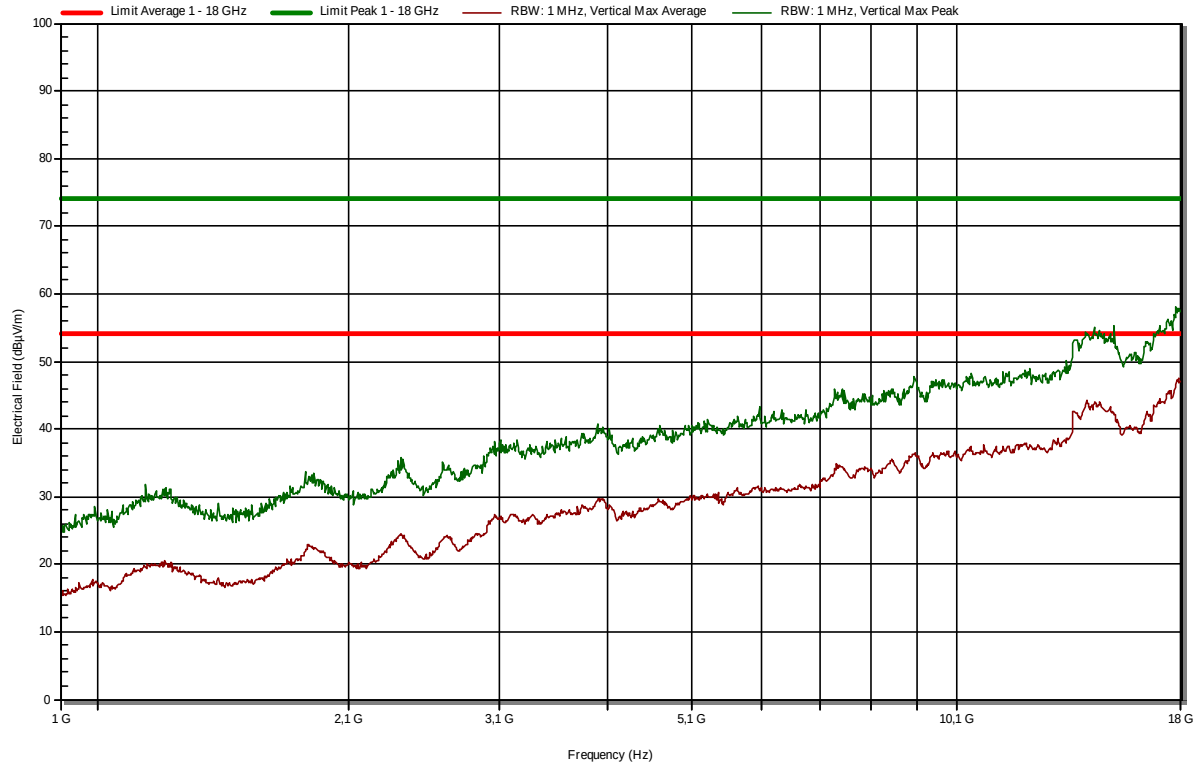


802.11n

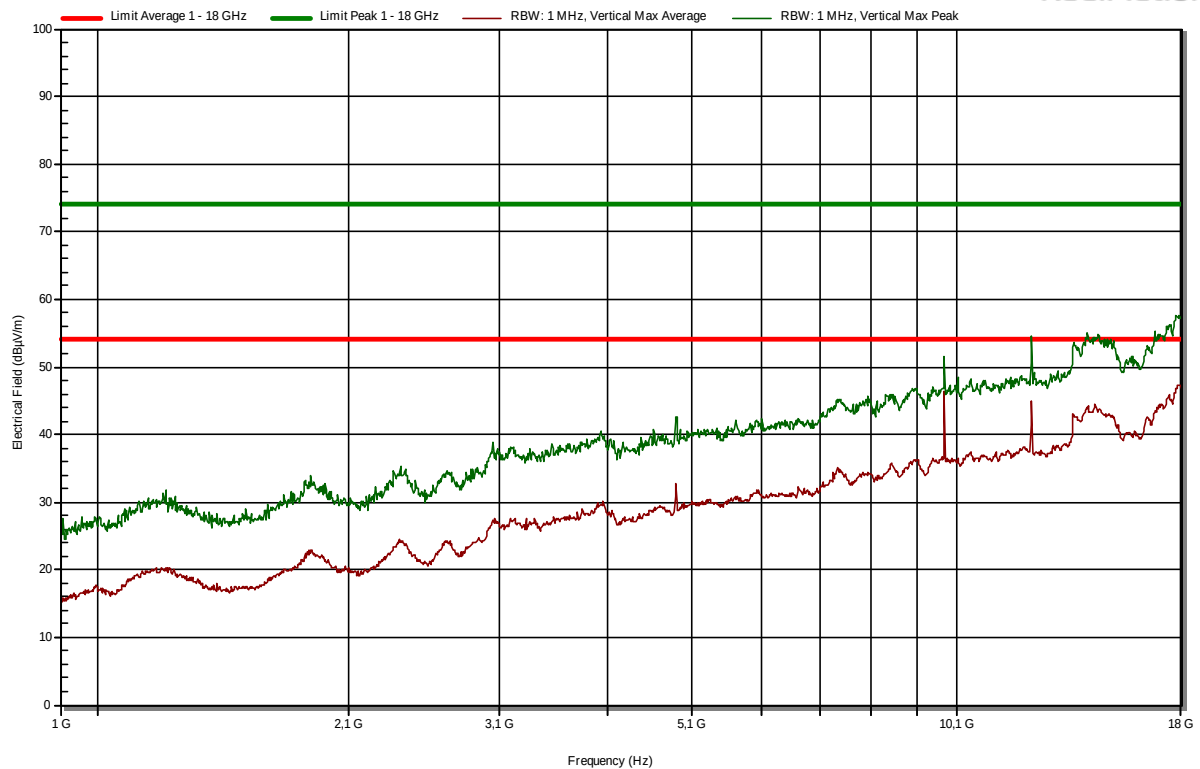
Vertical polarization
Low

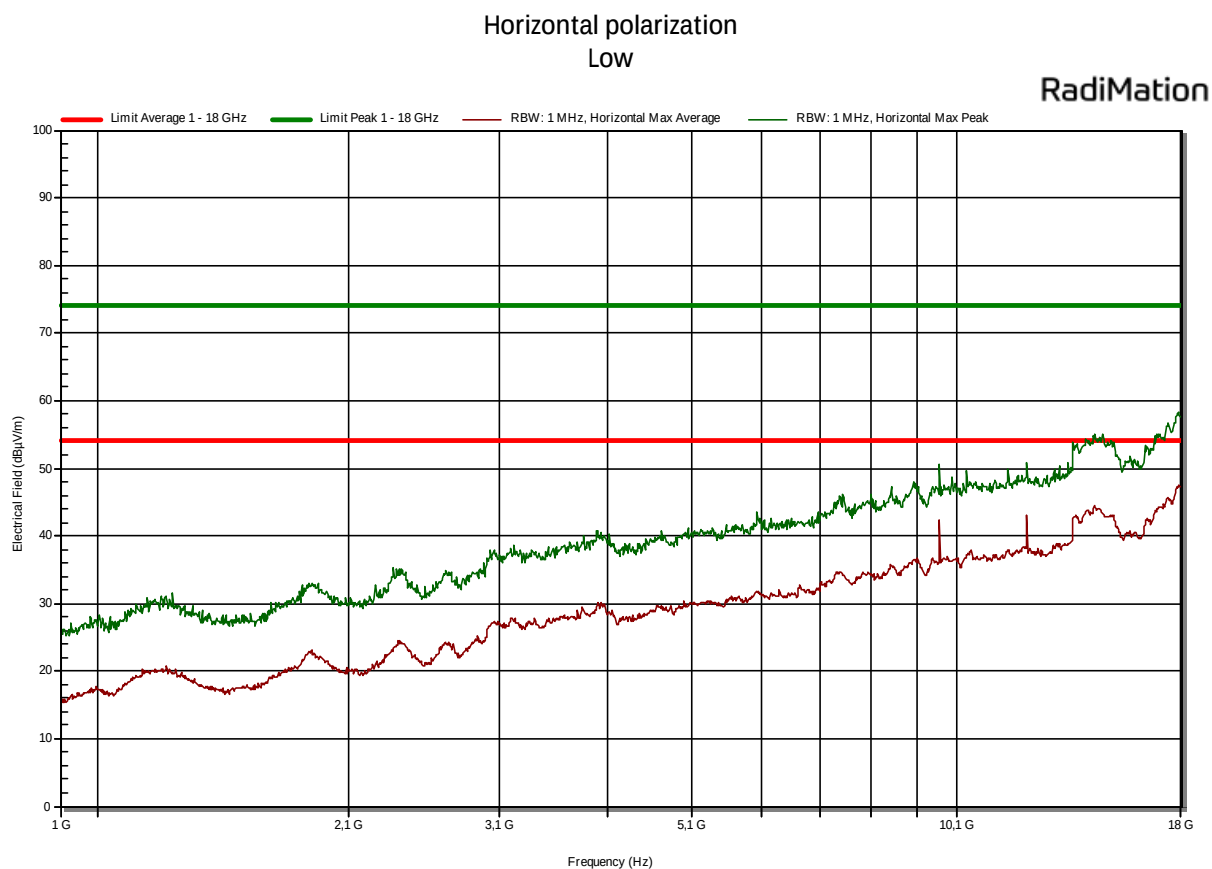
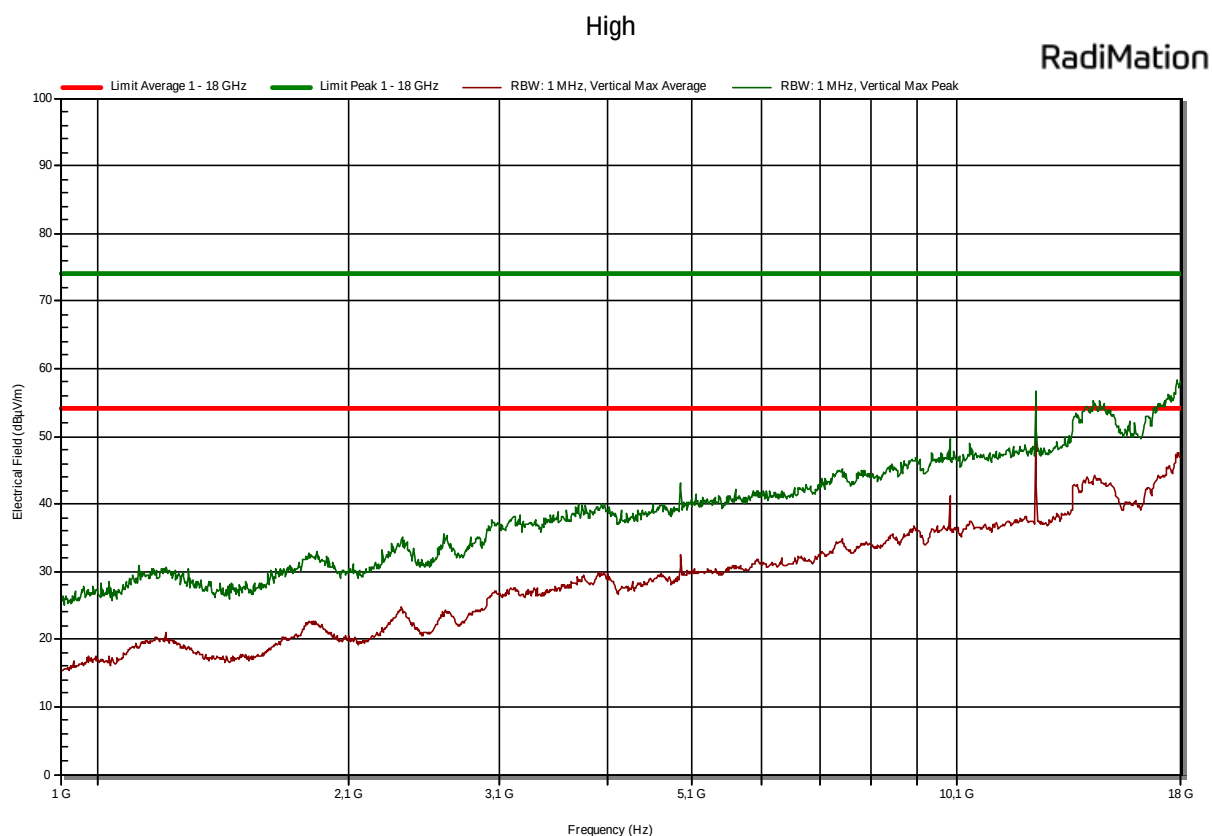
RadiMation



Mid

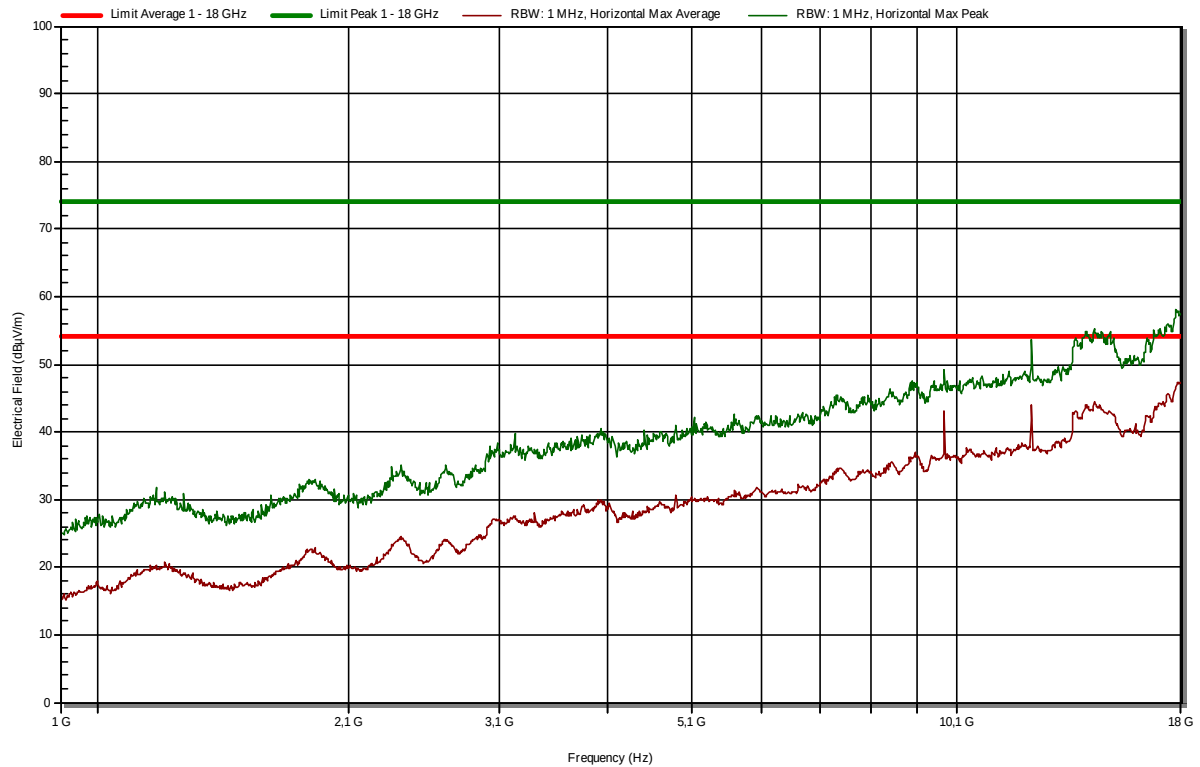
RadiMation





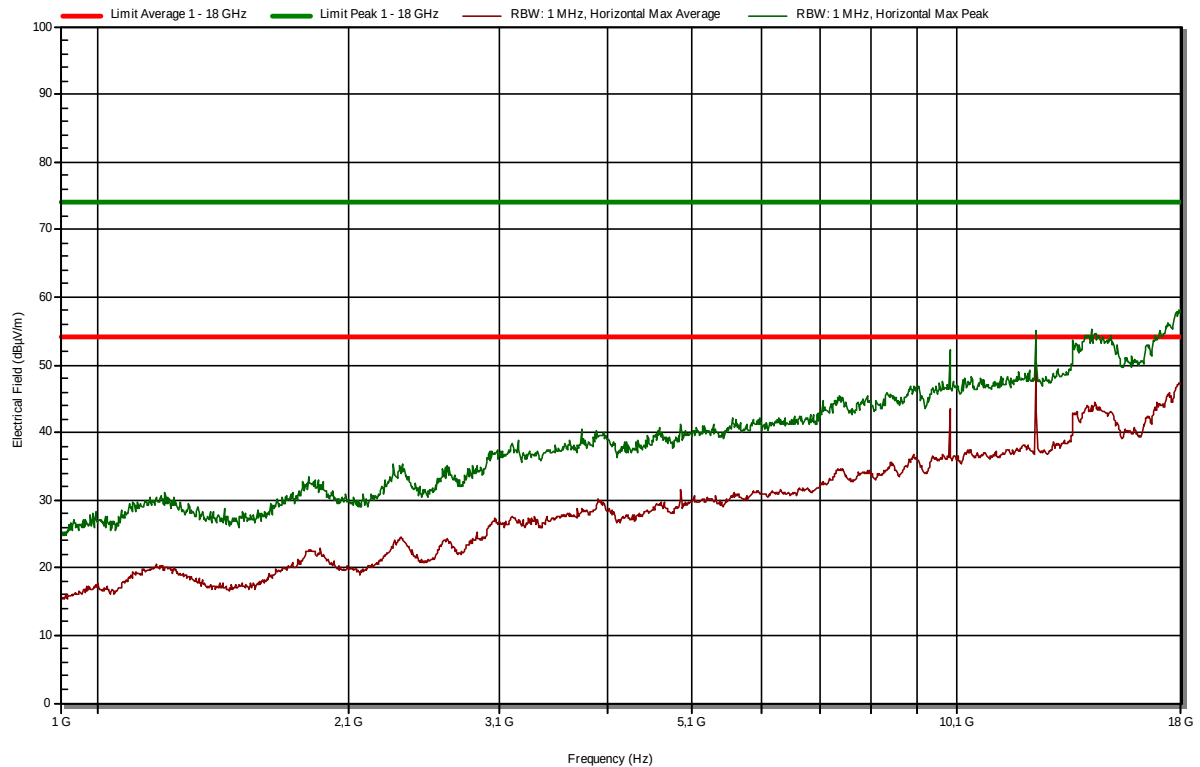
Mid

RadiMation



High

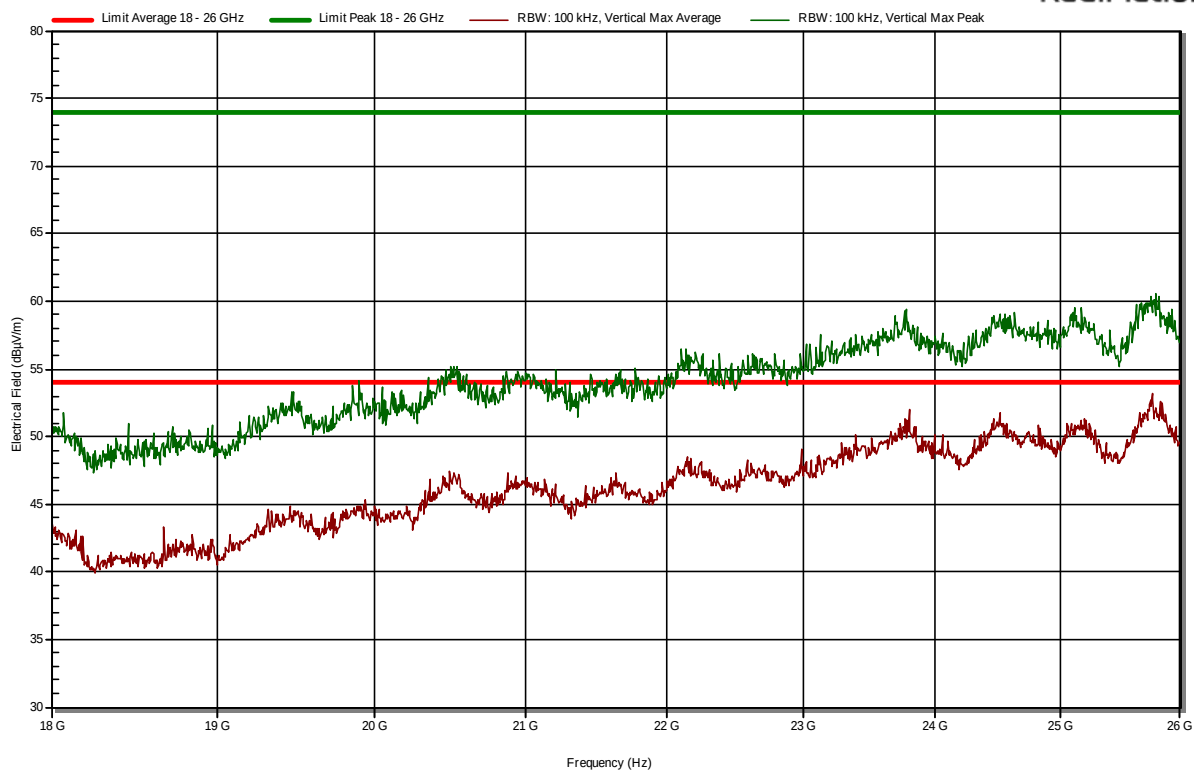
RadiMation



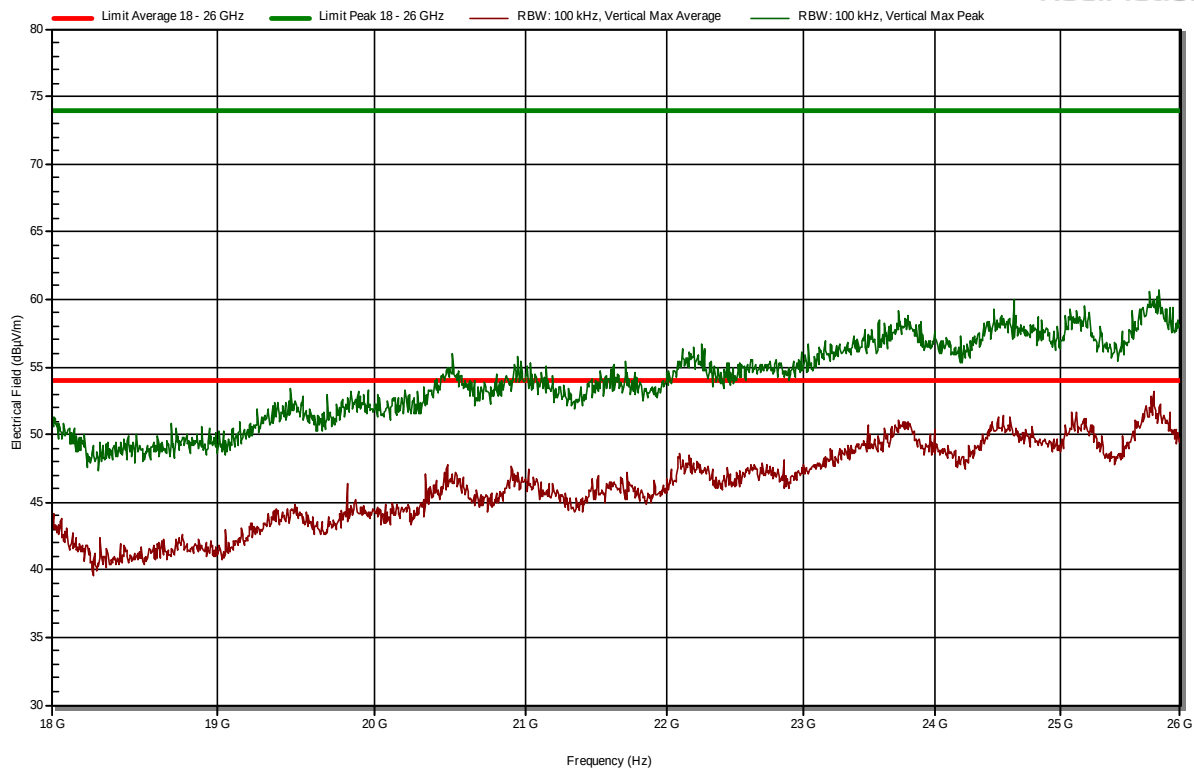
18 – 26 GHz
802.11b

Vertical polarization
Low

RadiMation

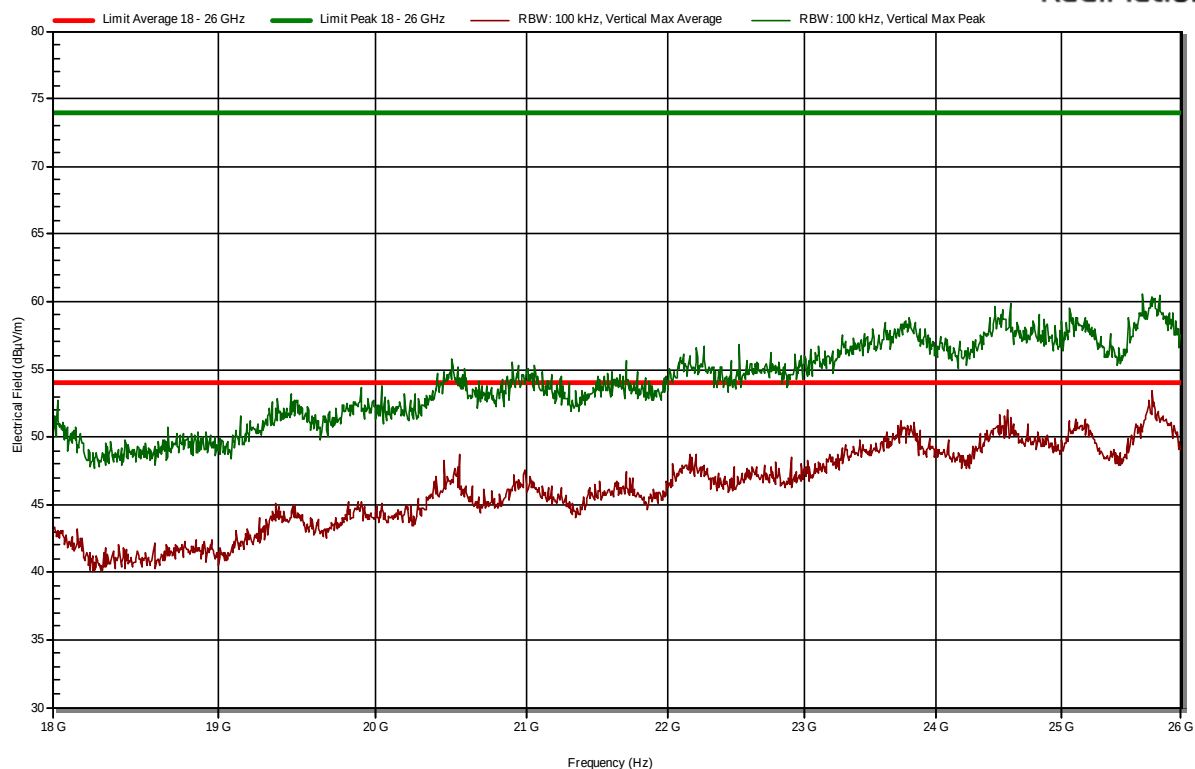


RadiMation



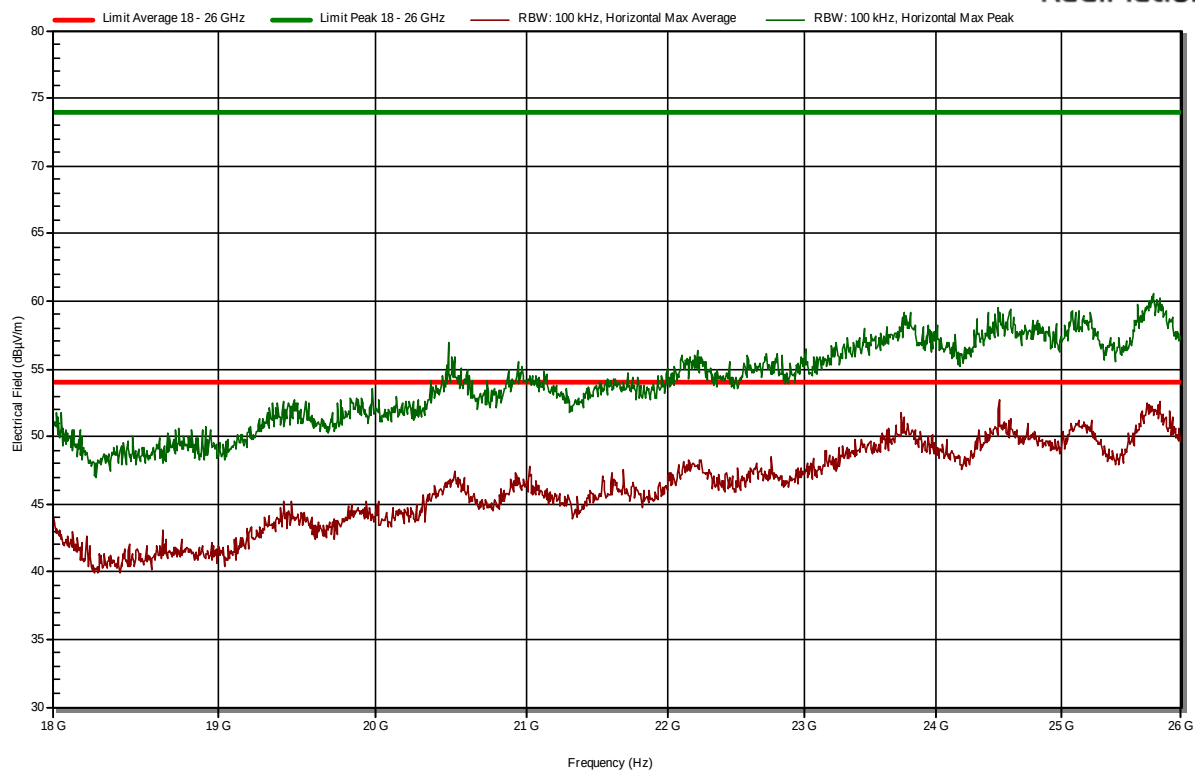
High

RadiMation



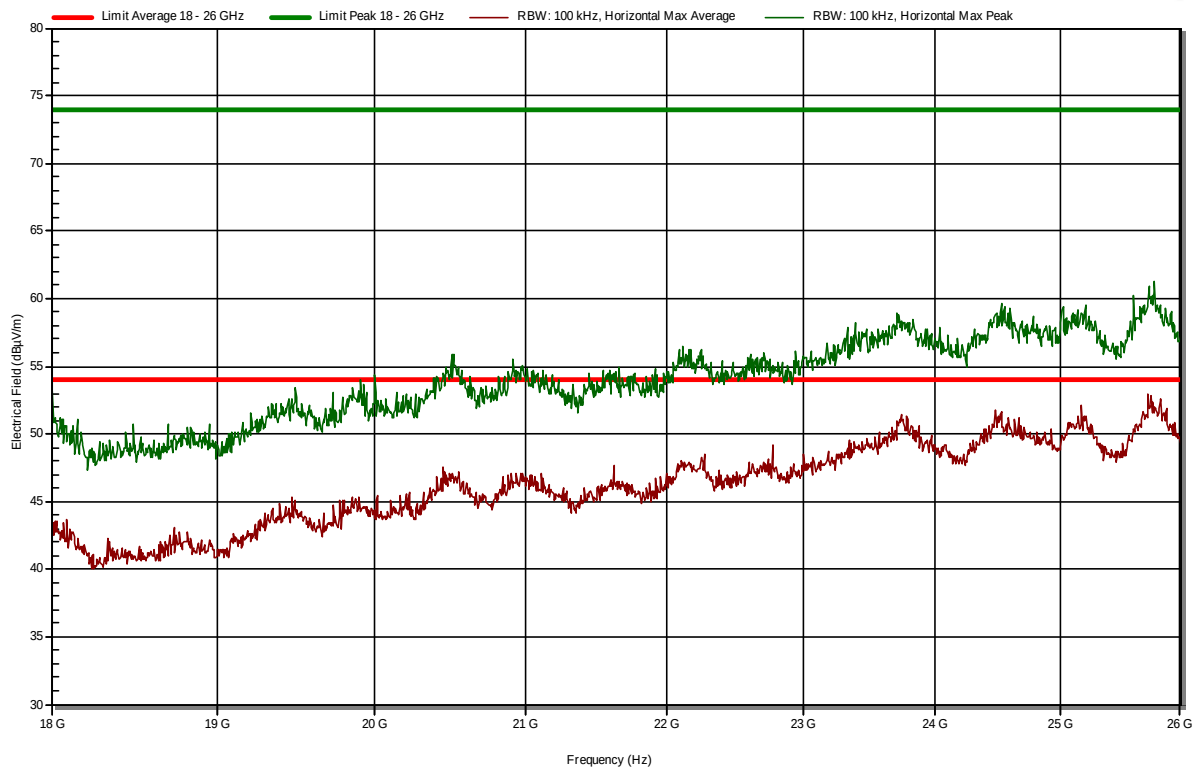
Horizontal polarization
Low

RadiMation



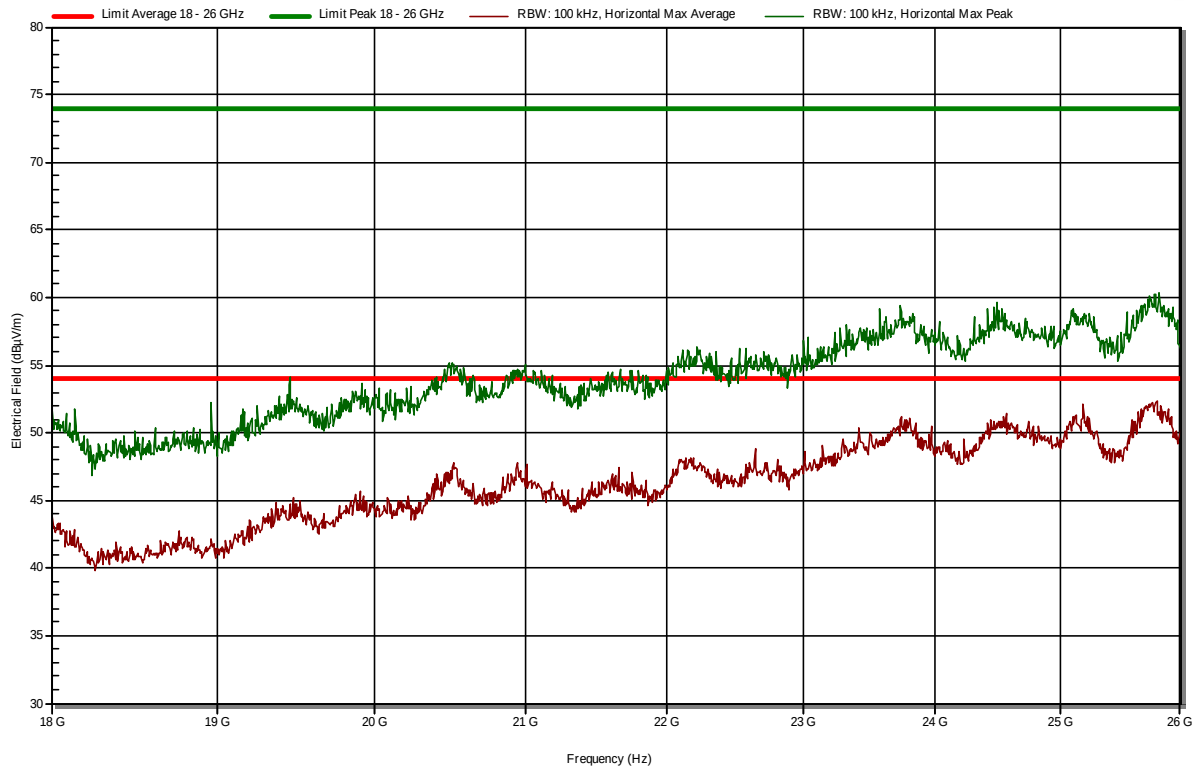
Mid

RadiMation



High

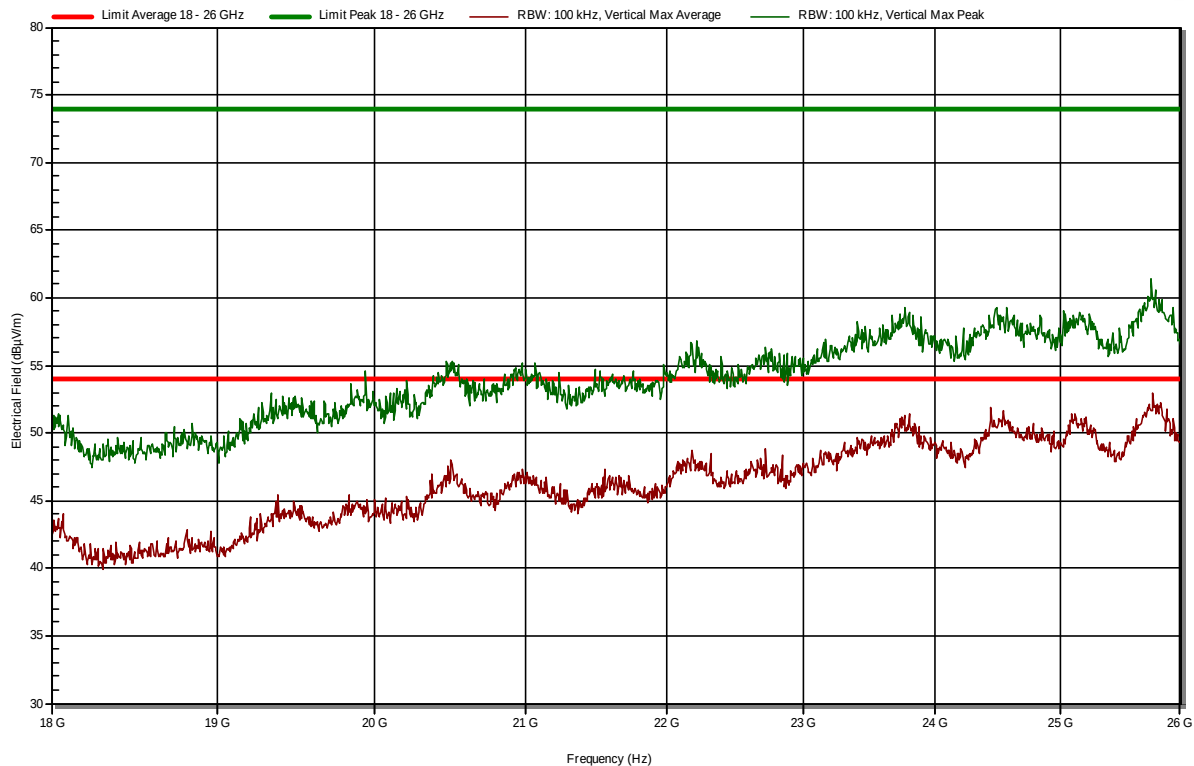
RadiMation



802.11n

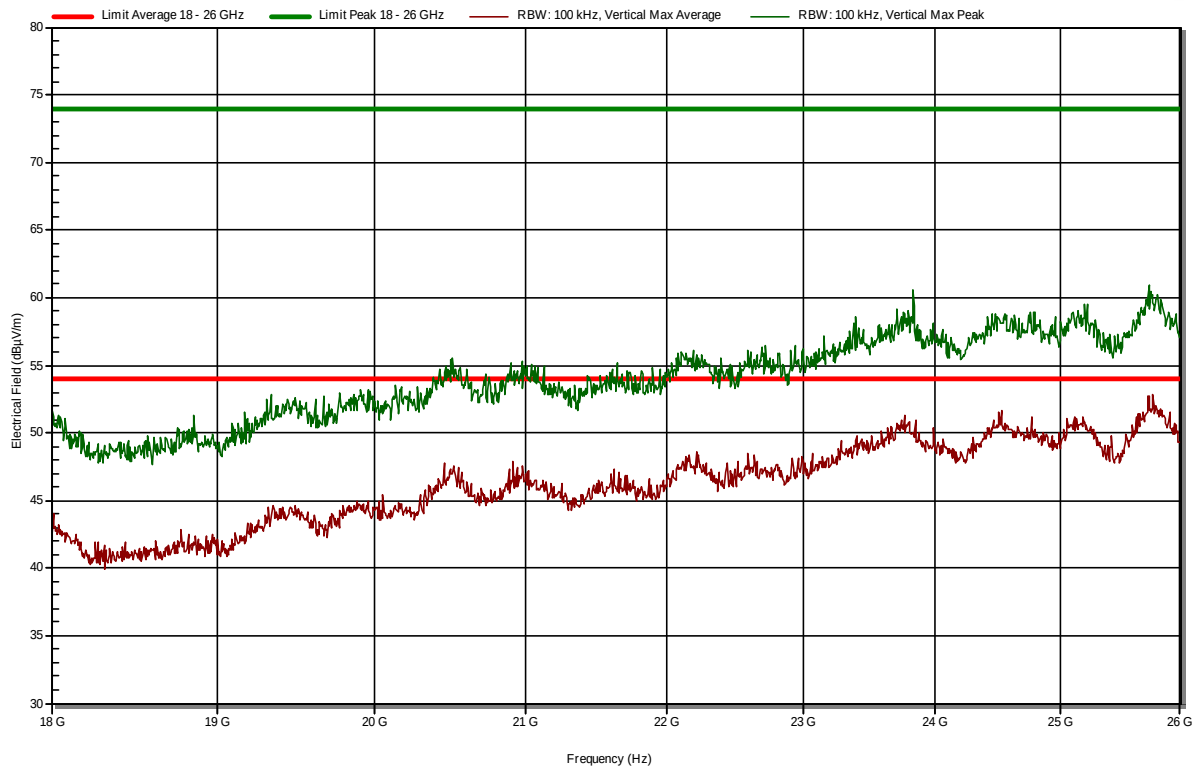
Vertical polarization
Low

RadiMation



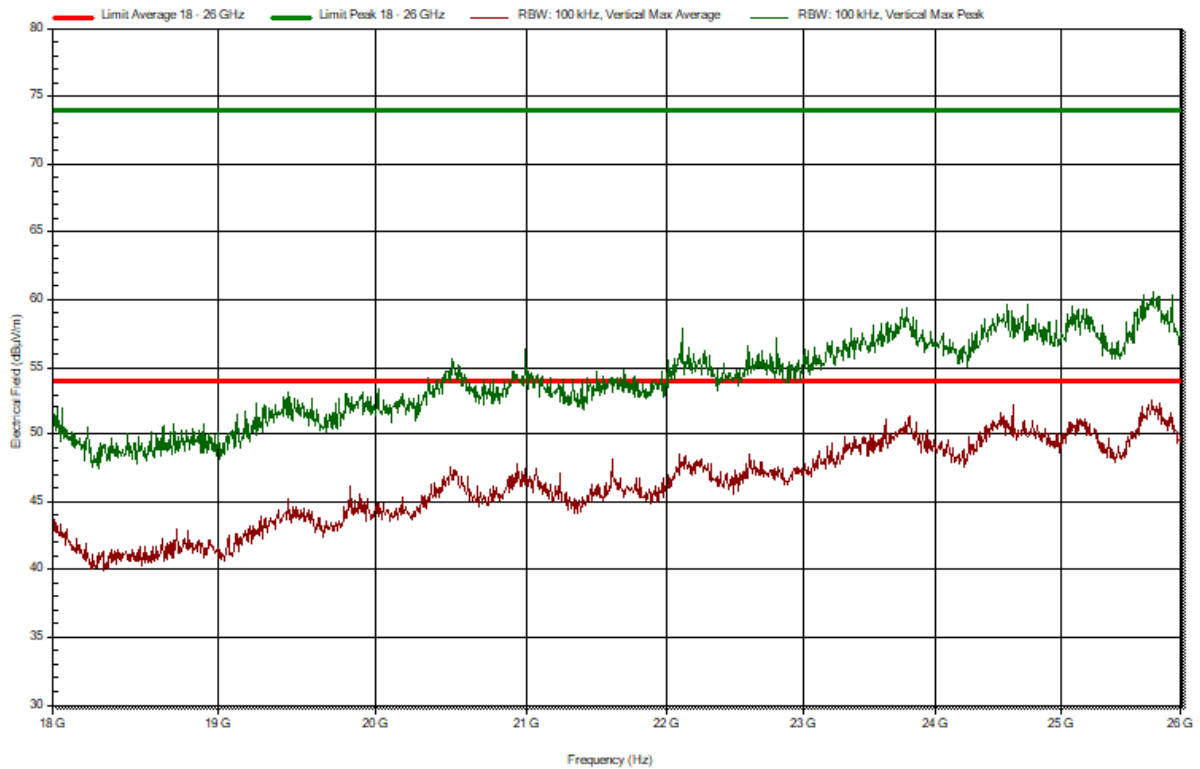
Mid

RadiMation



High

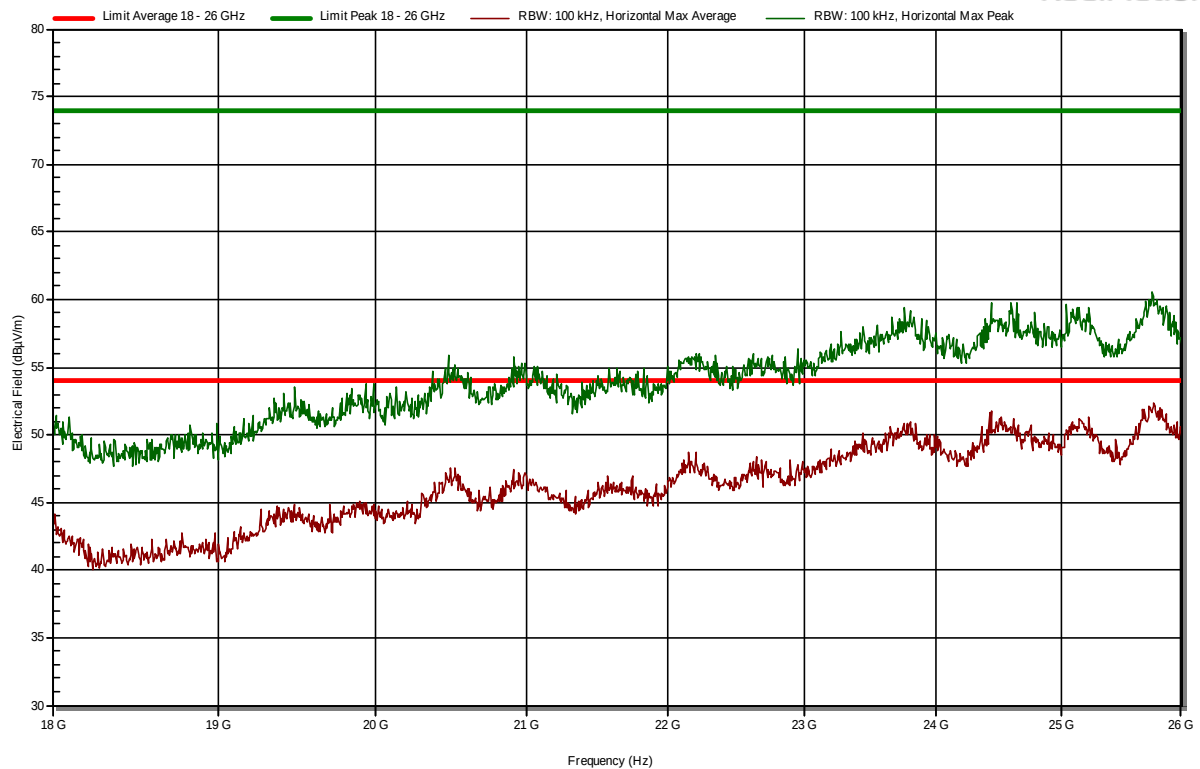
RadiMation



Horizontal polarization

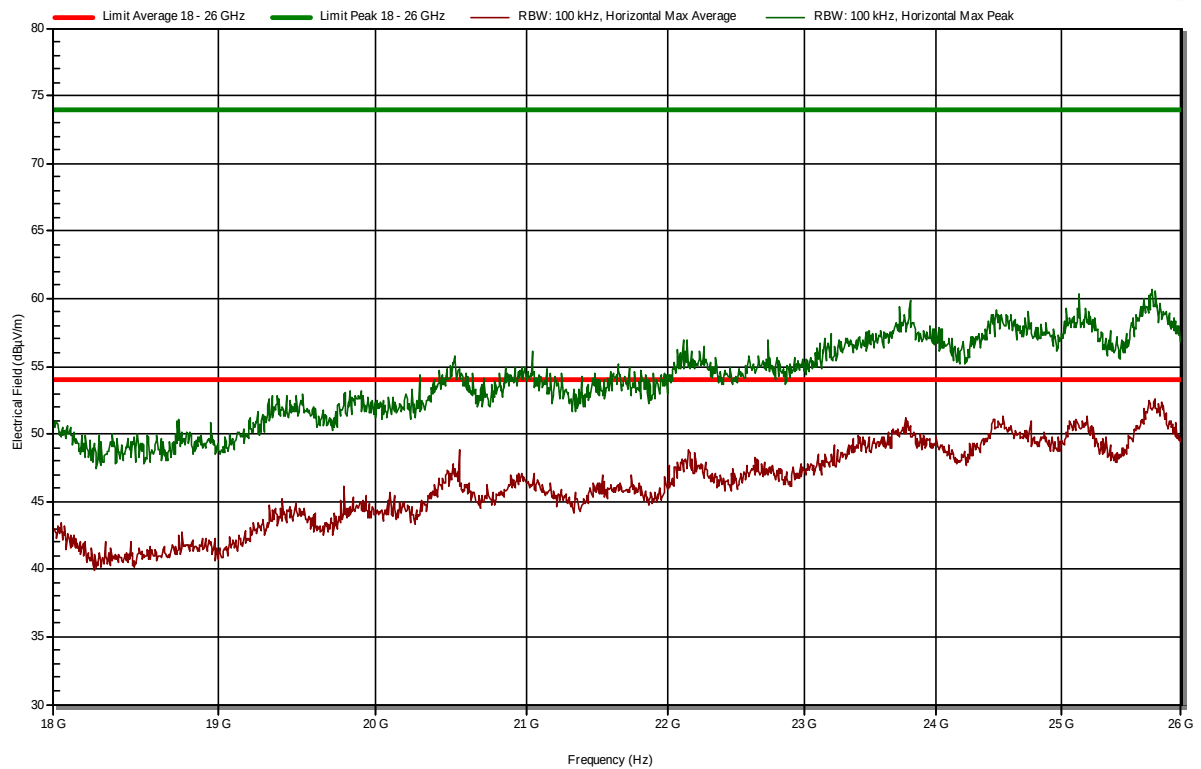
Low

RadiMation



Mid

RadiMation



High

RadiMation



3.2 6dB bandwidth Measurement

3.2.1 Limit

The minimum 6 dB Bandwidth shall be at least 500 kHz.

3.2.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.2.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.2.4 Test procedure

Tests according to ANSI C63.10

IRN 017 - Occupied bandwidth (Hz) Method 4 – DTS Bandwidth.

3.2.5 Test Results of the 6 dB bandwidth Measurement

Technology Std.	Channel	Frequency (MHz)	Data rate	6dB bandwidth (kHz)
802.11b	1	2412	1 Mbps	12028.0
	6	2437	1 Mbps	11958.0
	11	2462	1 Mbps	11960.0
802.11g	1	2412	6 Mbps	15610.8
	6	2437	6 Mbps	15824.5
	11	2462	6 Mbps	15714.4
802.11n	1	2412	6.5 Mbps	16300.7
	6	2437	6.5 Mbps	16043.2
	11	2462	6.5 Mbps	16353.2
Uncertainty	± 36.2 kHz			

3.3 99% Occupied Bandwidth

3.3.1 Limit

According to RSS-Gen 6.7

3.3.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.3.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.3.4 Test procedure

IRN 017 - Occupied bandwidth (Hz) Method 1 – XX % power bandwidth.

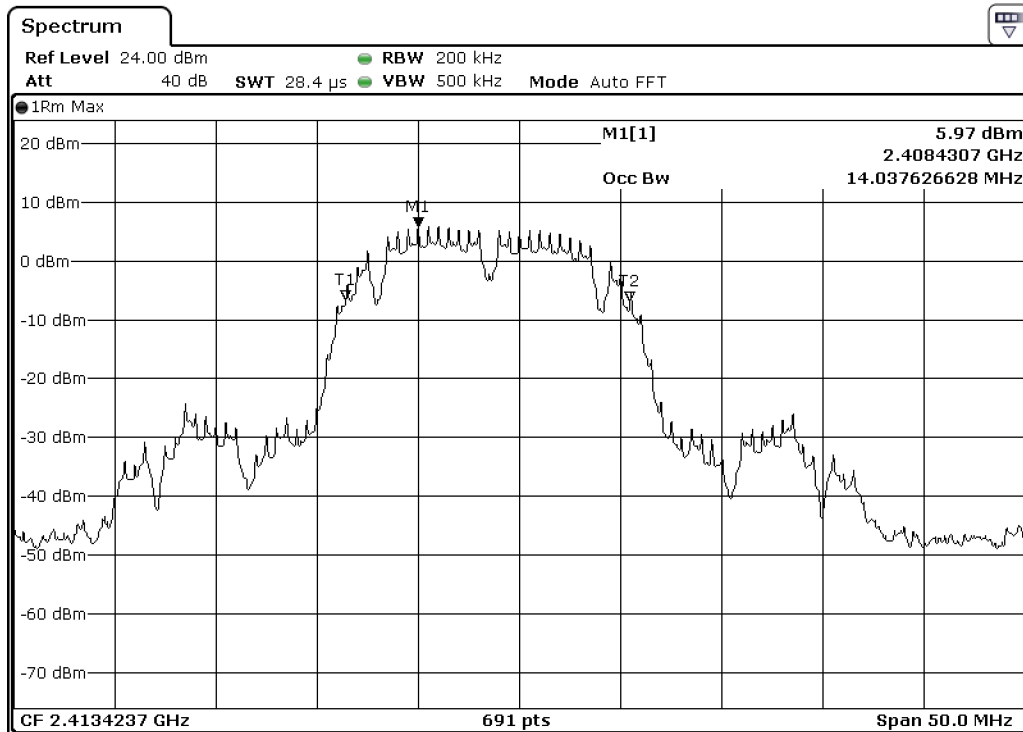
1. Set the centre frequency to the nominal EUT channel centre frequency
2. Set span = 1.5 times to 0.5 times the Occupied Bandwidth
3. Set VBW $\geq$ 3x RBW
4. Video averaging is not permitted. Where practical, detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

3.3.5 Test results of the 99% occupied bandwidth measurement

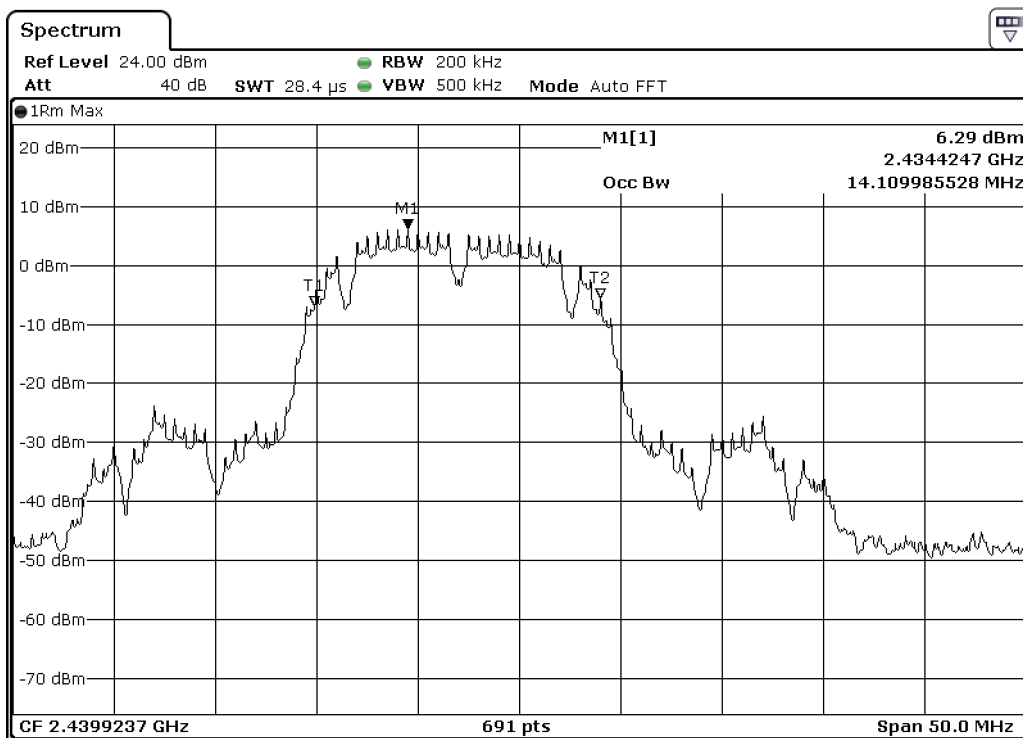
Technology Std.	Channel	Frequency (MHz)	Data rate	99% bandwidth (kHz)
802.11b	1	2412	1 Mbps	14037
	6	2437	1 Mbps	14109
	11	2462	1 Mbps	14037
802.11g	1	2412	6 Mbps	16596
	6	2437	6 Mbps	16690
	11	2462	6 Mbps	16495
802.11n	1	2412	6.5 Mbps	17705
	6	2437	6.5 Mbps	17751
	11	2462	6.5 Mbps	17711
Uncertainty	± 12 kHz			

3.3.6 Plots of the 802.11b 99% occupied bandwidth measurement

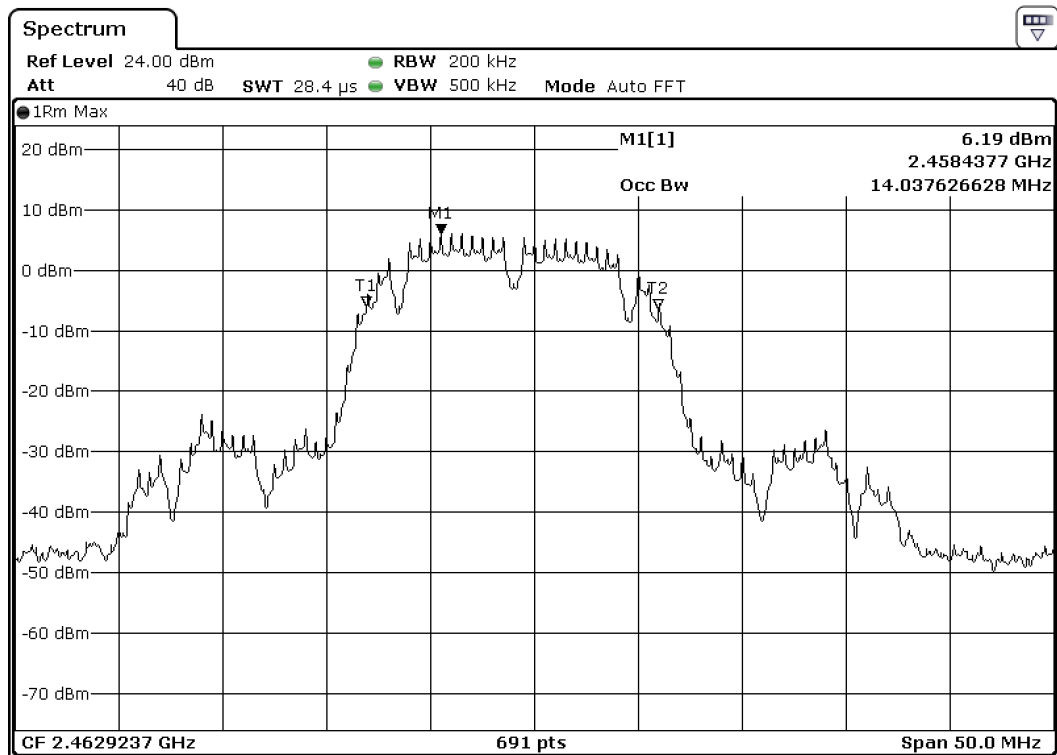
Channel 1



Channel 6

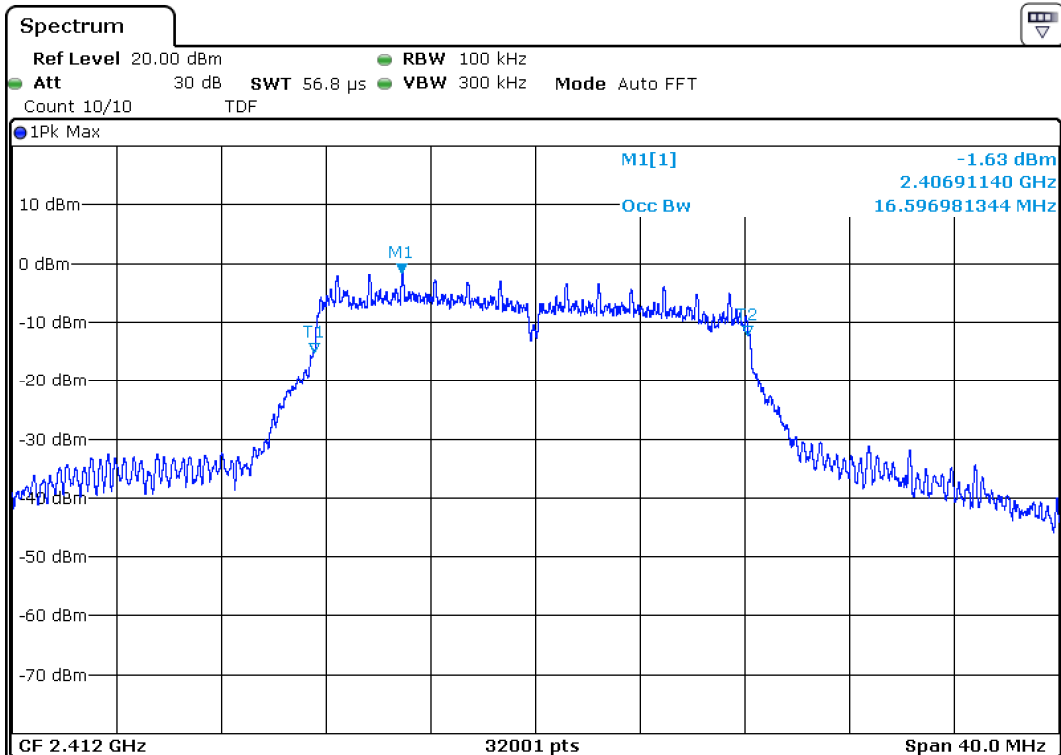


Channel 11

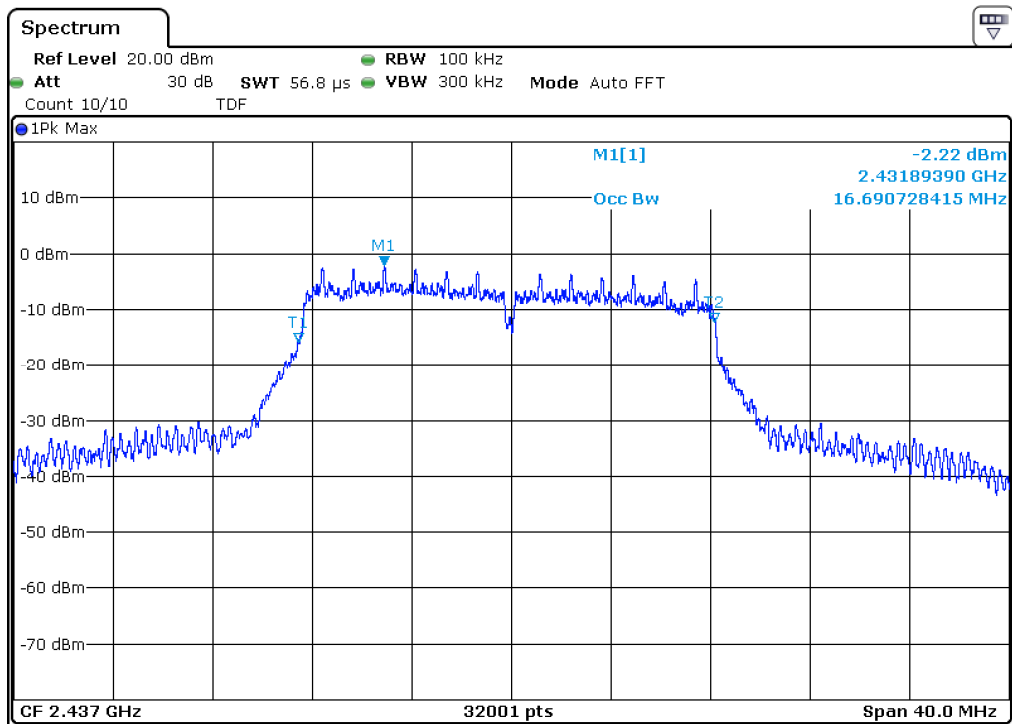


3.3.7 Plots of the 802.11g 99% occupied bandwidth measurement

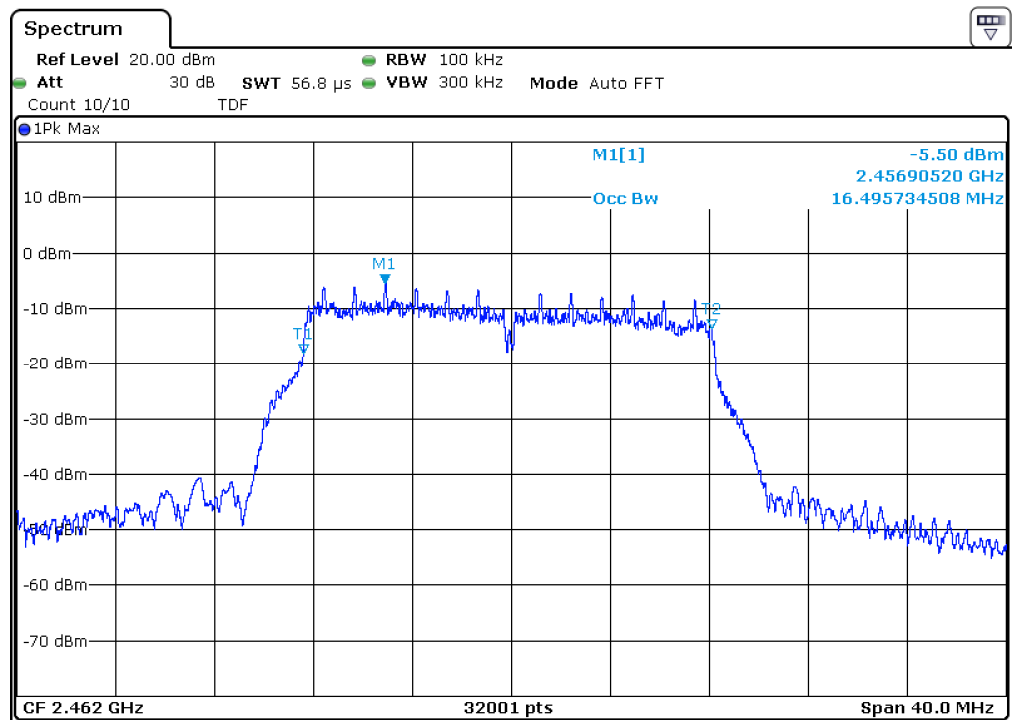
Channel 1



Channel 6

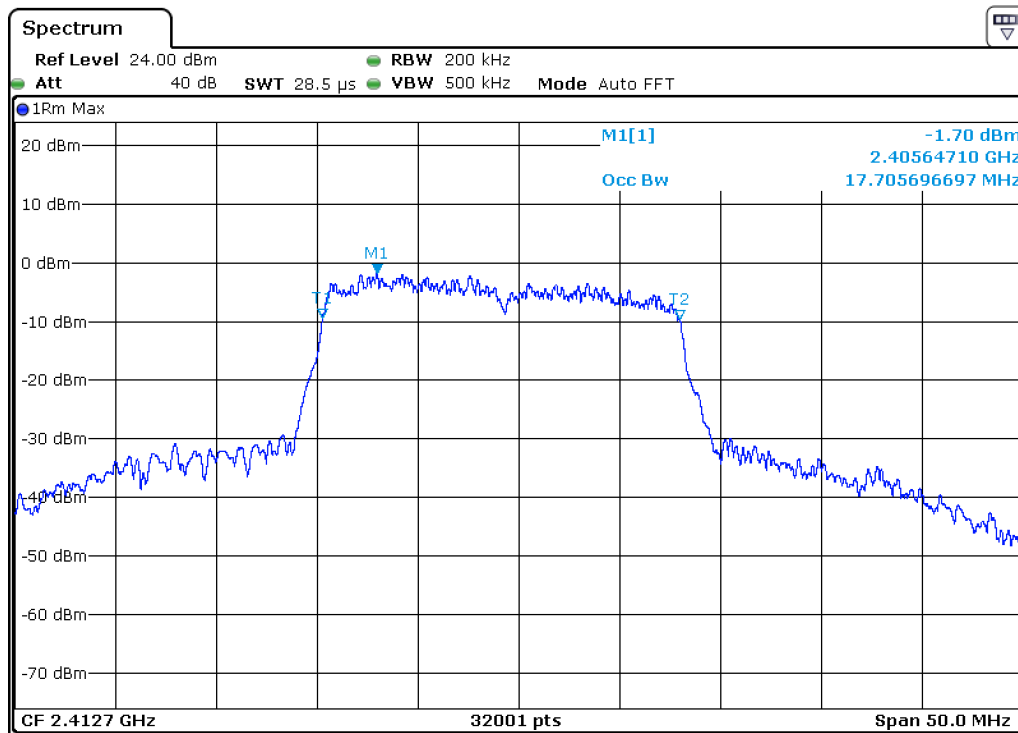


Channel 11

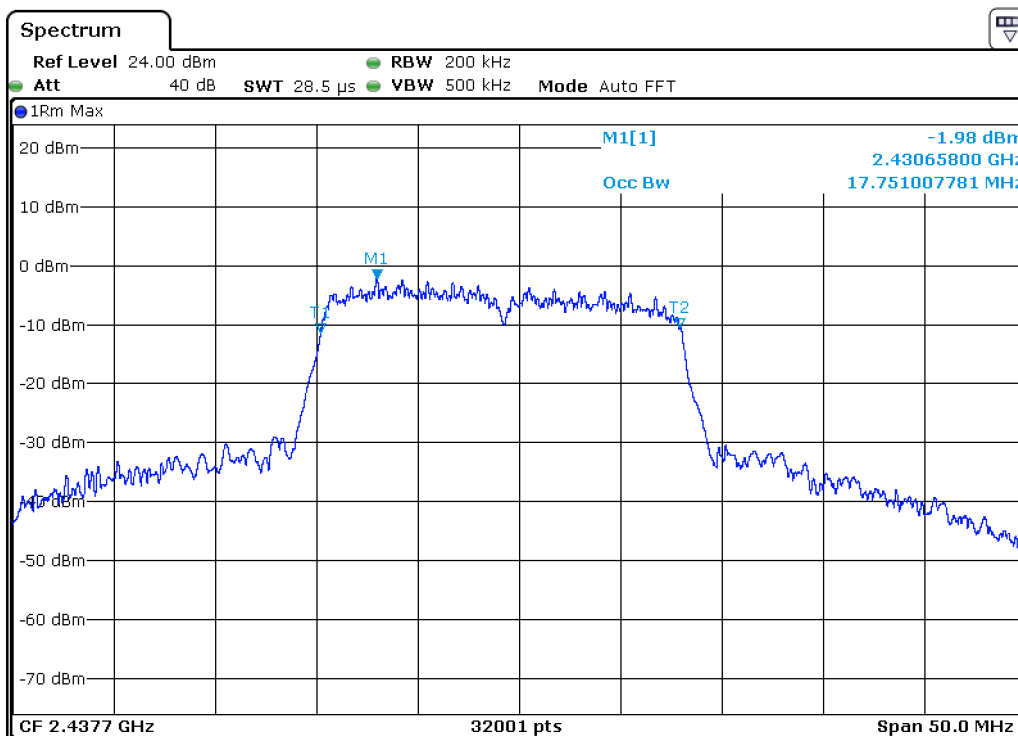


3.3.8 Plots of the 802.11n 99% occupied bandwidth measurement

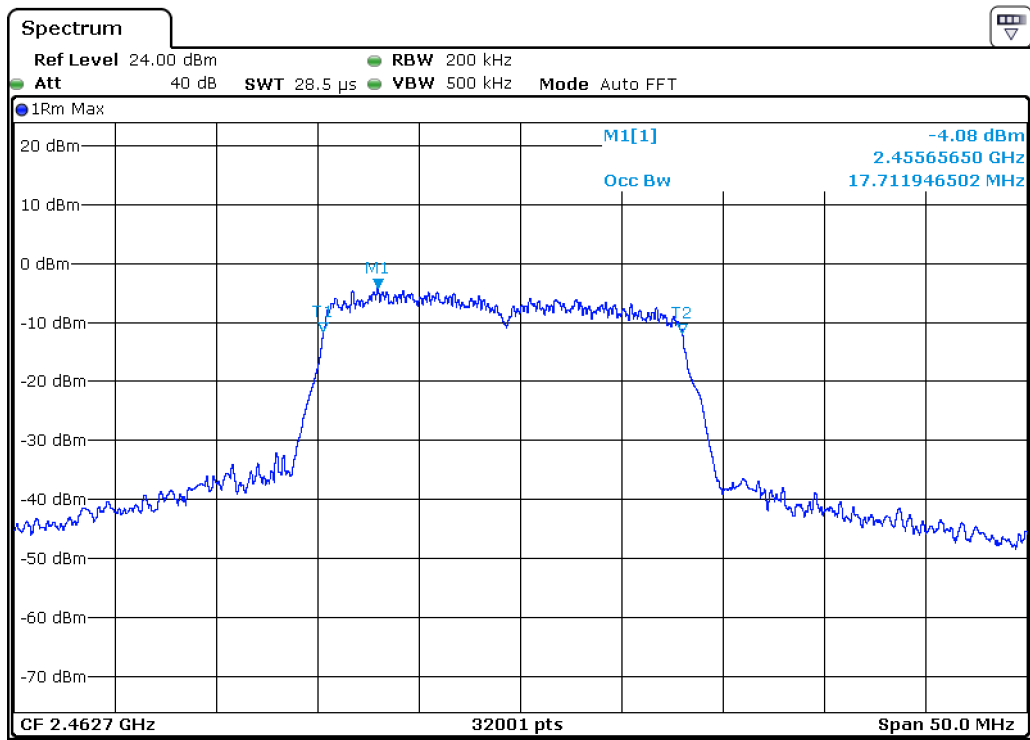
Channel 1



Channel 6



Channel 11



3.4 Output Power Measurement

3.4.1 Limit

For systems using digital modulation in the 2400-2483.5 MHz, the limit for the peak output power is 30 dBm. If transmitting antenna of directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point to point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.4.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.4.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.4.4 Test procedure

The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05.

IRN 014 - RF power (W) - Method 6 – Peak (DTS) according to ANSI C63.10.

3.4.5 Test results of Output Power Measurement

Technology Std.	Channel	Peak method		
		Frequency (MHz)	Data rate	Peak output power (dBm)
802.11b	1	2412	1 Mbps	14.37
	6	2437	1 Mbps	12.28
	11	2462	1 Mbps	10.59
802.11g	1	2412	6 Mbps	15.75
	6	2437	6 Mbps	15.73
	11	2462	6 Mbps	12.76
802.11n	1	2412	6.5 Mbps	15.88
	6	2437	6.5 Mbps	15.06
	11	2462	6.5 Mbps	12.58
Uncertainty	±0.71 dB			

3.5 Power Spectral Density

3.5.1 Limit

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

3.5.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.5.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.5.4 Test procedure

The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05.

IRN 030 - Spectral power density (W per n.Hz) - Method 5 – Peak method PKPSD (PSD in 3 kHz band)

3.5.5 Test results of Power Spectral Density Measurement

Peak Power spectral density				
Technology Std.	Channel	Frequency (MHz)	Data rate	PSD (dBm/3 kHz)
802.11b	1	2412	1 Mbps	-14.64
	6	2437	1 Mbps	-13.79
	11	2462	1 Mbps	-10.59
802.11g	1	2412	6 Mbps	-15.36
	6	2437	6 Mbps	-15.66
	11	2462	6 Mbps	-19.01
802.11n	1	2412	6.5 Mbps	-15.98
	6	2437	6.5 Mbps	-15.98
	11	2462	6.5 Mbps	-18.25
Uncertainty	±2 dB			

3.6 Band edge Measurement

3.6.1 Limit

Band edge:

At the edge of the authorized band the RF power shall be at least 20 dB down.

3.6.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.6.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.6.4 Test procedure

The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05, sections 11.3 and 12.1.
IRN 026 - Radiated electrical disturbance (V per m) Method 6 – Radiated electrical disturbance at the Authorized band edge.

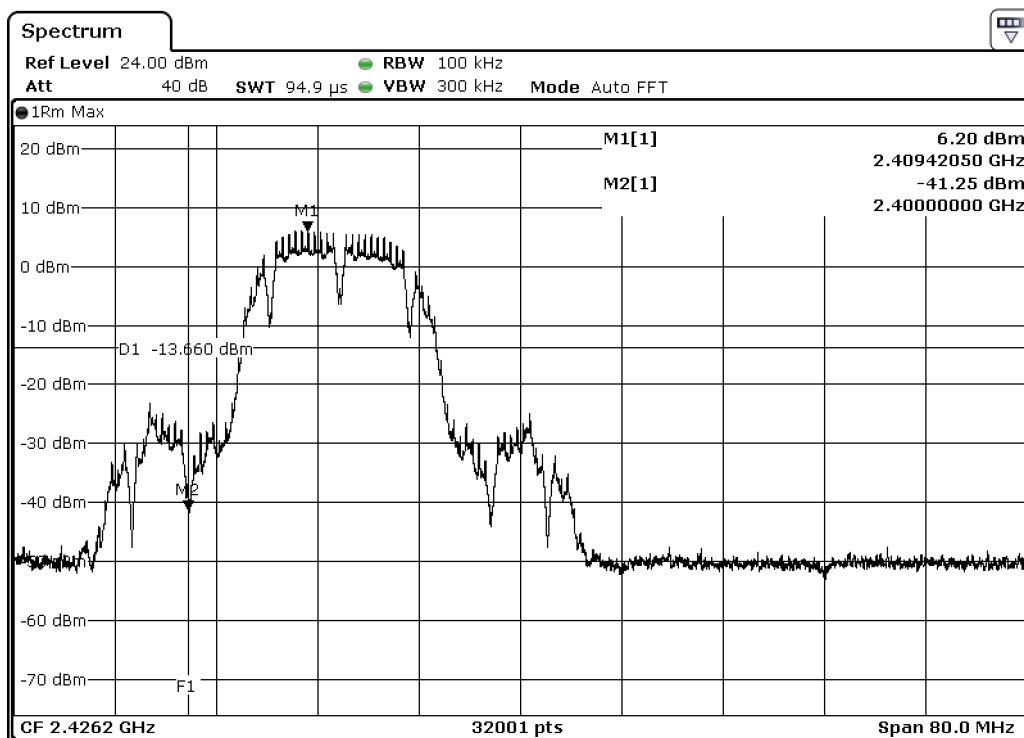
3.6.5 Measurement Uncertainty

± 5.7 dB.

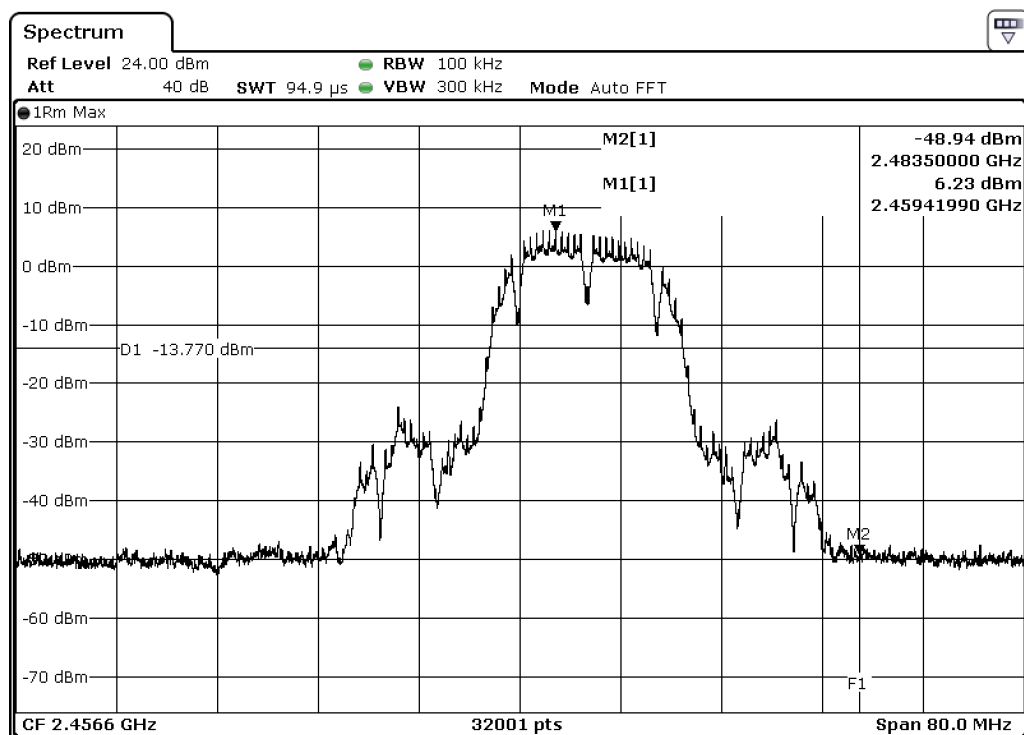
3.6.6 Plots of the Band edge Measurements

See next page

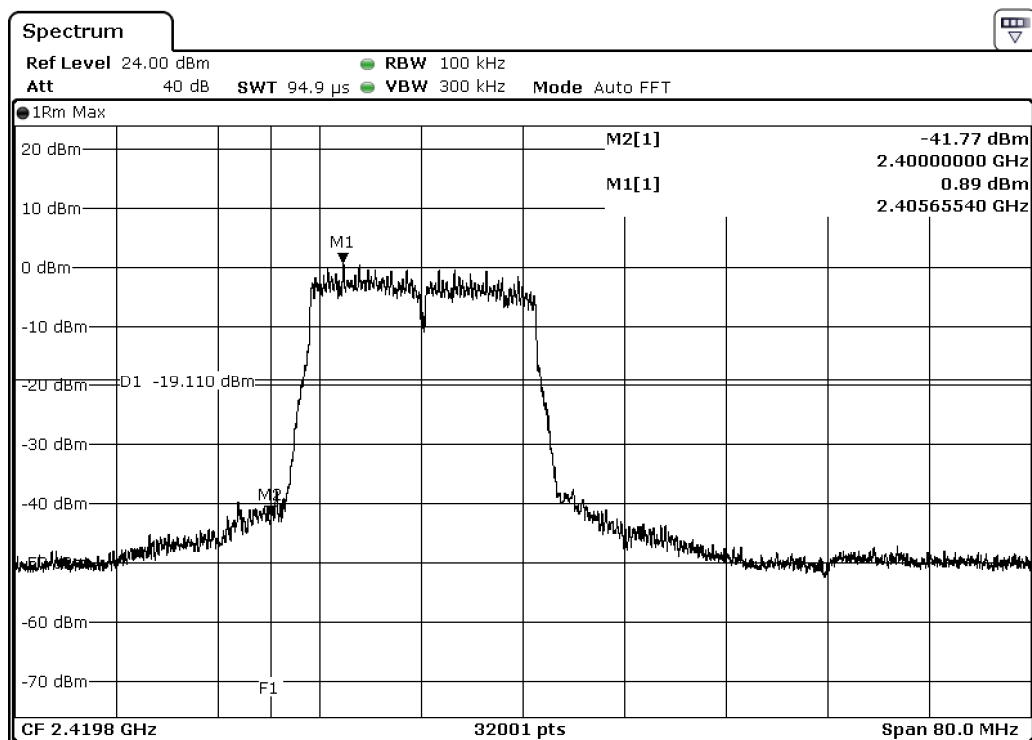
802.11b Lower band edge (Channel 1)



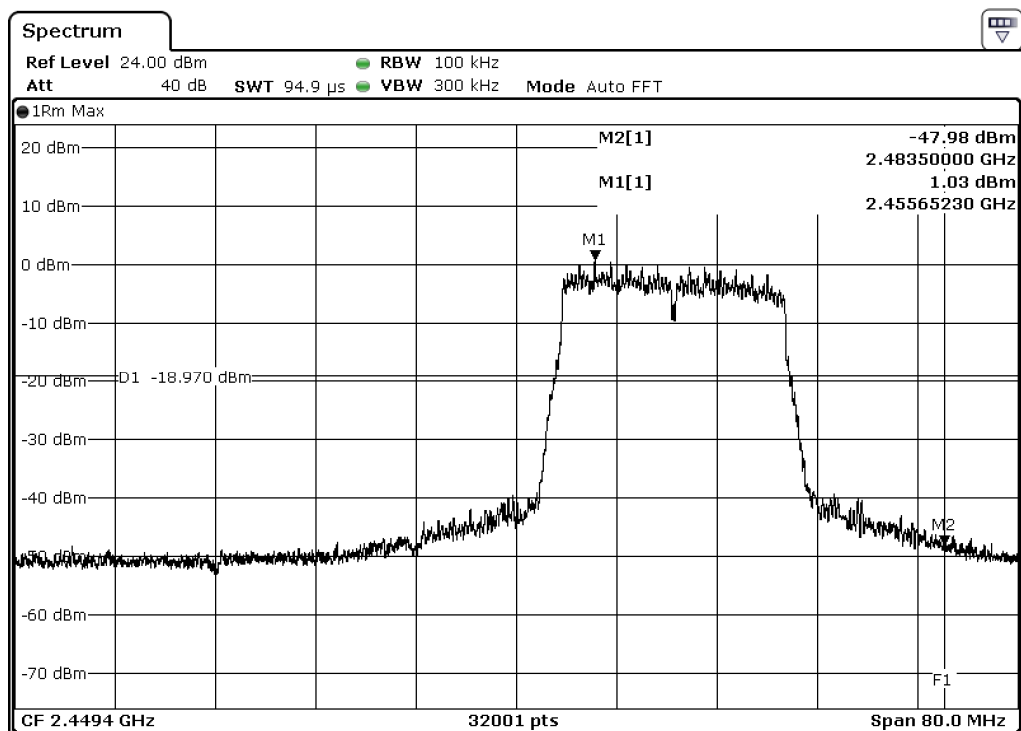
802.11b Upper band edge (Channel 11)



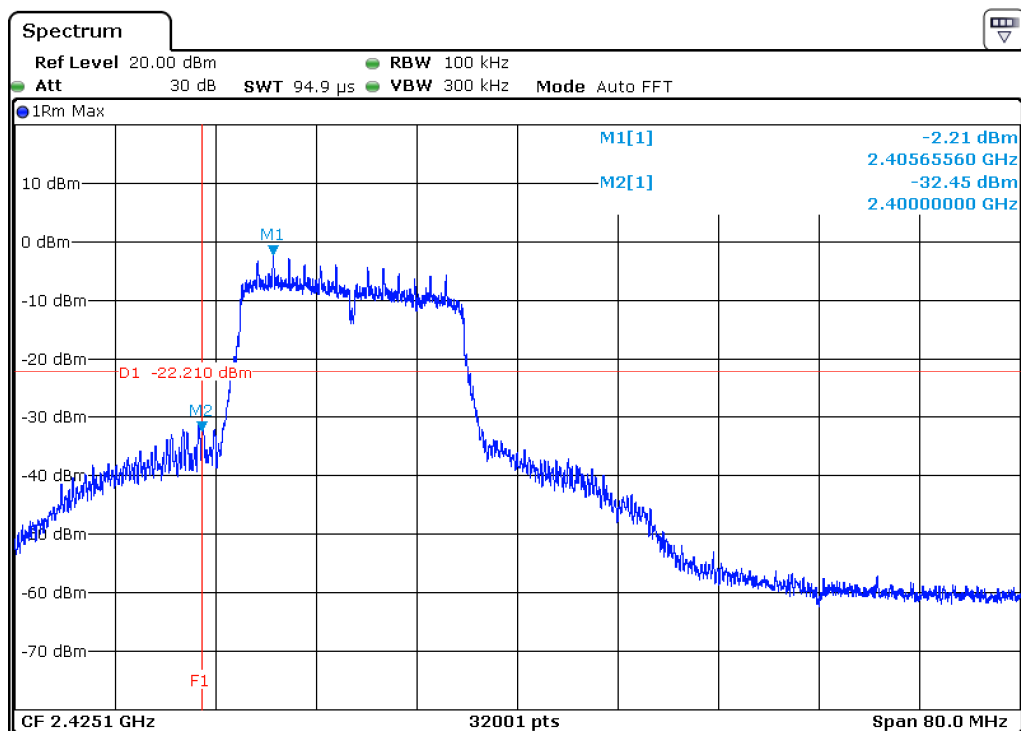
802.11g Lower band edge (Channel 1)



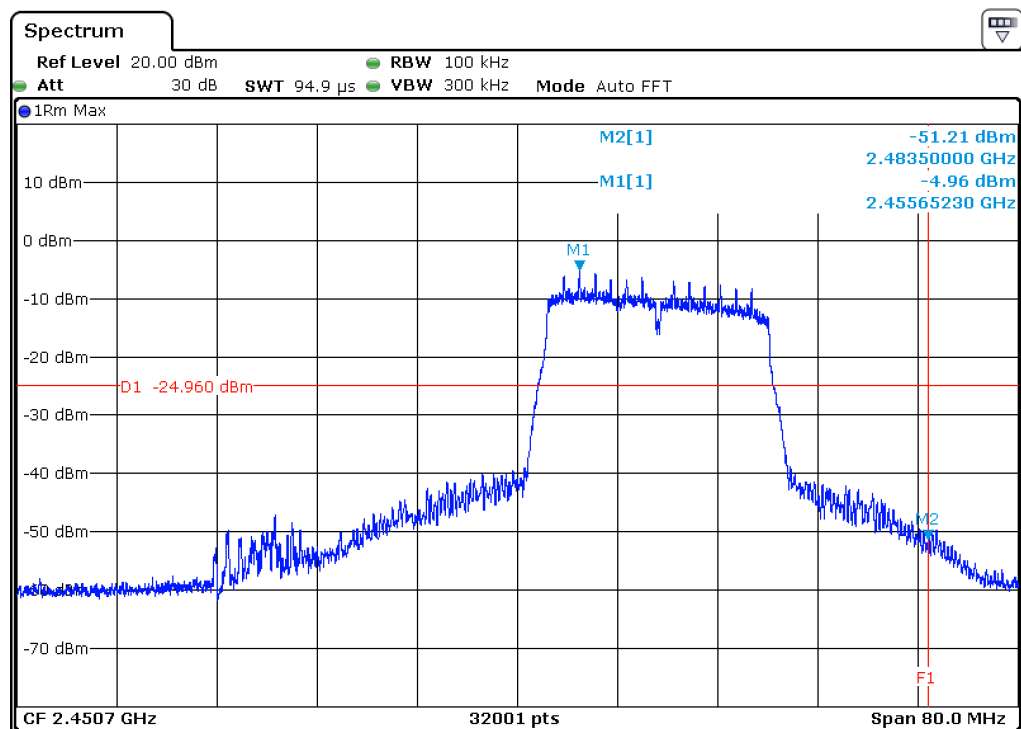
802.11g Upper band edge (Channel 11)



802.11n Lower band edge (Channel 1)



802.11n Upper band edge (Channel 11)



4 Sample calculations

All formulas for data conversions and conversion factors are reported in this chapter.

Field Strength Measurement:

$$E \text{ (dB}\mu\text{V/m)} = U \text{ (dB}\mu\text{V)} + AF \text{ (dB/m)} + \text{Corr. (dB)}$$

Where:

E = Electric field strength

U = Measuring receiver voltage

AF = Antenna factor

CL = Cable loss

Corr. = sum of single correction factors of used cable and amplifier (if applicable).

Linear interpolation will be used for frequencies in between the values in the table.

Tables shows an extract of the values.

Frequency (Mhz)	AF (dB/m)	Cable loss (dB)	Corr. (dB)
	TE 00967 Chase CBL6112A SN: 2308	Id: SAR cable	
30	18,6	0,68	19,28
100	10,7	1,15	11,85
150	10,6	1,41	12,01
200	9,3	1,63	10,93
250	12,6	1,93	14,53
300	13,3	2,12	15,42
350	14,6	2,2	16,8
400	15,5	2,29	17,79
450	16,9	2,53	19,43
500	17,5	2,67	20,17
550	18,4	2,9	21,3
600	18,8	3,02	21,82
650	19,2	3,09	22,29
700	19	3,22	22,22
750	19,8	3,56	23,36
800	19,7	3,69	23,39
900	20,4	3,81	24,21
950	20,8	3,91	24,71
1000	21,2	4,3	25,5

Frequency (Mhz)	AF (dB/m)	Gain (dB)	Cable loss (dB)	Corr. (dB)
	TE 00531 Emco 3115 SN: 9412-4377	TE 11132 Miteq JS4-18004000-30-8P-A1	TE 01315	
1000	23,6	40,4	2,0	66
1500	25,1	40,5	2,4	68
2000	27,1	40,5	2,7	70,3
2500	28,6	40,7	3,2	72,5
3000	30,5	40,7	3,2	74,4
3500	31,2	40,7	3,4	75,3
4000	32,7	40,9	4,9	78,5
4500	32,4	40,9	4,4	77,7
5000	33,2	40,7	4,6	78,5
5500	34,0	40,5	4,5	79
6000	34,6	40,0	5,2	79,8
6500	34,3	39,4	5,9	79,6
7000	35,2	38,6	5,7	79,5
7500	36,4	39,2	5,9	81,5
8000	37,0	38,9	6,3	82,2
8500	37,5	38,4	6,4	82,3
9000	38,1	37,4	6,5	82

9500	37,8	37,0	7,1	81,9
10000	38,2	36,5	7,3	82
10500	38,1	36,7	7,6	82,4
11000	38,3	36,9	8,3	83,5
11500	38,5	37,6	8,1	84,2
12000	39,1	38,3	8,4	85,8
12500	38,7	38,5	8,3	85,5
13000	39,2	38,9	9,2	87,3
13500	40,5	40,2	8,3	89
14000	41,1	40,0	8,2	89,3
14500	41,4	40,1	8,2	89,7
15000	40,2	41,4	8,3	89,9
15500	37,9	41,4	8,6	87,9
16000	37,5	42,8	9,2	89,5
16500	38,6	42,3	8,8	89,7
17000	41,1	43,1	9,4	93,6
17500	42,7	43,2	9,4	95,3
18000	44,0	44,2	9,8	98

Frequency (Mhz)	AF (dB/m)	Gain (dB)	Cable loss (dB)	Corr. (dB)
	TE 00531 Emco 3115 SN: 9412-4377	TE 11132 Miteq JS4-18004000-30-8P-A1	TE 01315	
18000	31,3	26,2	9,8	67,3
19000	31,5	26,1	9,6	67,2
20000	31,7	25,9	11	68,6
21000	31,9	24,3	10,7	66,9
22000	32,1	18,3	10,5	60,9
23000	32,2	18,9	10,8	61,9
24000	32,3	23,6	11,4	67,3
25000	32,4	24,5	11,6	68,5
26000	32,5	25,3	11,7	69,5