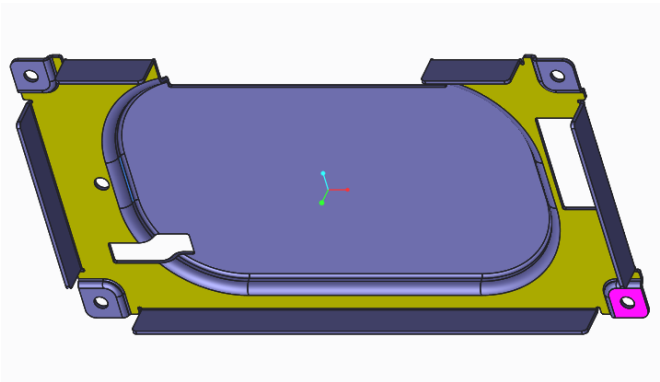
2.1.4 Lower sink

SGCC material is used to protect the wireless charging internal structure with the lower cover. It provides the installation frame, heat dissipation of the whole machine, IP protection for PCBA, and completes the coordination with the interior of the vehicle.



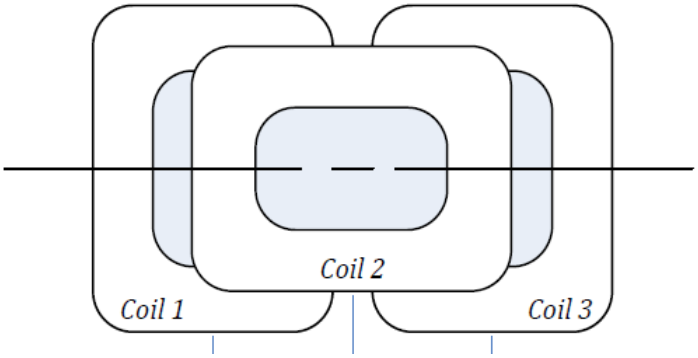
2.1.5 Shield

Provide support and paste surface for coil and strip separation disk assembly.



2.1.6 Coil with separation plate assembly

Function, material, molding process, performance, MP-A13 coil.



2.1.7 Description of waterproof and dustproof module

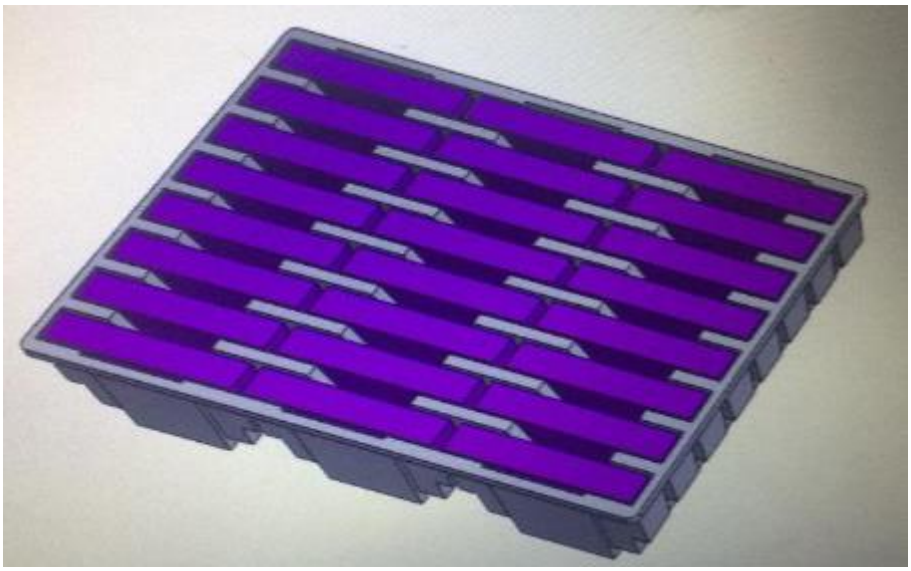
The flat upper cover and the lower shell are bonded by a snap structure, and the upper cover and the lower shell contact face to face, which plays a certain dust-proof and water-proof role.

2.1.8 Module installation instructions

After the module is located by two positioning columns on the interior panel, the remaining 4 holes are fastened by screwing in self-tapping screws.

3 Product packaging instructions

The specific packaging requirements entered by the customer shall prevail. If there is no mandatory requirement, the packing form is suggested to follow the general scheme of pulp mold and vertical insert as shown below. The outer packing carton is in the form of 0201 carton.



Packing form (pulp mold)

Outer packing (Type 0201)

4 EU&UKCA declaration of conformity

Hereby, **Hefei Invispower Co.,Ltd** declares that the radio equipment Model-Wireless charging (model: WPC-15SN-21493) is in compliance with Directive 2014/53/EU.

Hereby, **Hefei Invispower Co.,Ltd** declares that the radio equipment Model-Wireless charging (model: WPC-15SN-21493) is in compliance with UK Radio Equipment Regulations (SI 2017/1206).

5 FCC and ISED

This device complies with part 15 of the FCC rules and with RSS-Gen,RSS-216 rules of Canada. 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.

Any changed or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC RF Radiation Exposure Statement: This equipment complies with FCC RF Radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Note: 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

IDéclaration d'avertissement ISED

Son fonctionnement est soumis aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquerd'interferences nuisibles, et

(2) Cet appareil doit accepter toute interference recue, y compris les interferences pouvant entrainerun fonctionnement indesirable.

Les changements ou modifications non expressement approuves par LG Vehicle Components Company pourraient annuler l'autorite de l'utilisateura utilizer l'equipement.

Déclaration d'exposition aux radiations RF de l'ISED: Cet équipement est conforme aux limites d'exposition aux rayonnements RF de l'ISED définies pour un environnement non contrôlé. Cet appareil et son antenne ne doivent pas être situés ou fonctionner conjointement avec une autre antenne ou un autre émetteur.

Cet équipement doit être installé pour fonctionner avec une distance minimale de 20cm entre le radiateuret

le corps de l'utilisateur final.