

FCC Test Report

Product Name	Klipsch Heritage Wireless TableTop Bluetooth Small
Model No.	the Sixes
FCC ID.	2AJAATHESIXES

Applicant	DONGGUAN MEILOON ACOUSTIC EQUIPMENTS CO., LTD.
Address	77, Yuanlin Road, Fenghuanggang Ind. Estate, Tangxia Town, Guangdong Province, Dongguan City, 523727, China

Date of Receipt	Dec. 07, 2016
Issued Date	Jan. 06, 2017
Report No.	16C0190R-RFUSP23V00
Report Version	V1.0



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 of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issued Date: Jan. 06, 2017

Report No.: 16C0190R-RFUSP23V00



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Applicant	DONGGUAN MEILOON ACOUSTIC EQUIPMENTS CO., LTD.
Address	77, Yuanlin Road, Fenghuanggang Ind. Estate, Tangxia Town, Guangdong Province, Dongguan City, 523727, China
Manufacturer	Klipsch Group, Inc.
Model No.	the Sixes
FCC ID.	2AJAATHESIXES
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: 2015 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v03r05
Test Result	Complied

Documented By :



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Tested By :



(Assistant Engineer / Bruce Lan)

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 Sixes
FCC ID.	2AJAATHESIXES
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”
Signal Cable	Shielded, 6.2m
Fiber Cable	Non-Shielded, 1.5m
USB Cable	Non-Shielded, 2m
Audio Cable	Non-Shielded, 1.5m
PowerCord Cable	Non-Shielded, 1.8m
Remote Control	Klipsch
Contain Module	Fihonest / JS-BTM513

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Meiloon	RF-TRSPIPADF-1	IFA	0.5dBi for 2.4 GHz

Note: The antenna of EUT conforms to FCC 15.203.

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.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK) Mode 2: Transmit - 3Mbps (8DPSK)
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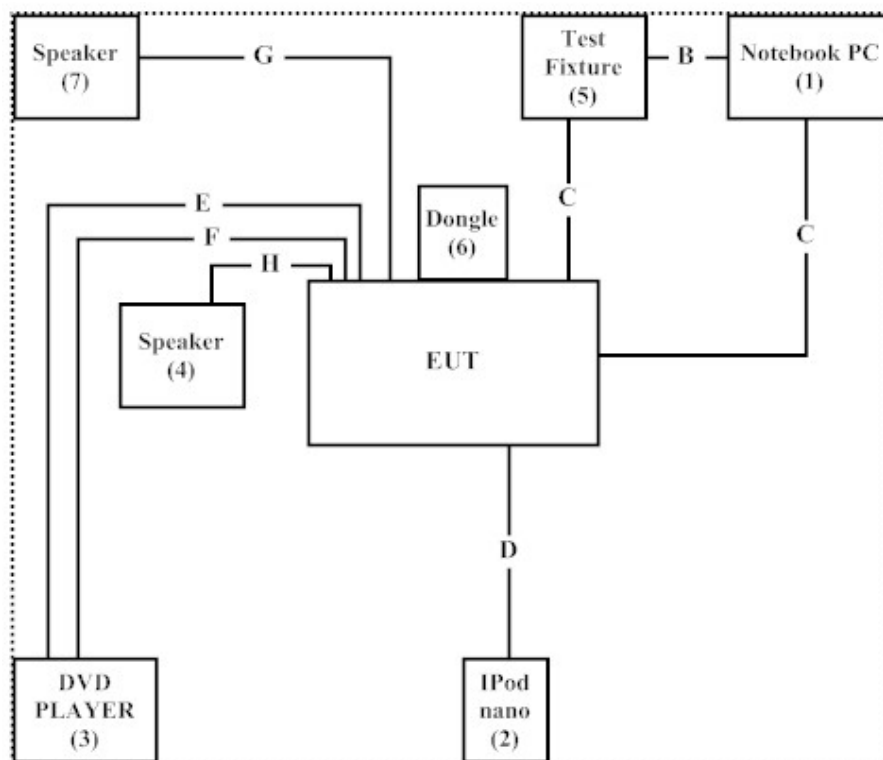
1.3. Tested System Details

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	B6TYTZ1	Non-Shielded, 0.8m
2 IPod nano	Apple	A1199	5U7047U8VQ5	N/A
3 DVD PLAYER	Pioneer	DV-610AV-S	HLKD008120LS	Non-Shielded, 1.8m
4 Speaker	Klipsch	the Sixes	N/A	N/A
5 Test Fixture	CSR	N/A	N/A	N/A
6 Dongle	Transcead	JF V30	N/A	N/A
7 Speaker	Meiloon	N/A	N/A	N/A

Signal Cable Type	Signal Cable Description
A USB Cable	Shielded, 1.8m
B USB Cable	Shielded, 0.8m
C Signal Cable	Non-Shielded, 0.2m
D Audio Cable	Non-Shielded, 1.8m
E AV Cable	Non-Shielded, 1.8m
F Fiber Cable	Non-Shielded, 1.8m
G AV Cable	Non-Shielded, 1.8m
H Audio Cable	Non-Shielded, 6m

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>

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FCC Accreditation Number: TW1014

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	2016/10/1	2017/9/29
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2016/7/22	2017/7/21
X	Power Meter	Anritsu	ML2495A	6K00003357	2016/6/23	2017/6/22
X	Pulse power sensor	Anritsu	MA2411B	0846193	2016/6/23	2017/6/22
X	EMI Test Receiver	R&S	ESCS 30	100369	2016/10/13	2017/10/12
X	LISN	R&S	ESH3-Z5	836679/017	2016/1/7	2017/1/6
X	LISN	R&S	ENV216	100097	2016/1/7	2017/1/6
X	Coaxial Cable	QTK(Arnist)	RG 400	LC018-RG	2016/6/25	2017/6/24

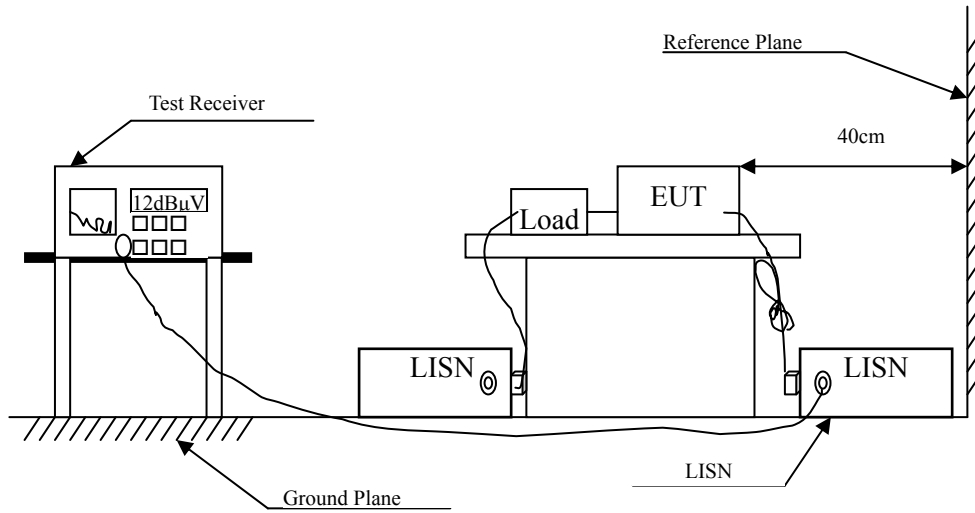
For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSP40	100170	2016/1/5	2017/1/4
	Loop Antenna	Teseq	HLA6121	37133	2016/3/18	2017/3/17
X	Bi-Log Antenna	Schaffner Chase	CBL6112B	2707	2016/6/11	2017/6/10
X	<u>Horn Antenna</u>	ETS-Lindgren	3117	00135205	2016/4/6	2017/4/5
X	<u>Horn Antenna</u>	Schwarzbeck	BBHA9170	9170430	2016/1/11	2017/1/10
X	<u>Pre-Amplifier</u>	QTK	AP/0100A	CHM/0901069	2016/6/23	2017/6/22
X	<u>Pre-Amplifier</u>	EMCI	EMC012630SE	980210	2016/1/26	2017/1/24
X	<u>Pre-Amplifier</u>	NARDA WE	DBL-1840N506	013	2016/9/30	2017/9/29
X	Filter	MicroTRON	BRM50701	019	2016/11/2	2017/11/1
X	Filter	Microwave Circuits	N0257881	36681	2016/12/7	2017/12/6
X	EMI Test Receiver	R&S	ESR26	101385	2016/9/29	2017/9/28
X	Coaxial Cable	QTK(Arnist)	SUCOFLEX 106	L1606-015C	2016/6/23	2017/6/22
X	EMI Test Receiver	R&S	ESCS 30	838251/001	2016/7/21	2017/7/20
X	Coaxial Cable	QTK(Arnist)	RG 214	LC003-RG	2016/6/16	2017/6/15
X	Coaxial signal switch	Anritsu	MP59B	6201415889	2016/6/16	2017/6/15

- Note:
- All equipments are calibrated every one year.
- The test instruments marked with "X" are used to measure the final test results.
- 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 investigated 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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 1					
Quasi-Peak					
0.158	9.685	28.210	37.895	-27.876	65.771
0.216	9.677	20.490	30.167	-33.947	64.114
0.236	9.677	17.090	26.767	-36.776	63.543
0.392	9.672	14.230	23.902	-35.184	59.086
0.572	9.678	11.660	21.338	-34.662	56.000
1.486	9.719	3.280	12.999	-43.001	56.000
Average					
0.158	9.685	14.110	23.795	-31.976	55.771
0.216	9.677	6.550	16.227	-37.887	54.114
0.236	9.677	5.120	14.797	-38.746	53.543
0.392	9.672	0.930	10.602	-38.484	49.086
0.572	9.678	9.380	19.058	-26.942	46.000
1.486	9.719	-1.830	7.889	-38.111	46.000

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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

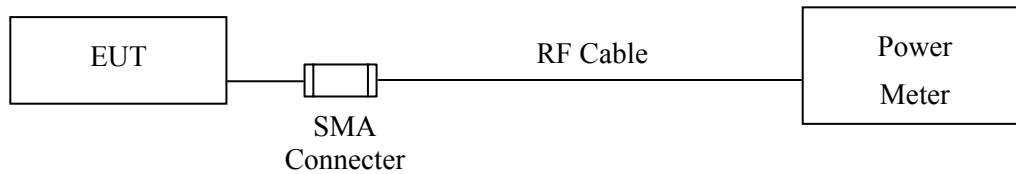
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V	dB	dB μ V
LINE 2					
Quasi-Peak					
0.228	9.737	22.640	32.377	-31.394	63.771
0.369	9.741	24.680	34.421	-25.322	59.743
0.584	9.748	11.000	20.748	-35.252	56.000
2.974	9.827	4.560	14.387	-41.613	56.000
3.451	9.831	7.300	17.131	-38.869	56.000
14.658	10.080	7.720	17.800	-42.200	60.000
Average					
0.228	9.737	15.530	25.267	-28.504	53.771
0.369	9.741	13.410	23.151	-26.592	49.743
0.584	9.748	6.960	16.708	-29.292	46.000
2.974	9.827	-1.850	7.977	-38.023	46.000
3.451	9.831	-1.670	8.161	-37.839	46.000
14.658	10.080	0.910	10.990	-39.010	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

The maximum peak power shall be less 1Watt.

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 : 2016/12/09
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	5.76	1 Watt= 30 dBm	Pass
Channel 39	2441.00	5.44	1 Watt= 30 dBm	Pass
Channel 78	2480.00	4.93	1 Watt= 30 dBm	Pass

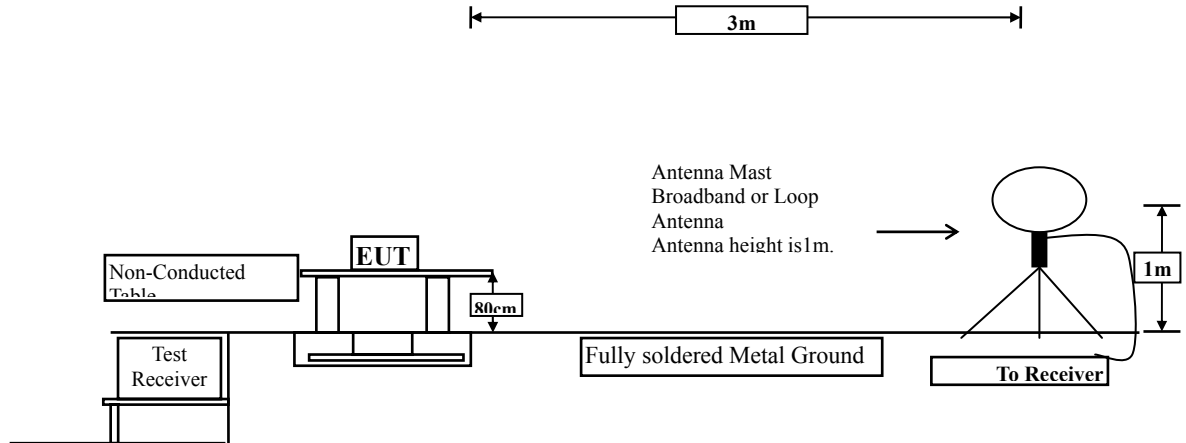
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2016/12/09
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	4.52	1 Watt= 30 dBm	Pass
Channel 39	2441.00	4.11	1 Watt= 30 dBm	Pass
Channel 78	2480.00	3.53	1 Watt= 30 dBm	Pass

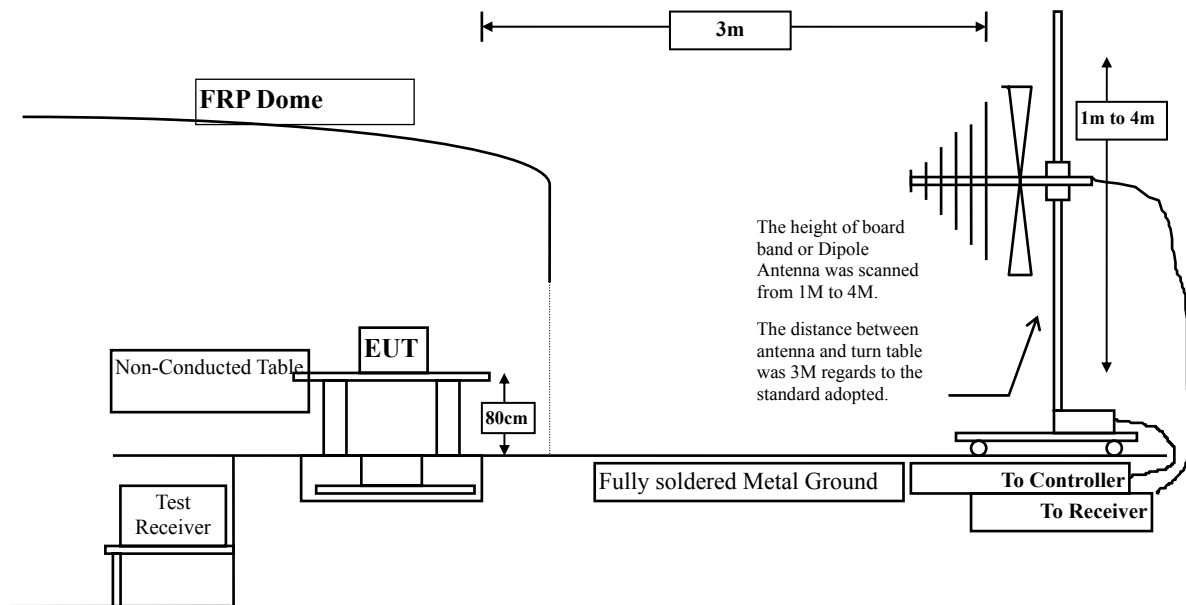
4. Radiated Emission

4.1. Test Setup

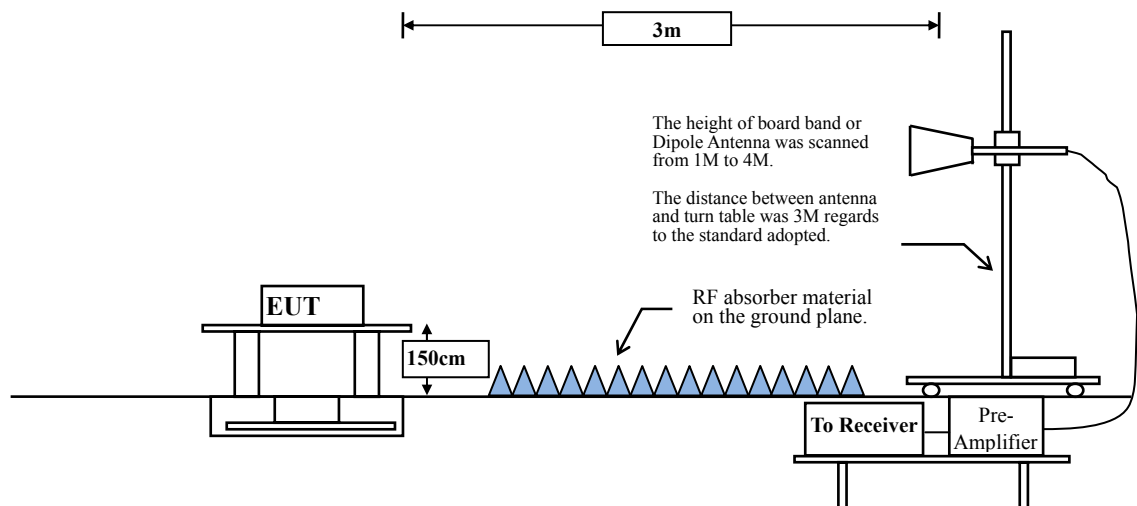
Under 30MHz



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	uV/m @3m	dBμV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- 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 from 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 : 2016/12/09
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4804.000	2.511	44.099	46.609	-27.391	74.000
7206.000	9.511	40.901	50.412	-23.588	74.000
9608.000	10.394	37.095	47.489	-26.511	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4804.000	2.923	45.018	47.940	-26.060	74.000
7206.000	9.988	39.043	49.032	-24.968	74.000
9608.000	10.847	36.839	47.686	-26.314	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 : 2016/12/09
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4882.000	2.025	44.560	46.585	-27.415	74.000
7323.000	9.762	40.797	50.558	-23.442	74.000
9764.000	9.682	37.713	47.394	-26.606	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	2.488	45.566	48.054	-25.946	74.000
7323.000	10.375	39.480	49.854	-24.146	74.000
9764.000	10.315	37.371	47.686	-26.314	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 : 2016/12/09
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4960.000	2.582	45.003	47.585	-26.415	74.000
7440.000	10.555	39.500	50.055	-23.945	74.000
9920.000	10.206	37.308	47.514	-26.486	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4960.000	3.398	43.586	46.985	-27.015	74.000
7440.000	11.214	37.843	49.057	-24.943	74.000
9920.000	11.245	36.613	47.858	-26.142	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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dB μ V/m
Horizontal					
Peak Detector:					
4804.000	2.511	44.112	46.622	-27.378	74.000
7206.000	9.511	40.544	50.055	-23.945	74.000
9608.000	10.394	37.120	47.514	-26.486	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4804.000	2.923	44.278	47.200	-26.800	74.000
7206.000	9.988	38.605	48.594	-25.406	74.000
9608.000	10.847	36.516	47.363	-26.637	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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4882.000	2.025	44.560	46.585	-27.415	74.000
7323.000	9.762	40.200	49.961	-24.039	74.000
9764.000	9.682	37.873	47.554	-26.446	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	2.488	45.231	47.719	-26.281	74.000
7323.000	10.375	39.148	49.522	-24.478	74.000
9764.000	10.315	37.729	48.044	-25.956	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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4960.000	2.582	45.006	47.588	-26.412	74.000
7440.000	10.555	39.697	50.252	-23.748	74.000
9920.000	10.206	37.089	47.295	-26.705	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4960.000	3.398	43.264	46.663	-27.337	74.000
7440.000	11.214	37.010	48.224	-25.776	74.000
9920.000	11.245	35.966	47.211	-26.789	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 : 2016/12/08
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
144.460	-7.703	44.873	37.170	-6.330	43.500
191.990	-9.887	41.946	32.059	-11.441	43.500
256.010	-5.415	47.155	41.740	-4.260	46.000
384.050	1.268	41.144	42.412	-3.588	46.000
494.630	1.458	35.790	37.249	-8.751	46.000
832.190	6.873	30.334	37.207	-8.793	46.000
Vertical					
144.460	-5.503	46.213	40.710	-2.790	43.500
240.490	-6.032	42.020	35.987	-10.013	46.000
384.050	-0.122	41.189	41.067	-4.933	46.000
598.420	1.114	33.826	34.940	-11.060	46.000
833.160	1.716	34.606	36.322	-9.678	46.000
938.890	3.260	32.991	36.251	-9.749	46.000

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 : 2016/12/08
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

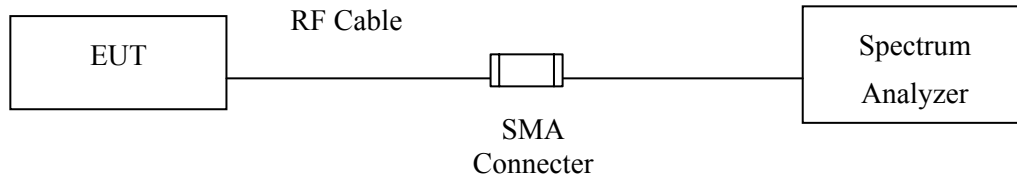
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
111.480	-7.489	42.942	35.454	-8.046	43.500
176.470	-10.260	45.252	34.992	-8.508	43.500
288.020	-5.557	44.754	39.197	-6.803	46.000
416.060	-0.221	39.369	39.148	-6.852	46.000
448.070	0.154	40.133	40.287	-5.713	46.000
599.390	3.488	34.612	38.100	-7.900	46.000
Vertical					
112.450	-3.573	39.650	36.076	-7.424	43.500
256.010	-5.045	41.422	36.377	-9.623	46.000
384.050	-0.122	44.170	44.048	-1.952	46.000
598.420	1.114	32.048	33.162	-12.838	46.000
757.500	2.487	32.116	34.603	-11.397	46.000
931.130	3.650	32.577	36.227	-9.773	46.000

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

$\pm 1.20\text{dB}$

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 : 2016/12/14
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 00:

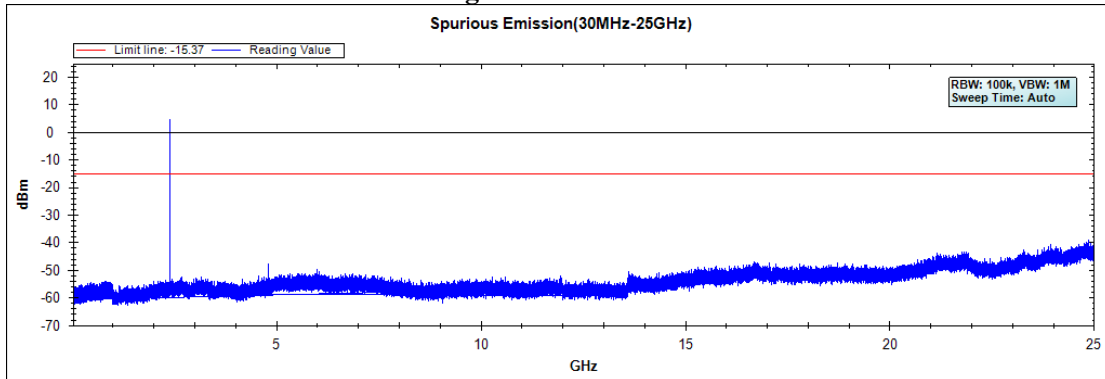


Figure Channel 39:

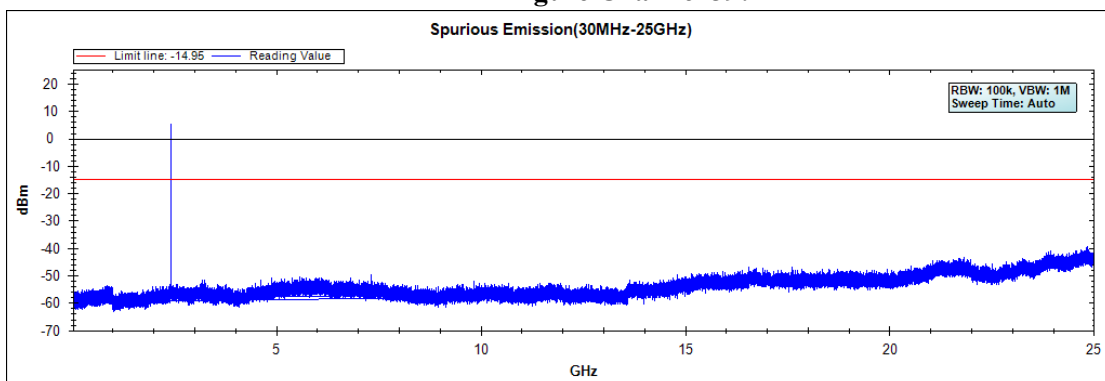
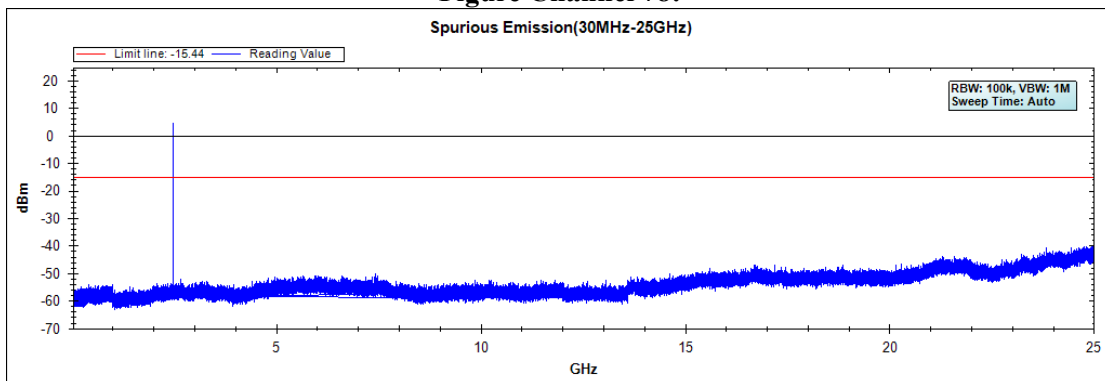
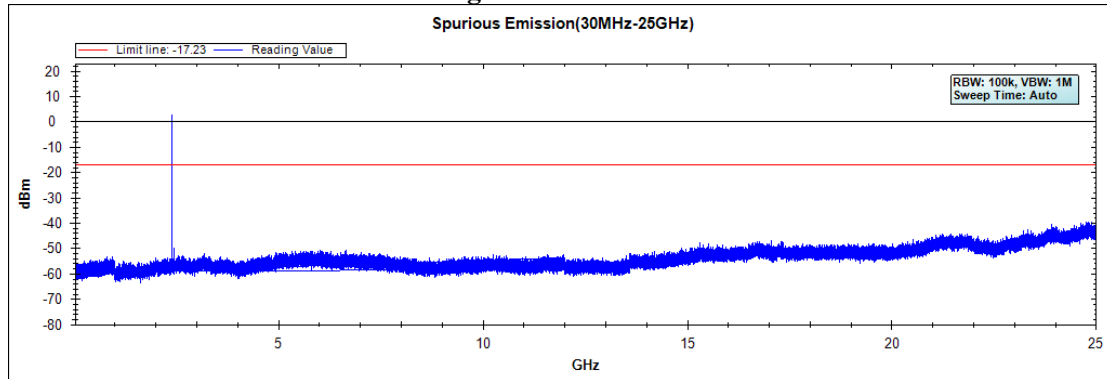
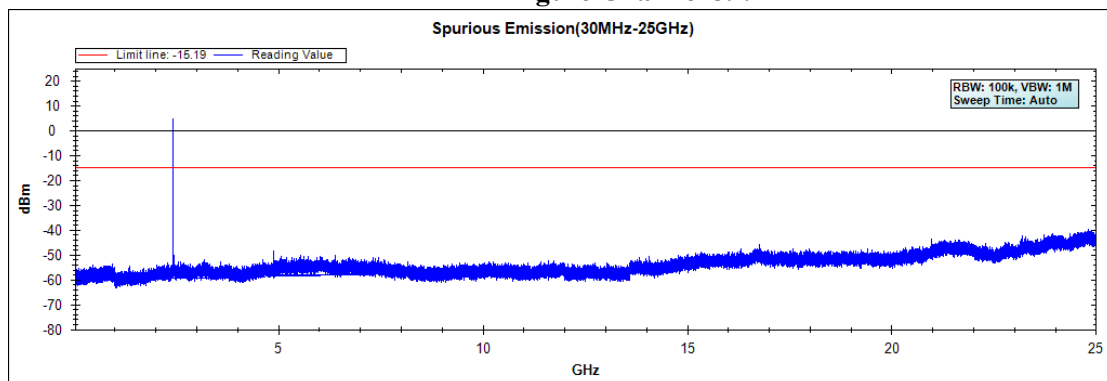
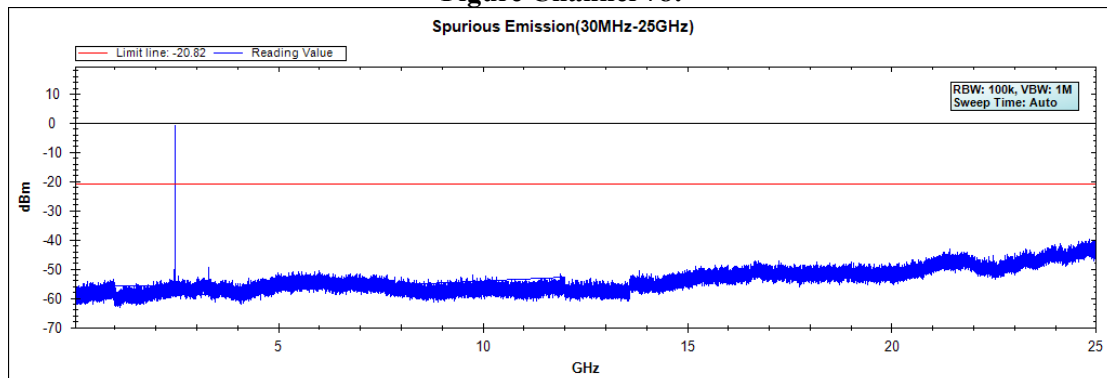


Figure Channel 78:



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 : 2016/12/14
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Figure Channel 00:**Figure Channel 39:****Figure Channel 78:**

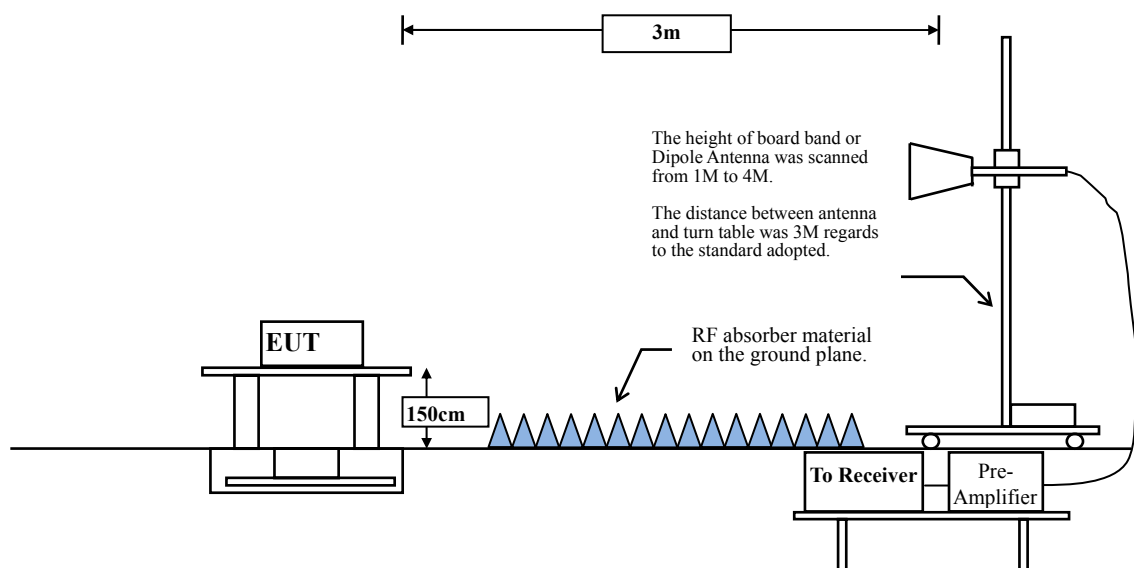
Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

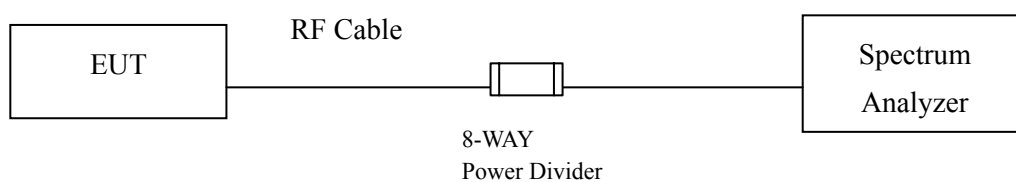
6.1. Test Setup

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 : 2016/12/09
 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)	Average Limit (dBμV/m)	Result
00 (Peak)	2388.400	-2.694	47.802	45.108	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	46.741	44.054	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	72.144	69.484	--	--	--
00 (Peak)	2402.100	-2.657	106.264	103.607	--	--	--
00 (Average)	2376.100	-2.748	38.386	35.638	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	34.158	31.471	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	56.148	53.488	--	--	--
00 (Average)	2402.100	-2.657	91.474	88.817	--	--	--

Figure Channel 00:

Horizontal (Peak)

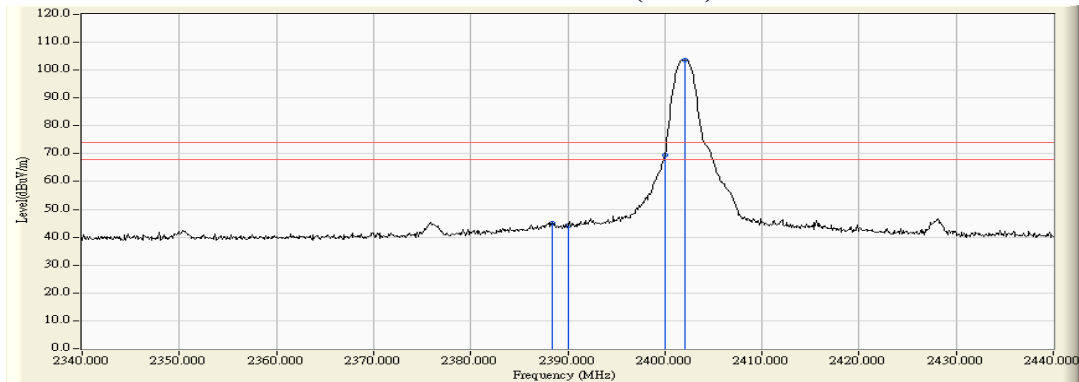
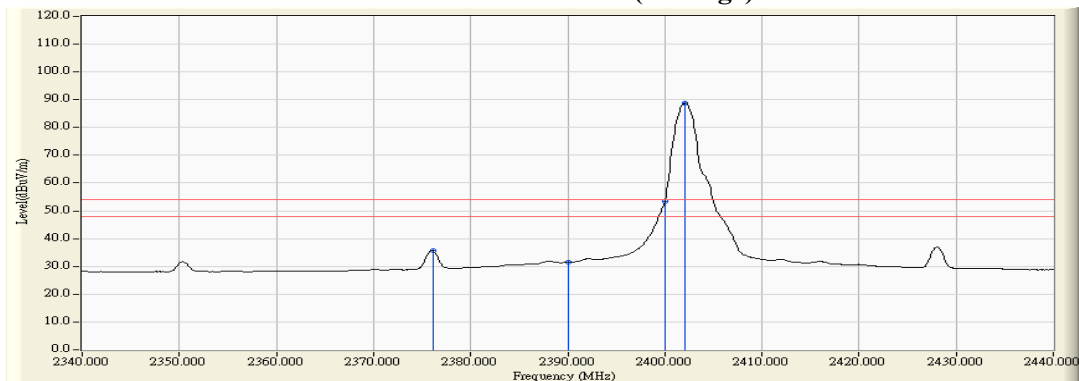


Figure Channel 00:

Horizontal (Average)



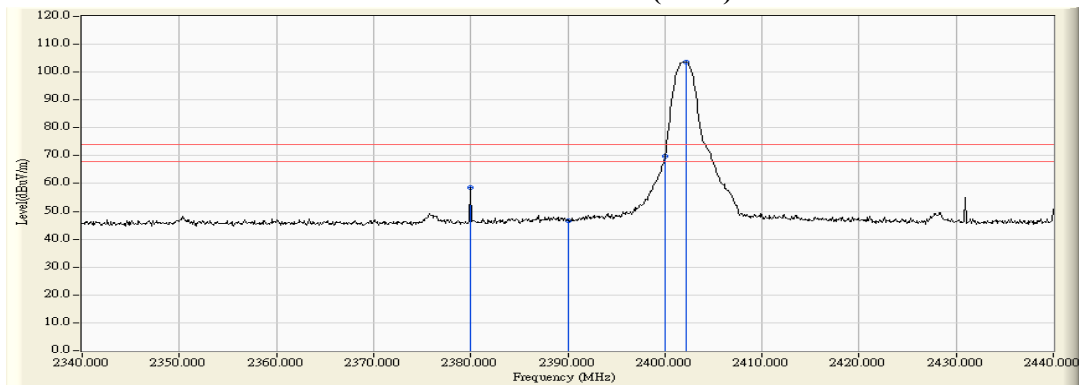
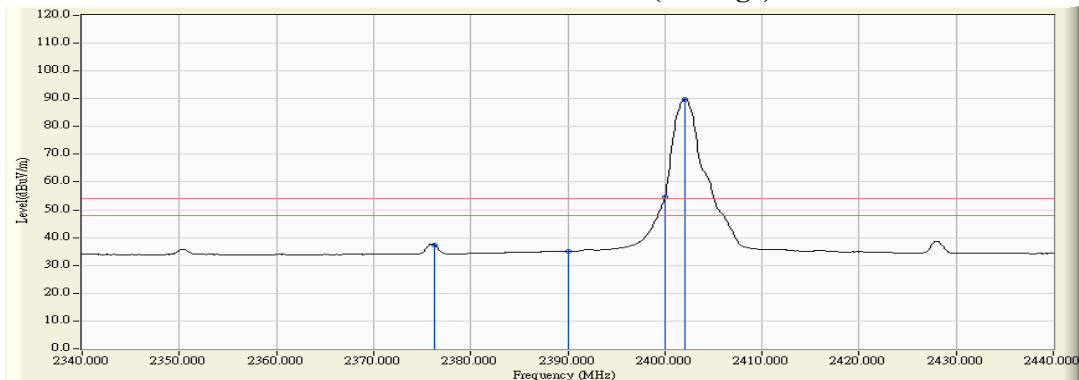
Note:

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 : 2016/12/09
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
00 (Peak)	2380.000	-4.126	62.585	58.459	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	50.839	46.680	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	73.987	69.816	--	--	--
00 (Peak)	2402.200	-4.171	107.723	103.552	--	--	--
00 (Average)	2376.300	-4.113	41.403	37.290	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	39.188	35.029	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	58.811	54.640	--	--	--
00 (Average)	2402.100	-4.171	93.870	89.699	--	--	--

Figure Channel 00:**VERTICAL (Peak)****Figure Channel 00:****VERTICAL (Average)**

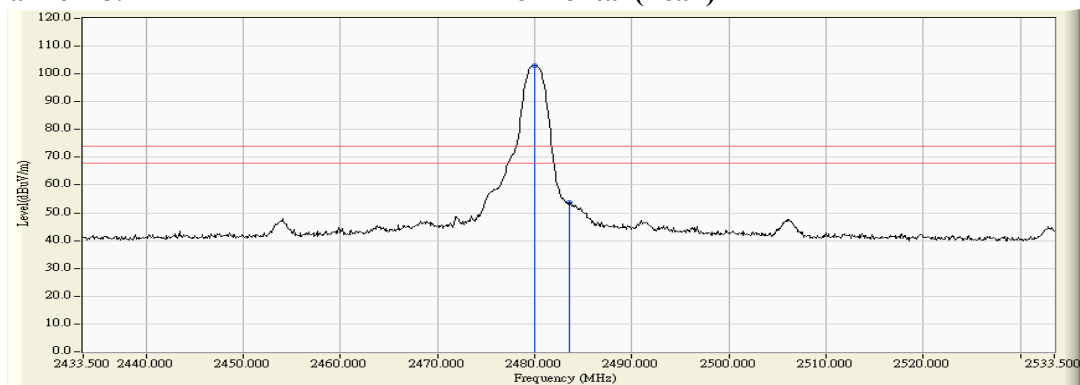
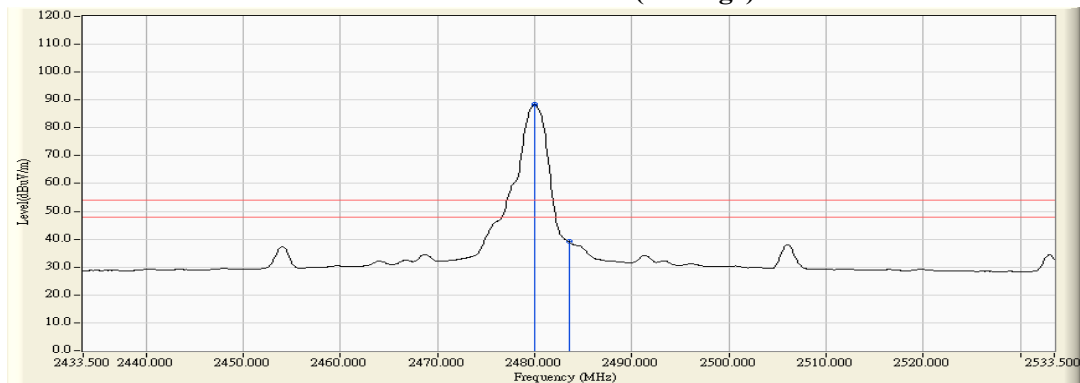
Note:

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 : 2016/12/09
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
78 (Peak)	2480.000	-2.605	105.569	102.964	--	--	Pass
78 (Peak)	2483.500	-2.601	56.214	53.612	74.00	54.00	Pass
78 (Average)	2480.000	-2.605	90.934	88.329	--	--	Pass
78 (Average)	2483.500	-2.601	41.692	39.090	74.00	54.00	Pass

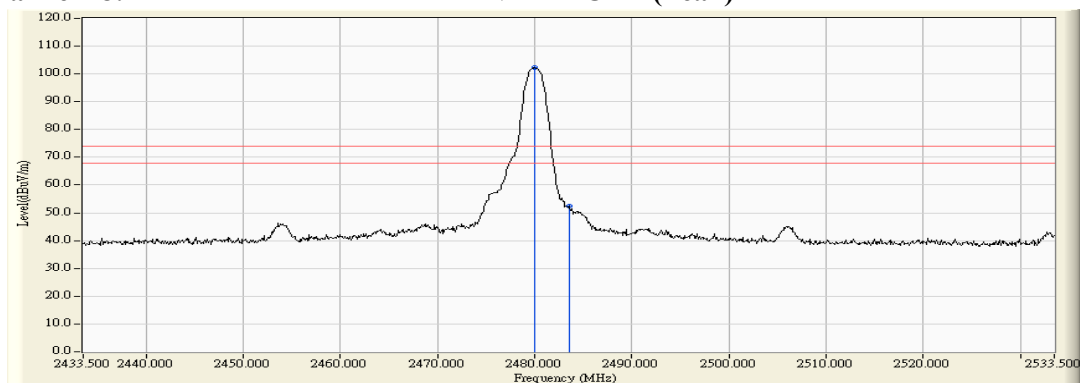
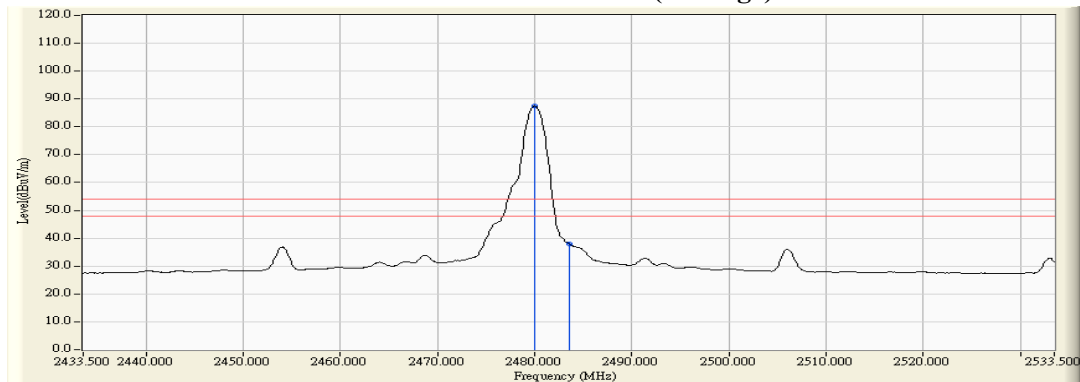
Figure Channel 78:**Horizontal (Peak)****Figure Channel 78:****Horizontal (Average)****Note:**

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 : 2016/12/09
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
78 (Peak)	2480.000	-3.978	106.163	102.185	--	--	Pass
78 (Peak)	2483.500	-3.966	56.558	52.591	74.00	54.00	Pass
78 (Average)	2480.000	-3.978	91.373	87.395	--	--	Pass
78 (Average)	2483.500	-3.966	41.993	38.026	74.00	54.00	Pass

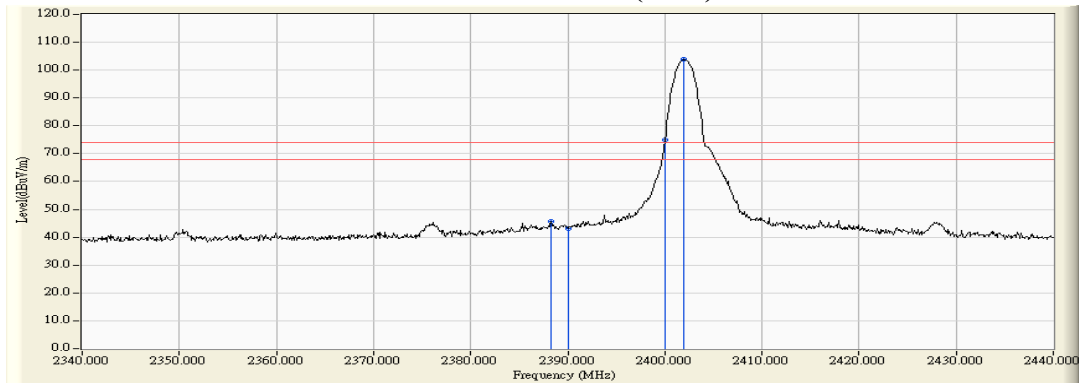
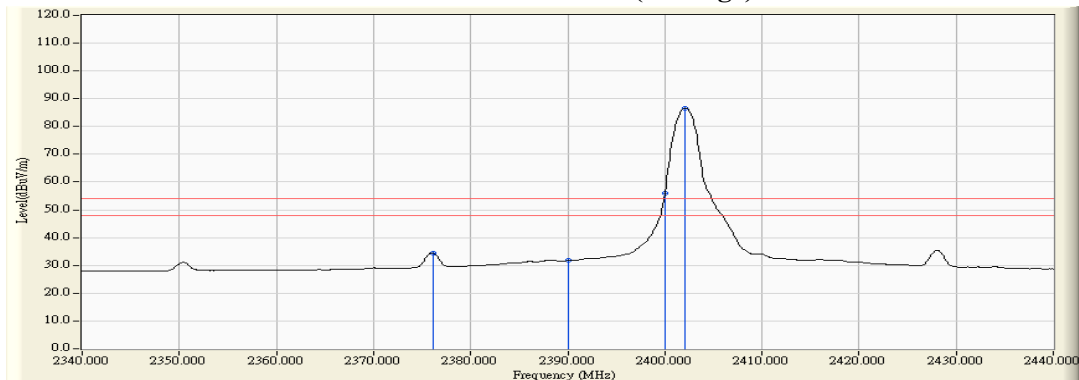
Figure Channel 78:**VERTICAL (Peak)****Figure Channel 78:****VERTICAL (Average)****Note:**

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 : 2016/12/09
 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)	Average Limit (dBμV/m)	Result
00 (Peak)	2388.300	-2.694	48.410	45.716	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	45.814	43.127	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	77.676	75.016	--	--	--
00 (Peak)	2402.000	-2.657	106.413	103.756	--	--	--
00 (Average)	2376.100	-2.748	37.257	34.509	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	34.435	31.748	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	58.531	55.871	--	--	--
00 (Average)	2402.100	-2.657	89.342	86.685	--	--	--

Figure Channel 00:**Horizontal (Peak)****Figure Channel 00:****Horizontal (Average)**

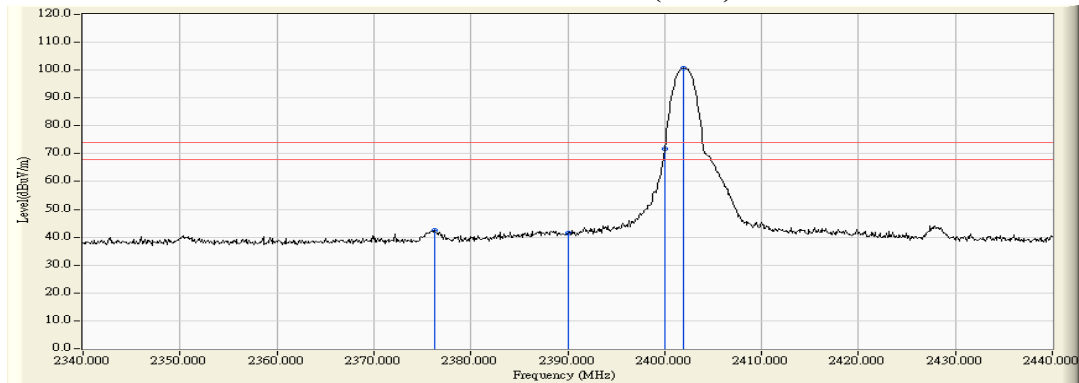
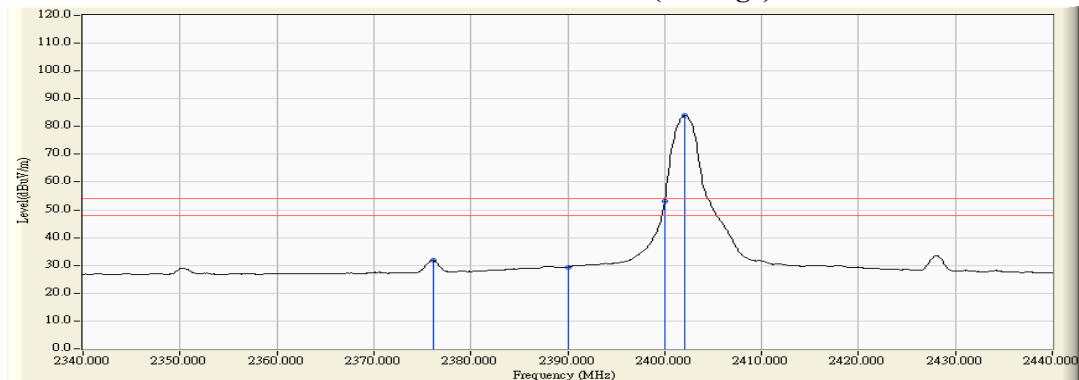
Note:

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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
00 (Peak)	2376.300	-4.113	46.460	42.347	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	45.627	41.468	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	75.825	71.654	--	--	--
00 (Peak)	2402.000	-4.171	105.022	100.851	--	--	--
00 (Average)	2376.100	-4.112	35.868	31.756	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	33.551	29.392	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	57.277	53.106	--	--	--
00 (Average)	2402.100	-4.171	88.164	83.993	--	--	--

Figure Channel 00:**VERTICAL (Peak)****Figure Channel 00:****VERTICAL (Average)**

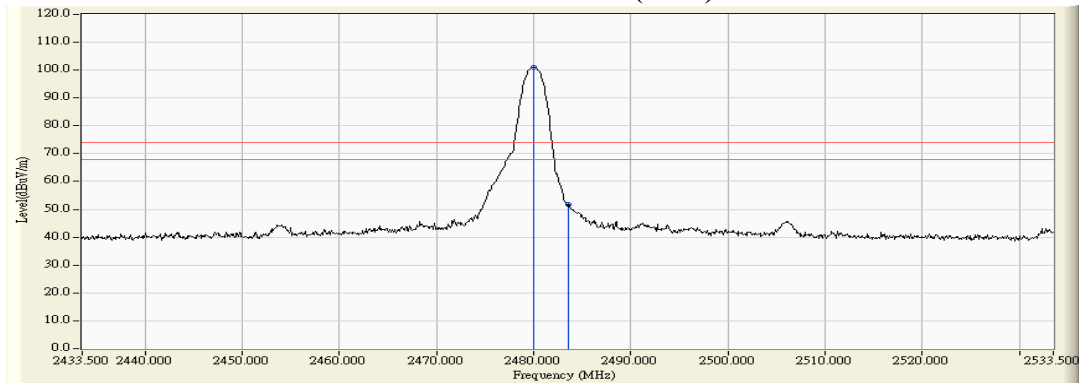
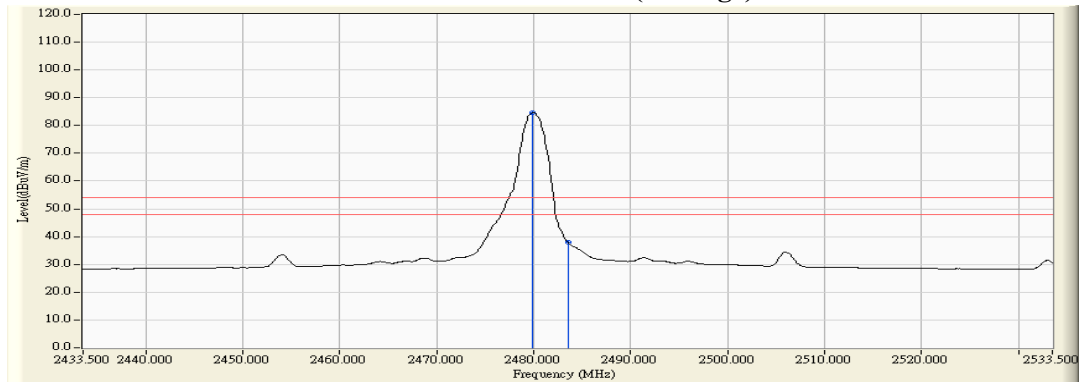
Note:

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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
78 (Peak)	2480.000	-2.605	103.712	101.107	--	--	Pass
78 (Peak)	2483.500	-2.601	54.248	51.646	74.00	54.00	Pass
78 (Average)	2479.900	-2.605	87.238	84.633	--	--	Pass
78 (Average)	2483.500	-2.601	40.454	37.852	74.00	54.00	Pass

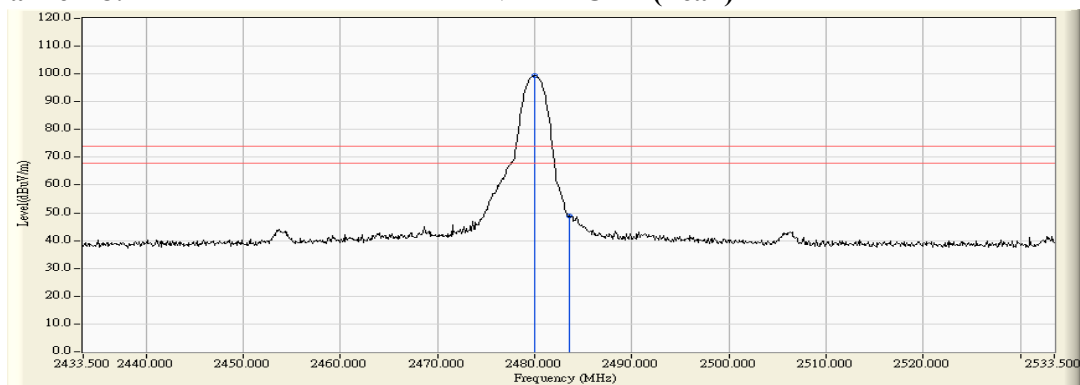
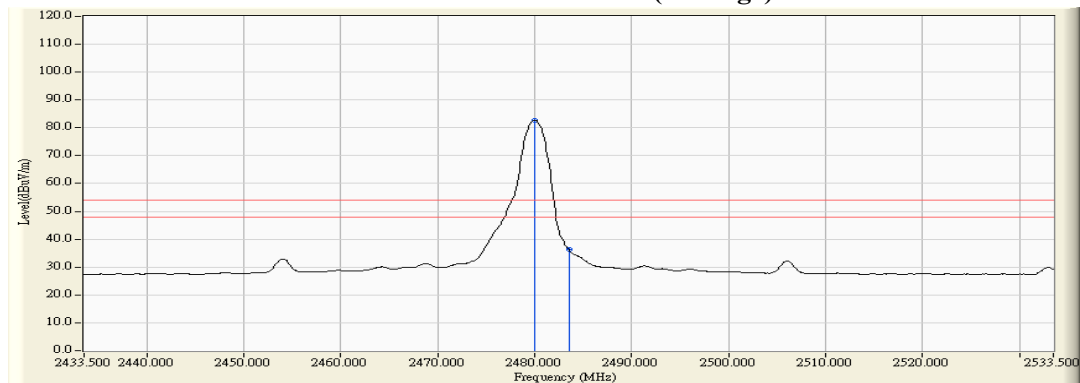
Figure Channel 00: Horizontal (Peak)**Figure Channel 00: Horizontal (Average)****Note:**

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 : 2016/12/09
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
78 (Peak)	2480.000	-3.978	103.312	99.334	--	--	Pass
78 (Peak)	2483.500	-3.966	52.717	48.750	74.00	54.00	Pass
78 (Average)	2480.000	-3.978	86.819	82.841	--	--	Pass
78 (Average)	2483.500	-3.966	40.195	36.228	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 : 2016/12/14
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

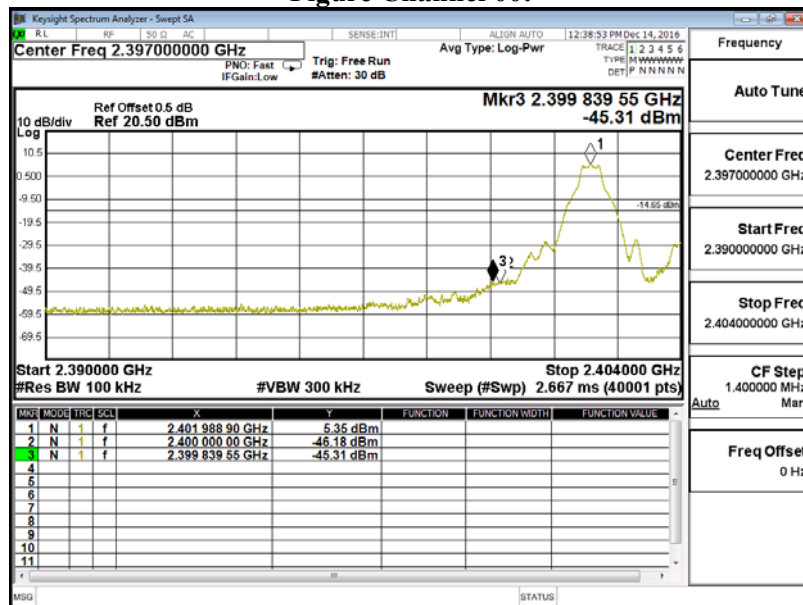
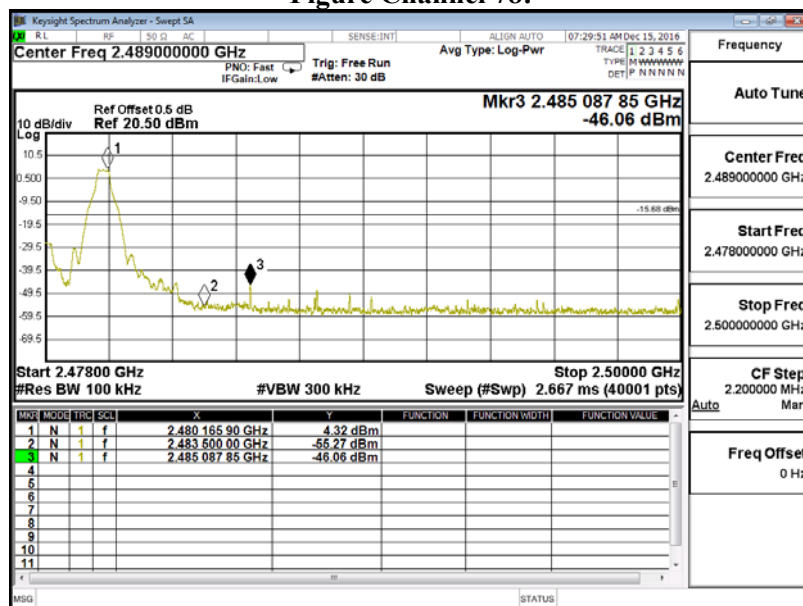


Figure Channel 78:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

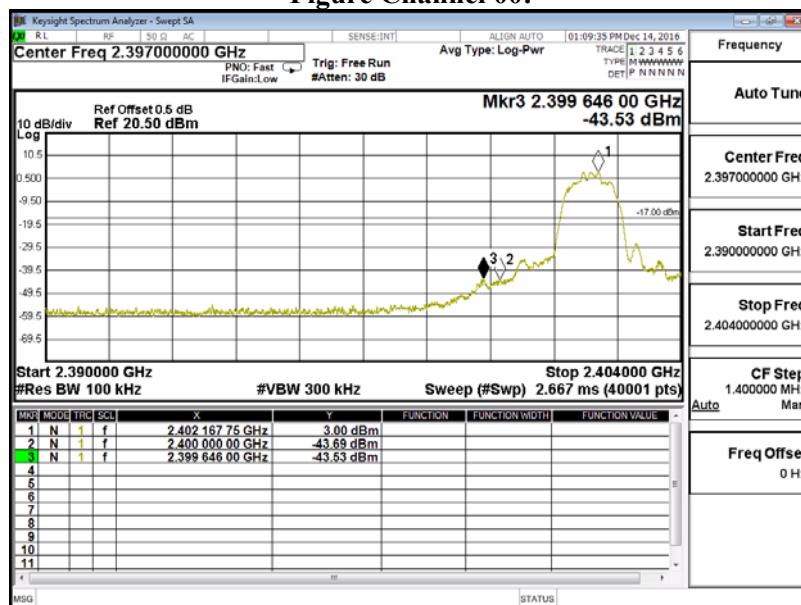
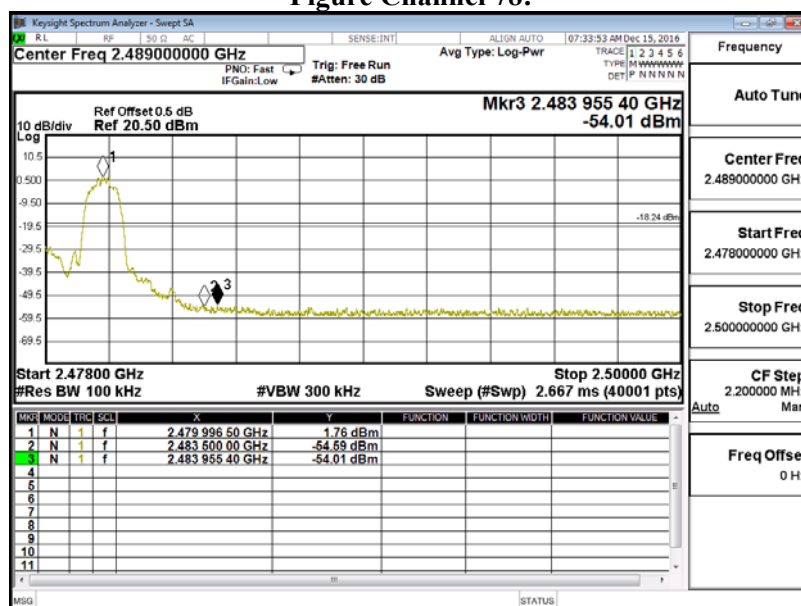


Figure Channel 78:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

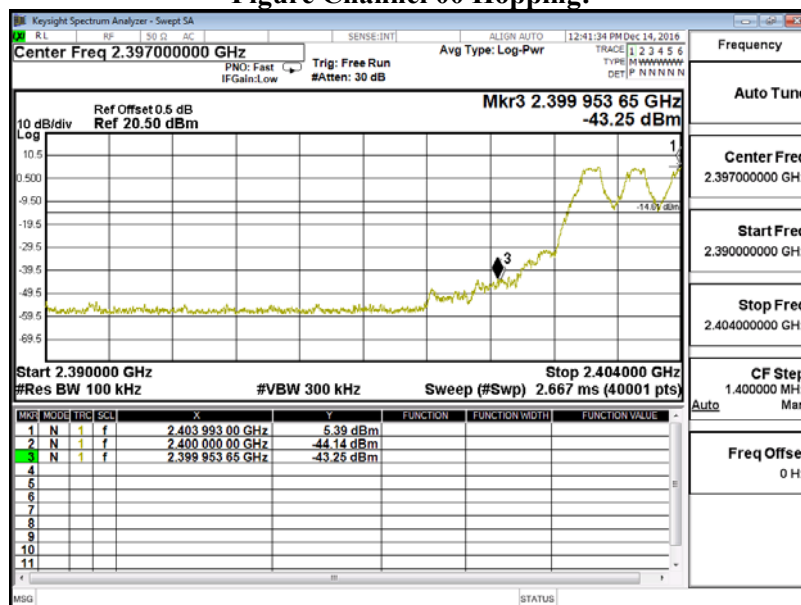
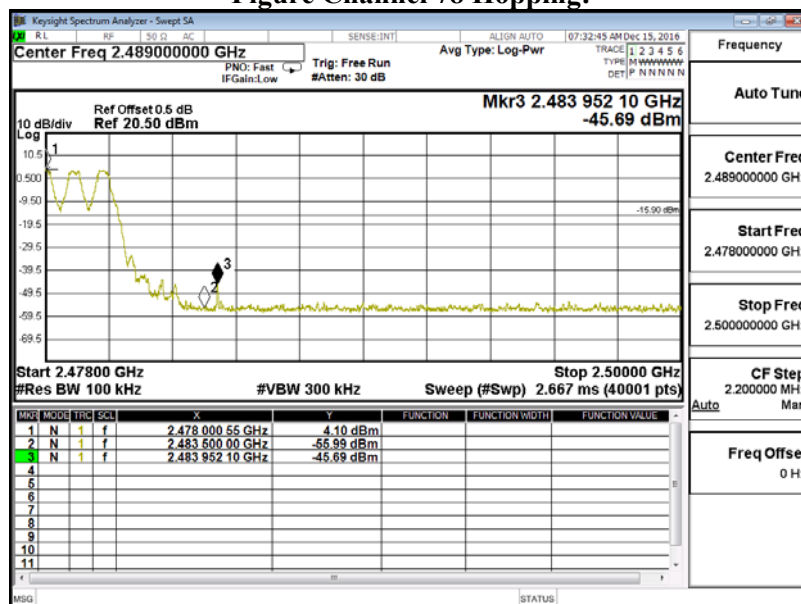


Figure Channel 78 Hopping:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00 Hopping:

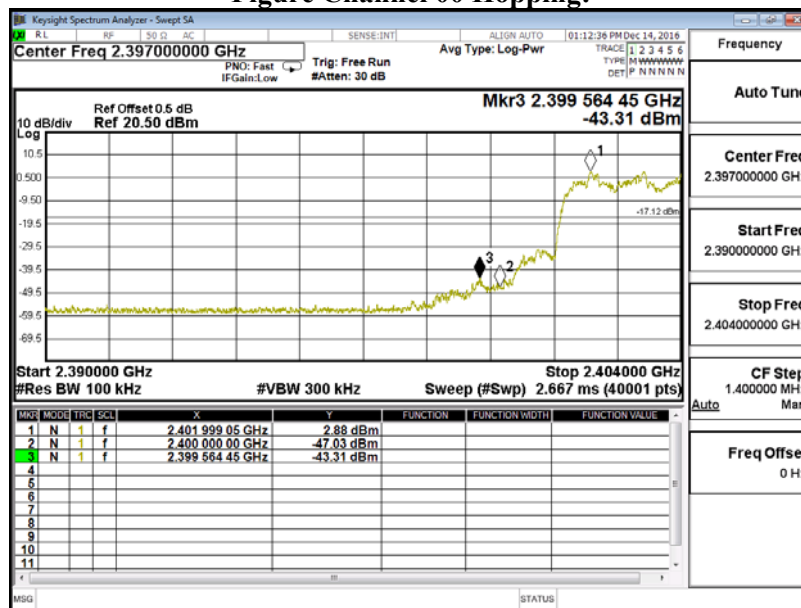
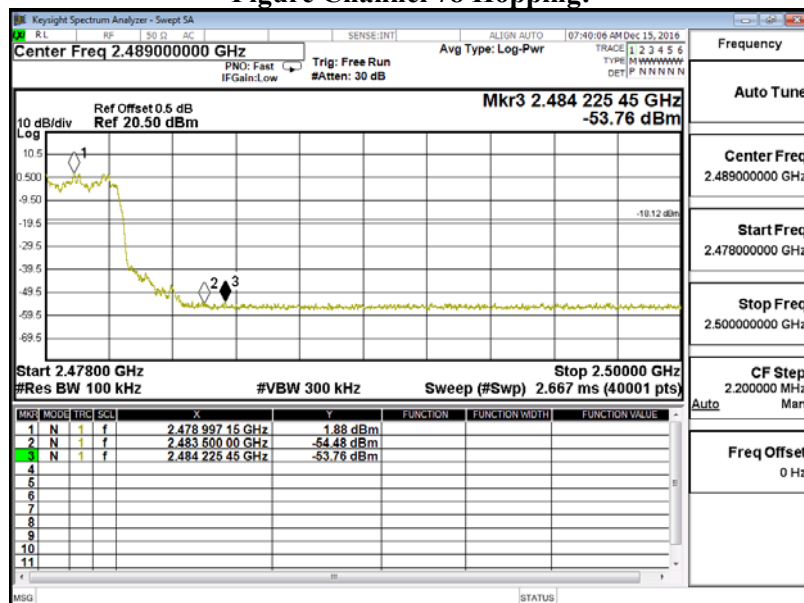
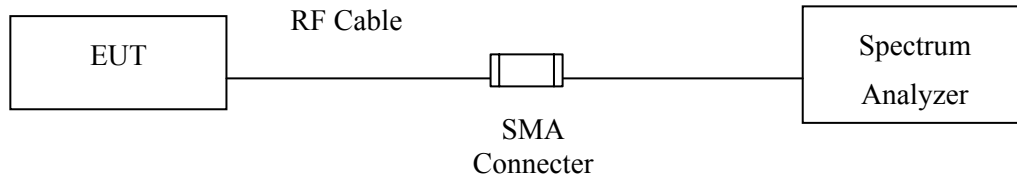


Figure Channel 78 Hopping:



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 75 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

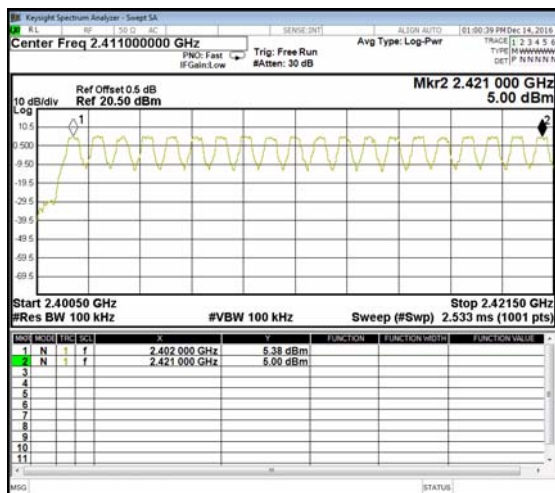
N/A

7.5. Test Result of Channel Number

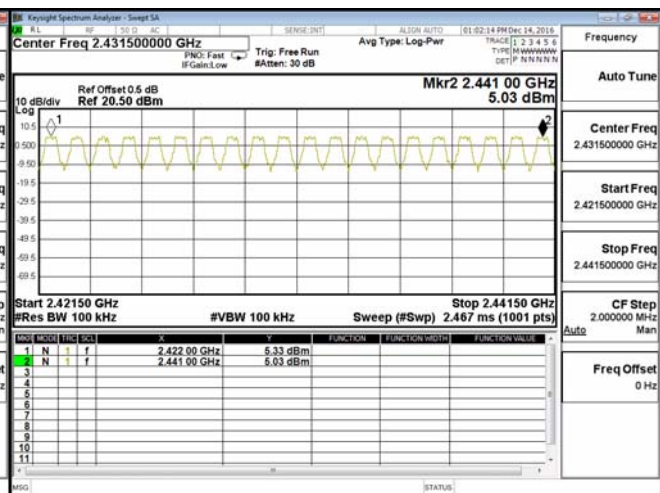
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

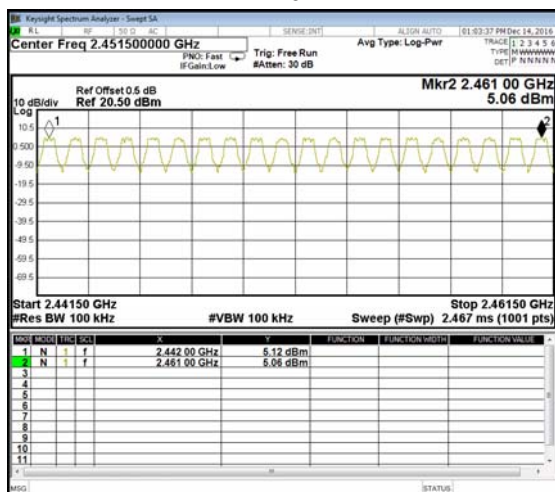
2402-2421MHz



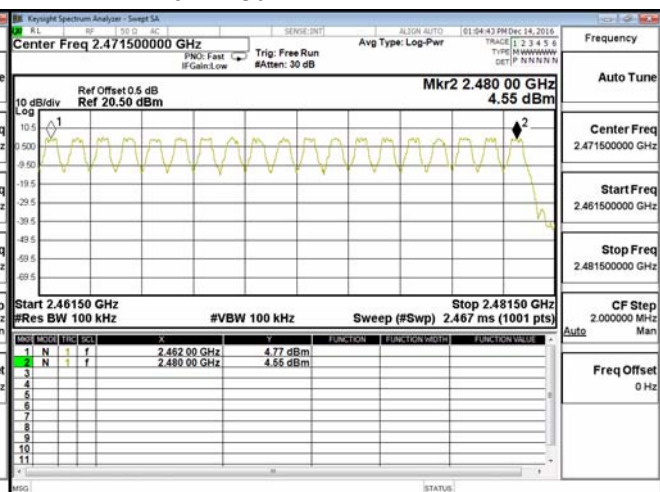
2422-2441MHz



2442-2461MHz



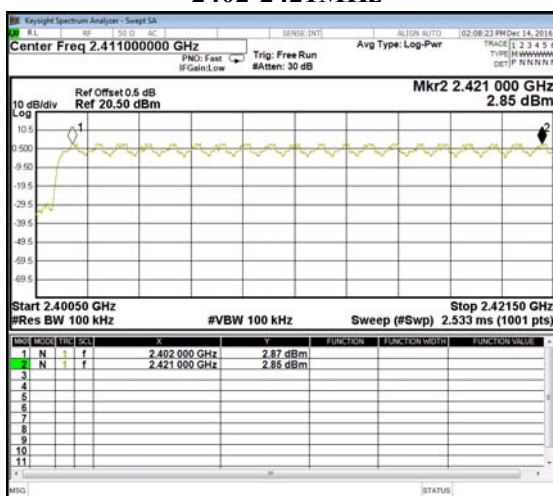
2462-2480MHz



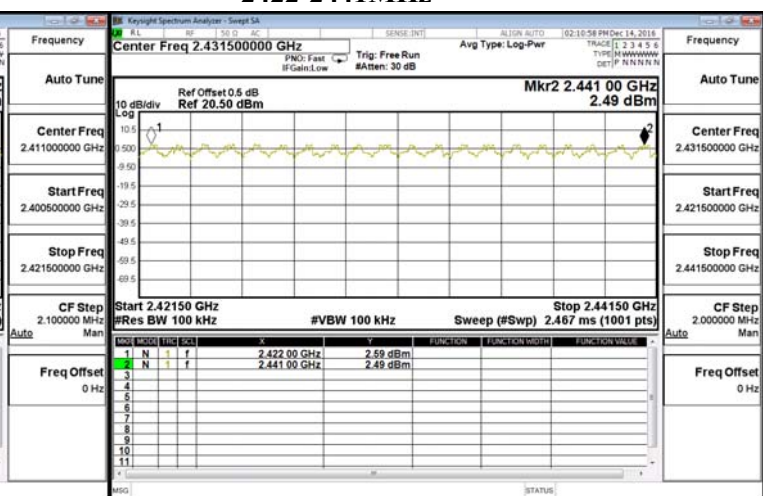
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

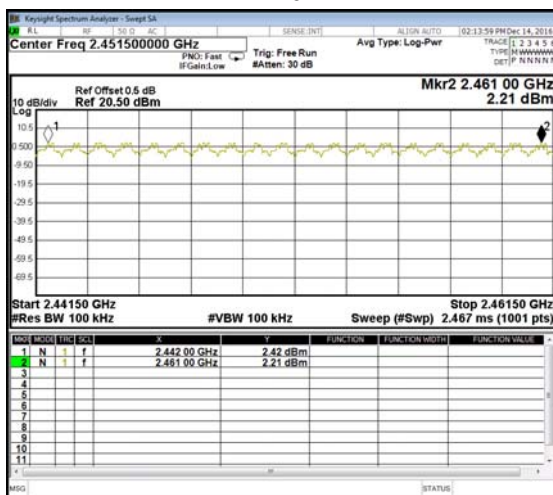
2402-2421MHz



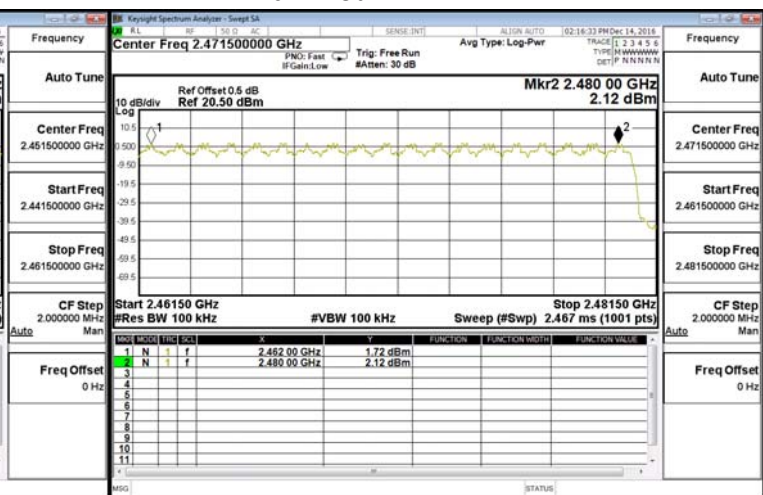
2422-2441MHz



2442-2461MHz

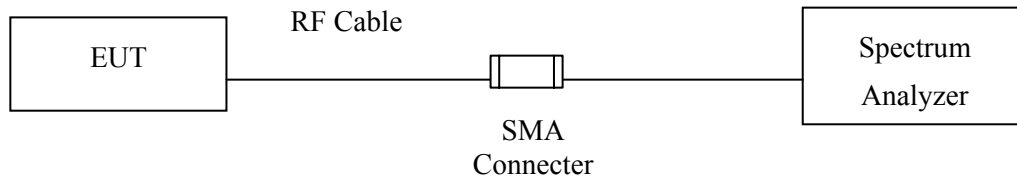


2462-2480MHz



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

$\pm 283\text{Hz}$

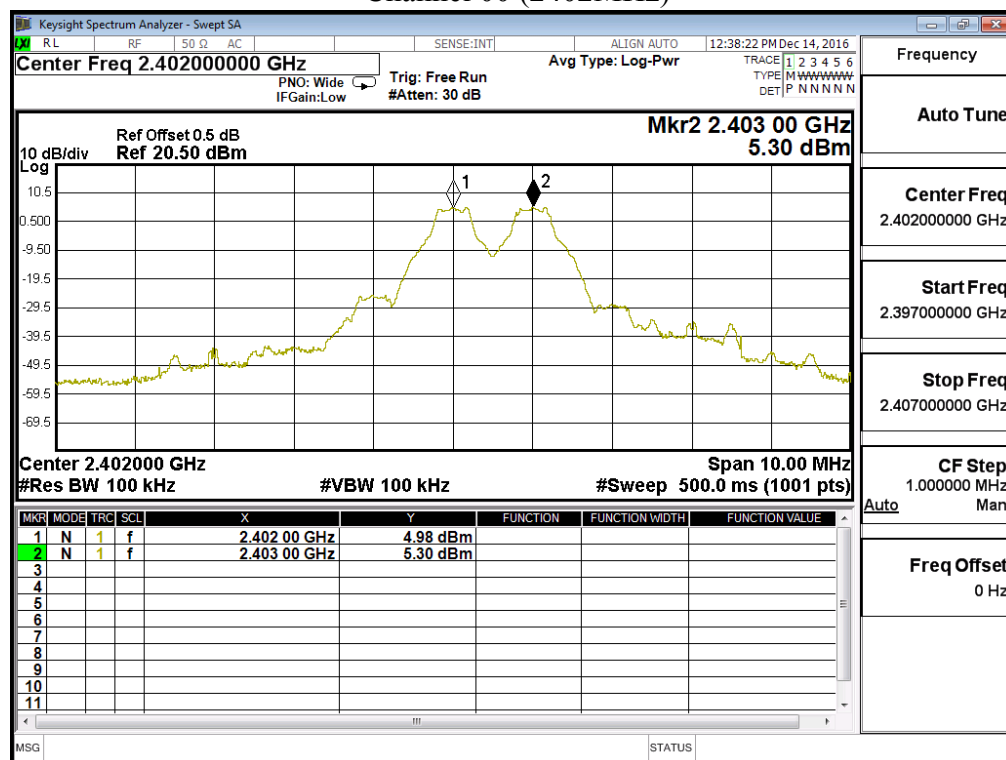
8.5. Test Result of Channel Separation

Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

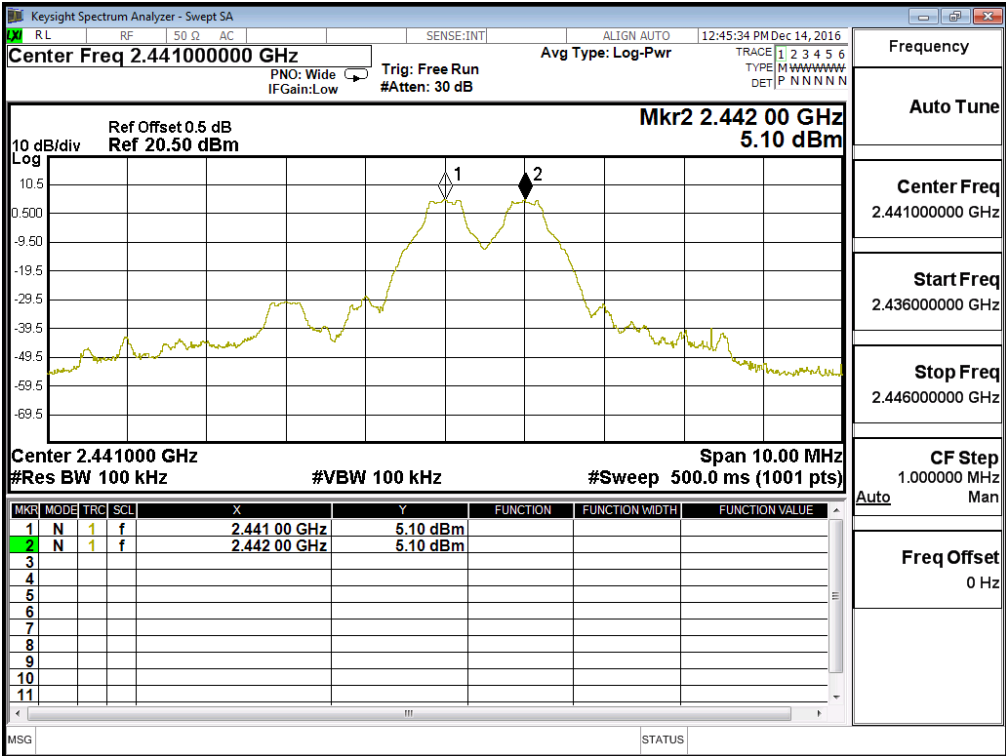
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	628.0	Pass
39	2441	1000	>25 kHz	626.0	Pass
78	2480	1000	>25 kHz	626.0	Pass

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

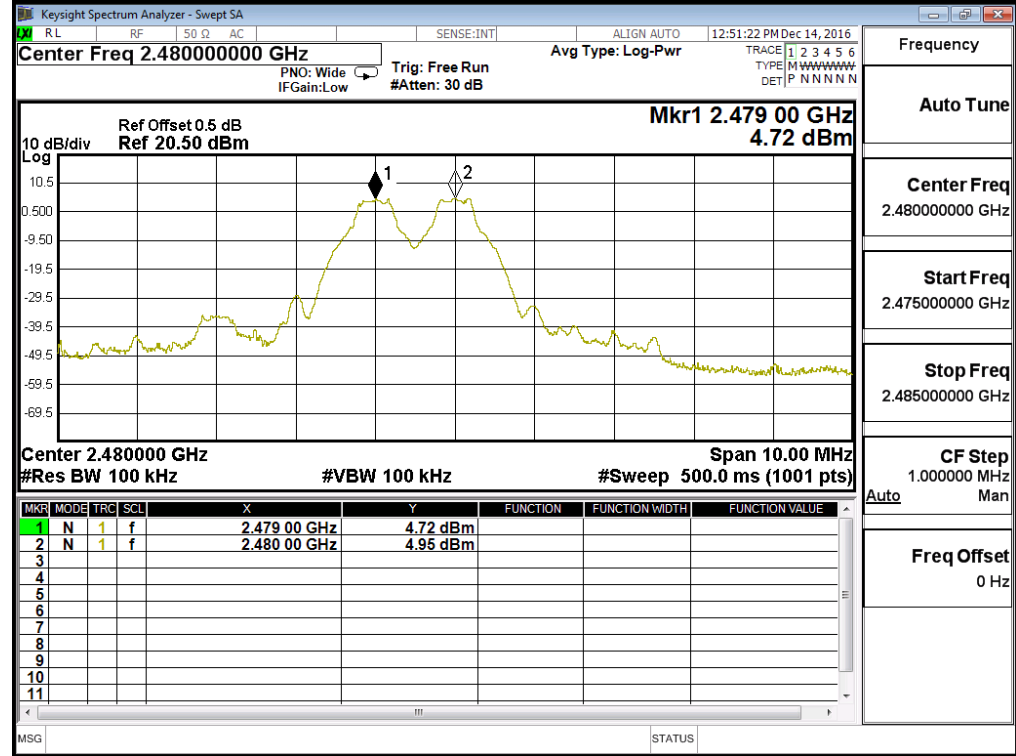
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)

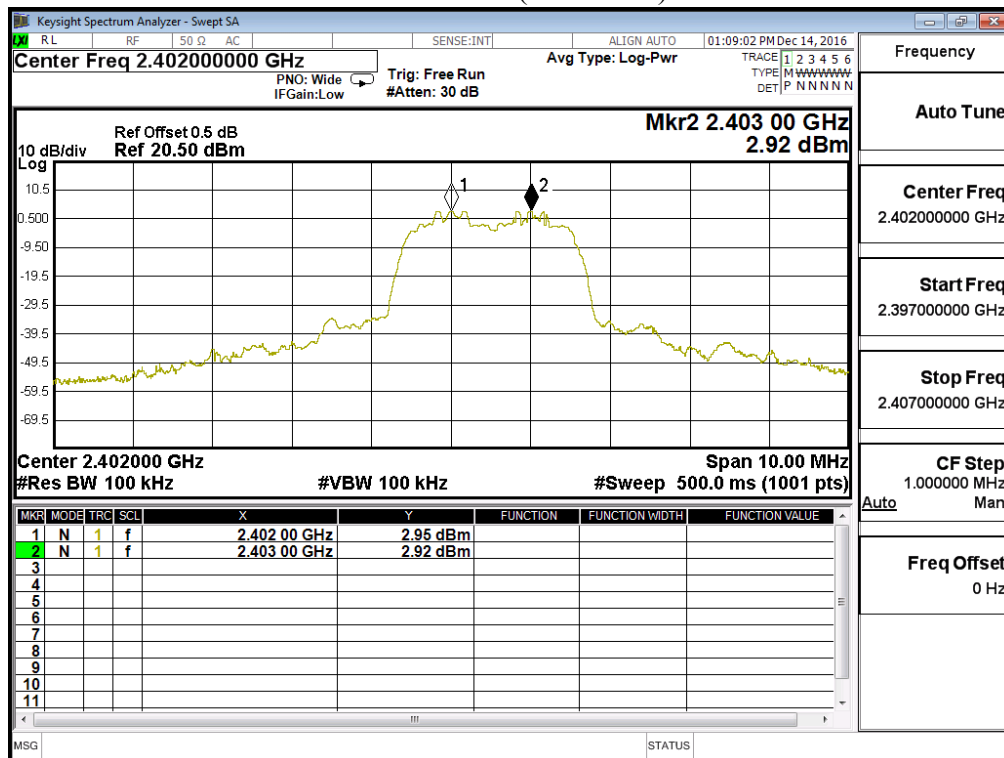


Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

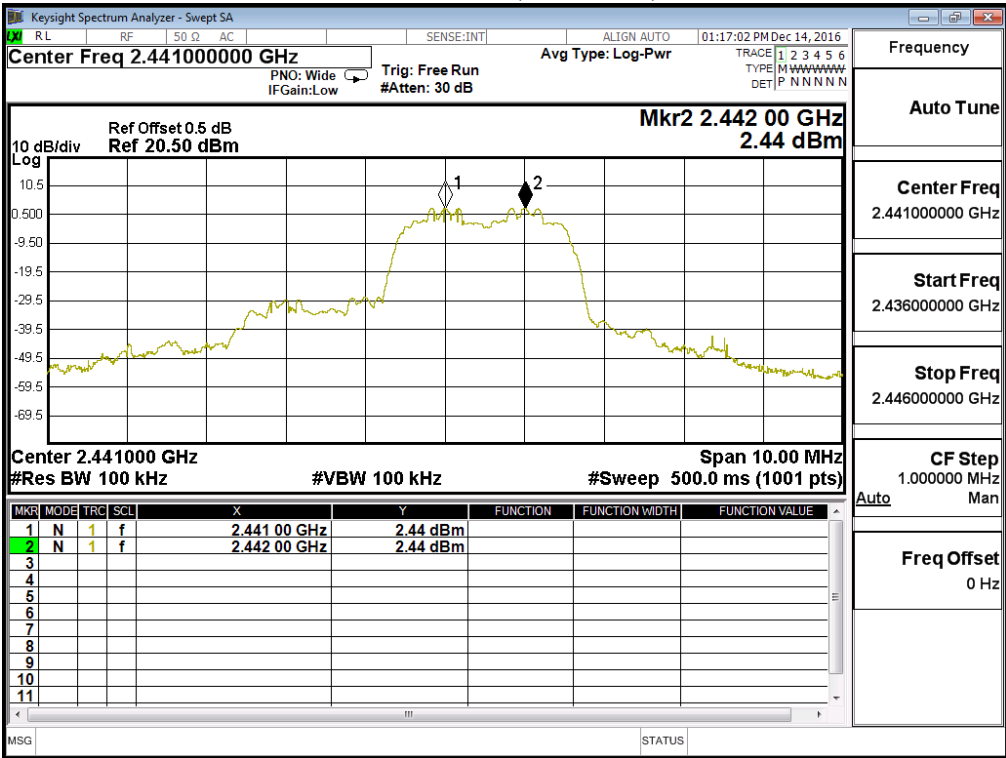
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	850.0	Pass
39	2441	1000	>25 kHz	844.0	Pass
78	2480	1000	>25 kHz	844.0	Pass

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

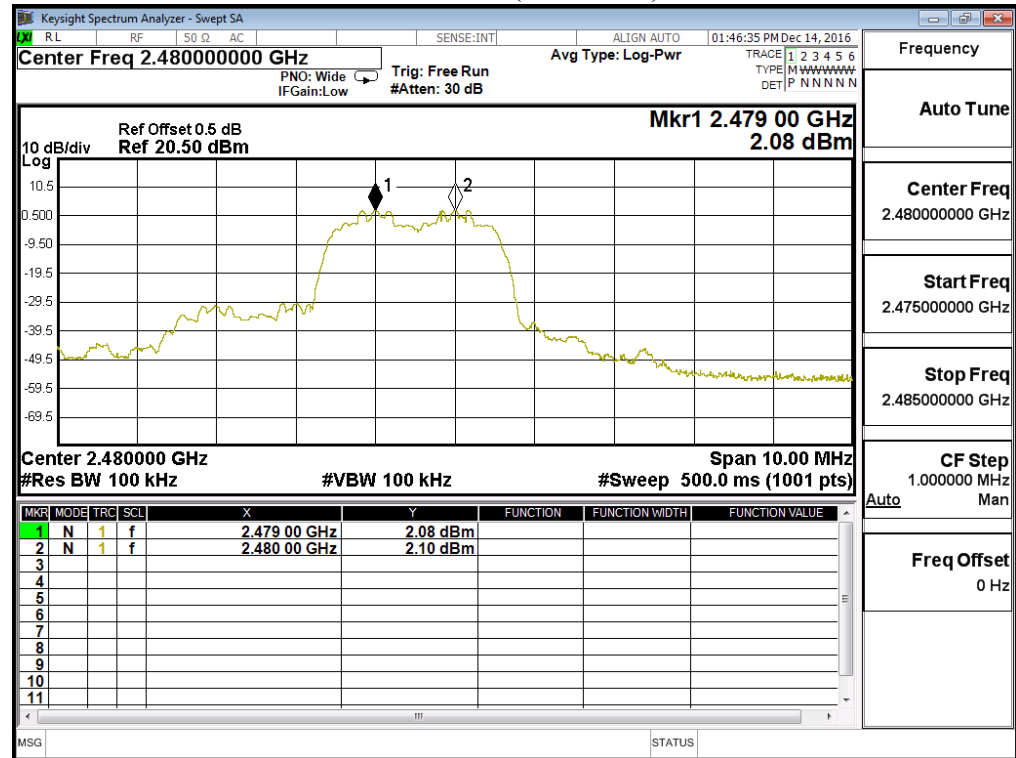
Channel 00 (2402MHz)



Channel 39 (2441MHz)

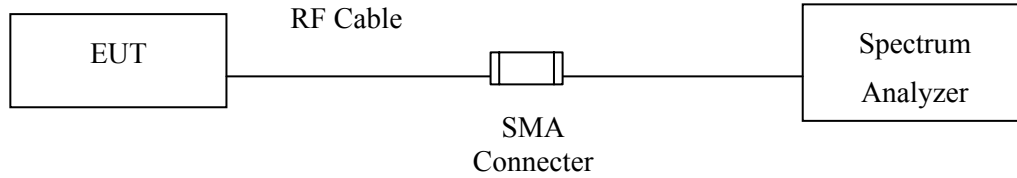


Channel 78 (2480MHz)



9. Dwell Time

9.1. Test Setup



9.2. Limit

The dwell time shall be the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

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

$\pm 25\text{msec}$

9.5. Test Result of Dwell Time

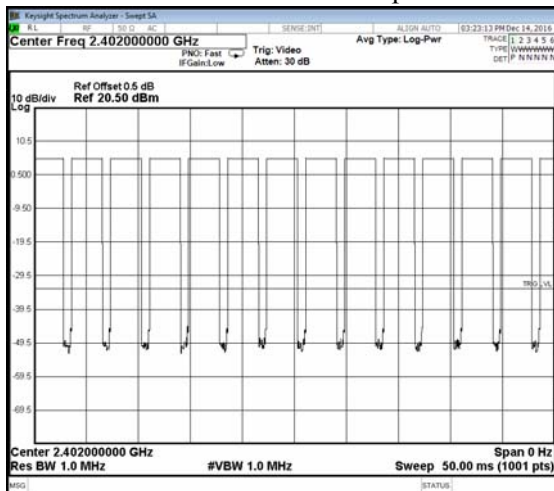
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.907	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

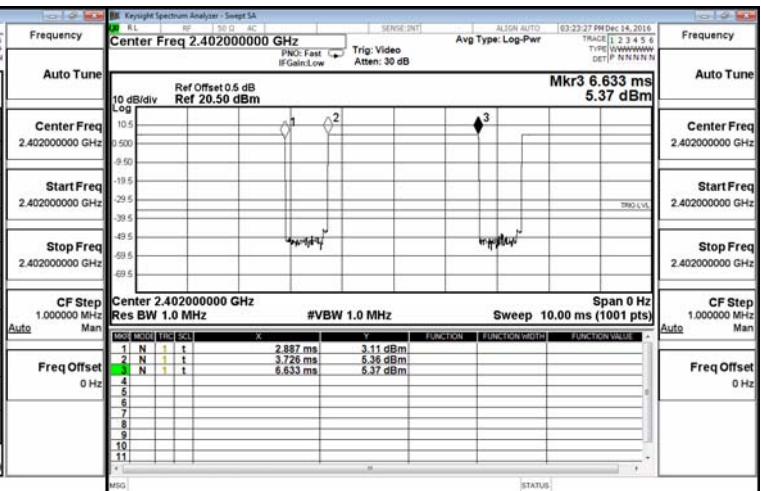
Duty cycle = ((Time slot length(ms)*Hopping of Number) / Sweep time (ms))

Dwell time = (Duty cycle /79) * (79*0.4)

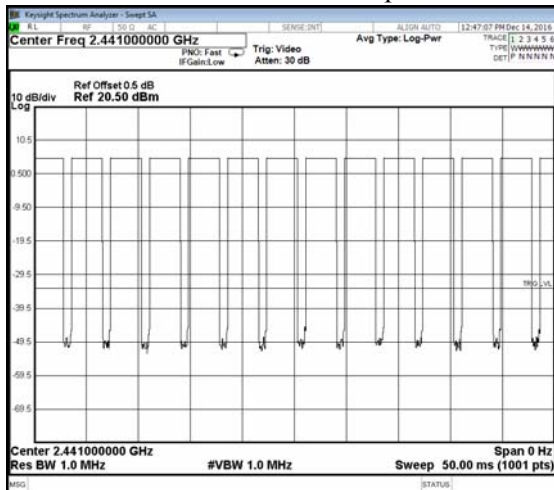
CH 00 Time Interval between hops



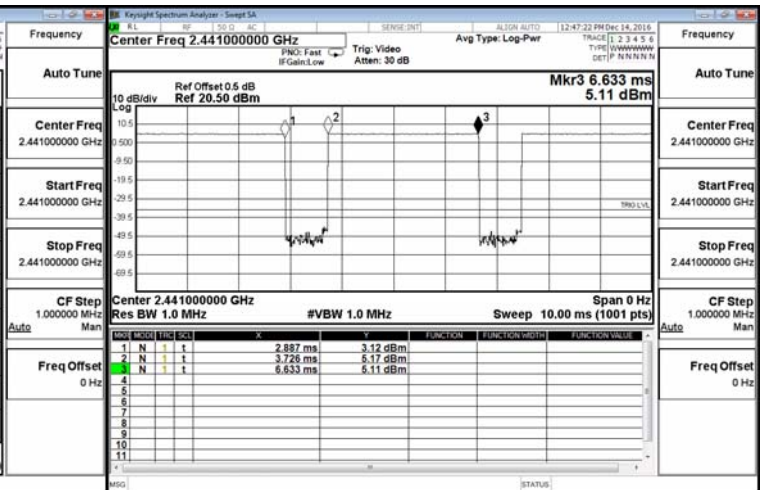
CH 00 Transmission Time



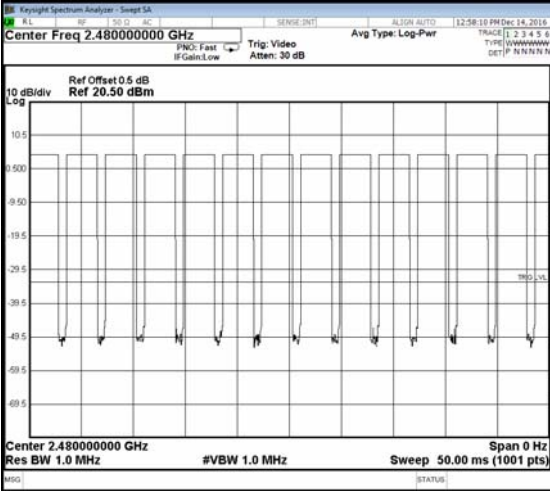
CH39 Time Interval between hops



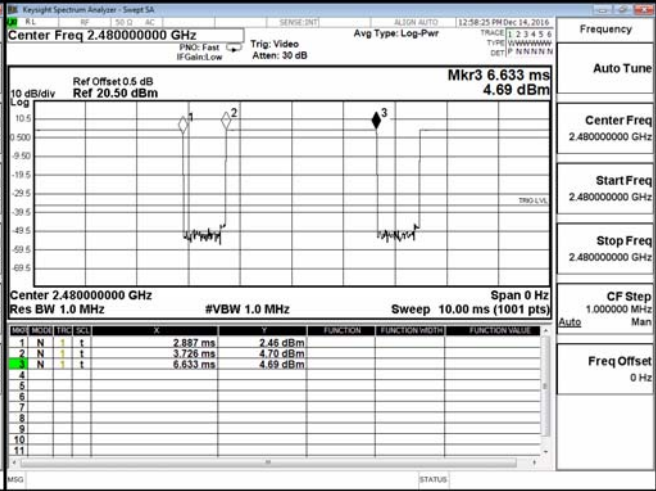
CH 39Transmission Time



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.

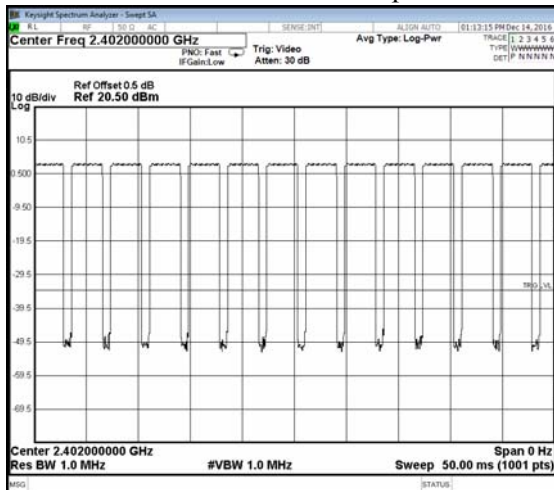
Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

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

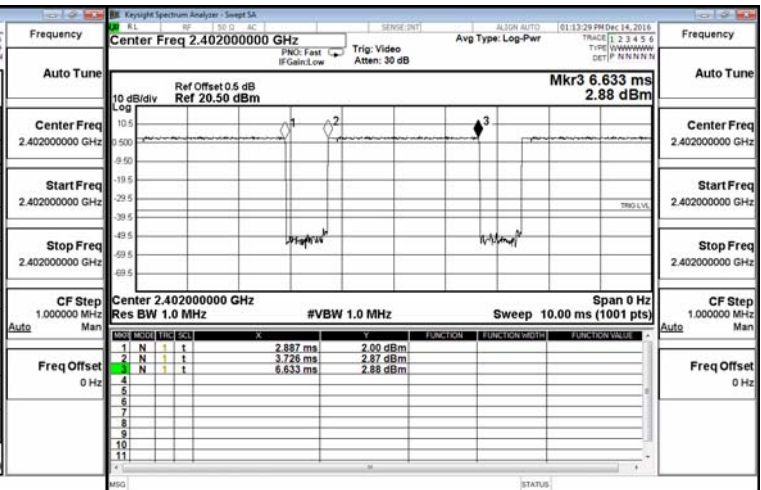
Duty cycle = ((Time slot length(ms)*Hopping of Number) / Sweep time (ms))

Dwell time = (Duty cycle / 79) * (79*0.4)

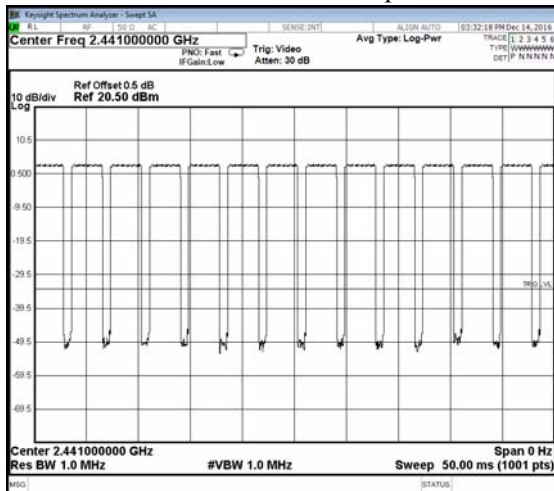
CH 00 Time Interval between hops



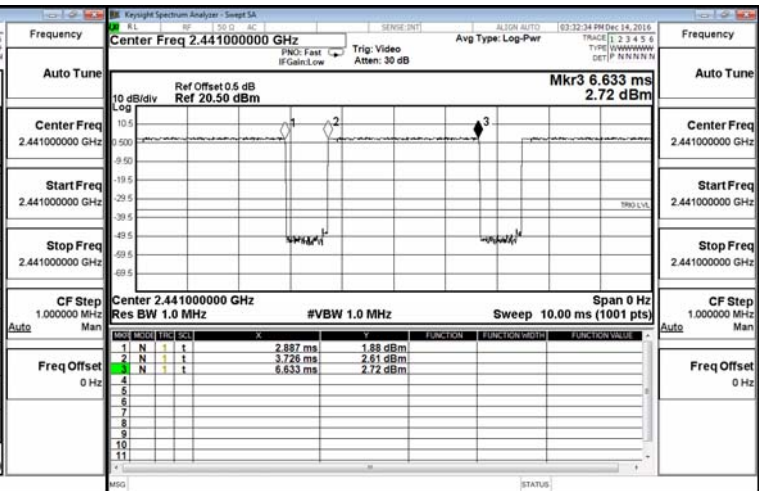
CH 00 Transmission Time



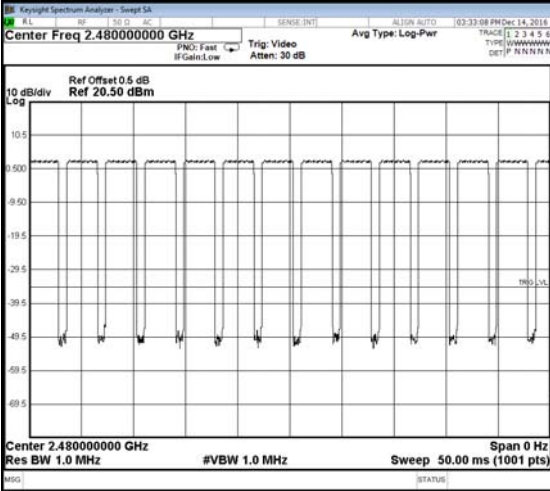
CH39 Time Interval between hops



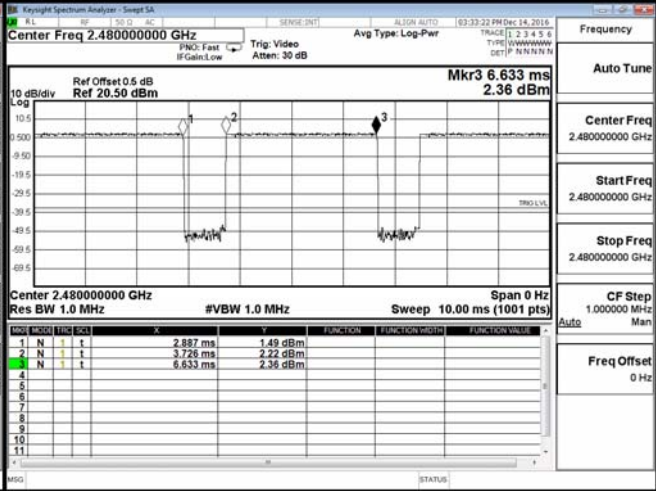
CH 39Transmission Time



CH 78 Time Interval between hops



CH 78 Transmission Time

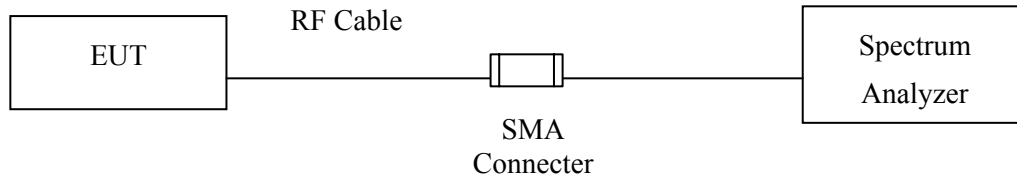


Note:

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

$\pm 283\text{Hz}$

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 date : 2016/12/15
 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	939	--	NA

Figure Channel 00:

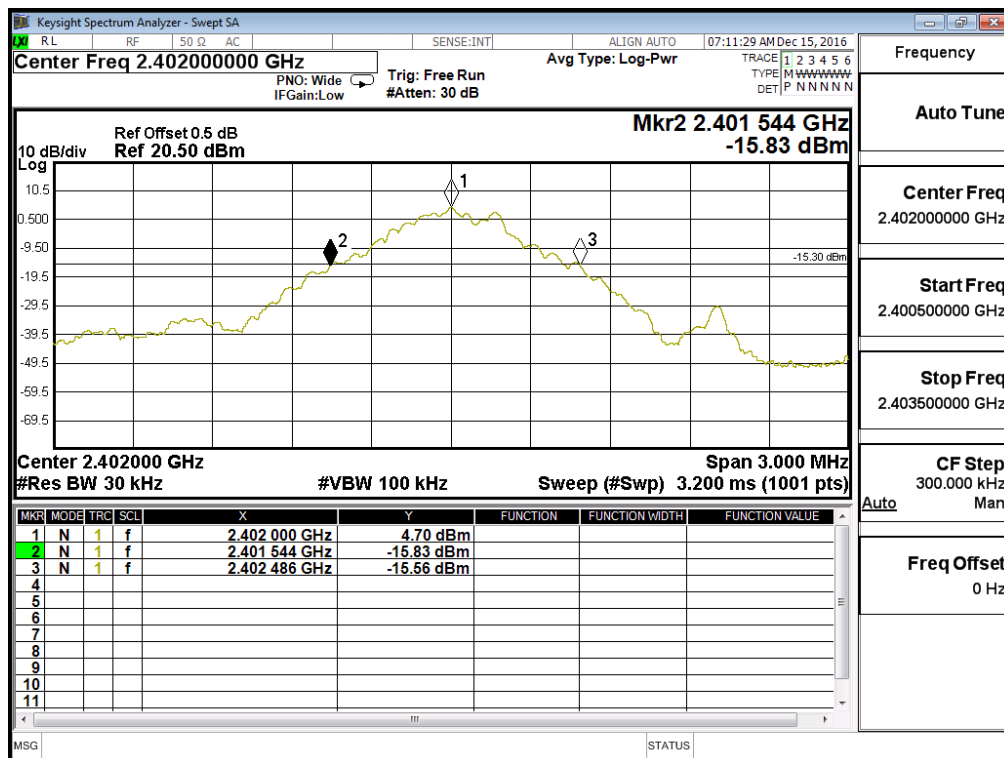


Figure Channel 39:

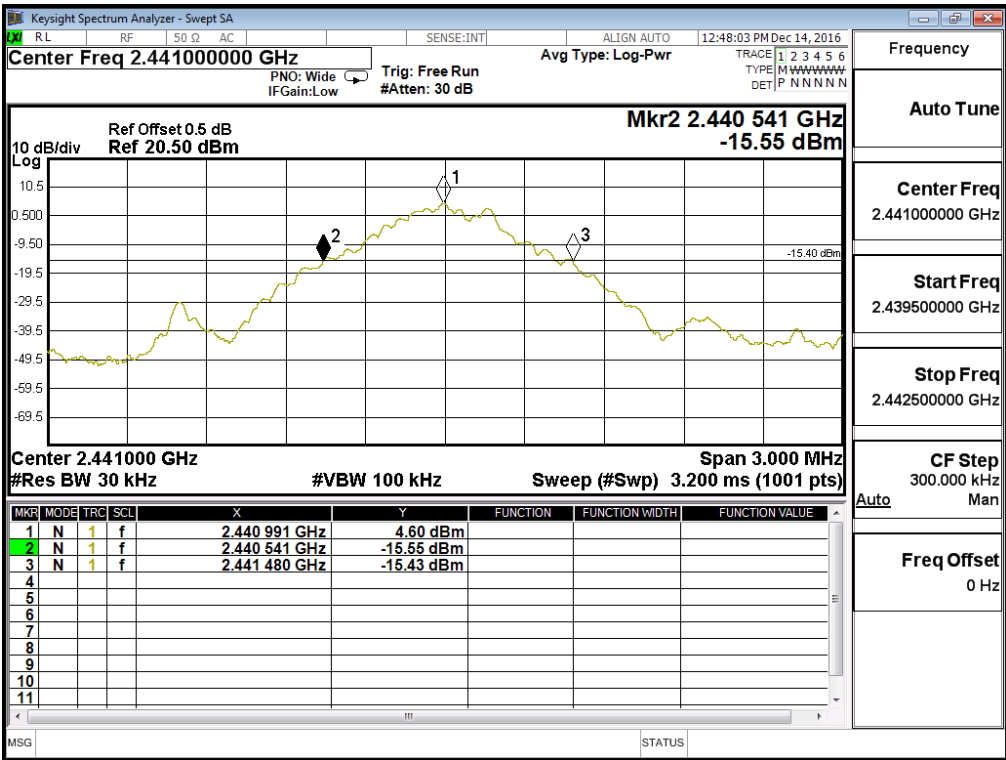
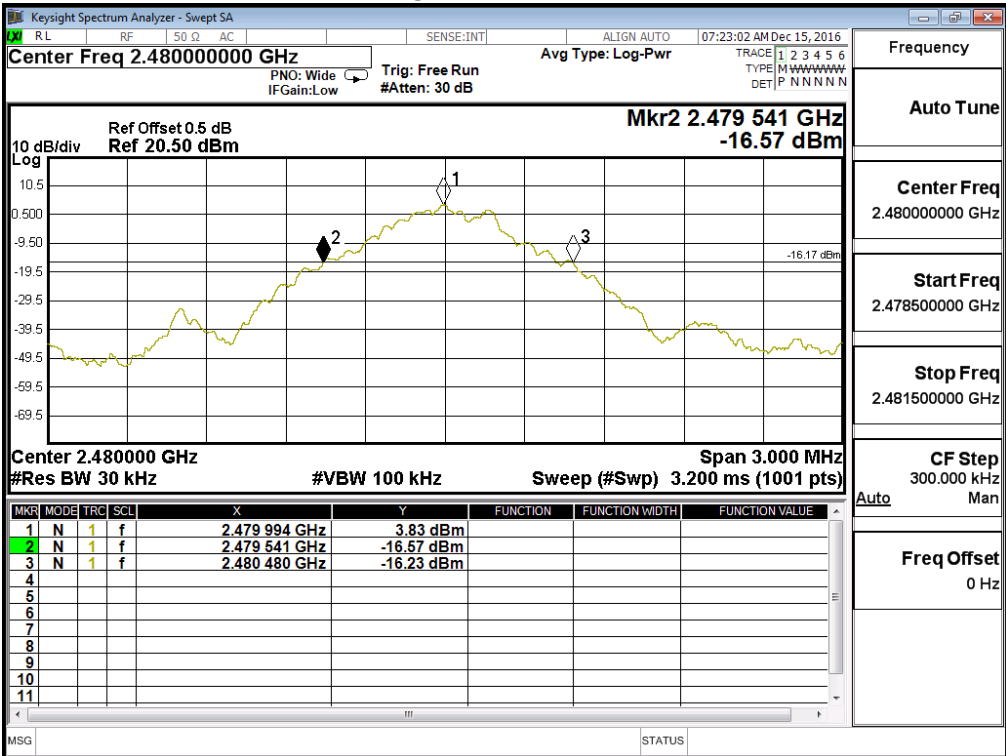


Figure Channel 78:



Product : Klipsch Heritage Wireless TableTop Bluetooth Small
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test date : 2016/12/14
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1275	--	NA
39	2441	1266	--	NA
78	2480	1266	--	NA

Figure Channel 00:

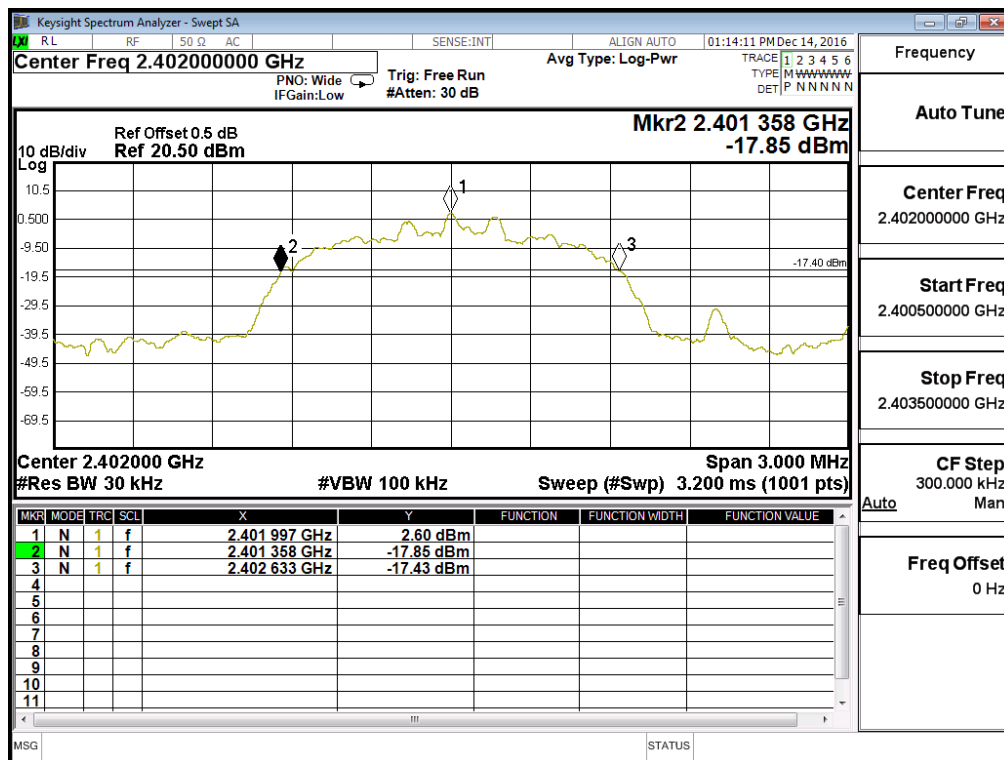


Figure Channel 39:

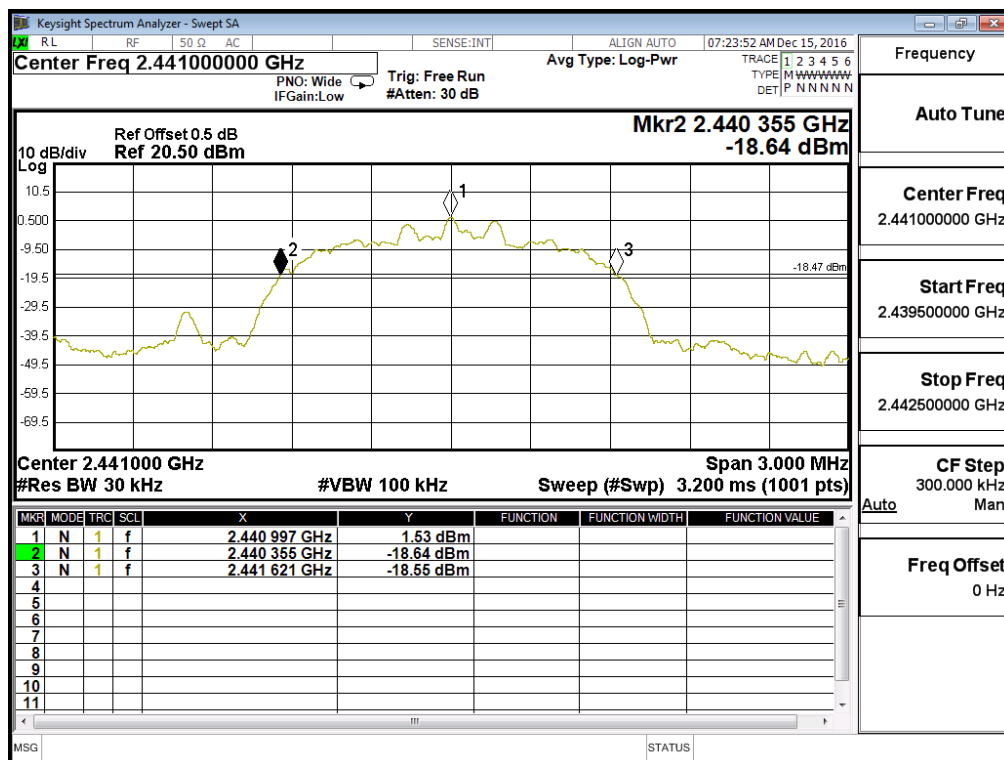
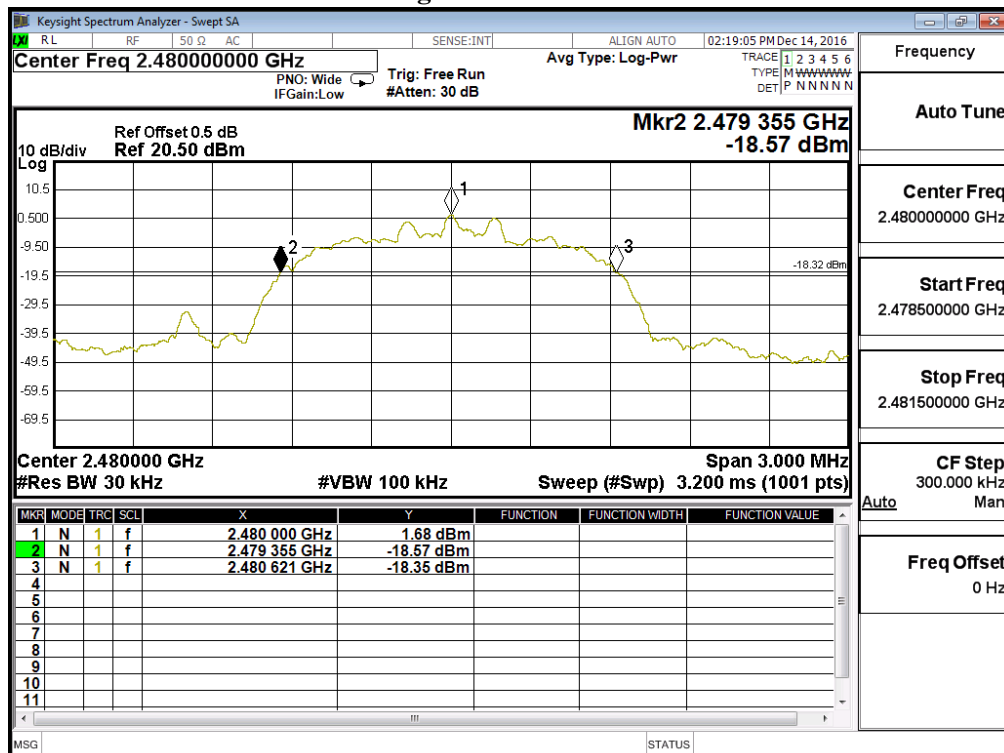


Figure Channel 78:



11. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs