

Sample Calculation

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

Duty Cycle Correction Factor Calculation

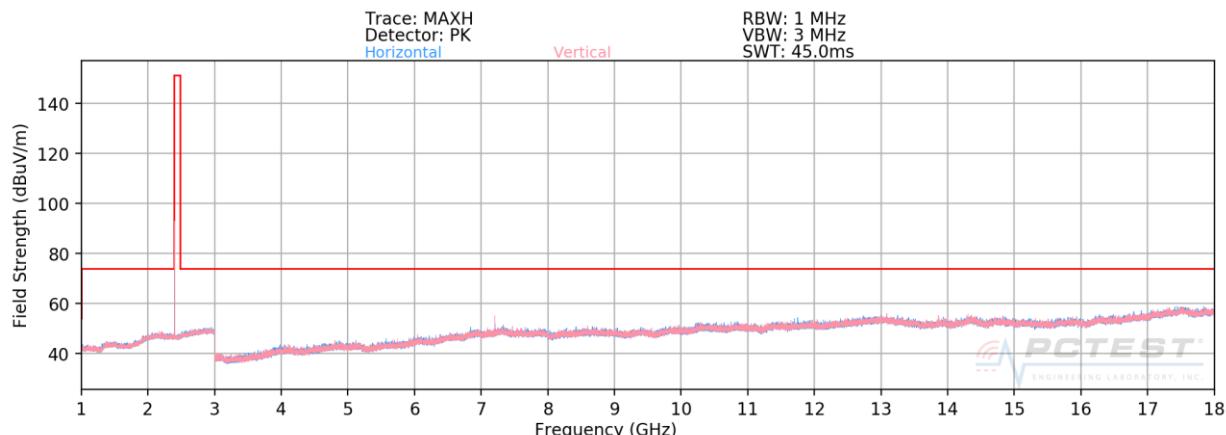
- Channel hop rate = 800 hops/second (AFH Mode)
- Adjusted channel hop rate for DH5 mode = 133.33 hops/second
- Time per channel hop = 1 / 133.33 hops/second = 7.50 ms
- Time to cycle through all channels = 7.50 x 20 channels = 150 ms
- Number of times transmitter hits on one channel = 100 ms / 150 ms = 1 time(s)
- Worst case dwell time = 7.5 ms
- Duty cycle correction factor = $20\log_{10}(7.5\text{ms}/100\text{ms}) = -22.5 \text{ dB}$

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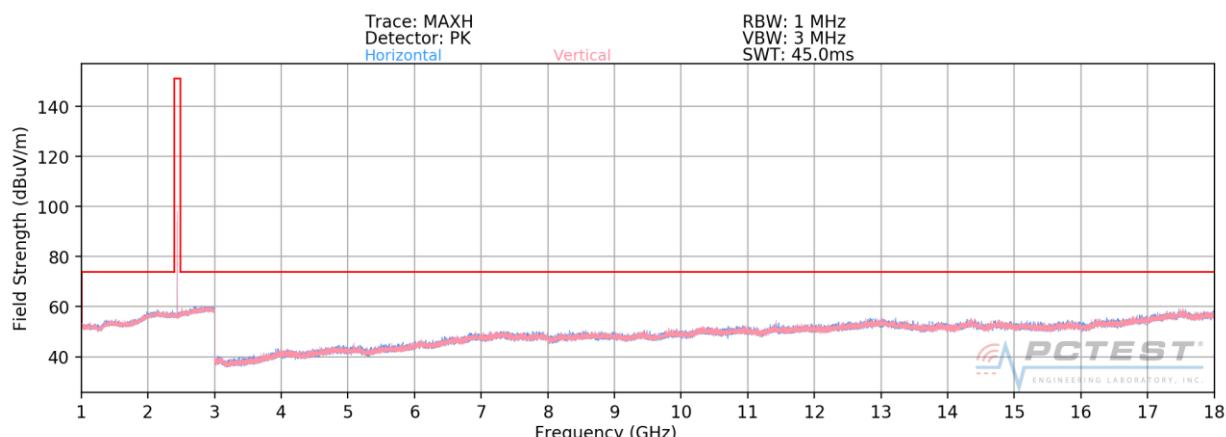
Radiated Spurious Emission Measurements

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

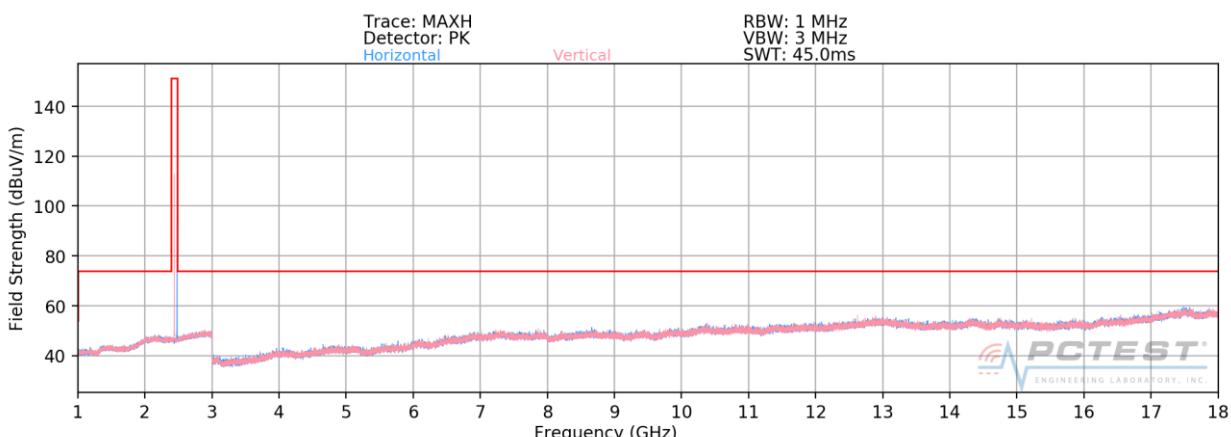
Antenna 0



Plot 7-85. Radiated Spurious Plot above 1GHz ANT0 (BT GFSK ePA – Ch. 0)



Plot 7-86. Radiated Spurious Plot above 1GHz ANT0 (BT GFSK ePA – Ch. 39)



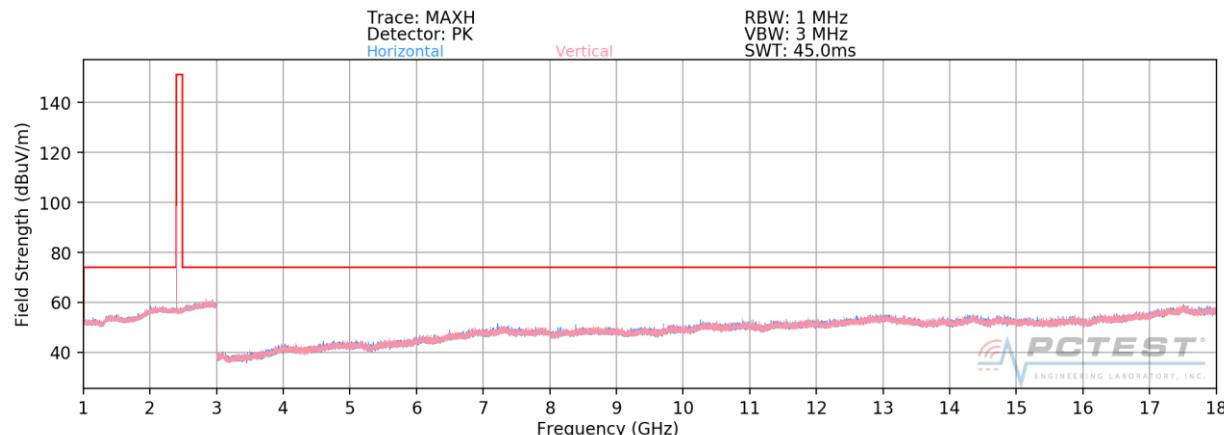
Plot 7-87. Radiated Spurious Plot above 1GHz ANT0 (BT GFSK ePA – Ch. 78)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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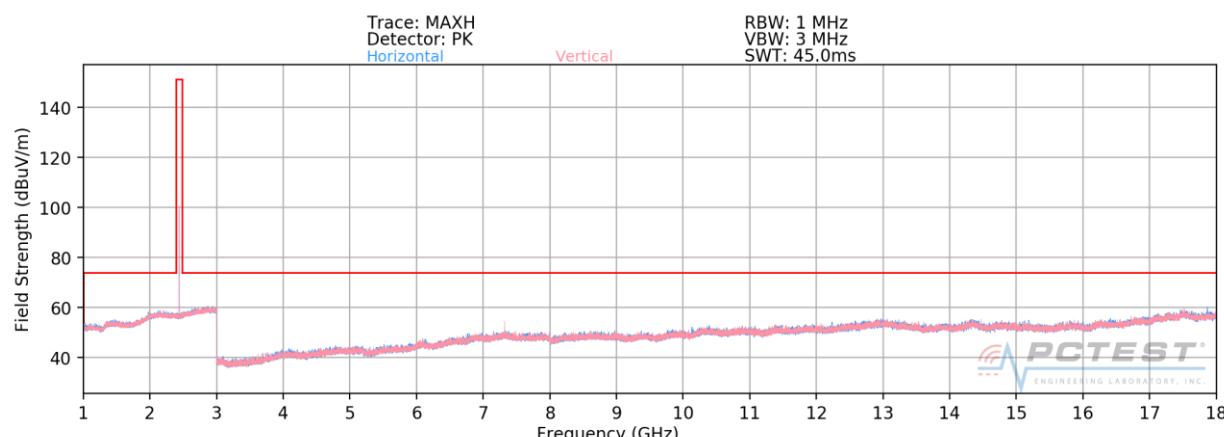
Radiated Spurious Emission Measurements

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

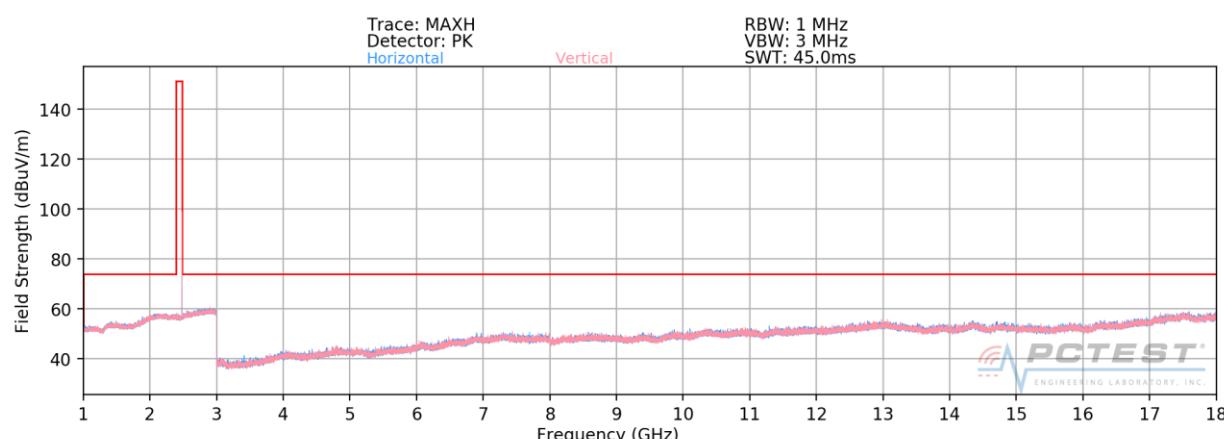
Antenna 1



Plot 7-88. Radiated Spurious Plot above 1GHz ANT1 (BT GFSK ePA – Ch. 0)



Plot 7-89. Radiated Spurious Plot above 1GHz ANT1 (BT GFSK ePA – Ch. 39)



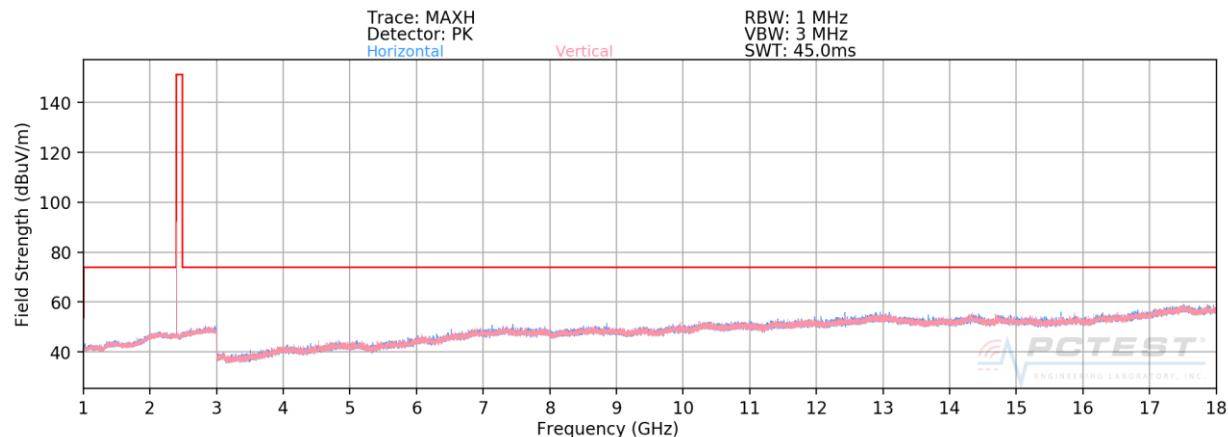
Plot 7-90. Radiated Spurious Plot above 1GHz ANT1 (BT GFSK ePA – Ch. 78)

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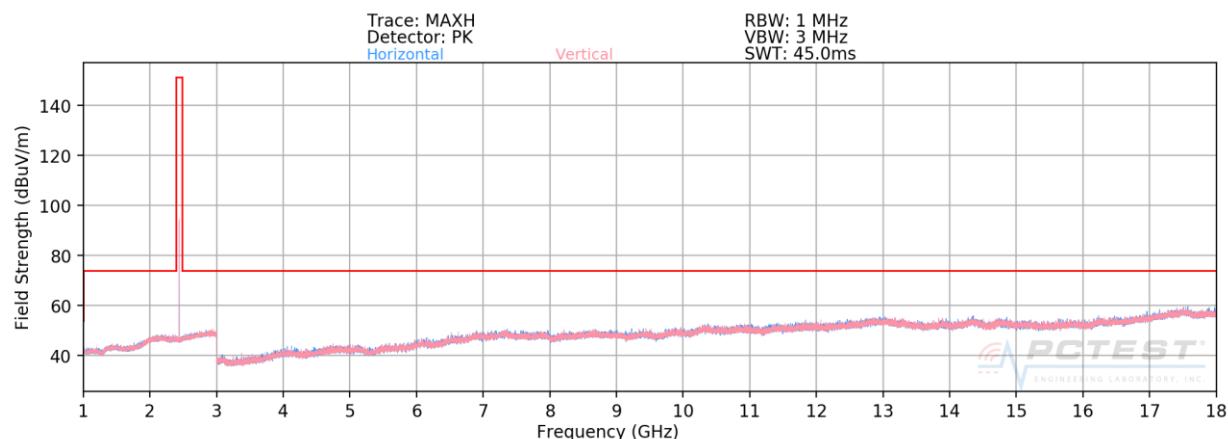
Radiated Spurious Emission Measurements

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

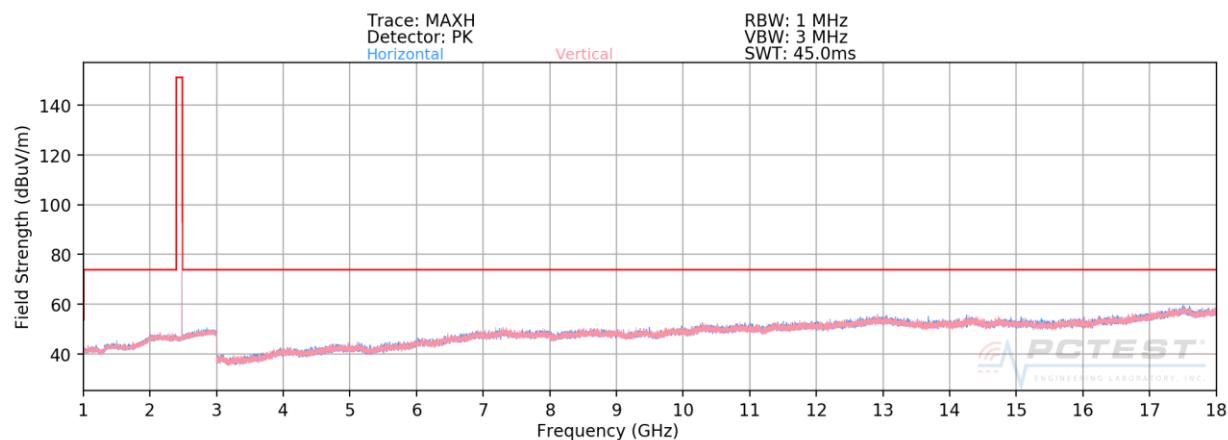
Antenna 2



Plot 7-91. Radiated Spurious Plot above 1GHz ANT2 (BT GFSK ePA – Ch. 0)



Plot 7-92. Radiated Spurious Plot above 1GHz ANT2 (BT GFSK ePA – Ch. 39)

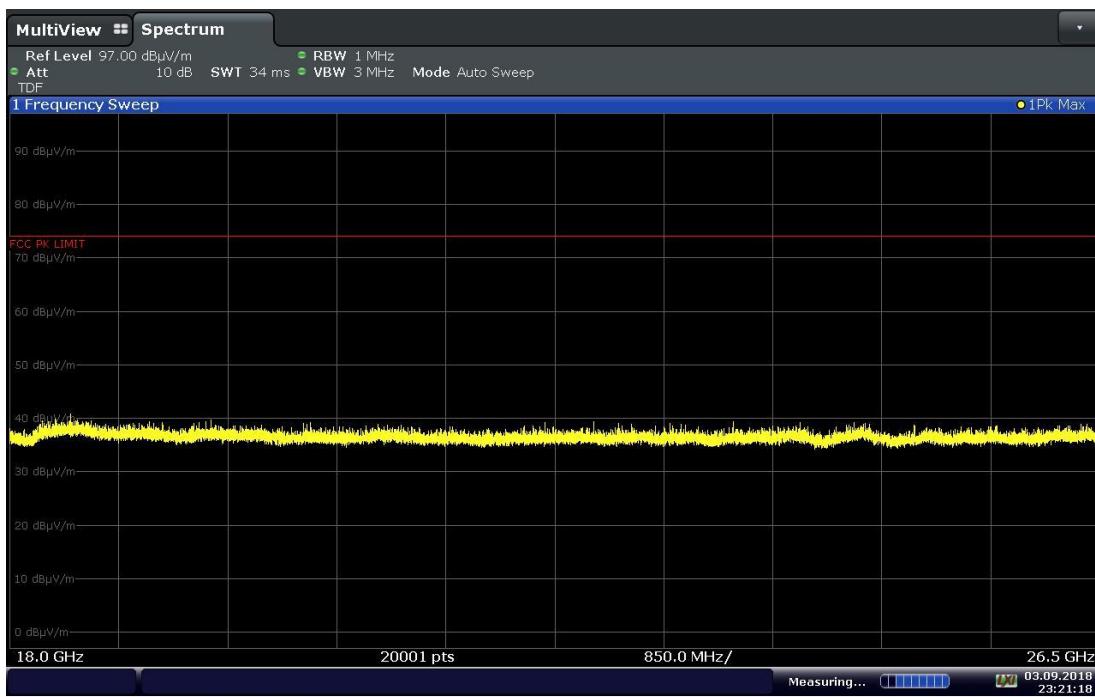


Plot 7-93. Radiated Spurious Plot above 1GHz ANT2 (BT GFSK ePA – Ch. 78)

FCC ID: BCGA1895	 PCTEST® ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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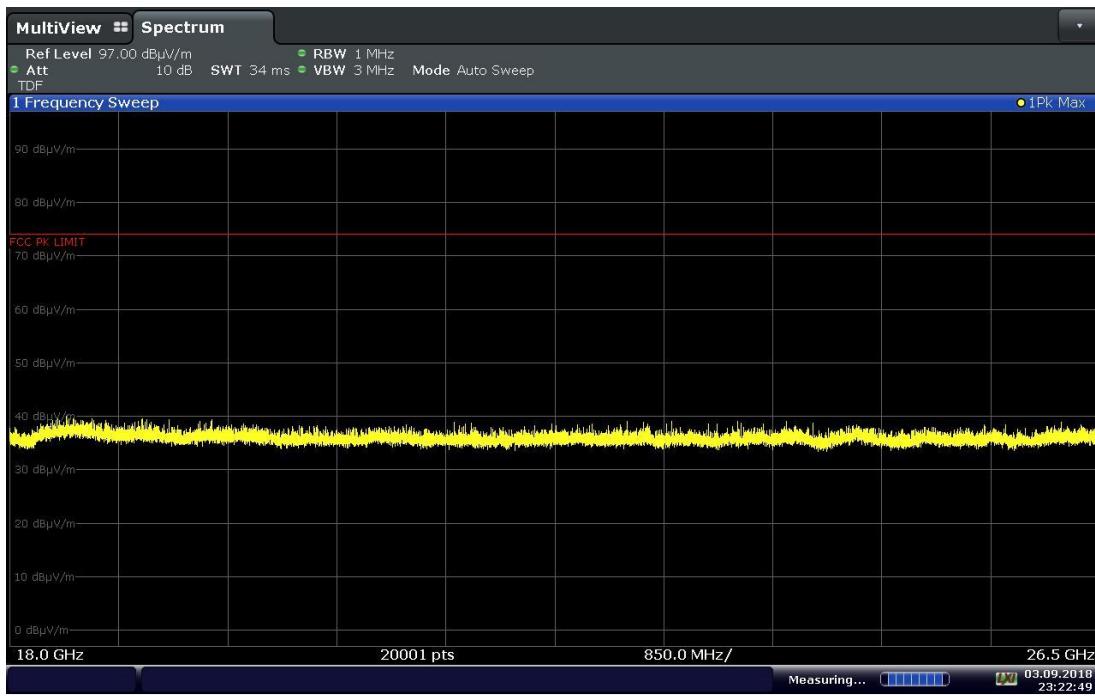
Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209; RSS-Gen [8.9]



23:21:18 03.09.2018

Plot 7-94. Radiated Spurious Plot above 18GHz ANT0 (GFSK ePA – Ch. 39, Ant. Pol. H)



23:22:50 03.09.2018

Plot 7-95. Radiated Spurious Plot above 18GHz ANT0 (GFSK ePA – Ch. 39, Ant. Pol. V)

FCC ID: BCGA1895	 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 0

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	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 [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4804.00	Avg	H	-	-	-79.74	4.50	31.76	53.98	-22.22
4804.00	Peak	H	-	-	-67.75	4.50	43.75	73.98	-30.23
12010.00	Avg	H	-	-	-82.41	19.87	44.46	53.98	-9.52
12010.00	Peak	H	-	-	-72.48	19.87	54.39	73.98	-19.59

Table 7-16. Radiated Measurements

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2441MHz
Channel:	39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4882.00	Avg	H	-	-	-80.17	4.98	31.81	53.98	-22.17
4882.00	Peak	H	-	-	-67.65	4.98	44.33	73.98	-29.65
7323.00	Avg	H	-	-	-80.60	12.01	38.41	53.98	-15.57
7323.00	Peak	H	-	-	-70.26	12.01	48.75	73.98	-25.23
12205.00	Avg	H	-	-	-82.66	19.93	44.27	53.98	-9.71
12205.00	Peak	H	-	-	-72.79	19.93	54.14	73.98	-19.84

Table 7-17. Radiated Measurements

FCC ID: BCGA1895	 PCTEST® ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)					Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device					

Radiated Spurious Emission Measurements

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

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4960.00	Avg	H	113	159	-78.26	4.22	10.46	53.98	-43.52
4960.00	Peak	H	113	159	-67.40	4.22	43.82	73.98	-30.16
7440.00	Avg	H	-	-	-79.52	12.31	39.79	53.98	-14.19
7440.00	Peak	H	-	-	-68.43	12.31	50.88	73.98	-23.10
12400.00	Avg	H	-	-	-81.75	20.71	45.96	53.98	-8.02
12400.00	Peak	H	-	-	-70.53	20.71	57.18	73.98	-16.80

Table 7-18. Radiated Measurements

FCC ID: BCGA1895	MEASUREMENT REPORT (CERTIFICATION)				Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device			

Radiated Spurious Emission Measurements

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

Antenna 1

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	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 [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4804.00	Avg	H	-	-	-79.58	4.50	31.92	53.98	-22.06
4804.00	Peak	H	-	-	-67.64	4.50	43.86	73.98	-30.12
12010.00	Avg	H	-	-	-83.17	19.87	43.70	53.98	-10.28
12010.00	Peak	H	-	-	-69.91	19.87	56.96	73.98	-17.02

Table 7-19. Radiated Measurements

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2441MHz
Channel:	39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4882.00	Avg	H	-	-	-80.23	4.98	31.75	53.98	-22.23
4882.00	Peak	H	-	-	-67.05	4.98	44.93	73.98	-29.05
7323.00	Avg	H	-	-	-79.95	12.01	39.06	53.98	-14.92
7323.00	Peak	H	-	-	-68.11	12.01	50.90	73.98	-23.08
12205.00	Avg	H	-	-	-82.47	19.93	44.46	53.98	-9.52
12205.00	Peak	H	-	-	-69.74	19.93	57.19	73.98	-16.79

Table 7-20. Radiated Measurements

FCC ID: BCGA1895	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]

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4960.00	Avg	H	-	-	-79.81	4.22	31.41	53.98	-22.57
4960.00	Peak	H	-	-	-68.32	4.22	42.90	73.98	-31.08
7440.00	Avg	H	-	-	-77.67	12.31	41.64	53.98	-12.34
7440.00	Peak	H	-	-	-67.98	12.31	51.33	73.98	-22.65
12400.00	Avg	H	-	-	-83.24	20.71	44.47	53.98	-9.51
12400.00	Peak	H	-	-	-70.56	20.71	57.15	73.98	-16.83

Table 7-21. Radiated Measurements

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device		

Radiated Spurious Emission Measurements

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

Antenna 2

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	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 [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4804.00	Avg	H	-	-	-79.66	4.50	31.84	53.98	-22.14
4804.00	Peak	H	-	-	-67.71	4.50	43.79	73.98	-30.19
12010.00	Avg	H	-	-	-82.89	19.87	43.98	53.98	-10.00
12010.00	Peak	H	-	-	-69.84	19.87	57.03	73.98	-16.95

Table 7-22. Radiated Measurements

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2441MHz
Channel:	39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4882.00	Avg	H	-	-	-79.67	4.98	32.31	53.98	-21.67
4882.00	Peak	H	-	-	-68.42	4.98	43.56	73.98	-30.42
7323.00	Avg	H	-	-	-80.45	12.01	38.56	53.98	-15.42
7323.00	Peak	H	-	-	-67.07	12.01	51.94	73.98	-22.04
12205.00	Avg	H	-	-	-82.36	19.93	44.57	53.98	-9.41
12205.00	Peak	H	-	-	-71.14	19.93	55.79	73.98	-18.19

Table 7-23. Radiated Measurements

FCC ID: BCGA1895	 PCTEST® ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)					Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device					

Radiated Spurious Emission Measurements

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

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	GFSK
Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]
4960.00	Avg	H	-	-	-80.10	4.22	31.12	53.98	-22.86
4960.00	Peak	H	-	-	-67.00	4.22	44.22	73.98	-29.76
7440.00	Avg	H	-	-	-80.16	12.31	39.15	53.98	-14.83
7440.00	Peak	H	-	-	-69.00	12.31	50.31	73.98	-23.67
12400.00	Avg	H	-	-	-80.15	20.71	47.56	53.98	-6.42
12400.00	Peak	H	-	-	-67.11	20.71	60.60	73.98	-13.38

Table 7-24. Radiated Measurements

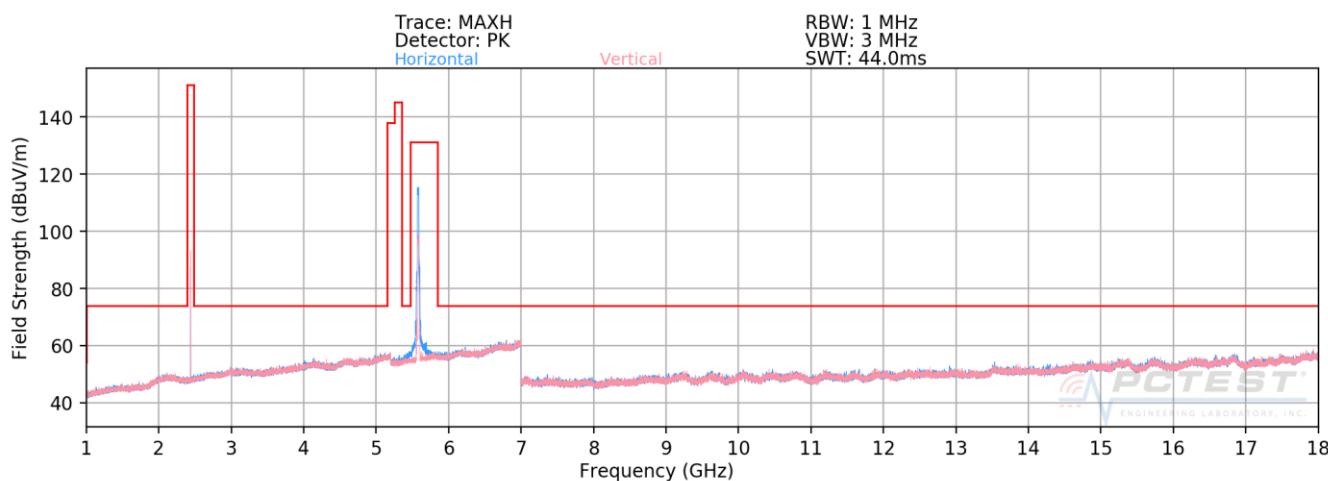
FCC ID: BCGA1895	MEASUREMENT REPORT (CERTIFICATION)				Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device			

Simultaneous Tx Radiated Spurious Emission Measurements

§15.247 §15.205 & §15.209; RSS-Gen [8.9]

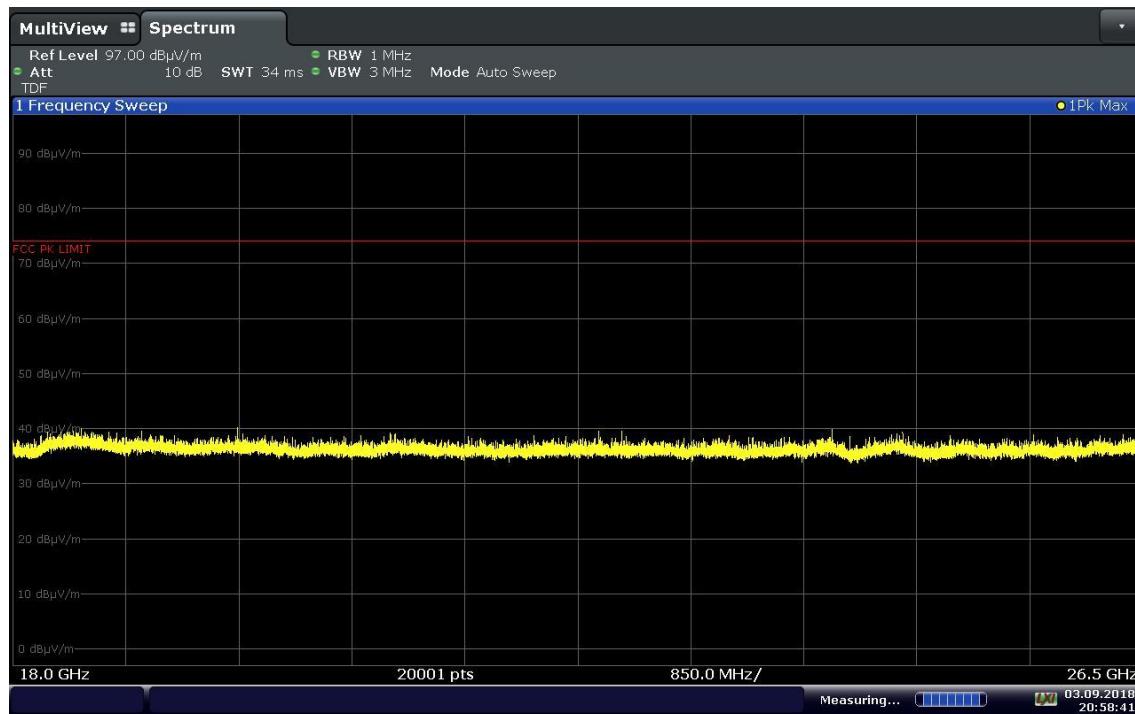
Description	2.4 GHz Emission	5 GHz Emission
Antenna	2	2
Channel	39	116
Operating Frequency (MHz)	2441	5580
Data Rate (Mbps)	GFSK/1Mbps	MCS0
Mode	Bluetooth	UNII

Table 7-25. Worst Cast Simultaneous Transmission Config



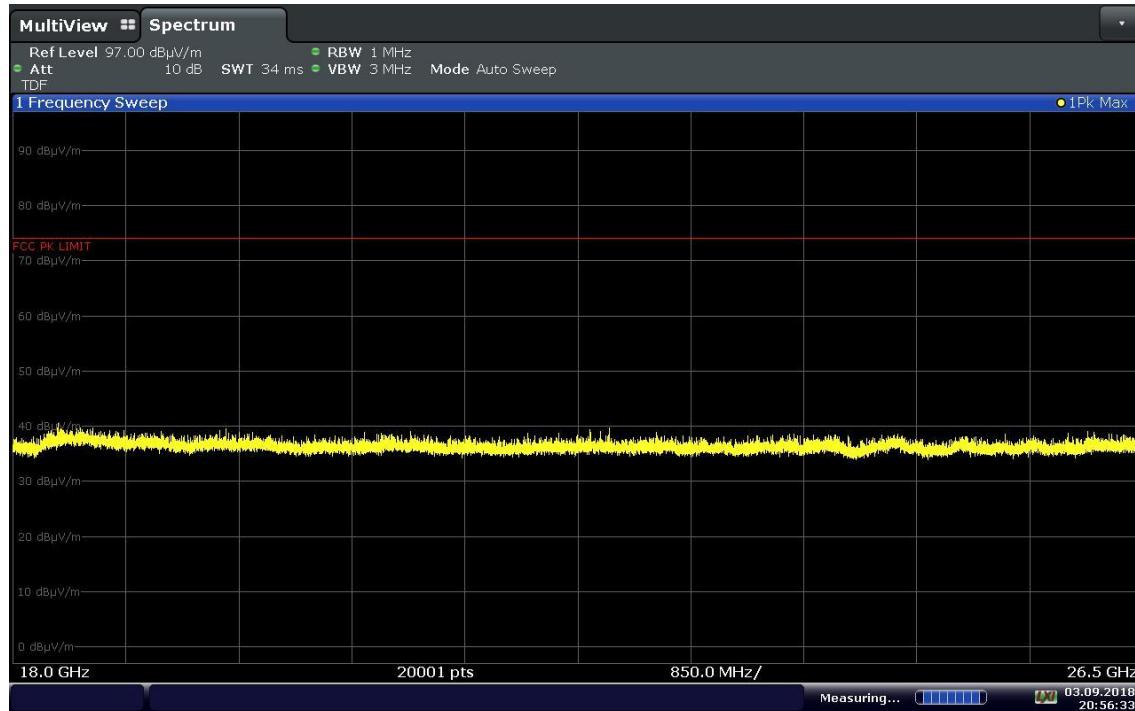
Plot 7-96. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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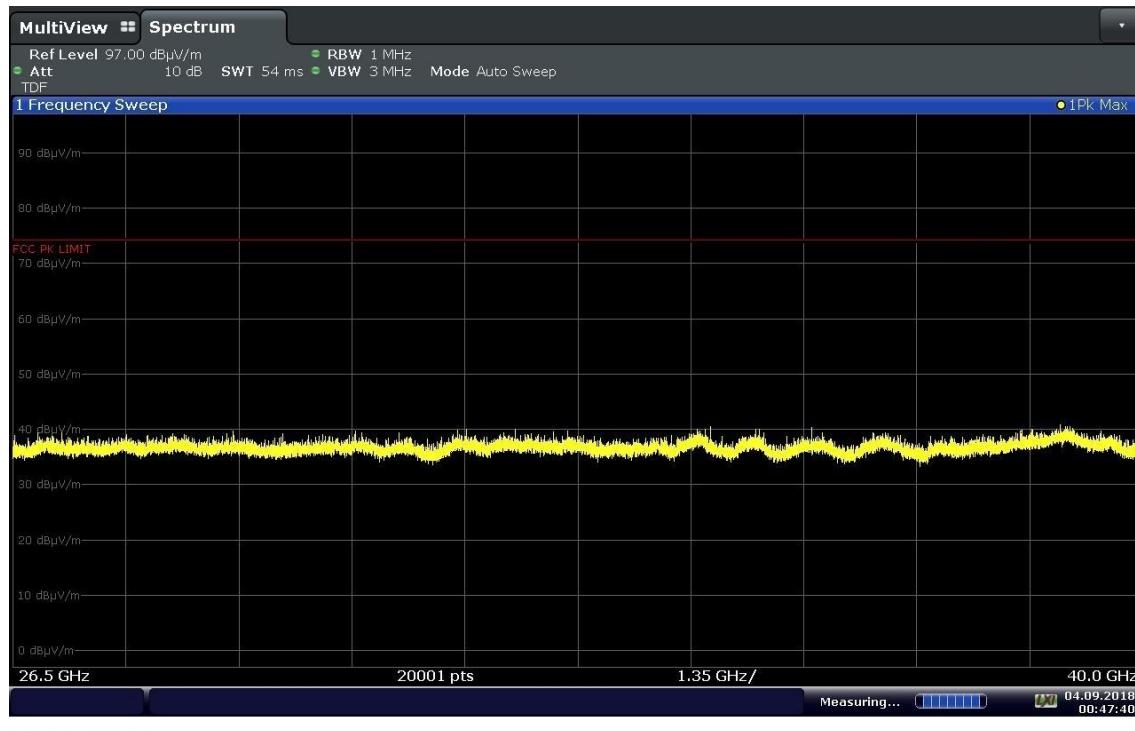
Plot 7-97. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz) Pol. H



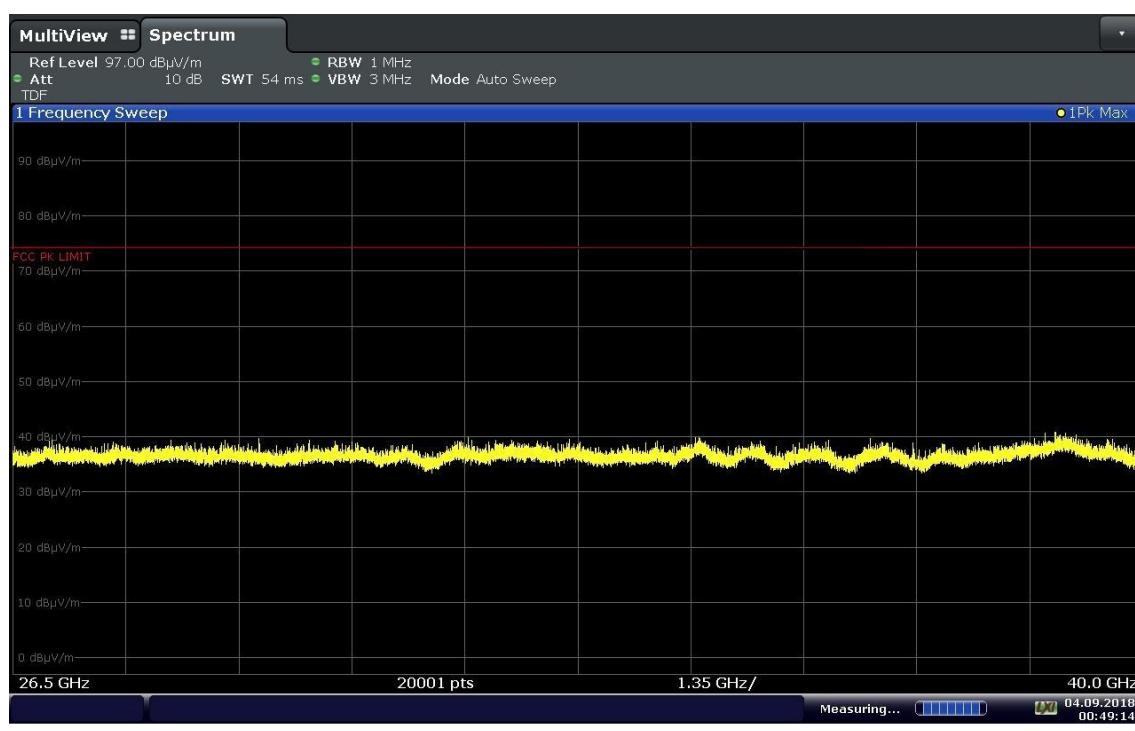
20:56:33 03.09.2018

Plot 7-98. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz) Pol. V

FCC ID: BCGA1895	PCTEST® ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-99. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz) Pol. H



Plot 7-100. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz) Pol. V

FCC ID: BCGA1895	PCTEST® ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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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]
4882.00	Avg	H	-	-	-80.41	10.98	37.57	53.98	-16.41
4882.00	Peak	H	-	-	-69.52	10.98	48.46	73.98	-25.52
7323.00	Avg	H	-	-	-79.86	18.47	45.61	53.98	-8.37
7323.00	Peak	H	-	-	-68.90	18.47	56.57	73.98	-17.41
12205.00	Avg	H	-	-	-82.80	26.12	50.32	53.98	-3.66
12205.00	Peak	H	-	-	-72.17	26.12	60.95	73.98	-13.03
11160.00	Avg	H	-	-	-82.34	25.47	50.13	53.98	-3.85
11160.00	Peak	H	-	-	-72.40	25.47	60.07	73.98	-13.91
16740.00	Avg	H	-	-	-89.12	30.79	48.67	53.98	-5.31
16740.00	Peak	H	-	-	-79.59	30.79	58.20	73.98	-15.78
8719.00	Avg	H	-	-	-80.43	21.64	48.21	53.98	-5.77
8719.00	Peak	H	-	-	-72.14	21.64	56.50	73.98	-17.48
11858.00	Avg	H	-	-	-83.06	25.18	49.12	53.98	-4.86
11858.00	Peak	H	-	-	-72.79	25.18	59.39	73.98	-14.59
3837.00	Avg	H	-	-	-79.50	8.01	35.51	53.98	-18.47
3837.00	Peak	H	-	-	-69.26	8.01	45.75	73.98	-28.23

Table 7-26. Radiated Measurements (ANT2 2.4GHz – ANT2 5GHz)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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7.10 Radiated Restricted Band Edge Measurements

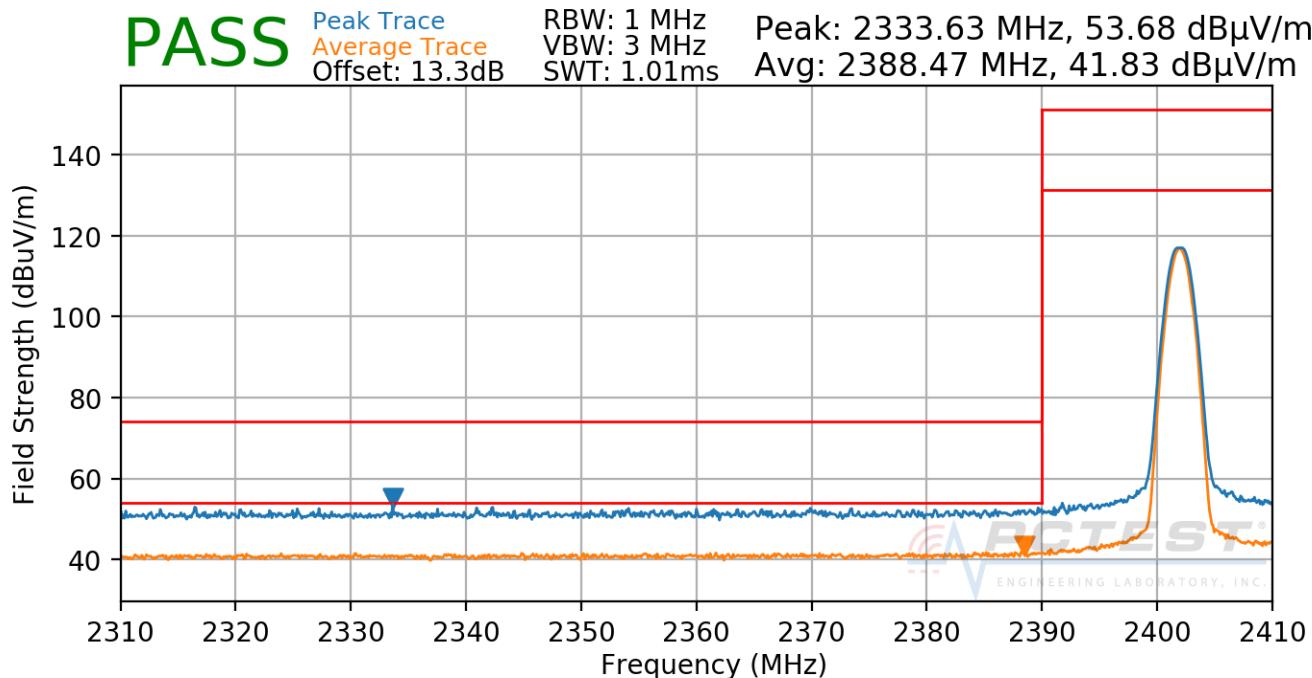
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting. Two different amplitude offsets were used depending on whether peak or average measurements were measured. The average measurements use a duty cycle correction factor (DCCF).

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

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

Worst Case Mode:	Bluetooth
Worst Case Modulation:	GFSK
Worst Case Power Scheme:	ePA
Measurement Distance:	3 Meters
Operating Frequency:	2402MHz
Channel:	0



Plot 7-101. Radiated Restricted Lower Band Edge Measurement ANT0 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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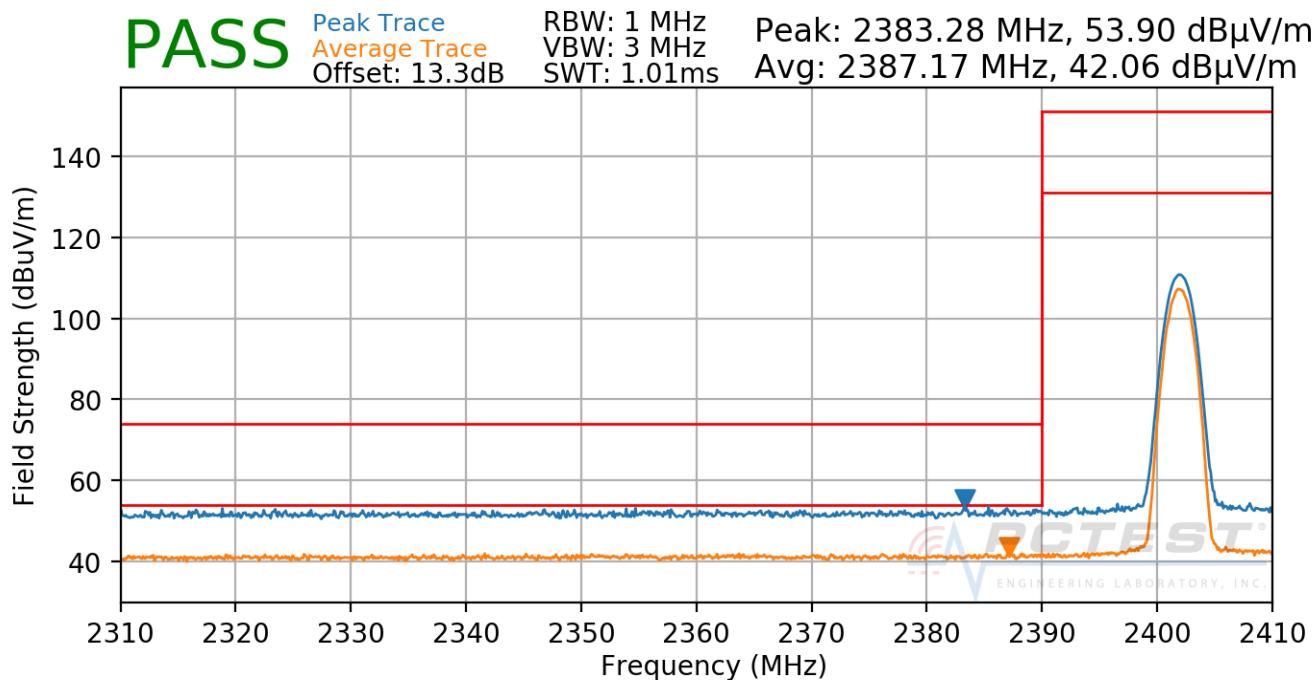
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: 8DPSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0



Plot 7-102. Radiated Restricted Lower Band Edge Measurement ANT0 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device	Page 93 of 112

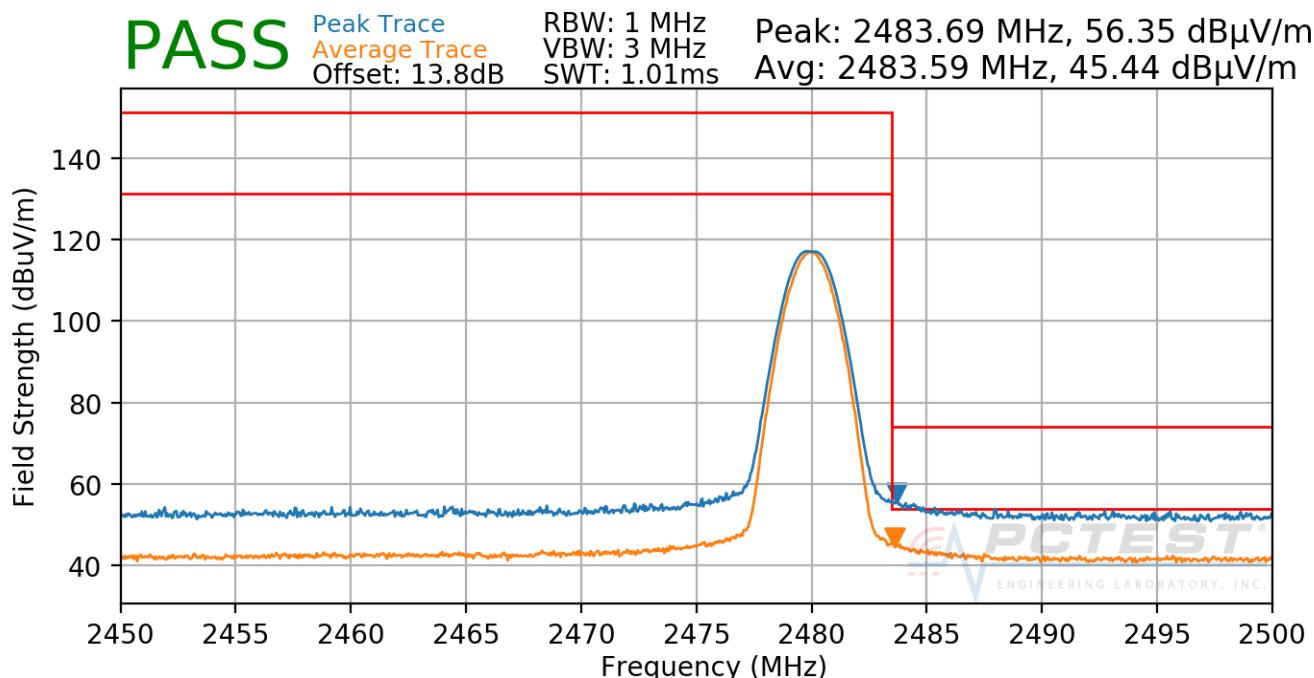
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: GFSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78



Plot 7-103. Radiated Restricted Upper Band Edge Measurement ANT0 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device		Page 94 of 112

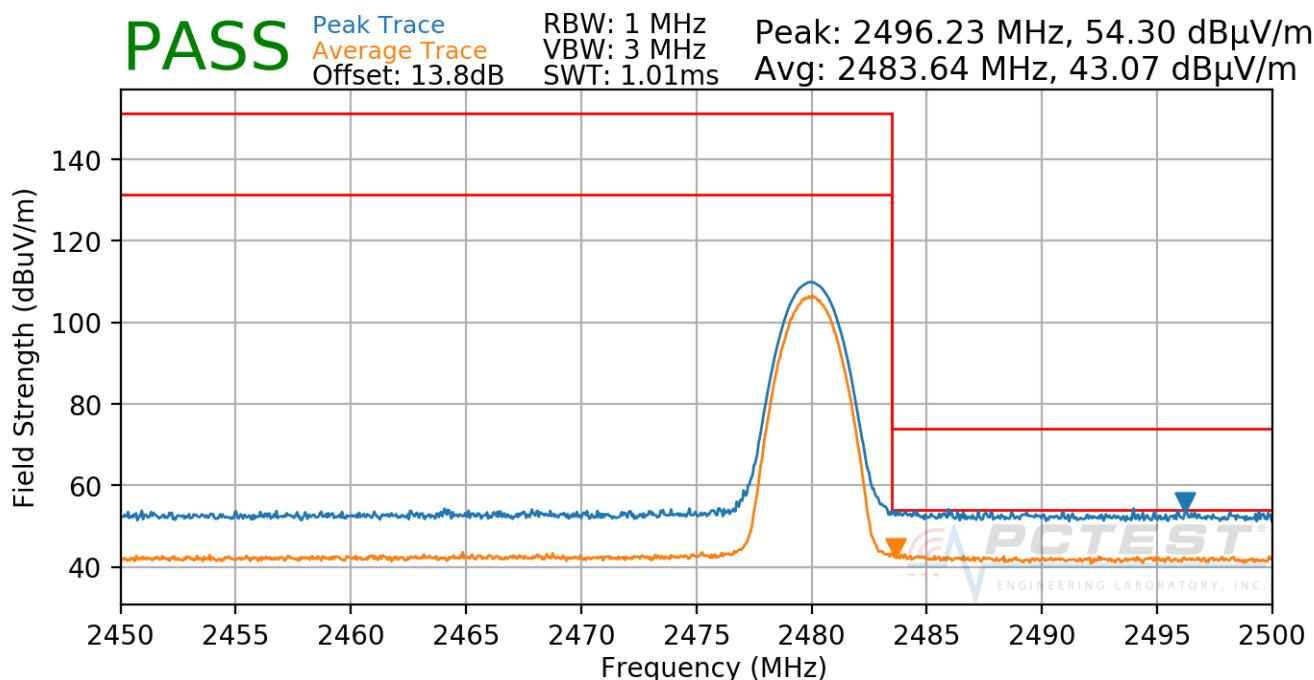
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: 8DPSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78



Plot 7-104. Radiated Restricted Upper Band Edge Measurement ANT0 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device		Page 95 of 112

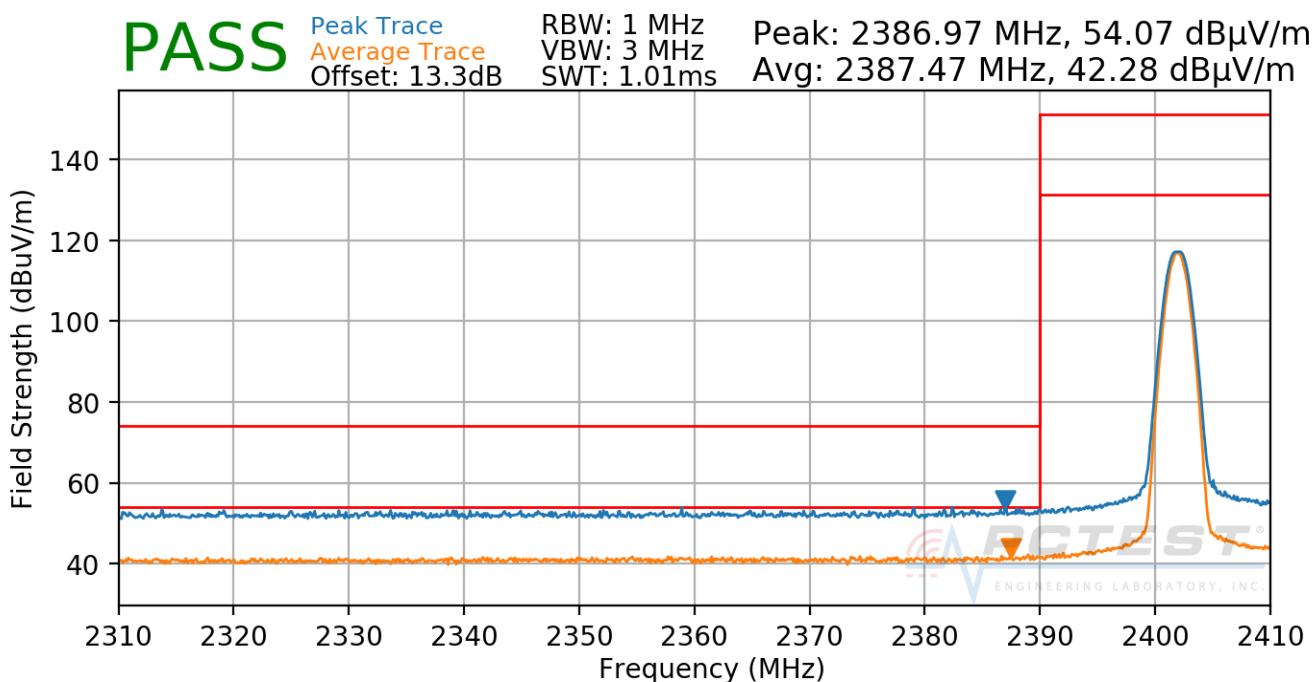
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: GFSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0



Plot 7-105. Radiated Restricted Lower Band Edge Measurement ANT1 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device		Page 96 of 112

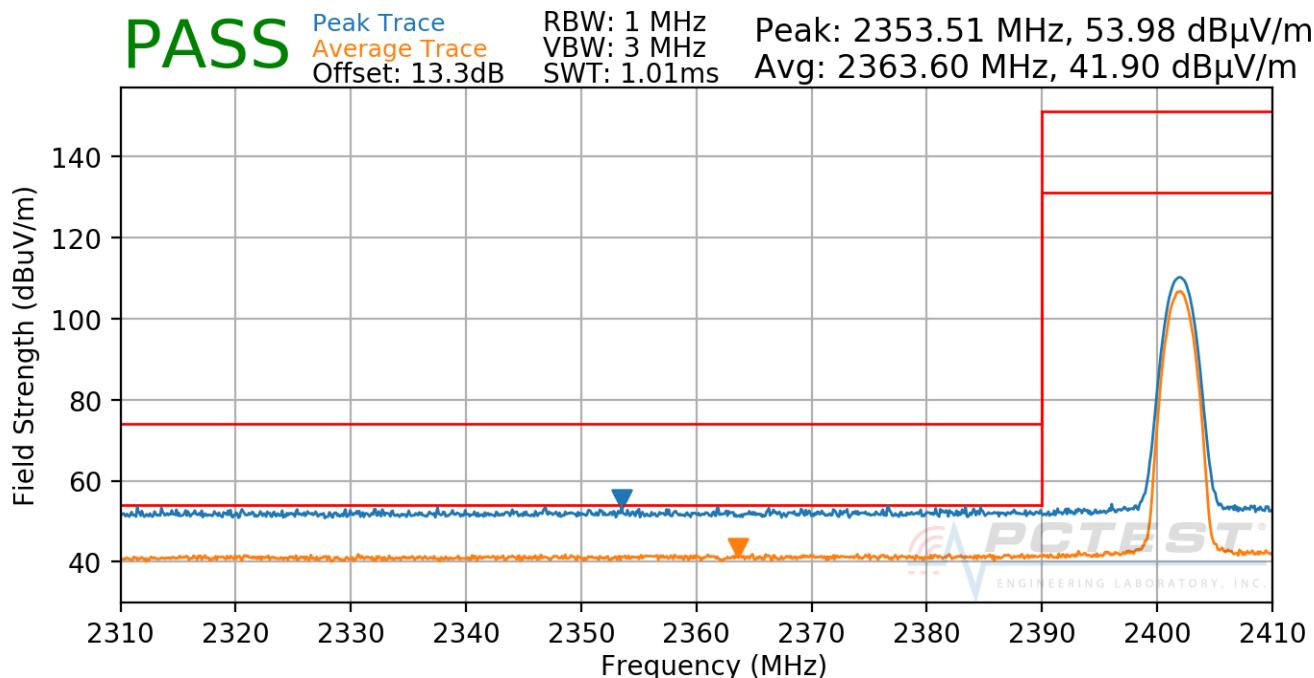
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: 8DPSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0



Plot 7-106. Radiated Restricted Lower Band Edge Measurement ANT1 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device	Page 97 of 112

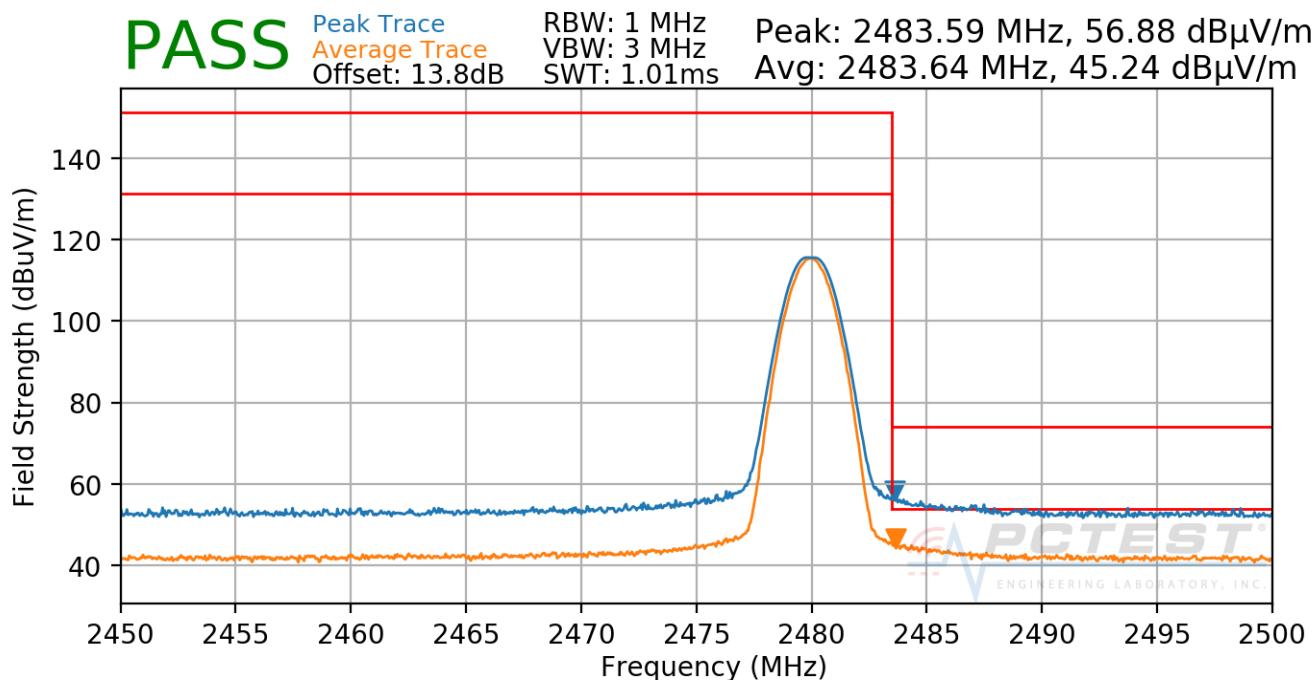
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: GFSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78



Plot 7-107. Radiated Restricted Upper Band Edge Measurement ANT1 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device	Page 98 of 112

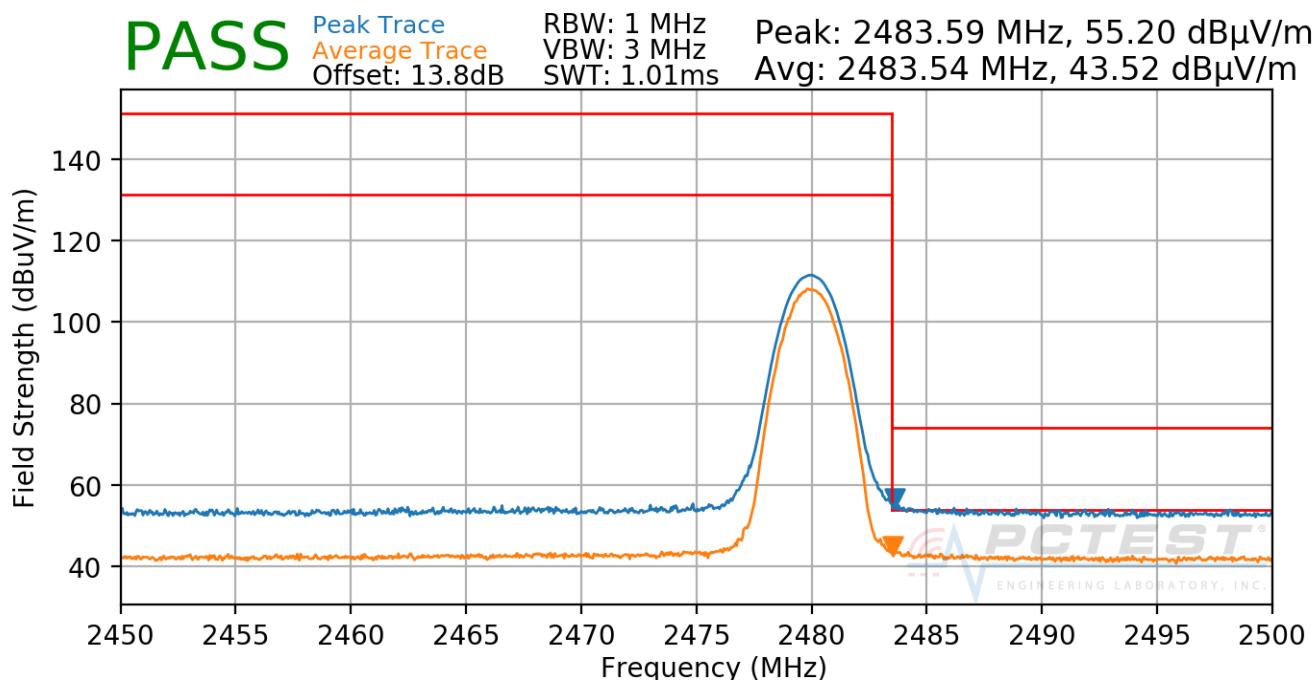
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: 8DPSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78



Plot 7-108. Radiated Restricted Upper Band Edge Measurement ANT1 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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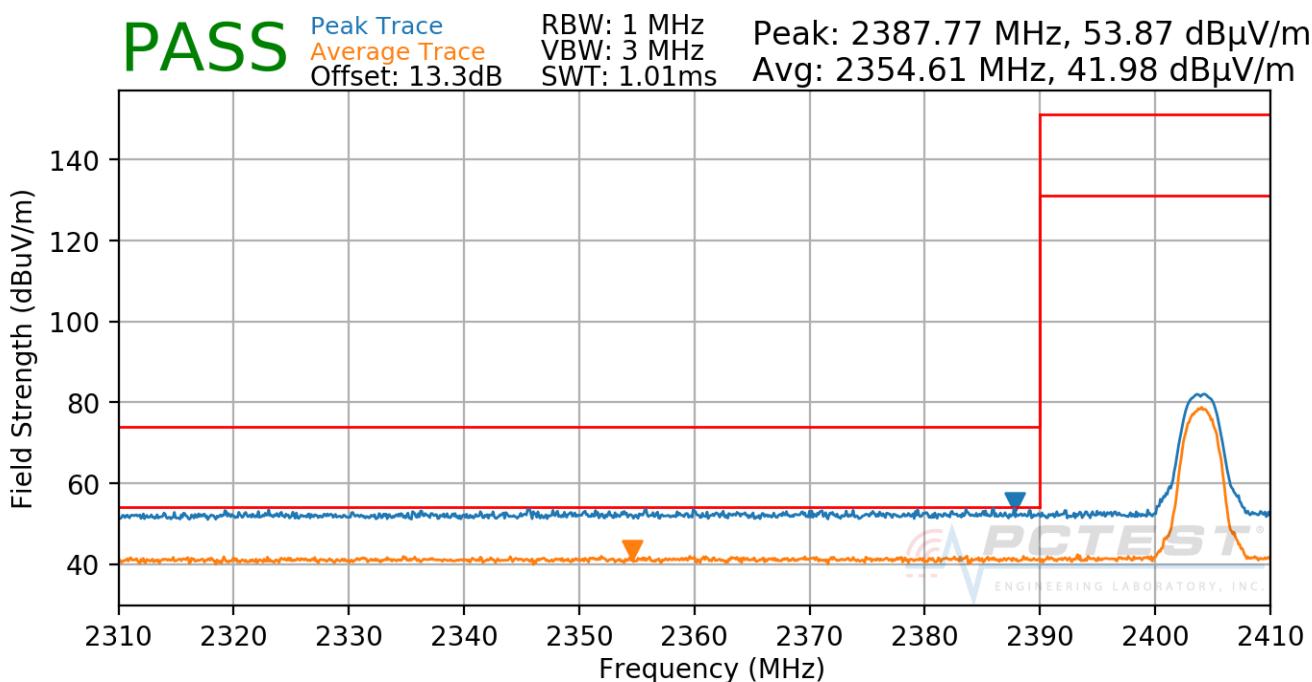
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: GFSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0



Plot 7-109. Radiated Restricted Lower Band Edge Measurement ANT2 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device	Page 100 of 112

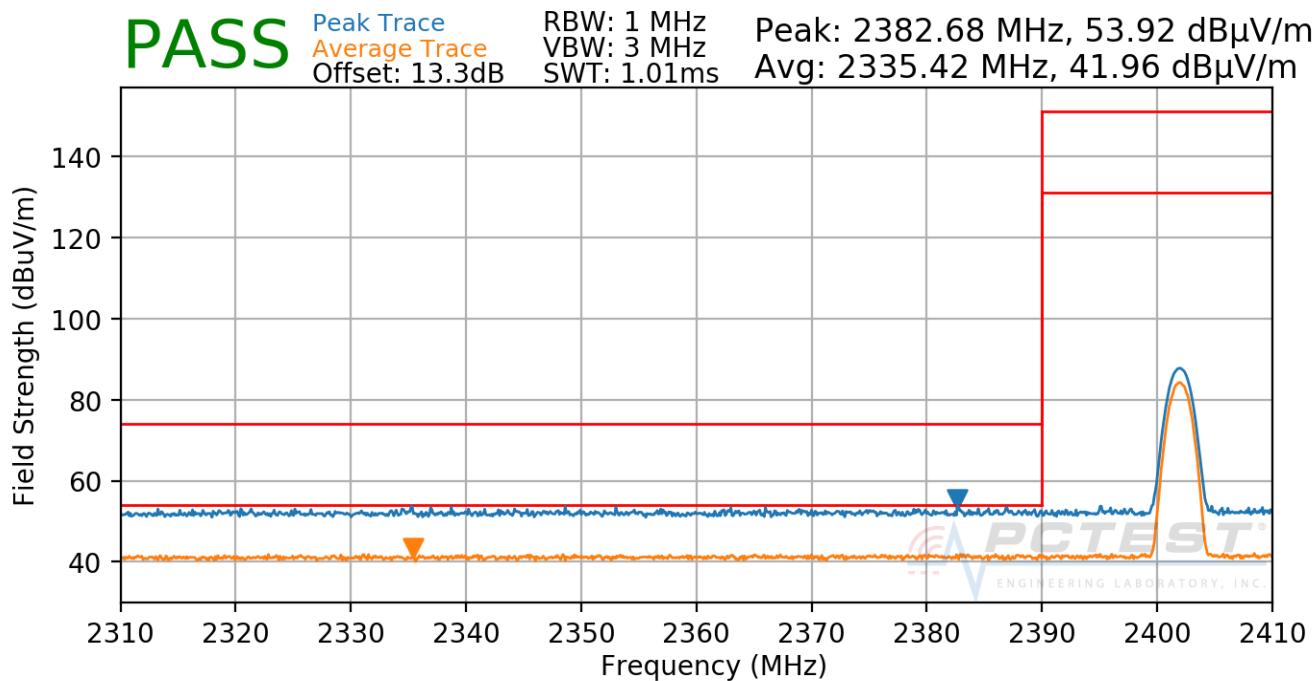
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: 8DPSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0



Plot 7-110. Radiated Restricted Lower Band Edge Measurement ANT2 (Average & Peak)

FCC ID: BCGA1895	PCTEST ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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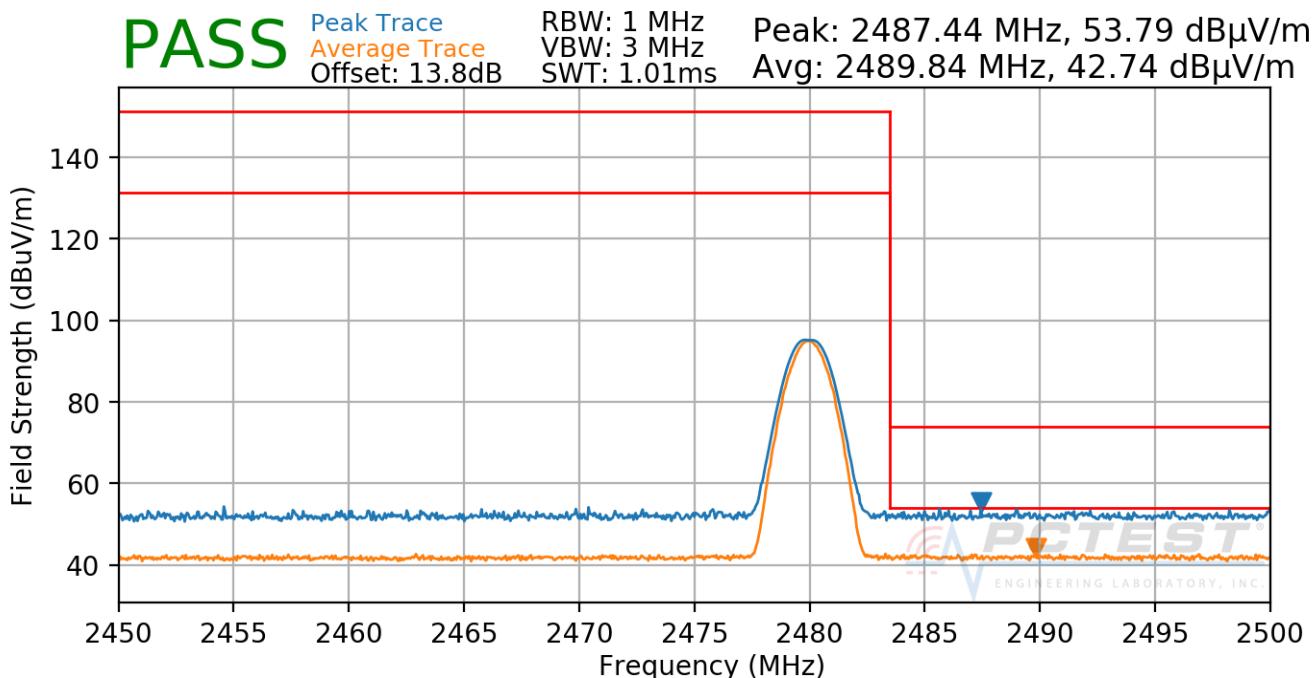
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: GFSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78



Plot 7-111. Radiated Restricted Upper Band Edge Measurement ANT2 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device	Page 102 of 112

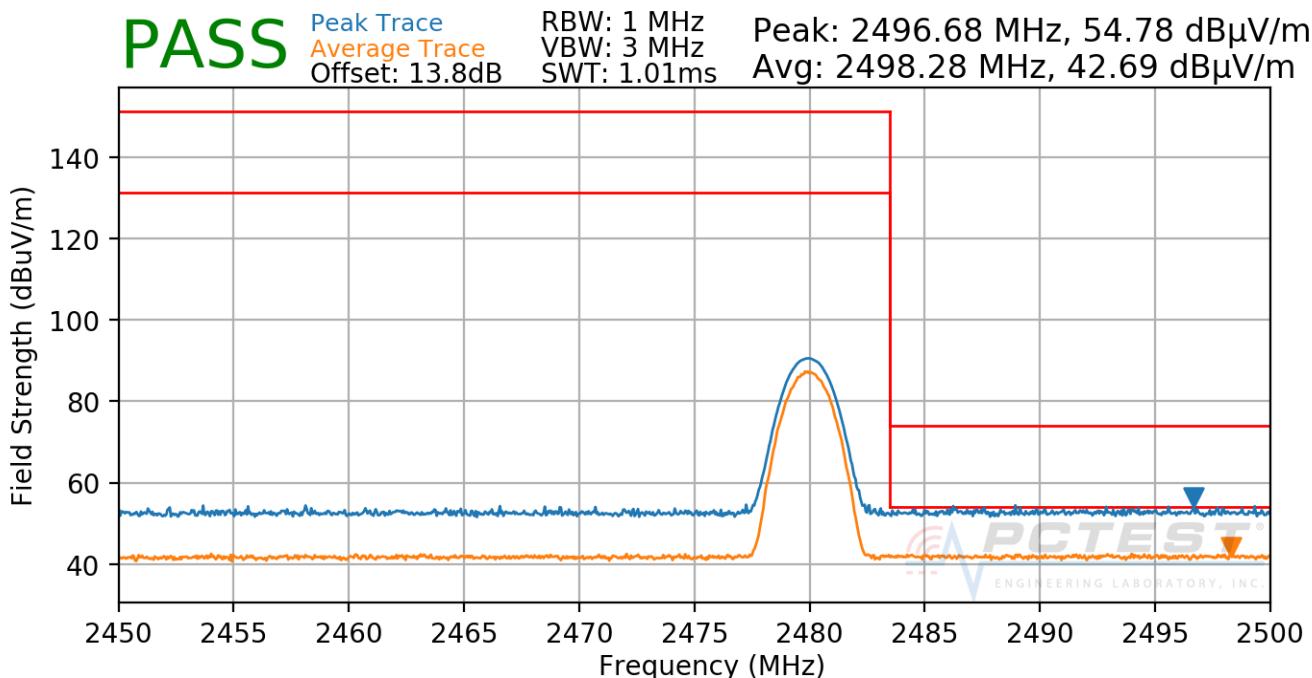
Radiated Restricted Band Edge Measurements

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

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

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

Worst Case Mode: Bluetooth
 Worst Case Modulation: 8DPSK
 Worst Case Power Scheme: ePA
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78



Plot 7-112. Radiated Restricted Upper Band Edge Measurement ANT2 (Average & Peak)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220014-08.BCG	Test Dates: 7/31/2018-10/12/2018	EUT Type: Tablet Device	Page 103 of 112

7.11 Radiated Spurious Emissions Measurements – 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 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-27 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μ V/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 7-27. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 100kHz (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

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

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Test Setup

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

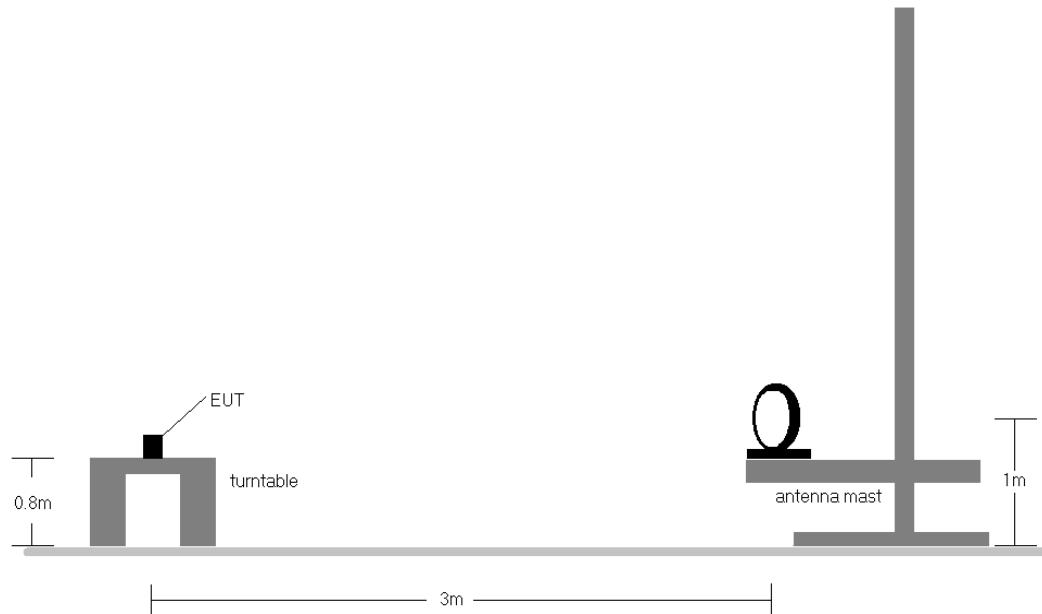


Figure 7-9. Radiated Test Setup < 30Mhz

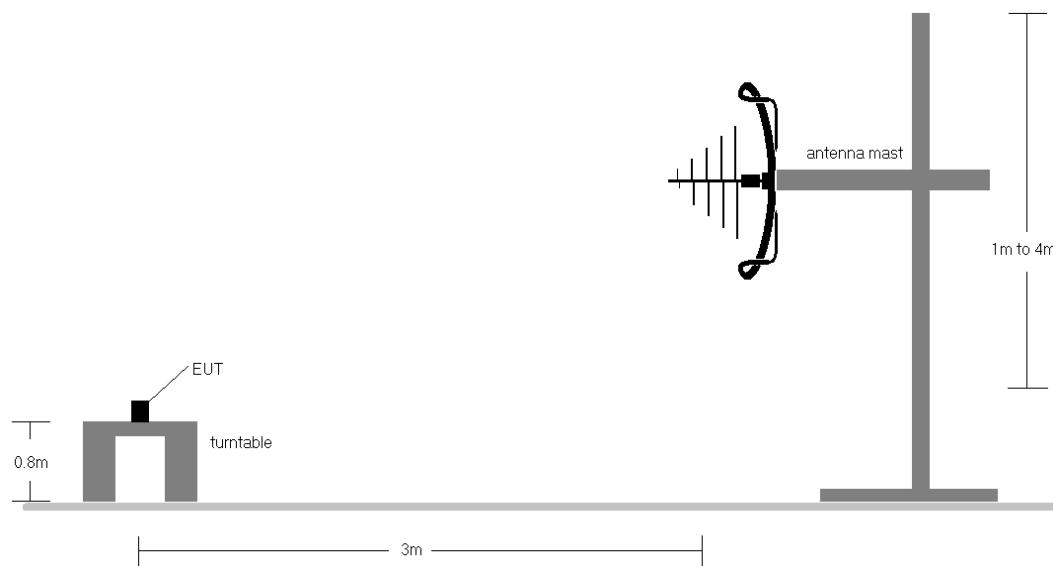


Figure 7-10. Radiated Test Setup < 1GHz

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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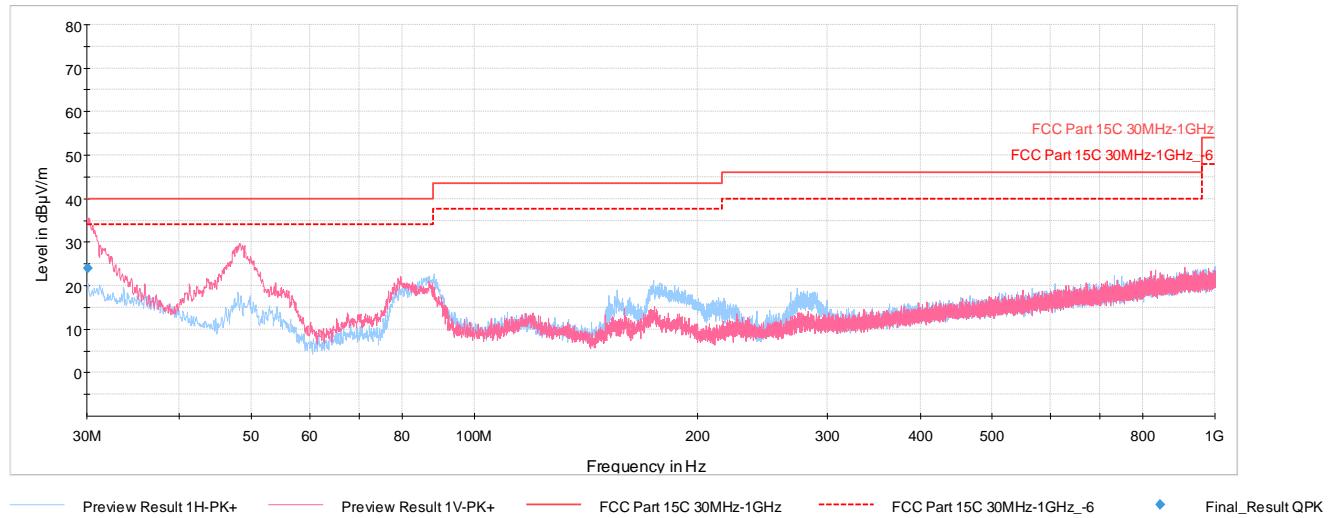
Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-27.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
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. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
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.

FCC ID: BCGA1895	 PCTEST® ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



Plot 7-113. Radiated Spurious Plot below 1GHz ANT0 (GFSK ePA – Ch. 39, AC/DC Charger)

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]
30.10	Quasi-Peak	V	100	237	-62.62	-8.93	35.45	40.00	-4.55
35.92	Max Peak	V	100	183	-74.53	-11.96	20.51	40.00	-19.49
53.91	Max Peak	V	250	218	-62.96	-23.35	20.69	40.00	-19.31
88.20	Max Peak	V	250	325	-66.05	-18.29	22.66	43.52	-20.86
155.86	Max Peak	H	100	247	-68.98	-19.13	18.89	43.52	-24.63
272.99	Max Peak	H	100	100	-70.98	-16.58	19.44	46.02	-26.58

Table 7-28. Radiated Spurious Emissions Below 1GHz ANT0 (GFSK ePA – Ch. 39, AC/DC Charger)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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7.12 AC Line Conducted Measurement Data

§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 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 (dB μ V)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-29. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength 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 Field Strength 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: BCGA1895	 PCTEST [®] ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Test Setup

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

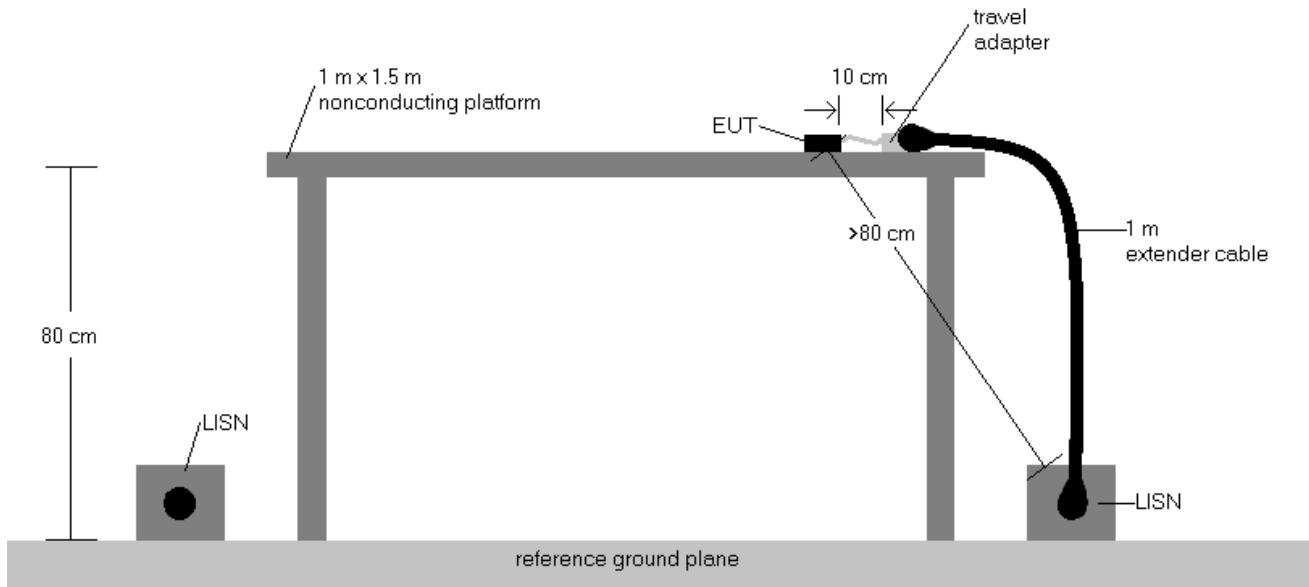
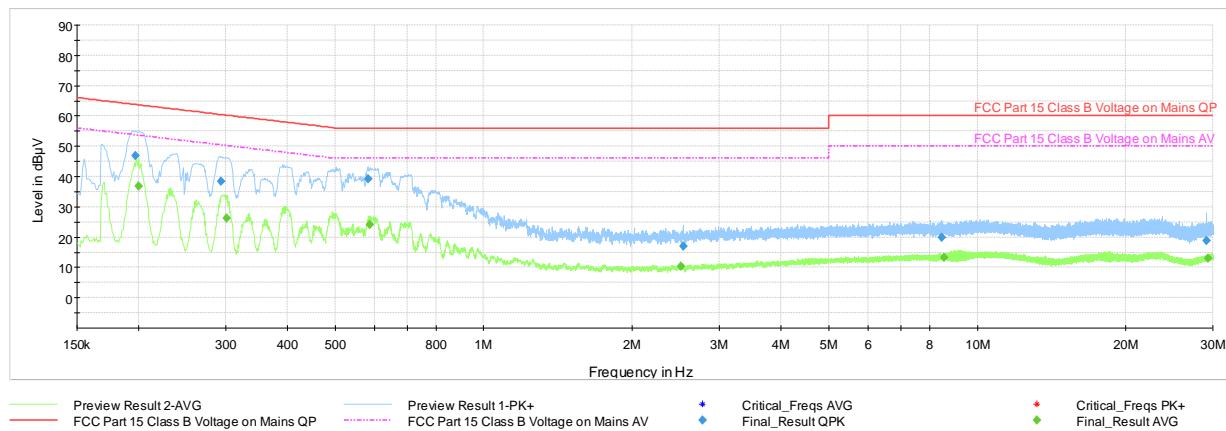


Figure 7-11. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. 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 15.207 and RSS-Gen (8.8).
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dB μ V) = QP/AV Analyzer/Receiver Level (dB μ V) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dB μ V) - QP/AV Level (dB μ V)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

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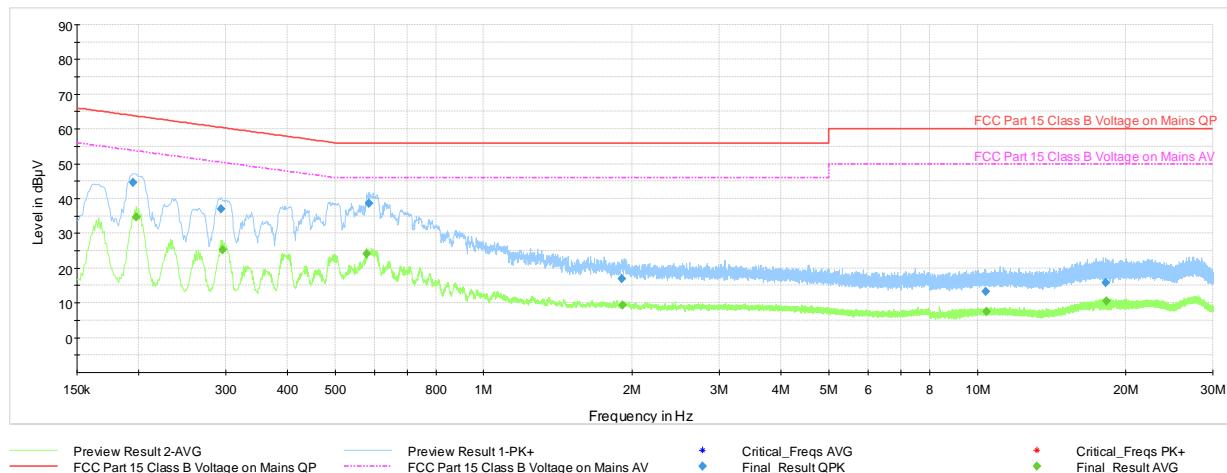


Plot 7-114. Line-Conducted Test Plot (GFSK ePA – Ch. 39, L1, with AC/DC Adapter)

Frequency MHz	Process State	QuasiPeak dB μ V	Average dB μ V	Limit dB μ V	Margin dB	Bandwidth kHz	Line	PE
0.197000	FINAL	46.95	—	63.74	-16.79	9.000	L1	GND
0.200000	FINAL	—	36.91	53.61	-16.70	9.000	L1	GND
0.294000	FINAL	38.44	—	60.41	-21.97	9.000	L1	GND
0.301000	FINAL	—	26.15	50.22	-24.07	9.000	L1	GND
0.584000	FINAL	39.24	—	56.00	-16.76	9.000	L1	GND
0.588000	FINAL	—	24.06	46.00	-21.94	9.000	L1	GND
2.509000	FINAL	—	10.32	46.00	-35.68	9.000	L1	GND
2.533000	FINAL	16.99	—	56.00	-39.01	9.000	L1	GND
8.465000	FINAL	19.77	—	60.00	-40.23	9.000	L1	GND
8.548000	FINAL	—	13.27	50.00	-36.73	9.000	L1	GND
29.106000	FINAL	18.75	—	60.00	-41.25	9.000	L1	GND
29.340000	FINAL	—	13.09	50.00	-36.91	9.000	L1	GND

Table 7-30. Line-Conducted Test Data (GFSK ePA – Ch. 39, L1, with AC/DC Adapter)

FCC ID: BCGA1895	 PCTEST® ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Plot 7-115. Line-Conducted Test Plot (GFSK ePA – Ch. 39, N, with AC/DC Adapter)

Frequency MHz	Process State	QuasiPeak dB μ V	Average dB μ V	Limit dB μ V	Margin dB	Bandwidth kHz	Line	PE
0.195000	FINAL	44.53	—	63.82	-19.29	9.000	N	GND
0.198000	FINAL	—	34.72	53.69	-18.97	9.000	N	GND
0.294000	FINAL	36.91	—	60.41	-23.50	9.000	N	GND
0.296000	FINAL	—	25.34	50.35	-25.01	9.000	N	GND
0.580000	FINAL	—	24.09	46.00	-21.91	9.000	N	GND
0.585000	FINAL	38.54	—	56.00	-17.46	9.000	N	GND
1.901000	FINAL	16.88	—	56.00	-39.12	9.000	N	GND
1.912000	FINAL	—	9.46	46.00	-36.54	9.000	N	GND
10.414000	FINAL	13.16	—	60.00	-46.84	9.000	N	GND
10.425000	FINAL	—	7.60	50.00	-42.40	9.000	N	GND
18.217000	FINAL	15.87	—	60.00	-44.13	9.000	N	GND
18.239000	FINAL	—	10.61	50.00	-39.39	9.000	N	GND

Table 7-31. Line-Conducted Test Data (GFSK ePA – Ch. 39, N, with AC/DC Adapter)

FCC ID: BCGA1895	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA1895** 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.

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