

# TEST REPORT

of

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

FCC ID: TQ8-ACB10GWGG

1. Equipment Under Test : DIGITAL CAR AUDIO SYSTEM
2. Model Name : ACB10GWGG
3. Variant Model Name(s) : Refer to page 3
4. Applicant : Hyundai Mobis Co., Ltd.
5. Manufacturer : Hyundai Mobis Co., Ltd.
6. Date of Receipt : 2020.03.26
7. Date of Test(s) : 2020.04.12 ~ 2020.04.14
8. Date of Issue : 2020.04.20

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Tested by:



Jinhyoung Cho

Technical  
Manager:



Hyunchoe You

**SGS Korea Co., Ltd. Gunpo Laboratory**



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Report Number: F690501-RF-RTL000563

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## 1. General Information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, 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>.

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### 1.2. Details of Applicant

Applicant : Hyundai Mobis Co., Ltd.

Address : 203, Teheran-ro, Gangnam-gu, Seoul, South Korea, 135-977

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>	DIGITAL CAR AUDIO SYSTEM
<b>Model Name</b>	ACB10GWGG
<b>Variant Model Names</b>	ACB10GWDG, ACB11GWGG, ACB10GWGN, ACB10GWEG, ACB10GWEP, ACB11GWEP, AU210GWRP, ACB10GTMG, ACB11GTMG, ACB10GTMN, ACB10GTEG, ACB10GTEP, AU211GTEP, AU211GTFN, ACB11GTEP, ACB12GTEP
<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>	-0.01 dBi

### 1.5. Information of Variant Models

Model	Model Name	LOCAL	BT	UI	RDS	DAB	SXM	HD	HANDLE	FM/AM Code
Basic Model	ACB10GWGG	General	O	GEN	X	X	X	X	LHD	A1
Variant Models	ACB10GWDG	Domestic	O	GEN	X	X	X	X	LHD	A1
	ACB11GWGG	General	O	GEN	O	X	X	X	LHD	A1
	ACB10GWGN	General	O	GEN	X	X	X	X	LHD	A2
	ACB10GWEG	Europe	O	GEN	X	X	X	X	LHD	A1
	ACB10GWEP	Europe	O	GEN	X	X	X	X	LHD	A8
	ACB11GWEP	Europe	O	GEN	O	X	X	X	LHD	A8
	AU210GWRP	Russia	O	GEN	O	X	X	X	LHD	A8
	ACB10GTMG	Middle East	O	GEN	X	X	X	X	LHD	A1
	ACB11GTMG	Middle East	O	GEN	O	X	X	X	LHD	A1
	ACB10GTMN	Middle East	O	GEN	X	X	X	X	LHD	A2
	ACB10GTEG	Colombia	O	GEN	X	X	X	X	LHD	A5
	ACB10GTEP	Europe	O	GEN	X	X	X	X	LHD	A1
	AU211GTEP	Europe	O	GEN	X	X	X	X	LHD	A8
	AU211GTFN	Mexico	O	GEN	O	X	X	X	LHD	A2
	ACB11GTEP	Europe	O	GEN	O	X	X	X	LHD	A8
ACB12GTEP	Europe	O	GEN	O	O	X	X	LHD	A8	

CODE	BAND	FREQUENCY RANGE	STEP	LOCAL
A1	FM	87.5-108.0 MHz	100 kHz	DOM/GEN
	AM	531-1 602 kHz	9 kHz	
A2	FM	87.5-107.9 MHz	200 kHz	NA/GEN
	AM	530-1 710 kHz	10 kHz	
A3	FM	87.5-108.0 MHz	50 kHz	EU
	AM	522-1 620 kHz	9 kHz	
A4	FM	76.0-90.0 MHz	100 kHz	JAPAN
	AM	522-1 629 kHz	9 kHz	
A5	FM	87.5-107.9 MHz	100 kHz	COLOMBIA
	AM	530-1 710 kHz	10 kHz	
A6	FM	87.5-107.9 MHz	200 kHz	GUAM
	AM	531-1 701 kHz	9 kHz	
A7	FM	76.1-107.9 MHz	100 kHz	BRAZIL
	AM	530-1 710 kHz	10 kHz	
A8	FM	87.5-108.0 MHz	100 kHz	EU
	AM	522-1 620 kHz	9 kHz	



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**1.6. Test Report Revision**

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL000563	2020.04.20	Initial

## 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><u>1 500-100 000</u></b>	-	-	<b><u>1.0</u></b>	<b><u>30</u></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  $mW/cm^2$

$P_{out}$  = 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,  $1 mW/cm^2$ . 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.

**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 (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	-0.01	0.000 499	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.
- According to KDB 447498 D01 RF Exposure Guidance 4.1.d, Output Average Power to Antenna applied Maximum Tune up power considering tolerance.

**- End of the Test Report -**