

# TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: TQ8-ADB14G5GG

Equipment Under Test : DISPLAY CAR SYSTEM  
Model Name : ADB14G5GG  
Variant Model Name : ADB15G5GG, ADB12G5GN, ADB12G5GL,  
ADB12G5MG, ADB12G5EG, ADB13G5EG,  
ADBC2G5UG, ADB12G5FN, ADB12G5EP,  
ADB13G5EP, ADBC2G5EP, ADB12G5DG  
ADBC2G5EP  
Applicant : Hyundai Mobis Co., Ltd.  
Manufacturer : Hyundai Mobis Co., Ltd.  
Date of Receipt : 2018.11.26  
Date of Test(s) : 2018.11.29 ~ 2018.12.03  
Date of Issue : 2018.12.26

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Murphy Kim

Date:

2018.12.26

Technical  
Manager:



Jungmin Yang

Date:

2018.12.26

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SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

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A4(210 mm x 297 mm)

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## 1. General Information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

-Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

-Designation number: KR0150

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Telephone : +82 31 688 0901

FAX : +82 31 688 0921

### 1.2. Details of Applicant

Applicant : Hyundai Mobis Co., Ltd.

Address : 203, Teheran-ro, Gangnam-gu, Seoul, South Korea, 06141

Contact Person : Choe, Seung-hoon

Phone No. : +82 31 260 0098

### 1.3. Details of Manufacturer

Company : Same as applicant

Address : Same as applicant

### 1.4. Description of EUT

Kind of Product	DISPLAY CAR SYSTEM
Model Name	ADB14G5GG
Variant Model Name	ADB15G5GG, ADB12G5GN, ADB12G5GL, ADB12G5MG, ADB12G5EG, ADB13G5EG, ADBC2G5UG, ADB12G5FN, ADB12G5EP, ADB13G5EP, ADBC2G5EP, ADB12G5DG, ADBC2G5EP
Power Supply	DC 14.4 V
Frequency Range	2 402 MHz ~ 2 480 MHz (Bluetooth)
Modulation Technique	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	79 channels (Bluetooth)
Antenna Type	pattern antenna
Antenna Gain	-0.05 dBi

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## 1.5. Test Report Revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL013191	2018.12.03	Initial
1	F690501/RF-RTL013191-1	2018.12.26	Revised the equipment under test

## 1.6. Information of Variant Models

Model Name		BT	RDS	GPS	AA/CP	DAB	Rear camera	AMP
Basic model	ADB14G5GG	O	X	O	O	X	O	O
Variant model	ADB15G5GG	O	O	O	O	X	O	O
	ADB12G5GN	O	X	O	O	X	O	O
	ADB12G5GL	O	X	O	O	X	O	O
	ADB12G5MG	O	X	O	O	X	O	O
	ADB12G5EG	O	X	O	O	X	O	O
	ADB13G5EG	O	O	O	O	X	O	O
	ADBC2G5UG	O	O	O	O	O	O	O
	ADB12G5FN	O	X	O	O	X	O	O
	ADB12G5EP	O	X	O	O	X	O	O
	ADB13G5EP	O	O	O	O	X	O	O
	ADBC2G5EP	O	O	O	O	O	O	O
	ADB12G5DG	O	X	O	O	X	O	O
	ADBC2G5EP	O	O	O	O	O	O	O

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## 2. RF Exposure Evaluation

### 2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1 500	-	-	f/300	6
1 500-100 000	-	-	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1 500	-	-	f/1500	30
<b>1 500-100 000</b>	-	-	<b>1.0</b>	<b>30</b>

#### 2.1.1. Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where  $P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$R$  = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

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## 2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data  
Test Mode : Normal Operation

## 2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

### - Maximum tune up tolerance

Frequency Range (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm <sup>2</sup> )	Limits (mW/cm <sup>2</sup> )
2 402 ~ 2 480	4	-0.05	0.000 494	1

### Note;

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dB i and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.

**- End of the Test Report -**

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