

# TEST REPORT

of

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

FCC ID: TQ8- ACB10SKGG

Equipment Under Test : DIGITAL CAR AUDIO SYSTEM

Model Name : ACB10SKGG

Variant Model Names : ACB10SKMG, ACB11SKGG, ACB10SKGN, ACB10SKFN, ACB10SKBB, ACB10SKGE, ACB10SKEE, ACB11SKEE, ACB10SKRE, ACB12SKEE, ACB10SKTE, ACB11SKRE, ACB10SKGL

Applicant : Hyundai Mobis Co., Ltd.

Manufacturer : Hyundai Mobis Co., Ltd.

Date of Receipt : 2018.02.13

Date of Test(s) : 2018.02.28 ~ 2018.03.02

Date of Issue : 2018.03.05

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

Tested By:



Date:

2018.03.05

Nancy Park

Technical Manager:



Date:

2018.03.05

Hyunchae You

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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)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

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>.

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, South Korea

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	DIGITAL CAR AUDIO SYSTEM
Model Name	ACB10SKGG
Variant Model Name	ACB10SKMG, ACB11SKGG, ACB10SKGN, ACB10SKFN, ACB10SKBB, ACB10SKGE, ACB10SKEE, ACB11SKEE, ACB10SKRE, ACB12SKEE, ACB10SKTE, ACB11SKRE, ACB10SKGL
Power Supply	DC 14.4 V
Frequency Range	2 402 MHz ~ 2 480 MHz (Bluetooth)
Modulation Technique	GFSK, π/4DQPSK, 8DPSK
Number of Channels	79 channels
Antenna Type	Dielectric Chip Antenna
Antenna Gain	-0.10 dB i

### 1.5. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL012425	2018.03.05	Initial

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## 1.6. Information of Variant Models

Model Name		Region	Frequency	BT	Logic On	RDS	CAN	e-Call	CLOCK
Basic model	ACB10SKGG	General	A1	O	X	X	X	X	O
Variant models	ACB10SKMG	The Middle East	A1	O	X	X	X	X	O
	ACB11SKGG	South Africa / Tunisia	A1	O	X	O	X	X	O
	ACB10SKGN	General	A2	O	X	X	X	X	O
	ACB10SKFN	Mexico	A2	O	X	X	X	X	O
	ACB10SKBB	Brazil	A7	O	X	X	X	X	O
	ACB10SKGE	General	A8	O	X	X	X	X	O
	ACB10SKEE	Europe	A8	O	O	X	X	X	O
	ACB11SKEE	Europe	A8	O	O	O	X	X	O
	ACB10SKRE	Russia	A8	O	O	O	X	X	O
	ACB12SKEE	Europe	A8	O	O	O	O	O	O
	ACB10SKTE	Turkey	A8	O	O	O	O	O	O
	ACB11SKRE	Russia	A8	O	O	O	O	O	O
	ACB10SKGL	Colombia	A5	O	X	X	X	X	O

Frequency 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	
A5	FM	87.5-107.9 MHz	100 kHz	COLOMBIA
	AM	530-1 710 kHz	10 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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## 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

Operating 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	-0.10	0.000 488	1

Remark:

- The power density  $P_d$  (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1  $\text{mW/cm}^2$ .
- 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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