

FCC Test Report

(Class II Permissive Change)

Product Name	Intel® Wireless-AC 9560
Model No.	9560NGW
FCC ID.	2AKHF9560NG

Applicant	TONGFANG HONGKONG (SUZHOU) LIMITED
Address	NO. 83 Wu Lane, Suzhou Industrial Park, Suzhou City, Jiangsu Province, 215000 China

Date of Receipt	Dec. 12, 2018
Issued Date	Jan. 17, 2019
Report No.	18C0177R-RFUSP11V00-A
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 report of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issued Date: Jan. 17, 2019

Report No.: 18C0177R-RFUSP11V00-A



Product Name	Intel® Wireless-AC 9560
Applicant	TONGFANG HONGKONG (SUZHOU) LIMITED
Address	NO. 83 Wu Lane, Suzhou Industrial Park, Suzhou City, Jiangsu Province, 215000 China
Manufacturer	Intel Mobile Communications
Model No.	9560NGW
FCC ID.	2AKHF9560NG
EUT Rated Voltage	AC 100-240V / 50-60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	Intel
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04
Test Result	Complied

Documented By : Anny Chou

(Senior Adm. Specialist / Anny Chou)

Tested By : Sam Hsu

(Assistant Engineer / Sam Hsu)

Approved By : Vincent Lin

(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Intel® Wireless-AC 9560
Trade Name	Intel
Model No.	9560NGW
FCC ID.	2AKHF9560NG
Frequency Range	2402 – 2480MHz
Channel Number	V5.0: 40CH
Type of Modulation	V5.0: GFSK
Antenna Type	Slot Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Test Platform	Product name: Notebook PC, Brand: TONGFANG, Model number: GK5CQ7Z, GK5CP0Z, GK5CQ8Z
Adapter	MFR: Chicony, M/N: A15-180P1A Input: AC 100-240V, 50-60Hz, 2.5A Output: DC 19.5V, 9.23A Cable Out: Non-Shielded, 1.7m with two ferrite cores

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	WGT	ANTRG5Z119-0302 (Aux)	Slot Antenna	1.6dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 01:	2404 MHz	Channel 02:	2406 MHz	Channel 03:	2408 MHz
Channel 04:	2410 MHz	Channel 05:	2412 MHz	Channel 06:	2414 MHz	Channel 07:	2416 MHz
Channel 08:	2418 MHz	Channel 09:	2420 MHz	Channel 10:	2422 MHz	Channel 11:	2424 MHz
Channel 12:	2426 MHz	Channel 13:	2428 MHz	Channel 14:	2430 MHz	Channel 15:	2432 MHz
Channel 16:	2434 MHz	Channel 17:	2436 MHz	Channel 18:	2438 MHz	Channel 19:	2440 MHz
Channel 20:	2442 MHz	Channel 21:	2444 MHz	Channel 22:	2446 MHz	Channel 23:	2448 MHz
Channel 24:	2450 MHz	Channel 25:	2452 MHz	Channel 26:	2454 MHz	Channel 27:	2456 MHz
Channel 28:	2458 MHz	Channel 29:	2460 MHz	Channel 30:	2462 MHz	Channel 31:	2464 MHz
Channel 32:	2466 MHz	Channel 33:	2468 MHz	Channel 34:	2470 MHz	Channel 35:	2472 MHz
Channel 36:	2474 MHz	Channel 37:	2476 MHz	Channel 38:	2478 MHz	Channel 39:	2480 MHz

Note:

1. The EUT is an Intel® Wireless-AC 9560 with built-in WLAN (802.11a/b/g/n/ac) with Bluetooth (5.0 and V3.0+HS, V2.1+EDR) transceiver, this report for Bluetooth V5.0.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of 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. This is to request a Class II permissive change for FCC ID: 2AKHF9560NG, originally granted on 03/16/2018.

The major change filed under this application is:

Change #1: Additional Chassis is added, Product name: Notebook PC, Brand: TONGFANG, Model number: GK5CQ7Z, GK5CP0Z, GK5CQ8Z.

All models are listed as below:

Brand	Model	GPU (NVIDIA)	Difference
TONGF ANG	GK5CP0Z (Main test sample)	GTX2060, N18E-G1	All models are electrically identical and different model names are used to distinguish between different GPU specifications.
	GK5CQ7Z	GTX2070, N18E-G2	
	GK5CQ8Z	GTX2080, N18E-G3	

#2: Reduce the Output Power through firmware, and SAR measurement were evaluated.

#3: Addition an antenna, the antenna type is different from the original application and the antenna gain is higher than the original application.

Test Mode	Mode 1: Transmit - BLE (GFSK)
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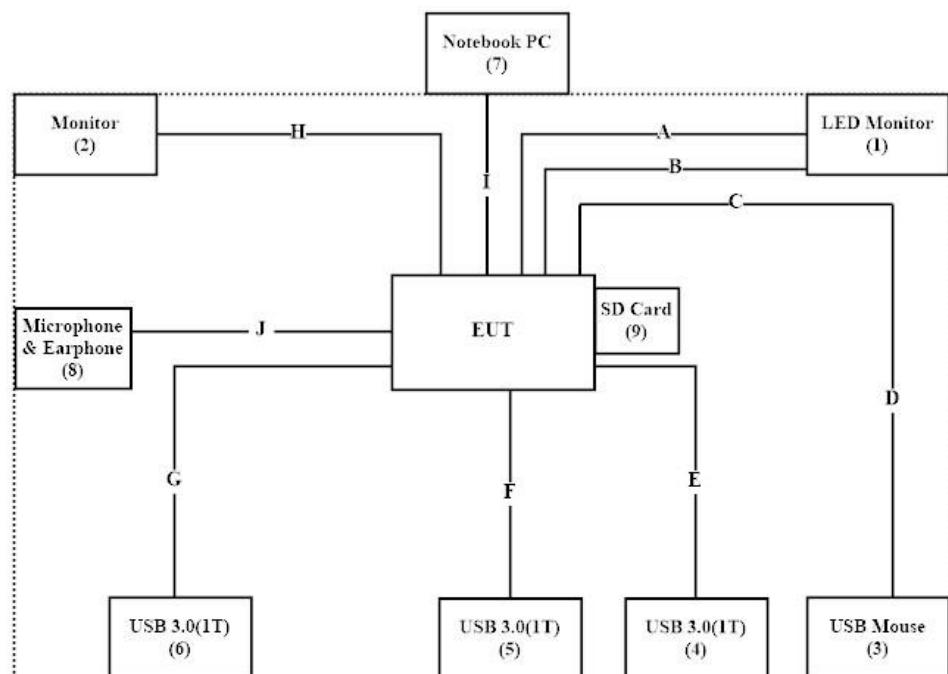
1.3. Tested System Details

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 LED Monitor	ViewSonic	VX2257-mhd	UFY163502150	Non-shielded, 1.8m
2 Monitor	Dell	U2410f	CN-0J257M-72872-985-0JML	Non-shielded, 1.8m
3 USB Mouse	Logitech	M-U0026	1245HS0684D8	N/A
4 USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
5 USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
6 USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
7 Notebook PC	DELL	Latitude 5580	2HRD7H2	Non-shielded, 0.8m
8 Microphone & Earphone	Ergotech	ET-E201	N/A	N/A
9 SD Card 2GB	Transcend	TS2GSDC	205380-8144	N/A

Signal Cable Type	Signal cable Description
A Display Cable	Shielded, 2m
B HDMI Cable	Shielded, 1.7m
C Type-C to USB Cable	Non-shielded, 0.2m
D Mouse Cable	Non-shielded, 1.8m
E USB Cable	Non-shielded, 0.5m
F USB Cable	Non-shielded, 0.5m
G USB Cable	Non-shielded, 0.5m
H Display Cable	Shielded, 1.8m
I LAN Cable	Shielded, 1.9m
J Microphone & Earphone Cable	Non-shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown on 1.4
- (2) Execute software “DRTU 10.1748.0-06430” on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Start the continuous transmission.
- (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/chinese/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>

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 Item and 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	2018/02/12	2019/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2018/09/27	2019/09/26
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19	2019/11/18
X	LISN	R&S	ESH3-Z5	836679/017	2018/02/09	2019/02/08
X	LISN	R&S	ENV216	100097	2018/02/09	2019/02/08
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

For Radiated measurements /Site3/CB8

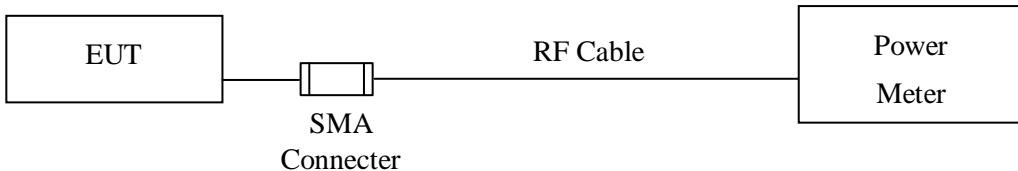
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/06/14	2019/06/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2018/12/18	2019/12/17
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
X	Horn Antenna	Com-Power	AH-840	101043	2019/01/09	2020/01/08
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
X	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

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. Peak Power Output

2.1. Test Setup



2.2. Limit

The maximum peak power shall be less 1Watt.

2.3. 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.

2.4. Uncertainty

± 1.27 dB

2.5. Test Result of Peak Power Output

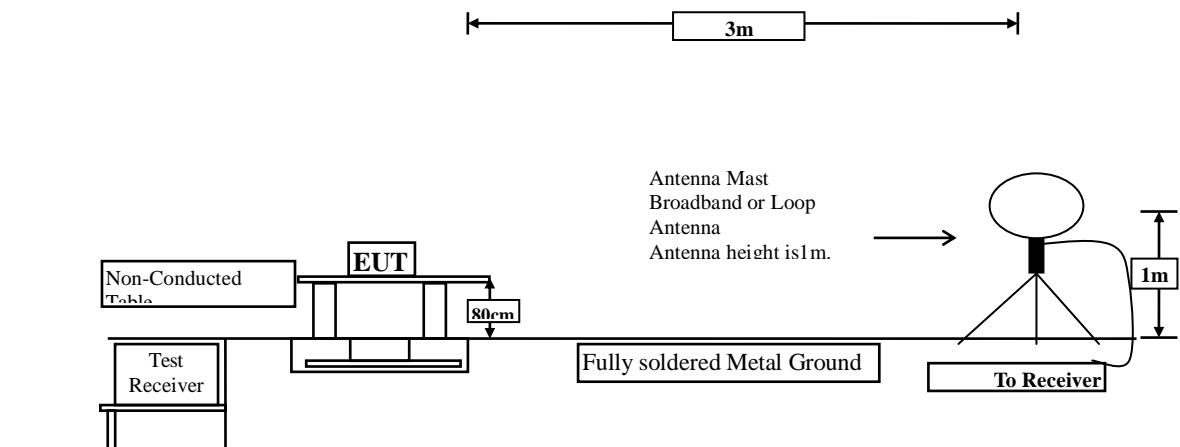
Product : Intel® Wireless-AC 9560
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/01/07
Test Mode : Mode 1: Transmit - BLE (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	7.23	1 Watt= 30 dBm	Pass
Channel 19	2440.00	7.68	1 Watt= 30 dBm	Pass
Channel 39	2480.00	7.08	1 Watt= 30 dBm	Pass

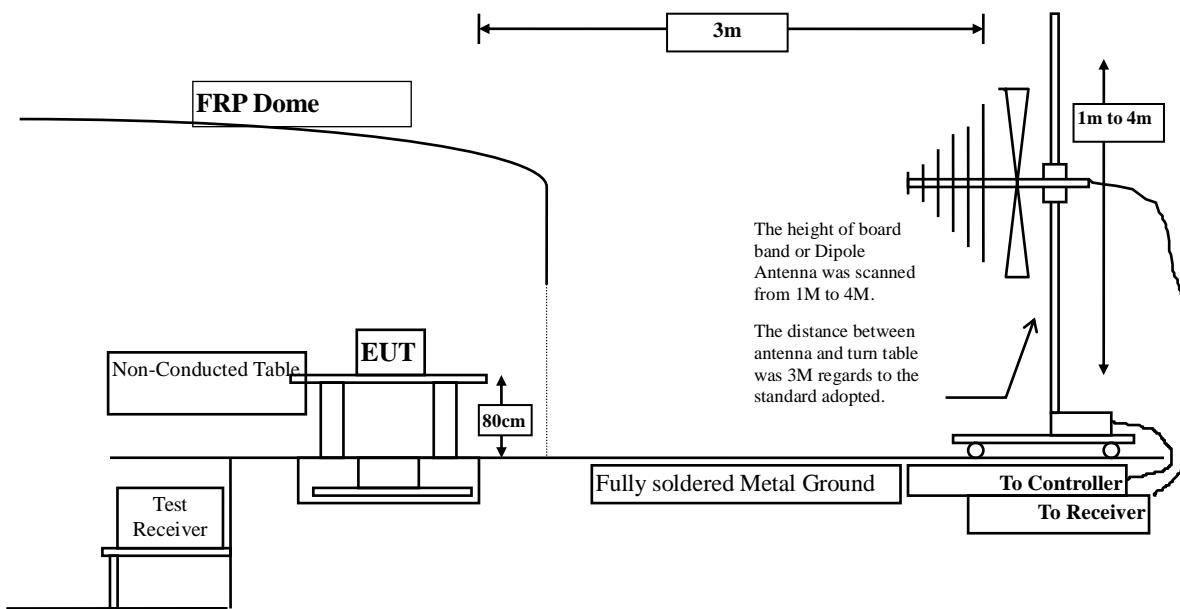
3. Radiated Emission

3.1. Test Setup

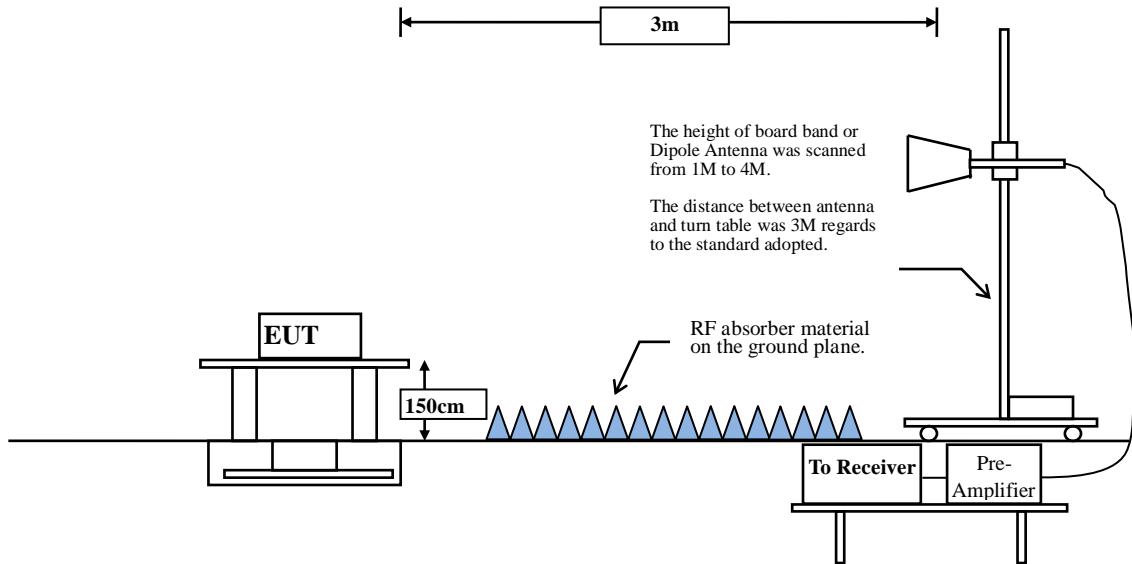
Under 30MHz



Below 1GHz



Above 1GHz



3.2. Limits

➤ General Radiated Emission Limits

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

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

Remarks:

1. RF Voltage (dBuV) = $20 \log \text{RF Voltage (uV)}$
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.

3.3. 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 from 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to KDB 558074 Peak power measurement procedure

RBW = as specified in Table 1.

VBW $\geq 3 \times$ 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 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq 98 \%$

VBW $\geq 1/T$, 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)
BLE	61.87	1.1600	862	1k

Note: Duty Cycle Refer to Section 5.

3.4. Uncertainty

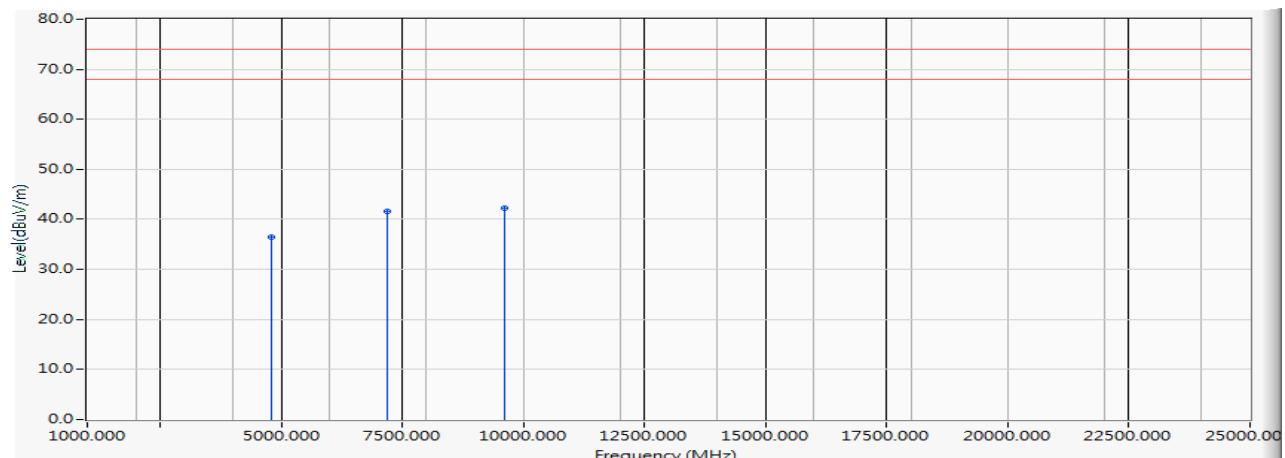
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : Intel® Wireless-AC 9560
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/02
 Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz)

Horizontal

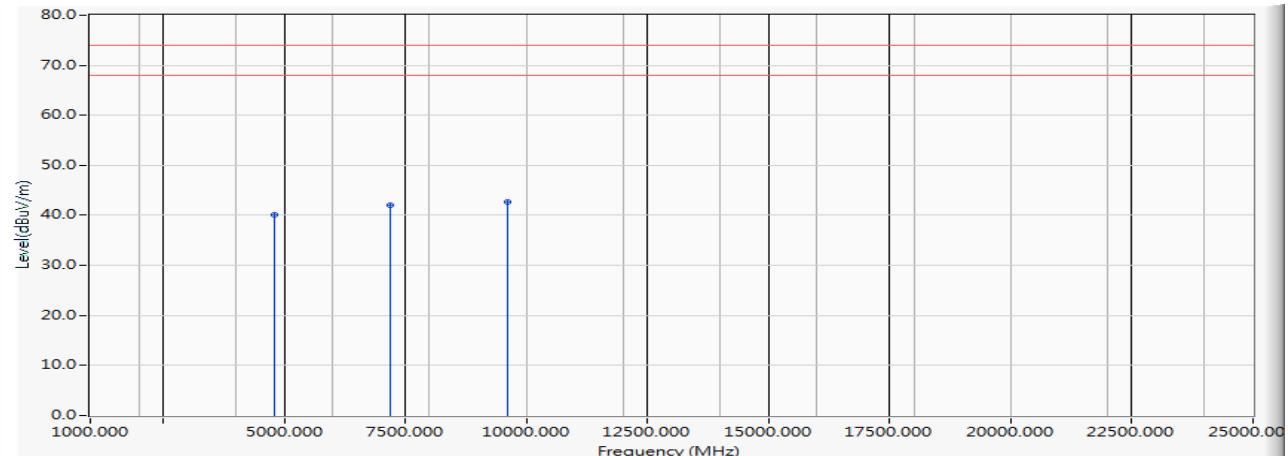


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4804.000	-9.896	46.430	36.534	-37.466	74.000	PEAK
2	7206.000	-5.013	46.660	41.647	-32.353	74.000	PEAK
3 *	9608.000	-1.472	43.730	42.259	-31.741	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/02
 Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz)

Vertical


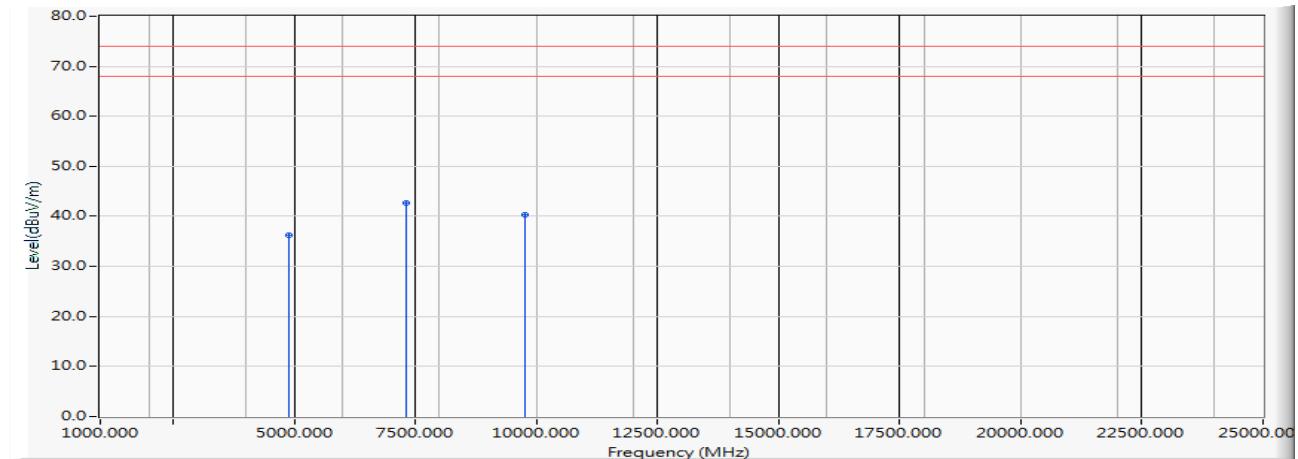
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4804.000	-6.585	46.600	40.015	-33.985	74.000	PEAK
2	7206.000	-4.144	46.130	41.986	-32.014	74.000	PEAK
3 *	9608.000	-1.075	43.800	42.726	-31.274	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/02
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Horizontal

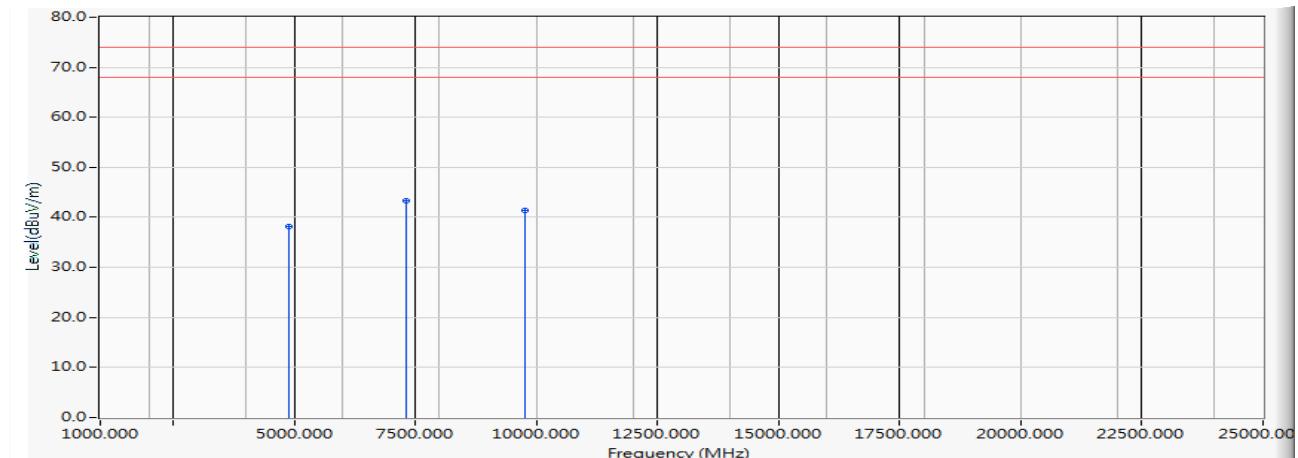


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4880.000	-10.307	46.480	36.173	-37.827	74.000	PEAK
2	* 7320.000	-3.857	46.640	42.783	-31.217	74.000	PEAK
3	9760.000	-2.579	42.810	40.232	-33.768	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/02
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Vertical


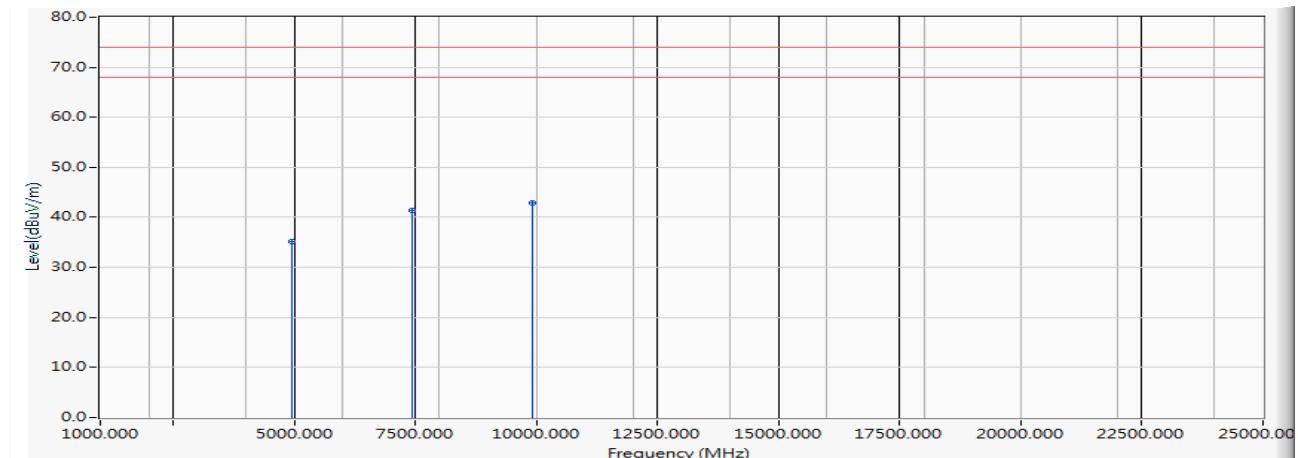
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4880.000	-7.579	45.860	38.281	-35.719	74.000	PEAK
2 *	7320.000	-2.987	46.370	43.383	-30.617	74.000	PEAK
3	9760.000	-2.107	43.420	41.313	-32.687	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/02
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Horizontal



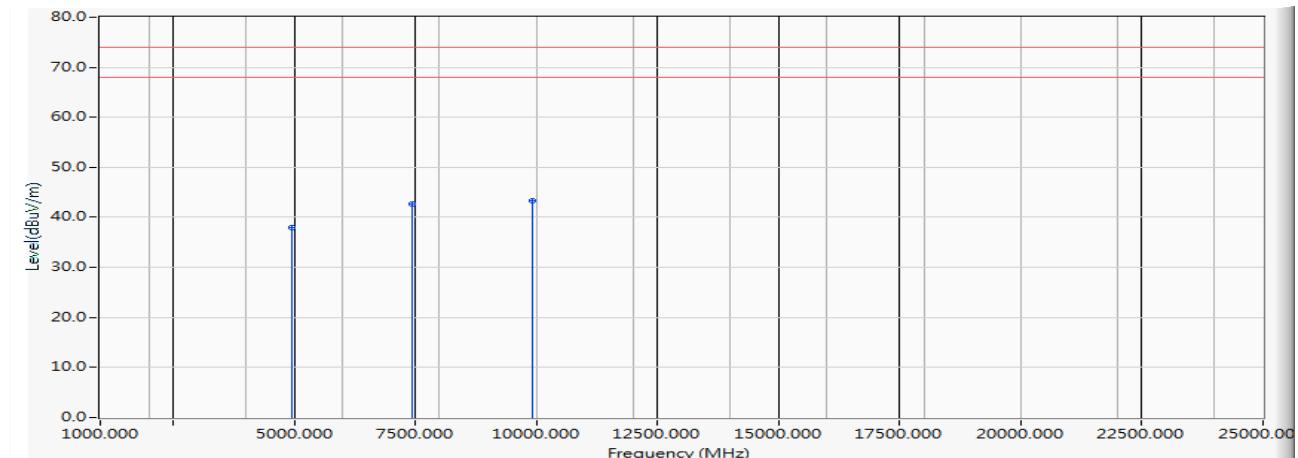
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4960.000	-10.666	45.880	35.215	-38.785	74.000	PEAK
2	7440.000	-3.631	45.050	41.419	-32.581	74.000	PEAK
3	*	-2.397	45.190	42.793	-31.207	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/02
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Vertical



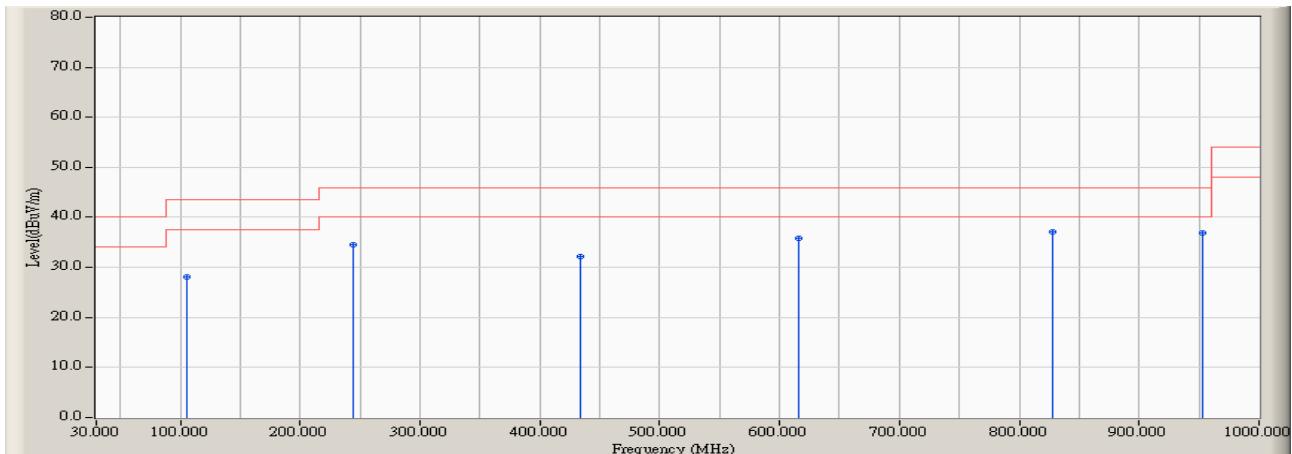
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	
1	4960.000	-7.869	45.780	37.912	-36.088	74.000	PEAK	
2	7440.000	-2.772	45.560	42.788	-31.212	74.000	PEAK	
3	*	9920.000	-1.895	45.150	43.255	-30.745	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/09
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Horizontal

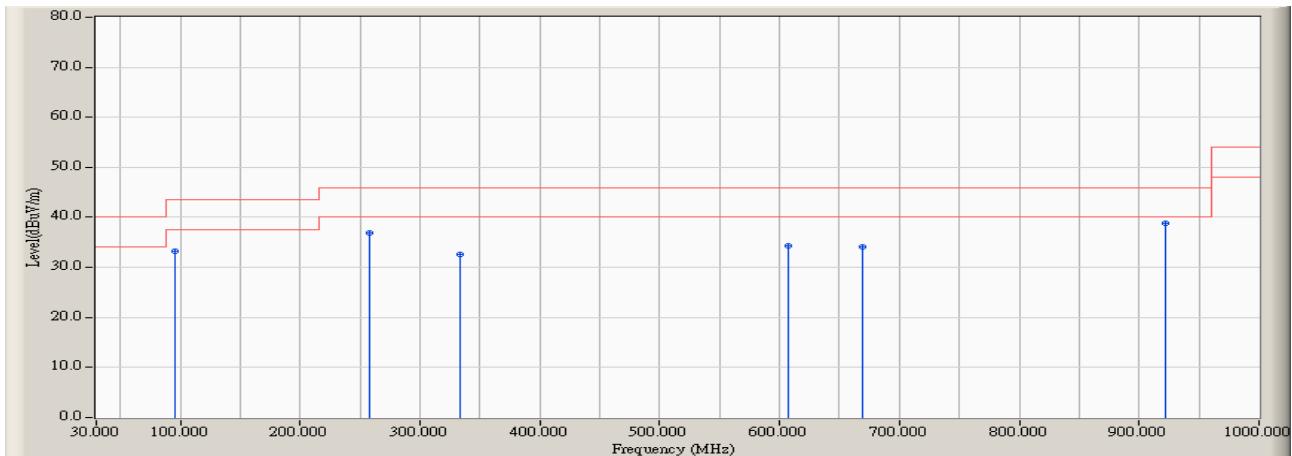


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	106.170	15.867	12.268	28.135	-15.365	43.500	QUASIPEAK
2	244.519	14.496	20.137	34.633	-11.367	46.000	QUASIPEAK
3	434.167	21.640	10.535	32.175	-13.825	46.000	QUASIPEAK
4	616.042	26.478	9.328	35.805	-10.195	46.000	QUASIPEAK
5	* 827.452	26.687	10.436	37.122	-8.878	46.000	QUASIPEAK
6	953.365	27.005	9.976	36.981	-9.019	46.000	QUASIPEAK

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 : Intel® Wireless-AC 9560
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/01/09
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Vertical


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	95.288	16.199	17.002	33.200	-10.300	43.500	QUASIPEAK
2	258.510	18.810	18.060	36.869	-9.131	46.000	QUASIPEAK
3	333.125	15.968	16.529	32.497	-13.503	46.000	QUASIPEAK
4	606.715	23.355	10.879	34.234	-11.766	46.000	QUASIPEAK
5	668.894	23.492	10.629	34.121	-11.879	46.000	QUASIPEAK
6	*	27.710	11.038	38.748	-7.252	46.000	QUASIPEAK

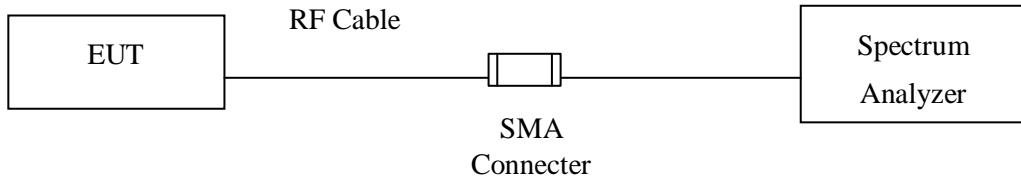
Note:

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.

4. Band Edge

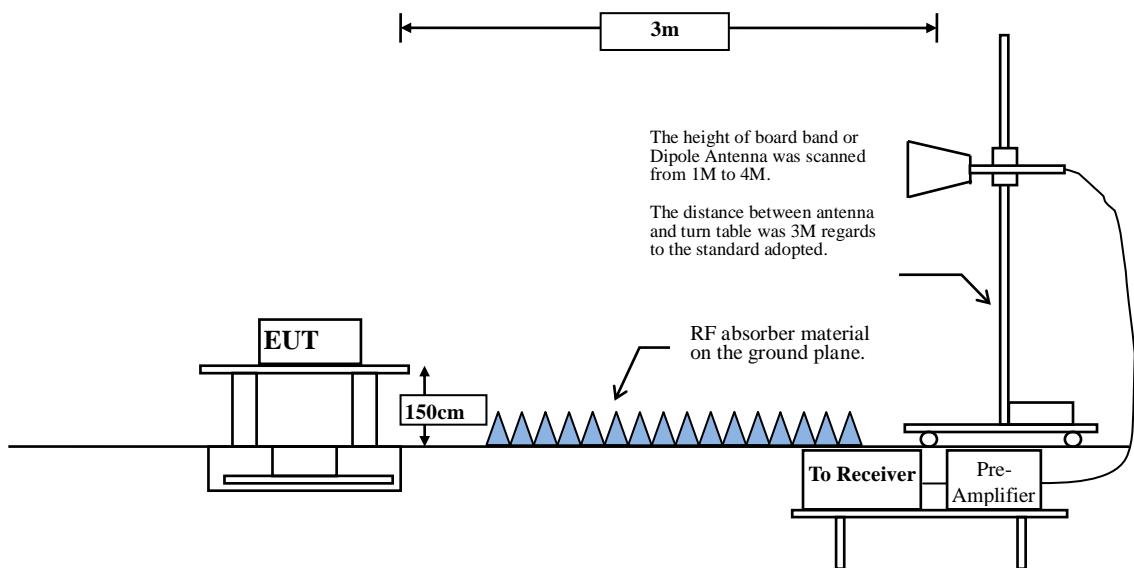
4.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



4.2. 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)).

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.

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 Peak power measurement procedure

RBW = as specified in Table 1.

VBW $\geq 3 \times$ 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 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq 98 \%$

VBW $\geq 1/T$, 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)
BLE	61.87	1.1600	862	1k

Note: Duty Cycle Refer to Section 5.

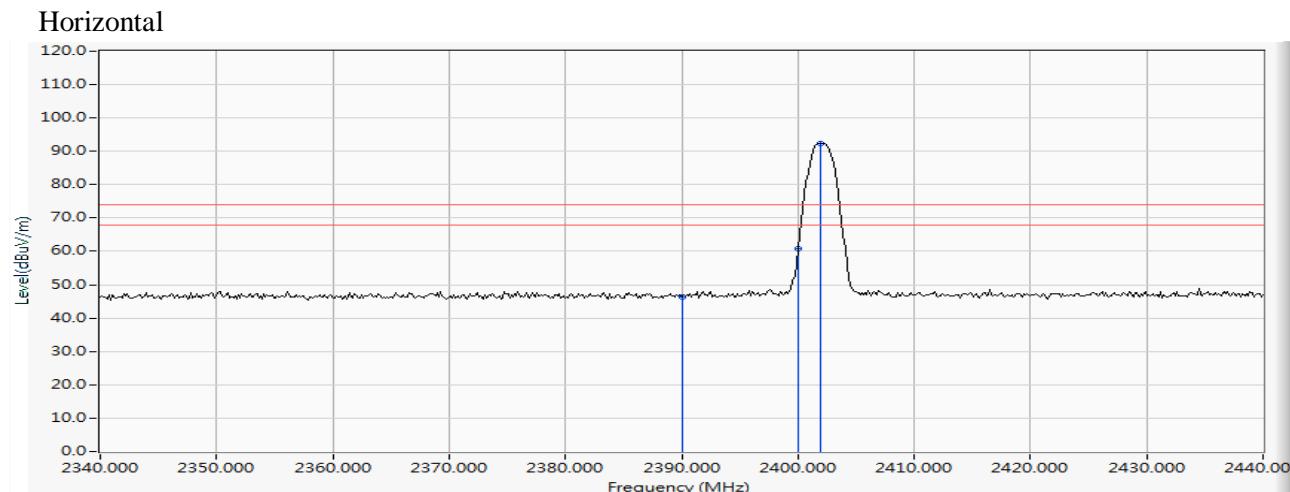
4.4. **Uncertainty**

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Band Edge

Product : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)



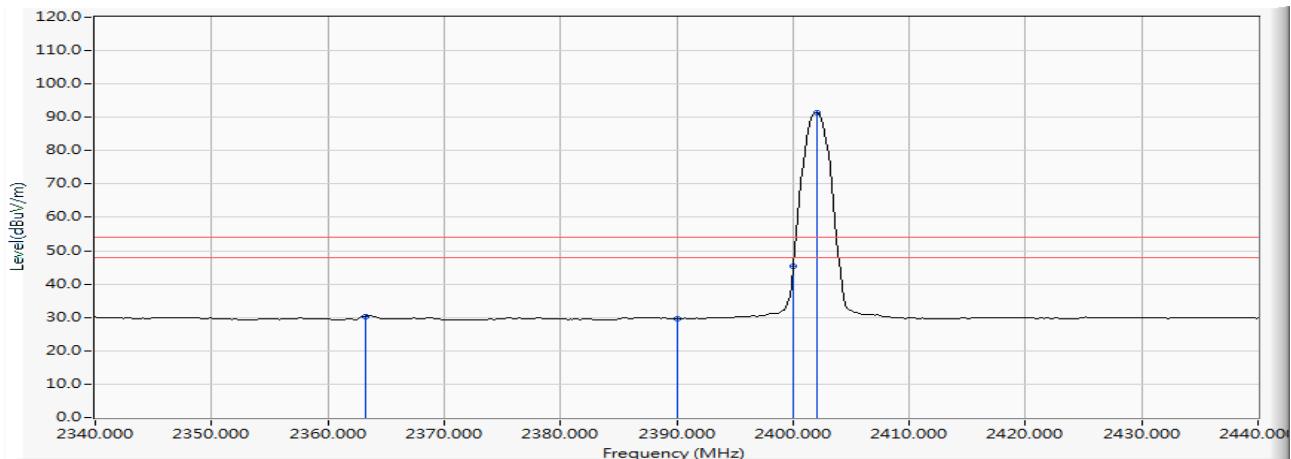
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2390.000	6.474	39.738	46.213	-27.787	74.000	PEAK
2	2400.000	6.528	54.303	60.831	-13.169	74.000	PEAK
3 *	2401.884	6.540	85.697	92.237	18.237	74.000	PEAK

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 + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

Horizontal



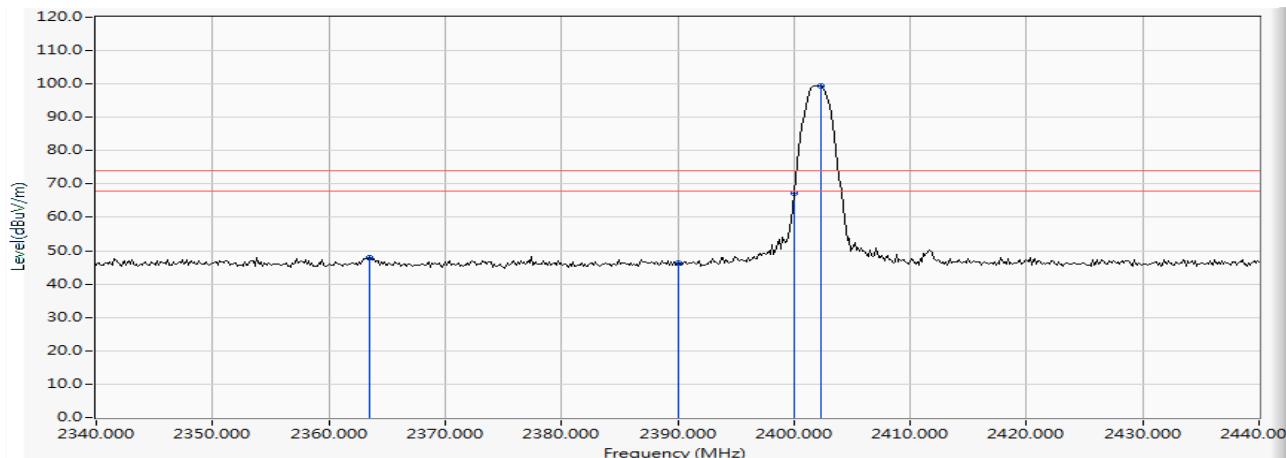
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2363.188	6.355	24.033	30.388	-23.612	54.000	AVERAGE
2	2390.000	6.474	23.096	29.571	-24.429	54.000	AVERAGE
3	2400.000	6.528	38.679	45.207	-8.793	54.000	AVERAGE
4 *	2402.029	6.540	84.963	91.503	37.503	54.000	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 : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

Vertical



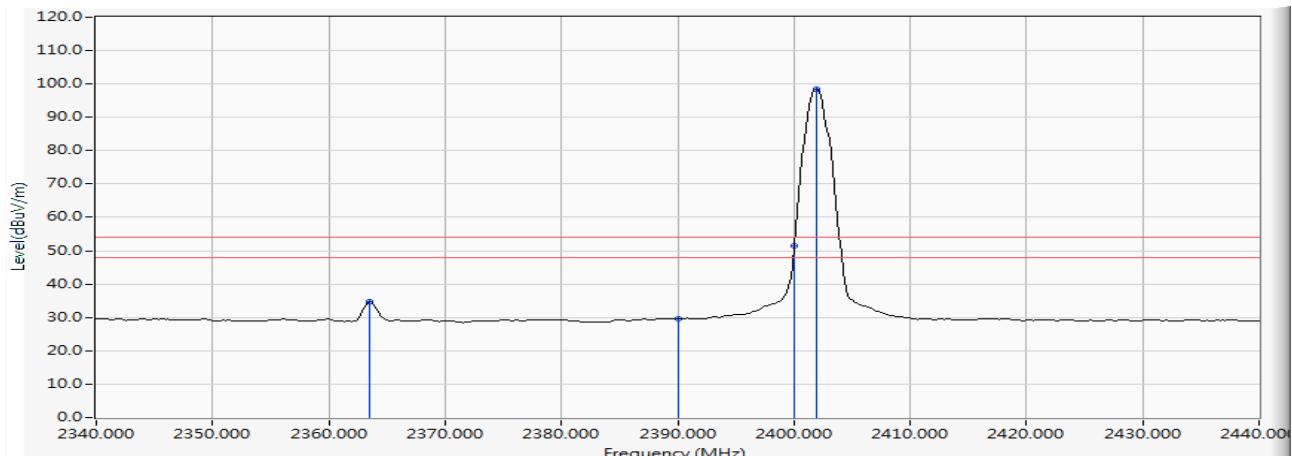
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2363.478	5.989	41.939	47.928	-26.072	74.000	PEAK
2	2390.000	5.880	40.394	46.275	-27.725	74.000	PEAK
3	2400.000	5.879	61.518	67.397	-6.603	74.000	PEAK
4	* 2402.319	5.885	93.524	99.409	25.409	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

Vertical



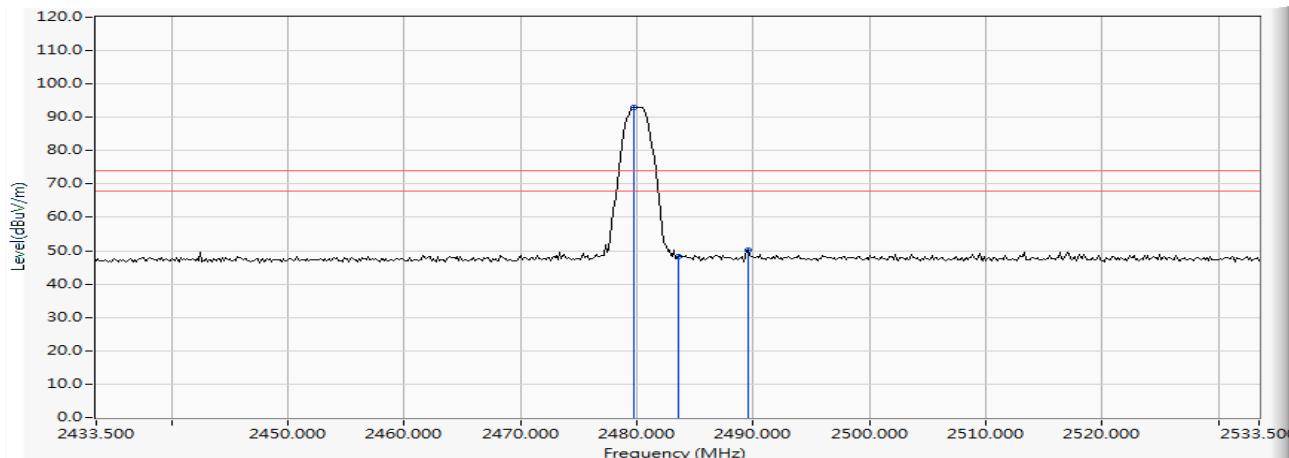
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2363.478	5.989	28.835	34.824	-19.176	54.000	AVERAGE
2	2390.000	5.880	23.638	29.519	-24.481	54.000	AVERAGE
3	2400.000	5.879	45.713	51.592	-2.408	54.000	AVERAGE
4 *	2401.884	5.884	92.662	98.546	44.546	54.000	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 : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Horizontal



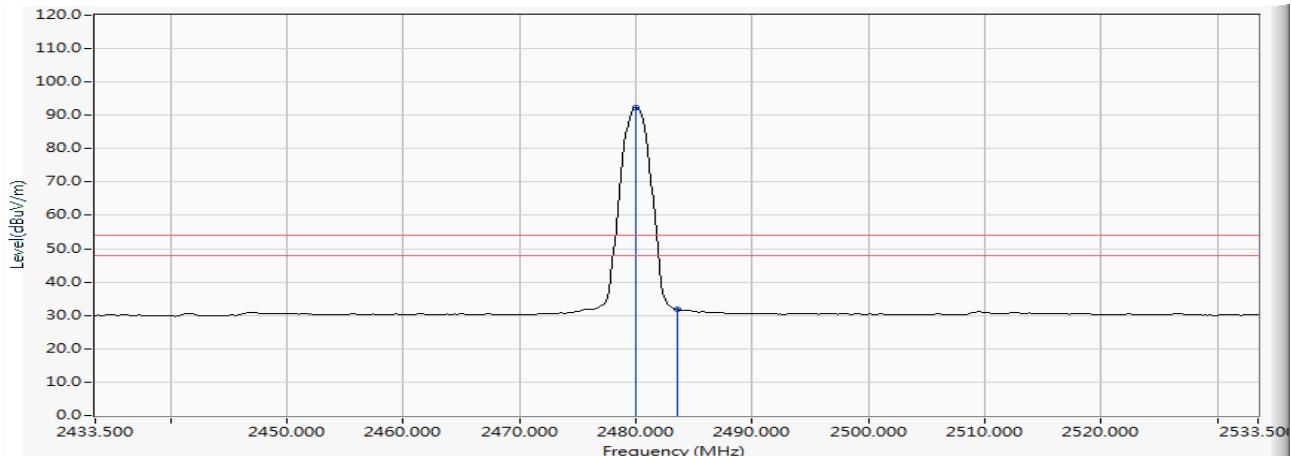
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.732	7.084	86.017	93.100	19.100	74.000	PEAK
2		2483.500	7.110	40.996	48.106	-25.894	74.000	PEAK
3		2489.587	7.154	43.113	50.266	-23.734	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Horizontal



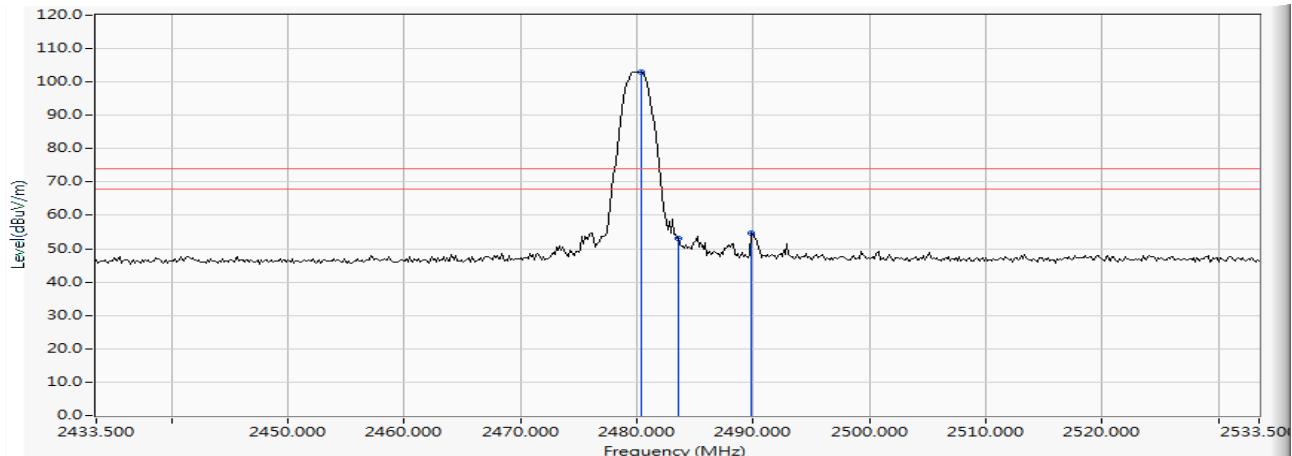
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2480.022	7.086	85.214	92.299	38.299	54.000	AVERAGE
2	2483.500	7.110	24.605	31.715	-22.285	54.000	AVERAGE

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 : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Vertical



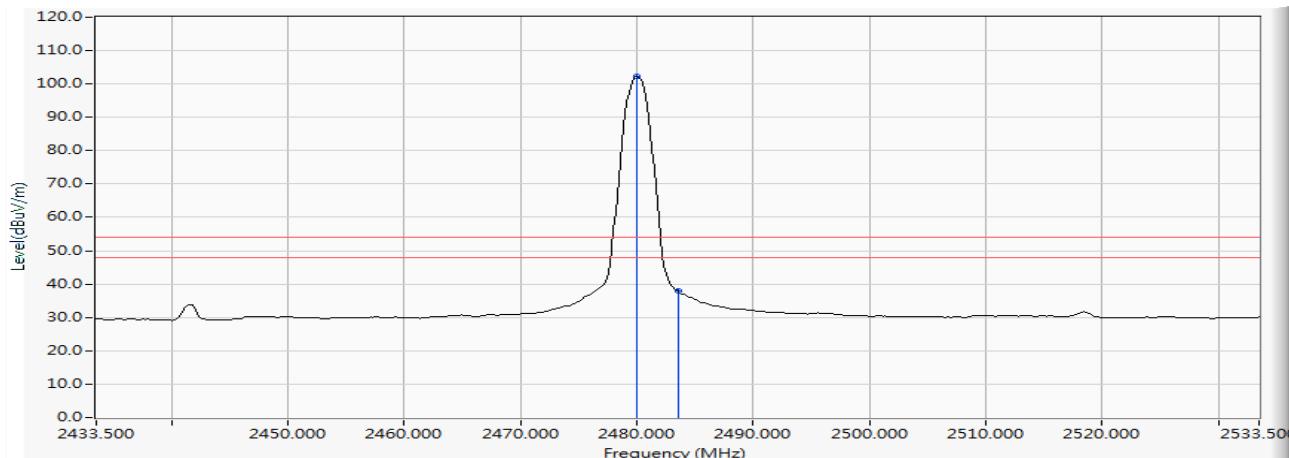
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.312	6.343	96.738	103.081	29.081	74.000	PEAK
2		2483.500	6.363	46.798	53.161	-20.839	74.000	PEAK
3		2489.877	6.403	48.347	54.750	-19.250	74.000	PEAK

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 : Intel® Wireless-AC 9560
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2018/12/26
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Vertical



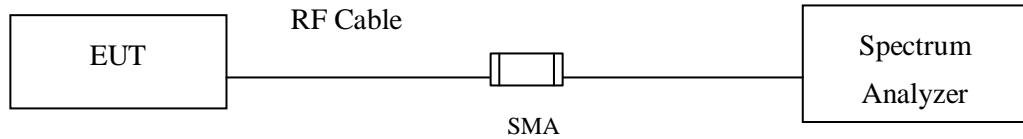
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2480.022	6.342	95.990	102.332	48.332	54.000	AVERAGE
2	2483.500	6.363	31.480	37.843	-16.157	54.000	AVERAGE

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.

5. Duty Cycle

5.1. Test Setup



5.2. 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.

5.3. Uncertainty

± 2.31msec

5.4. Test Result of Duty Cycle

Product : Intel® Wireless-AC 9560
 Test Item : Duty Cycle
 Test Mode : Mode 1: Transmit - BLE (GFSK)

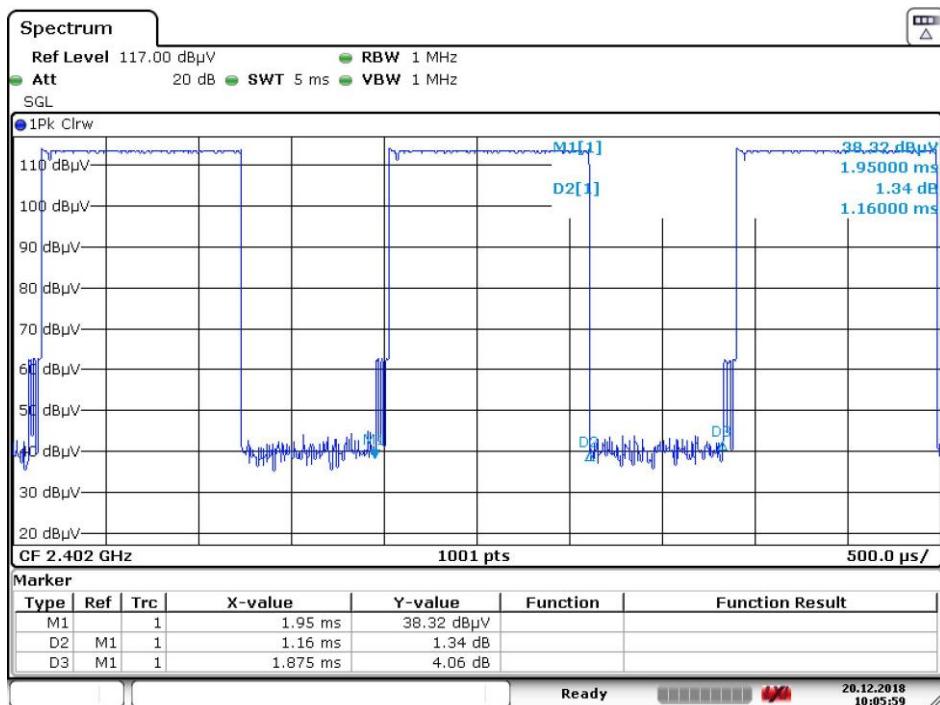
Duty Cycle Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

$$\text{Duty Factor} = 10 \log (1/\text{Duty Cycle})$$

Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
BLE	1.1600	1.8750	61.87	2.09



Date: 20.DEC.2018 10:05:59

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.