



SGS-CSTC Standards Technical Services Ltd.

198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology
Development District, Guangzhou, Guangdong, China 510663
Telephone: +86 (0) 20 82155555
Fax: +86 (0) 20 82075059
Email: sgs_internet_operations@sgs.com
FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMO080602016RFTT
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FCC ID: WRX-PE-HA-T

TEST REPORT

Application No. : GLEMO080602016RF
Applicant: Phonic Ear A/S
FCC ID: WRX-PE-HA-T
Frequency Band 2.4 GHz to 2.4835 GHz
Equipment Under Test (EUT):
Name: Heartl All
Model No.: 210-00-030-00
Serial No.: Not supplied by client
Standards: FCC PART 15 SUBPART C: 2008
Please refer to section 2 for further details.
Date of Receipt: 24 October, 2008
Date of Test: 24 October, 2008 to 31 October, 2008
Date of Issue: 1 November, 2008

Test Result :	PASS *
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In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



2008-Nov.

Stephen Guo
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Field Strength of Fundamental	FCC PART 15 :2008	Section 15.249 (a)	PASS
Field Strength of Unwanted Emissions	FCC PART 15 :2008	Section 15.249 (a) Section 15.249 (d)	PASS
Occupied Bandwidth	FCC PART 15 :2008	Section 15.249	PASS
Band Edges	FCC PART 15 :2008	Section 15.249 (d)	PASS

Remark:

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.



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4 General Information

4.1 Client Information

Applicant Name: Phonic Ear A/S
Applicant Address: Kongebakken Smørum DK-2765 Denmark

4.2 General Description of E.U.T.

Product Name: Heart All
Model: 210-00-030-00
Power Supply: Rechargeable Battery 3.7V inside
Adapter information Model No: UE08WCP-060100SPA
supplied(Only for charge): Input: 100-200V~ 50-60Hz, 400mA
Output: DC6.0V 1.0A MAX

4.3 Description of EUT operation

Type of Modulation FSK
Frequency Band 2.4GHz to 2.4835 GHz
Antenna Type Integrate Antenna

4.4 Standards Applicable for Testing

The standard used was FCC PART 15, SUBPART C (2008) section 15.249.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,

No.198 Kezhu Road, Science Town Economic & Technology Development District Guangzhou,
China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.



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4.7 Test Facility

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

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., 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 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.



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5 Equipments Used during Test

RE in Chamber						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	28-01-2008	28-01-2009
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2007	04-12-2008
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2008	12-08-2009
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2008	12-08-2009
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2008	12-08-2009
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2008	05-12-2009
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	11-03-2008	11-03-2009
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	11-03-2008	11-03-2009
EMC0075	310N Amplifier	Sonama	310N	272683	10-09-2008	10-09-2009
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2008	09-08-2010
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	10-08-2008	10-08-2009

Conducted Emission						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	N/A	N/A
EMC0102	LISN	Schaffner Chase	MNZ050D/1	1421	14-12-2007	14-12-2008
EMC0118	Two-line v-netwok	Rohde & Schwarz	ENV216	3560.6550.02	28-07-2008	28-07-2009
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	14-12-2007	14-12-2008
EMC0107	Coaxial Cable	SGS	2m	N/A	24-11-2007	26-11-2008
EMC0106	Voltage Probe	SGS	N/A	N/A	N/A	N/A
EMC0120	8 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	20550	21-02-2008	21-02-2009
EMC0121	4 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	20549	21-02-2008	21-02-2009
EMC0122	2 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	20548	21-02-2008	21-02-2009

General used equipment						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0006	DMM	Fluke	73	70681569	27-09-2008	27-09-2009
EMC0007	DMM	Fluke	73	70671122	27-09-2008	27-09-2009

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6 Test Result

6.1 E.U.T. Operation

Input voltage: DC 3.7V

Operating Environment:

Temperature: 26°C

Humidity: 56% RH

Atmospheric Pressure: 1005mbar

EUT Operation: The program used to control the EUT for staying in continuous transmitting and receiving mode is programmed by manufacturer .
Channel lowest (2404MHz), middle (2441MHz) and highest (2480MHz) are chosen for full testing.
Test the Host in transmitting mode.



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6.2 Test Procedure & Measurement Data

6.2.1 Field Strength of Fundamental & Field Strength of Unwanted Emissions

Test Requirement: FCC Part15 C Section 15.249(a) & (d)
Test Method: Based on FCC Part15 C Section 15.249 & ANSI C63.4
Test Date: 25 October 2008
Measurement Distance: 3m (Semi-Anechoic Chamber)
Frequency range: 30 MHz – 25GHz for transmitting mode.
Test instrumentation resolution bandwidth
120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 25GHz)
Operation: Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal, a turntable rotate through 360° in the horizontal plane and it is used to support the test sample at 0.8m above the ground plane.

Requirements:

FCC Part 15.249(a)

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m @ 3m)	Field Strength of Harmonics (dBuV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

FCC Part 15.249(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.

Remark:

The fundamental frequency rang of the EUT is 2404MHz ~ 2480MHz.

The limit for average field strength dBuV/m for the fundamental frequency = 94.0 dBuV/m.

The limit for Peak field strength dBuV/m for the fundamental frequency = 114.0 dBuV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuV/m for the harmonics = 54.0 dBuV/m.

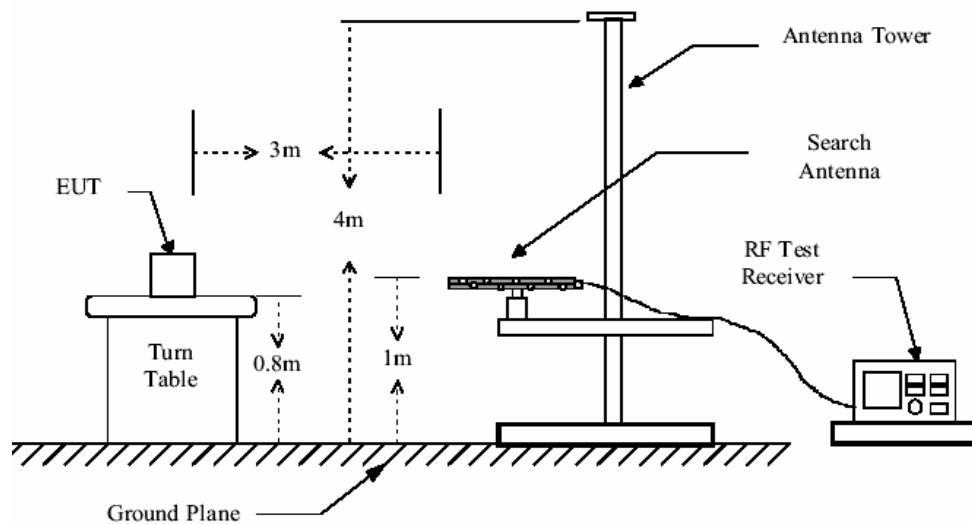
The limit for peak field strength dBuV/m for the harmonics = 74.0 dBuV/m.

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or 54.0 dBuV/m in 15.209. Here the limit for the other emission is 54.0 dBuV/m.

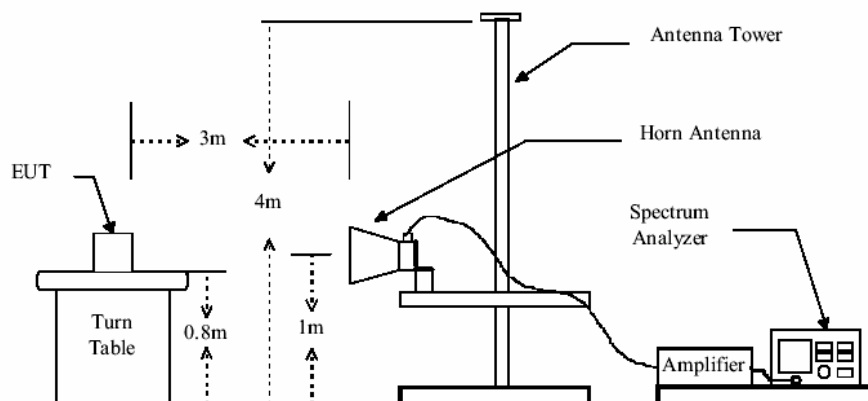
Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery. Pretest the equipment on 3 axis, and the worst case emissions were reported.

Test Configuration:

30MHz to 1GHz:



Above 1GHz:





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The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier . The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

The following test results were performed on the Host:

1. Test in Channel lowest (2404MHz), keep in continuously transmitting status.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
30.000	28.35	24.20	0.60	25.50	25.65	40.00	-14.35	Horizontal
125.893	27.81	14.25	1.30	25.10	17.26	43.50	-26.24	Vertical

(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
2404.000	95.14	28.60	4.60	34.76	93.58	114.00	-20.42	Peak
2404.000	94.02	28.60	4.60	34.76	92.46	94.00	-1.54	Average
4808.000	53.85	33.19	6.90	33.01	60.93	74.00	-13.07	Peak
4808.000	45.85	33.19	6.90	33.01	52.92	54.00	-1.08	Average

(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
2404.000	90.88	28.60	4.60	34.76	89.26	114.00	-24.74	Peak
2404.000	89.88	28.60	4.60	34.76	88.34	94.00	-5.66	Average
4808.000	46.28	33.19	6.90	33.01	53.36	74.00	-20.64	Peak
4808.000	34.28	33.19	6.90	33.01	41.30	54.00	-12.70	Average

2. Test in Channel middle (2440MHz), keep in continuously transmitting status.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
32.157	28.80	24.22	0.60	25.55	28.07	40.00	-11.93	Horizontal
125.200	27.51	14.25	1.30	25.10	16.94	43.50	-26.56	Vertical

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(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
2441.000	93.87	28.69	4.60	34.74	92.42	114.00	-21.58	Peak
2441.000	91.87	28.69	4.60	34.74	90.73	94.00	-3.27	Average
4882.000	53.98	33.27	7.20	32.97	61.48	74.00	-12.52	Peak
4882.000	44.98	33.27	7.20	32.97	52.21	54.00	-1.79	Average

(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
2441.000	90.32	28.69	4.60	34.74	88.42	114.00	-25.58	Peak
2441.000	89.32	28.69	4.60	34.74	87.87	94.00	-6.13	Average
4882.000	46.03	33.27	7.20	32.97	53.34	74.00	-21.66	Peak
4882.000	36.03	33.27	7.20	32.97	43.53	54.00	-10.47	Average

3. Test in Channel highest (2480MHz), keep in continuously transmitting status.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
73.650	43.86	6.64	1.00	25.10	26.40	40.00	-13.60	Horizontal
125.060	37.48	12.50	1.30	25.10	26.18	43.50	-26.56	Vertical

(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
2480.000	93.21	28.78	4.67	34.72	91.72	114.00	-2.28	Peak
2480.000	92.21	28.78	4.67	34.72	90.94	94.00	-23.06	Average
4959.767	53.16	33.36	7.33	32.92	60.93	74.00	-13.07	Peak
4959.767	45.16	33.36	7.33	32.92	52.65	54.00	-1.35	Average



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(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
2480.000	89.77	28.78	4.67	34.72	88.50	114.00	-25.50	Peak
2480.000	88.77	28.78	4.67	34.72	87.50	94.00	-6.50	Average
4959.724	46.19	33.36	7.33	32.92	53.96	74.00	-20.04	Peak
4959.724	36.19	33.36	7.33	32.92	43.96	54.00	-10.04	Average

Remark:

- 1). According to 15.249 (e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above 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.
- 2) Sweep from 30MHz to 25GHz, find the max radiated emissions and record it, when the emissions are too weak to be detected, it will not be reported.

TEST RESULTS: The unit does meet the FCC requirements.



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6.2.2 Occupied Bandwidth & Band Edge

Test Requirement: FCC Part 15 C Section 15.249

Test Method: ANSI C63.4 and FCC Part 2.1049

Operation within the band 2400-2483.5MHz

Test Date: 26 October 2008

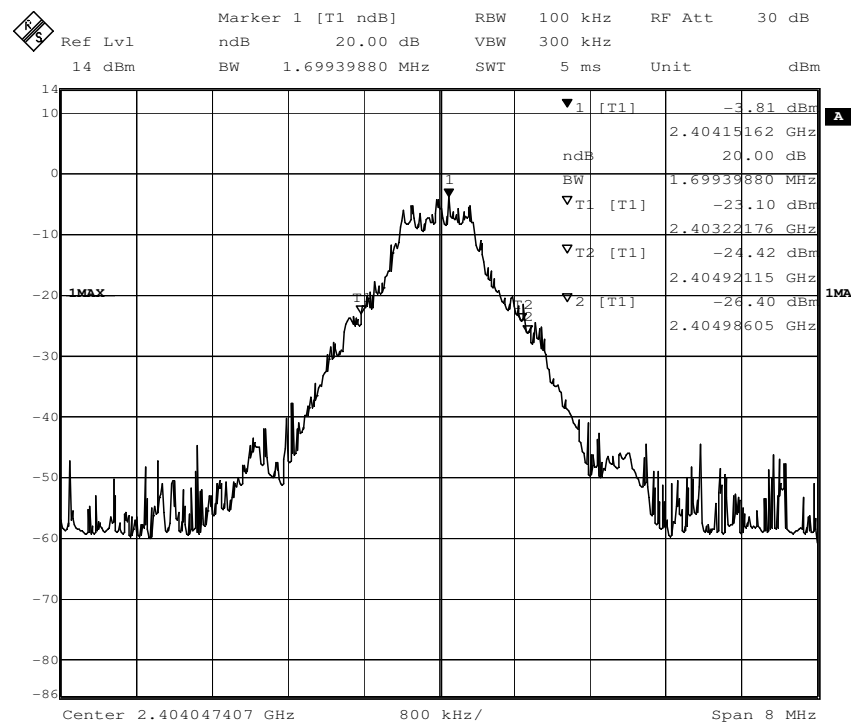
Requirements: 15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

For Controller:

The occupied bandwidth as below:

Lowest Channel:2404MHz:





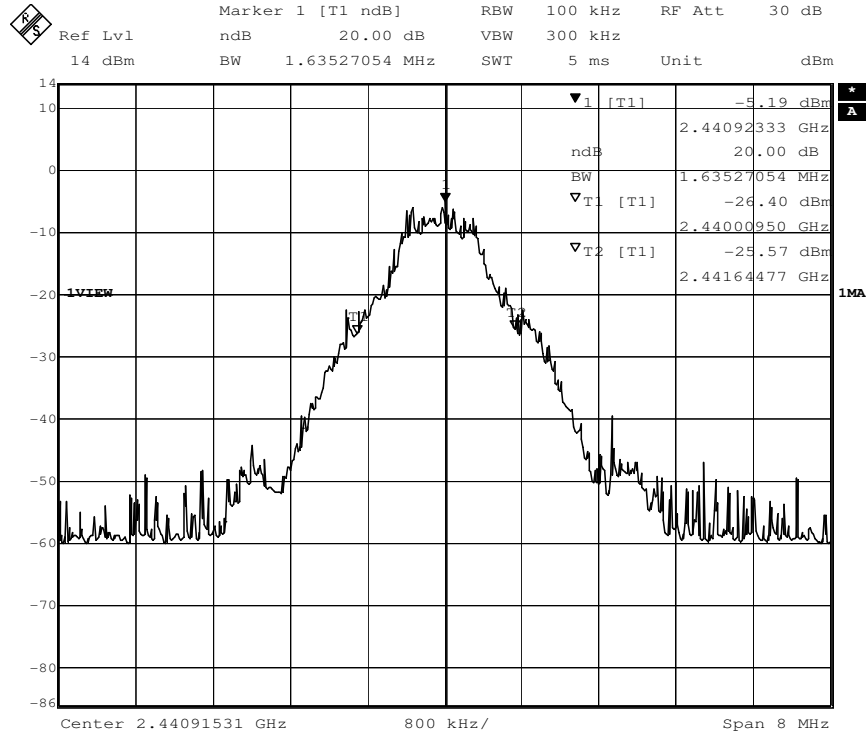
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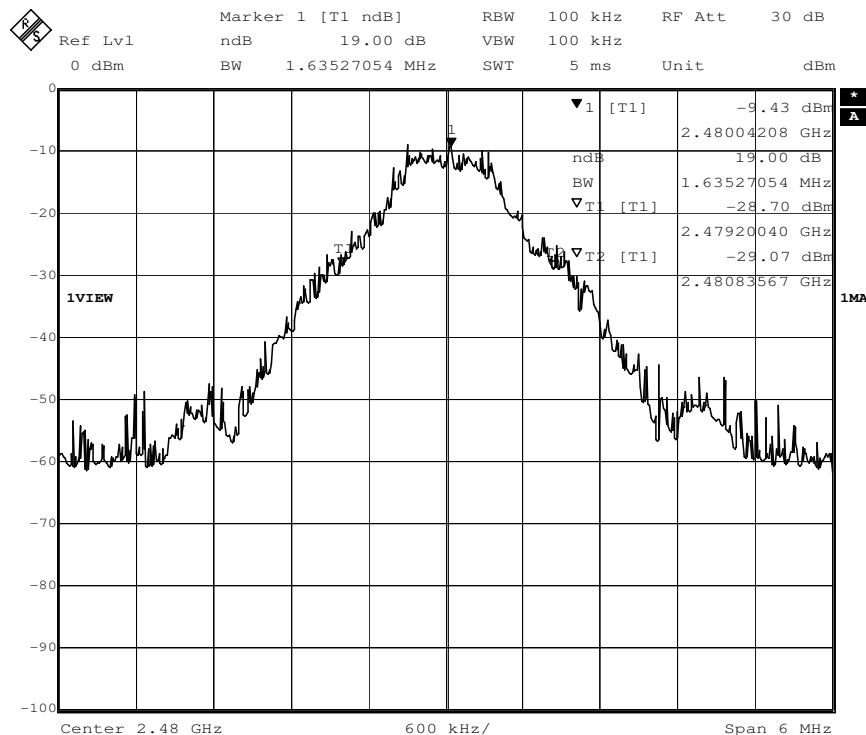
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Middle Channel 2441MHz:



Highest Channel 2480MHz:





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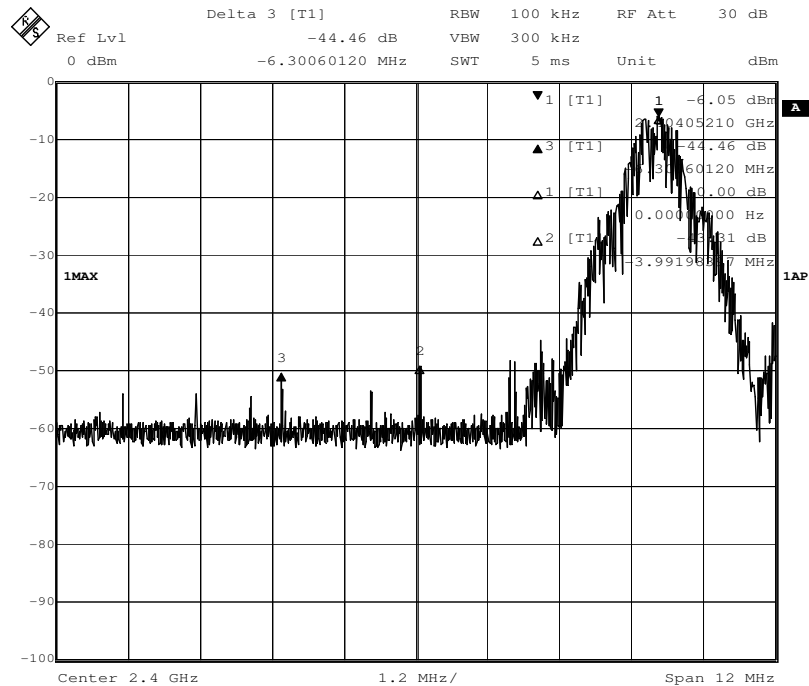
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The Band Edge Emission as below:

Lowest Band Edge 2400MHz

Detector mode:Peak





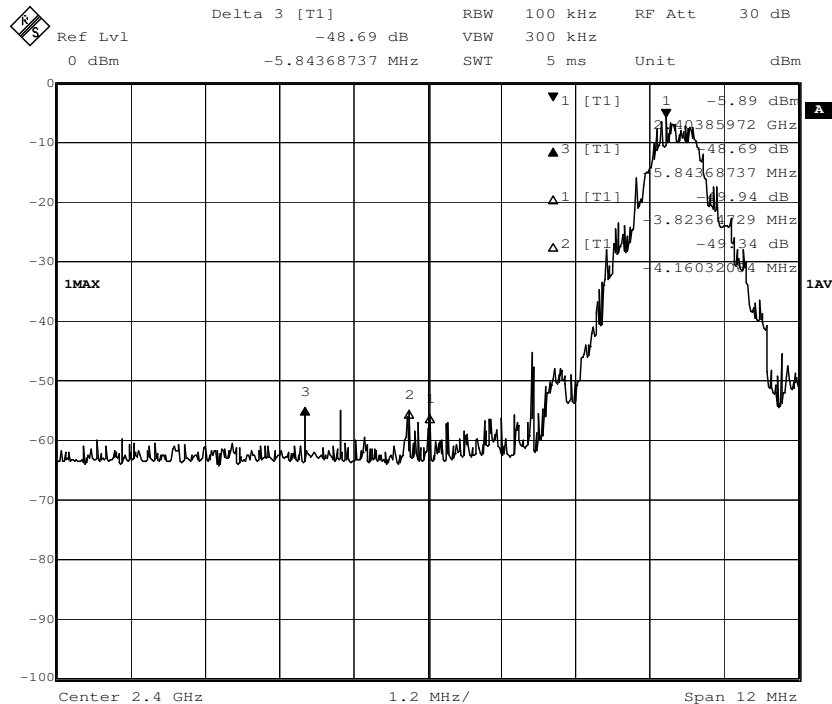
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Detector mode: Average



For 2400MHz bandedge checked with 2404MHz frequency operated, the delta shown at the plots are 43.31dB for peak detector mode and 49.91dB for Average detector mode.

With the peak value 93.58dBuV/m and average value at 92.46dBuV/m presented at the report for the fundamental, the spurious emission level at 2400MHz were 50.57dBuV/m for peak and 42.55dBuV/m for average.



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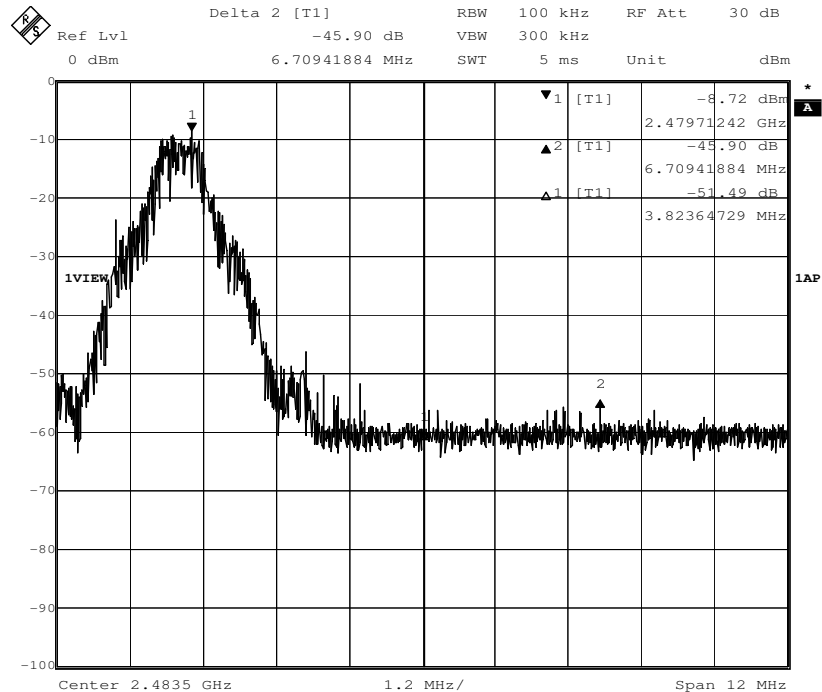
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Highest Band Edge 2483.5MHz

Detector mode:Peak





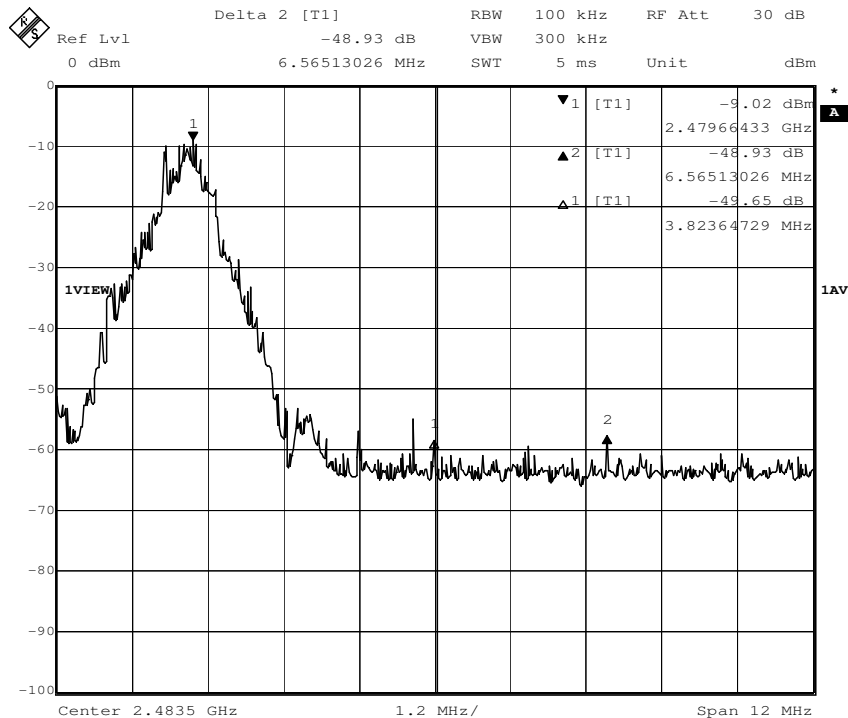
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Detector mode:Average



For 2483.5MHz bandedge checked with 2480MHz frequency operated,the delta shown at the plots are 45.90dB for peak detector mode and 48.93dB for Average detector mode.

With the peak value 91.72dBuV/m and average value at 90.94dBuV/m presented at the report for the fundamental, the spurious emission level at 2483.5MHz were 45.82dBuV/m for peak and 42.01dBuV/m for average.

The test result for the Emissions radiated outside of the specified frequency bands , please refer to the section 6.2.1 of this report.

The results: The unit does meet the FCC requirements.