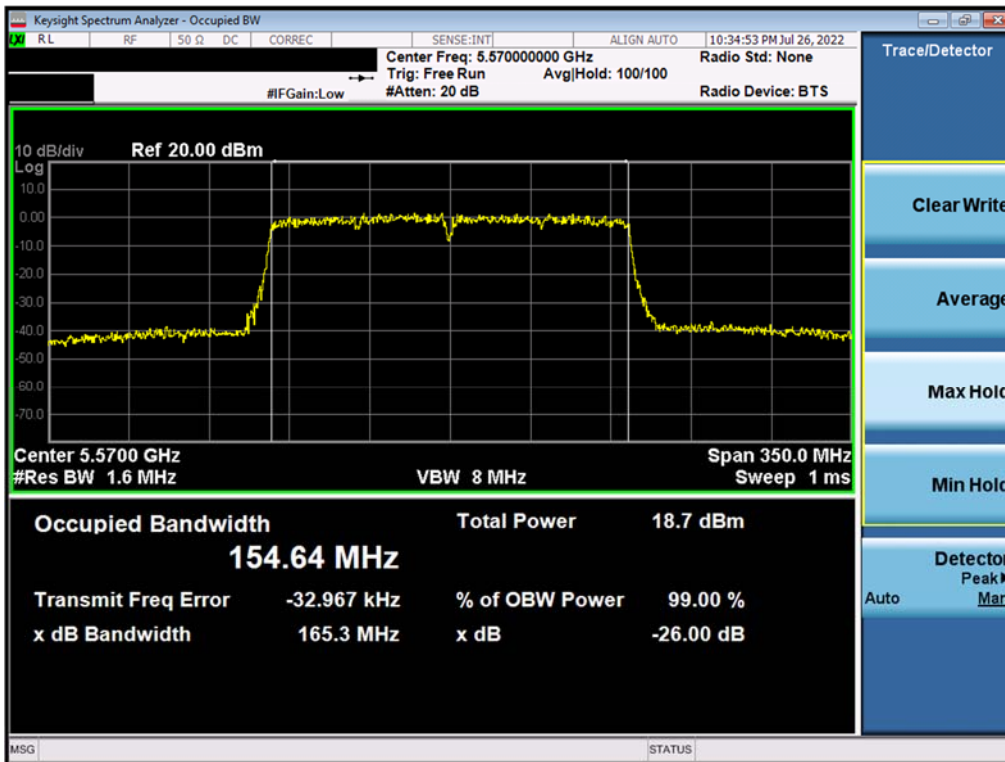
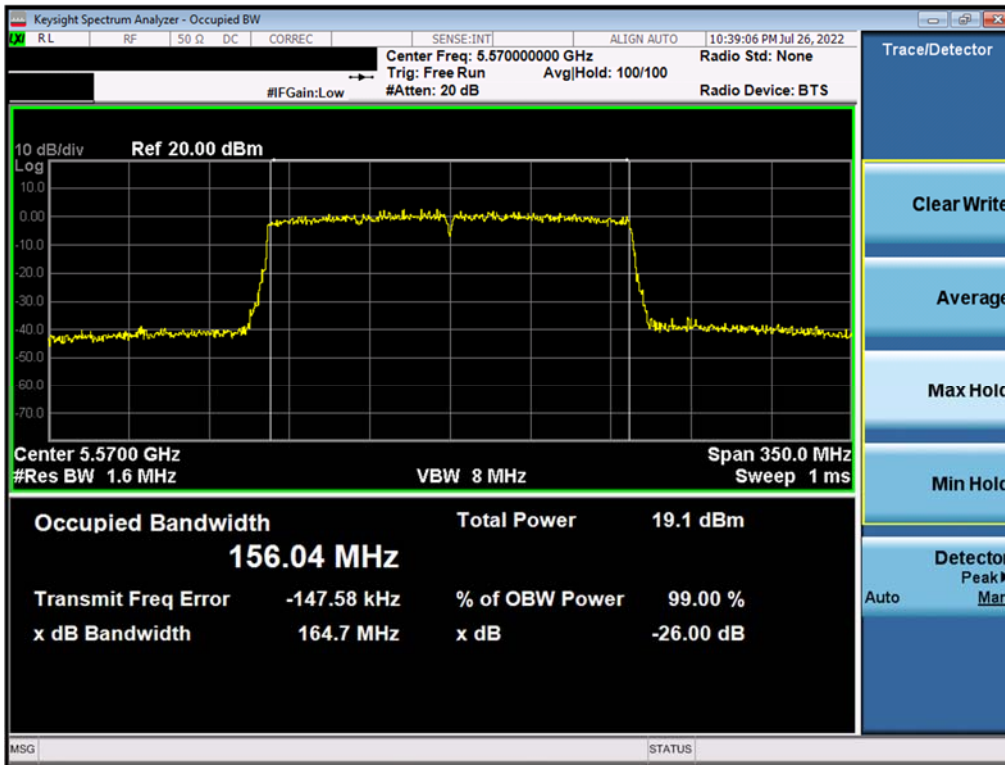


Plot 7-108. 26dB Bandwidth Plot MIMO ANT2 (802.11ax – 80MHz BW (UNII Band 2C) – Ch. 138)



Plot 7-109. 26dB Bandwidth Plot MIMO ANT2 (802.11ac – 160MHz BW (UNII Band 2C) – Ch. 114)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 71 of 209



Plot 7-110. 26dB Bandwidth Plot MIMO ANT2 (802.11ax – 160MHz BW (UNII Band 2C) – Ch. 114)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 72 of 209

6dB Bandwidth Measurement – 802.11a

§15.407 (e); RSS-Gen [6.2]

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 ANSI C63.10-2013 and KDB 789033 D02 v02r01, 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

ANSI C63.10-2013 – Section 6.9.2
KDB 789033 D02 v02r01 – 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: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 73 of 209

MIMO Antenna-1 6 dB Bandwidth Measurements

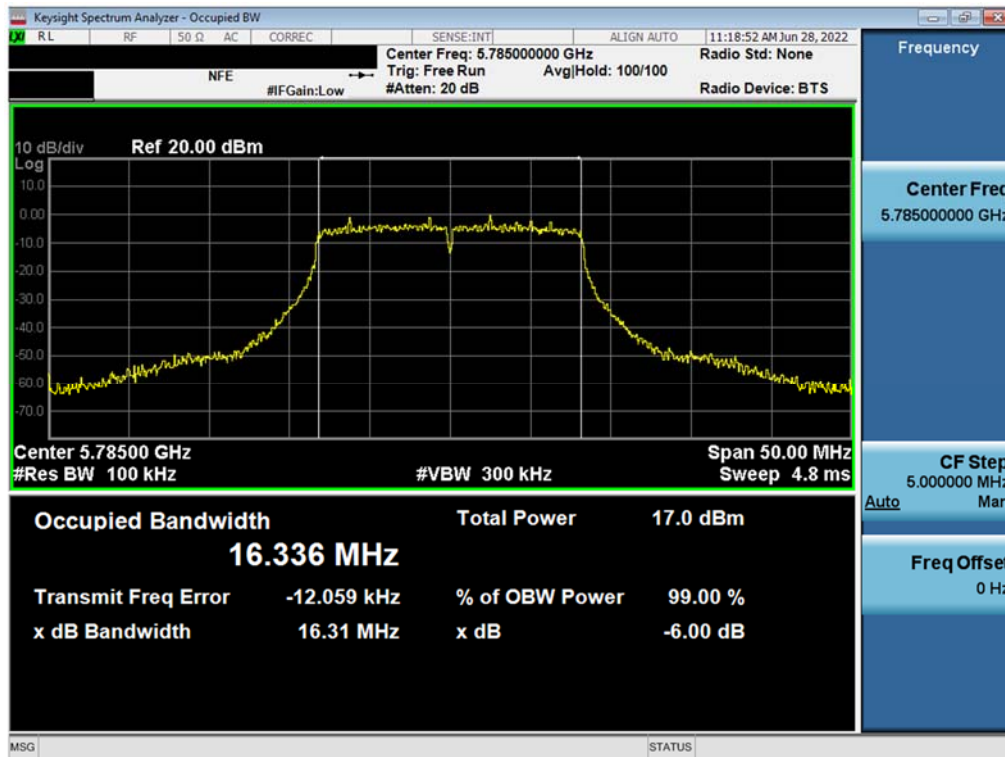
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
Band 3	5745	149	a	6	16.33
	5785	157	a	6	16.31
	5825	165	a	6	16.33
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.53
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.63
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.64
	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	18.55
	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	18.72
	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	19.10
	5755	151	n (40MHz)	13.5/15 (MCS0)	35.91
	5795	159	n (40MHz)	13.5/15 (MCS0)	35.83
	5755	151	ax (40MHz)	13.5/15 (MCS0)	36.69
	5795	159	ax (40MHz)	13.5/15 (MCS0)	36.84
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	73.60
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	76.97

Table 7-4. Conducted Bandwidth Measurements MIMO ANT1

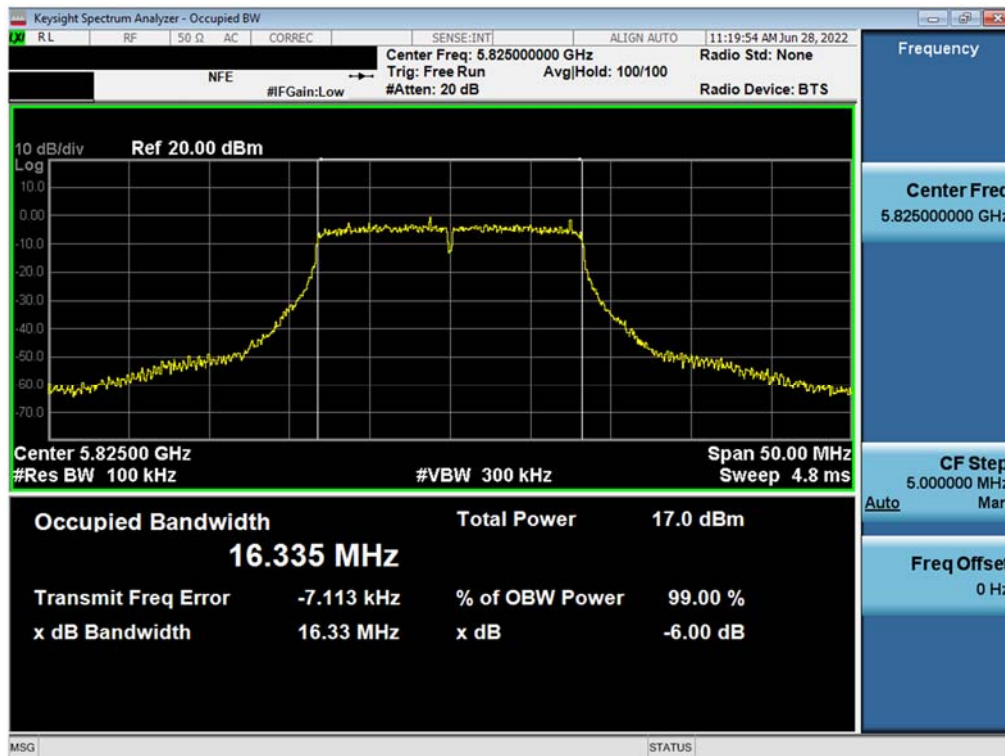


Plot 7-111. 6dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 3) – Ch. 149)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 74 of 209

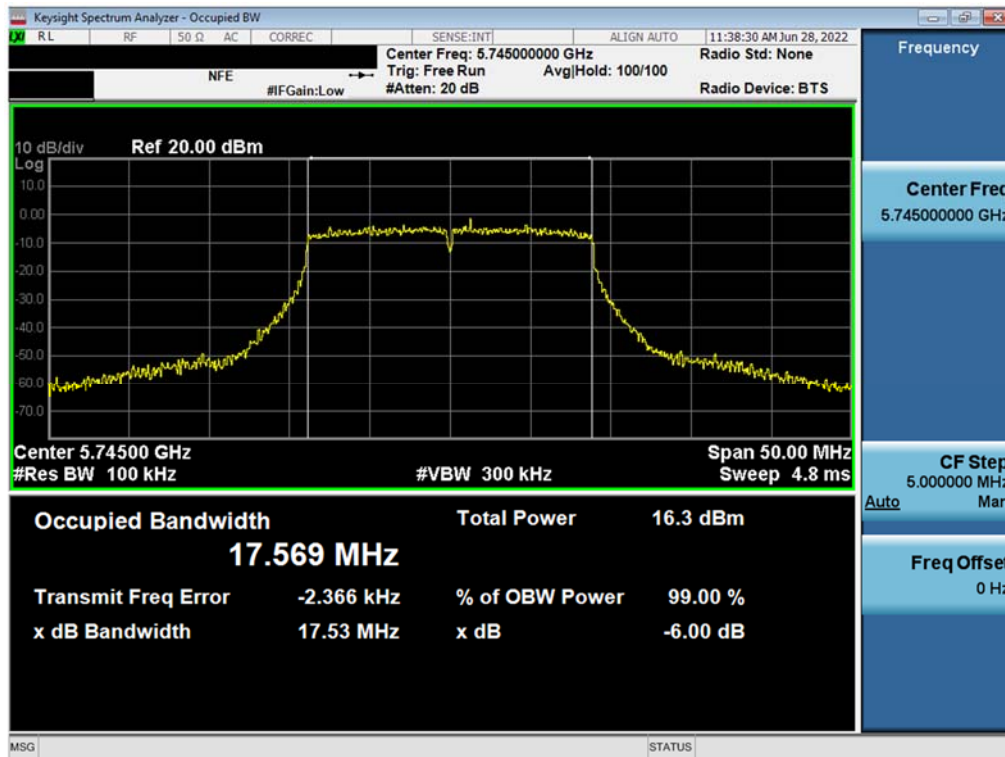


Plot 7-112. 6dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 3) – Ch. 157)



Plot 7-113. 6dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 3) – Ch. 165)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 75 of 209

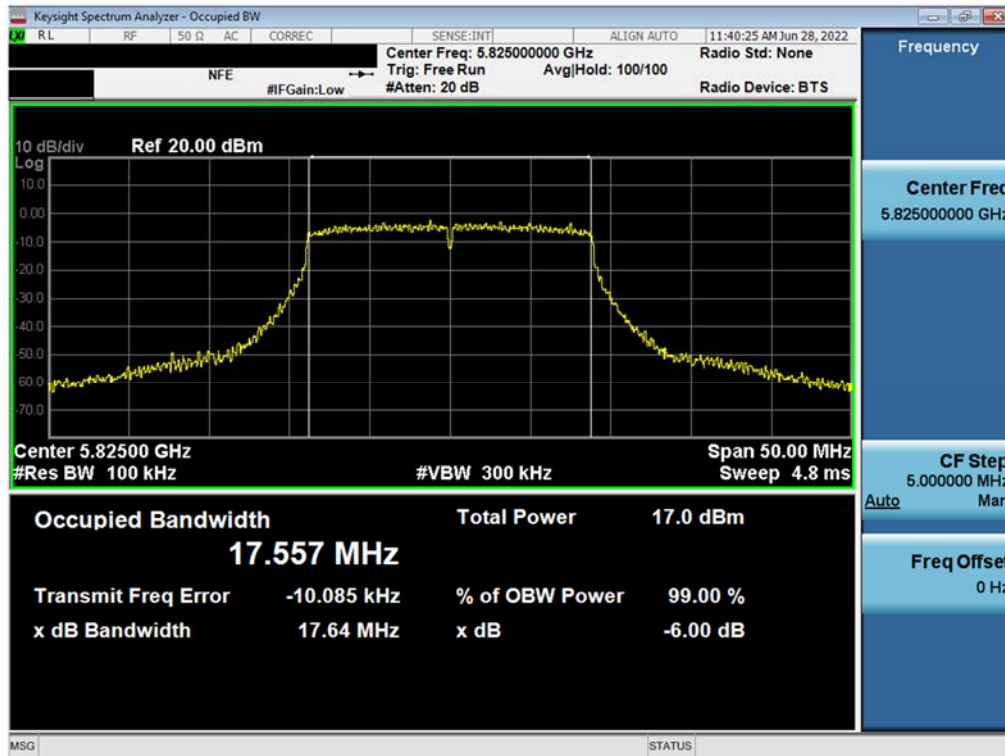


Plot 7-114. 6dB Bandwidth Plot MIMO ANT1 (802.11n – 20MHz BW (UNII Band 3) – Ch. 149)

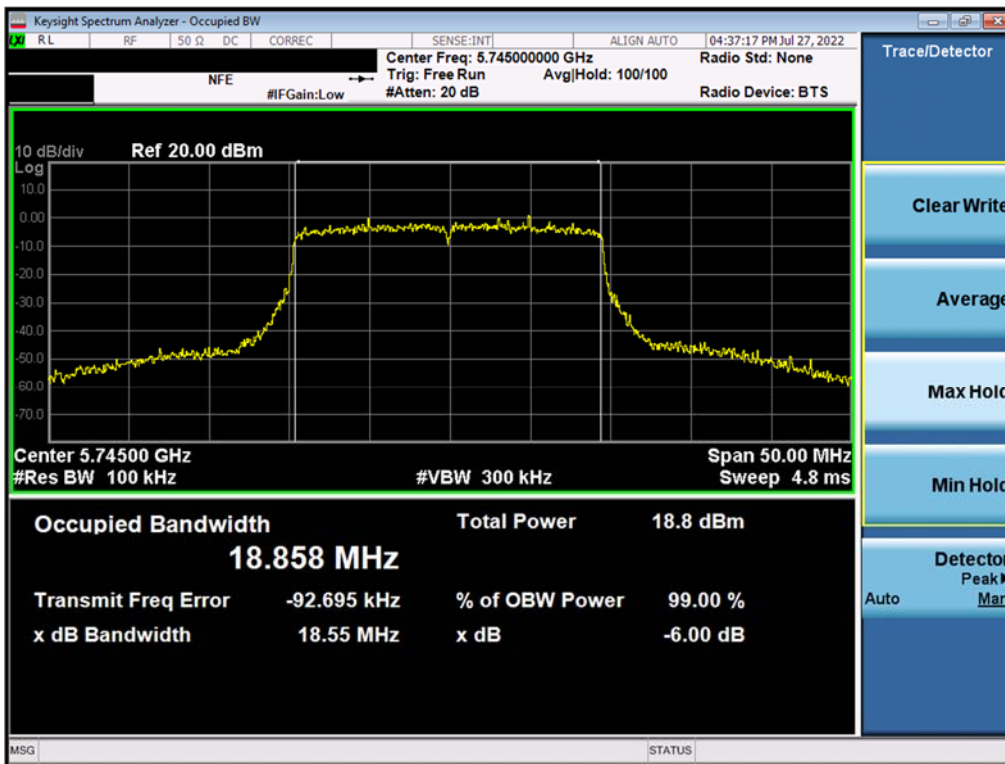


Plot 7-115. 6dB Bandwidth Plot MIMO ANT1 (802.11n – 20MHz BW (UNII Band 3) – Ch. 157)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 76 of 209

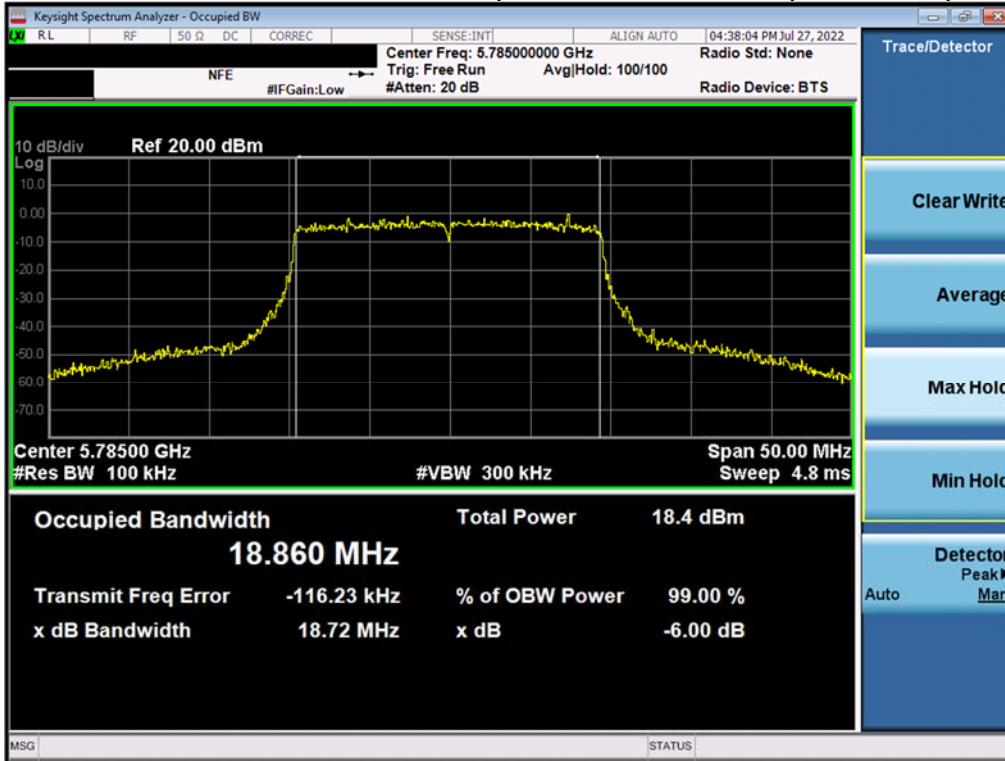


Plot 7-116. 6dB Bandwidth Plot MIMO ANT1 (802.11n – 20MHz BW (UNII Band 3) – Ch. 165)



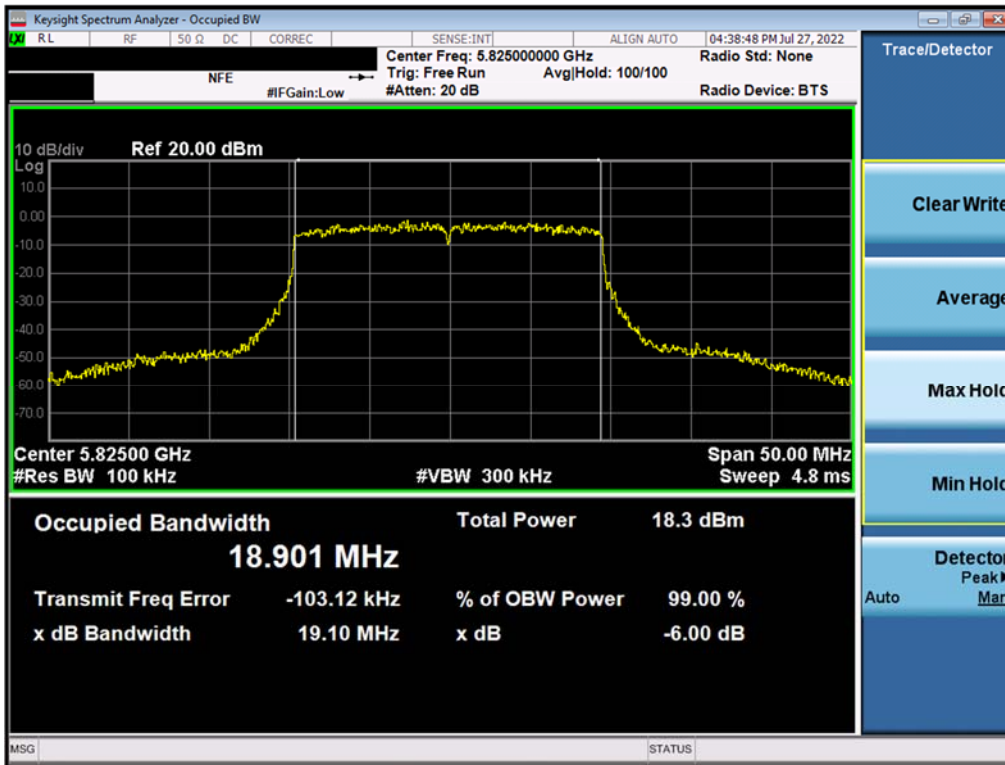
FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 77 of 209

Plot 7-117. 6dB Bandwidth Plot MIMO ANT1 (802.11ax – 20MHz BW (UNII Band 3) – Ch. 149)

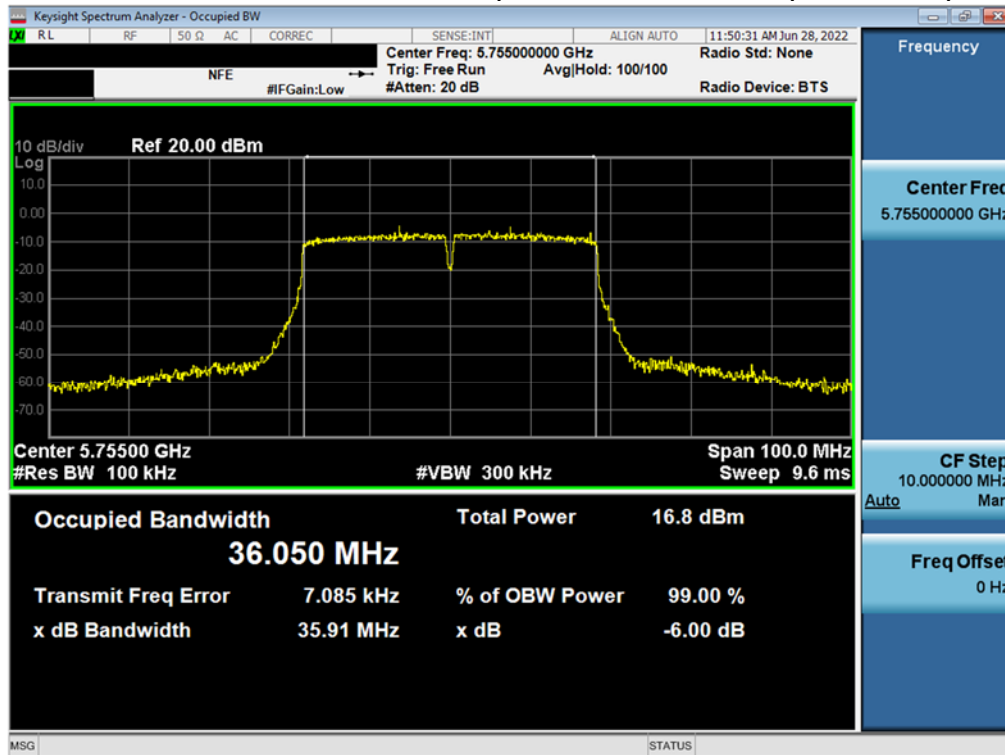


Plot 7-118. 6dB Bandwidth Plot MIMO ANT1 (802.11ax – 20MHz BW (UNII Band 3) – Ch. 157)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 78 of 209

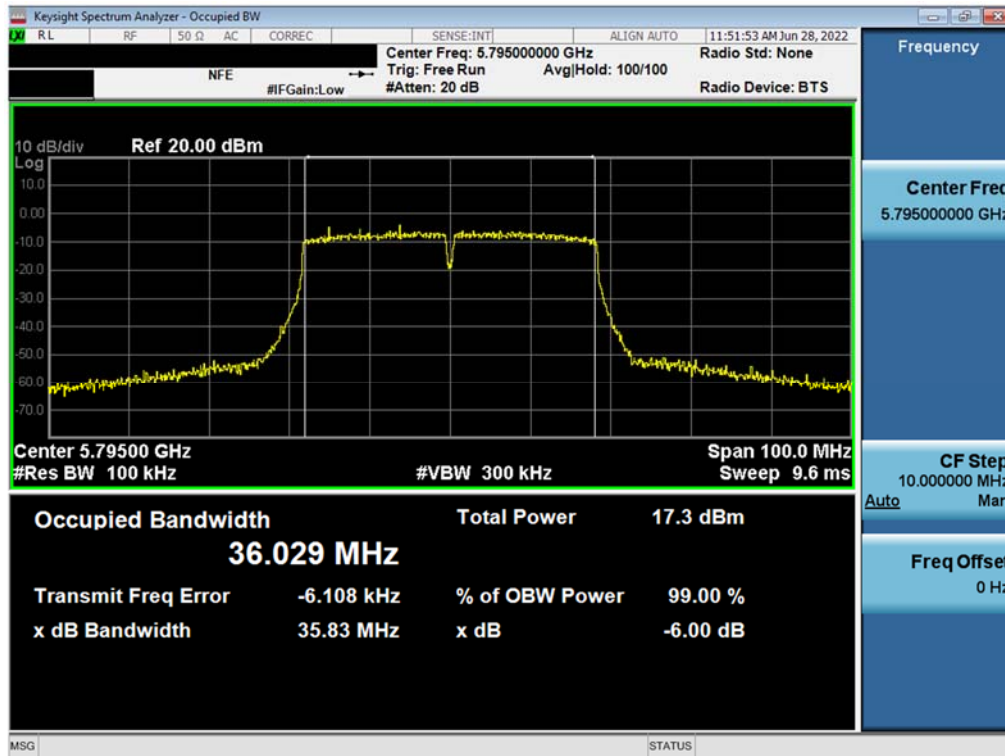


Plot 7-119. 6dB Bandwidth Plot MIMO ANT1 (802.11ax – 20MHz BW (UNII Band 3) – Ch. 165)

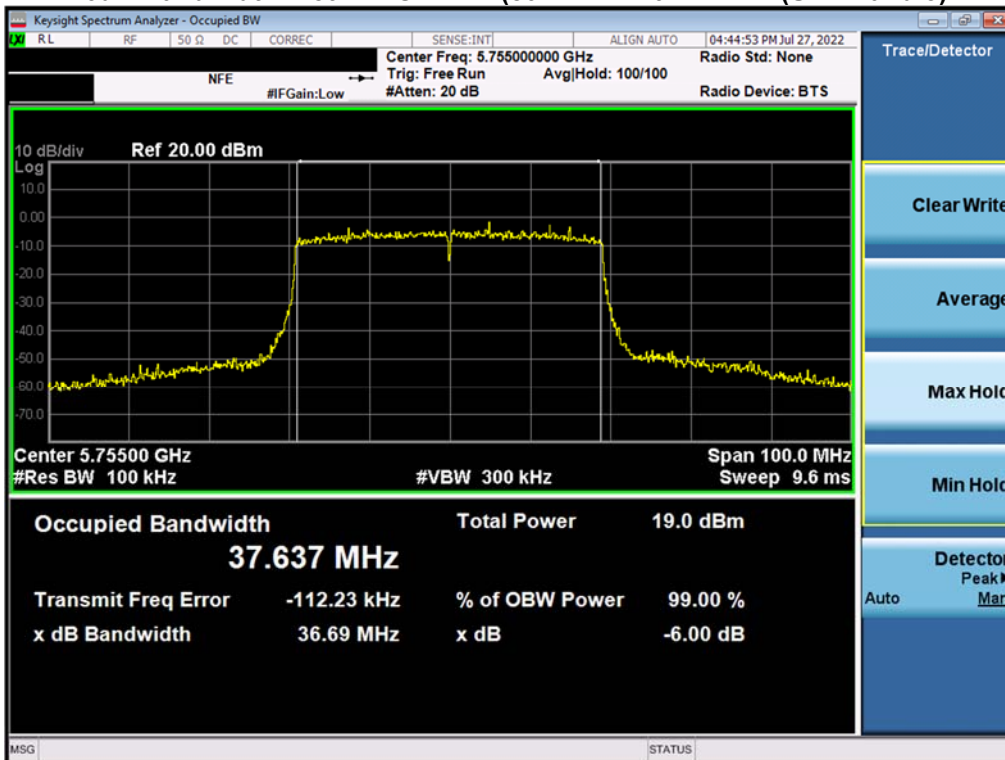


Plot 7-120. 6dB Bandwidth Plot MIMO ANT1 (802.11n – 40MHz BW (UNII Band 3) – Ch. 151)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 79 of 209

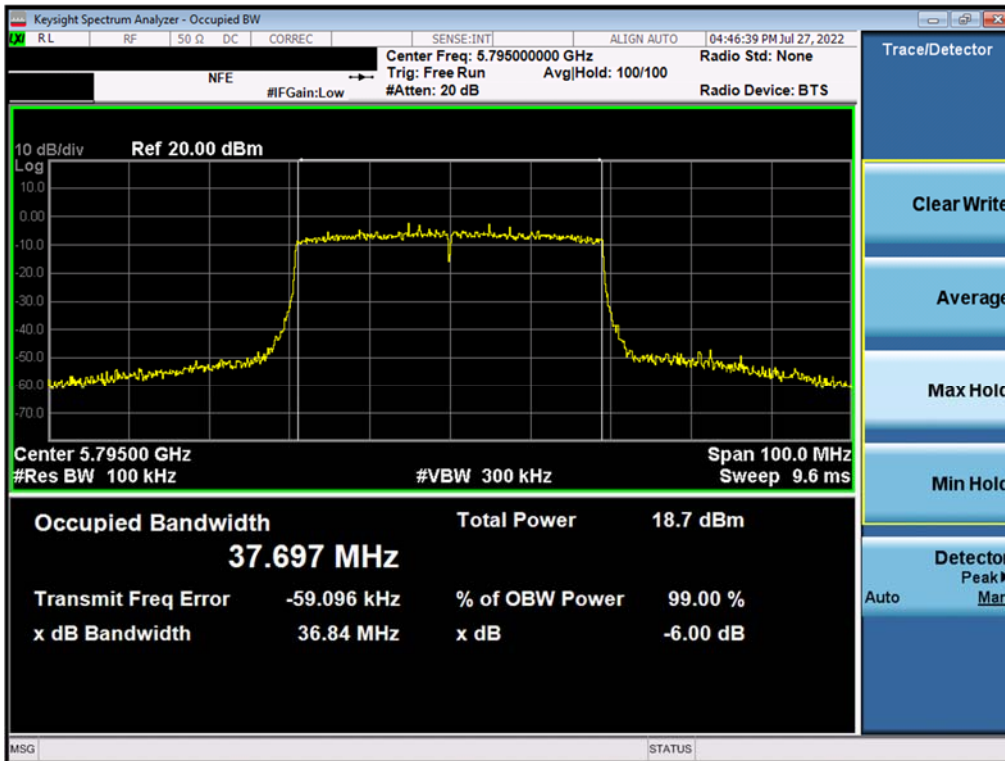


Plot 7-121. 6dB Bandwidth Plot MIMO ANT1 (802.11n – 40MHz BW (UNII Band 3) – Ch. 159)

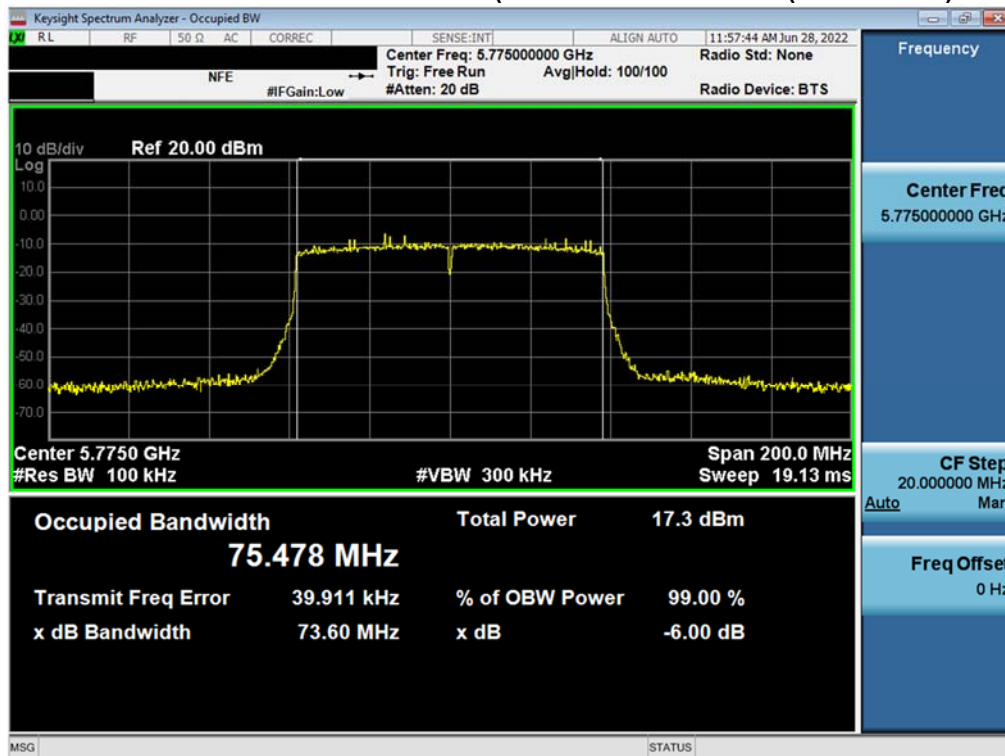


Plot 7-122. 6dB Bandwidth Plot MIMO ANT1 (802.11ax – 40MHz BW (UNII Band 3) – Ch. 151)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 80 of 209

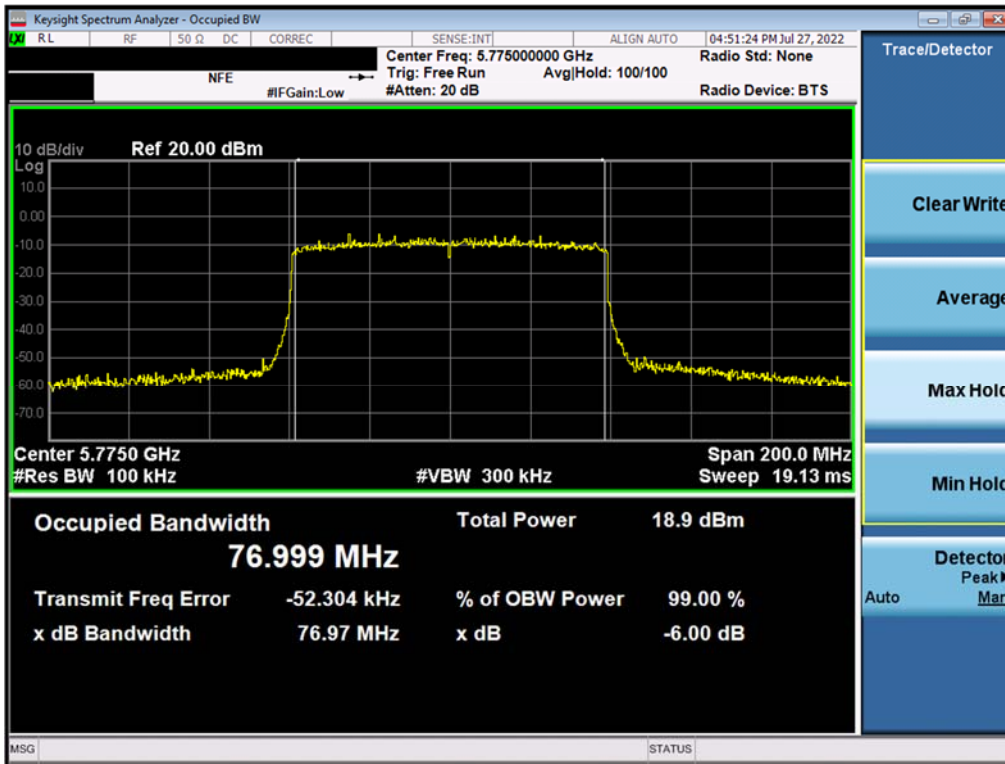


Plot 7-123. 6dB Bandwidth Plot MIMO ANT1 (802.11ax – 40MHz BW (UNII Band 3) – Ch. 159)



Plot 7-124. 6dB Bandwidth Plot MIMO ANT1 (802.11ac – 80MHz BW (UNII Band 3) – Ch. 155)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 81 of 209



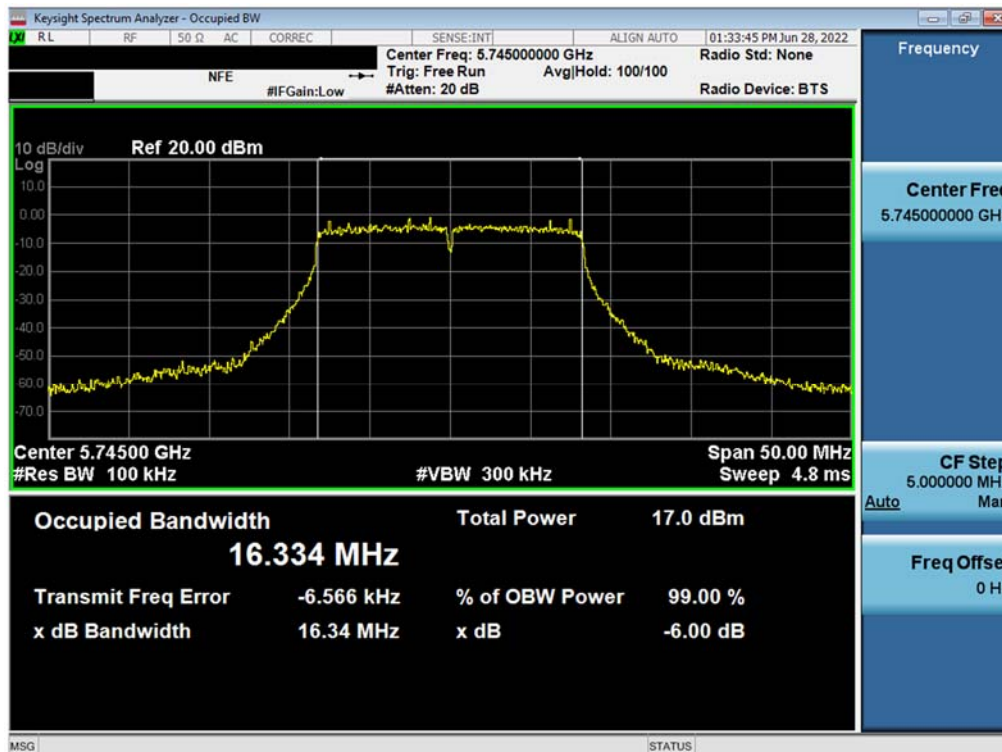
Plot 7-125. 6dB Bandwidth Plot MIMO ANT1 (802.11ax – 80MHz BW (UNII Band 3) – Ch. 155)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 82 of 209

MIMO Antenna-2 6dB Bandwidth Measurements

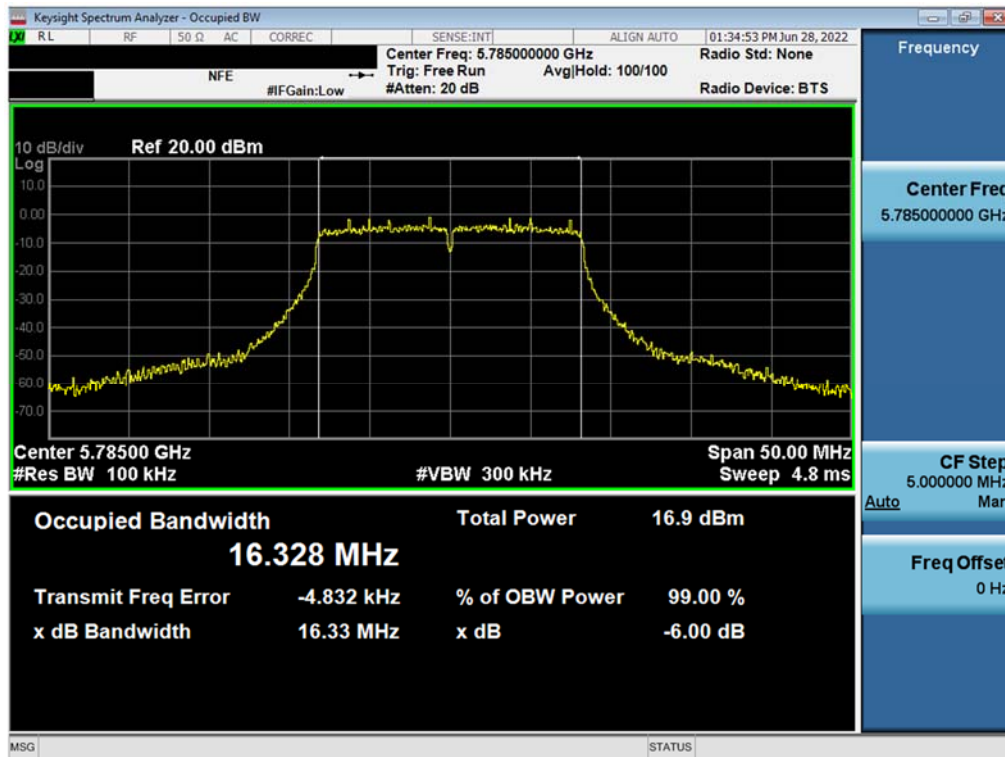
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
Band 3	5745	149	a	6	16.34
	5785	157	a	6	16.33
	5825	165	a	6	16.35
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.29
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.62
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.29
	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	18.56
	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	18.59
	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	19.12
	5755	151	n (40MHz)	13.5/15 (MCS0)	35.40
	5795	159	n (40MHz)	13.5/15 (MCS0)	36.27
	5755	151	ax (40MHz)	13.5/15 (MCS0)	36.47
	5795	159	ax (40MHz)	13.5/15 (MCS0)	37.08
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	74.94
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	77.06

Table 7-5. Conducted Bandwidth Measurements SISO ANT2



Plot 7-126. 6dB Bandwidth Plot MIMO ANT2 (802.11a) (UNII Band 3) – Ch. 149

FCC ID: PY7-58692W		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 83 of 209	

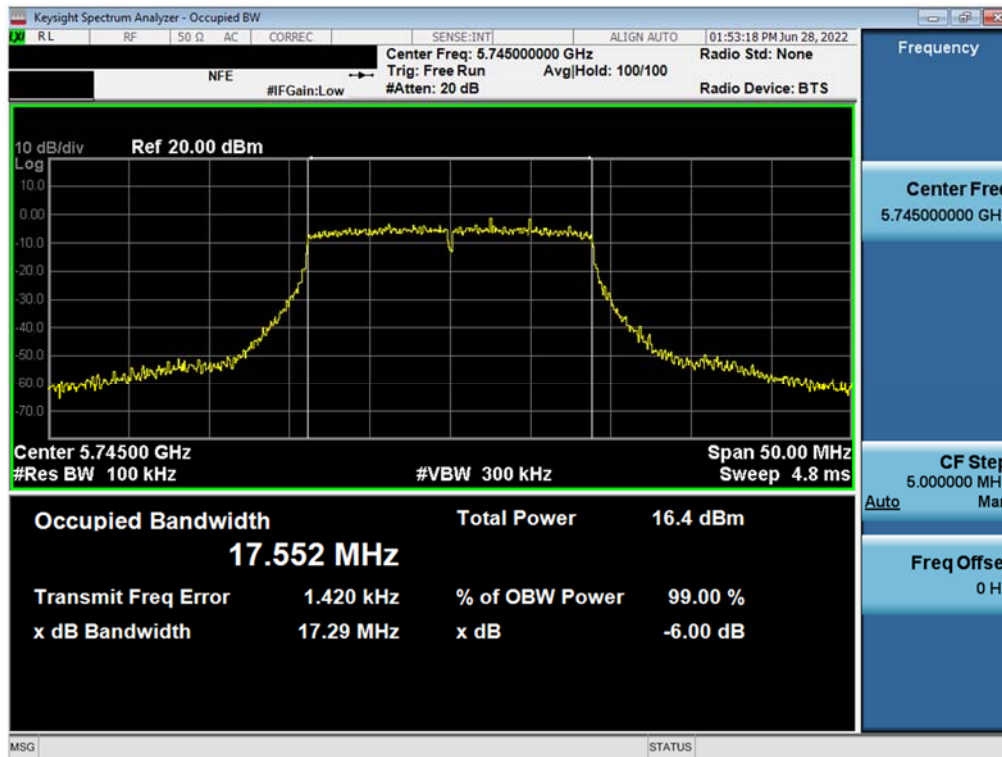


Plot 7-127. 6dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 3) – Ch. 157)



Plot 7-128. 6dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 3) – Ch. 165)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 84 of 209

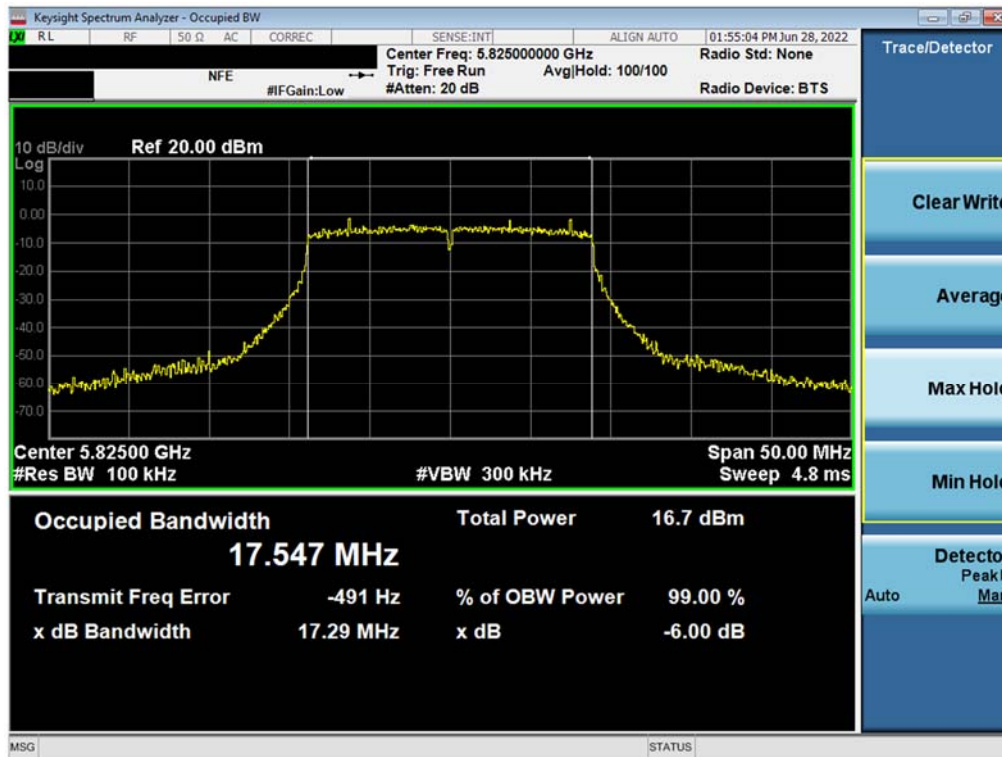


Plot 7-129. 6dB Bandwidth Plot MIMO ANT2 (802.11n – 20MHz BW (UNII Band 3) – Ch. 149)

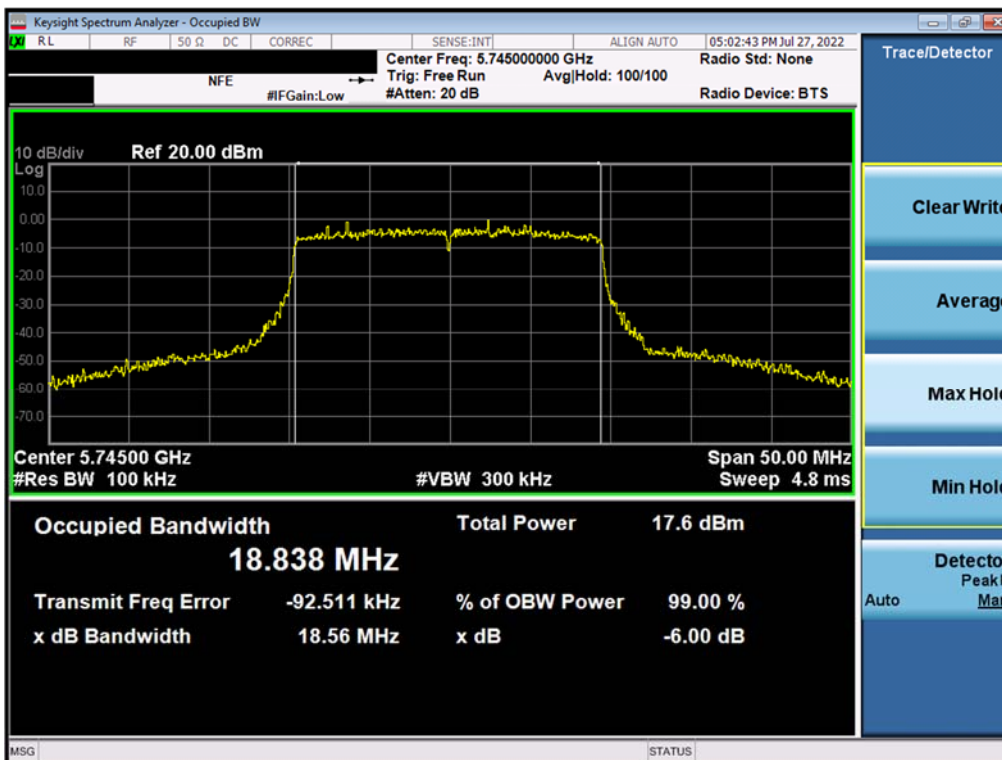


Plot 7-130. 6dB Bandwidth Plot MIMO ANT2 (802.11n – 20MHz BW (UNII Band 3) – Ch. 157)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 85 of 209

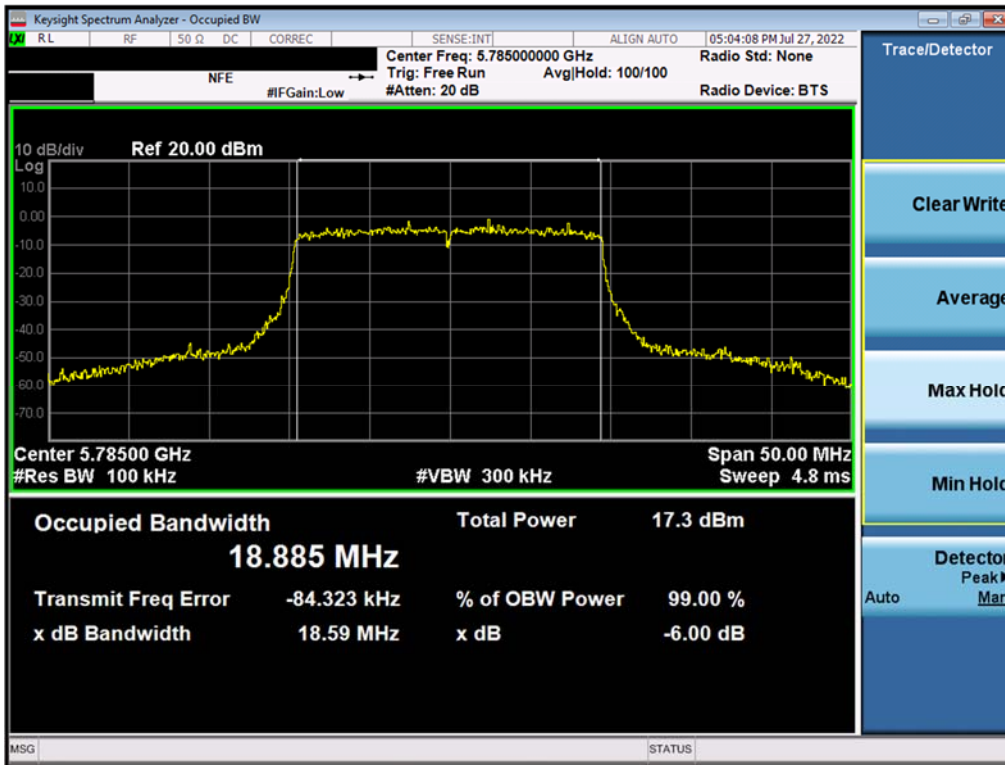


Plot 7-131. 6dB Bandwidth Plot MIMO ANT2 (802.11n – 20MHz BW (UNII Band 3) – Ch. 165)

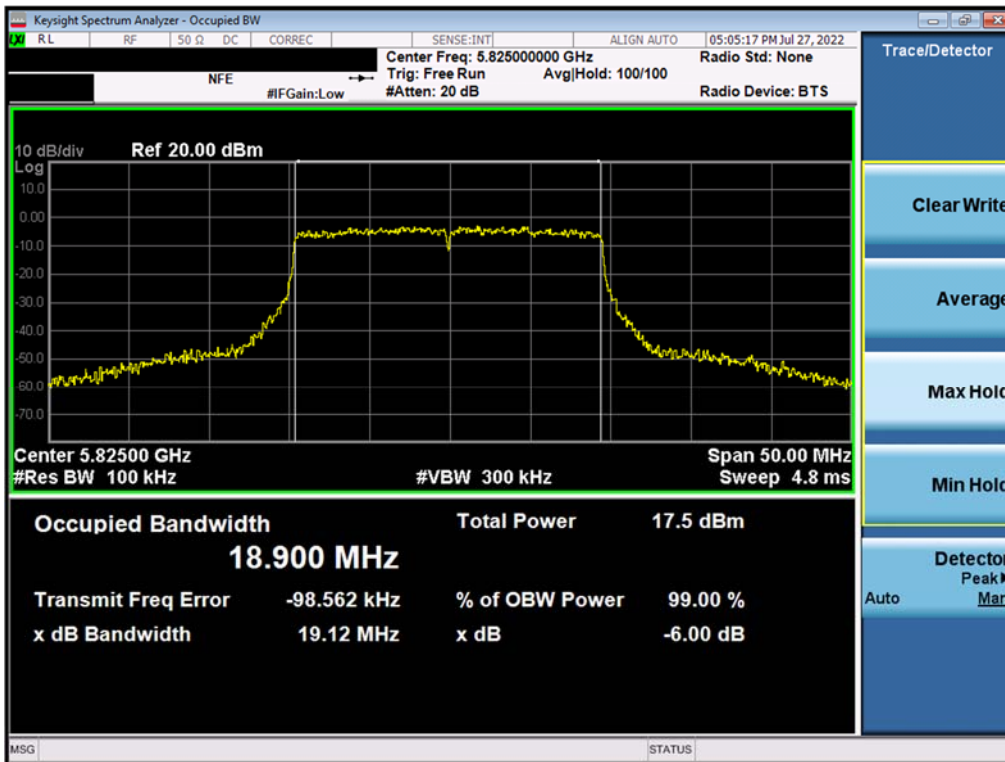


Plot 7-132. 6dB Bandwidth Plot MIMO ANT2 (802.11ax – 20MHz BW (UNII Band 3) – Ch. 149)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 86 of 209

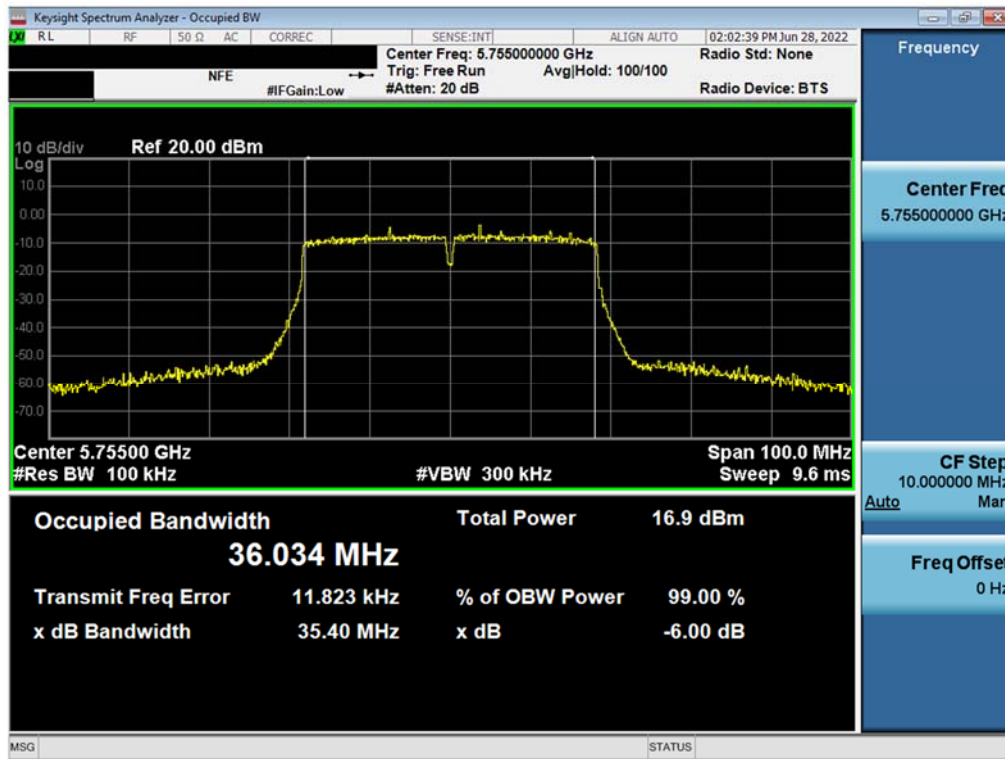


Plot 7-133. 6dB Bandwidth Plot MIMO ANT2 (802.11ax – 20MHz BW (UNII Band 3) – Ch. 157)

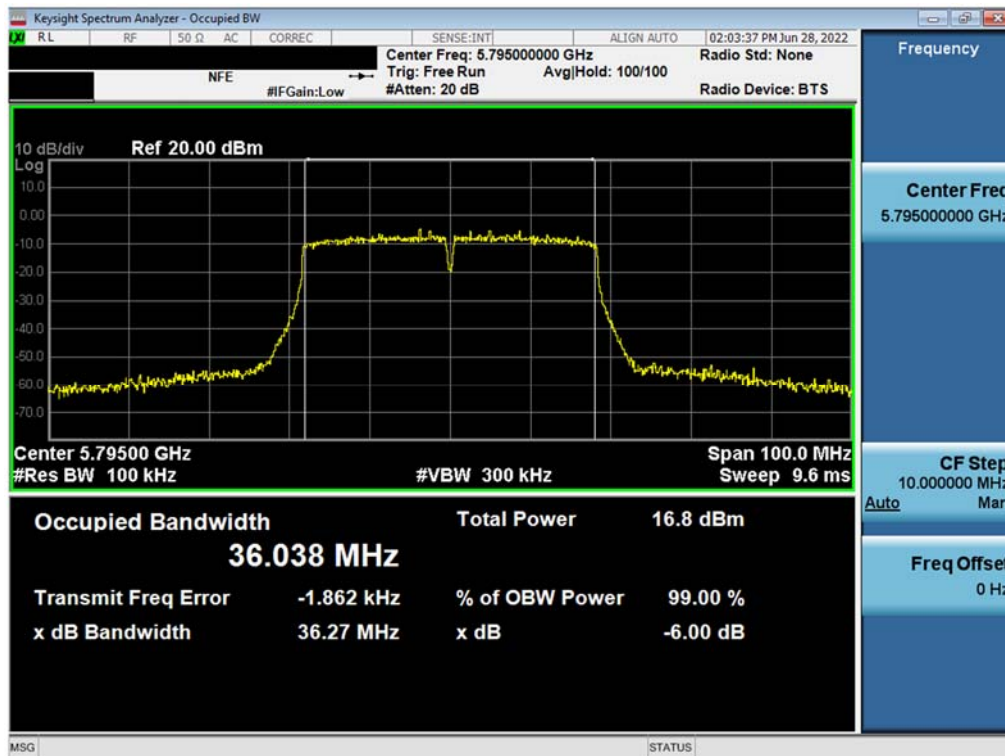


Plot 7-134. 6dB Bandwidth Plot MIMO ANT2 (802.11ax – 20MHz BW (UNII Band 3) – Ch. 165)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 87 of 209

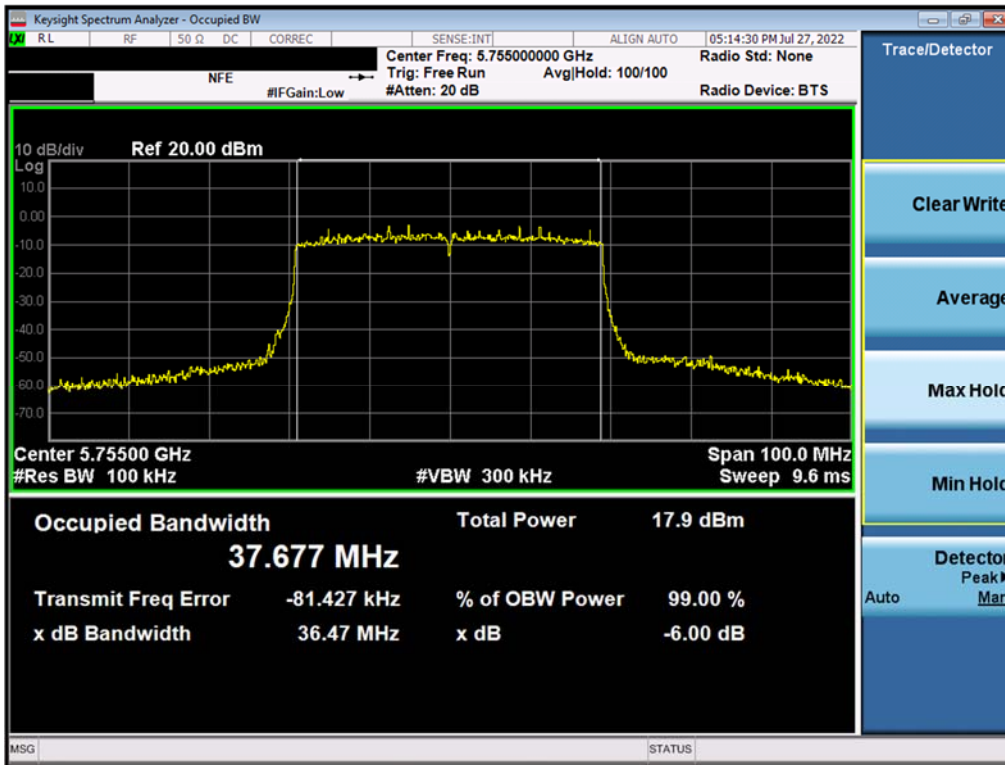


Plot 7-135. 6dB Bandwidth Plot MIMO ANT2 (802.11n – 40MHz BW (UNII Band 3) – Ch. 151)

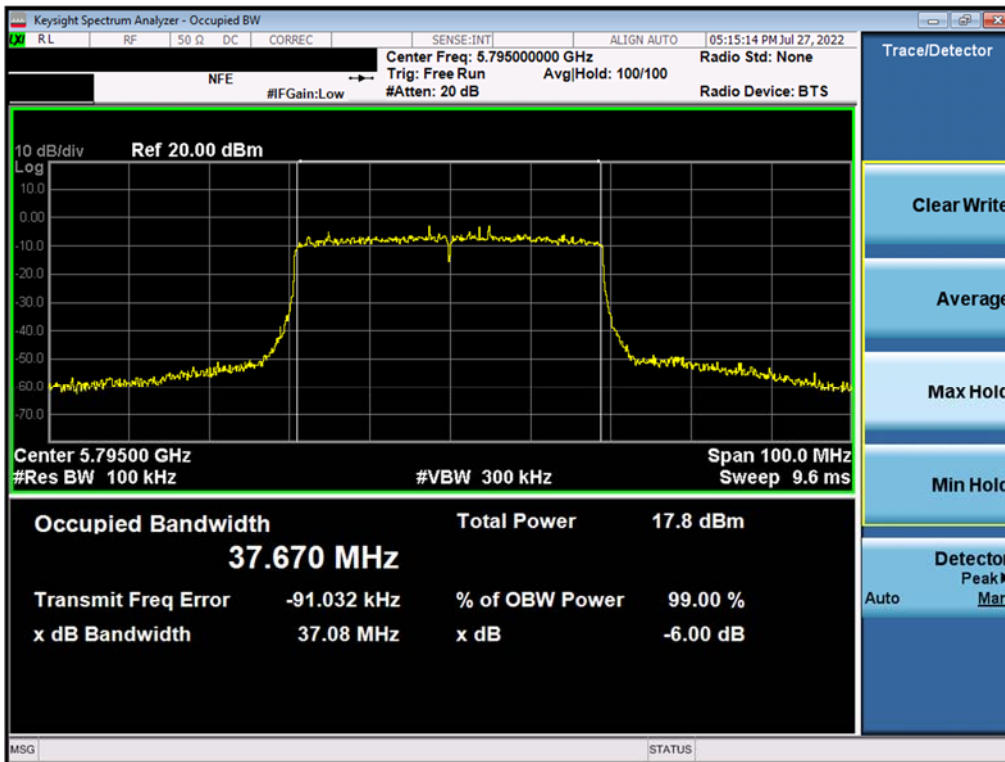


Plot 7-136. 6dB Bandwidth Plot MIMO ANT2 (802.11n – 40MHz BW (UNII Band 3) – Ch. 159)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 88 of 209

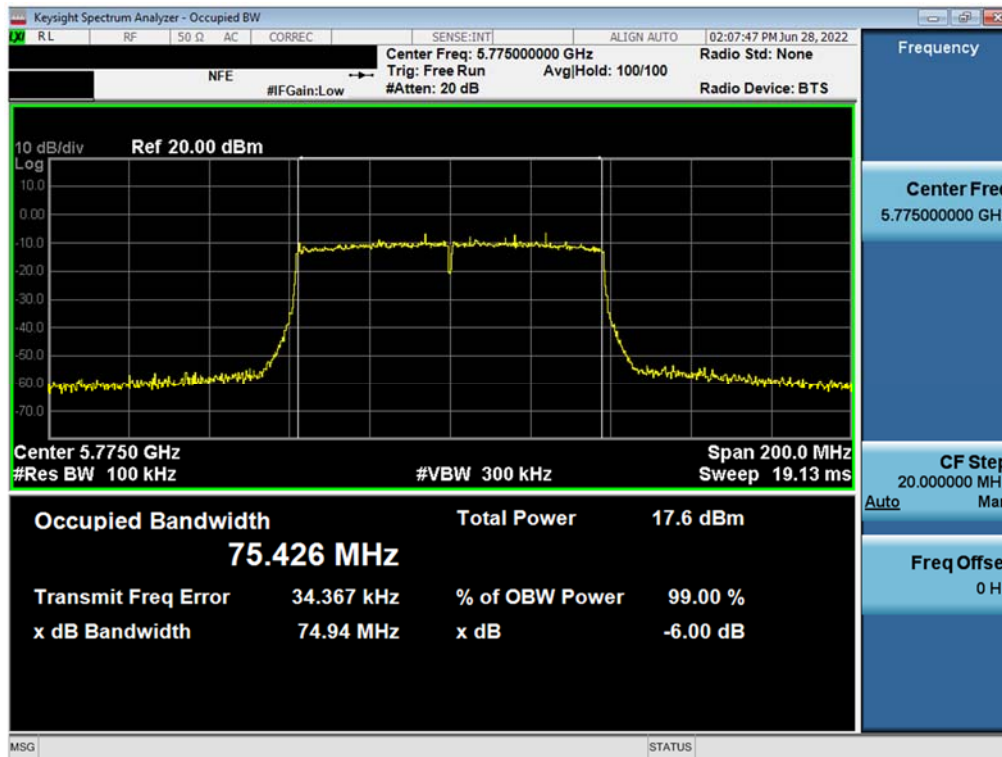


Plot 7-137. 6dB Bandwidth Plot MIMO ANT2 (802.11ax – 40MHz BW (UNII Band 3) – Ch. 151)

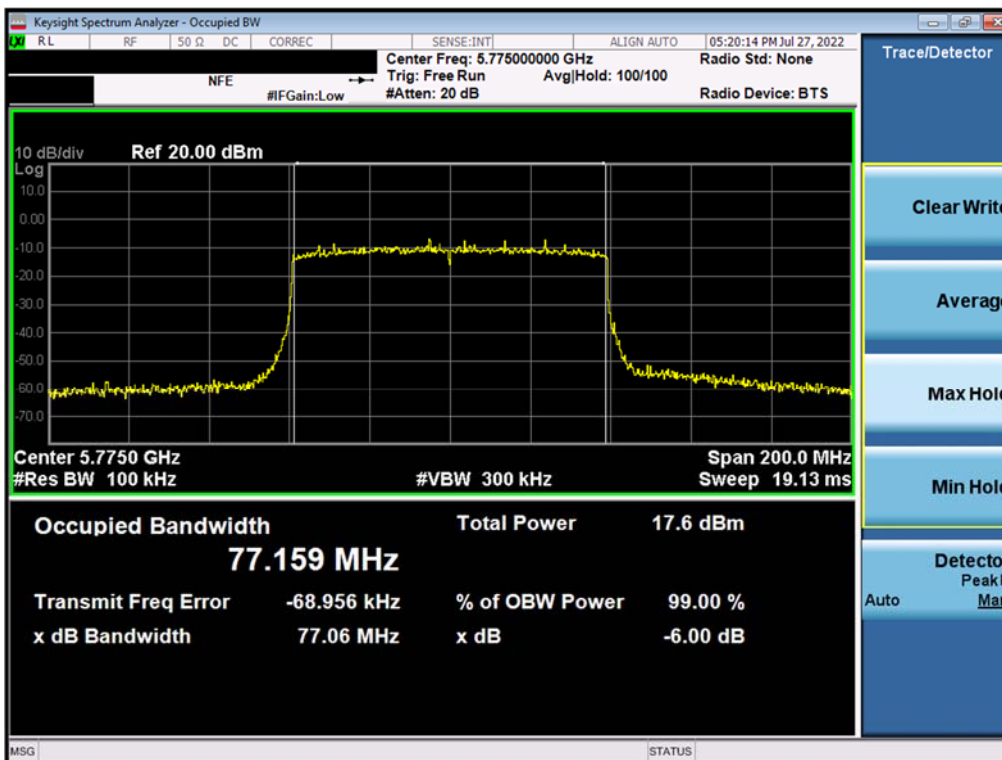


Plot 7-138. 6dB Bandwidth Plot MIMO ANT2 (802.11ax – 40MHz BW (UNII Band 3) – Ch. 159)

FCC ID: PY7-58692W		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset		Page 89 of 209



Plot 7-139. 6dB Bandwidth Plot MIMO ANT2 (802.11ac – 80MHz BW (UNII Band 3) – Ch. 155)



Plot 7-140. 6dB Bandwidth Plot MIMO ANT2 (802.11ax – 80MHz BW (UNII Band 3) – Ch. 155)

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC ID: PY7-58692W	Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	Page 90 of 209
EUT Type: Portable Handset			

UNII Output Power Measurement – 802.11a/n/ac/ax
§15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

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 ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies.

In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (23.98dBm). The maximum e.i.r.p. shall not exceed the lesser of 200 mW or $10 + 10 \log_{10}B$, dBm.

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(18.69) = 23.72\text{dBm}$. The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or $17 + 10 \log_{10}B$, dBm.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(N/A) = N/\text{AdBm}$. The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or $17 + 10 \log_{10}B$, dBm.

In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm). The maximum e.i.r.p. is 36 dBm.

Test Procedure Used

ANSI C63.10-2013 – Section 12.3.3.2 Method PM-G
 KDB 789033 D02 v02r01 – Section E)3)b) Method PM-G
 ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique
 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

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 91 of 209

MIMO Maximum Conducted Output Power Measurements

5GHz (20MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5180	36	AVG	11.07	11.35	14.22	23.98	-9.76
	5200	40	AVG	10.94	11.36	14.17	23.98	-9.81
	5220	44	AVG	11.02	11.41	14.23	23.98	-9.75
	5240	48	AVG	11.01	11.39	14.21	23.98	-9.77
	5260	52	AVG	10.81	11.46	14.16	23.98	-9.82
	5280	56	AVG	10.99	11.03	14.02	23.98	-9.96
	5300	60	AVG	10.89	11.05	13.98	23.98	-10.00
	5320	64	AVG	11.24	11.33	14.30	23.98	-9.68
	5500	100	AVG	11.35	11.49	14.43	23.98	-9.55
	5600	120	AVG	11.42	11.10	14.27	23.98	-9.71
	5620	124	AVG	11.40	11.12	14.27	23.98	-9.71
	5720	144	AVG	11.44	11.48	14.47	23.98	-9.51
	5745	149	AVG	11.27	11.49	14.39	30.00	-15.61
	5765	153	AVG	11.28	11.41	14.36	30.00	-15.64
	5785	157	AVG	11.17	11.16	14.18	30.00	-15.82
	5805	161	AVG	11.26	11.08	14.18	30.00	-15.82
	5825	165	AVG	11.36	11.09	14.24	30.00	-15.76

Table 7-6. MIMO 802.11a (UNII) Maximum Conducted Output Power

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 92 of 209

5GHz (20MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5180	36	AVG	10.97	11.23	14.11	23.98	-9.87
	5200	40	AVG	10.85	11.23	14.05	23.98	-9.93
	5220	44	AVG	11.46	11.32	14.40	23.98	-9.58
	5240	48	AVG	10.93	11.28	14.12	23.98	-9.86
	5260	52	AVG	10.70	11.35	14.05	23.98	-9.93
	5280	56	AVG	10.88	10.99	13.95	23.98	-10.03
	5300	60	AVG	10.78	10.91	13.86	23.98	-10.12
	5320	64	AVG	11.13	11.18	14.17	23.98	-9.81
	5500	100	AVG	11.24	11.34	14.30	23.98	-9.68
	5600	120	AVG	11.28	10.92	14.11	23.98	-9.87
	5620	124	AVG	11.29	11.00	14.16	23.98	-9.82
	5720	144	AVG	11.32	11.31	14.33	23.98	-9.65
	5745	149	AVG	10.56	10.76	13.67	30.00	-16.33
	5765	153	AVG	11.15	11.28	14.23	30.00	-15.77
	5785	157	AVG	11.08	11.05	14.08	30.00	-15.92
	5805	161	AVG	11.18	10.93	14.07	30.00	-15.93
	5825	165	AVG	11.27	10.94	14.12	30.00	-15.88

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

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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5GHz (20MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5180	36	AVG	10.99	11.25	14.13	23.98	-9.85
	5200	40	AVG	10.85	11.25	14.06	23.98	-9.92
	5220	44	AVG	11.45	11.31	14.39	23.98	-9.59
	5240	48	AVG	10.93	11.22	14.09	23.98	-9.89
	5260	52	AVG	10.73	11.35	14.06	23.98	-9.92
	5280	56	AVG	10.87	10.91	13.90	23.98	-10.08
	5300	60	AVG	10.73	10.91	13.83	23.98	-10.15
	5320	64	AVG	11.20	11.18	14.20	23.98	-9.78
	5500	100	AVG	11.27	11.33	14.31	23.98	-9.67
	5600	120	AVG	11.00	10.93	13.98	23.98	-10.00
	5620	124	AVG	11.31	10.99	14.16	23.98	-9.82
	5720	144	AVG	11.34	11.31	14.34	23.98	-9.64
	5745	149	AVG	10.51	10.82	13.68	30.00	-16.32
	5765	153	AVG	11.14	11.27	14.22	30.00	-15.78
	5785	157	AVG	11.05	11.05	14.06	30.00	-15.94
	5805	161	AVG	11.14	10.91	14.04	30.00	-15.96
	5825	165	AVG	11.27	10.92	14.11	30.00	-15.89

Table 7-8. MIMO 20MHz BW 802.11ac (UNII) Maximum Conducted Output Power

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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5GHz (20MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5180	36	AVG	11.03	11.24	14.15	23.98	-9.83
	5200	40	AVG	10.90	11.28	14.10	23.98	-9.88
	5220	44	AVG	11.49	11.36	14.44	23.98	-9.54
	5240	48	AVG	11.01	11.34	14.19	23.98	-9.79
	5260	52	AVG	10.79	11.41	14.12	23.98	-9.86
	5280	56	AVG	10.94	10.98	13.97	23.98	-10.01
	5300	60	AVG	10.80	11.00	13.91	23.98	-10.07
	5320	64	AVG	11.17	11.27	14.23	23.98	-9.75
	5500	100	AVG	11.27	11.43	14.36	23.98	-9.62
	5600	120	AVG	11.34	11.01	14.19	23.98	-9.79
	5620	124	AVG	11.31	11.07	14.20	23.98	-9.78
	5720	144	AVG	11.37	11.39	14.39	23.98	-9.59
	5745	149	AVG	10.56	10.88	13.73	30.00	-16.27
	5765	153	AVG	11.23	11.37	14.31	30.00	-15.69
	5785	157	AVG	11.11	10.99	14.06	30.00	-15.94
	5805	161	AVG	11.28	10.99	14.15	30.00	-15.85
	5825	165	AVG	11.33	11.01	14.18	30.00	-15.82

Table 7-9. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power

5GHz (40MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5190	38	AVG	11.10	10.94	14.03	23.98	-9.95
	5230	46	AVG	11.49	11.11	14.31	23.98	-9.67
	5270	54	AVG	10.83	11.21	14.03	23.98	-9.95
	5310	62	AVG	11.40	11.05	14.24	23.98	-9.74
	5510	102	AVG	11.42	11.17	14.31	23.98	-9.67
	5590	118	AVG	11.44	10.71	14.10	23.98	-9.88
	5630	126	AVG	10.96	10.88	13.93	23.98	-10.05
	5710	142	AVG	11.26	10.96	14.12	23.98	-9.86
	5755	151	AVG	10.72	10.56	13.65	30.00	-16.35
	5795	159	AVG	11.36	10.67	14.04	30.00	-15.96

Table 7-10. MIMO 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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5GHz (40MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5190	38	AVG	11.06	10.93	14.01	23.98	-9.97
	5230	46	AVG	11.49	11.06	14.29	23.98	-9.69
	5270	54	AVG	10.80	11.16	13.99	23.98	-9.99
	5310	62	AVG	11.42	11.02	14.23	23.98	-9.75
	5510	102	AVG	11.37	11.04	14.22	23.98	-9.76
	5590	118	AVG	11.44	10.68	14.09	23.98	-9.89
	5630	126	AVG	10.95	10.90	13.94	23.98	-10.04
	5710	142	AVG	11.28	10.97	14.14	23.98	-9.84
5755	151	AVG	10.76	10.46	13.62	30.00	-16.38	
5795	159	AVG	11.29	10.55	13.95	30.00	-16.05	

Table 7-11. MIMO 40MHz BW 802.11ac (UNII) Maximum Conducted Output Power

5GHz (40MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5190	38	AVG	10.93	10.78	13.87	23.98	-10.11
	5230	46	AVG	11.37	10.90	14.15	23.98	-9.83
	5270	54	AVG	10.65	10.92	13.80	23.98	-10.18
	5310	62	AVG	11.24	10.85	14.06	23.98	-9.92
	5510	102	AVG	11.22	10.92	14.08	23.98	-9.90
	5590	118	AVG	11.24	10.53	13.91	23.98	-10.07
	5630	126	AVG	11.40	10.69	14.07	23.98	-9.91
	5710	142	AVG	11.11	10.83	13.98	23.98	-10.00
5755	151	AVG	10.60	10.84	13.73	30.00	-16.27	
5795	159	AVG	11.20	10.51	13.88	30.00	-16.12	

Table 7-12. MIMO 40MHz BW 802.11ax (UNII) Maximum Conducted Output Power

5GHz (80MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5210	42	AVG	10.96	11.38	14.19	23.98	-9.79
	5290	58	AVG	10.73	11.20	13.98	23.98	-10.00
	5530	106	AVG	10.65	11.36	14.03	23.98	-9.95
	5610	122	AVG	10.73	11.24	14.00	23.98	-9.98
5690	138	AVG	11.28	11.12	14.21	23.98	-9.77	
5775	155	AVG	10.52	11.22	13.89	30.00	-16.11	

Table 7-13. MIMO 80MHz BW 802.11ac (UNII) Maximum Conducted Output Power

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5GHz (80MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5210	42	AVG	11.05	11.12	14.10	23.98	-9.88
5290	58	AVG	10.81	10.78	13.80	23.98	-10.18	
5530	106	AVG	10.71	11.03	13.88	23.98	-10.10	
5610	122	AVG	10.80	10.71	13.77	23.98	-10.21	
5690	138	AVG	11.40	11.13	14.28	23.98	-9.70	
5775	155	AVG	10.60	10.84	13.73	30.00	-16.27	

Table 7-14. MIMO 80MHz BW 802.11ax (UNII) Maximum Conducted Output Power

5GHz (160MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5250	50	AVG	11.12	11.48	14.31	23.98	-9.67
5570	114	AVG	11.26	10.92	14.10	30.00	-15.90	

Table 7-15. MIMO 160MHz BW 802.11ac (UNII) Maximum Conducted Output Power

5GHz (160MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				ANT1	ANT2	MIMO		
	5250	50	AVG	11.15	11.48	14.33	23.98	-9.65
5570	114	AVG	11.27	10.87	14.08	30.00	-15.92	

Table 7-16. MIMO 160MHz BW 802.11ax (UNII) Maximum Conducted Output Power

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Note:

Per ANSI C63.10-2013 and 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.

Per ANSI C63.10-2013 Section 14.4.3, the directional gain is calculated using the following formula, where G_N is the gain of the nth antenna and N_{ANT} , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi}$$

Sample MIMO Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average conducted output power was measured to be 10.97 dBm for Antenna 1 and 11.23 dBm for Antenna 2.

Antenna 1 + Antenna 2 = MIMO

$$(10.97 \text{ dBm} + 11.23 \text{ dBm}) = (12.50 \text{ mW} + 13.27 \text{ mW}) = 25.78 \text{ mW} = 14.11 \text{ dBm}$$

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Maximum Power Spectral Density – 802.11a/n/ac/ax
§15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

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 ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. Method SA-1, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, was used to measure the power spectral density.

In the 5.15 – 5.25GHz band, the maximum permissible power spectral density is 11dBm/MHz.

In the 5.25 – 5.35GHz and 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

ANSI C63.10-2013 – Section 12.3.2.2
 KDB 789033 D02 v02r01 – Section F
 ANSI C63.10-2013 – Section 14.3.2.2 Measure-and-Sum Technique
 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 $\geq 2 \times$ (span/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

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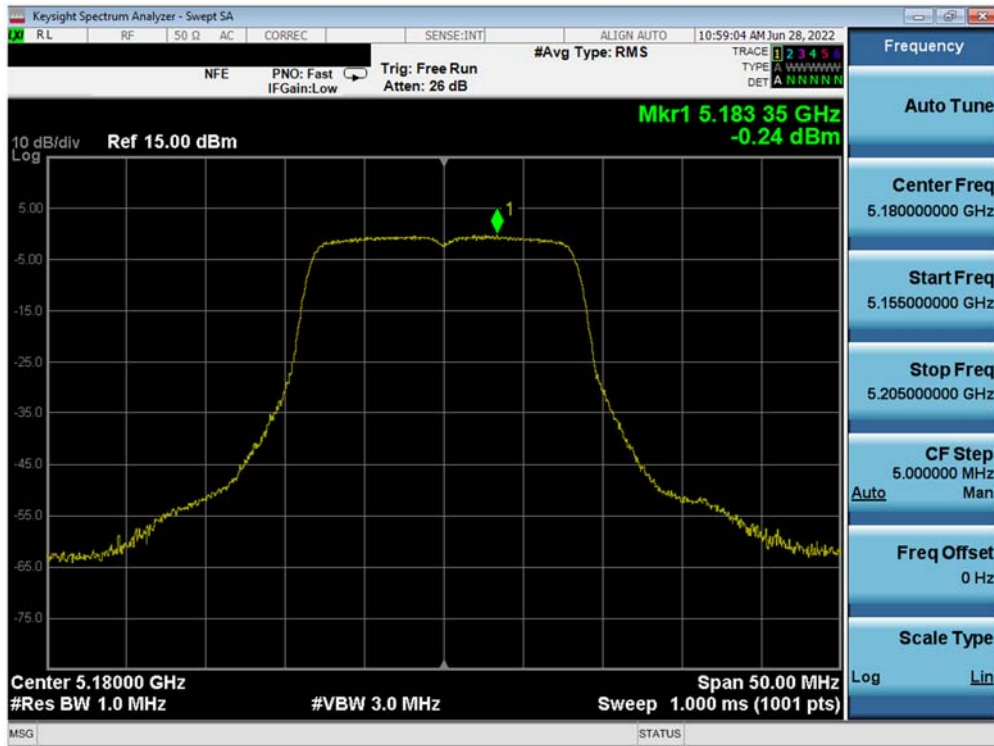


MIMO Power Spectral Density Measurements

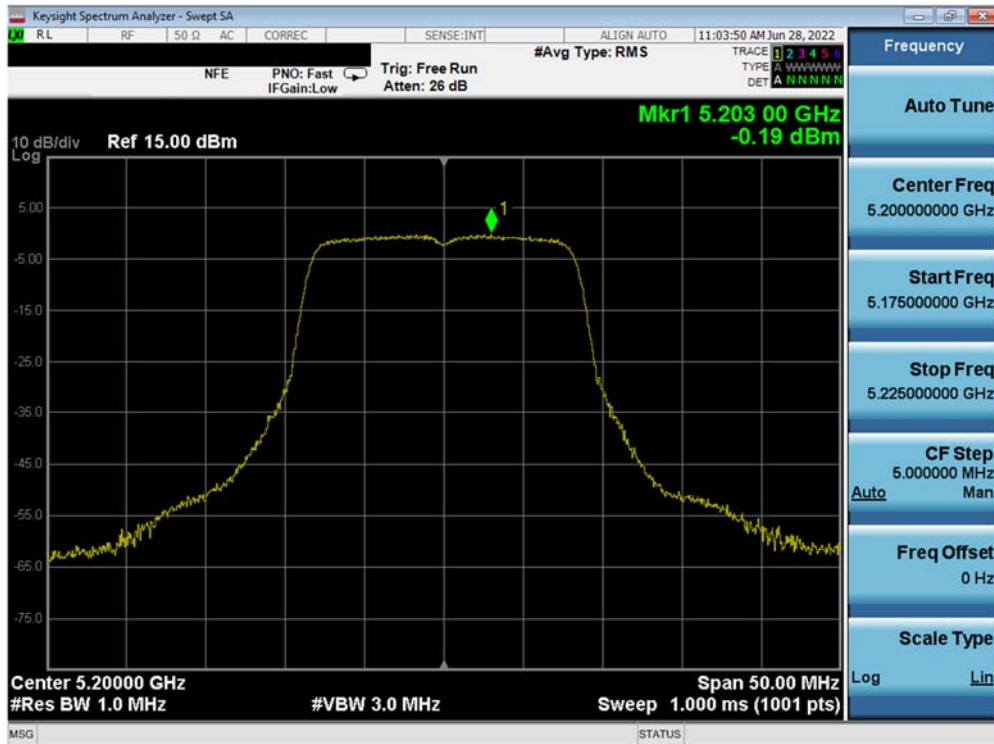
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	a	6	-0.24	0.52	3.17	11.0	-7.83
	5200	40	a	6	-0.19	0.50	3.18	11.0	-7.82
	5240	48	a	6	0.31	0.79	3.57	11.0	-7.43
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	-0.51	0.31	2.93	11.0	-8.07
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	-0.81	0.37	2.83	11.0	-8.17
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	-0.02	1.25	3.67	11.0	-7.33
	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	1.27	1.03	4.16	11.0	-6.84
	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	1.97	0.71	4.40	11.0	-6.60
	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	2.03	0.55	4.36	11.0	-6.64
	5190	38	n (40MHz)	13.5/15 (MCS0)	-3.34	-2.94	-0.13	11.0	-11.13
	5230	46	n (40MHz)	13.5/15 (MCS0)	-2.50	-2.69	0.42	11.0	-10.58
	5190	38	ax (40MHz)	13.5/15 (MCS0)	-1.15	-2.28	1.33	11.0	-9.67
	5230	46	ax (40MHz)	13.5/15 (MCS0)	-1.02	-1.96	1.55	11.0	-9.45
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	-6.58	-5.57	-3.04	11.0	-14.04
5210	42	ax (80MHz)	29.3/32.5 (MCS0)	-4.21	-5.05	-1.60	11.0	-12.60	
Band 1/2A	5250	50	ac (160MHz)	58.5/65 (MCS0)	-9.25	-9.00	-6.11	11.0	-17.11
	5250	50	ax (160MHz)	58.5/65 (MCS0)	-9.39	-8.86	-6.11	11.0	-17.11
Band 2A	5260	52	a	6	0.05	0.69	3.39	11.0	-7.61
	5280	56	a	6	0.07	0.88	3.50	11.0	-7.50
	5320	64	a	6	0.24	0.63	3.45	11.0	-7.55
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	-0.35	0.43	3.07	11.0	-7.93
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	-0.26	0.75	3.28	11.0	-7.72
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	-0.30	0.17	2.95	11.0	-8.05
	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	2.27	0.87	4.64	11.0	-6.36
	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	1.80	0.16	4.07	11.0	-6.93
	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	1.72	0.45	4.14	11.0	-6.86
	5270	54	n (40MHz)	13.5/15 (MCS0)	-3.49	-2.45	0.07	11.0	-10.93
	5310	62	n (40MHz)	13.5/15 (MCS0)	-2.94	-2.88	0.10	11.0	-10.90
	5270	54	ax (40MHz)	13.5/15 (MCS0)	-1.69	-2.63	0.88	11.0	-10.12
	5310	62	ax (40MHz)	13.5/15 (MCS0)	-1.63	-2.30	1.06	11.0	-9.94
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	-6.67	-5.50	-3.04	11.0	-14.04
5290	58	ax (80MHz)	29.3/32.5 (MCS0)	-4.54	-5.67	-2.06	11.0	-13.06	
Band 2C	5500	100	a	6	0.14	0.97	3.59	11.0	-7.41
	5600	120	a	6	0.01	-0.24	2.90	11.0	-8.10
	5720	144	a	6	0.03	0.24	3.15	11.0	-7.85
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	-0.29	0.70	3.24	11.0	-7.76
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	-0.38	0.02	2.83	11.0	-8.17
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	-0.43	0.43	3.03	11.0	-7.97
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	2.06	1.13	4.63	11.0	-6.37
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	0.81	0.47	3.65	11.0	-7.35
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	1.14	0.47	3.83	11.0	-7.17
	5510	102	n (40MHz)	13.5/15 (MCS0)	-3.16	-2.93	-0.03	11.0	-11.03
	5590	118	n (40MHz)	13.5/15 (MCS0)	-3.03	-3.77	-0.37	11.0	-11.37
	5710	142	n (40MHz)	13.5/15 (MCS0)	-3.30	-3.80	-0.53	11.0	-11.53
	5510	102	ax (40MHz)	13.5/15 (MCS0)	-1.71	-2.25	1.04	11.0	-9.96
	5590	118	ax (40MHz)	13.5/15 (MCS0)	-2.41	-2.45	0.58	11.0	-10.42
	5710	142	ax (40MHz)	13.5/15 (MCS0)	-1.80	-1.82	1.20	11.0	-9.80
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	-7.05	-6.21	-3.60	11.0	-14.60
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	-6.91	-6.16	-3.51	11.0	-14.51
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	-6.80	-6.82	-3.80	11.0	-14.80
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	-5.22	-5.19	-2.19	11.0	-13.19
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	-4.97	-5.56	-2.24	11.0	-13.24
5690	138	ax (80MHz)	29.3/32.5 (MCS0)	-5.20	-5.60	-2.39	11.0	-13.39	
5570	114	ac (160MHz)	58.5/65 (MCS0)	-9.26	-9.52	-6.38	11.0	-17.38	
5570	114	ax (160MHz)	58.5/65 (MCS0)	-9.38	-9.46	-6.41	11.0	-17.41	

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

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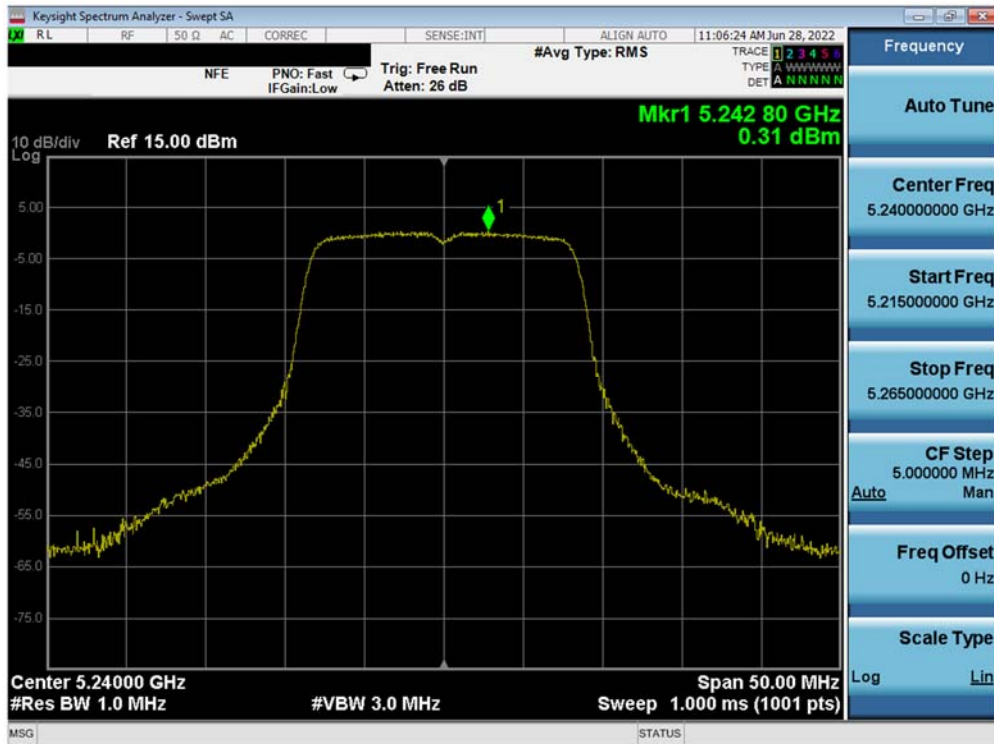


Plot 7-141. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 1) – Ch. 36)

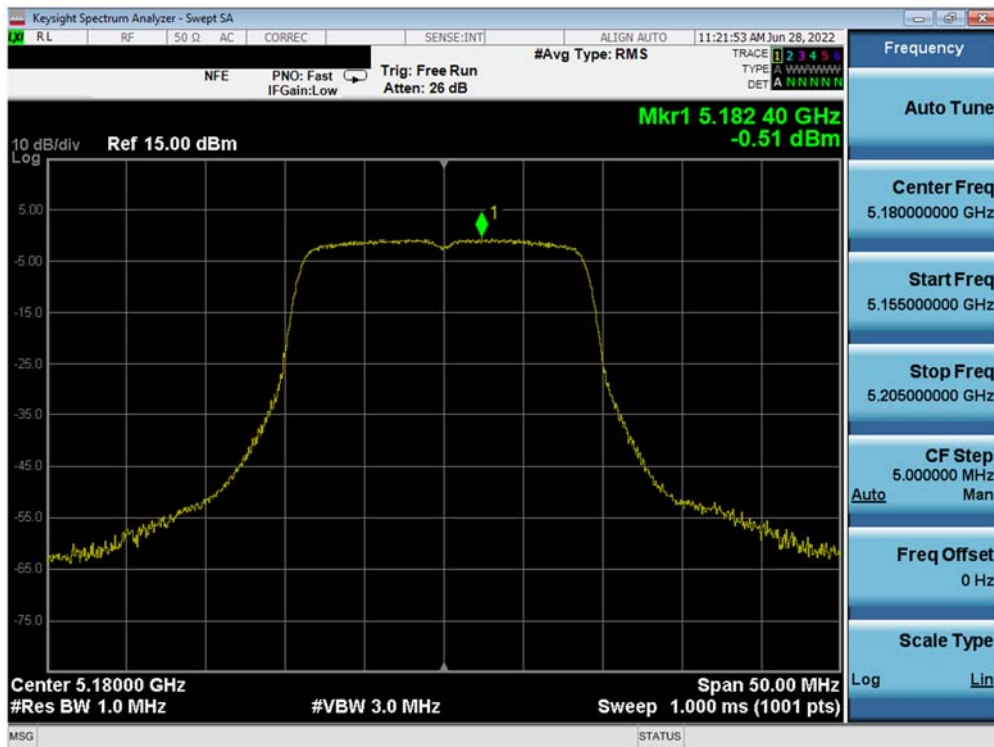


Plot 7-142. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 1) – Ch. 40)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 101 of 209

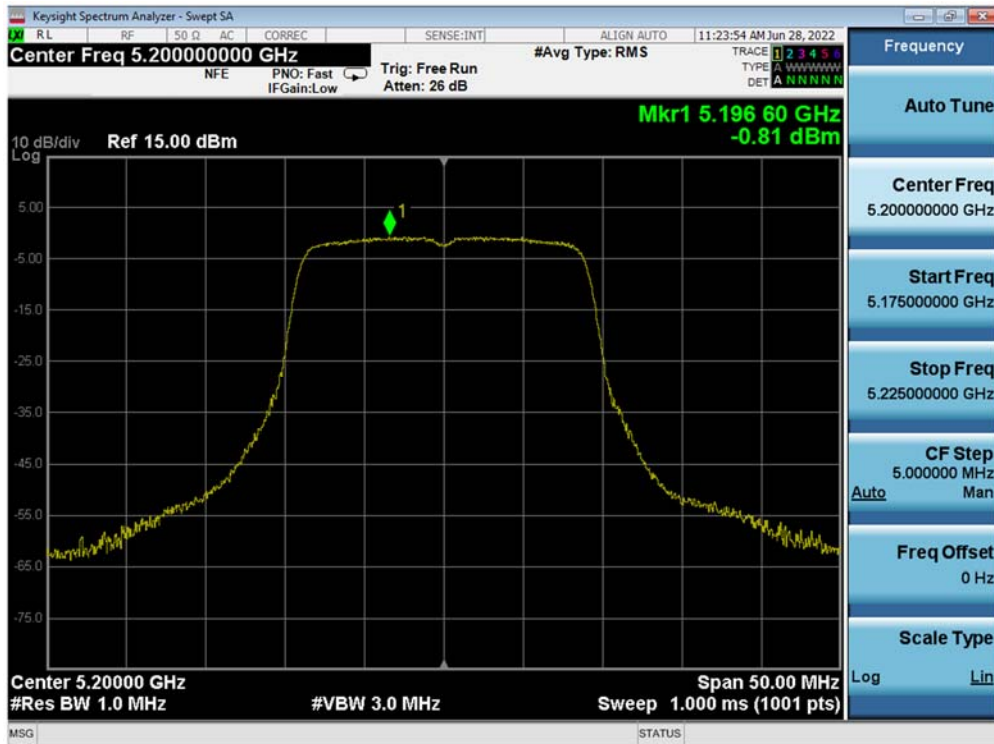


Plot 7-143. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 1) – Ch. 48)

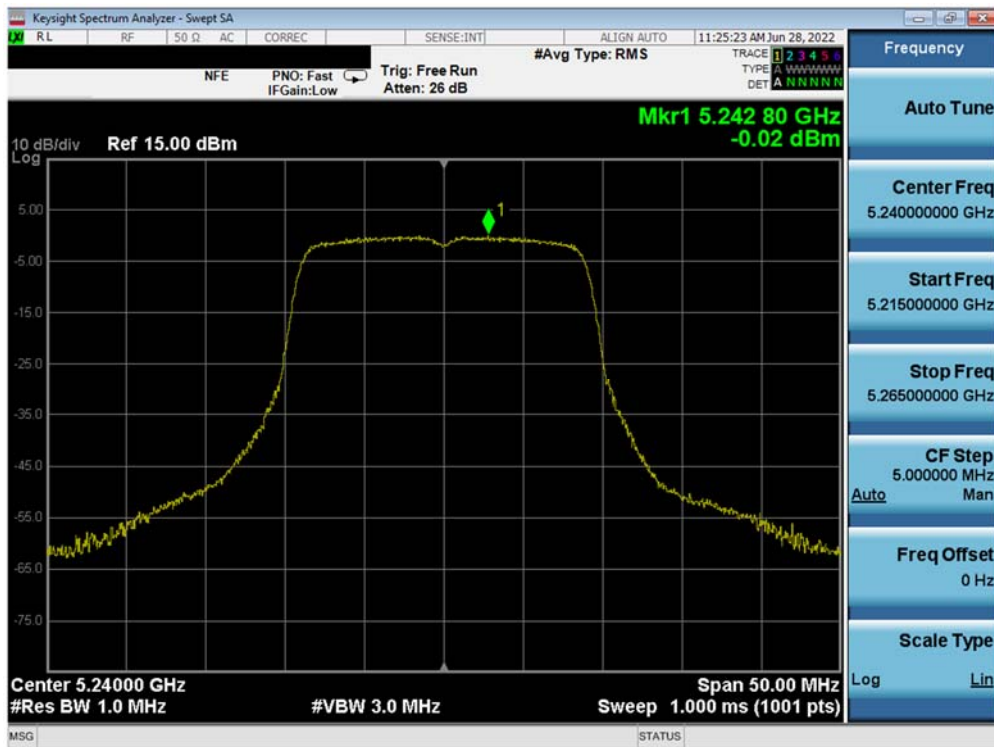


Plot 7-144. Power Spectral Density Plot MIMO ANT1 (802.11n – 20MHz BW (UNII Band 1) – Ch. 36)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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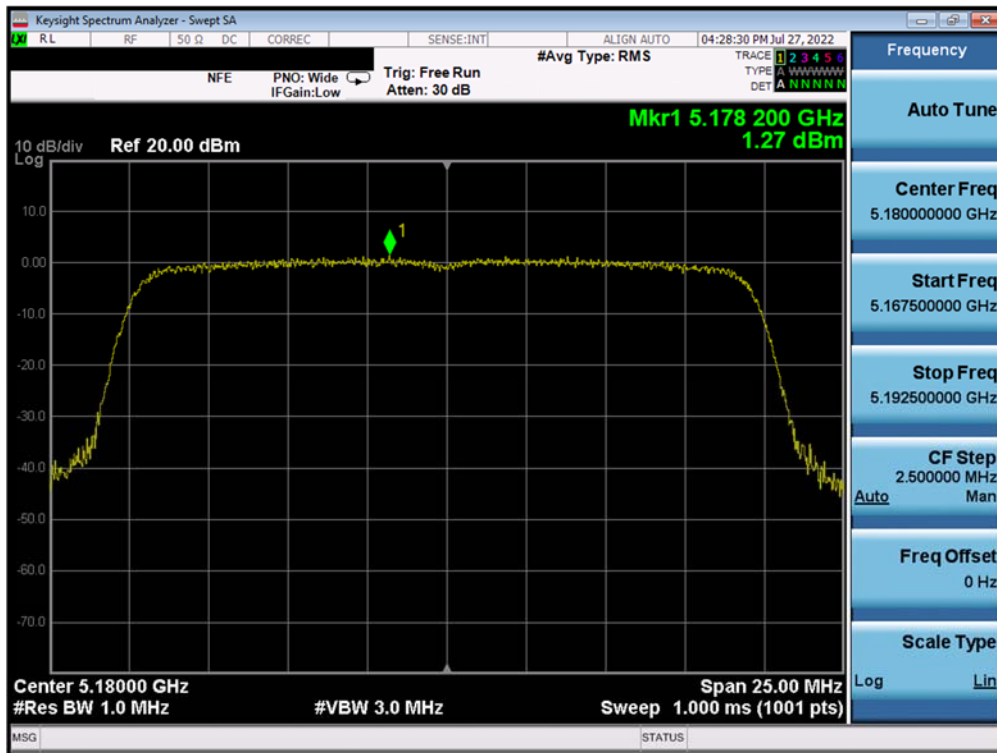


Plot 7-145. Power Spectral Density Plot MIMO ANT1 (802.11n – 20MHz BW (UNII Band 1) – Ch. 40)

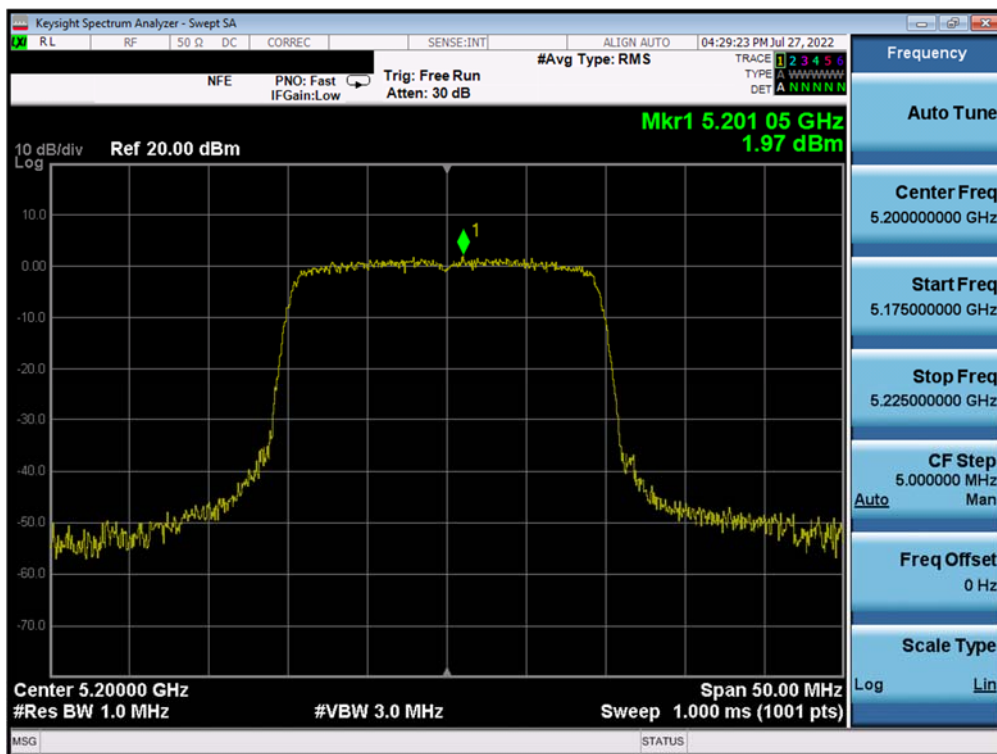


Plot 7-146. Power Spectral Density Plot MIMO ANT1 (802.11n – 20MHz BW (UNII Band 1) – Ch. 48)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 103 of 209

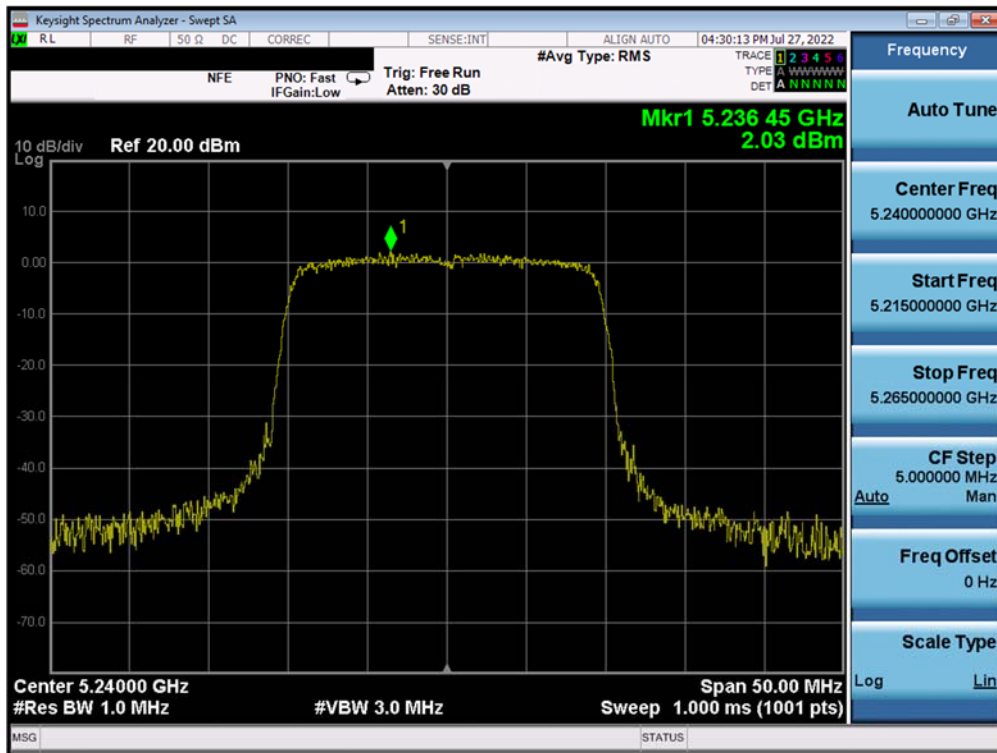


Plot 7-147. Power Spectral Density Plot MIMO ANT1 (802.11ax – 20MHz BW (UNII Band 1) – Ch. 36)

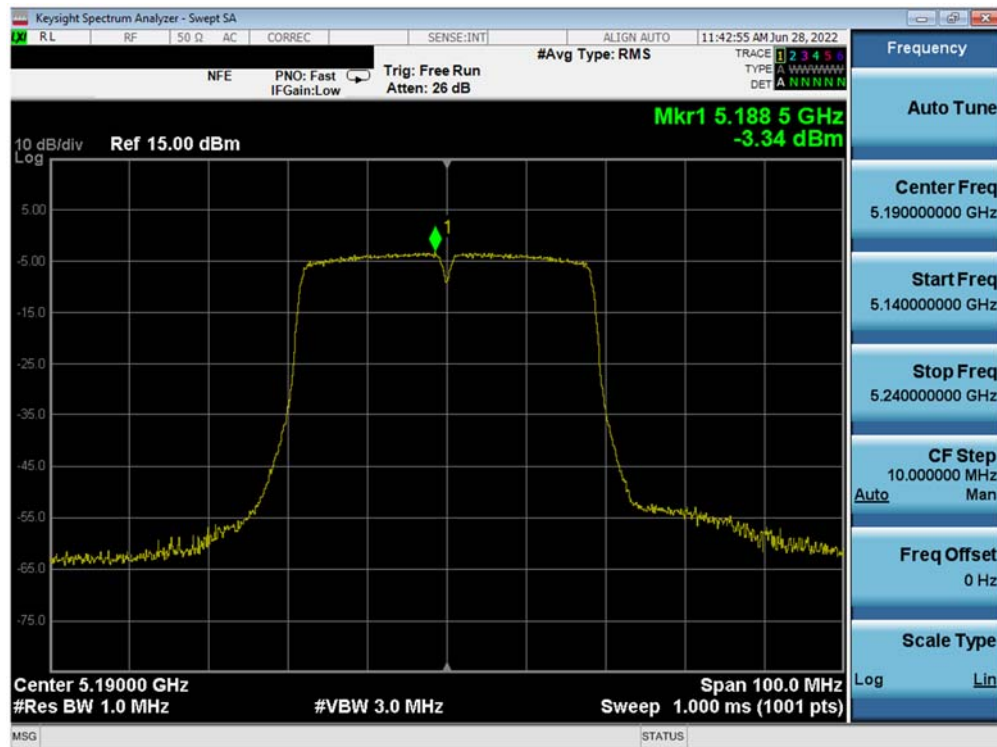


Plot 7-148. Power Spectral Density Plot MIMO ANT1 (802.11ax – 20MHz BW (UNII Band 1) – Ch. 40)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 104 of 209

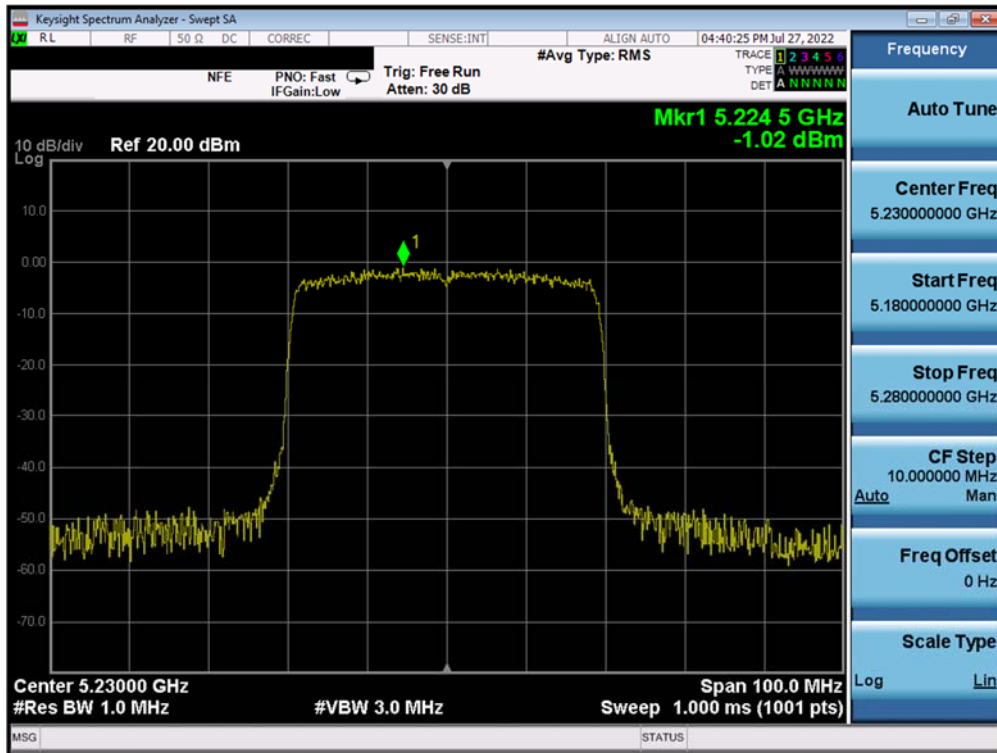


Plot 7-149. Power Spectral Density Plot MIMO ANT1 (802.11ax – 20MHz BW (UNII Band 1) – Ch. 48)

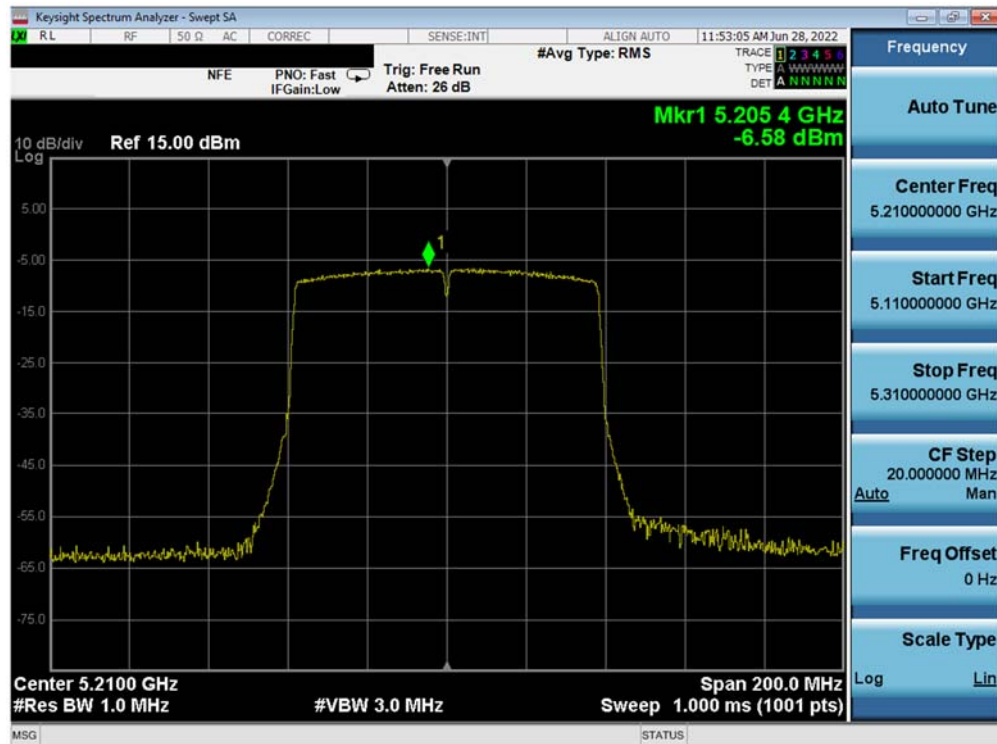


Plot 7-150. Power Spectral Density Plot MIMO ANT1 (802.11n – 40MHz BW (UNII Band 1) – Ch. 38)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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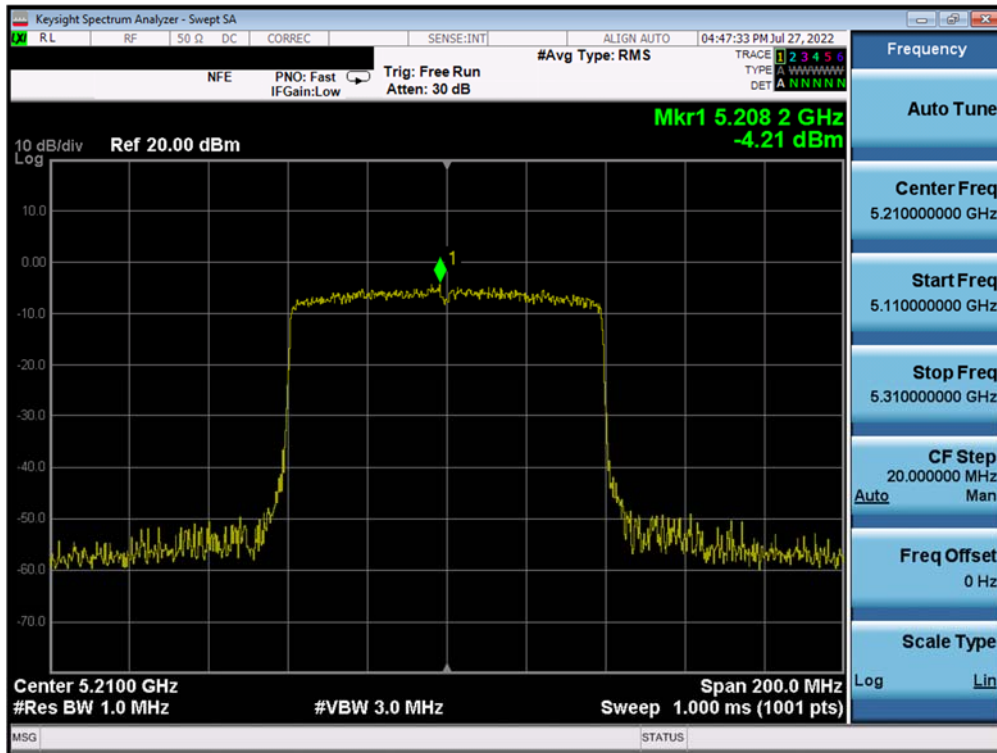


Plot 7-153. Power Spectral Density Plot MIMO ANT1 (802.11ax – 40MHz BW (UNII Band 1) – Ch. 46)

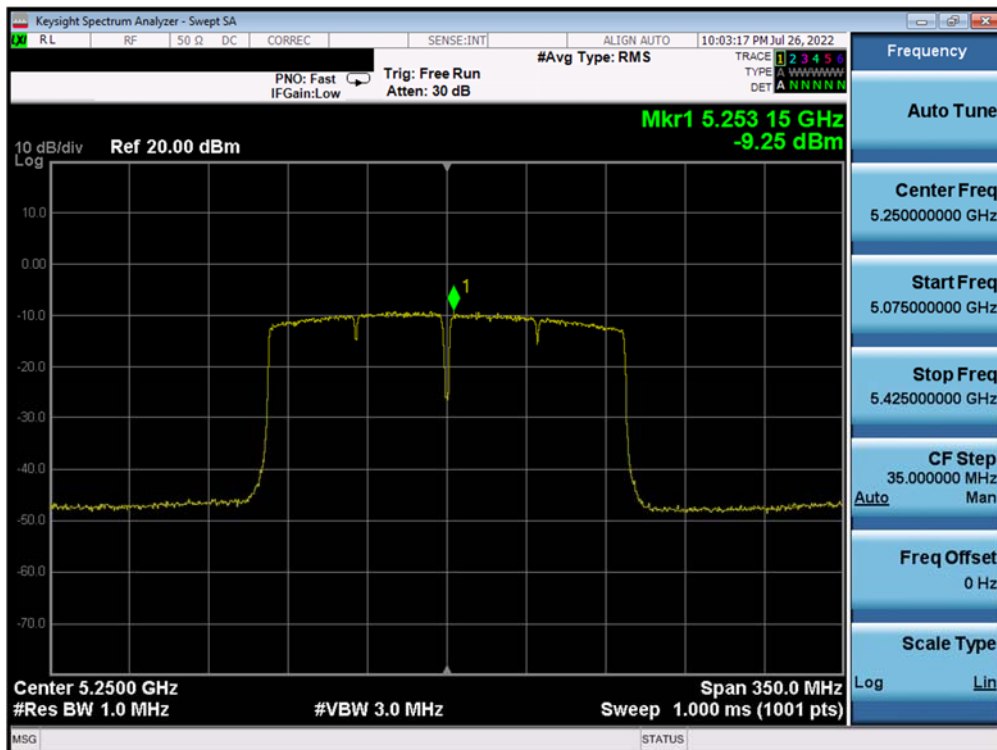


Plot 7-154. Power Spectral Density Plot MIMO ANT1 (802.11ac – 80MHz BW (UNII Band 1) – Ch. 42)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 107 of 209

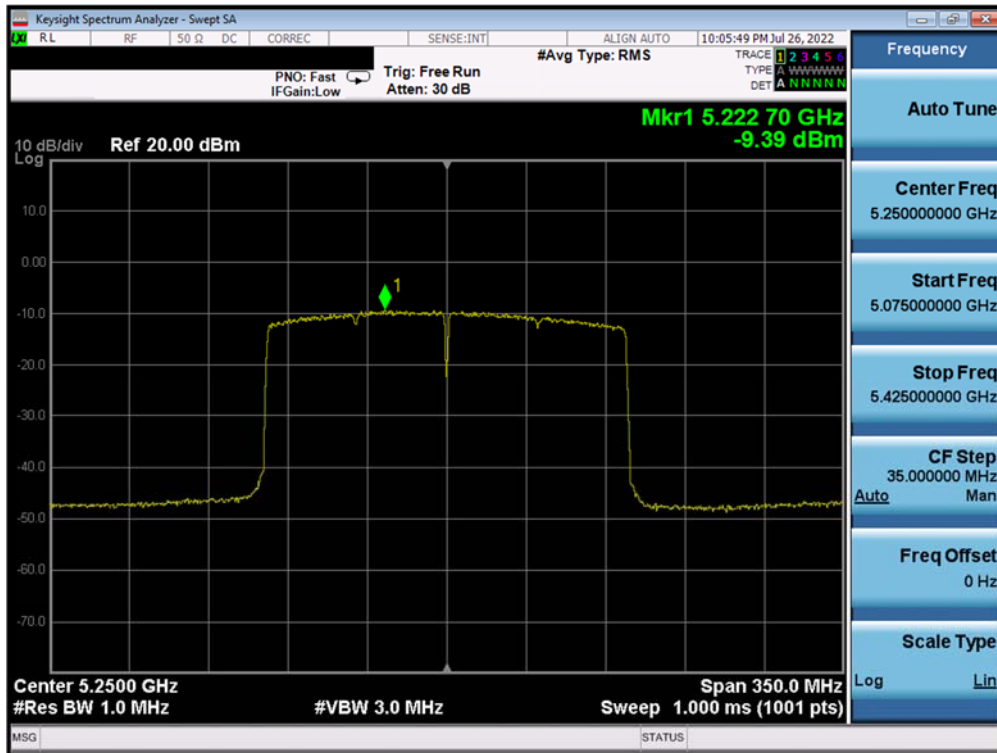


Plot 7-155. Power Spectral Density Plot MIMO ANT1 (802.11ax – 80MHz BW (UNII Band 1) – Ch. 42)

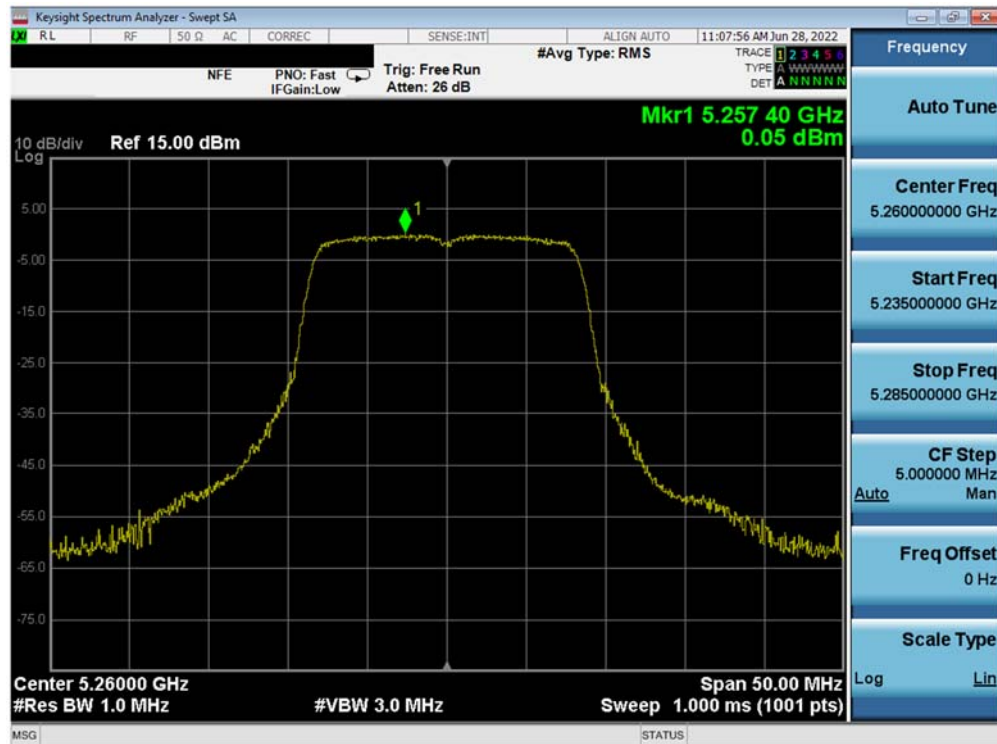


Plot 7-156. Power Spectral Density Plot MIMO ANT1 (802.11ac – 160MHz BW (UNII Band 1/2A) – Ch. 50)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-157. Power Spectral Density Plot MIMO ANT1 (802.11ax – 160MHz BW (UNII Band 1/2A) – Ch. 50)



Plot 7-158. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: PY7-58692W	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2207200079-10.PY7	Test Dates: 6/3/2022-7/29/2022	EUT Type: Portable Handset	Page 109 of 209