



RF TEST REPORT

Applicant Beijing Chusudu Technology Co., Ltd.
FCC ID 2AQ5PAUTORINGA2
Product Vehicular wireless terminal(with 4G function)
Brand AutoRing
Model A2
Report No. R1807A0315-R5
Issue Date October 18, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Peng Tao

Approved by: Kai Xu

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Summary of measurement results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Maximum conducted output power	15.247(b)(3)	PASS
2	6 dB bandwidth	15.247(a)(2)	PASS
3	Power spectral density	15.247(e)	PASS
4	Band Edge	15.247(d)	PASS
5	Spurious RF Conducted Emissions	15.247(d)	PASS
6	Unwanted Emissions	15.247(d),15.205,15.209	PASS
7	Conducted Emissions	15.207	NA
Date of Testing: July 8 ,2018 ~ August 1 ,2018			

1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

Client Information

Applicant	Beijing Chusudu Technology Co., Ltd.
Applicant address	Dongsheng Plaza A,5th Floor,8 Zhongguancun East Rd, Haidian District, Beijing, China
Manufacturer	Beijing Chusudu Technology Co., Ltd.
Manufacturer address	Dongsheng Plaza A,5th Floor,8 Zhongguancun East Rd, Haidian District, Beijing, China

General information

EUT Description	
Model	A2
IMEI	863346039069490
Hardware Version	V3.1
Software Version	RC108_D2_MT2_C1_BOM_V3.1_S20180622
Power Supply	External Power Supply
Antenna Type	Internal Antenna
Antenna Connector	A permanently attached antenna
Antenna Gain	1.00 dBi
additional beamforming gain	NA
Test Mode	Bluetooth V4.0 LE 802.11b, 802.11g, 802.11n(HT20/HT40);
Modulation Type	BLE :GFSK 802.11b: DSSS; 802.11g/n(HT20/HT40): OFDM
Max. Conducted Power	Wi-Fi 2.4G :14.58dBm BLE : 0.34dBm
Operating Frequency Range(s)	802.11b/g/n(HT20): 2412 ~ 2462 MHz 802.11n(HT40): 2422 ~ 2452 MHz BLE: 2402 ~2480 MHz
EUT Accessory	
AutoRing A2 Power Cable	Manufacturer: Shenzhen GuanLiJie Technology Co.,Ltd Model: AutoRing A2 Power cord
Camera	Manufacturer: Beijing Chusudu Technology Co., Ltd. Model: MMT-AHD-H65
Note: The information of the EUT is declared by the manufacturer.	



3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

- **FCC CFR47 Part 15C (2018) Radio Frequency Devices**
- **ANSI C63.10 (2013)**
- **KDB 558074 D01 DTS Meas Guidance v04**

4. Test Configuration

Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

The test software is used Vysor

Worst-case data rates are shown as following table.

Band	Data Rate
Bluetooth(Low Energy)	2Mbps
802.11b	11 Mbps
802.11g	54 Mbps
802.11n HT20	MCS7
802.11n HT40	MCS7

5. Test Case Results

5.1. Maximum conducted output power

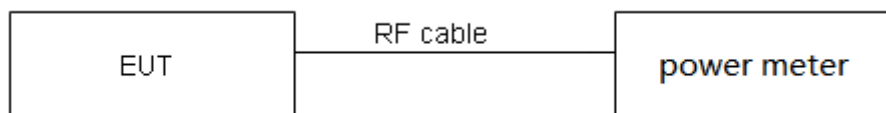
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to Average Power meter with a known loss. The EUT is max power transmission with proper modulation. The signal transmission is continuous.

Test Setup



Limits

Rule Part 15.247 (b) (3) specifies that " For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz: 1 Watt."

Average Output Power	$\leq 1W$ (30dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.44$ dB.

Test Results

Band	T _{on} (ms)	T _(on+off) (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11b	0.94	1.10	0.85	0.70
802.11g	0.17	0.35	0.50	2.99
802.11n HT20	0.16	0.33	0.49	3.09
802.11n HT40	0.10	0.27	0.37	4.37
BLE	0.38	0.63	0.602	2.205
Note: when Duty cycle>0.98, Duty cycle correction Factor not required.				

Single Antenna Power Index			
Packet Type	CH1	CH6	CH11
802.11b	16	16	16
802.11g	15	15	15
802.11n HT20	12	12	12
Packet Type	CH3	CH6	CH9
802.11n HT40	12	12	12

Network Standards	Carrier frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412	13.88	14.58	30	PASS
	2437	13.79	14.49	30	PASS
	2462	13.33	14.03	30	PASS
802.11g	2412	10.91	13.90	30	PASS
	2437	11.20	14.19	30	PASS
	2462	10.81	13.80	30	PASS
802.11n HT20	2412	7.99	11.08	30	PASS
	2437	8.20	11.29	30	PASS
	2462	7.85	10.94	30	PASS
802.11n HT40	2422	6.97	11.34	30	PASS
	2437	6.92	11.29	30	PASS
	2452	6.89	11.26	30	PASS
Bluetooth (Low Energy)	2402	-2.32	-0.12	30	PASS
	2440	-1.86	0.34	30	PASS
	2480	-3.90	-1.70	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

5.2. 6dB Bandwidth

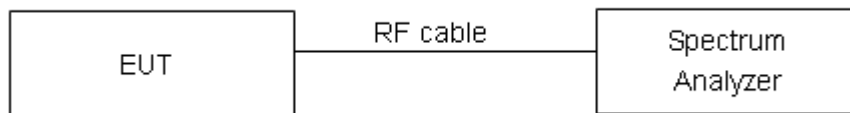
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 100 kHz; VBW is set to 300 kHz on spectrum analyzer. Dector=Peak, Trace mode=max hold.

Test Setup



Limits

Rule Part 15.247 (a) (2) specifies that “Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.”

minimum 6 dB bandwidth	≥ 500 kHz
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

Test Results:

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	12.469	9.805	500	PASS
	2437	12.134	9.079	500	PASS
	2462	12.439	9.937	500	PASS
802.11g	2412	16.392	16.390	500	PASS
	2437	16.314	15.420	500	PASS
	2462	16.386	16.080	500	PASS
802.11n HT20	2412	17.670	17.750	500	PASS
	2437	17.603	17.650	500	PASS
	2462	17.658	17.740	500	PASS
802.11n HT40	2422	36.204	35.980	500	PASS
	2437	35.822	35.160	500	PASS
	2452	35.899	35.800	500	PASS
Bluetooth (Low Energy)	2402	1.0463	0.7109	500	PASS
	2440	1.0451	0.7055	500	PASS
	2480	1.0463	0.7052	500	PASS

802.11b, Carrier frequency (MHz): 2412



802.11g, Carrier frequency (MHz): 2412



802.11b, Carrier frequency (MHz): 2437



802.11g, Carrier frequency (MHz): 2437



802.11b, Carrier frequency (MHz): 2462



802.11g, Carrier frequency (MHz): 2462



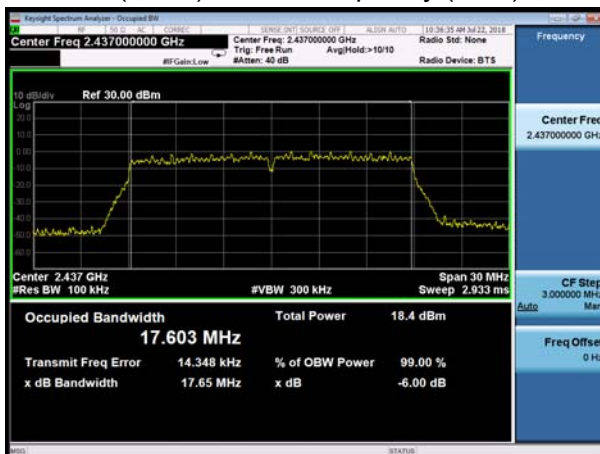
802.11n(HT20), Carrier frequency (MHz): 2412



802.11n(HT40), Carrier frequency (MHz): 2422



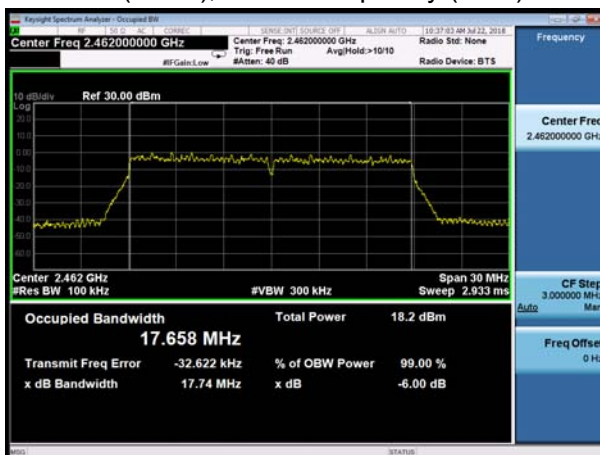
802.11n(HT20), Carrier frequency (MHz): 2437



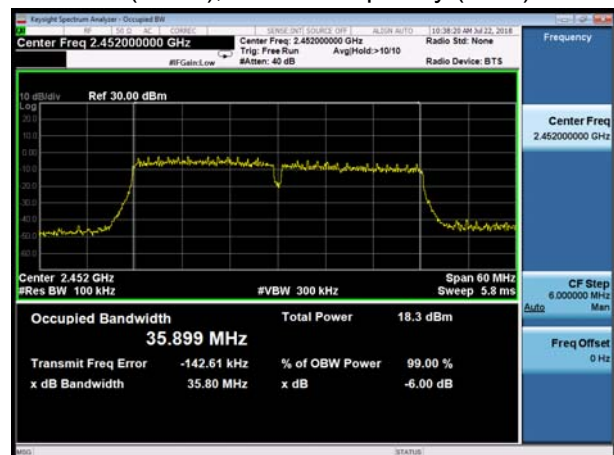
802.11n(HT40), Carrier frequency (MHz): 2437



802.11n(HT20), Carrier frequency (MHz): 2462



802.11n(HT40), Carrier frequency (MHz): 2452





BLE Carrier frequency (MHz): 2402



BLE Carrier frequency (MHz): 2440



BLE Carrier frequency (MHz): 2480



5.3. Band Edge

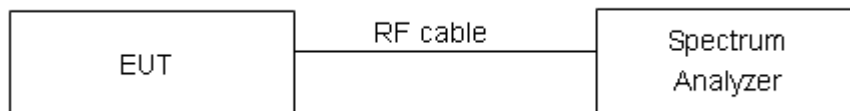
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 15.247(d) specifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, 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, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.”

Measurement Uncertainty

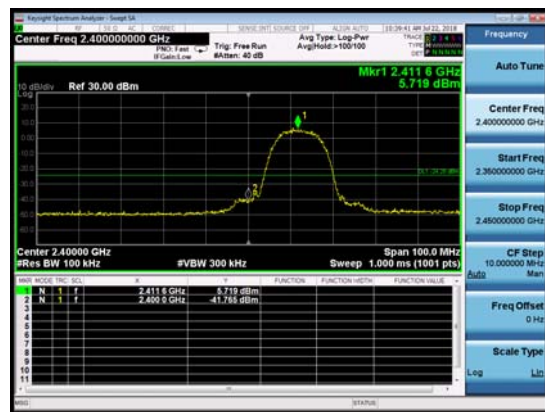
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

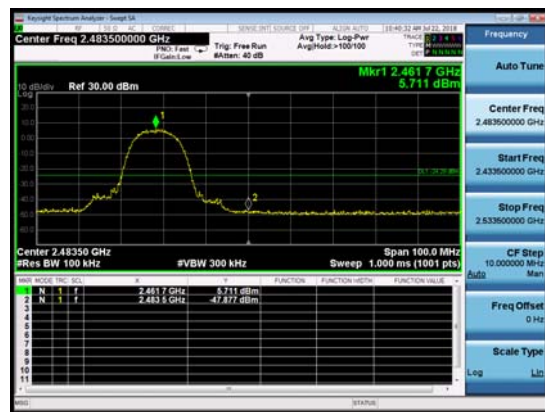


Test Results: PASS

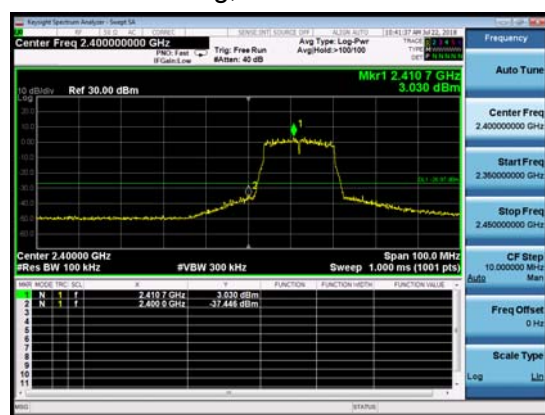
802.11b, Channel No.: 1



802.11b, Channel No.: 11



802.11g, Channel No.: 1



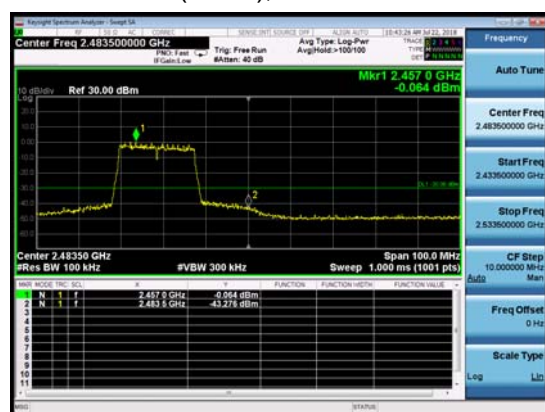
802.11g, Channel No.: 11



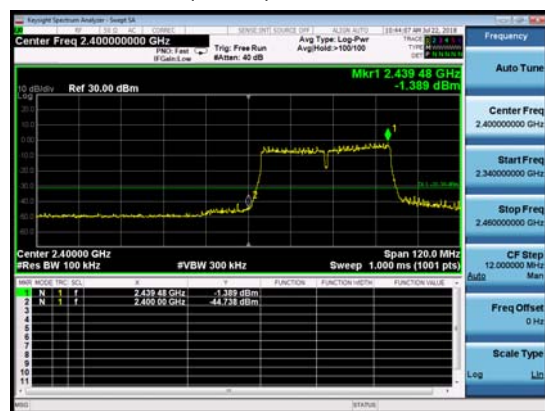
802.11n(HT20), Channel No.: 1



802.11n(HT20), Channel No.: 11

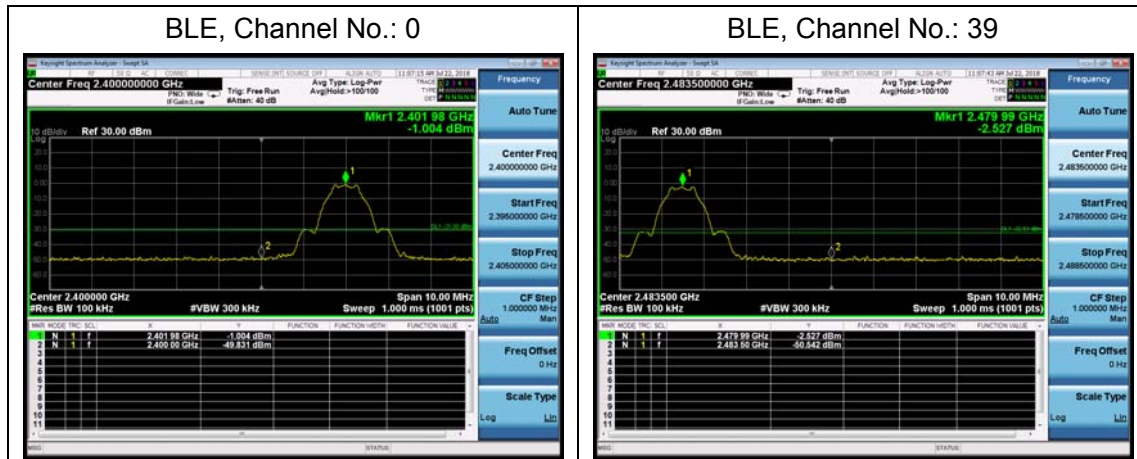


802.11n(HT40), Channel No.: 3



802.11n(HT40), Channel No.: 9





5.4. Power Spectral Density

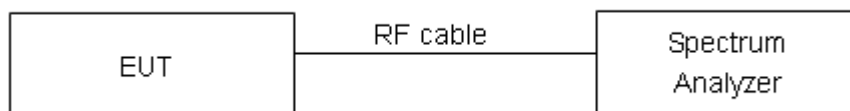
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. Method AVGPS-2 in KDB558074 D01 was used for this test.

Test setup



Limits

Rule Part 15.247(e) specifies that” For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. ”

Limits	$\leq 8 \text{ dBm} / 3\text{kHz}$
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.75\text{dB}$.

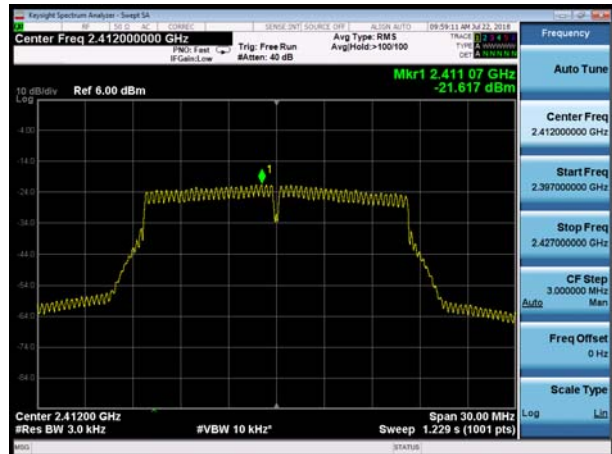
Test Results:

Network Standards	Channel Number	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	1	-18.31	-17.61	8	PASS
	6	-17.90	-17.19	8	PASS
	11	-18.46	-17.76	8	PASS
802.11g	1	-21.62	-18.63	8	PASS
	6	-20.19	-17.20	8	PASS
	11	-21.27	-18.29	8	PASS
802.11n HT20	1	-24.66	-21.57	8	PASS
	6	-24.34	-21.25	8	PASS
	11	-24.49	-21.40	8	PASS
802.11n HT40	3	-26.68	-22.31	8	PASS
	6	-27.11	-22.74	8	PASS
	9	-26.62	-22.25	8	PASS
Bluetooth (Low Energy)	0	-20.28	-18.08	8	PASS
	19	-18.83	-16.63	8	PASS
	39	-21.65	-19.45	8	PASS
Note: Power Spectral Density =Read Value+Duty cycle correction factor					

802.11b, Channel No.: 1



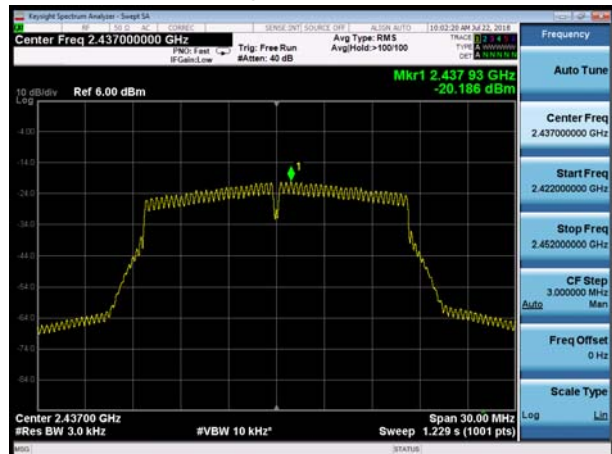
802.11g, Channel No.: 1



802.11b, Channel No.: 6



802.11g, Channel No.: 6



802.11b, Channel No.: 11



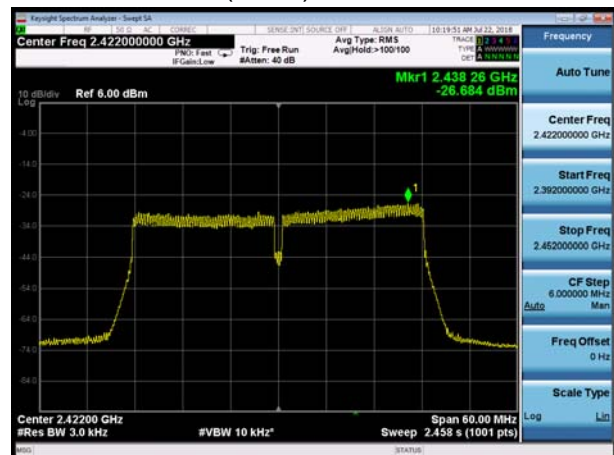
802.11g, Channel No.: 11



802.11n(HT20), Channel No. 1



802.11n(HT40), Channel No. 3



802.11n(HT20), Channel No. 6



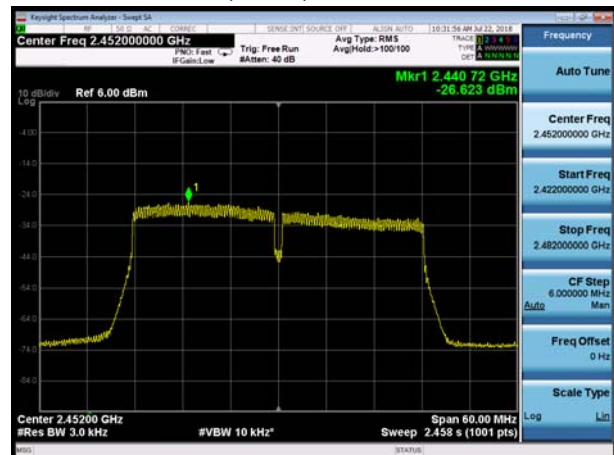
802.11n(HT40), Channel No. 6



802.11n(HT20), Channel No. 11



802.11n(HT40), Channel No. 9





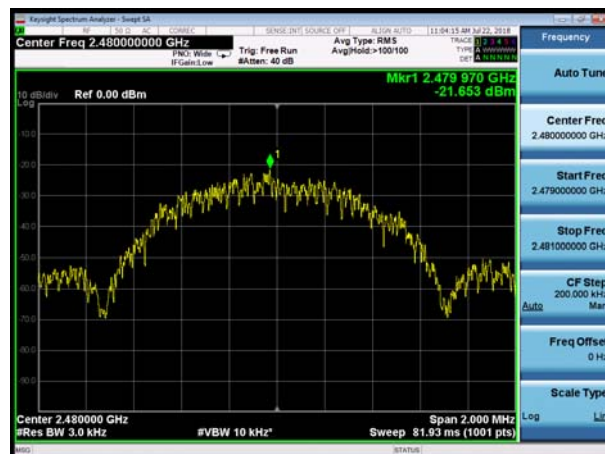
BLE, Channel No.: 0



BLE, Channel No.: 19



BLE, Channel No.: 39



5.5. Spurious RF Conducted Emissions

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. Set RBW to 100kHz and VBW to 300 kHz, Sweep is set to ATUO.

The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies that “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 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.” If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.”

Network Standards	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	5.53	-24.47
	2437	5.61	-24.39
	2462	5.65	-24.35
802.11g	2412	3.13	-26.87
	2437	3.65	-26.35
	2462	2.84	-27.16
802.11n HT20	2412	0.04	-29.96
	2437	0.40	-29.60
	2462	-0.13	-30.13
802.11n HT40	2422	-1.26	-31.26
	2437	-1.85	-31.85
	2452	-2.08	-32.08
Bluetooth (Low Energy)	2402	-0.88	-30.88
	2440	-0.04	-30.04
	2480	-2.37	-32.37

Measurement Uncertainty

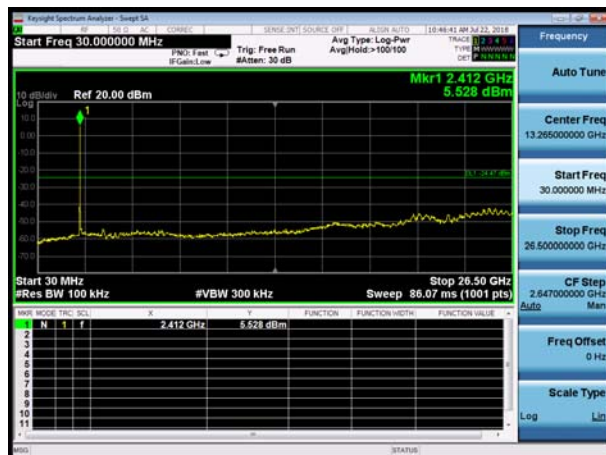
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

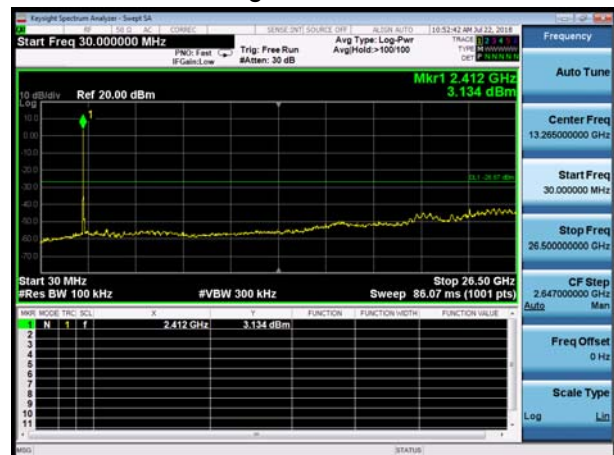


Test Results:

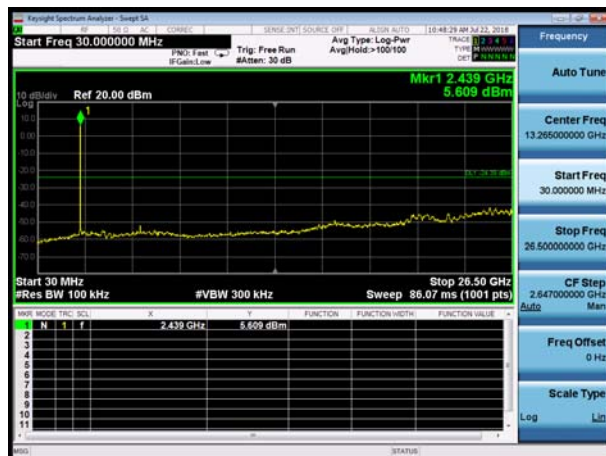
802.11b, Channel No.: 1



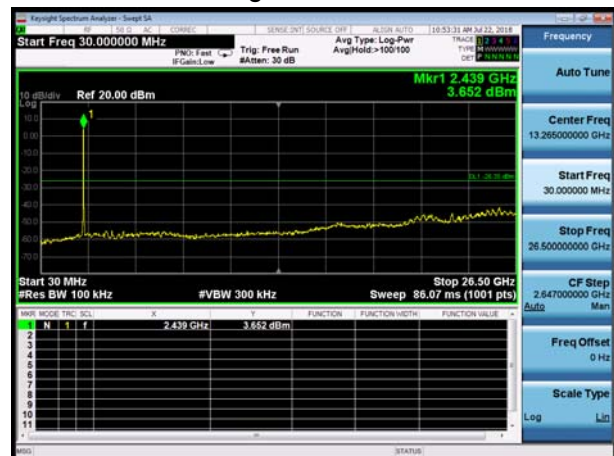
802.11g, Channel No.: 1



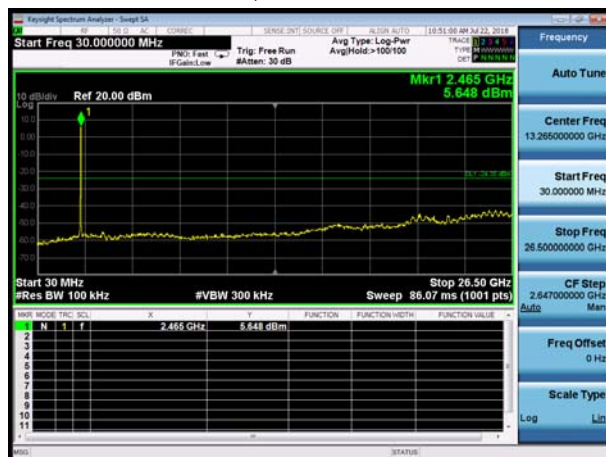
802.11b, Channel No.: 6



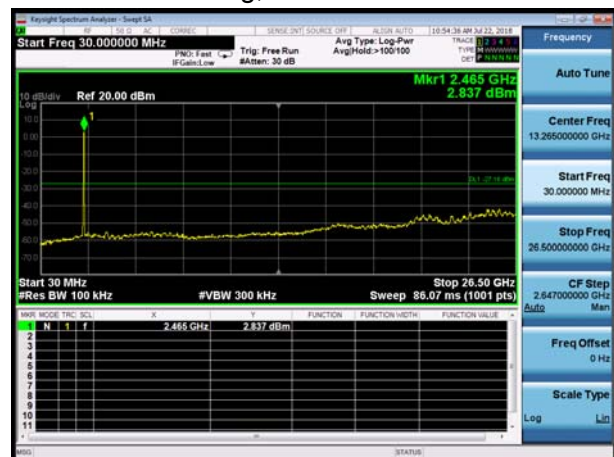
802.11g, Channel No.: 6



802.11b, Channel No.: 11

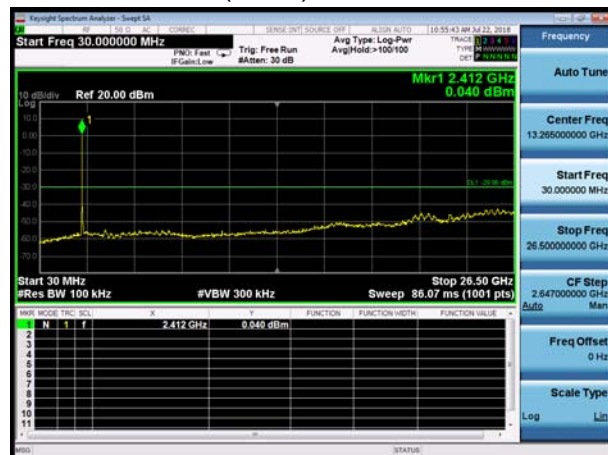


802.11g, Channel No.: 11

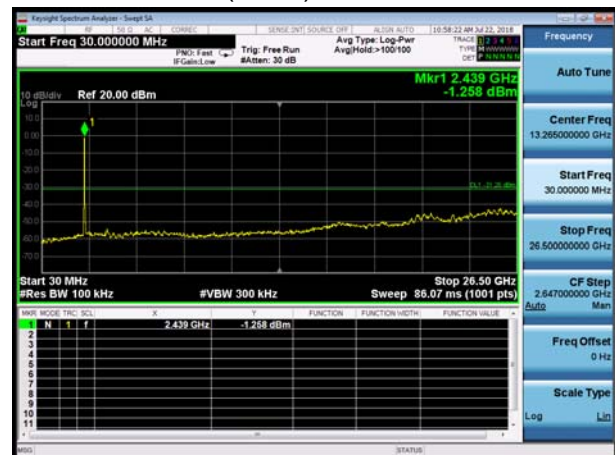




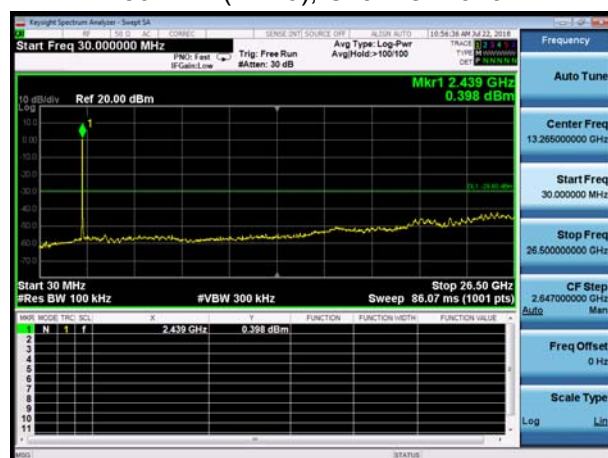
802.11n(HT20), Channel No. 1



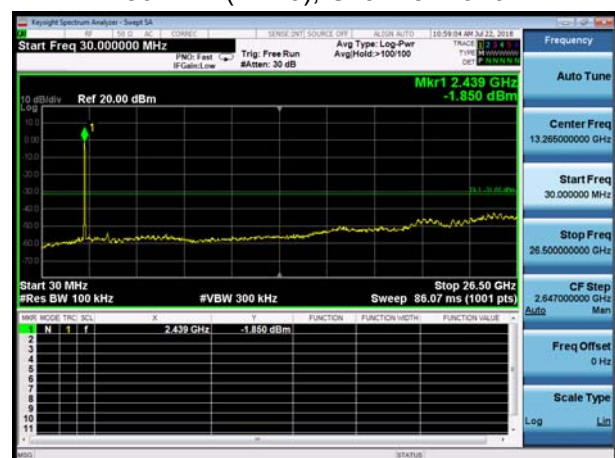
802.11n(HT40), Channel No. 3



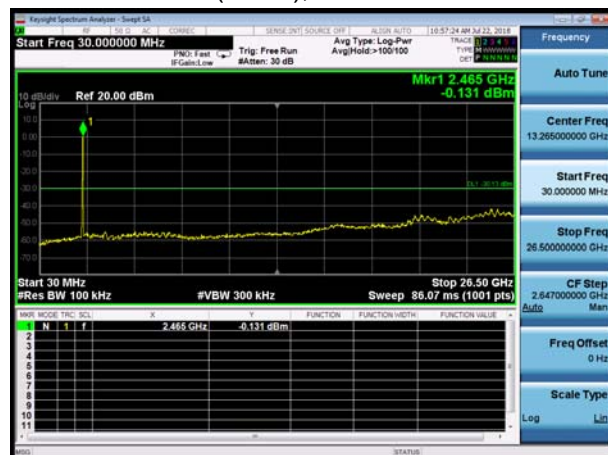
802.11n(HT20), Channel No. 6



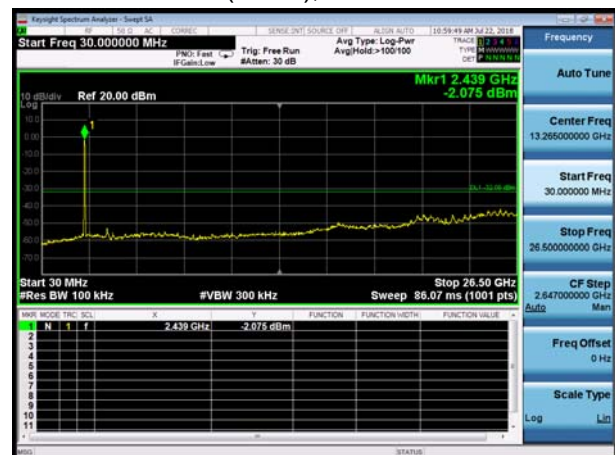
802.11n(HT40), Channel No. 6



802.11n(HT20), Channel No. 11

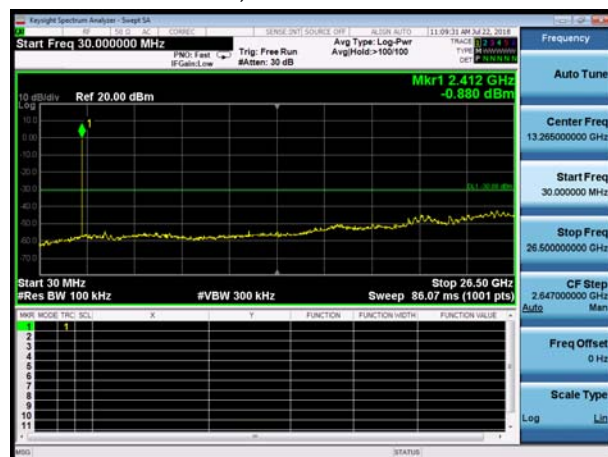


802.11n(HT40), Channel No. 9

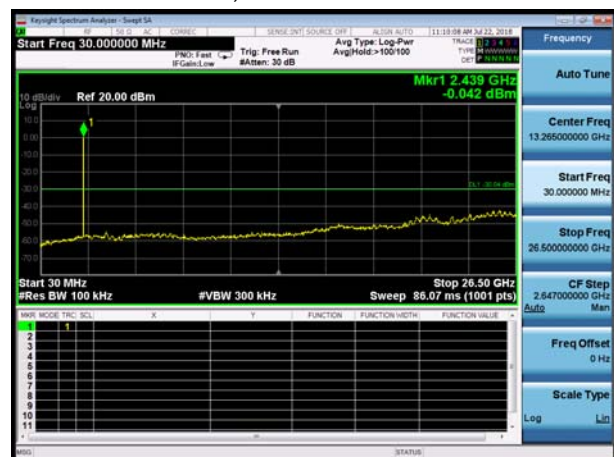




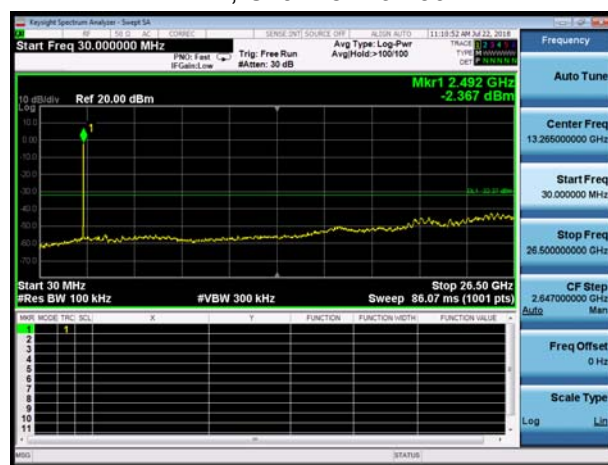
BLE, Channel No.: 0



BLE, Channel No.: 19



BLE, Channel No.: 39



5.6. Unwanted Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	102.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013.

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. Sweep the Restricted Band and the emissions less than 20 dB below the permissible value are reported.

The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

This method refer to KDB 558074.

The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:

I) Peak emission levels are measured by setting the instrument as follows:

- 1) RBW = 1 MHz.
- 2) VBW $\geq [3 \times \text{RBW}]$
- 3) Detector = peak.
- 4) Sweep time = auto.
- 5) Trace mode = max hold.
- 6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately $1 / D$, where D is the duty cycle.

II) Average emission levels are measured by setting the instrument as follows:

- a) RBW = 1 MHz.
- b) VBW $\geq [3 \times \text{RBW}]$.
- c) Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq \text{RBW} / 2$. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
- d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage

averaging. Log or dB averaging shall not be used.)

e) Sweep time = auto.

f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of $1 / D$, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)

g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is $[10 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is $[20 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.

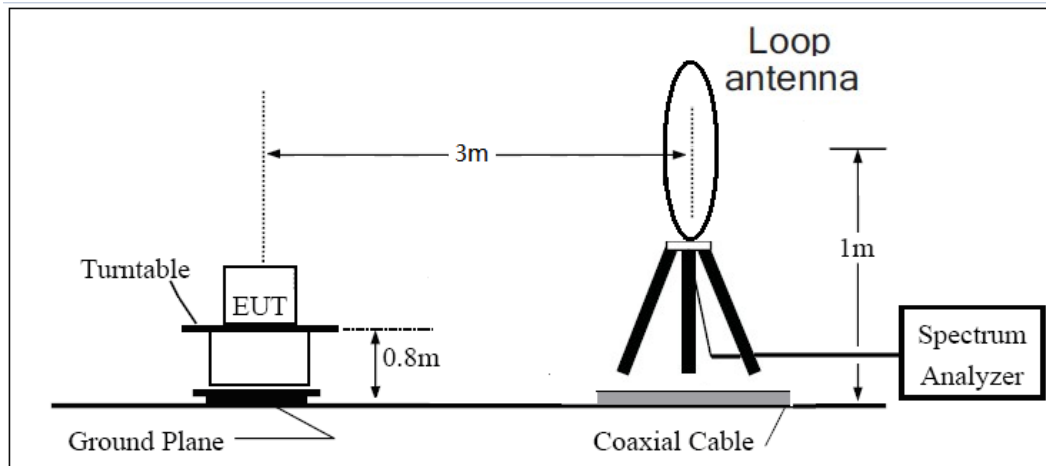
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the antenna is vertical.

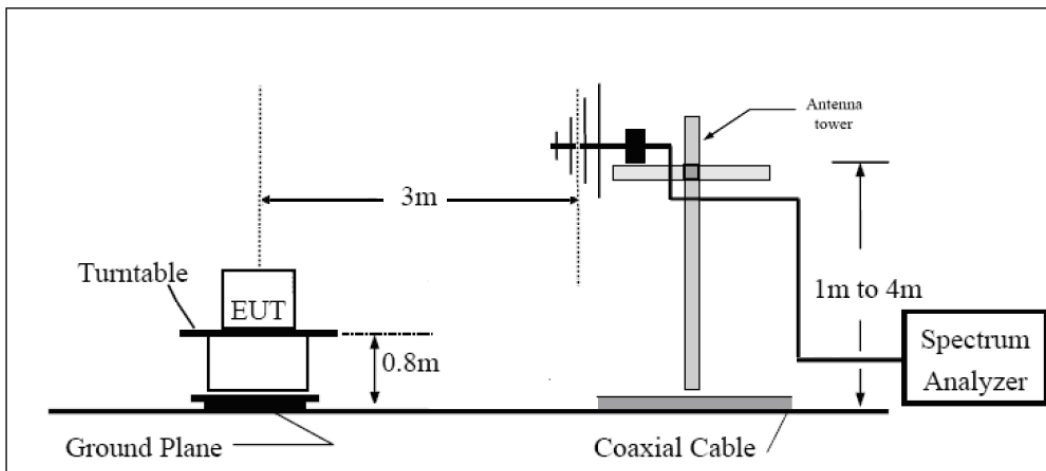
The test is in transmitting mode.

Test setup

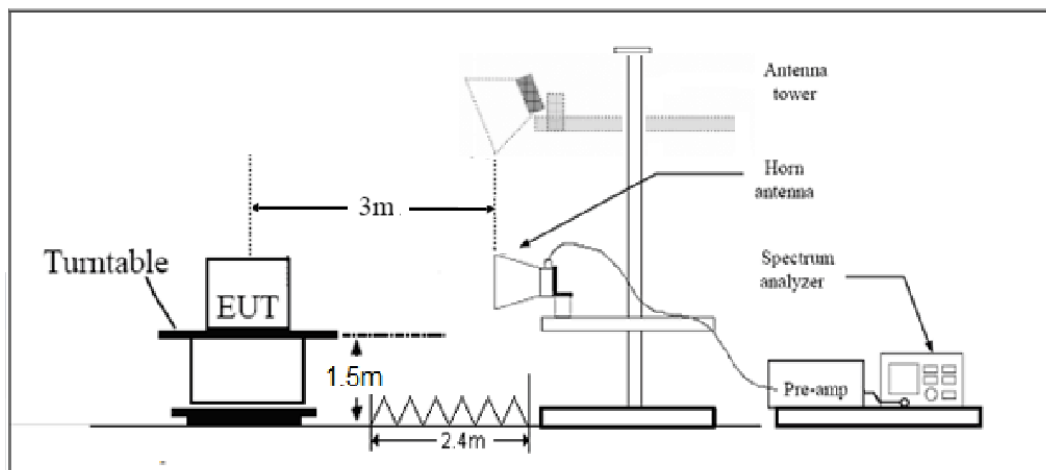
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74 dBuV/m

Average Limit=54 dBuV/m

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

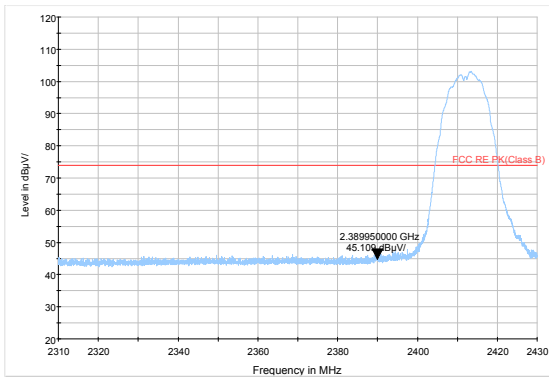
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

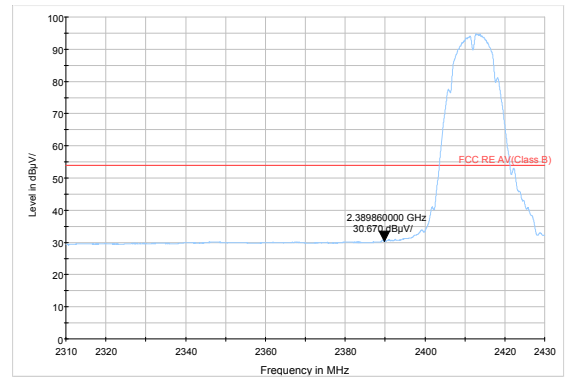
Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB



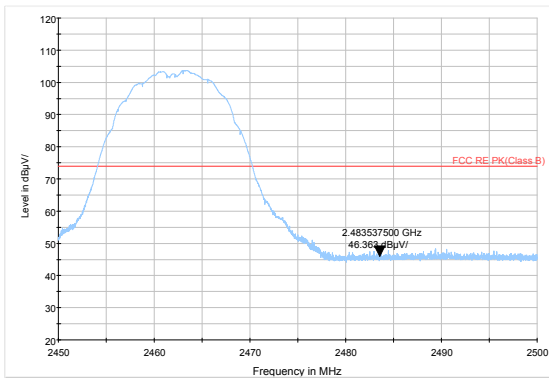
Test Results:



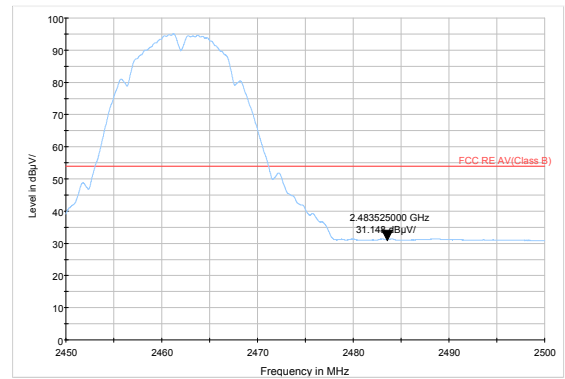
802.11b-Channel 1 Peak



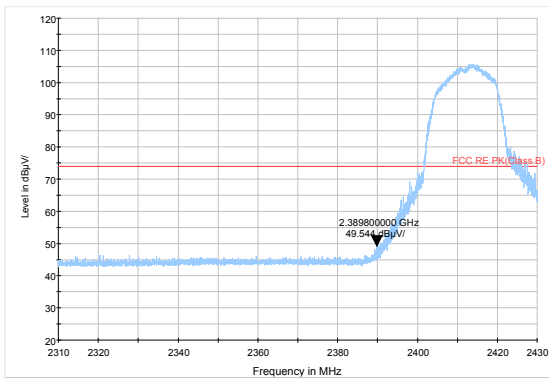
802.11b-Channel 1 Average



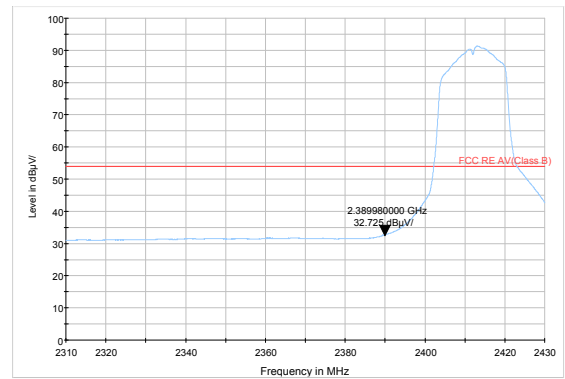
802.11b-Channel 11 Peak



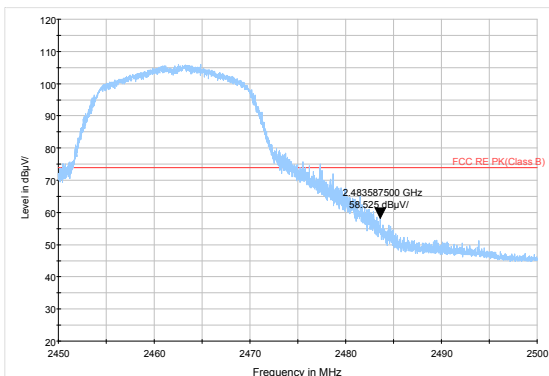
802.11b-Channel 11 Average



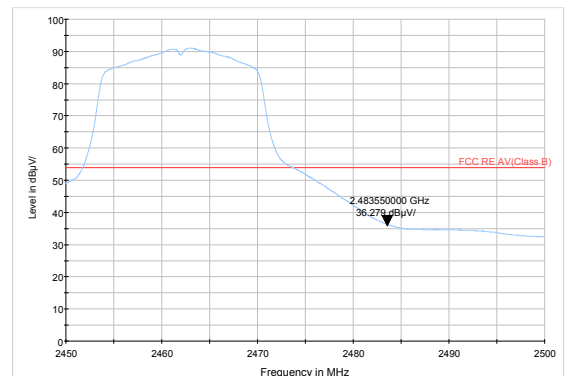
802.11g-Channel 1 Peak



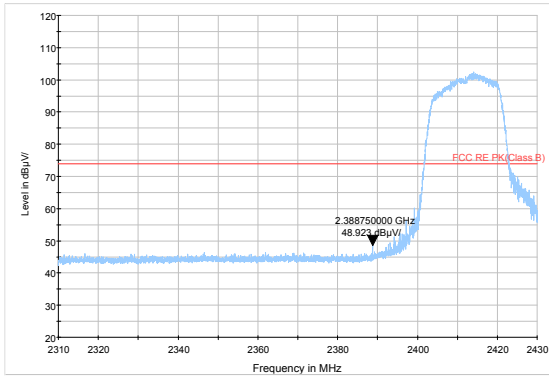
802.11g-Channel 1 Average



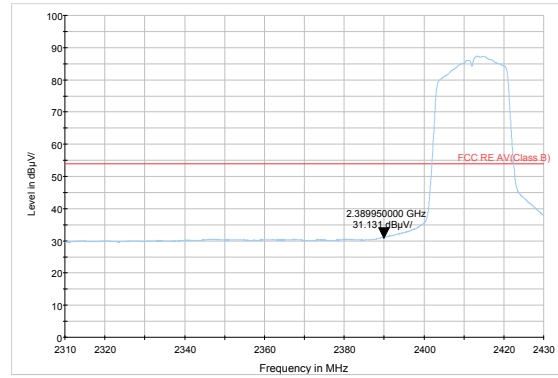
802.11g-Channel 11 Peak



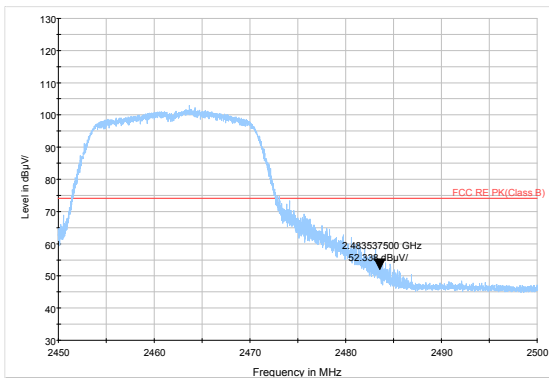
802.11g-Channel 11 Average



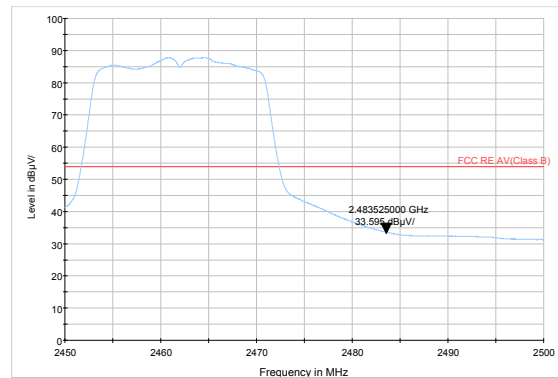
802.11n HT20 -Channel 1 Peak



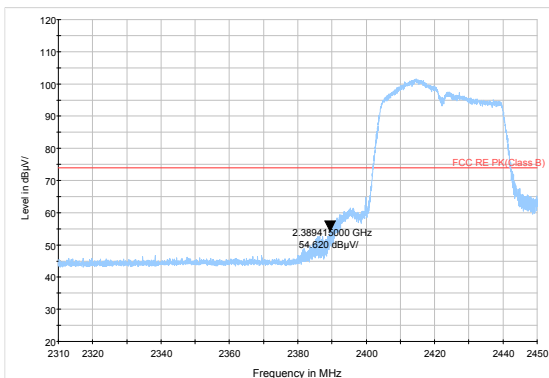
802.11n HT20 -Channel 1 Average



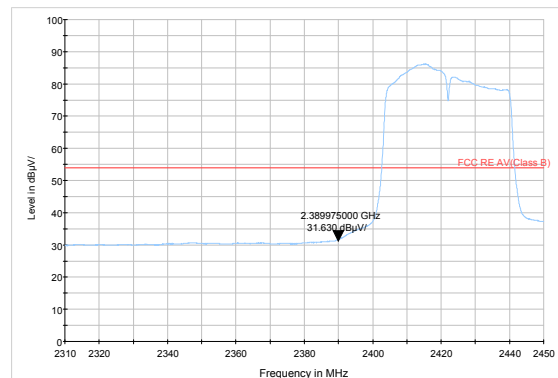
802.11n HT20 -Channel 11 Peak



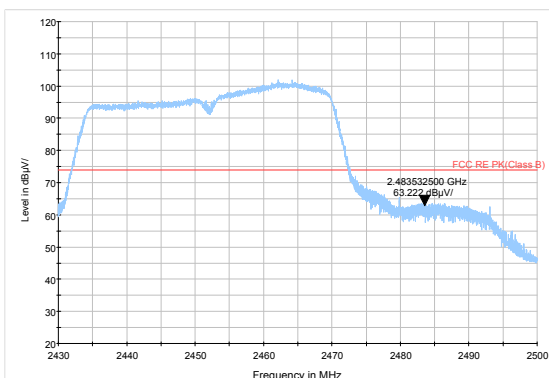
802.11n HT20 -Channel 11 Average



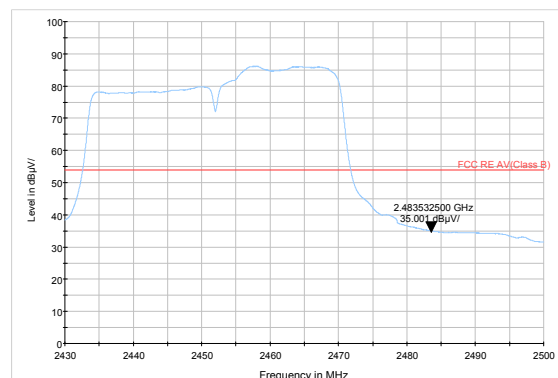
802.11n HT40 -Channel 3 Peak



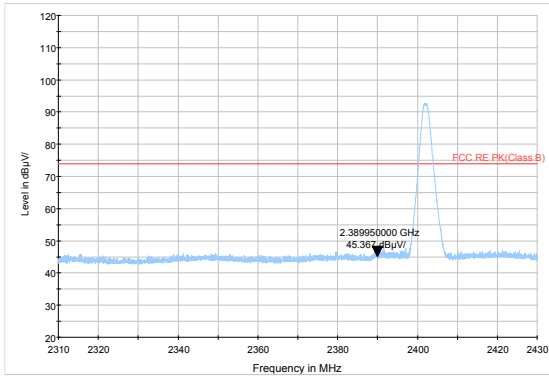
802.11n HT40 -Channel 3 Average



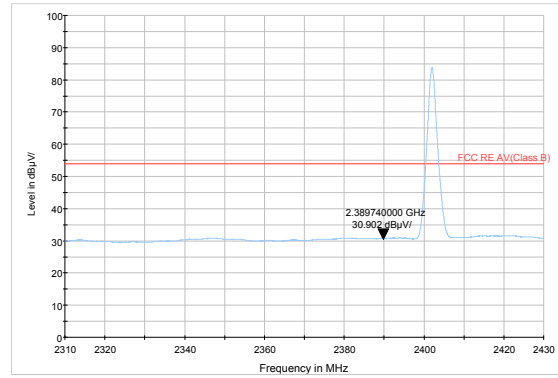
802.11n HT40 -Channel 9 Peak



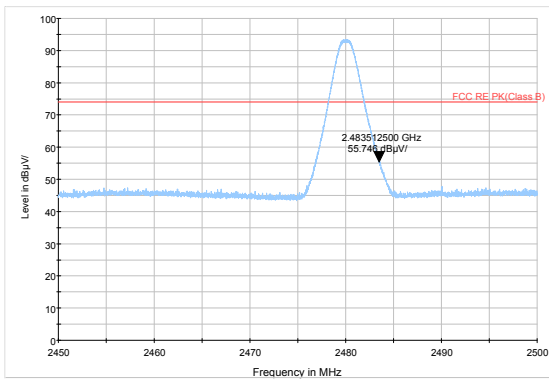
802.11n HT40 -Channel 9 Average



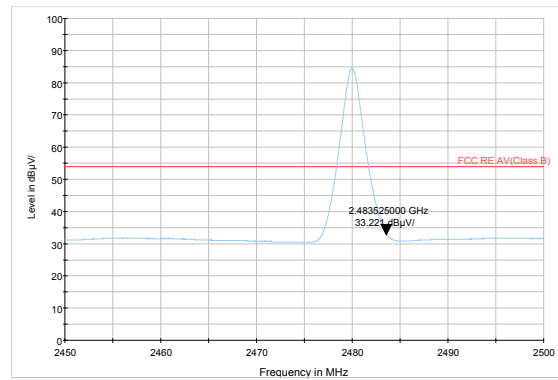
BLE Channel 0 Peak



BLE Channel 0 Average



BLE Channel 39 Peak



BLE Channel 39 Average

Band	T _{on} (ms)	T _(on+off) (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11b	0.94	1.10	0.85	0.70
802.11g	0.17	0.35	0.50	2.99
802.11n HT20	0.16	0.33	0.49	3.09
802.11n HT40	0.10	0.27	0.37	4.37
BLE	0.38	0.63	0.602	2.205

Note: when Duty cycle>0.98, Duty cycle correction Factor not required.

**802.11b-Channel 1**

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2390	45.109	--	200.0	V	135	0.70	45.809	28.191	74
2390	--	30.670	200.0	V	135	0.70	31.370	22.630	54

802.11b-Channel 11

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2483.5	46.363	--	200.0	V	135	0.70	47.063	26.937	74
2483.5	--	31.148	200.0	V	135	0.70	31.848	22.152	54

802.11g-Channel 1

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2390	49.544	--	150	V	65	2.99	52.534	21.466	74
2390	--	32.725	150	V	65	2.99	35.715	18.285	54

802.11g-Channel 11

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2483.5	58.525	--	150	V	78	2.99	61.515	12.485	74
2483.5	--	36.279	150	V	78	2.99	39.269	14.731	54

802.11n HT20 -Channel 1

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2390	48.923	--	200	V	90	3.09	52.013	21.987	74
2390	--	31.131	200	V	90	3.09	34.221	19.779	54

802.11n HT20-Channel 11

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2483.5	52.338	--	200	V	90	3.09	55.428	18.572	74
2483.5	--	33.595	200	V	90	3.09	36.685	17.315	54

**802.11n HT40 -Channel 3**

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2390	54.620	--	150	V	46	4.37	58.990	15.010	74
2390	--	31.630	150	V	46	4.37	36.000	18.000	54

802.11n HT40-Channel 9

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2483.5	63.222	--	150	V	46	4.37	67.592	6.408	74
2483.5	--	35.001	150	V	46	4.37	39.371	14.629	54

BLE Channel 0

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2390	45.367	--	200.0	V	135	2.205	47.572	26.428	74
2390	--	30.902	200.0	V	135	2.205	33.107	20.893	54

BLE Channel 39

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Duty cycle correction Factor(dB)	conclusion value (dBuV/m)	Margin (dB)	Limit (dBuV/m)
2483.5	55.746	--	200.0	V	135	2.205	57.951	16.049	74
2483.5	--	33.221	200.0	V	135	2.205	35.426	18.574	54

Result of RE

Test result

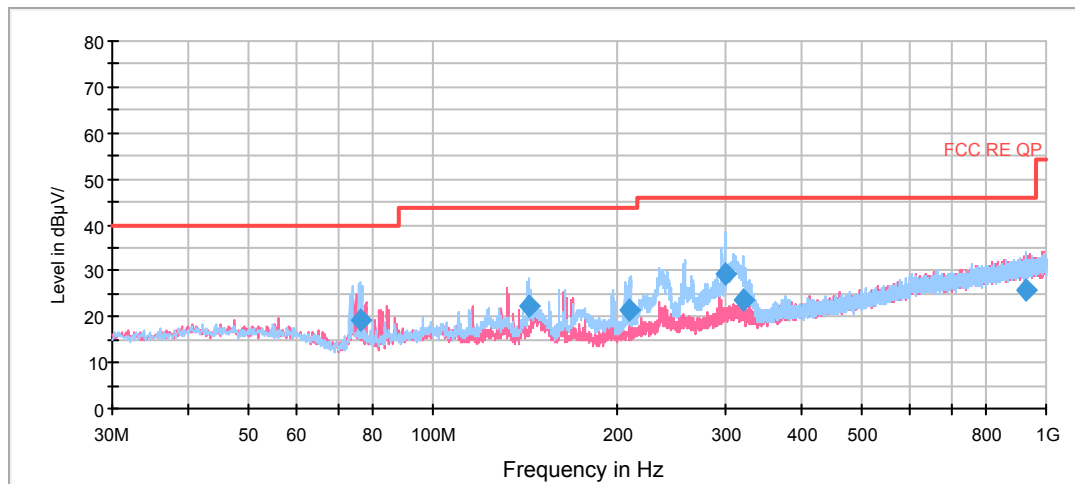
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz and 18GHz-26.5GHz are more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, 802.11b, Channel 11 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Continuous TX mode:

RE EN301489 0.03-1GHz QP Class B



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
76.195000	19.3	10.7	200.0	H	118.0	8.6	20.7	40.0
143.205000	22.5	13.5	100.0	H	240.0	9.0	21.0	43.5
209.655000	21.4	8.8	100.0	H	313.0	12.6	22.1	43.5
299.213750	29.4	13.7	100.0	H	288.0	15.7	16.6	46.0
320.596250	23.6	7.4	100.0	H	34.0	16.2	22.4	46.0
929.997500	25.9	-1.2	200.0	H	336.0	27.1	20.1	46.0

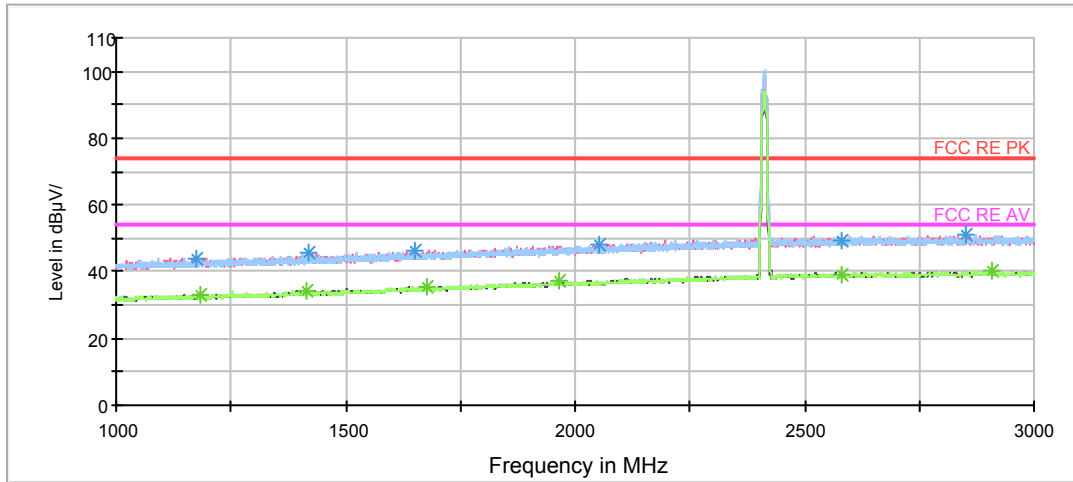
Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak

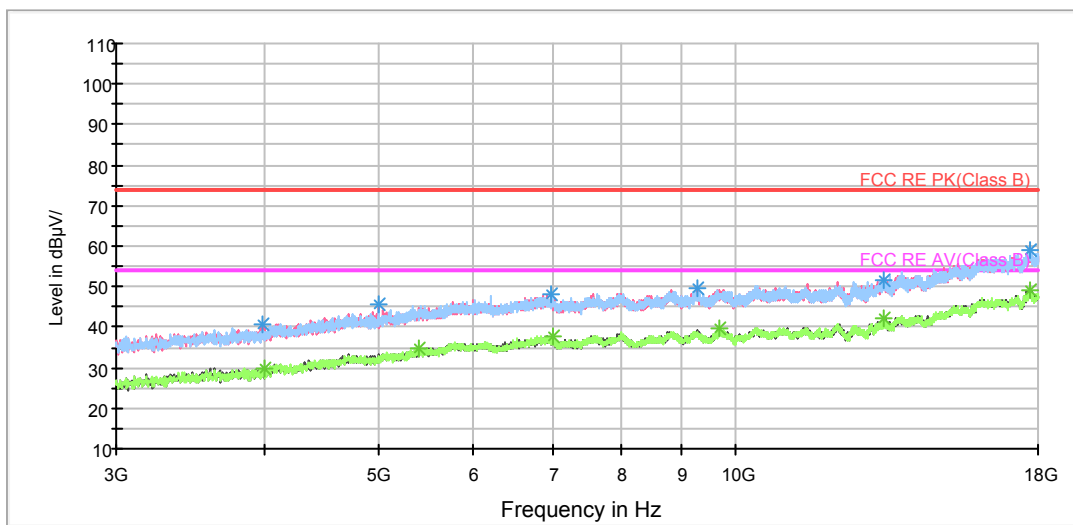
802.11b CH1

RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1173.000000	44.0	100.0	H	300.0	38.4	5.6	30.0	74
1419.500000	45.5	200.0	H	0.0	38.8	6.7	28.5	74
1648.500000	46.4	100.0	H	170.0	38.5	7.9	27.6	74
2054.000000	47.9	100.0	V	344.0	37.9	10.0	26.1	74
2851.000000	51.3	100.0	V	113.0	38.7	12.6	22.7	74
2579.000000	49.1	100.0	V	259.0	36.7	12.4	24.9	74

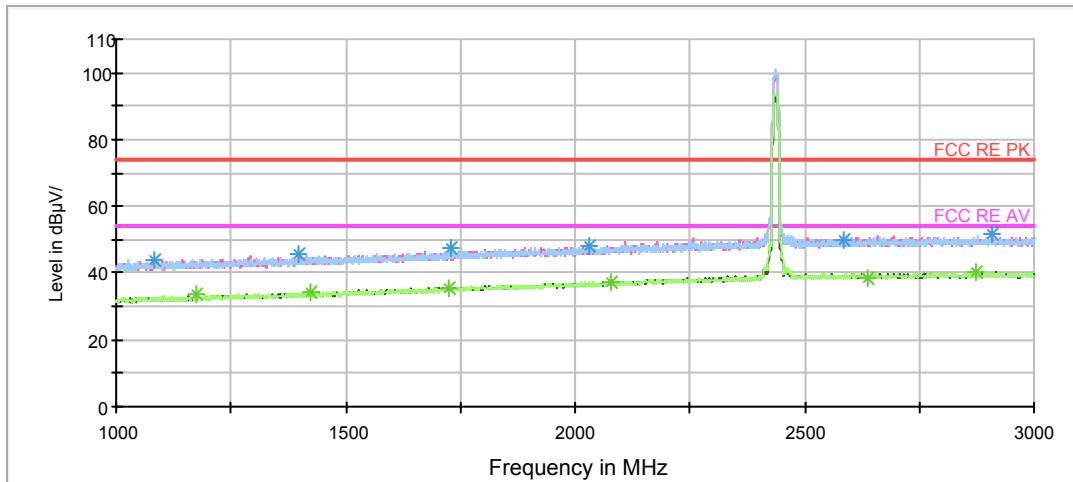
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1184.000000	33.0	200.0	V	0.0	27.3	5.7	21.0	54
1416.000000	34.2	100.0	V	328.0	27.5	6.7	19.8	54
1678.000000	35.6	200.0	V	53.0	27.6	8.0	18.4	54
1964.000000	37.2	100.0	V	350.0	27.6	9.6	16.8	54
2907.000000	40.2	100.0	H	144.0	27.5	12.7	13.8	54
2580.500000	38.8	200.0	V	114.0	26.5	12.3	15.2	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11b CH6

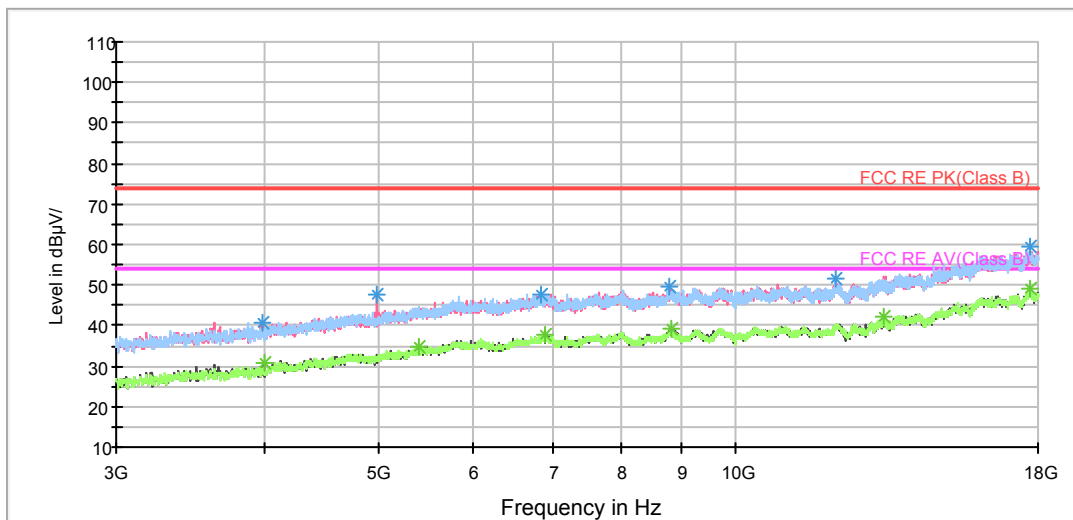
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1085.000000	44.0	200.0	H	279.0	38.7	5.3	30.0	74
1397.500000	45.5	200.0	H	22.0	38.9	6.6	28.5	74
1730.500000	47.7	200.0	V	0.0	39.4	8.3	26.3	74
2028.500000	48.0	100.0	V	140.0	38.1	9.9	26.0	74
2906.500000	51.5	200.0	H	242.0	38.8	12.7	22.5	74
2585.500000	49.6	100.0	V	166.0	37.4	12.2	24.4	74

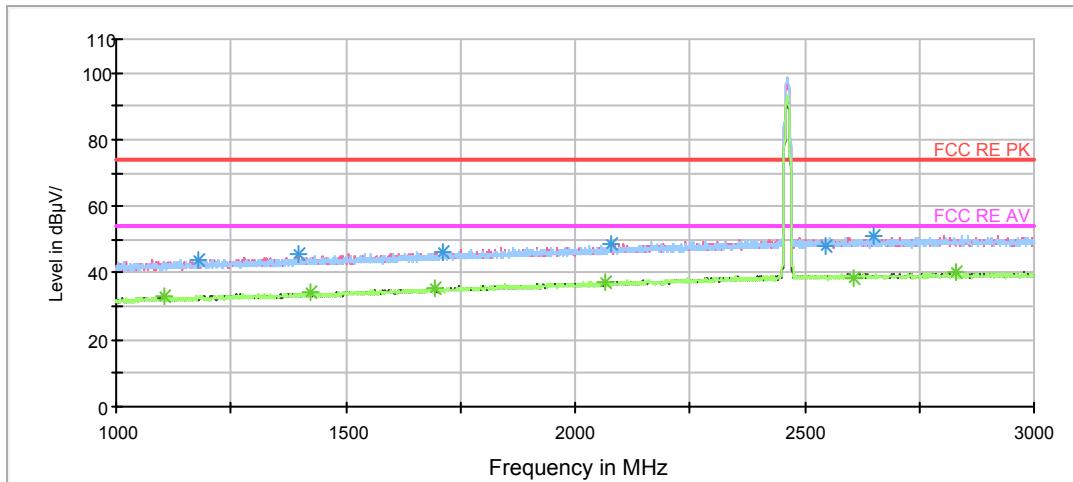
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1174.500000	33.4	100.0	H	45.0	27.8	5.6	20.6	54
1424.000000	34.1	100.0	V	246.0	27.3	6.8	19.9	54
1727.000000	35.6	100.0	V	149.0	27.2	8.4	18.4	54
2080.000000	37.2	200.0	H	317.0	26.9	10.3	16.8	54
2874.000000	40.0	100.0	V	281.0	27.1	12.9	14.0	54
2636.000000	38.7	200.0	V	130.0	26.2	12.5	15.3	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11b CH11

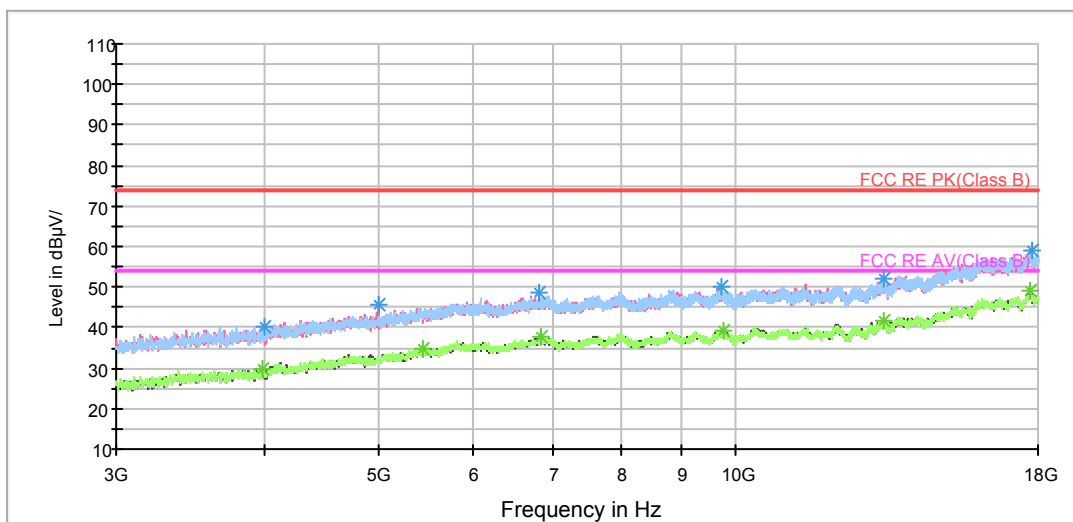
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1177.000000	44.1	200.0	V	5.0	38.5	5.6	29.9	74
1396.500000	45.5	100.0	V	348.0	39.0	6.5	28.5	74
1710.000000	46.3	200.0	H	335.0	38.1	8.2	27.7	74
2076.500000	48.4	100.0	H	136.0	38.3	10.1	25.6	74
2650.500000	51.3	200.0	H	326.0	38.8	12.5	22.7	74
2545.000000	48.1	200.0	V	1.0	35.8	12.3	25.9	74

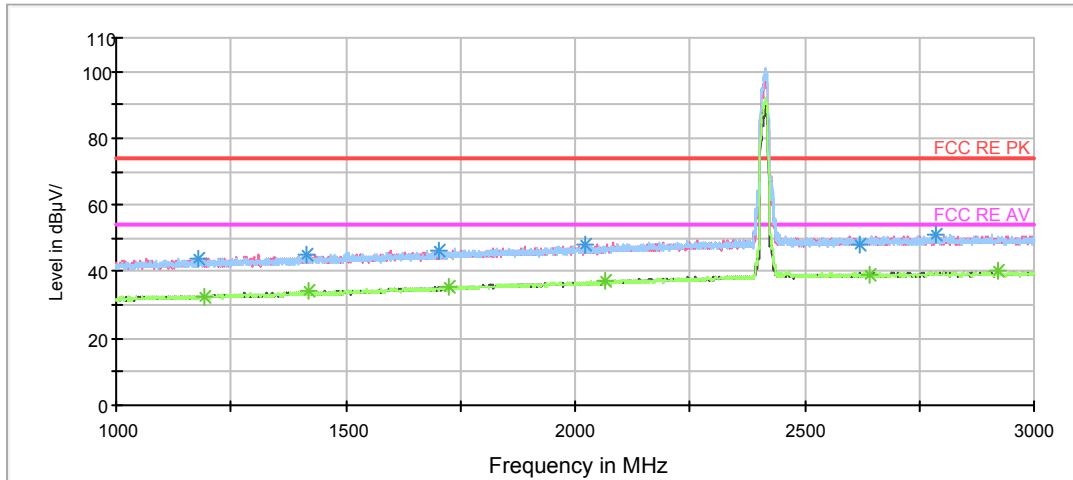
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1104.000000	33.1	200.0	V	238.0	27.6	5.5	20.9	54
1423.000000	34.0	100.0	H	188.0	27.2	6.8	20.0	54
1695.500000	35.8	200.0	V	12.0	27.7	8.1	18.2	54
2066.500000	37.2	200.0	V	18.0	27.1	10.1	16.8	54
2828.000000	40.0	100.0	H	22.0	27.4	12.6	14.0	54
2608.500000	38.6	100.0	V	221.0	26.2	12.4	15.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

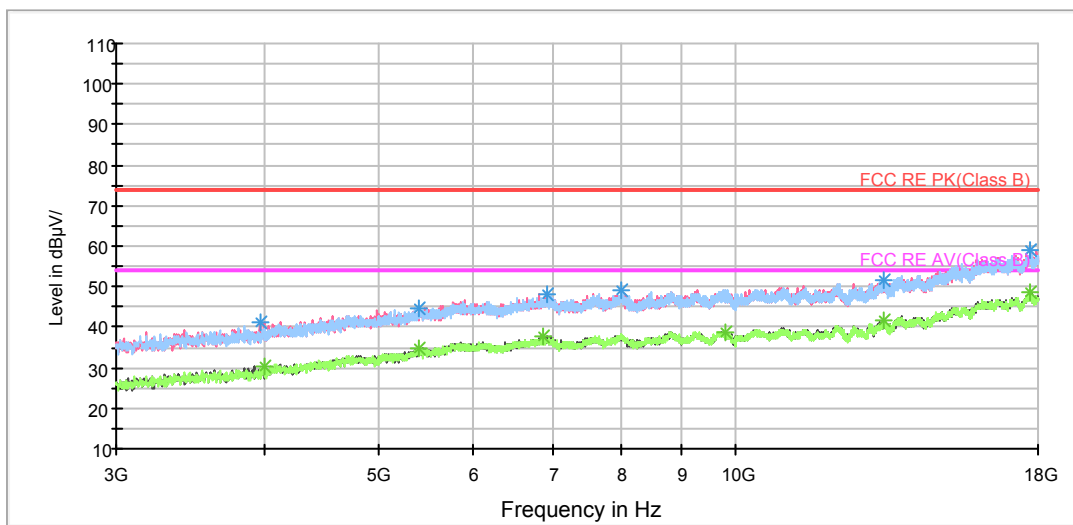
802.11g CH1

RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1180.000000	44.2	200.0	V	0.0	38.6	5.6	29.8	74
1416.000000	45.3	100.0	V	345.0	38.6	6.7	28.7	74
1705.000000	46.2	200.0	H	357.0	38.1	8.1	27.8	74
2023.500000	48.3	200.0	H	358.0	38.4	9.9	25.7	74
2784.500000	51.2	200.0	V	98.0	38.5	12.7	22.8	74
2618.000000	48.4	200.0	V	0.0	36.0	12.4	25.6	74

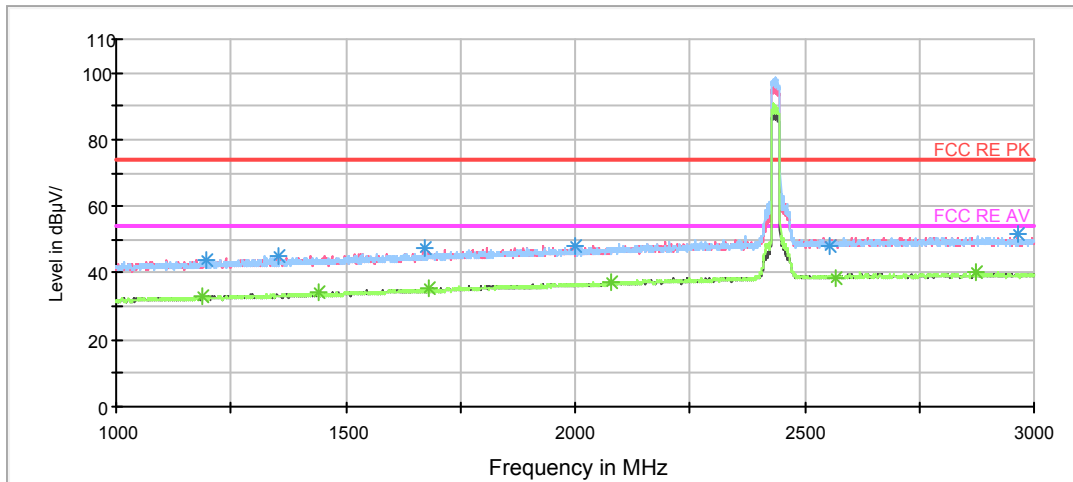
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1193.500000	32.8	200.0	V	125.0	27.1	5.7	21.2	54
1419.000000	34.3	200.0	H	185.0	27.6	6.7	19.7	54
1726.000000	35.5	100.0	H	14.0	27.1	8.4	18.5	54
2067.500000	37.2	100.0	H	219.0	27.0	10.2	16.8	54
2920.500000	40.1	200.0	H	307.0	27.2	12.9	13.9	54
2640.000000	39.2	100.0	V	0.0	26.8	12.4	14.8	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11g CH6

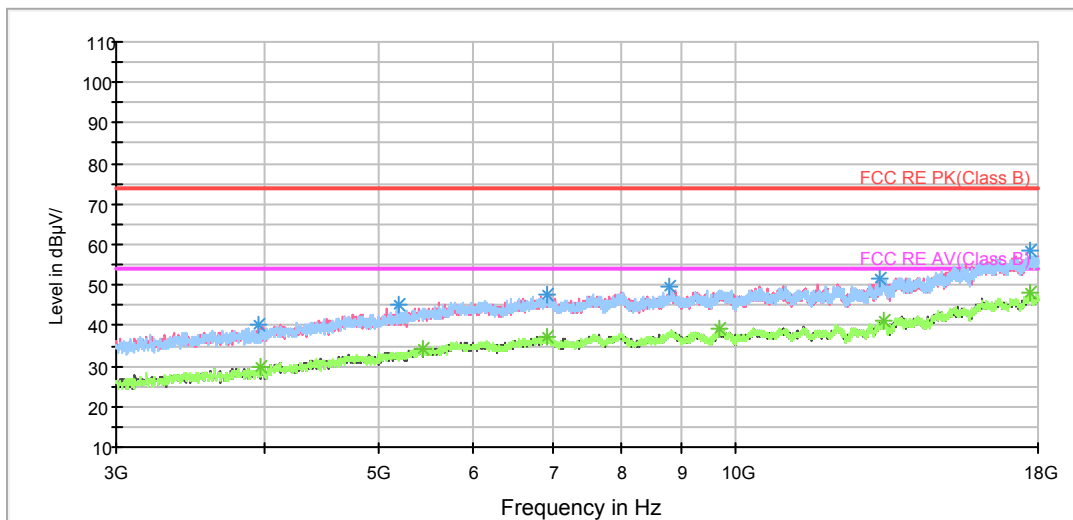
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1196.000000	43.7	100.0	H	0.0	38.0	5.7	30.3	74
1352.000000	45.0	200.0	V	237.0	38.6	6.4	29.0	74
1674.500000	47.6	200.0	H	335.0	39.7	7.9	26.4	74
2001.000000	48.0	200.0	H	195.0	38.4	9.6	26.0	74
2963.000000	51.4	100.0	V	227.0	38.7	12.7	22.6	74
2555.500000	48.3	100.0	V	236.0	35.9	12.4	25.7	74

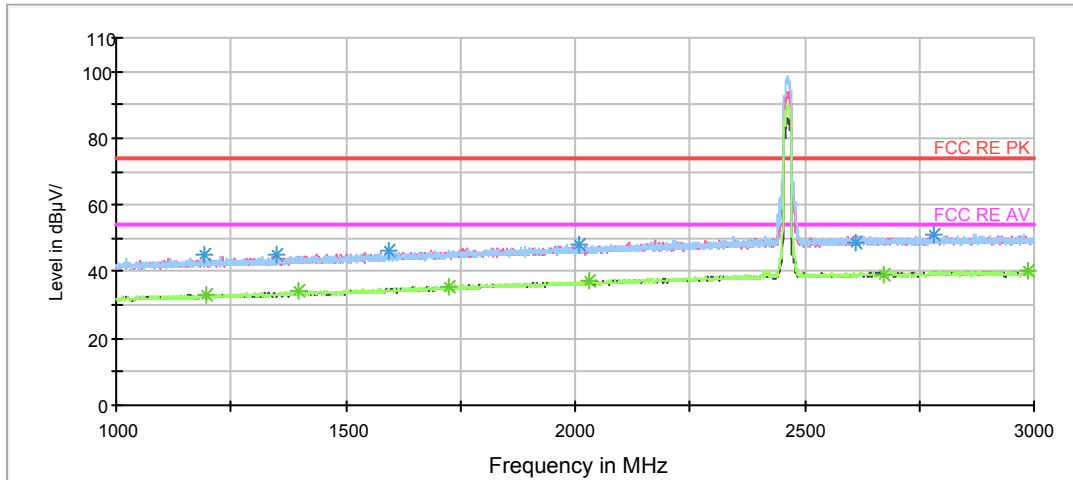
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1189.000000	33.1	100.0	H	23.0	27.4	5.7	20.9	54
1441.000000	34.0	100.0	V	356.0	27.2	6.8	20.0	54
1680.000000	35.4	100.0	V	18.0	27.3	8.1	18.6	54
2079.000000	37.3	100.0	V	324.0	27.1	10.2	16.7	54
2872.000000	40.2	100.0	H	6.0	27.4	12.8	13.8	54
2568.000000	38.4	200.0	V	62.0	26.1	12.3	15.6	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

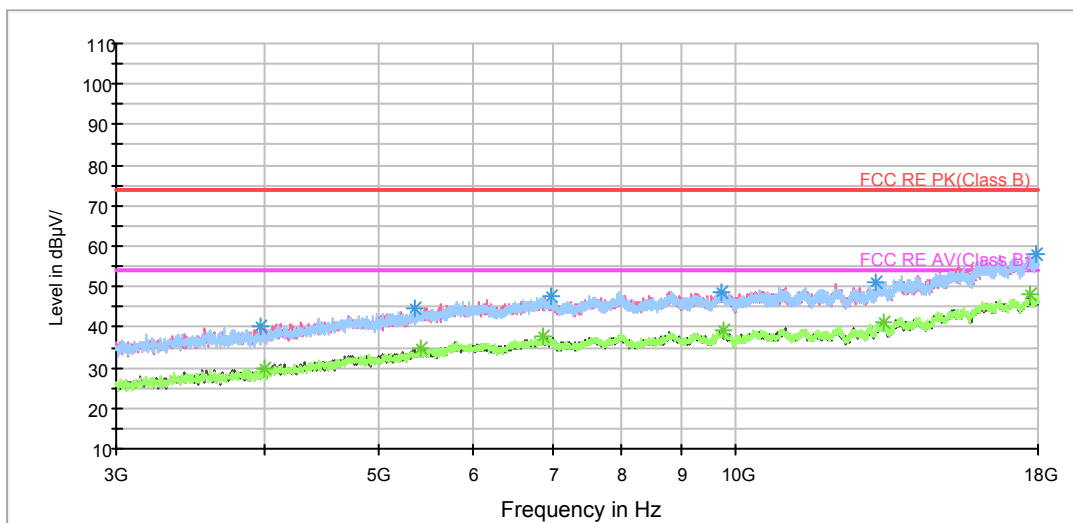
802.11g CH11

RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1190.000000	45.1	200.0	V	36.0	39.4	5.7	28.9	74
1351.000000	45.1	100.0	V	122.0	38.8	6.3	28.9	74
1594.000000	46.3	200.0	H	0.0	38.7	7.6	27.7	74
2009.000000	48.0	200.0	V	140.0	38.3	9.7	26.0	74
2782.500000	51.1	100.0	H	191.0	38.4	12.7	22.9	74
2613.000000	49.0	200.0	V	27.0	36.8	12.2	25.0	74

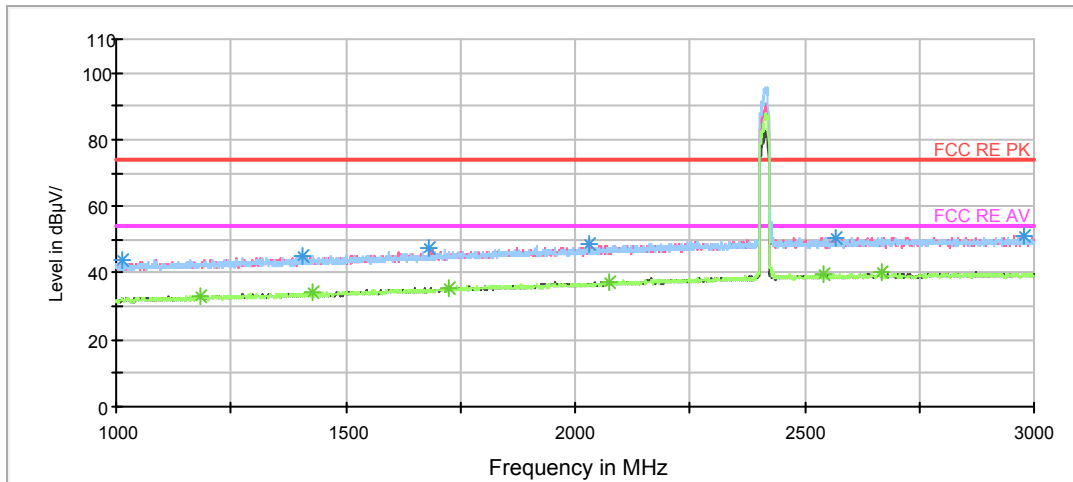
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1194.500000	33.1	200.0	H	349.0	27.4	5.7	20.9	54
1399.000000	34.1	100.0	V	0.0	27.5	6.6	19.9	54
1724.500000	35.6	200.0	H	265.0	27.1	8.5	18.4	54
2032.000000	37.3	100.0	H	108.0	27.3	10.0	16.7	54
2988.500000	40.4	200.0	H	343.0	27.6	12.8	13.6	54
2673.000000	38.9	200.0	V	3.0	26.7	12.2	15.1	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH1

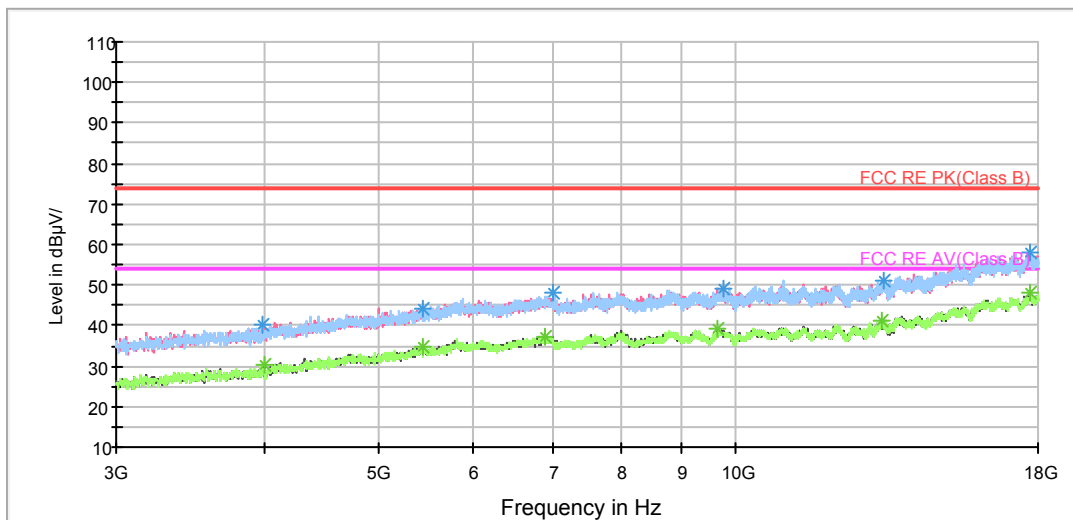
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1013.500000	44.1	100.0	V	193.0	39.0	5.1	29.9	74
1406.500000	45.2	100.0	V	340.0	38.6	6.6	28.8	74
1683.000000	47.3	200.0	V	138.0	39.2	8.1	26.7	74
2029.000000	48.4	200.0	V	7.0	38.5	9.9	25.6	74
2567.500000	50.6	100.0	V	0.0	38.3	12.3	23.4	74
2978.000000	51.1	100.0	V	95.0	38.2	12.9	22.9	74

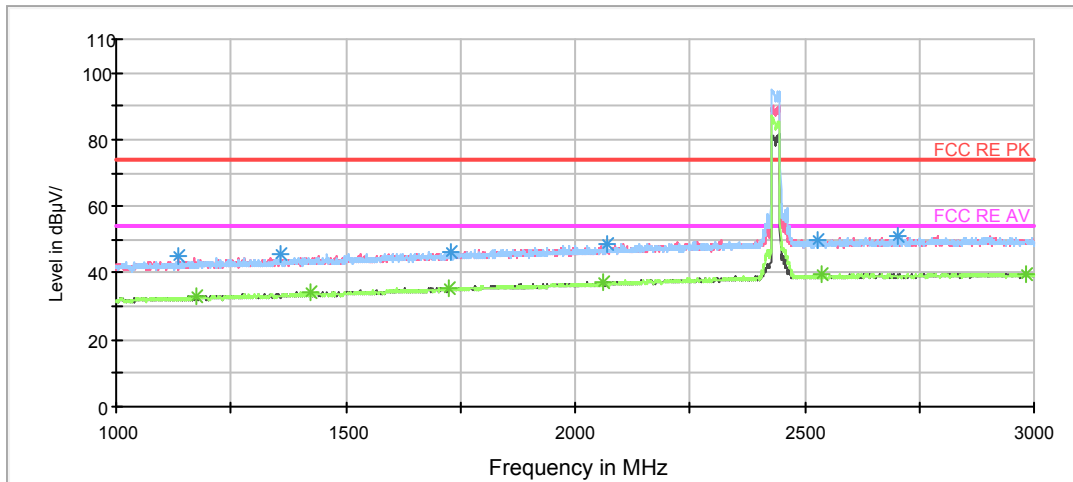
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1183.500000	33.1	100.0	H	117.0	27.4	5.7	20.9	54
1429.500000	34.0	200.0	H	193.0	27.2	6.8	20.0	54
1725.000000	35.7	100.0	V	193.0	27.2	8.5	18.3	54
2073.500000	37.2	100.0	V	140.0	27.1	10.1	16.8	54
2542.000000	39.8	200.0	H	114.0	27.3	12.5	14.2	54
2669.000000	40.2	100.0	H	9.0	27.8	12.4	13.8	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH6

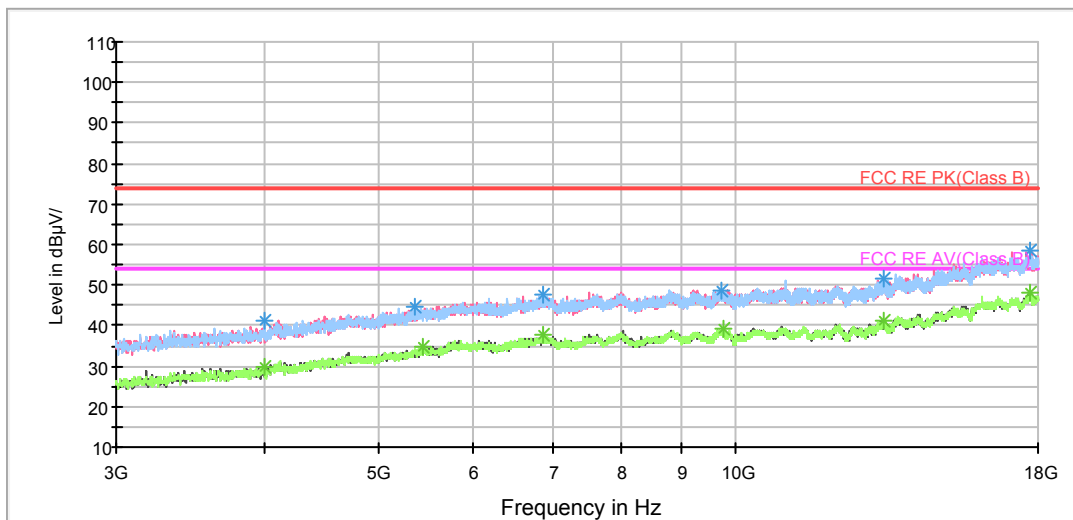
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1134.000000	45.3	100.0	V	236.0	40.0	5.3	28.7	74
1356.000000	45.5	100.0	H	0.0	39.2	6.3	28.5	74
1728.500000	46.1	100.0	V	0.0	37.8	8.3	27.9	74
2068.000000	49.0	200.0	H	238.0	38.8	10.2	25.0	74
2526.500000	49.9	200.0	V	106.0	37.8	12.1	24.1	74
2701.000000	51.1	200.0	V	114.0	38.7	12.4	22.9	74

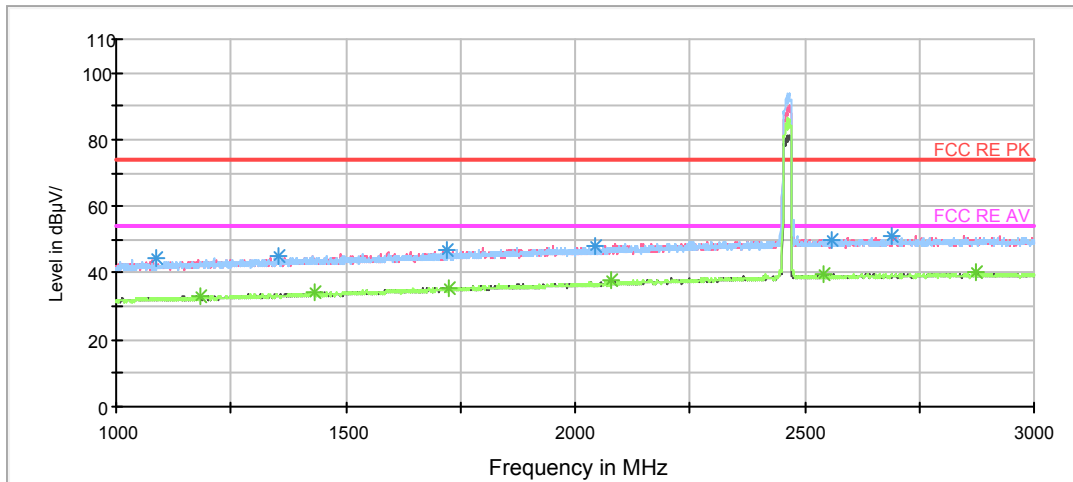
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1176.500000	33.1	100.0	V	246.0	27.5	5.6	20.9	54
1421.500000	34.2	100.0	V	298.0	27.4	6.8	19.8	54
1724.000000	35.6	100.0	H	254.0	27.1	8.5	18.4	54
2059.500000	37.2	200.0	V	340.0	27.2	10.0	16.8	54
2539.000000	39.5	200.0	V	2.0	27.1	12.4	14.5	54
2981.500000	39.9	100.0	V	2.0	27.0	12.9	14.1	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH11

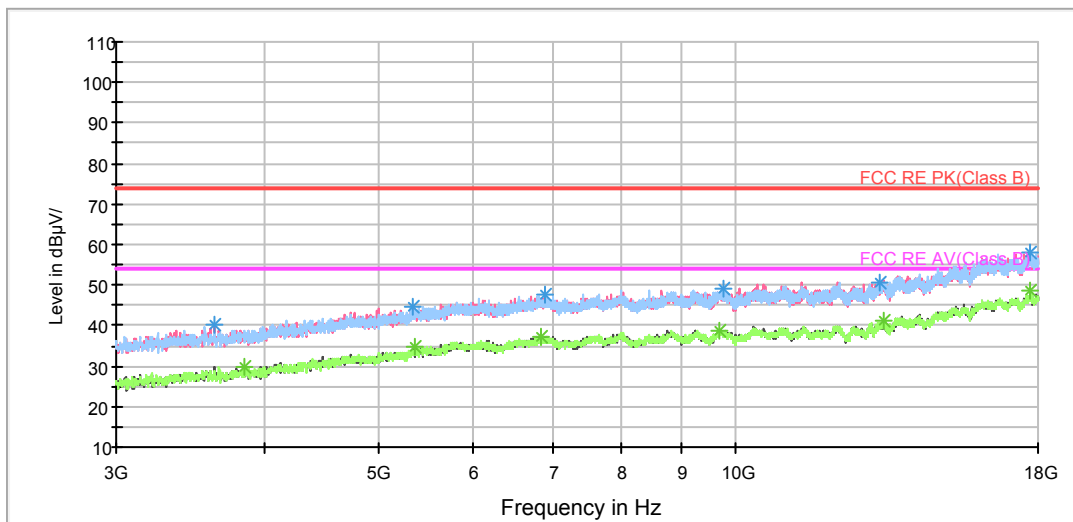
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1085.500000	44.4	200.0	H	202.0	39.1	5.3	29.6	74
1355.000000	45.1	200.0	H	282.0	38.8	6.3	28.9	74
1718.500000	47.1	200.0	H	299.0	38.8	8.3	26.9	74
2042.000000	48.3	100.0	V	149.0	38.4	9.9	25.7	74
2560.500000	50.0	100.0	H	282.0	37.6	12.4	24.0	74
2689.000000	51.1	200.0	V	70.0	38.6	12.5	22.9	74

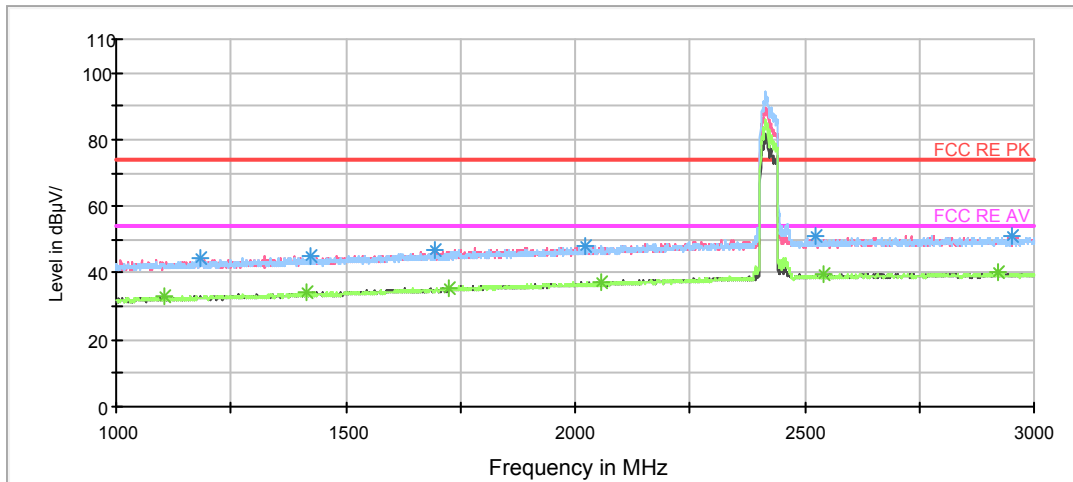
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1183.000000	33.0	100.0	H	59.0	27.3	5.7	21.0	54
1433.500000	34.2	100.0	H	11.0	27.4	6.8	19.8	54
1724.500000	35.5	200.0	V	18.0	27.0	8.5	18.5	54
2080.000000	37.7	200.0	H	150.0	27.4	10.3	16.3	54
2539.500000	39.6	100.0	V	354.0	27.2	12.4	14.4	54
2872.000000	40.1	200.0	V	212.0	27.3	12.8	13.9	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH3

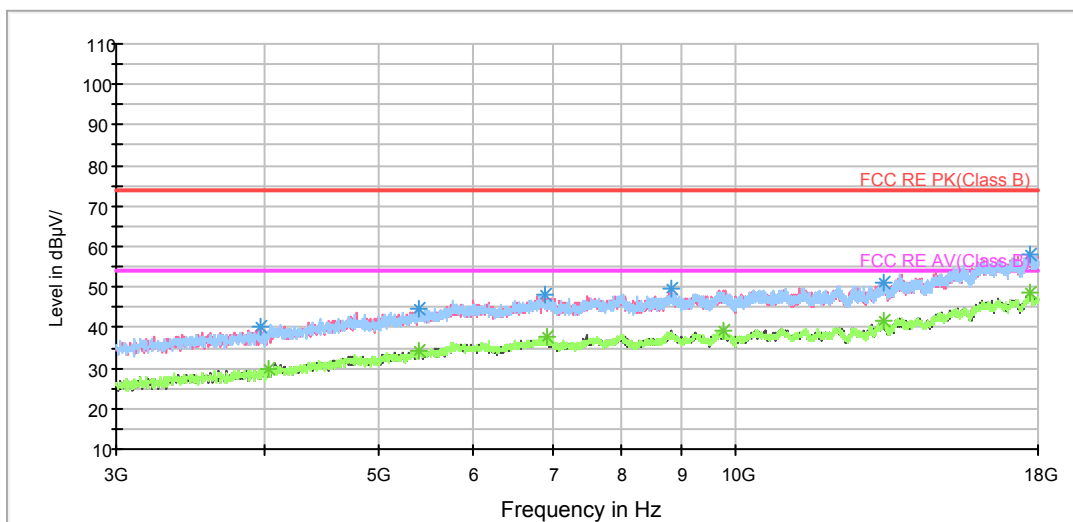
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1184.500000	44.4	100.0	H	4.0	38.7	5.7	29.6	74
1423.000000	45.1	100.0	H	1.0	38.3	6.8	28.9	74
1693.500000	46.6	200.0	V	3.0	38.6	8.0	27.4	74
2023.000000	48.0	200.0	H	50.0	38.1	9.9	26.0	74
2952.500000	51.1	100.0	V	326.0	38.3	12.8	22.9	74
2526.000000	50.9	100.0	H	4.0	38.8	12.1	23.1	74

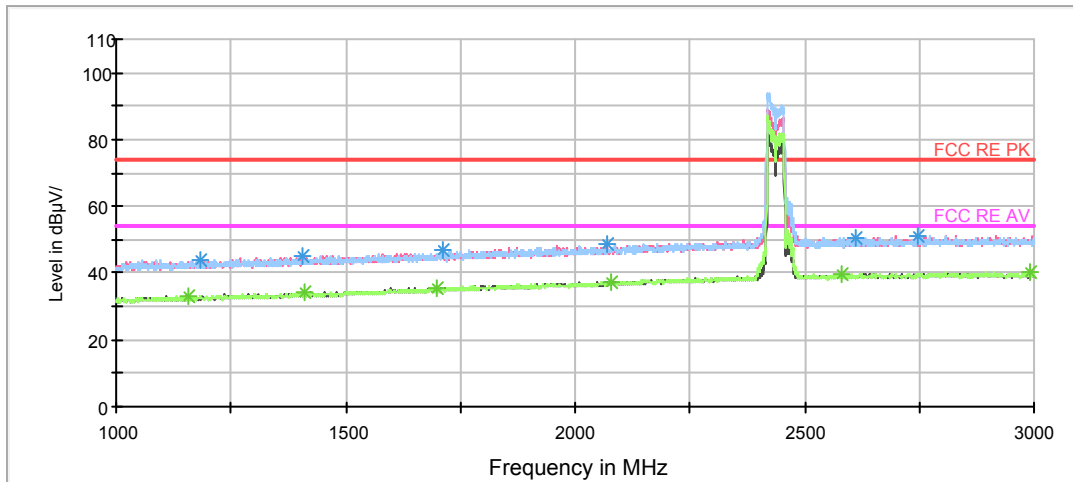
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1105.000000	33.1	100.0	H	0.0	27.7	5.4	20.9	54
1417.000000	34.1	100.0	H	17.0	27.4	6.7	19.9	54
1726.000000	35.6	200.0	H	304.0	27.2	8.4	18.4	54
2058.500000	37.3	100.0	V	95.0	27.3	10.0	16.7	54
2923.000000	40.0	100.0	V	326.0	27.2	12.8	14.0	54
2542.500000	39.7	200.0	V	25.0	27.2	12.5	14.3	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH6

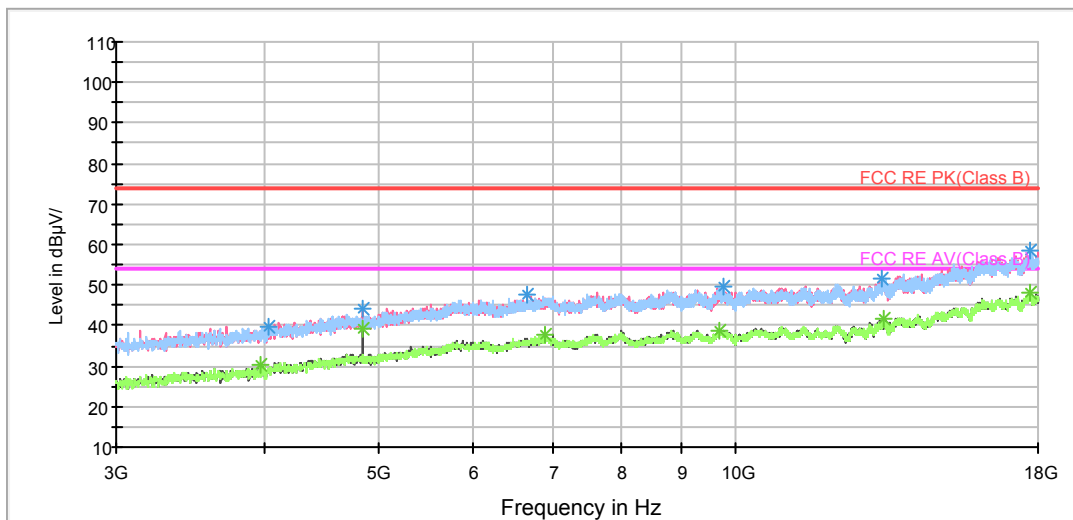
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1184.500000	44.0	200.0	H	268.0	38.3	5.7	30.0	74
1407.500000	45.1	100.0	H	60.0	38.5	6.6	28.9	74
1710.500000	47.0	100.0	V	317.0	38.8	8.2	27.0	74
2068.500000	48.5	100.0	V	0.0	38.3	10.2	25.5	74
2748.500000	51.2	100.0	V	291.0	38.6	12.6	22.8	74
2612.000000	50.6	100.0	H	148.0	38.3	12.3	23.4	74

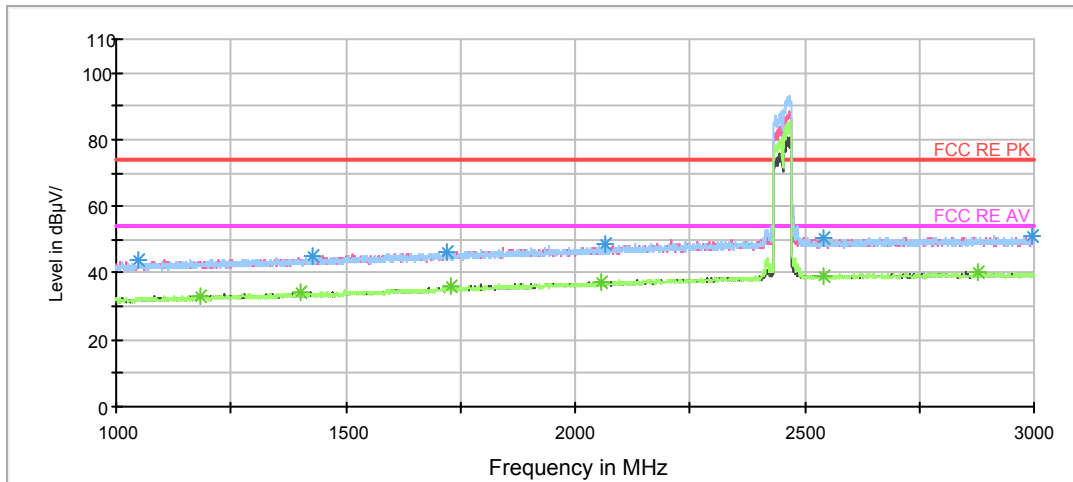
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1158.500000	33.1	100.0	V	355.0	27.7	5.4	20.9	54
1412.500000	34.2	100.0	H	219.0	27.5	6.7	19.8	54
1698.000000	35.4	200.0	H	335.0	27.2	8.2	18.6	54
2078.000000	37.2	200.0	V	17.0	27.0	10.2	16.8	54
2993.000000	40.2	100.0	V	78.0	27.5	12.7	13.8	54
2580.000000	39.6	200.0	V	87.0	27.2	12.4	14.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH9

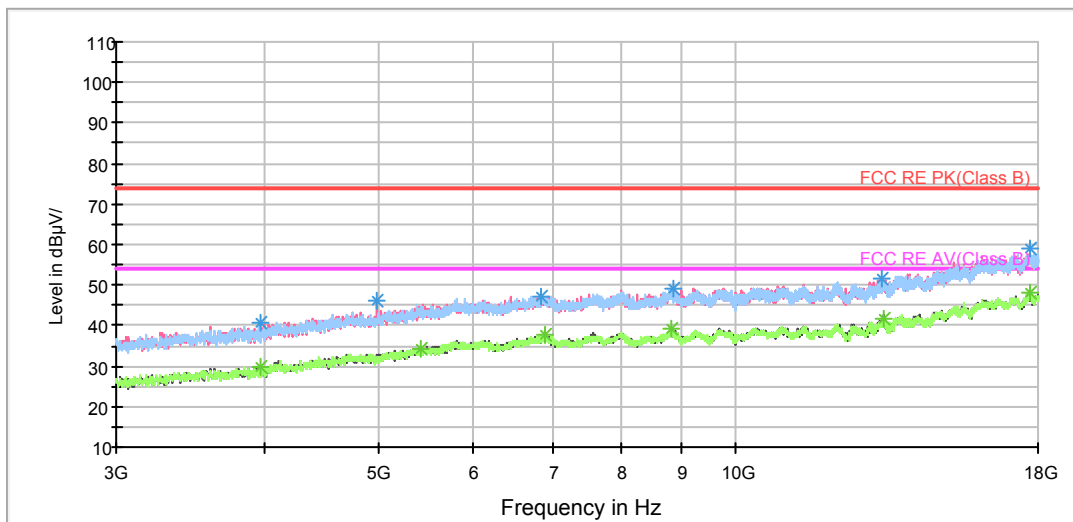
RE 1G-6GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1047.000000	44.2	200.0	V	229.0	39.1	5.1	29.8	74
1429.500000	44.9	200.0	H	348.0	38.1	6.8	29.1	74
1720.000000	46.5	100.0	H	1.0	38.2	8.3	27.5	74
2066.500000	48.8	100.0	V	346.0	38.7	10.1	25.2	74
2997.500000	51.2	200.0	V	4.0	38.5	12.7	22.8	74
2539.500000	50.6	100.0	H	143.0	38.2	12.4	23.4	74

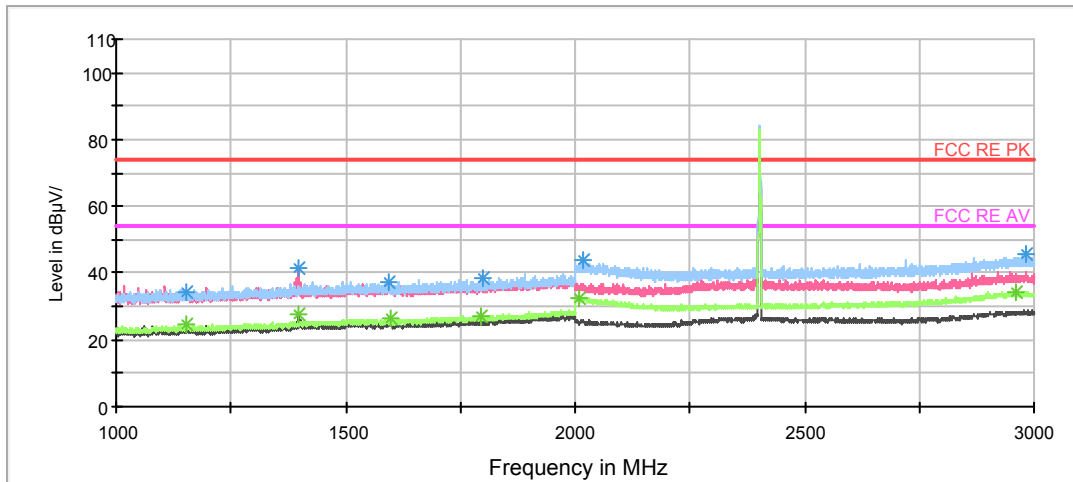
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1182.000000	33.0	200.0	V	169.0	27.3	5.7	21.0	54
1402.000000	34.1	100.0	H	0.0	27.5	6.6	19.9	54
1727.500000	35.8	100.0	V	259.0	27.5	8.3	18.2	54
2058.500000	37.1	200.0	V	108.0	27.1	10.0	16.9	54
2876.000000	40.2	100.0	V	339.0	27.5	12.7	13.8	54
2542.500000	39.0	200.0	H	127.0	26.5	12.5	15.0	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BLE-Channel 0

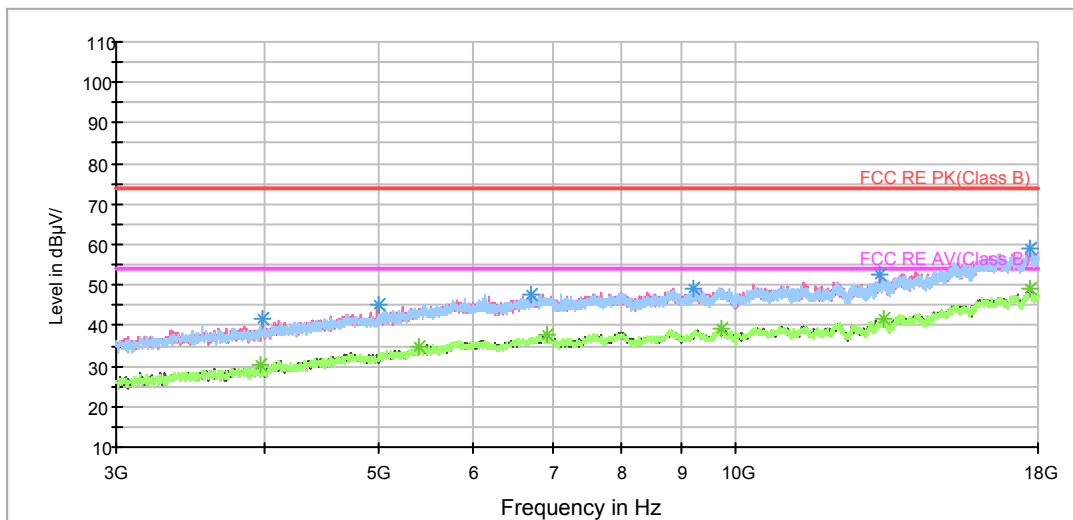
FCC RE 1G-3GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.750000	34.5	200.0	H	347.0	39.7	-5.2	39.5	74
1395.750000	41.7	100.0	V	38.0	45.2	-3.5	32.3	74
1595.250000	37.0	200.0	H	0.0	39.8	-2.8	37.0	74
1797.750000	38.3	200.0	V	110.0	40.1	-1.8	35.7	74
2017.250000	44.0	200.0	H	352.0	44.1	-0.1	30.0	74
2982.250000	45.9	200.0	H	359.0	42.9	3.0	28.1	74

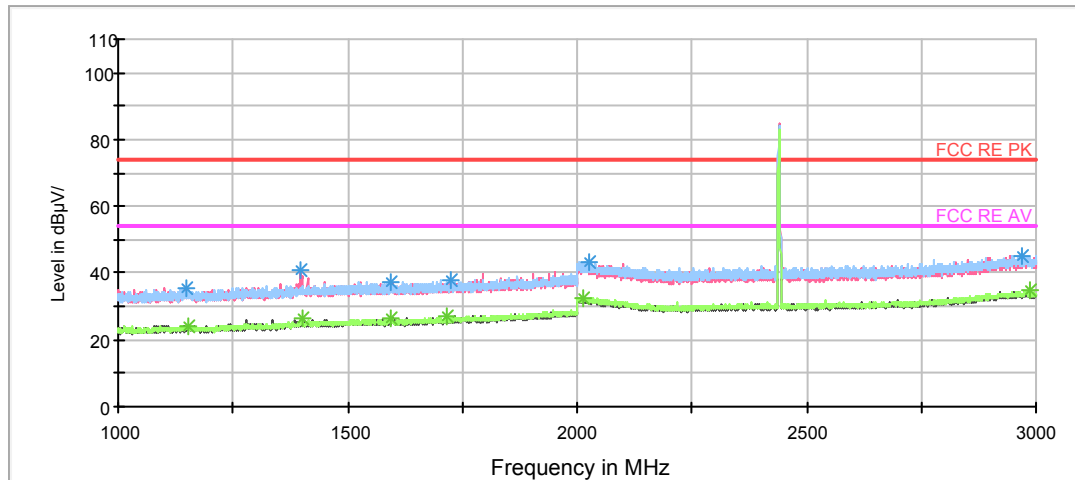
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1155.000000	24.6	200.0	H	341.0	29.7	-5.1	29.4	54
1399.000000	27.4	100.0	V	0.0	30.8	-3.4	26.6	54
1598.250000	26.7	100.0	V	207.0	29.4	-2.7	27.3	54
1794.500000	26.8	200.0	H	0.0	28.6	-1.8	27.2	54
2007.500000	32.7	200.0	H	352.0	32.9	-0.2	21.3	54
2962.500000	34.3	200.0	H	0.0	31.4	2.9	19.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BLE-Channel 19

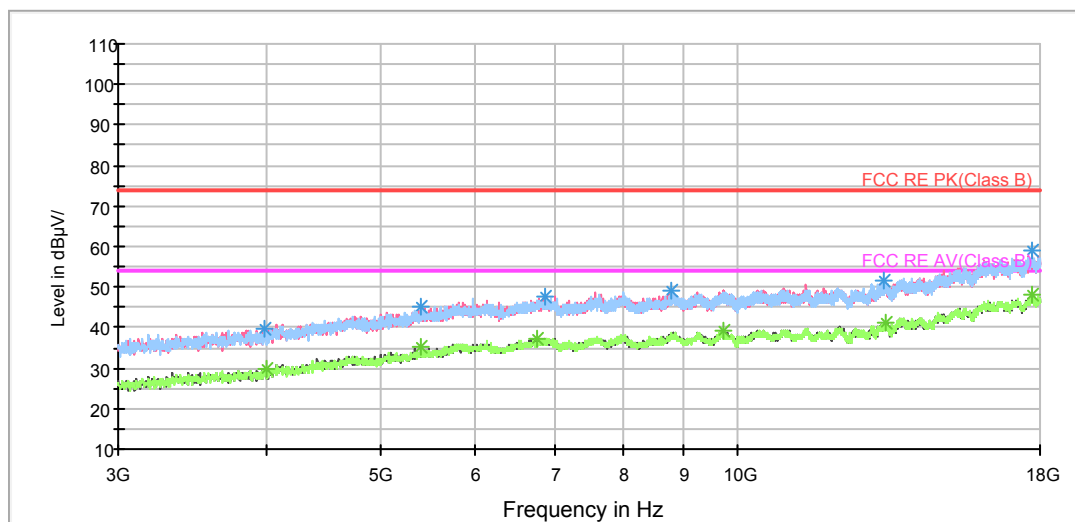
FCC RE 1G-3GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1147.500000	35.5	100.0	V	0.0	40.7	-5.2	38.5	74
1398.500000	40.6	100.0	V	38.0	44.0	-3.4	33.4	74
1595.750000	37.2	100.0	V	354.0	40.0	-2.8	36.8	74
1722.750000	38.1	100.0	V	359.0	40.2	-2.1	35.9	74
2026.000000	43.2	100.0	V	359.0	43.2	0.0	30.8	74
2967.250000	45.2	200.0	H	350.0	42.4	2.8	28.8	74

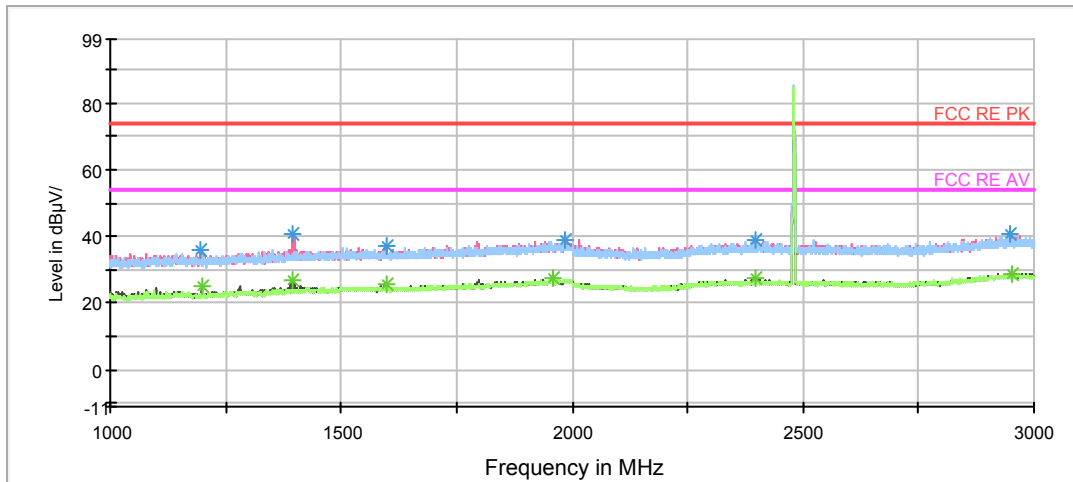
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1154.000000	24.3	200.0	H	0.0	29.5	-5.2	29.7	54
1399.750000	26.2	100.0	V	0.0	29.6	-3.4	27.8	54
1595.250000	26.4	100.0	V	354.0	29.2	-2.8	27.6	54
1716.750000	27.0	100.0	V	359.0	29.2	-2.2	27.0	54
2014.250000	32.6	100.0	V	359.0	32.7	-0.1	21.4	54
2988.250000	34.6	200.0	H	353.0	31.6	3.0	19.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BLE-Channel 39

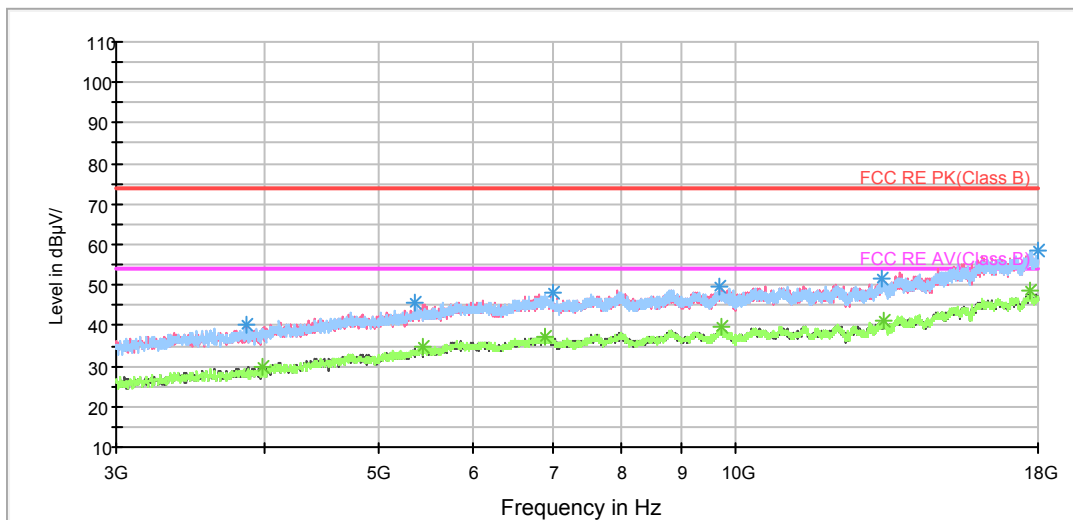
FCC RE 1G-3GHz PK+AV Class B



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

RE 3-18GHz PK+AV



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1196.250000	35.9	200.0	V	114.0	40.8	-4.9	38.1	74
1395.250000	40.8	100.0	V	134.0	44.3	-3.5	33.2	74
1597.500000	37.3	200.0	V	14.0	40.0	-2.7	36.7	74
1984.250000	39.1	200.0	V	174.0	39.5	-0.4	34.9	74
2397.250000	38.9	200.0	V	3.0	37.1	1.8	35.1	74
2947.250000	40.5	100.0	V	344.0	37.7	2.8	33.5	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1197.500000	25.2	100.0	V	159.0	30.1	-4.9	28.8	54
1395.250000	26.6	100.0	V	134.0	30.1	-3.5	27.4	54
1597.750000	25.9	100.0	V	122.0	28.6	-2.7	28.1	54
1957.250000	27.2	100.0	H	22.0	27.7	-0.5	26.8	54
2396.250000	27.6	200.0	V	1.0	25.7	1.9	26.4	54
2952.000000	28.8	100.0	V	0.0	25.9	2.9	25.2	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

5.7. Conducted Emission

Ambient condition

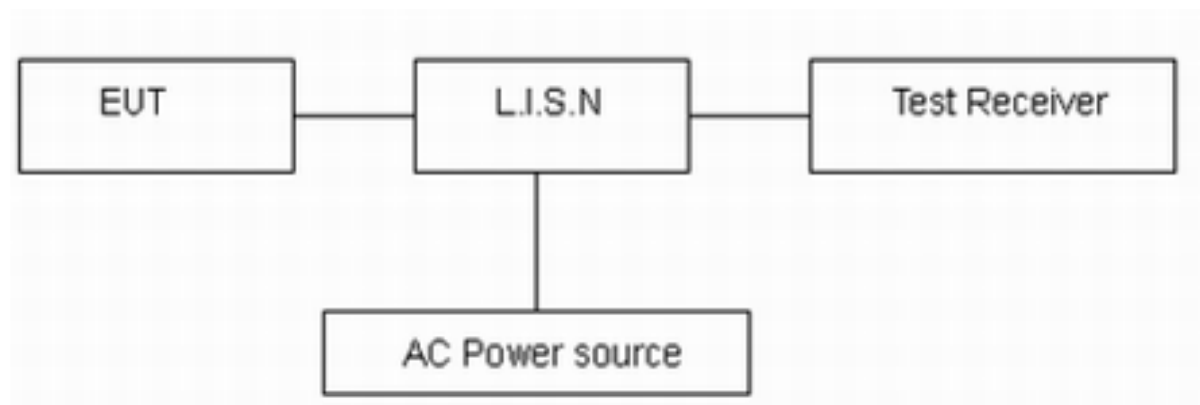
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10-2013. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

*: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 2.69$ dB.



Test Results:

This device is DC power supply, so this item is not application

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Spectrum Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-201	2017-11-18	2020-11-17
Double Ridged Waveguide Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-11-18	2020-11-17
Standard Gain Horn	ETS-Lindgren	3160-09	00102644	2015-01-30	2020-01-29
EMI Test Receiver	R&S	ESR	101667	2017-09-06	2018-09-05
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Spectrum Analyzer	Agilent	N9010A	MY47191109	2018-05-20	2019-05-19
Power Meter	R&S	NRP2	1144.1374K02 -104306-EX	2017-12-21	2018-12-20
Power Sensor	R&S	NRP-Z21	104799	2018-05-20	2019-05-19
RF Cable	Agilent	SMA 15cm	0001	/	/
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance

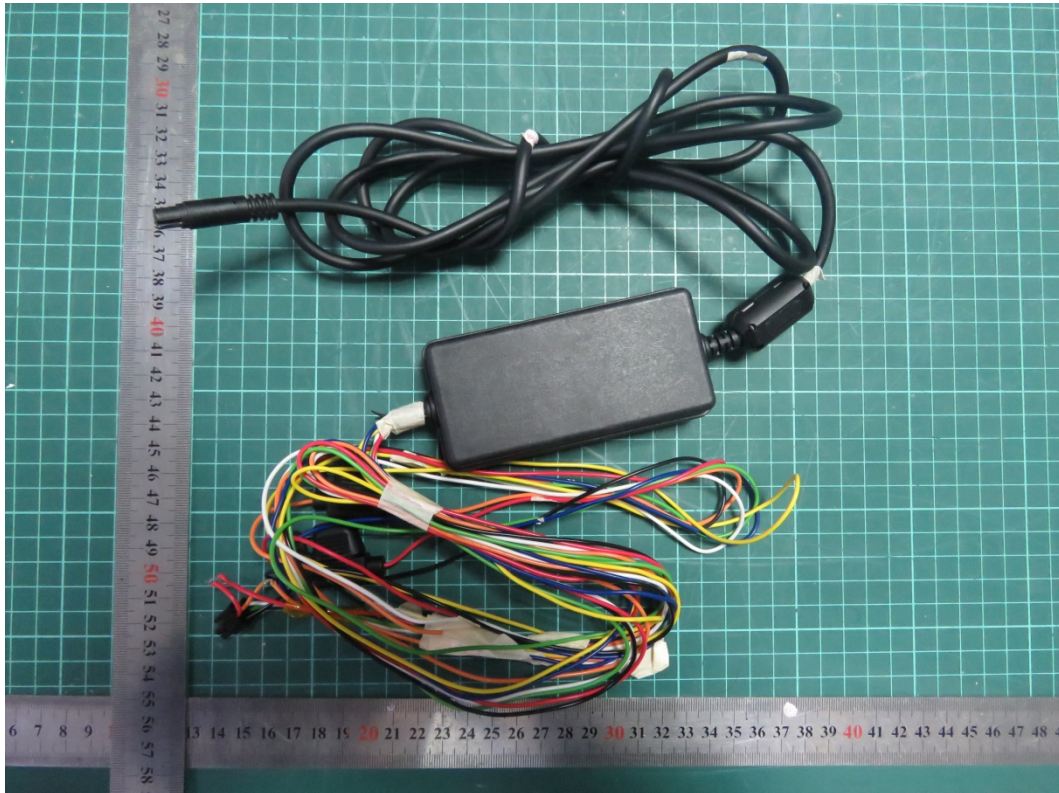


Front Side



Back Side

a: EUT



b: AutoRing A2 Power Cable

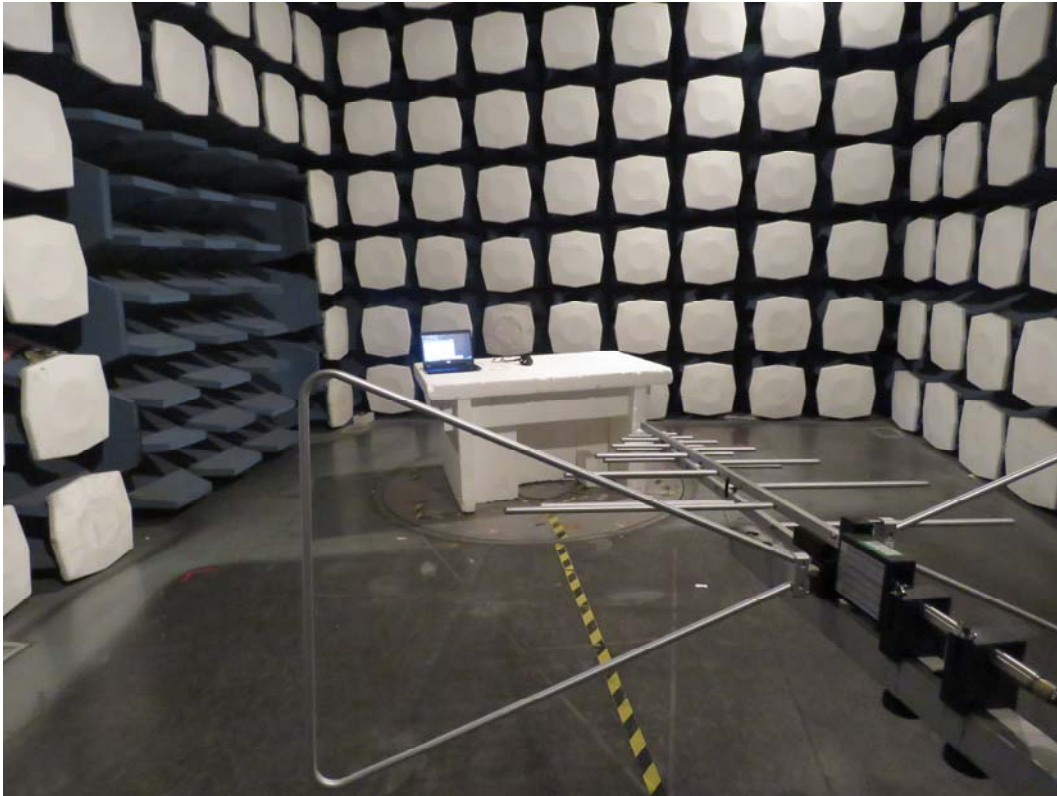




c:Camera

Picture 1 EUT and Accessory

A.2 Test Setup



30MHz-1GHz



Above 1GHz

Picture 2 Radiated Emission Test Setup