

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

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 v01r02, 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 $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(21.83) = 24.39\text{dBm}$.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(21.64) = 24.35\text{dBm}$.

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

Test Procedure Used

KDB 789033 D02 v01r02 – Section E)3)b) Method PM-G

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.

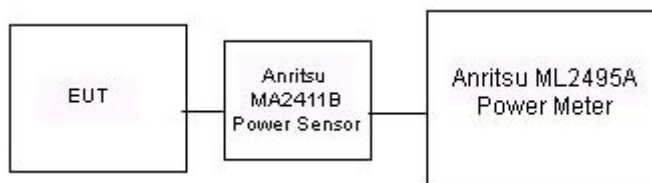


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

None

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed 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	14.58	13.51	13.42
5200	40	AVG	17.07	13.55	13.50
5220	44	AVG	17.05	13.52	13.55
5240	48	AVG	17.17	13.55	13.64
5260	52	AVG	16.90	13.50	13.54
5280	56	AVG	16.96	13.66	13.64
5300	60	AVG	16.87	13.70	13.63
5320	64	AVG	16.91	13.64	13.74
5500	100	AVG	17.07	13.42	14.46
5580	116	AVG	16.97	14.21	14.28
5600	120	AVG	16.76	14.28	14.27
5620	124	AVG	17.11	14.07	14.05
5640	128	AVG	17.07	13.97	14.05
5660	132	AVG	17.08	14.09	14.04
5680	136	AVG	17.15	13.98	13.97
5700	140	AVG	16.93	13.92	13.85
5720	144	AVG	17.30	13.87	13.74
5745	149	AVG	17.12	13.94	14.04
5785	157	AVG	16.93	13.83	13.71
5825	165	AVG	17.13	13.73	13.71

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

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Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]	
			IEEE Transmission Mode	
			802.11n	802.11ac
5190	38	AVG	12.34	12.28
5230	46	AVG	15.08	15.16
5270	54	AVG	15.38	15.34
5310	62	AVG	14.53	15.41
5510	102	AVG	15.44	14.72
5550	110	AVG	15.11	14.80
5590	118	AVG	14.96	14.70
5630	126	AVG	14.77	14.39
5670	134	AVG	14.63	14.33
5710	142	AVG	14.64	14.44
5755	151	AVG	14.59	14.35
5795	159	AVG	14.30	14.14

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	Detector	IEEE Transmission Mode
			802.11ac
5210	42	AVG	11.09
5290	58	AVG	13.14
5530	106	AVG	12.61
5610	122	AVG	12.98
5690	138	AVG	13.27
5775	155	AVG	13.25

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed 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	16.34	14.49	14.44
5200	40	AVG	17.39	14.46	14.45
5220	44	AVG	17.42	14.49	14.43
5240	48	AVG	17.43	14.45	14.49
5260	52	AVG	17.27	14.14	14.32
5280	56	AVG	17.19	14.02	14.31
5300	60	AVG	17.26	13.99	14.08
5320	64	AVG	17.25	13.88	14.22
5500	100	AVG	17.20	13.64	13.94
5580	116	AVG	17.05	14.38	13.58
5600	120	AVG	17.00	14.22	13.51
5620	124	AVG	17.12	14.30	14.26
5640	128	AVG	17.16	14.26	14.33
5660	132	AVG	17.17	14.02	14.32
5680	136	AVG	17.18	14.11	14.15
5700	140	AVG	16.83	14.28	14.16
5720	144	AVG	16.82	14.15	14.13
5745	149	AVG	16.66	13.71	13.54
5785	157	AVG	16.67	13.54	13.49
5825	165	AVG	16.75	13.55	13.55

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]	
			IEEE Transmission Mode	
			802.11n	802.11ac
5190	38	AVG	13.74	13.29
5230	46	AVG	14.78	15.05
5270	54	AVG	14.91	14.74
5310	62	AVG	14.67	14.55
5510	102	AVG	14.97	14.99
5550	110	AVG	15.20	15.11
5590	118	AVG	15.39	15.32
5630	126	AVG	15.43	15.45
5670	134	AVG	15.42	15.47
5710	142	AVG	15.33	15.30
5755	151	AVG	14.63	14.56
5795	159	AVG	14.78	14.57

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	Detector	IEEE Transmission Mode
			802.11ac
5210	42	AVG	12.91
5290	58	AVG	13.21
5530	106	AVG	13.08
5610	122	AVG	13.16
5690	138	AVG	12.72
5775	155	AVG	13.36

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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MIMO Maximum Conducted Output Power Measurements

Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			ANT1	ANT2	MIMO
5180	36	AVG	13.51	14.49	17.04
5200	40	AVG	13.55	14.46	17.04
5220	44	AVG	13.52	14.49	17.04
5240	48	AVG	13.55	14.45	17.03
5260	52	AVG	13.50	14.14	16.84
5280	56	AVG	13.66	14.02	16.85
5300	60	AVG	13.70	13.99	16.86
5320	64	AVG	13.64	13.88	16.77
5500	100	AVG	13.42	13.64	16.54
5520	104	AVG	13.38	13.93	16.67
5540	108	AVG	13.39	13.83	16.63
5560	112	AVG	14.34	13.81	17.09
5580	116	AVG	14.21	14.38	17.31
5600	120	AVG	14.28	14.22	17.26
5620	124	AVG	14.07	14.30	17.20
5640	128	AVG	13.97	14.26	17.13
5660	132	AVG	14.09	14.02	17.07
5680	136	AVG	13.98	14.11	17.06
5700	140	AVG	13.92	14.28	17.11
5720	144	AVG	13.87	14.15	17.02
5745	149	AVG	13.94	13.71	16.84
5785	157	AVG	13.83	13.54	16.70
5805	161	AVG	13.75	13.56	16.67
5825	165	AVG	13.73	13.55	16.65

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Freq [MHz]	Channel	Detector	5GHz (20MHz) Conducted Power [dBm]		
			ANT1	ANT2	MIMO
5180	36	AVG	13.42	14.44	16.97
5200	40	AVG	13.50	14.45	17.01
5220	44	AVG	13.55	14.43	17.02
5240	48	AVG	13.64	14.49	17.10
5260	52	AVG	13.54	14.32	16.96
5280	56	AVG	13.64	14.31	17.00
5300	60	AVG	13.63	14.08	16.87
5320	64	AVG	13.74	14.22	17.00
5500	100	AVG	14.46	13.94	17.22
5520	104	AVG	14.48	13.85	17.19
5540	108	AVG	14.29	13.74	17.03
5560	112	AVG	14.40	13.55	17.01
5580	116	AVG	14.28	13.58	16.95
5600	120	AVG	14.27	13.51	16.92
5620	124	AVG	14.05	14.26	17.17
5640	128	AVG	14.05	14.33	17.20
5660	132	AVG	14.04	14.32	17.19
5680	136	AVG	13.97	14.15	17.07
5700	140	AVG	13.85	14.16	17.02
5720	144	AVG	13.74	14.13	16.95
5745	149	AVG	14.04	13.54	16.81
5785	157	AVG	13.71	13.49	16.61
5805	161	AVG	13.69	13.46	16.59
5825	165	AVG	13.71	13.55	16.64

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]		
			ANT1	ANT2	MIMO
5190	38	AVG	10.79	13.69	15.49
5230	46	AVG	10.02	12.54	14.47
5270	54	AVG	10.39	12.57	14.63
5310	62	AVG	10.53	12.54	14.66
5510	102	AVG	11.05	12.55	14.87
5550	110	AVG	11.11	12.45	14.84
5590	118	AVG	11.04	12.43	14.80
5630	126	AVG	10.96	12.26	14.67
5670	134	AVG	10.84	12.23	14.60
5710	142	AVG	10.87	12.21	14.60
5755	151	AVG	11.74	12.48	15.14
5795	159	AVG	11.54	12.44	15.02

Table 7-14. MIMO 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

Freq [MHz]	Channel	Detector	5GHz (40MHz) Conducted Power [dBm]		
			ANT1	ANT2	MIMO
5190	38	AVG	10.56	13.70	15.42
5230	46	AVG	10.11	12.56	14.52
5270	54	AVG	10.33	12.45	14.53
5310	62	AVG	10.66	12.49	14.68
5510	102	AVG	11.12	12.58	14.92
5550	110	AVG	11.17	12.41	14.84
5590	118	AVG	11.12	12.45	14.85
5630	126	AVG	11.00	12.30	14.71
5670	134	AVG	10.91	12.23	14.63
5710	142	AVG	10.93	12.14	14.59
5755	151	AVG	11.84	12.42	15.15
5795	159	AVG	11.68	12.39	15.06

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

FCC ID: A3LSMN930F		FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5GHz (80MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	Detector	5GHz (80MHz) Conducted Power [dBm]		
			ANT1	ANT2	MIMO
5210	42	AVG	9.14	11.47	13.47
5290	58	AVG	8.81	10.93	13.01
5530	106	AVG	9.49	10.95	13.29
5610	122	AVG	9.39	10.52	13.00
5690	138	AVG	9.39	10.40	12.93
5775	155	AVG	9.91	10.24	13.09

Table 7-16. MIMO 80MHz BW 802.11ac (UNII) Maximum Conducted Output Power

Note:

Per KDB 662911 v02r01 Section E)1), 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 11.96 dBm for Antenna-1 and 15.69 dBm for Antenna-2.

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

$$(13.51 \text{ dBm} + 14.49 \text{ dBm}) = (22.44 \text{ mW} + 28.12 \text{ mW}) = 50.56 \text{ mW} = 17.04 \text{ dBm}$$

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7.5 Maximum Power Spectral Density – 802.11a/n/ac §15.407(a.1)(2.5)

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 v01r02, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 D02 v01r02, 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 v01r02 – Section F

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.

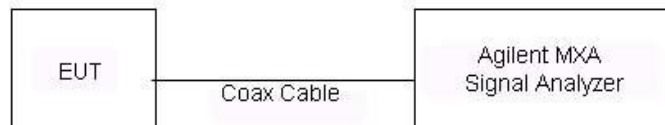


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

None

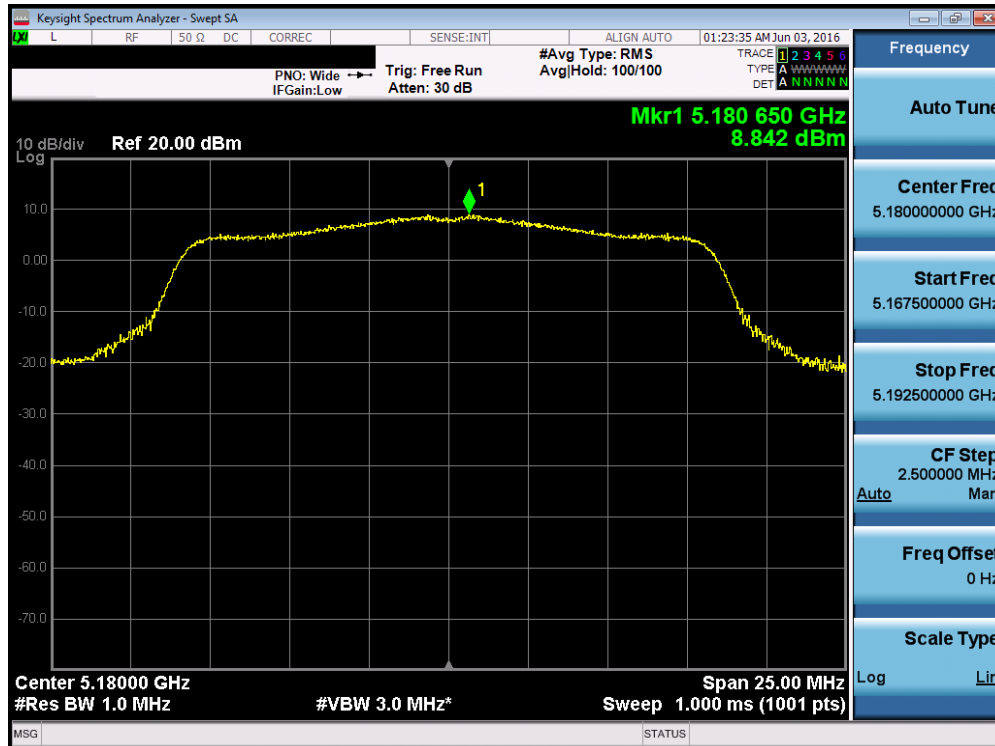
FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Antenna-1 Power Spectral Density Measurements

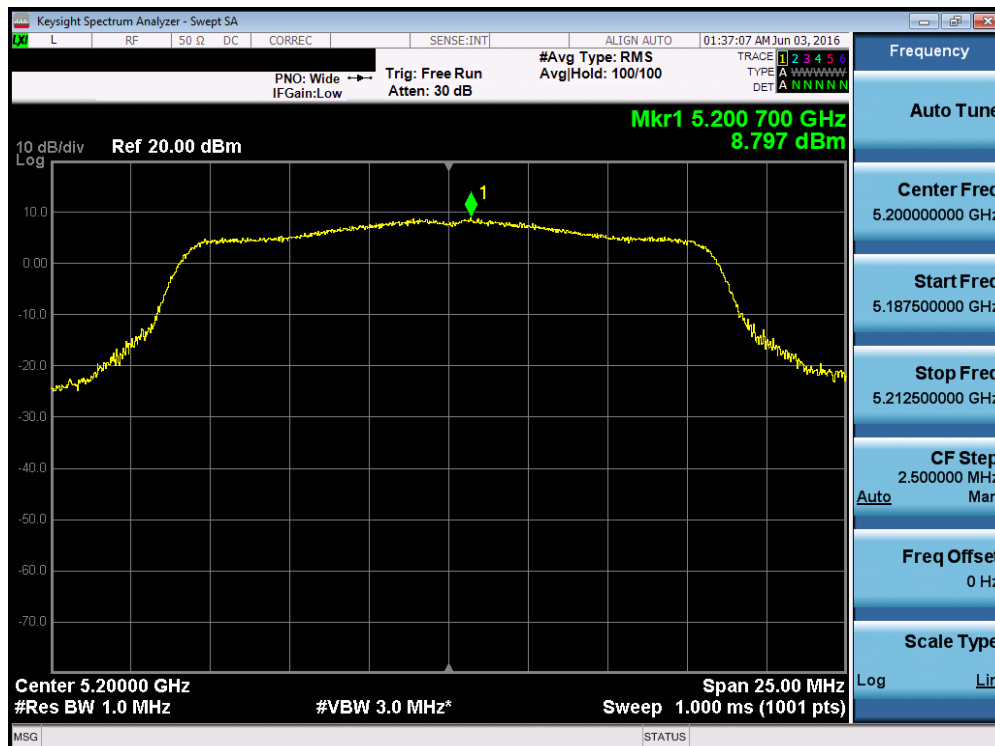
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	8.84	11.0	-2.16	Pass
	5200	40	a	6	8.80	11.0	-2.20	Pass
	5240	48	a	6	9.29	11.0	-1.71	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	7.23	11.0	-3.77	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	7.24	11.0	-3.76	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	7.73	11.0	-3.27	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	3.13	11.0	-7.87	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	4.04	11.0	-6.96	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-4.00	11.0	-15.00	Pass
Band 2A	5260	52	a	6	8.96	11.0	-2.04	Pass
	5280	56	a	6	8.62	11.0	-2.39	Pass
	5320	64	a	6	8.30	11.0	-2.71	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	7.29	11.0	-3.71	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	8.44	11.0	-2.56	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	8.09	11.0	-2.91	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	4.22	11.0	-6.78	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	3.96	11.0	-7.04	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-3.90	11.0	-14.90	Pass
Band 2C	5500	100	a	6	9.37	11.0	-1.63	Pass
	5600	120	a	6	7.85	11.0	-3.15	Pass
	5720	144	a	6	8.80	11.0	-2.20	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	8.53	11.0	-2.48	Pass
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	6.98	11.0	-4.02	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	8.14	11.0	-2.86	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	4.77	11.0	-6.24	Pass
	5590	118	n (40MHz)	13.5/15 (MCS0)	3.48	11.0	-7.52	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	4.08	11.0	-6.92	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-3.44	11.0	-14.44	Pass
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-4.21	11.0	-15.21	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-3.82	11.0	-14.82	Pass

Table 7-17. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements

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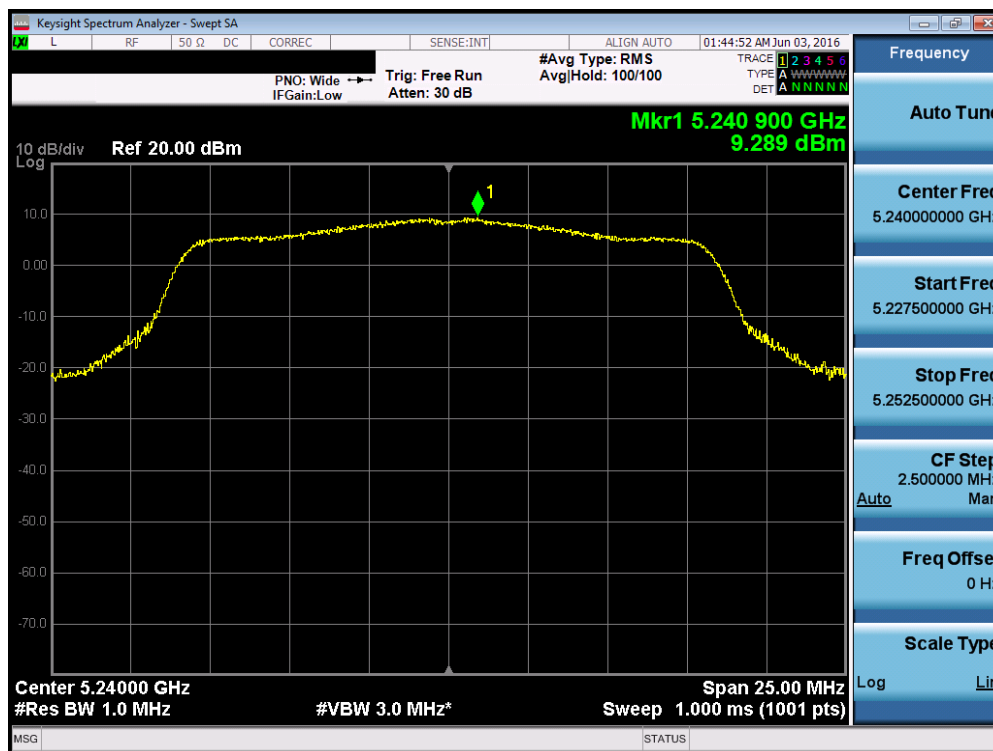


Plot 7-79. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

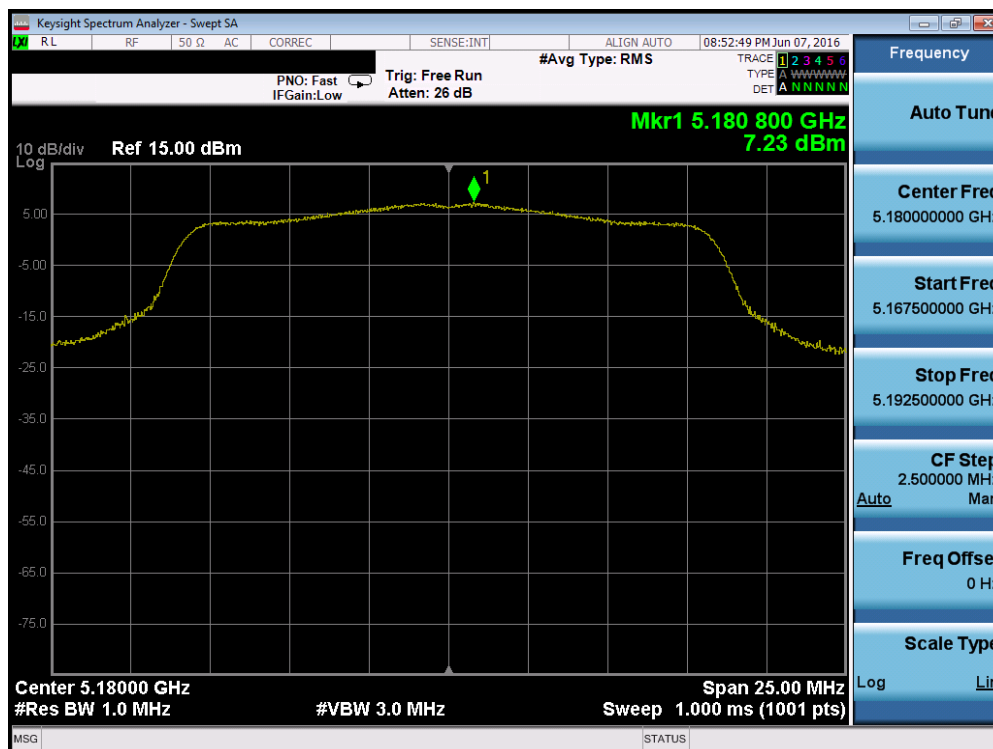


Plot 7-80. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 71 of 272

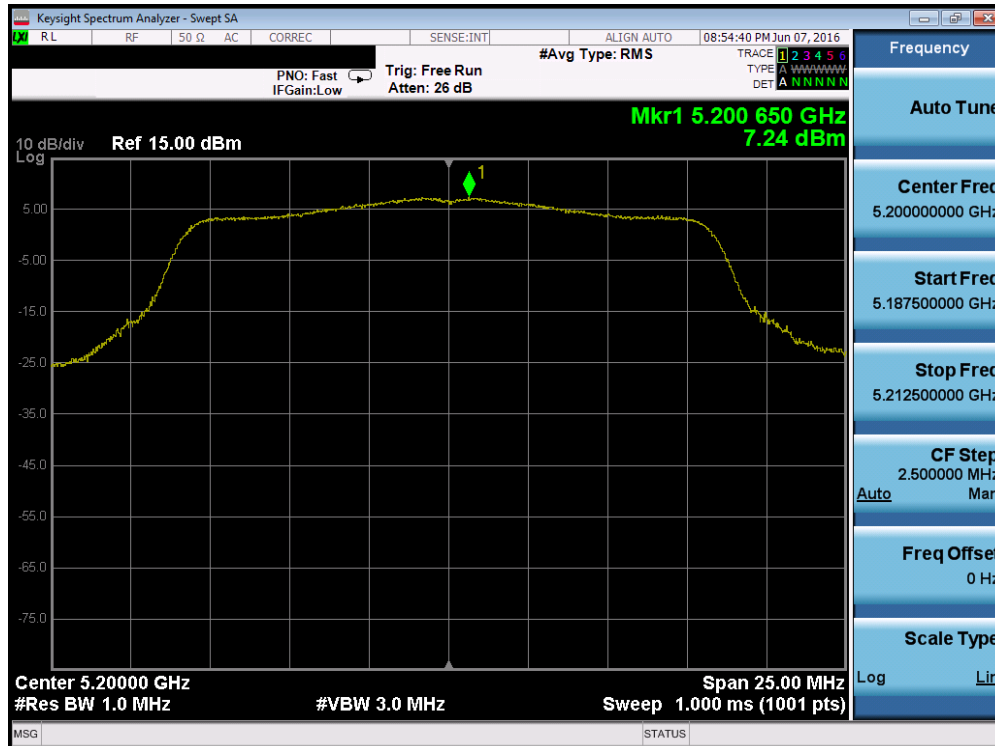


Plot 7-81. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

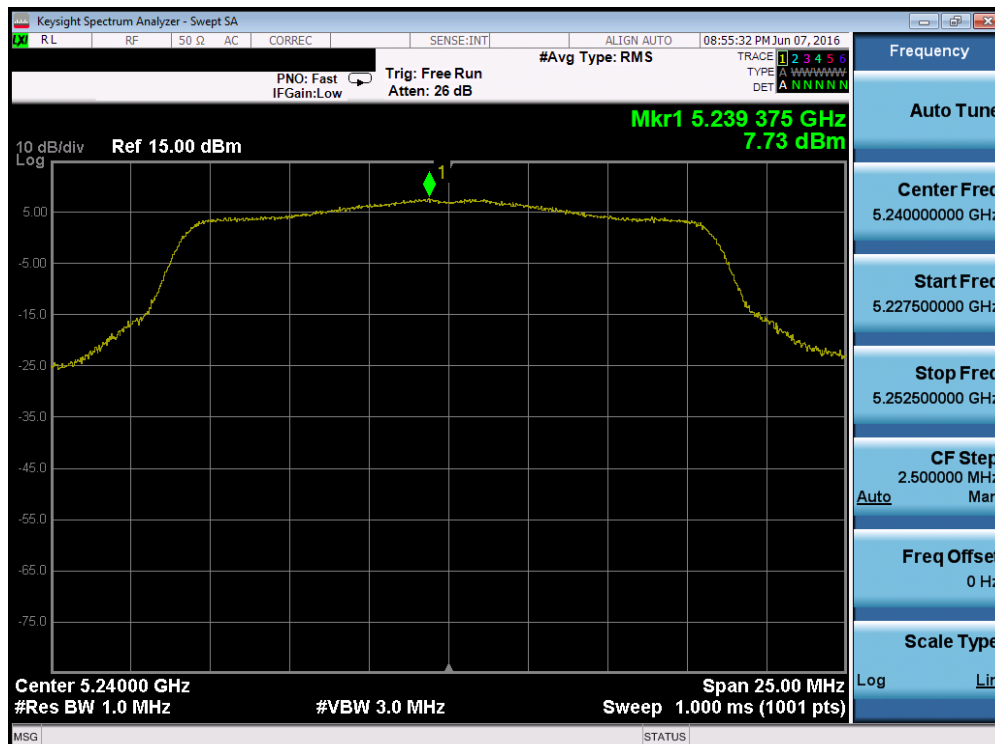


Plot 7-82. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 72 of 272

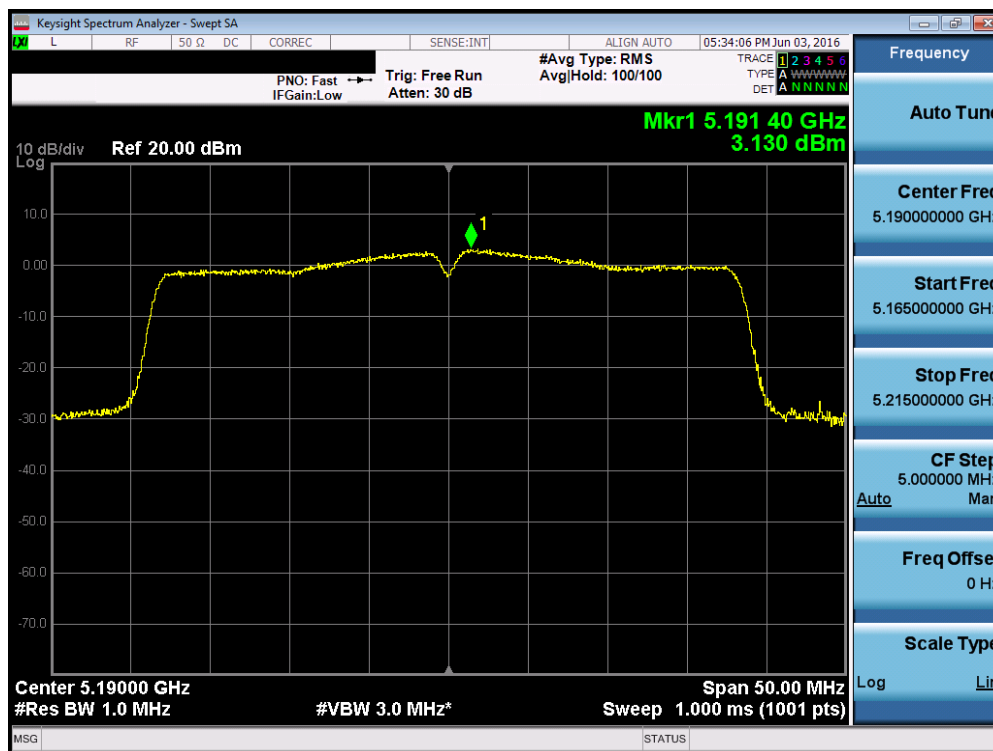


Plot 7-83. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

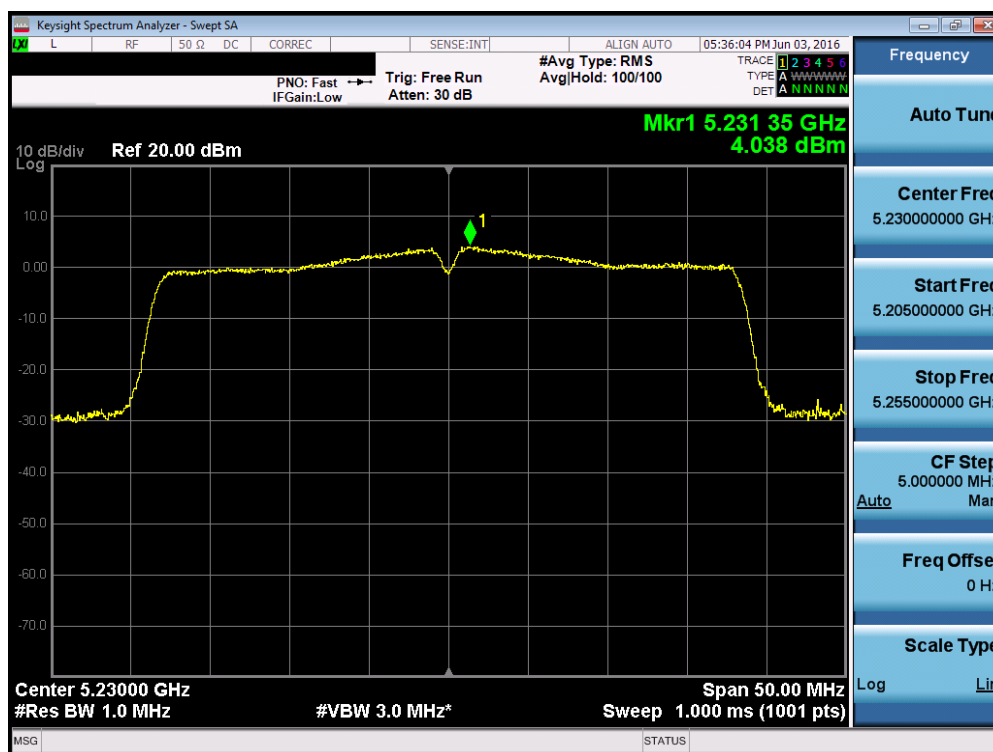


Plot 7-84. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 73 of 272

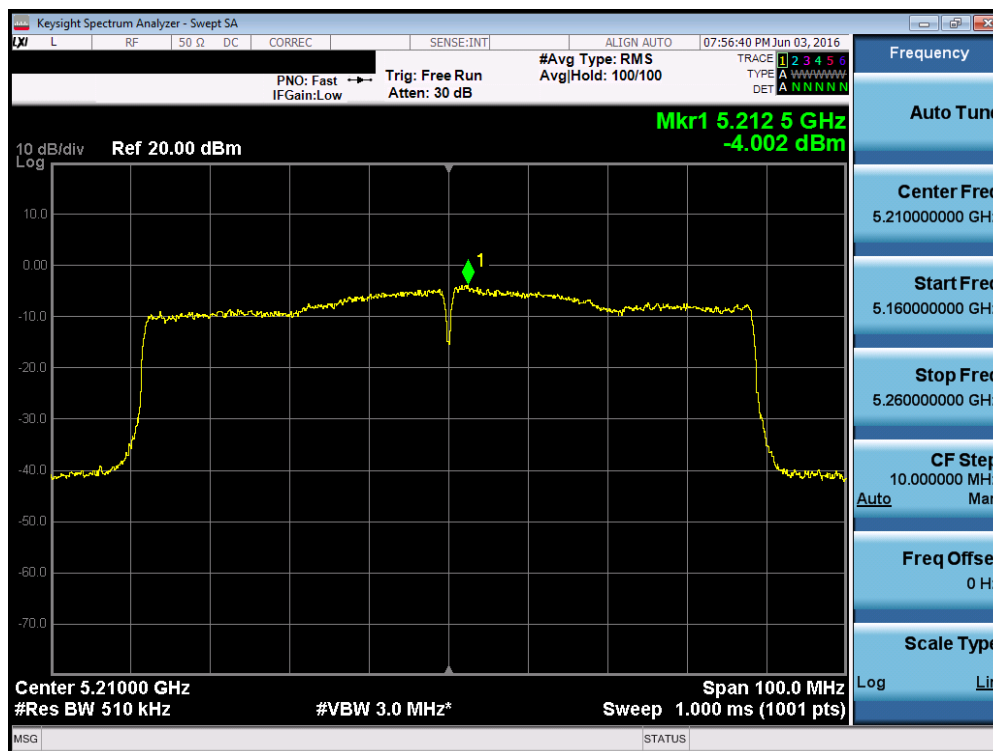


Plot 7-85. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

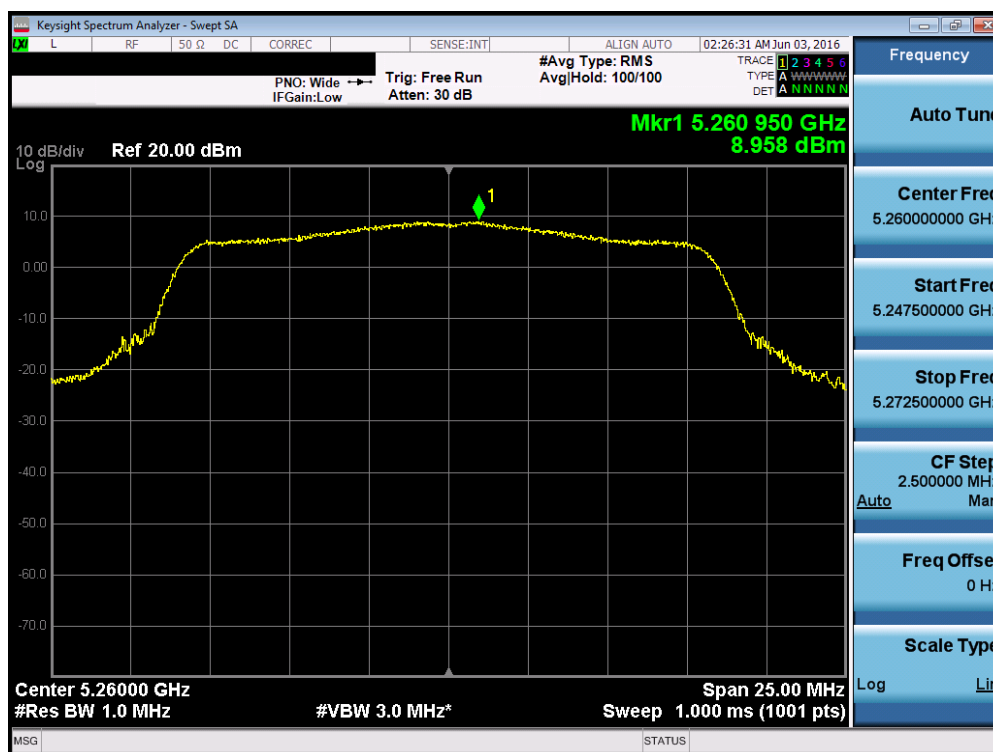


Plot 7-86. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 74 of 272

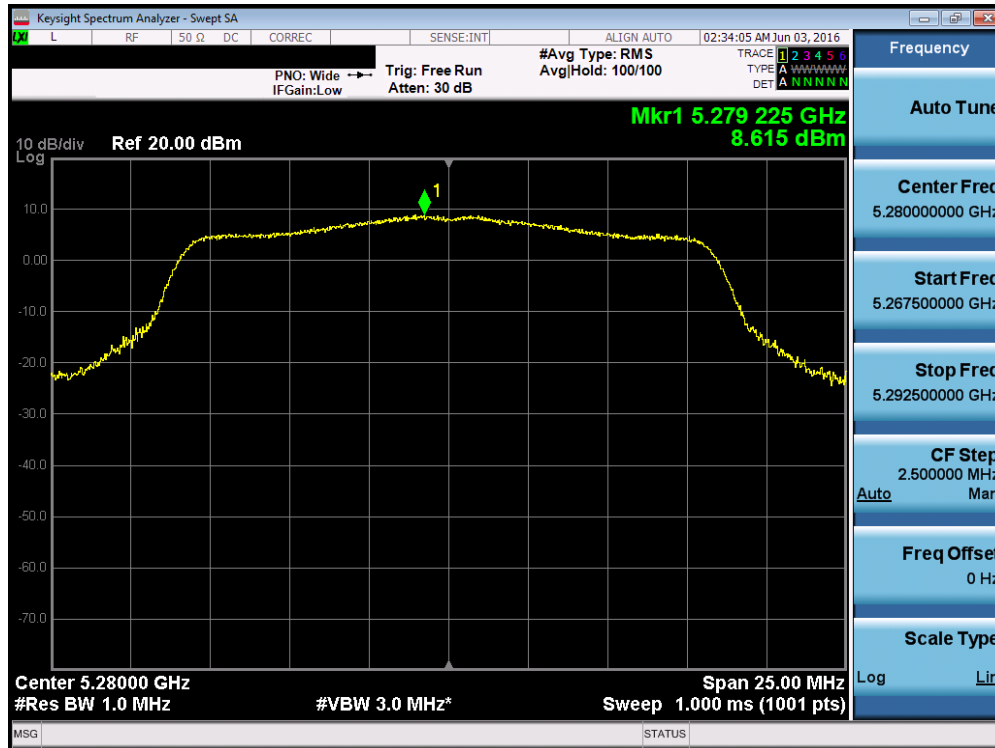


Plot 7-87. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

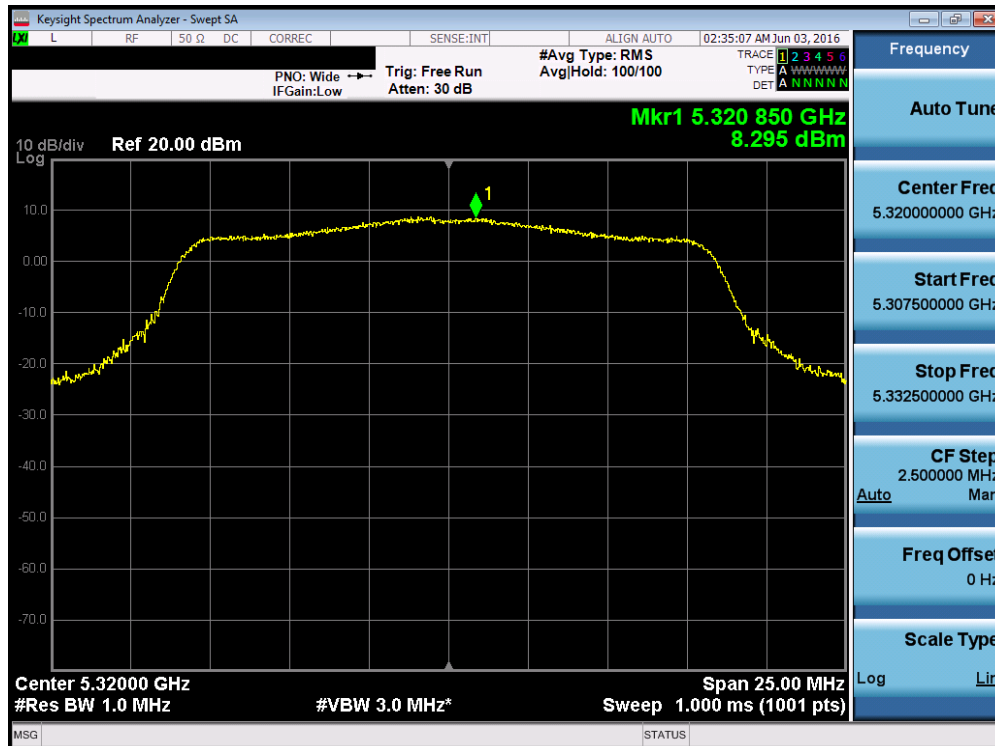


Plot 7-88. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 75 of 272

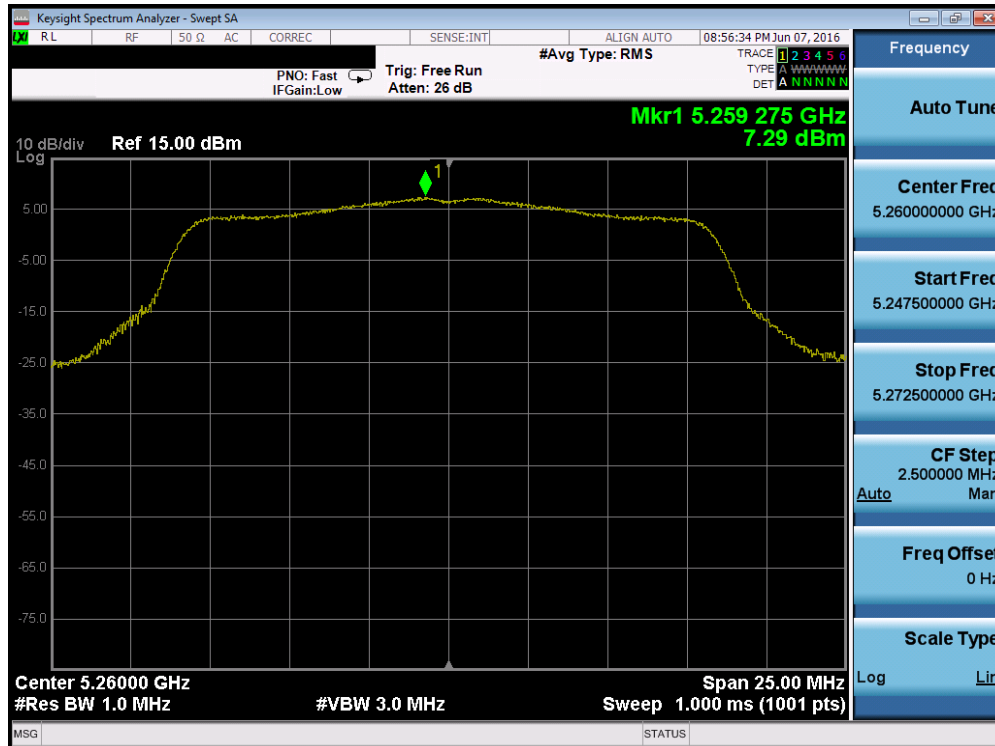


Plot 7-89. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

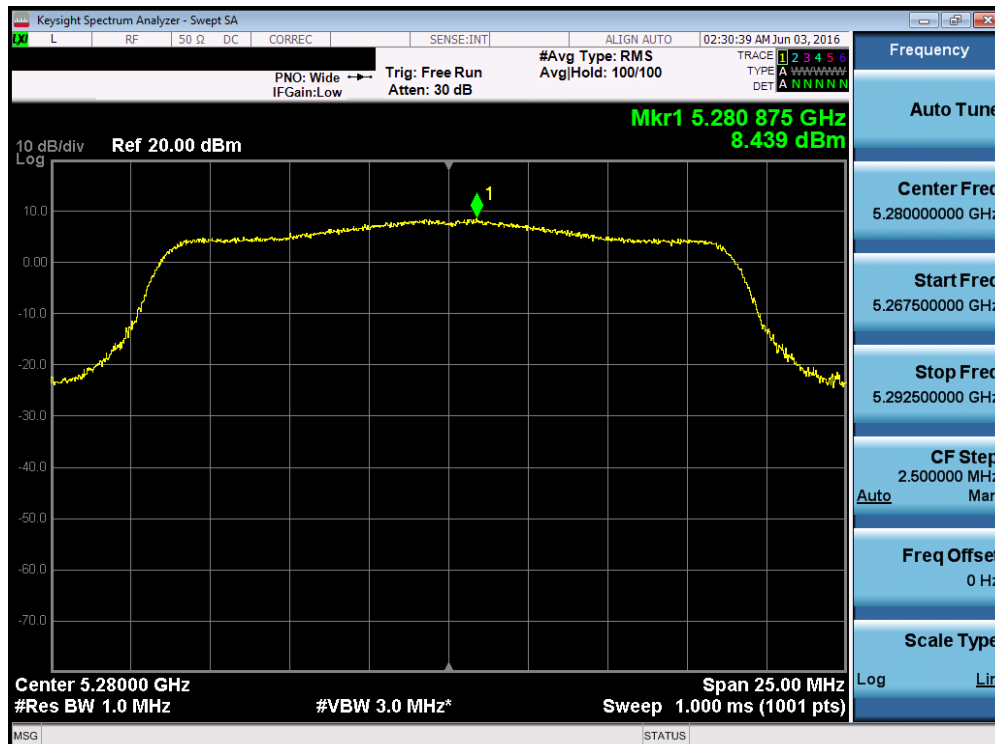


Plot 7-90. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 76 of 272

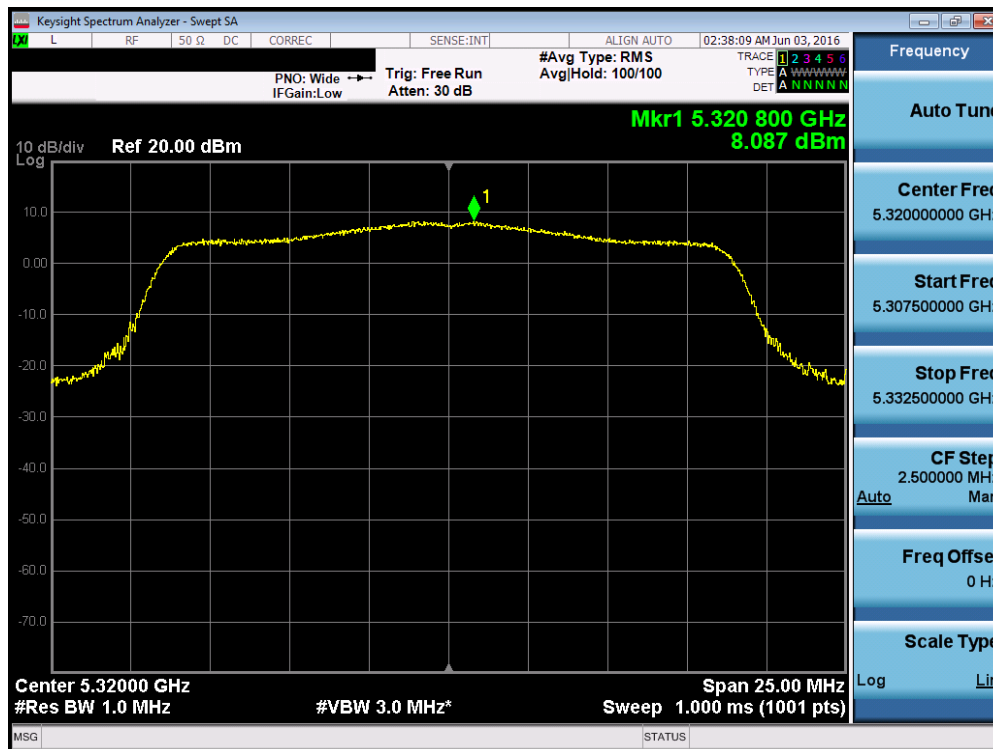


Plot 7-91. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

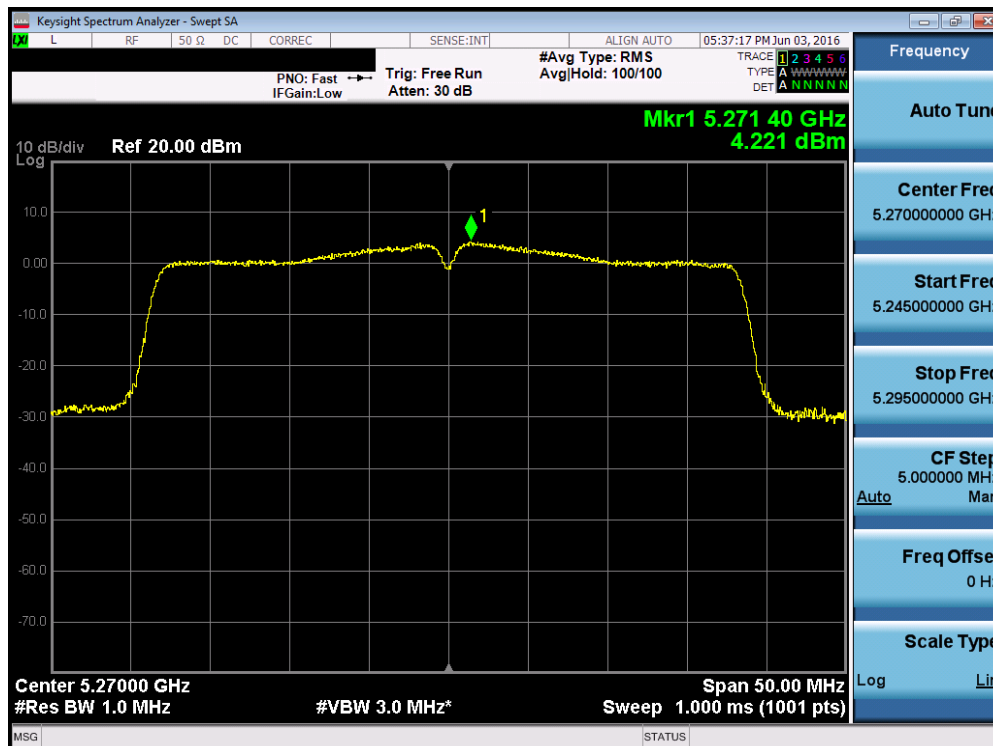


Plot 7-92. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 77 of 272

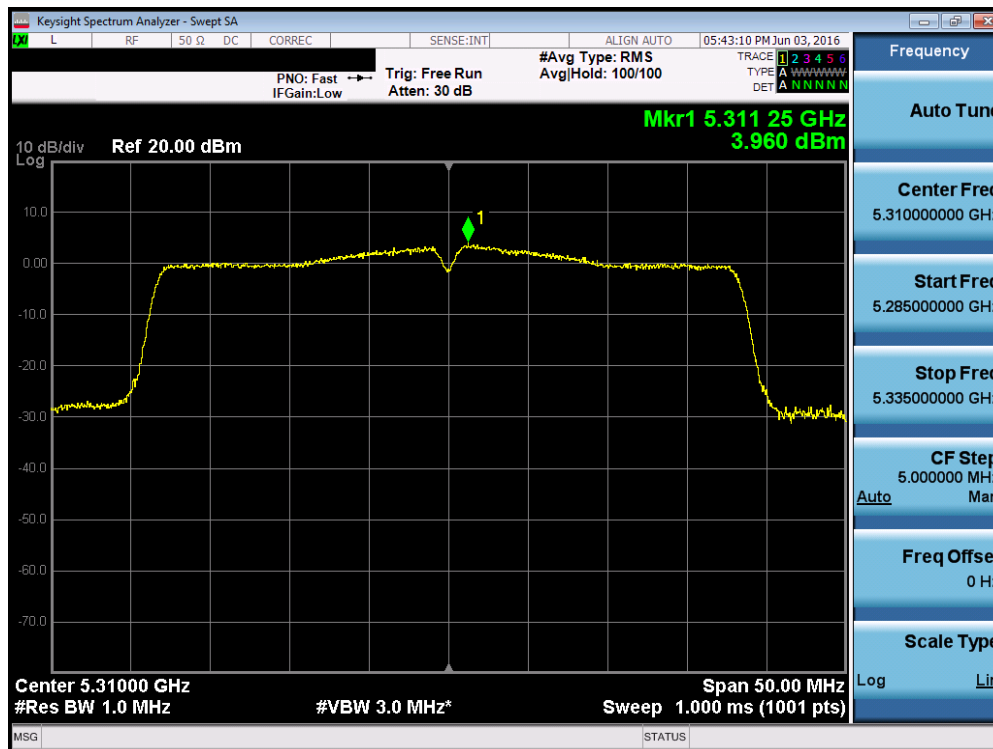


Plot 7-93. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

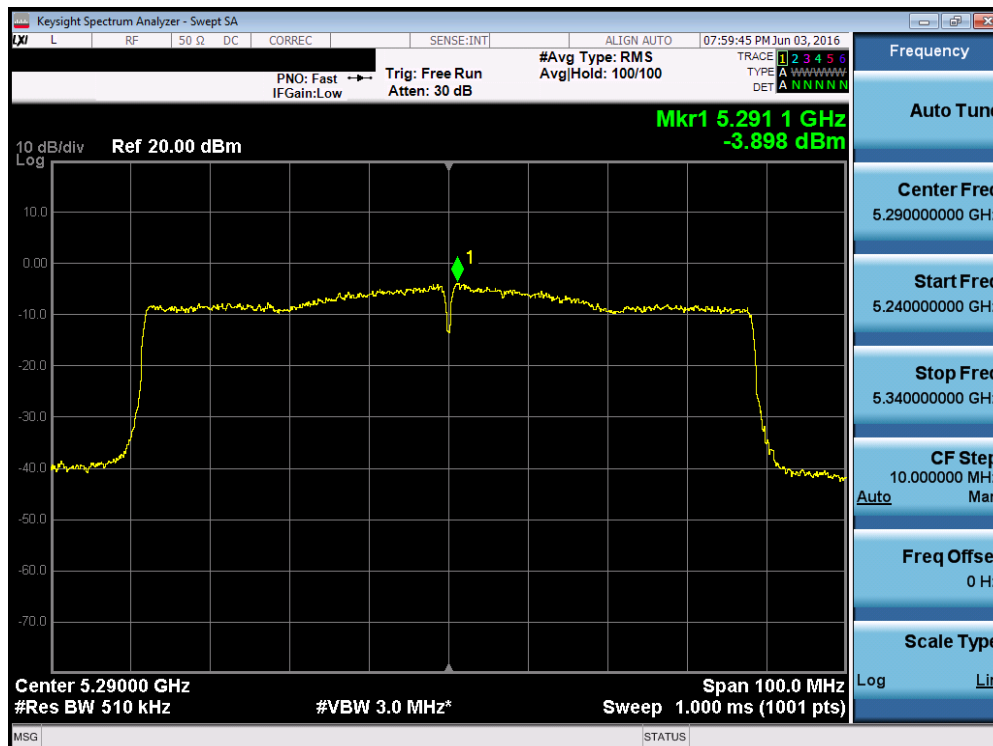


Plot 7-94. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 78 of 272

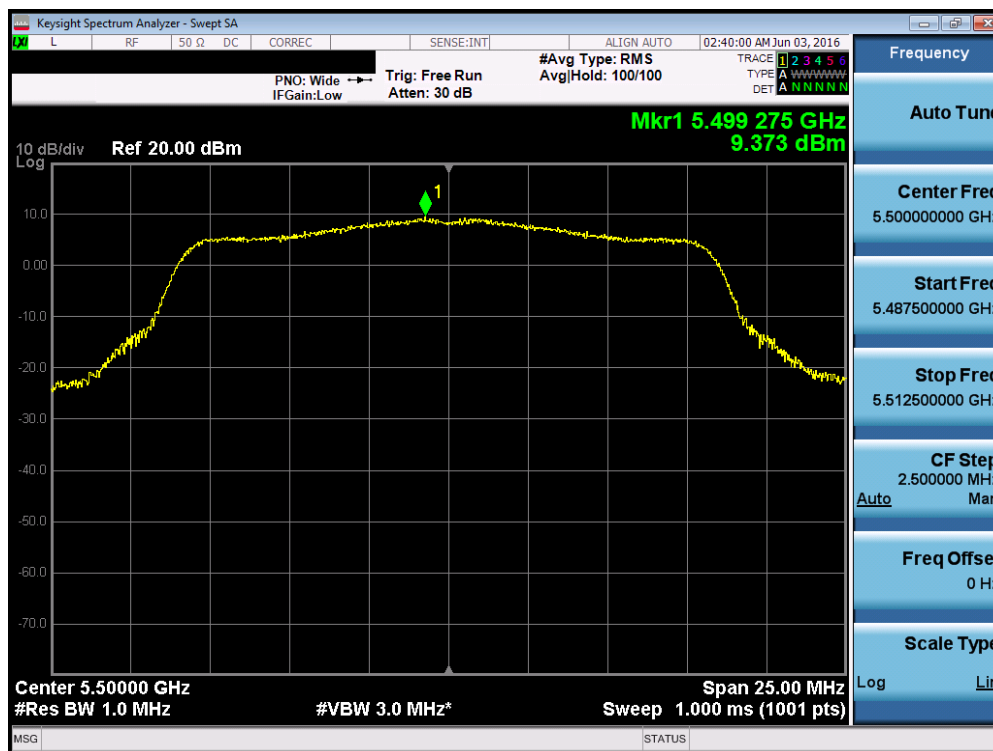


Plot 7-95. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

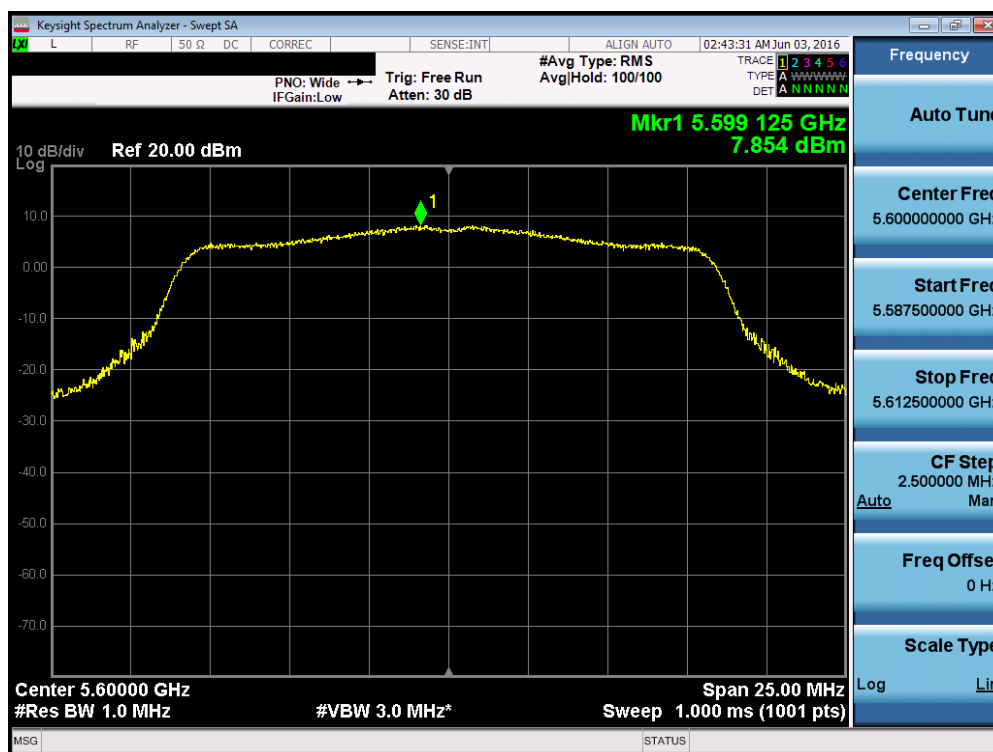


Plot 7-96. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 79 of 272

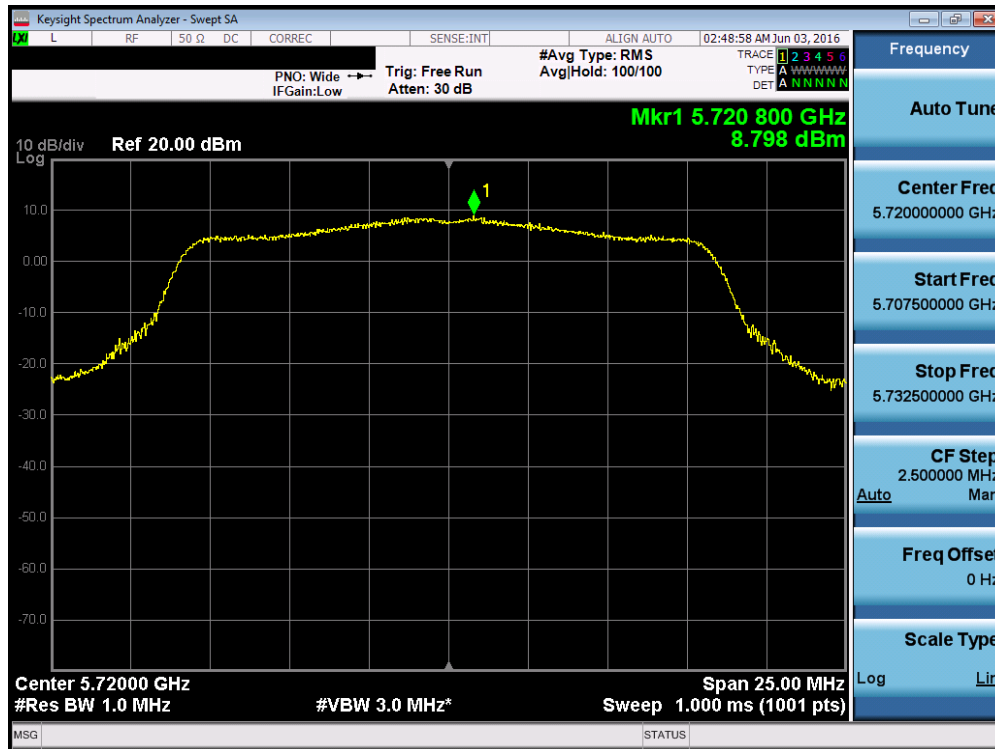


Plot 7-97. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

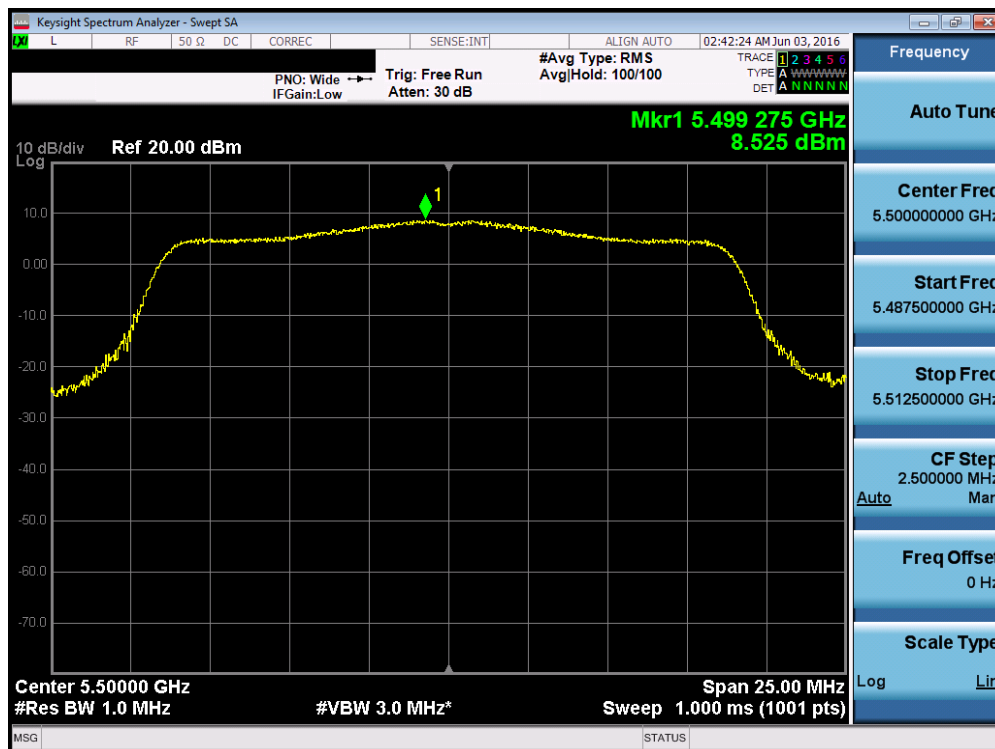


Plot 7-98. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 80 of 272

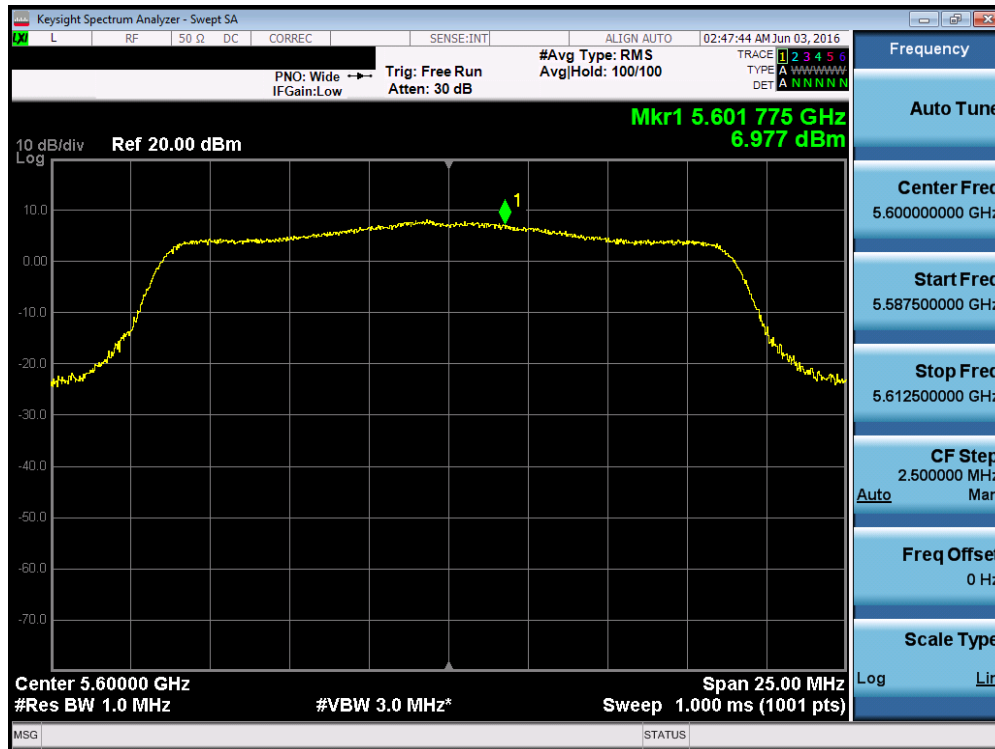


Plot 7-99. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

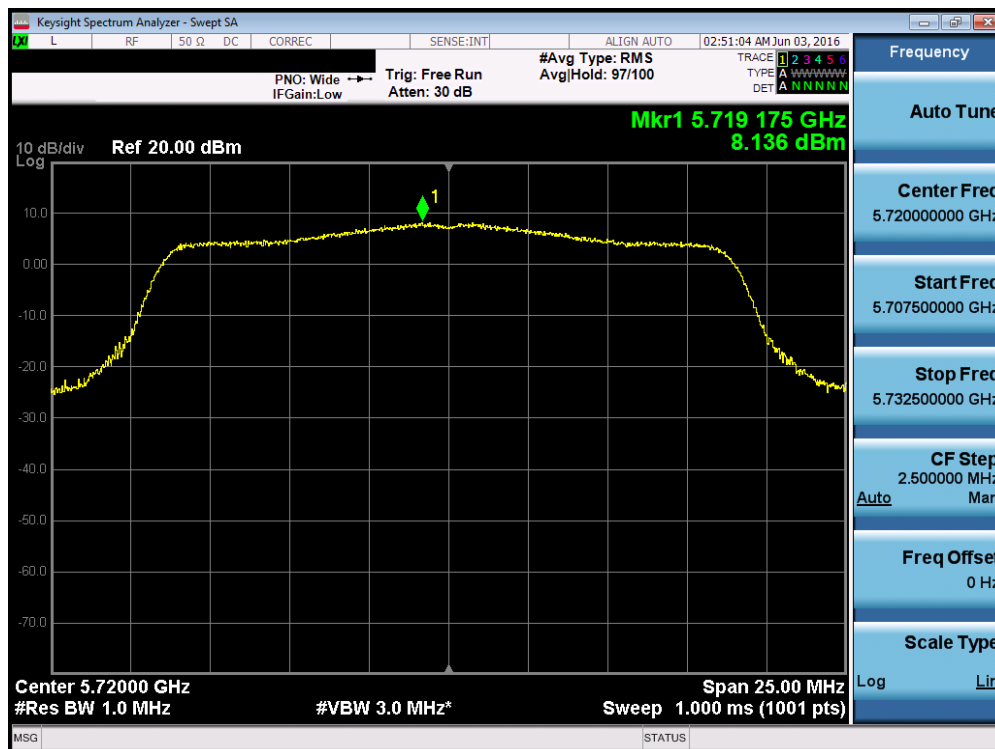


Plot 7-100. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 81 of 272

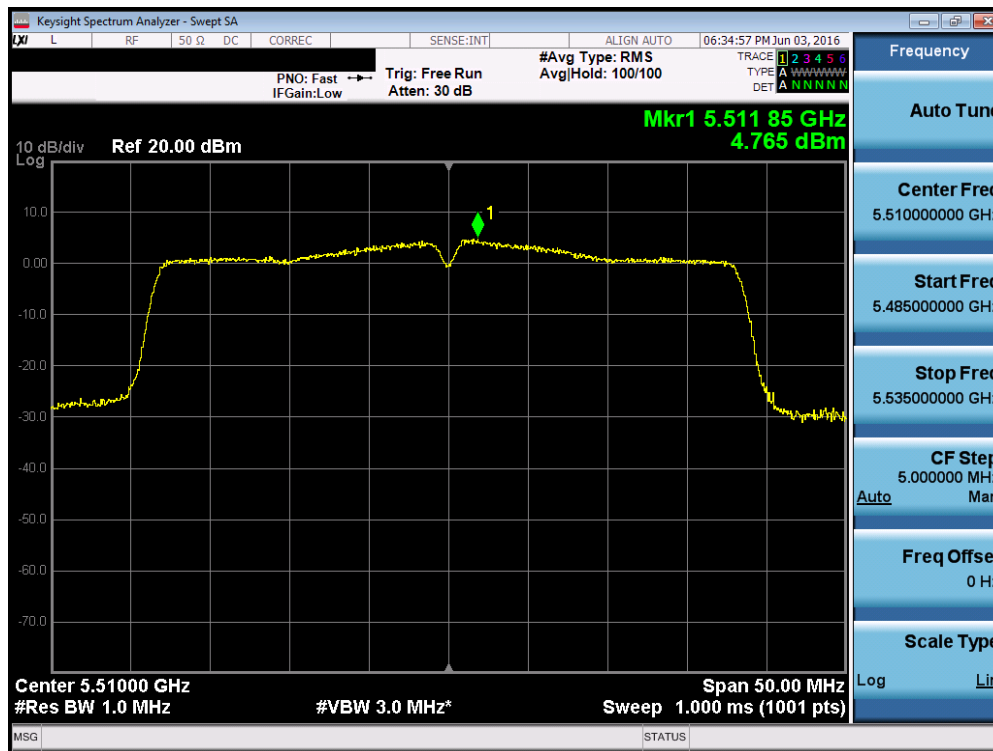


Plot 7-101. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

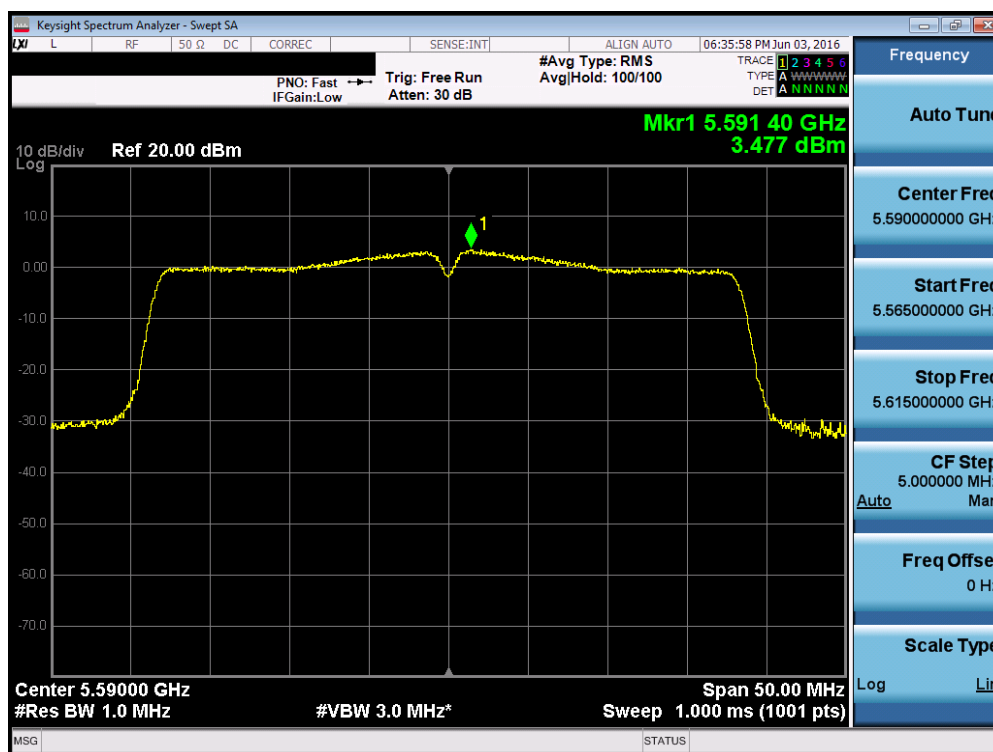


Plot 7-102. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 82 of 272

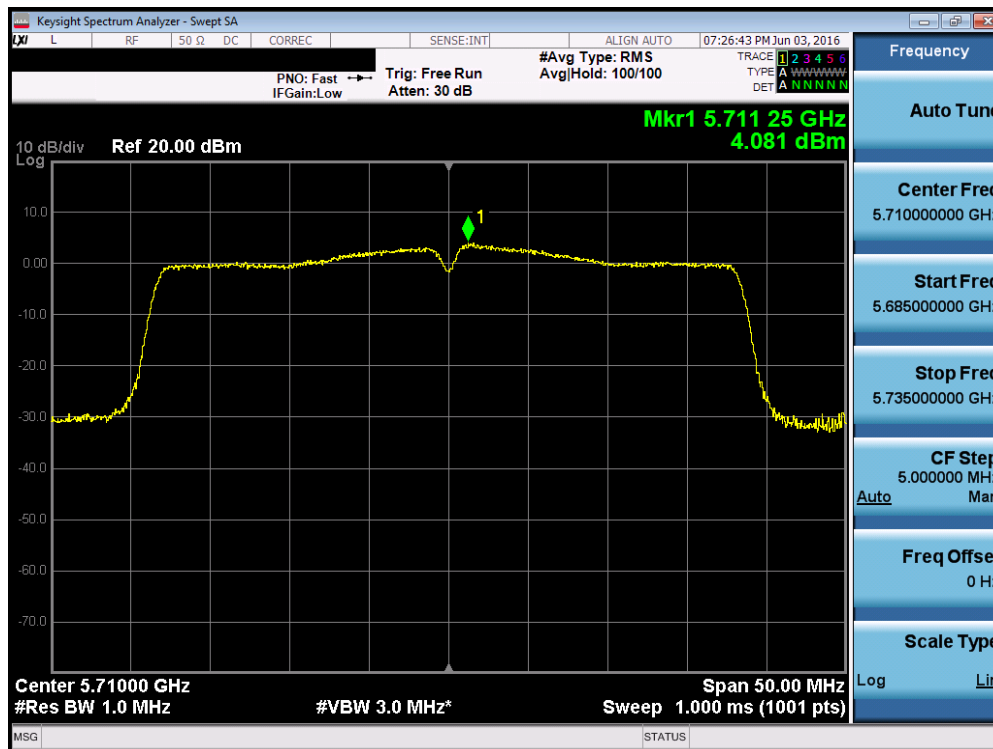


Plot 7-103. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

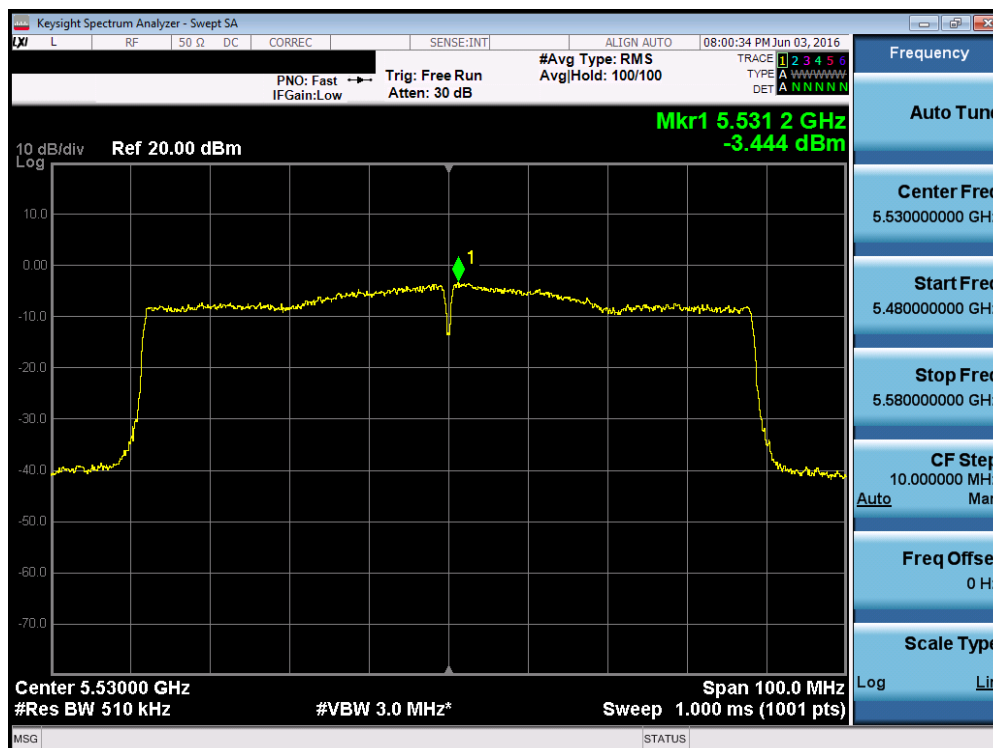


Plot 7-104. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 83 of 272

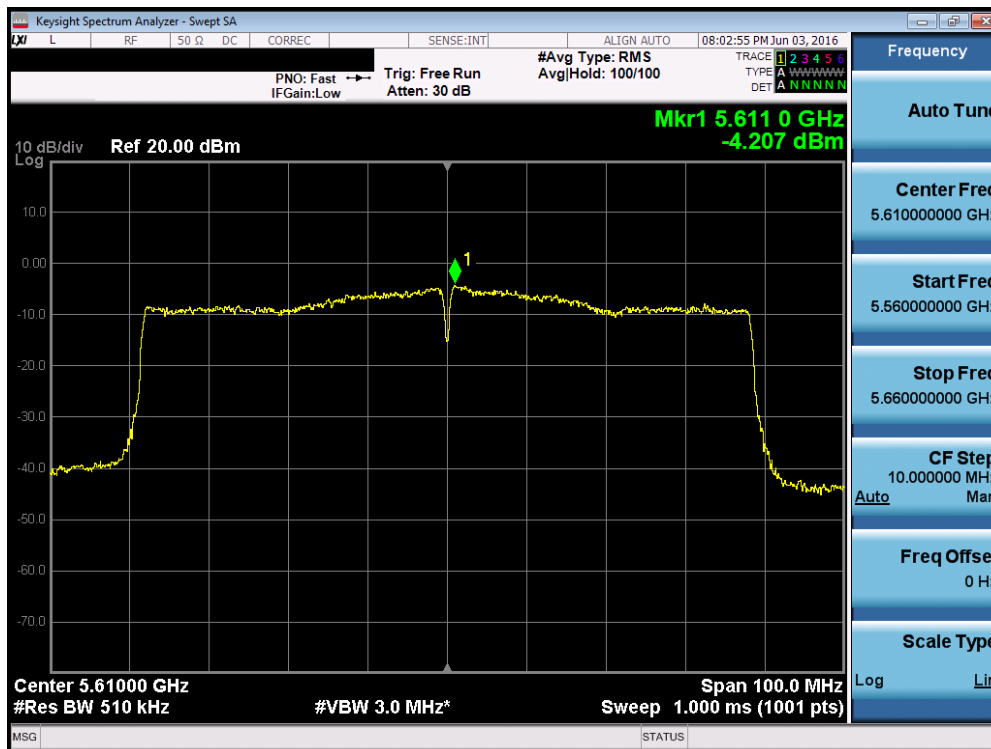


Plot 7-105. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

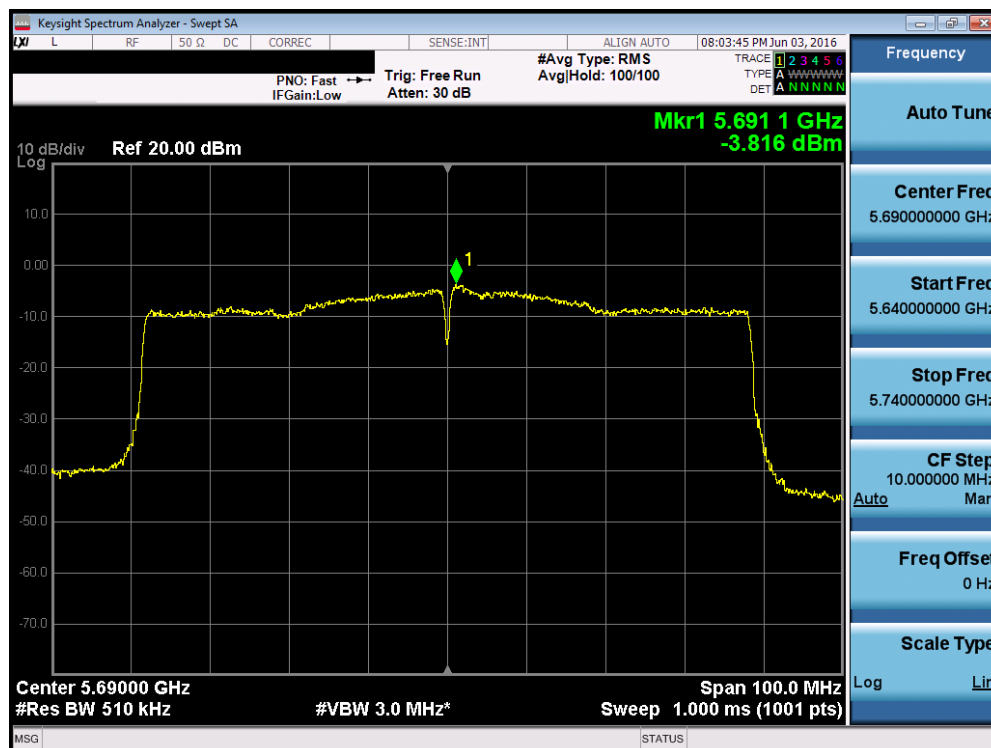


Plot 7-106. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 84 of 272



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

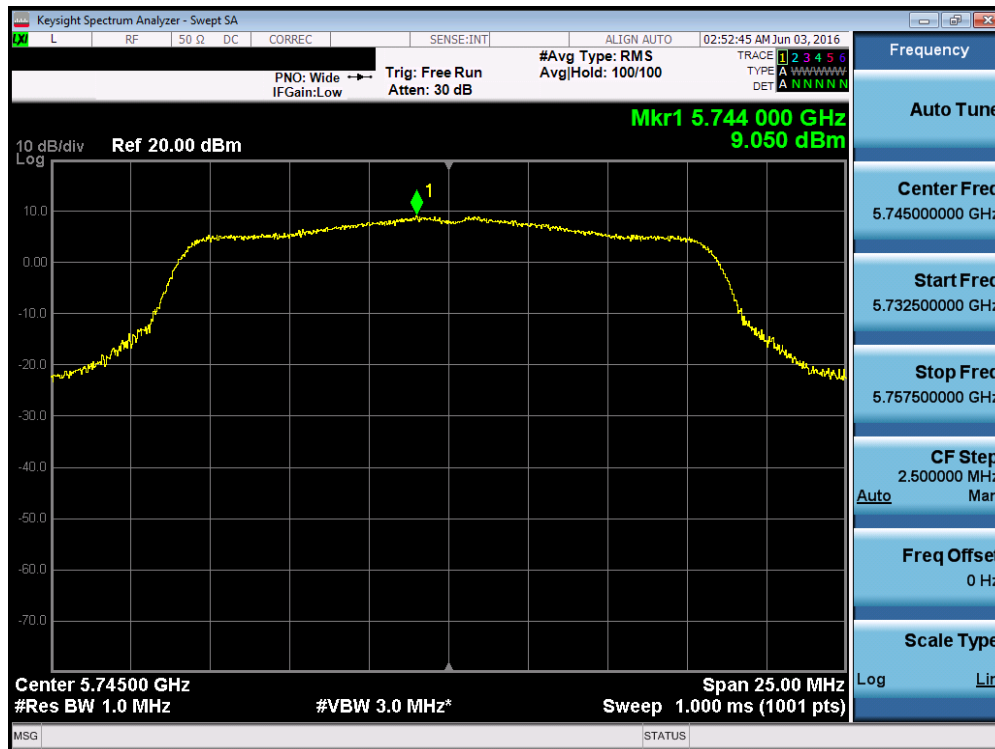


Plot 7-108. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 85 of 272

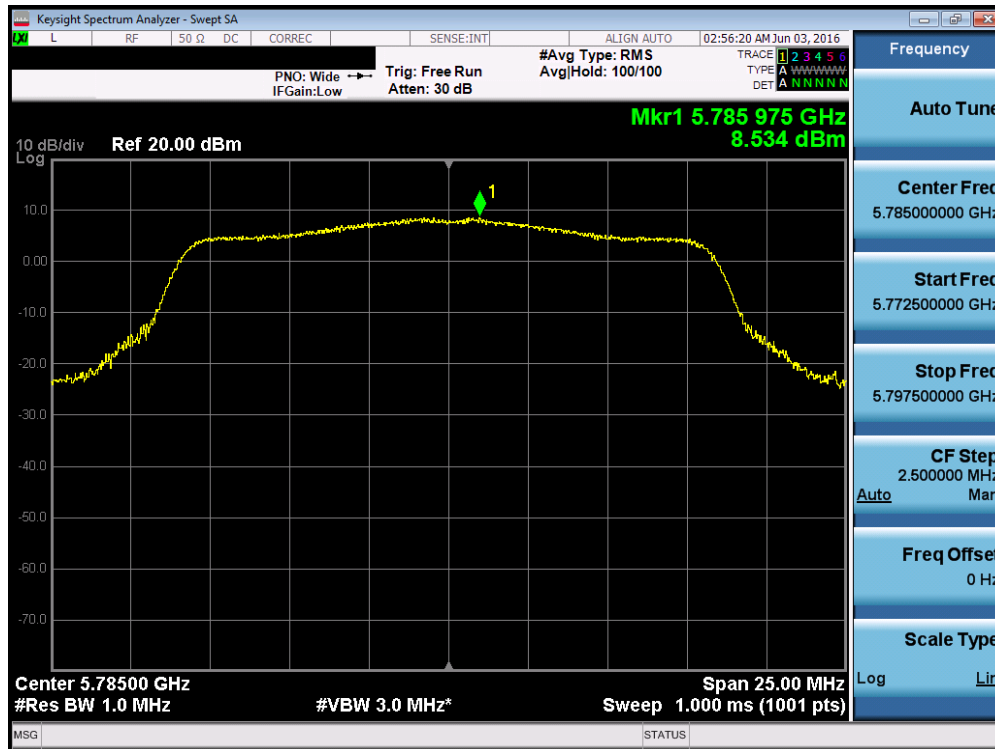
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	9.05	30.0	-20.95	Pass
	5785	157	a	6	8.53	30.0	-21.47	Pass
	5825	165	a	6	8.24	30.0	-21.76	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	8.40	30.0	-21.60	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	8.26	30.0	-21.74	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	7.12	30.0	-22.88	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	1.36	30.0	-28.64	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	0.55	30.0	-29.45	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-4.75	30.0	-34.75	Pass

Table 7-18. Band 3 Conducted Power Spectral Density Measurements

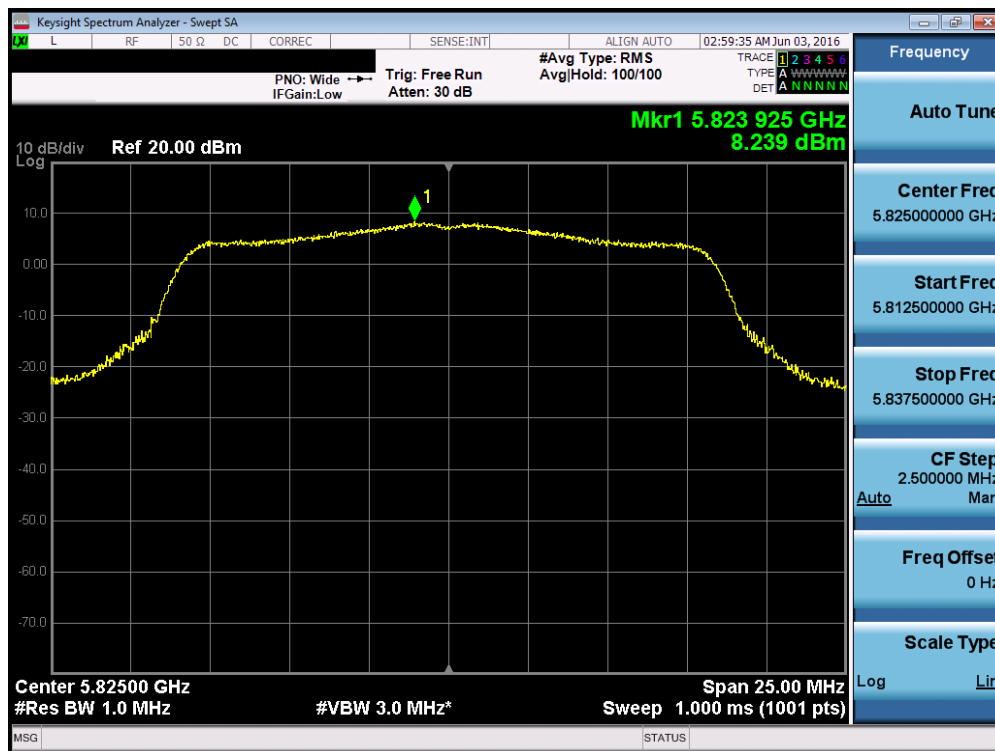


Plot 7-109. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 86 of 272

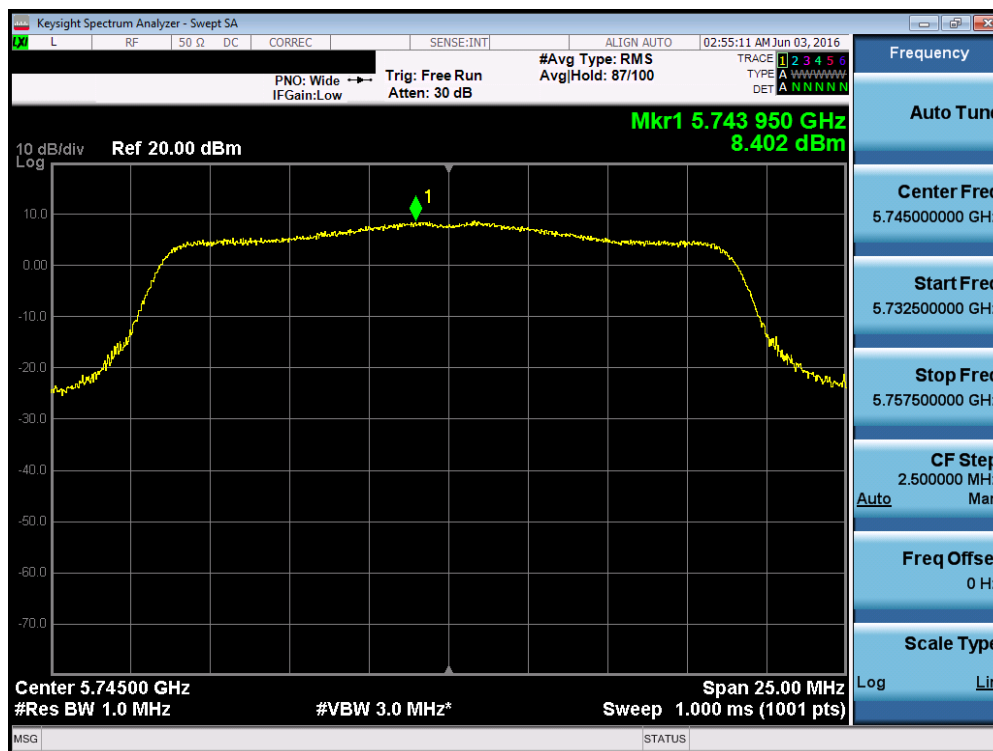


Plot 7-110. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

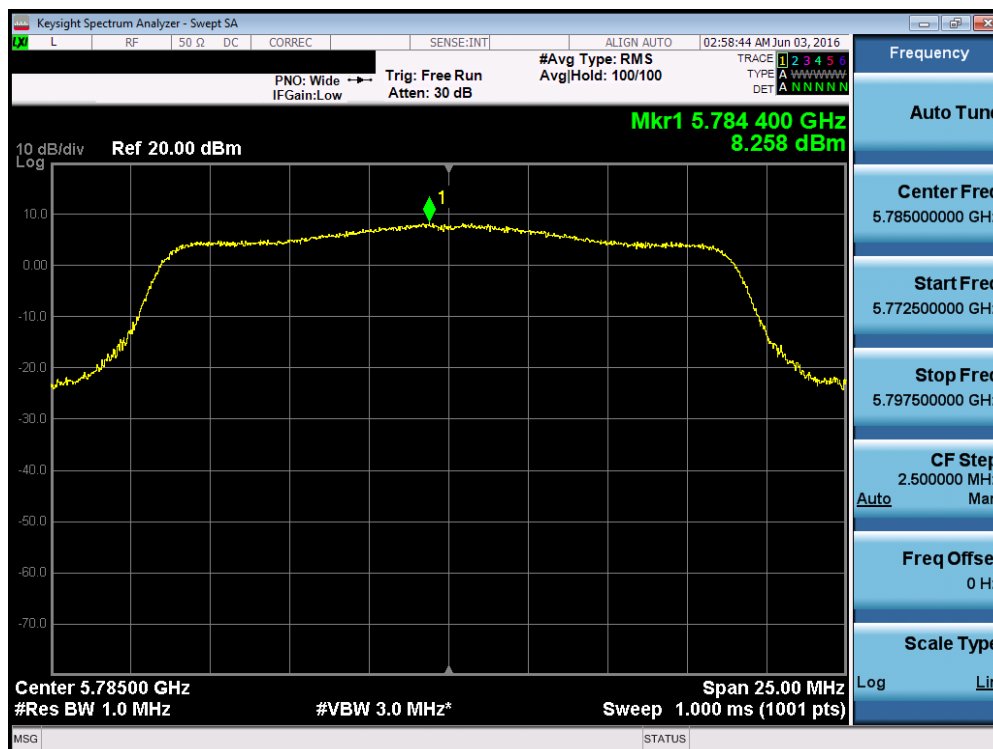


Plot 7-111. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 87 of 272

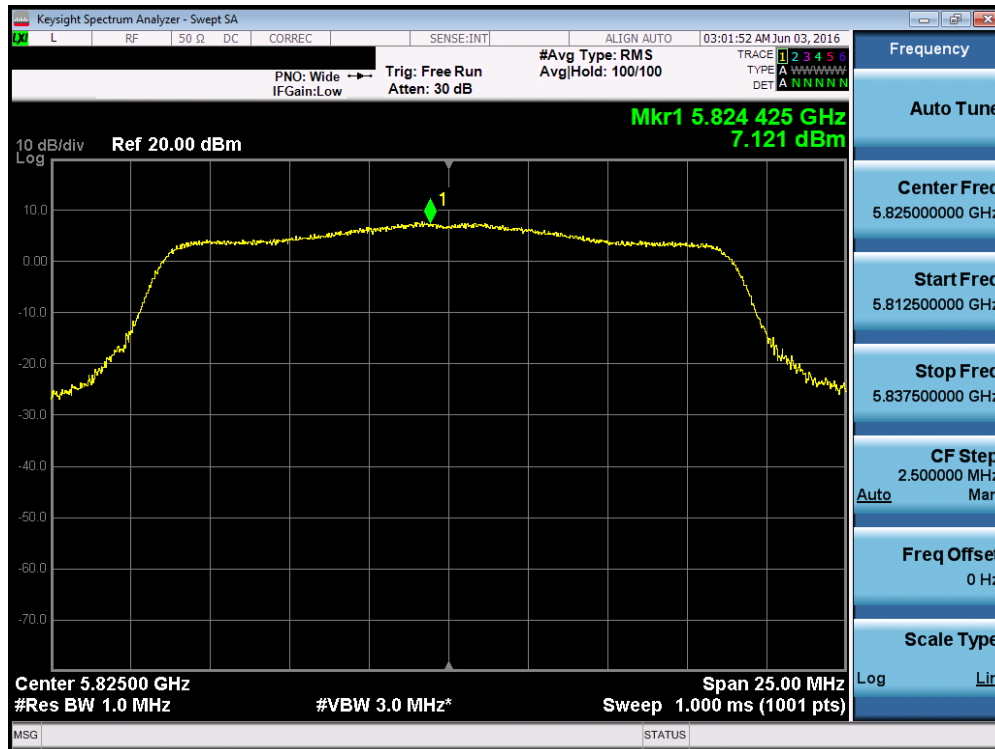


Plot 7-112. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

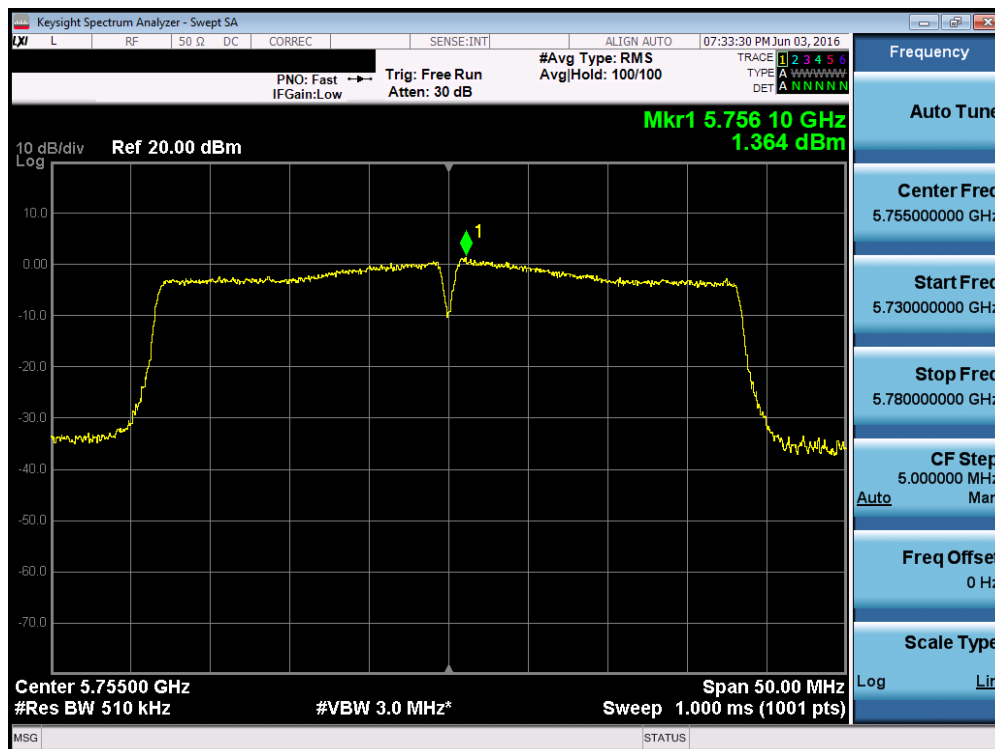


Plot 7-113. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 88 of 272

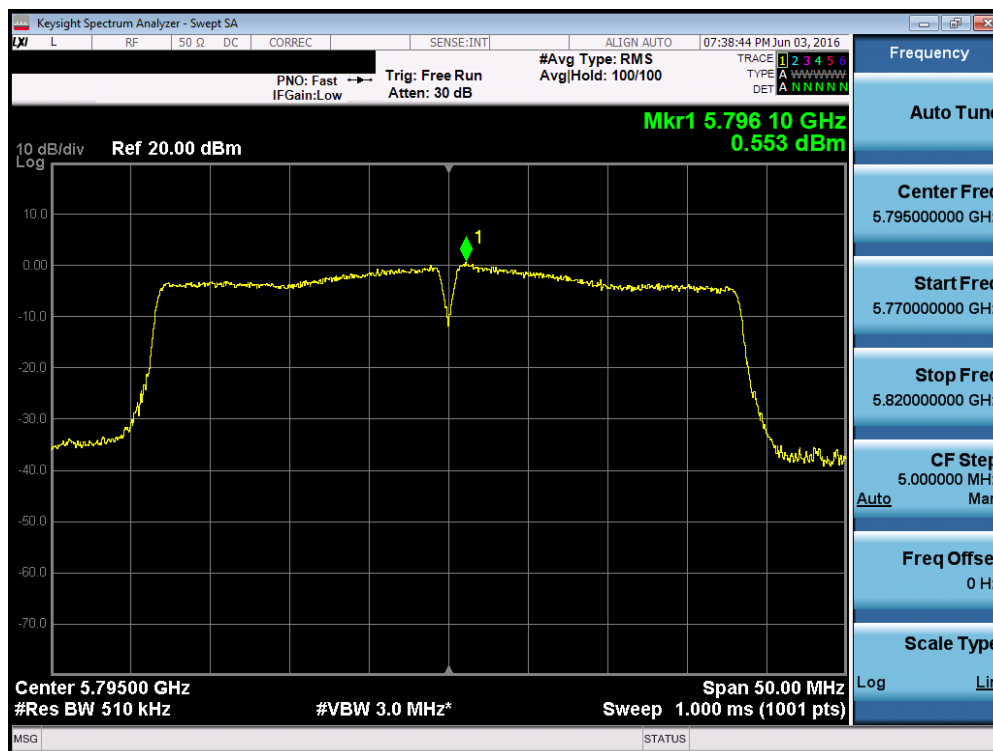


Plot 7-114. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

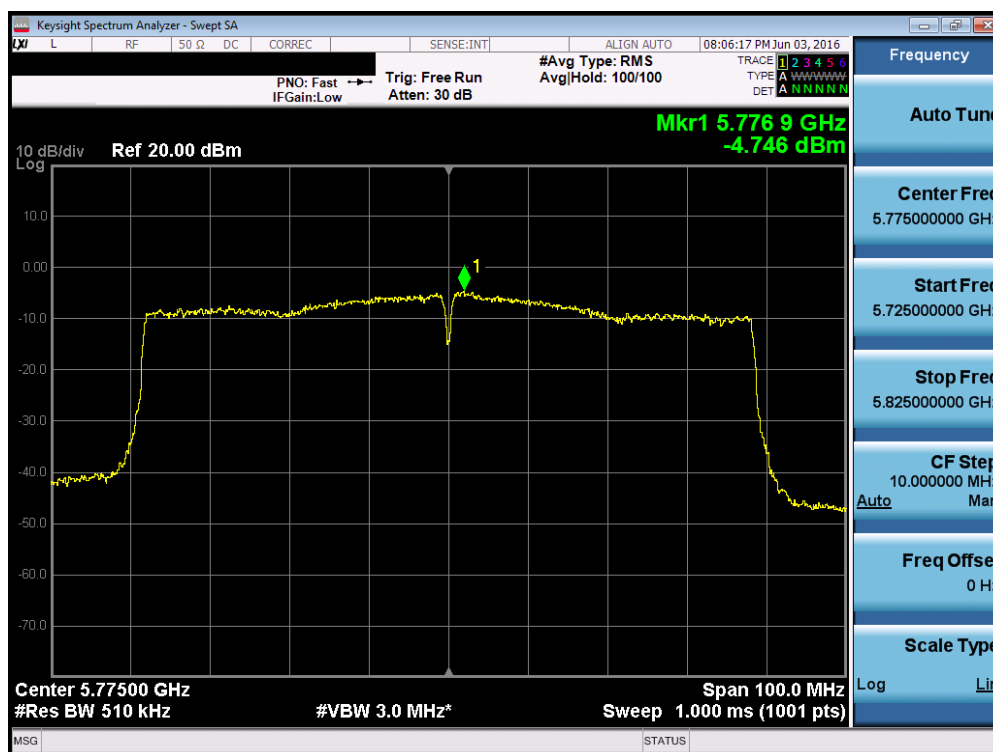


Plot 7-115. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 89 of 272



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



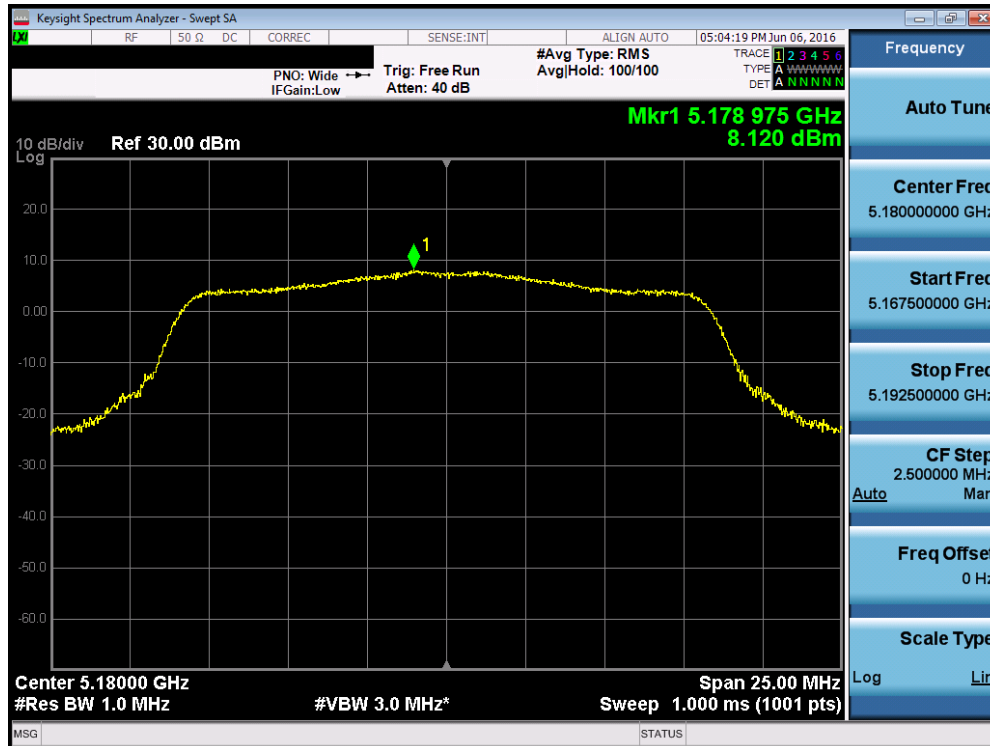
Plot 7-117. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 155)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 90 of 272

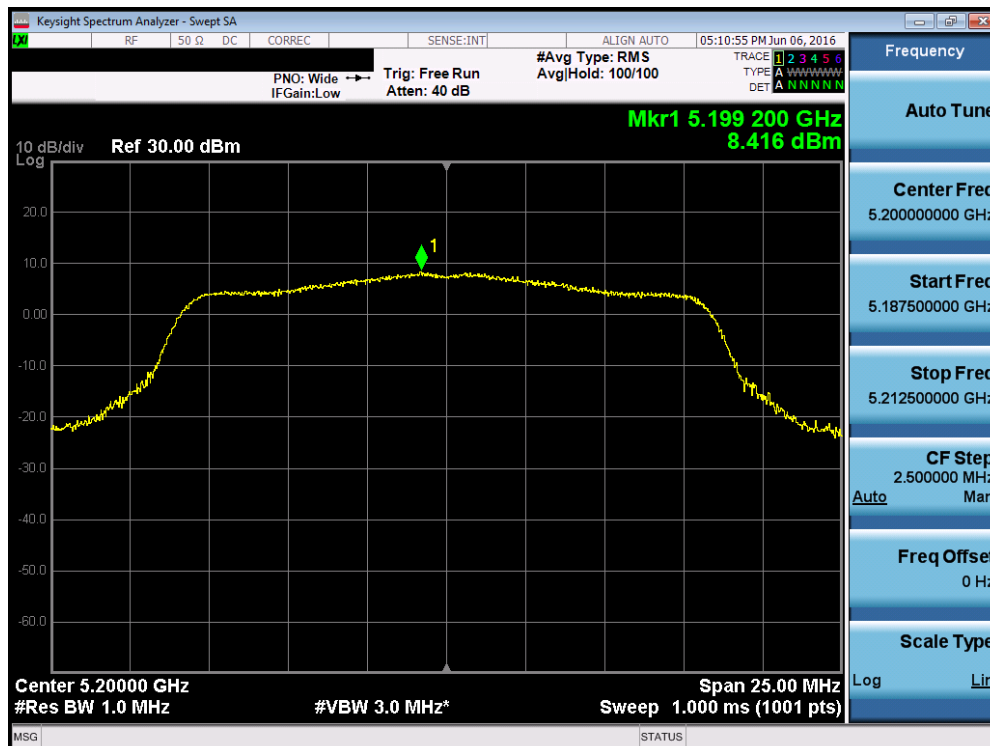
Antenna-2 Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Pass / Fail
Band 1	5180	36	a	6	8.12	11.0	-2.88	Pass
	5200	40	a	6	8.42	11.0	-2.58	Pass
	5240	48	a	6	8.22	11.0	-2.78	Pass
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	8.14	11.0	-2.86	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	7.57	11.0	-3.43	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	8.01	11.0	-2.99	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	2.57	11.0	-8.43	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	2.74	11.0	-8.26	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-2.61	11.0	-13.61	Pass
Band 2A	5260	52	a	6	7.78	11.0	-3.22	Pass
	5280	56	a	6	7.39	11.0	-3.62	Pass
	5320	64	a	6	7.35	11.0	-3.65	Pass
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	7.99	11.0	-3.01	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	7.34	11.0	-3.66	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	7.07	11.0	-3.93	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	2.31	11.0	-8.69	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	1.45	11.0	-9.55	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-2.88	11.0	-13.88	Pass
Band 2C	5500	100	a	6	7.60	11.0	-3.41	Pass
	5600	120	a	6	5.60	11.0	-5.40	Pass
	5720	144	a	6	7.36	11.0	-3.64	Pass
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	6.99	11.0	-4.02	Pass
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	6.46	11.0	-4.55	Pass
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	7.10	11.0	-3.90	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	1.88	11.0	-9.12	Pass
	5590	118	n (40MHz)	13.5/15 (MCS0)	0.63	11.0	-10.37	Pass
	5710	142	n (40MHz)	13.5/15 (MCS0)	3.01	11.0	-7.99	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-2.40	11.0	-13.40	Pass
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-3.12	11.0	-14.12	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-2.56	11.0	-13.56	Pass

Table 7-19. Conducted Power Spectral Density Measurements

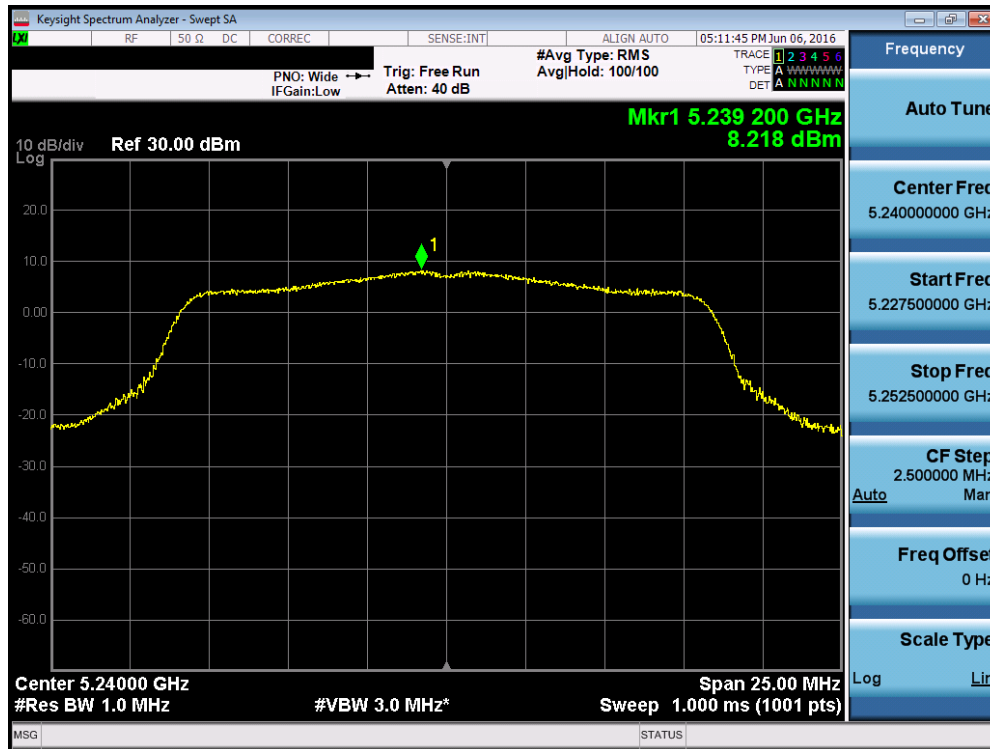


Plot 7-118. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

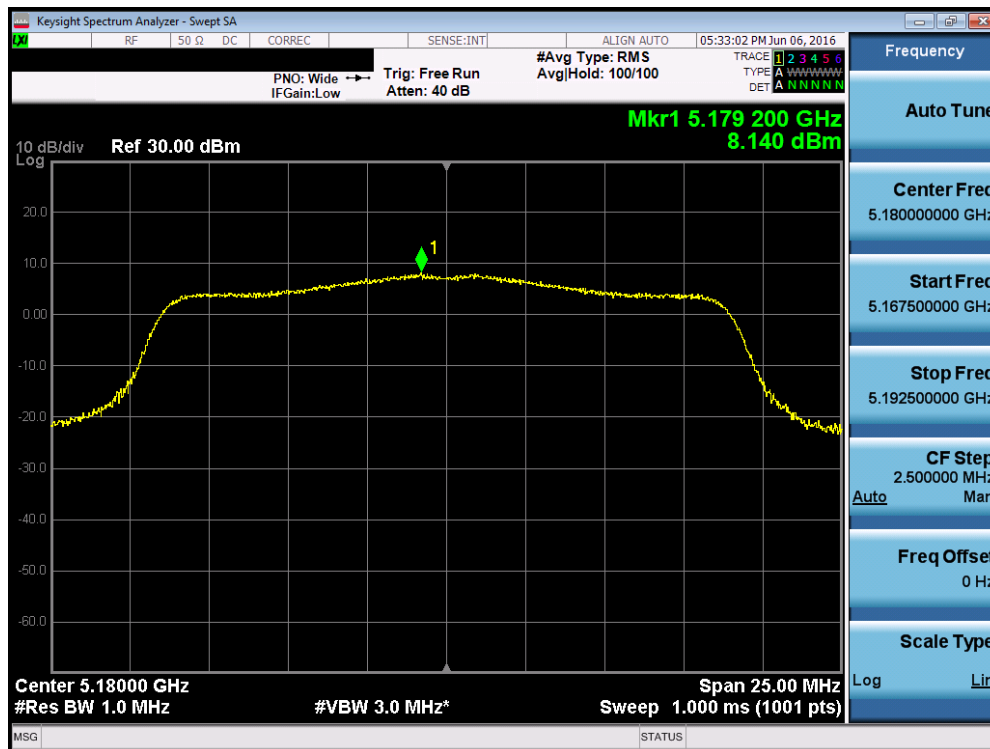


Plot 7-119. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 92 of 272

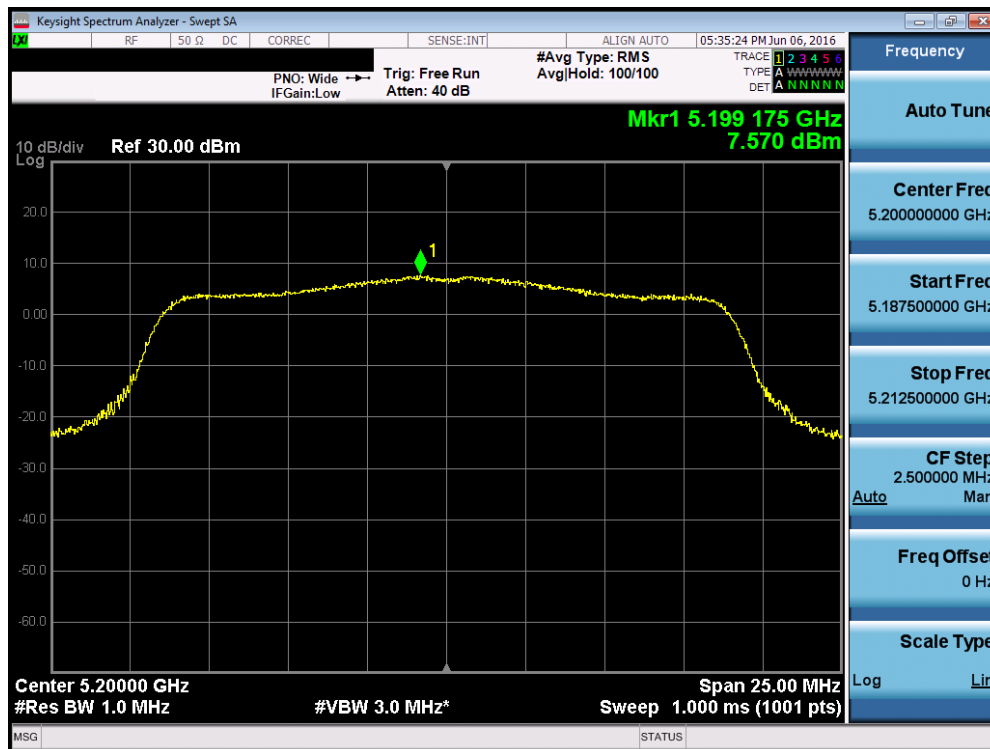


Plot 7-120. Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

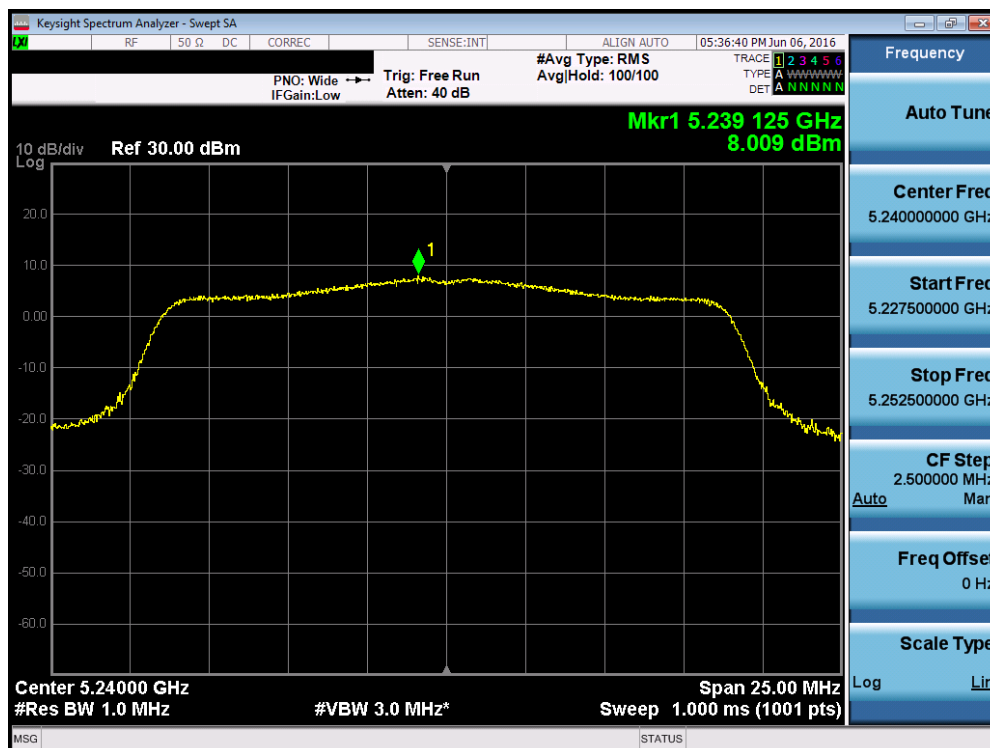


Plot 7-121. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 93 of 272

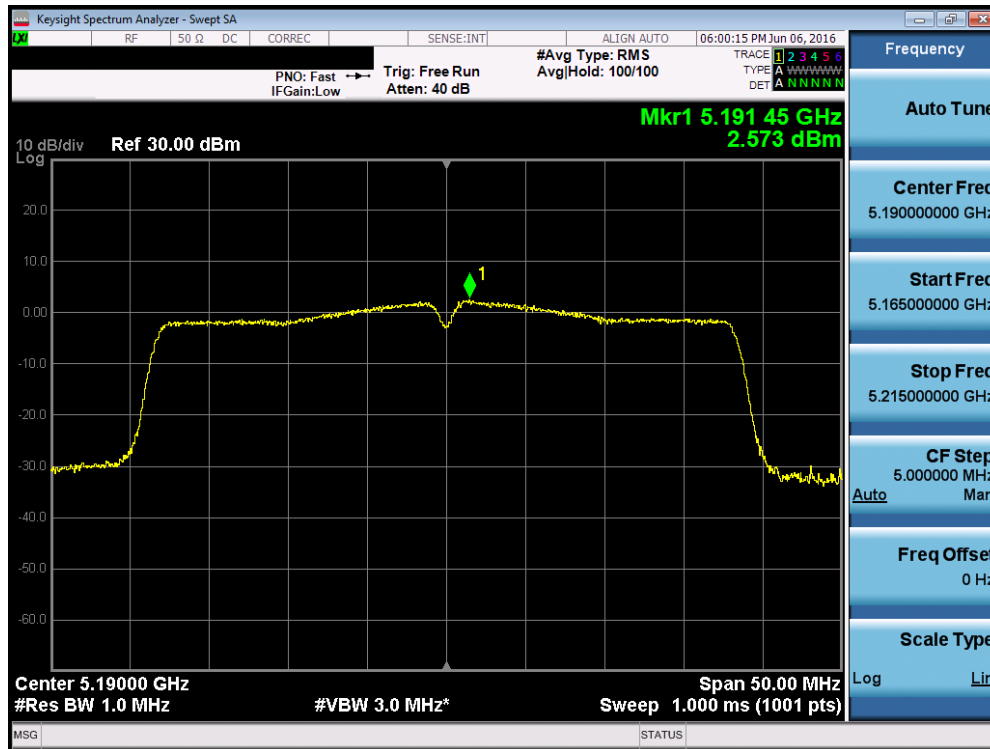


Plot 7-122. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

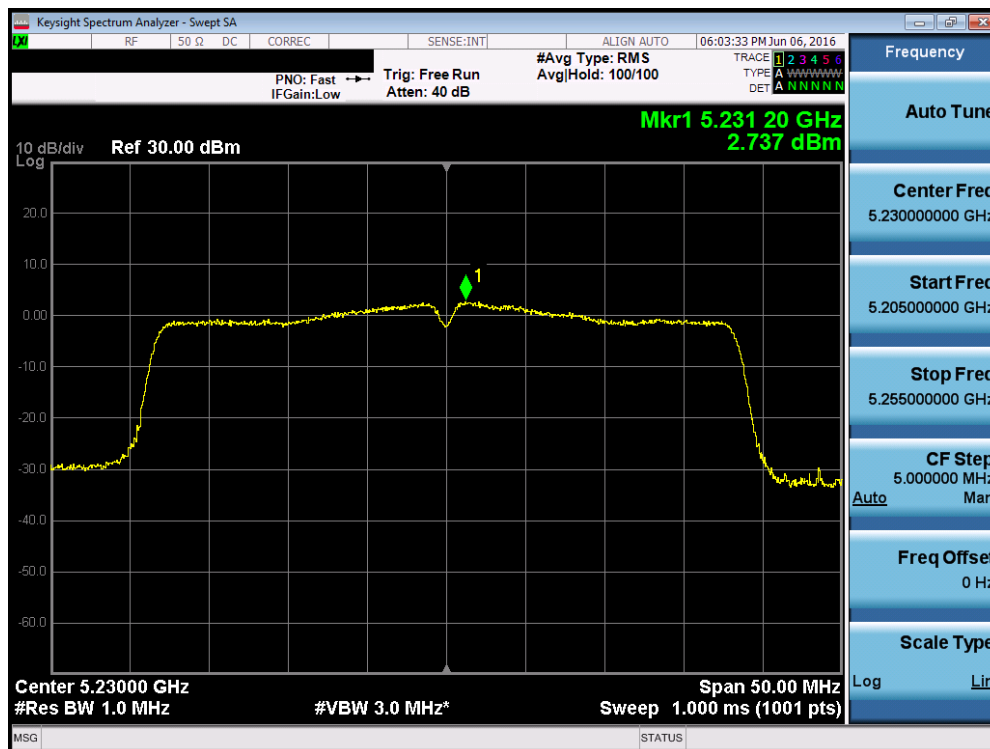


Plot 7-123. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 94 of 272

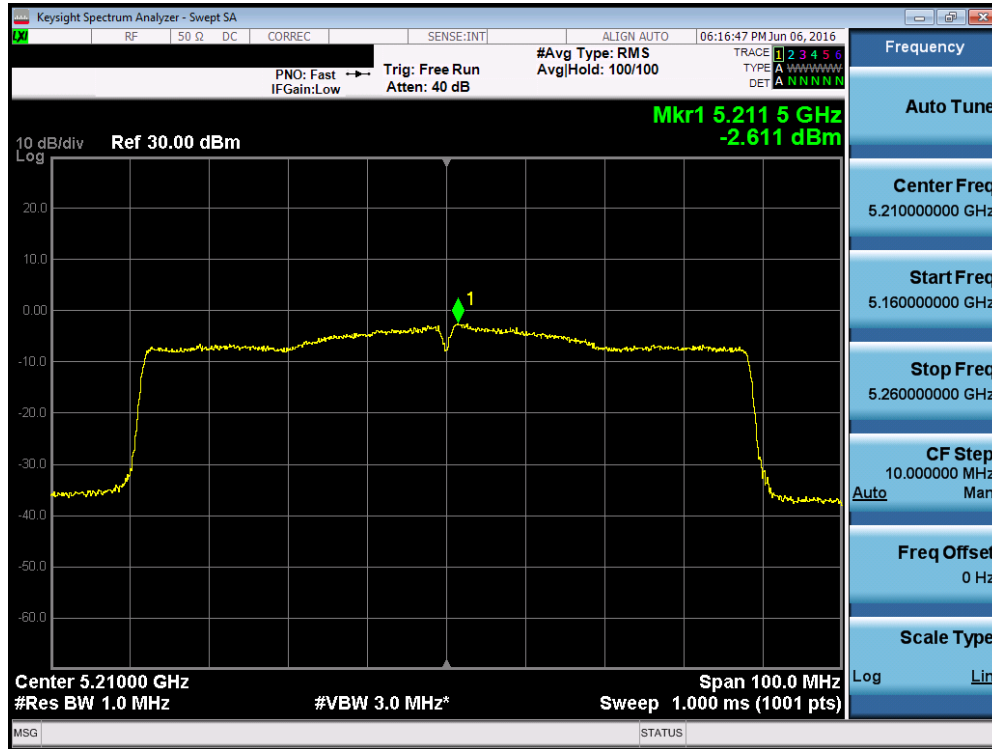


Plot 7-124. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

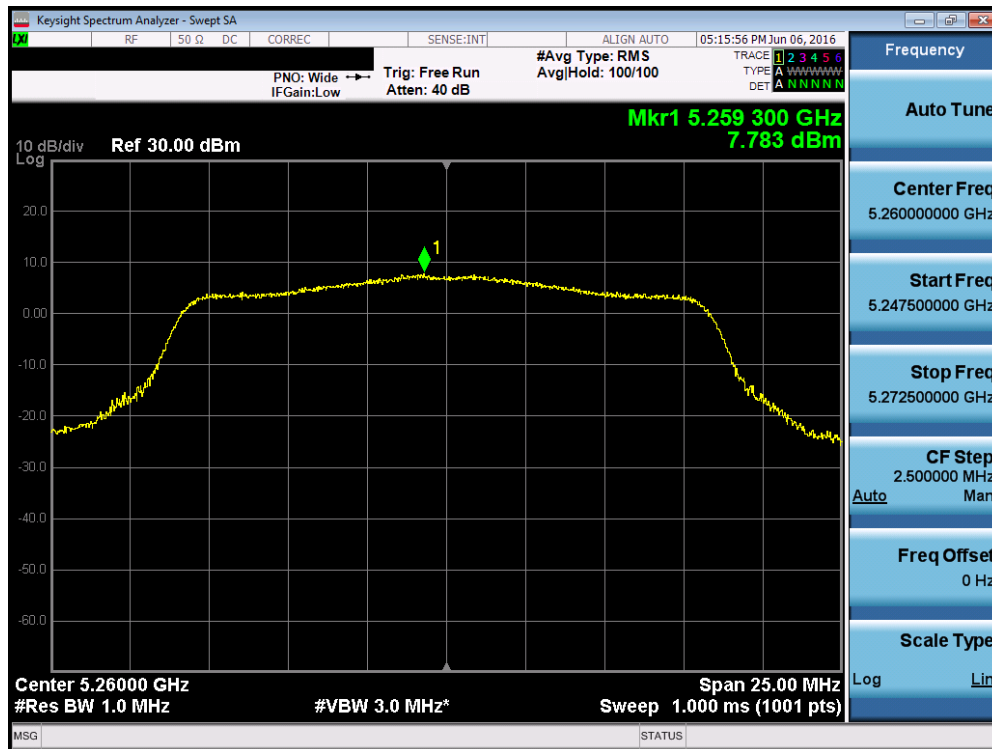


Plot 7-125. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 95 of 272

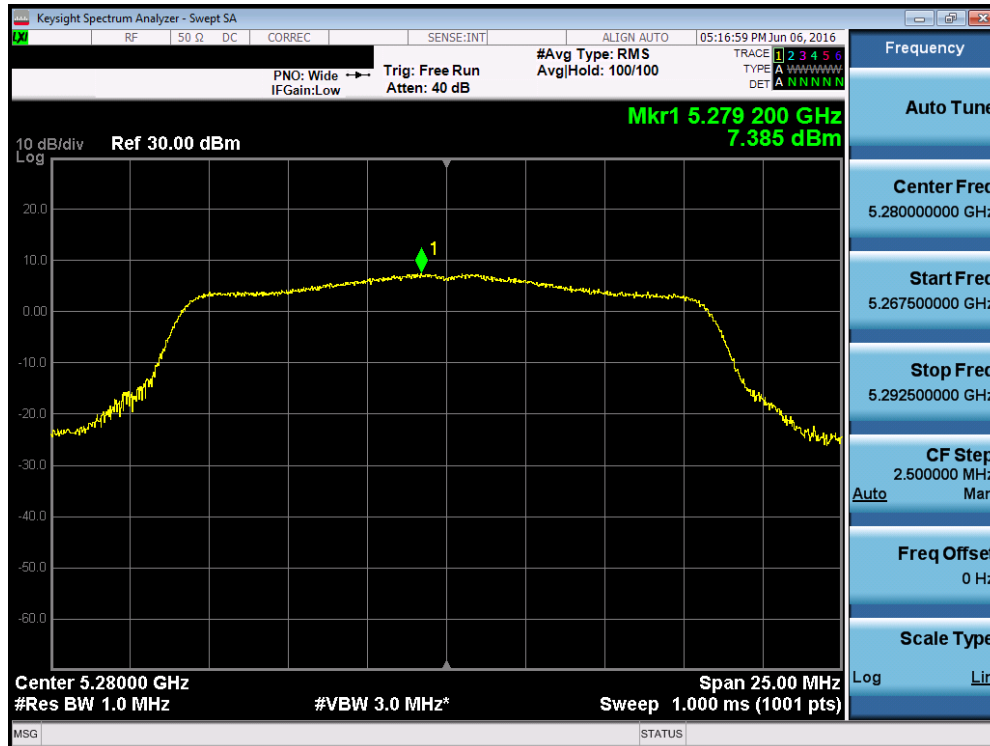


Plot 7-126. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

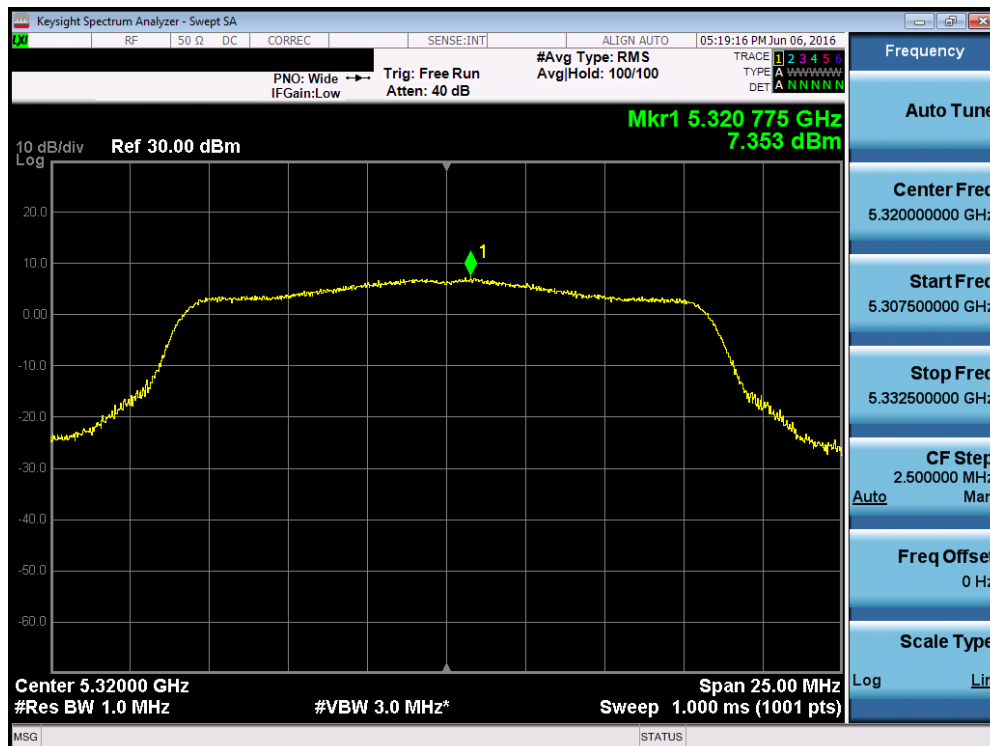


Plot 7-127. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 96 of 272

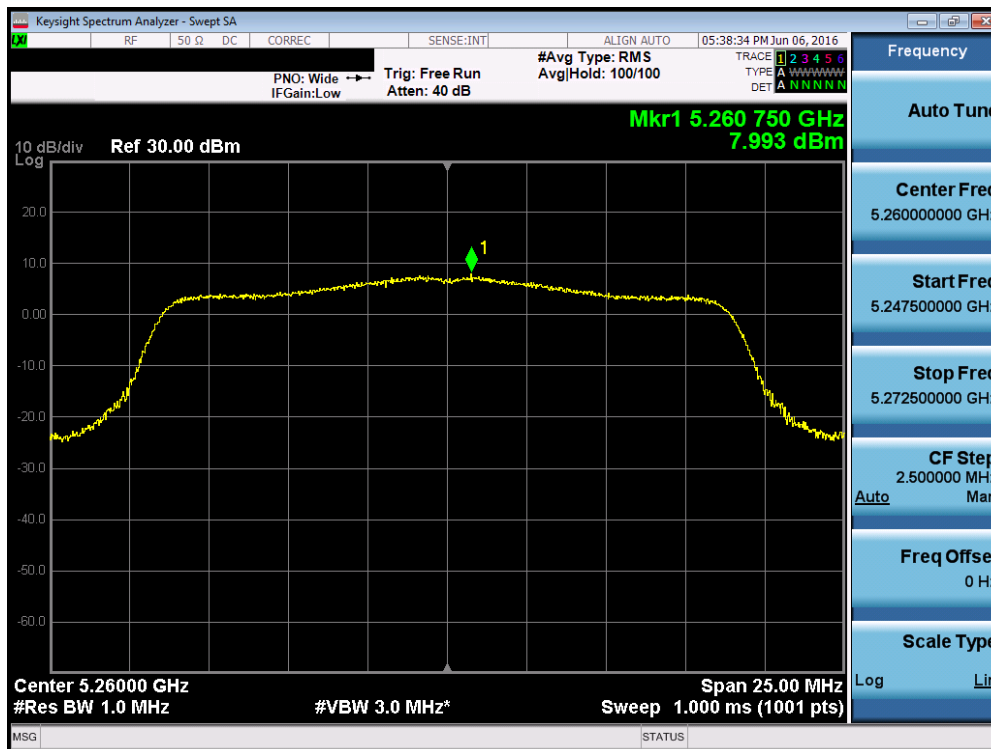


Plot 7-128. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

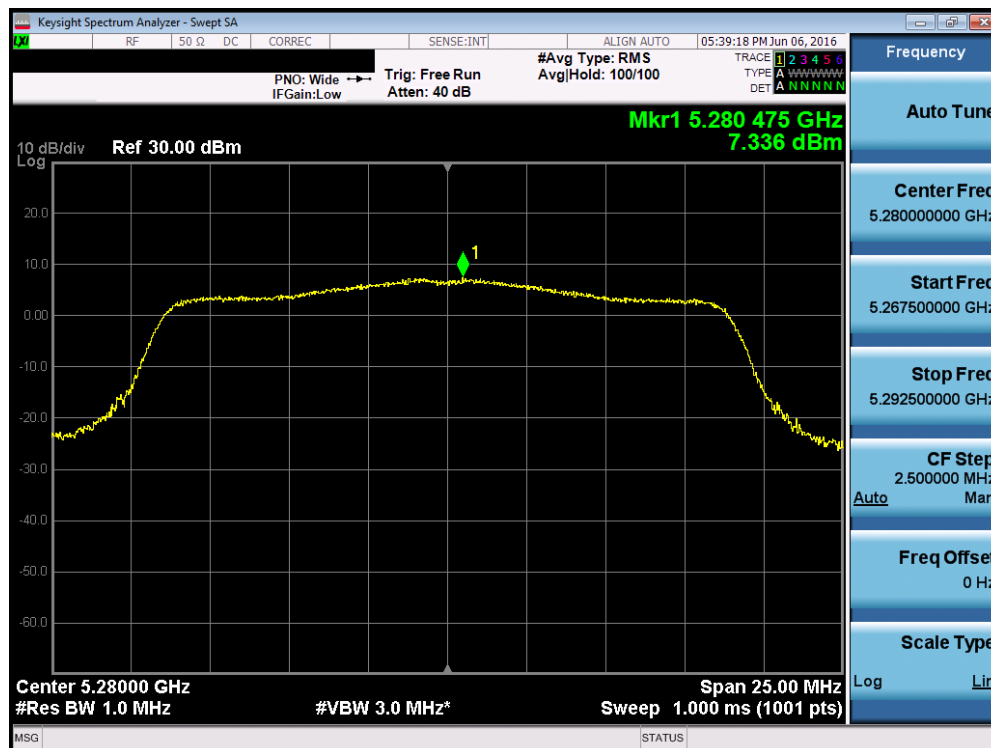


Plot 7-129. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 97 of 272

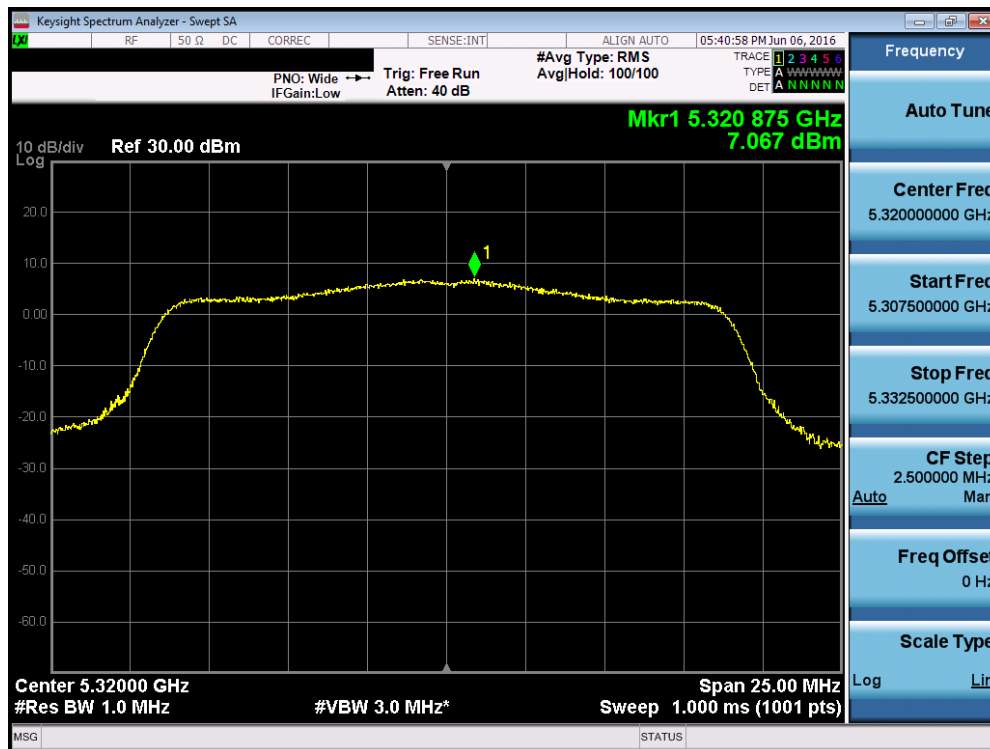


Plot 7-130. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

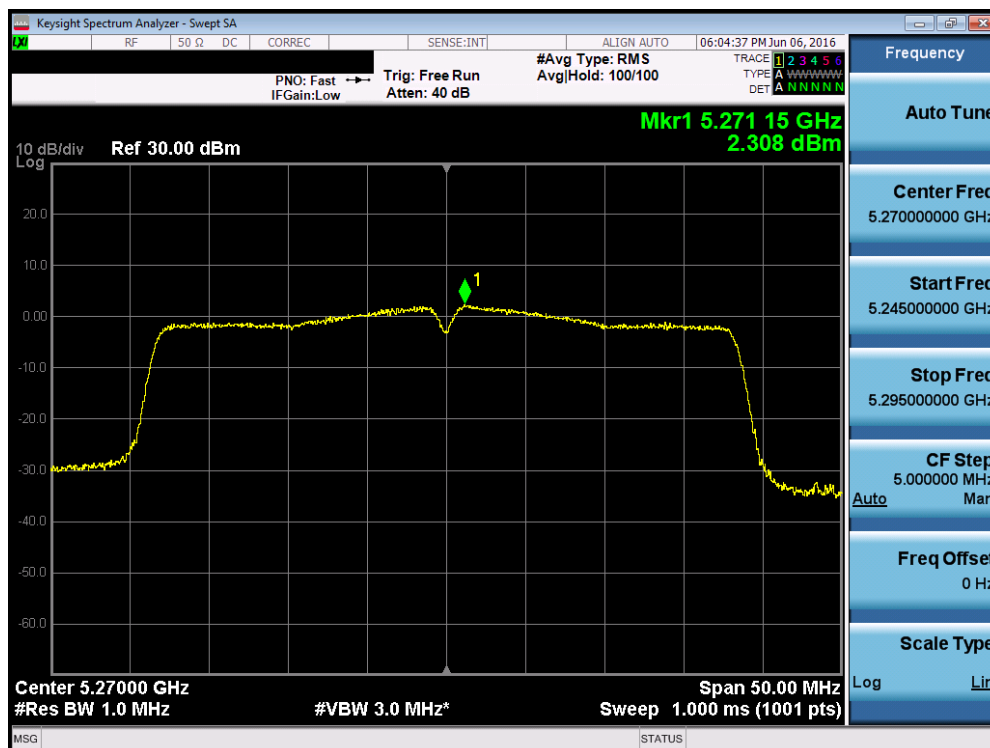


Plot 7-131. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 98 of 272

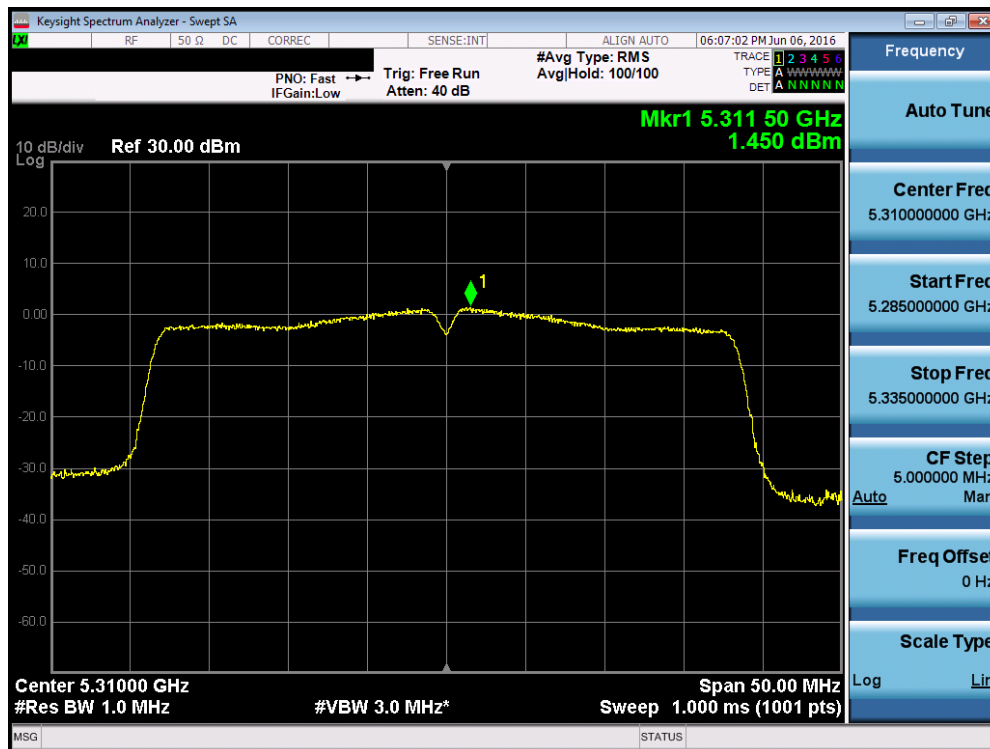


Plot 7-132. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

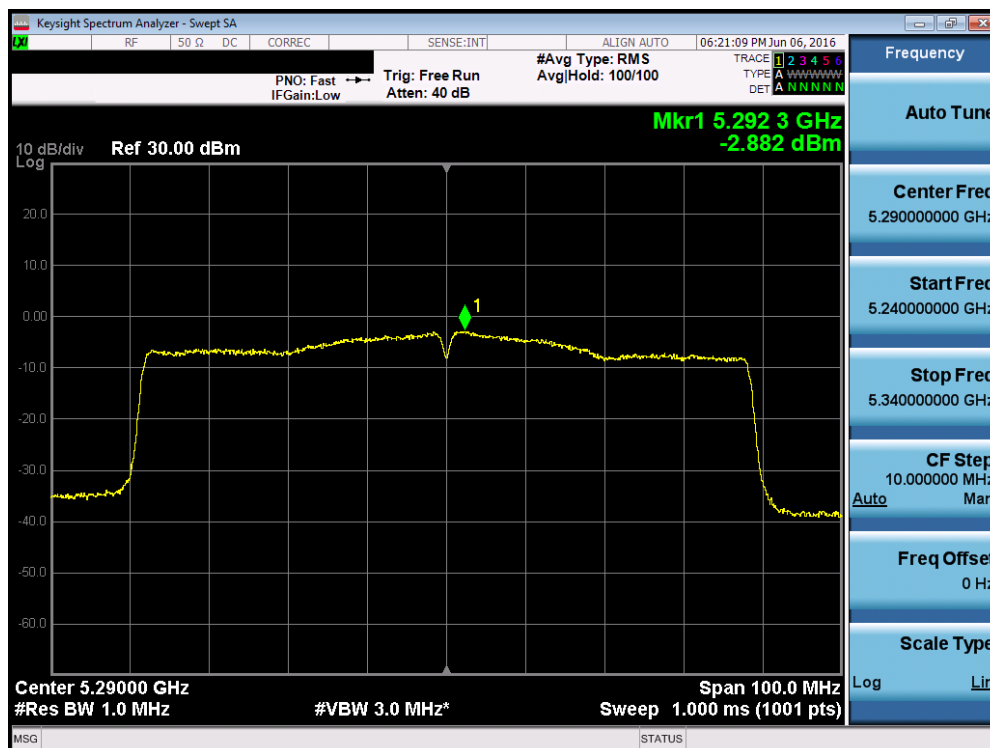


Plot 7-133. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 99 of 272

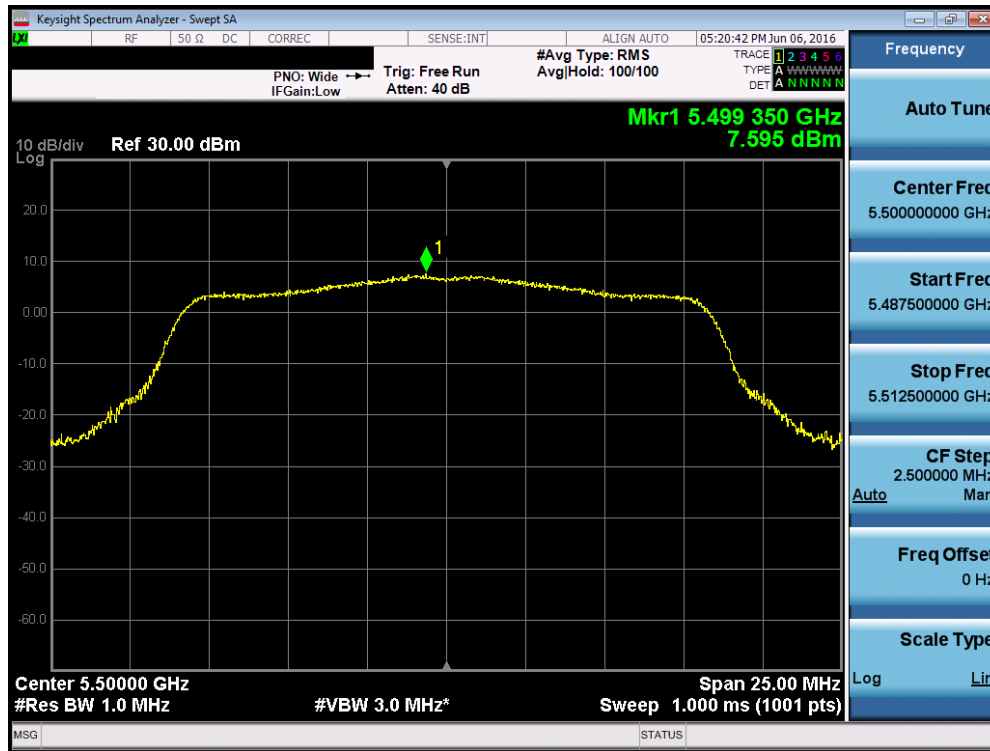


Plot 7-134. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)



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

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 100 of 272

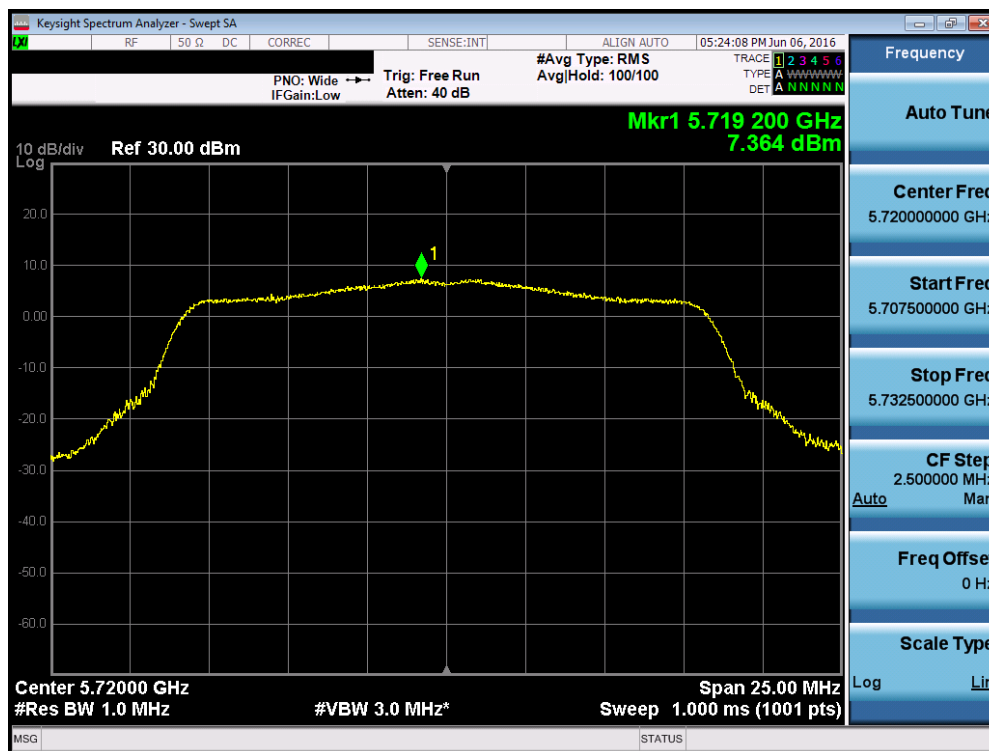


Plot 7-136. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

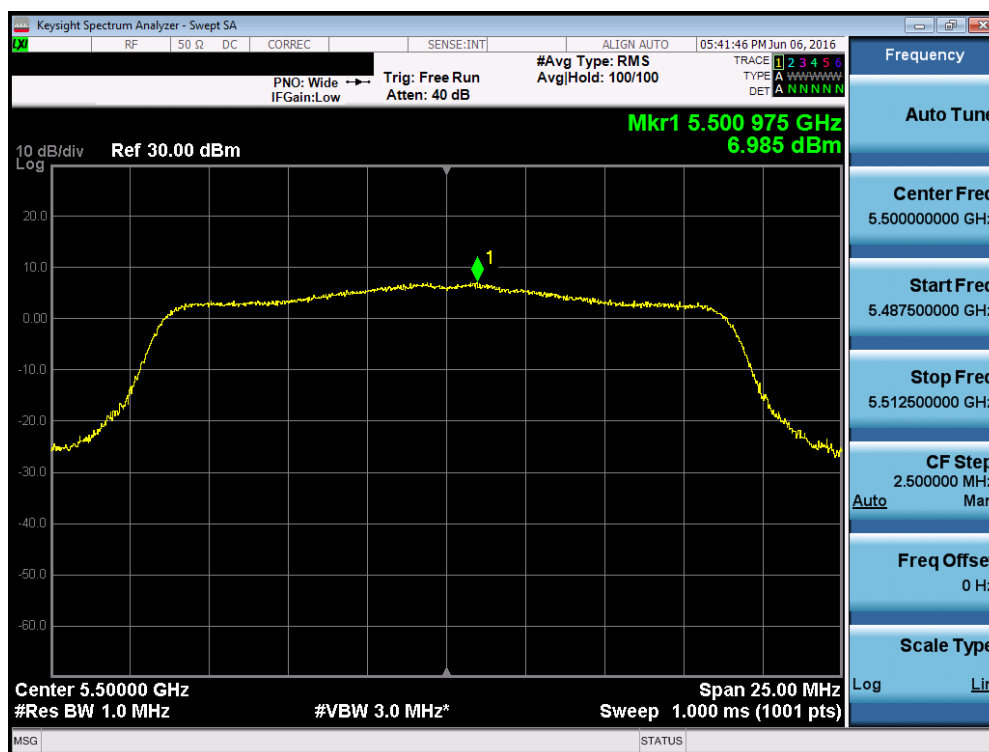


Plot 7-137. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 101 of 272

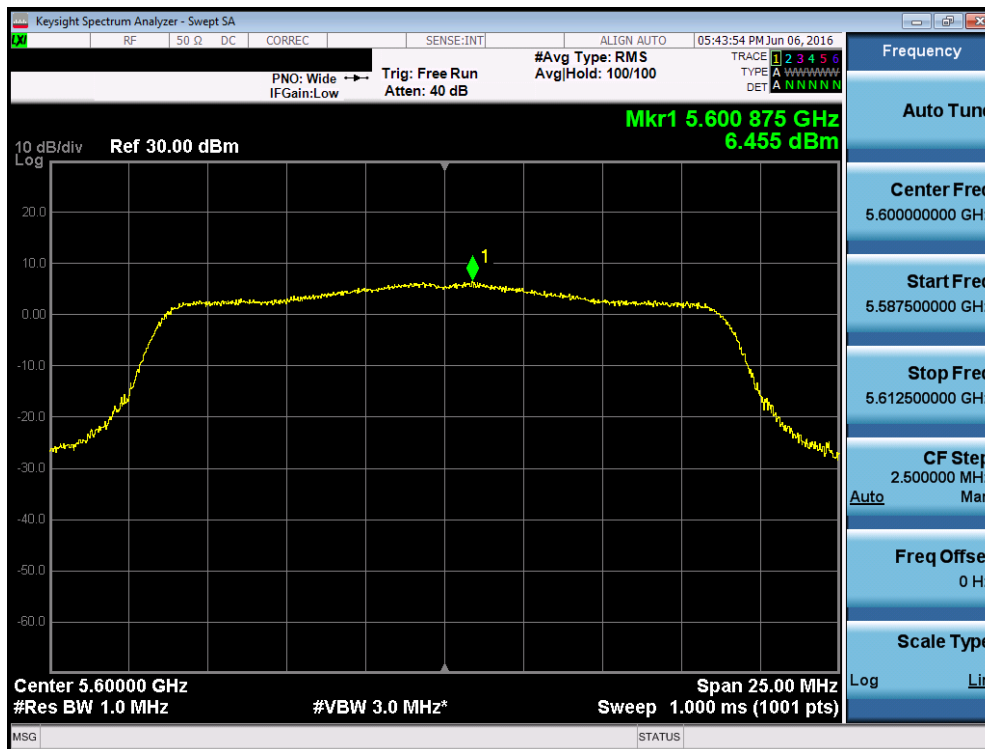


Plot 7-138. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

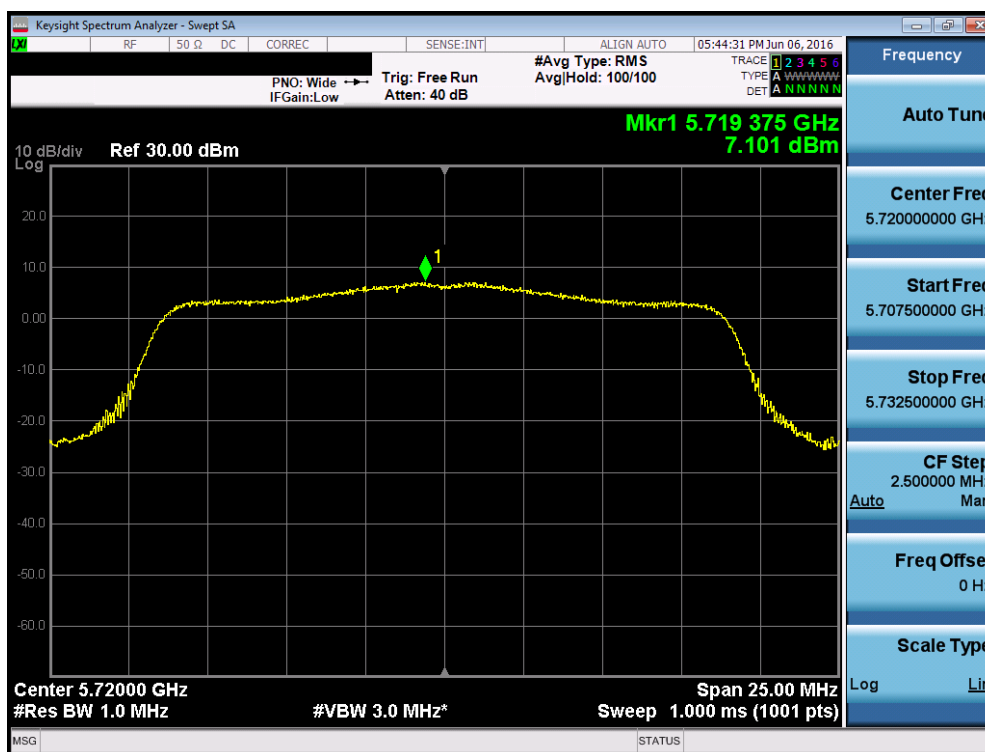


Plot 7-139. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 102 of 272

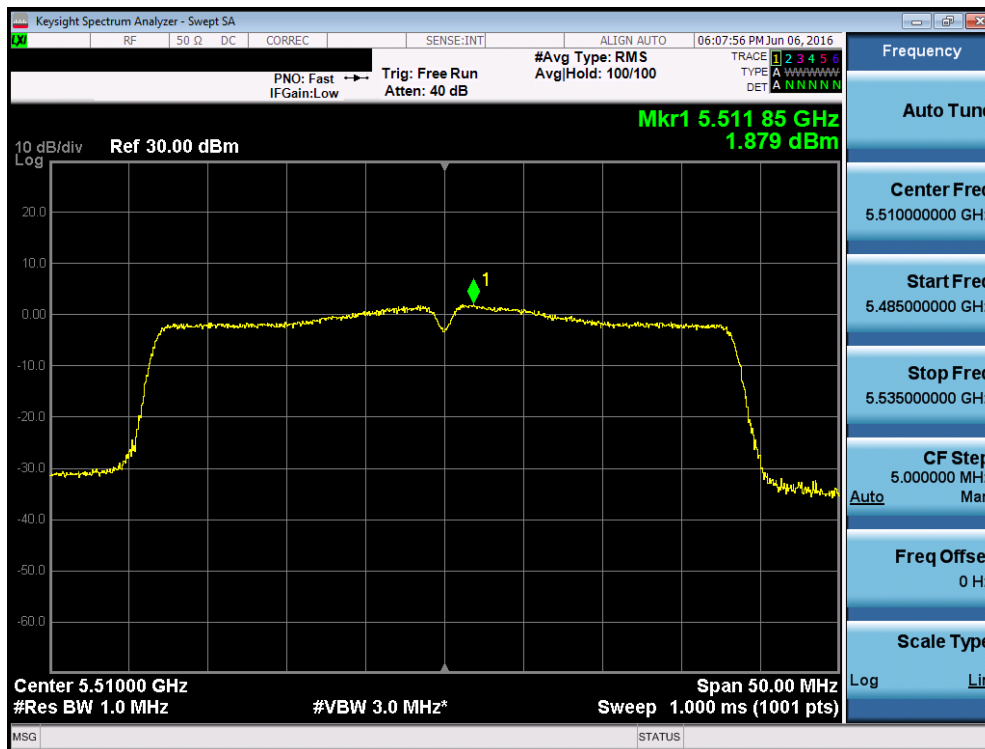


Plot 7-140. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

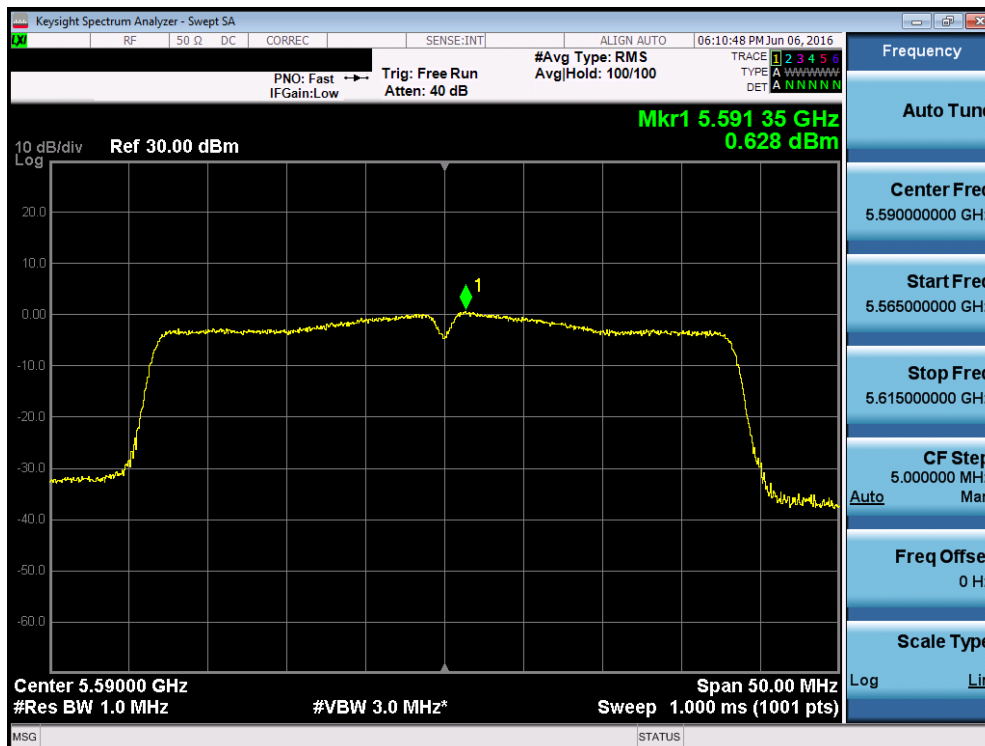


Plot 7-141. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 103 of 272

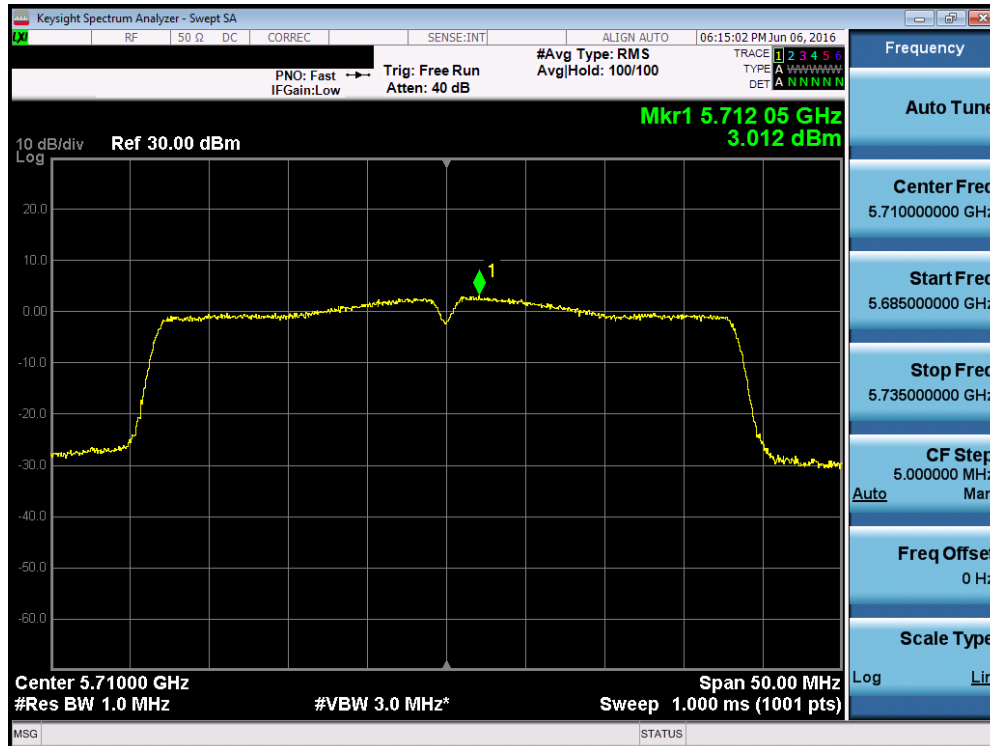


Plot 7-142. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

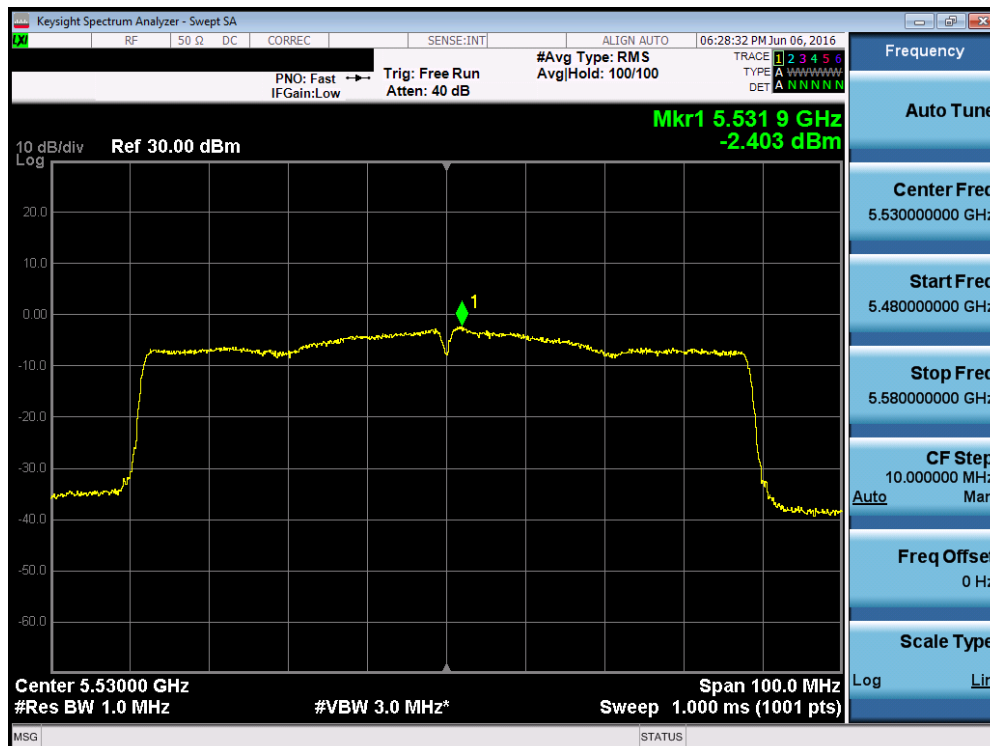


Plot 7-143. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 104 of 272

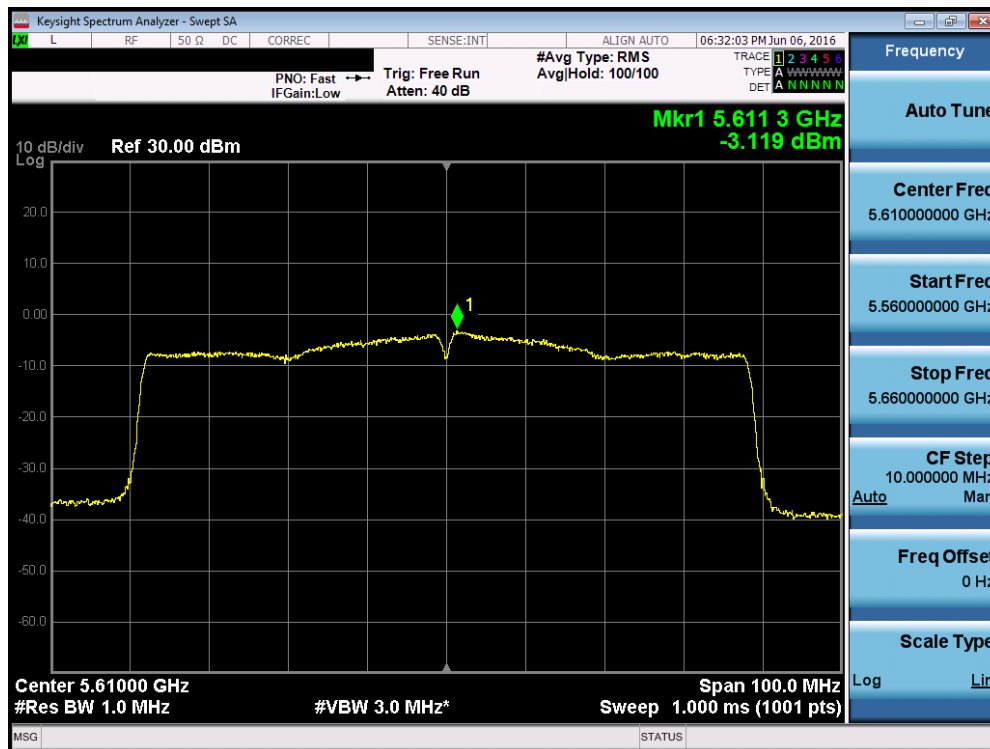


Plot 7-144. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

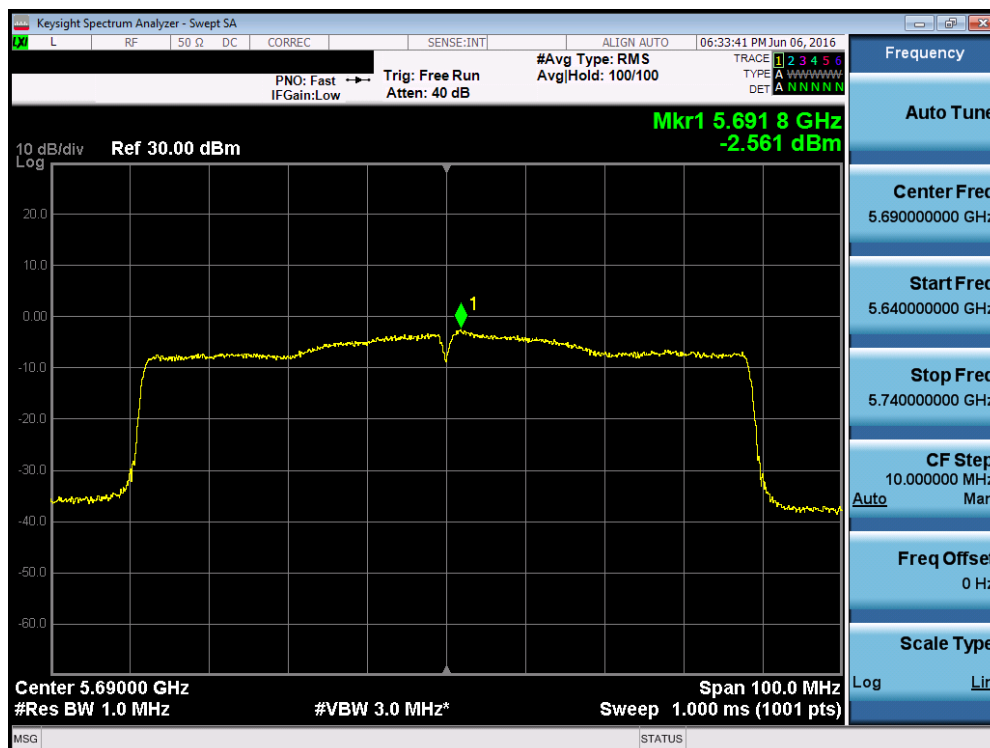


Plot 7-145. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 105 of 272



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

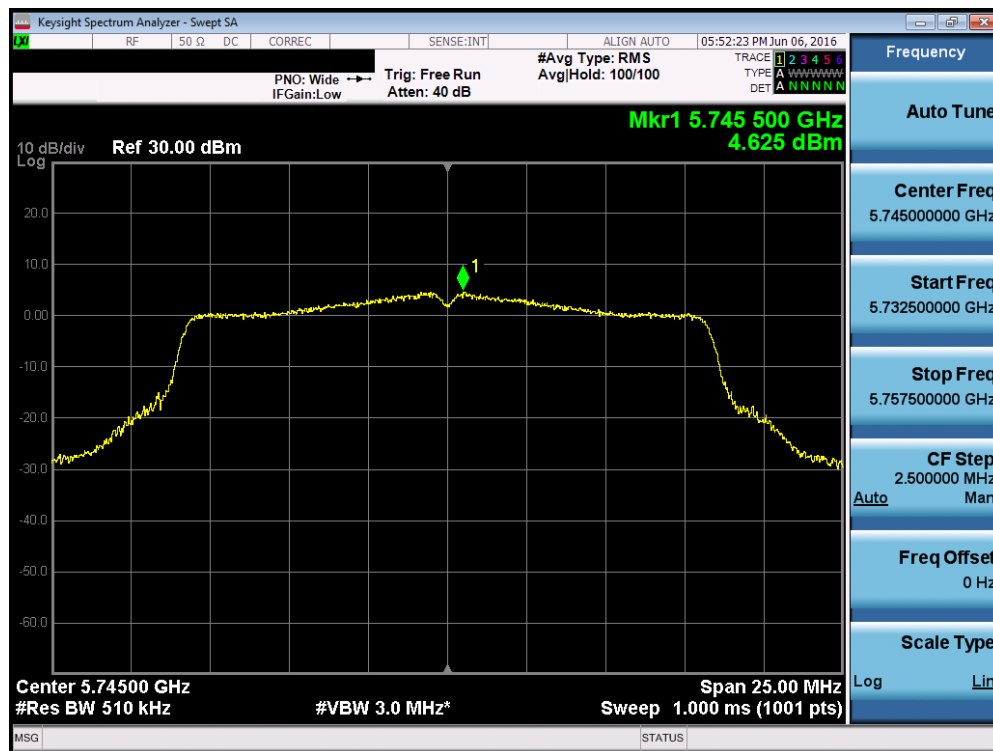


Plot 7-147. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 106 of 272

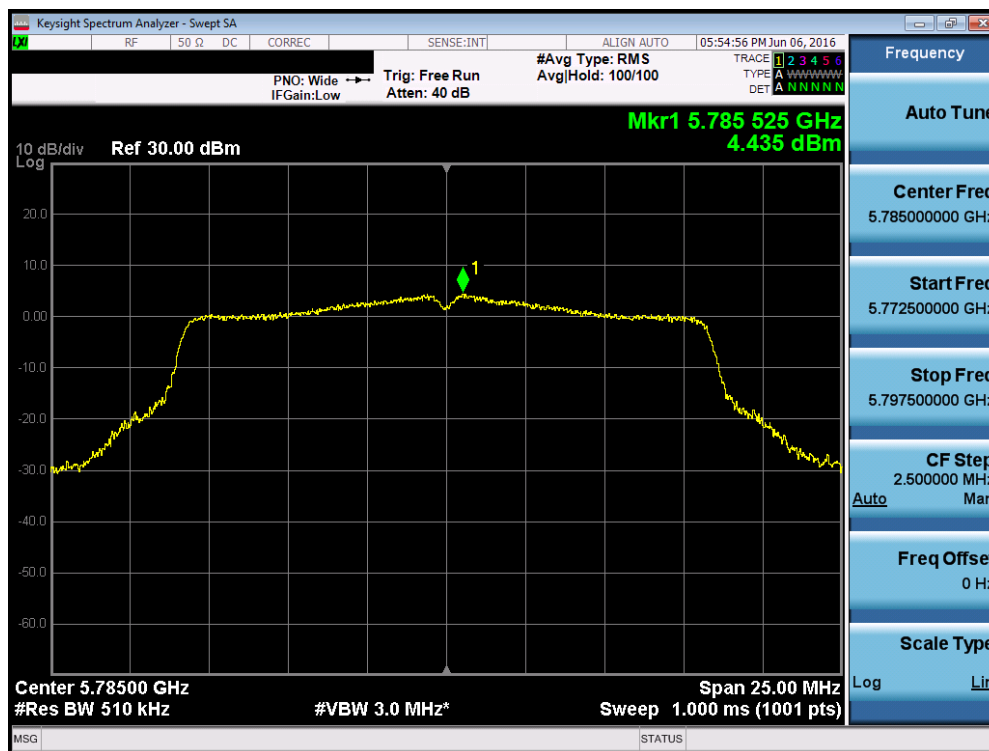
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]	Pass / Fail
Band 3	5745	149	a	6	4.63	30.0	-25.38	Pass
	5785	157	a	6	4.44	30.0	-25.57	Pass
	5825	165	a	6	4.30	30.0	-25.71	Pass
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	4.21	30.0	-25.79	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	3.96	30.0	-26.04	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	4.11	30.0	-25.89	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	1.46	30.0	-28.54	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	0.82	30.0	-29.18	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-1.98	30.0	-31.98	Pass

Table 7-20. Band 3 Conducted Power Spectral Density Measurements

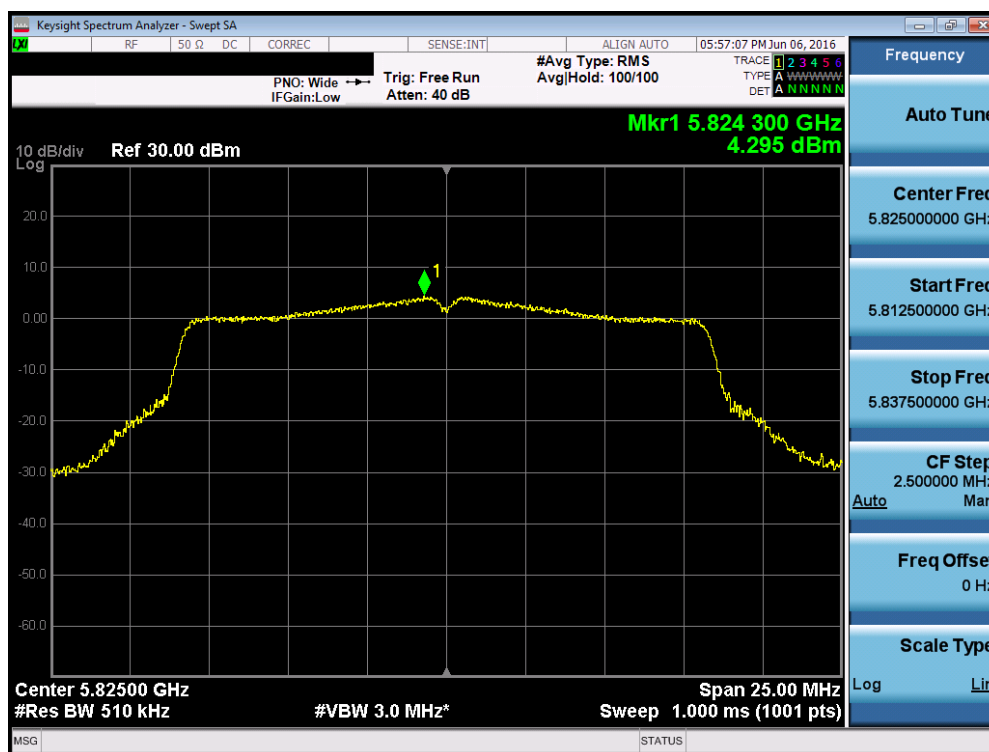


Plot 7-148. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 149)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 107 of 272

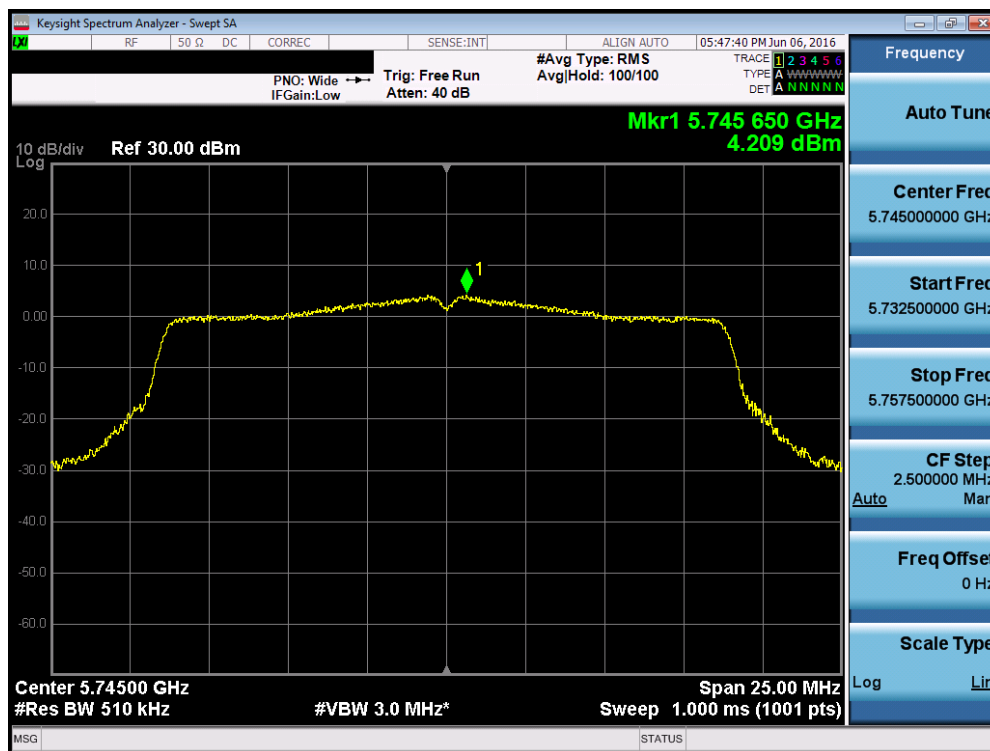


Plot 7-149. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 157)

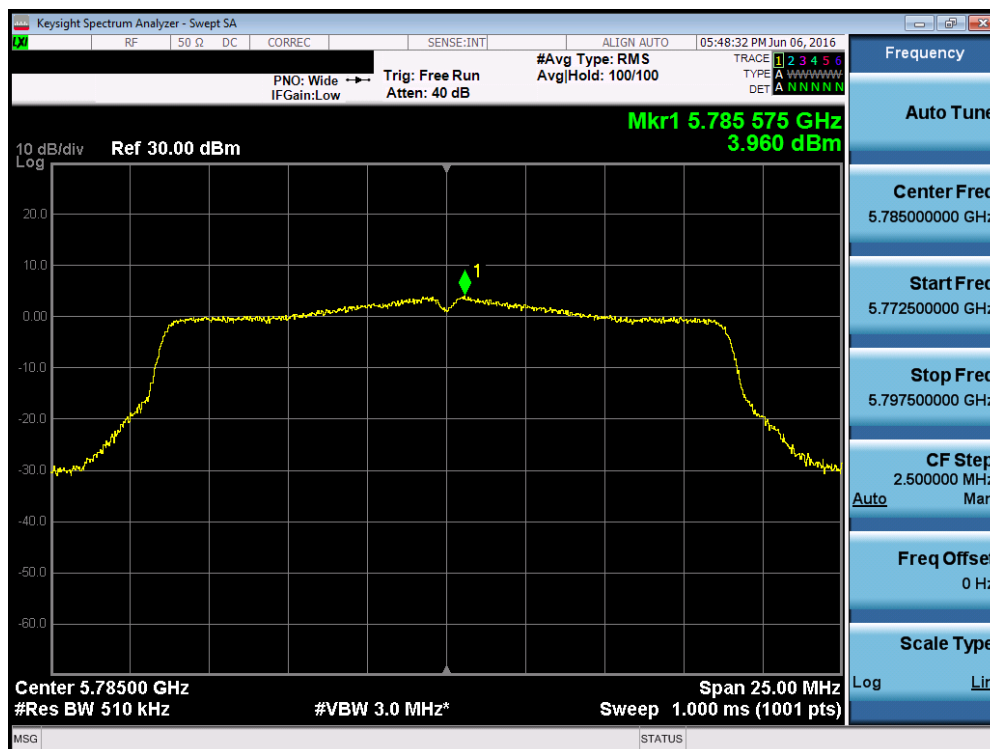


Plot 7-150. Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 108 of 272

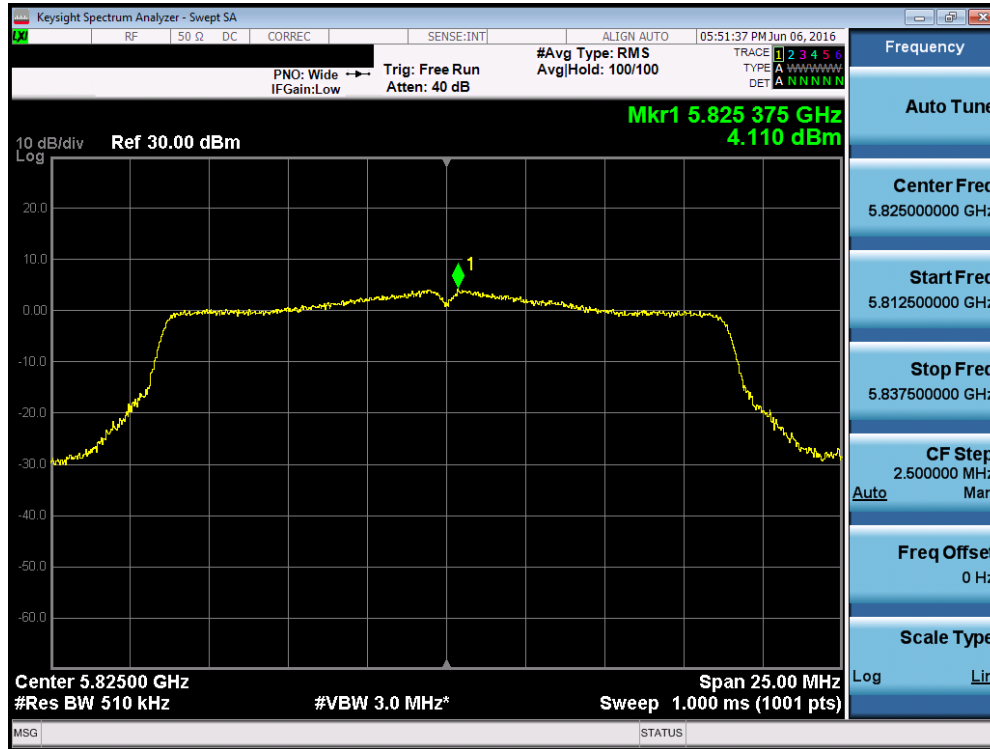


Plot 7-151. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 149)

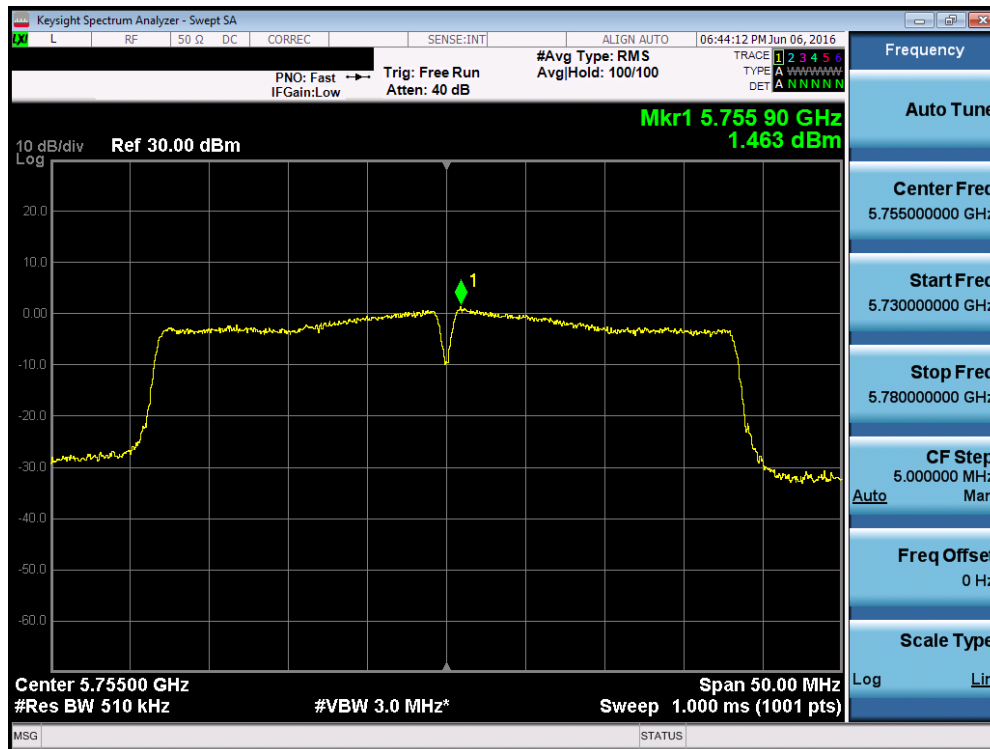


Plot 7-152. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 157)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 109 of 272

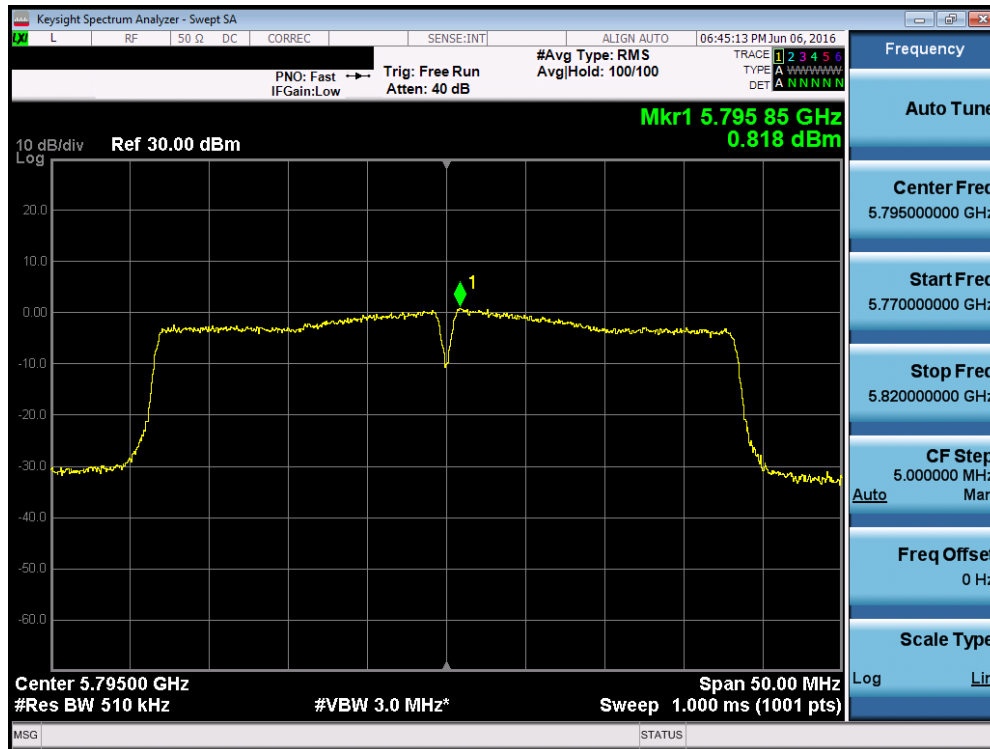


Plot 7-153. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 165)

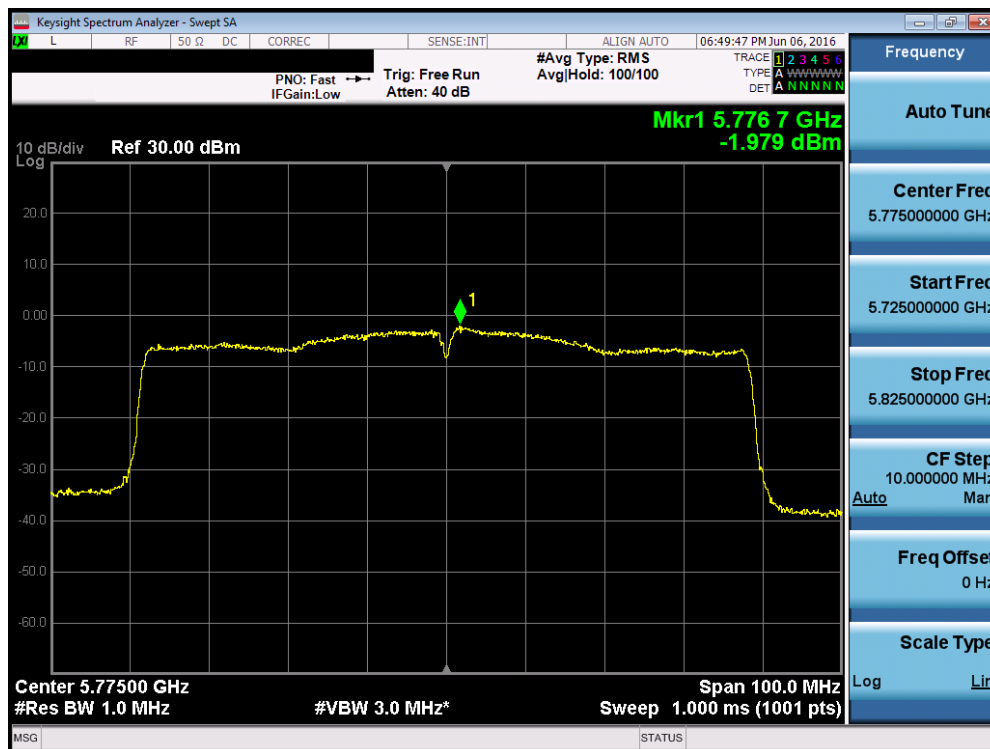


Plot 7-154. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 151)

FCC ID: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 110 of 272



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: A3LSMN930F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1605250973.A3L	Test Dates: 5/25-6/16/2016	EUT Type: Portable Handset		Page 111 of 272

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]	Pass / Fail
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	7.23	8.14	10.72	11.0	-0.28	Pass
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	7.24	7.57	10.42	11.0	-0.58	Pass
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	7.73	8.01	10.88	11.0	-0.12	Pass
	5190	38	n (40MHz)	13.5/15 (MCS0)	3.13	2.57	5.87	11.0	-5.13	Pass
	5230	46	n (40MHz)	13.5/15 (MCS0)	4.04	2.74	6.45	11.0	-4.55	Pass
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-4.00	-2.61	-0.24	11.0	-11.24	Pass
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	7.29	7.99	10.67	11.0	-0.33	Pass
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	8.44	7.34	10.93	11.0	-0.07	Pass
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	8.09	7.07	10.62	11.0	-0.38	Pass
	5270	54	n (40MHz)	13.5/15 (MCS0)	4.22	2.31	6.38	11.0	-4.62	Pass
	5310	62	n (40MHz)	13.5/15 (MCS0)	3.96	1.45	5.89	11.0	-5.11	Pass
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-3.90	-2.88	-0.35	11.0	-11.35	Pass
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	8.53	6.99	10.83	11.0	-0.17	Pass
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	6.98	6.46	9.73	11.0	-1.27	Pass
	5720	140	n (20MHz)	6.5/7.2 (MCS0)	8.14	7.10	10.66	11.0	-0.34	Pass
	5510	102	n (40MHz)	13.5/15 (MCS0)	4.77	1.88	6.57	11.0	-4.43	Pass
	5590	110	n (40MHz)	13.5/15 (MCS0)	3.48	0.63	5.29	11.0	-5.71	Pass
	5670	134	n (40MHz)	13.5/15 (MCS0)	4.08	3.01	6.59	11.0	-4.41	Pass
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-3.44	-2.40	0.12	11.0	-10.88	Pass
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-4.21	-3.12	-0.62	11.0	-11.62	Pass
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-3.82	-2.56	-0.13	11.0	-11.13	Pass

Table 7-21. 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]	Pass / Fail
Band 3	5745	149	n (20MHz)	6.5/7.2 (MCS0)	8.40	4.21	9.80	30.0	-20.20	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	8.26	3.96	9.63	30.0	-20.37	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	7.12	4.11	8.88	30.0	-21.12	Pass
	5755	151	n (40MHz)	13.5/15 (MCS0)	1.36	1.46	4.42	30.0	-25.58	Pass
	5795	159	n (40MHz)	13.5/15 (MCS0)	0.55	0.82	3.70	30.0	-26.30	Pass
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-4.75	-1.98	-0.14	30.0	-30.14	Pass

Table 7-22. 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 7.23 dBm for Antenna-1 and 8.14 dBm for Antenna-2.

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

$$(7.23 \text{ dBm} + 8.14 \text{ dBm}) = (5.29 \text{ mW} + 6.52 \text{ mW}) = 11.80 \text{ mW} = 10.72 \text{ dBm}$$

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