

# TEST REPORT

of

FCC Part 15 Subpart C §15.247

FCC ID: TQ8-ADB11S1GG

Equipment Under Test : DISPLAY CAR SYSTEM  
Model Name : ADB11S1GG  
Variant Model Names : ADB10S1GG, ADB10S1MG, ADB10S1GN, ADB10S1GE,  
ADB10S1EE, ADBC0S1EE, ADB10S1RE, ADB10S1GL,  
ADB10S1EG, ADB10S1UG, ADB12S1EE  
Applicant : Hyundai MOBIS Co., Ltd.  
Manufacturer : AUTONICS Co., Ltd.  
Date of Receipt : 2017.10.16  
Date of Test(s) : 2017.10.24 ~ 2017.11.02  
Date of Issue : 2017.11.02

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

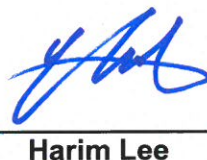
Tested By:

  
Jaeha Chung

Date:

2017.11.02

Technical  
Manager:

  
Harim Lee

Date:

2017.11.02

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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

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. Details of manufacturer

Company : AUTONICS Co., Ltd.

Address : 69-23, Hansam-ro, Deoksan-myeon, Jincheon-gun, Chungcheongbuk-do, 27850, Republic of Korea

### 1.4. Description of EUT

Kind of Product	DISPLAY CAR SYSTEM
Model Name	ADB11S1GG
Variant Model Name	ADB10S1GG, ADB10S1MG, ADB10S1GN, ADB10S1GE, ADB10S1EE, ADBC0S1EE, ADB10S1RE, ADB10S1GL, ADB10S1EG, ADB10S1UG, ADB12S1EE
Power Supply	DC 14.4 V
Frequency Range	2 402 MHz ~ 2 480 MHz (Bluetooth)
Modulation Technique	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	79 channels
Antenna Type	Dielectric Chip Antenna
Antenna Gain	-0.10 dBi

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## 1.5. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL011946	2017.11.02	Initial

## 1.6. Information of Variant models

Model name		H/W				S/W			Appearance	Note
		Bluetooth	USB/AUX	GPS	DAB Sub-mode	RDS	Voice Recognition	FM/AM BAND	Printing Specification	
Basic model	ADB11S1GG	O	O	X	X	O	X	General BAND(A1)	US English	96160-S1020
Variant model	ADB10S1GG	O	O	X	X	X	X	General BAND(A1)	US English	96160-S1010
	ADBC0S1EE	O	O	X	O	O	X	Europe BAND(A8)	UK English	96160-S1080
	ADB10S1MG	O	O	X	X	X	X	Middle East BAND(A1)	Arabic	96160-S1030
	ADB10S1GN	O	O	X	X	X	X	General BAND(A2)	US English	96160-S1040
	ADB10S1GE	O	O	X	X	X	X	General BAND(A8)	US English	96160-S1060
	ADB10S1EE	O	O	X	X	O	X	Europe BAND(A8)	UK English	96160-S1070
	ADB10S1RE	O	O	X	X	O	X	Russia BAND(A8)	UK English	96160-S1090
	ADB10S1GL	O	O	X	X	X	X	General BAND(A5)	US English	96160-S1100
	ADB10S1EG	O	O	X	O	O	X	Europe BAND(A8)	UK English	96160-S1120
	ADB10S1UG	O	O	X	O	O	X	Europe BAND(A8)	UK English	96160-S1130
	ADB12S1EE	O	O	X	O	O	X	Europe BAND(A8)	UK English	96160-S1140

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

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

### 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

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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