FCC Test Report

Product Name	Klipsch Heritage Wireless TableTop Bluetooth Small
Model No.	the Three II
FCC ID.	2AJAATHETHREEI

Applicant	Dongguan Meiloon Acoustic Equipment Co., Ltd.
Address	77, Yuanlin Road, Feng Huang Gang Ind Estate, Tangxia Town, 523727 Dongguan City, Guangdong Province, China.

Date of Receipt	Mar. 29, 2019
Issued Date	Apr 11, 2019
Report No.	1930477R-RFUSP23V00
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
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Test Report

Issued Date: Apr 11, 2019
Report No.: 1930477R-RFUSP23V00

Product Name	Klipsch Heritage Wireless TableTop Bluetooth Small
Applicant	Dongguan Meiloon Acoustic Equipment Co., Ltd.
Address	77, Yuanlin Road, Feng Huang Gang Ind Estate, Tangxia Town, 523727 Dongguan City, Guangdong Province, China.
Manufacturer	Klipsch Group, Inc.
Model No.	the Three II
FCC ID.	2AJAATHETHREEI
EUT Rated Voltage	AC 100-240V~50/60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	Klipsch
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 15.247 Meas Guidance v05
Test Result	Complied

Documented By : Elephant Chen

(Adm. Assistant / Elephant Chen)

Tested By : Sam Hsu

(Engineer / Sam Hsu)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Klipsch Heritage Wireless TableTop Bluetooth Small
Trade Name	Klipsch
Model No.	the Three II
FCC ID.	2AJAATHETHREEI
Frequency Range	2402-2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	IFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Contain Module	Fihonest / JS-BTM513

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Meiloon	N/A	IFA	0.5dBi for 2.4 GHz

Note:

1. The antenna of EUT conforms to FCC 15.203.
2. Only the higher gain antenna was tested and recorded in this report.

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

Note:

1. The EUT is a Klipsch Heritage Wireless TableTop Bluetooth Small with a built-in Bluetooth V3.0, V2.1+EDR transceiver, this report for Bluetooth V3.0, V2.1+EDR.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test
4. Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through pre-testing, to produce emissions similar to those for 3Mb/s.
5. The EUT employs Adaptive Frequency Hopping (AFH) which identifies sources of interference namely devices operating in 802.11 WLAN and excludes them from the list of available channels. The process of re-mapping reduces the number of test channels from 79 channels to a minimum number of 20 channels.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK) Mode 2: Transmit - 3Mbps (8DPSK)

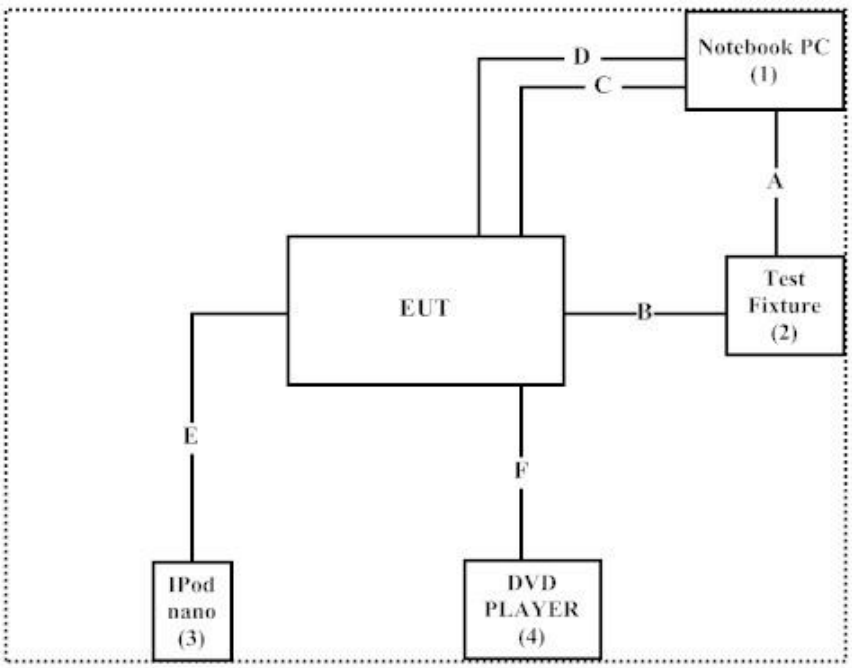
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-Shielded, 0.8m
2	Test Fixture	CSR	N/A	N/A	N/A
3	IPod nano	Apple	A1199	5U7047U8VQ5	N/A
4	DVD PLAYER	Pioneer	DV-600AV	GJKD006482LS	Non-Shielded, 0.8m

Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 0.8m
B	Signal Cable	Non-Shielded, 0.5m
C	USB Cable	Shielded, 1m
D	USB Cable	Shielded, 1.5m
E	Audio Cable	Non-Shielded, 1m
F	RCA Cable	Non-Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software ”Blue Test v2.5.0” on the Notebook PC.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/11/28	2019/11/27
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2018/7/22	2019/7/21
X	Power Meter	Anritsu	ML2495A	6K00003357	2018/6/23	2019/6/22
X	Pulse power sensor	Anritsu	MA2411B	0846193	2018/6/23	2019/6/22
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/10/13	2019/10/12
X	LISN	R&S	ESH3-Z5	836679/017	2019/1/7	2020/1/6
X	LISN	R&S	ENV216	100097	2019/1/7	2020/1/6
X	Coaxial Cable	QTK(Arnist)	RG 400	LC018-RG	2018/6/25	2019/6/24

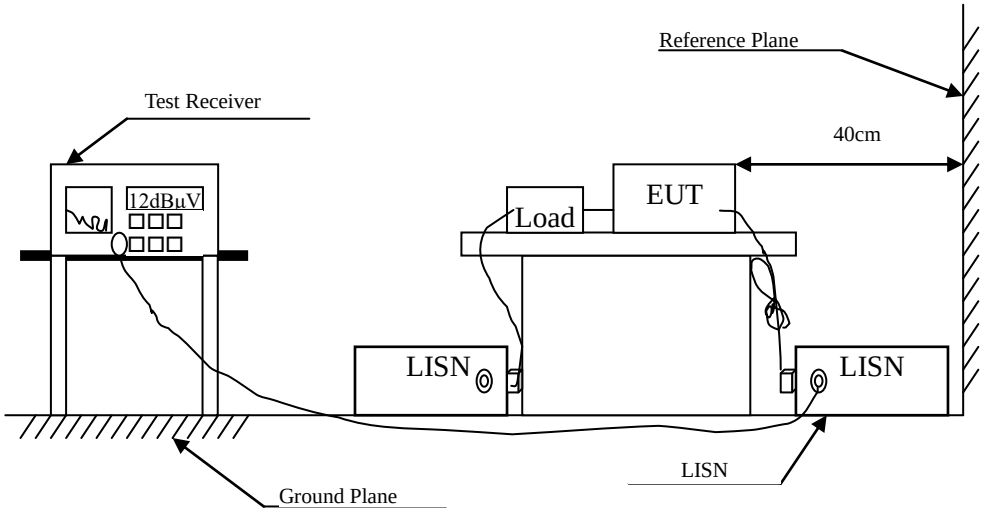
For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSP40	100170	2019/1/5	2020/1/4
	Loop Antenna	Teseq	HLA6121	37133	2019/3/18	2020/3/17
X	Bi-Log Antenna	Schaffner Chase	CBL6112B	2707	2018/6/11	2019/6/10
X	Horn Antenna	ETS-Lindgren	3117	00135205	2019/4/6	2020/4/5
X	Horn Antenna	Schwarzbeck	BBHA9170	9170430	2019/1/11	2020/1/10
X	Pre-Amplifier	QTK	AP/0100A	CHM/0901069	2018/6/23	2019/6/22
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2019/1/26	2020/1/24
X	Pre-Amplifier	NARDA WE	DBL-1840N506	013	2018/9/30	2019/9/29
X	Filter	MicroTRON	BRM50701	019	2018/11/2	2019/11/1
X	Filter	Microwave Circuits	N0257881	36681	2018/12/7	2019/12/6
X	EMI Test Receiver	R&S	ESR26	101385	2018/9/29	2019/9/28
X	Coaxial Cable	QTK(Arnist)	SUCOFLEX 106	L1606-015C	2018/6/23	2019/6/22
X	EMI Test Receiver	R&S	ESCS 30	838251/001	2018/7/21	2019/7/20
X	Coaxial Cable	QTK(Arnist)	RG 214	LC003-RG	2018/6/16	2019/6/15
X	Coaxial signal switch	Anritsu	MP59B	6201415889	2018/6/16	2019/6/15

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version :QuieTek EMI 2.0 V2.1.113.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBμV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Conducted Emission Test
Power Line : Line 1
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.154	9.687	38.660	48.346	-17.540	65.886
0.486	9.675	25.090	34.765	-21.635	56.400
1.084	9.704	11.830	21.534	-34.466	56.000
11.701	9.916	29.490	39.406	-20.594	60.000
15.537	9.962	21.940	31.902	-28.098	60.000
20.224	10.032	17.930	27.962	-32.038	60.000
Average					
0.154	9.687	22.640	32.326	-23.560	55.886
0.486	9.675	17.000	26.675	-19.725	46.400
1.084	9.704	3.360	13.064	-32.936	46.000
11.701	9.916	8.600	18.516	-31.484	50.000
15.537	9.962	4.940	14.902	-35.098	50.000
20.224	10.032	2.710	12.742	-37.258	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Conducted Emission Test
Power Line : Line 2
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

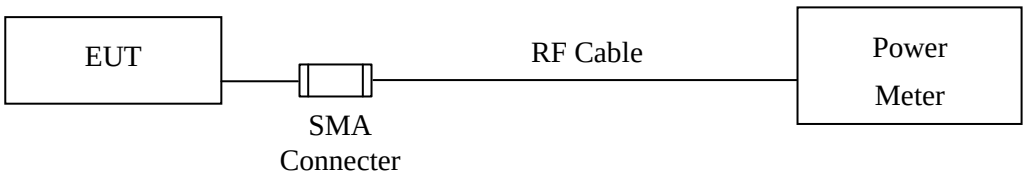
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.150	9.734	39.040	48.774	-17.226	66.000
0.236	9.737	24.460	34.197	-29.346	63.543
0.498	9.746	23.500	33.246	-22.811	56.057
10.236	9.989	16.330	26.319	-33.681	60.000
12.291	10.032	23.660	33.692	-26.308	60.000
13.931	10.070	23.590	33.660	-26.340	60.000
Average					
0.150	9.734	23.060	32.794	-23.206	56.000
0.236	9.737	11.900	21.637	-31.906	53.543
0.498	9.746	15.960	25.706	-20.351	46.057
10.236	9.989	8.020	18.009	-31.991	50.000
12.291	10.032	22.980	33.012	-16.988	50.000
13.931	10.070	4.980	15.050	-34.950	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

3.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	5.23	0.125W = 20.97dBm	Pass
Channel 39	2441.00	5.47	0.125W = 20.97dBm	Pass
Channel 78	2480.00	5.26	0.125W = 20.97dBm	Pass

Note: For AFH mode using 20 hopping channels,the maximum output power limit is 0.125W.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

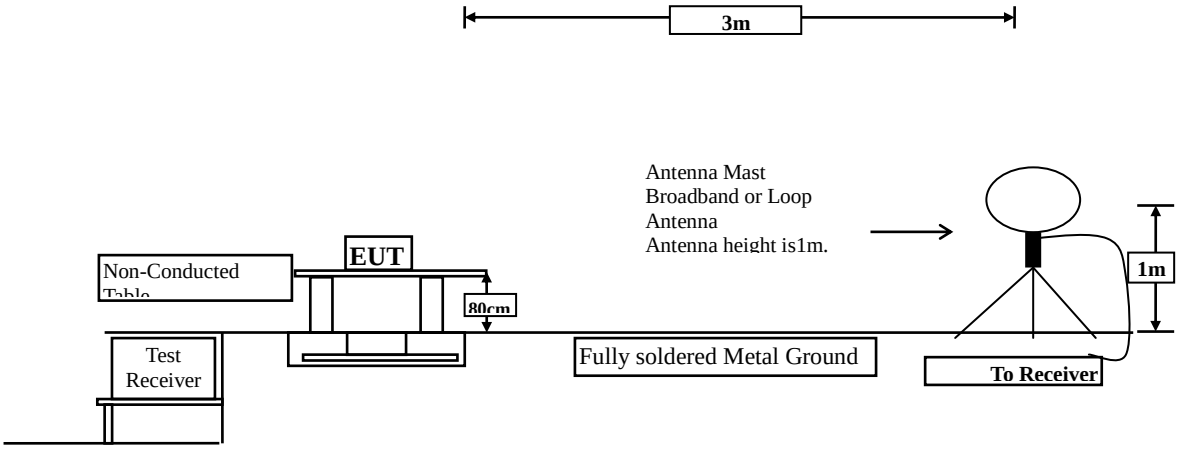
Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	6.59	0.125W = 20.97dBm	Pass
Channel 39	2441.00	6.57	0.125W = 20.97dBm	Pass
Channel 78	2480.00	6.16	0.125W = 20.97dBm	Pass

Note: For AFH mode using 20 hopping channels,the maximum output power limit is 0.125W.

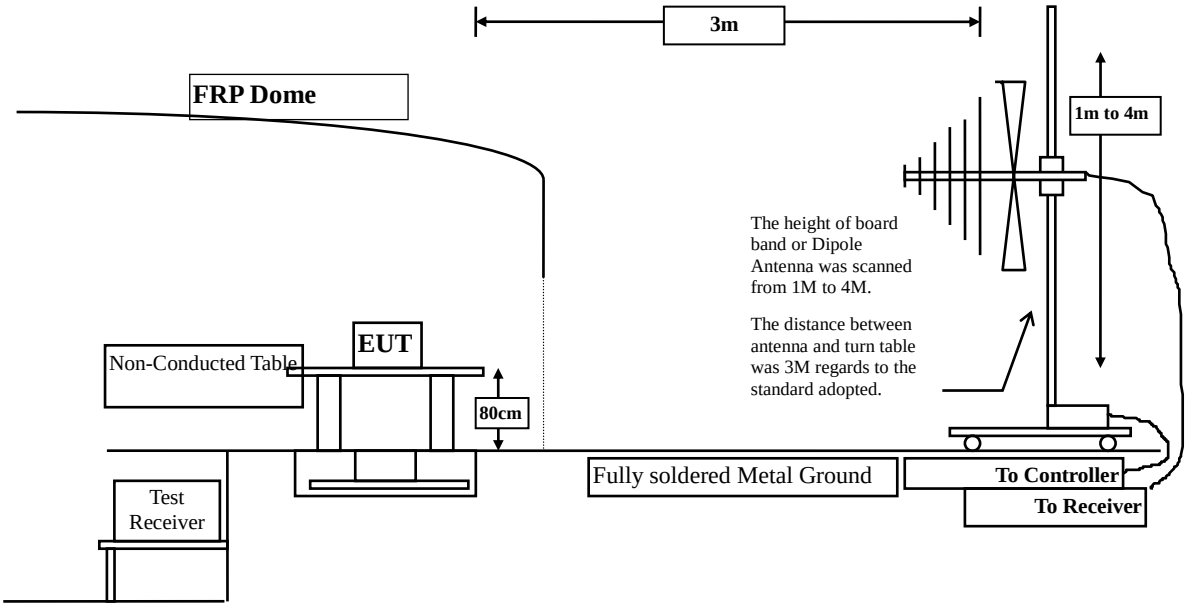
4. Radiated Emission

4.1. Test Setup

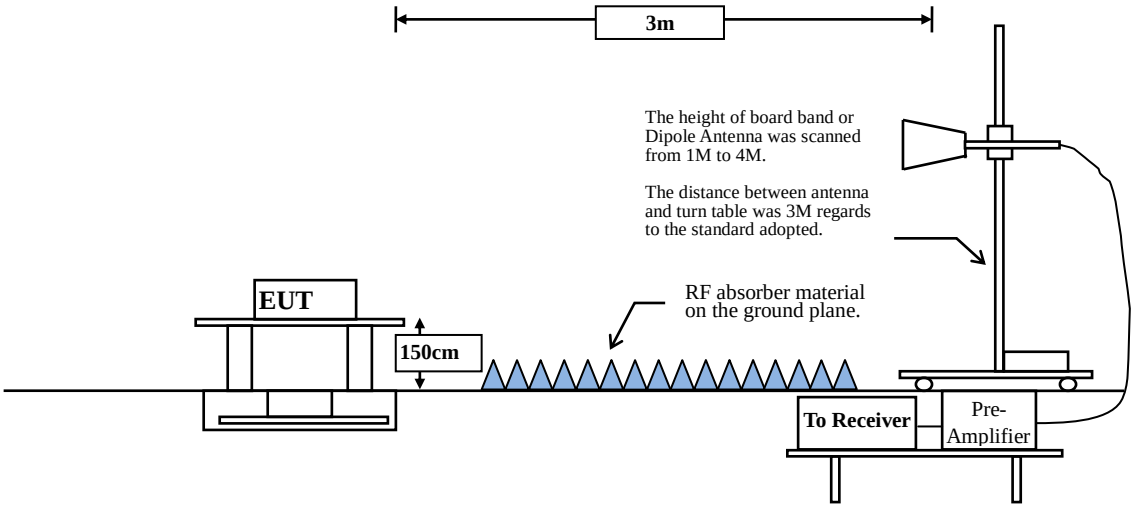
Under 30MHz



Below 1GHz



Above 1GHz



4.2. Limits

➢ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: 1. RF Voltage (dBμV) = 20 log RF Voltage (uV)

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

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

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Radiated Emission

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4804.000	2.511	42.680	45.190	-28.810	74.000
7206.000	9.511	40.130	49.641	-24.359	74.000
9608.000	10.394	38.710	49.104	-24.896	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4804.000	2.923	43.100	46.022	-27.978	74.000
7206.000	9.988	39.490	49.479	-24.521	74.000
9608.000	10.847	38.250	49.097	-24.903	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2016/10/13
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4882.000	2.025	42.350	44.375	-29.625	74.000
7323.000	9.762	40.160	49.921	-24.079	74.000
9764.000	9.682	37.770	47.451	-26.549	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	2.488	42.530	45.018	-28.982	74.000
7323.000	10.375	39.830	50.204	-23.796	74.000
9764.000	10.315	38.260	48.575	-25.425	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2016/10/13
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4960.000	2.582	42.240	44.822	-29.178	74.000
7440.000	10.555	38.940	49.495	-24.505	74.000
9920.000	10.206	37.900	48.106	-25.894	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4960.000	3.398	43.820	47.219	-26.781	74.000
7440.000	11.214	39.820	51.034	-22.966	74.000
9920.000	11.245	38.370	49.615	-24.385	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2016/10/13
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4804.000	2.511	41.270	43.780	-30.220	74.000
7206.000	9.511	37.680	47.191	-26.809	74.000
9608.000	10.394	37.920	48.314	-25.686	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4804.000	2.923	40.650	43.572	-30.428	74.000
7206.000	9.988	37.900	47.889	-26.111	74.000
9608.000	10.847	38.150	48.997	-25.003	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4882.000	2.025	41.110	43.135	-30.865	74.000
7323.000	9.762	38.380	48.141	-25.859	74.000
9764.000	9.682	38.030	47.711	-26.289	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	2.488	40.220	42.708	-31.292	74.000
7323.000	10.375	37.700	48.074	-25.926	74.000
9764.000	10.315	37.580	47.895	-26.105	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4960.000	2.582	40.850	43.432	-30.568	74.000
7440.000	10.555	38.240	48.795	-25.205	74.000
9920.000	10.206	38.120	48.326	-25.674	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4960.000	3.398	40.200	43.599	-30.401	74.000
7440.000	11.214	37.880	49.094	-24.906	74.000
9920.000	11.245	38.590	49.835	-24.165	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test date : 2019/04/09
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
104.615	-1.783	32.339	30.556	-12.944	43.500
191.667	-3.087	34.866	31.779	-11.721	43.500
317.580	2.269	34.598	36.867	-9.133	46.000
528.990	7.291	21.702	28.993	-17.007	46.000
774.599	10.478	22.084	32.562	-13.438	46.000
936.266	12.719	22.052	34.771	-11.229	46.000
Vertical					
103.061	-1.995	35.323	33.329	-10.171	43.500
211.875	-1.927	27.958	26.031	-17.469	43.500
365.769	3.914	26.570	30.484	-15.516	46.000
491.683	6.545	23.363	29.907	-16.093	46.000
672.003	9.239	21.661	30.900	-15.100	46.000
972.019	13.149	22.719	35.867	-18.133	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/04/09
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

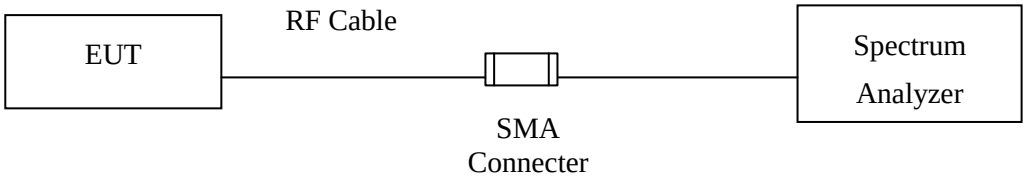
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
108.395	-1.262	30.920	29.658	-13.842	43.500
189.493	-3.221	36.034	32.814	-10.686	43.500
315.962	2.211	35.038	37.249	-8.751	46.000
531.567	7.349	21.795	29.144	-16.856	46.000
778.196	10.522	22.469	32.991	-13.009	46.000
939.552	12.772	20.913	33.685	-12.315	46.000
Vertical					
102.744	-2.036	35.594	33.558	-9.942	43.500
212.658	-1.931	29.243	27.311	-16.189	43.500
366.293	3.927	27.190	31.117	-14.883	46.000
492.358	6.559	23.809	30.369	-15.631	46.000
676.921	9.260	21.959	31.219	-14.781	46.000
971.008	13.145	23.770	36.915	-17.085	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF Antenna Conducted Test

5.1. Test Setup



5.2. Limits

According to FCC Section 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

± 1.20dB

5.5. Test Result of RF Antenna Conducted Test

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2016/10/13
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 00:

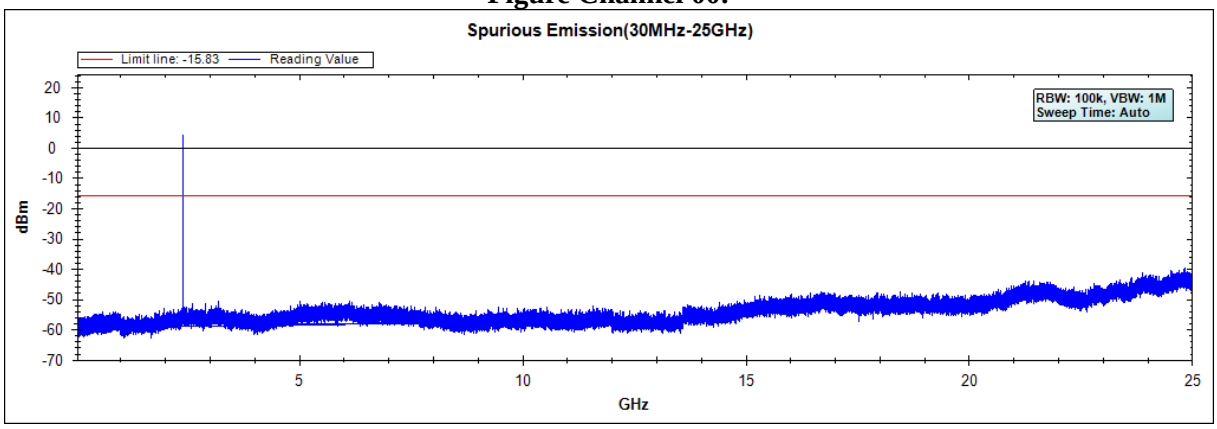


Figure Channel 39:

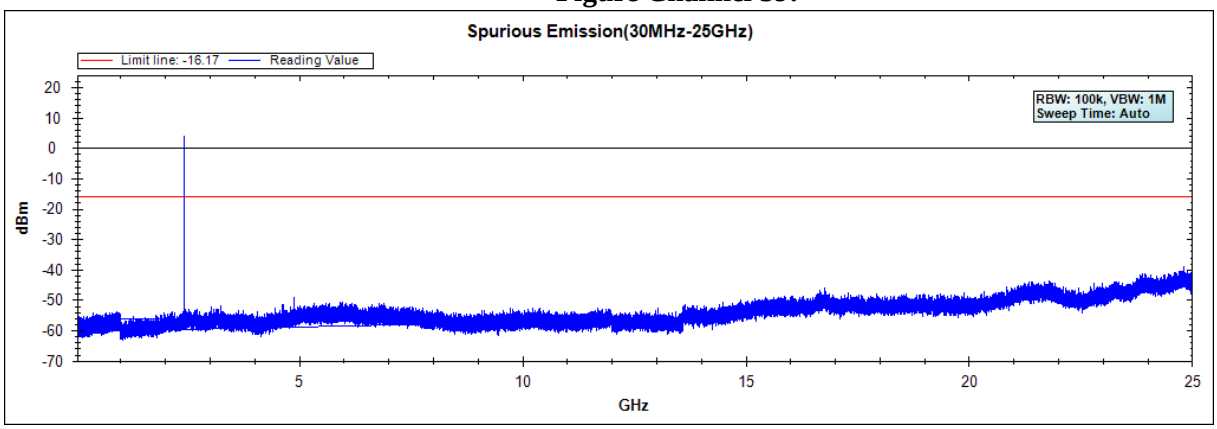
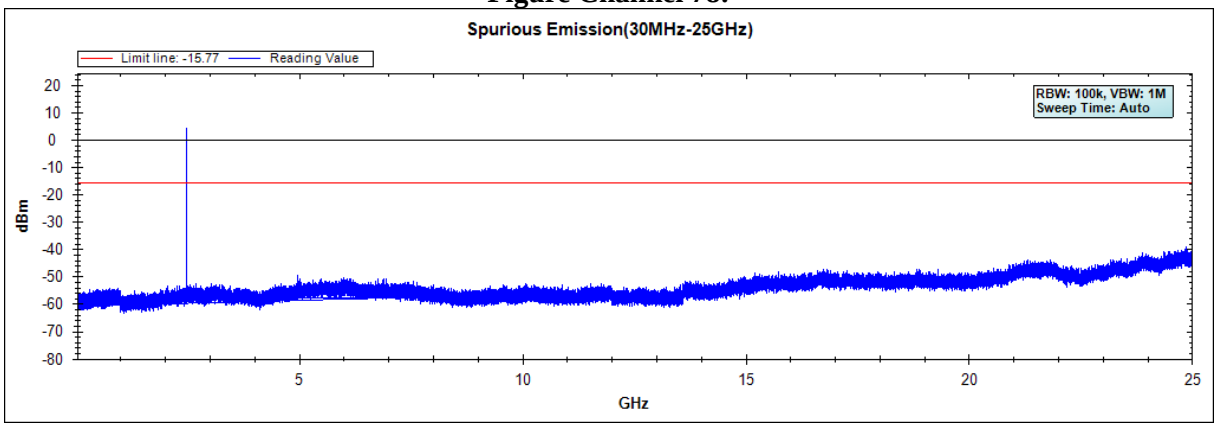


Figure Channel 78:



Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2016/10/13
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

Figure Channel 00:

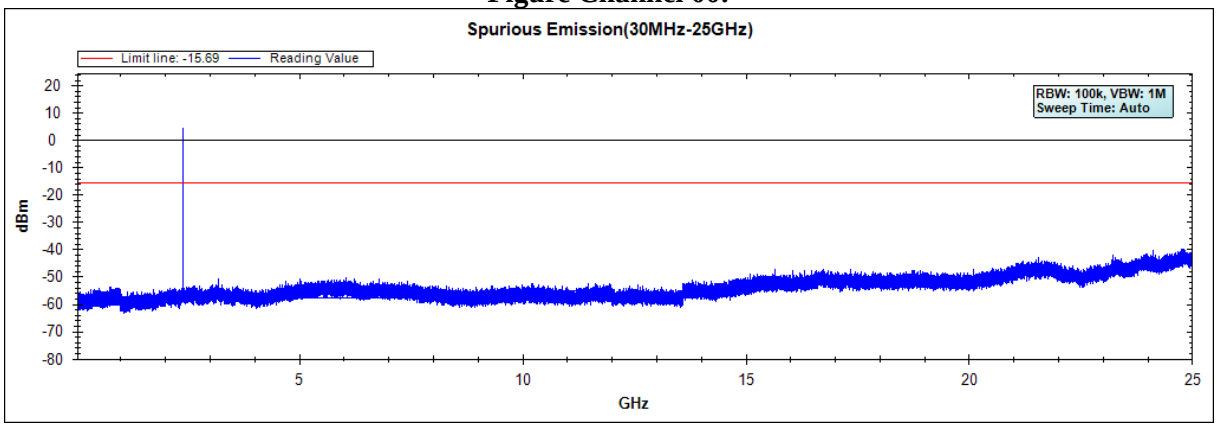


Figure Channel 39:

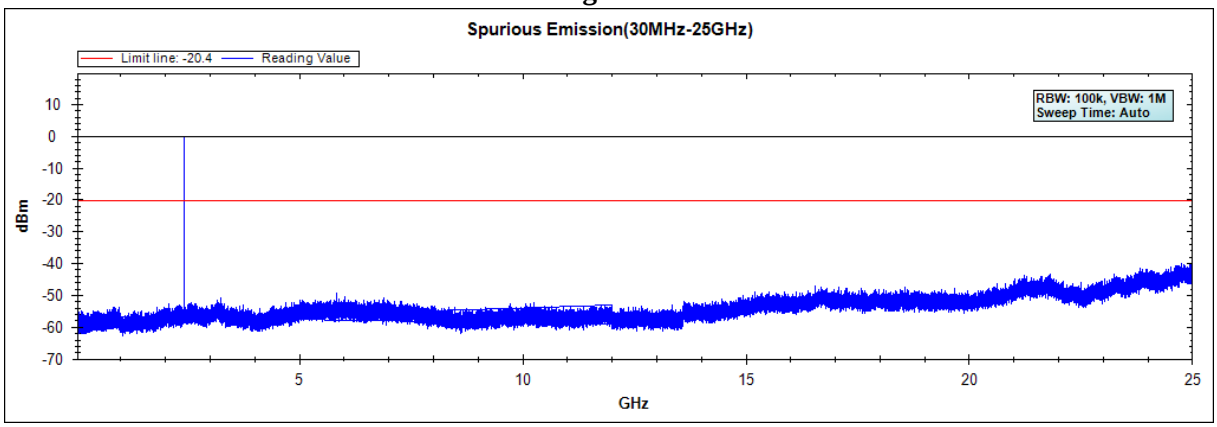
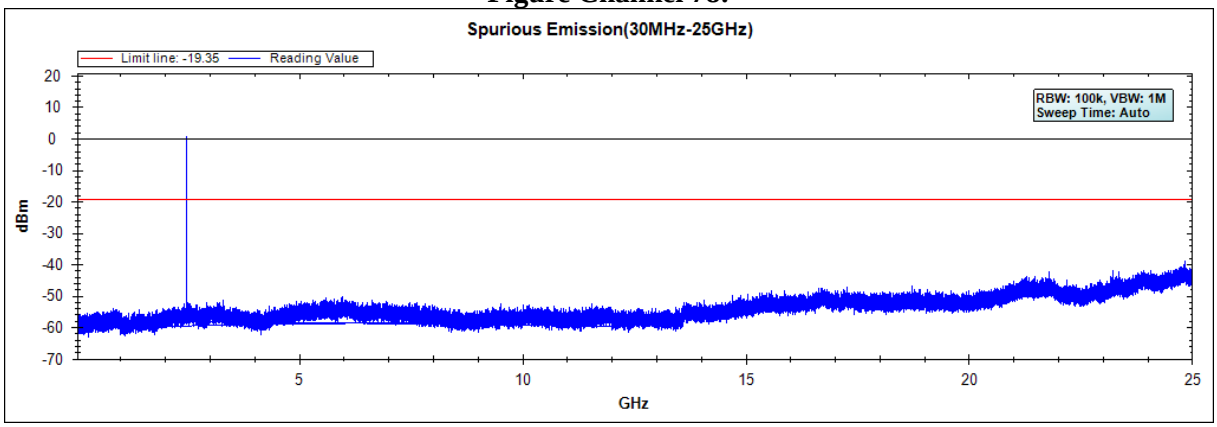


Figure Channel 78:



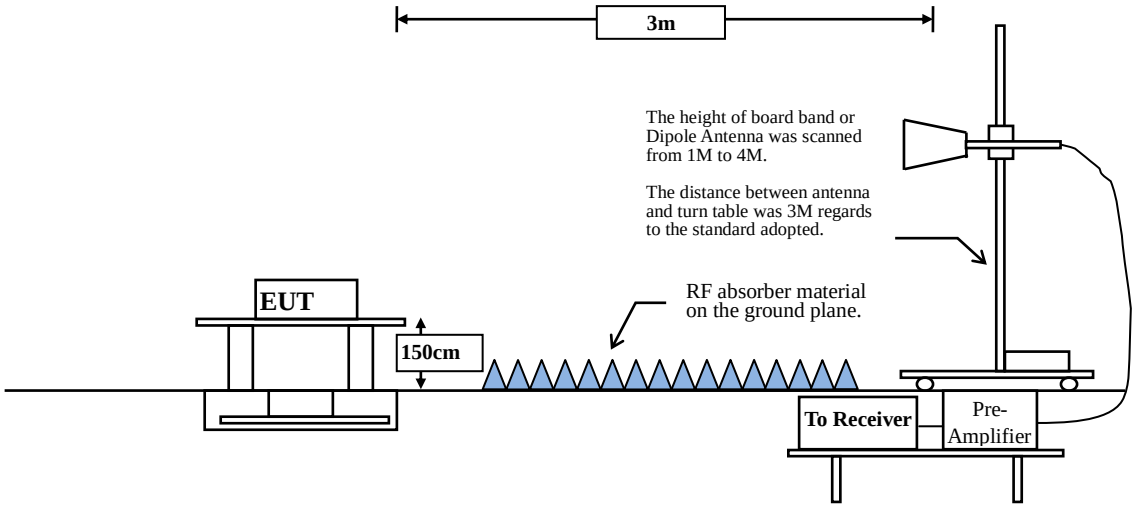
Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

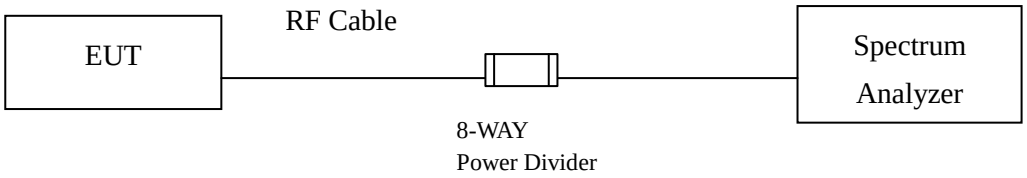
6.1. Test Setup

RF Radiated Measurement:

Above 1GHz



RF Conducted Measurement



6.2. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.
The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Uncertainty

± 4.08 dB above 1GHz
± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product	:	Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2016/10/13
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
00 (Peak)	2375.942	-2.749	48.875	46.126	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	45.703	43.016	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	72.928	70.268	--	--	--
00 (Peak)	2402.174	-2.657	105.913	103.256	--	--	--
00 (Average)	2376.087	-2.748	39.689	36.940	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	33.488	30.801	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	53.779	51.119	--	--	--
00 (Average)	2402.029	-2.657	91.489	88.832	--	--	--

Figure Channel 00: Horizontal (Peak)

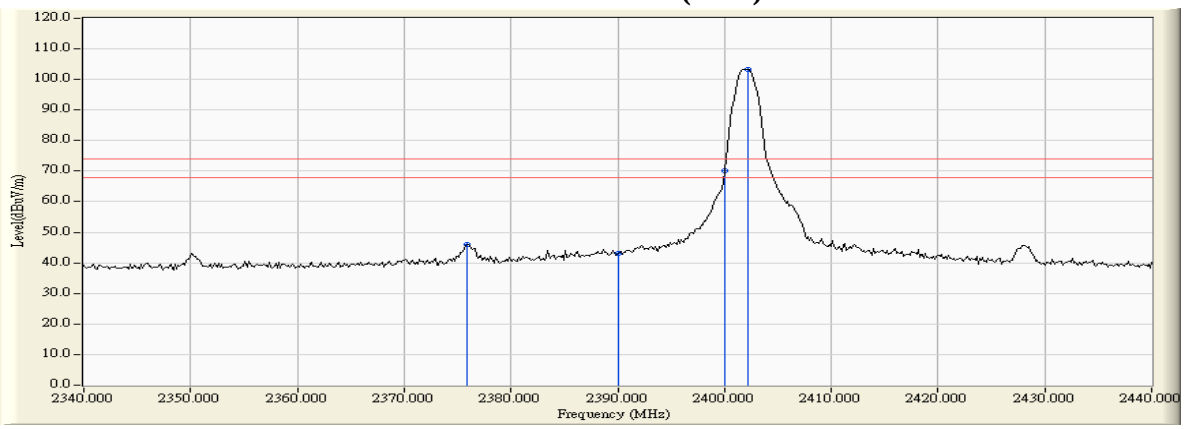
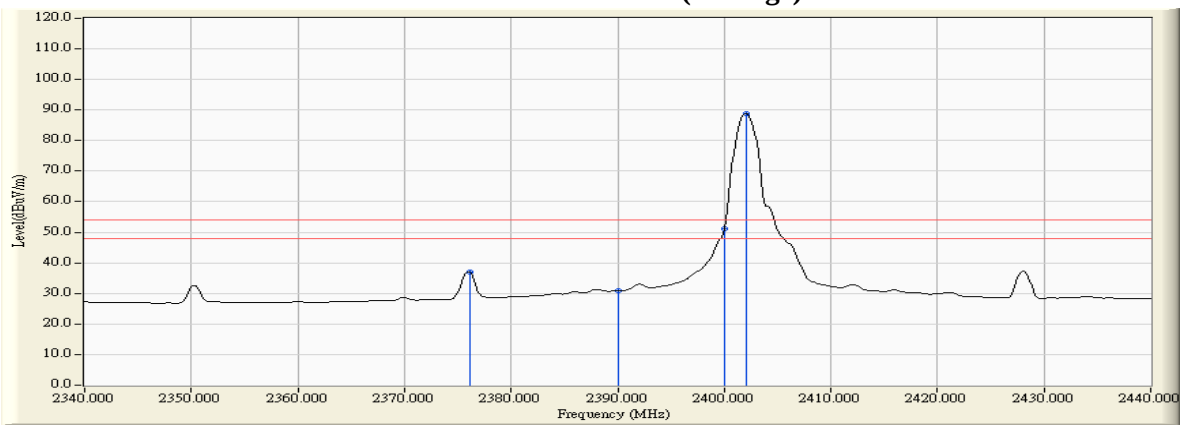


Figure Channel 00: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
00 (Peak)	2376.087	-4.112	47.380	43.268	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	45.680	41.521	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	71.020	66.849	--	--	--
00 (Peak)	2402.174	-4.171	103.639	99.468	--	--	--
00 (Average)	2376.087	-4.112	37.382	33.270	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	32.194	28.035	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	52.127	47.956	--	--	--
00 (Average)	2402.029	-4.171	88.238	84.067	--	--	--

Figure Channel 00: VERTICAL (Peak)

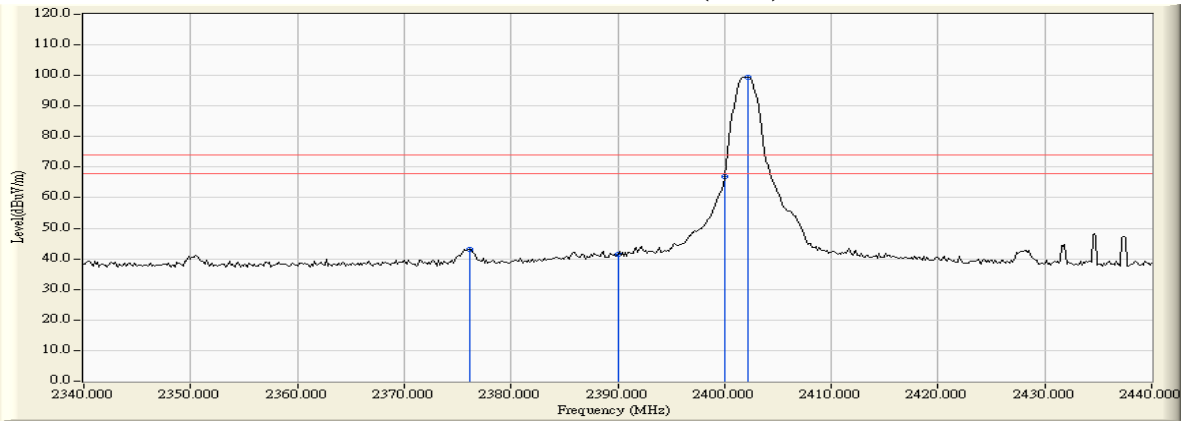
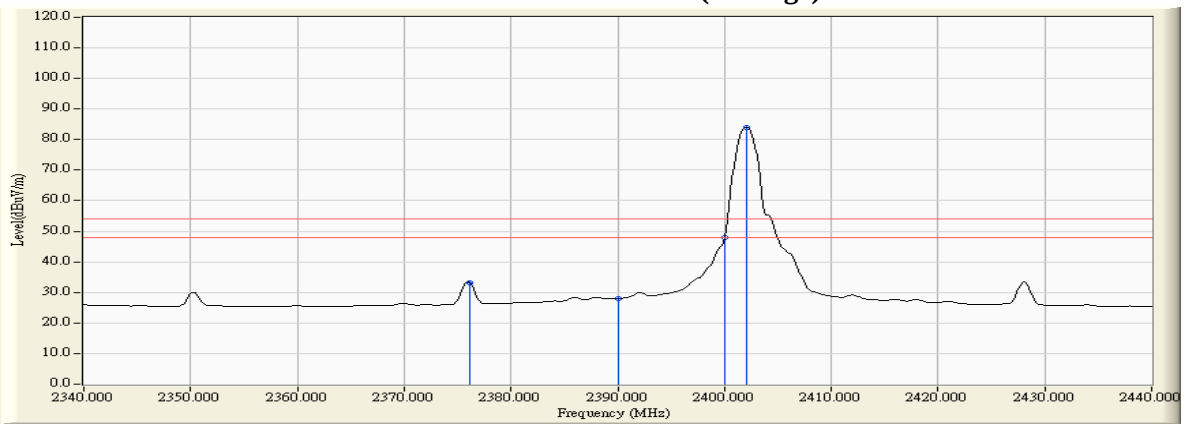


Figure Channel 00: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
78 (Peak)	2479.877	-2.605	104.887	102.282	--	--	Pass
78 (Peak)	2483.500	-2.601	55.679	53.077	74.00	54.00	Pass
78 (Average)	2480.022	-2.605	90.010	87.405	--	--	Pass
78 (Average)	2483.500	-2.601	40.817	38.215	74.00	54.00	Pass

Figure Channel 78: Horizontal (Peak)

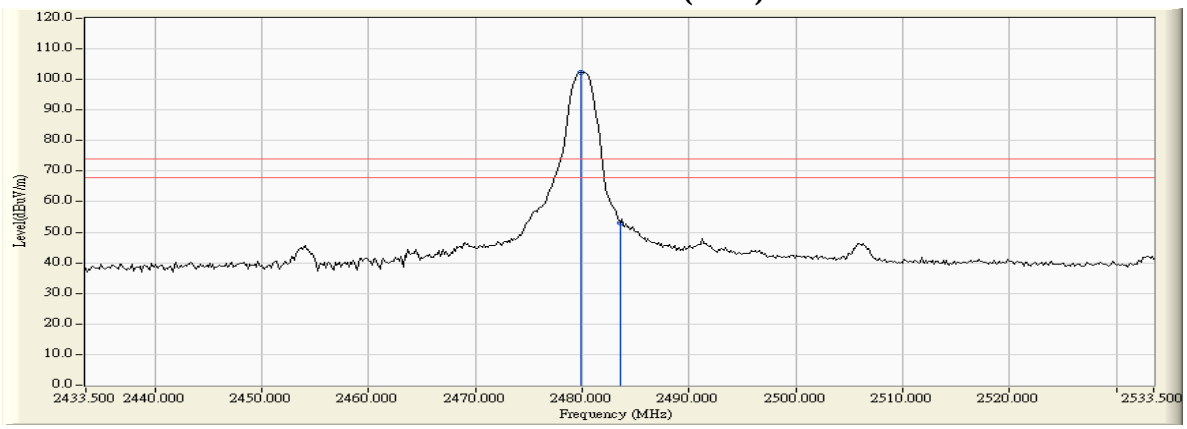
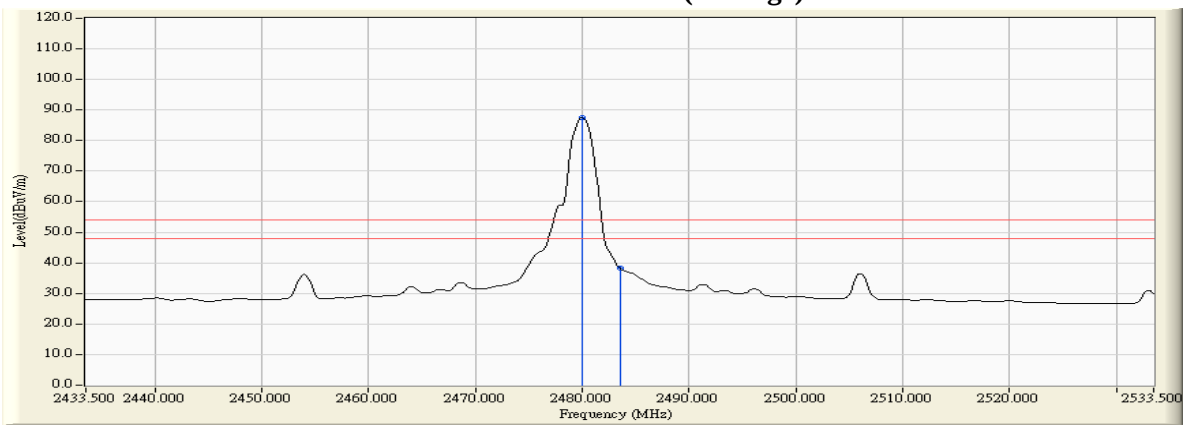


Figure Channel 78: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
78 (Peak)	2479.877	-3.978	101.605	97.627	--	--	Pass
78 (Peak)	2483.500	-3.966	52.659	48.692	74.00	54.00	Pass
78 (Average)	2479.877	-3.978	87.053	83.075	--	--	Pass
78 (Average)	2483.500	-3.966	38.481	34.514	74.00	54.00	Pass

Figure Channel 78: VERTICAL (Peak)

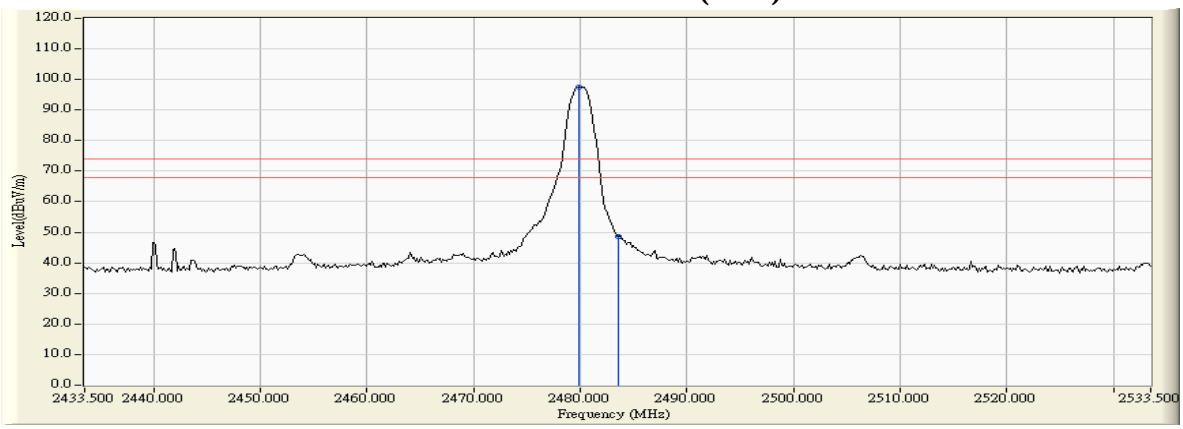
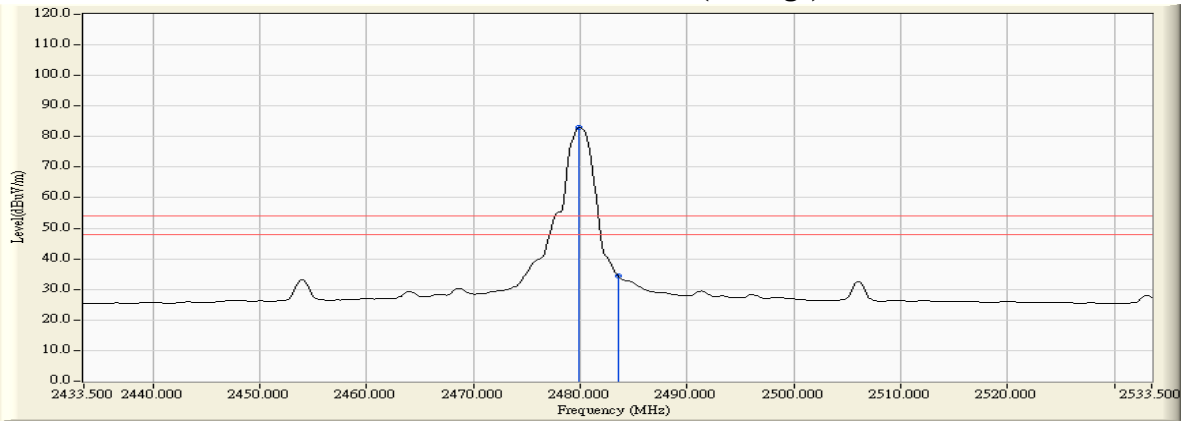


Figure Channel 78: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
00 (Peak)	2376.377	-2.748	46.809	44.062	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	45.957	43.270	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	77.234	74.574	74.00	54.00	Pass
00 (Peak)	2402.029	-2.657	104.538	101.881	--	--	--
00 (Average)	2376.087	-2.748	36.212	33.463	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	32.943	30.256	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	54.475	51.815	--	--	--
00 (Average)	2402.319	-2.657	85.768	83.111	--	--	--

Figure Channel 00: Horizontal (Peak)

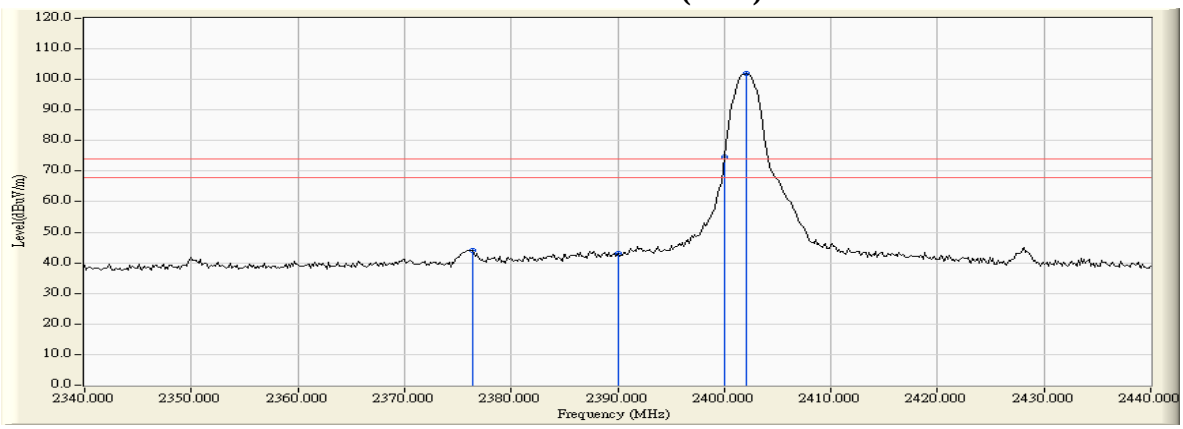
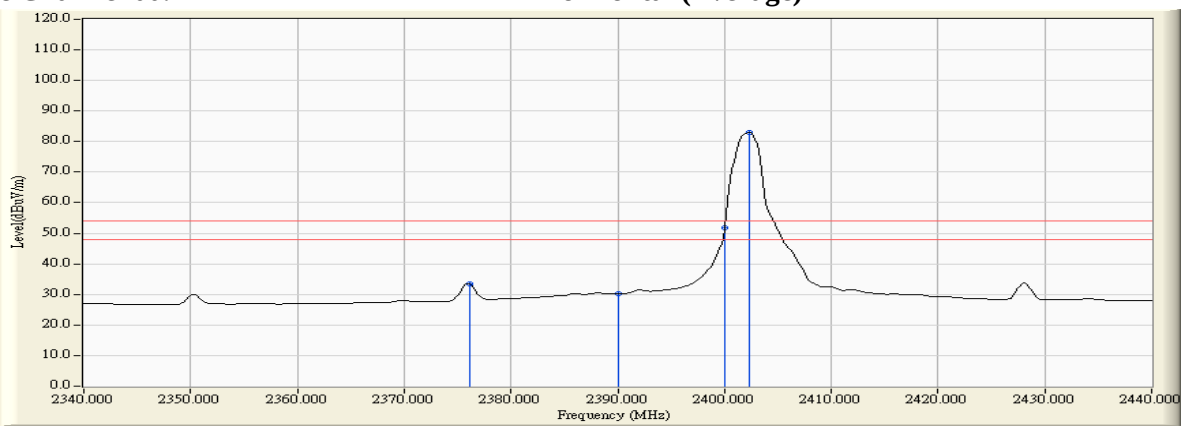


Figure Channel 00: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
00 (Peak)	2376.087	-4.112	46.480	42.368	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	45.276	41.117	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	75.051	70.880	74.00	54.00	Pass
00 (Peak)	2402.029	-4.171	101.960	97.789	--	--	--
00 (Average)	2375.942	-4.111	34.448	30.336	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	31.868	27.709	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	53.208	49.037	--	--	--
00 (Average)	2402.029	-4.171	84.637	80.466	--	--	--

Figure Channel 00: VERTICAL (Peak)

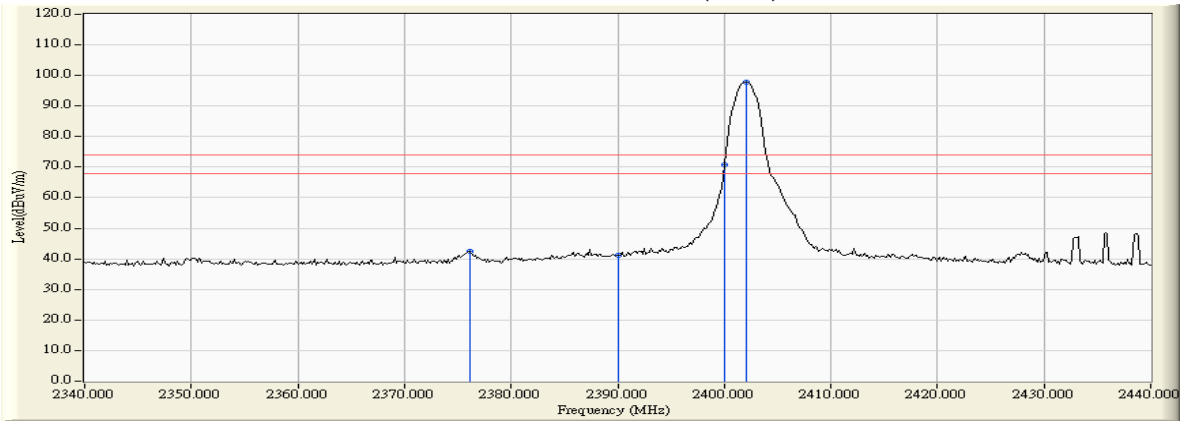
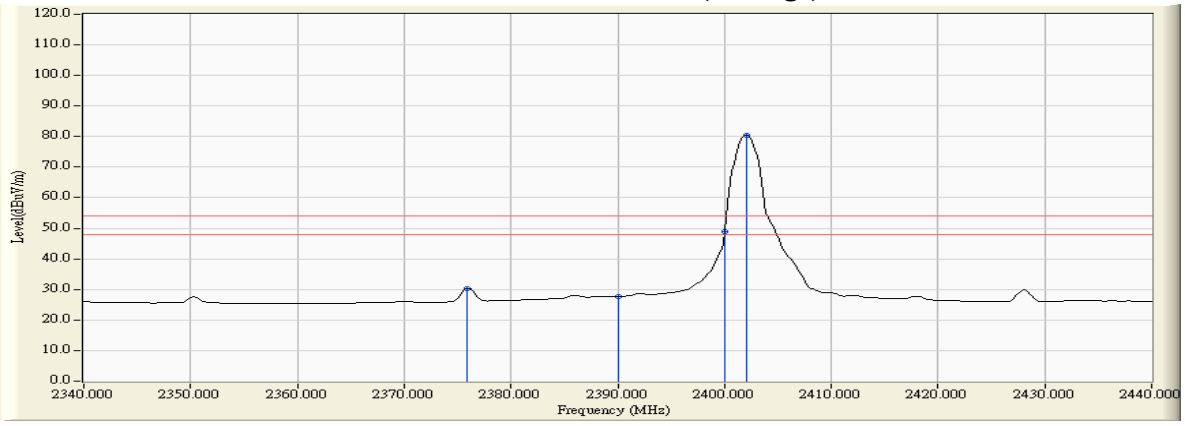


Figure Channel 00: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
78 (Peak)	2480.022	-2.605	102.848	100.243	--	--	Pass
78 (Peak)	2483.500	-2.601	54.189	51.587	74.00	54.00	Pass
78 (Average)	2479.877	-2.605	85.643	83.038	--	--	Pass
78 (Average)	2483.500	-2.601	39.328	36.726	74.00	54.00	Pass

Figure Channel 00: Horizontal (Peak)

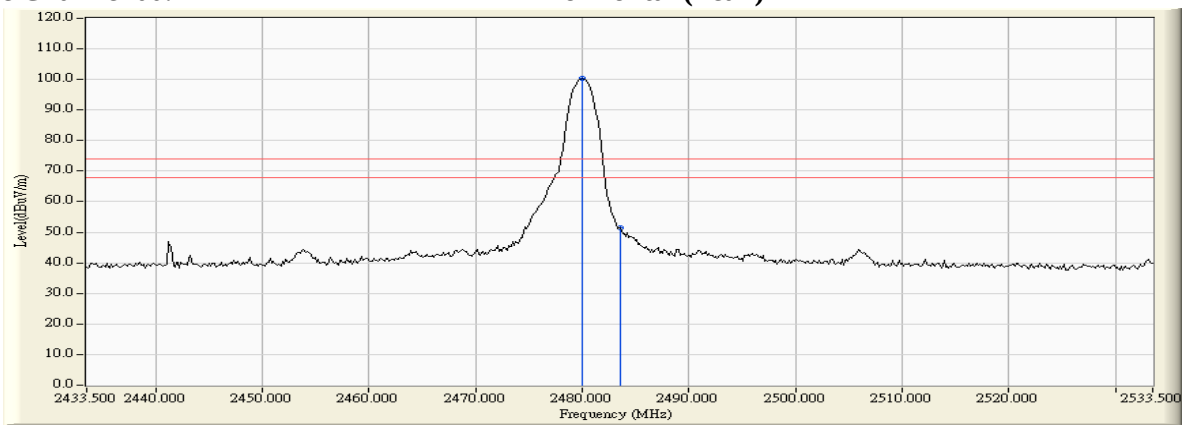
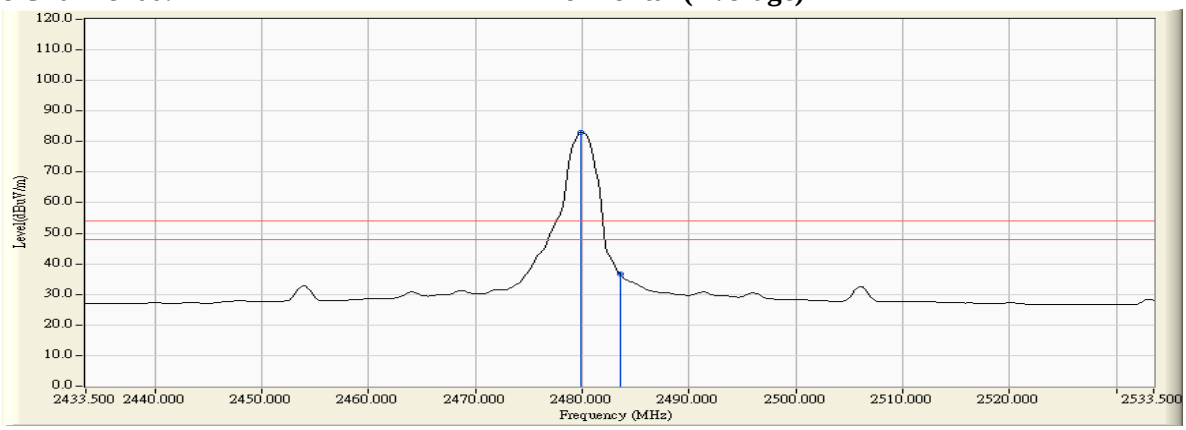


Figure Channel 00: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2016/10/13
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
78 (Peak)	2480.022	-3.978	99.576	95.598	--	--	Pass
78 (Peak)	2483.500	-3.966	51.256	47.289	74.00	54.00	Pass
78 (Average)	2479.877	-3.978	83.319	79.341	--	--	Pass
78 (Average)	2483.500	-3.966	36.829	32.862	74.00	54.00	Pass

Figure Channel 78: VERTICAL (Peak)

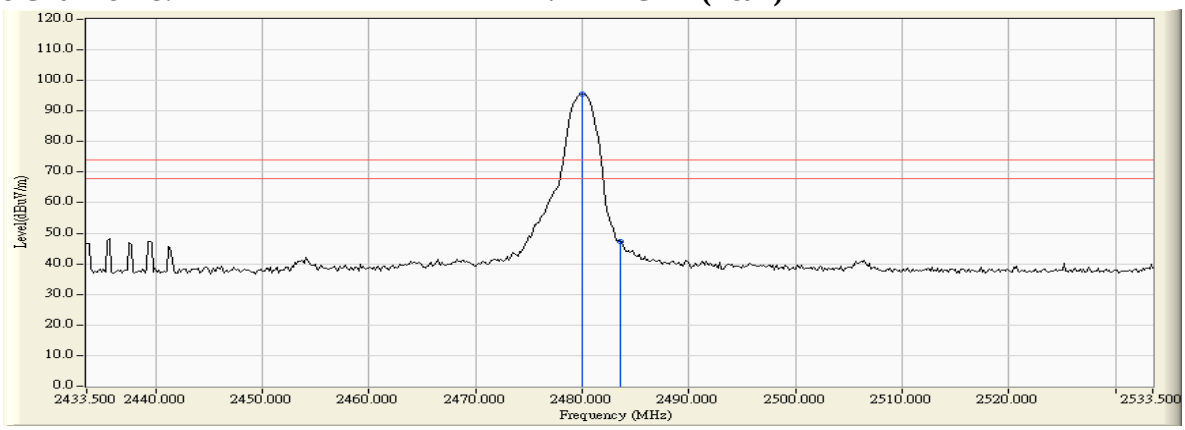
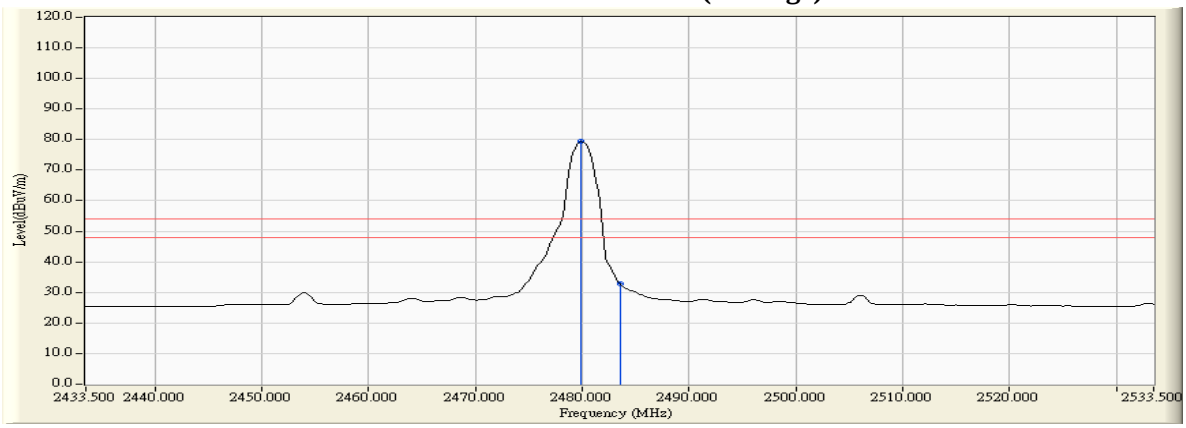


Figure Channel 78: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00:

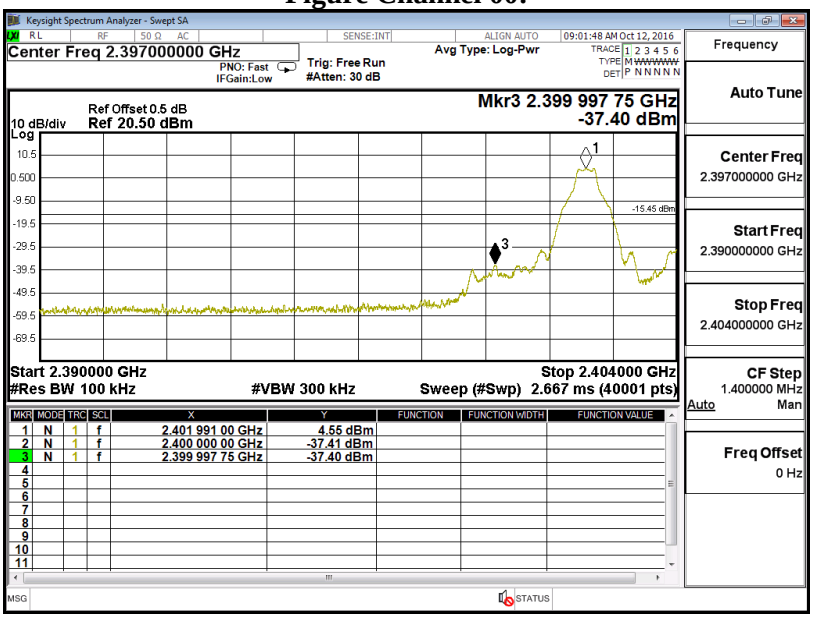
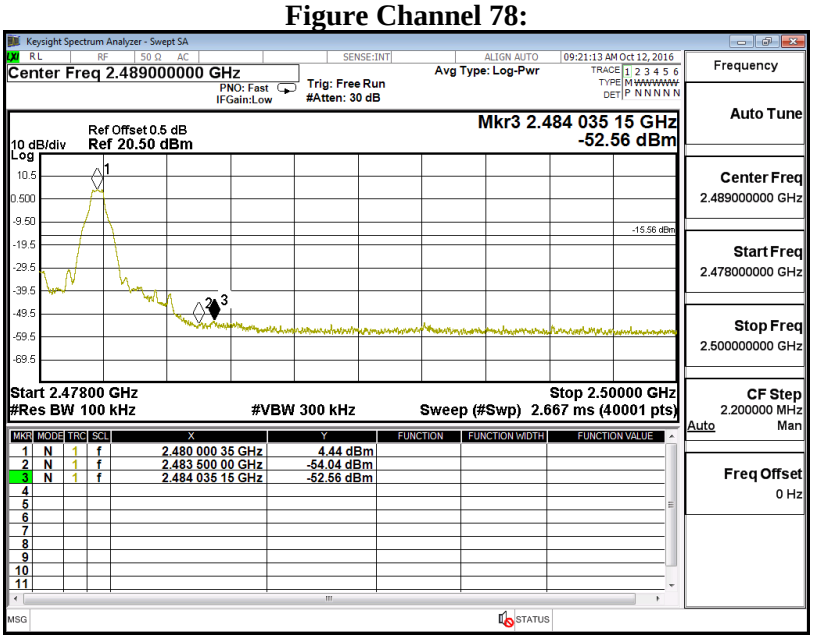


Figure Channel 78:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00:

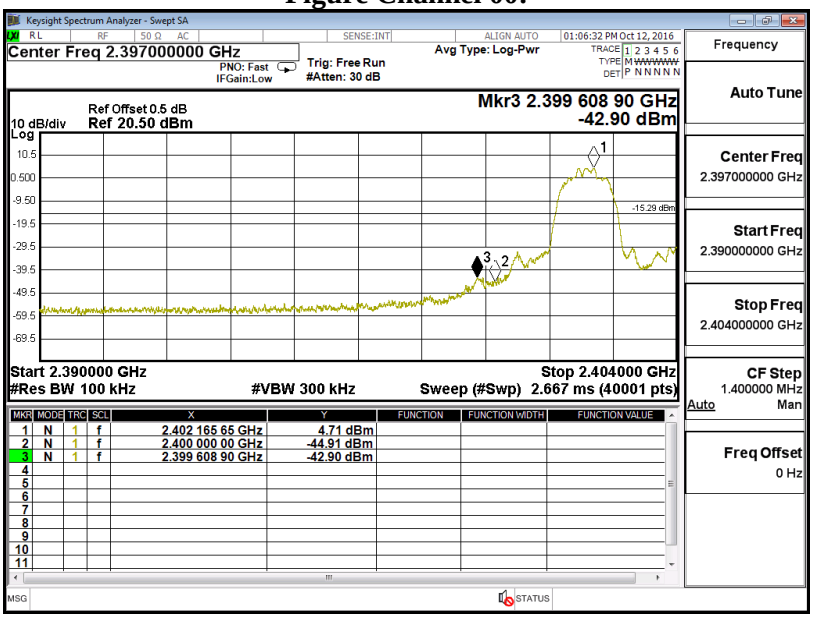
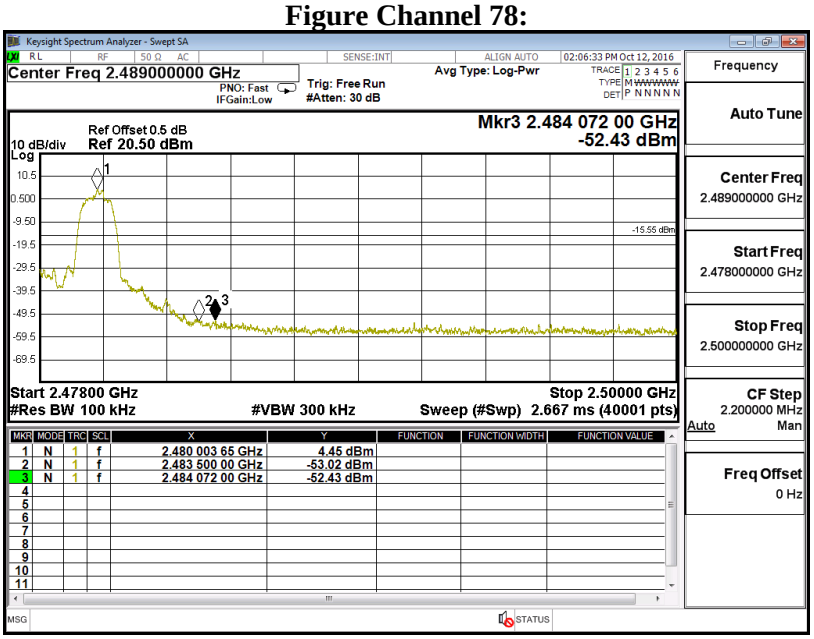


Figure Channel 78:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping on)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00 Hopping:

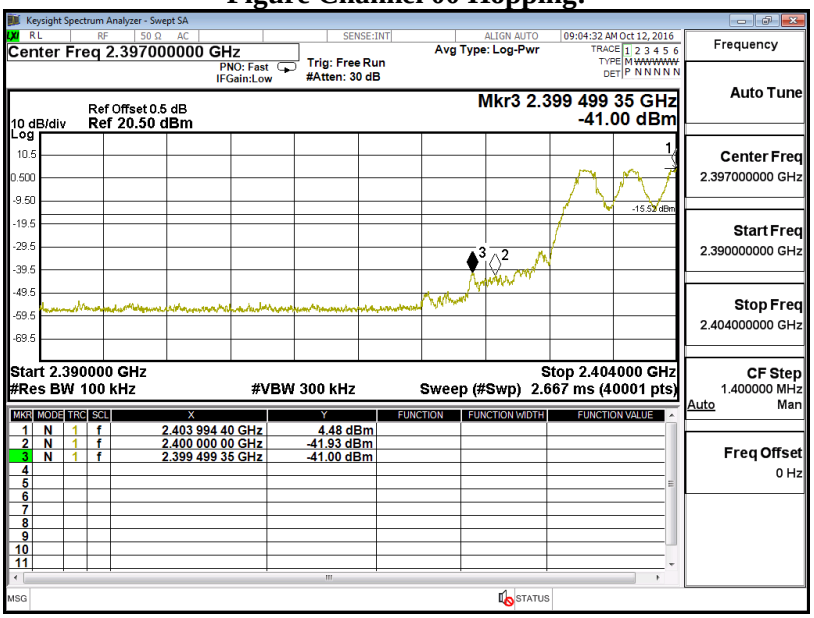
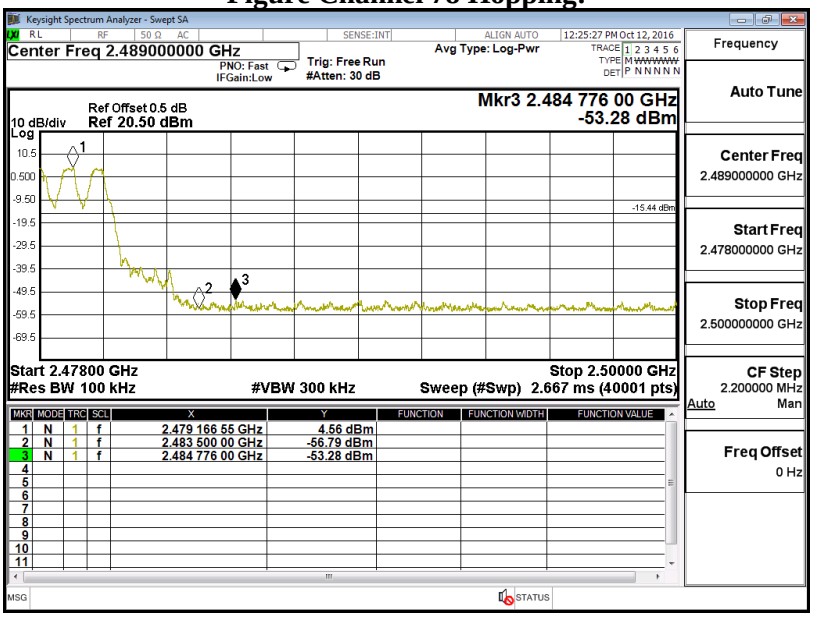


Figure Channel 78 Hopping:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00 Hopping:

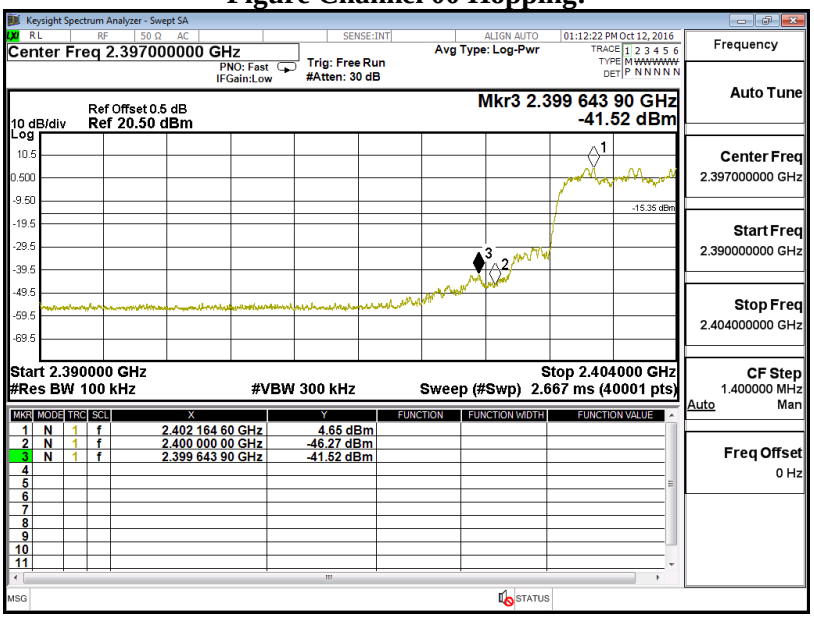
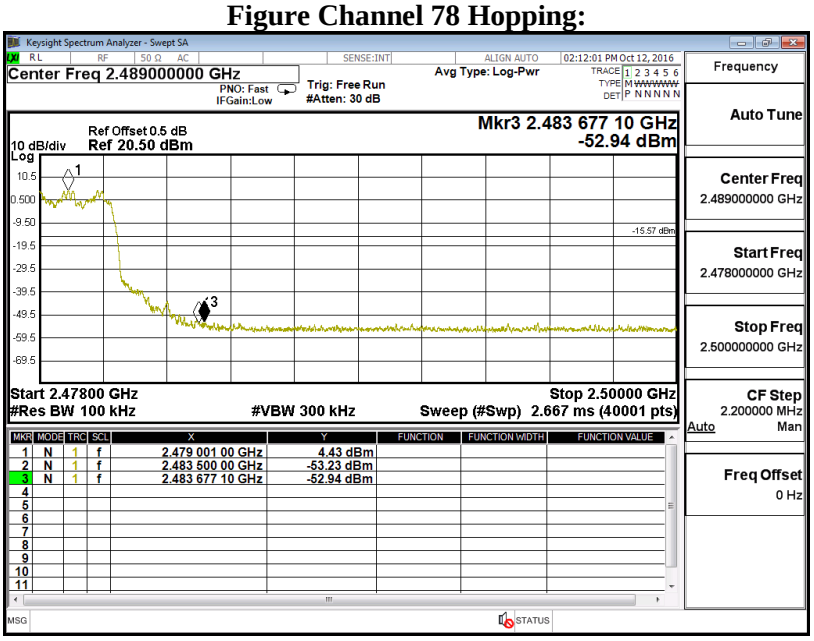
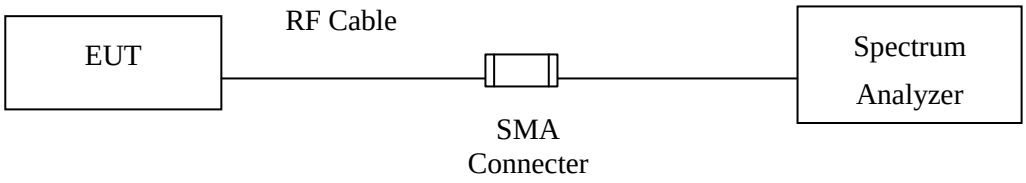


Figure Channel 78 Hopping:



7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 15 hopping frequencies.

7.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

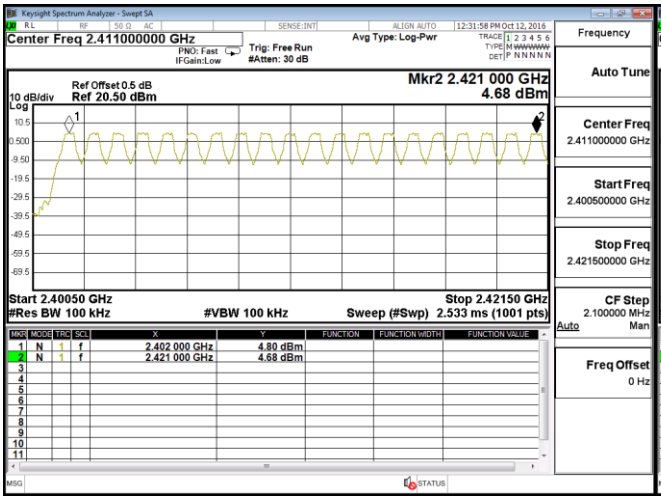
N/A

7.5. Test Result of Channel Number

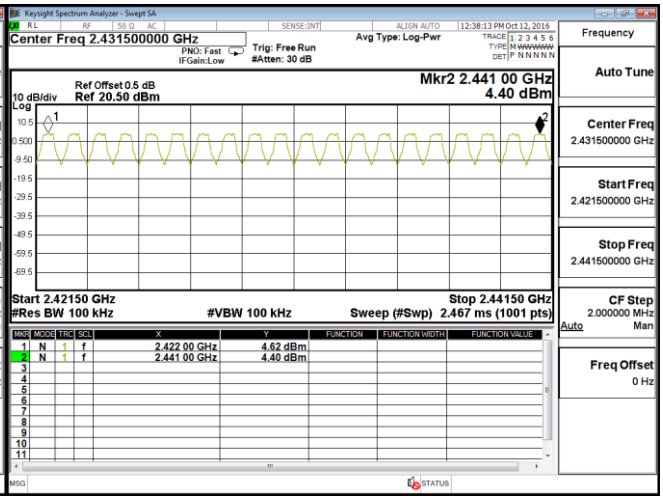
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Channel Number
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>15	Pass

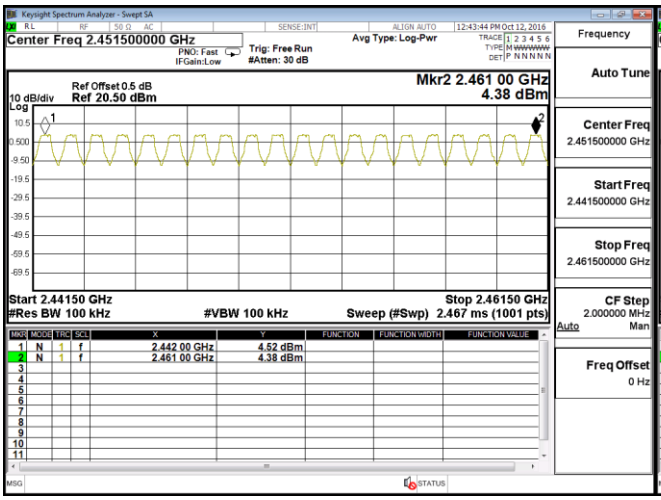
2402-2421MHz



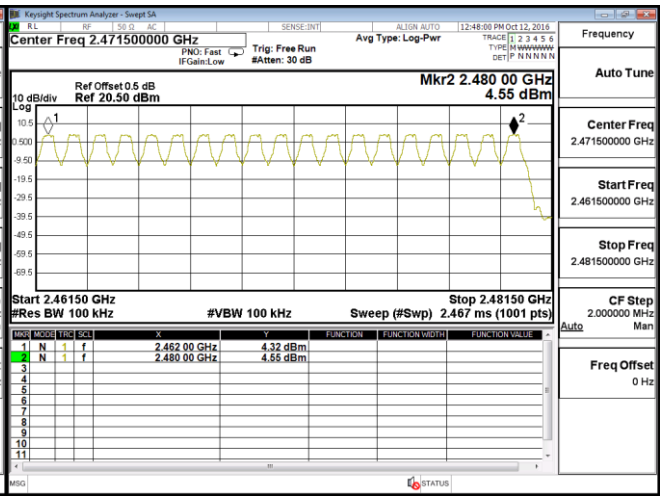
2422-2441MHz



2442-2461MHz



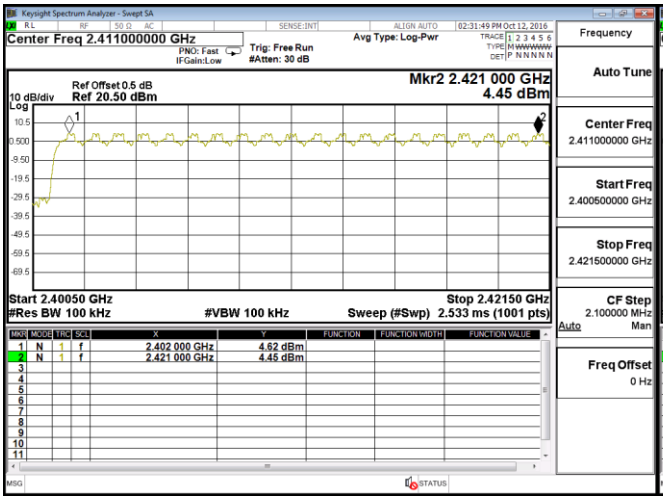
2462-2480MHz



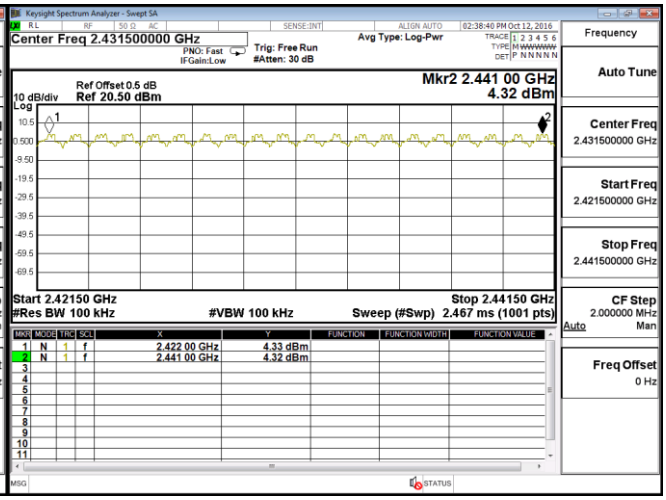
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Channel Number
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>15	Pass

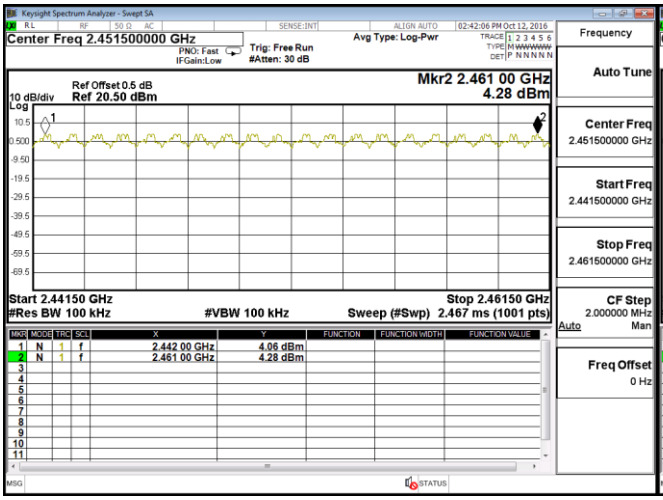
2402-2421MHz



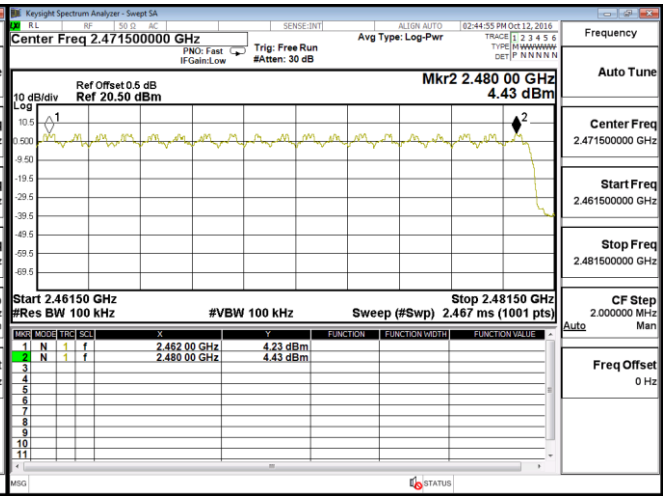
2422-2441MHz



2442-2461MHz

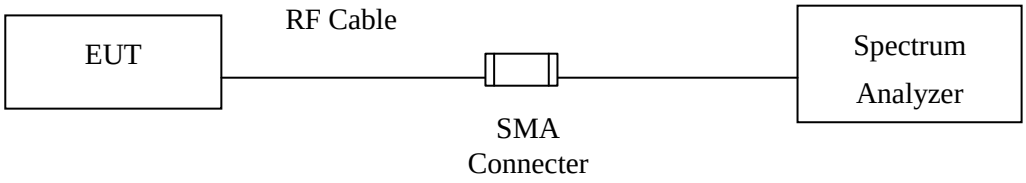


2462-2480MHz



8. Channel Separation

8.1. Test Setup



8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

8.4. Uncertainty

± 283Hz

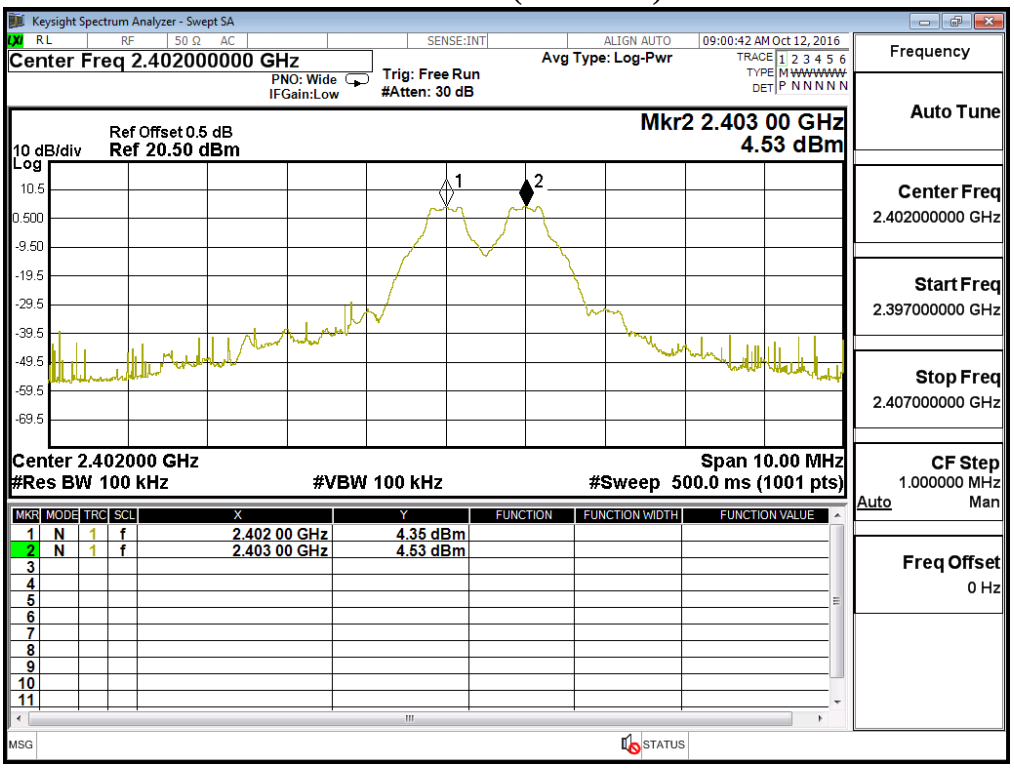
8.5. Test Result of Channel Separation

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Channel Separation
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

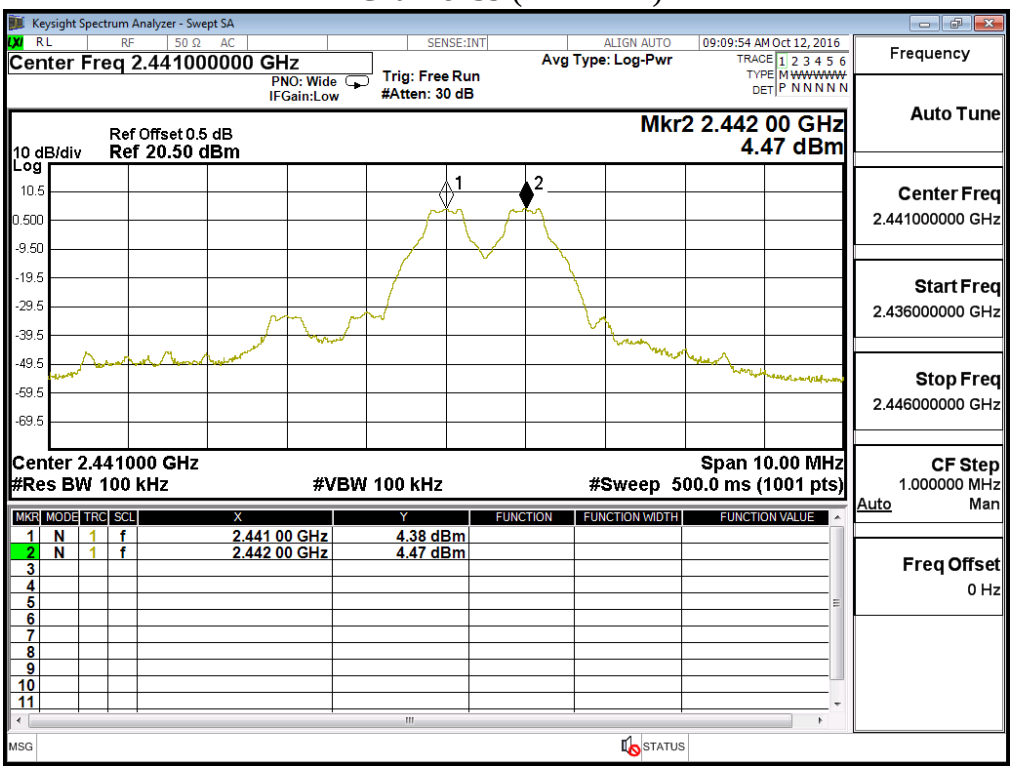
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	628.0	Pass
39	2441	1000	>25 kHz	626.0	Pass
78	2480	1000	>25 kHz	622.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

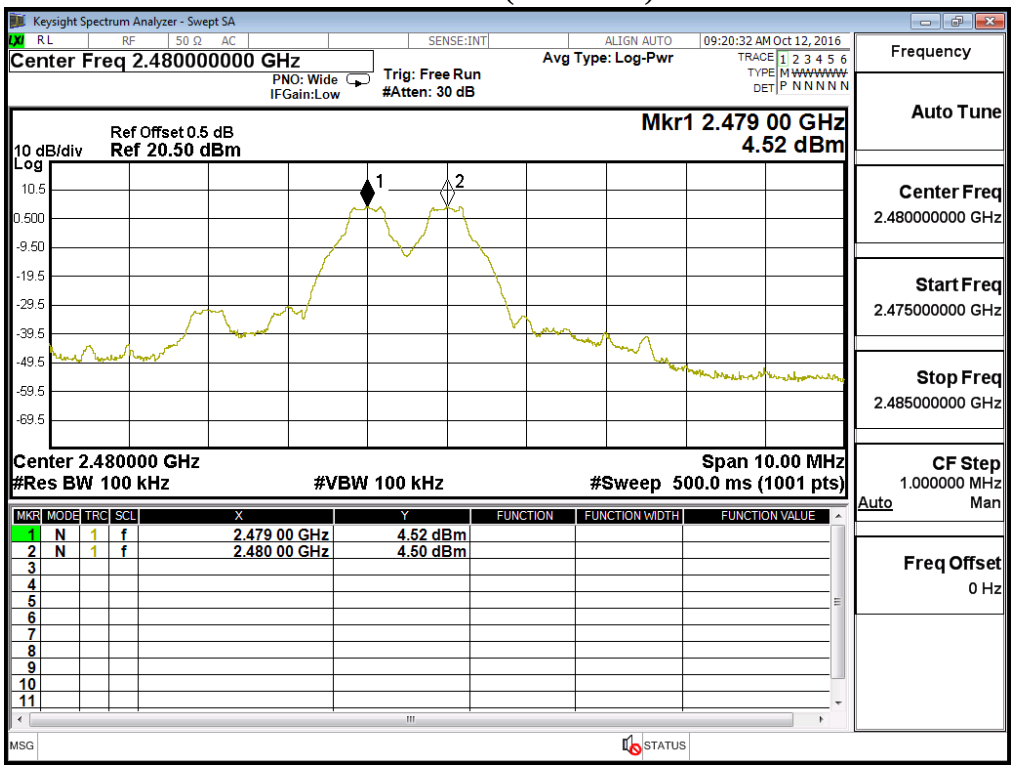
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)

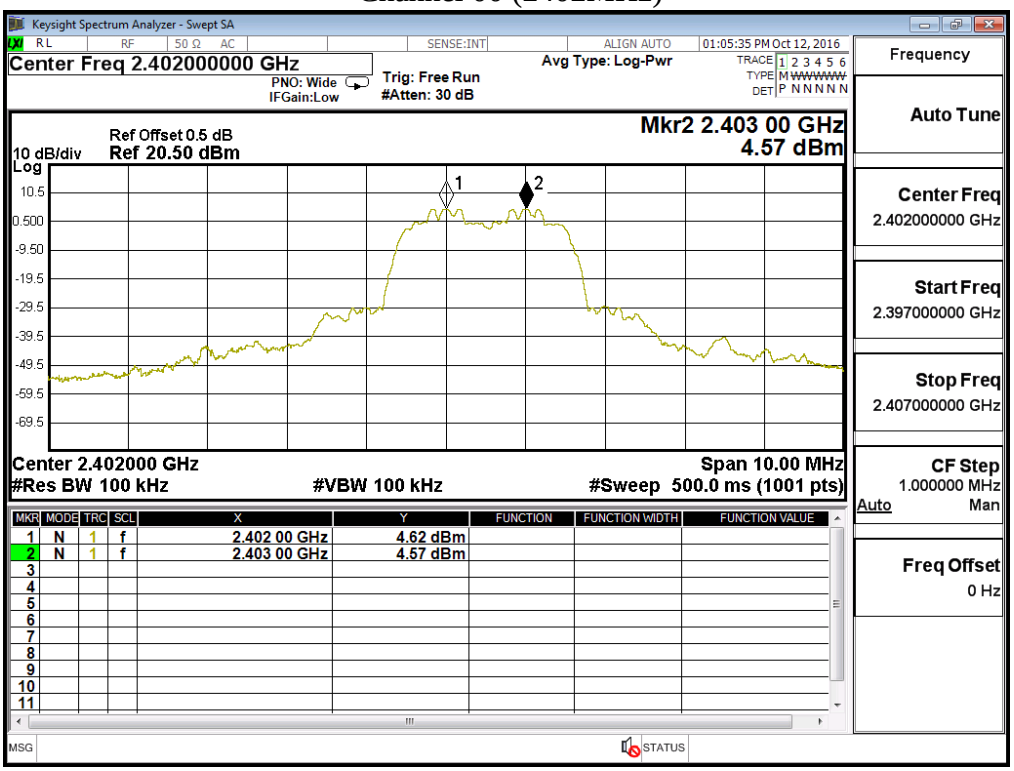


Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Channel Separation
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

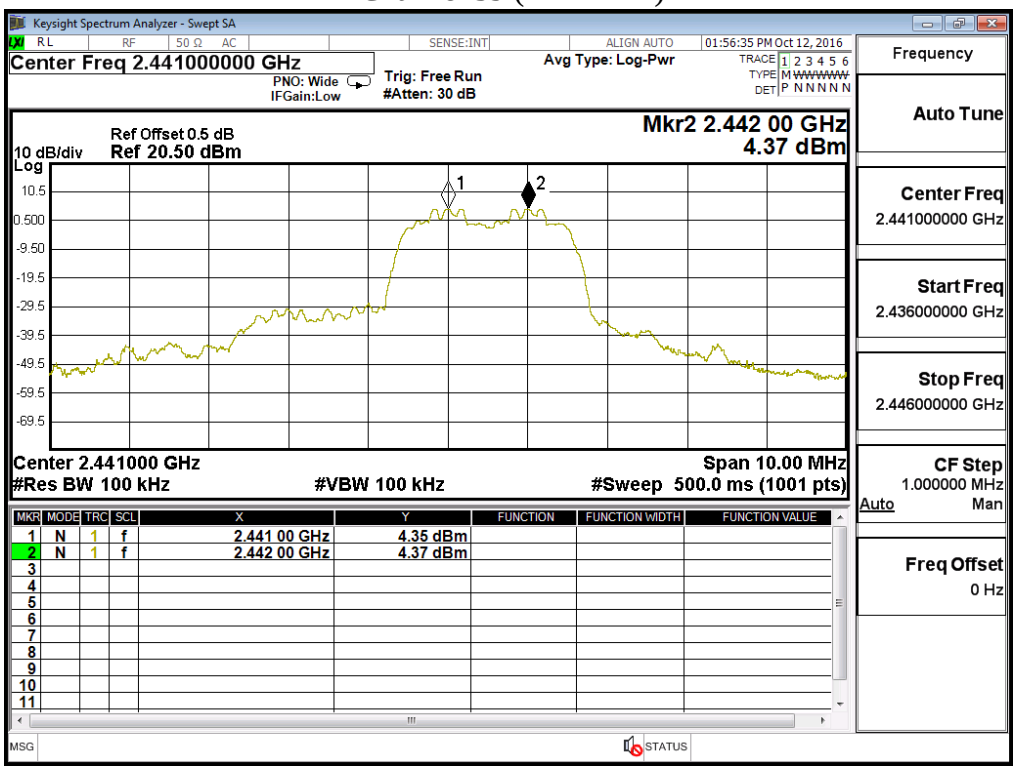
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	864.0	Pass
39	2441	1000	>25 kHz	850.0	Pass
78	2480	1000	>25 kHz	838.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

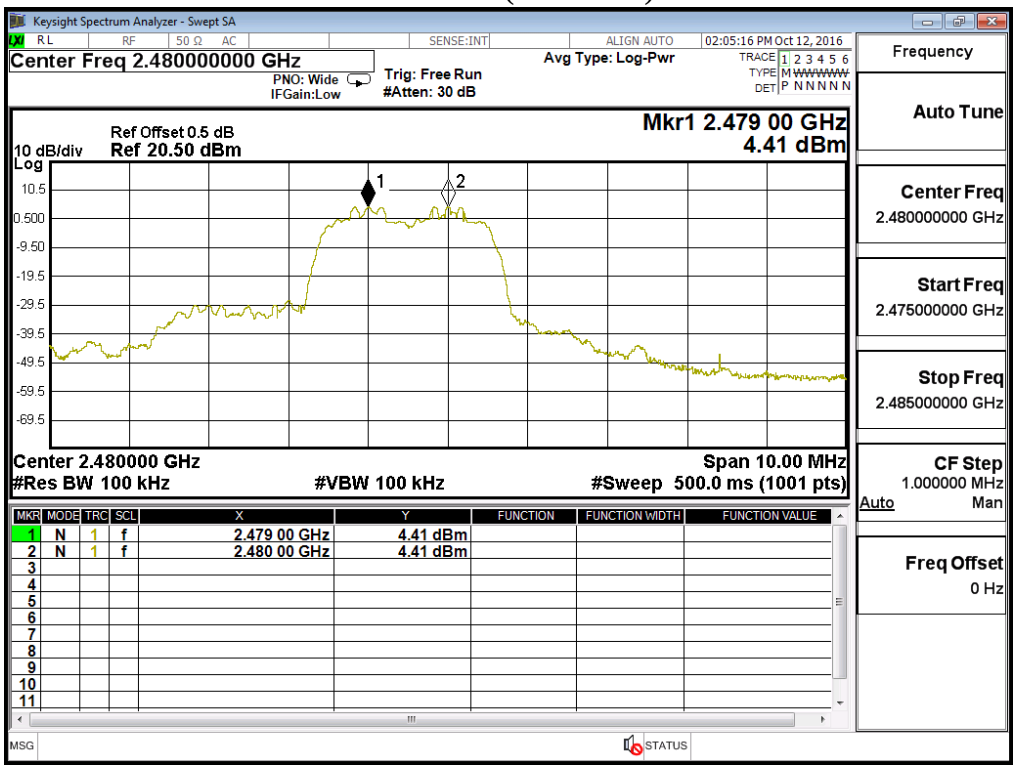
Channel 00 (2402MHz)



Channel 39 (2441MHz)

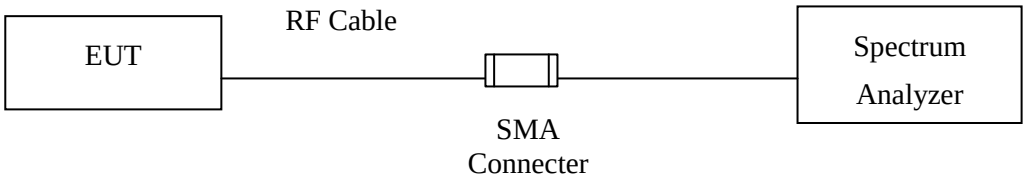


Channel 78 (2480MHz)



9. Dwell Time

9.1. Test Setup



9.2. Limit

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.

9.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

9.4. Uncertainty

± 25msec

9.5. Test Result of Dwell Time

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Dwell Time
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

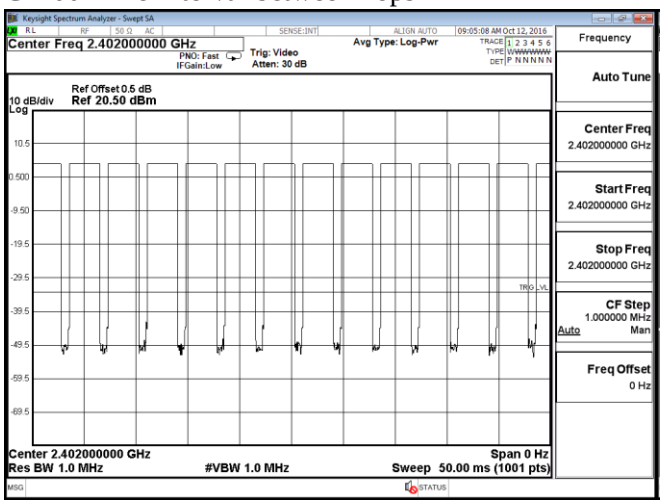
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.897	13	50	0.75	0.301	0.4	Pass
2441	2.897	13	50	0.75	0.301	0.4	Pass
2480	2.897	13	50	0.75	0.301	0.4	Pass

Dwell time = Time slot length*Hopping of number

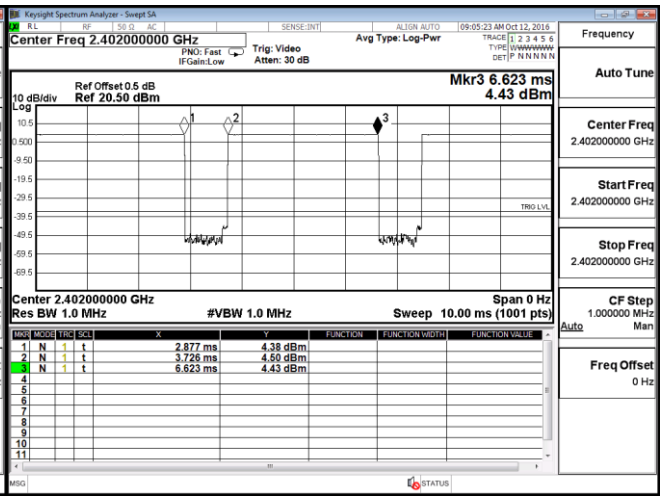
Sweep time= 79 CHannel * 0.4

Dwell time in AFH mode / 20 channels with hopping rate 800 hops /sec.

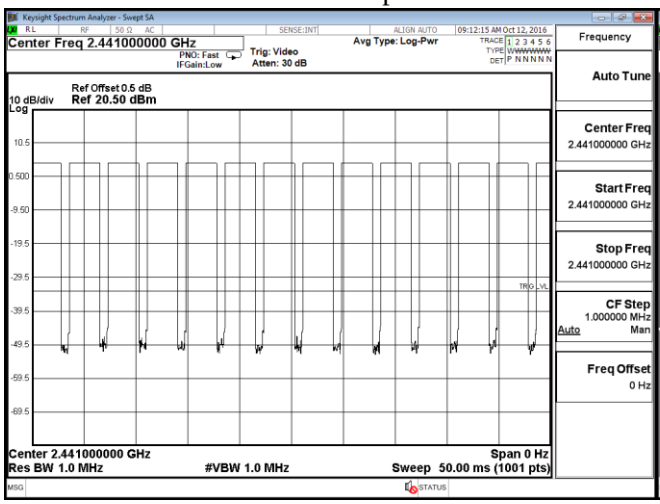
CH 00 Time Interval between hops



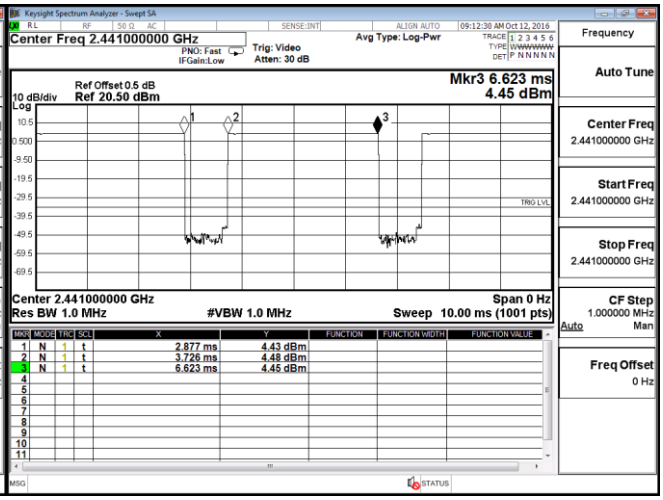
CH 00 Transmission Time



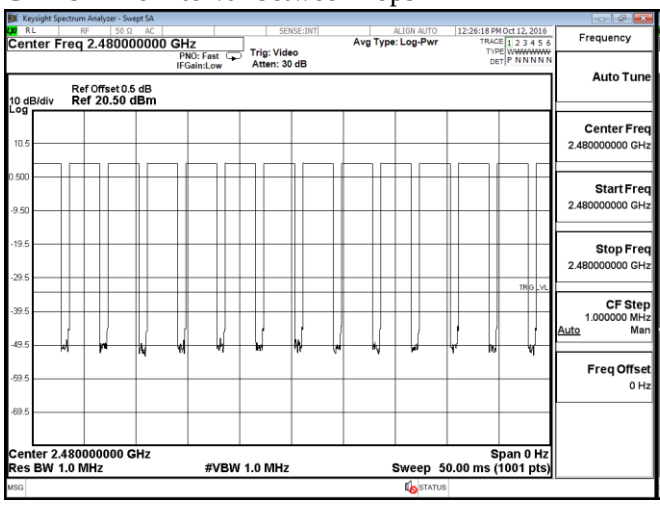
CH39 Time Interval between hops



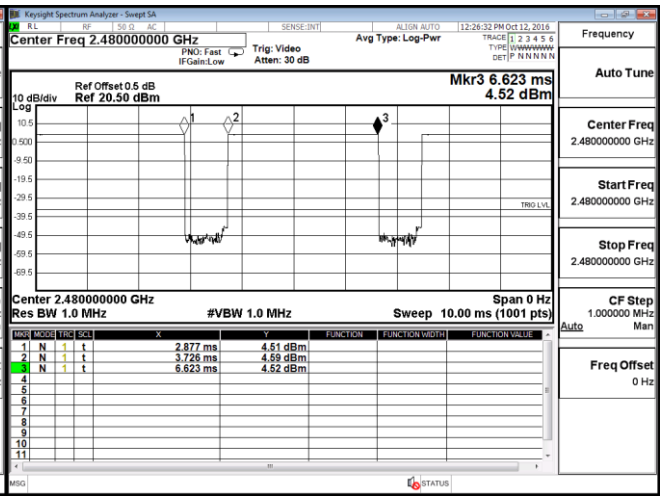
CH 39Transmission Time



CH 78 Time Interval between hops



CH 78 Transmission Time



Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Dwell Time
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

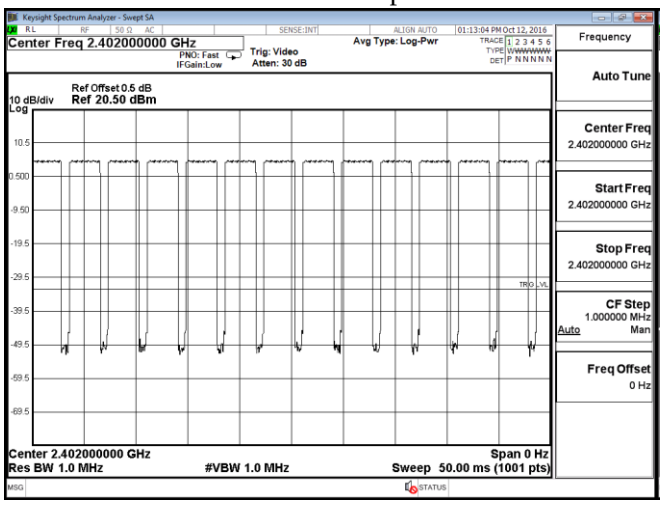
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.907	13	50	0.76	0.302	0.4	Pass
2441	2.907	13	50	0.76	0.302	0.4	Pass
2480	2.907	13	50	0.76	0.302	0.4	Pass

Dwell time = Time slot length*Hopping of number

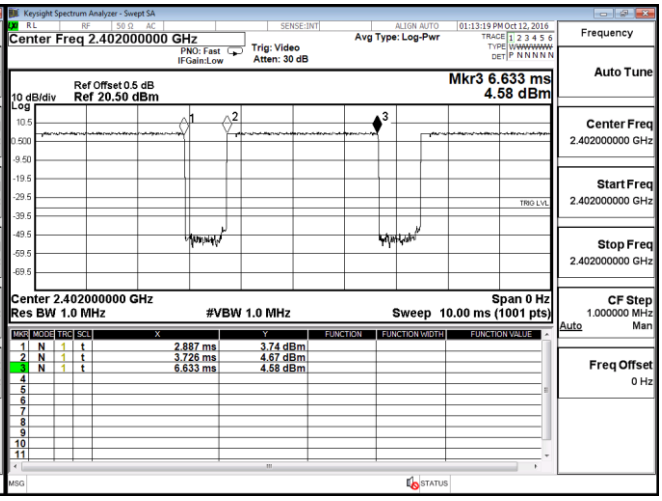
Sweep time= 79 CHannel * 0.4

Dwell time in AFH mode / 20 channels with hopping rate 800 hops /sec.

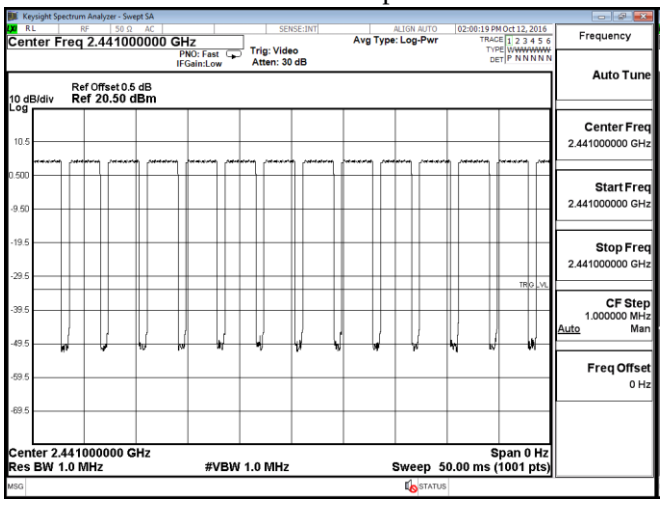
CH 00 Time Interval between hops



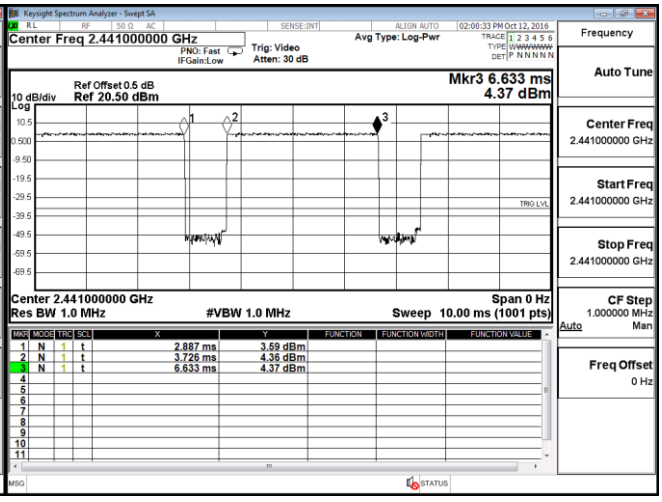
CH 00 Transmission Time



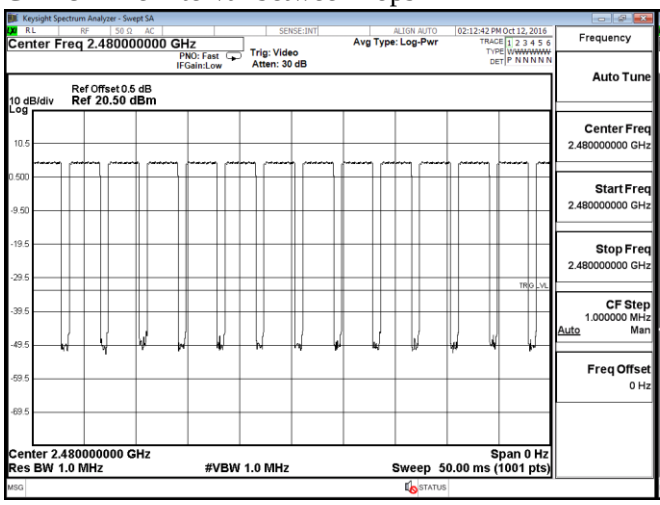
CH39 Time Interval between hops



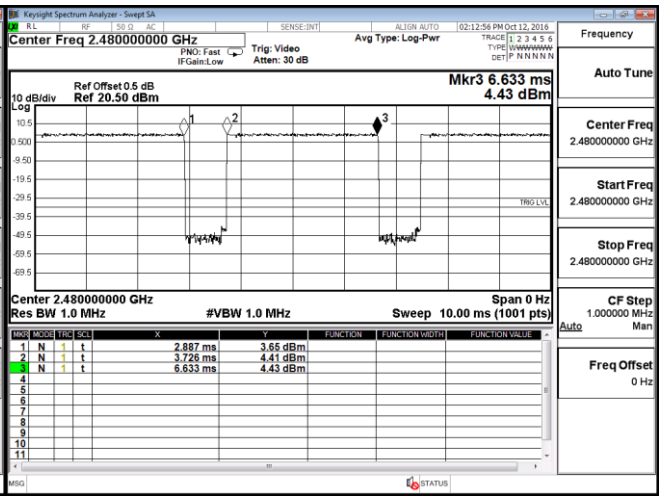
CH 39Transmission Time



CH 78 Time Interval between hops



CH 78 Transmission Time

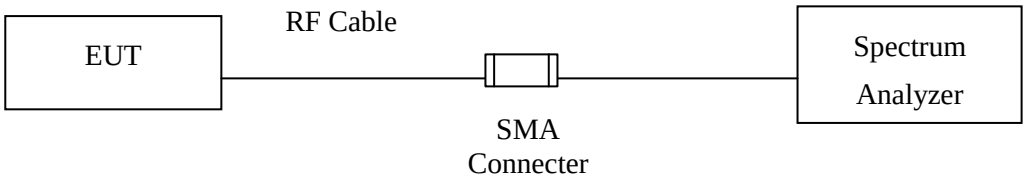


Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

10.4. Uncertainty

± 283Hz

10.5. Test Result of Occupied Bandwidth

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	942	--	NA
39	2441	939	--	NA
78	2480	933	--	NA

Figure Channel 00:

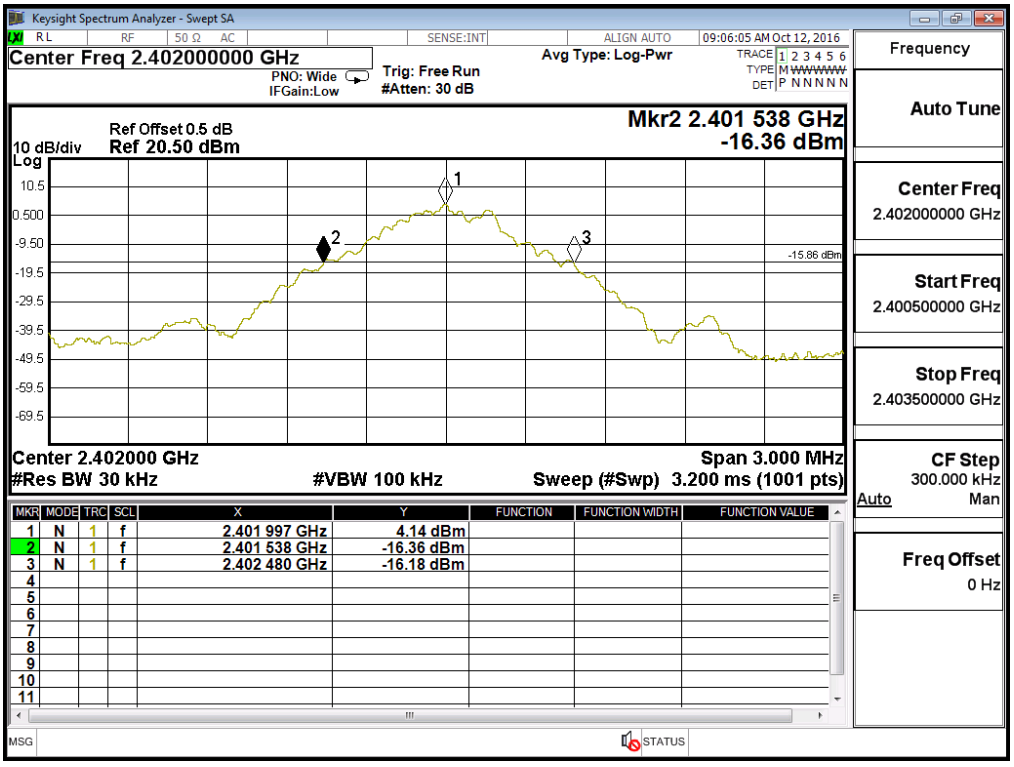


Figure Channel 39:

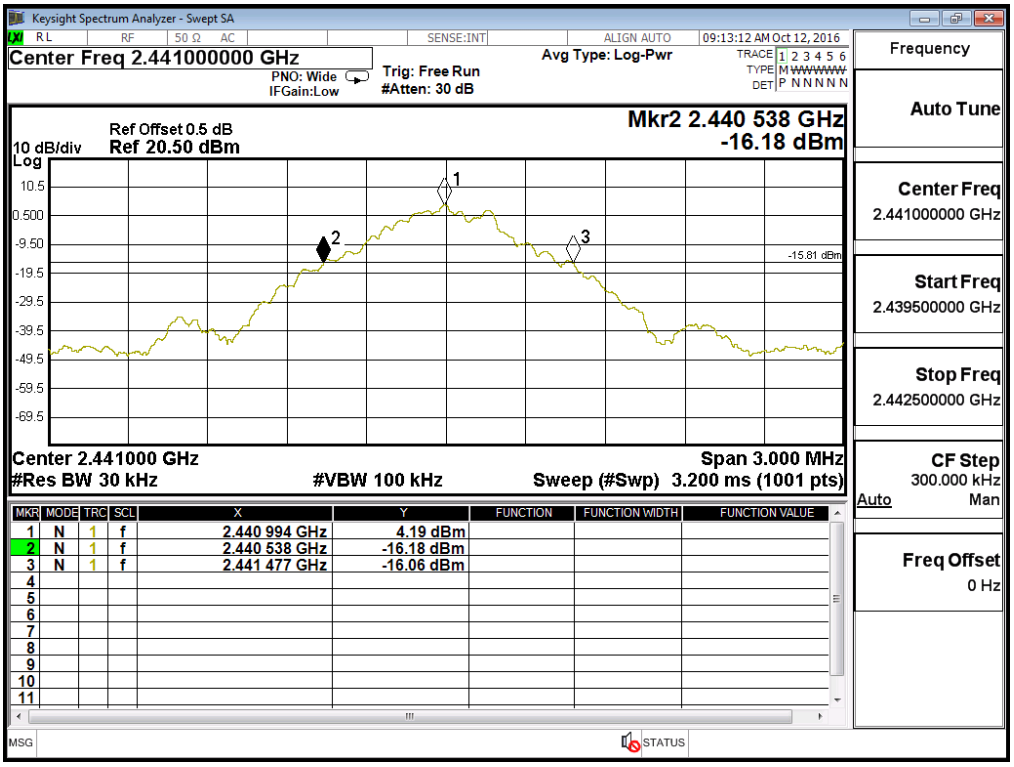
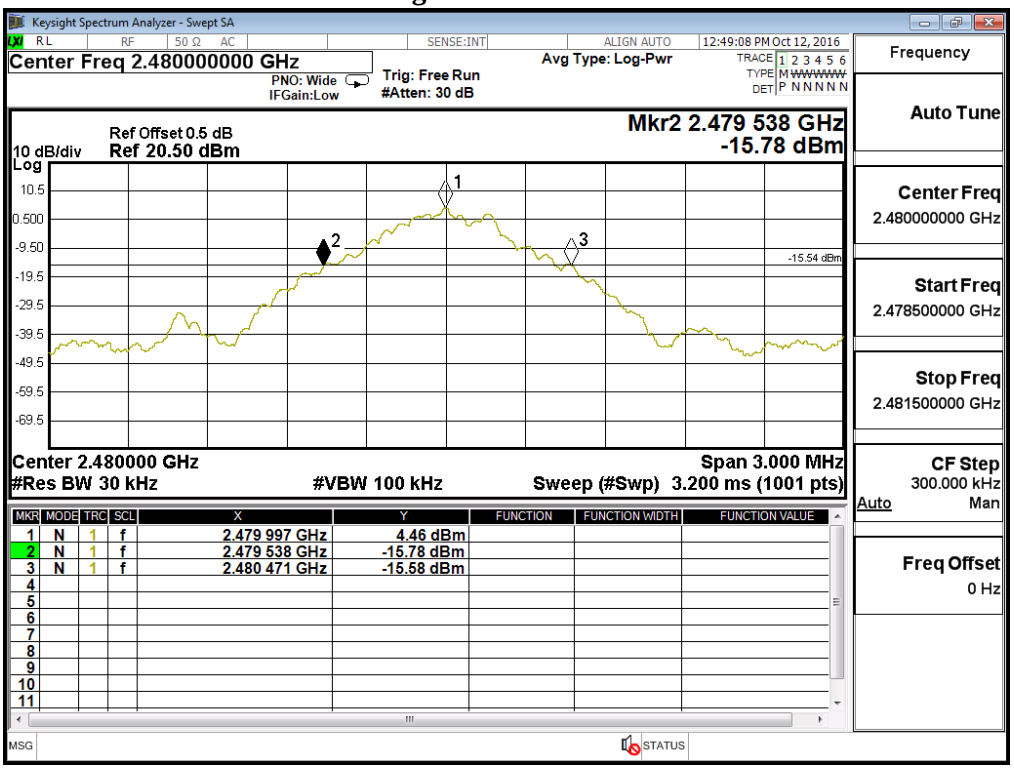


Figure Channel 78:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1296	--	NA
39	2441	1275	--	NA
78	2480	1257	--	NA

Figure Channel 00:

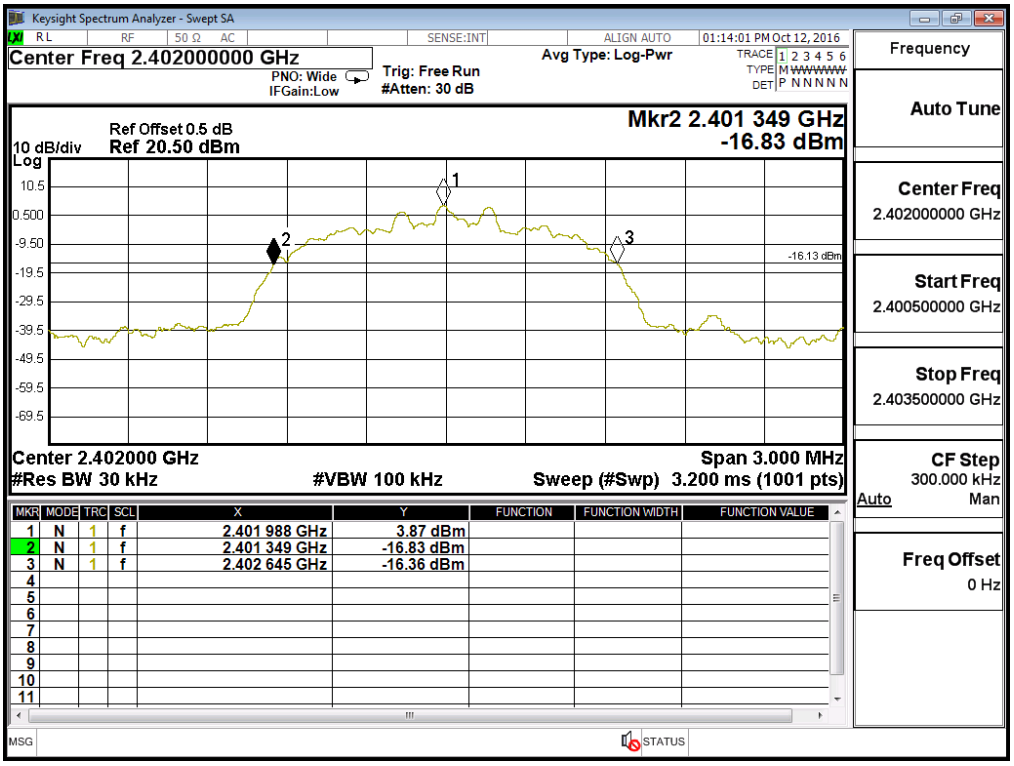


Figure Channel 39:

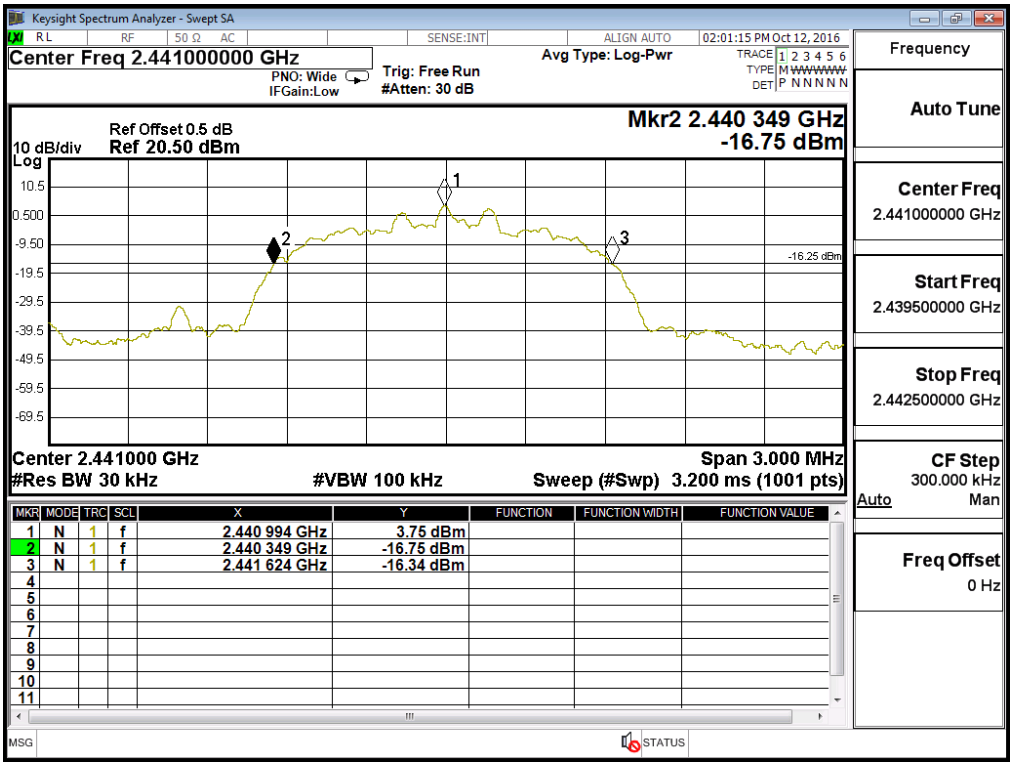
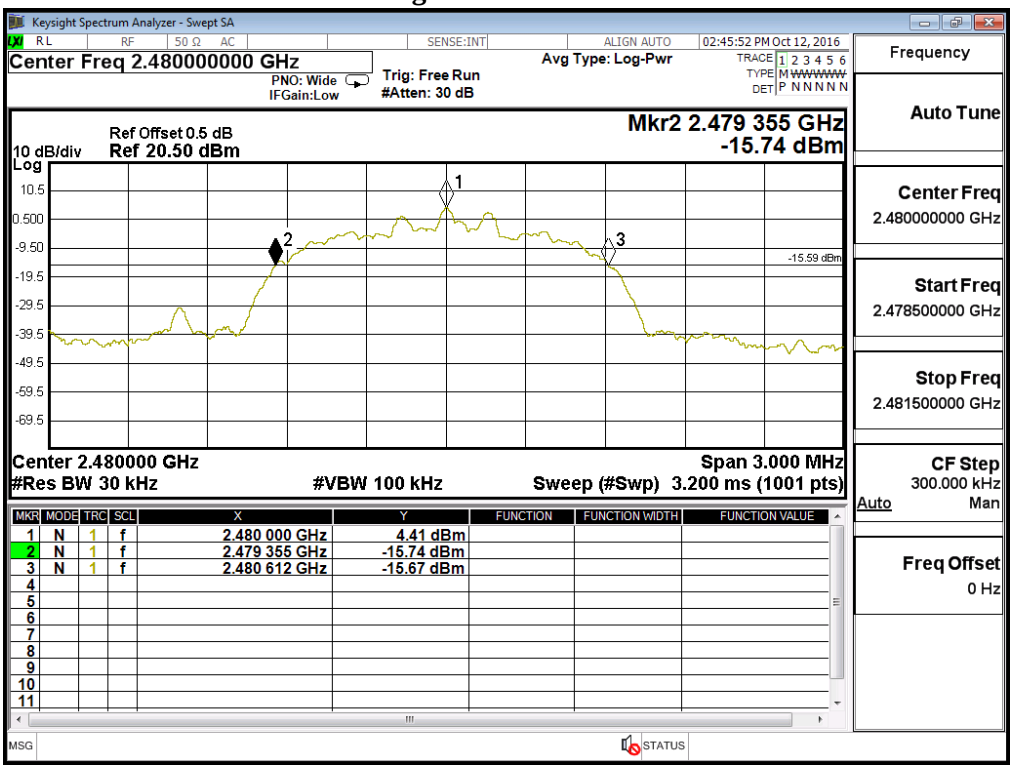


Figure Channel 78:



11. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs