

7.3 6dB Bandwidth Measurement – 802.11a/n/ac

§15.407 (e)

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 6dB bandwidth.

In the 5.725 – 5.850GHz band, the 6dB bandwidth must be ≥ 500 kHz.

Test Procedure Used

KDB 789033 D02 v01r04 – Section C

Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100 kHz
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple

Test Setup

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

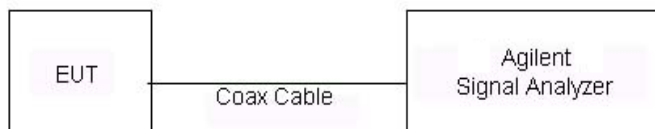


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

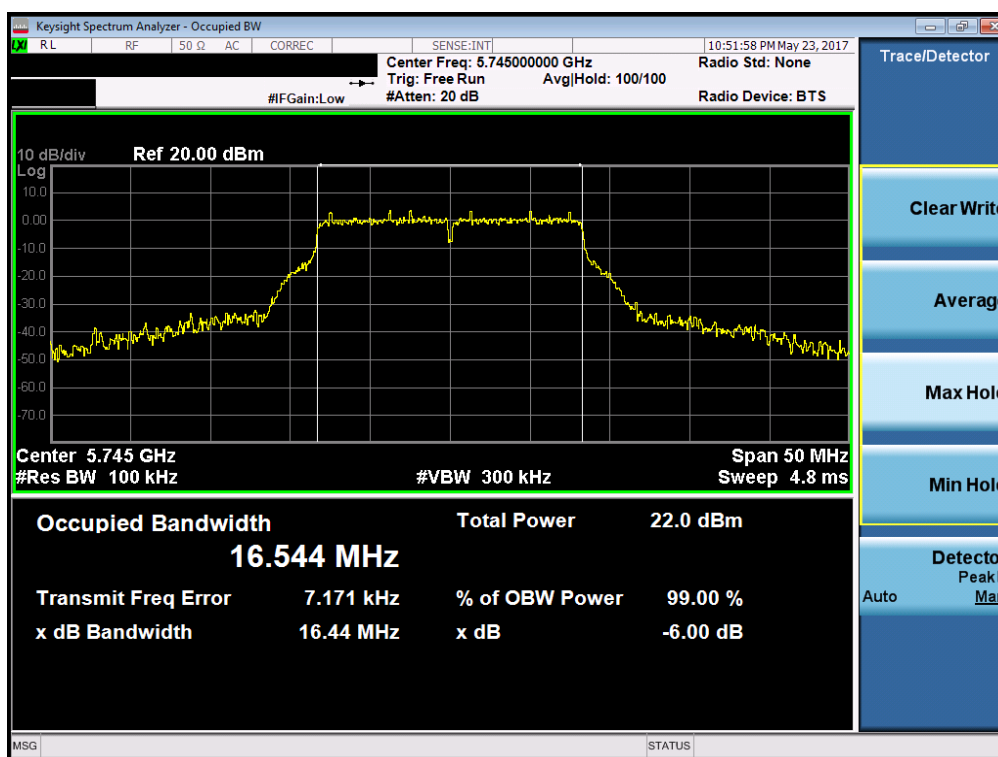
None.

FCC ID: A3LSMN9500		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Antenna-1 6 dB Bandwidth Measurements

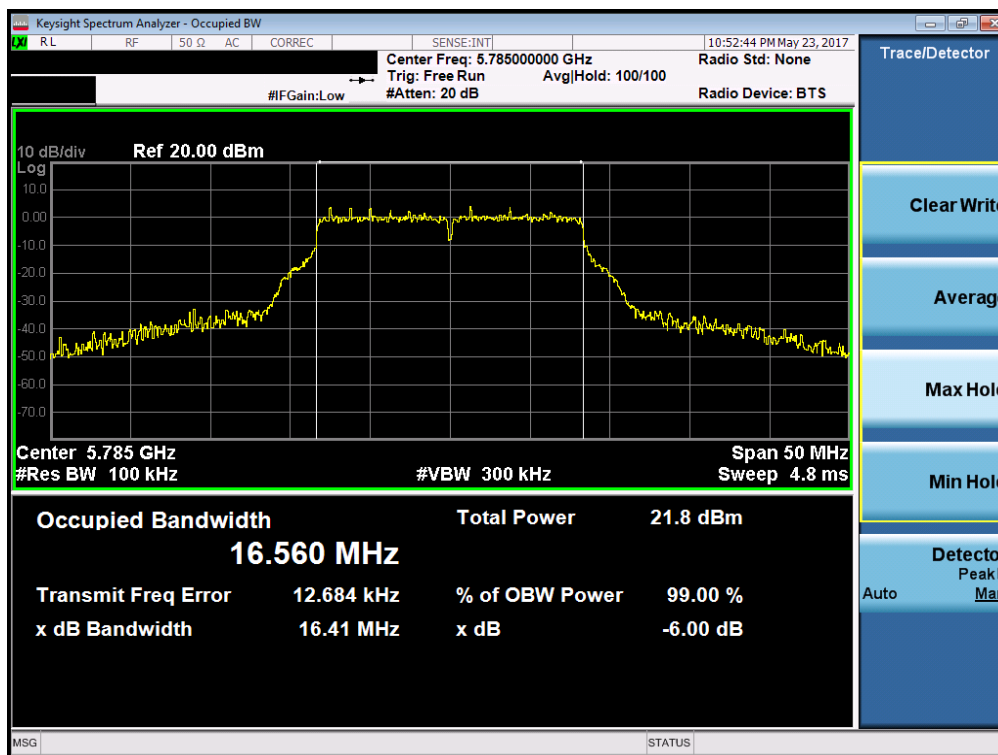
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
Band 3	5745	149	a	6	16.44
	5785	157	a	6	16.41
	5825	165	a	6	16.42
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.64
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.66
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.67
	5755	151	n (40MHz)	13.5/15 (MCS0)	36.36
	5795	159	n (40MHz)	13.5/15 (MCS0)	36.42
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	75.46

Table 7-4. Conducted Bandwidth Measurements

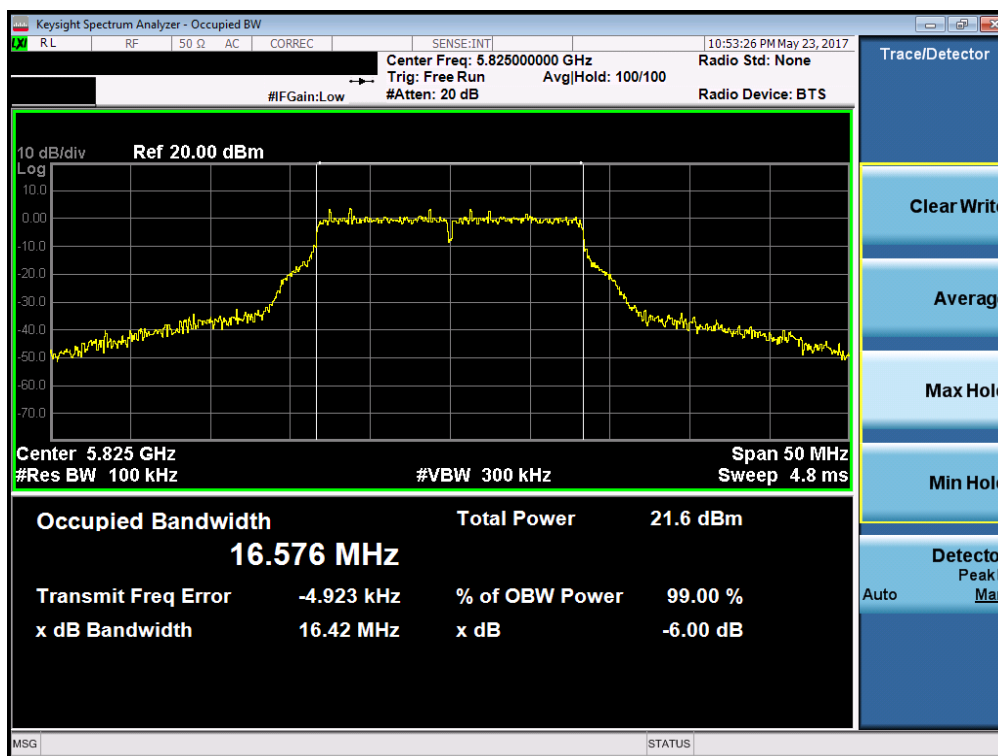


Plot 7-61. 6dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 149)

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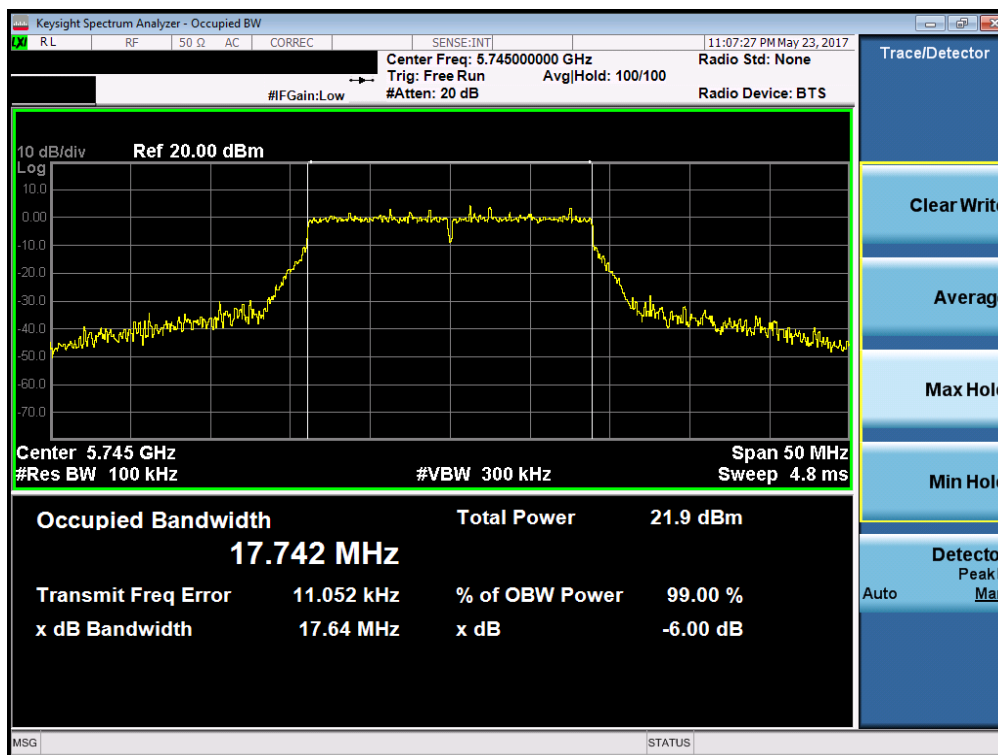


Plot 7-62. 6dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 157)

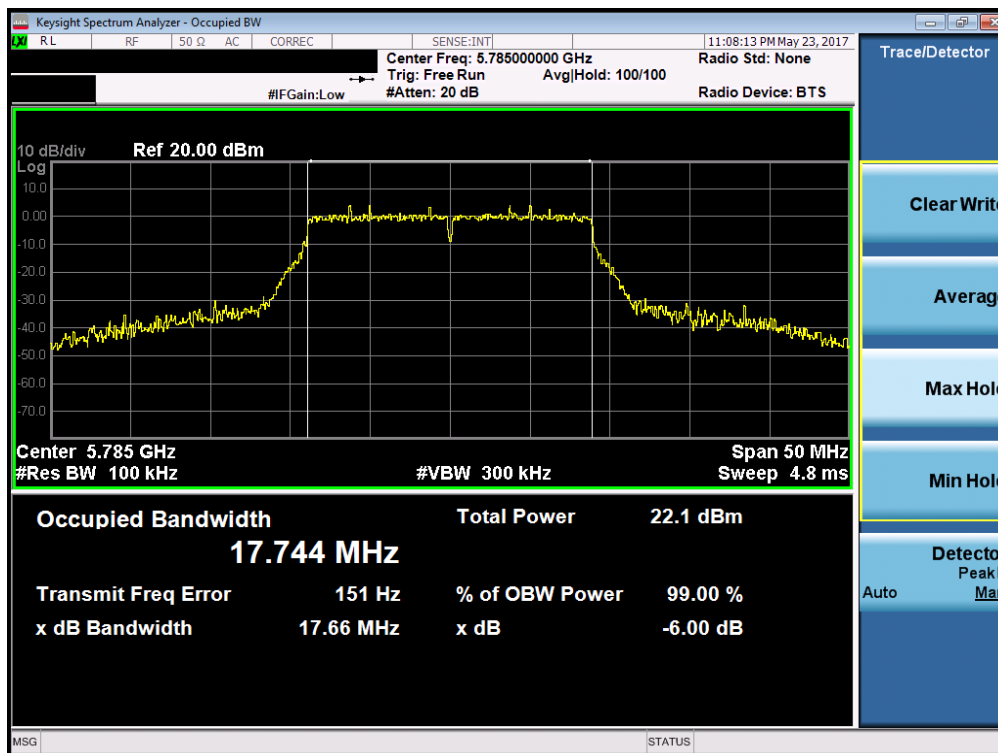


Plot 7-63. 6dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 49 of 254

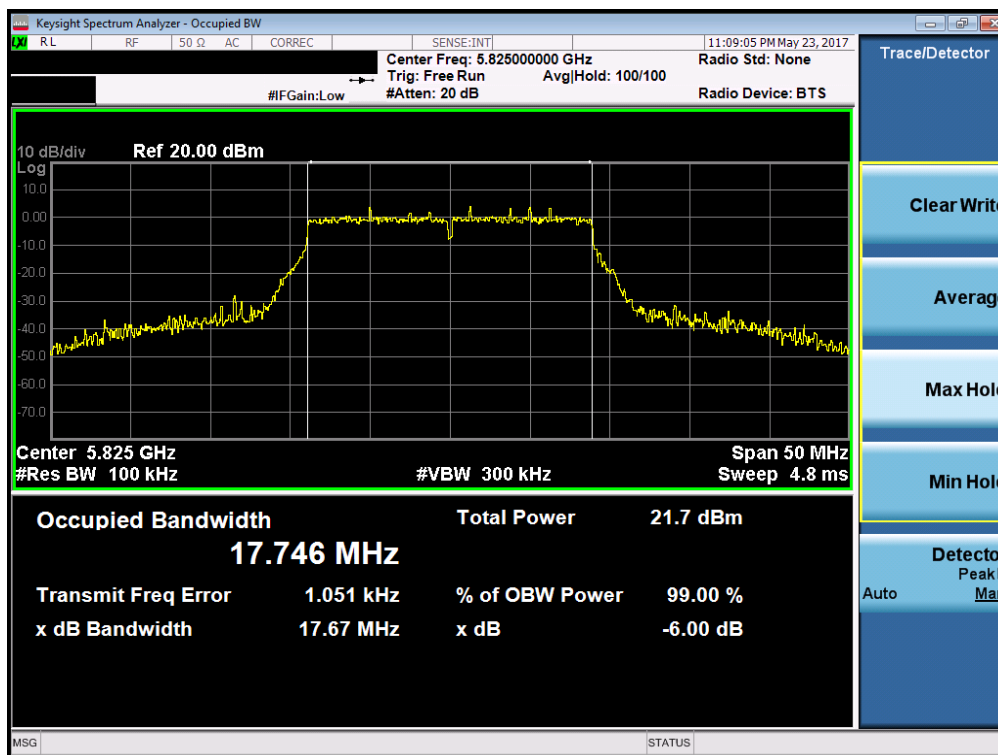


Plot 7-64. 6dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

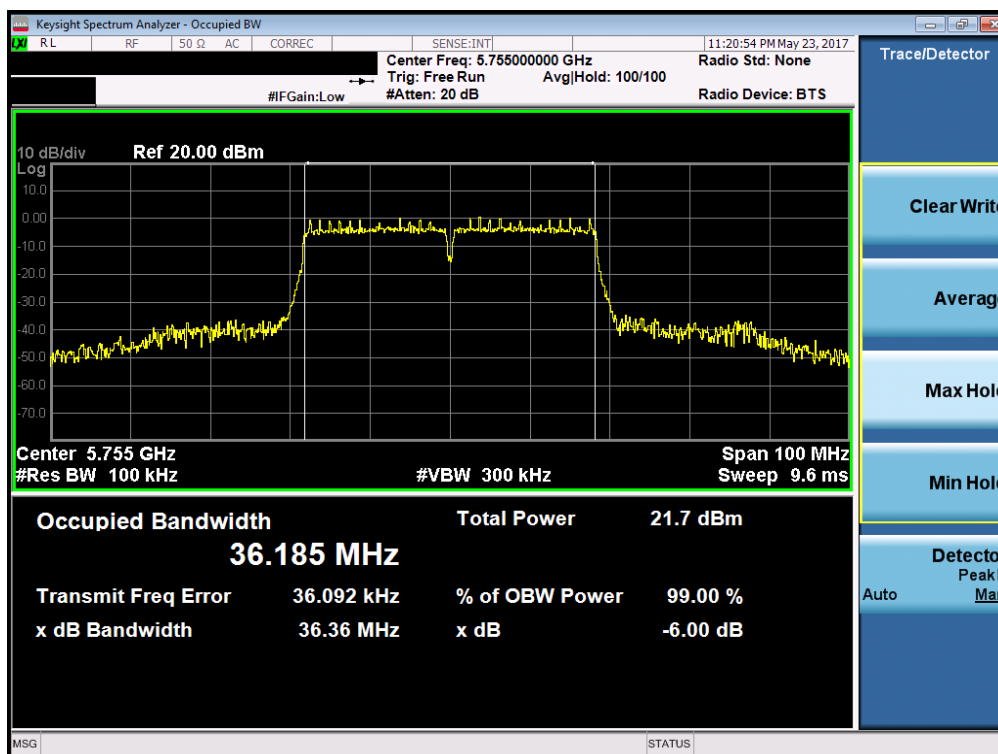


Plot 7-65. 6dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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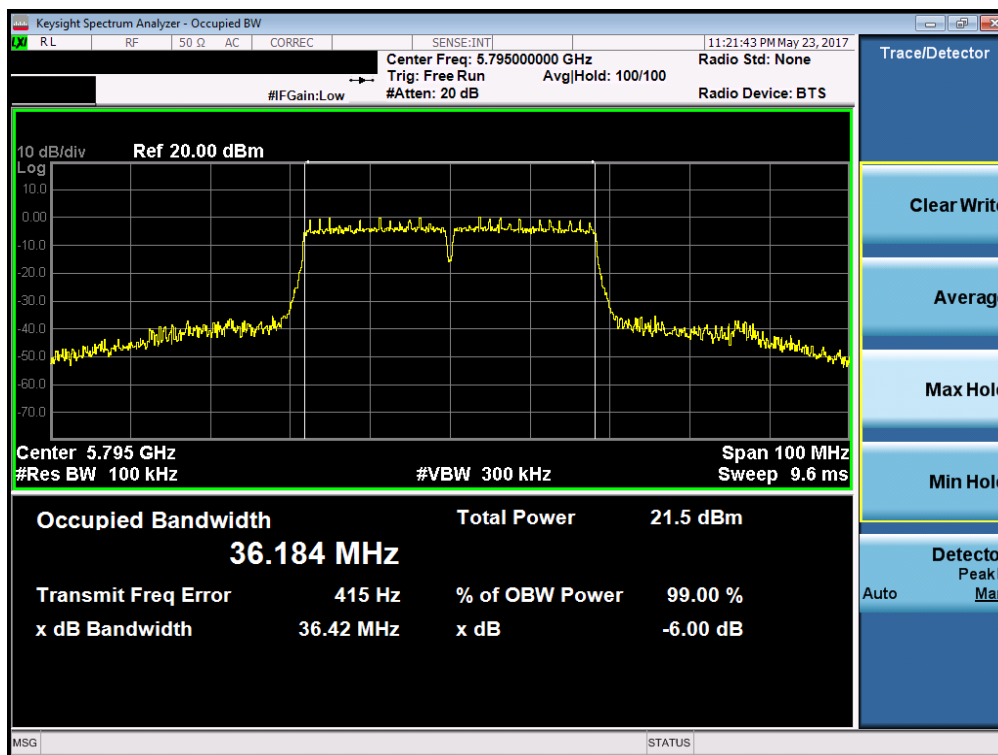


Plot 7-66. 6dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

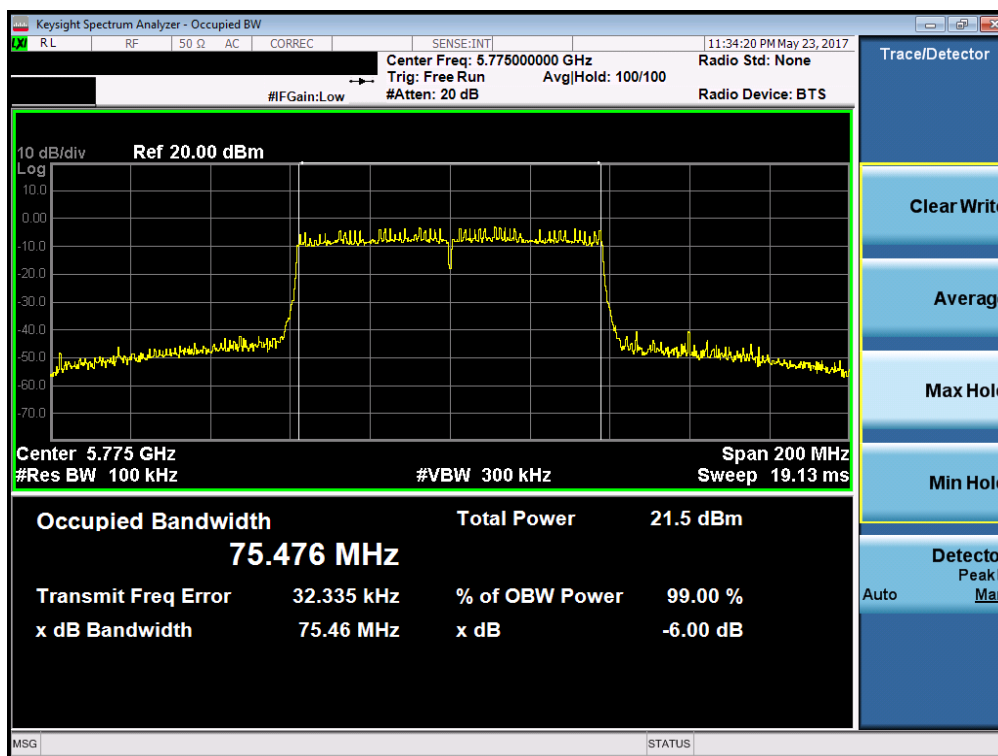


Plot 7-67. 6dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-68. 6dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



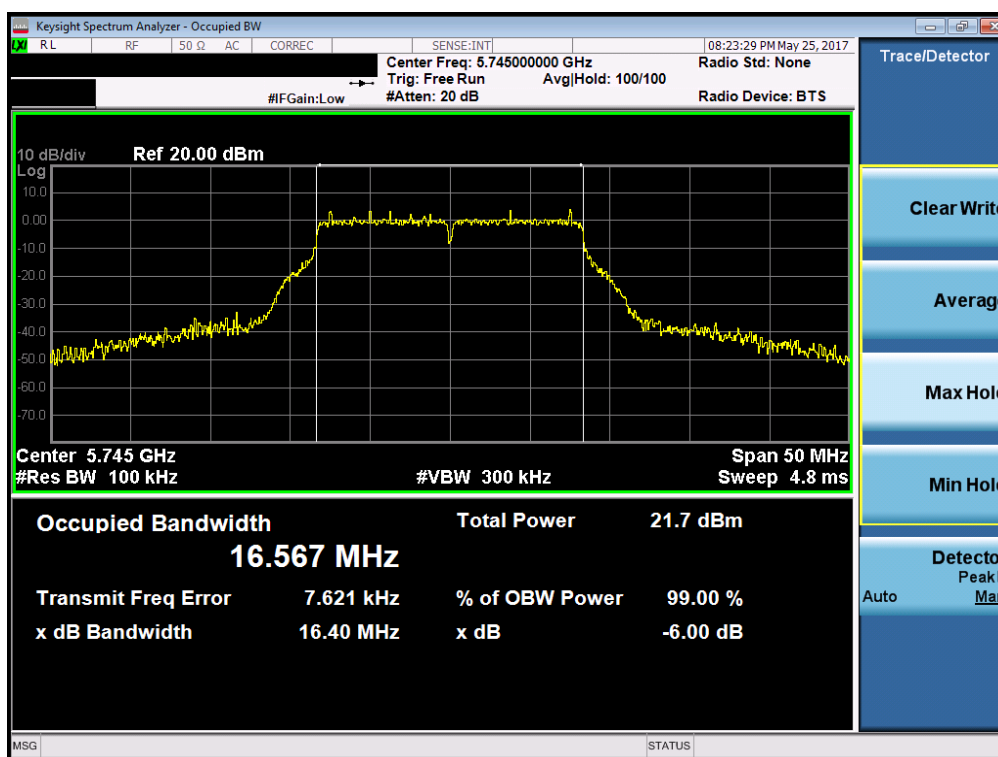
Plot 7-69. 6dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 52 of 254

Antenna-2 6dB Bandwidth Measurements

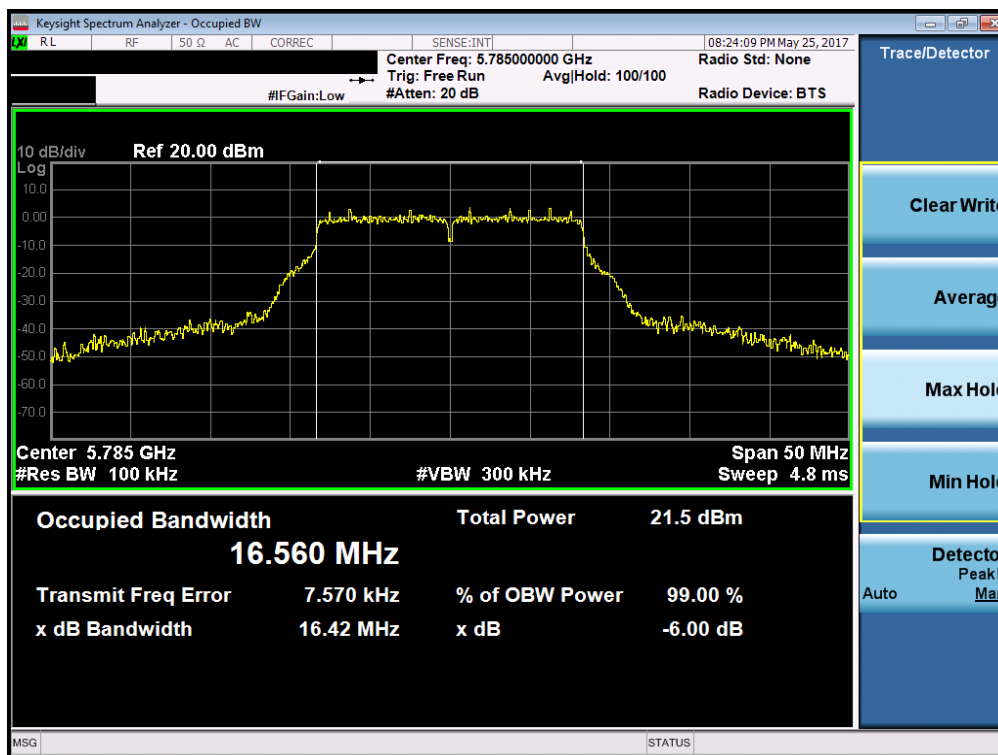
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
Band 3	5745	149	a	6	16.40
	5785	157	a	6	16.42
	5825	165	a	6	16.40
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.63
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.63
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.64
	5755	151	n (40MHz)	13.5/15 (MCS0)	36.39
	5795	159	n (40MHz)	13.5/15 (MCS0)	36.41
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	75.87

Table 7-5. Conducted Bandwidth Measurements

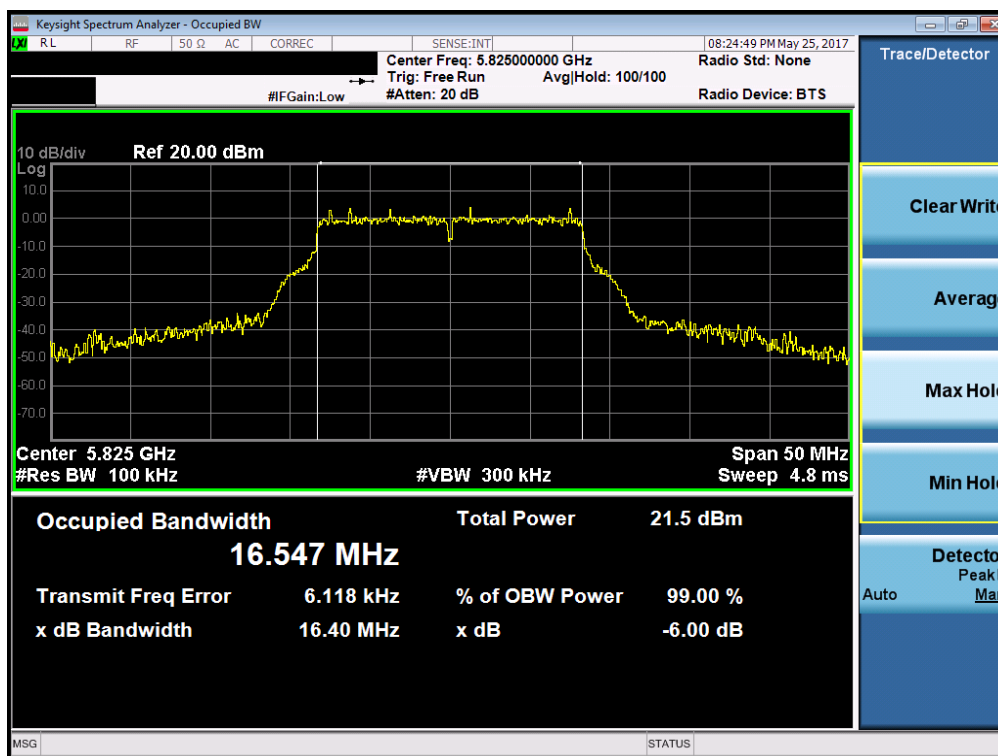


Plot 7-70. 6dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 53 of 254

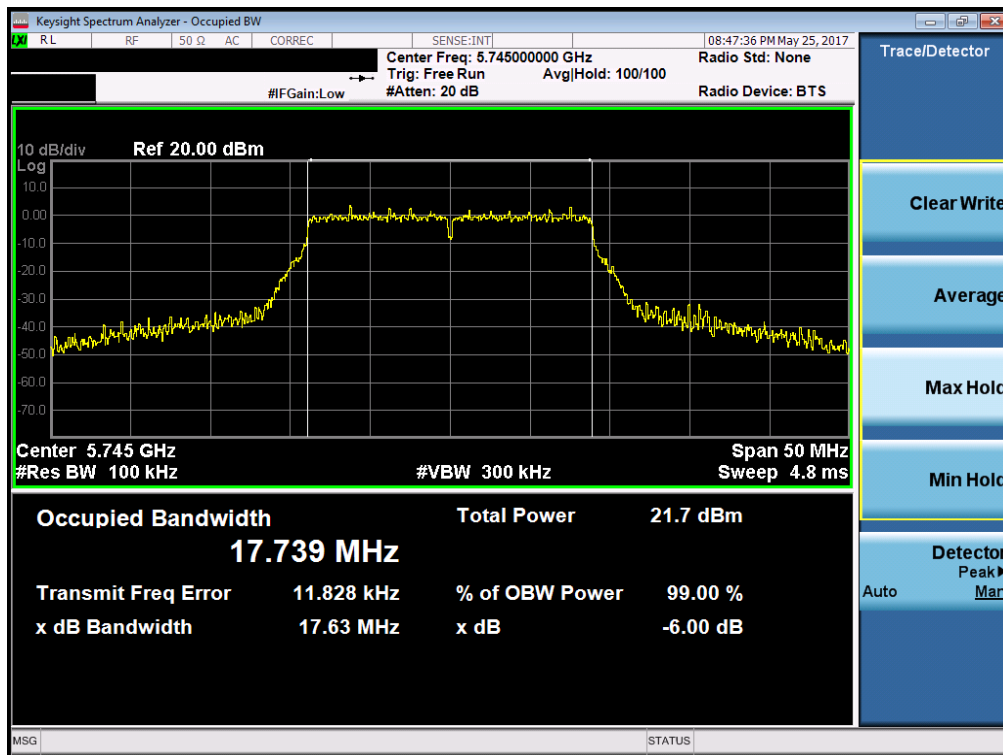


Plot 7-71. 6dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 157)

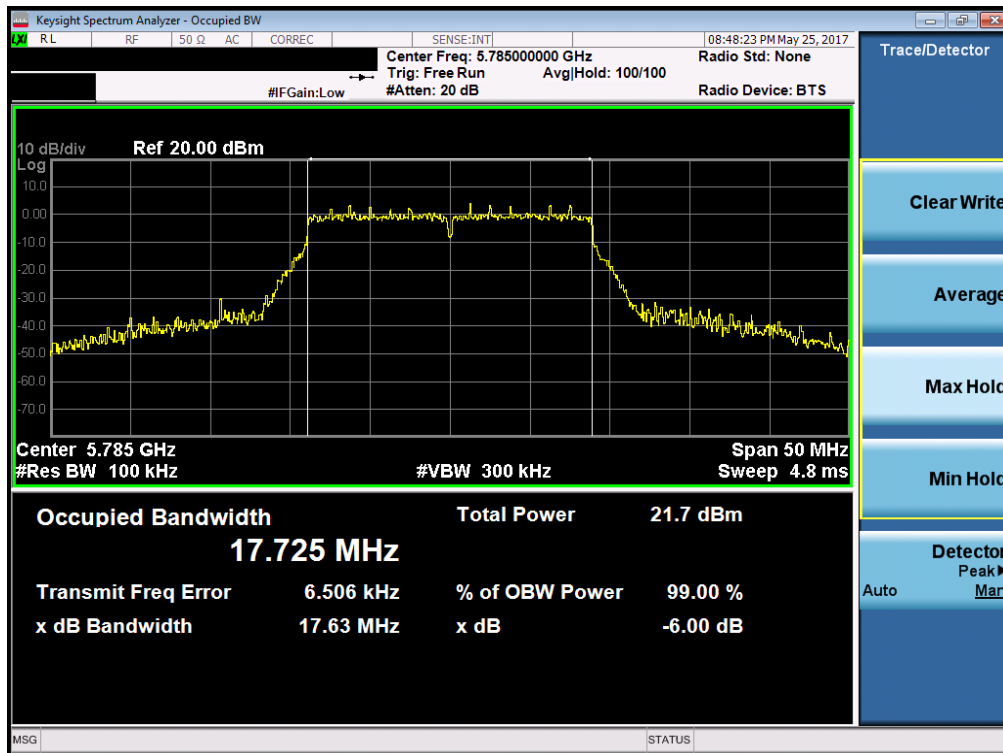


Plot 7-72. 6dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 54 of 254

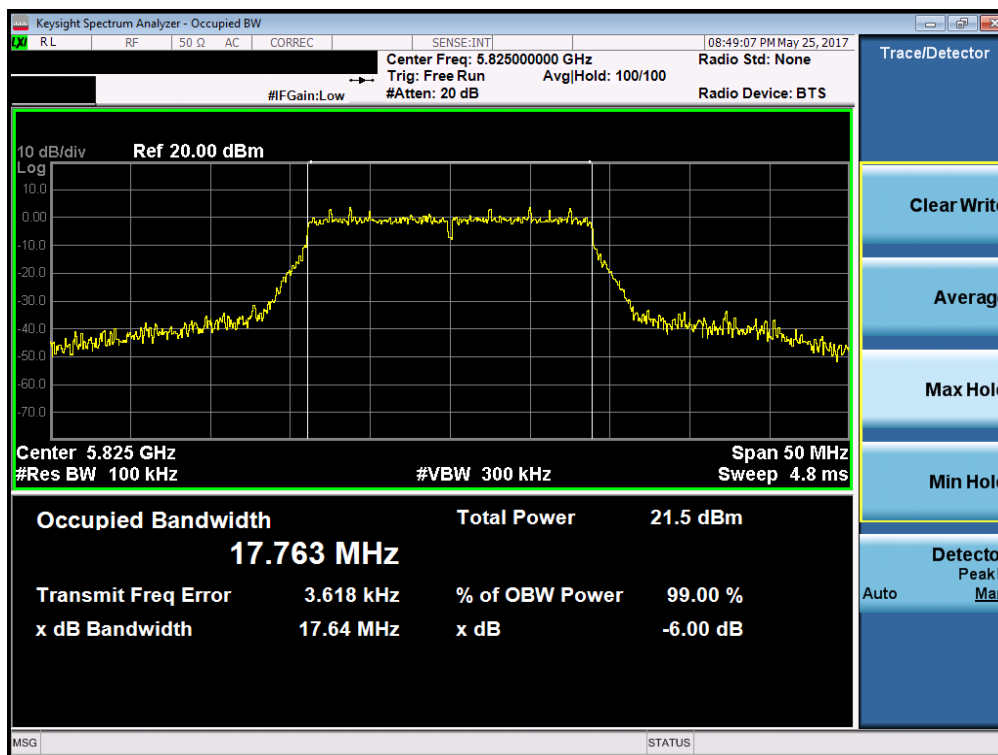


Plot 7-73. 6dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

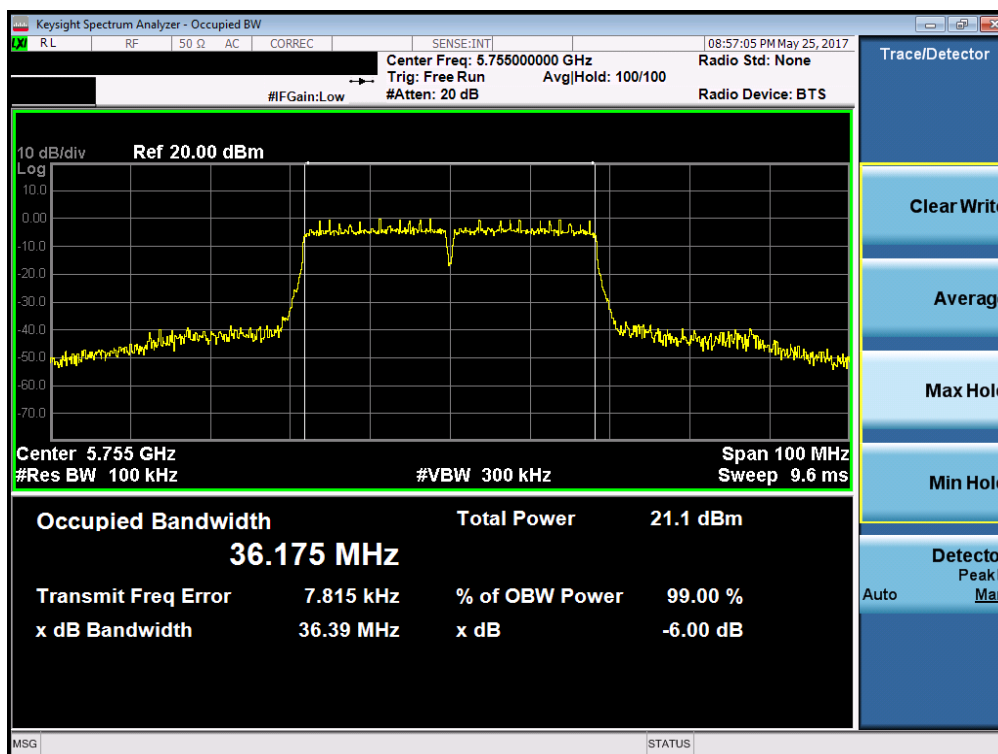


Plot 7-74. 6dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 55 of 254

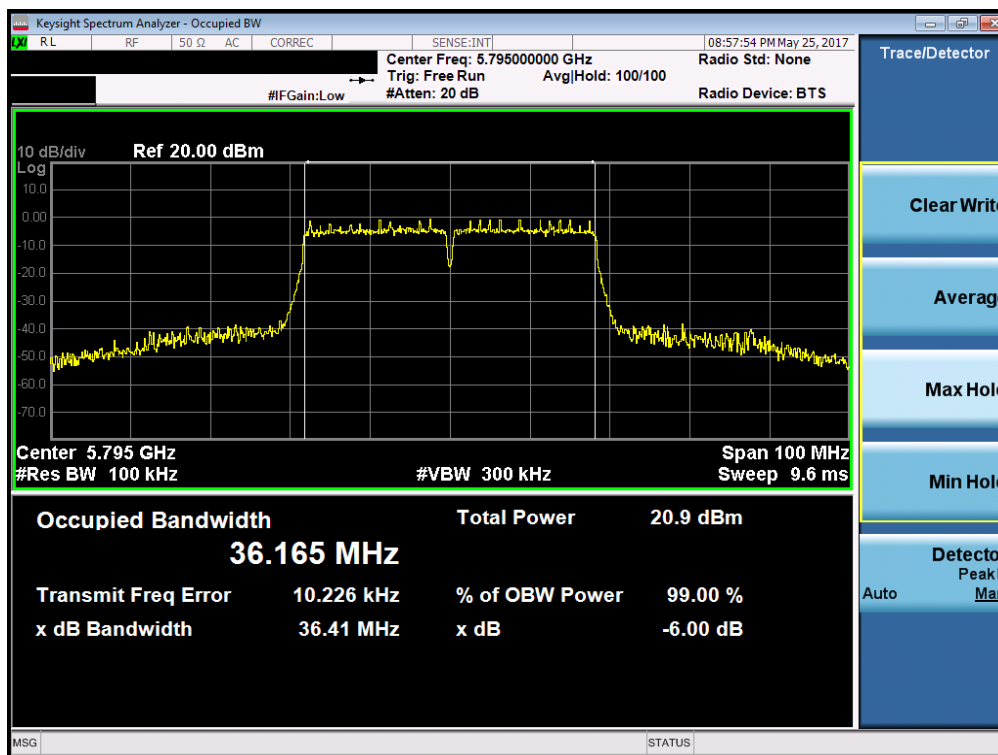


Plot 7-75. 6dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

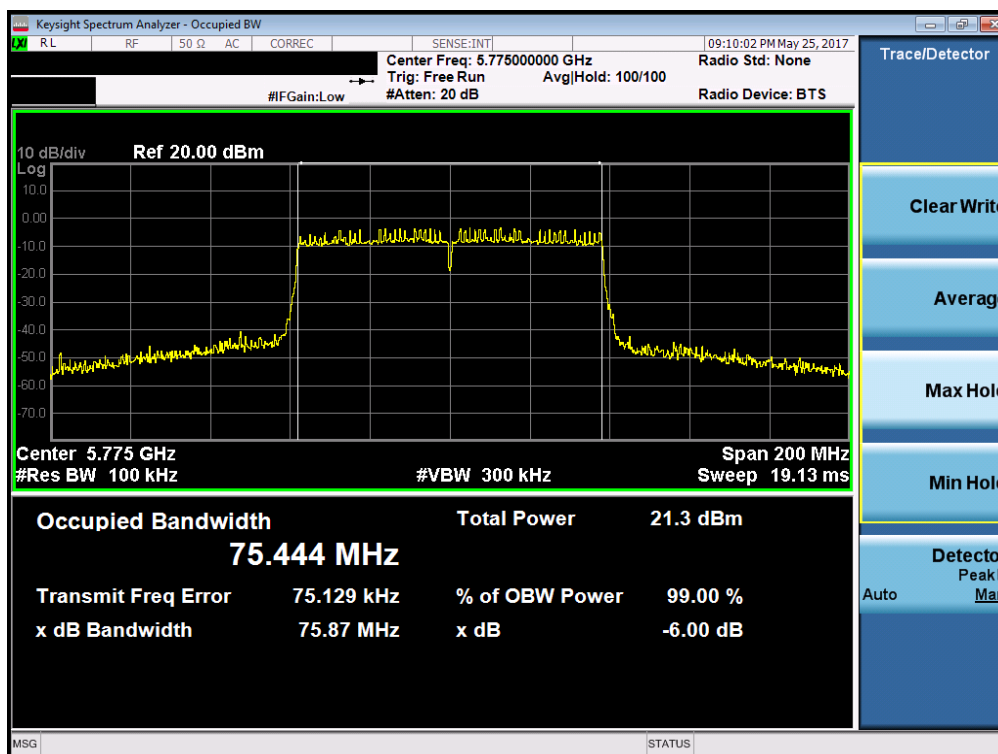


Plot 7-76. 6dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-77. 6dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-78. 6dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

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Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 57 of 254

7.4 UNII Output Power Measurement – 802.11a/n/ac §15.407(a.1.iv) §15.407(a.2) §15.407(a.3)

Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies.

In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (23.98dBm).

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(21.05) = 24.23\text{dBm}$.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(N/A) = N/\text{AdBm}$.

In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

Test Procedure Used

KDB 789033 D02 v01r04 – Section E)3)b) Method PM-G
KDB 662911 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

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

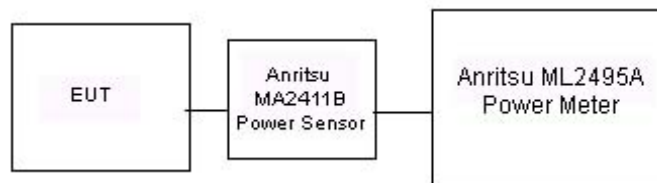


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

None

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Antenna-1 Conducted Output Power Measurements

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			802.11a	802.11n	802.11ac
5180	36	AVG	15.88	15.86	15.90
5200	40	AVG	15.86	15.77	15.82
5220	44	AVG	15.91	15.85	15.83
5240	48	AVG	15.85	15.89	15.85
5260	52	AVG	15.74	15.79	15.83
5280	56	AVG	15.78	15.67	15.70
5300	60	AVG	15.72	15.69	15.72
5320	64	AVG	15.74	15.78	15.69
5500	100	AVG	15.88	16.00	15.96
5600	120	AVG	16.03	16.04	16.12
5620	124	AVG	16.12	16.08	16.06
5720	144	AVG	16.04	15.97	16.08
5745	149	AVG	15.98	15.99	15.93
5785	157	AVG	15.82	15.95	15.96
5825	165	AVG	15.79	15.87	15.79

Table 7-6. 20MHz BW (UNII) Maximum Conducted Output Power

Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]	
			IEEE Transmission Mode	
			802.11n	802.11ac
5190	38	AVG	14.77	14.70
5230	46	AVG	14.77	14.71
5270	54	AVG	14.43	14.45
5310	62	AVG	14.49	14.46
5510	102	AVG	14.69	14.58
5590	118	AVG	14.77	14.75
5710	142	AVG	14.94	14.90
5755	151	AVG	14.87	14.90
5795	159	AVG	14.96	14.96

Table 7-7. 40MHz BW (UNII) Maximum Conducted Output Power

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	Detector	IEEE Transmission Mode
			802.11ac
5210	42	AVG	13.60
5290	58	AVG	13.50
5530	106	AVG	13.73
5610	122	AVG	13.93
5690	138	AVG	13.99
5775	155	AVG	14.06

Table 7-8. 80MHz BW (UNII) Maximum Conducted Output Power

FCC ID: A3LSMN9500			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Antenna-2 Conducted Output Power Measurements

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			802.11a	802.11n	802.11ac
5180	36	AVG	16.03	16.02	16.12
5200	40	AVG	16.02	15.99	16.04
5220	44	AVG	16.23	16.12	16.03
5240	48	AVG	16.07	16.03	16.07
5260	52	AVG	16.13	16.10	16.02
5280	56	AVG	16.09	16.13	16.11
5300	60	AVG	16.09	16.00	16.11
5320	64	AVG	16.11	16.13	16.11
5500	100	AVG	16.00	16.04	16.03
5600	120	AVG	16.21	16.22	16.17
5620	124	AVG	16.24	16.21	16.16
5720	144	AVG	16.34	16.26	16.23
5745	149	AVG	16.21	16.16	16.17
5785	157	AVG	16.23	16.21	16.15
5825	165	AVG	16.21	16.21	16.24

Table 7-9. 20MHz BW (UNII) Maximum Conducted Output Power

Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]	
			IEEE Transmission Mode	
			802.11n	802.11ac
5190	38	AVG	14.81	14.64
5230	46	AVG	14.83	14.80
5270	54	AVG	14.14	14.12
5310	62	AVG	13.80	13.95
5510	102	AVG	14.83	14.83
5590	118	AVG	14.95	14.98
5710	142	AVG	15.23	15.15
5755	151	AVG	15.13	15.29
5795	159	AVG	15.17	15.14

Table 7-10. 40MHz BW (UNII) Maximum Conducted Output Power

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	Detector	IEEE Transmission Mode
			802.11ac
5210	42	AVG	13.77
5290	58	AVG	13.74
5530	106	AVG	14.29
5610	122	AVG	14.38
5690	138	AVG	14.49
5775	155	AVG	14.36

Table 7-11. 80MHz BW (UNII) Maximum Conducted Output Power

FCC ID: A3LSMN9500		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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MIMO Maximum Conducted Output Power Measurements

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			ANT1	ANT2	MIMO
5180	36	AVG	15.88	16.03	18.97
5200	40	AVG	15.86	16.02	18.95
5220	44	AVG	15.91	16.23	19.08
5240	48	AVG	15.85	16.07	18.97
5260	52	AVG	15.74	16.13	18.95
5280	56	AVG	15.78	16.09	18.95
5300	60	AVG	15.72	16.09	18.92
5320	64	AVG	15.74	16.11	18.94
5500	100	AVG	15.88	16.00	18.95
5600	120	AVG	16.03	16.21	19.13
5620	124	AVG	16.12	16.24	19.19
5720	144	AVG	16.04	16.34	19.20
5745	149	AVG	15.98	16.21	19.11
5785	157	AVG	15.82	16.23	19.04
5825	165	AVG	15.79	16.21	19.02

Table 7-12. MIMO 20MHz BW 802.11a (UNII) Maximum Conducted Output Power

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			ANT1	ANT2	MIMO
5180	36	AVG	15.86	16.02	18.95
5200	40	AVG	15.77	15.99	18.89
5220	44	AVG	15.85	16.12	19.00
5240	48	AVG	15.89	16.03	18.97
5260	52	AVG	15.79	16.10	18.96
5280	56	AVG	15.67	16.13	18.92
5300	60	AVG	15.69	16.00	18.86
5320	64	AVG	15.78	16.13	18.97
5500	100	AVG	16.00	16.04	19.03
5600	120	AVG	16.04	16.22	19.14
5620	124	AVG	16.08	16.21	19.16
5720	144	AVG	15.97	16.26	19.13
5745	149	AVG	15.99	16.16	19.09
5785	157	AVG	15.95	16.21	19.09
5825	165	AVG	15.87	16.21	19.05

Table 7-13. MIMO 20MHz BW 802.11n (UNII) Maximum Conducted Output Power

FCC ID: A3LSMN9500		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)				Approved by: Quality Manager
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Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			ANT1	ANT2	MIMO
5180	36	AVG	15.90	16.12	19.02
5200	40	AVG	15.82	16.04	18.94
5220	44	AVG	15.83	16.03	18.94
5240	48	AVG	15.85	16.07	18.97
5260	52	AVG	15.83	16.02	18.94
5280	56	AVG	15.70	16.11	18.92
5300	60	AVG	15.72	16.11	18.93
5320	64	AVG	15.69	16.11	18.92
5500	100	AVG	15.96	16.03	19.01
5600	120	AVG	16.12	16.17	19.16
5620	124	AVG	16.06	16.16	19.12
5720	144	AVG	16.08	16.23	19.17
5745	149	AVG	15.93	16.17	19.06
5785	157	AVG	15.96	16.15	19.07
5825	165	AVG	15.79	16.24	19.03

Table 7-14. MIMO 20MHz BW 802.11ac (UNII) Maximum Conducted Output Power

Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			ANT1	ANT2	MIMO
5190	38	AVG	14.77	14.81	17.80
5230	46	AVG	14.77	14.83	17.81
5270	54	AVG	14.43	14.14	17.30
5310	62	AVG	14.49	13.80	17.17
5510	102	AVG	14.69	14.83	17.77
5590	118	AVG	14.77	14.95	17.87
5710	142	AVG	14.94	15.23	18.10
5755	151	AVG	14.87	15.13	18.01
5795	159	AVG	14.96	15.17	18.08

Table 7-15. MIMO 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

FCC ID: A3LSMN9500			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset			Page 62 of 254

Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]		
			IEEE Transmission Mode		
			ANT1	ANT2	MIMO
5190	38	AVG	14.70	14.64	17.68
5230	46	AVG	14.71	14.80	17.77
5270	54	AVG	14.45	14.12	17.30
5310	62	AVG	14.46	13.95	17.22
5510	102	AVG	14.58	14.83	17.72
5590	118	AVG	14.75	14.98	17.88
5710	142	AVG	14.90	15.15	18.04
5755	151	AVG	14.90	15.29	18.11
5795	159	AVG	14.96	15.14	18.06

Table 7-16. MIMO 40MHz BW 802.11ac (UNII) Maximum Conducted Output Power

5GHz (80MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	Detector	IEEE Transmission Mode		
			ANT1	ANT2	MIMO
5210	42	AVG	13.60	13.77	16.70
5290	58	AVG	13.50	13.74	16.63
5530	106	AVG	13.73	14.29	17.03
5610	122	AVG	13.93	14.38	17.17
5690	138	AVG	13.99	14.49	17.26
5775	155	AVG	14.06	14.36	17.22

Table 7-17. MIMO 80MHz BW 802.11ac (UNII) Maximum Conducted Output Power

Note:

Per KDB 662911 v02r01 Section E1), the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 5180MHz the average conducted output power was measured to be 15.86 dBm for Antenna-1 and 16.02 dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(15.86 \text{ dBm} + 16.02 \text{ dBm}) = (38.55 \text{ mW} + 39.99 \text{ mW}) = 78.54 \text{ mW} = 18.95 \text{ dBm}$$

FCC ID: A3LSMN9500			FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.5 Maximum Power Spectral Density – 802.11a/n/ac

§15.407(a.1.iv) §15.407(a.2) §15.407(a.3)

Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 D02 v01r04, was used to measure the power spectral density.

In the 5.15 – 5.25GHz, 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

Test Procedure Used

KDB 789033 D02 v01r04 – Section F

KDB 662911 v02r01 – Section E)2) Measure-and-Sum Technique

Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points $\geq 2 \times (\text{span}/\text{RBW})$
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run for all modes
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

Test Setup

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

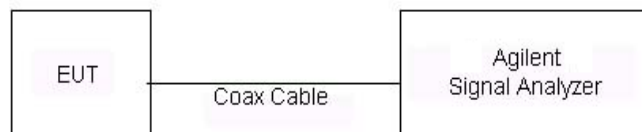


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

None

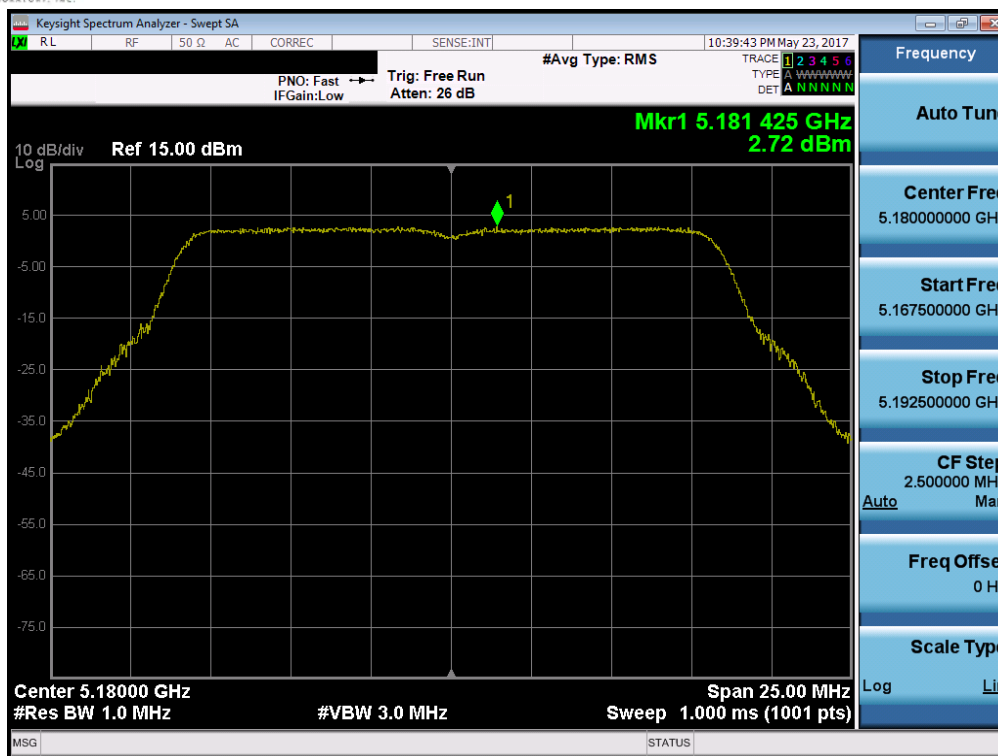
FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 64 of 254

Antenna-1 Power Spectral Density Measurements

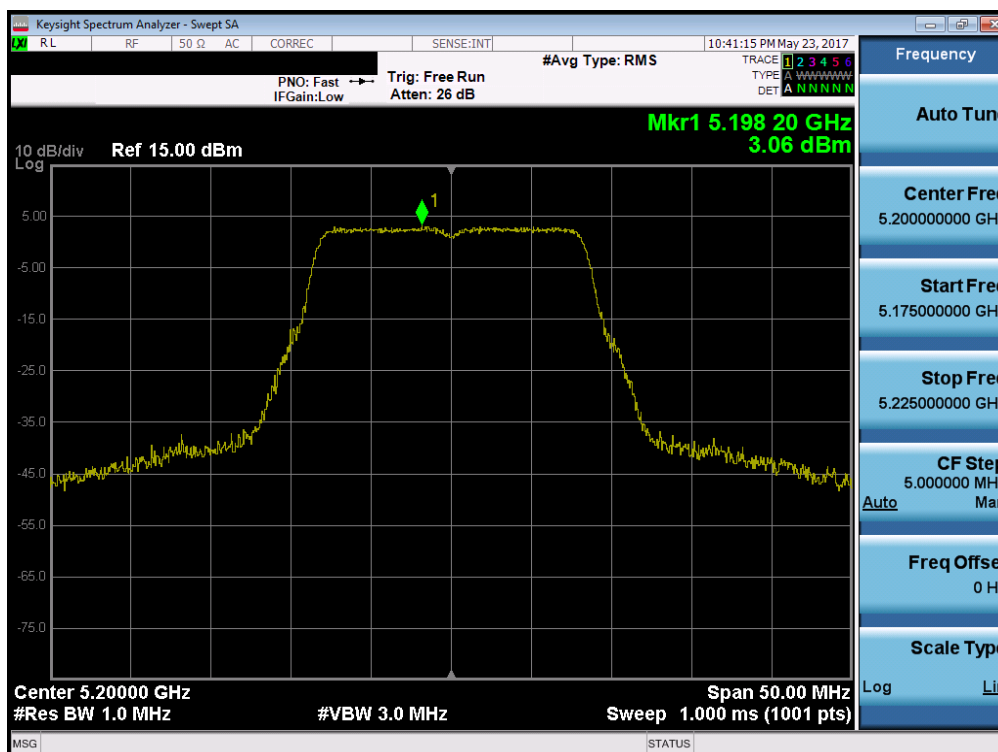
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	a	6	2.72	11.0	-8.28
	5200	40	a	6	3.06	11.0	-7.94
	5240	48	a	6	3.12	11.0	-7.88
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	2.85	11.0	-8.15
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	2.85	11.0	-8.15
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	2.74	11.0	-8.26
	5190	38	n (40MHz)	13.5/15 (MCS0)	-1.07	11.0	-12.07
	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.77	11.0	-11.77
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-6.89	11.0	-17.89
Band 2A	5260	52	a	6	1.36	11.0	-9.64
	5280	56	a	6	2.68	11.0	-8.32
	5320	64	a	6	3.27	11.0	-7.73
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	2.48	11.0	-8.52
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	2.26	11.0	-8.74
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	2.74	11.0	-8.26
	5270	54	n (40MHz)	13.5/15 (MCS0)	-0.44	11.0	-11.44
	5310	62	n (40MHz)	13.5/15 (MCS0)	-0.59	11.0	-11.59
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-6.42	11.0	-17.42
Band 2C	5500	100	a	6	4.06	11.0	-6.94
	5600	120	a	6	2.83	11.0	-8.17
	5720	144	a	6	4.03	11.0	-6.97
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	3.47	11.0	-7.53
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	3.97	11.0	-7.03
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	3.83	11.0	-7.17
	5510	102	n (40MHz)	13.5/15 (MCS0)	-2.11	11.0	-13.11
	5590	118	n (40MHz)	13.5/15 (MCS0)	-1.61	11.0	-12.61
	5710	142	n (40MHz)	13.5/15 (MCS0)	-1.50	11.0	-12.50
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-6.12	11.0	-17.12
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-5.87	11.0	-16.87
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-8.33	11.0	-19.33

Table 7-18. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements

FCC ID: A3LSMN9500		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 65 of 254

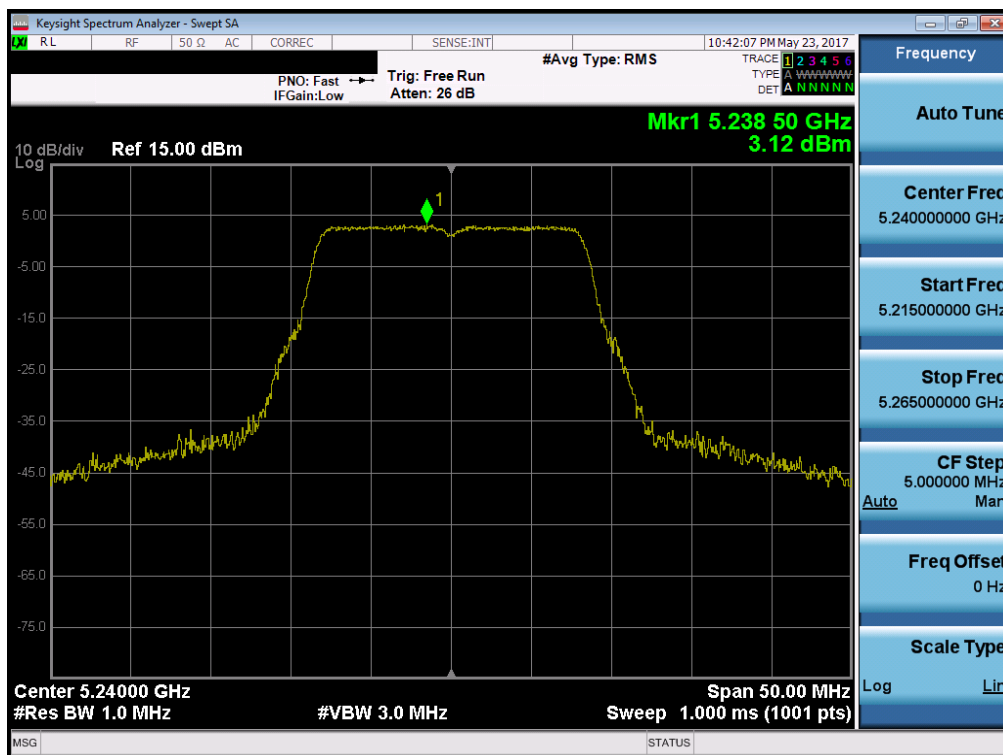


Plot 7-79. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

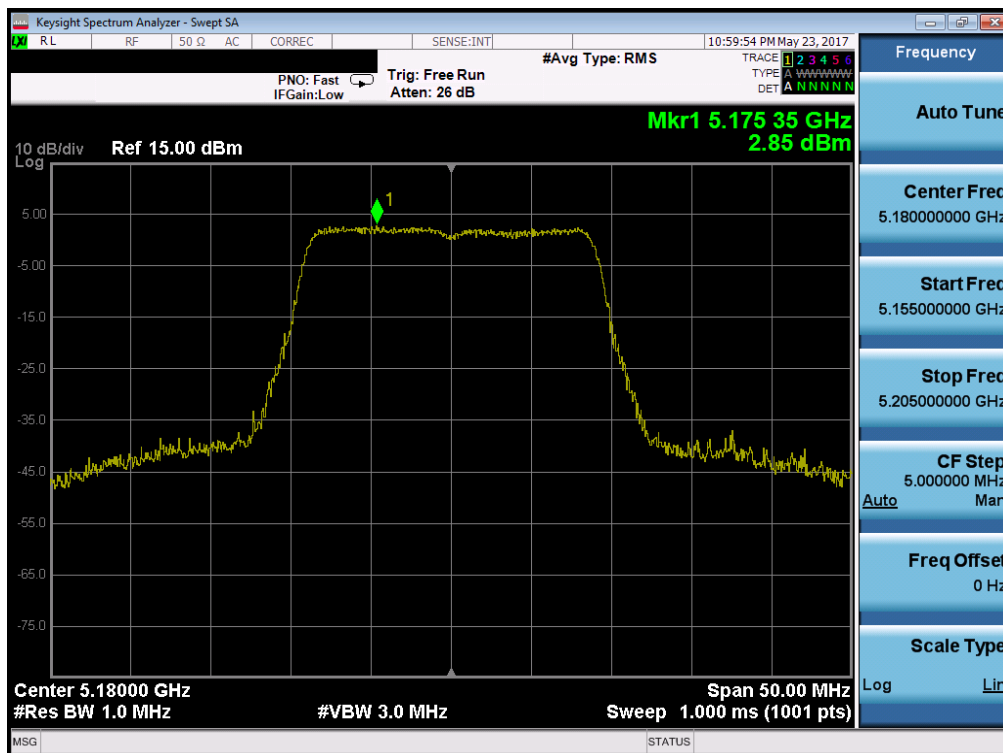


Plot 7-80. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 66 of 254

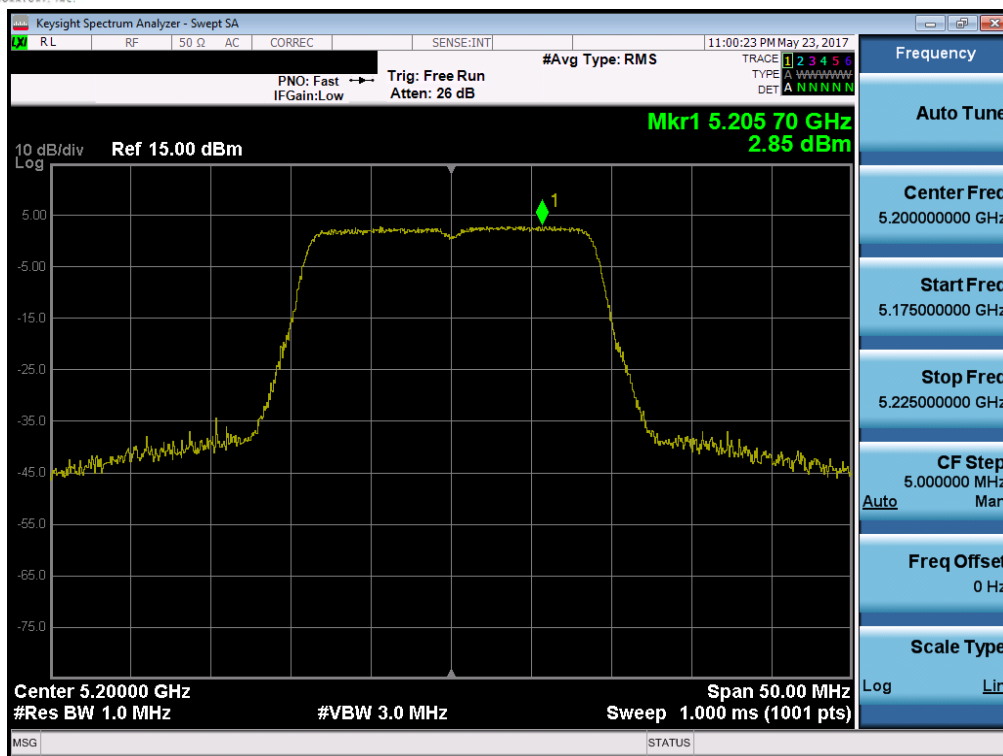


Plot 7-81. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

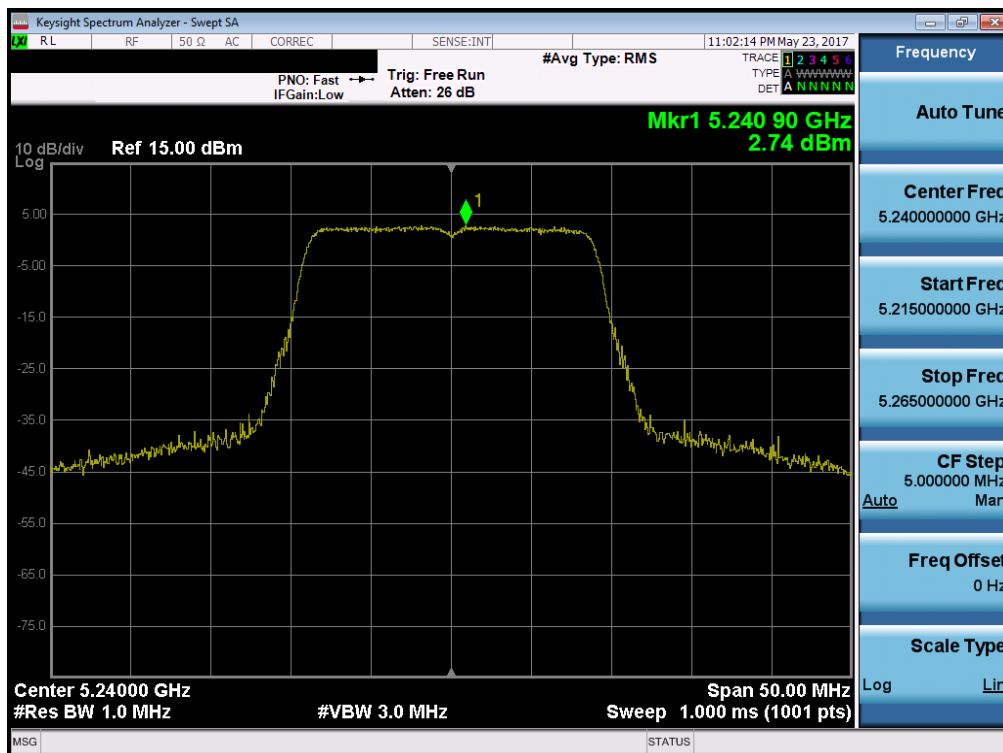


Plot 7-82. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 67 of 254

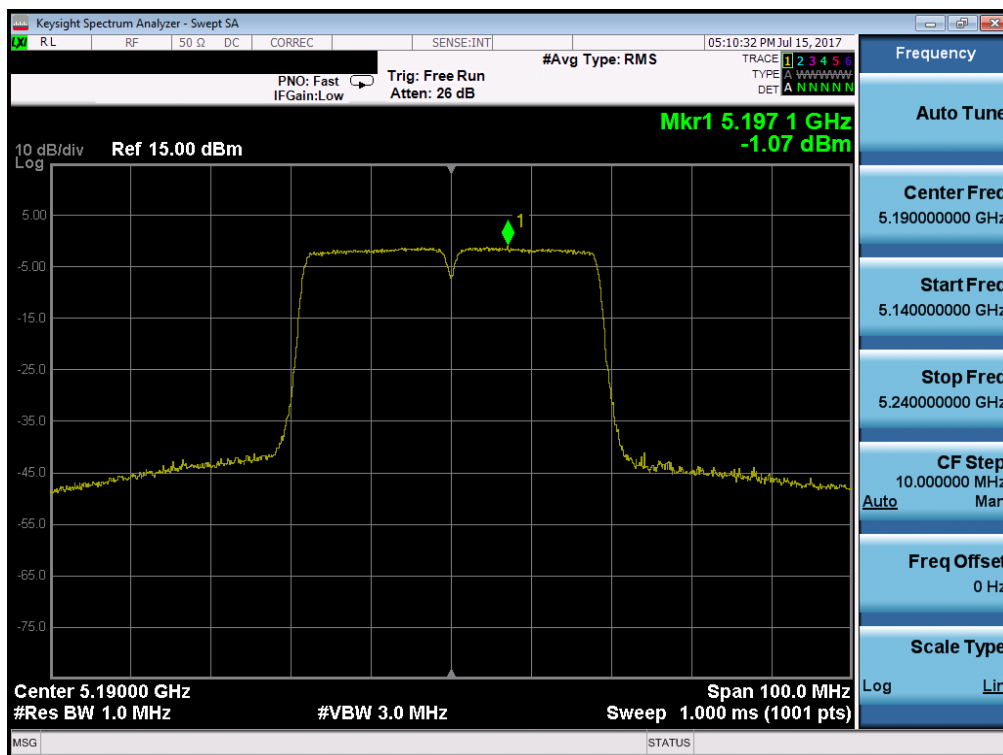


Plot 7-83. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

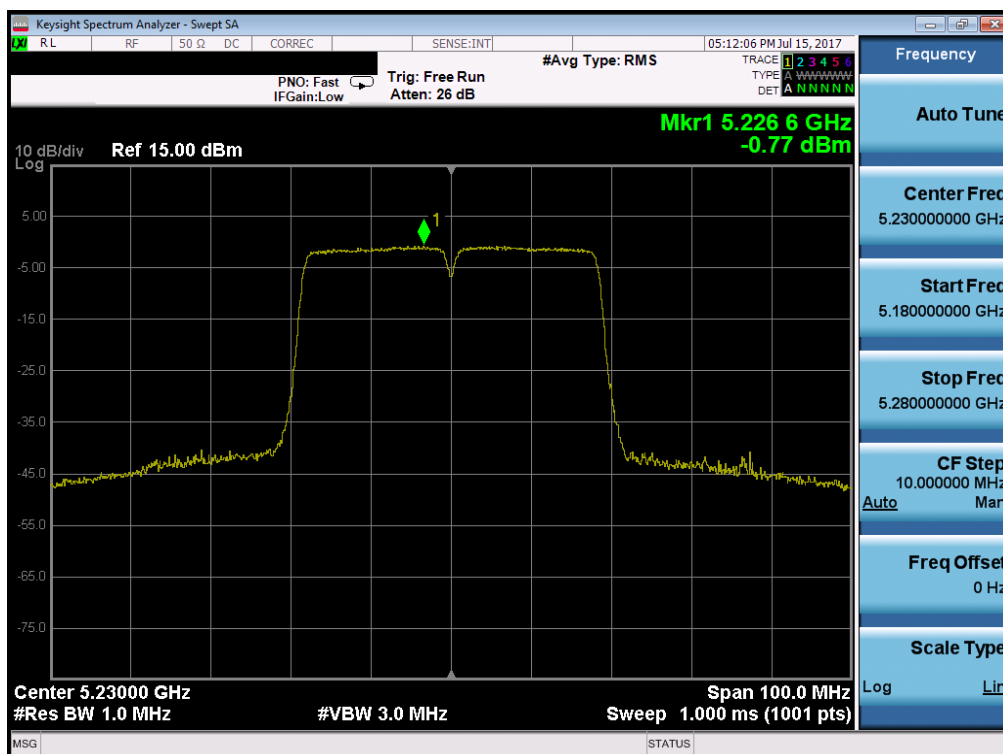


Plot 7-84. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 68 of 254

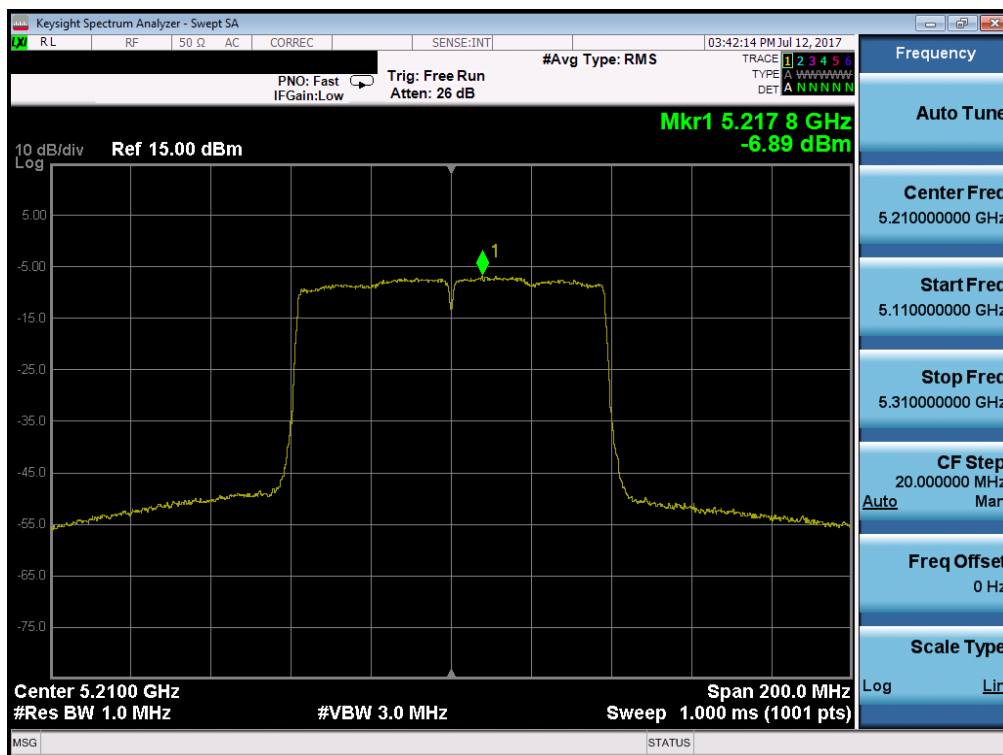


Plot 7-85. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

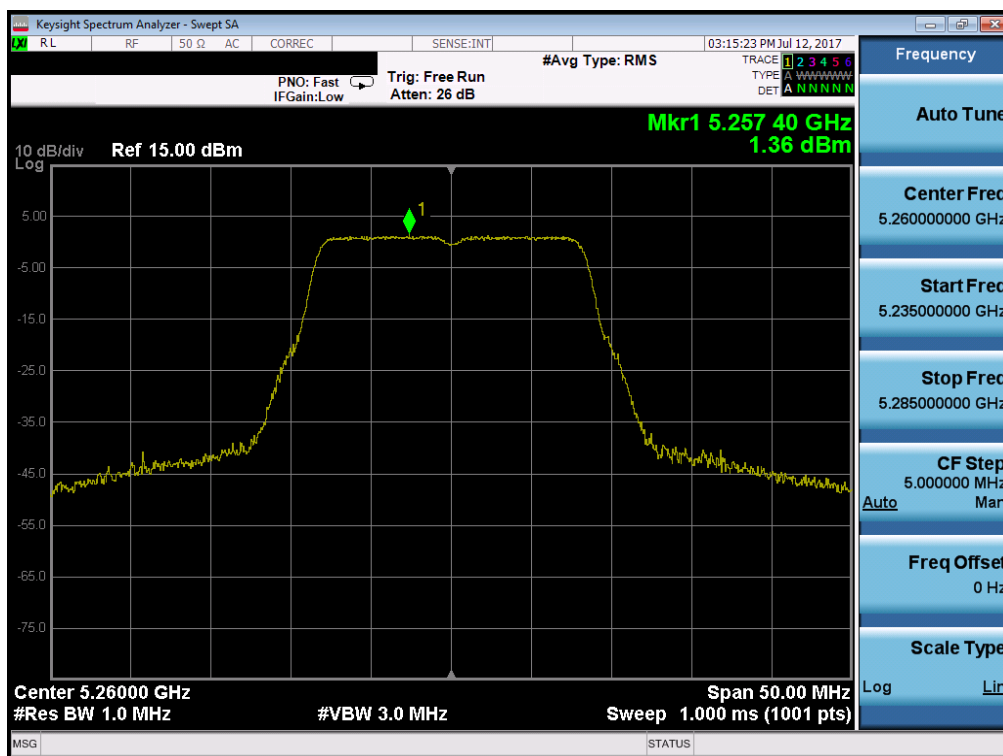


Plot 7-86. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 69 of 254

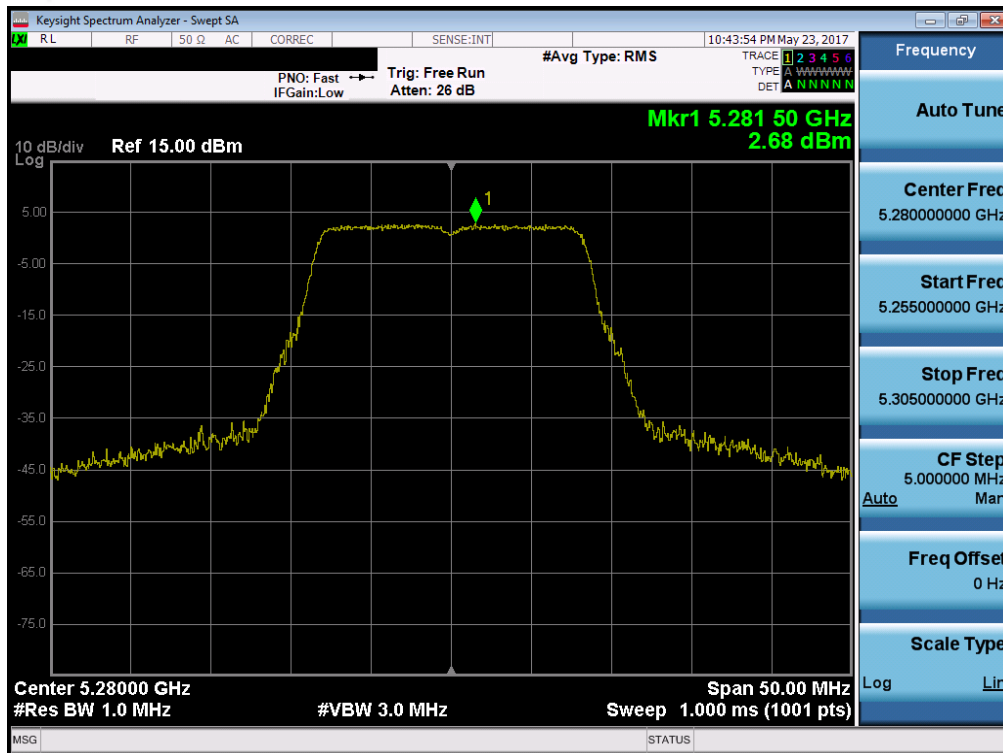


Plot 7-87. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

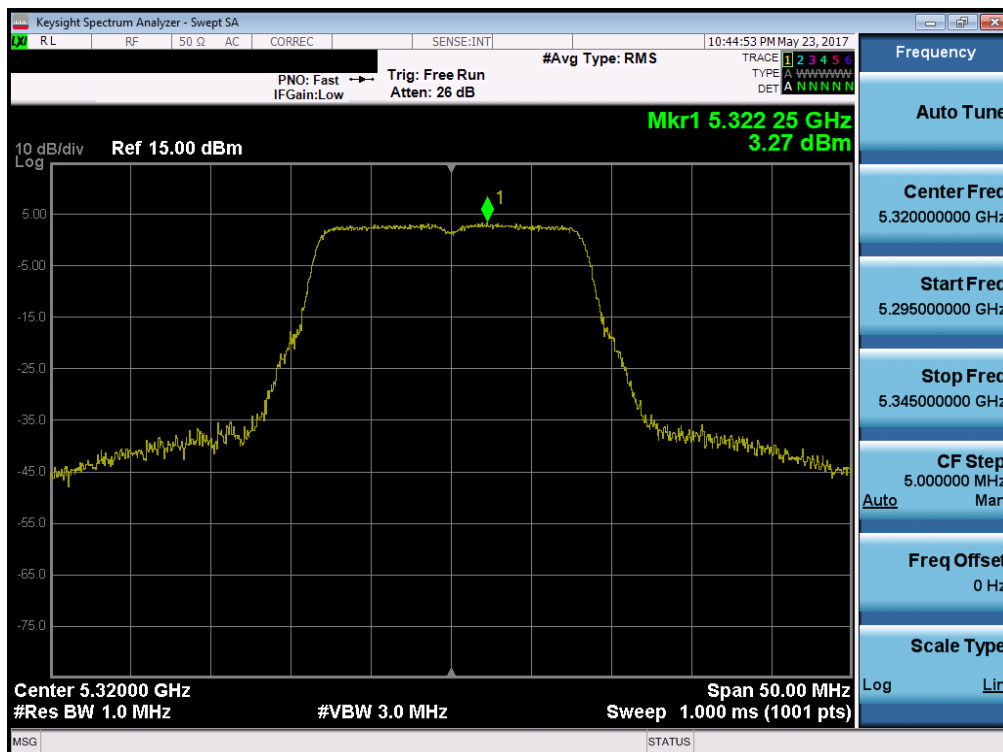


Plot 7-88. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 70 of 254

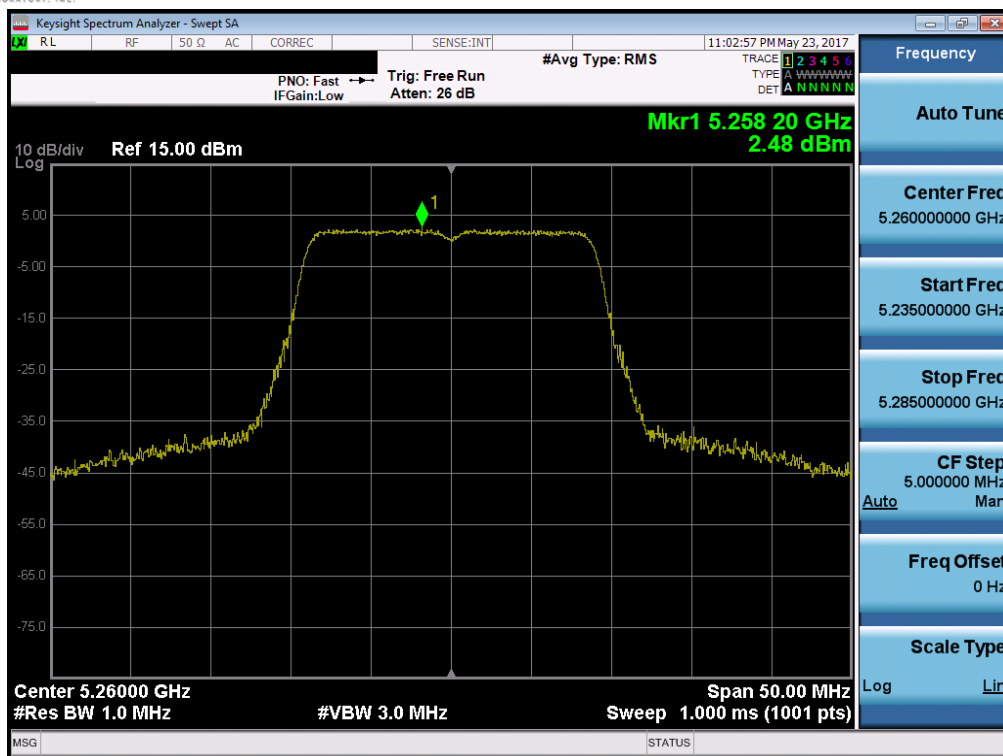


Plot 7-89. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

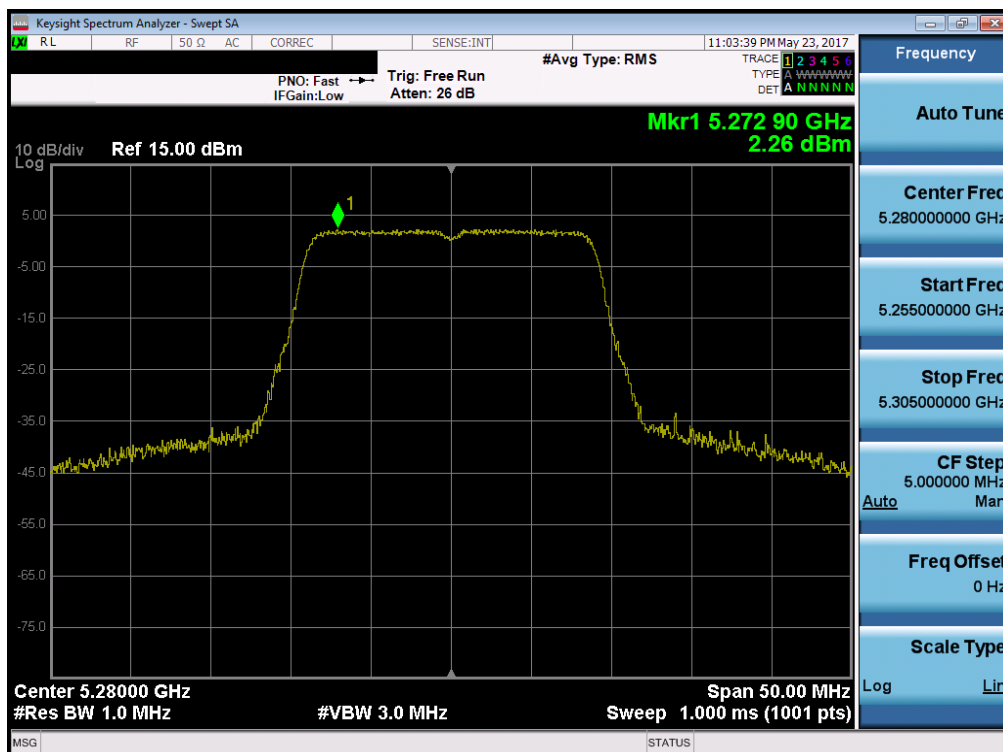


Plot 7-90. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 71 of 254

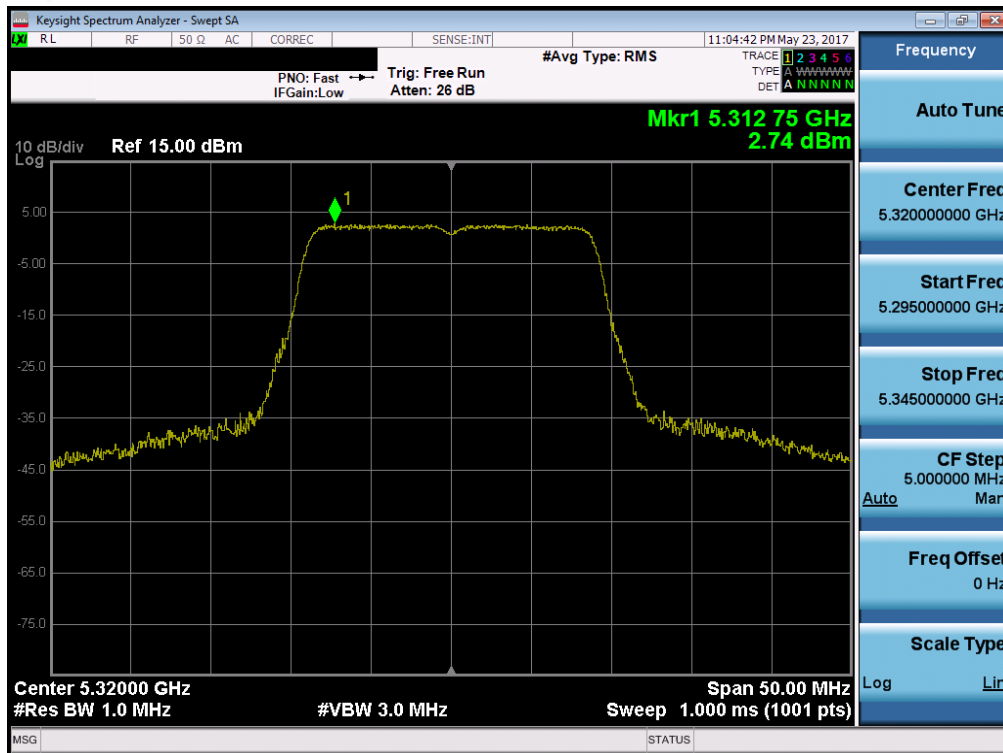


Plot 7-91. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

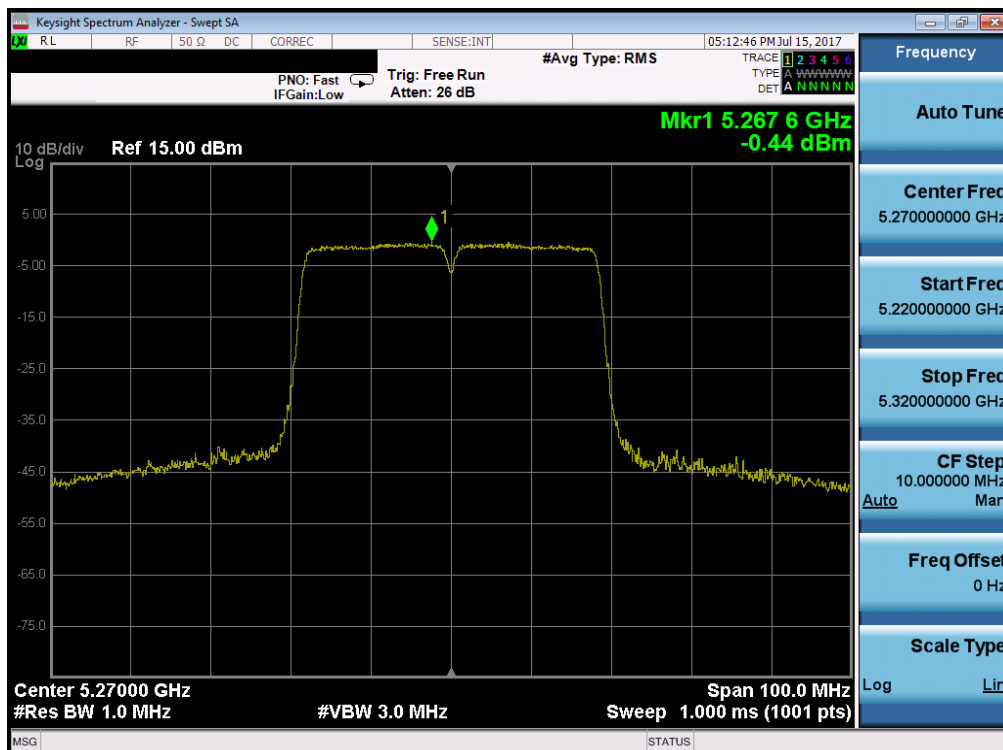


Plot 7-92. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 72 of 254

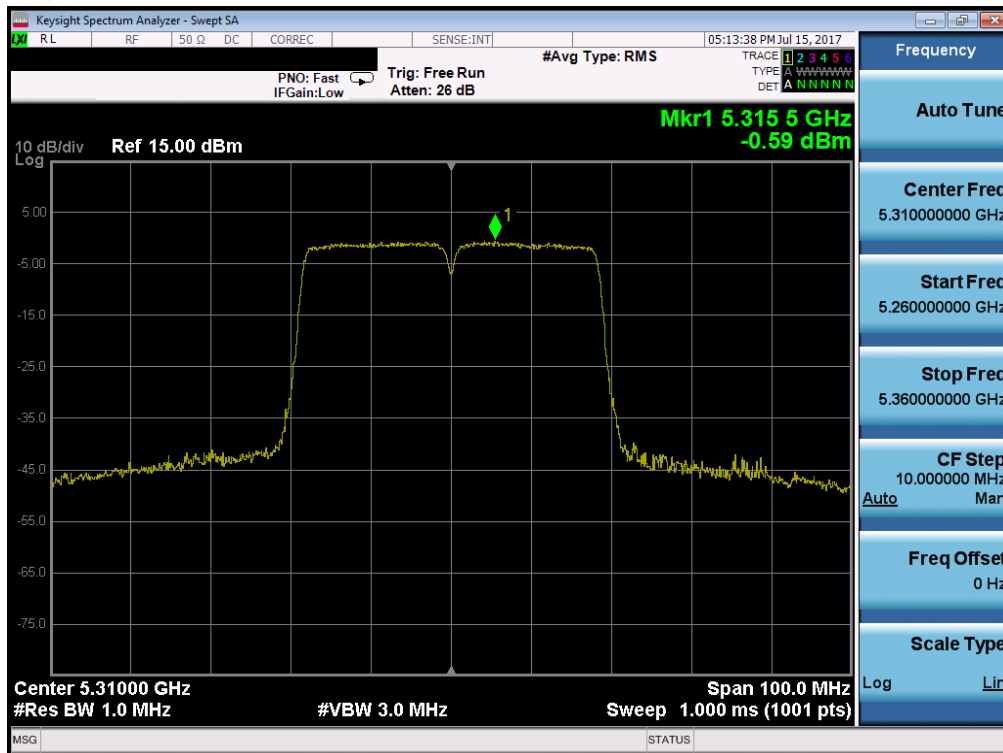


Plot 7-93. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

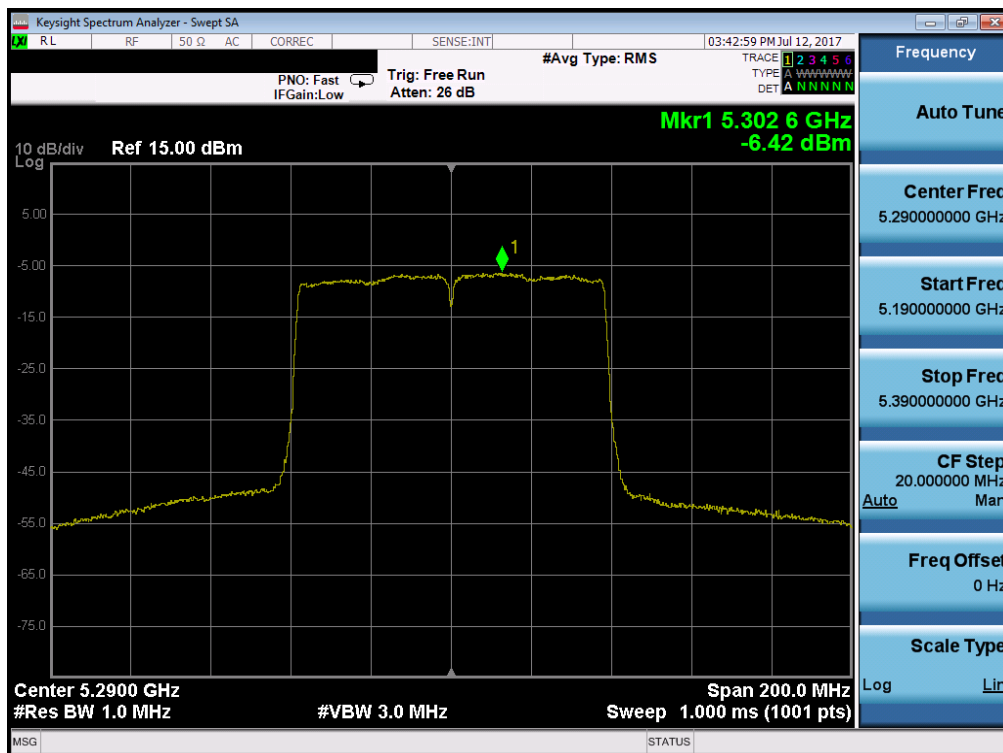


Plot 7-94. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 73 of 254

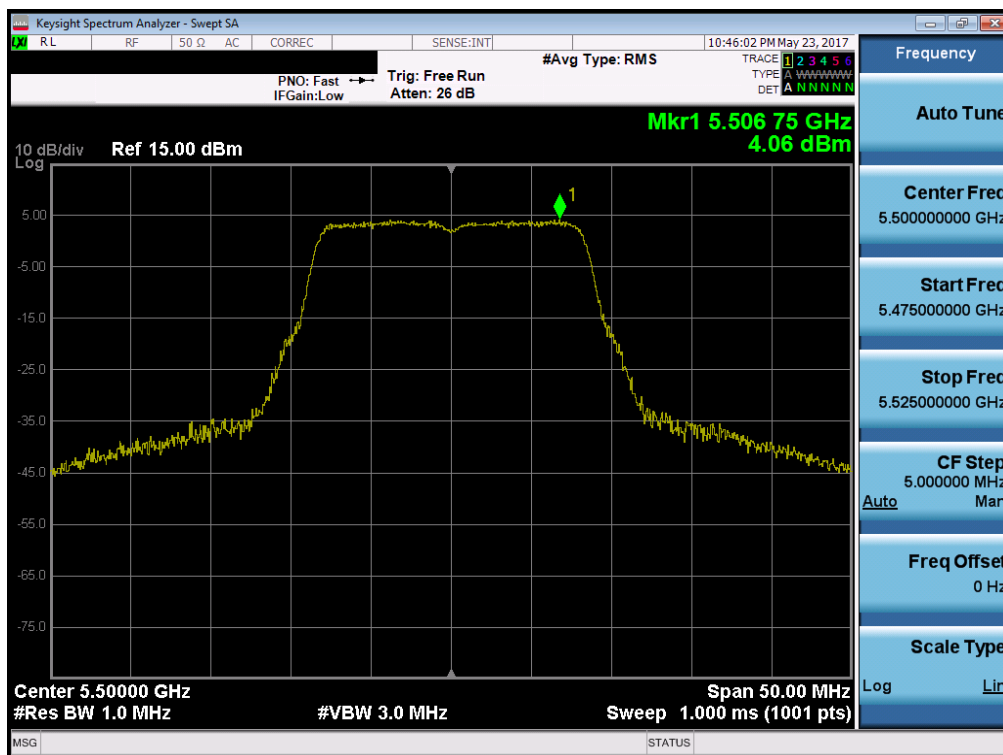


Plot 7-95. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

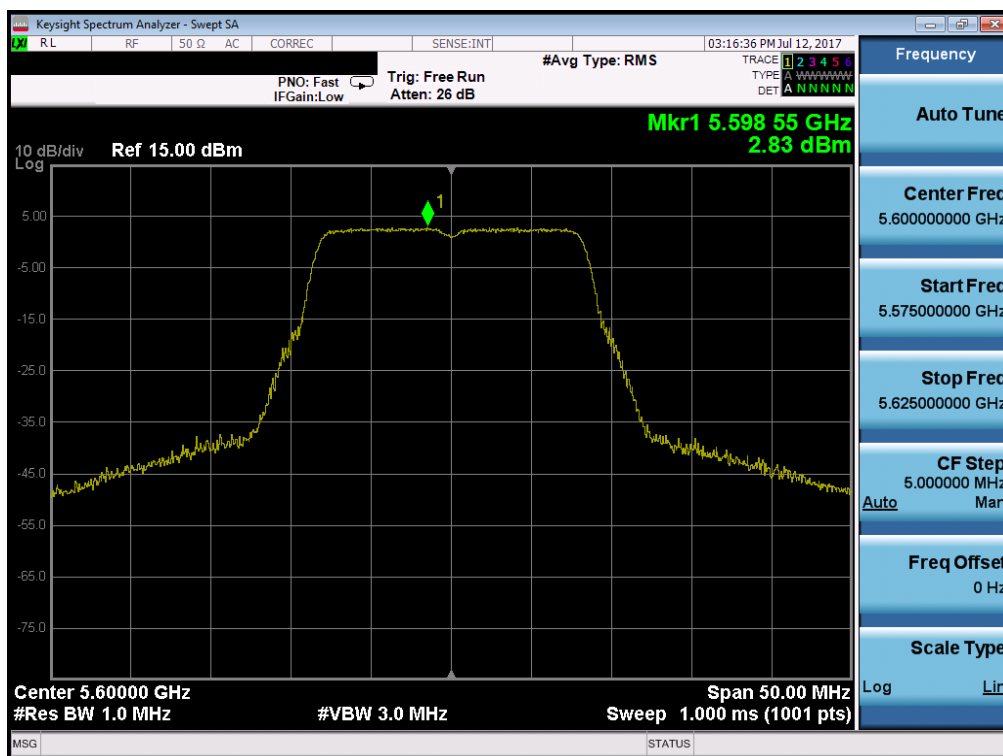


Plot 7-96. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 74 of 254

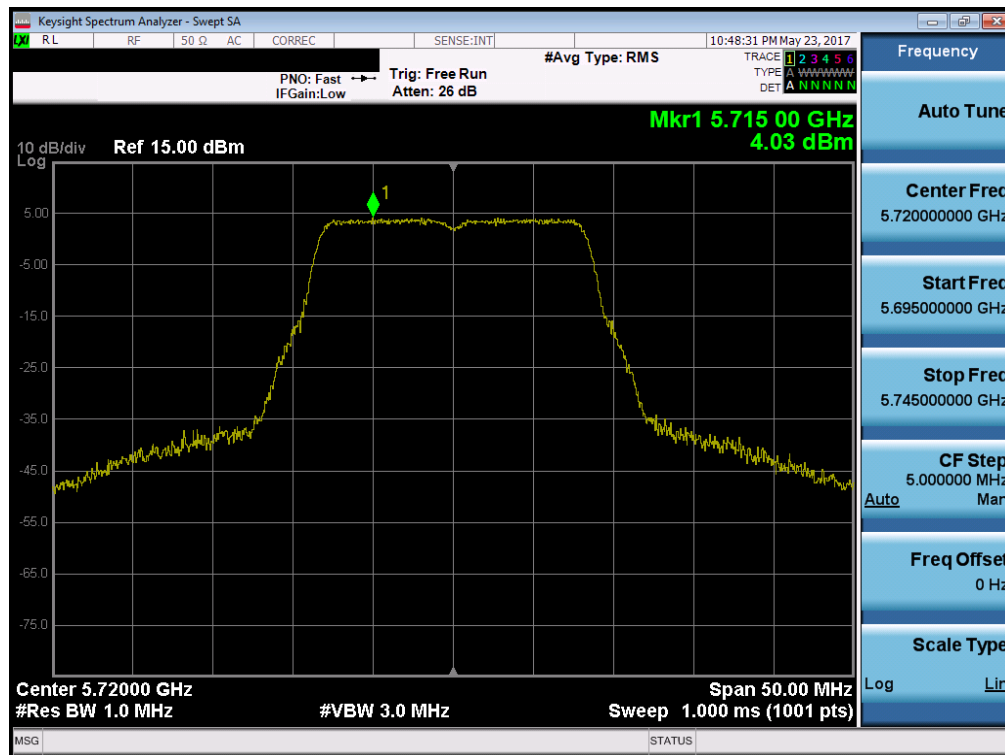


Plot 7-97. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

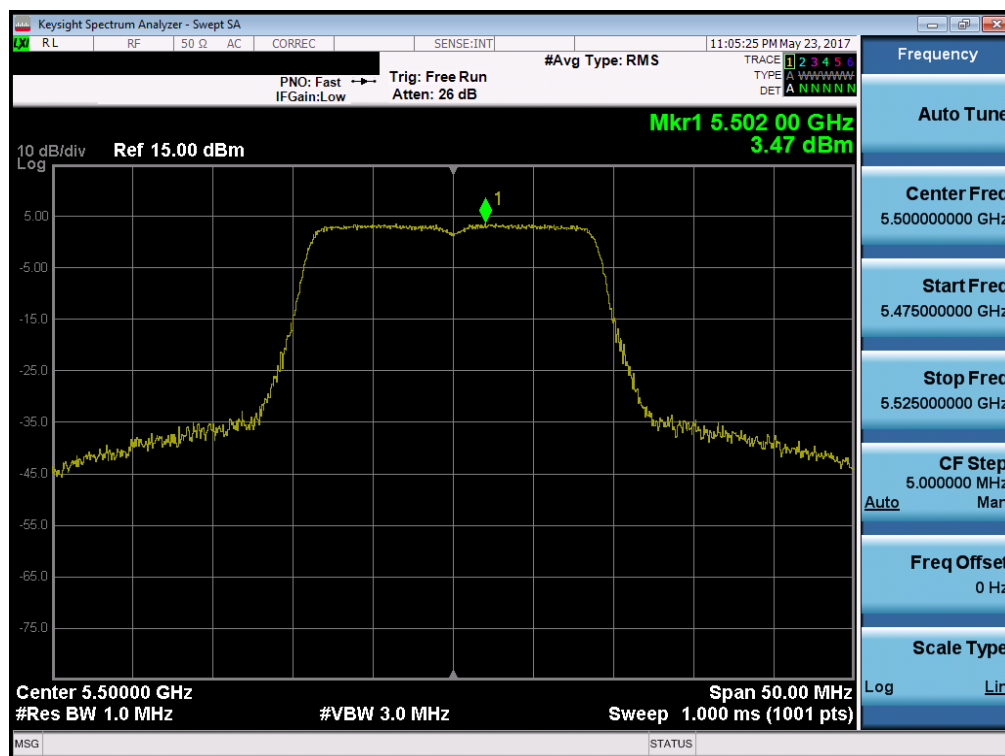


Plot 7-98. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 75 of 254

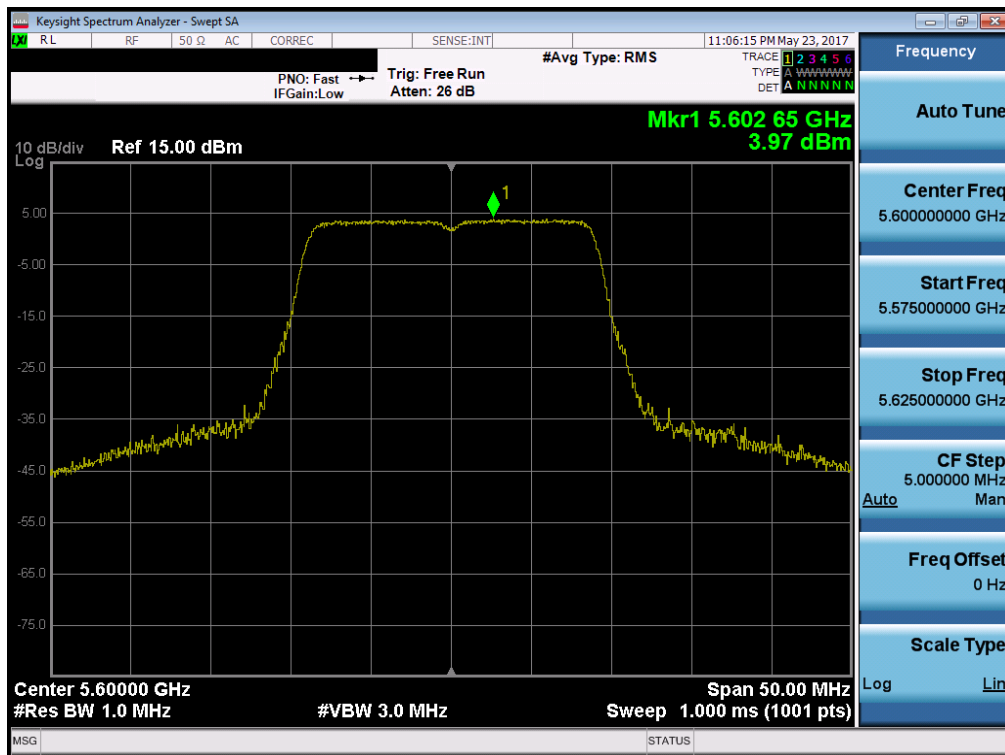


Plot 7-99. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

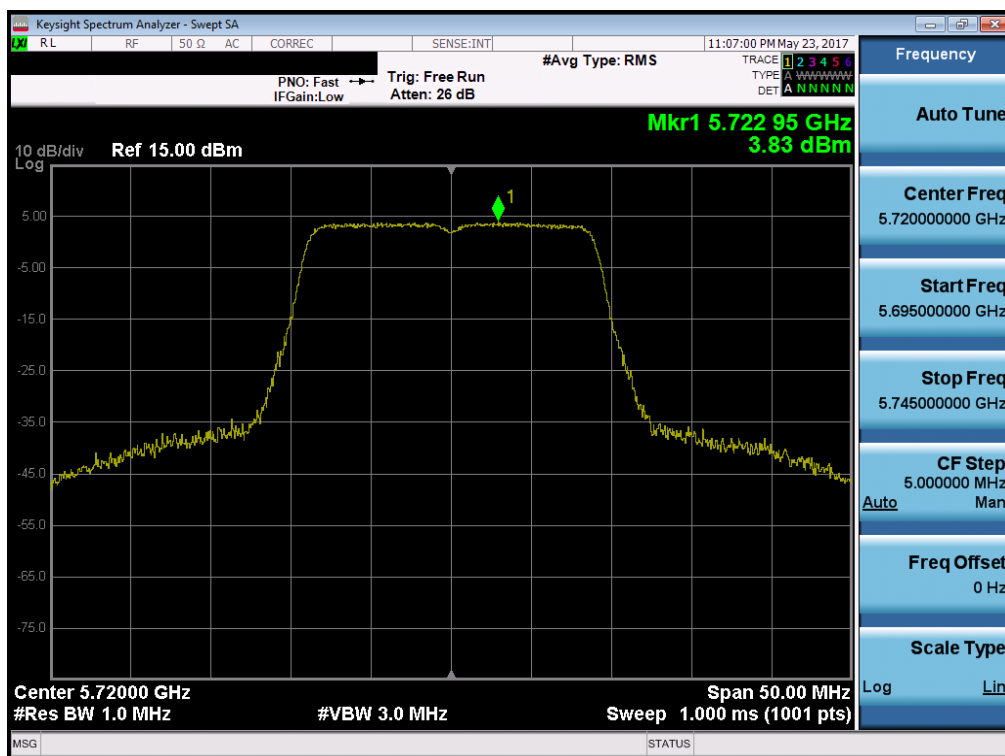


Plot 7-100. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 76 of 254

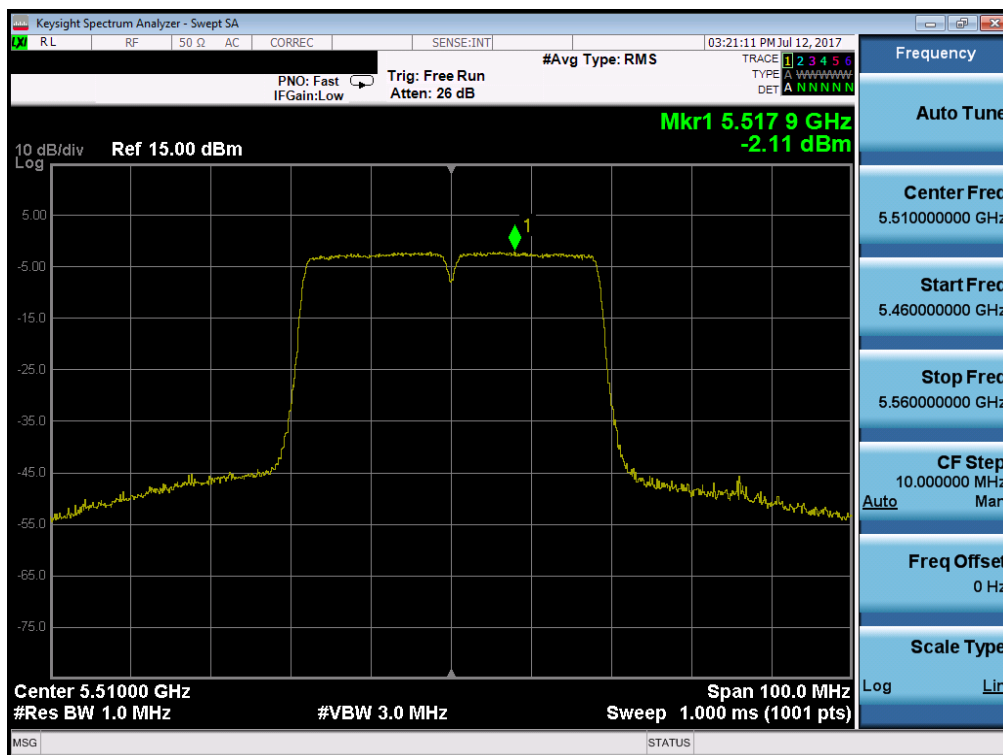


Plot 7-101. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

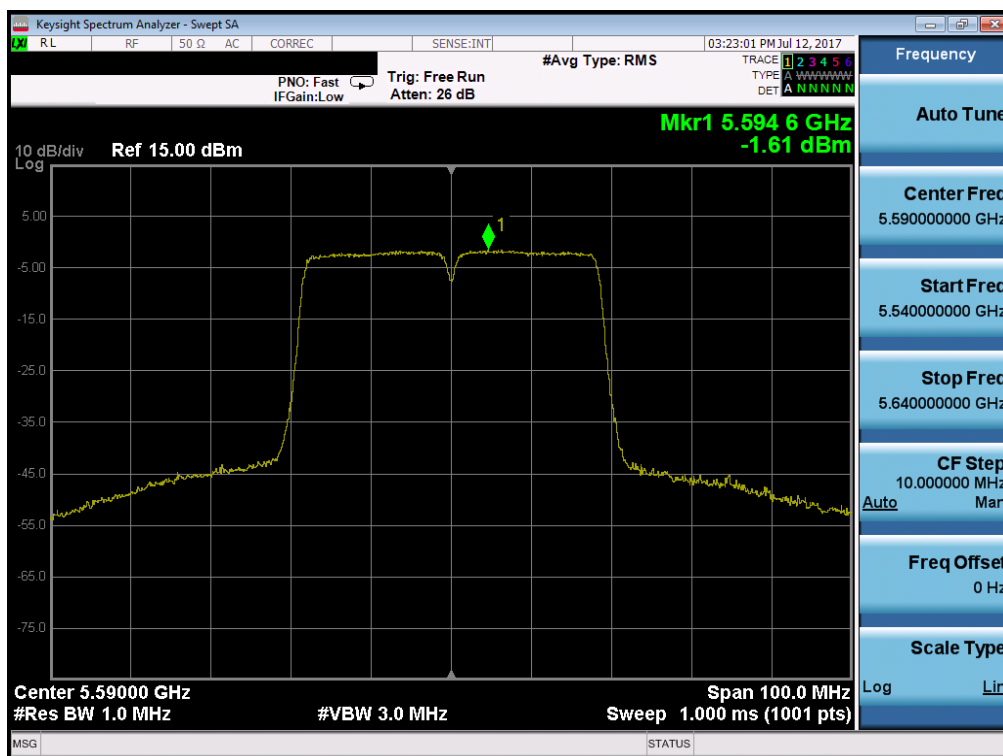


Plot 7-102. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 77 of 254

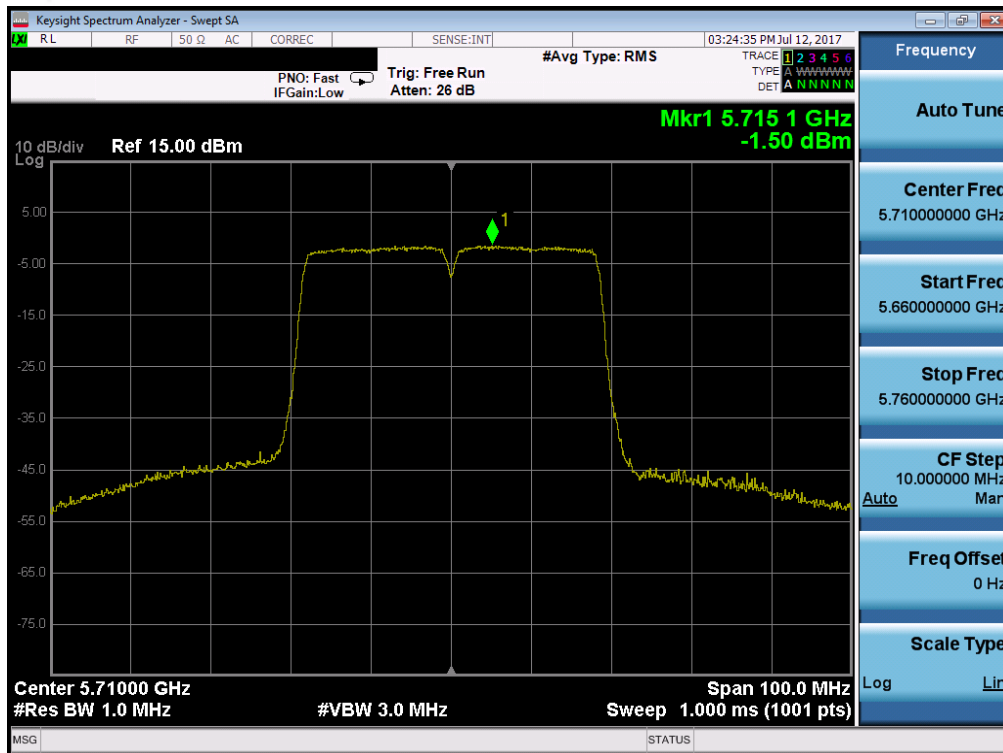


Plot 7-103. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

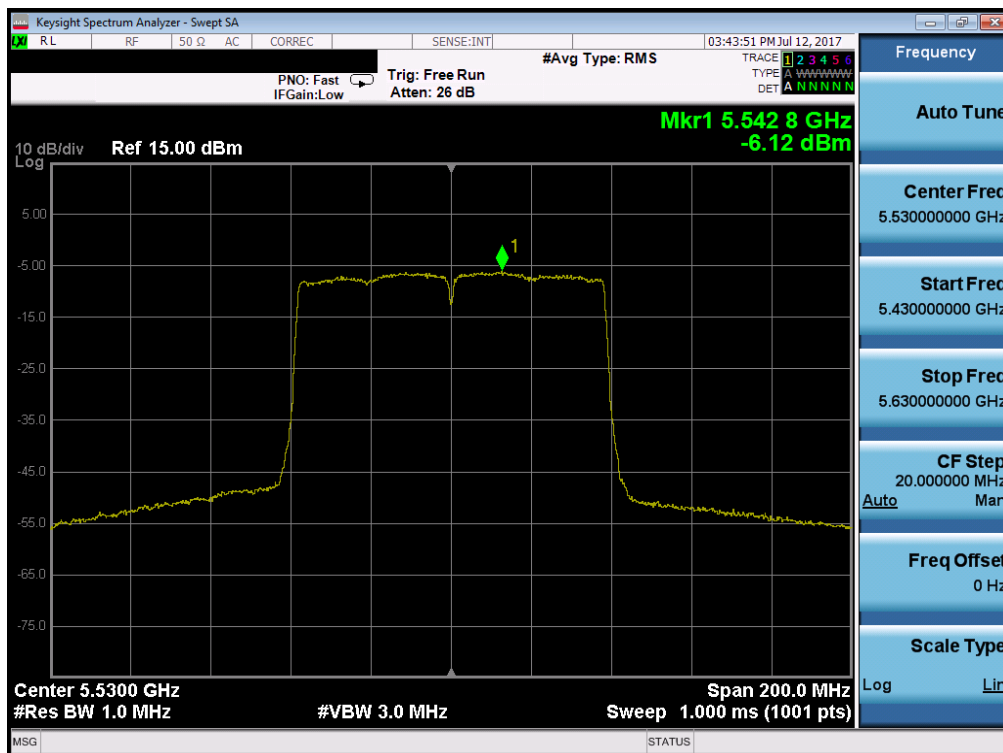


Plot 7-104. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 78 of 254

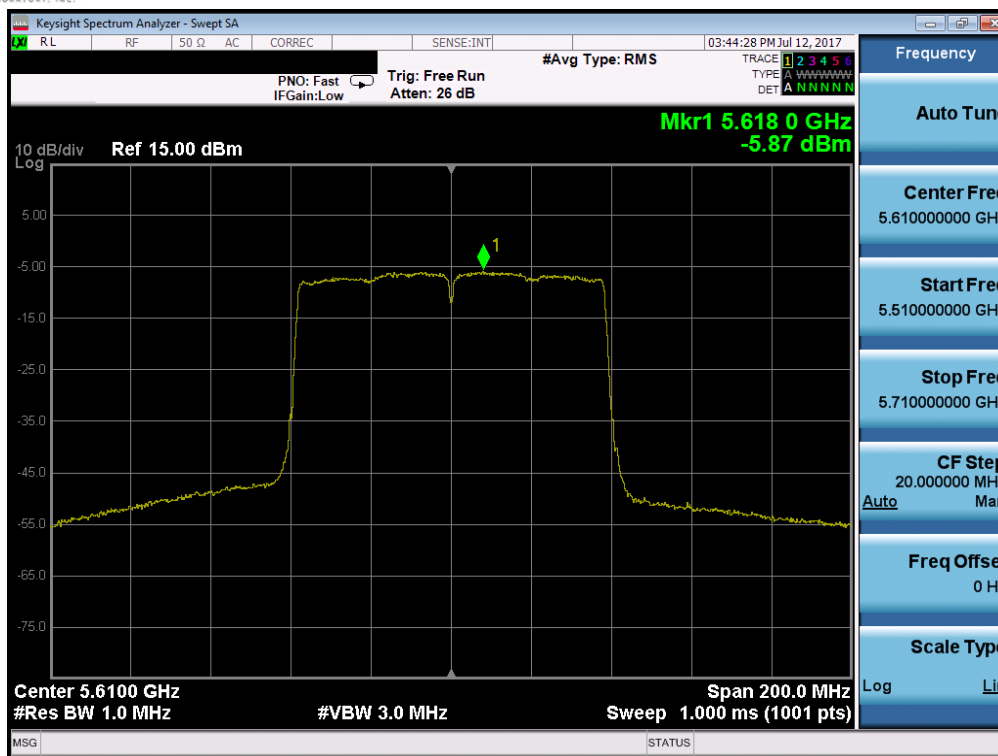


Plot 7-105. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

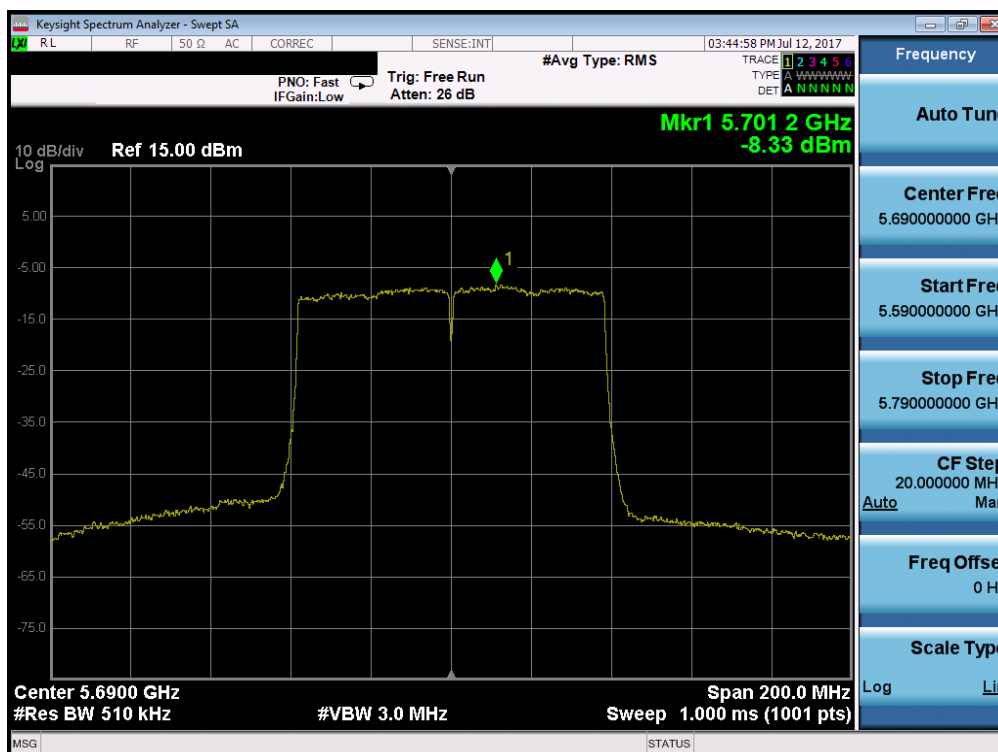


Plot 7-106. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 79 of 254



Plot 7-107. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

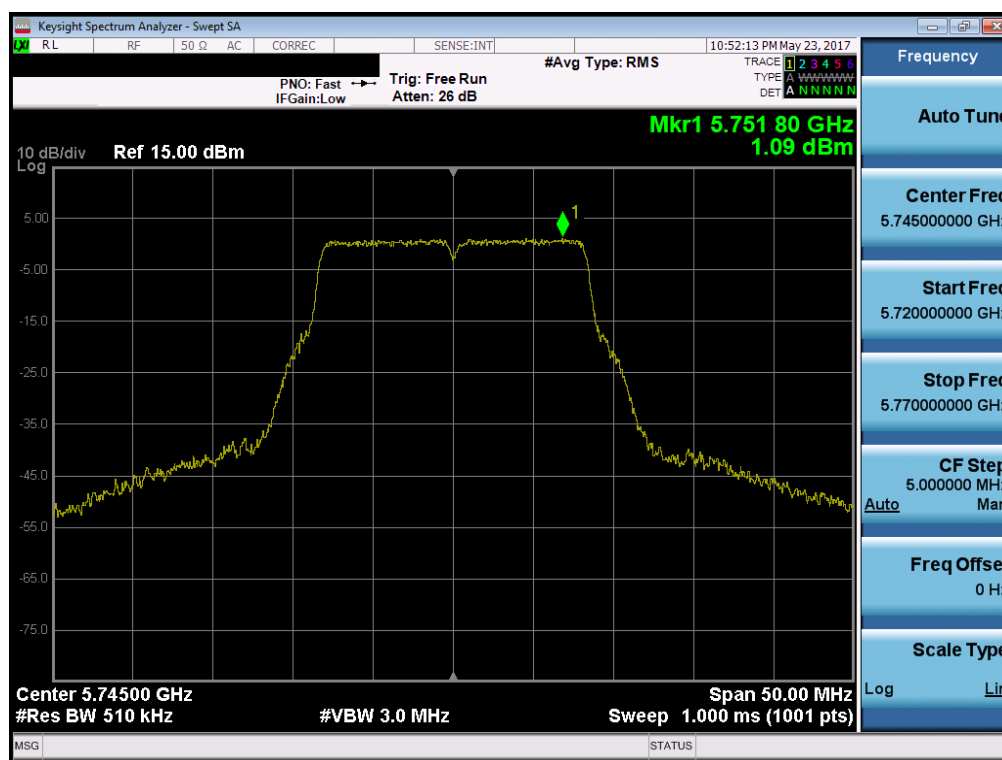


Plot 7-108. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN9500	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset	Page 80 of 254

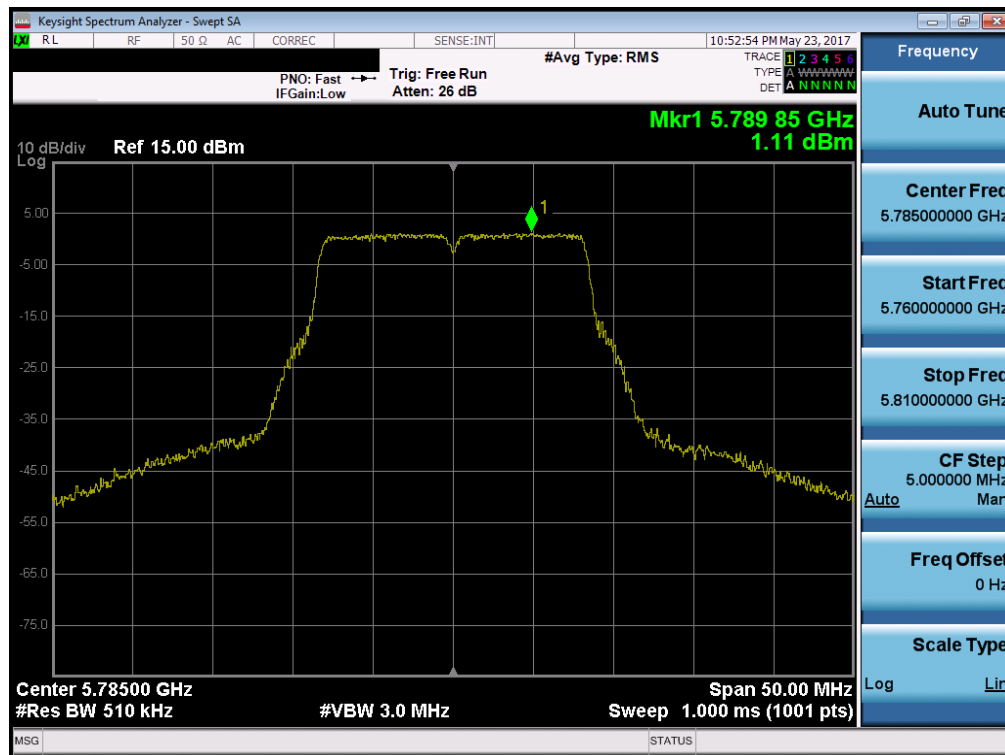
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	a	6	1.09	30.0	-28.91
	5785	157	a	6	1.11	30.0	-28.90
	5825	165	a	6	0.76	30.0	-29.24
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	1.00	30.0	-29.01
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	1.09	30.0	-28.91
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	0.81	30.0	-29.19
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.51	30.0	-32.51
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.65	30.0	-32.65
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-4.52	30.0	-34.52

Table 7-19. Band 3 Conducted Power Spectral Density Measurements

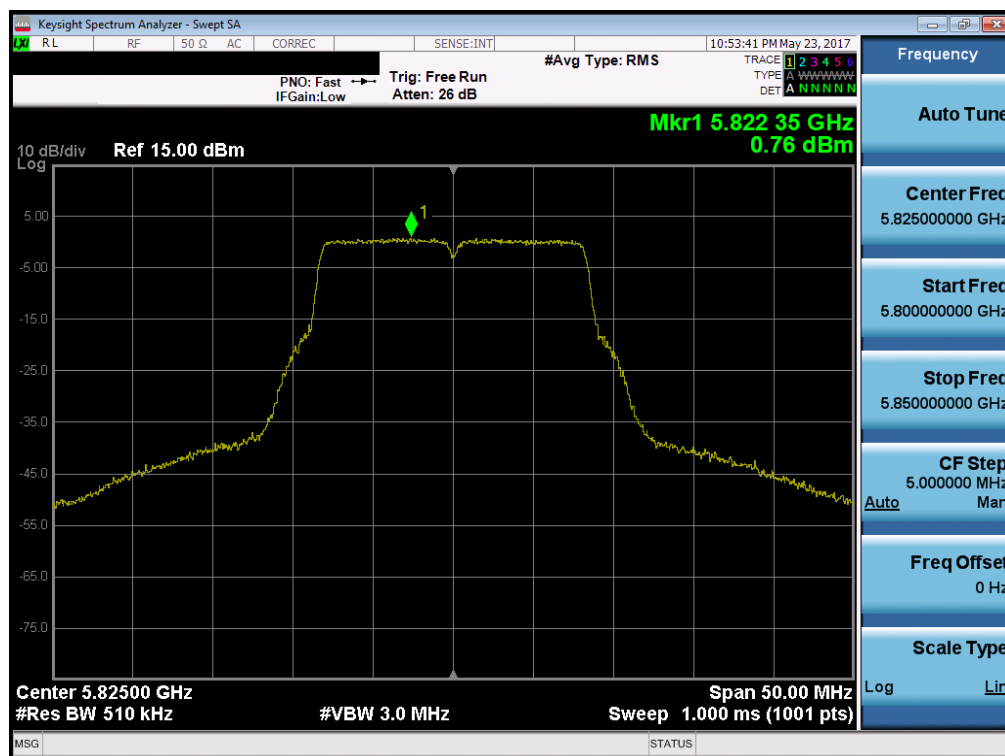


Plot 7-109. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 81 of 254

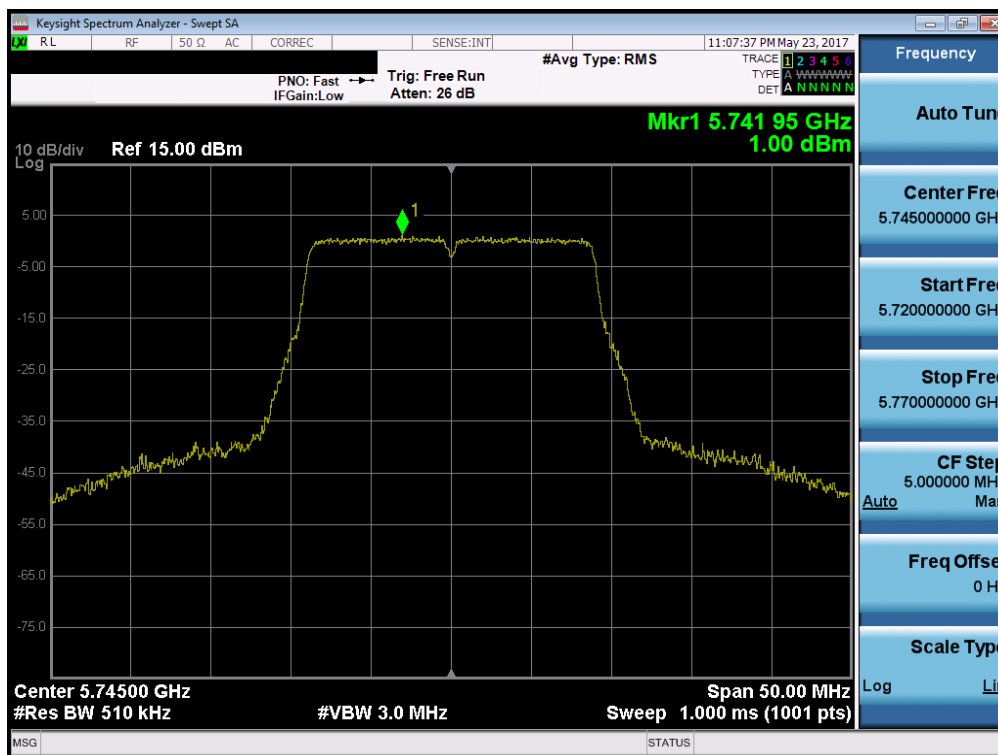


Plot 7-110. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

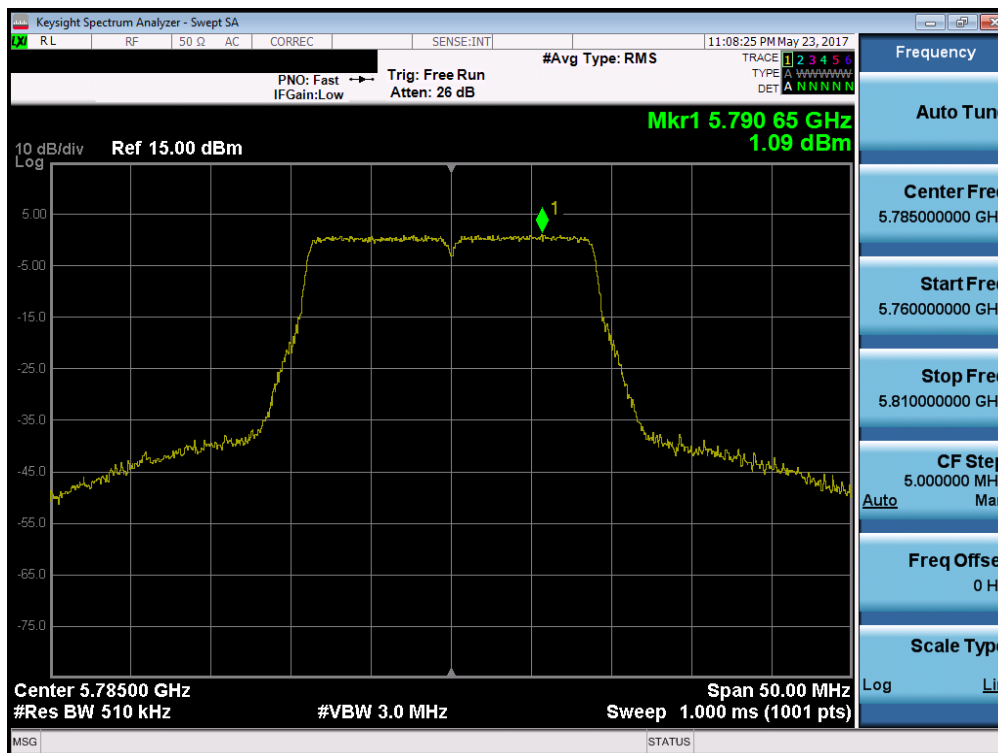


Plot 7-111. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 82 of 254

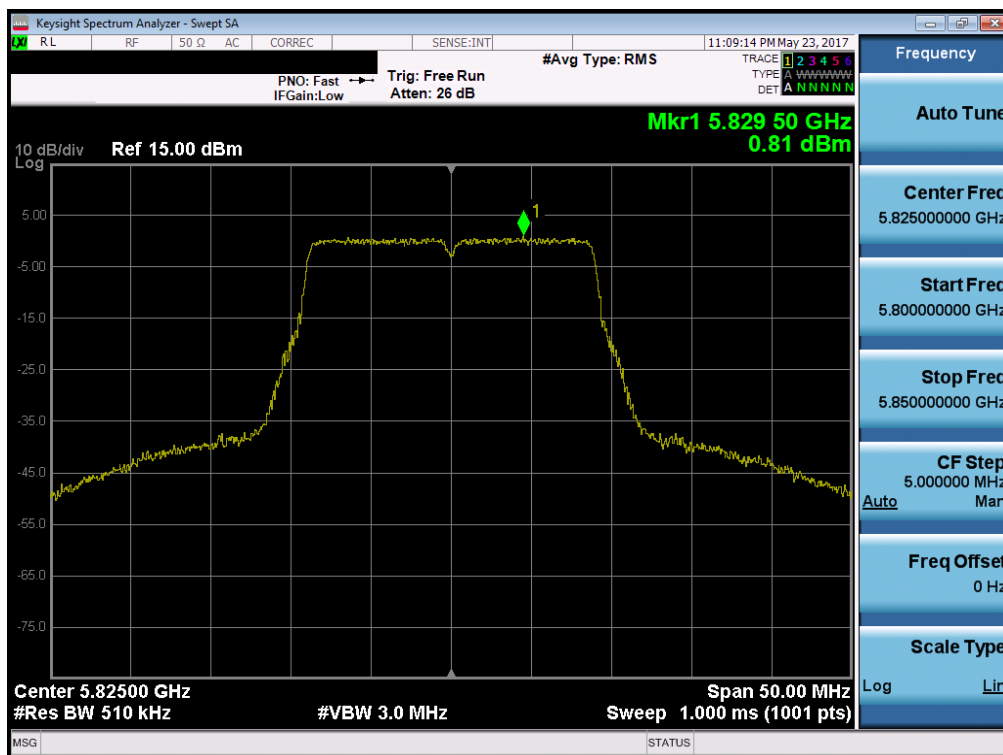


Plot 7-112. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

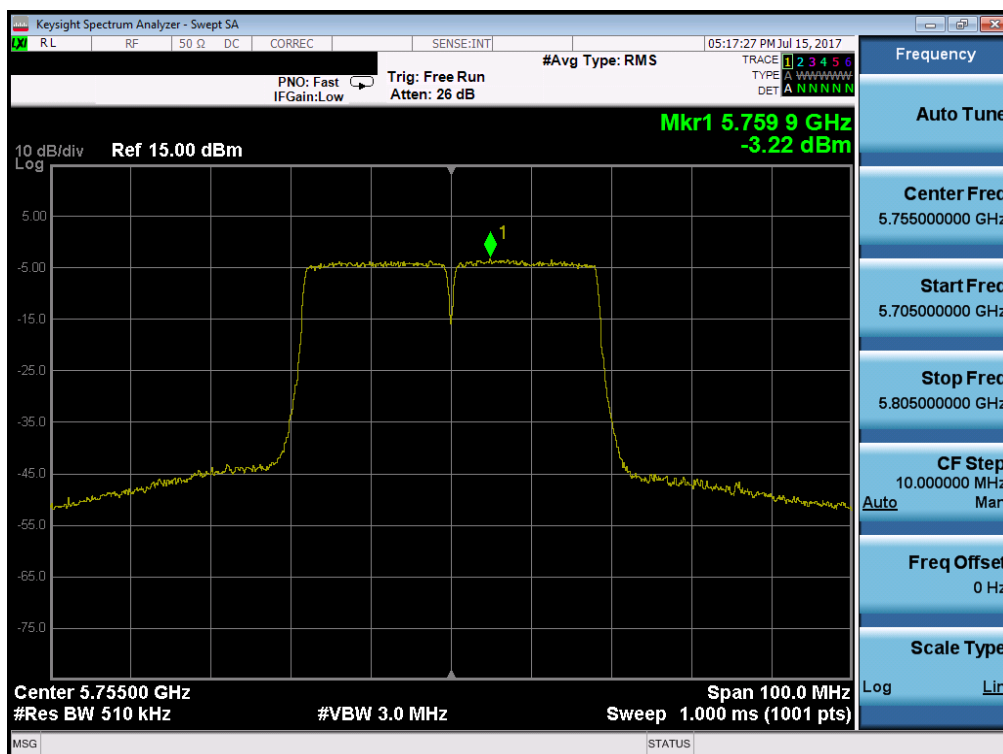


Plot 7-113. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 83 of 254

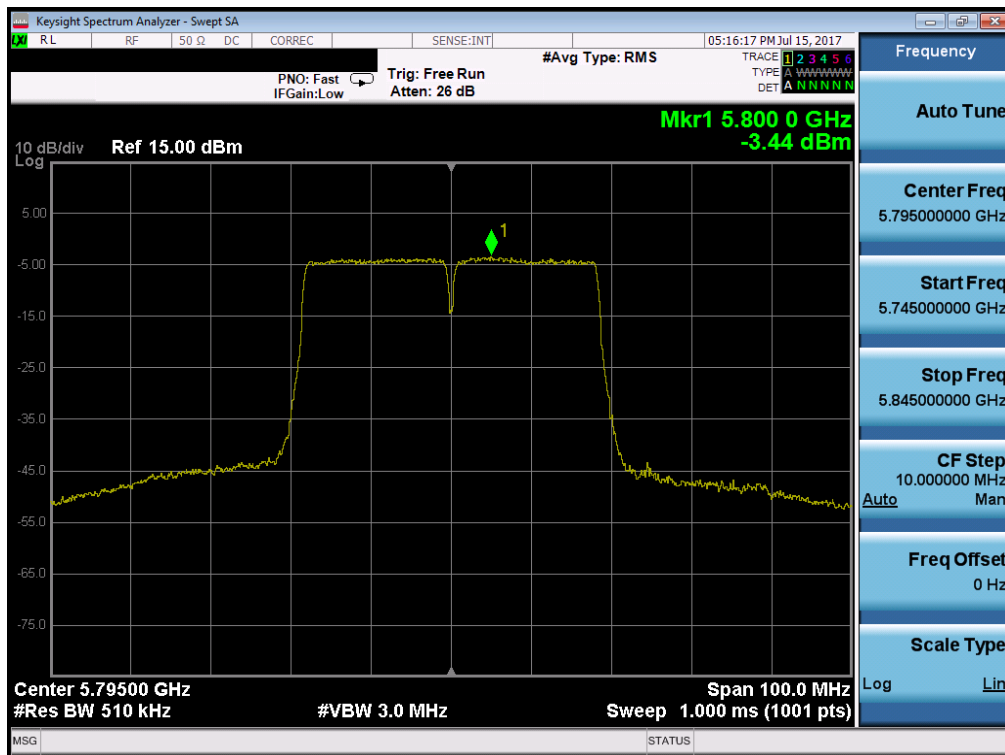


Plot 7-114. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

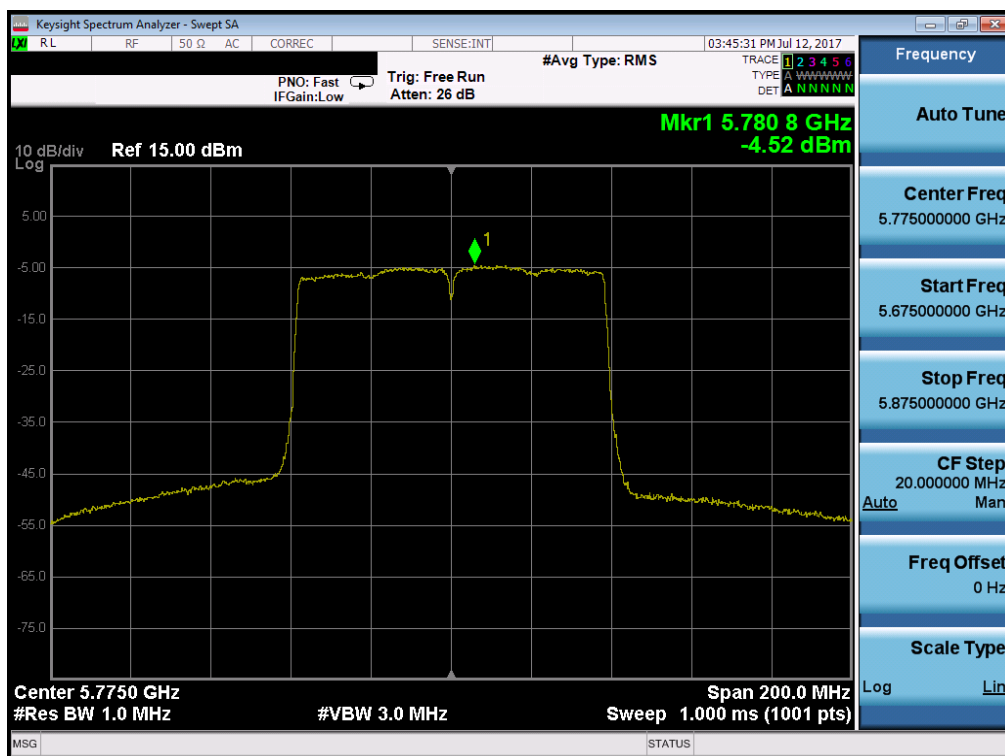


Plot 7-115. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 84 of 254



Plot 7-116. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-117. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

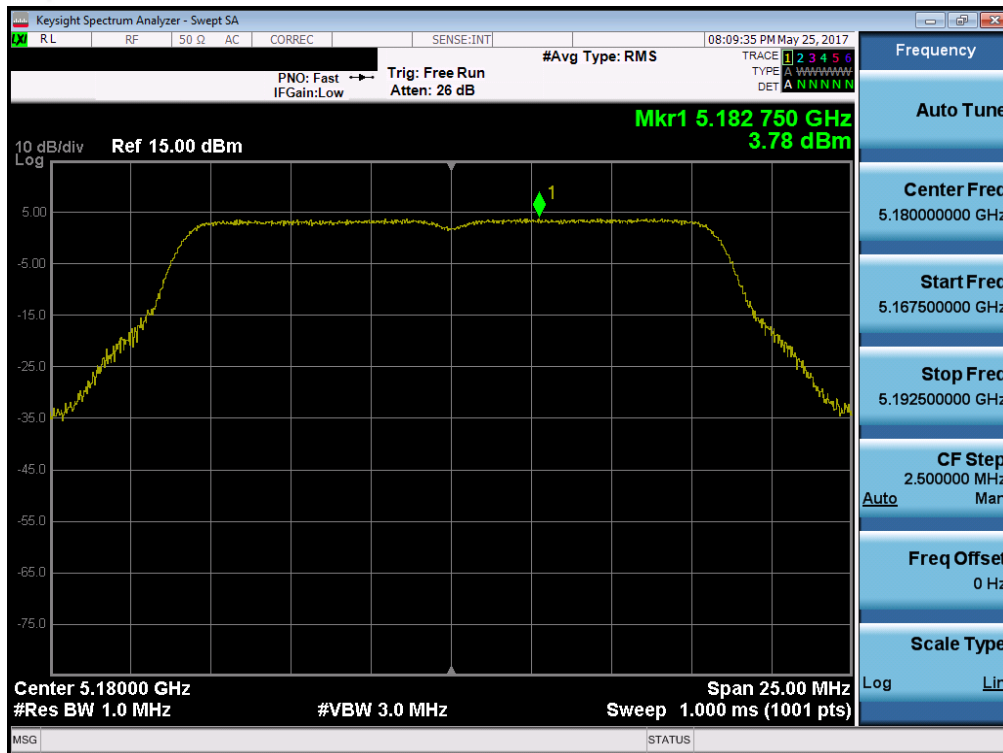
FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 85 of 254

Antenna-2 Power Spectral Density Measurements

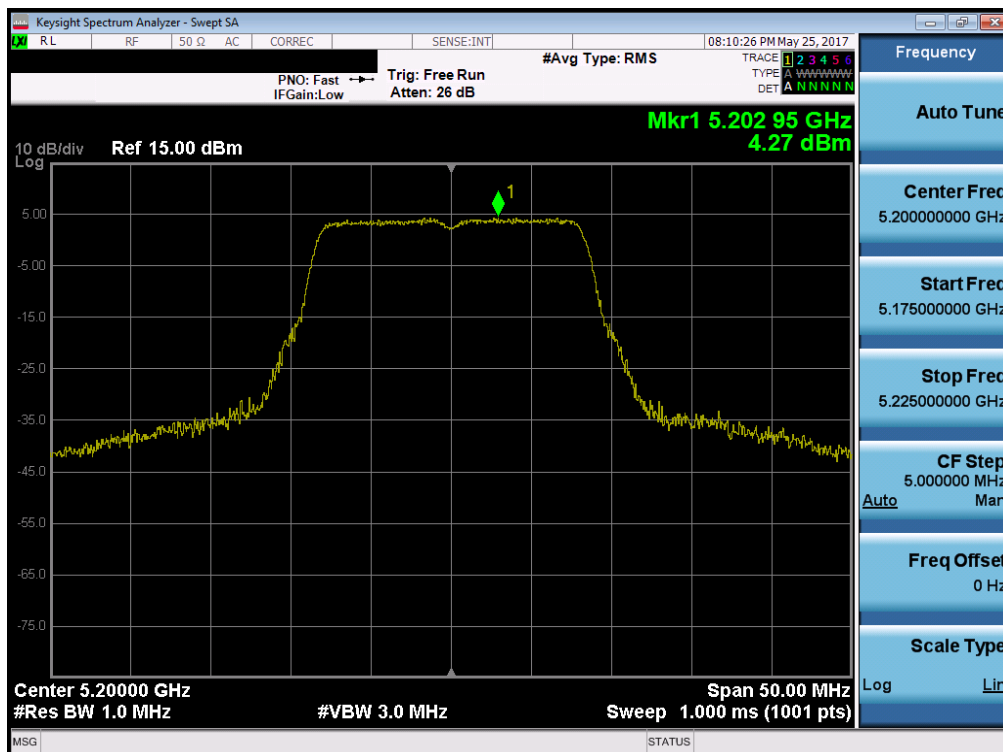
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	a	6	3.78	11.0	-7.22
	5200	40	a	6	4.27	11.0	-6.73
	5240	48	a	6	4.60	11.0	-6.41
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	3.65	11.0	-7.36
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	3.95	11.0	-7.05
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	3.66	11.0	-7.34
	5190	38	n (40MHz)	13.5/15 (MCS0)	-0.42	11.0	-11.42
	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.15	11.0	-11.15
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-7.01	11.0	-18.01
Band 2A	5260	52	a	6	4.42	11.0	-6.58
	5280	56	a	6	4.63	11.0	-6.37
	5320	64	a	6	5.07	11.0	-5.93
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	3.85	11.0	-7.15
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	4.32	11.0	-6.68
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	4.44	11.0	-6.56
	5270	54	n (40MHz)	13.5/15 (MCS0)	0.18	11.0	-10.82
	5310	62	n (40MHz)	13.5/15 (MCS0)	0.50	11.0	-10.50
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-6.26	11.0	-17.26
Band 2C	5500	100	a	6	4.78	11.0	-6.22
	5600	120	a	6	4.55	11.0	-6.45
	5720	144	a	6	3.79	11.0	-7.22
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	4.46	11.0	-6.54
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	3.84	11.0	-7.16
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	3.59	11.0	-7.41
	5510	102	n (40MHz)	13.5/15 (MCS0)	0.06	11.0	-10.95
	5590	118	n (40MHz)	13.5/15 (MCS0)	0.03	11.0	-10.97
	5710	142	n (40MHz)	13.5/15 (MCS0)	-0.36	11.0	-11.36
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-5.06	11.0	-16.06
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-5.05	11.0	-16.05
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-7.81	11.0	-18.81

Table 7-20. Conducted Power Spectral Density Measurements

FCC ID: A3LSMN9500	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 86 of 254

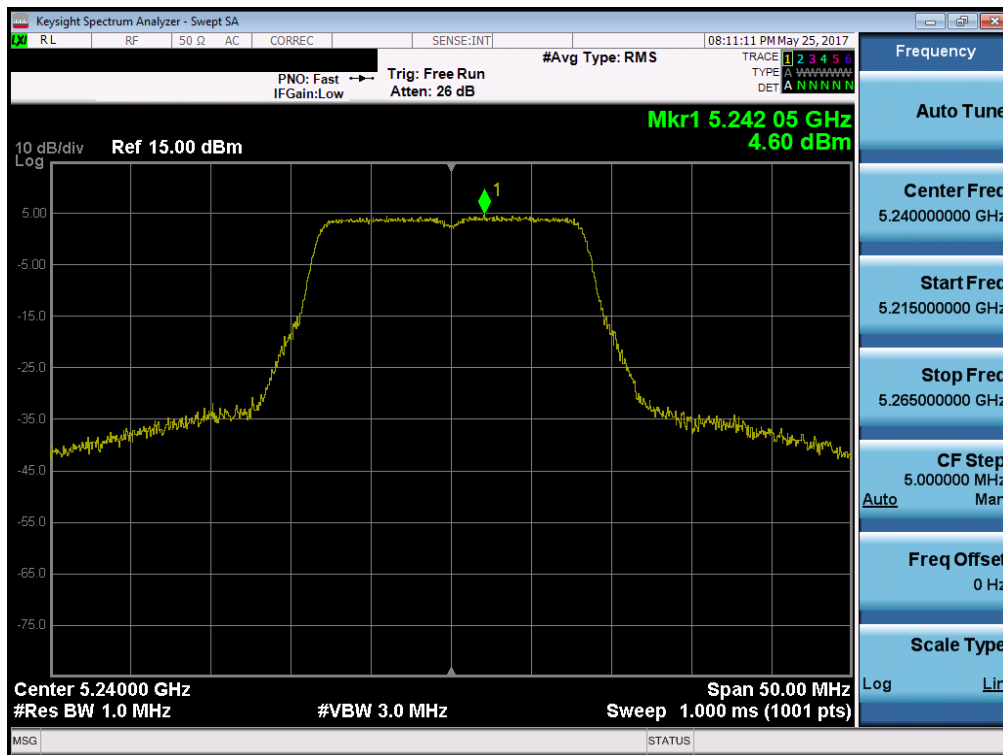


Plot 7-118. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

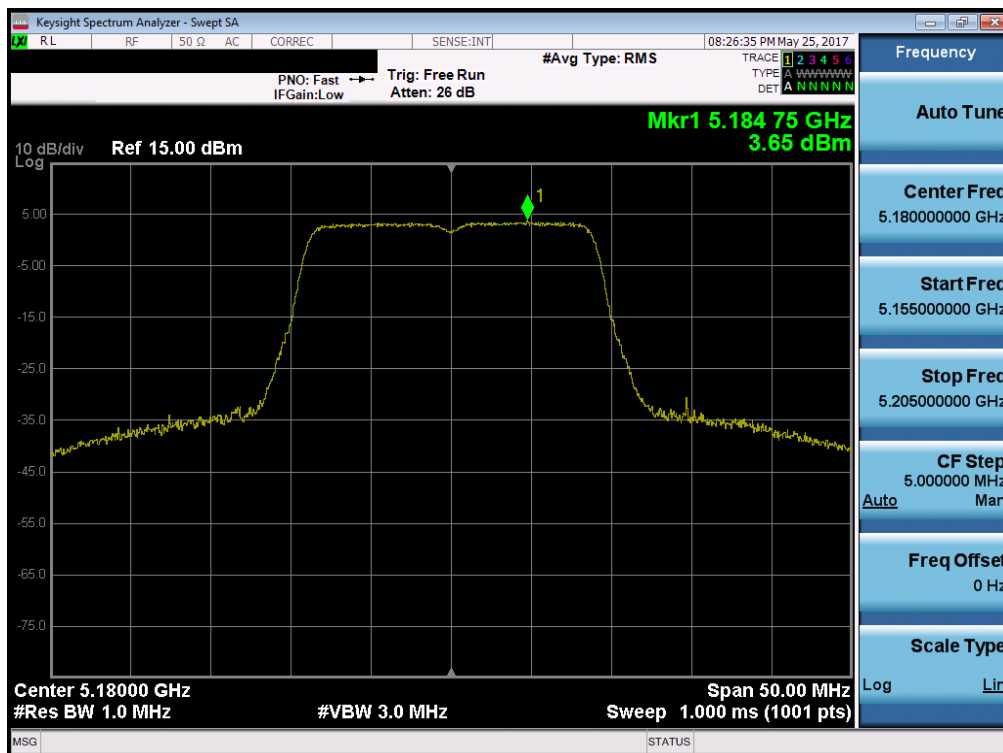


Plot 7-119. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 87 of 254

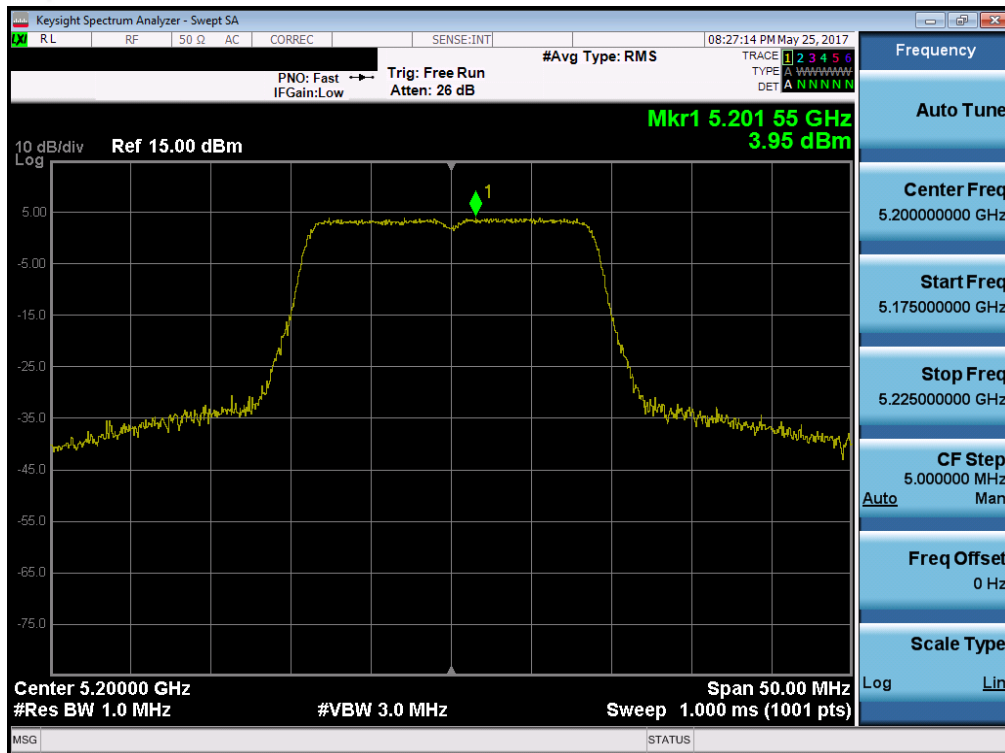


Plot 7-120. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

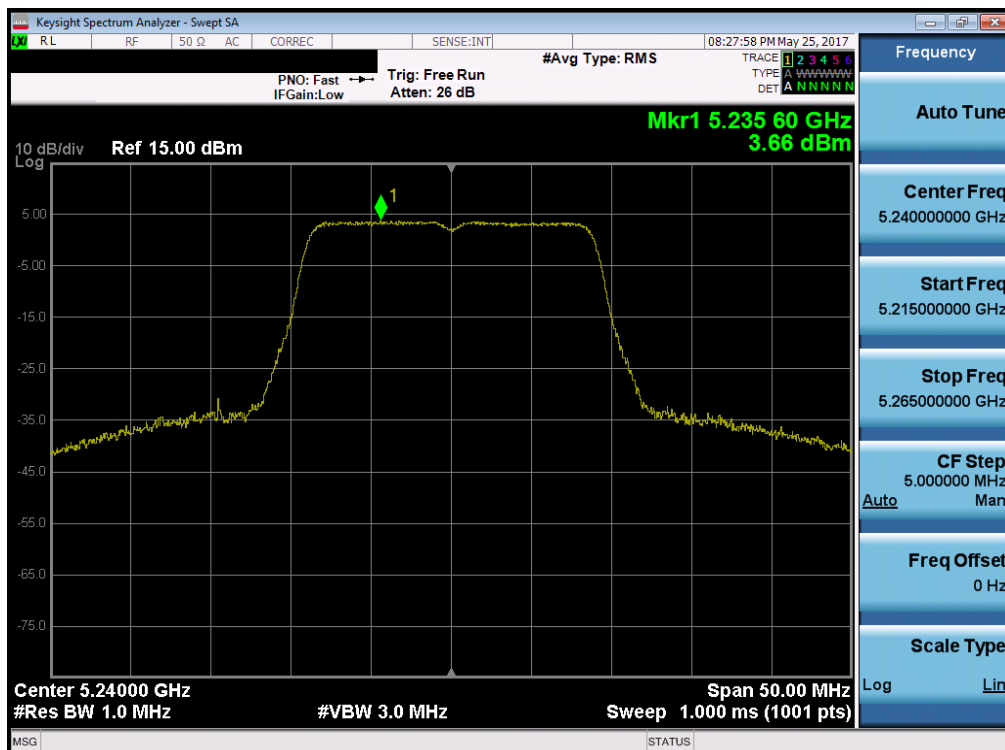


Plot 7-121. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 88 of 254

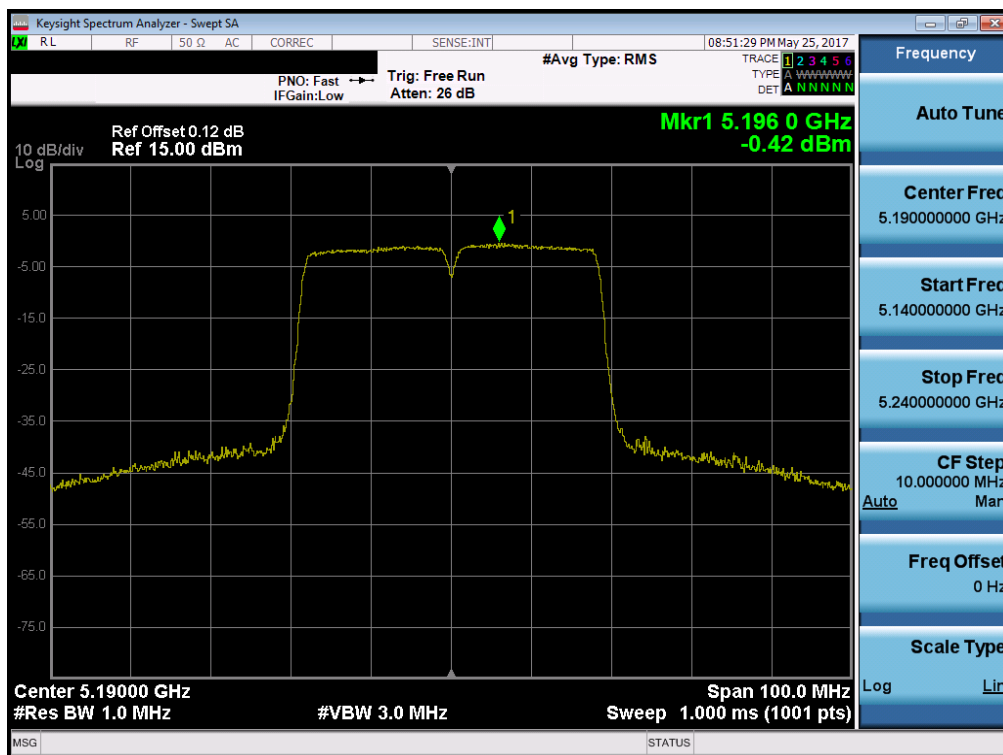


Plot 7-122. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

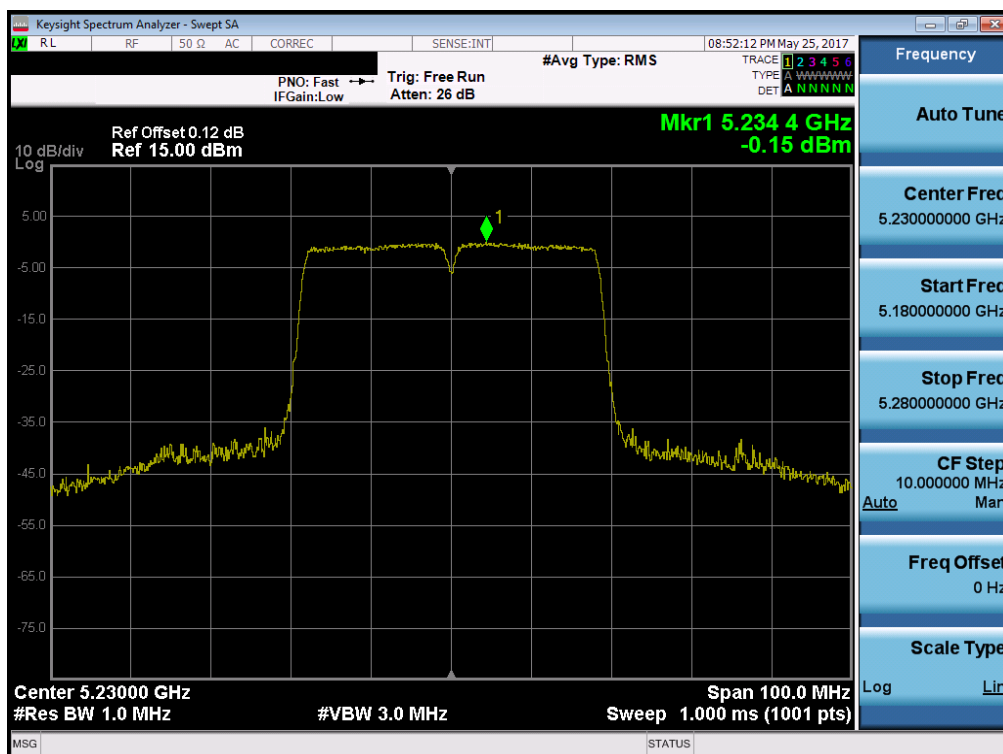


Plot 7-123. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 89 of 254

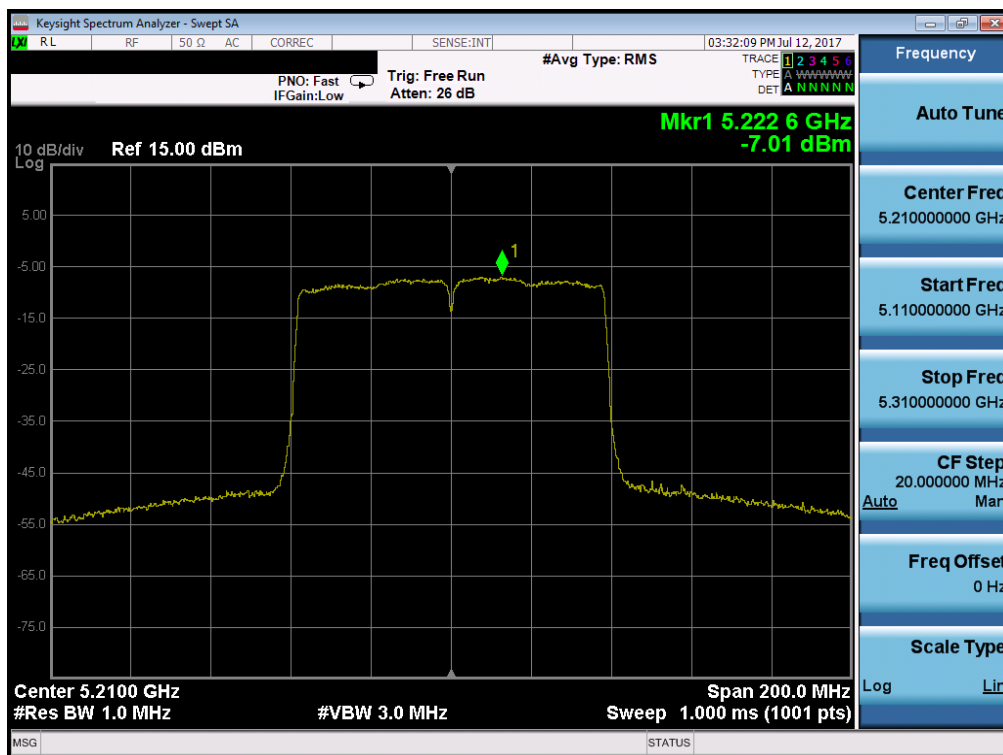


Plot 7-124. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

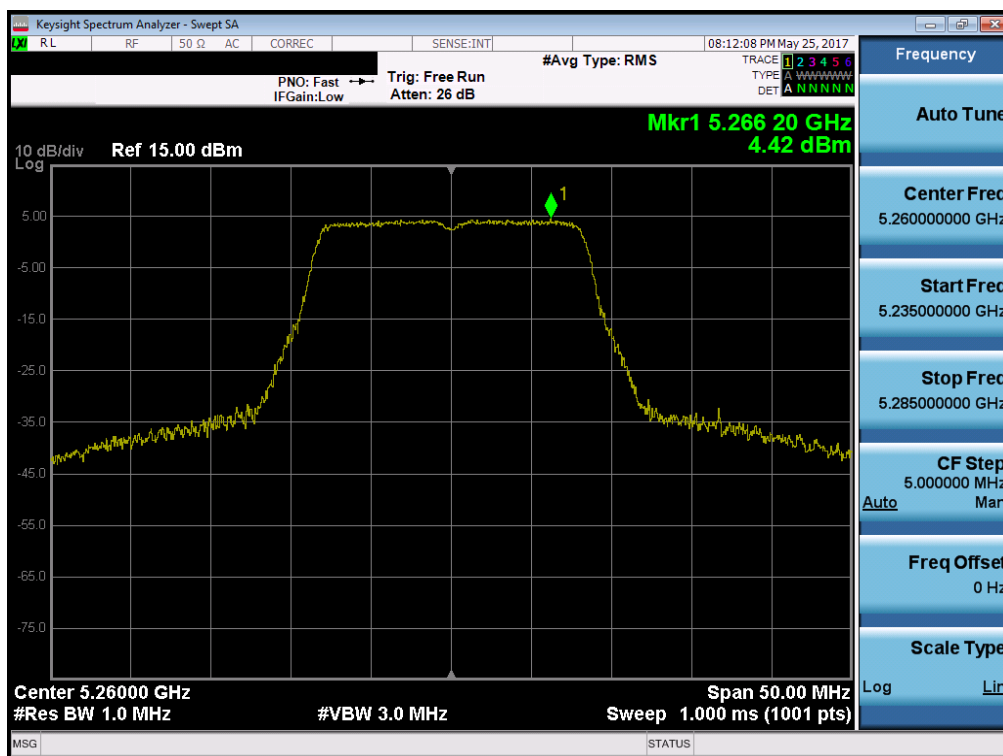


Plot 7-125. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 90 of 254

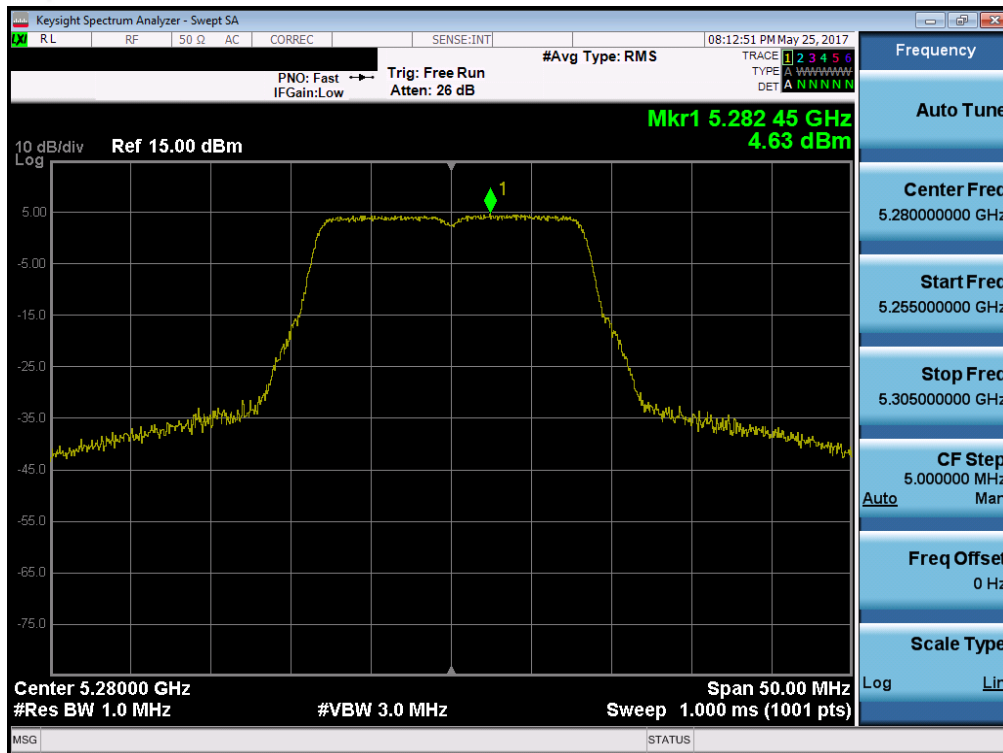


Plot 7-126. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

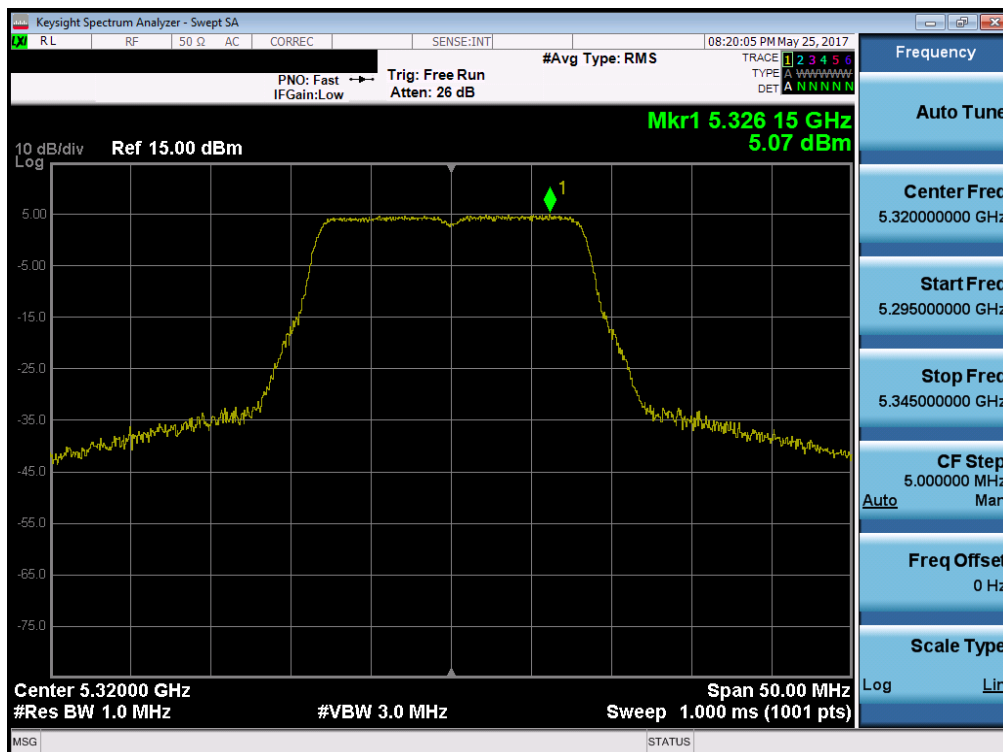


Plot 7-127. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 91 of 254

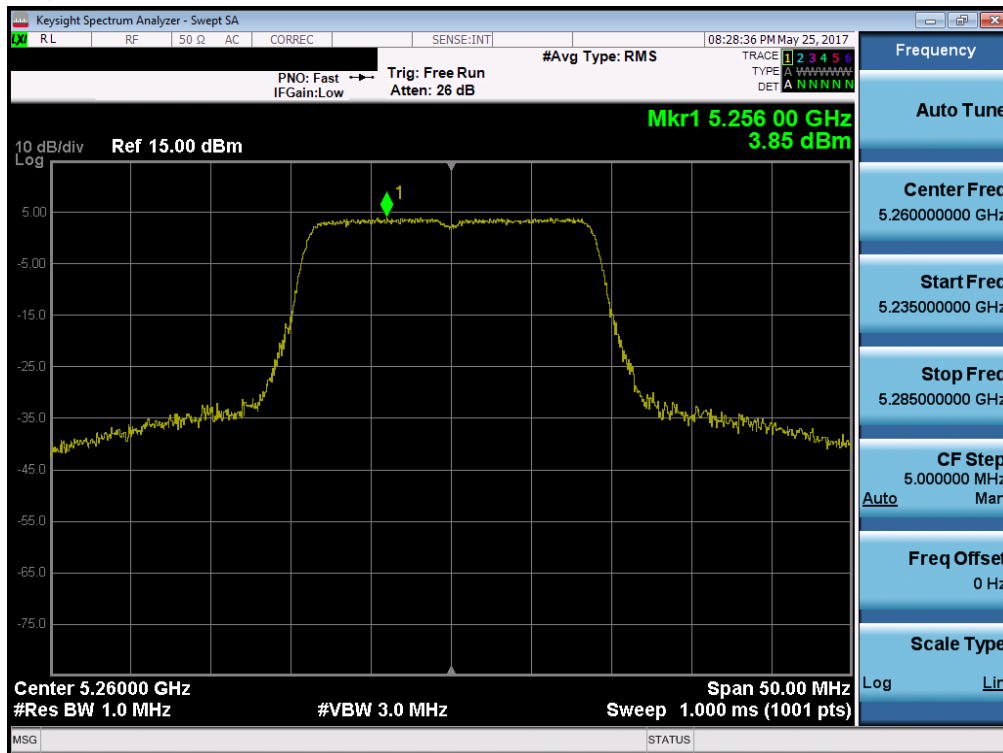


Plot 7-128. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

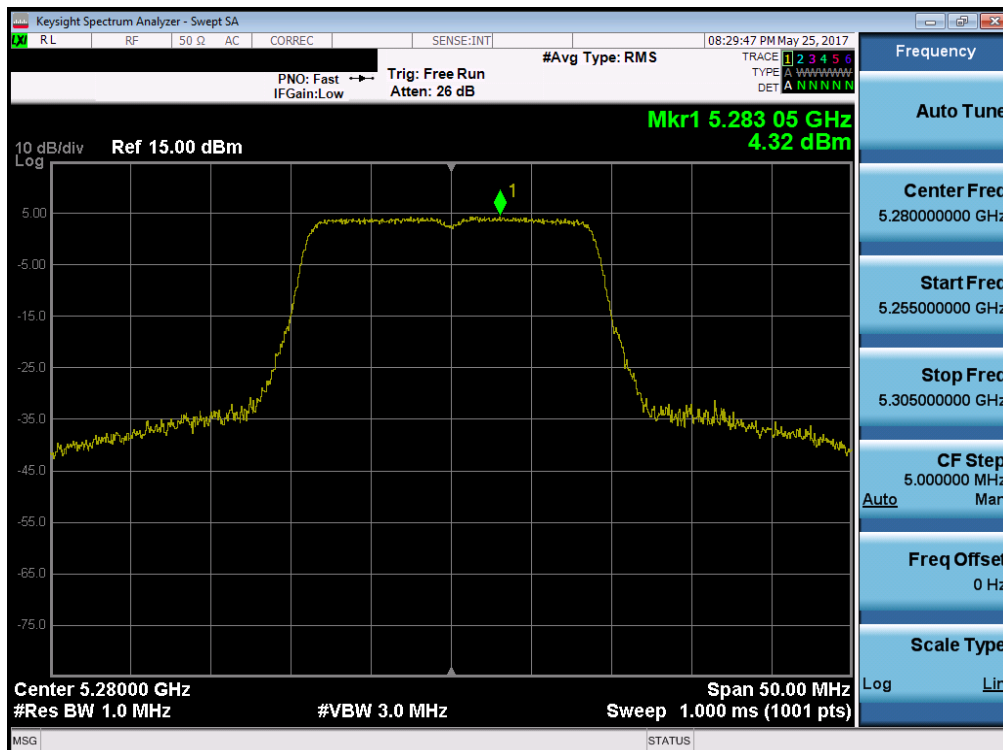


Plot 7-129. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 92 of 254

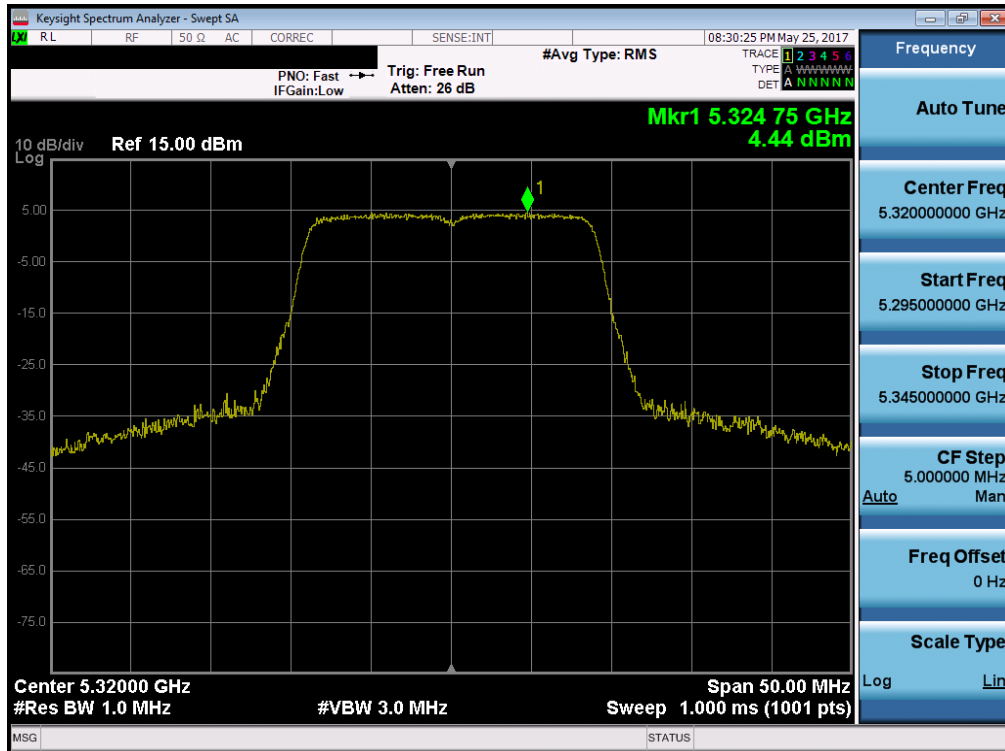


Plot 7-130. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

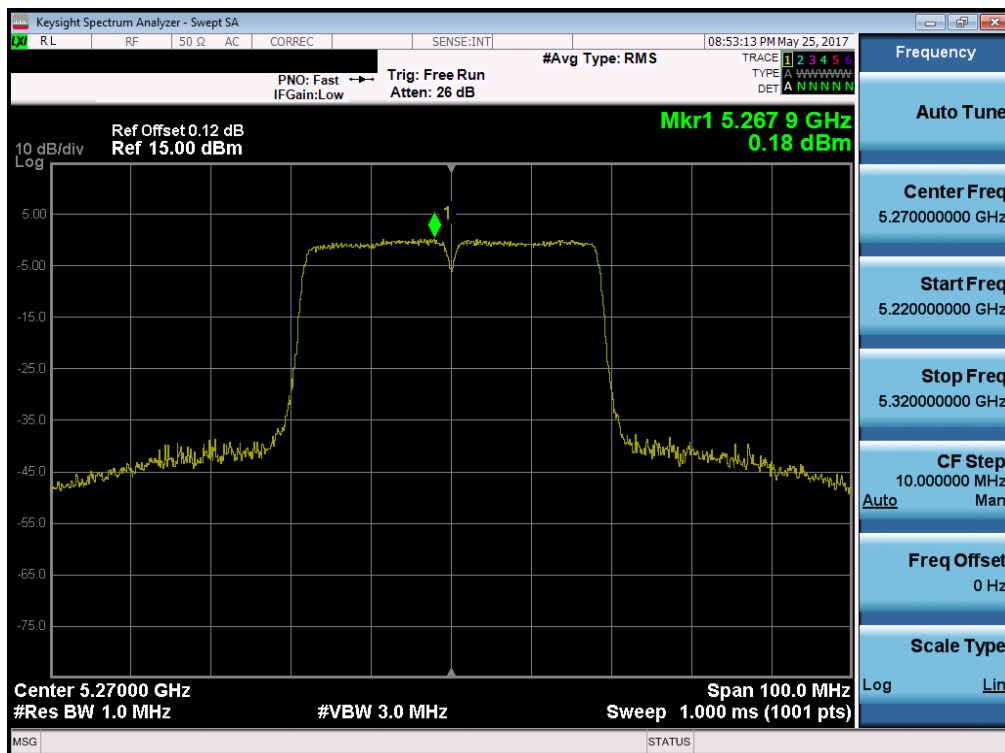


Plot 7-131. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 93 of 254

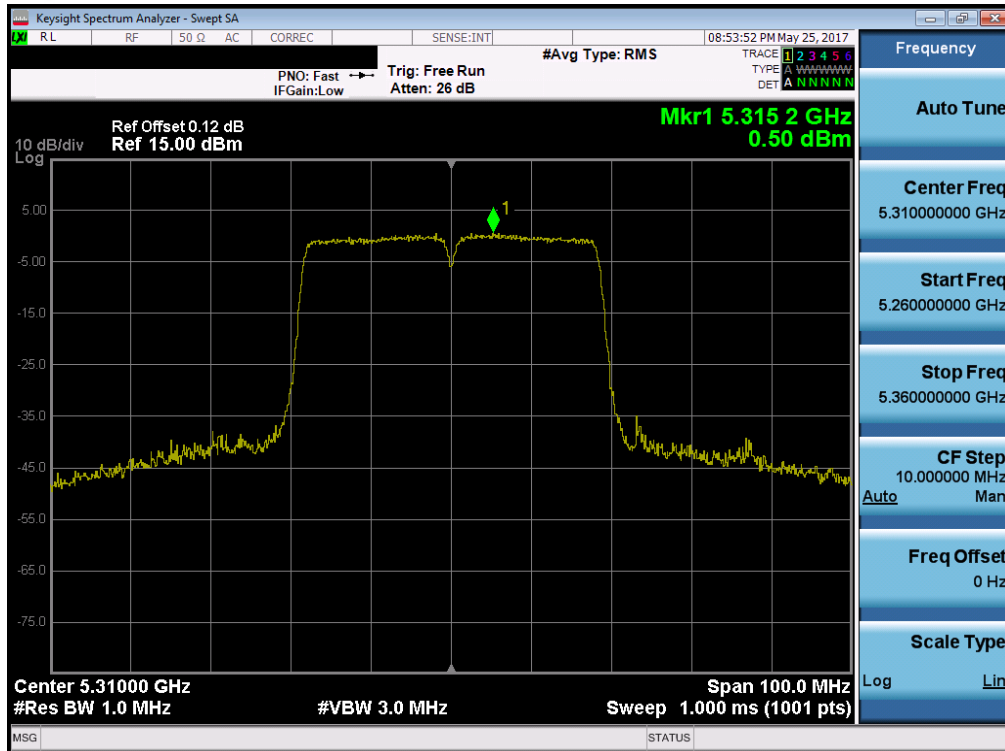


Plot 7-132. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

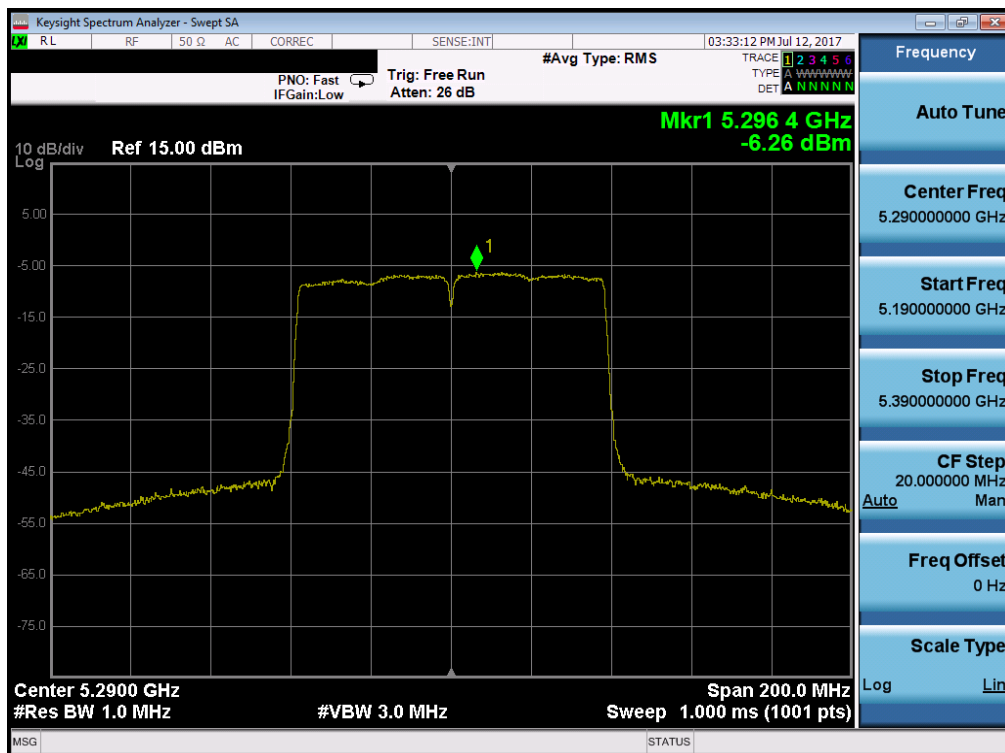


Plot 7-133. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 94 of 254

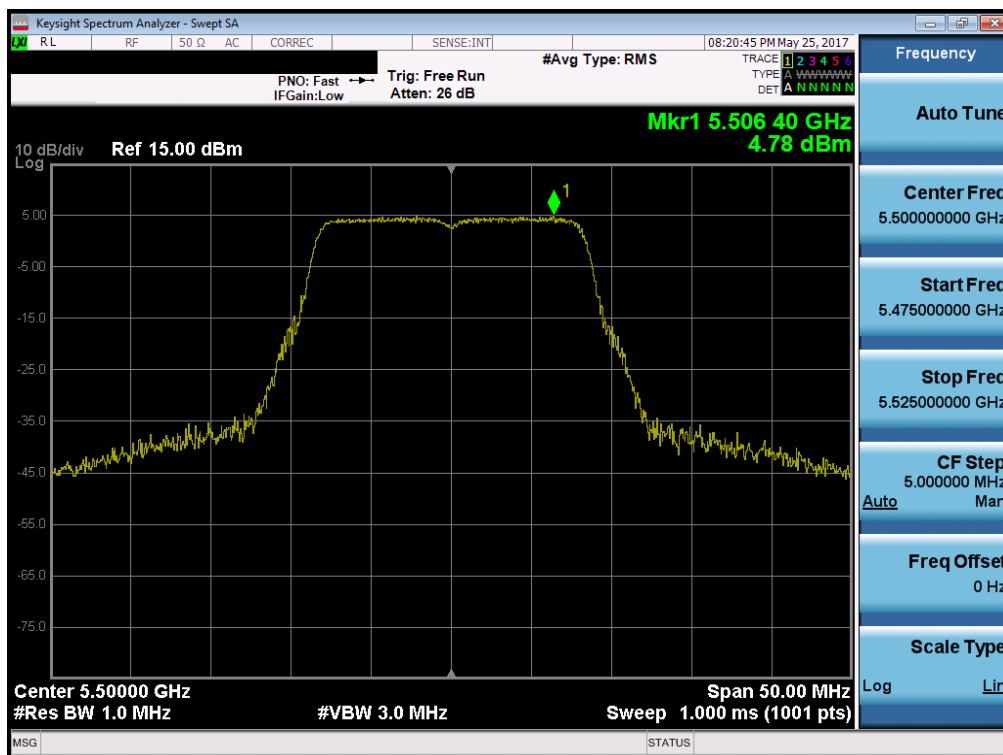


Plot 7-134. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

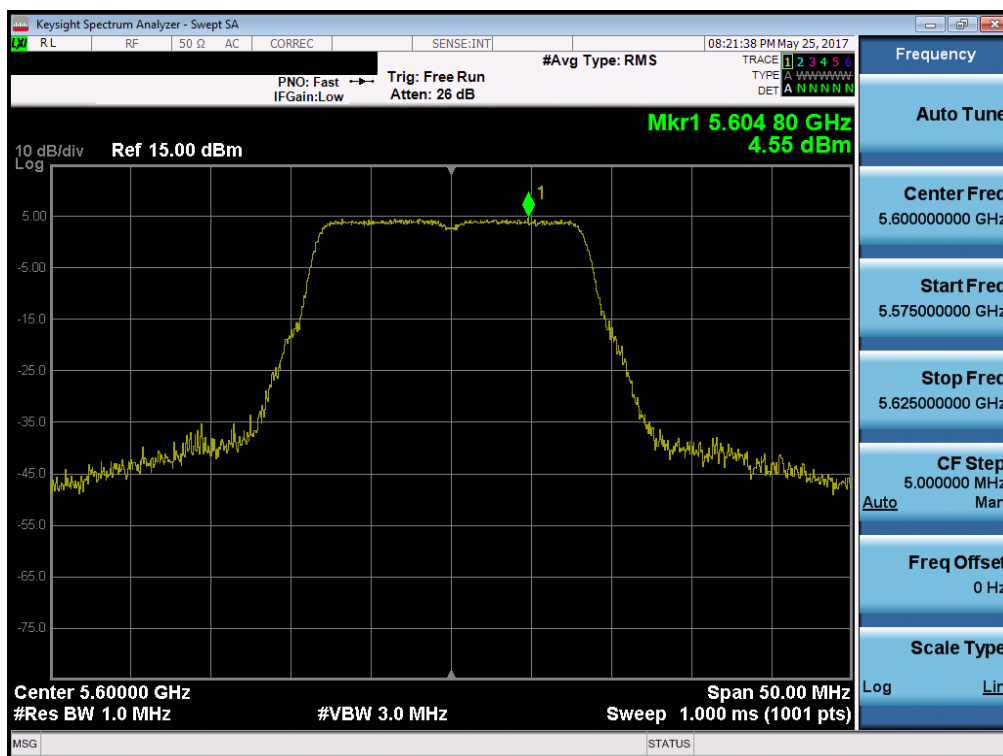


Plot 7-135. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 95 of 254

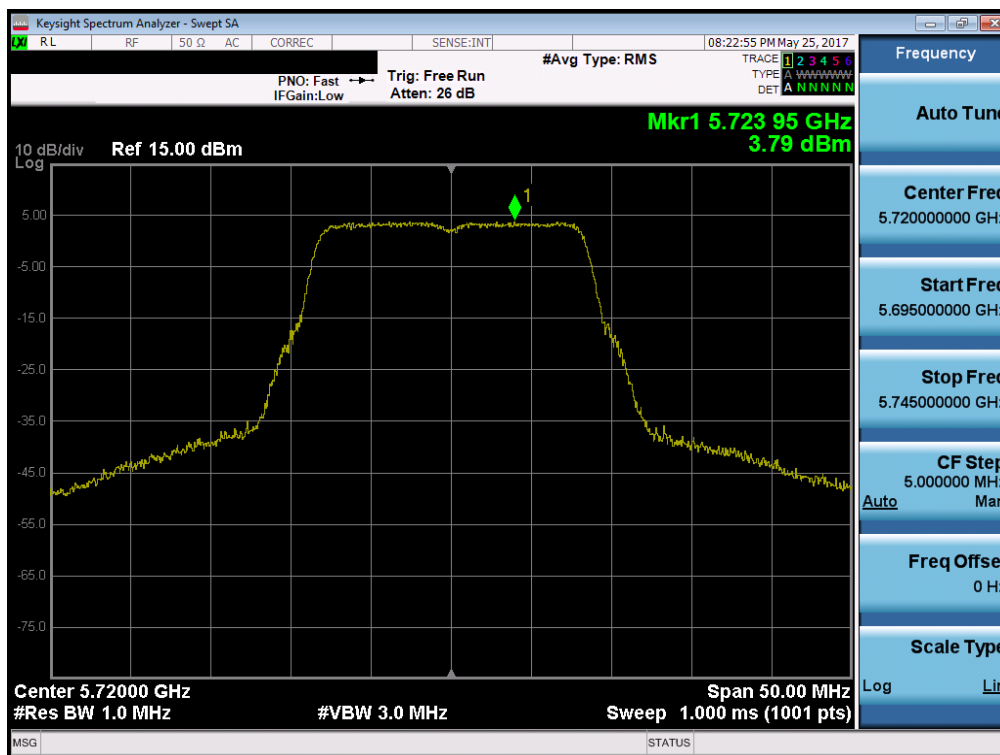


Plot 7-136. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

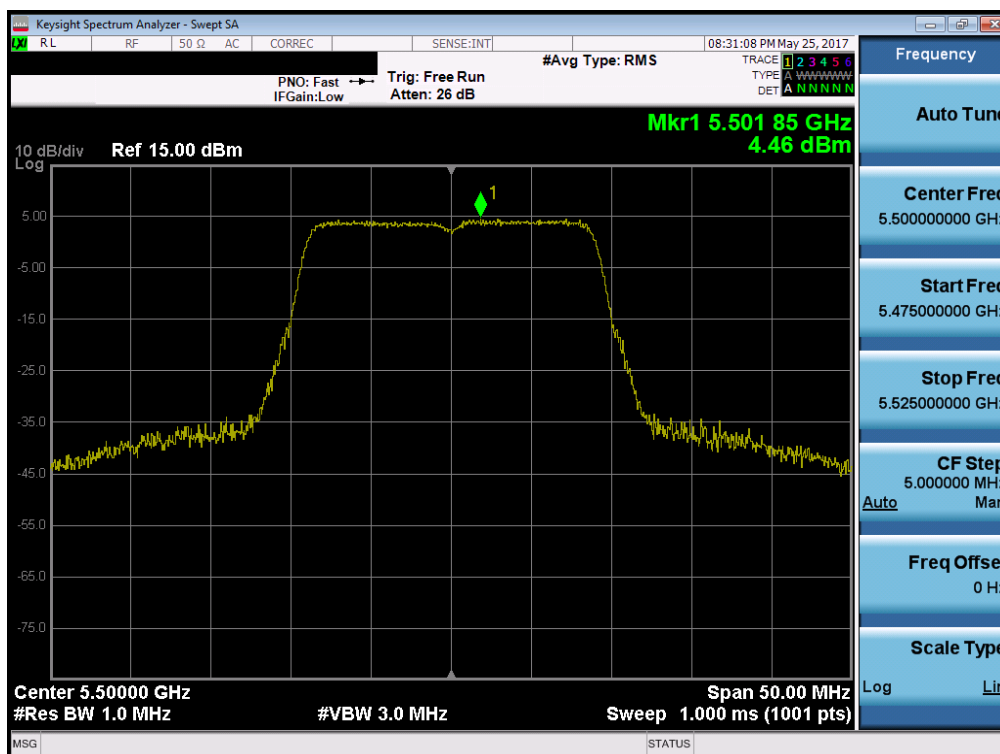


Plot 7-137. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 96 of 254

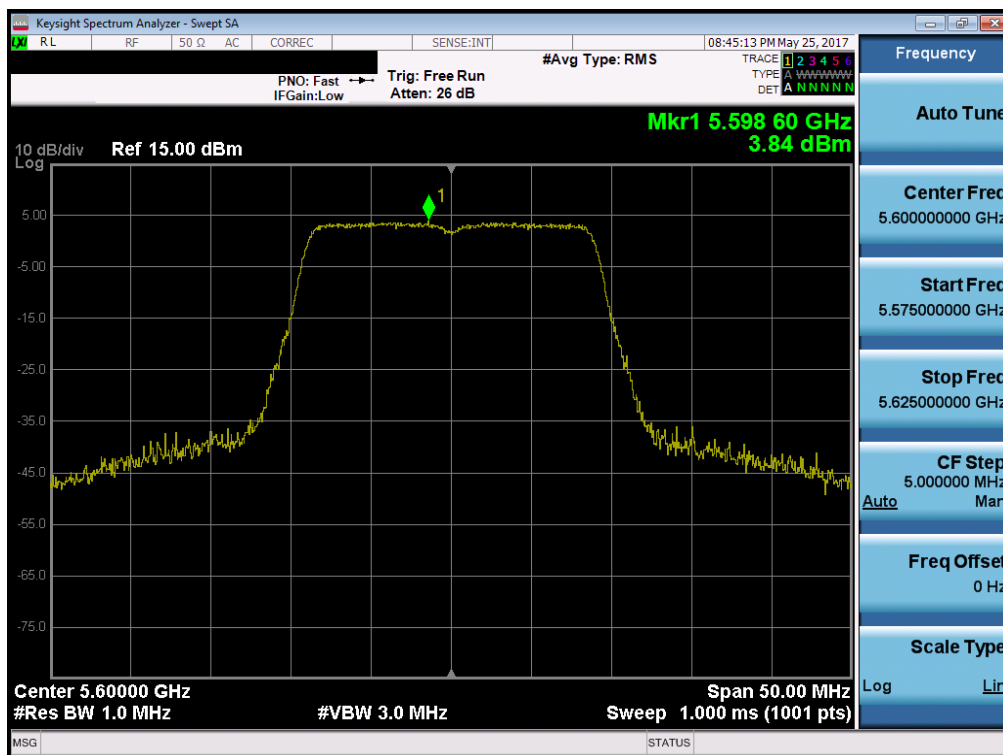


Plot 7-138. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

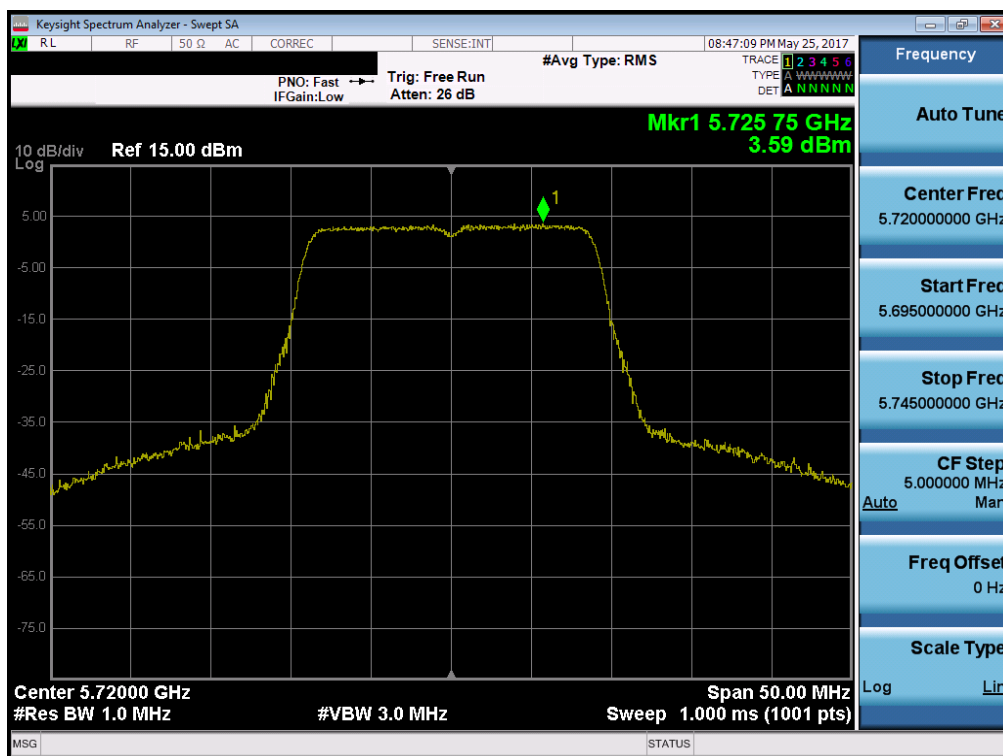


Plot 7-139. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 97 of 254

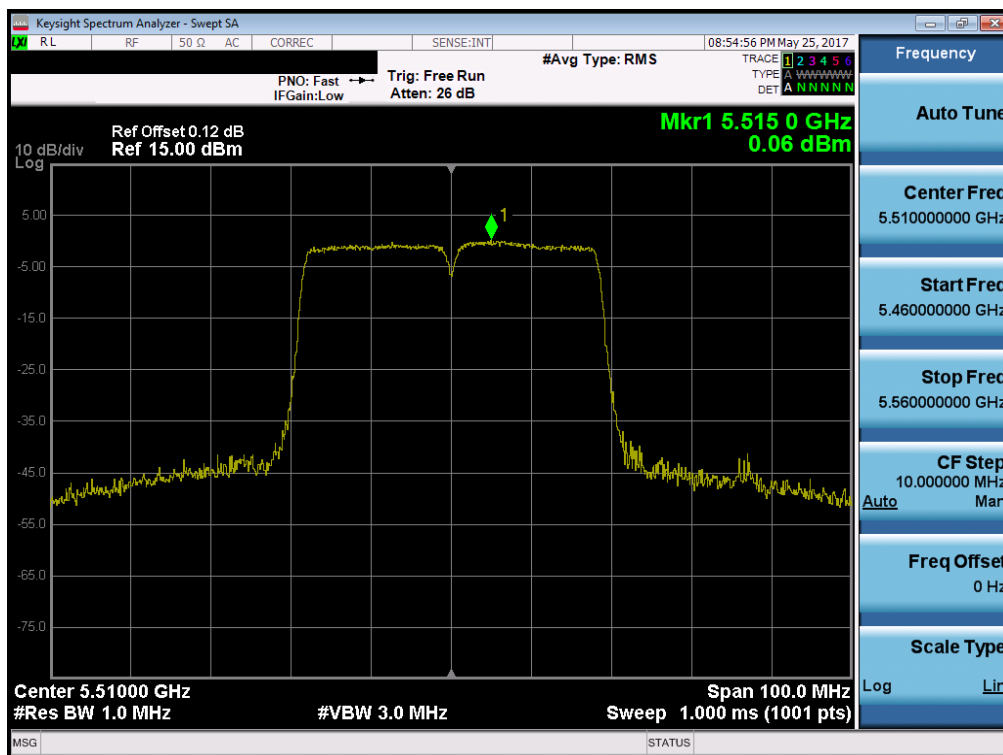


Plot 7-140. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

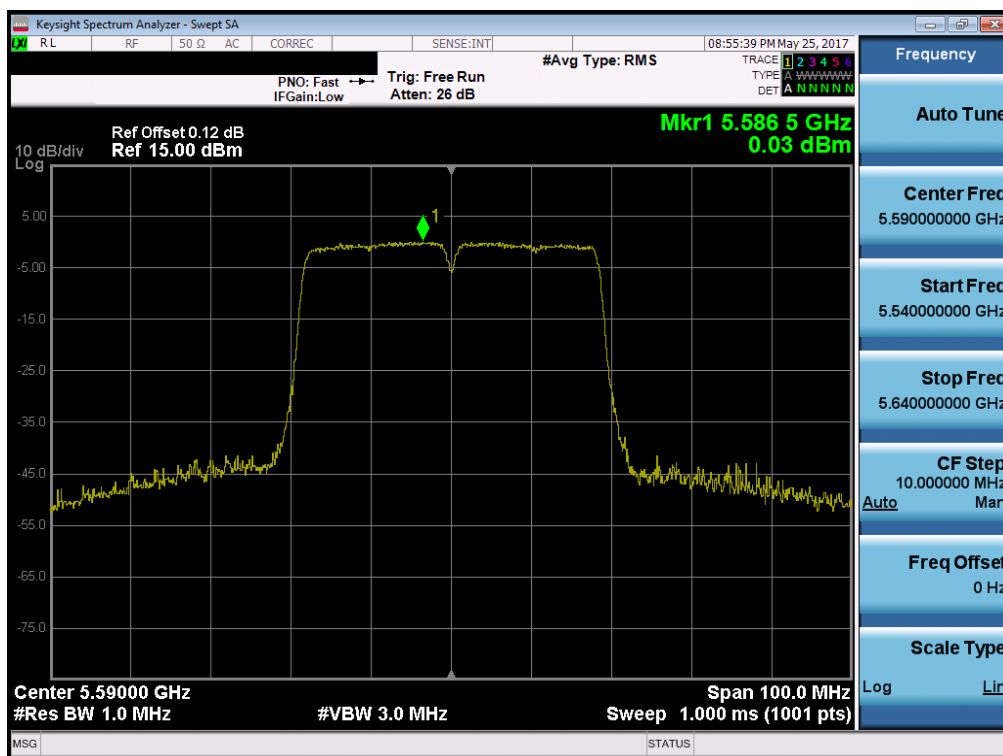


Plot 7-141. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 98 of 254

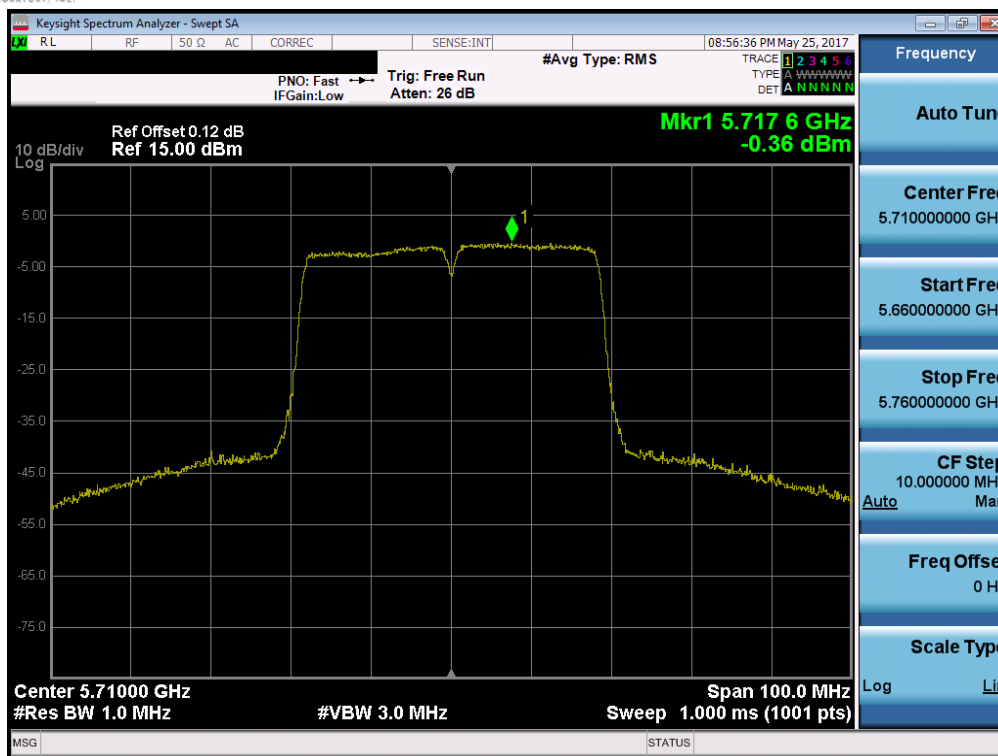


Plot 7-142. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

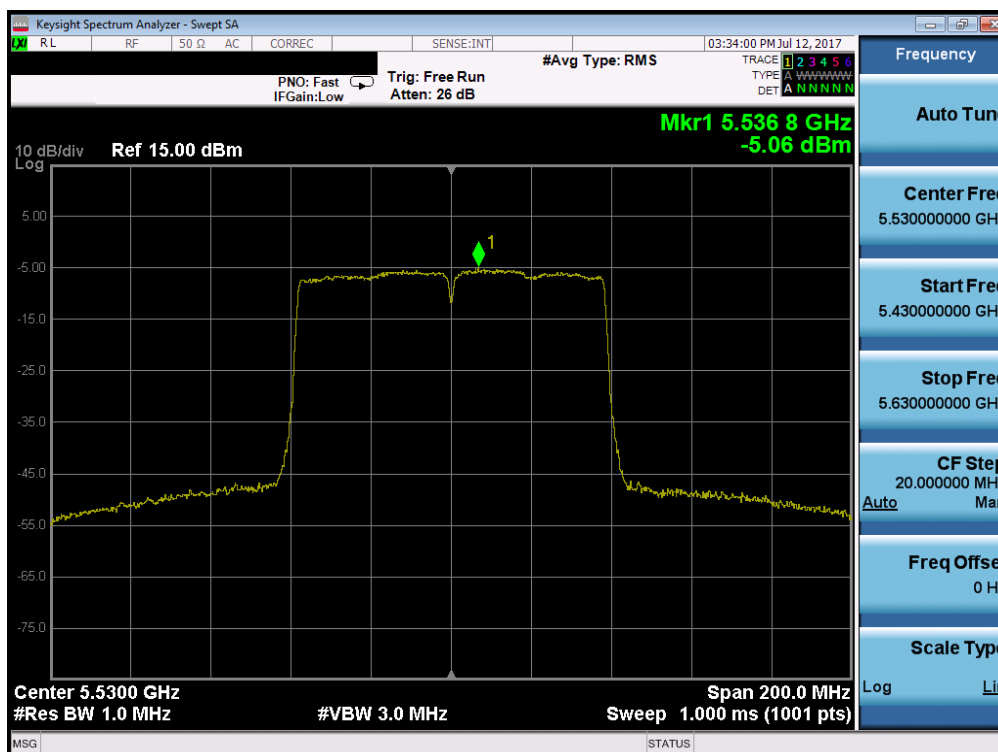


Plot 7-143. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 99 of 254

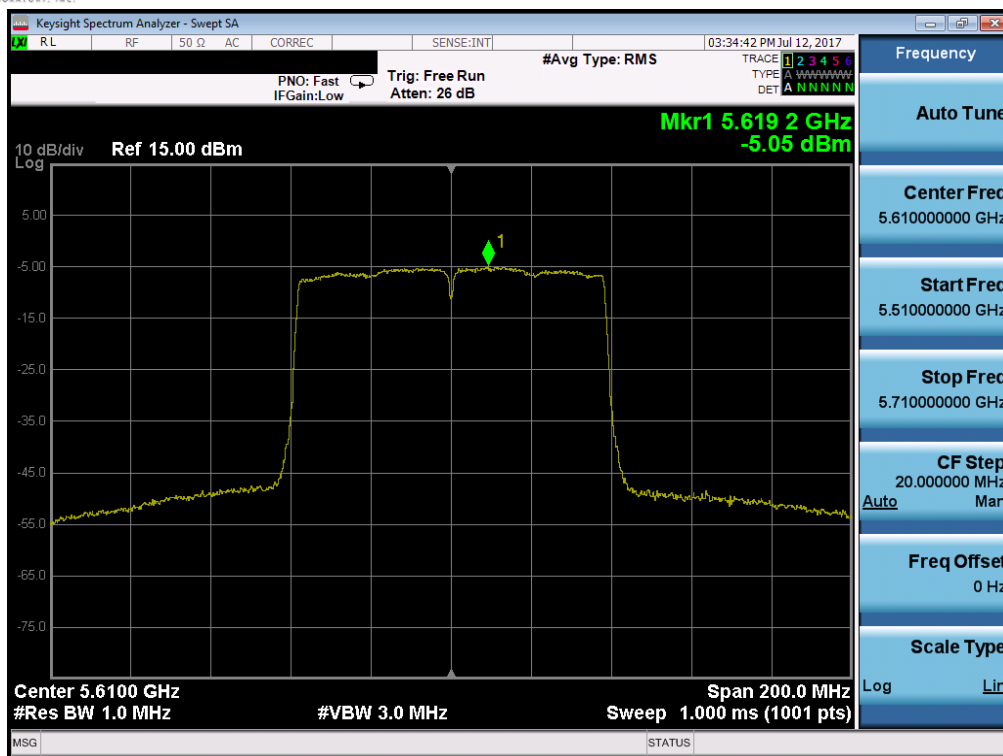


Plot 7-144. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

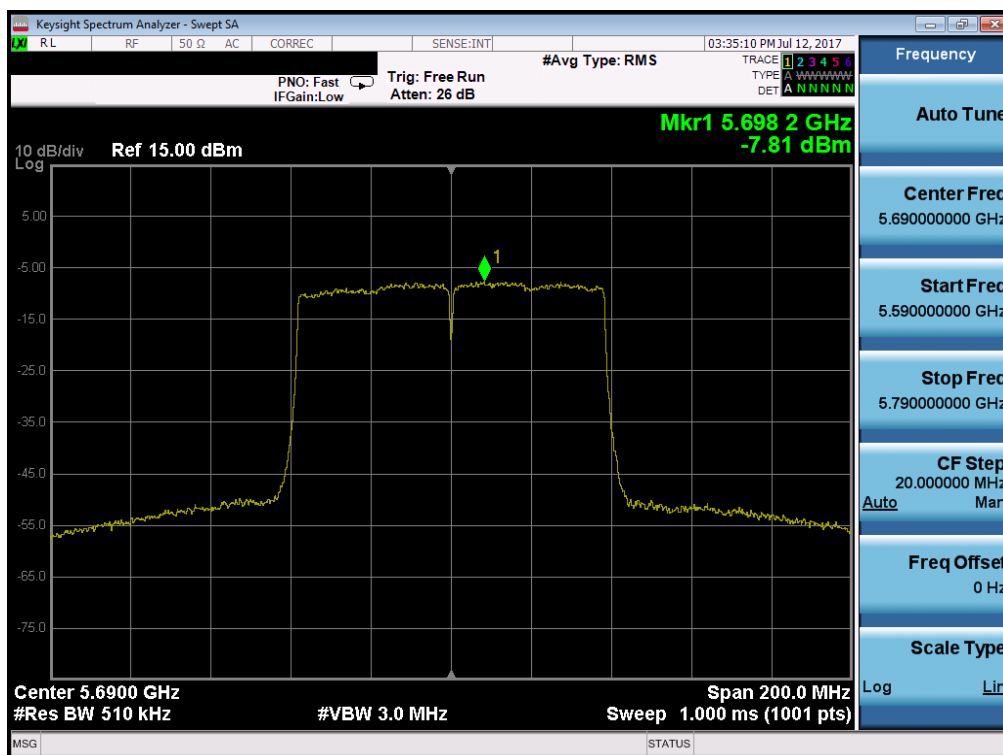


Plot 7-145. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 100 of 254



Plot 7-146. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

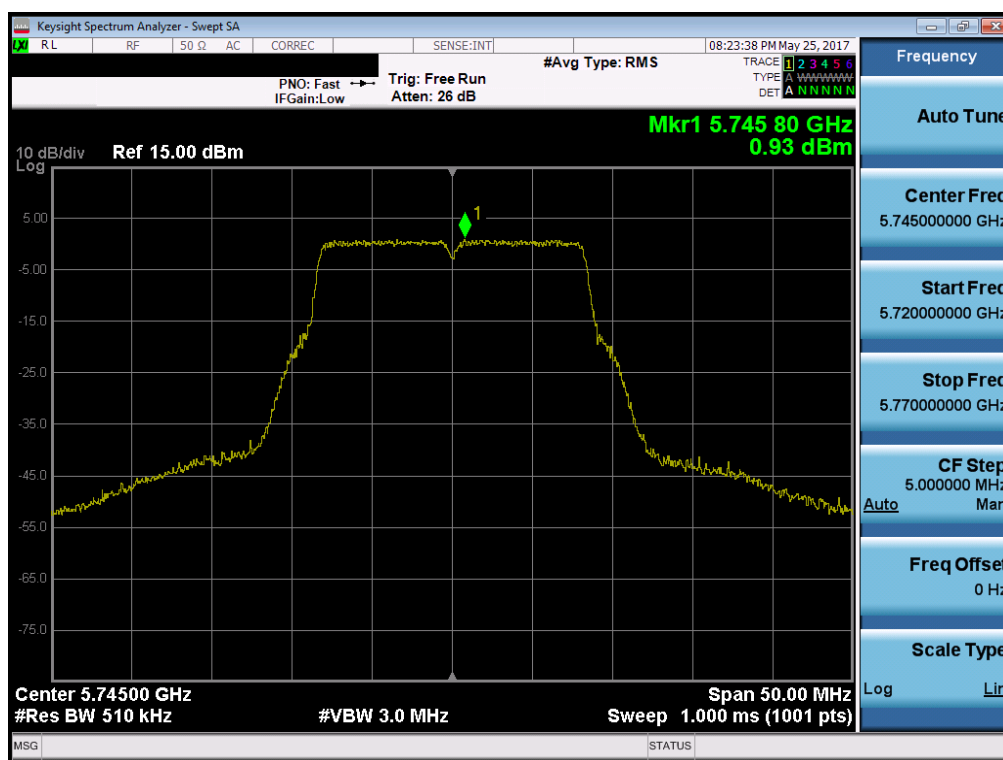


Plot 7-147. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN9500	 FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset	Page 101 of 254

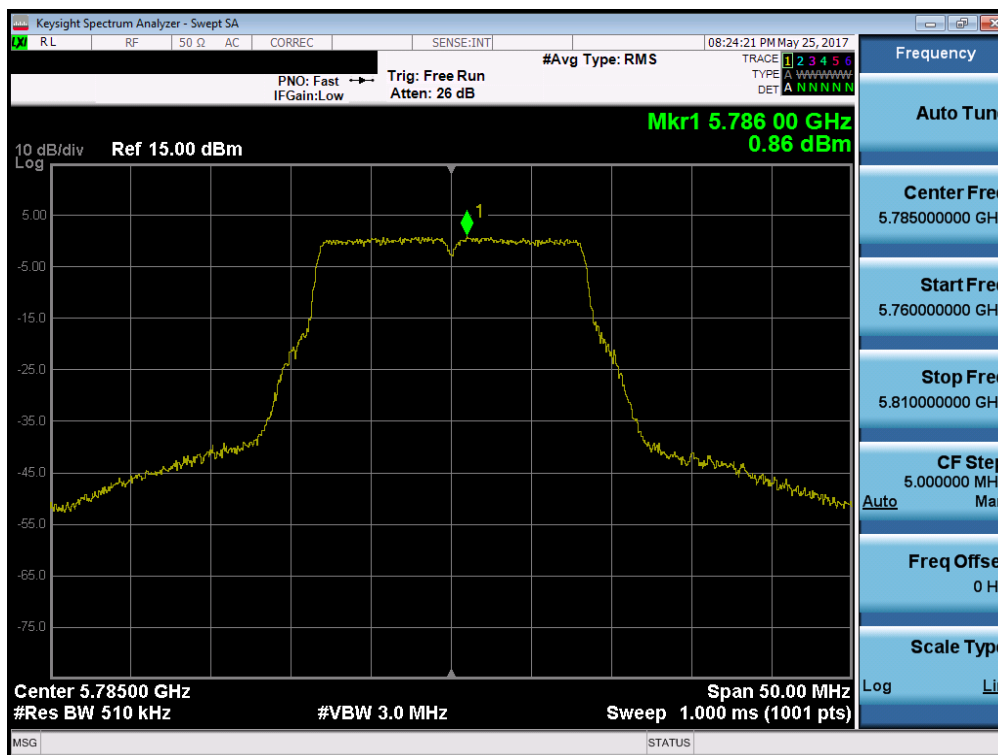
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	a	6	0.93	30.0	-29.07
	5785	157	a	6	0.86	30.0	-29.14
	5825	165	a	6	0.69	30.0	-29.31
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	0.47	30.0	-29.53
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	0.39	30.0	-29.61
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	0.42	30.0	-29.58
	5755	151	n (40MHz)	13.5/15 (MCS0)	-3.21	30.0	-33.21
	5795	159	n (40MHz)	13.5/15 (MCS0)	-3.57	30.0	-33.57
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-4.11	30.0	-34.11

Table 7-21. Band 3 Conducted Power Spectral Density Measurements

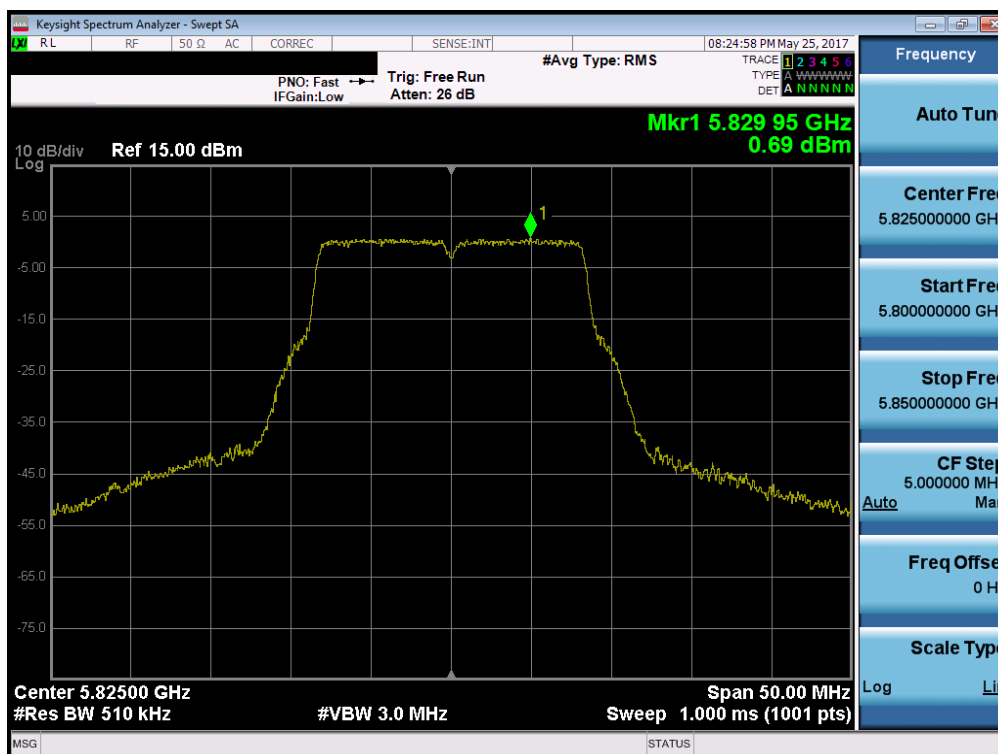


Plot 7-148. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 102 of 254

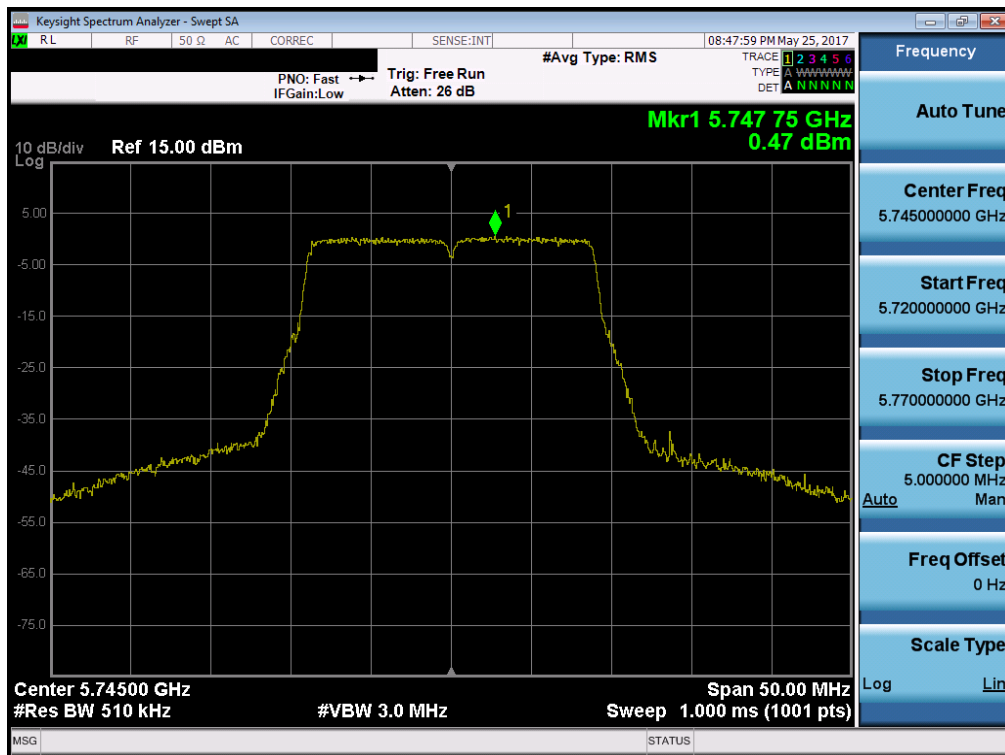


Plot 7-149. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

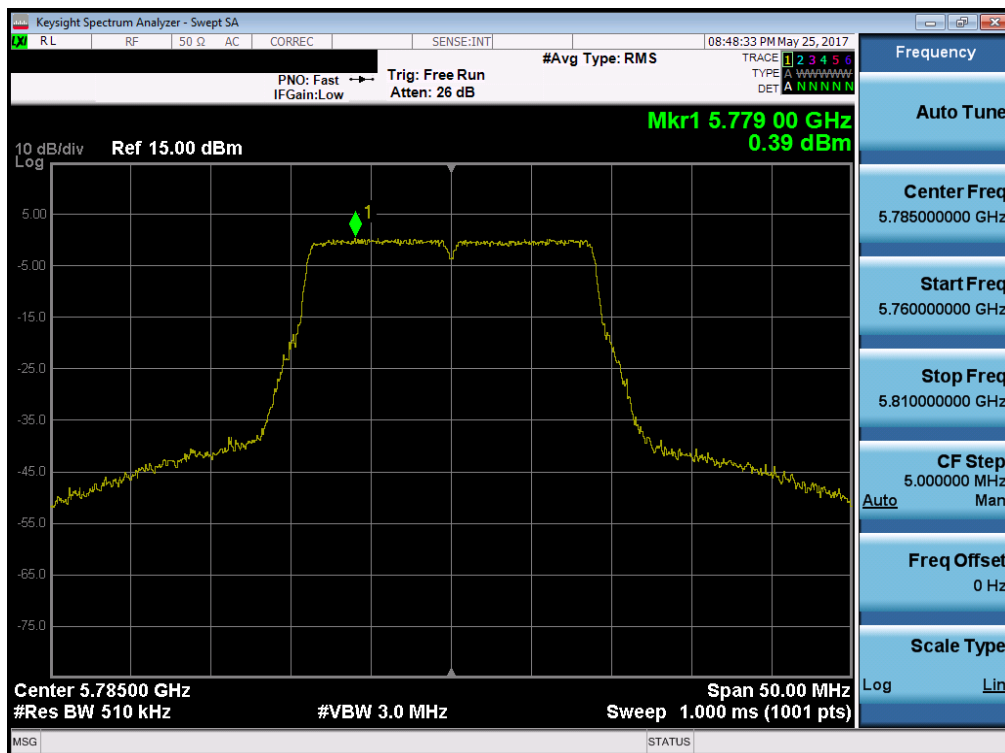


Plot 7-150. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 103 of 254

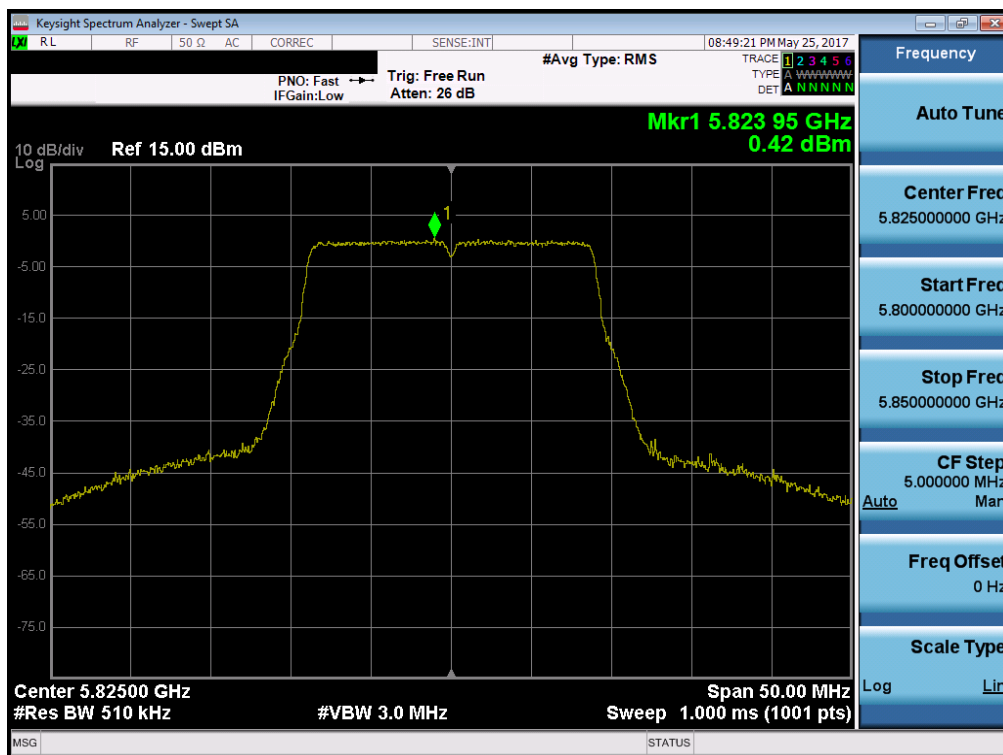


Plot 7-151. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

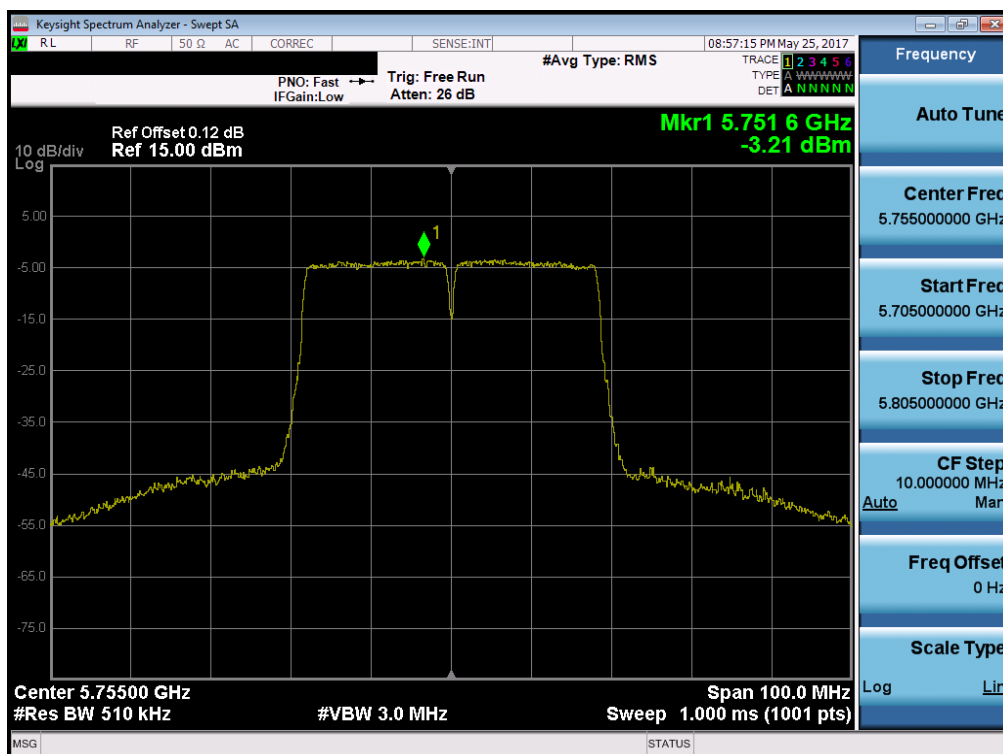


Plot 7-152. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 104 of 254

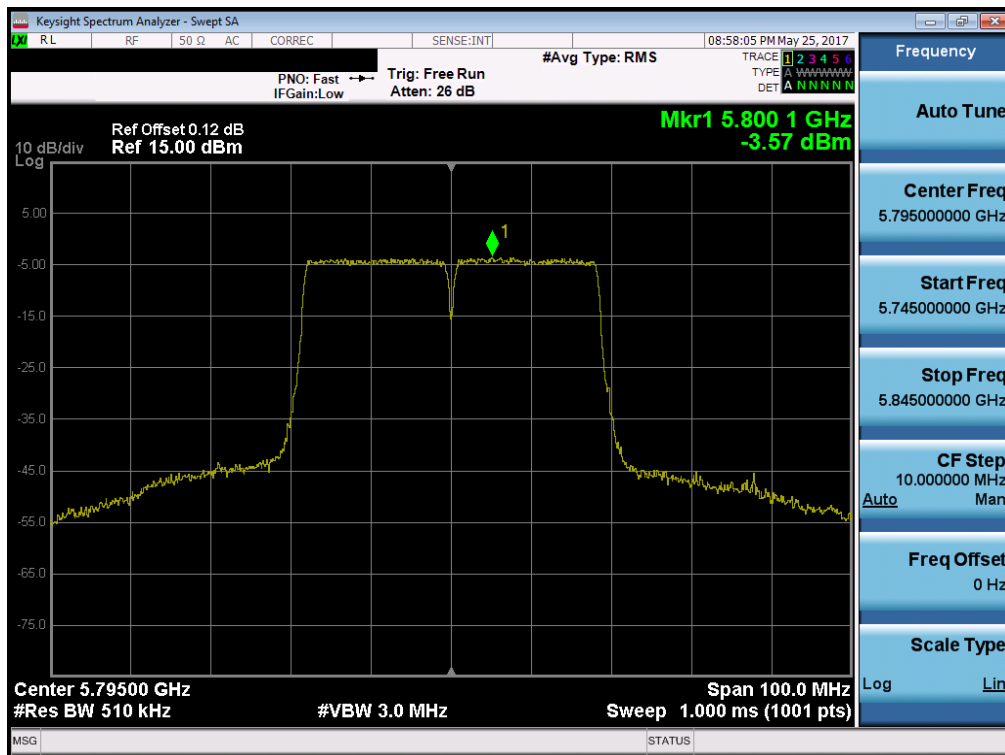


Plot 7-153. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

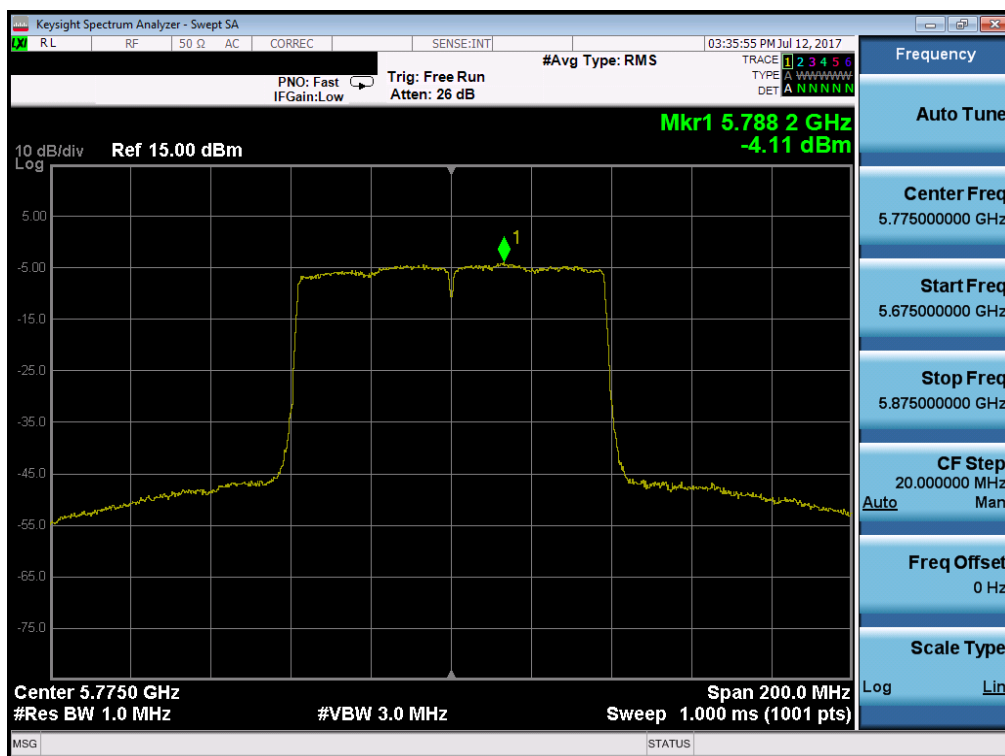


Plot 7-154. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-155. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 159)



Plot 7-156. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

FCC ID: A3LSMN9500	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1706190199-07.A3L	Test Dates: 5/22 – 7/15/2017	EUT Type: Portable Handset		Page 106 of 254

Summed MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	2.85	3.65	6.28	11.0	-4.72
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	2.85	3.95	6.44	11.0	-4.56
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	2.74	3.66	6.23	11.0	-4.77
	5190	38	n (40MHz)	13.5/15 (MCS0)	-1.07	-0.42	2.28	11.0	-8.72
	5230	46	n (40MHz)	13.5/15 (MCS0)	-0.77	-0.15	2.56	11.0	-8.44
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-6.89	-7.01	-3.93	11.0	-14.93
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	2.48	3.85	6.23	11.0	-4.77
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	2.26	4.32	6.42	11.0	-4.58
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	2.74	4.44	6.69	11.0	-4.31
	5270	54	n (40MHz)	13.5/15 (MCS0)	-0.44	0.18	2.89	11.0	-8.11
	5310	62	n (40MHz)	13.5/15 (MCS0)	-0.59	0.50	3.00	11.0	-8.00
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-6.42	-6.26	-3.33	11.0	-14.33
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	3.47	4.46	7.01	11.0	-3.99
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	3.97	3.84	6.92	11.0	-4.08
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	3.83	3.59	6.72	11.0	-4.28
	5510	102	n (40MHz)	13.5/15 (MCS0)	-2.11	0.06	2.12	11.0	-8.88
	5590	118	n (40MHz)	13.5/15 (MCS0)	-1.61	0.03	2.30	11.0	-8.70
	5710	142	n (40MHz)	13.5/15 (MCS0)	-1.50	-0.36	2.12	11.0	-8.88
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-6.12	-5.06	-2.55	11.0	-13.55
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-5.87	-5.05	-2.43	11.0	-13.43
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-8.33	-7.81	-5.05	11.0	-16.05

Table 7-22. Bands 1, 2A, 2C MIMO Conducted Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	n (20MHz)	6.5/7.2 (MCS0)	1.00	0.47	3.75	30.0	-26.25
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	1.09	0.39	3.77	30.0	-26.23
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	0.81	0.42	3.63	30.0	-26.37
	5755	151	n (40MHz)	13.5/15 (MCS0)	-2.51	-3.21	0.17	30.0	-29.83
	5795	159	n (40MHz)	13.5/15 (MCS0)	-2.65	-3.57	-0.08	30.0	-30.08
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-4.52	-4.11	-1.30	30.0	-31.30

Table 7-23. Band 3 MIMO Conducted Power Spectral Density Measurements

Note:

Per KDB 662911 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 5180MHz the average conducted power spectral density was measured to be 2.85 dBm for Antenna-1 and 3.65 dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(2.85 \text{ dBm} + 3.65 \text{ dBm}) = (1.93 \text{ mW} + 2.31 \text{ mW}) = 4.24 \text{ mW} = 6.28 \text{ dBm}$$

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