

RF TEST REPORT

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Model No. : TWFP-M601D
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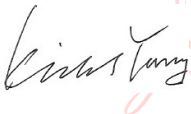
Applicant: Shen Zhen MTC Co., LTD
Co., LTD MTC Industry Park, 1st Lilang Road, Xialilang
community, Nanwan street, Longgang district, Shenzhen,
China

**Test Method/
Standard:** FCC Part 15 Subpart E;
KDB 789033 D02 v01r03;
KDB 662911 D01 v02r01;
ANSI C63.10-2013

Test By: Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
6F, D Block, Huahan Building, Langshan Road,
Nanshan District, Shenzhen, P. R. China

The test report was prepared by: Sign on File
Powell Bao / Engineer

The test report was reviewed by:

 Digitally signed
by Kidd Yang
Location: Intertek
Testing Services
Name Kidd Yang
Title Senior Project Engineer

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Table of Contents

Summary of Tests.....	3
1. General information	4
1.1 Identification of the EUT	4
1.2 Additional information about the EUT.....	5
1.3 Antenna description (15.203)	5
1.4 Peripherals equipment	5
2. Test specifications	6
2.1 Test standard.....	6
2.2 Operation mode	7
3. Maximum Output Power test (FCC 15.407)	8
3.1 Operating environment.....	8
3.2 Test setup & procedure	8
3.3 Limit	8
3.4 Measured data of Maximum Output Power test results	9
4. Power Spectrum Density test (FCC 15.407)	13
4.1 Operating environment.....	13
4.2 Test setup & procedure	13
4.3 Limit	13
4.4 Measured data of Power Spectrum Density test results	14
5. Minimum 6 dB RF Bandwidth (FCC 15.407).....	16
5.1 Operating environment.....	16
5.2 Test setup & procedure	16
5.3 Limit	16
5.4 Measured data of Minimum 6 dB RF Bandwidth test results	17
6. Radiated Emission test (FCC 15.205 & 15.209 & 15.407)	18
6.1 Operating environment.....	18
6.2 Test setup & procedure	18
6.3 Limit	20
6.4 Radiated spurious emission test data.....	22
6.4.1 Measurement results: frequencies equal to or less than 1 GHz.....	22
6.4.2 Measurement results: frequency above 1GHz	23
7. Power Line Conducted Emission test.....	41
7.1 Operating environment.....	41
7.2 Test setup & procedure	41
7.3 Limit	42
7.4 Power Line Conducted Emission test data	43
8. Frequency Stability Test	45
8.1 Test setup & procedure	45
8.2 Frequency Stability Test Data	45

Summary of Tests

FCC Parts	Test	Section	Results
15.203	Antenna Requirement	1.3	Pass
15.407 a (1)/(3)	Maximum output power test	3	Pass
15.407 a (1)/(3)	Power Spectrum Density test	4	Pass
15.407 e	6dB Bandwidth	5	Pass
15.407 b, 15.205, 15.209	Radiated spurious emission test	6	Pass
15.207	AC line conducted emission test	7	Pass
15.407 g	Frequency Stability	8	Pass

1. General information

1.1 Identification of the EUT

Product:	WiFi Module
Model No.:	TWFP-M601D
Type of Device:	Master device
Nominal Channel Bandwidth:	802.11a/n-HT20 (20 MHz), 802.11n-HT40 (40MHz), 802.11ac (20/40/80MHz)
Operating Frequency:	1. 5180 MHz ~ 5240 MHz 2. 5745 MHz ~ 5825 MHz
Channel Number:	4 channels for 5180 MHz ~ 5240 MHz for 802.11a/n/ac-HT20; 2 channels for 5190 MHz ~ 5230 MHz for 802.11n/ac-HT40; 1 channels for 5210 MHz for 802.11ac; 5 channels for 5745 MHz ~ 5825 MHz for 802.11a/n/ac-HT20; 2 channels for 5755 MHz ~ 5795 MHz for 802.11n/ac-HT40 1 channels for 5775 MHz for 802.11ac
Rated Power:	5.0Vdc, 1.5A from adapter (Model No.: GAC-002)
Test Date(s):	1 August 2016 to 30 August 2016
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Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

1.2 Additional information about the EUT

The EUT is a WiFi Module with 4 Antennas. 4 antennas can be used for WiFi 5GHz band and 2.4GHz band. When product operates on SISO mode 802.11a/n/ac mode (5.2/5.8G band), only one antenna(Ant1) is used for transmitting according the rationale that the receiver sensitivity has meet internal limit valve. When product operates on MIMO mode (4Tx), Ant1 to Ant4 will transmit simultaneously.

For more detail features, please refer to User's description as file name “descri.pdf”.

1.3 Antenna description (15.203)

The EUT uses Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

1.4 Peripherals equipment

Description	Manufacturer	Model No.
Laptop	HP	Compaq 2510p
Adapter	N/A	GAC-002
HDMI Cable	N/A	1.5m (Unshielded)

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 E, Section 15.203, 15.207, 15.209, 15.407 and ANSI C63.10/2013, method of measurement: KDB 789033.

The test of radiated measurements according to FCC Part 15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

The AC power conducted emissions was investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz (15.207 paragraph).

Radiated emissions were investigated cover the frequency range from 9KHz to 30MHz using a receiver RBW of 9kHz, from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz, VBW of 3MHz, Detector=Peak record for Peak reading, RBW of 1 MHz, VBW of 3MHz, Detector=RMS record for Average reading recorded on the report.

The EUT setup configurations please refer to the photo of radiated setup photos.pdf & conducted setup photos.pdf.

2.2 Operation mode

The EUT was supplied by adapter with 5.0Vdc, 1.5A and it was run in TX mode that was controlled by client provided RF testing program.

The EUT was transmitted continuously during the test. The worst case test result was showed in the report.

With individual verifying, the maximum output power was found at 6 Mbps data rate for 802.11a mode, 6.5 Mbps data rate for 802.11n-HT20 mode, 13.5 Mbps data rate for 802.11n-HT40 mode, 29.3Mbps data rate for 802.11ac. The final tests were executed under these conditions and recorded in this report individually.

Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3. Maximum Output Power test (FCC 15.407)

3.1 Operating environment

Temperature: 25 °C
Relative Humidity: 50 %
Atmospheric Pressure: 1023 hPa

3.2 Test setup & procedure

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm SMA cable connected to Power Meter and the measurement method refer to 789033 D02. Power was read directly and cable loss correction (0.5dB) was added to the reading to obtain power at the EUT antenna terminals.

3.3 Limit

Operating Frequency (MHz)	Max Conducted TX Power	Max EIRP
5150~5250	* ₁ 30dBm (1W) for master device	* ₂ 4W (36dBm) with 6dBi antenna
	24dBm (250mW) for client device	
5725~5850	* ₁ 30dBm (1W)	* ₂ 4W (36dBm) with 6dBi antenna

Remark: *₁ The device declare as Master device.

- *₂ 1).Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.
 2). For MIMO system of 802.11n/ac, total power is calculated by combining the output power of each antenna according to KDB662911.
 3). 5.2/5.8G band Ant: -3.5dBi
 4). In MIMO (4Tx), Ant1+Ant2+Ant3+Ant4 Directional gain = GANT + 10 log(N)
 $\text{dBi} = -3.5 + 10 \log(4) = 2.5 \text{ dBi} < 6 \text{ dBi}.$

3.4 Measured data of Maximum Output Power test results

5150 MHz ~ 5250 MHz

Max Conducted TX Power

SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)
802.11a	36	6	19.0	30
	40		19.0	30
	48		19.2	30
802.11n-HT20	36	6.5	19.2	30
	40		19.2	30
	48		19.3	30
802.11n-HT40	38	13.5	19.1	30
	46		19.7	30
802.11ac-HT20	36	6.5	19.2	30
	40		19.6	30
	48		19.9	30
802.11ac-HT40	38	13.5	20.6	30
	46		20.4	30
802.11ac-HT80	42	29.3	19.4	30

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Mode	Channel	Data Rate (Mbps)	Output Power (dBm)					Limit (dBm)
			Ant1	Ant2	Ant3	Ant4	Total	
802.11n-HT20	36	26	19.2	19.0	19.2	19.3	25.2	30
	40		19.2	19.0	19.0	19.1	25.1	30
	48		19.3	19.2	19.3	19.3	25.3	30
802.11n-HT40	38	54	19.1	19.1	19.2	19.2	25.2	30
	46		19.7	19.2	19.3	19.5	25.4	30
802.11ac-HT20	36	26	19.2	19.2	19.2	19.3	25.2	30
	40		19.6	19.3	19.4	19.4	25.4	30
	48		19.9	19.0	19.5	19.0	25.4	30
802.11ac-HT40	38	54	20.6	20.0	20.6	20.0	26.3	30
	46		20.4	20.1	20.1	20.0	26.2	30
802.11ac-HT80	42	117.2	19.4	19.0	19.0	19.1	25.1	30

Max EIRP
SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	Duty cycle	Output Power (dBm)	Gain (dBi)	E.I.R.P (dBm)	Limit (dBm)
802.11a	36	6	99%	19.0	-3.5	15.5	36
	40			19.0	-3.5	15.5	36
	48			19.2	-3.5	15.7	36
802.11n-HT20	36	6.5	99%	19.2	-3.5	15.7	36
	40			19.2	-3.5	15.7	36
	48			19.3	-3.5	15.8	36
802.11n-HT40	38	13.5	99%	19.1	-3.5	15.6	36
	46			19.7	-3.5	16.2	36
802.11ac-HT20	36	6.5	99%	19.2	-3.5	15.7	36
	40			19.6	-3.5	16.1	36
	48			19.9	-3.5	16.4	36
802.11ac-HT40	38	13.5	99%	20.6	-3.5	17.1	36
	46			20.4	-3.5	16.9	36
802.11ac-HT80	42	29.3	99%	19.4	-3.5	15.9	36

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Mode	Channel	Data Rate (Mbps)	Duty cycle	Output Power (dBm)					Gain (dBi)	E.I.R.P (dBm)	Limit (dBm)
				Ant1	Ant2	Ant3	Ant4	Total			
802.11n-HT20	36	26	99%	19.2	19.0	19.2	19.3	25.2	-3.5	21.7	36
	40			19.2	19.0	19.0	19.1	25.1	-3.5	21.6	36
	48			19.3	19.2	19.3	19.3	25.3	-3.5	21.8	36
802.11n-HT40	38	54	99%	19.1	19.1	19.2	19.2	25.2	-3.5	21.7	36
	46			19.7	19.2	19.3	19.5	25.4	-3.5	21.9	36
802.11ac-HT20	36	26	99%	19.2	19.2	19.2	19.3	25.2	-3.5	21.7	36
	40			19.6	19.3	19.4	19.4	25.4	-3.5	21.9	36
	48			19.9	19.0	19.5	19.0	25.4	-3.5	21.9	36
802.11ac-HT40	38	54	99%	20.6	20.0	20.6	20.0	26.3	-3.5	22.8	36
	46			20.4	20.1	20.1	20.0	26.2	-3.5	22.7	36
802.11ac-HT80	42	117.2	99%	19.4	19.0	19.0	19.1	25.1	-3.5	19.6	36

5725 MHz ~ 5850 MHz

Max Conducted TX Power

SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)
802.11a	149	6	19.5	30
	157		19.1	30
	165		19.0	30
802.11n-HT20	149	6.5	19.8	30
	157		19.6	30
	165		19.2	30
802.11n-HT40	151	13.5	19.2	30
	159		19.9	30
802.11ac-HT20	149	6.5	19.8	30
	157		19.5	30
	165		19.4	30
802.11ac-HT40	151	13.5	19.8	30
	159		19.7	30
802.11ac-HT80	155	29.3	19.5	30

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Mode	Channel	Data Rate (Mbps)	Output Power (dBm)					Limit (dBm)
			Ant1	Ant2	Ant3	Ant4	Total	
802.11n-HT20	149	26	19.8	17.7	17.6	17.7	24.3	30
	157		19.6	16.6	16.5	16.6	23.6	30
	165		19.2	17.4	17.5	19.2	24.4	30
802.11n-HT40	151	54	19.2	17.0	17.5	18.2	24.4	30
	159		19.9	17.9	17.0	17.9	24.1	30
802.11ac-HT20	149	26	19.8	17.8	17.5	17.8	24.3	30
	157		19.5	17.6	17.6	18.5	24.4	30
	165		19.4	18.6	17.6	19.4	24.8	30
802.11ac-HT40	151	54	19.8	19.1	18.1	19.8	25.3	30
	159		19.7	18.2	18.5	19.7	25.1	30
802.11ac-HT80	155	117.2	19.5	18.3	17.3	19.5	24.8	30

Max EIRP

SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	Duty cycle	Output Power (dBm)	Gain (dBi)	E.I.R.P (dBm)	Limit (dBm)
802.11a	149	6	99%	19.5	-3.5	16.0	36
	157			19.1	-3.5	15.6	36
	165			19.0	-3.5	15.5	36
802.11n-HT20	149	6.5	99%	19.8	-3.5	16.3	36
	157			19.6	-3.5	16.1	36
	165			19.2	-3.5	15.7	36
802.11n-HT40	151	13.5	99%	19.2	-3.5	15.7	36
	159			19.9	-3.5	16.4	36
802.11n-HT20	149	6.5	99%	19.8	-3.5	16.3	36
	157			19.5	-3.5	16.0	36
	165			19.4	-3.5	15.9	36
802.11n-HT40	151	13.5	99%	19.8	-3.5	16.3	36
	159			19.7	-3.5	16.2	36
802.11ac	155	29.3	99%	19.5	-3.5	16.0	36

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Mode	Channel	Data Rate (Mbps)	Duty cycle	Output Power (dBm)					Gain (dBi)	E.I.R.P (dBm)	Limit (dBm)
				Ant1	Ant2	Ant3	Ant4	Total			
802.11n-HT20	149	26	99%	19.8	17.7	17.6	17.7	24.3	-3.5	20.6	36
	157			19.6	16.6	16.5	16.6	23.6	-3.5	20.1	36
	165			19.2	17.4	17.5	19.2	24.4	-3.5	20.9	36
802.11n-HT40	151	54	99%	19.2	17.0	17.5	18.2	24.4	-3.5	20.9	36
	159			19.9	17.9	17.0	17.9	24.1	-3.5	20.6	36
802.11ac-HT20	149	26	99%	19.8	17.8	17.5	17.8	24.3	-3.5	20.8	36
	157			19.5	17.6	17.6	18.5	24.4	-3.5	20.9	36
	165			19.4	18.6	17.6	19.4	24.8	-3.5	21.3	36
802.11ac-HT40	151	54	99%	19.8	19.1	18.1	19.8	25.3	-3.5	21.8	36
	159			19.7	18.2	18.5	19.7	25.1	-3.5	21.6	36
802.11ac-HT80	155	117.2	99%	19.5	18.3	17.3	19.5	24.8	-3.5	21.3	36

4. Power Spectrum Density test (FCC 15.407)

4.1 Operating environment

Temperature: 25 °C
Relative Humidity: 50 %
Atmospheric Pressure: 1023 hPa

4.2 Test setup & procedure

Method of Measurement:

The power spectrum density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz/500KHz, the video bandwidth set at 3 MHz/2MHz (measurement method refer to KDB 789033 D02). Power spectrum density was read directly and cable loss (0.5 dB) reading to obtain power at the EUT antenna terminals.

For MIMO system 4Tx the antenna ports is checked, the worst case power density is calculated from the method of Measure by adding $10\log(2)/10\log(3)$ according KDB662911.

4.3 Limit

Operating Frequency (MHz)	Max Conducted Power Spectral Density
5150~5250	* ₁ 17dBm/MHz for master device
	11dBm/MHz for mobile/portable client device
5725~5850	* ₁ 30dBm/500KHz for master device

Remark: *₁ The device declare as Master device.

- 1).Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.
- 2). 5.2/5.8G band Ant: -3.5dBi
- 3). In MIMO (4Tx), Ant1+Ant2+Ant3+Ant4 Directional gain = GANT + 10 log(N)
dBi = -3.5 + 10 log(4) = 2.5dBi < 6dBi

4.4 Measured data of Power Spectrum Density test results

5150 MHz ~ 5250 MHz

SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	PSD (dBm/MHz)	Limit (dBm/MHz)
802.11a	36	6	7.87	17
	40		7.44	17
	48		7.96	17
802.11n-HT20	36	6.5	8.64	17
	40		8.49	17
	48		8.34	17
802.11n-HT40	38	13.5	4.38	17
	46		4.48	17
802.11ac-HT20	36	6.5	8.50	17
	40		8.32	17
	48		8.61	17
802.11ac-HT40	38	13.5	5.02	17
	46		4.92	17
802.11ac-HT80	42	29.3	1.88	17

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Mode	Channel	Data Rate (Mbps)	PSD (dBm/MHz)					Limit (dBm/MHz)
			Ant1	Ant2	Ant3	Ant4	Total	
802.11n-HT20	36	26	7.06	7.94	5.30	3.90	12.34	17
	40		7.50	8.01	4.61	3.33	12.30	17
	48		7.51	8.04	4.76	3.87	12.41	17
802.11n-HT40	38	54	0.56	2.95	0.74	1.59	7.59	17
	46		0.69	3.10	0.01	0.50	7.27	17
802.11ac-HT20	36	26	7.16	7.95	5.58	4.64	12.54	17
	40		4.31	5.65	4.60	4.04	10.72	17
	48		3.89	5.36	4.34	3.58	10.37	17
802.11ac-HT40	38	54	0.31	3.46	1.25	1.91	7.91	17
	46		0.49	3.65	0.67	0.81	7.64	17
802.11ac-HT80	42	117.2	-2.17	-0.70	-1.78	-1.40	4.54	17

5725 MHz ~ 5850 MHz

SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	PSD (dBm/500KHz)	Limit (dBm/500KHz)
802.11a	149	6	5.96	30
	157		5.74	30
	165		5.58	30
802.11n-HT20	149	6.5	6.13	30
	157		6.13	30
	165		5.61	30
802.11n-HT40	151	13.5	2.13	30
	159		1.98	30
802.11ac-HT20	149	6.5	5.92	30
	157		5.84	30
	165		6.00	30
802.11ac-HT40	151	13.5	2.14	30
	159		2.06	30
802.11ac-HT80	155	29.3	-1.43	30

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Mode	Channel	Data Rate (Mbps)	PSD (dBm/500KHz)					Limit (dBm/500KHz)
			Ant1	Ant2	Ant3	Ant4	Total	
802.11n-HT20	149	26	1.54	2.71	2.31	0.38	7.84	30
	157		1.37	2.86	2.45	0.49	7.91	30
	165		1.66	1.95	2.35	0.50	7.69	30
802.11n-HT40	151	54	-2.67	-0.53	-1.28	-2.78	4.31	30
	159		-2.19	-1.38	-1.44	-2.26	4.22	30
802.11ac-HT20	149	26	1.93	1.40	2.48	1.51	7.87	30
	157		1.99	1.88	2.32	1.56	7.97	30
	165		2.04	1.89	2.38	1.60	8.00	30
802.11ac-HT40	151	54	-2.21	-0.73	-0.86	-2.19	4.67	30
	159		-1.90	-0.81	-0.69	-1.92	4.73	30
802.11ac-HT80	155	117.2	-4.90	-4.45	-4.70	-5.39	1.17	30

Please refer the graph of “PSD.pdf”.

5. Minimum 6 dB RF Bandwidth (FCC 15.407)

5.1 Operating environment

Temperature: 25 °C
Relative Humidity: 50 %
Atmospheric Pressure: 1023 hPa

5.2 Test setup & procedure

The Minimum 6 dB RF Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100KHz, and set the video bandwidth (VBW) $\geq 3 \times$ RBW. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

For 26dB down Emission Bandwidth

The 26dB down Emission Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW, Detector = Peak, Trace mode = max hold (Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%).

For 99% Occupied Bandwidth

The 99% Occupied Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set center frequency to the nominal EUT channel center frequency, set span = 1.5 times to 5.0 times the OBW, set RBW = 1 % to 5 % of the OBW, set VBW $\geq 3 \times$ RBW, The 99% occupied bandwidth was determined from where the channel output spectrum intersected the display line.

5.3 Limit

Operating Frequency (MHz)	Minimum 6 dB RF Bandwidth Limit
5150~5250	N/A
5725~5850	$\geq 500\text{KHz}$

Note: 99% Occupied Bandwidth within the U-NII-1 band and 26dB Emission Bandwidth for reference.

5.4 Measured data of Minimum 6 dB RF Bandwidth test results

SISO Mode, Ant1

Mode	Channel	Data Rate (Mbps)	Result
802.11a	157	6	Pass
802.11n-HT20	157	6.5	Pass
802.11n-HT40	159	13.5	Pass
802.11ac-HT20	157	6.5	Pass
802.11ac-HT40	159	13.5	Pass
802.11ac-HT80	155	29.3	Pass

MIMO Mode, Ant1+Ant2+Ant3+Ant4

Ant1

Mode	Channel	Data Rate (Mbps)	Result
802.11n-HT20	157	26	Pass
802.11n-HT40	159	54	Pass
802.11ac-HT20	157	26	Pass
802.11ac-HT40	159	54	Pass
802.11ac-HT80	155	117.2	Pass

Note:

1. Please refer the graph of “6 dB Bandwidth.pdf”.
2. For each operating mode, it is not necessary to measure the bandwidth on the high and low channels, as the measured channel bandwidth on the middle channel is at least 150% of the minimum permitted bandwidth.
3. For multiple-input multiple-output (MIMO) systems, it is not necessary to repeat testing on the other chains, as the measured channel bandwidth on testing the middle channel exceeds the minimum permitted bandwidth by more than 50% on one transmit chain.

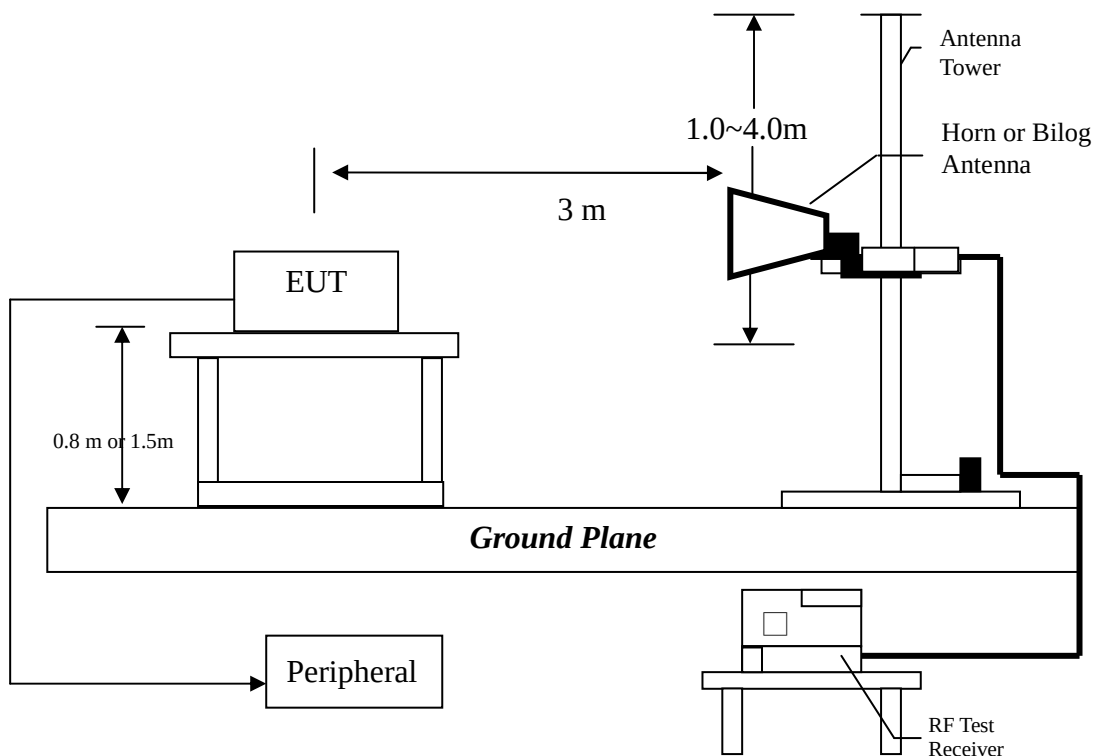
6. Radiated Emission test (FCC 15.205 & 15.209 & 15.407)

6.1 Operating environment

Temperature: 23 °C
Relative Humidity: 58 %
Atmospheric Pressure 1023 hPa

6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emission measurements were performed from 9KHz to tenth harmonic or 40GHz. The EUT for testing is arranged on a styrene turntable with the height of 0.8m up to 1GHz and 1.5m above 1GHz. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

Testing settings (refer to KDB 789033 D02)

Peak Measurements below 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=120KHz
- 4, Detector=Quasi-Peak
- 5, Trace was allowed to stabilize

Peak Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= Peak (Max-hold)
- 5, Trace was allowed to stabilize

Average Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= RMS (Max-hold)
- 5, Trace was allowed to stabilize

6.3 Limit

The spurious Emission shall test through the 10th harmonic or 40GHz (whichever is lower). 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).

Notes:

- 1, All emission out-side of the 5.15-5.35GHz & 5.47-5.725GHz band shall not exceed an EIRP of -27dBm/MHz (68.2dBuV/m, test distance: 3 meter), for band 5.725-5.85GHz shall not exceed an $\leq$ -17dBm/MHz (78.2dBuV/m, test distance: 3 meter) within 5715-5725MHz and 5850-5860MHz, $\leq$ -27dBm/MHz (68.2dBuV/m, test distance: 3 meter) outside 5715-5860MHz.
- 2, The spectrum is measured from 9KHz to the 10th harmonic of the fundamental frequency of the transmitter using QP detector below 1GHz, above 1GHz, average & peak measurements were taken using for test. The worst-case emission are reported however emission whose levels were not within 20dB of the respective limited were not reported.
- 3, The test was performed on EUT under 802.11a/n-HT20/40/ac-HT20/40/80 continuously transmitting mode. Simultaneous transmitting was considered during the testing.

Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where FS = Field Strength in dB μ V/m
RA = Receiver Amplitude (including preamplifier) in dB μ V
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ PD &= 0 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

6.4 Radiated spurious emission test data

6.4.1 Measurement results: frequencies equal to or less than 1 GHz

The worst case occurred at 802.11n-HT40, MIMO, 4Tx, Channel 38/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	30.970	23.4	20.0	17.9	21.3	40.0	-18.7
Horizontal	441.765	38.0	20.0	11.3	29.3	43.5	-14.2
Horizontal	638.220	22.3	20.0	29.7	32.0	46.0	-14.0
Vertical	38.245	31.2	20.0	13.3	24.5	40.0	-15.5
Vertical	40.680	38.9	20.0	8.6	27.5	40.0	-12.5
Vertical	177.925	17.5	20.0	28.0	25.5	43.5	-18.0

6.4.2 Measurement results: frequency above 1GHz

Test Condition : 802.11a, SISO, Ant1, Channel 36/6Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	59.7	36.3	38.9	62.3	68.2	-5.9
Horizontal	15540.000	56.6	34.7	41.0	62.9	68.2	-5.3
Horizontal	5149.300	58.8	36.1	35.5	58.2	68.2	-10.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15540	44.2	34.7	41.0	50.5	54.0	-3.5
Horizontal	*5149.3	50.6	36.1	35.5	50.0	54.0	-4.0

Test Condition : 802.11a, SISO, Ant1, Channel 40/6Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	59.2	36.3	38.9	61.8	68.2	-6.4
Horizontal	15600.000	53.9	34.7	41.0	60.2	68.2	-8.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15600	44.8	34.7	41.0	51.1	54.0	-2.9

Test Condition : 802.11a, SISO, Ant1, Channel 48/6Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	57.6	36.3	38.9	60.2	68.2	-8.0
Horizontal	15720.000	51.8	34.7	41.0	58.1	68.2	-10.1
Horizontal	5351.780	58.6	35.9	36.4	59.1	68.2	-9.1

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15720.000	44.5	34.7	41.0	50.8	54.0	-3.2
Horizontal	*5351.780	49.7	35.9	36.4	50.2	54.0	-3.8

Test Condition : 802.11n-HT20, SISO, Ant1, Channel 36/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	58.7	36.3	38.9	61.3	68.2	-6.9
Horizontal	15540.000	56.5	34.7	41.0	62.8	68.2	-5.4
Horizontal	5148.569	59.1	36.1	35.5	58.5	68.2	-9.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15540	40.5	34.7	41.0	46.8	54.0	-7.2
Horizontal	*5148.569	47.1	36.1	35.5	46.5	54.0	-7.5

Test Condition : 802.11n-HT20, SISO, Ant1, Channel 40/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	57.7	36.3	38.9	60.3	68.2	-7.9
Horizontal	15600.000	55.1	34.7	41.0	61.4	68.2	-6.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15600	42.7	34.7	41.0	49.0	54.0	-5.0

Test Condition : 802.11n-HT20, SISO, Ant1, Channel 48/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	57.9	36.3	38.9	60.5	68.2	-7.7
Horizontal	15720.000	56.8	34.7	41.0	63.1	68.2	-5.1
Horizontal	5351.594	58.1	35.9	36.4	58.6	68.2	-9.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15720	40.3	34.7	41.0	46.6	54.0	-7.4
Horizontal	*5351.594	47.6	35.9	36.4	48.1	54.0	-5.9

Test Condition : 802.11n-HT20, MIMO, Ant1+2+3+4, Channel 36/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	58.0	36.3	38.9	60.6	68.2	-7.6
Horizontal	15540.000	53.9	34.7	41.0	60.2	68.2	-8.0
Horizontal	5149.470	58.9	36.1	35.5	58.3	68.2	-9.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15540	43.0	34.7	41.0	49.3	54.0	-4.7
Horizontal	*5149.47	47.1	36.1	35.5	46.5	54.0	-7.5

Test Condition : 802.11n-HT20, MIMO, Ant1+2+3+4, Channel 40/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	57.9	36.3	38.9	60.5	68.2	-7.7
Horizontal	15600.000	53.3	34.7	41.0	59.6	68.2	-8.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15600	40.5	34.7	41.0	46.8	54.0	-7.2

Test Condition : 802.11n-HT20, MIMO, Ant1+2+3+4, Channel 48/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	58.8	36.3	38.9	61.4	68.2	-6.8
Horizontal	15720.000	54.2	34.7	41.0	60.5	68.2	-7.7
Horizontal	5351.562	57.8	35.9	36.4	58.3	68.2	-9.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15720	40.0	34.7	41.0	46.3	54.0	-7.7
Horizontal	*5351.562	46.0	35.9	36.4	46.5	54.0	-7.5

Test Condition : 802.11n-HT40, SISO, Ant1, Channel 38/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10380.000	58.1	36.3	38.9	60.7	68.2	-7.5
Horizontal	15570.000	55.2	34.7	41.0	61.5	68.2	-6.7
Horizontal	5148.850	57.1	36.1	35.5	56.5	68.2	-11.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15570	44.3	34.7	41.0	50.6	54.0	-3.4
Horizontal	*5148.850	47.4	36.1	35.5	46.8	54.0	-7.2

Test Condition : 802.11n-HT40, SISO, Ant1, Channel 46/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10460.000	58.7	36.3	38.9	61.3	68.2	-6.9
Horizontal	15690.000	55.2	34.7	41.0	61.5	68.2	-6.7
Horizontal	5352.600	58.5	35.9	36.4	59.0	68.2	-9.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15690	45.2	34.7	41.0	51.5	54.0	-2.5
Horizontal	*5352.6	47.3	35.9	36.4	47.8	54.0	-6.2

Test Condition : 802.11n-HT40, MIMO, Ant1+2+3+4, Channel 38/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10380.000	58.4	36.3	38.9	61.0	68.2	-7.2
Horizontal	15570.000	53.1	34.7	41.0	59.4	68.2	-8.8
Horizontal	5148.674	59.1	36.1	35.5	58.5	68.2	-9.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15570	42.5	34.7	41.0	48.8	54.0	-5.2
Horizontal	*5148.674	47.5	36.1	35.5	46.9	54.0	-7.1

Test Condition : 802.11n-HT40, MIMO, Ant1+2+3+4, Channel 46/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10460.000	58.6	36.3	38.9	61.2	68.2	-7.0
Horizontal	15690.000	53.5	34.7	41.0	59.8	68.2	-8.4
Horizontal	5351.780	58.7	35.9	36.4	59.2	68.2	-9.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15690	43.6	34.7	41.0	49.9	54.0	-4.1
Horizontal	*5351.78	47.3	35.9	36.4	47.8	54.0	-6.2

Test Condition : 802.11ac-HT20, SISO, Ant1, Channel 36/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	60.5	36.3	38.9	63.1	68.2	-5.1
Horizontal	15540.000	53.9	34.7	41.0	60.2	68.2	-8.0
Horizontal	5148.550	59.5	36.1	35.5	58.9	68.2	-9.3

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15540	43.5	34.7	41.0	49.8	54.0	-4.2
Horizontal	*5148.550	49.7	36.1	35.5	49.1	54.0	-4.9

Test Condition : 802.11ac-HT20, SISO, Ant1, Channel 40/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	61.5	36.3	38.9	64.1	68.2	-4.1
Horizontal	15600.000	53.0	34.7	41.0	59.3	68.2	-8.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15600	42.9	34.7	41.0	49.2	54.0	-4.8

Test Condition : 802.11ac-HT20, SISO, Ant1, Channel 48/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	60.9	36.3	38.9	63.5	68.2	-4.7
Horizontal	15720.000	53.3	34.7	41.0	59.6	68.2	-8.6
Horizontal	5351.598	58.3	35.9	36.4	58.8	68.2	-9.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15720	43.5	34.7	41.0	49.8	54.0	-4.2
Horizontal	*5351.98	46.4	35.9	36.4	46.9	54.0	-7.1

Test Condition : 802.11ac-HT20, MIMO, Ant1+2+3+4, Channel 36/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	57.9	36.3	38.9	60.5	68.2	-7.7
Horizontal	15540.000	54.3	34.7	41.0	60.6	68.2	-7.6
Horizontal	5149.700	59.4	36.1	35.5	58.8	68.2	-9.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15540	41.3	34.7	41.0	47.6	54.0	-6.4
Horizontal	*5149.7	50.5	36.1	35.5	49.9	54.0	-4.1

Test Condition : 802.11ac-HT20, MIMO, Ant1+2+3+4, Channel 40/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	57.8	36.3	38.9	60.4	68.2	-7.8
Horizontal	15600.000	53.8	34.7	41.0	60.1	68.2	-8.1

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15600	43.7	34.7	41.0	50.0	54.0	-4.0

Test Condition : 802.11ac-HT20, MIMO, Ant1+2+3+4, Channel 48/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	58.6	36.3	38.9	61.2	68.2	-7.0
Horizontal	15720.000	54.1	34.7	41.0	60.4	68.2	-7.8
Horizontal	5351.600	59.3	35.9	36.4	59.8	68.2	-8.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15720	43.6	34.7	41.0	49.9	54.0	-4.1
Horizontal	*5351.6	47.0	35.9	36.4	47.5	54.0	-6.5

Test Condition : 802.11ac-HT40, SISO, Ant1, Channel 38/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10380.000	56.7	36.3	38.9	59.3	68.2	-8.9
Horizontal	15570.000	54.1	34.7	41.0	60.4	68.2	-7.8
Horizontal	5148.980	58.8	36.1	35.5	58.2	68.2	-10.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15570	43.2	34.7	41.0	49.5	54.0	-4.5
Horizontal	*5148.98	48.4	36.1	35.5	47.8	54.0	-6.2

Test Condition : 802.11ac-HT40, SISO, Ant1, Channel 46/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10460.000	56.0	36.3	38.9	58.6	68.2	-9.6
Horizontal	15690.000	52.4	34.7	41.0	58.7	68.2	-9.5
Horizontal	5352.670	58.4	35.9	36.4	58.9	68.2	-9.3

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15690	43.2	34.7	41.0	49.5	54.0	-4.5
Horizontal	*5352.67	48.1	35.9	36.4	48.6	54.0	-5.4

Test Condition : 802.11ac-HT40, MIMO, Ant1+2+3+4, Channel 38/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10380.000	56.6	36.3	38.9	59.2	68.2	-9.0
Horizontal	15570.000	51.9	34.7	41.0	58.2	68.2	-10.0
Horizontal	5148.890	58.4	36.1	35.5	57.8	68.2	-10.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15570	40.5	34.7	41.0	46.8	54.0	-7.2
Horizontal	*5148.890	50.3	36.1	35.5	49.7	54.0	-4.3

Test Condition : 802.11ac-HT40, MIMO, Ant1+2+3+4, Channel 46/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10460.000	58.9	36.3	38.9	61.5	68.2	-6.7
Horizontal	15690.000	55.3	34.7	41.0	61.6	68.2	-6.6
Horizontal	5352.700	58.2	35.9	36.4	58.7	68.2	-9.5

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15690	42.8	34.7	41.0	49.1	54.0	-4.9
Horizontal	*5352.7	47.1	35.9	36.4	47.6	54.0	-6.4

Test Condition : 802.11ac, SISO, Ant1, Channel 42/29.3Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10420.000	55.6	36.3	38.9	58.2	68.2	-10.0
Horizontal	15630.000	52.7	34.7	41.0	59.0	68.2	-9.2
Horizontal	5148.450	58.3	35.9	36.4	58.8	68.2	-9.4
Horizontal	5351.465	58.2	35.9	36.4	58.7	68.2	-9.5

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15630	43.1	34.7	41.0	49.4	54.0	-4.6
Horizontal	*5148.450	47.2	35.9	36.4	47.7	54.0	-6.3
Horizontal	*5351.465	46.4	35.9	36.4	46.9	54.0	-7.1

Test Condition : 802.11ac, MIMO, Ant1+2+3+4, Channel 42/117.2Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10420.000	56.3	36.3	38.9	58.9	68.2	-9.3
Horizontal	15630.000	53.6	34.7	41.0	59.9	68.2	-8.3
Horizontal	5148.561	56.4	35.9	36.4	56.9	68.2	-11.3
Horizontal	5352.586	57.0	35.9	36.4	57.5	68.2	-10.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*15630	41.5	34.7	41.0	47.8	54.0	-6.2
Horizontal	*5148.561	47.9	35.9	36.4	48.4	54.0	-5.6
Horizontal	*5352.586	47.1	35.9	36.4	47.6	54.0	-6.4

Test Condition : 802.11a, SISO, Ant1, Channel 149/6Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	54.3	35.3	41.2	60.2	68.2	-8.0
Horizontal	17235.000	55.3	33.9	39.2	60.6	68.2	-7.6
Horizontal	5716.399	68.2	36.7	27.2	58.7	78.2	-19.5

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11490	41.7	35.3	41.2	47.6	54.0	-6.4

Test Condition : 802.11a, SISO, Ant1, Channel 157/6Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	54.4	35.3	41.2	60.3	68.2	-7.9
Horizontal	17355.000	54.2	33.9	39.2	59.5	68.2	-8.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11570	43.9	35.3	41.2	49.8	54.0	-4.2

Test Condition : 802.11a, SISO, Ant1, Channel 165/6Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	53.0	35.3	41.2	58.9	68.2	-9.3
Horizontal	17475.000	54.9	33.9	39.2	60.2	68.2	-8.0
Horizontal	5856.399	71.5	36.7	27.7	62.5	78.2	-15.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11650	43.3	35.3	41.2	49.2	54.0	-4.8

Test Condition : 802.11n-HT20, SISO, Ant1, Channel 149/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	55.6	35.3	41.2	61.5	68.2	-6.7
Horizontal	17235.000	57.0	33.9	39.2	62.3	68.2	-5.9
Horizontal	5718.024	70.9	36.7	27.2	61.4	78.2	-16.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11490	41.6	35.3	41.2	47.5	54.0	-6.5

Test Condition : 802.11n-HT20, SISO, Ant1, Channel 157/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	54.4	35.3	41.2	60.3	68.2	-7.9
Horizontal	17355.000	55.2	33.9	39.2	60.5	68.2	-7.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11570	41.9	35.3	41.2	47.8	54.0	-6.2

Test Condition : 802.11n-HT20, SISO, Ant1, Channel 165/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	54.4	35.3	41.2	60.3	68.2	-7.9
Horizontal	17475.000	55.1	33.9	39.2	60.4	68.2	-7.8
Horizontal	5855.892	68.4	36.7	27.7	59.4	78.2	-18.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11650	42.7	35.3	41.2	48.6	54.0	-5.4

Test Condition : 802.11n-HT20, MIMO, Ant1+2+3+4, Channel 149/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	54.6	35.3	41.2	60.5	68.2	-7.7
Horizontal	17235.000	56.7	33.9	39.2	62.0	68.2	-6.2
Horizontal	5717.168	70.3	36.7	27.2	60.8	78.2	-17.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11490	42.8	35.3	41.2	48.7	54.0	-5.3

Test Condition : 802.11n-HT20, MIMO, Ant1+2+3+4, Channel 157/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	55.0	35.3	41.2	60.9	68.2	-7.3
Horizontal	17355.000	55.1	33.9	39.2	60.4	68.2	-7.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11570	41.9	35.3	41.2	47.8	54.0	-6.2

Test Condition : 802.11n-HT20, MIMO, Ant1+2+3+4, Channel 165/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	56.1	35.3	41.2	62.0	68.2	-6.2
Horizontal	17475.000	56.0	33.9	39.2	61.3	68.2	-6.9
Horizontal	5853.530	67.5	36.7	27.7	58.5	78.2	-19.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11650	43.6	35.3	41.2	49.5	54.0	-4.5

Test Condition : 802.11n-HT40, SISO, Ant1, Channel 151/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11510.000	54.3	35.3	41.2	60.2	68.2	-8.0
Horizontal	17265.000	55.3	33.9	39.2	60.6	68.2	-7.6
Horizontal	5719.004	69.8	36.8	26.5	59.5	78.2	-18.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11510	43.9	35.3	41.2	49.8	54.0	-4.2

Test Condition : 802.11n-HT40, SISO, Ant1, Channel 159/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11590.000	53.9	35.3	41.2	59.8	68.2	-8.4
Horizontal	17385.000	55.3	33.9	39.2	60.6	68.2	-7.6
Horizontal	5855.890	72.5	36.7	27.7	63.5	78.2	-14.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11590	43.4	35.3	41.2	49.3	54.0	-4.7

Test Condition : 802.11n-HT40, MIMO, Ant1+2+3+4, Channel 151/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11510.000	54.6	35.3	41.2	60.5	68.2	-7.7
Horizontal	17265.000	56.3	33.9	39.2	61.6	68.2	-6.6
Horizontal	5722.425	73.8	36.8	26.5	63.5	78.2	-14.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11510	43.7	35.3	41.2	49.6	54.0	-4.4

Test Condition : 802.11n-HT40, MIMO, Ant1+2+3+4, Channel 159/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11590.000	54.0	35.3	41.2	59.9	68.2	-8.3
Horizontal	17385.000	55.9	33.9	39.2	61.2	68.2	-7.0
Horizontal	5852.221	72.0	36.7	27.7	63.0	78.2	-15.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11590	43.0	35.3	41.2	48.9	54.0	-5.1

Test Condition : 802.11ac-HT20, SISO, Ant1, Channel 149/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	53.6	35.3	41.2	59.5	68.2	-8.7
Horizontal	17235.000	55.9	33.9	39.2	61.2	68.2	-7.0
Horizontal	5718.140	71.5	36.7	27.2	62.0	78.2	-16.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11490	42.6	35.3	41.2	48.5	54.0	-5.5

Test Condition : 802.11ac-HT20, SISO, Ant1, Channel 157/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	56.4	35.3	41.2	62.3	68.2	-5.9
Horizontal	17355.000	55.2	33.9	39.2	60.5	68.2	-7.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11570	44.0	35.3	41.2	49.9	54.0	-4.1

Test Condition : 802.11ac-HT20, SISO, Ant1, Channel 165/6.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	54.0	35.3	41.2	59.9	68.2	-8.3
Horizontal	17475.000	54.9	33.9	39.2	60.2	68.2	-8.0
Horizontal	5855.916	71.3	36.7	27.7	62.3	78.2	-15.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11650	43.7	35.3	41.2	49.6	54.0	-4.4

Test Condition : 802.11ac-HT20, MIMO, Ant1+2+3+4, Channel 149/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	53.5	35.3	41.2	59.4	68.2	-8.8
Horizontal	17235.000	55.3	33.9	39.2	60.6	68.2	-7.6
Horizontal	5717.125	72.0	36.7	27.2	62.5	78.2	-15.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11490	42.6	35.3	41.2	48.5	54.0	-5.5

Test Condition : 802.11ac-HT20, MIMO, Ant1+2+3+4, Channel 157/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	54.0	35.3	41.2	59.9	68.2	-8.3
Horizontal	17355.000	55.1	33.9	39.2	60.4	68.2	-7.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11570	42.6	35.3	41.2	48.5	54.0	-5.5

Test Condition : 802.11ac-HT20, MIMO, Ant1+2+3+4, Channel 165/26Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	54.6	35.3	41.2	60.5	68.2	-7.7
Horizontal	17475.000	55.5	33.9	39.2	60.8	68.2	-7.4
Horizontal	5853.880	67.9	36.7	27.7	58.9	78.2	-19.3

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11650	44.0	35.3	41.2	49.9	54.0	-4.1

Test Condition : 802.11ac-HT40, SISO, Ant1, Channel 151/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11510.000	53.6	35.3	41.2	59.5	68.2	-8.7
Horizontal	17265.000	55.5	33.9	39.2	60.8	68.2	-7.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11510	43.6	35.3	41.2	49.5	54.0	-4.5

Test Condition : 802.11ac-HT40, SISO, Ant1, Channel 159/13.5Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11590.000	54.1	35.3	41.2	60.0	68.2	-8.2
Horizontal	17385.000	54.9	33.9	39.2	60.2	68.2	-8.0
Horizontal	5855.860	72.2	36.7	27.7	63.2	78.2	-15.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11590	43.6	35.3	41.2	49.5	54.0	-4.5

Test Condition : 802.11ac-HT40, MIMO, Ant1+2+3+4, Channel 151/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11510.000	53.6	35.3	41.2	59.5	68.2	-8.7
Horizontal	17265.000	56.2	33.9	39.2	61.5	68.2	-6.7
Horizontal	5722.880	73.3	36.8	26.5	63.0	78.2	-15.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11510	40.8	35.3	41.2	46.7	54.0	-7.3

Test Condition : 802.11ac-HT40, MIMO, Ant1+2+3+4, Channel 159/54Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11590.000	54.0	35.3	41.2	59.9	68.2	-8.3
Horizontal	17385.000	55.2	33.9	39.2	60.5	68.2	-7.7
Horizontal	5852.106	71.0	36.7	27.7	62.0	78.2	-16.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11590	43.5	35.3	41.2	49.4	54.0	-4.6

Test Condition : 802.11ac, SISO, Ant1, Channel 155/29.3Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11550.000	54.0	35.3	41.2	59.9	68.2	-8.3
Horizontal	17325.000	55.2	33.9	39.2	60.5	68.2	-7.7
Horizontal	5721.395	71.4	36.8	26.5	61.1	78.2	-17.1
Horizontal	5858.068	59.5	36.3	38.6	61.8	78.2	-16.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11550	41.0	35.3	41.2	46.9	54.0	-7.1

Test Condition : 802.11ac, MIMO, Ant1+2+3+4, Channel 155/117.2Mbps

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11550.000	54.3	35.3	41.2	60.2	68.2	-8.0
Horizontal	17325.000	55.2	33.9	39.2	60.5	68.2	-7.7
Horizontal	5722.140	72.8	36.8	26.5	62.5	78.2	-15.7
Horizontal	5851.735	60.5	36.3	38.6	62.8	78.2	-15.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*11550	39.9	35.3	41.2	45.8	54.0	-8.2

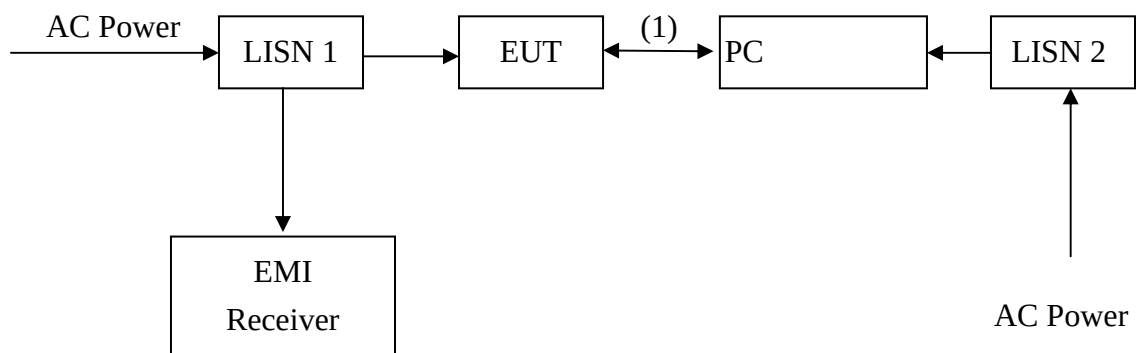
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

7. Power Line Conducted Emission test

7.1 Operating environment

Temperature: 23 °C
Relative Humidity: 55 %
Atmospheric Pressure 1023 hPa

7.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination. Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10/2013 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCI 30) is set at 9 kHz.

7.3 Limit

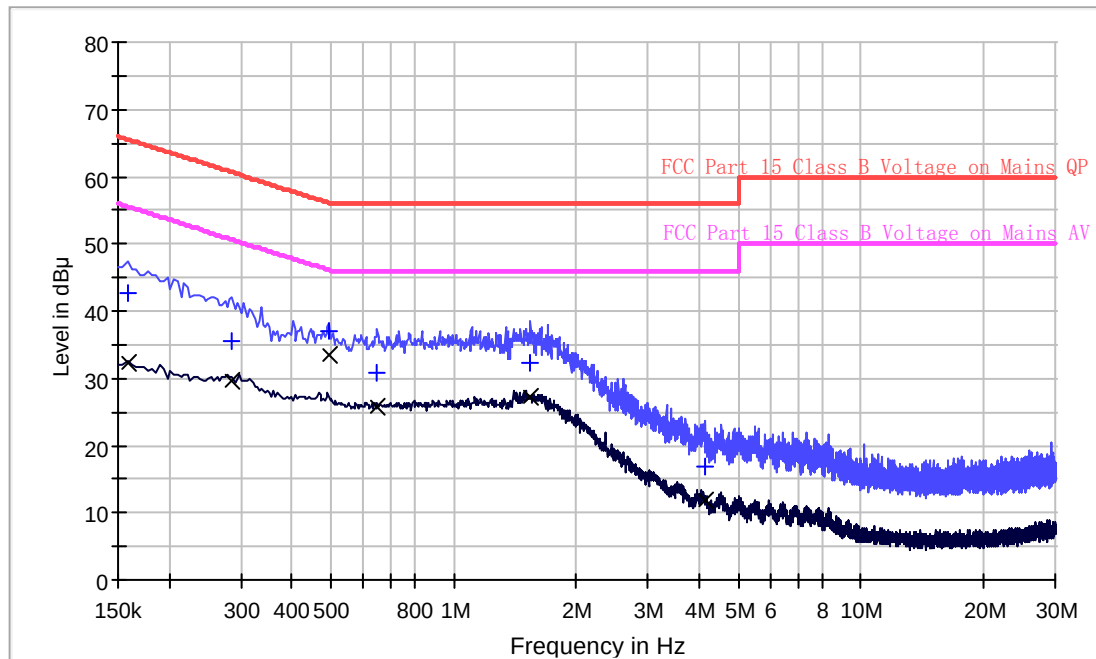
Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

7.4 Power Line Conducted Emission test data

The worst case test was performed on EUT under 802.11 ac-HT40 Link

Phase: Live
Test Condition: 802.11ac-HT40, MIMO, 38/54Mbps



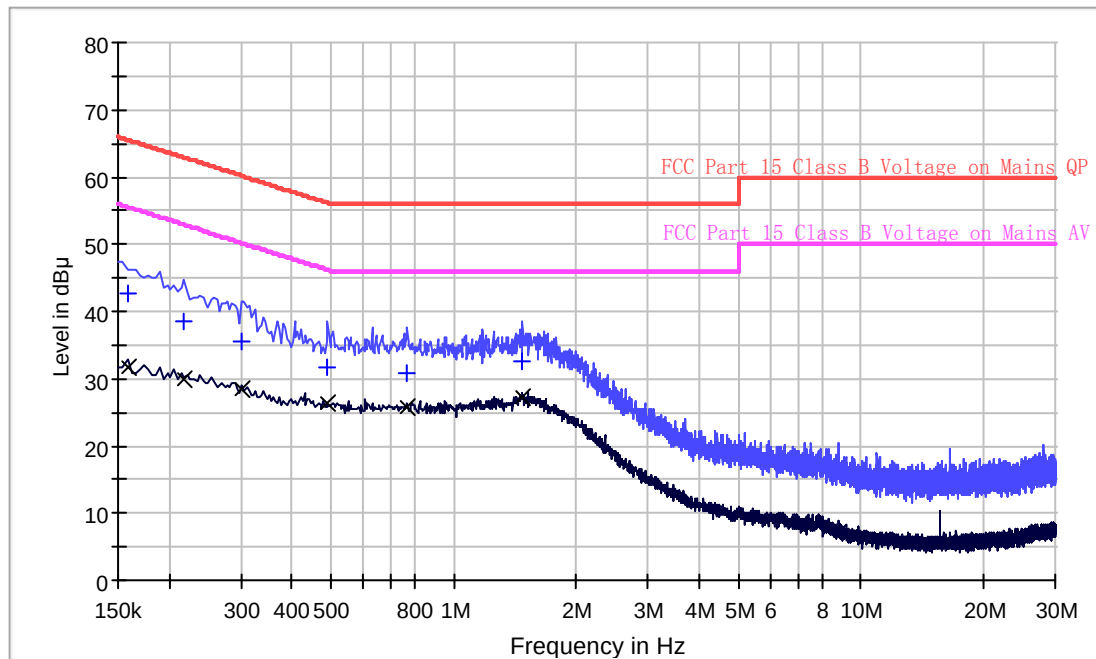
Result Table QP

Frequency (MHz)	QuasiPeak (dB μV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.158	42.5	9.000	L1	9.5	23.1	65.6
0.286	35.6	9.000	L1	9.6	25.0	60.6
0.494	36.9	9.000	L1	9.6	19.2	56.1
0.650	30.8	9.000	L1	9.6	25.2	56.0
1.546	32.2	9.000	L1	9.6	23.8	56.0
4.158	17.0	9.000	L1	9.6	39.0	56.0

Result Table AV

Frequency (MHz)	Average (dB μV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.158	32.3	9.000	L1	9.5	23.3	55.6
0.286	29.5	9.000	L1	9.6	21.1	50.6
0.494	33.6	9.000	L1	9.6	12.5	46.1
0.650	25.7	9.000	L1	9.6	20.3	46.0
1.546	27.1	9.000	L1	9.6	18.9	46.0
4.158	11.8	9.000	L1	9.6	34.2	46.0

Phase: : Neutral
Test Condition: : 802.11ac-HT40, MIMO, 38/54Mbps



Result Table QP

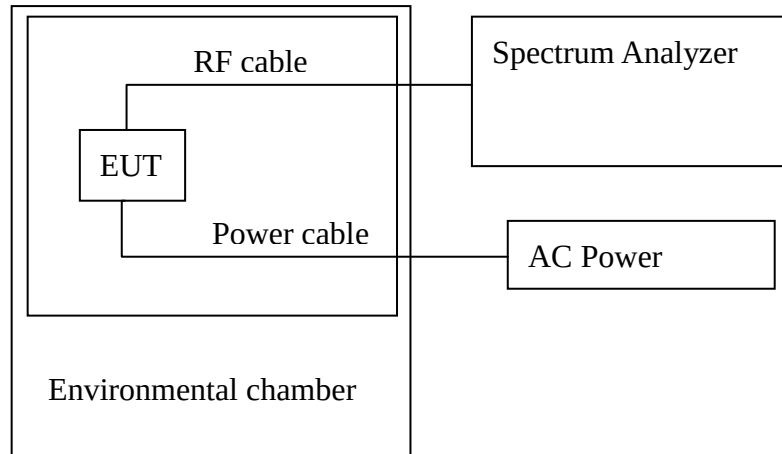
Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.158	42.6	9.000	N	9.6	23.0	65.6
0.218	38.6	9.000	N	9.6	24.3	62.9
0.302	35.7	9.000	N	9.6	24.5	60.2
0.490	31.8	9.000	N	9.6	24.4	56.2
0.770	30.7	9.000	N	9.6	25.3	56.0
1.478	32.5	9.000	N	9.6	23.5	56.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.158	31.7	9.000	N	9.6	23.9	55.6
0.218	29.9	9.000	N	9.6	23.0	52.9
0.302	28.3	9.000	N	9.6	21.9	50.2
0.490	26.3	9.000	N	9.6	19.9	46.2
0.770	25.7	9.000	N	9.6	20.3	46.0
1.478	27.3	9.000	N	9.6	18.7	46.0

8. Frequency Stability Test

8.1 Test setup & procedure



Note1: The frequency stability is measured with the temperature variation range of 0°C to +40°C (10°C increment), and voltage supply variation range of 85% to 115% of nominal AC supply voltage.

2: To ensure emission at the band-edge is maintained within the authorized band, the frequency 802.11a/n-HT20/40/ac-HT20/40/80 channel 36, 48, 38, 46, 42, 149, 165, 151, 159, 155 are selected to test and the worst case of ant1 was reported.

8.2 Frequency Stability Test Data

20°C is taken as temperature in normal condition.

Model: 802.11a, Operation frequency: 5180MHz, Channel: 36, Rate: 6Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5180.000125	125	Pass
	+10	5179.999574	-426	Pass
	+20	5179.999836	-164	Pass
	+30	5179.999516	-494	Pass
	+40	5179.999920	-80	Pass
102	+20	5180.000115	115	Pass
138	+20	5180.000112	112	Pass

Model: 802.11a, Operation frequency: 5240MHz, Channel: 48, Rate: 6Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5240.000134	134	Pass
	+10	5240.000155	155	Pass
	+20	5240.000168	168	Pass
	+30	5240.000112	112	Pass
	+40	5240.000183	183	Pass
102	+20	5240.000215	215	Pass
138	+20	5240.000228	228	Pass

Model: 802.11n-HT20, Operation frequency: 5180MHz, Channel: 36, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5180.000125	125	Pass
	+10	5179.999524	-476	Pass
	+20	5179.999860	-140	Pass
	+30	5179.999523	-477	Pass
	+40	5179.999576	-424	Pass
102	+20	5180.000135	135	Pass
138	+20	5180.000126	126	Pass

Model: 802.11n-HT20, Operation frequency: 5240MHz, Channel: 48, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5240.000125	125	Pass
	+10	5240.000121	121	Pass
	+20	5240.000154	154	Pass
	+30	5240.000125	125	Pass
	+40	5240.000129	129	Pass
102	+20	5240.000181	181	Pass
138	+20	5240.000146	146	Pass

Model: 802.11n-HT40, Operation frequency: 5190MHz, Channel: 38, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5190.000184	184	Pass
	+10	5189.999260	-740	Pass
	+20	5189.999415	-585	Pass
	+30	5189.999295	-705	Pass
	+40	5190.000194	194	Pass
102	+20	5190.000254	254	Pass
138	+20	5190.000188	188	Pass

Model: 802.11n-HT40, Operation frequency: 5230MHz, Channel: 46, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5230.000251	251	Pass
	+10	5230.000285	285	Pass
	+20	5230.000266	266	Pass
	+30	5230.000198	198	Pass
	+40	5230.000126	126	Pass
102	+20	5230.000256	256	Pass
138	+20	5230.000298	298	Pass

Model: 802.11ac-HT20, Operation frequency: 5180MHz, Channel: 36, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5180.000126	126	Pass
	+10	5179.999544	-456	Pass
	+20	5179.999857	-143	Pass
	+30	5179.999508	-492	Pass
	+40	5179.999258	-742	Pass
102	+20	5180.000185	185	Pass
138	+20	5180.000159	159	Pass

Model: 802.11ac-HT20, Operation frequency: 5240MHz, Channel: 48, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5240.000198	198	Pass
	+10	5240.000158	158	Pass
	+20	5240.000146	146	Pass
	+30	5240.000125	125	Pass
	+40	5240.000188	188	Pass
102	+20	5240.000168	168	Pass
138	+20	5240.000149	149	Pass

Model: 802.11ac-HT40, Operation frequency: 5190MHz, Channel: 38, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5190.000124	124	Pass
	+10	5189.999254	-746	Pass
	+20	5189.999385	-615	Pass
	+30	5189.999295	-715	Pass
	+40	5190.000191	191	Pass
102	+20	5190.000210	210	Pass
138	+20	5190.000196	196	Pass

Model: 802.11ac-HT40, Operation frequency: 5230MHz, Channel: 46, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5230.000246	246	Pass
	+10	5230.000298	298	Pass
	+20	5230.000286	286	Pass
	+30	5230.000267	267	Pass
	+40	5230.000155	155	Pass
102	+20	5230.000248	248	Pass
138	+20	5230.000296	296	Pass

Model: 802.11ac-HT80, Operation frequency: 5210MHz, Channel: 42, Rate: 29.3Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5210.000225	225	Pass
	+10	5210.000156	156	Pass
	+20	5210.000198	198	Pass
	+30	5210.000156	156	Pass
	+40	5210.000226	226	Pass
102	+20	5210.000290	290	Pass
138	+20	5210.000178	178	Pass

Model: 802.11a, Operation frequency: 5745MHz, Channel: 149, Rate: 6Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5745.000195	195	Pass
	+10	5745.000165	165	Pass
	+20	5745.000124	124	Pass
	+30	5745.000255	255	Pass
	+40	5745.000211	211	Pass
102	+20	5745.000199	199	Pass
138	+20	5745.000122	122	Pass

Model: 802.11a, Operation frequency: 5825MHz, Channel: 165, Rate: 6Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5825.000165	165	Pass
	+10	5825.000246	246	Pass
	+20	5825.000218	218	Pass
	+30	5825.000139	139	Pass
	+40	5825.000228	228	Pass
102	+20	5825.000258	258	Pass
138	+20	5825.000255	255	Pass

Model: 802.11n-HT20, Operation frequency: 5745MHz, Channel: 149, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5745.000145	145	Pass
	+10	5745.000243	243	Pass
	+20	5745.000225	225	Pass
	+30	5745.000196	196	Pass
	+40	5745.000159	159	Pass
102	+20	5745.000245	245	Pass
138	+20	5745.000141	141	Pass

Model: 802.11n-HT20, Operation frequency: 5825MHz, Channel: 165, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5825.000228	228	Pass
	+10	5825.000242	242	Pass
	+20	5825.000129	129	Pass
	+30	5825.000216	216	Pass
	+40	5825.000165	165	Pass
102	+20	5825.000243	243	Pass
138	+20	5825.000125	125	Pass

Model: 802.11n-HT40, Operation frequency: 5755MHz, Channel: 151, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5754.999826	-174	Pass
	+10	5754.999858	-142	Pass
	+20	5754.999825	-175	Pass
	+30	5754.999877	-123	Pass
	+40	5754.999845	-155	Pass
102	+20	5754.999856	-144	Pass
138	+20	5754.999844	-156	Pass

Model: 802.11n-HT40, Operation frequency: 5795MHz, Channel: 159, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5795.000266	266	Pass
	+10	5795.000278	278	Pass
	+20	5795.000293	293	Pass
	+30	5795.000216	216	Pass
	+40	5795.000276	276	Pass
102	+20	5795.000146	146	Pass
138	+20	5795.000252	252	Pass

Model: 802.11n-HT20, Operation frequency: 5745MHz, Channel: 149, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5745.000148	148	Pass
	+10	5745.000275	275	Pass
	+20	5745.000222	222	Pass
	+30	5745.000236	236	Pass
	+40	5745.000465	465	Pass
102	+20	5745.000215	215	Pass
138	+20	5745.000235	235	Pass

Model: 802.11n-HT20, Operation frequency: 5825MHz, Channel: 165, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5825.000335	335	Pass
	+10	5825.000346	346	Pass
	+20	5825.000217	217	Pass
	+30	5825.000255	255	Pass
	+40	5825.000236	236	Pass
102	+20	5825.000215	215	Pass
138	+20	5825.000309	309	Pass

Model: 802.11n-HT40, Operation frequency: 5755MHz, Channel: 151, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5754.999295	-705	Pass
	+10	5754.999296	-704	Pass
	+20	5754.999725	-275	Pass
	+30	5754.999276	-724	Pass
	+40	5754.999027	-973	Pass
102	+20	5755.000180	180	Pass
138	+20	5755.000239	239	Pass

Model: 802.11n-HT40, Operation frequency: 5795MHz, Channel: 159, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5795.000312	312	Pass
	+10	5795.000245	245	Pass
	+20	5795.000218	218	Pass
	+30	5795.000225	225	Pass
	+40	5795.000299	299	Pass
102	+20	5795.000215	215	Pass
138	+20	5795.000214	214	Pass

Model: 802.11ac-HT20, Operation frequency: 5745MHz, Channel: 149, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5745.000155	155	Pass
	+10	5745.000235	235	Pass
	+20	5745.000245	245	Pass
	+30	5745.000245	245	Pass
	+40	5745.000256	256	Pass
102	+20	5745.000258	258	Pass
138	+20	5745.000221	221	Pass

Model: 802.11ac-HT20, Operation frequency: 5825MHz, Channel: 165, Rate: 6.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5825.000204	204	Pass
	+10	5825.000236	236	Pass
	+20	5825.000156	156	Pass
	+30	5825.000246	246	Pass
	+40	5825.000235	235	Pass
102	+20	5825.000226	226	Pass
138	+20	5825.000246	246	Pass

Model: 802.11n-HT40, Operation frequency: 5755MHz, Channel: 151, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5754.999295	-705	Pass
	+10	5754.999227	-773	Pass
	+20	5754.999716	-284	Pass
	+30	5754.999275	-725	Pass
	+40	5754.999128	-872	Pass
102	+20	5755.000265	265	Pass
138	+20	5755.000255	255	Pass

Model: 802.11ac-HT40, Operation frequency: 5795MHz, Channel: 159, Rate: 13.5Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5795.000224	224	Pass
	+10	5795.000248	248	Pass
	+20	5795.000215	215	Pass
	+30	5795.000235	235	Pass
	+40	5795.000278	278	Pass
102	+20	5795.000158	158	Pass
138	+20	5795.000218	218	Pass

Model: 802.11ac-HT80 Operation frequency: 5775MHz, Channel: 155, Rate: 29.3Mbps

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Frequency deviation (Hz)	Result
120	0	5775.000266	266	Pass
	+10	5775.000257	257	Pass
	+20	5775.000245	245	Pass
	+30	5775.000235	235	Pass
	+40	5775.000237	237	Pass
102	+20	5775.000125	125	Pass
138	+20	5775.000216	216	Pass

Note: All emissions are maintained within the band of operation under all conditions of normal operation as specified in the user manual. It fulfills the requirement of 15.407(g).

Appendix A: Test equipment list

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	23-May-2016	23-May-2017
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	23-May-2016	23-May-2017
SZ070-24	Open Switch and Control Unit with TS8997 option for power measurement test	R&S	OSP120+B157	--	8-Apr-2016	8-Oct-2016
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	15-Sep-2015	15-Sep-2016
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-2016	29-Apr-2017
SZ061-09	Horn Antenna	ETS	3115	00092346	31-Oct-2015	31-Oct-2016
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	29-Mar-2016	29-Mar-2017
SZ061-13	Pyramidal Horn Antenna	ETS	3160-10	00084329	03-Sep-2015	03-Sep-2016
SZ185-01	EMI Receiver	R&S	ESCI	100547	23-Jan-2016	23-Jan-2017
SZ056-06	EXA Spectrum Analyzer	R&S	FSV40	101101	2-Jul-2016	2-Jul-2017
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	23-Jan-2016	23-Jan-2017
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	16-Apr-2016	16-Apr-2018
SZ062-02	RF Cable	RADIAL	RG 213U	--	30-Jun-2016	30-Dec-2016
SZ062-05	RF Cable	RADIAL	0.04-26.5GHz	--	6-Apr-2016	6-Oct-2016
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	--	6-Apr-2016	6-Oct-2016
SZ067-21	Notch Filter	Micro-Tronics	High-pass filter	--	23-Jan-2016	23-Jan-2017
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	6-Apr-2016	6-Oct-2016
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	23-May-2016	23-May-2017
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	3-Nov-2015	3-Nov-2016
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	3-Nov-2015	3-Nov-2016
SZ188-03	Shielding Room	ETS	RFD-100	4100	1-Jul-2016	1-Jul-2017
SZ016-12	Programmable Temperature & Humidity Chamber	Taili	MHK-120NK	AB0105	23-Jan-2016	23-Jan-2017
SZ006-11	AC Power Source	Apcpowers	AFC-11005G	F311040110	23-Mar-2016	23-Sep-2016

Expanded uncertainty of radiated emission measurement is ± 4.9 dB.

Expanded uncertainty of conducted emission measurement is ± 3.6 dB.