FCC/IC Test Report

FOR:

Model Name: Xenon 1902
Bluetooth Area-Imaging Scanner

FCC ID: HD5-CS19A
IC ID: 1693B-CS19A

47 CFR Part 15.247 for FHSS Systems

IC RSS-210 Issue 7

TEST REPORT #: EMC_HONEY_032_10001_SC_FCC15.247
DATE: 2010-5-20

Bluetooth Qualification Test Facility (BQTF)

FCC listed
A2LA Accredited

IC recognized # 3462B

***CETECOM* Inc.**
411 Dixon Landing Road ◆ Milpitas, CA 95035 ◆ U.S.A.
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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686
Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and Industry Canada Standards RSS 210 Issue 7.

Company	Description	Model #
Honeywell International Inc.	Bluetooth Area-Imaging Scanner	Xenon 1902

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2010-05-20	Compliance	Marc Douat (Test Lab Manager)	

Responsible for the Report:

Date	Section	Name	Signature
2010-05-20	Compliance	Sajay Jose (EMC Engineer)	

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Heiko Strehlow
Responsible Project Leader:	Sajay Jose

2.2 Identification of the Client

Applicant's Name:	Honeywell International Inc. Honeywell Scanning and Mobility
Street Address:	9680 Old Bailes Road
City/Zip Code	Fort Mill, SC 29707
Country	USA
Contact Person:	Michael Robinson
Phone No.	+1 315 554 6387
e-mail:	michael.robinson3@honeywell.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as above.
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Description:	Xenon 1902 Wireless Area-Imaging Scanner
Model No:	Xenon 1902
Product Type:	Bluetooth Area-Imaging Scanner
FCC-ID:	HD5-CS19A
IC-ID:	1693B-CS19A
Frequency:	2.4 GHz- 2.4835 GHz
Type(s) of Modulation:	GFSK, л/4 DQPSK, 8DPSK (EDR Supported)
Antenna Type:	Taiyo Yuden Chip antenna; 0dBi gain.
Operating Voltage (DC):	3.5V (Low)/4.0V (Nominal)/4.5V (High)
Temperature Range °C:	0 (Low)/25 (Nominal)/50 (High)

3.2 Identification of the Equipment Under Test (EUT)

EUT #	Device	Serial Number	Sample	Cetecom ID
1	1902	10084A0426	Radiated	C005508
2	1902	10084A030D	Conducted	C005506
3	1902	BJ000004AAA10	Radiated	C005521

3.3 Identification of Accessory equipment

AE #	Type	Model	Manufacturer	Cetecom ID
1	AC Adapter	3A-052WP05	ENG	C005509
2	Communication Cable	CCB-020-300-C00	Honeywell	C005512
3	Laptop for serial port termination	Inspiron 6800	DELL	-
4	Dummy Battery	NA	Honeywell	C005515

4 Subject Of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS-210 Issue 7.

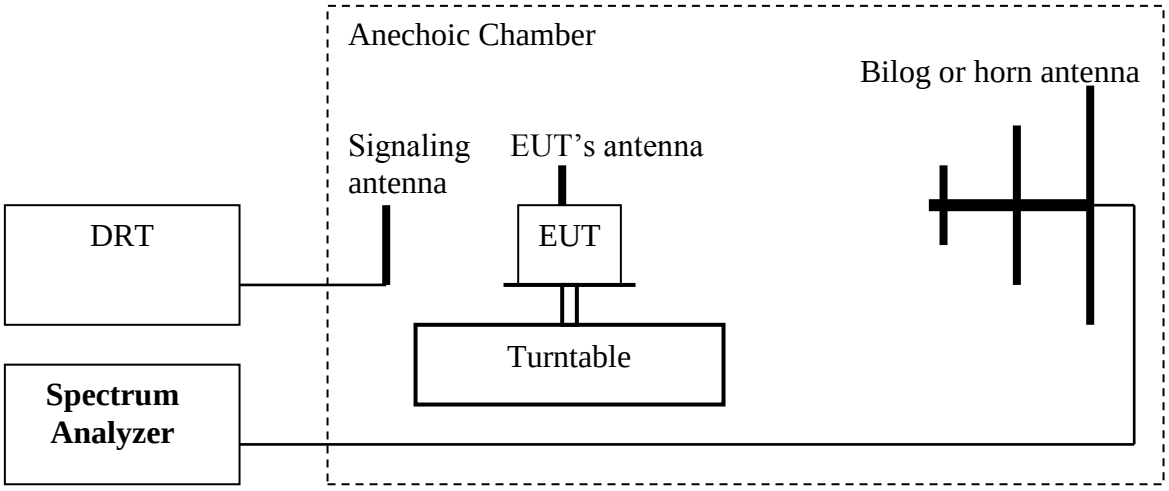
This test report is to support a request for new equipment authorization under the FCC ID **HD5-CS19A** and IC ID **1693B-CS19A.**
All testing was performed on the product referred to in Section 3 as EUT. This test report contains full radiated and conducted testing results as per FCC15.247.

During the testing process the EUT was tested on a single channel using PRBS payload using DH5, 2DH5 or 3DH5 packets, all data in this report shows the worst case between horizontal and vertical polarization measurements.

5 Measurements

5.1 Radiated Measurement Procedure

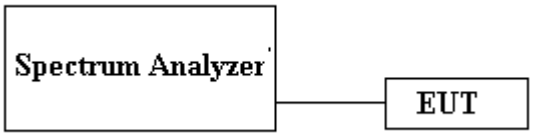
Ref: TIA-603C 2004 -2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
2. Adjust the settings of the Digital RadioCommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360°. Record the peak level in dBm (**LVL**).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS)**. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
   ERP (dBm) = **LVL** (dBm) + **LOSS** (dB)
8. Determine the EIRP using the following equation:
   EIRP (dBm) = **ERP** (dBm) + 2.14 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channels.

Spectrum analyzer settings: RBW=VBW=3MHz

5.2 Conducted Measurement Procedure



1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the Digital RadioCommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Measurements are to be performed with the EUT set to the low, middle and high channels.

5.3 Maximum Peak Output Power

5.3.1 Limits:

§15.247 (b)(1)
RSS 210- A8.4(2)
Nominal Peak Output Power < 30 dBm (1W)

5.3.2 Test Conditions:

Tnom: 25°C; Vnom: 4.0 V
Antenna Gain: 0 dBi

5.3.3 Test Result:

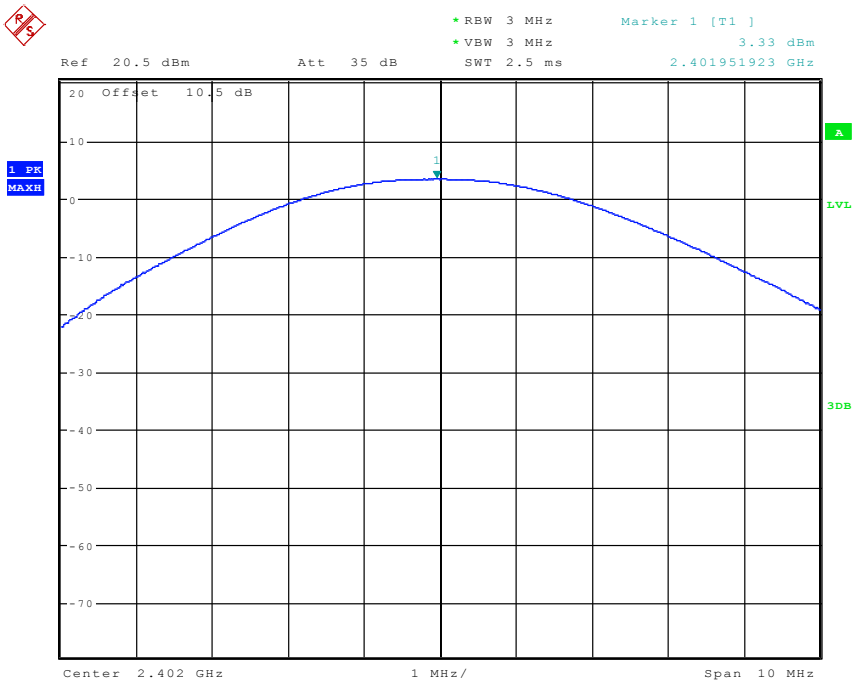
Max Peak Output Power- Conducted (dBm)			
Modulation	**Frequency (MHz)**		
	2402	**2441**	**2480**
GFSK	3.33	2.73	1.99
π/4 DQPSK	3.03	2.15	1.12
8-DPSK	3.24	2.34	1.33
Measurement Uncertainty: ±0.5dB			

Max Peak Output Power- Radiated (dBm)			
Modulation	**Frequency (MHz)**		
	2402	**2441**	**2480**
GFSK	3.33	2.73	1.99
π/4 DQPSK	3.03	2.15	1.12
8-DPSK	3.24	2.34	1.33
Measurement Uncertainty: ±3dB			

Note: Radiated EIRP is calculated as
Conducted Measurement + Antenna Gain

5.3.4 Test Data/plots:

Conducted Peak Power GFSK 2402 MHz



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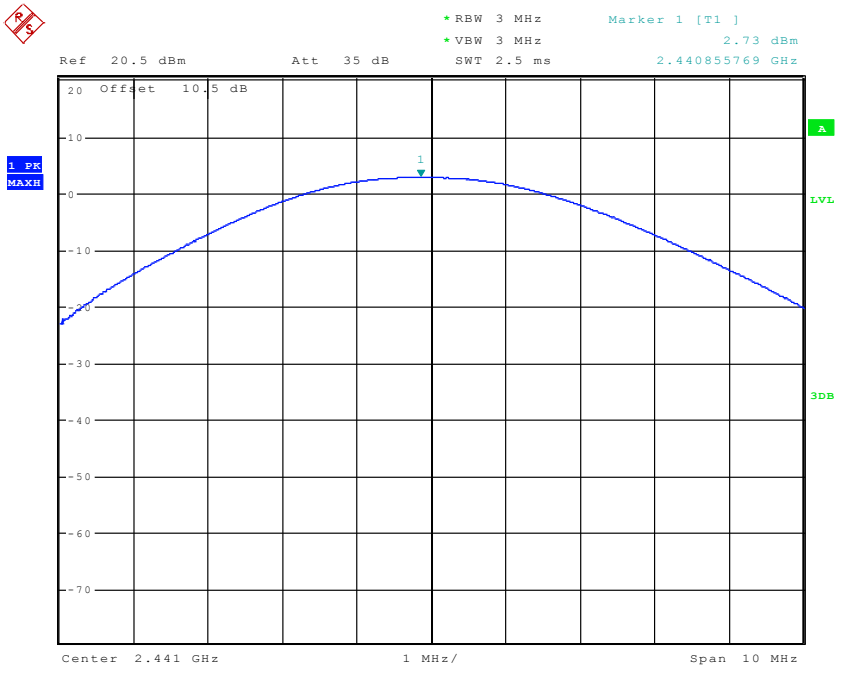
Conducted Peak Power GFSK 2441 MHz



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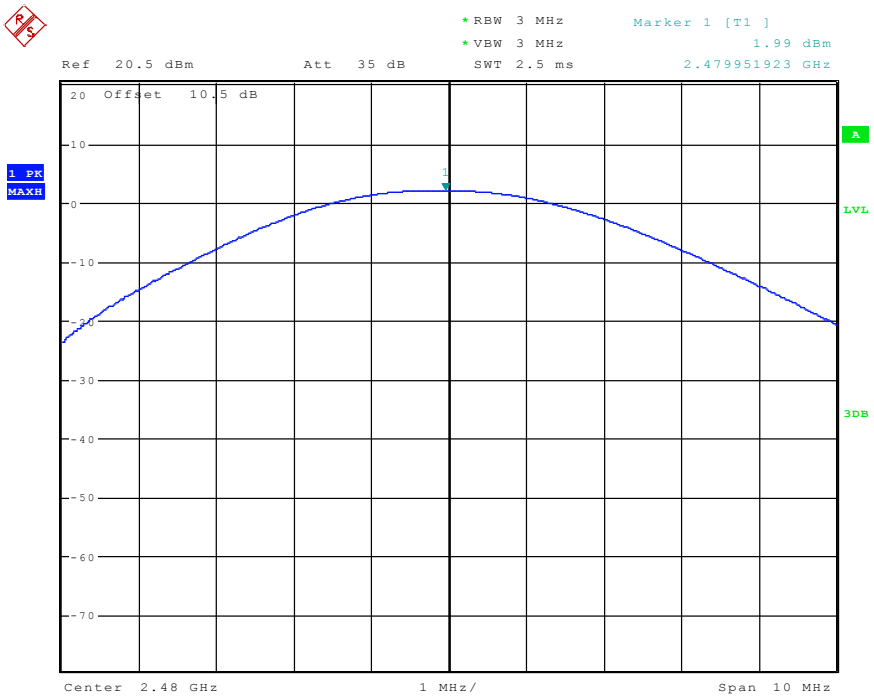
Conducted Peak Power GFSK 2480 MHz



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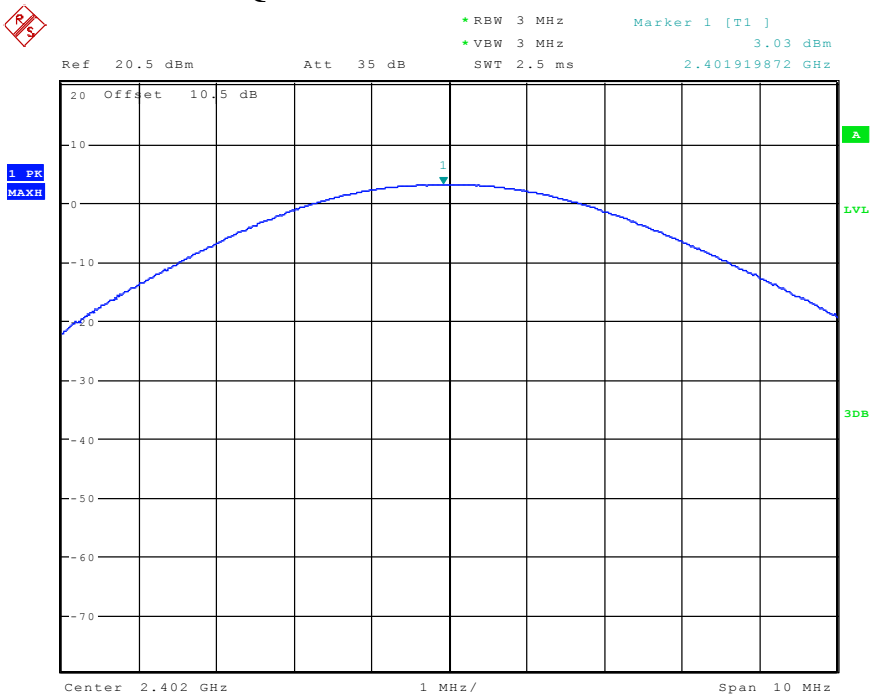
Conducted Peak Power π / 4 DQPSK 2402 MHz



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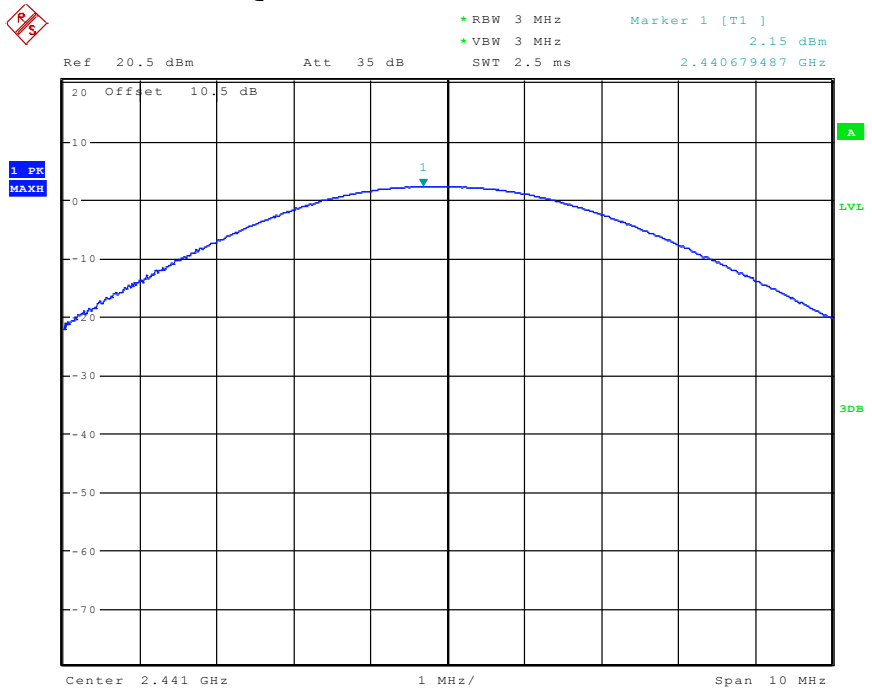
Conducted Peak Power π / 4 DQPSK 2441 MHz



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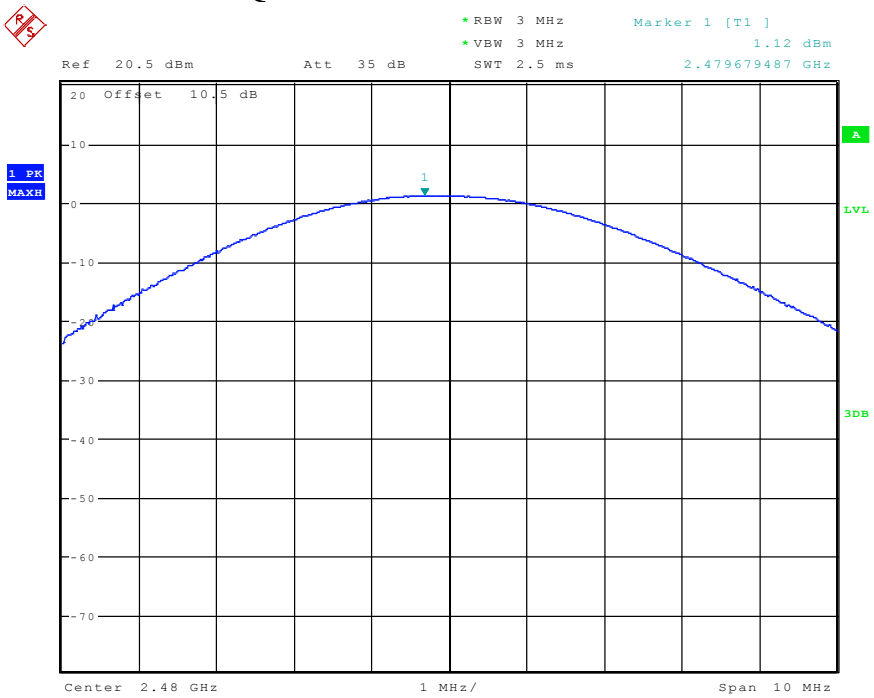
Conducted Peak Power π / 4 DQPSK 2480 MHz



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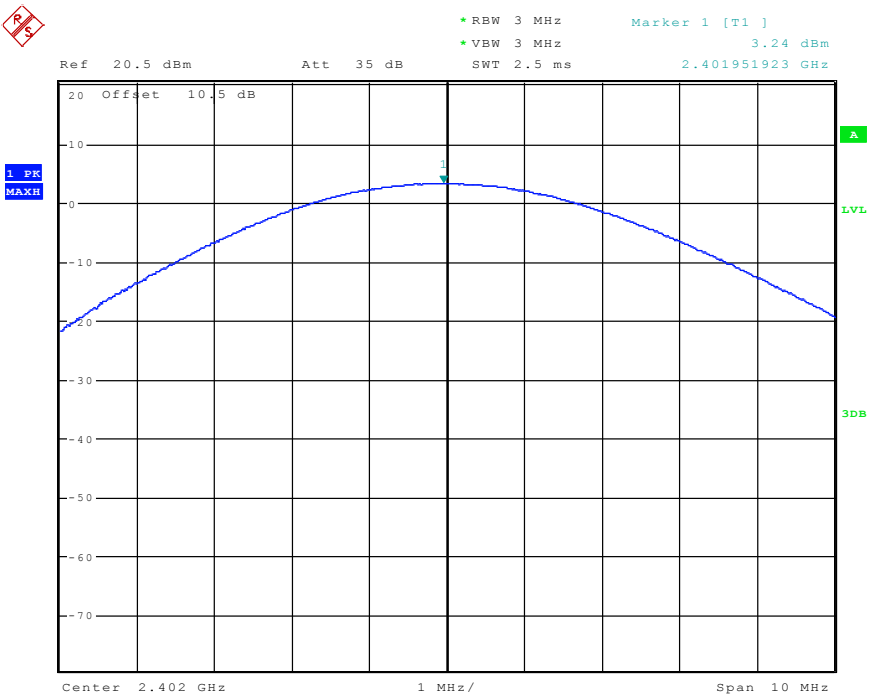
Conducted Peak Power 8DPSK 2402 MHz



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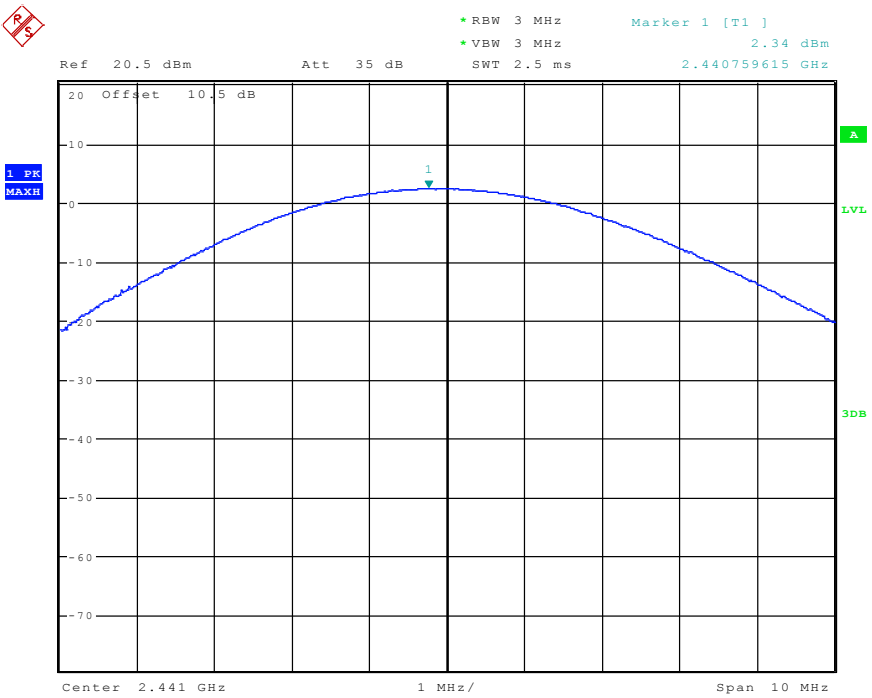
Conducted Peak Power 8DPSK 2441 MHz



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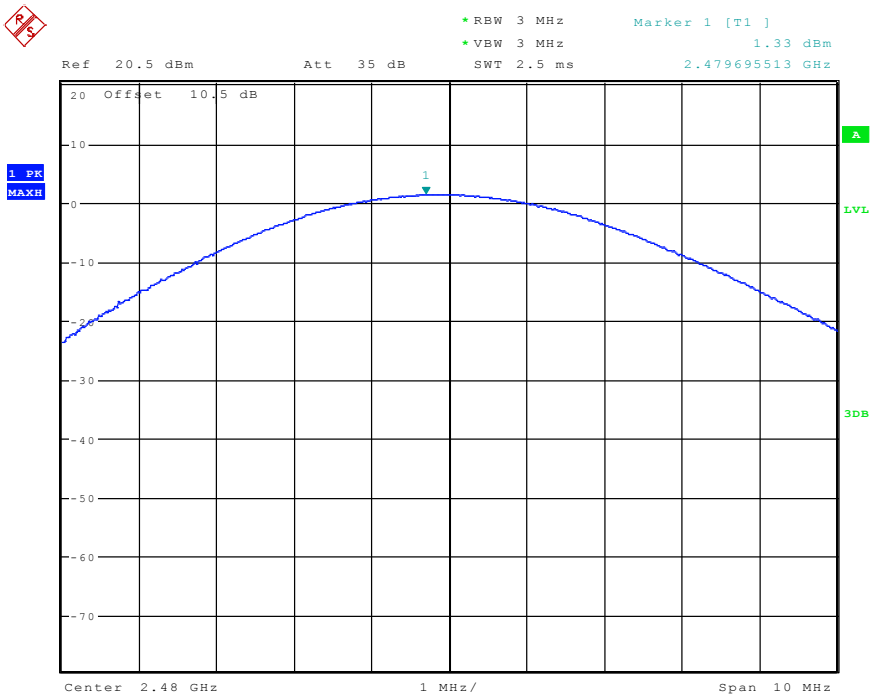
Conducted Peak Power 8DPSK 2480 MHz



5.4 Restricted Band Edge Compliance

5.4.1 Limits: §15.247/15.205

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

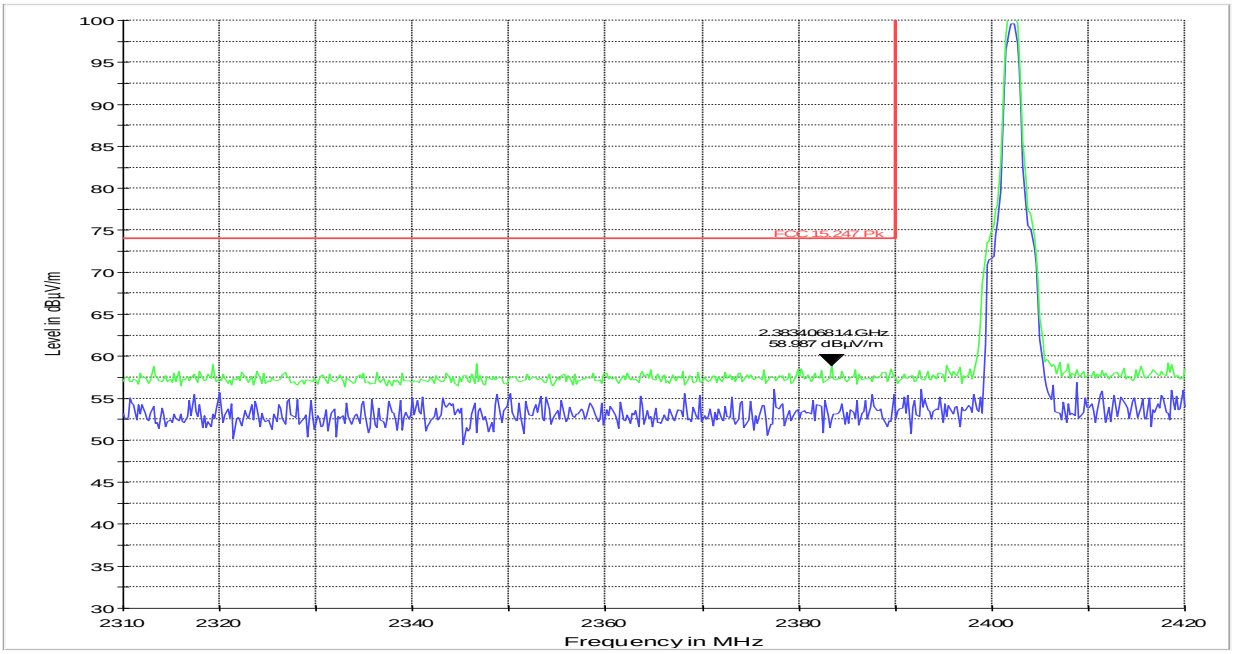
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

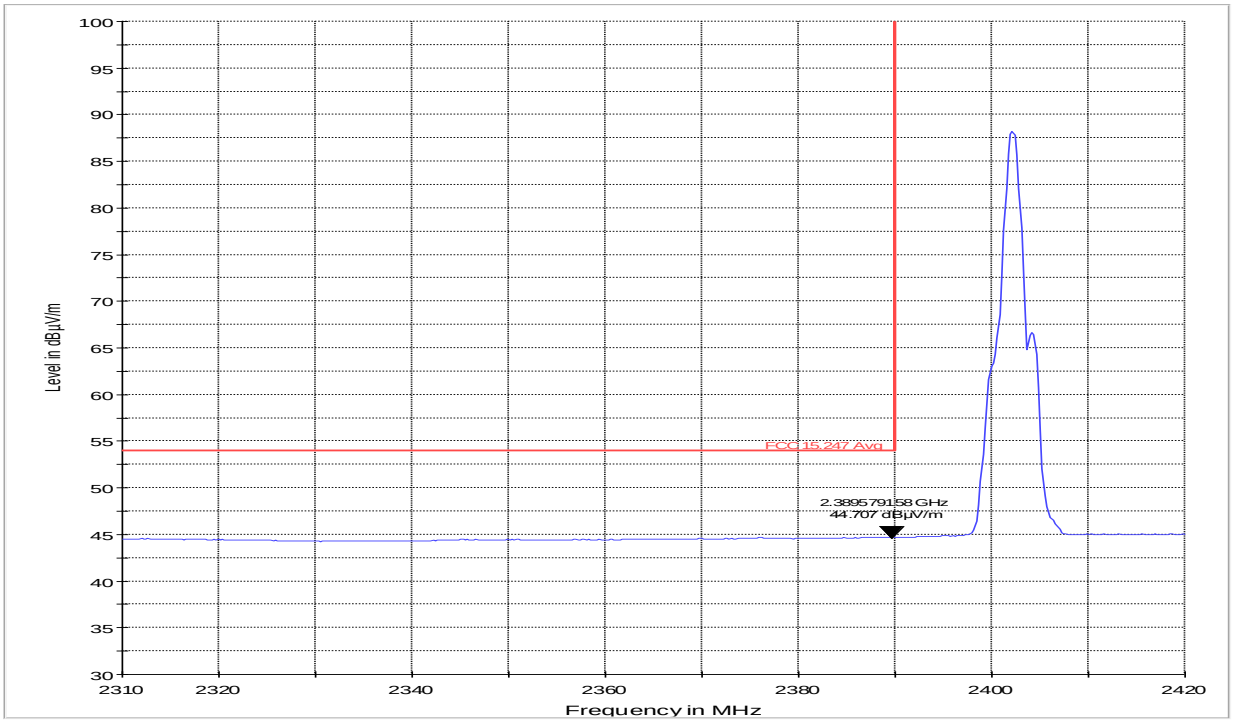
*PEAK LIMIT= 74dBµV/m
*AVG. LIMIT= 54dBµV/m

5.4.2 Test Data/plots:

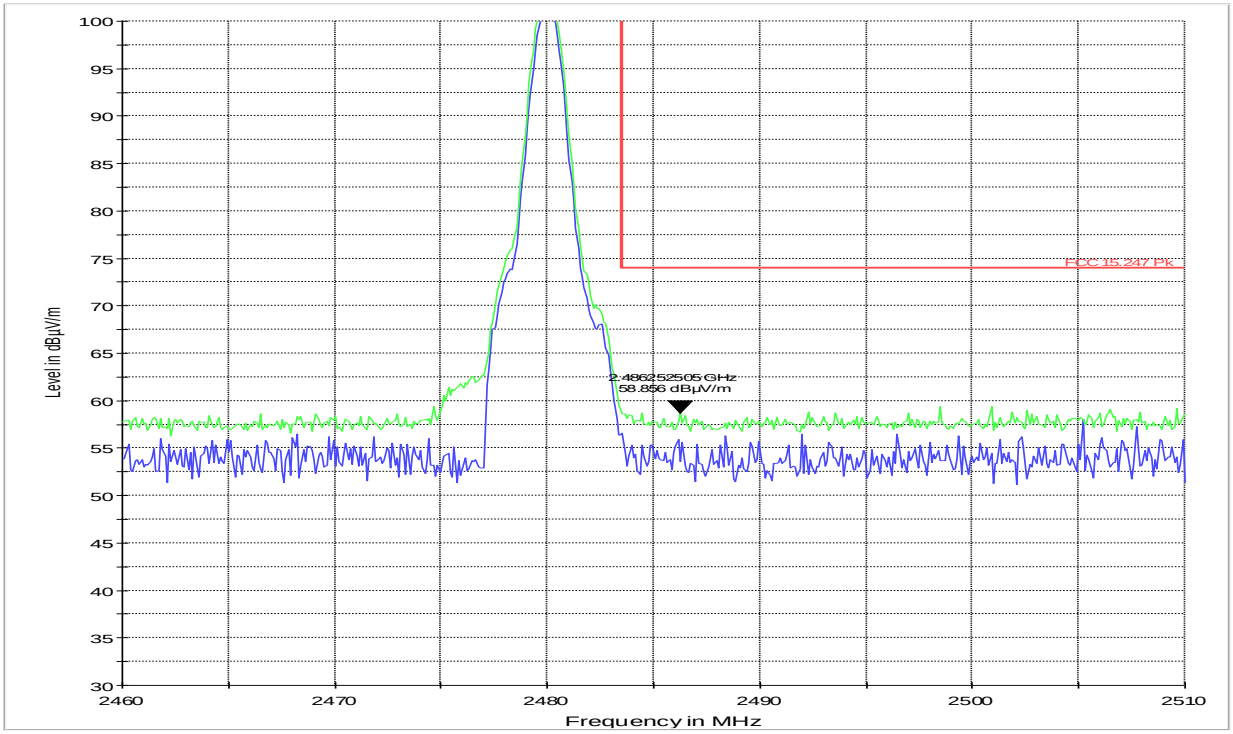
Lower band edge peak -GFSK modulation



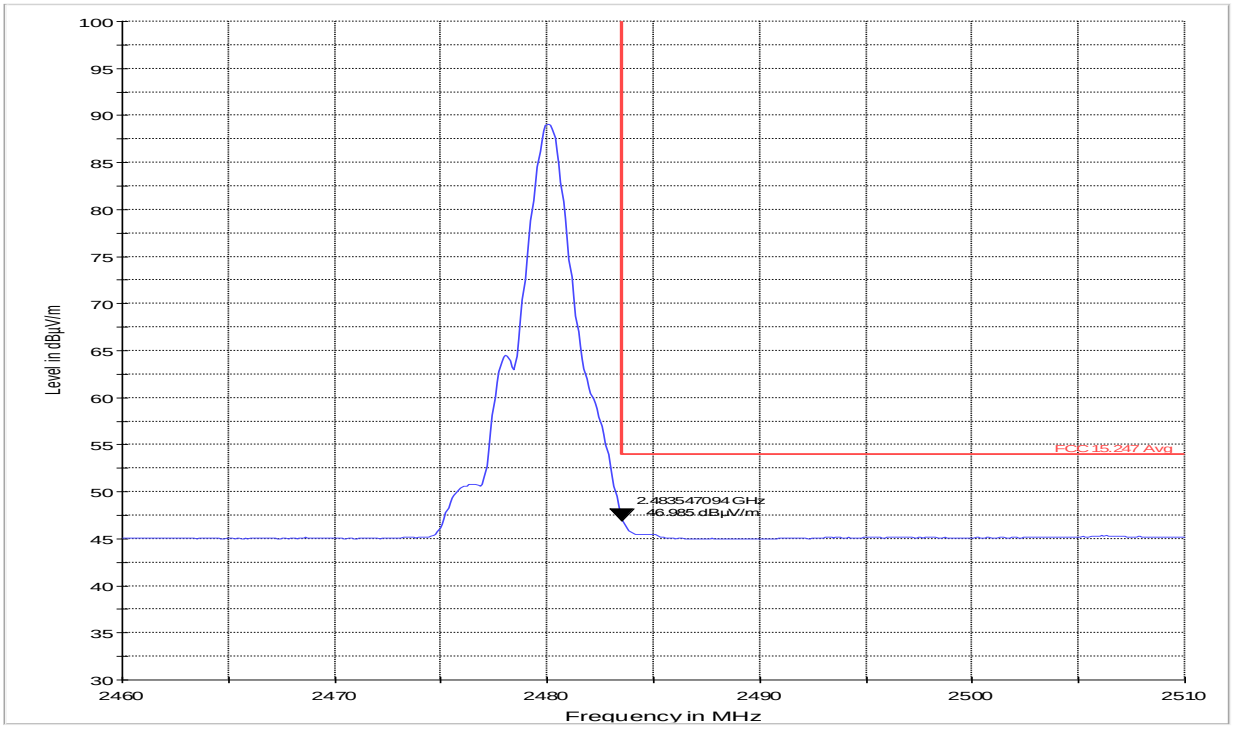
Lower band edge average -GFSK modulation



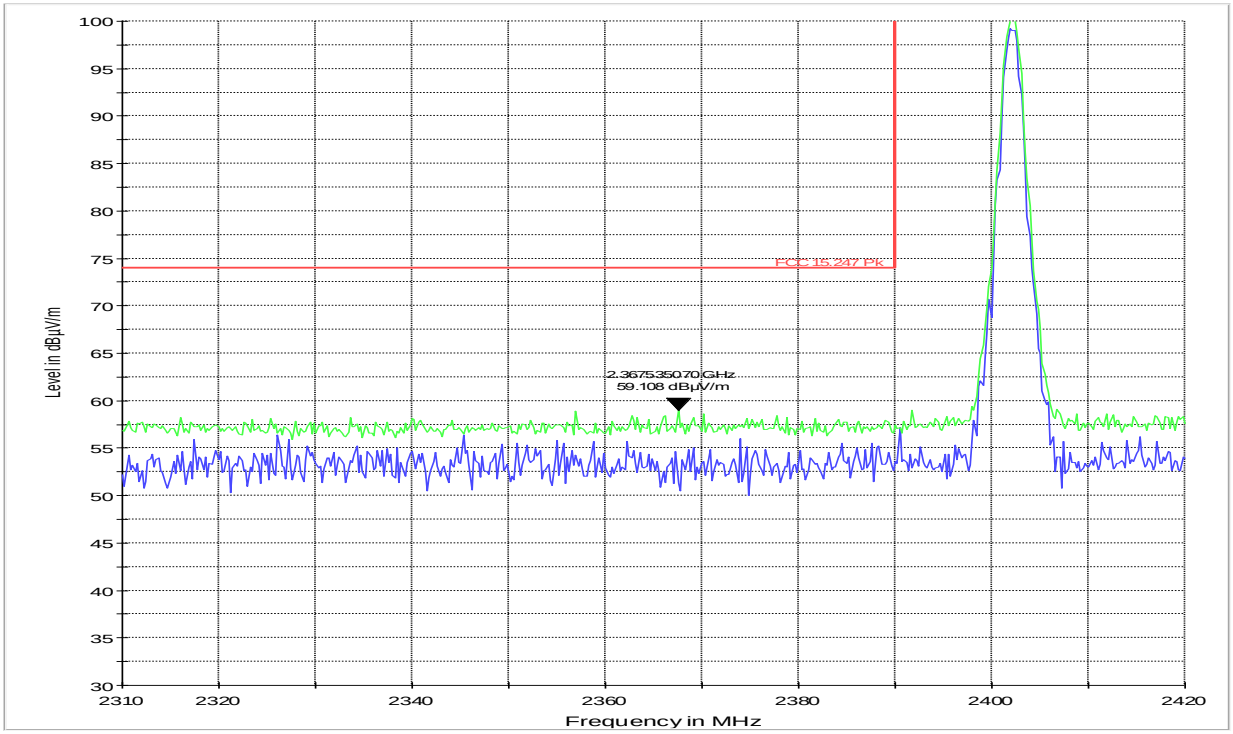
Higher band edge peak -GFSK modulation



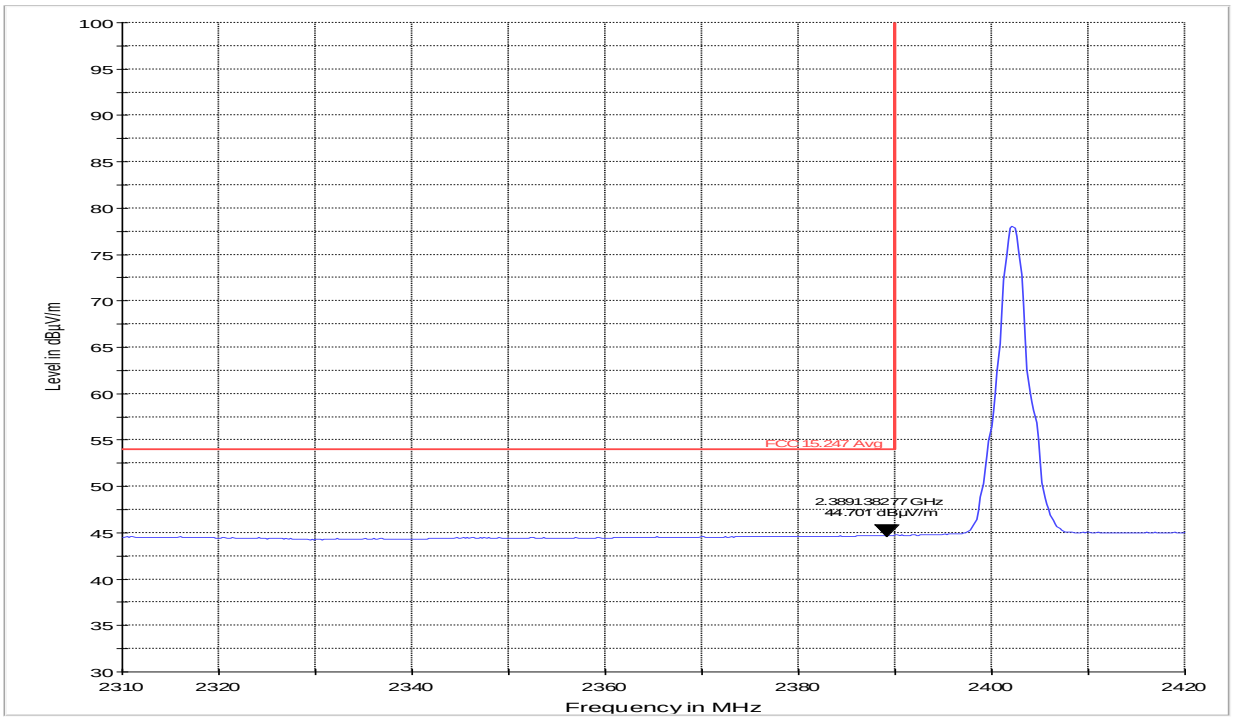
Higher band edge average-GFSK modulation



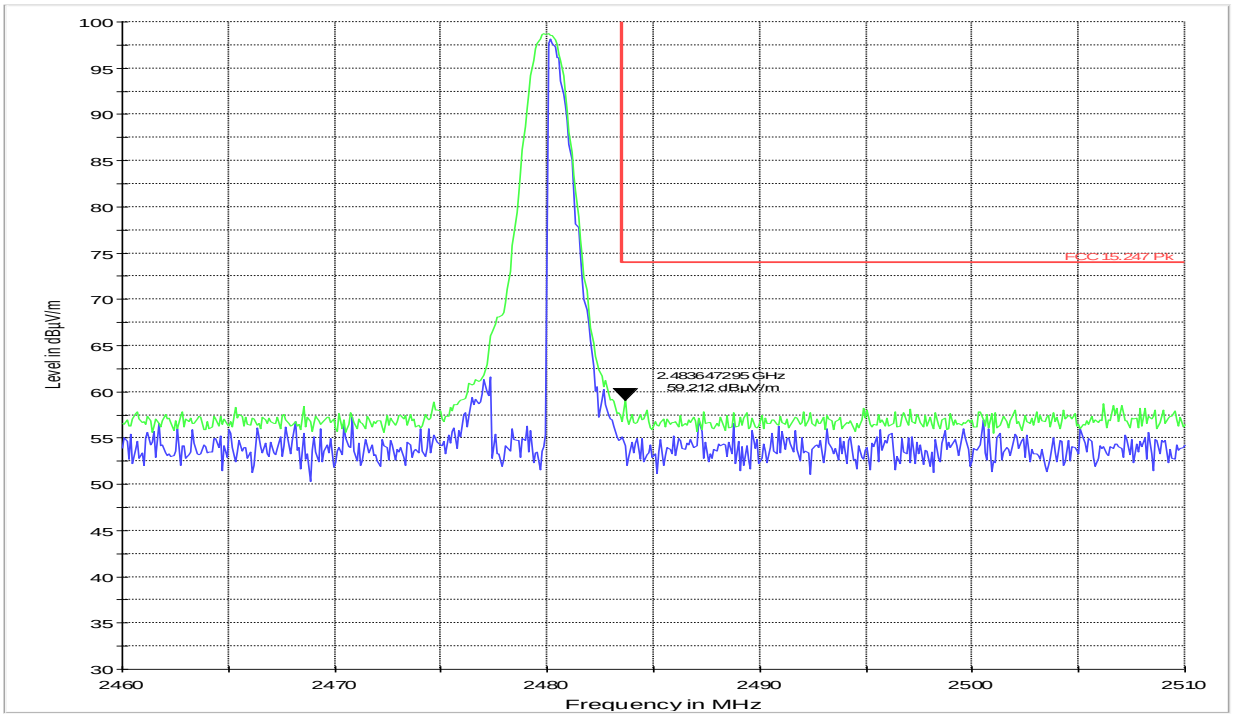
Lower band edge peak - π/4 DQPSK modulation



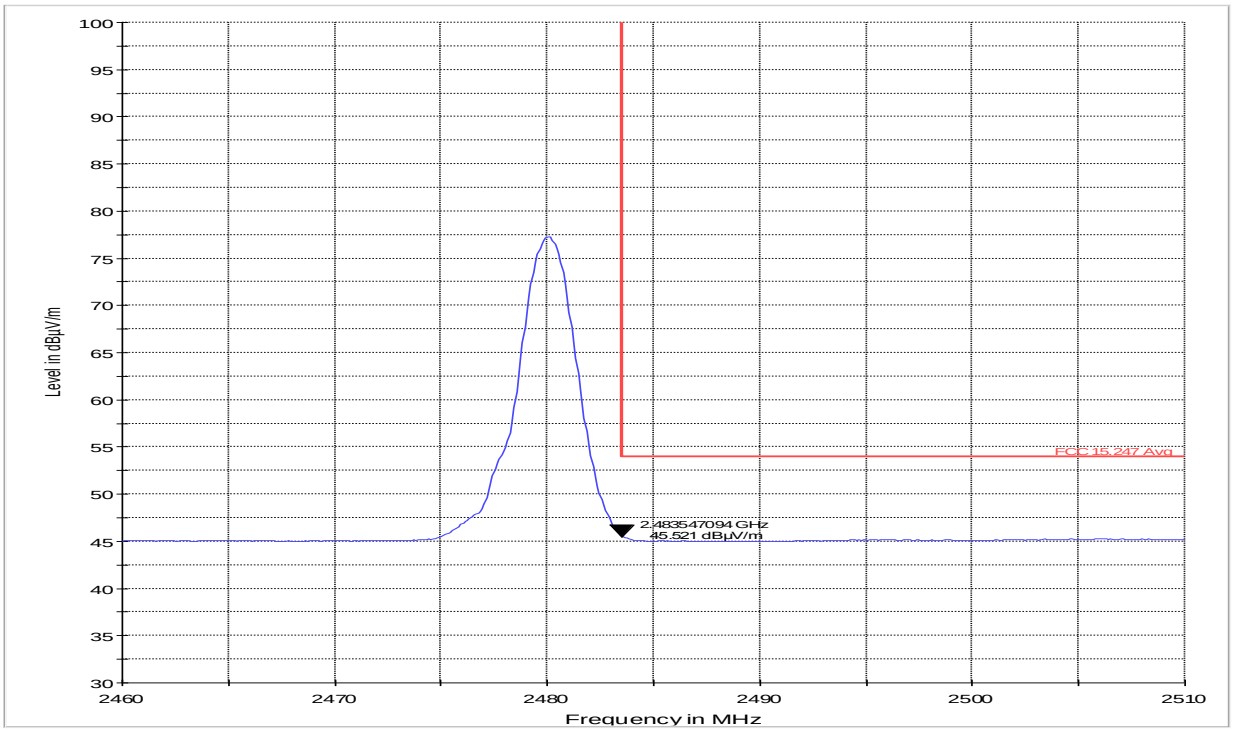
Lower band edge average -π/4 DQPSK modulation



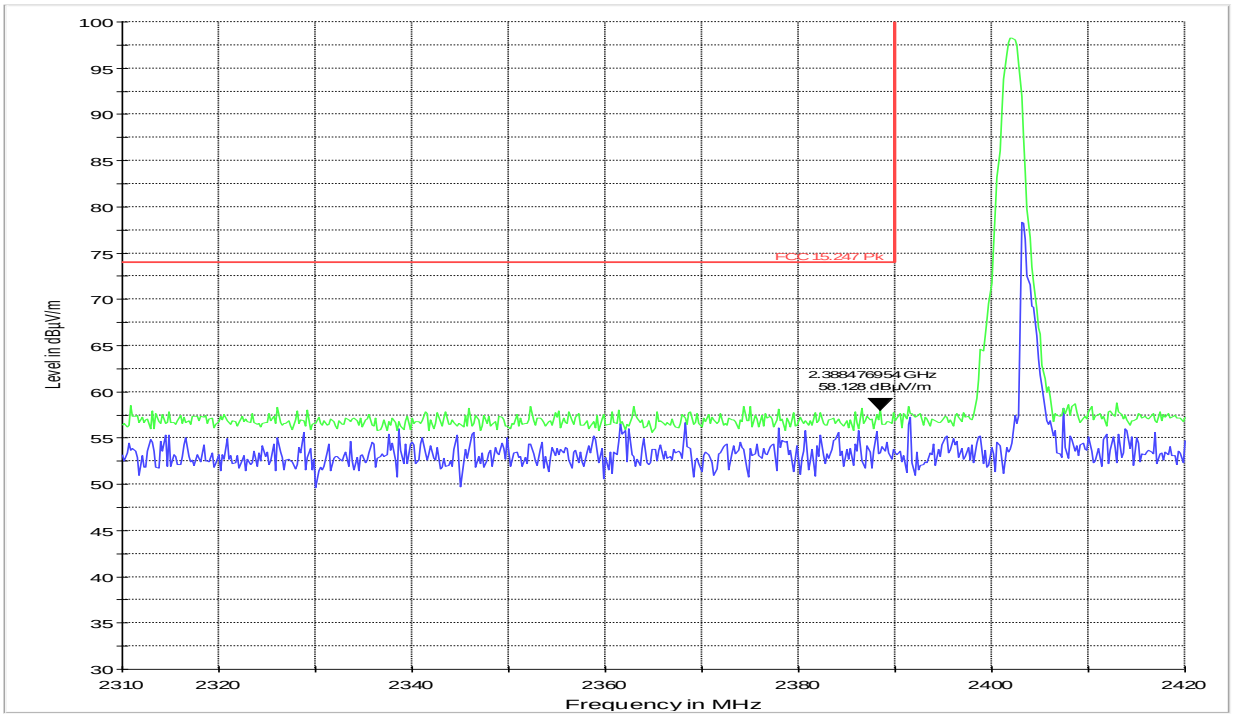
Higher band edge peak -π/4 DQPSK modulation



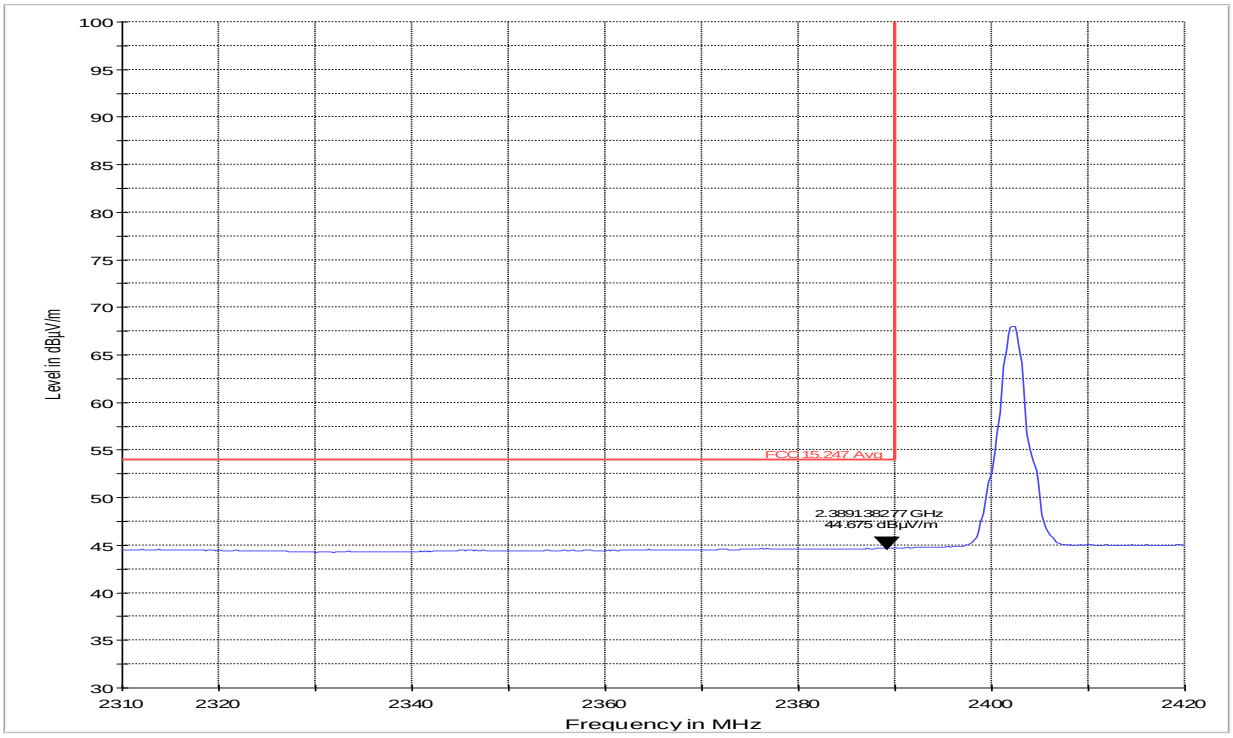
Higher band edge average- π/4 DQPSK modulation



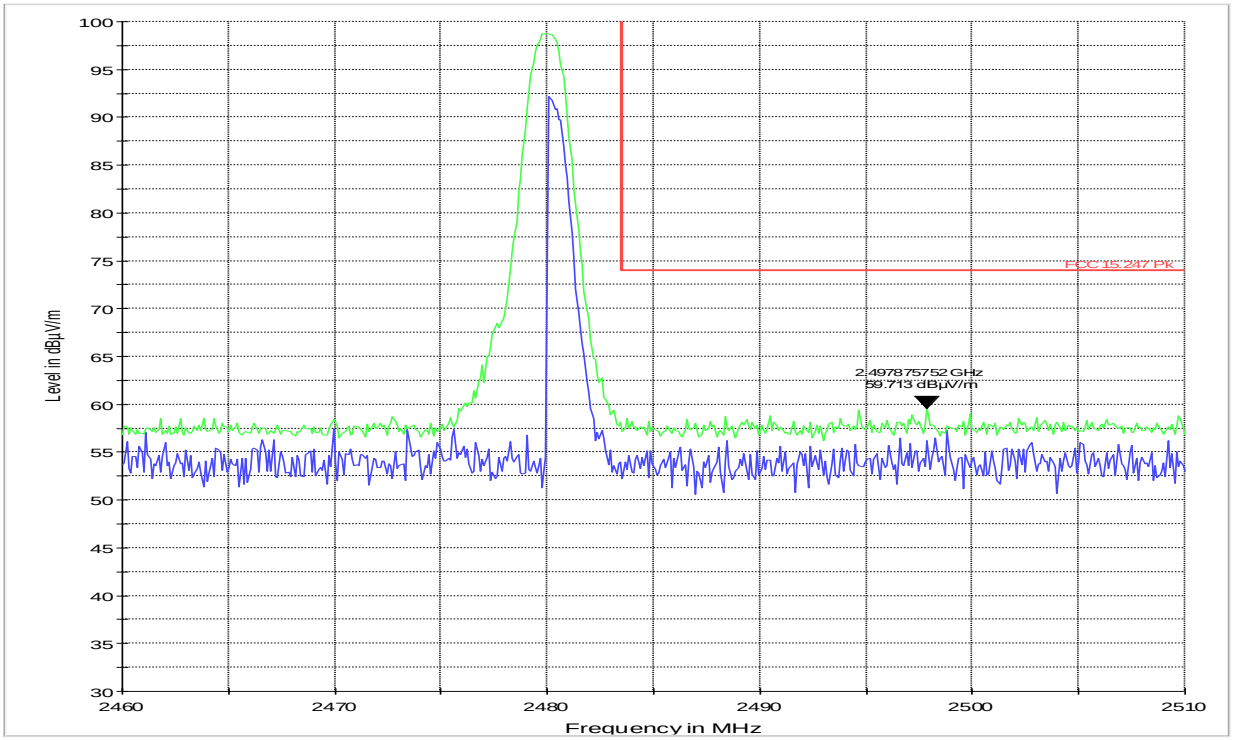
Lower band edge peak - 8DPSK modulation



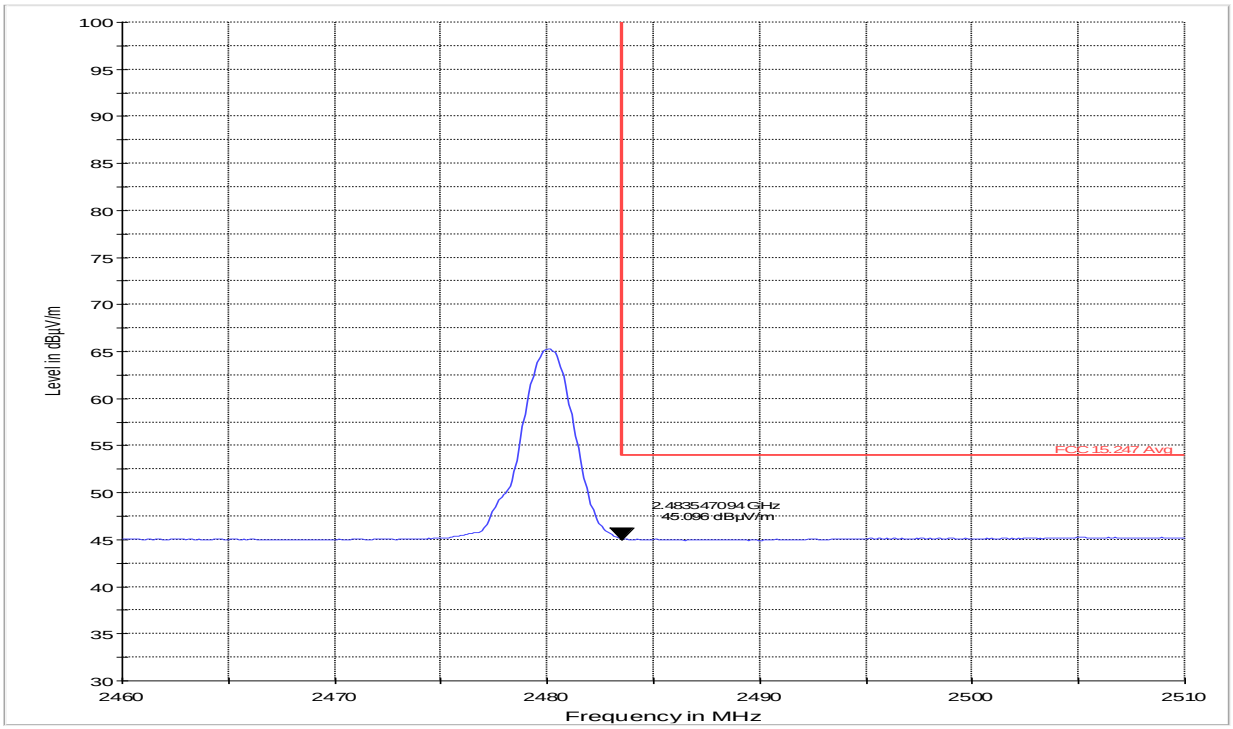
Lower band edge average -8DPSK modulation



Higher band edge peak - 8DPSK modulation



Higher band edge average-8DPSK modulation



5.5 Spectrum Bandwidth/ 20dB Bandwidth

5.5.1 Limits:

§ 15.247 (a)(1)
RSS 210- A8.1(b)
Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

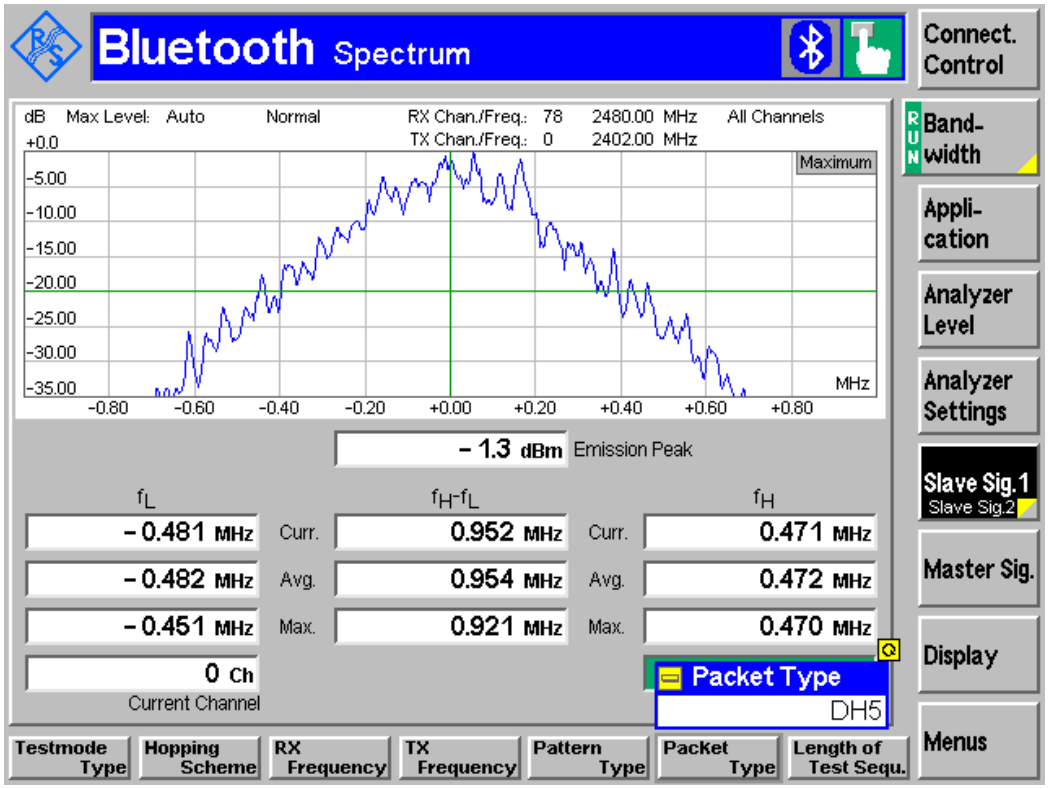
GFSK < 1000 kHz
π / 4 DQPSK < 1500 kHz
8 dPSK < 1500kHz

5.5.2 Test Result:

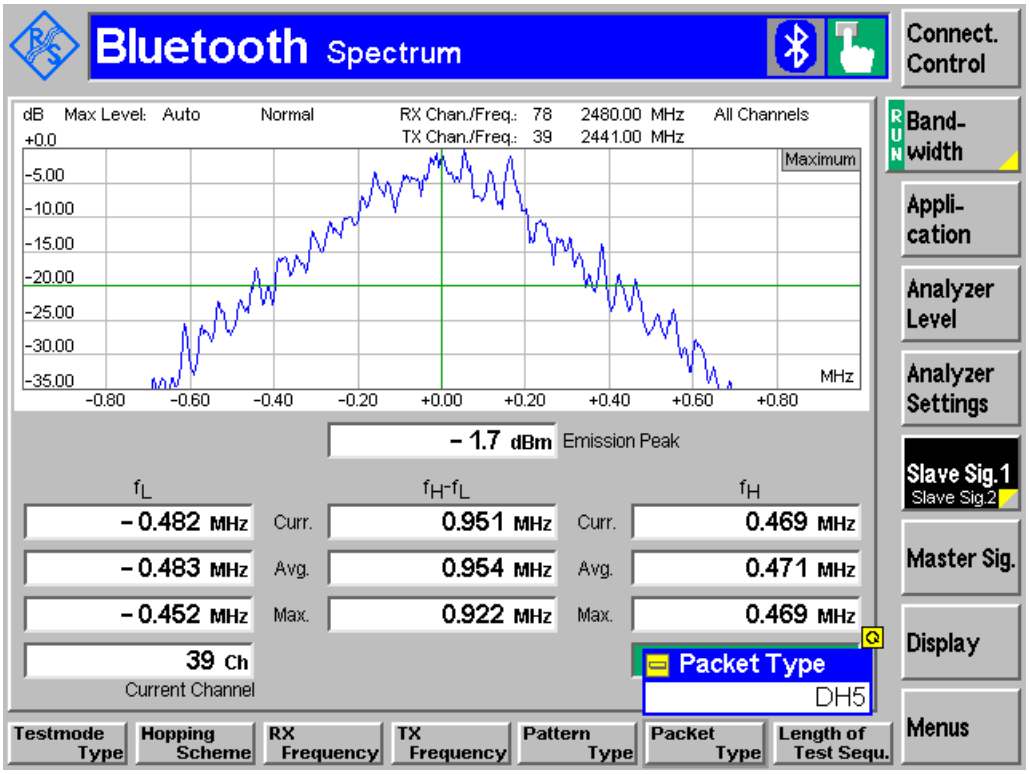
20dB Bandwidth (Hz)			
Modulation	**Frequency (MHz)**		
	2402	**2441**	**2480**
GFSK	921K	922K	921K
π/4 DQPSK	1.316M	1.318M	1.314M
8-DPSK	1.284M	1.289M	1.264M
Measurement Uncertainty: ±1 kHz			

5.5.3 Test Data/plots:

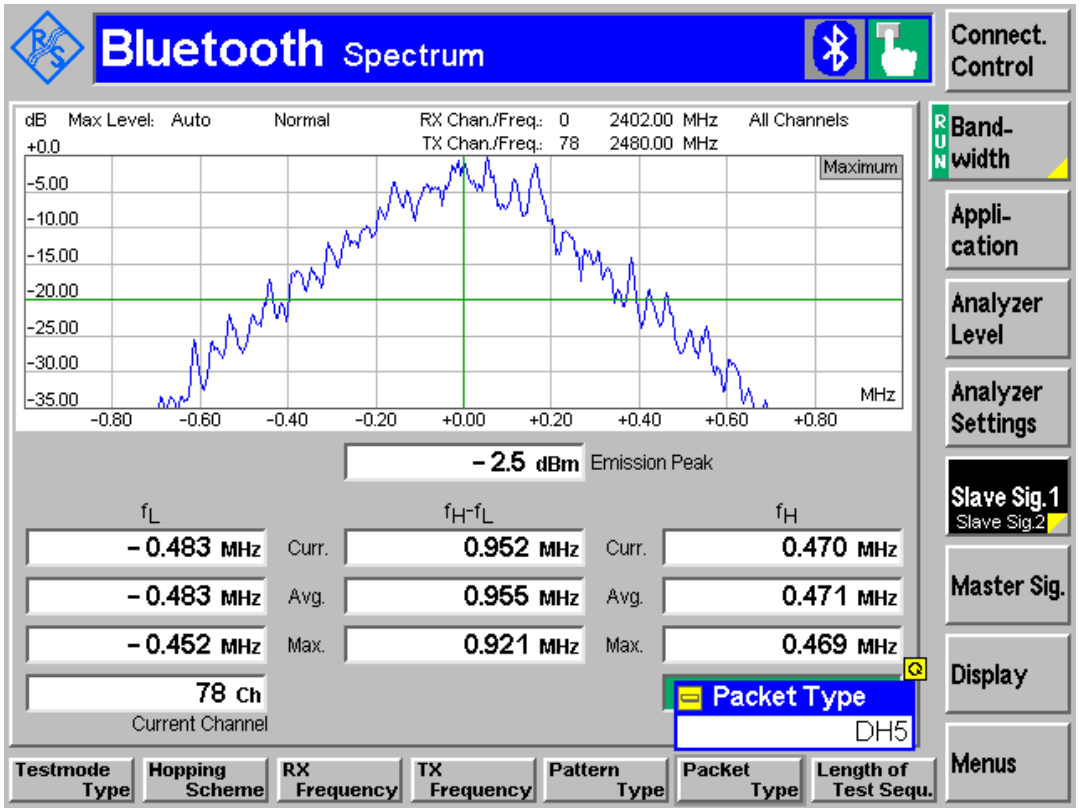
20dB Bandwidth GFSK 2402MHz



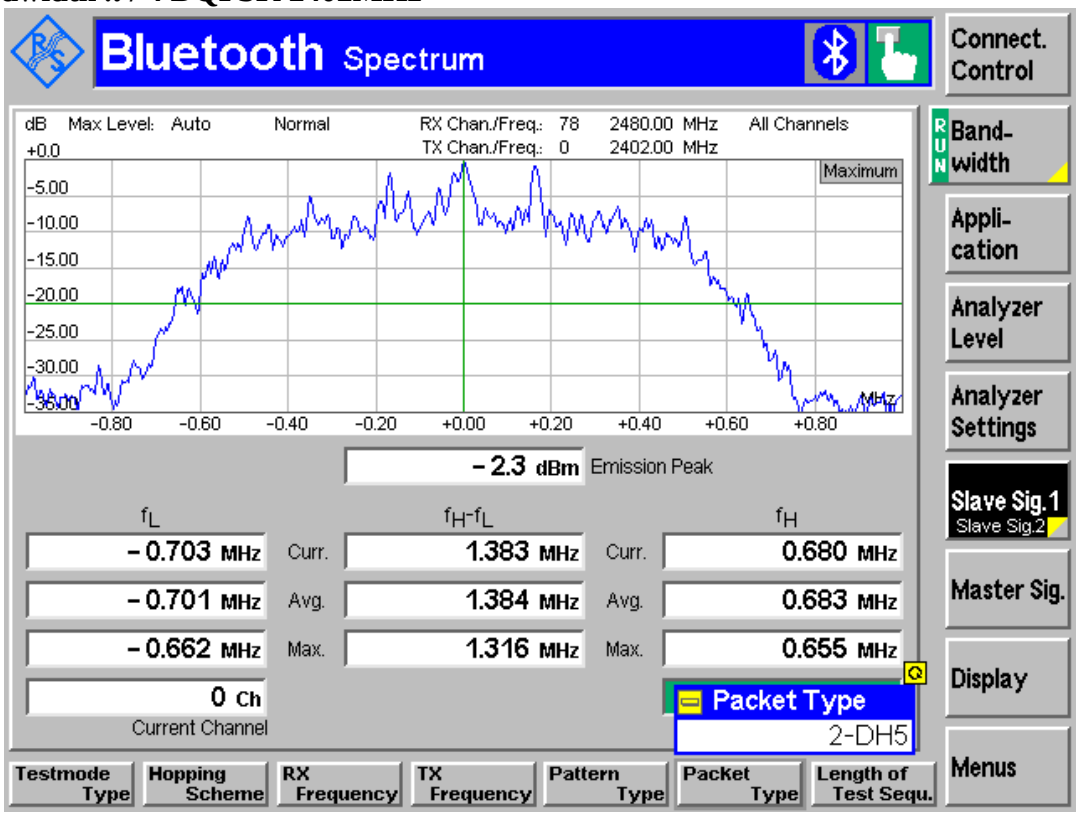
20dB Bandwidth GFSK 2441MHz



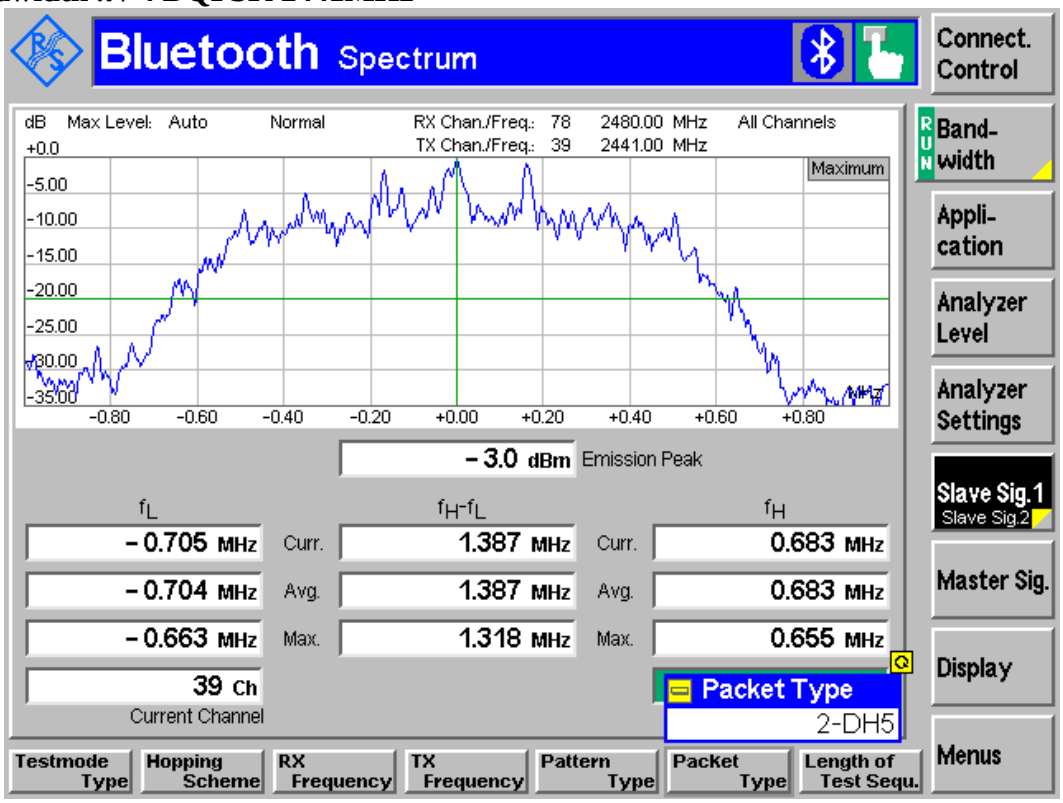
20dB Bandwidth GFSK 2480MHz



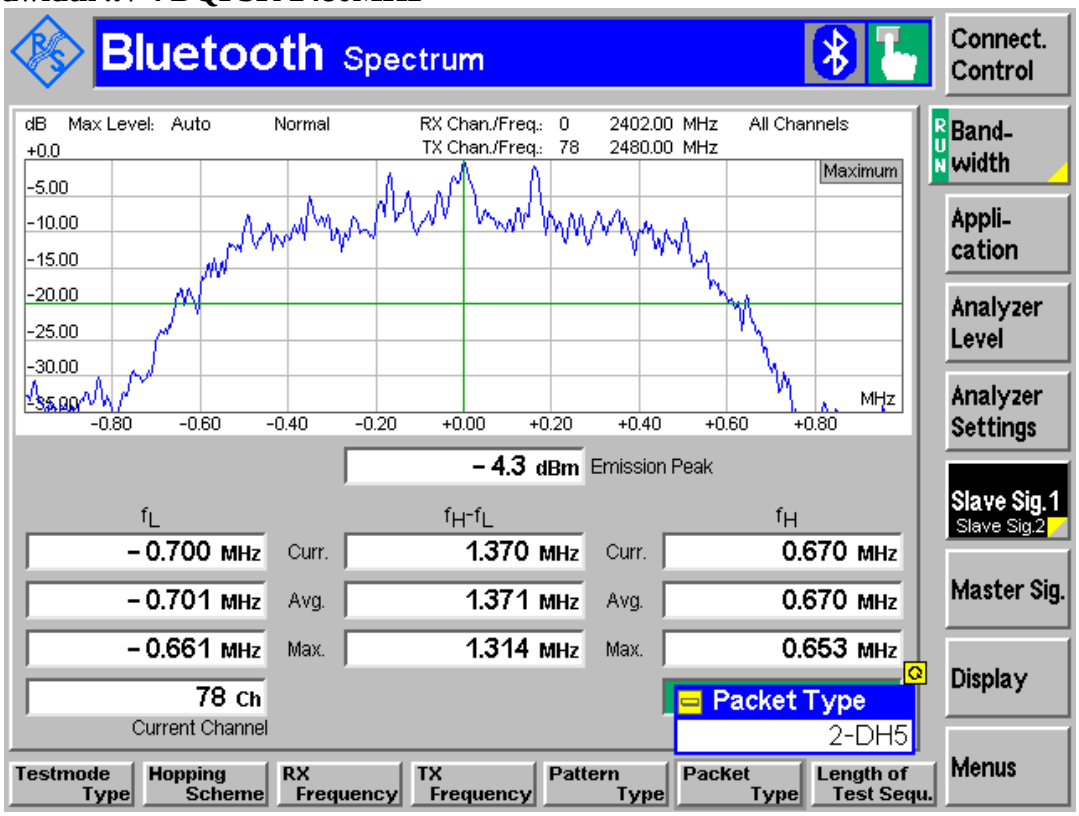
20dB Bandwidth π / 4 DQPSK 2402MHz



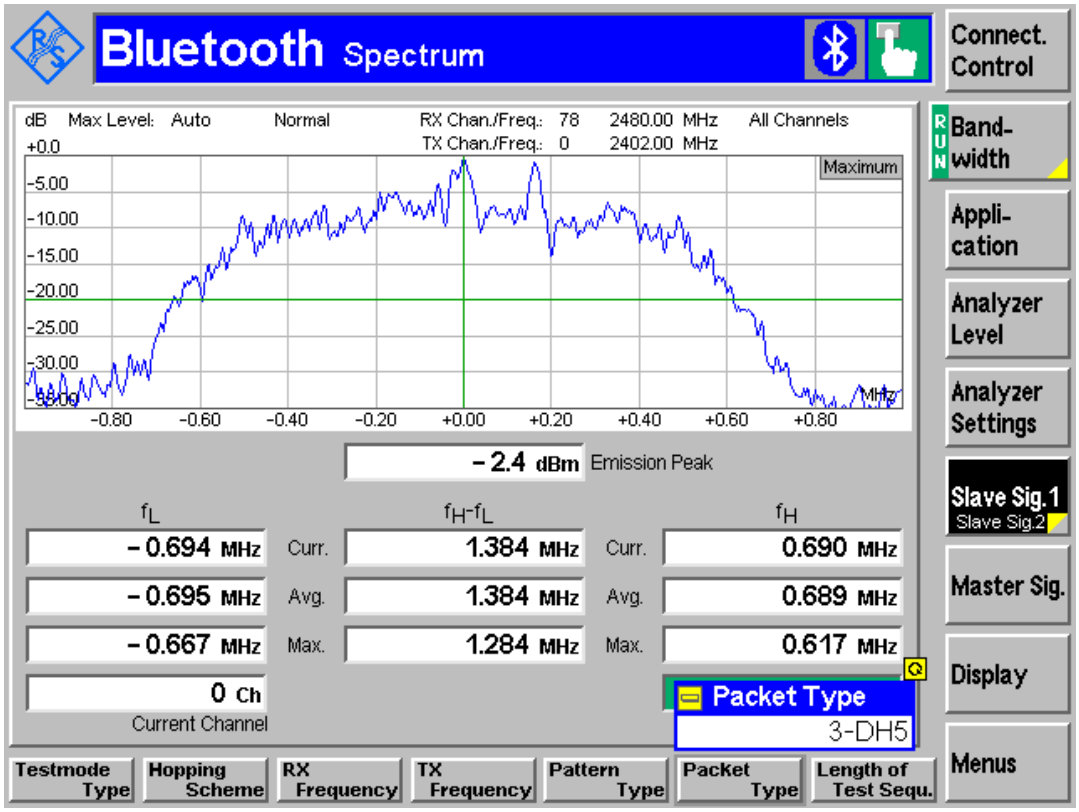
20dB Bandwidth π / 4 DQPSK 2441MHz



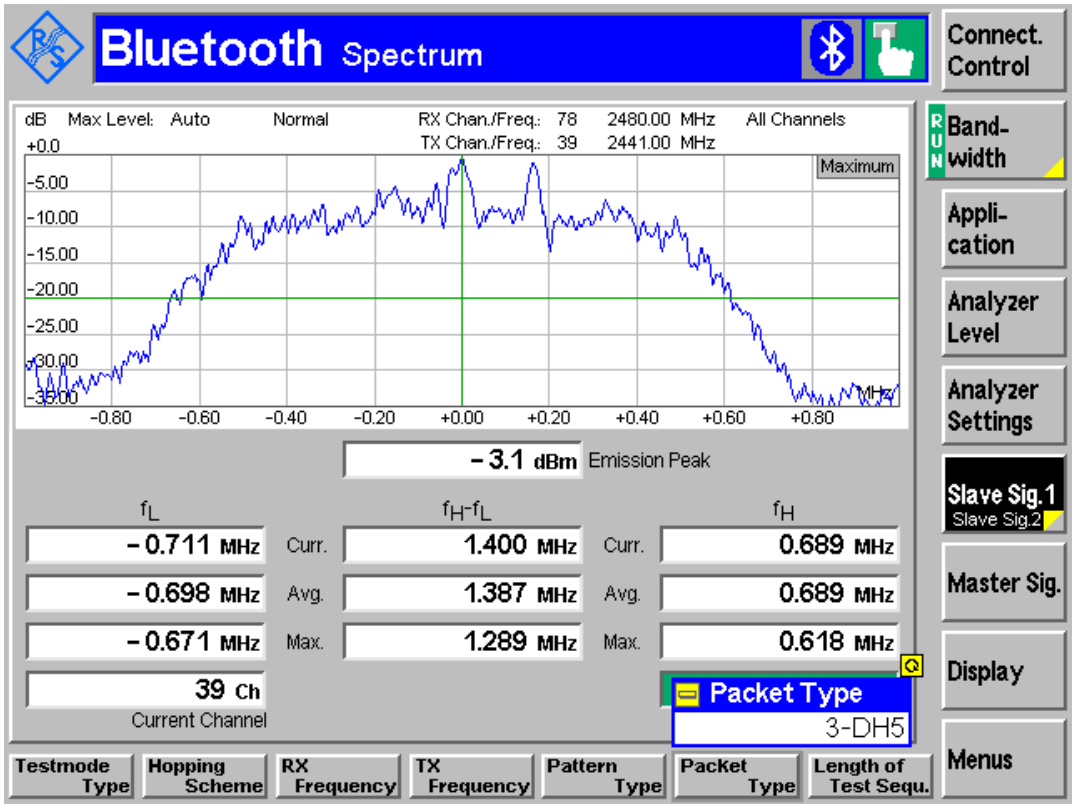
20dB Bandwidth π / 4 DQPSK 2480MHz



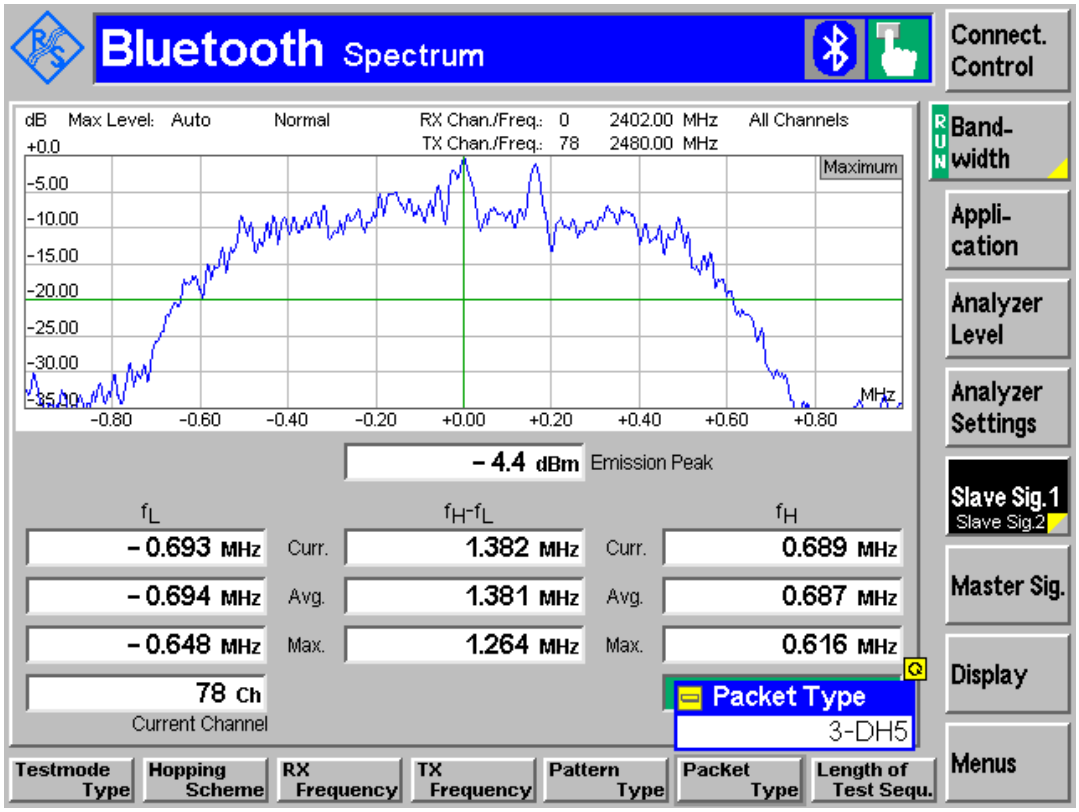
20dB Bandwidth 8PSK 2402MHz



20dB Bandwidth 8PSK 2441MHz



20dB Bandwidth 8PSK 2480MHz



5.6 Carrier Frequency Separation

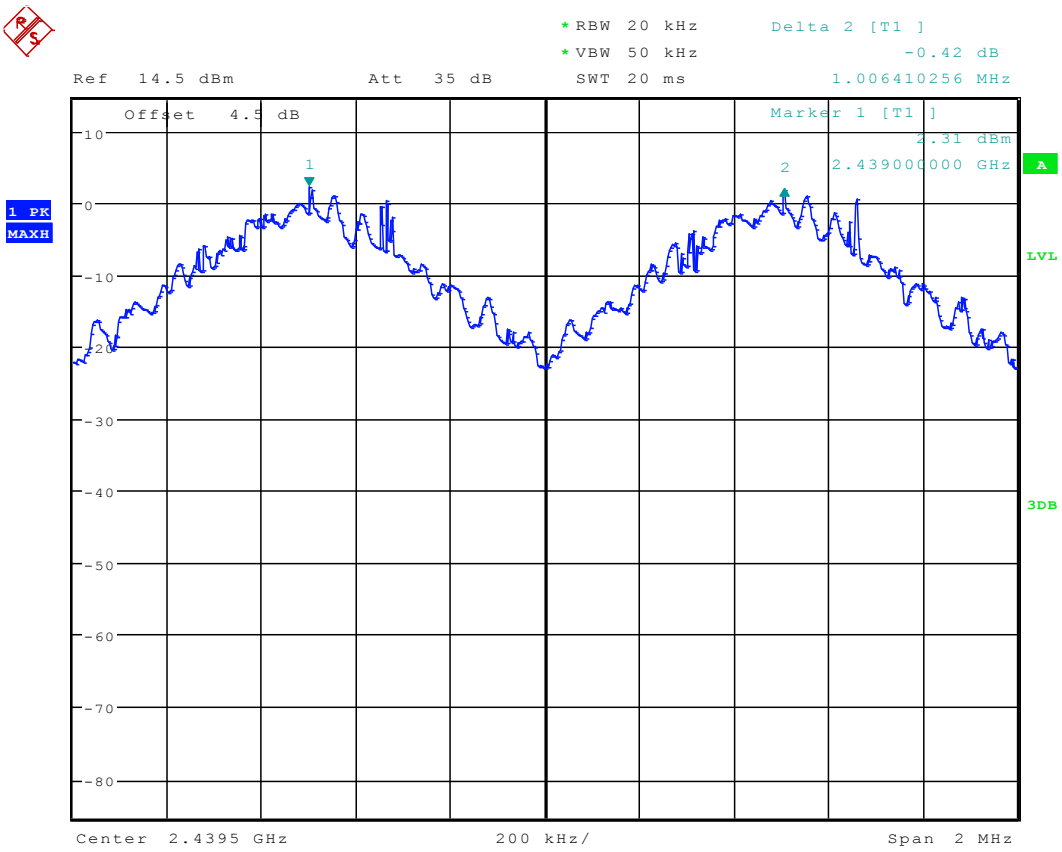
5.6.1 Limits:

§ 15.247 (a) (1)
RSS 210- A8.1(b)
Minimum 25kHz or 2/3 of the 20dB bandwidth of the hopping system

5.6.2 Test Result:

Modulation: GFSK
Channel Separation: 1.006 MHz

5.6.3 Test Data/plot:



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5.7 Number of hopping channels

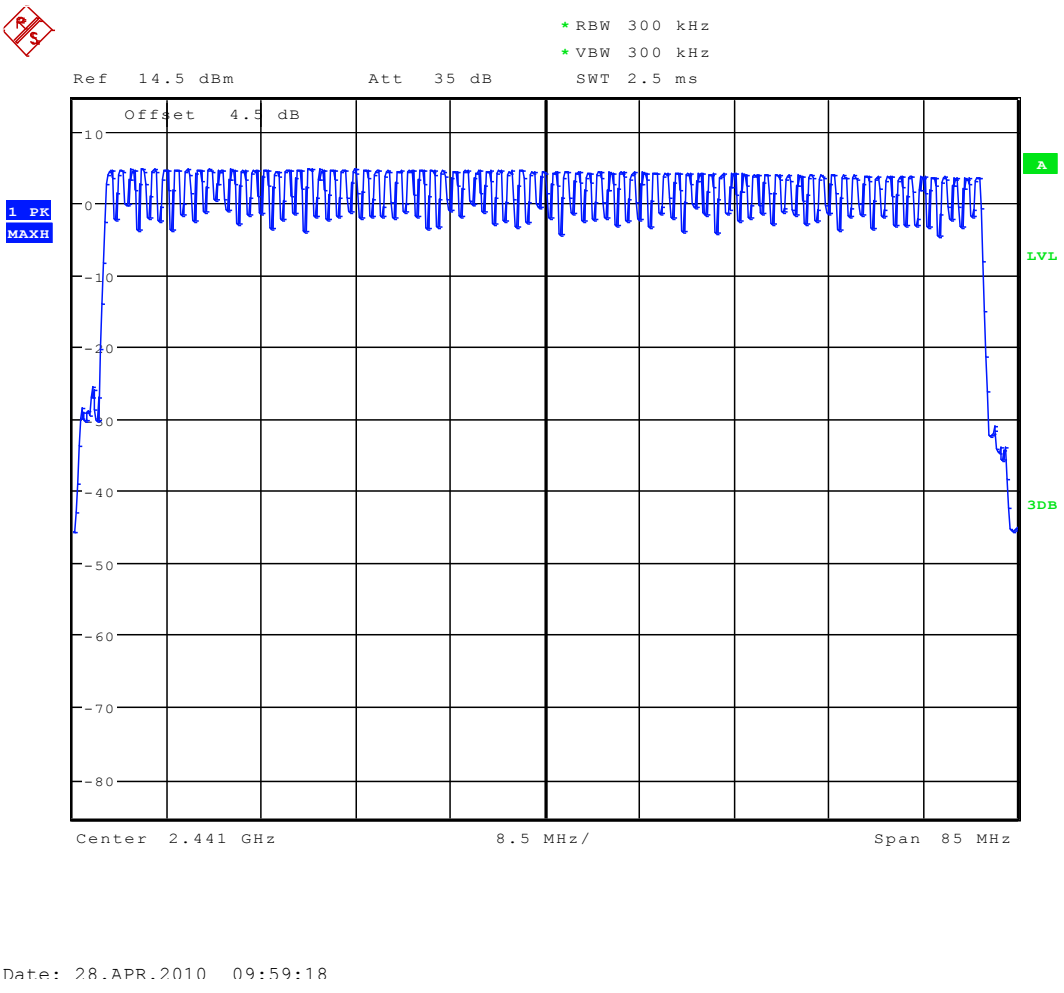
5.7.1 Limits:

§ 15.247 (a) (1)
RSS 210- A8.1(d)
Atleast 15 non-overlapping channels

5.7.2 Test Result:

Modulation: GFSK
Number of hopping channels: 79

5.7.3 Test Data/plot:



5.8 Time of occupancy (Dwell time)

5.8.1 Limits:

§ 15.247 (a) (1) (iii)
RSS 210- A8.1(d)
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

5.8.2 Test Result:

For Bluetooth devices:

The dwell time of 0.4 s within a 31.6 second period in data mode is independent from the packet type (packet length). The calculation for a 31.6 second period is a follows:

Dwell time = time slot length * hop rate / number of hopping channels *31.6 s

Example for a DH1 packet (with a maximum length of one time slot)
Dwell time = 625 µs * 1600 1/s / 79 * 31.6 s = 0.4 s (in a 31.6 s period)

For multi-slot packet the hopping is reduced according to the length of the packet.
Example for a DH5 packet (with a maximum length of five time slots)
Dwell time = 5 * 625 µs * 1600 * 1/5 *1/s / 79 * 31.6 s = 0.4 s (in a 31.6 s period)

This is according to Bluetooth Core Specification for all Bluetooth devices. Therefore all BT devices satisfy FCC requirement on time of occupancy (dwell time) in the data mode.

5.9 Power Spectral Density (Hybrid system in Inquiry mode/ Page scan)

5.9.1 Limits: § 15.247 (e)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

5.9.2 Test Result:

Not Applicable.

5.10 Transmitter Spurious Emissions- Conducted

5.10.1 Limits:

§ 15.247 (d)
RSS 210-A8.5
30dBm for the transmitter.
-20dBc in the frequency range 30MHz- 25GHz.

5.10.2 Test Conditions:

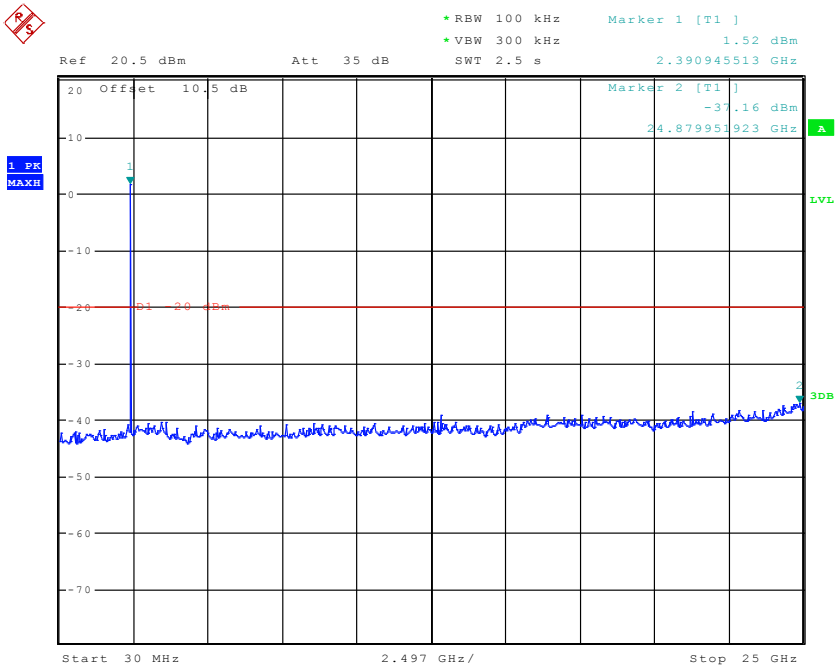
Modulation: GFSK (since this is the mode with highest output power)
Analyzer settings: RBW=100 kHz

5.10.3 Test data/ plots:

Conducted Spurious Emissions			
Channel	**Frequency (MHz)**	**Amplitude (dBm)**	**Limits**
Low	**2402**	1.52	30dBm
	No critical peaks		-20dBc
Mid	**2441**	2.08	30 dBm
	No critical peaks		-20dBc
High	**2480**	1.54	30 dBm
	No critical peaks		-20dBc
Measurement Uncertainty: ±1 dB			

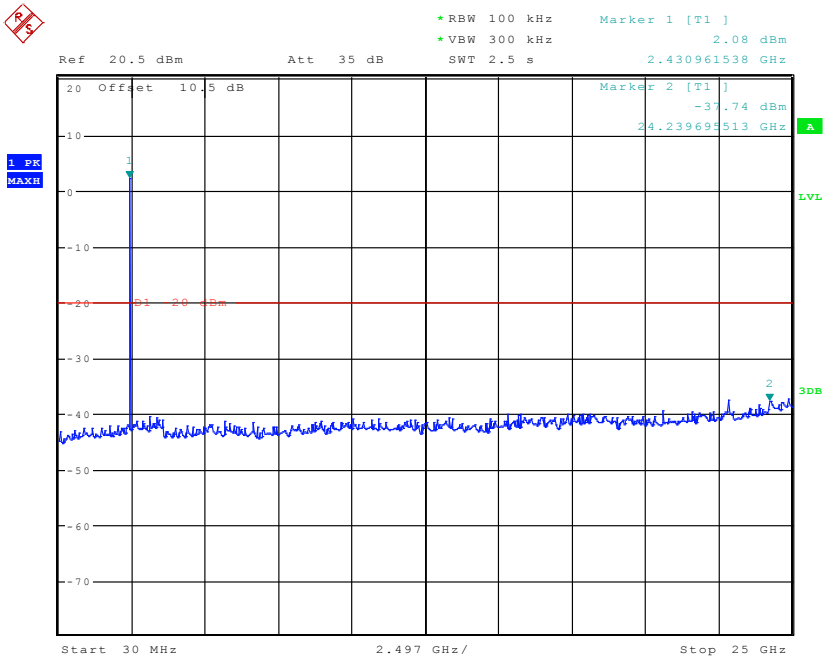
Test data/ plots:

Conducted Spurious Emission 2402MHz



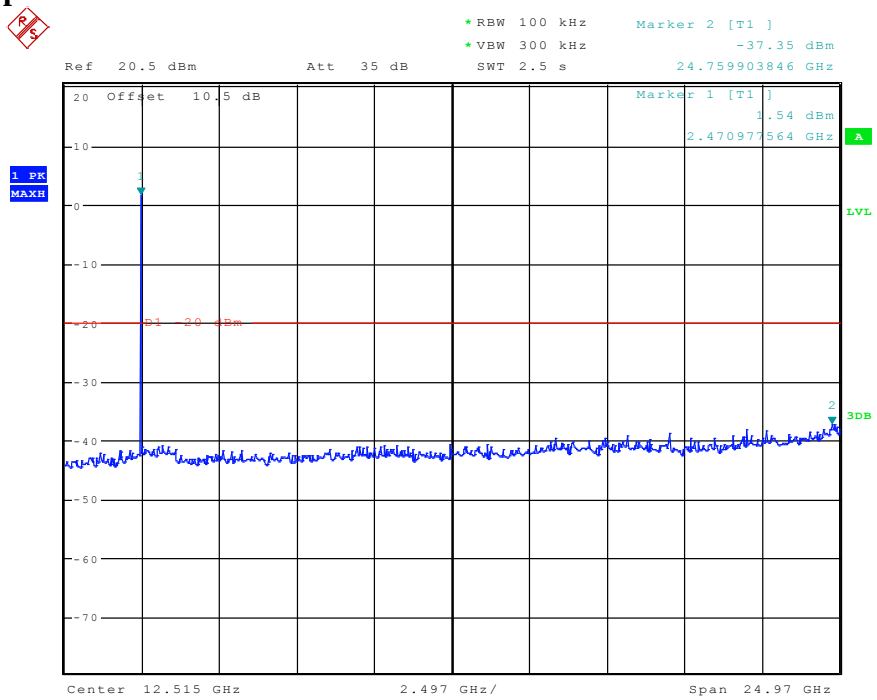
Date: 21.APR.2010 13:24:11

Conducted Spurious Emission 2441 MHz



Date: 21.APR.2010 13:24:57

Conducted Spurious Emission 2480MHz



Date: 21.APR.2010 13:25:44

5.11 Transmitter Spurious Emissions- Radiated

5.11.1 Limits:
§15.247/15.205
RSS 210-A8.5

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
*PEAK LIMIT= 74dBµV/m
*AVG. LIMIT= 54dBµV/m

5.11.2 Limits: §15.209
(For measurement distance of 3m)

Frequency of emission (MHz)	Field strength (µV/m)
30–88	100 (40dBµV/m)
88–216	150 (43.5 dBµV/m)
216–960	200 (46 dBµV/m)
Above 960	500 (54 dBµV/m)

NOTE:
1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All measurements are done in Peak mode using an Average limit, unless specified within the plots.

5.11.3 Limits: §15.209

Frequency of emission (MHz)	Field strength (µV/m)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30

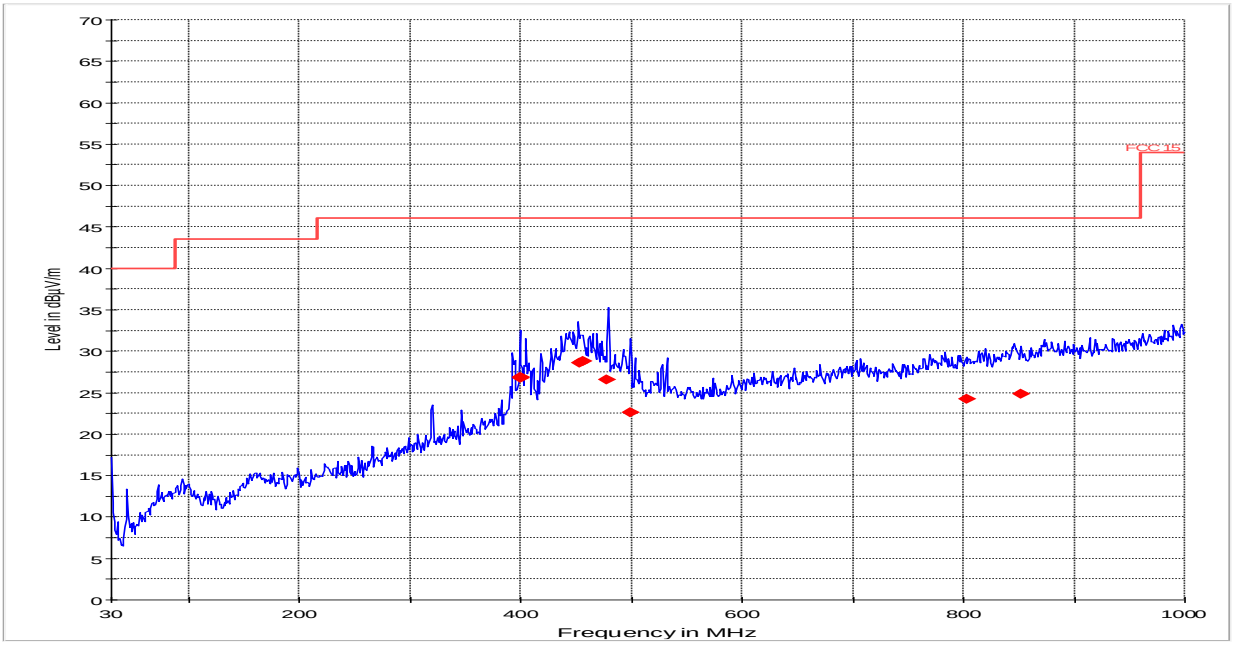
5.11.4 Test Result:
No significant emissions measurable. Plots reported here represent the worse case emissions.
No failing emissions reports below 30MHz.

Unless mentioned otherwise, the peaks in the plots which are above the limit lines are from the Transmitter TCH signal.

Testing performed with EUT#3 which includes the final design changes and representative of production sample.
Modulation: DH5

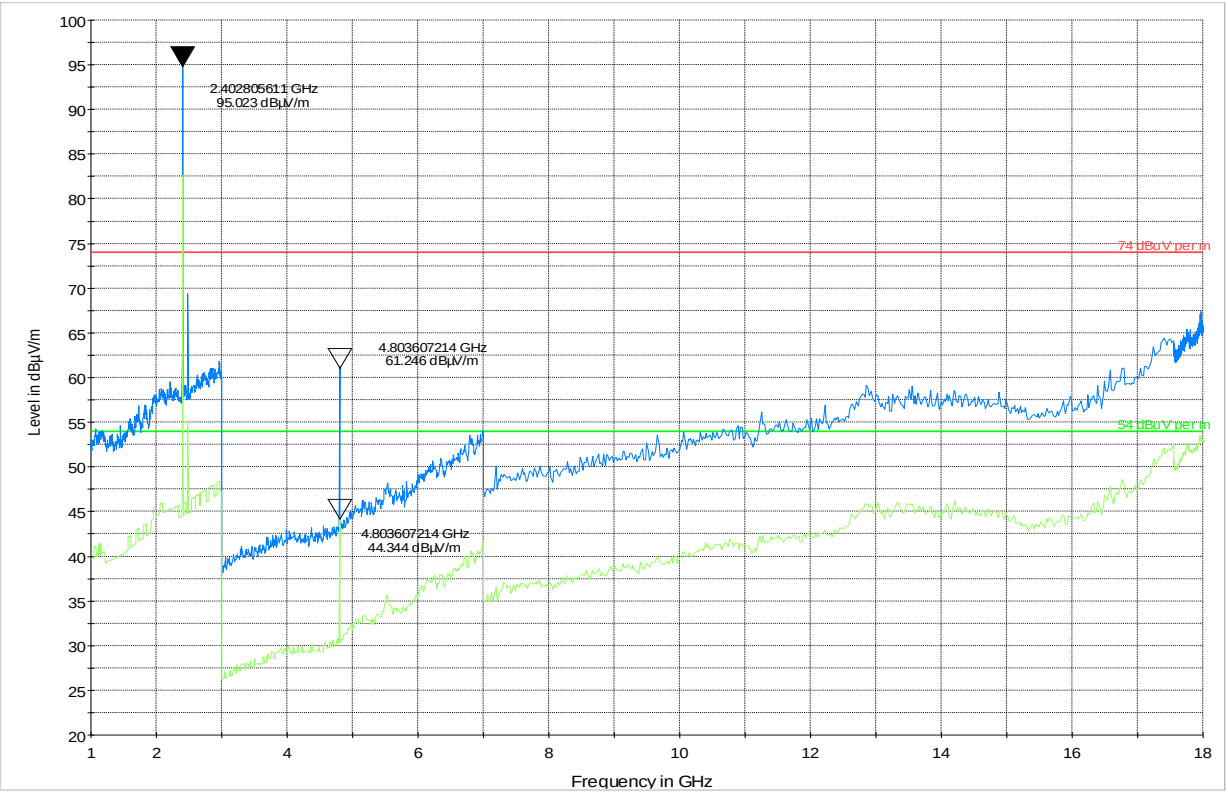
5.11.5 Test data/ plots:

Transmitter Radiated Spurious Emission- Ch0- 30M-1GHz

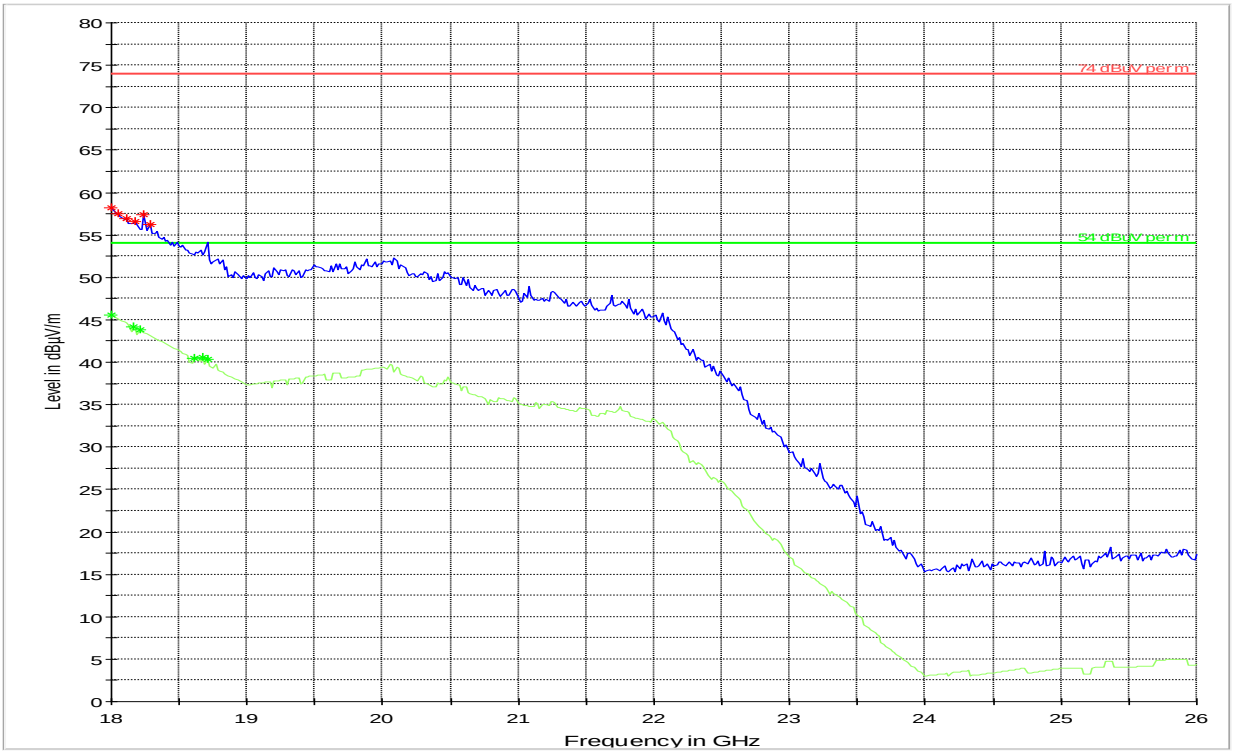


Transmitter Radiated Spurious Emission- Ch0- 1G-18GHz

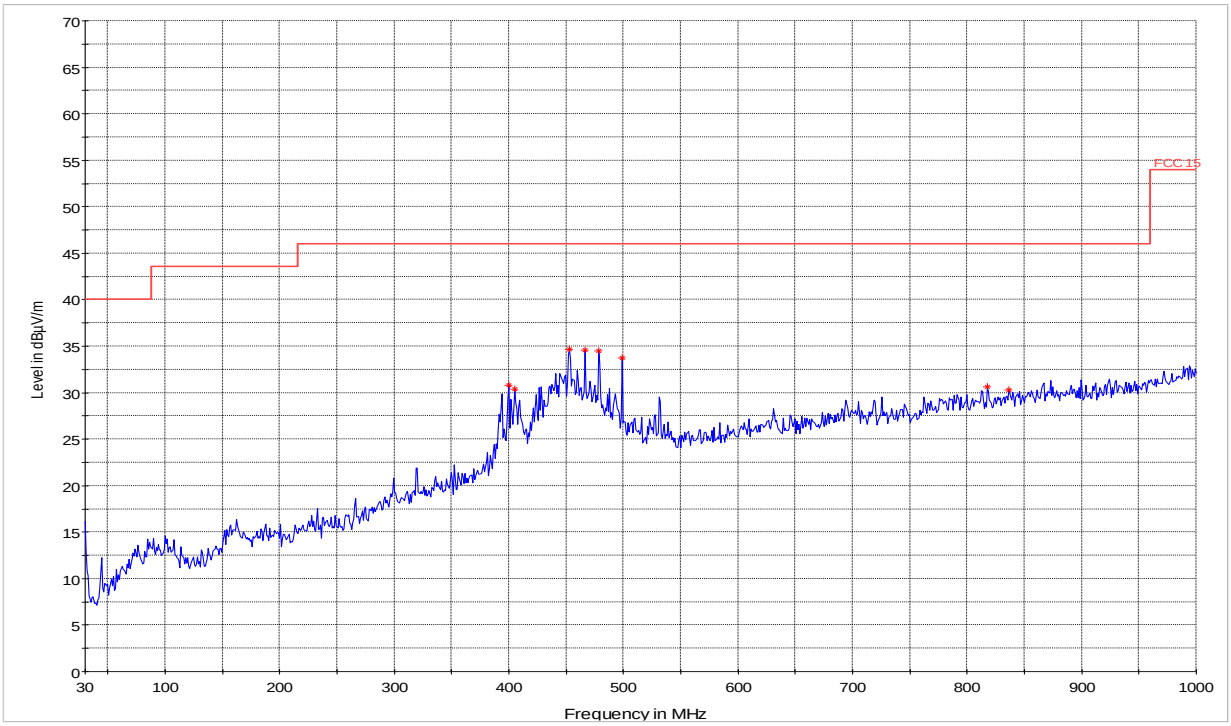
The signal adjacent to the TCH is the RX from Base Station Simulator.



Transmitter Radiated Spurious Emission- Ch0- 18G-26GHz
Note: Worst case representation for all channels in this frequency range.

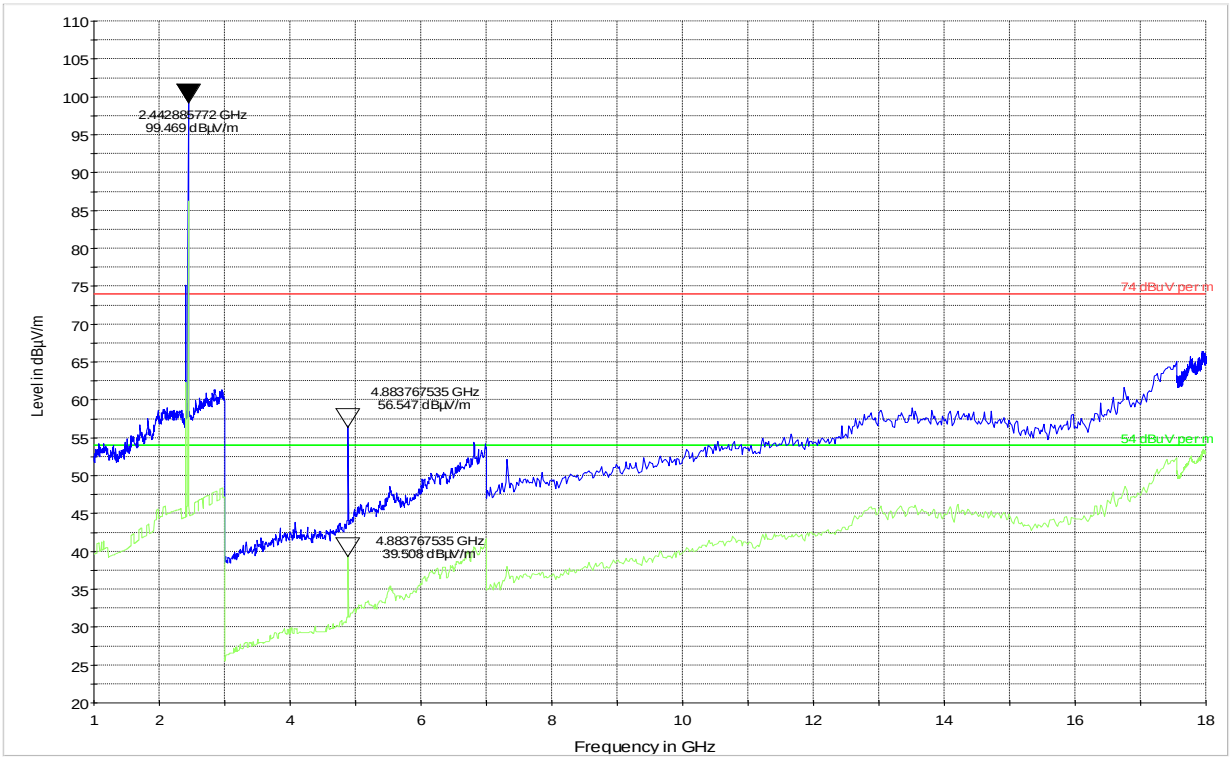


Transmitter Radiated Spurious Emission- Ch39- 30M-1GHz

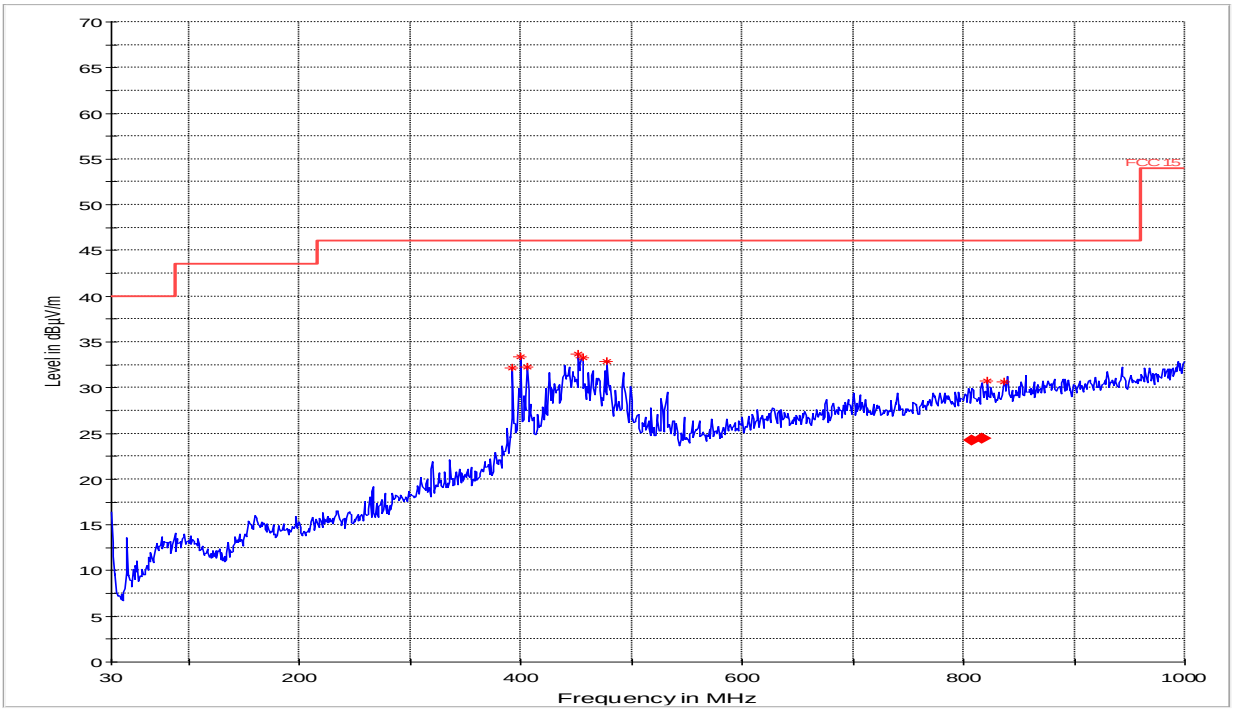


Transmitter Radiated Spurious Emission- Ch39- 1G-18GHz

The signal adjacent to the TCH is the RX from Base Station Simulator.

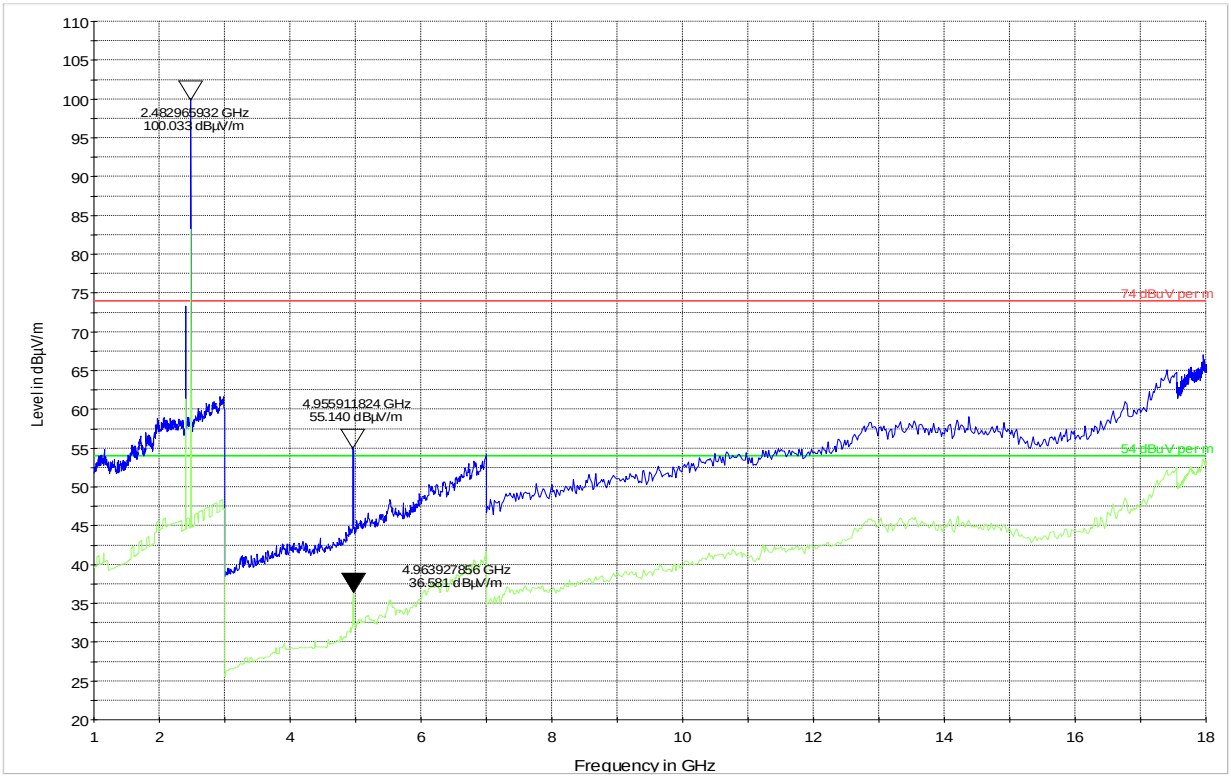


Transmitter Radiated Spurious Emission- Ch78- 30M-1GHz



Transmitter Radiated Spurious Emission- Ch78- 1G-18GHz

The signal adjacent to the TCH is the RX from Base Station Simulator.



5.12 Receiver Spurious Emissions- Radiated

5.12.1 Limits: §15.109

Frequency of emission (MHz)	Field strength (µV/m)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100 (40dBµV/m)	3
88–216	150 (43.5 dBµV/m)	3
216–960	200 (46 dBµV/m)	3
Above 960	500 (54 dBµV/m)	3

5.12.2 Test Conditions:

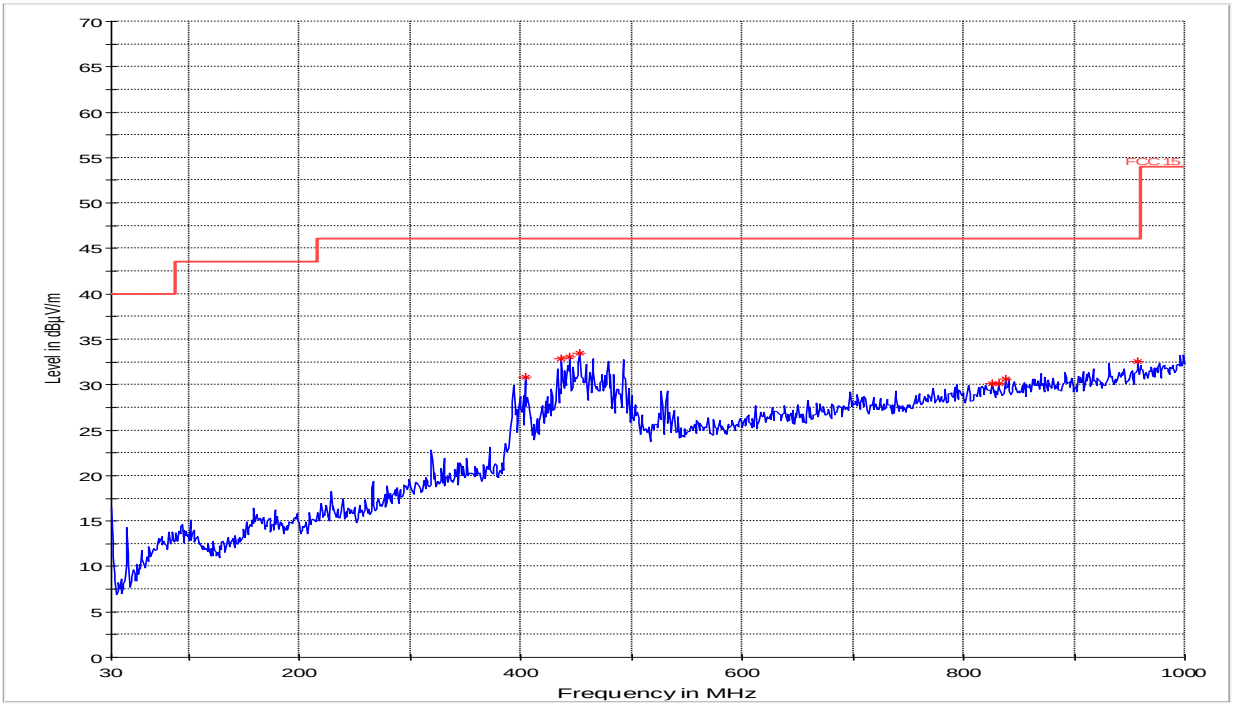
Idle Mode.

5.12.3 Test Result:

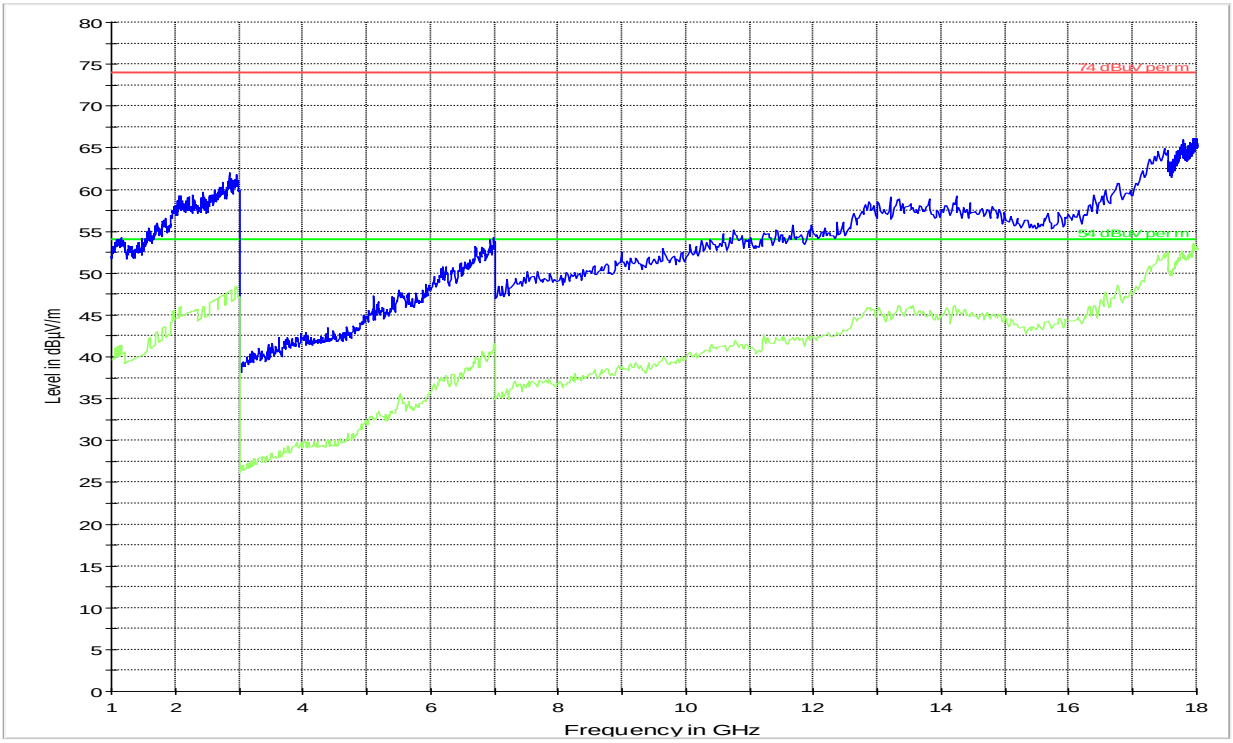
No failing emissions reports below 30MHz.
Testing performed with EUT#3 which includes the final design changes and representative of production sample.

5.12.4 Test data/ plots:

Receive Mode: 30MHz-1GHz



Receive Mode: 1GHz-18GHz



5.13 AC Power Line Conducted Emissions

5.13.1 Limits: §15.107/15.207

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

Analyzer Settings: RBW = 10KHz; VBW = 10KHz

5.13.2 Test Conditions:

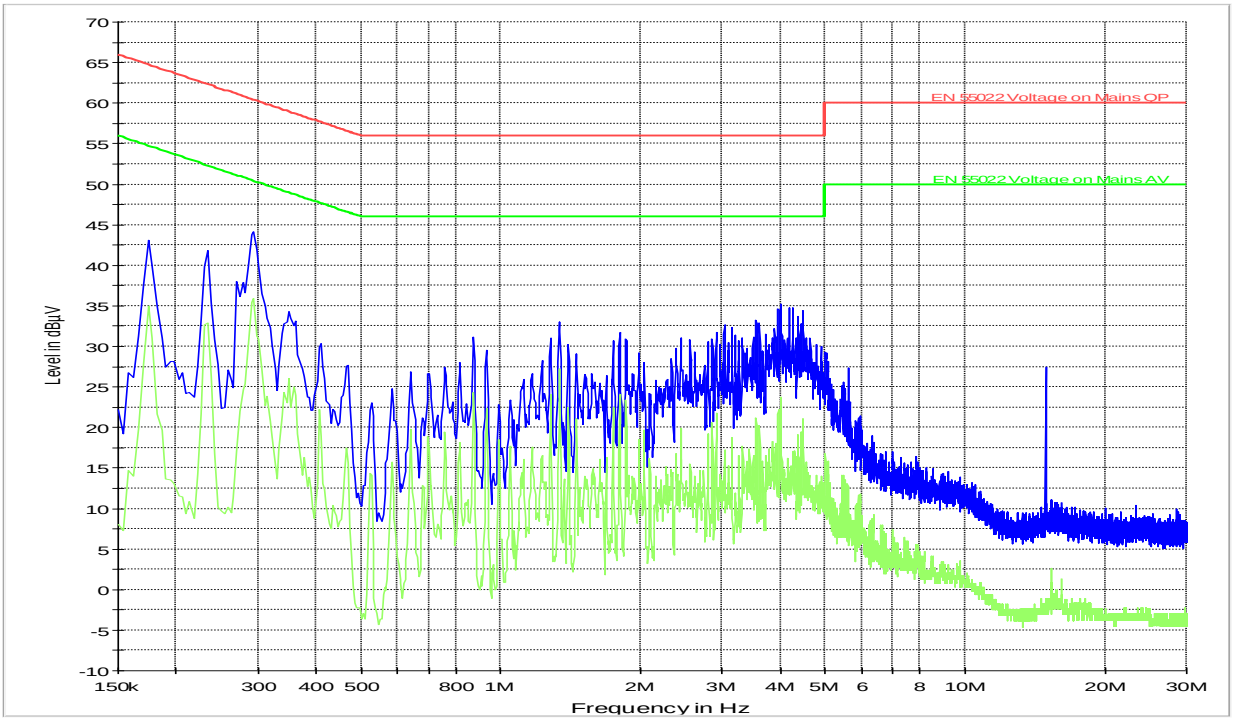
Modulation: DH5

5.13.3 Test Result:

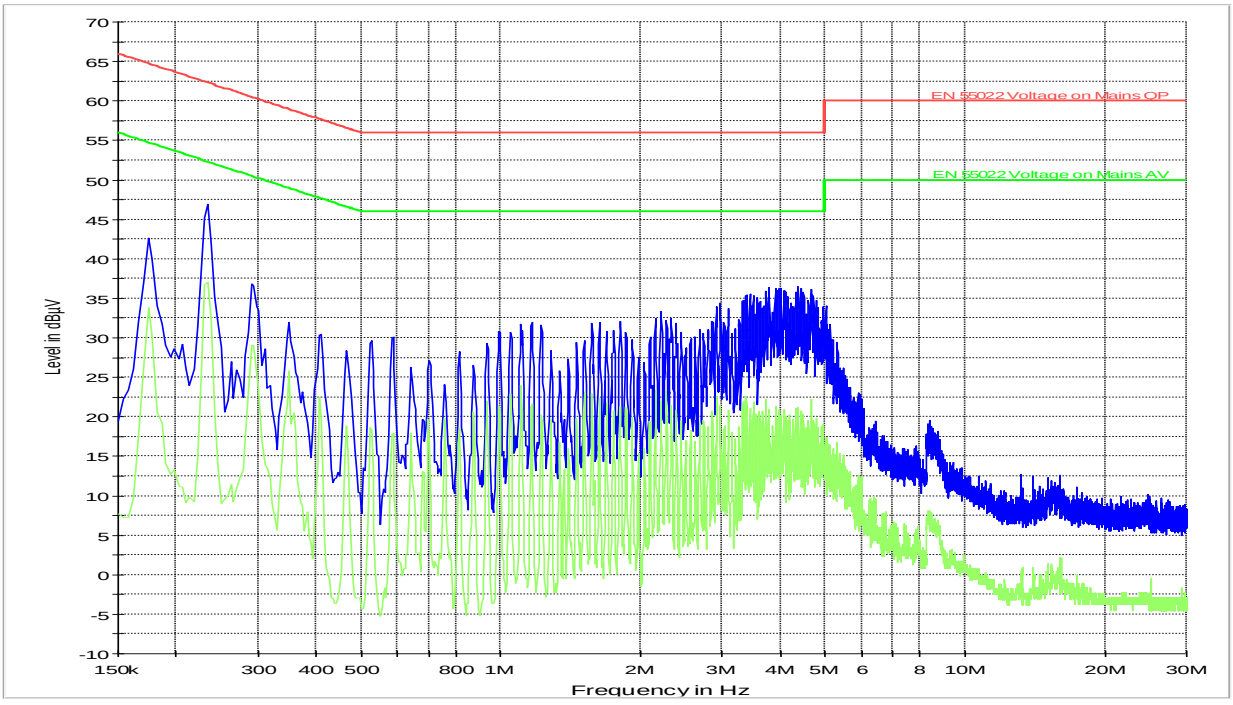
No significant emissions measurable. Plots reported here represent the worse case emissions.

5.13.4 Test data/ plots:

BT Transmit Mode



BT Idle Mode

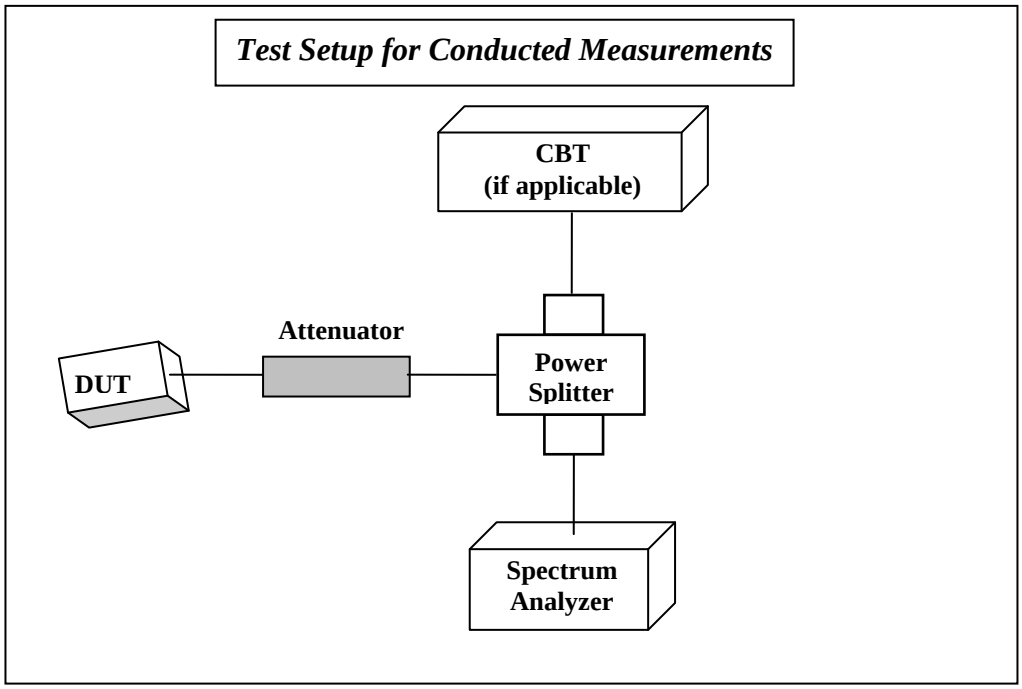


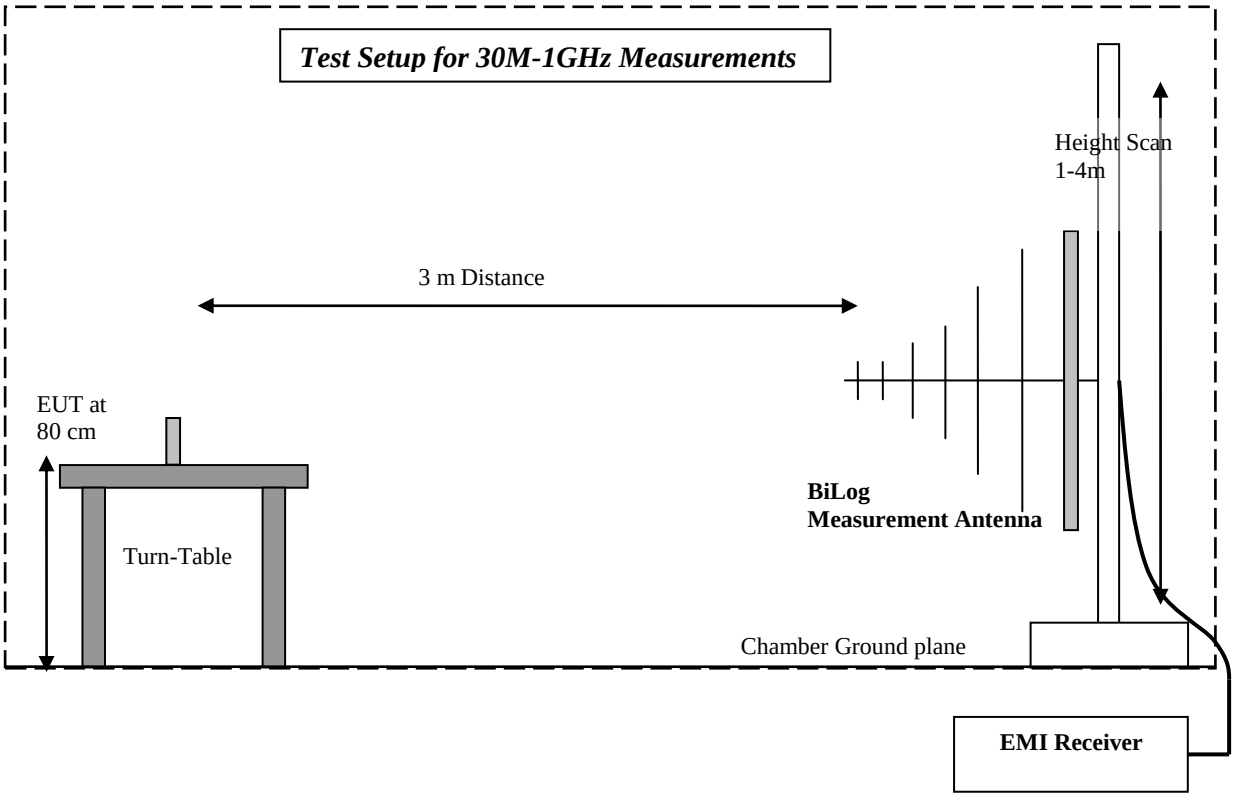
6 Test Equipment and Ancillaries used for tests

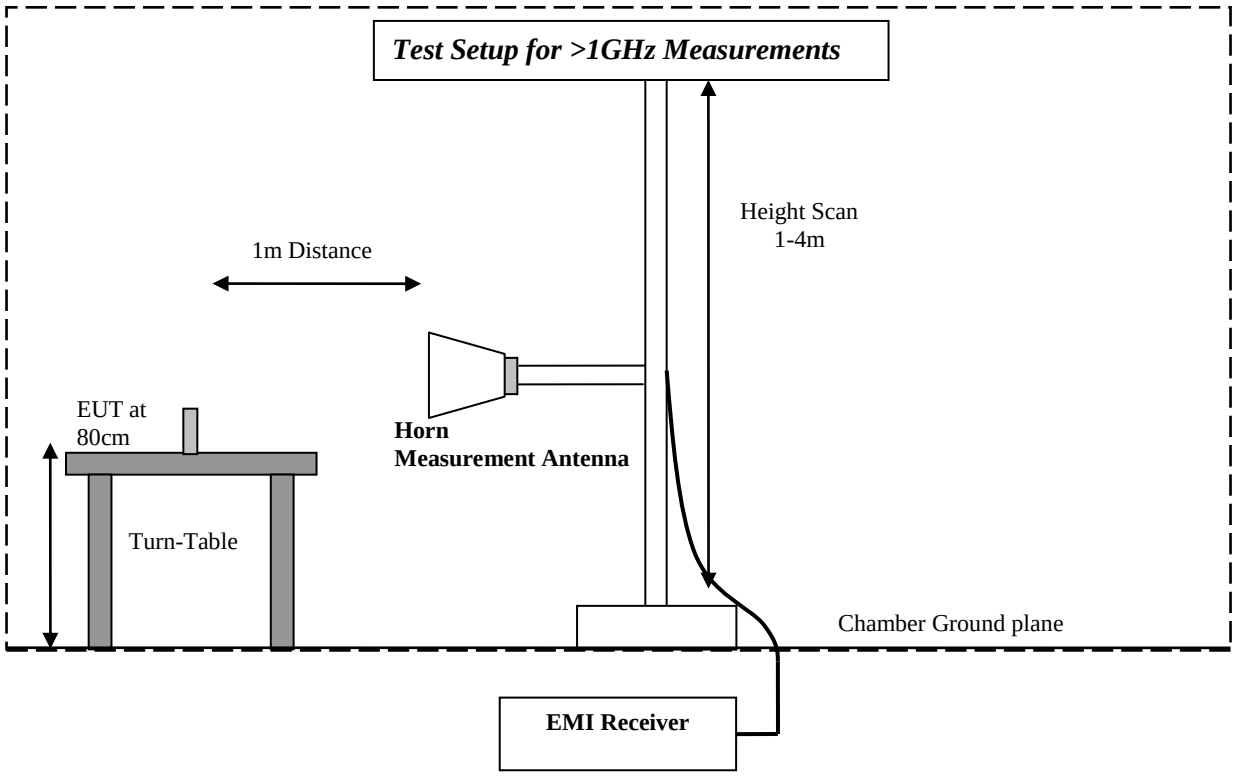
Instrument/Ancillary	Model	Manufacturer	Serial No.	Cal Date	Cal Interval
Radio Communication Tester	CMU 200	Rohde & Schwarz	101821	May 2009	1 year
Radio Communication Tester	CMU 200	Rohde & Schwarz	109879	May 2009	1 year
Radio Communication Tester	CMU 200	Rohde & Schwarz	110759	May 2009	1 year
Bluetooth Tester	CBT	Rohde & Schwarz	100212	May 2009	1 year
EMI Receiver/Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2009	1 year
Spectrum Analyzer	FSU	Rohde & Schwarz	200302	Dec 2009	1 year
Loop Antenna	6512	EMCO	00049838	July 2008	2 years
Biconilog Antenna	3141	EMCO	0005-1186	June 2009	2 years
Horn Antenna (1-18GHz)	3115	ETS	00035111	Jan 2009	3 years
Horn Antenna (18-40GHz)	3116	ETS	00070497	Jan 2009	3 years
Communication Antenna	IBP5-900/1940	Kathrein	n/a	n/a	n/a
High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
6GHz High Pass Filter	HPM50106	Microtronics	001	n/a	n/a
Pre-Amplifier	JS4-00102600	Miteq	00616	May 2009	1 year
LISN	50-25-2-08	FCC	08014	Apr 2009	1 year
Power Smart Sensor	R&S	NRP-Z81	100161	May 2009	1 Year
Power Smart Sensor	R&S	NRP-Z22	100223	May 2009	1 Year
Upconverter	PXI-5610	NI	E93740	Aug 2008	2 years
Waveform Generator	PXI-5421	NI	E965F1	Aug 2008	2 years
10dB attenuator	ATT-0298-10	MidwestMicrowav	n/a	n/a	n/a
Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
DC Power Supply	E3610A	Hewlett Packard	KR83021224	n/a	n/a
DC Power Supply	E3610A	Hewlett Packard	KR83023316	n/a	n/a
DC Power Supply	6632A	Hewlett Packard	3524A-12822	n/a	n/a
DC Power Supply	6655A	Hewlett Packard	3403A-00487	n/a	n/a
Multimeter	179	Fluke	N/A	Feb 2010	1 Year
Temp Hum Logger	TM320	Dickson	03280063	Feb 2010	1 Year
Temp Hum Logger	TM325	Dickson	5285354	Feb 2010	1 Year
Climatic Chamber	VT4004	Votsch	G1115	May 2009	1 year

Note:
Equipment calibration is performed by an accredited calibration lab according to ISO 17025 requirements.
Calibration intervals are determined from manufacturer recommendation and/or lab discretion.
Cetecom Inc takes all measures to calibrate equipment before the due date; for instances when the equipment has to be used beyond the calibration due date, necessary steps are taken for calibration verification and documented until accredited calibration can be performed- to meet the Quality System requirements

7 BLOCK DIAGRAMS

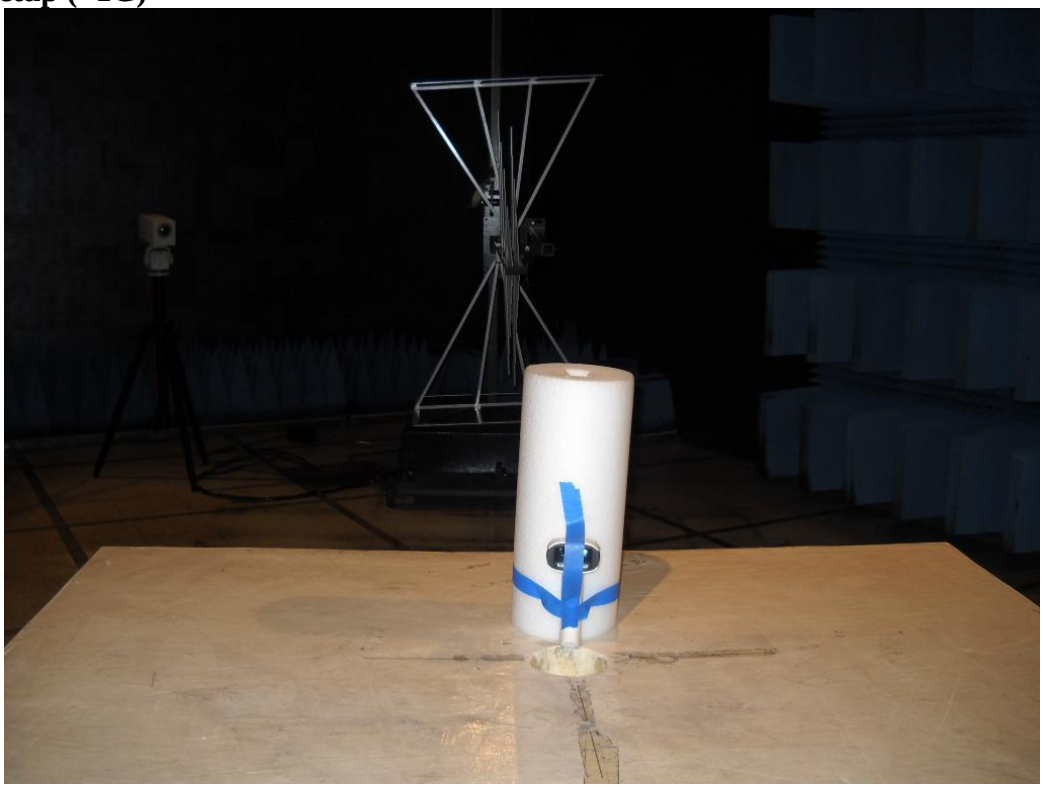





Test Setup for >1GHz Measurements
Height Scan
1-4m
1m Distance
EUT at
80cm
Horn
Measurement Antenna
Turn-Table
Chamber Ground plane
EMI Receiver

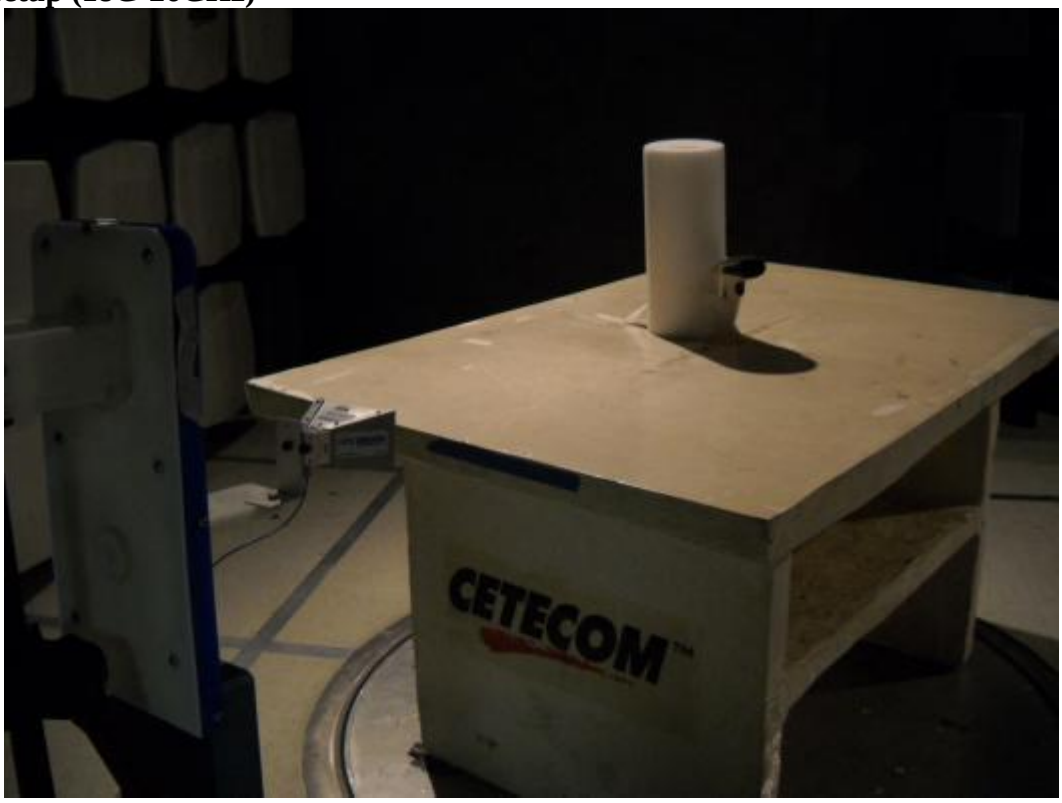
8 Test Setup photos

Radiated Setup (<1G)



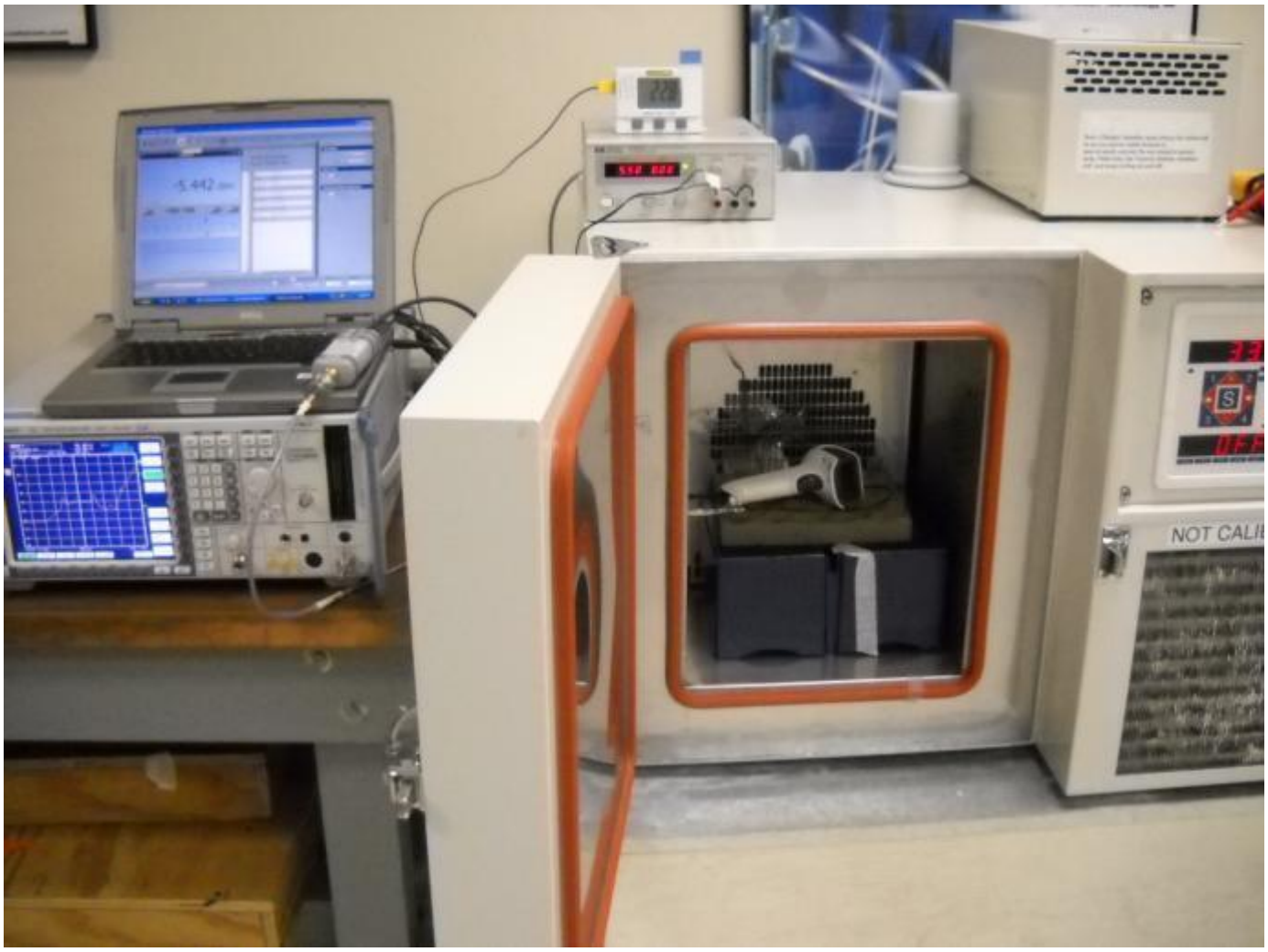
Radiated setup (1G-18G)

Radiated setup (18G-26GHz)



AC Line Conducted Emissions Setup

Conducted Measurements



9 Revision History

Date	Report Name	Changes to report	Report prepared by
2010-05-20	**EMC_Honey_032_10001_FCC15.247**	**First Version**	**Sajay Jose**