

# 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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## 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

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### 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

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

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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>

### 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

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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