

TEST REPORT



of

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

FCC ID: TQ8-ADB12D9GG

Equipment Under Test : DISPLAY CAR SYSTEM
Model Name : ADB12D9GG
Variant Model Names : ADB12D9GN, ADB12D9BN, ADB12D9GE,
ADB12D9GL, ADB12D9EG, ADB12D9EN,
ADB10F1EG, ADB10F1GG, ADB10F1MG
Applicant : Hyundai Mobis Co., Ltd.
Manufacturer : Hyundai Mobis Co., Ltd.
Date of Receipt : 2018.01.11
Date of Test(s) : 2018.01.23 ~ 2018.01.30
Date of Issue : 2018.01.30

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

Tested By:		Date:	2018.01.30
	_____		_____
	Jinhyoung Cho		
Technical Manager:		Date:	2018.01.30
	_____		_____
	Hyunhae You		

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

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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
- 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

Fax No. : +82 31 688 0921

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	DISPLAY CAR SYSTEM
Model Name	ADB12D9GG
Variant Model Names	ADB12D9GN, ADB12D9BN, ADB12D9GE, ADB12D9GL, ADB12D9EG, ADB12D9EN, ADB10F1EG, ADB10F1GG, ADB10F1MG
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	Pattern Antenna
Antenna Gain	-0.05 dB i

1.5. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL012334	2018.01.30	Initial

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1.6. Information of Variant Models

Model name		BT	DAB	RDS	E-CAII	E.AMP
Basic model	ADB12D9GG	O	X	X	X	Internal
Variant models	ADB12D9GN	O	X	X	X	Internal
	ADB12D9BN	O	X	X	X	Internal
	ADB12D9GE	O	X	X	X	Internal
	ADB12D9GL	O	X	X	X	Internal
	ADB12D9EG	O	X	X	X	Internal
	ADB12D9EN	O	X	X	X	Internal
	ADB10F1EG	O	X	O	X	Internal
	ADB10F1GG	O	X	O	X	Internal
	ADB10F1MG	O	X	X	X	Internal

Remark:

The variant model is added for marketing purpose.

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RTT5041-19(2017.07.10)(0)

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A4(210 mm x 297 mm)

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

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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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	-0.05	0.000 494	1

Remark :

- 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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