

8.7 Test data for 802.11ac_HT20 RLAN Mode

8.7.1 Test data for Antenna 0

-. Test Date : June 16, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	21.28	12.05	23.98	11.93
	Middle	5 200	21.28	12.15	23.98	11.83
	High	5 240	21.28	12.12	23.98	11.86
5 250 ~ 5 350	Low	5 260	21.28	13.35	23.98	10.63
	Middle	5 300	21.28	12.79	23.98	11.19
	High	5 320	21.28	13.04	23.98	10.94
5 470 ~ 5 725	Low	5 500	21.38	13.57	23.98	10.41
	Middle	5 600	21.38	13.97	23.98	10.01
	High	5 700	21.38	13.34	23.98	10.64
5 725 ~ 5 850	Low	5 745	21.28	12.74	30.00	17.26
	Middle	5 785	21.28	12.66	30.00	17.34
	High	5 825	21.28	12.29	30.00	17.71

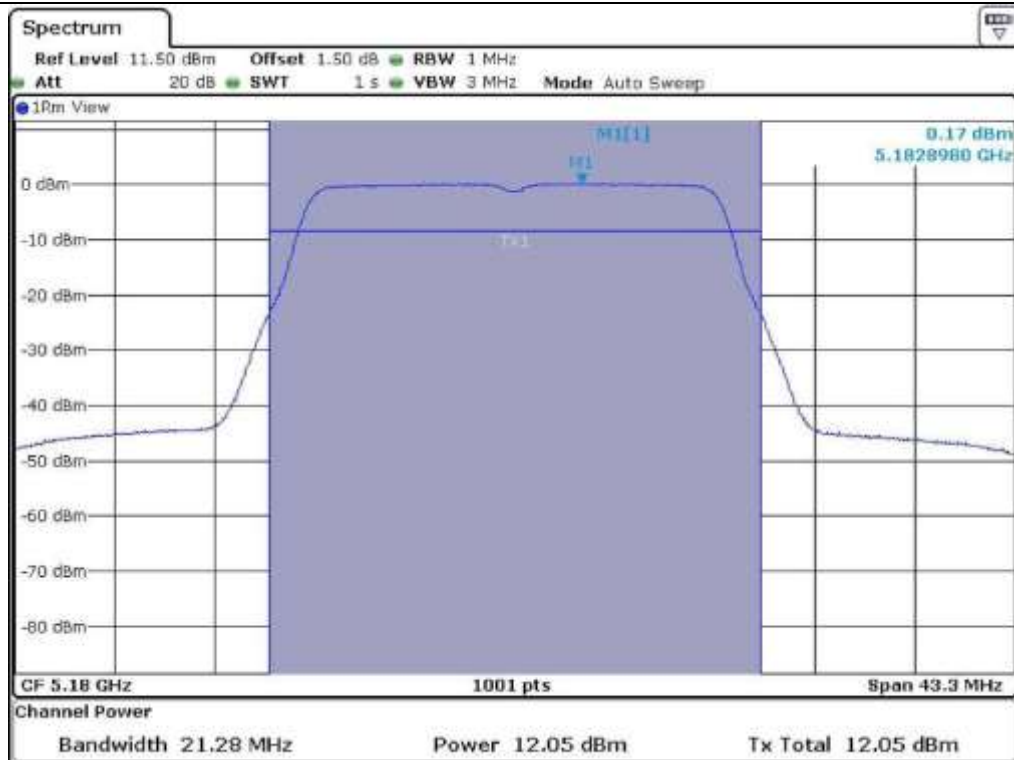
-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Low	5 180	2.90	17.73	12.03	23.00	8.07	14.93
	Middle	5 200		17.73	11.88	23.00	8.22	14.78
	High	5 240		17.73	12.01	23.00	8.09	14.91
5 250 ~ 5 350	Low	5 260		17.73	13.26	30.00	13.84	16.16
	Middle	5 300		17.73	12.99	30.00	14.11	15.89
	High	5 320		17.73	12.87	30.00	14.23	15.77
5 470 ~ 5 725	Low	5 500		17.78	13.39	30.00	13.71	16.29
	Middle	5 600		17.78	13.83	30.00	13.27	16.73
	High	5 700		17.78	13.19	30.00	13.91	16.09
5 725 ~ 5 825	Low	5 745		17.78	12.76	36.00	20.34	15.66
	Middle	5 785		17.78	12.50	36.00	20.60	15.40
	High	5 825		17.78	12.14	36.00	20.96	15.04

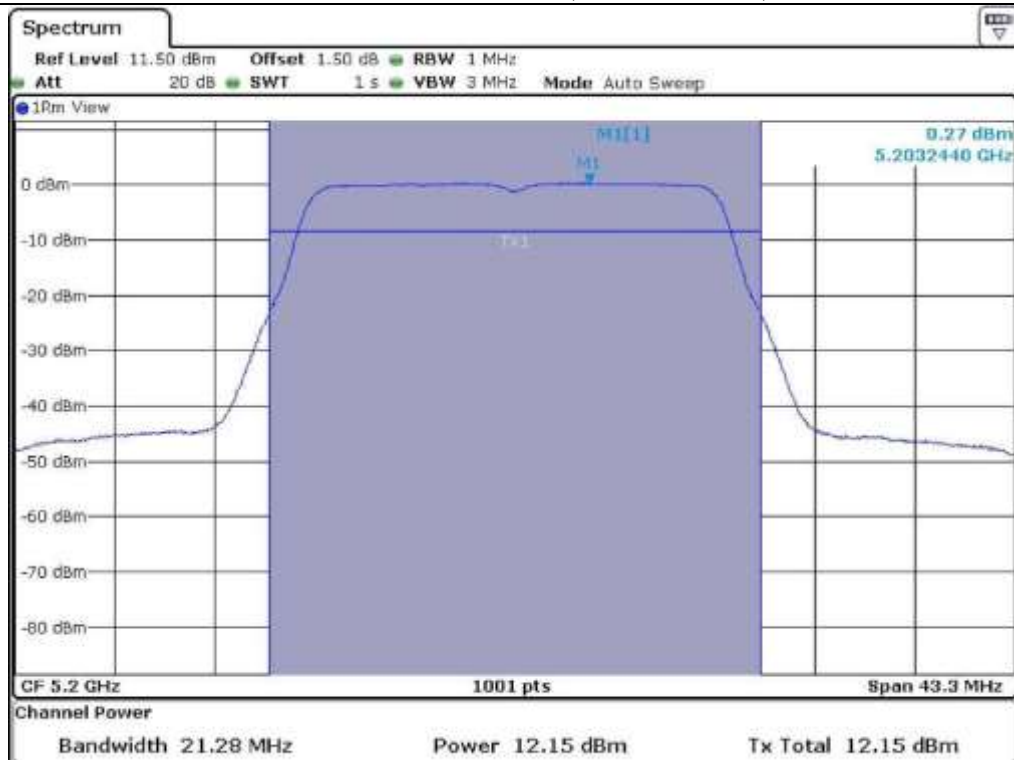
Remark: See next page for measurement data.



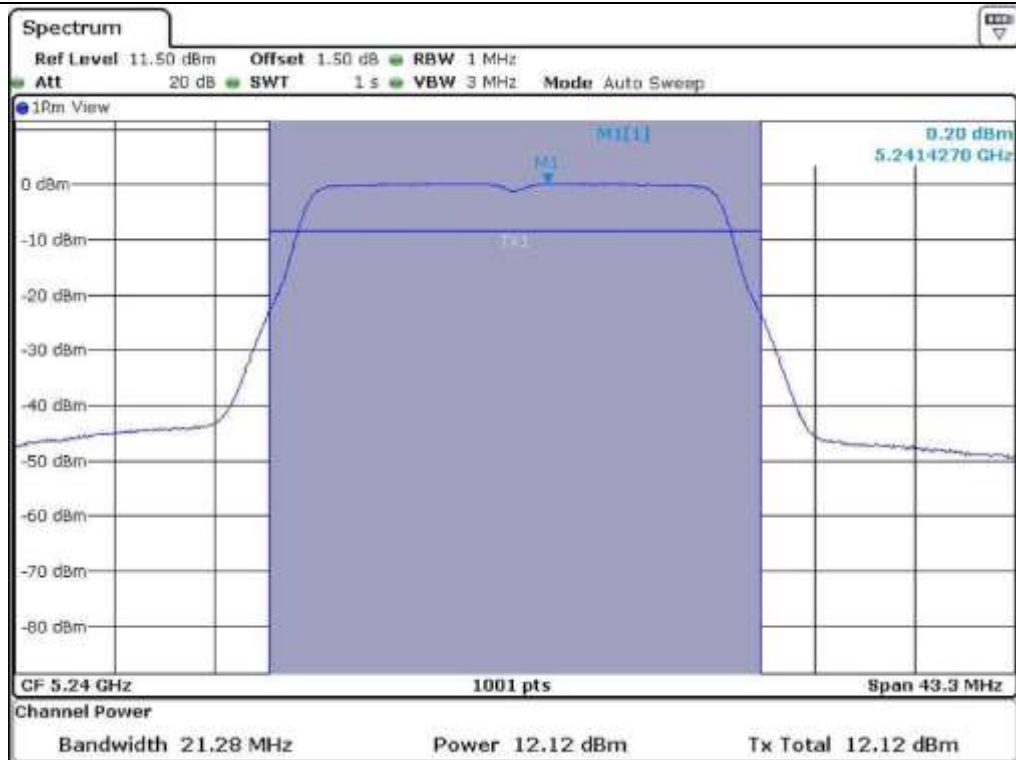
Tested by: Tae-Ho, Kim / Senior Engineer



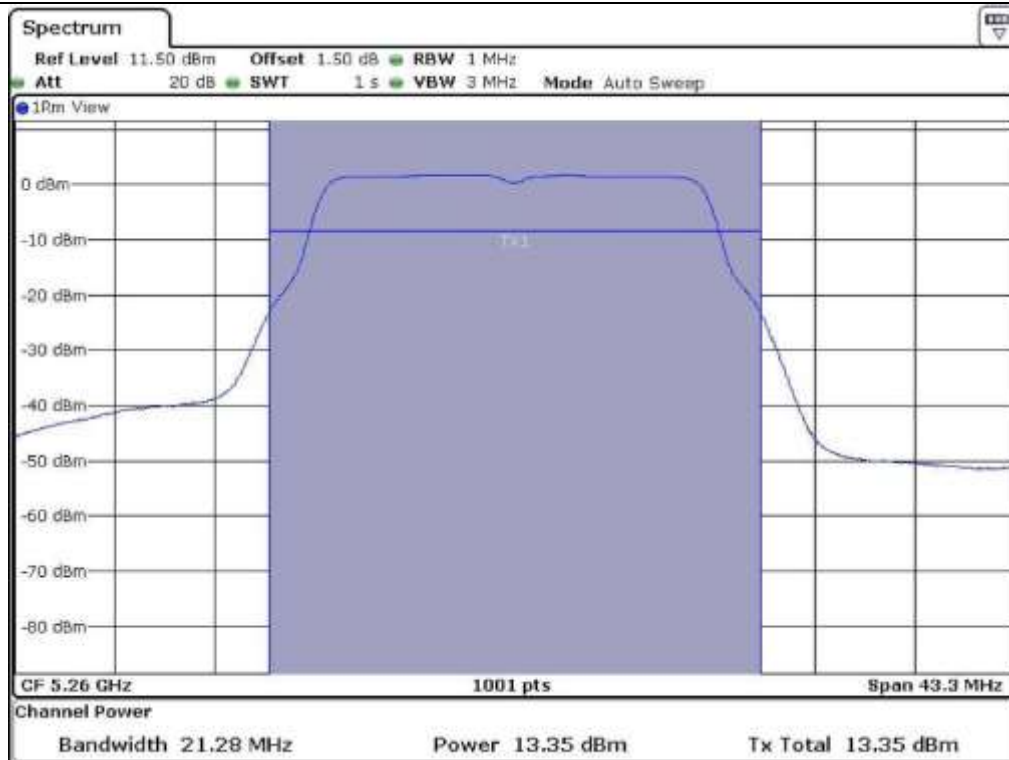
Low Channel @ 5 180 MHz (26 dB Bandwidth)



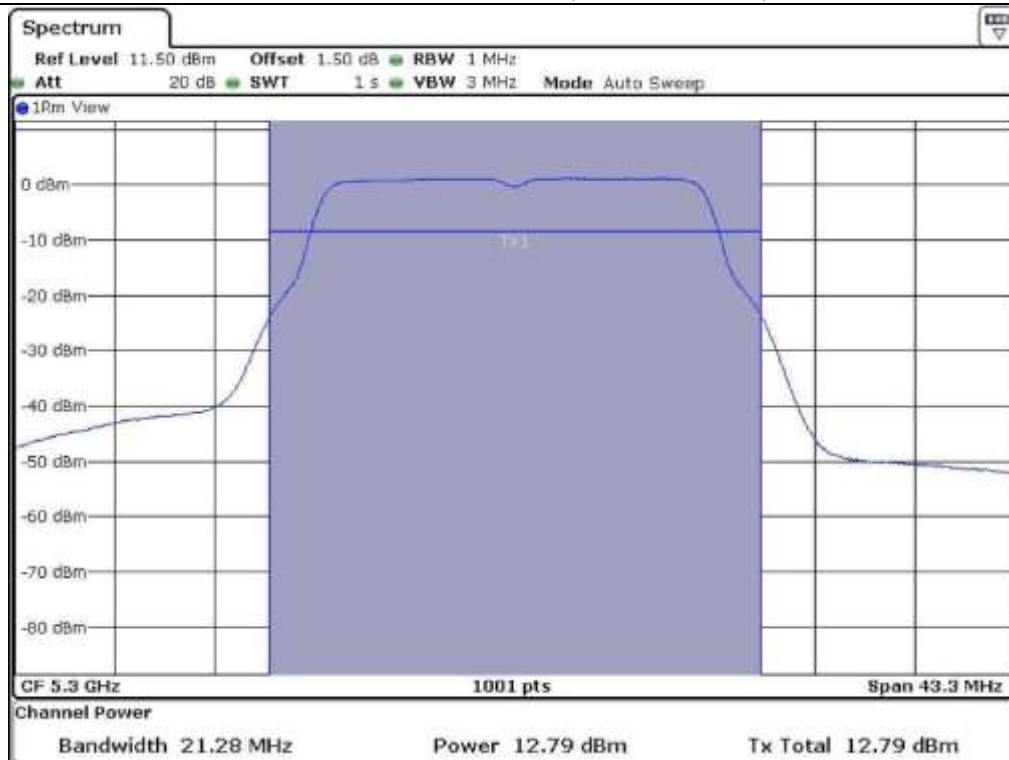
Middle Channel @ 5 200 MHz (26 dB Bandwidth)



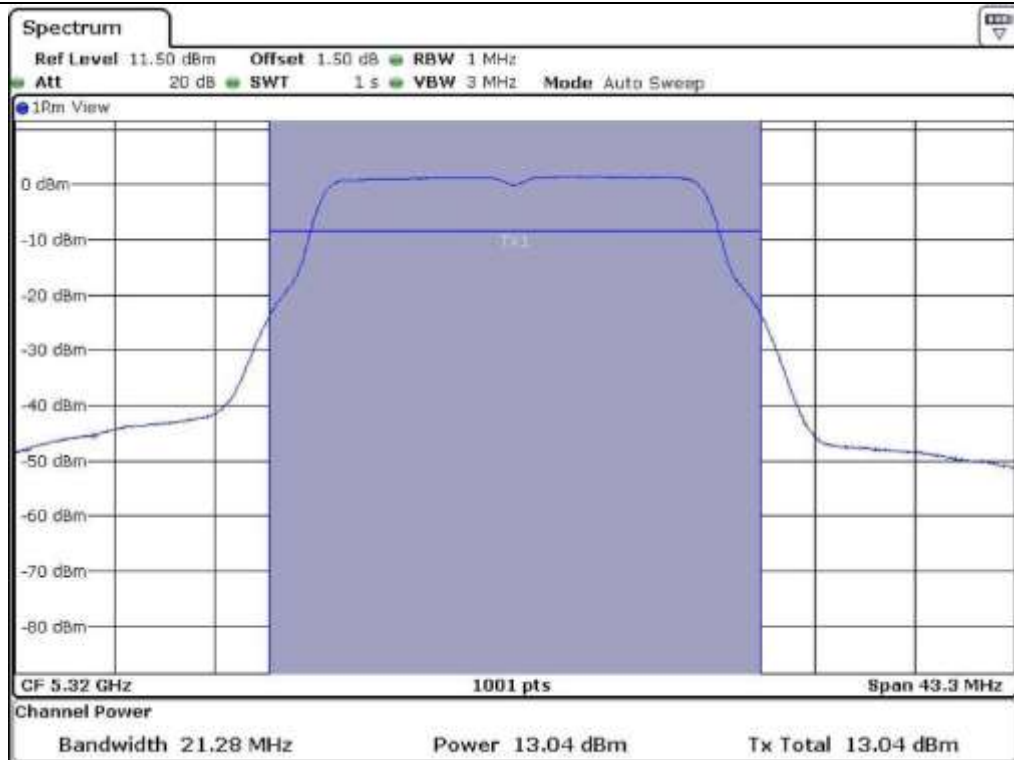
High Channel @ 5 240 MHz (26 dB Bandwidth)



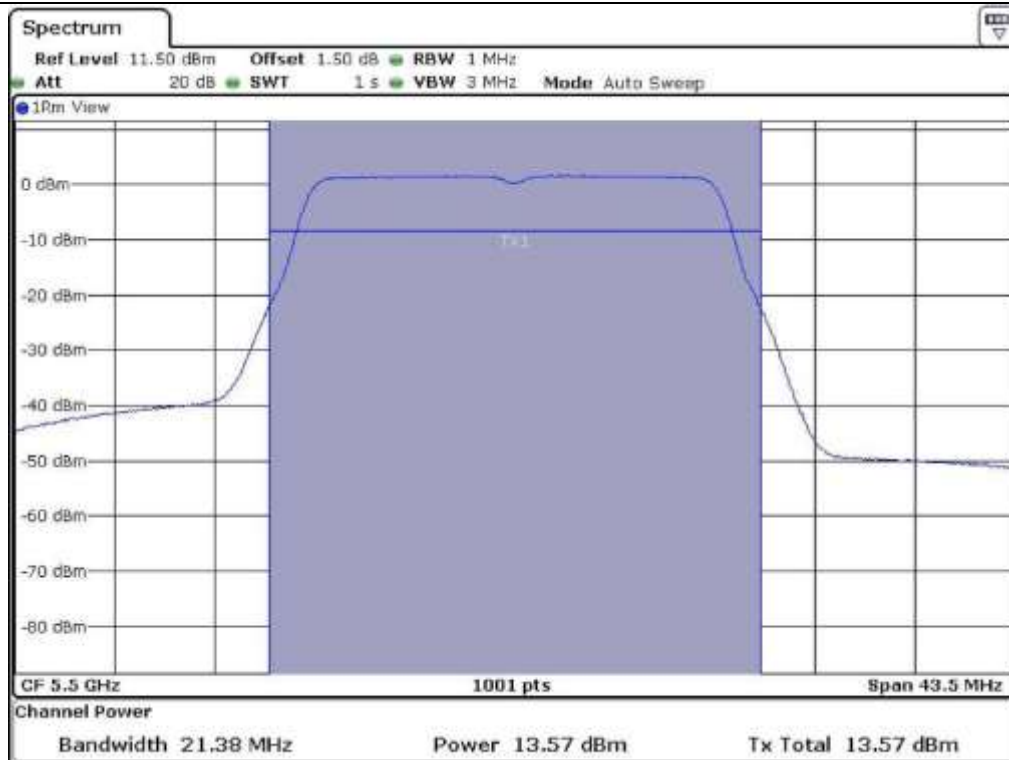
Low Channel @ 5 260 MHz (26 dB Bandwidth)



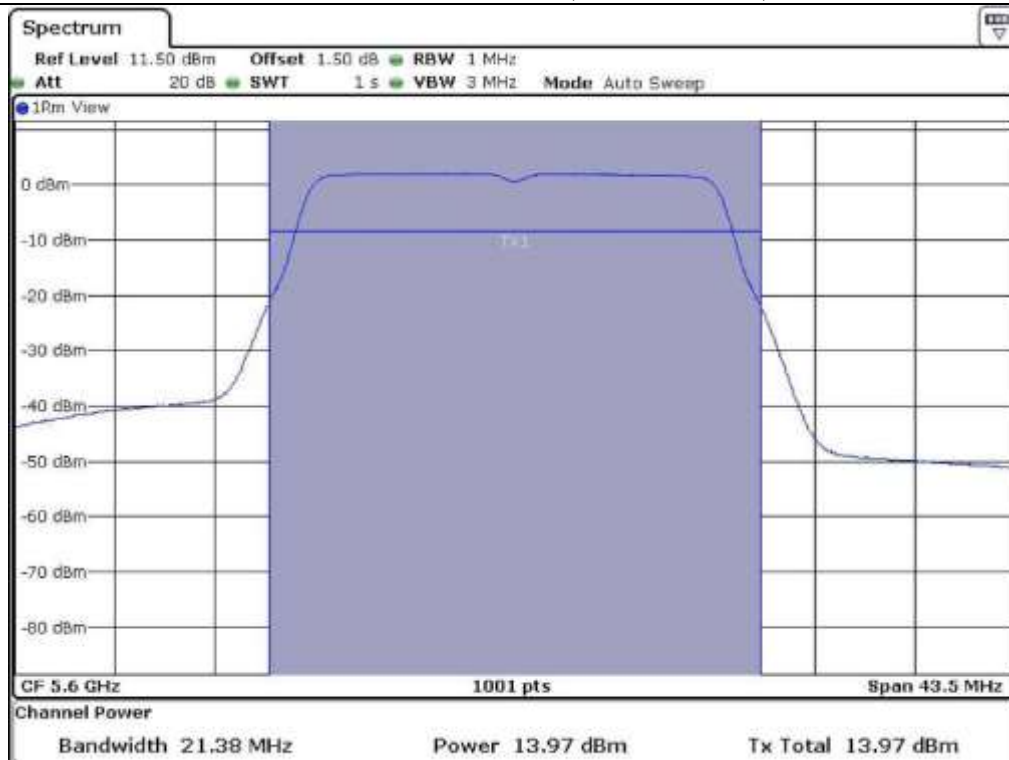
Middle Channel @ 5 300 MHz (26 dB Bandwidth)



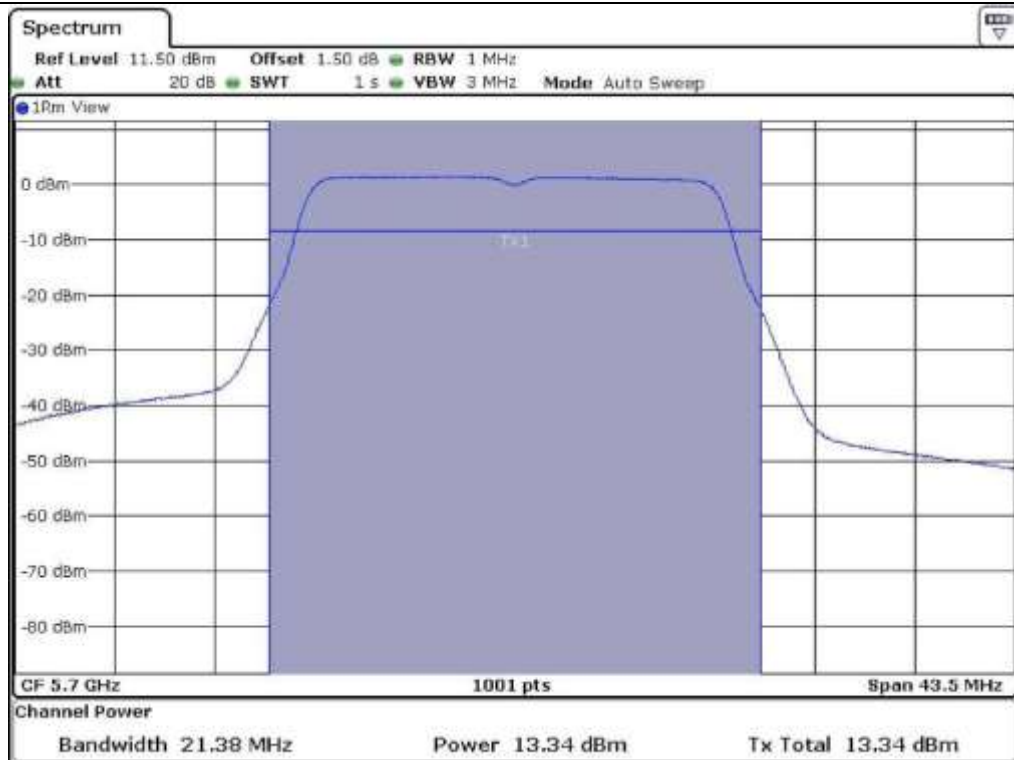
High Channel @ 5 320 MHz (26 dB Bandwidth)



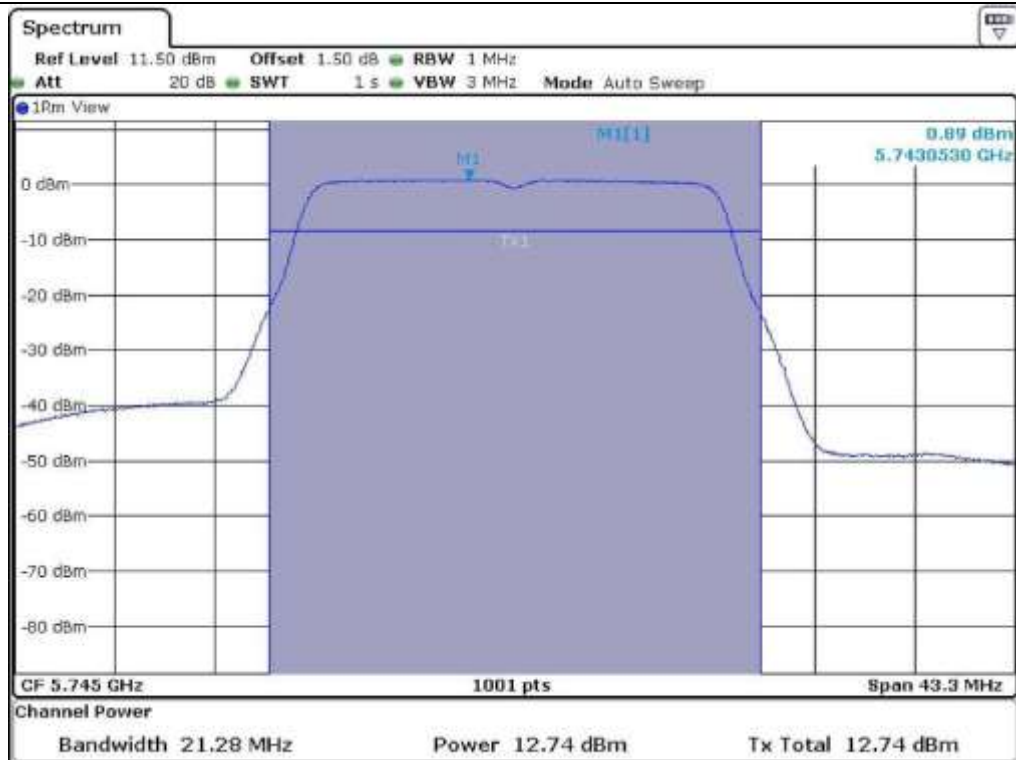
Low Channel @ 5 500 MHz (26 dB Bandwidth)



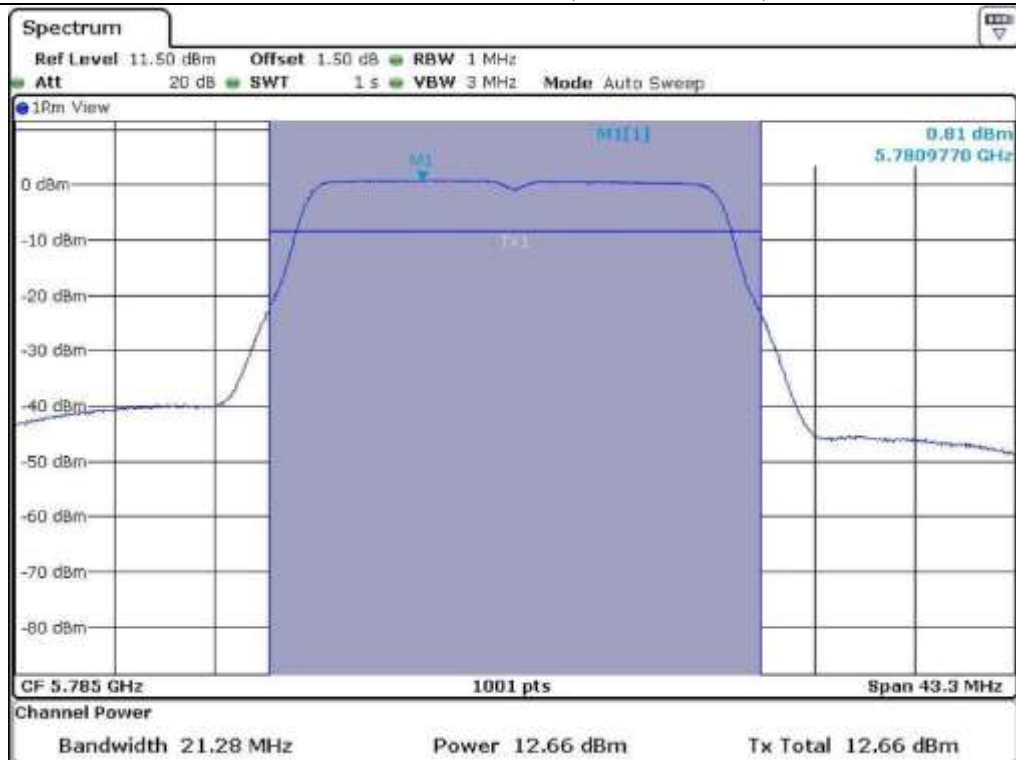
Middle Channel @ 5 600 MHz (26 dB Bandwidth)



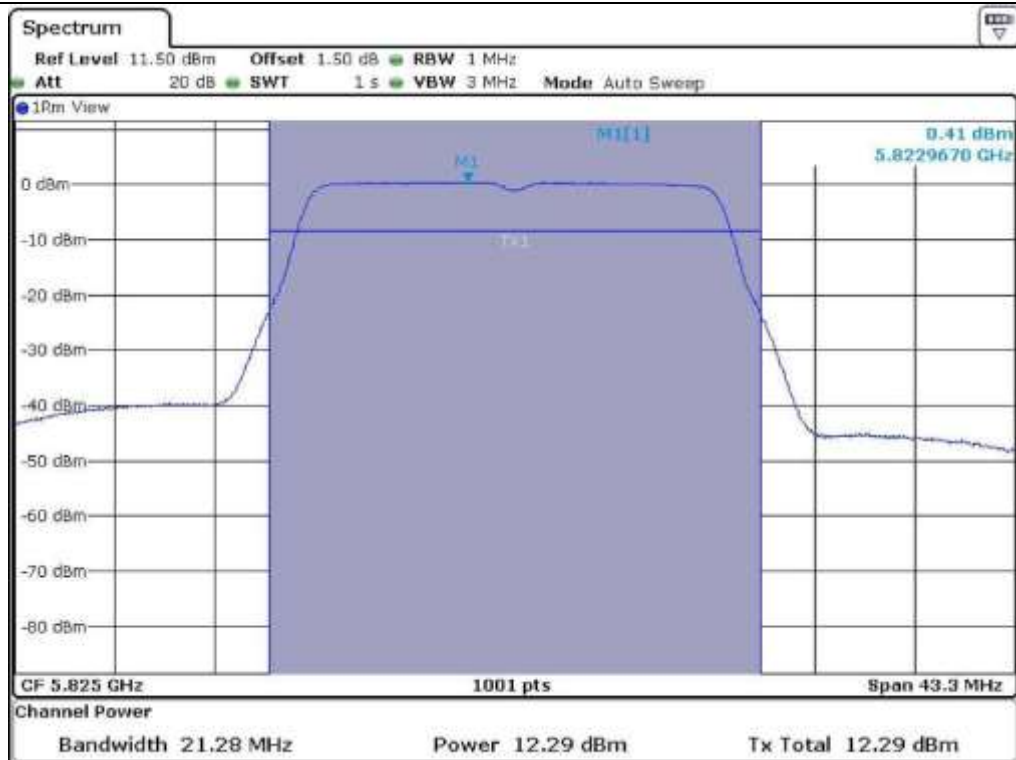
High Channel @ 5 700 MHz (26 dB Bandwidth)



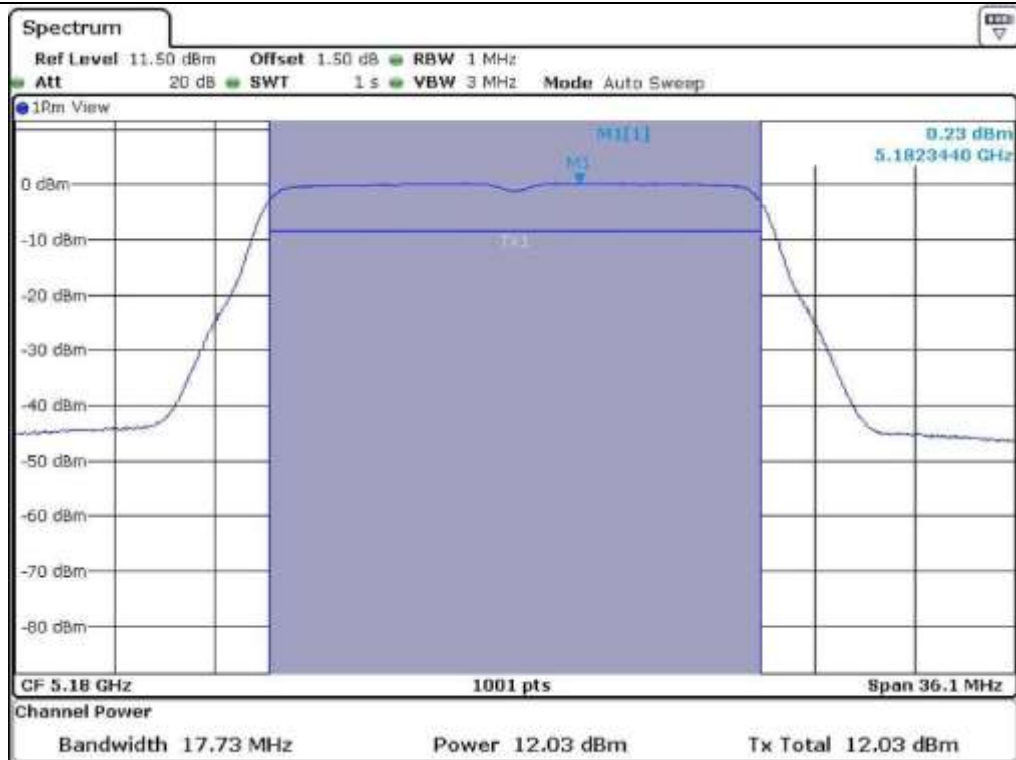
Low Channel @ 5.745 MHz (26 dB Bandwidth)



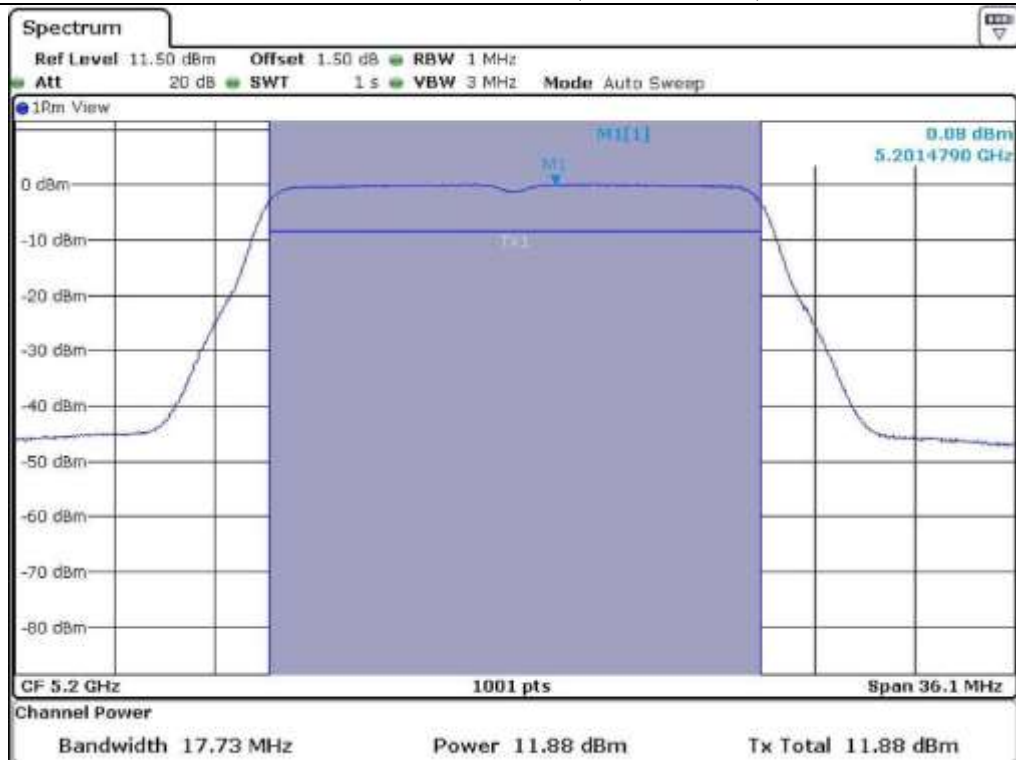
Middle Channel @ 5.785 MHz (26 dB Bandwidth)



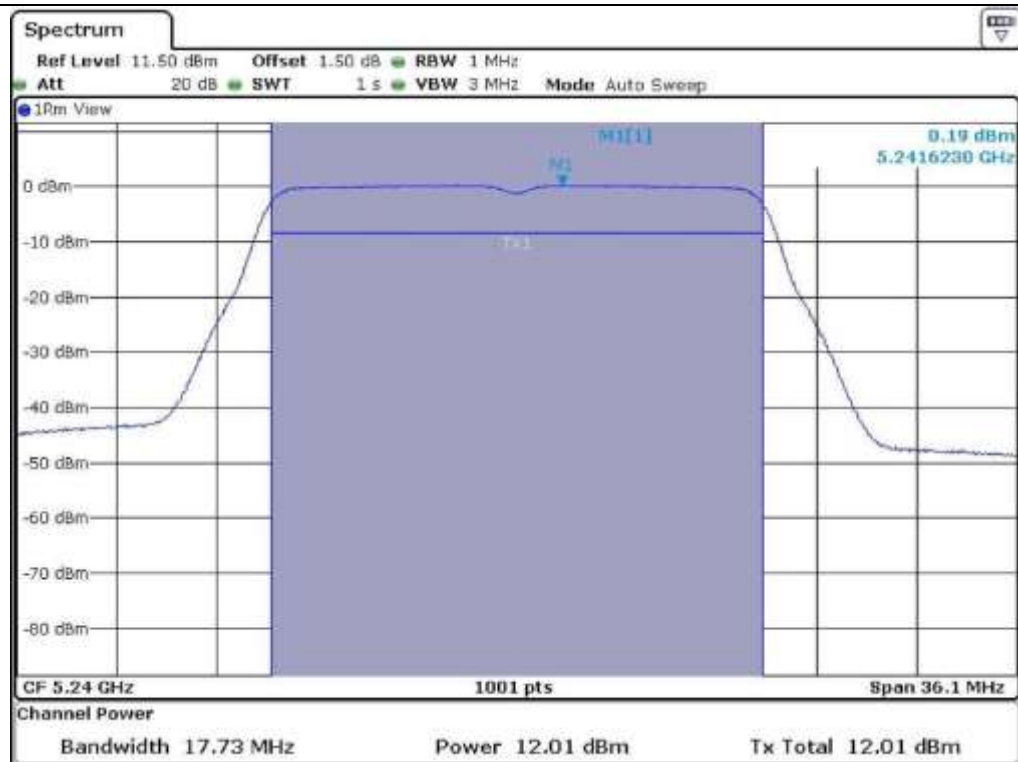
High Channel @ 5 825 MHz (26 dB Bandwidth)



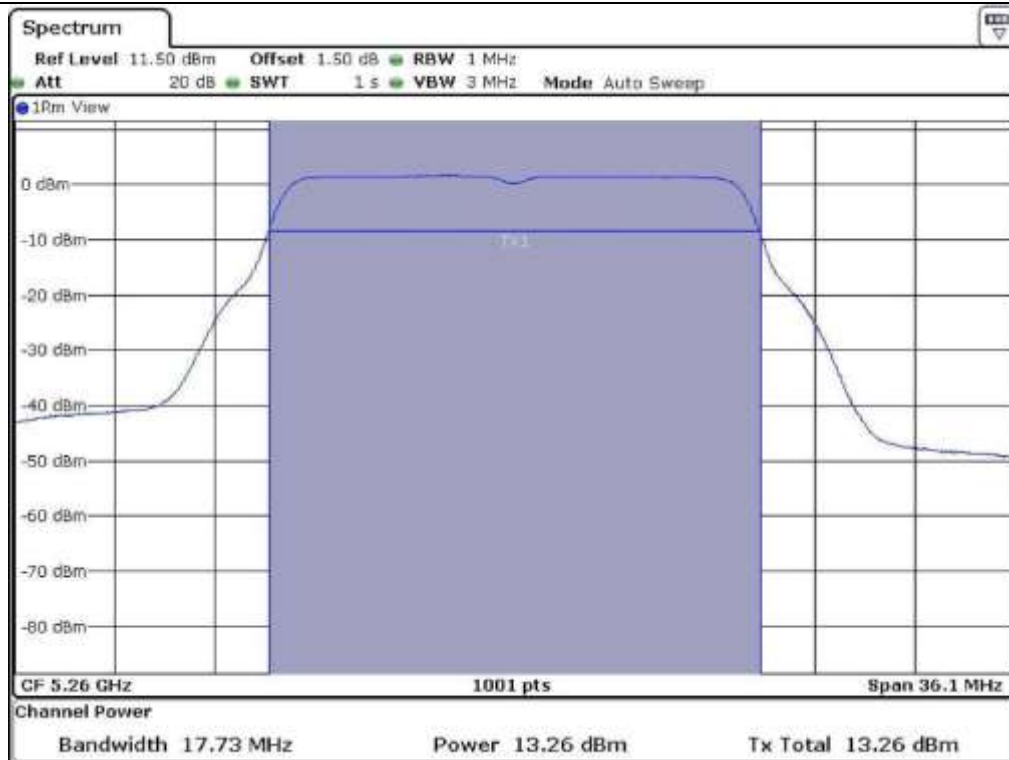
Low Channel @ 5 180 MHz (99 % bandwidth)



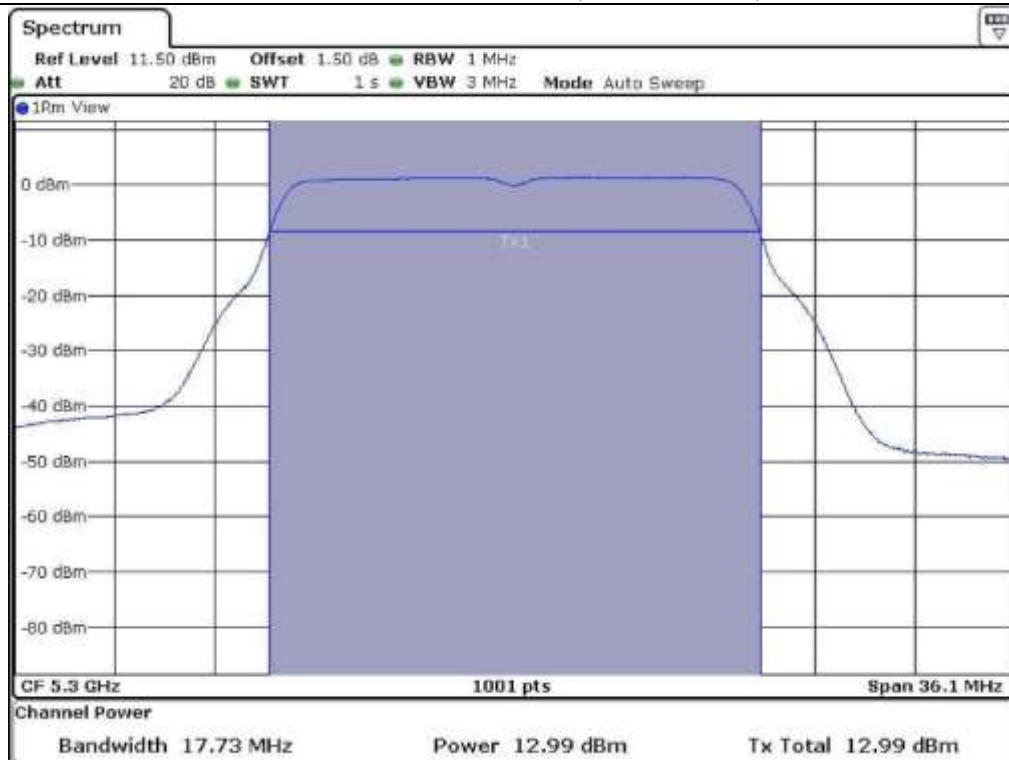
Middle Channel @ 5 200 MHz (99 % bandwidth)



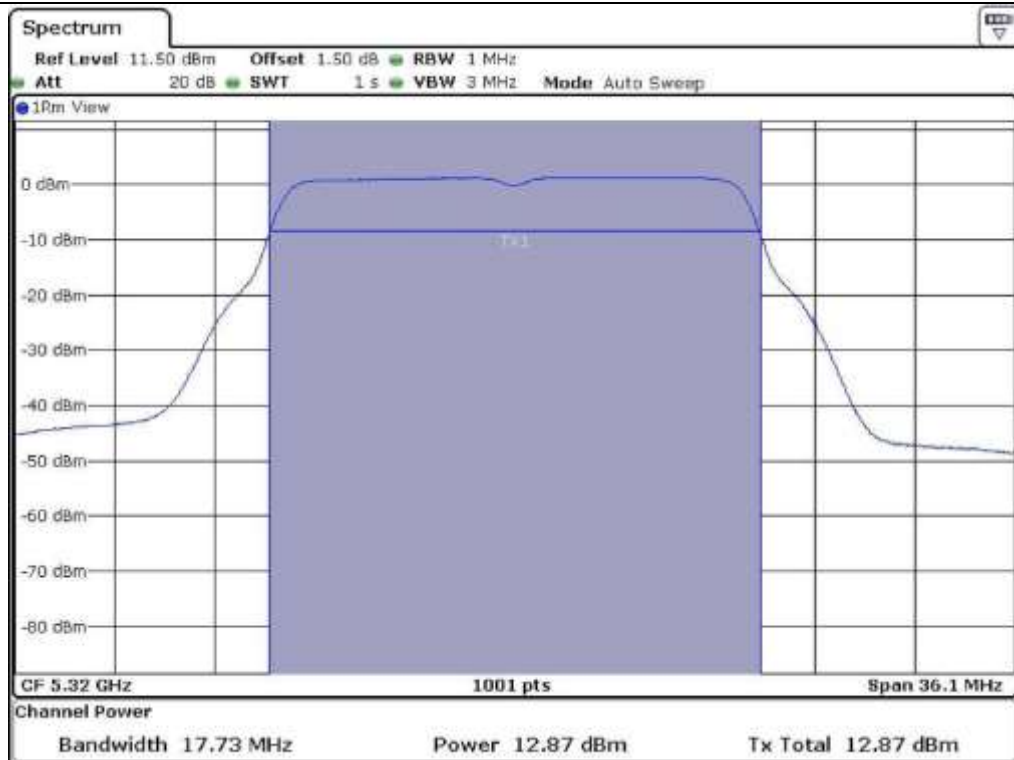
High Channel @ 5 240 MHz (99 % bandwidth)



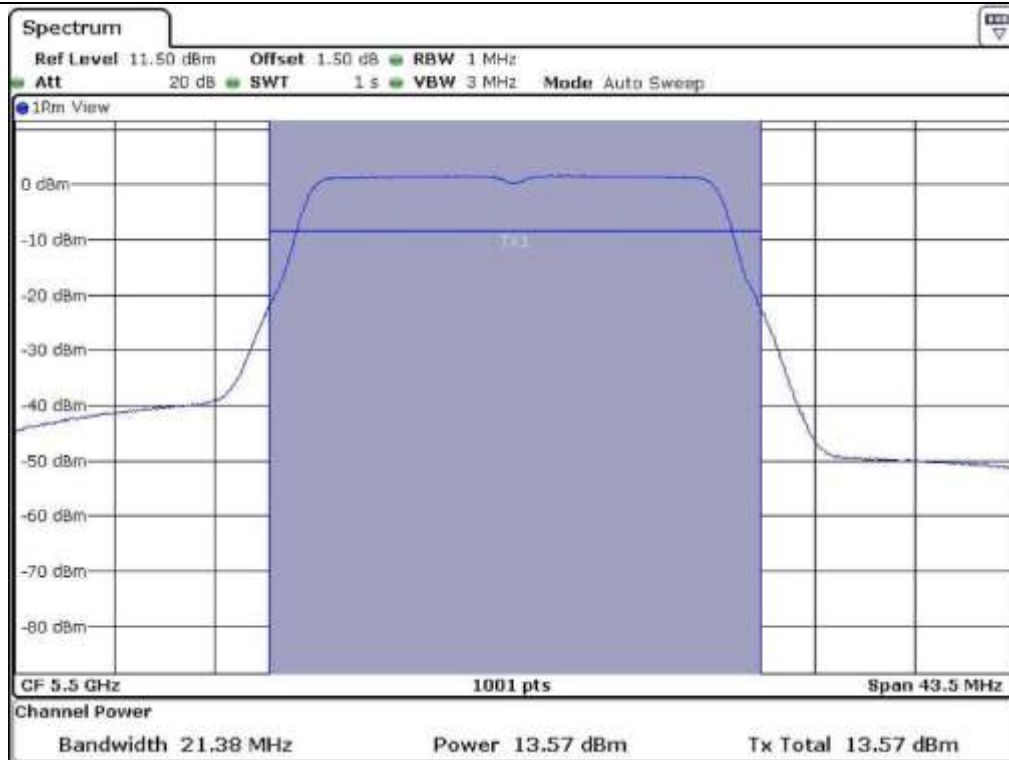
Low Channel @ 5 260 MHz (99 % bandwidth)



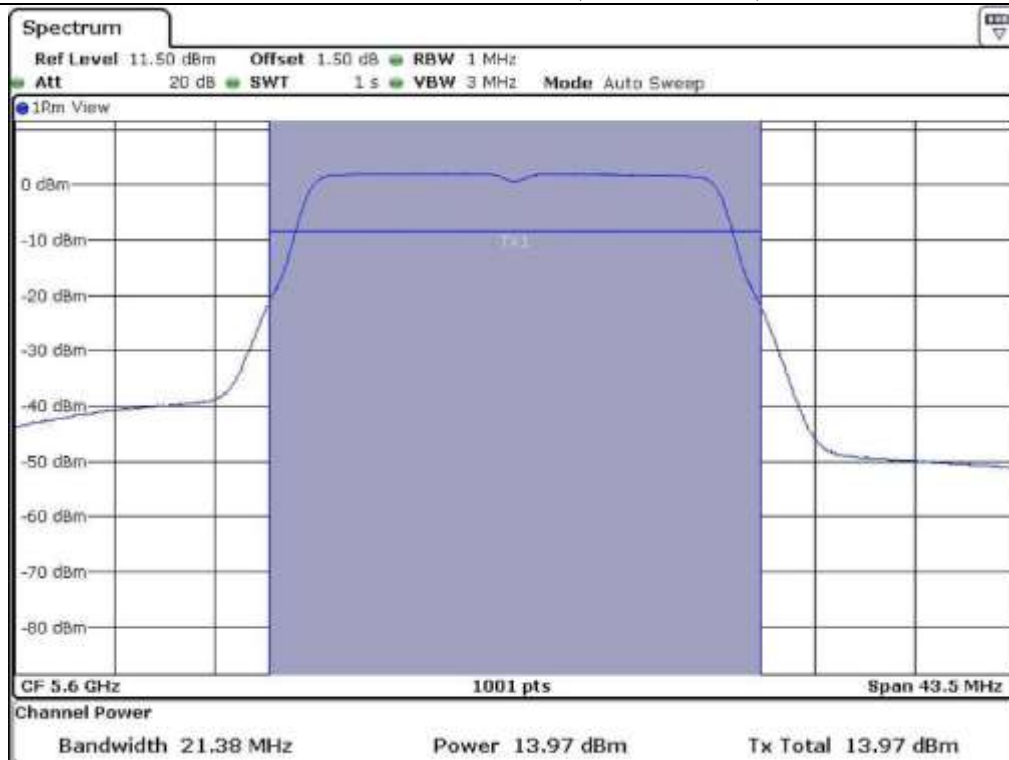
Middle Channel @ 5 300 MHz (99 % bandwidth)



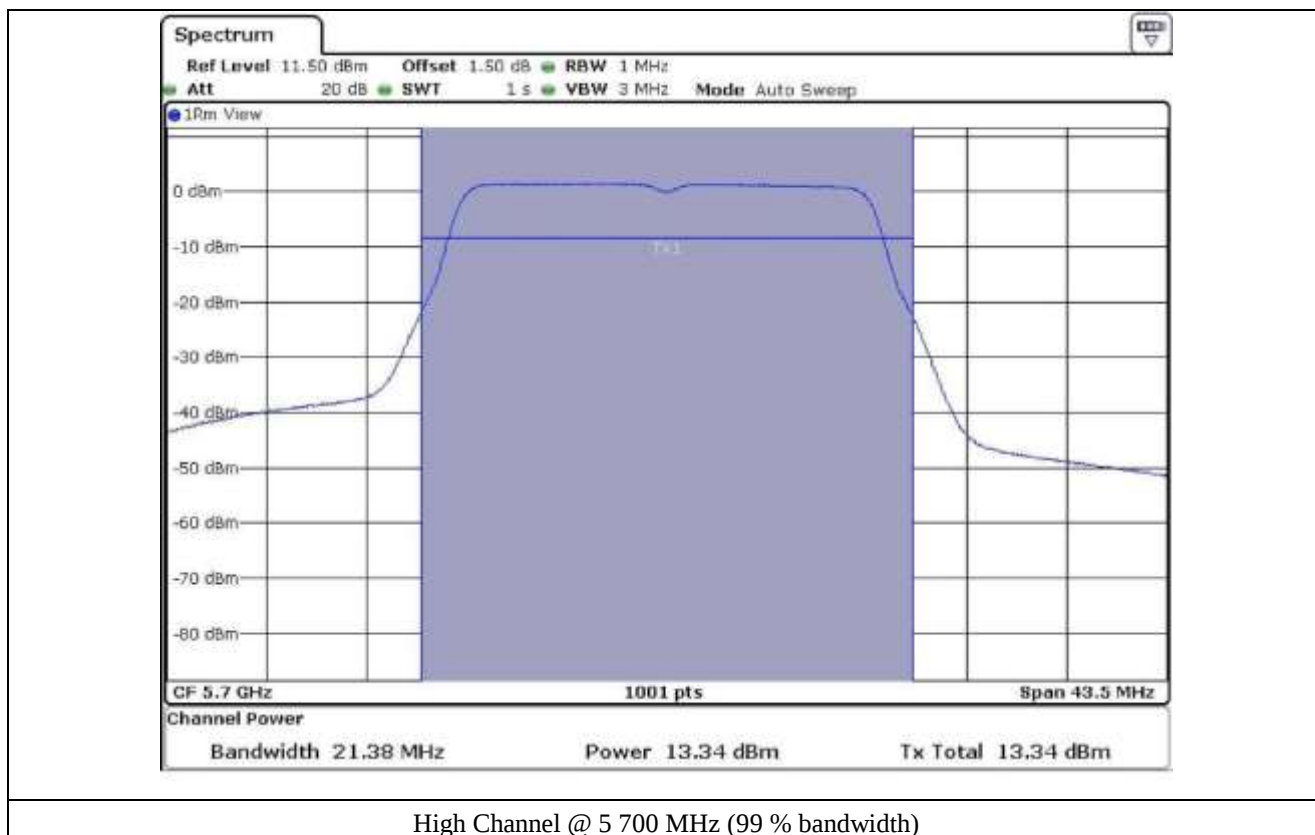
High Channel @ 5 320 MHz (99 % bandwidth)

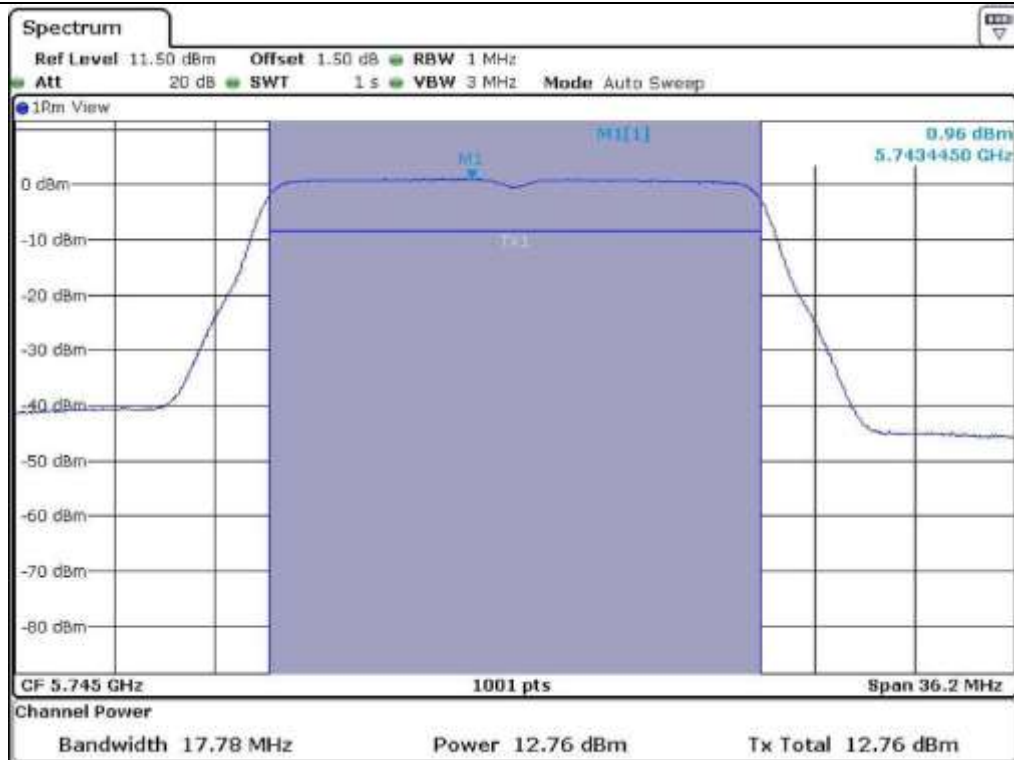


Low Channel @ 5 500 MHz (99 % bandwidth)

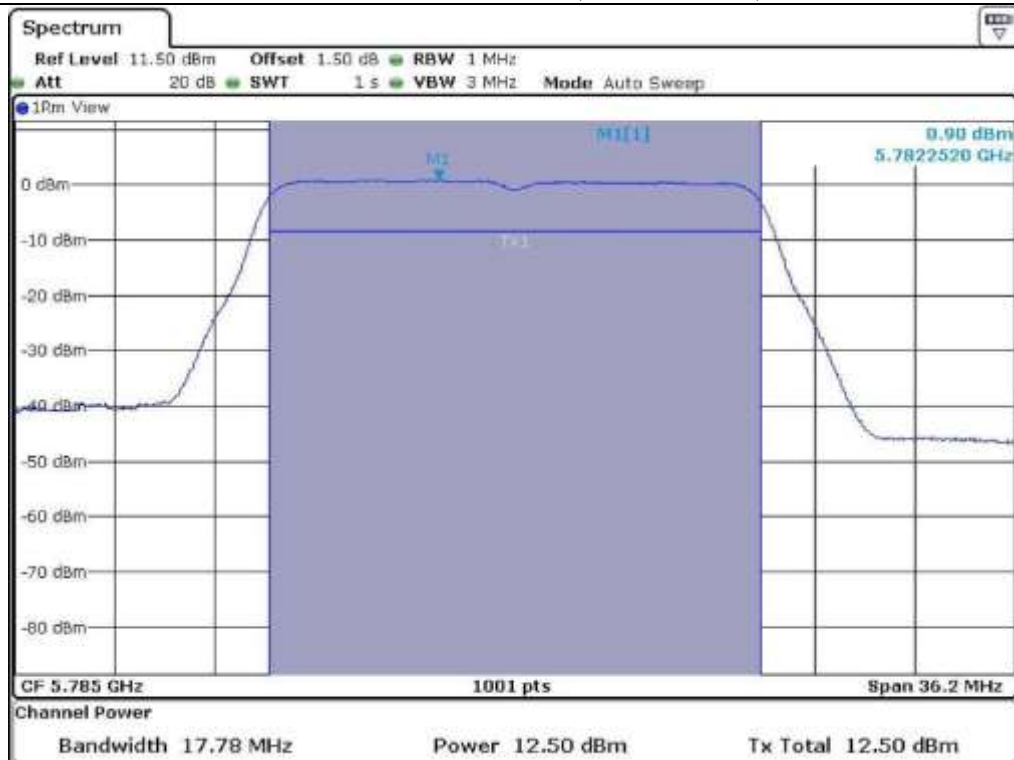


Middle Channel @ 5 600 MHz (99 % bandwidth)

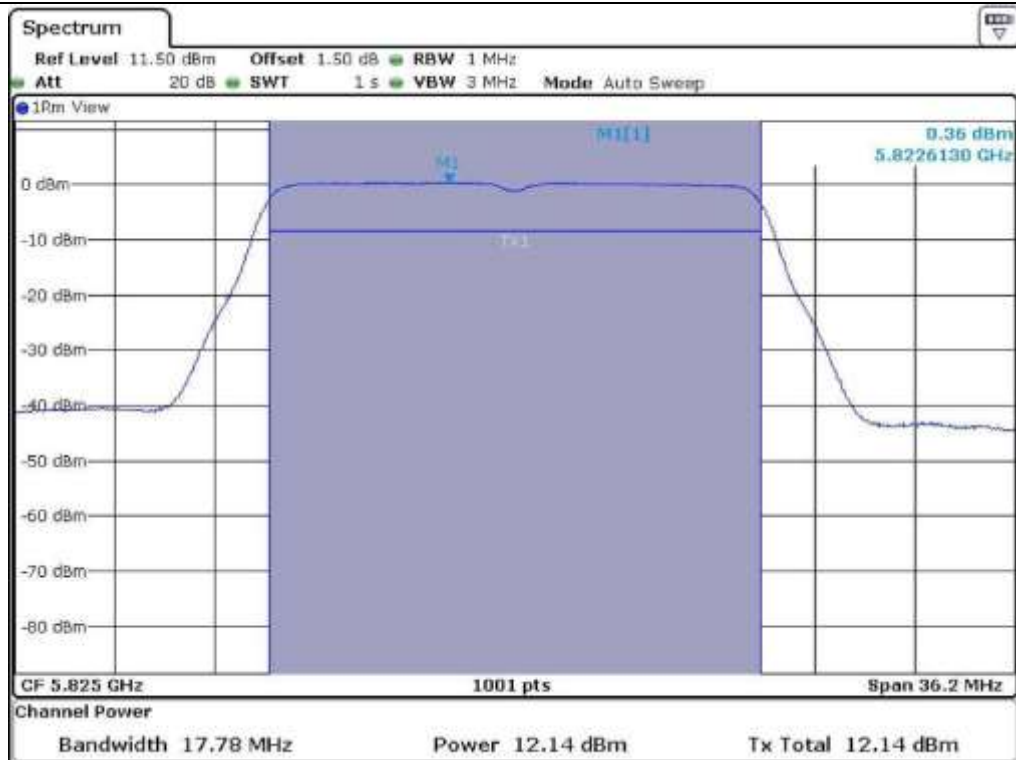




Low Channel @ 5 745 MHz (99 % bandwidth)



Middle Channel @ 5 785 MHz (99 % bandwidth)



High Channel @ 5 825 MHz (99 % bandwidth)

8.7.2 Test data for Antenna 1

-. Test Date : June 16, 2015

-. Test Result : Pass

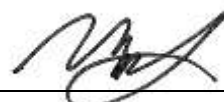
-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	21.28	12.83	23.98	11.15
	Middle	5 200	21.28	12.72	23.98	11.26
	High	5 240	21.28	12.78	23.98	11.20
5 250 ~ 5 350	Low	5 260	21.28	12.14	23.98	11.84
	Middle	5 300	21.28	11.79	23.98	12.19
	High	5 320	21.28	12.13	23.98	11.85
5 470 ~ 5 725	Low	5 500	21.38	12.53	23.98	11.45
	Middle	5 600	21.38	13.34	23.98	10.64
	High	5 700	21.38	12.65	23.98	11.33
5 725 ~ 5 850	Low	5 745	21.28	13.54	30.00	16.46
	Middle	5 785	21.28	13.44	30.00	16.56
	High	5 825	21.28	13.42	30.00	16.58

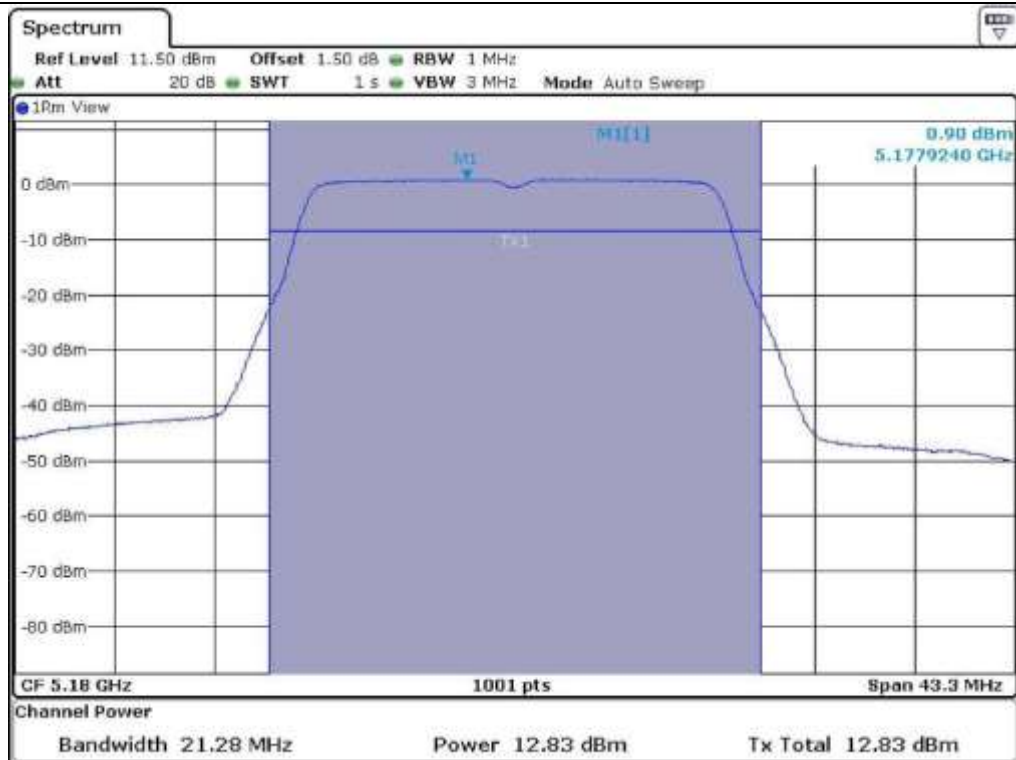
-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Low	5 180	2.90	17.73	12.52	23.00	7.58	15.42
	Middle	5 200		17.73	12.61	23.00	7.49	15.51
	High	5 240		17.73	12.63	23.00	7.47	15.53
5 250 ~ 5 350	Low	5 260		17.73	11.96	30.00	15.14	14.86
	Middle	5 300		17.73	11.71	30.00	15.39	14.61
	High	5 320		17.73	12.14	30.00	14.96	15.04
5 470 ~ 5 725	Low	5 500		17.78	12.65	30.00	14.45	15.55
	Middle	5 600		17.78	13.42	30.00	13.68	16.32
	High	5 700		17.78	12.51	30.00	14.59	15.41
5 725 ~ 5 825	Low	5 745		17.78	13.55	36.00	19.55	16.45
	Middle	5 785		17.78	13.52	36.00	19.58	16.42
	High	5 825		17.78	13.59	36.00	19.51	16.49

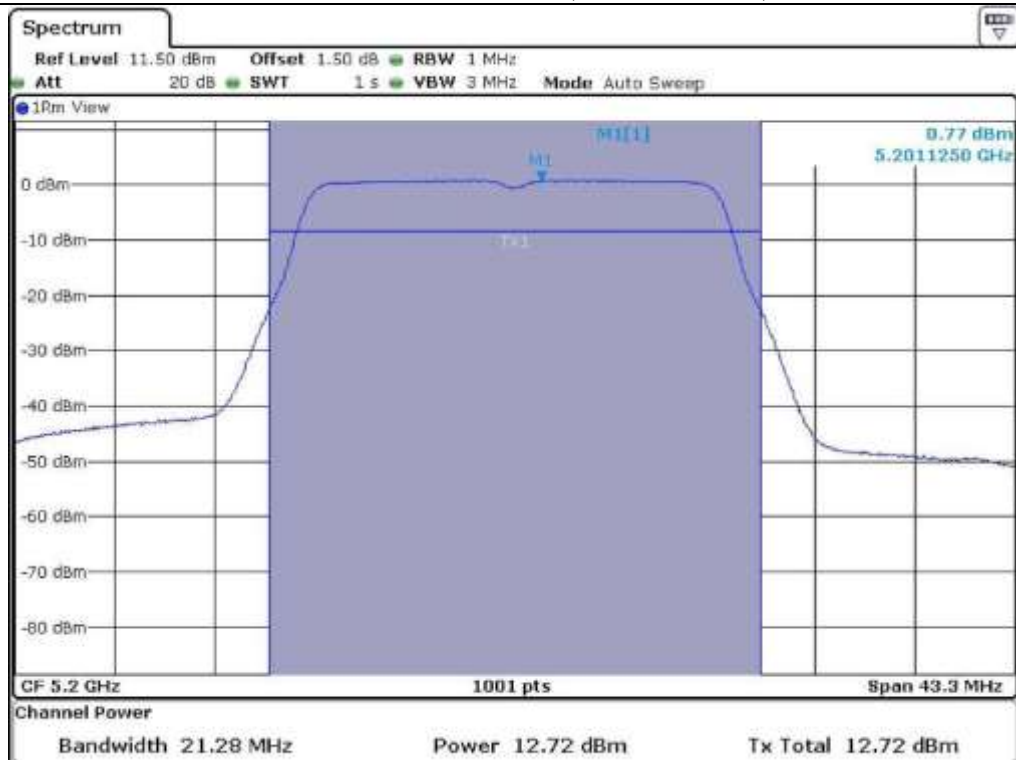
Remark: See next page for measurement data.



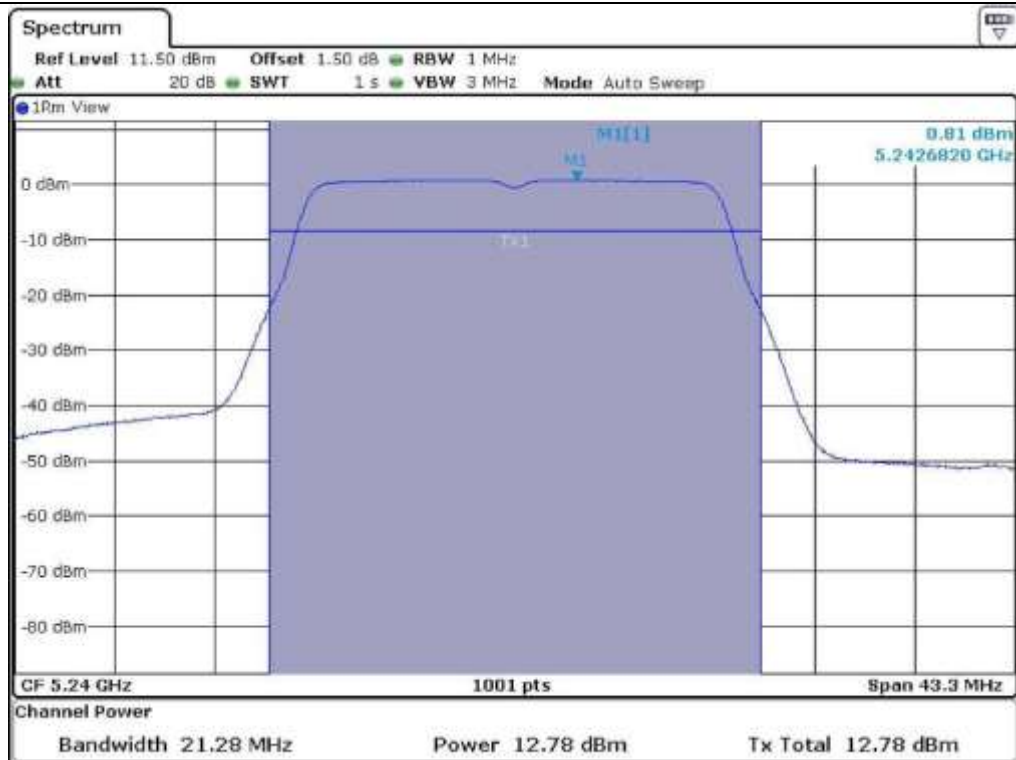
Tested by: Tae-Ho, Kim / Senior Engineer



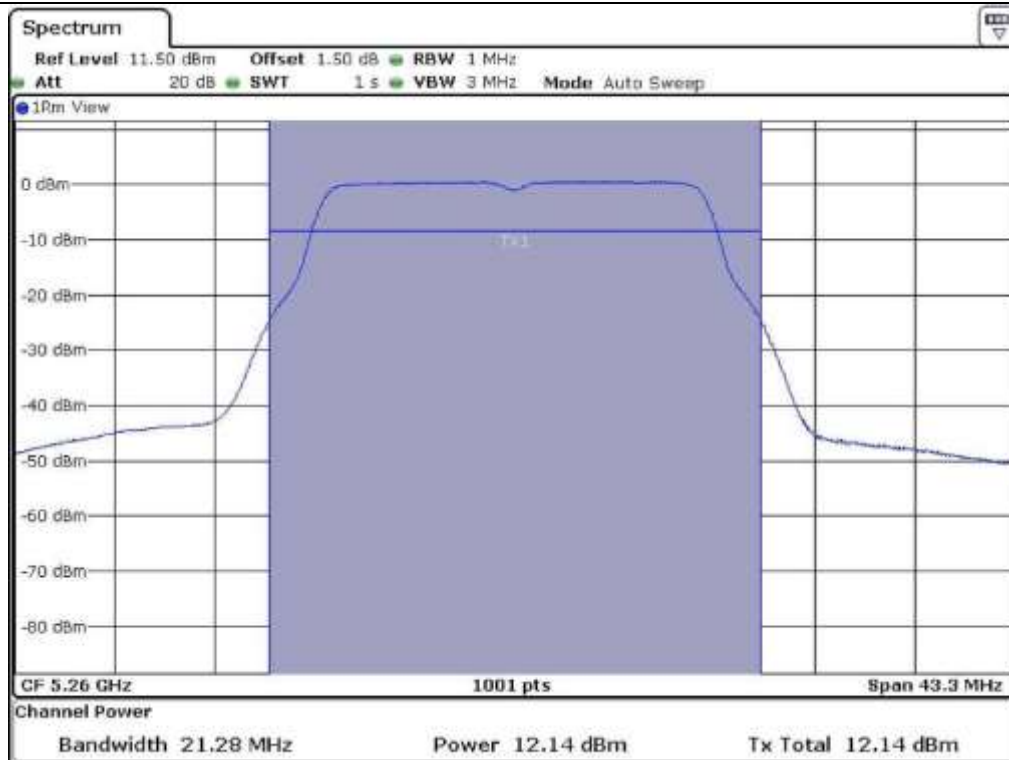
Low Channel @ 5 180 MHz (26 dB Bandwidth)



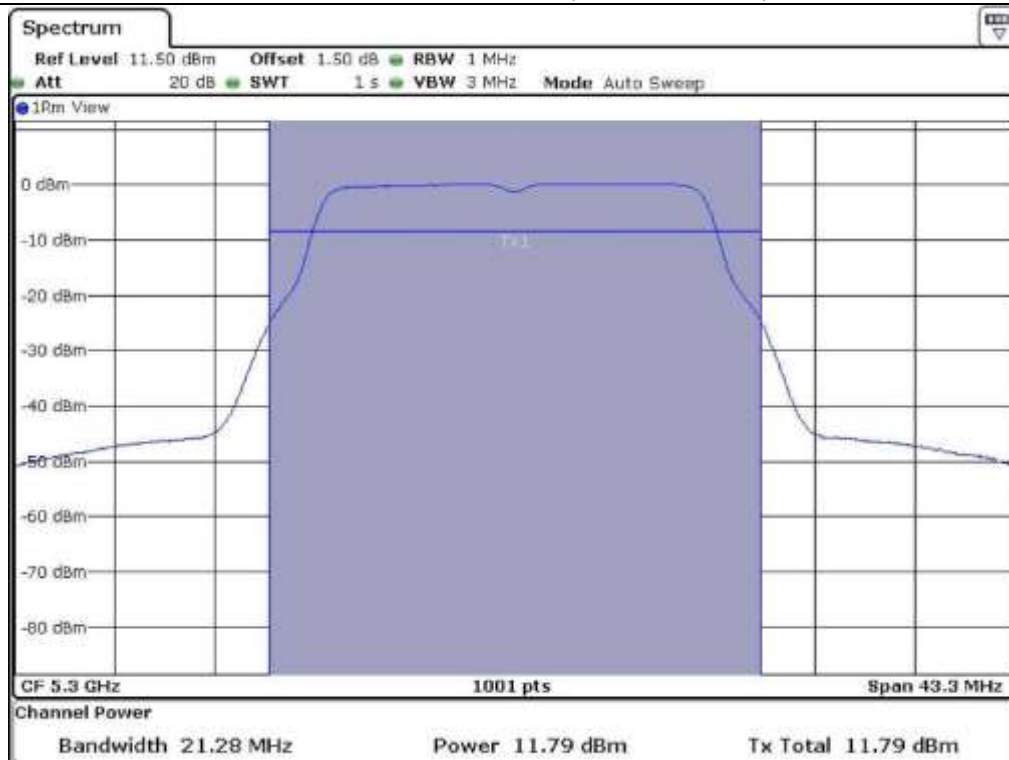
Middle Channel @ 5 200 MHz (26 dB Bandwidth)



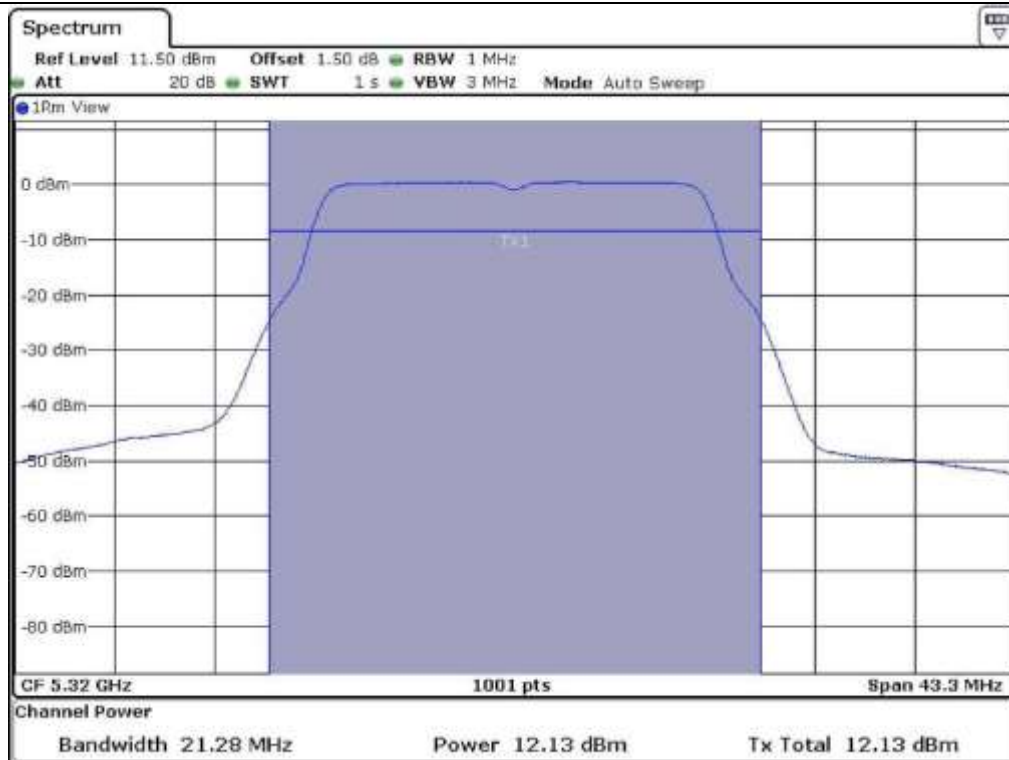
High Channel @ 5 240 MHz (26 dB Bandwidth)



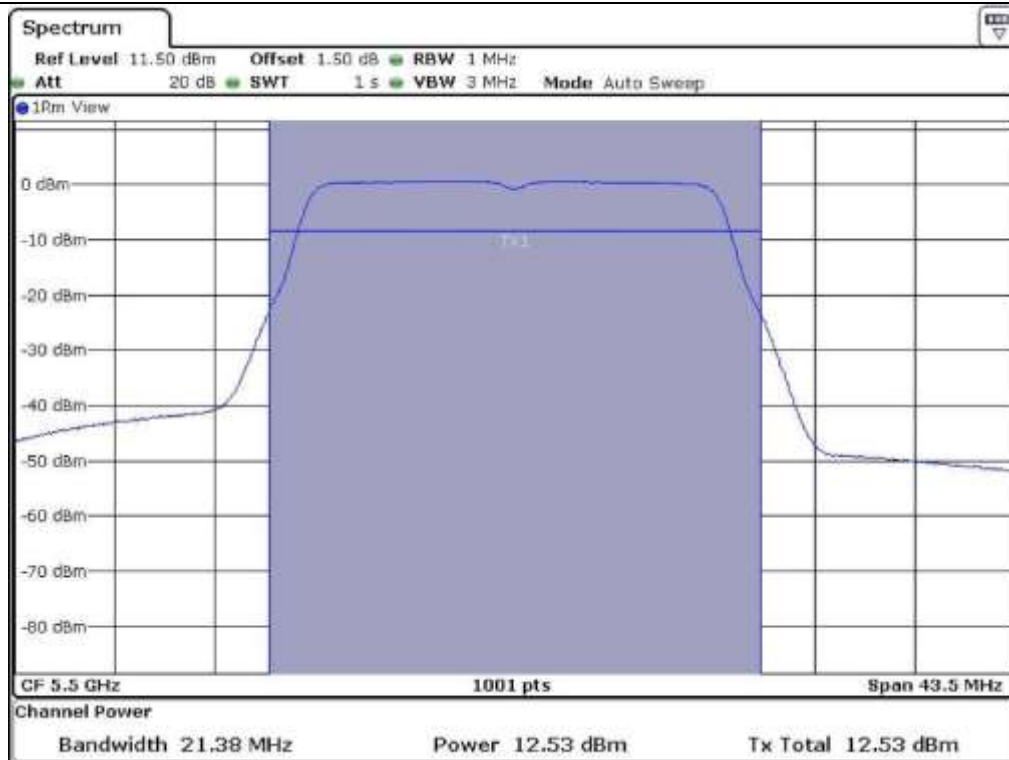
Low Channel @ 5 260 MHz (26 dB Bandwidth)



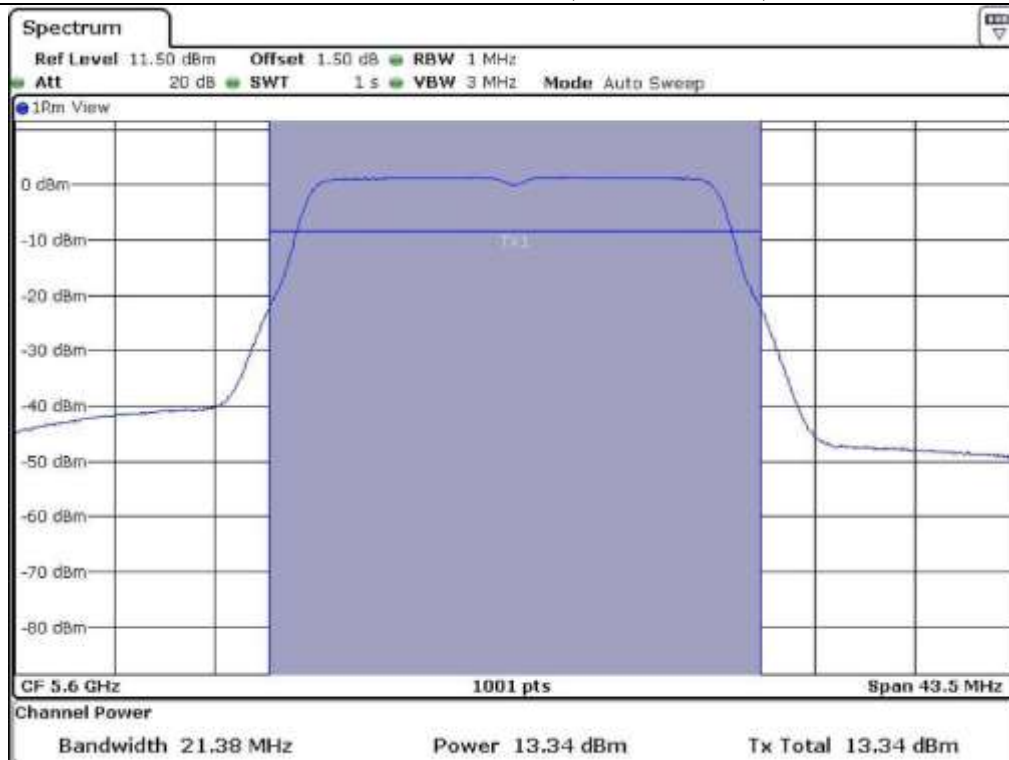
Middle Channel @ 5 300 MHz (26 dB Bandwidth)



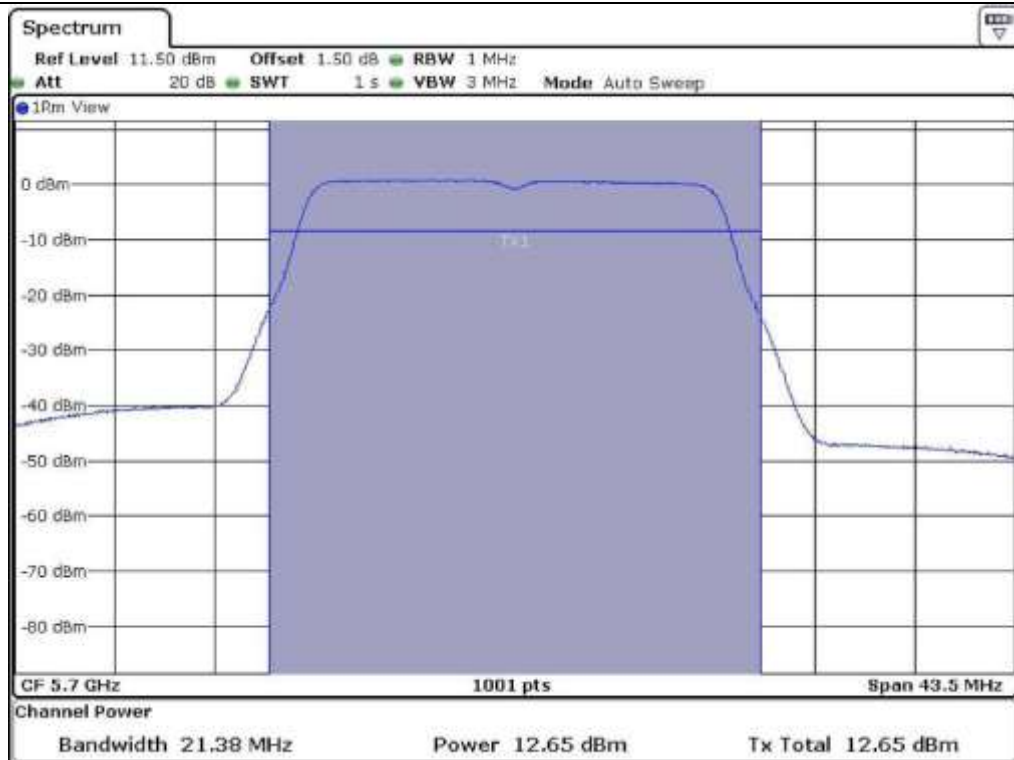
High Channel @ 5 320 MHz (26 dB Bandwidth)



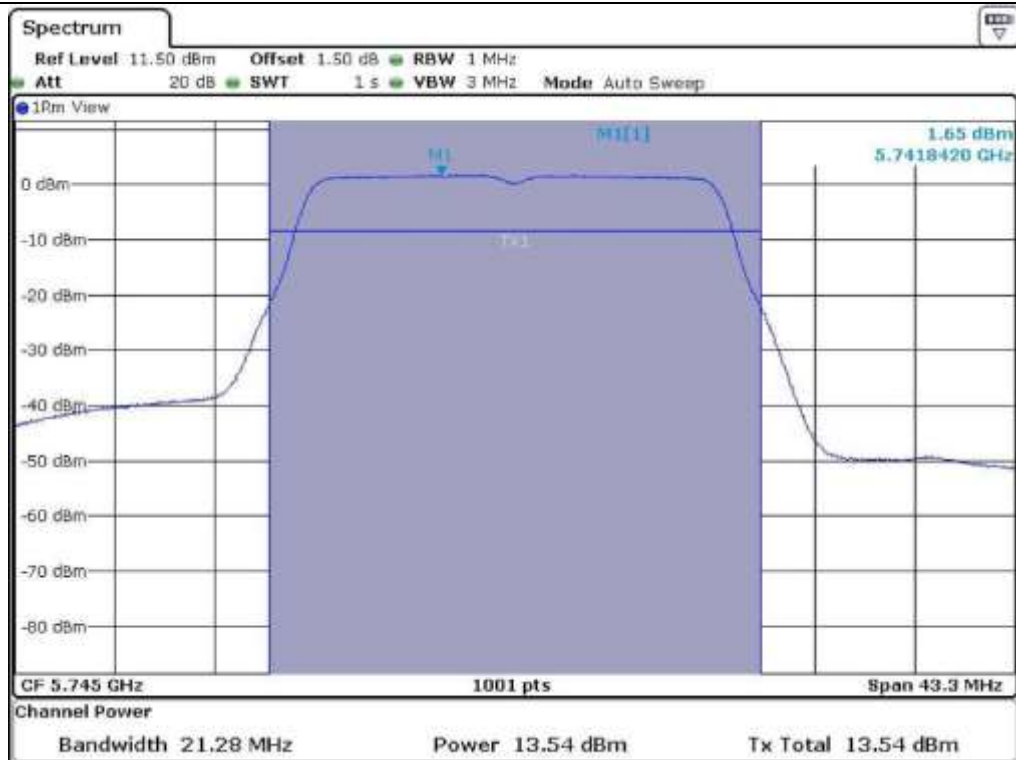
Low Channel @ 5 500 MHz (26 dB Bandwidth)



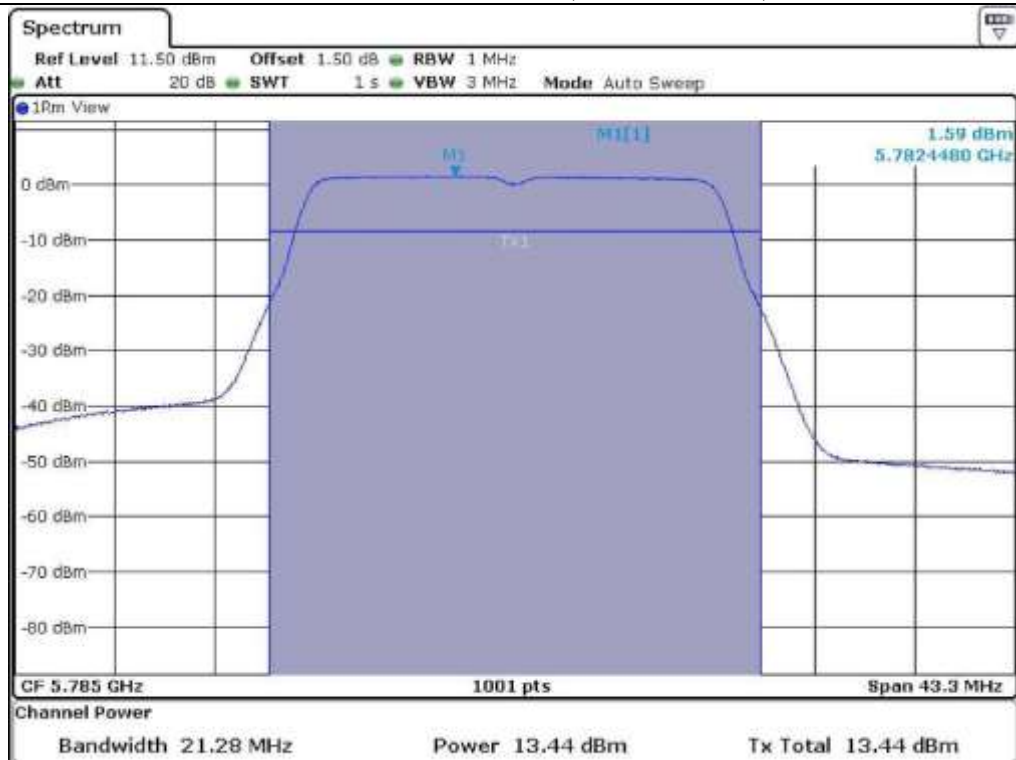
Middle Channel @ 5 600 MHz (26 dB Bandwidth)



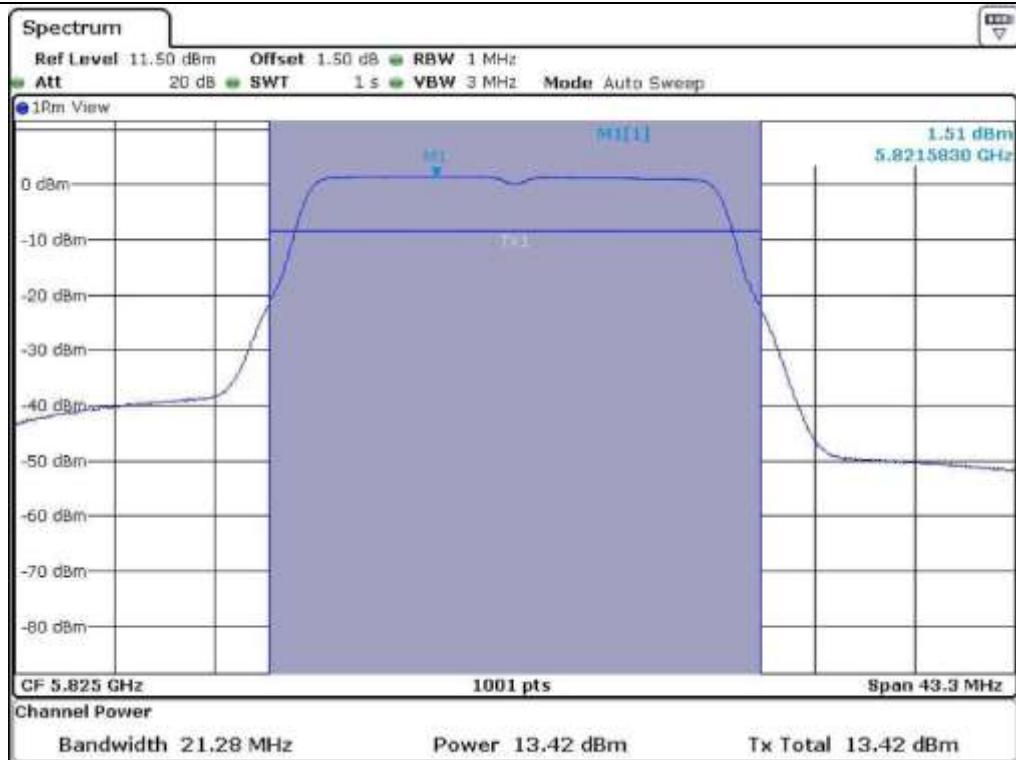
High Channel @ 5 700 MHz (26 dB Bandwidth)



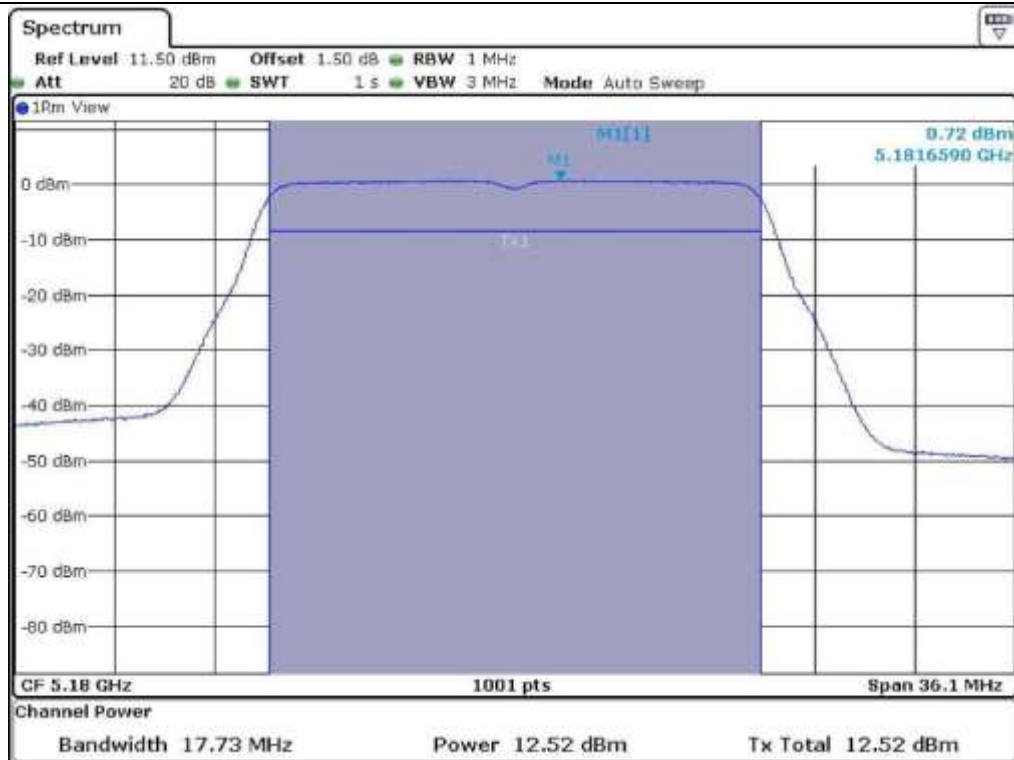
Low Channel @ 5.745 MHz (26 dB Bandwidth)



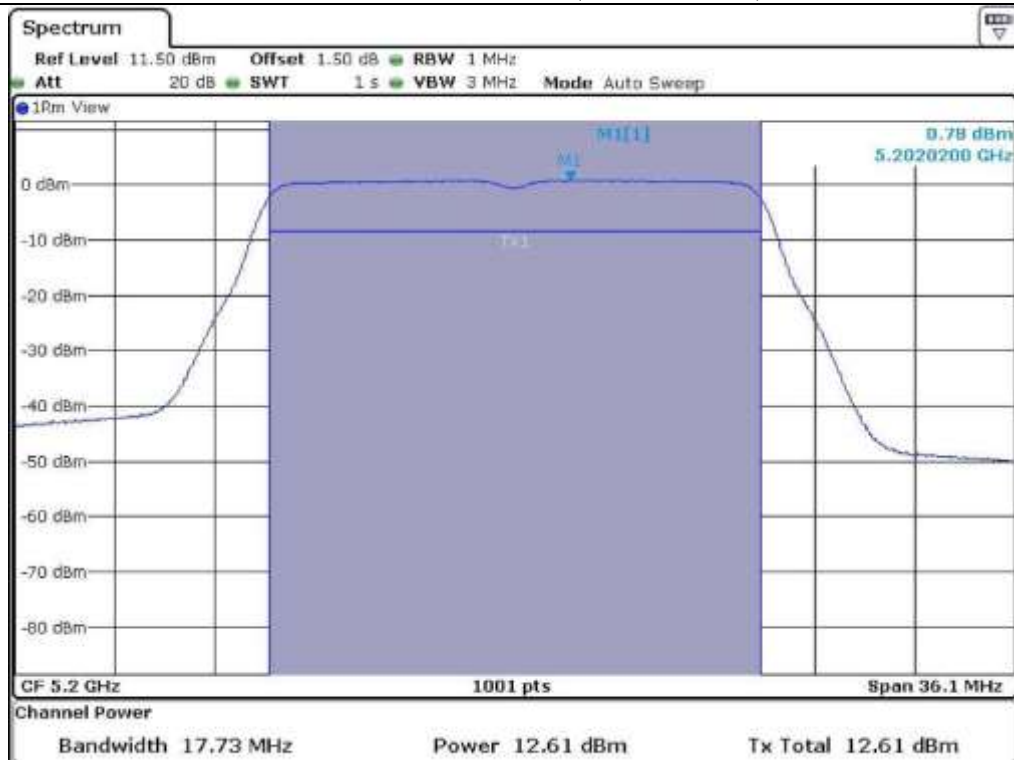
Middle Channel @ 5.785 MHz (26 dB Bandwidth)



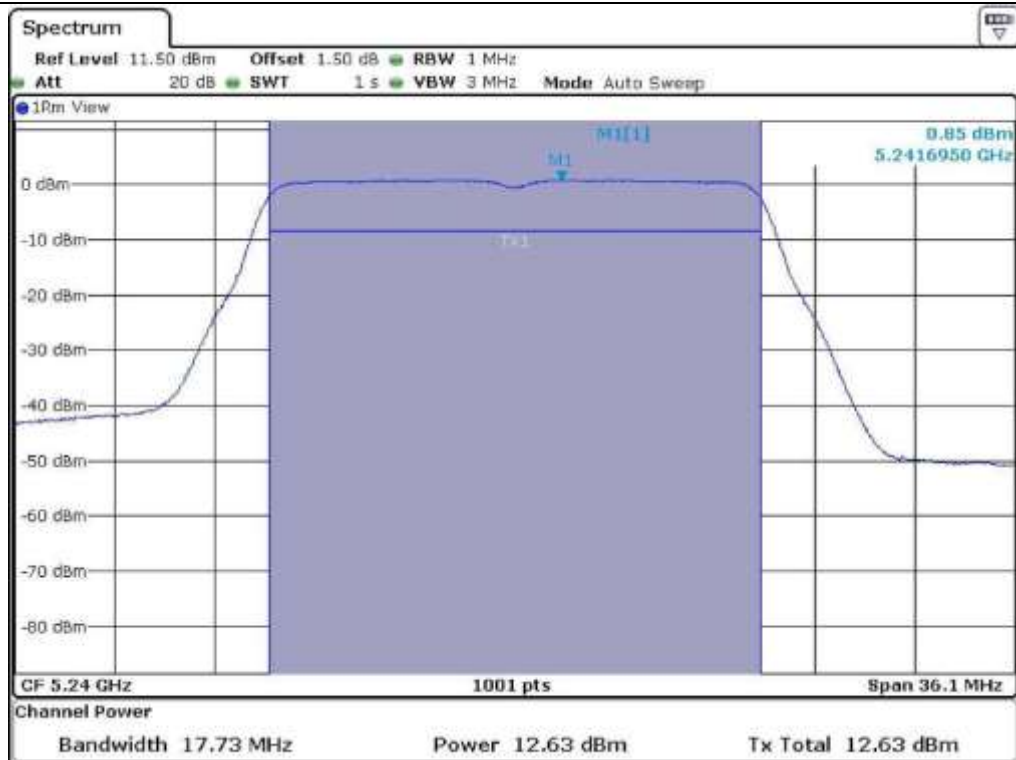
High Channel @ 5 825 MHz (26 dB Bandwidth)



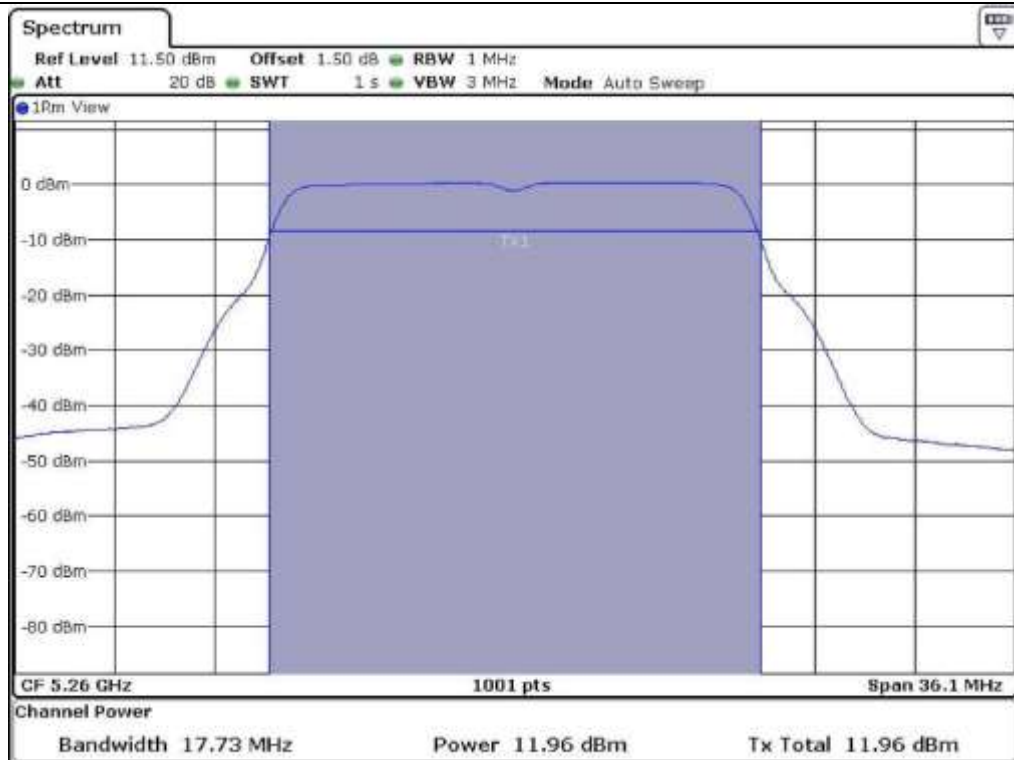
Low Channel @ 5 180 MHz (99 % bandwidth)



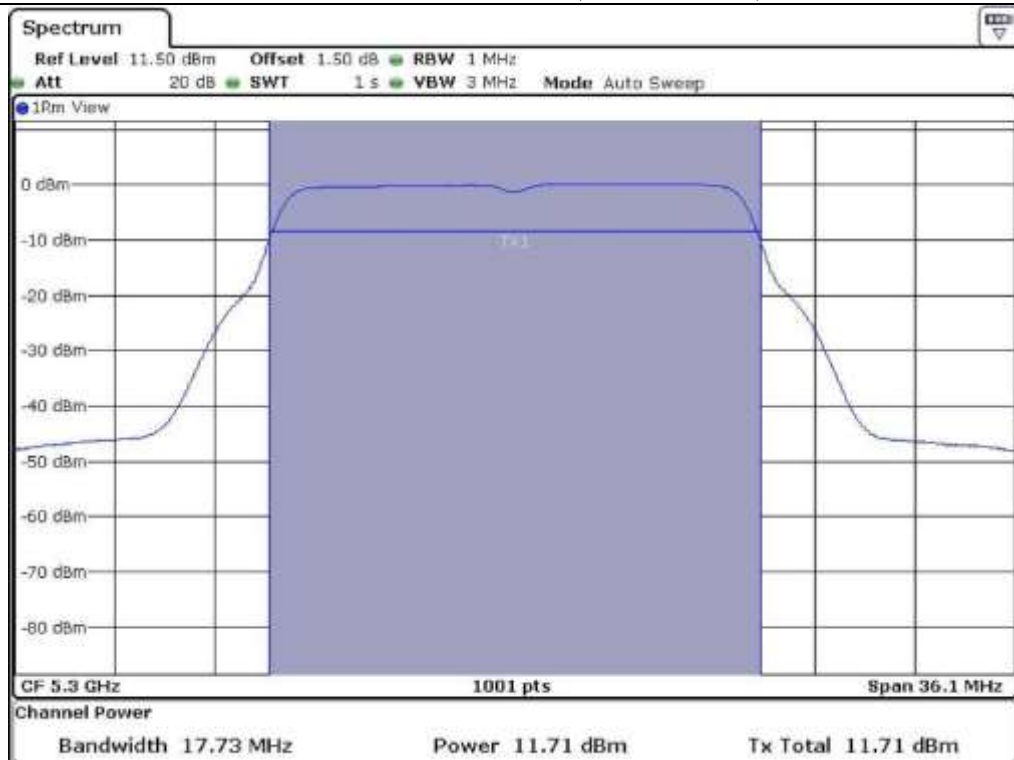
Middle Channel @ 5 200 MHz (99 % bandwidth)



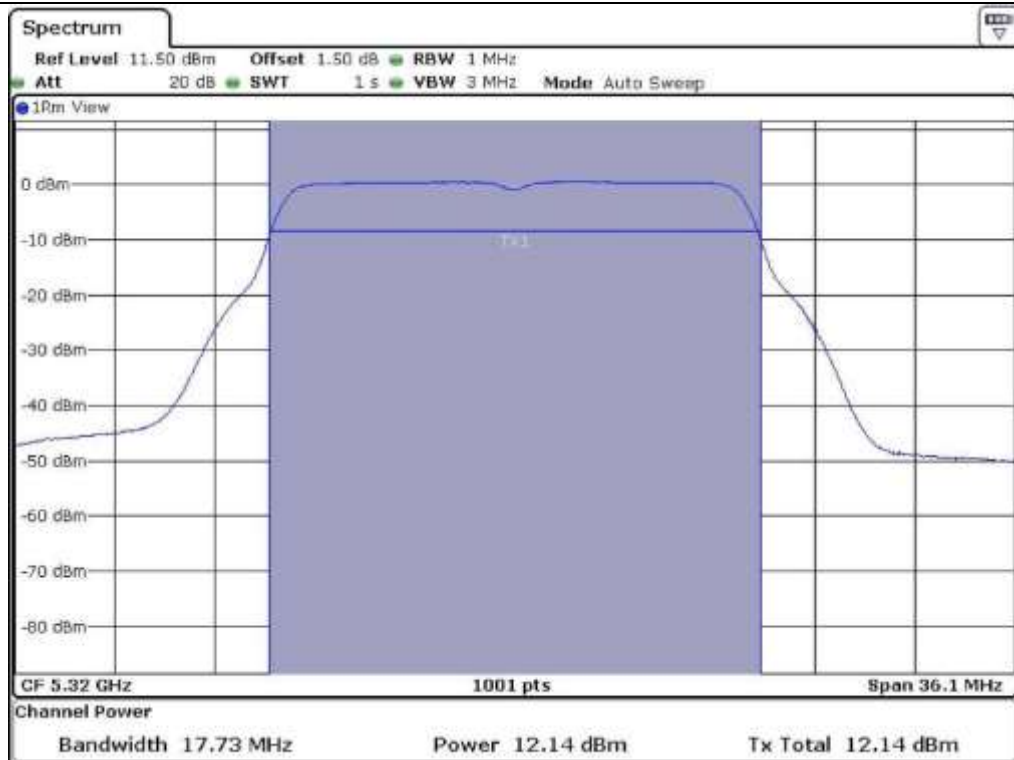
High Channel @ 5 240 MHz (99 % bandwidth)



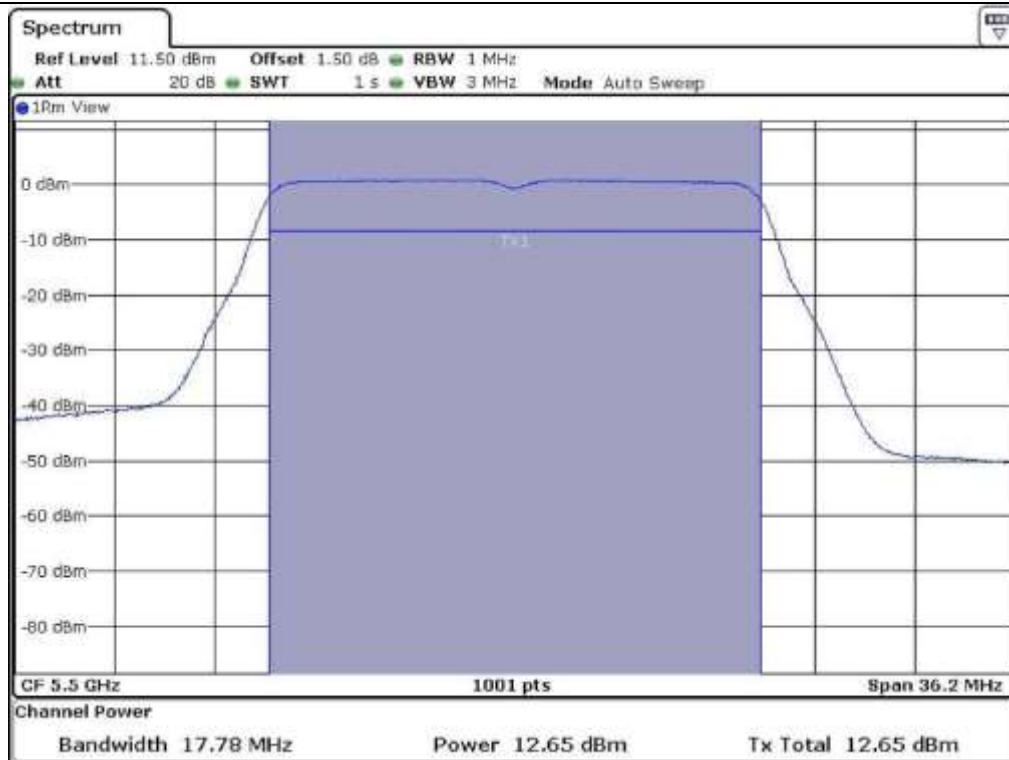
Low Channel @ 5 260 MHz (99 % bandwidth)



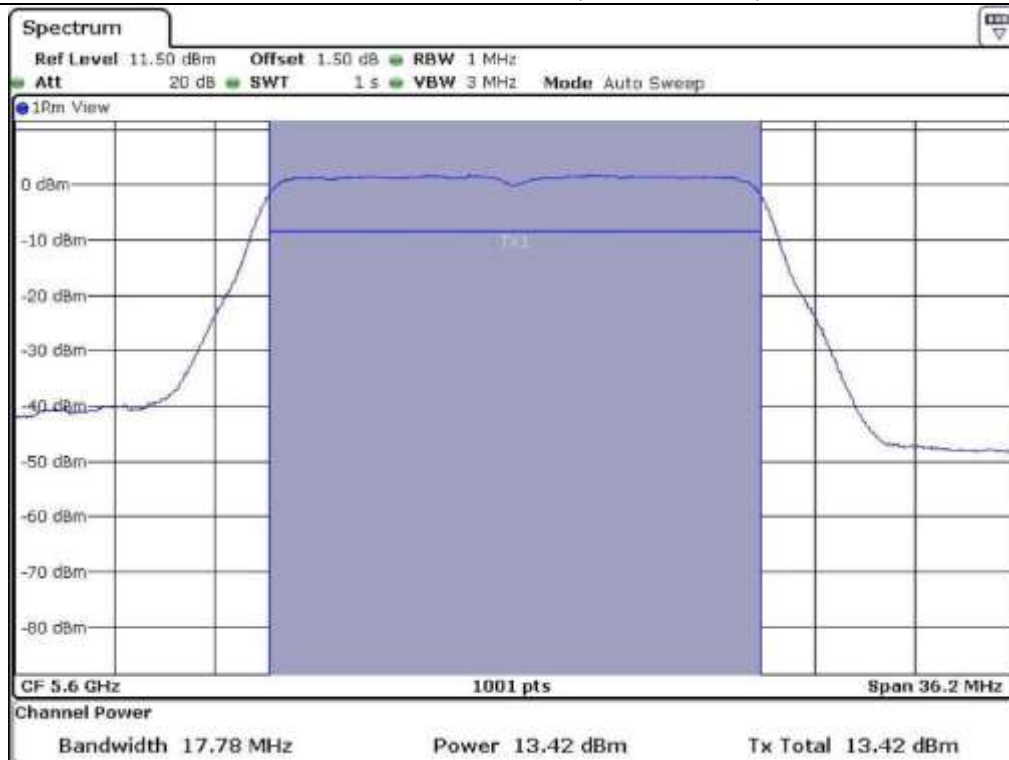
Middle Channel @ 5 300 MHz (99 % bandwidth)



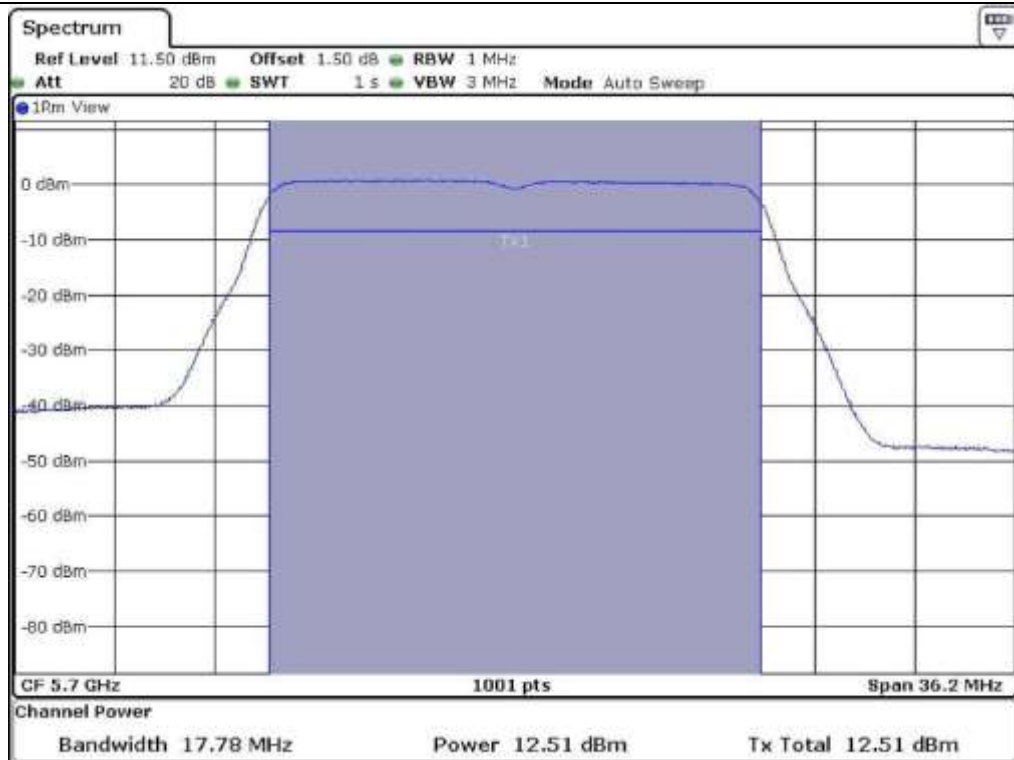
High Channel @ 5 320 MHz (99 % bandwidth)



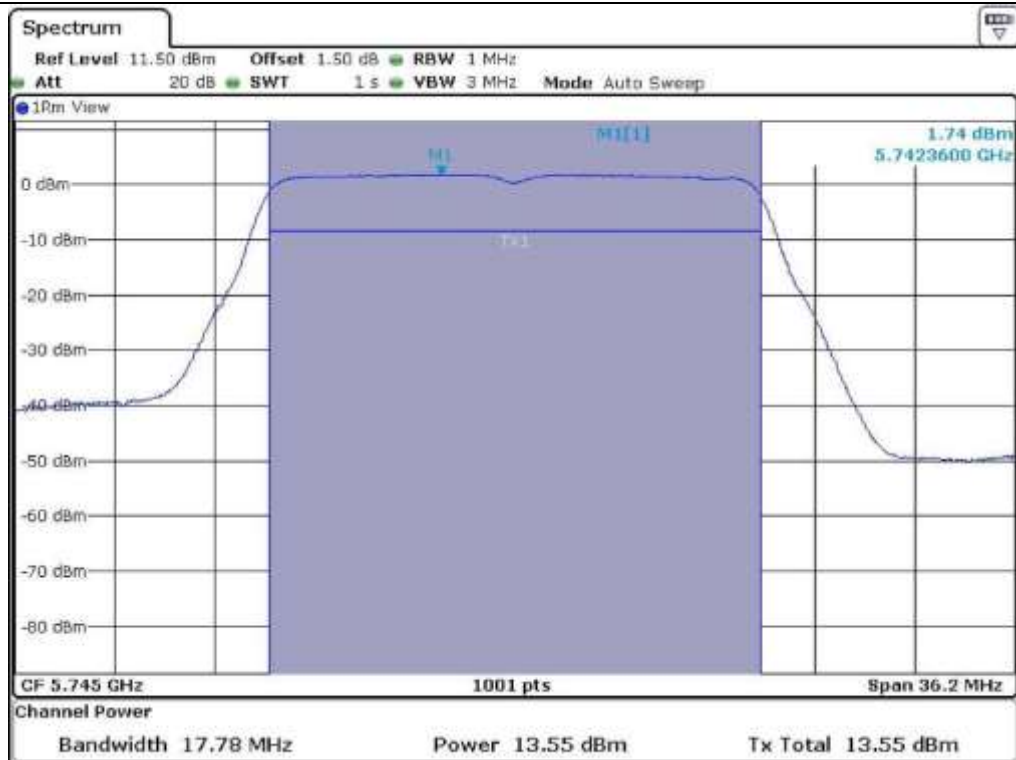
Low Channel @ 5 500 MHz (99 % bandwidth)



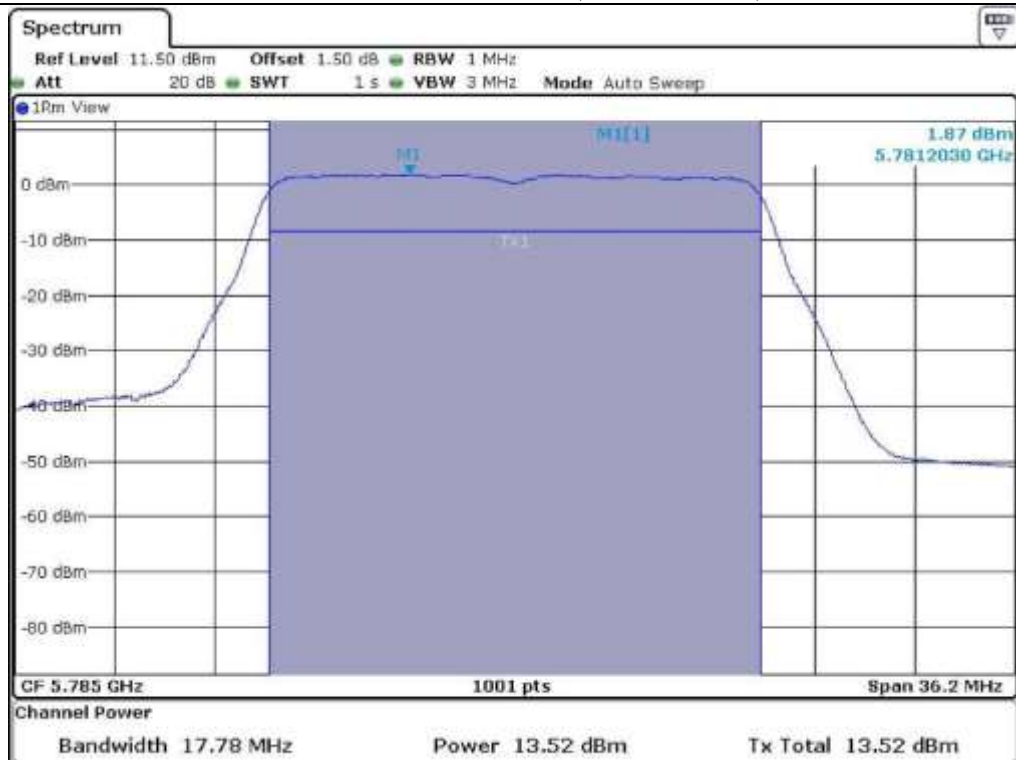
Middle Channel @ 5 600 MHz (99 % bandwidth)



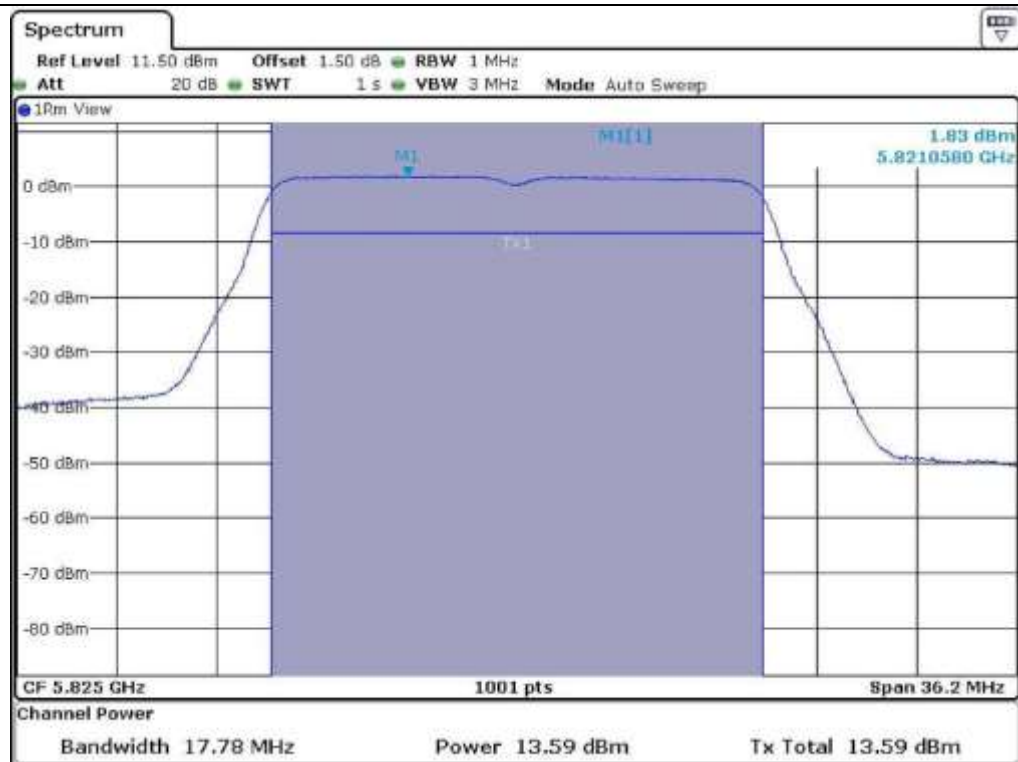
High Channel @ 5 700 MHz (99 % bandwidth)



Low Channel @ 5 745 MHz (99 % bandwidth)



Middle Channel @ 5 785 MHz (99 % bandwidth)



High Channel @ 5 825 MHz (99 % bandwidth)

8.7.3 Test data for Multiple transmit

-. Test Date : June 16, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	15.47	23.98	8.51
	Middle	5 200	15.45	23.98	8.53
	High	5 240	15.47	23.98	8.51
5 250 ~ 5 350	Low	5 260	15.80	23.98	8.18
	Middle	5 300	15.33	23.98	8.65
	High	5 320	15.62	23.98	8.36
5 470 ~ 5 725	Low	5 500	16.09	23.98	7.89
	Middle	5 600	16.68	23.98	7.30
	High	5 700	16.02	23.98	7.96
5 725 ~ 5 850	Low	5 745	16.17	30.00	13.83
	Middle	5 785	16.08	30.00	13.92
	High	5 825	15.90	30.00	14.10

Remark 1 : Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Remark 2 : Calculated Output Power= $10\log(10^{(\text{Antenna1 Output Power}/10)} + 10^{(\text{Antenna2 Output Power}/10)})$

-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Low	5 180	5.91	15.29	23.00	1.80	21.20
	Middle	5 200		15.27	23.00	1.82	21.18
	High	5 240		15.34	23.00	1.75	21.25
5 250 ~ 5 350	Low	5 260		15.67	30.00	8.42	21.58
	Middle	5 300		15.41	30.00	8.68	21.32
	High	5 320		15.53	30.00	8.56	21.44
5 470 ~ 5 725	Low	5 500		16.05	30.00	8.04	21.96
	Middle	5 600		16.64	30.00	7.45	22.55
	High	5 700		15.87	30.00	8.22	21.78
5 725 ~ 5 825	Low	5 745		16.18	36.00	13.91	22.09
	Middle	5 785		16.05	36.00	14.04	21.96
	High	5 825		15.94	36.00	14.15	21.85

Remark 1 : Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Remark 2 :Calculated Output Power= $10\log (10^{(\text{Antenna1 Output Power}/10)}+10^{(\text{Antenna2 Output Power}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

8.8 Test data for 802.11ac_HT40 RLAN Mode

8.8.1 Test data for Antenna 0

-. Test Date : June 17, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	38.96	12.53	23.98	11.45
	High	5 230	38.96	12.65	23.98	11.33
5 250 ~ 5 350	Low	5 270	38.86	13.82	23.98	10.16
	High	5 310	38.86	13.71	23.98	10.27
5 470 ~ 5 725	Low	5 510	38.86	14.19	23.98	9.79
	Middle	5 590	38.86	14.34	23.98	9.64
	High	5 670	38.86	14.03	23.98	9.95
5 725 ~ 5 850	Low	5 755	38.96	13.24	30.00	16.76
	High	5 795	38.96	13.02	30.00	16.98

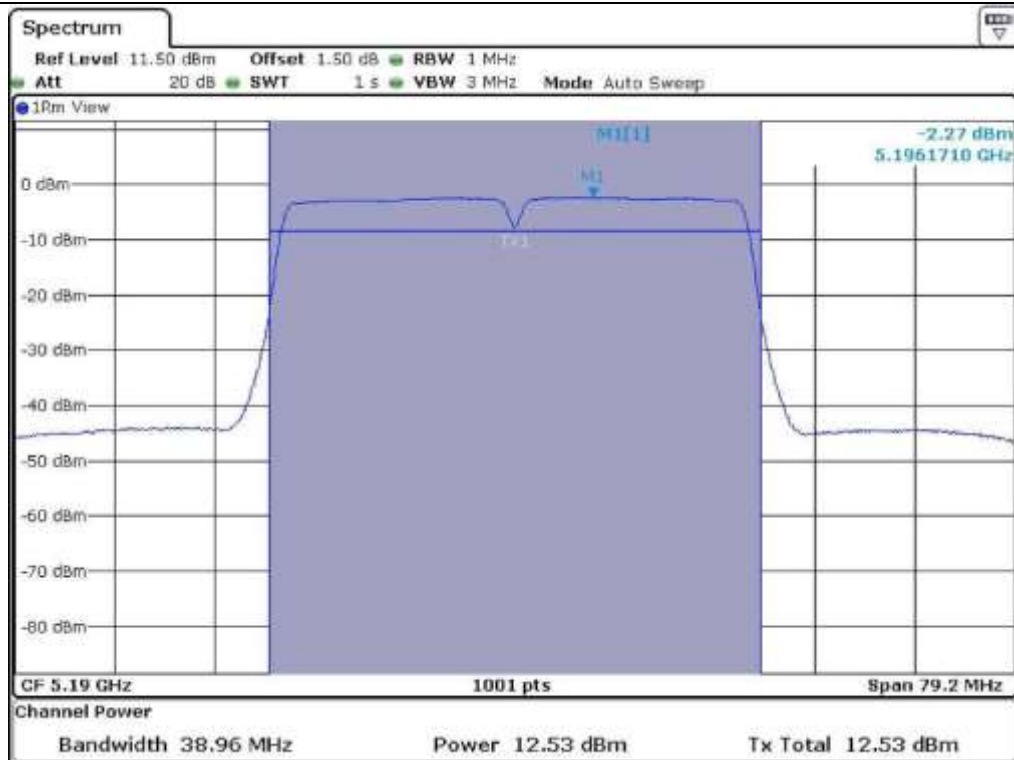
-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Low	5 190	2.90	36.16	12.39	23.00	7.71	15.29
	High	5 230		36.16	12.57	23.00	7.53	15.47
5 250 ~ 5 350	Low	5 270		36.16	13.79	30.00	13.31	16.69
	High	5 310		36.16	13.64	30.00	13.46	16.54
5 470 ~ 5 725	Low	5 510		36.26	14.24	30.00	26.90	12.86
	Middle	5 590		36.26	14.26	30.00	26.90	12.84
	High	5 670		36.26	13.94	30.00	26.90	13.16
5 725 ~ 5 825	Low	5 755		36.16	13.26	36.00	19.84	16.16
	High	5 795		36.16	12.98	36.00	20.12	15.88

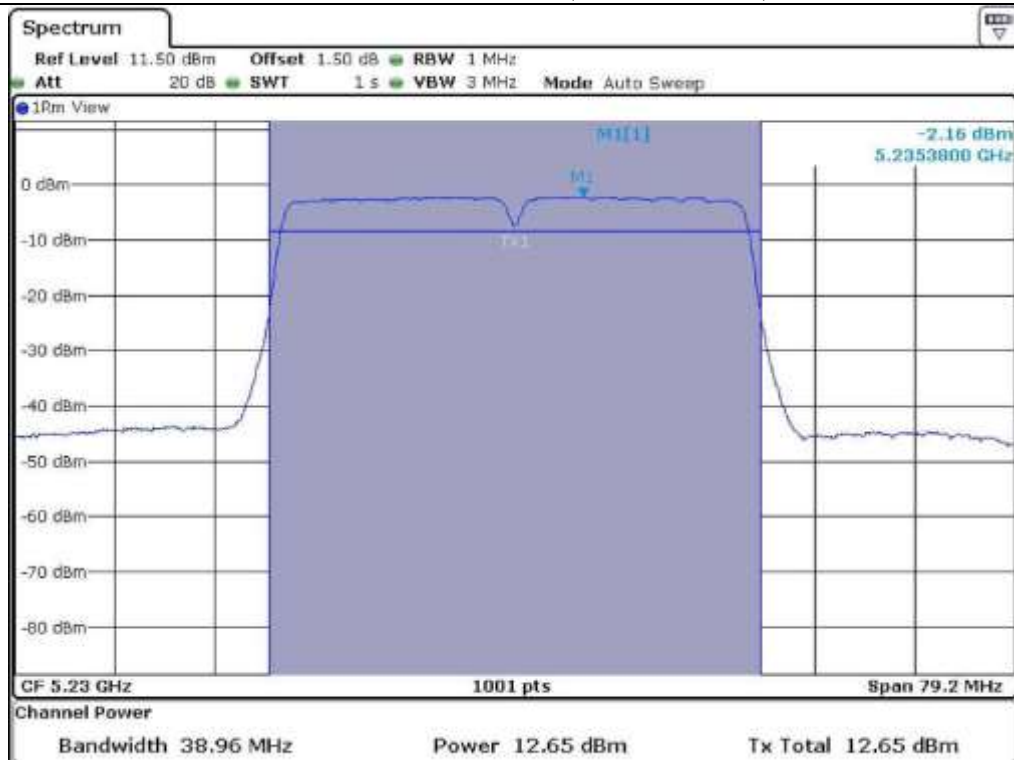
Remark: See next page for measurement data.



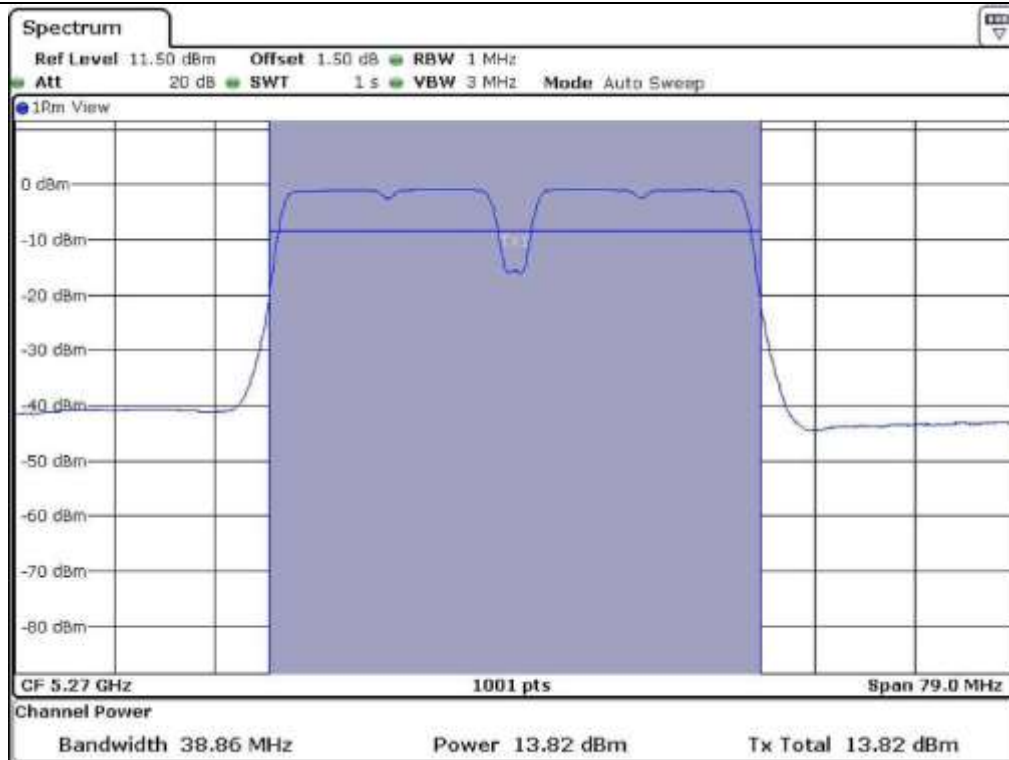
Tested by: Tae-Ho, Kim / Senior Engineer



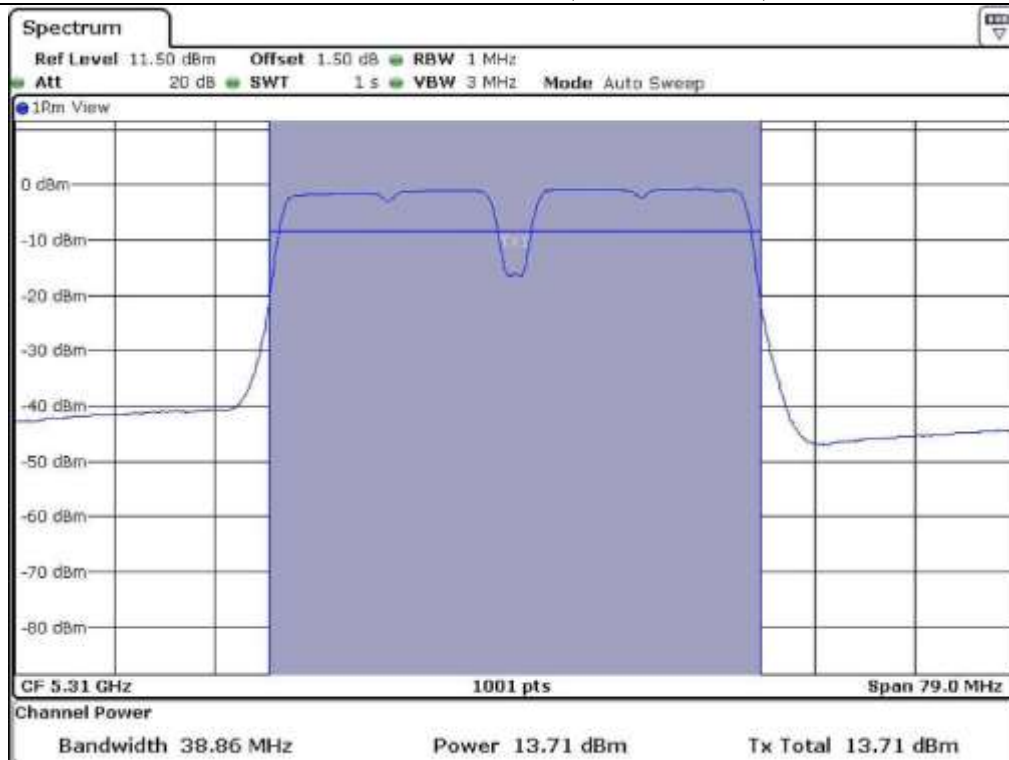
Low Channel @ 5 190 MHz (26 dB Bandwidth)



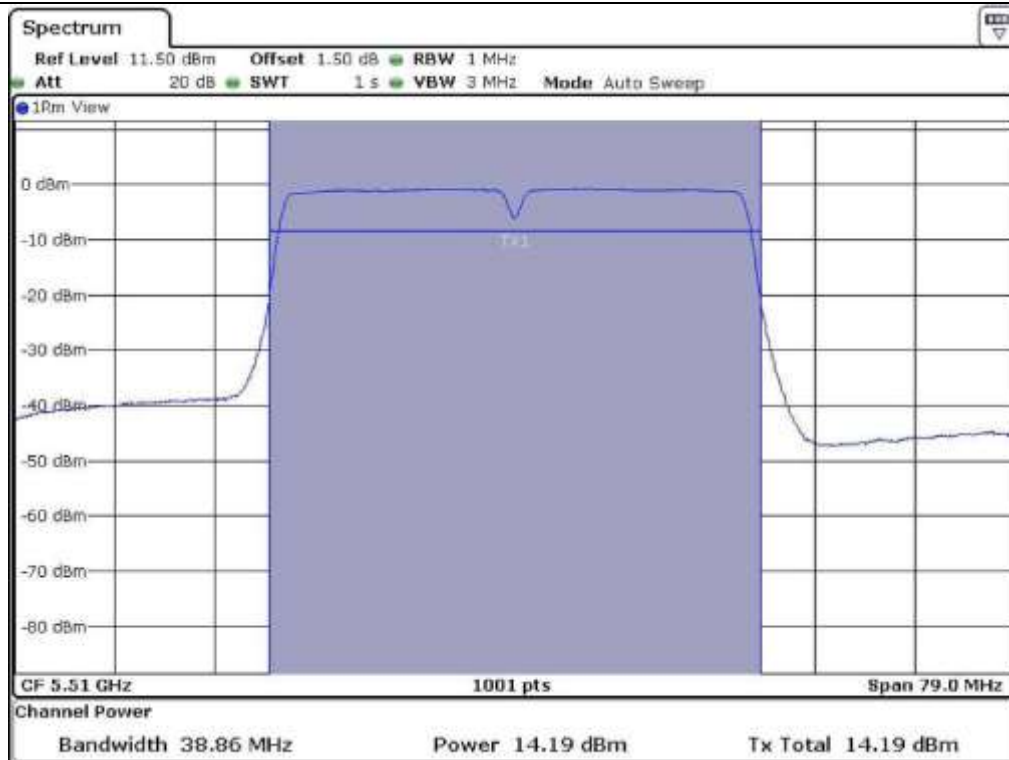
High Channel @ 5 230 MHz (26 dB Bandwidth)



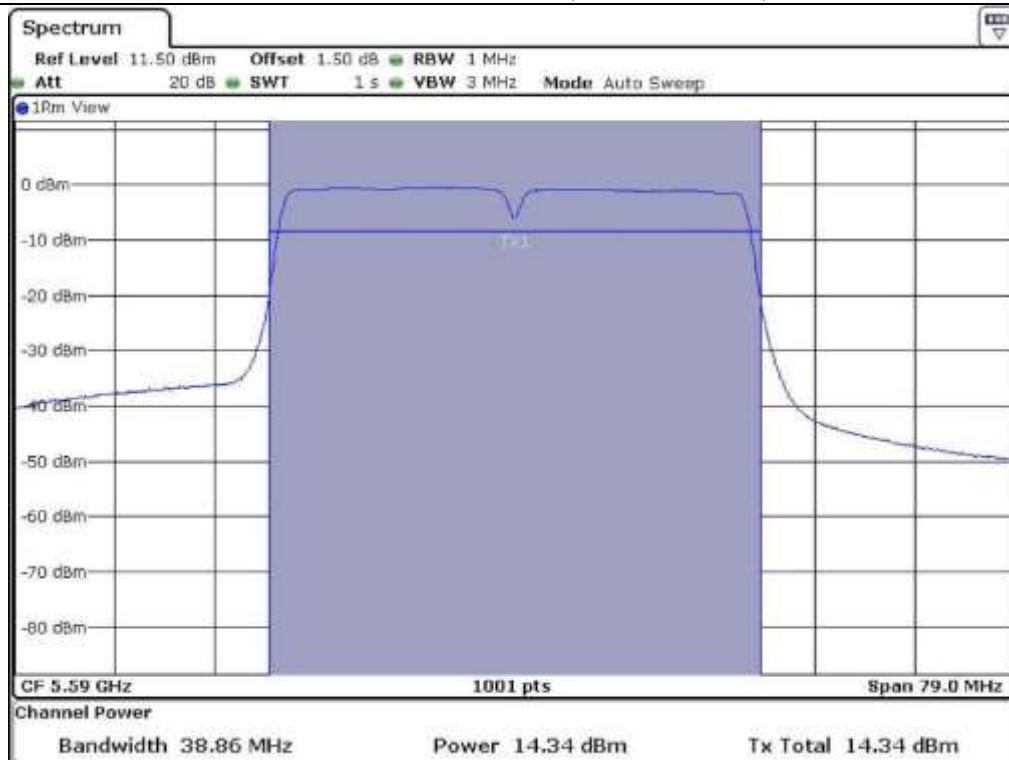
Low Channel @ 5 270 MHz (26 dB Bandwidth)



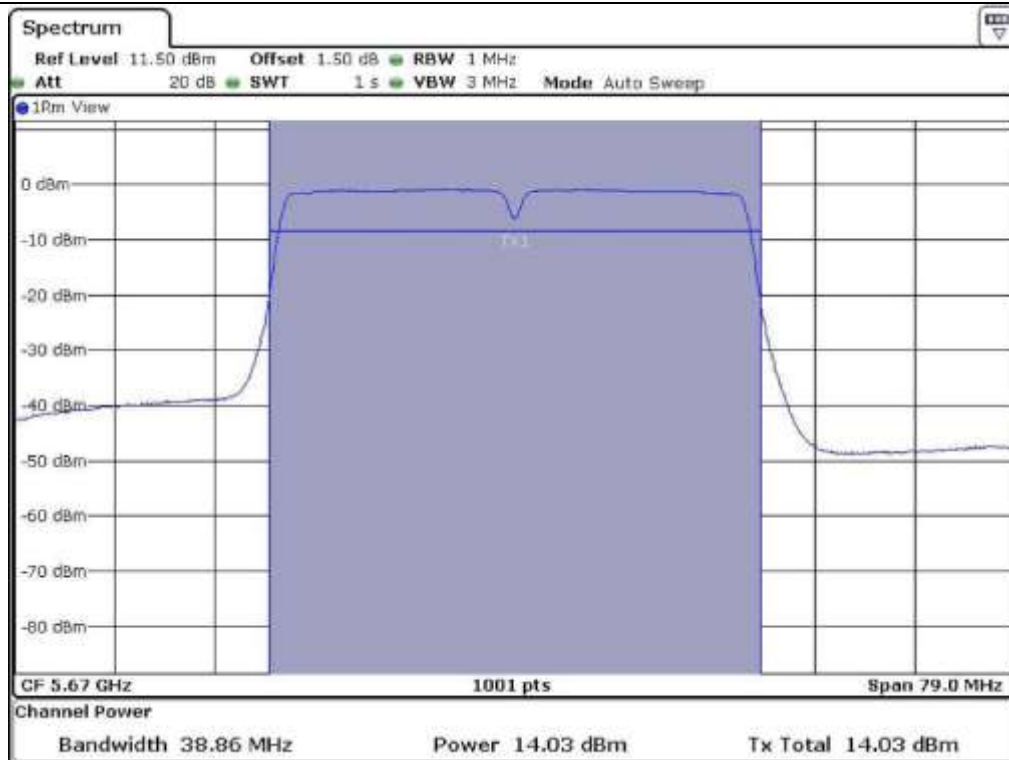
High Channel @ 5 310 MHz (26 dB Bandwidth)



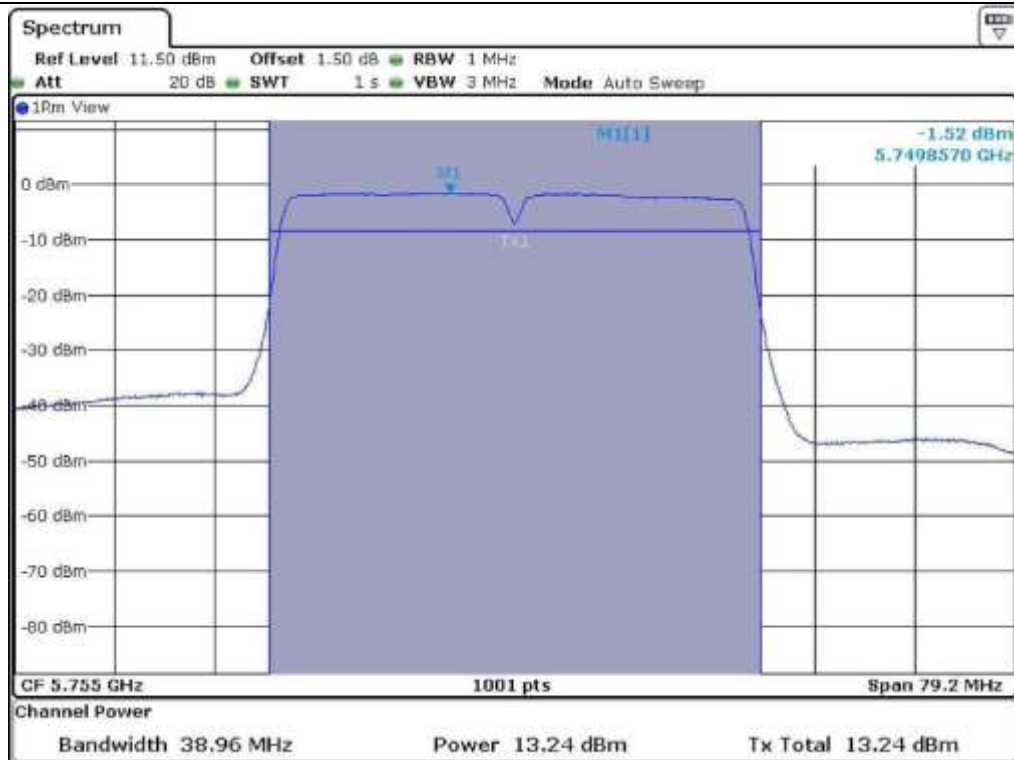
Low Channel @ 5.510 MHz (26 dB Bandwidth)



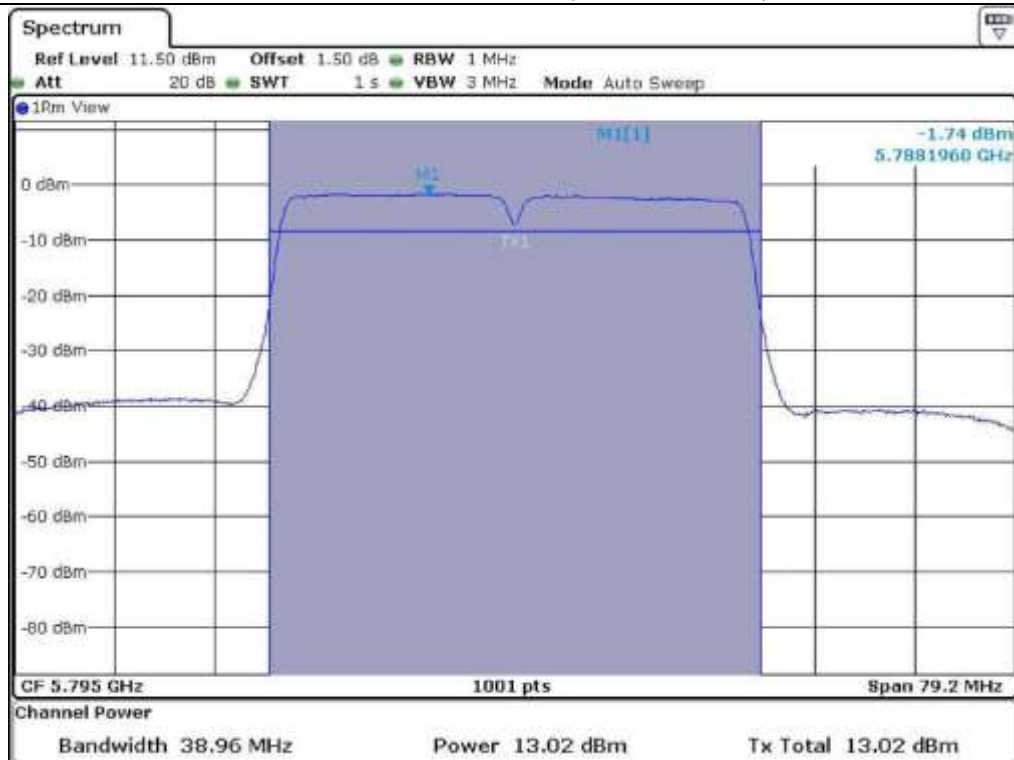
Middle Channel @ 5.590 MHz (26 dB Bandwidth)



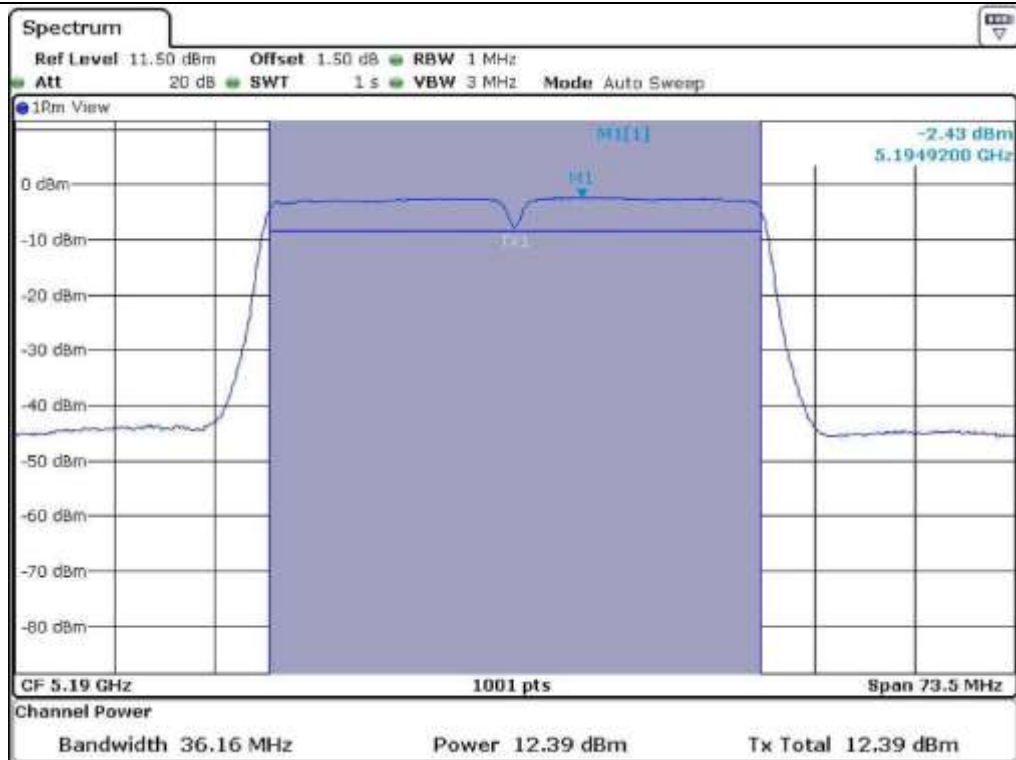
High Channel @ 5 670 MHz (26 dB Bandwidth)



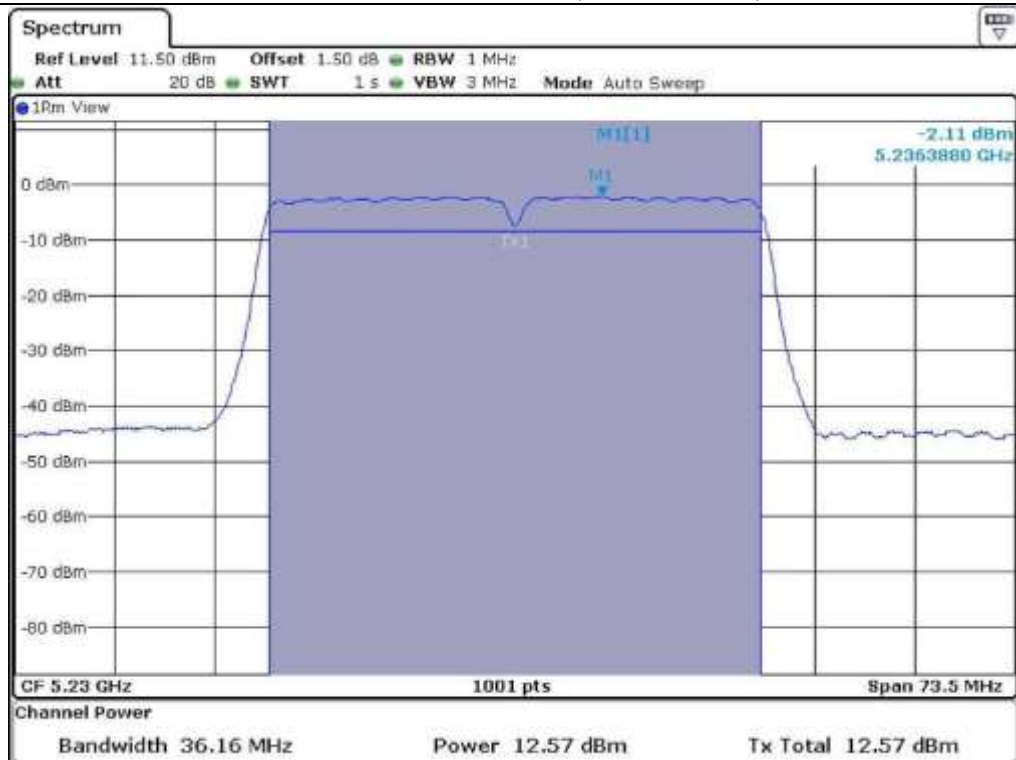
Low Channel @ 5.755 MHz (26 dB Bandwidth)



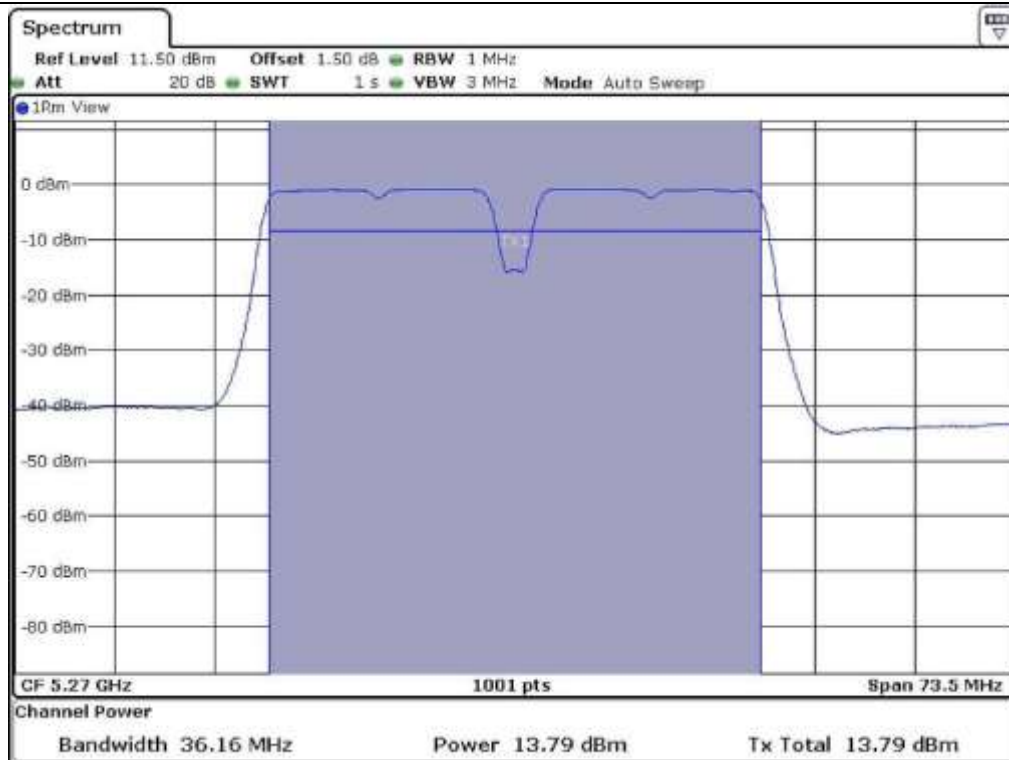
High Channel @ 5.795 MHz (26 dB Bandwidth)



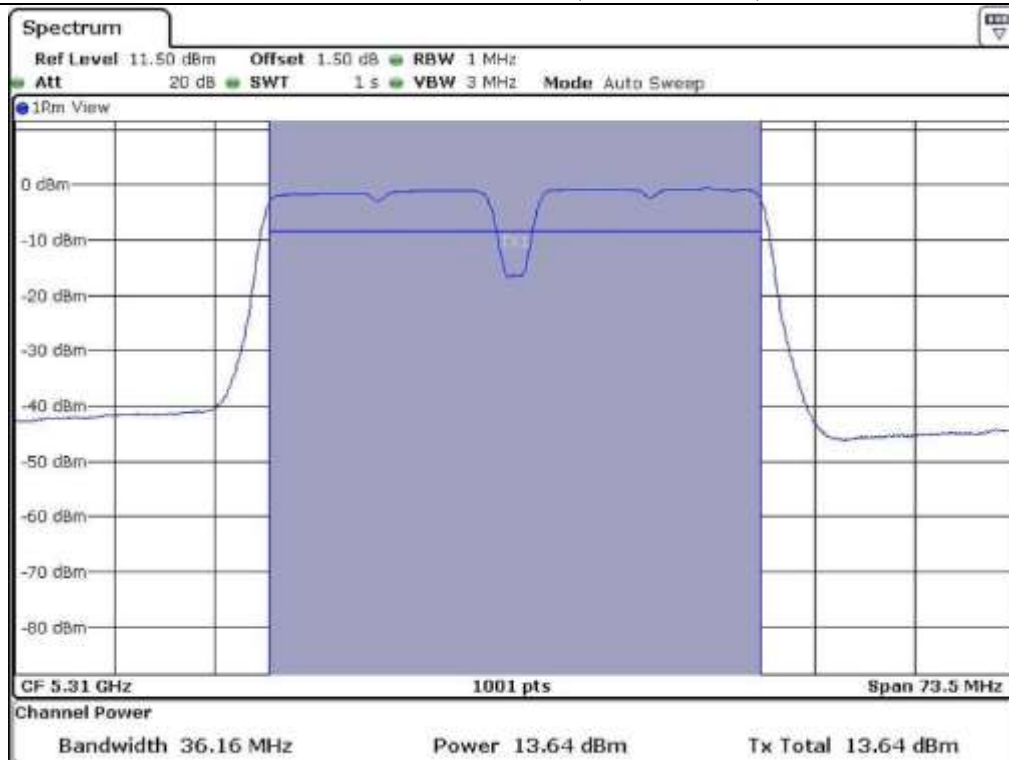
Low Channel @ 5 190 MHz (99 % bandwidth)



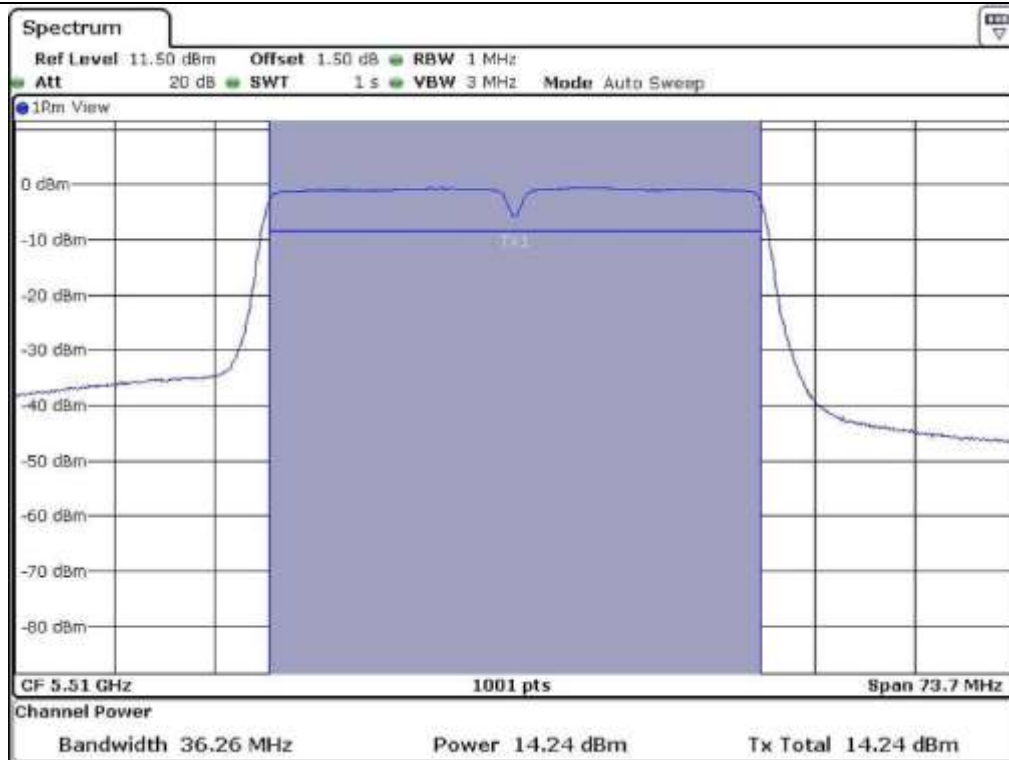
High Channel @ 5 230 MHz (99 % bandwidth)



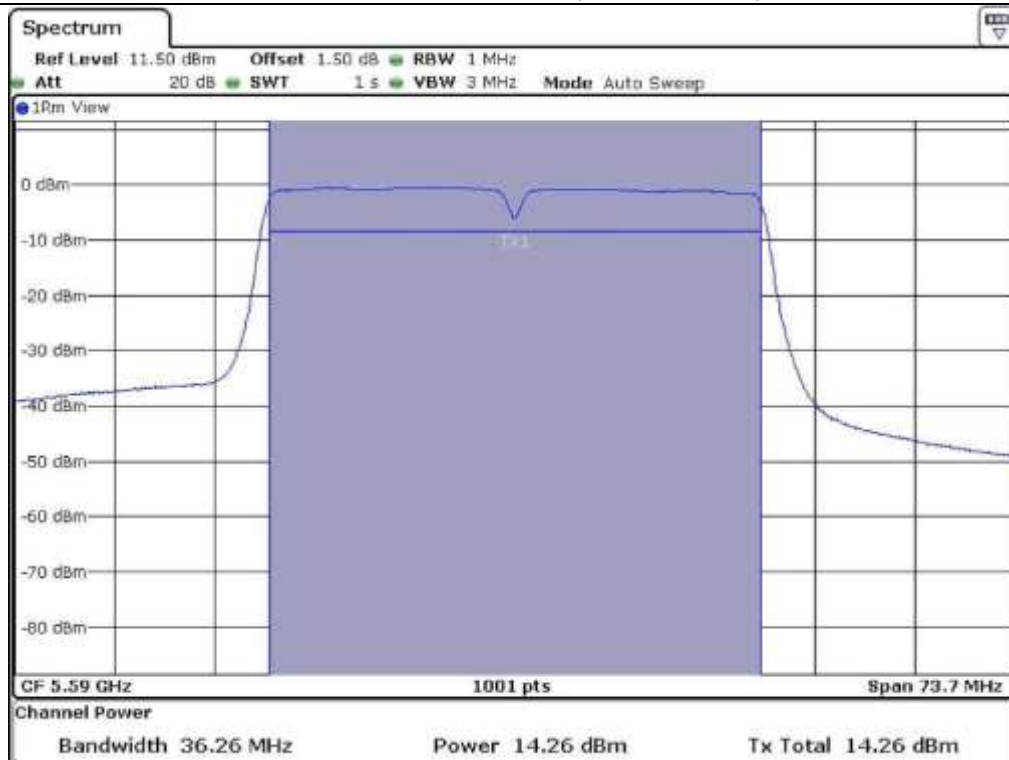
Low Channel @ 5 270 MHz (99 % bandwidth)



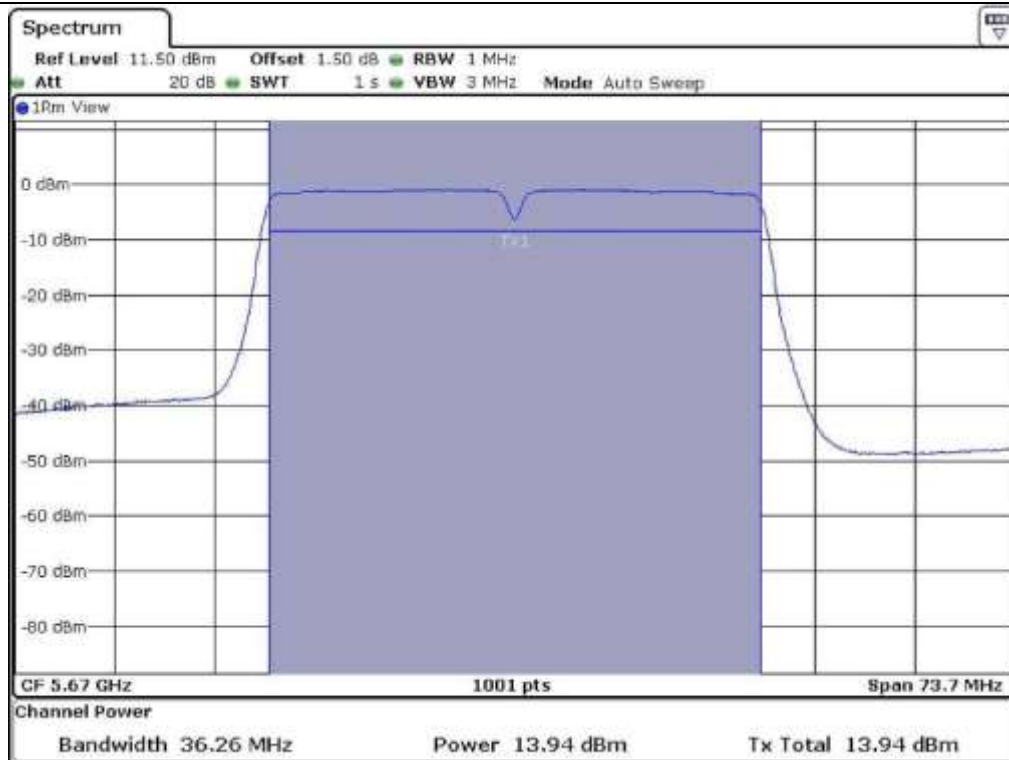
High Channel @ 5 310 MHz (99 % bandwidth)



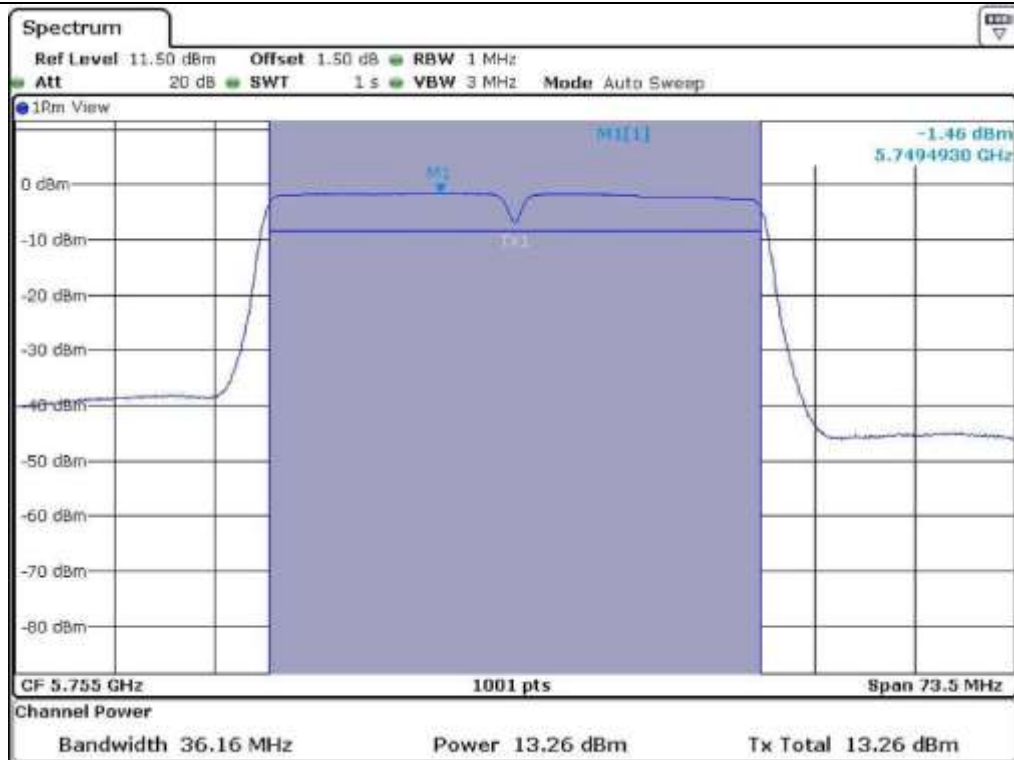
Low Channel @ 5 510 MHz (99 % bandwidth)



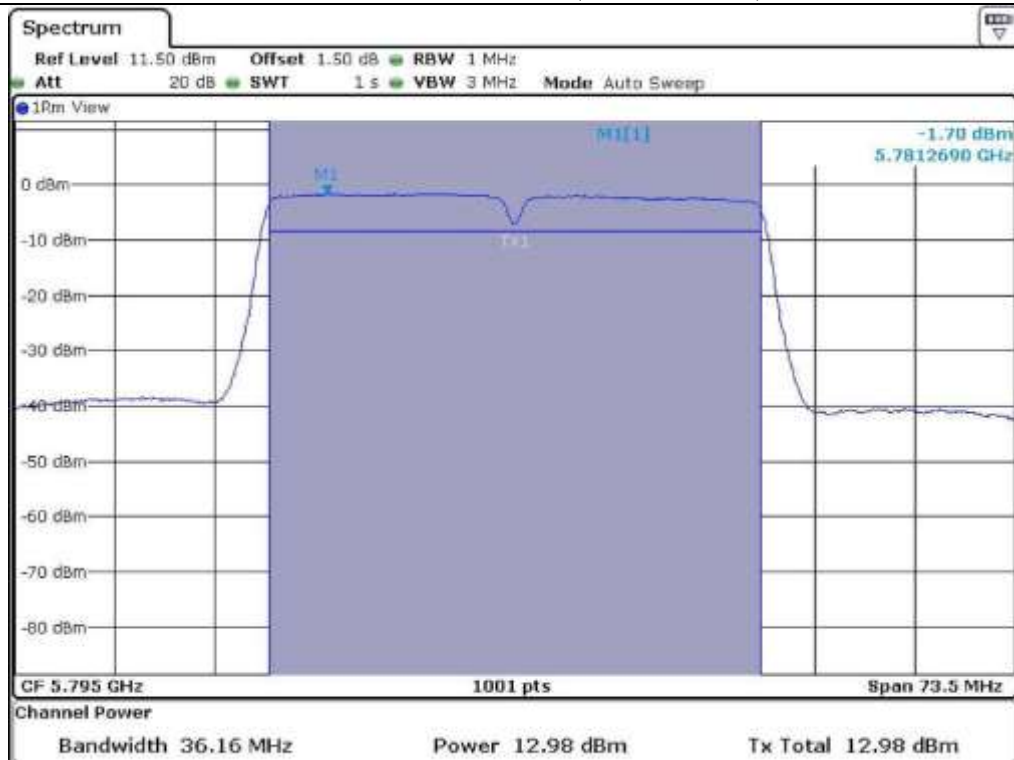
Middle Channel @ 5 590 MHz (99 % bandwidth)



High Channel @ 5 670 MHz (99 % bandwidth)



Low Channel @ 5 755 MHz (99 % bandwidth)



High Channel @ 5 795 MHz (99 % bandwidth)

8.8.2 Test data for Antenna 1

-. Test Date : June 17, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	38.96	13.28	23.98	10.70
	High	5 230	38.96	13.37	23.98	10.61
5 250 ~ 5 350	Low	5 270	38.86	12.35	23.98	11.63
	High	5 310	38.86	12.73	23.98	11.25
5 470 ~ 5 725	Low	5 510	38.86	13.23	23.98	10.75
	Middle	5 590	38.86	13.79	23.98	10.19
	High	5 670	38.86	13.19	23.98	10.79
5 725 ~ 5 850	Low	5 755	38.96	14.22	30.00	15.78
	High	5 795	38.96	14.04	30.00	15.96

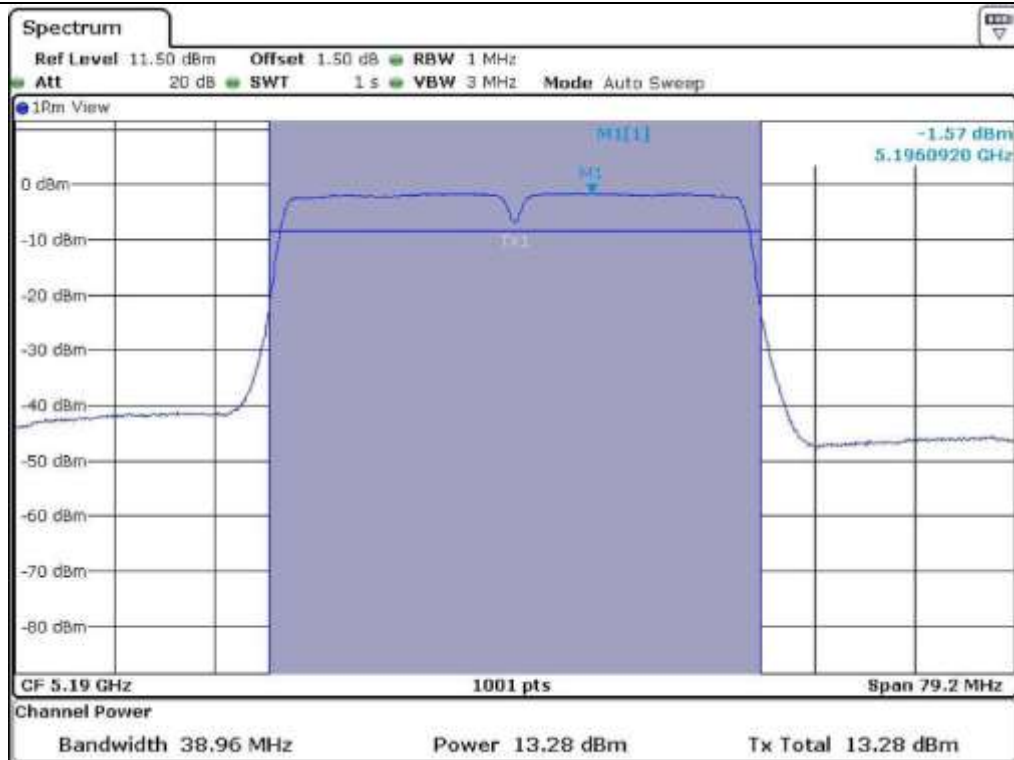
-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Low	5 190	2.90	36.16	13.37	23.00	6.73	16.27
	High	5 230		36.16	13.33	23.00	6.77	16.23
5 250 ~ 5 350	Low	5 270		36.16	12.56	30.00	14.54	15.46
	High	5 310		36.16	12.57	30.00	14.53	15.47
5 470 ~ 5 725	Low	5 510		36.26	13.05	30.00	26.90	14.05
	Middle	5 590		36.26	13.67	30.00	26.90	13.43
	High	5 670		36.26	13.11	30.00	26.90	13.99
5 725 ~ 5 825	Low	5 755		36.16	13.89	36.00	19.21	16.79
	High	5 795		36.16	13.90	36.00	19.20	16.80

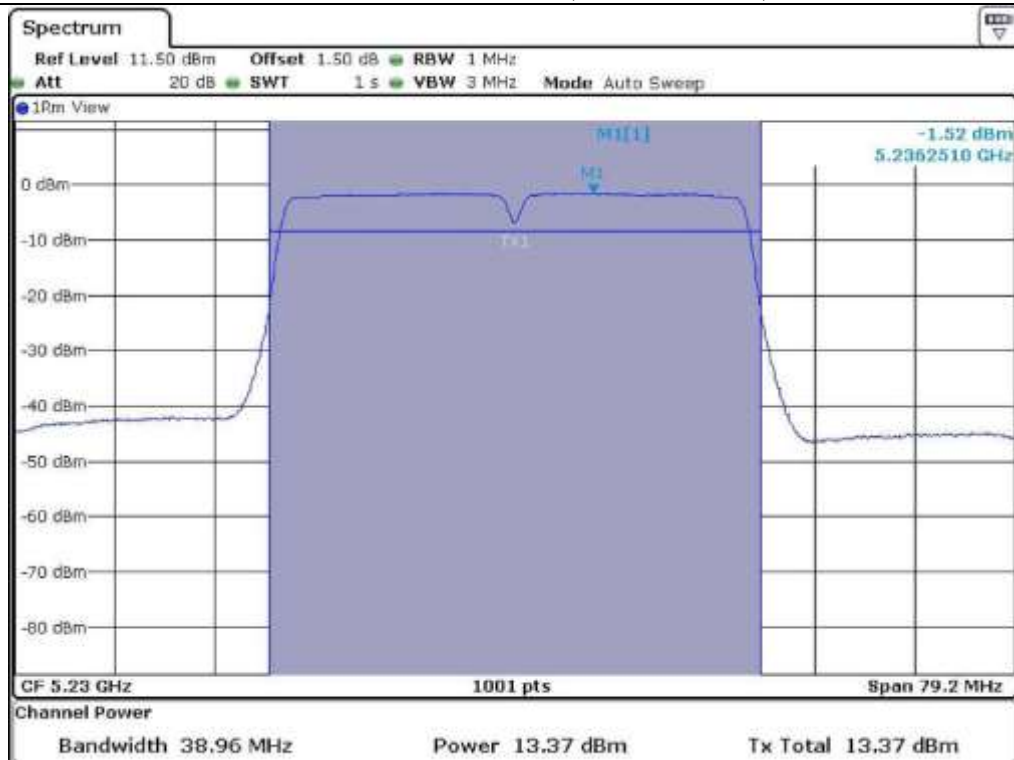
Remark: See next page for measurement data.



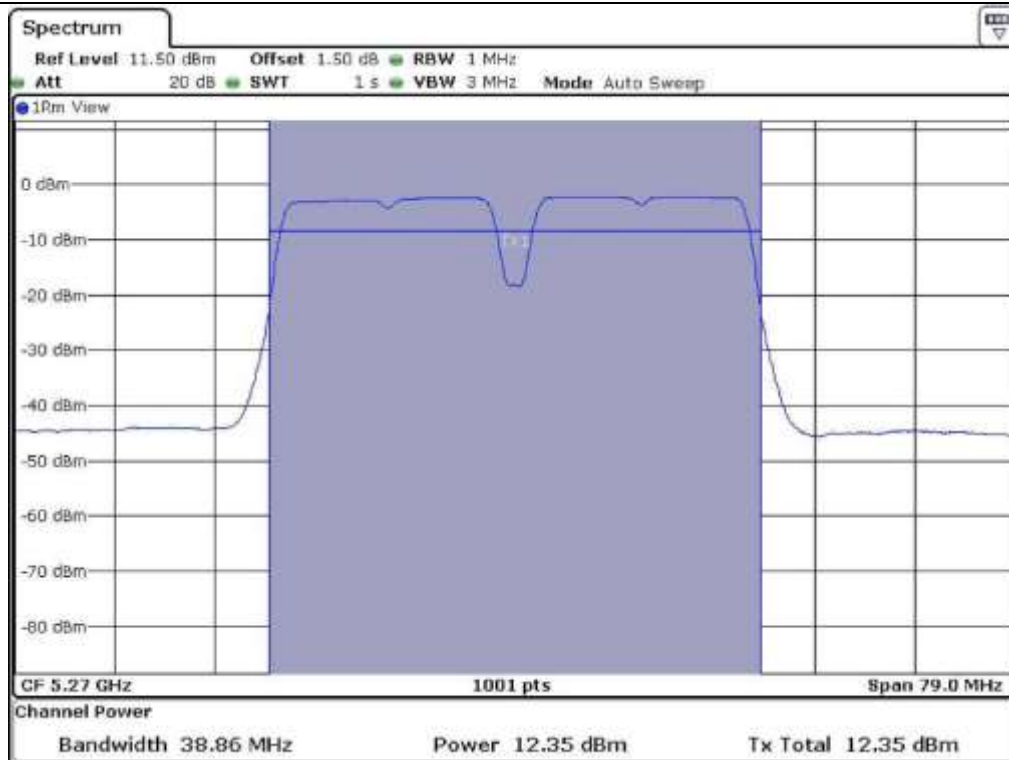
Tested by: Tae-Ho, Kim / Senior Engineer



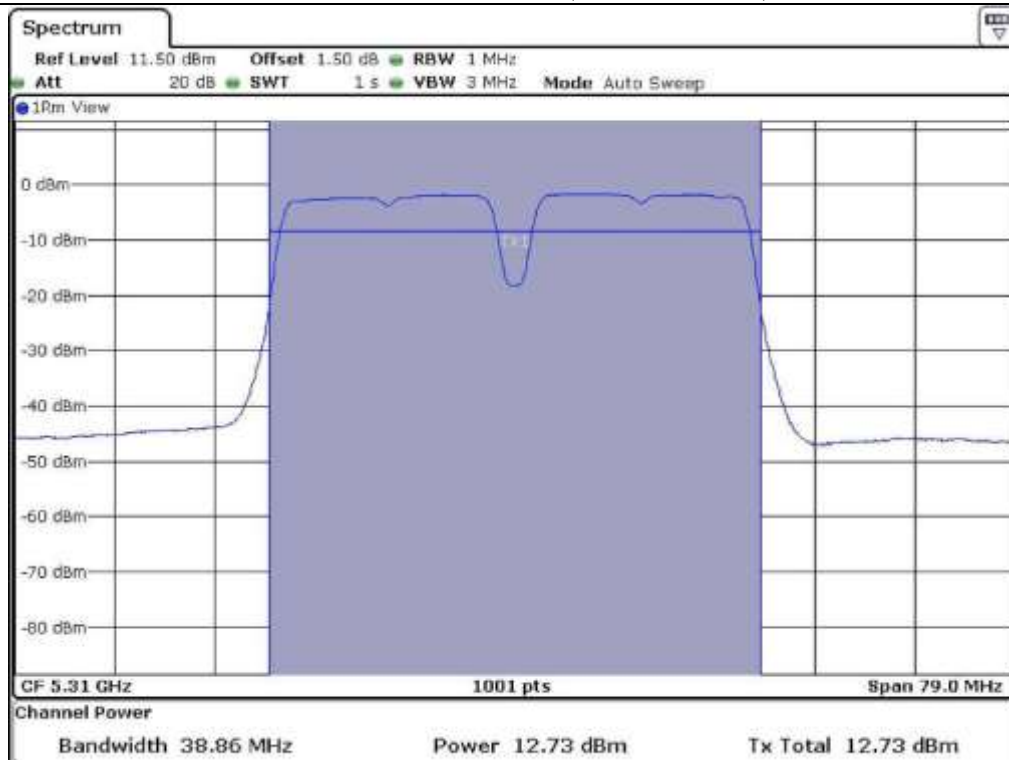
Low Channel @ 5 190 MHz (26 dB Bandwidth)



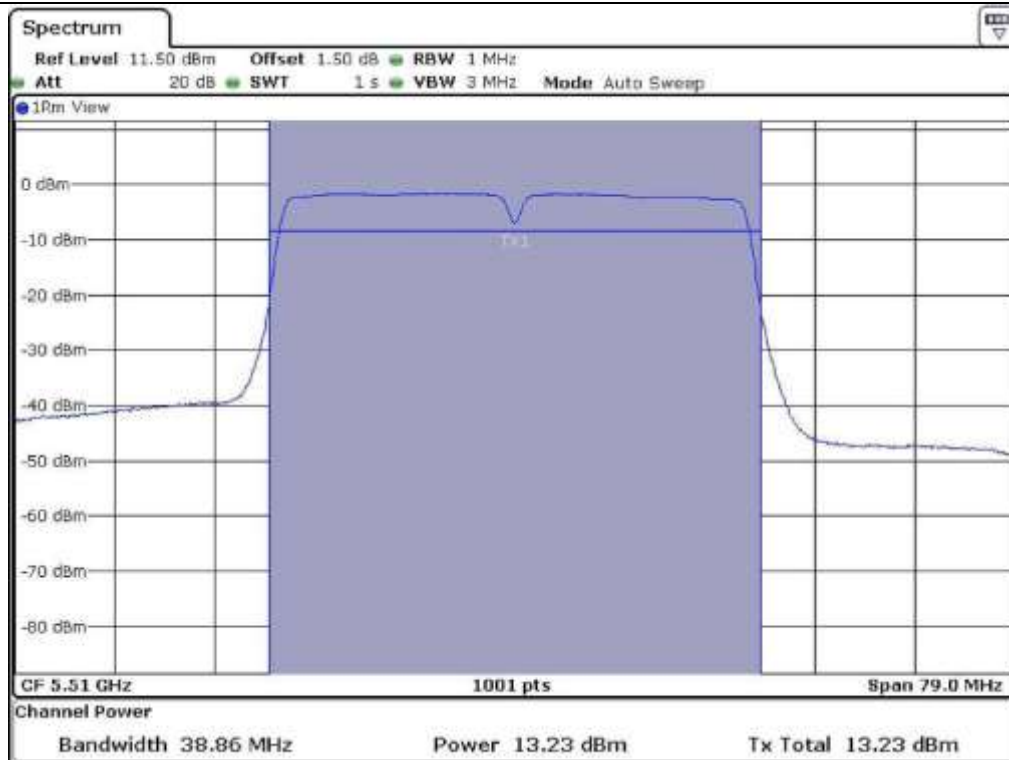
High Channel @ 5 230 MHz (26 dB Bandwidth)



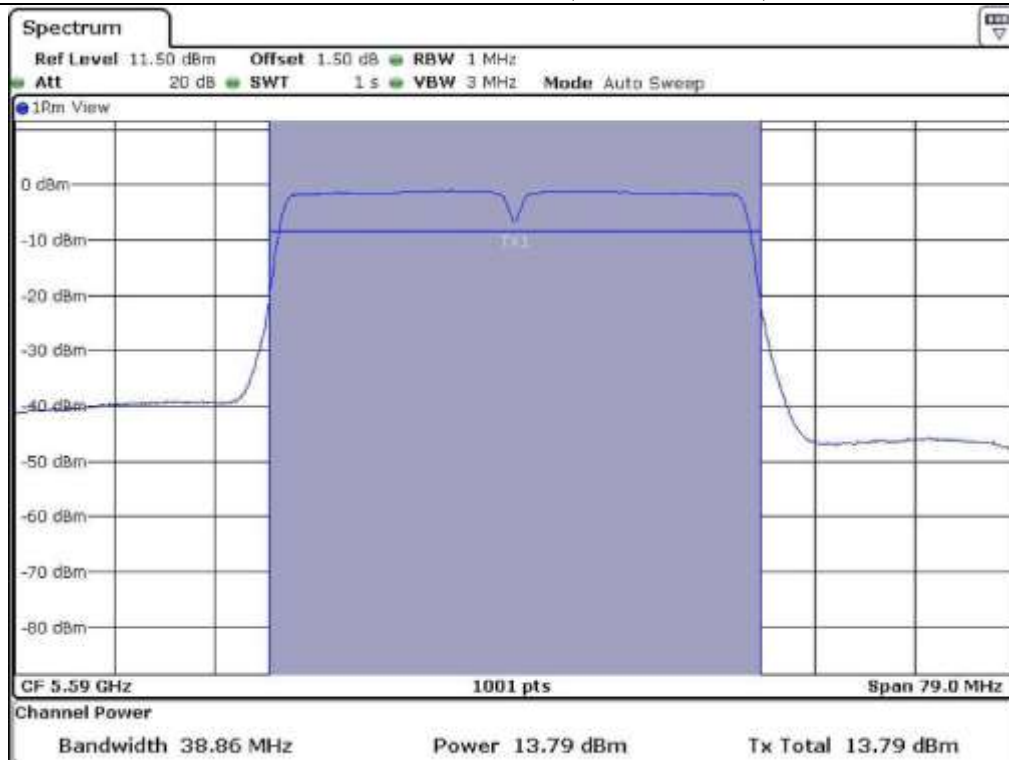
Low Channel @ 5 270 MHz (26 dB Bandwidth)



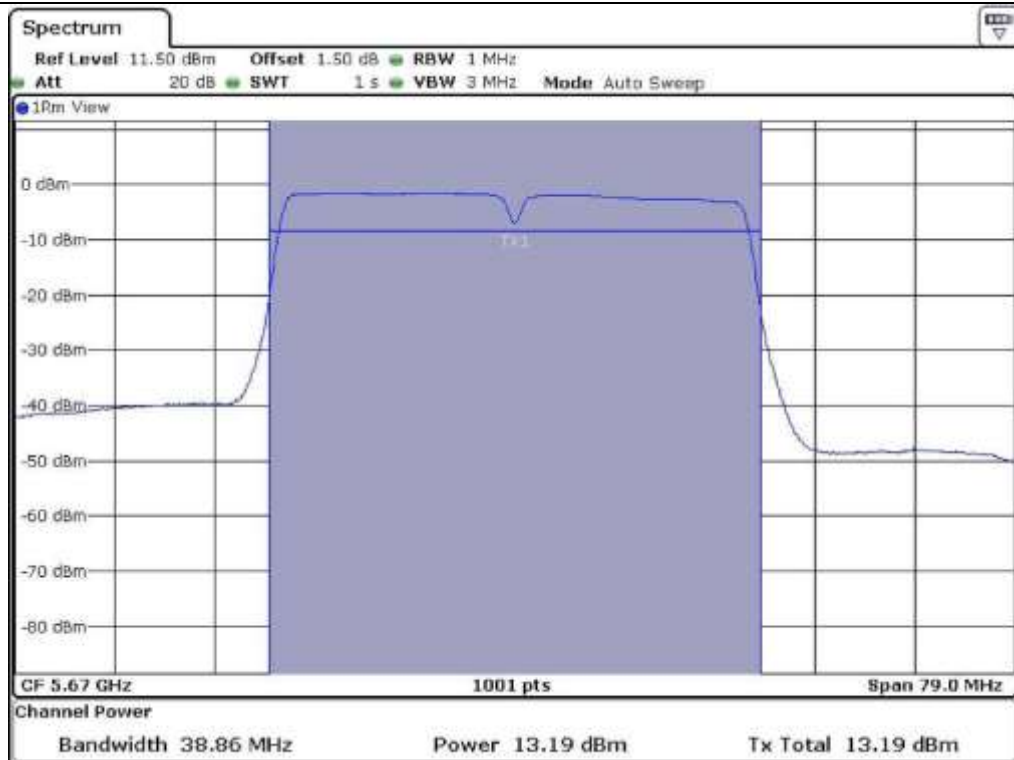
High Channel @ 5 310 MHz (26 dB Bandwidth)



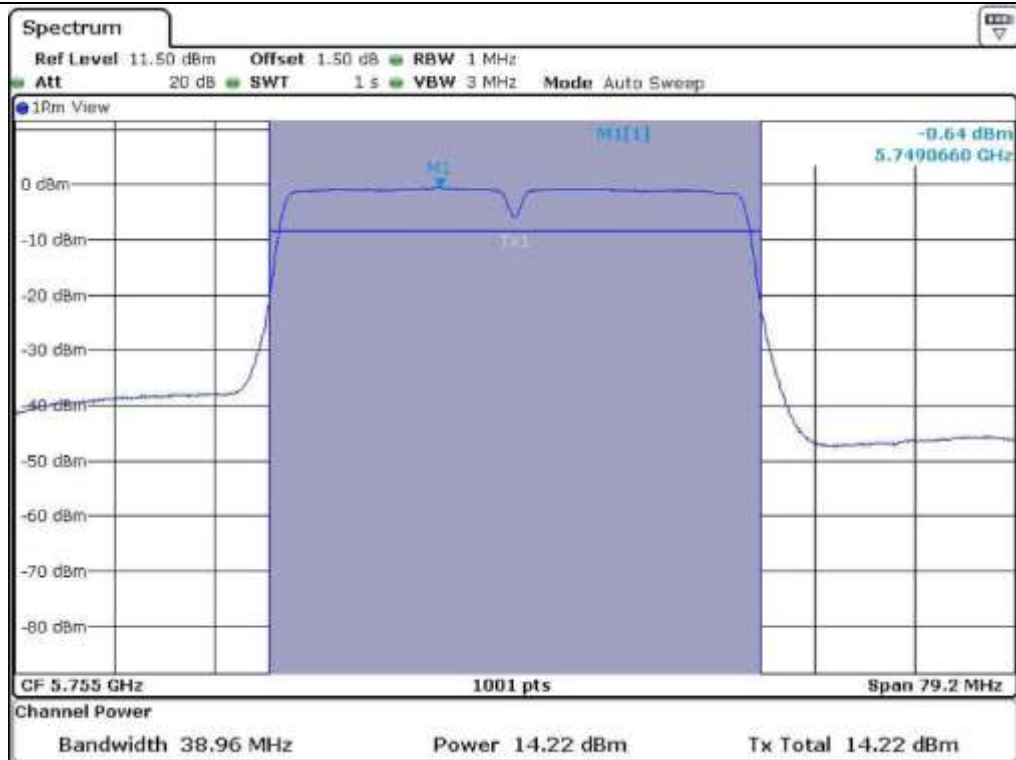
Low Channel @ 5.510 MHz (26 dB Bandwidth)



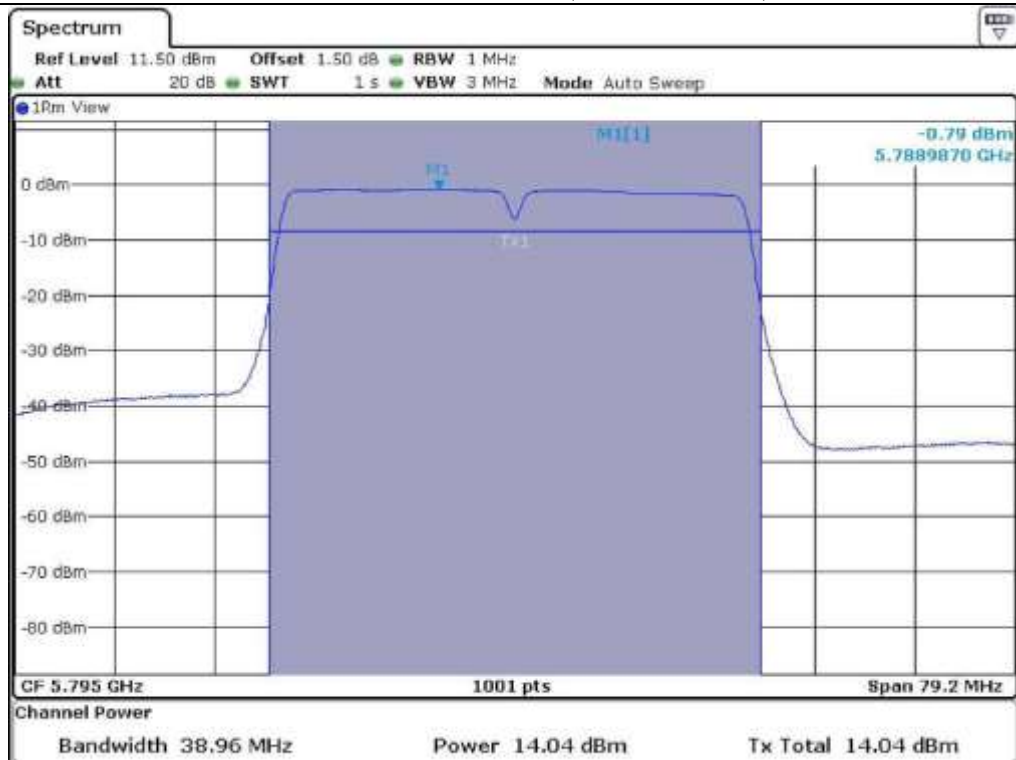
Middle Channel @ 5.590 MHz (26 dB Bandwidth)



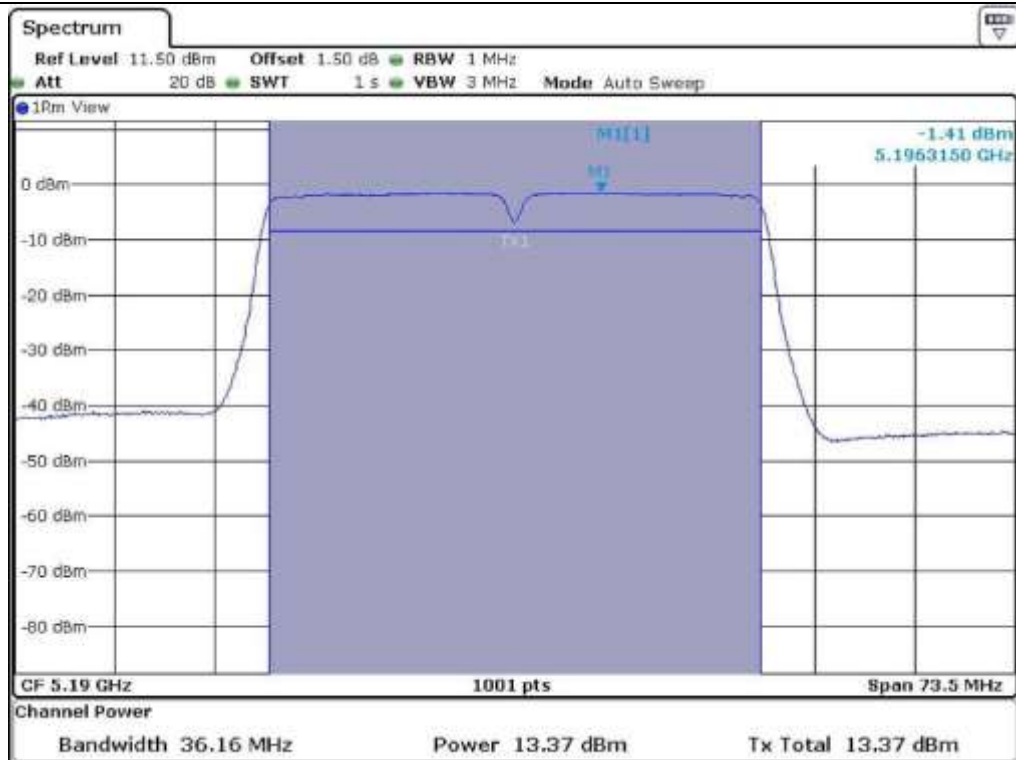
High Channel @ 5 670 MHz (26 dB Bandwidth)



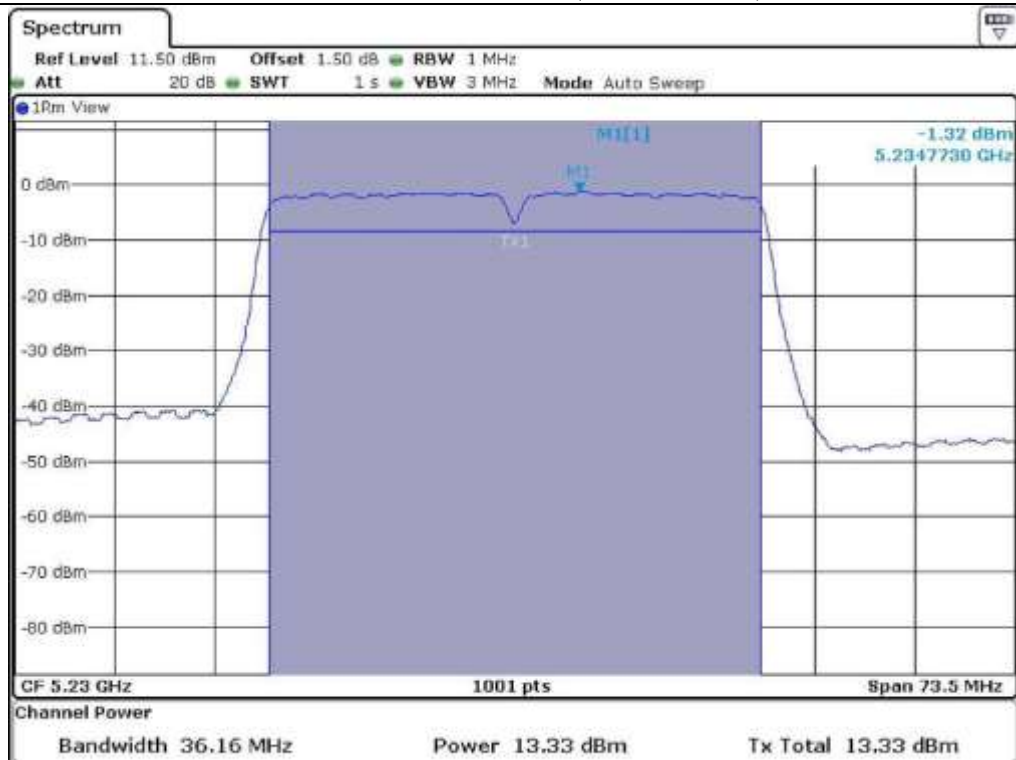
Low Channel @ 5.755 MHz (26 dB Bandwidth)



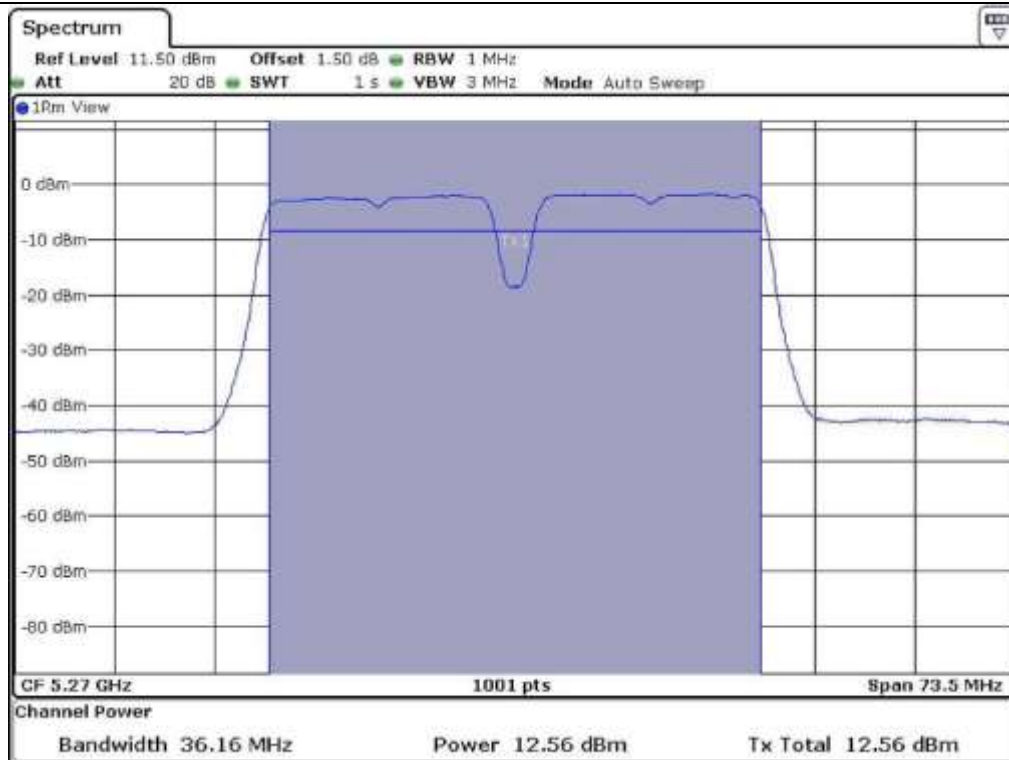
High Channel @ 5.795 MHz (26 dB Bandwidth)



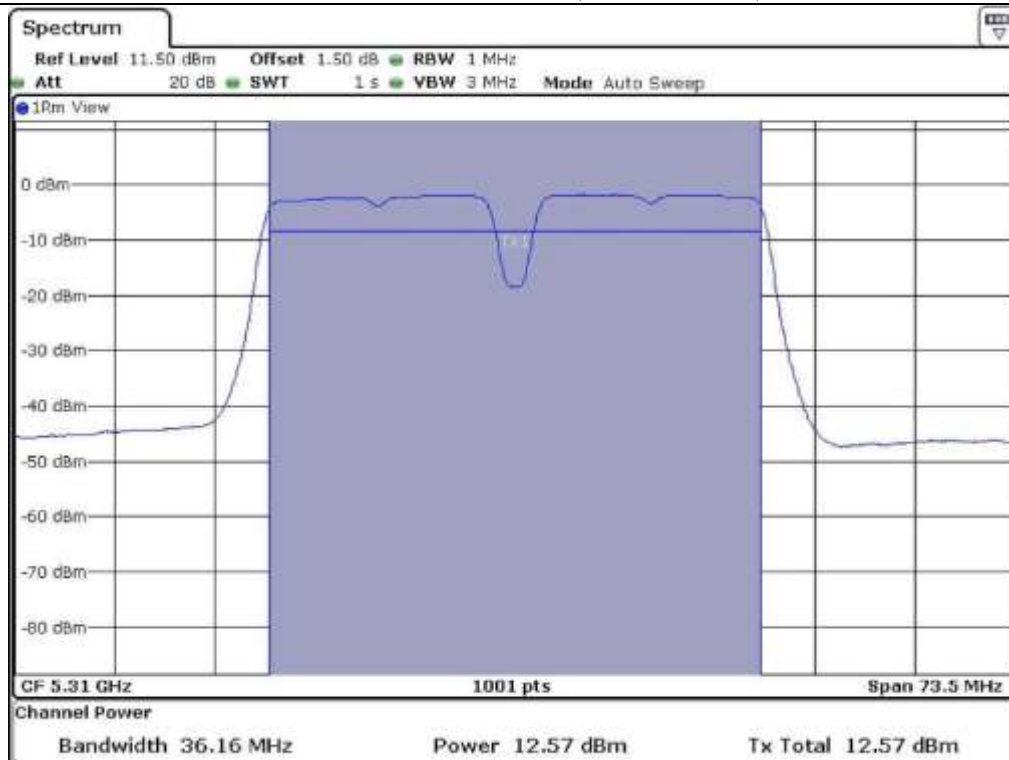
Low Channel @ 5 190 MHz (99 % bandwidth)



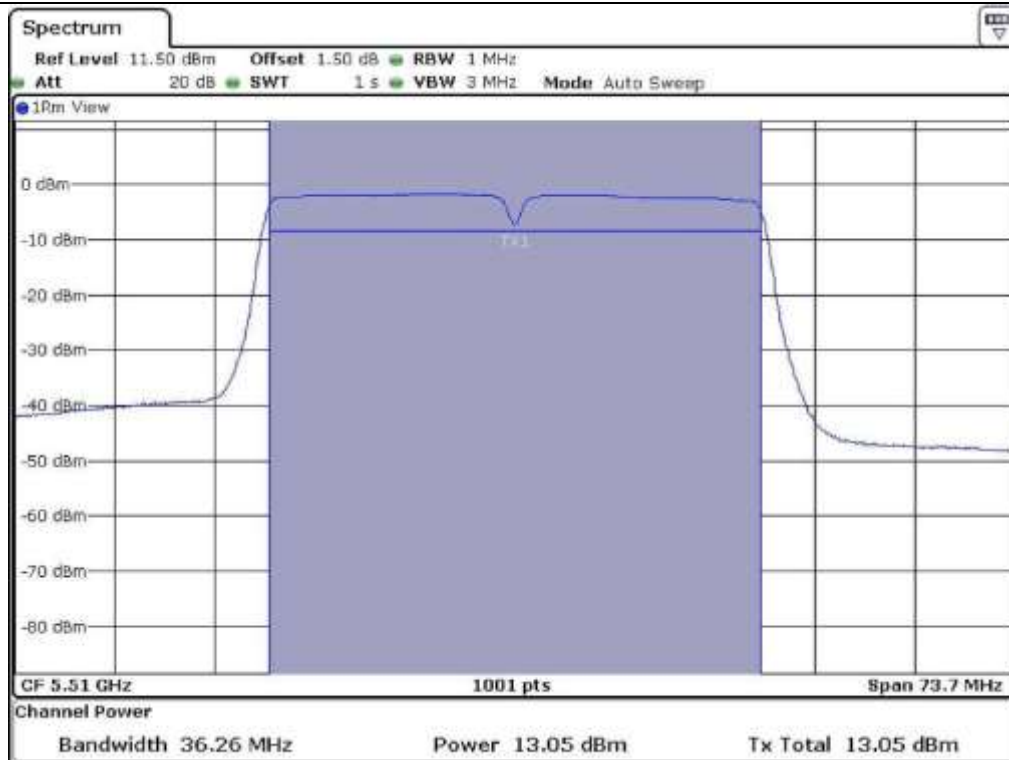
High Channel @ 5 230 MHz (99 % bandwidth)



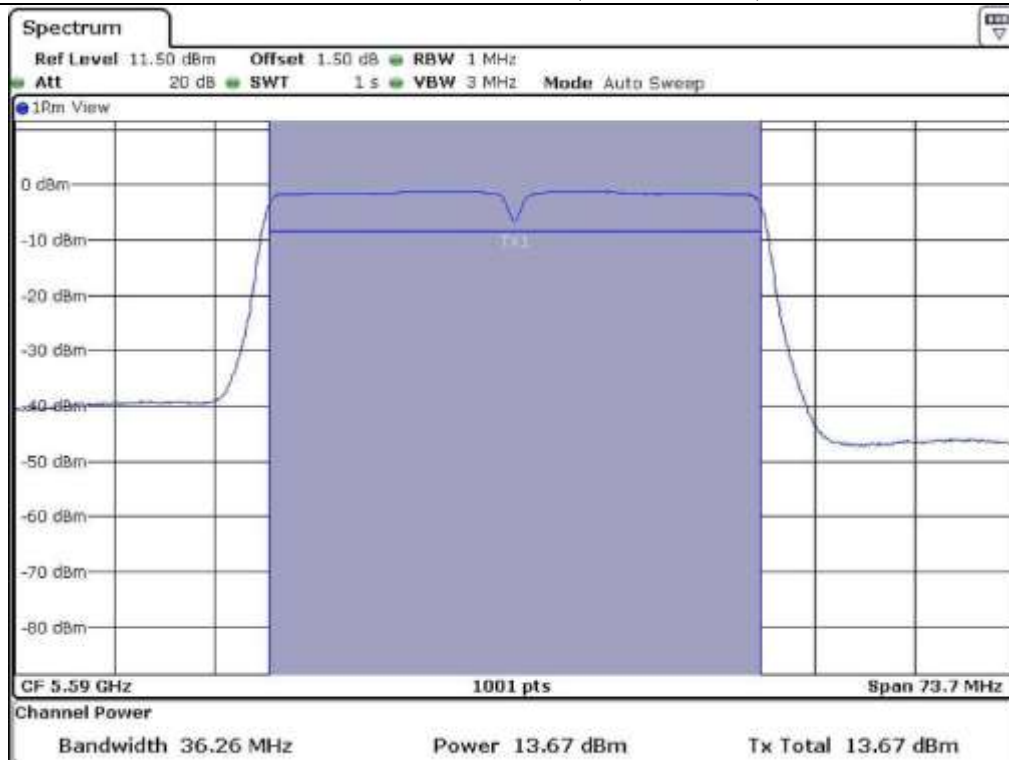
Low Channel @ 5 270 MHz (99 % bandwidth)



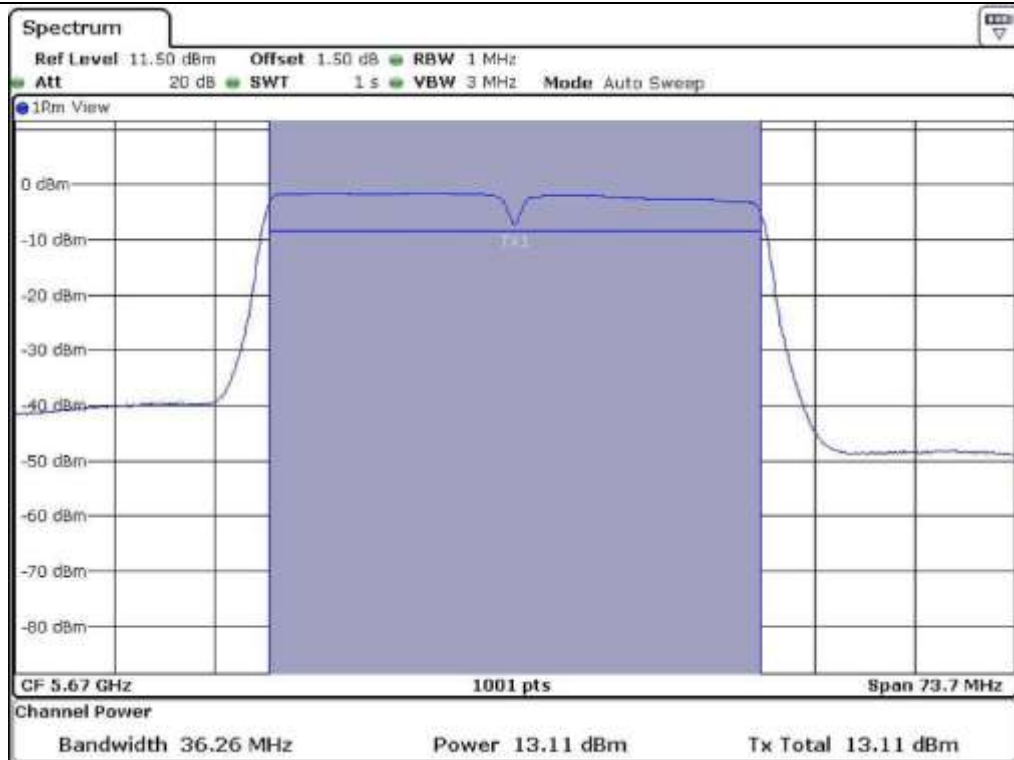
High Channel @ 5 310 MHz (99 % bandwidth)



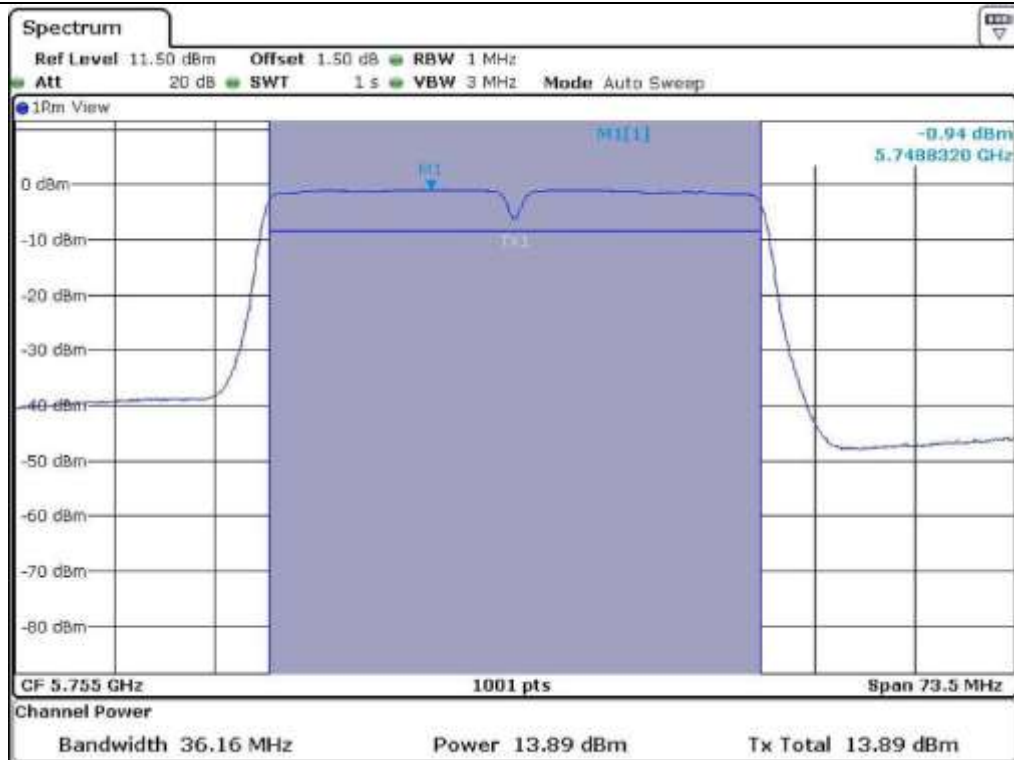
Low Channel @ 5 510 MHz (99 % bandwidth)



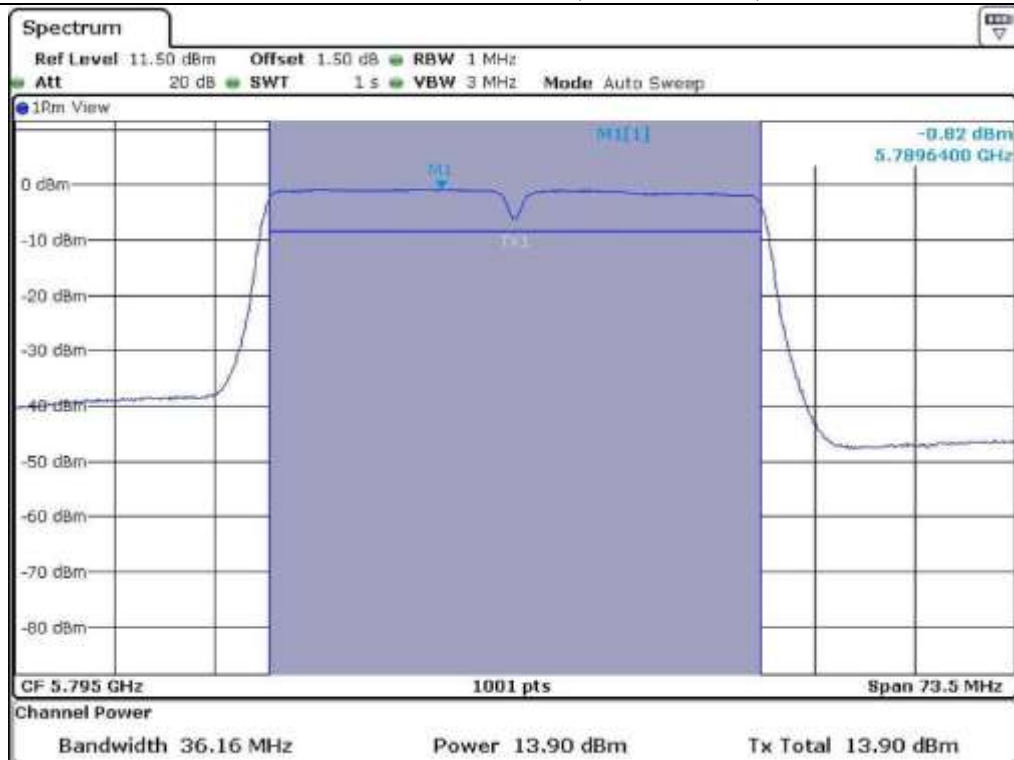
Middle Channel @ 5 590 MHz (99 % bandwidth)



High Channel @ 5 670 MHz (99 % bandwidth)



Low Channel @ 5 755 MHz (99 % bandwidth)



High Channel @ 5 795 MHz (99 % bandwidth)

8.8.3 Test data for Multiple transmit

-. Test Date : June 17, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	15.93	23.98	8.05
	High	5 230	16.04	23.98	7.94
5 250 ~ 5 350	Low	5 270	16.16	23.98	7.82
	High	5 310	16.26	23.98	7.72
5 470 ~ 5 725	Low	5 510	16.75	23.98	7.23
	Middle	5 590	17.08	23.98	6.90
	High	5 670	16.64	23.98	7.34
5 725 ~ 5 850	Low	5 755	16.77	30.00	13.23
	High	5 795	16.57	30.00	13.43

Remark 1 : Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Remark 2 : Calculated Output Power= $10\log (10^{(\text{Antenna1 Output Power}/10)} + 10^{(\text{Antenna2 Output Power}/10)})$

-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Low	5 190	5.91	15.92	23.00	1.17	21.83
	High	5 230		15.98	23.00	1.11	21.89
5 250 ~ 5 350	Low	5 270		16.23	30.00	7.86	22.14
	High	5 310		16.15	30.00	7.94	22.06
5 470 ~ 5 725	Low	5 510		16.70	30.00	26.90	7.39
	Middle	5 590		16.99	30.00	26.90	7.10
	High	5 670		16.56	30.00	26.90	7.53
5 725 ~ 5 825	Low	5 755		16.60	36.00	13.49	22.51
	High	5 795		16.47	36.00	13.62	22.38

Remark 1 : Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Remark 2 : Calculated Output Power= $10\log(10^{(\text{Antenna1 Output Power}/10)} + 10^{(\text{Antenna2 Output Power}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

8.9 Test data for 802.11ac_HT80 RLAN Mode

8.9.1 Test data for Antenna 0

-. Test Date : June 18, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210	79.27	9.81	23.98	14.17
5 250 ~ 5 350	Middle	5 290	79.27	9.74	23.98	14.24
5 470 ~ 5 725	Middle	5 530	79.72	11.40	23.98	12.58
5 725 ~ 5 850	Middle	5 775	79.42	10.32	30.00	19.68

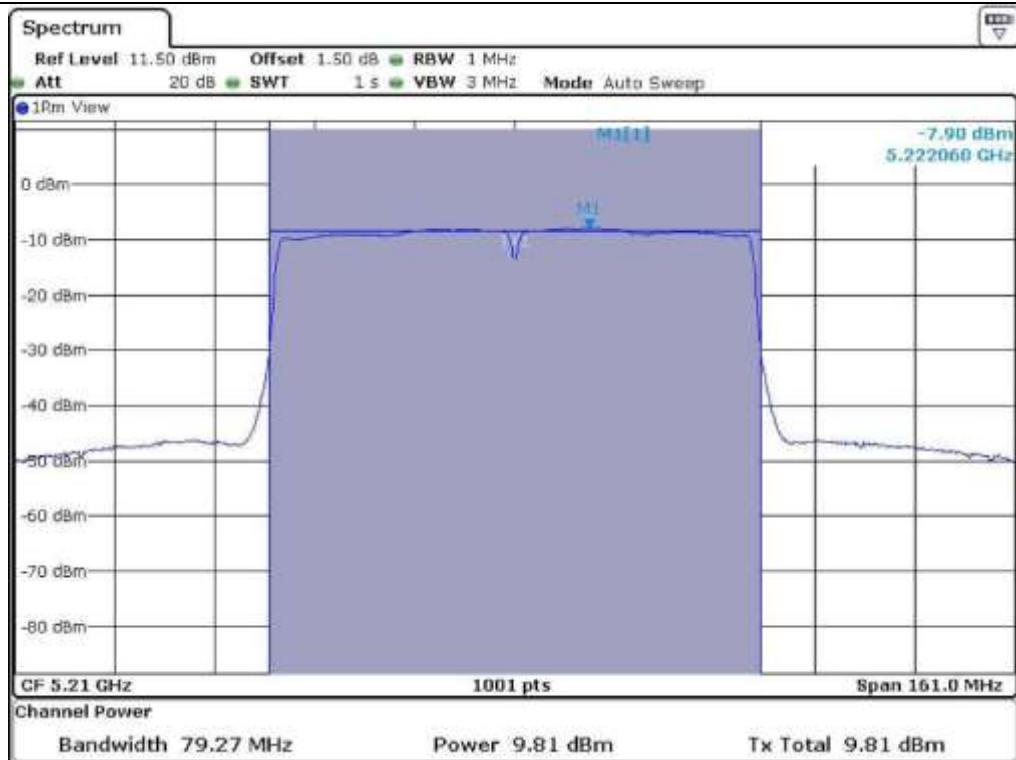
-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Middle	5 210	2.90	75.52	9.60	23.00	10.50	12.50
5 250 ~ 5 350	Middle	5 290		75.52	9.75	30.00	17.35	12.65
5 470 ~ 5 725	Middle	5 530		75.37	11.32	30.00	15.78	14.22
5 725 ~ 5 850	Middle	5 775		75.52	10.26	36.00	22.84	13.16

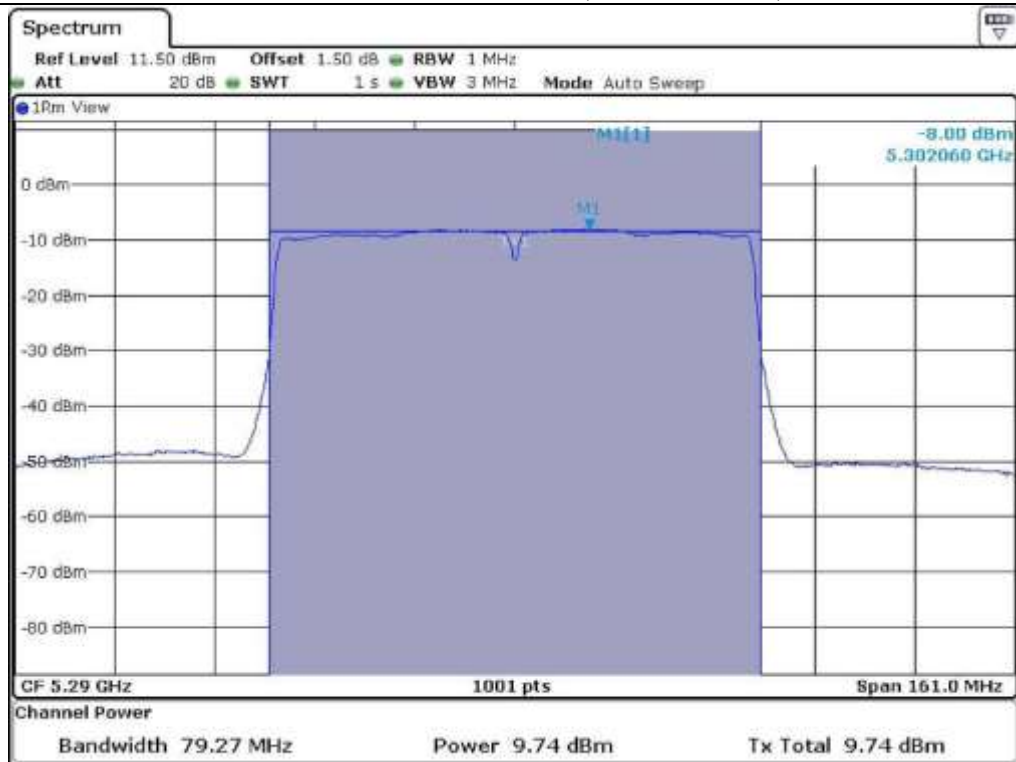
⌞ Remark: See next page for measurement data.



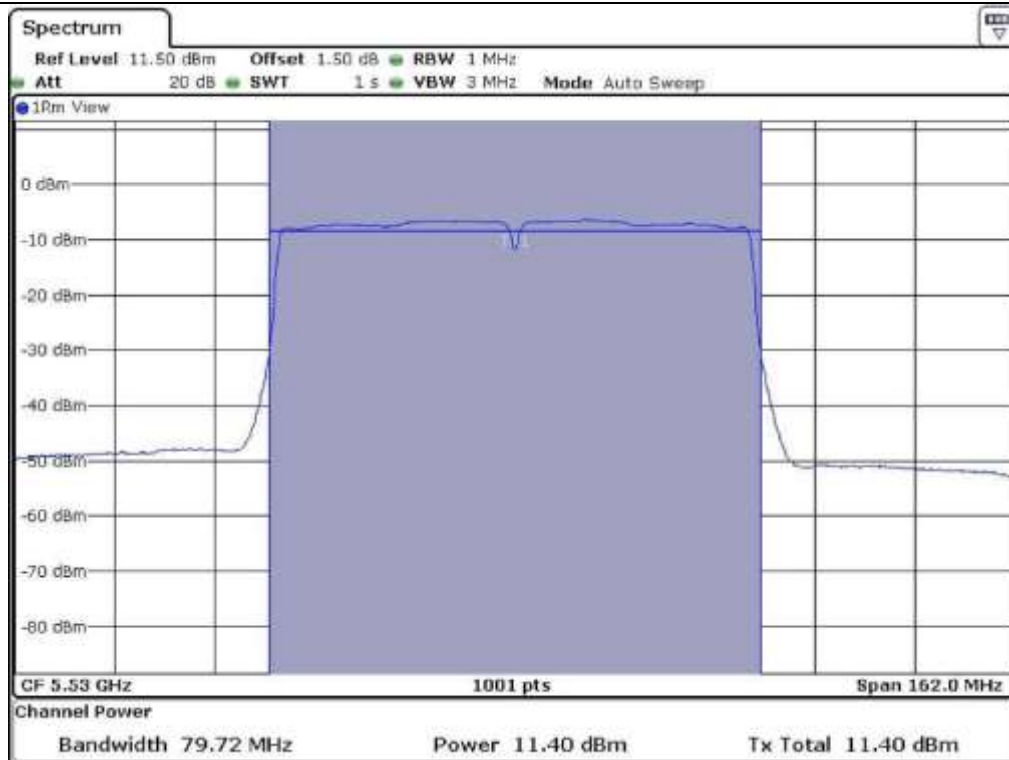
Tested by: Tae-Ho, Kim / Senior Engineer



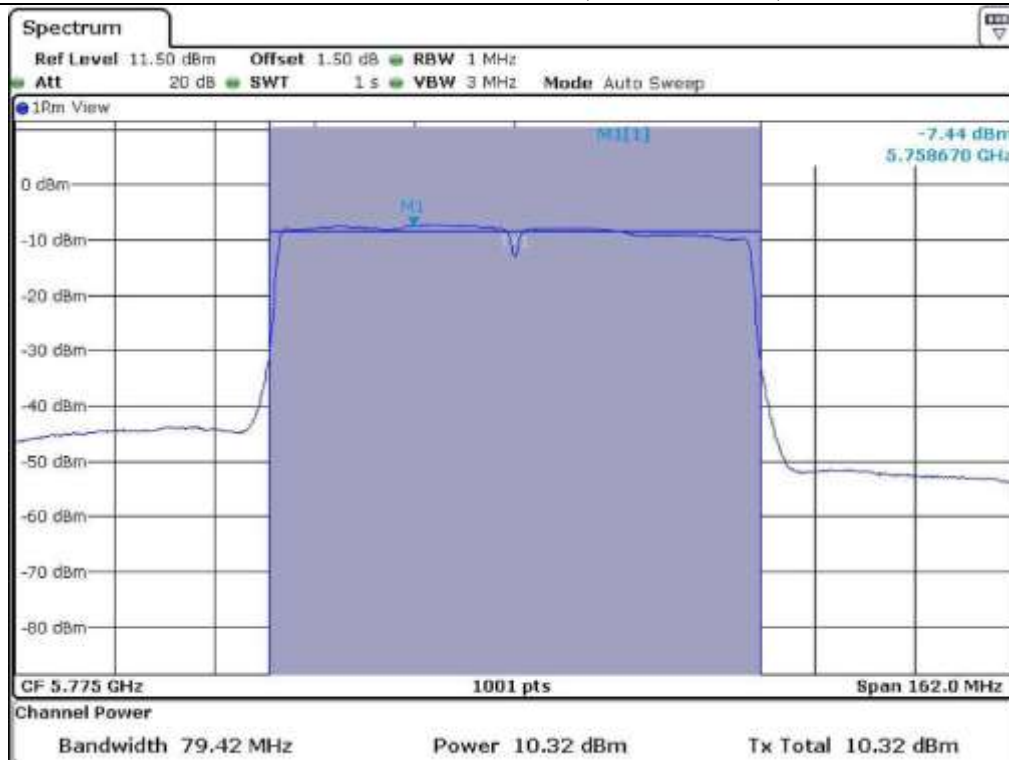
Middle Channel @ 5 210 MHz (26 dB Bandwidth)



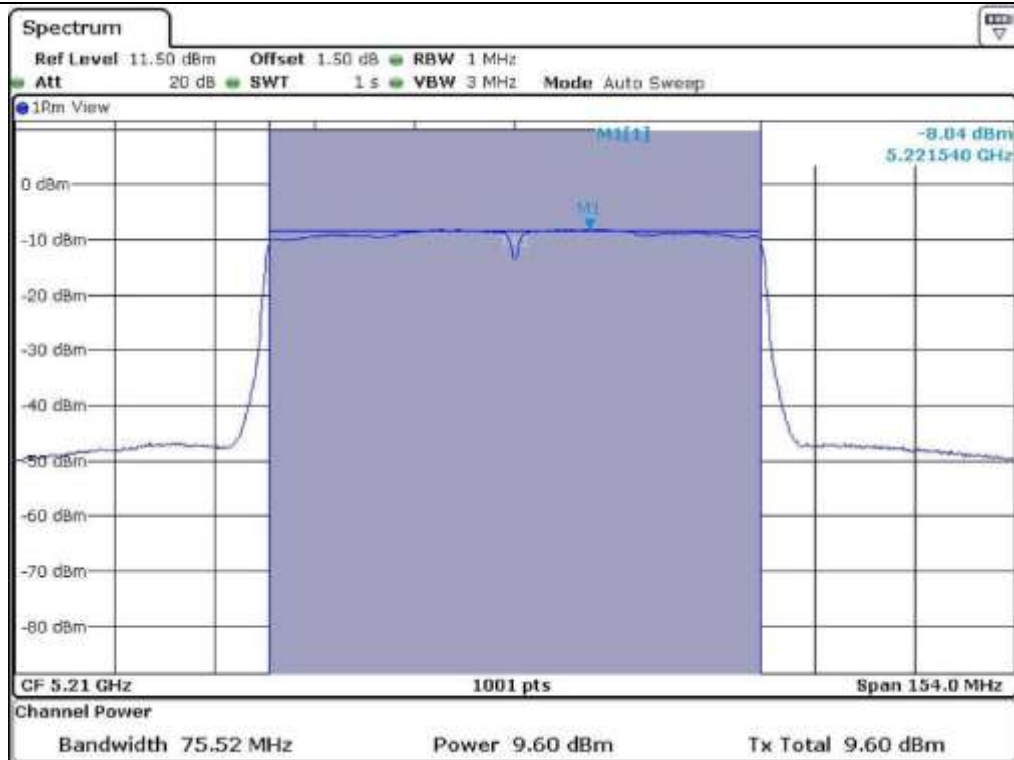
Middle Channel @ 5 290MHz (26 dB Bandwidth)



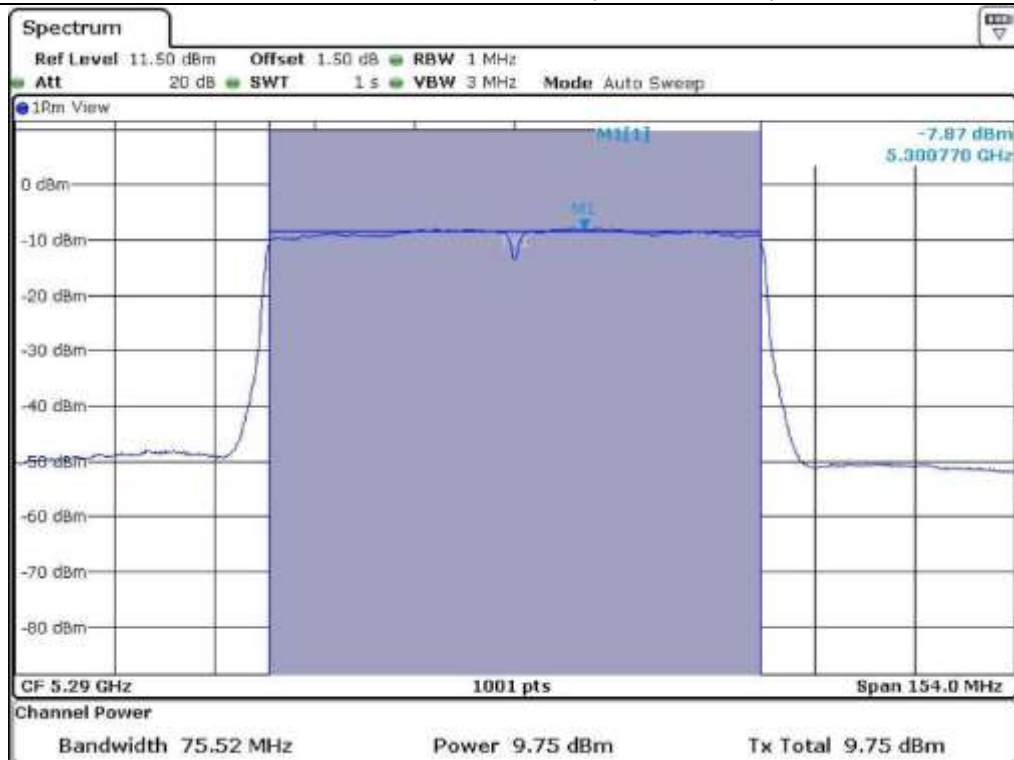
Middle Channel @ 5 530 MHz (26 dB Bandwidth)



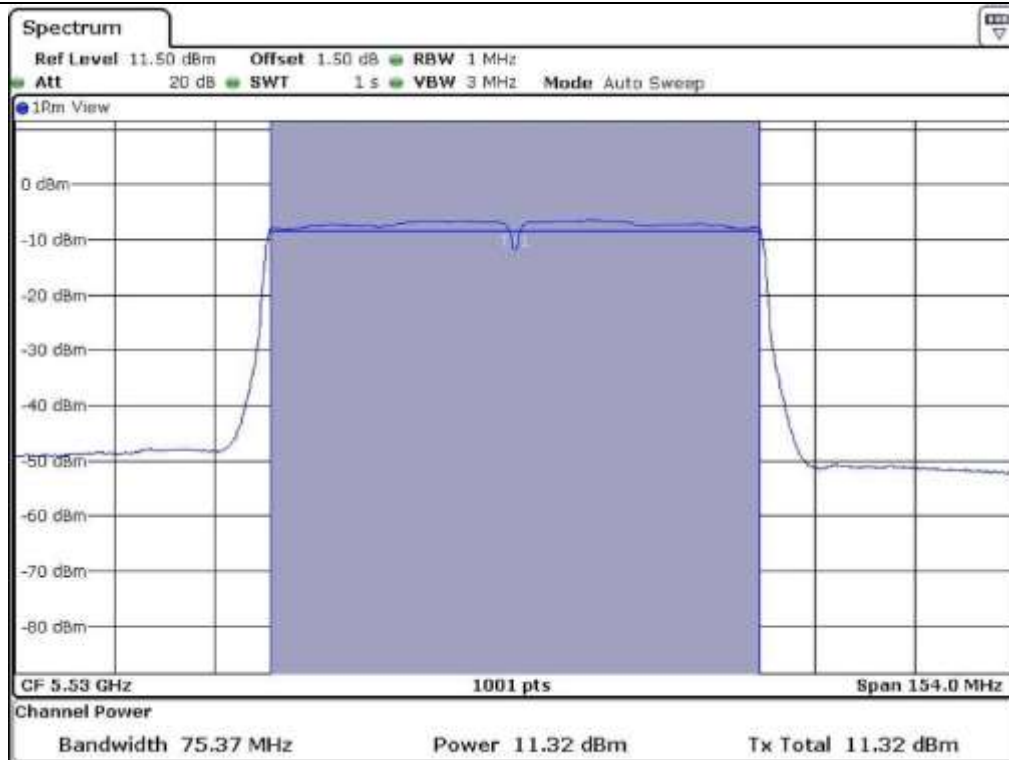
Middle Channel @ 5 775 MHz (26 dB Bandwidth)



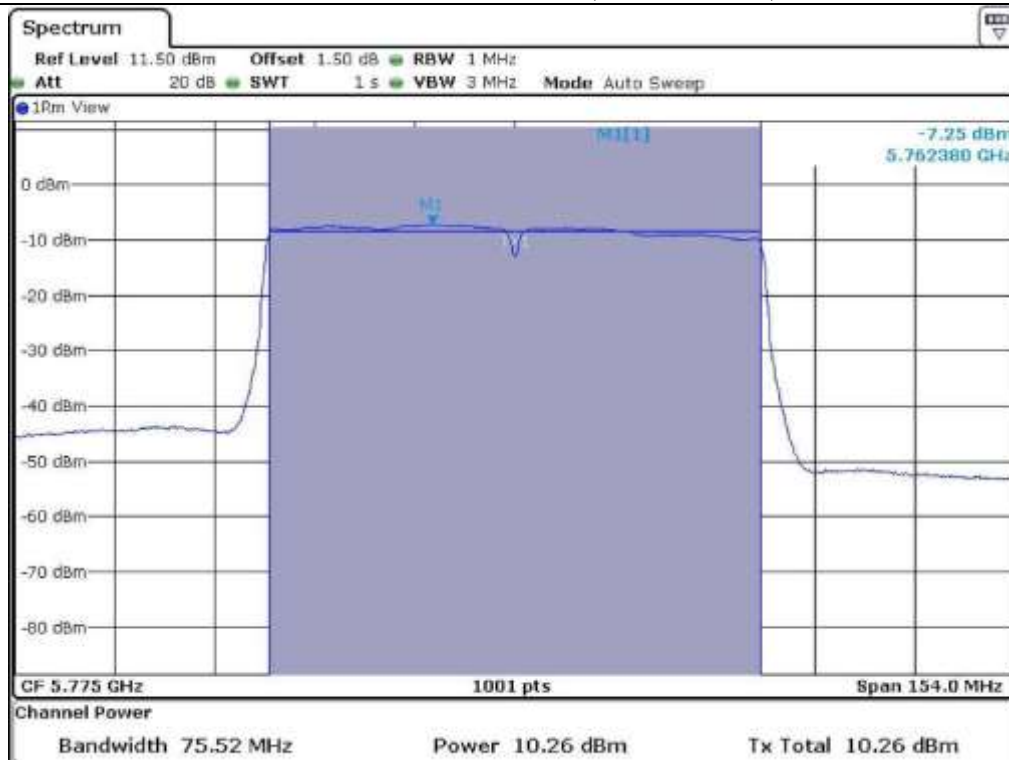
Middle Channel @ 5 210 MHz (99 % bandwidth)



Middle Channel @ 5 290MHz (99 % bandwidth)



Middle Channel @ 5 530 MHz (99 % bandwidth)



Middle Channel @ 5 775 MHz (99 % bandwidth)

8.9.2 Test data for Antenna 1

-. Test Date : June 18, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210	79.27	10.82	23.98	13.16
5 250 ~ 5 350	Middle	5 290	79.27	10.59	23.98	13.39
5 470 ~ 5 725	Middle	5 530	79.72	10.59	23.98	13.39
5 725 ~ 5 850	Middle	5 775	79.27	11.30	30.00	18.70

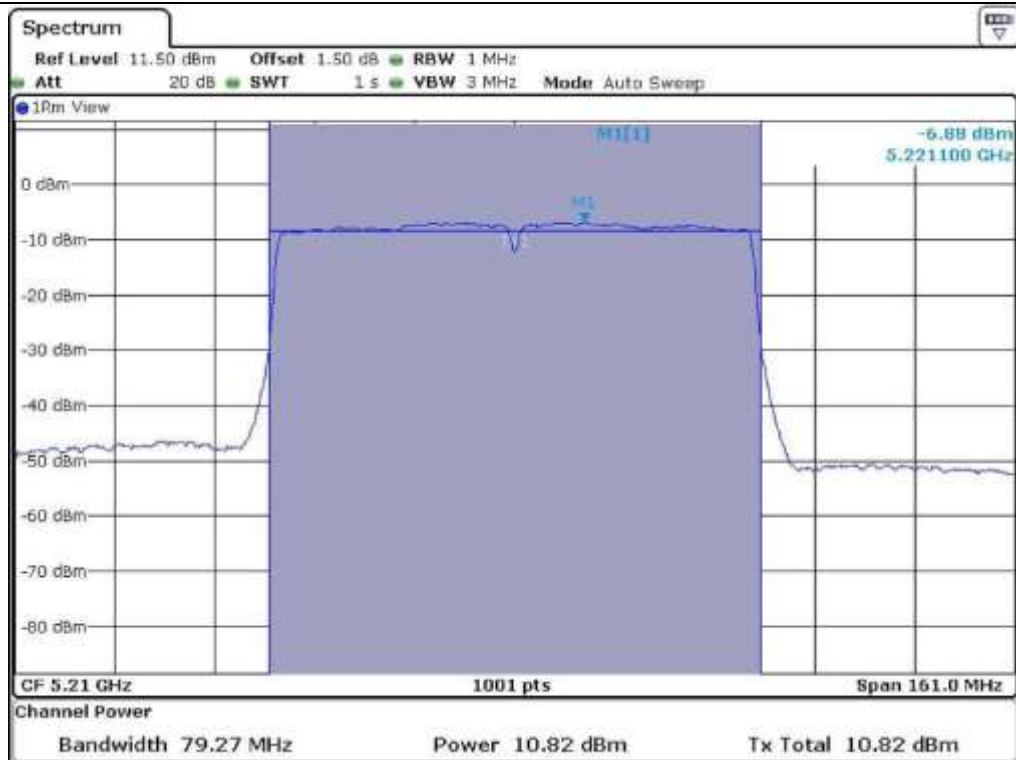
-. IC Test data

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	Antenna Gain	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	Middle	5 210	2.90	75.52	10.80	23.00	9.30	13.70
5 250 ~ 5 350	Middle	5 290		75.52	10.46	30.00	16.64	13.36
5 470 ~ 5 725	Middle	5 530		75.37	10.38	30.00	16.72	13.28
5 725 ~ 5 850	Middle	5 775		75.52	11.23	36.00	21.87	14.13

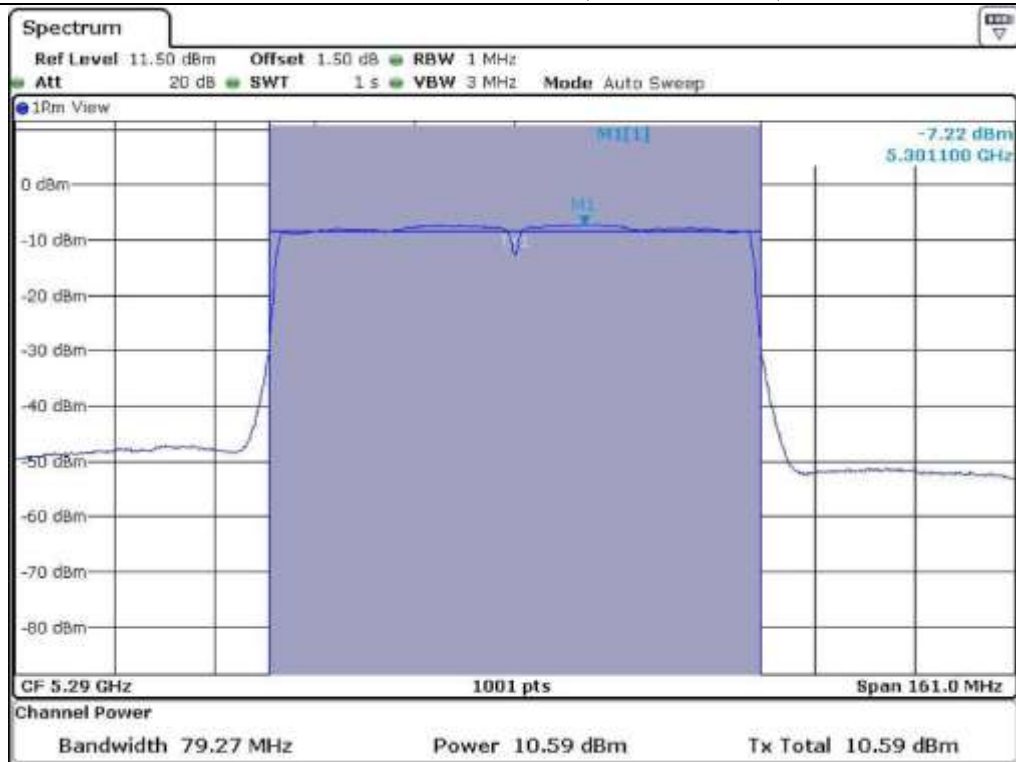
Remark: See next page for measurement data.



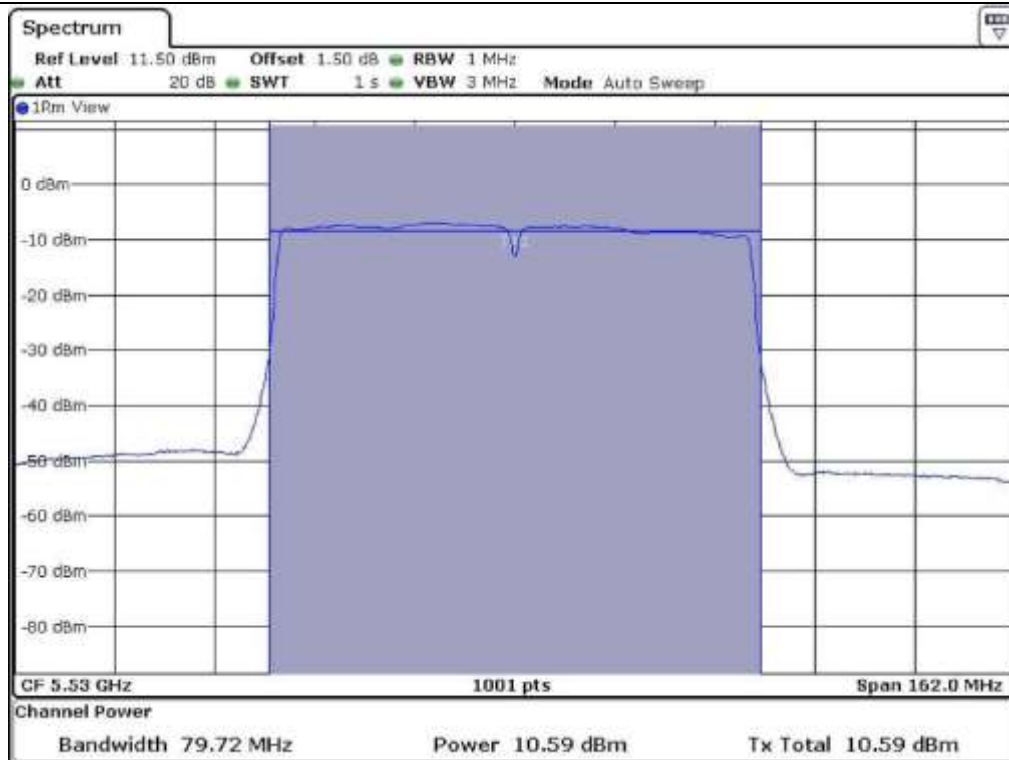
Tested by: Tae-Ho, Kim / Senior Engineer



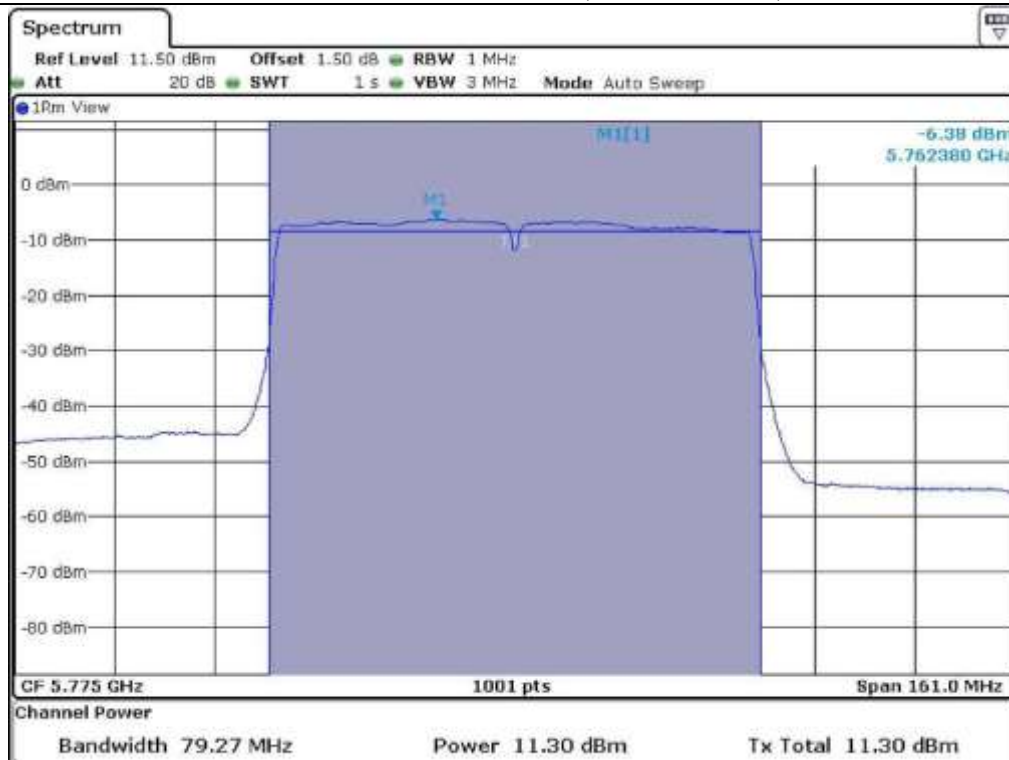
Middle Channel @ 5 210 MHz (26 dB Bandwidth)



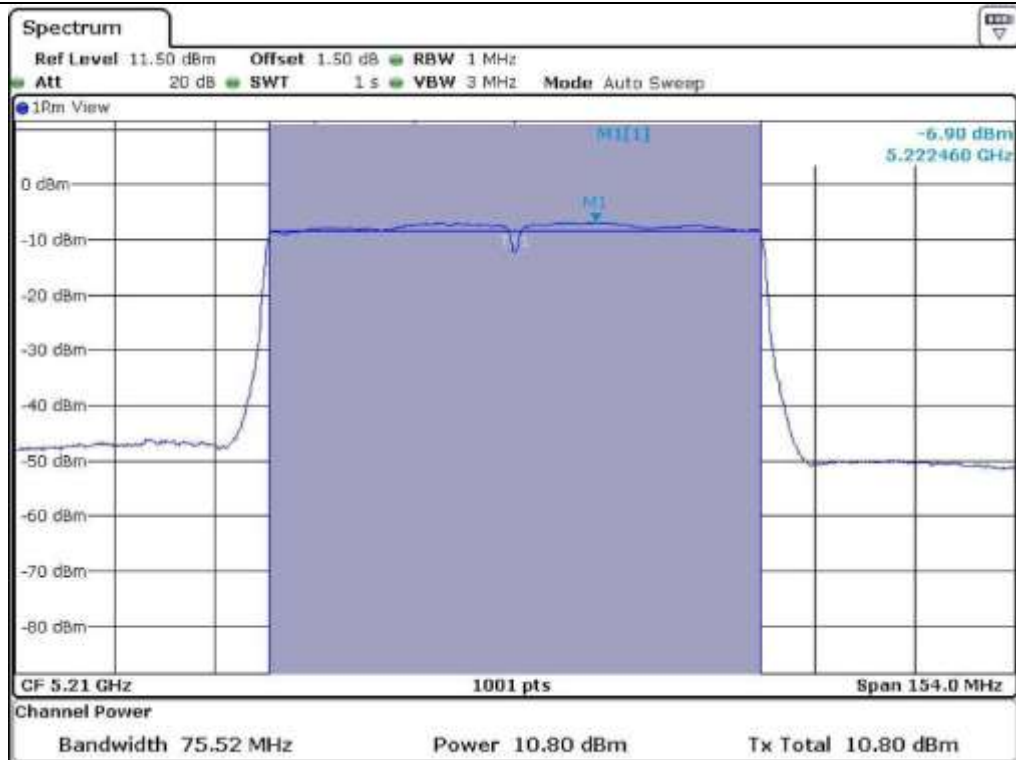
Middle Channel @ 5 290MHz (26 dB Bandwidth)



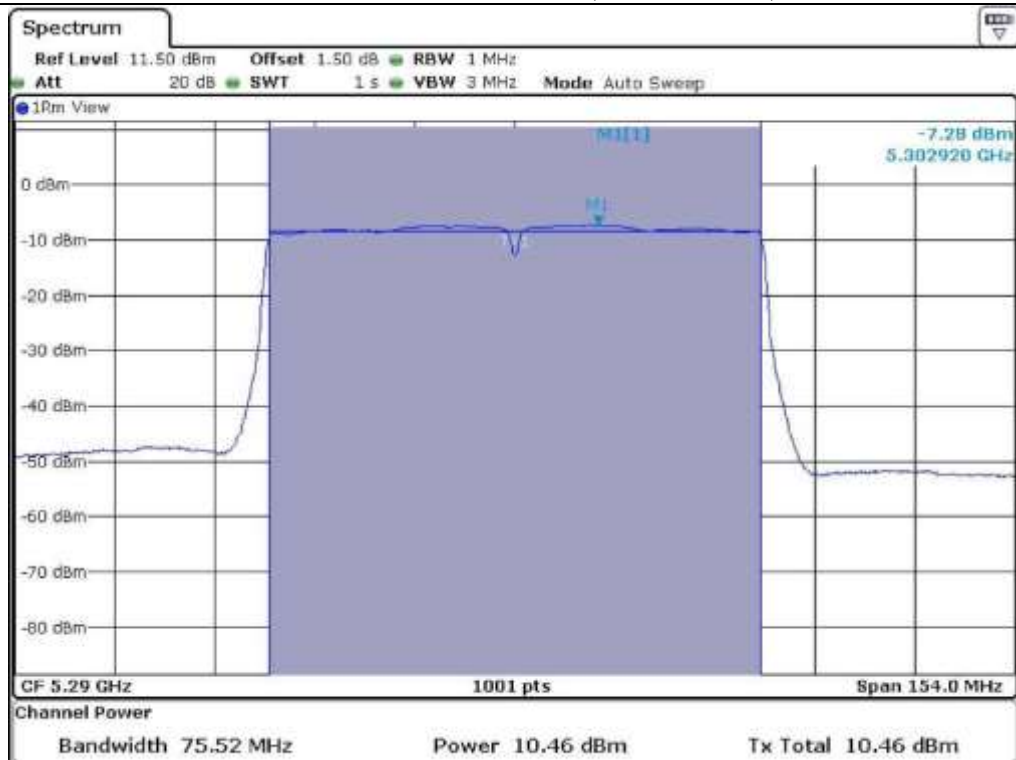
Middle Channel @ 5 530 MHz (26 dB Bandwidth)



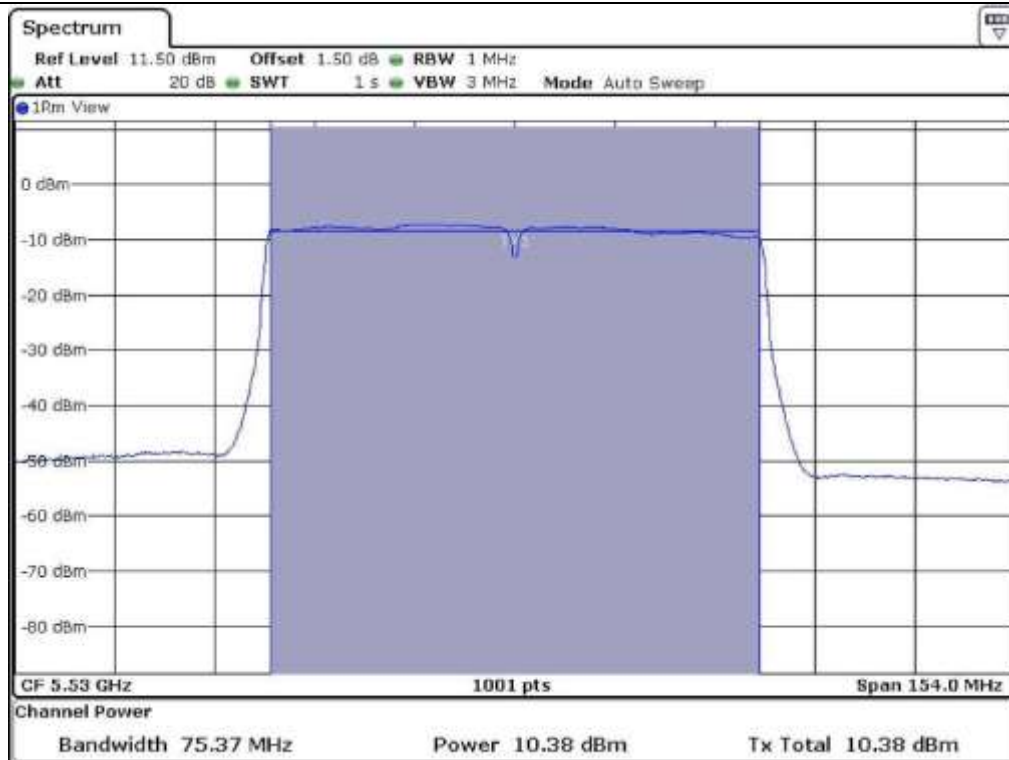
Middle Channel @ 5 775 MHz (26 dB Bandwidth)



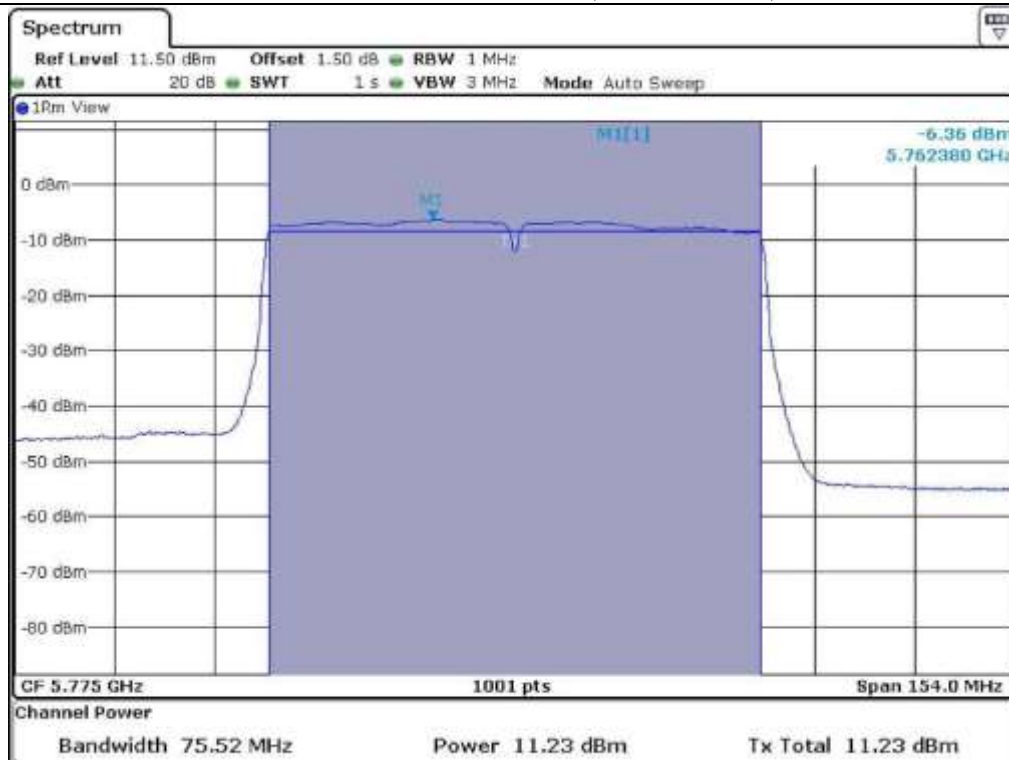
Middle Channel @ 5 210 MHz (99 % bandwidth)



Middle Channel @ 5 290MHz (99 % bandwidth)



Middle Channel @ 5 530 MHz (99 % bandwidth)



Middle Channel @ 5 775 MHz (99 % bandwidth)

8.9.3 Test data for Multiple transmit

-. Test Date : June 18, 2015

-. Test Result : Pass

-. FCC Test data

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210	13.35	23.98	10.63
5 250 ~ 5 350	5 290	13.20	23.98	10.78
5 470 ~ 5 725	5 530	14.02	23.98	9.96
5 725 ~ 5 850	5 775	13.85	30.00	16.15

Remark 1 : Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Remark 2 : Calculated Output Power= $10\log(10^{(\text{Antenna1 Output Power}/10)} + 10^{(\text{Antenna2 Output Power}/10)})$

-. IC Test data

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	Antenna Gain	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)	EIRP (dBm)
5 150 ~ 5 250	5 210	5.91	13.25	23.00	3.84	19.16
5 250 ~ 5 350	5 290		13.13	30.00	10.96	19.04
5 470 ~ 5 725	5 530		13.89	30.00	10.20	19.80
5 725 ~ 5 850	5 775		13.78	36.00	16.31	19.69

Remark 1 : Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Remark 2 : Calculated Output Power= $10\log(10^{(\text{Antenna1 Output Power}/10)} + 10^{(\text{Antenna2 Output Power}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

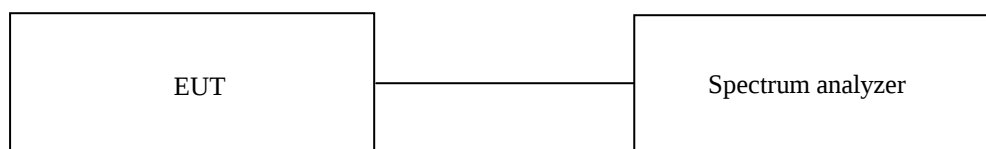
9. PEAK POWER SPECTRUL DENSITY

9.1 Operating environment

Temperature : 24 °C
Relative humidity : 48 % R.H.

9.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, the video bandwidth is set to 3 times the resolution bandwidth. The maximum level from the EUT in 1 MHz bandwidth was measured with above condition.



9.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 30, 2014 (1Y)

All test equipment used is calibrated on a regular basis.

9.4 Test data for 802.11a RLAN Mode

9.4.1 Test data for Antenna 0

- . Test Date : June 15, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	-0.55	10.00	10.55
	Middle	5 200	-0.39	10.00	10.39
	High	5 240	-0.51	10.00	10.51
5 250 ~ 5 350	Low	5 260	0.29	11.00	7.81
	Middle	5 300	-0.12	11.00	8.22
	High	5 320	-0.41	11.00	8.51
5 470 ~ 5 725	Low	5 500	1.03	11.00	7.07
	Middle	5 600	1.36	11.00	6.74
	High	5 700	0.87	11.00	7.23
5 725 ~ 5 850	Low	5 745	1.41	30.00	28.59
	Middle	5 785	1.08	30.00	28.92
	High	5 805	0.64	30.00	29.36

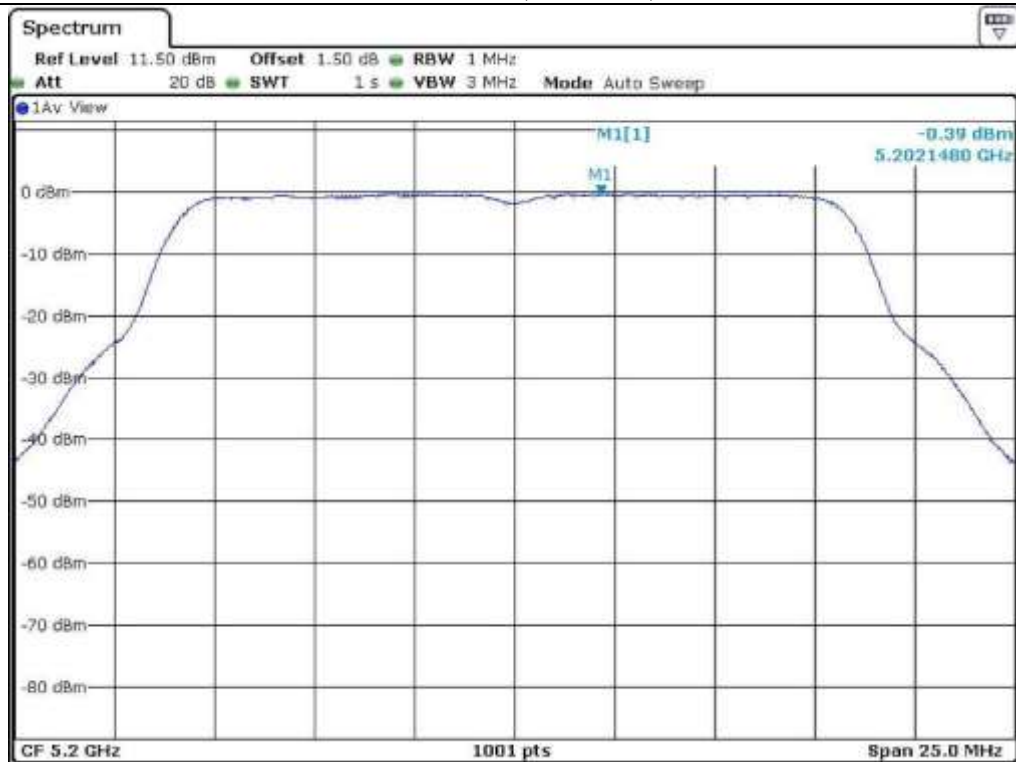
Remark: See next page for measurement data.



Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 180 MHz)

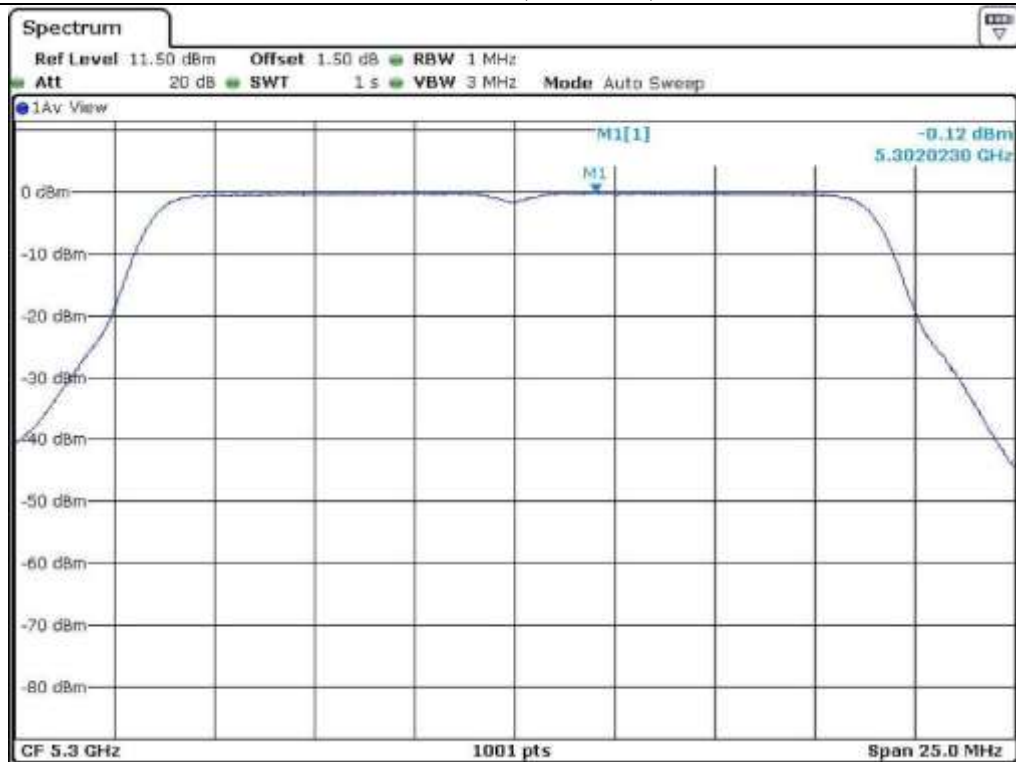


Middle Channel (5 200 MHz)





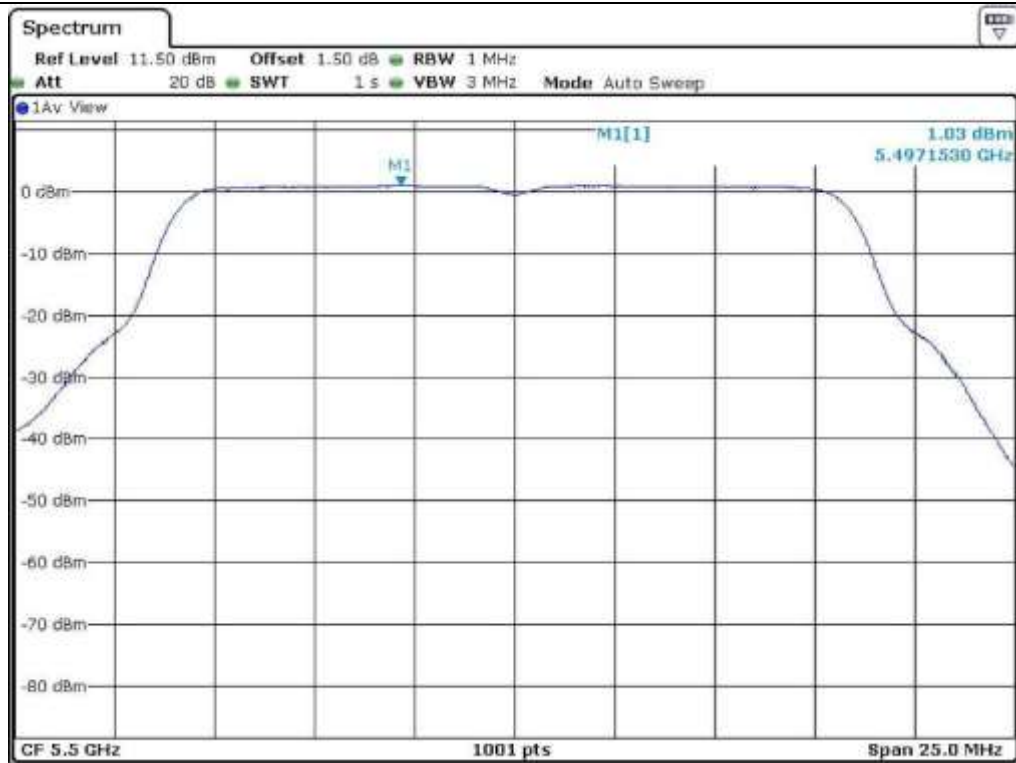
Low Channel (5 260 MHz)



Middle Channel (5 300 MHz)



High Channel (5 320 MHz)



Low Channel (5 500 MHz)

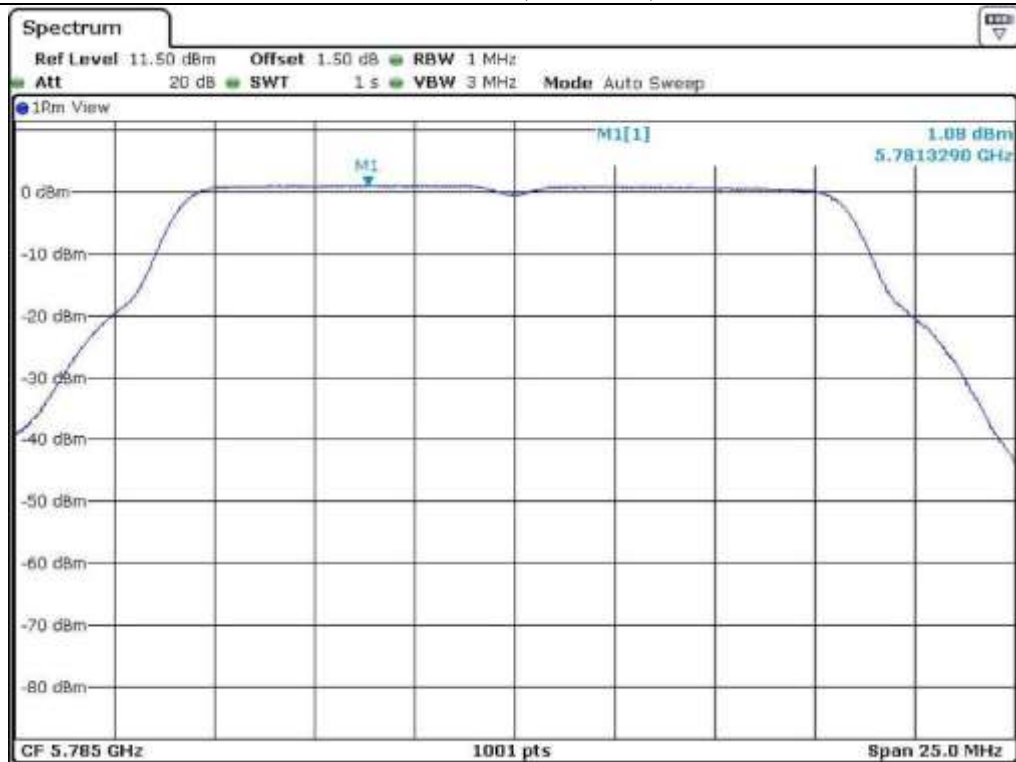


Middle Channel (5 600 MHz)





Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)



High Channel (5 825 MHz)

9.4.2 Test data for Antenna 1

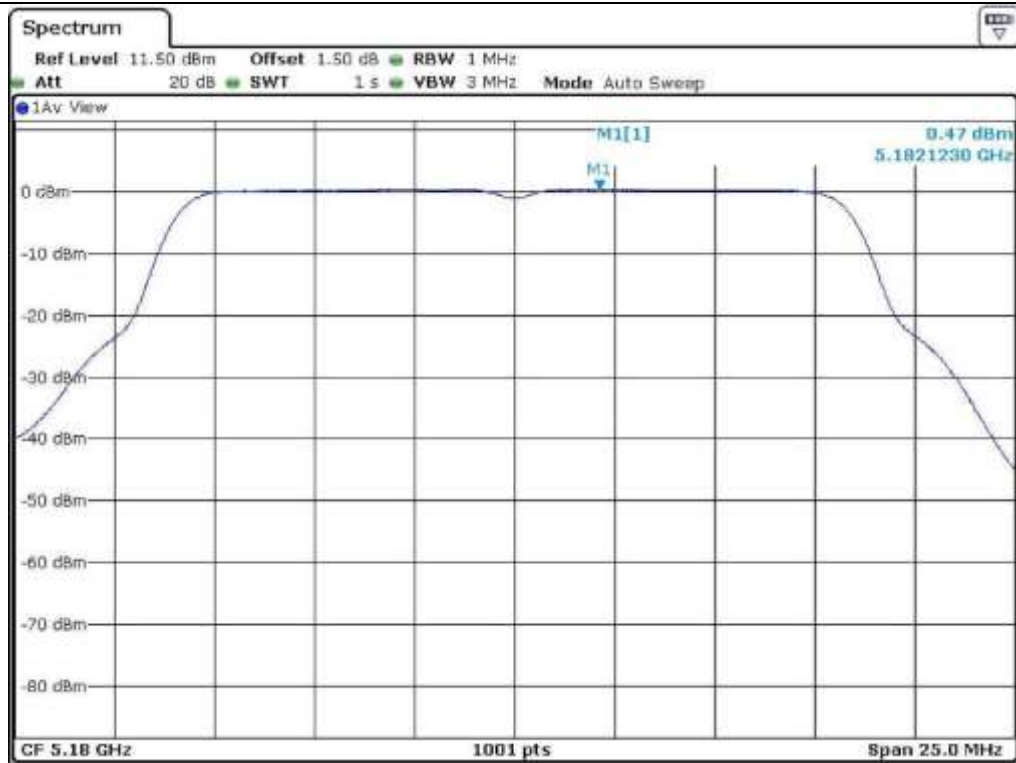
- . Test Date : June 15, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	0.47	10.00	9.53
	Middle	5 200	0.40	10.00	9.60
	High	5 240	0.34	10.00	9.66
5 250 ~ 5 350	Low	5 260	-0.98	11.00	9.08
	Middle	5 300	-1.11	11.00	9.21
	High	5 320	-0.71	11.00	8.81
5 470 ~ 5 725	Low	5 500	0.19	11.00	7.91
	Middle	5 600	0.95	11.00	7.15
	High	5 700	0.25	11.00	7.85
5 725 ~ 5 850	Low	5 745	2.02	30.00	27.98
	Middle	5 785	2.04	30.00	27.96
	High	5 805	1.97	30.00	28.03

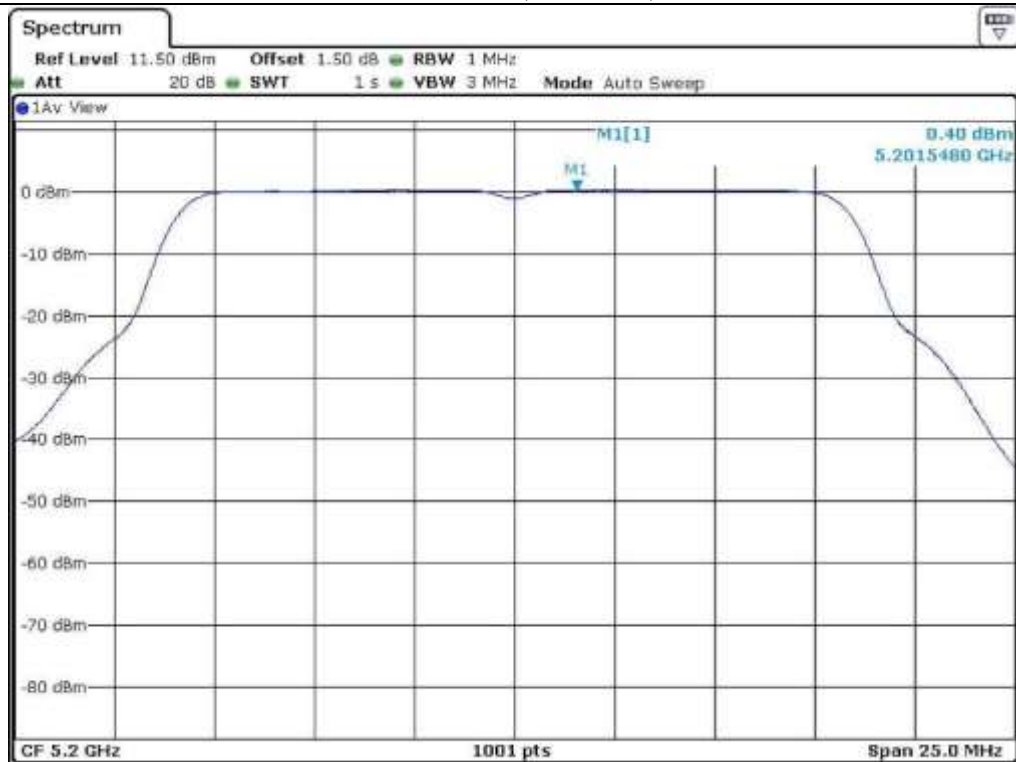
Remark: See next page for measurement data.



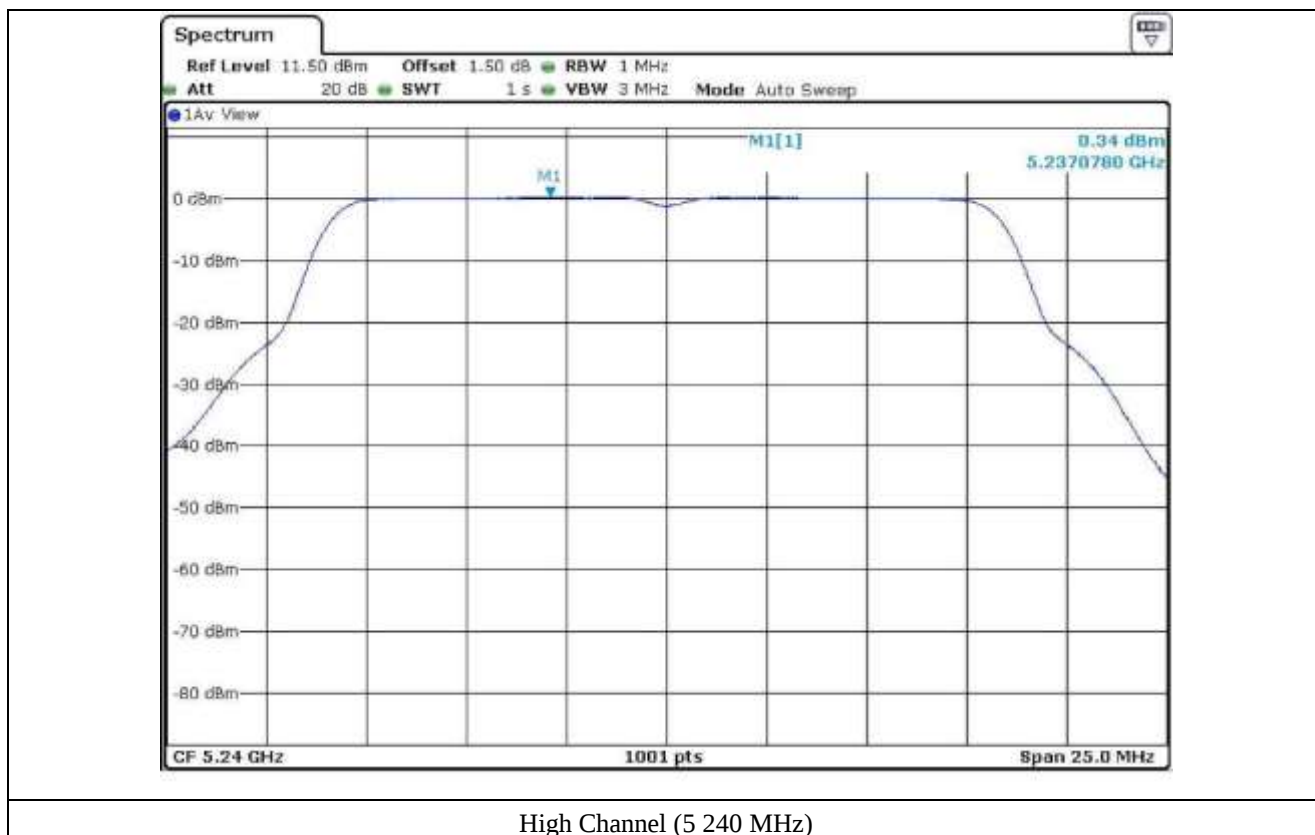
Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)

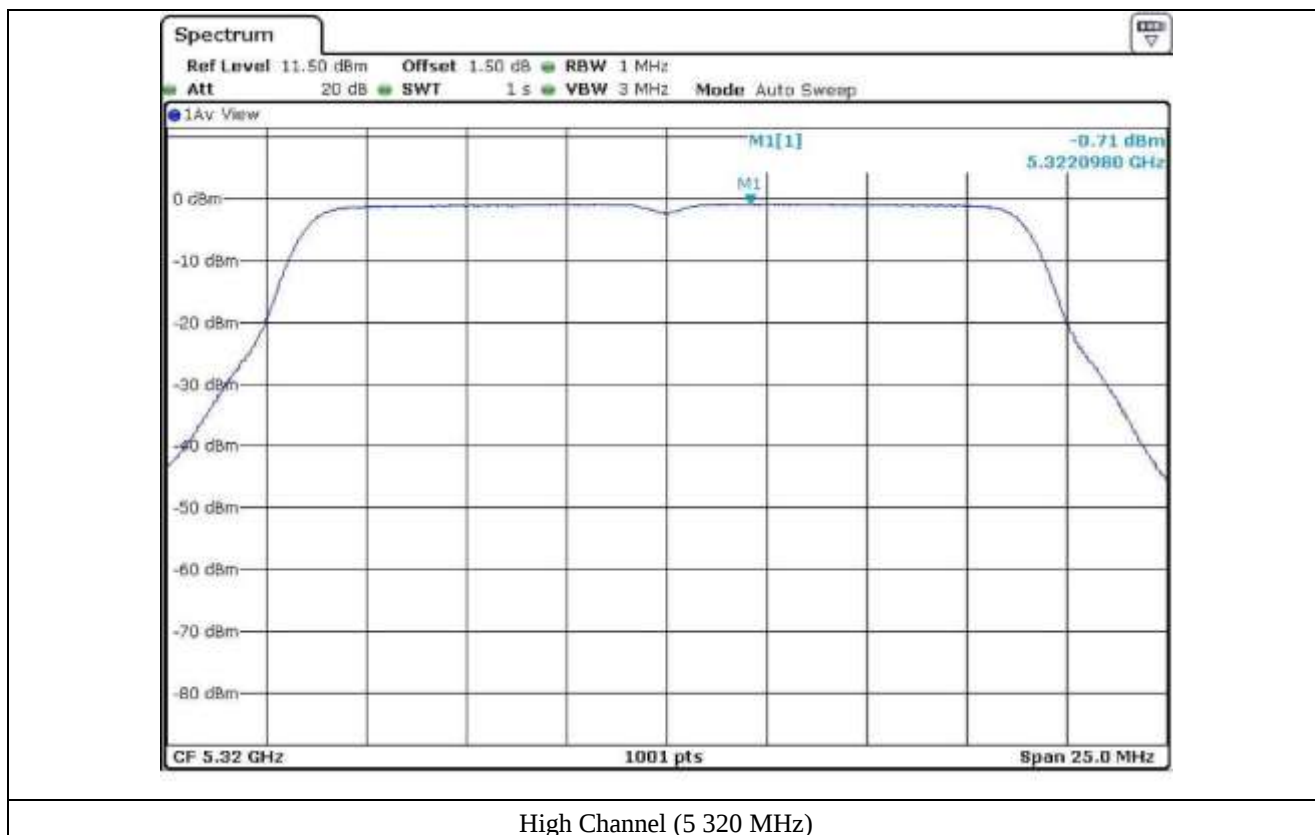


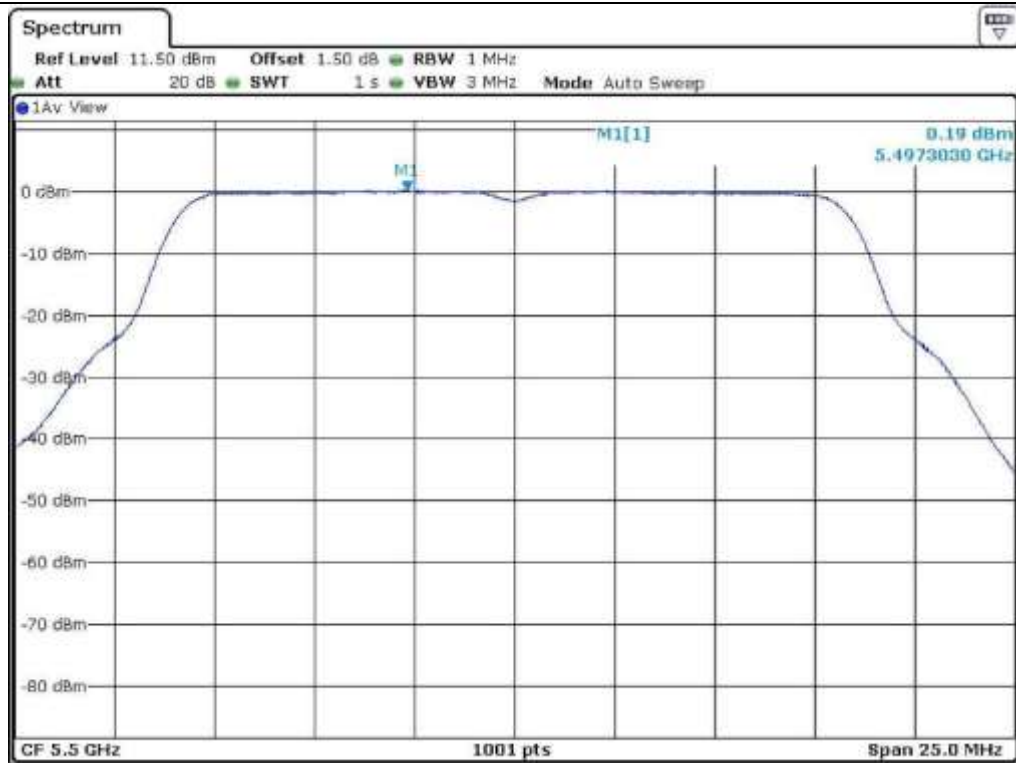


Low Channel (5 260 MHz)

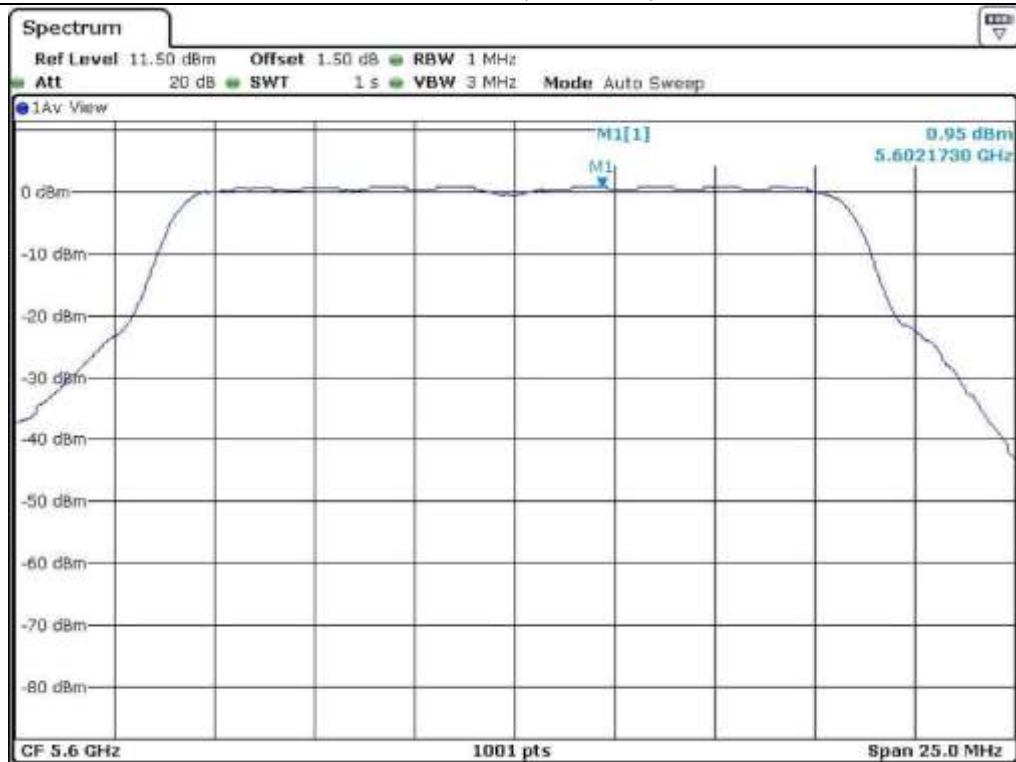


Middle Channel (5 300 MHz)

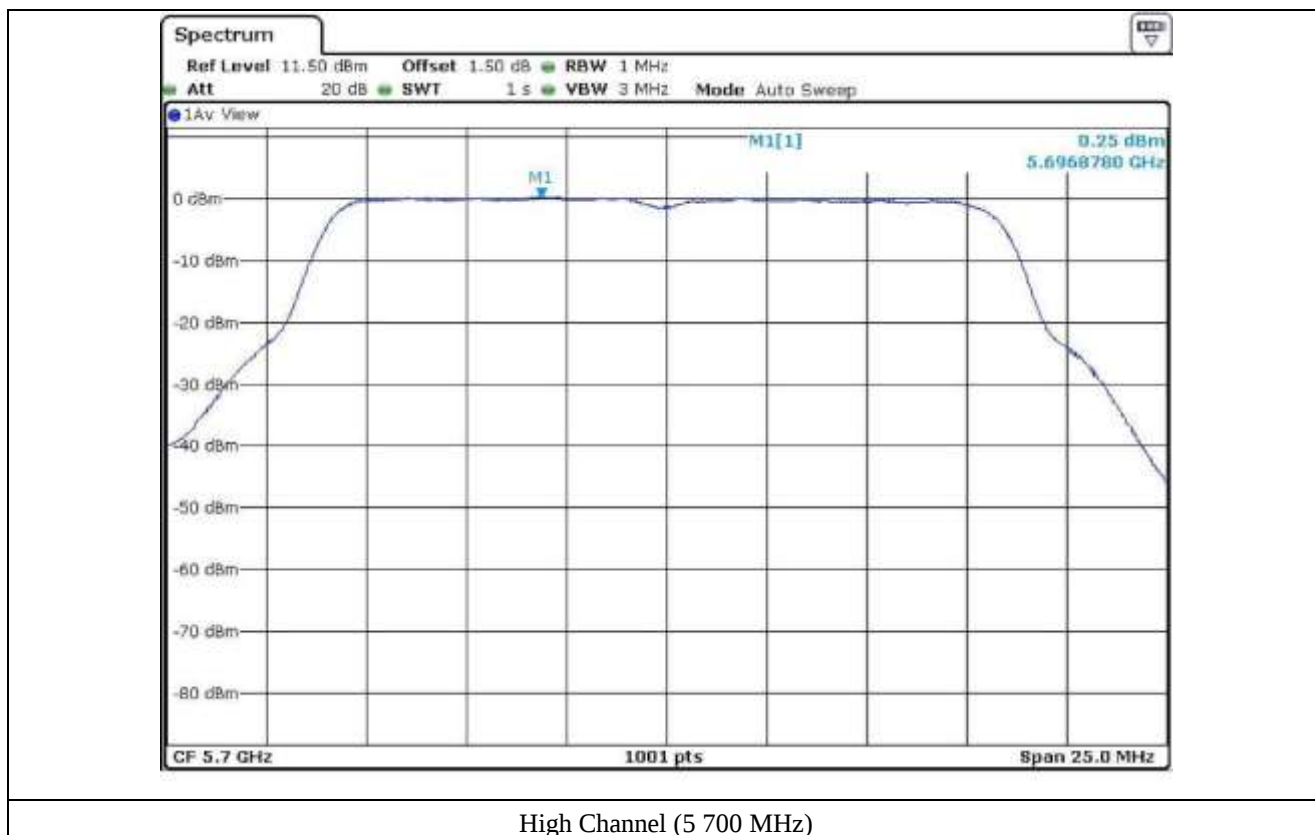


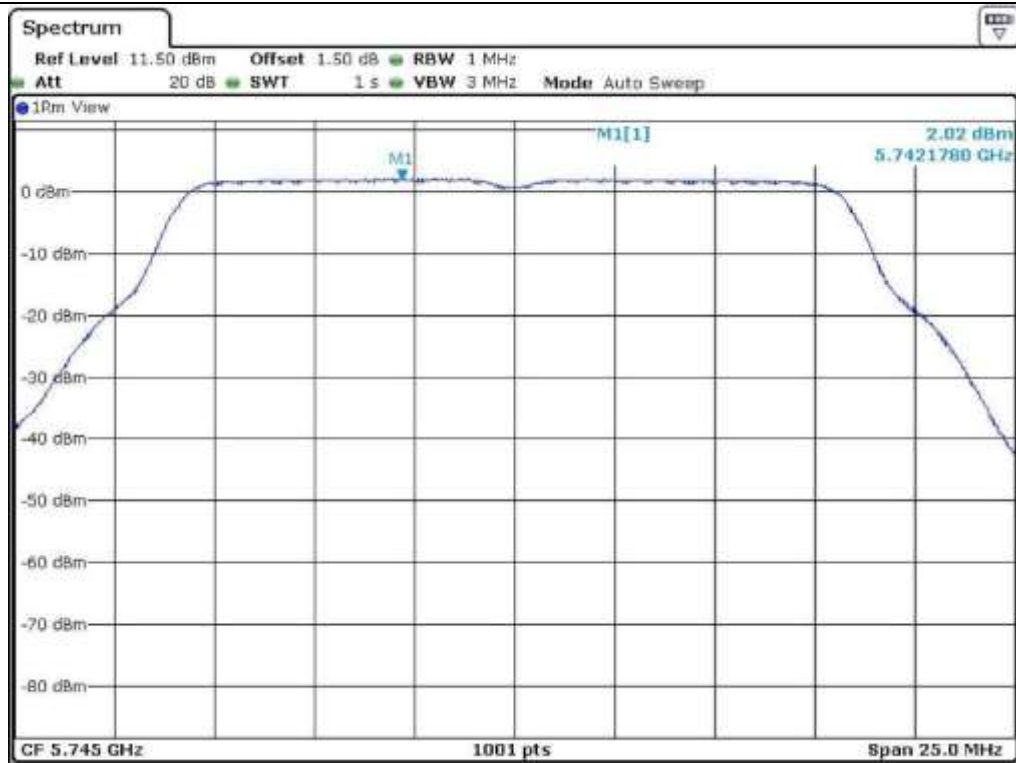


Low Channel (5 500 MHz)



Middle Channel (5 600 MHz)





Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)



High Channel (5 825 MHz)

9.4.3 Test data for Multiple Transmit

- Test Date : June 15, 2015
- Operating condition : Highest Output Power Transmitting Mode
- Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	3.00	10.00	7.00
	Middle	5 200	3.03	10.00	6.97
	High	5 240	2.95	10.00	7.05
5 250 ~ 5 350	Low	5 260	2.71	11.00	5.39
	Middle	5 300	2.42	11.00	5.68
	High	5 320	2.45	11.00	5.65
5 470 ~ 5 725	Low	5 500	3.64	11.00	4.46
	Middle	5 600	4.17	11.00	3.93
	High	5 700	3.58	11.00	4.52
5 725 ~ 5 850	Low	5 745	4.74	30.00	25.26
	Middle	5 785	4.60	30.00	25.40
	High	5 825	4.37	30.00	25.63

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna1 Power Density}/10)} + 10^{(\text{Antenna2 Power Density}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

9.5 Test data for 802.11n_HT20 RLAN Mode

9.5.1 Test data for Antenna 0

- . Test Date : June 19, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	-0.93	10.00	10.93
	Middle	5 200	-0.89	10.00	10.89
	High	5 240	-0.85	10.00	10.85
5 250 ~ 5 350	Low	5 260	0.79	11.00	9.16
	Middle	5 300	0.22	11.00	9.73
	High	5 320	-0.05	11.00	10.00
5 470 ~ 5 725	Low	5 500	0.56	11.00	10.44
	Middle	5 600	0.93	11.00	10.07
	High	5 700	0.56	11.00	10.44
5 725 ~ 5 850	Low	5 745	1.02	30.00	28.98
	Middle	5 785	0.84	30.00	29.16
	High	5 825	0.16	30.00	29.84

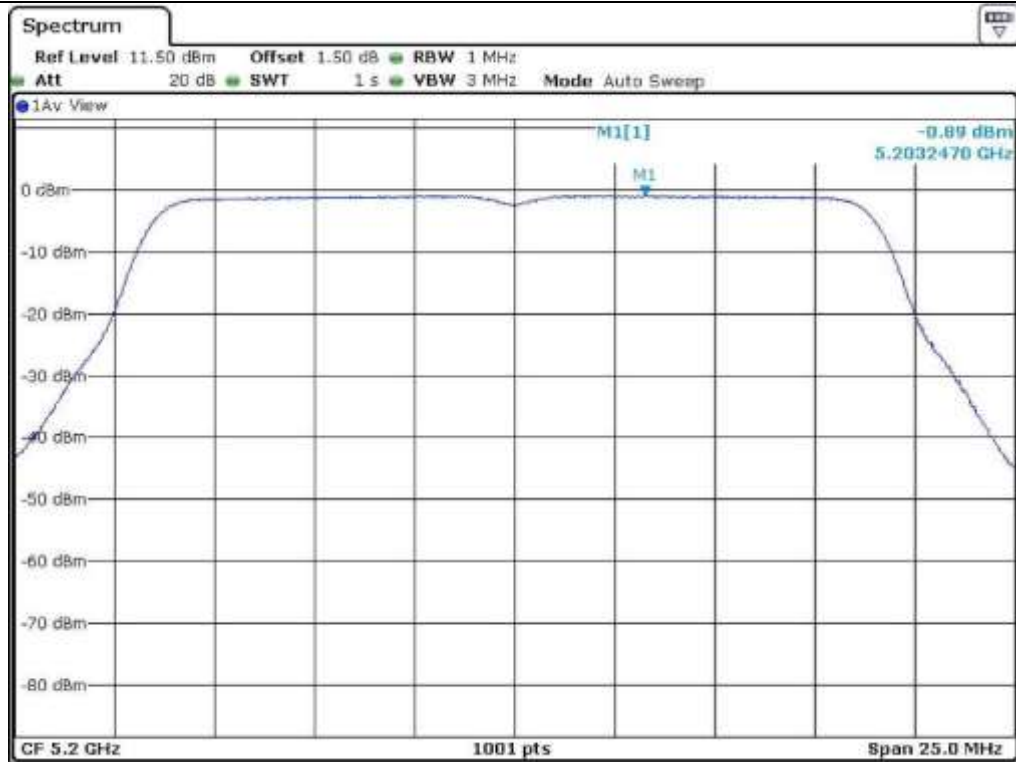
Remark: See next page for measurement data.



Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 180 MHz)



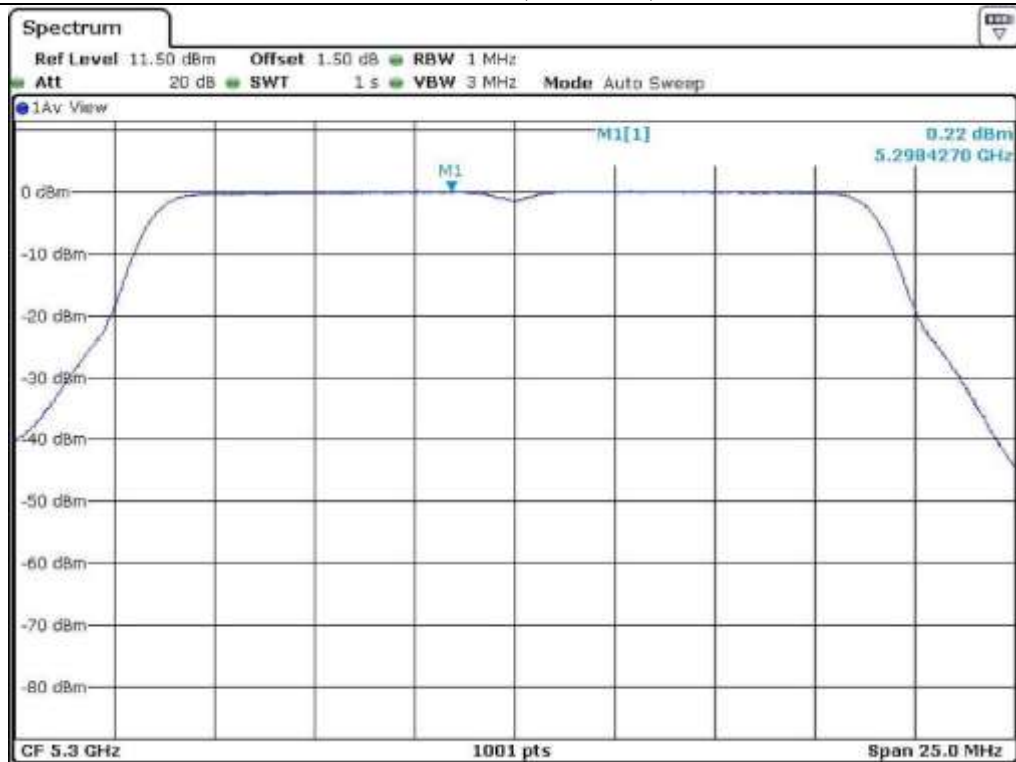
Middle Channel (5 200 MHz)



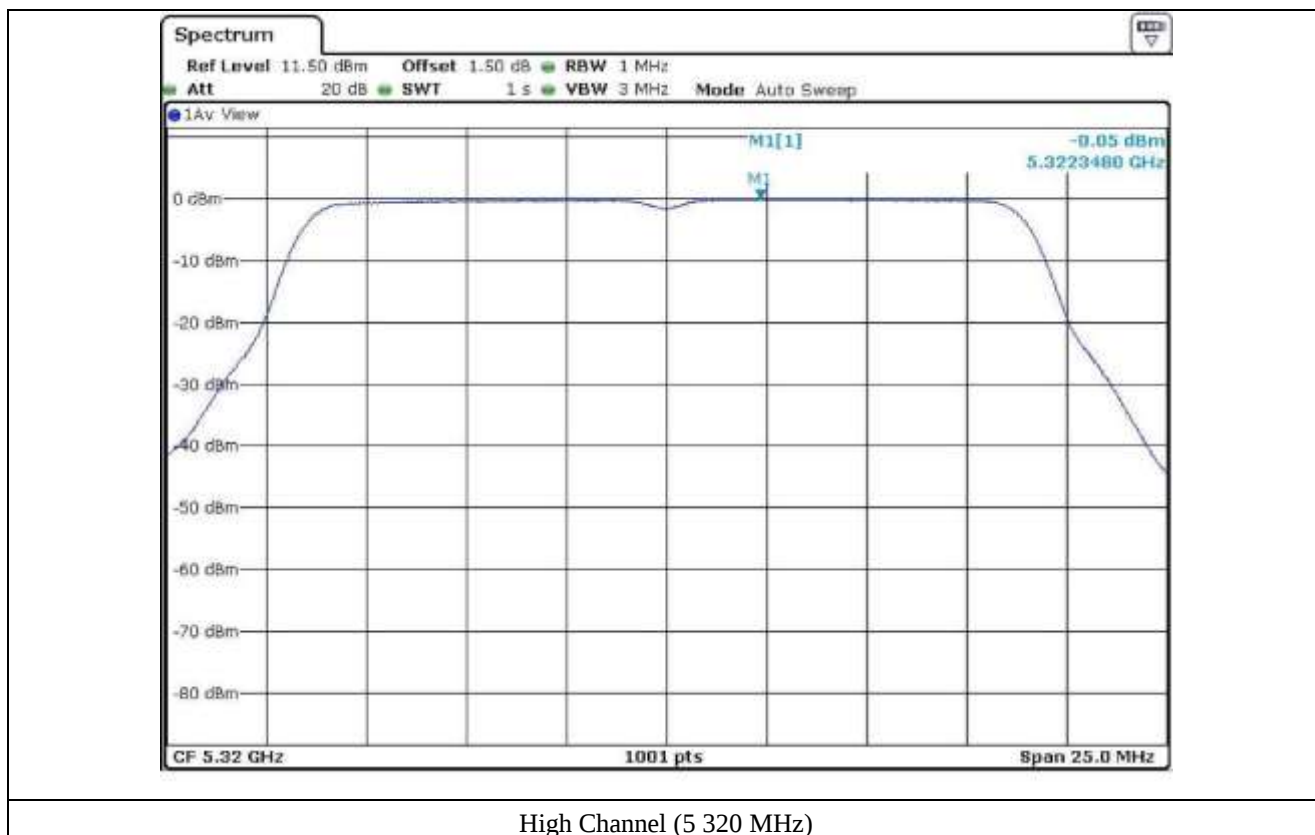
High Channel (5 240 MHz)

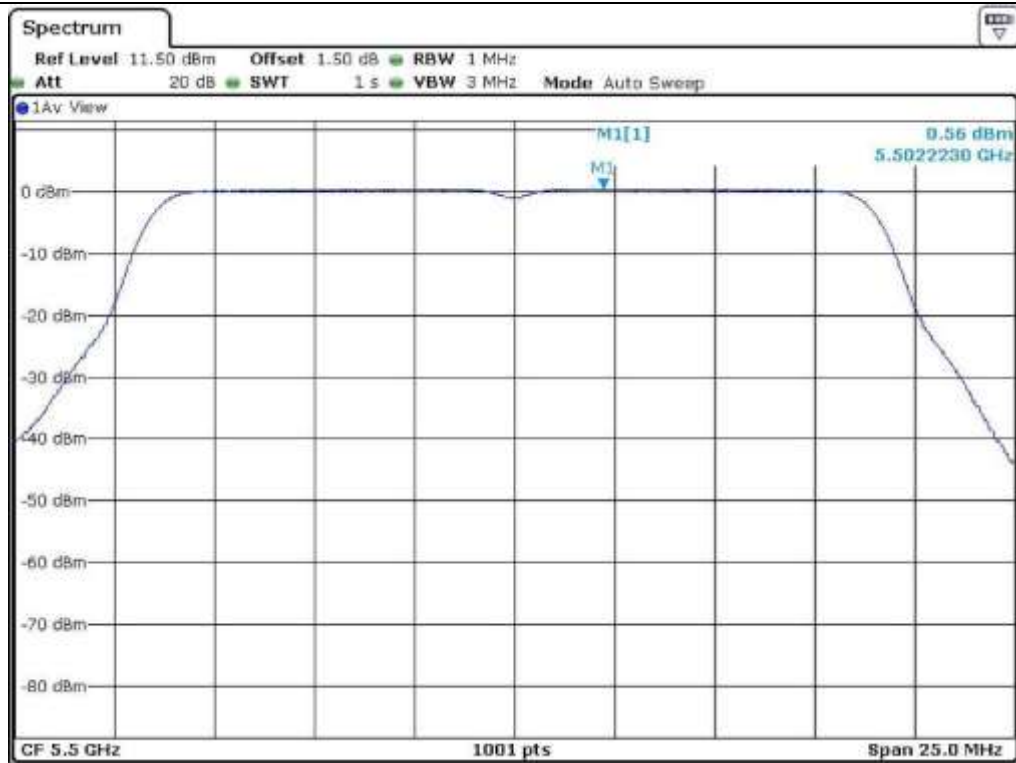


Low Channel (5 260 MHz)

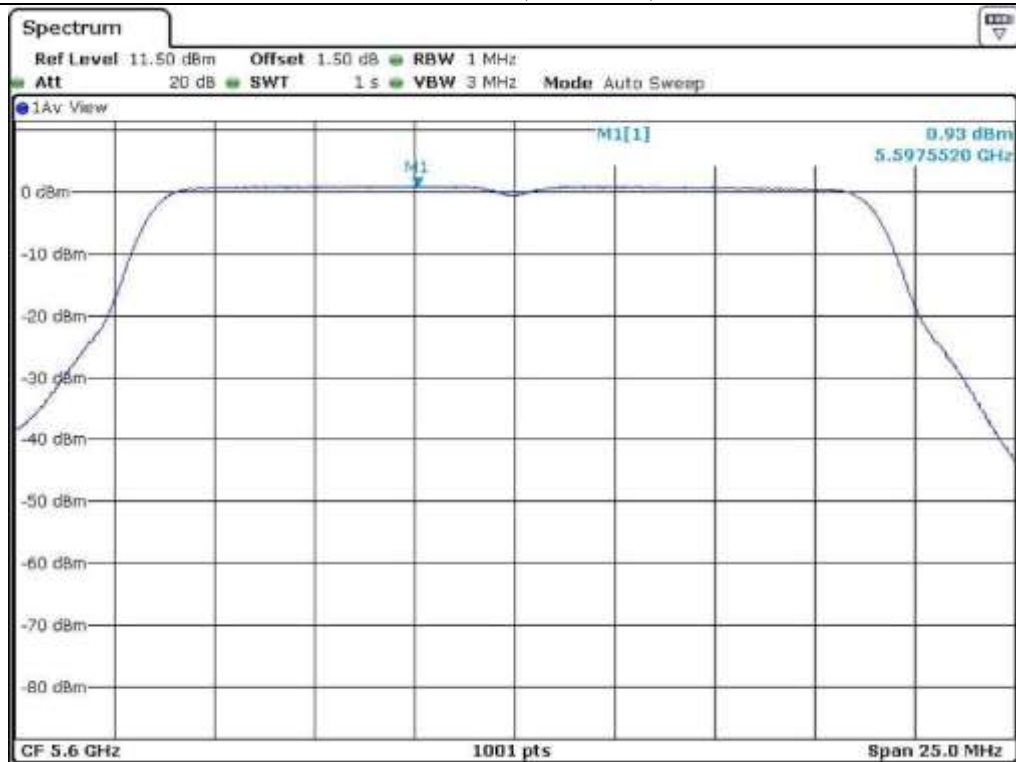


Middle Channel (5 300 MHz)





Low Channel (5 500 MHz)



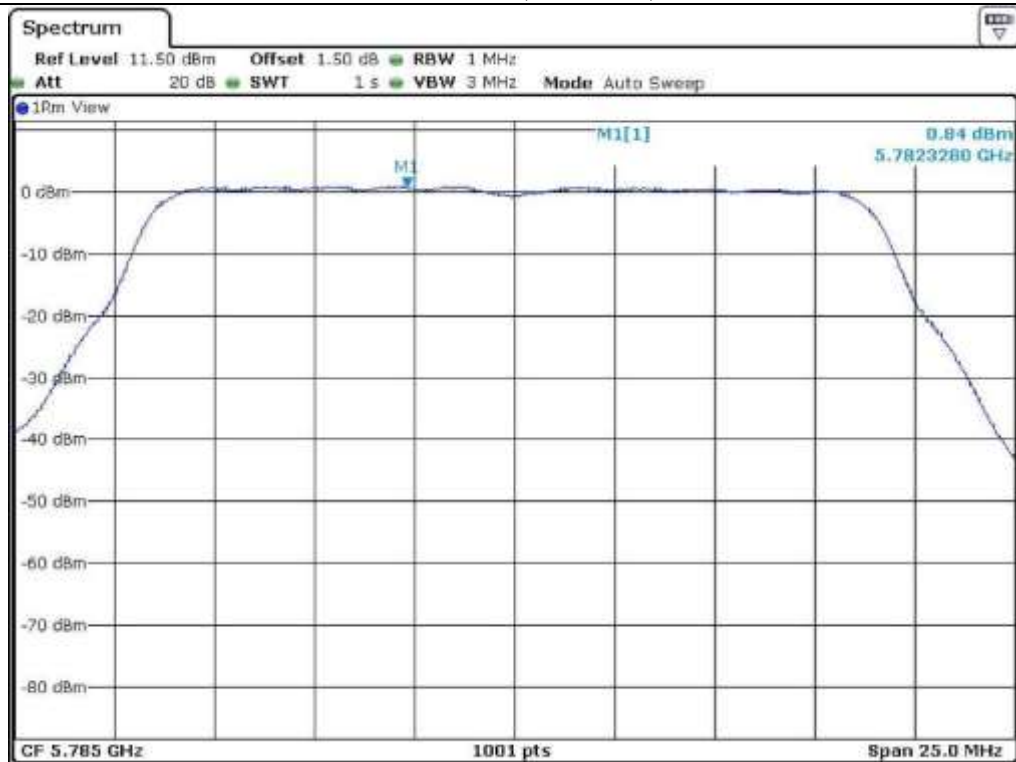
Middle Channel (5 600 MHz)



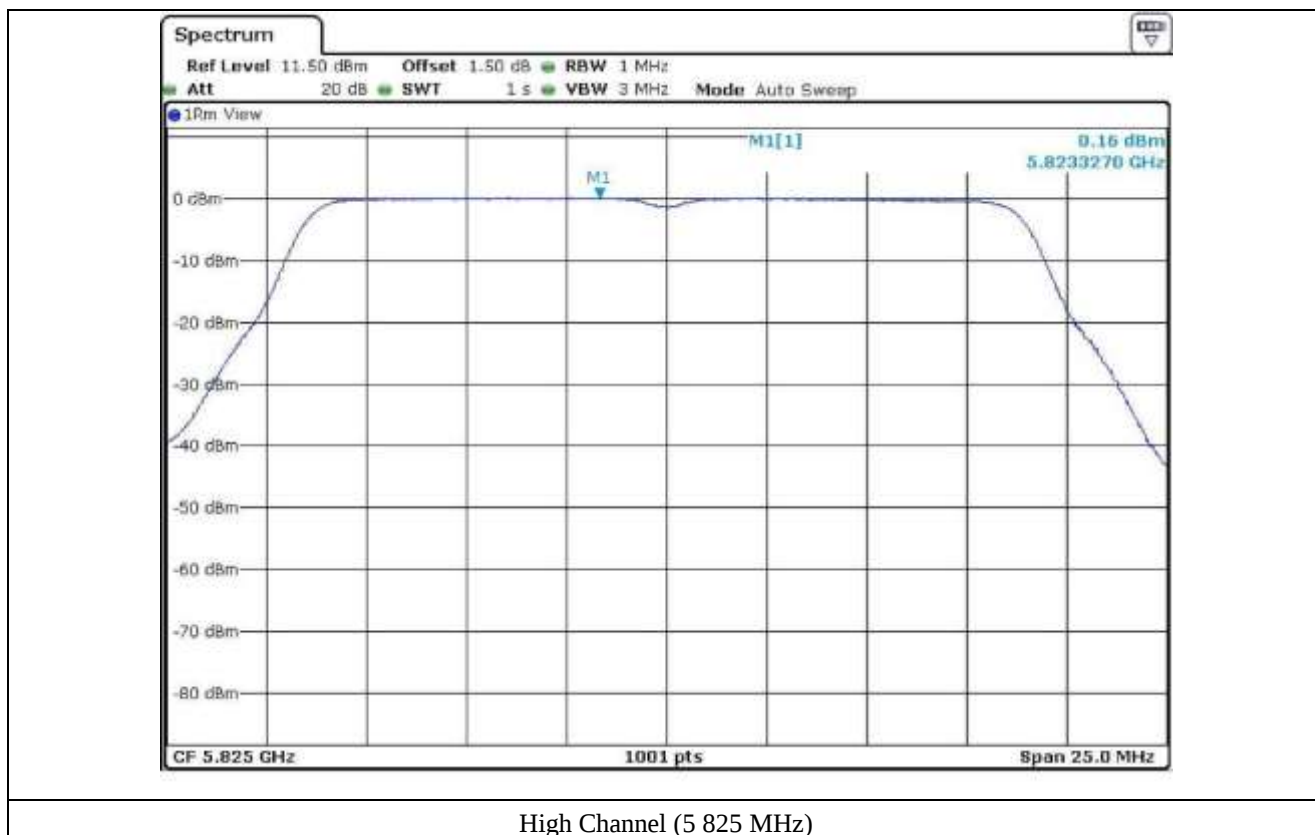
High Channel (5 700 MHz)



Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)



9.5.2 Test data for Antenna 1

- . Test Date : June 19, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	0.12	10.00	9.88
	Middle	5 200	0.07	10.00	9.93
	High	5 240	-0.10	10.00	10.10
5 250 ~ 5 350	Low	5 260	-0.60	11.00	10.29
	Middle	5 300	-1.03	11.00	10.72
	High	5 320	-0.98	11.00	10.67
5 470 ~ 5 725	Low	5 500	-0.38	11.00	11.38
	Middle	5 600	0.44	11.00	10.56
	High	5 700	-0.33	11.00	11.33
5 725 ~ 5 850	Low	5 745	1.74	30.00	28.26
	Middle	5 785	1.42	30.00	28.58
	High	5 825	1.46	30.00	28.54

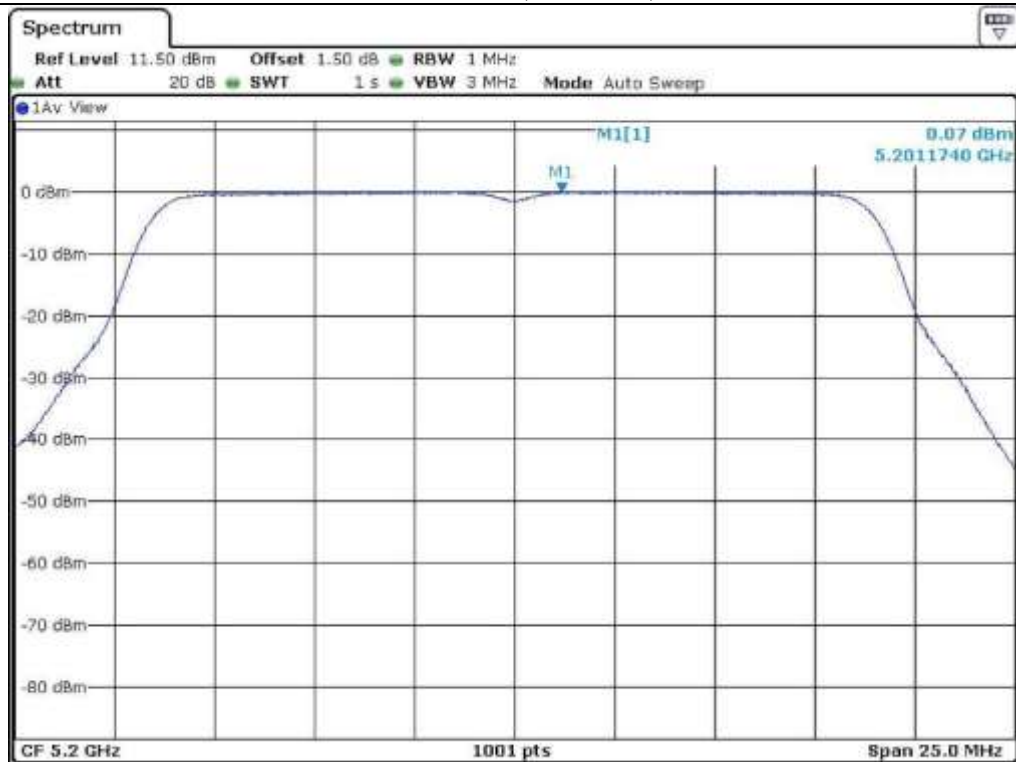
Remark: See next page for measurement data.



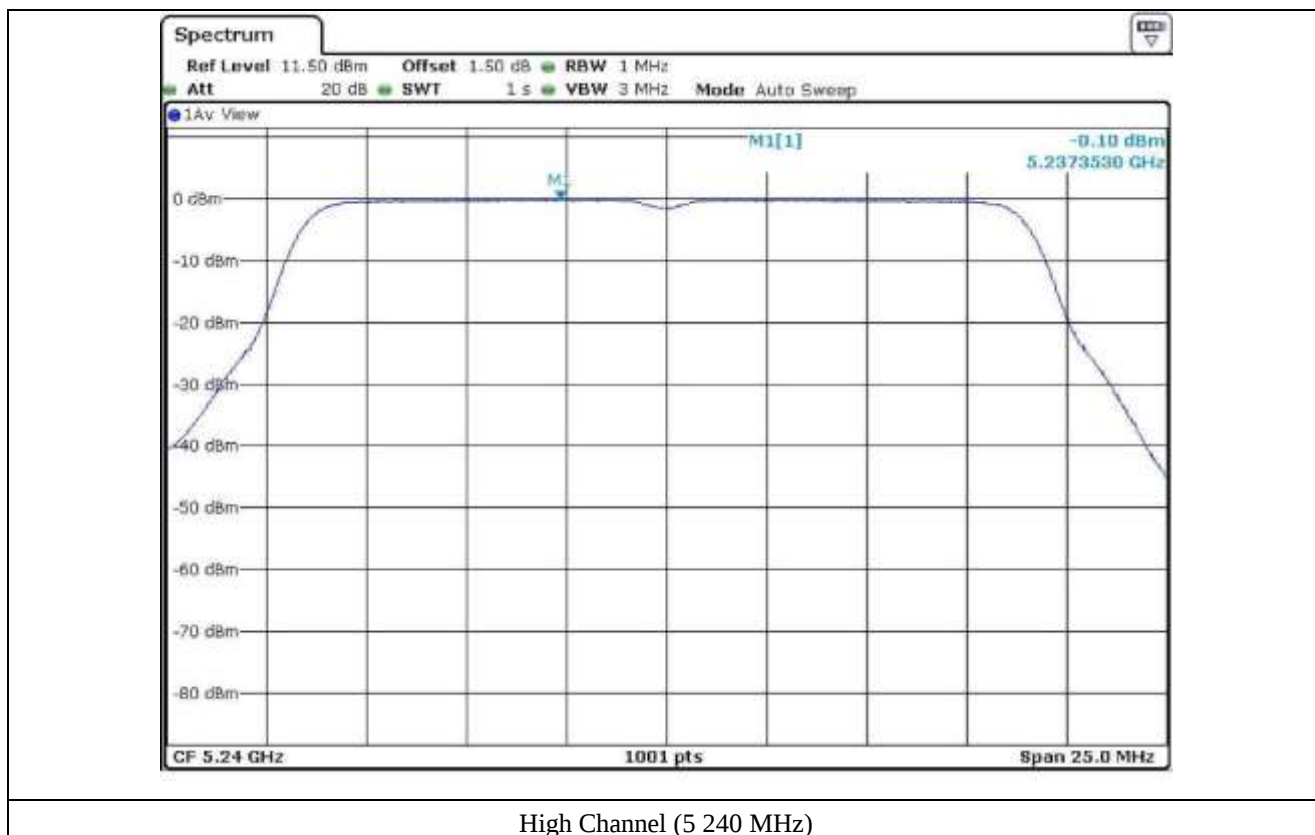
Tested by: Tae-Ho, Kim / Senior Engineer

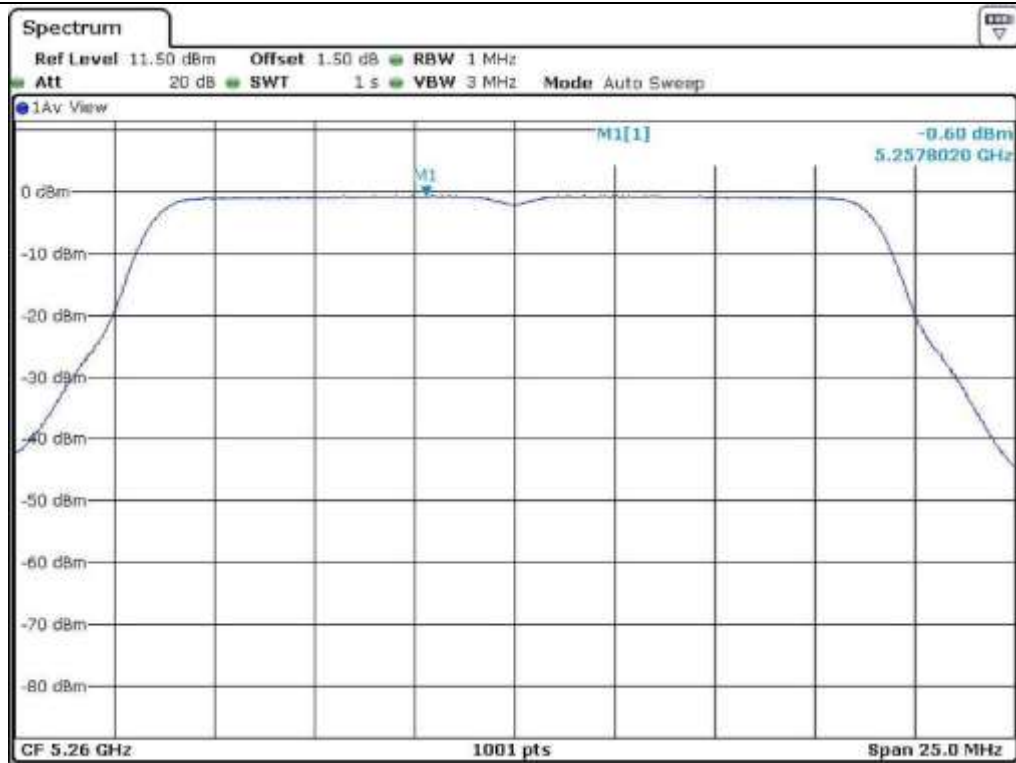


Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)





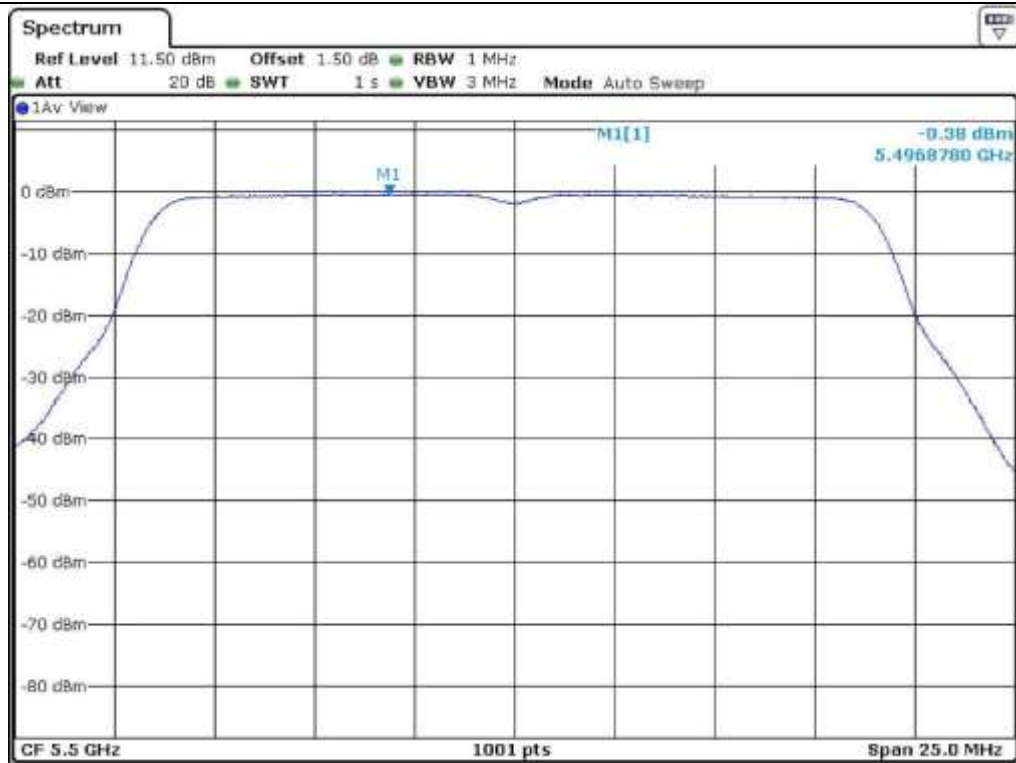
Low Channel (5 260 MHz)



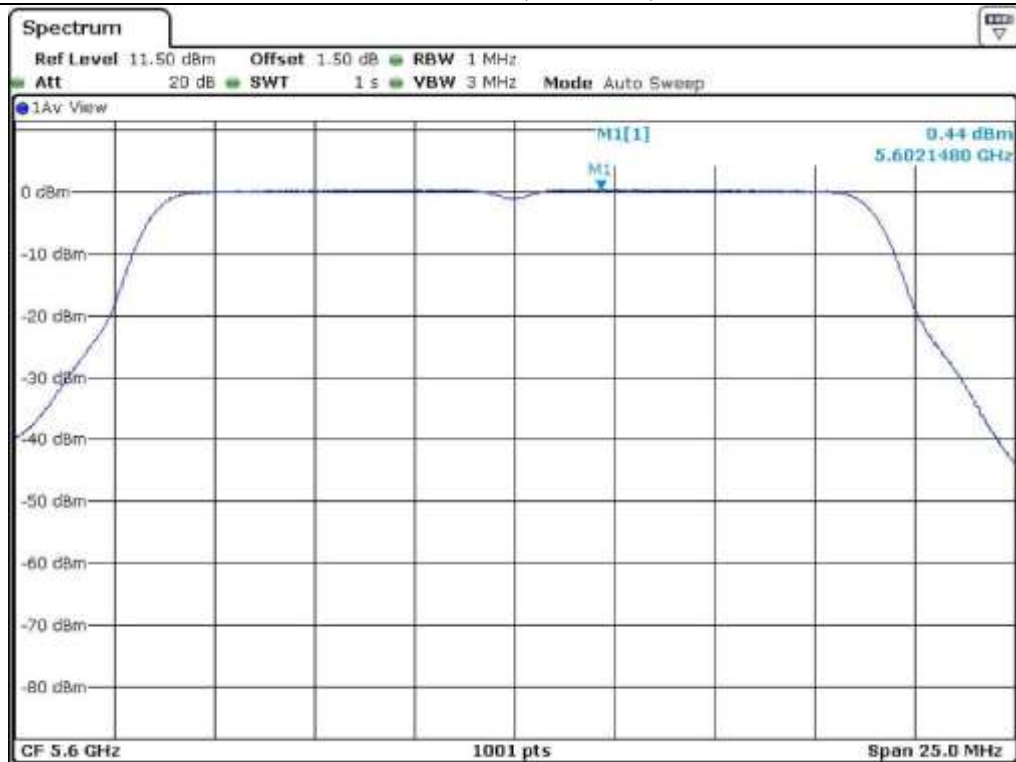
Middle Channel (5 300 MHz)



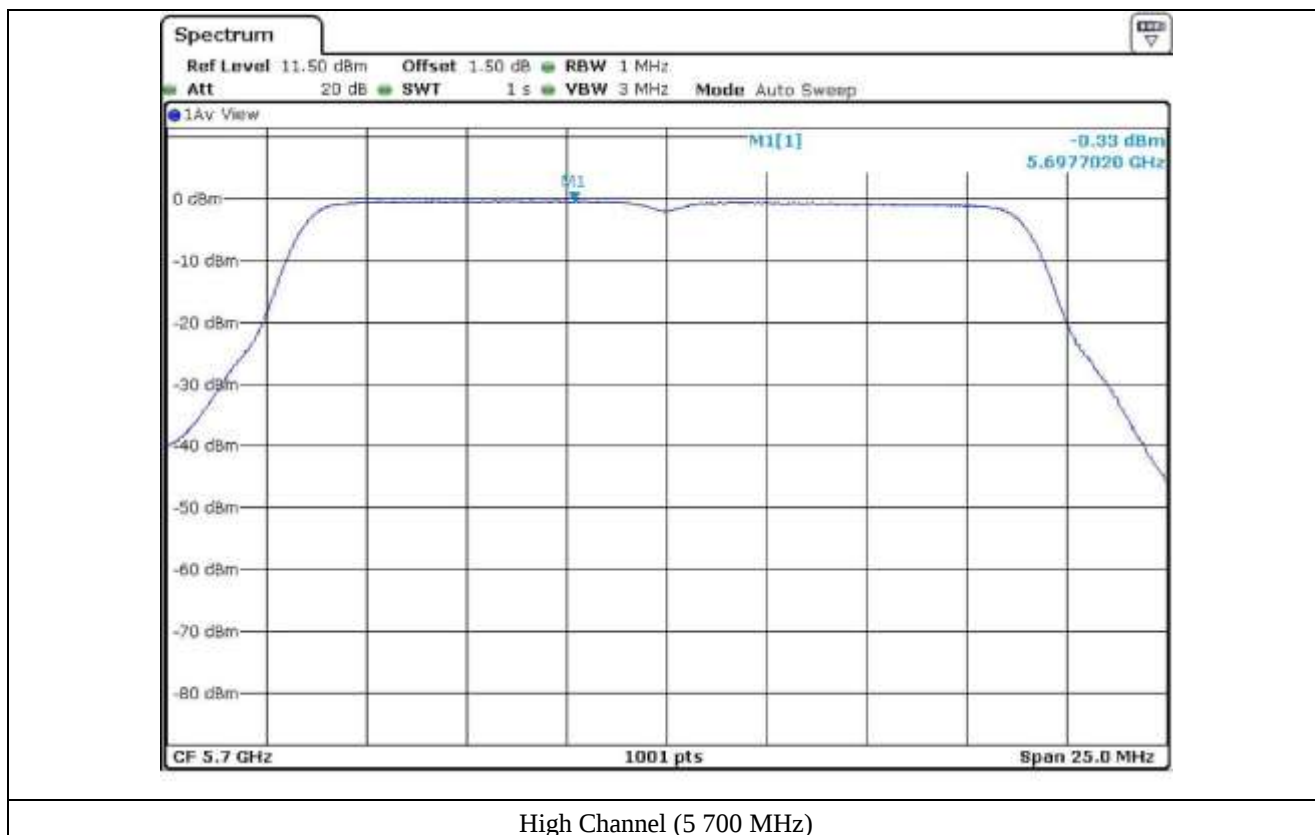
High Channel (5 320 MHz)

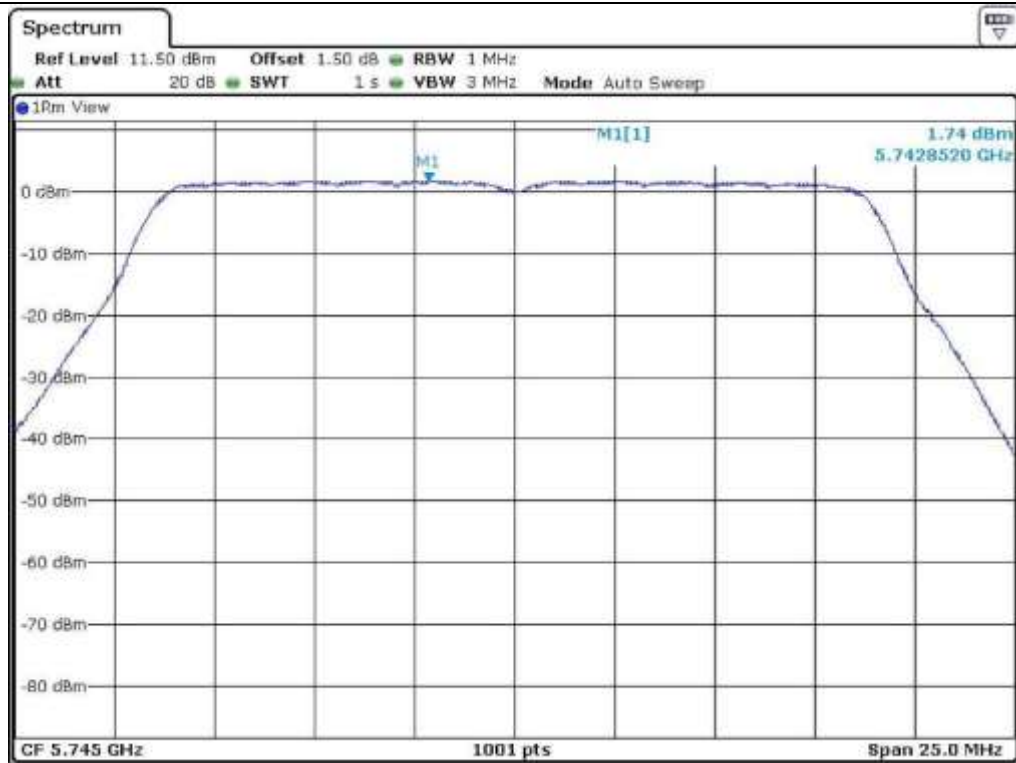


Low Channel (5 500 MHz)

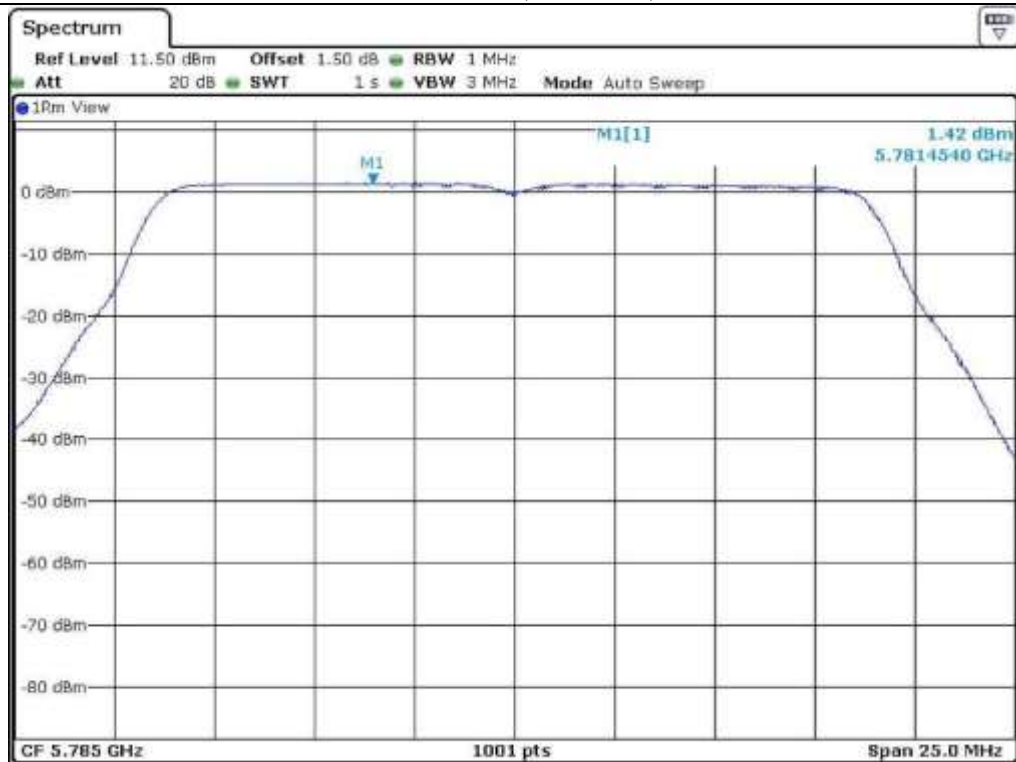


Middle Channel (5 600 MHz)





Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)



9.5.3 Test data for Multiple transmit

- Test Date : June 19, 2015
- Operating condition : Highest Output Power Transmitting Mode
- Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	2.64	10.00	7.36
	Middle	5 200	2.63	10.00	7.37
	High	5 240	2.55	10.00	7.45
5 250 ~ 5 350	Low	5 260	3.16	11.00	3.65
	Middle	5 300	2.65	11.00	4.16
	High	5 320	2.52	11.00	4.29
5 470 ~ 5 725	Low	5 500	3.13	11.00	7.87
	Middle	5 600	3.70	11.00	7.30
	High	5 700	3.15	11.00	7.85
5 725 ~ 5 850	Low	5 745	4.41	30.00	25.59
	Middle	5 785	4.15	30.00	25.85
	High	5 825	3.87	30.00	26.13

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna1 Power Density}/10)} + 10^{(\text{Antenna2 Power Density}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

9.6 Test data for 802.11n_HT40 RLAN Mode

9.6.1 Test data for Antenna 0

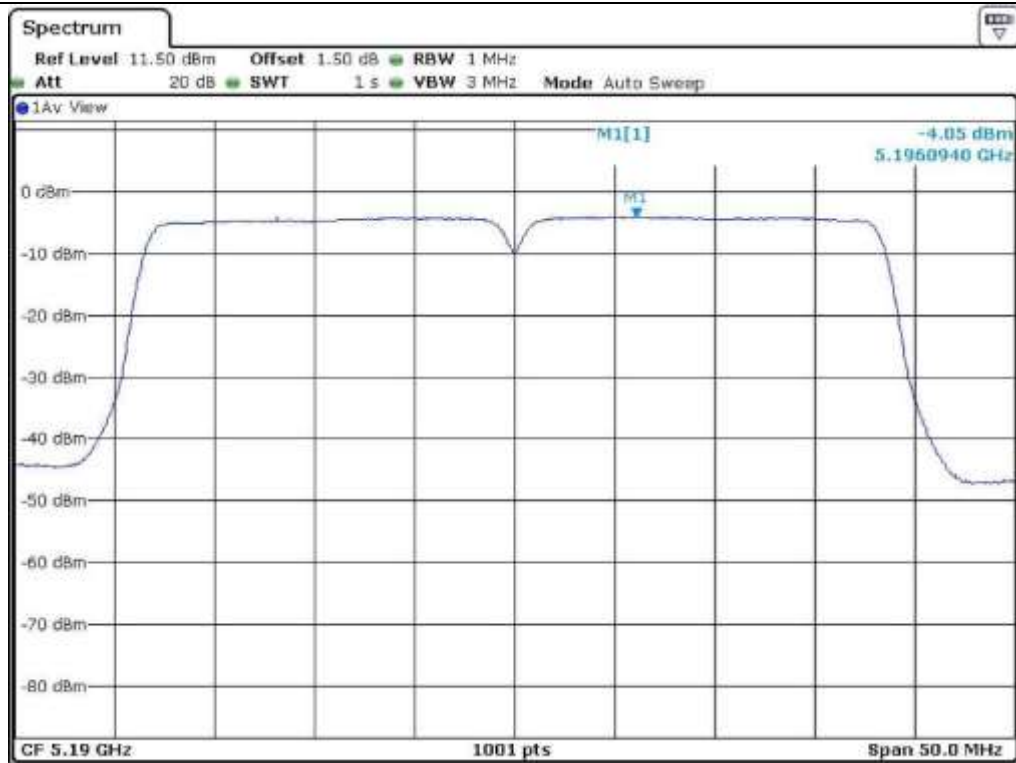
- . Test Date : June 20, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	-4.05	10.00	14.05
	High	5 230	-4.05	10.00	14.05
5 250 ~ 5 350	Low	5 270	-2.75	11.00	13.75
	High	5 310	-3.10	11.00	14.10
5 470 ~ 5 725	Low	5 510	-2.40	11.00	13.40
	Middle	5 590	-1.94	11.00	12.94
	High	5 670	-2.41	11.00	13.41
5 725 ~ 5 850	Low	5 755	-1.87	30.00	28.97
	High	5 795	-1.92	30.00	29.02

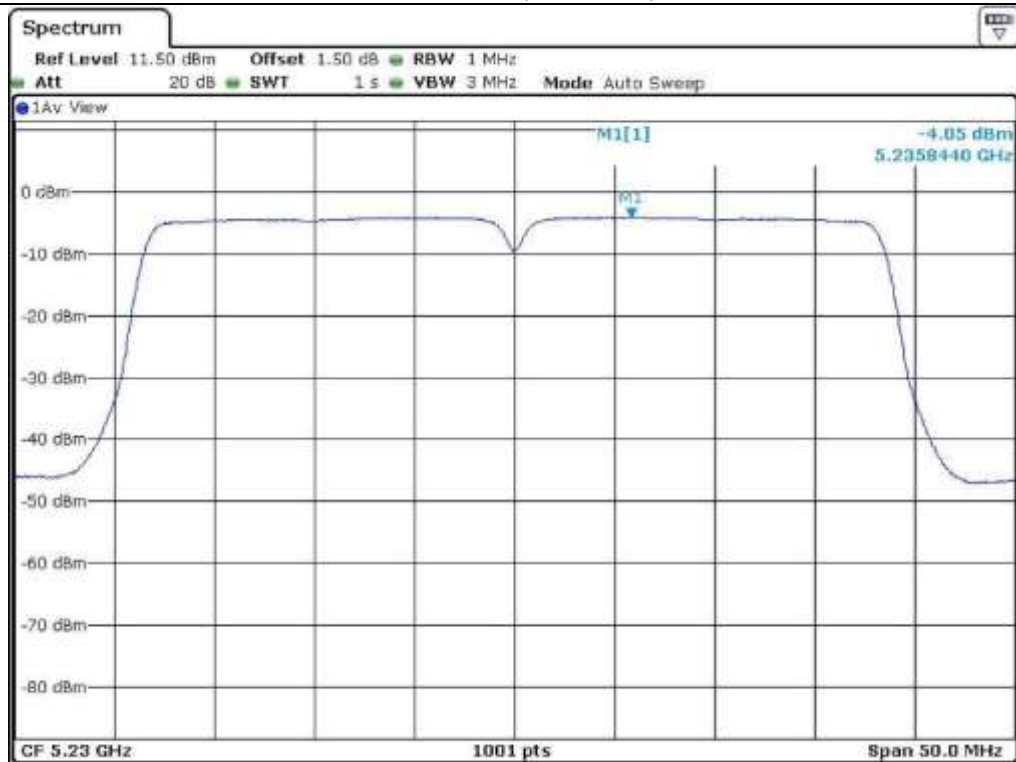
Remark: See next page for measurement data.



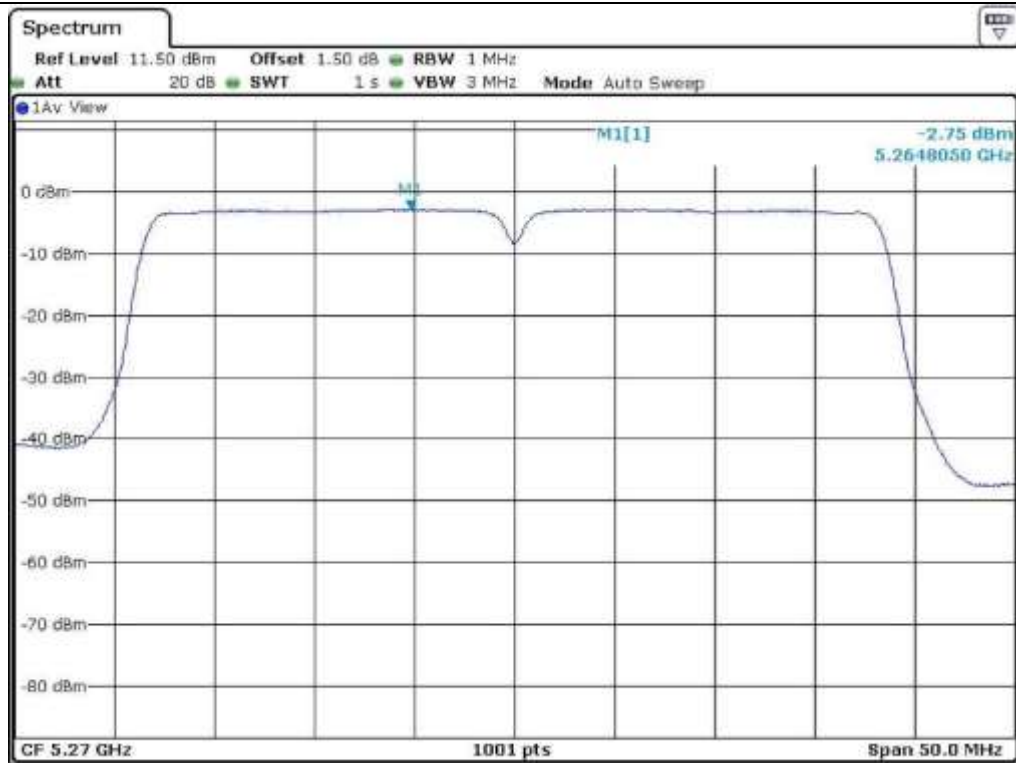
Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 190 MHz)



High Channel (5 230 MHz)



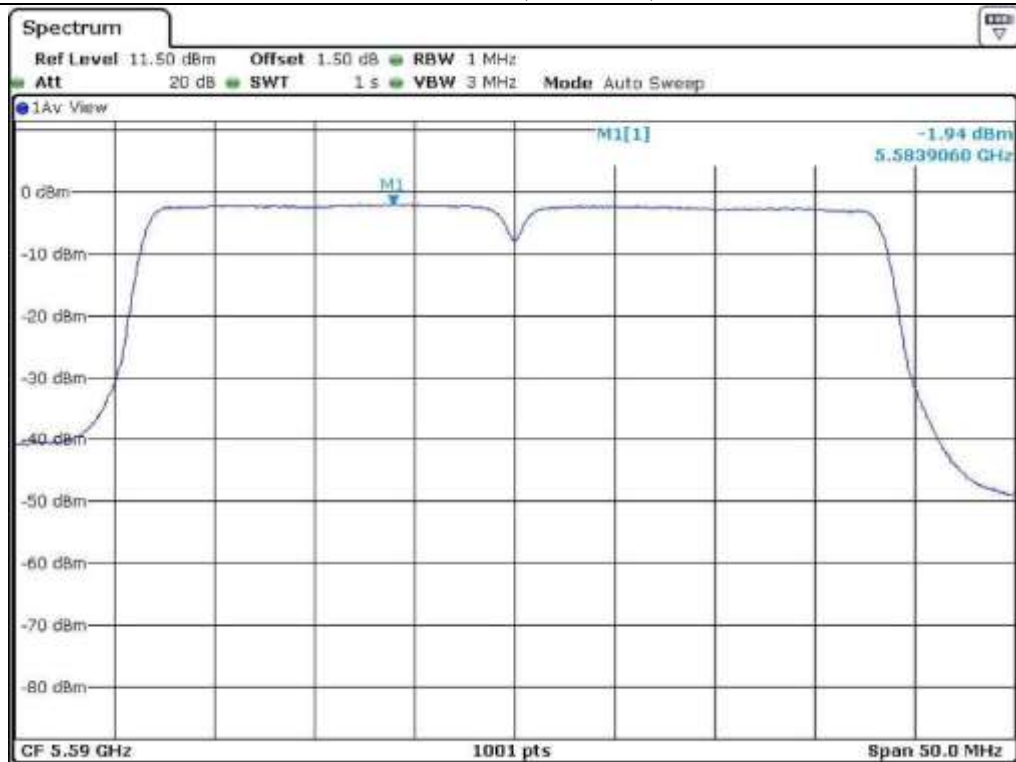
Low Channel (5 270 MHz)



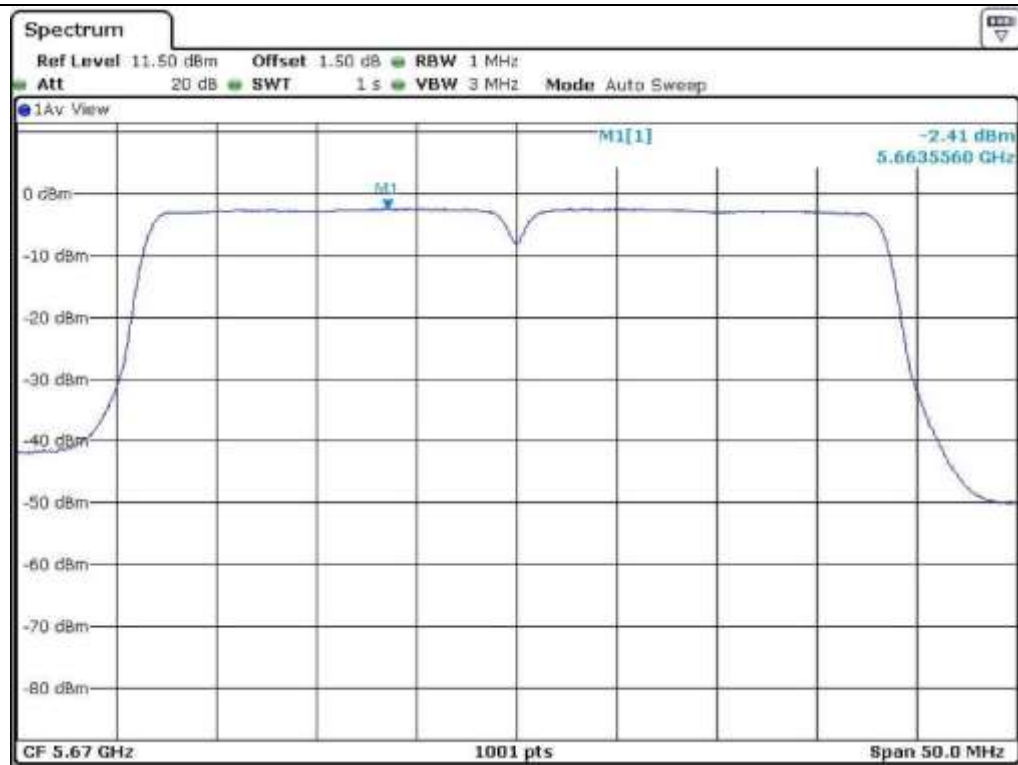
High Channel (5 310 MHz)



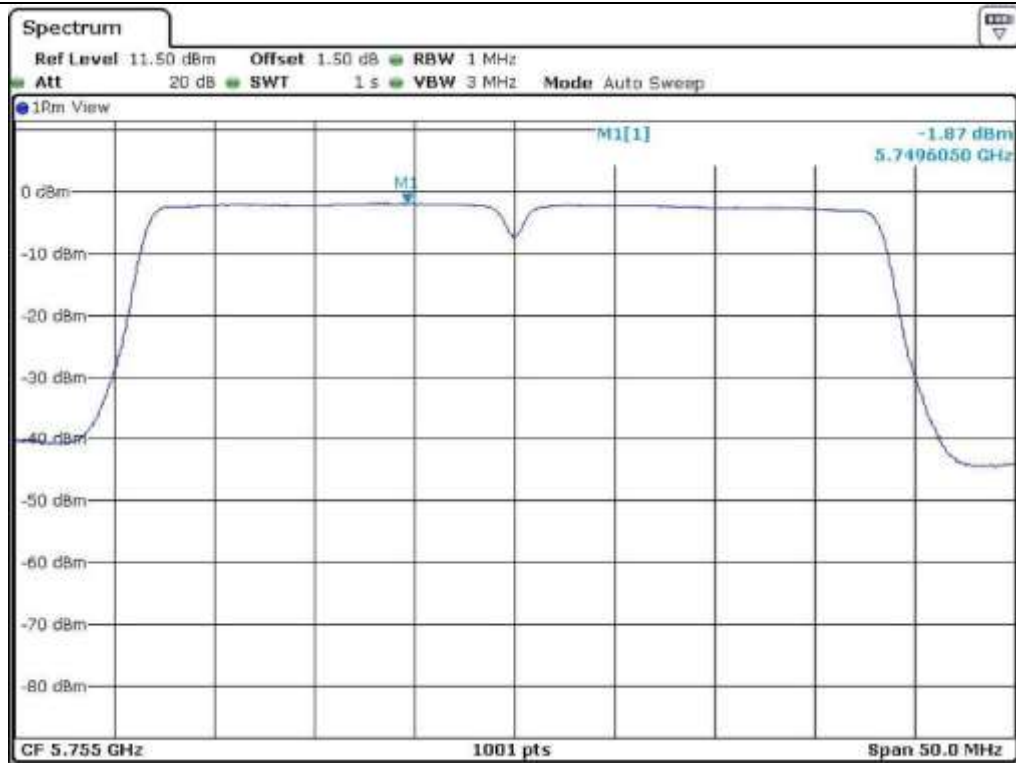
Low Channel (5 510 MHz)



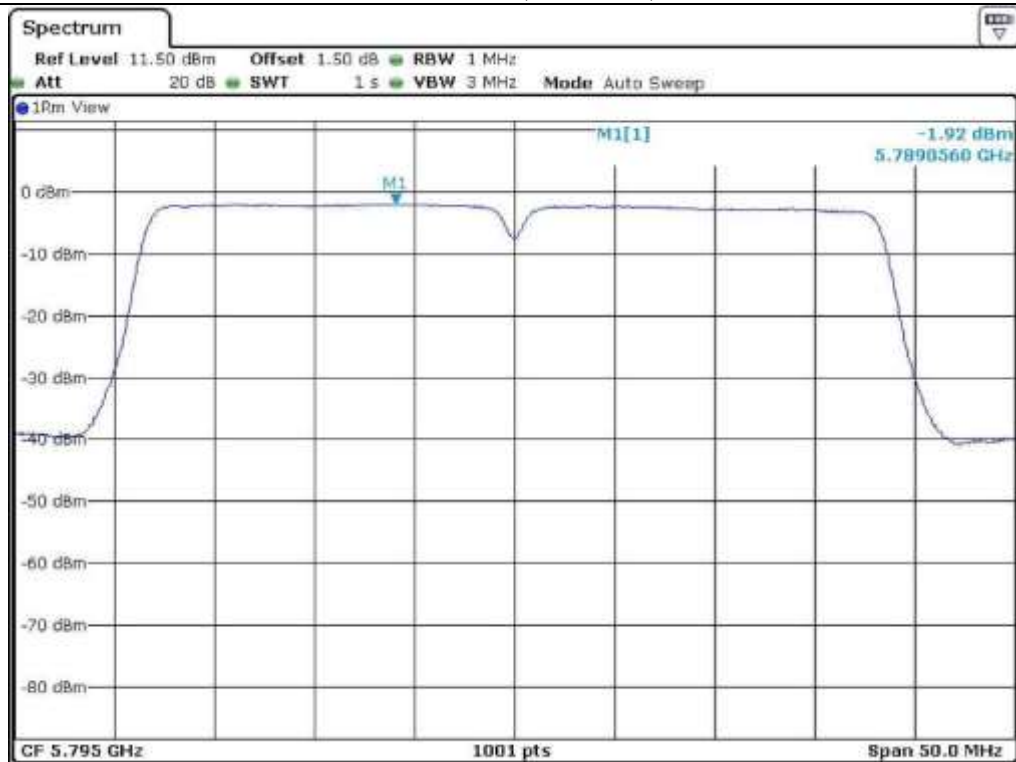
Middle Channel (5 590 MHz)



High Channel (5 670 MHz)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

9.6.2 Test data for Antenna 1

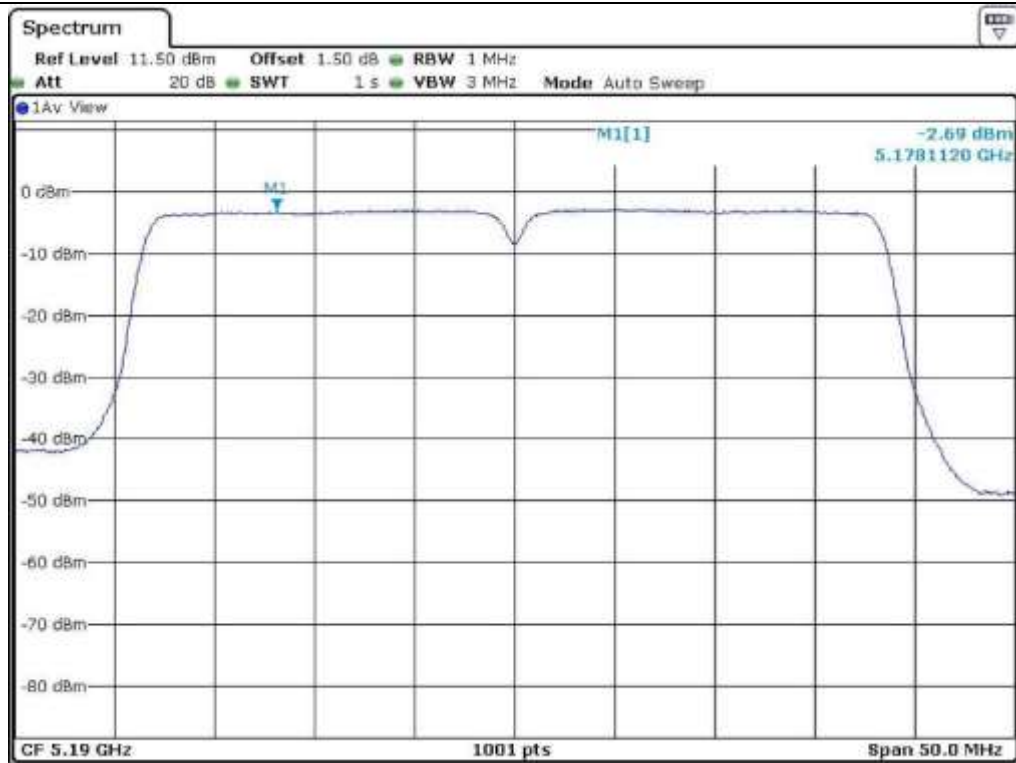
- . Test Date : June 20, 2015
- . Operating condition : Highest Output Power Transmitting Mode
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	-2.69	10.00	12.69
	High	5 230	-3.21	10.00	13.21
5 250 ~ 5 350	Low	5 270	-4.29	11.00	15.29
	High	5 310	-4.23	11.00	15.23
5 470 ~ 5 725	Low	5 510	-3.41	11.00	14.41
	Middle	5 590	-2.80	11.00	13.80
	High	5 670	-2.97	11.00	13.97
5 725 ~ 5 850	Low	5 755	-1.10	30.00	28.20
	High	5 795	-1.19	30.00	28.29

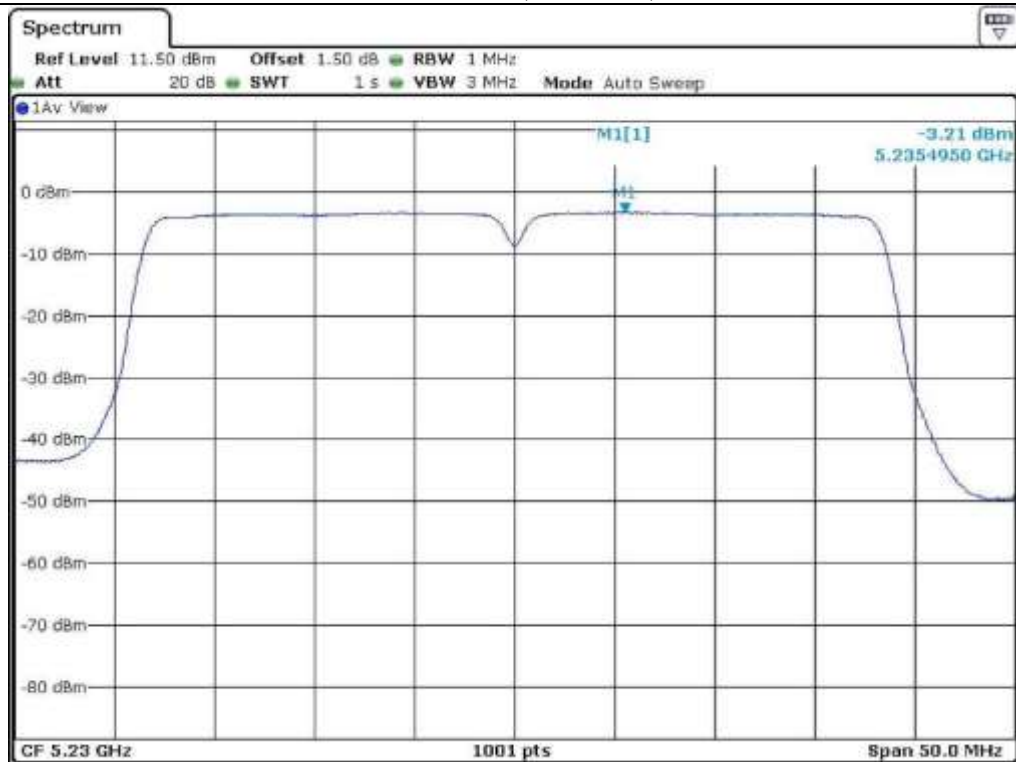
Remark: See next page for measurement data.



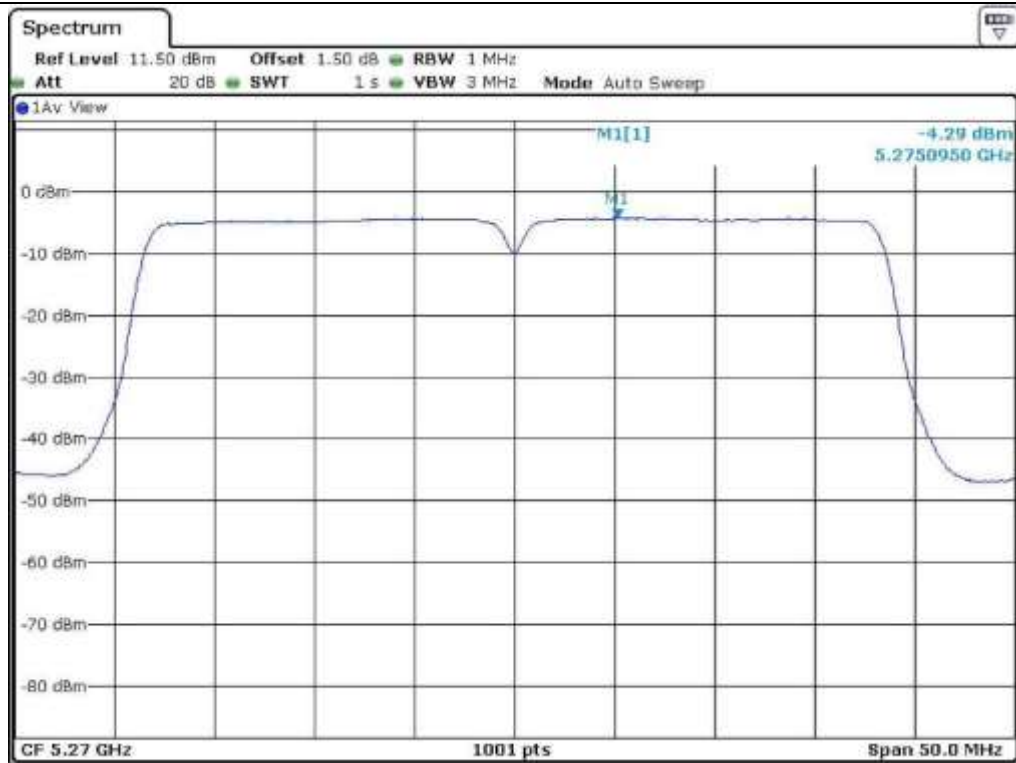
Tested by: Tae-Ho, Kim / Senior Engineer



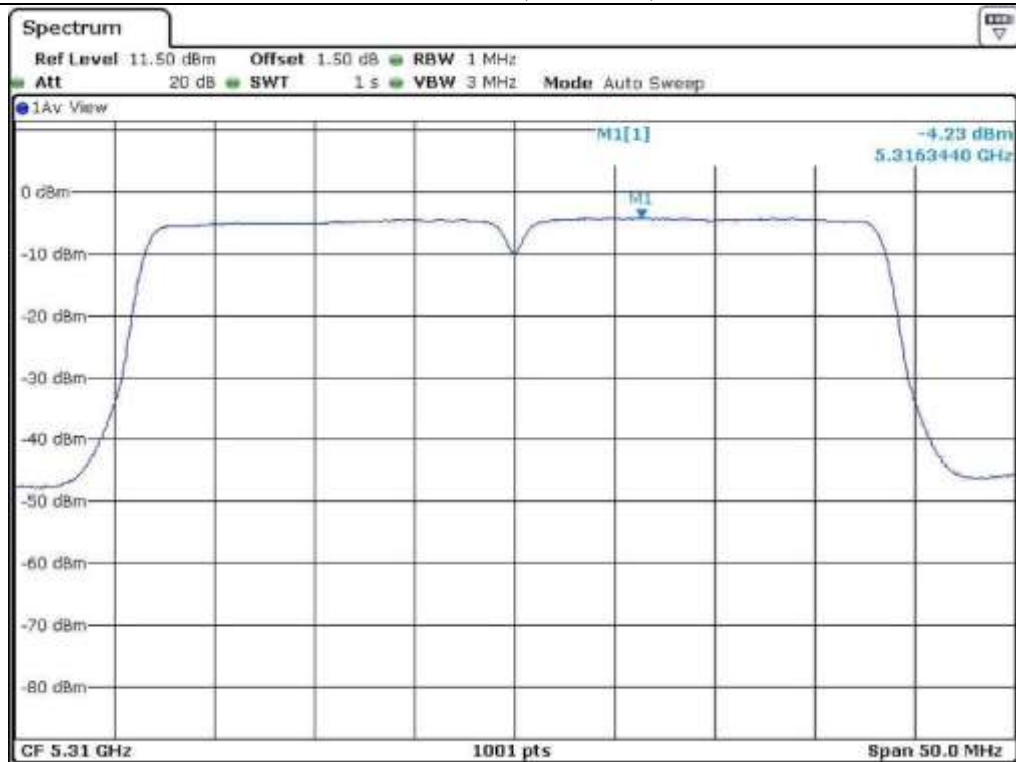
Low Channel (5 190 MHz)



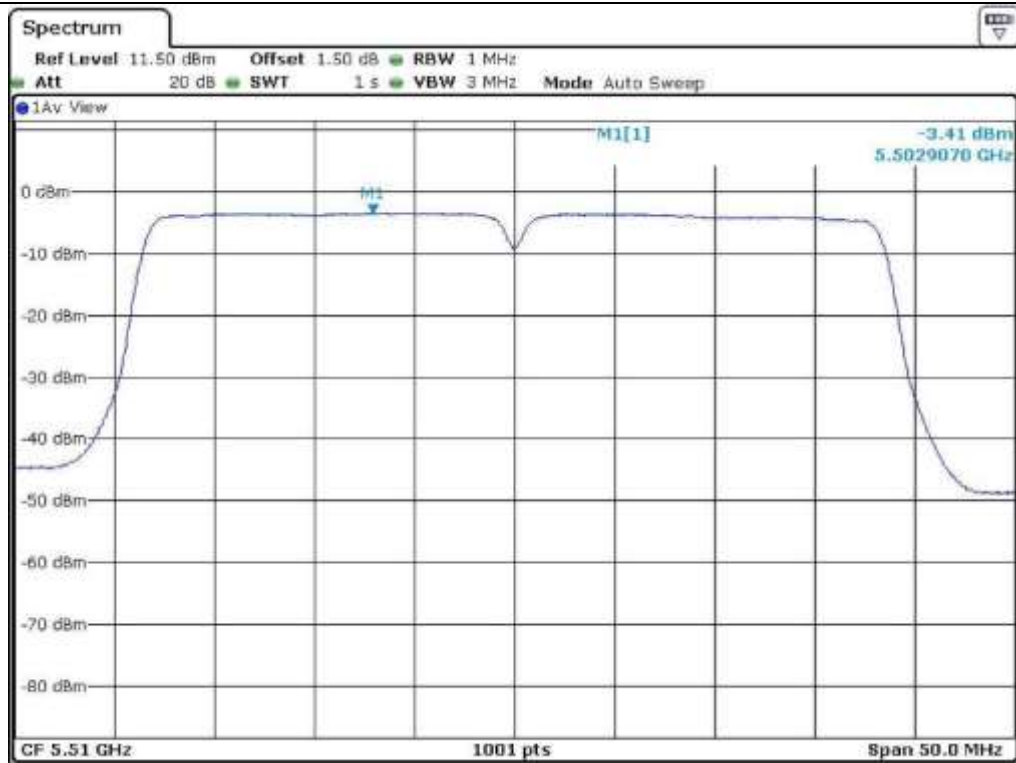
High Channel (5 230 MHz)



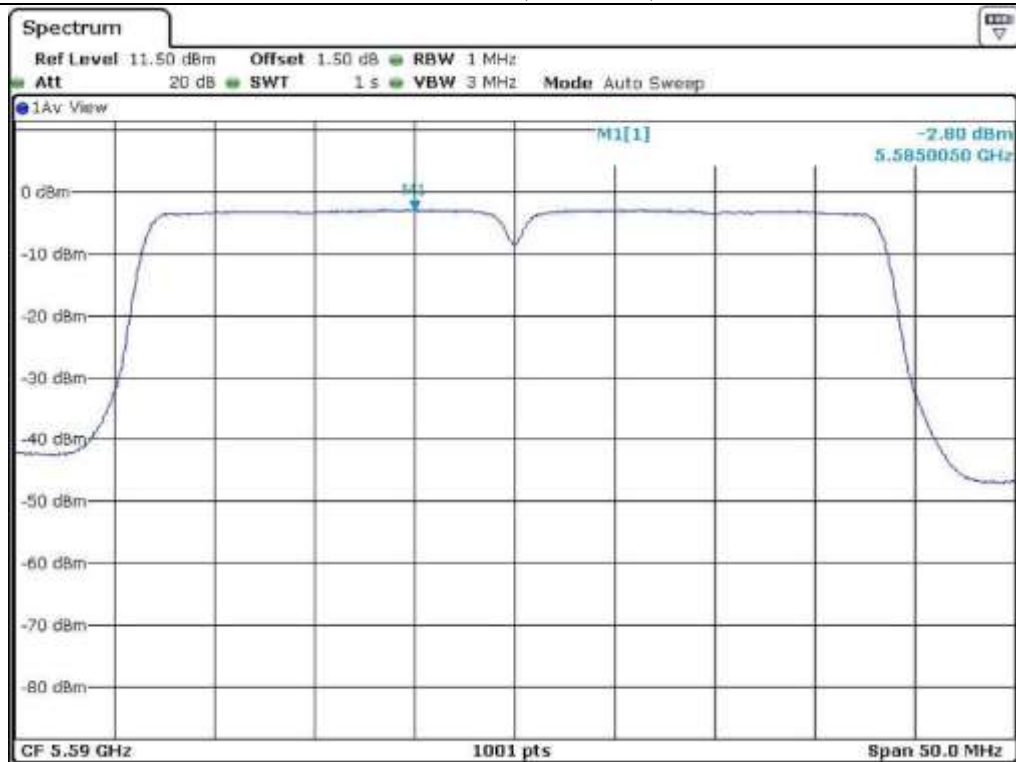
Low Channel (5 270 MHz)



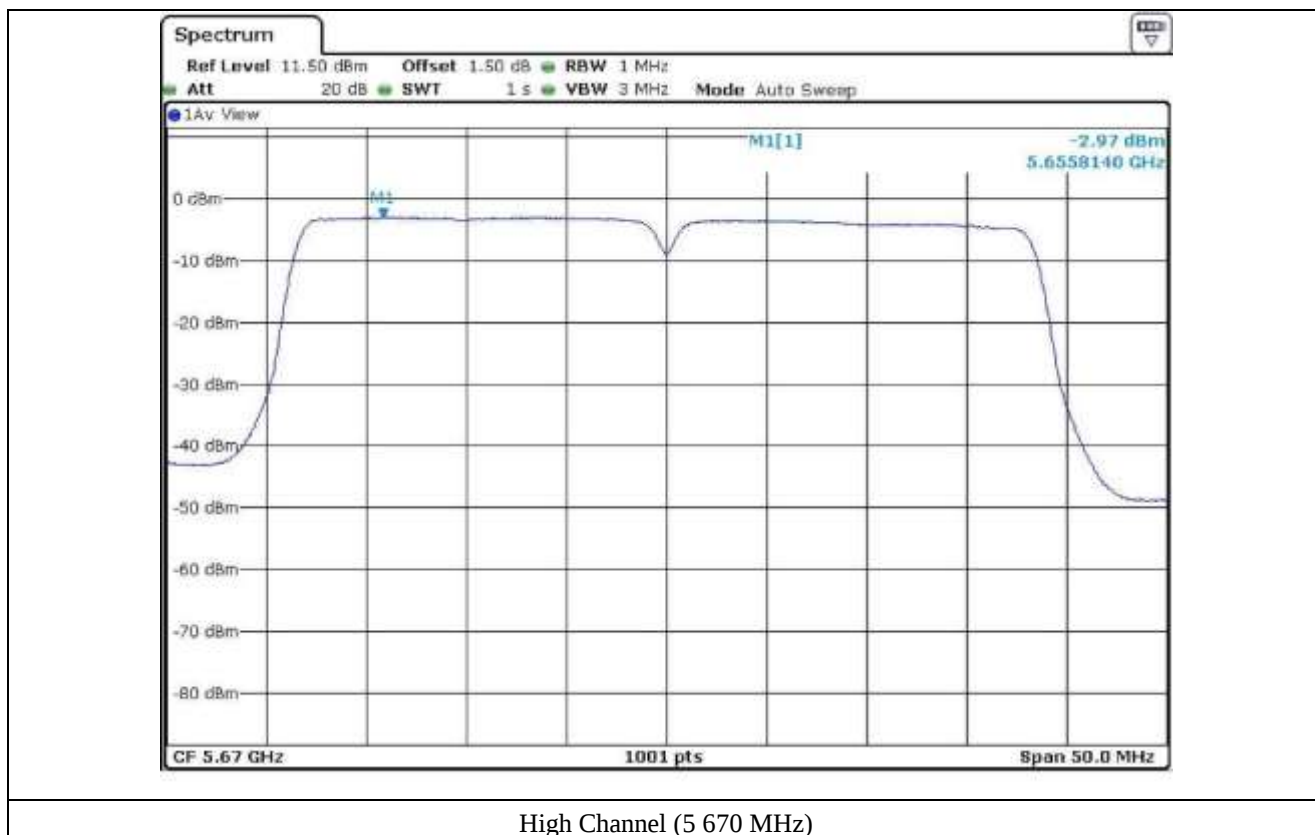
High Channel (5 310 MHz)

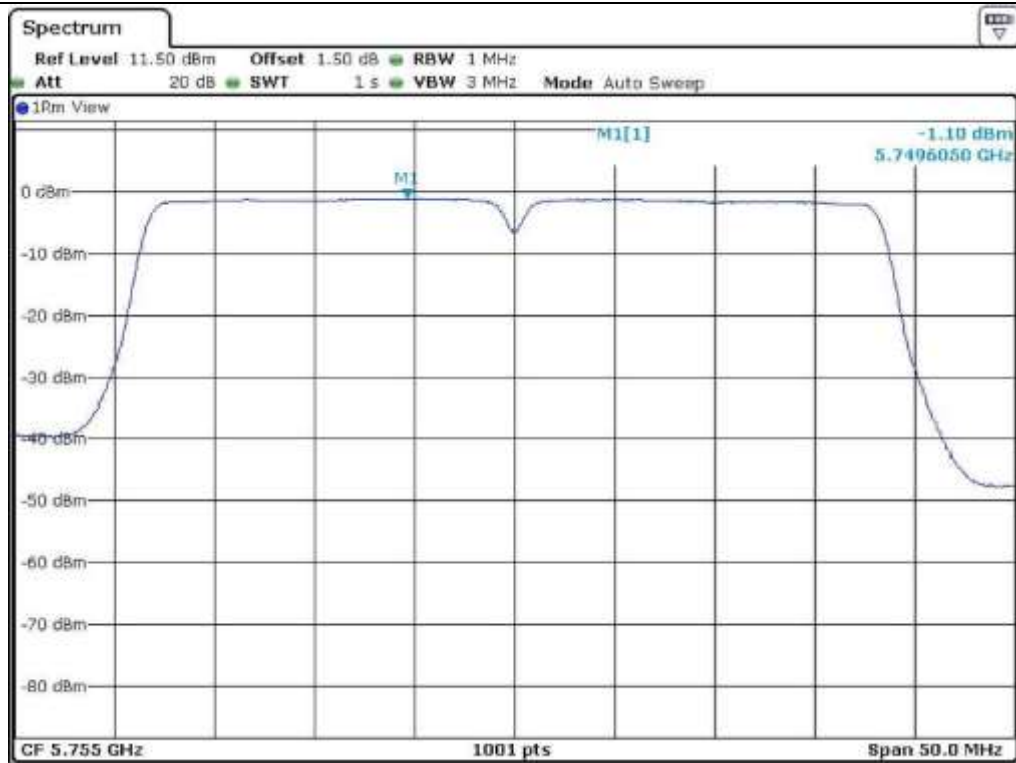


Low Channel (5 510 MHz)

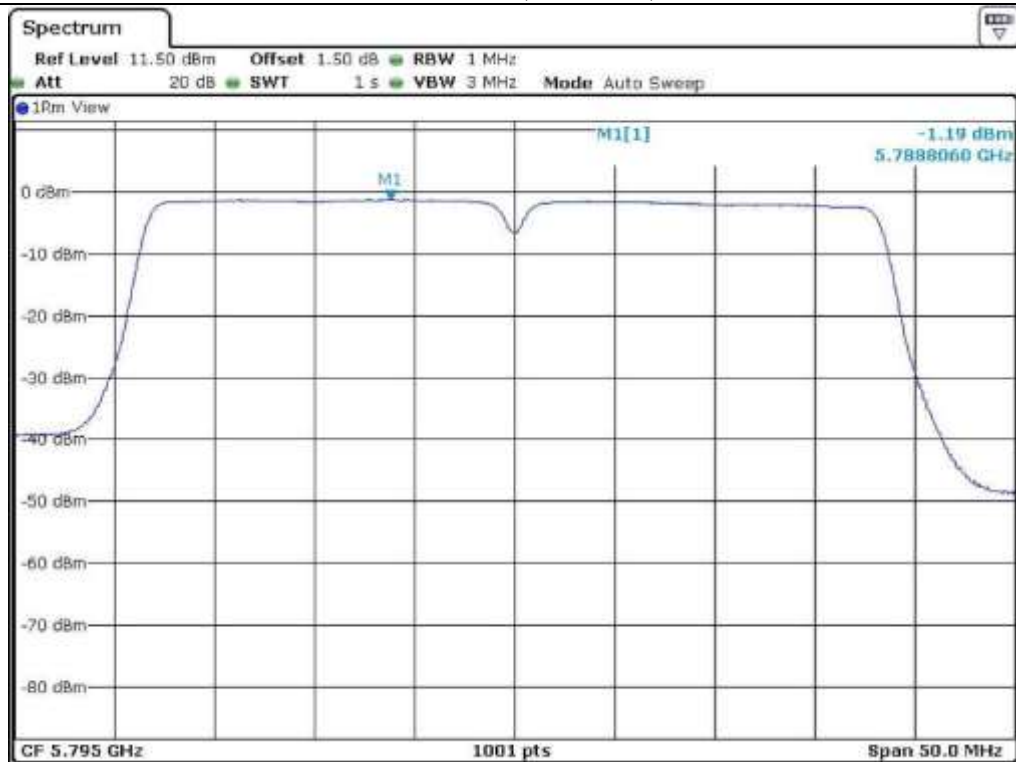


Middle Channel (5 590 MHz)





Low Channel (5 755 MHz)



High Channel (5 795 MHz)

9.6.3 Test data for Multiple transmit

- . Test Date : June 20, 2015
- . Operating condition : Highest Output Power Transmitting Mode
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	-0.31	10.00	10.31
	High	5 230	-0.60	10.00	10.60
5 250 ~ 5 350	Low	5 270	-0.44	11.00	11.44
	High	5 310	-0.62	11.00	11.62
5 470 ~ 5 725	Low	5 510	0.13	11.00	10.87
	Middle	5 590	0.66	11.00	10.34
	High	5 670	0.33	11.00	10.67
5 725 ~ 5 850	Low	5 755	1.54	30.00	25.56
	High	5 795	1.47	30.00	25.63

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna1 Power Density}/10)} + 10^{(\text{Antenna2 Power Density}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

9.7 Test data for 802.11ac_HT20 RLAN Mode

9.7.1 Test data for Antenna 0

- . Test Date : June 16, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	-0.66	10.00	10.66
	Middle	5 200	-0.71	10.00	10.71
	High	5 240	-0.61	10.00	10.61
5 250 ~ 5 350	Low	5 260	0.69	11.00	7.41
	Middle	5 300	0.15	11.00	7.95
	High	5 320	0.11	11.00	7.99
5 470 ~ 5 725	Low	5 500	0.57	11.00	10.43
	Middle	5 600	1.14	11.00	9.86
	High	5 700	0.41	11.00	10.59
5 725 ~ 5 850	Low	5 745	1.01	30.00	28.99
	Middle	5 785	0.72	30.00	29.28
	High	5 825	0.36	30.00	29.64

Remark: See next page for measurement data.



Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)



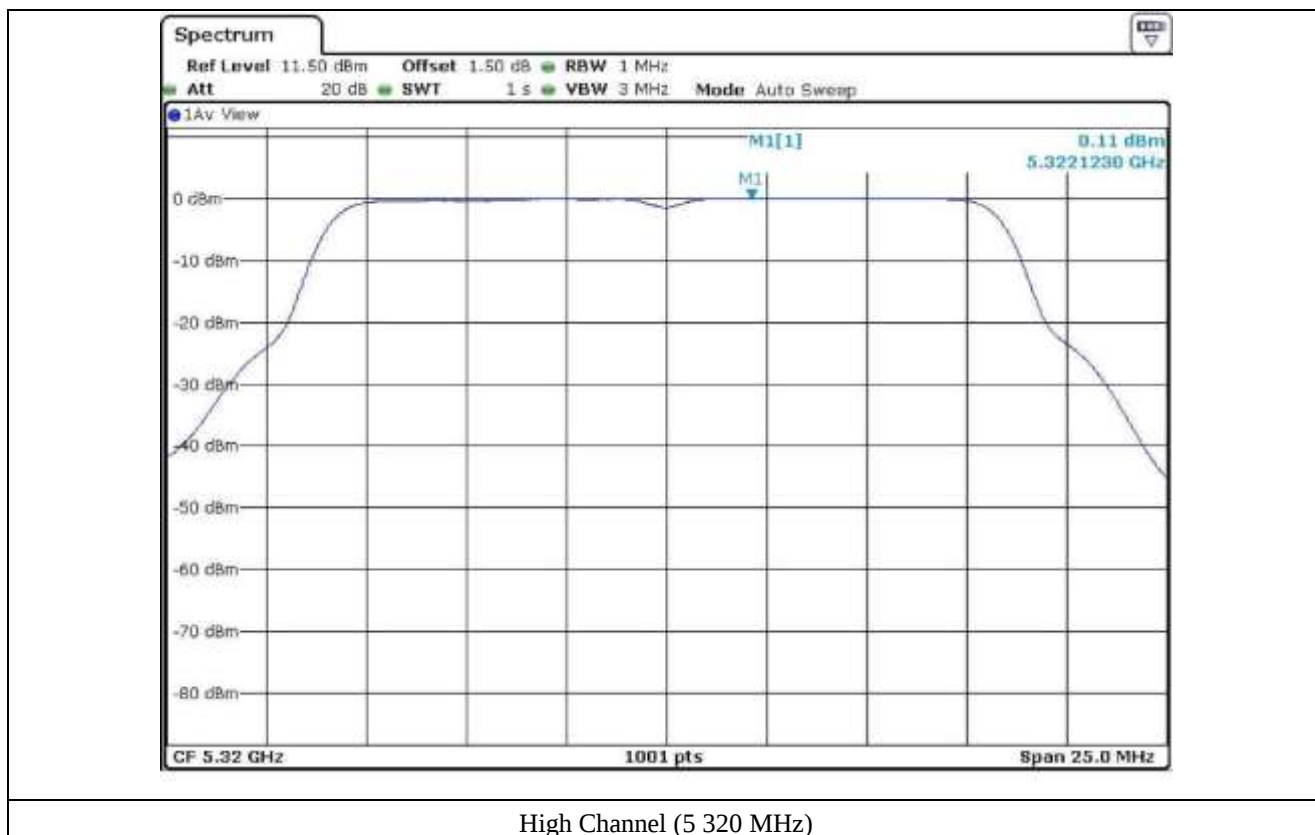
High Channel (5 240 MHz)



Low Channel (5 260 MHz)



Middle Channel (5 300 MHz)



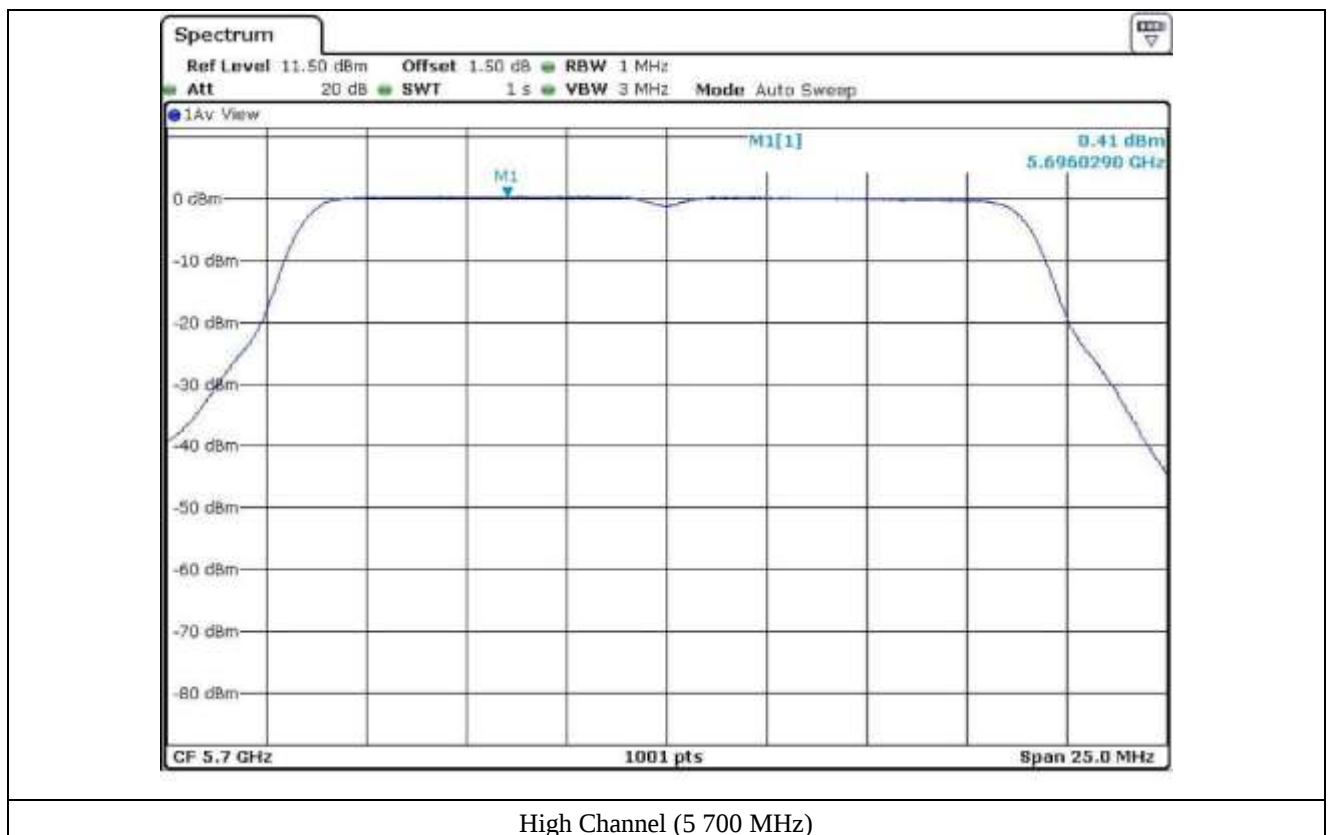
High Channel (5 320 MHz)



Low Channel (5 500 MHz)

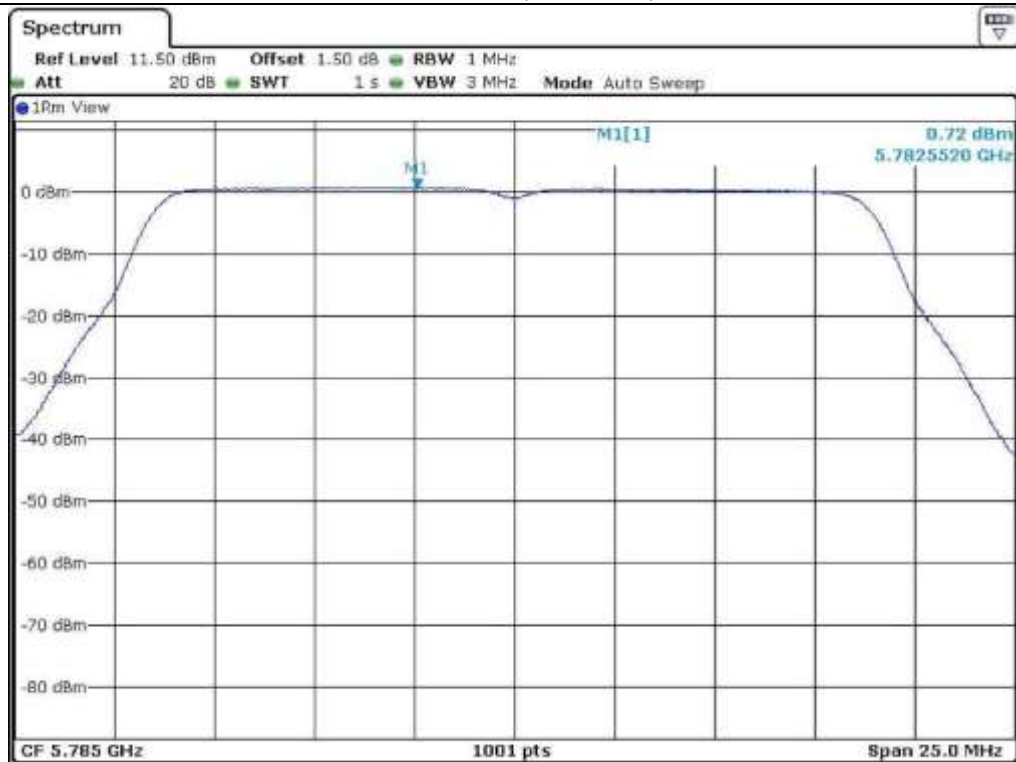


Middle Channel (5 600 MHz)





Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)



9.7.2 Test data for Antenna 1

- . Test Date : June 16, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	-0.22	10.00	10.22
	Middle	5 200	-0.18	10.00	10.18
	High	5 240	-0.22	10.00	10.22
5 250 ~ 5 350	Low	5 260	-0.66	11.00	8.76
	Middle	5 300	-0.80	11.00	8.90
	High	5 320	-0.44	11.00	8.54
5 470 ~ 5 725	Low	5 500	-0.15	11.00	11.15
	Middle	5 600	0.51	11.00	10.49
	High	5 700	-0.41	11.00	11.41
5 725 ~ 5 850	Low	5 745	1.70	30.00	28.30
	Middle	5 785	1.68	30.00	28.32
	High	5 825	1.67	30.00	28.33

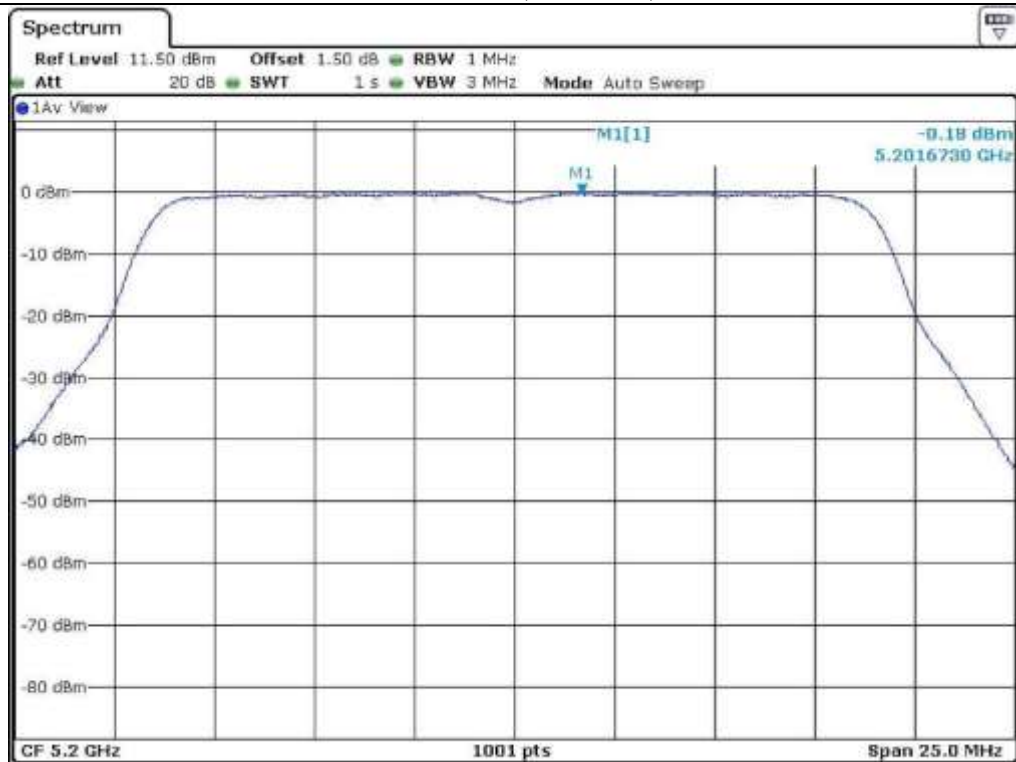
Remark: See next page for measurement data.



Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)



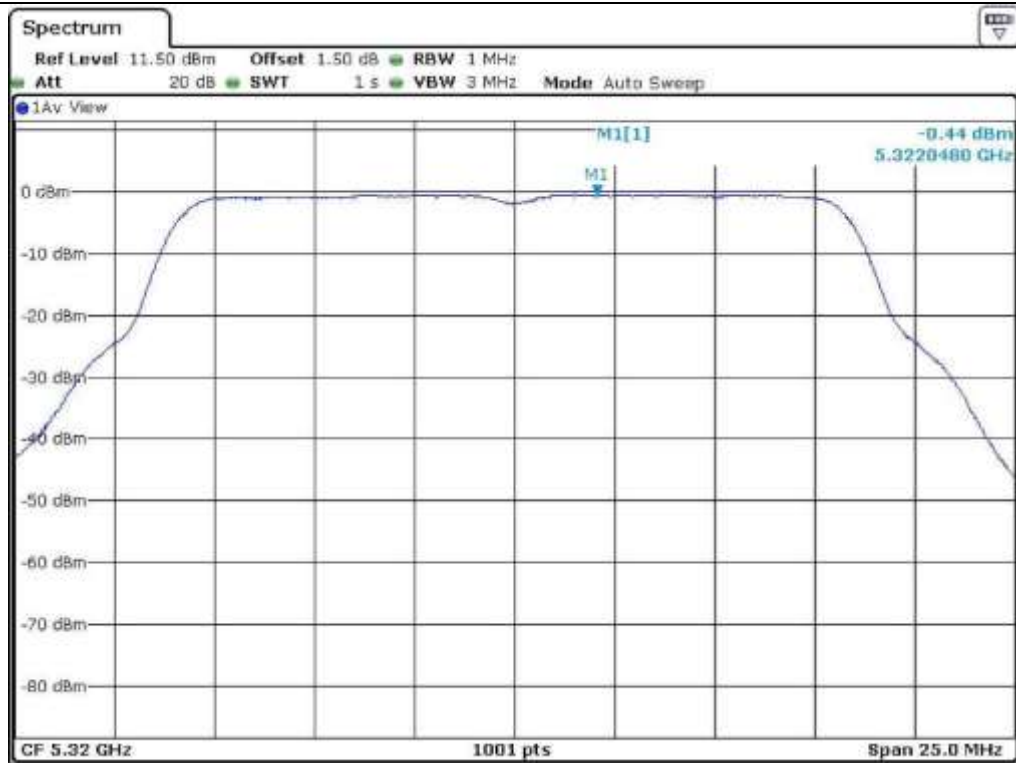
High Channel (5 240 MHz)



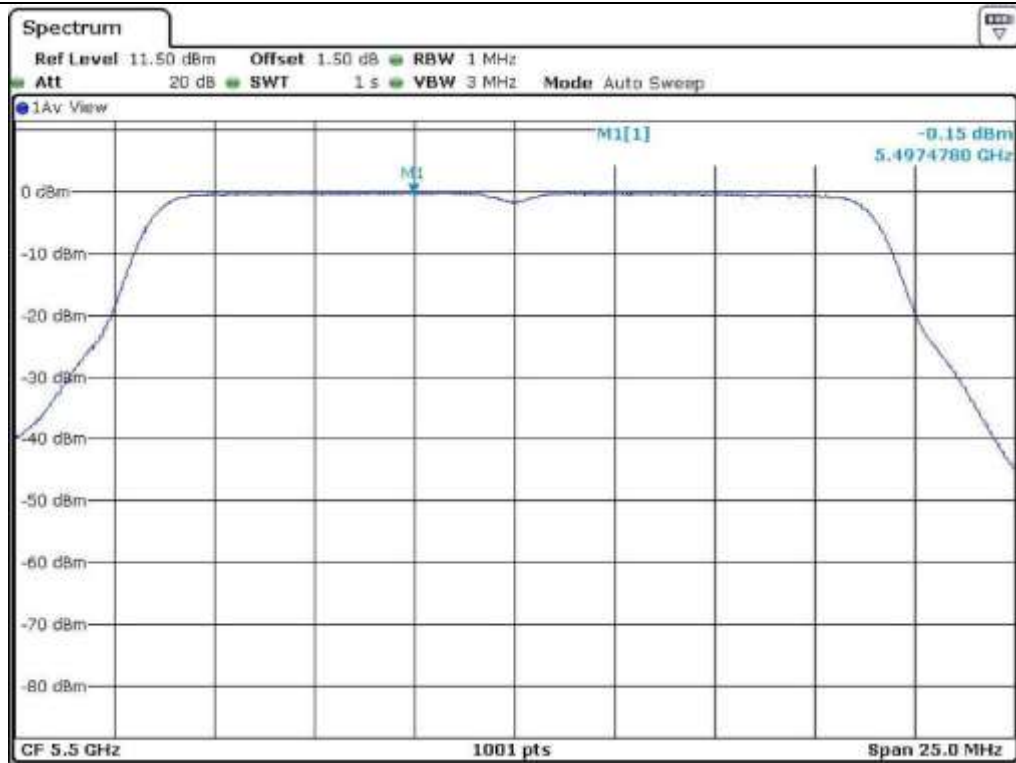
Low Channel (5 260 MHz)



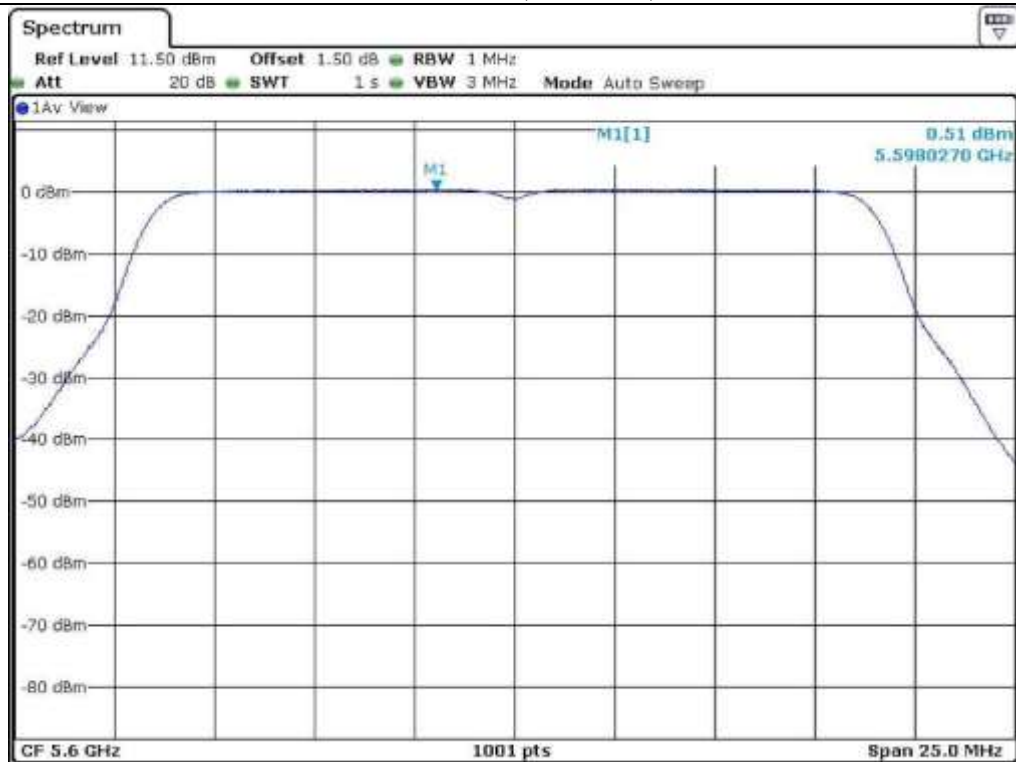
Middle Channel (5 300 MHz)



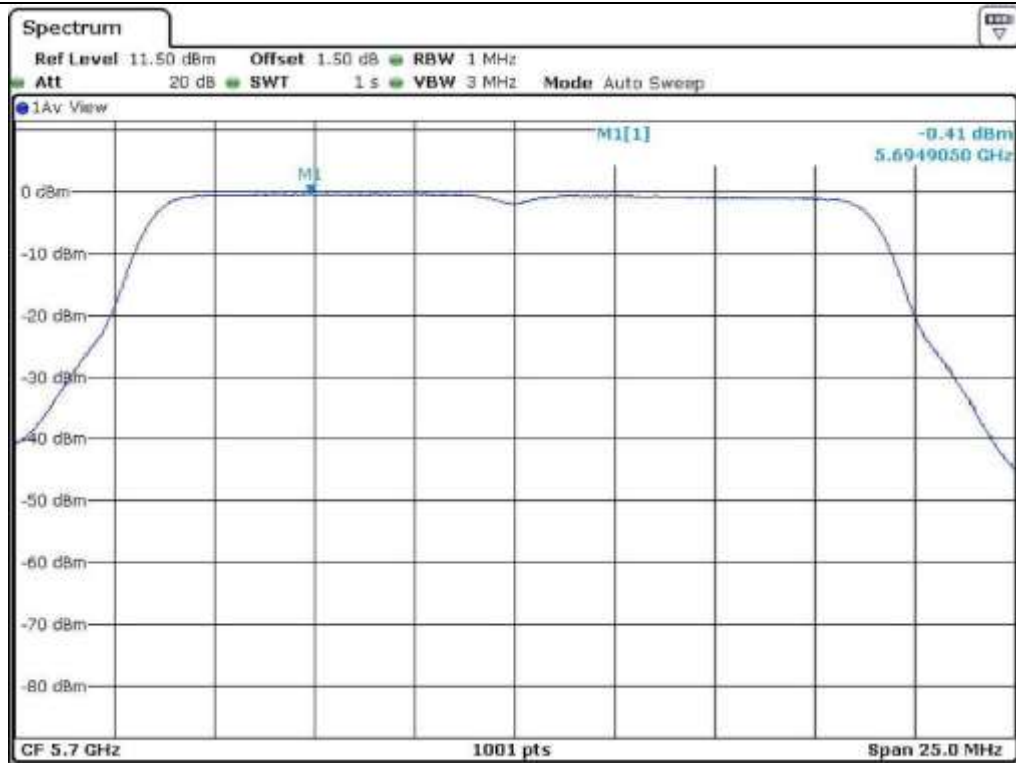
High Channel (5 320 MHz)



Low Channel (5 500 MHz)



Middle Channel (5 600 MHz)



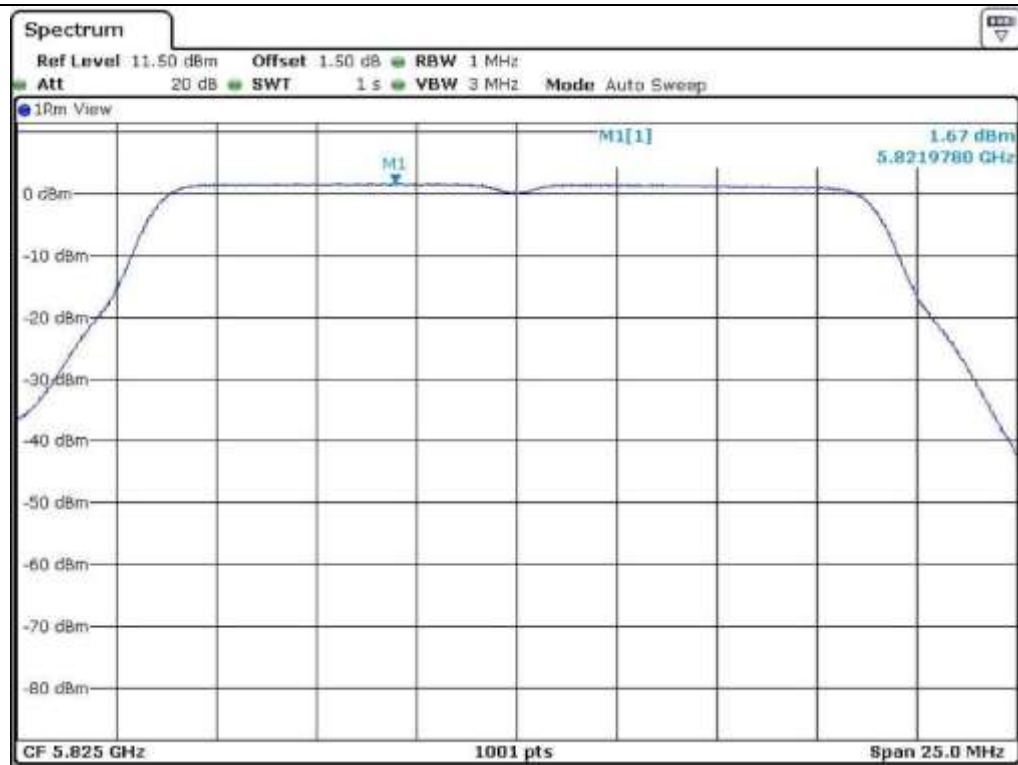
High Channel (5 700 MHz)



Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)



High Channel (5 825 MHz)

9.7.3 Test data for Multiple transmit

- Test Date : June 16, 2015
- Operating condition : Highest Output Power Transmitting Mode
- Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180	2.58	10.00	7.42
	Middle	5 200	2.57	10.00	7.43
	High	5 240	2.60	10.00	7.40
5 250 ~ 5 350	Low	5 260	3.08	11.00	5.02
	Middle	5 300	2.71	11.00	5.39
	High	5 320	2.85	11.00	5.25
5 470 ~ 5 725	Low	5 500	3.24	11.00	7.76
	Middle	5 600	3.85	11.00	7.15
	High	5 700	3.03	11.00	7.97
5 725 ~ 5 850	Low	5 745	4.38	30.00	25.62
	Middle	5 785	4.24	30.00	25.76
	High	5 825	4.07	30.00	25.93

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna1 Power Density}/10)} + 10^{(\text{Antenna2 Power Density}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer