

MPE TEST REPORT

of

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

FCC ID : TQ8-AM1B1DPAN

Equipment Under Test : DIGITAL CAR AUDIO SYSTEM
Model Name : AM1B1DPAN(Alt.: AM1B0DPKN, AM110DMGG,
AM110DMGE, AM111DMGL, AM110DMGN,
AM110DPGN)
Applicant : Hyundai MOBIS Co., Ltd.
Manufacturer : Hyundai MOBIS Co., Ltd.
Date of Test(s) : 2015.02.10 ~ 2015.02.12
Date of Issue : 2015.03.13

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

Tested By:



Patrick Kang

Date:

2015.03.13

Approved By:



Hyunchoe You

Date:

2015.03.13

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.

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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, 435-837

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>.

Telephone : +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, 135-977, Korea

Contact Person : Choi, Seung-Hoon

Phone No. : +82 31 260 0098

1.3. Description of EUT

Kind of Product	DIGITAL CAR AUDIO SYSTEM
Model Name	AM1B1DPAN(Alt.: AM1B0DPKN, AM110DMGG, AM110DMGE, AM111DMGL, AM110DMGN, AM110DPGN)
Power Supply	DC 14.4 V (Vehicle Battery)
Frequency Range	2 402 MHz ~ 2 480 MHz
Modulation Technique	GFSK, π /4DQPSK, 8DPSK
Number of Channels	79 channels
Antenna Type	Internal Type
Antenna Gain	3.5 dB i

1.4. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL008435	2015.02.16	Initial
1	F690501/RF-RTL008435-1	2015.03.13	Modified alternative model names

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1.5. Alternative models

DM PE2 Audio B Type			H/W			S/W				
			B/T type	KNOB	NAND Capacity	Region	Frequency	Freq. RANGE	Freq. SPACE	VR
Basic Model	AM1B1DPAN	R+CD+MP3+BT+VR+XM	9552A2	General	1G	North America	9615A2	87.5 ~ 107.9 MHz 530 ~ 1 710 kHz	200 kHz 10 kHz	O
Alternative models	AM1B0DPKN	R+CD+MP3+BT+VR+XM	9552A1	General	1G	Canada	9615A2	87.5 ~ 107.9 MHz 530 ~ 1 710 kHz	200 kHz 10 kHz	O
	AM110DMGG	R+CD+MP3+BT	9552A1	Europe	1G	General	9615A1	87.5 ~ 108.0 MHz 531 ~ 1 602 kHz	100K kHz 9 kHz	X
	AM110DMGE	R+CD+MP3+BT	9552A1	Europe	1G	General	9615A3	87.5 ~ 108.0 MHz 522 ~ 1 620 kHz	50 kHz 9 kHz	X
	AM111DMGL	R+CD+MP3+BT	9552A1	Europe	1G	Colombia	9615A5	87.5 ~ 107.9 MHz 530 ~ 1 710 kHz	100 kHz 10 kHz	X
	AM110DMGN	R+CD+MP3+BT	9552A1	Europe	1G	General	9615A2	87.5 ~ 107.9 MHz 530 ~ 1 710 kHz	200 kHz 10 kHz	X
	AM110DPGN	R+CD+MP3+BT	9552A1	Europe	1G	Mexico	9615A2	87.5 ~ 107.9 MHz 530 ~ 1 710 kHz	200 kHz 10 kHz	X

*9552A1 : Not supporting bluetooth voice recognition

*9553A2 : Supporting bluetooth voice recognition

*VR : Voice Recognition

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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

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

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 /Control Exposures				
300 – 1 500	--	--	F/300	6
1 500 – 100 000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1 500	--	--	F/1500	30
<u>1 500 – 100 000</u>	--	--	<u>1</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 mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.141 6

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.

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

Channel	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	LIMITS (mW/cm ²)
Maximum tune up tolerance	4.00	3.50	0.001 119	1

Note :

1. 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.