ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: OT-18D-RWD-014**
AGR No	**: A187A-351**
Applicant	**: BROS&COMPANY INC.**
Address	**: A-101, InnoValley, 253, Pangyo-ro,Bundang-gu, Seongnam-si, Gyeonggi-do, Korea**
Manufacturer	**: Shenzhen Hongbo Innovation Co.,Ltd**
Address	**: 4F, D, Xinshida Gongrong Distration, Shiyan Street, Baoanqu, Shenzhen, Guangdong, China**
Type of Equipment	**: HANDS3**
FCC ID.	**: 2AQISPOUT-00801**
Model Name	**: POUT-00801**
Multiple Model Name	**: N/A**
Serial number	**: N/A**
Total page of Report	**: 19 pages (including this page)**
Date of Incoming	**: August 23, 2018**
Date of issue	**: December 10, 2018**

SUMMARY

The equipment complies with the regulation; **FCC CFR47 Part 15 Subpart C Section 15.207 and 15.209**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by: Jae-Ho, Lee / Chief Engineer
ONETECH Corp.

Approved by: Keun-Young, Choi / Vice President
ONETECH Corp.

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Revision History

Issue Report No.	Issued Date	Revisions	Effect Section
OT-18D-RWD-014	December 10, 2018	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: BROS&COMPANY INC.
ADDRESS	: A-101, InnoValley, 253, Pangyo-ro,Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
CONTACT PERSON	: KIYEOL PARK / CEO
TELEPHONE NO	: +82-31-286-8646
FCC ID	: 2AQISPOUT-00801
MODEL NAME	: POUT-00801
BRAND NAME	: N/A
SERIAL NUMBER	: N/A
DATE	: December 10, 2018

EQUIPMENT CLASS	**FCC: DCD – Part 15 Low Power Transmitter Below 1 705 kHz**
KIND OF EQUIPMENT	HANDS3
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC&IC RULES PART(S)	FCC CFR47 Part 15 Subpart C Section 15.207 and 15.209
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC&IC Rules and Regulations. The equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.209, 15.209(a)	Radiated emission, Spurious Emission and Field Strength of Fundamental	Met the Limit / PASS
2.1049	20 dB Bandwidth	Met the Limit / PASS
15.207	Transmitter AC Power Line Conducted Emission	N / A

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC CFR47 Part 15 Subpart C Section 15.207 and 15.209, 2.1049 and IC RSS-Gen Issue 4 and RSS-216 Issue 2.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.10: 2013 at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 301-14, Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862 Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-4617/ G-666/ T-1842

IC (Industry Canada) – Registration No. Site# 3736-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

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3. GENERAL INFORMATION

3.1 Product Description

The BROS&COMPANY INC., Model: POUT-00801 (referred to as the EUT in this report) is a HANDS3. Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Wireless Charger
OPERATING FREQUENCY	110 kHz ~ 205 kHz
RATED RF OUTPUT POWER	55.10 dBμV/m
ANTENNA TYPE	Coil Antenna
MODULATION	ASK
LIST OF EACH OSC. OR CRY. FREQ.(FREQ. >= 1 MHz)	110 kHz ~ 205 kHz
RATED SUPPLY VOLTAGE	DC 5.0 V

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None

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5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	N/A	N/A

5.2 Peripheral equipment

Model	Manufacturer	Description	Connected to
N/A	N/A	DUMMY load	N/A

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at Max. load (115 kHz), Mid. load (115 kHz), and Min. load (115 kHz). To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

Mode	Charging current	Description
Charging Mode With load	1 000 mA	Using Max. load
	500 mA	Using Mid. load
	100 mA	Using Min. load

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5.4 Configuration of Test System

Line Conducted Test **:** The EUT was tested in a charging mode. The EUT was connected to USB and the power of USB was connected to Adapter. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2009 7.3.3 to determine the worse operating conditions.

Radiated Emission Test **:** Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

According to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is a Coil Antenna on the main board in the EUT, so no consideration of replacement by the user.

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6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

As this product is only using DC power, AC conducted emission test has not been performed.

6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

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8. 20 dB BANDWIDTH

8.1 Operating environment

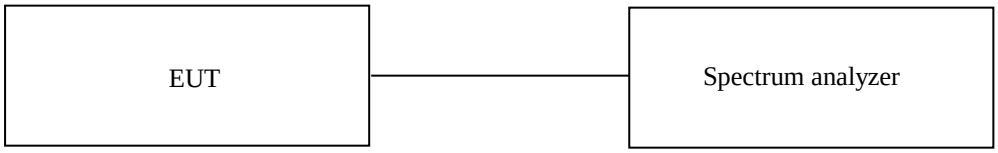
Temperature : 24 ℃

Relative humidity : 46 % R.H.

8.2 Test set-up

a. Span = approximately 2 to 3 times the 20 dB bandwidth, RBW = greater than 1 % of the 20 dB bandwidth, VBW = RBW, Sweep = auto, Detector = peak, Trace = max hold.

b. The marker-to-peak function to set the mark to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level.
The marker-delta reading at this point is 20 dB bandwidth of the emission.

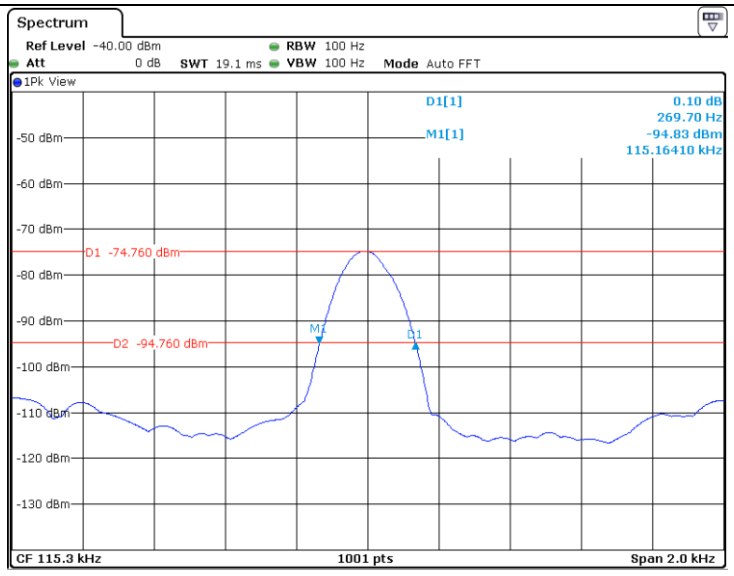


8.3 Test data for 5V

Test Date : September 19, 2018

Frequency : 115.3 KHz

20 dB Bandwidth : 269.7 Hz



Tested by: Min-Gu, Ji / Project Engineer

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9. Spurious Emission Test

9.1 Regulation

According to §15.209(a), for an intentional device, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency [MHz]	Field strength [μ V/m]	Field strength [dBμ V/m]	Measurement distance [m]
0.009 ~ 0.490	2 400 / F (kHz)		300
0.490 ~ 1.705	24 000 / F (kHz)		30
1.705 ~ 30	30	29.50	30
30 ~ 88	*100	40.00	3
88 ~ 216	*150	43.52	3
216 ~ 960	*200	46.02	3
Above 960	500	53.98	3

*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 ~ 72 MHz, 76 ~ 88 MHz, 174 ~ 216 MHz or 470 ~ 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

9.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 kHz to 1 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 ms in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

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9.3 Test data for Using Max load (1 000 mA)

9.3.1 Spurious Radiated Emission Below 30 MHz

Humidity Level : 46 % R.H. Temperature: 24 ℃

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency Range : 9 kHz ~ 30 MHz

Result : PASSED

EUT : HANDS3 Date: September 18, 2018

Operating Condition : Transmitting Mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
0.016	10.4	H	19.00	0.1	29.50	123.52	94.02
0.034	15.3	H	19.40	0.1	34.80	116.97	82.17
0.068	20.1	H	19.40	0.1	39.60	110.95	71.35
0.115	35.6	H	19.40	0.1	55.10	106.39	51.29
0.389	23.2	H	19.40	0.1	42.71	95.81	53.10
26.09	32.1	H	20.30	0.8	53.20	70.00	16.80

-. Remark: “H” Horizontal, “V” Vertical

-. “*” Means Fundamental frequency

-. Emission Level [dB μ V/m] = Reading [dBμV] + Ant. Factor [dB/m] + Cable Loss [dB]

-. Margin [dB] = Emission Level [dBμV/m] – Limit [dBμV/m]

-. Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz

Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz, Below 30 MHz

Tested by: Min-Gu, Ji / Project Engineer

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9.3.2 Spurious Radiated Emission below 1 GHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 46 % R.H. Temperature: 24 ℃

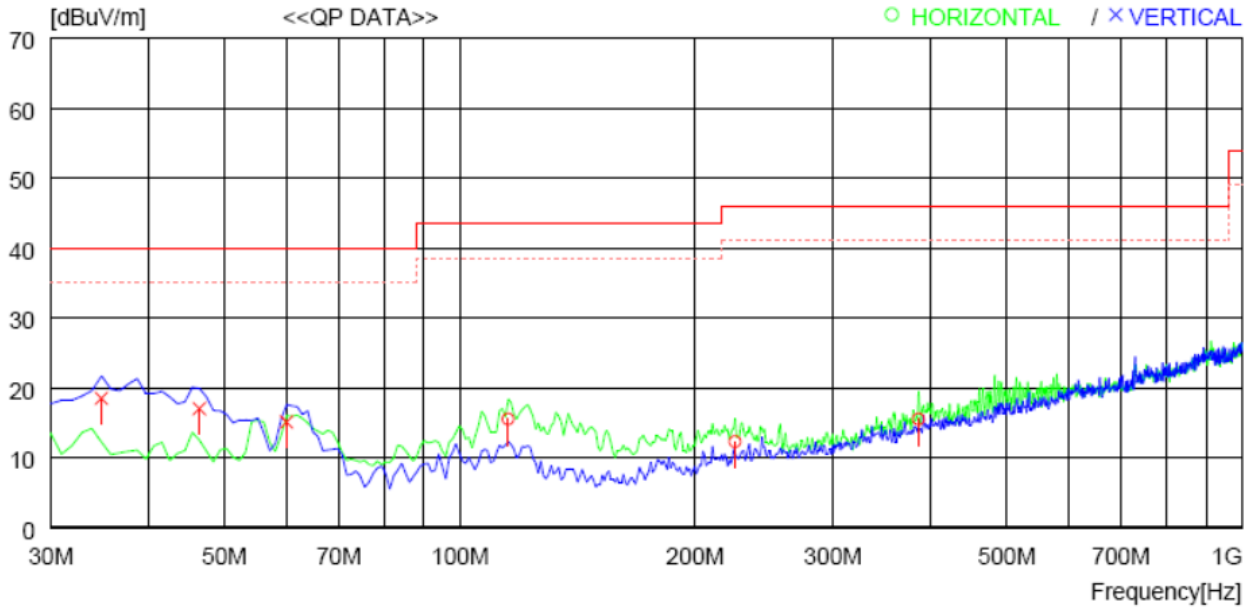
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency range : 30 MHz ~ 1 000 MHz

Result : PASSED

EUT : HANDS3 Date: September 18, 2018

Operating Condition : Transmitting Mode



No.	FREQ	READING QP	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal ------										
1	115.360	34.7	11.3	2.5	33.0	15.5	43.5	28.0	300	84
2	224.970	30.2	11.6	3.4	32.9	12.3	46.0	33.7	200	0
3	385.990	28.6	15.5	4.5	33.1	15.5	46.0	30.5	100	359
----- Vertical ------										
4	34.850	37.6	12.6	1.4	33.1	18.5	40.0	21.5	100	236
5	46.490	34.5	14.0	1.6	33.1	17.0	40.0	23.0	100	275
6	60.070	33.2	13.2	1.8	33.1	15.1	40.0	24.9	100	0

Tested by: Min-Gu, Ji / Project Engineer

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9.4 Test data for Using Mid. load (500 mA)

9.4.1 Spurious Radiated Emission Below 30 MHz

Humidity Level : 46 % R.H. Temperature: 24 ℃

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency Range : 9 kHz ~ 30 MHz

Result : PASSED

EUT : HANDS3 Date: September 18, 2018

Operating Condition : Transmitting Mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
0.016	9.8	H	19.00	0.1	28.90	123.52	94.62
0.031	16.3	H	19.40	0.1	35.80	117.78	81.98
0.076	18.7	H	19.40	0.1	38.20	109.99	71.79
0.115	31.6	H	19.40	0.1	51.05	106.39	55.34
0.367	22.1	H	19.40	0.1	41.63	96.31	54.68
25.7	30.1	H	20.30	0.8	51.20	70.00	18.80

-. Remark: “H” Horizontal, “V” Vertical

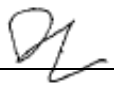
-. “*” Means Fundamental frequency

-. Emission Level [dB μ V/m] = Reading [dBμV] + Ant. Factor [dB/m] + Cable Loss [dB]

-. Margin [dB] = Emission Level [dBμV/m] – Limit [dBμV/m]

-. Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz

Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz, Below 30 MHz



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9.4.2 Spurious Radiated Emission below 1 GHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 46 % R.H. Temperature: 24 ℃

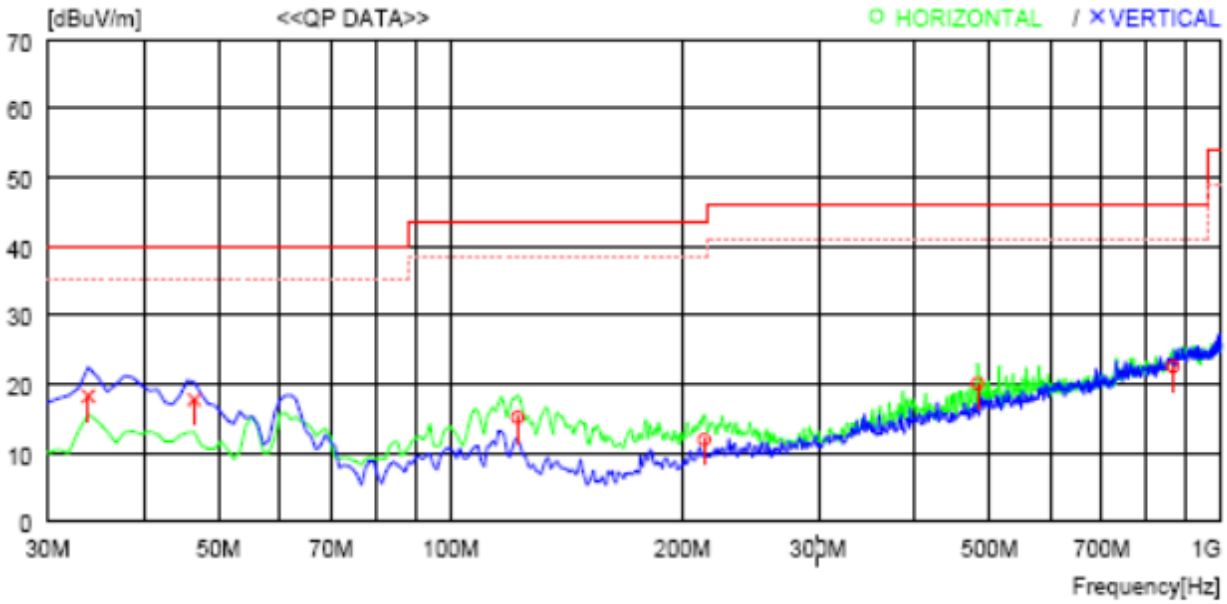
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency range : 30 MHz ~ 1 000 MHz

Result : PASSED

EUT : HANDS3 Date: September 18, 2018

Operating Condition : Transmitting Mode



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	122.150	35.5	**10.1**	2.5	33.0	15.1	43.5	28.4	300	94
2	213.330	30.5	**11.0**	3.4	33.0	11.9	43.5	31.6	200	101
3	482.991	31.1	**17.0**	5.1	33.2	20.0	46.0	26.0	100	359
4	866.130	26.4	**21.8**	6.9	32.6	22.5	46.0	23.5	400	0
----- Vertical ------										
5	33.880	37.5	**12.4**	1.4	33.1	18.2	40.0	21.8	100	256
6	46.490	35.2	**14.0**	1.6	33.1	17.7	40.0	22.3	100	0

Tested by: Min-Gu, Ji / Project Engineer

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9.5 Test data for Using Min. load (100 mA)

9.5.1 Spurious Radiated Emission Below 30 MHz

Humidity Level : 46 % R.H. Temperature: 24 ℃

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency Range : 9 kHz ~ 30 MHz

Result : PASSED

EUT : HANDS3 Date: January 05, 2016

Operating Condition : Transmitting Mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
0.016	12.6	H	19.00	0.1	31.70	123.52	91.82
0.026	13.2	H	19.40	0.1	32.70	119.30	86.60
0.087	18.8	H	19.40	0.1	38.30	108.81	70.51
0.115	29.7	H	19.40	0.1	49.21	106.39	57.18
0.405	24.1	H	19.40	0.1	43.63	95.46	51.83
25.67	33.1	H	20.30	0.8	54.20	70.00	15.80

-. Remark: “H” Horizontal, “V” Vertical

-. “*” Means Fundamental frequency

-. Emission Level [dB μ V/m] = Reading [dBμV] + Ant. Factor [dB/m] + Cable Loss [dB]

-. Margin [dB] = Emission Level [dBμV/m] – Limit [dBμV/m]

-. Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz

Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz, Below 30 MHz

Tested by: Min-Gu, Ji / Project Engineer

HEAD OFFICE : 301-14 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

EMC Testing Div. : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

9.5.2 Spurious Radiated Emission below 1 GHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 46 % R.H. Temperature: 24 ℃

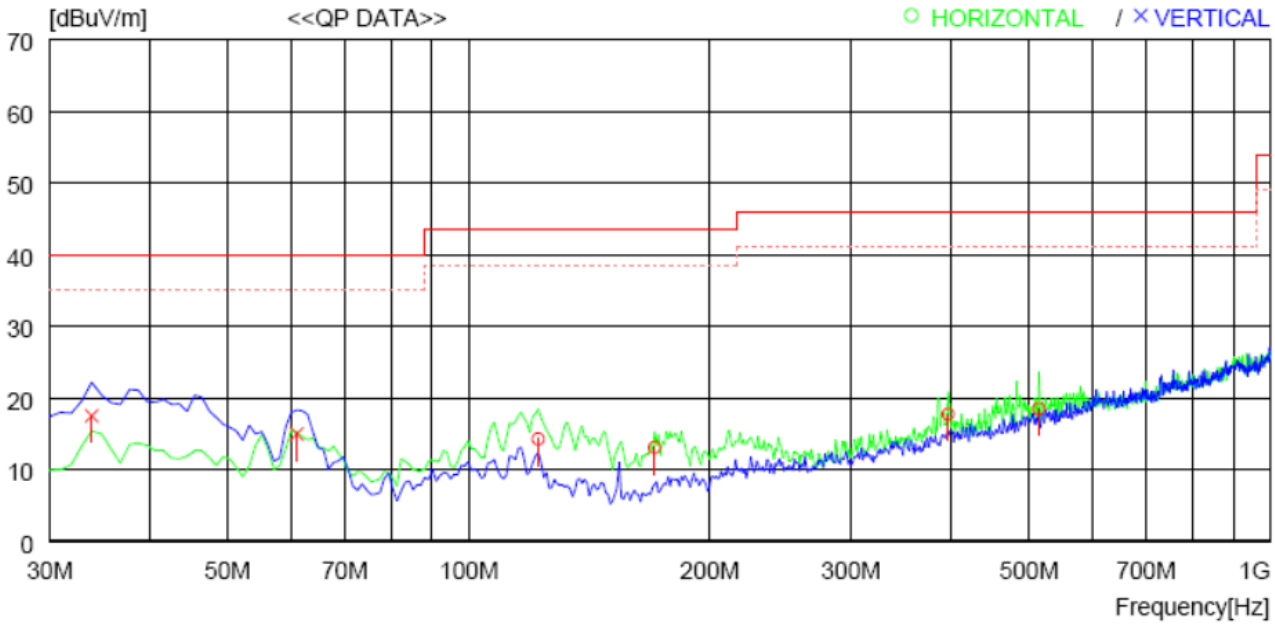
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency range : 30 MHz ~ 1 000 MHz

Result : PASSED

EUT : HANDS3 Date: September 18, 2018

Operating Condition : Transmitting Mode



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	122.150	34.7	10.1	2.5	33.0	14.3	43.5	29.2	300	102
2	170.650	34.2	8.9	3.0	33.0	13.1	43.5	30.4	100	66
3	396.660	30.2	16.0	4.6	33.1	17.7	46.0	28.3	100	99
4	515.001	28.7	17.7	5.3	33.2	18.5	46.0	27.5	200	82
----- Vertical ------										
5	33.880	36.8	12.4	1.4	33.1	17.5	40.0	22.5	100	251
6	61.040	33.5	12.8	1.8	33.1	15.0	40.0	25.0	100	0

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10. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESCI	101012	Oct. 22, 2018	One Year	■
2.		R/S	ESR	101470	Oct. 22, 2018	One Year	■
3.		R/S	ESHS10	834467/007	Mar. 29, 2018	One Year	■
4.	Spectrum analyzer	R/S	FSV30	101372	Aug 23, 2018	One Year	■
5.	Amplifier	Sonoma Instrument	310N	312544	Mar. 28, 2018	One Year	■
6.	Amplifier	Sonoma Instrument	310N	312545	Mar. 28, 2018	One Year	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-255	Jun 05, 2018	Two Years	■
8.	Controller	Innco System	CO2000	619/27030611/L	N/A	N/A	■
9.	LISN	EMCO	3825/2	9109-1869	Apr. 11, 2018	One Year	-
		Schwarzbeck	NSLK8126	8126-404	Apr. 04, 2018	One Year	■
		Schwarzbeck	NSLK8128	8128-216	Mar. 28, 2018	One Year	■
10.	Turn Table	Innco System	DT3000	930611	N/A	N/A	■
11.	Antenna Master	Innco System	MA4000-EP	MA4000/332	N/A	N/A	■
12.	Antenna Master	Innco System	MA4000-EP	MA4000/335	N/A	N/A	■
13.	Triple Loop Antenna	Schwarzbeck	HXYZ 9170	HFCD 9171-207	Sep. 25, 2017	Two Years	■
14.	Frequency Counter	HP	53152A	US39270295	Aug. 23, 2018	One Year	■
15	Loop Antenna	Schwarzbeck	FMZB 1513	1513-235	May. 13, 2018	Two Years	■

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