FCC Test Report

Product Name	Heat Finder
Model No	AD-HF048, AD-HF048ER, AD-HF048SR
FCC ID.	2AQTD-HF048SER

Applicant	ADE Technology Inc.
Address	15F., No69, Sec.2, Guangfu Rd., Sanchong Dist., New Taipei City 24158, Taiwan (R.O.C)

Date of Receipt	Jun. 14, 2018
Issue Date	Aug. 03, 2018
Report No.	1860171R-RFUSP02V00
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.
This report must not be used to claim product endorsement by TAF or any agency of the government.
The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Test Report

Issue Date: Aug. 03, 2018
Report No.: 1860171R-RFUSP02V00

Product Name	Heat Finder
Applicant	ADE Technology Inc.
Address	15F., No69, Sec.2, Guangfu Rd., Sanchong Dist., New Taipei City 24158, Taiwan (R.O.C)
Manufacturer	ADE Technology Inc.
Model No.	AD-HF048, AD-HF048ER, AD-HF048SR
FCC ID.	2AQTD-HF048SER
EUT Rated Voltage	AC 100-240V, 50/60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	HEAT FINDER
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04
Test Result	Complied

Documented By : April Chen

(Senior Adm. Specialist / April Chen)

Tested By : Jason Tuan

(Engineer / Jason Tuan)

Approved By :

(Director / Vincent Lin)

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Heat Finder
Trade Name	HEAT FINDER
Model No.	AD-HF048, AD-HF048ER, AD-HF048SR
FCC ID.	2AQTD-HF048SER
Frequency Range	802.11b/g :2412-2472 MHz
Number of Channels	802.11b/g-20MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g:OFDM (BPSK, QPSK,16QAM,64QAM)
Antenna Type	Chip Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Power Adapter	MFR: Sunny, M/N: SYS1531-1505-W2 Input: AC 100-240V~,1.0A MAX, 50/60Hz Output: 5V⎓3.0A Cable Out: Shielded, 1.3m

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	AEL	A2450M000000S007	Chip Antenna	2.3496 dBi 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

802.11b/g-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

Note:

1. The EUT is a Heat Finder with a built-in 2.4GHz WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps、802.11g is 6Mbps)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
5. The EUT is including series models for different is listed as below:

HEAT FINDER	Type	Difference	Extended Model Number	Functional Description
	Indoor Type	The function of the supplied software is different	AD-HF048	Thermal image perception
			AD-HF048ER	Thermal image perception People Counting
			AD-HF048SR	Thermal image perception People Counting Security Monitor

6. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)

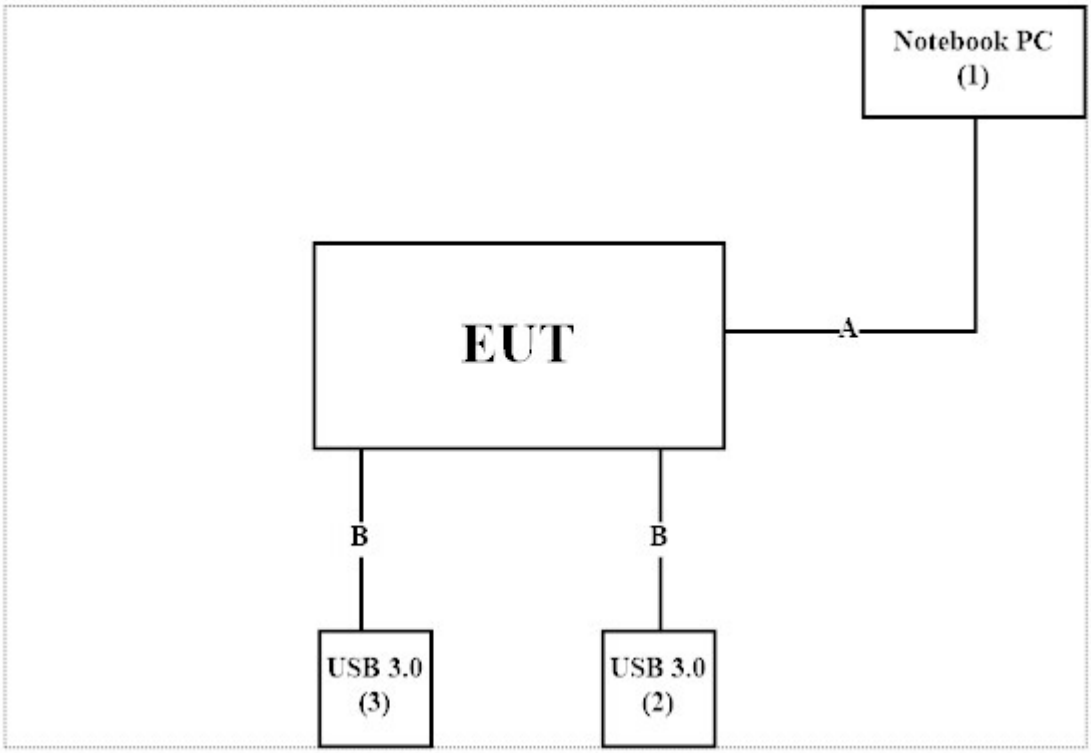
1.3. Tested System Details

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	74BTK32	Non-Shielded, 0.8m
2	USB 3.0(2T)	WD	WDBACW0020HBK	WCAZAL508385	Non-Shielded, 1.5m
3	USB 3.0(2T)	WD	WDBACW0020HBK	WCAZAL442147	Non-Shielded, 1.5m

Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 1.5m
B	USB Cable	Non-Shielded, 0.2m, two PCS.

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Putty v0.63.0.0” on the EUT.
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	50-65
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. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/2/12	2019/2/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2017/10/13	2018/10/12
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/7/19	2019/7/18
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/7/6	2019/7/5
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/7/6	2019/7/5
X	EMI Test Receiver	R&S	ESCS 30	100369	2017/11/7	2018/11/6
X	LISN	R&S	ESH3-Z5	836679/017	2018/2/9	2019/2/8
X	LISN	R&S	ENV216	100097	2018/2/9	2019/2/8
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/6/21	2019/6/20

For Radiated measurements /Site3/CB8

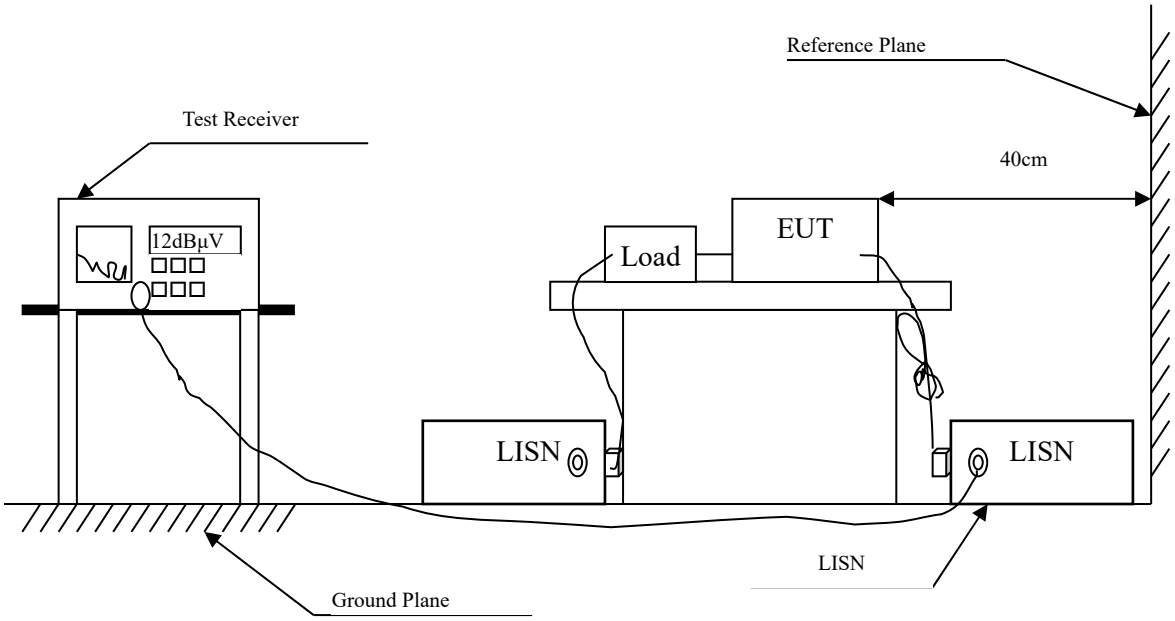
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/3/12	2019/3/11
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2018/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/6/24	2019/6/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/6/14	2019/6/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/6/14	2019/6/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2017/12/07	2018/12/06
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
X	Horn Antenna	Com-Power	AH-840	101043	2018/01/09	2019/01/08
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
X	Filter	MicroTRON	BRM50701	019	2017/11/21	2018/11/20
X	Filter	Microwave Circuits	N0257881	36681	2018/1/22	2019/1/21

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	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

The EUT and simulators 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 refers 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 of 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.

2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : Heat Finder
Test Item : Conducted Emission Test
Power Line : Line 1
Test Date : 2018/07/31
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 1					
Quasi-Peak					
0.158	9.746	40.500	50.246	-15.525	65.771
0.377	9.745	22.300	32.045	-27.469	59.514
0.529	9.751	25.100	34.851	-21.149	56.000
0.623	9.755	17.620	27.375	-28.625	56.000
1.060	9.783	10.600	20.383	-35.617	56.000
11.138	10.092	10.020	20.112	-39.888	60.000
Average					
0.158	9.746	29.190	38.936	-16.835	55.771
0.377	9.745	9.390	19.135	-30.379	49.514
0.529	9.751	17.630	27.381	-18.619	46.000
0.623	9.755	13.150	22.905	-23.095	46.000
1.060	9.783	5.590	15.373	-30.627	46.000
11.138	10.092	5.210	15.302	-34.698	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 : Heat Finder
Test Item : Conducted Emission Test
Power Line : Line 2
Test Date : 2018/07/31
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

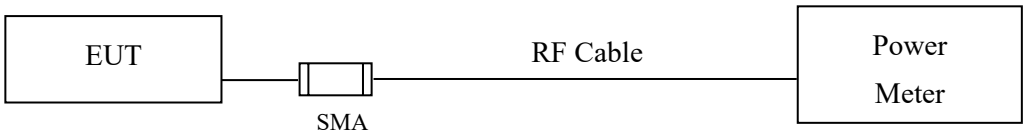
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 2					
Quasi-Peak					
0.162	9.736	42.760	52.496	-13.161	65.657
0.525	9.741	25.640	35.381	-20.619	56.000
0.783	9.762	13.340	23.102	-32.898	56.000
1.068	9.773	15.940	25.713	-30.287	56.000
1.337	9.784	16.000	25.784	-30.216	56.000
18.244	10.339	15.120	25.459	-34.541	60.000
Average					
0.162	9.736	23.270	33.006	-22.651	55.657
0.525	9.741	20.270	30.011	-15.989	46.000
0.783	9.762	9.800	19.562	-26.438	46.000
1.068	9.773	11.230	21.003	-24.997	46.000
1.337	9.784	11.420	21.204	-24.796	46.000
18.244	10.339	12.020	22.359	-27.641	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. Limits

The maximum peak power shall be less 1 Watt.

3.3. Test Procedure

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product : Heat Finder
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Date : 2018/07/31
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	9.73	--	--	--	16.9	<30dBm	Pass
06	2437	15.72	15.61	15.54	15.43	17.34	<30dBm	Pass
11	2462	16.59	--	--	--	18.06	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Heat Finder
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Date : 2018/07/31
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

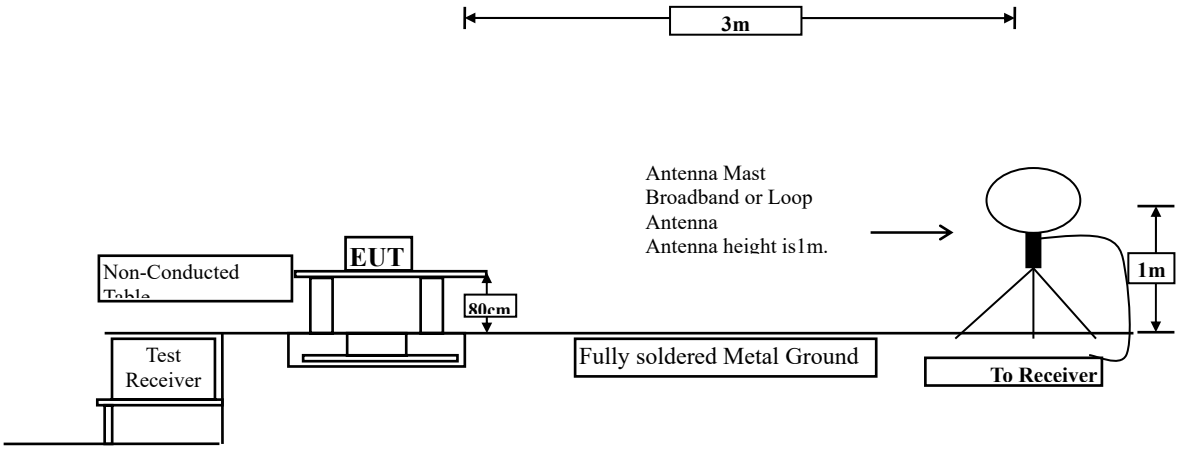
Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	9.28	--	--	--	--	--	--	--	17.05	<30dBm	Pass
06	2437	13.82	13.74	13.66	13.52	13.41	13.33	13.25	13.14	18.14	<30dBm	Pass
11	2462	14.85	--	--	--	--	--	--	--	18.71	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

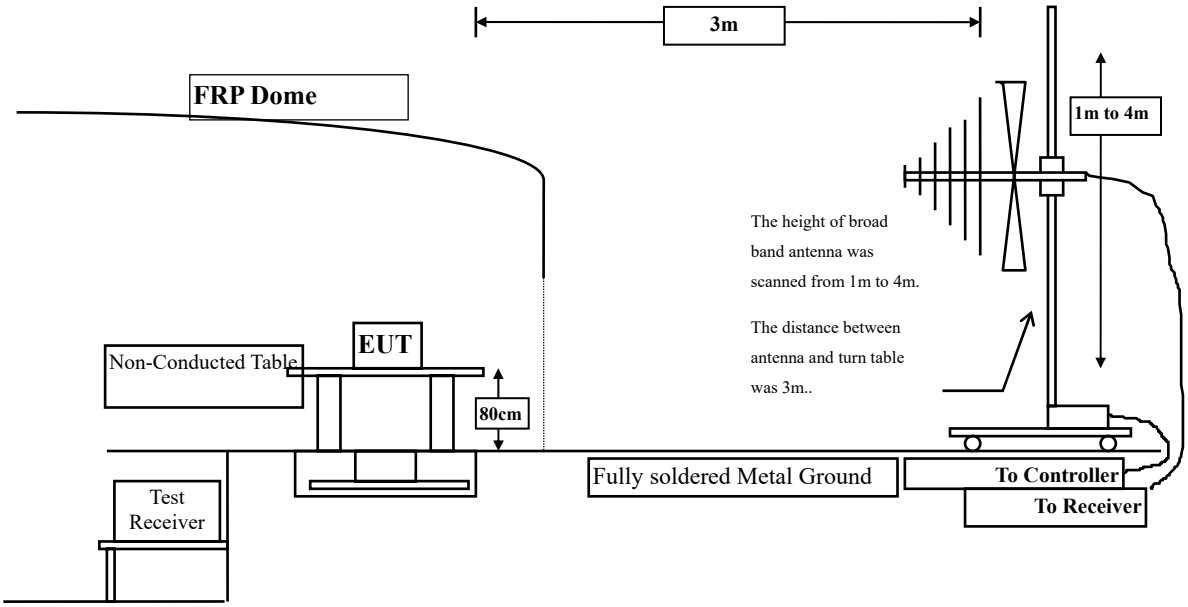
4. Radiated Emission

4.1. Test Setup

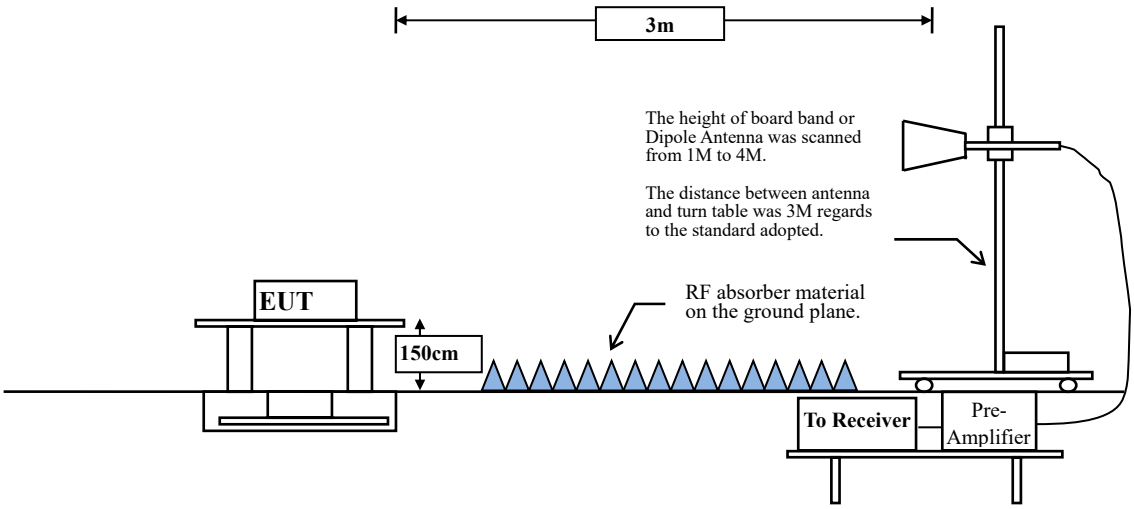
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. 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(a) 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: E field strength (dBμV/m) = 20 log E field strength (uV/m)

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for 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.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	99.66	--	--	10
802.11g	96.46	1.3841	723	1000

Note: Duty Cycle Refer to Section 9

4.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Radiated Emission

Product : Heat Finder
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/24
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	2.428	51.100	53.529	-20.471	74.000
7236.000	9.177	39.410	48.587	-25.413	74.000
9648.000	10.019	38.690	48.710	-25.290	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4824.000	2.836	44.310	47.147	-26.853	74.000
7236.000	9.676	39.000	48.676	-25.324	74.000
9648.000	10.556	38.730	49.287	-24.713	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Heat Finder
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/24
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	2.076	51.330	53.407	-20.593	74.000
7311.000	9.512	41.720	51.232	-22.768	74.000
9748.000	9.630	39.250	48.880	-25.120	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4874.000	2.532	58.960	61.492	-12.508	74.000
7311.000	10.089	42.660	52.749	-21.251	74.000
9748.000	10.266	39.670	49.937	-24.063	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Heat Finder
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/24
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4924.000	2.191	49.540	51.731	-22.269	74.000
7386.000	10.373	42.260	52.634	-21.366	74.000
9848.000	9.964	38.350	48.314	-25.686	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4924.000	2.805	54.020	56.825	-17.175	74.000
7386.000	11.180	41.500	52.680	-21.320	74.000
9848.000	10.801	38.360	49.161	-24.839	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Heat Finder
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/24
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	2.428	45.250	47.679	-26.321	74.000
7236.000	9.177	39.170	48.347	-25.653	74.000
9648.000	10.019	38.800	48.820	-25.180	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4824.000	2.836	53.220	56.057	-17.943	74.000
7236.000	9.676	40.030	49.706	-24.294	74.000
9648.000	10.556	38.460	49.017	-24.983	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Heat Finder
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/24
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	2.076	48.130	50.207	-23.793	74.000
7311.000	9.512	40.110	49.622	-24.378	74.000
9748.000	9.630	38.840	48.470	-25.530	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4874.000	2.532	55.930	58.462	-15.538	74.000
7311.000	10.089	40.950	51.039	-22.961	74.000
9748.000	10.266	39.200	49.467	-24.533	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Heat Finder
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/24
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4924.000	2.191	46.380	48.571	-25.429	74.000
7386.000	10.373	40.470	50.844	-23.156	74.000
9848.000	9.964	38.360	48.324	-25.676	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4924.000	2.805	51.810	54.615	-19.385	74.000
7386.000	11.180	39.450	50.630	-23.370	74.000
9848.000	10.801	38.690	49.491	-24.509	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. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Heat Finder
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/31
Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
104.615	-7.891	44.261	36.371	-7.129	43.500
250.134	-6.139	50.607	44.469	-1.531	46.000
375.096	0.910	41.361	42.271	-3.729	46.000
500.817	2.028	41.782	43.811	-2.189	46.000
751.240	4.238	37.154	41.393	-4.607	46.000
875.641	5.806	31.508	37.313	-8.687	46.000
Vertical					
81.298	-4.696	41.299	36.604	-3.396	40.000
250.120	-4.955	48.114	43.160	-2.840	46.000
501.490	-0.100	37.572	37.471	-8.529	46.000
749.724	2.020	35.609	37.629	-8.371	46.000
783.727	2.742	39.242	41.983	-4.017	46.000
961.138	3.302	33.612	36.914	-17.086	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Heat Finder
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/31
Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
249.157	-6.221	49.702	43.481	-2.519	46.000
375.096	0.910	37.381	38.291	-7.709	46.000
499.354	1.973	40.643	42.617	-3.383	46.000
625.369	1.440	40.622	42.061	-3.939	46.000
749.118	3.934	36.687	40.622	-5.378	46.000
874.199	5.765	31.540	37.305	-8.695	46.000
Vertical					
76.635	-6.475	41.642	35.167	-4.833	40.000
249.667	-5.027	47.219	42.193	-3.807	46.000
375.096	0.350	30.715	31.065	-14.935	46.000
499.455	-0.205	36.518	36.313	-9.687	46.000
749.728	2.021	36.855	38.876	-7.124	46.000
875.641	0.481	36.814	37.295	-8.705	46.000

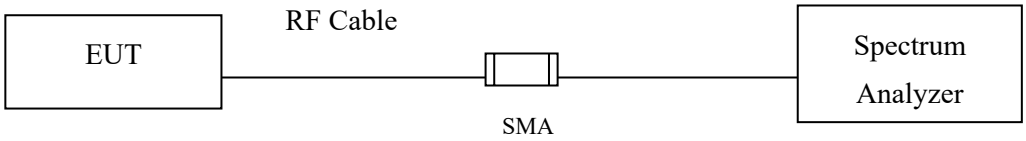
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF antenna conducted test

5.1. Test Setup

RF antenna Conducted Measurement:



5.2. Limits

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)).

5.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

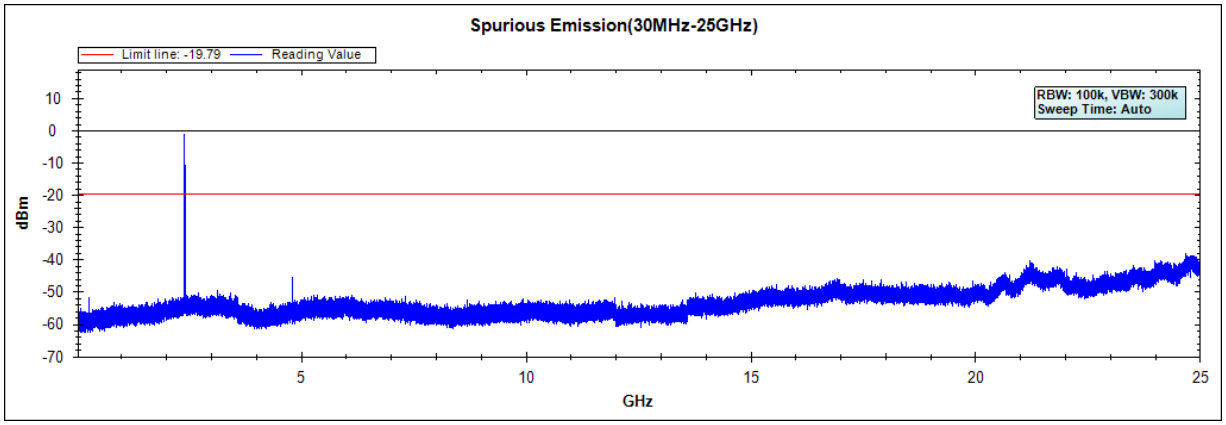
5.4. Uncertainty

The measurement uncertainty
Conducted is defined as ± 1.20dB

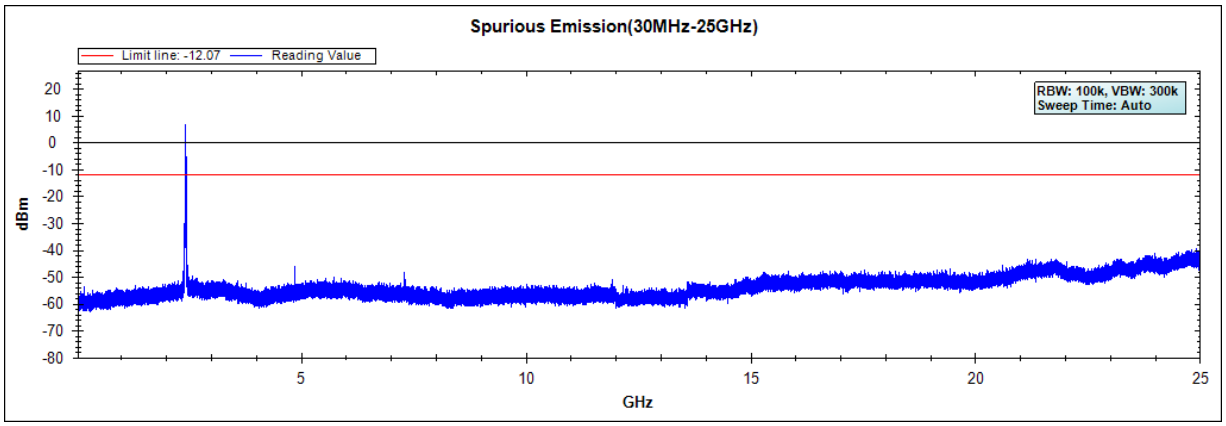
5.5. Test Result of RF antenna conducted test

Product : Heat Finder
Test Item : RF antenna conducted test
Test Site : No.3 OATS
Test Date : 2018/07/31
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

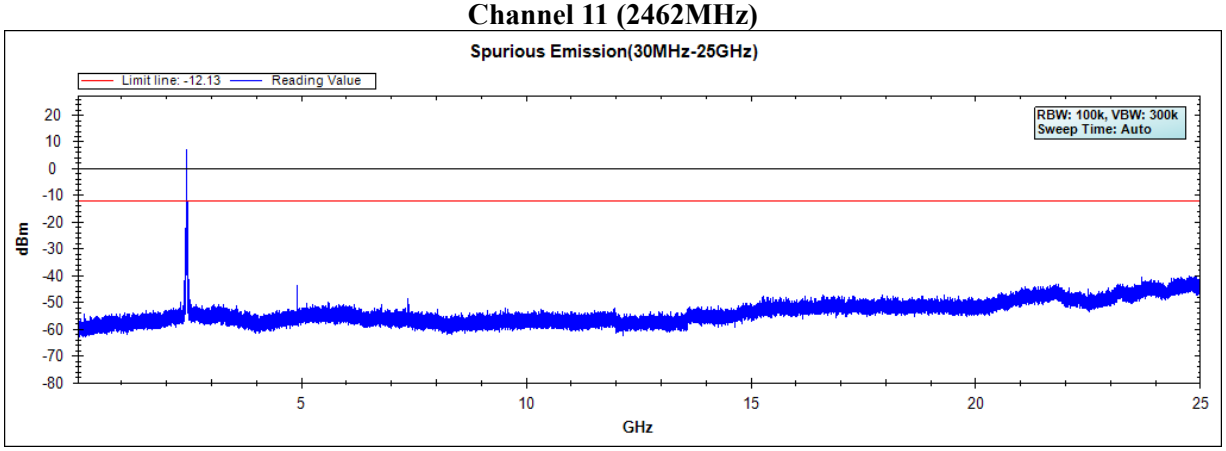
Channel 01 (2412MHz)



Channel 06 (2437MHz)



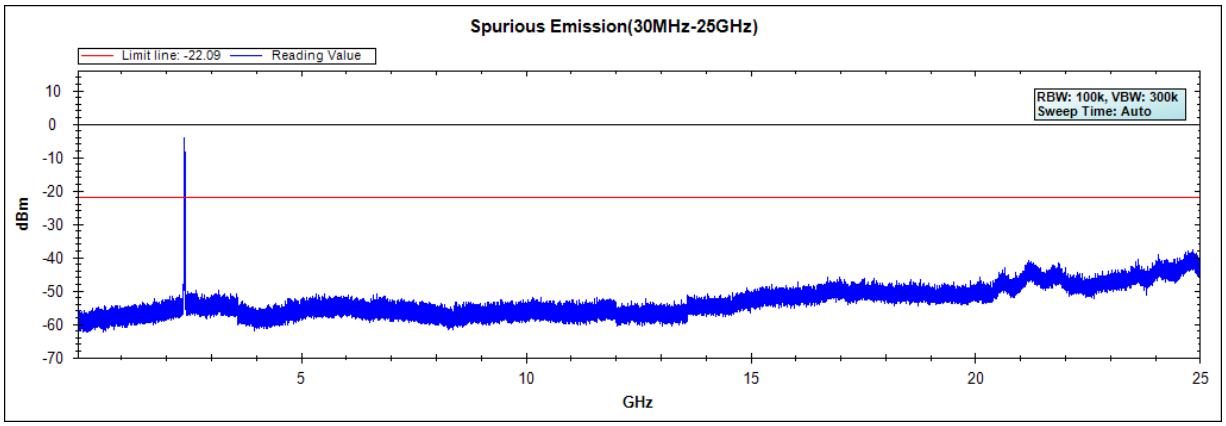
Channel 11 (2462MHz)



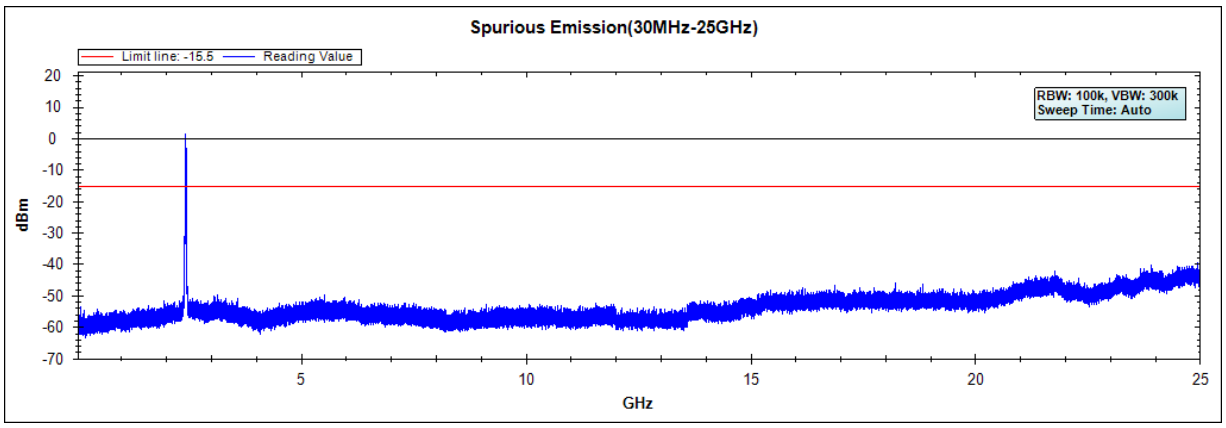
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Heat Finder
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Date	:	2018/07/31
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

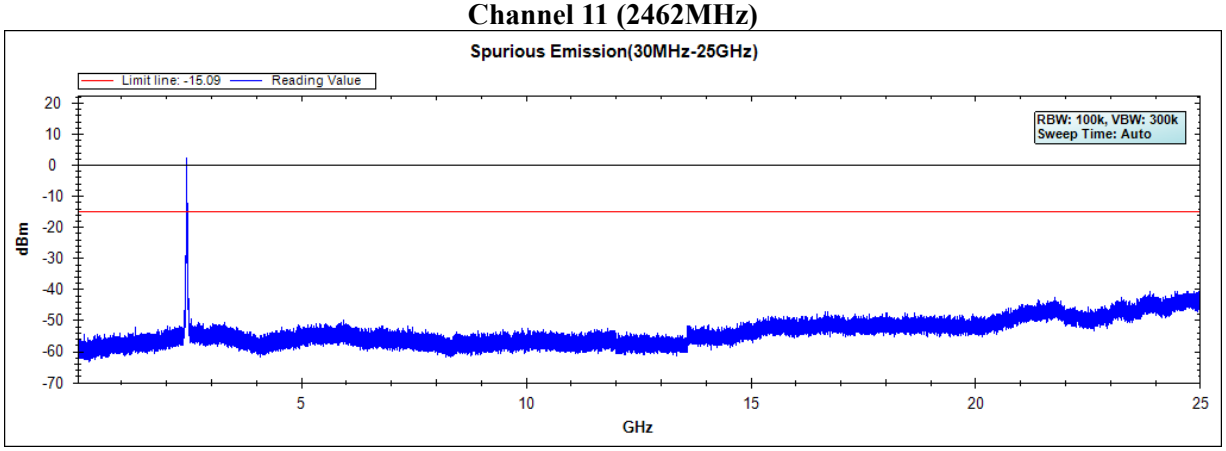
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)

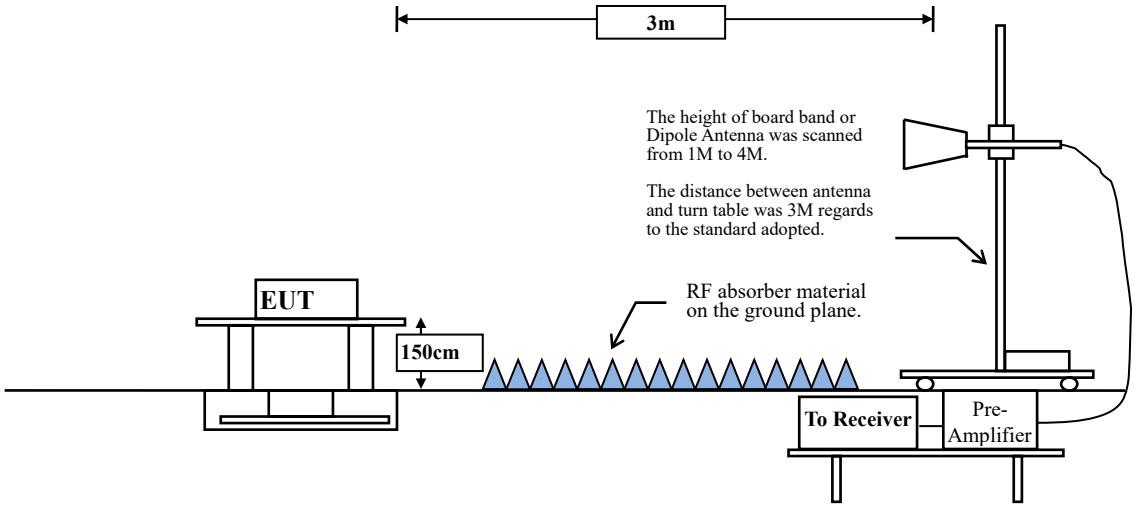


Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

6.1. Test Setup

RF Radiated Measurement:



6.2. 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.

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
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 from 1 meter to 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.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	99.66	--	--	10
802.11g	96.46	1.3841	723	1000

Note: Duty Cycle Refer to Section 9

6.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

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
01 (Peak)	2390.000	6.474	43.812	50.287	74.00	54.00	Pass
01 (Peak)	2396.957	6.510	51.594	58.104	74.00	54.00	Pass
01 (Peak)	2400.000	6.528	49.558	56.086	--	--	--
01 (Peak)	2411.014	6.595	90.068	96.664	--	--	--
01 (Average)	2383.913	6.448	29.231	35.679	74.00	54.00	Pass
01 (Average)	2390.000	6.474	26.882	33.357	74.00	54.00	Pass
01 (Average)	2396.812	6.510	44.842	51.351	74.00	54.00	Pass
01 (Average)	2400.000	6.528	38.369	44.897	--	--	--
01 (Average)	2411.304	6.598	86.843	93.441	--	--	--

Figure Channel 01: Horizontal (Peak)

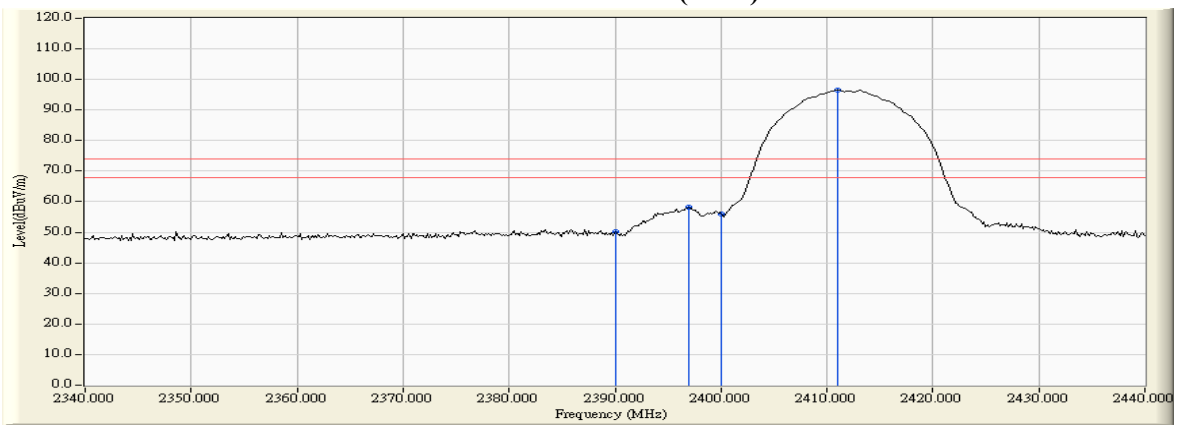
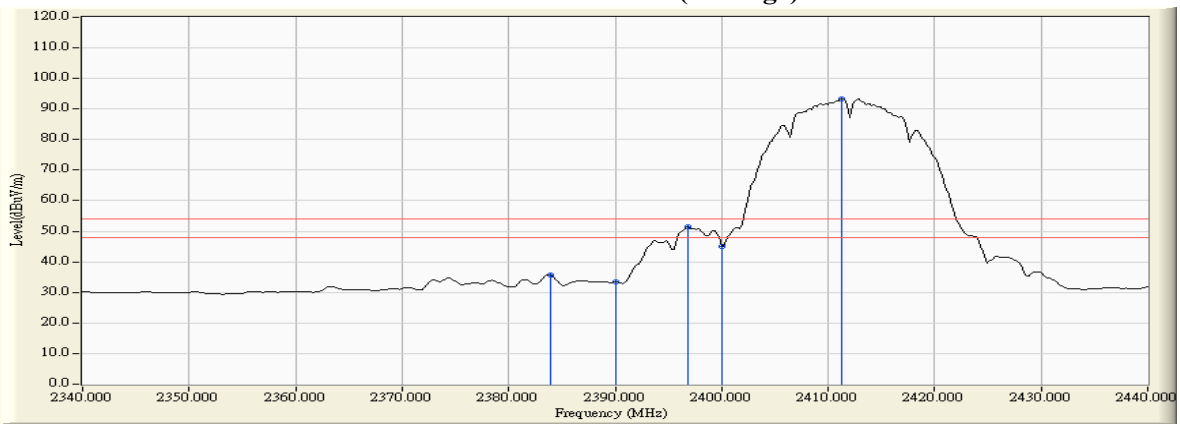


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	5.880	42.943	48.824	74.00	54.00	Pass
01 (Peak)	2397.101	5.872	51.958	57.830	74.00	54.00	Pass
01 (Peak)	2400.000	5.879	49.003	54.882	--	--	--
01 (Peak)	2411.014	5.907	89.953	95.861	--	--	--
01 (Average)	2390.000	5.880	26.796	32.677	74.00	54.00	Pass
01 (Average)	2396.667	5.871	43.693	49.564	74.00	54.00	Pass
01 (Average)	2400.000	5.879	37.479	43.358	--	--	--
01 (Average)	2411.304	5.910	86.214	92.123	--	--	--

Figure Channel 01: VERTICAL (Peak)

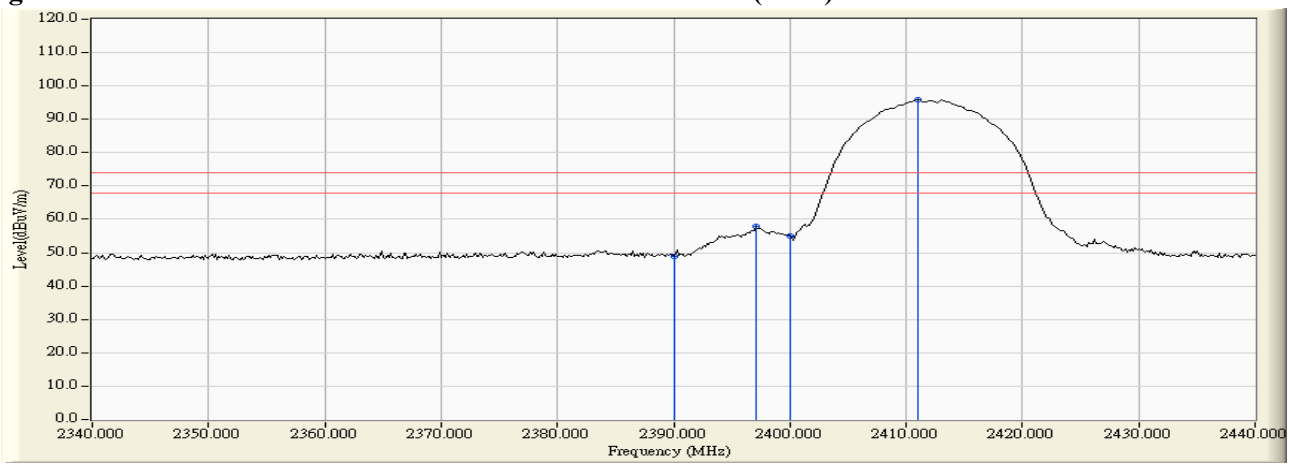
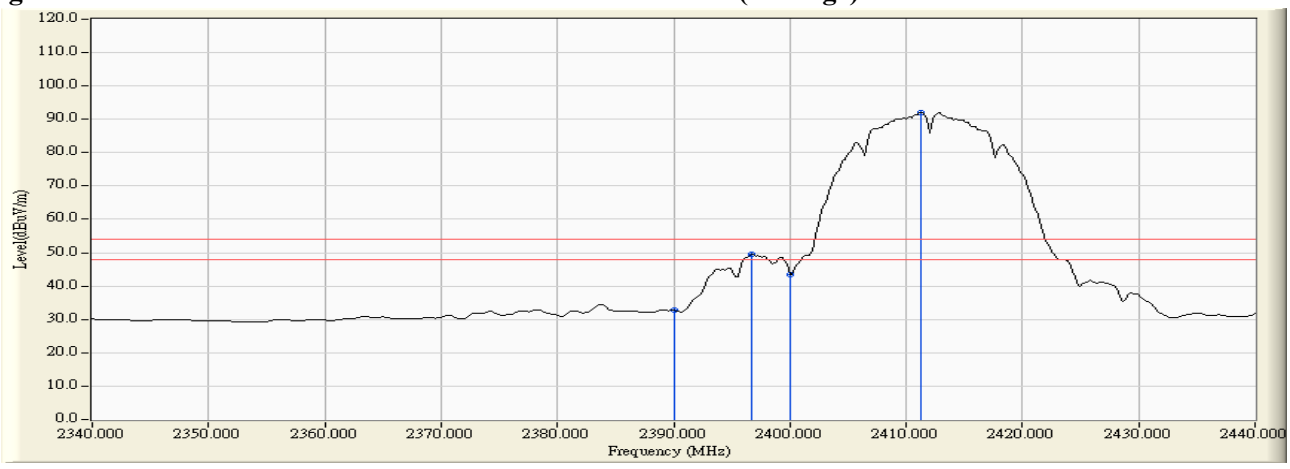


Figure Channel 01: VERTICAL (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

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
11 (Peak)	2463.065	6.966	93.292	100.258	--	--	--
11 (Peak)	2483.500	7.110	43.327	50.437	74.00	54.00	Pass
11 (Peak)	2488.138	7.143	49.522	56.665	74.00	54.00	Pass
11 (Average)	2462.775	6.964	89.610	96.574	--	--	--
11 (Average)	2483.500	7.110	30.820	37.930	74.00	54.00	Pass
11 (Average)	2488.717	7.147	42.079	49.226	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

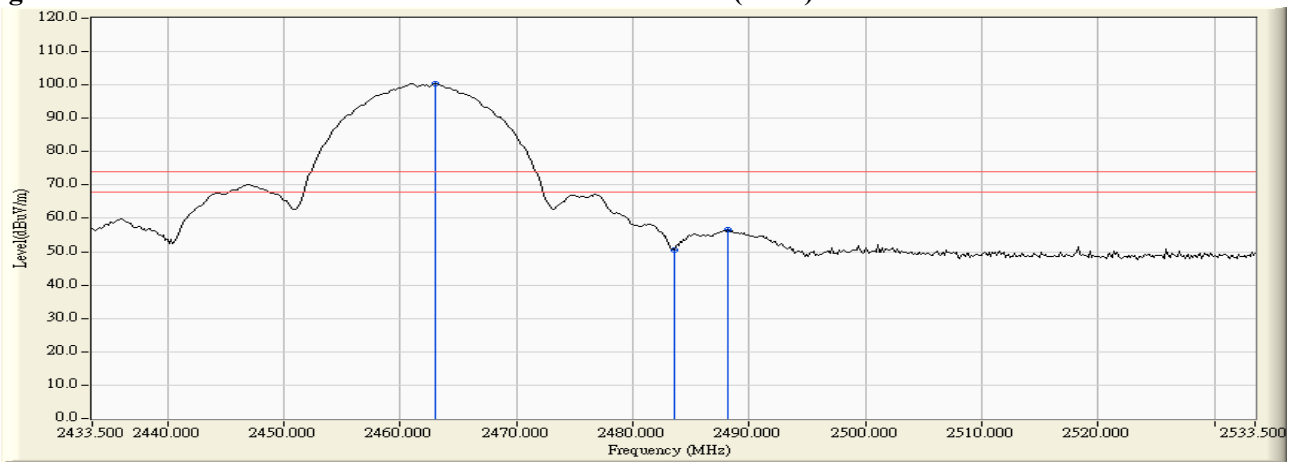
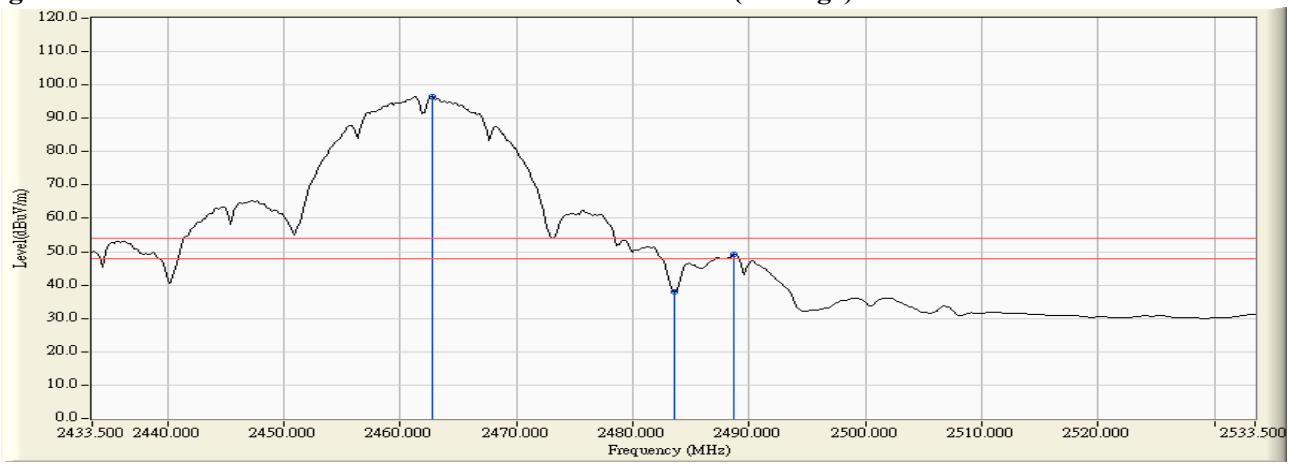


Figure Channel 11: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2463.065	6.236	95.548	101.784	--	--	--
11 (Peak)	2483.500	6.363	45.043	51.406	74.00	54.00	Pass
11 (Peak)	2487.993	6.392	51.068	57.459	74.00	54.00	Pass
11 (Average)	2462.775	6.234	91.824	98.058	--	--	--
11 (Average)	2483.500	6.363	32.674	39.037	74.00	54.00	Pass
11 (Average)	2488.717	6.396	44.806	51.202	74.00	54.00	Pass

Figure Channel 11: VERTICAL (Peak)

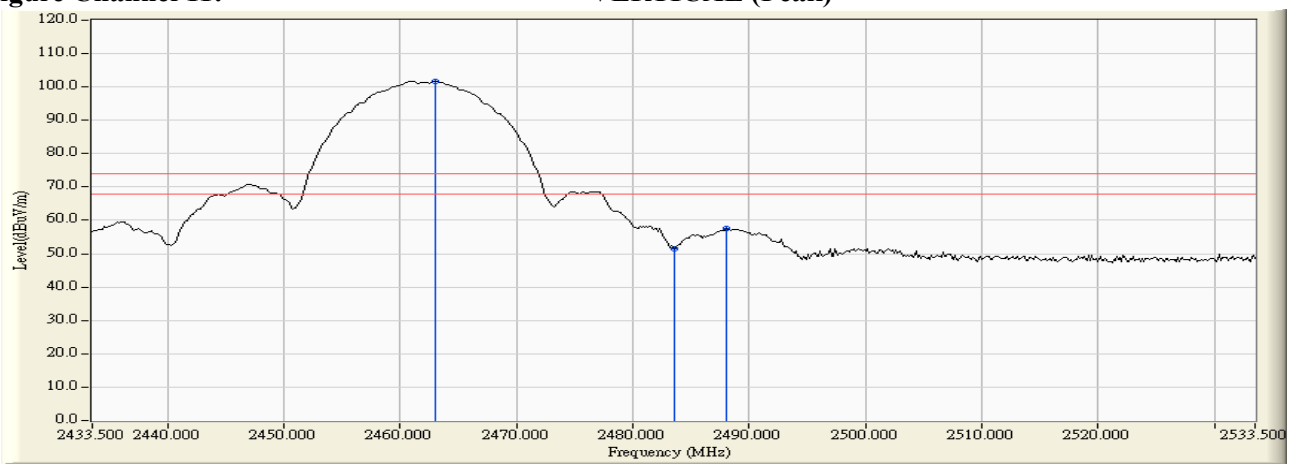
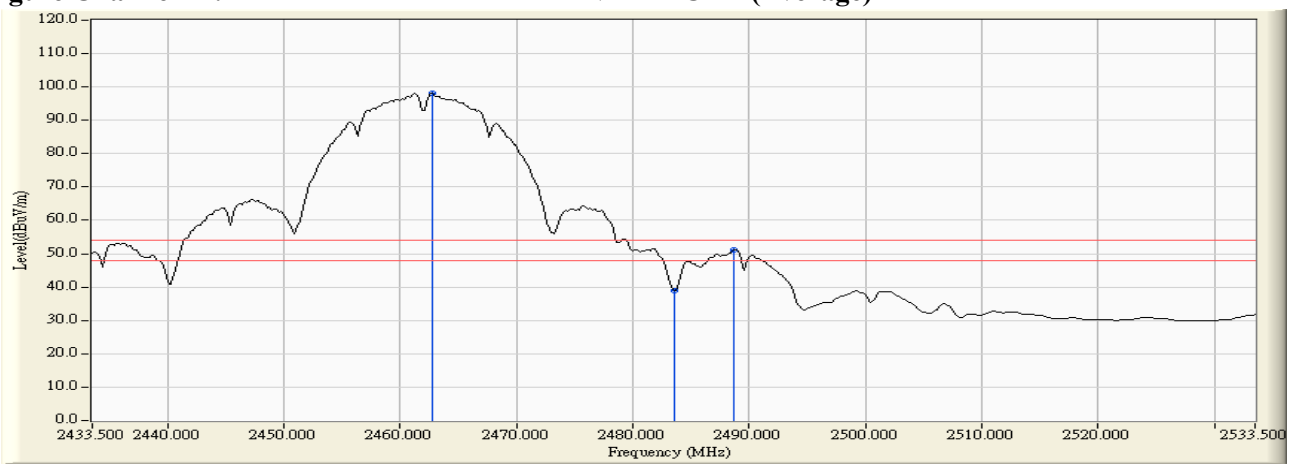


Figure Channel 11: VERTICAL (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

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
01 (Peak)	2390.000	6.474	54.230	60.705	74.00	54.00	Pass
01 (Peak)	2400.000	6.528	70.754	77.282	74.00	54.00	Pass
01 (Peak)	2409.275	6.584	94.325	100.910	--	--	--
01 (Average)	2390.000	6.474	36.398	42.873	74.00	54.00	Pass
01 (Average)	2400.000	6.528	46.671	53.199	--	--	--
01 (Average)	2408.696	6.581	80.515	87.096	--	--	--

Figure Channel 01: Horizontal (Peak)

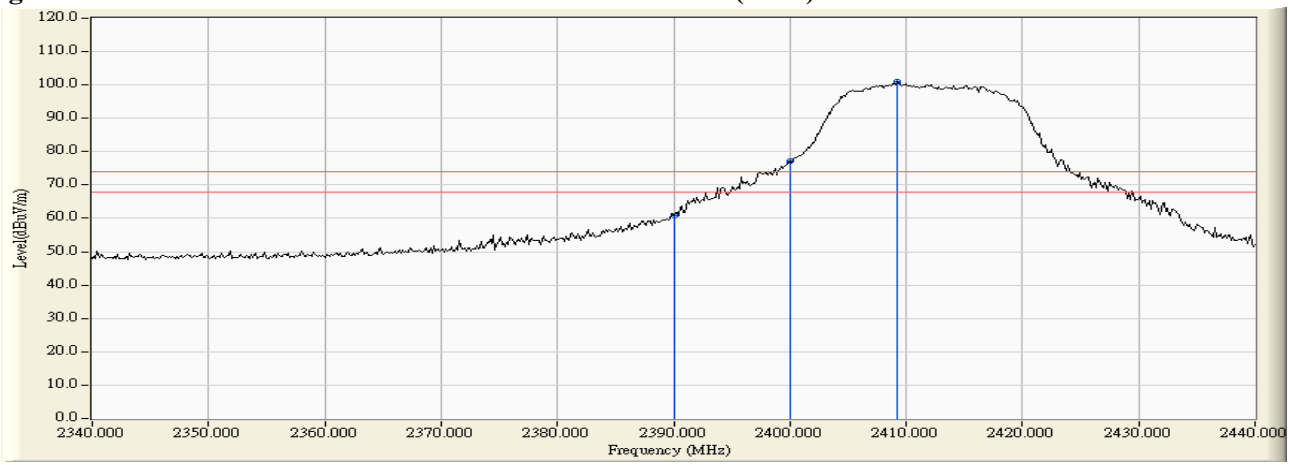
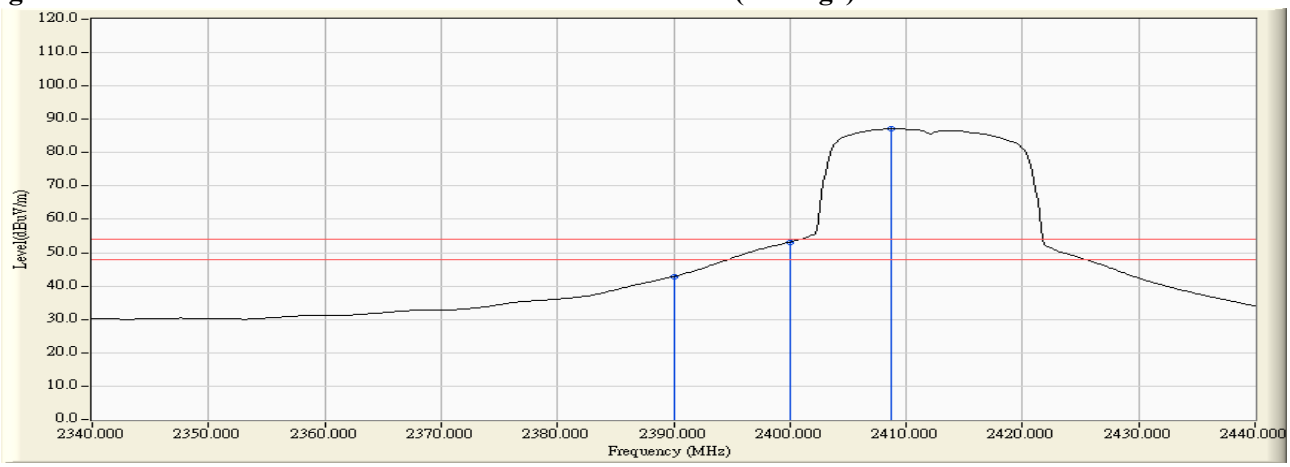


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	5.880	52.525	58.406	74.00	54.00	Pass
01 (Peak)	2400.000	5.879	68.141	74.020	74.00	54.00	Pass
01 (Peak)	2409.275	5.903	94.573	100.476	--	--	--
01 (Average)	2390.000	5.880	35.718	41.599	74.00	54.00	Pass
01 (Average)	2400.000	5.879	46.146	52.025	--	--	--
01 (Average)	2410.580	5.906	80.951	86.857	--	--	--

Figure Channel 01: VERTICAL (Peak)

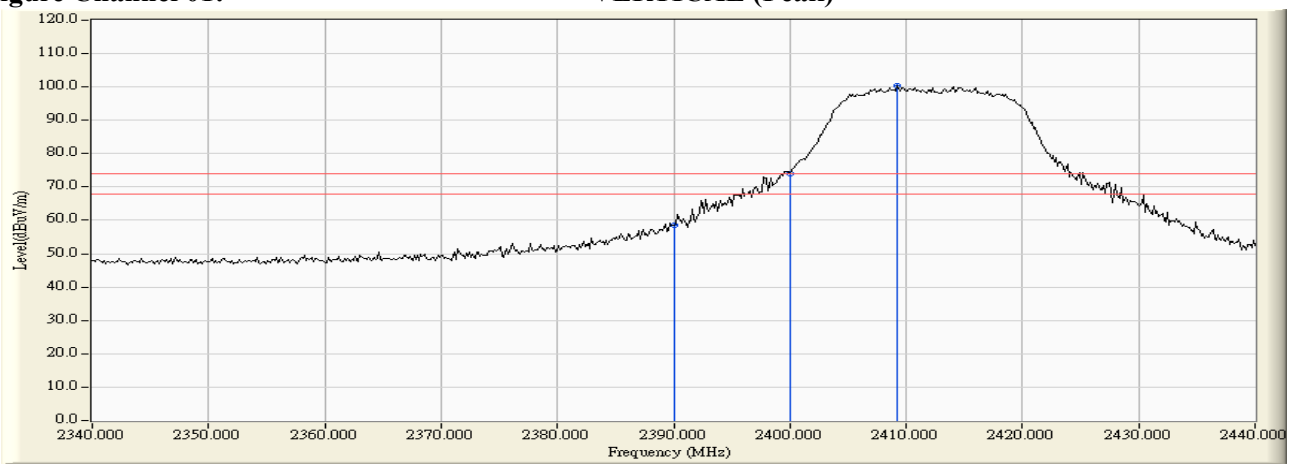
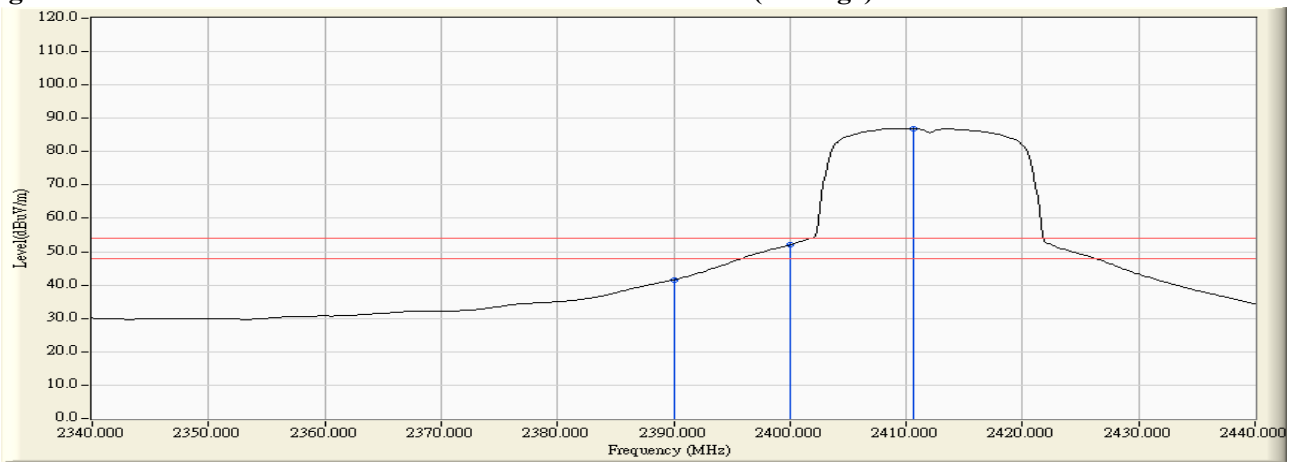


Figure Channel 01: VERTICAL (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

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
11 (Peak)	2461.761	6.956	95.739	102.696	--	--	--
11 (Peak)	2483.500	7.110	63.013	70.123	74.00	54.00	Pass
11 (Average)	2463.065	6.966	81.742	88.708	--	--	--
11 (Average)	2483.500	7.110	39.958	47.068	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

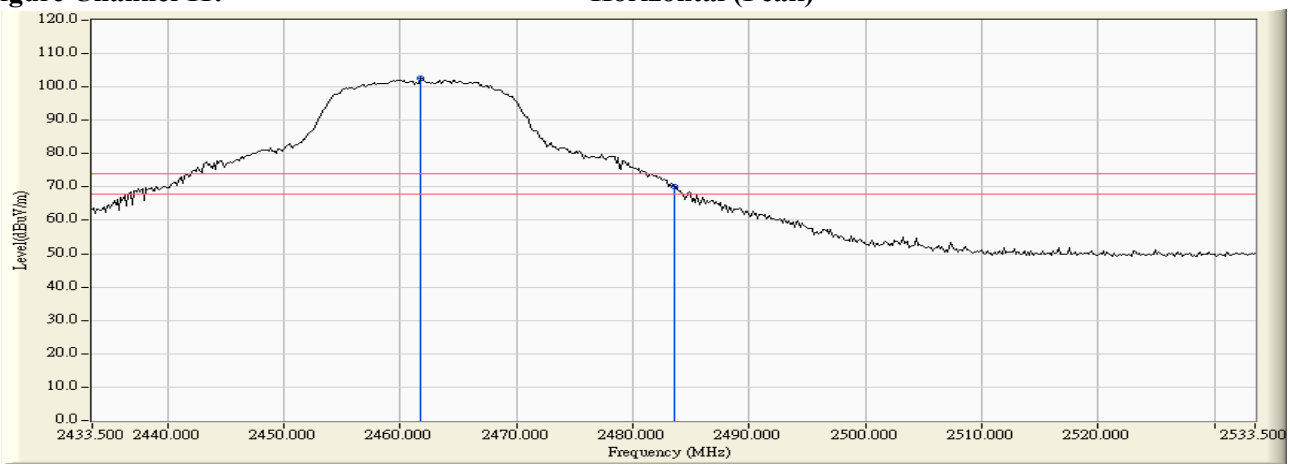
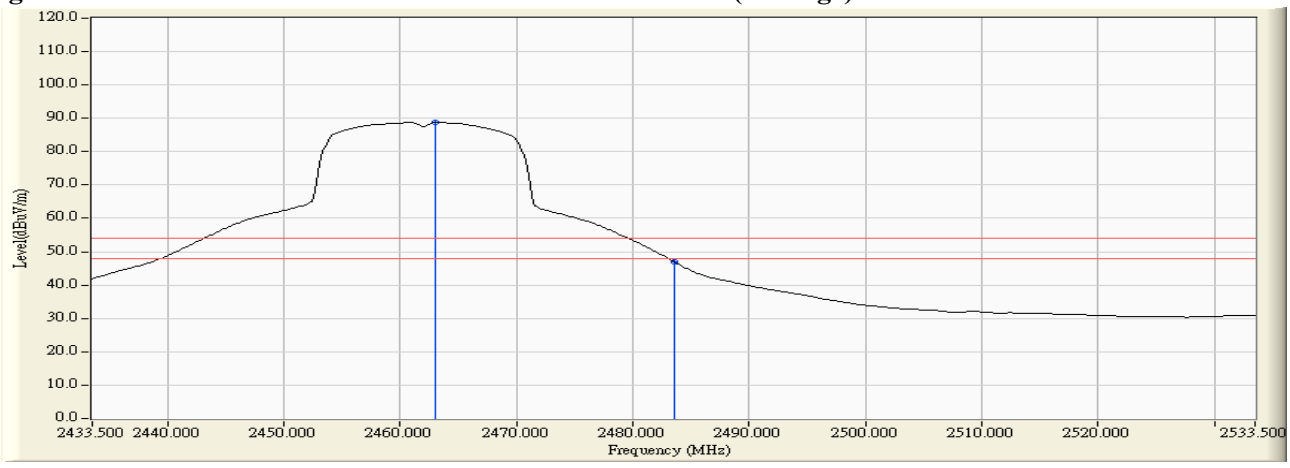


Figure Channel 11: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Heat Finder
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/07/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2461.906	6.228	98.000	104.229	--	--	--
11 (Peak)	2483.500	6.363	66.188	72.551	74.00	54.00	Pass
11 (Average)	2463.500	6.238	84.025	90.264	--	--	--
11 (Average)	2483.500	6.363	42.614	48.977	74.00	54.00	Pass

Figure Channel 11: VERTICAL (Peak)

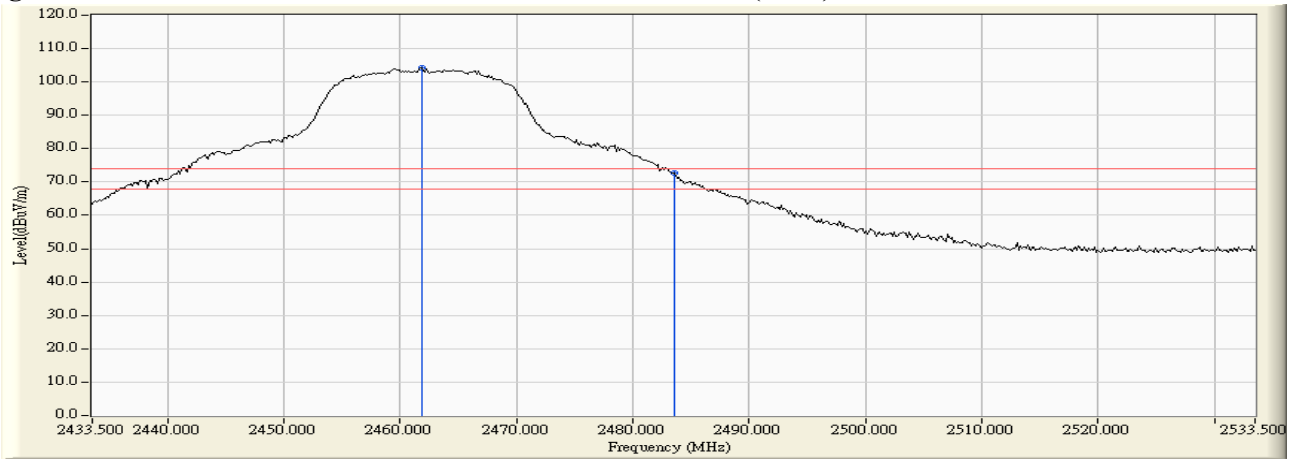
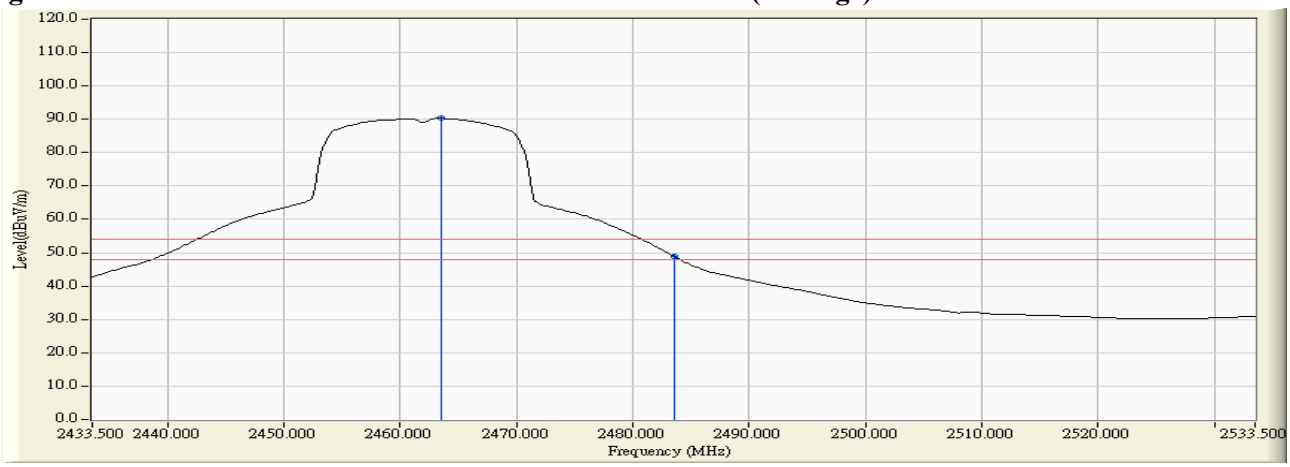


Figure Channel 11: VERTICAL (Average)

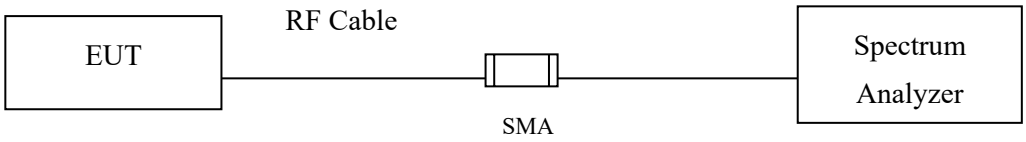


Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

The EUT was setup according to ANSI C63.4: 2014; tested according to DTS test procedure of Jan KDB558074 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

± 283Hz

7.5. Test Result of 6dB Bandwidth

Product : Heat Finder
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	9150	>500	Pass
06	2437	10150	>500	Pass
11	2462	10150	>500	Pass

Figure Channel 01:

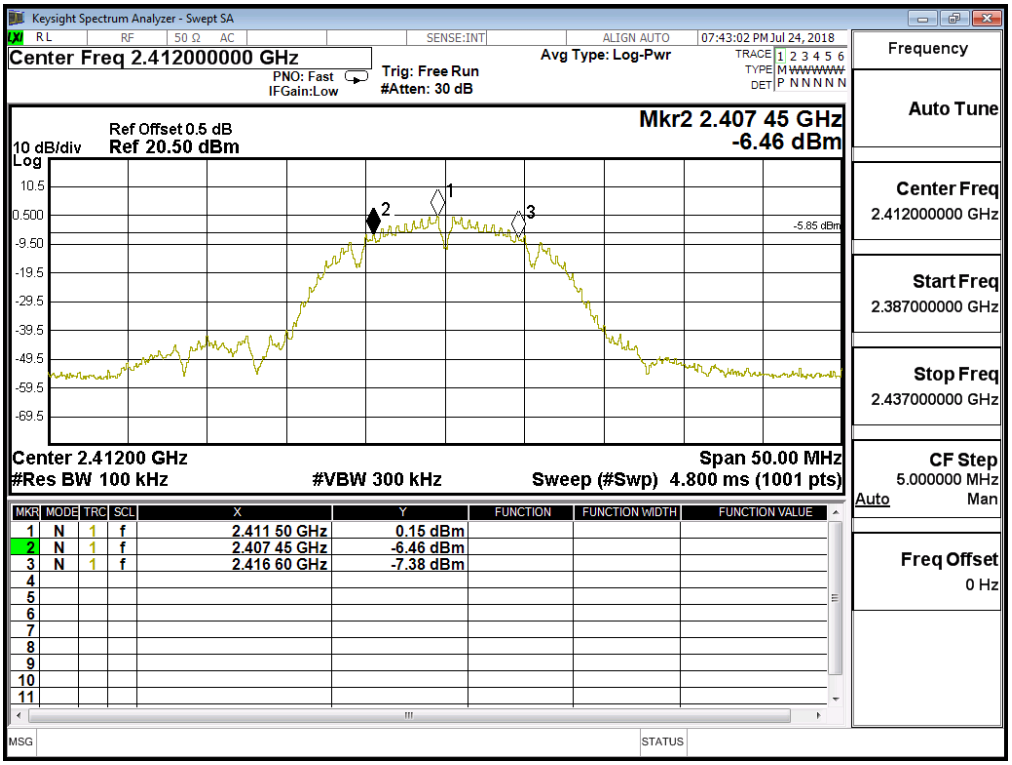


Figure Channel 06:

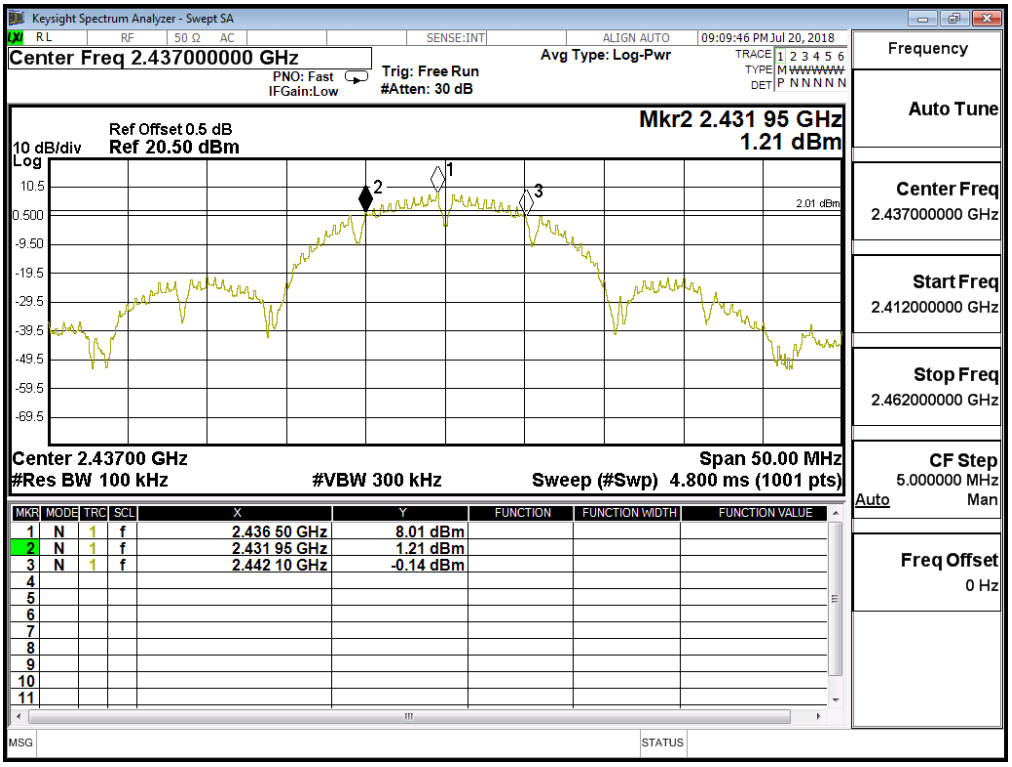
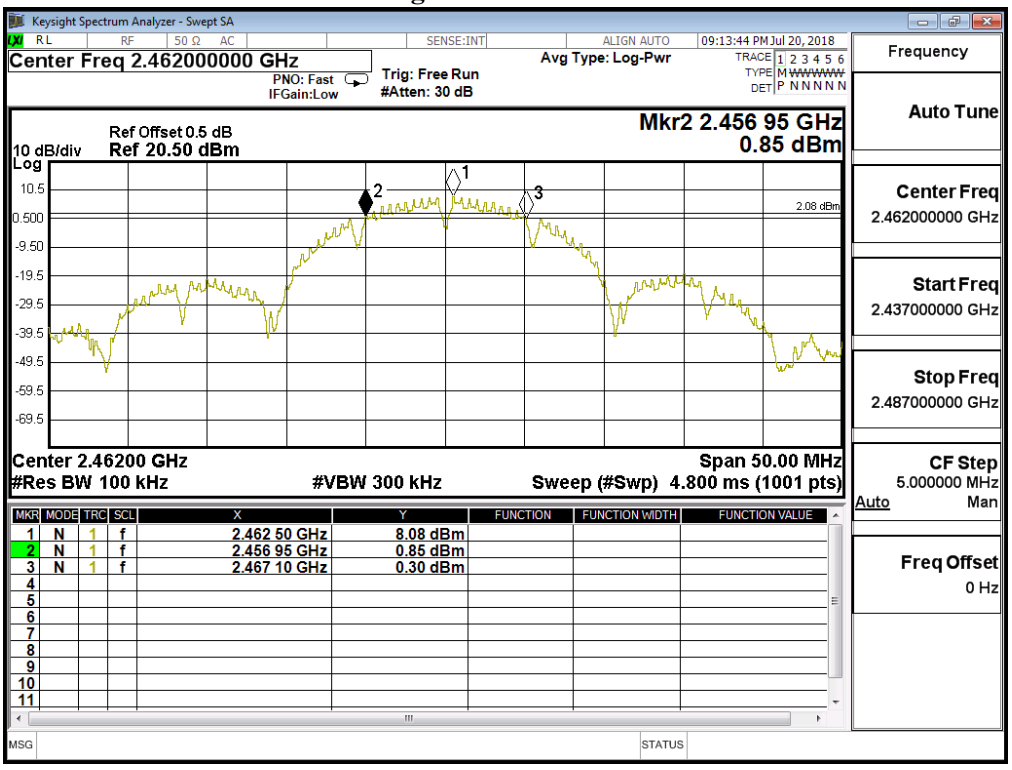


Figure Channel 11:



Product : Heat Finder
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	15250	>500	Pass
06	2437	15250	>500	Pass
11	2462	15250	>500	Pass

Figure Channel 01:

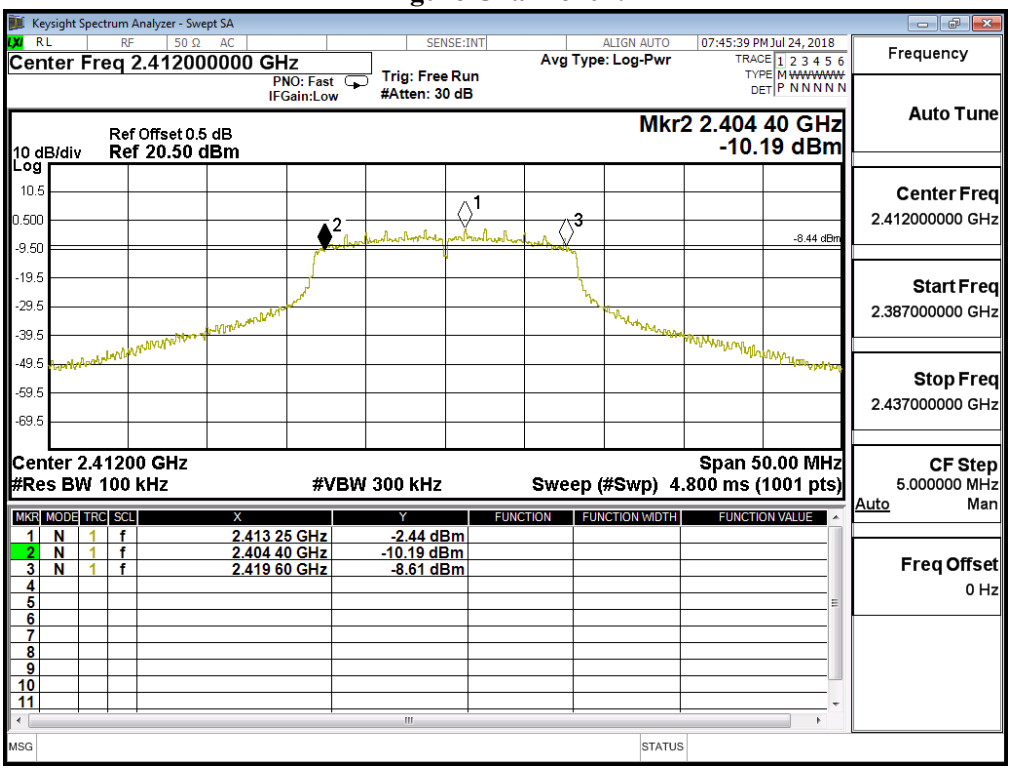


Figure Channel 06:

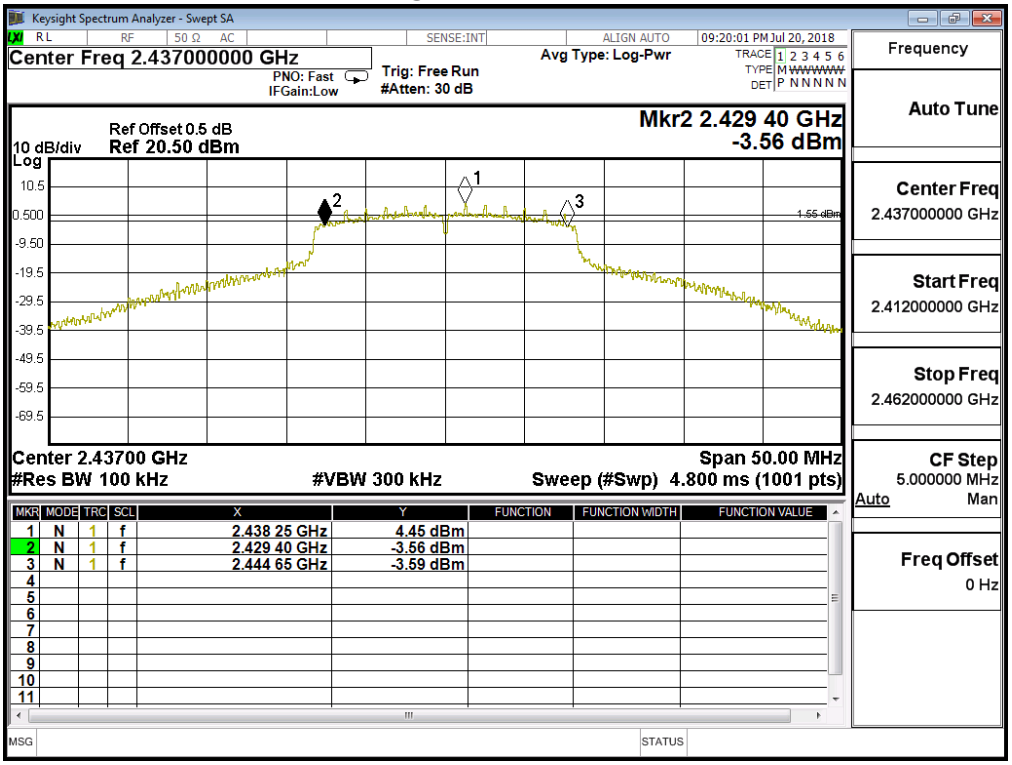
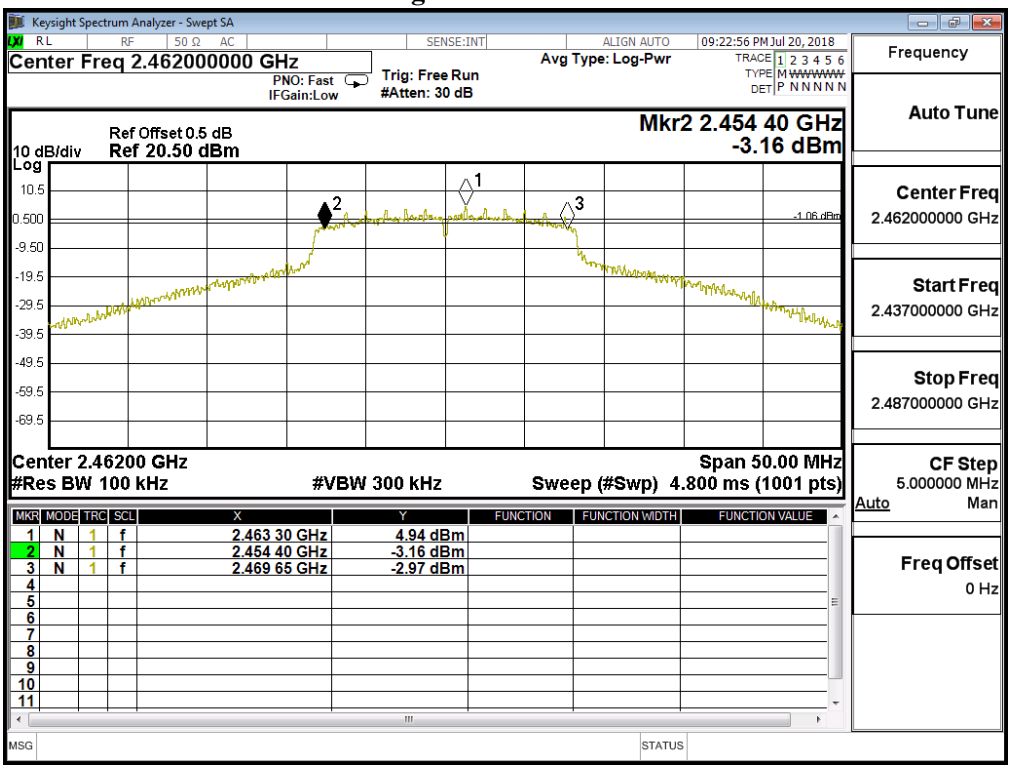
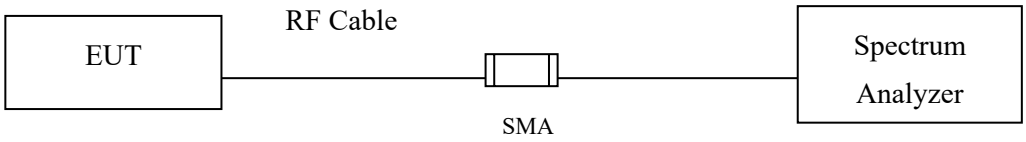


Figure Channel 11:



8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.
The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.4. Uncertainty

± 1.20 dB

8.5. Test Result of Power Density

Product : Heat Finder
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	0.210	≦8dBm	Pass
06	2437	7.930	≦8dBm	Pass
11	2462	7.870	≦8dBm	Pass

Figure Channel 01:

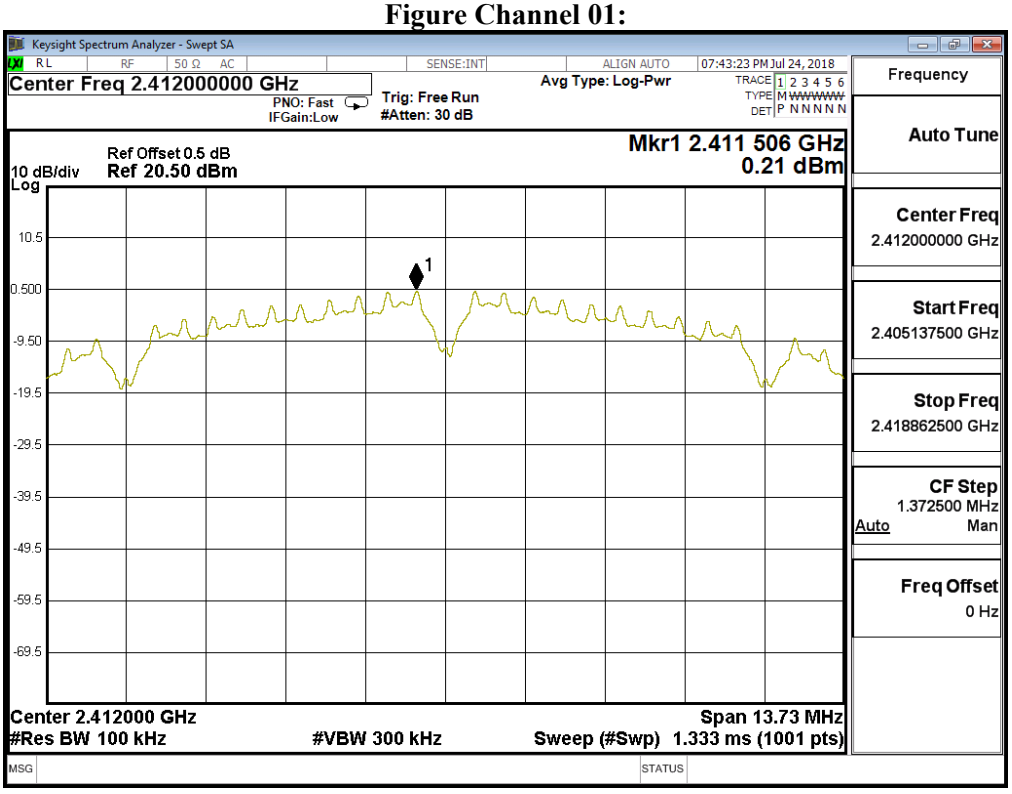


Figure Channel 06:

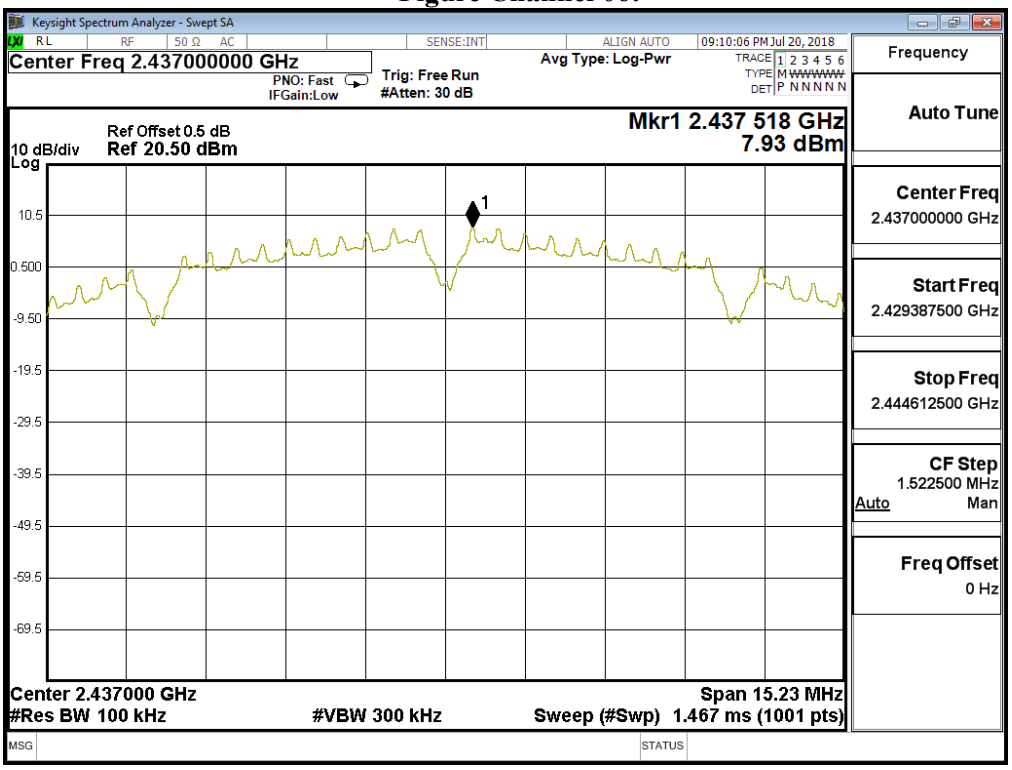
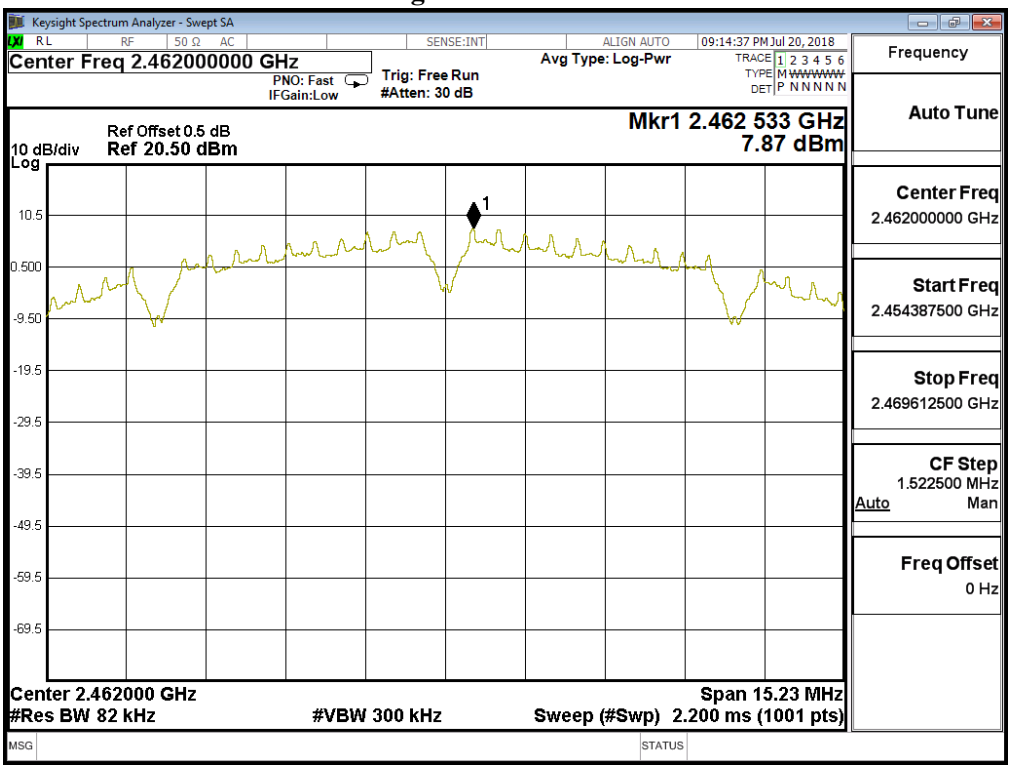


Figure Channel 11:



Product : Heat Finder
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	-2.090	≦8dBm	Pass
06	2437	4.500	≦8dBm	Pass
11	2462	4.910	≦8dBm	Pass

Figure Channel 01:

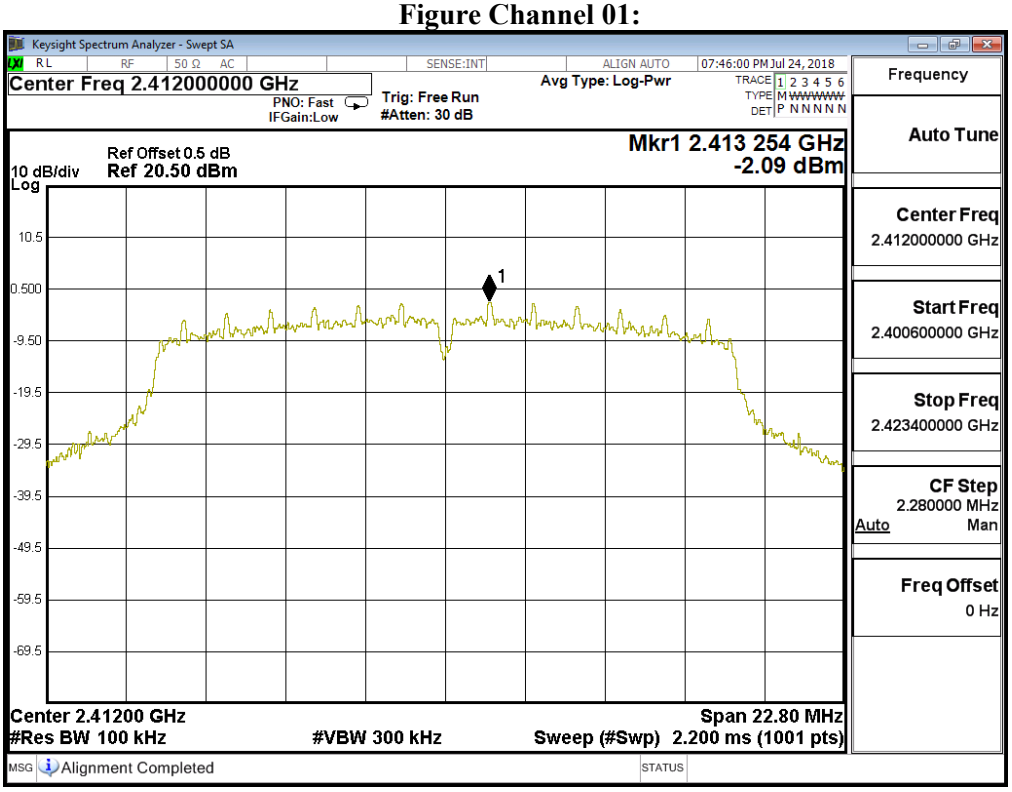


Figure Channel 06:

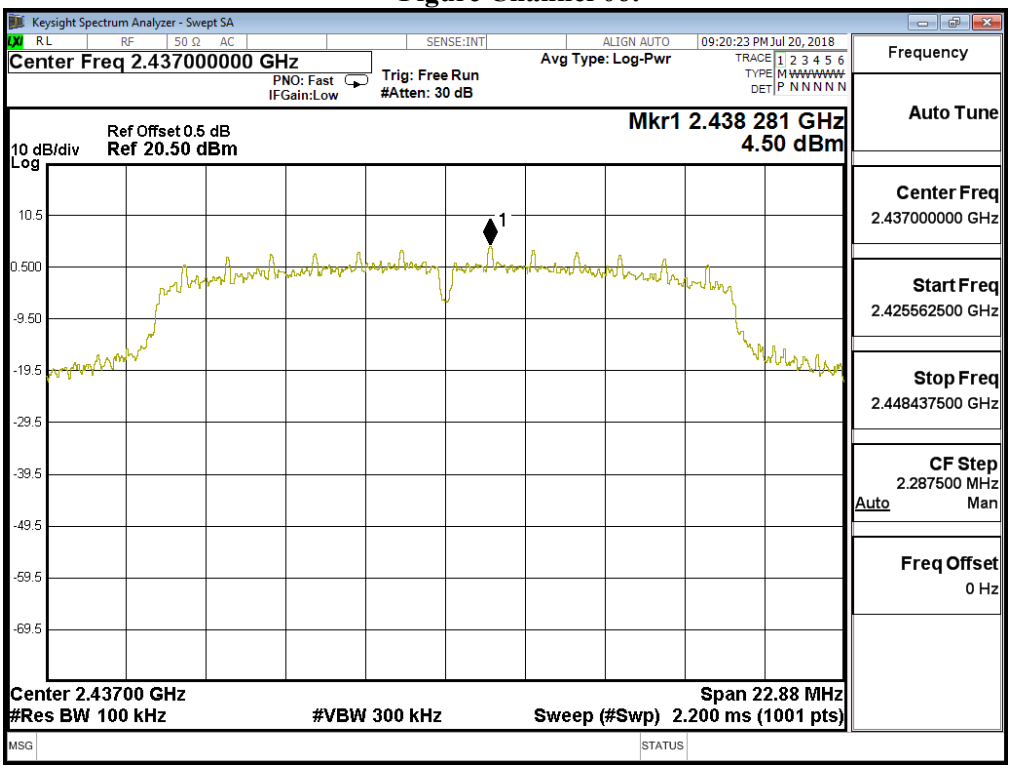
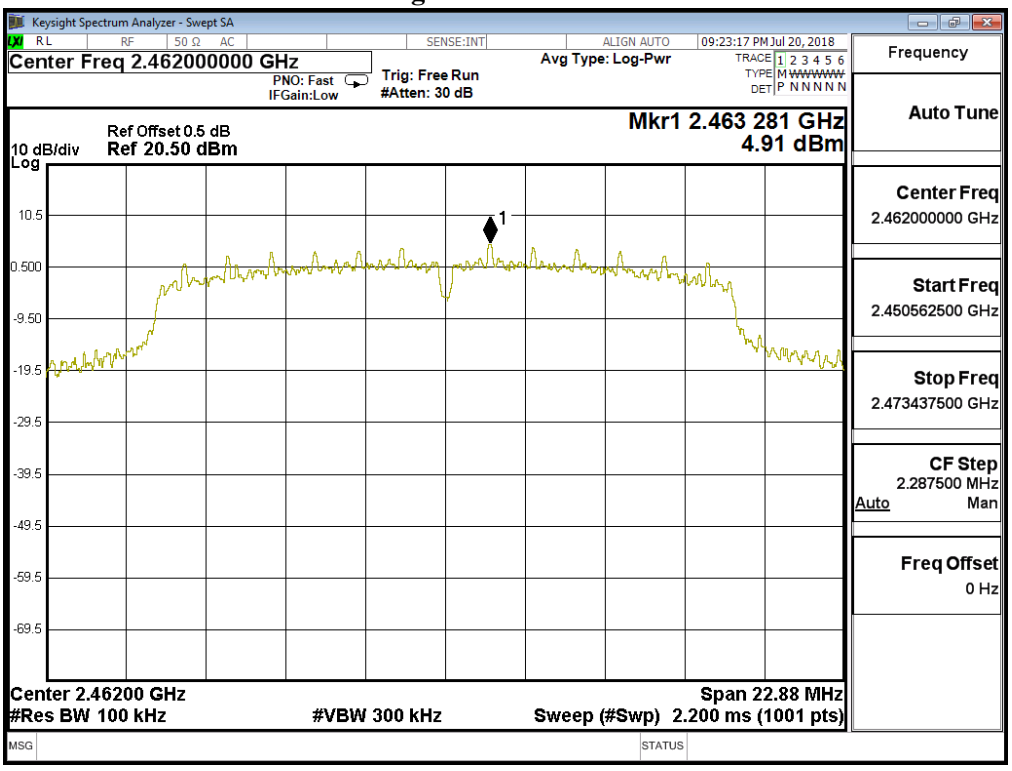
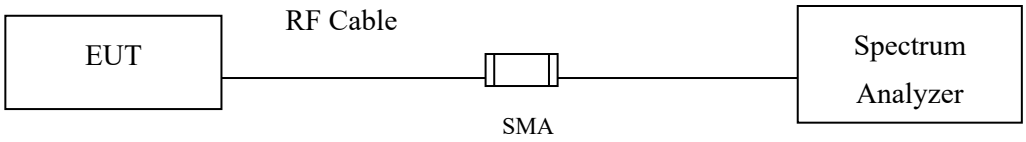


Figure Channel 11:



9. Duty Cycle

9.1. Test Setup



9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

9.3. Uncertainty

± 2.31msec

9.4. Test Result of Duty Cycle

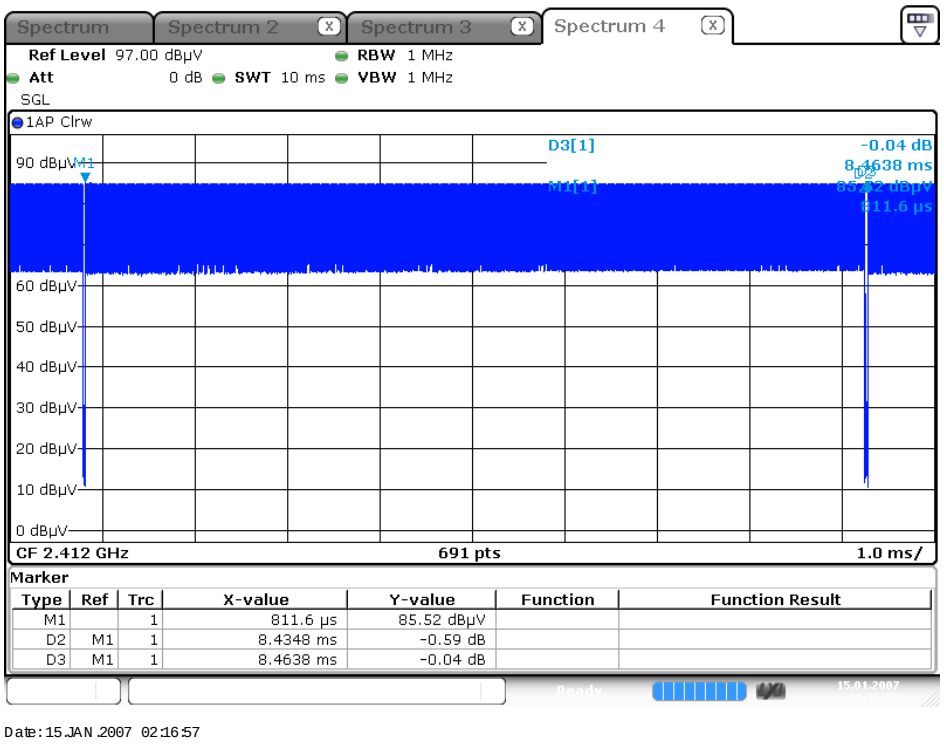
Product : Heat Finder
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

Results:

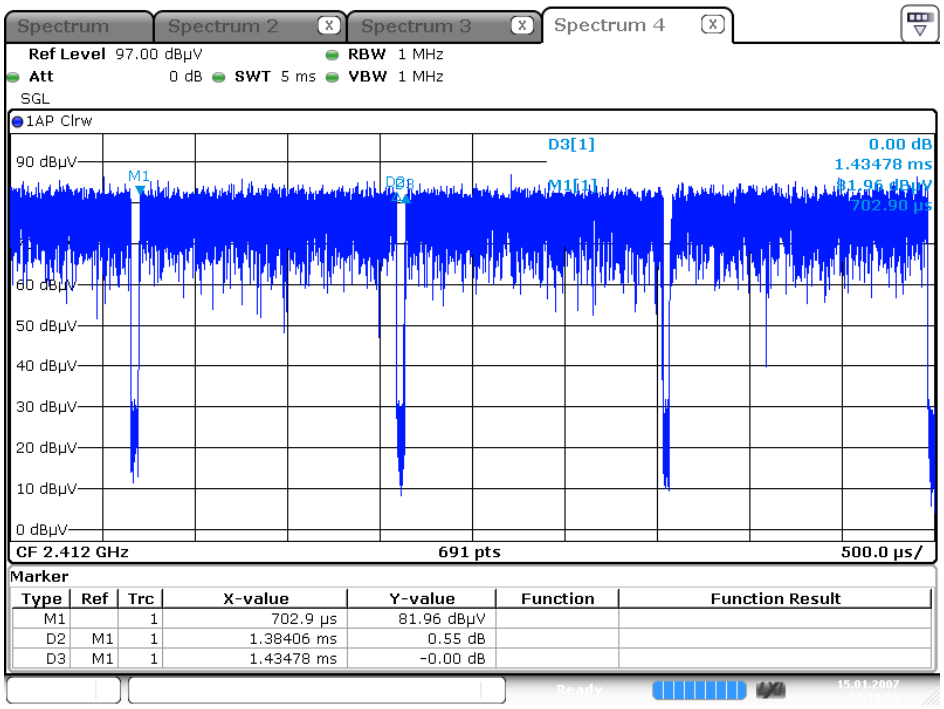
2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	8.4348	8.4638	99.66	0.01
802.11g	1.3841	1.4348	96.46	0.16

802.11b



Date:15.JAN.2007 02:16:57

802.11g


Spectrum
Spectrum 2
Spectrum 3
Spectrum 4
Ref Level 97.00 dBµV
RBW 1 MHz
Att 0 dB SWT 5 ms VBW 1 MHz
SGL
1AP Clrw
D3[1]
0.00 dB
1.43478 ms
M1[1]
702.90 µs
90 dBµV
80 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
0 dBµV
CF 2.412 GHz
691 pts
500.0 µs/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 702.9 µs 81.96 dBµV
D2 M1 1 1.38406 ms 0.55 dB
D3 M1 1 1.43478 ms -0.00 dB
Ready
15.01.2007
Date:15.JAN.2007 02:19:07

10. EMI Reduction Method During Compliance Testing

No modification was made during testing.