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Emissions Test Report

EUT Name: Norton core mini

Model No.: 518

CFR 47 Part 15.247: 2018, RSS 247 Issue 2, 2017

Prepared for:

Client	Symantec Inc.
Address	350 Ellis St
Address	Mountain View, CA 94043
Contact Person	Vijay Poojari
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Prepared by:

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Revisions

Revision No.	Date MM/DD/YYYY	Reason for Change	Author
1	07/31/2018	Initial	D. Foster
2	08/21/2018	Make changes per review	D. Foster

Note: Latest revision report will replace all previous reports.

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Report# 31863617.001

Statement of compliance

Manufacturer: Symantec Inc.
Requester / Applicant: Vijay Poojari
Name of Equipment: Norton core mini
Model No. 518
Type of Equipment: Access point router
Application of Regulations: Rules for digital transmission systems
Test Dates: 06/18/2018-07/23/2018

Guidance Documents:

Emissions: ANSI C63.10-2013 CFR47 part 15.247:2018 and RSS247: 2017

Test Methods:

Emissions: ANSI C63.10: 2013

The electromagnetic compatibility test and documented data described in this report has been performed and recorded by TUV Rheinland, in accordance with the standards and procedures listed herein. As the responsible authorized agent of the EMC laboratory, I hereby declare that the equipment described above has been shown to be compliant with the EMC requirements of the stated regulations and standards based on these results. If any special accessories and/or modifications were required for compliance, they are listed in section 1.4 of this report.

This report must not be used to claim product endorsement by A2LA or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written authorization of TUV Rheinland of North America.

Donn Foster	August 24, 2018	Josie Sabado	August 24, 2018
Test Engineer	Date	Laboratory Signature	Date

INDUSTRY CANADA

Testing Cert #3331.02 US1131 2932M-1

1 Executive Summary

1.1 Scope

The purpose of the following report is to demonstrate compliance of the Norton core mini to the various regulatory requirements further listed in this Report.

It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Summary of Test Results

Table 1: Summary of Test Results

Test	Test Method ANSI C63.10 2013	Test Parameters	Result
Occupied Bandwidth (99% and -6db)	CFR 47 15.247(a1), RSS Gen Sect. 4.4.	Limits	**Pass**
Output Power	CFR47 15.247 (b1), RSS 210 Sect. A.8.1	Limits	**Pass**
Out of Band Emission	CFR47 15.247 (d), RSS 210 Sect. A.8.5	Limits	**Pass**
Band-Edge	FCC Part 15.205, 15.209	Limits	**Pass**
Transmitted Spurious Emission (30 MHz – 1GHz)	FCC Part 15.205, 15.209	Limits	**Pass**
Transmitted Spurious Emission (Above 1GHz)	FCC Part 15.205, 15.209	Limits	**Pass**
AC Conducted Emission FCC Part 15.207	Class B	Limits	**Pass**

Note:

1.4 Special Accessories

No special accessories were necessary in order to achieve compliance.

1.5 Equipment Modifications

None

2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 US Federal Communications Commission

TUV Rheinland of North America at 1279 Quarry Ln, Pleasanton, CA 94566 is recognized by the commission for performing testing services for the general public on a fee basis. These laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (US1131). The laboratory scope of accreditation includes: Title 47 CFR Parts 15, 18, and 90. The accreditation is updated every 3 years.

2.1.2 NIST / A2LA

TUV Rheinland of North America is accredited by the National Voluntary Laboratory Accreditation Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Guide 17025:2005 and ISO 9002 (Lab Code 3331.02). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Canada – Industry Canada

TUV Rheinland of North America at the 1279 Quarry Ln, Pleasanton, CA 94566 address is accredited by Industry Canada for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by Industry Canada (File Number 2932M). The accreditation is updated every 3 years.

2.1.4 Japan – VCCI

The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland of North America at 1279 Quarry Ln, Pleasanton, CA 94566 has been assessed and approved in accordance with the Regulations for Voluntary Control Measures.

VCCI Registration No. for Pleasanton: A-0268

2.1.5 Acceptance by Mutual Recognition Arrangement

The United States has an established agreement with specific countries under the Asia Pacific Laboratory Accreditation Corporation (APLAC) Mutual Recognition Arrangement. Under this agreement, all TUV Rheinland at 1279 Quarry Ln, Pleasanton, CA 94566 test results and test reports within the scope of the laboratory NIST / A2LA accreditation will be accepted by each member country.

2.2 Test Facilities

All of the test facilities are located at 1279 Quarry Lane, Pleasanton, California 94566, USA.

2.2.1 Emission Test Facility

The Semi-Anechoic chamber and AC Line Conducted measurement facility used to collect the radiated and conducted data has been constructed in accordance with ANSI C63.7:1992. The site has been measured in accordance with and verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2014, at a test distance of 3 and 5 meters. The site is listed with the FCC and accredited by A2LA (Lab Code 3331.02). The 3/5-meter semi-anechoic chamber used to collect the radiated data has been verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2014, at a test distance of 3 meter and 5 meters. A report detailing this site can be obtained from TUV Rheinland of North America.

2.3 Measurement Uncertainty

Two types of measurement uncertainty are expressed in this report, per *ISO Guide To The Expression Of Uncertainty In Measurement*, 1st Edition, 1995.

The Combined Standard Uncertainty is the standard uncertainty of the result of a measurement when that result is obtained from the values of a number of other quantities; it is equal to the positive square root of the sum of the variances or co-variances of these other quantities, weighted according to how the measurement result varies with changes in these quantities. The term *standard uncertainty* is the result of a measurement expressed as a standard deviation.

2.3.1 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{RAW} - \text{AMP} + \text{CBL} + \text{ACF}$$

Where: RAW = Measured level before correction (dBµV)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu\text{V/m} = 10^{\frac{dB\mu V/m}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)

25 dBuV/m + 17.5 dB – 20 dB + 1.0 dB = 23.5 dBuV/m

2.3.2 Measurement Uncertainty Emissions

Per CISPR 16-4-2	U_{lab}	U_{cispr}
Radiated Disturbance @ 10 meters		
30 – 1,000 MHz	2.25 dB	4.51 dB
Radiated Disturbance @ 3 meters		
30 – 1,000 MHz	2.26 dB	4.52 dB
1 – 6 GHz	2.12 dB	4.25 dB
6 – 18 GHz	2.47 dB	4.93 dB
Conducted Disturbance @ Mains Terminals		
150 kHz – 30 MHz	1.09 dB	2.18 dB
Disturbance Power		
30 MHz – 300 MHz	3.92 dB	4.3 dB

The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2. Compliance criteria are not based on measurement uncertainty.

2.4 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005.

3 Product Information

3.1 Product Description

The Norton Core mini is an access point incorporating several technologies of wifi. This report will focus on the Bluetooth BLE technology that the system uses.

3.2 Equipment Configuration

A description of the equipment configuration is given in the Test Plan Section. The EUT was tested as called for in the test standard and was configured and operated in a manner consistent with its intended use. The EUT was controlled from the support laptop used to configure the various modes of operation. The placement of the EUT system components was guided by the test standard and selected to represent typical installation conditions.

3.3 Operating Mode

A description of the operation mode is given in the Test Plan Section.

The final operating mode was selected to produce the worst case radiation for emissions testing.

3.4 Unique Antenna Connector

The Norton core mini has an internal fixed antenna which is not removable.

4 Duty Cycle

Test Method

The ANSI C63.10-2013 Section 11.6 Conducted method was used to measure the duty cycle. The preliminary investigation was performed at different data rate to determine the highest power output for each mode. The system was powered on and port 1 connected to the Spectrum analyzer. A diag program called QRCT was used to set the AP in continuous Tx mode and also to set the channel, channel power and data rate. This test was conducted on 3 channels for each of the throughput modes. The analyzer was configured as follows.

Cable loss was entered as an offset

RBW=8MHz

VBW= 50MHz

Span = 0Hz

Reference level= as needed to maintain headroom

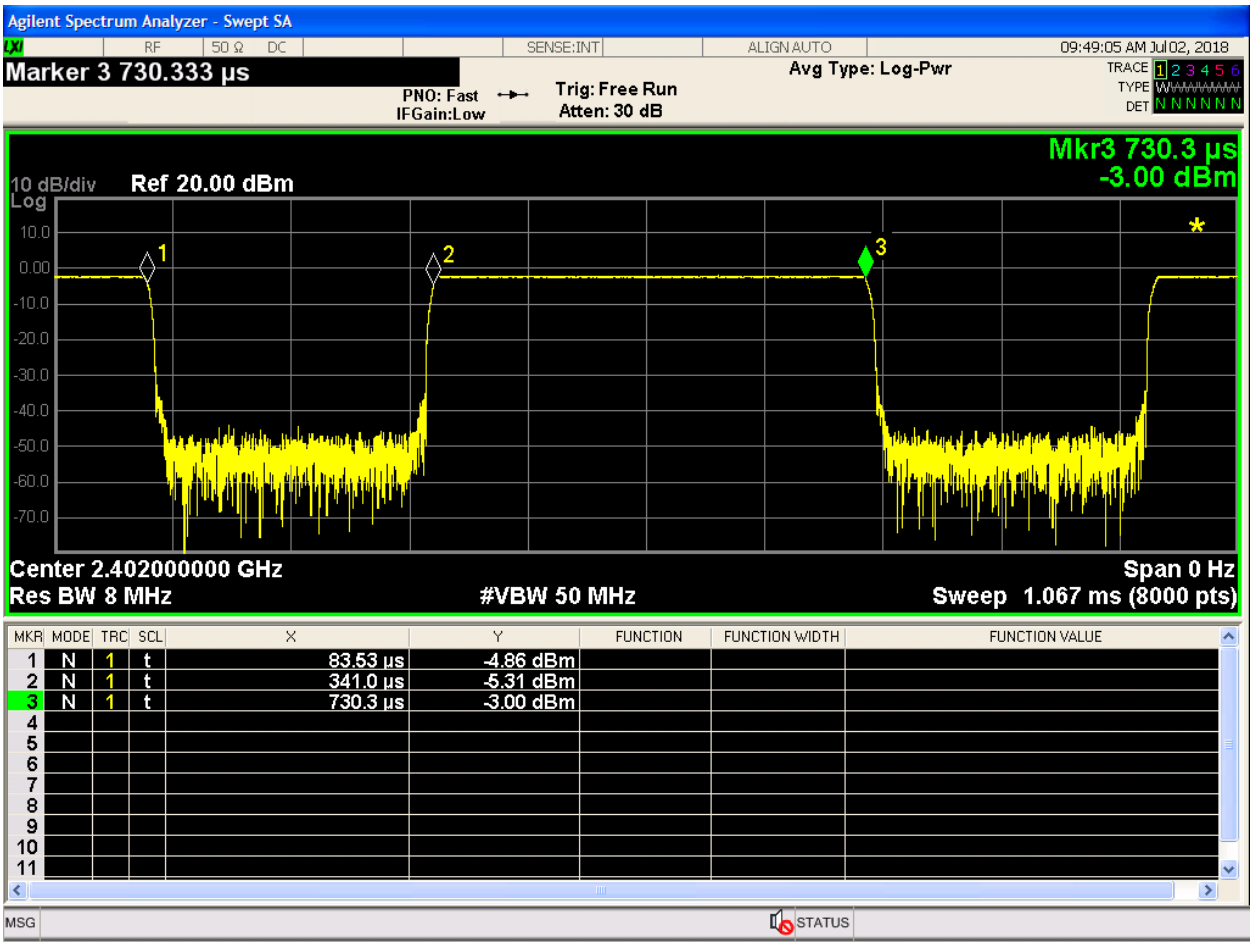
SWT= 5ms adjusted as needed to capture approx. 1.5 cycles

The off time and cycle time were captured using the marker functions and the duty cycle calculated.

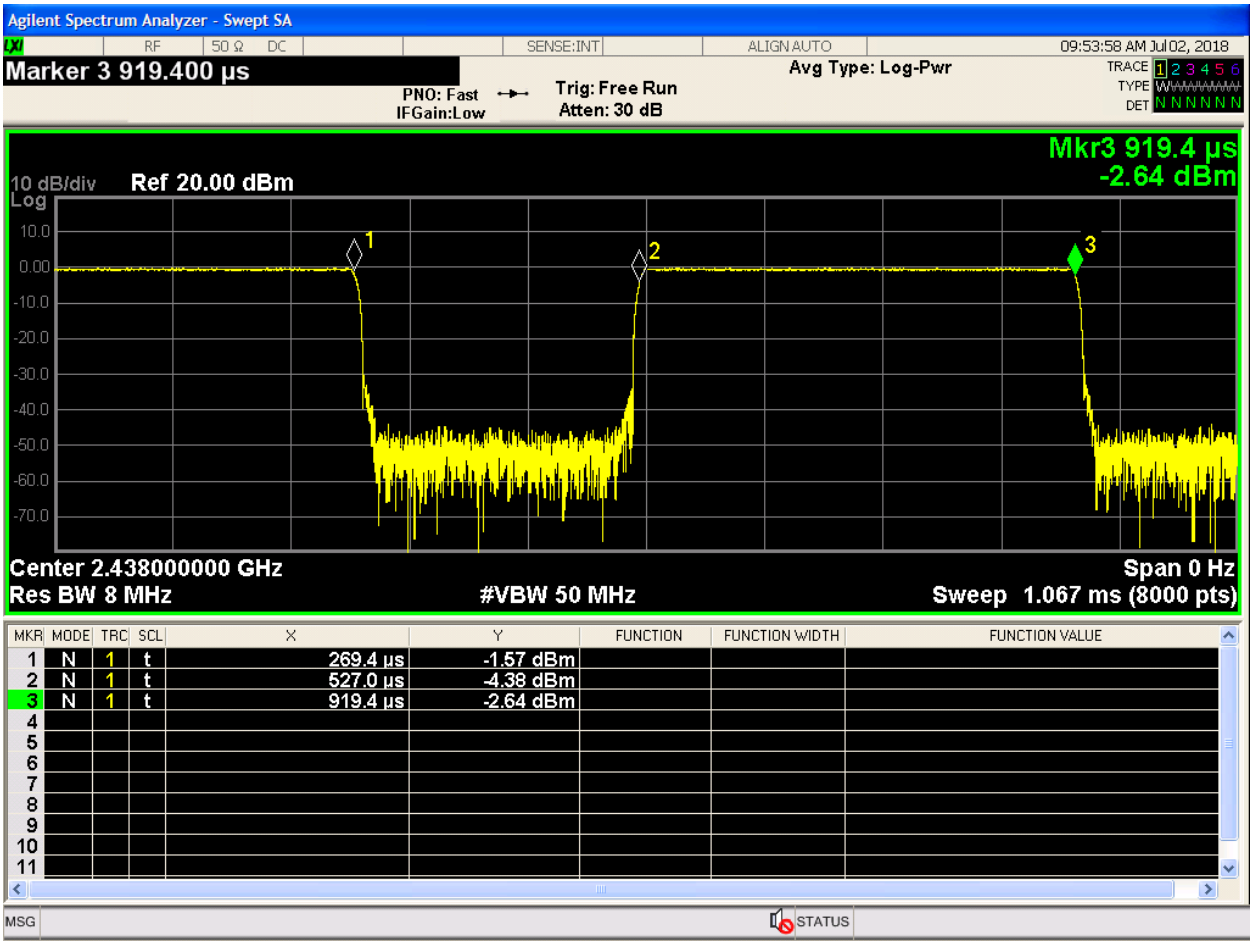
Test Conditions: Conducted Measurement (SA), Normal Temperature	**Date**: 07/02/2018
Antenna Type:	Integrated PIFA antenna
Duty cycle correction: table below	Data Rate: 1mbps
Ambient Temp.: 24º C	Relative Humidity: 39 %RH

Duty cycle		
Mode	% of 100% cycle	DCCF
GFSK channel 0	60%	-2.2
GFSK channel 40	60%	-2.2
GFSK channel 80	60%	-2.2

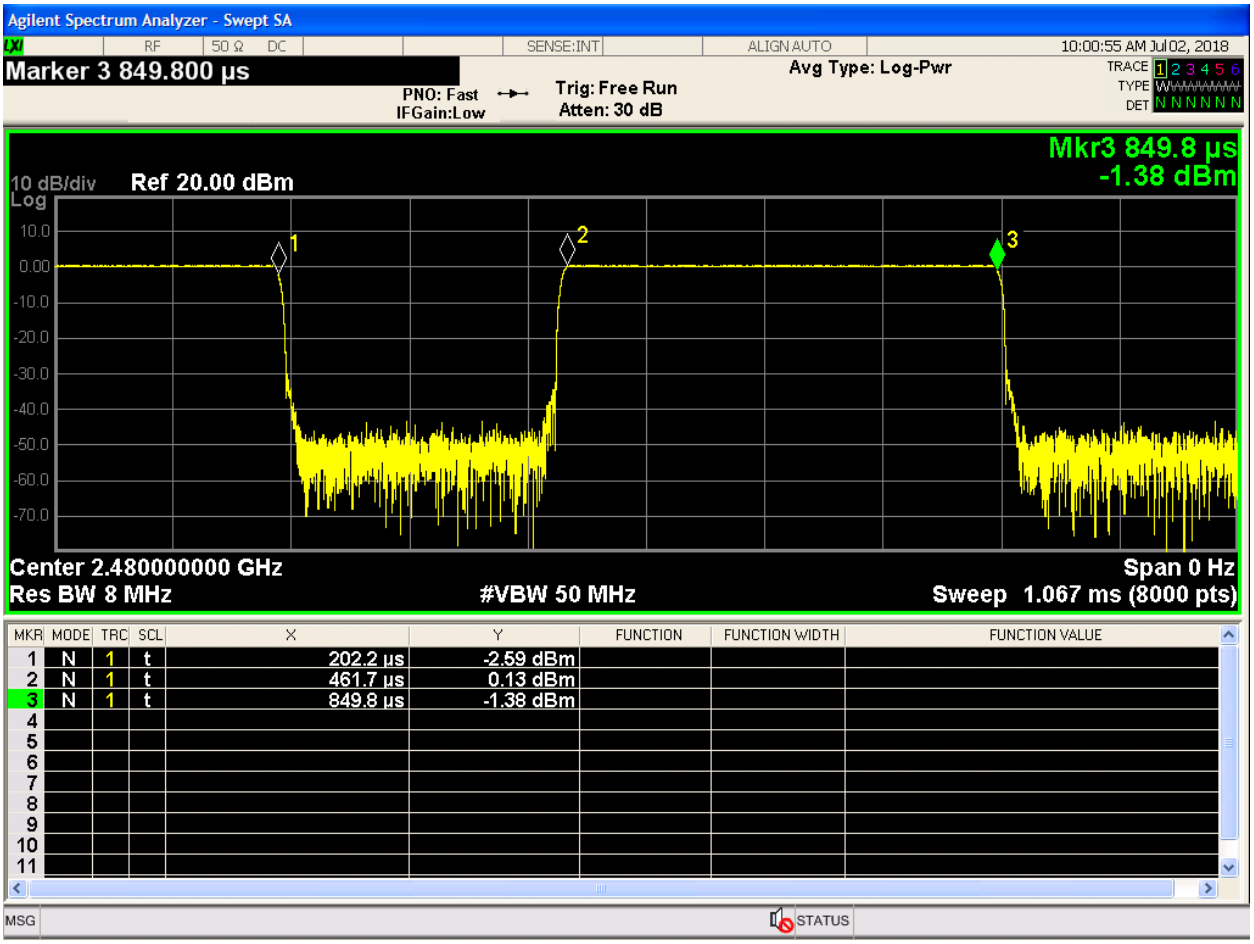
4.1 Results



Duty Cycle channel 0



Duty Cycle channel 19



Duty Cycle channel 39

5 Emission Requirements – 2400 MHz to 2483.5 MHz Band

Testing was performed in accordance with CFR 47 part 15.209 CFR 47 Part 15.247: 2018 and RSS 247 2017. These test methods are listed under the laboratory's A2LA Scope of Accreditation. This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Procedures described in Section 11 of ANSI C63.10: 2013

6 Output Power Requirements

The maximum output power requirement is the maximum equivalent isotropic radiated power delivering at the transmitting antenna under specified conditions of measurements in the presence of modulation.

The maximum output power and harmonics shall not exceed CFR47 Part 15.247 (b):2018 and RSS 247: 2017 Sect. 5.4.4.

The maximum allowable transmitted power in the band 2400-2483.5 MHz: 1 W

6.1 Test Method

The ANSI C63.10-2013 11.9.2.3.1 Method AVGPM was used to measure the channel power output. Conducted method was used to measure the channel power output. The preliminary investigation was performed at different data rate to determine the highest power output for each mode. This test was conducted on 3 channels. The worst mode result indicated in the tables below.

6.2 Test Setup

A diagram of the configuration of this test is found in the test plan.

6.2.1 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 2: RF Output Power at the Antenna Port – Test Results

Test Conditions: Conducted Measurement, Normal Temperature			**Date**: 07/02/2018	
Antenna Type: Integrated Antenna			**Power Setting:** 7	
Max. Antenna Gain: 3.36dbi			**Signal State:** Modulated	
Duty Cycle: 60%			**Data Rate:** BLE	
Ambient Temp.: 23º C			**Relative Humidity:** 38 %RH	
Results				
Mode	**Operating Channel**	**Limit [dBm]**	**Power [dBm]**	**Comments**
BLE	2402 MHz	+30.00	-0.2	
	2438 MHz	+30.00	2.3	
	2480 MHz	+30.00	3.9	

7 Occupied Bandwidth

The occupied bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency.

The 99% bandwidth is the bandwidth in which 99% of the transmitted power occupied.

20 dB bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer.

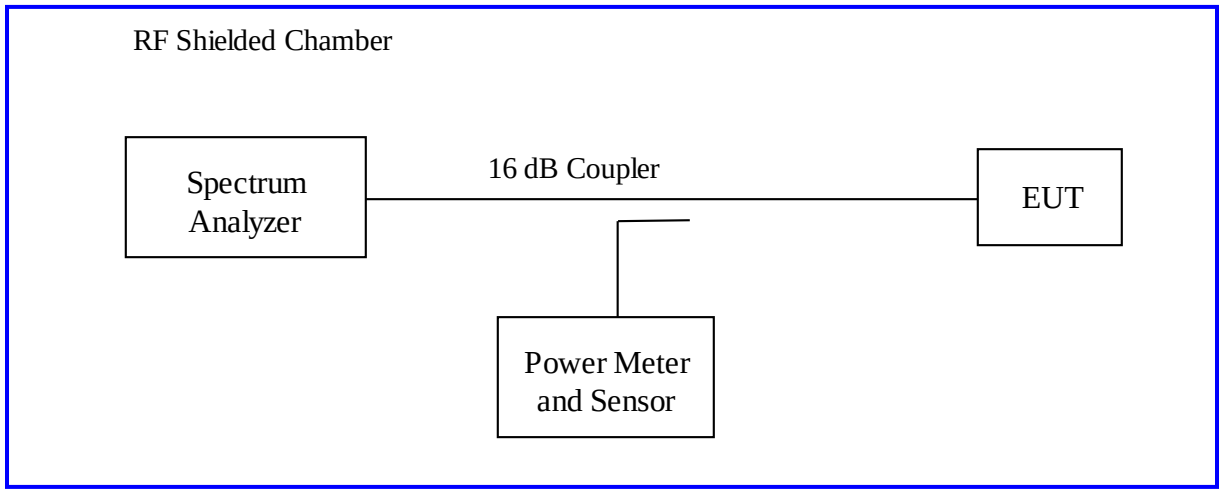
The 6dB bandwidth is defined the bandwidth of 6dBr from highest transmitted level of the fundamental frequency.

The minimum 6 dB bandwidth shall be at least 500 kHz per Section CFR47 15.247(a2) 2017 and RSS-247 Sect. 5.3(a) Issue 2, 2017.

7.1.1 Test Method

The conducted method was used to measure the occupied bandwidth according to ANSI C63.10:2013 Section 11.8. The measurement was performed with modulation per CFR47 15.247 (a) (2) 2016 and RSS Gen Sect. 6.6 2014. This test was conducted on 3 channels. The worst sample result indicated below.

Test Setup:

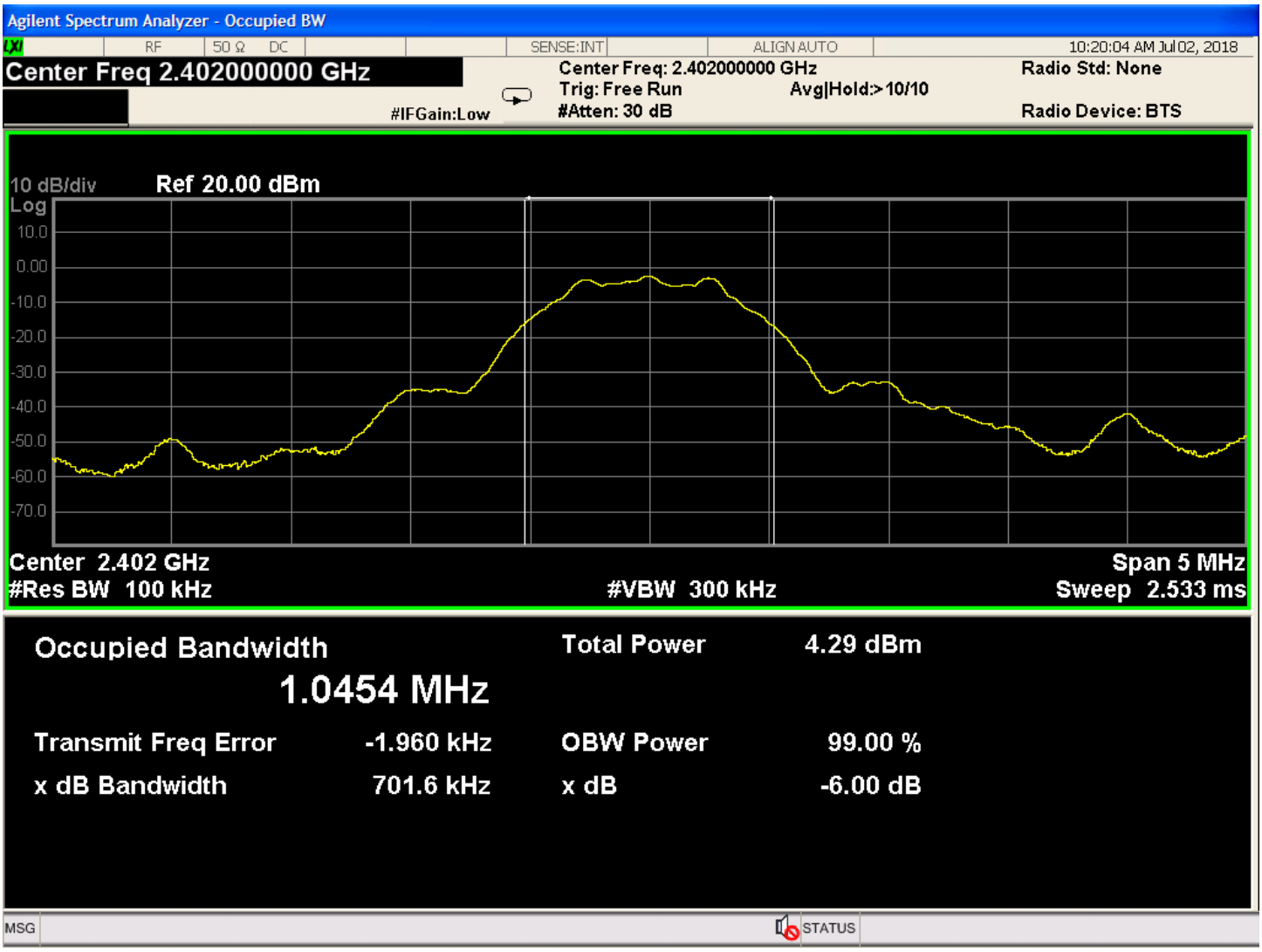


7.1.2 Results

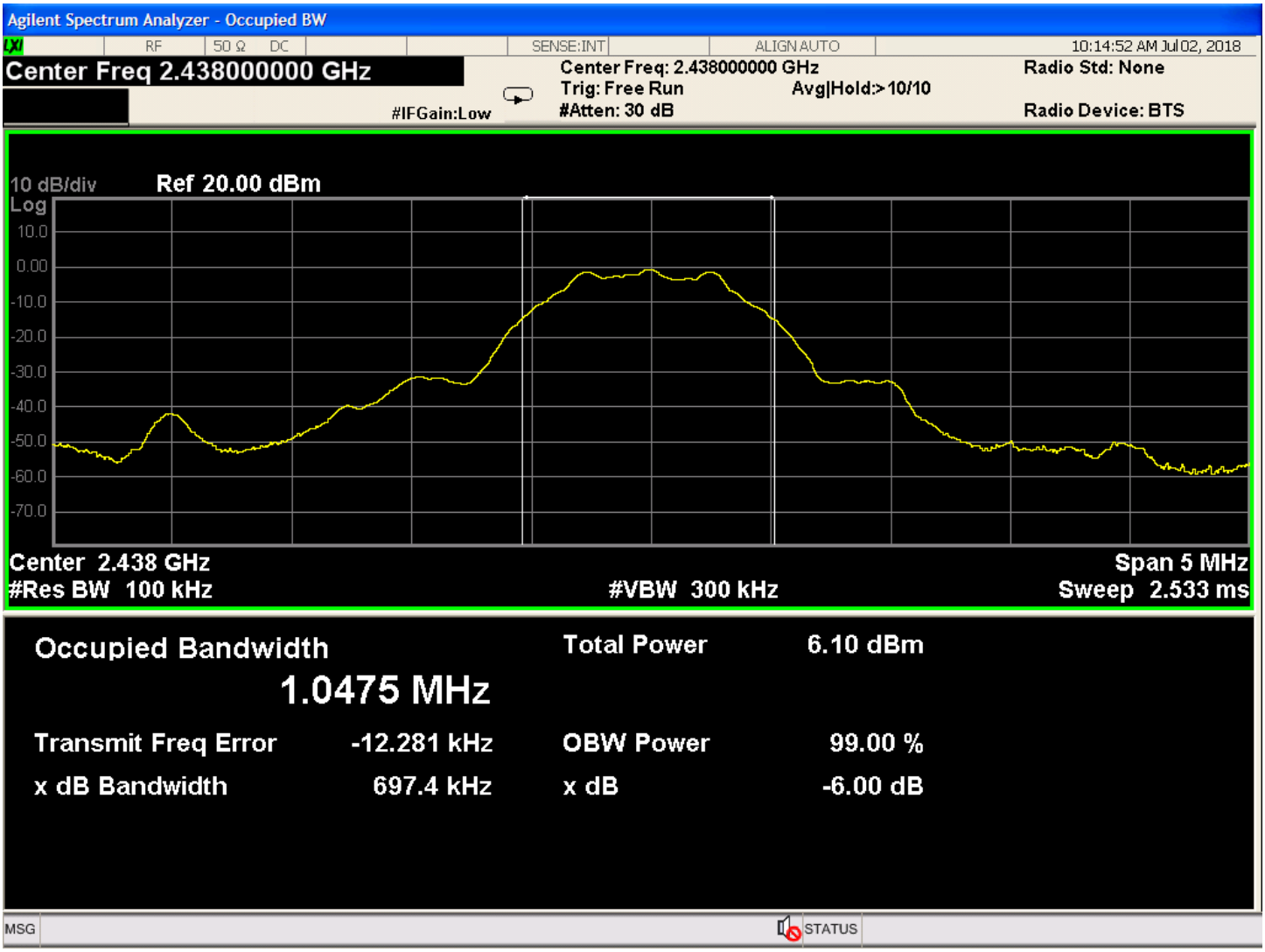
Test Conditions: Conducted Measurement, Normal Temperature	**Date**: 07/02/2018
Antenna Type: Integrated Antenna	**Power Setting:** Fixed
Max. Antenna Gain: 3.36dbi	**Signal State:** Modulated
Duty Cycle: 60%	**Data Rate:** 1mbps
Ambient Temp.: 23º C	**Relative Humidity:** 38 %RH

Results

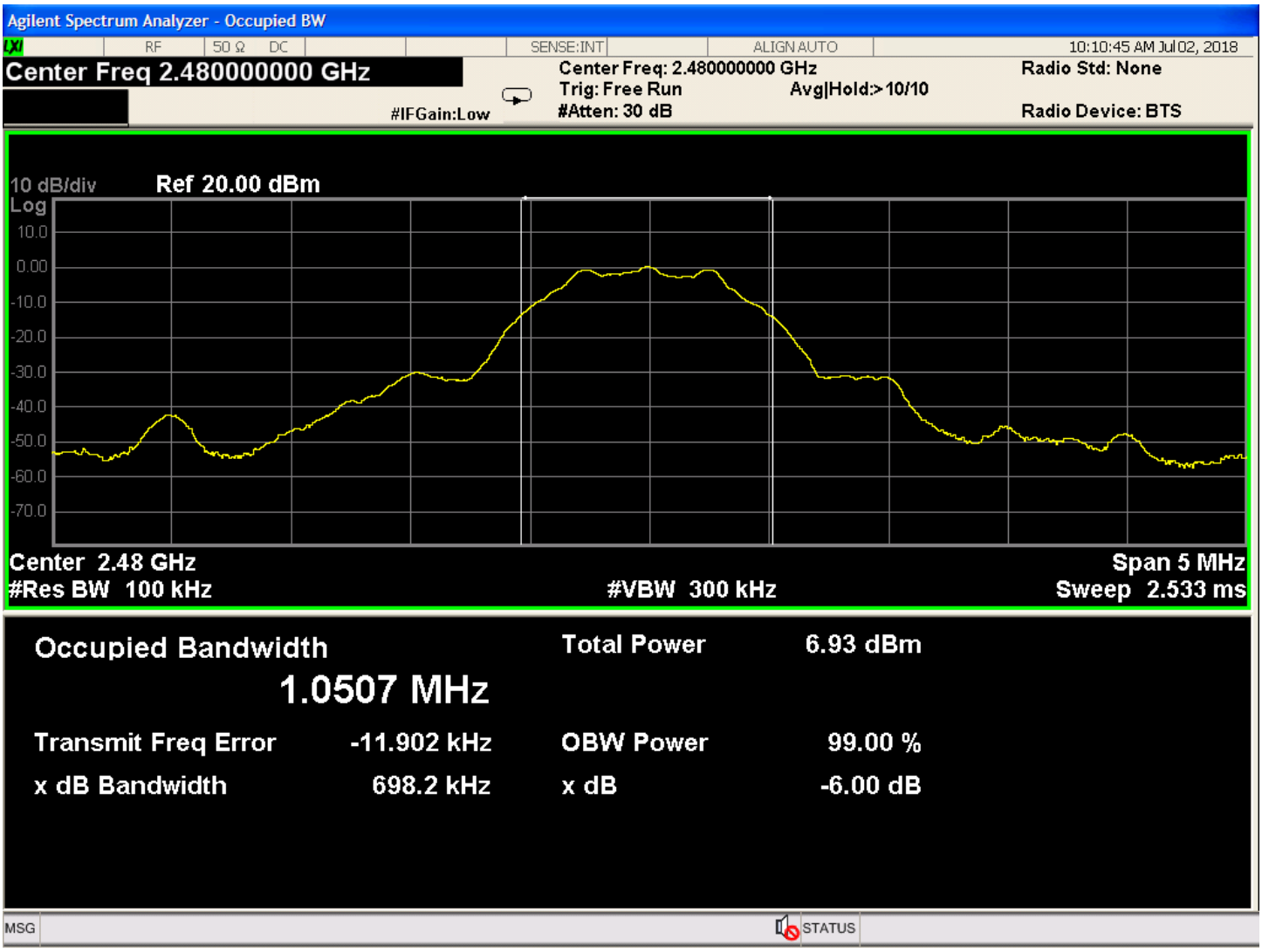
Mode	Operating Channel	Limit [dBm]	99% OBW	-6db BW
BLE	2402 MHz	>500khz	1.04	.701
	2438 MHz	>500khz	1.04	.697
	2480 MHz	>500khz	1.05	.698



OBW BLE mode 2402



OBW BLE mode 2438



OBW BLE mode 2480

8 Peak Power Spectral Density

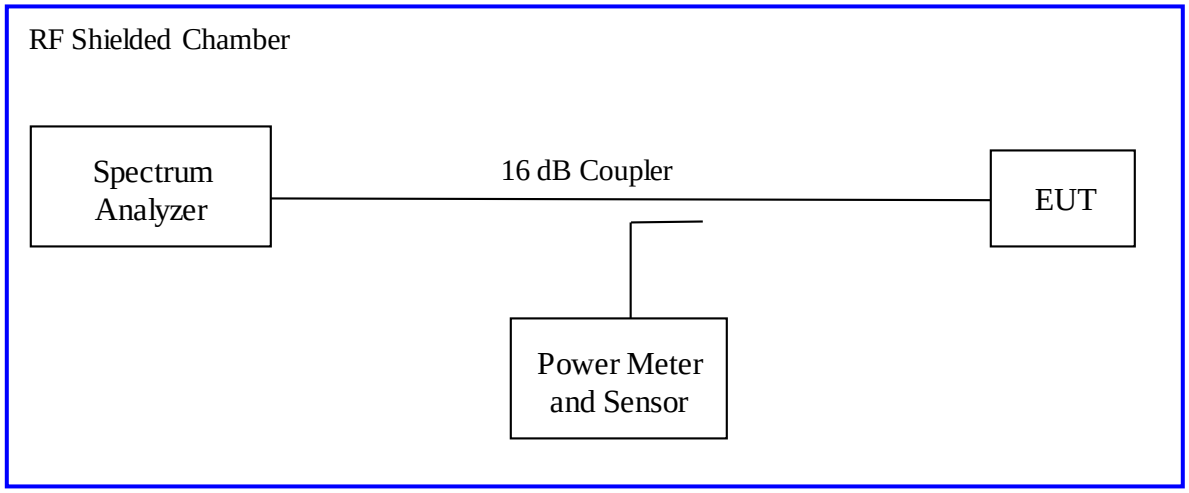
According to the CFR47 Part 15.247 (e) and RSS 247 Sect.5.2 (b), the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.1.1 Test Method

The conducted method was used to measure the channel power output per ANSI C63.10-2013 Section 11.10.3. The measurement was performed with modulation per CFR47 Part 15.247 (e) and RSS 247 Sect.5.2 (b). The pre-evaluation was performed to find the worst modes. The worst findings were conducted on 3 channels in each operating frequency range of 2400 MHz to 2483.5 MHz. The worst sample result indicated below.

Will demonstrate compliance to the rules required for DTS per KDB 453039

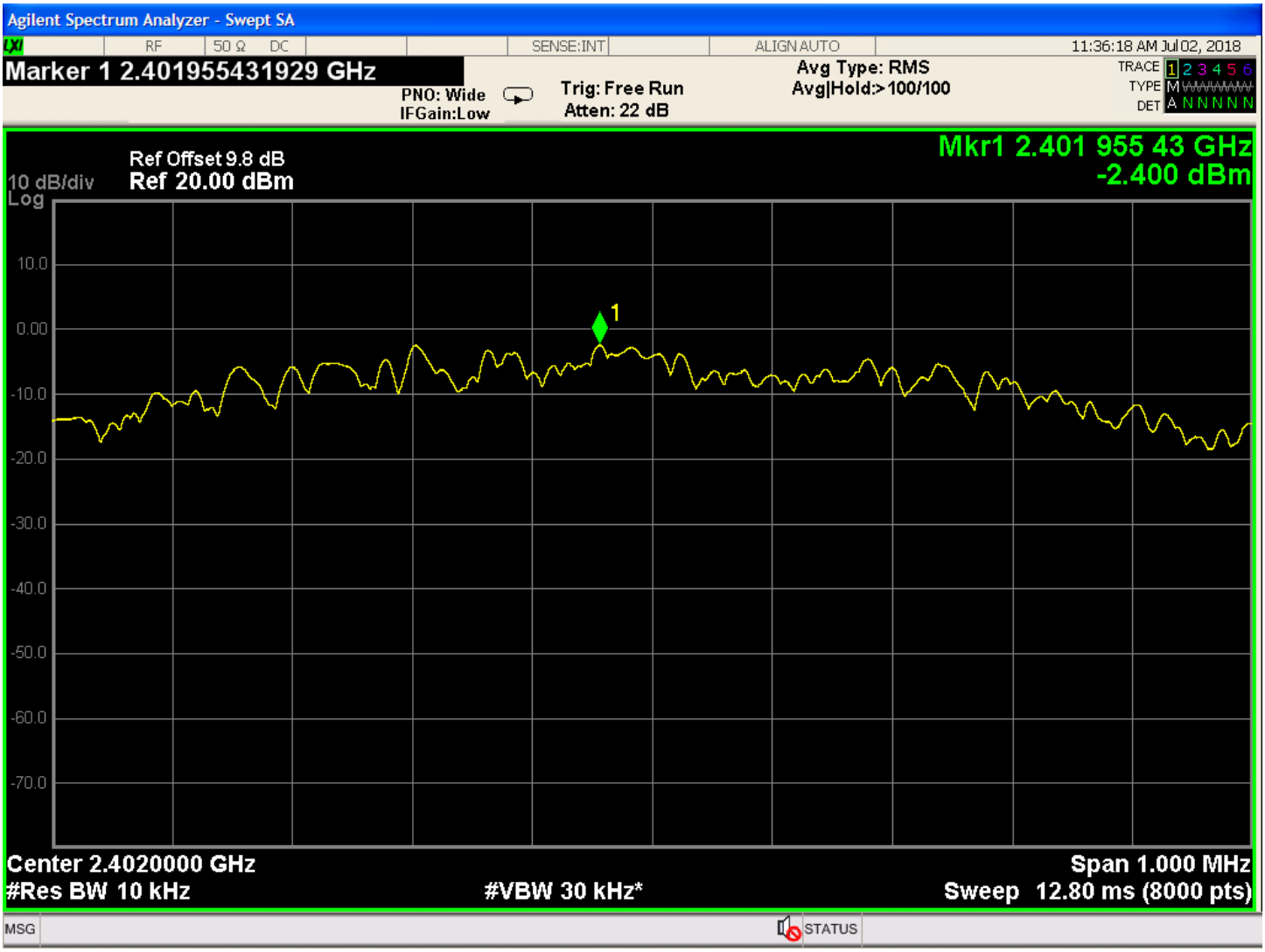
Test Setup:



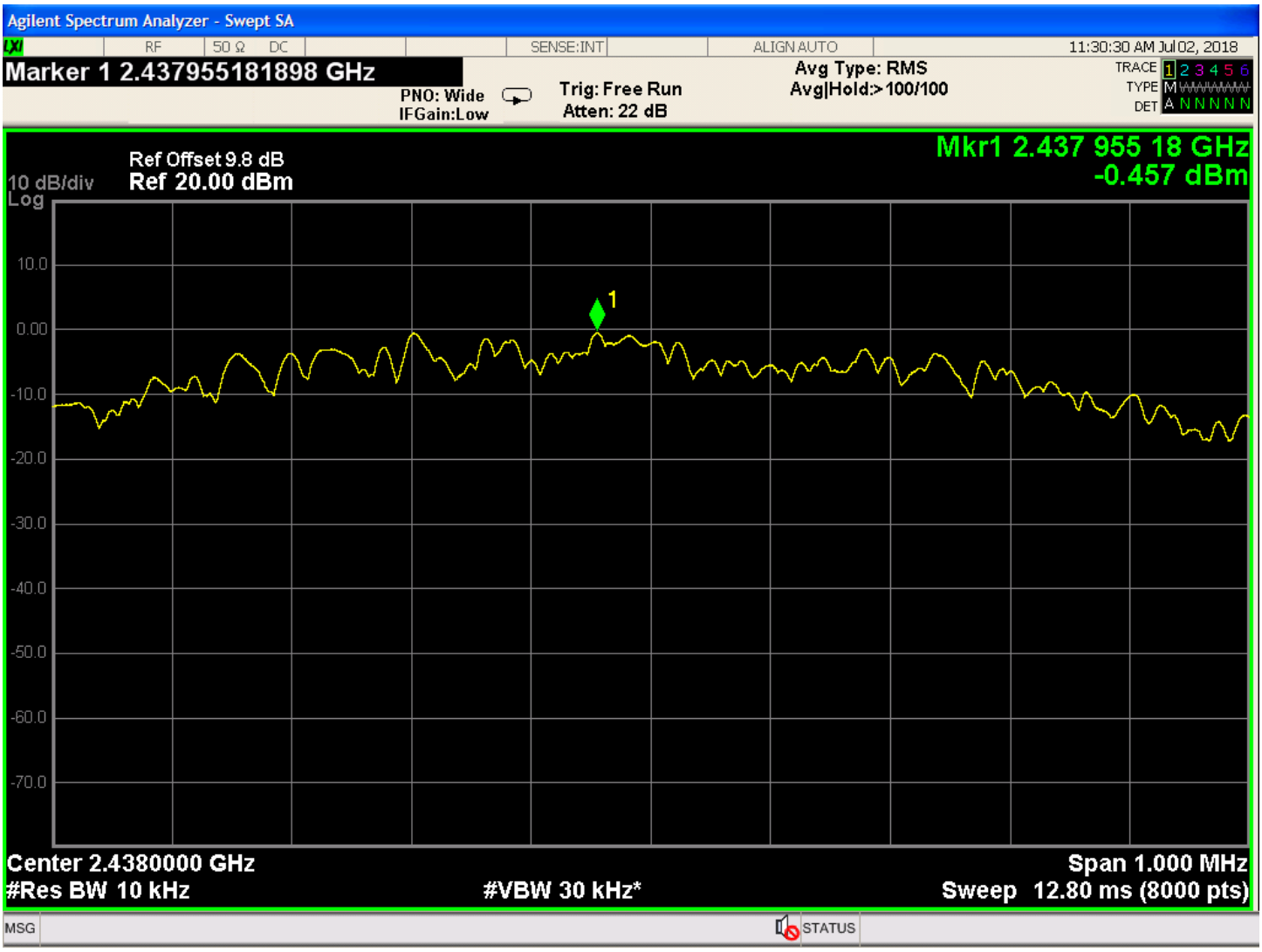
Test Conditions: Conducted Measurement, Normal Temperature	**Date**: 07/02/2018
Antenna Type: Integrated PIFA Antenna	**Power Setting:** Fixed
Max. Antenna Gain: 3.36dbi	**Signal State:** Modulated
Duty Cycle: 60%	**Data Rate:** 1 mbps
Ambient Temp.: 23º C	**Relative Humidity:** 38 %RH

Results

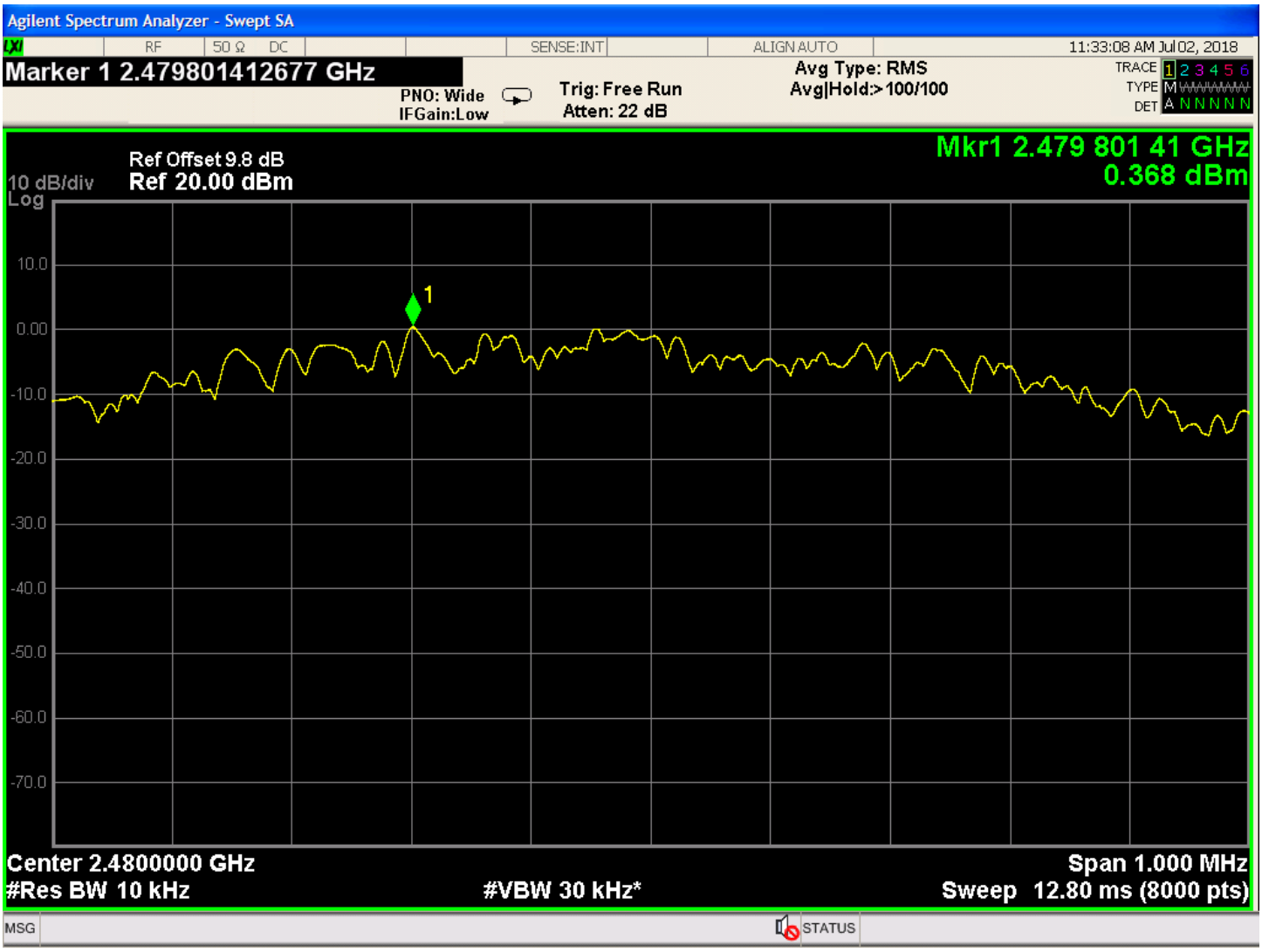
Mode	Operating Channel	Limit [dBm]	PPSD [dBm]	Corrected to 3kHz (dbm)
BLE	2402 MHz	8	-2.4	-7.6
	2438 MHz	8	-.45	-5.7
	2480 MHz	8	-.368	-5.6



Power Spectral Density BLE mode 2402



Power Spectral Density BLE mode 2438



Power Spectral Density BLE mode 2480

9 Non-Restricted Band Emission requirements

The setup was identical to RF output power measurement. Intentional radiators operating under the alternative provisions to the general emission limits, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If the frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Any frequency outside the band of 2400 MHz to 2483.5 MHz, the power output level must be below 20 dB from the in-band transmitting signal; CFR 47 Part 15.215, 15.247(d) and RSS 247 Sect.5.5.

Note: The Norton core mini will demonstrate compliance to the rules required for DTS per KDB 453039

The setup was identical to RF output power measurement.

9.1.1 Results

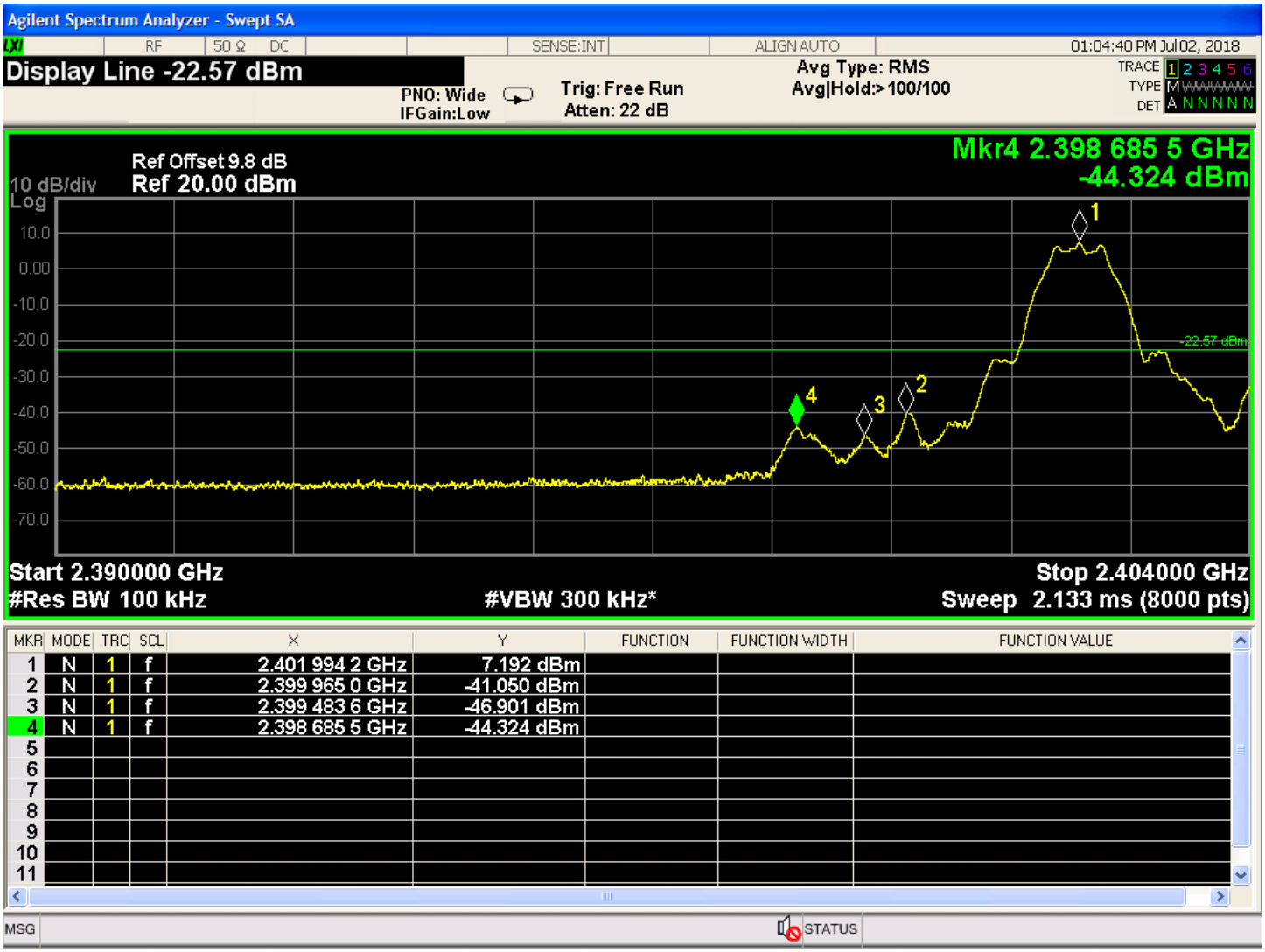
As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Non-Restricted band emissions

Test Conditions: Conducted Measurement, Normal Temperature	**Date**: 07/02/2018
Antenna Type: Integrated Antenna	**Power Setting:** Fixed
Max. Antenna Gain: 3.36	**Signal State:** Modulated
Duty Cycle: 60%	**Data Rate:** 1mbps
Ambient Temp.: 23º C	**Relative Humidity:** 38 %RH

Results

Mode		Operating Channel	Limit [dBm]	Final Result	Comments
BLE		2402 MHz	-22.57	Pass	


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:INT
ALIGN AUTO
01:04:40 PM Jul 02, 2018
Display Line -22.57 dBm
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 22 dB
Avg Type: RMS
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET A N N N N N
Ref Offset 9.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr4 2.398 685 5 GHz
-44.324 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-22.57 dBm
Start 2.390000 GHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 2.404000 GHz
Sweep 2.133 ms (8000 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.401 994 2 GHz 7.192 dBm
2 N 1 f 2.399 965 0 GHz -41.050 dBm
3 N 1 f 2.399 483 6 GHz -46.901 dBm
4 N 1 f 2.398 685 5 GHz -44.324 dBm
5
6
7
8
9
10
11
MSG
STATUS

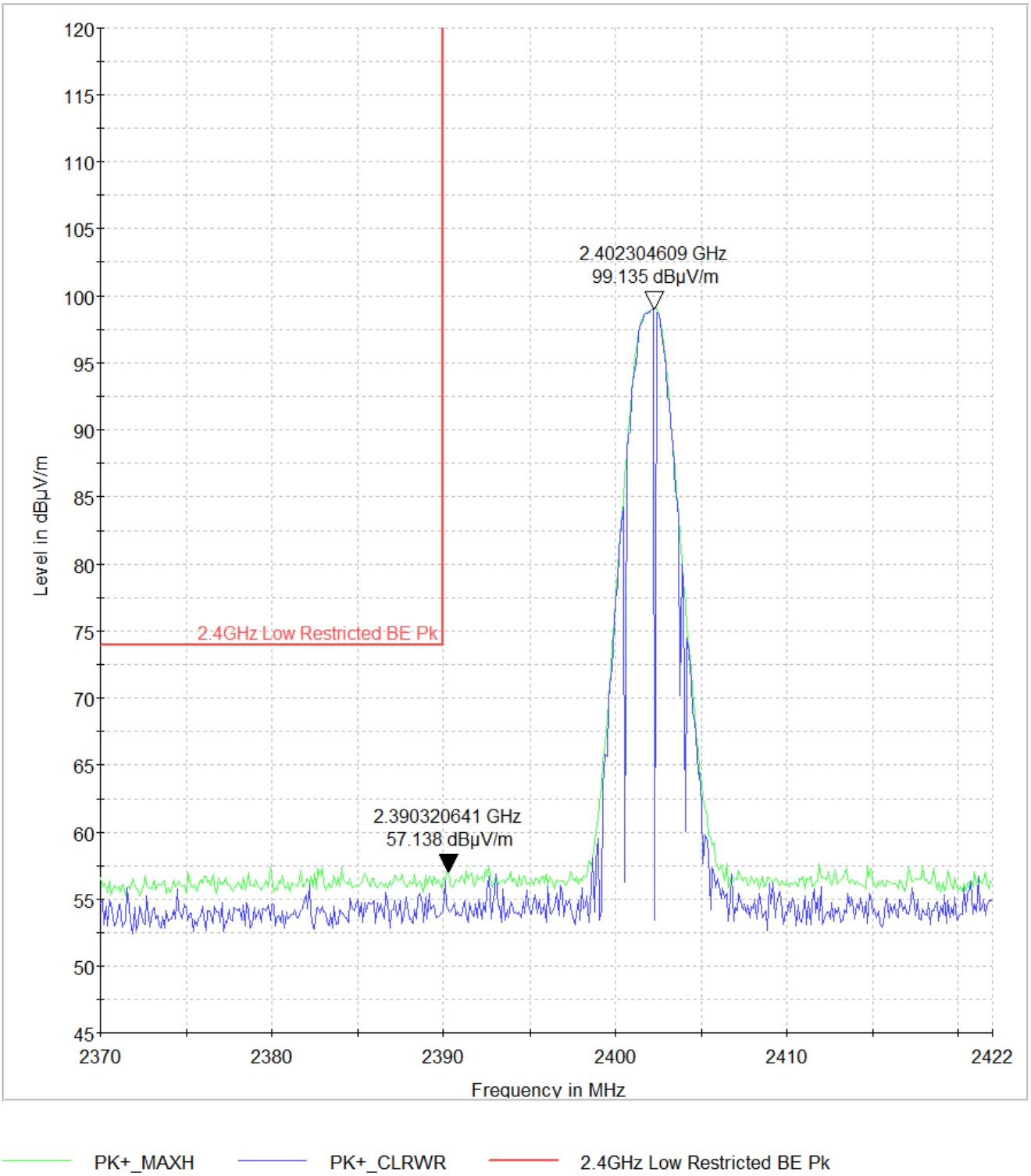
10 Restricted Band edges

10.1.1 Peak Band edge Emissions

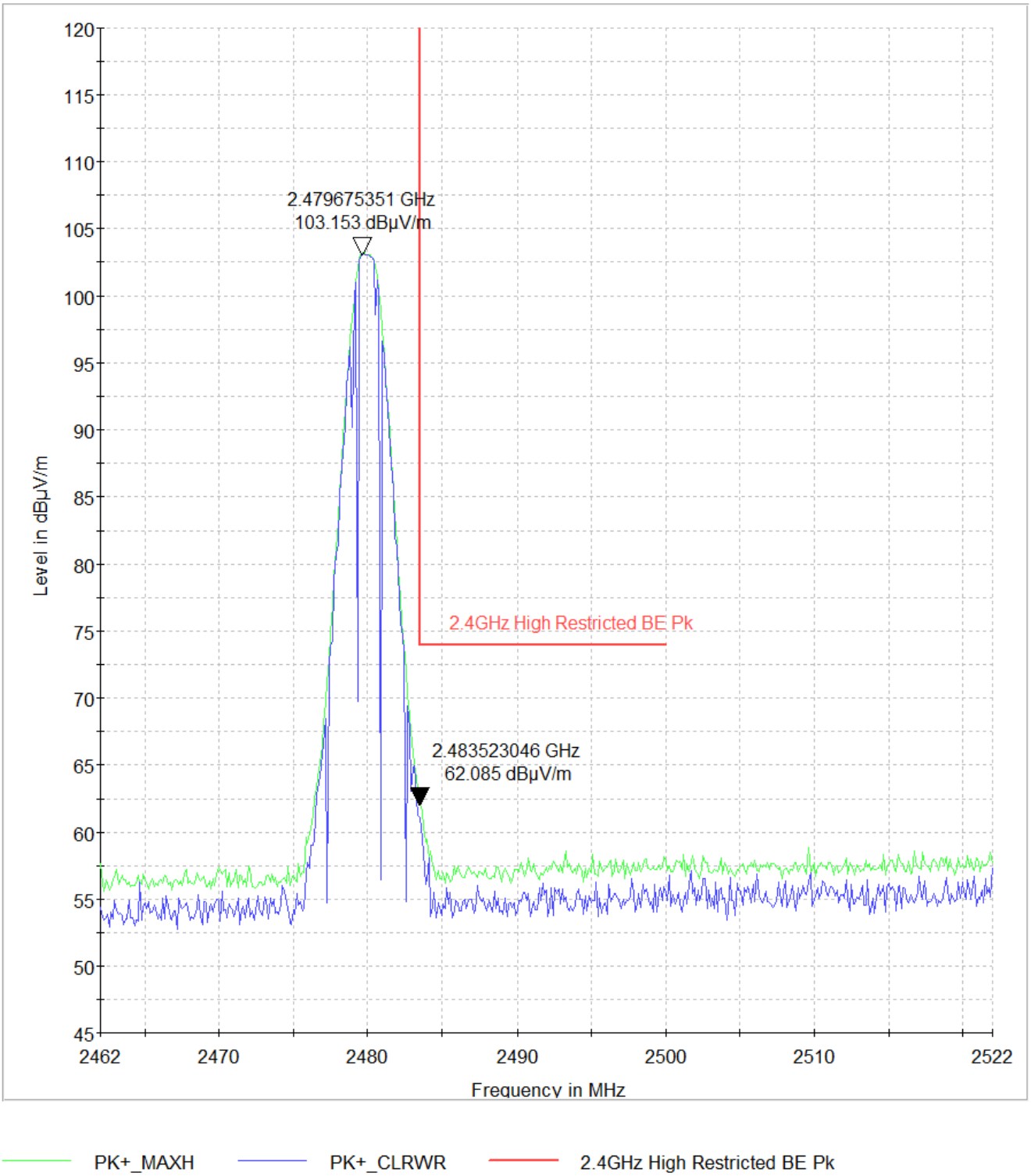
Test Method

The ANSI C63.10-2013 Section 6.10.5 the procedure described was followed testing in an anechoic chamber. The preliminary investigation was not needed as the interface supports only one modulation and one power setting. A diag program called QRCT was used to set the BT in continuous Tx mode and also to set the channel, channel power and data rate. This test was conducted on the edge channels.

Mode	Operating Channel	Limit dbuV	Max Emission dbuV	Comments
BLE	2402	74	57.1	
	2480	74	62	



BLE band BLE Bandedge 2402



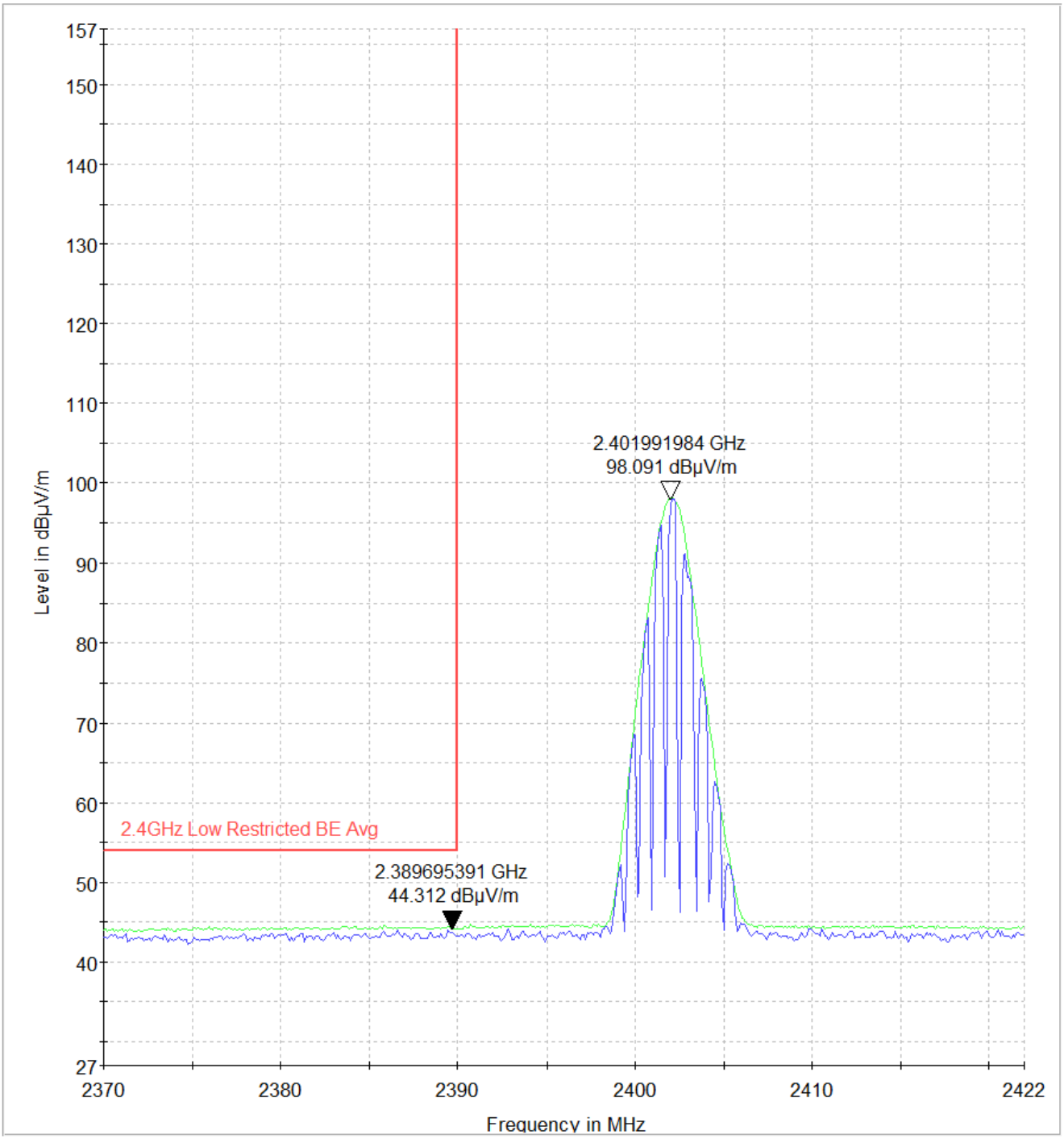
BLE band edge 2480

10.1.2 Average Band Edge Emissions

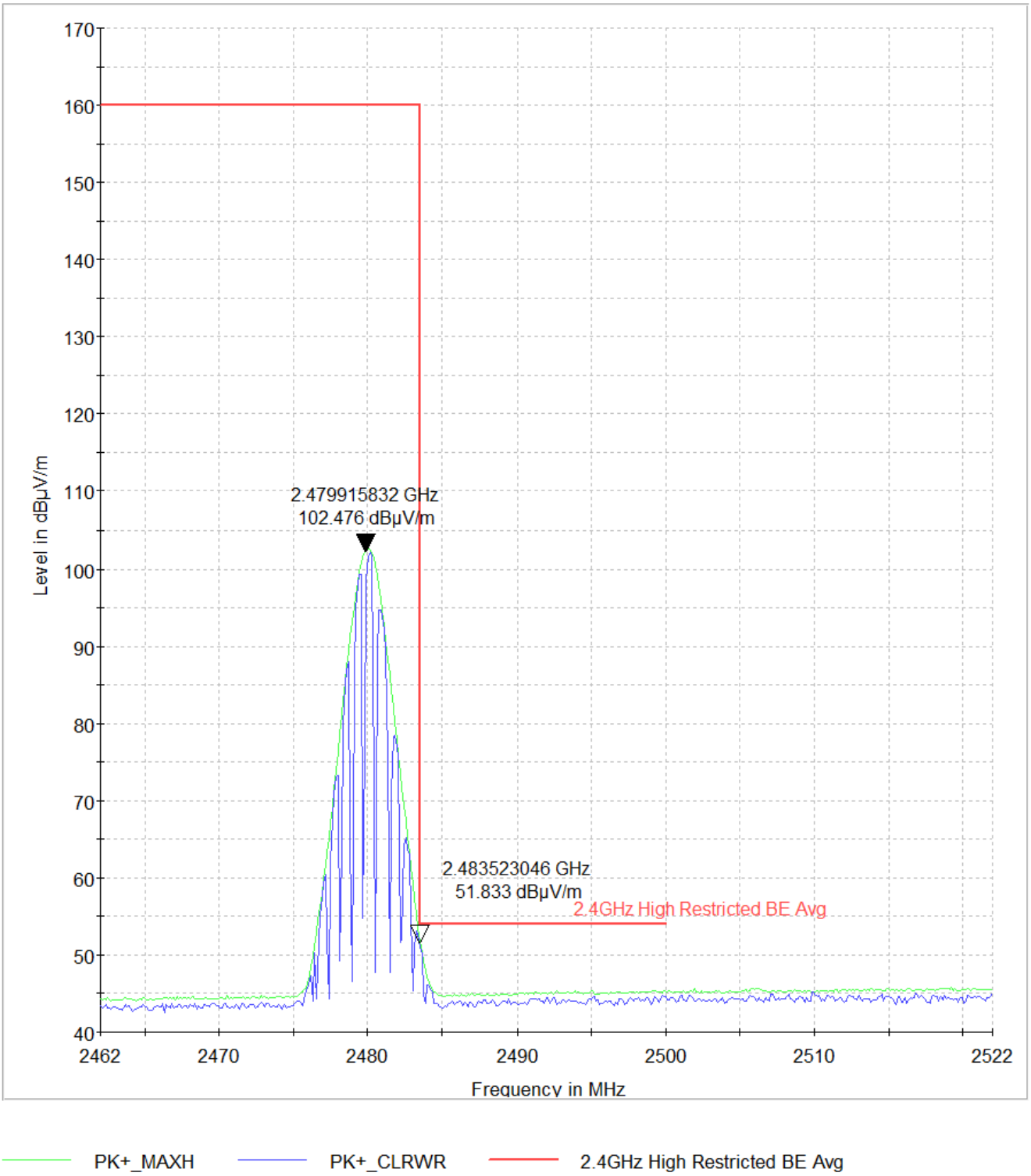
Test Method

The ANSI C63.10-2013 Section 6.10.5 and 11.13.3.5 the procedure described was followed testing in an anechoic chamber. The preliminary investigation was not needed as the interface supports only one modulation and one power setting. A diag program called QRCT was used to set the BT in continuous Tx mode and also to set the channel, channel power and data rate. This test was conducted on the edge channels.

Mode	Operating Channel	Limit dbuV	Max Emission dbuV	Comments
BLE	2402	54	44.3	
	2480	54	51.8	



BLE band edge 2402



BLE band edge 2480

11 Restricted Band Emissions

9KHz-30MHz

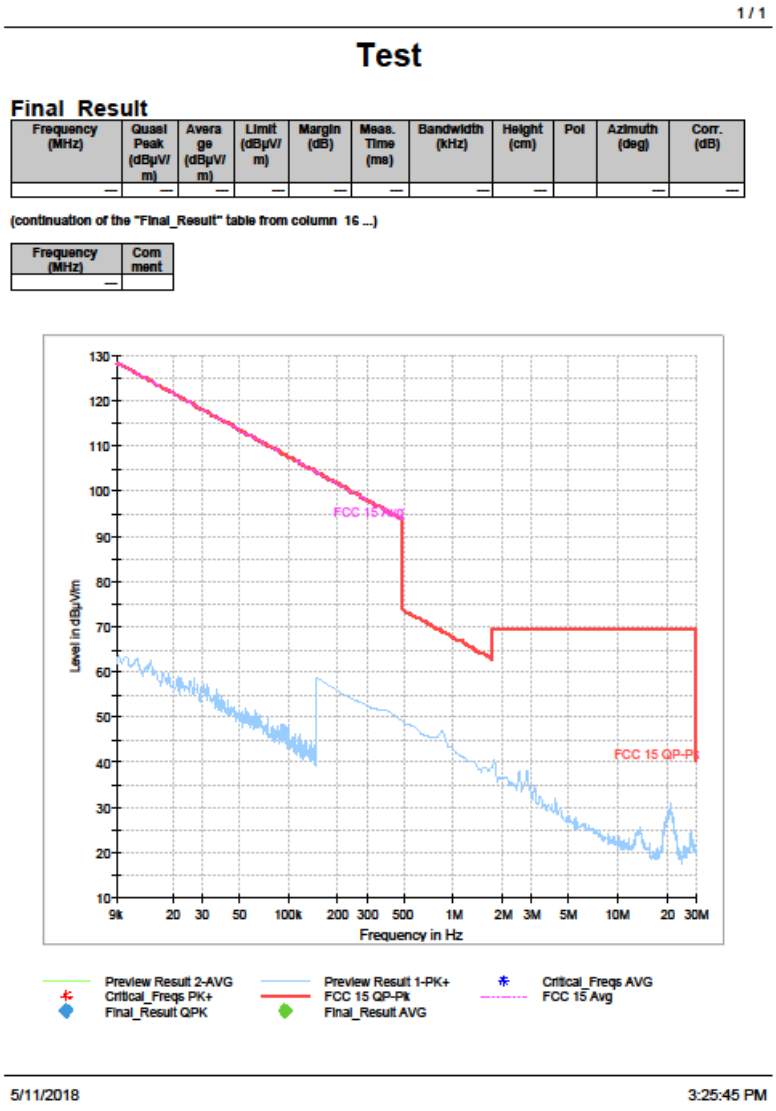


Figure 9 9KHz-30MHz_BTLE_Ch_0

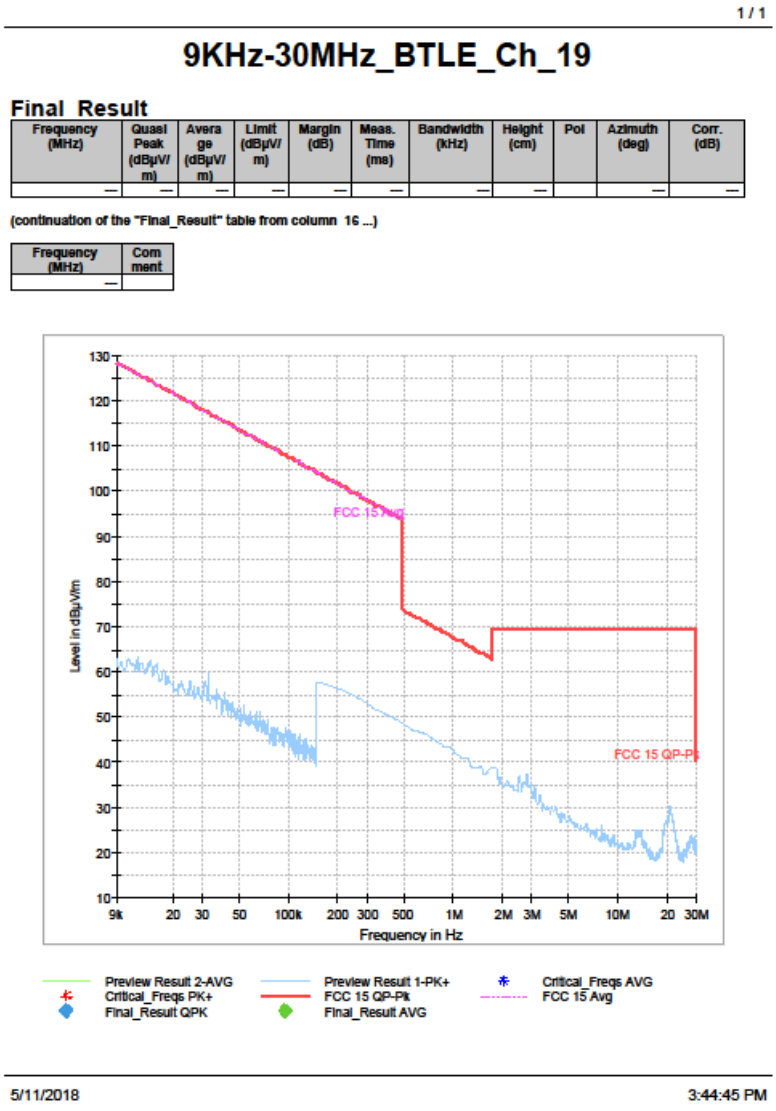


Figure 10 9KHz-30MHz_BTLE_Ch_19

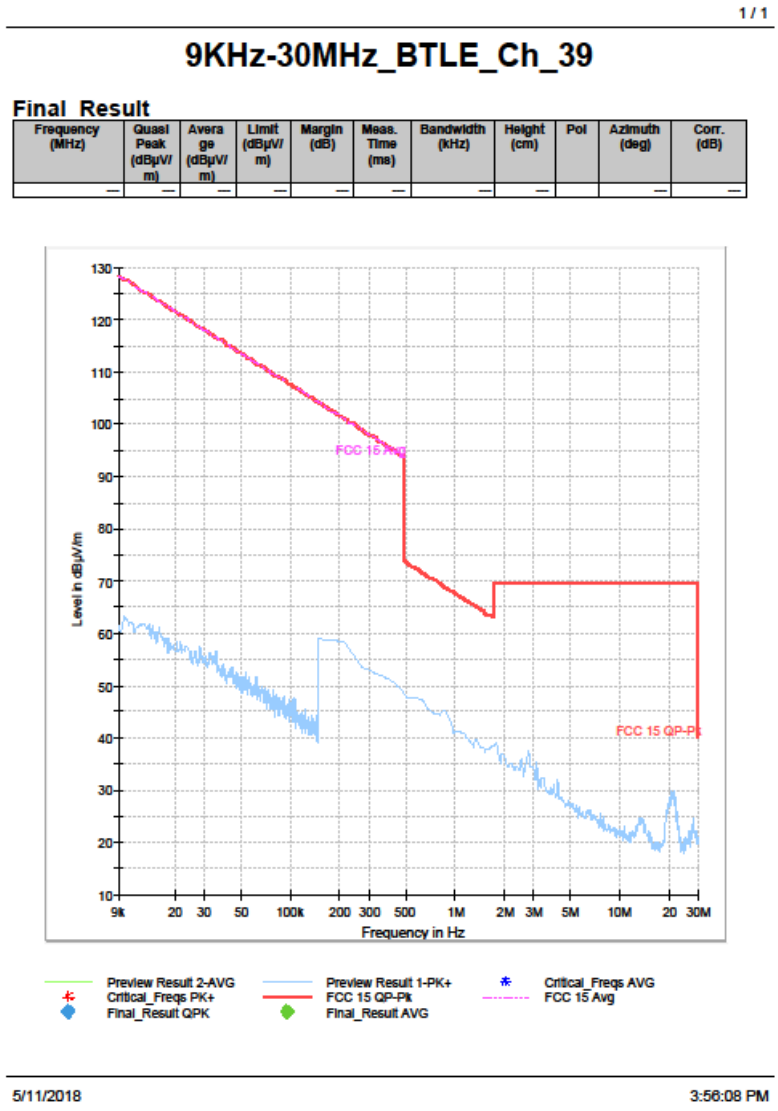


Figure 11 9KHz-30MHz_BTLE_Ch_39

30MHz-1GHz

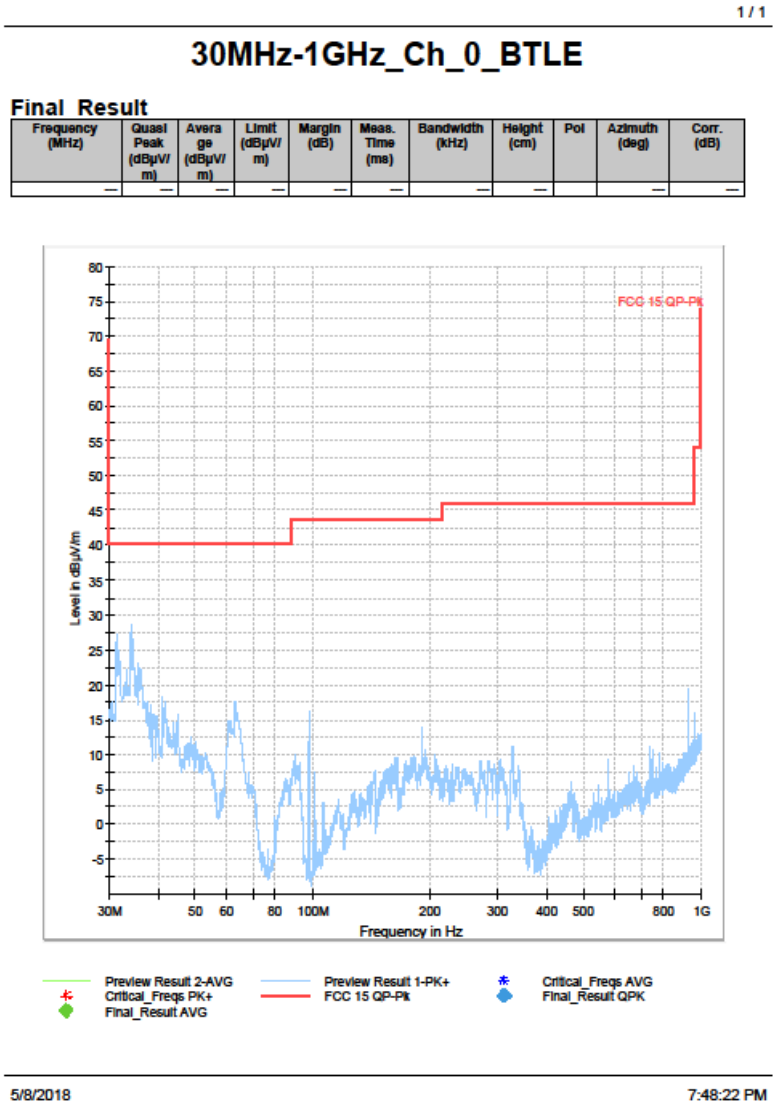


Figure 12 30MHz-1GHz_Ch_0_BTLE

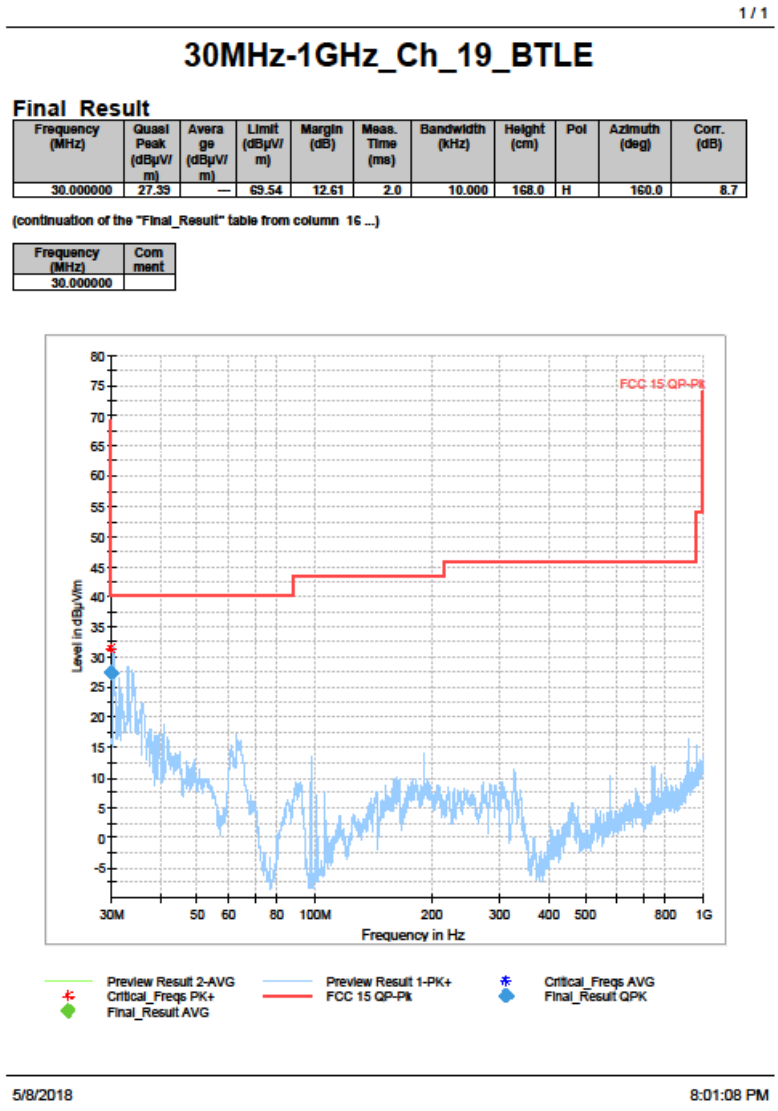


Figure 13 30MHz-1GHz_Ch_19_BTLE

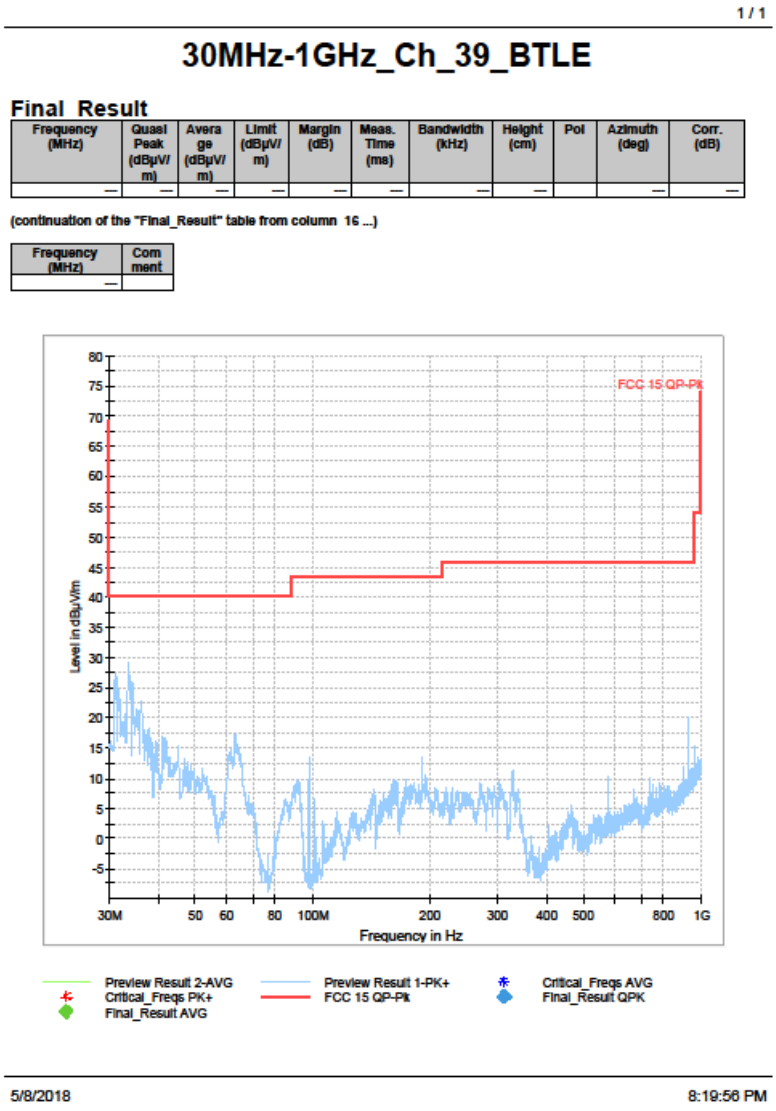


Figure 14 30MHz-1GHz_Ch_39_BTLE

1-3.5GHz

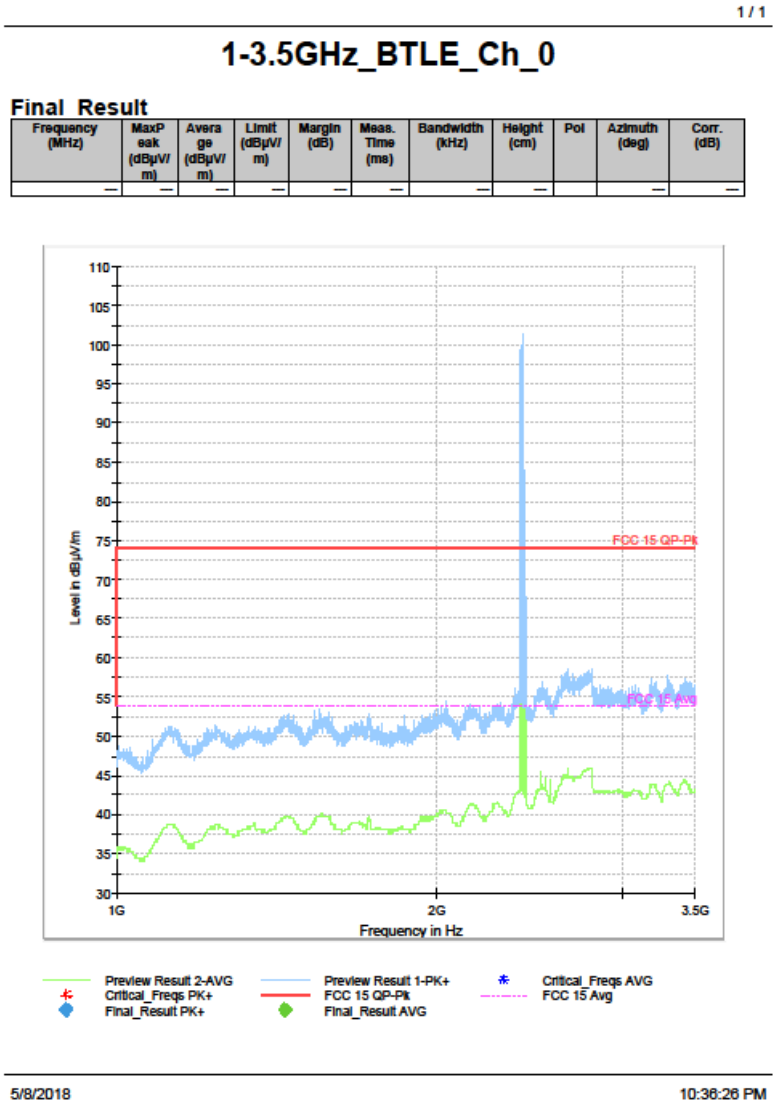


Figure 1 1-3.5GHz_BTLE_Ch_0

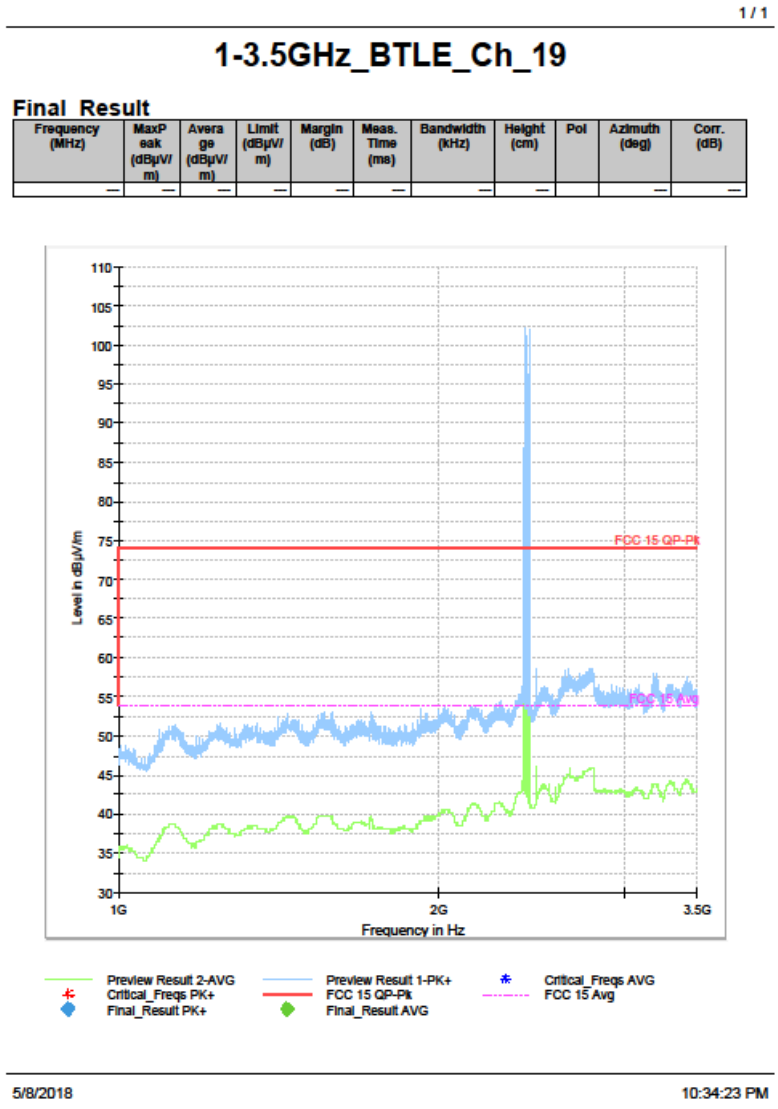


Figure 2 1-3.5GHz_BTLE_Ch_19

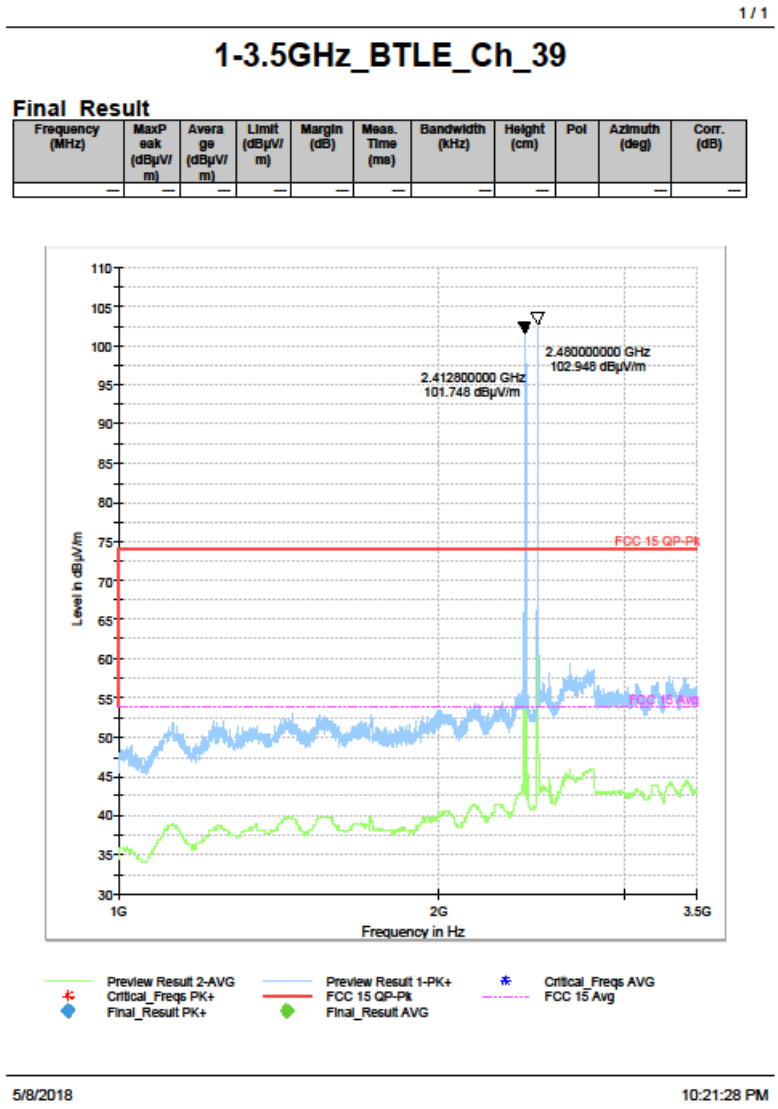


Figure 3 1-3.5GHz_BTLE_Ch_39

3.5-18GHz

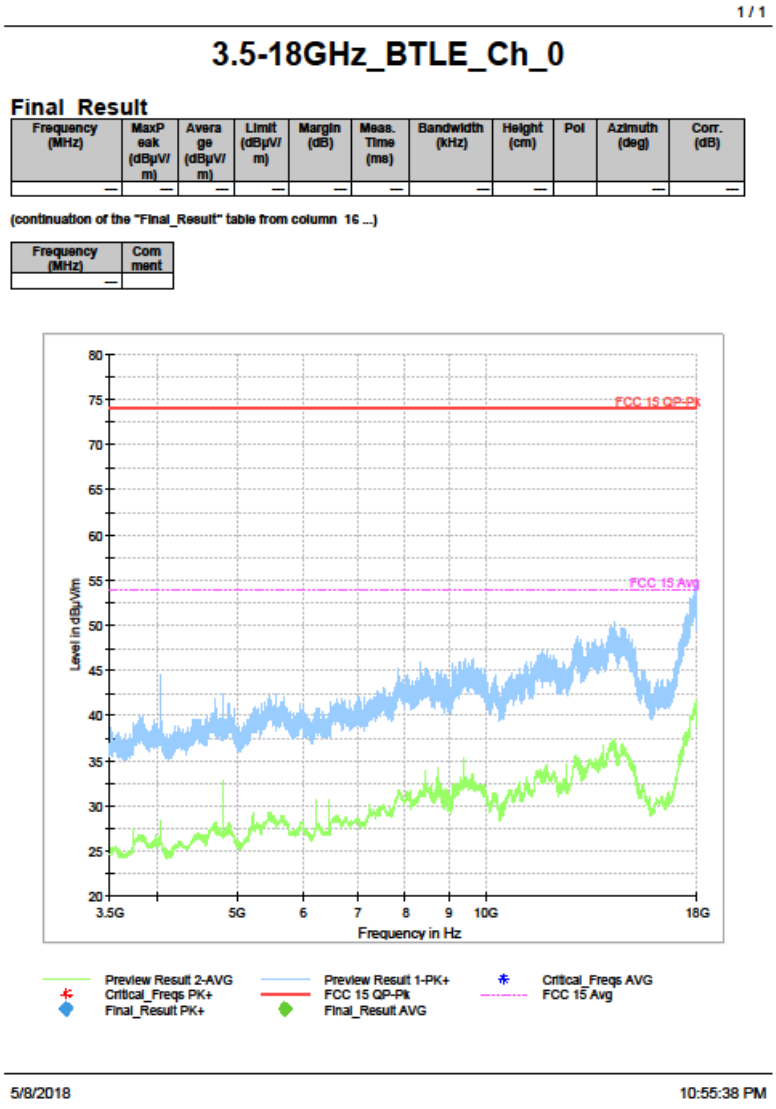


Figure 4 3.5-18GHz_BTLE_Ch_0

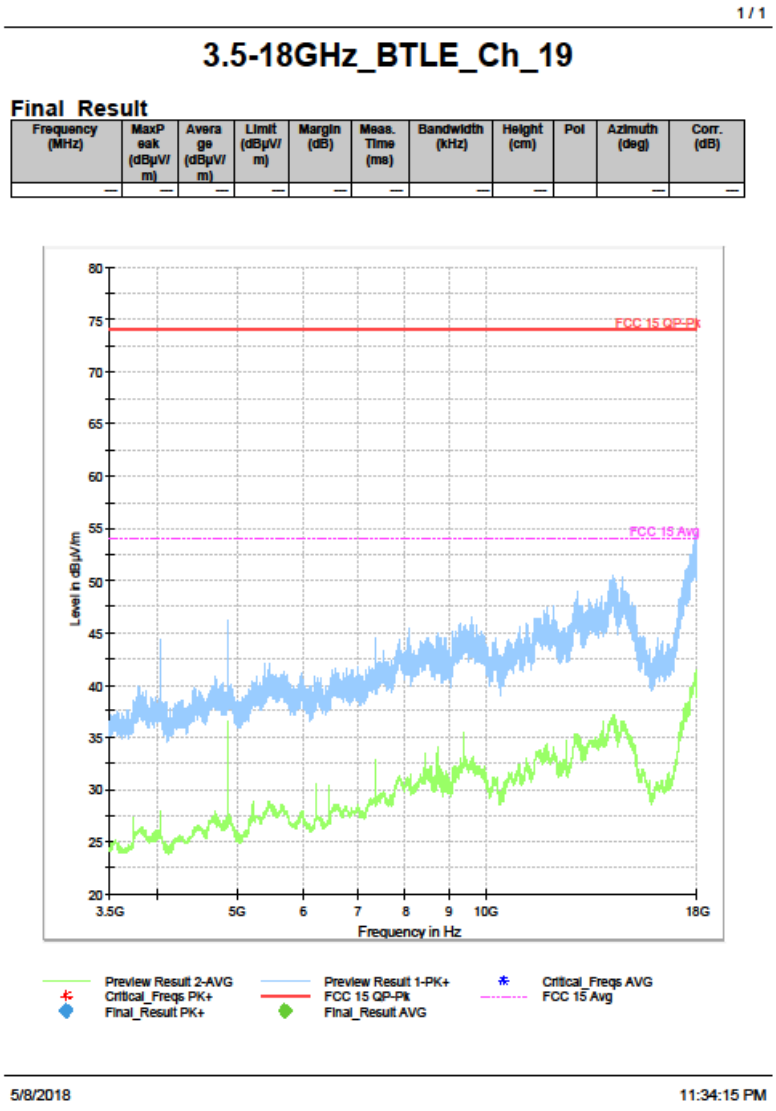


Figure 5 3.5-18GHz_BTLE_Ch_19

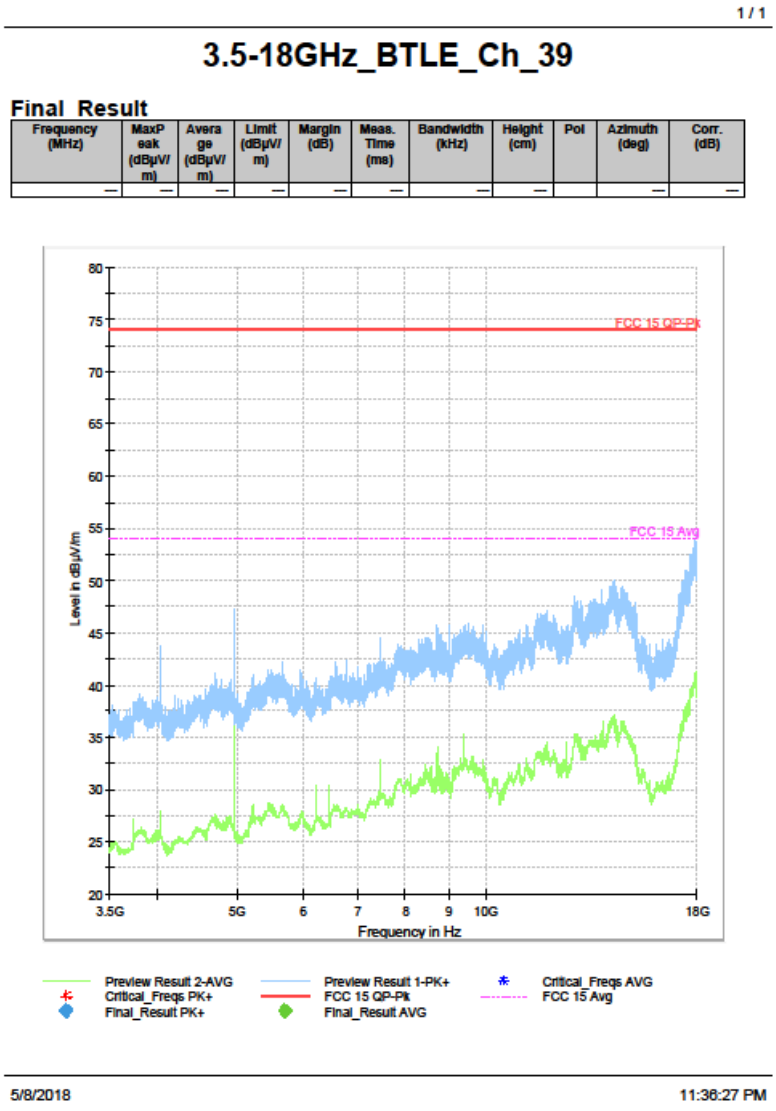


Figure 6 3.5-18GHz_BTLE_Ch_39

18-25GHz

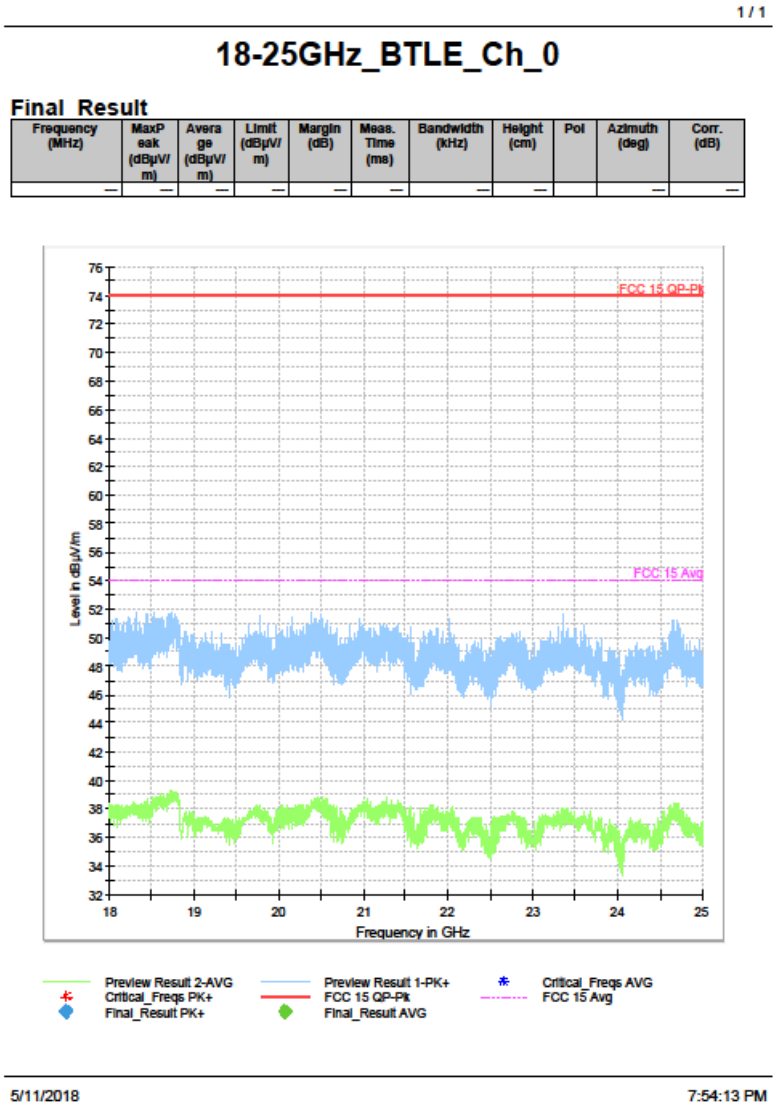


Figure 7 18-25GHz_BTLE_Ch_0

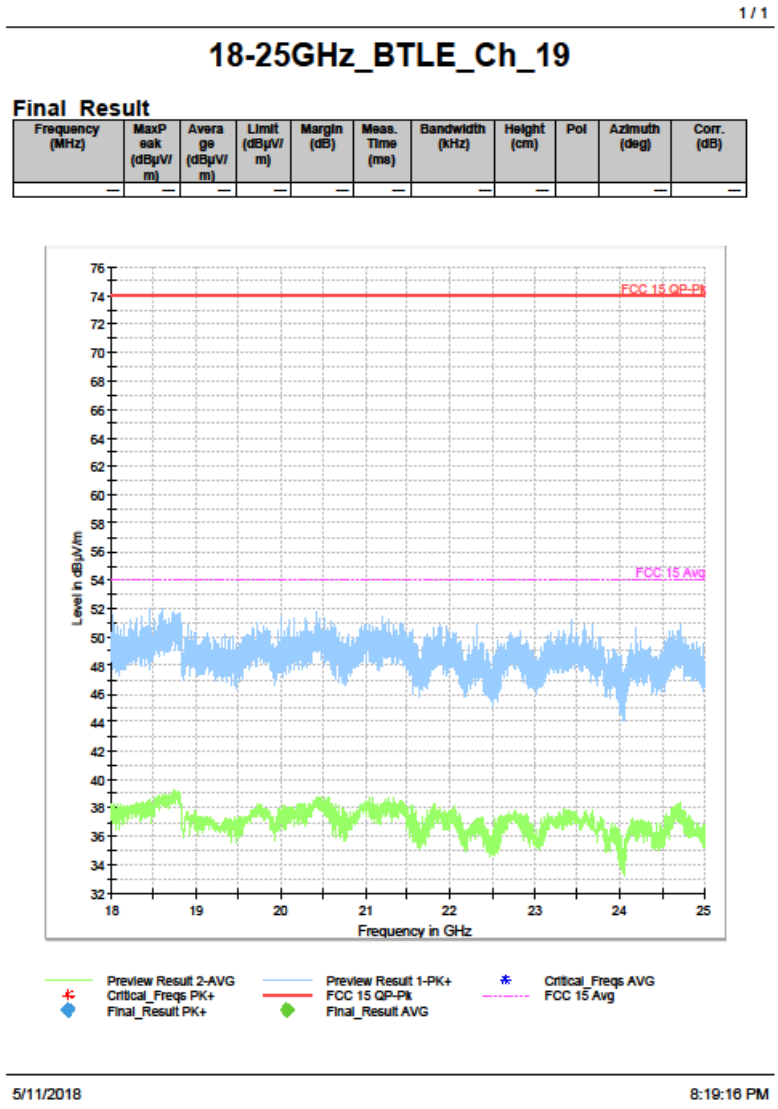


Figure 8 18-25GHz_BTLE_Ch_19

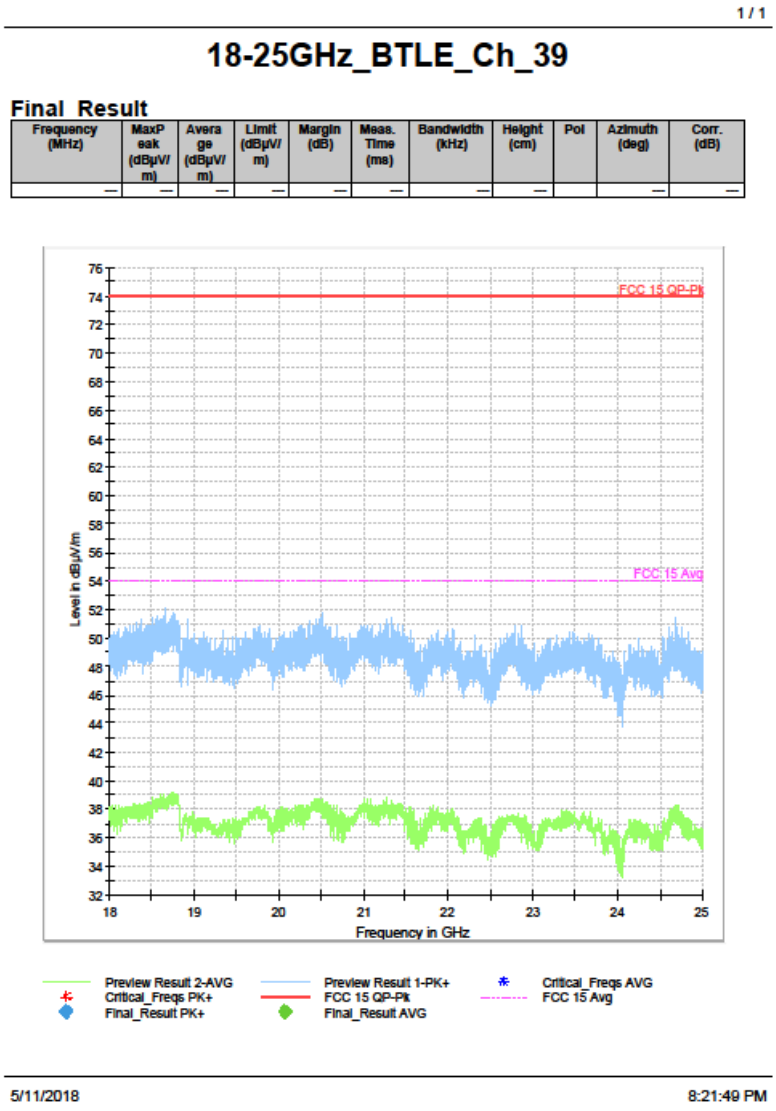


Figure 8 18-25GHz_BTLE_Ch_39

12 Conducted Emissions

Testing was performed in accordance with ANSI C63.10: 2013. These test methods are listed under the laboratory's A2LA Scope of Accreditation.

This test measures the levels emanating from the EUT's AC input port, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

The AC conducted emissions of equipment under test shall not exceed the values in CFR47 Part 15.207 and RSS-GEN. Sect. 8.8.

12.1.1 Test Methodology

A test program that controls instrumentation and data logging was used to automate the AC Power Line Conducted emission test procedure. The frequency range of interest was divided into sub-ranges such as to yield a frequency resolution of 9 kHz. Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a set of 50µH / 50Ω LISNs.

Testing is performed in Lab 5. The setup photographs clearly identify which site was used. The vertical ground plane used in the semi-anechoic chamber is a 2m x 2m solid aluminum frame and panel, and it is bonded to the horizontal ground plane.

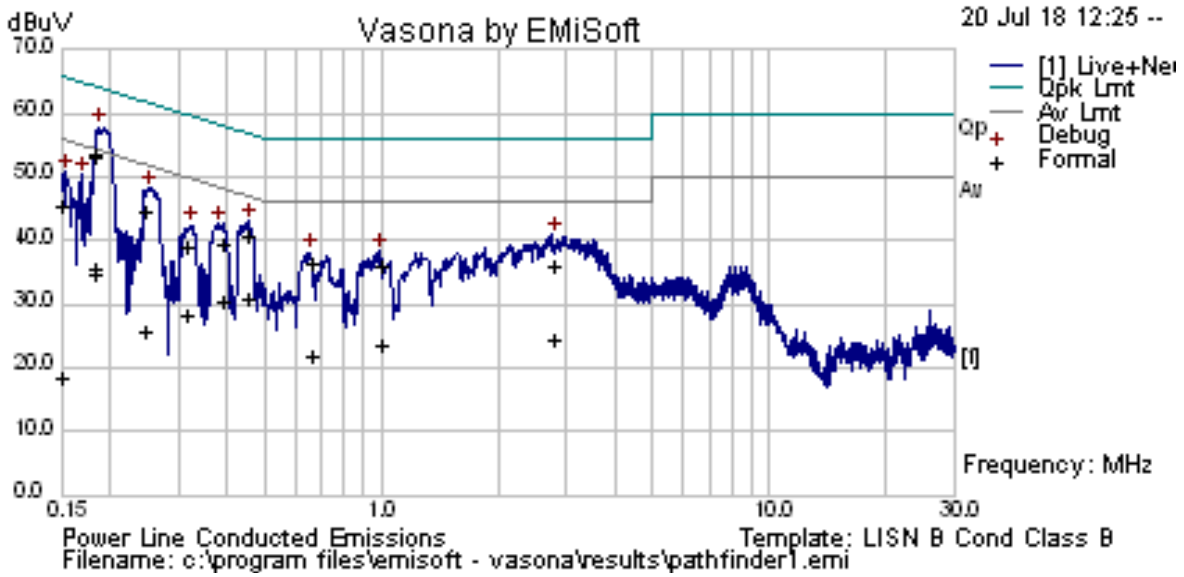
In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane. Support equipment was powered from a separate LISN.

Preliminary test performed on all modes. The worst case observed at 3DH1.

12.1.1.1 Deviations

There were no deviations from this test methodology.

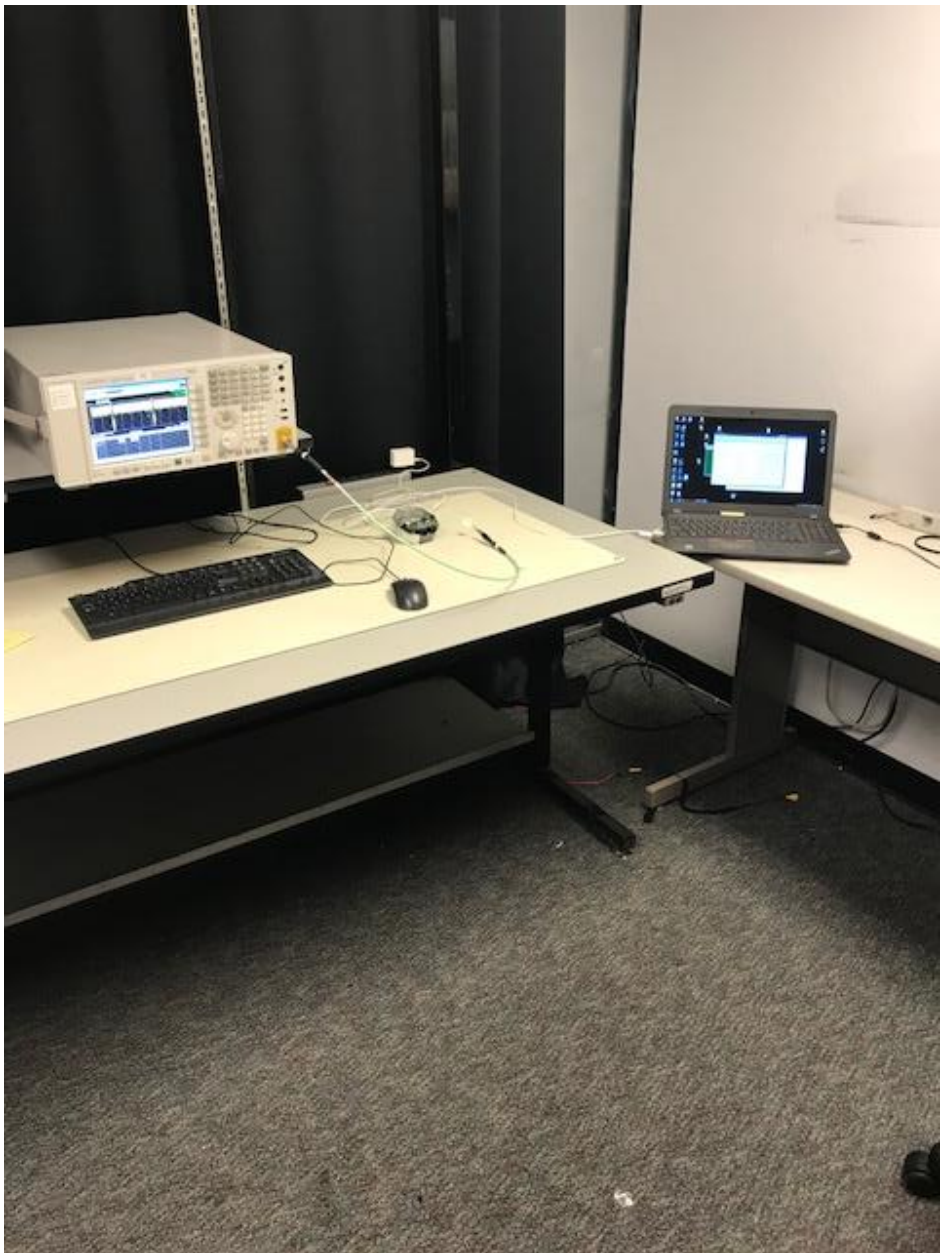
12.1.2 Test Results



Vasona Data : Formally Assessed Peaks										
No	Frequency	Raw dBu\	Cable Los	Factors d	Level dBu	Measurem	Line	Limit dBu\	Margin dE	Pass /Fail
1 (28)	0.15	45.44	0.07	0.03	45.55	Quasi Pea	Live	66	-20.45	Pass
2 (23)	0.18283	53.73	0.07	0.03	53.83	Quasi Pea	Live	64.36	-10.52	Pass
3 (25)	0.449715	40.51	0.1	0.04	40.65	Quasi Pea	Live	56.88	-16.23	Pass
4 (29)	0.392164	39.39	0.1	0.07	39.56	Quasi Pea	Live	58.02	-18.46	Pass
5 (30)	0.316016	38.98	0.09	0.01	39.07	Quasi Pea	Live	59.81	-20.74	Pass
6 (31)	0.991379	35.99	0.15	0.05	36.19	Quasi Pea	Live	56	-19.81	Pass
11 (28)	0.15	18.3	0.07	0.03	18.41	Average	Live	56	-37.59	Pass
12 (23)	0.18283	34.77	0.07	0.03	34.87	Average	Live	54.36	-19.48	Pass
13 (25)	0.449715	30.84	0.1	0.04	30.98	Average	Live	46.88	-15.9	Pass
14 (29)	0.392164	30.5	0.1	0.07	30.67	Average	Live	48.02	-17.35	Pass
15 (30)	0.316016	28.26	0.09	0.01	28.35	Average	Live	49.81	-21.46	Pass
16 (31)	0.991379	23.31	0.15	0.05	23.52	Average	Live	46	-22.48	Pass

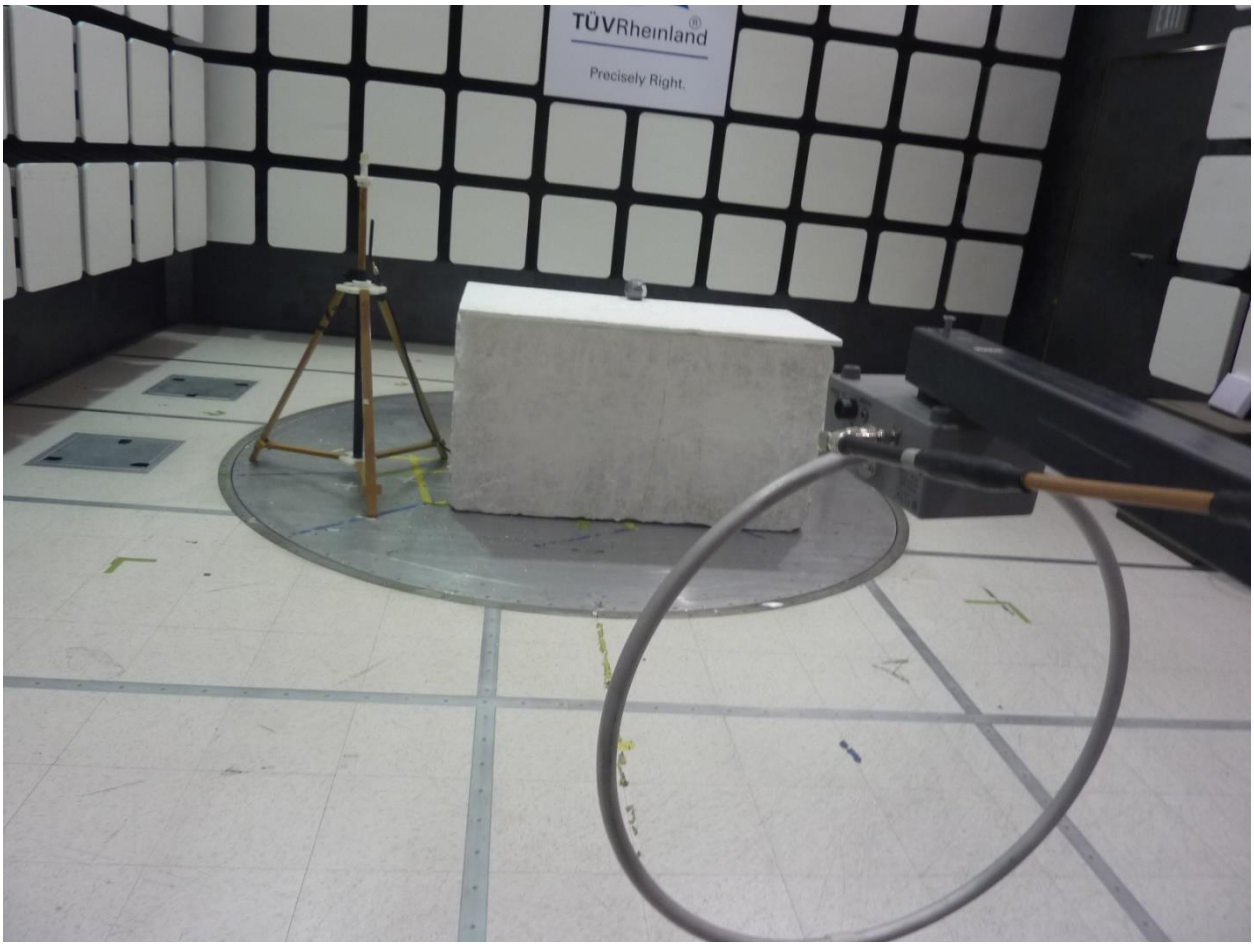
Conducted emissions channel 0

13 Photos

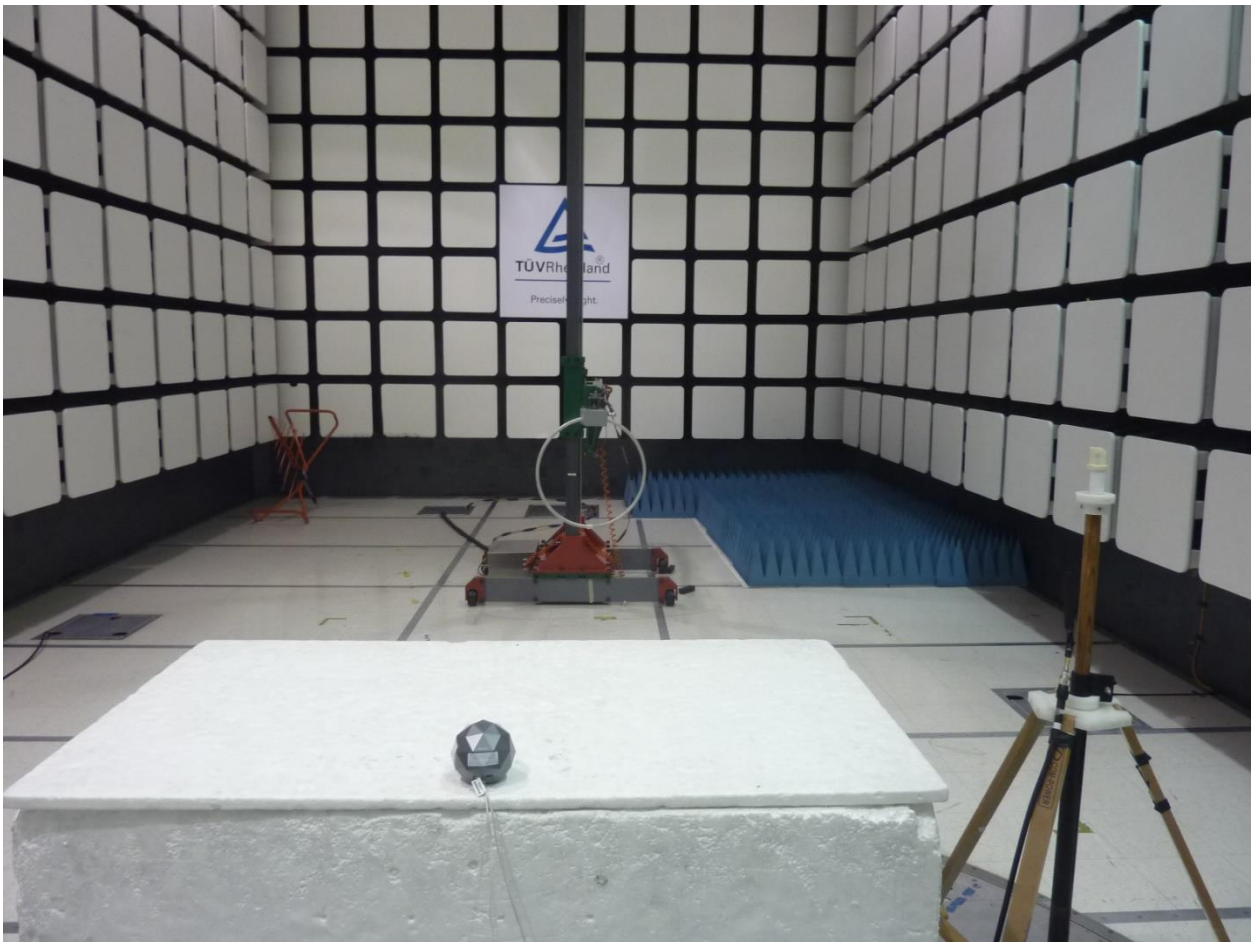


Conducted measurements setup

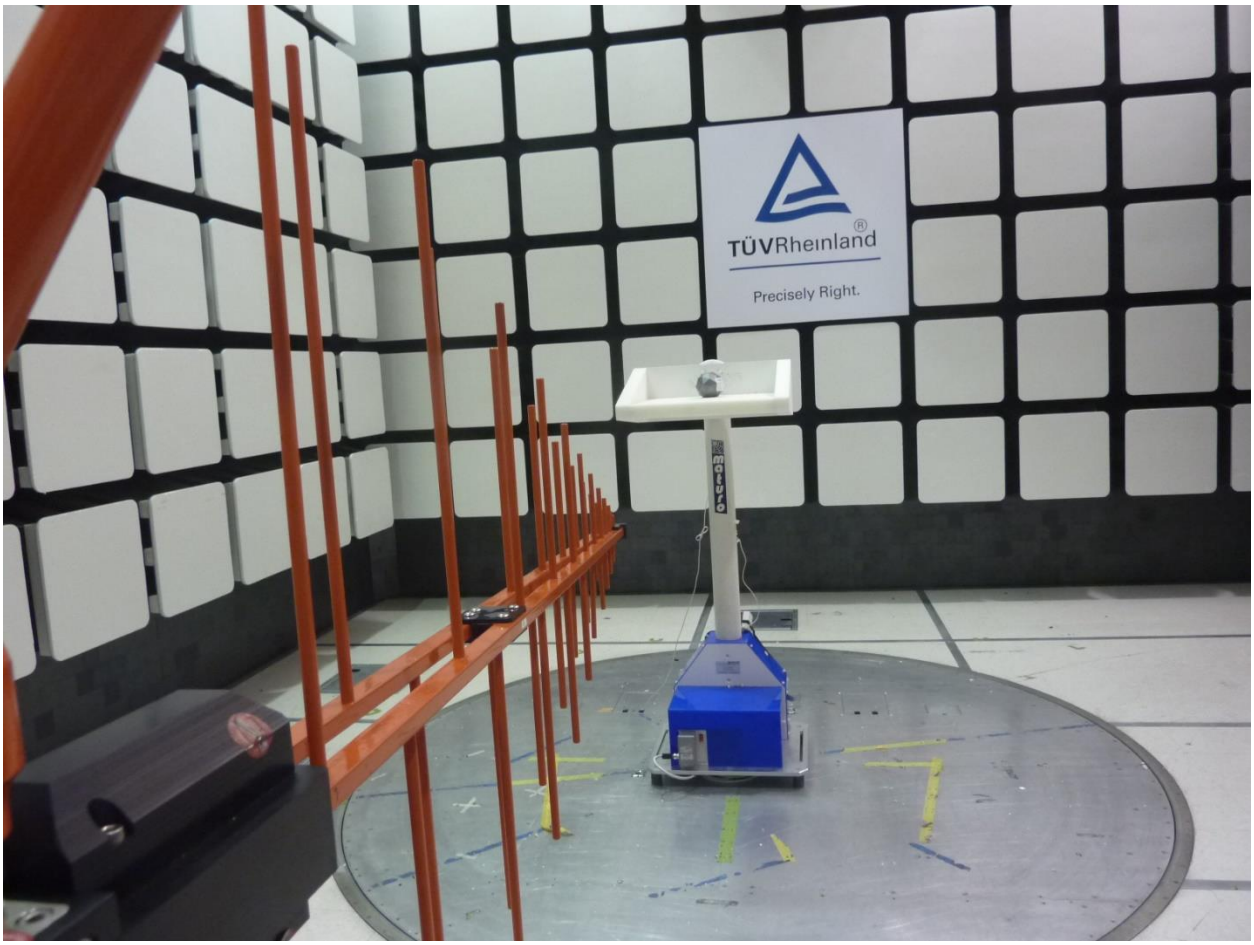
Power line conducted emissions setup



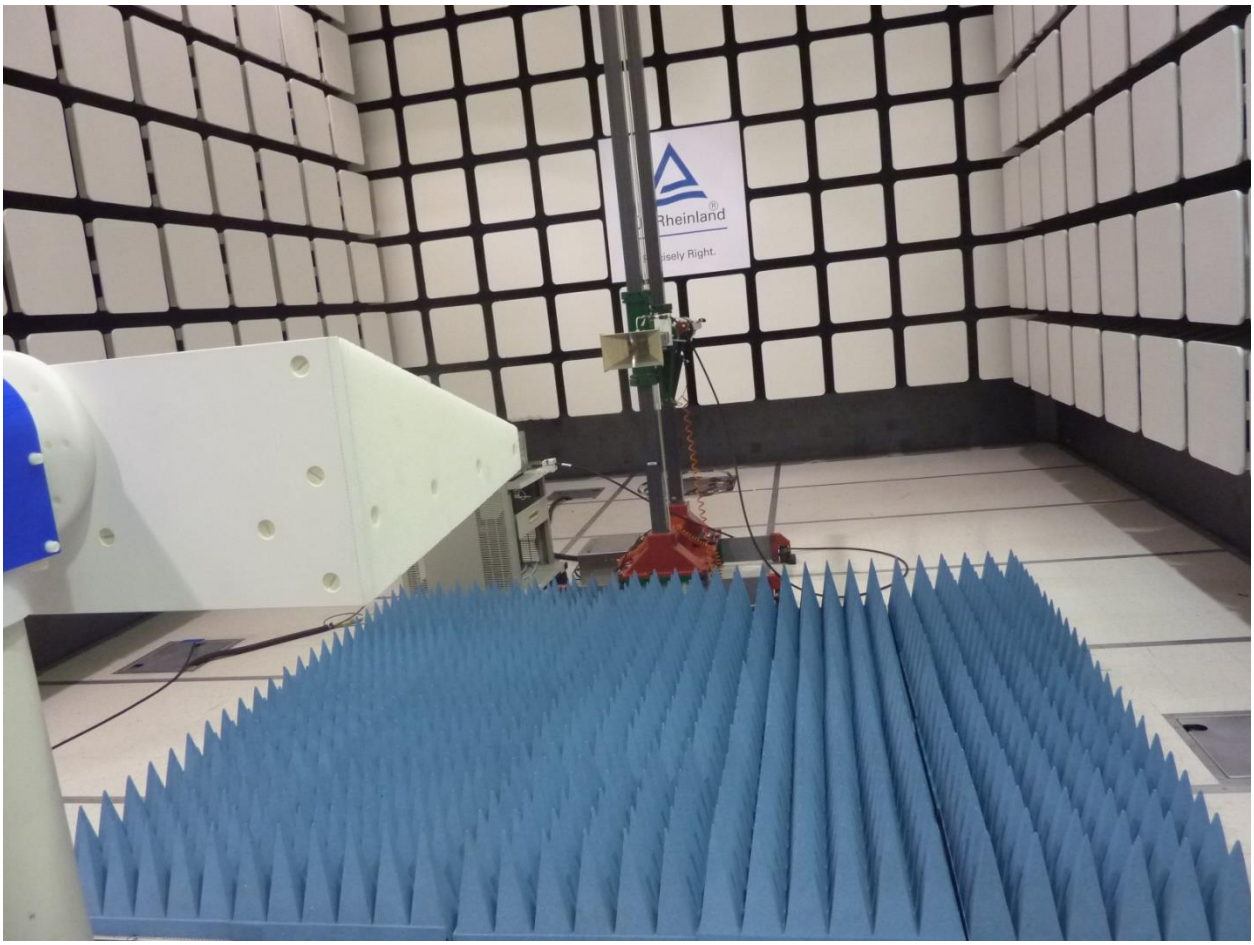
Radiated Emissions 9k-30 MHz front



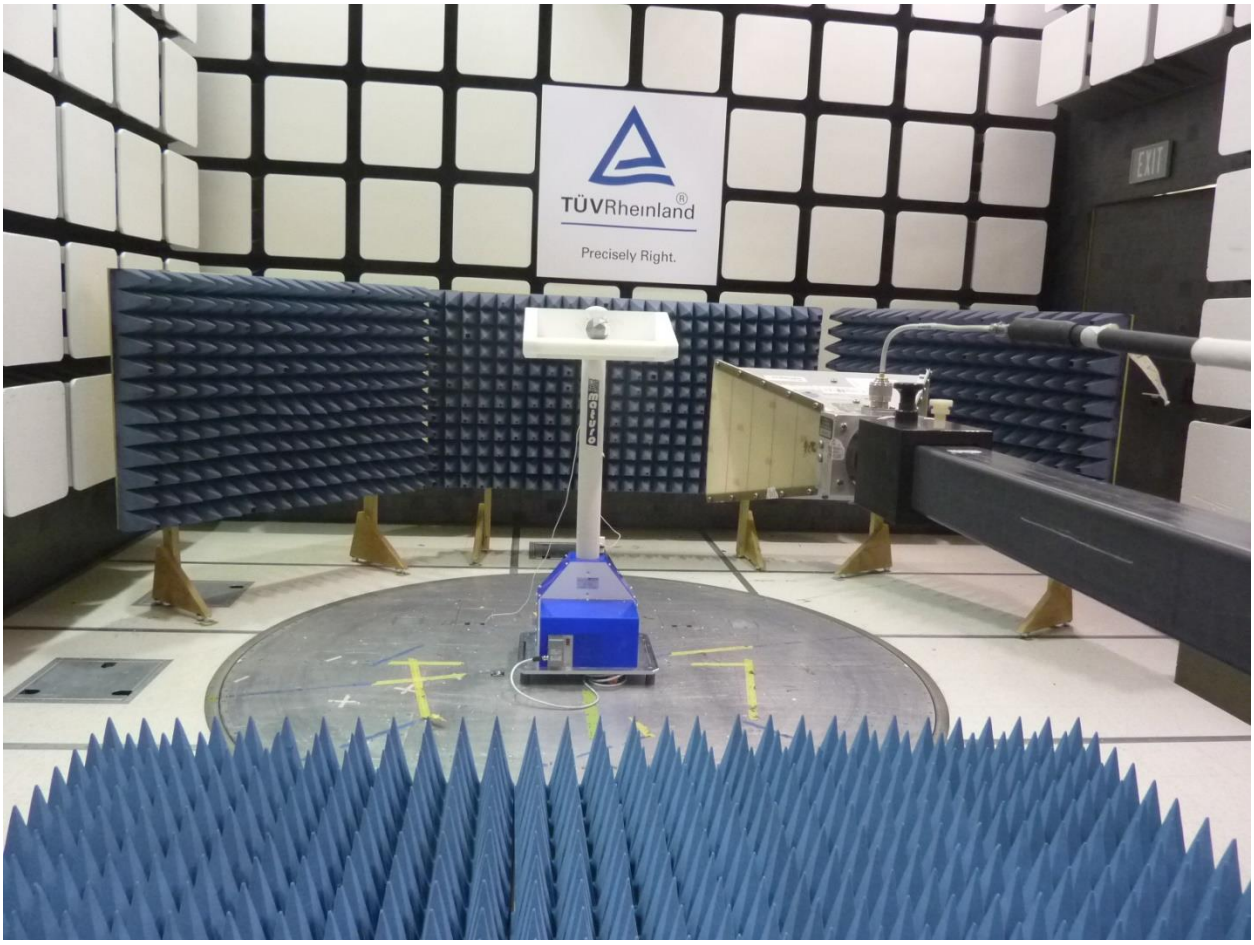
Radiated Emissions 9k-30 MHz rear



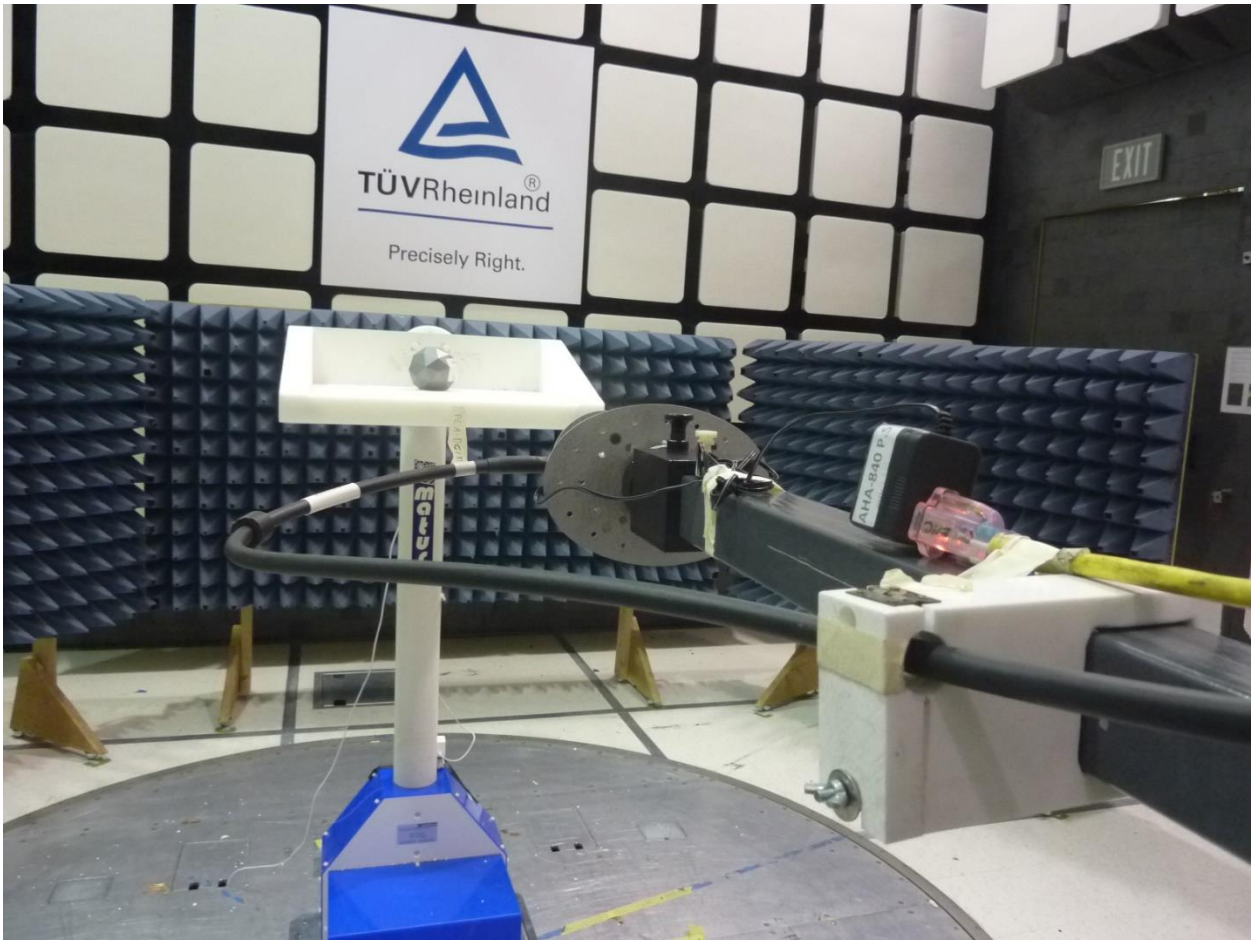
Radiated Emissions 30-1000 MHz



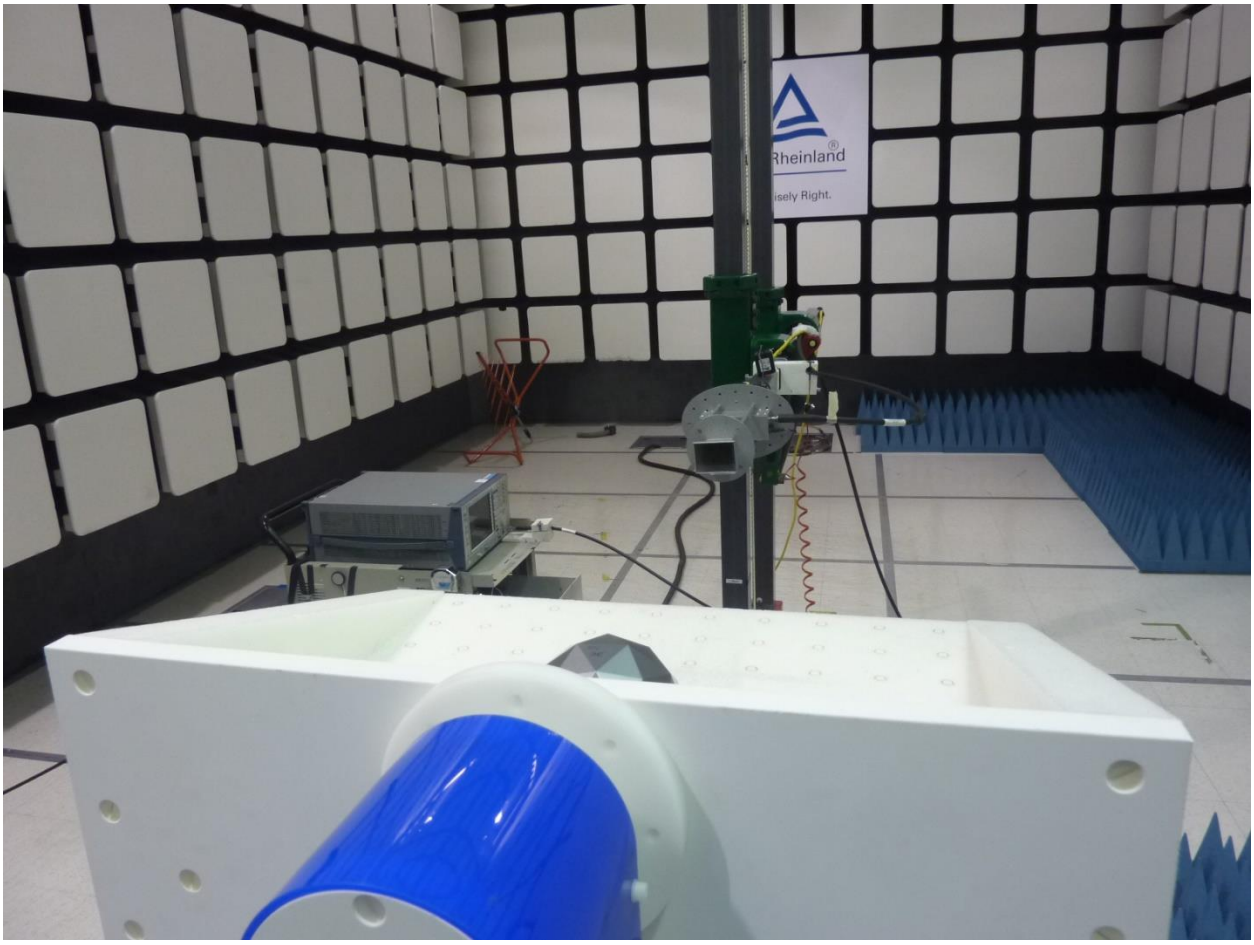
Radiated Emissions 1-18 GHz rear



Radiated Emissions 1-18 GHz front



Radiated Emissions 18-40 GHz front



Radiated Emissions 18-40 GHz rear

14 Test Equipment Use List

14.1 Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yyyy	Next Cal mm/dd/yyyy
Bilog Antenna	Sunol Sciences	JB3	A102606	06/15/2016	06/15/2018
Horn Antenna	Sunol Science	DRH118	A040806	11/11/2016	11/11/2018
Horn Antenna	Com-Power	AHA-840	105005	05/26/2017	05/26/2019
Amplifier	Sonoma Instruments	310	165516	01/19/2017	01/19/2018
Spectrum Analyzer	Rohde & Schwarz	FSL6	100169	01/13/2017	01/13/2018
Spectrum Analyzer	Agilent	MXE	52260210	1/22/2018	1/22/2019
Spectrum Analyzer	Agilent	PXA	US513358291	01/22/2019	01/22/2019
LISN	Compower	n/a	12100	01/24/2018	01/24/2019
Spectrum Analyzer	Rohde & Schwarz	ESI	1088.7490	01/22/2018	01/22/2019
Power Sensors	Rohde & Schwarz	OSP-B157	26160467	01/18/2018	01/18/2019

* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.

15 EMC Test Plan

15.1 Introduction

This section provides a description of the Equipment Under Test (EUT), configurations, operating conditions, and performance acceptance criteria. It is an overview of information provided by the manufacturer so that the test laboratory may perform the requested testing.

15.2 Customer

Customer Information

Company Name	Symantec Inc.
Address	350 Ellis St
City, State, Zip	Mountain View, CA 94043
Country	USA

Technical Contact Information

Name	Vijay Poojari
E-mail	Vijay_poojari@symantec.com
Phone	(650) 527-8000

15.3 Equipment Under Test (EUT)

Table 3: EUT Specifications

EUT Specifications	
Dimensions	6" diameter
AC Input	110VAC
Environment	Indoor
Operating Temperature Range:	-20 / 60C
Multiple Feeds:	☐ Yes and how many ☒ No
Product Marketing Name (PMN)	Norton core mini
Hardware Version Identification Number (HVIN)	518
Firmware Version Identification Number (FVIN)	n/a
Bluetooth Radio	
Operating Mode	BLE
Transmitter Frequency Band	2402 MHz to 2480 MHz
Operating Bandwidth	1 MHz
Max. Power Output	3.9 dbm (RMS, Conducted)
Power Setting @ Operating Channel	7
Antenna Type	1 integrated PIFA antenna
Antenna Gain	3.36 dbi
Modulation Type	GFSK
Data Rate	1 Mbps

Table 4: Antenna Information

Number	Antenna Type	Description	Max Gain (dBi)
Antenna 1	Integrated PIFA	Max. peak gain at 2.4 GHz	+3.36

Table 5: Interface Specifications

Interface Type	Cabled with what type of cable?	Is the cable shielded?	Maximum potential length of the cable?	Metallic (M), Coax (C), Fiber (F), or Not Applicable?
Ethernet	CAT5 RJ45	☐ No	Various	☒ M

Table 6: Support Equipment

Equipment	Manufacturer	Model	Serial	Used for
Laptop	Thinkpad	20DF003 WUS	00392-918-500002-85320	Software control
Ethernet cable	(generic)	n/a	n/a	Communication with EUT
Laptop AC adapter	Lenovo	ADLX65 NPC2A	11S36200282 ZZ2048	Power
Note: None.				

Table 7: Description of Sample used for Testing

Device	Serial	RF Connection	CFR47 Part 15.247
Norton core mini	PP #1	Integrated Antenna	TX Emissions. Bandedge, RSE
	PP #1	Direct via SMA Connection	Transmit Power, Occupied Bandwidth, Out of Band Emission, PSD,

Table 8: Description of Test Configuration used for Radiated Measurement.

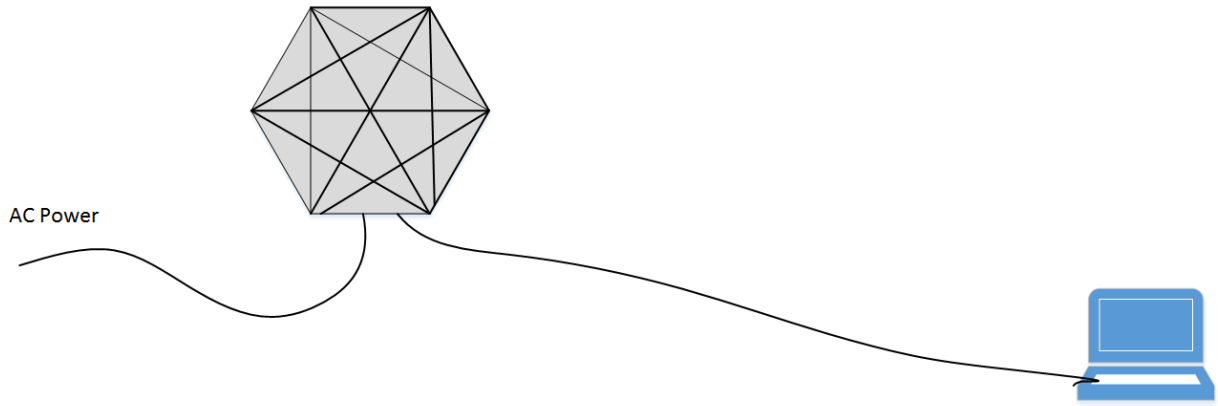
Device	Antenna	Mode	Setup Photo (X-Axis)	Setup Photo (Y-Axis)	Setup Photo (Z-Axis)
Norton core mini	Integrated	Transmit	N/A	See photos	N/A
Note:					

Table 9: Final Test Mode for 2402 MHz to 2480MHz Channels

Test	802.11a
Occupied Bandwidth CFR 47 15.247(a1), RSS Gen Sect. 4.4.	2402, 2438, 2480 MHz BLE
Output Power CFR47 15.247 (b1), RSS 210 Sect. A.8.1	2402, 2438, 2480 MHz BLE
Out of Band Emission CFR47 15.247 (d), RSS 210 Sect. A.8.5	2402, 2438, 2480 MHz BLE
Band-Edge (Conducted) FCC Part 15.205, 15.209	2402, 2480 MHz BLE
Transmitted Spurious Emission (30 MHz – 1GHz) FCC Part 15.205, 15.209	2402, 2438, 2480 MHz BLE
Transmitted Spurious Emission (Above 1GHz) FCC Part 15.205, 15.209	2402, 2438, 2480 MHz BLE
AC Conducted Emission FCC Part 15.207	110VAC
Note The Norton core mini supports only BLE and will demonstrate compliance to the rules required for DTS per KDB 453039.	

15.4 Block Diagram

Radiated emissions test setup



Conducted Tx emissions setup