

TEST REPORT

of

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

FCC ID: 2AK63RMCU-COMPACT

Equipment Under Test : RMCU
Model Name : RMCU-COMPACT
Applicant : HYUNDAI BS&C Co., Ltd.
Manufacturer : HYUNDAI BS&C Co., Ltd.
Date of Receipt : 2017.02.06
Date of Test(s) : 2017.02.24 ~ 2017.04.26
Date of Issue : 2017.06.14

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

Tested By:



Jinhyoung Cho

Date:

2017.06.14

Technical
Manager:



Hyunchae You

Date:

2017.06.14

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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>

RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

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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, 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

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1.2. Details of applicant

Applicant : HYUNDAI BS&C Co., Ltd.

Address : Adora Tower 2F, 272, Toegye-ro, Jung-gu, Seoul

Contact Person : Lee, Han

Phone No. : +82 70 8277 7285

1.3. Description of EUT

Kind of Product	RMCU
Model Name	RMCU-COMPACT
Approved Module	LISA-U200 (FCC ID : XPYLISAU200)
Power Supply	DC 12 V, DC 24 V
Frequency Range	GSM 850 : 824 MHz ~ 849 MHz GSM 1 900 : 1 850 MHz ~ 1 910 MHz WCDMA 2 : 1 850 MHz ~ 1 910 MHz WCDMA 5 : 824 MHz ~ 849 MHz
Antenna Gain	824 MHz ~ 849 MHz : -0.06 dB i 1 850 MHz ~ 1 910 MHz : -3.91 dB i

1.4. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL011347	2017.05.25	Initial
1	F690501/RF-RTL011347-1	2017.06.14	Changed antenna gain

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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
<u>300 – 1 500</u>	-	-	<u>f/1500</u>	<u>30</u>
<u>1 500 – 100 000</u>	-	-	<u>1.0</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 = 3.1416

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

Power Index table

1. Maximum output Power (Target Power, Tolerance)

	Target Power [dBm]	Tolerance [dB]
WCDMA B2,B5	23	±2.0
GSM850	32.5	+1.5/-1.5
PCS1900	29.5	+2.5/-1.5

WCDMA Band 2

- Maximum tune up tolerance

Channel	Channel 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)
9400	1 880.0	25	-3.91	0.025 570	1

WCDMA Band 5

- Maximum tune up tolerance

Channel	Channel 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)
4132	826.4	25	-0.06	0.062 048	0.550 933

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GSM 850
- Maximum tune up tolerance

Channel	Channel 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)
128	824.2	34	-0.06	0.492 867	0.549 467

GSM 1 900
- Maximum tune up tolerance

Channel	Channel 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)
512	1 850.2	32	-3.91	0.128 153	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.

- End of the Test Report -

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