TECHNICAL REPORT

卓時檢測 TIMEWAY TESTING LABORATORY

TESTING CNAS L2292

ISO/IEC17025 Accredited Lab.

Report No: FCC 0812044
File reference No: 2008-12-18

Applicant: FUZHOU EMAX ELECTRONIC CO.,LTD

Product: Cooking Thermometer With Timer

Model No: EM2213

Trademark: N/A

Test Standards: FCC Part 15 Subpart C, Paragraph 15.231

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.231 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung
Manager

Dated: Dec. 31 ,2008

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Tel (755) 83448688 Fax (755) 83442996

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

IC- Registration No.: IC5205A-01

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-01.

Test Report Conclusion

Content

1.0 **General Details**

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao, FuTian District, Shenzhen, CHINA.

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: FUZHOU EMAX ELECTRONIC CO.,LTD

Address: Building #12-#16, CangShan Industrial Area, JuYuanZhou JinShan District, FuZhou, China.

Telephone: +86-591-83766095

Fax: +86-591-83766099

1.3 Description of EUT

Product:	Cooking Thermometer With Timer
Brand Name:	N/A
Model Number:	EM2213
Additional Model Name	N/A
Additional Trade Name	N/A
Rating:	3V DC (2 pcs AAA Batteries)
Operation Frequency	433.92MHz
Antenna Designation	Printed Antenna

Note: there are two operation modes provided to the EUT, one is the temperature change, the other is keeping temperature unchanged. So we tested according to part15.231(a) and 15.231（e）.

1.4 Submitted Sample

2 Sample

1.5 Test Duration

2008-12-09 to 2008-12-31

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

The sample tested by Terry Tang

Print Name: Terry Tang

2.0	**Test Equipments**				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2008-12-05	2009-12-04
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2008-12-05	2009-12-04
System Controller	CT	SC100	-	2008-02-18	2009-02-17
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2008-02-18	2009-02-17
3m OATS	--	--	N/A	2008-02-18	2009-02-17
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2008-08-16	2009-08-15

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	**N/A**	N/A
FCC Part 15, Paragraph 15.209	General Requirement	**PASS**	Compliant
FCC Part 15, Paragraph 15.231 (b)（e）	Radiated Emission Test	**PASS**	Compliant
FCC Part 15, Paragraph 15.231 (c)	20dB Bandwidth Testing	**PASS**	Compliant
FCC Part 15, Paragraph 15.231 (a) (1)，(e)	Deactivate Testing	**PASS**	Compliant

3.2 Test Standards

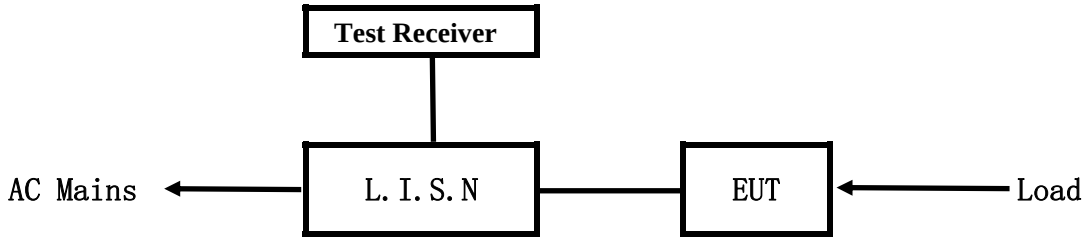
FCC Part 15 Subpart C, Paragraph 15.231

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

5. Power Line Conducted Emission Test

5.1 Schematics of the test

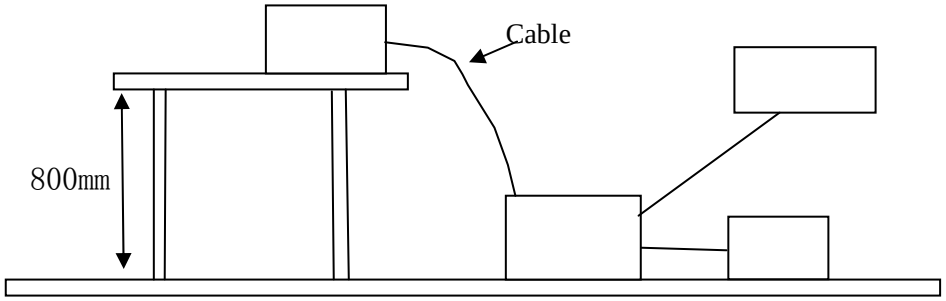


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC ID
Cooking Thermometer with Timer	Fuzhou EMAX Electronic Co., Ltd	EM2213	WEC-1214

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Note: **This test isn't performed because the EUT is powered by battery**

6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.

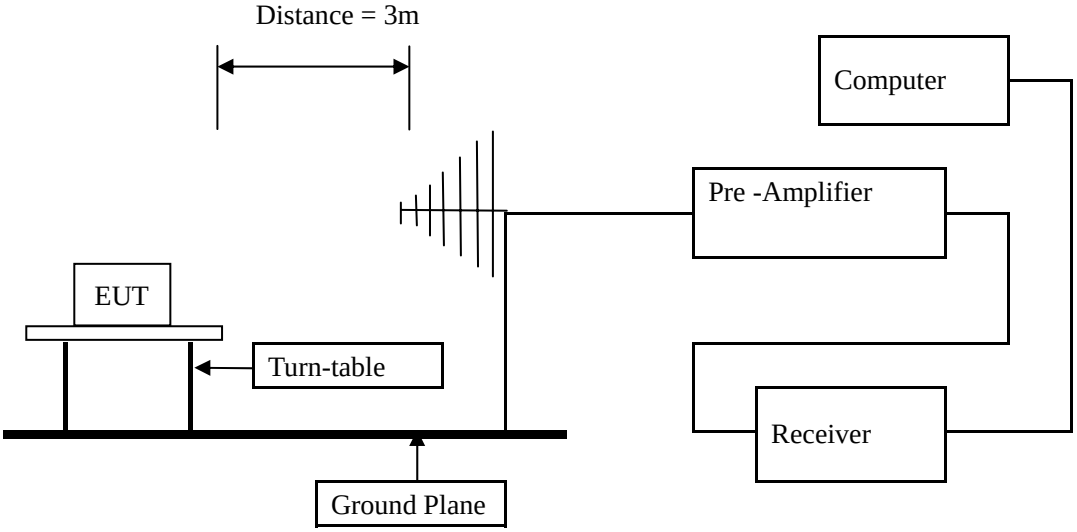
(3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.

(6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15 Subpart C Paragraph 15.231（b） Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious Emission	
	uV/m	**dBuV/m**	**uV/m**	**dBuV/m**
40.66-40.70	2250	67.04	225	47.04
70-130	1250	61.94	125	41.94
130-174	1250-3750	61.94-71.48	125-375	41.94-51.48
174-260	3750	71.48	375	51.48
260-470	3750-12500	71.48-81.94	375-1250	51.48-61.94
Above 470	12500	81.94	1250	61.94

B FCC Part 15 Subpart C Paragraph 15.231（e） Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious Emission	
	uV/m	**dBuV/m**	**uV/m**	**dBuV/m**
40.66-40.70	1000	60	100	40
70-130	500	54	50	34
130-174	500-1500	54-63.5	50-150	34-43.5
174-260	1500	63.5	150	43.5
260-470	1500-5000	63.5-74	150-500	43.5-54
Above 470	5000	74	500	54

Note: 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

4.Linear interpolations for frequency ranges 130-174MHz and 260-470MHz

5.the above field strength limits are specified at a distance of 3-meters and the tighter limits apply at the band edges

C. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-4G, the final emission level got using PK detector. And Average Value = peak(dBuV/m)+duty cycle factor(dB)

5. New batteries were installed in the equipment under test for radiated emission testing.

6.5 Test result

Radiated Emission Data

Product:	Cooking Thermometer with Timer	Test Mode:	Temperature change
Test Voltage:	3V	Humidity:	56%
Test Result:	Pass		

Radiation Emission for Fundamental

Frequency (MHz)	Emission PK/AV (dBuV/m)	Antenna Polarity (H/V)	Limits PK/AV (dBuV/m)	Results	Remarks
433.92	61.03 (PK)/ 42.69(AV)	H	100.8 / 80.8	PASS	Fundamental
433.92	62.71(PK) /44.37(AV)	V	100.8 / 80.8	PASS	Fundamental

Note: Average = Peak value + Duty cycle factor

Duty cycle factor=-18.34

Spurious Emission (Below 1GHz)

Frequency (MHz)	Emission PK/AV (dBuV/m)	Antenna Polarity (H/V)	Limits PK/AV (dBuV/m)	Results	Remarks
867.84	59.04(PK) / 40.70(AV)	H	80.8 / 60.8	PASS	Spurious
867.84	51.64(PK) / 33.30(AV)	V	80.8 / 60.8	PASS	Spurious

Note: Average = Peak value + Duty cycle factor

Duty cycle factor=-18.34

Spurious Emission (Above 1GHz)

Frequency (GHz)	Emission PK/AV (dBuV/m)	Antenna Polarity (H/V)	Limits PK/AV (dBuV/m)	Results	Remarks
1301.76	55.1(PK）	H	80.8 / 60.8	PASS	Spurious
1301.76	48.6(PK)	V	80.8 / 60.8	PASS	Spurious
1735.68	59.7(PK)	H	80.8 / 60.8	PASS	Spurious
1735.68	51.8(PK）	V	80.8 / 60.8	PASS	Spurious
2169.60	54.2(PK)	H	80.8 / 60.8	PASS	Spurious
2169.60	48.4(PK)	V	80.8 / 60.8	PASS	Spurious
2603.52	50.6(PK)	H	80.8 / 60.8	PASS	Spurious

Note: Average = Peak value + Duty cycle factor

Duty cycle factor=-18.34

Product:	Cooking Thermometer with Timer	Test Mode:	Keep temperature unchanged
Test Voltage:	3V	Humidity:	56%
Test Result:	Pass		

Radiation Emission for Fundamental

Frequency (MHz)	Emission PK/AV (dBuV/m)	Antenna Polarity (H/V)	Limits PK/AV (dBuV/m)	Results	Remarks
433.92	62.43 (PK)	H	92.87 / 72.87	PASS	Fundamental
433.92	57.34 (PK)	V	92.87 / 72.87	PASS	Fundamental

Note: Average = Peak value + Duty cycle factor

Duty cycle factor=-30.45

Spurious Emission (Below 1GHz)

Frequency (MHz)	Emission PK/AV (dBuV/m)	Antenna Polarity (H/V)	Limits PK/AV (dBuV/m)	Results	Remarks
867.84	54.69(PK) / 24.24(AV)	H	72.87 / 52.87	PASS	Spurious
867.84	51.92 (PK)/ 21.47(AV)	V	72.87 /52.87	PASS	Spurious

Note: Average = Peak value + Duty cycle factor

Duty cycle factor=-30.45

Spurious Emission (Above 1GHz)

Frequency (GHz)	Emission PK/AV (dBuV/m)	Antenna Polarity (H/V)	Limits PK/AV (dBuV/m)	Results	Remarks
1301.76	50.12(PK）	H	72.87 /52.87	PASS	Spurious
1301.76	48.65(PK)	V	72.87 /52.87	PASS	Spurious
1735.68	54.28(PK)/23.83(AV)	H	72.87 /52.87	PASS	Spurious
1735.68	52.38(PK)/21.93(AV)	V	72.87 /52.87	PASS	Spurious
2169.60	49.02(PK）	H	72.87/52.87	PASS	Spurious
2169.60	46.72(PK）	V	72.87/52.87	PASS	Spurious
2603.52	--	H	72.87 /52.87	--	--
2603.52	--	V	72.87 /52.87	--	--

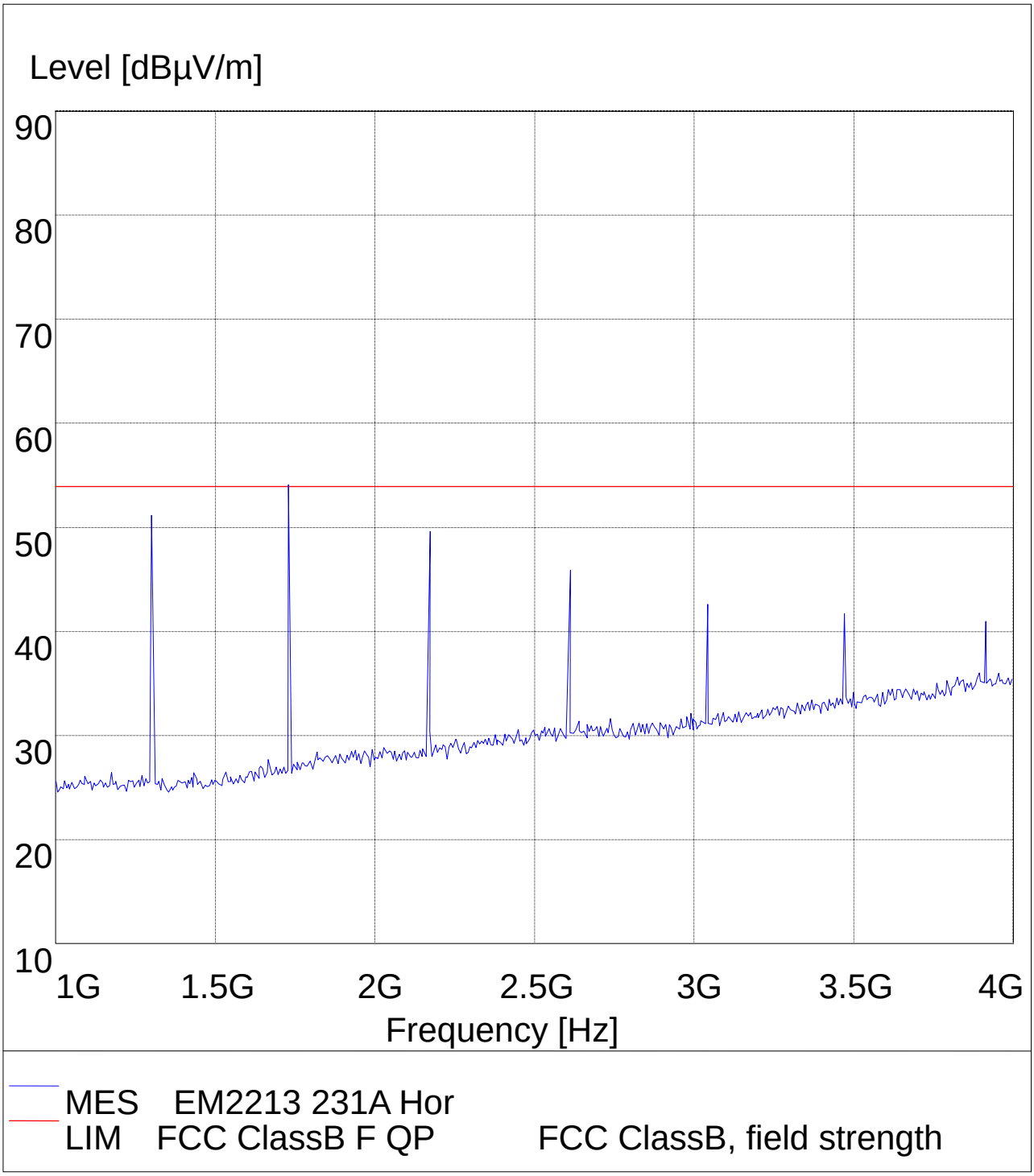
Note: Average = Peak value + Duty cycle factor

Duty cycle factor=-30.45

Test Plots for Above 1GHz:

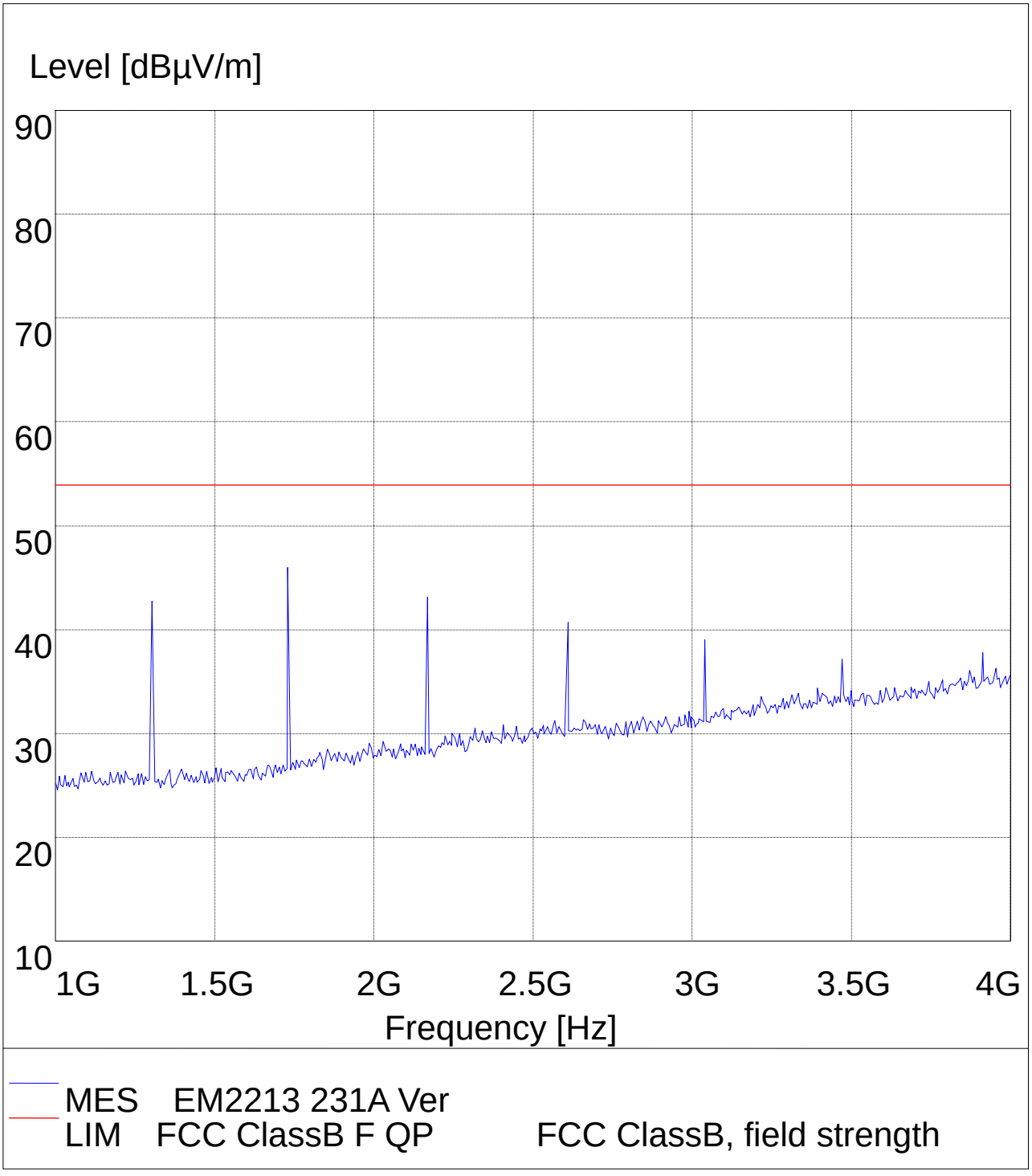
Test Mode: Temperature change

Horizontal



Test Mode: Temperature change

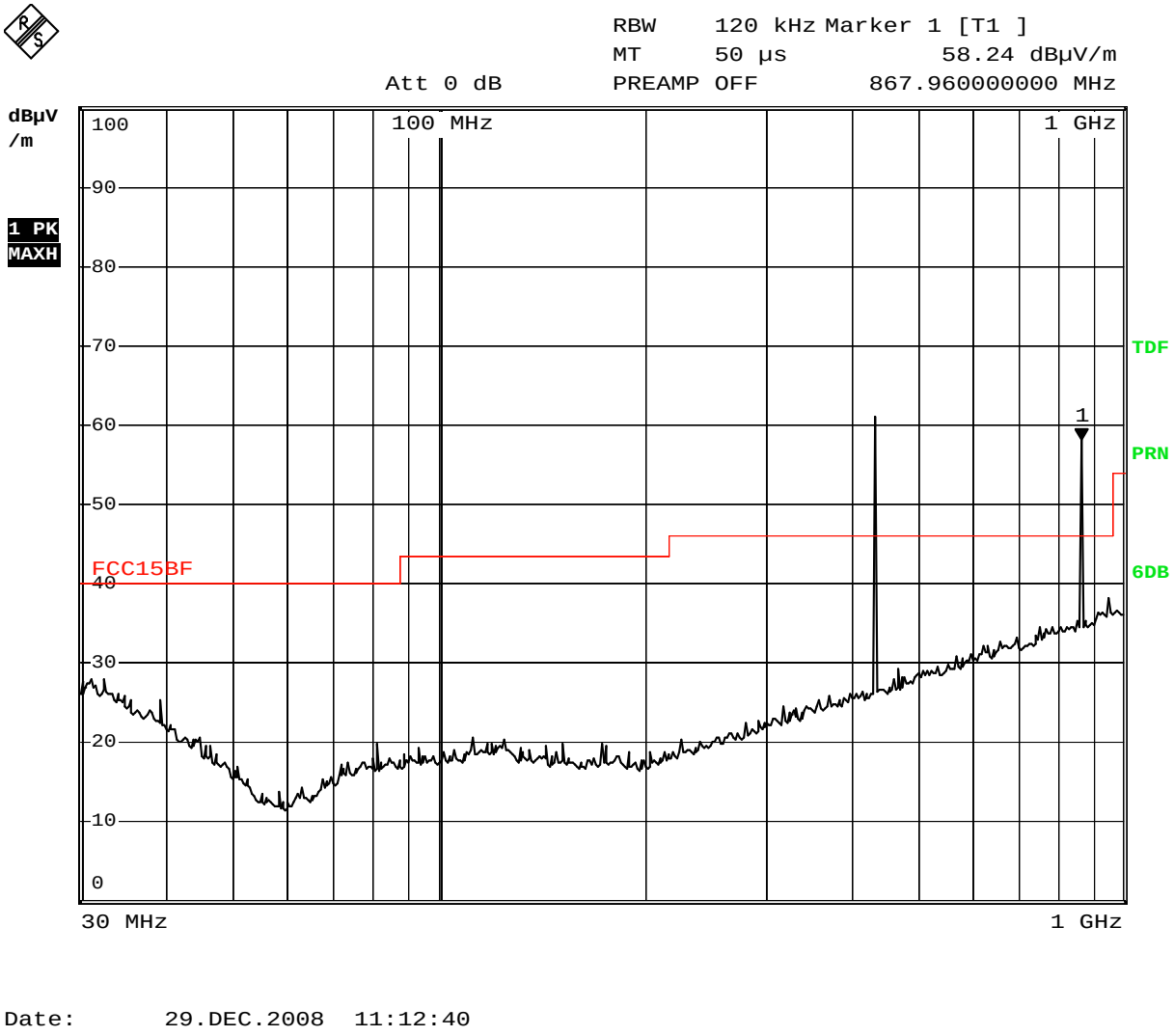
Vertical



Test Plots for Below 1GHz:

Test Mode: Temperature change

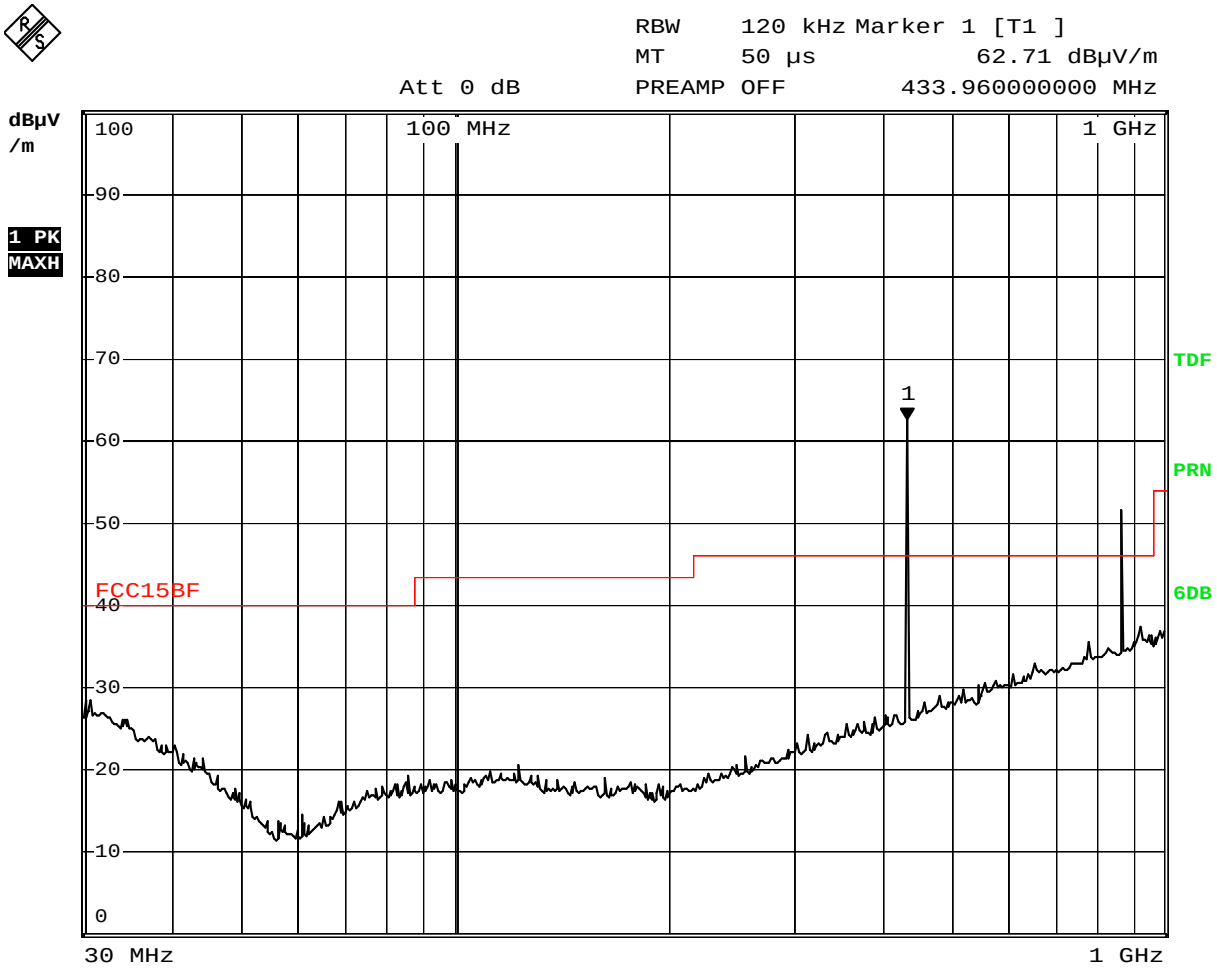
Horizontal



Date: 29.DEC.2008 11:12:40

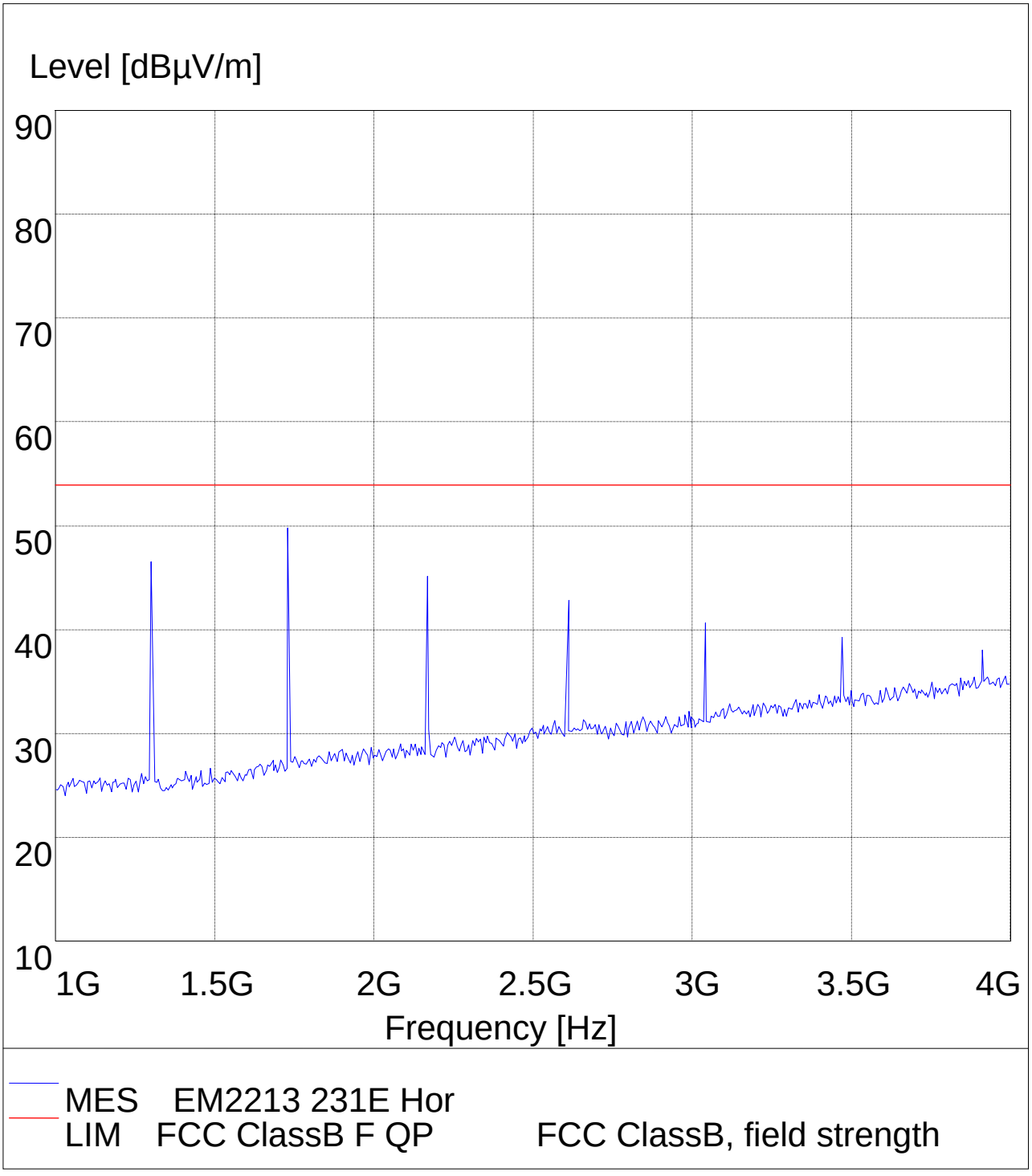
Test Mode: Temperature change

Vertical

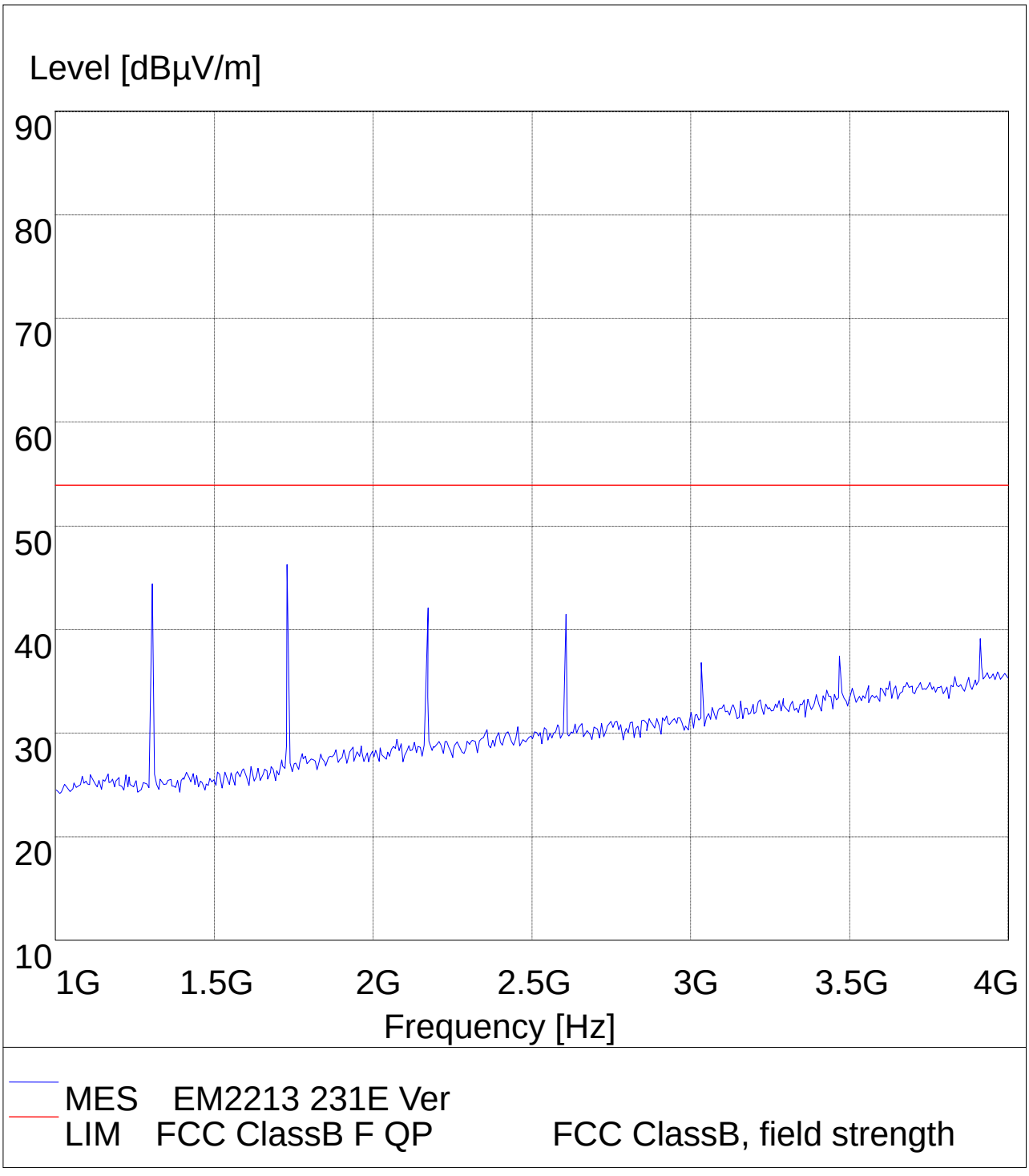


Test Plots for Above 1GHz: Keep Temperature Unchanged

Horizontal

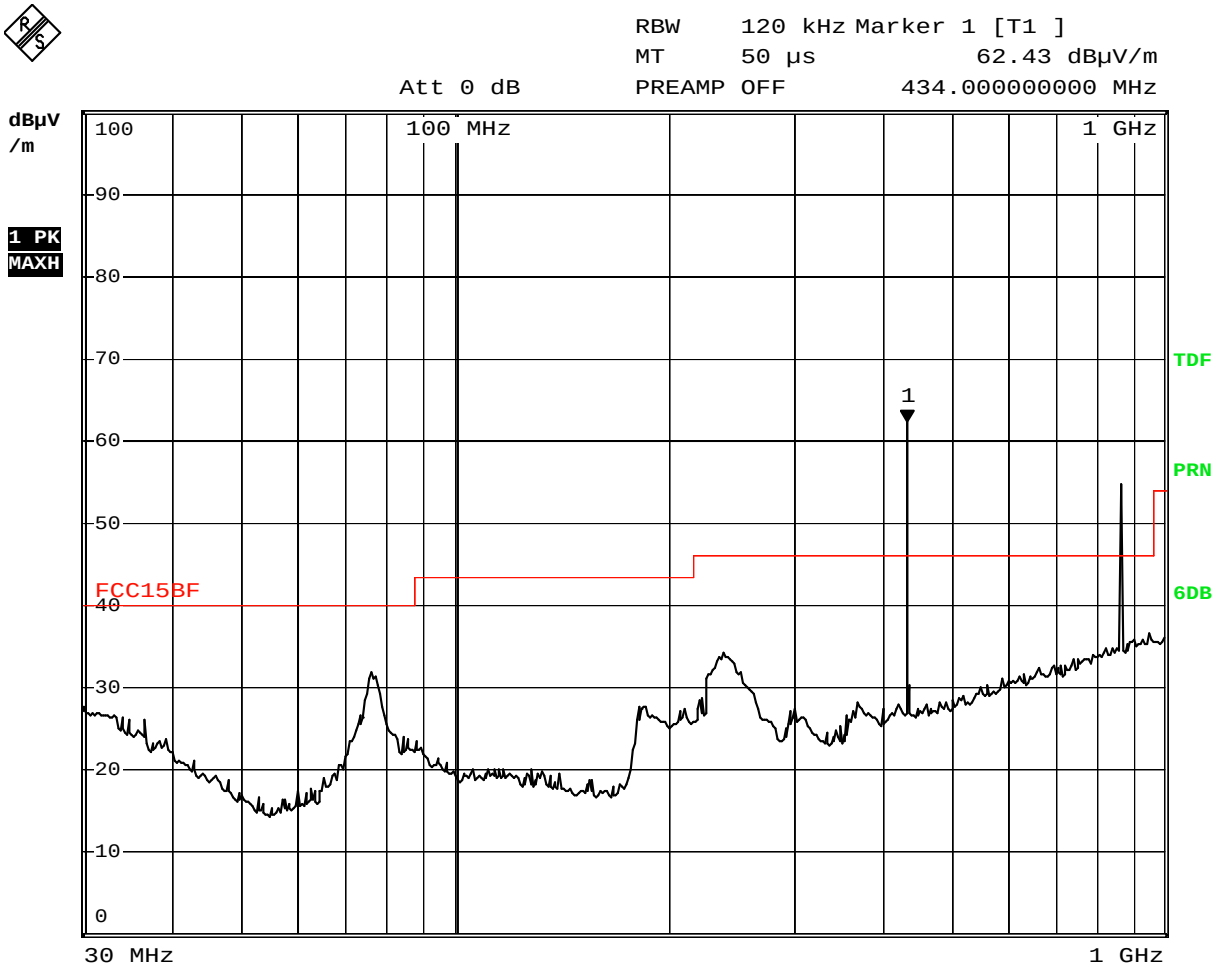


Vertical

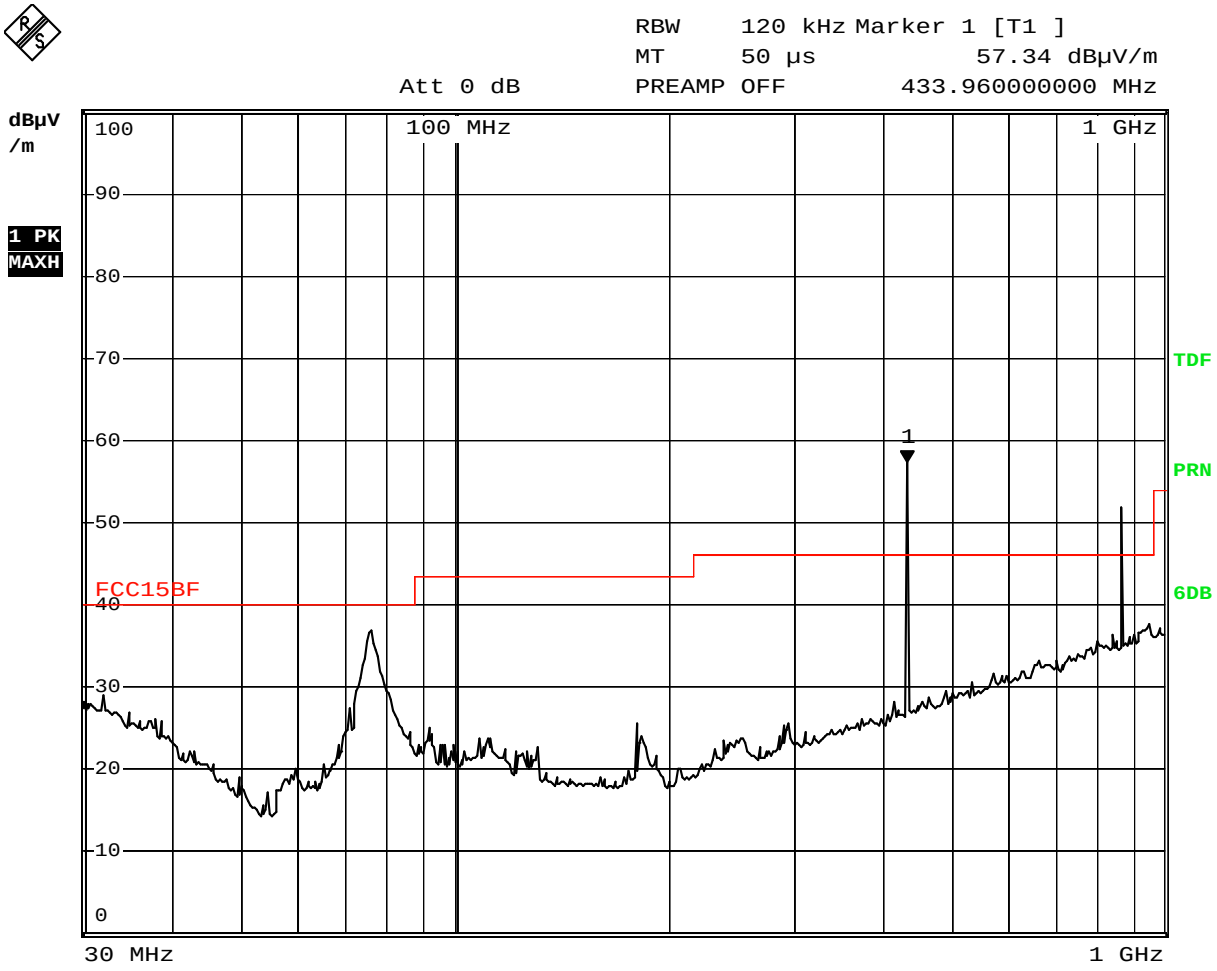


Test Plots for Below 1GHz: Keep Temperature Unchanged

Horizontal



Vertical



Date: 29.DEC.2008 11:31:14

7.0 20dB Bandwidth Testing

7.1 Requirement

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

7.2 Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

7.3 **Test Data**

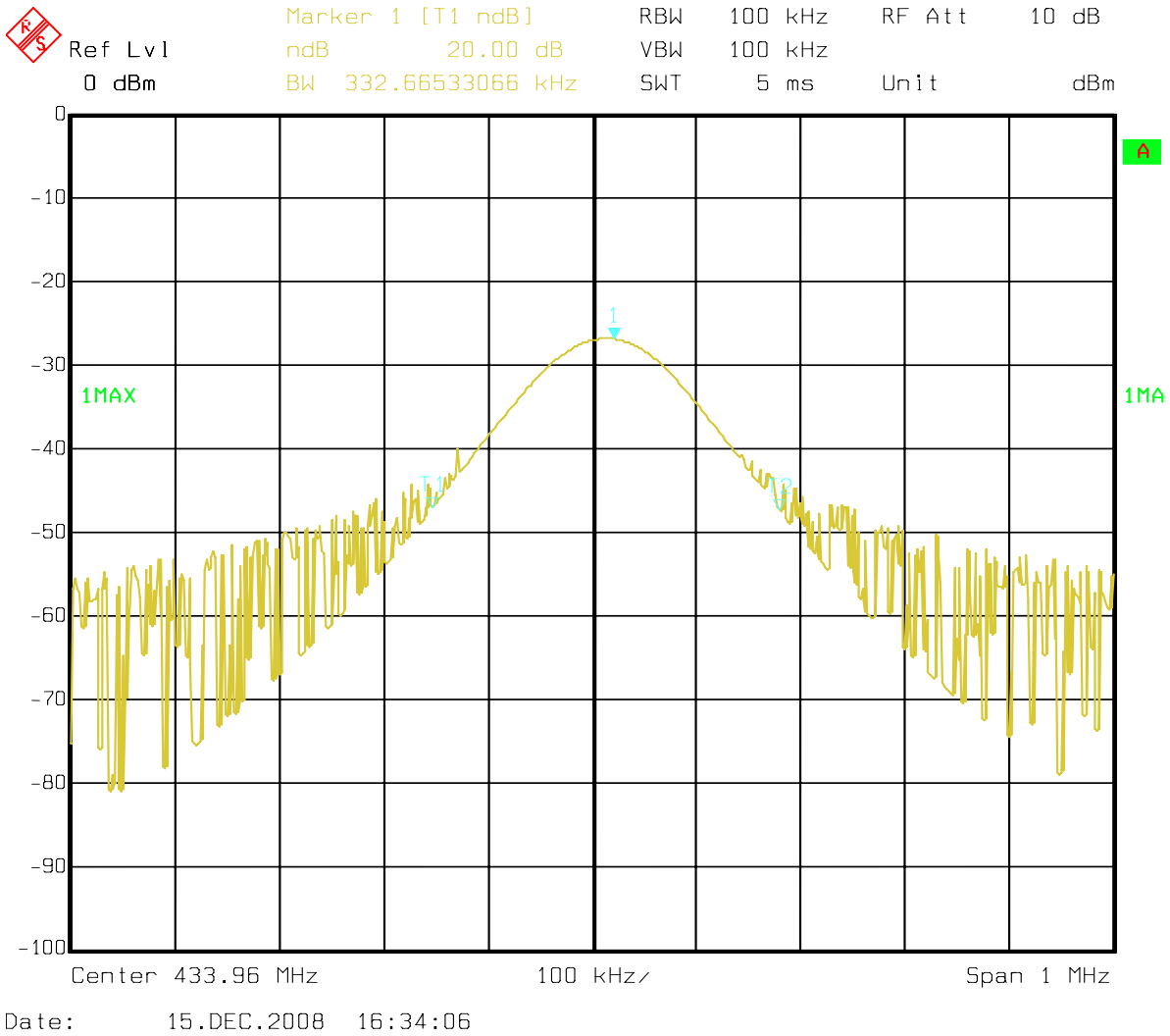
Test mode: Temperature change

Frequency （MHz）	20dB Bandwidth Emission (kHz)	Limit (kHz)	Result
433.92	332.665	1084.8	Pass

Limit=Frequency x 0.25%=433.92 x 0.25%=1.0848MHz

Refer to attached plots:

TEST PLOTS:



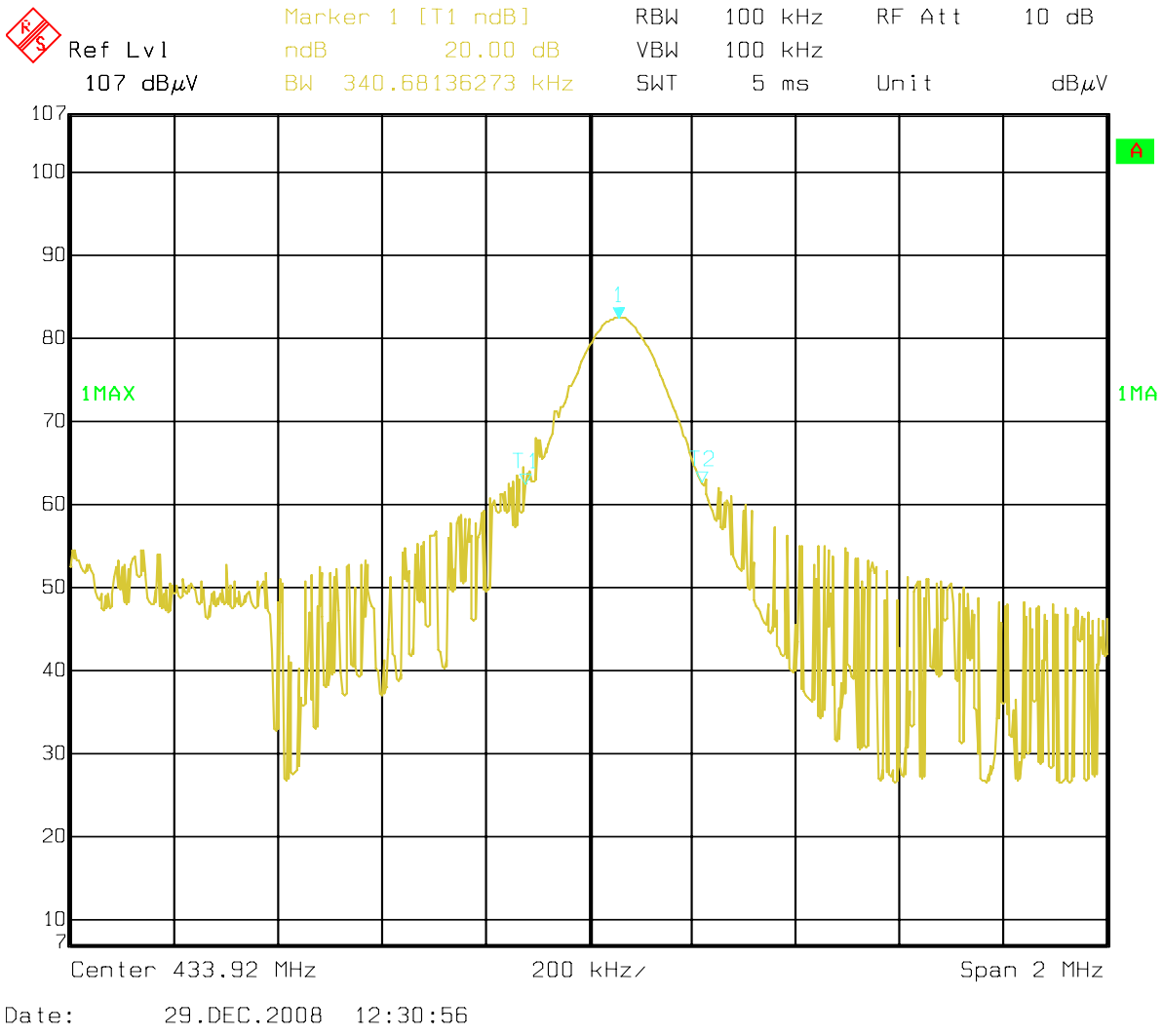
Test mode: Keep temperature Unchanged

Frequency （MHz）	20dB Bandwidth Emission (kHz)	Limit (kHz)	Result
433.92	332.665	1084.8	Pass

Limit=Frequency x 0.25%=433.92 x 0.25%=1.0848MHz

Refer to attached plots:

TEST PLOTS:



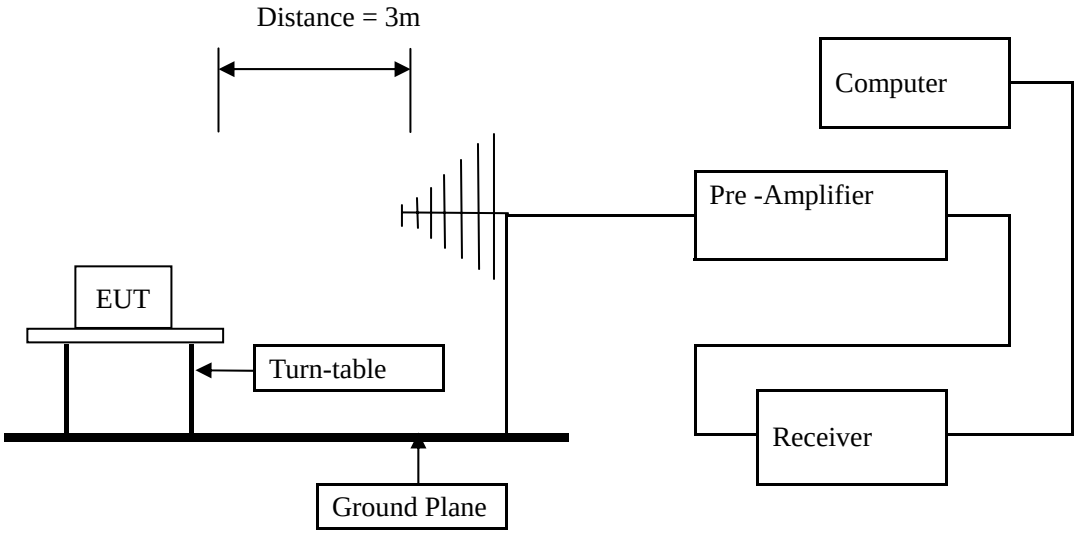
8.0 Deactivate Test

8.1 Requirement

Per 15.231(a) (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Per 15.231(e) devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds

8. 2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing
The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15.231(a) and (e) limits.

8.3 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

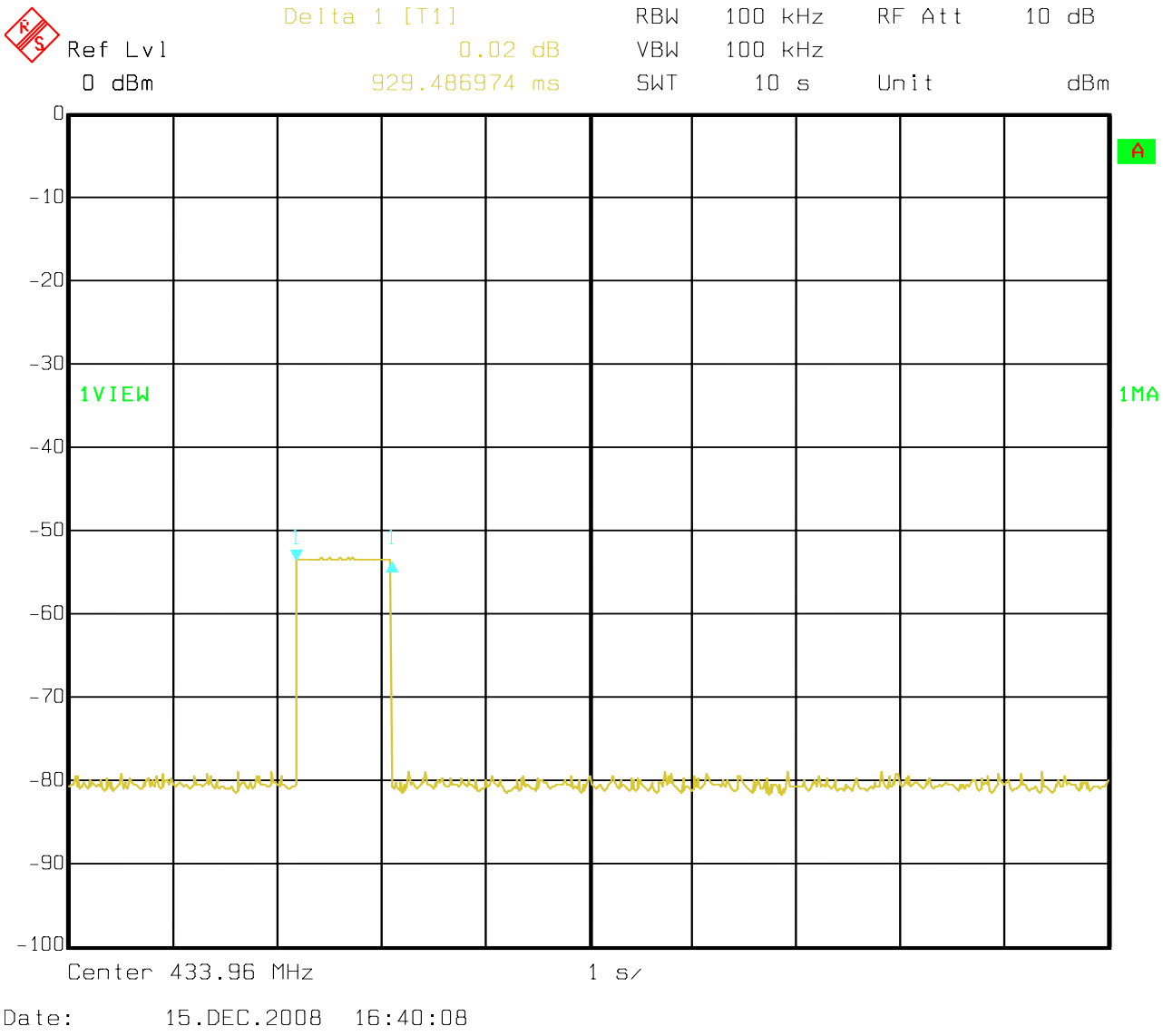
8.4 Test Data

Test mode: Temperature change

Deactivate time=0.929s (not more than 5 seconds)

Test results: PASS

Test Plots:

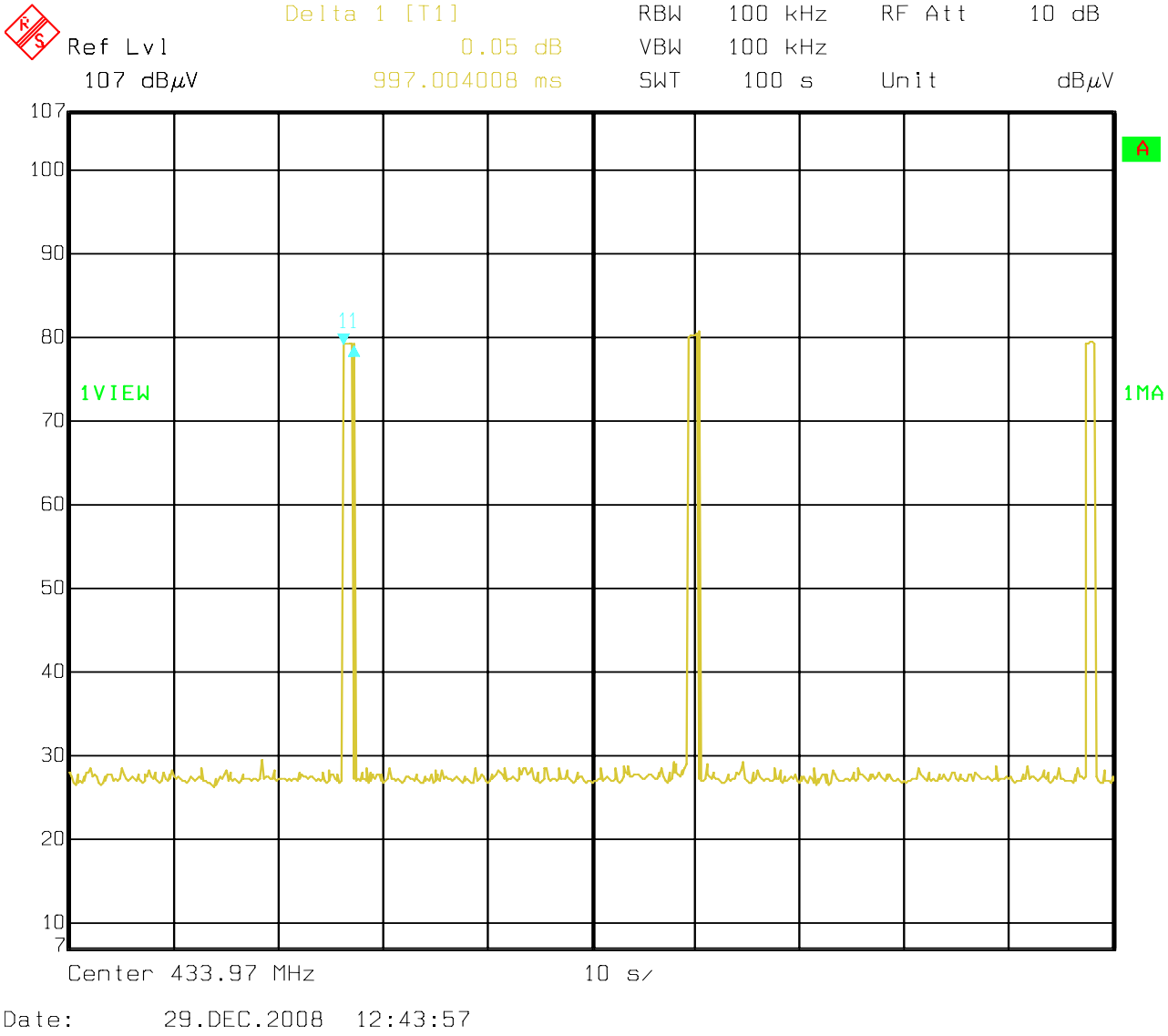


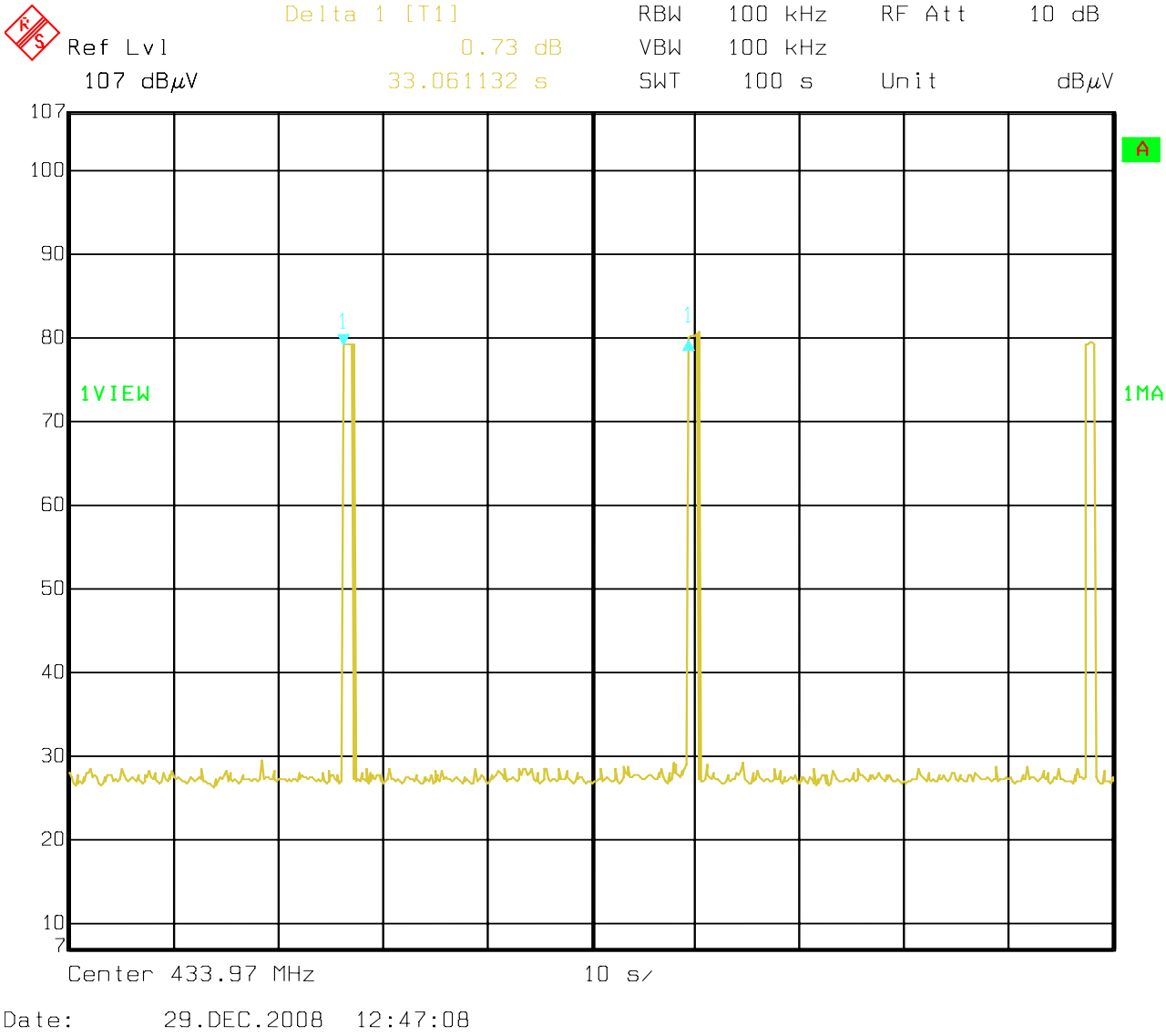
Test mode: Keep temperature unchanged

Deactivate time=0.997s (not more than 1 seconds)

Silent period=33.06s>30*0.997=29.91s

Test results: PASS





9.0 Duty Cycle

9.1 Limit

No dedicated limit specified in the Rules

9.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer=operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100kHz, Span=0Hz
5. Repeat above procedures until all frequency measured were complete.

9.3 Test Data

Base on the worst case

Test Mode: Temperature change

Tp = 159.519 ms

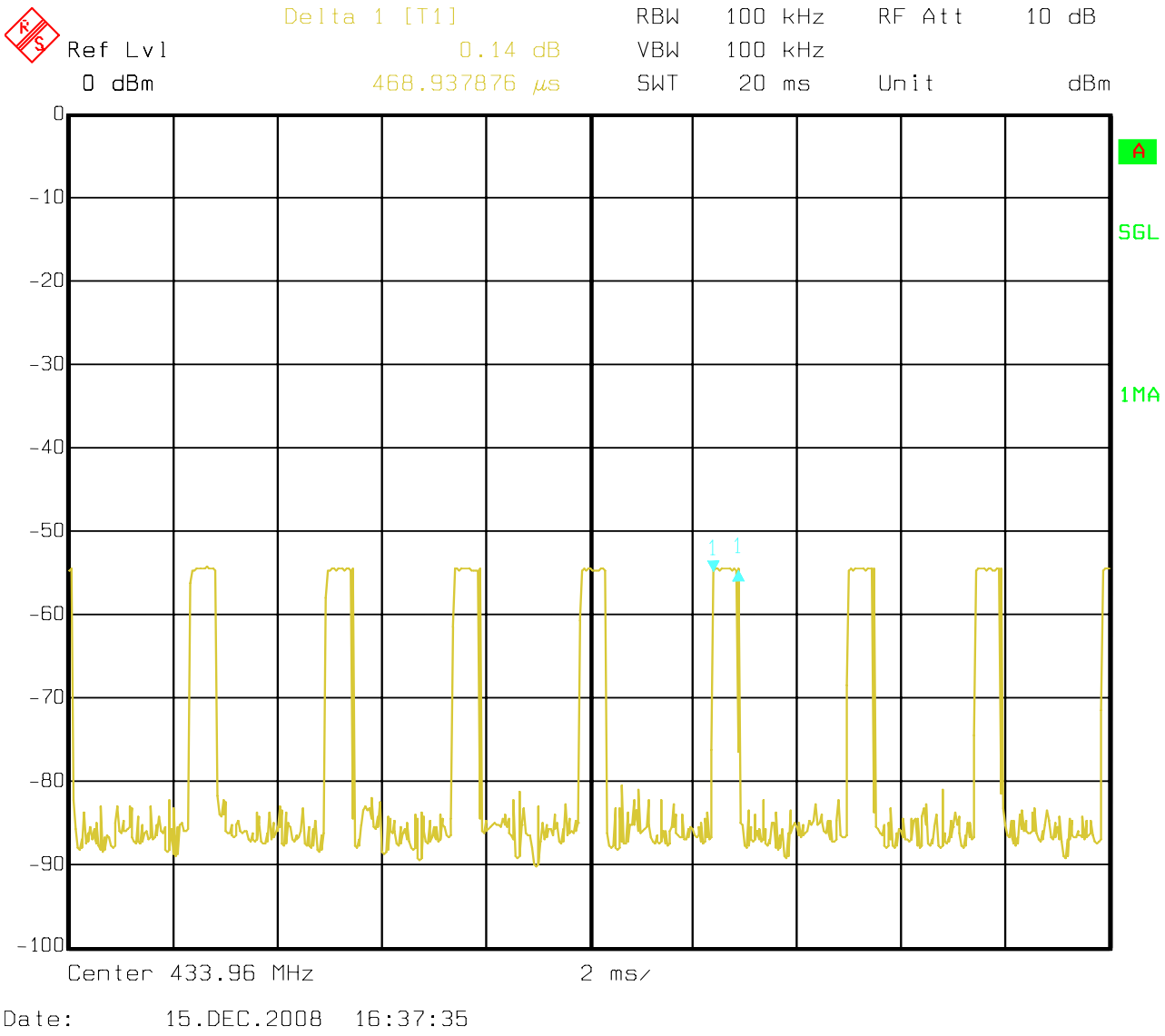
Ton = 0.469*41 = 19.229 (ms)

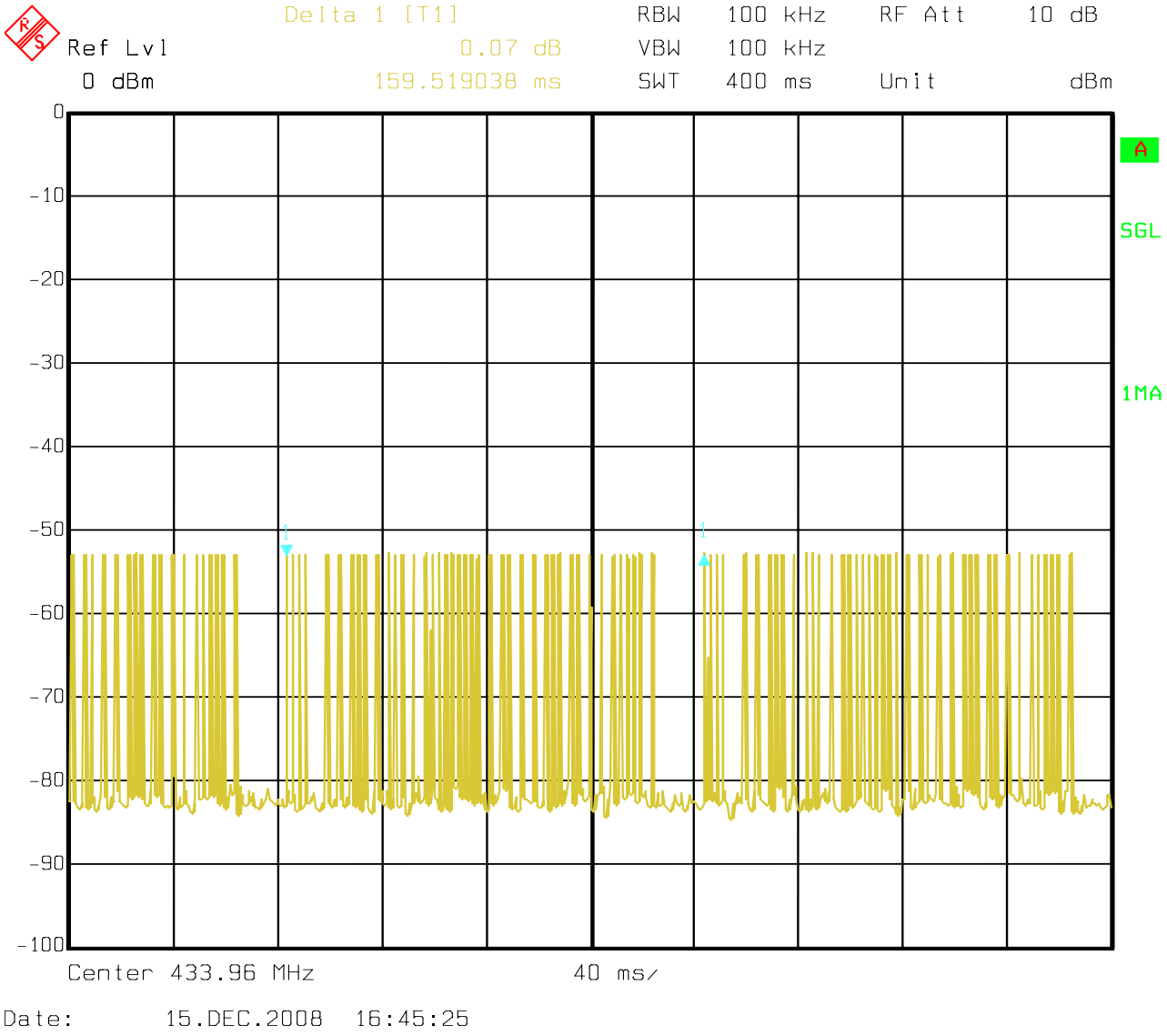
Duty cycle=Ton/Tp=0.121

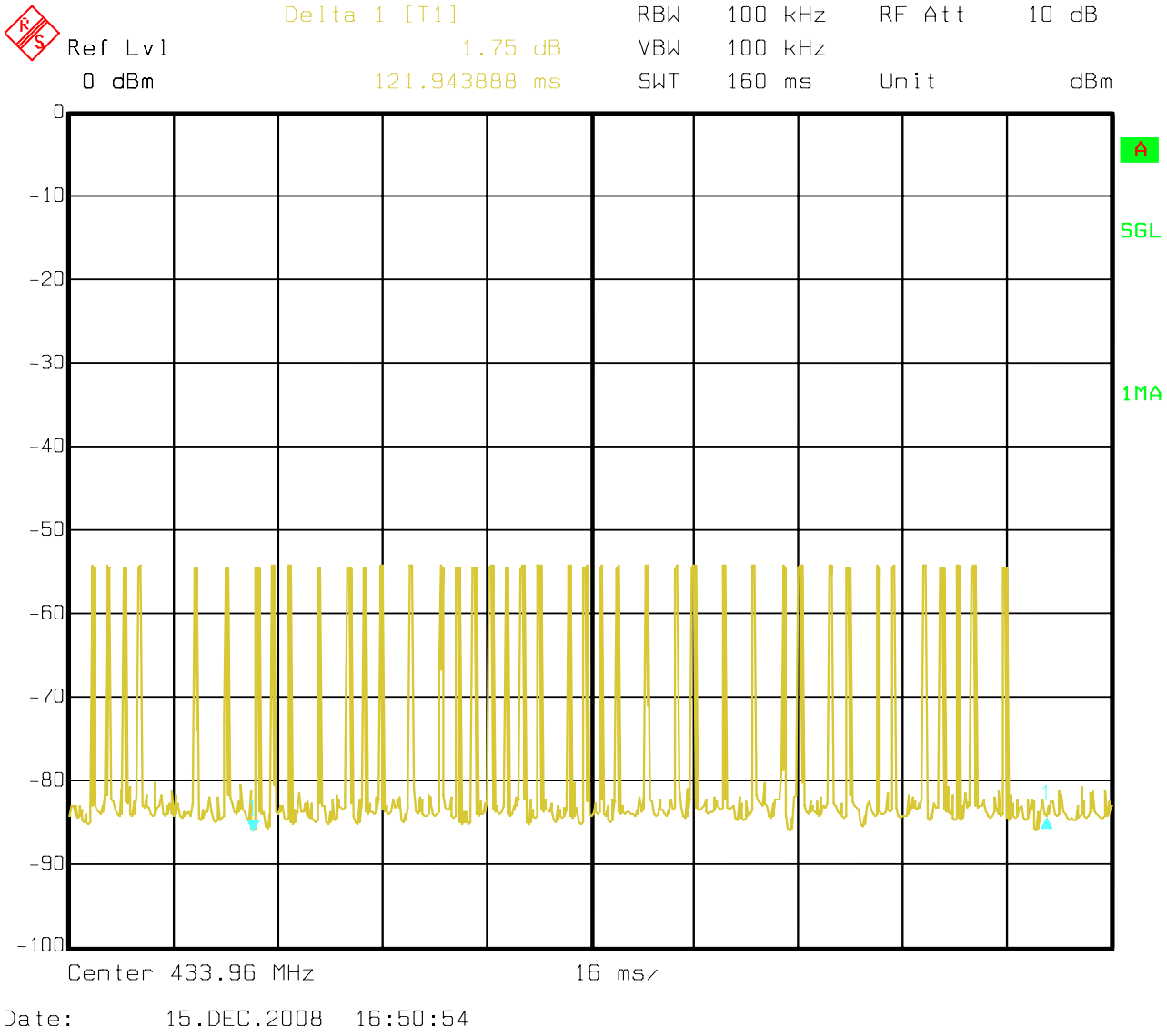
Duty cycle factor = 20 * log (duty cycle) = 20 * log (0.121) = -18.34dB

Testing Plots:

Test mode: temperature change







Test Mode: Keep Temperature unchanged
Tp = 33.06s
Ton = 0.997s
Duty cycle=Ton/Tp=0.03
Duty cycle factor = 20 * log (duty cycle) = 20 * log (0.03) = -30.45dB
Please see page 27 and 28 for test polts

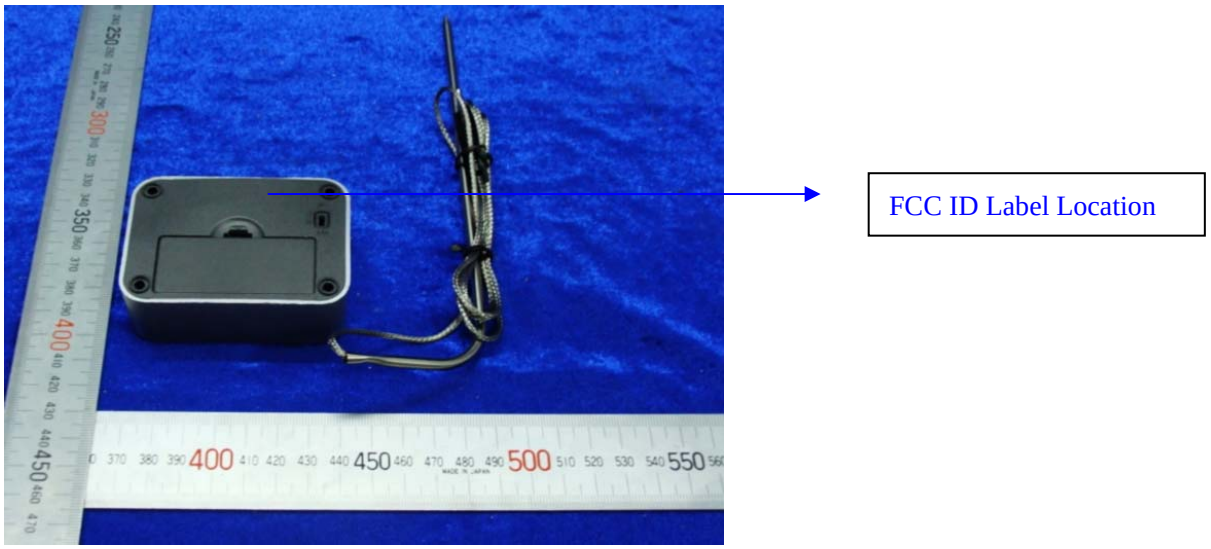
10.0 FCC ID Label

FCC ID: WEC-1214

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:

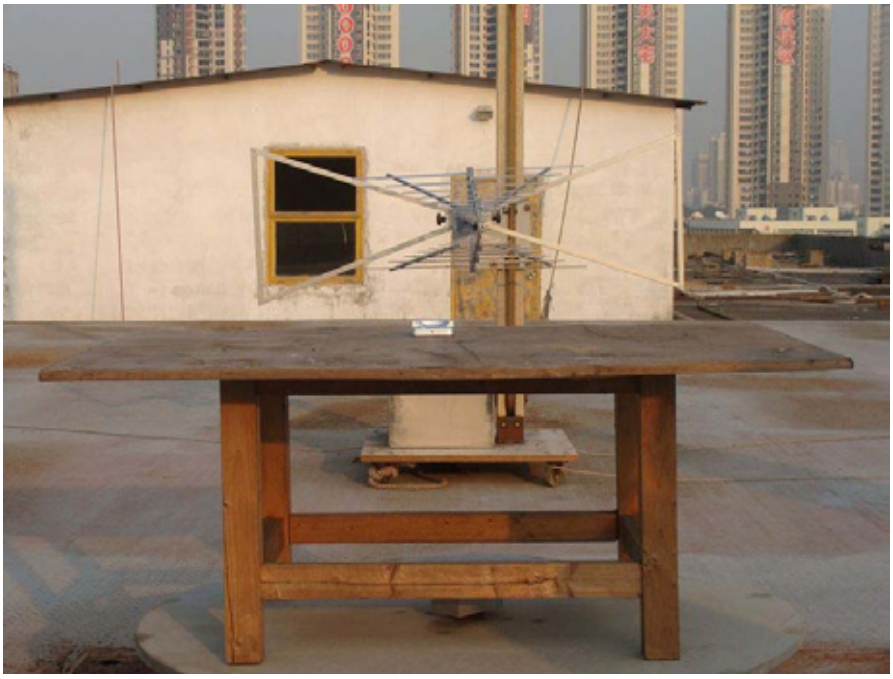


11.0. Photo of testing

11.1 Conducted test View—N/A

11.2 Radiated emission test view

Below 1GHz



Above 1GHz

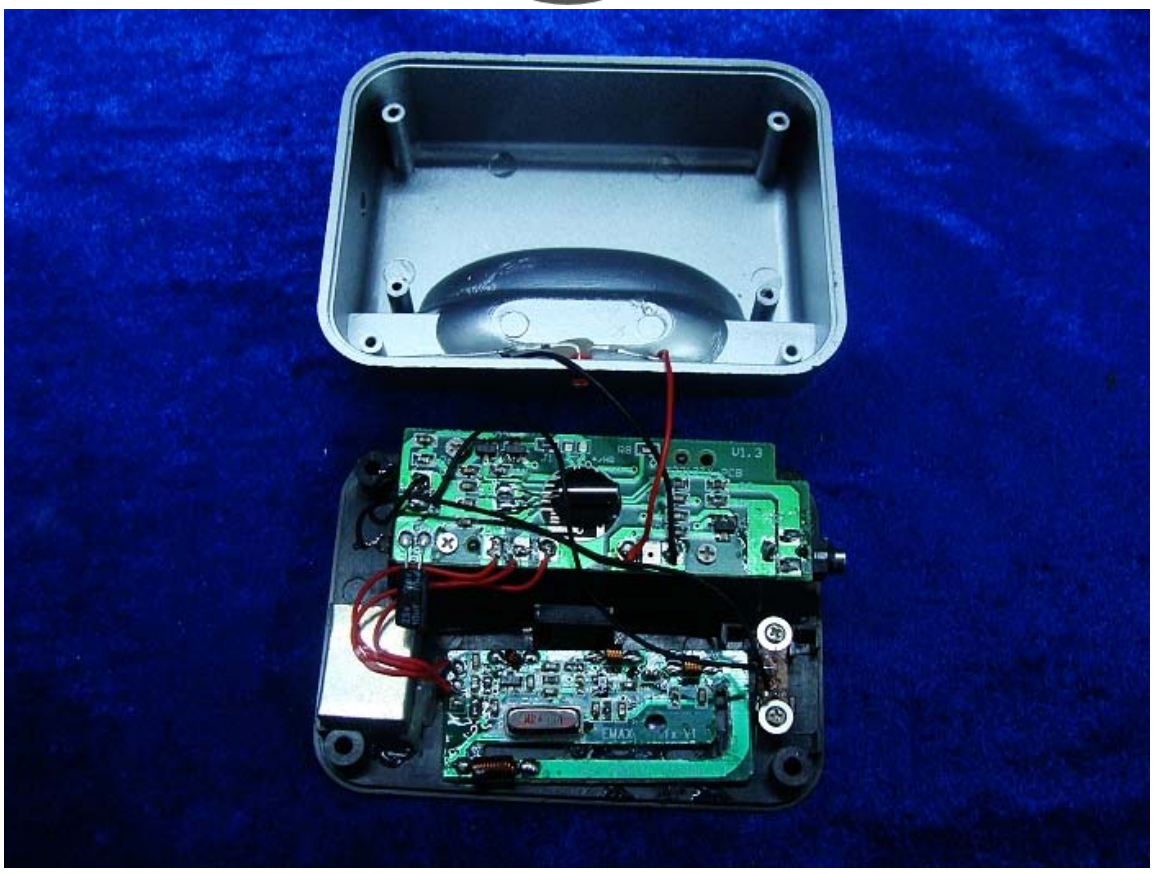
11.3 Photo for the EUT

Front view of EUT

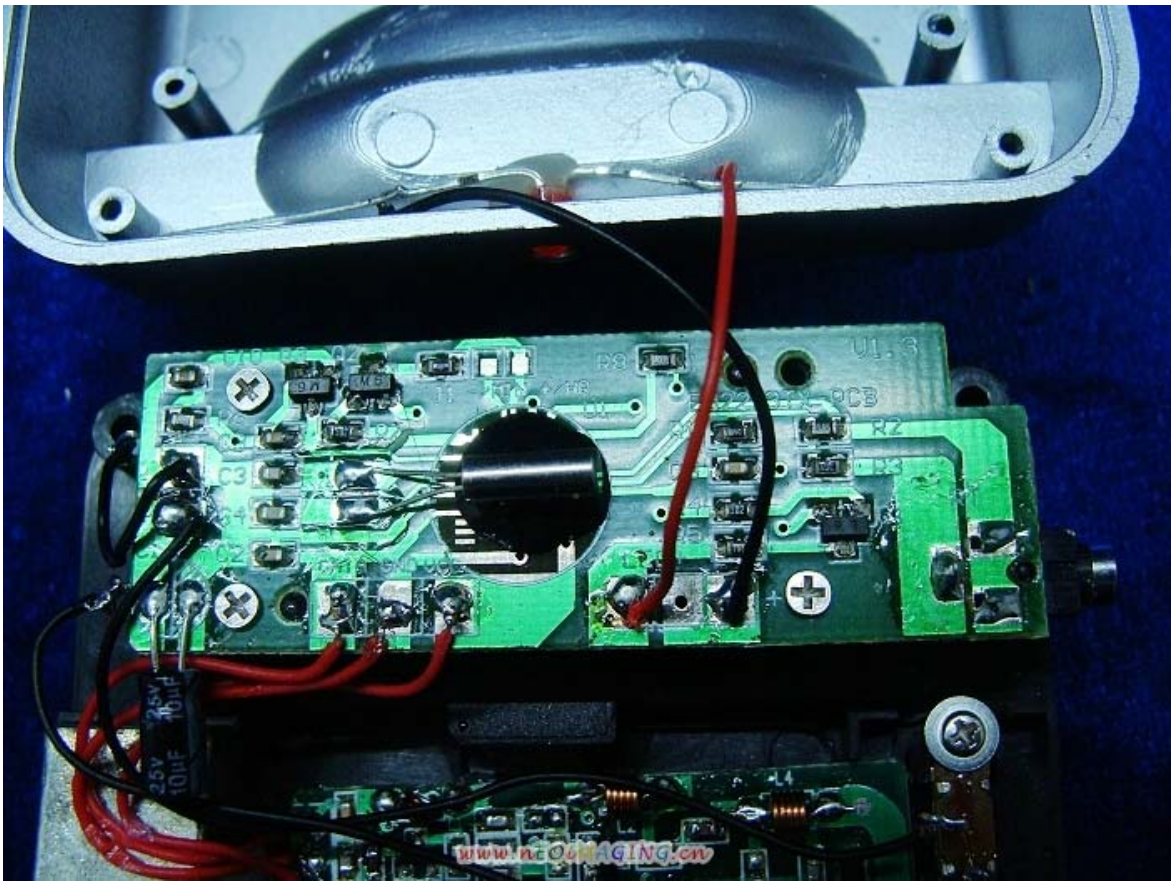
Back view of EUT

Side view of EUT

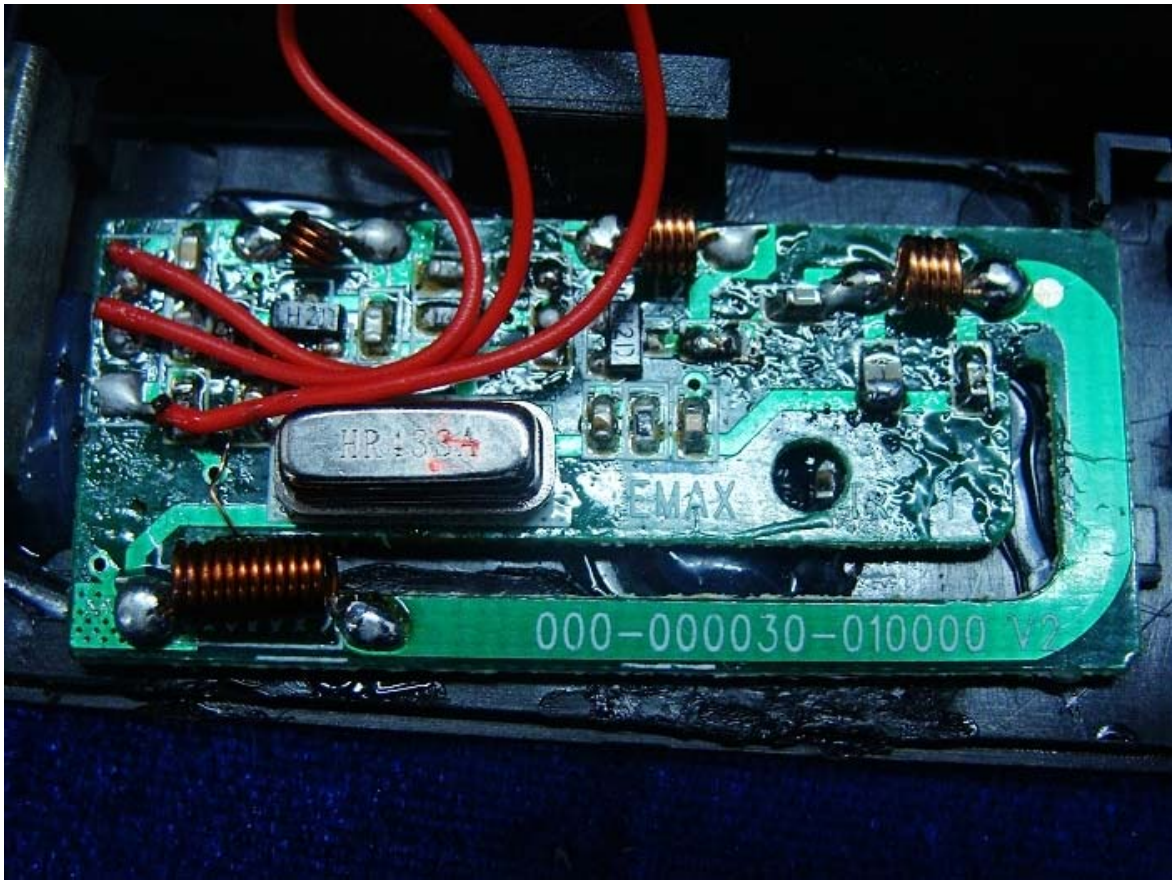
Inside view 1 of EUT



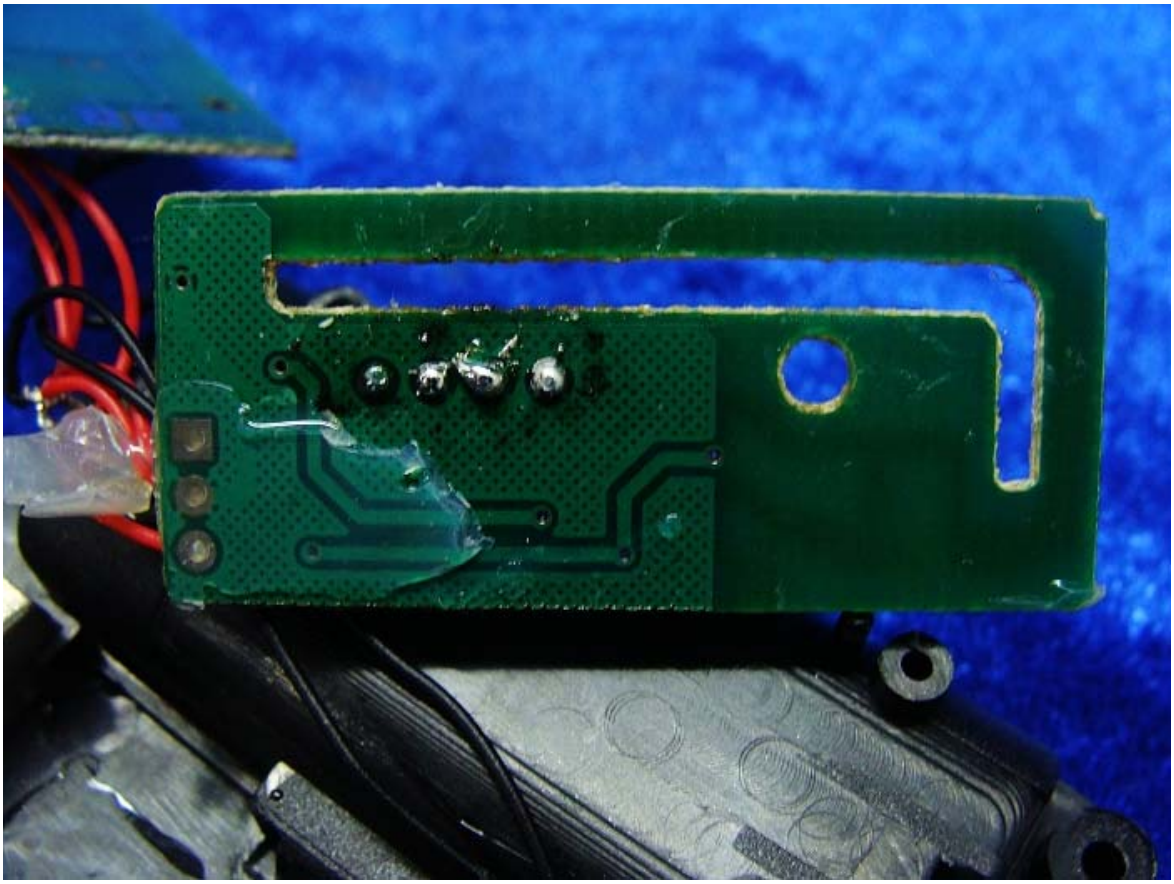
Inside view 2 of EUT



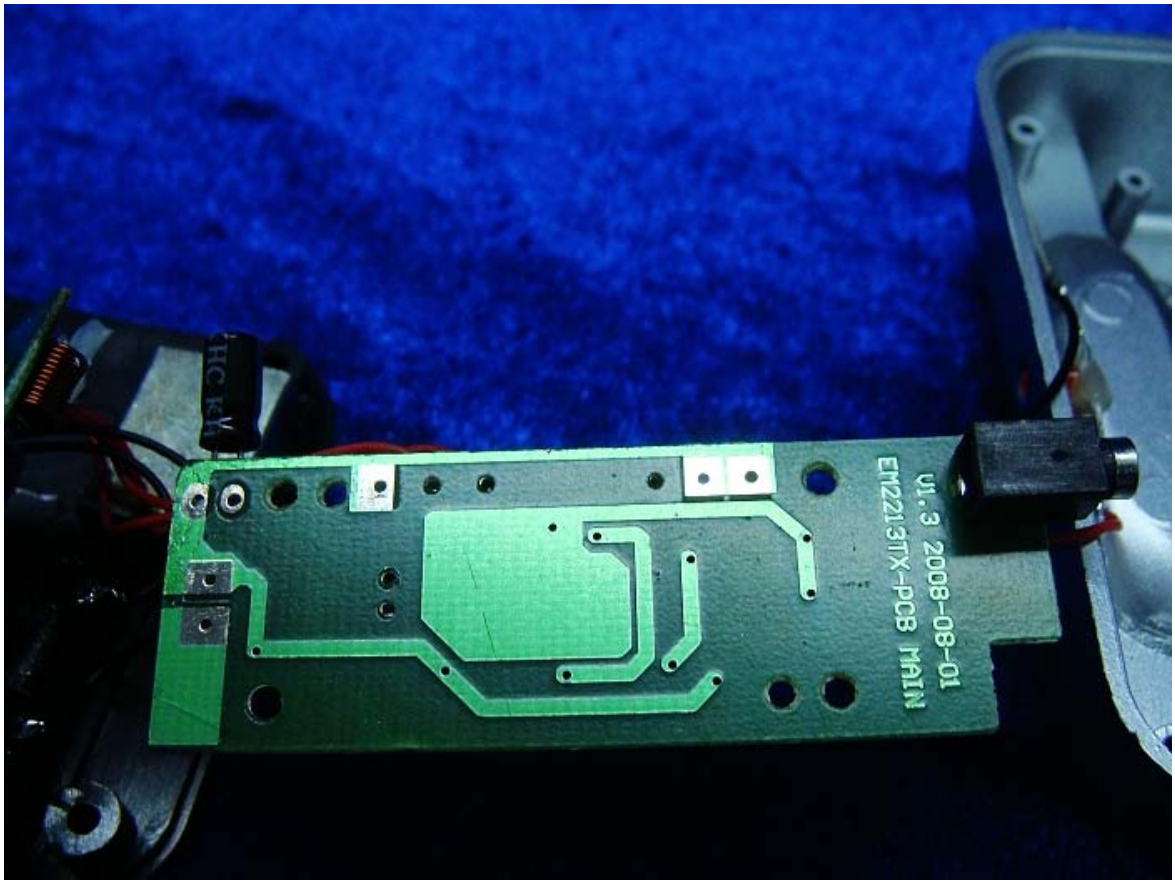
Inside view 2 of EUT



Inside view 2 of EUT



Inside view 2 of EUT



End of the report