

9.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1) (2) (3)

FCC

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

TEST PROCEDURE

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used for power and PPSD. RBW set to 1MHz (500kHz for the band 5.725-5.85 GHz, the VBW $\geq 3 \times$ RBW, RMS detector and trace averaging). Band power function used for power and peak marker value of the spectrum is used for PSD. Add duty cycle correction factor.

DIRECTIONAL ANTENNA GAIN

For OUTPUT POWER and PSD: The TX chains are correlated and the antenna gains are unequal among the chains. The directional gain is:

Frequency Band [MHz]	Chain 0 Antenna Gain [dBi]	Chain 1 Antenna Gain [dBi]	Correlated Chains Directional Gain [dBi]
5150 - 5250	-1.30	-4.10	0.42
5250 - 5350	-2.40	-3.50	0.08
5470 - 5725	0.50	1.30	3.92
5725 - 5850	0.60	1.30	3.97

RESULTS

9.2.1.802.11a MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5180	18.73	16.34	0.42	0.42
Mid	5200	18.54	16.33	0.42	0.42
High	5240	18.38	16.34	0.42	0.42

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5180	23.72	23.72	11.00
Mid	5200	23.68	23.68	11.00
High	5240	23.64	23.64	11.00

Duty Cycle CF [dB]	0.23	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Primary Antenna 1 Power [dBm]	Secondary Antenna 2 Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5180	13.54	13.49	16.76	23.72	-6.97
Mid	5200	13.51	13.37	16.68	23.68	-7.00
High	5240	13.36	13.48	16.66	23.64	-6.99

PPSD Results

Channel	Frequency [MHz]	Primary Antenna 1 PPSD [dBm]	Secondary Antenna 2 PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5180	3.29	3.32	6.54	11.00	-4.46
Mid	5200	3.60	3.27	6.68	11.00	-4.32
High	5240	3.55	3.66	6.84	11.00	-4.16

9.2.2.802.11n HT20 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5180	19.69	17.44	0.42	0.42
Mid	5200	19.62	17.51	0.42	0.42
High	5240	19.56	17.51	0.42	0.42

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5180	23.94	23.94	11.00
Mid	5200	23.93	23.93	11.00
High	5240	23.91	23.91	11.00

Duty Cycle CF [dB]	0.24	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5180	13.32	13.35	16.59	23.94	-7.36
Mid	5200	13.34	14.17	17.02	23.93	-6.90
High	5240	14.13	13.28	16.97	23.91	-6.94

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5180	3.26	3.31	6.53	11.00	-4.47
Mid	5200	3.08	3.92	6.77	11.00	-4.23
High	5240	4.03	3.54	7.04	11.00	-3.96

9.2.3.802.11n HT40 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSP [dBi]
Low	5190	40.34	30.00	0.42	0.42
High	5230	39.97	35.82	0.42	0.42

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSP Limit [dBm]
Low	5190	24.00	24.00	11.00
High	5230	24.00	24.00	11.00

Duty Cycle CF [dB]	0.48	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5190	10.74	10.72	14.22	24.00	-9.78
High	5230	10.48	10.55	14.01	24.00	-9.99

PPSP Results

Channel	Frequency [MHz]	Chain 0 Meas PPSP [dBm]	Chain 1 Meas PPSP [dBm]	Total Corr'd PPSP [dBm]	PPSP Limit [dBm]	PPSP Margin [dB]
Low	5190	-2.69	-2.60	0.84	11.00	-10.16
High	5230	-2.71	-2.64	0.81	11.00	-10.19

9.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSP [dBi]
Middle	5210	82.16	75.01	0.42	0.42

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSP Limit [dBm]
Middle	5210	24.00	24.00	11.00

Duty Cycle CF [dB]	0.88	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Middle	5210	9.95	9.88	13.81	24.00	-10.19

PPSP Results

Channel	Frequency [MHz]	Chain 0 Meas PPSP [dBm]	Chain 1 Meas PPSP [dBm]	Total Corr'd PPSP [dBm]	PPSP Limit [dBm]	PPSP Margin [dB]
Middle	5210	-6.50	-6.33	-2.52	11.00	-13.52

9.2.5.802.11a MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5260	18.62	16.32	0.08	0.08
Mid	5300	18.47	16.31	0.08	0.08
High	5320	18.57	16.31	0.08	0.08

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5260	23.70	23.70	11.00
Mid	5300	23.66	23.66	11.00
High	5320	23.69	23.69	11.00

Duty Cycle CF [dB]	0.23	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Primary Antenna 1 Power [dBm]	Secondary Antenna 2 Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5260	14.11	13.53	17.07	23.70	-6.63
Mid	5300	14.14	13.44	17.04	23.66	-6.62
High	5320	14.10	13.71	17.15	23.69	-6.54

PPSD Results

Channel	Frequency [MHz]	Primary Antenna 1 PPSD [dBm]	Secondary Antenna 2 PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5260	3.81	3.72	7.00	11.00	-4.00
Mid	5300	4.43	3.60	7.27	11.00	-3.73
High	5320	4.36	3.87	7.36	11.00	-3.64

9.2.6.802.11n HT20 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5260	19.66	17.49	0.08	0.08
Mid	5300	19.68	17.50	0.08	0.08
High	5320	19.57	17.50	0.08	0.08

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5260	23.94	23.94	11.00
Mid	5300	23.94	23.94	11.00
High	5320	23.92	23.92	11.00

Duty Cycle CF [dB]	0.24	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5260	13.81	13.18	16.75	23.94	-7.18
Mid	5300	14.04	14.17	17.36	23.94	-6.58
High	5320	13.93	13.45	16.95	23.92	-6.97

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5260	3.59	3.26	6.68	11.00	-4.32
Mid	5300	3.81	3.93	7.12	11.00	-3.88
High	5320	3.81	3.35	6.84	11.00	-4.16

9.2.7.802.11n HT40 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5270	40.05	35.92	0.08	0.08
High	5310	40.63	35.88	0.08	0.08

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5270	24.00	24.00	11.00
High	5310	24.00	24.00	11.00

Duty Cycle CF [dB]	0.48	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5270	10.23	10.63	13.92	24.00	-10.08
High	5310	10.49	10.49	13.98	24.00	-10.02

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5270	-3.15	-2.52	0.66	11.00	-10.34
High	5310	-2.74	-3.65	0.32	11.00	-10.68

9.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Middle	5290	81.95	75.06	0.08	0.08

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Middle	5290	24.00	24.00	11.00

Duty Cycle CF [dB]	0.88	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Middle	5290	9.74	9.84	13.68	24.00	-10.32

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Middle	5290	-6.74	-6.30	-2.63	11.00	-13.63

9.2.9.802.11a MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5500	18.62	16.31	3.92	3.92
Mid	5580	18.68	16.33	3.92	3.92
High	5700	18.66	16.33	3.92	3.92

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5500	23.70	23.70	11.00
Mid	5580	23.71	23.71	11.00
High	5700	23.71	23.71	11.00

Duty Cycle CF [dB]	0.23	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Primary Antenna 1 Power [dBm]	Secondary Antenna 2 Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5500	13.98	13.42	16.95	23.70	-6.75
Mid	5580	13.86	13.56	16.95	23.71	-6.76
High	5700	13.71	13.49	16.84	23.71	-6.87

PPSD Results

Channel	Frequency [MHz]	Primary Antenna 1 PPSD [dBm]	Secondary Antenna 2 PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5500	4.07	3.43	7.00	11.00	-4.00
Mid	5580	3.83	3.45	6.88	11.00	-4.12
High	5700	3.60	3.47	6.77	11.00	-4.23

9.2.10.802.11n HT20 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5500	19.65	17.49	3.92	3.92
Mid	5580	19.39	17.51	3.92	3.92
High	5700	19.65	17.45	3.92	3.92

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5500	23.93	23.93	11.00
Mid	5580	23.88	23.88	11.00
High	5700	23.93	23.93	11.00

Duty Cycle CF [dB]	0.24	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5500	13.83	14.11	17.22	23.93	-6.71
Mid	5580	13.73	14.16	17.20	23.88	-6.68
High	5700	13.56	13.22	16.64	23.93	-7.29

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5500	3.70	3.99	7.10	11.00	-3.90
Mid	5580	3.78	4.03	7.16	11.00	-3.84
High	5700	3.55	2.99	6.53	11.00	-4.47

9.2.11.802.11n HT40 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSP [dBi]
Low	5510	39.92	35.86	3.92	3.92
Mid	5550	40.64	35.93	3.92	3.92
Mid	5590	40.84	35.86	3.92	3.92
High	5670	40.62	35.88	3.92	3.92

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSP Limit [dBm]
Low	5510	24.00	24.00	11.00
Mid	5550	24.00	24.00	11.00
Mid	5590	24.00	24.00	11.00
High	5670	24.00	24.00	11.00

Duty Cycle CF [dB]	0.48	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5510	10.91	10.14	14.03	24.00	-9.97
Mid	5550	10.87	10.71	14.28	24.00	-9.72
Mid	5590	10.12	10.58	13.85	24.00	-10.15
High	5670	10.12	10.61	13.86	24.00	-10.14

PPSP Results

Channel	Frequency [MHz]	Chain 0 Meas PPSP [dBm]	Chain 1 Meas PPSP [dBm]	Total Corr'd PPSP [dBm]	PPSP Limit [dBm]	PPSP Margin [dB]
Low	5510	-2.18	-3.18	0.84	11.00	-10.16
Mid	5550	-2.27	-2.61	1.05	11.00	-9.95
Mid	5590	-3.38	-2.88	0.36	11.00	-10.64
High	5670	-2.71	-2.77	0.75	11.00	-10.25

9.2.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5530	81.86	75.04	3.92	3.92
High	5610	81.71	74.94	3.92	3.92

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5530	24.00	24.00	11.00
High	5610	24.00	24.00	11.00

Duty Cycle CF [dB]	0.88	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5530	10.28	10.05	14.06	24.00	-9.94
High	5610	10.33	9.85	13.99	24.00	-10.01

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5530	-5.74	-6.22	-2.08	11.00	-13.08
High	5610	-6.12	-6.59	-2.46	11.00	-13.46

9.2.13.802.11a MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5745	18.72	16.32	3.97	3.97
Mid	5785	18.73	16.33	3.97	3.97
High	5825	18.85	16.34	3.97	3.97

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5745	30.00	30.00	30.00
Mid	5785	30.00	30.00	30.00
High	5825	30.00	30.00	30.00

Duty Cycle CF [dB]	0.23	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Primary Antenna 1 Power [dBm]	Secondary Antenna 2 Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5745	13.61	13.49	16.79	30.00	-13.21
Mid	5785	13.73	13.48	16.84	30.00	-13.16
High	5825	13.91	13.49	16.94	30.00	-13.06

PPSD Results

Channel	Frequency [MHz]	Primary Antenna 1 PPSD [dBm]	Secondary Antenna 2 PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5745	0.74	0.40	3.81	30.00	-26.19
Mid	5785	0.62	0.44	3.77	30.00	-26.23
High	5825	0.67	0.52	3.83	30.00	-26.17

9.2.14.802.11n HT20 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSD [dBi]
Low	5745	19.72	17.51	3.97	3.97
Mid	5785	19.98	17.50	3.97	3.97
High	5825	19.65	17.50	3.97	3.97

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSD Limit [dBm]
Low	5745	30.00	30.00	30.00
Mid	5785	30.00	30.00	30.00
High	5825	30.00	30.00	30.00

Duty Cycle CF [dB]	0.24	Included in Calculations of Corr'd Power & PPSD
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Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5745	13.40	13.16	16.53	30.00	-13.47
Mid	5785	13.55	14.16	17.11	30.00	-12.89
High	5825	13.77	13.22	16.75	30.00	-13.25

PPSD Results

Channel	Frequency [MHz]	Chain 0 Meas PPSD [dBm]	Chain 1 Meas PPSD [dBm]	Total Corr'd PPSD [dBm]	PPSD Limit [dBm]	PPSD Margin [dB]
Low	5745	0.64	0.34	3.74	30.00	-26.26
Mid	5785	0.12	1.15	3.91	30.00	-26.09
High	5825	0.72	0.34	3.78	30.00	-26.22

9.2.15.802.11n HT40 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSP [dBi]
Low	5755	40.33	35.85	3.97	3.97
High	5795	40.89	35.90	3.97	3.97

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSP Limit [dBm]
Low	5755	30.00	30.00	30.00
High	5795	30.00	30.00	30.00

Duty Cycle CF [dB]	0.48	Included in Calculations of Corr'd Power & PPSP
--------------------	------	---

Output Power Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Low	5755	10.73	10.53	14.12	30.00	-15.88
High	5795	10.80	10.53	14.16	30.00	-15.84

PPSP Results

Channel	Frequency [MHz]	Chain 0 Meas PPSP [dBm]	Chain 1 Meas PPSP [dBm]	Total Corr'd PPSP [dBm]	PPSP Limit [dBm]	PPSP Margin [dB]
Low	5755	-5.53	-5.78	-2.16	30.00	-32.16
High	5795	-5.56	-5.56	-2.07	30.00	-32.07

9.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Min 99% BW [MHz]	Directional Gain for Power [dBi]	Directional Gain for PPSP [dBi]
Middle	5775	82.05	75.15	3.97	3.97

Limits

Channel	Frequency [MHz]	FCC Power Limit [dBm]	Power Limit [dBm]	FCC PPSP Limit [dBm]
Middle	5775	30.00	30.00	30.00

Duty Cycle CF [dB]	0.88	Included in Calculations of Corr'd Power & PPSP
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Output Power Results

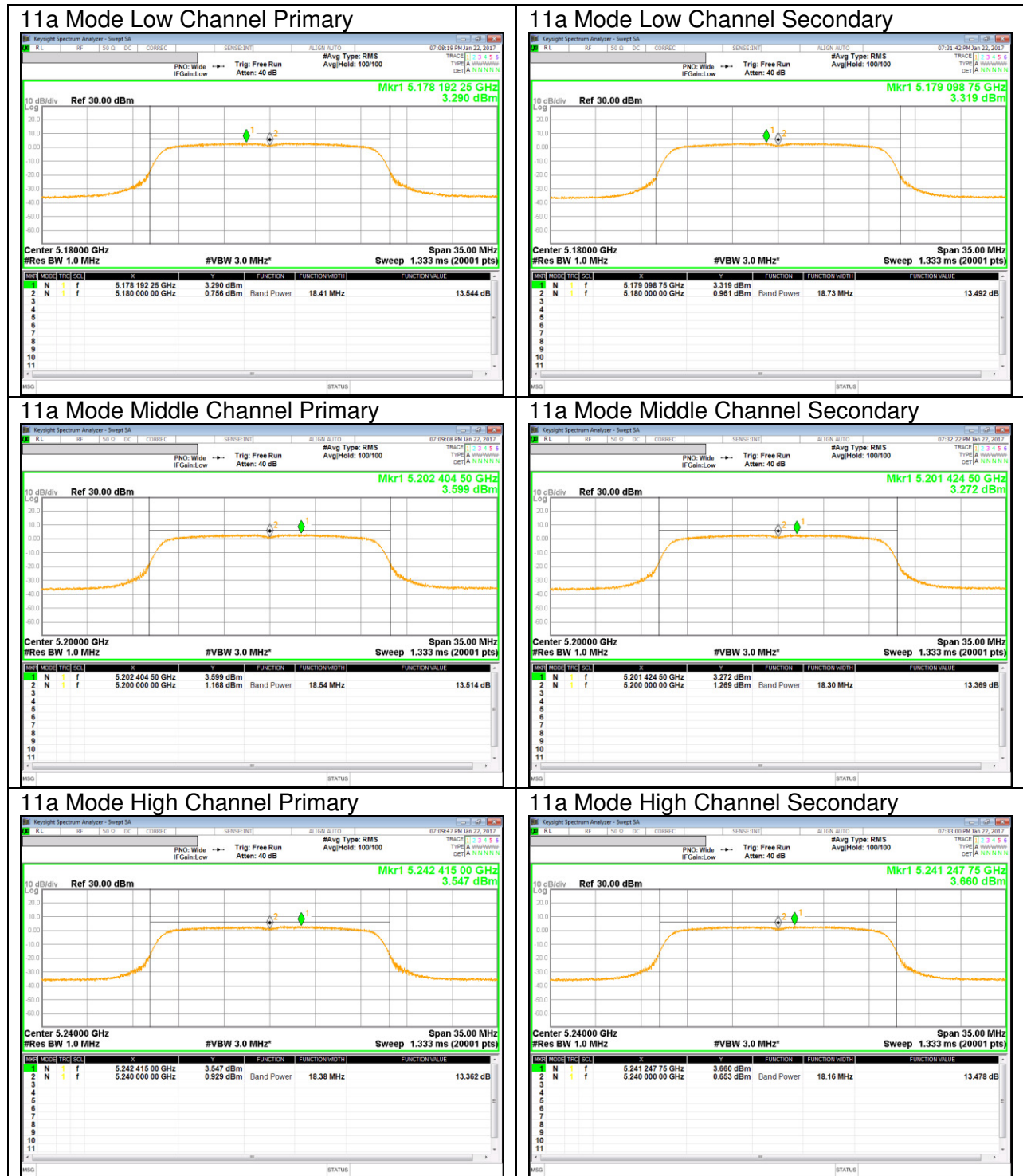
Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Power Margin [dB]
Middle	5775	10.13	10.01	13.96	30.00	-16.04

PPSP Results

Channel	Frequency [MHz]	Chain 0 Meas PPSP [dBm]	Chain 1 Meas PPSP [dBm]	Total Corr'd PPSP [dBm]	PPSP Limit [dBm]	PPSP Margin [dB]
Middle	5775	-9.19	-9.35	-5.38	30.00	-35.38

9.2.17.OUTPUT POWER AND PPSD PLOTS

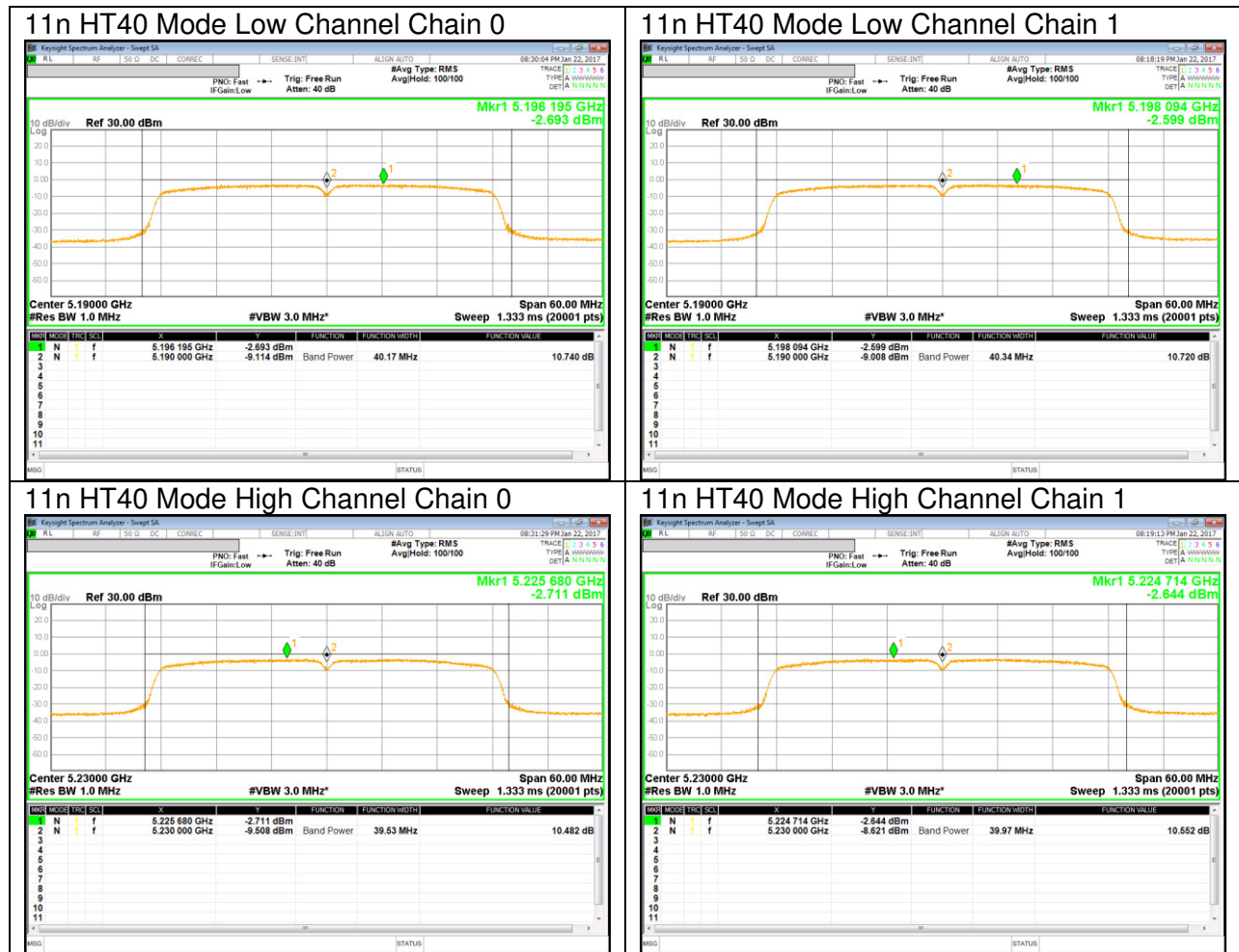
UNII 5.2 GHz IEEE 802.11a mode



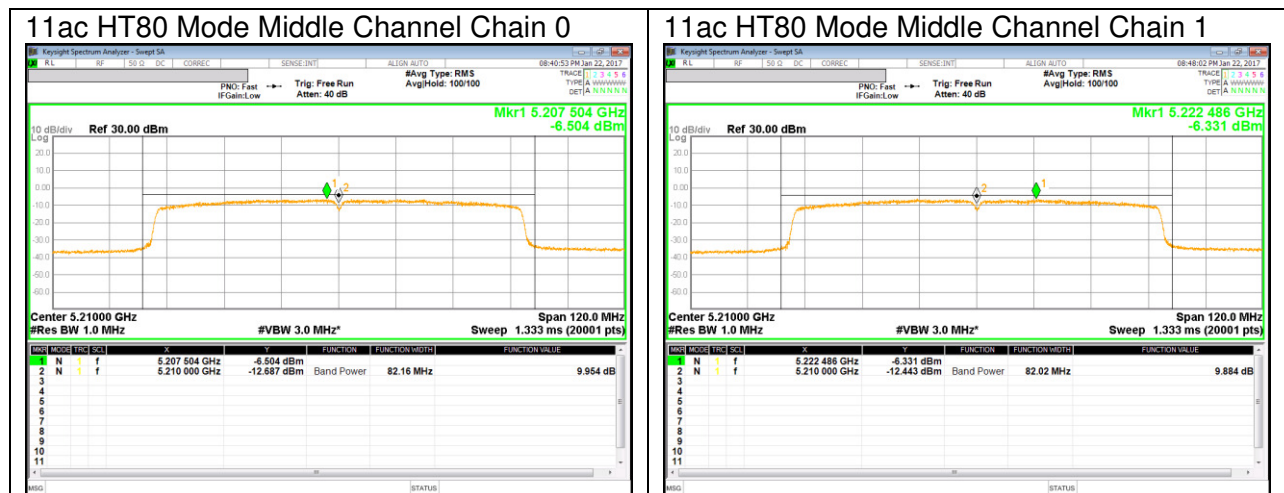
UNII 5.2 GHz IEEE 802.11n HT20 mode



UNII 5.2 GHz IEEE 802.11n HT40 mode



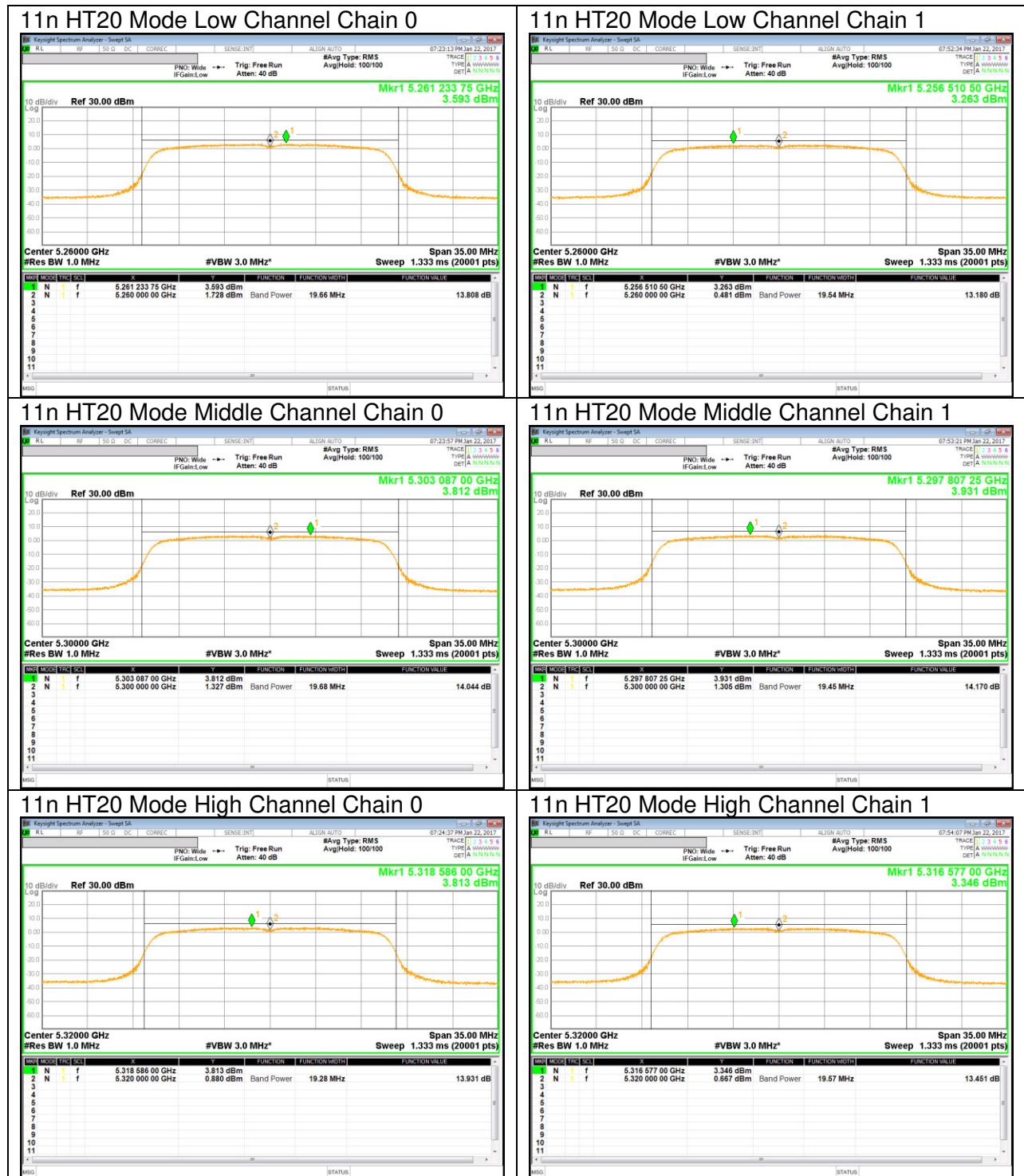
UNII 5.2 GHz IEEE 802.11ac VHT80 mode



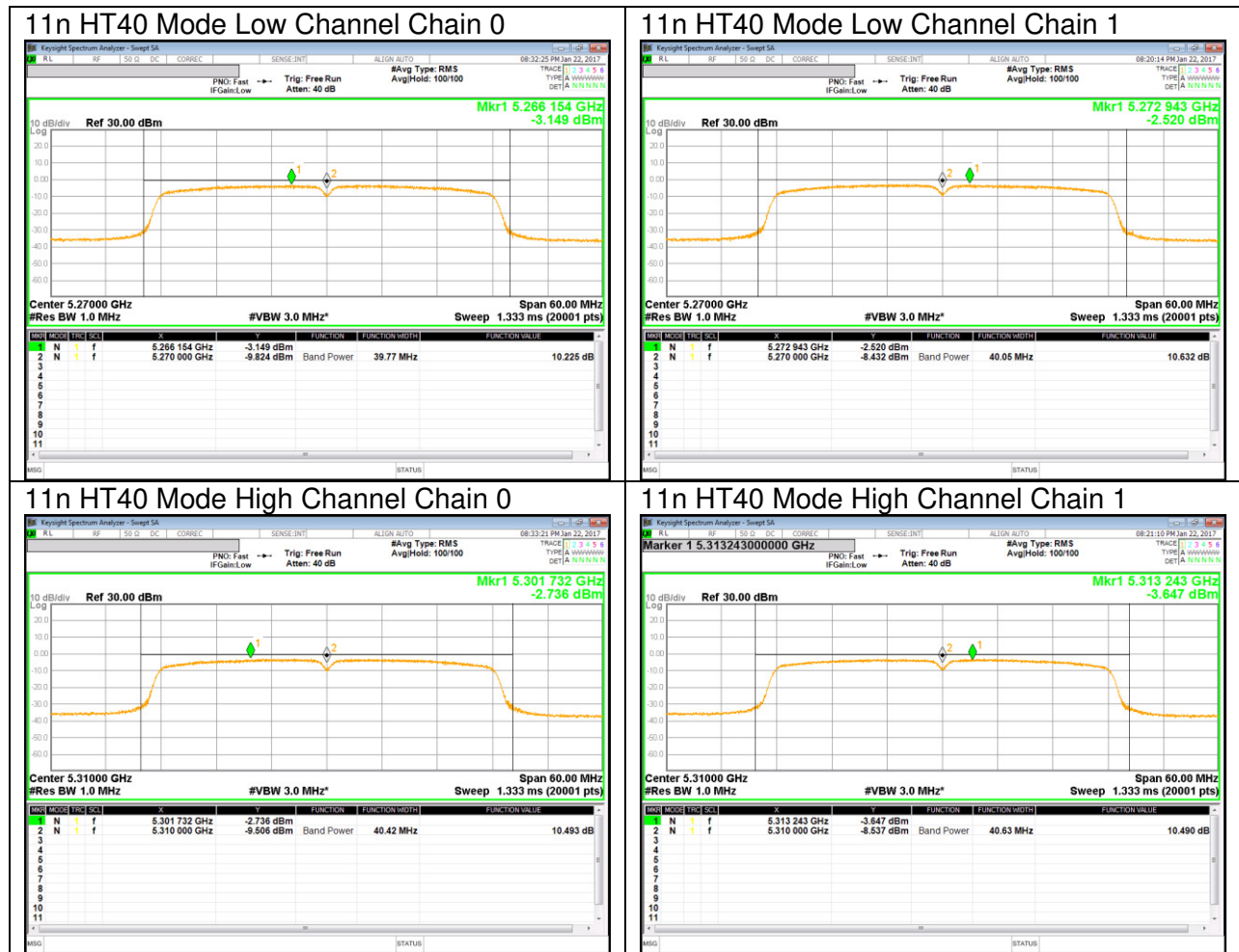
UNII 5.3 GHz IEEE 802.11a mode



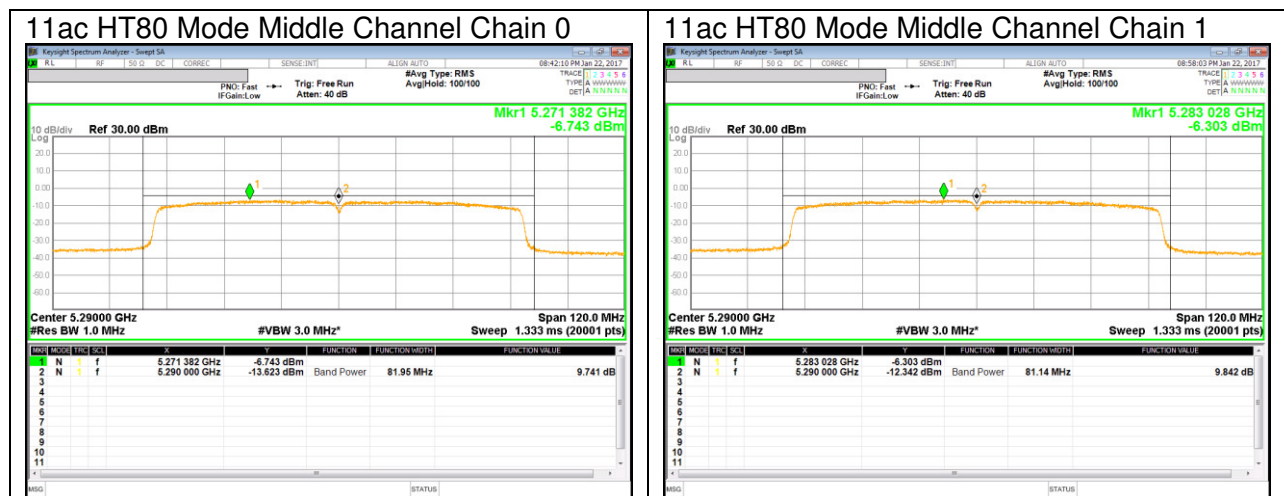
UNII 5.3 GHz IEEE 802.11n HT20 mode



UNII 5.3 GHz IEEE 802.11n HT40 mode



UNII 5.3 GHz IEEE 802.11ac VHT80 mode



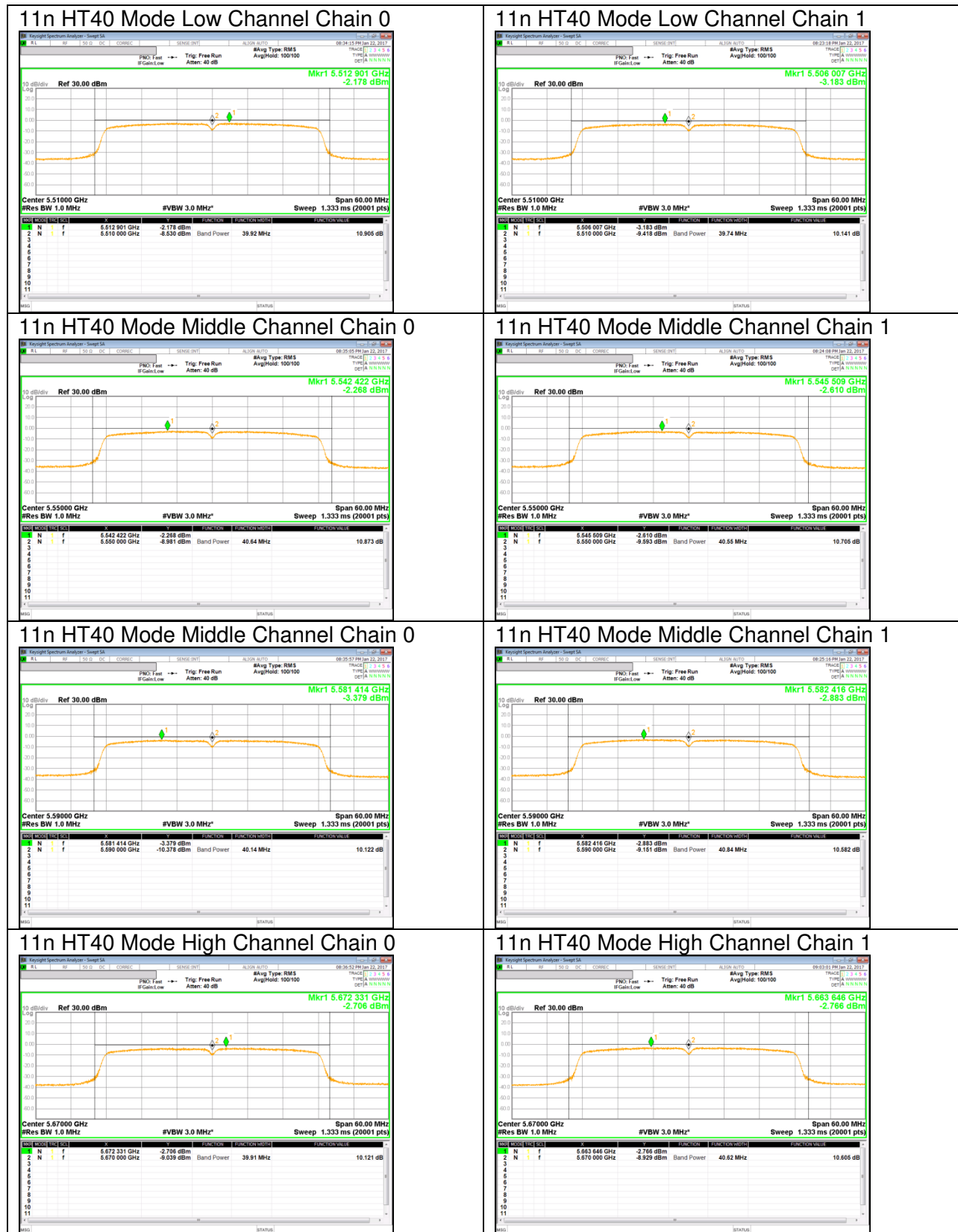
UNII 5.5 GHz IEEE 802.11a mode



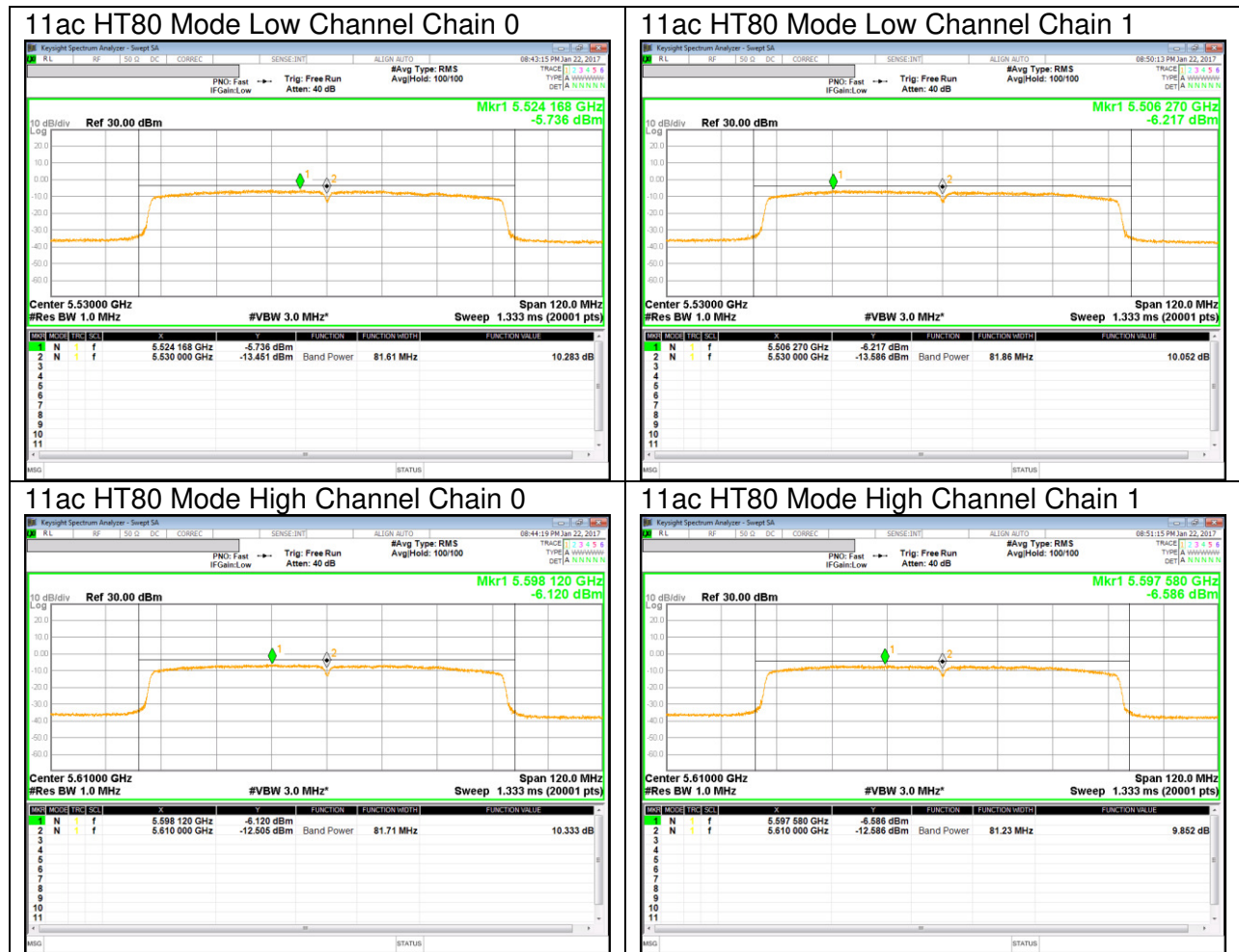
UNII 5.5 GHz IEEE 802.11n HT20 mode



UNII 5.5 GHz IEEE 802.11n HT40 mode

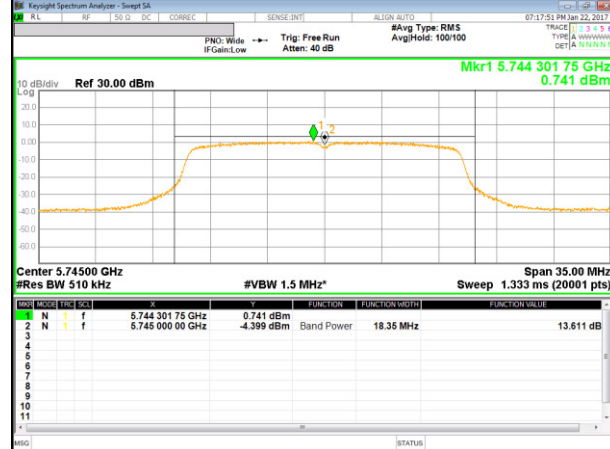


UNII 5.5 GHz IEEE 802.11ac VHT80 mode

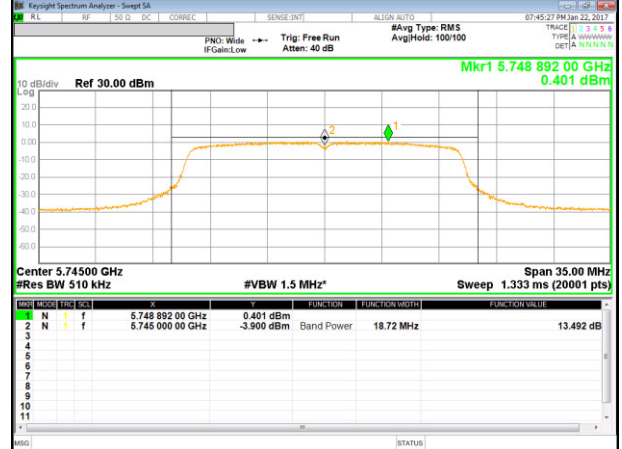


UNII 5.8 GHz IEEE 802.11a mode

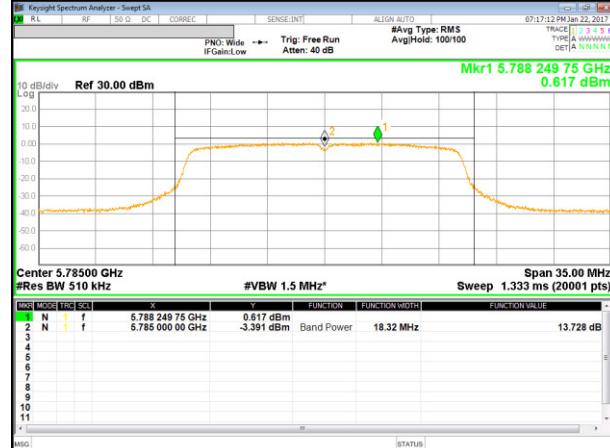
11a Mode Low Channel Primary



11a Mode Low Channel Secondary



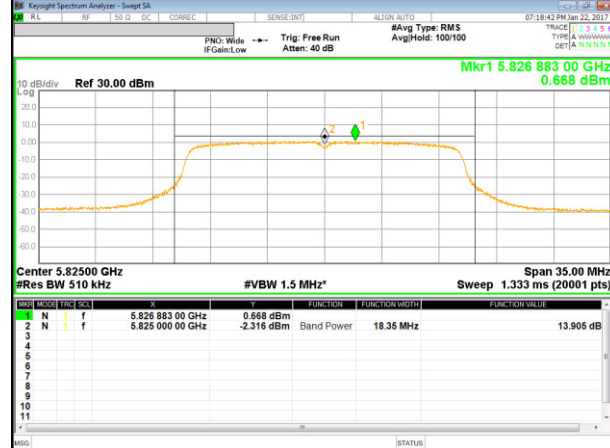
11a Mode Middle Channel Primary



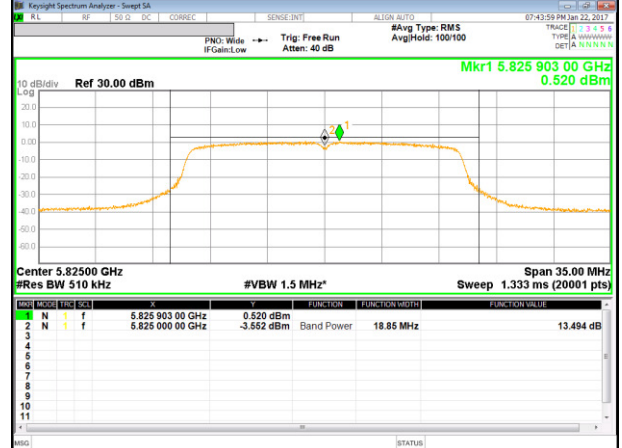
11a Mode Middle Channel Secondary



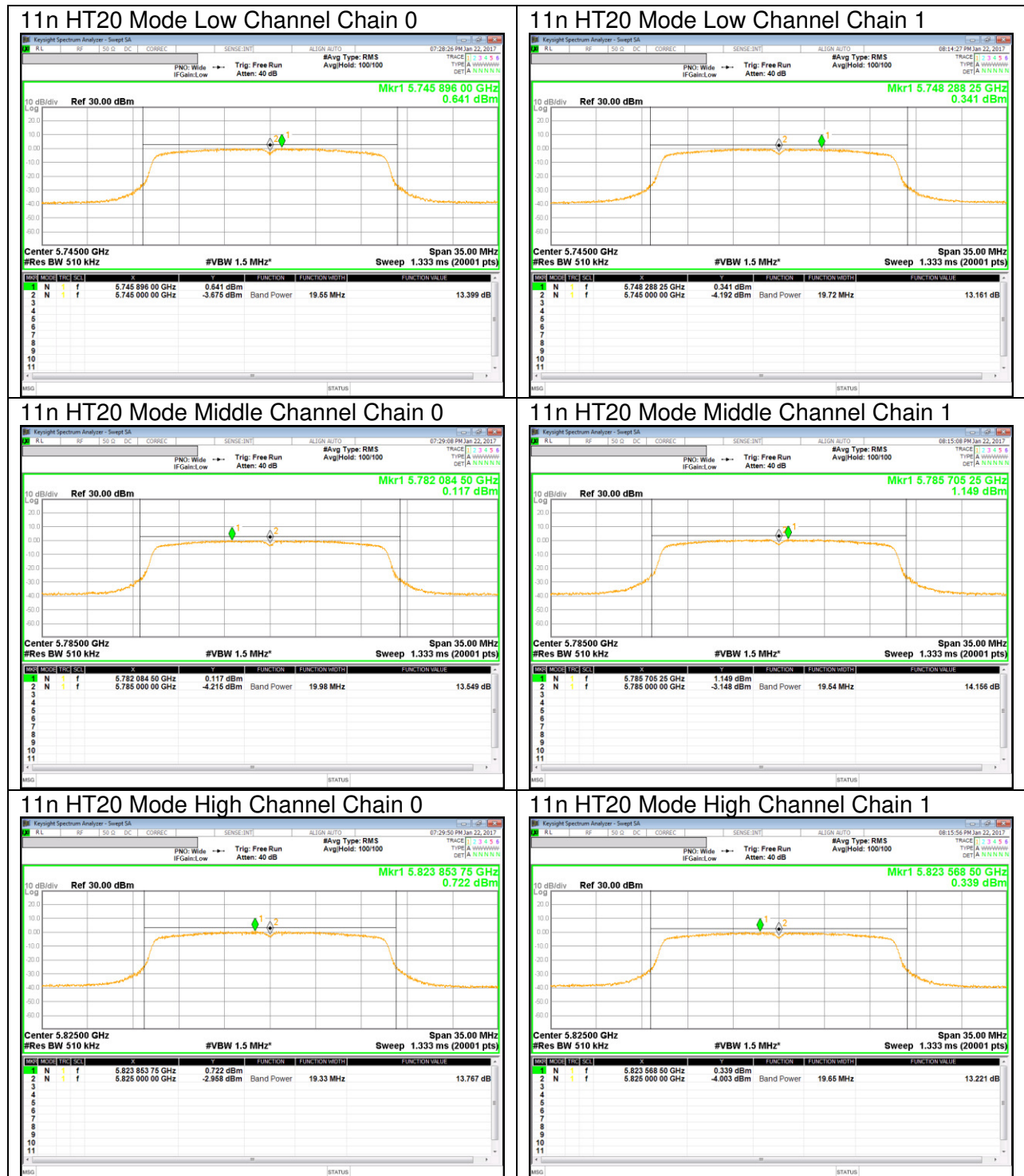
11a Mode High Channel Primary



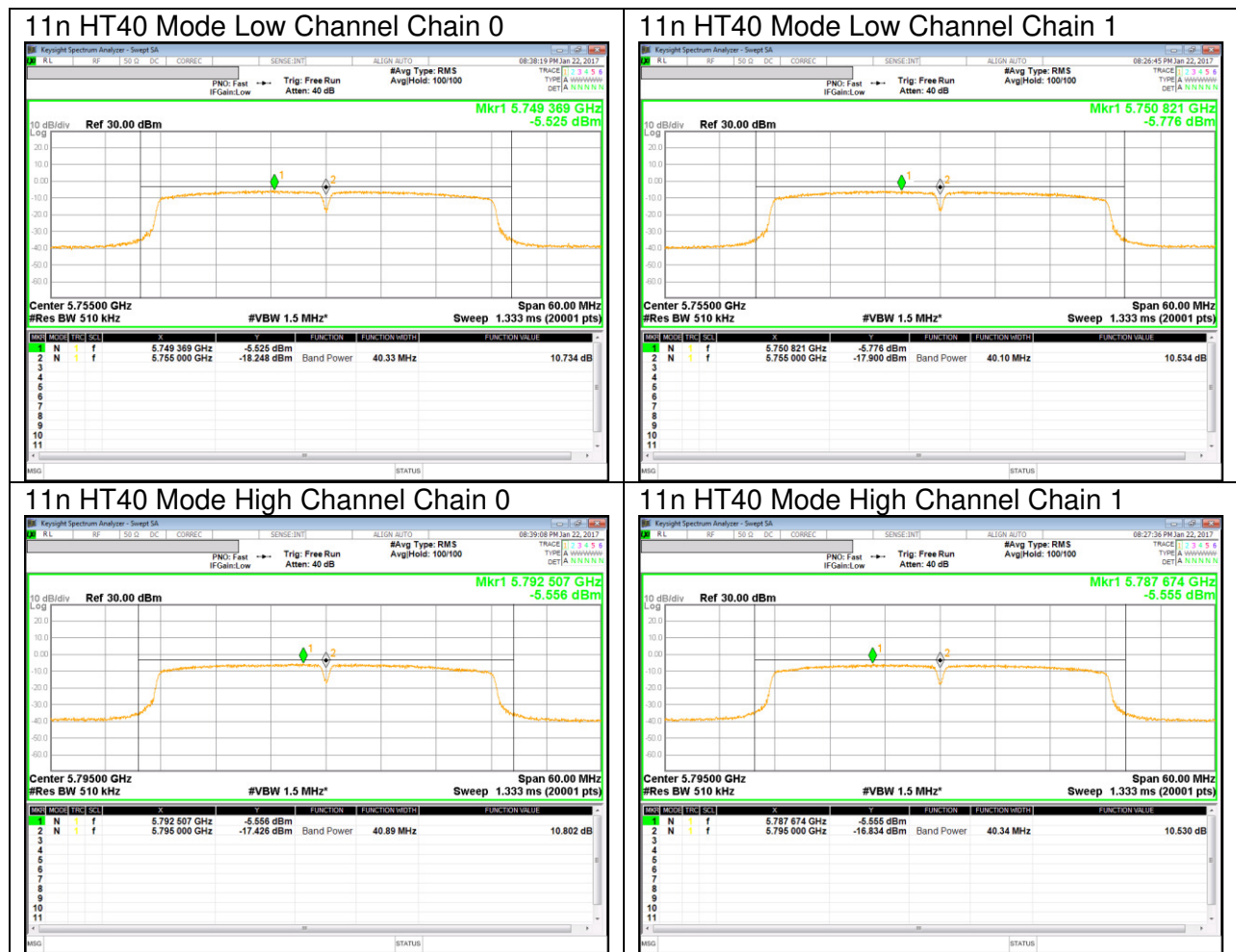
11a Mode High Channel Secondary



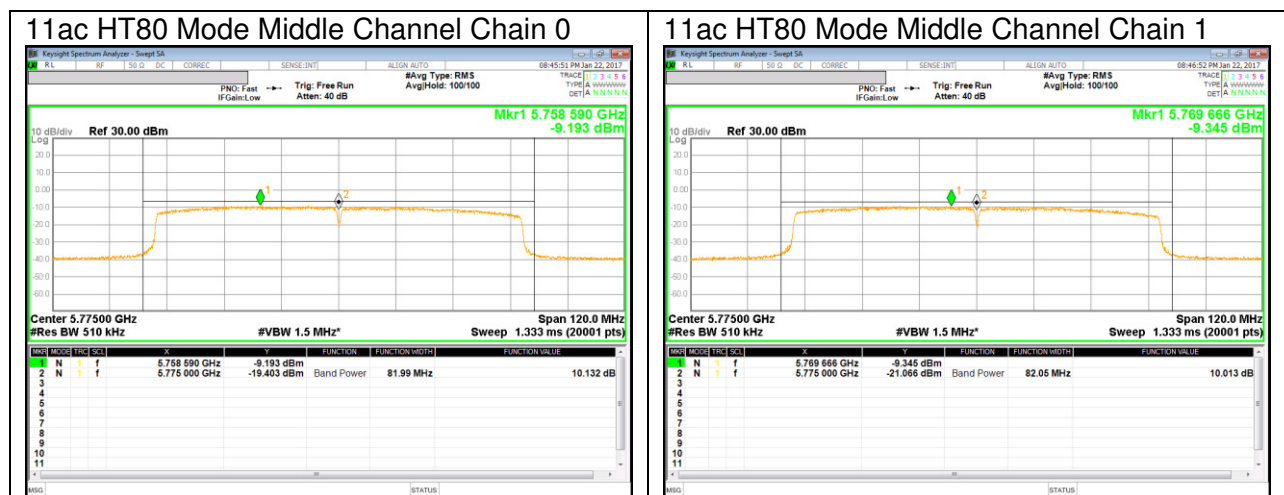
UNII 5.8 GHz IEEE 802.11n HT20 mode



UNII 5.8 GHz IEEE 802.11n HT40 mode



UNII 5.8 GHz IEEE 802.11ac VHT80 mode



10. TRANSMITTER ABOVE 1 GHz

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

FCC §15.407 (b)

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

Note

- Limit translation to field strength level (FCC §15.407)

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2 = -27\text{dBm} + 95.2 = 68.2\text{dBuV/m}$$

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2 = -17\text{dBm} + 95.2 = 78.2\text{dBuV/m}$$

- Undesirable emission limit for 5.725-5.8GHz, old limit line described on the result plot(More worst case) due to future IC(ISED) filling.

Limit : For the band 5725-5850 MHz, emissions at frequencies from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p.

For emissions at frequencies more than 10 MHz above or below the band edges, the emissions power shall not exceed -27 dBm/MHz.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Reference to KDB 789033 D02 v01r03 UNII part G) 6) c) Method AD:

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset for average measurements.

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Note : Emission was pre-scanned from 9KHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

Formula for converting the field strength from uV/m to dBuV/m is:
 $\text{Limit (dBuV/m)} = 20 \log \text{limit (uV/m)}$

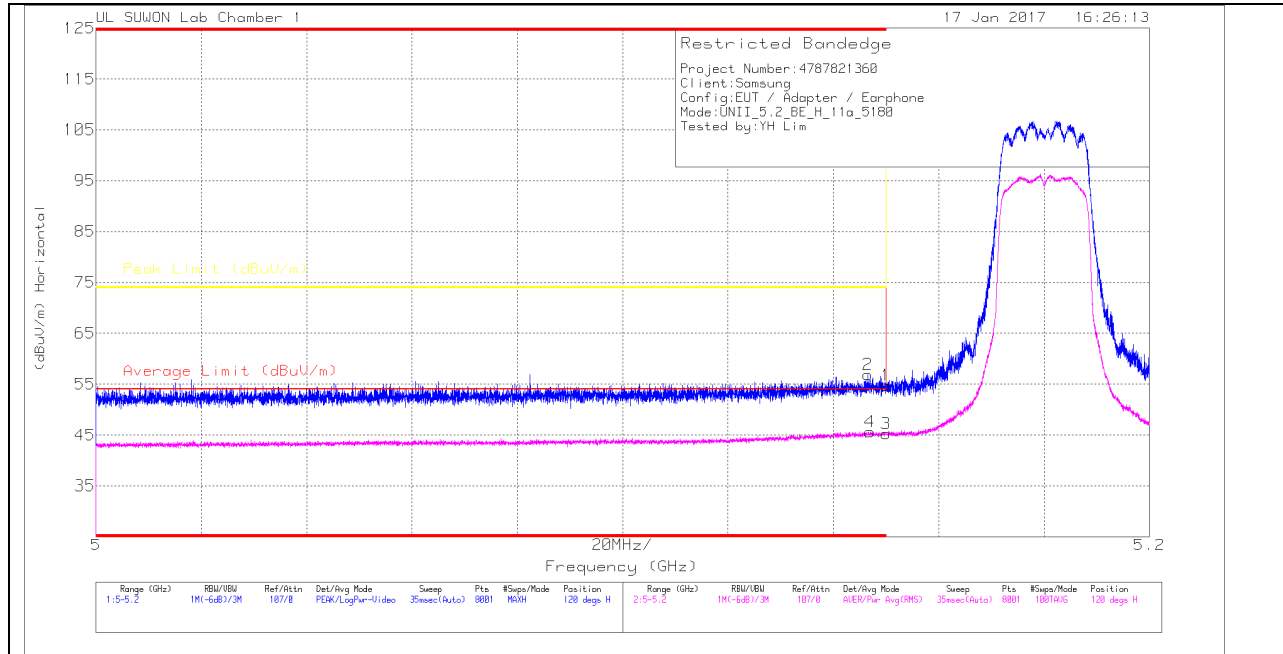
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 937606.

10.1. 5.2 GHz

10.1.1. TX Above 1GHz 802.11a 2Tx CDD MODE IN THE 5.2GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

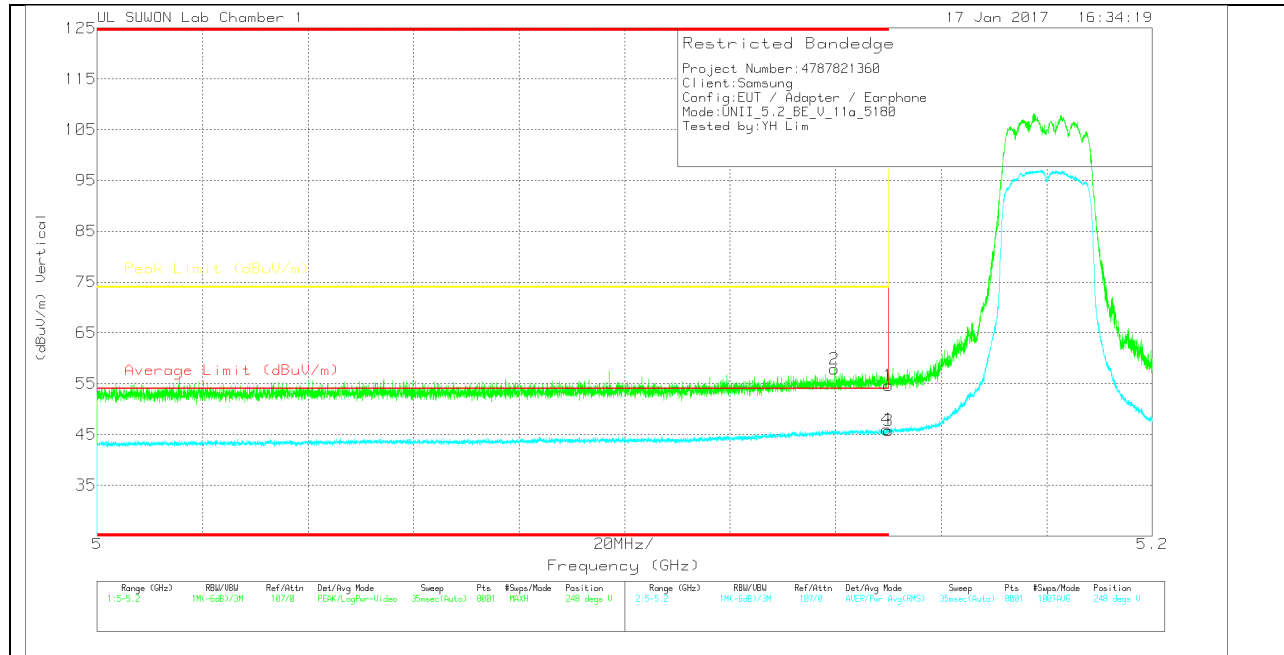
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	10dB[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	44.43	Pk	34.2	-23.8	0	54.83	-	-	74	-19.17	120	120	H
2	* 5.147	46.38	Pk	34.2	-23.7	0	56.88	-	-	74	-17.12	120	120	H
3	* 5.15	34.66	RMS	34.2	-23.8	.23	45.29	54	-8.71	-	-	120	120	H
4	* 5.147	34.9	RMS	34.2	-23.7	.23	45.63	54	-8.37	-	-	120	120	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	10dB[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	44.2	Pk		-23.8	0	54.6	-	-	74	-19.4	248	191	V
2	* 5.14	47.51	Pk		-23.8	0	57.91	-	-	74	-16.09	248	191	V
3	* 5.15	35.09	RMS		-23.8	.23	45.72	54	-8.28	-	-	248	191	V
4	* 5.15	35.36	RMS		-23.8	.23	45.99	54	-8.01	-	-	248	191	V

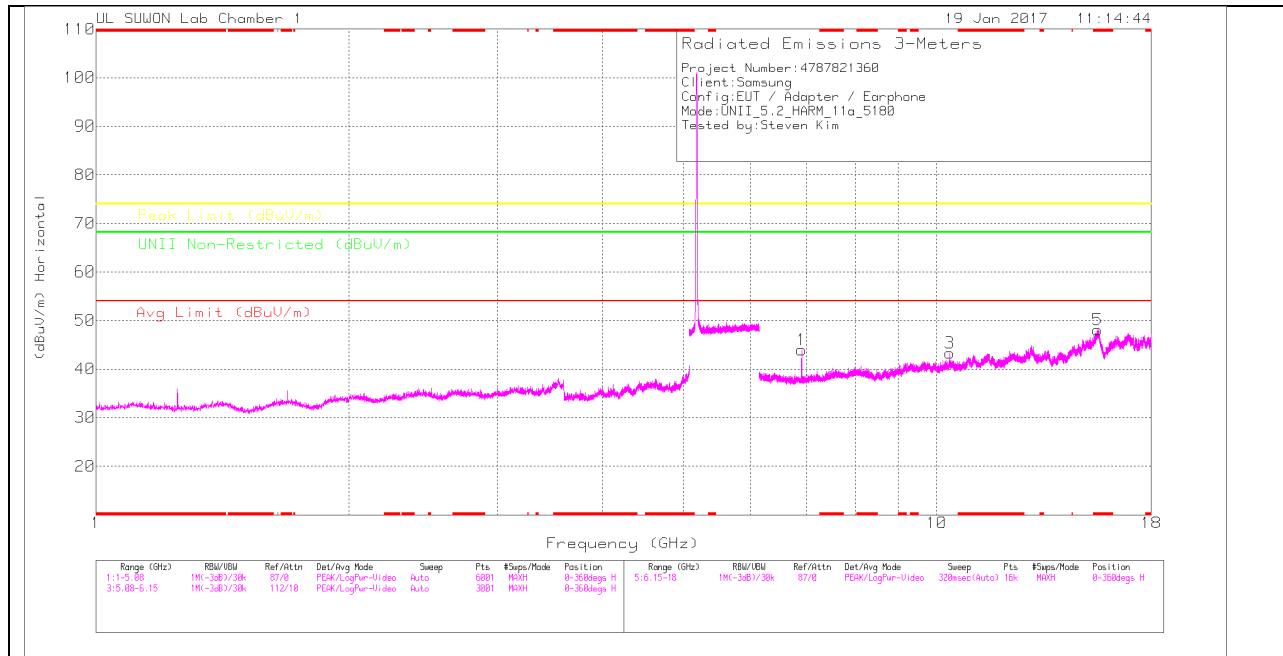
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

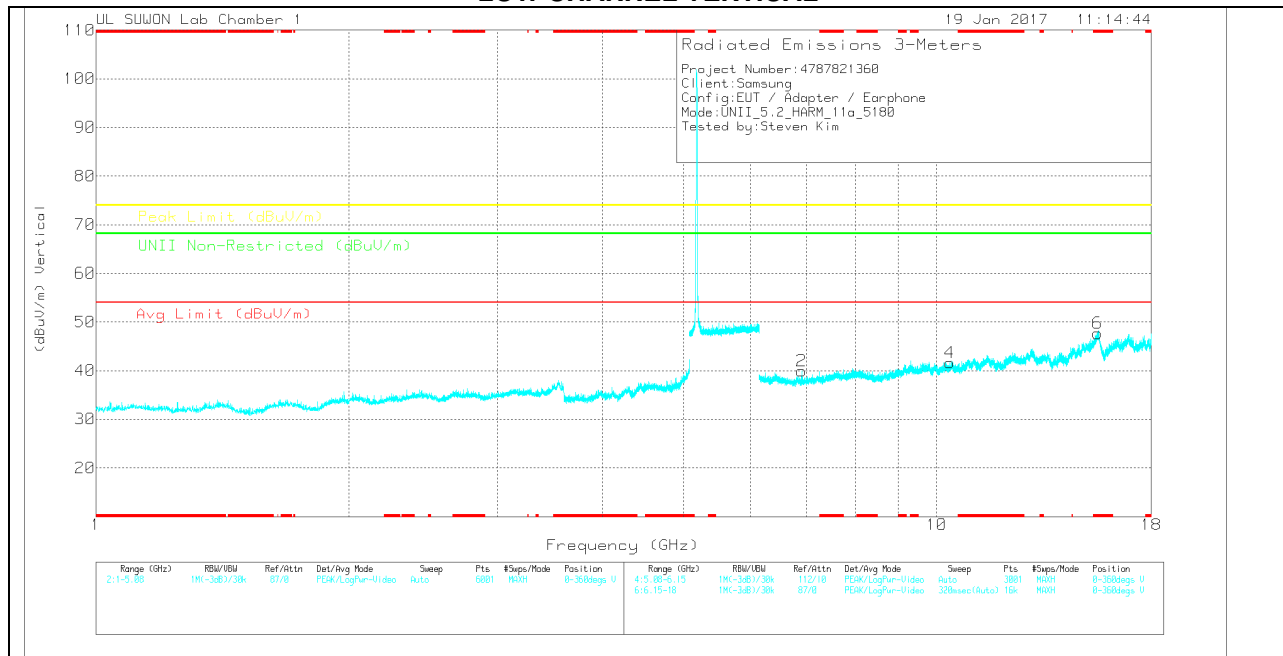
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8717)_150 619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.906	39.12	PK	35.6	-30.8	0	43.92	-	-	-	-	68.2	-24.28	0-360	150	H
3	10.36	32.79	PK	37.8	-27.3	0	43.29	-	-	-	-	68.2	-24.91	0-360	150	H
5	* 15.535	24.37	PK	40.2	-16.5	0	48.07	-	-	74	-25.93	-	-	0-360	250	H
2	6.906	35.1	PK	35.6	-30.8	0	39.9	-	-	-	-	68.2	-28.3	0-360	150	V
4	10.356	31.26	PK	37.8	-27.4	0	41.66	-	-	-	-	68.2	-26.54	0-360	150	V
6	* 15.535	23.94	PK	40.2	-16.5	0	47.64	-	-	74	-26.36	-	-	0-360	150	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

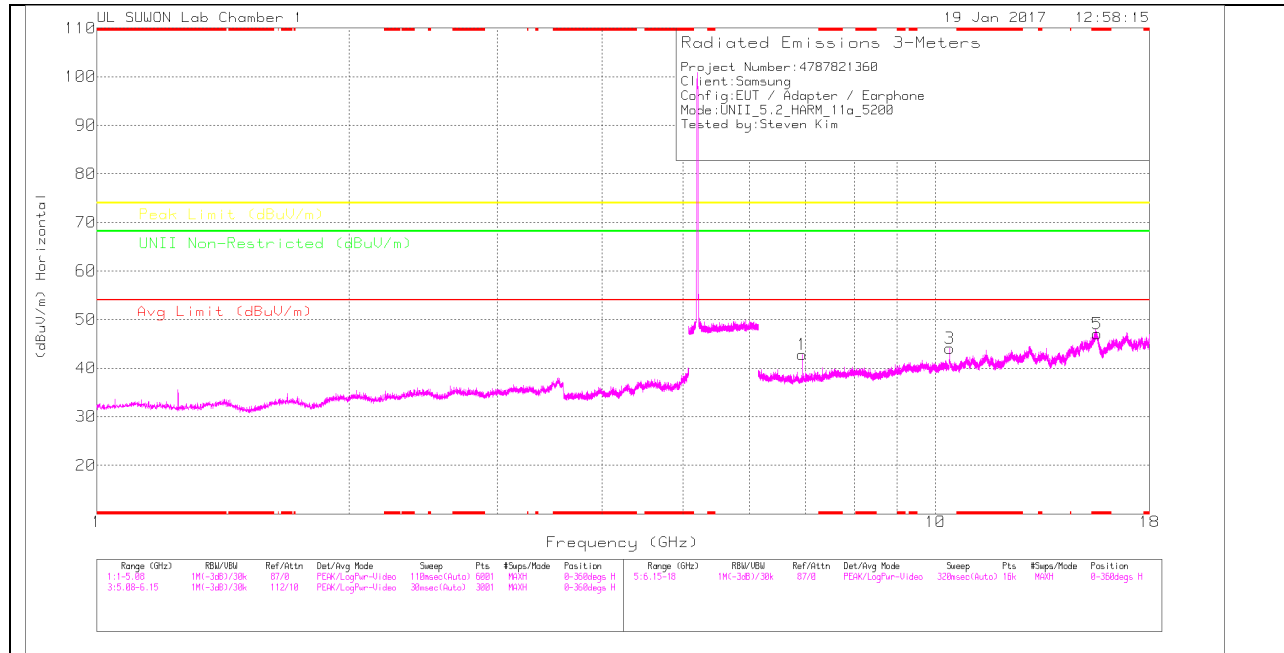
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6.907	46.7	PK-U	35.6	-30.8	0	51.5	-	-	-	-	68.2	-16.7	137	132	H
10.36	44.04	PK-U	37.8	-27.3	0	54.54	-	-	-	-	68.2	-13.66	208	144	H

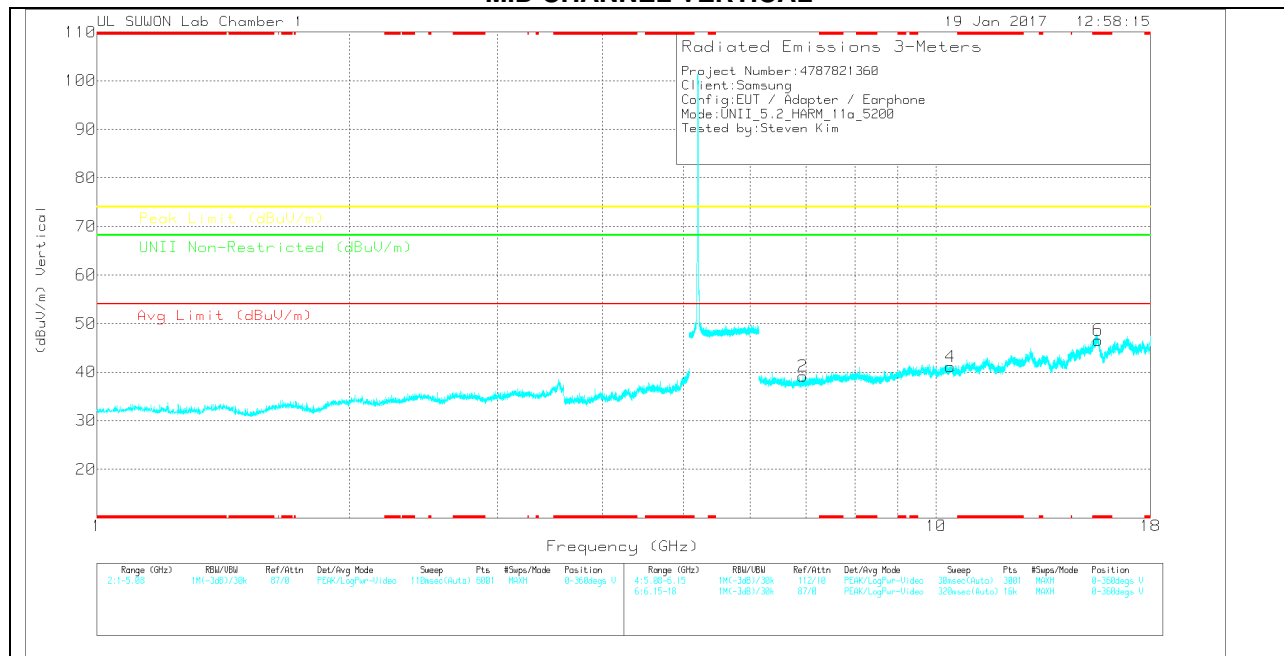
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK-U - U-NII: Maximum Peak

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Trace Markers

Marker	Frequen cy (GHz)	Meter Reading (dBuV)	Det	3117(00 168717) _150619	Path_5	DC Corr (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non- Restrict ed (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.933	37.8	PK	35.7	-30.7	0	42.8	-	-	-	-	68.2	-25.4	0-360	150	H
3	10.399	32.97	PK	37.8	-26.7	0	44.07	-	-	-	-	68.2	-24.13	0-360	150	H
5	* 15.596	21.35	PK	40.3	-14.6	0	47.05	-	-	74	-26.95	-	-	0-360	250	H
2	6.933	34.11	PK	35.7	-30.7	0	39.11	-	-	-	-	68.2	-29.09	0-360	250	V
4	10.396	30.06	PK	37.8	-26.8	0	41.06	-	-	-	-	68.2	-27.14	0-360	150	V
6	* 15.595	20.9	PK	40.3	-14.6	0	46.6	-	-	74	-27.4	-	-	0-360	250	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

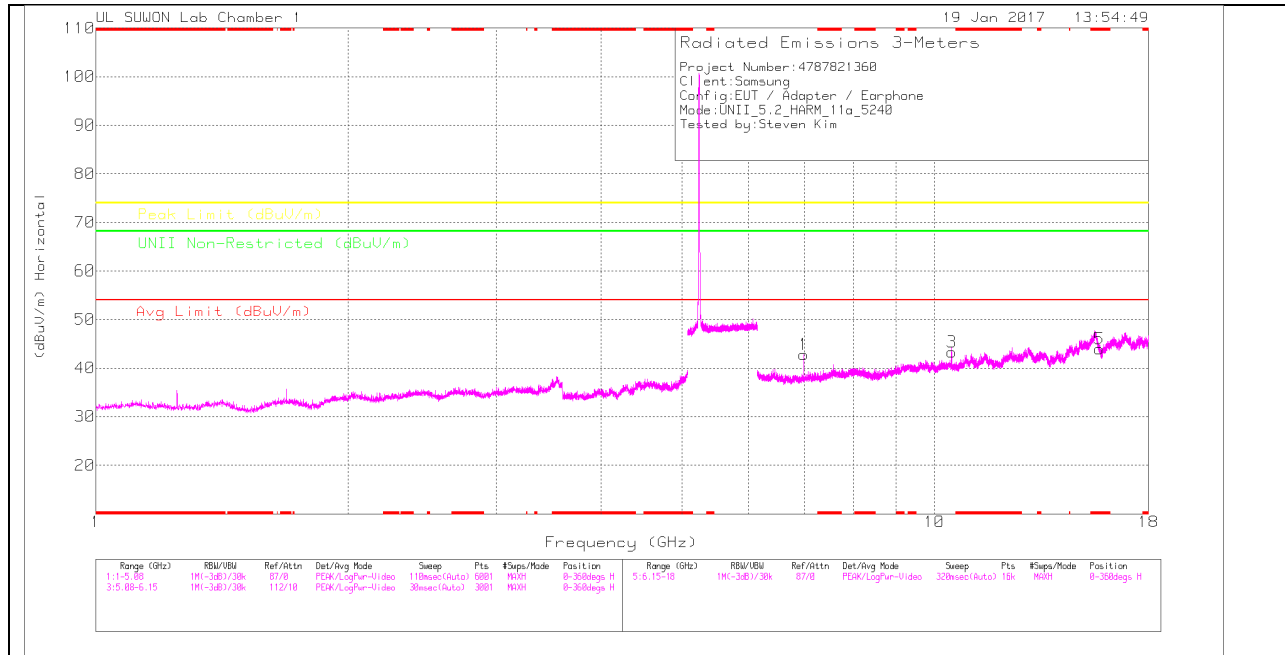
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non- Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6.933	46.1	PK-U	35.7	-30.7	0	51.1	-	-	-	-	68.2	-17.1	141	117	H
10.401	43.38	PK-U	37.8	-26.7	0	54.48	-	-	-	-	68.2	-13.72	209	171	H

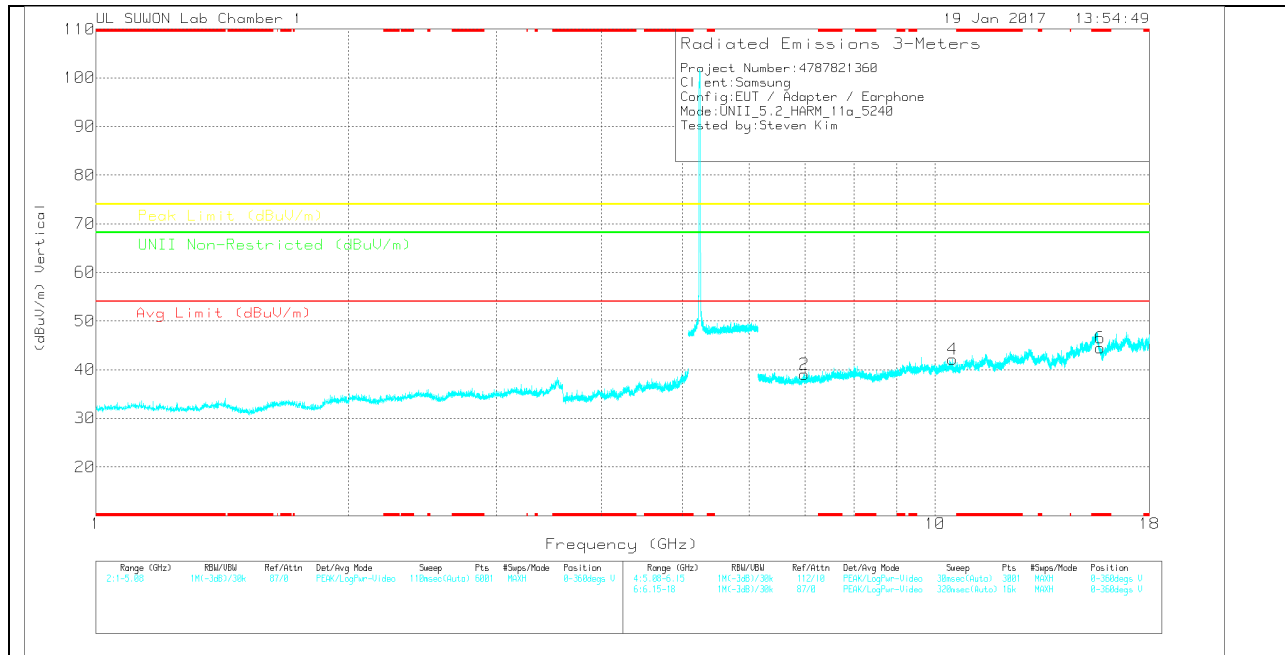
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK-U - U-NII: Maximum Peak

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8717)_150 619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.987	37.72	PK	35.7	-30.6	0	42.82	-	-	-	-	68.2	-25.38	0-360	150	H
3	10.481	33.2	PK	37.8	-27.7	0	43.3	-	-	-	-	68.2	-24.9	0-360	150	H
5	* 15.721	20.89	PK	40.4	-17.4	0	43.89	-	-	74	-30.11	-	-	0-360	150	H
2	6.986	33.98	PK	35.7	-30.6	0	39.08	-	-	-	-	68.2	-29.12	0-360	150	V
4	10.48	32.03	PK	37.8	-27.7	0	42.13	-	-	-	-	68.2	-26.07	0-360	150	V
6	* 15.719	21.47	PK	40.4	-17.4	0	44.47	-	-	74	-29.53	-	-	0-360	250	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

Radiated Emissions

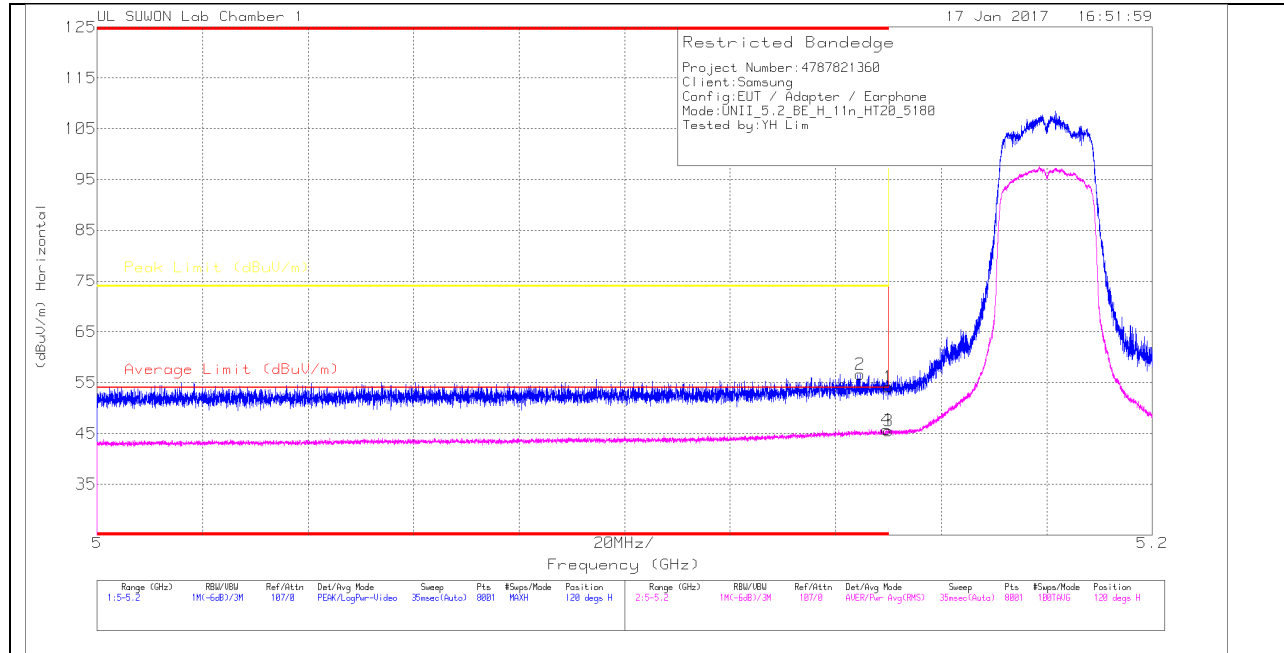
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6.987	45.41	PK-U	35.7	-30.6	0	50.51	-	-	-	-	68.2	-17.69	143	127	H
10.479	44.21	PK-U	37.8	-27.7	0	54.31	-	-	-	-	68.2	-13.89	224	150	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK-U - U-NII: Maximum Peak

10.1.2. TX Above 1GHz 802.11n HT20 2Tx CDD MODE IN THE 5.2GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

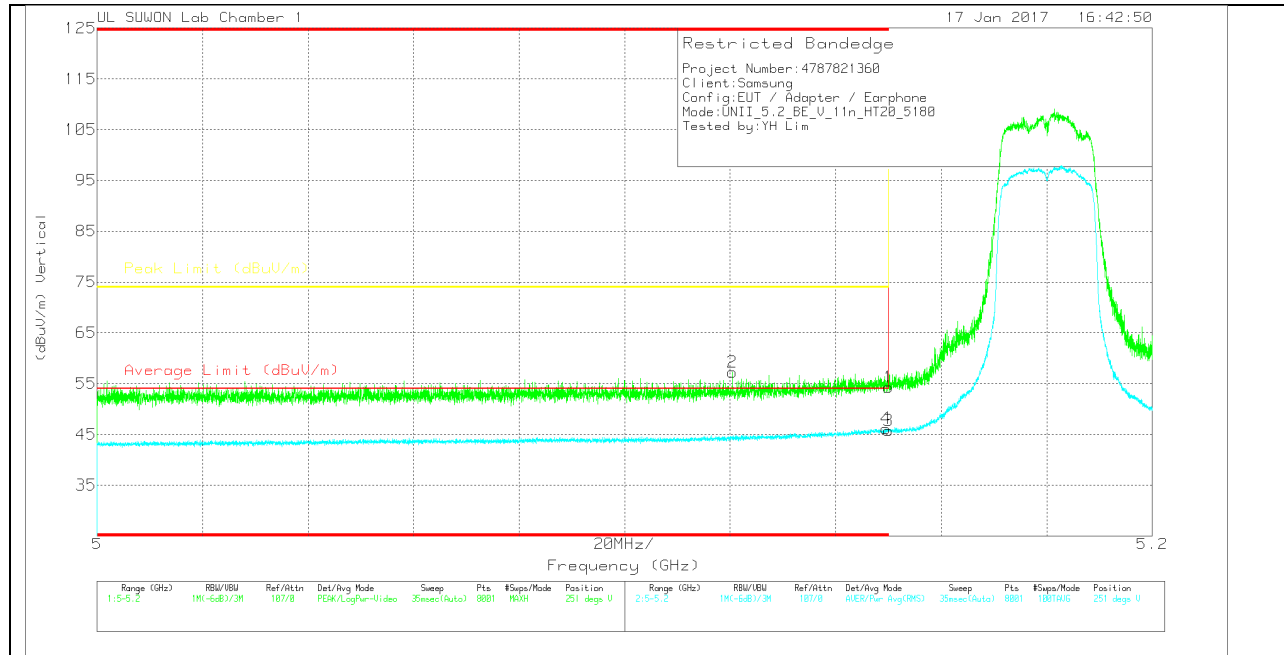
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 171_150619	10dB[dB]	DC Corr [dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	43.78	Pk		-23.8	0	54.18	-	-	74	-19.82	120	121	H
2	* 5.145	46.15	Pk		-23.7	0	56.65	-	-	74	-17.35	120	121	H
3	* 5.15	34.88	RMS		-23.8	.24	45.52	54	-8.48	-	-	120	121	H
4	* 5.15	35.12	RMS		-23.8	.24	45.76	54	-8.24	-	-	120	121	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	10dB[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	43.9	Pk	34.2	-23.8	0	54.3	-	-	74	-19.7	251	189	V
2	* 5.12	46.81	Pk	34.2	-23.8	0	57.21	-	-	74	-16.79	251	189	V
3	* 5.15	35.06	RMS	34.2	-23.8	.24	45.7	54	-8.3	-	-	251	189	V
4	* 5.15	35.54	RMS	34.2	-23.8	.24	46.18	54	-7.82	-	-	251	189	V

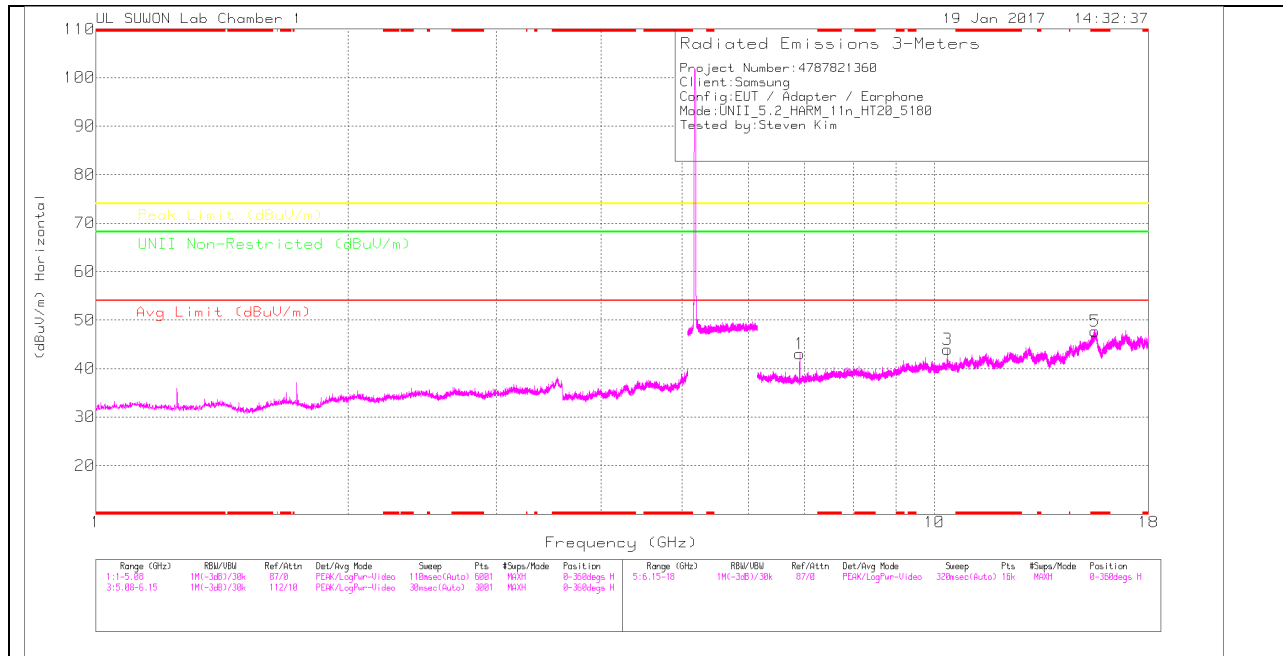
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

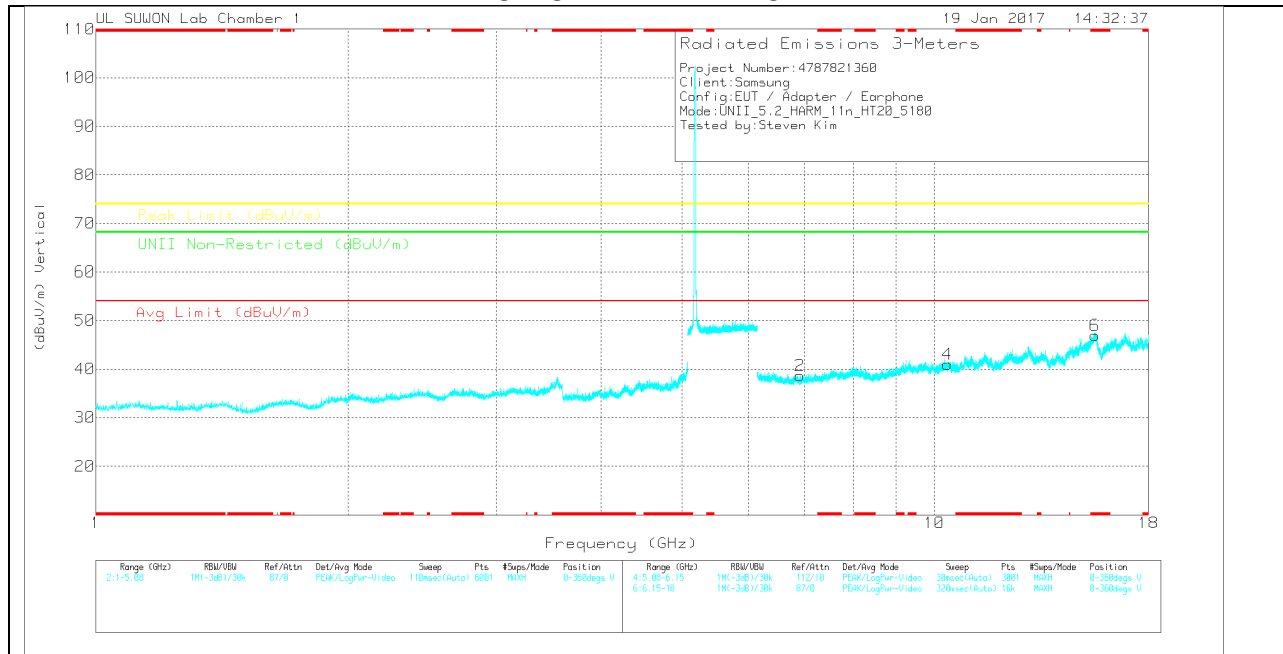
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8717)_150 619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.906	38.24	PK	35.6	-30.8	0	43.04	-	-	-	-	68.2	-25.16	0-360	150	H
3	10.362	33.39	PK	37.8	-27.3	0	43.89	-	-	-	-	68.2	-24.31	0-360	150	H
5	* 15.542	23.56	PK	40.3	-16.2	0	47.66	-	-	74	-26.34	-	-	0-360	150	H
2	6.907	33.85	PK	35.6	-30.8	0	38.65	-	-	-	-	68.2	-29.55	0-360	150	V
4	10.365	30.43	PK	37.8	-27.3	0	40.93	-	-	-	-	68.2	-27.27	0-360	150	V
6	* 15.541	22.94	PK	40.3	-16.3	0	46.94	-	-	74	-27.06	-	-	0-360	250	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_5	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6.907	46.77	PK-U	35.6	-30.8	0	51.57	-	-	-	-	68.2	-16.63	141	137	H
10.365	44.65	PK-U	37.8	-27.3	0	55.15	-	-	-	-	68.2	-13.05	203	146	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK-U - U-NII: Maximum Peak