

# TEST REPORT

of

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

FCC ID: TQ8-ACB41G5AN

Equipment Under Test : DISPLAY CAR SYSTEM

Model Name : ACB41G5AN

Variant Model Name : ACBB1G5AN

Applicant : Hyundai MOBIS Co., Ltd.

Manufacturer : Hyundai MOBIS Co., Ltd.

Date of Receipt : 2016.11.09

Date of Test(s) : 2016.11.22 ~ 2016.11.25

Date of Issue : 2016.12.21

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

Tested By:



Date:

2016.12.21

Demian Kim

Technical  
Manager:



Date:

2016.12.21

Alvin Kim

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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>

RTT5041-20(2015.10.01)(3)

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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

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>.

Phone No. : +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, 06141, Korea

Contact Person : Kwon, Heung-Chul

Phone No. : +82 31 260 2714

### 1.3. Description of EUT

<b>Kind of Product</b>	DISPLAY CAR SYSTEM
<b>Model Name</b>	ACB41G5AN
<b>Variant Model Name</b>	ACBB1G5AN
<b>Power Supply</b>	DC 14.4 V
<b>Frequency Range</b>	2 402 MHz ~ 2 480 MHz (Bluetooth)
<b>Modulation Technique</b>	GFSK, π/4DQPSK, 8DPSK
<b>Number of Channels</b>	79 channels
<b>Antenna Type</b>	Dielectric Chip Antenna
<b>Antenna Gain</b>	-0.10 dB i

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#### 1.4. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL010592	2016.11.28	Initial
1	F690501/RF-RTL010592-1	2016.12.21	Added note for RF Exposure Evaluation

#### 1.5. Information of Variant Model

Model Name	Information
ACB41G5AN	- Basic Model
ACBB1G5AN	- Same to basic model, but HD Radio is not supported.

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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
<u>1 500 – 100 000</u>	-	-	<u>1.0</u>	<u>30</u>

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

Where  $P_d$  = power density in  $\text{mW/cm}^2$

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

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = distance between observation point and center of the radiator in  $\text{cm}$

$P_d$  the limit of MPE,  $1 \text{ mW/cm}^2$ . 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

#### Bluetooth

##### - Maximum tune up tolerance

Channel	Channel Frequency (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> )
0	2 402	4	-0.10	0.000 488	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 6dBi 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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