

8.5 Test data for 802.11g WLAN Mode

8.5.1 Test data for Antenna 0

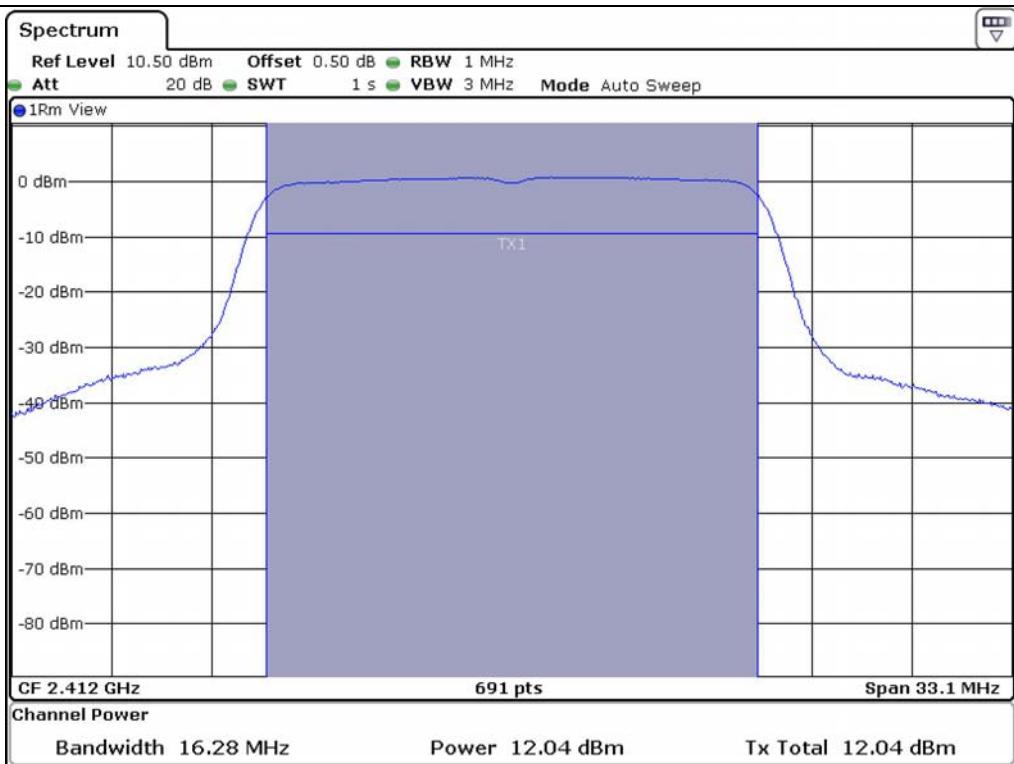
- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.28	12.04	30	17.96
MIDDLE	2 442	16.28	12.40	30	17.60
HIGH	2 462	16.28	12.21	30	17.79

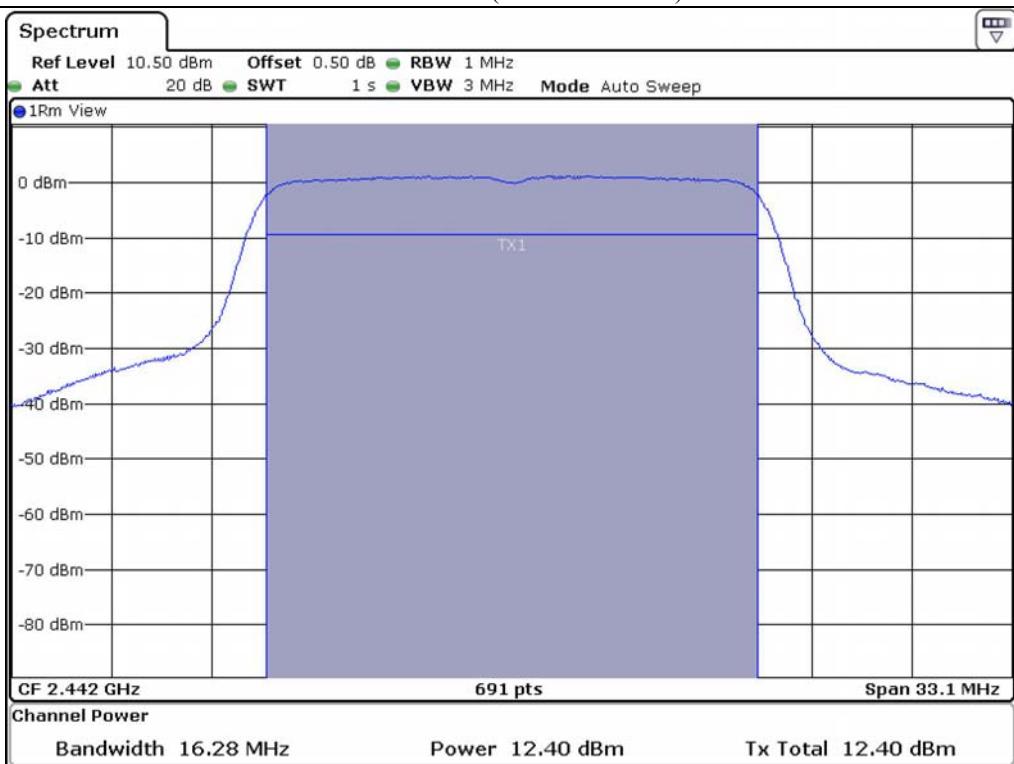
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.35	11.89	30	18.11
MIDDLE	2 442	16.35	12.36	30	17.64
HIGH	2 462	16.35	12.19	30	17.81

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

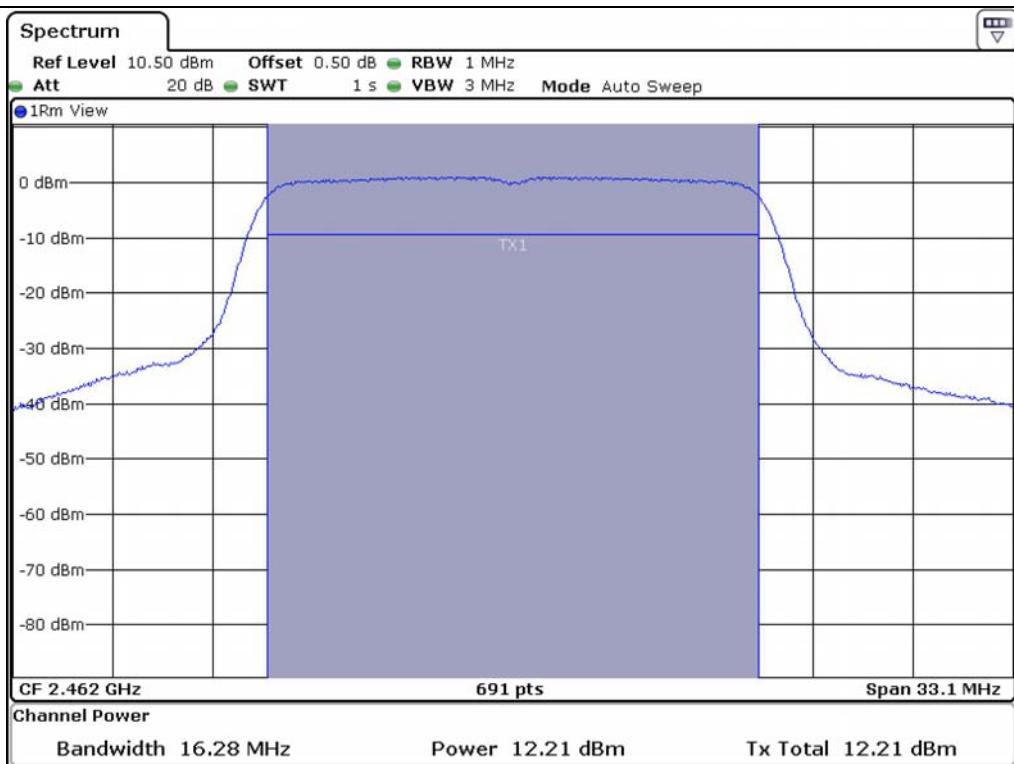
Tested by: Hong-Kyu, Lee/ Engineer



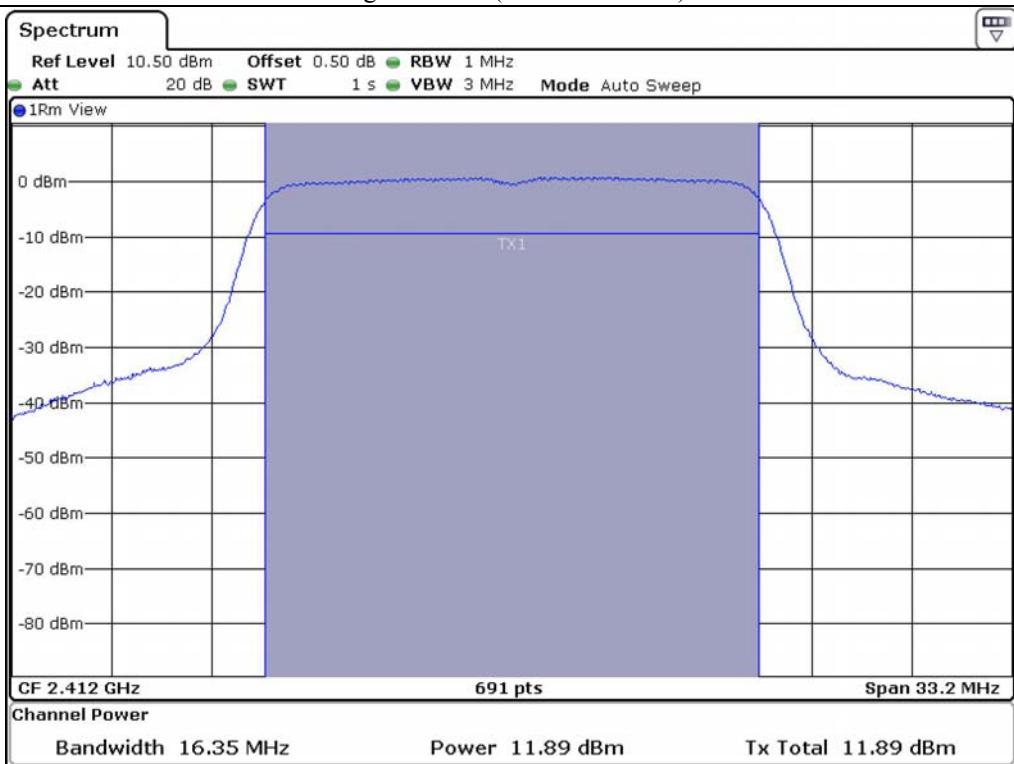
Low Channel (6 dB Bandwidth)



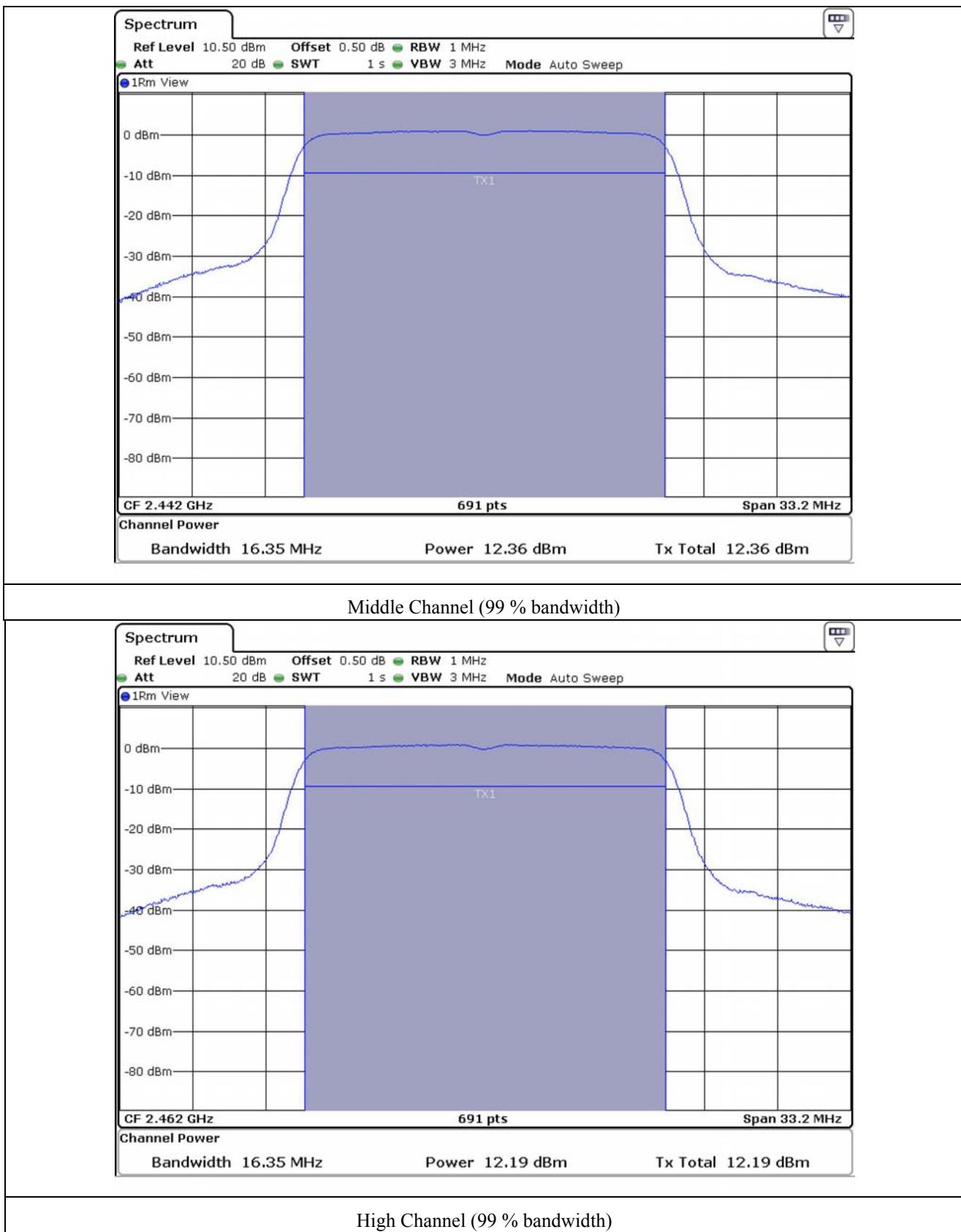
Middle Channel (6 dB Bandwidth)



High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



8.5.2 Test data for Antenna 1

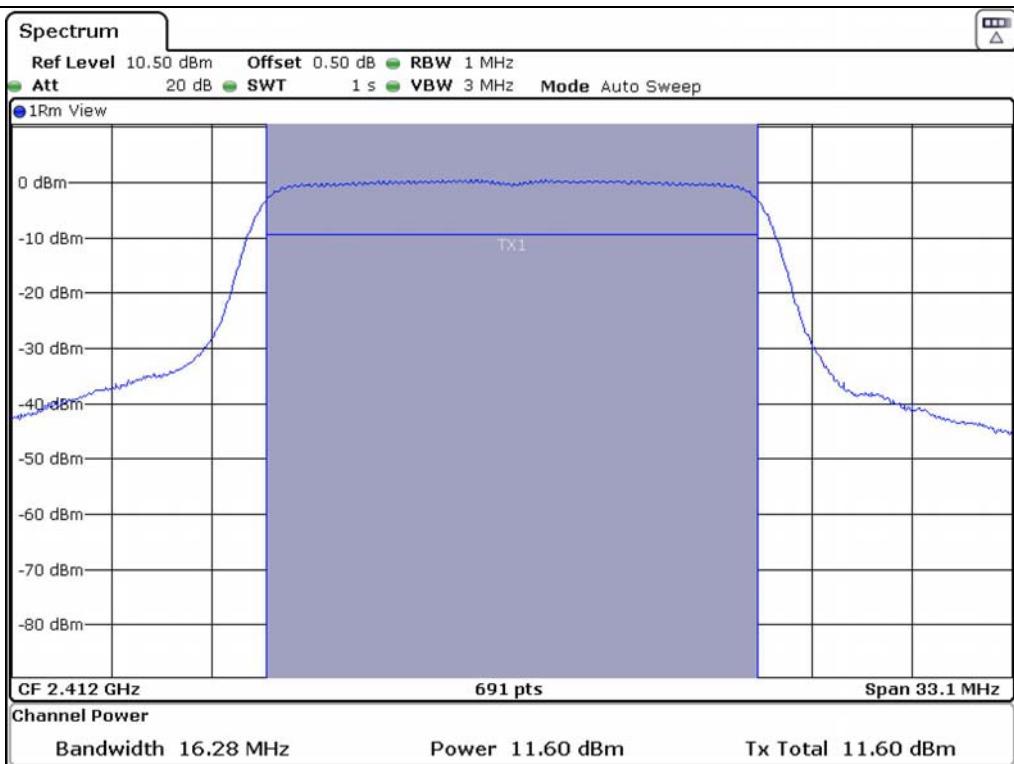
- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.28	11.60	30	18.40
MIDDLE	2 442	16.28	11.94	30	18.06
HIGH	2 462	16.28	11.64	30	18.36

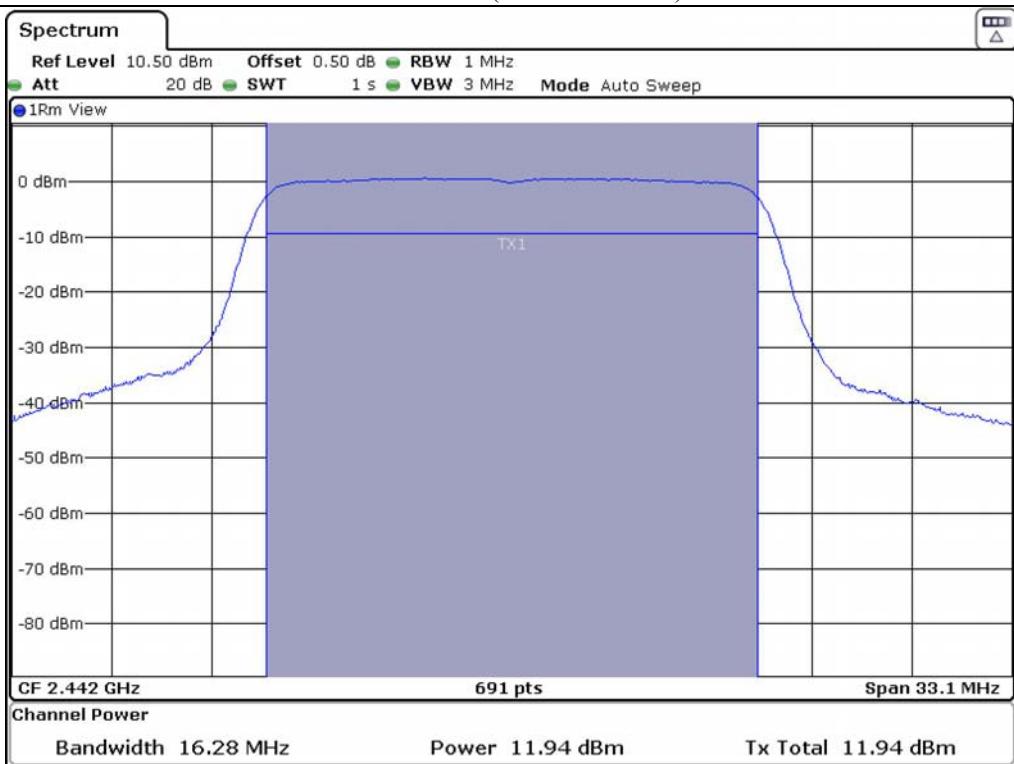
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.35	11.84	30	18.16
MIDDLE	2 442	16.35	11.97	30	18.03
HIGH	2 462	16.35	11.62	30	18.38

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

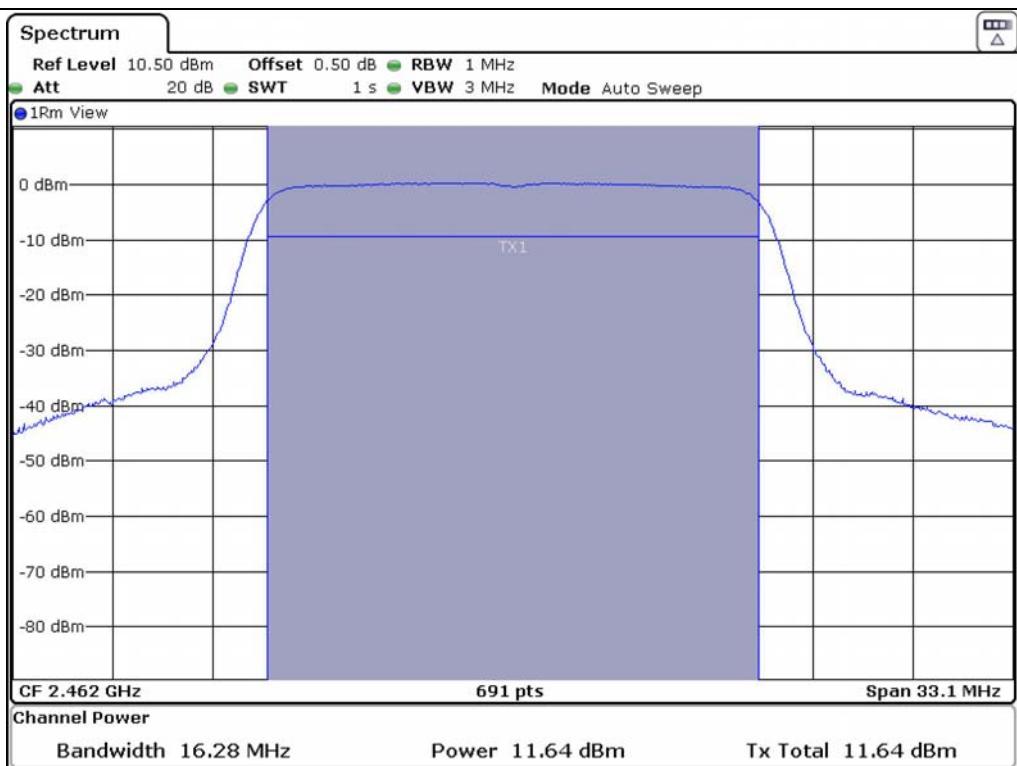
Tested by: Hong-Kyu, Lee/ Engineer



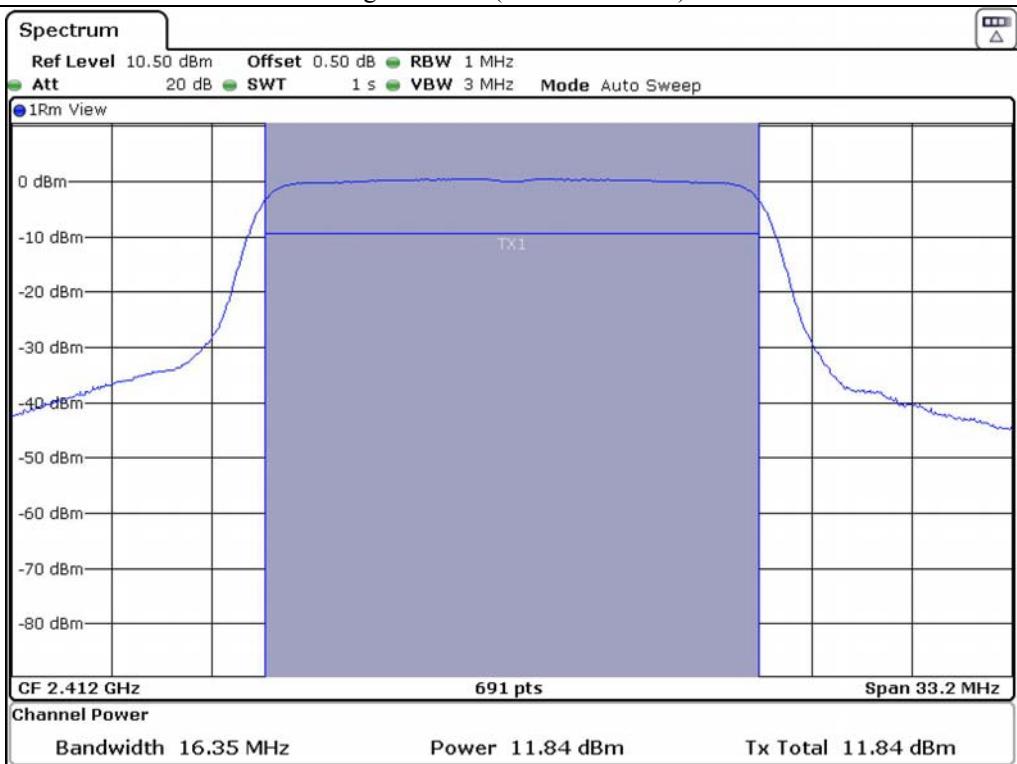
Low Channel (6 dB Bandwidth)



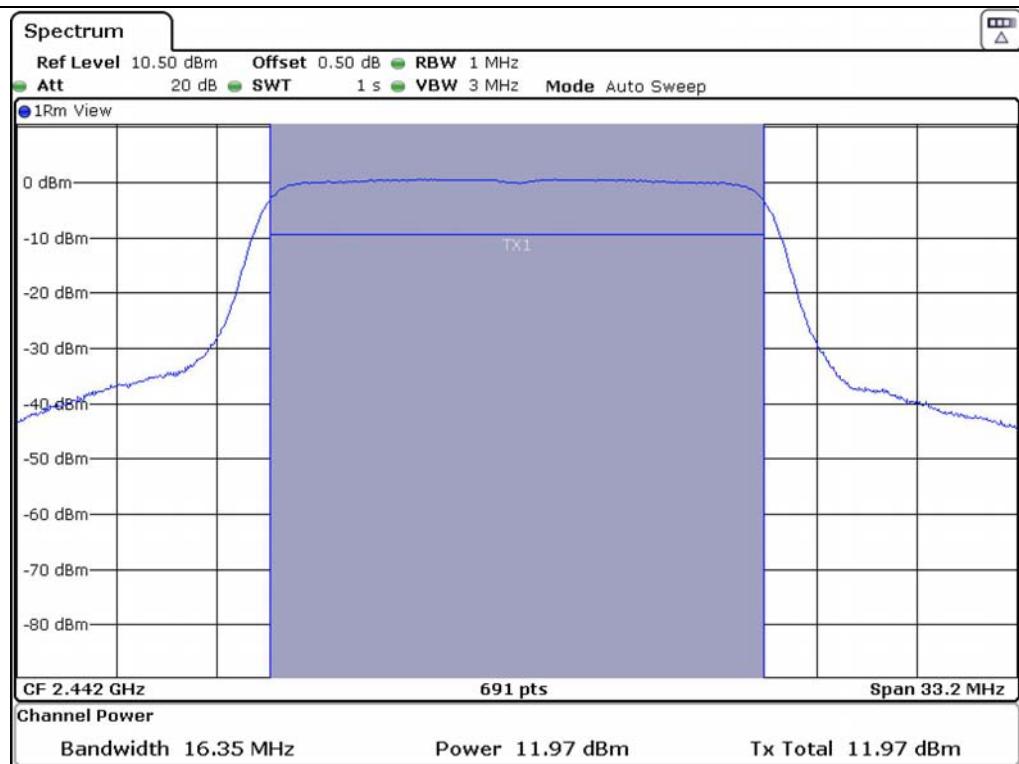
Middle Channel (6 dB Bandwidth)



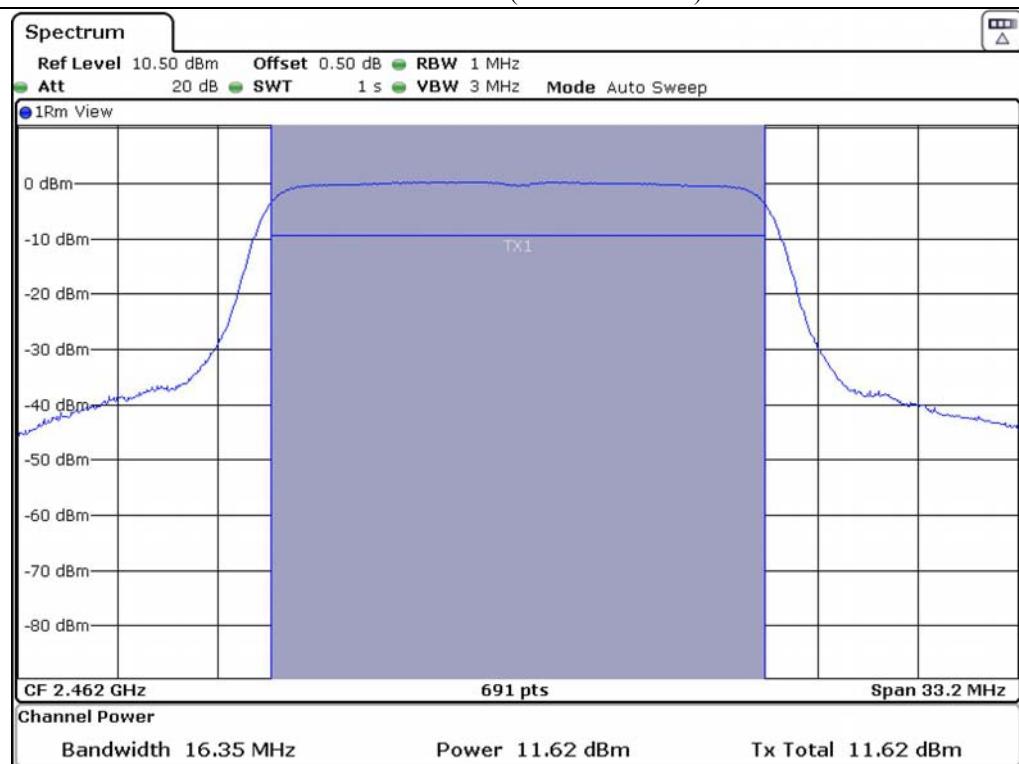
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.6 Test data for 802.11n_HT20 WLAN Mode

8.6.1 Test data for Antenna 0

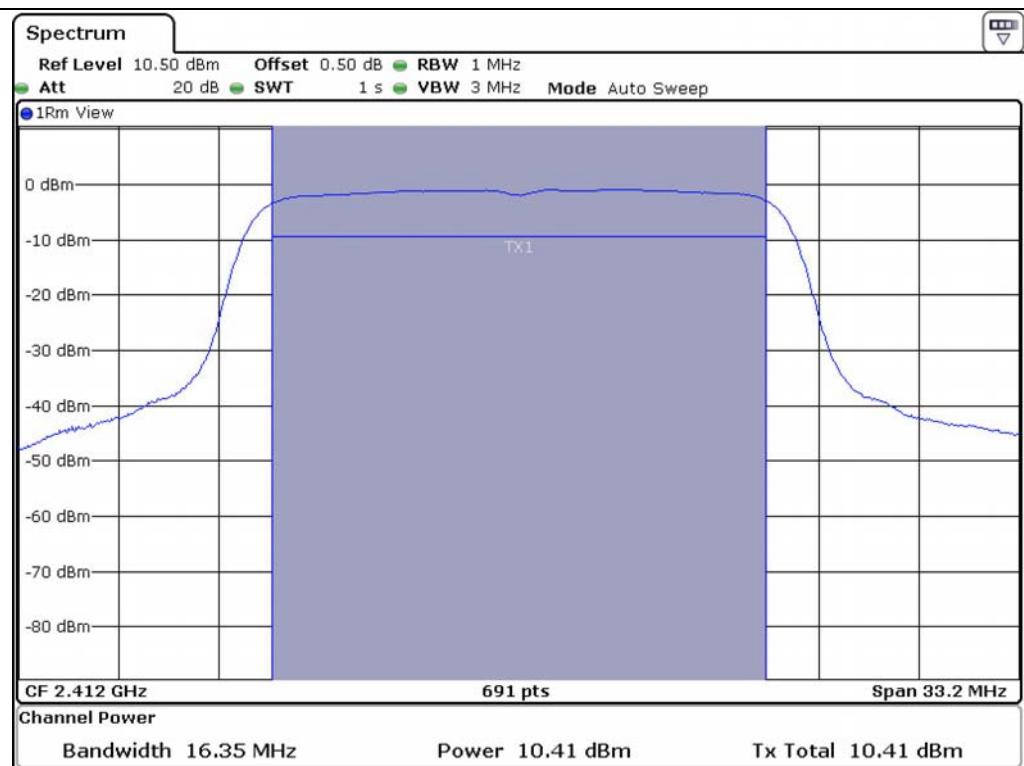
- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.35	10.41	30	19.59
MIDDLE	2 442	16.35	10.84	30	19.16
HIGH	2 462	16.35	10.69	30	19.31

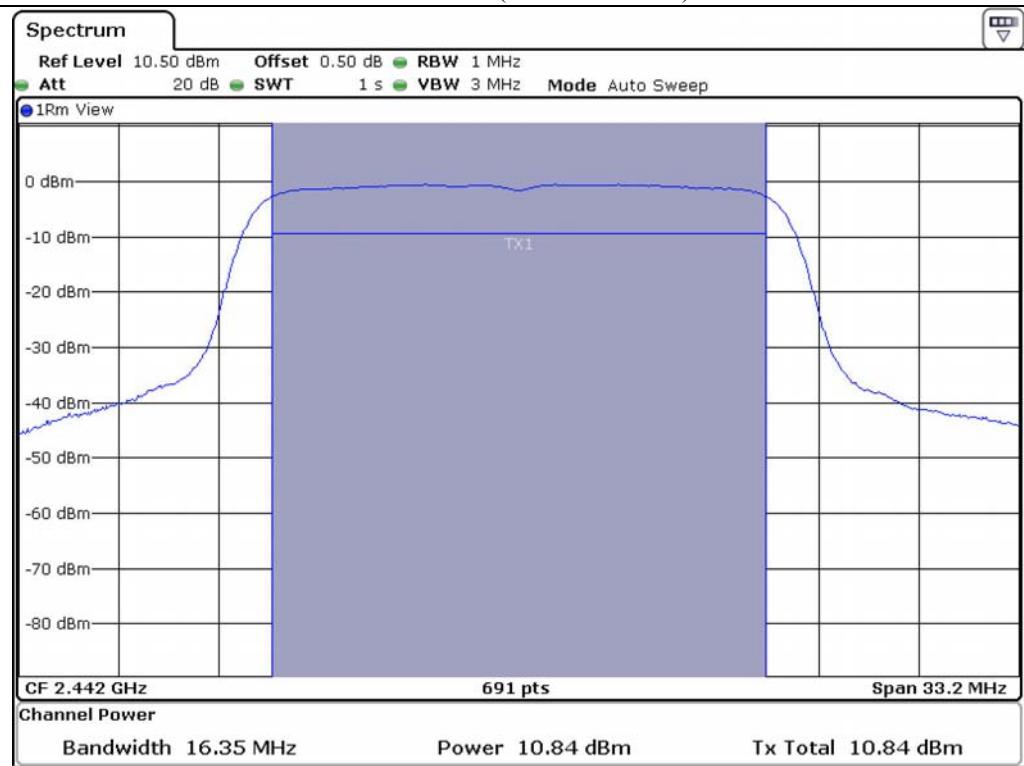
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	17.37	10.61	30	19.39
MIDDLE	2 442	17.37	11.01	30	18.99
HIGH	2 462	17.37	10.88	30	19.12

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

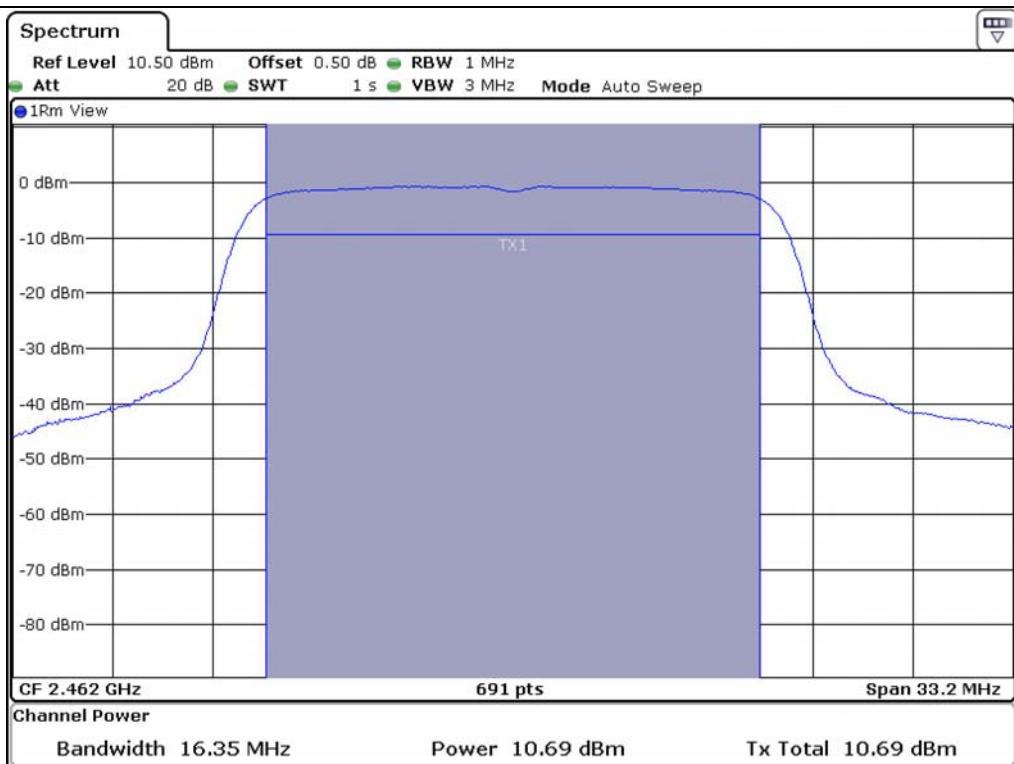
Tested by: Hong-Kyu, Lee/ Engineer



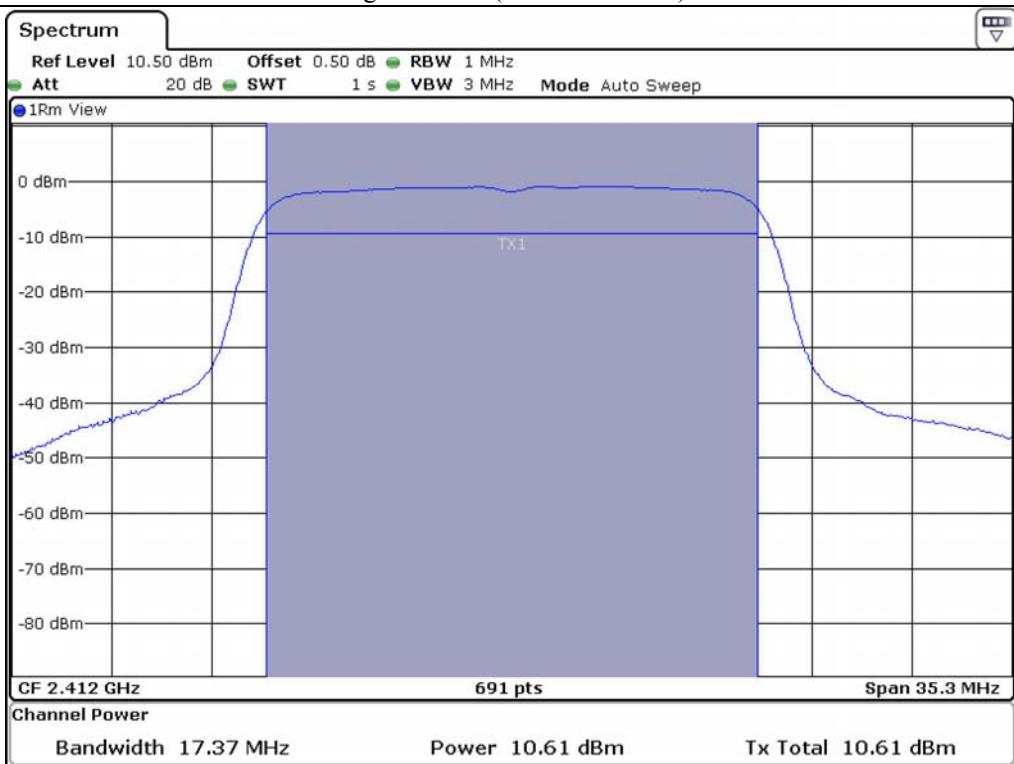
Low Channel (6 dB Bandwidth)



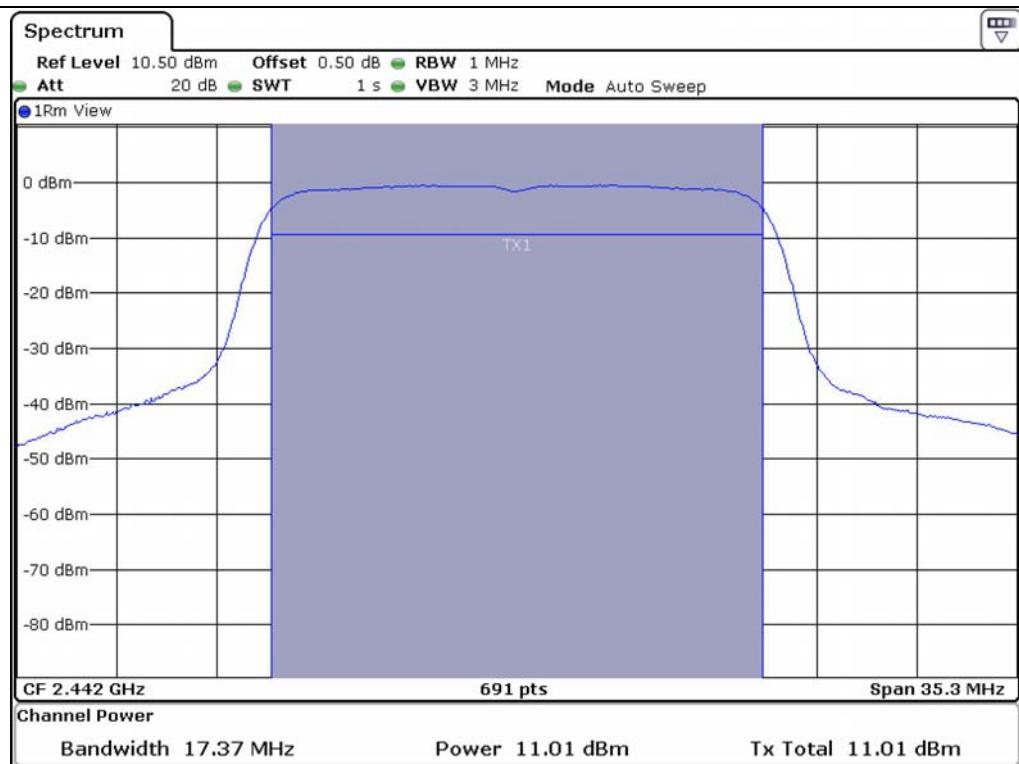
Middle Channel (6 dB Bandwidth)



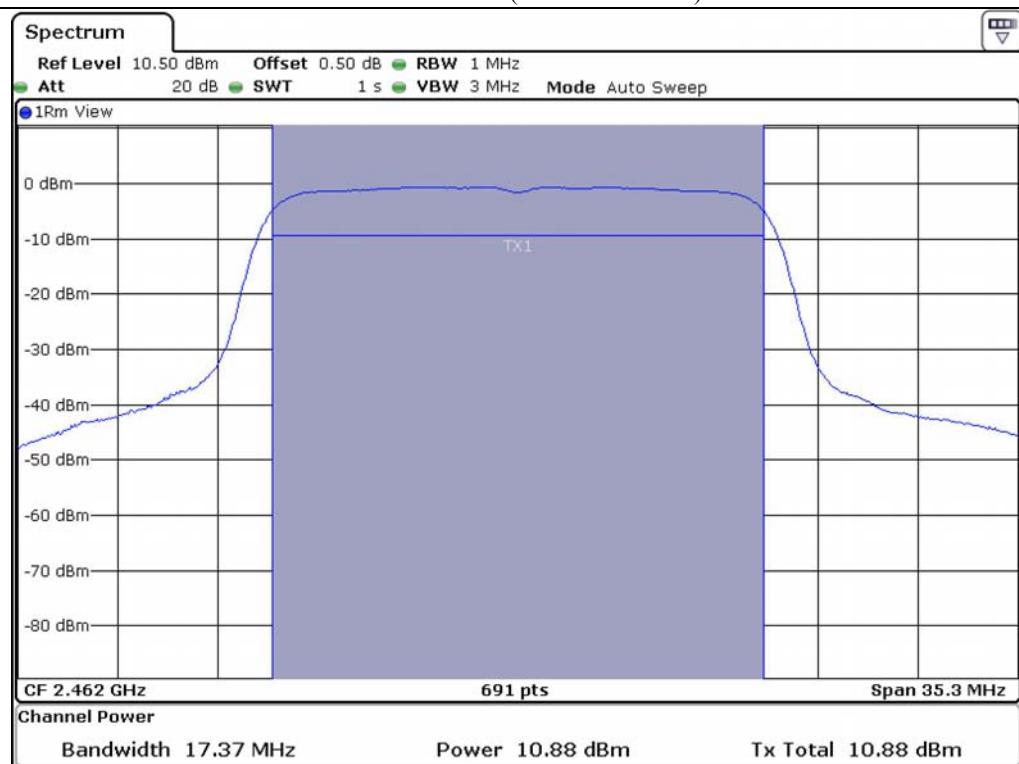
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.6.2 Test data for Antenna 1

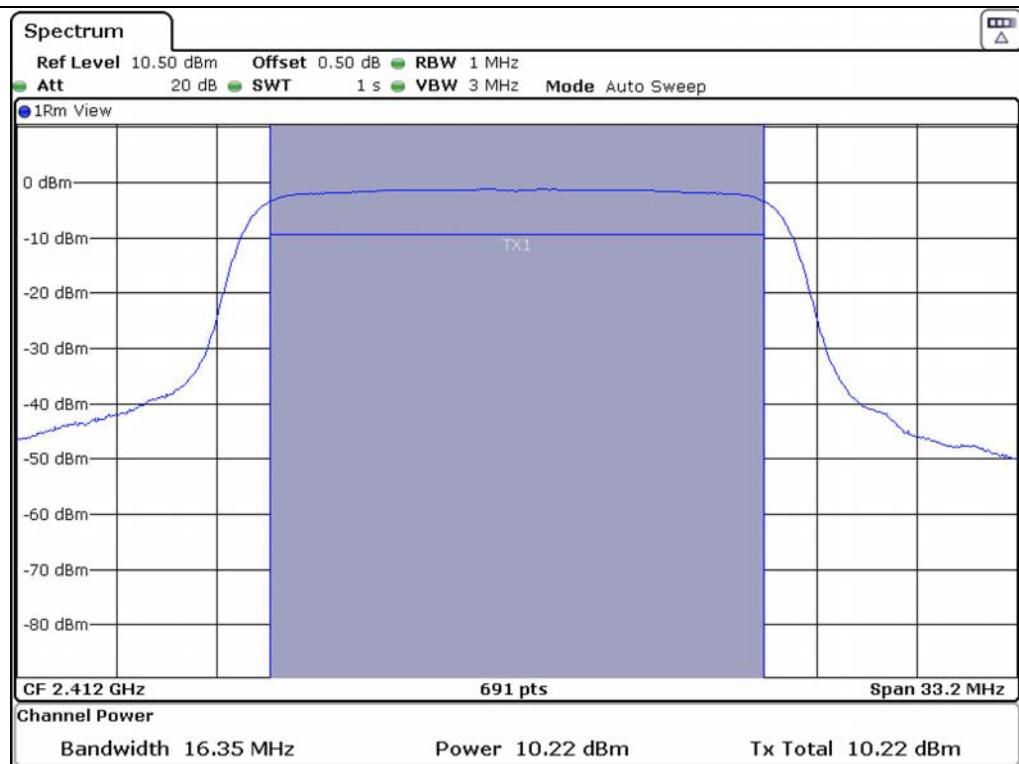
- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.35	10.22	30	19.78
MIDDLE	2 442	16.35	10.43	30	19.57
HIGH	2 462	16.35	10.07	30	19.93

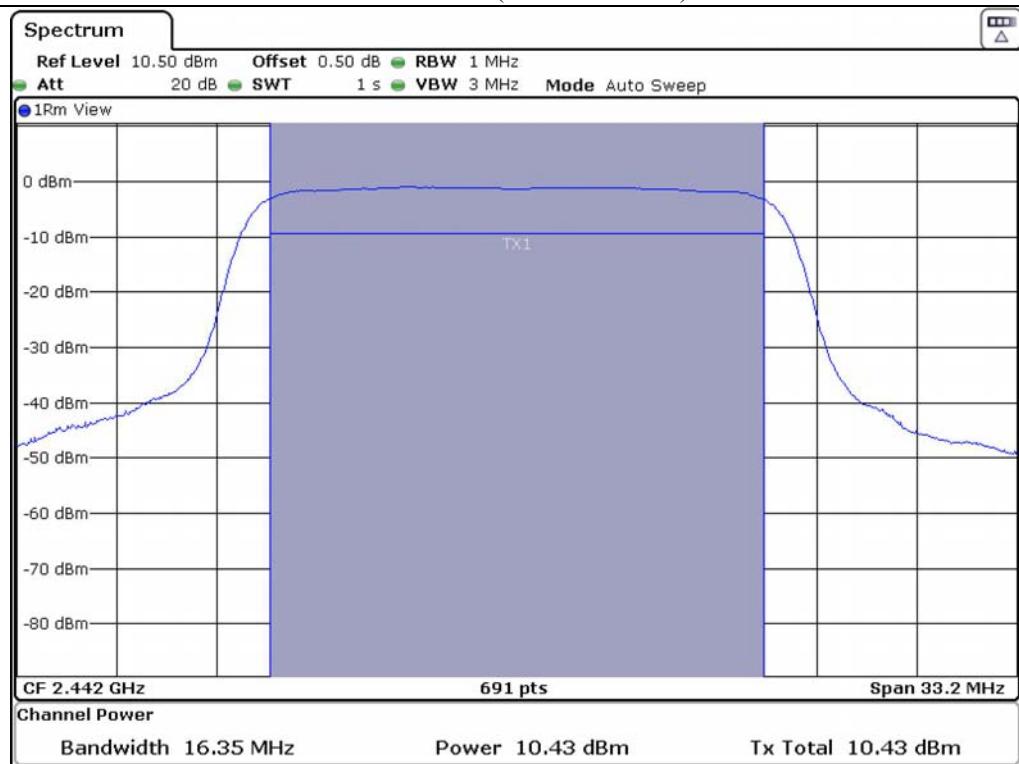
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	17.37	10.42	30	19.58
MIDDLE	2 442	17.37	10.58	30	19.42
HIGH	2 462	17.37	10.20	30	19.80

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

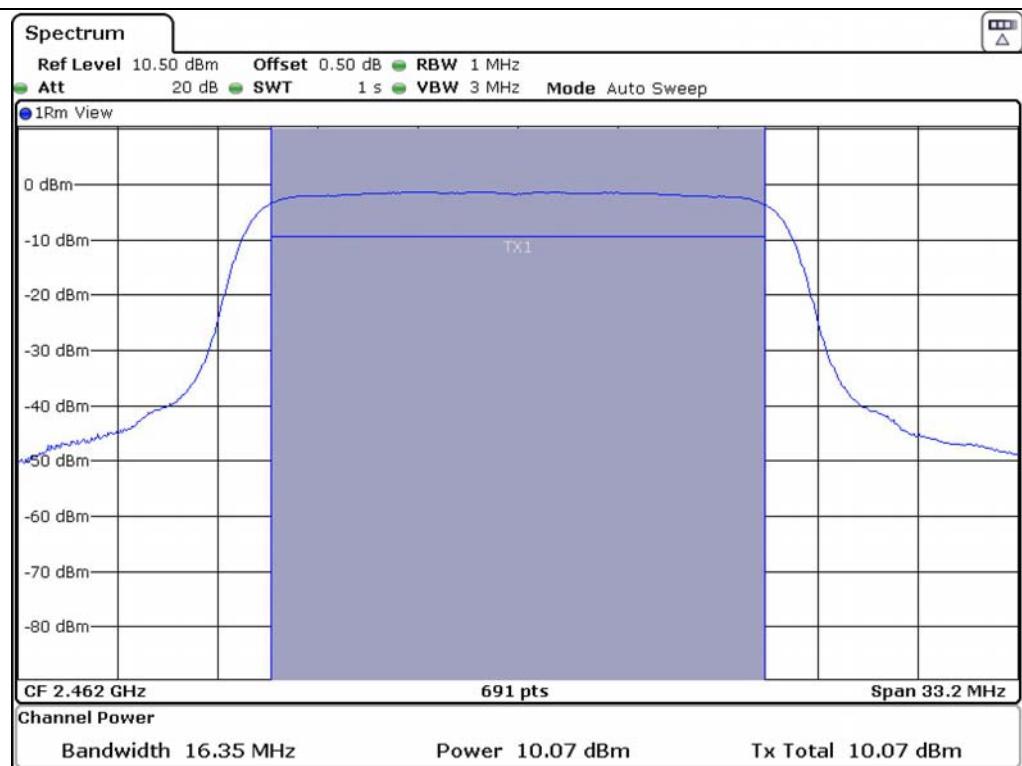
Tested by: Hong-Kyu, Lee/ Engineer



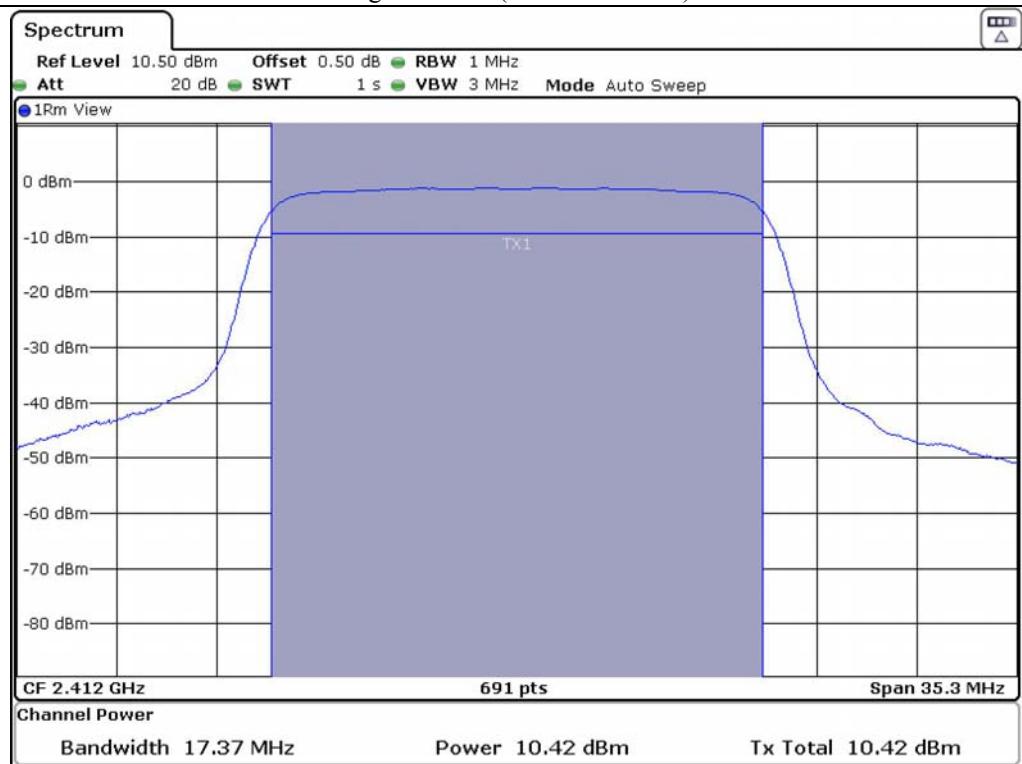
Low Channel (6 dB Bandwidth)



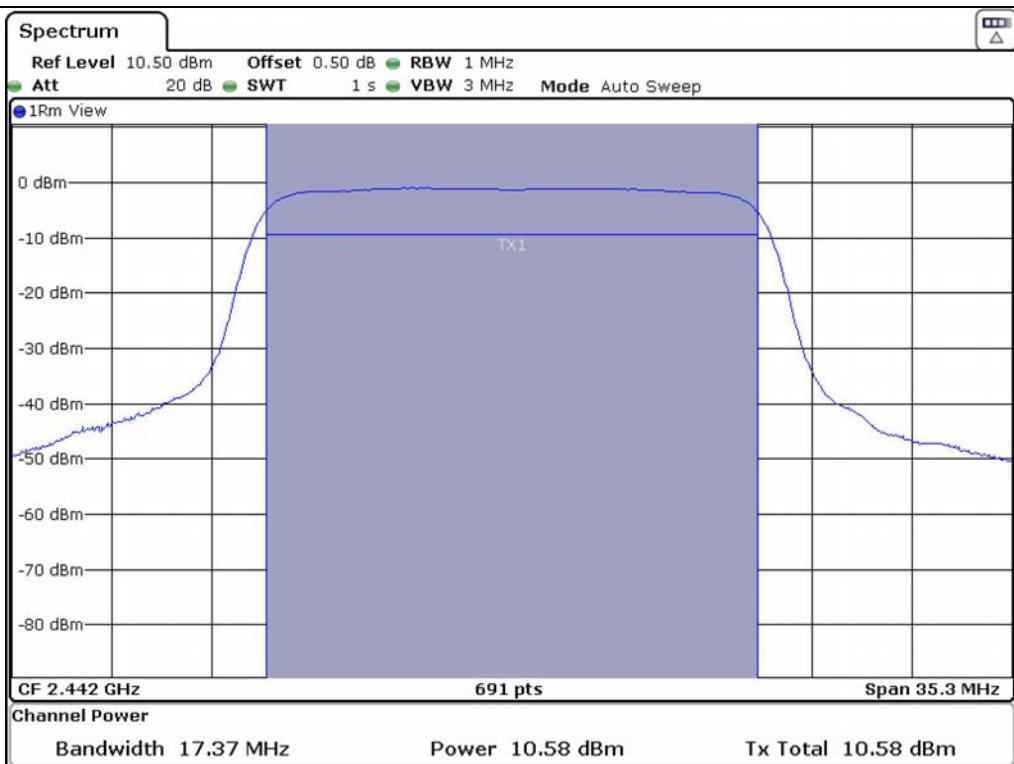
Middle Channel (6 dB Bandwidth)



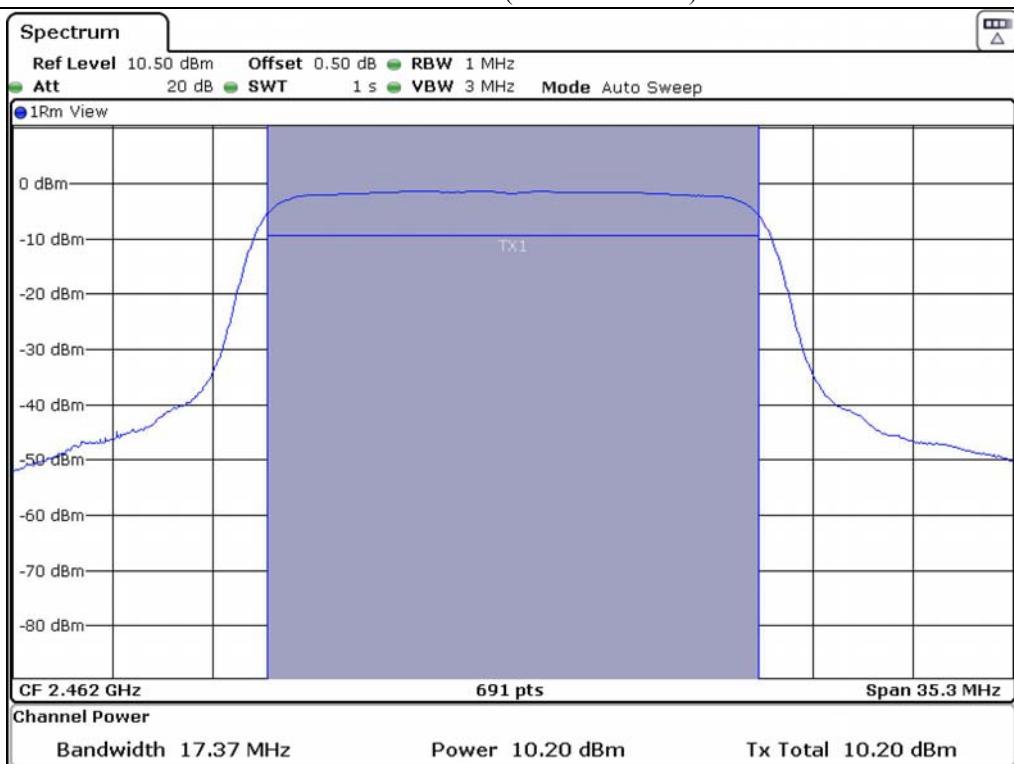
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.6.3 Test data for Multiple transmit

- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	16.35	13.33	30	16.67
MIDDLE	2 442	16.35	13.65	30	16.35
HIGH	2 462	16.35	13.40	30	16.60

CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412	17.37	13.53	30	16.47
MIDDLE	2 442	17.37	13.81	30	16.19
HIGH	2 462	17.37	13.56	30	16.44

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: Hong-Kyu, Lee/ Engineer

8.7 Test data for 802.11n_HT40 WLAN Mode

8.7.1 Test data for Antenna 0

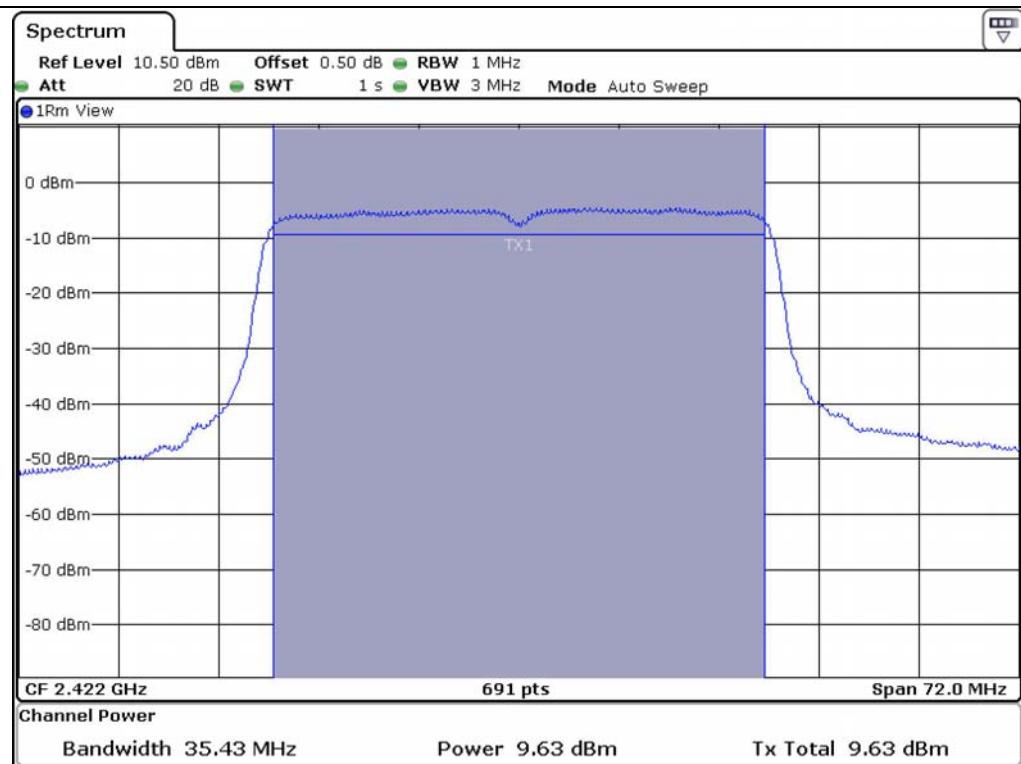
- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 422	35.43	9.63	30	20.37
MIDDLE	2 442	35.43	10.14	30	19.86
HIGH	2 452	35.43	10.22	30	19.78

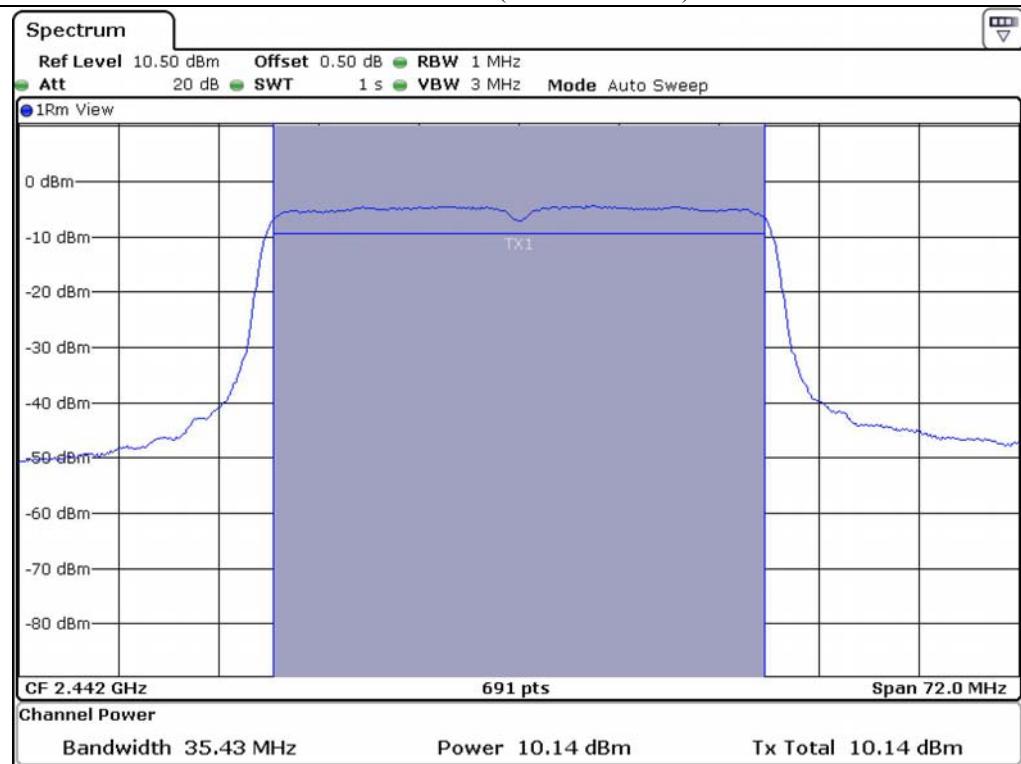
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 422	35.89	10.04	30	19.96
MIDDLE	2 442	35.89	10.09	30	19.91
HIGH	2 452	35.89	10.21	30	19.79

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

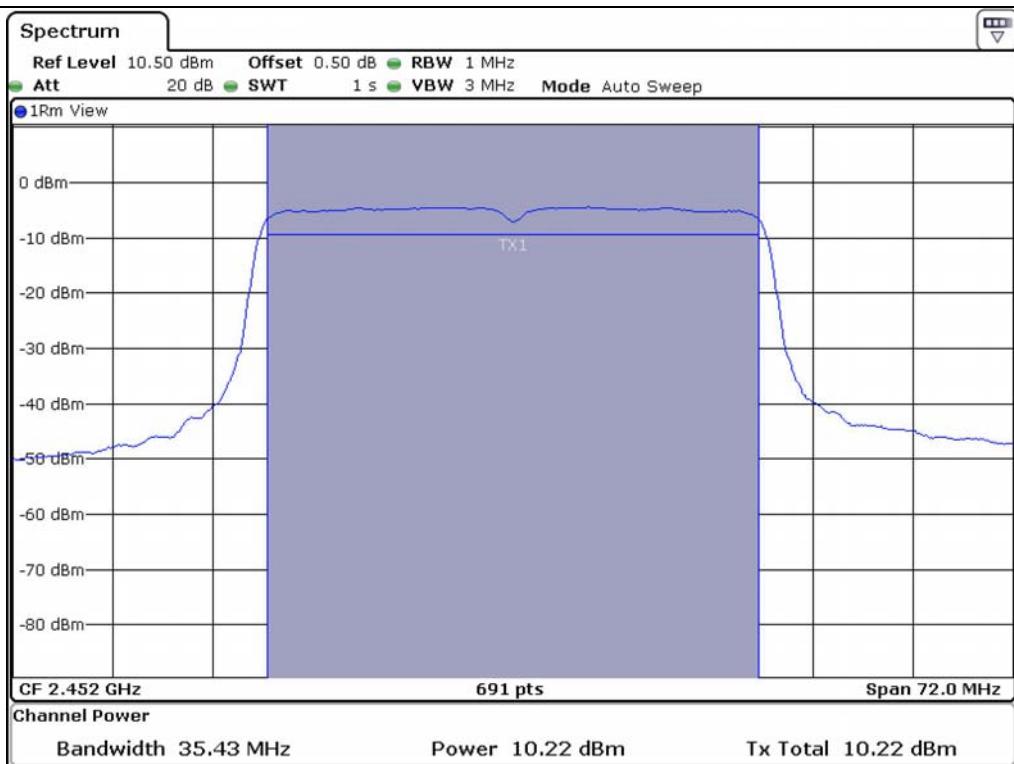
Tested by: Hong-Kyu, Lee/ Engineer



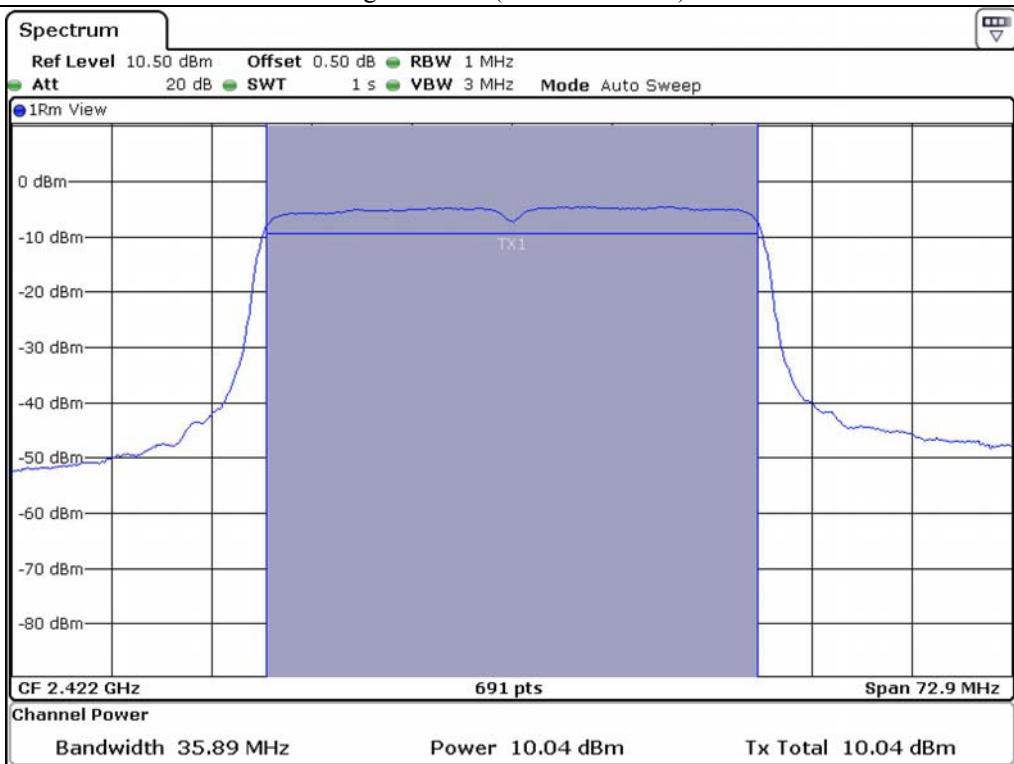
Low Channel (6 dB Bandwidth)



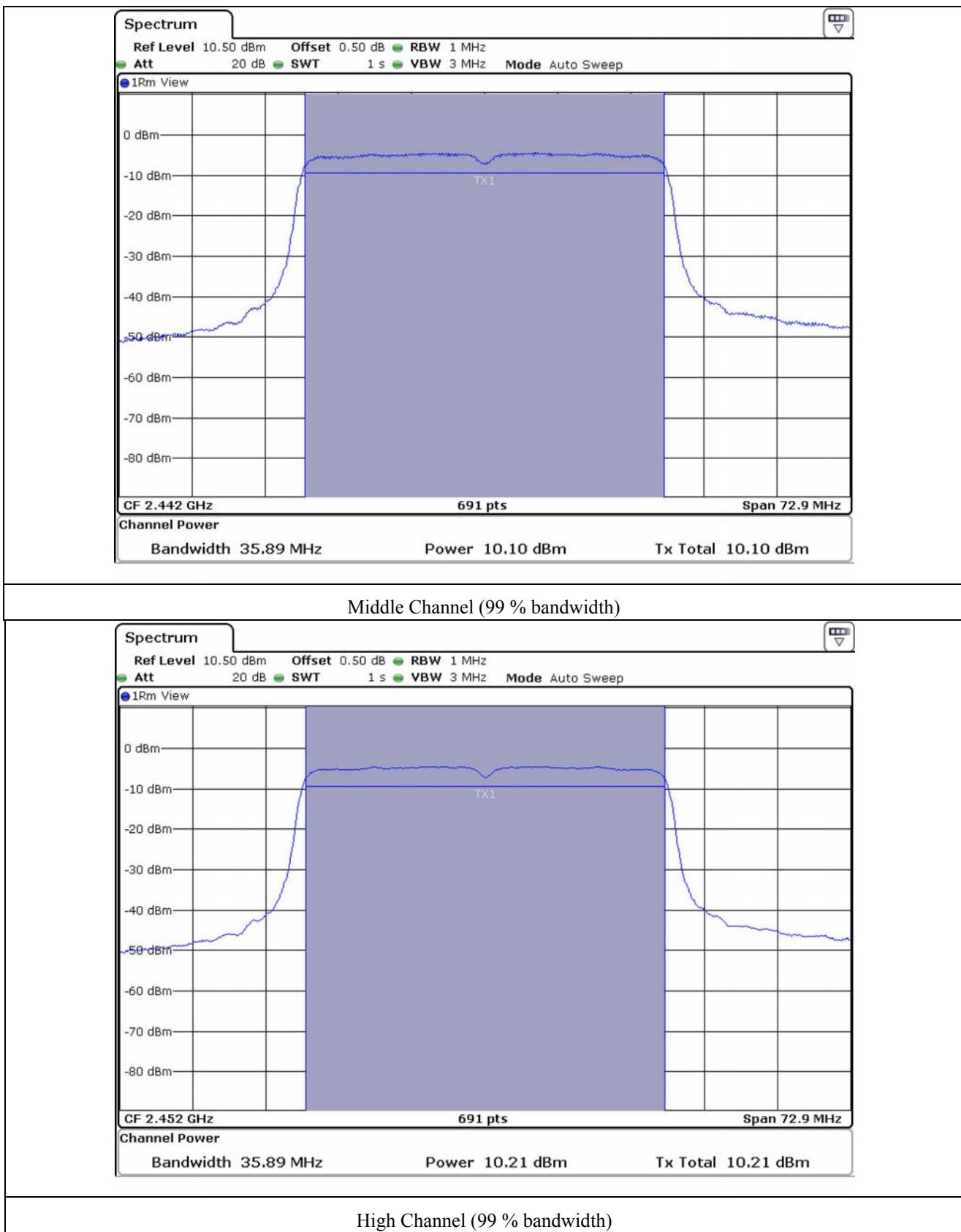
Middle Channel (6 dB Bandwidth)



High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



8.7.2 Test data for Antenna 1

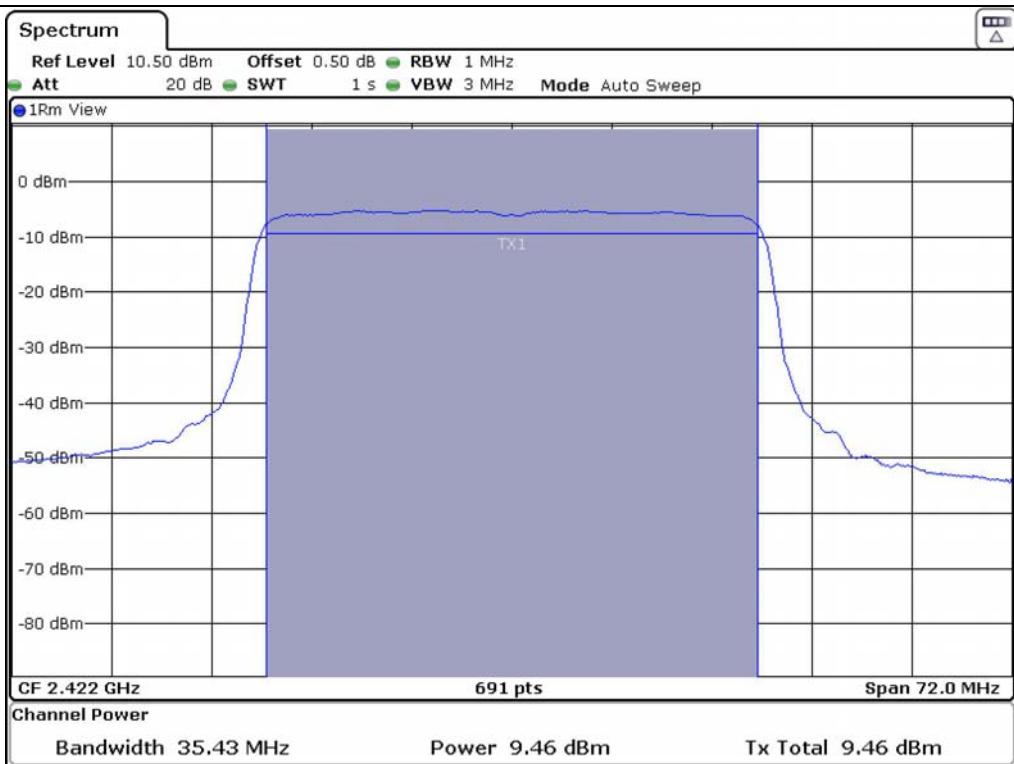
- . Test Date : December 26, 2013
- . Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 422	35.43	9.46	30	17.44
MIDDLE	2 442	35.43	9.63	30	17.10
HIGH	2 452	35.43	9.55	30	17.09

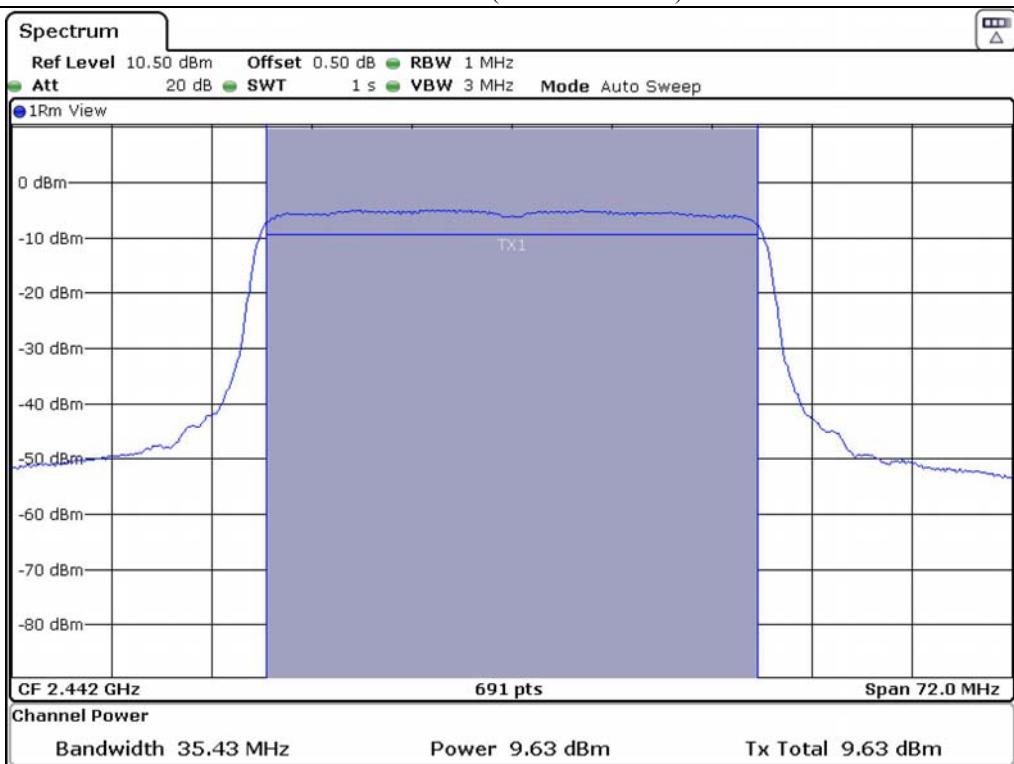
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 422	35.89	9.49	30	20.51
MIDDLE	2 442	35.89	9.72	30	20.28
HIGH	2 452	35.89	9.45	30	20.55

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

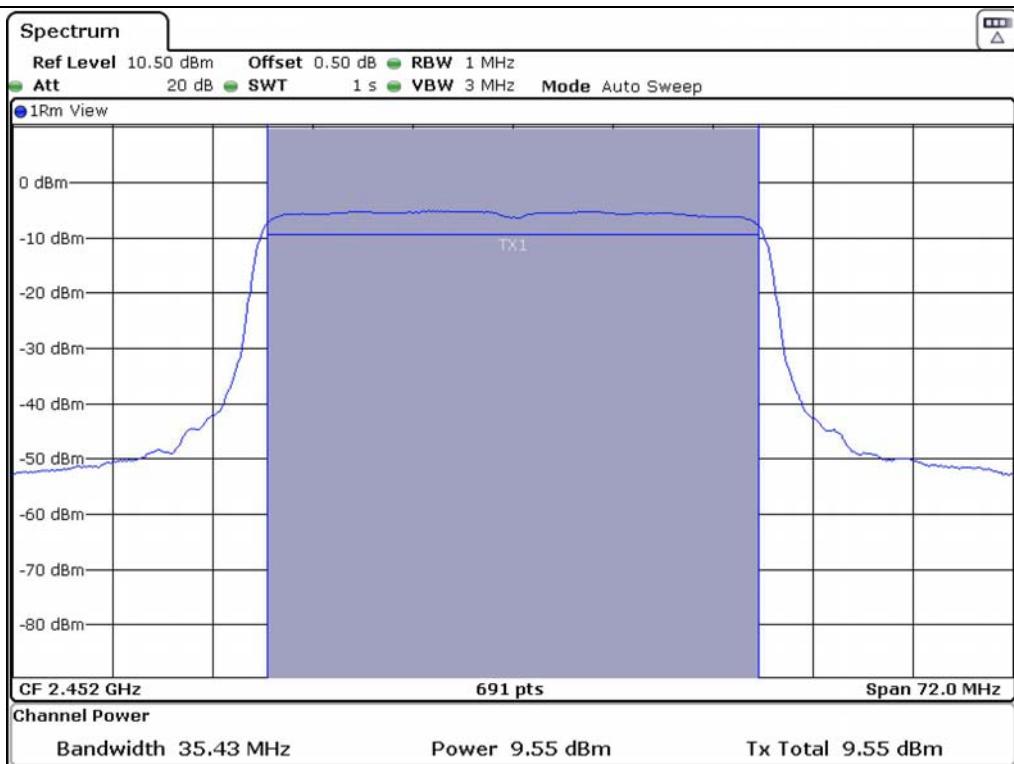
Tested by: Hong-Kyu, Lee/ Engineer



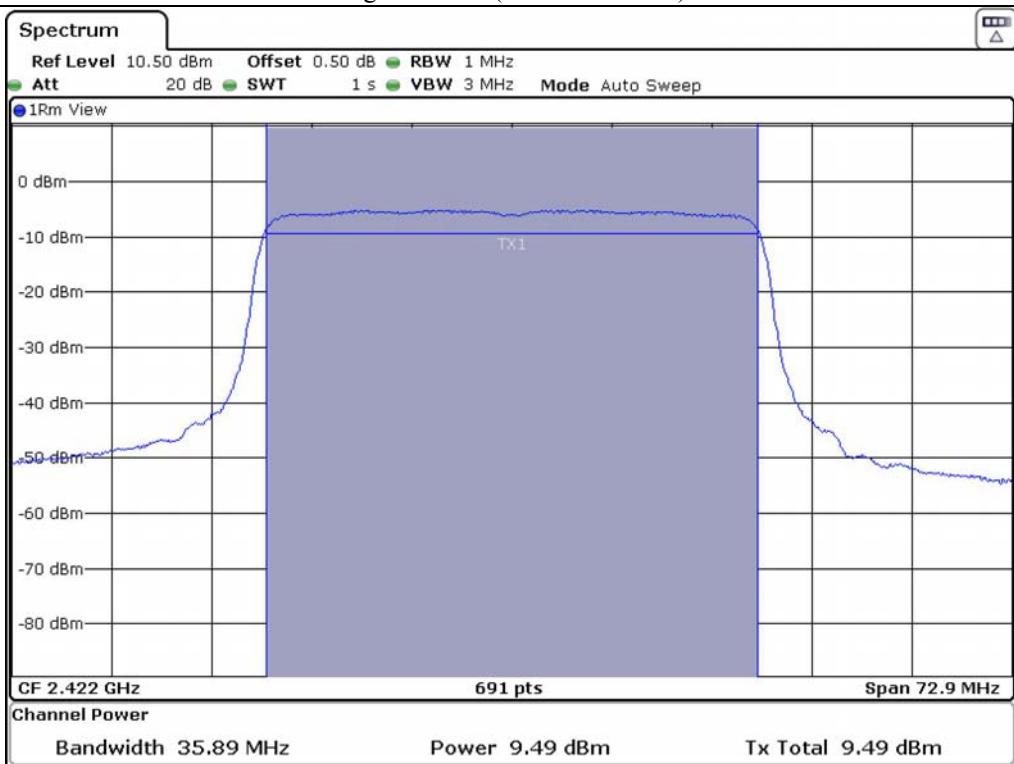
Low Channel (6 dB Bandwidth)



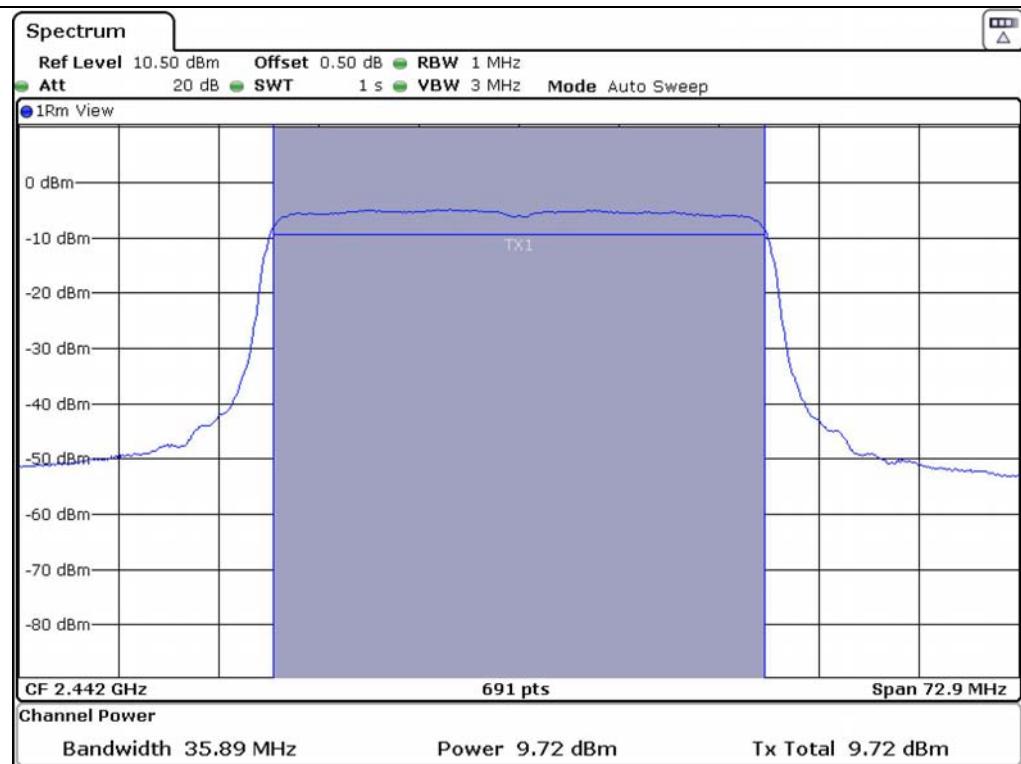
Middle Channel (6 dB Bandwidth)



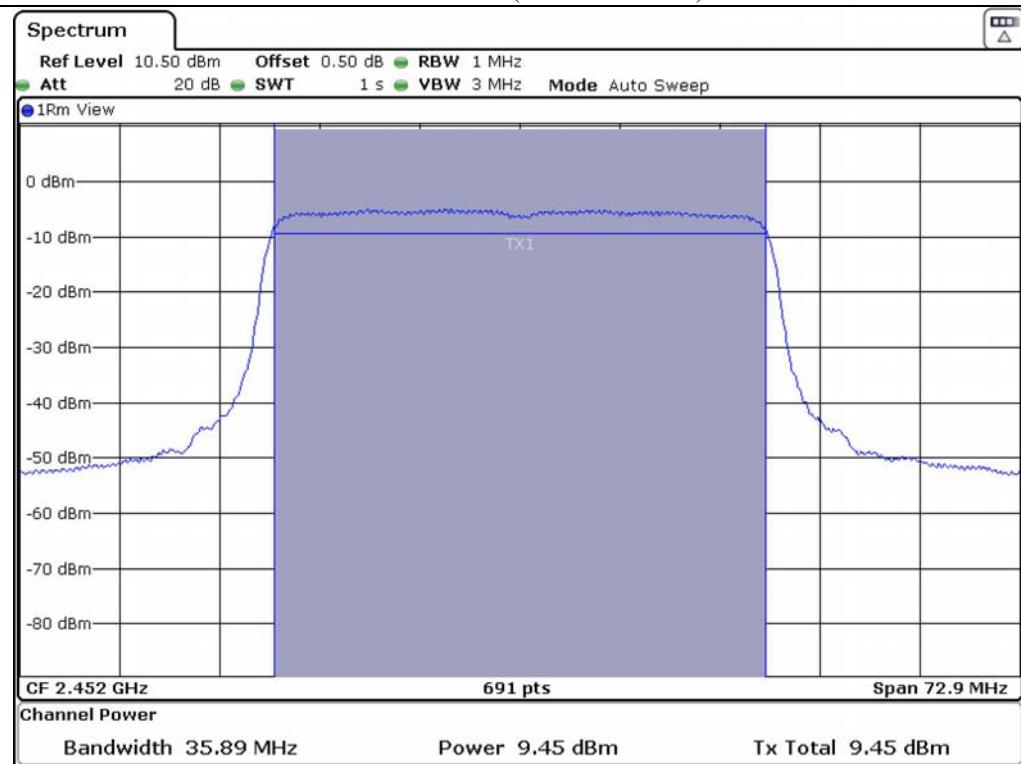
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.7.3 Test data for Multiple transmit

- Test Date : December 26, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 422	35.43	12.56	30	17.44
MIDDLE	2 442	35.43	12.90	30	17.10
HIGH	2 452	35.43	12.91	30	17.09

CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 422	35.89	12.78	30	17.22
MIDDLE	2 442	35.89	12.92	30	17.08
HIGH	2 452	35.89	12.86	30	17.14

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: Hong-Kyu, Lee/ Engineer

8.8 Test data for 802.11a RLAN Mode

8.8.1 Test data for Antenna 0

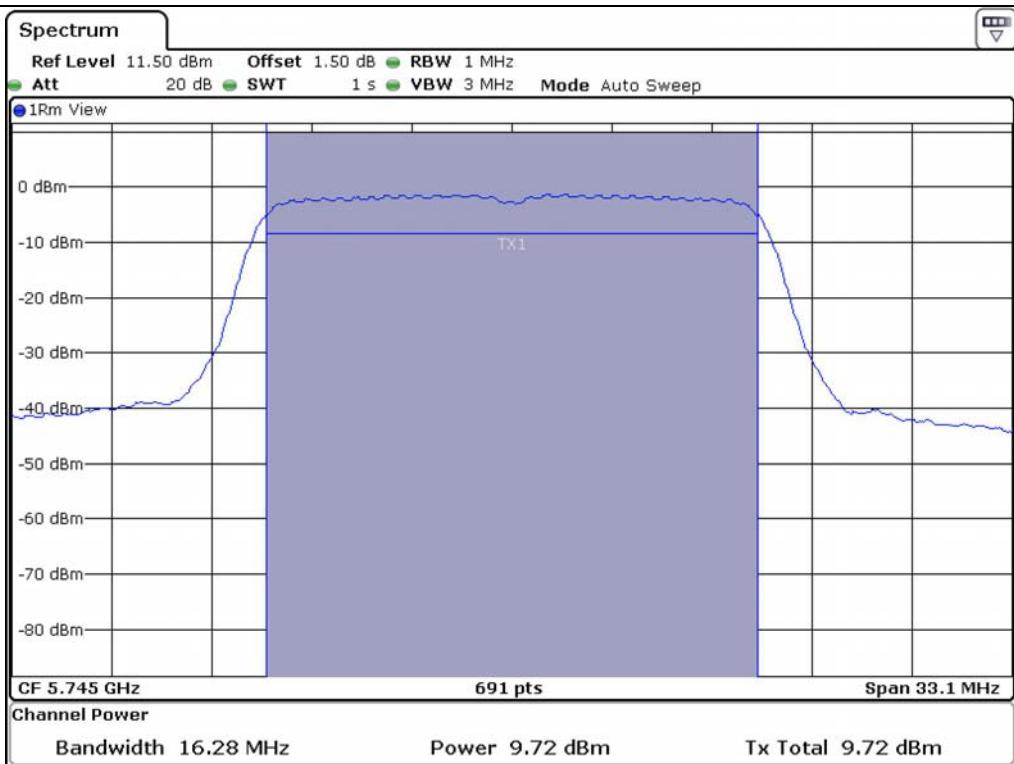
- Test Date : December 27, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.28	9.72	30	20.28
MIDDLE	5 785	16.28	9.91	30	20.09
HIGH	5 825	16.28	10.25	30	19.75

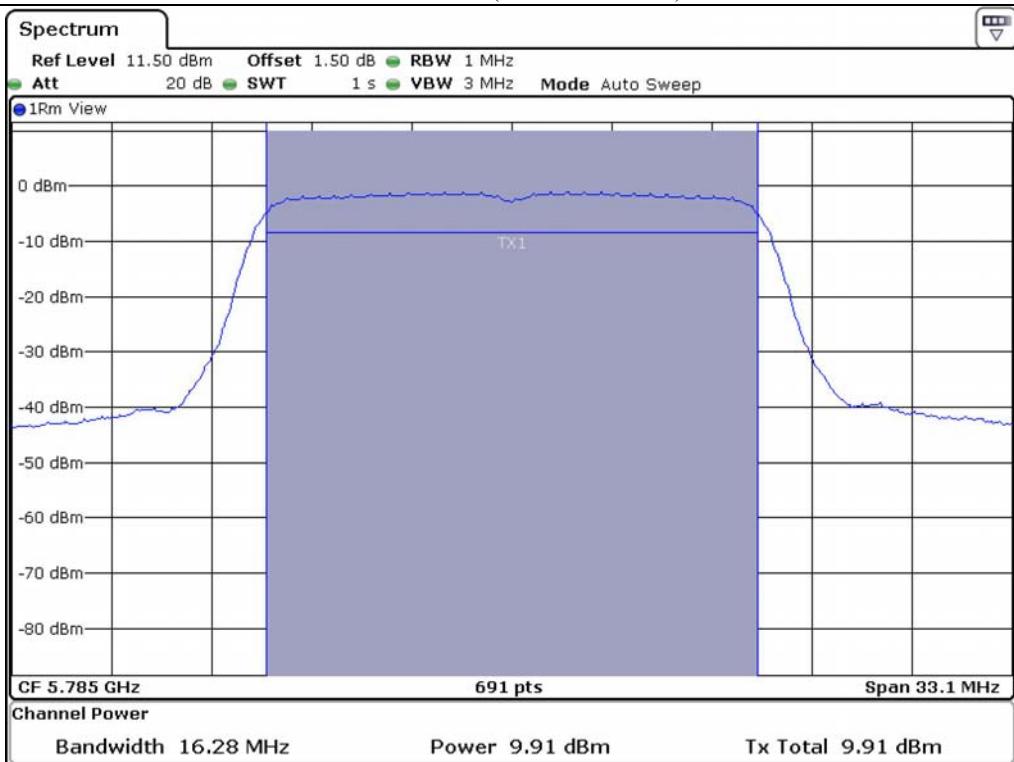
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.35	9.52	30	20.48
MIDDLE	5 785	16.35	9.96	30	20.04
HIGH	5 825	16.35	10.24	30	19.76

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

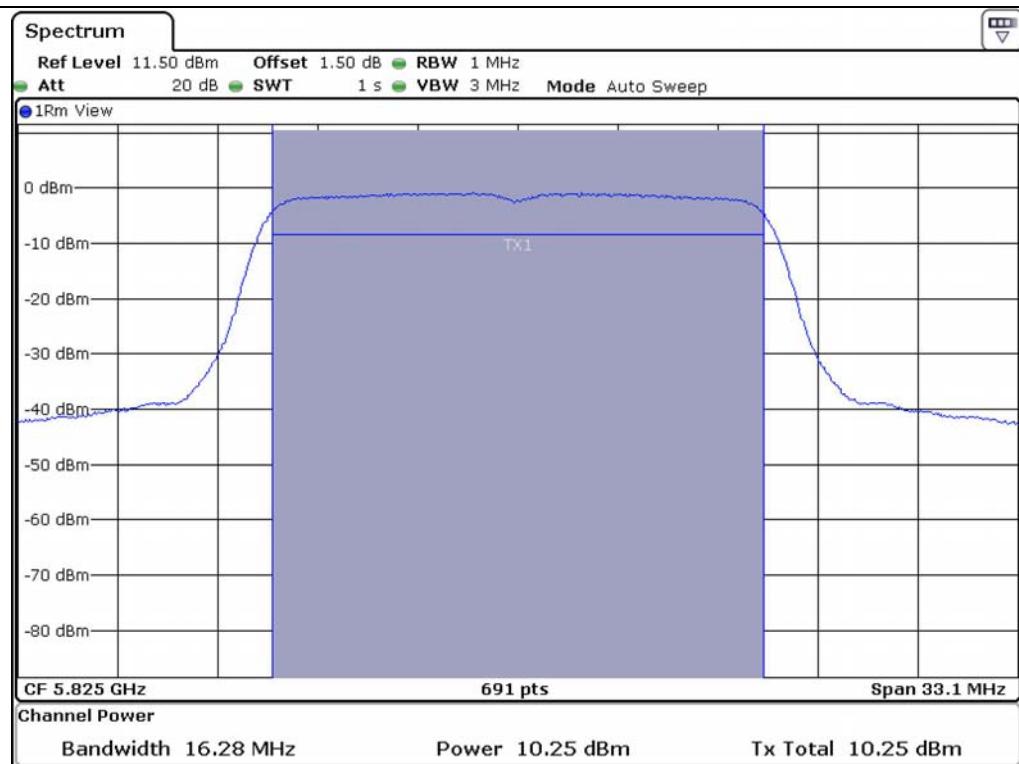
Tested by: Hong-Kyu, Lee/ Engineer



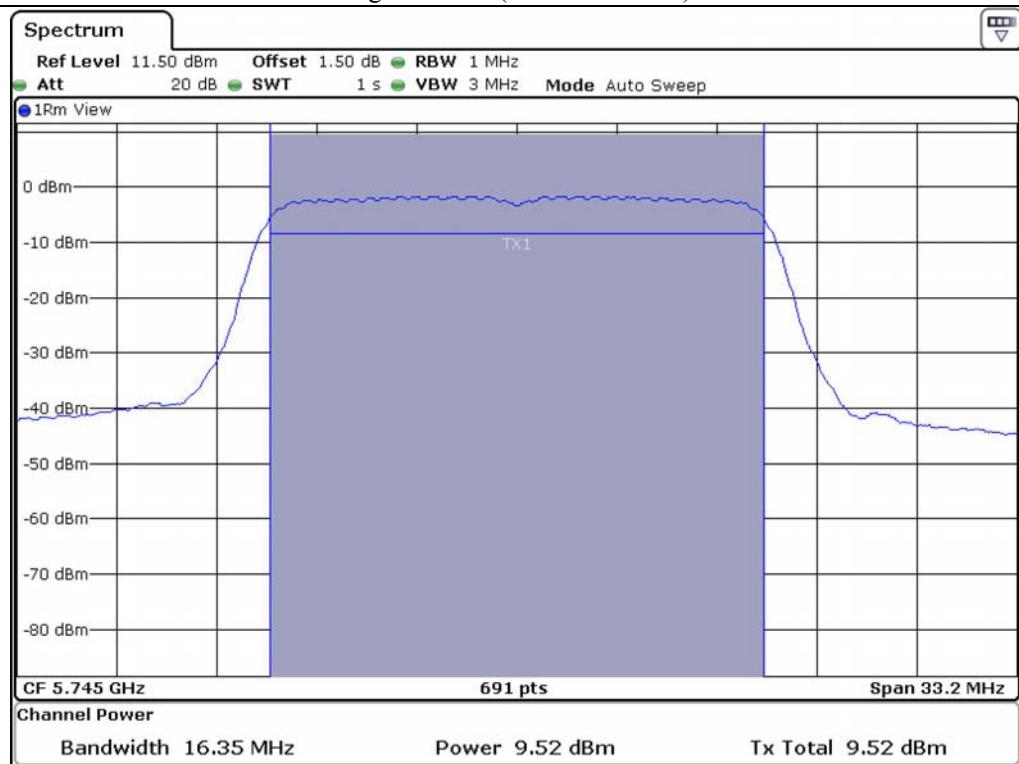
Low Channel (6 dB Bandwidth)



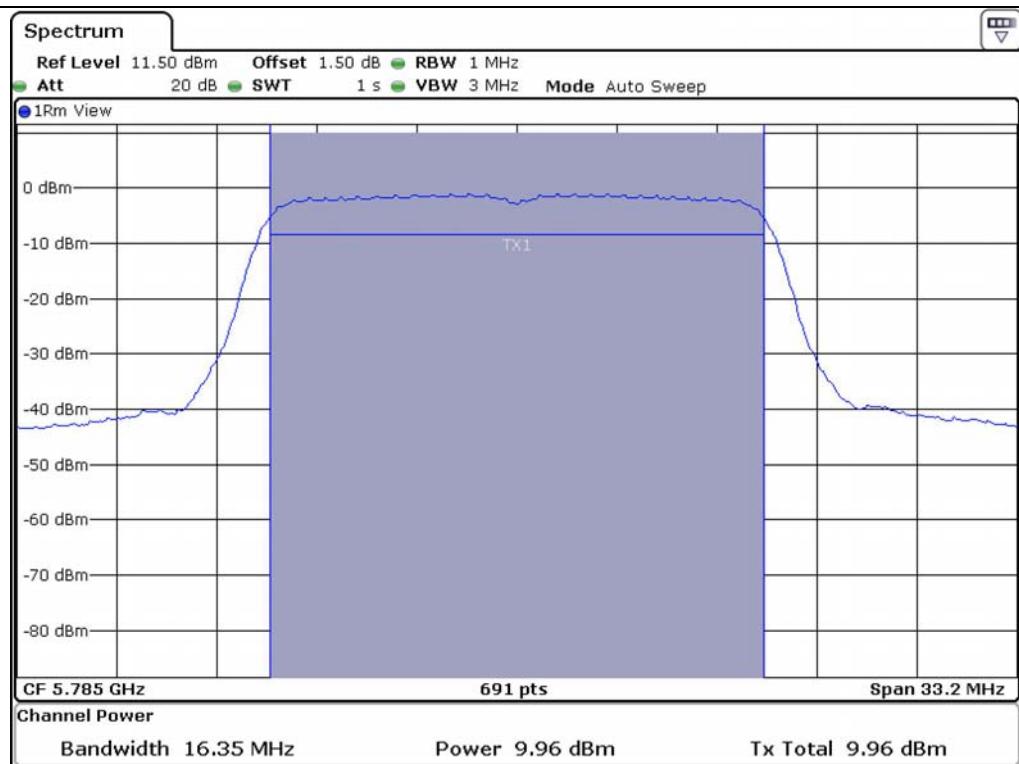
Middle Channel (6 dB Bandwidth)



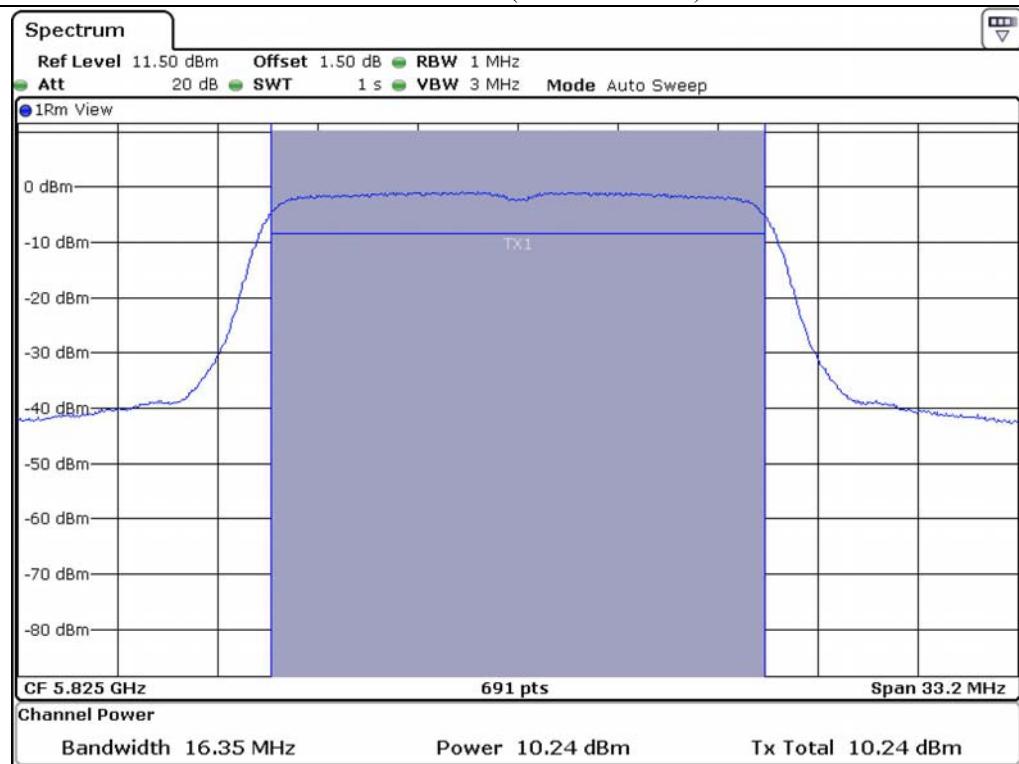
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.8.2 Test data for Antenna 1

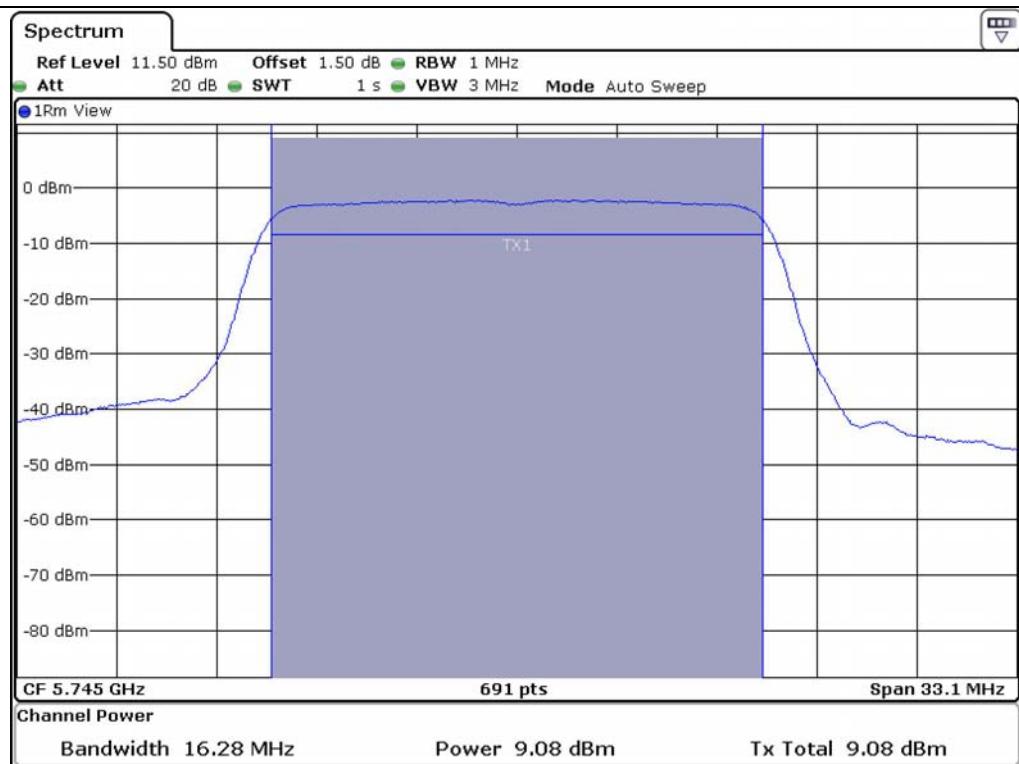
- Test Date : December 27, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.28	9.08	30	20.92
MIDDLE	5 785	16.28	9.44	30	20.56
HIGH	5 825	16.28	10.33	30	19.67

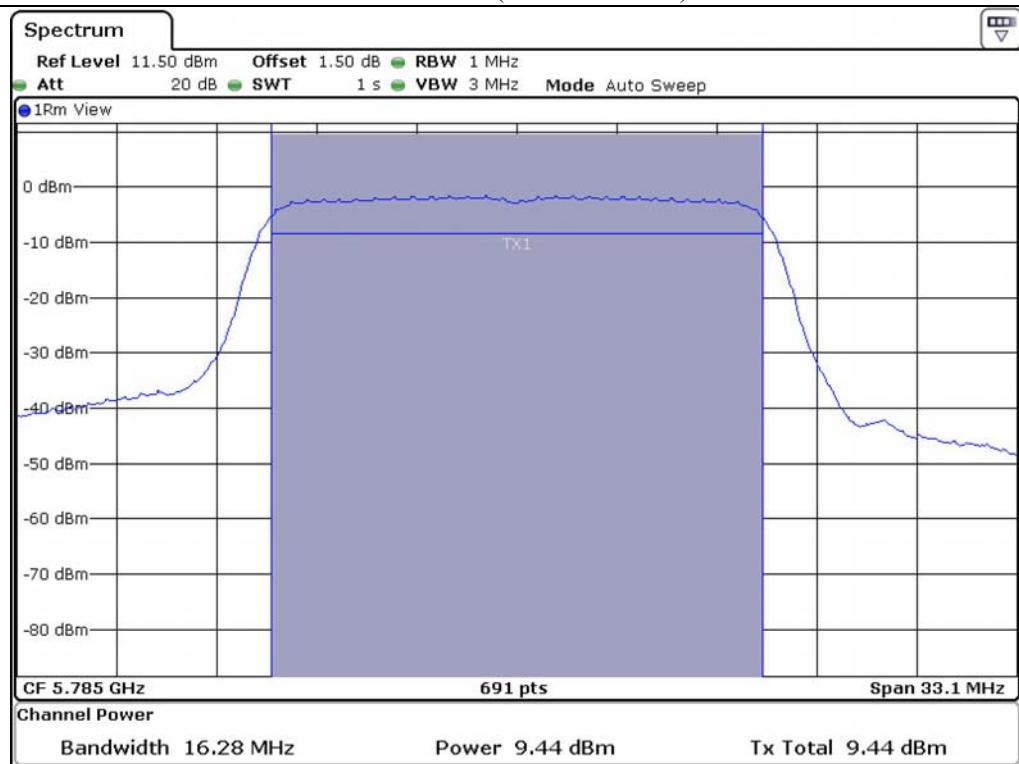
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.35	9.03	30	20.97
MIDDLE	5 785	16.35	8.65	30	21.35
HIGH	5 825	16.35	10.59	30	19.41

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

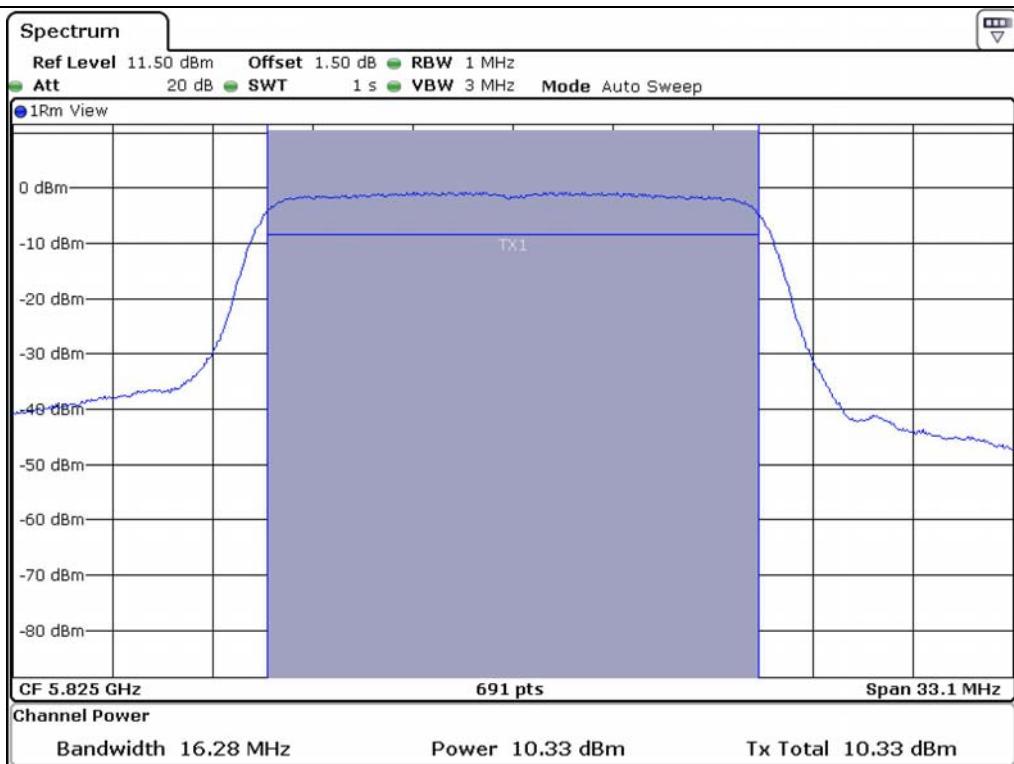
Tested by: Hong-Kyu, Lee/ Engineer



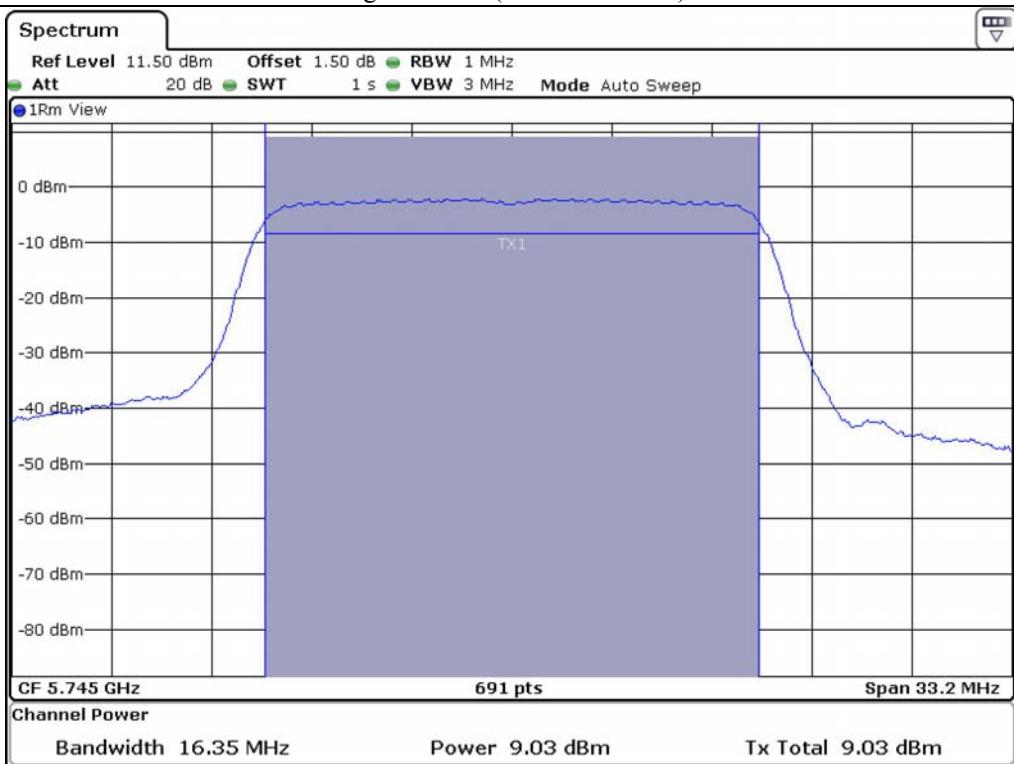
Low Channel (6 dB Bandwidth)



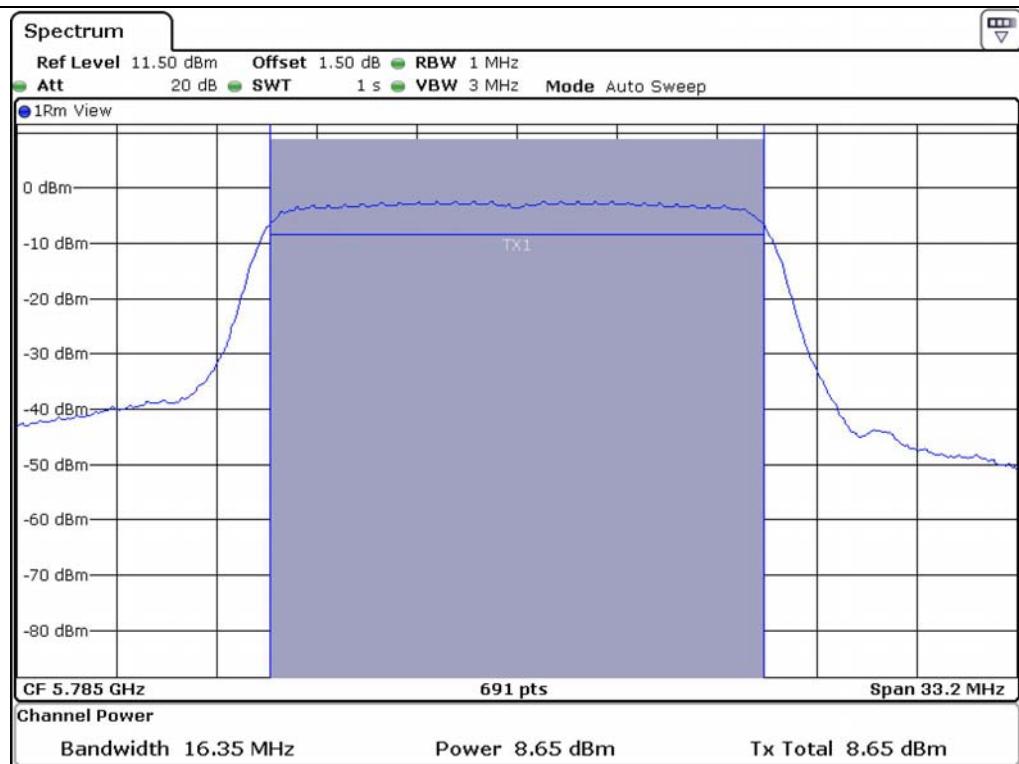
Middle Channel (6 dB Bandwidth)



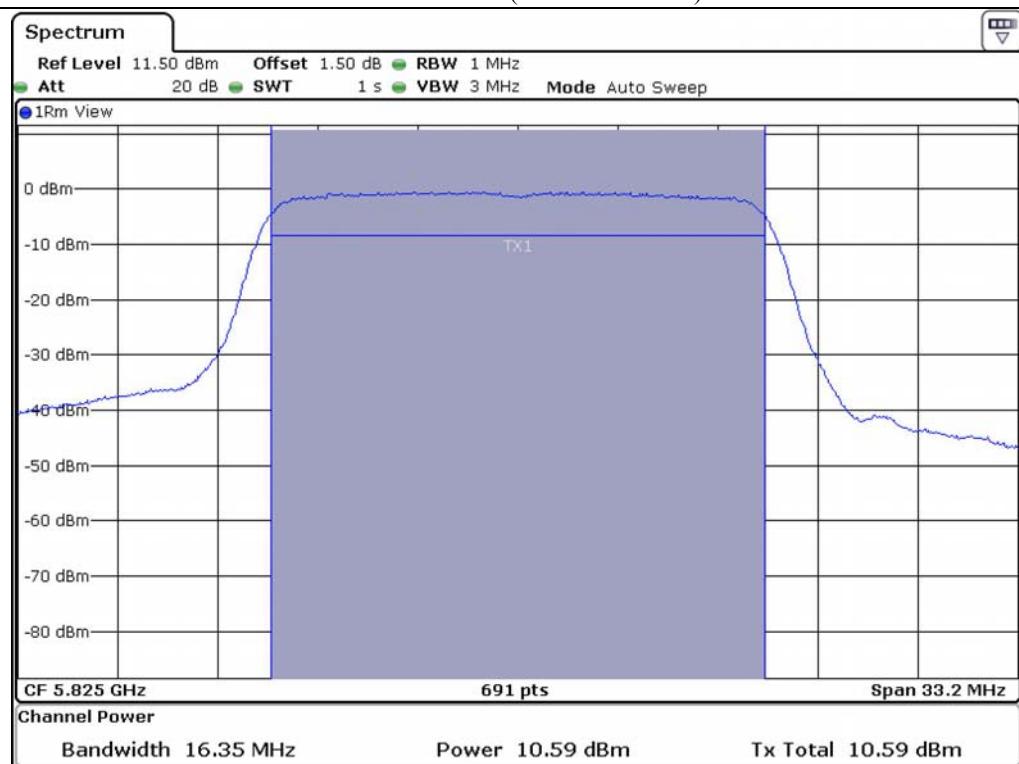
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.9 Test data for 802.11n_HT20 RLAN Mode

8.9.1 Test data for Antenna 0

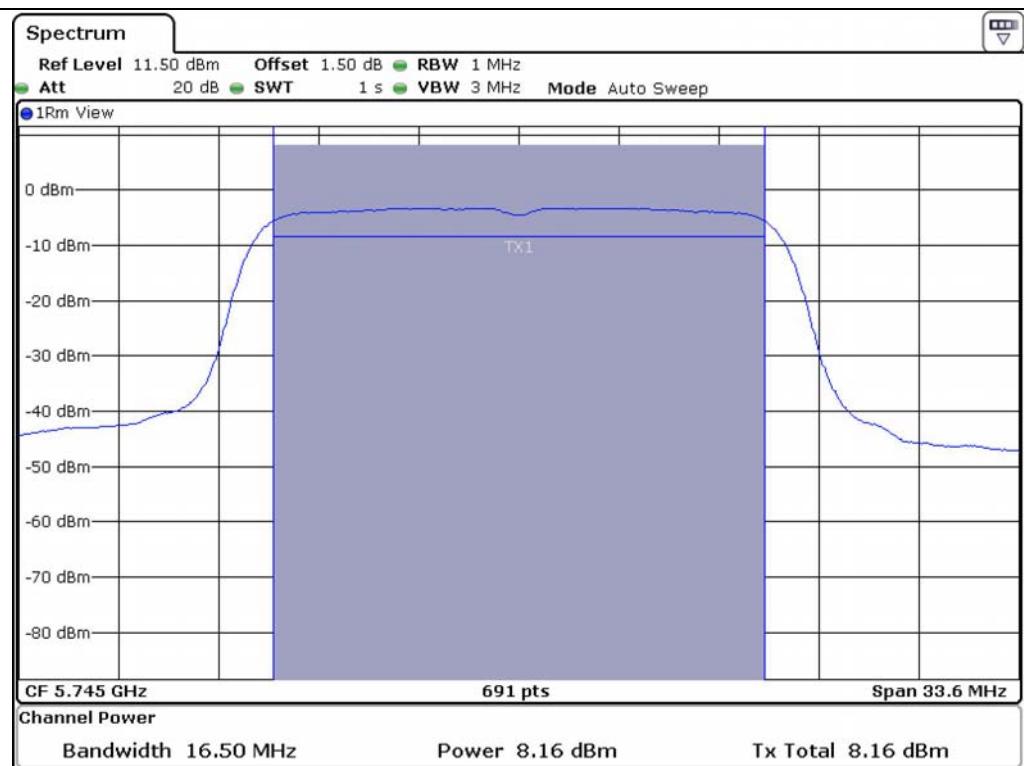
- Test Date : December 27, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.50	8.16	30	21.84
MIDDLE	5 785	16.50	8.40	30	21.60
HIGH	5 825	16.50	8.53	30	21.47

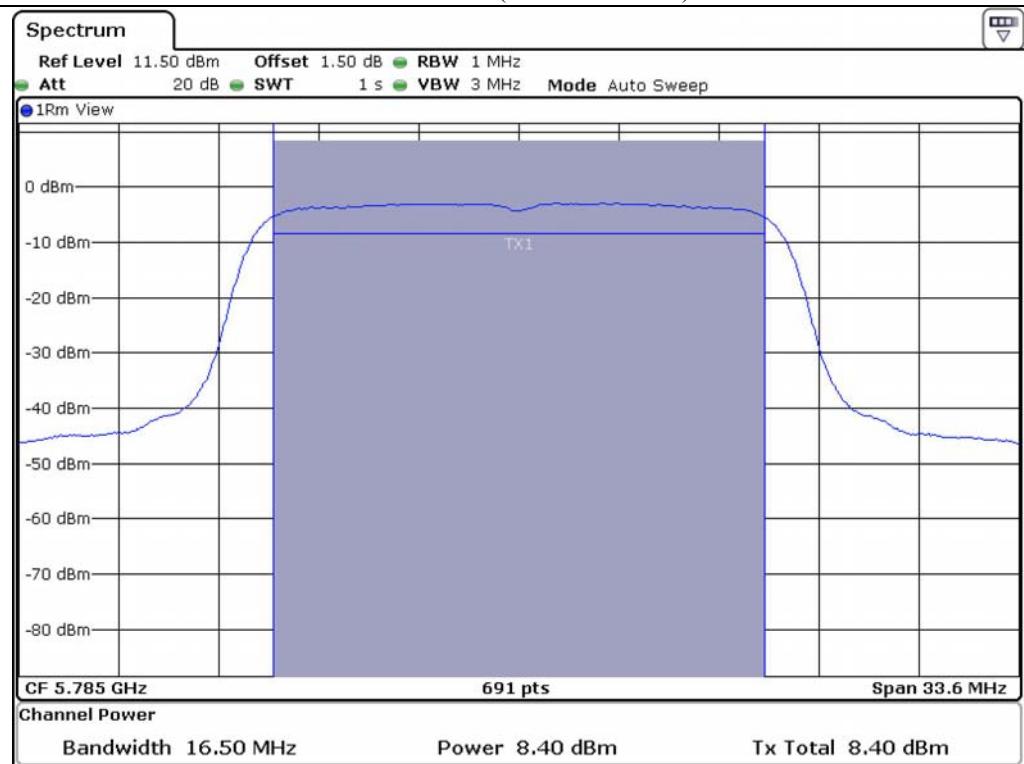
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz))	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	17.44	8.62	30	21.38
MIDDLE	5 785	17.44	8.53	30	21.47
HIGH	5 825	17.44	8.70	30	21.30

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

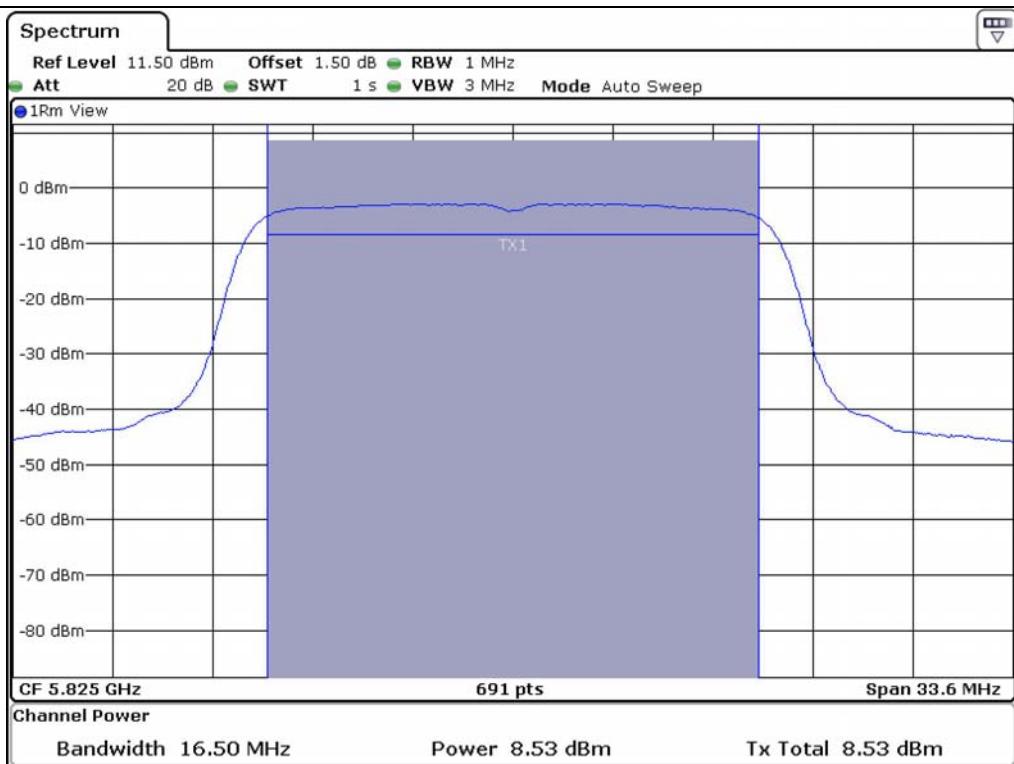
Tested by: Hong-Kyu, Lee/ Engineer



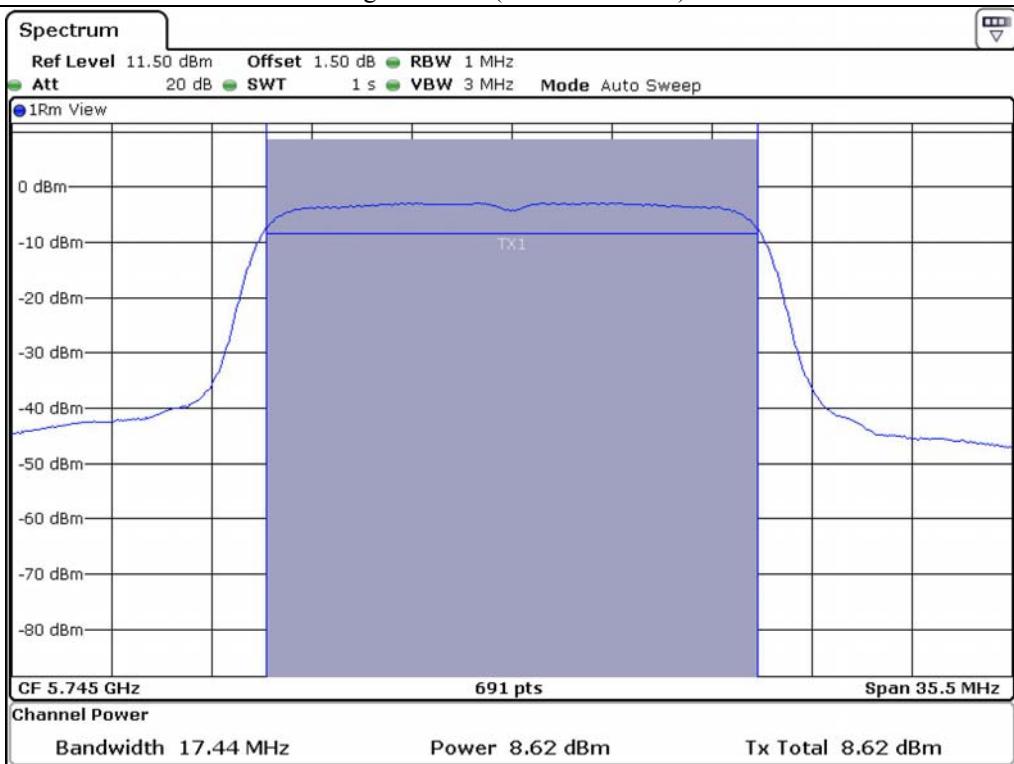
Low Channel (6 dB Bandwidth)



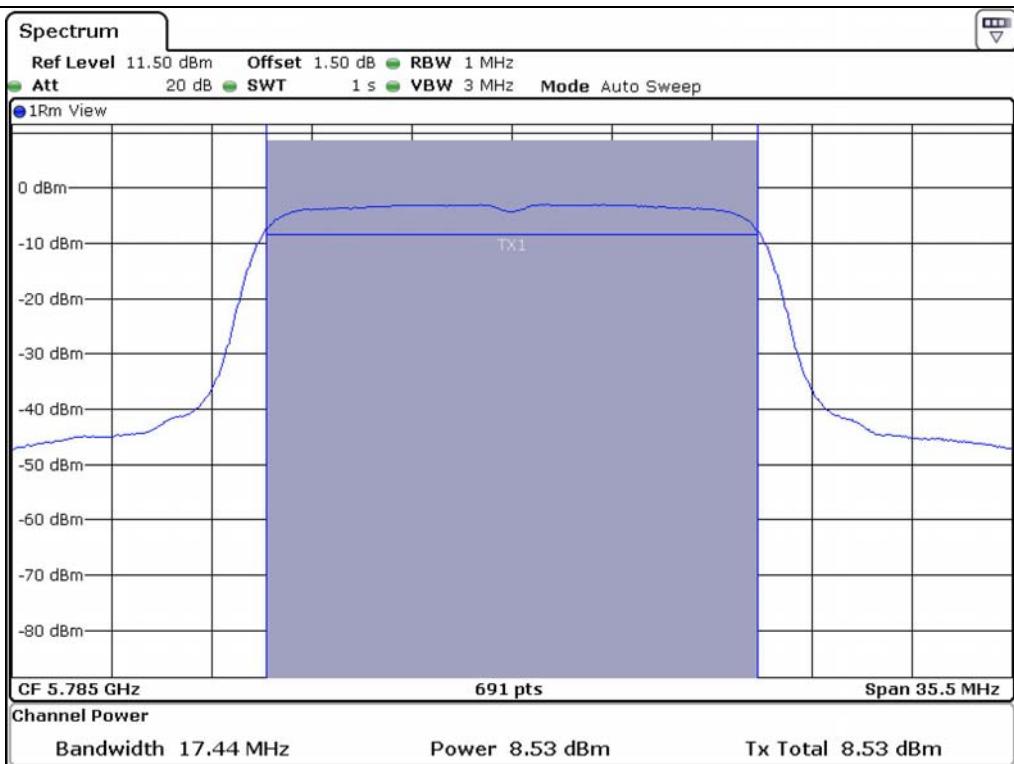
Middle Channel (6 dB Bandwidth)



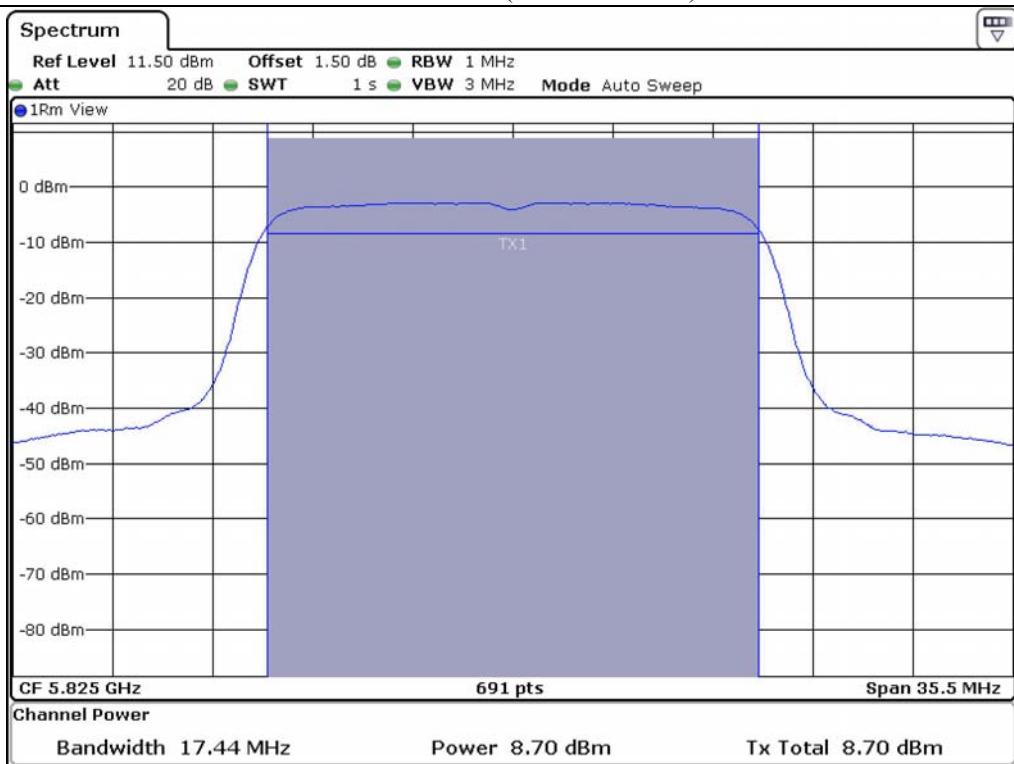
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.9.2 Test data for Antenna 1

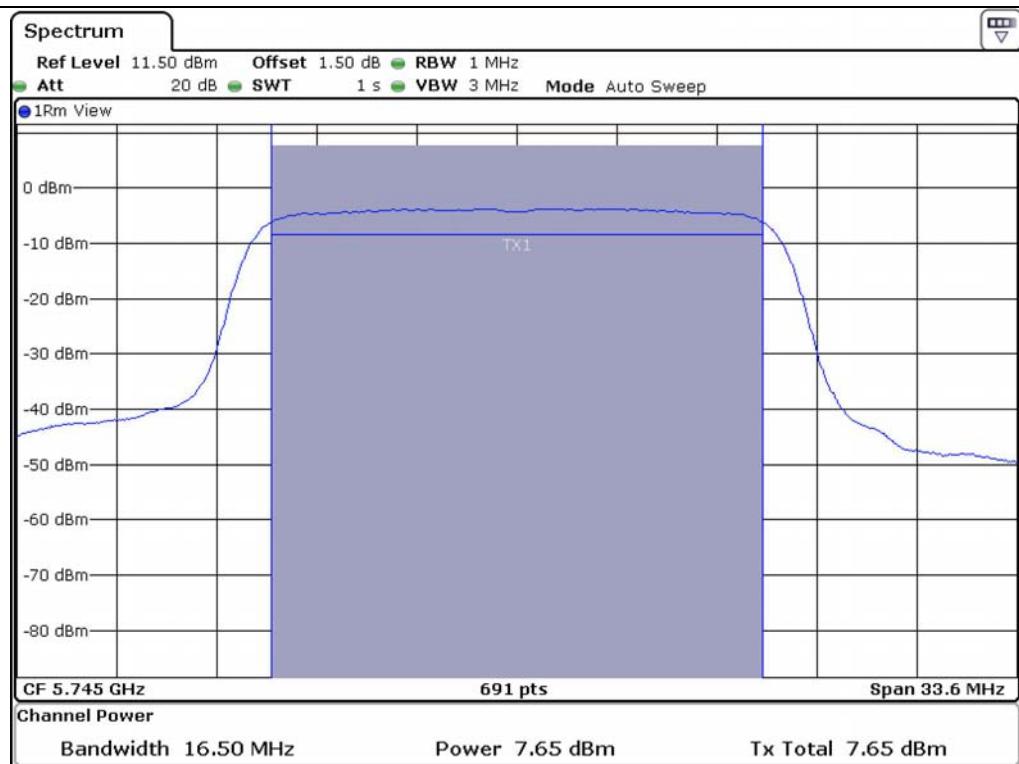
- Test Date : December 27, 2013
 - Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.50	7.65	30	22.35
MIDDLE	5 785	16.50	8.29	30	21.71
HIGH	5 825	16.50	9.03	30	20.97

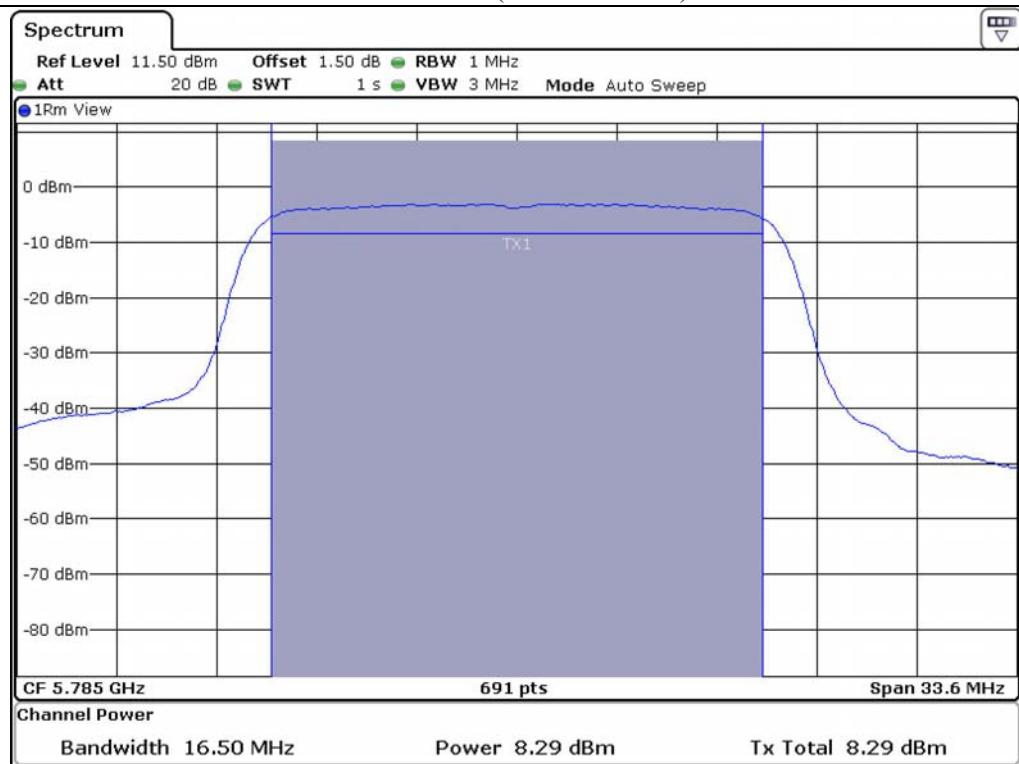
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	17.44	7.75	30	22.25
MIDDLE	5 785	17.44	8.42	30	21.58
HIGH	5 825	17.44	9.12	30	20.88

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

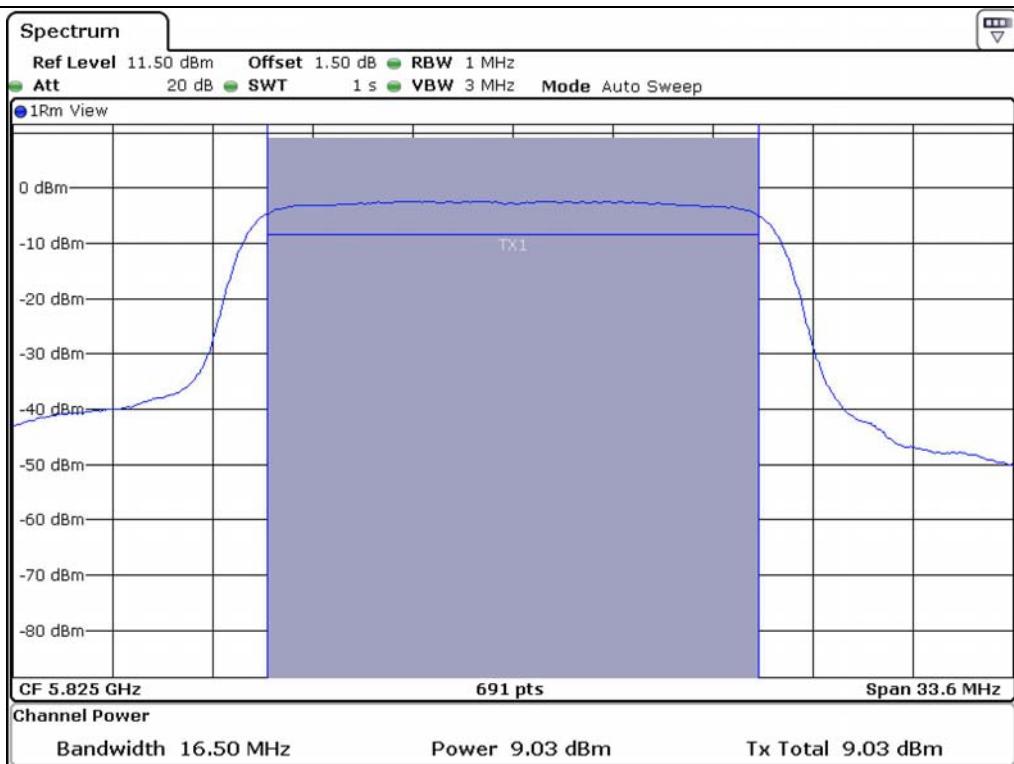
Tested by: Hong-Kyu, Lee/ Engineer



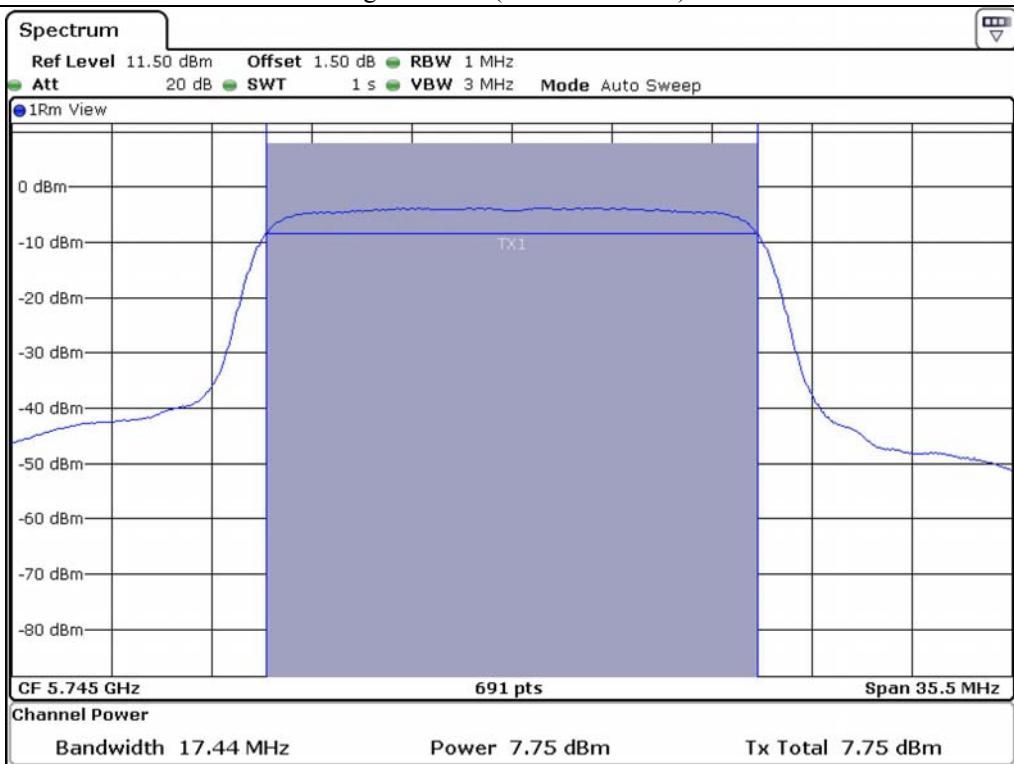
Low Channel (6 dB Bandwidth)



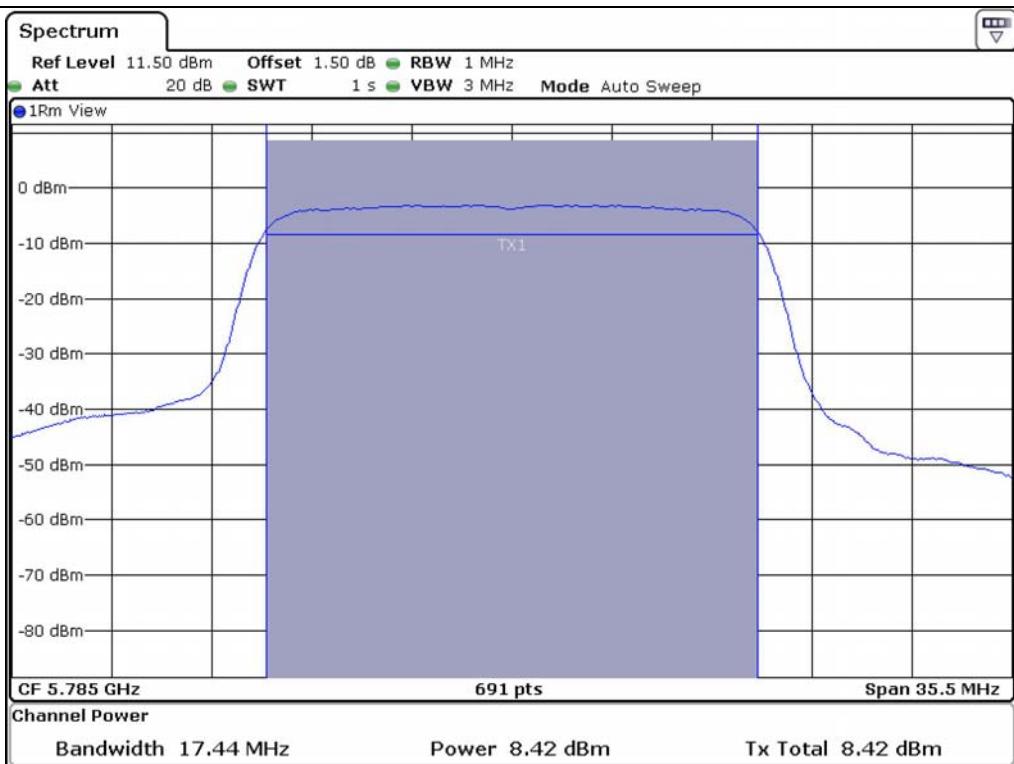
Middle Channel (6 dB Bandwidth)



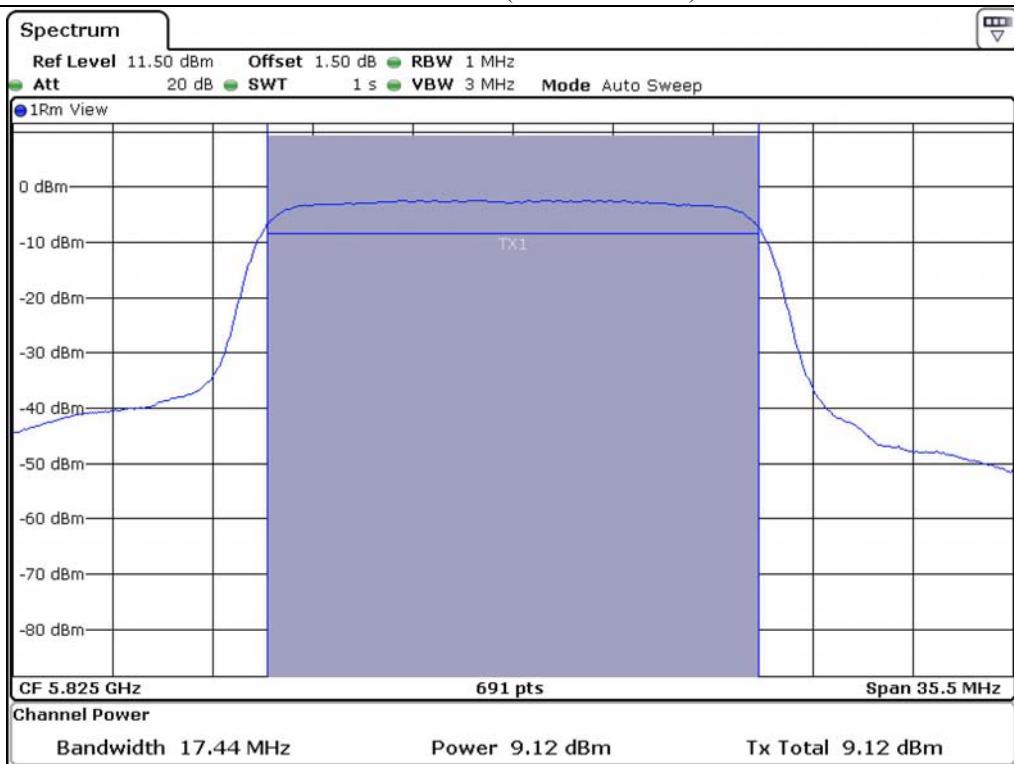
High Channel (6 dB Bandwidth)



Low Channel (99 % bandwidth)



Middle Channel (99 % bandwidth)



High Channel (99 % bandwidth)

8.9.3 Test data for Multiple transmit

- Test Date : December 27, 2013

- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	16.50	10.92	30	19.08
MIDDLE	5 785	16.50	11.36	30	18.64
HIGH	5 825	16.50	11.80	30	18.20

CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 745	17.44	11.22	30	18.78
MIDDLE	5 785	17.44	11.49	30	18.51
HIGH	5 825	17.44	11.93	30	18.07

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

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

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Tested by: Hong-Kyu, Lee/ Engineer

8.10 Test data for 802.11n_HT40 RLAN Mode**8.10.1 Test data for Antenna 0**

- Test Date : December 27, 2013
- Test Result : Pass

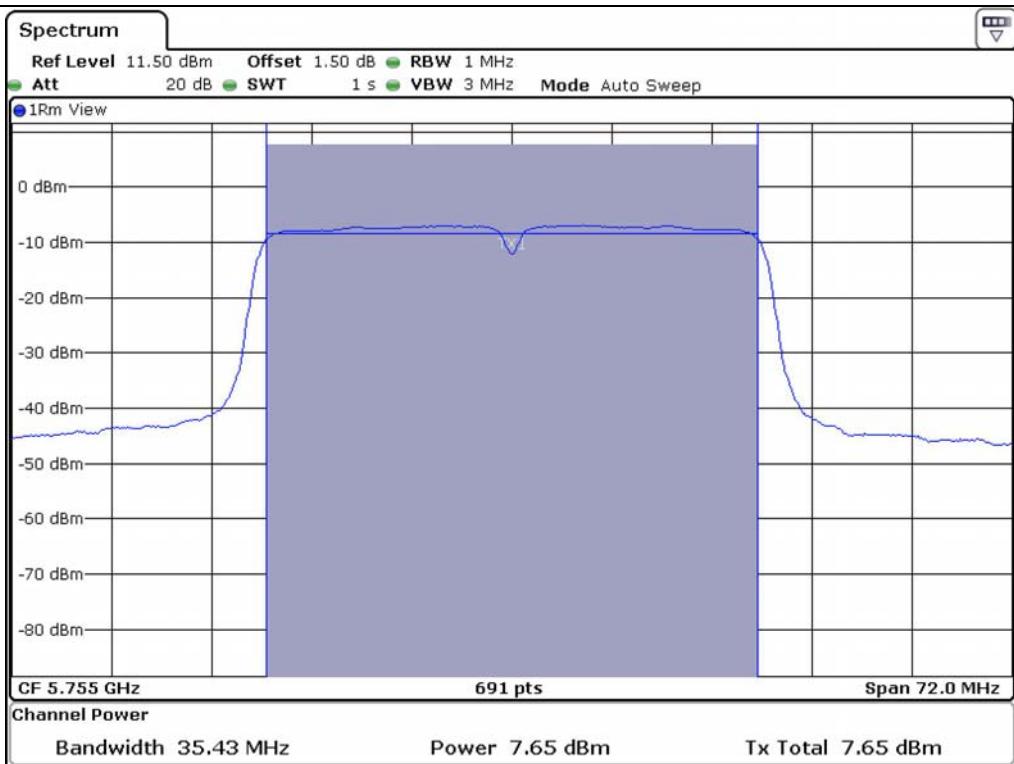
CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 755	35.43	7.65	30	22.35
HIGH	5 795	35.43	8.21	30	21.79

CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 755	35.89	7.71	30	22.29
HIGH	5 795	35.89	8.22	30	21.78

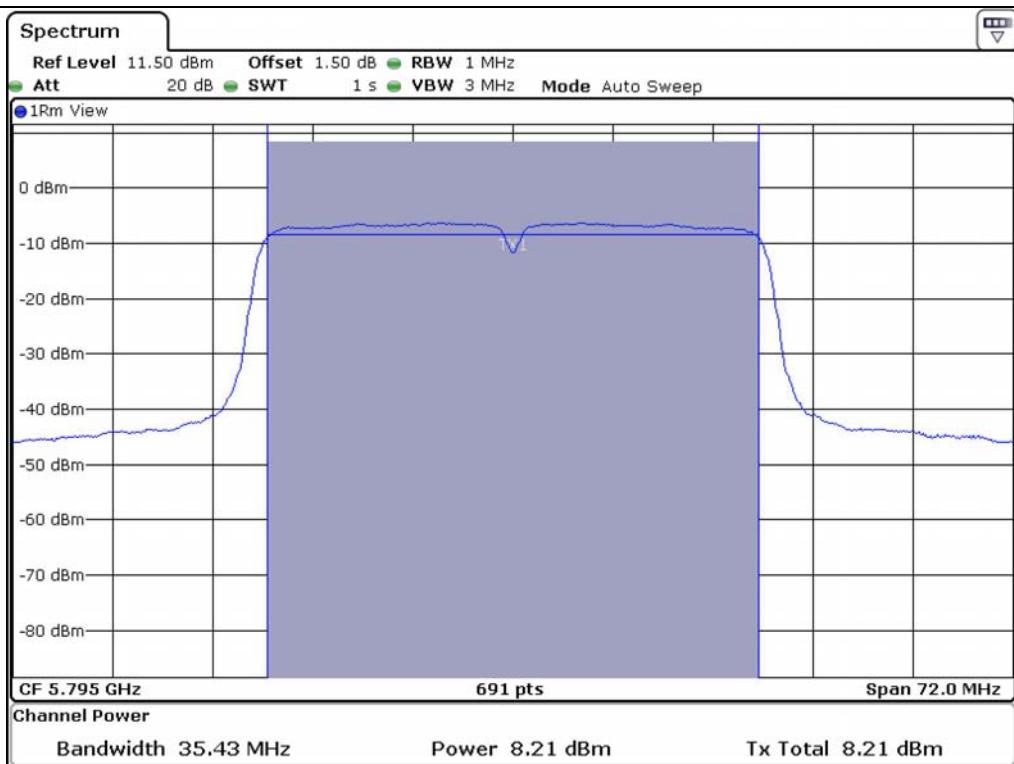
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

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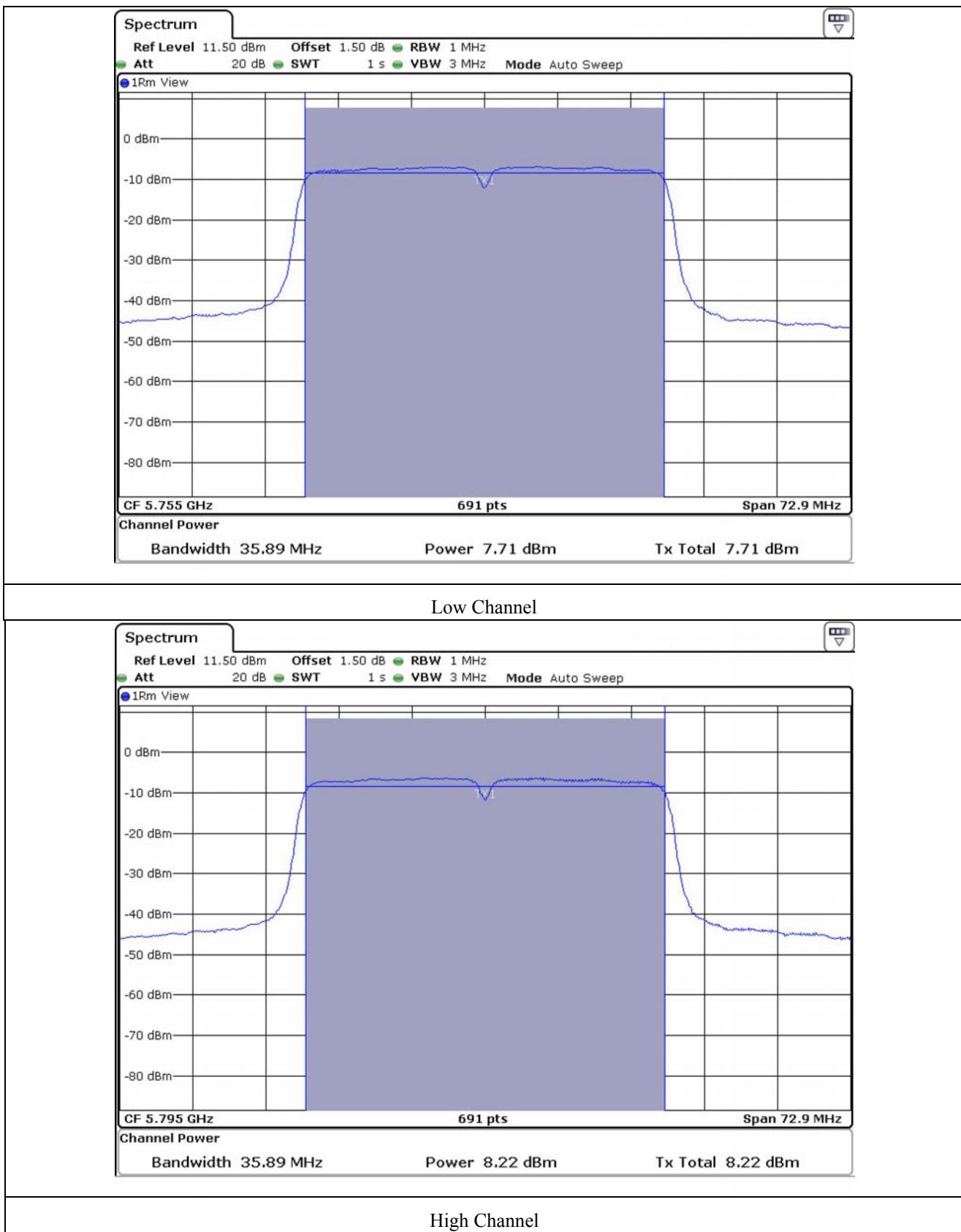
Tested by: Hong-Kyu, Lee/ Engineer



Low Channel



High Channel



8.10.2 Test data for Antenna 1

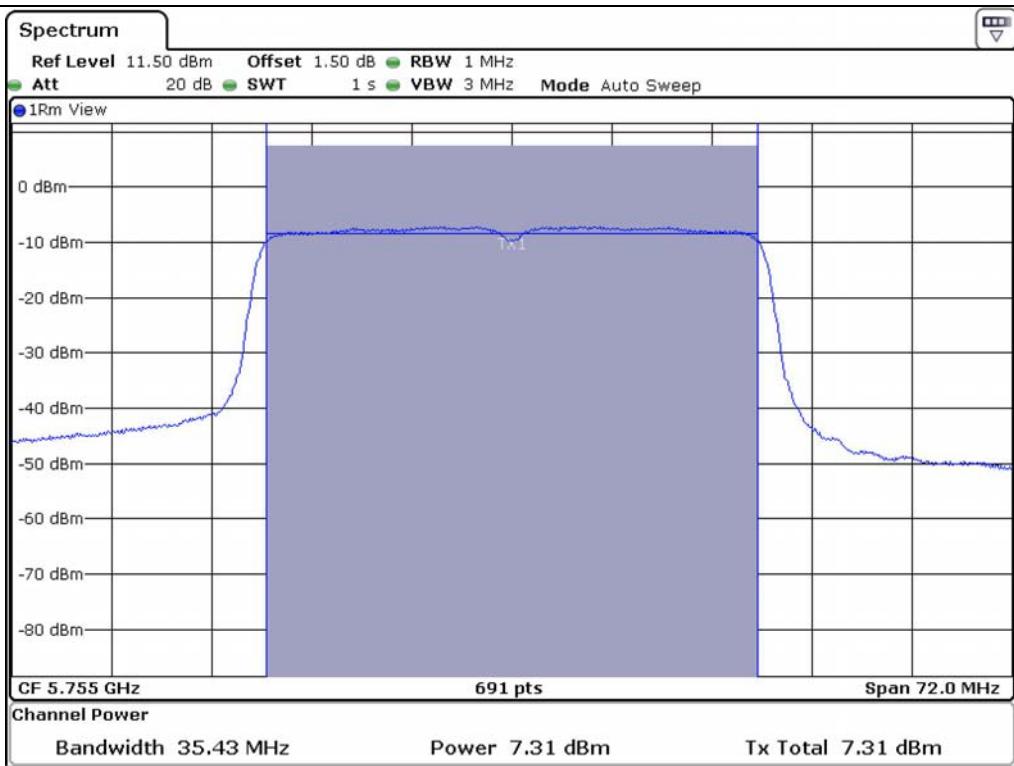
- Test Date : December 27, 2013
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 755	35.43	7.31	30	22.69
HIGH	5 795	35.43	7.48	30	22.52

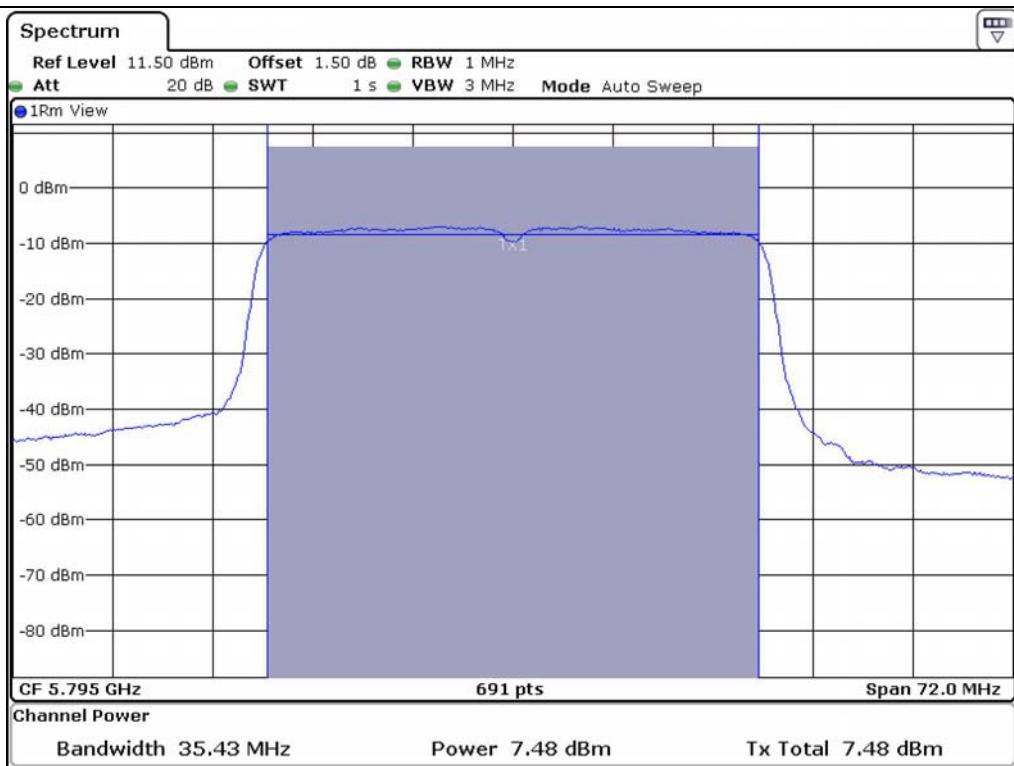
CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 755	35.89	7.39	30	22.61
HIGH	5 795	35.89	7.48	30	22.52

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

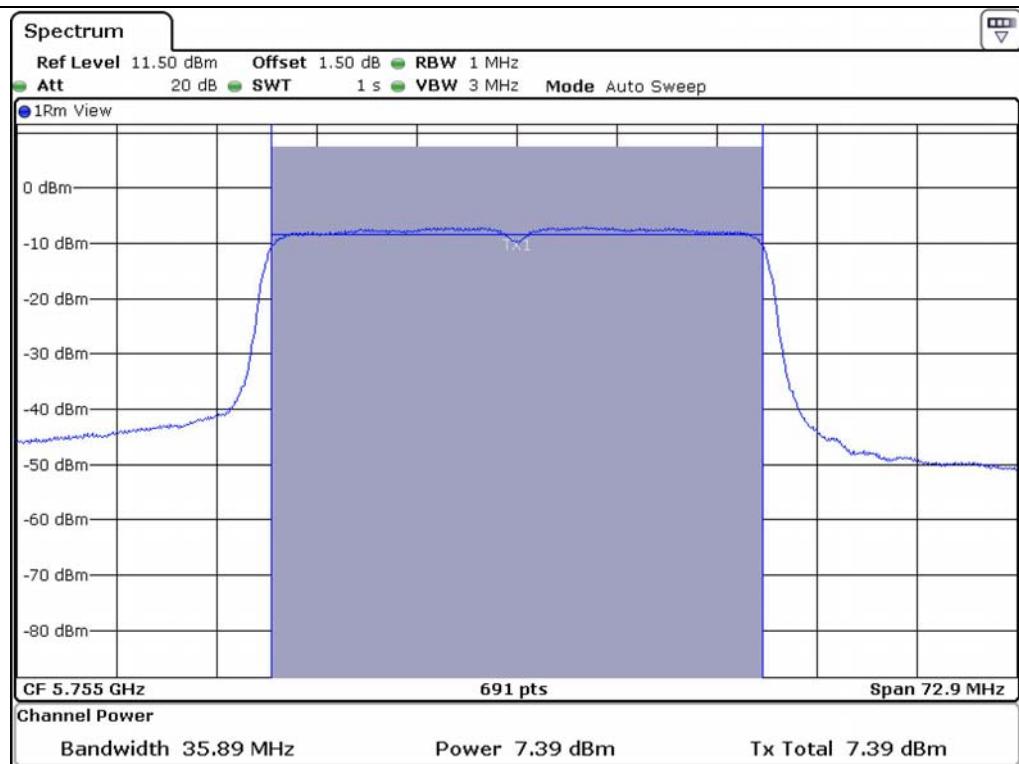
Tested by: Hong-Kyu, Lee/ Engineer



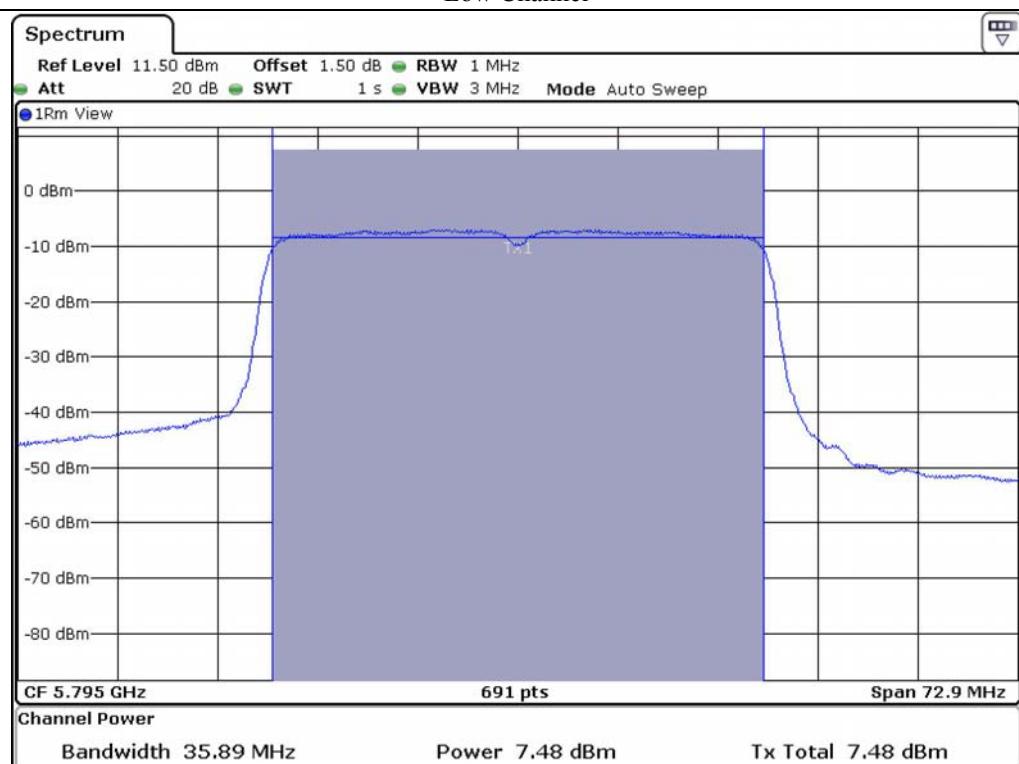
Low Channel



High Channel



Low Channel



High Channel

8.10.3 Test data for Multiple transmit

- Test Date : December 27, 2013

- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 755	35.43	10.49	30	19.51
HIGH	5 795	35.43	10.87	30	19.13

CHANNEL	FREQUENCY (MHz)	99 % bandwidth (MHz)	CALCULATED OUTPUT POWER (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	5 755	35.89	10.56	30	19.44
HIGH	5 795	35.89	10.88	30	19.12

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

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

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Tested by: Hong-Kyu, Lee/ Engineer

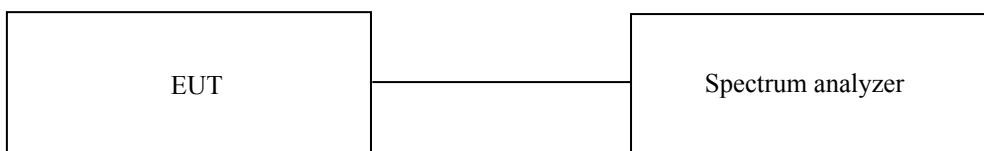
9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature : 20 °C
Relative humidity : 45 % R.H.

9.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



9.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane. The frequency spectrum from 30 MHz to 40 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

9.4 Test equipment used

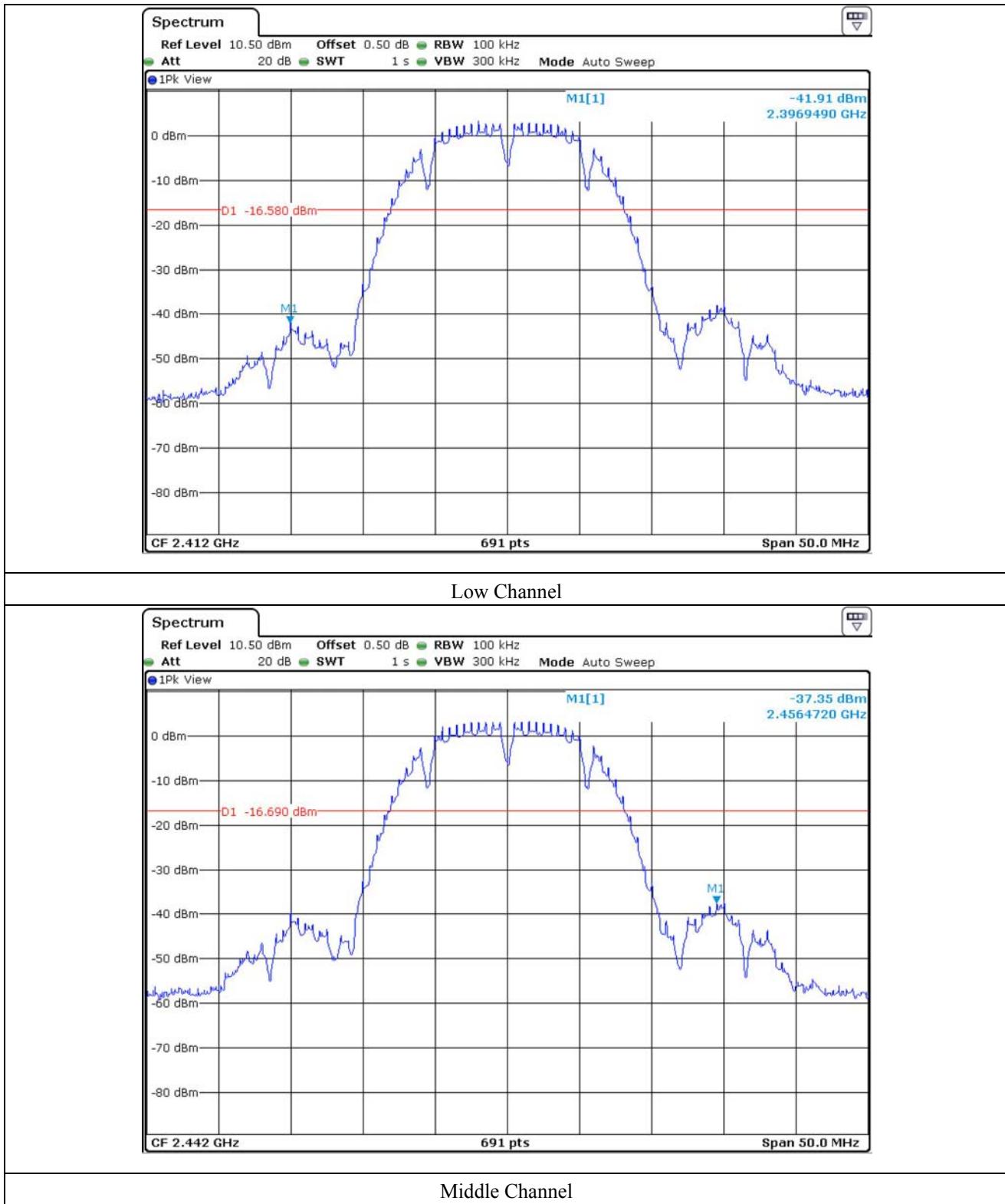
Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ - 8564E	HP	Spectrum Analyzer	3650A00756	May 03, 2013(1Y)
■ - ESU	Rohde & Schwarz	EMI Test Receiver	100261	May 27, 2013(1Y)
■ - 310N	Sonoma Instrument	AMPLIFIER	312544	May 21, 2013(1Y)
■ - 83051A	Agilent	Microwave System Preamplifier	3950M00201	May 22, 2013(1Y)
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	May 20, 2013(1Y)
■ - SCU-18	Rohde & Schwarz	PRE-AMPLIFIER	10041	Jan. 25, 2013(1Y)
■ - MA220	HD	Turn Table	N/A	N/A
■ - HD240	HD	Antenna Mast	N/A	N/A
■ - VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-255	Apr. 24, 2012(2Y)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D294	Sep. 30, 2013 (2Y)
■ - BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jun. 17, 2013 (2Y)

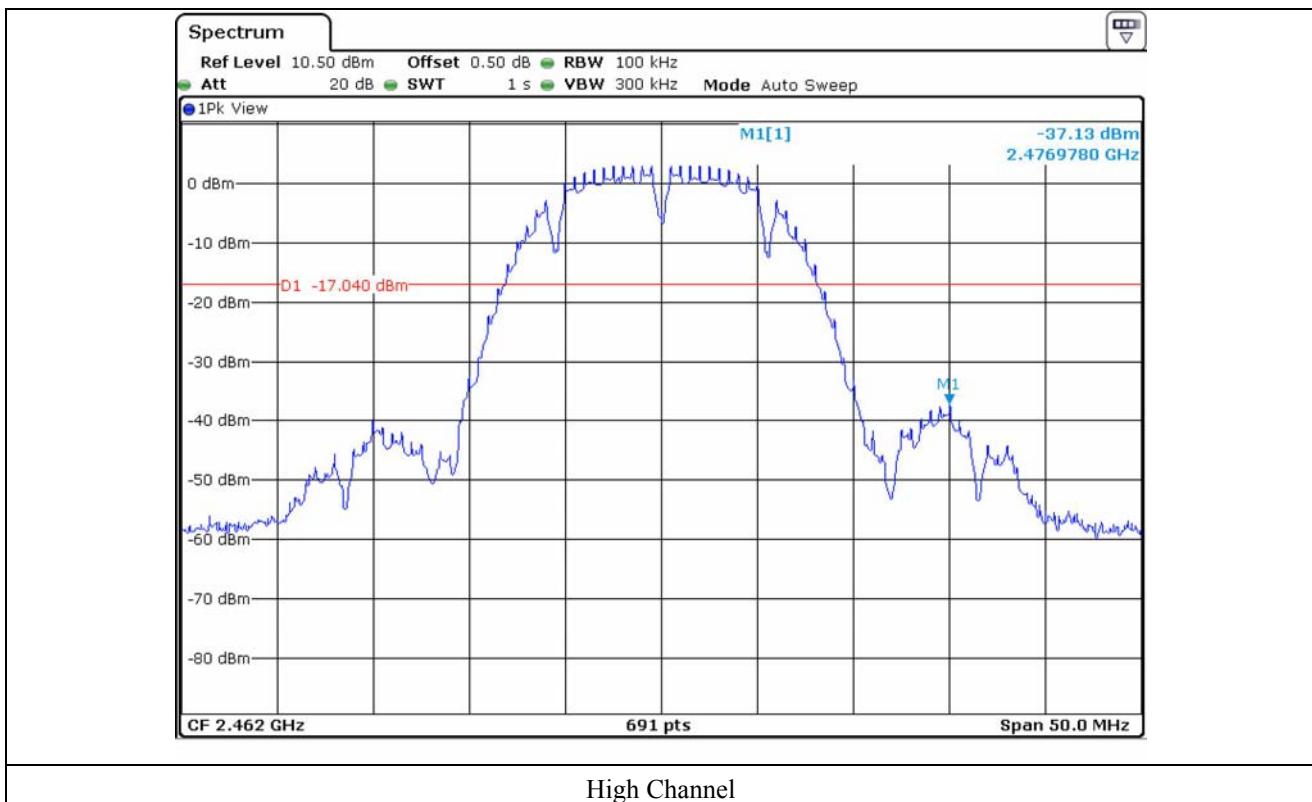
All test equipment used is calibrated on a regular basis.

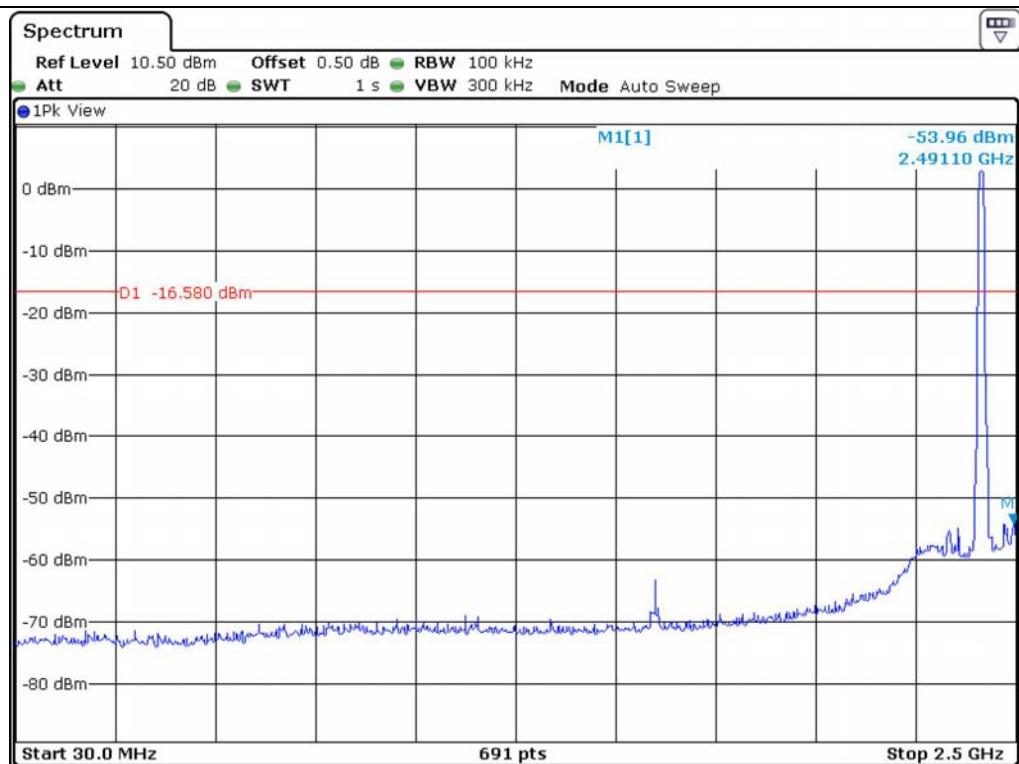
9.5 Test data for conducted emission

9.5.1 Test data for 802.11b WLAN Mode

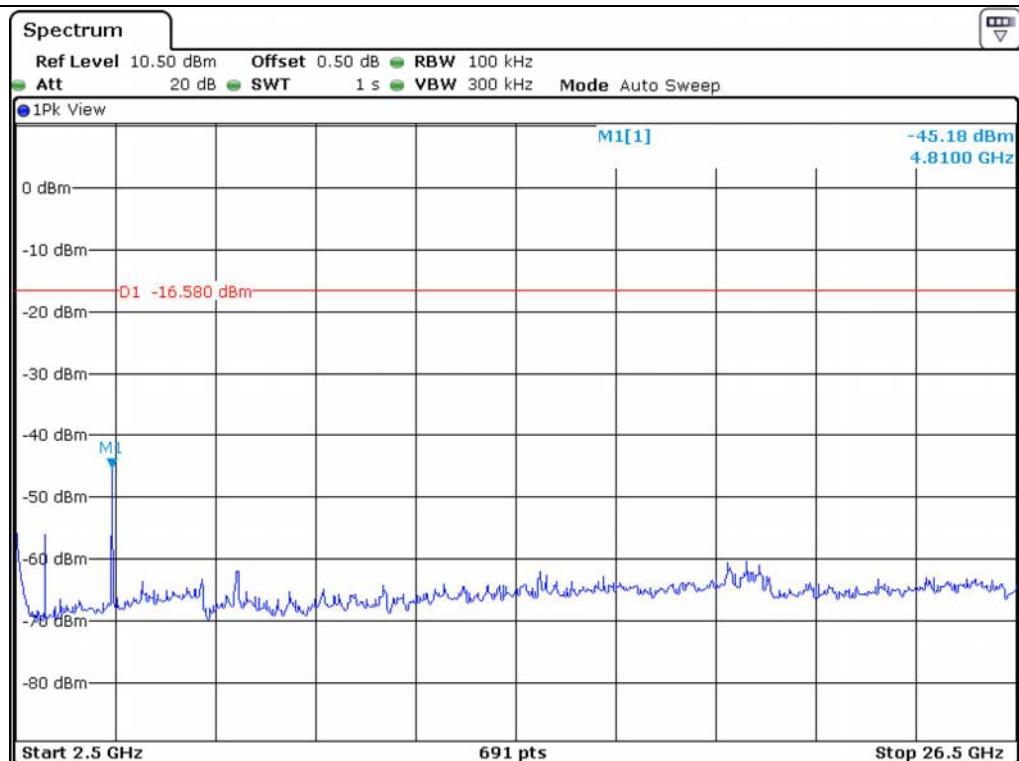
9.5.1.1 Test data for Antenna 0



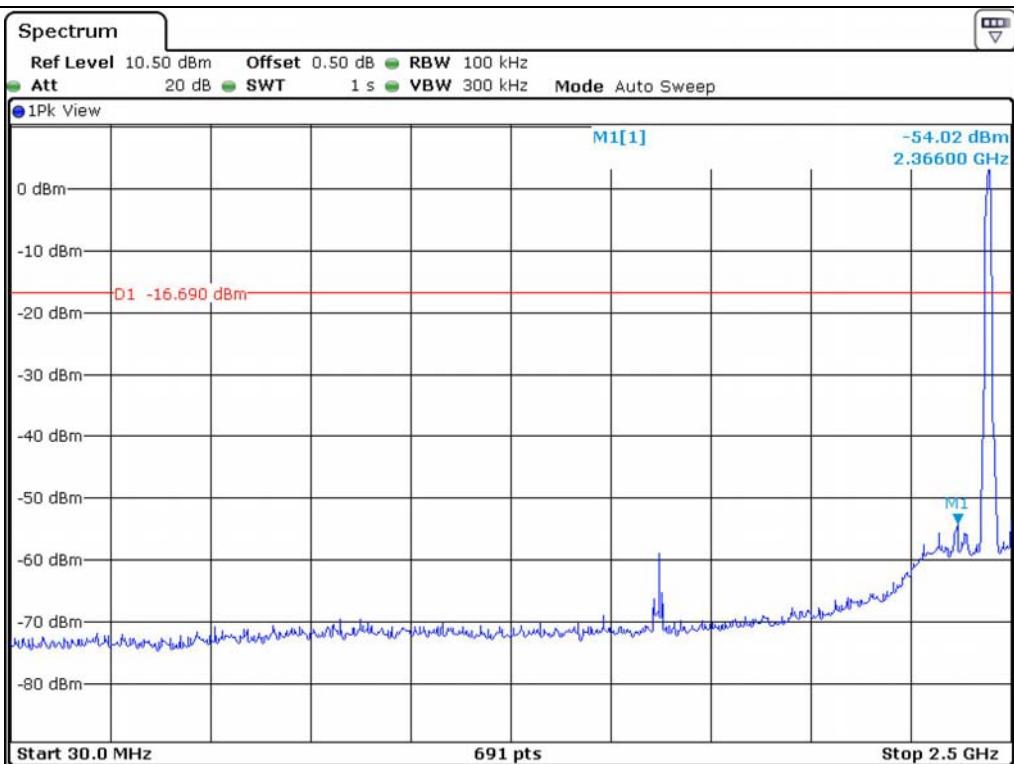




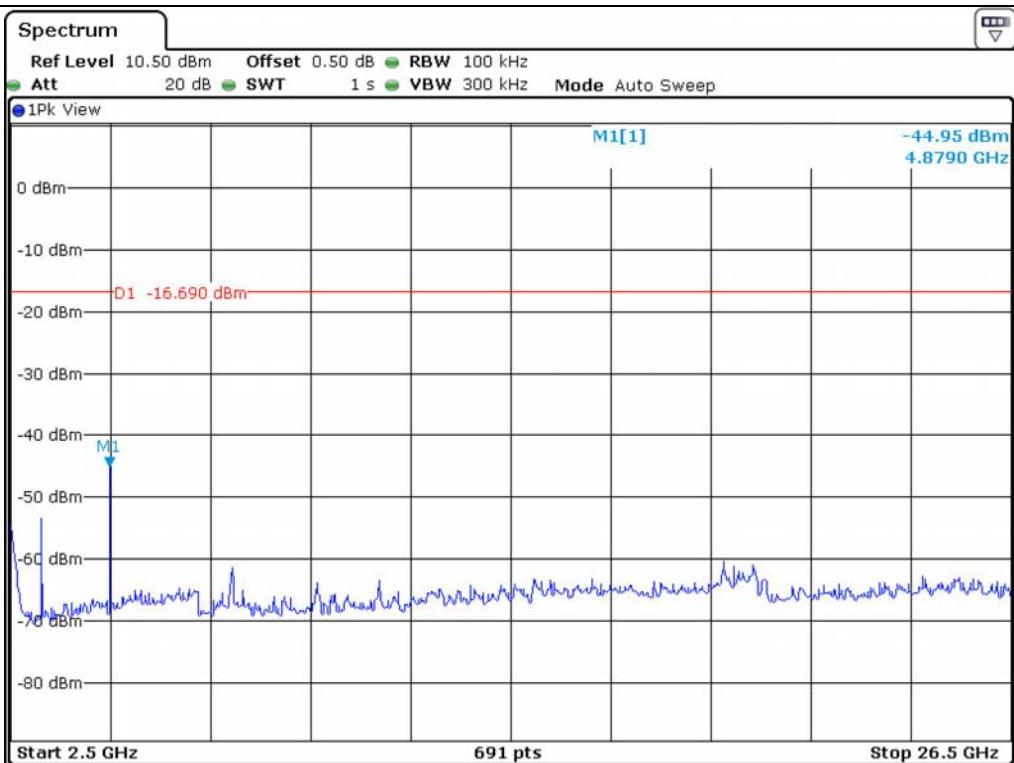
Low Channel



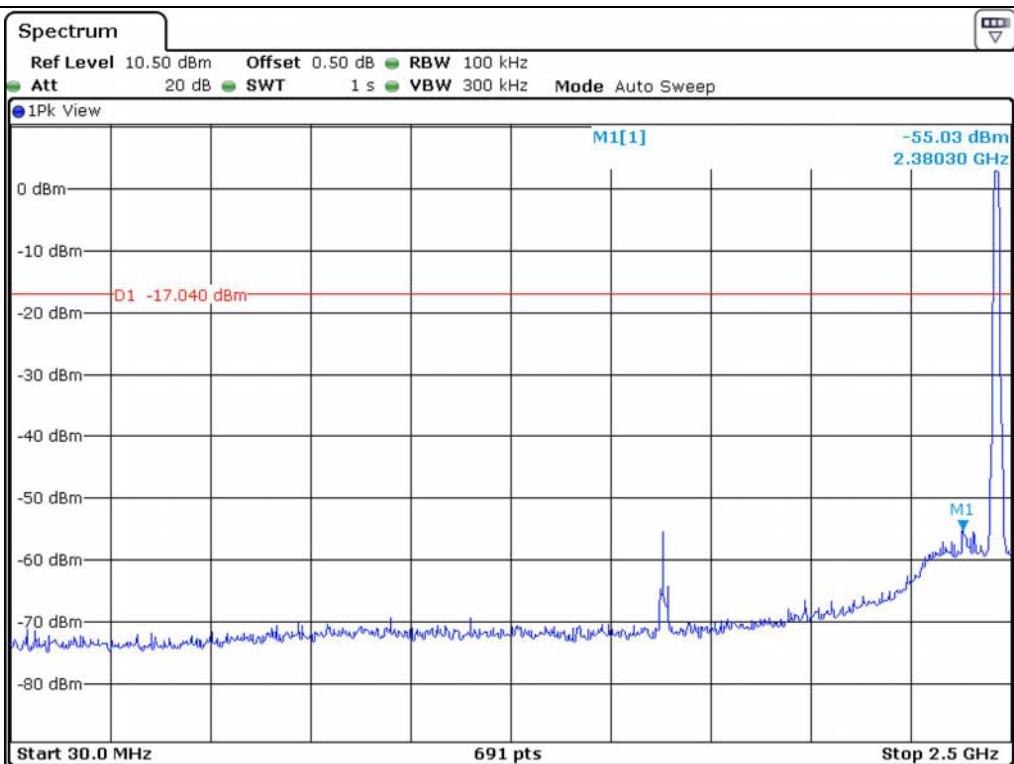
Low Channel



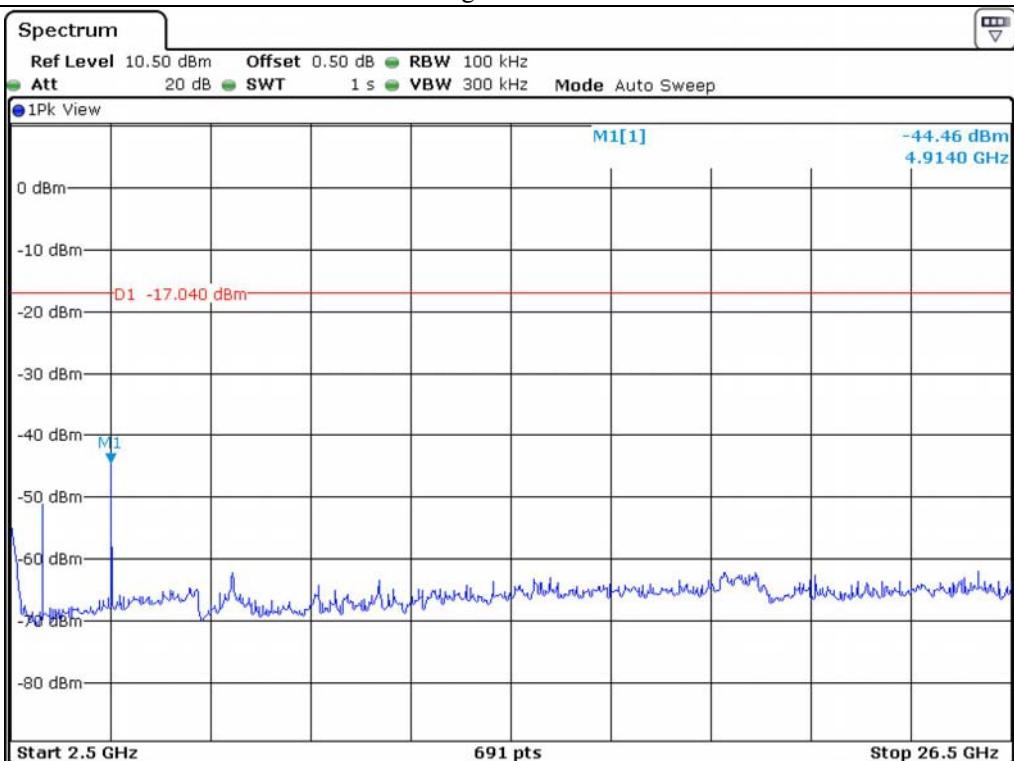
Middle Channel



Middle Channel

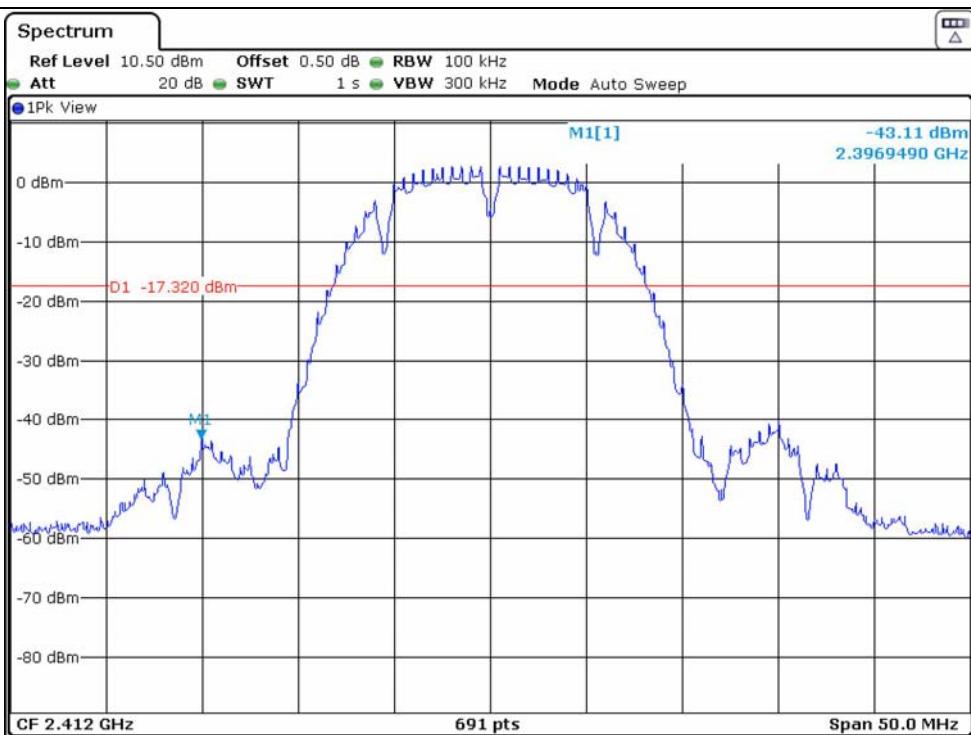


High Channel

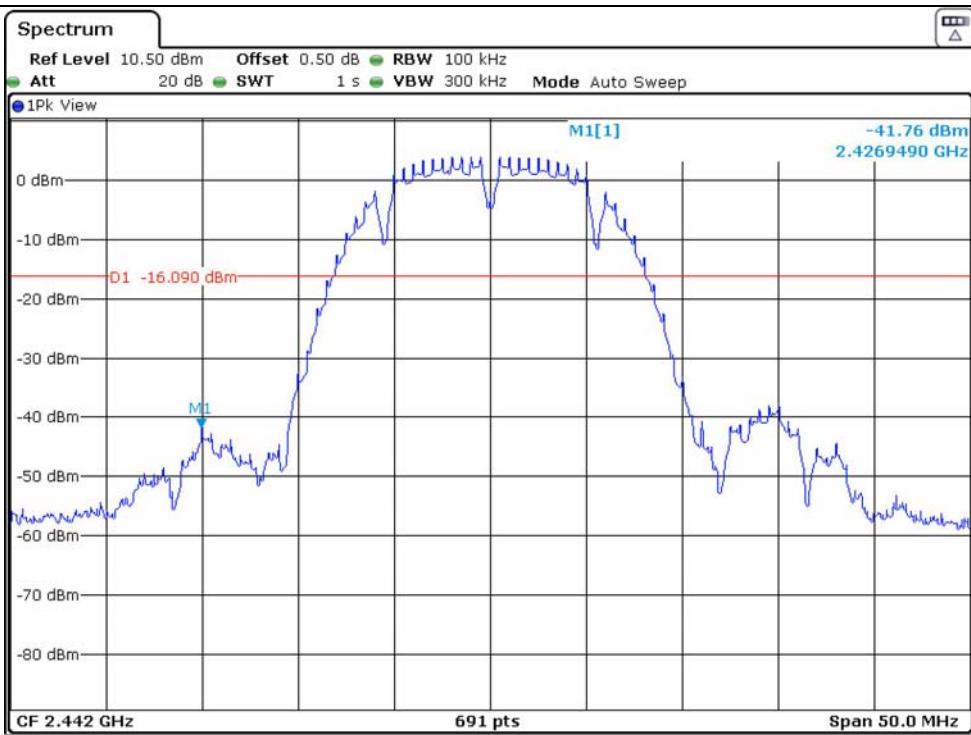


High Channel

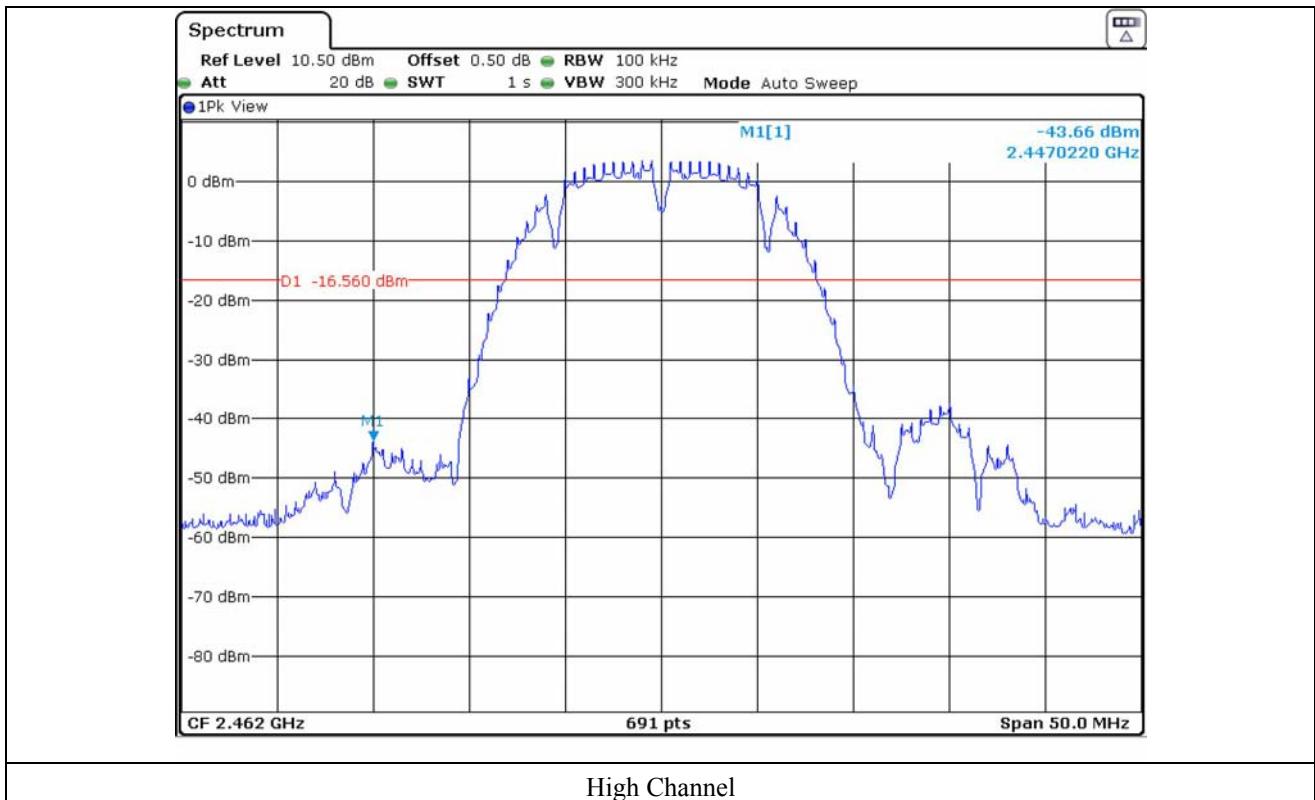
9.5.1.2 Test data for Antenna 1

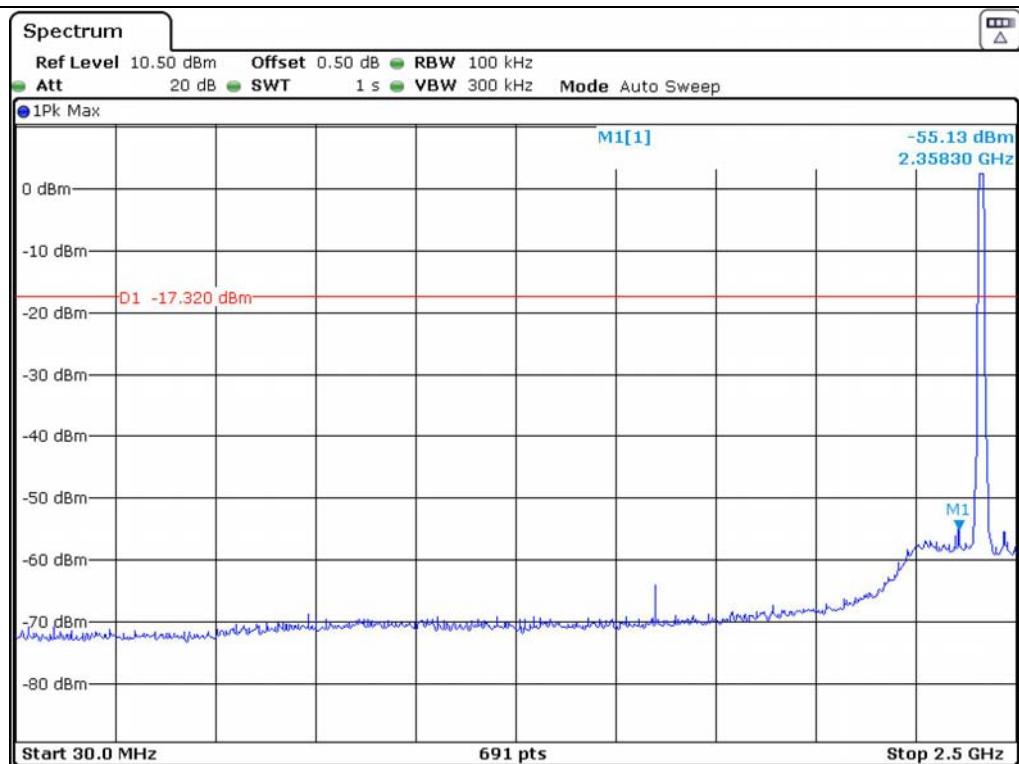


Low Channel

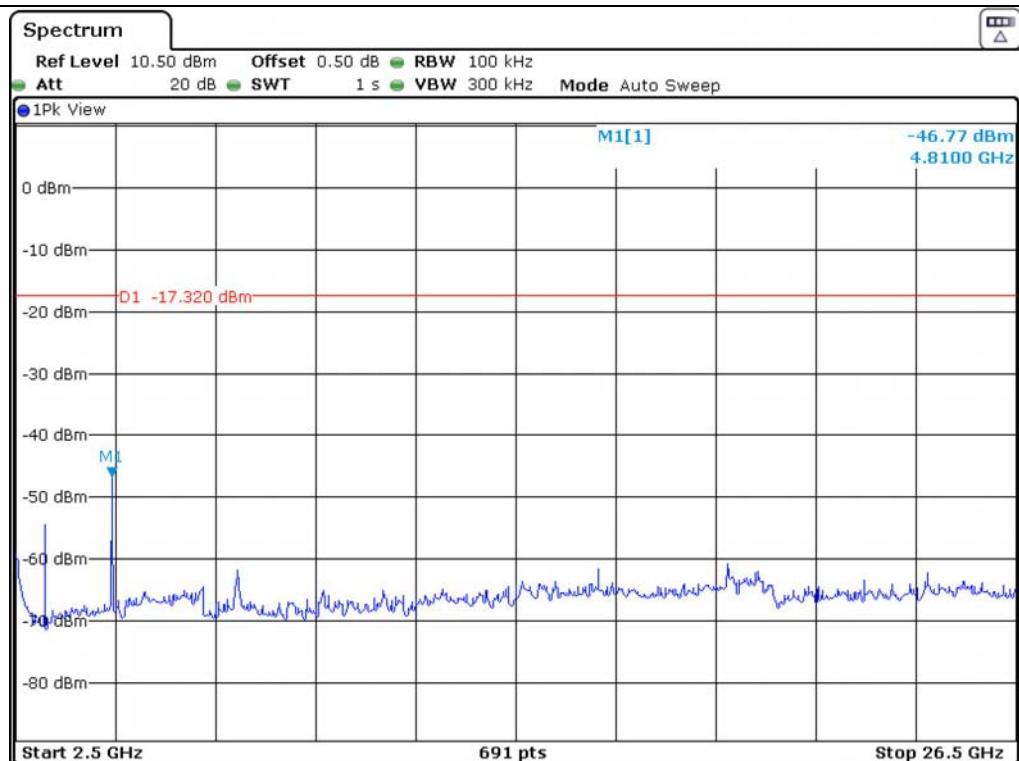


Middle Channel

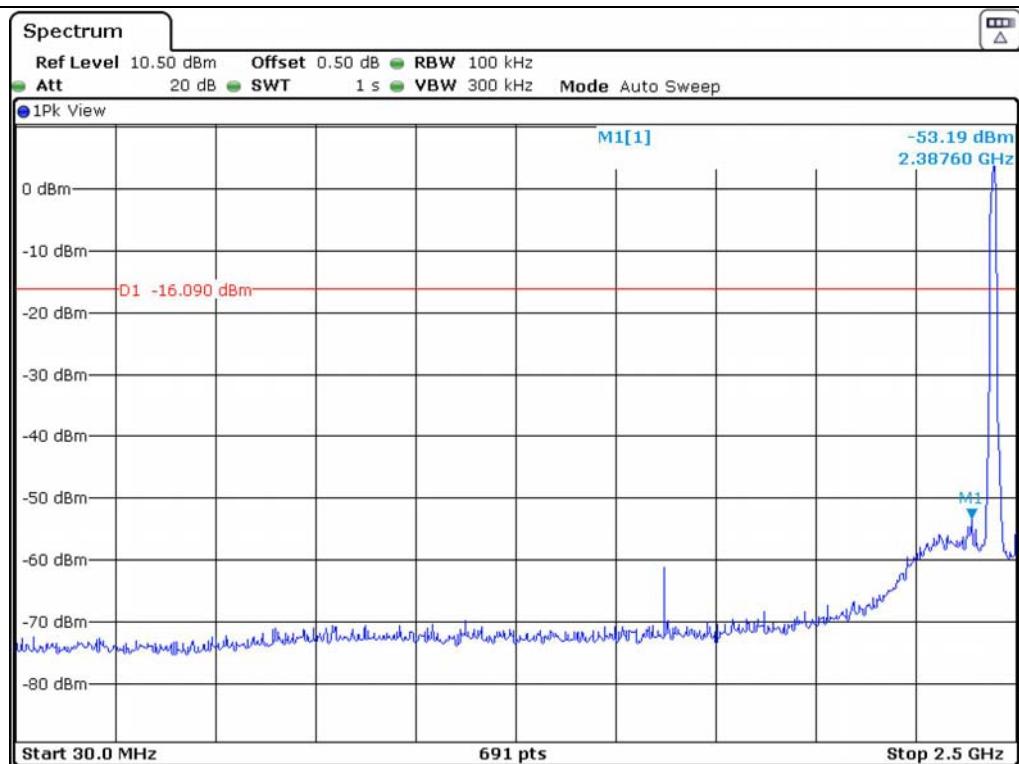




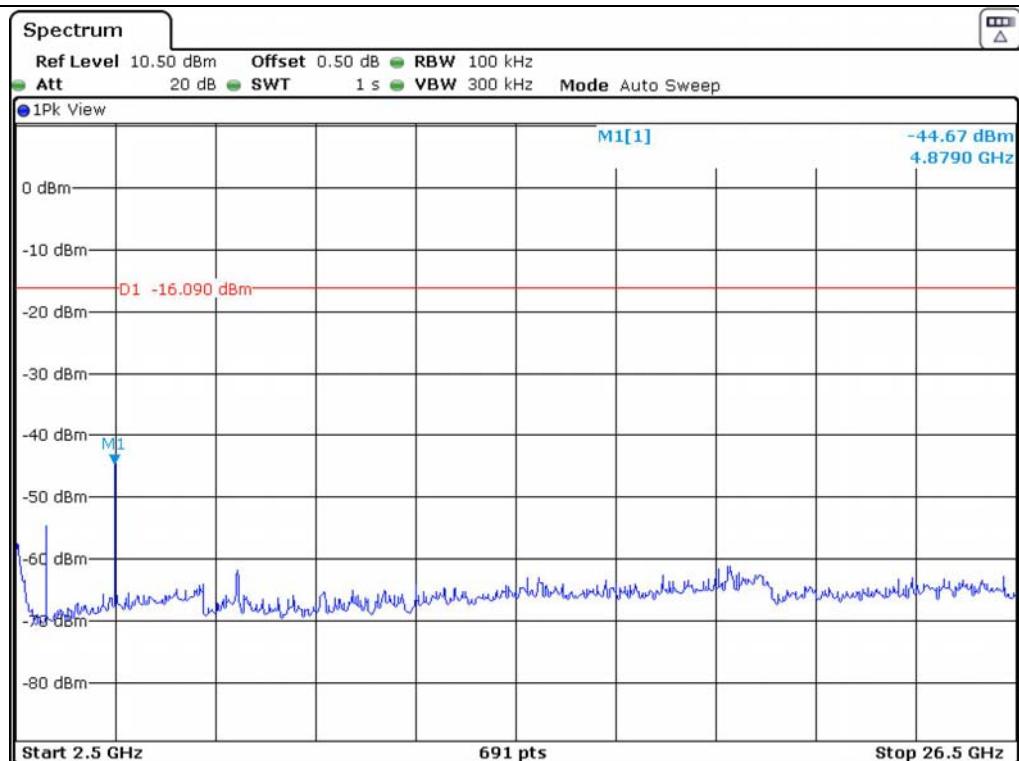
Low Channel



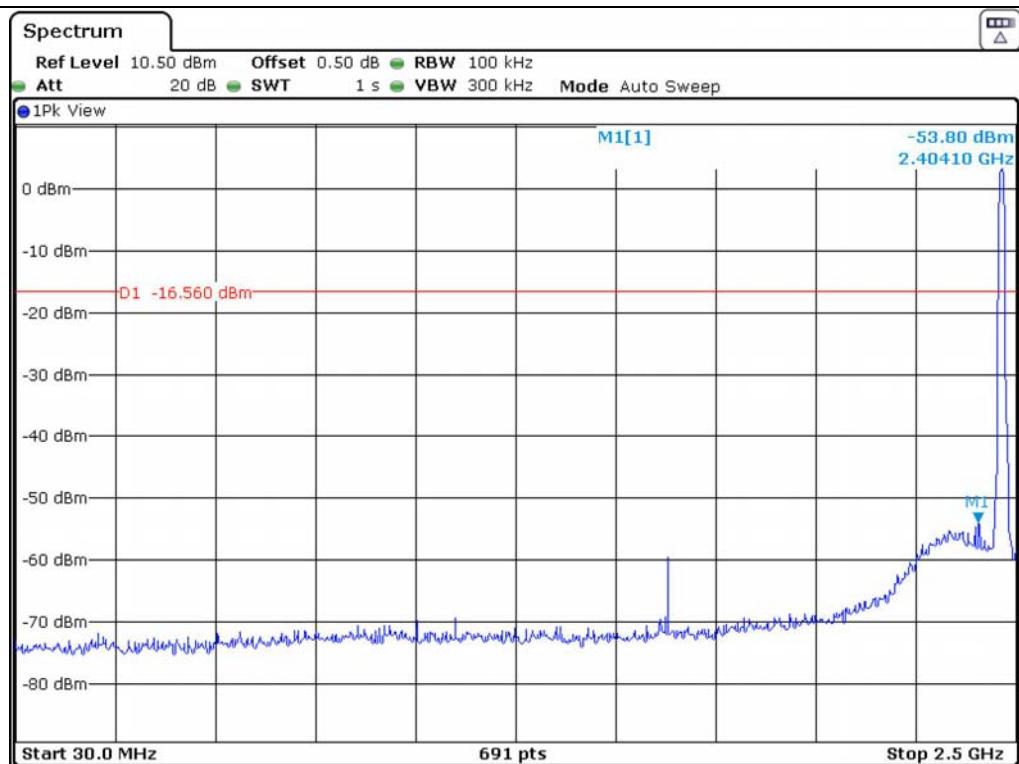
Low Channel



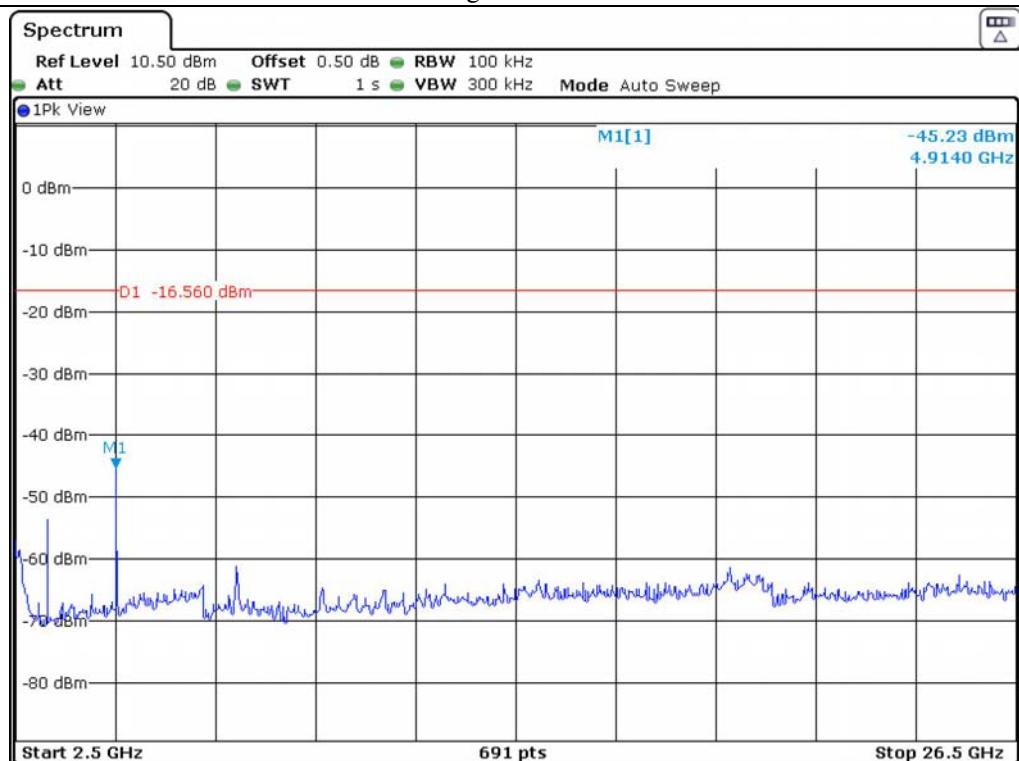
Middle Channel



Middle Channel



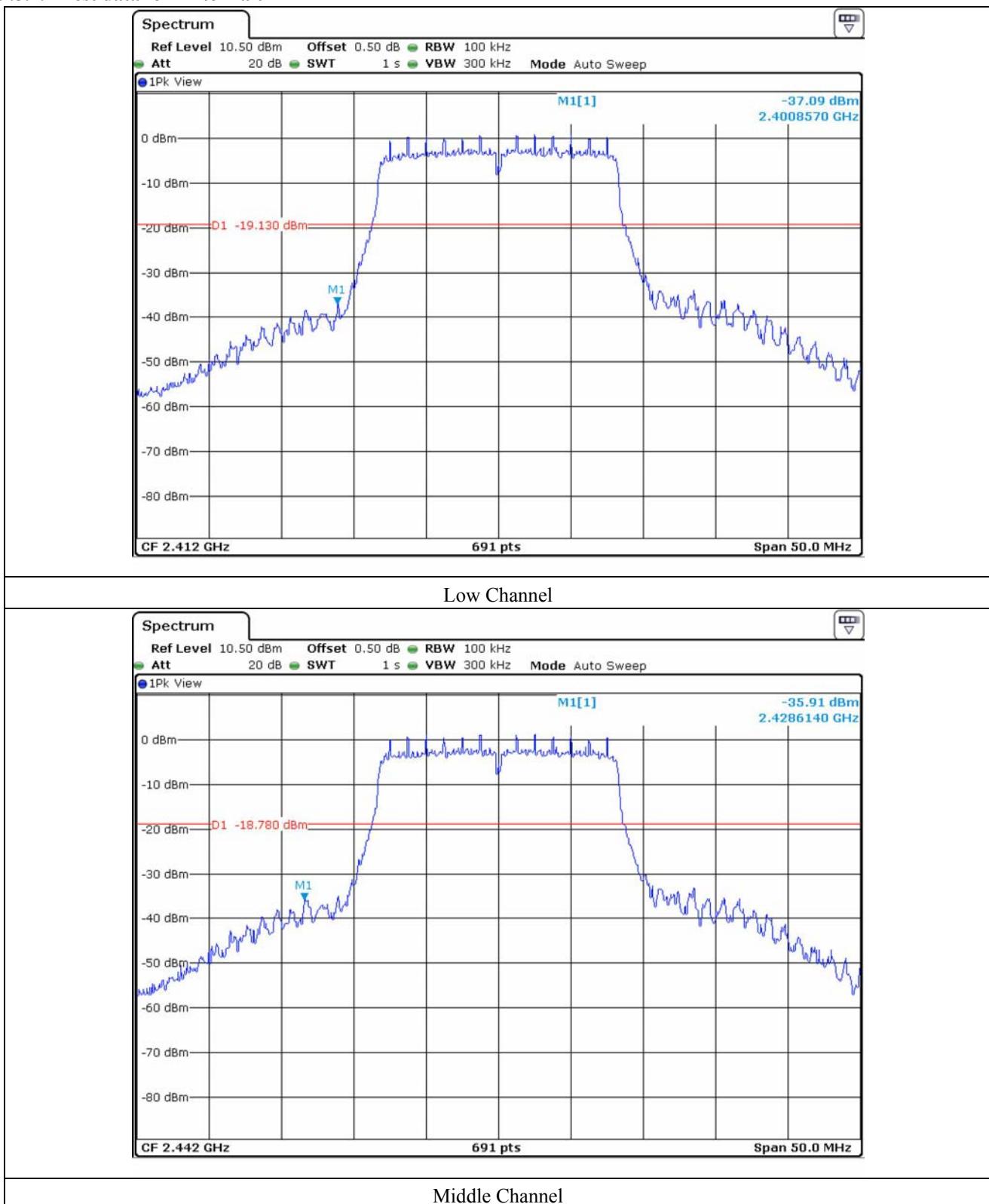
High Channel

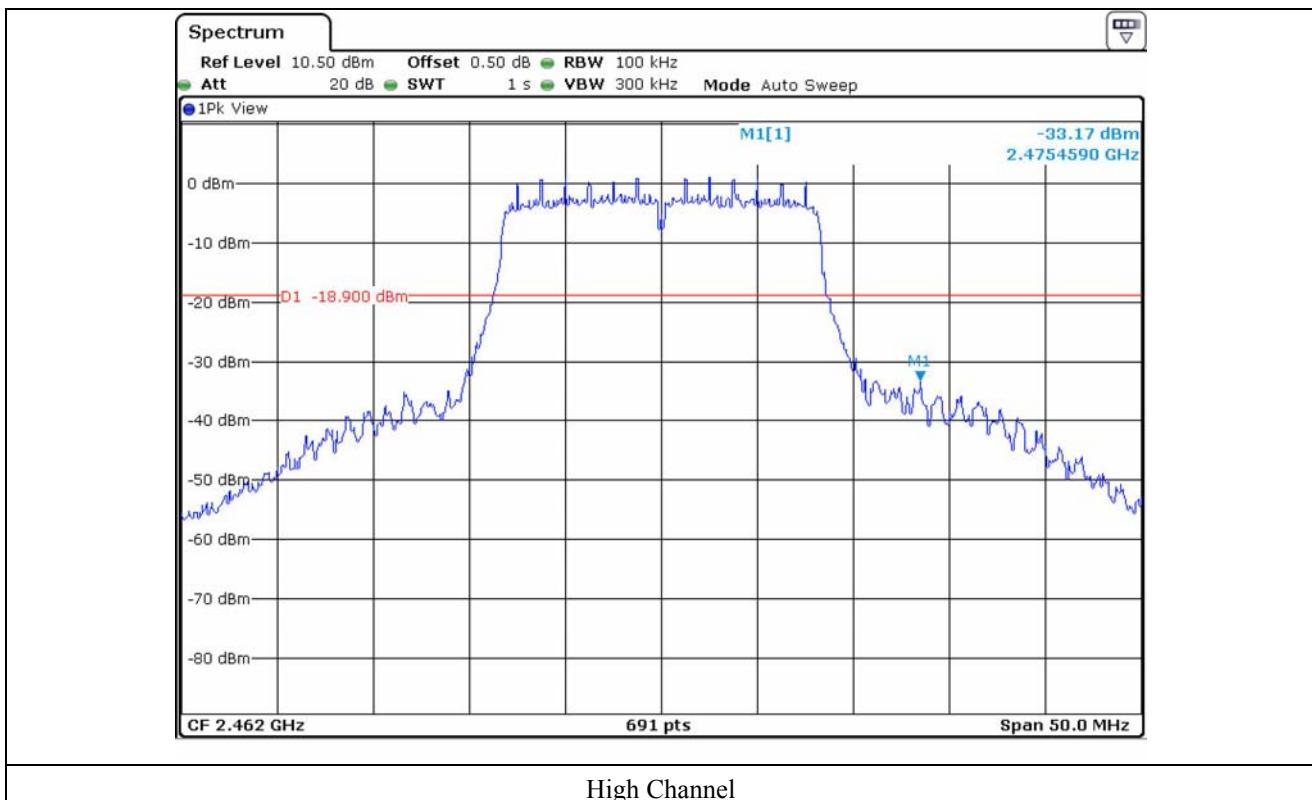


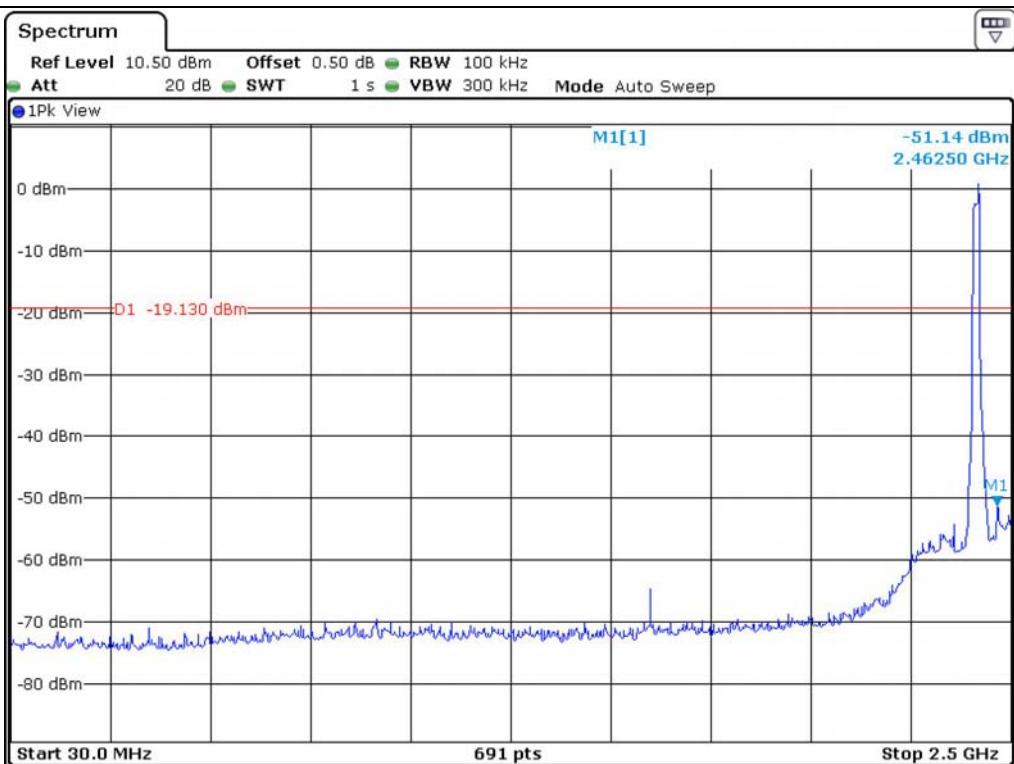
High Channel

9.5.2 Test data for 802.11g WLAN Mode

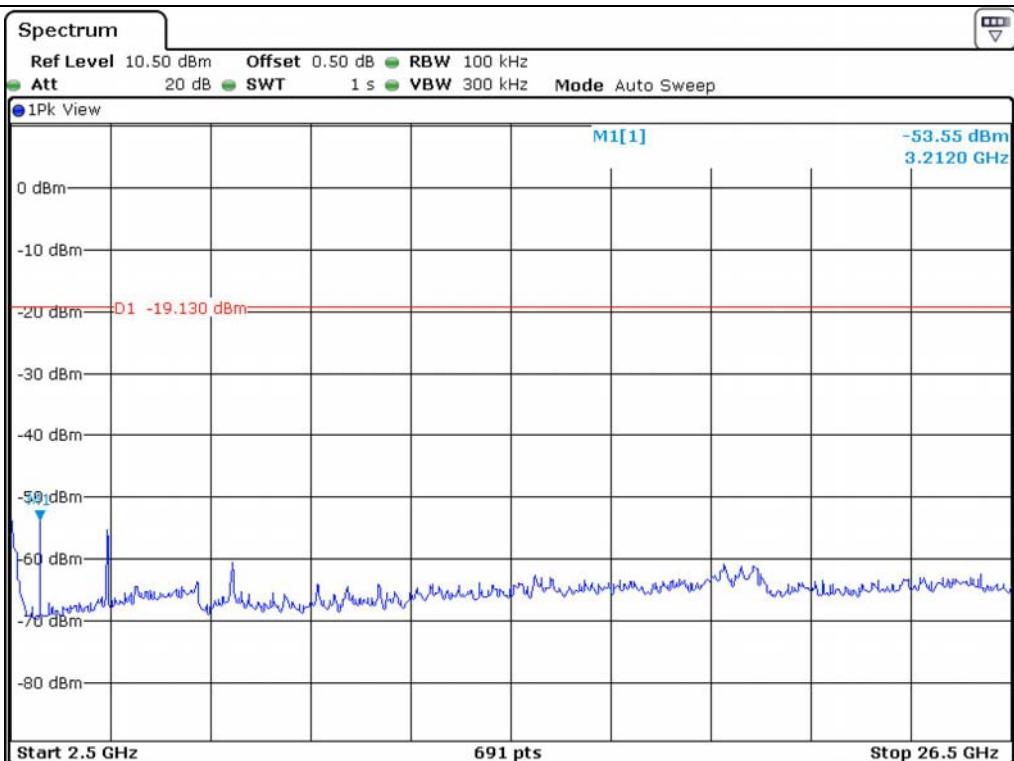
9.5.2.1 Test data for Antenna 0



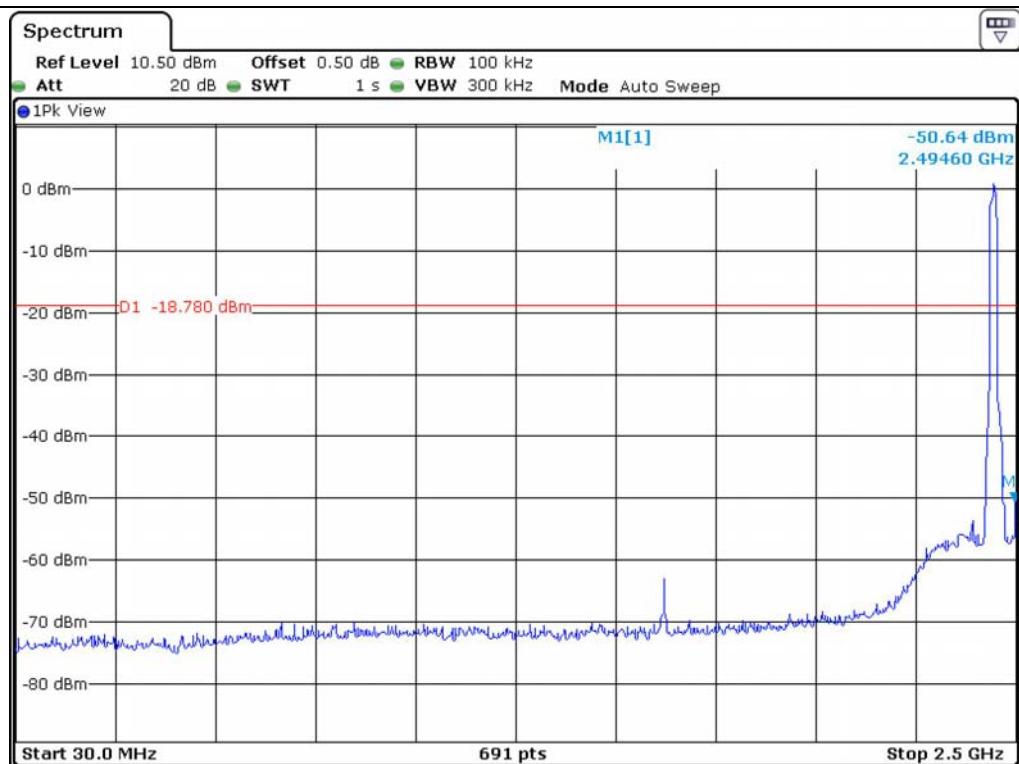




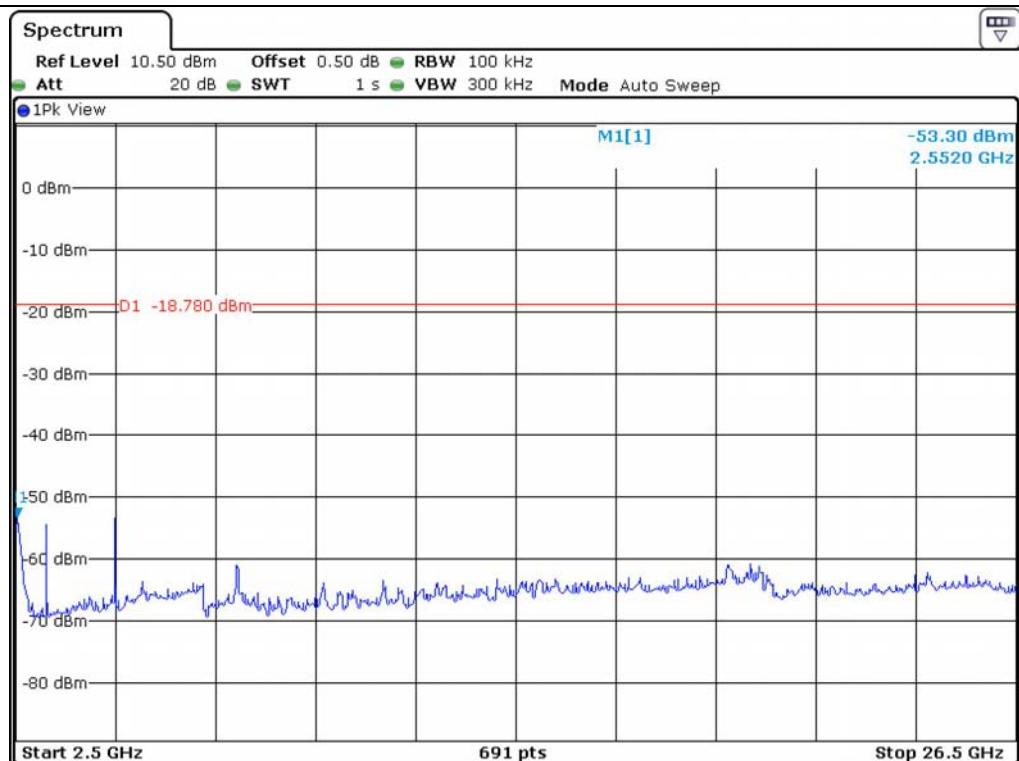
Low Channel



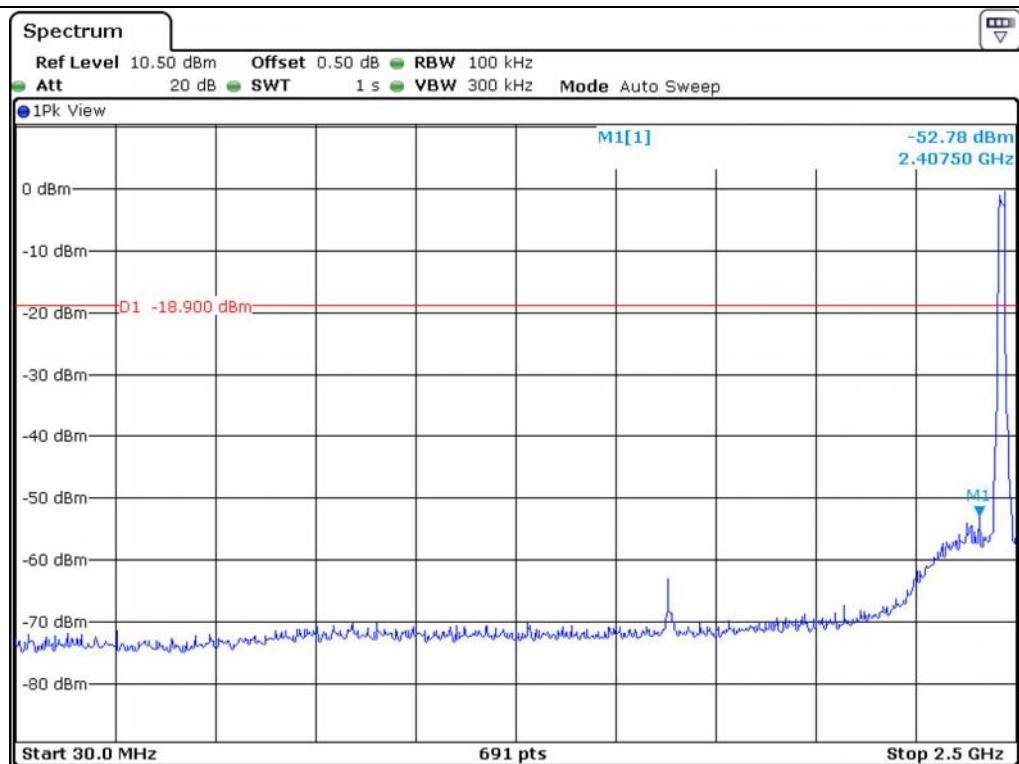
Low Channel



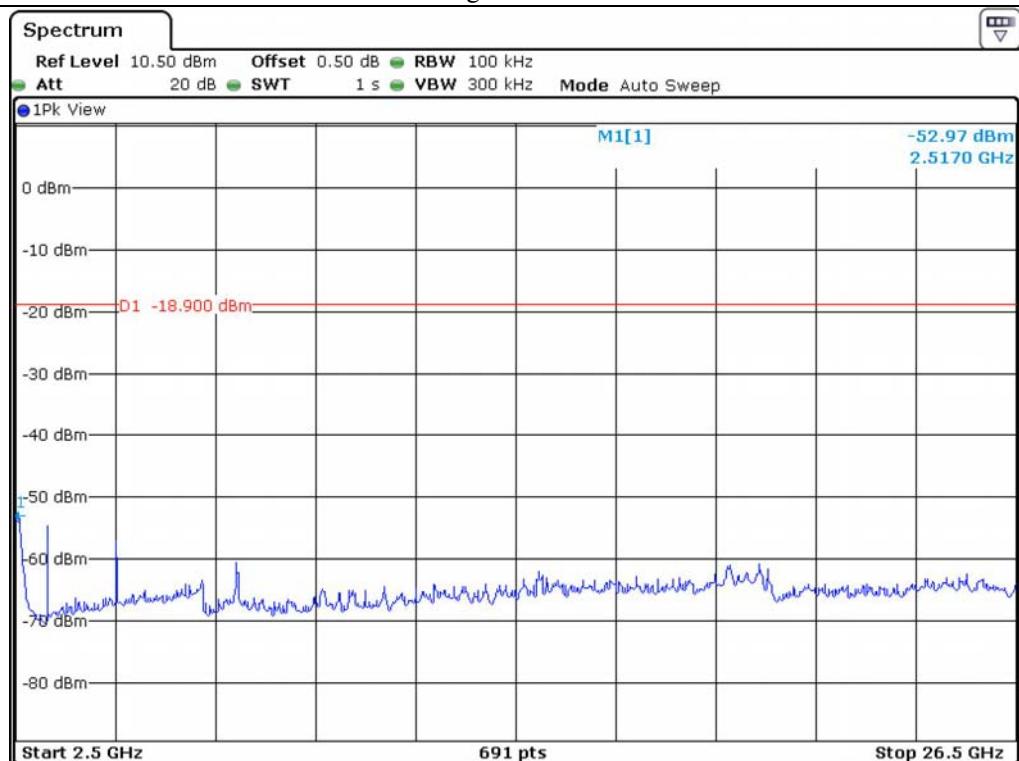
Middle Channel



Middle Channel

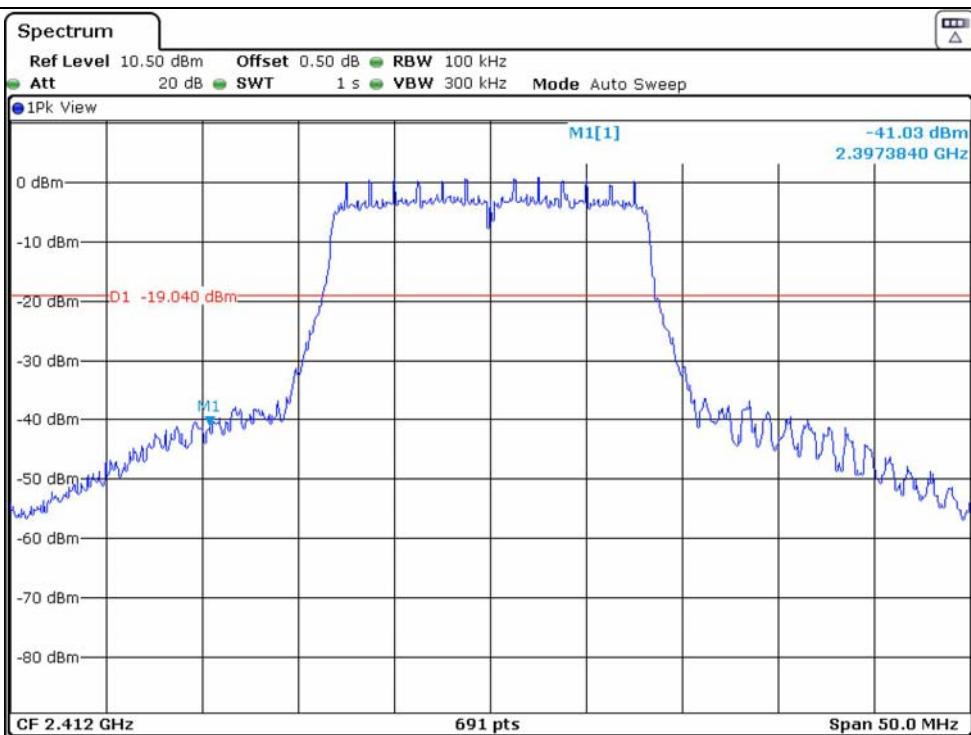


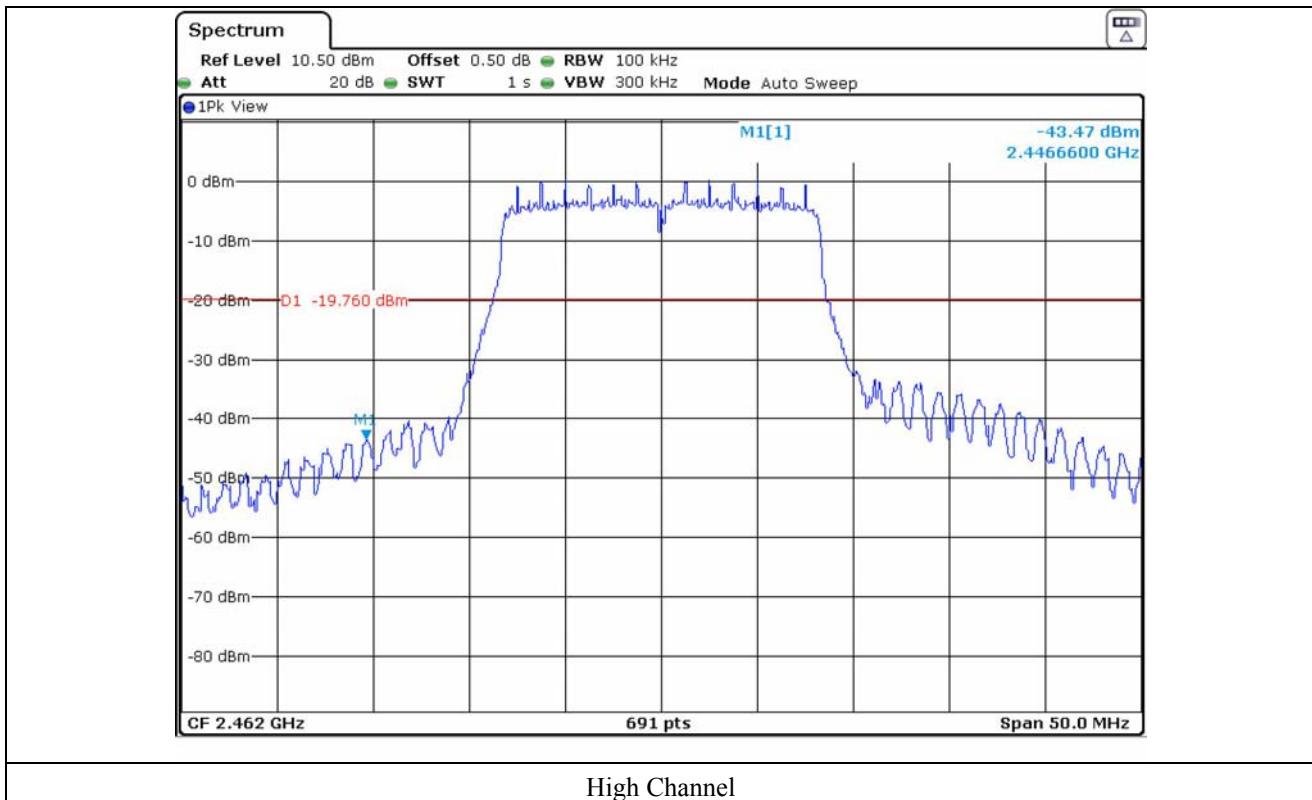
High Channel

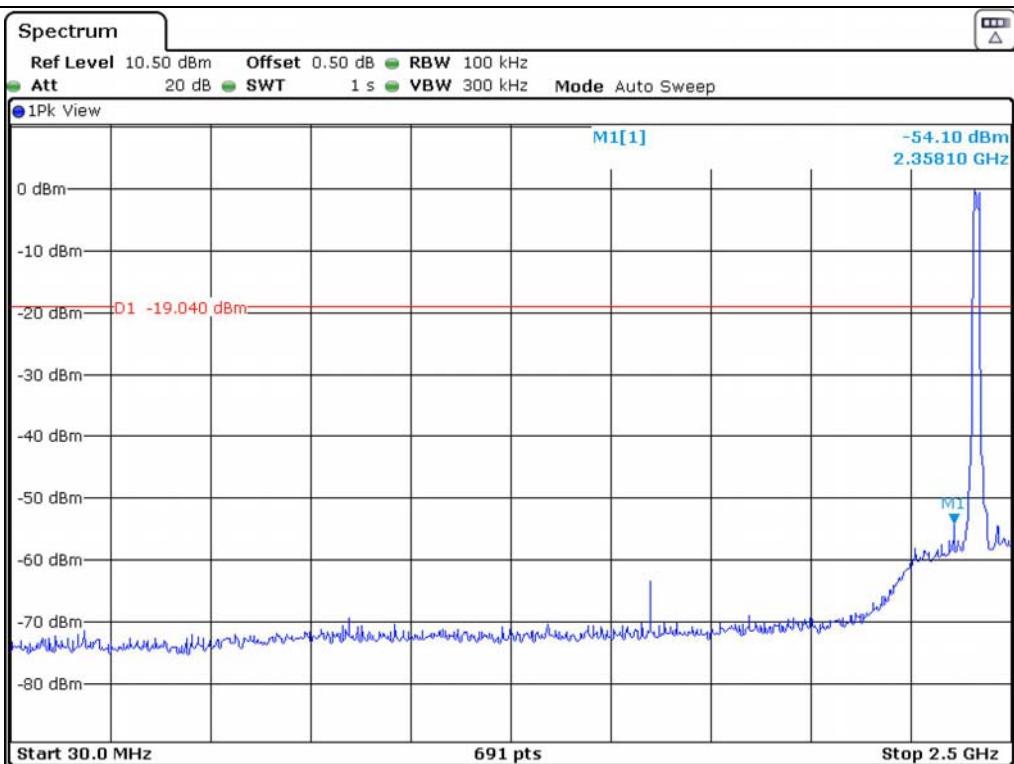


High Channel

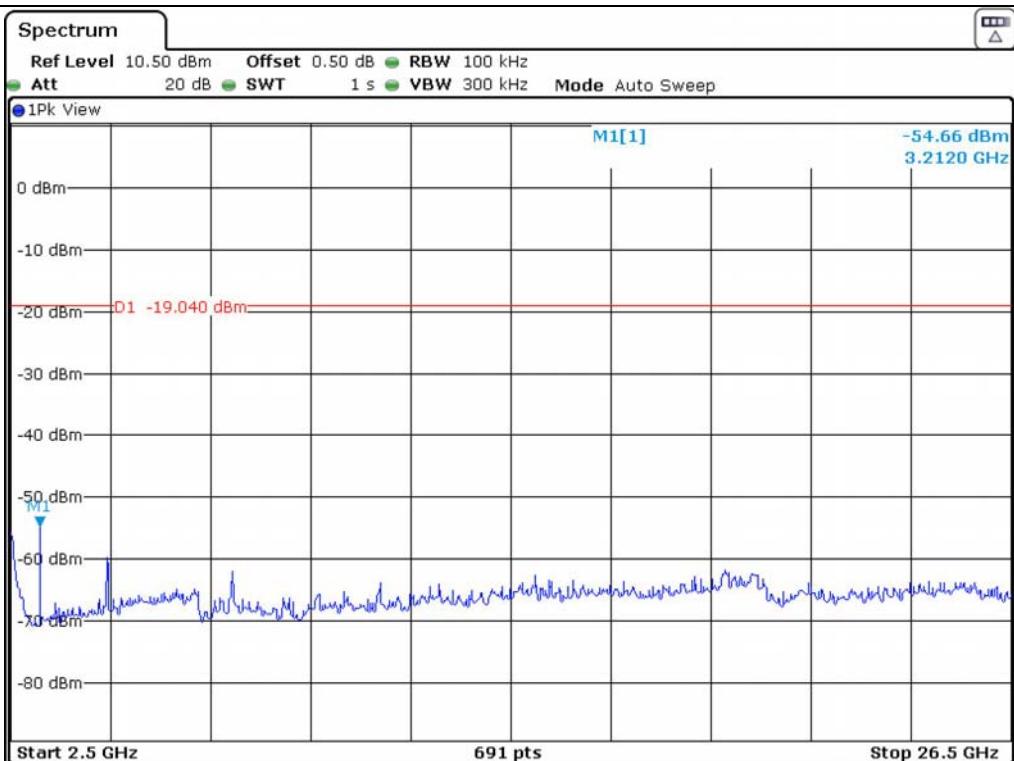
9.5.2.2 Test data for Antenna 1



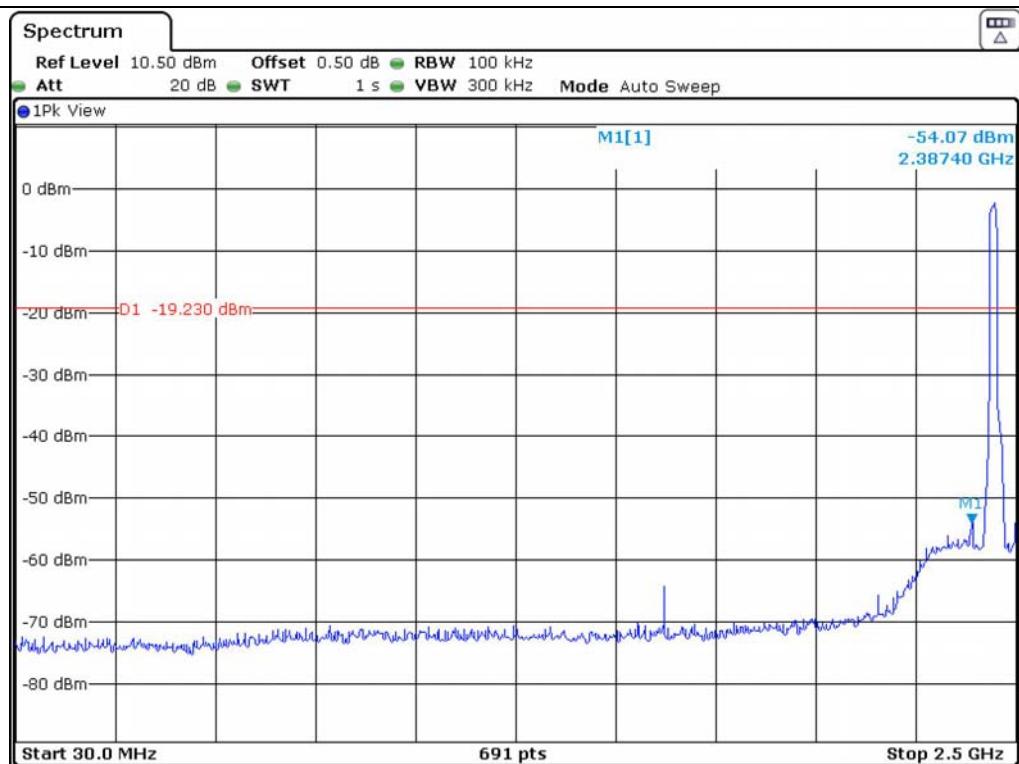




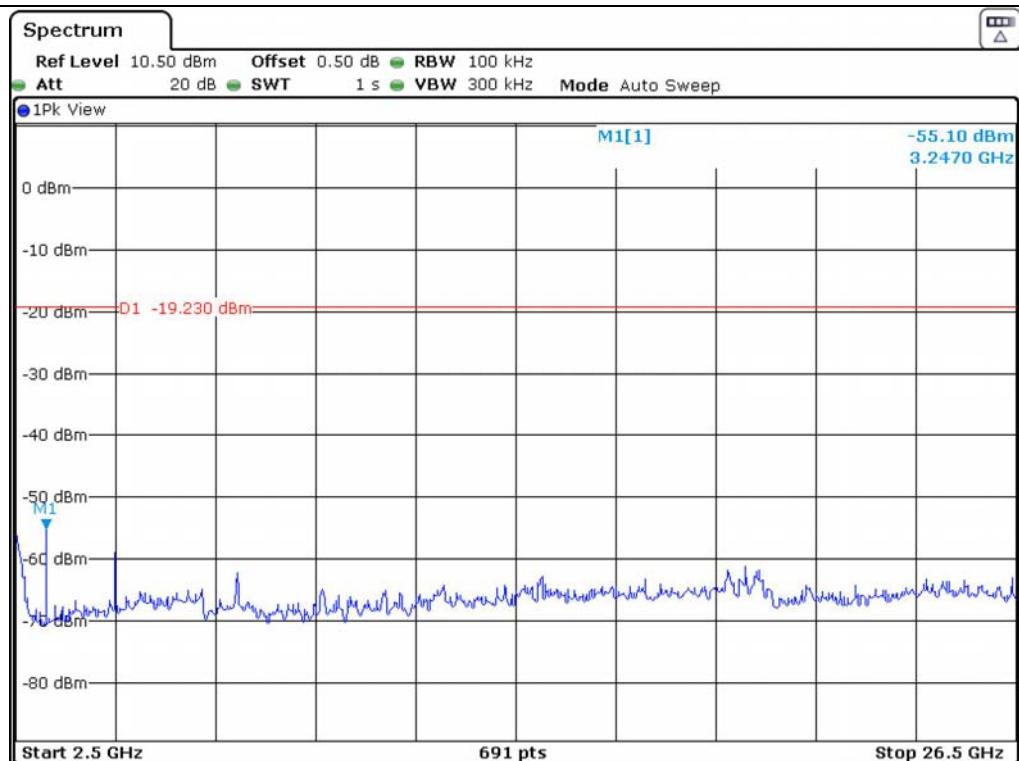
Low Channel



Low Channel



Middle Channel



Middle Channel