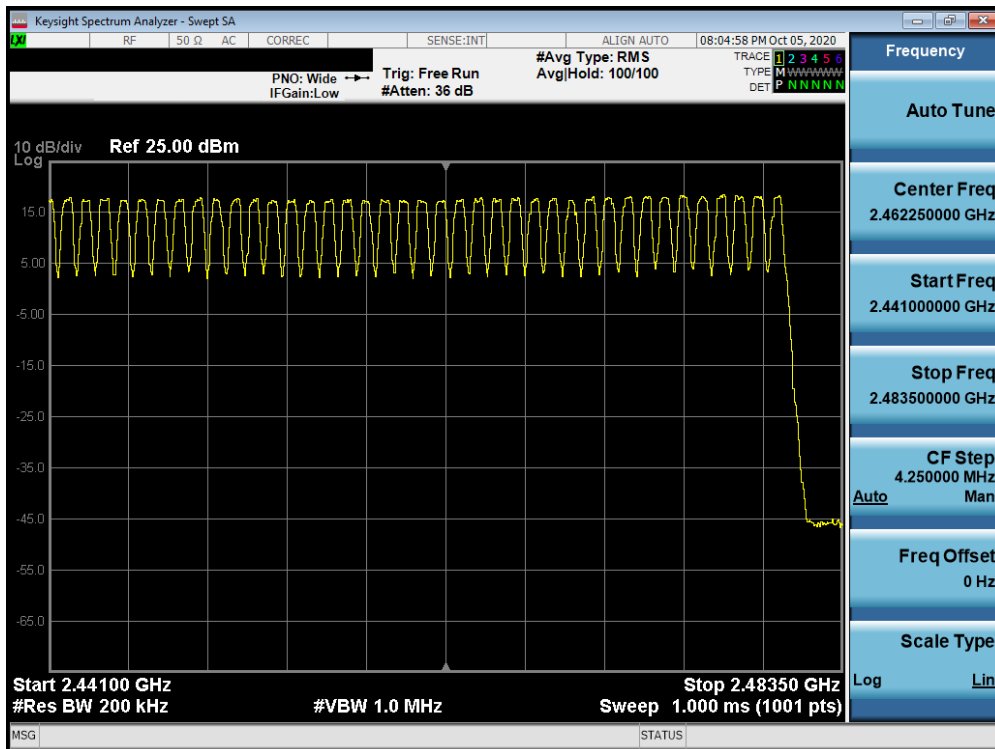


Plot 7-105. Low End Spectrum Channel Hopping Plot (Bluetooth) – ANT2



Plot 7-106. High End Spectrum Channel Hopping Plot (Bluetooth) – ANT2

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 76 of 107

7.8 Conducted Spurious Emissions

§15.247 (d); RSS-247 [5.5]

Test Overview and Limit

Conducted out-of-band spurious emissions were investigated from 30MHz up to 25GHz to include the 10th harmonic of the fundamental transmit frequency. **The maximum permissible out-of-band emission level is 20 dBc.**

Test Procedure Used

ANSI C63.10-2013 – Section 7.8.8

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
2. RBW = 1MHz* (See note below)
3. VBW = 3MHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Test Setup



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



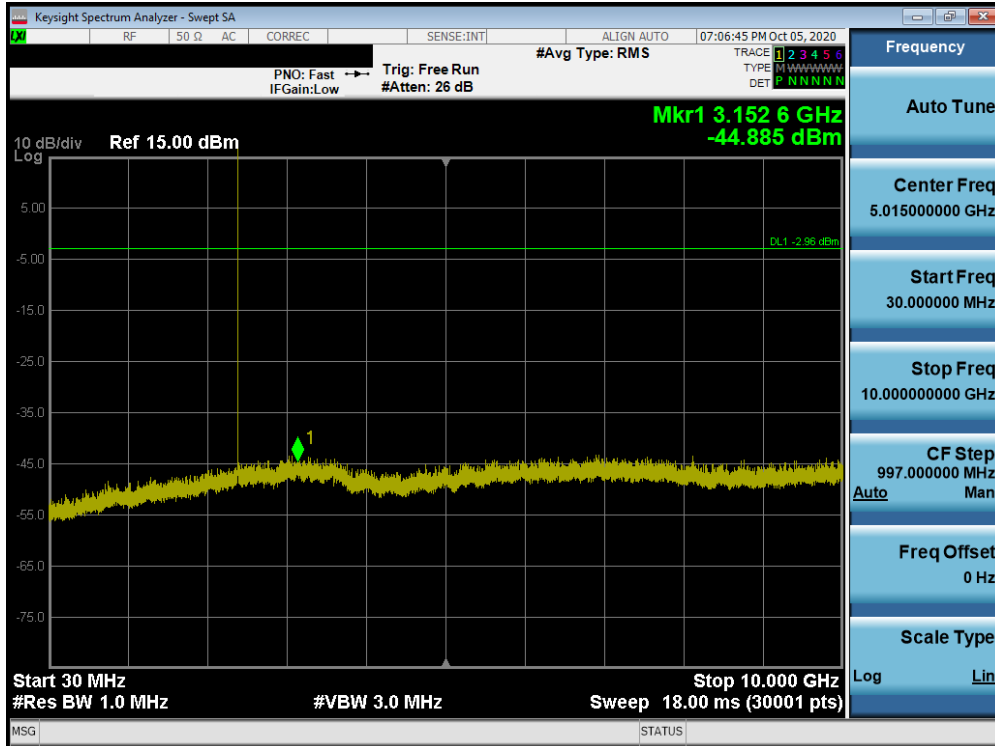
Figure 7-7. Test Instrument & Measurement Setup

Test Notes

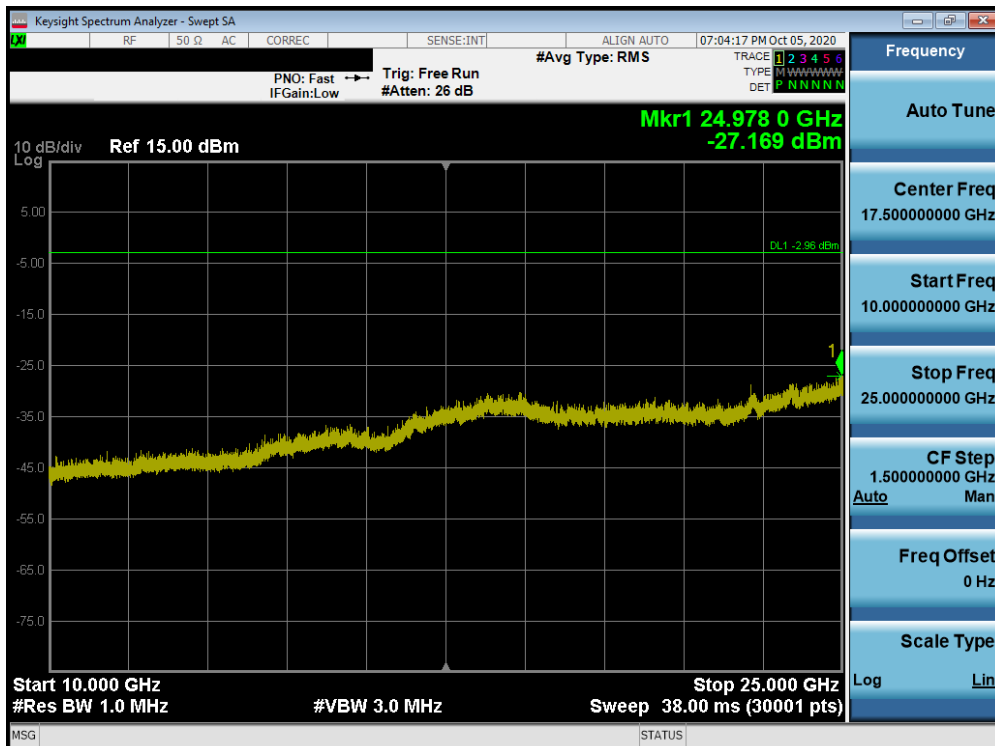
Out-of-band conducted spurious emissions were investigated for all data rates and the worst case emissions were found with the EUT transmitting at 3Mbps. The display line shown in the following plots is the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth. However, the traces in the following plots are measured with a 1MHz RBW to reduce test time, so the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz bandwidth.

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 77 of 107

Antenna 1

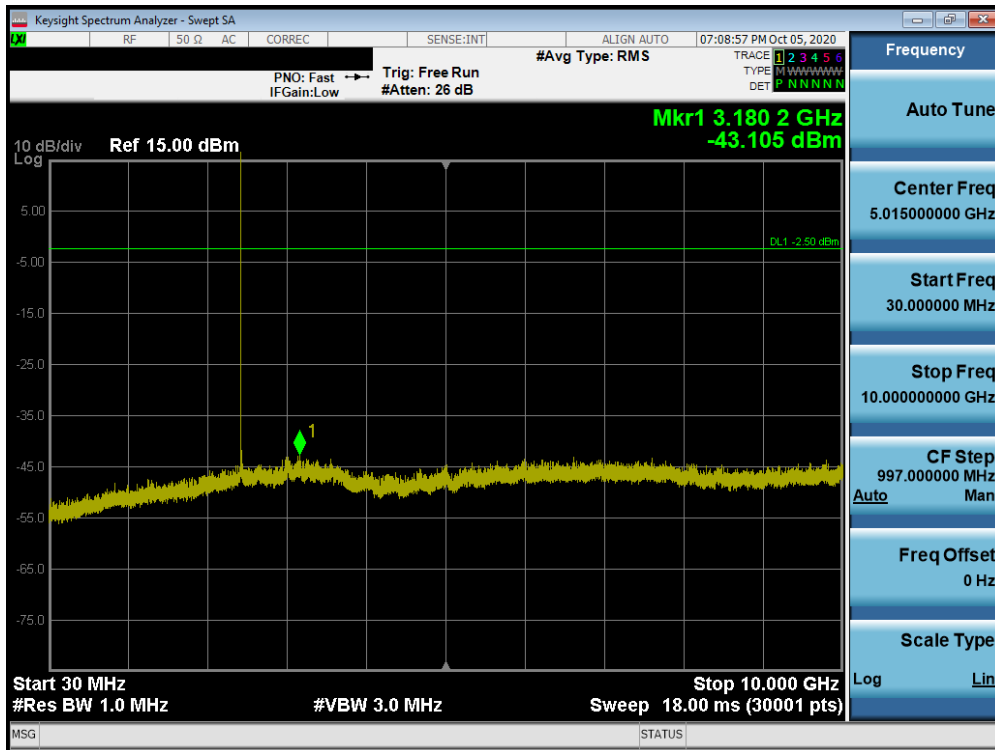


Plot 7-107. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 0)

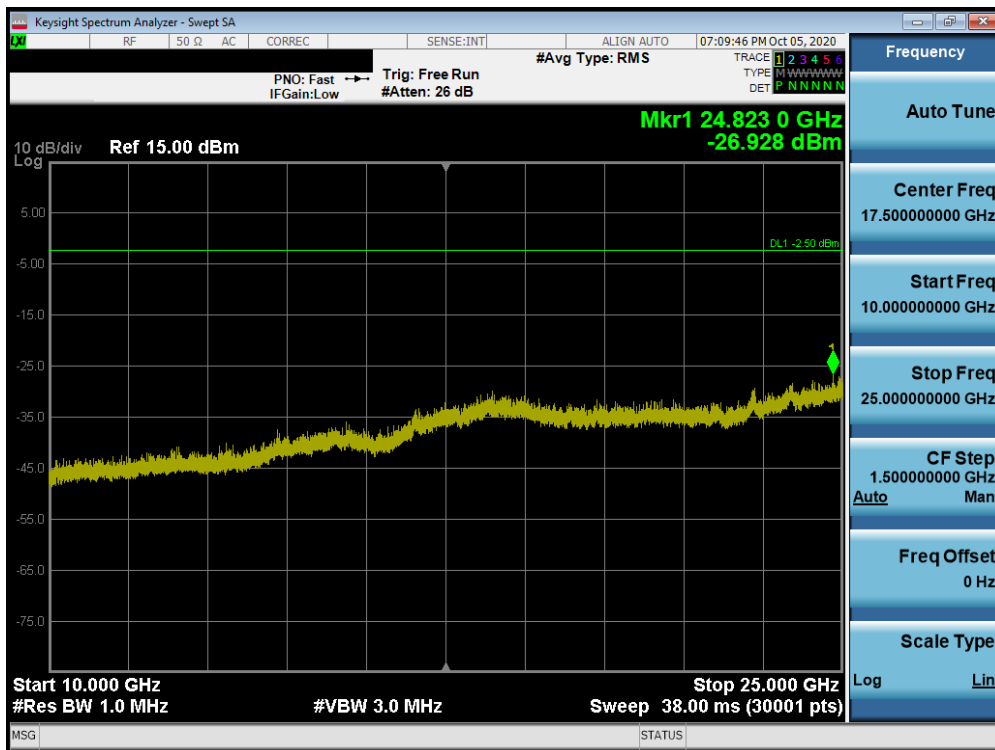


Plot 7-108. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 0)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 78 of 107

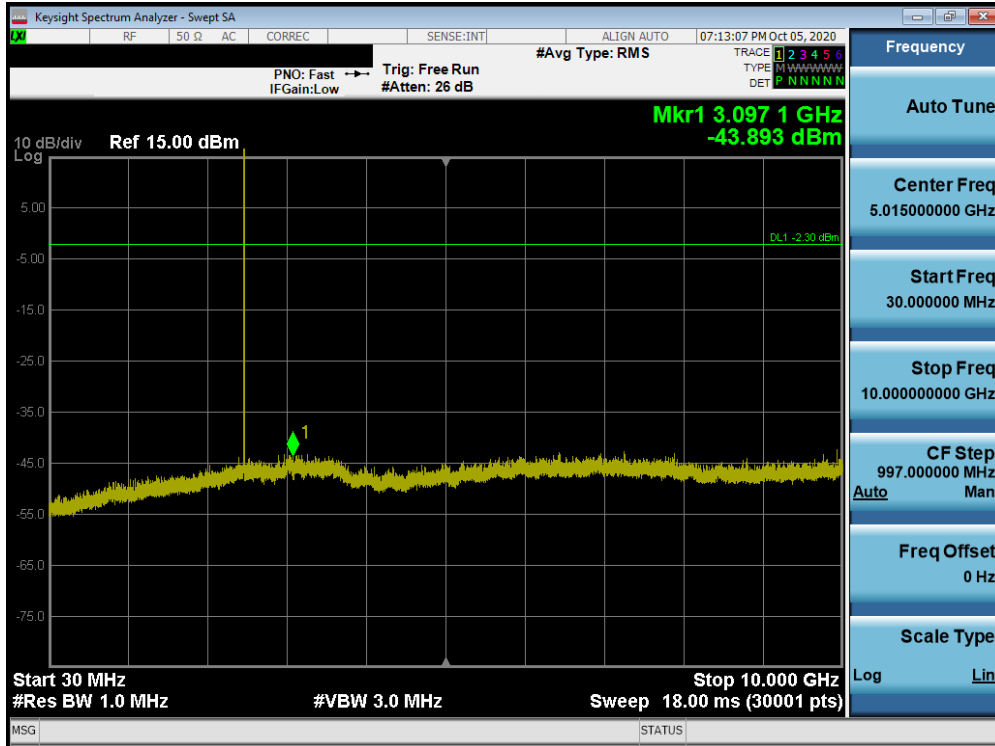


Plot 7-109. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 39)

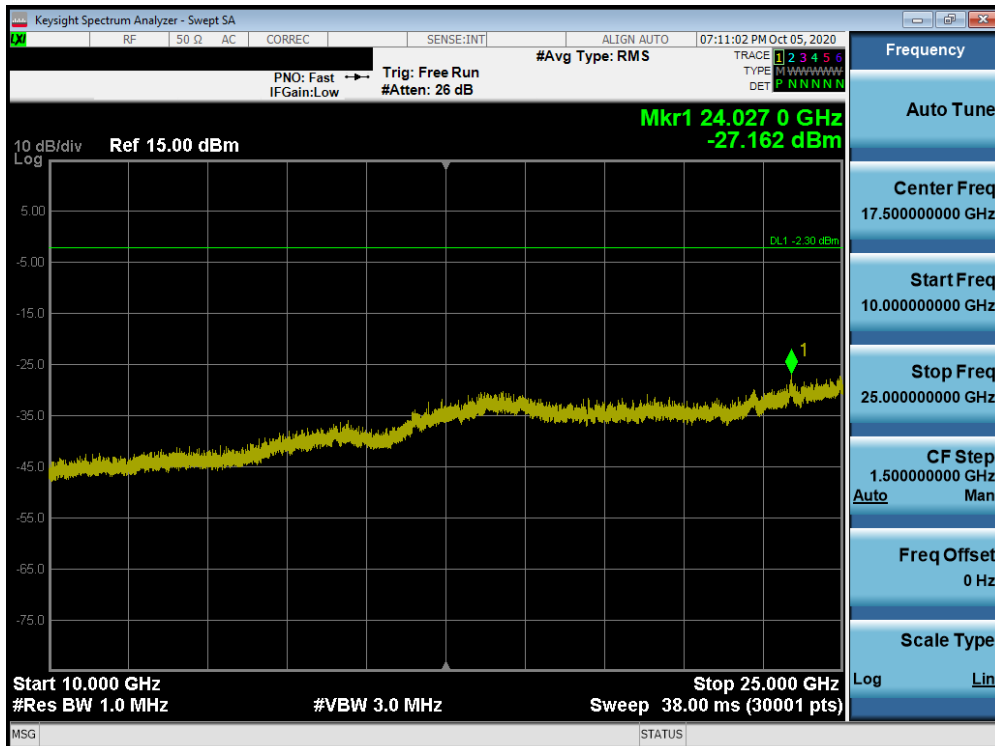


Plot 7-110. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 39)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 79 of 107



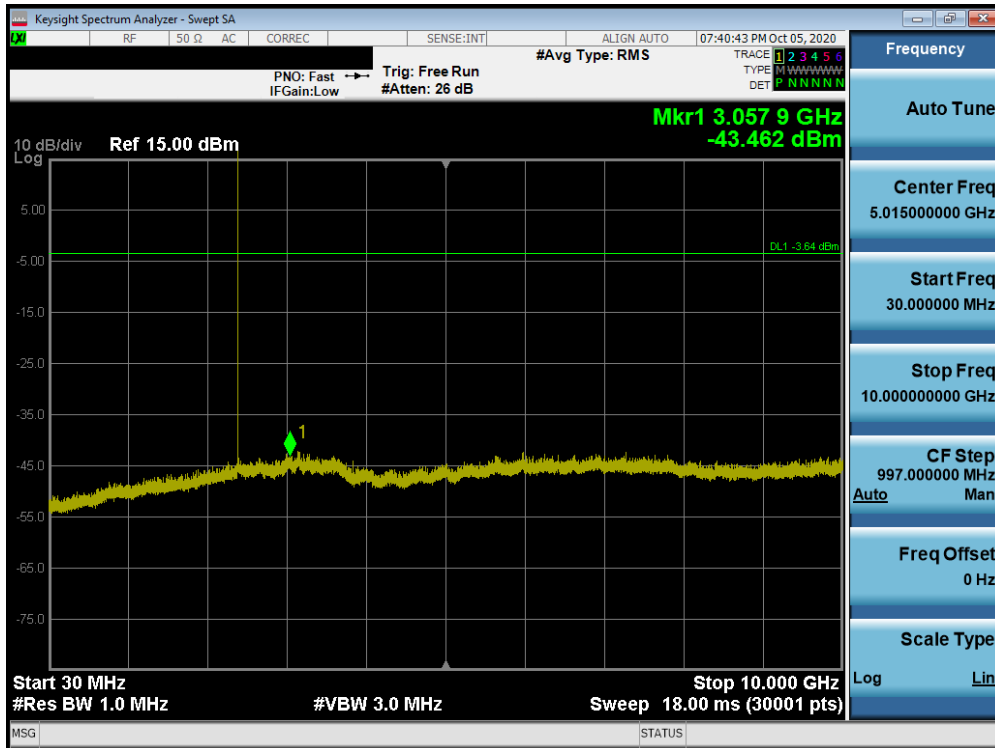
Plot 7-111. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 78)



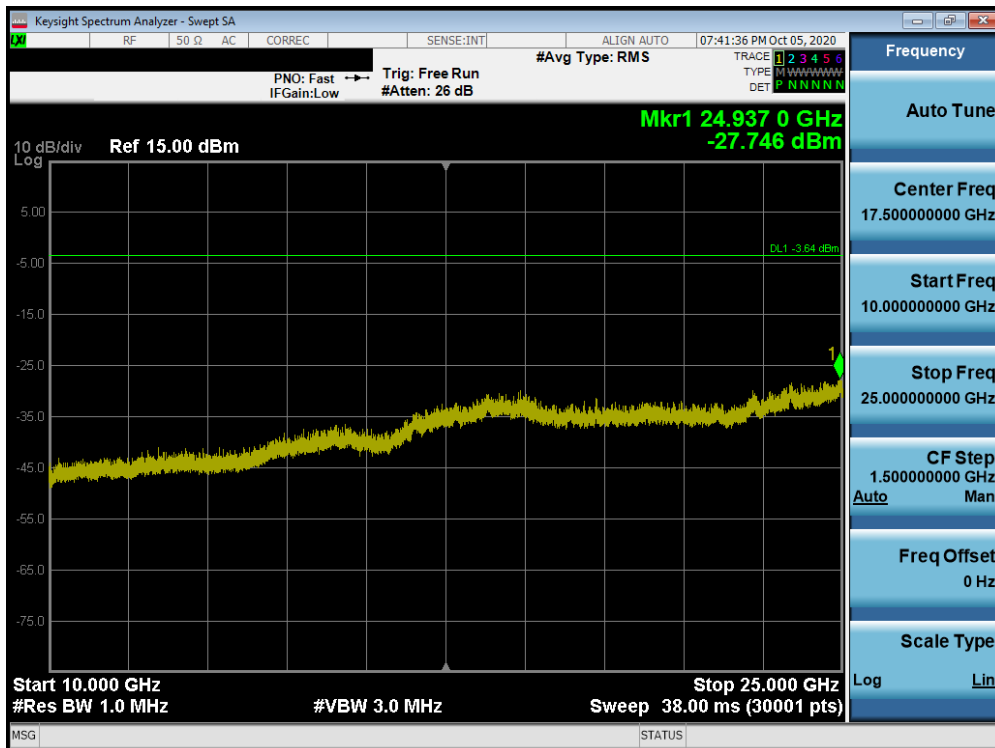
Plot 7-112. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 78)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 80 of 107

Antenna 2

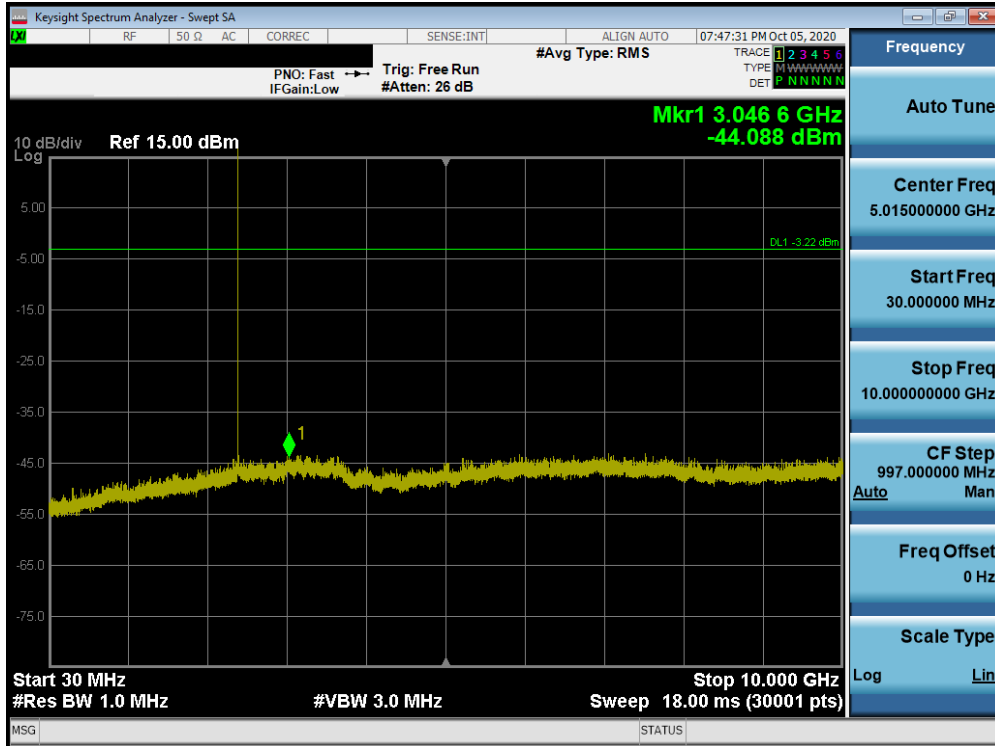


Plot 7-113. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 0)

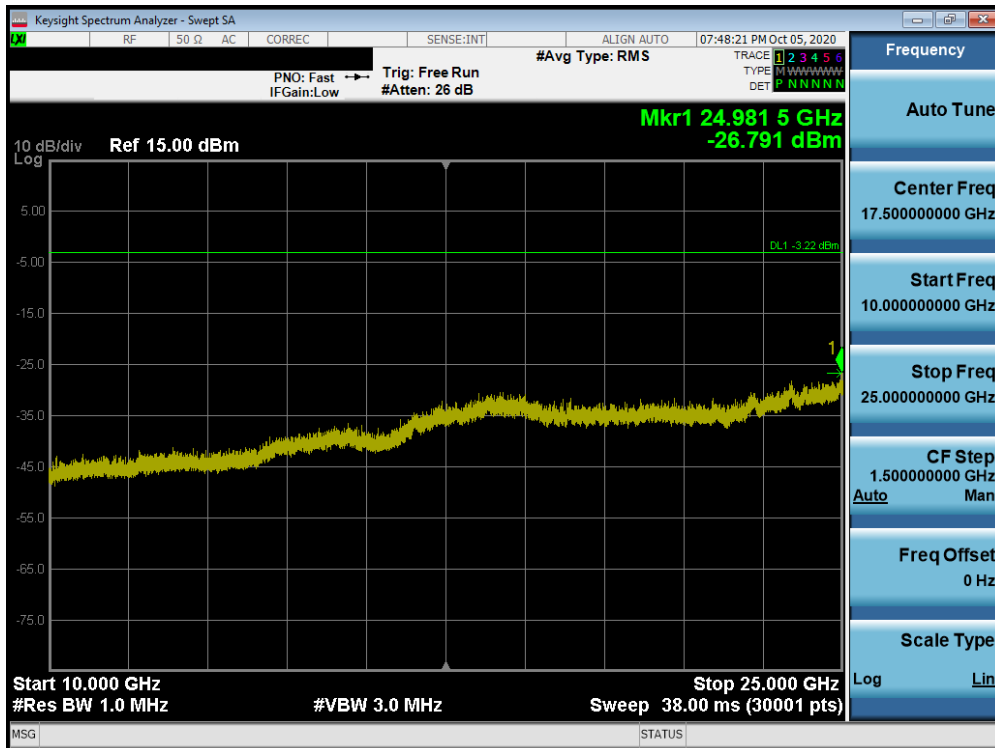


Plot 7-114. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 0)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 81 of 107

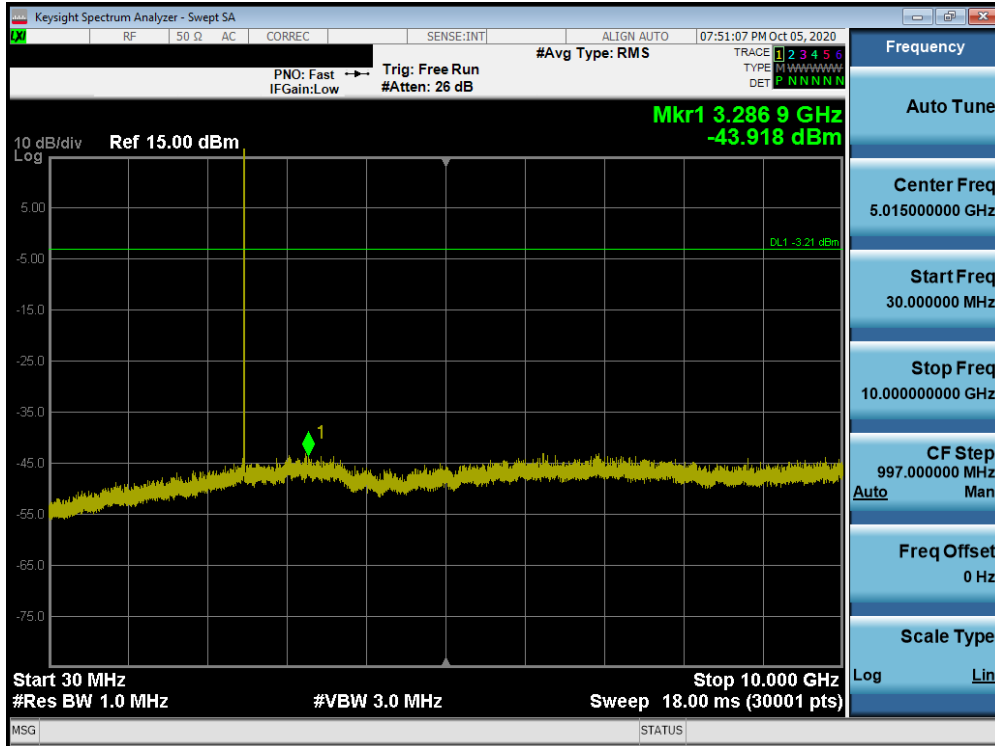


Plot 7-115. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 39)

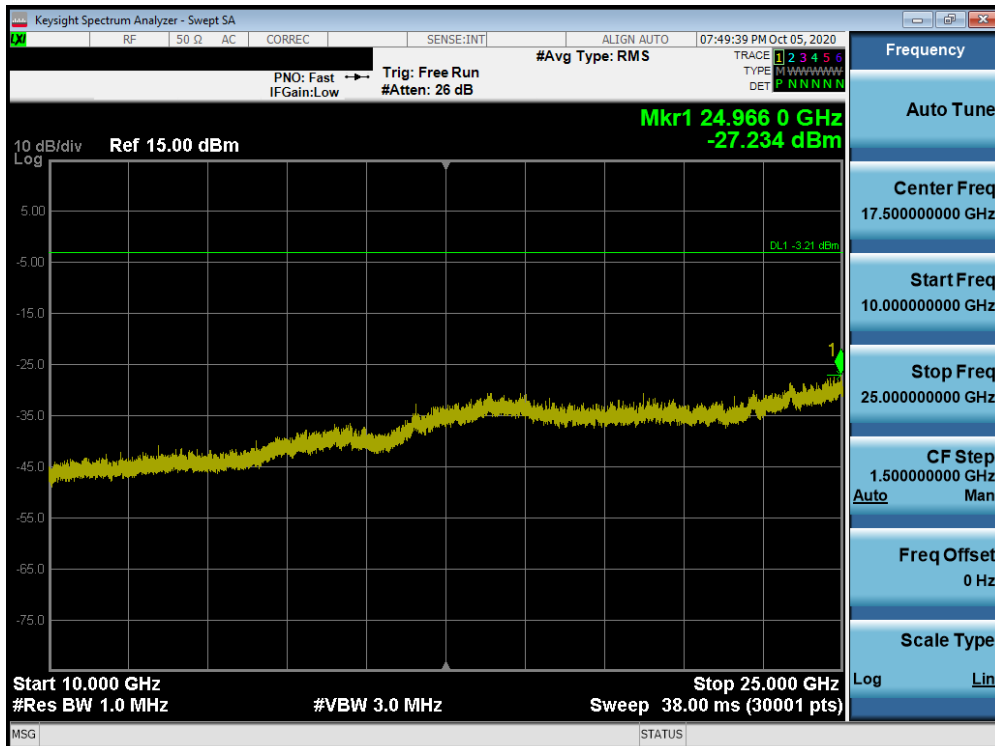


Plot 7-116. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 39)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 82 of 107



Plot 7-117. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 78)



Plot 7-118. Conducted Spurious Plot (Bluetooth, 3Mbps – Ch. 78)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 83 of 107

7.9 Radiated Spurious Emission Measurements – 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 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-10 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 7-10. Radiated Limits

Test Procedure Used

ANSI C63.10-2013 – Section 6.6.4.3



Test Settings

Average Field Strength Measurements per Section 4.1.4.2.3 of ANSI C63.10-2013

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 1kHz $\geq 1/\tau$ Hz, where τ = pulse width in seconds
4. Averaging type was set to RMS to ensure that video filtering was applied in the power domain
5. Detector = peak
6. Sweep time = auto
7. Trace mode = max hold
8. Trace was allowed to stabilize

Peak Field Strength Measurements per Section 4.1.4.2.2 of ANSI C63.10-2013

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in Table 7-11 below
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 84 of 107	

Frequency	RBW
9 – 150kHz	200 – 300Hz
0.15 – 30MHz	9 – 10kHz
30 – 1000MHz	100 – 120kHz
> 1000MHz	1MHz

Table 7-11. RBW as a Function of Frequency

Test Setup

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

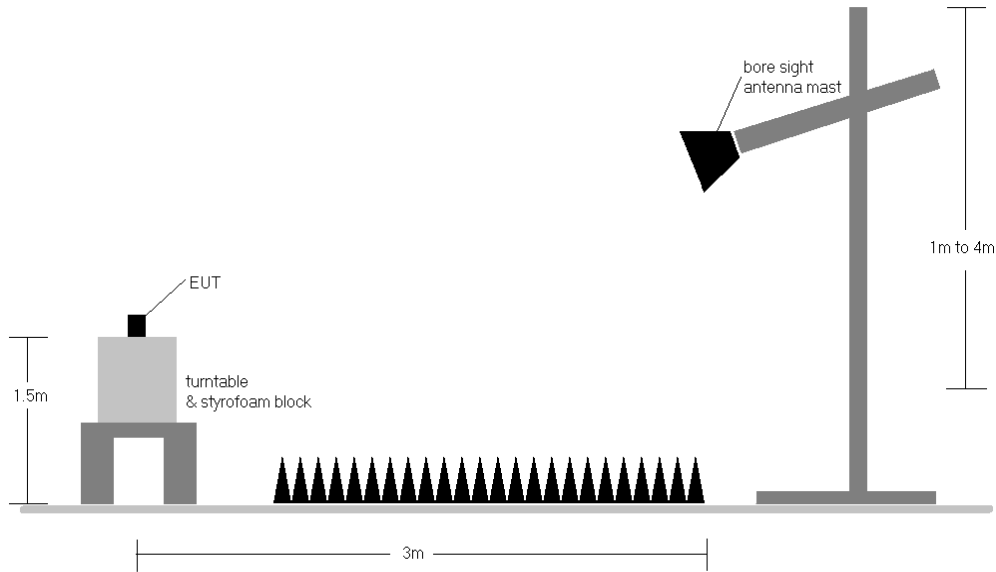





Figure 7-8. Radiated Test Setup >1GHz

Test Notes

1. All emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-10.
2. No significant radiated emissions were found in the 2310 - 2390MHz restricted band.
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 and the worst-case emissions are reported.
6. The duty cycle correction factor was not applied to noise floor measurements.
7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
8. The "-" shown in the following RSE tables are used to denote a noise floor measurement.



FCC ID: A3LSMG998JPN	 PCTEST Proud to be part of 	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 85 of 107

Sample Calculation

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

Duty Cycle Correction Factor Calculation

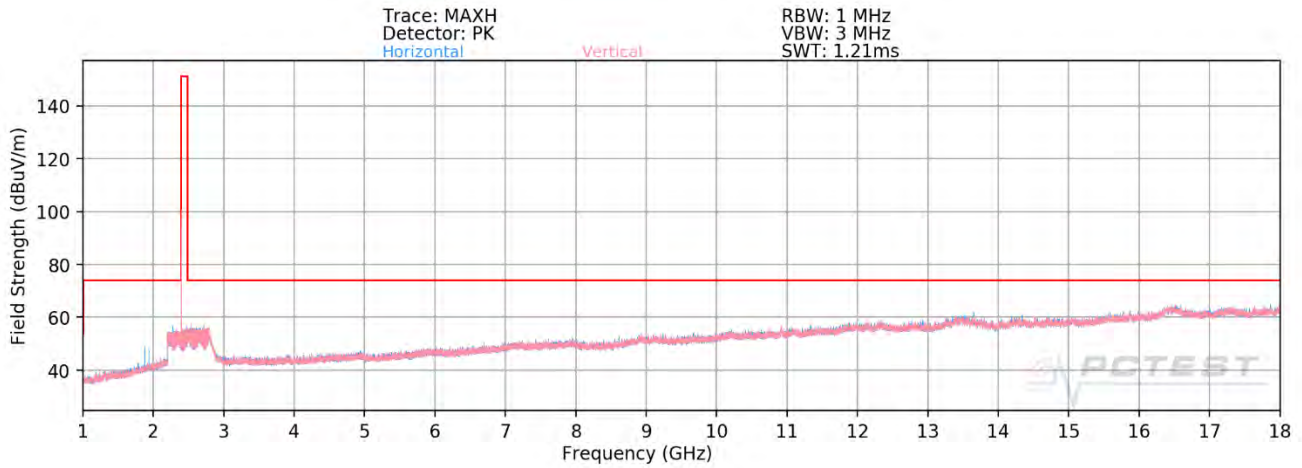
- Channel hop rate = #REF! hops/second (#REF! Mode)
- Adjusted channel hop rate for DH5 mode = #REF! hops/second
- Time per channel hop = $1 / \text{\#REF! hops/second} = \text{\#REF! ms}$
- Time to cycle through all channels = #REF! x #REF! channels = #REF! ms
- Number of times transmitter hits on one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

FCC ID: A3LSMG998JPN	 <p>PCTEST® Proud to be part of element</p>	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 86 of 107	

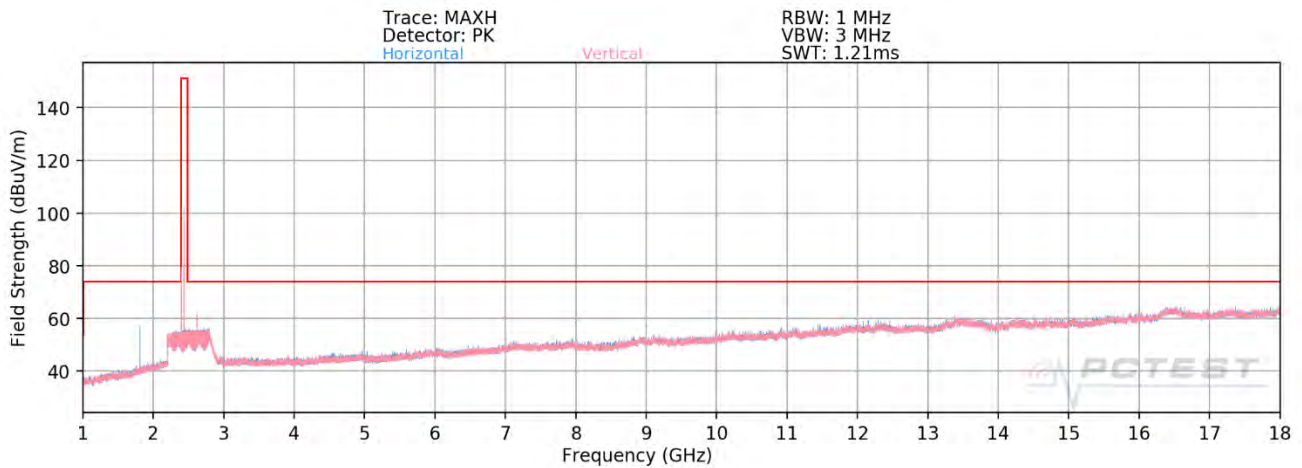
Radiated Spurious Emission Measurements (1 – 18GHz)

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

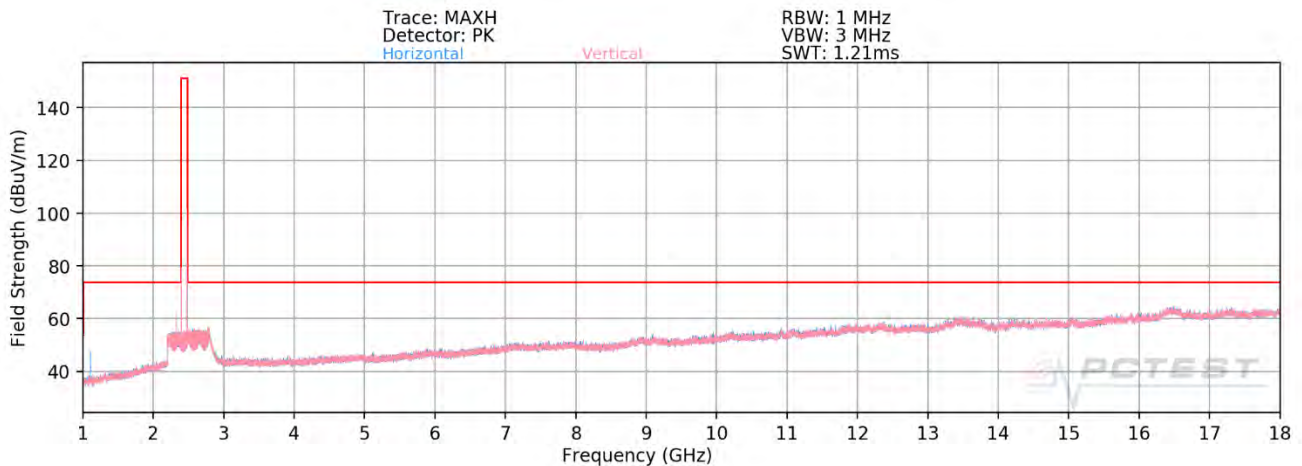
Antenna 1






Plot 7-119. Radiated Spurious Plot above 1GHz Ant-1 (BT – Ch. 0)



Plot 7-120. Radiated Spurious Plot above 1GHz Ant-1 (BT – Ch. 39)



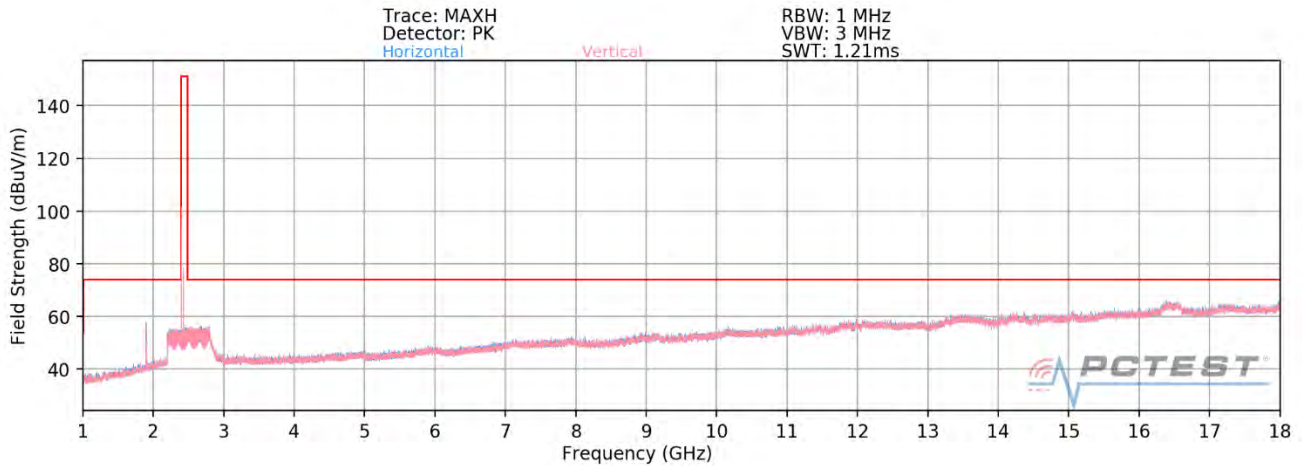
Plot 7-121. Radiated Spurious Plot above 1GHz Ant-1 (BT – Ch. 78)

FCC ID: A3LSMG998JPN	 Proud to be part of 	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 87 of 107

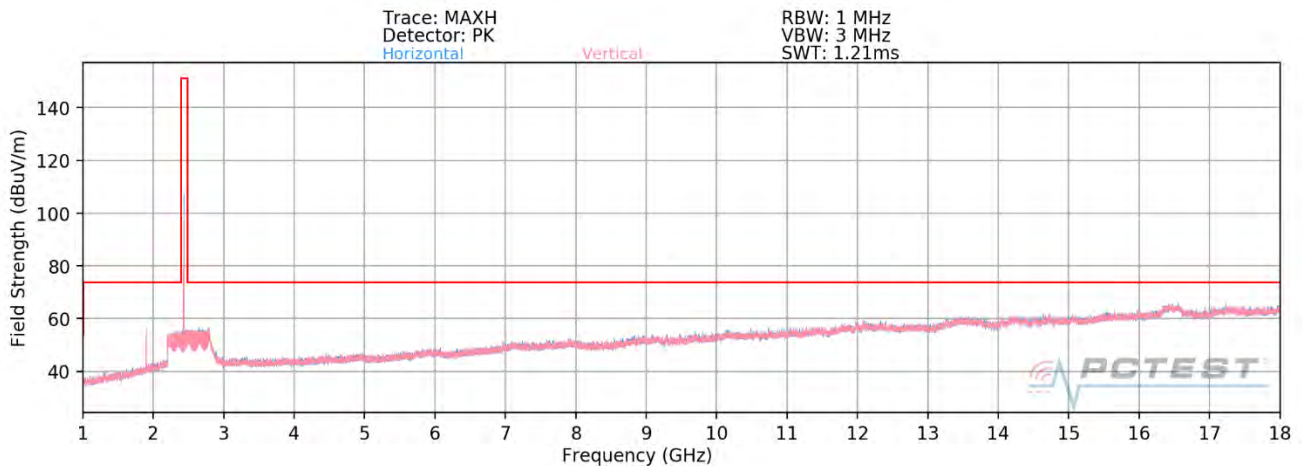
Radiated Spurious Emission Measurements (1 – 18GHz)

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

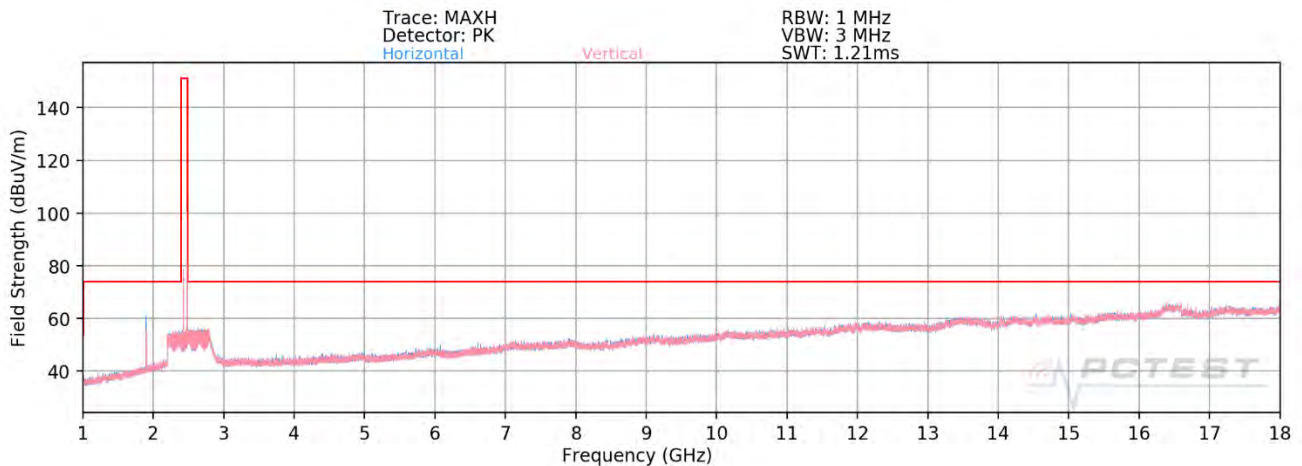
Antenna 2






Plot 7-122. Radiated Spurious Plot above 1GHz Ant-2 (BT – Ch. 0)



Plot 7-123. Radiated Spurious Plot above 1GHz Ant-2 (BT – Ch. 39)



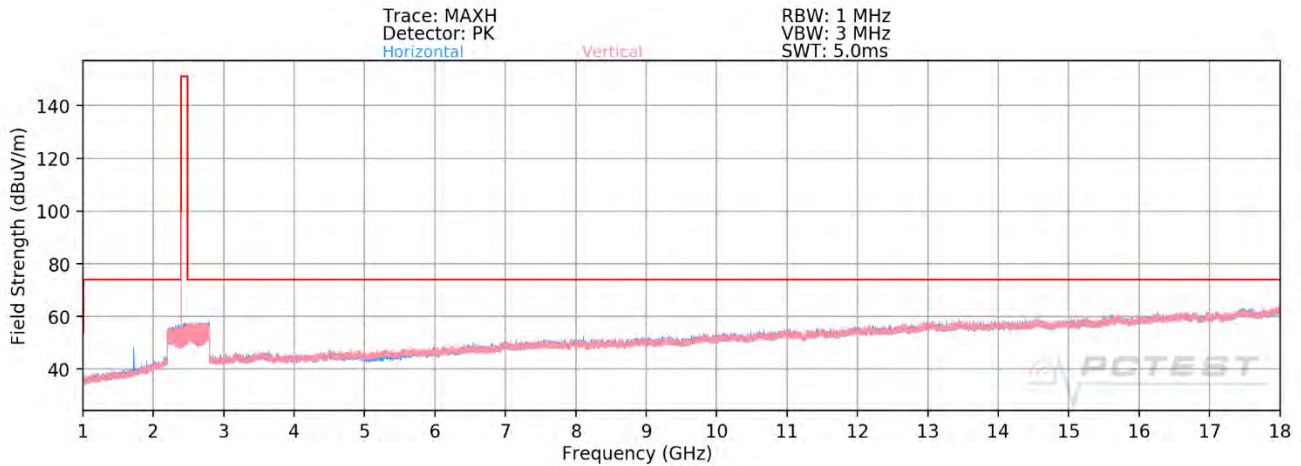
Plot 7-124. Radiated Spurious Plot above 1GHz Ant-2 (BT – Ch. 78)

FCC ID: A3LSMG998JPN	 Proud to be part of 	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 88 of 107

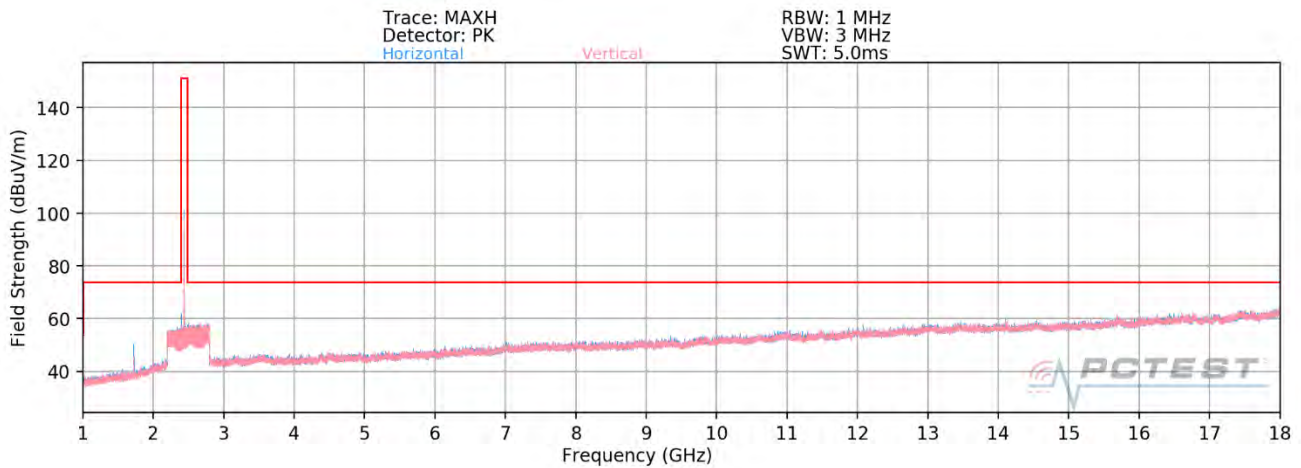
Radiated Spurious Emission Measurements (1 – 18GHz)

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

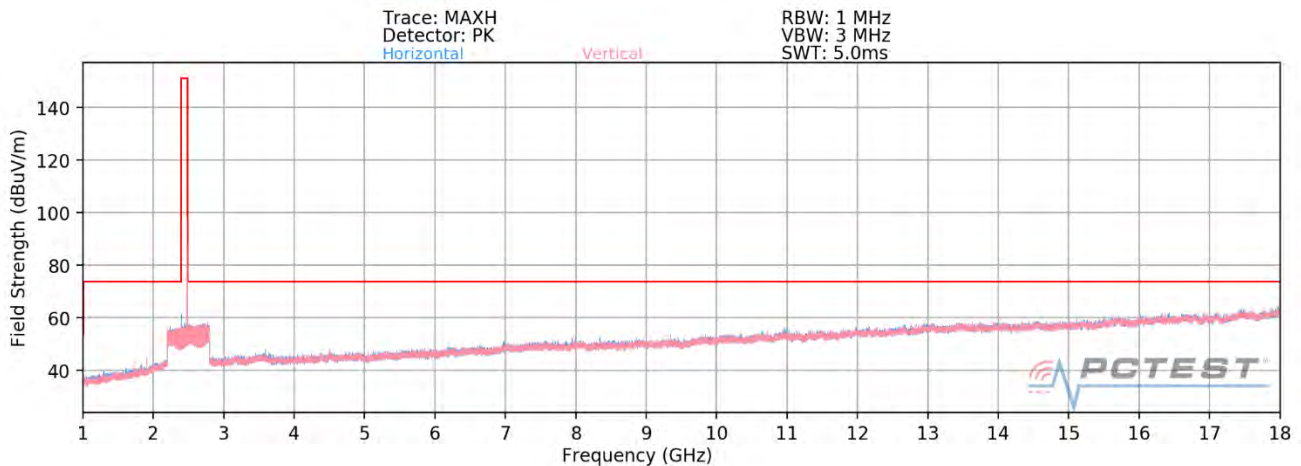
Dual BT






Plot 7-125. Radiated Spurious Plot above 1GHz Dual BT, Ant-1 + Ant-2 (BT – Ch. 0)



Plot 7-126. Radiated Spurious Plot above 1GHz Dual BT, Ant-1 + Ant-2 (BT – Ch. 39)

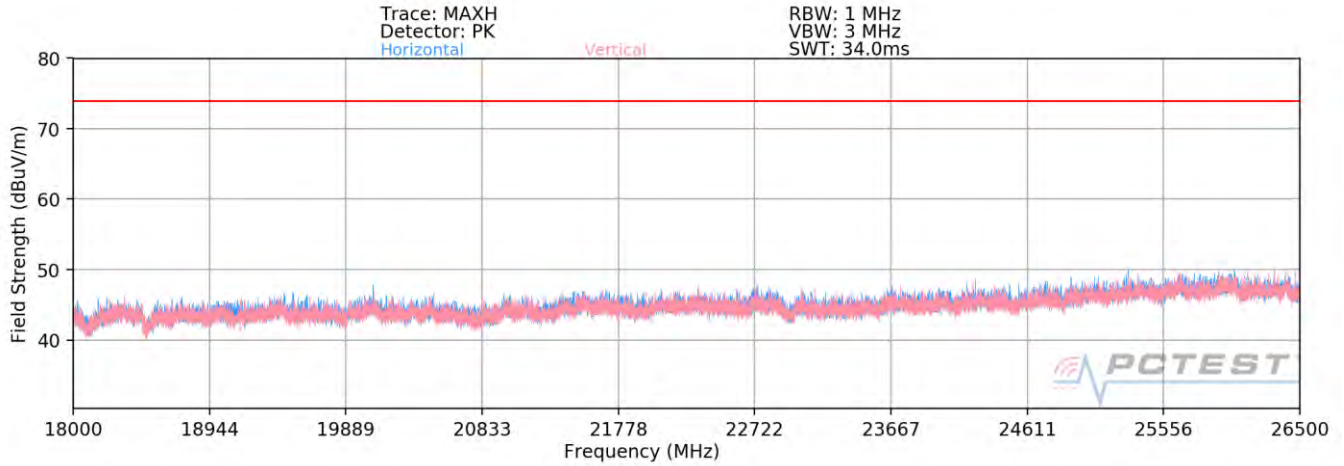


Plot 7-127. Radiated Spurious Plot above 1GHz Dual BT, Ant-1 + Ant-2 (BT – Ch. 78)



FCC ID: A3LSMG998JPN	 PCTEST Proud to be part of 	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 89 of 107

Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209; RSS-Gen [8.9]



Plot 7-128. Radiated Spurious Plot above 18GHz

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 90 of 107	

Radiated Spurious Emission Measurements

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

ANT1

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	-	-	-82.09	9.23	34.14	53.98	-19.84
4804.00	Peak	H	-	-	-69.98	9.23	46.25	73.98	-27.73
12010.00	Avg	H	-	-	-85.18	22.67	44.49	53.98	-9.49
12010.00	Peak	H	-	-	-72.87	22.67	56.80	73.98	-17.18

Table 7-12. Radiated Measurements-ANT1

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4882.00	Avg	H	-	-	-82.23	9.37	34.14	53.98	-19.84
4882.00	Peak	H	-	-	-70.39	9.37	45.98	73.98	-28.00
7323.00	Avg	H	-	-	-84.01	14.98	37.97	53.98	-16.01
7323.00	Peak	H	-	-	-72.42	14.98	49.56	73.98	-24.42
12205.00	Avg	H	-	-	-85.02	22.08	44.06	53.98	-9.92
12205.00	Peak	H	-	-	-73.30	22.08	55.78	73.98	-18.20

Table 7-13. Radiated Measurements-ANT1

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 91 of 107	

Radiated Spurious Emission Measurements

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

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	-	-	-82.36	9.40	34.04	53.98	-19.94
4960.00	Peak	H	-	-	-70.74	9.40	45.66	73.98	-28.32
7440.00	Avg	H	-	-	-84.46	15.58	38.12	53.98	-15.85
7440.00	Peak	H	-	-	-71.88	15.58	50.70	73.98	-23.27
12400.00	Avg	H	-	-	-85.25	22.81	44.56	53.98	-9.42
12400.00	Peak	H	-	-	-72.75	22.81	57.06	73.98	-16.92

Table 7-14. Radiated Measurements-ANT1

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	-	-	-82.46	9.23	33.77	53.98	-20.21
4804.00	Peak	H	-	-	-69.62	9.23	46.61	73.98	-27.37
12010.00	Avg	H	-	-	-85.19	22.67	44.48	53.98	-9.50
12010.00	Peak	H	-	-	-72.92	22.67	56.75	73.98	-17.23

Table 7-15. Radiated Measurements with WCP-ANT1

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 92 of 107

ANT2

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	-	-	-79.38	7.22	34.84	53.98	-19.14
4804.00	Peak	H	-	-	-67.79	7.22	46.43	73.98	-27.55
12010.00	Avg	H	-	-	-80.89	18.11	44.22	53.98	-9.76
12010.00	Peak	H	-	-	-69.13	18.11	55.98	73.98	-18.00

Table 7-16. Radiated Measurements-ANT2

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4882.00	Avg	H	-	-	-79.77	7.86	35.09	53.98	-18.89
4882.00	Peak	H	-	-	-67.68	7.86	47.18	73.98	-26.80
7323.00	Avg	H	-	-	-79.67	12.08	39.41	53.98	-14.57
7323.00	Peak	H	-	-	-67.17	12.08	51.91	73.98	-22.07
12205.00	Avg	H	-	-	-80.81	18.16	44.35	53.98	-9.63
12205.00	Peak	H	-	-	-68.63	18.16	56.53	73.98	-17.45

Table 7-17. Radiated Measurements-ANT2

FCC ID: A3LSMG998JPN	 PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 93 of 107	




Radiated Spurious Emission Measurements

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

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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 [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	-	-	-79.66	7.13	34.47	53.98	-19.51
4960.00	Peak	H	-	-	-68.27	7.13	45.86	73.98	-28.12
7440.00	Avg	H	-	-	-79.91	12.17	39.26	53.98	-14.72
7440.00	Peak	H	-	-	-68.17	12.17	51.00	73.98	-22.98
12400.00	Avg	H	-	-	-81.06	18.09	44.03	53.98	-9.95
12400.00	Peak	H	-	-	-69.67	18.09	55.42	73.98	-18.56

Table 7-18. Radiated Measurements-ANT2

FCC ID: A3LSMG998JPN	 PCTEST Proud to be part of  element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 94 of 107

Dual BT

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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]	Duty Cycle Correction [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4804.00	Avg	H	251	76	-79.00	7.22	-22.50	12.72	53.98	-41.26
4804.00	Peak	H	251	76	-67.21	7.22	0.00	47.01	73.98	-26.97
7206.00	Avg	H	379	266	-79.60	11.45	-22.50	16.35	53.98	-37.63
7206.00	Peak	H	379	266	-67.17	11.45	0.00	51.28	73.98	-22.70
12010.00	Avg	H	-	-	-80.61	18.11	0.00	44.50	53.98	-9.48
12010.00	Peak	H	-	-	-68.24	18.11	0.00	56.87	73.98	-17.11

Table 7-19. Radiated Measurements-Dual

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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]	Duty Cycle Correction [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4882.00	Avg	H	-	-	-79.80	7.86	0.00	35.06	53.98	-18.92
4882.00	Peak	H	-	-	-67.36	7.86	0.00	47.50	73.98	-26.48
7323.00	Avg	H	-	-	-79.71	12.08	0.00	39.37	53.98	-14.61
7323.00	Peak	H	-	-	-66.61	12.08	0.00	52.47	73.98	-21.51
12205.00	Avg	H	-	-	-80.80	18.16	0.00	44.36	53.98	-9.62
12205.00	Peak	H	-	-	-68.91	18.16	0.00	56.25	73.98	-17.73

Table 7-20. Radiated Measurements-Dual

FCC ID: A3LSMG998JPN	 PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 95 of 107	

Radiated Spurious Emission Measurements

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

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	114	343	-79.56	7.13	-22.50	12.07	53.98	-41.90
4960.00	Peak	H	114	343	-67.80	7.13	0.00	46.33	73.98	-27.65
7440.00	Avg	H	387	234	-79.84	12.17	-22.50	16.83	53.98	-37.15
7440.00	Peak	H	387	234	-67.34	12.17	0.00	51.83	73.98	-22.15
12400.00	Avg	H	-	-	-81.08	18.09	0.00	44.01	53.98	-9.97
12400.00	Peak	H	-	-	-69.21	18.09	0.00	55.88	73.98	-18.10

Table 7-21. Radiated Measurements-Dual

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 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]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	207	282	-79.67	7.22	-22.50	12.05	53.98	-41.93
4804.00	Peak	H	207	282	-68.04	7.22	0.00	46.18	73.98	-27.80
7206.00	Avg	H	265	180	-79.59	11.45	-22.50	16.36	53.98	-37.62
7206.00	Peak	H	265	180	-68.01	11.45	0.00	50.44	73.98	-23.54
12010.00	Avg	H	-	-	-80.67	18.11	0.00	44.44	53.98	-9.54
12010.00	Peak	H	-	-	-68.51	18.11	0.00	56.60	73.98	-17.38

Table 7-22. Radiated Measurements with WCP-Dual

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 96 of 107	

7.10 Radiated Restricted Band Edge Measurements

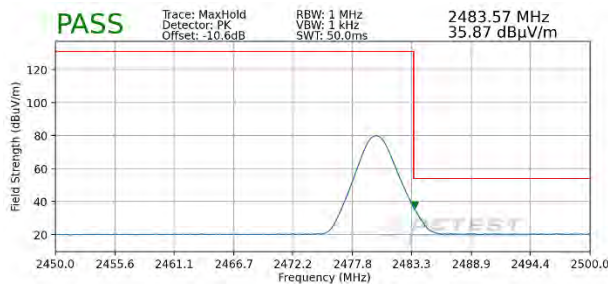
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

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).

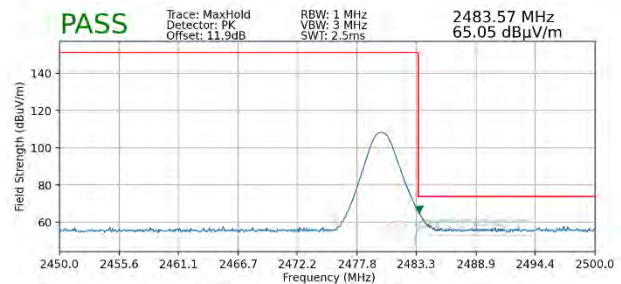
The amplitude offset shown in the following plots for average measurements was calculated using the formula:

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

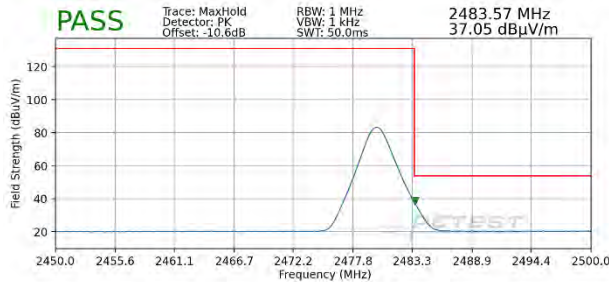
Worst Case Mode:	Bluetooth
Worst Case Data Rate:	1 Mbps
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78



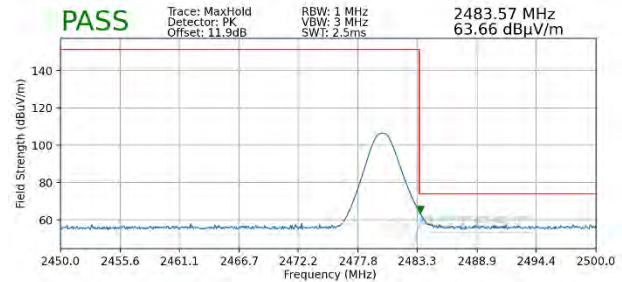
Plot 7-129. Radiated Restricted Upper Band Edge Measurement (Average) – ANT1






Plot 7-130. Radiated Restricted Upper Band Edge Measurement (Peak) – ANT1

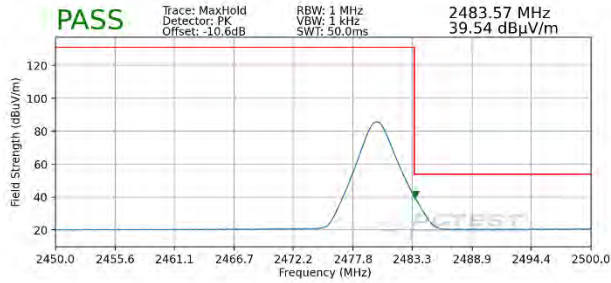


Plot 7-131. Radiated Restricted Upper Band Edge Measurement with WCP (Average) – ANT1

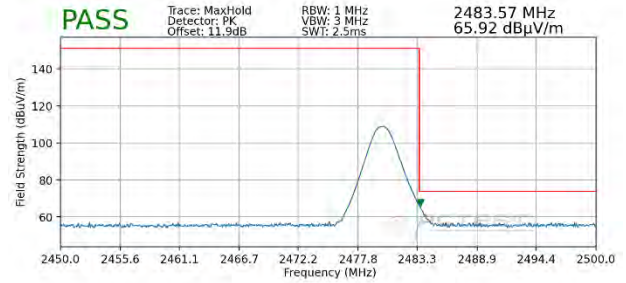


Plot 7-132. Radiated Restricted Upper Band Edge Measurement with WCP (Peak) – ANT1

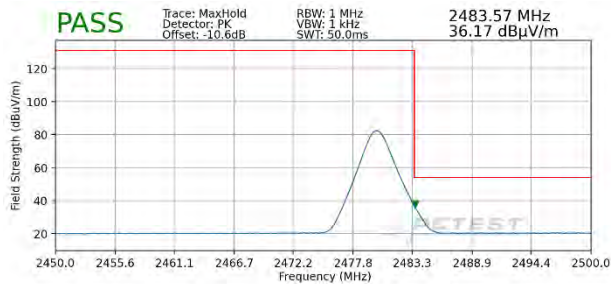
FCC ID: A3LSMG998JPN	 PCTEST Proud to be part of 	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 97 of 107



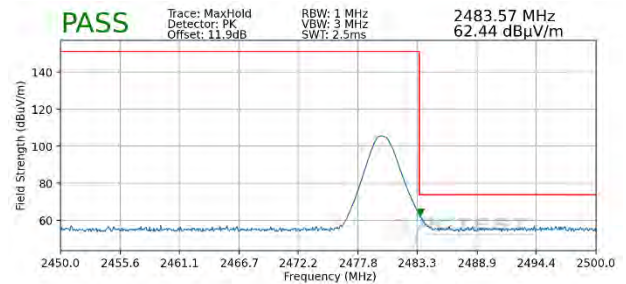
Plot 7-133. Radiated Restricted Upper Band Edge Measurement (Average) – ANT2



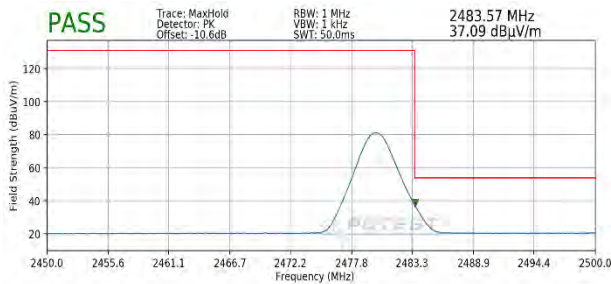
Plot 7-134. Radiated Restricted Upper Band Edge Measurement (Peak) – ANT2



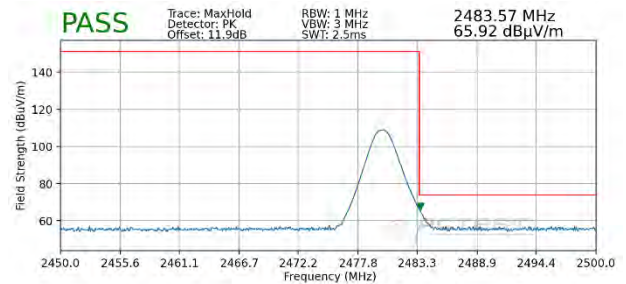
Plot 7-135. Radiated Restricted Upper Band Edge Measurement with WCP (Average) – ANT2



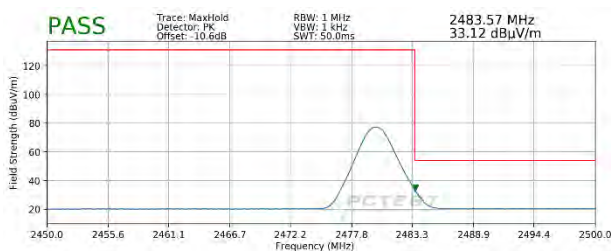
Plot 7-136. Radiated Restricted Upper Band Edge Measurement with WCP (Peak) – ANT2



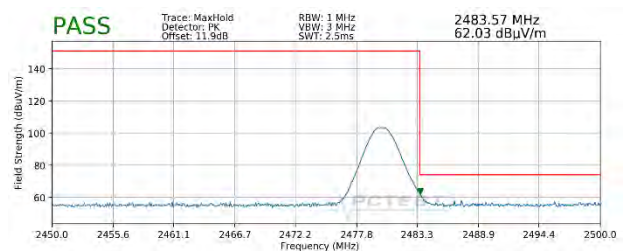
Plot 7-137. Radiated Restricted Upper Band Edge Measurement (Average) – Dual BT





Plot 7-138. Radiated Restricted Upper Band Edge Measurement (Peak) – DUAL BT



Plot 7-139. Radiated Restricted Upper Band Edge Measurement with WCP (Average) – Dual BT



Plot 7-140. Radiated Restricted Upper Band Edge Measurement with WCP (Peak) – Dual BT

FCC ID: A3LSMG998JPN	 Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 98 of 107

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 7-23 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 7-23. 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

FCC ID: A3LSMG998JPN	 PCTEST® Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 99 of 107	

Test Setup

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

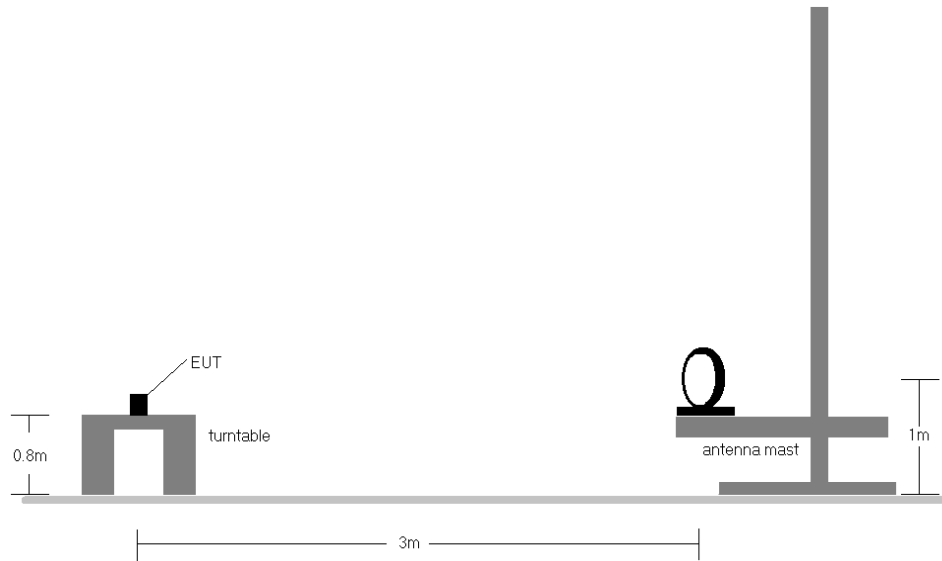


Figure 7-9. Radiated Test Setup < 30Mhz

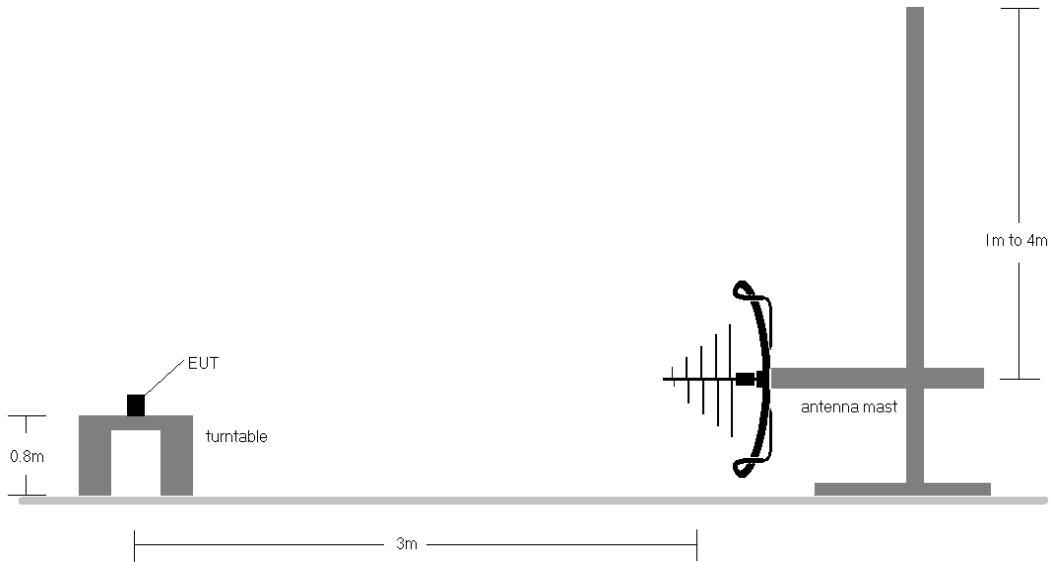





Figure 7-10. Radiated Test Setup < 1GHz

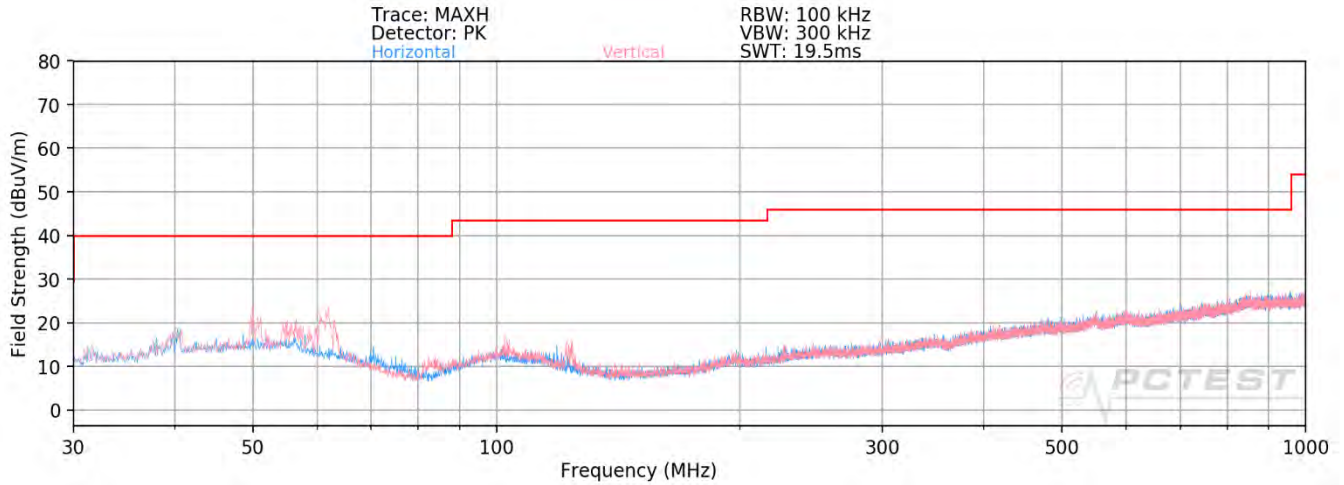
FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 100 of 107	

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.
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: A3LSMG998JPN	 <p>PCTEST® Proud to be part of  element</p>	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 101 of 107	

Radiated Spurious Emissions Measurements (Below 1GHz)
§15.209; RSS-Gen [8.9]



Plot 7-141. Radiated Spurious Plot below 1GHz

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset	Page 102 of 107	

7.12 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 7-24. 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: A3LSMG998JPN	 PCTEST Proud to be part of  element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 103 of 107

Test Setup

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

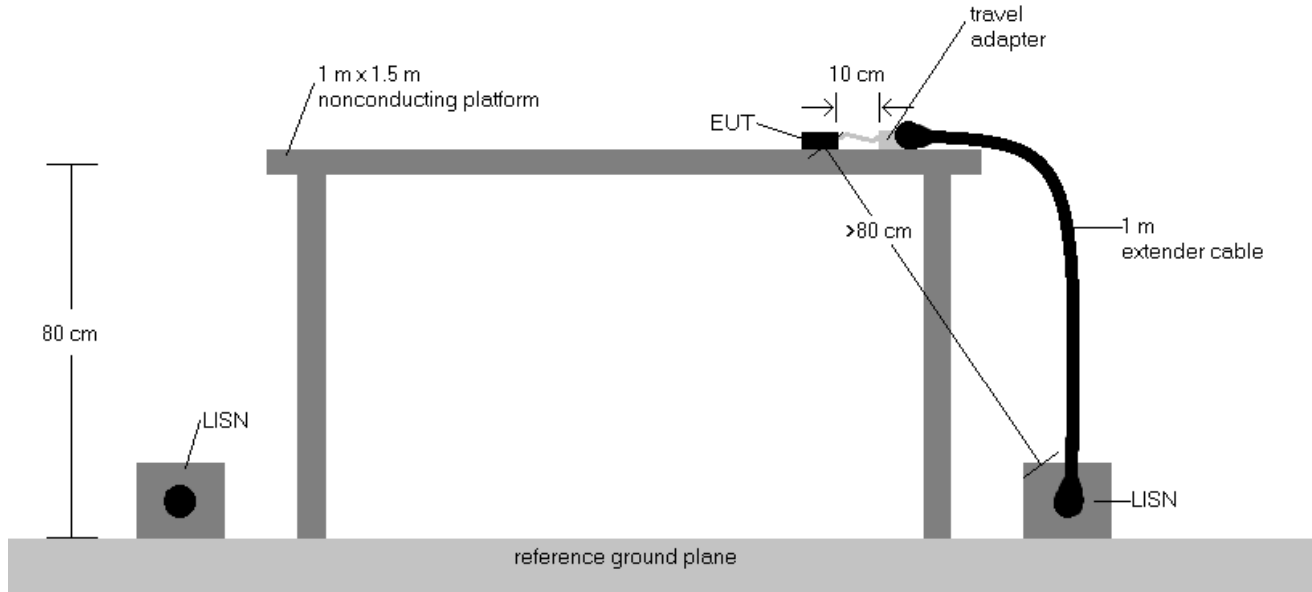


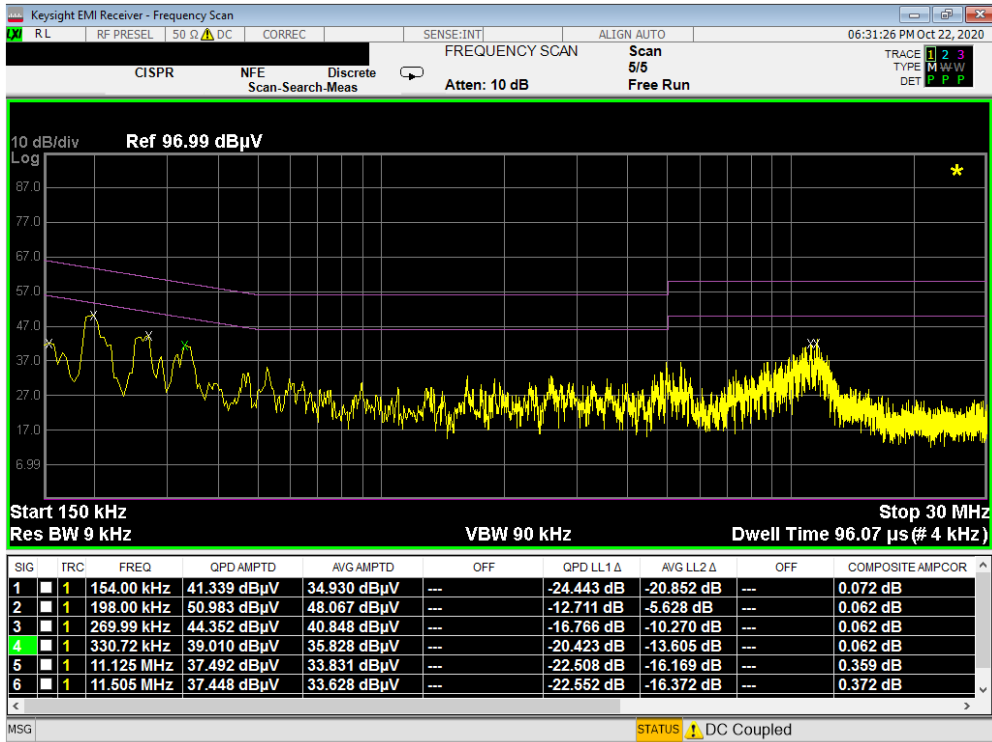


Figure 7-11. Test Instrument & Measurement Setup

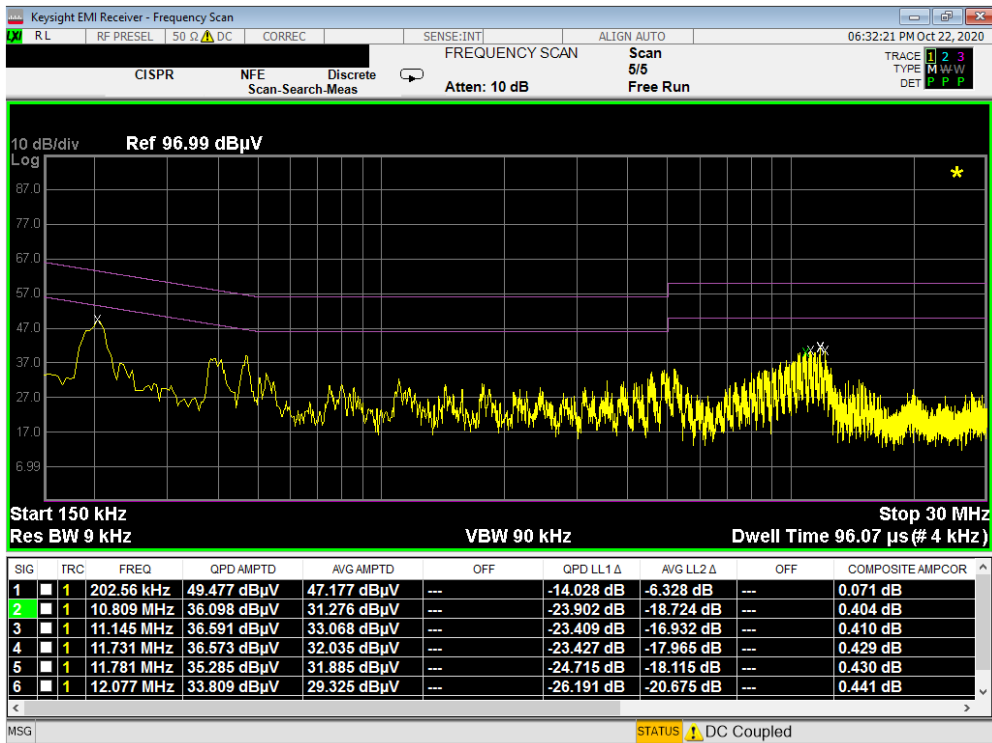
Test Notes

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. $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4. $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5. $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

FCC ID: A3LSMG998JPN		MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 104 of 107

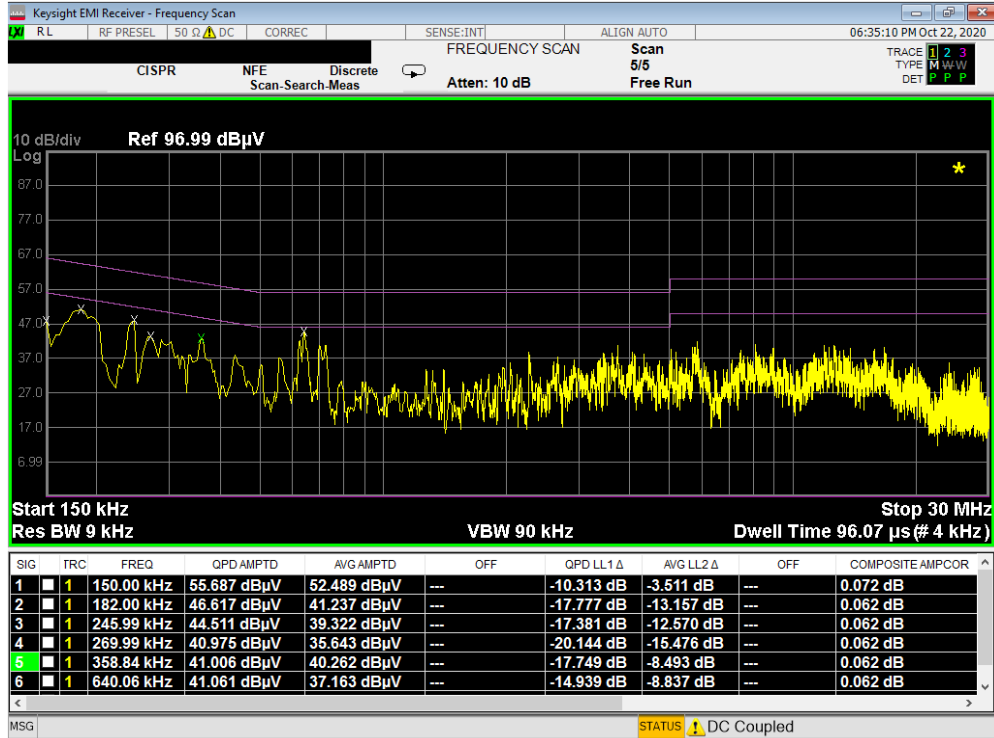


Plot 7-142. Line-Conducted Test Plot (L1)

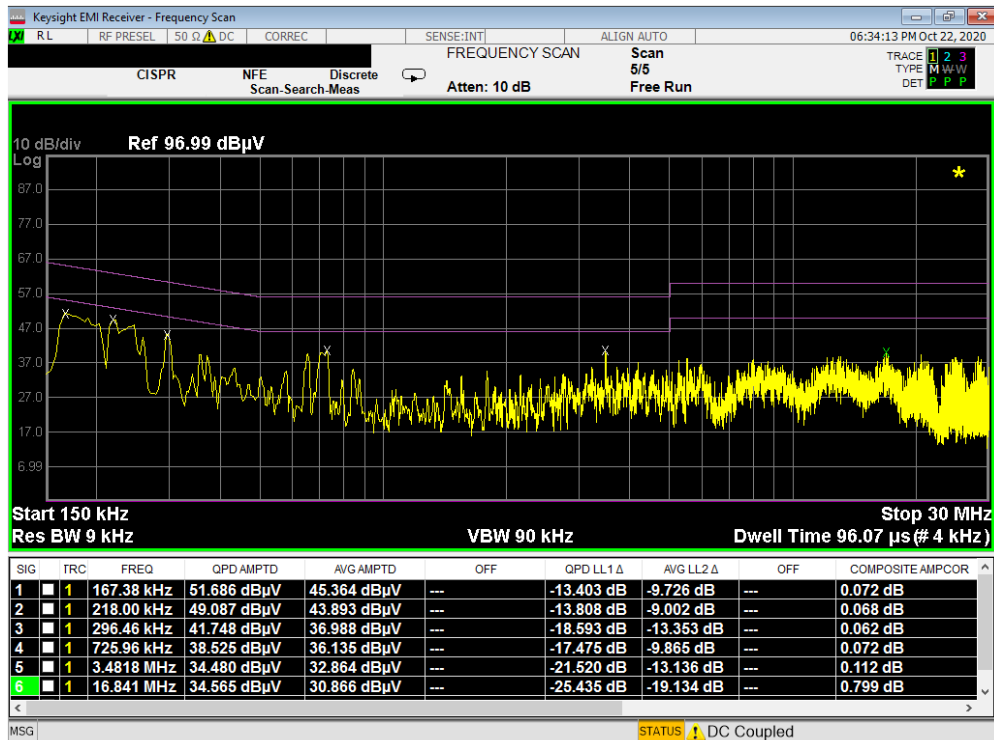


Plot 7-143. Line-Conducted Test Plot (N)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 105 of 107



Plot 7-144. Line-Conducted Test Plot (L1) with WCP






Plot 7-145. Line-Conducted Test Plot (N) with WCP

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 106 of 107

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG998JPN** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

FCC ID: A3LSMG998JPN	 <p>PCTEST Proud to be part of  element</p>	MEASUREMENT REPORT (Certification)		Approved by: Quality Manager
Test Report S/N: 1M2101110003-12.A3L	Test Dates: 1/16 – 1/22/2021	EUT Type: Portable Handset		Page 107 of 107