FCC TEST REPORT

On Behalf of

FLUENT AUDIO INC

Portable Audio Guide Transmitter

Model No.: FA-AG-T100BP, OEM-AG1PT, OEM-AG2PT, OEM-AG3PT, OEM-AG4PT, OEM-AG5PT, OEM-AG6PT, OEM-AG7PT, OEM-AG8PT, OEM-AG9PT

FCC ID: 2APTAFA-AG-T100BP

Prepared for	:	FLUENT AUDIO INC
Address	:	8362 TAMARACK VILLAGE SUITE# 119-252 WOODBURY, MINNESOTA 55125 USA

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	T1880889 01
Date of Receipt	:	June 07, 2018
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TEST REPORT DECLARATION

Applicant	:	FLUENT AUDIO INC
Address	:	8362 TAMARACK VILLAGE SUITE# 119-252 WOODBURY, MINNESOTA 55125 USA
Manufacturer	:	Shenzhen Alcors Technology Co.,Ltd
Address	:	4th floor south, Bldg 23, LianChuang Sci& Tech Park, Bulan Road, LongGang District, Shenzhen, China
EUT Description	:	Portable Audio Guide Transmitter
	(A) Model No.	: FA-AG-T100BP, OEM-AG1PT, OEM-AG2PT, OEM-AG3PT, OEM-AG4PT, OEM-AG5PT, OEM-AG6PT, OEM-AG7PT, OEM-AG8PT, OEM-AG9PT
	(B) Trademark	: N/A

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249: 2018, ANSI C63.10:2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part15 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Reak Yang Test Engineer	…… Reak Yang
Approved by (name + signature)…....:	Simple Guan Project Manager	……
Date of issue……..:	June 19, 2018	

Revision History

Revision	Issue Date	Revisions	Revised By
00	January 1, 2018	Initial released Issue	Simple Guan

1. SUMMARY OF STANDARDS AND RESULTS

1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

EMISSION			
Description of Test Item	**Test Requirement**	**Standard Paragraph**	**Results**
Power Line Conducted Emission Test	FCC Part 15C:2018	Section 15.207	**P**
Spurious Emission Test	FCC Part 15C:2018	Section 15.249&15.209	**P**
Occupied bandwidth	FCC Part 15C:2018	Section 15.215	**P**
Band edge Requirement	FCC Part 15C:2018	Section 15.249	**P**
Antenna Requirement	FCC Part 15C:2018	Section 15.203	**P**

Note: 1. P is an abbreviation for Pass.
2. F is an abbreviation for Fail.
3. N/A is an abbreviation for Not Applicable.

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

Description	:	Portable Audio Guide Transmitter
Model Number	:	FA-AG-T100BP, OEM-AG1PT, OEM-AG2PT, OEM-AG3PT, OEM-AG4PT, OEM-AG5PT, OEM-AG6PT, OEM-AG7PT, OEM-AG8PT, OEM-AG9PT
Diff	:	All the models are the same except the model number, this report performs the FA-AG-T100BP to test.
Test Voltage	:	DC 3.7V From Battery, or DC 5V From USB Port
Operation frequency	:	903MHz-927MHz
Channel No.	:	25
Channel Separation	:	1MHz
Modulation type	:	GFSK
Data Rate	:	500Kbps
Antenna Type	:	Integral antenna, max gain 0dBi.
Software version	:	V1.0
Hardware version	:	V1.0
Trademark	:	N/A
Sample Type	:	Prototype production

2.2.Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
1	N/A	N/A	N/A	N/A	N/A

2.3.Block Diagram of connection between EUT and simulators

EUT

2.4.Test Mode Description

Test mode:

Mode	Channel	Frequency (MHz)
GFSK	CH1	903
	CH13	915
	CH25	927

Note: 1. Control EUT work in Continuous TX mode, and select test channel, wireless mode
2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.
3. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB

Channel list:

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
CH 1	903	CH 11	913	…….	…….
CH 2	904	CH 12	914	CH 23	925
CH 3	905	CH 13	915	CH 24	926
……	……	CH 14	916	CH 25	927

2.5.Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.6.Test Facility

Shenzhen Alpha Product Testing Co., Ltd.
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,
518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

July 25, 2017 Certificated by IC
Registration Number: 12135A

2.7.Measurement Uncertainty

(95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.71dB
Uncertainty for Radiation Emission test (<1G)	3.90 dB (Distance: 3m Polarize: V)
	3.92 dB (Distance: 3m Polarize: H)
Uncertainty for Radiation Emission test (>1G)	4.26 dB (Distance: 3m Polarize: V)
	4.28 dB (Distance: 3m Polarize: H)
Uncertainty for conducted RF Power	0.16dB

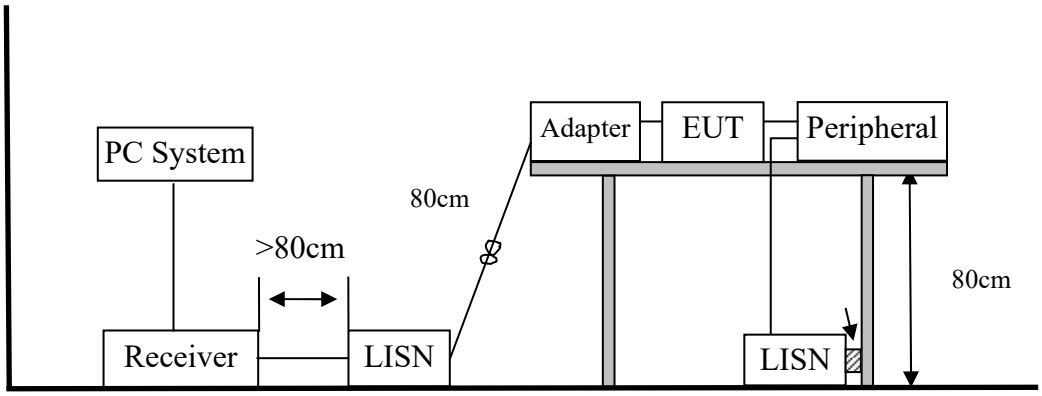
2.8.Test Equipment List

Equipment	Manufacturer	Model No.	Serial No.	Last cal.	Cal. Due day
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-4 38	2016.09.30	2018.09.29
Test Receiver	ROHDE&SCHWARZ	ESCI	101165	2017.09.22	2018.09.21
Spectrum analyzer	Agilent	E4407B	MY49510055	2017.09.23	2018.09.22
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2016.09.30	2018.09.29
Filter	KANGMAI	ZLPF-LDC-1000- 1959	1209002075	2017.09.22	2018.09.21
Filter	WAINWRIGHT	WHKX2.80 /18G- 12SS	SN1	2017.09.22	2018.09.21
RF Cable	Resenberger	Cable 4	N/A	2017.09.22	2018.09.21
CMU200	ROHDE&SCHWARZ	CMU200	116785	2017.09.22	2018.09.21
Signal Analyzer	Agilent	N9020A	MY499100060	2017.09.23	2018.09.22
vector Signal	Agilent	N5182A	MY49060042	2017.09.22	2018.09.21
vector Signal	Agilent	E4438C	US44271917	2017.09.28	2018.09.27
Amplifier	HP	HP8347A	2834A00455	2017.09.23	2018.09.22
Amplifier	Teseq	LNA6901	72718	2017.09.23	2018.09.22
Amplifier	Agilent	8449B	3008A02664	2017.09.23	2018.09.22
Filter	WAINWRIGHT	WHKX1.0G/ 15G- 10SS	SN40	2017.09.22	2018.09.21
Test Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-102082-Wa	2017.09.23	2018.09.22
Bilog Antenna	SCHWARZBEC	VULB 9168	9168-438	2016.09.30	2018.09.29
9*6*6 anechoic	CHENYU	9*6*6	N/A	2016.07.21	2020.07.20
RF Cable	Resenberger	Cable 1	N/A	2017.09.22	2018.09.21
RF Cable	Resenberger	Cable 2	N/A	2017.09.22	2018.09.21
RF Cable	Resenberger	Cable 3	N/A	2017.09.28	2018.09.27
Power Sensor	Power Radio	RPR3006W	15100041SNO91	2017.09.23	2018.09.22
Power Sensor	Power Radio	RPR3006W	15100041SNO92	2017.09.23	2018.09.22
CMW500	ROHDE&SCHWARZ	CMW500	1201.0002K50-117239-sM	2017.09.22	2018.09.21
Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2016.09.29	2018.09.28
Audio Analyzer	ROHDE&SCHWARZ	UPL	100689	2017.06.15	2018.06.15
Attenuator	HP	8494B	DC-18G	2017.10.22	2018.10.23

Attenuator	HP	8496B	DC-18G	2017.10.22	2018.10.23
Temperature& Humidity test	GZGONGWEN	GDS-250	080821	2017.10.22	2018.10.23
20dB Attenuator	ICPROBING	IATS1	82347	2017.09.22	2018.09.21
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.09.22	2018.09.21
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.09.22	2018.09.21

3. POWER LINE CONDUCTED EMISSION TEST

3.1.Block Diagram of Test Setup



3.2.Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. Emission level=Read level + LISN factor-Preamp factor + Cable loss

2. * Decreasing linearly with logarithm of frequency.

3. The lower limit shall apply at the transition frequencies.

3.3.Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.Operating Condition of EUT

（1） Setup the EUT as shown as Section 3.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

3.5.Test Procedure

（1） The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on conducted Emission test.

（2） The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 9kHz.

（3） The test results are reported on Section 3.6.

（4）auxiliary equipment

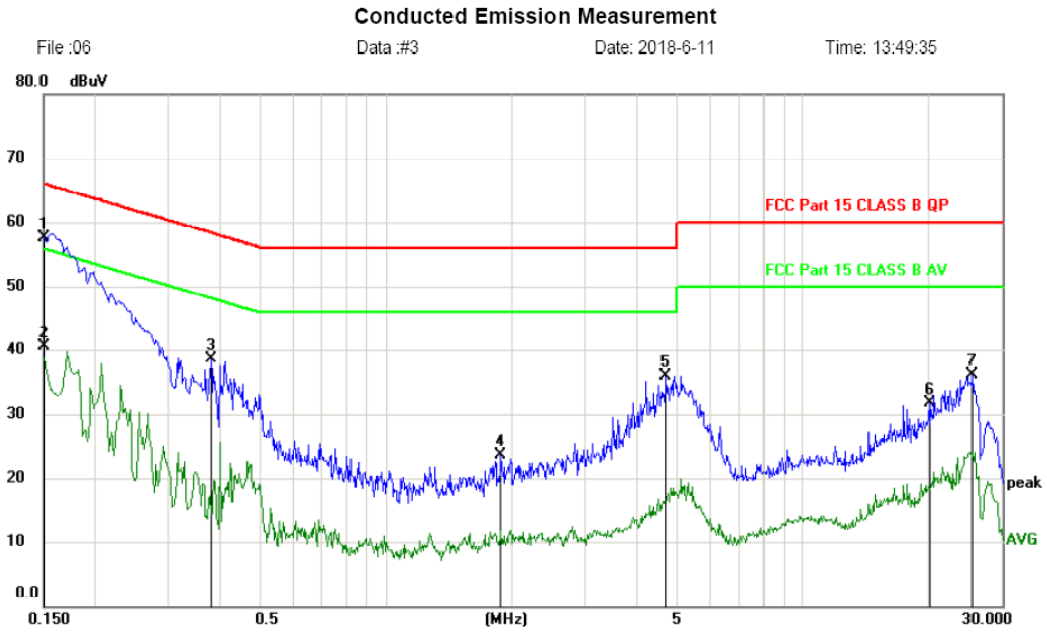
Equipment	Manufacturer	Model No.	Remark
Notebook	ACER	ZQT	SDOC
Microphone	FLUENT	M1	/

3.6.Test Results

EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.6.11
M/N	:	FA-AG-T100BP	Temperature	:	23.6°C
Test Engineer	:	Reak Yang	Humidity	:	54%
Test Mode	:	TX CH1			
Test Results	:	**PASS**			

Note:
1. All modes have been tested, and only worse case mode is reported only.
2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.
3. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Line:

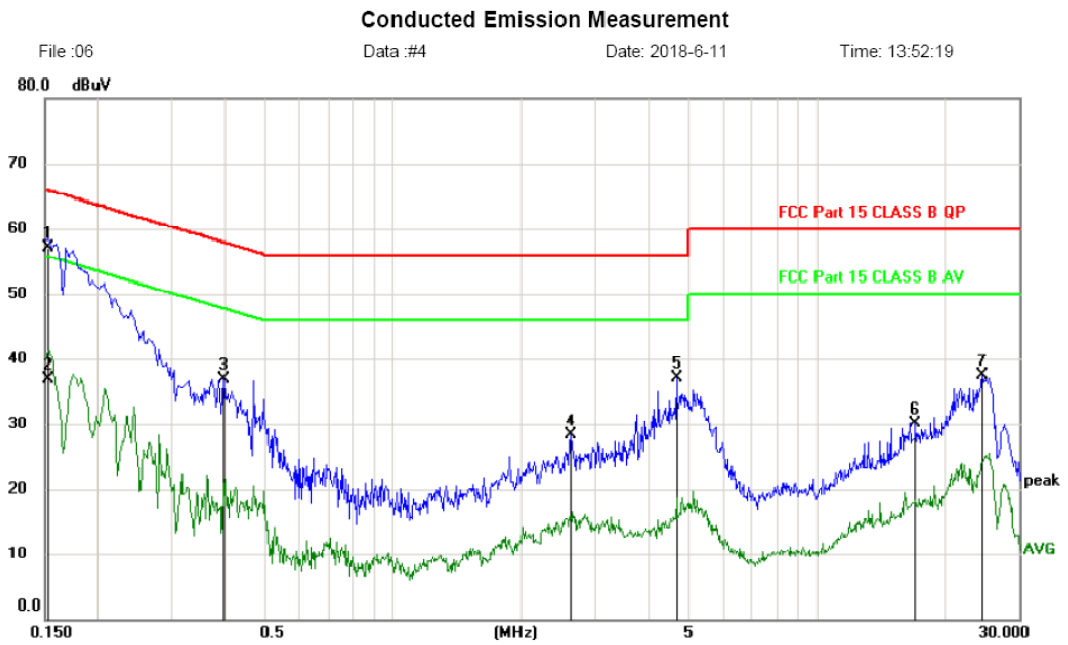


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	47.80	9.73	57.53	66.00	-8.47	QP	
2		0.1500	30.76	9.73	40.49	56.00	-15.51	AVG	
3		0.3810	28.66	9.77	38.43	58.26	-19.83	peak	
4		1.8780	13.56	9.91	23.47	56.00	-32.53	peak	
5		4.6920	25.75	10.17	35.92	56.00	-20.08	peak	
6		20.1180	21.18	10.50	31.68	60.00	-28.32	peak	
7		25.4670	25.24	10.83	36.07	60.00	-23.93	peak	

*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Neutral:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1530	47.41	9.73	57.14	65.84	-8.70	QP	
2		0.1530	27.18	9.73	36.91	55.84	-18.93	AVG	
3		0.3960	27.14	9.77	36.91	57.94	-21.03	peak	
4		2.6099	18.30	10.01	28.31	56.00	-27.69	peak	
5		4.6680	26.99	10.17	37.16	56.00	-18.84	peak	
6		17.0790	19.70	10.47	30.17	60.00	-29.83	peak	
7		24.6480	26.75	10.76	37.51	60.00	-22.49	peak	

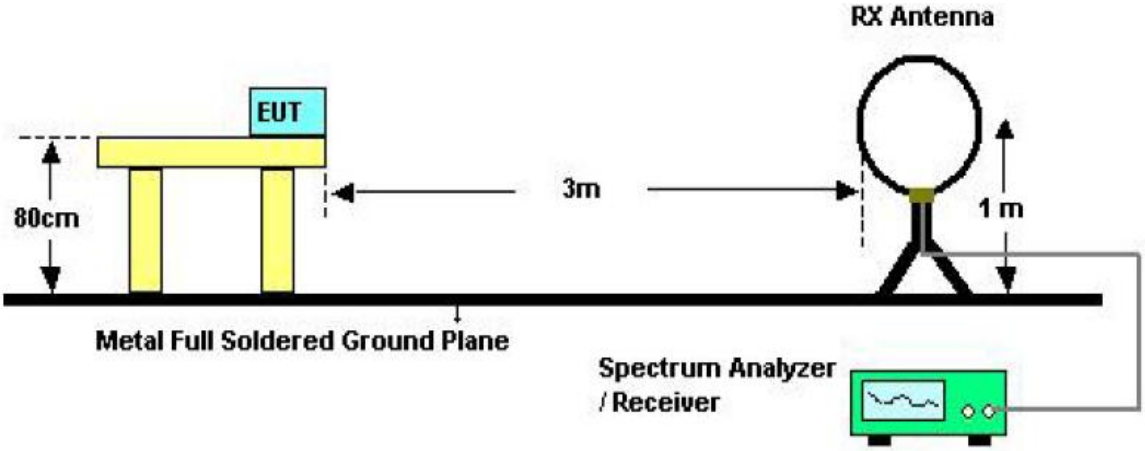
*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

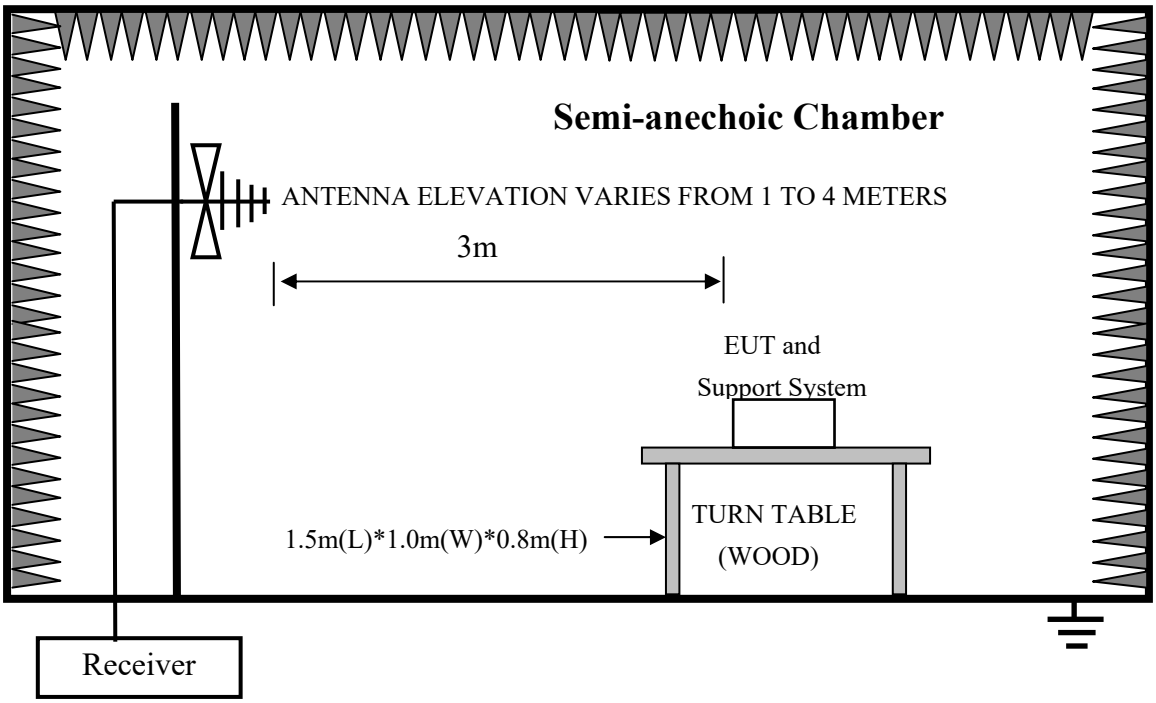
4. RADIATED EMISSION TEST

4.1.Block Diagram of Test Setup

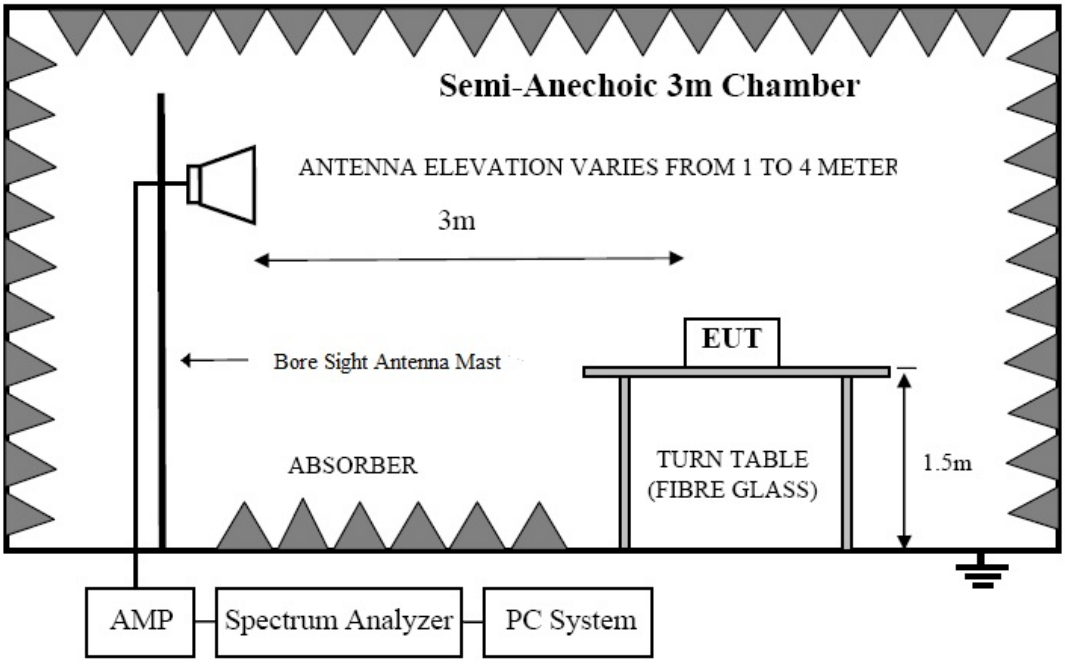
In Semi Anechoic Chamber (3m) Test Setup Diagram for 9KHz~30MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz



4.2.Test Limit

Frequency MHz	Distance (Meters)	Field Strengths Limits	
		uV/m	dB uV/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 1.705	30	24000/F(kHz)	----
1.705 30	30	30	29.5
30 88	3	100(3nW)	40
88 216	3	150(6.8nW)	43.5
216 960	3	200(12nW)	46
Above 960	3	500(75nW)	54
Carrier frequency	3	50000(avg)	113.97(peak) 93.97(avg)

Notes: 1. Emission level = Read level + Antenna Factor - Preamp Factor + Cable Loss

2. The smaller limit shall apply at the cross point between two frequency bands.

3. Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4. For frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

4.3.Configuration of EUT on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

4.4.Operating Condition of EUT

（1） Setup the EUT as shown as Section 4.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

4.5.Test Procedure

（1） The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1GHz and 150 cm above the ground plane inside a semi-anechoic chamber for above 1GHz. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10: 2013 on Radiated Emission test.

（2） For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

（3） Test antenna was located 4m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

（4） For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP

（5） The frequency range from 9KHz to 150KHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 200Hz.
The frequency range from 150KHz to 30MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 9KHz.
The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 120kHz.
The frequency range from above 1GHz is checked, the bandwidth of Signal Analyzer (Signal Analyzer N9020A) is set at 1MHz.

（6） The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

（7） Test for all x, y, z axes is performed and only the worst case was recorded in the test report.

（8） The test results are reported on Section 4.6.

（9）auxiliary equipment

Equipment	Manufacturer	Model No.	Remark
Notebook	ACER	ZQT	SDOC
Microphone	FLUENT	M1	/

Frequency Range	:	**9KHz~30MHz**			
EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.06.11
M/N	:	FA-AG-T100BP	Temperature	:	23.8℃
Test Engineer	:	Reak Yang	Humidity	:	56%
Test Mode	:	TX			
Test Results	:	**PASS**			
Note:	1. Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.				

Frequency Range	:	**30MHz~1000MHz**			
EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.06.11
M/N	:	FA-AG-T100BP	Temperature	:	23.8℃
Test Engineer	:	Reak Yang	Humidity	:	56%
Test Mode	:	TX			
Test Results	:	**PASS**			
Note:	1. The test results are listed in next pages.				

2. This mode is worst case mode, and this report only reflected the worst mode.
3. If the limits for the measurement with the quasi-peak detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

■ Field Strength of The Fundamental Signal

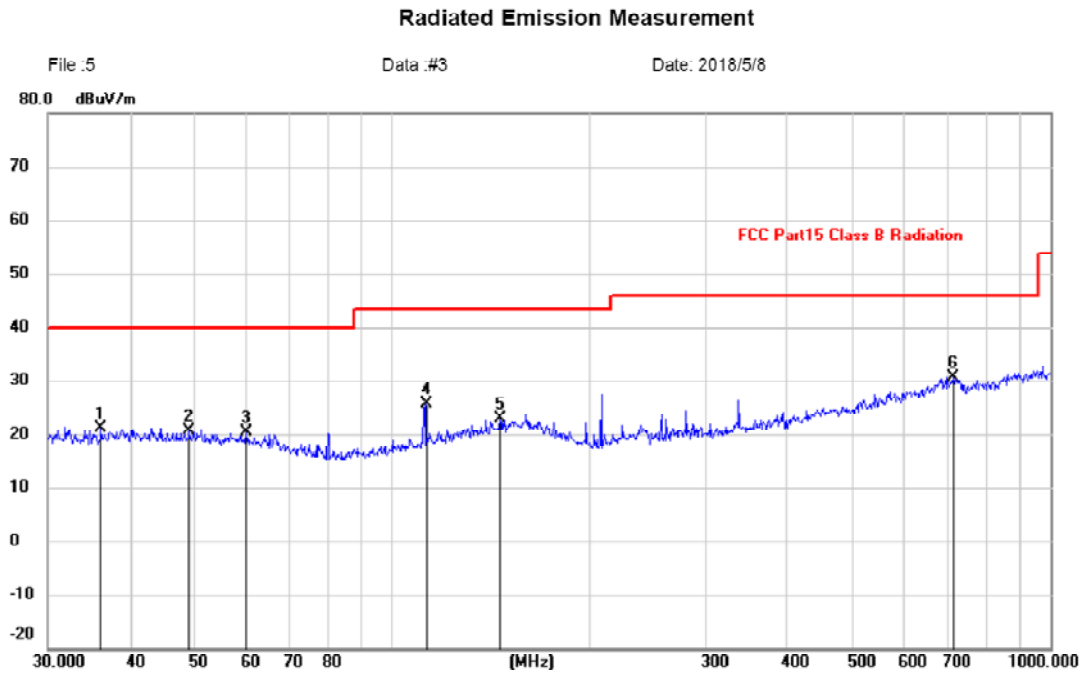
EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.06.11
M/N	:	FA-AG-T100BP	Temperature	:	24℃
Test Engineer	:	Reak Yang	Humidity	:	56%
Test Mode	:	TX			
Test Results	:	**PASS**			

No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	903	H	64.65	22.79	87.44	94	-6.56	QP
3	915	H	68.02	23.59	91.61	94	-2.39	QP
5	927	H	66.32	23.46	89.78	94	-4.22	QP
1	903	V	53.26	22.79	76.05	94	-17.95	QP
3	915	V	59.77	23.59	83.36	94	-10.64	QP
5	927	V	55.06	23.46	78.52	94	-15.48	QP

Note:
1. Correct Factor=Cable Loss+ Antenna Factor.
Result=Reading + Correct Factor.
Margin= Result-Limit.
3. Spectrum Set for QP measure: RBW=120KHz, VBW=300KHz, Sweep time=Auto, Detector: QP.

■ Spurious emission of below 1GHz

Horizontal:



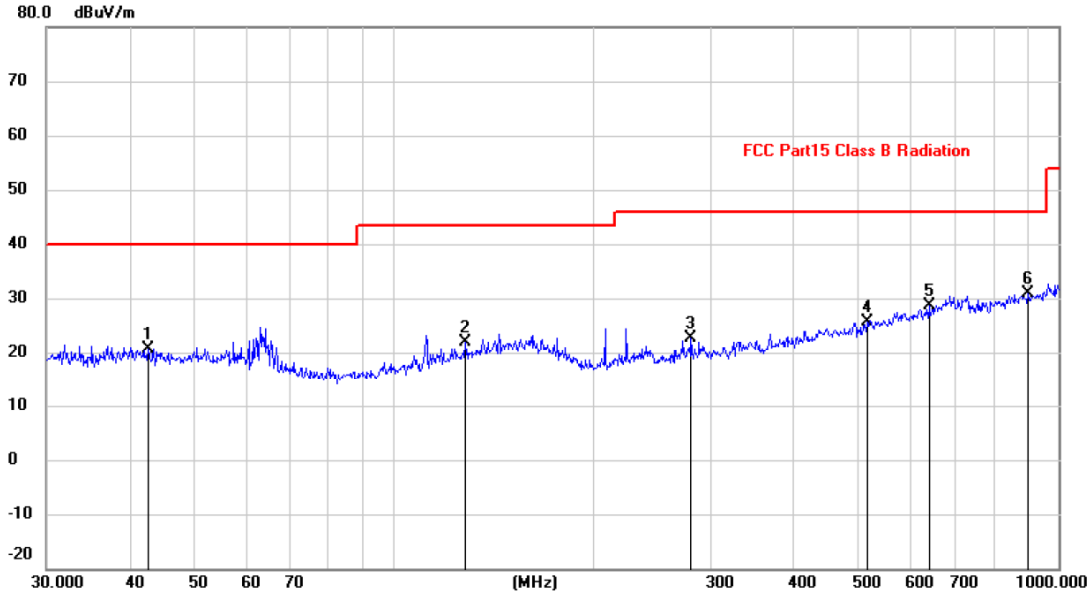
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		36.2540	7.42	13.59	21.01	40.00	-18.99	peak			
2		49.1865	7.03	13.65	20.68	40.00	-19.32	peak			
3		60.0691	7.37	12.96	20.33	40.00	-19.67	peak			
4		112.5243	13.81	11.78	25.59	43.50	-17.91	peak			
5		145.8611	8.58	14.25	22.83	43.50	-20.67	peak			
6	*	711.6734	9.87	20.72	30.59	46.00	-15.41	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Vertical:

Radiated Emission Measurement

File :5 Data :#4 Date: 2018/5/8



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		42.7494	6.77	13.97	20.74	40.00	-19.26	peak			
2		128.5629	8.84	13.14	21.98	43.50	-21.52	peak			
3		280.0237	9.69	12.97	22.66	46.00	-23.34	peak			
4		517.2478	7.96	17.74	25.70	46.00	-20.30	peak			
5		638.3686	8.65	20.01	28.66	46.00	-17.34	peak			
6	*	900.1473	7.91	22.95	30.86	46.00	-15.14	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

■ Spurious emission of above 1GHz

Frequency Range	:	**1GHz~9.5GHz**			
EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.06.11
M/N	:	FA-AG-T100BP	Temperature	:	24℃
Test Engineer	:	Reak Yang	Humidity	:	56%
Test Mode	:	TX 903MHz			
Test Results	:	**PASS**			

Note:

1. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Measurement=Reading + Correct Factor.
Margin= Measurement -Limit.
2. Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK.
3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.
4:Full charged battery is used

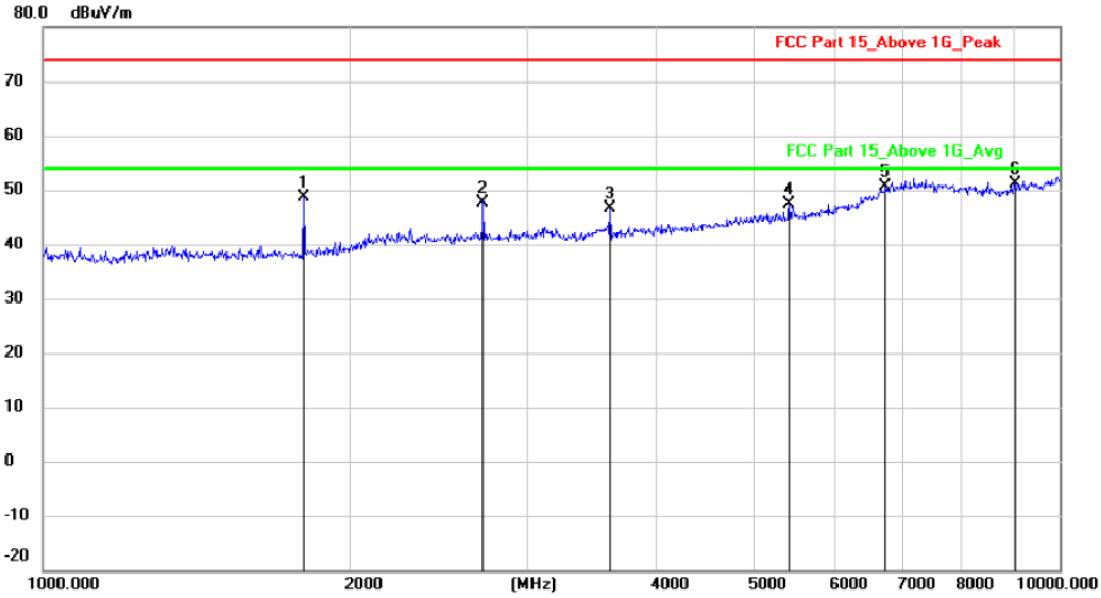
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide
M/N: FA-AG-T100BP
Mode: TX 903
Note:
Engineer Signature:

Polarization: *Vertical*
Power: DC 5V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100BP Data :#18 Date: 2018/6/13 Time: 21:03:55



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1807.174	55.10	-6.41	48.69	74.00	-25.31	peak			
2		2710.192	50.65	-2.90	47.75	74.00	-26.25	peak			
3		3614.099	52.60	-6.07	46.53	74.00	-27.47	peak			
4		5420.009	49.30	-1.90	47.40	74.00	-26.60	peak			
5		6745.280	49.62	1.10	50.72	74.00	-23.28	peak			
6	*	9036.495	47.64	3.41	51.05	74.00	-22.95	peak			

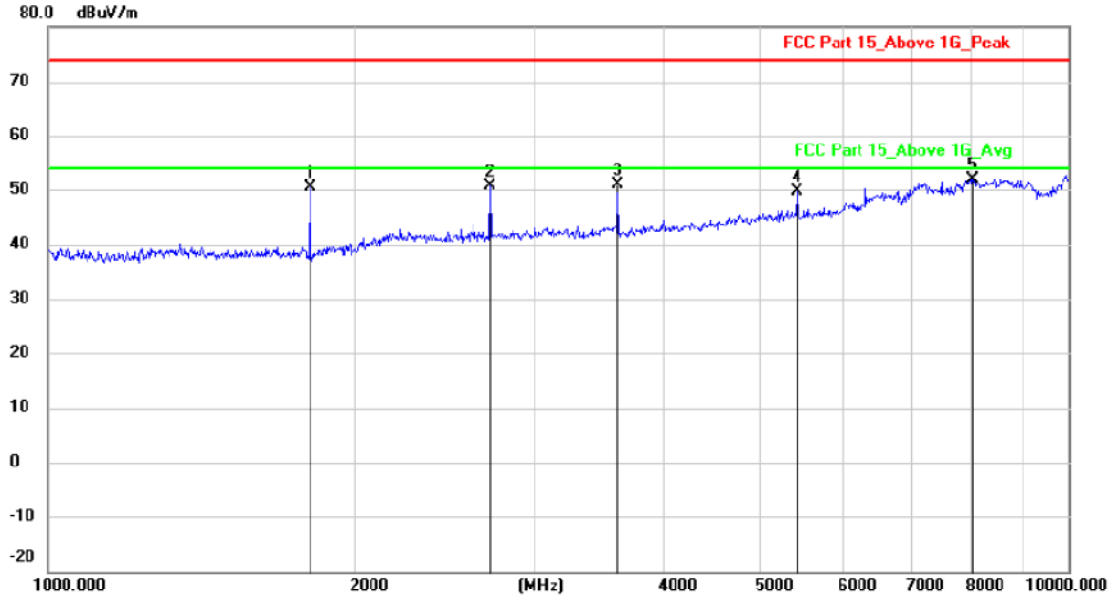
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide
M/N: FA-AG-T100BP
Mode:TX 903
Note:
Engineer Signature:

Polarization: ***Horizontal***
Power: DC 5V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100BP Data #17 Date: 2018/6/13 Time: 20:59:25



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1803.018	56.77	-6.44	50.33	74.00	-23.67	peak			
2		2703.958	53.61	-2.91	50.70	74.00	-23.30	peak			
3		3614.099	57.01	-6.07	50.94	74.00	-23.06	peak			
4		5420.009	51.52	-1.90	49.62	74.00	-24.38	peak			
5	*	8053.784	48.38	3.57	51.95	74.00	-22.05	peak			

Frequency Range	:	**1GHz~9.5GHz**			
EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.06.11
M/N	:	FA-AG-T100BP	Temperature	:	24℃
Test Engineer	:	Reak Yang	Humidity	:	56%
Test Mode	:	TX 915MHz			
Test Results	:	**PASS**			

Note:

1. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Measurement=Reading + Correct Factor.
Margin= Measurement -Limit.
2. Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK.
3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.
4:Full charged battery is used

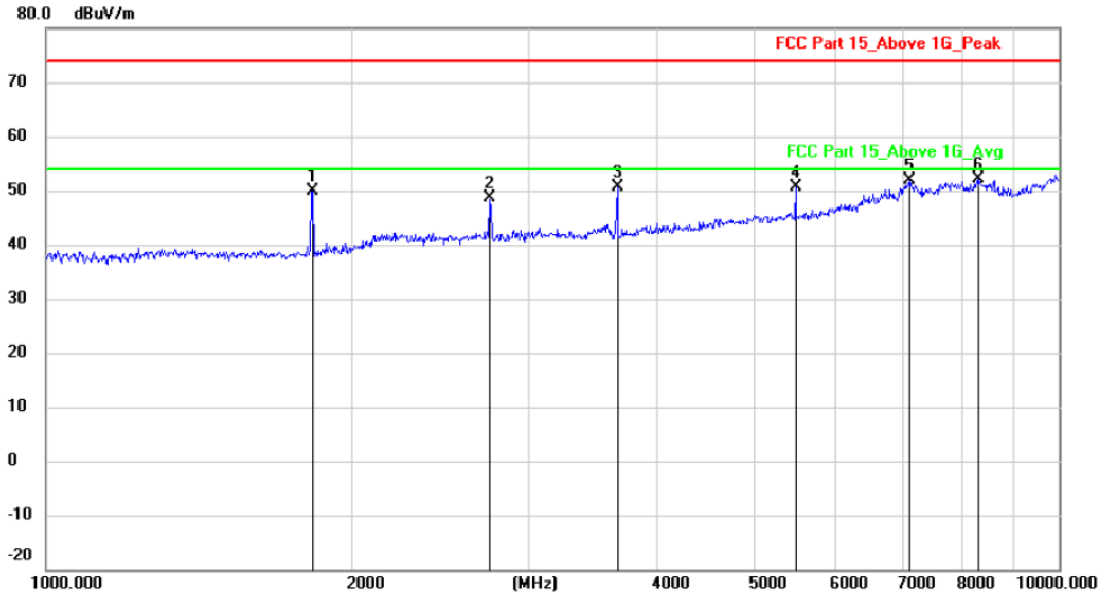
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide
M/N: FA-AG-T100BP
Mode:TX 915
Note:
Engineer Signature:

Polarization: *Horizontal*
Power: DC 5V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100BP Data :#16 Date: 2018/6/13 Time: 20:53:56



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1832.314	56.27	-6.32	49.95	74.00	-24.05	peak			
2		2747.894	51.62	-2.87	48.75	74.00	-25.25	peak			
3		3664.376	56.59	-6.00	50.59	74.00	-23.41	peak			
4		5495.409	52.32	-1.73	50.59	74.00	-23.41	peak			
5		7128.530	48.65	3.12	51.77	74.00	-22.23	peak			
6	*	8317.638	48.68	3.35	52.03	74.00	-21.97	peak			

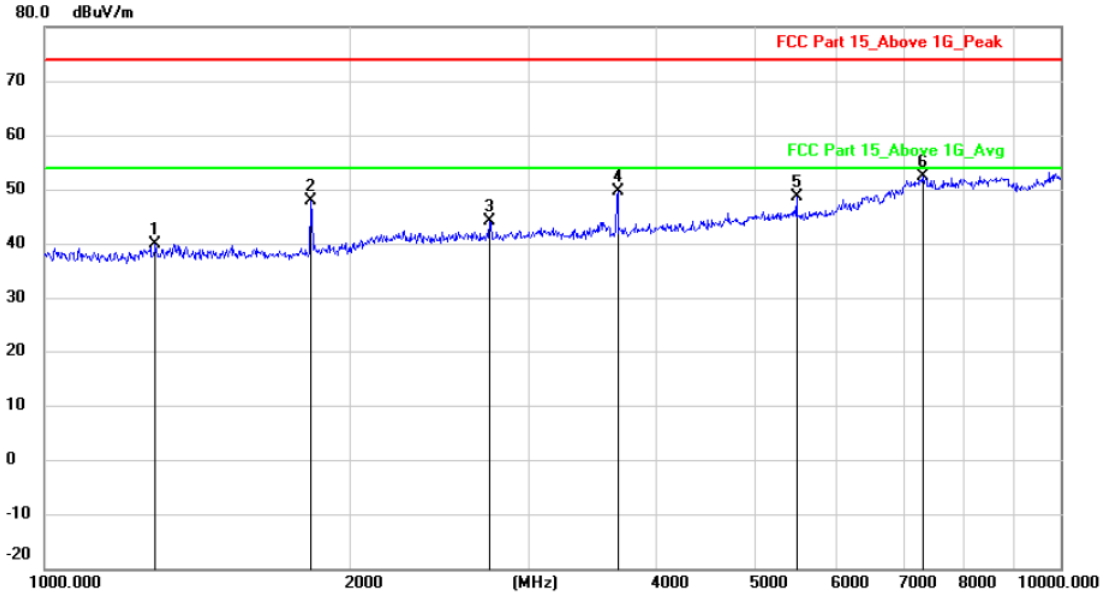
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide
M/N: FA-AG-T100BP
Mode:TX 915
Note:
Engineer Signature:

Polarization: *Vertical*
Power: DC 5V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100BP Data :#15 Date: 2018/6/13 Time: 20:51:27



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1285.287	47.31	-7.47	39.84	74.00	-34.16	peak			
2		1828.100	54.28	-6.32	47.96	74.00	-26.04	peak			
3		2741.574	46.95	-2.87	44.08	74.00	-29.92	peak			
4		3664.376	55.60	-6.00	49.60	74.00	-24.40	peak			
5		5495.409	50.33	-1.73	48.60	74.00	-25.40	peak			
6	*	7311.391	48.96	3.45	52.41	74.00	-21.59	peak			

Frequency Range	:	**1GHz~9.5GHz**			
EUT	:	Portable Audio Guide Transmitter	Test Date	:	2018.06.11
M/N	:	FA-AG-T100BP	Temperature	:	24℃
Test Engineer	:	Reak Yang	Humidity	:	56%
Test Mode	:	TX 927MHz			
Test Results	:	**PASS**			

Note:

1. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Measurement=Reading + Correct Factor.
Margin= Measurement -Limit.
2. Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK.
3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.
4:Full charged battery is used

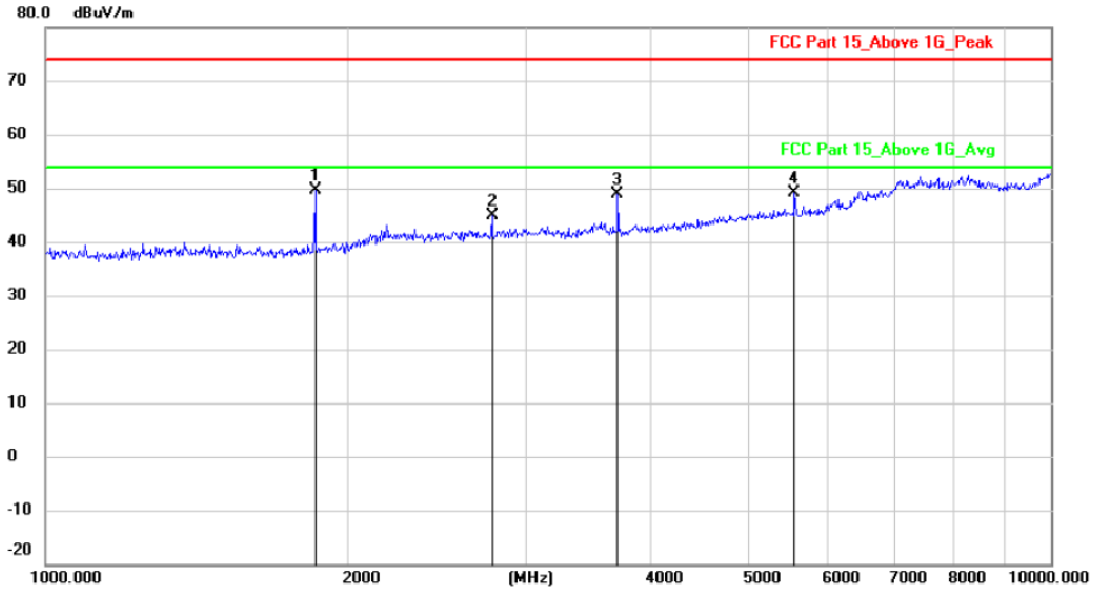
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide
M/N: FA-AG-T100BP
Mode:TX 927
Note:
Engineer Signature:

Polarization: *Vertical*
Power: DC 5V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100BP Data :#14 Date: 2018/6/13 Time: 20:48:57



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	1853.532	55.98	-6.23	49.75	74.00	-24.25	peak			
2		2779.713	47.77	-2.83	44.94	74.00	-29.06	peak			
3		3706.807	54.80	-5.93	48.87	74.00	-25.13	peak			
4		5559.043	50.76	-1.59	49.17	74.00	-24.83	peak			

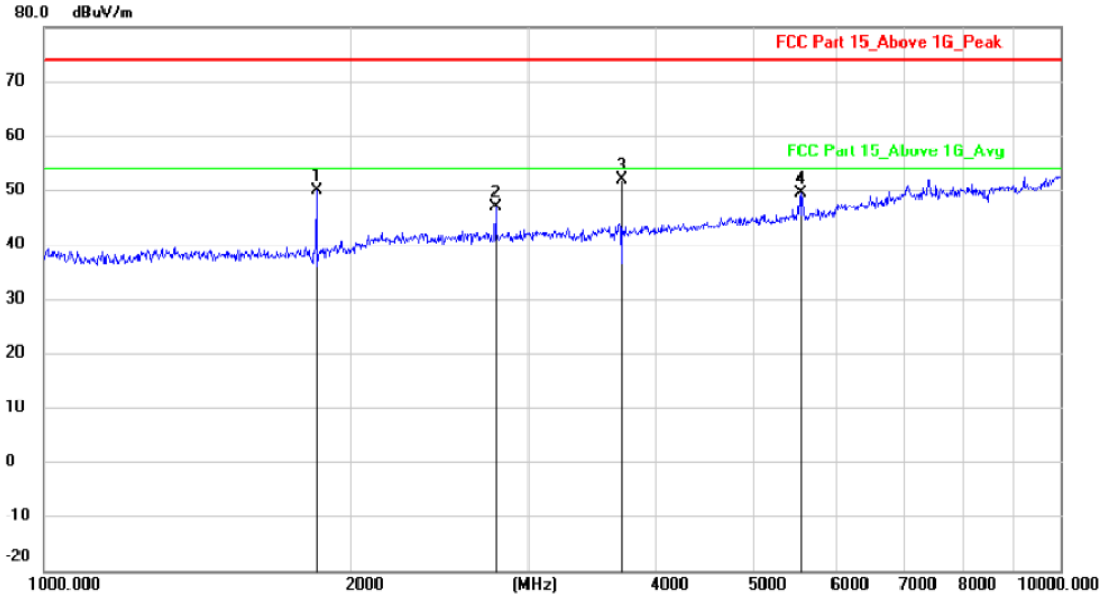
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide
M/N: FA-AG-T100BP
Mode:TX 927
Note:
Engineer Signature:

Polarization: ***Horizontal***
Power: DC 5V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

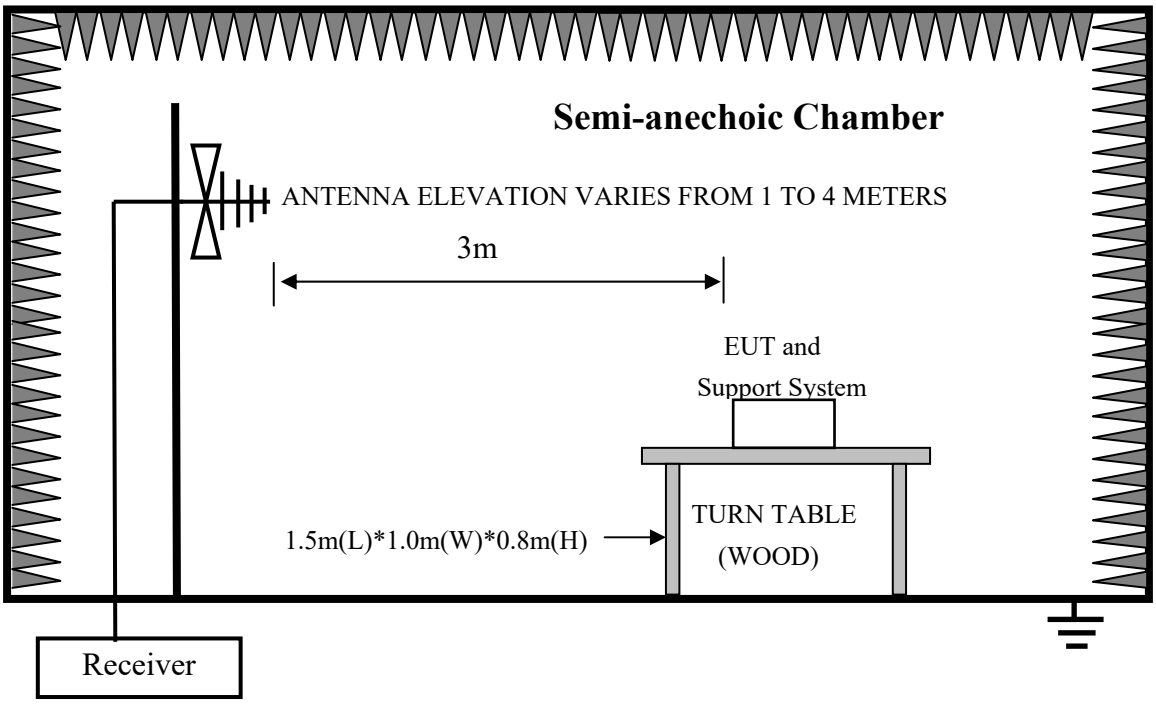
File .FA-AG-T100BP Data .#13 Date. 2018/6/13 Time. 20.17.44



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1853.532	56.16	-6.23	49.93	74.00	-24.07	peak			
2		2779.713	49.81	-2.83	46.98	74.00	-27.02	peak			
3	*	3706.807	57.72	-5.93	51.79	74.00	-22.21	peak			
4		5559.042	51.08	-1.59	49.49	74.00	-24.51	peak			

5. BAND EDGE TEST

5.1.Block Diagram of Test Setup



5.2.Test Limit

Please refer section15.249 and section 15.205.

249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in section 15.209, whichever is the lesser attenuation.

5.3.Configuration of EUT on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

5.4.Operating Condition of EUT

（1） Setup the EUT as shown as Section 5.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

5.5.Test Procedure

（1） The EUT was placed on a non-metallic table, 150 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10: 2013 on Radiated Emission test.

（2） For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

（3） Test antenna was located 4m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

（4） The frequency range from above 1GHz is checked, the bandwidth of Signal Analyzer (Signal Analyzer N9020A) is set at 1MHz.

（5） The frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

（6） Test for all x, y, z axes is performed and only the worst case was recorded in the test report. Full charged battery is used.

（7） The test results are reported on Section 5.6.

5.6.Test Results

EUT	:	Portable Audio Guide Transmitter			Test Date	:	2018.06.12	
M/N	:	FA-AG-T100BP			Temperature	:	23.8℃	
Test Engineer	:	Reak Yang			Humidity	:	56%	
Test Mode	:	TX 903MHz						
Test Results	:	**PASS**						
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
2	902	H	15.49	23.02	38.51	46(QP)	-7.49	QP
4	928	H	16.76	23.35	40.11	46(QP)	-5.89	QP
2	902	V	14.82	23.02	37.84	46(QP)	-8.16	QP
4	928	V	16.29	23.35	39.64	46(QP)	-6.36	QP
Test Mode	:	TX 927MHz						
Test Results	:	**PASS**						
2	902	H	15.02	23.02	38.04	46(QP)	-7.96	QP
4.	928	H	16.17	23.35	39.52	46(QP)	-6.48	QP
2	902	V	16.34	23.02	39.36	46(QP)	-6.64	QP
4.	928	V	17.97	23.35	41.32	46(QP)	-4.68	QP

Note:
1. Correct Factor=Cable Loss+ Antenna Factor .
Result=Reading + Correct Factor, Margin= Result-Limit.
2. Spectrum Set for QP measure: RBW=120KHz, VBW=300KHz, Sweep time=Auto, Detector: QP.
3.For bandedge test ， Low and High channel was found as the worse case and only reported by pre-scan

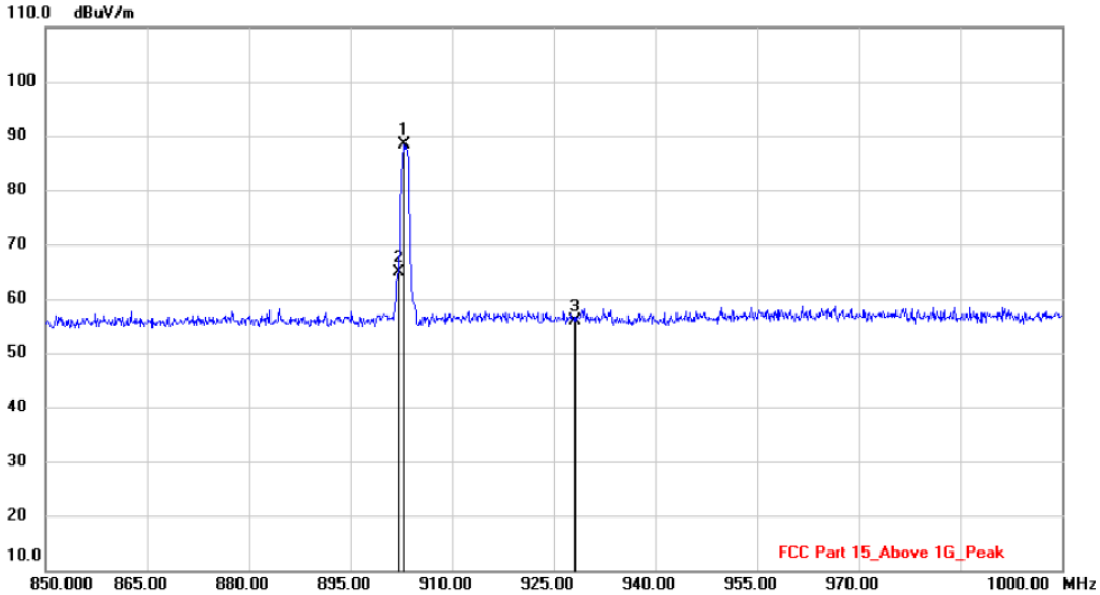
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide Transmitt
M/N: FA-AG-T100BP
Mode: TX 903
Note:
Engineer Signature:

Polarization: *Vertical*
Power: DC 3.7V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100ST Data :#21 Date: 2018/6/12 Time: 20:48:05



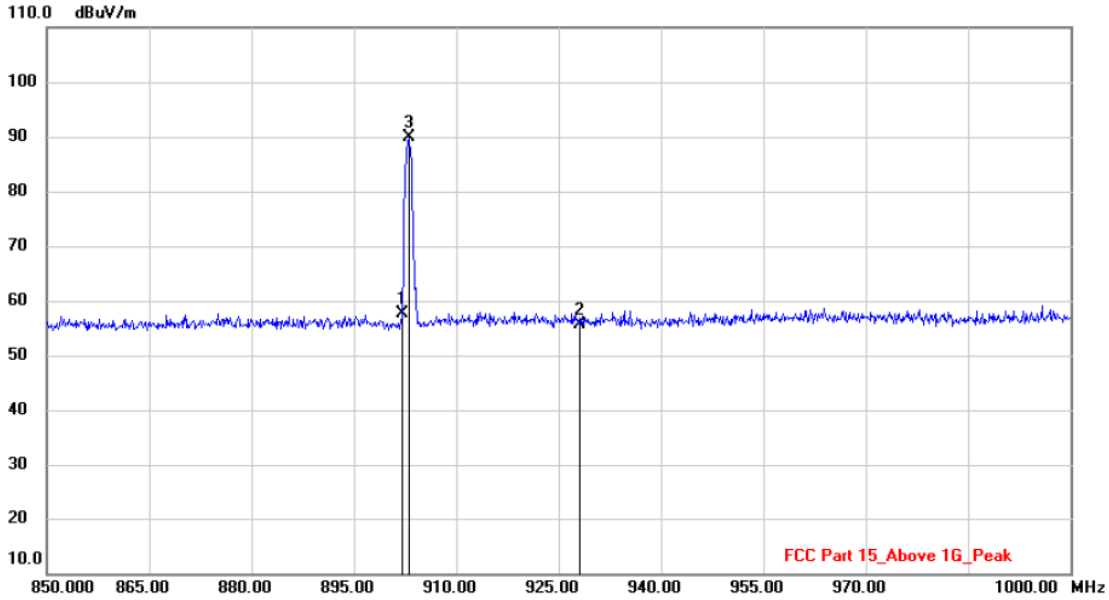
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	902.9500	65.30	23.04	88.34	74.00	14.34	peak			
2		902.0000	41.89	23.02	64.91	74.00	-9.09	peak			
3		928.0000	32.60	23.35	55.95	74.00	-18.05	peak			
2`		902.0000	14.82	23.02	37.84	46.00	-8.16	QP			
3`		928.0000	16.29	23.35	39.64	46.00	-5.36	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Site LAB	Polarization: ***Horizontal***	Temperature: 23.9
Limit: FCC Part 15_Above 1G_Peak	Power: DC 3.7V	Humidity: 46 %
EUT: Portable Audio Guide Transmitt	Distance: 3m	
M/N: FA-AG-T100BP		
Mode: TX 903		
Note:		
Engineer Signature:		

Radiated Emission Measurement

File :FA-AG-T100ST Data :#22 Date: 2018/6/12 Time: 20:52:06



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		902.0000	34.58	23.02	57.60	74.00	-16.40	peak			
2		928.0000	32.28	23.35	55.63	74.00	-18.37	peak			
3	*	903.1000	66.90	23.05	89.95	74.00	15.95	peak			
1`		902.0000	15.49	23.02	38.51	46.00	-7.49	QP			
2`		928.0000	16.76	23.35	40.11	46.00	-5.89	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

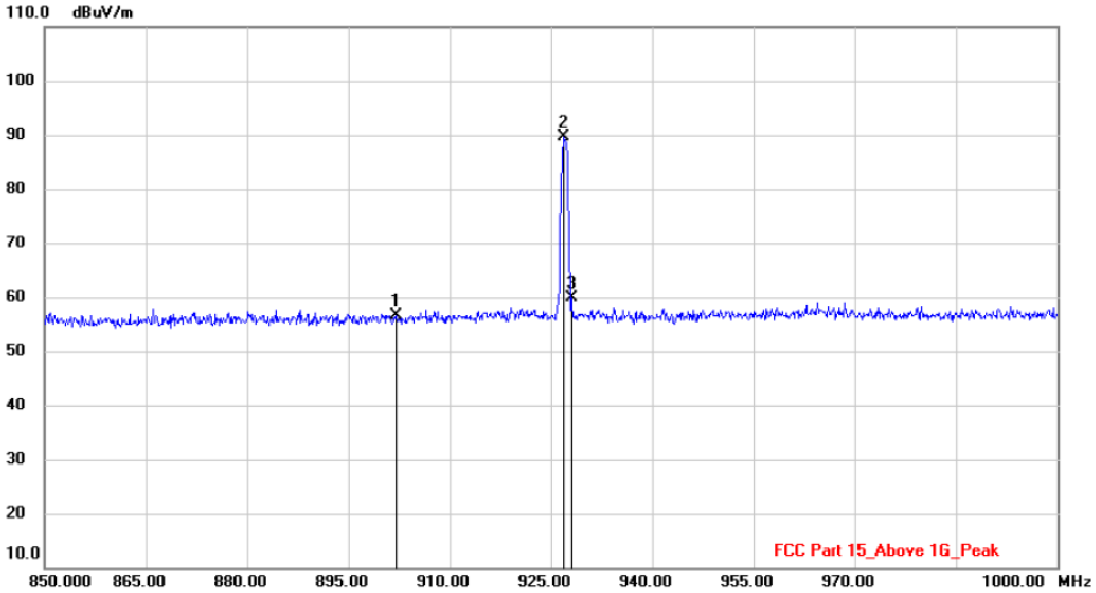
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide Transmitt
M/N: FA-AG-T100BP
Mode:TX 927
Note:
Engineer Signature:

Polarization: ***Horizontal***
Power: DC 3.7V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100ST Data :#23 Date: 2018/6/12 Time: 20:57:22



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		902.0000	33.60	23.02	56.62	74.00	-17.38	peak			
2	*	926.8000	66.32	23.39	89.71	74.00	15.71	peak			
3		928.0000	36.43	23.35	59.78	74.00	-14.22	peak			
1`		902.0000	15.02	23.02	38.04	46.00	-7.38	QP			
3`		928.0000	16.17	23.35	39.52	46.00	-6.48	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

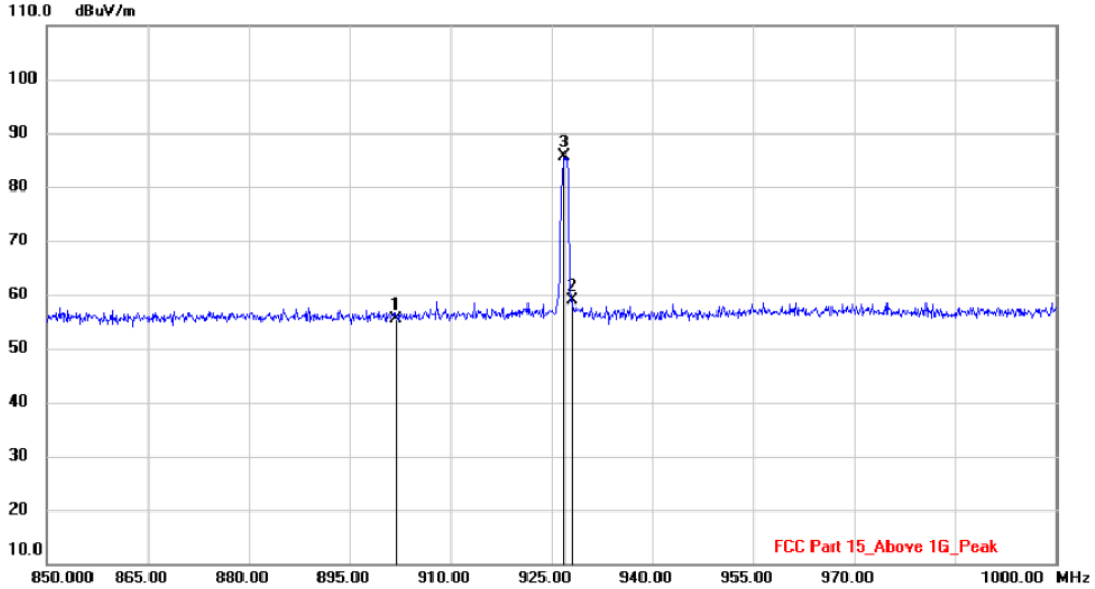
Site LAB
Limit: FCC Part 15_Above 1G_Peak
EUT: Portable Audio Guide Transmitt
M/N: FA-AG-T100BP
Mode:TX 927
Note:
Engineer Signature:

Polarization: *Vertical*
Power: DC 3.7V
Distance: 3m

Temperature: 23.9
Humidity: 46 %

Radiated Emission Measurement

File :FA-AG-T100ST Data :#24 Date: 2018/6/12 Time: 21:05:49

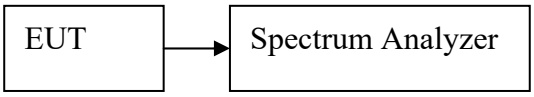


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		902.0000	32.27	23.02	55.29	74.00	-18.71	peak			
2		928.0000	35.62	23.35	58.97	74.00	-15.03	peak			
3	*	926.8000	62.20	23.39	85.59	74.00	11.59	peak			
1`		902.0000	16.34	23.02	39.36	46.00	-6.71	QP			
2`		928.0000	17.97	23.35	41.32	46.00	-4.68	QP			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

6. OCCUPIED BANDWIDTH TEST

6.1.Block Diagram of Test Setup



6.2.Test Limit

Please refer section15.249 and section 15.205.

6.3.Test Procedure

（1） The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

（2） The test receiver RBW set 30KHz,VBW set 100KHz,Sweep time set auto.

6.4.Test Results

EUT	:	Portable Audio Guide Transmitter		Test Date	:	2018.06.14
M/N	:	FA-AG-T100BP		Temperature	:	24℃
Test Engineer	:	Reak Yang		Humidity	:	56%
Test Results	:	**PASS**				
Mode	Frequency MHz	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (kHz)		
GFSK	903	1.301	1.2503	/		
	915	1.315	1.2526	/		
	927	1.314	1.2490	/		
Note: 1. The test results are listed in next pages.						

Frequency: 903MHz

Frequency: 915MHz

Frequency: 927MHz

7. ANTENNA REQUIREMENT

7.1.Standard Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

7.2.Antenna Connected Construction

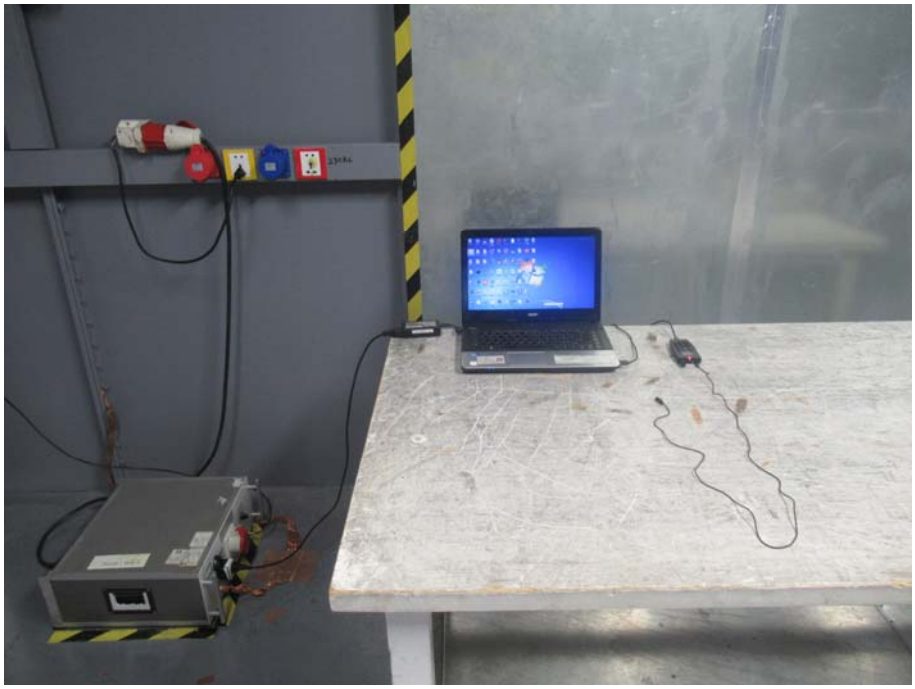
The gains of antenna used for transmitting is 0dBi, and the antenna is fixed antenna no consideration of replacement. Please see EUT photo for details.

7.3.Results

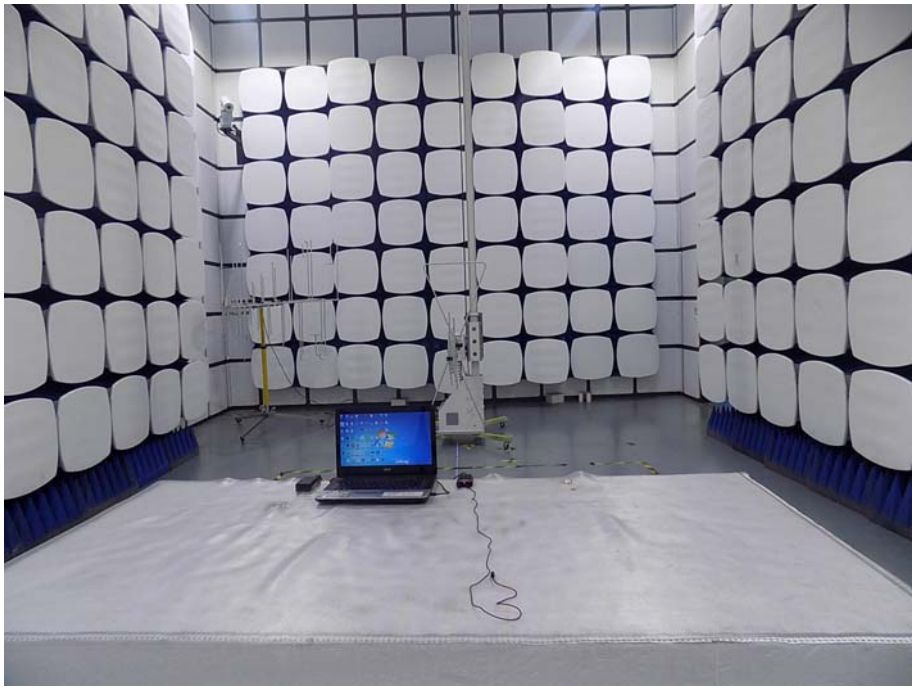
The EUT antenna is fixed antenna. It complies with the standard requirement.

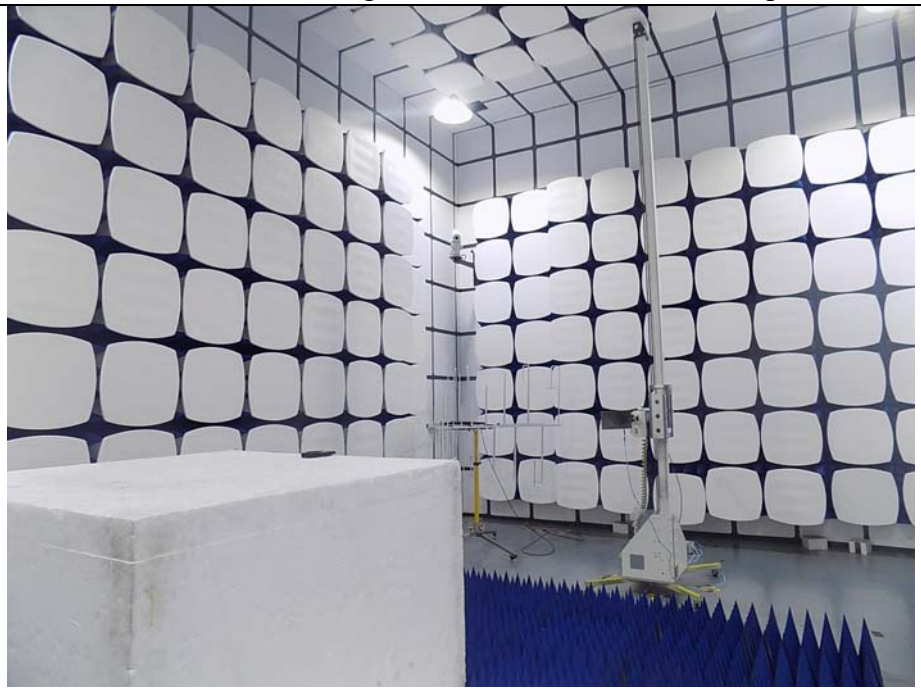
8. PHOTOGRAPH

8.1.Photo of Conducted Emission



8.2.Photos of Radiated Emission Test (In Semi Anechoic Chamber)

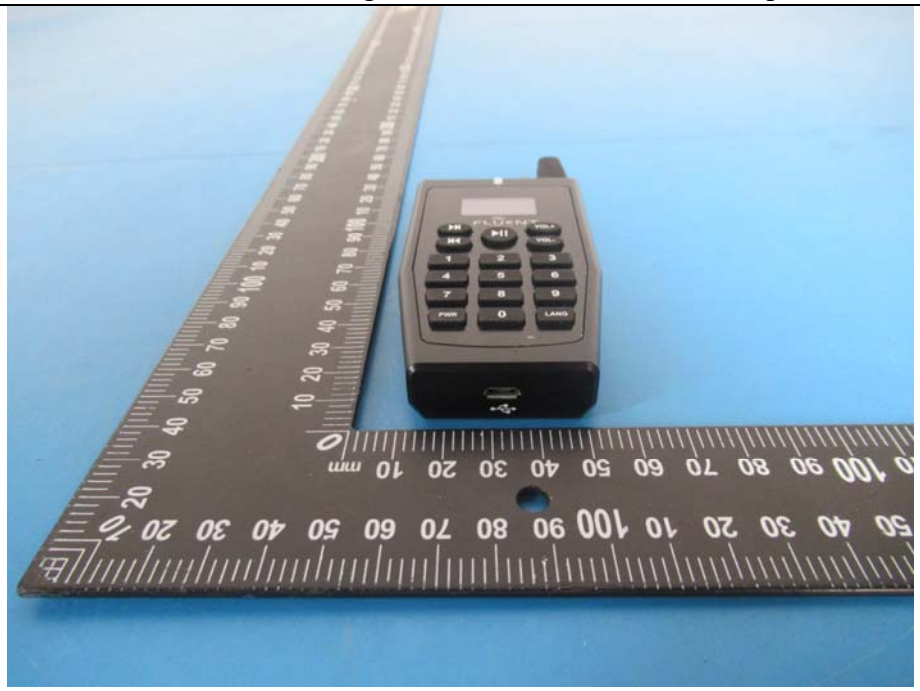




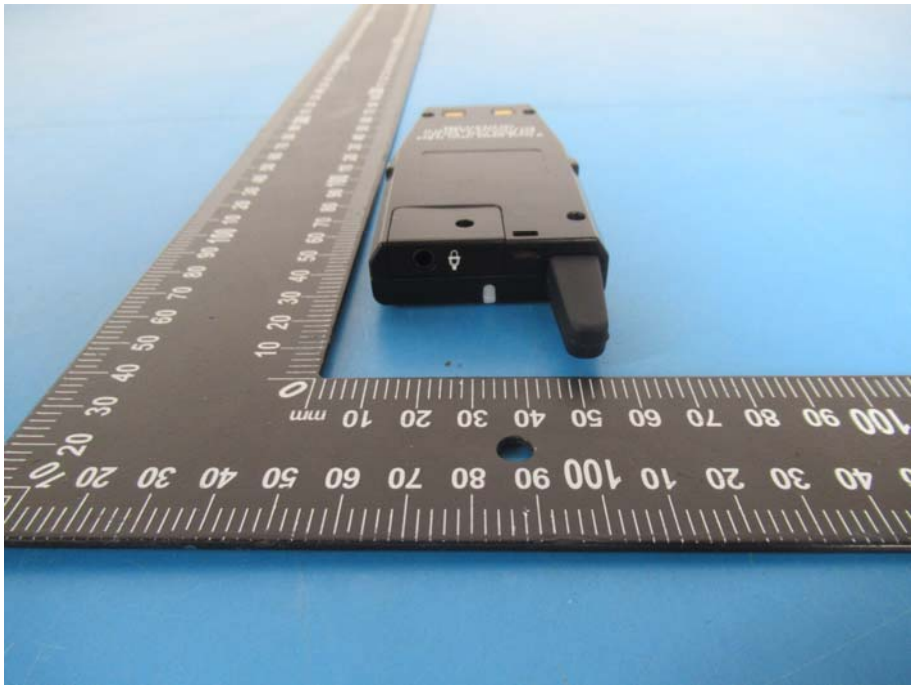
9. PHOTOS OF THE EUT

EUT View

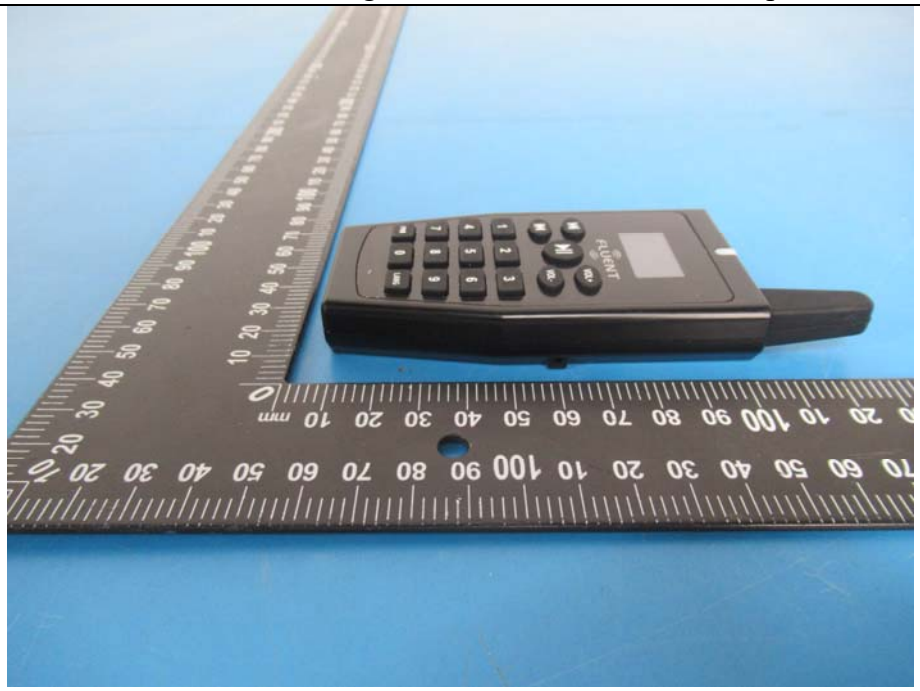
EUT View



EUT View

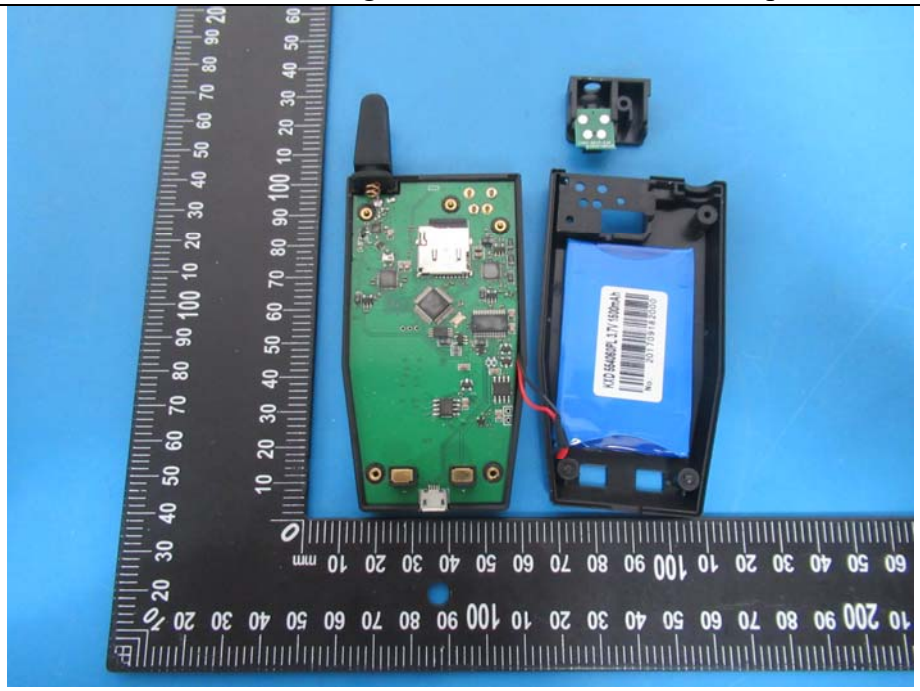


EUT View

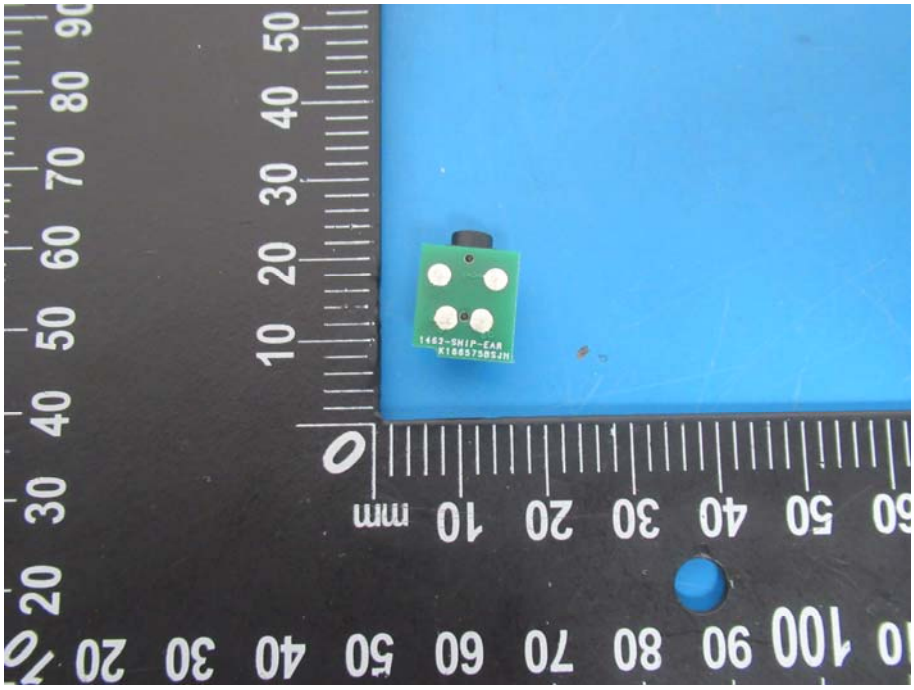


EUT View

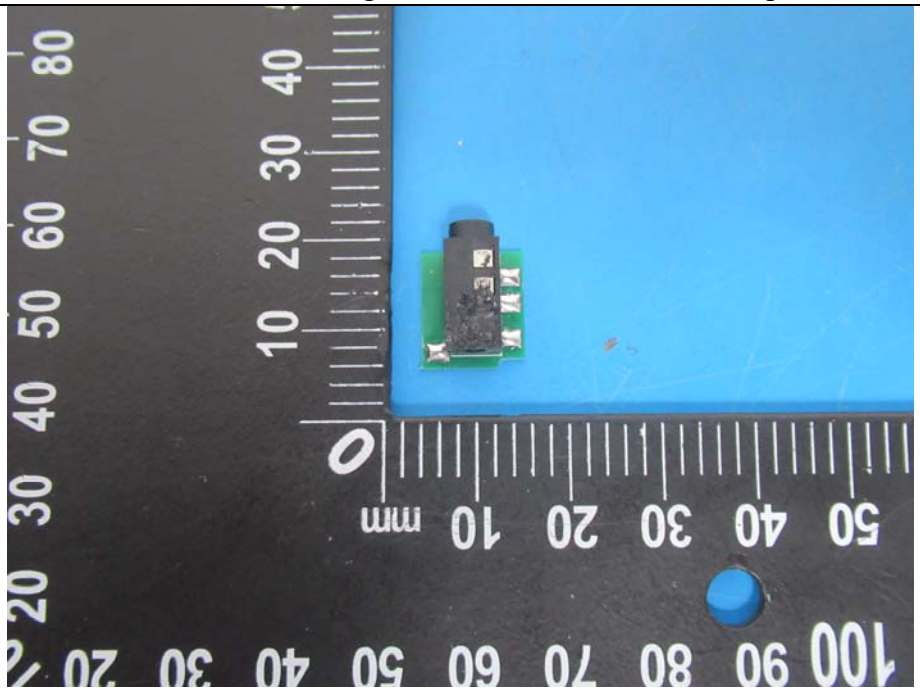
EUT View



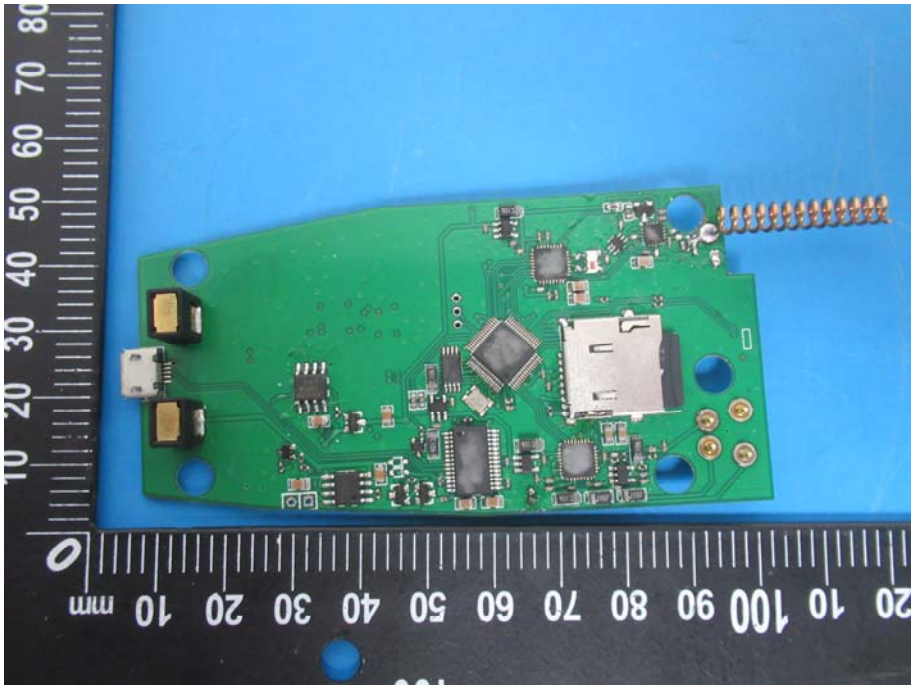
EUT View



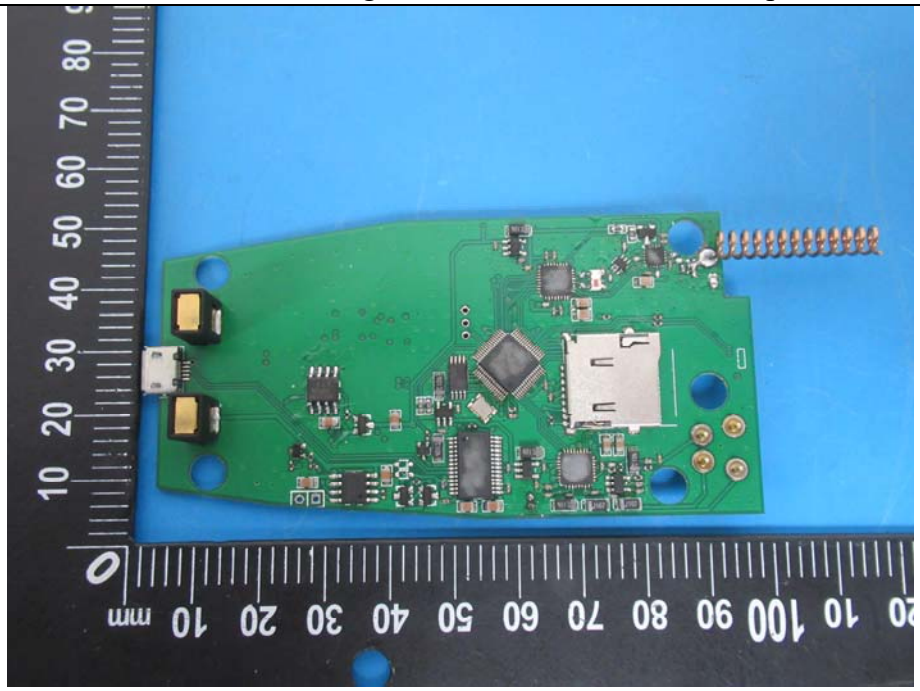
EUT View



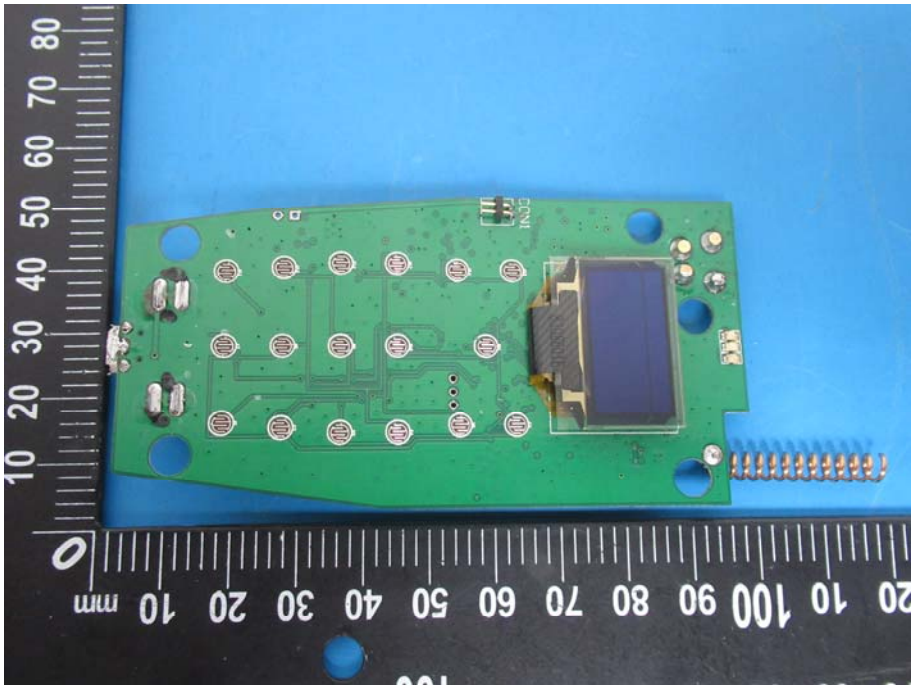
EUT View



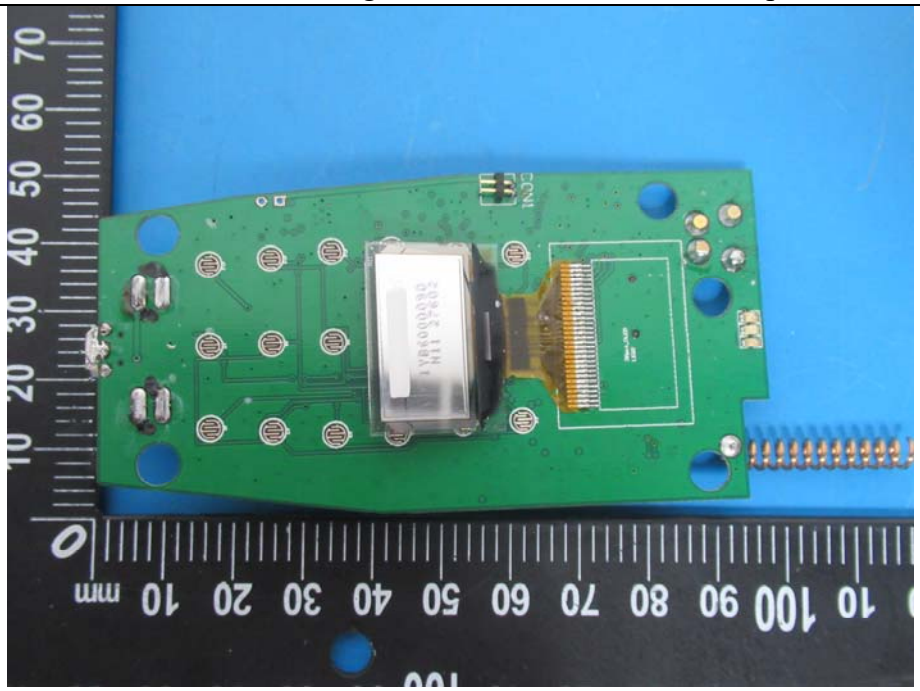
EUT View



EUT View



EUT View



EUT View

----END OF REPORT----