

Limited Test report

435594-3R1TRFWL

Date of issue: May 26, 2021

Applicant:

Edge Networks Inc.

Product:

Communications Module

Model:

EvocaScoutV2

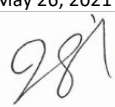
FCC ID:

2AWBYENI-1VA

Specifications:

- ◆ **FCC 47 CFR Part 15, Subpart C – §15.247**
Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5727 – 5850 MHz
- ◆ **Industry Canada RSS-247, Issue 2**
Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Lab and test locations

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FCC Site Number	Test Firm Registration Number: 392943 Designation Number: US5058
ISED Test Site	2040B-3
Tested by	David Hewitt, EMC Specialist
Reviewed by	James Cunningham
Review date	May 26, 2021
Reviewer signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

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Section 1 Report summary

1.1 Applicant

Company name	Edge Networks Inc.
Address	PO Box 5860
City	Ketchum
State	ID
Postal/Zip code	83340
Country	USA

1.2 Manufacturer

Company name	Edge Networks Inc.
Address	PO Box 5860
City	Ketchum
State	ID
Postal/Zip code	83340
Country	USA

1.3 Test specifications

FCC 47 CFR Part 15, Subpart C – §15.247	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz
IC RSS-247 Issue 2	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.4 Test methods

ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
558074 D01 DTS Measurement Guidance v03r02 (June 5, 2014)	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

1.5 Exclusions

Testing includes limited Radiated Spurious emissions, limited Restricted Band Edge measurements, and limited maximum peak conducted power measurements only.

1.6 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.5 above. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.7 Test report revision history

Table 1.7-1: Test report revision history

Revision #	Details of changes made to test report
435594-3TRFWL	Original report issued
435594-3R1TRFWL	Corrected product name and model number
Notes:	None

Section 2 Summary of test results

2.1 FCC Part 15 Subpart C, general requirements

Part	Test description	Verdict
§15.207(a)	Conducted limits	Not tested
§15.31(e)	Variation of power source	Not tested
§15.203	Antenna requirement	Not tested

Notes: EUT is AC powered
The antenna is located within the protective cover of EUT on PCB

2.2 FCC Part 15.247

Part	Test description	Verdict
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not tested
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Not tested
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band	Not tested
§15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands	Pass
§15.247(b)(4)	Transmitting antennas of directional gain greater than 6 dBi	Not applicable
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	Not applicable
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	Not applicable
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Not tested
§15.247(f)	Time of occupancy for hybrid systems	Not tested

2.3 IC RSS-247, Issue 2

Part	Test description	Verdict
5.1 (a)	Bandwidth of a frequency hopping channel	Not tested
5.1 (b)	Minimum channel spacing for frequency hopping systems	Not tested
5.1 (c)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.1 (d)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not tested
5.1 (e)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
5.2 (a)	Minimum 6 dB bandwidth	Not tested
5.2 (b)	Maximum power spectral density	Not tested
5.3 (a)	Digital modulation turned off	Not tested
5.3 (b)	Frequency hopping turned off	Not tested
5.4 (a)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.4 (b)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not tested
5.4 (c)	Frequency hopping systems operating in the 5725–5850 MHz	Not applicable
5.4 (d)	Systems employing digital modulation techniques	Pass ¹
5.4 (e)	Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band	Not tested
5.4 (f)	Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams	Not tested
5.5	Out-of-band emissions	Pass

2.4 IC RSS-GEN, Issue 5

Part	Test description	Verdict
7.3	Receiver radiated emission limits	Not applicable
7.4	Receiver conducted emission limits	Not applicable
8.8	Power Line Conducted Emissions Limits for License-Exempt Radio Apparatus	Not tested

2.5 Scope of Limited Testing

The EUT supports the following wireless technologies:

- IEEE 802.11b
- IEEE 802.11g,
- IEEE 802.11n (SISO and MIMO)
- IEEE 802.11ac (SISO and MIMO).

The following table summarizes the scope of the limited testing performed:

Clause	Tests
§15.247(b)(1) Maximum peak output power	IEEE 802.11n (SISO) Channel 1 (2412 MHz) IEEE 802.11n (SISO) Channel 6 (2437 MHz) IEEE 802.11n (SISO) Channel 11 (2462 MHz) IEEE 802.11ac (SISO), Channel 1 (2412 MHz) IEEE 802.11ac (SISO), Channel 11 (2462 MHz)
§15.247(d) Restricted band edges	IEEE 802.11b, High and Low band edge IEEE 802.11g, High and Low band edge IEEE 802.11n (MIMO), High and Low band edge IEEE 802.11ac (SISO), High and Low band edge
§15.247(d) Radiated spurious emissions, 30 – 1000 MHz	IEEE 802.11b (SISO), Channel 6 (2437 MHz) IEEE 802.11g (SISO), Channel 6 (2437 MHz) IEEE 802.11n (MIMO), Channel 6 (2437 MHz)
§15.247(d) Radiated spurious emissions, 1 – 18 GHz	IEEE 802.11b, Channel 1 (2412 MHz) IEEE 802.11b, Channel 6 (2437 MHz) IEEE 802.11b, Channel 11 (2462 MHz) IEEE 802.11g, Channel 1 (2412 MHz) IEEE 802.11g, Channel 6 (2437 MHz) IEEE 802.11g, Channel 11 (2462 MHz) IEEE 802.11n (MIMO), Channel 1 (2412 MHz) IEEE 802.11n (MIMO), Channel 6 (2437 MHz) IEEE 802.11n (MIMO), Channel 11 (2462 MHz)
§15.247(d) Radiated spurious emissions, 18 – 26 GHz	IEEE 802.11b, Channel 1 (2412 MHz) IEEE 802.11b, Channel 6 (2437 MHz) IEEE 802.11b, Channel 11 (2462 MHz) IEEE 802.11g, Channel 1 (2412 MHz) IEEE 802.11g, Channel 6 (2437 MHz) IEEE 802.11g, Channel 11 (2462 MHz) IEEE 802.11n (MIMO), Channel 1 (2412 MHz) IEEE 802.11n (MIMO), Channel 6 (2437 MHz) IEEE 802.11n (MIMO), Channel 11 (2462 MHz)

Section 3 Equipment under test (EUT) details

3.1 Sample information

Receipt date	April 26, 2021
Nemko sample ID number	NEx: 435594

3.2 EUT information

Product name	Communications Module
Model	EvocaScoutV2
Serial number	SS9011003
Part number	3061344CB449
FCC ID	2AWBYENI-1VA

3.3 Technical information

Used IC test site(s) reg. number	2040A
RSS number and issue	RSS-247 issue 2 (February 2017)
Frequency band	2400 – 2483.5 MHz
Minimum frequency (MHz)	2402
Maximum frequency (MHz)	2480
Type of modulation	802.11b, 802.11g, 802.11n, 802.11ac
Emission classification	F1D
Power requirements	3.3 V _{DC} ; 800 mA
Antenna information	3.6 dBi gain, PCB SMT Antenna

3.4 EUT exercise and monitoring details

EUT was tested in 802.11b/.11g/.11n/.11ac wireless network specifications; using SISO and MIMO antenna configurations as applicable; on the low, mid, and high channels.

Table 3.4-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number	Rev.
ENI-1VA	Murata Manufacturing Co., Ltd.	M/N: LBEE5XV1VA P/N: 3061344CB449	SS9011003	A

Table 3.4-2: EUT interface ports

Description	Qty.
USB-C	1
Ethernet	1
HDMI	1
F-type Coax	1

Table 3.4-3: Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
Support Laptop	Dell	Inspiron 15-5548	20814012794	--

Table 3.4-4: Inter-connection cables

Cable description	From	To	Length (m)
Ethernet	Support Laptop	EUT	10

3.5 EUT setup diagram

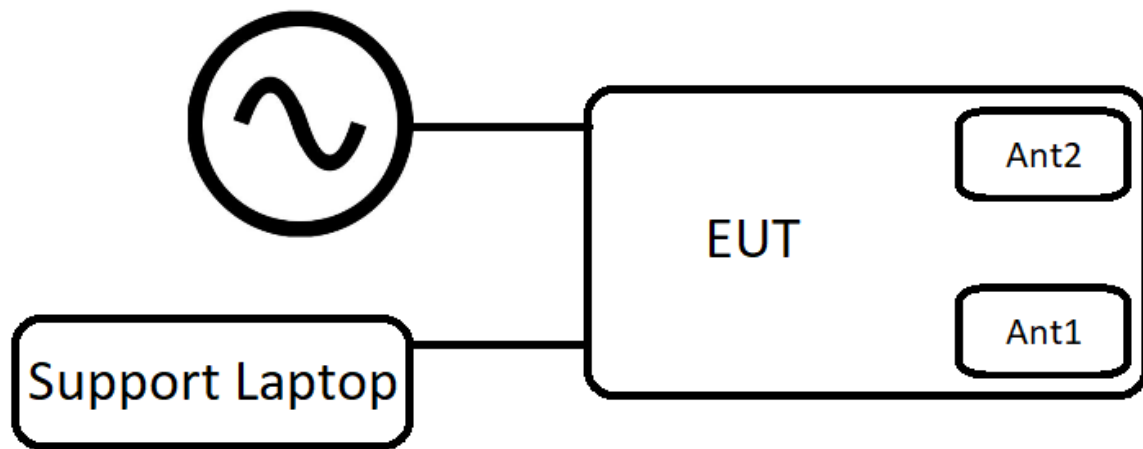


Figure 3.5-1: Setup diagram

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	15-30 °C
Relative humidity	20-75 %
Air pressure	86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of $K = 2$ with 95% certainty.

Test name	Measurement uncertainty, dB
Radiated spurious emissions	3.78
Powerline conducted emissions	1.38
All antenna port measurements	0.55
Conducted spurious emissions	1.13

Section 7 Test Equipment

Table 6.1-1: Test Equipment List

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Test Receiver	Rohde & Schwarz	ESU40	Rental equipment	1 yr	17 Jun 2021
System Controller	Sunol Sciences	SC104V	E1191	NCR	NCR
Bilog Antenna (30-1000 MHz)	Schaffner	CBL 6111D	1763	2 yr	18 Feb 2022
DRG Horn (1-18 GHz)	ETS-Lindgren	3117-PA	E1160	1 yr	2 Dec 2021
Horn antenna (18-26 GHz)	Sage Millimeter, Inc.	SAR-2309-42-S2	E1143	2 yr	13 Nov 2022
Low Noise Pre Amp	Sage Millimeter, Inc.	SBL-1834034030-KFKF	E1228	NCR	NCR
Notch Filter (2.4 GHz)	Micro-Tonics	HPM50110-01	E1142	NCR	NCR
Power Sensor	ETS-Lindgren	7002-006	E1062	1 yr	14 Oct 2021

Notes: NCR - no calibration required

Table 6.1-2: Test Software

Manufacturer of Software	Details
Rohde & Schwarz	EMC 32 V10.60.15 (radiated emissions)

Notes: None

Section 8 Testing data

8.1 FCC 15.247(b) and RSS-247 5.4 (4) Transmitter output power and e.i.r.p. requirements

8.1.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.247(b)(2) / (3)

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

- (3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 W (30 dBm). As an alternative to a peak power measurement, compliance with the one-Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
- (4) The conducted output power limit specified in paragraph (b) of this Section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this Section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this Section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 → §5.4(d)

(d) For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

8.1.2 Test summary

Verdict	Pass		
Test date	May 3, 2021	Temperature	23 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1002 mbar
Test location	Wireless bench	Relative humidity	54 %

8.1.3 Notes

Testing was performed in Wi-Fi 2.4 GHz mode and the EUT transmitting on a fixed channel at full power.

The attenuation of the interconnecting cable was included in the power meter software as a correction factor.

The antenna gain is 3.6 dBi per client declaration.

EIR3P = Conducted Power + Declared Antenna Gain

8.1.4 Setup details

EUT setup configuration	Table top
Test facility	Nemko San Diego
Measurement method	ANSI C63.10 §11.9.2.3 AVGPM Power Meter

8.1.5 Test data

Table 8.1-1: Output power

Operating Mode	Test Frequency (MHz)	Maximum Conducted Power (dBm)	Conducted Limit (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)
IEEE 802.11n (SISO) Channel 1	2412	12.91	30.0	3.6	16.51	36.0
IEEE 802.11n (SISO) Channel 6	2437	17.71	30.0	3.6	21.31	36.0
IEEE 802.11n (SISO) Channel 11	2462	13.76	30.0	3.6	17.36	36.0
IEEE 802.11ac (SISO), Channel 1	2412	15.62	30.0	3.6	19.22	36.0
IEEE 802.11ac (SISO), Channel 11	2462	16.95	30.0	3.6	20.55	36.0

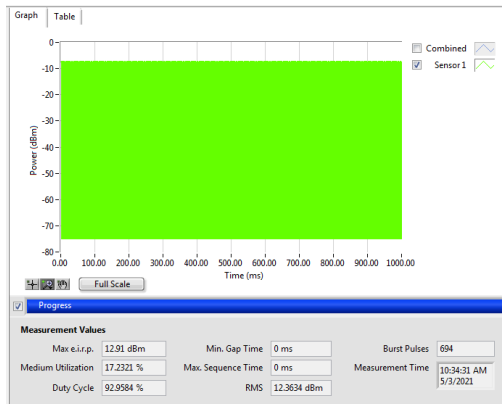


Figure 8.1-1: Maximum conducted power, 802.11n (SISO), low channel

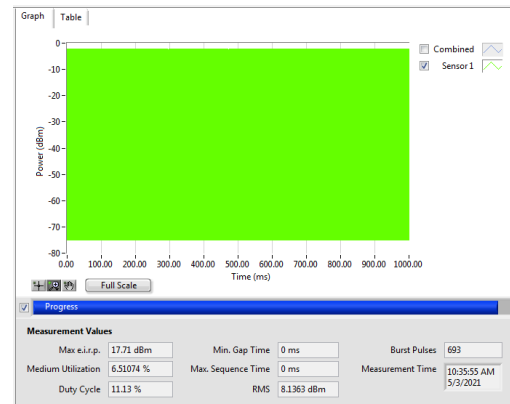


Figure 8.1-2: Maximum conducted power, 802.11n (SISO), mid channel

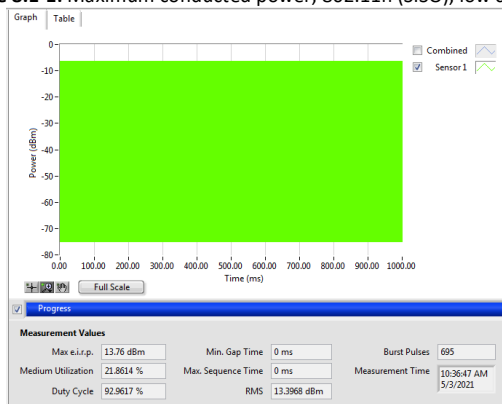


Figure 8.1-3: Maximum conducted power, 802.11n (SISO), high channel

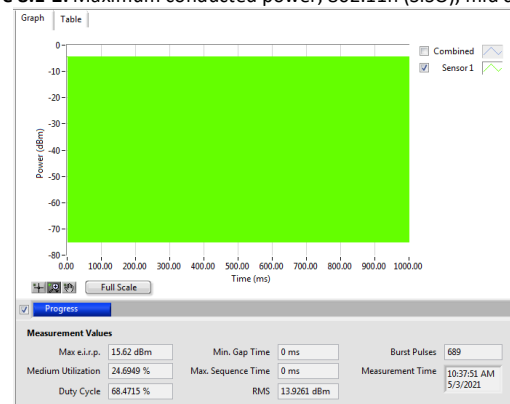


Figure 8.1-4: Maximum conducted power, 802.11ac (SISO), low channel

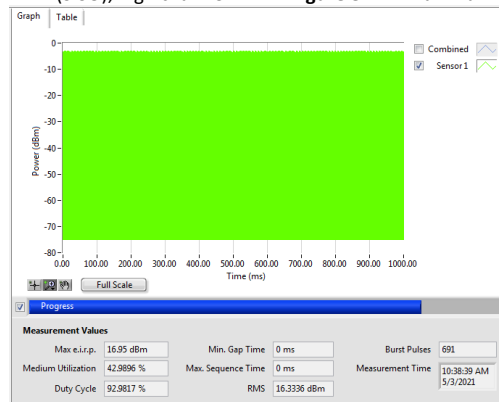


Figure 8.1-5: Maximum conducted power, 802.11ac (SISO), high channel

8.2 FCC 15.247(d) and RSS-247 5.5 Radiated restricted band-edges and spurious emission

8.2.1 Definition and limits

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.247(d)

- (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or 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. Attenuation below the general limits specified in §15.209(a) is not required. 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)).

RSS-247 → §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Table 8.2-1: FCC §15.209— Radiated emission limits

Frequency, MHz	Field strength of emissions		Measurement distance, m
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Table 8.2-2: FCC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
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	Above 38.6
13.36–13.41			

8.2.2 Test summary

Verdict	Pass		
Test date	April 26, 2021	Temperature	22 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1004 mbar
Test location	3m semi-anechoic chamber (Radiated)	Relative humidity	47 %
Test date	April 27, 2021	Temperature	20 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1006 mbar
Test location	3m semi-anechoic chamber (Radiated)	Relative humidity	43 %
Test date	April 28, 2021	Temperature	19 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1010 mbar
Test location	3m semi-anechoic chamber (Radiated)	Relative humidity	49 %
Test date	May 3, 2021	Temperature	22 °C
Test engineer	David Hewitt, EMC Specialist	Air pressure	1002 mbar
Test location	3m semi-anechoic chamber (Radiated)	Relative humidity	56 %

8.2.3 Notes

The EUT was configured to transmit continuously on the lowest, middle and highest channels.

The spectrum was search from 30 MHz to 26 GHz (above the 10th harmonic of the highest transmit frequency of 2480 MHz).

Radiated measurements were performed at a 3 m measurement distance.

8.2.4 Setup details

EUT setup configuration	Tabletop
Test facility	Nemko San Diego
Measurement details	Radiated spurious emissions measurement performed as per C63.10 §11.12

Receiver settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	Peak (preview measurements) Quasi-Peak (final measurements)
Trace mode	Max Hold
Measurement time	5 s (final measurements)

Receiver settings for radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak and CAverage (final measurements)
Trace mode	Max Hold
Measurement time	5 s (final measurements)

8.2.5 Test data

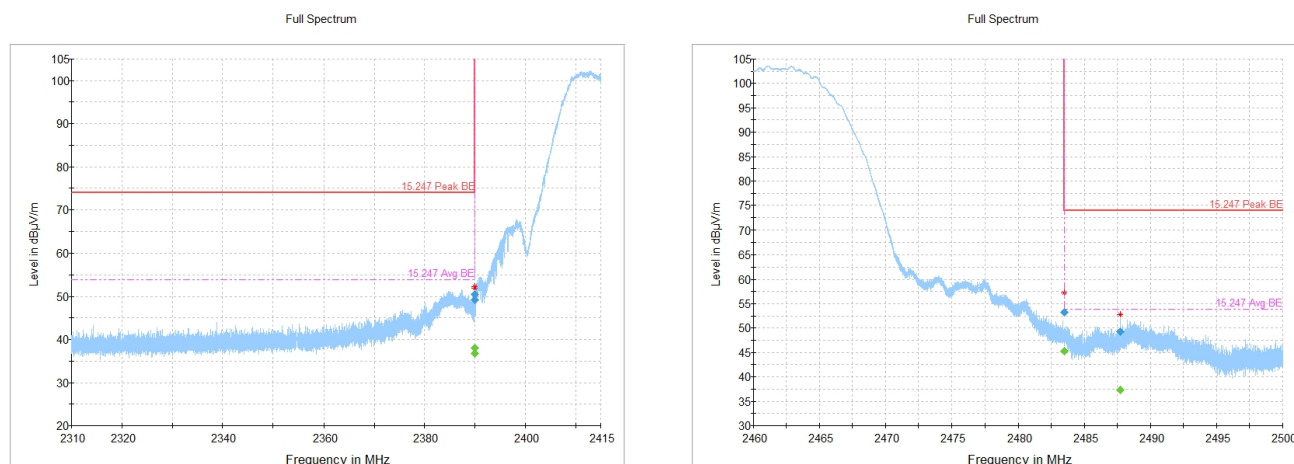


Figure 8.2-1: Radiated emissions, restricted band edge, 802.11b, SISO antenna configuration

Table 8.2-2: Radiated emissions, restricted band edge, 802.11b, SISO antenna configuration, low channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.947000	---	36.74	53.90	17.16	5000.0	1000.000	146.0	V	126.0	-4.1
2389.947000	49.29	---	73.90	24.61	5000.0	1000.000	146.0	V	126.0	-4.1
2390.000000	---	38.10	53.90	15.80	5000.0	1000.000	172.0	V	128.0	-4.1
2390.000000	50.52	---	73.90	23.38	5000.0	1000.000	172.0	V	128.0	-4.1

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-3: Radiated emissions, restricted band edge, 802.11b, SISO antenna configuration, high channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	45.29	53.90	8.61	5000.0	1000.000	153.0	V	126.0	-3.5
2483.500000	53.21	---	73.90	20.69	5000.0	1000.000	153.0	V	126.0	-3.5
2487.725333	---	37.40	53.90	16.50	5000.0	1000.000	152.0	V	225.0	-3.4
2487.725333	49.30	---	73.90	24.60	5000.0	1000.000	152.0	V	225.0	-3.4

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

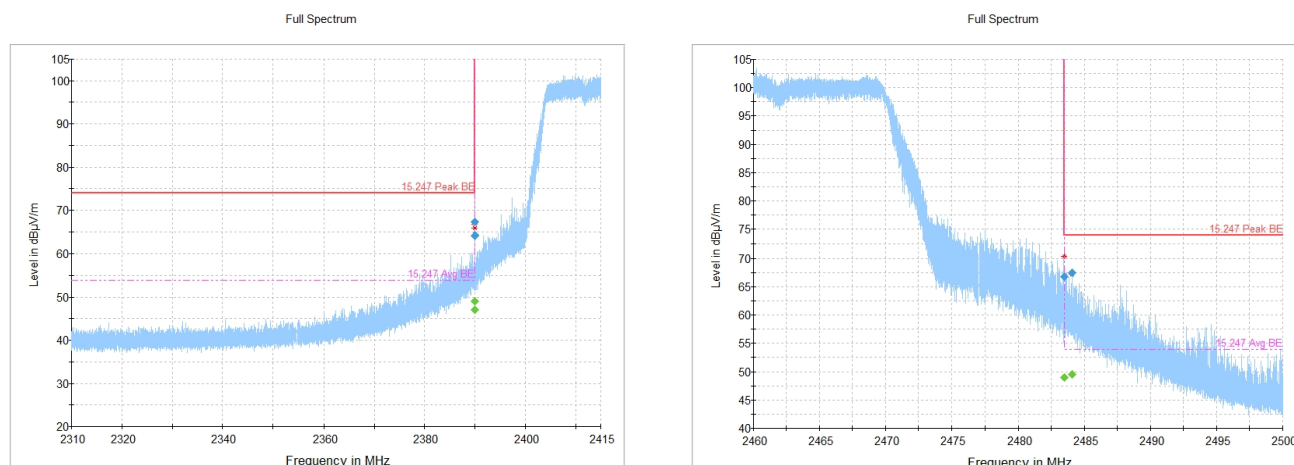


Figure 8.2-2: Radiated emissions, restricted band edge, 802.11g, SISO antenna configuration

Table 8.2-4: Radiated emissions, restricted band edge, 802.11g, SISO antenna configuration, low channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.992500	---	47.03	53.90	6.87	5000.0	1000.000	130.0	V	124.0	-4.1
2389.992500	64.29	---	73.90	9.61	5000.0	1000.000	130.0	V	124.0	-4.1
2390.000000	---	49.05	53.90	4.85	5000.0	1000.000	153.0	V	128.0	-4.1
2390.000000	67.21	---	73.90	6.69	5000.0	1000.000	153.0	V	128.0	-4.1

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-5: Radiated emissions, restricted band edge, 802.11g, SISO antenna configuration, high channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	48.94	53.90	4.96	5000.0	1000.000	238.0	V	88.0	-3.5
2483.500000	66.78	---	73.90	7.12	5000.0	1000.000	238.0	V	88.0	-3.5
2484.086667	---	49.55	53.90	4.35	5000.0	1000.000	234.0	V	76.0	-3.5
2484.086667	67.40	---	73.90	6.50	5000.0	1000.000	234.0	V	76.0	-3.5

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

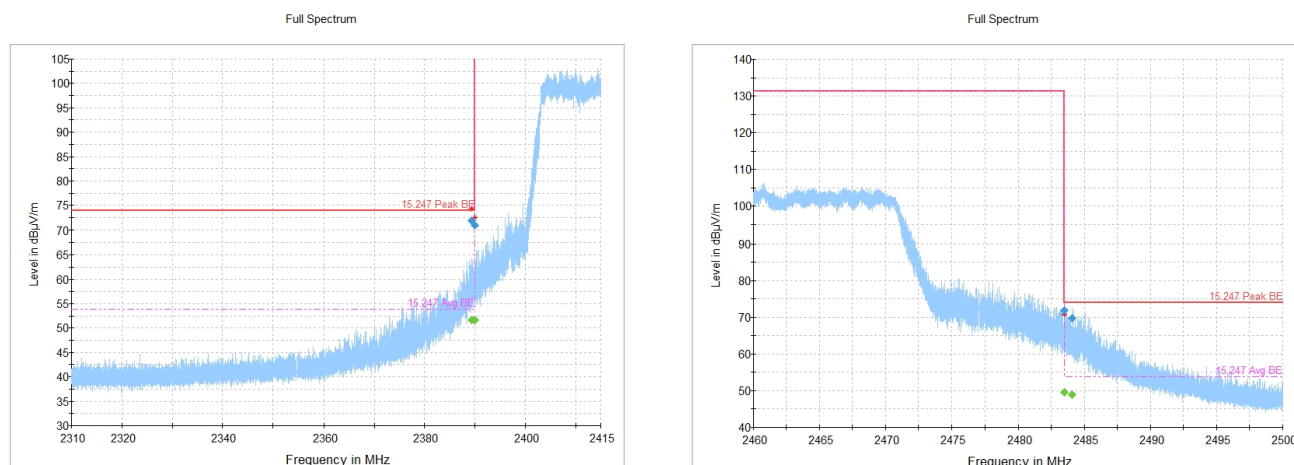


Figure 8.2-3: Radiated emissions, restricted band edge, 802.11n, MIMO antenna configuration

Table 8.2-6: Radiated emissions, restricted band edge, 802.11n, MIMO antenna configuration, low channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.345000	---	51.66	53.90	2.24	5000.0	1000.000	236.0	V	157.0	-4.1
2389.345000	71.93	---	73.90	1.97	5000.0	1000.000	236.0	V	157.0	-4.1
2390.000000	---	51.72	53.90	2.18	5000.0	1000.000	110.0	V	323.0	-4.1
2390.000000	70.87	---	73.90	3.03	5000.0	1000.000	110.0	V	323.0	-4.1

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-7: Radiated emissions, restricted band edge, 802.11n, MIMO antenna configuration, high channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	49.52	53.90	4.38	5000.0	1000.000	100.0	H	345.0	-3.5
2483.500000	71.83	---	73.90	2.07	5000.0	1000.000	100.0	H	345.0	-3.5
2484.080000	---	49.01	53.90	4.89	5000.0	1000.000	100.0	V	348.0	-3.5
2484.080000	69.80	---	73.90	4.10	5000.0	1000.000	100.0	V	348.0	-3.5

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

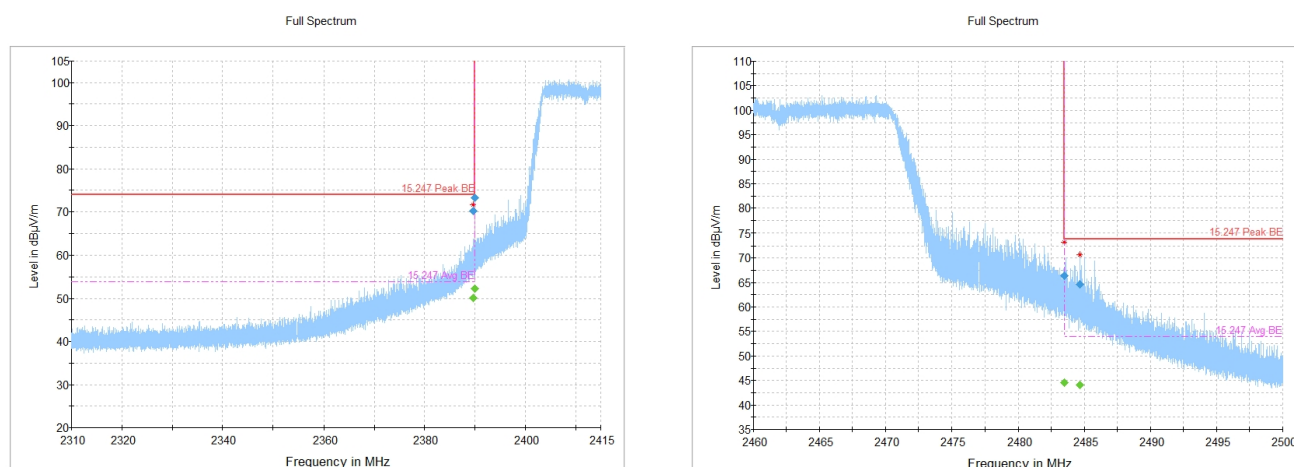


Figure 8.2-4: Radiated emissions, restricted band edge, 802.11ac, SISO antenna configuration

Table 8.2-8: Radiated emissions, restricted band edge, 802.11ac, SISO antenna configuration, low channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.656500	---	50.18	53.90	3.72	5000.0	1000.000	100.0	H	335.0	-4.1
2389.656500	70.17	---	73.90	3.73	5000.0	1000.000	100.0	H	335.0	-4.1
2390.000000	---	52.38	53.90	1.52	5000.0	1000.000	100.0	H	0.0	-4.1
2390.000000	73.31	---	73.90	0.59	5000.0	1000.000	100.0	H	0.0	-4.1

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-9: Radiated emissions, restricted band edge, 802.11ac, SISO antenna configuration, high channel

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	44.56	53.90	9.34	5000.0	1000.000	100.0	H	101.0	-3.5
2483.500000	66.43	---	73.90	7.47	5000.0	1000.000	100.0	H	101.0	-3.5
2484.618667	---	44.03	53.90	9.87	5000.0	1000.000	100.0	H	79.0	-3.5
2484.618667	64.65	---	73.90	9.25	5000.0	1000.000	100.0	H	79.0	-3.5

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB) – pre-amp (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

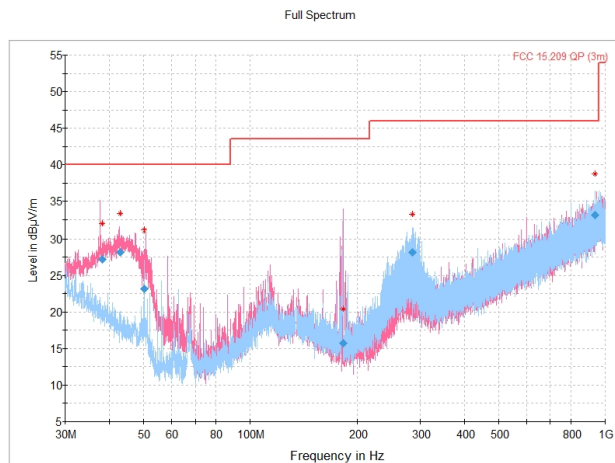


Figure 8.2-5: Radiated spurious emissions, 802.11b, SISO antenna configuration, mid channel

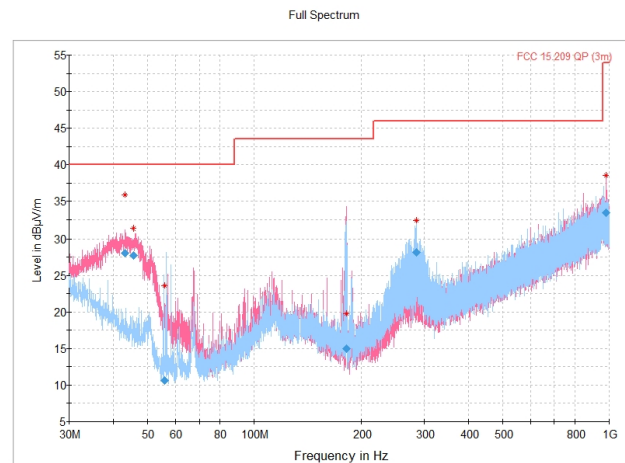


Figure 8.2-6: Radiated spurious emissions, 802.11g, SISO antenna configuration, mid channel

Table 8.2-10: Radiated spurious emissions, 802.11b, SISO antenna configuration, mid channel, 30-1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
38.155333	27.17	40.00	12.83	5000.0	120.000	100.0	V	0.0	22.1
42.847000	28.19	40.00	11.81	5000.0	120.000	100.0	V	40.0	19.6
50.248667	23.16	40.00	16.84	5000.0	120.000	118.0	V	156.0	15.8
181.929667	15.76	43.50	27.74	5000.0	120.000	110.0	V	95.0	17.0
286.326333	28.17	46.00	17.83	5000.0	120.000	100.0	H	236.0	21.6
935.567667	33.09	46.00	12.91	5000.0	120.000	158.0	H	249.0	34.0

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-11: Radiated spurious emissions, 802.11g, SISO antenna configuration, mid channel, 30-1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
43.092000	28.04	40.00	11.96	5000.0	120.000	110.0	V	24.0	19.5
45.545000	27.70	40.00	12.30	5000.0	120.000	100.0	V	10.0	18.2
55.747000	10.61	40.00	29.39	5000.0	120.000	149.0	H	24.0	13.5
181.146000	14.95	43.50	28.55	5000.0	120.000	220.0	V	72.0	17.1
286.052333	28.09	46.00	17.91	5000.0	120.000	100.0	H	236.0	21.6
977.824000	33.45	53.90	20.45	5000.0	120.000	383.0	V	269.0	34.4

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

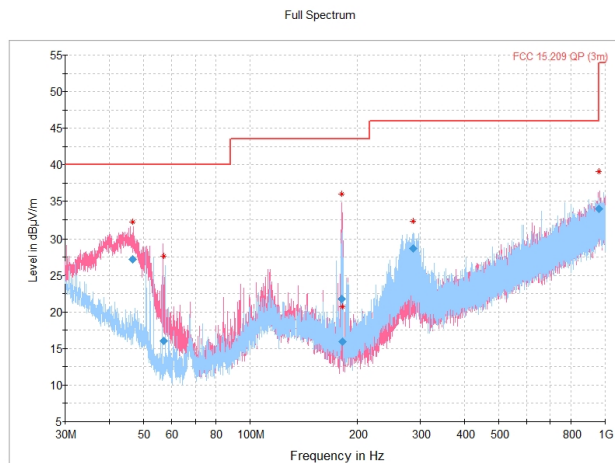


Figure 8.2-7: Radiated spurious emissions, 802.11n, MIMO antenna configuration, mid channel

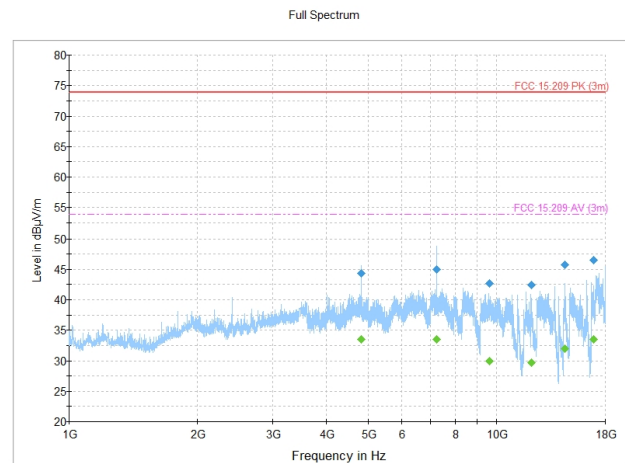


Figure 8.2-8: Radiated spurious emissions, 802.11b, SISO antenna configuration, low channel

Table 8.2-12: Radiated spurious emissions, 802.11n, MIMO antenna configuration, mid channel, 30-1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
46.578000	27.16	40.00	12.84	5000.0	120.000	100.0	V	284.0	17.6
57.104333	16.09	40.00	23.91	5000.0	120.000	160.0	V	119.0	13.1
180.025333	21.74	43.50	21.76	5000.0	120.000	100.0	V	217.0	17.1
181.255667	15.97	43.50	27.53	5000.0	120.000	118.0	V	104.0	17.1
287.109000	28.70	46.00	17.30	5000.0	120.000	110.0	H	249.0	21.6
957.969667	33.94	46.00	12.06	5000.0	120.000	142.0	V	72.0	34.7

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-13: Radiated spurious emissions, 802.11b, SISO antenna configuration, low channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	---	33.51	53.90	20.39	1000.0	1000.000	177.0	H	213.0	-1.7
4824.000000	44.39	---	73.90	29.51	1000.0	1000.000	177.0	H	213.0	-1.7
7236.400000	---	33.47	53.90	20.43	1000.0	1000.000	173.0	H	214.0	0.7
7236.400000	44.92	---	73.90	28.98	1000.0	1000.000	173.0	H	214.0	0.7
9639.600000	---	29.96	53.90	23.94	1000.0	1000.000	350.0	V	0.0	4.0
9639.600000	42.69	---	73.90	31.21	1000.0	1000.000	350.0	V	0.0	4.0
12065.200000	---	29.71	53.90	24.19	1000.0	1000.000	394.0	V	82.0	6.4
12065.200000	42.37	---	73.90	31.53	1000.0	1000.000	394.0	V	82.0	6.4
14470.000000	---	31.97	53.90	21.93	1000.0	1000.000	319.0	V	141.0	9.3
14470.000000	45.70	---	73.90	28.20	1000.0	1000.000	319.0	V	141.0	9.3
16883.200000	---	33.53	53.90	20.37	1000.0	1000.000	335.0	V	33.0	12.8
16883.200000	46.51	---	73.90	27.39	1000.0	1000.000	335.0	V	33.0	12.8

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

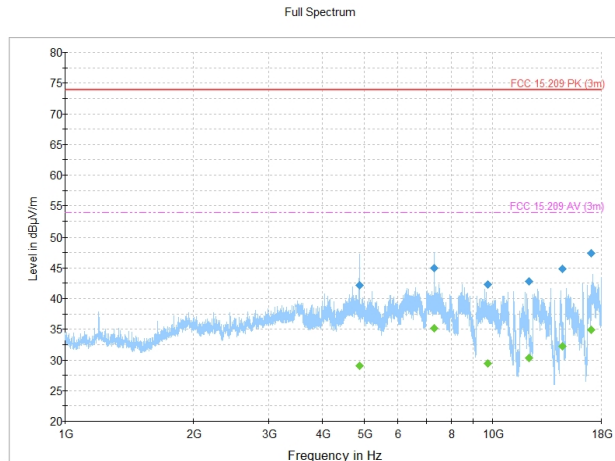


Figure 8.2-9: Radiated spurious emissions, 802.11b, SISO antenna configuration, mid channel

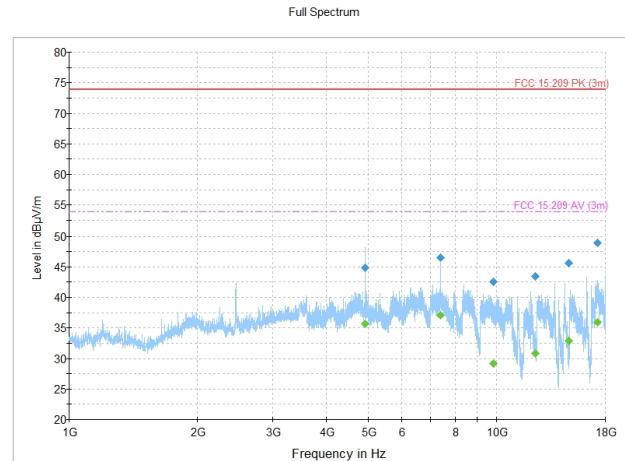


Figure 8.2-10: Radiated spurious emissions, 802.11b, SISO antenna configuration, high channel

Table 8.2-14: Radiated spurious emissions, 802.11b, SISO antenna configuration, mid channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4872.800000	---	29.06	53.90	24.84	1000.0	1000.000	278.0	H	309.0	-1.9
4872.800000	42.10	---	73.90	31.80	1000.0	1000.000	278.0	H	309.0	-1.9
7312.200000	---	35.21	53.90	18.69	1000.0	1000.000	188.0	H	214.0	0.9
7312.200000	44.91	---	73.90	28.99	1000.0	1000.000	188.0	H	214.0	0.9
9740.800000	---	29.37	53.90	24.53	1000.0	1000.000	402.0	V	54.0	3.7
9740.800000	42.34	---	73.90	31.56	1000.0	1000.000	402.0	V	54.0	3.7
12183.000000	---	30.27	53.90	23.63	1000.0	1000.000	278.0	V	358.0	6.8
12183.000000	42.81	---	73.90	31.09	1000.0	1000.000	278.0	V	358.0	6.8
14614.800000	---	32.29	53.90	21.61	1000.0	1000.000	124.0	V	358.0	9.5
14614.800000	44.82	---	73.90	29.08	1000.0	1000.000	124.0	V	358.0	9.5
17057.400000	---	34.85	53.90	19.05	1000.0	1000.000	381.0	V	130.0	13.0
17057.400000	47.42	---	73.90	26.48	1000.0	1000.000	381.0	V	130.0	13.0

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-15: Radiated spurious emissions, 802.11b, SISO antenna configuration, high channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	---	35.65	53.90	18.25	1000.0	1000.000	176.0	H	210.0	-2.1
4924.000000	44.82	---	73.90	29.08	1000.0	1000.000	176.0	H	210.0	-2.1
7386.800000	---	37.01	53.90	16.89	1000.0	1000.000	153.0	H	264.0	1.0
7386.800000	46.44	---	73.90	27.46	1000.0	1000.000	153.0	H	264.0	1.0
9840.000000	---	29.13	53.90	24.77	1000.0	1000.000	279.0	H	45.0	3.6
9840.000000	42.60	---	73.90	31.30	1000.0	1000.000	279.0	H	45.0	3.6
12316.400000	---	30.84	53.90	23.06	1000.0	1000.000	235.0	V	286.0	7.3
12316.400000	43.46	---	73.90	30.44	1000.0	1000.000	235.0	V	286.0	7.3
14771.600000	---	32.87	53.90	21.03	1000.0	1000.000	300.0	V	0.0	10.1
14771.600000	45.62	---	73.90	28.28	1000.0	1000.000	300.0	V	0.0	10.1
17239.200000	---	35.88	53.90	18.02	1000.0	1000.000	109.0	V	58.0	14.7
17239.200000	48.87	---	73.90	25.03	1000.0	1000.000	109.0	V	58.0	14.7

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

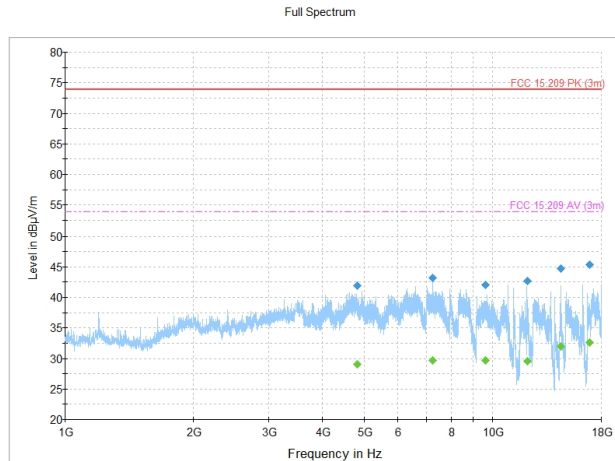


Figure 8.2-11: Radiated spurious emissions, 802.11g, SISO antenna configuration, low channel

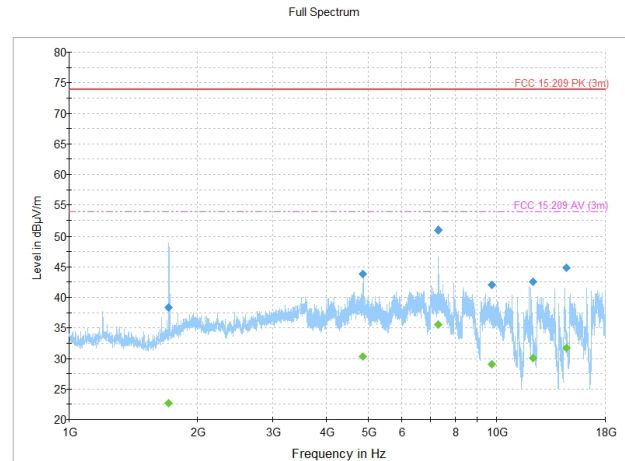


Figure 8.2-12: Radiated spurious emissions, 802.11g, SISO antenna configuration, mid channel

Table 8.2-16: Radiated spurious emissions, 802.11g, SISO antenna configuration, low channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.800000	---	29.08	53.90	24.82	1000.0	1000.000	202.0	H	106.0	-1.7
4824.800000	41.88	---	73.90	32.02	1000.0	1000.000	202.0	H	106.0	-1.7
7235.200000	---	29.73	53.90	24.17	1000.0	1000.000	290.0	H	323.0	0.7
7235.200000	43.24	---	73.90	30.66	1000.0	1000.000	290.0	H	323.0	0.7
9648.800000	---	29.74	53.90	24.16	1000.0	1000.000	335.0	H	105.0	4.1
9648.800000	42.06	---	73.90	31.84	1000.0	1000.000	335.0	H	105.0	4.1
12061.200000	---	29.55	53.90	24.35	1000.0	1000.000	257.0	V	287.0	6.4
12061.200000	42.66	---	73.90	31.24	1000.0	1000.000	257.0	V	287.0	6.4
14467.600000	---	32.00	53.90	21.90	1000.0	1000.000	293.0	V	94.0	9.3
14467.600000	44.77	---	73.90	29.13	1000.0	1000.000	293.0	V	94.0	9.3
16881.600000	---	32.63	53.90	21.27	1000.0	1000.000	267.0	V	242.0	12.8
16881.600000	45.41	---	73.90	28.49	1000.0	1000.000	267.0	V	242.0	12.8

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-17: Radiated spurious emissions, 802.11g, SISO antenna configuration, mid channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1710.800000	38.40	---	73.90	35.50	1000.0	1000.000	130.0	V	317.0	-12.8
1710.800000	---	22.62	53.90	31.28	1000.0	1000.000	130.0	V	317.0	-12.8
4870.800000	43.77	---	73.90	30.13	1000.0	1000.000	145.0	H	227.0	-1.9
4870.800000	---	30.34	53.90	23.57	1000.0	1000.000	145.0	H	227.0	-1.9
7314.200000	---	35.54	53.90	18.36	1000.0	1000.000	138.0	V	251.0	0.9
7314.200000	50.92	---	73.90	22.98	1000.0	1000.000	138.0	V	251.0	0.9
9746.800000	---	28.99	53.90	24.91	1000.0	1000.000	191.0	V	283.0	3.7
9746.800000	42.00	---	73.90	31.90	1000.0	1000.000	191.0	V	283.0	3.7
12184.200000	---	30.05	53.90	23.85	1000.0	1000.000	263.0	V	179.0	6.8
12184.200000	42.61	---	73.90	31.29	1000.0	1000.000	263.0	V	179.0	6.8
14620.400000	---	31.76	53.90	22.14	1000.0	1000.000	371.0	V	129.0	9.6
14620.400000	44.79	---	73.90	29.11	1000.0	1000.000	371.0	V	129.0	9.6

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

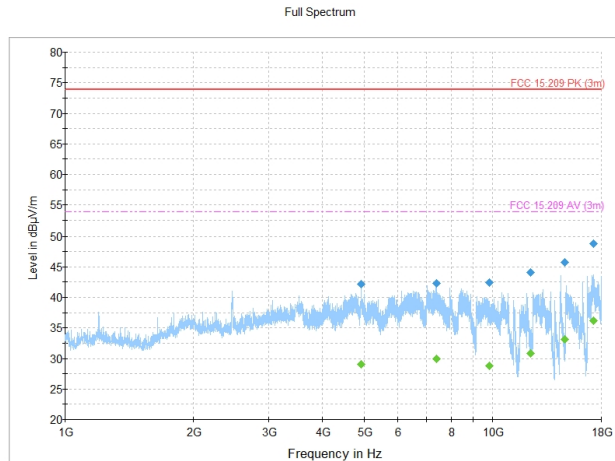


Figure 8.2-13: Radiated spurious emissions, 802.11g, SISO antenna configuration, high channel

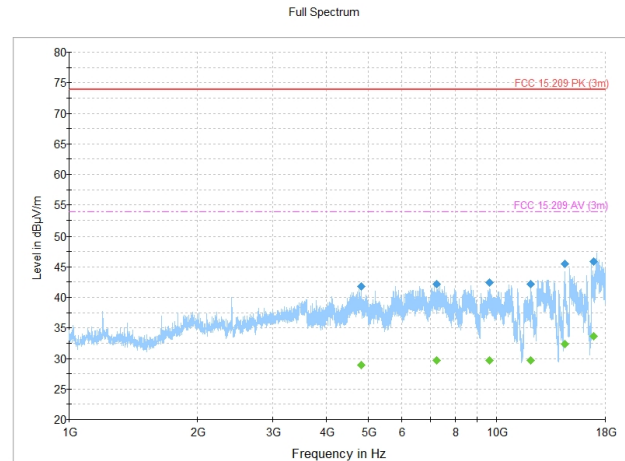


Figure 8.2-14: Radiated spurious emissions, 802.11n, MIMO antenna configuration, low channel

Table 8.2-18: Radiated spurious emissions, 802.11g, SISO antenna configuration, high channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4919.200000	---	29.05	53.90	24.85	1000.0	1000.000	359.0	H	213.0	-2.1
4919.200000	42.12	---	73.90	31.78	1000.0	1000.000	359.0	H	213.0	-2.1
7390.400000	---	29.98	53.90	23.92	1000.0	1000.000	287.0	H	204.0	1.0
7390.400000	42.29	---	73.90	31.61	1000.0	1000.000	287.0	H	204.0	1.0
9847.600000	---	28.82	53.90	25.08	1000.0	1000.000	205.0	H	117.0	3.6
9847.600000	42.46	---	73.90	31.44	1000.0	1000.000	205.0	H	117.0	3.6
12309.200000	---	30.88	53.90	23.02	1000.0	1000.000	225.0	V	153.0	7.2
12309.200000	44.04	---	73.90	29.86	1000.0	1000.000	225.0	V	153.0	7.2
14772.800000	---	33.10	53.90	20.80	1000.0	1000.000	360.0	V	356.0	10.1
14772.800000	45.69	---	73.90	28.21	1000.0	1000.000	360.0	V	356.0	10.1
17232.000000	---	36.17	53.90	17.73	1000.0	1000.000	195.0	V	238.0	14.7
17232.000000	48.80	---	73.90	25.10	1000.0	1000.000	195.0	V	238.0	14.7

Notes:

¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBµV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-19: Radiated spurious emissions, 802.11n, MIMO antenna configuration, low channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4820.800000	---	28.88	53.90	25.02	1000.0	1000.000	359.0	H	154.0	-1.7
4820.800000	41.83	---	73.90	32.07	1000.0	1000.000	359.0	H	154.0	-1.7
7234.800000	---	29.67	53.90	24.23	1000.0	1000.000	281.0	H	168.0	0.7
7234.800000	42.11	---	73.90	31.79	1000.0	1000.000	281.0	H	168.0	0.7
9639.600000	---	29.65	53.90	24.25	1000.0	1000.000	160.0	H	336.0	4.0
9639.600000	42.42	---	73.90	31.48	1000.0	1000.000	160.0	H	336.0	4.0
12058.000000	---	29.71	53.90	24.19	1000.0	1000.000	114.0	V	118.0	6.4
12058.000000	42.19	---	73.90	31.71	1000.0	1000.000	114.0	V	118.0	6.4
14476.800000	---	32.37	53.90	21.53	1000.0	1000.000	402.0	V	0.0	9.3
14476.800000	45.42	---	73.90	28.48	1000.0	1000.000	402.0	V	0.0	9.3
16882.000000	---	33.69	53.90	20.21	1000.0	1000.000	169.0	V	338.0	12.8
16882.000000	45.89	---	73.90	28.01	1000.0	1000.000	169.0	V	338.0	12.8

Notes:

¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBµV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

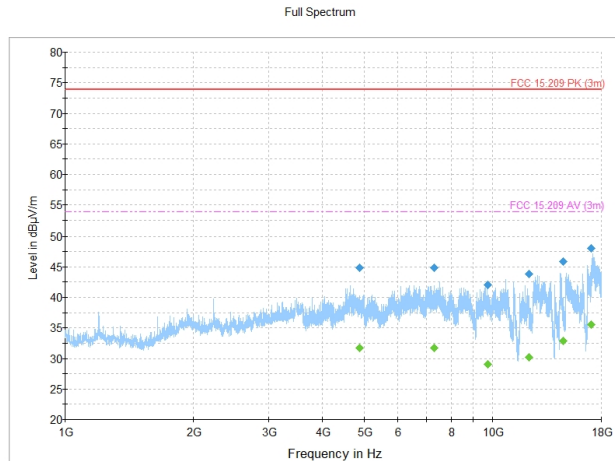


Figure 8.2-15: Radiated spurious emissions, 802.11n, MIMO antenna configuration, mid channel

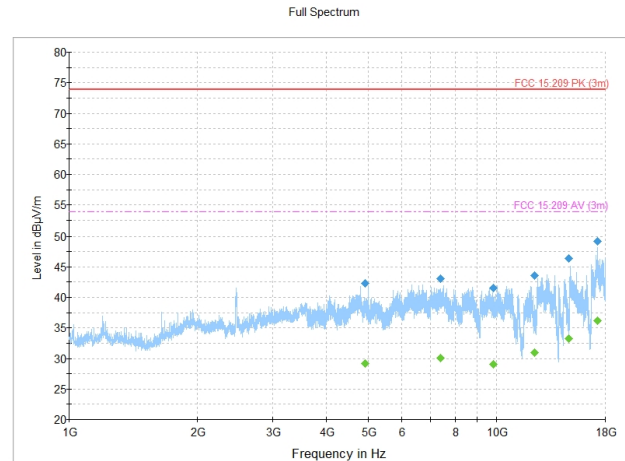


Figure 8.2-16: Radiated spurious emissions, 802.11n, MIMO antenna configuration, high channel

Table 8.2-20: Radiated spurious emissions, 802.11n, MIMO antenna configuration, mid channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4880.000000	---	31.74	53.90	22.16	1000.0	1000.000	150.0	V	239.0	-2.0
4880.000000	44.89	---	73.90	29.01	1000.0	1000.000	150.0	V	239.0	-2.0
7310.200000	---	31.68	53.90	22.22	1000.0	1000.000	147.0	V	252.0	0.9
7310.200000	44.79	---	73.90	29.11	1000.0	1000.000	147.0	V	252.0	0.9
9753.600000	---	29.09	53.90	24.81	1000.0	1000.000	402.0	V	130.0	3.7
9753.600000	42.01	---	73.90	31.89	1000.0	1000.000	402.0	V	130.0	3.7
12182.600000	---	30.18	53.90	23.72	1000.0	1000.000	302.0	V	0.0	6.8
12182.600000	43.88	---	73.90	30.02	1000.0	1000.000	302.0	V	0.0	6.8
14628.800000	---	32.82	53.90	21.08	1000.0	1000.000	254.0	V	32.0	9.6
14628.800000	45.90	---	73.90	28.00	1000.0	1000.000	254.0	V	32.0	9.6
17056.200000	---	35.59	53.90	18.31	1000.0	1000.000	257.0	V	266.0	13.0
17056.200000	48.04	---	73.90	25.86	1000.0	1000.000	257.0	V	266.0	13.0

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-21: Radiated spurious emissions, 802.11n, MIMO antenna configuration, high channel, 1-18 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4929.600000	---	29.12	53.90	24.78	1000.0	1000.000	138.0	H	11.0	-2.1
4929.600000	42.27	---	73.90	31.63	1000.0	1000.000	138.0	H	11.0	-2.1
7388.800000	---	30.10	53.90	23.80	1000.0	1000.000	230.0	H	176.0	1.0
7388.800000	43.01	---	73.90	30.89	1000.0	1000.000	230.0	H	176.0	1.0
9840.800000	---	29.03	53.90	24.87	1000.0	1000.000	169.0	V	142.0	3.6
9840.800000	41.56	---	73.90	32.34	1000.0	1000.000	169.0	V	142.0	3.6
12306.000000	---	30.95	53.90	22.95	1000.0	1000.000	142.0	V	11.0	7.2
12306.000000	43.58	---	73.90	30.32	1000.0	1000.000	142.0	V	11.0	7.2
14773.200000	---	33.21	53.90	20.69	1000.0	1000.000	342.0	V	165.0	10.1
14773.200000	46.38	---	73.90	27.52	1000.0	1000.000	342.0	V	165.0	10.1
17234.000000	---	36.18	53.90	17.72	1000.0	1000.000	120.0	V	356.0	14.7
17234.000000	49.22	---	73.90	24.68	1000.0	1000.000	120.0	V	356.0	14.7

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

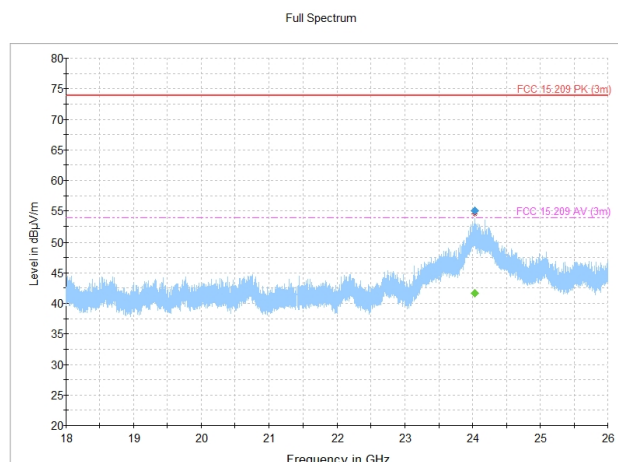


Figure 8.2-17: Radiated spurious emissions, 802.11b, SISO antenna configuration, low channel

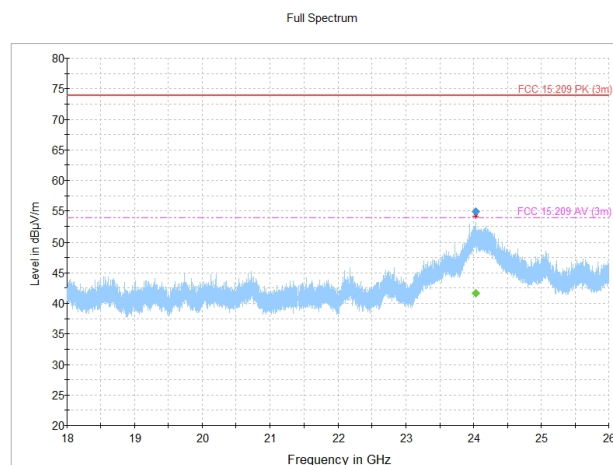


Figure 8.2-18: Radiated spurious emissions, 802.11b, SISO antenna configuration, mid channel

Table 8.2-22: Radiated spurious emissions, 802.11b, SISO antenna configuration, low channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24033.833333	---	41.64	53.90	12.26	5000.0	1000.000	340.0	H	278.0	29.7
24033.833333	55.08	---	73.90	18.82	5000.0	1000.000	340.0	H	278.0	29.7

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-23: Radiated spurious emissions, 802.11b, SISO antenna configuration, mid channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24036.833333	---	41.68	53.90	12.22	5000.0	1000.000	410.0	H	160.0	29.7
24036.833333	54.94	---	73.90	18.96	5000.0	1000.000	410.0	H	160.0	29.7

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

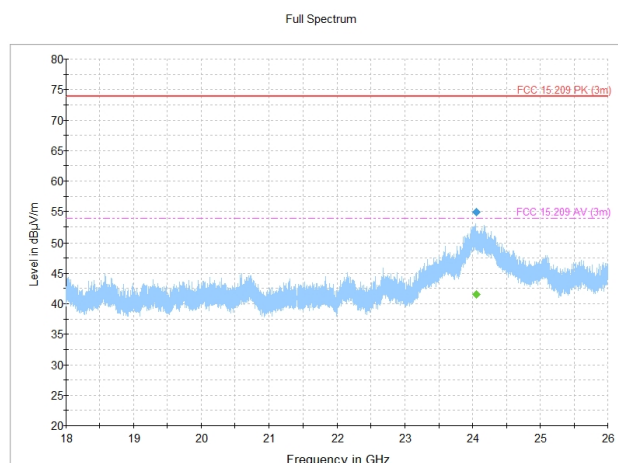


Figure 8.2-19: Radiated spurious emissions, 802.11b, SISO antenna configuration, high channel

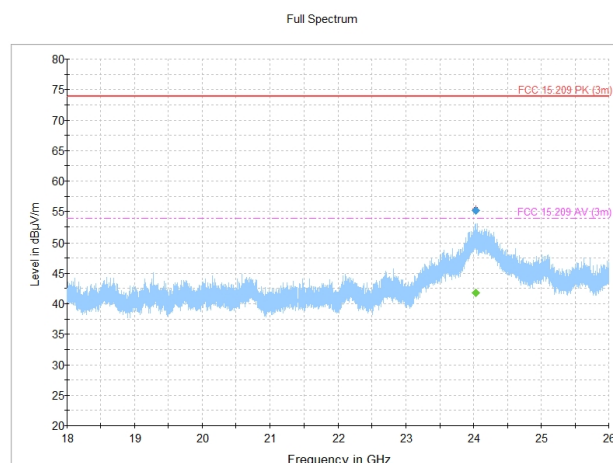


Figure 8.2-20: Radiated spurious emissions, 802.11g, SISO antenna configuration, low channel

Table 8.2-24: Radiated spurious emissions, 802.11b, SISO antenna configuration, high channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24051.966667	---	41.53	53.90	12.37	5000.0	1000.000	400.0	H	151.0	29.7
24051.966667	54.92	---	73.90	18.98	5000.0	1000.000	400.0	H	151.0	29.7

Notes:

- ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
- ² Correction factor = antenna factor ACF (dB) + cable loss (dB)
- ³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-25: Radiated spurious emissions, 802.11g, SISO antenna configuration, low channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24031.766667	---	41.75	53.90	12.15	5000.0	1000.000	410.0	H	333.0	29.7
24031.766667	55.15	---	73.90	18.75	5000.0	1000.000	410.0	H	333.0	29.7

Notes:

- ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
- ² Correction factor = antenna factor ACF (dB) + cable loss (dB)
- ³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

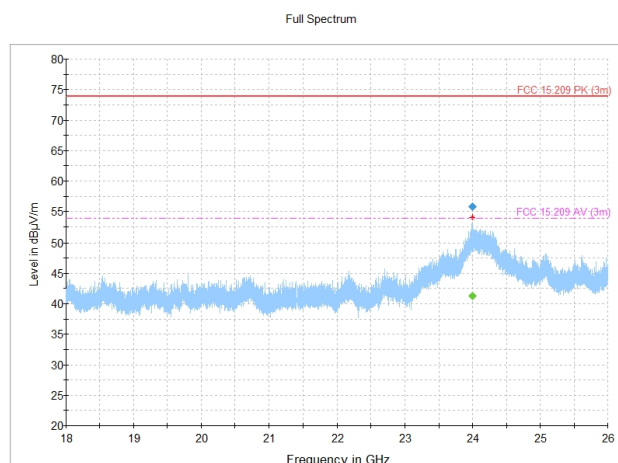


Figure 8.2-21: Radiated spurious emissions, 802.11g, SISO antenna configuration, mid channel

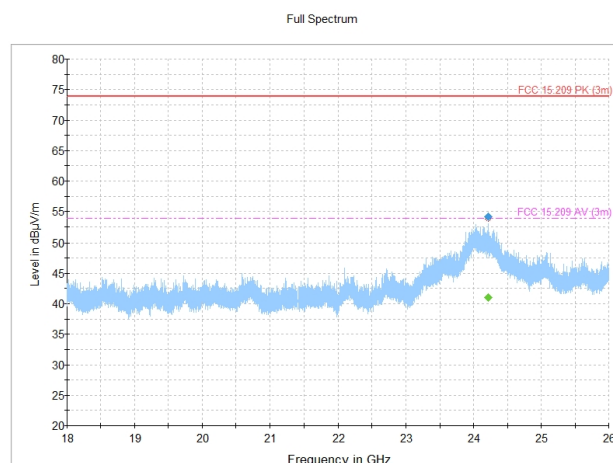


Figure 8.2-22: Radiated spurious emissions, 802.11g, SISO antenna configuration, high channel

Table 8.2-26: Radiated spurious emissions, 802.11g, SISO antenna configuration, mid channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
23997.833333	---	41.28	53.90	12.63	5000.0	1000.000	327.0	H	195.0	29.3
23997.833333	55.77	---	73.90	18.13	5000.0	1000.000	327.0	H	195.0	29.3

Notes:

- ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
- ² Correction factor = antenna factor ACF (dB) + cable loss (dB)
- ³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-27: Radiated spurious emissions, 802.11g, SISO antenna configuration, high channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24220.166667	---	41.08	53.90	12.82	5000.0	1000.000	237.0	V	318.0	29.1
24220.166667	54.19	---	73.90	19.71	5000.0	1000.000	237.0	V	318.0	29.1

Notes:

- ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
- ² Correction factor = antenna factor ACF (dB) + cable loss (dB)
- ³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

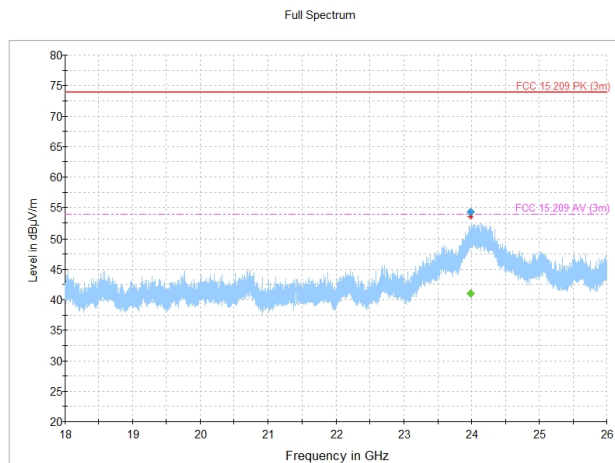


Figure 8.2-23: Radiated spurious emissions, 802.11n, MIMO antenna configuration, low channel

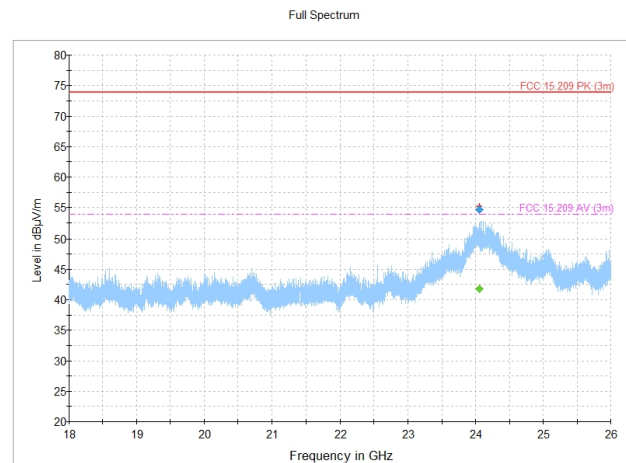


Figure 8.2-24: Radiated spurious emissions, 802.11n, MIMO antenna configuration, mid channel

Table 8.2-28: Radiated spurious emissions, 802.11n, MIMO antenna configuration, low channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
23992.566667	---	41.05	53.90	12.85	5000.0	1000.000	216.0	H	326.0	29.2
23992.566667	54.26	---	73.90	19.64	5000.0	1000.000	216.0	H	326.0	29.2

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Table 8.2-29: Radiated spurious emissions, 802.11n, MIMO antenna configuration, mid channel, 18-26 GHz

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24060.900000	---	41.74	53.90	12.16	5000.0	1000.000	199.0	H	0.0	29.7
24060.900000	54.68	---	73.90	19.22	5000.0	1000.000	199.0	H	0.0	29.7

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

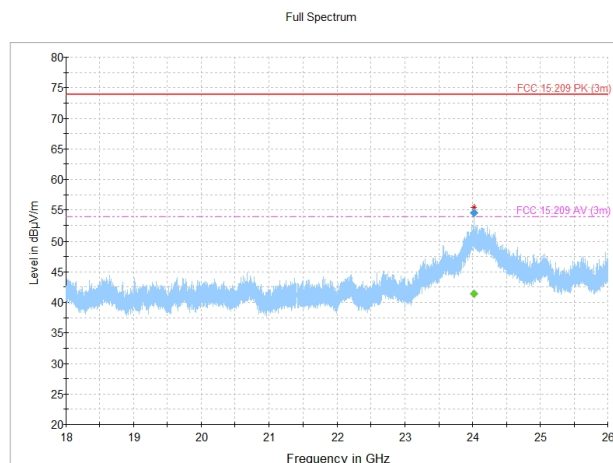


Figure 8.2-25: Radiated emissions, 802.11n, MIMO antenna configuration, high channel

Table 8.2-30: Radiated emissions, 802.11n, MIMO antenna configuration, high channel, 18 – 26 GHz (Quasi-Peak) results

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
24020.233333	---	41.40	53.90	12.50	5000.0	1000.000	203.0	H	0.0	29.7
24020.233333	54.47	---	73.90	19.43	5000.0	1000.000	203.0	H	0.0	29.7

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factor = antenna factor ACF (dB) + cable loss (dB) - pre amp (dB)

³ Limits converted to dBμV/m and an inverse proportionality factor of 20 dB per decade has been used to normalize the specification limit to a measurement distance of 3 meters to determine compliance.

Section 9 Block diagrams of test set-ups

9.1 Radiated emissions set-up

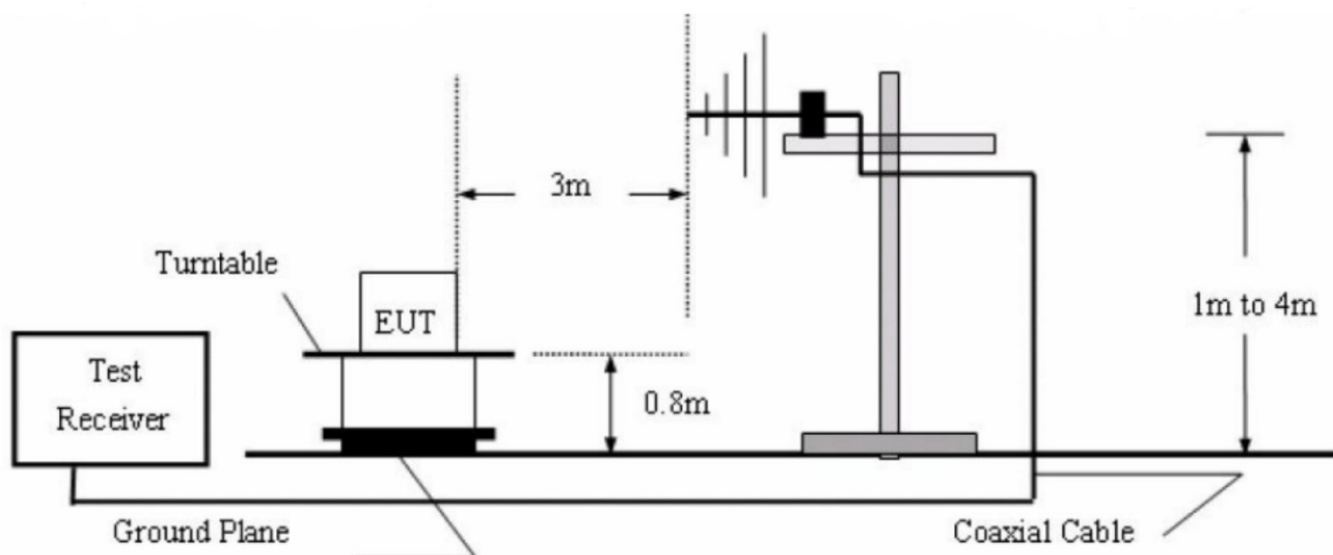


Figure 9.1-1: 30 MHz - 1000 MHz Setup

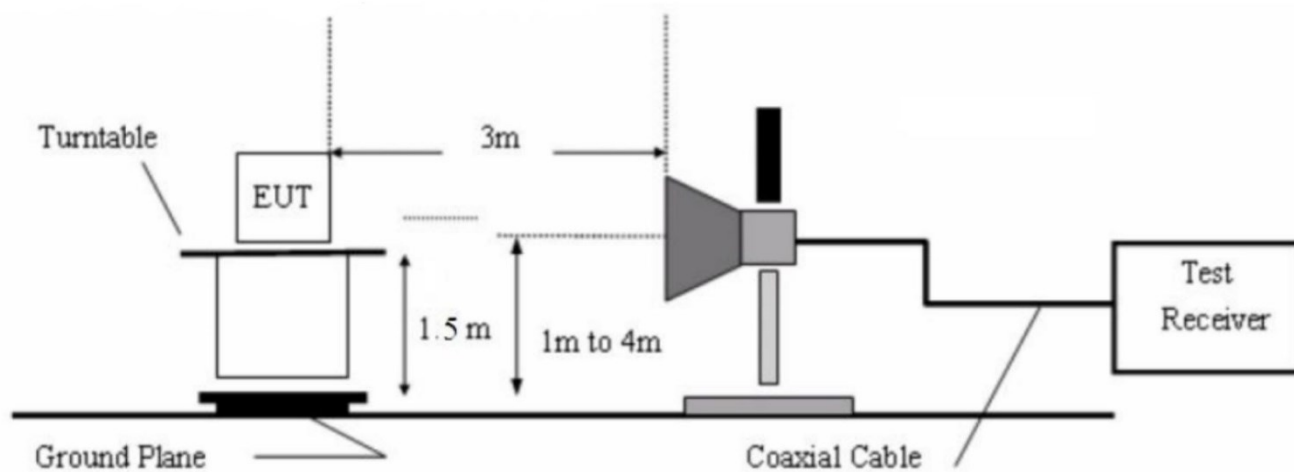


Figure 9.1-2: 1 GHz - 26 GHz Setup