FCC Test Report

Report No.: AGC01040141001FE02

FCC ID	:	2ACD8BW16T
APPLICATION PURPOSE	:	ORIGINAL EQUIPMENT
PRODUCT DESIGNATION	:	BODYPACK TRANSMITTER
BRAND NAME	:	PASGAO,BES,POLSEN
MODEL NAME	:	BW16T, ULW-16
CLIENT	:	ENPING PASGAO ELECTRONICS CO., LTD.
DATE OF ISSUE	:	Nov. 17, 2014
STANDARD(S)	:	FCC PART 74 RULES
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd.

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov.17, 2014	Valid	Original Report

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1. VERIFICATION OF COMPLIANCE

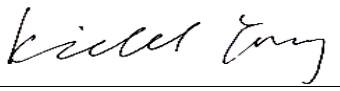
Applicant	ENPING PASGAO ELECTRONICS CO., LTD.
Address	V1 2nd District Industrial Transfer Park, Enping, Jiangmen, Guangdong, China
Manufacturer	ENPING PASGAO ELECTRONICS CO., LTD.
Address	V1 2nd District Industrial Transfer Park, Enping, Jiangmen, Guangdong, China
Product Description	BODYPACK TRANSMITTER
Brand Name	PASGAO, BES, POLSEN
Model Name	ULW-16
Series Model	BW16T
Model Difference	All the same except for model name and brand name.
Date of Test	Nov.03,2014 to Nov. 17,2014

We hereby certify that:

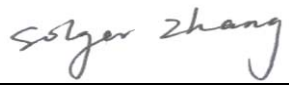
The report for the equipment was prepared by Attestation Of Global Compliance Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA 603; ANSI C 63.4:2003 and the sample tested as described in this report is in compliance with the FCC Rules Part 74 Subpart H. The test results of this report relate only to the tested sample identified in this report.

Tested By :

Bart Xie Nov. 17,2014

Reviewed By : 

Kidd Yang Nov. 17,2014

Approved By: 

Solger Zhang Nov. 17,2014

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

The EUT is a BODYPACK TRANSMITTER designed as Low Power Auxiliary Stations for transmitting voice only. It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical description of EUT is described as following:

Communication Type	Voice / Tone only
Modulation	FM
Emission Type	F3E
Emission Bandwidth	106.838kHz(Max)
Peak Frequency Deviation	48.71KHz(Max)
Audio Frequency Deviation	18.78 KHz(Max)
Maximum Output Power	8.79 mW
Output Power Modification	Fixed can't be changed
Antenna Designation	Integral
Power Supply	DC 3V
Battery Endpoint	DC 2.55V
Operation Frequency Range and Channel	Frequency Range: 584.40 MHz-606.75 MHz
	Channel: High Channel:606.75MHz, Middle Channel: 595.60 MHz, Low Channel: 584.40 MHz
Frequency Tolerance	0.0024%

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ACD8BW16T** filing to comply with the FCC Part 74, Subpart H Rules.

2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI TIA/EIA 603 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

2.4 TEST FACILITY

. Attestation of Global Compliance (Shenzhen) Co., Ltd.
1F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.

FCC register No.: 259865

2.5 SPECIAL ACCESSORIE

Not available for this EUT intended for grant.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7 DIFFERENCES BETWEEN MODELS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

a) Section 74.861 (e) - 1: Maximum transmitter power less than 250mW

b) Section 74.861 (e) - 3: Peak Frequency Deviation less than ±75 KHz

c) Section 74.861 (e) - 4: Frequency Tolerance less than 0.005%

d) Section 74.861 (e) - 5: Emission Bandwidth shall less than 200 KHz

e). Section 74.861 (e) - 6: Unwanted radiation

According to Section 74.861 (e) – 6, the mean power of emission shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

1). At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

2). At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

4). At least 43 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%

3.4 CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	BODYPACK TRANSMITTER	PASGAO	ULW-16	2ACD8BW16T	N/A	EUT
--	--	--	--	--	--	--
--	--	--	--	--	--	--

4. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§74.861 (e)-1	Carrier Power	Compliant
§74.861 (e)-3	Frequency Deviation	Compliant
§74.861 (e)-4	Frequency Tolerance	Compliant
§74.861 (e)-5	Operating Bandwidth	Compliant
§74.861 (e)-6	Unwanted Radiation	Compliant

5. DESCRIPTION OF TEST MODES

Test mode:

Mode 1: TX in Low Channel

Mode 2: TX in middle Channel

Mode 3: TX in high Channel

Note: The EUT (HANDHELD TRANSMITTER) has been tested under normal operating condition. Three channels (the Low channel, the middle channel and the High channel) have been chosen for testing. On each channel three axes have been evaluated for radiated emission.

6. MAXIMUM TRANSMITTER POWER

6.1 PROVISIONS APPLICABLE

According to FCC Part 74 Section 74.861(e) – 1: The power of the measured unmodulated carrier power at the output of the transmitter power amplifier may not exceed 250mW

6.2 MEASUREMENT PROCEDURE

1).On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

2).The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.

3).The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

4).The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

5).The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.

6).The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

7). The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

8). The maximum signal level detected by the measuring receiver shall be noted.

9). Replace the antenna with a proper Antenna (substitution antenna).

10).The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.

11).The substitution antenna shall be connected to a calibrated signal generator.

12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

14). The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

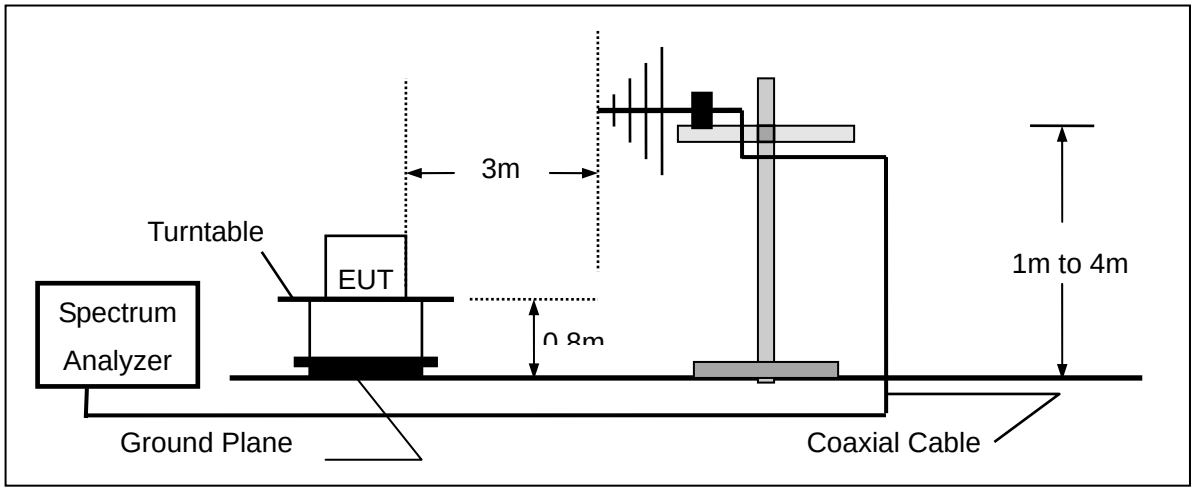
15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

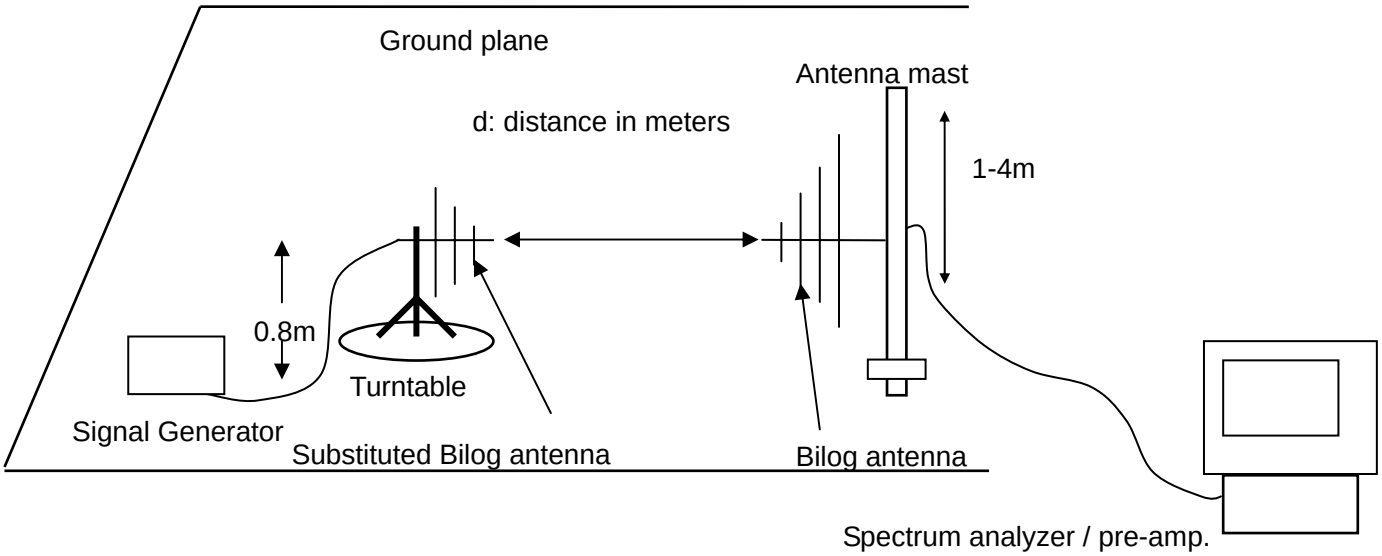
16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

6.3 TEST SETUP BLOCK DAIGRAM

TEST SETUP OF SUBSTITUTION METHOD





6.4 MEASUREMENT EQUIPMENT USED

EQUIPMENT TYPE	MFR	MODEL NO.	SERIAL NO.	CAL DATE.	NEXT CAL DAT.
Spectrum Analyzer	AGILENT	E4440A	US41421290	July 25, 2014	July 24, 2015
Pre-Amplifier	EM	EM30180	2944A07999	Feb. 17, 2014	Feb. 16, 2015
Loop Antenna	A.H.	SAS-562B	SEL0097	May 11, 2014	May 10, 2015
Wideband Requency Antenna	SCHWARZBECK	VULB9168	26	Aug.17,2014	Aug.16, 2015
Substitution Antenna	EMCO	3142C	---	June 7,2014	June 6, 2015
Substitution Antenna	EM	EM-AH-10180	67	Feb.17, 2014	Feb.16, 2015
Horn Antenna	A.H. Systems Inc.	SAS-574	128	June 7,2014	June 6, 2014
SIGNAL GENERATOR	AGILENT	E4438C	MY44260051	Feb.23,2014	Feb.22,2015
CABLE	TIME MICROWAVE	LMR-400	N-TYPE04	July 16, 2014	July 15, 2015

6.5 TEST RESULT

Test Result @ Low Channel

Freq.	Antenna	Reading	SG O/P	Ant. Gain	Dipole Gain	Cable	Corrected Power		Limit
(MHz)	Polarity	(dBm)	(dBm)	(dB)	(dBi)	(dB)	(dBm)	(mW)	(mW)
584.4	V	-8.36	-5.37	15.83	0	1.41	9.05	8.04	50
584.4	H	-7.63	-5.58	14.79	0	1.32	7.89	6.15	50

Test Result@Middle Channel

Freq.	Antenna	Reading	SG O/P	Ant. Gain	Dipole Gain	Cable	Corrected Power		Limit
(MHz)	Polarity	(dBm)	(dBm)	(dB)	(dBi)	(dB)	(dBm)	(mW)	(mW)
595.6	V	-8.34	-4.49	15.34	0	1.41	9.44	8.79	50
595.6	H	-7.17	-5.08	14.97	0	1.32	8.57	7.19	50

Test Result@High Channel

Freq.	Antenna	Reading	SG O/P	Ant. Gain	Dipole Gain	Cable	Corrected Power		Limit
(MHz)	Polarity	(dBm)	(dBm)	(dB)	(dBi)	(dB)	(dBm)	(mW)	(mW)
606.75	V	-8.65	-5.82	15.59	0	1.41	8.36	6.85	50
606.75	H	-7.78	-5.55	14.92	0	1.32	8.05	6.38	50

7. MODULATION CHARACTERISTICS

7.1 PROVISIONS APPLICABLE

a).According to CFR 47 section 2.1047(a), for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

b). According to CFR 47 section 74.861(e)-3, any form of modulation may be used. A maximum deviation of ±75 KHz is permitted when frequency modulation is employed.

7.2 MEASUREMENT METHOD

7.2.1 MODULATION LIMIT

1). Configure the EUT as shown in figure 6-1, adjust the audio input for 60% of rated system deviation at 1KHz using this level as a reference (0dB) and vary the input level from –20 to +20dB. Record the frequency deviation obtained as a function of the input level.

2). Repeat step 1 with input frequency changing to 300, 1000, 3000, and 12000 Hz in sequence.

7.2.2 AUDIO FREQUENCY RESPONSE

1). Configure the EUT as shown in figure 6-1.

2). Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0 dB).

3). Vary the Audio frequency from 100 Hz to 30 KHz and record the frequency deviation.

4). Audio Frequency Response = 20log10 (Deviation of test frequency/Deviation of 1 KHz reference).

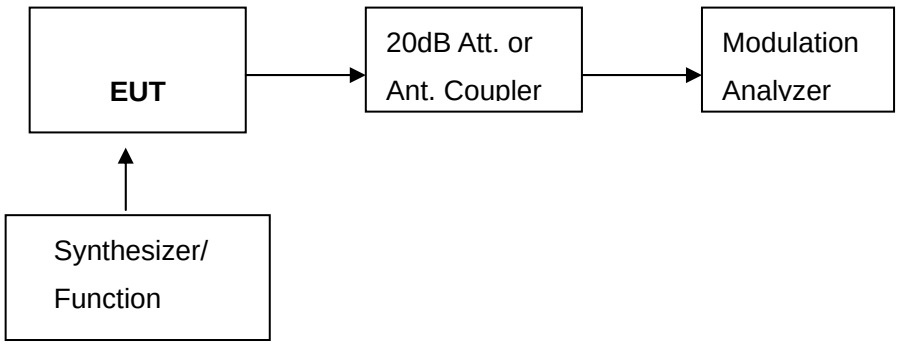


Figure 6-1: Modulation Characteristic Measurement Configuration

7.3 MEASUREMENT INSTRUMENTS

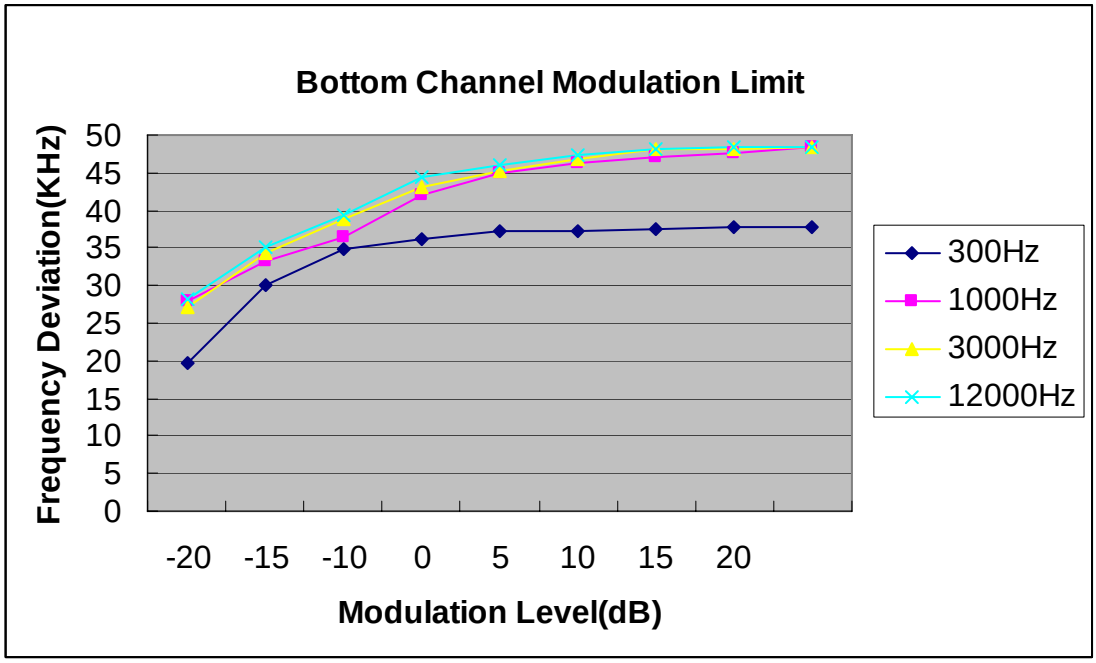
EQUIPMENT TYPE	MFR	MODEL NUMBER	CAL DATE.	NEXT CAL DAT.
Audio Signal Generator	AGILENT	E4438C	Feb.23,2014	Feb.22,2015
Modulation Analyzer	HP	8920B	Feb.17, 2014	Feb.16, 2015
Attenuator	MINI CIRCUITS	MCL BW-S20W2	July 17, 2014	July 16, 2015

7.4 TEST RESULT

a). **Modulation Limit:**

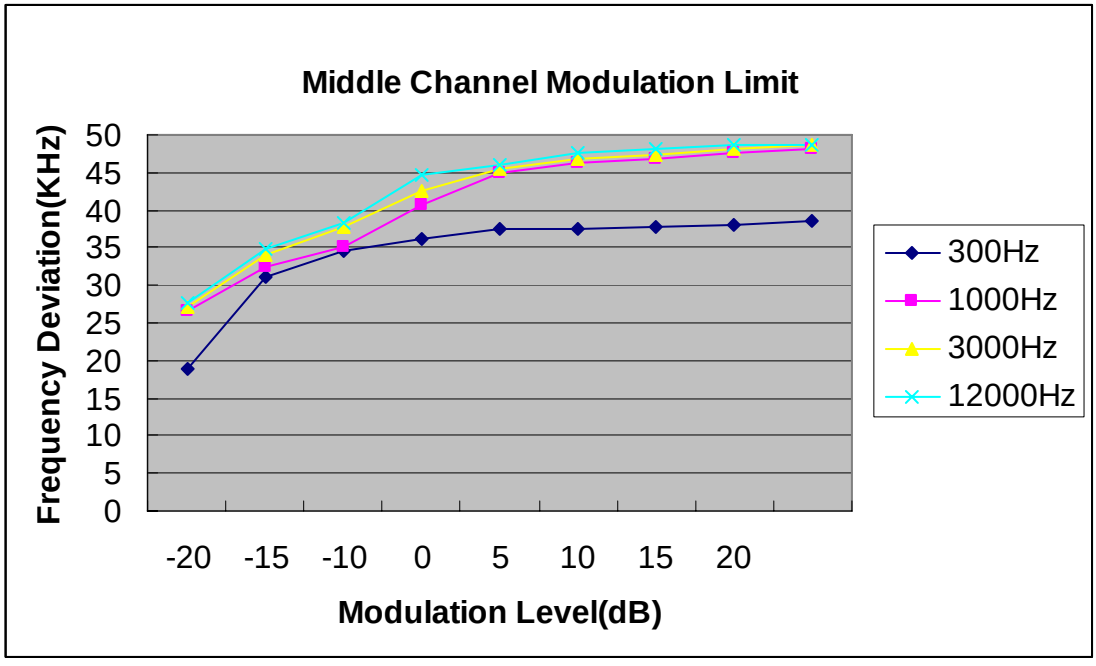
Test Result @Low Channel

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1000 Hz (KHz)	Peak Freq. Deviation At 3000 Hz (KHz)	Peak Freq. Deviation At 12000 Hz (KHz)
-20	19.67	27.84	27.05	28.27
-15	30.13	33.15	34.27	35.15
-10	34.89	36.37	38.86	39.23
-5	36.05	41.87	43.15	44.51
0	37.12	44.99	45.19	46.07
+5	37.27	46.26	46.79	47.22
+10	37.45	46.97	48.11	48.14
+15	37.66	47.64	48.17	48.27
+20	37.89	48.25	48.41	48.55


Bottom Channel Modulation Limit
Frequency Deviation(KHz)
50
45
40
35
30
25
20
15
10
5
0
-20
-15
-10
0
5
10
15
20
Modulation Level(dB)
300Hz
1000Hz
3000Hz
12000Hz

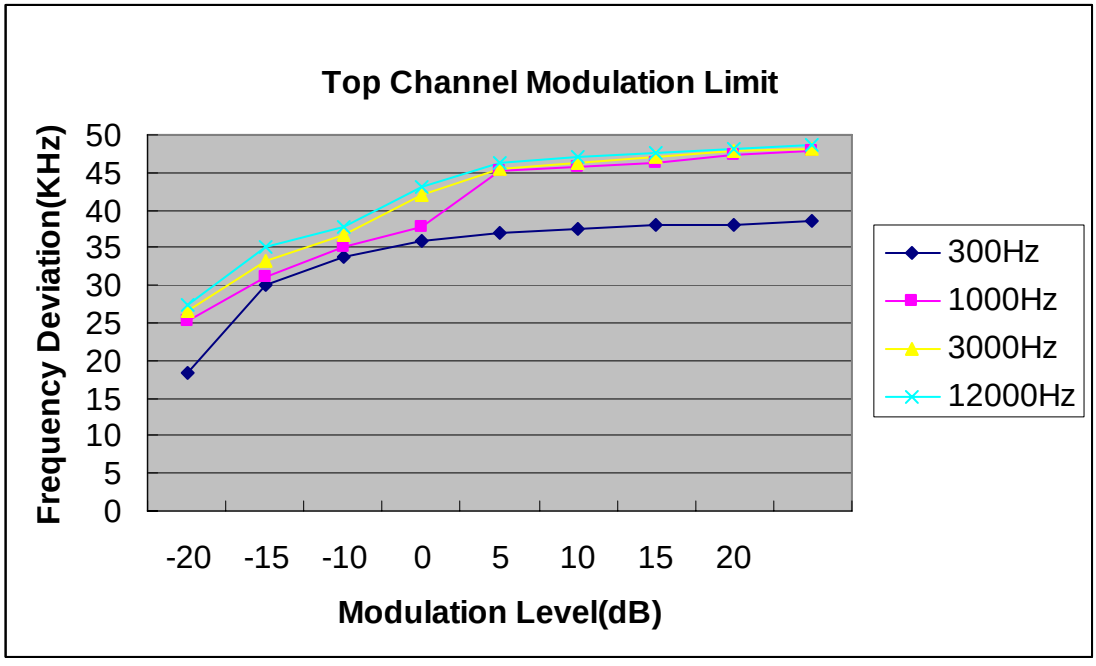
Test Result @ Middle Channel

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1000 Hz (KHz)	Peak Freq. Deviation At 3000 Hz (KHz)	Peak Freq. Deviation At 12000 Hz (KHz)
-20	18.97	26.69	27.26	27.77
-15	31.01	32.46	34.11	34.85
-10	34.58	35.11	37.68	38.14
-5	36.22	40.77	42.49	44.73
0	37.4	45.05	45.46	46.13
+5	37.59	46.18	46.89	47.47
+10	37.88	46.77	47.38	48.01
+15	38.13	47.53	48.22	48.53
+20	38.49	48.18	48.59	48.71



Test Result @High Channel

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1000 Hz (KHz)	Peak Freq. Deviation At 3000 Hz (KHz)	Peak Freq. Deviation At 12000 Hz (KHz)
-20	18.42	25.38	26.58	27.31
-15	30.11	31.17	33.14	35.15
-10	33.62	35.05	36.72	37.74
-5	35.84	37.84	41.97	43.07
0	36.93	45.05	45.54	46.25
+5	37.37	45.89	46.25	47.13
+10	37.97	46.37	47.03	47.67
+15	38.14	47.24	47.82	48.11
+20	38.53	47.79	48.22	48.67

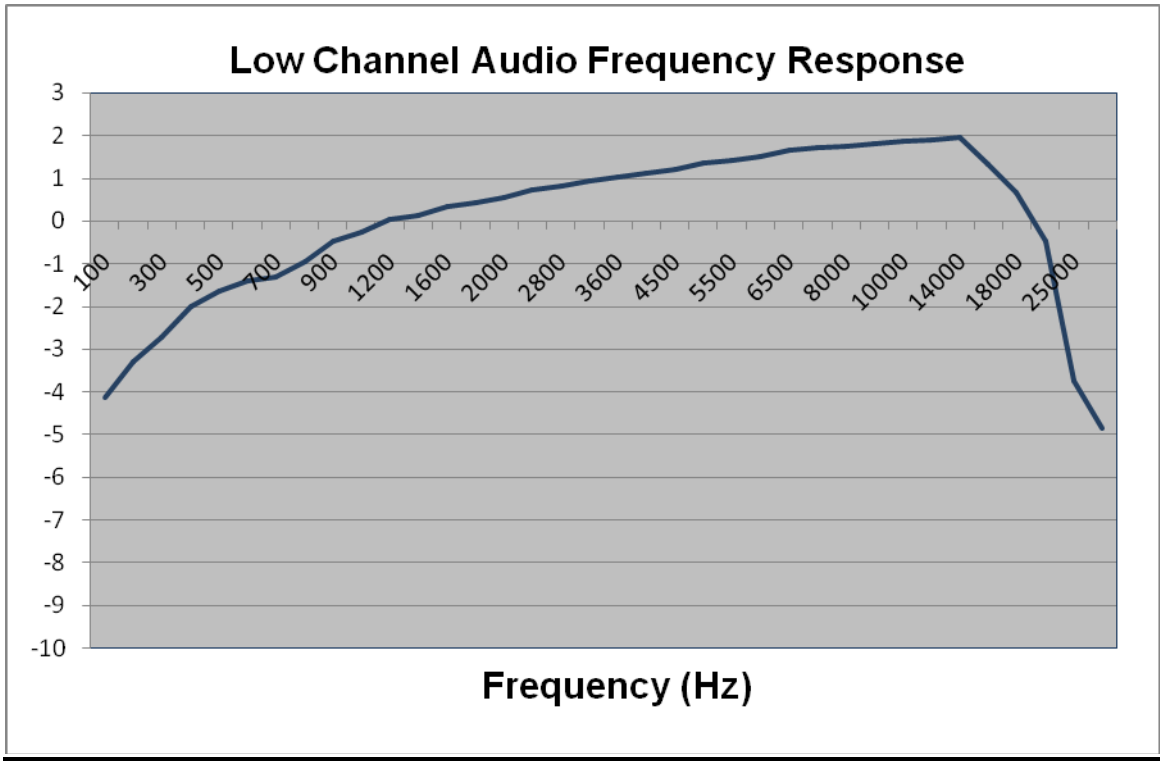


b). **Audio Frequency Response:**

Test Result @ Low Channel

Frequency (Hz)	Deviation (KHz)
100	9.97
200	10.34
300	11.75
400	11.38
500	12.75
600	13.53
700	13.86
800	14.34
900	14.65
1000	15.34
1200	15.29
1400	15.51
1600	15.79
1800	16.12
2000	16.56
2400	16.72
2800	16.88
3200	16.95
3600	17.10
4000	17.24
4500	17.44
5000	17.66
5500	17.84
6000	17.98
6500	18.14
7000	18.26
8000	18.37
9000	18.43
10000	18.58
12000	18.64
14000	17.28
16000	16.15
18000	14.28
20000	12.15
25000	10.17
30000	8.49

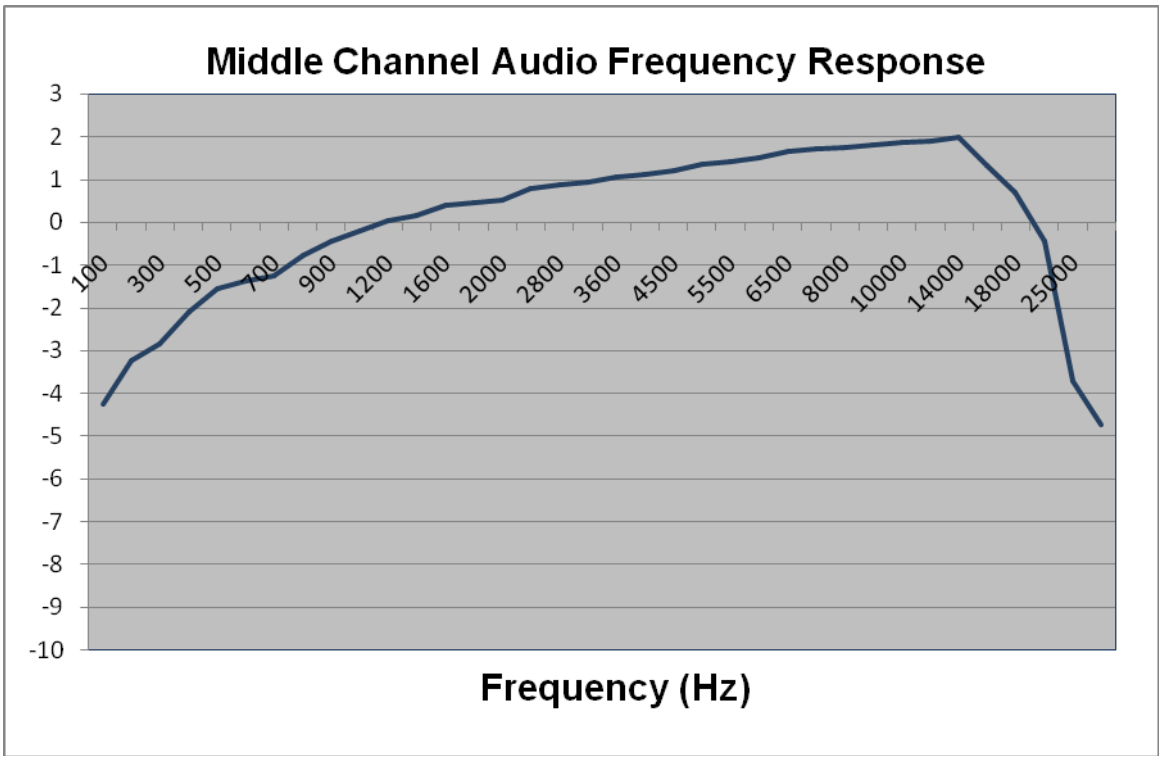
Audio Frequency Response @Low Channel



Test Result @Middle Channel

Frequency (Hz)	Deviation (KHz)
100	9.53
200	10.65
300	11.26
400	11.78
500	12.75
600	13.47
700	13.63
800	14.21
900	14.54
1000	15.41
1200	15.36
1400	15.54
1600	15.82
1800	15.86
2000	16.35
2400	16.31
2800	16.68
3200	16.86
3600	17.41
4000	17.34
4500	17.41
5000	17.48
5500	17.76
6000	17.62
6500	17.97
7000	18.08
8000	18.27
9000	18.35
10000	18.59
12000	18.78
14000	17.39
16000	16.12
18000	14.35
20000	12.19
25000	10.25
30000	9.20

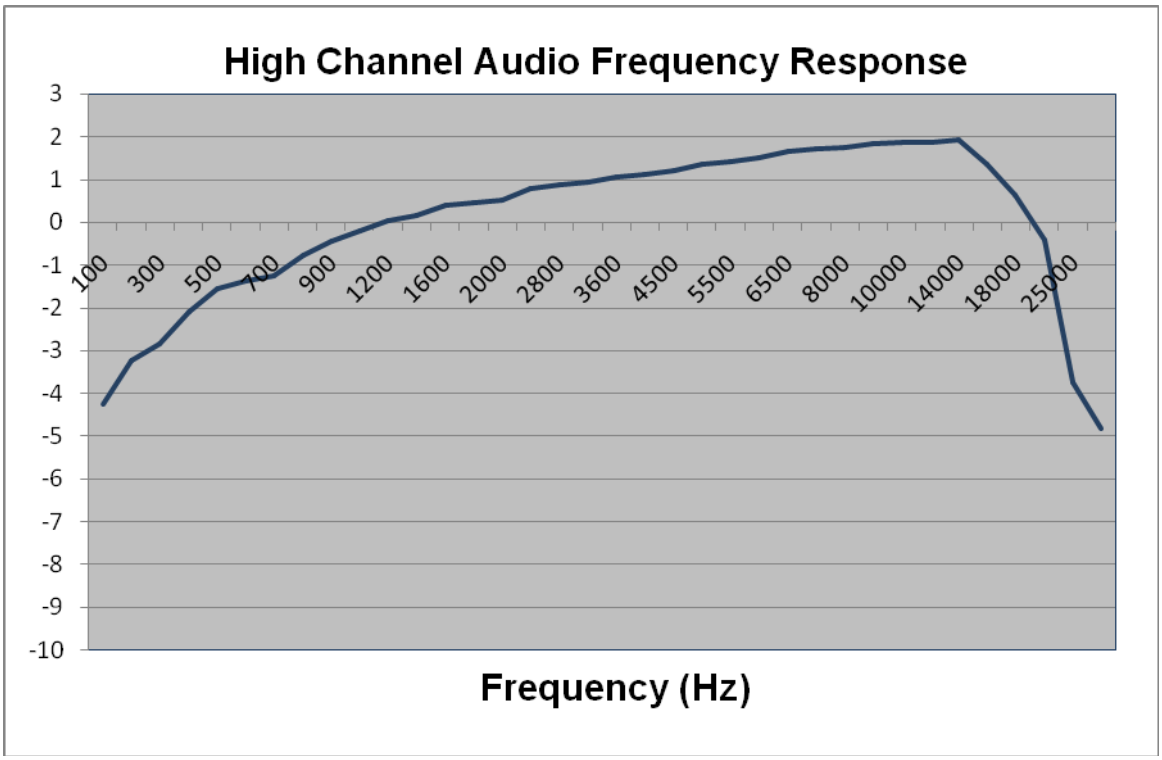
Audio Frequency Response @Middle Channel



Test Result @High Channel

Frequency (Hz)	Deviation (KHz)
100	9.96
200	10.32
300	11.25
400	11.82
500	12.84
600	13.52
700	13.83
800	14.45
900	14.78
1000	15.37
1200	15.26
1400	15.68
1600	15.86
1800	15.92
2000	16.73
2400	16.35
2800	16.52
3200	16.79
3600	17.07
4000	17.19
4500	17.37
5000	17.47
5500	17.53
6000	17.75
6500	18.08
7000	18.52
8000	18.62
9000	18.38
10000	18.45
12000	18.57
14000	17.23
16000	16.76
18000	14.64
20000	12.64
25000	10.28
30000	9.47

Audio Frequency Response@ High Channel



8. FREQUENCY TOLERANCE

8.1 PROVISIONS APPLICABLE

a). According to FCC Part 2 Section 2.1055(a)(1), the frequency stability shall be measured with variation of ambient temperature from –30℃ to +50℃ centigrade.

b). According to FCC Part 2 Section 2.1055(d)(2), for hand carried battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.

c). According to FCC Part 74 Section 74.861(e)-4, the frequency tolerance must be maintained within 0.005%.

8.2 MEASUREMENT PROCEDURE

8.2.1 FREQUENCY STABILITY VERSUS ENVIRONMENTAL TEMPERATURE

1) Setup the configuration per figure 7-1 for frequencies measurement inside an environment chamber, install new battery in the EUT.
2) Turn on EUT and set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1KHz and Video Resolution Bandwidth to 1KHz and Frequency Span to 50KHz.Record this frequency as reference frequency.
3) Set the temperature of chamber to 50℃. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4) Repeat step 2 with a 10℃ decreased per stage until the lowest temperature -30℃ is measured, record all measured frequencies on each temperature step.

8.2.2 FREQUENCY STABILITY VERSUS INPUT VOLTAGE

1) Setup the configuration per figure 7-1 for frequencies measured at temperature if it is within 15℃ to 25℃. Otherwise, an environment chamber set for a temperature of 20℃ shall be used. Install new battery in the EUT.
2) Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1 KHz and Video Resolution Bandwidth to 1KHz. Record this frequency as reference frequency.
3) For battery operated only device, supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.

8.3 TEST SETUP BLOCK DIAGRAM

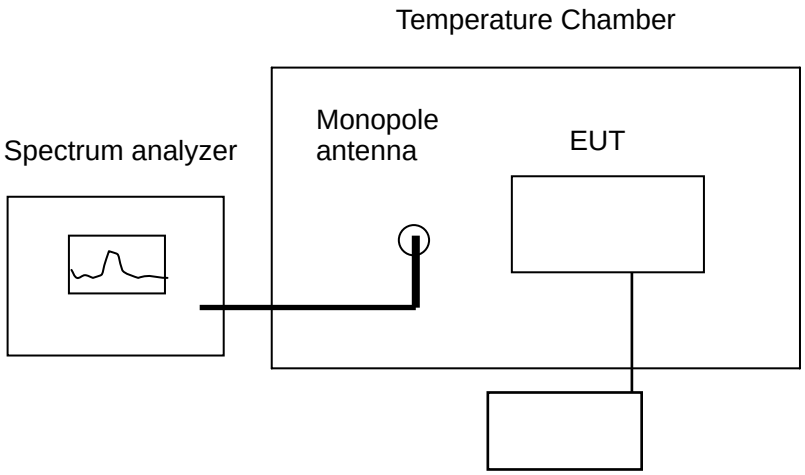


Figure 7-1

8.4 TEST EQUIPMENT USED

EQUIPMENT TYPE	MFR	MODEL NO.	SERIAL NO.	CAL DATE.	NEXT CAL DAT.
EMI Test Receiver	R&S	ESCI	100694	July 17, 2014	July 16, 2015
Temperature Chamber	SHIHIN	BM50-CB	908	July 17, 2014	July 16, 2015
DC Power Supply	LONGWEI	WYK-605	N/A	July 17, 2014	July 16, 2015

8.5 TEST RESULT

a) Frequency stability versus input voltage (battery operation end point voltage is 2.55 V)

Wireless Microphone	Reference Frequency (MHz)	Frequency Measured at End Point Voltage	Frequency Error (%)	Limit (%)
Low channel	584.4	584.4065	0.0011	0.005
Middle Channel	595.6	595.60689	0.0012	0.005
High channel	606.75	606.75482	0.0008	0.005

b) Frequency stability versus ambient temperature

Test Result @ Low Channel

Reference Frequency: 584.40MHz			Limit: ±0.005%
Environment Temperature (℃)	Power Supply	Frequency deviation measured with time Elapsed (30 minutes)	
		(MHz)	%
50	DC 3V	584.410162	0.0017
40	DC 3V	584.414214	0.0024
30	DC 3V	584.411314	0.0019
20	DC 3V	584.413025	0.0022
10	DC 3V	584.411102	0.0019
0	DC 3V	584.411047	0.0019
-10	DC 3V	584.411021	0.0019
-20	DC 3V	584.412325	0.0021
-30	DC 3V	584.411052	0.0019

Test Result @ Middle Channel

Reference Frequency: 675.25MHz			Limit: ±0.005%
Environment Temperature (℃)	Power Supply	Frequency deviation measured with time Elapsed(30 minutes)	
		(MHz)	%
50	DC 3V	595.608324	0.0014
40	DC 3V	595.608579	0.0014
30	DC 3V	595.607516	0.0013
20	DC 3V	595.609412	0.0016
10	DC 3V	595.60842	0.0014
0	DC 3V	595.609435	0.0016
-10	DC 3V	595.608782	0.0015
-20	DC 3V	595.607943	0.0013
-30	DC 3V	595.608846	0.0015

Test Result @ High Channel

Reference Frequency: 689.50 MHz			Limit: ±0.005%
Environment Temperature (℃)	Power Supply	Frequency deviation measured with time Elapsed (30 minutes)	
		(MHz)	%
50	DC 3V	606.758324	0.0014
40	DC 3V	606.758579	0.0014
30	DC 3V	606.757516	0.0012
20	DC 3V	606.759412	0.0016
10	DC 3V	606.75842	0.0014
0	DC 3V	606.759435	0.0016
-10	DC 3V	606.758782	0.0014
-20	DC 3V	606.757943	0.0013
-30	DC 3V	606.758846	0.0015

9. EMISSION BANDWIDTH

9.1 PROVISIONS APPLICABLE

According to FCC Part 74 Section 74.861(e)-5: The operation bandwidth shall not exceed 200 KHz

9.2 MEASUREMENT PROCEDURE

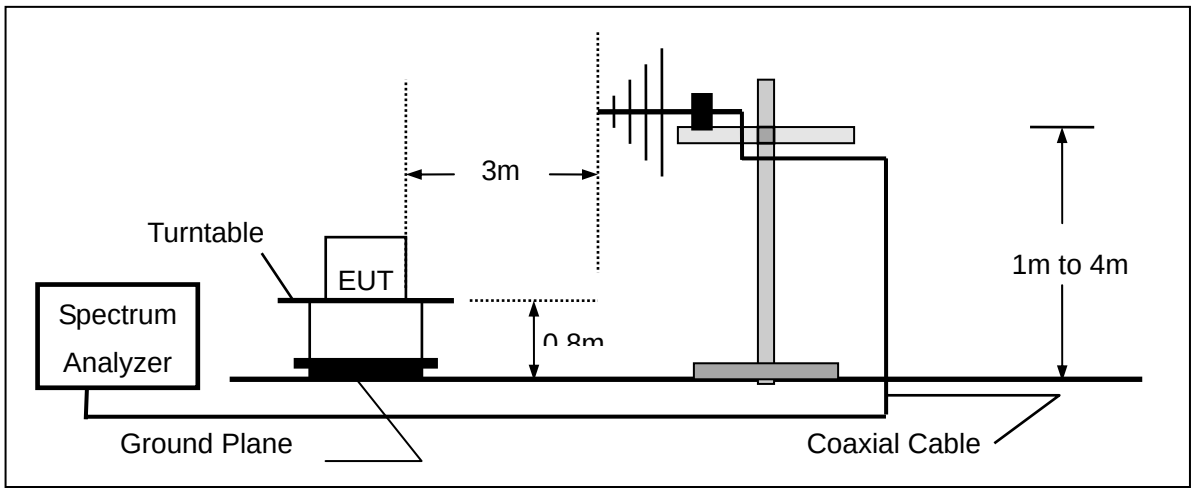
1). The EUT was placed on a turn table which is 0.8m above ground plane.

2). Set EUT as normal operation

3). Set SPA Center Frequency = fundamental frequency, RBW=1 KHz, VBW=1 KHz, Span =600 KHz.

4). Set SPA Max hold. Mark peak, -26dB.

9.3 TEST SETUP BLOCK DIAGRAM



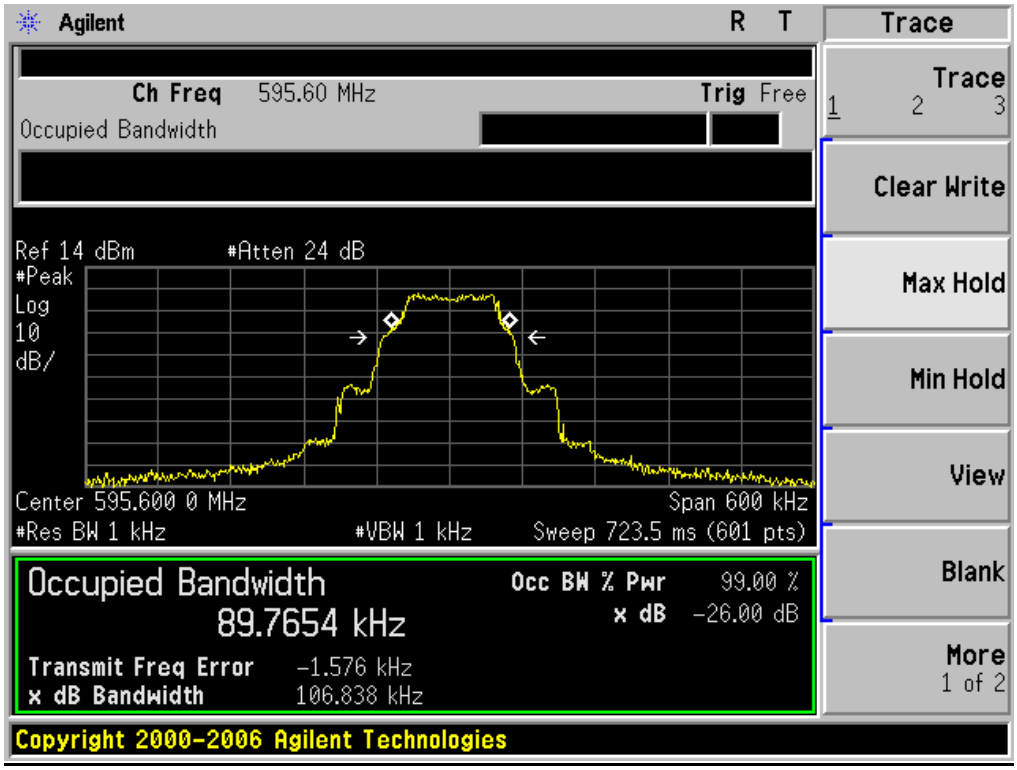
9.4 MEASUREMENT EQUIPMENT USED

EQUIPMENT TYPE	MFR	MODEL NO.	SERIAL NO.	CAL DATE.	NEXT CAL DAT.
Spectrum Analyzer	AGILENT	E4440A	US41421290	July 25, 2014	July 24, 2015
Pre-Amplifier	EM	EM30180	E013	Feb. 17, 2014	Feb. 16, 2015
Wideband Requency Antenna	SCHWARZBECK	VULB9168	26	Aug.17,2014	Aug.16, 2015

9.5 TEST RESULT

26 dB Test Result			
Operation Channel	Test Data	Limit	Result
Low Channel	107.678 KHz	⩽200 KHz	Pass
Middle Channel	106.838 KHz	⩽200 KHz	Pass
High Channel	107.693 KHz	⩽200 KHz	Pass

Emission Bandwidth @ Middle Channel



Note: All the above channels (High, middle, Low) were tested, there is only give the worst data.

10. UNWANTED RADIATION

10.1 PROVISIONS APPLICABLE

According to Section 74.861(e)-6, the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

1). On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;

2). On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;

3). On any frequency removed form the operating frequency by more than 250 percent of the authorized bandwidth:
at least 43 + 10 log10 (TP) dB

10.2 MEASUREMENT PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.

3). The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

4). The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

5). The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.

6). The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

7). The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

8). The maximum signal level detected by the measuring receiver shall be noted.

9). The measurement shall be repeated with the test antenna set to horizontal polarization.

10). Replace the antenna with a proper Antenna (substitution antenna).

11). The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.

12). The substitution antenna shall be connected to a calibrated signal generator.

13). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

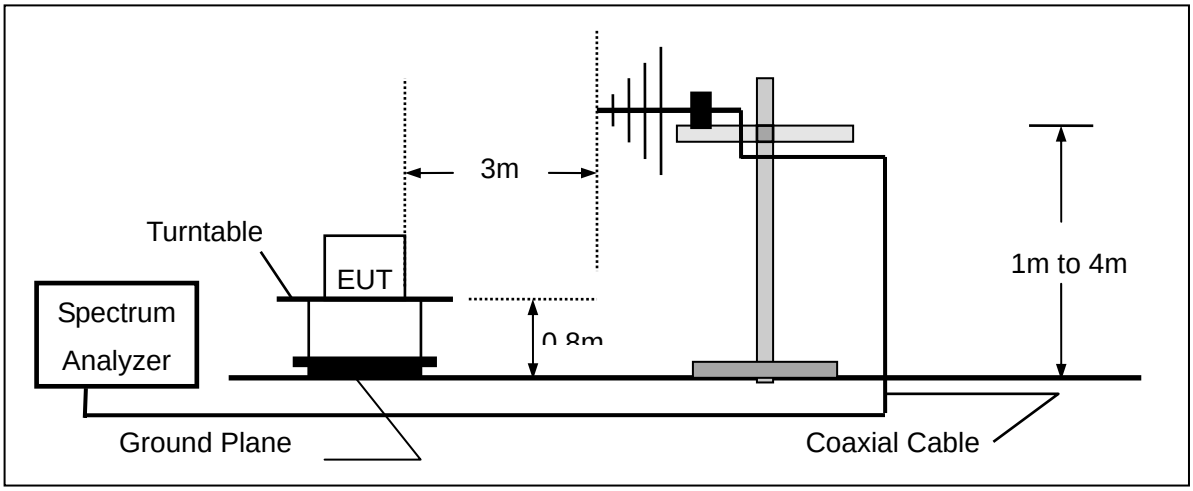
14). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

15). The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

16). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

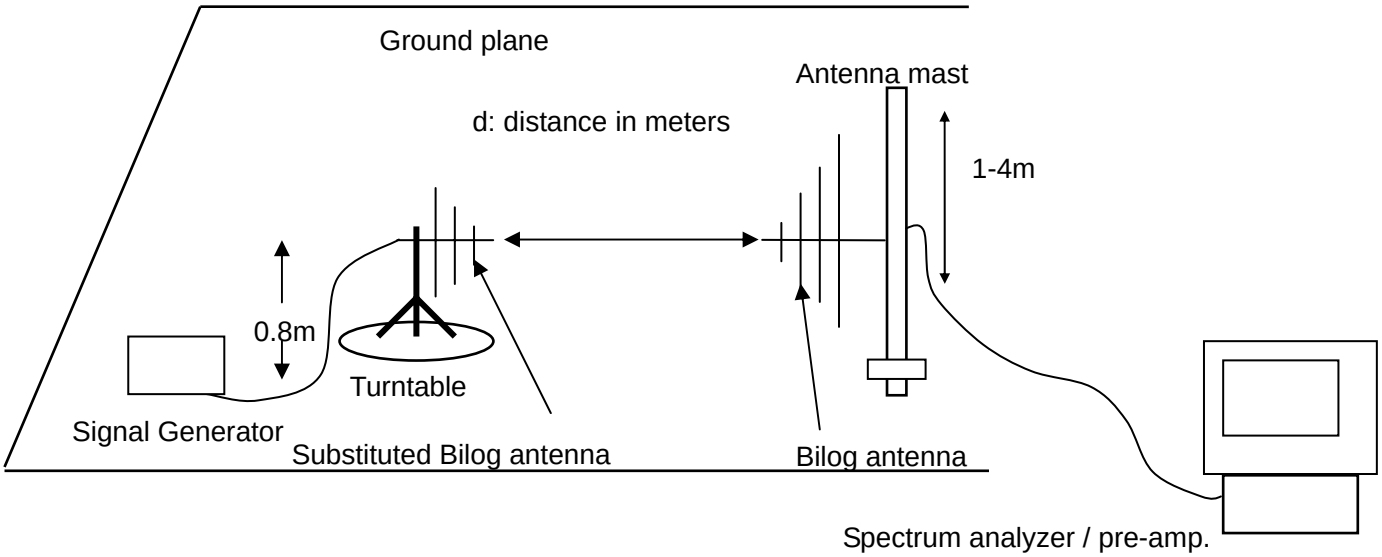
17). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

10.3 TEST SETUP BLOCK DIAGRAM

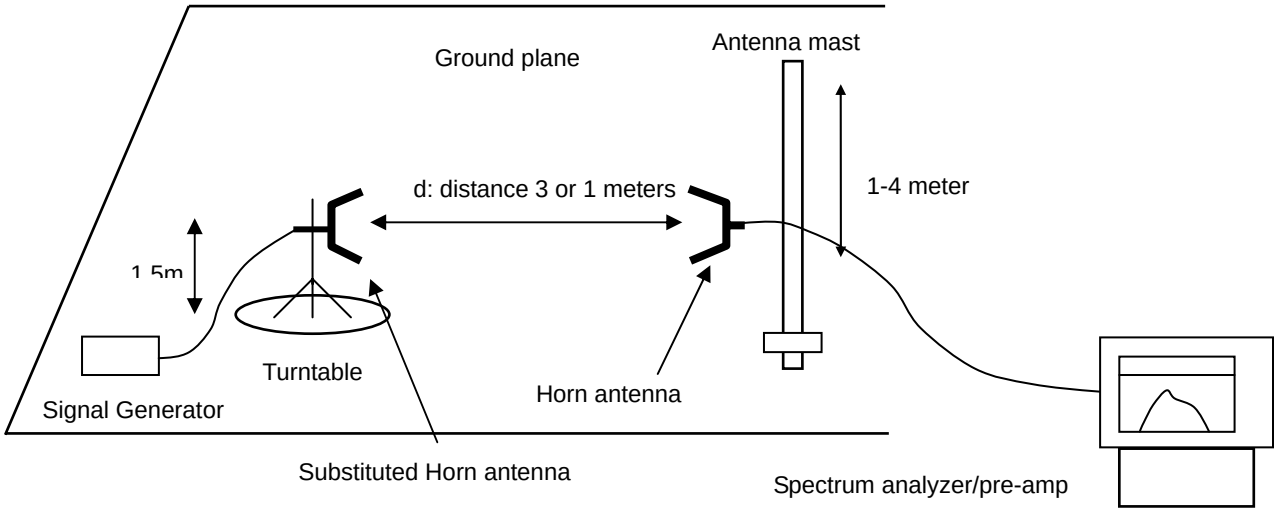


Substitution Method:

Radiation below 1GHz



Radiation above 1GHz



10.4 MEASUREMENT EQUIPMENT USED

EQUIPMENT TYPE	MFR	MODEL NO.	SERIAL NO.	CAL DATE.	NEXT CAL DAT.
Spectrum Analyzer	AGILENT	E4440A	US41421290	July 25, 2014	July 24, 2015
Pre-Amplifier	EM	EM30180	2944A07999	Feb. 17, 2014	Feb. 16, 2015
Loop Antenna	A.H.	SAS-562B	SEL0097	May 11, 2014	May 10, 2015
Wideband Requency Antenna	SCHWARZBECK	VULB9168	26	Aug.17,2014	Aug.16, 2015
Substitution Antenna	EMCO	3142C	---	June 7,2014	June 6, 2015
Substitution Antenna	EM	EM-AH-10180	67	Feb.17, 2014	Feb.16, 2015
Horn Antenna	A.H. Systems Inc.	SAS-574	128	June 7,2014	June 6, 2014
SIGNAL GENERATOR	AGILENT	E4438C	MY44260051	Feb.23,2014	Feb.22,2015

10.5 TEST RESULTS

Calculation: Limit (dBm)= EL-43-10log10 (TP)

Notes: No emission found below 30MHz,EL is the emission level of the Output

Power expressed in dBm, in this application, the EL is 1.72 dBm.

Limit (dBm)=1.72-43-10log 10 (0.00149) = -13

High Channel, Middle Channel & Low Channel

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	S.G. (dBm) (dBm)	Cabel Loss (dB)	Ant.Gain (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Low Channel								
366.6	-66.97	H	-45.75	1.47	13.37	-33.85	-13	-20.85
366.7	-61.53	V	-40.75	1.47	13.37	-28.85	-13	-15.85
1375.5	-68.86	H	-46.34	1.52	13.42	-34.44	-13	-21.44
1375.3	-62.86	V	-41.75	1.52	13.42	-29.85	-13	-16.85
Middle Channel								
454.2	-68.48	H	-47.25	1.58	13.67	-35.16	-13	-22.16
454.5	-62.64	V	-42.75	1.58	13.67	-30.66	-13	-17.66
1546.7	-82.86	H	-63.23	1.61	13.83	-51.01	-13	-38.01
1546.6	-79.64	V	-60.17	1.61	13.83	-47.95	-13	-34.95
High Channel								
584.6	-83.75	H	-64.76	1.64	13.87	-52.53	-13	-39.53
584.4	-80.64	V	-62.34	1.64	13.87	-50.11	-13	-37.11
1645.3	-83.25	H	-64.62	1.69	13.95	-52.36	-13	-39.36
1645.4	-80.75	V	-62.64	1.69	13.95	-50.38	-13	-37.38
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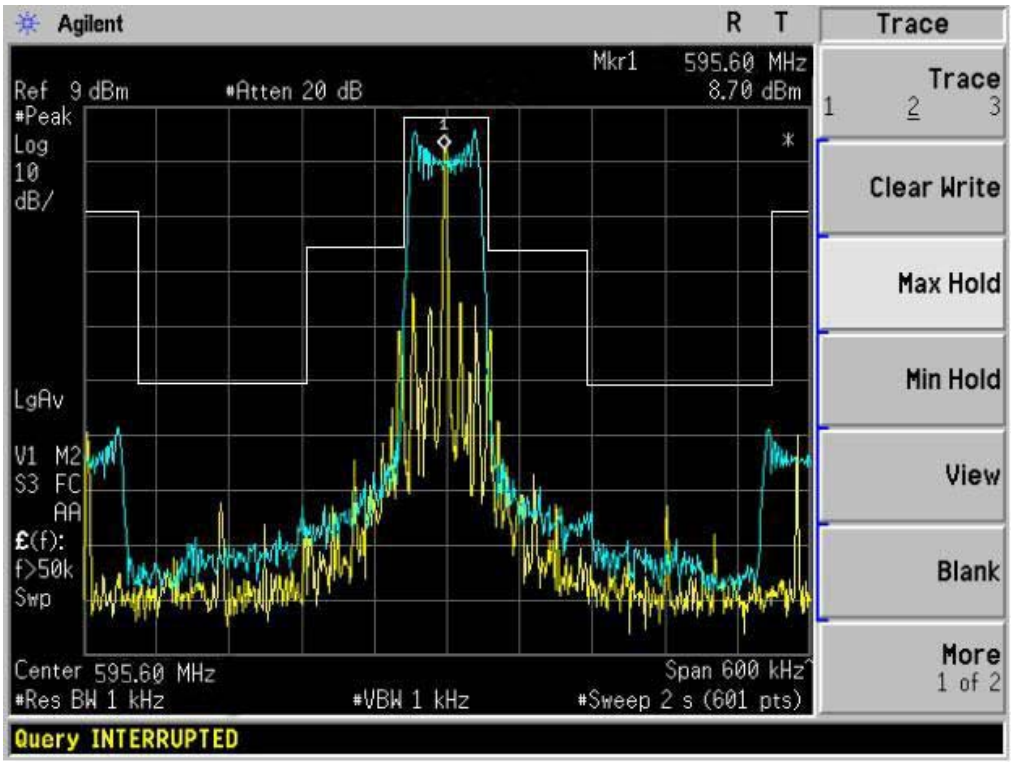
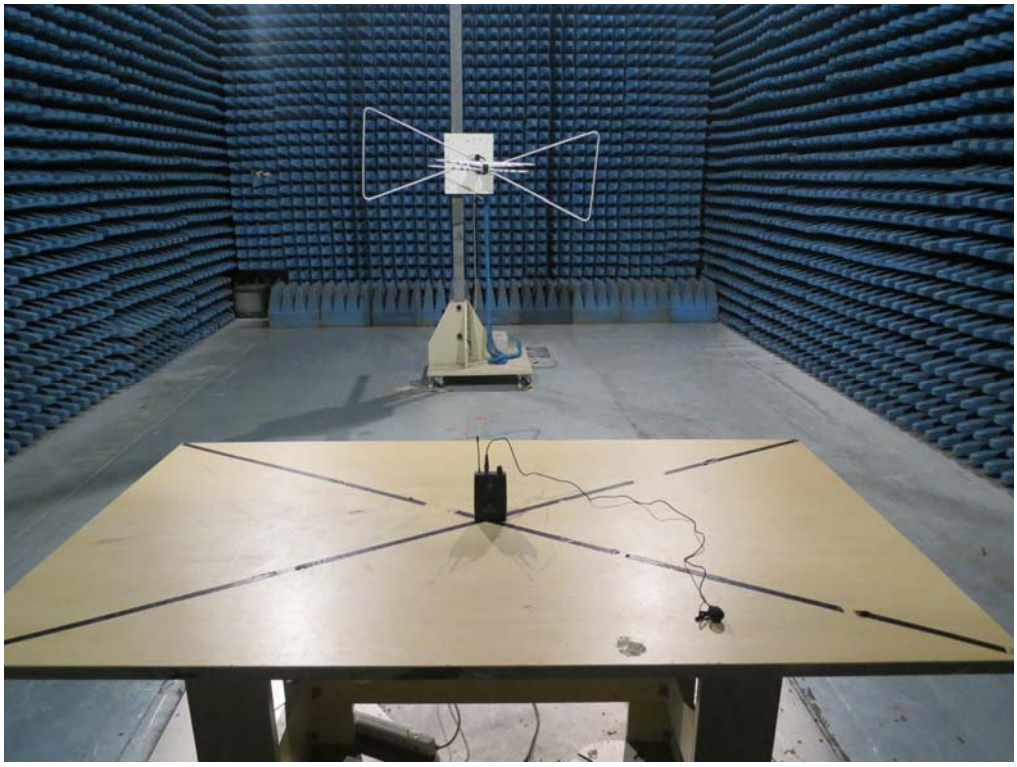
Notes: -- means the output power of all the spurious frequency is at least 20dB down to the limit.

Emission Mask @ Middle Channel



APPENDIX Ⅰ: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP



APPENDIX Ⅱ: PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT

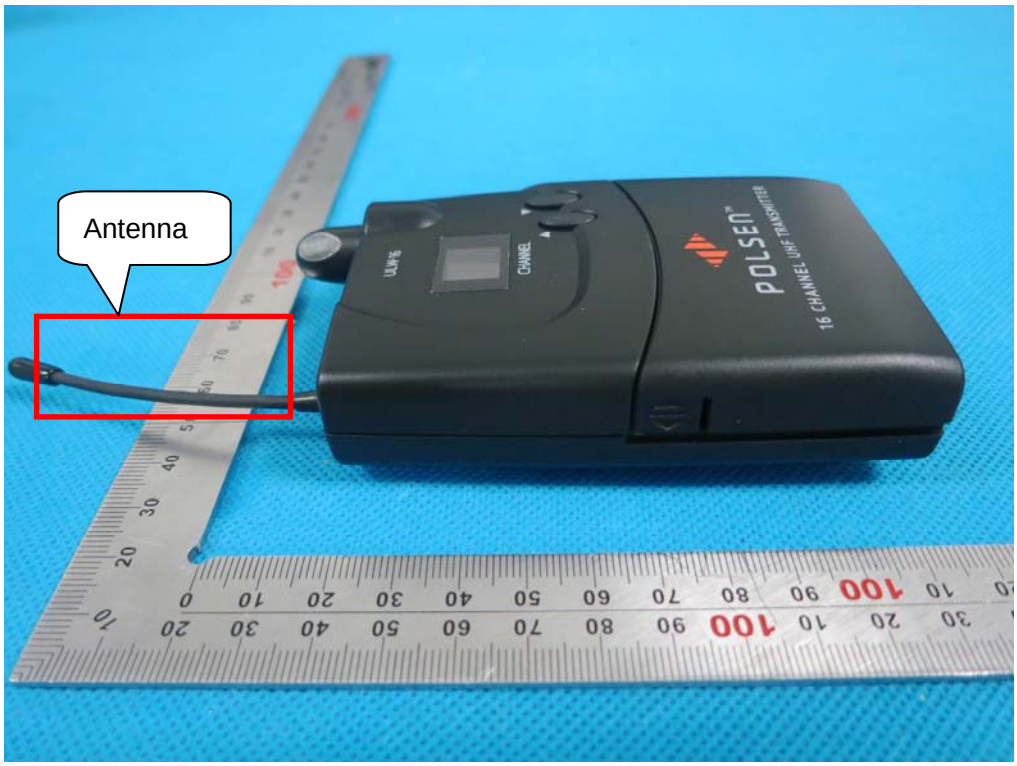
TOP VIEW OF EUT

BOTTOM VIEW OF EUT

FRONT VIEW OF EUT

BACK VIEW OF EUT

LEFT VIEW OF EUT

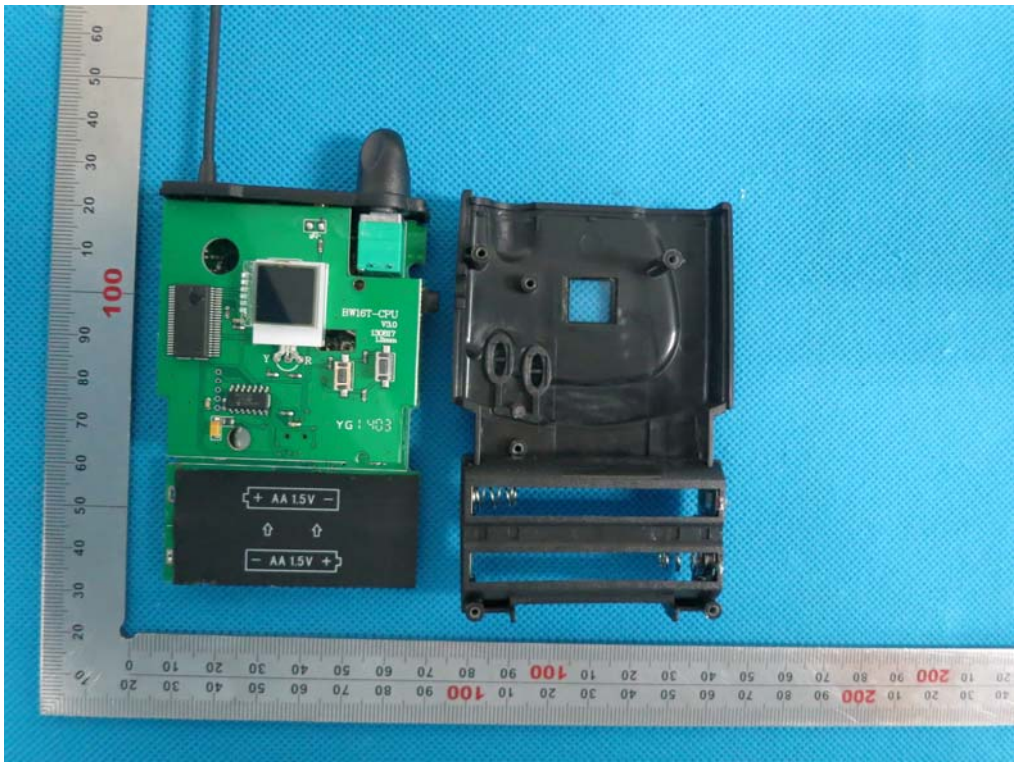


RIGHT VIEW OF EUT

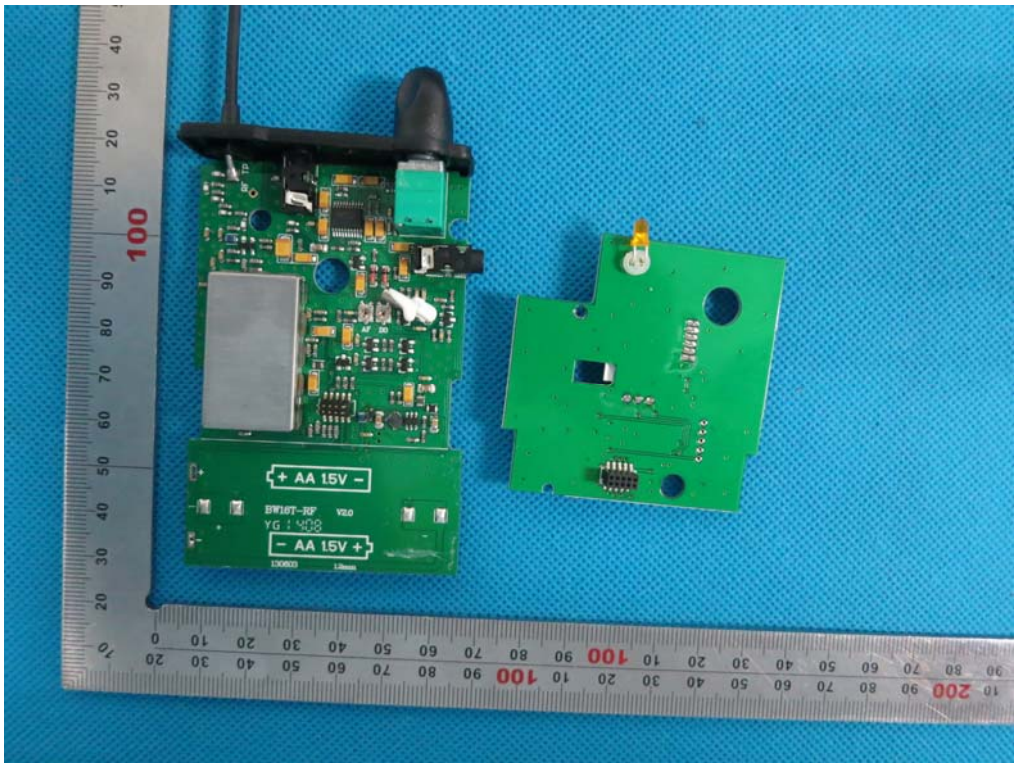
OPEN VIEW OF EUT-1

OPEN VIEW OF EUT-2

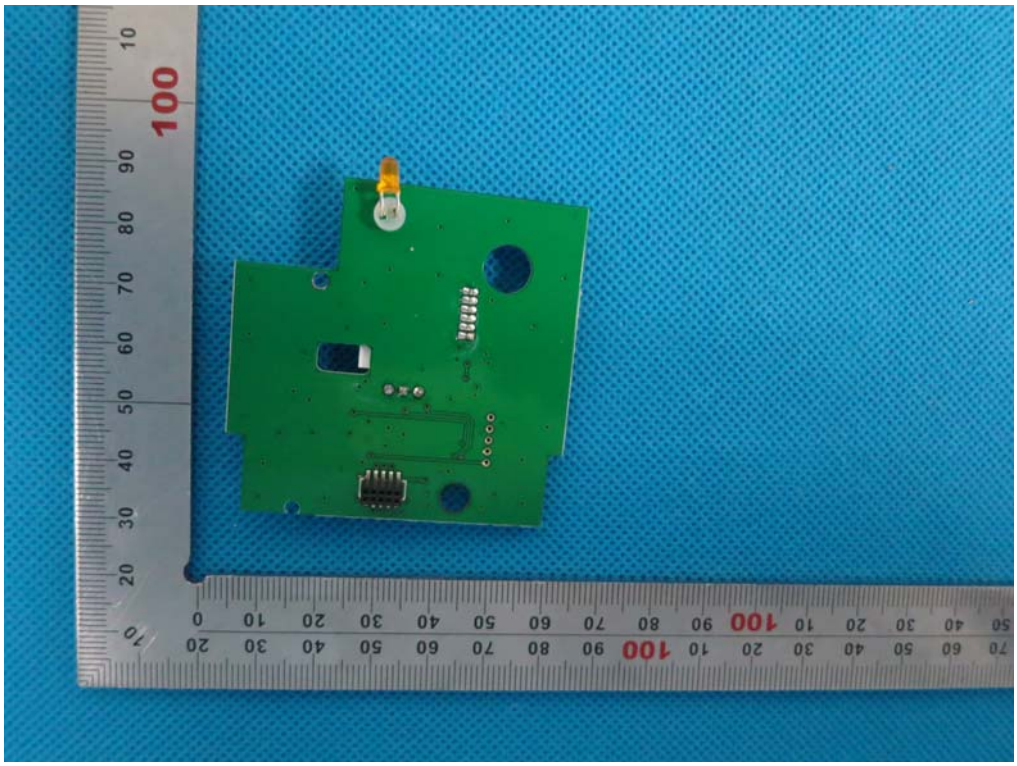
OPEN VIEW OF EUT-3



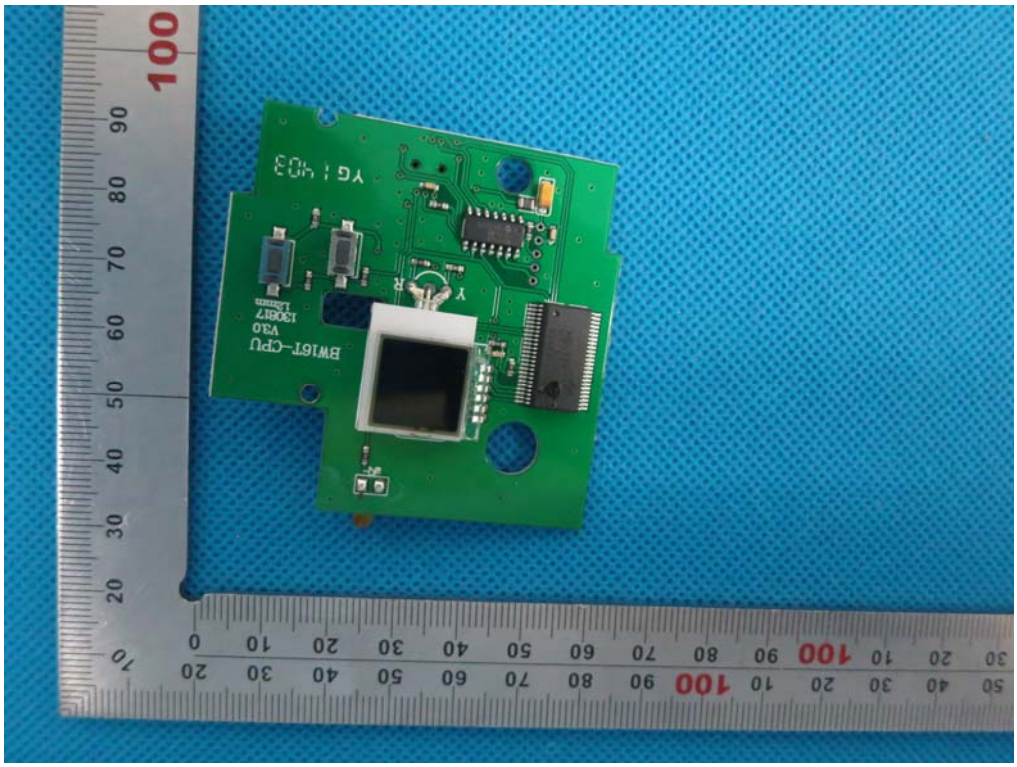
INTERNAL VIEW OF EUT-1



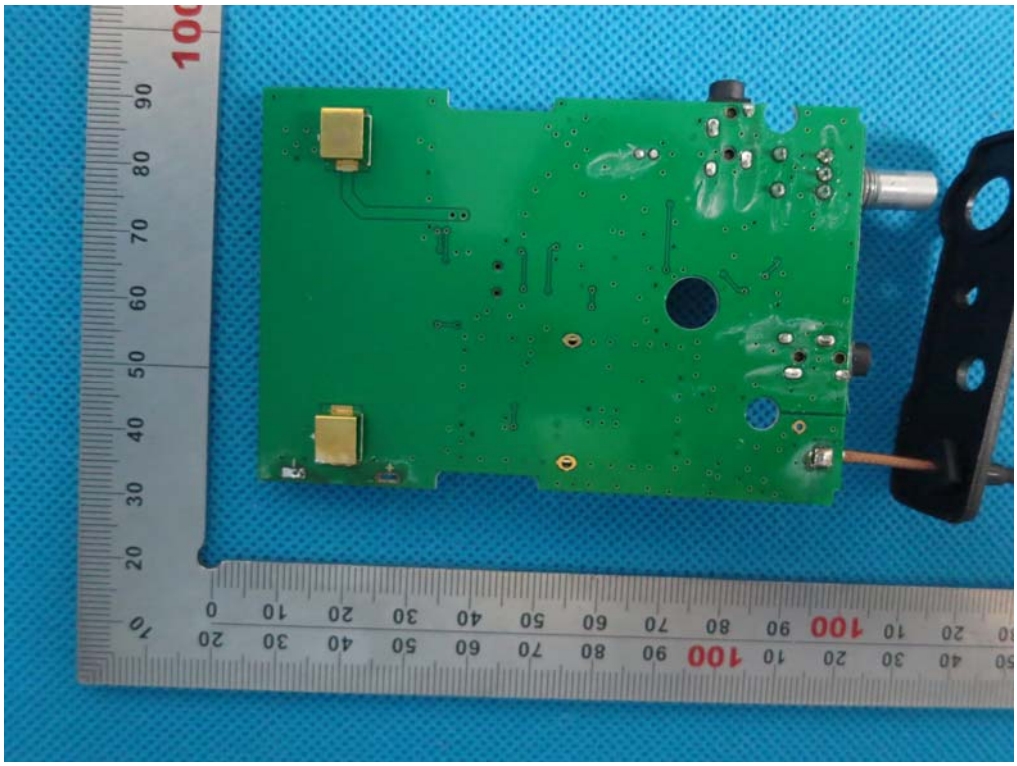
INTERNAL VIEW OF EUT-2



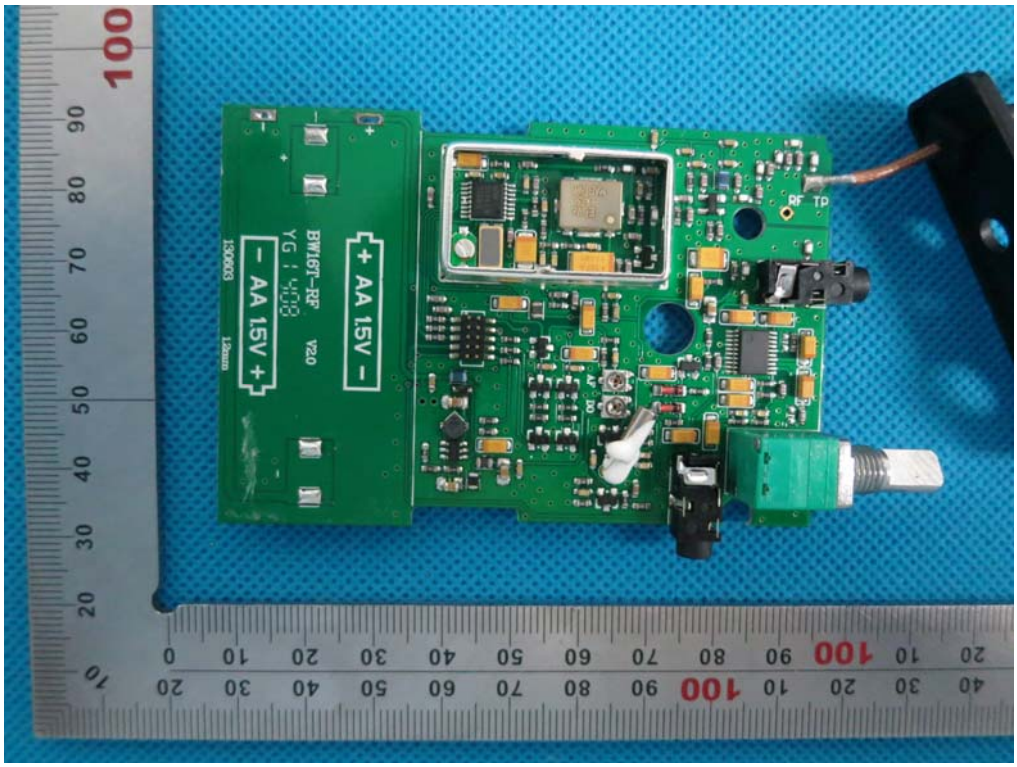
INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



INTERNAL VIEW OF EUT-5



---END OF REPORT---