MPE TEST REPORT

of

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

FCC ID: TQ8-AT240B1AN

Equipment Under Test	:	DIGITAL CAR AVNT SYSTEM
Model Name	:	AT240B1AN
Serial No.	:	N/A
Applicant	:	HYUNDAI MOBIS CO., LTD.
Manufacturer	:	HYUNDAI MOBIS CO., LTD.
Date of Test(s)	:	2013.01.15 ~ 2013.01.15
Date of Issue	:	2013.03.08

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

Tested By:	Logan Lee	**Date**	**2013.03.08**
Approved By:	Denny Ham	**Date**	**2013.03.08**

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SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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 31 428 5700
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1.2. Details of Applicant

Applicant : HYUNDAI MOBIS CO., LTD.
Address : 80-9, Mabook-Dong, Giheung-Gu, Yongin-shi, Gyunggi-Do, 446-912, South Korea
Contact Person : Kim, Jong-Tae
Phone No. : +82 31 260 0092

1.3. Description of EUT

Kind of Product	DIGITAL CAR AVNT SYSTEM
Model Name	AT240B1AN
Serial Number	N/A
Power Supply	DC 14.4 V (Vehicle Battery)
Frequency Range	2 412 ㎒ ~ 2 462 ㎒ (11b/g/n_HT20)
Modulation Technique	DSSS, OFDM
Number of Channels	11 channels (11b/g/n_HT20)
Antenna Type	Lead wire square type
Antenna Gain	2 412 ㎒ ~ 2 462 ㎒: 3.08 ㏈i

1.4. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL006156	Initial
1	F690501/RF-RTL006156-1	Added MPE data of maximum tune up tolerance
2	F690501/RF-RTL006156-2	Modified Revision No.

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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 (㎒)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (㎽/㎠)	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	6
1 500 – 100 000	**--**	**--**	**1**	**30**

2.1.1. Friis transmission formula: Pd = (Pout*G)/(4*pi*R^2)

Where Pd = power density in ㎽/㎠

Pout = output power to antenna in ㎽

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd the limit of MPE, 1 ㎽/㎠. 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

11b mode

Channel	Channel Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Low	2 412	13.96	3.08	0.010 063	1
Middle	2 437	14.46	3.08	0.011 291	1
High	2 462	15.15	3.08	0.013 235	1

Mode	Channel Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Maximum tune up tolerance	2 462	18.00	3.08	0.010 156	1

11g mode

Channel	Channel Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Low	2 412	9.62	3.08	0.003 705	1
Middle	2 437	10.15	3.08	0.004 185	1
High	2 462	10.10	3.08	0.004 137	1

Mode	Channel Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Maximum tune up tolerance	2 437	14.00	3.08	0.010 156	1

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11n mode

Channel	Channel Frequency (㎒)	Output Average Power to Antenna (㏈ m)	Antenna Gain (㏈ i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Low	2 412	9.56	3.08	0.003 654	1
Middle	2 437	9.87	3.08	0.003 924	1
High	2 462	10.67	3.08	0.004 718	1

Mode	Channel Frequency (㎒)	Output Average Power to Antenna (㏈ m)	Antenna Gain (㏈ i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Maximum tune up tolerance	2 462	14.00	3.08	0.010 156	1

Note :

1. The power density Pd (5th column) at a distance of 20 ㎝ calculated from the friis transmission formula is far below the limit of 1 ㎽/㎠.

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