

Test Report

FCC ID: XBD-BT43ISC

Date of issue: Apr. 15, 2019

Report Number:	MTi190411E063
Sample Description:	BluStreamFM
Model(s):	BT43IS Rev C, BTHFS430 Rev C
Applicant:	AAMP of Florida, Inc. dba AAMP Global
Address:	15500 Lightwave Dr. Suite 202 Clearwater, Florida 33760 United States
Date of Test:	Mar. 29, 2019 – Apr. 15, 2019

Shenzhen Microtest Co., Ltd.
<http://www.mtitest.com>

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Test Result Certification

Applicant's name: AAMP of Florida, Inc. dba AAMP Global

Address: 15500 Lightwave Dr. Suite 202 Clearwater, Florida 33760 United States

Manufacture's name: Skytech creations limited

Address: Unit 507, 5/F., IC Development Centre, No.6 Science Park West Avenue, Shatin, Hong Kong

Product name: BluStreamFM

Trademark: iSimple

Model name: BT43IS Rev C, BTHFS430 Rev C

Standards: FCC Part 15.239

Test Procedure: ANSI C63.10-2013
DA 00-705

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

Tested by:



Demi Mu

Apr. 15, 2019

Reviewed by:



Blue Zheng

Apr. 15, 2019

Approved by:



Smith Chen

Apr. 15, 2019

1 General description

1.1 Descriptions of EUT

Product name:	BluStreamFM
Model name:	BT43IS Rev C
Series model:	BTHFS430 Rev C
Difference of series model:	All models are the same circuit and RF module, except for the model No..
Tx/Rx frequency range:	88.1 MHz to 107.9 MHz
Modulation type:	FM
Power source:	DC 12V by battery
Adapter information:	N/A
Antenna designation:	PCB antenna (Antenna Gain: 0dBi)
Hardware version:	V0.6
Software version:	V0.3

1.2 199 channels are provided to FM

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	88.1	100	98.0	198	107.8
2	88.2	101	98.1	199	107.9
k	$88.1+0.1(k-1)$	--	--		

1.3 Frequency Channel Under Test

Channel	Frequency
Low	88.1MHz
Middle	98.1MHz
High	107.9MHz

1.4 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
Battery	/	/	/

1.5 Description of Support Units

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	Brand	Model/Type No.	Series No.	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 Summary of Test Results

Test procedures according to the technical standards:

Item	FCC Part No.	Description of Test	Result	Remark
1	15.203	Antenna requirement	Pass	
2	15.207	AC power line conducted emission	Pass	
3	15.239 (b)	Field strength of fundamental and harmonic emissions	Pass	
4	15.209	Radiated emission	Pass	
5	15.239 (a)	Operating frequency	Pass	
6	15.239 (a)	Occupied Bandwidth	Pass	
The meaning of symbols: "N/A" – Not Applicable				

3 Test Facilities and Accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.:	448573

3.2 Environmental conditions

Temperature:	15°C~35°C
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

3.3 Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %

RF frequency	1×10^{-7}
RF power, conducted	$\pm 1.38\text{dB}$
Conducted emission(150kHz~30MHz)	$\pm 0.21\text{dB}$
Radiated emission(30MHz~1GHz)	$\pm 4.68\text{dB}$
Radiated emission (above 1GHz)	$\pm 4.89\text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 2 \%$

3.4 Test software

Software Name	Manufacturer	Model	Version
RF Test System	Farad	LZ-RF	Lz_Rf 3A3

4 Equipment list

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E001	Spectrum Analyzer	Agilent	E4407B	MY41441082	2018/09/18	2019/09/17
MTI-E004	EMI Test Receiver	Rohde&schwarz	ESPI	1000314	2018/09/18	2019/09/17
MTI-E006	Broadband antenna	schwarabeck	VULB9163	872	2018/09/18	2019/09/17
MTI-E007	Horn antenna	schwarabeck	BBHA9120D	1201	2018/09/18	2019/09/17
MTI-E014	amplifier	America	8447D	3113A06150	2018/09/18	2019/09/17
MTI-E015	Conduction Immunity Signal Generator	Schloder	CDG6000	126A1343/2015	2018/09/18	2019/09/17
MTI-E016	Coupled decoupling network	Schloder	CND M2/M3	A2210332/2015	2018/09/18	2019/09/17
MTI-E034	amplifier	Agilent	8449B	3008A02400	2018/09/18	2019/09/17
MTI-E037	Artificial power network	Schwarzbeck	NSLK8127	#841	2018/09/18	2019/09/17
MTI-E040	Spectrum analyzer	Agilent	N9020A	MY49100060	2018/09/18	2019/09/17
MTI-E041	Signal generator	Agilent	N5182A	MY49060455	2018/09/18	2019/09/17
MTI-E042	Analog signal generator	Agilent	E4421B	GB40051240	2018/09/18	2019/09/17
MTI-E043	Power probe	Dare Instruments	RPR3006W	16I00054SN016	2018/09/18	2019/09/17
MTI-E047	10dB attenuator	Mini-Circuits	UNAT-10+	15542	2018/09/18	2019/09/17
MTI-E049	spectrum analyzer	Rohde&schwarz	FSP-38	100019	2018/09/18	2019/09/17
MTI-E050	PSG Signal generator	Agilent	E8257D	MY46520873	2018/09/18	2019/09/17
MTI-E061	Active Loop Antenna 9kHz - 30MHz	Schwarzbeek	FMZB 1519 B	00044	2018/09/18	2019/09/17
MTI-E052	18-40GHz amplifier	Chengdu step Micro Technology	ZLNA-18-40G-21	1608001	2018/09/18	2019/09/17
MTI-E053	15-40G Antenna	Schwarzbeek	BBHA9170	BBHA9170582	2018/09/18	2019/09/17
MTI-E058	Artificial power network	Schwarzbeck	NSLK8127	#841	2018/09/18	2019/09/17
Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).						

5 Test Result

5.1 Antenna requirement

5.1.1 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

5.1.2 EUT antenna description

The EUT antenna is PCB antenna (0dBi). It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

5.2 AC power line conducted emission

5.2.1 Limit

Frequency (MHz)	Limit	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency from 0.15MHz to 0.5MHz.

5.2.2 Test method

1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.
2. 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.
3. 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.
4. LISN is at least 80 cm from nearest part of EUT chassis.
5. The resolution bandwidth of EMI test receiver is set at 9kHz.

5.2.3 Test Result

Note: the device is battery powered, so this item is not available.

5.3 Field strength of fundamental and harmonic emissions

5.3.1 Limits

§15.239 (b): The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

5.3.2 Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.
2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
3. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1\text{GHz}$

RBW = 100 kHz for $f < 1\text{GHz}$

VBW $\geq$ RBW

Sweep = Auto

Detector function = Peak

Trace = max hold

4. Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

5. The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the spectrum to

RBW = 1MHz

VBW = 10Hz

Detector = PK for AV value, while maintaining all of the other instrument settings

5.3.3 Test Result

Field Strength of Fundamental Emissions and Field strength of spurious emissions Value					
Operating Frequency (MHz)	Field Strength (dBuV/m)	Detector	Limit @3m (dBuV/m)	Margin (dB)	Antenna
88.1	41.13	QP	67.96	26.83	Vertical
	21.71	Average	47.96	26.25	Horizontal
98.1	43.29	QP	67.96	24.67	Vertical
	21.46	Average	47.96	26.50	Horizontal
107.9	42.31	QP	67.96	25.65	Vertical
	20.8	Average	47.96	27.16	Horizontal

Note: If the PK measured values lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

5.4 Operating frequency& Occupied Bandwidth

5.4.1 Limits

§15.239 (a): Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

5.4.2 Test method

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
 RBW $\geq 1\%$ of the 20 dB bandwidth
 VBW $\geq$ RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta 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 the 20 dB bandwidth and 99% occupied bandwidth of the emission.

5.4.3 Test result

Permitted range of operating frequencies				
F_L (KHz) (kHz)	F_H (kHz)	Limit (MHz)		Result
88.0658	107.9342	$F_L \geq 88$	$F_H \leq 108$	Pass

Frequency (MHz)	20dBm emission bandwidth (KHz)	Limit (KHz)
88.1	68.25	200
98.1	68.31	200
107.9	68.43	200

5.5 Radiated emission

5.5.1 Limit

Emissions radiated outside of the specified frequency bands, except for harmonic emissions, (b) shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

Frequency (MHz)	Field strength $\mu\text{V/m}$	Field strength $\text{dB}\mu\text{V/m}$	Detector	Measurement distance
30-88	100	40	QP	3m
88-216	150	43.5	QP	
216-960	200	46	QP	
960-1000	500	54	QP	
Above 1000	500	54	AV	
Above 1000	5000	74	PK	

5.5.2 Test method

1. The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

3. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1\text{GHz}$

100 kHz for $f < 1\text{GHz}$, VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

4. Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

5. The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

5.5.3 Test Result

Remark:

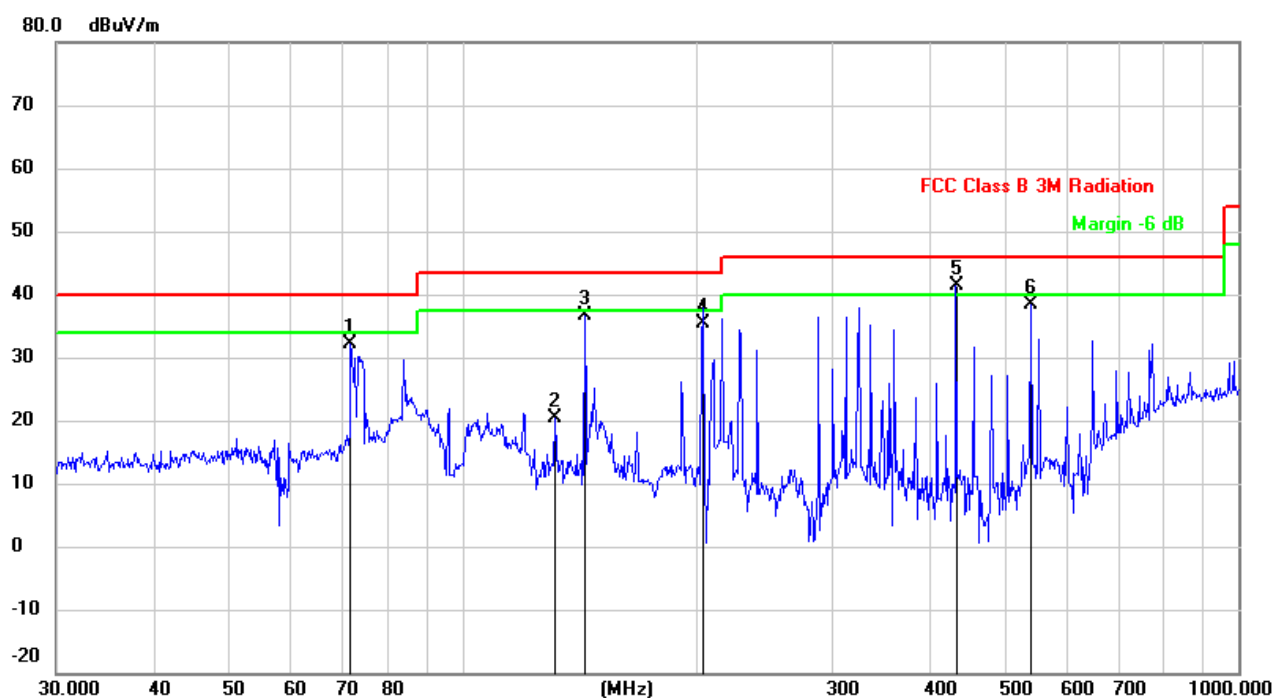
If the PK measured values lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

Radiated emission

Between 30MHz – 1GHz

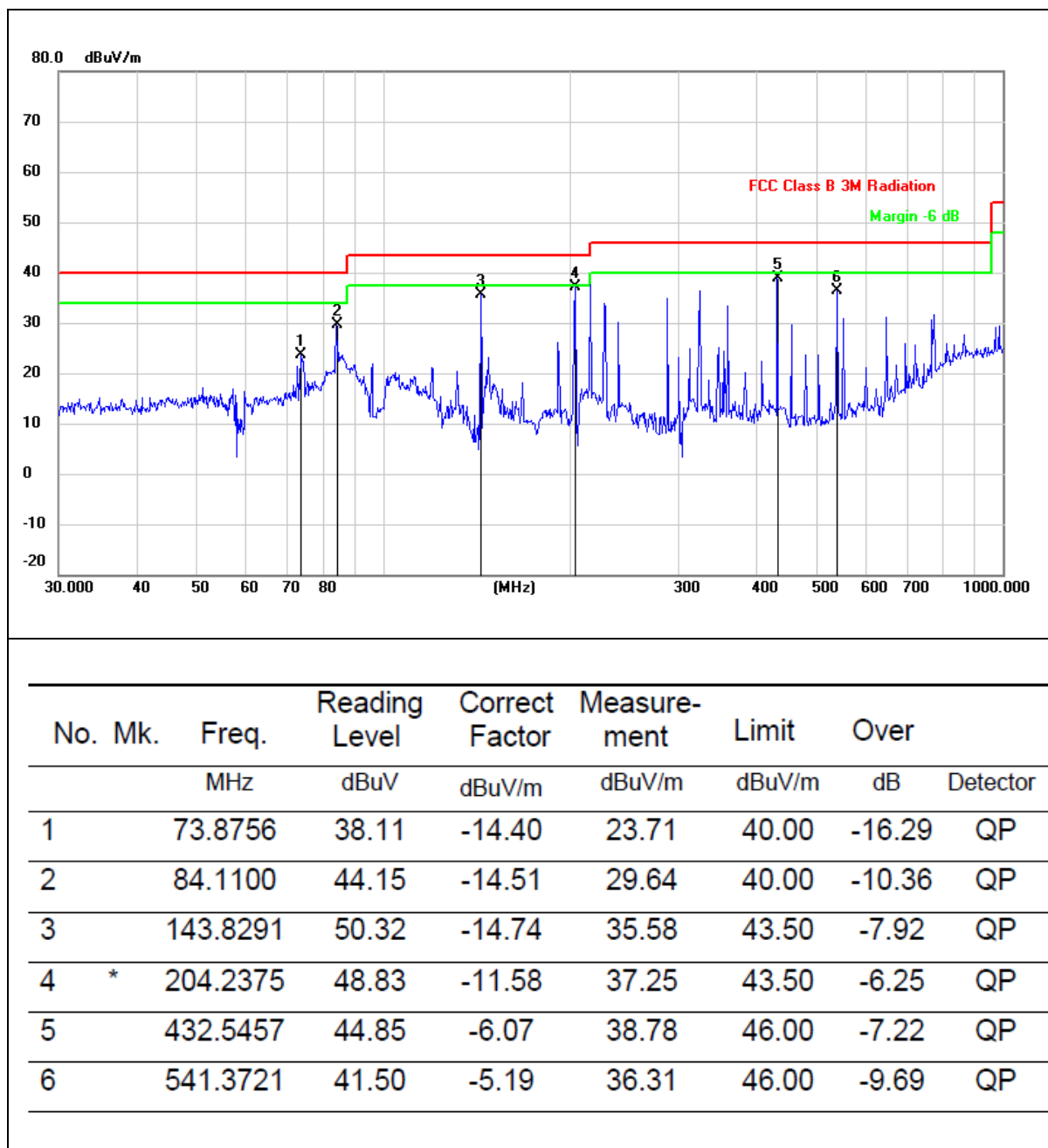
Note: All the modulation modes have been tested, and the worst result was report as below:

EUT:	BluStreamFM	Model Name :	BT43IS Rev C
Relative Humidity:	52%	Phase:	H
Pressure:	1010 hPa	Test Voltage :	DC 12V from battery
Test Mode :	TX (98.1MHz)		



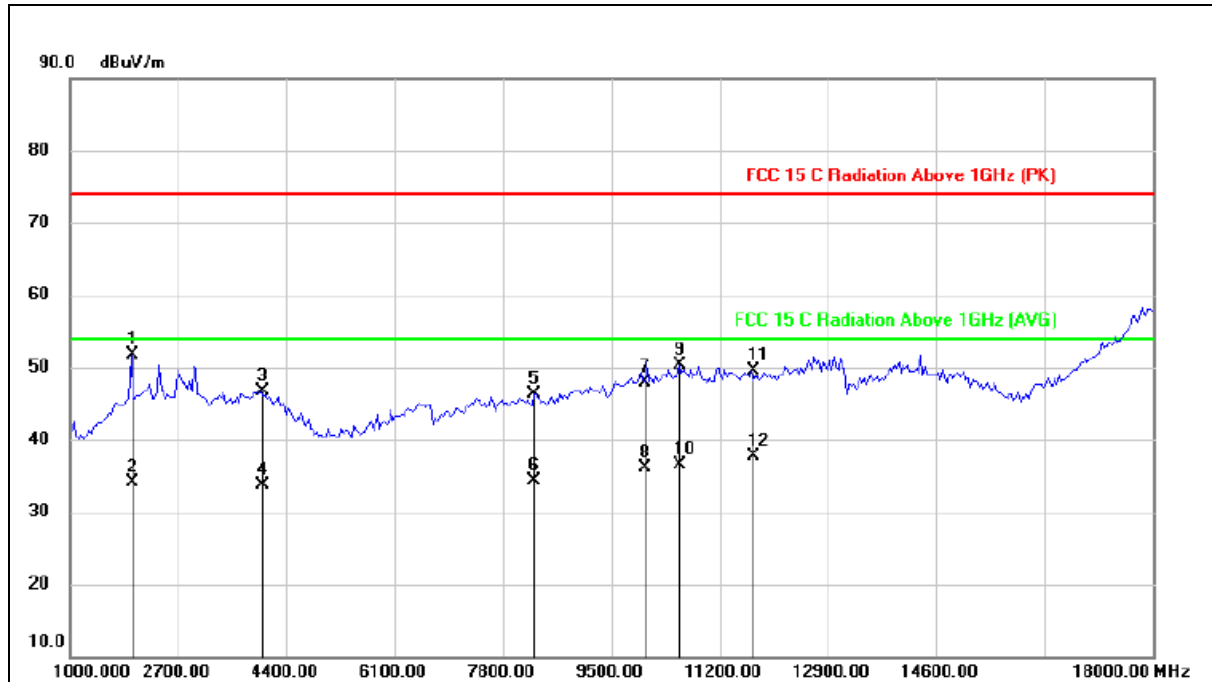
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		71.8319	46.07	-14.02	32.05	40.00	-7.95	QP
2		131.7574	34.82	-14.56	20.26	43.50	-23.24	QP
3		143.8292	51.32	-14.74	36.58	43.50	-6.92	QP
4		204.2375	46.88	-11.58	35.30	43.50	-8.20	QP
5	*	432.5457	47.35	-6.07	41.28	46.00	-4.72	QP
6		541.3721	43.50	-5.19	38.31	46.00	-7.69	QP

EUT:	BluStreamFM	Model Name :	BT43IS Rev C
Relative Humidity:	52%	Phase:	V
Pressure:	1010 hPa	Test Voltage :	DC 12V from battery
Test Mode :	TX (98.1MHz)		



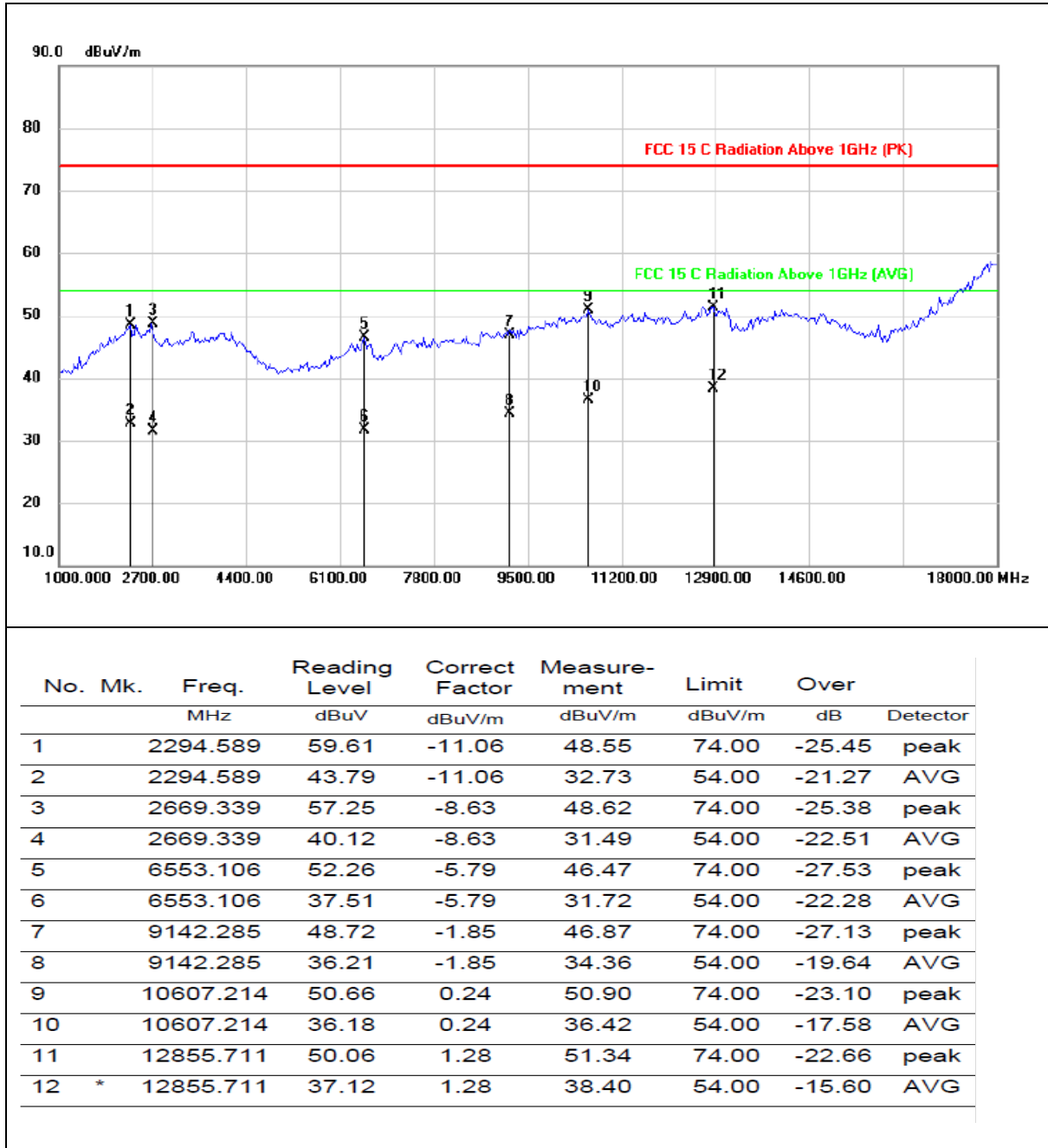
ABOVE 1GHz

EUT:	BluStreamFM	Model Name :	BT43IS Rev C
Relative Humidity:	52%	Phase:	H
Pressure:	1010 hPa	Test Voltage :	DC 12V from battery
Test Mode :	TX (98.1MHz)		



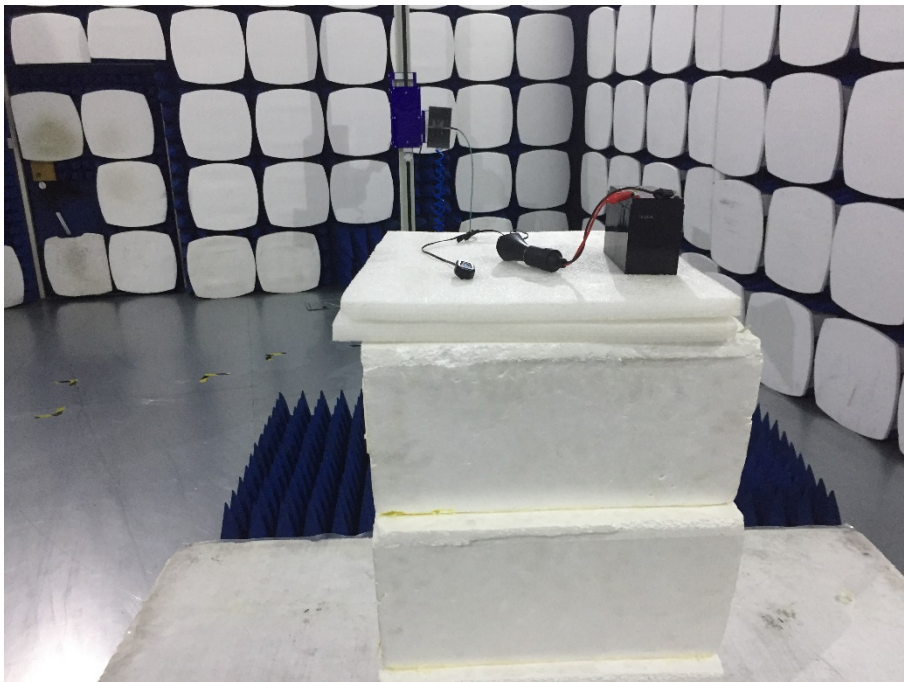
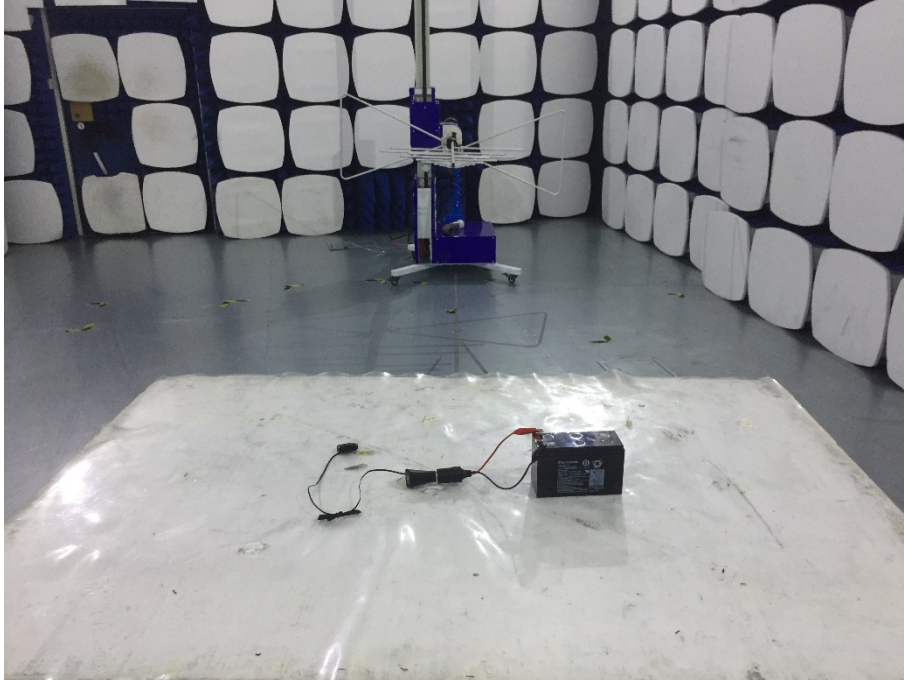
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		1953.908	65.09	-13.33	51.76	74.00	-22.24	peak
2		1953.908	47.35	-13.33	34.02	54.00	-19.98	AVG
3		3997.996	49.30	-2.63	46.67	74.00	-27.33	peak
4		3997.996	36.26	-2.63	33.63	54.00	-20.37	AVG
5		8290.581	48.24	-1.93	46.31	74.00	-27.69	peak
6		8290.581	36.15	-1.93	34.22	54.00	-19.78	AVG
7		10028.056	46.08	1.91	47.99	74.00	-26.01	peak
8		10028.056	34.26	1.91	36.17	54.00	-17.83	AVG
9		10573.146	48.00	2.28	50.28	74.00	-23.72	peak
10		10573.146	34.18	2.28	36.46	54.00	-17.54	AVG
11		11697.395	47.06	2.47	49.53	74.00	-24.47	peak
12	*	11697.395	35.22	2.47	37.69	54.00	-16.31	AVG

EUT:	BluStreamFM	Model Name :	BT43IS Rev C
Relative Humidity:	52%	Phase:	V
Pressure:	1010 hPa	Test Voltage :	DC 12V from battery
Test Mode :	TX (98.1MHz)		



PHOTOGRAPHS OF THE TEST SETUP

Radiated emission



PHOTOGRAPHS OF THE EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi190411E062-1.

----END OF REPORT----