TEST REPORT

FCC Part 15C

Equipment under test Bladder Volume Measurement System

Model name BioCon-900

FCC ID 2AGCZBIOCON900

Applicant Mcube Technology Co., Ltd.

Manufacturer Mcube Technology Co., Ltd.

Date of test(s) 2016.02.15~2016.02.19

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	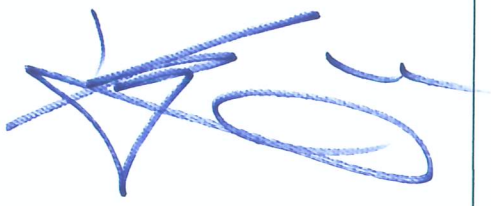
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Revision history

Revision	Date of issue	Test report No.	Description
-	2016.02.19	KES-RF-16T0021	Initial

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1. General information

Applicant	Mcube Technology Co., Ltd.
Applicant address	#803, 123, BONGHWASAN-RO, JUNGNANG-GU, SEOUL, KOREA
Test site	KES Co., Ltd.
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Rule part(s)	Part 15C
Test device serial No.	☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test	Bladder Volume Measurement System
Frequency	0.150 ㎒
Modulation type	ASK
Model:	BioCon-900
Antenna specification	Internal type(Coil antenna)
Power source	AC 120 V

1.2. Test frequency

	Frequency
Frequency (㎑)	0.150 ㎒

1.3. Information about derivative model

N/A

1.4. Device modifications

N/A

1.5. Device information

N/A

2. Summary of tests

FCC Part Sections	Parameter	Test results
15.209	Radiated spurious emission	Pass
15.207	AC conducted emissions	Pass

Statement;

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 ㎑ to 40 ㎓ (ANSI C63.10-2009) were used in the measurement of the DUT.

3. Test results

3.1. Radiated spurious emission

Test location

Testing was performed at a test distance of 3 meter Open Area Test Site

Test procedures

[9 ㎑ to 30 ㎒]

The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Quasi-peak function and specified bandwidth with maximum hold mode.

The spectrum analyzer is set to:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 200 ㎐ / 300 ㎐ for peak detection (PK) at frequency below 9 ㎑~ 150 ㎑.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 9 ㎑ / 10 ㎑ for peak detection (PK) at frequency below 150 ㎑~ 30 ㎒.
3. For the frequency bands 9~ 90 ㎑, 110~490 ㎑ the radiated emission limits are based on measurements employing an average detector.

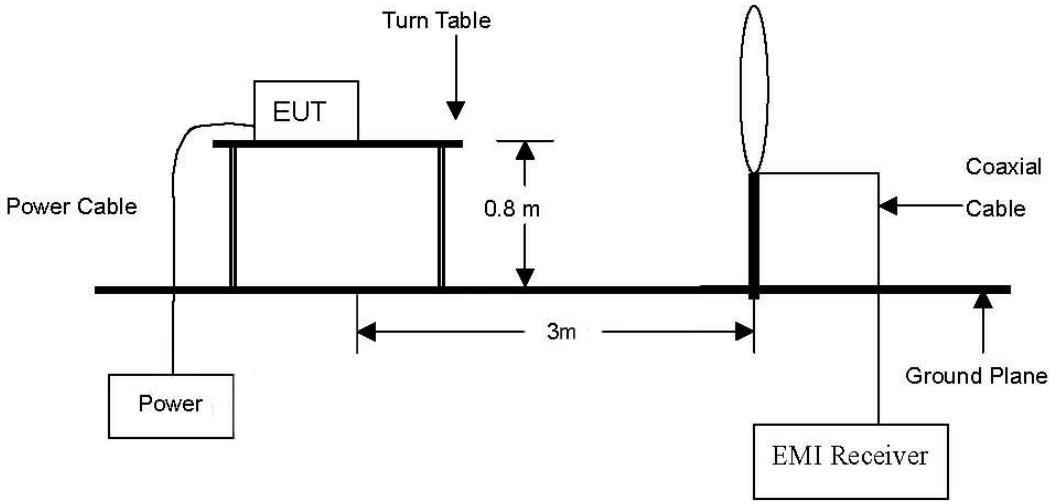
[30 ㎒ to 1 ㎓]

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity.
The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

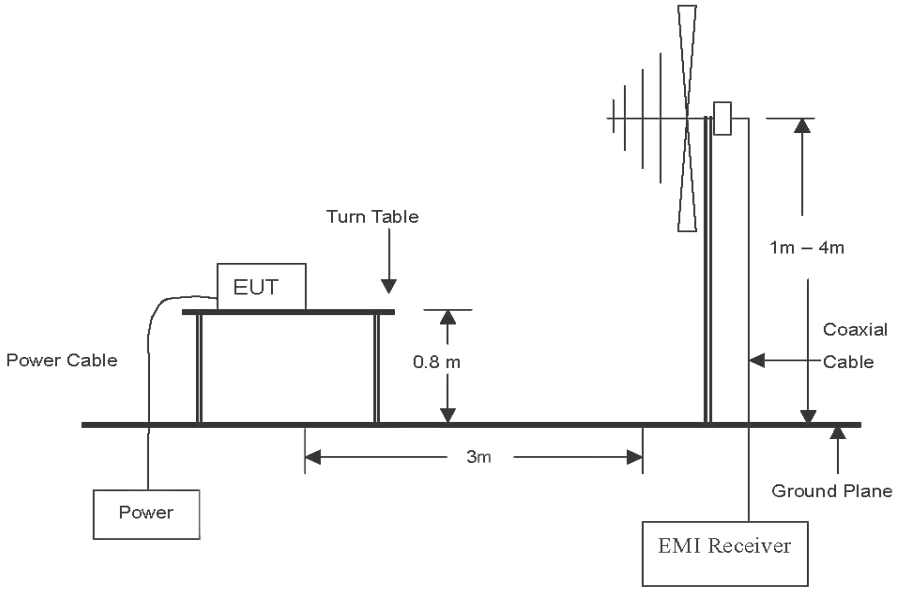
The spectrum analyzer is set to:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 120 ㎑ for Peak detection (PK) or Quasi-peak detection (QP) at frequency below 1 ㎓.

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



Limit

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

Frequency (㎒)	Distance (Meters)	Radiated (㎶/m)
0.009 ~ 0.490	300	2400 / F(㎑)
0.490 ~ 1.705	30	24000 / F(㎑)
1.705 ~ 30.0	30	30
30 ~ 88	3	100**
88 ~ 216	3	150**
216 ~ 960	3	200**
Above 960	3	500

**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 ㎒, 76 ~ 88 ㎒, 174 ~ 216 ㎒ or 470 ~ 806 ㎒. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

Test results (Below 30 ㎒)

The frequency spectrum from 9 ㎑ to 30 ㎒ was investigated.

Frequency (㎒)	Level (dB㎶)	Ant. Pol. (H/V)	Correction factors (dB/m)	Fd (dB)	Field strength (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
0.150	36.33	H	19.52	-80	-24.15	24.08	48.23
0.150	39.61	V	19.52	-80	-20.87	24.08	44.95
0.459	17.85	H	19.47	-80	-42.68	14.37	57.05
0.766	11.63	H	19.48	-40	-8.89	29.92	38.81

※ Remark

1. Measurement distance : 3 m.
2. Field strength = Level + Correction factor + F_d
3. $F_d = 40\log(D_m / D_s)$

Where:

F_d = Distance factor in ㏈

D_m = Measurement distance in meters

D_s = Specification distance in meters

For 300m: 40log(300/3) = 80 dB for frequency band 0.009 ㎒ to 0.490 ㎒

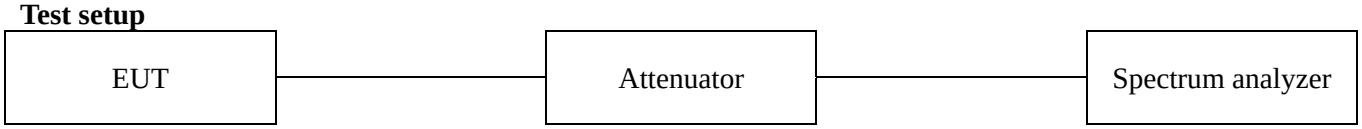
For 30m: 40log(30/3) = 40 dB for frequency band 0.490 ㎒ to 30 ㎒

Test results (Below 1 000 ㎒)

Frequency (㎒)	Level (dB㎶)	Ant. Pol. (H/V)	Correction factors (dB/m)	Fd (dB)	Field strength (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
No emissions were detected at a level greater than 20 dB below limit							

3.2. Occupied Bandwidth

Test setup



Test procedures

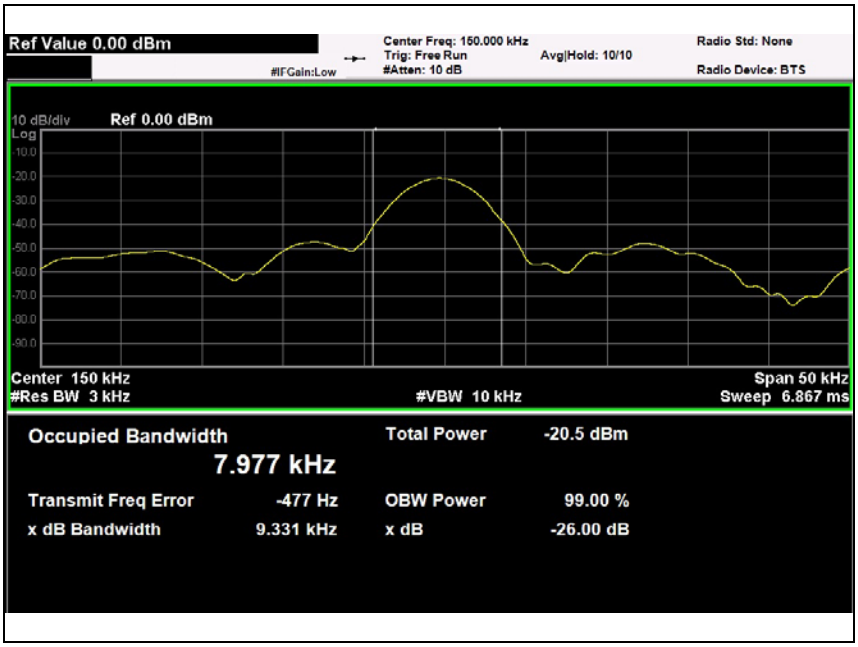
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the emission bandwidth. The VBW is set to ≥RBW. The sweep time is coupled.

Limit

None; for reporting purposes only.

Test results

Frequency(㎒)	Measured bandwidth(㎑)
0.150	7.977



3.3. AC conducted emissions

Frequency range of measurement
150 ㎑ to 30 ㎒

Instrument settings
IF Band Width: 9 ㎑

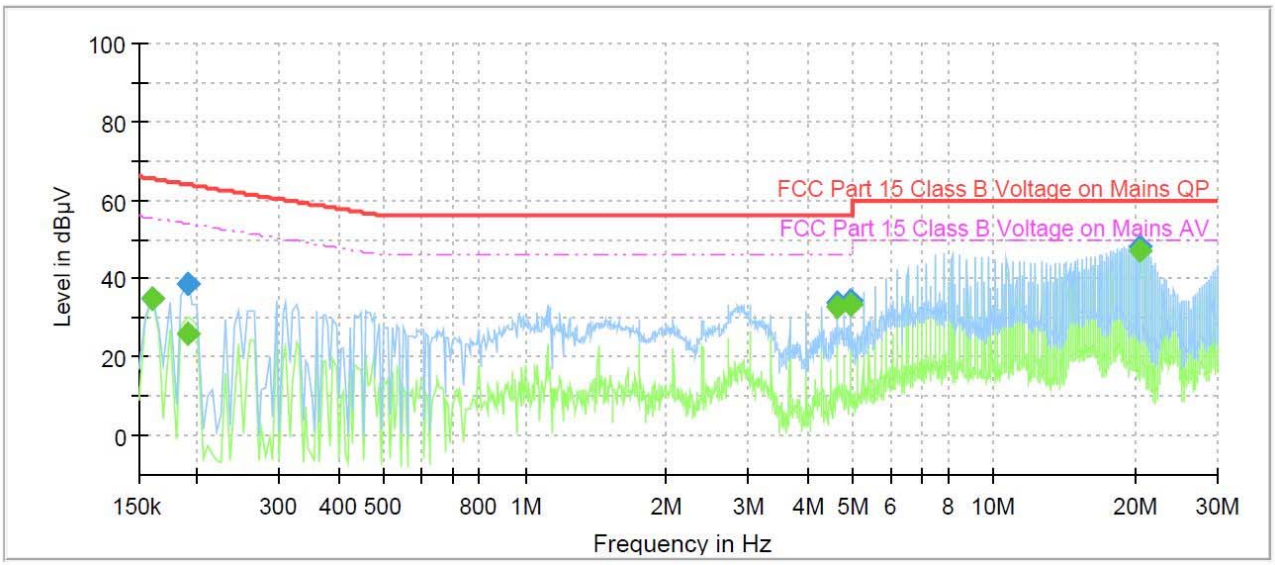
Test procedures
The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m. Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit
According to 15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

Frequency of Emission (㎒)	Conducted limit (dB㎶/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

※ Remark
1. Decreases with the logarithm of the frequency.

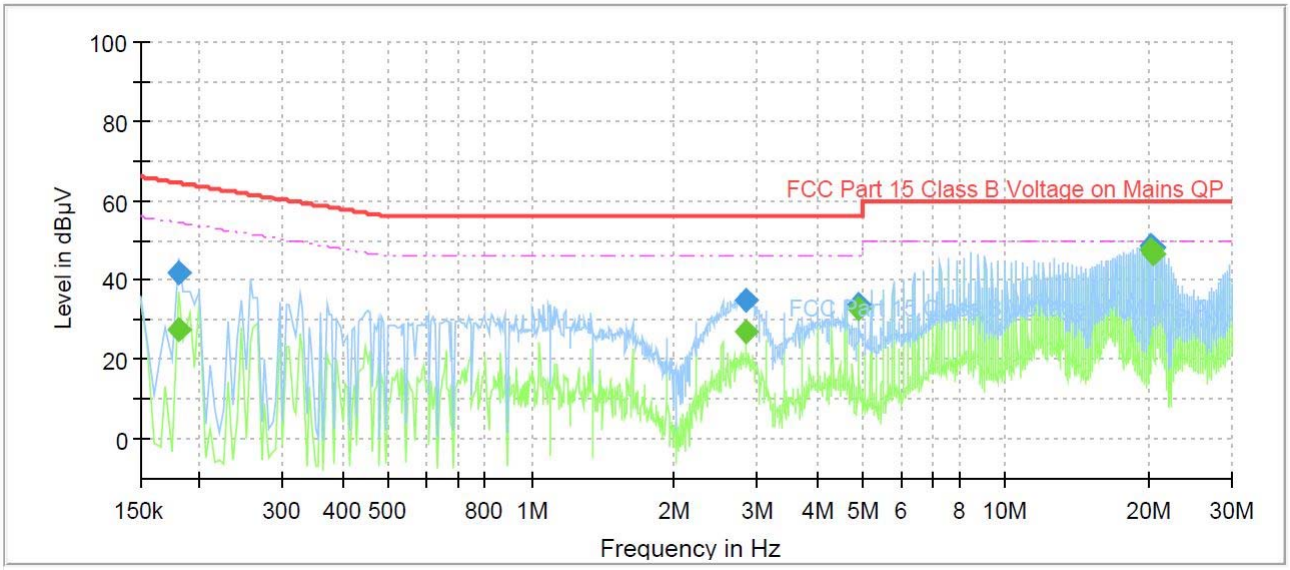
Test results



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	34.90	55.46	20.56	1000.0	9.000	L1	9.7
0.160000	34.90	---	65.46	30.56	1000.0	9.000	L1	9.7
0.190000	---	25.92	54.04	28.12	1000.0	9.000	L1	9.7
0.190000	38.74	---	64.04	25.30	1000.0	9.000	L1	9.7
4.625000	---	32.59	46.00	13.41	1000.0	9.000	L1	9.8
4.625000	33.74	---	56.00	22.26	1000.0	9.000	L1	9.8
4.945000	---	33.50	46.00	12.50	1000.0	9.000	L1	9.8
4.945000	34.24	---	56.00	21.76	1000.0	9.000	L1	9.8
20.415000	---	47.24	50.00	2.76	1000.0	9.000	L1	10.2
20.415000	48.14	---	60.00	11.86	1000.0	9.000	L1	10.2

Note; Hot Line
Both Cable loss and LISN factor are included in measurement level(QP Level or AV Level).



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.180000	---	27.32	54.49	27.17	1000.0	9.000	N	9.7
0.180000	42.03	---	64.49	22.46	1000.0	9.000	N	9.7
2.825000	---	26.91	46.00	19.09	1000.0	9.000	N	9.8
2.825000	34.69	---	56.00	21.31	1000.0	9.000	N	9.8
4.905000	---	32.80	46.00	13.20	1000.0	9.000	N	9.8
4.905000	33.90	---	56.00	22.10	1000.0	9.000	N	9.8
20.220000	---	47.76	50.00	2.24	1000.0	9.000	N	10.0
20.220000	48.57	---	60.00	11.43	1000.0	9.000	N	10.0
20.515000	---	46.84	50.00	3.16	1000.0	9.000	N	10.0
20.515000	48.32	---	60.00	11.68	1000.0	9.000	N	10.0

Note; Neutral Line
Both Cable loss and LISN factor are included in measurement level(QP Level or AV Level).

Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial number	Cal Interval	Calibration due.
Spectrum analyzer	R&S	FSV30	101389	1 year	2017.01.25
Spectrum analyzer	Agilent	N9010A	MY51440103	1 year	2017.01.25
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2017.01.25
Loop antenna	R&S	HFH2-Z2.335.4711.52	826532	2 years	2017.03.03
Trilog-broadband antenna	Schwarzbeck	VULB 9168	9168-461	2 years	2017.04.03
Preamplifier	HP	8447F	2805A02570	1 year	2017.01.21
AC power supply	HP	6813A	3729A00754	1 year	2017.01.21
EMI Test Receiver	R&S	ESR3	101781	1 year	2016.05.06
EMI Test Receiver	R & S	ESR3	101781	1 year	2016.05.06
EMI Test Receiver	R & S	ESR3	101783	1 year	2016.05.06
LISN	R & S	ENV216	101137	1 year	2017.02.04

Peripheral device

Device	Manufacturer	Model No.	Note
N/A			