

# TEST REPORT

of

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

FCC ID: TQ8-ADB10VEGN

Equipment Under Test : DISPLAY CAR SYSTEM  
Model Name : ADB10VEGN  
Variant Model Name : ADB10VEMG, ADB10VEUG  
Applicant : Hyundai Mobis Co., Ltd.  
Manufacturer : Hyundai Mobis Co., Ltd.  
Date of Receipt : 2019.04.03  
Date of Test(s) : 2019.04.09 ~ 2019.05.07  
Date of Issue : 2019.05.14

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

Tested By:

  
\_\_\_\_\_  
Murphy Kim

Date:

2019.05.14

Technical  
Manager:

  
\_\_\_\_\_  
Jungmin Yang

Date:

2019.05.14

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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(2019.04.24)(1)

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)

- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 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

<b>Kind of Product</b>	DISPLAY CAR SYSTEM
<b>Model Name</b>	ADB10VEGN
<b>Variant Model Names</b>	ADB10VEMG, ADB10VEUG
<b>Power Supply</b>	DC 24 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 channel (Bluetooth)
<b>Antenna Type</b>	Dielectric Chip Antenna
<b>Antenna Gain</b>	-0.10 dB i

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## 1.5. Test Report Revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL013838	2019.05.07	Initial
1	F690501/RF-RTL013838-1	2019.05.14	Revised the FCC ID

## 1.6. Information of Variant Models

Model	Model Name	HMC PART NO.	MOBIS PART NO.	ADM	RDS	Front type
Basic Model	ADB10VEGN	96150-6D020	6D9615020	X	X	LHD
Variant Models	ADB10VEMG	96150-6D010	6D9615010	X	O	LHD
	ADB10VEUG	96150-6D030	6D9615030	O	O	RHD

Model	Model Name	Frequency	FM		AM	
			Frequency Range	Channel Space	Frequency Range	Channel Space
Basic Model	ADB10VEGN	A2	87.5 MHz ~ 107.9 MHz	200 kHz	530 MHz ~ 1 710 MHz	10 kHz
Variant Models	ADB10VEMG	A1	87.5 MHz ~ 108.0 MHz	100 kHz	531 MHz ~ 1 602 MHz	9 kHz
	ADB10VEUG	Australia	87.5 MHz ~ 108.0 MHz	100 kHz	530 MHz ~ 1 702 MHz	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

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	-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 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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