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TEST REPORT

SCOPE OF WORK
FCC TESTING–1830

REPORT NUMBER
180516024SZN-002

ISSUE DATE	**[REVISED DATE]**
27 August 2018	[----------]

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TEST REPORT

Intertek Report No.: 180516024SZN-002

Microsoft Corporation

Application
For
Certification

FCC ID: C3K1830

Bluetooth Accessory

Model: 1830

2.4GHz Transceiver

Report No.: 180516024SZN-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-17]

Prepared and Checked by:

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Project Engineer

Approved by:

Kidd Yang
Technical Supervisor
Date: 27 August 2018

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Revision History

Report No.	Version	Description	Issued Date
180516024SZN-002	Rev.01	Initial issue of report	02 August 2018
180516024SZN-002	Rev.02	Second issue of report	17 August 2018
180516024SZN-002	Rev.03	Third issue of report	23 August 2018
180516024SZN-002	Rev.04	Fourth issue of report	27 August 2018

LIST OF EXHIBITS

INTRODUCTION

EXHIBIT 1: Summary of Tests

EXHIBIT 2: General Description

EXHIBIT 3: System Test Configuration

EXHIBIT 4: Measurement Results

EXHIBIT 5: Miscellaneous Information

EXHIBIT 6: Test Equipment List

MEASUREMENT/TECHNICAL REPORT

Bluetooth Accessory

Model: 1830

FCC ID: C3K1830

This report concerns (check one) Original Grant ___X___ Class II Change ____

Equipment Type: DTS - Part 15 Digital Transmission Systems (Bluetooth LE portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ___X_

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-17] Edition] provision.

Report prepared by:

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Table of Contents

1.0 Summary of Test results 6

2.0 General Description 8

2.1 Product Description 8
2.2 Related Submittal(s) Grants 8
2.3 Test Methodology 8
2.4 Test Facility 8

3.0 System Test Configuration 10

3.1 Justification 10
3.2 EUT Exercising Software 10
3.3 Special Accessories 11
3.4 Measurement Uncertainty 11
3.5 Equipment Modification 11
3.6 Support Equipment List and Description 11

4.0 Measurement Results 13

4.1 Maximum Conducted Output Power at Antenna Terminals 13
4.2 Minimum 6 dB RF Bandwidth 14
4.3 Maximum Power Density Reading 17
4.4 Out of Band Conducted Emissions 20
4.5 Out of Band Radiated Emissions 27
4.6 Transmitter Radiated Emissions in Restricted Bands 28
4.7 Field Strength Calculation 29
4.8 Radiated Spurious Emission 30
4.9 Conducted Emission 38
4.10 Radiated Emissions from Digital Section of Transceiver 41
4.11 Transmitter Duty Cycle Calculation and Measurements 42

5.0 Miscellaneous Information 44

5.1 Discussion of Pulse Desensitization 44
5.2 Discussion of Transmitter Duty Cycle 44

6.0 Test Equipment List 46

EXHIBIT 1

SUMMARY OF TEST RESULTS

1.0 Summary of Test results

Applicant: Microsoft Corporation

Address: One Microsoft Way Redmond, WA 98052 USA

Bluetooth Accessory

Model: 1830

FCC ID: C3K1830

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Bluetooth Accessory with Bluetooth function operating at 2402-2480MHz.For more detailed features description, please refer to the user's manual.

Bluetooth Version: 4.1 (dual-mode)
Antenna Type: Integral antenna
Antenna Gain: 2 dBi
Modulation Type: GFSK, π/4-DQPSK and 8-DPSK

For electronic filing, the brief circuit description is saved with filename: 1830 Operational Description.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of transceiver for the Bluetooth Accessory which has Bluetooth function(BLE mode), and for the classic Bluetooth mode was tested and demonstrated in report 180516024SZN-001.

2.3 Test Methodology

All measurements were performed according to the procedures in ANSI C63.10: 2013 and KDB 558074 D01 v04. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhu Subdistrict, Longhua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. Only the worst case data was reported.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The unit was placed at the center of turntable and the rear of unit was flushed with the rear of the styrene table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

The EUT was mounted to a plastic stand if necessary and placed on the styrene turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes. The worst case is X orthogonal axes placement.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Test Tool:

Description	Manufacturer	Name	Version
EMI Test Software	R&S	EMC32-ME+	V1.0

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Measurement Uncertainty	Uncertainty
Occupied Channel Bandwidth	±5%
RF Output Power	±1.5dB
Power Spectral Density	±3.0dB
Conducted Unwanted Emission	±3.0dB
Spurious emission (Above 1GHz)	±6.0dB
Radiated emission (Up to 1GHz)	±4.8dB
AC Conducted emission	±3.6 dB
Temperature	±1°C
Humidity	±5%

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Microsoft Corporation will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
USB A-C Cabel (Provided by Applicant)	N/A	Shielded, 135cm
PC (Provided by Intertek)	HP	430
AC Adaptor (Provided by Intertek)	HMD Global Oy	FC0200

EXHIBIT 4

MEASUREMENT RESULTS

Applicant: Microsoft Corporation
Date of Test: May 21, 2018 Model: 1830

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

Antenna Gain = 2dBi		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2402	2.63	1.832
Middle Channel: 2440	3.82	2.410
High Channel: 2480	3.76	2.377

Cable loss, external attenuation has been included in OFFSET (0.5 dB) function

EUT max. output level = 3.82dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Microsoft Corporation
Date of Test: May 21, 2018 Model: 1830

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

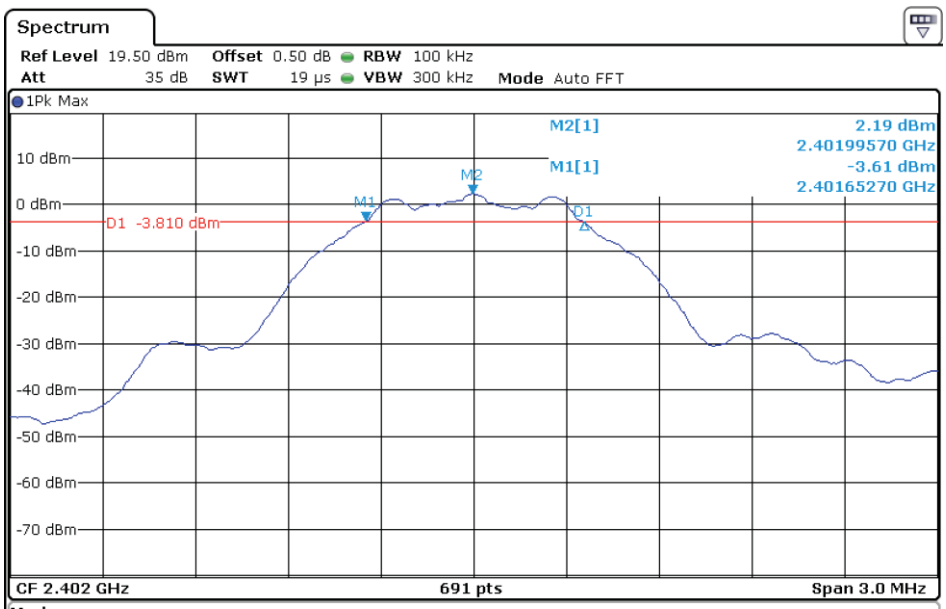
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v04. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

Frequency (MHz)	6 dB Bandwidth (KHz)
2402	703.3
2440	712.0
2480	707.7

The test plots are attached as below.

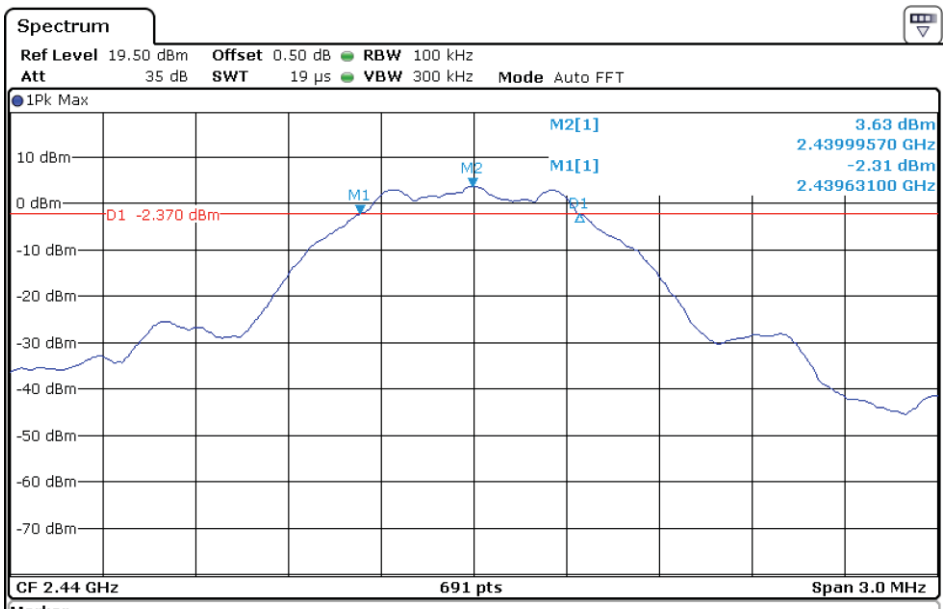
Low Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4016527 GHz	-3.61 dBm		
D1	M1	1	703.3 kHz	-0.28 dB		
M2		1	2.4019957 GHz	2.19 dBm		

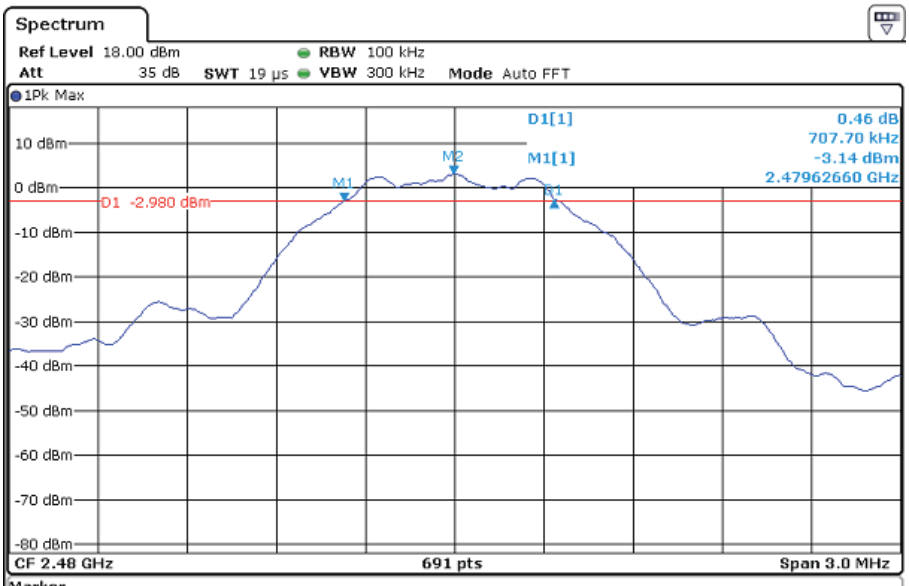
Middle Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.439631 GHz	-2.31 dBm		
D1	M1	1	712.0 kHz	0.00 dB		
M2		1	2.4399957 GHz	3.63 dBm		

High Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4796266 GHz	-3.14 dBm		
D1	M1	1	707.7 kHz	0.46 dB		
M2		1	2.4799957 GHz	3.02 dBm		

Applicant: Microsoft Corporation
Date of Test: July 20, 2018 Model: 1830

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v04.

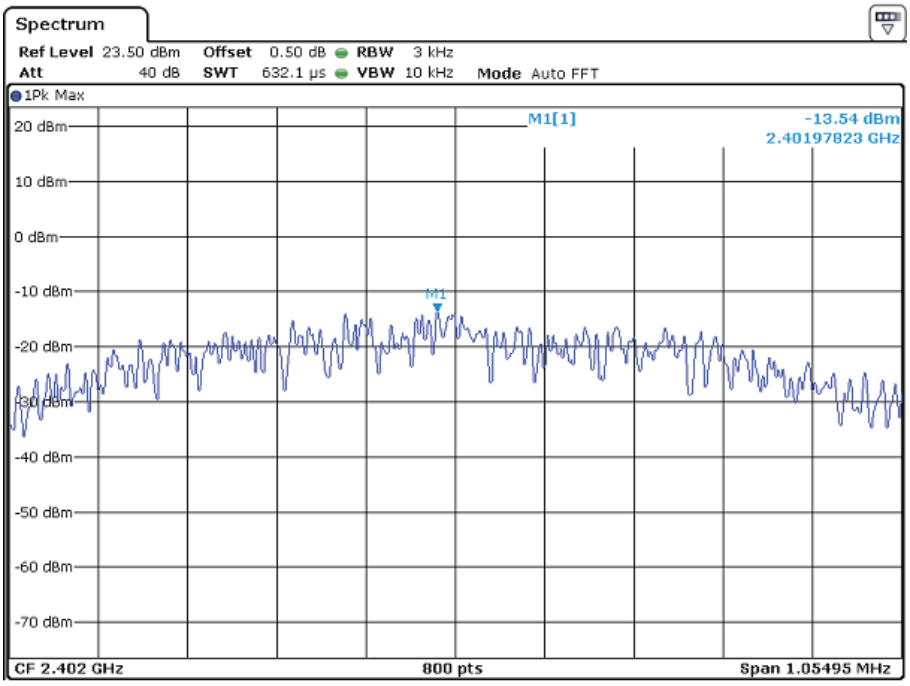
Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

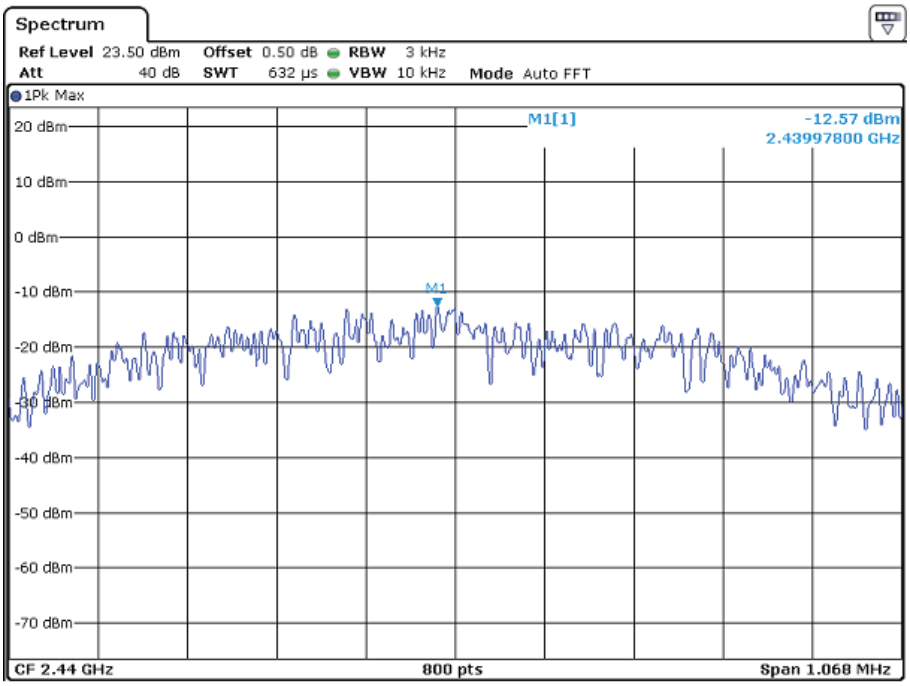
Frequency (MHz)	Power Density with RBW 3KHz
2402	-13.54
2440	-12.57
2480	-12.18

The test plots are attached as below.

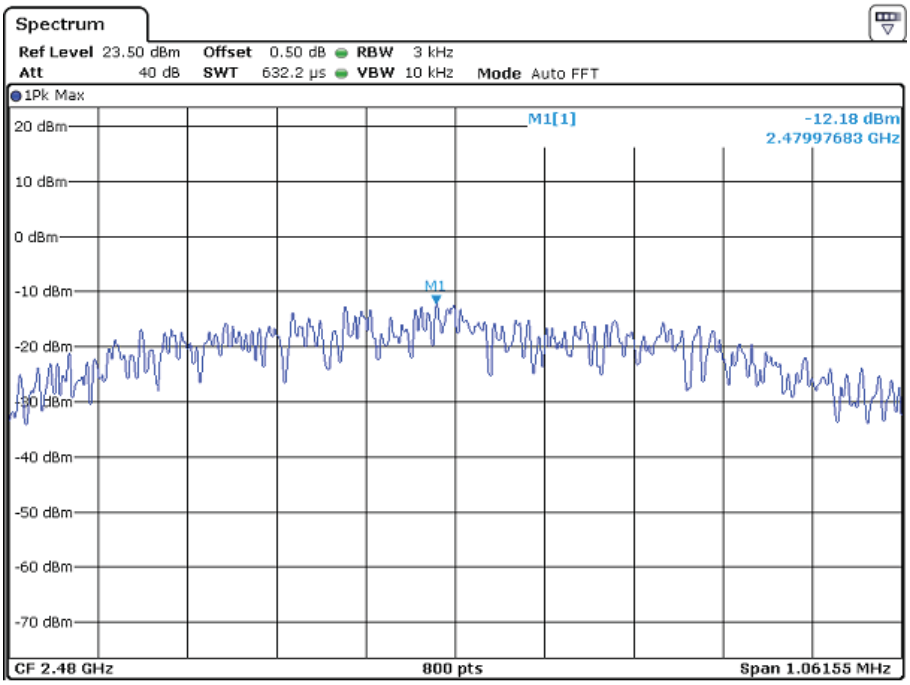
Low Channel



Middle Channel



High Channel



4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

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. The Measurement Procedure was set according to the FCC KDB 558074 D01 v04.

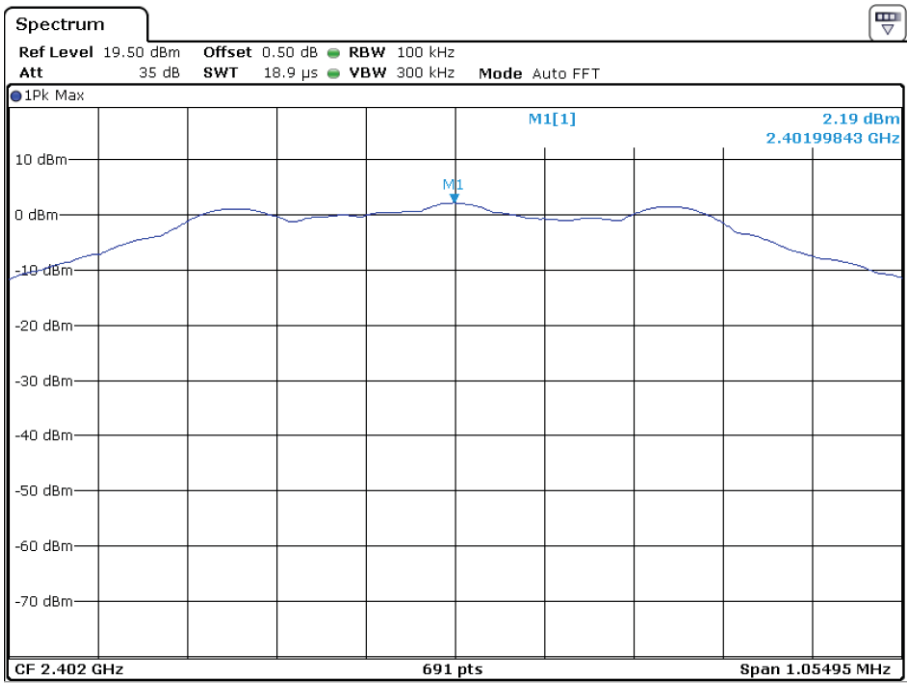
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

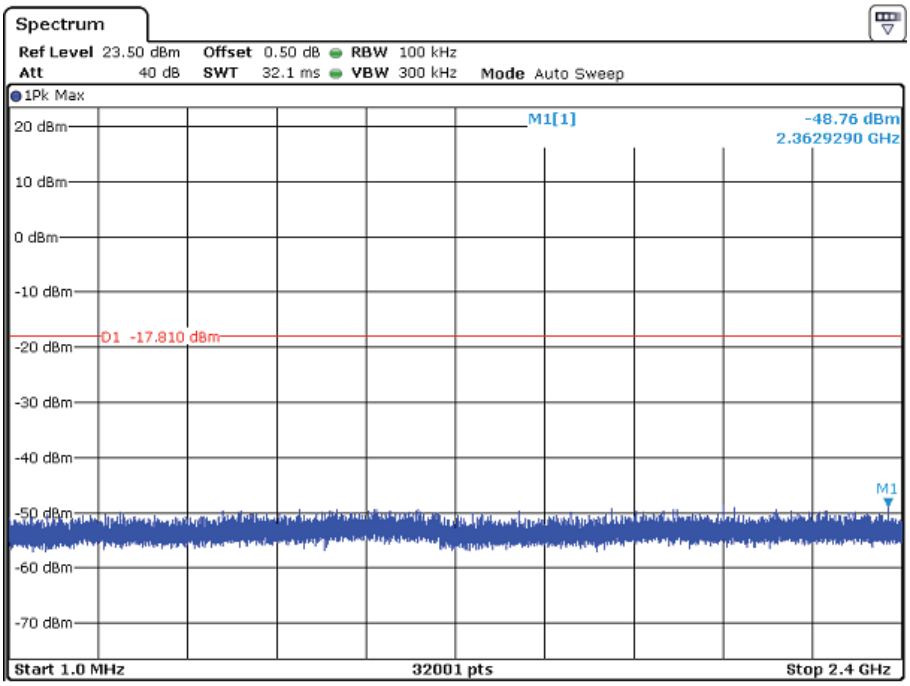
Refer to the attached test plot for out of band conducted emissions data.

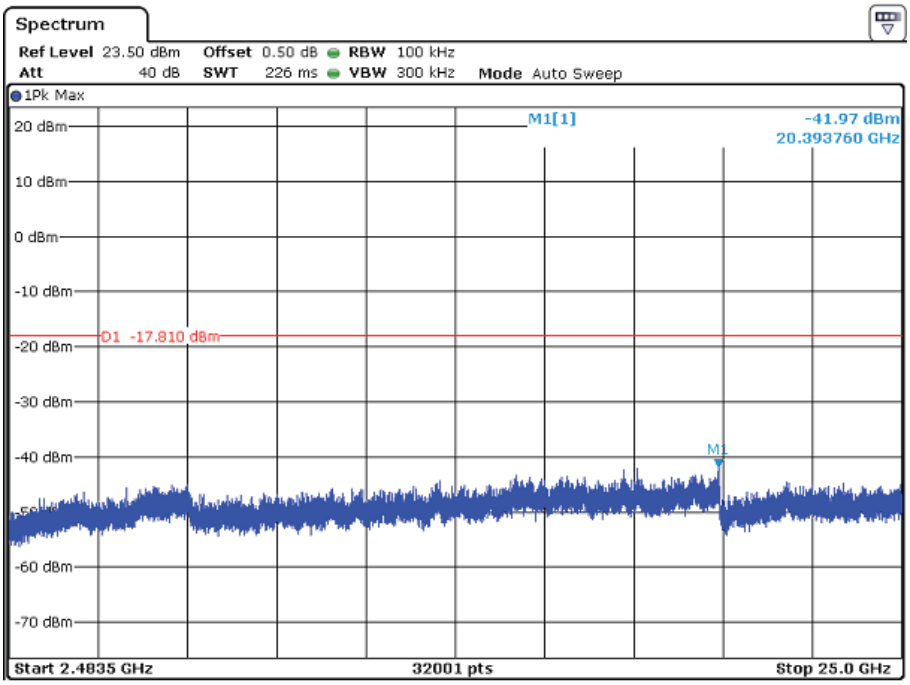
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

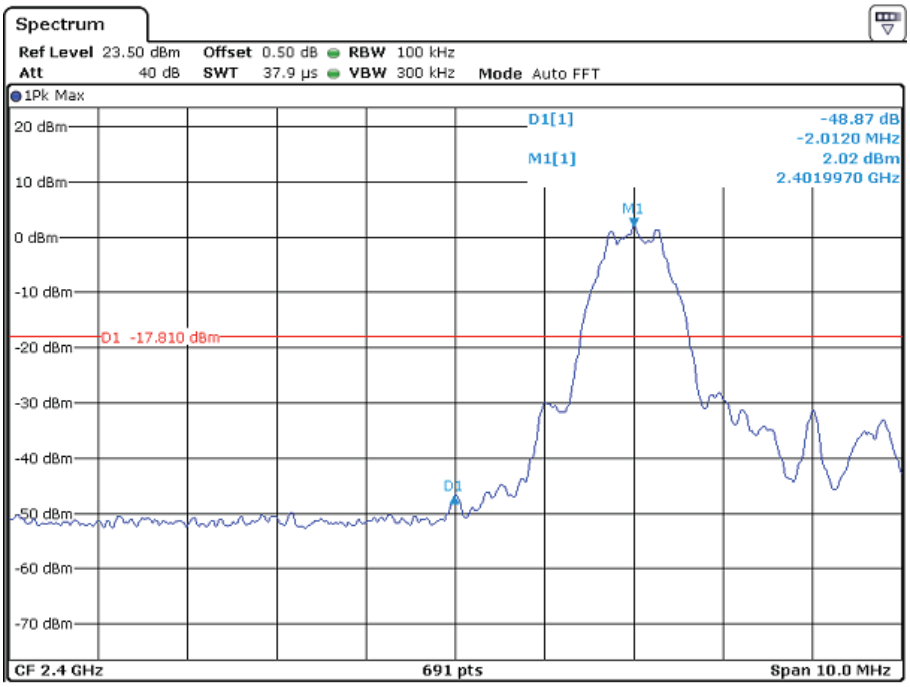
The test plots are attached as below.

Low Channel Reference Level: 2.19dBm

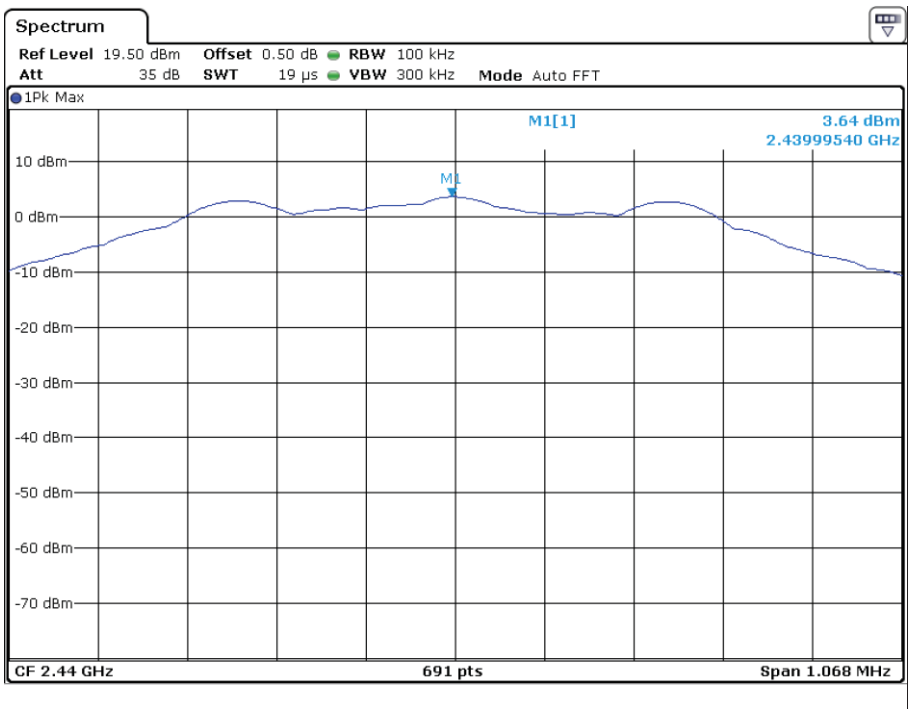


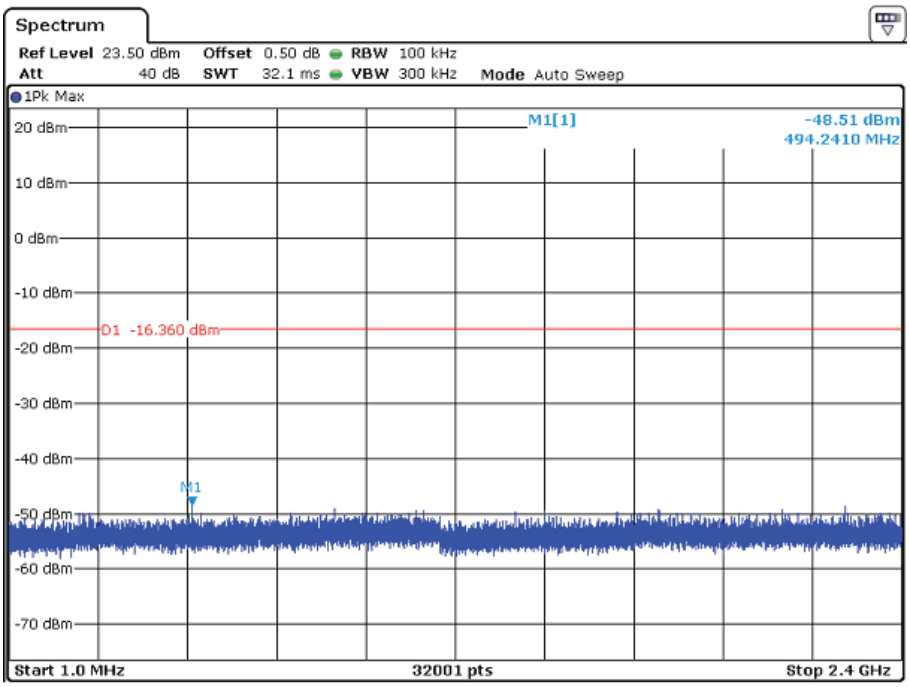


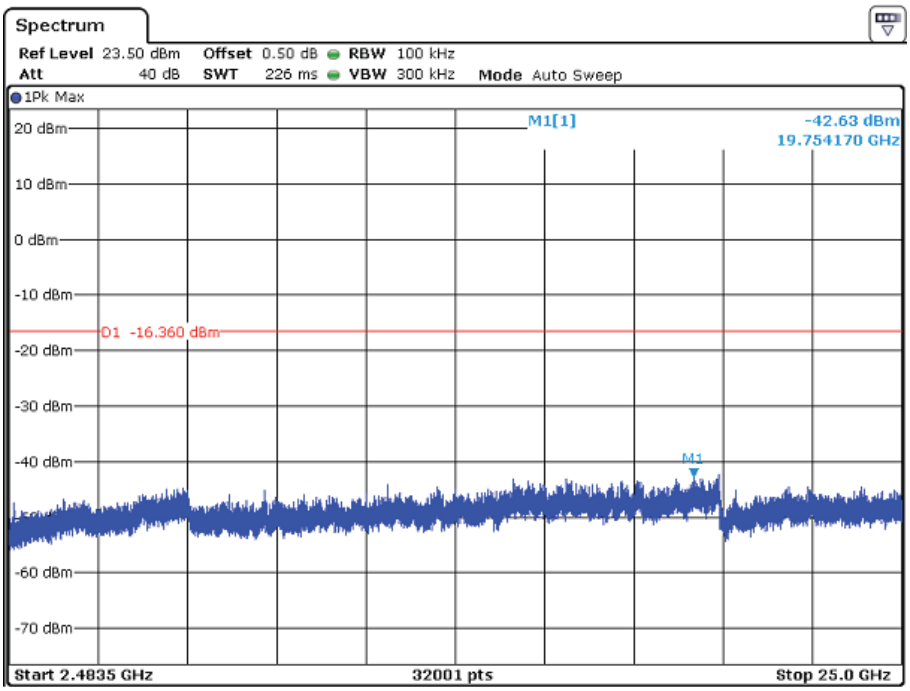

Spectrum
Ref Level 23.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -41.97 dBm
20.393760 GHz
D1 -17.810 dBm
M1
Start 2.4835 GHz 32001 pts Stop 25.0 GHz


Spectrum
Ref Level 23.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -48.87 dB
-2.0120 MHz
M1[1] 2.02 dBm
2.4019970 GHz
M1
D1 -17.810 dBm
D1
CF 2.4 GHz 691 pts Span 10.0 MHz

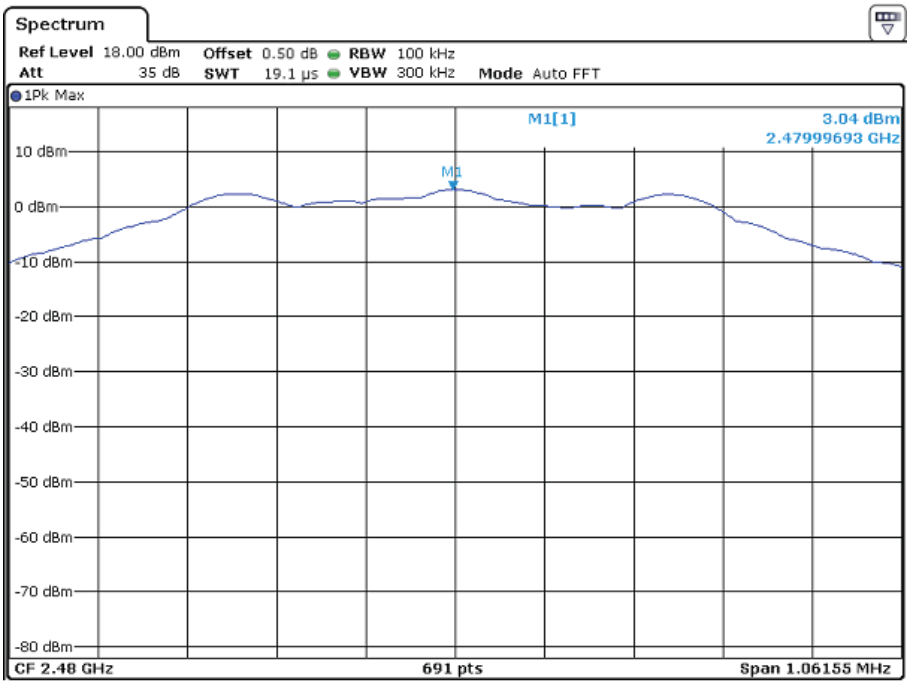
Middle Channel Reference Level: 3.64dBm

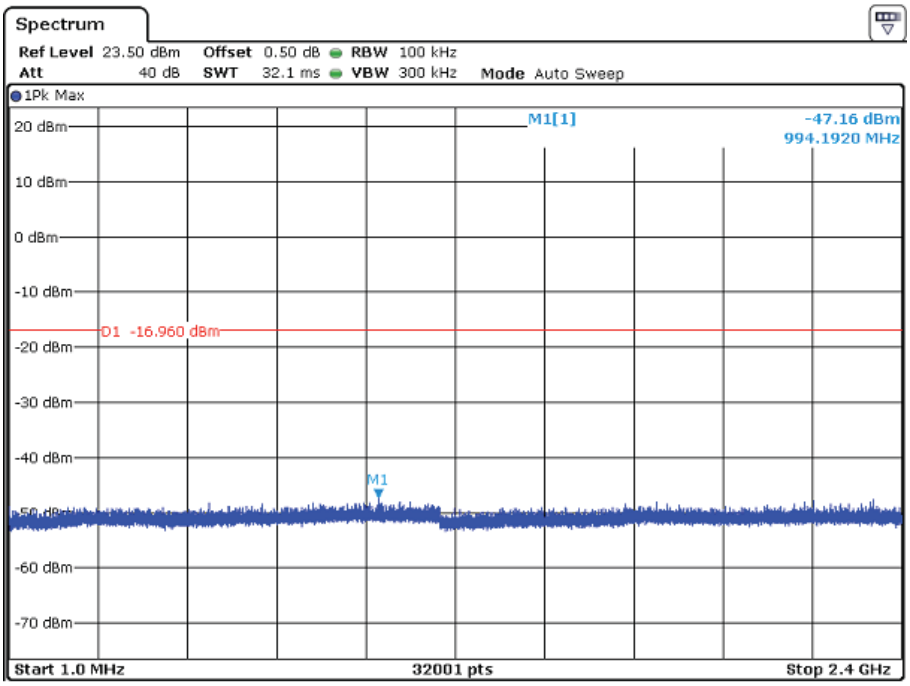


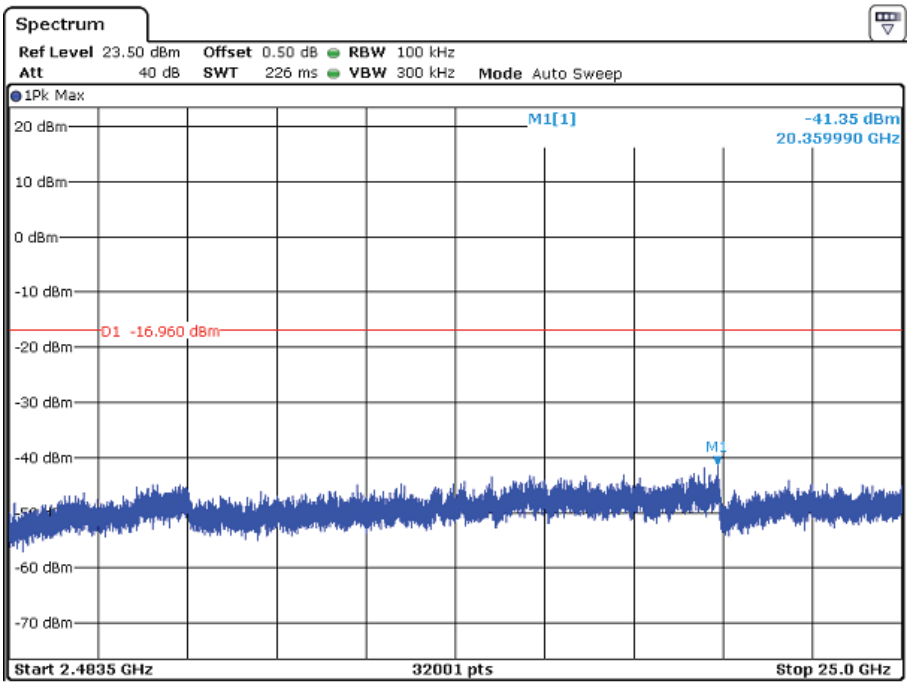


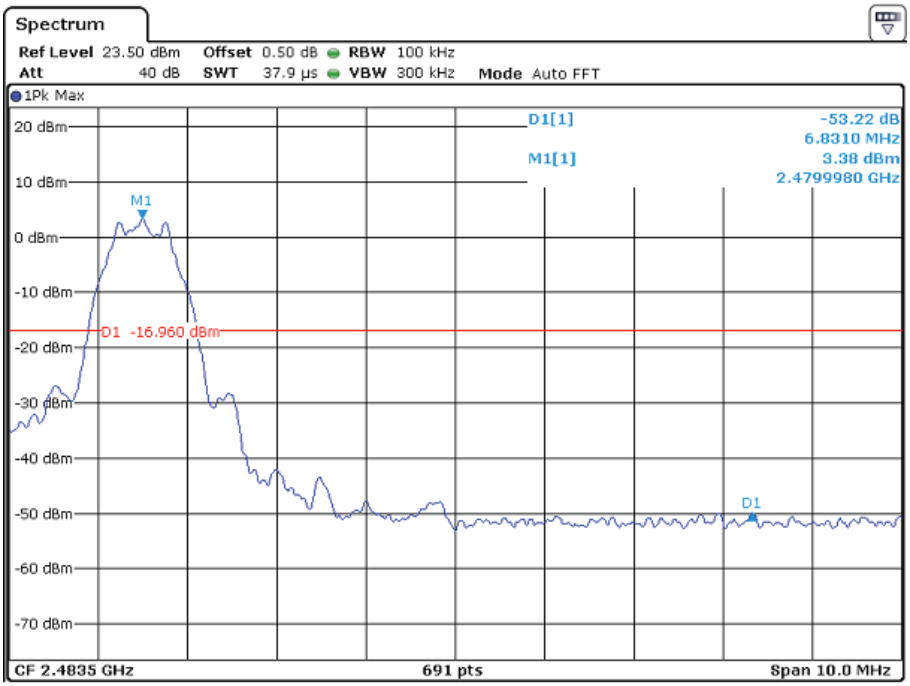

Spectrum
Ref Level 23.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -42.63 dBm
19.754170 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
D1 -16.360 dBm
-20 dBm
-30 dBm
-40 dBm
M1
-60 dBm
-70 dBm
Start 2.4835 GHz
32001 pts
Stop 25.0 GHz

High Channel Reference Level: 3.04dBm






Spectrum
Ref Level 23.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -41.35 dBm
20.359990 GHz
D1 -16.960 dBm
M1
Start 2.4835 GHz 32001 pts Stop 25.0 GHz


Spectrum
Ref Level 23.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -53.22 dB
6.8310 MHz
M1[1] 3.38 dBm
2.4799980 GHz
M1
D1 -16.960 dBm
D1
CF 2.4835 GHz 691 pts Span 10.0 MHz

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, since all emissions are more than 20dB below fundamental
[ ] See attached data sheet

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

<u>Example</u>
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

4.8 Radiated Spurious Emission

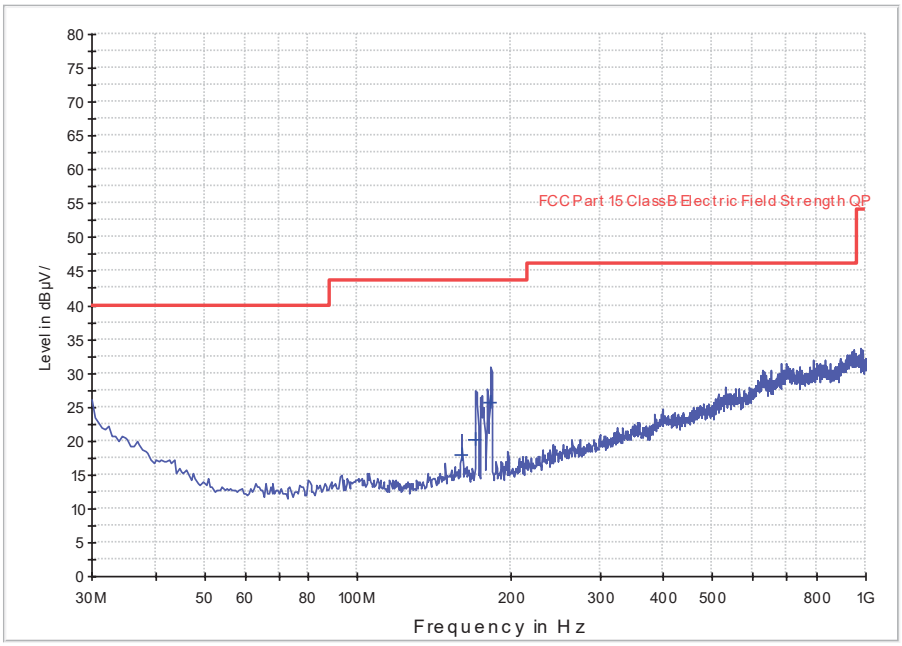
Worst Case Radiated Spurious Emission
at 7440.0MHz
is passed by 10.1dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: 1830 Test Setup Photos.pdf.

Applicant: Microsoft Corporation
Date of Test: May 24, 2018 Model: 1830
Worst Case Operating Mode: Transmitting(2402MHz)

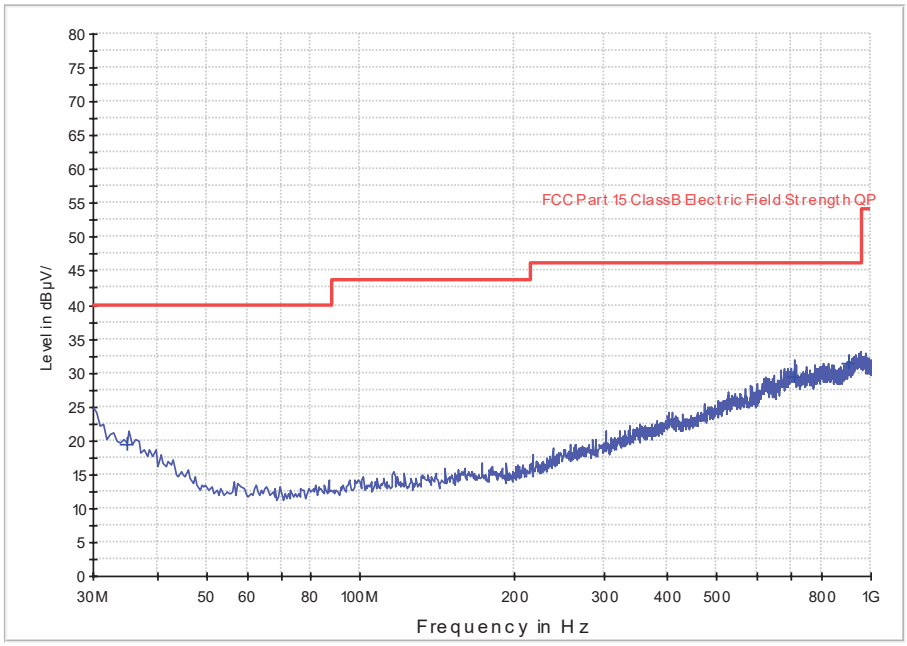
ANT Polarity: Horizontal

FCC Part 15



ANT Polarity: Vertical

FCC Part 15



Applicant: Microsoft Corporation
Date of Test: May 24, 2018 Model: 1830
Worst Case Operating Mode: Transmitting(2402MHz)

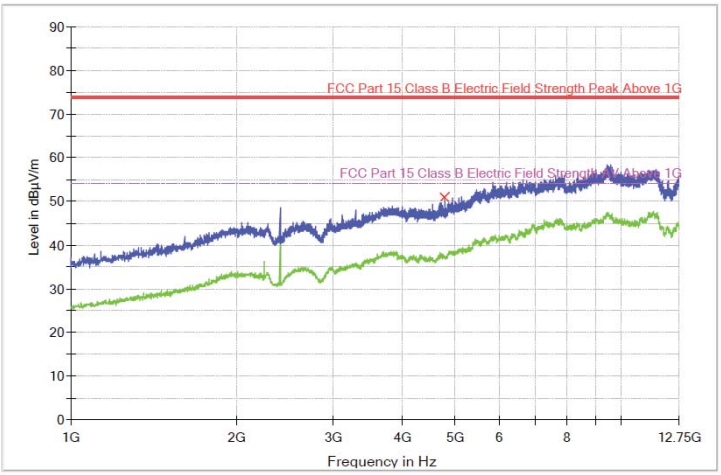
Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	160.465	26.5	20.0	11.3	17.8	43.5	-25.7
Horizontal	171.135	29.4	20.0	10.9	20.3	43.5	-23.2
Horizontal	183.000	34.3	20.0	11.4	25.7	43.5	-17.8
Vertical	35.000	24.0	20.0	15.3	19.3	40.0	-20.7
Vertical	707.545	24.0	20.0	25.3	29.3	46.0	-16.7
Vertical	905.910	24.8	20.0	26.6	31.4	46.0	-14.6

NOTES:
1. Quasi-Peak detector is used for frequency below 1GHz.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.
5. The spurious emissions were very low against the limit in the frequency range 9KHz to 30MHz. The amplitude of spurious emissions that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Applicant: Microsoft Corporation
Date of Test: August 27, 2018 Model: 1830
Worst Case Operating Mode: Transmitting (2402MHz)

Radiated Emissions



Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4804.000	54.5	36.8	33.5	51.2	74.0	-22.8

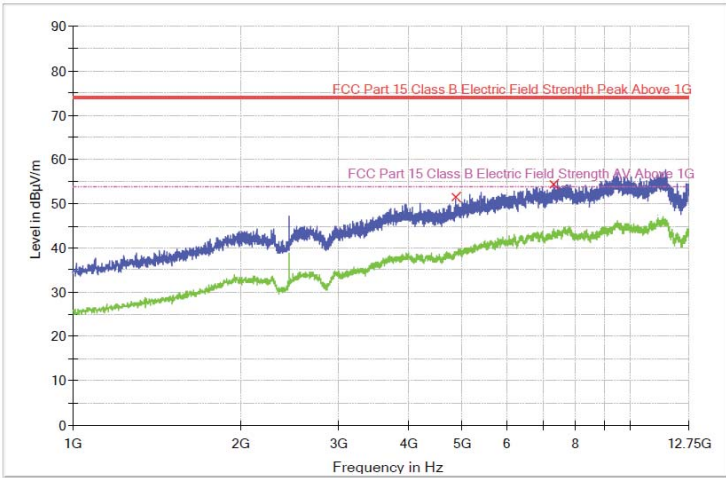
Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4804.000	42.8	36.8	33.5	39.5	54.0	-14.5

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value. RBW=1MHz/VBW=3KHz for average value.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Microsoft Corporation
Date of Test: August 27, 2018 Model: 1830
Worst Case Operating Mode: Transmitting (2440MHz)

Radiated Emissions



Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4880.000	54.7	36.7	33.4	51.4	74.0	-22.6
Horizontal	*7320.000	53.9	36.6	36.8	54.1	74.0	-19.9

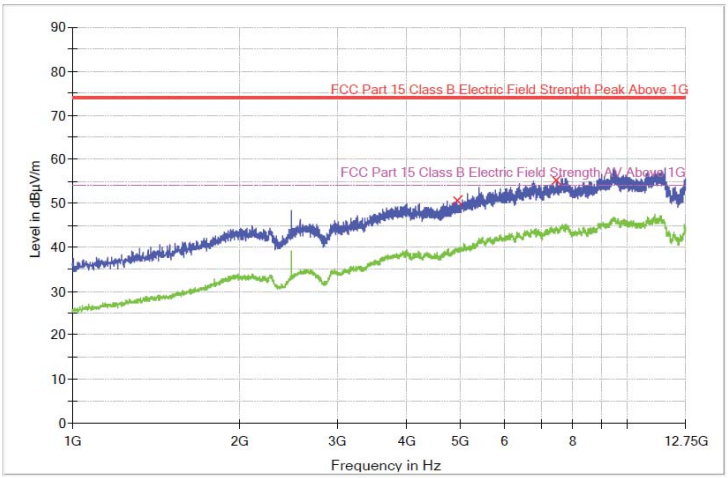
Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4880.000	43.0	36.7	33.4	39.7	54.0	-14.3
Horizontal	*7320.000	42.9	36.6	36.8	43.1	54.0	-10.9

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value. RBW=1MHz / VBW=3KHz for average value.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Microsoft Corporation
Date of Test: August 27, 2018 Model: 1830
Worst Case Operating Mode: Transmitting (2480MHz)

Radiated Emissions



Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4960.000	54.0	36.8	33.3	50.5	74.0	-23.5
Horizontal	*7440.000	55.0	36.5	36.7	55.2	74.0	-18.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4960.000	43.2	36.8	33.3	39.7	54.0	-14.3
Horizontal	*7440.000	43.7	36.5	36.7	43.9	54.0	-10.1

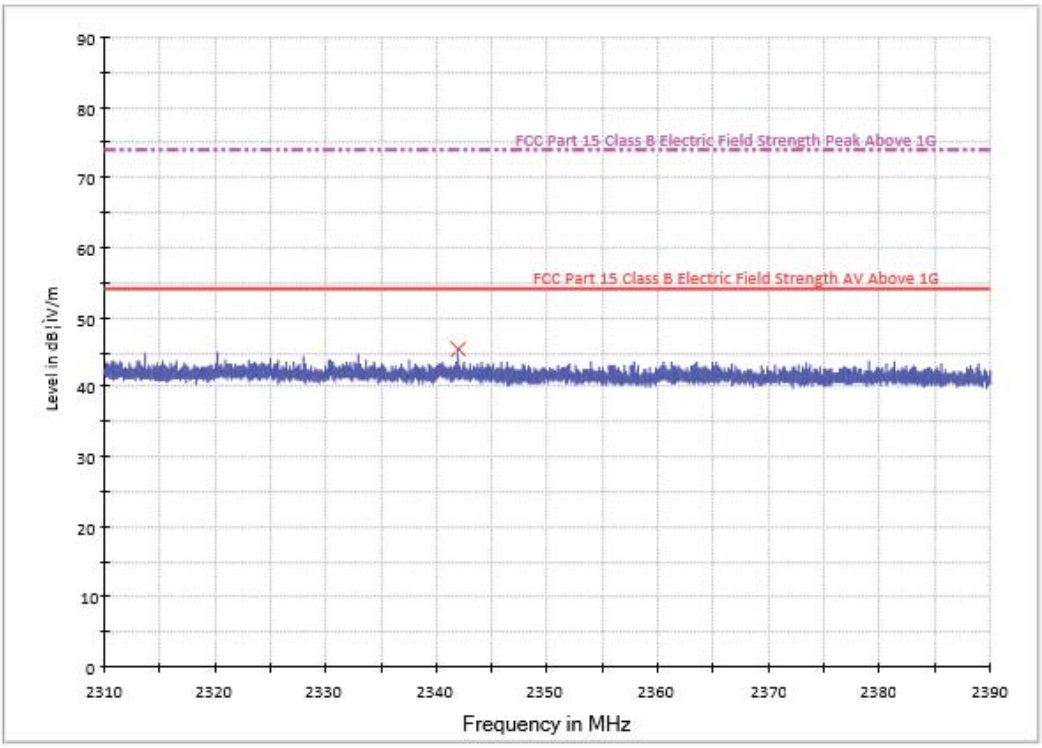
NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value. RBW=1MHz / VBW=3KHz for average value.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Restricted-Band Band-Edge Emissions (2310-2390MHz)

Applicant: Microsoft Corporation
Date of Test: May 24, 2018 Model: 1830
Worst Case Operating Mode: Transmitting (2402MHz)

Radiated Emissions



Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2342.117	54.7	36.7	28.1	46.1	74.0	-27.9

NOTES: 1. Peak detector is used except for others stated.

2. All measurements were made at 3 meters.

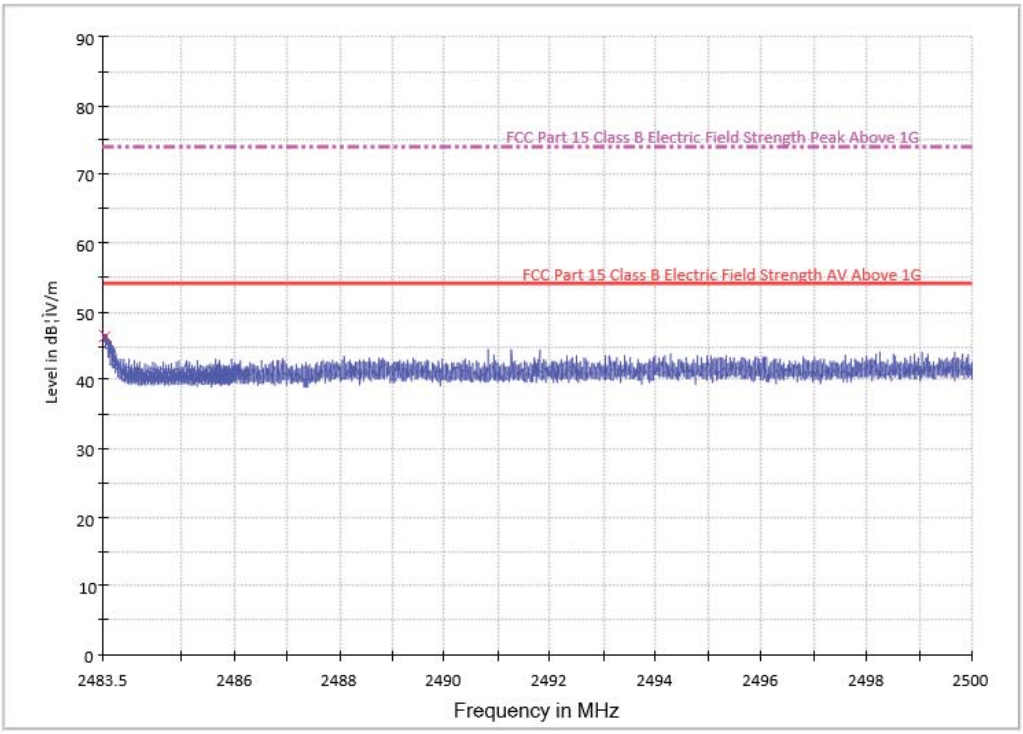
3. Negative value in the margin column shows emission below limit.

4. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

Restricted-Band Band-Edge Emissions (2483.5-2500MHz)

Applicant: Microsoft Corporation
Date of Test: May 24, 2018 Model: 1830
Worst Case Operating Mode: Transmitting (2480MHz)

Radiated Emissions



Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2483.512	55.7	36.7	28.1	47.1	74.0	-26.9

NOTES: 1. Peak detector is used except for others stated.

2. All measurements were made at 3 meters.

3. Negative value in the margin column shows emission below limit.

4. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

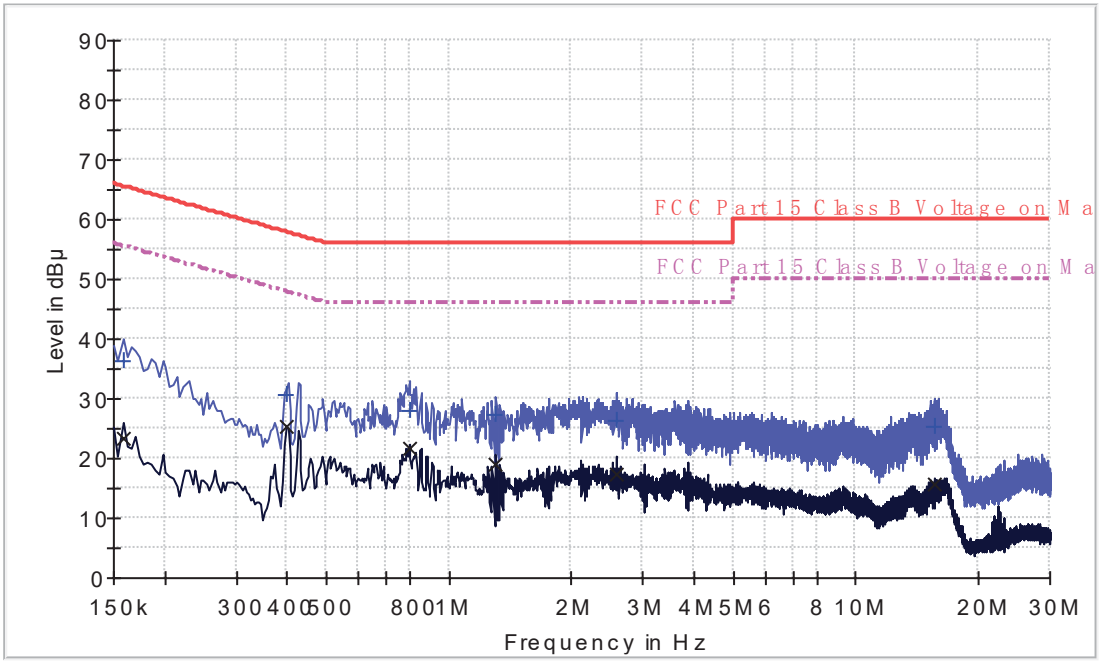
4.9 Conducted Emission

Worst Case Conducted emission at 0.422 MHz is Passed by 22.0 dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: 1830 Test Setup Photos.pdf.

Applicant: Microsoft Corporation
Date of Test: May 25, 2018
Model: 1830
Worst Case Operating Mode: BT Link
Modulation type: GFSK
Phase: Live

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB¦ÌV)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.158000	36.2	L1	9.6	29.4	65.6
0.398000	30.6	L1	9.7	27.3	57.9
0.802000	28.0	L1	9.7	28.0	56.0
1.306000	27.4	L1	9.7	28.6	56.0
2.582000	26.3	L1	9.7	29.7	56.0
15.658000	25.2	L1	10.1	34.8	60.0

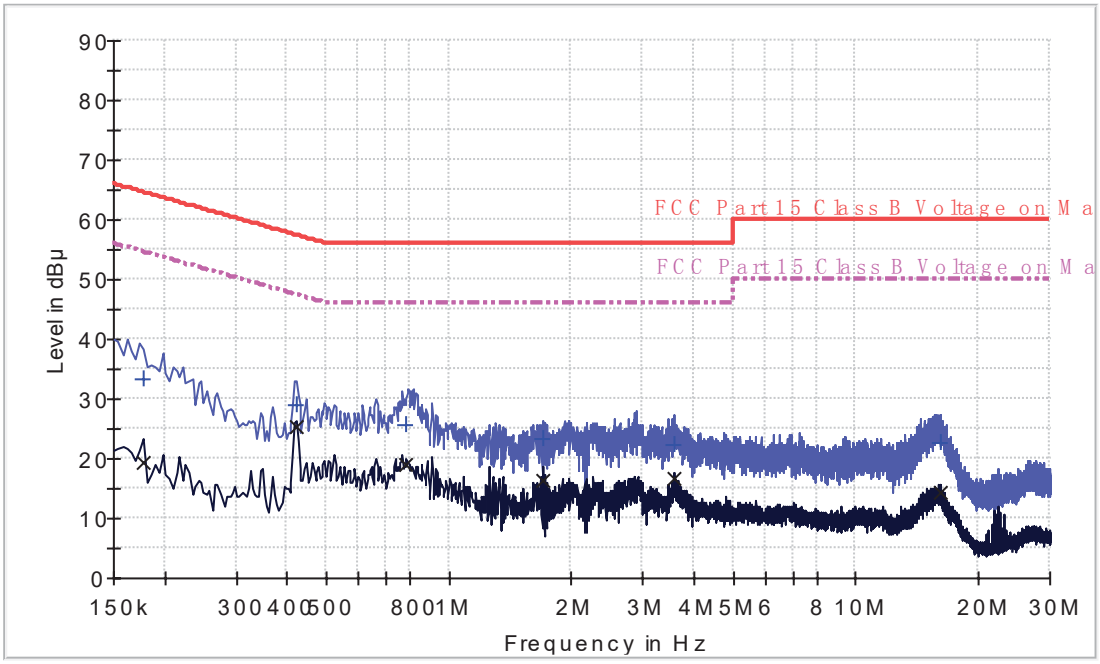
Result Table AV

Frequency (MHz)	Average (dB¦ÌV)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.158000	23.4	L1	9.6	32.2	55.6
0.398000	25.5	L1	9.7	22.4	47.9
0.802000	21.8	L1	9.7	24.2	46.0
1.306000	19.1	L1	9.7	26.9	46.0
2.582000	17.3	L1	9.7	28.7	46.0
15.658000	15.7	L1	10.1	34.3	50.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – Level (dBuV)

Applicant: Microsoft Corporation
Date of Test: May 25, 2018
Model: 1830
Worst Case Operating Mode: BT Link
Modulation type: GFSK
Phase: Neutral

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB¦ÌV)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.178000	33.2	N	9.7	31.4	64.6
0.422000	29.0	N	9.7	28.4	57.4
0.786000	25.8	N	9.7	30.2	56.0
1.702000	23.5	N	9.7	32.5	56.0
3.570000	22.4	N	9.8	33.6	56.0
16.114000	22.7	N	10.1	37.3	60.0

Result Table AV

Frequency (MHz)	Average (dB¦ÌV)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.178000	19.5	N	9.7	35.1	54.6
0.422000	25.4	N	9.7	22.0	47.4
0.786000	19.0	N	9.7	27.0	46.0
1.702000	16.4	N	9.7	29.6	46.0
3.570000	16.7	N	9.8	29.3	46.0
16.114000	14.5	N	10.1	35.5	50.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – Level (dBuV)

Applicant: Microsoft Corporation
Model: 1830

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required - No digital part

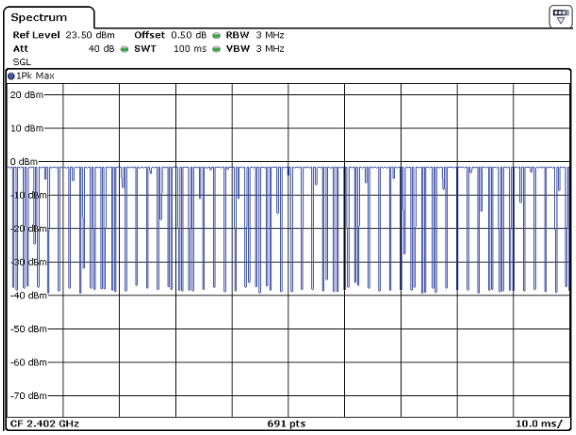
[ ] Test results are attached

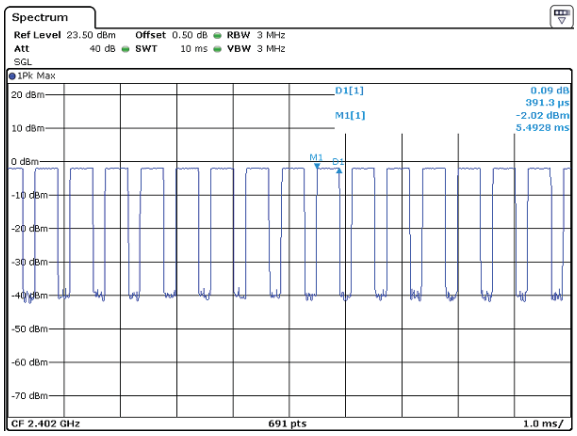
[x] Included in the separated report.

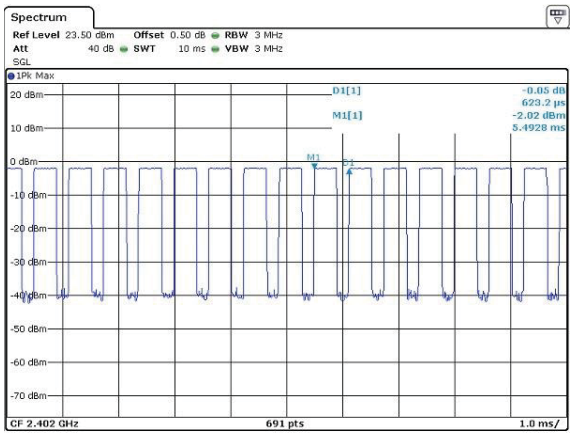
Applicant: Microsoft Corporation
Model: 1830

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:







T_{on} =391.3 µs
T=623.2 µs

Maximum Duty Cycle=62.8%

EXHIBIT 5

MISCELLANEOUS INFORMATION

5.0 Miscellaneous Information

This miscellaneous information includes details of the test procedure and calculation of factor such as pulse desensitization.

5.1 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

5.2 Discussion of Transmitter Duty Cycle

The device cannot operate at >98% duty cycle because of hardware limitation. EUT operated at its maximum power control level and operated at the maximum achievable duty cycle and set the transmit duration as long as possible during the test.

EXHIBIT 6

TEST EQUIPMENT LIST

6.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	01-Jun-2017	01-Jun-2018
					5-Jun-2018	5-Jun-2019
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	01-Jun-2017	01-Jun-2018
					5-Jun-2018	5-Jun-2019
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	20-Sep-2017	20-Sep-2018
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Jan-2018	24-Jan-2019
SZ061-08	Horn Antenna	ETS	3115	00092346	20-Sep-2017	20-Sep-2018
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	17-Mar-2018	17-Mar-2019
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	11-May-2018	11-May-2019
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	01-Jun-2017	01-Jun-2018
					05-Jun-2018	05-Jun-2019
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	07-Jul-2017	07-Jul-2018
					05-Jun-2018	05-Jun-2019
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	24-Jan-2018	24-Jan-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	16-Jan-2017	16-Jan-2019
SZ062-02	RF Cable	RADIALL	RG 213U	--	16-Jun-2017	16-Jun-2018
					02-Jun-2018	02-Jun-2019
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	16-Jun-2017	16-Jun-2018
					02-Jun-2018	02-Jun-2019
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	16-Jun-2017	16-Jun-2018
					02-Jun-2018	02-Jun-2019
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	14-Jun-2017	14-Jun-2018
					05-Jun-2018	05-Jun-2019
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	30-Oct-2017	30-Oct-2018
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	30-Oct-2017	30-Oct-2018
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2019

---END---