

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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INDEX

<u>Table of Contents</u>	Page
1. General Information -----	3
2. RF Exposure Evaluation -----	5

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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>

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

Fax No. : +82 31 688 0921

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 ²)	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 ²	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 ²	30
30 – 300	27.5	0.073	0.2	30
300 – 1 500	-	-	f/1500	30
1 500 – 100 000	-	-	1.0	30

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/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1 mW/cm². 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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RTT5041-19(2017.07.10)(0)

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

A4(210 mm x 297 mm)

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 ²)	Limits (mW/cm ²)
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/cm².
- 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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