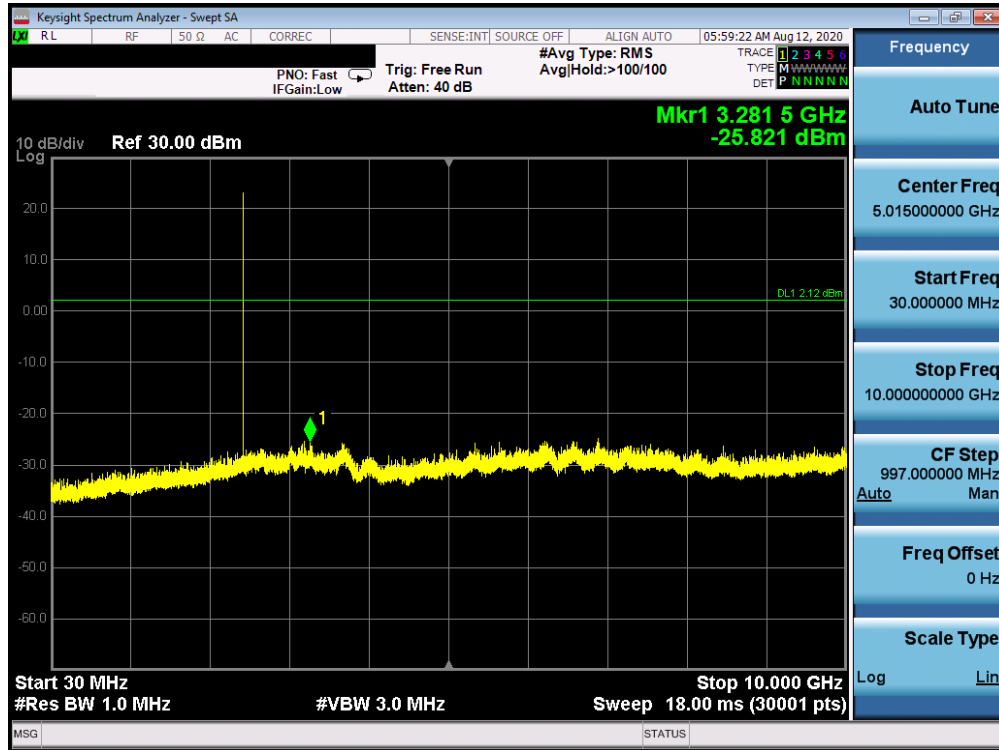
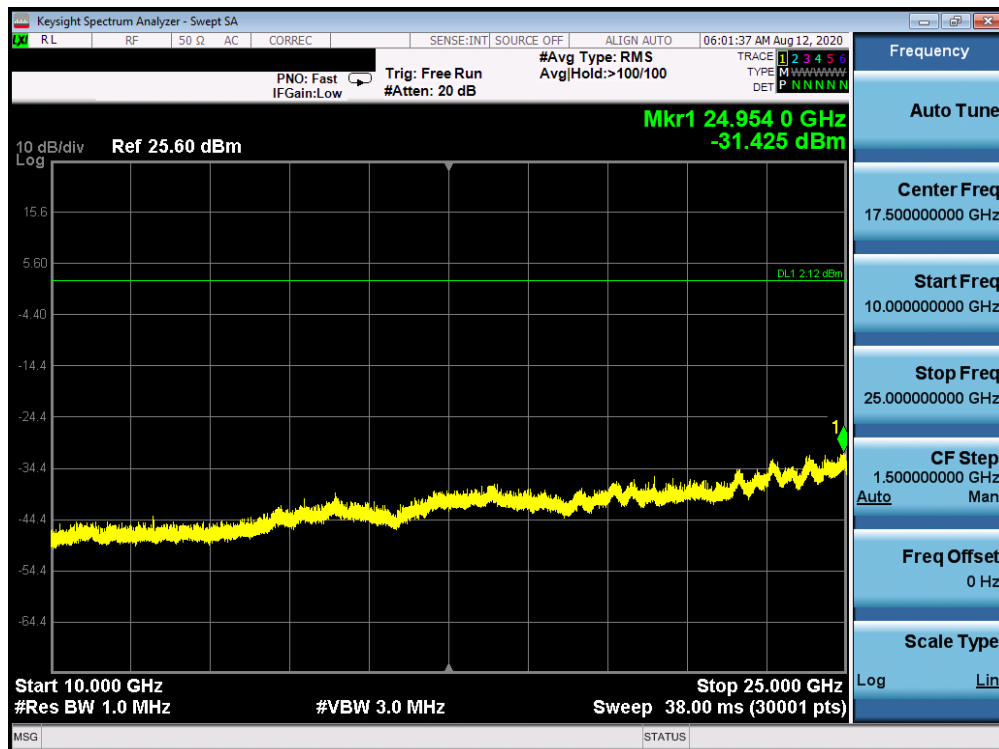


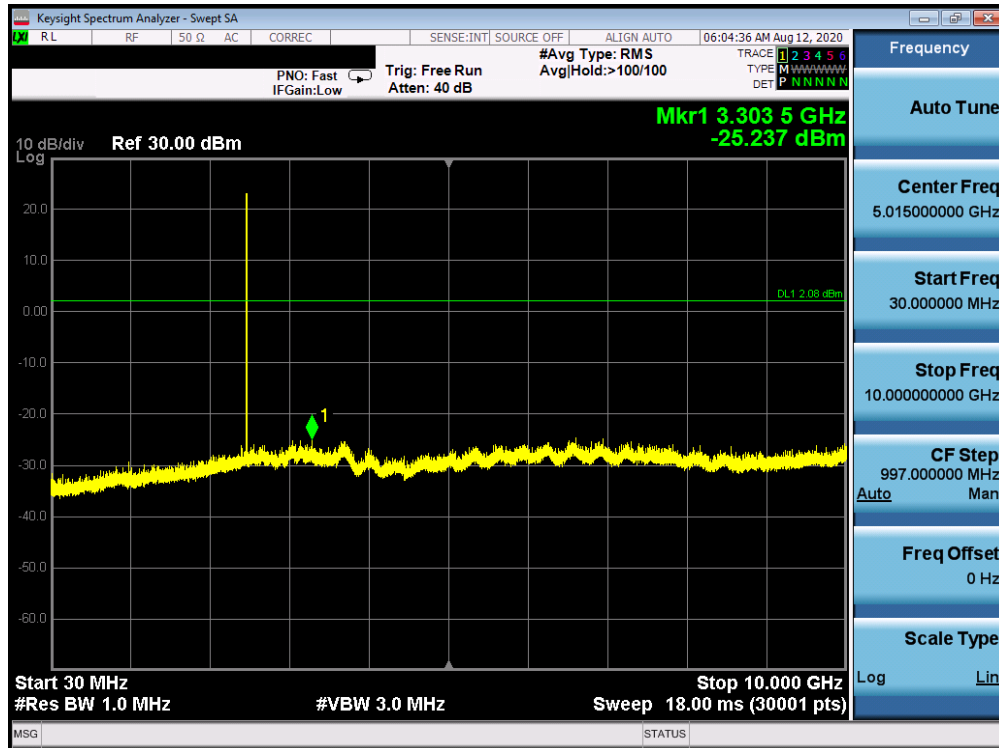


Plot 7-71. Conducted Spurious Plot Antenna WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

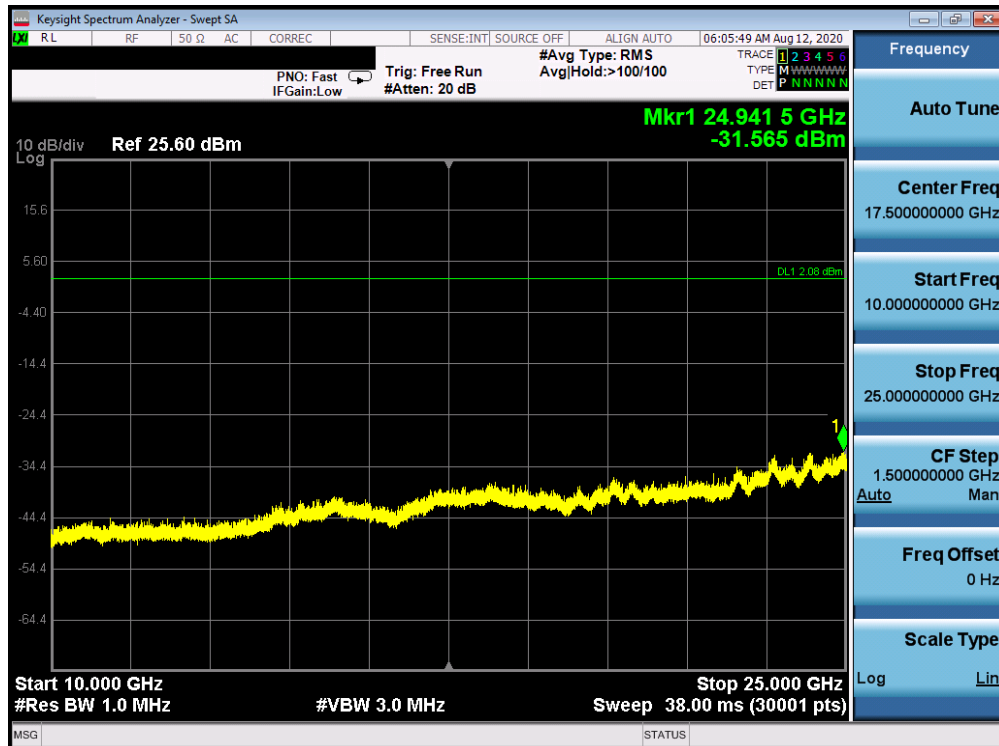


Plot 7-72. Conducted Spurious Plot Antenna WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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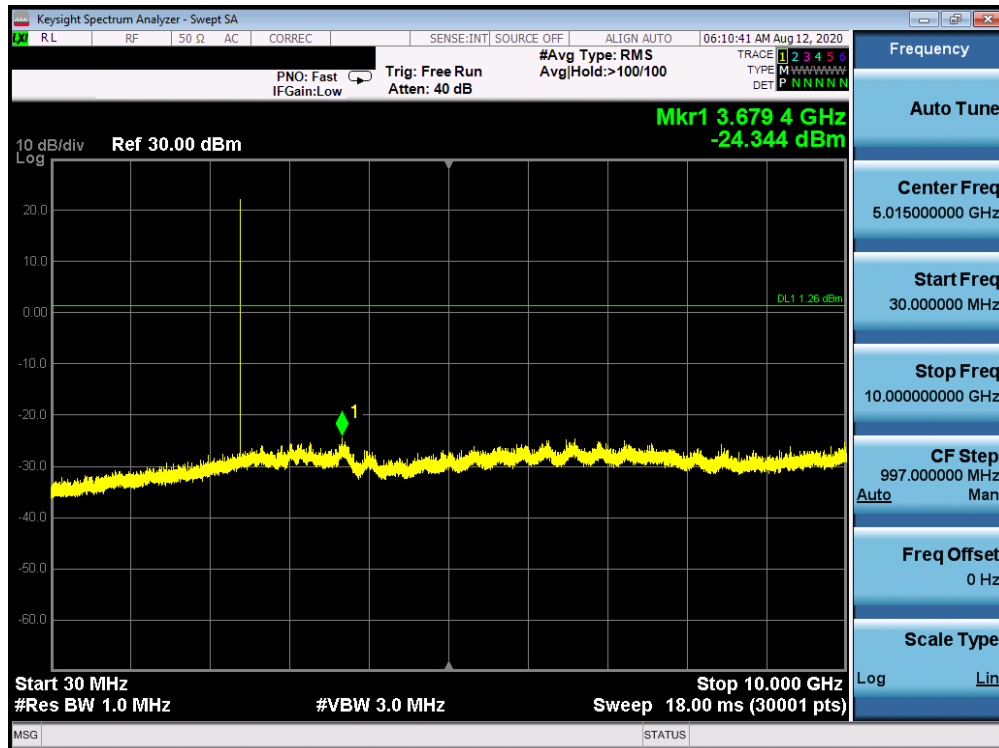
Plot 7-73. Conducted Spurious Plot Antenna WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 39)



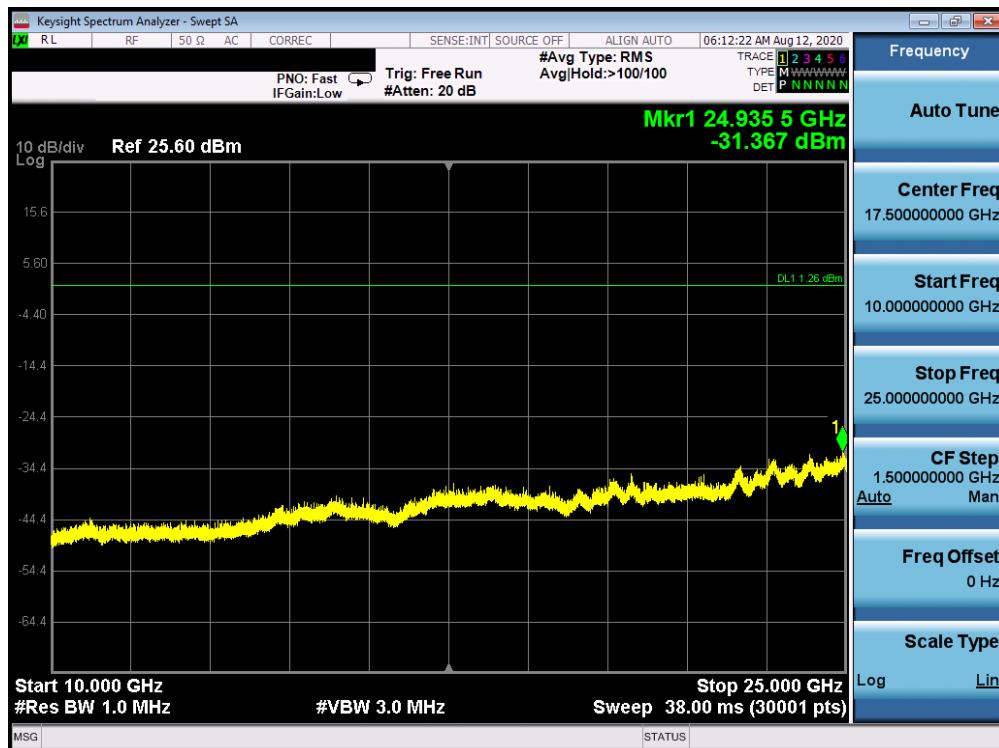
Plot 7-74. Conducted Spurious Plot Antenna WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 39)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Antenna WF7b

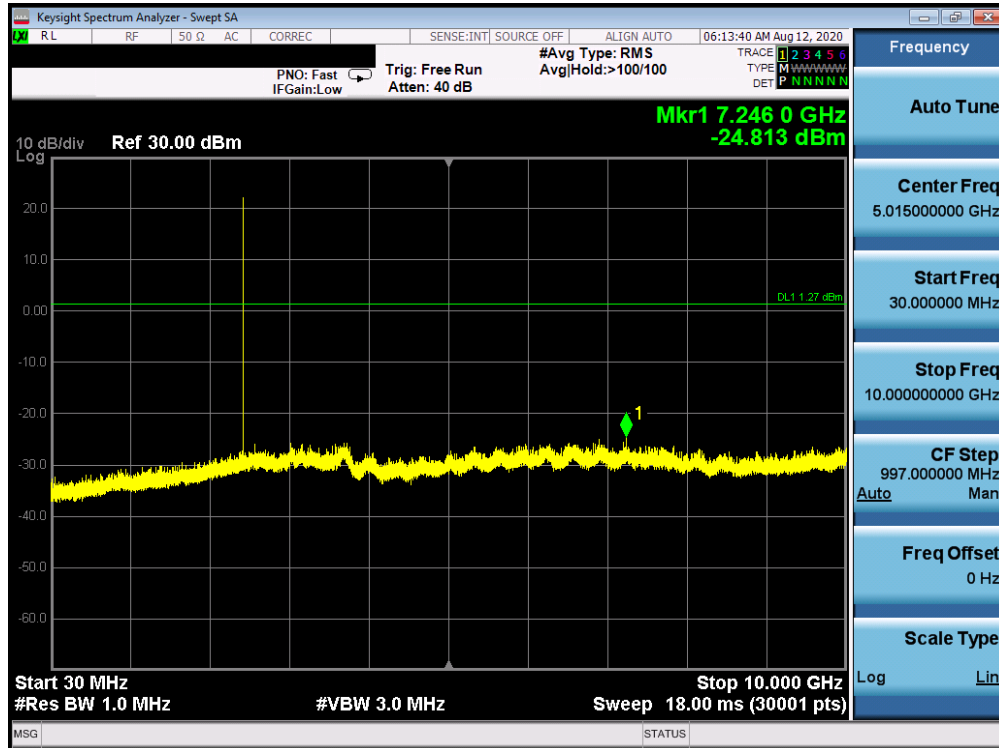


Plot 7-75. Conducted Spurious Plot Antenna WF7b (Bluetooth (LE), 1Mbps, ePA – Ch. 0)

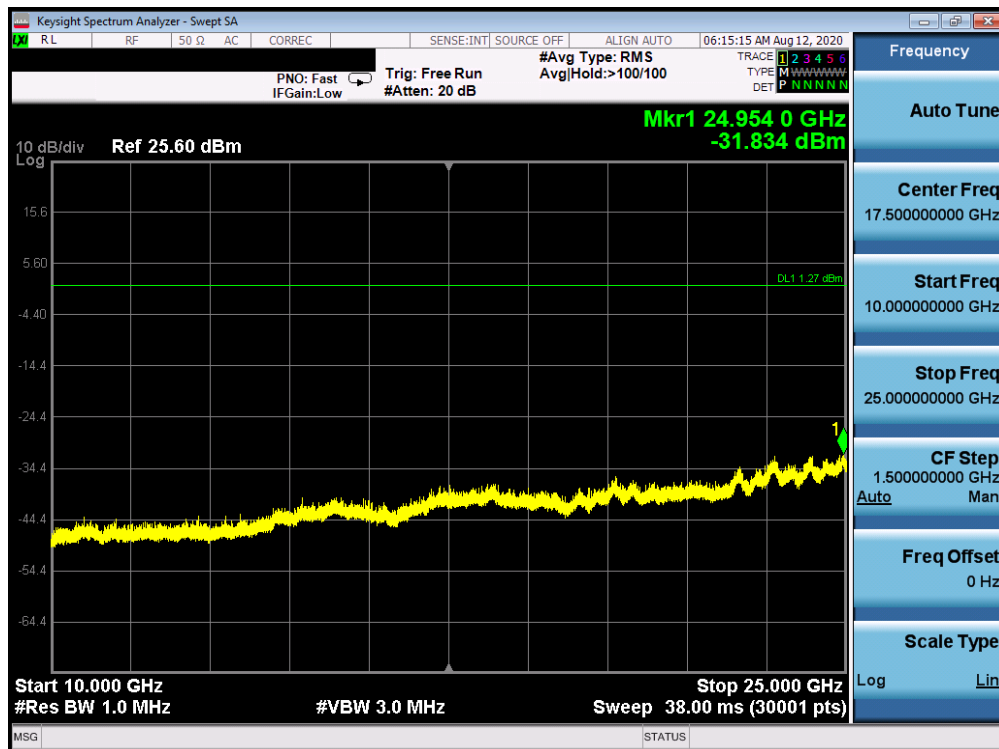


Plot 7-76. Conducted Spurious Plot Antenna WF7b (Bluetooth (LE), 1Mbps, ePA – Ch. 0)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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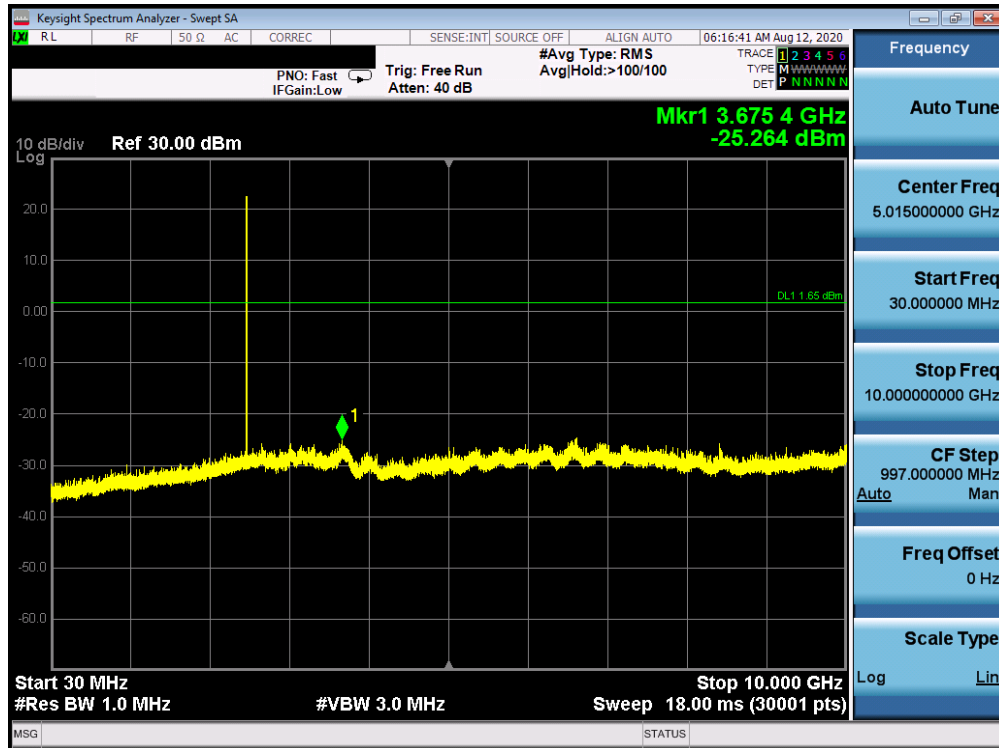


Plot 7-77. Conducted Spurious Plot Antenna WF7b (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

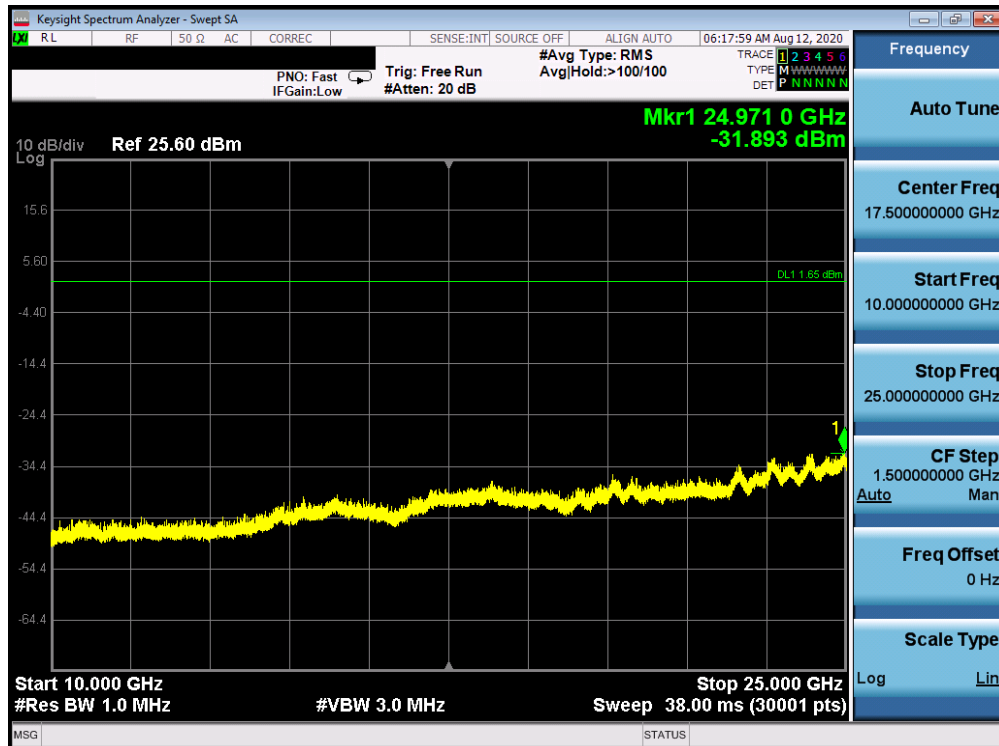


Plot 7-78. Conducted Spurious Plot Antenna WF7b (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-79. Conducted Spurious Plot Antenna WF7b (Bluetooth (LE), 1Mbps, ePA – Ch. 39)



Plot 7-80. Conducted Spurious Plot Antenna WF7b (Bluetooth (LE), 1Mbps, ePA – Ch. 39)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 65 of 99

7.7 Radiated Spurious Emissions – Above 1GHz

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-13 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-13. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.6.4.3

KDB 558074 D01 v05r02 – Section 8.6, 8.7

Test Settings

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

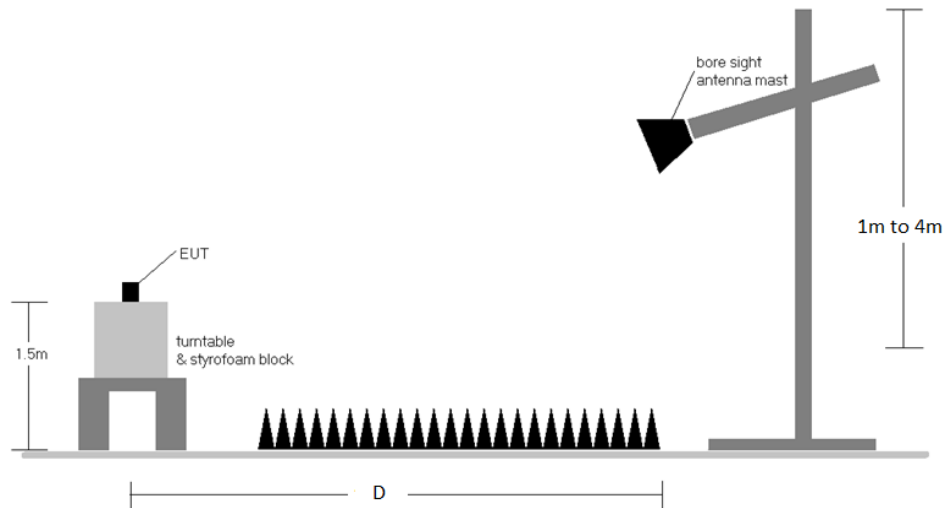


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

1. The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 D01 v05r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
2. All emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-13.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas.
6. D is the measurement test distance and emissions 1-18GHz were measured at a 3 meters test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
8. The unit was tested with all possible mode and power schemes and only the highest emission is reported.

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Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]} = \text{Analyzer Level}_{[dBm]} + 107 + \text{AFCL}_{[dB/m]}$
- $\text{AFCL}_{[dB/m]} = \text{Antenna Factor}_{[dB/m]} + \text{Cable Loss}_{[dB]} - \text{Preamplifier Gain}_{[dB]}$
- $\text{Margin}_{[dB]} = \text{Field Strength Level}_{[dB\mu V/m]} - \text{Limit}_{[dB\mu V/m]}$

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.8 was calculated using the formula:

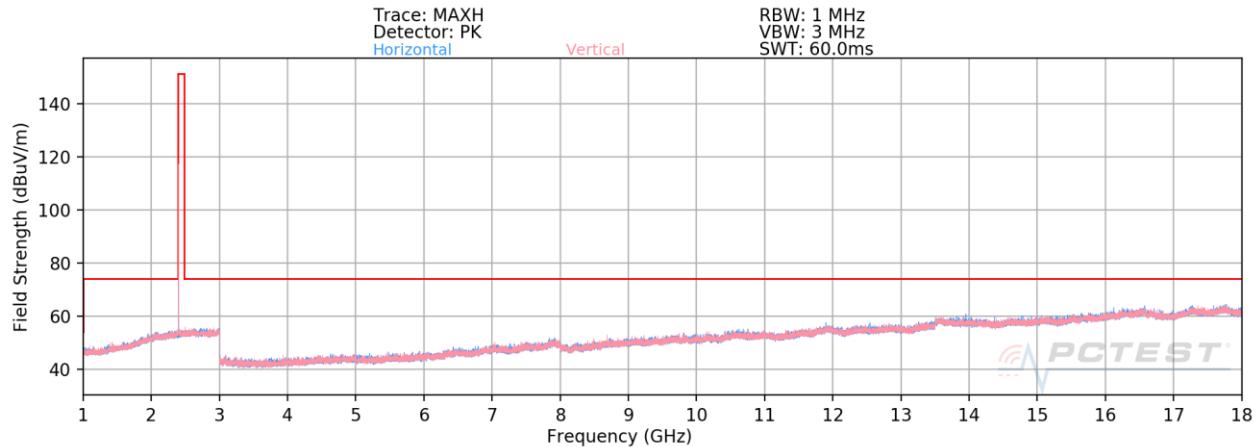
$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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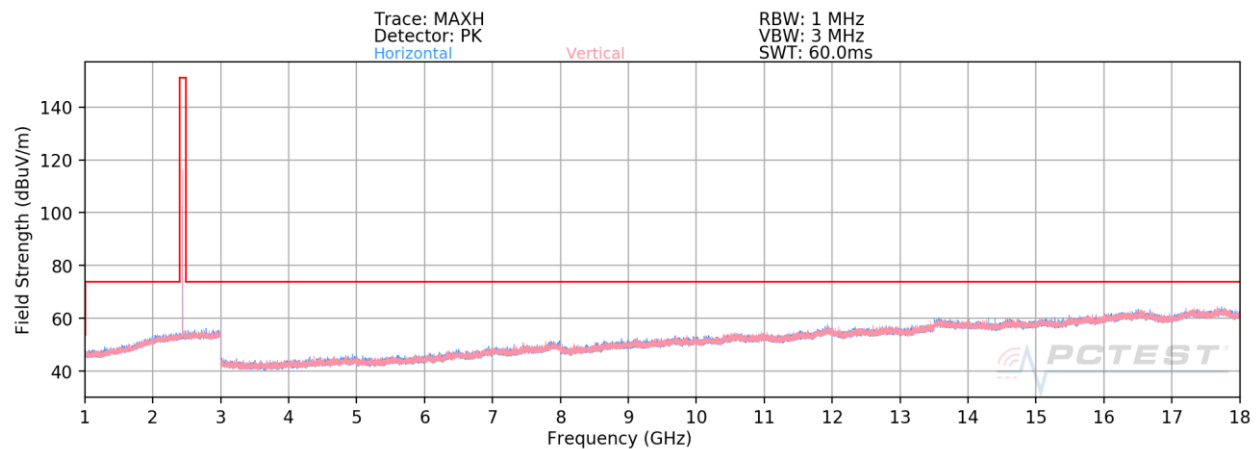
Radiated Spurious Emission Measurements (1 – 18GHz)

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

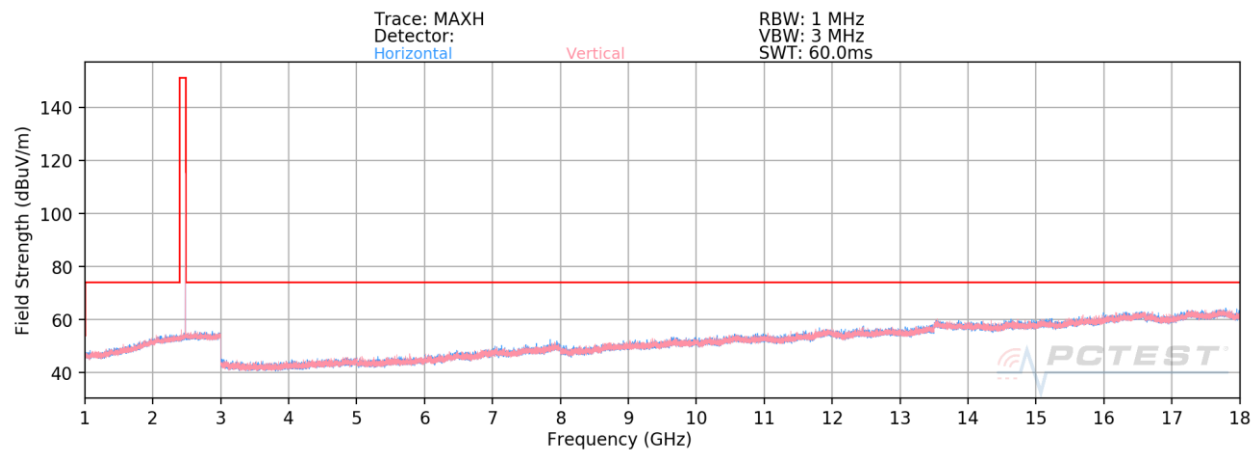
Antenna WF8



Plot 7-81. Radiated Spurious Emissions Above 1GHz Antenna WF8 (1Mbps, ePA – Ch. 0)



Plot 7-82. Radiated Spurious Emissions Above 1GHz Antenna WF8 (1Mbps, ePA – Ch. 19)



Plot 7-83. Radiated Spurious Emissions Above 1GHz Antenna WF8 (1Mbps ePA – Ch. 39)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Antenna WF8

Bluetooth Mode: LE
 Data Rate: 1Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4804.00	Avg	V	-	-	-82.82	9.02	33.20	53.98	-20.78
4804.00	Peak	V	-	-	-71.80	9.02	44.22	73.98	-29.76
12010.00	Avg	V	-	-	-85.30	21.52	43.22	53.98	-10.75
12010.00	Peak	V	-	-	-72.69	21.52	55.83	73.98	-18.14

Table 7-14. Radiated Measurements Antenna WF8

Bluetooth Mode: LE
 Data Rate: 1Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 2440MHz
 Channel: 19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4880.00	Avg	V	-	-	-83.24	9.33	33.09	53.98	-20.89
4880.00	Peak	V	-	-	-70.86	9.33	45.47	73.98	-28.51
7320.00	Avg	V	-	-	-84.70	13.84	36.14	53.98	-17.84
7320.00	Peak	V	-	-	-72.62	13.84	48.22	73.98	-25.76
12200.00	Avg	V	-	-	-86.16	21.77	42.61	53.98	-11.37
12200.00	Peak	V	-	-	-73.78	21.77	54.99	73.98	-18.99

Table 7-15. Radiated Measurements Antenna WF8

FCC ID: BCGA2316	 PCTEST [®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 70 of 99

Bluetooth Mode: LE
Data Rate: 1Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2480MHz
Channel: 39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4960.00	Avg	V	-	-	-82.78	9.27	33.49	53.98	-20.48
4960.00	Peak	V	-	-	-70.70	9.27	45.57	73.98	-28.40
7440.00	Avg	V	-	-	-84.69	14.67	36.98	53.98	-16.99
7440.00	Peak	V	-	-	-74.20	14.67	47.47	73.98	-26.50
12400.00	Avg	V	-	-	-86.00	22.32	43.32	53.98	-10.66
12400.00	Peak	V	-	-	-74.12	22.32	55.20	73.98	-18.78

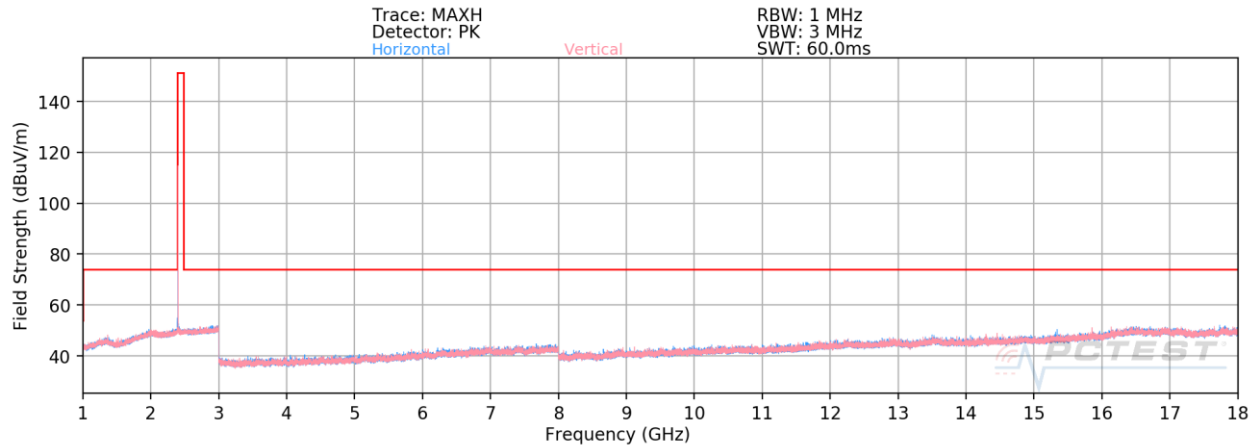
Table 7-16. Radiated Measurements Antenna WF8

FCC ID: BCGA2316		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 71 of 99

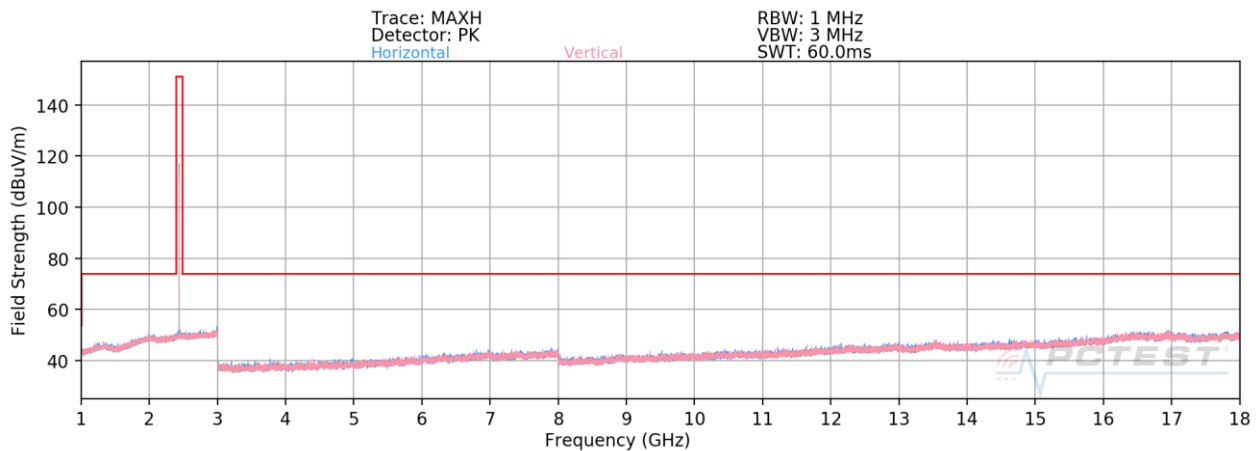
Radiated Spurious Emission Measurements (1 – 18GHz)

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

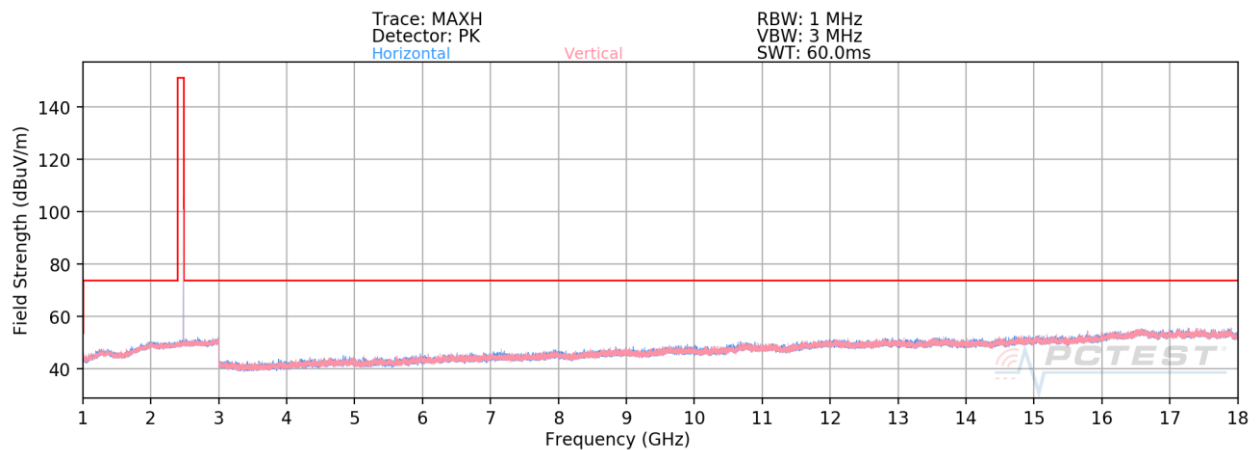
Antenna WF7b



Plot 7-84. Radiated Spurious Emissions Above 1GHz Antenna WF7b (1Mbps, ePA – Ch. 0)



Plot 7-85. Radiated Spurious Emissions Above 1GHz Antenna WF7b (1Mbps, ePA – Ch. 19)



Plot 7-86. Radiated Spurious Emissions Above 1GHz Antenna WF7b (1Mbps, ePA – Ch. 39)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Antenna WF7b

Bluetooth Mode: LE
 Data Rate: 1Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4804.00	Avg	V	-	-	-80.13	7.63	34.50	53.98	-19.48
4804.00	Peak	V	-	-	-70.29	7.63	44.34	73.98	-29.64
12010.00	Avg	V	-	-	-85.14	16.28	38.14	53.98	-15.84
12010.00	Peak	V	-	-	-73.63	16.28	49.65	73.98	-24.33

Table 7-17. Radiated Measurements Antenna WF7b

Bluetooth Mode: LE
 Data Rate: 1Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 2440MHz
 Channel: 19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4880.00	Avg	H	-	-	-80.07	7.35	34.28	53.98	-19.69
4880.00	Peak	H	-	-	-68.95	7.35	45.40	73.98	-28.57
7320.00	Avg	H	-	-	-81.94	10.46	35.52	53.98	-18.46
7320.00	Peak	H	-	-	-70.68	10.46	46.78	73.98	-27.20
12200.00	Avg	H	-	-	-82.13	16.42	41.29	53.98	-12.69
12200.00	Peak	H	-	-	-70.93	16.42	52.49	73.98	-21.49

Table 7-18. Radiated Measurements Antenna WF7b

FCC ID: BCGA2316		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Bluetooth Mode: LE
Data Rate: 1Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2480MHz
Channel: 39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4960.00	Avg	H	-	-	-80.68	8.59	34.91	53.98	-19.07
4960.00	Peak	H	-	-	-69.01	8.59	46.58	73.98	-27.40
7440.00	Avg	H	-	-	-82.24	11.74	36.50	53.98	-17.47
7440.00	Peak	H	-	-	-71.28	11.74	47.46	73.98	-26.51
12400.00	Avg	H	-	-	-83.48	16.81	40.33	53.98	-13.65
12400.00	Peak	H	-	-	-71.99	16.81	51.82	73.98	-22.16

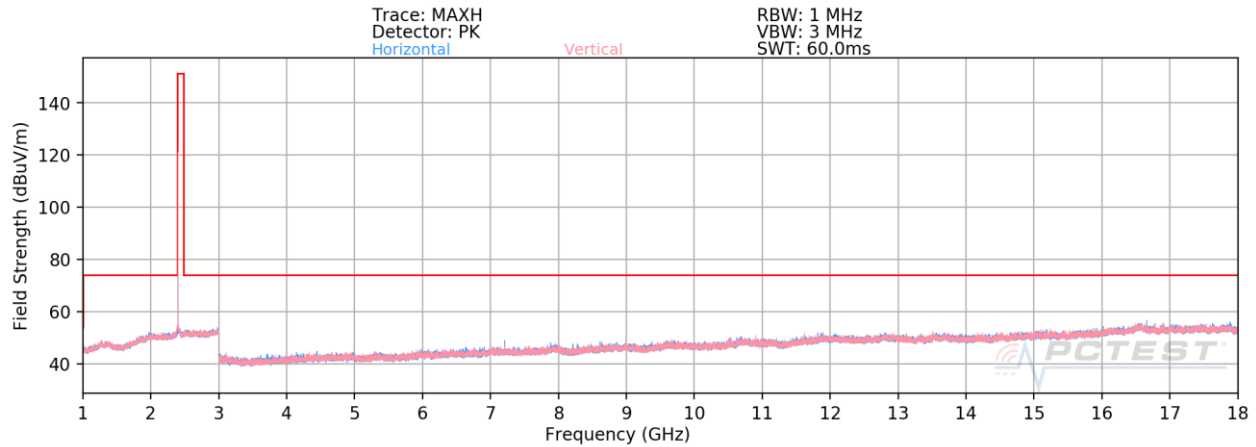
Table 7-19. Radiated Measurements Antenna WF7b

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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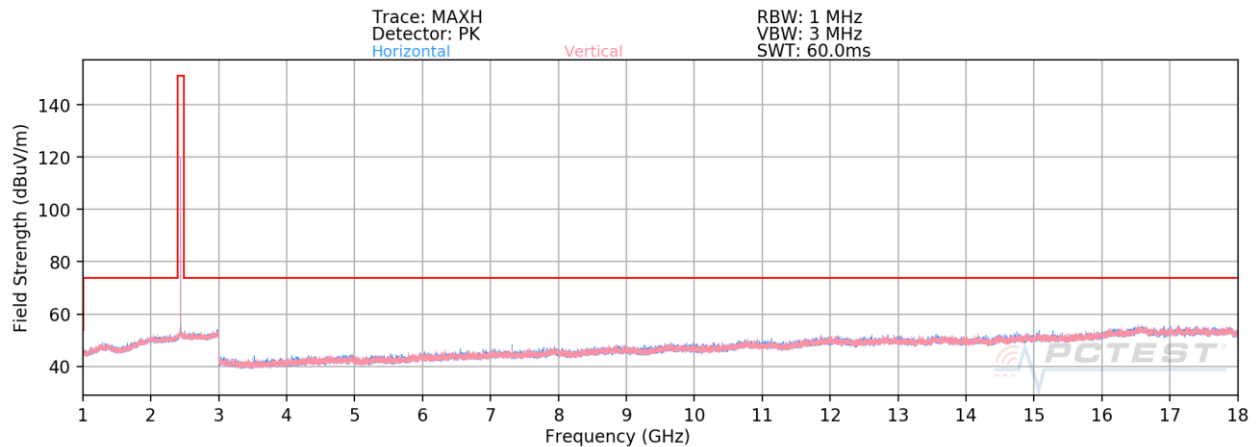
Radiated Spurious Emission Measurements (1 – 18GHz)

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

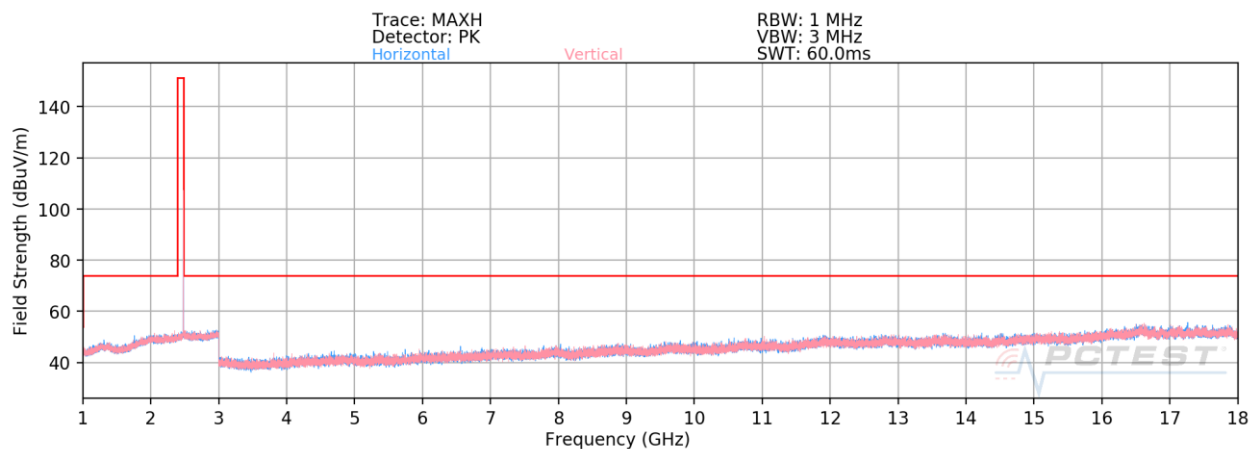
TxBF



Plot 7-87. Radiated Spurious Emissions Above 1GHz TxBF (1Mbps, ePA – Ch. 0)



Plot 7-88. Radiated Spurious Emissions Above 1GHz TxBF (1Mbps, ePA – Ch. 19)



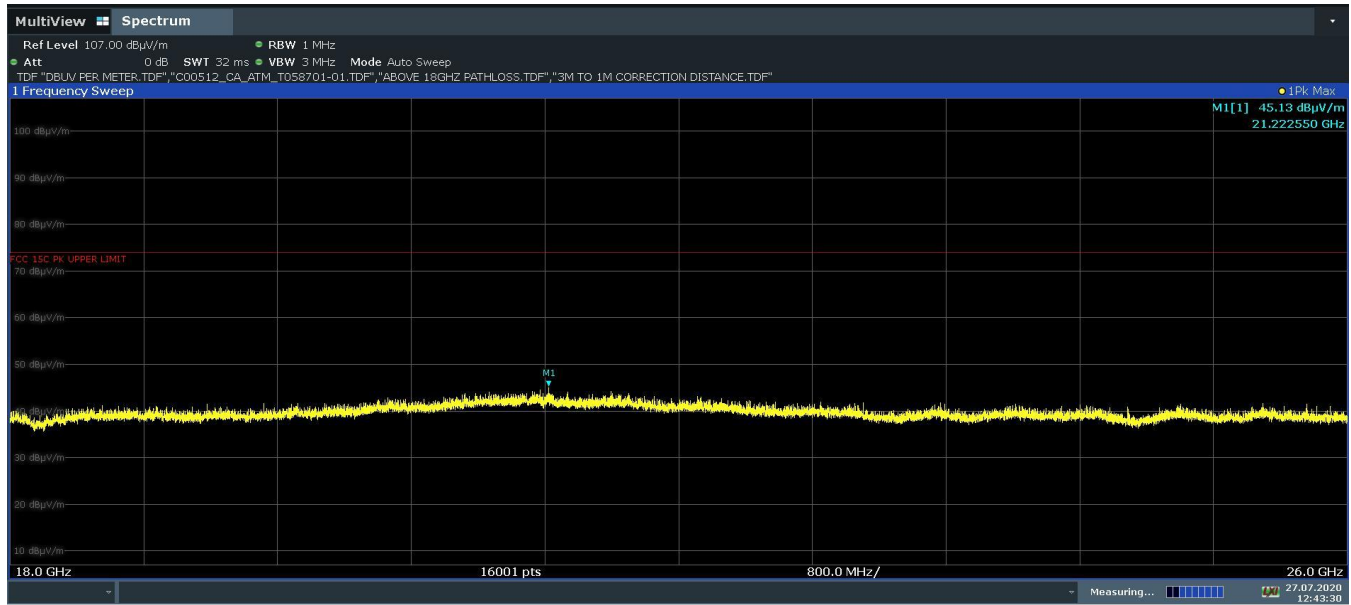
Plot 7-89. Radiated Spurious Emissions Above 1GHz TxBF (1Mbps, ePA – Ch. 39)

FCC ID: BCGA2316		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated Spurious Emission Measurements (Above 18GHz)

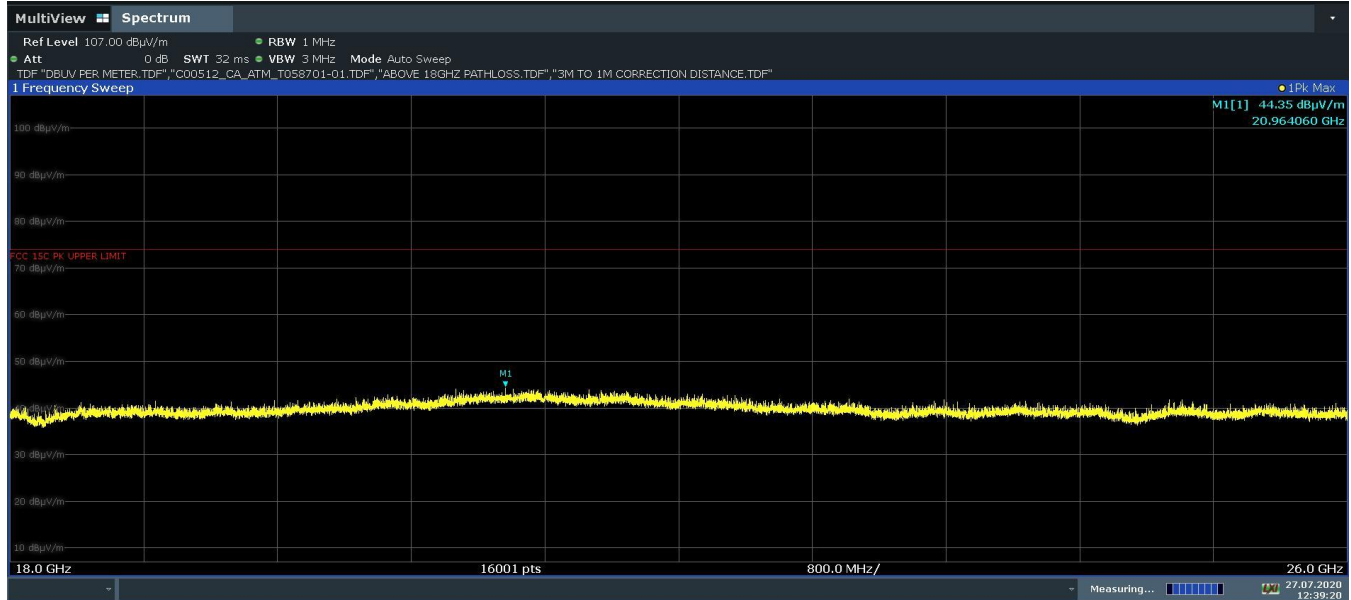
§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

TxBF



12:43:31 27.07.2020

Plot 7-90. Radiated Spurious Emissions Above 18GHz TxBF (1Mbps, ePA – Ch.19, Pol. H)



12:39:20 27.07.2020

Plot 7-91. Radiated Spurious Emissions Above 18GHz Antenna TxBF (1Mbps, ePA – Ch.19, Pol. V)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

TxBF

Bluetooth Mode: LE
 Data Rate: 1Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4804.00	Avg	V	-	-	-77.20	5.85	35.65	53.98	-18.33
4804.00	Peak	V	-	-	-65.16	5.85	47.69	73.98	-26.29
12010.00	Avg	V	-	-	-77.29	14.65	44.36	53.98	-9.62
12010.00	Peak	V	-	-	-65.95	14.65	55.70	73.98	-18.28

Table 7-20. Radiated Measurements TxBF

Bluetooth Mode: LE
 Data Rate: 1Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 2440MHz
 Channel: 19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4880.00	Avg	V	-	-	-79.92	5.82	32.90	53.98	-21.08
4880.00	Peak	V	-	-	-68.95	5.82	43.87	73.98	-30.11
7320.00	Avg	V	-	-	-81.93	9.31	34.43	53.98	-19.54
7320.00	Peak	V	-	-	-70.18	9.31	46.13	73.98	-27.84
12200.00	Avg	V	-	-	-82.64	15.02	39.38	53.98	-14.60
12200.00	Peak	Z	-	-	-71.21	15.02	50.81	73.98	-23.17

Table 7-21. Radiated Measurements TxBF

FCC ID: BCGA2316	 PCTEST® Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Bluetooth Mode: LE
Data Rate: 1Mbps
Distance of Measurements: 3 Meters
Operating Frequency: 2480MHz
Channel: 39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4960.00	Avg	Z	-	-	-79.94	6.57	33.63	53.98	-20.35
4960.00	Peak	Z	-	-	-68.72	6.57	44.85	73.98	-29.13
7440.00	Avg	Z	-	-	-80.79	9.83	36.04	53.98	-17.94
7440.00	Peak	Z	-	-	-69.80	9.83	47.03	73.98	-26.95
12400.00	Avg	Z	-	-	-83.44	14.83	38.39	53.98	-15.59
12400.00	Peak	Z	-	-	-72.26	14.83	49.57	73.98	-24.41

Table 7-22. Radiated Measurements TxBF

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 78 of 99

7.8 Radiated Restricted Band Edge Measurements

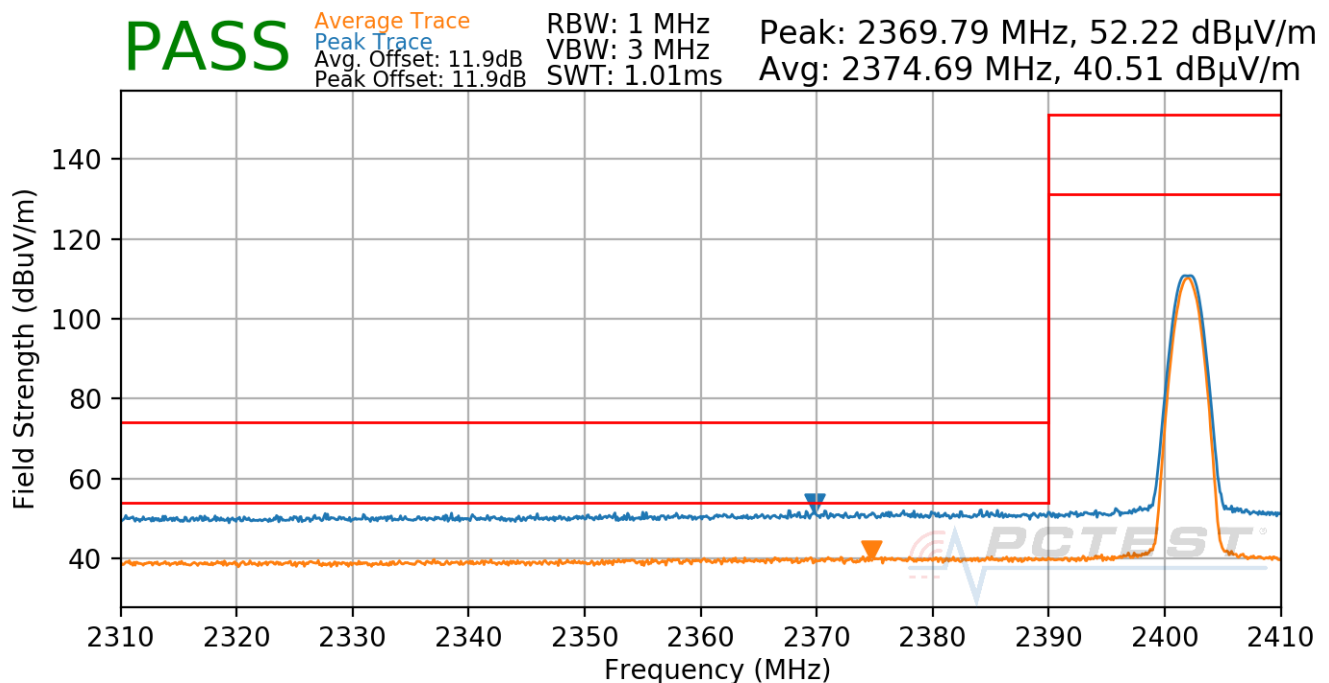
§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Antenna WF8

Bluetooth Mode:	LE
Data Rate:	1Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2402MHz
Channel:	0



Plot 7-92. Radiated Restricted Lower Band Edge Measurement Antenna WF8 (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 79 of 99

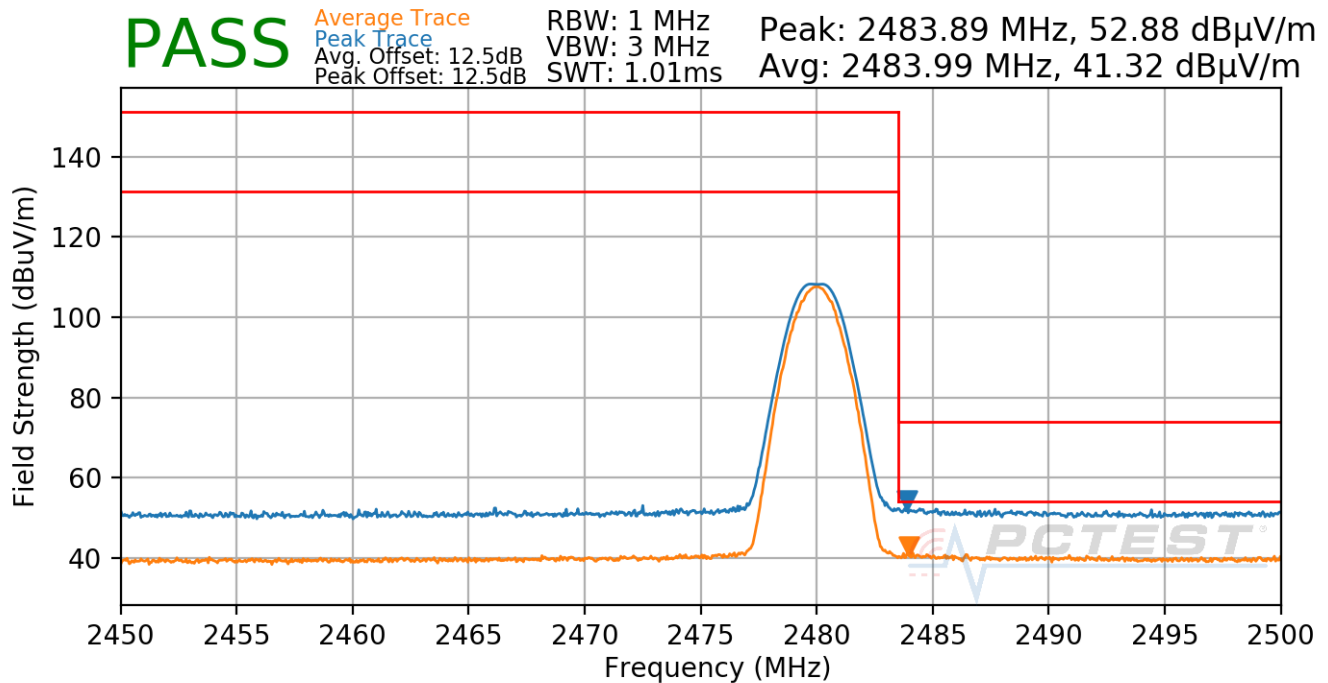
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Bluetooth Mode:	LE
Data Rate:	1Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	39



Plot 7-93. Radiated Restricted Upper Band Edge Measurement Antenna WF8 (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 80 of 99

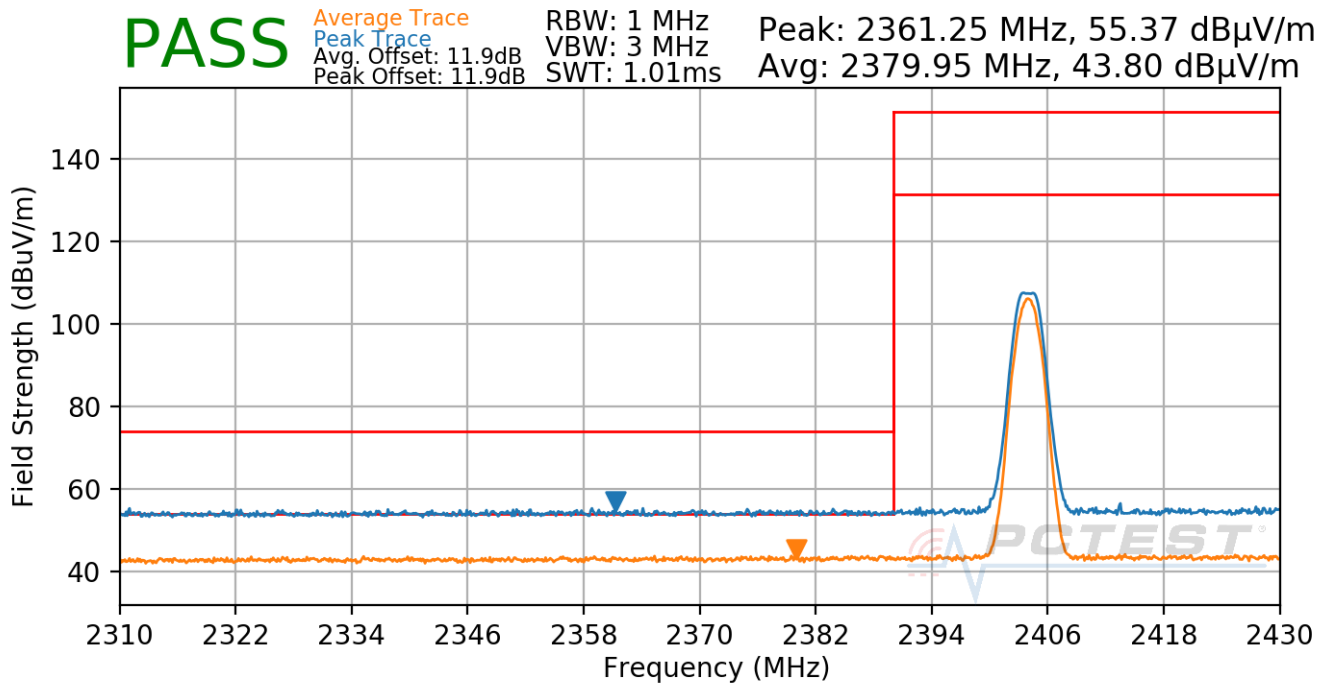
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

Bluetooth Mode:	LE
Data Rate:	2Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2404MHz
Channel:	1



Plot 7-94. Radiated Restricted Lower Band Edge Measurement Antenna WF8 (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 81 of 99

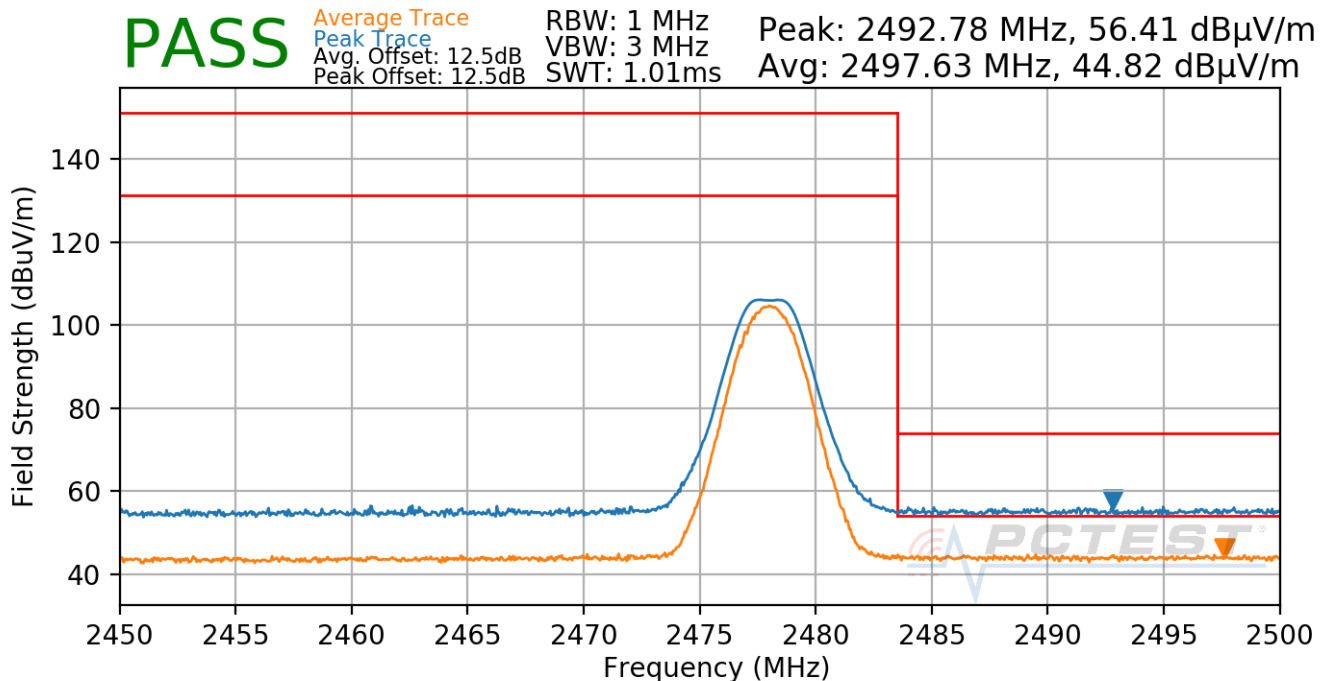
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Bluetooth Mode:	LE
Data Rate:	2Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2478MHz
Channel:	38



Plot 7-95. Radiated Restricted Upper Band Edge Measurement Antenna WF8 (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 82 of 99

Radiated Restricted Band Edge Measurements

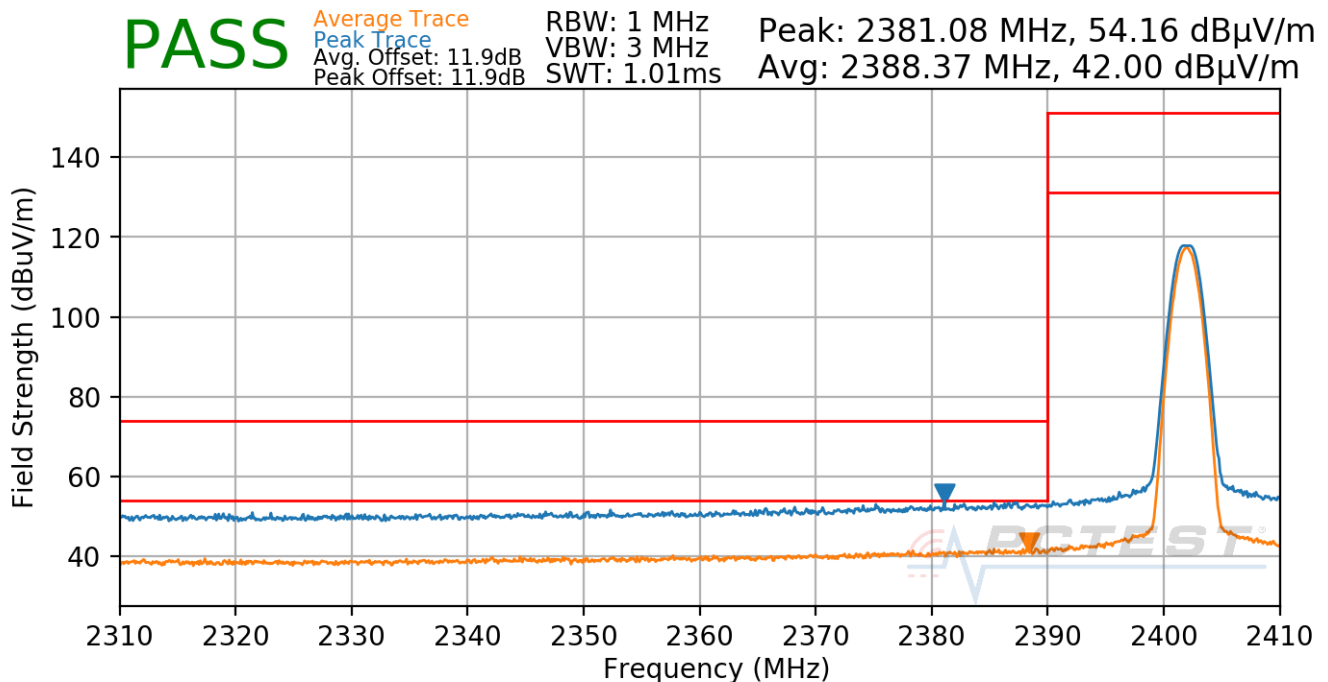
§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Antenna WF7b

Bluetooth Mode:	LE
Data Rate:	1Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2402MHz
Channel:	0



Plot 7-96. Radiated Restricted Lower Band Edge Measurement Antenna WF7b (Average & Peak)

FCC ID: BCGA2316		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 83 of 99

Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Bluetooth Mode: LE

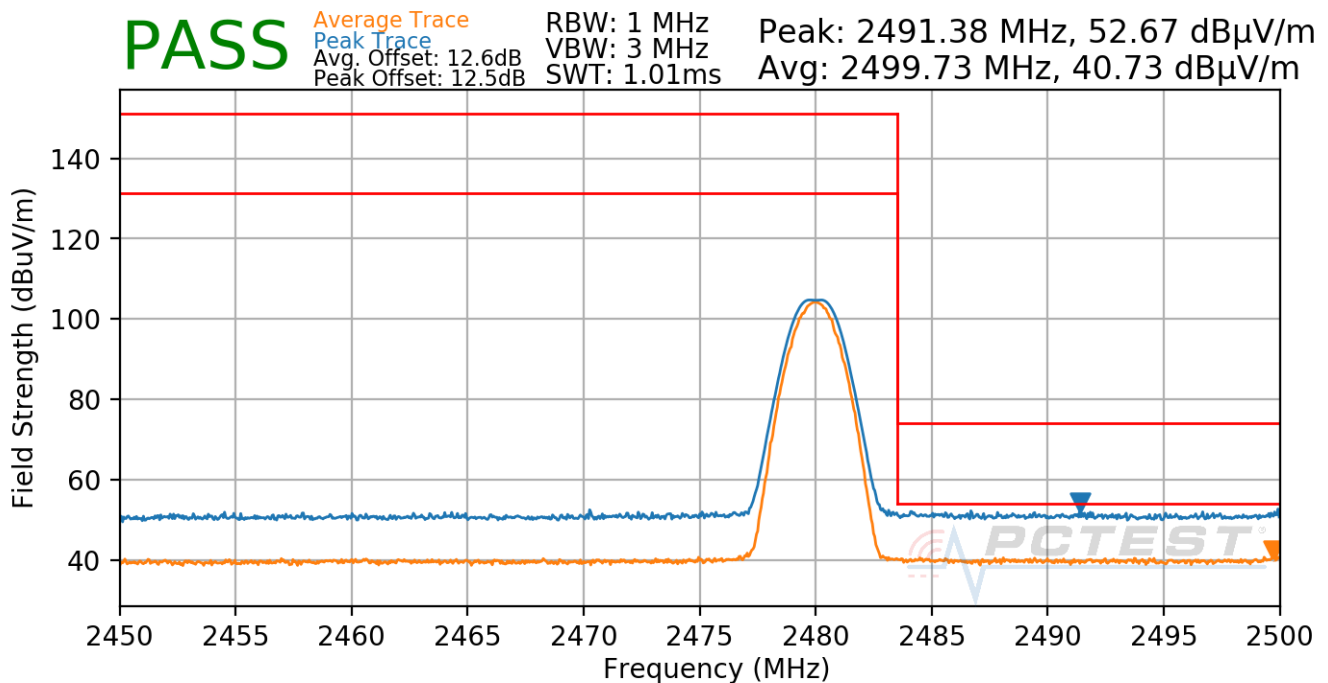
Data Rate: 1Mbps

Power Scheme: ePA

Measurement Distance: 3 Meters

Operating Frequency: 2480MHz

Channel: 39



Plot 7-97. Radiated Restricted Upper Band Edge Measurement Antenna WF7b (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 84 of 99

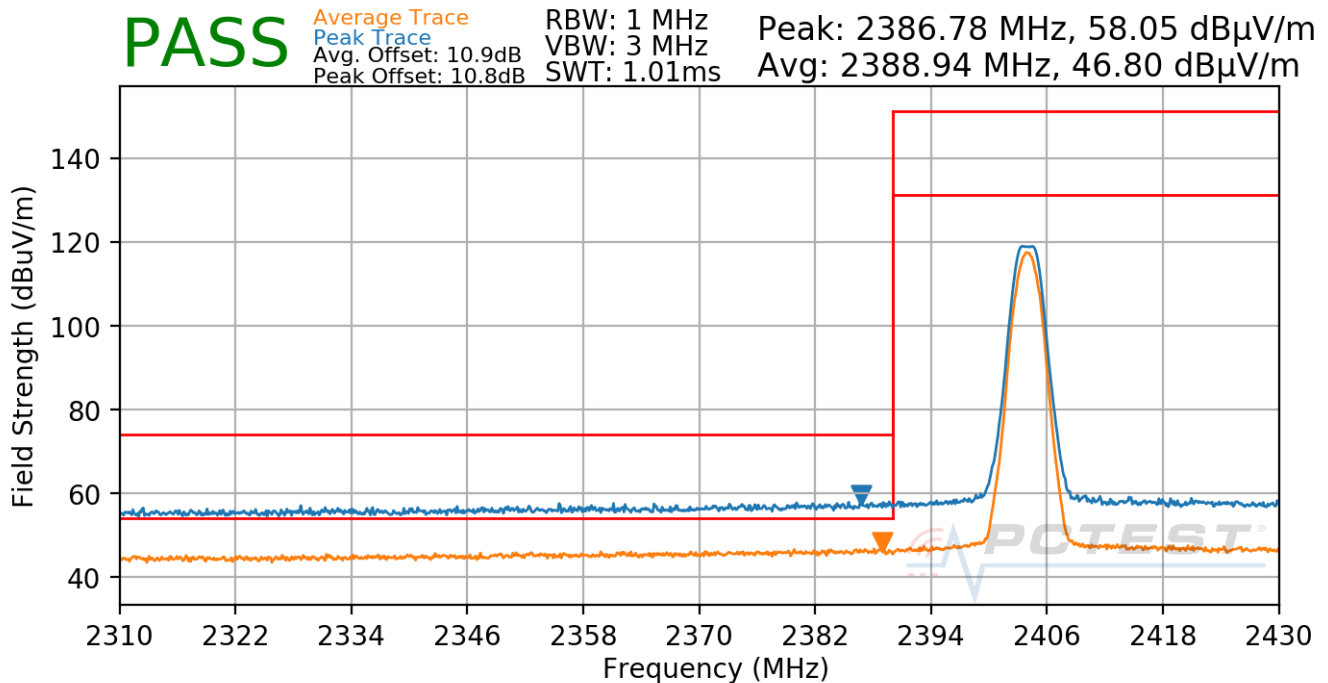
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Bluetooth Mode:	LE
Data Rate:	2Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2404MHz
Channel:	1



Plot 7-98. Radiated Restricted Lower Band Edge Measurement Antenna WF7b (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 85 of 99

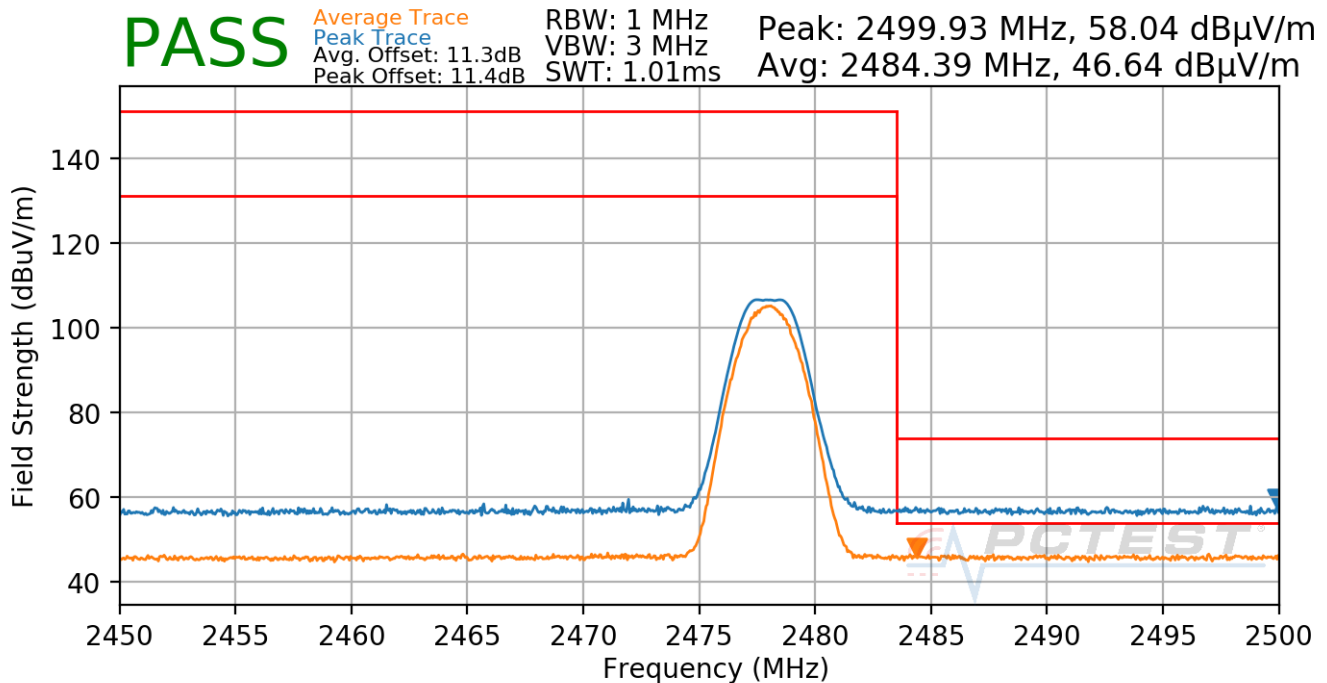
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

Bluetooth Mode:	LE
Data Rate:	2Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2478MHz
Channel:	38



Plot 7-99. Radiated Restricted Upper Band Edge Measurement Antenna WF7b (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 86 of 99

Radiated Restricted Band Edge Measurements

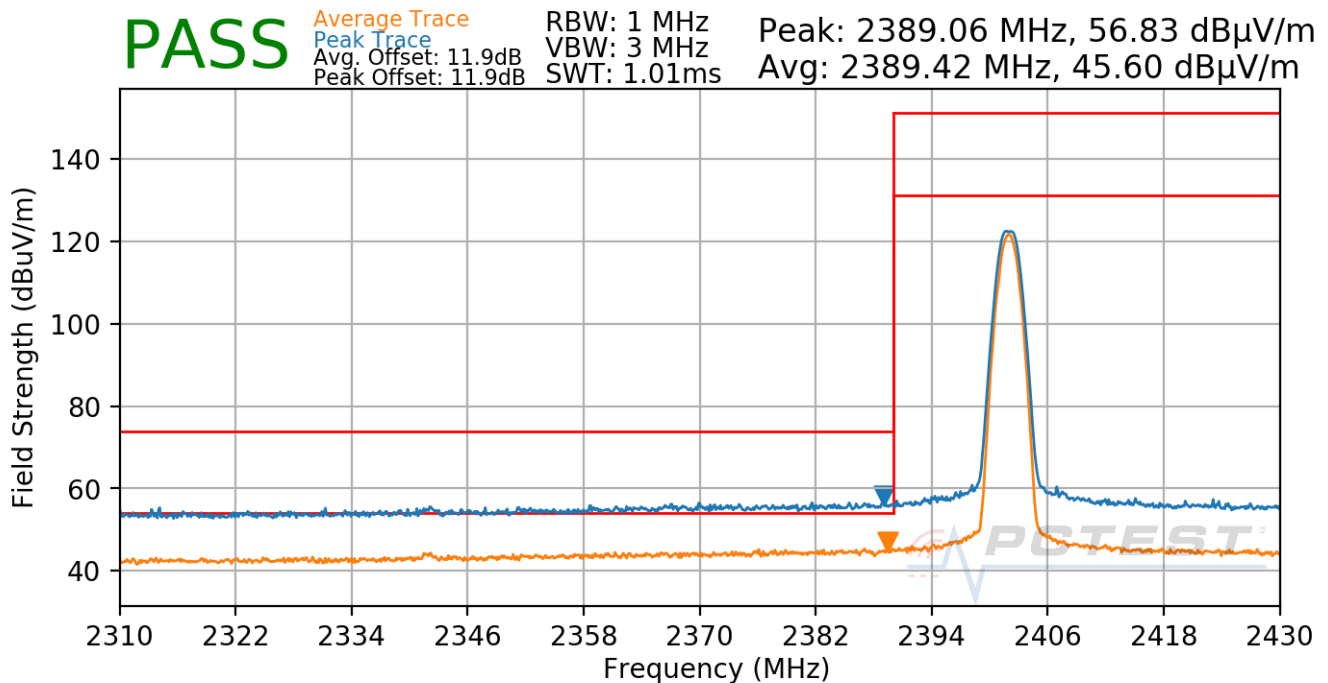
§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

TxBF

Bluetooth Mode:	LE
Data Rate:	1Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2402MHz
Channel:	0



Plot 7-100. Radiated Restricted Lower Band Edge Measurement TxBF (Average & Peak)

FCC ID: BCGA2316		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 87 of 99

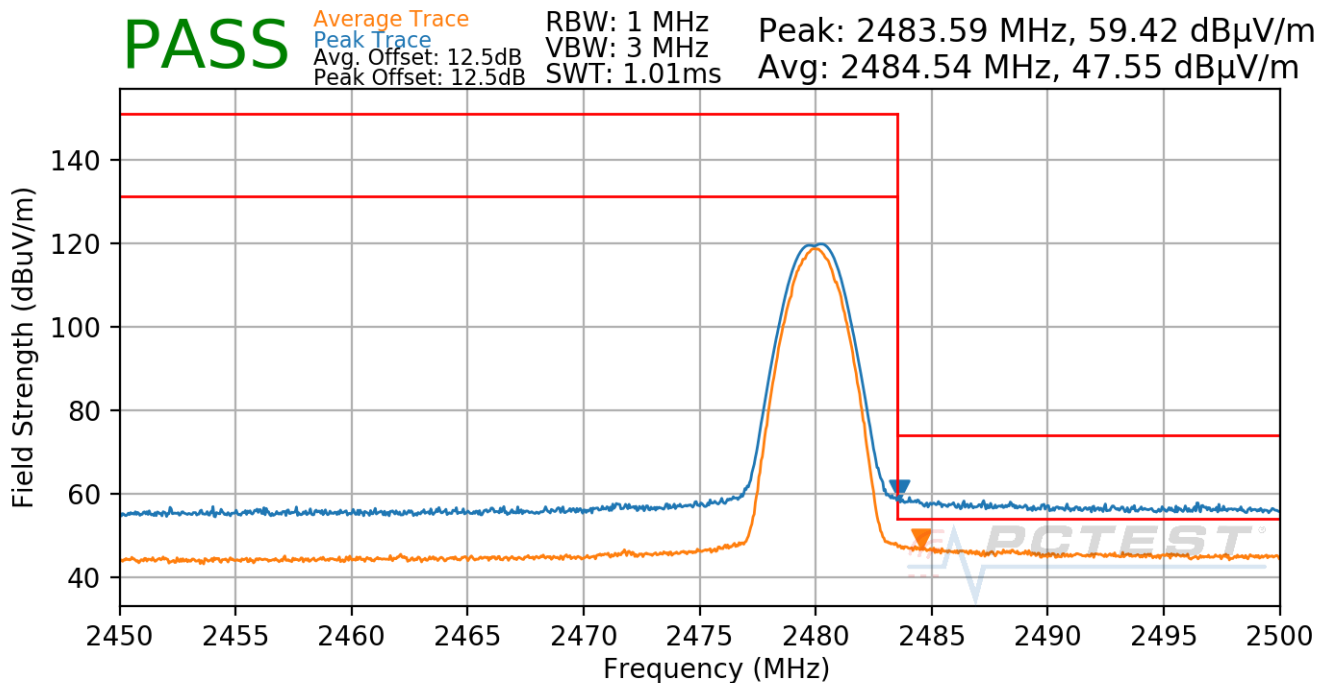
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Bluetooth Mode:	LE
Data Rate:	1Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	39



Plot 7-101. Radiated Restricted Upper Band Edge Measurement TxBF (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 88 of 99

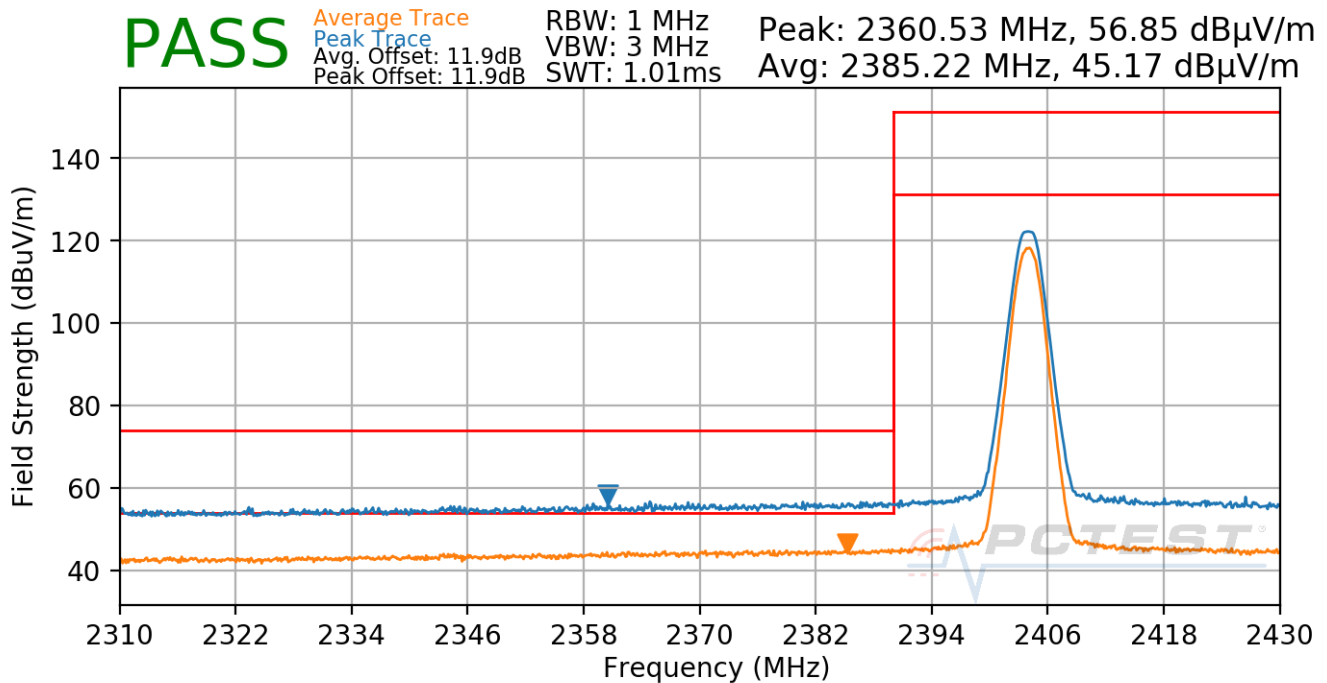
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

Bluetooth Mode:	LE
Data Rate:	2Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2404MHz
Channel:	1



Plot 7-102. Radiated Restricted Lower Band Edge Measurement TxBF (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 89 of 99

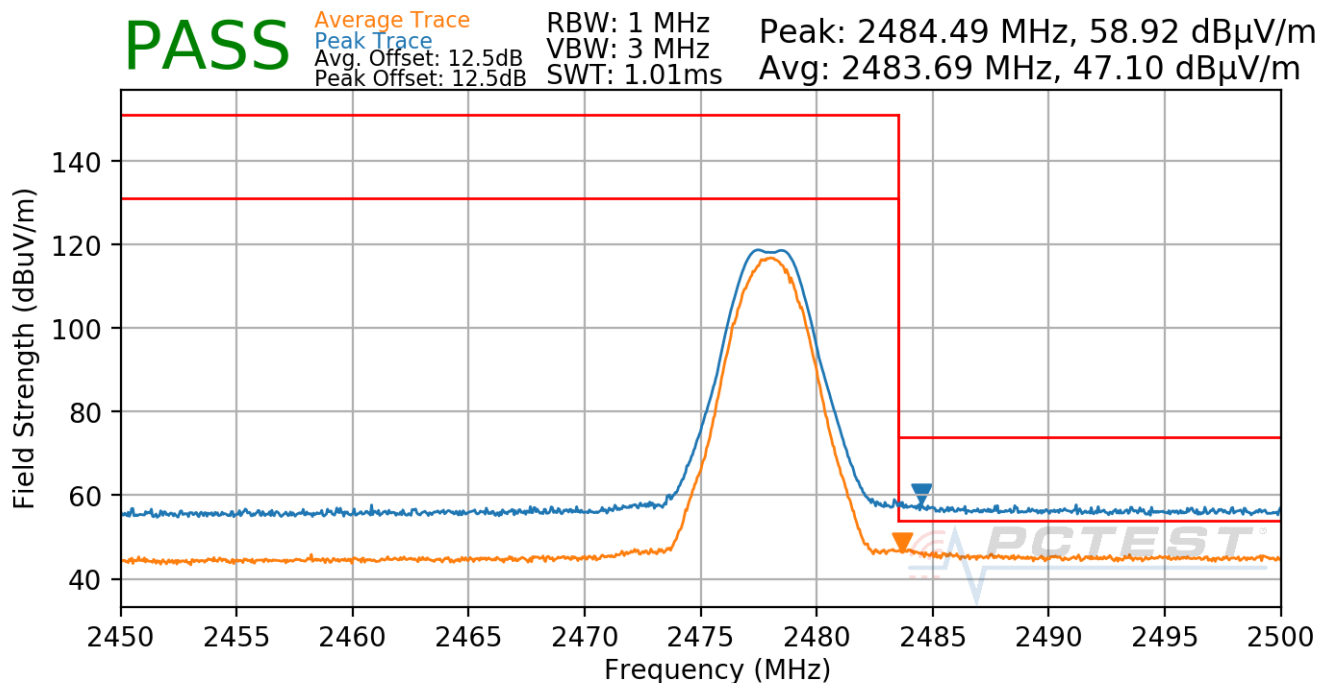
Radiated Restricted Band Edge Measurements

§15.205 §15.209; RSS-Gen [8.9]

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

Bluetooth Mode:	LE
Data Rate:	2Mbps
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2478MHz
Channel:	38



Plot 7-103. Radiated Restricted Upper Band Edge Measurement TxBF (Average & Peak)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 90 of 99

7.9 Radiated Spurious Emissions – Below 1GHz

§15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-23 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-23. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. VBW = 300kHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 91 of 99

Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

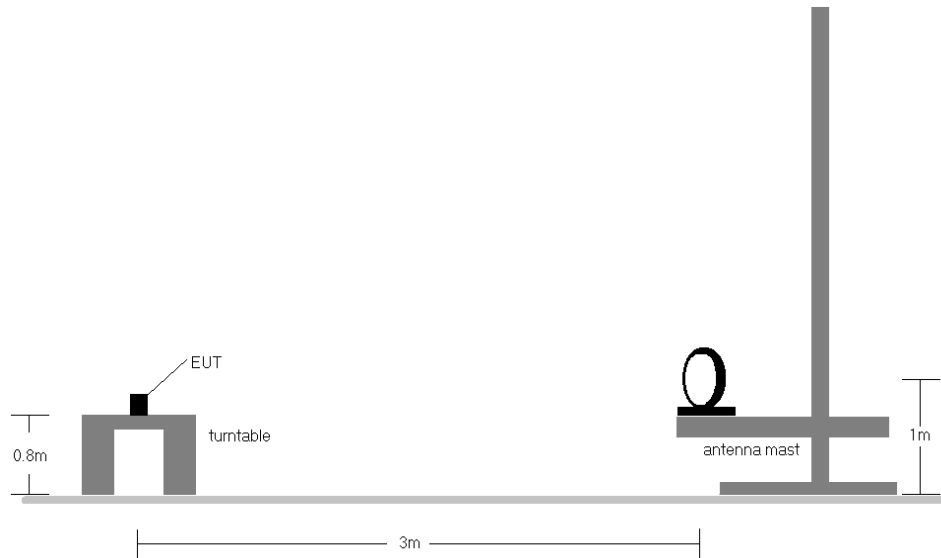


Figure 7-7. Radiated Test Setup < 30Mhz

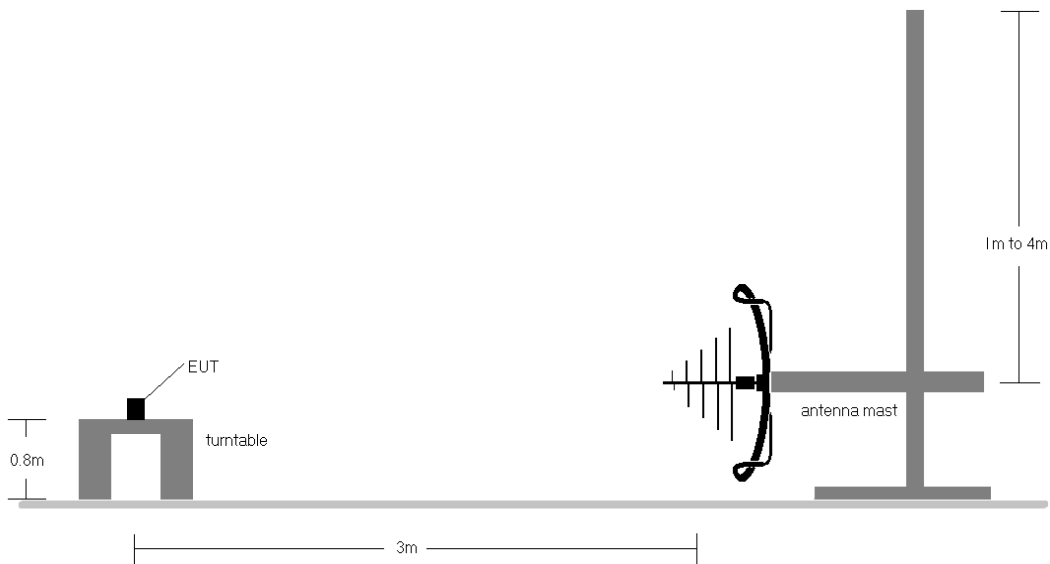


Figure 7-8. Radiated Test Setup < 1GHz

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 92 of 99

Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-23.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes. For below 30MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector on emissions that were within 6dB of the limit.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.
10. The unit was tested with all possible mode and power schemes and only the highest emission is reported.
11. Both configurations below were investigated, and the worst case has been reported.
 - a. EUT powered by AC/DC adaptor via USB-C cable with wire charger
 - b. EUT powered by host PC via USB-C cable with wire charger

Sample Calculations

Determining Spurious Emissions Levels

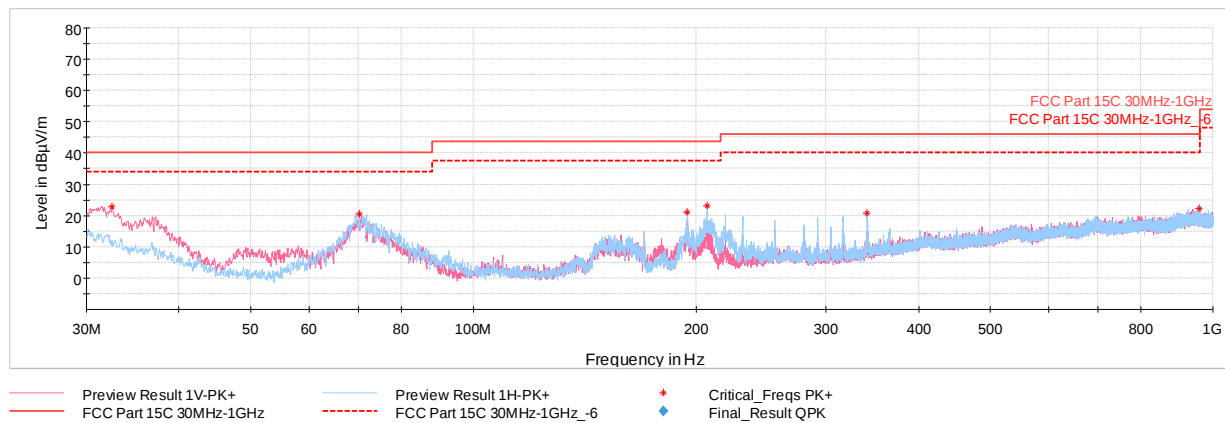
- Field Strength Level $[\text{dB}\mu\text{V/m}] = \text{Analyzer Level} [\text{dBm}] + 107 + \text{AFCL} [\text{dB/m}]$
- $\text{AFCL} [\text{dB/m}] = \text{Antenna Factor} [\text{dB/m}] + \text{Cable Loss} [\text{dB}] - \text{Preamplifier Gain} [\text{dB}]$
- $\text{Margin} [\text{dB}] = \text{Field Strength Level} [\text{dB}\mu\text{V/m}] - \text{Limit} [\text{dB}\mu\text{V/m}]$

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]

TxBF



Plot 7-104. Radiated Spurious Emissions Below 1GHz TxBF (1Mbps, ePA – Ch.19, Pol. H & V, with AC/DC Adapter)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
32.47	Max Peak	V	100	158	-65.29	-18.77	22.94	40.00	-17.06
70.11	Max Peak	H	250	196	-59.96	-26.48	20.56	40.00	-19.44
194.85	Max Peak	H	100	151	-63.14	-22.89	20.97	43.52	-22.55
206.98	Max Peak	H	100	160	-62.11	-21.86	23.03	43.52	-20.49
340.98	Max Peak	H	100	201	-68.97	-17.38	20.65	46.02	-25.37
957.95	Max Peak	H	100	252	-79.53	-5.35	22.12	46.02	-23.90

Table 7-24. Radiated Spurious Emissions Below 1GHz TxBF (1Mbps, ePA – Ch.19, Pol. H & V, with AC/DC Adapter)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.10 AC Line-Conducted Emissions Measurement

§15.207; RSS-Gen [8.8]

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for AC Line conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

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

Table 7-25. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 95 of 99

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

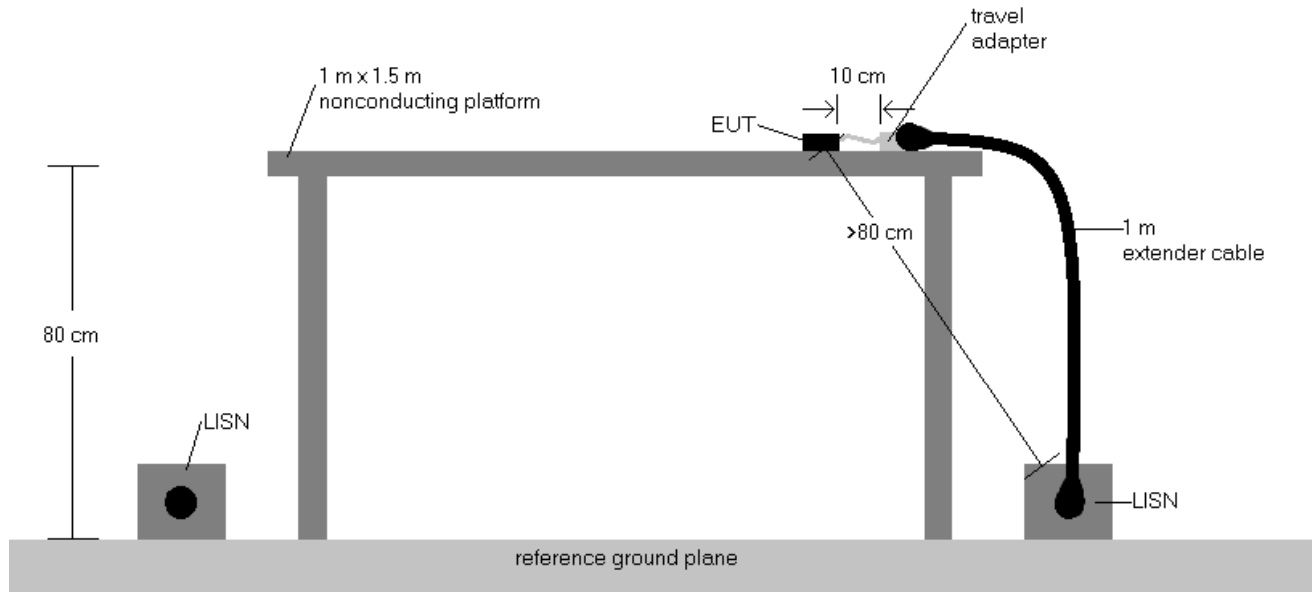
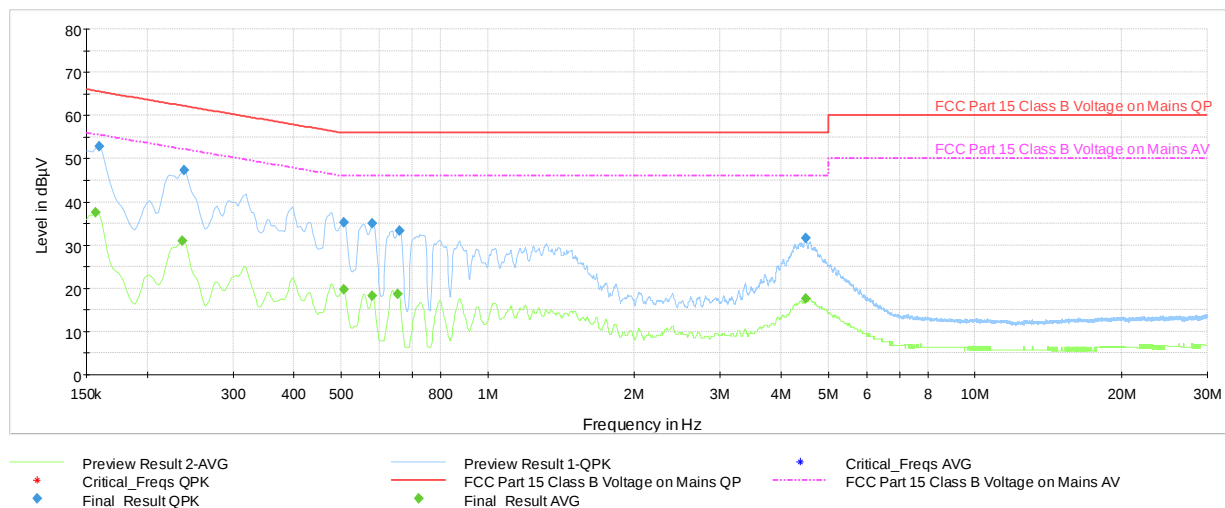


Figure 7-9. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in Part 15.207 and RSS-Gen (8.8).
3. $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4. $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5. $\text{Margin (dB)} = \text{QP/AV Level (dB}\mu\text{V)} - \text{QP/AV Limit (dB}\mu\text{V)}$
6. Traces shown in plot are made using a quasi peak and average detectors.
7. Deviations to the Specifications: None.
8. Both power schemes were investigated and only the worst case is reported.
9. Both configurations below were investigated, and the worst case has been reported.
 - a. EUT powered by AC/DC adaptor via USB-C cable with wire charger
 - b. EUT powered by host PC via USB-C cable with wire charger

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 96 of 99

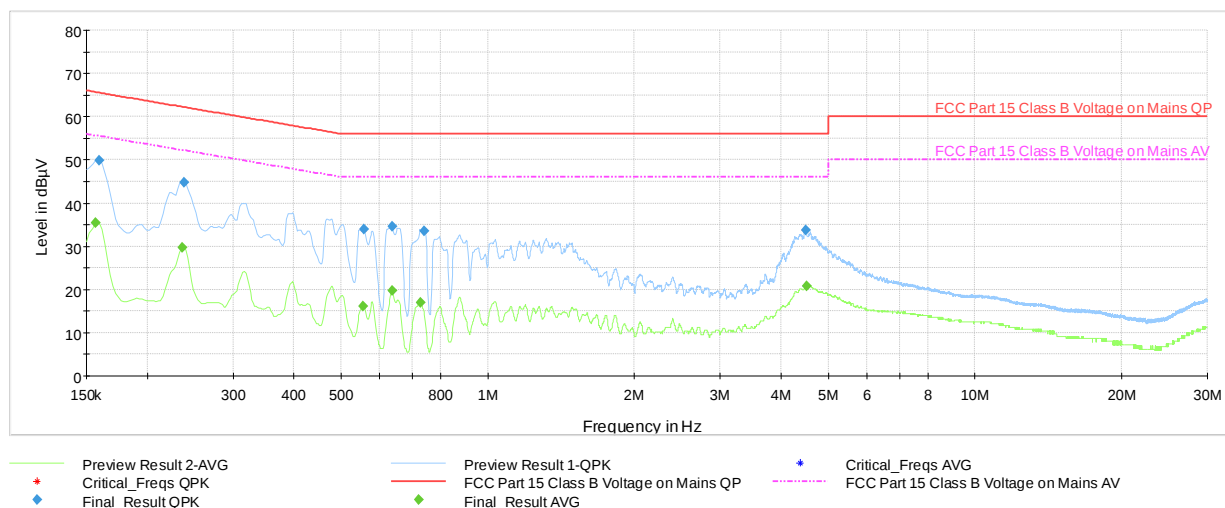


Plot 7-105. AC Line Conducted Plot with Bluetooth LE Tx BF (1Mbps, ePA – Ch.19, L1, with AC/DC Adapter)

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.157	FINAL	—	37.54	55.63	-18.09	L1	GND
0.159	FINAL	52.9	—	65.52	-12.65	L1	GND
0.236	FINAL	—	30.92	52.25	-21.33	L1	GND
0.238	FINAL	47.3	—	62.17	-14.86	L1	GND
0.506	FINAL	—	19.66	46.00	-26.34	L1	GND
0.506	FINAL	35.2	—	56.00	-20.78	L1	GND
0.580	FINAL	—	18.31	46.00	-27.69	L1	GND
0.580	FINAL	35.0	—	56.00	-21.00	L1	GND
0.654	FINAL	—	18.68	46.00	-27.32	L1	GND
0.659	FINAL	33.3	—	56.00	-22.71	L1	GND
4.493	FINAL	31.6	—	56.00	-24.36	L1	GND
4.495	FINAL	—	17.59	46.00	-28.41	L1	GND

Table 7-26. AC Line Conducted Data with Bluetooth LE Tx BF (1Mbps, ePA – Ch.19, L1, with AC/DC Adapter)

FCC ID: BCGA2316	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 97 of 99



Plot 7-106. AC Line Conducted Plot with Bluetooth LE Tx BF (1Mbps, ePA – Ch.19, N, with AC/DC Adapter)

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.157	FINAL	—	35.39	55.63	-20.25	N	GND
0.159	FINAL	50.0	—	65.52	-15.55	N	GND
0.236	FINAL	—	29.67	52.25	-22.58	N	GND
0.238	FINAL	44.8	—	62.17	-17.36	N	GND
0.555	FINAL	—	16.03	46.00	-29.97	N	GND
0.557	FINAL	33.9	—	56.00	-22.09	N	GND
0.636	FINAL	—	19.78	46.00	-26.22	N	GND
0.636	FINAL	34.5	—	56.00	-21.47	N	GND
0.728	FINAL	—	16.94	46.00	-29.06	N	GND
0.740	FINAL	33.6	—	56.00	-22.38	N	GND
4.497	FINAL	33.7	—	56.00	-22.28	N	GND
4.506	FINAL	—	20.85	46.00	-25.15	N	GND

Table 7-27. AC Line Conducted Data with Bluetooth LE Tx BF (1Mbps, ePA – Ch.19, N, with AC/DC Adapter)

FCC ID: BCGA2316	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 98 of 99

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2316** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.

FCC ID: BCGA2316	 Proud to be part of  element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270028-05.BCG	Test Dates: 6/15/2020 - 08/14/2020	EUT Type: Tablet Device	Page 99 of 99