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TEST REPORT

FCC MPE Test for ADB13H9AN&ADB13H9KN

Certification

APPLICANT
HYUNDAI MOBIS CO., LTD.

REPORT NO.
HCT-RF-1912-FI019

DATE OF ISSUE
December 27, 2019

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TEST REPORT

FCC MPE Test for ADB13H9AN& ADB13H9KN

REPORT NO.
HCT-RF-1912-FI019

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Additional Model
FCC: ADB43H9AN

Applicant	**HYUNDAI MOBIS CO., LTD.** 203, Teheran-ro, Gangnam-gu, Seoul, 135-977, South Korea
Eut Type Model Name	Car Audio System ADB13H9AN
FCC ID	TQ8-ADB13H9AN
Date of Receipt	November 11, 2019
Frequency range	2402 MHz - 2480 MHz (Bluetooth) 2 412 MHz ~ 2 462 MHz (WLAN) 5180 MHz - 5825 MHz (UNII)

This test results were applied only to the test methods required by the standard.

Tested by
Se Wook Park (signature)

Technical Manager
Jong Seok Lee (signature)

HCT CO., LTD.
Soo Chan Lee
SooChan Lee / CEO

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	December 27, 2019	Initial Release

The measurements shown in this report were made in accordance with the procedures specified in § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

RF Exposure Statement

1. Limit

According to § 1.1310, § 2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
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 - 1500	……...	……...	f/1500	30
1500 - 100.000	……...	……...	1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. Maximum Permissible Exposure Prediction

Prediction of MPE limit at a given distance

$$S = PG/4\pi R^2$$

S = Power density

P = Power input to antenna

G = Power gain to the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

3. RESULTS

3-1. Bluetooth

Average output Power at antenna input terminal	4.00	dBm
Average output Power at antenna input terminal	2.512	mW
Prediction distance	20.00	cm
Prediction frequency	2402 – 2480	MHz
Antenna Gain(typical)	-0.18	dBi
Antenna Gain(numeric)	0.959	-
Power density at prediction frequency(S)	0.0005	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

2.1091

EIRP	3.82	(dBm)
ERP	1.67	(dBm)
ERP	0.001	(W)
ERP Limit	3.00	(W)
MARGIN	33.10	(dB)

3-2. DTS

Average output Power at antenna input terminal	10.00	dBm
Average output Power at antenna input terminal	10.000	mW
Prediction distance	20.00	cm
Prediction frequency	2412 – 2462	MHz
Antenna Gain(typical)	-0.01	dBi
Antenna Gain(numeric)	0.998	-
Power density at prediction frequency(S)	0.0020	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

2.1091

EIRP	9.99	(dBm)
ERP	7.84	(dBm)
ERP	0.006	(W)
ERP Limit	3.00	(W)
MARGIN	26.93	(dB)

3-3. UNII

Average output Power at antenna input terminal	10.00	dBm
Average output Power at antenna input terminal	10.000	mW
Prediction distance	20.00	cm
Prediction frequency	5180 - 5825	MHz
Antenna Gain(typical)	-0.18	dBi
Antenna Gain(numeric)	0.959	-
Power density at prediction frequency(S)	0.0019	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

2.1091

EIRP	9.82	(dBm)
ERP	7.67	(dBm)
ERP	0.006	(W)
ERP Limit	3.00	(W)
MARGIN	27.10	(dB)

3-4. CDMA BC0

Average output Power at antenna input terminal	25.00	dBm
Average output Power at antenna input terminal	316.23	mW
Prediction distance	20.000	cm
Prediction frequency	824-849	MHz
Cable Loss	-1.71	dB
Antenna Gain(typical)	2.800	dBi
Antenna Gain(numeric)	1.905	-
Power density at prediction frequency(S)	0.11988	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.549	mW/cm^2

2.1091

EIRP	27.8	(dBm)
ERP	25.65	(dBm)
ERP	0.37	(W)
ERP Limit	1.50	(W)
MARGIN	6.11	(dB)

3-5. CDMA BC1

Average output Power at antenna input terminal	25.00	dBm
Average output Power at antenna input terminal	316.23	mW
Prediction distance	20.000	cm
Prediction frequency	1850-1910	MHz
Cable Loss	-3.300	dB
Antenna Gain(typical)	5.230	dBi
Antenna Gain(numeric)	3.334	-
Power density at prediction frequency(S)	0.20976	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

2.1091

EIRP	30.23	(dBm)
ERP	28.08	(dBm)
ERP	0.643	(W)
ERP Limit	3.00	(W)
MARGIN	6.69	(dB)

3-6. LTE B4

Average output Power at antenna input terminal	24.00	dBm
Average output Power at antenna input terminal	251.19	mW
Prediction distance	20.000	cm
Prediction frequency	1710-1755	MHz
Cable Loss	-3.300	dB
Antenna Gain(typical)	3.960	dBi
Antenna Gain(numeric)	2.489	-
Power density at prediction frequency(S)	0.12437	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

2.1091

EIRP	27.96	(dBm)
ERP	25.81	(dBm)
ERP	0.38	(W)
ERP Limit	3.00	(W)
MARGIN	8.96	(dB)

3-7. LTE B13

Average output Power at antenna input terminal	24.00	dBm
Average output Power at antenna input terminal	251.19	mW
Prediction distance	20.000	cm
Prediction frequency	777-787	MHz
Cable Loss	-1.710	dB
Antenna Gain(typical)	1.380	dBi
Antenna Gain(numeric)	1.374	-
Power density at prediction frequency(S)	0.06866	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.518	mW/cm^2

2.1091

EIRP	25.38	(dBm)
ERP	23.23	(dBm)
ERP	0.21	(W)
ERP Limit	1.50	(W)
MARGIN	8.53	(dB)

3-8. LTE B5

Average output Power at antenna input terminal	24.00	dBm
Average output Power at antenna input terminal	251.19	mW
Prediction distance	20.000	cm
Prediction frequency	824-849	MHz
Cable Loss	-1.71	dB
Antenna Gain(typical)	2.800	dBi
Antenna Gain(numeric)	1.905	-
Power density at prediction frequency(S)	0.09522	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.549	mW/cm^2

2.1091

EIRP	26.80	(dBm)
ERP	24.65	(dBm)
ERP	0.29	(W)
ERP Limit	1.50	(W)
MARGIN	7.11	(dB)

3-9. LTE B2

Average output Power at antenna input terminal	24.00	dBm
Average output Power at antenna input terminal	251.19	mW
Prediction distance	20.000	cm
Prediction frequency	1850-1910	MHz
Cable Loss	-3.300	dB
Antenna Gain(typical)	5.23	dBi
Antenna Gain(numeric)	3.334	-
Power density at prediction frequency(S)	0.16662	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

2.1091

EIRP	29.23	(dBm)
ERP	27.08	(dBm)
ERP	0.51	(W)
ERP Limit	3.00	(W)
MARGIN	7.69	(dB)

Worst Case: Simultaneous MPE 20cm is

5G WLAN (0.0019) +BT (0.0005) + CDMA BC0 (0.1199/0.549) + LTE B5 (0.0952/0.549) = 0.3942 < 1