RADIO TEST REPORT
FCC ID: 2AAHFBCS2-T
IC: 11224A-BCS2T

Product：	Exmobaby sensor
Trade Name：	N/A
Model Name：	BCS2
Serial Model：	N/A
Report No.：	F-D201306002

Prepared for

Exmovere Wireless, LLC

Suite 200,2121 Eisenhower Ave, Alexandria, Virginia 22314, United States

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	:	Exmovere Wireless, LLC
Address	:	Suite 200,2121 Eisenhower Ave, Alexandria, Virginia 22314, United States
Manufacture's Name	:	Shenzhen Growwin Technology Co., Ltd
Address	:	3rd Floor, Unit2, Building 2, Guanghui science park, Min Qing Lu, Bao An Qu, Shenzhen, Guangdong, China
Product description		
Product name	:	Exmobaby sensor
Model and/or type reference	:	BCS2
Serial Model：		N/A
Rating(s)	:	DC 3.7V
Standards	:	FCC Part15.231, RSS-210 Issue 8 Annex 1
Test procedure		ANSI C63.4-2003, RSS-Gen Issue 3

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test	:	
Date (s) of performance of tests	:	10 June 2013 ~19 June 2013
Date of Issue	:	20 June 2013
Test Result	:	**Pass**

Testing Engineer : Apple Huang

(Apple Huang)

Technical Manager : Tom Zhang

(Tom Zhang)

Authorized Signatory : Bovey Yang

(Bovey Yang)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.231) and RSS-210 Issue 8 Annex 1			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	Note(1)
15.203	Antenna Requirement	Pass	
15.231	Radiated Spurious Emission	Pass	
15.231	Occupied Bandwidth	Pass	
15.231	Deactivation Time	Pass	

NOTE:
(1) ” N/A” denotes test is not applicable in this Test Report.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration No.:238937; IC Registration No.:9270A-1
CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>Exmobaby sensor</td></tr>
<tr><td>Trade Name</td><td>N/A</td></tr>
<tr><td>Model Name</td><td>BCS2</td></tr>
<tr><td>Serial Model</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a Exmobaby sensor
<table>
<tr><td>Product Type</td><td>Low Power Communication Device Transmitter</td></tr>
<tr><td>Operation Frequency:</td><td>433.92MHz</td></tr>
<tr><td>Modulation Type:</td><td>ASK</td></tr>
<tr><td>Number Of Channel</td><td>1CH.</td></tr>
<tr><td>Antenna Designation:</td><td>Wire Spiral antenna</td></tr>
<tr><td>Antenna Gain(Peak)</td><td>0.16 dBi</td></tr>
<tr><td>Output Power:</td><td>69.86 dBuV/m (AV Max.)</td></tr>
</table>
More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Channel List</td><td>N/A</td></tr>
<tr><td>Adapter</td><td>N/A</td></tr>
<tr><td>Battery</td><td>DC 3.7V</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	Spiral Antenna	N/A	0.16	Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX

For Conducted Emission	
Final Test Mode	Description
Mode 1	N/A

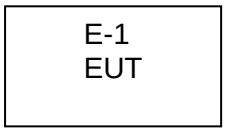
For Radiated Emission	
Final Test Mode	Description
Mode 1	TX

Note:

(1) The EUT use new battery.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Exmobaby sensor	N/A	BCS2	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	E4407B	160400005	Jul. 06. 2013
2	Test Receiver	R&S	ESPI	101318	Jul. 06. 2013
3	Bilog Antenna	TESEQ	CBL6111D	31216	Jul. 06. 2013
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	Jul. 06. 2013
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	Jul. 06. 2013
6	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06. 2013
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	Jul. 06. 2013
8	Amplifier	EM	EM-30180	060538	Jul. 06. 2013
9	Loop Antenna	ARA	PLA-1030/B	1029	Jul. 06. 2013
10	Power Meter	R&S	NRVS	100696	Jul. 06. 2013

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Test Receiver	R&S	ESCI	101160	Jul. 06. 2013
2	LISN	R&S	ENV216	101313	Jul. 06. 2013
3	LISN	EMCO	3816/2	00042990	Jul. 06. 2013
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	Jul. 06. 2013
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	Jul. 06. 2013
6	Absorbing clamp	R&S	MOS-21	100423	Jul. 06. 2013

3. ANTENNA REQUIREMENT

3.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

3.2 EUT ANTENNA

The EUT antenna is Wire Spiral Antenna. It comply with the standard requirement.

3.3 CONDUCTED EMISSION MEASUREMENT

3.3.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5			66 - 56 *	56 - 46 *	CISPR
0.50 -5.0			56.00	46.00	CISPR
5.0 -30.0			60.00	50.00	CISPR

0.15 -0.5			66 - 56 *	56 - 46 *	LP002.
0.50 -5.0			56.00	46.00	LP002.
5.0 -30.0			60.00	50.00	LP002.

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

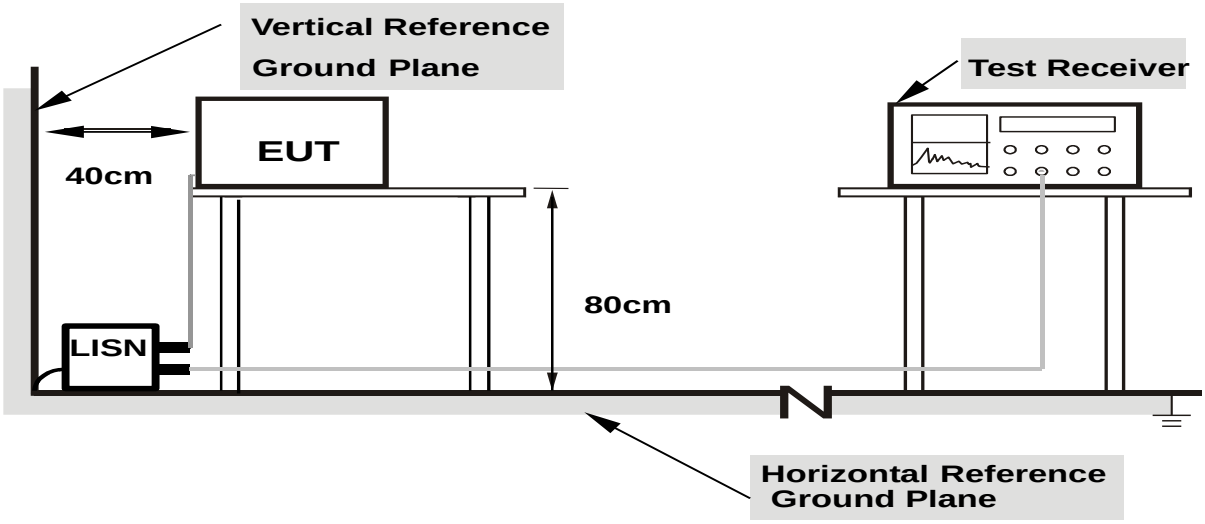
3.3.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.2.5 TEST RESULT

EUT：	Exmobaby sensor	Model Name. ：	BCS2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	N/A	Test Mode：	N/A

3.4 RADIATED EMISSION MEASUREMENT

3.4.1 Radiated Emission Limits (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.231.e)

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66 - 40.70	1,000	100
70 - 130	500	50
130 - 174	500 to 1,500 **	50 to 1,50 **
174 - 260	1,500	1,50
260 - 470	1,500 to 5,000 **	1,50 to 5,00 **
Above 470	5,000	5,00

Notes:

(1) ** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental
field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 22.72727(F) - 2454.545;
for the band 260-470 MHz, uV/m at 3 meters = 16.6667(F) - 2833.3333. The maximum permitted
unwanted emission level is 20 dB below the maximum permitted fundamental level.]
The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in 93 Section 15.209, whichever limit permits a higher field strength.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

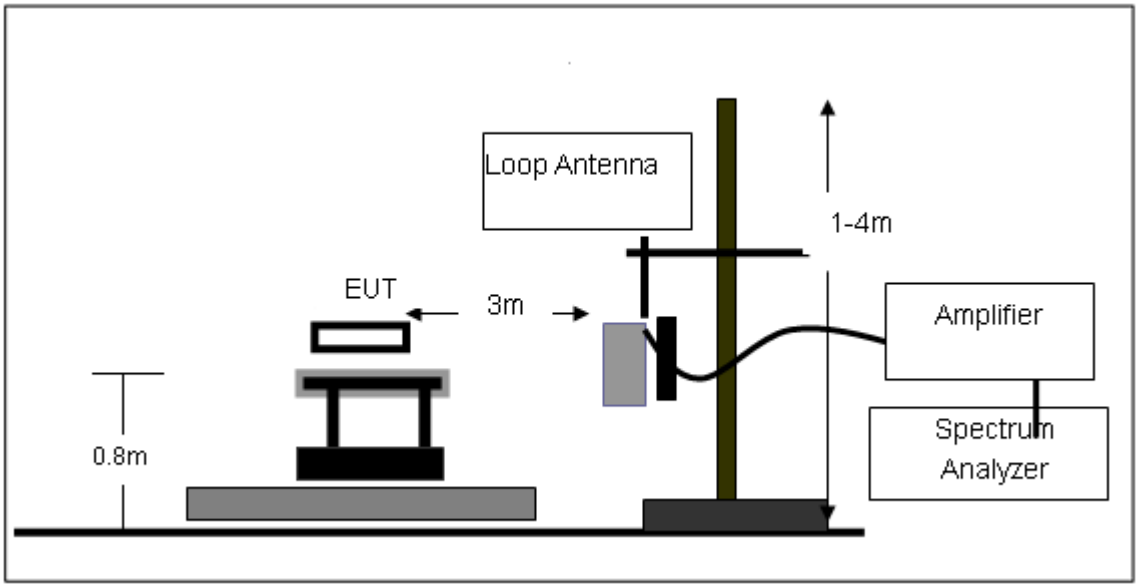
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.4.3 DEVIATION FROM TEST STANDARD

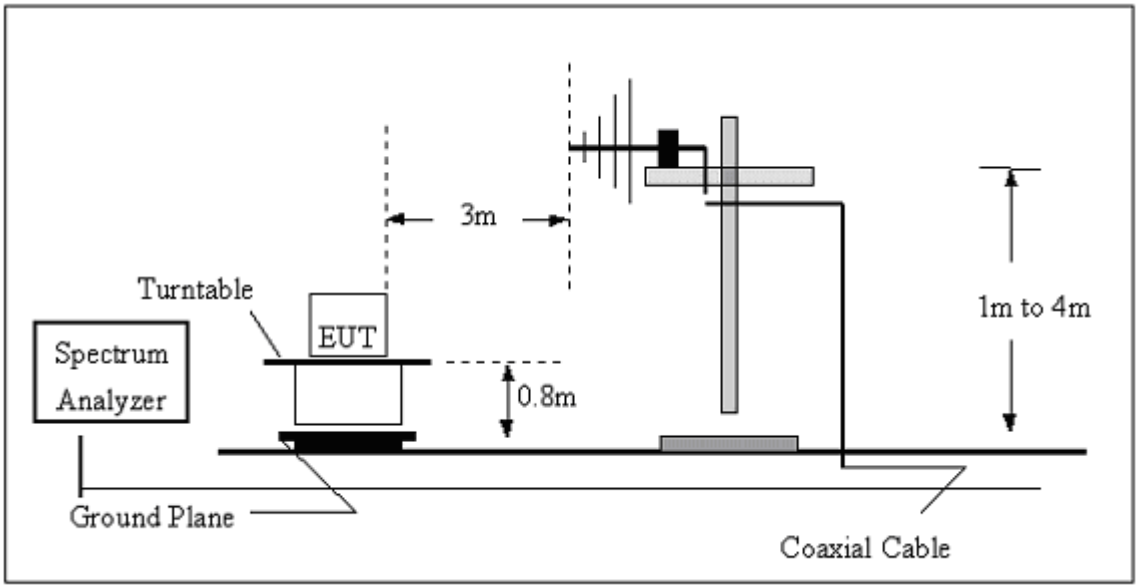
No deviation

3.4.4 TEST SETUP

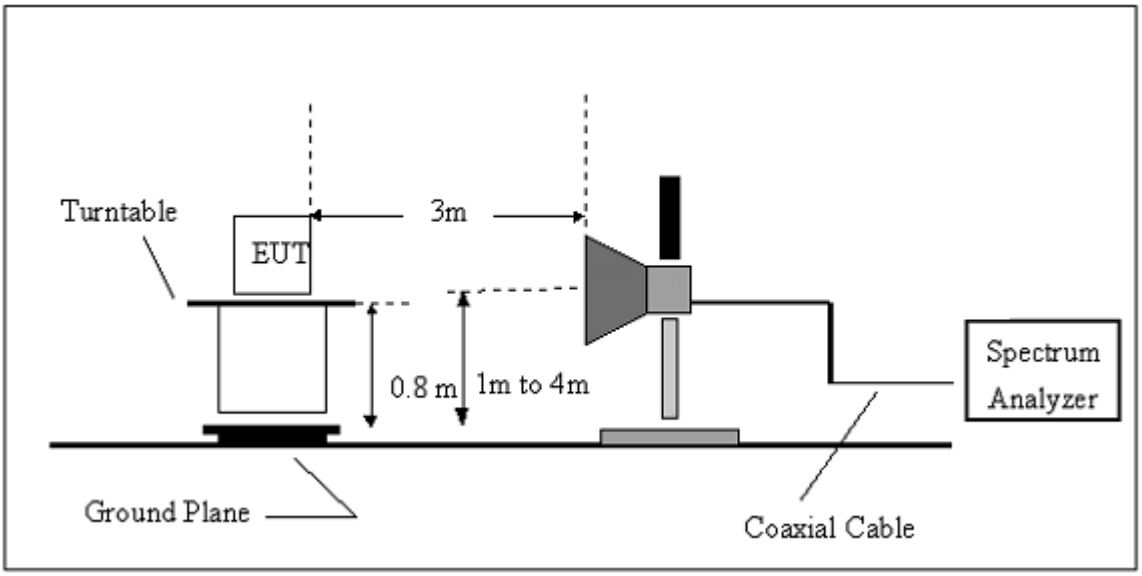
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.4.5 TEST RESULTS (BELOW 30MHz)

EUT：	Exmobaby sensor	Model Name. ：	BCS2
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.4.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)

The duty cycle is simply the on time divided by the period:

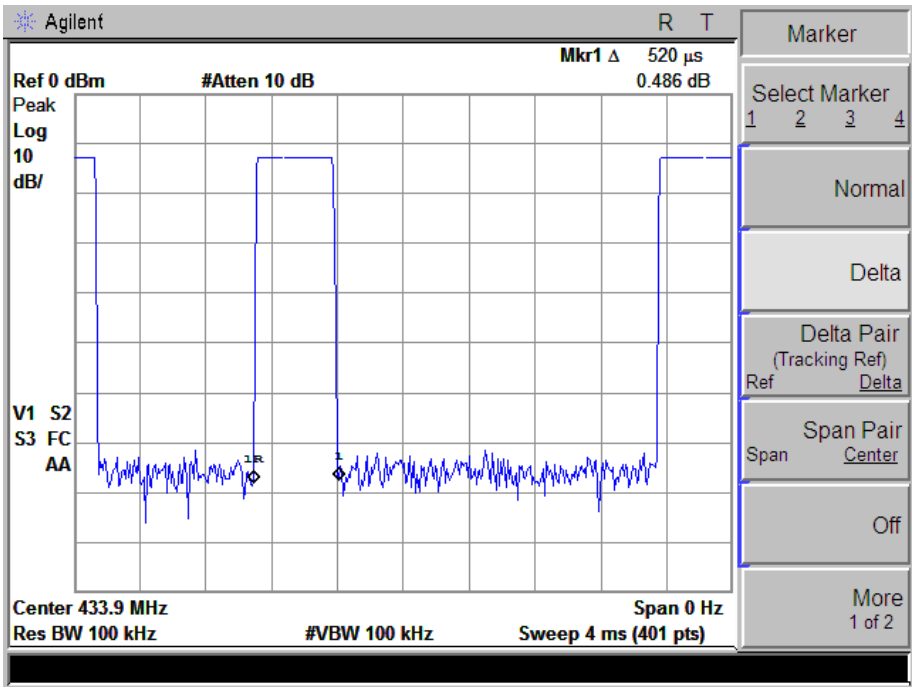
The duration of one cycle = 100 ms

Effective period of the cycle = 0.52×49 ms= 25.48ms

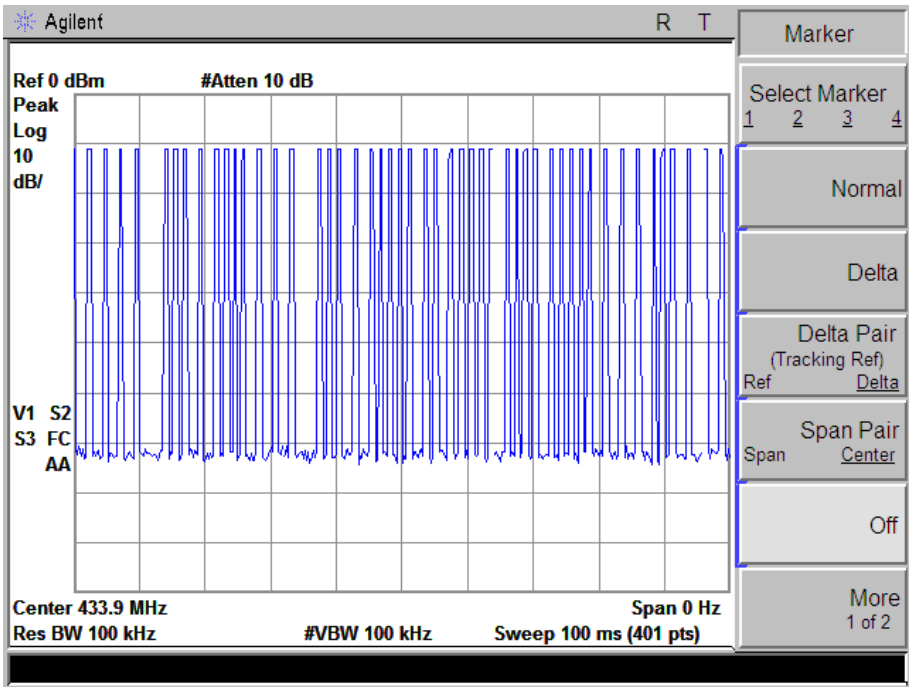
DC = 25.48ms/100ms = 0.2548

Therefore, the average factor is found by 20log0.2548 = -11.88dB

One cycle



49 signals within 100ms



EUT：	Exmobaby sensor	Model Name ：	BCS2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX	Polarization：	Horizontal

Frequency	Average Factor	Field Strength	Field Strength	Limit(PK)	Limit(AV)	State
MHz	dB	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
433.9200	-11.88	81.74	69.86	92.9	72.9	pass
867.8385	-11.88	62.49	50.61	72.9	52.9	pass
1301.7694	-11.88	48.86	36.98	72.9	52.9	pass
--	--	--	--	74.00	54.00	pass
--	--	--	--	74.00	54.00	pass
--	--	--	--	74.00	54.00	pass

EUT：	Exmobaby sensor	Model Name ：	BCS2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX	Polarization：	Vertical

Frequency	Average Factor	Field Strength	Field Strength	Limit(PK)	Limit(AV)	State
MHz	dB	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
433.9200	-11.88	77.68	65.80	92.9	72.9	pass
867.8387	-11.88	55.69	46.16	72.9	52.9	pass
1301.7692	-11.88	43.78	31.90	72.9	52.9	pass
--	--	--	--	74.00	54.00	pass
--	--	--	--	74.00	54.00	pass
--	--	--	--	74.00	54.00	pass

NOTE:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. *: Denotes restricted band of operation.

Measurements were made using a peak detector and average detector. Any emission falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.

4. BANDWIDTH TEST

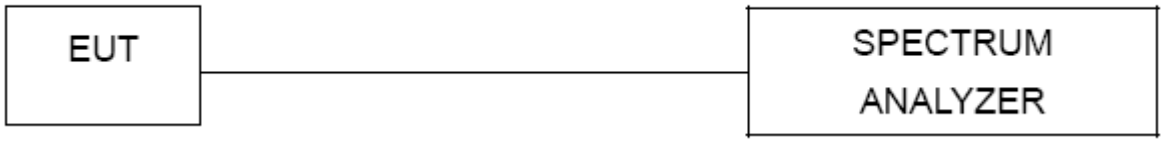
4.1 TEST PROCEDURE

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

4.2 DEVIATION FROM STANDARD

No deviation.

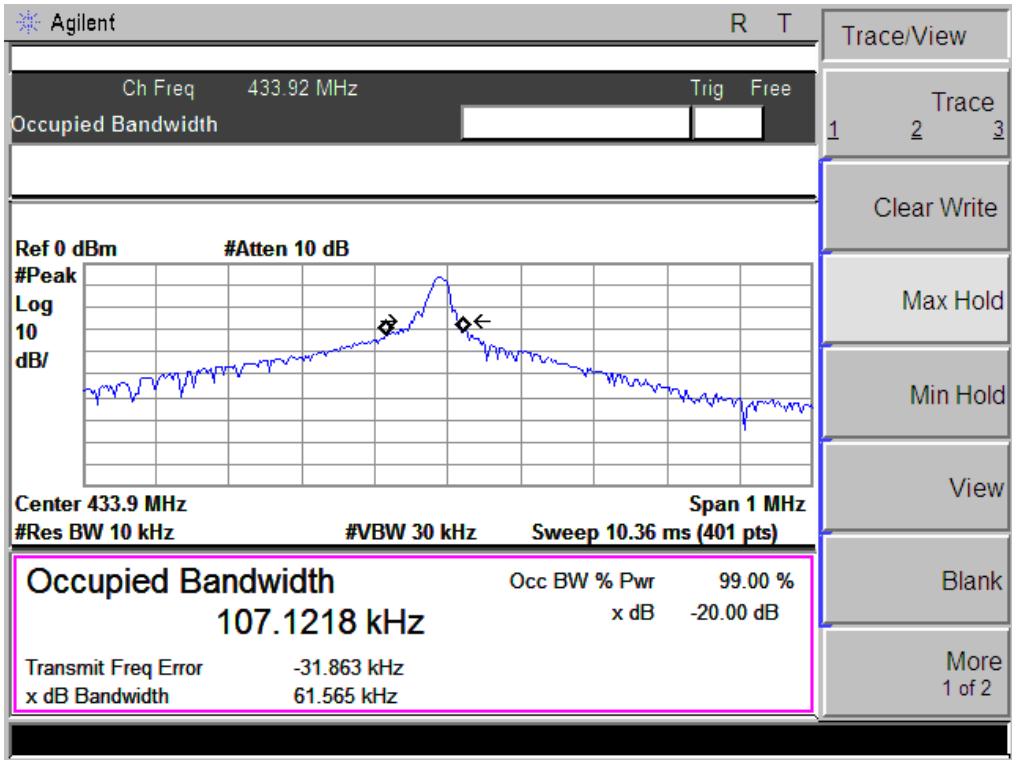
4.3 TEST SETUP



4.4 TEST RESULTS

EUT：	Exmobaby sensor	Model Name ：	BCS2
Temperature：	26 ℃	Relative Humidity：	53%
Pressure：	1020 hPa	Test Power ：	DC 3.7V
Test Mode ：	TX CH 1		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (kHz)	Limit (MHz)
CH01	433.92	61.565	1.0848MHz



5. PEAK OUTPUT POWER TEST

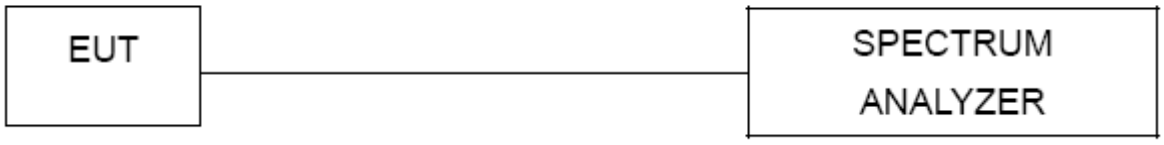
5.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW= 100KHz, Sweep time = Auto.

5.2 DEVIATION FROM STANDARD

No deviation.

5.3 TEST SETUP



5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.5 TEST RESULTS

EUT：	Exmobaby sensor	Model Name ：	BCS2
Temperature：	26 ℃	Relative Humidity：	53%
Pressure：	1020 hPa	Test Power ：	DC 3.7V
Test Mode ：	TX CH 1		

Test Channel	Frequency (MHz)	Power(dBm)
CH01	433.92	1.474

6. TRANSMITTER TIMEOUT

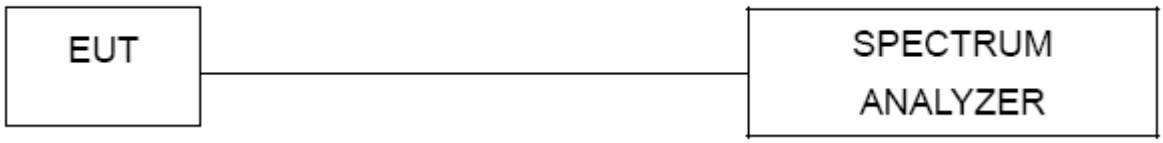
6.1 LIMIT

In addition, devices operated under the provisions of this paragraph shall be provided with a means For automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the but in no case less than 10 seconds.

6.2 TEST PROCEDURE

(1) Put the EUT on the support in its standard position with associated equipment and switched on.
(2) Set center frequency of spectrum analyzer = operating frequency.
(3) Set the spectrum analyzer as RBW=100kHz, VBW=100kHz, Span=0Hz, Adjust Sweep=120s.
(4) record the duration time

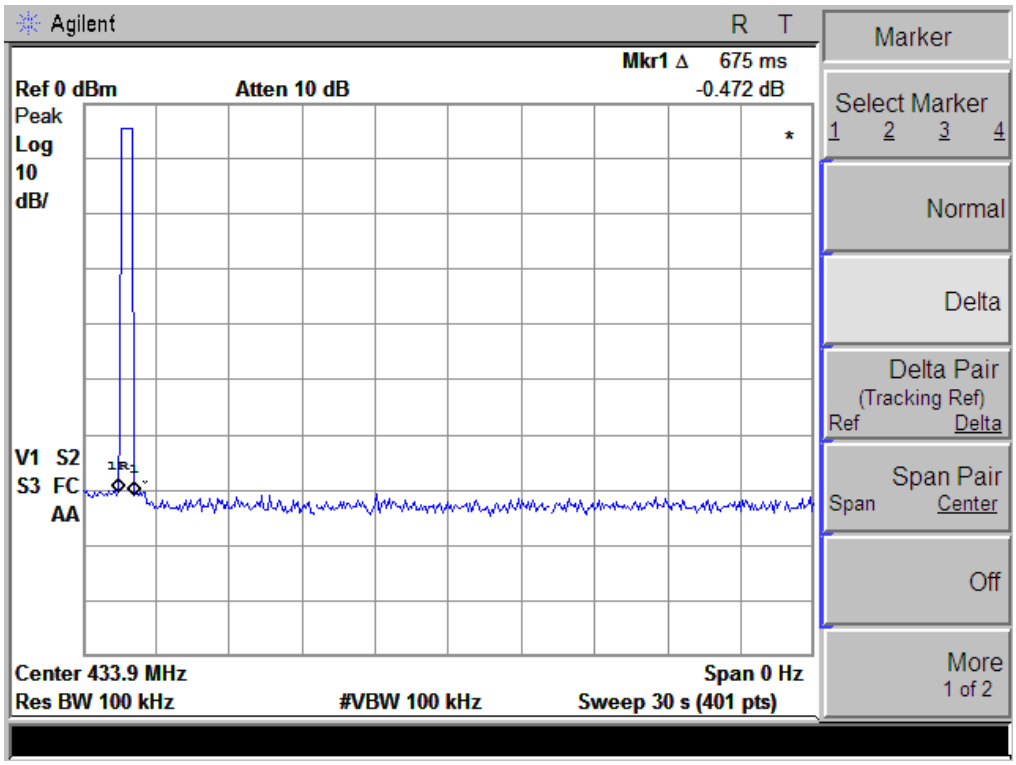
6.3 TEST SETUP

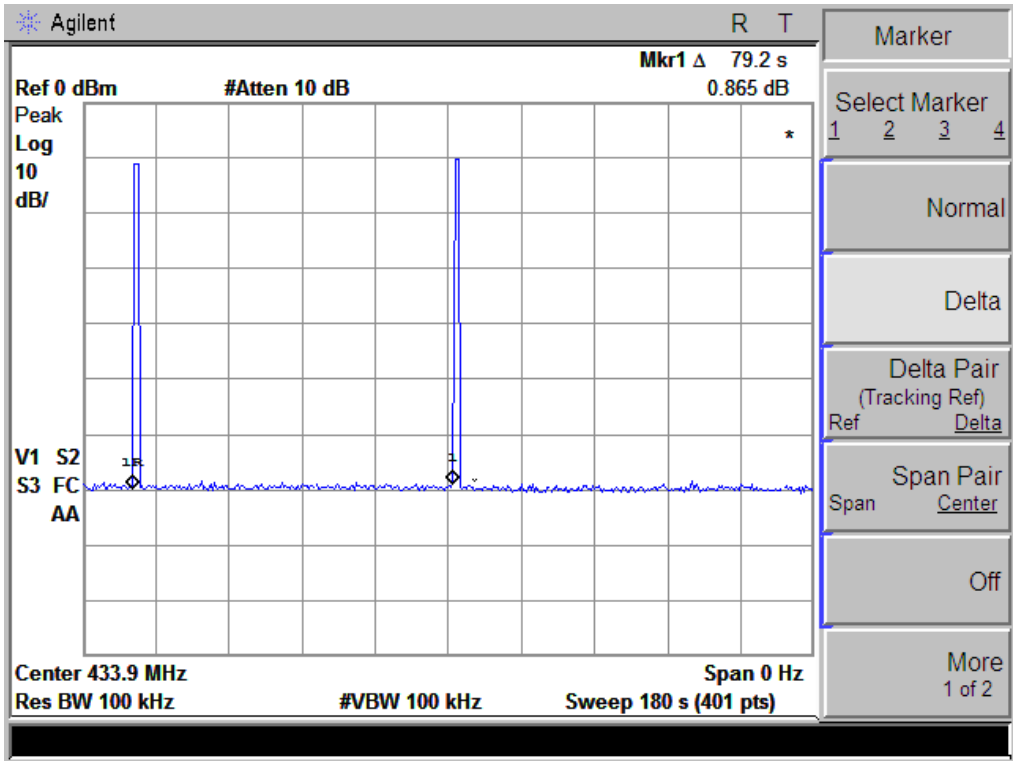


6.4 TEST RESULTS

EUT：	Exmobaby sensor	Model Name ：	BCS2
Temperature：	26 ℃	Relative Humidity：	53%
Pressure：	1020 hPa	Test Power ：	DC 3.7V
Test Mode ：	TX CH 1		

Frequency(MHz)	Each transmission time(s)	silent period between transmissions(s)
433.92	0.675	79.2
Limit	<1s	>10s and > 30*(duration of transmission)
Result	Pass	




Agilent
R T
Mkr1 Δ 79.2 s
Ref 0 dBm
#Atten 10 dB
0.865 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 433.9 MHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 180 s (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

7. EUT TEST PHOTO

Radiated Measurement Photos(worst case position)