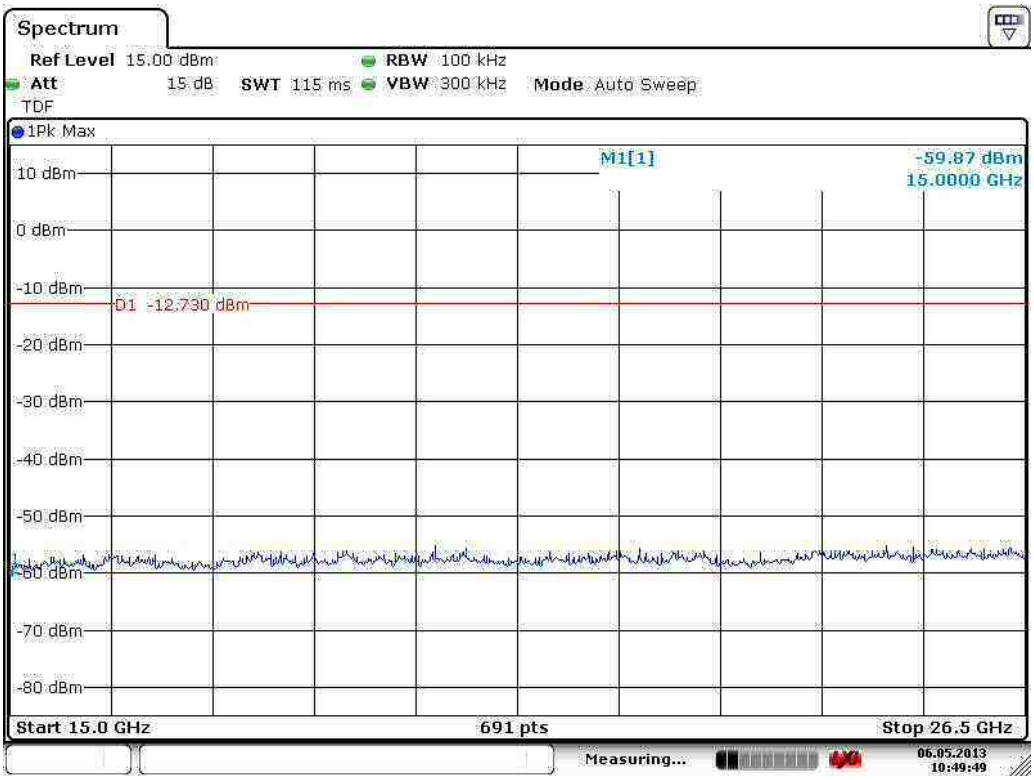


Date: 6.MAY.2013 10:49:48

Figure 70. High channel conductive emission 15 GHz to 26.5 GHz (2 Mbps).

Data rate 3 Mbps

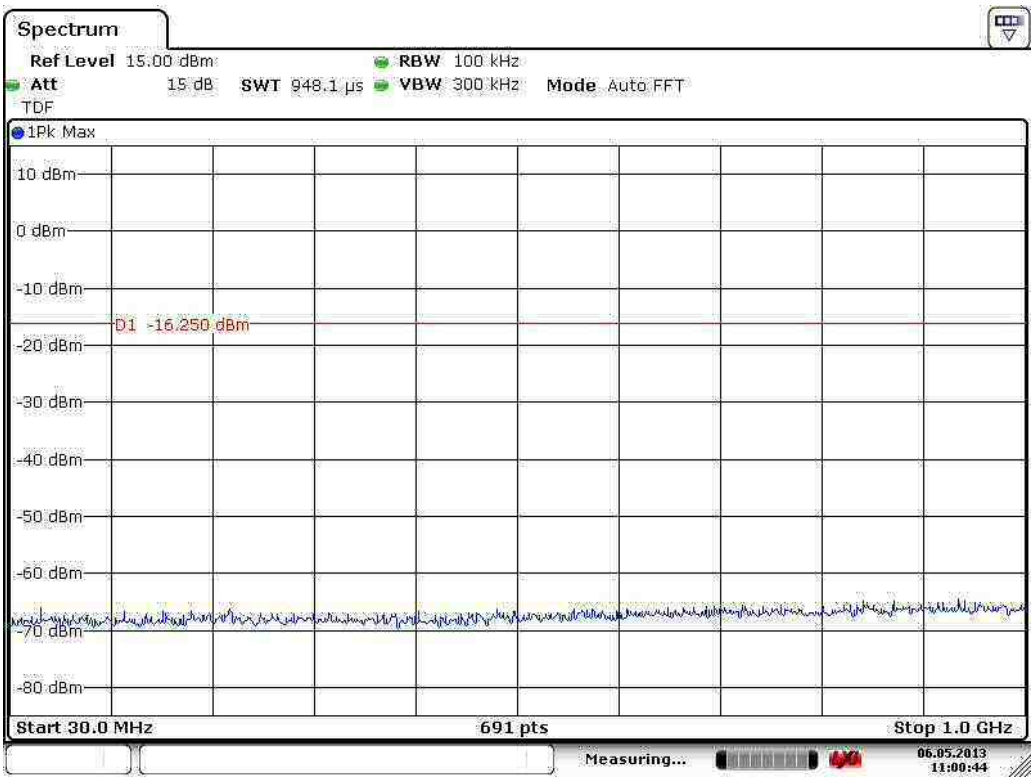
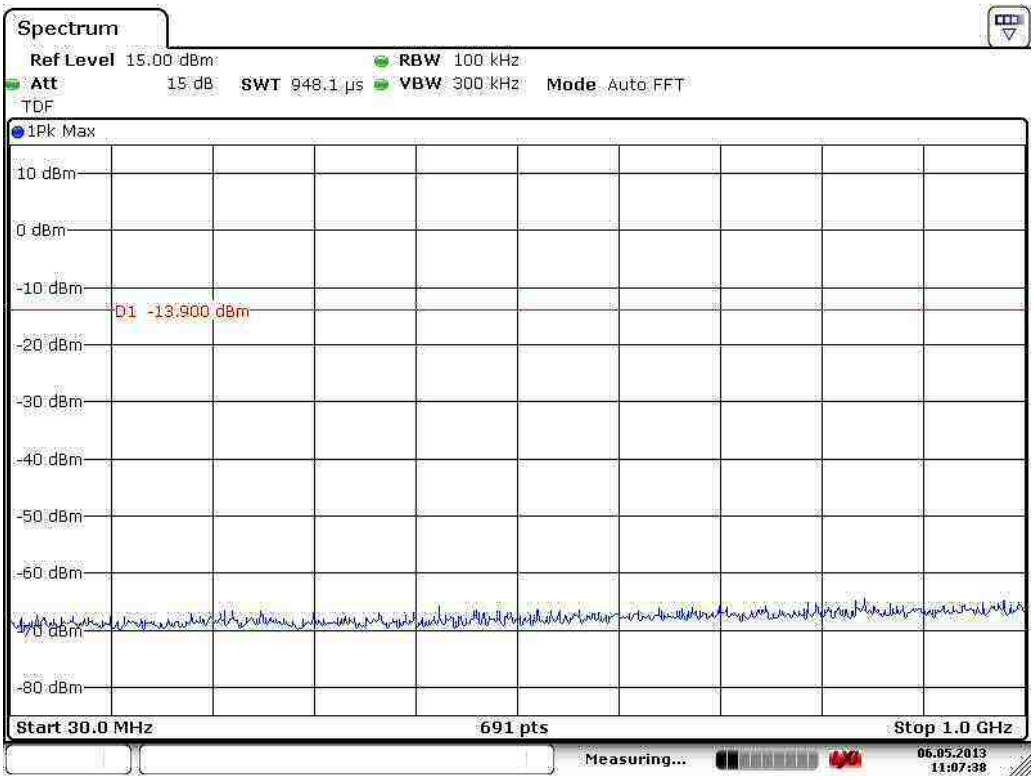
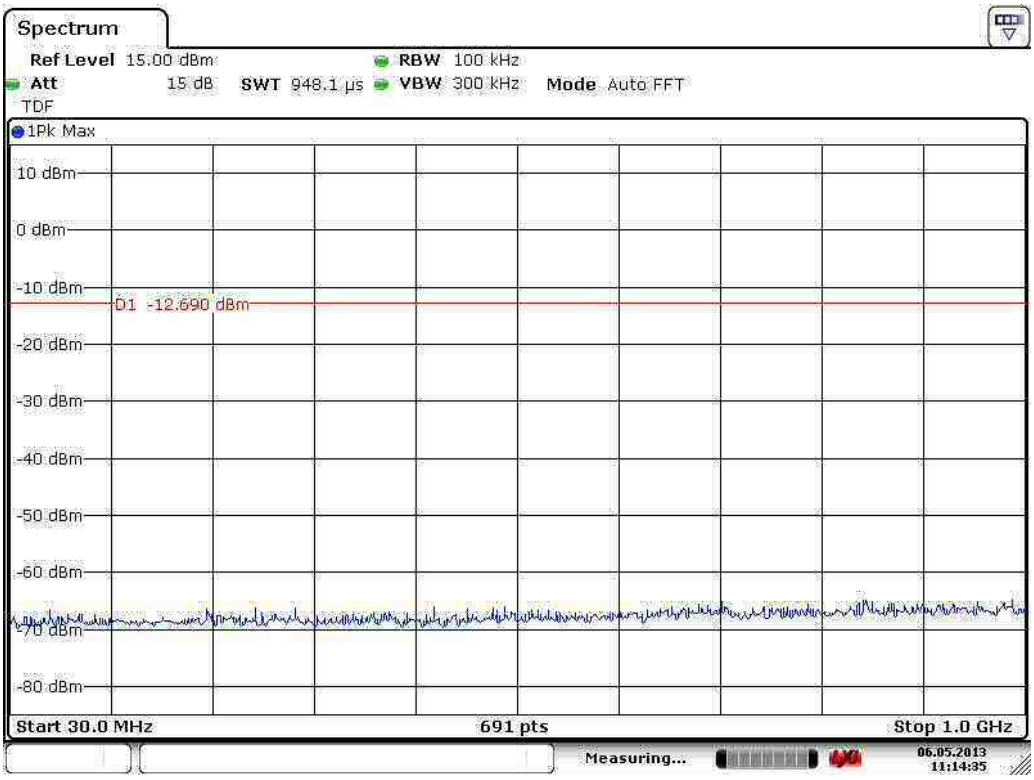


Figure 71. Low channel conductive emission 30 MHz to 1000 MHz (3 Mbps).



Date: 6.MAY.2013 11:07:37

Figure 72. Mid channel conductive emission 30 MHz to 1000 MHz (3 Mbps).



Date: 6.MAY.2013 11:14:34

Figure 73. High channel conductive emission 30 MHz to 1000 MHz (3 Mbps).

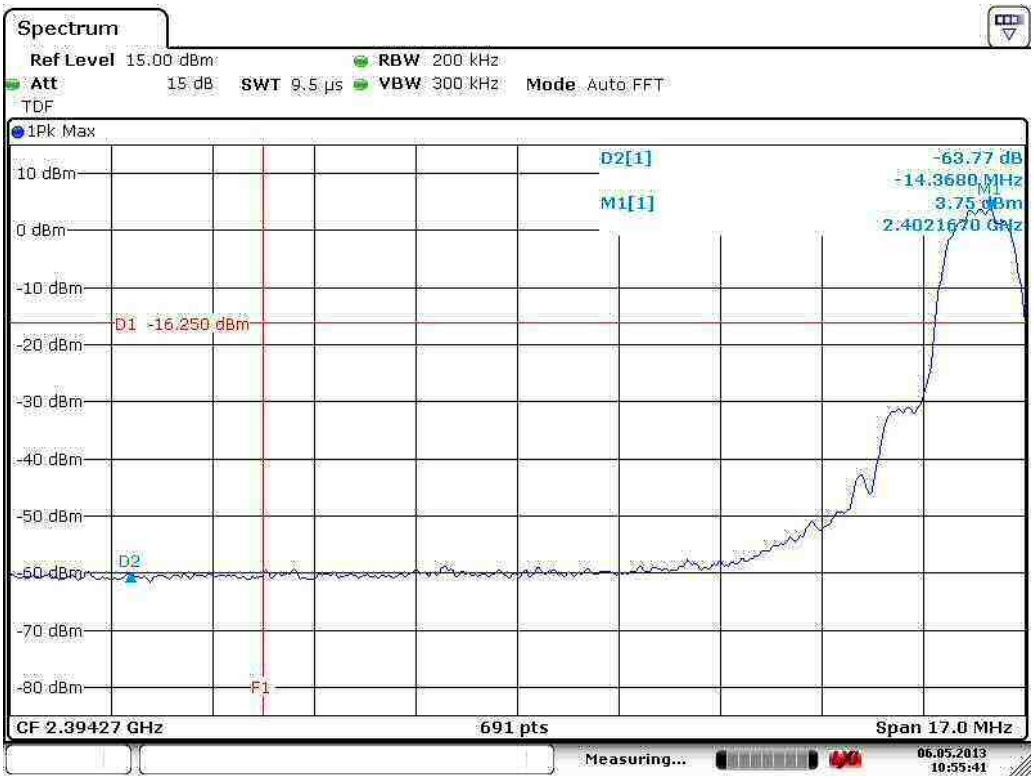


Figure 74. Low channel conductive emission at low band edge (3 Mbps).

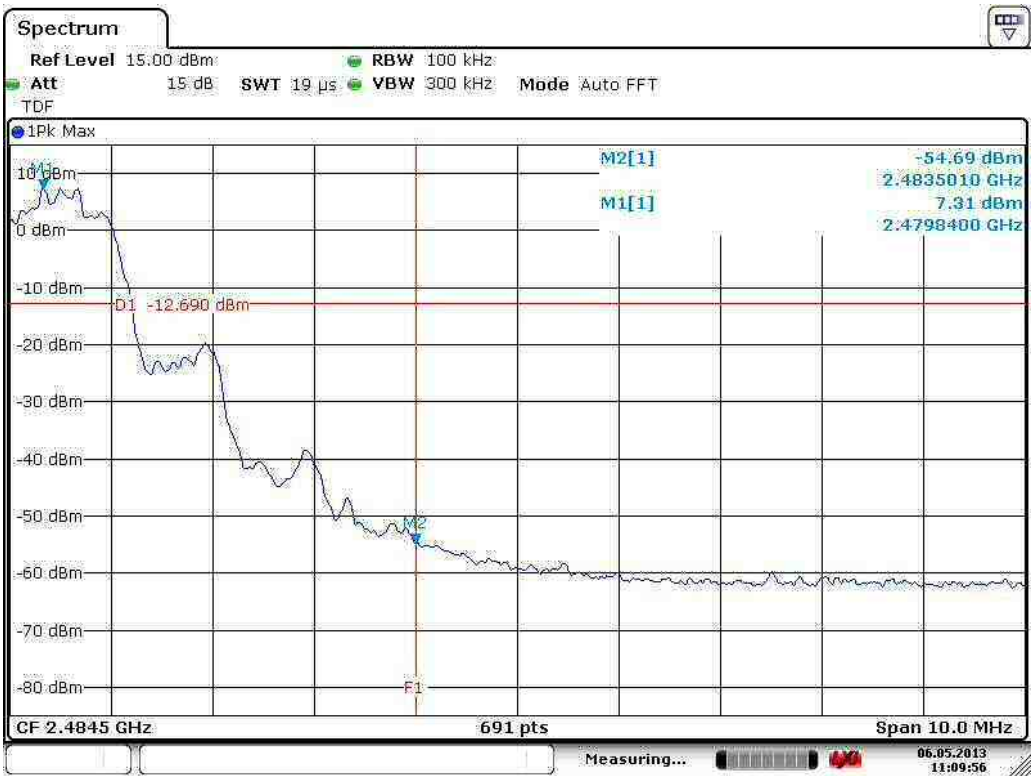
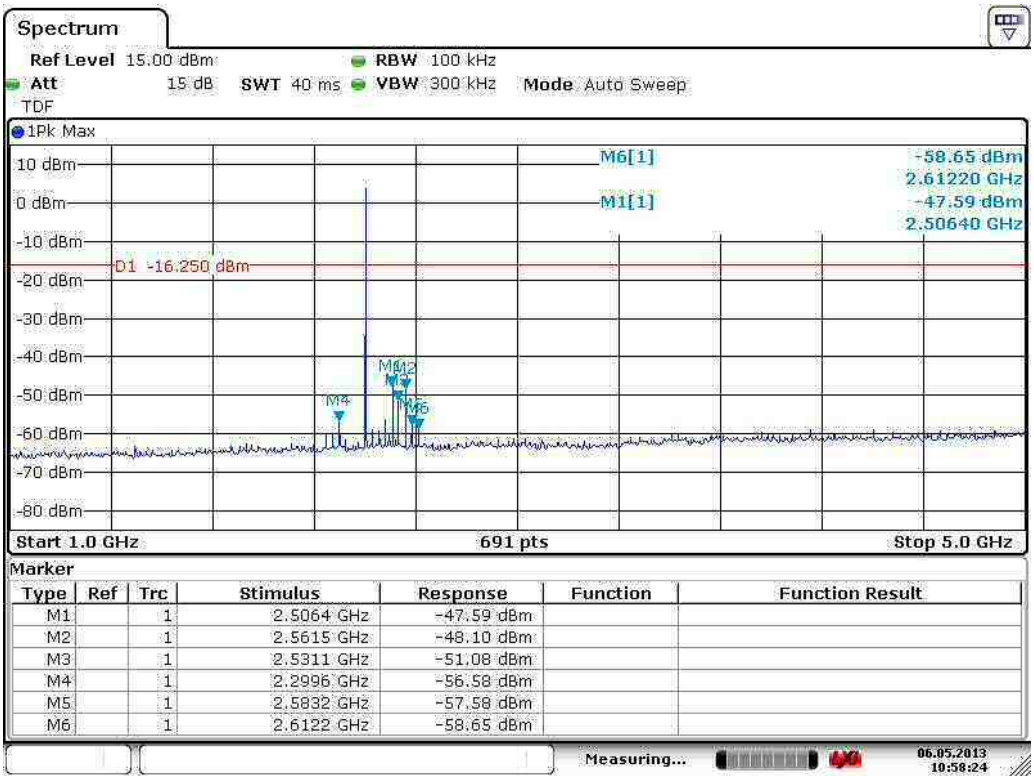
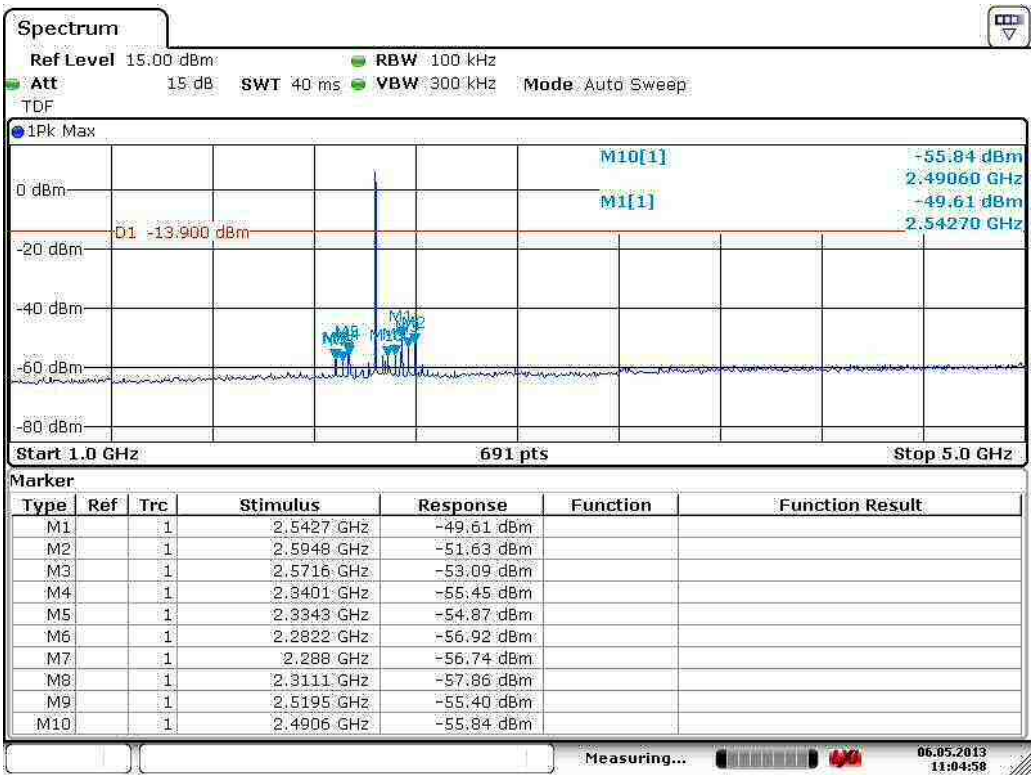


Figure 75. High channel conductive emission at high band edge (3 Mbps).



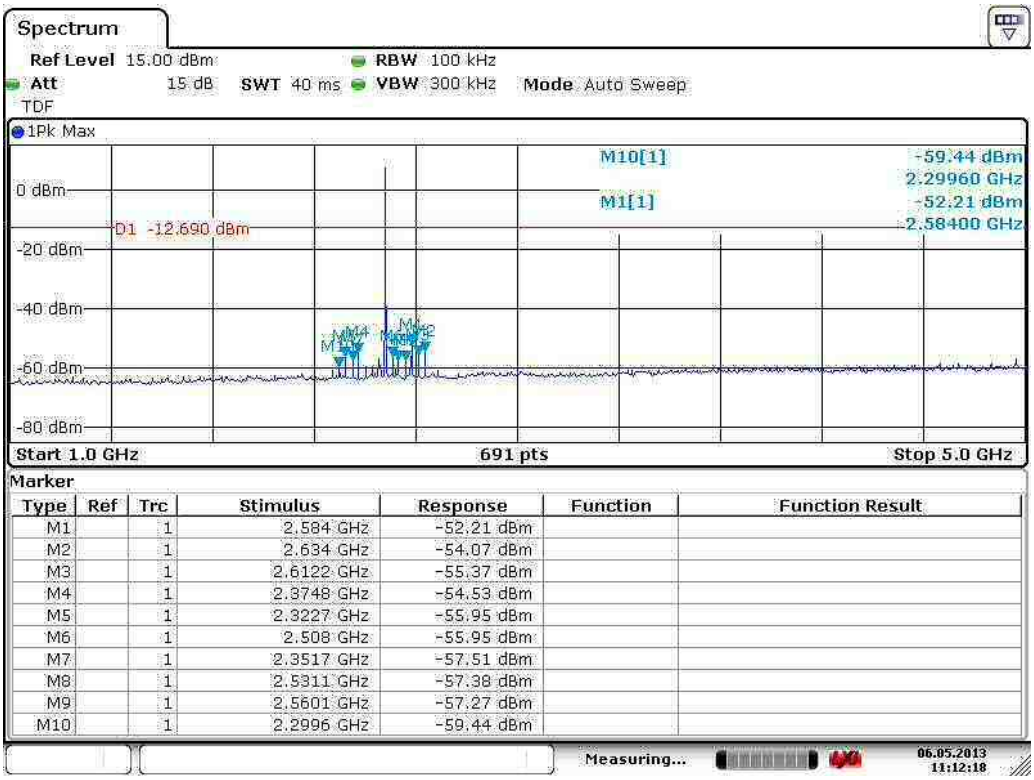
Date: 6.MAY.2013 10:58:23

Figure 76. Low channel conductive emission 1 GHz to 5 GHz (3 Mbps).



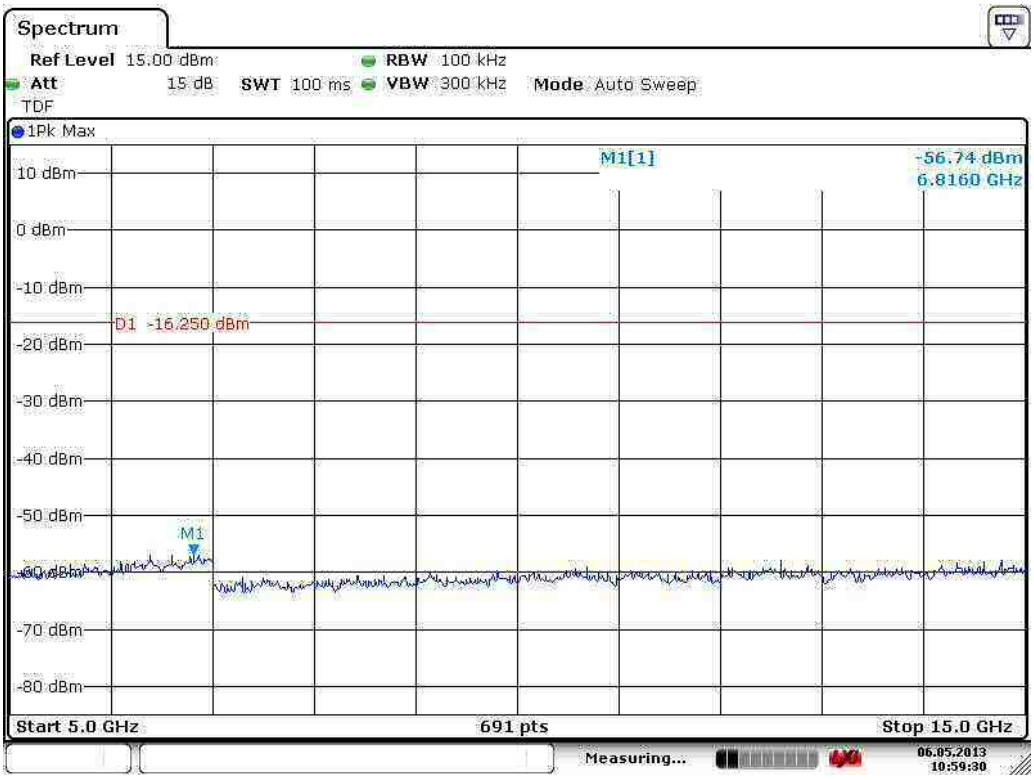
Date: 6.MAY.2013 11:04:57

Figure 77. Mid channel conductive emission 1 GHz to 5 GHz (3 Mbps).



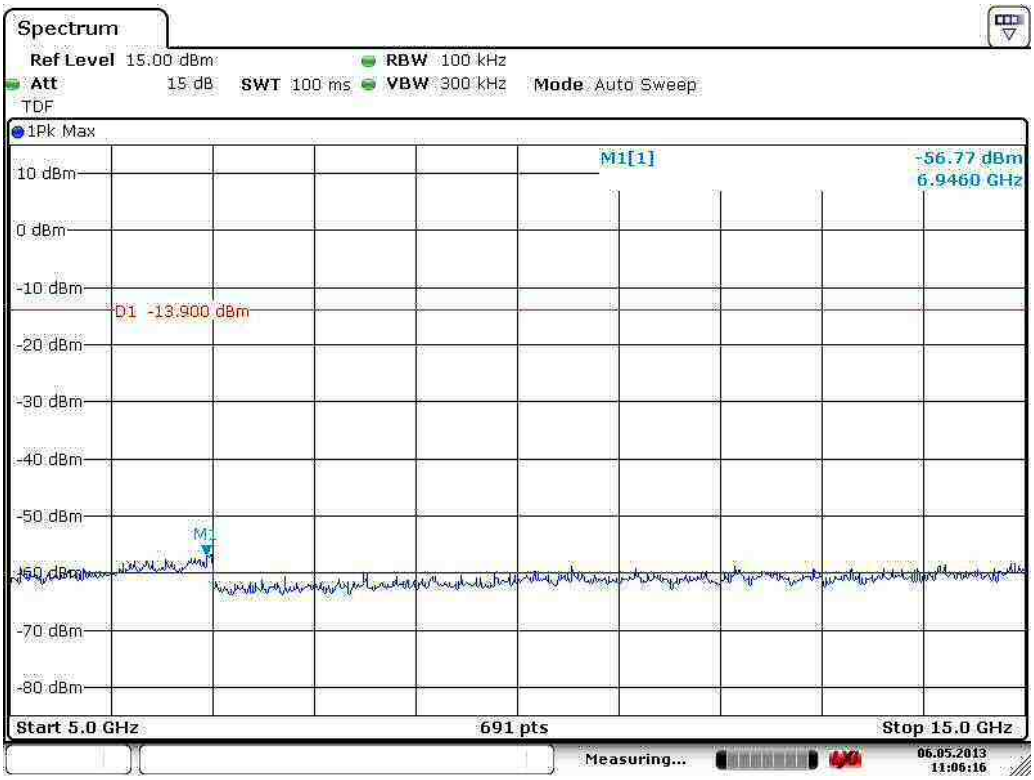
Date: 6.MAY.2013 11:12:17

Figure 78. High channel conductive emission 1 GHz to 5 GHz (3 Mbps).



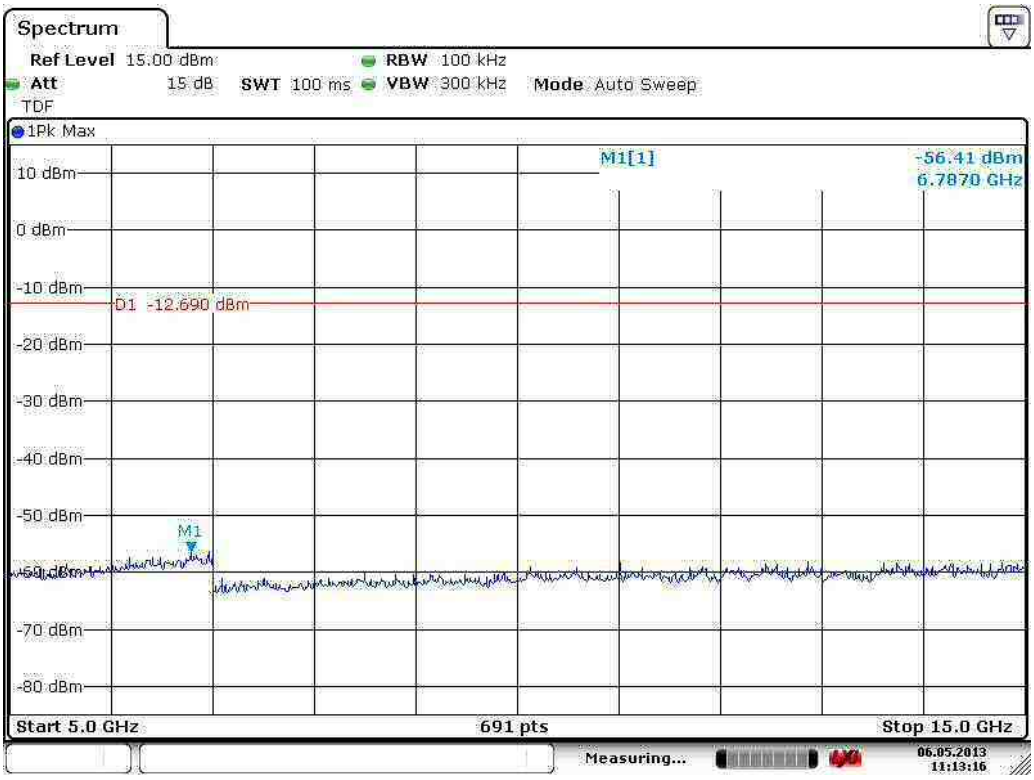
Date: 6.MAY.2013 10:59:30

Figure 79. Low channel conductive emission 5 GHz to 15 GHz (3 Mbps).



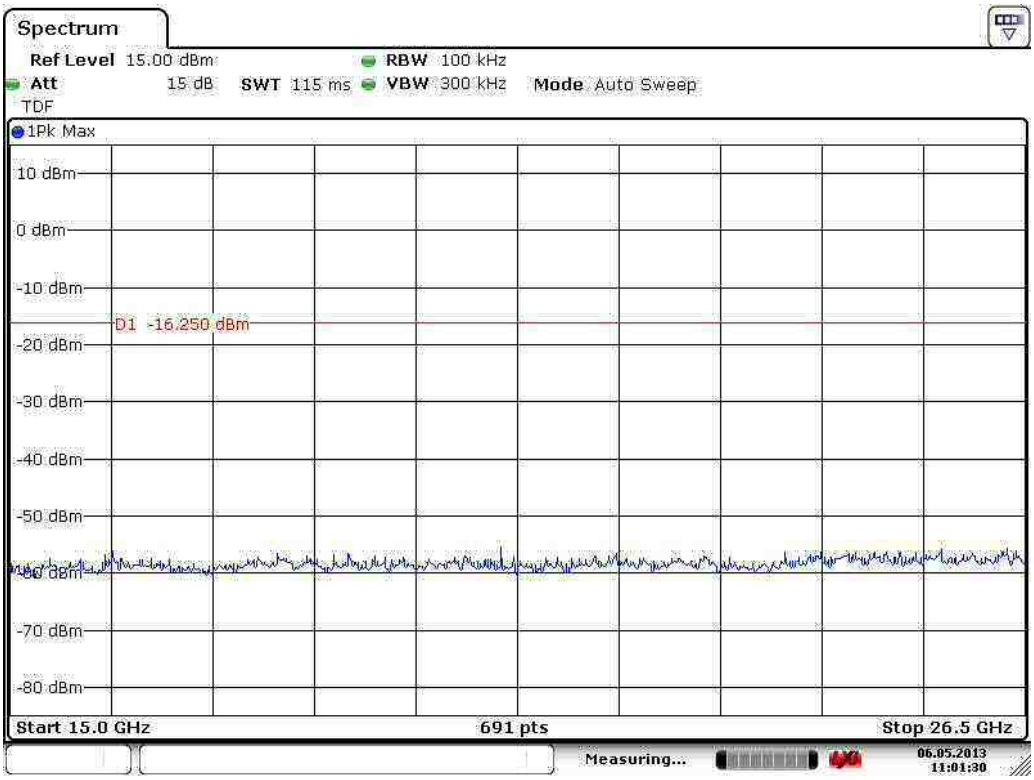
Date: 6.MAY.2013 11:06:15

Figure 80. Mid channel conductive emission 5 GHz to 15 GHz (3 Mbps).



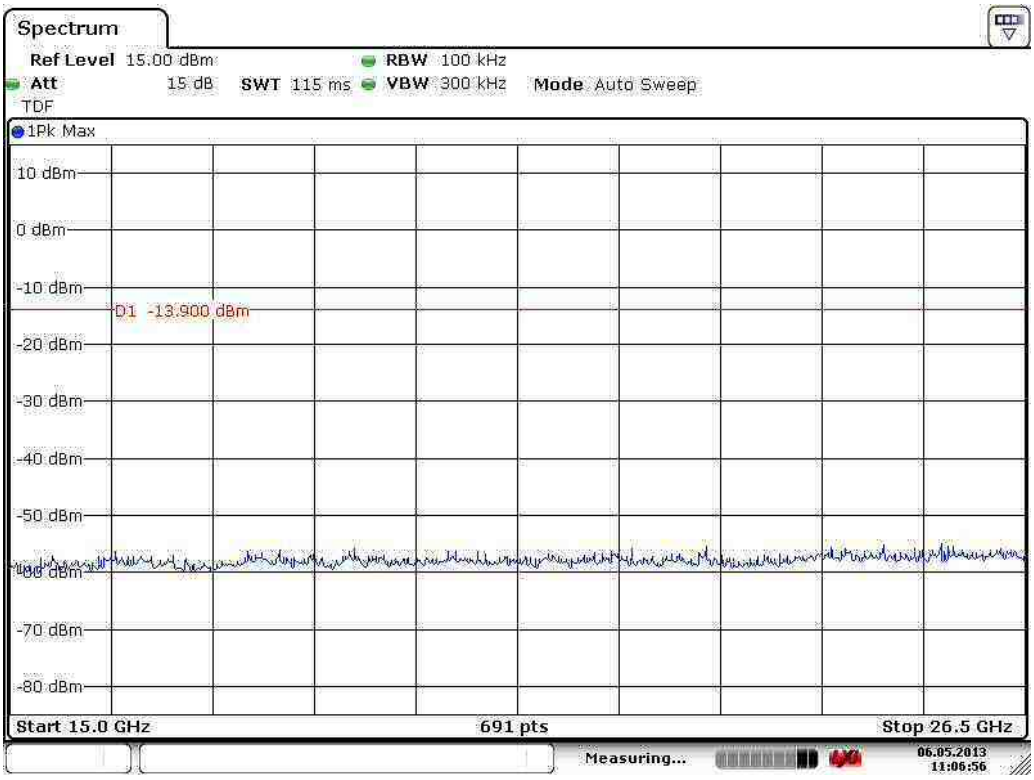
Date: 6.MAY.2013 11:13:15

Figure 81. High channel conductive emission 5 GHz to 15 GHz (3 Mbps).



Date: 6.MAY.2013 11:01:29

Figure 82. Low channel conductive emission 15 GHz to 26.5 GHz (3 Mbps).



Date: 6.MAY.2013 11:06:55

Figure 83. Mid channel conductive emission 15 GHz to 26.5 GHz (3 Mbps).

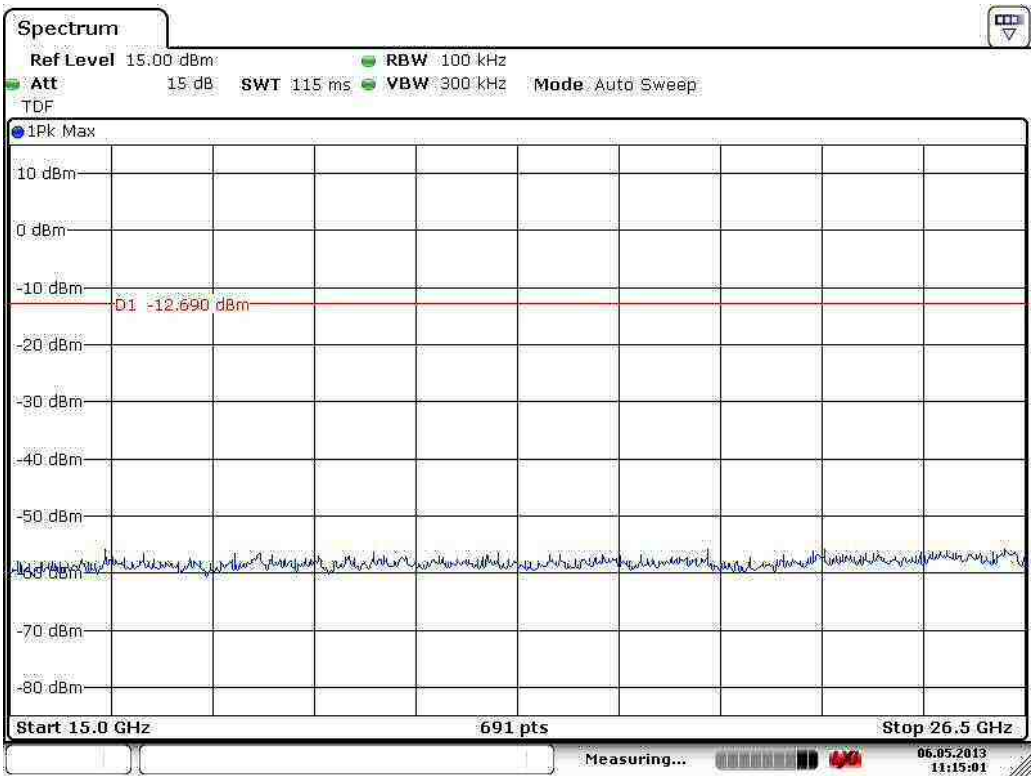


Figure 84. High channel conductive emission 15 GHz to 26.5 GHz (3 Mbps).

20 dB Bandwidth of the Hopping Channel

Standard:	ANSI C63.10	(2009)
Tested by:	RRE	
Date:	3.5.2013	
Temperature:	21 °C	
Humidity:	13 % RH	

FCC Rule: 15.247(a)(1)

Results:

1 Mbps

Table 35. 20 dB bandwidth test results 1 Mbps.

Channel	20 dB BW [kHz]
Low	1111.4
Mid	1111.4
High	1117.2

2 Mbps

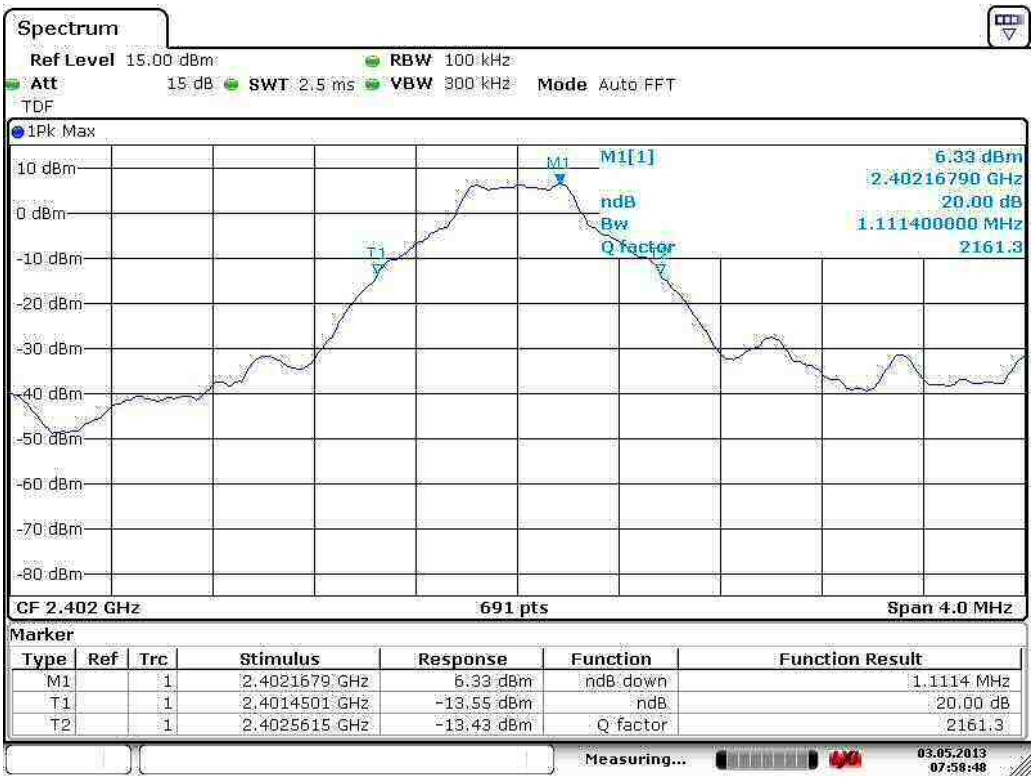
Table 36. 20 dB bandwidth test results 2 Mbps

Channel	20 dB BW [kHz]
Low	1377.7
Mid	1377.7
High	1389.3

3 Mbps

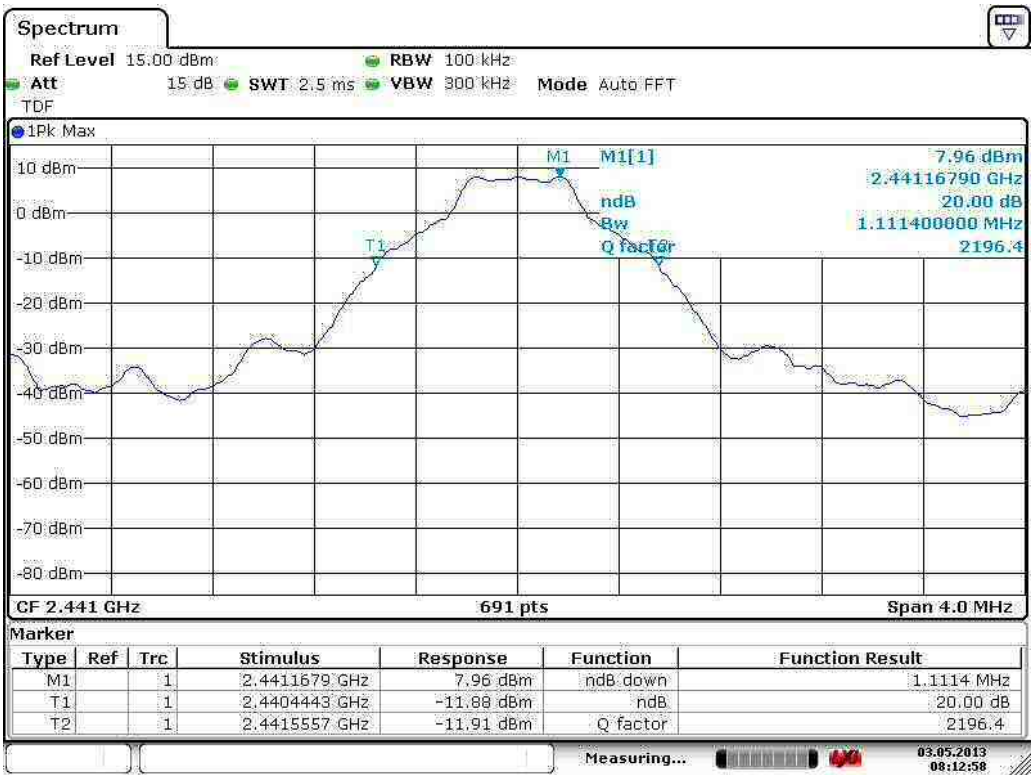
Table 37. 20 dB bandwidth test results 3 Mbps

Channel	20 dB BW [kHz]
Low	1377.7
Mid	1383.5
High	1406.7



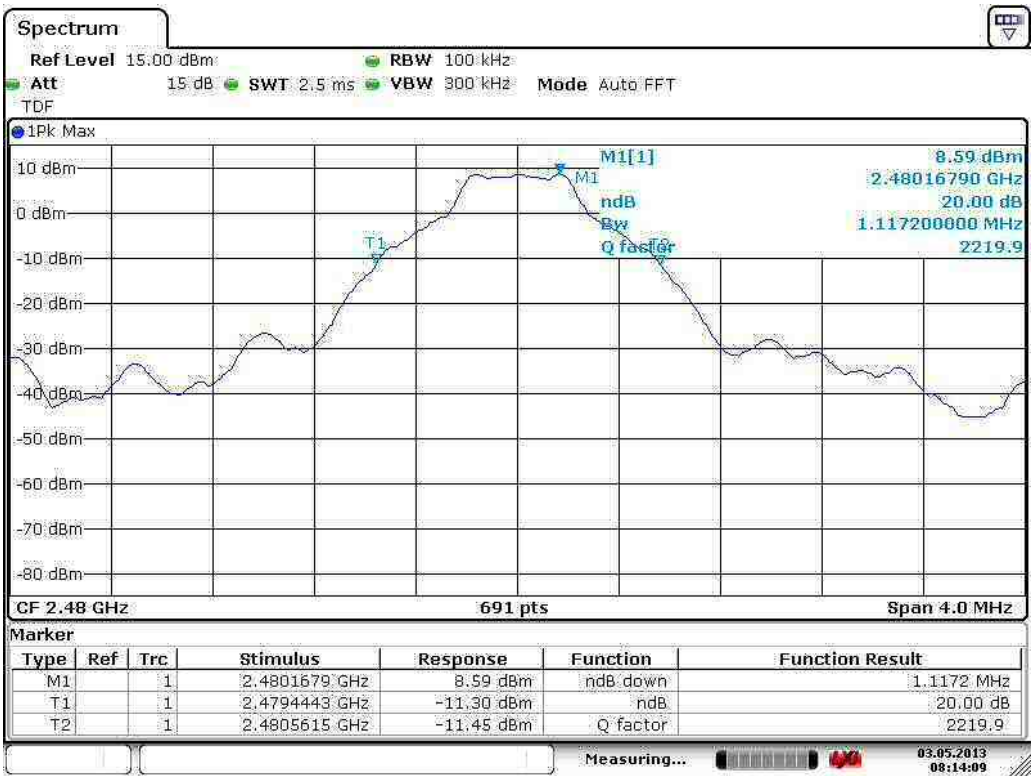
Date: 3.MAY.2013 07:58:48

Figure 85. 20 dB channel BW. 1 Mbps Channel LOW.



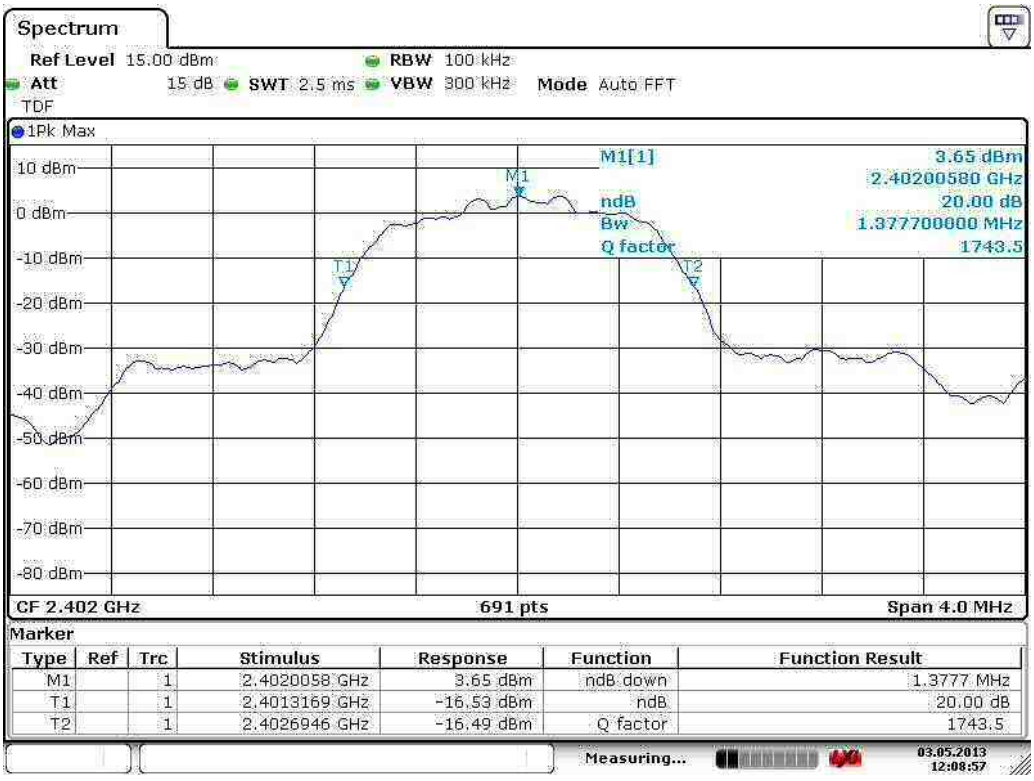
Date: 3.MAY.2013 08:12:57

Figure 86. 20 dB channel BW. 1 Mbps Channel MID.



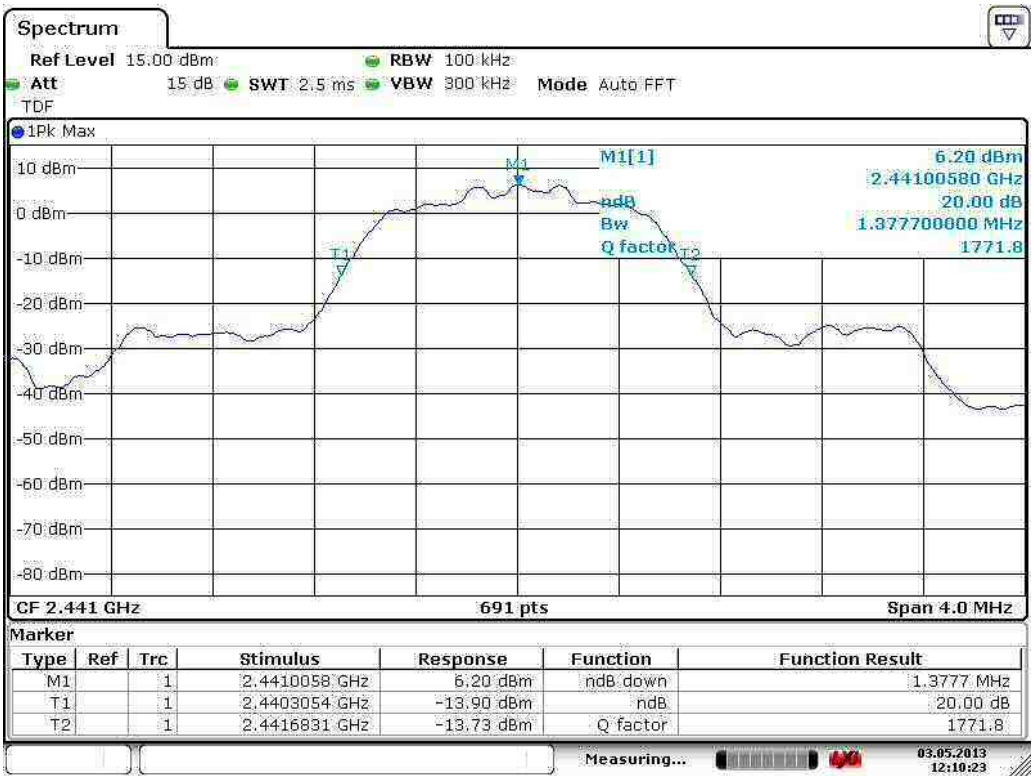
Date: 3.MAY.2013 08:14:09

Figure 87. 20 dB channel BW. 1 Mbps Channel HIGH.



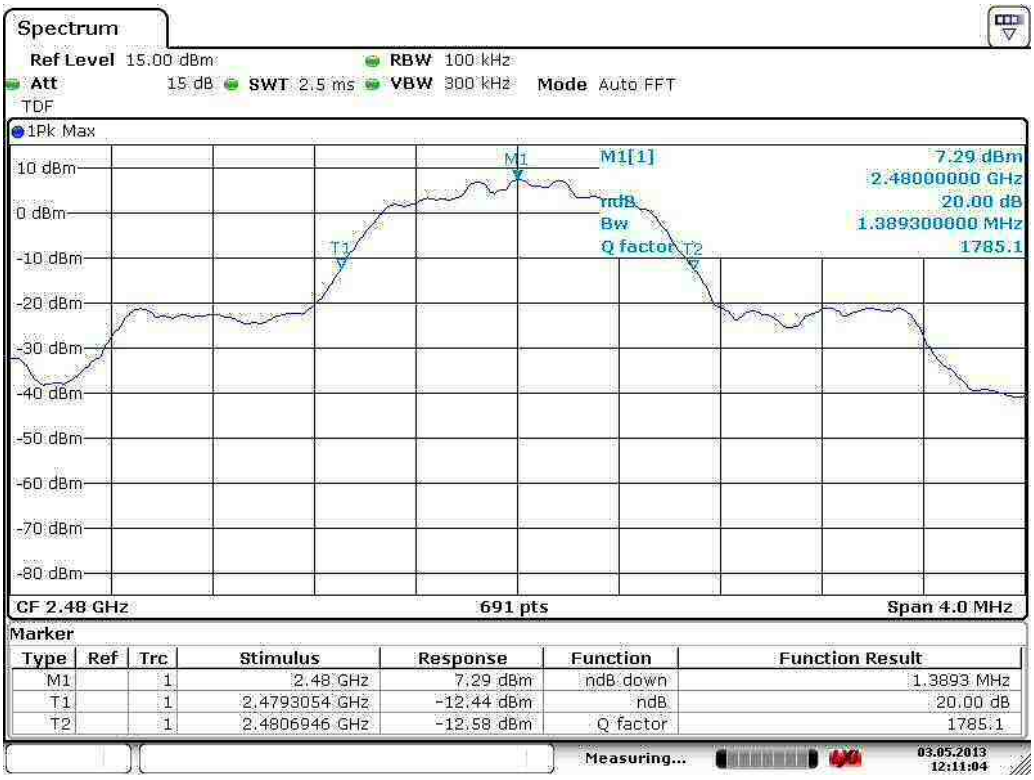
Date: 3.MAY.2013 12:08:57

Figure 88. 20 dB channel BW. 2 Mbps Channel LOW.



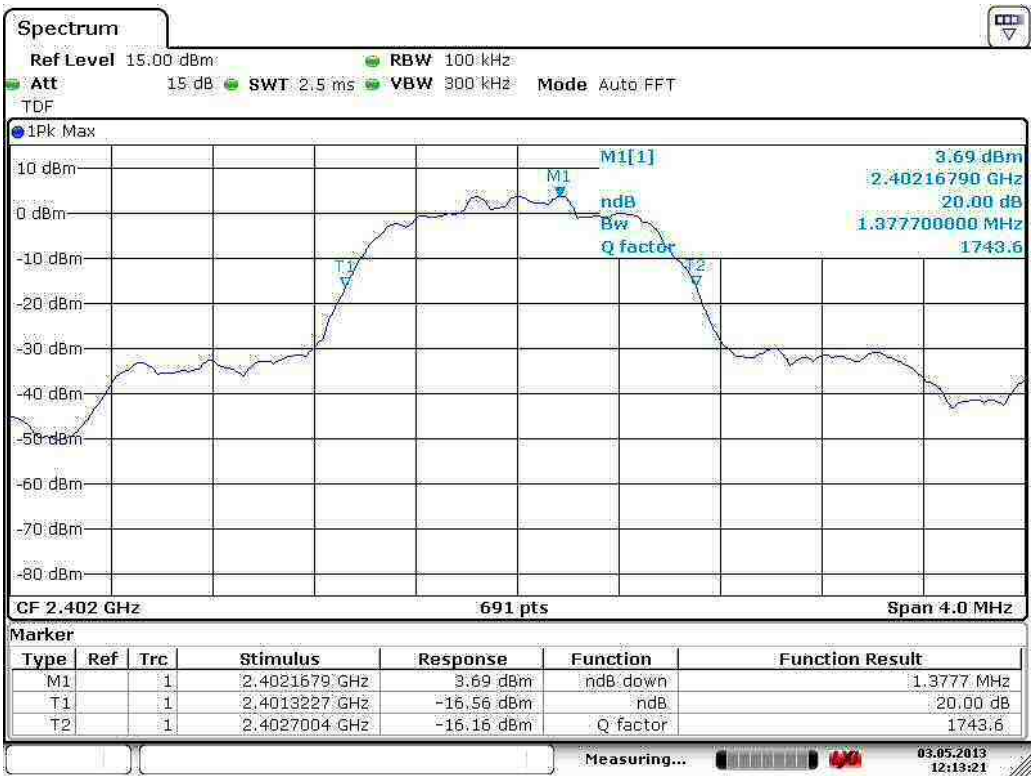
Date: 3.MAY.2013 12:10:22

Figure 89. 20 dB channel BW. 2 Mbps Channel MID.



Date: 3.MAY.2013 12:11:04

Figure 90. 20 dB channel BW. 2 Mbps Channel HIGH.

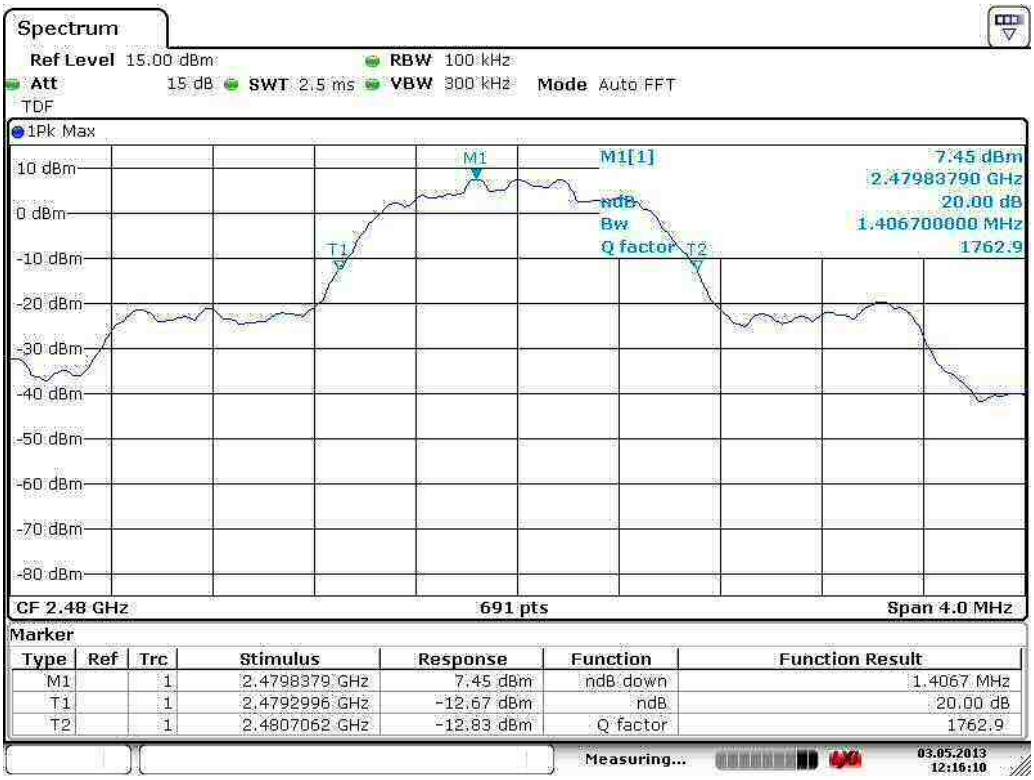


Date: 3.MAY.2013 12:13:21

Figure 91. 20 dB channel BW. 3 Mbps Channel LOW.

Date: 3.MAY.2013 12:14:35

Figure 92. 20 dB channel BW. 3 Mbps Channel MID.



Date: 3.MAY.2013 12:16:10

Figure 93. 20 dB channel BW. 3 Mbps Channel HIGH.

Hopping Channel Carrier Frequencies Separation

Standard:	ANSI C63.10	(2009)
Tested by:	RRE	
Date:	3.5.2013	
Temperature:	21 °C	
Humidity:	13 % RH	

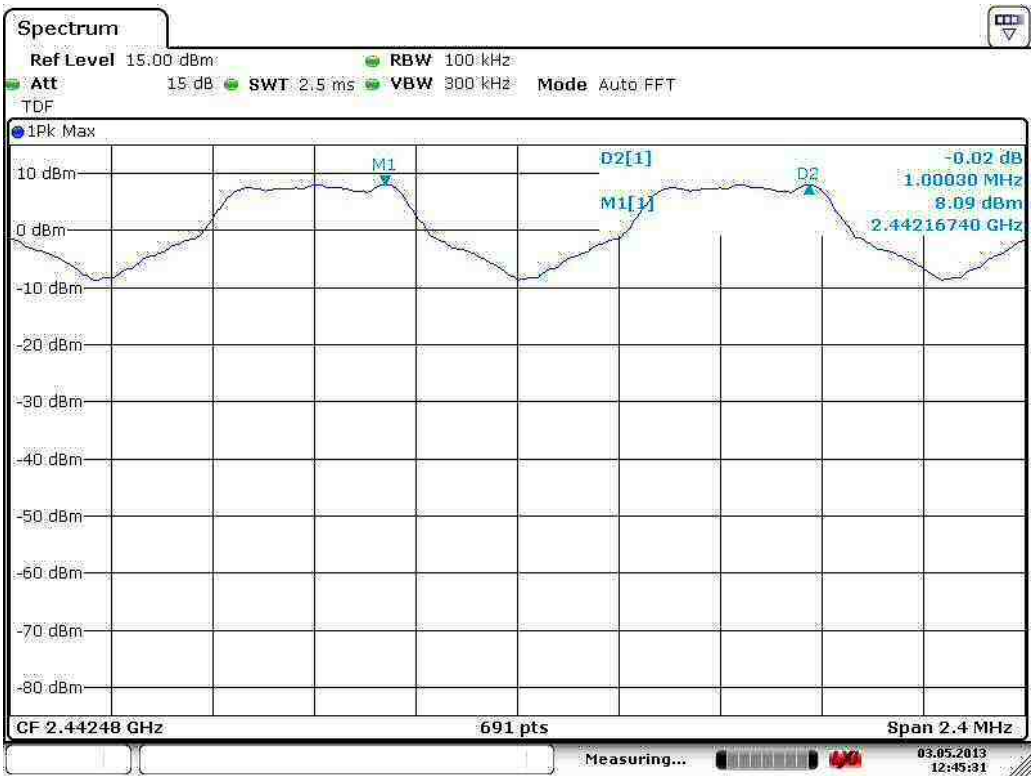
FCC Rule: 15.247(a)(1)

Frequency hopping systems with an output power less than 125mW shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 2/3 of the 20 dB bandwidth of the hopping channel, whichever is greater.

Test result

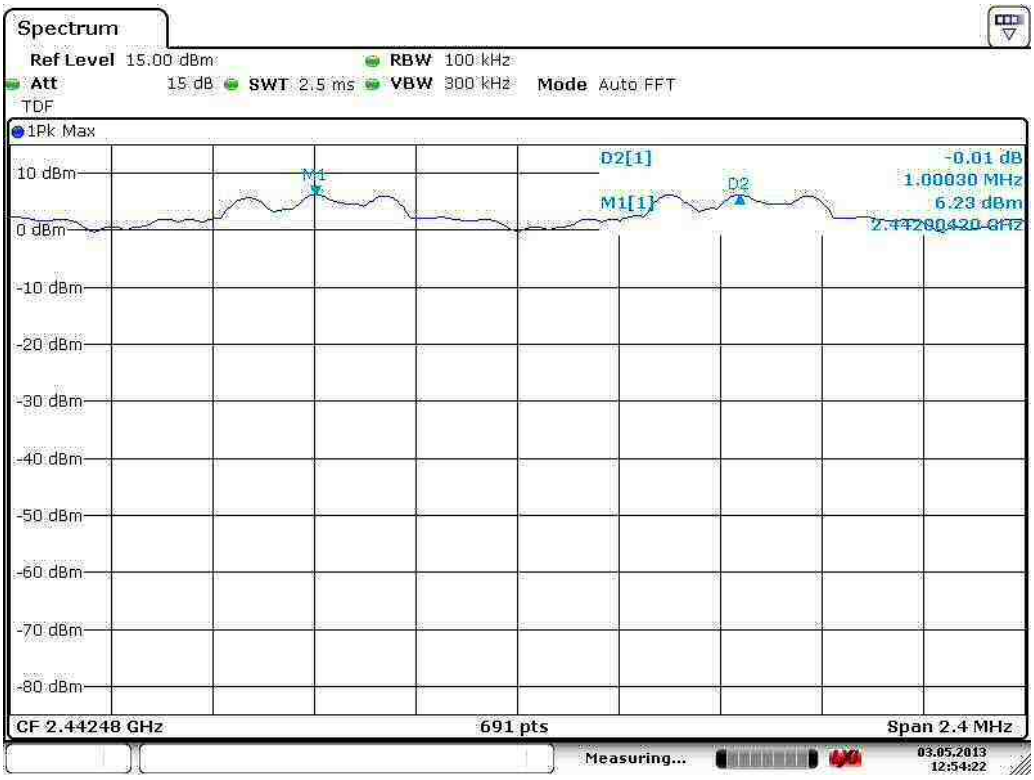
Table 38. Hopping channel carrier frequencies separation test result.

Data rate	Measured separation	Measured 20 dB BW	Limit	Result
1 Mbps	1.00030 MHz	1.1114 MHz	741 kHz	PASS
2 Mbps	1.00030 MHz	1.3777 MHz	918 kHz	PASS
3 Mbps	1.00030 MHz	1.3835 MHz	922 kHz	PASS
Limit:	25 kHz or 2/3 or the 20 dB bandwidth of the hopping channel whichever is greater			



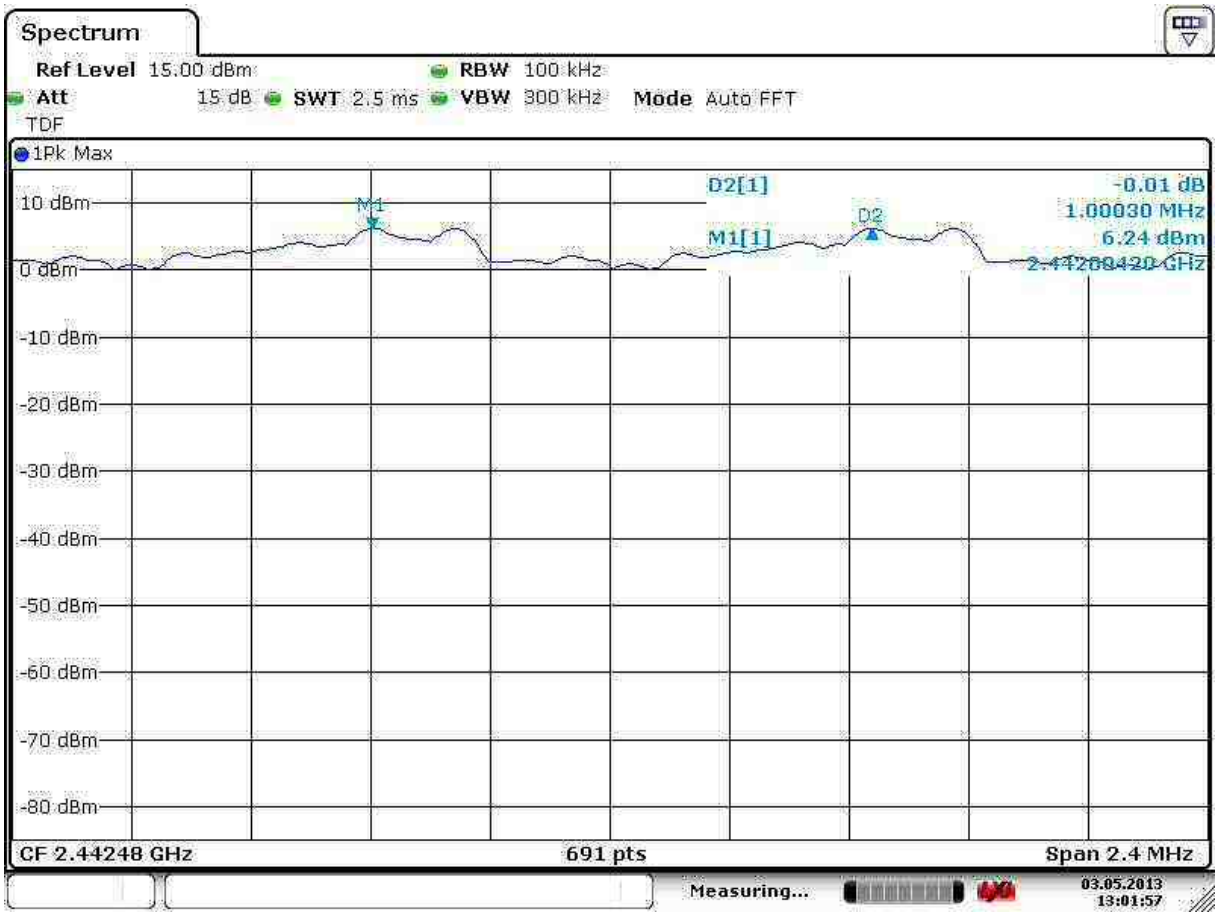
Date: 3.MAY.2013 12:45:30

Figure 94. Measured hopping channels carrier frequency separation 1 Mbps.



Date: 3.MAY.2013 12:54:22

Figure 95. Measured hopping channels carrier frequency separation 2 Mbps.



Date: 3.MAY.2013 13:01:57

Figure 96. Measured hopping channels carrier frequency separation 3 Mbps.

Number of Hopping Channels

Standard:	ANSI C63.10	(2009)
Tested by:	RRE	
Date:	3.5.2013	
Temperature:	21 °C	
Humidity:	13 % RH	

FCC Rule: 15.247(a)(1)(iii)

For frequency hopping systems operating in the 2400 – 2483.5 MHz band shall use at least 15 channels.

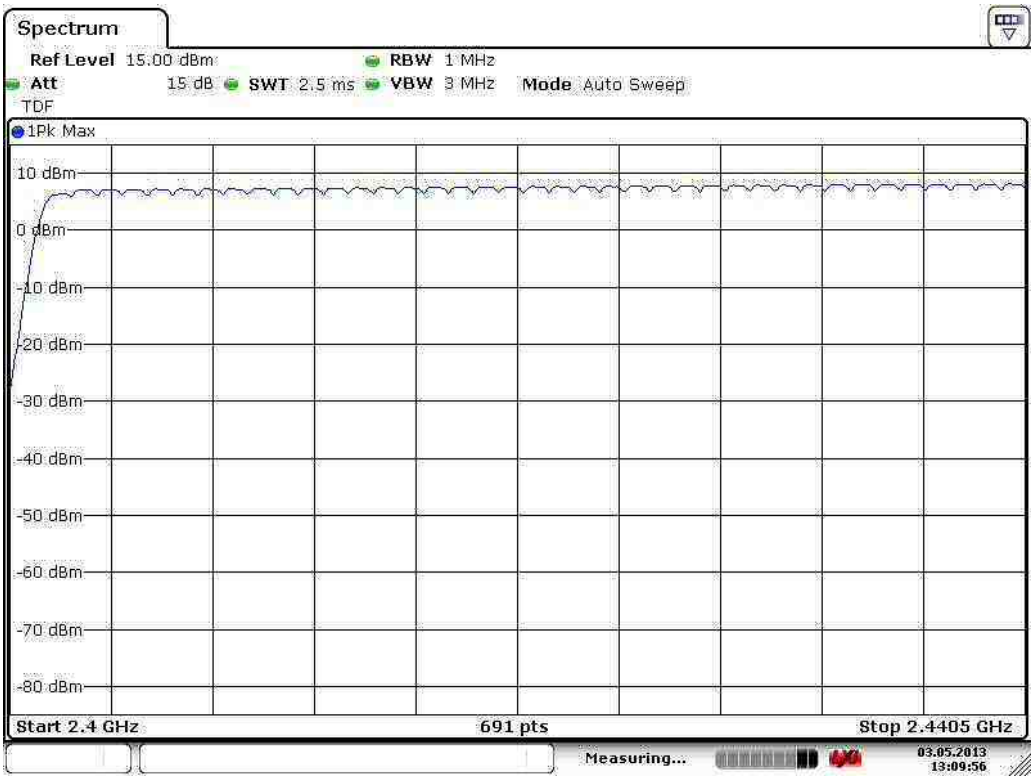
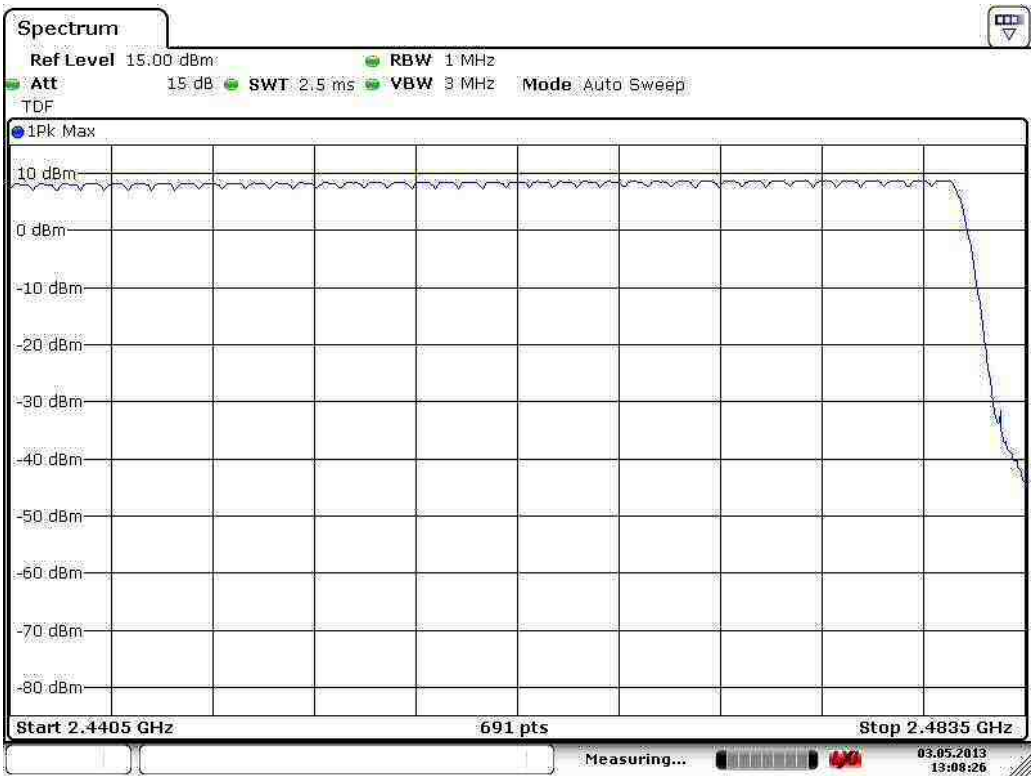
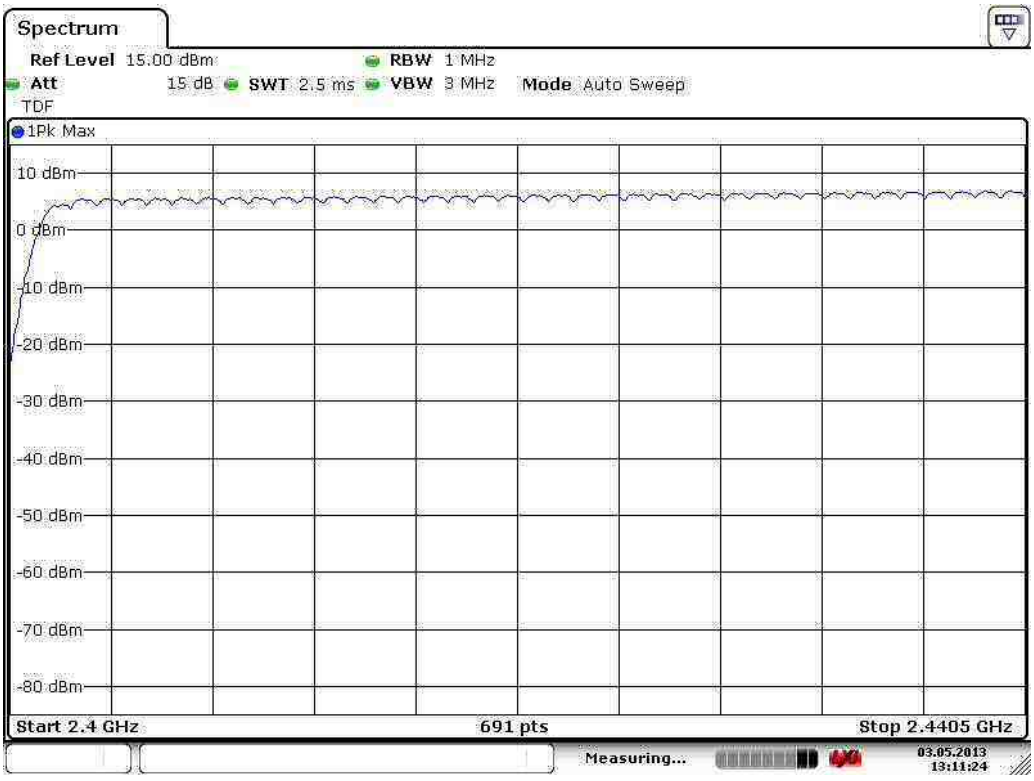


Figure 97. First 39 channels 1 Mbps.



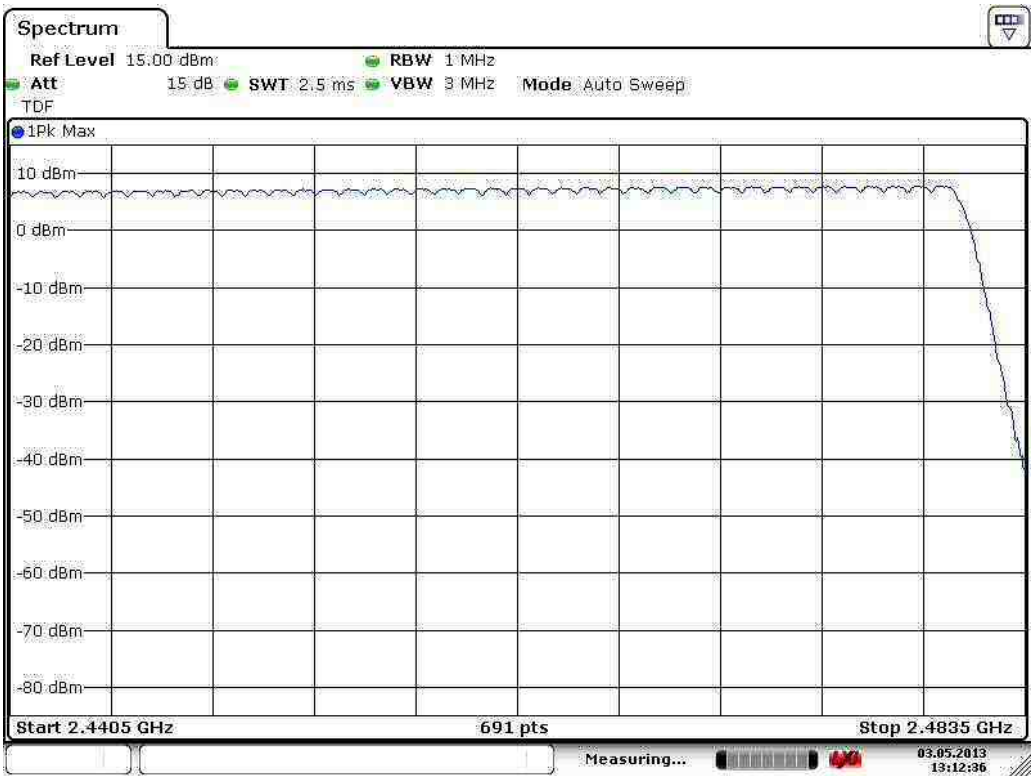
Date: 3.MAY.2013 13:08:26

Figure 98. Second 40 channels 1 Mbps.



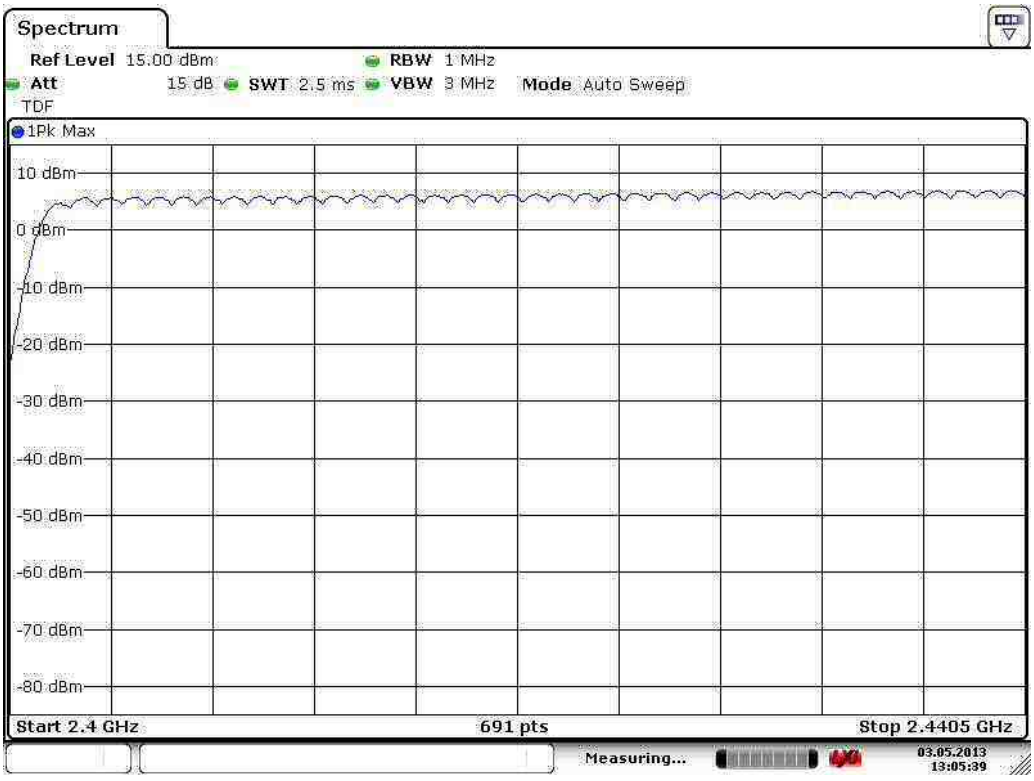
Date: 3.MAY.2013 13:11:24

Figure 99. First 39 channels 2 Mbps.



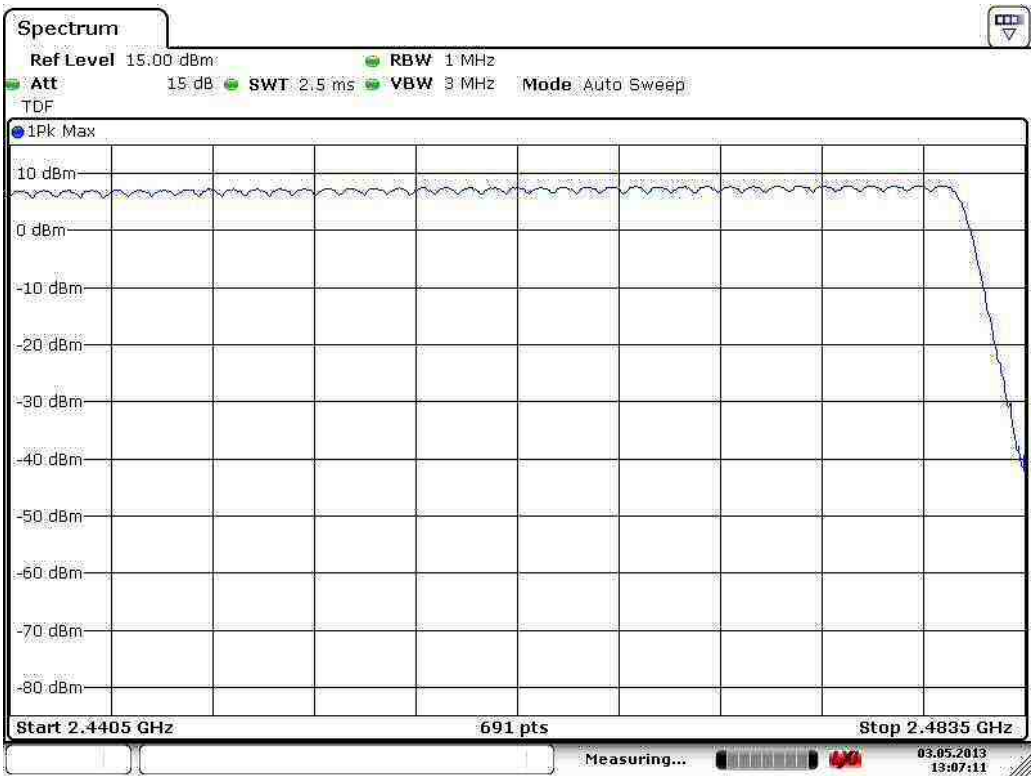
Date: 3.MAY.2013 13:12:35

Figure 100. Second 40 channels 2 Mbps.



Date: 3.MAY.2013 13:05:38

Figure 101. First 39 channels 3 Mbps.



Date: 3.MAY.2013 13:07:10

Figure 102. Second 40 channels 3 Mbps.

Average Time of Occupancy of Hopping Frequency

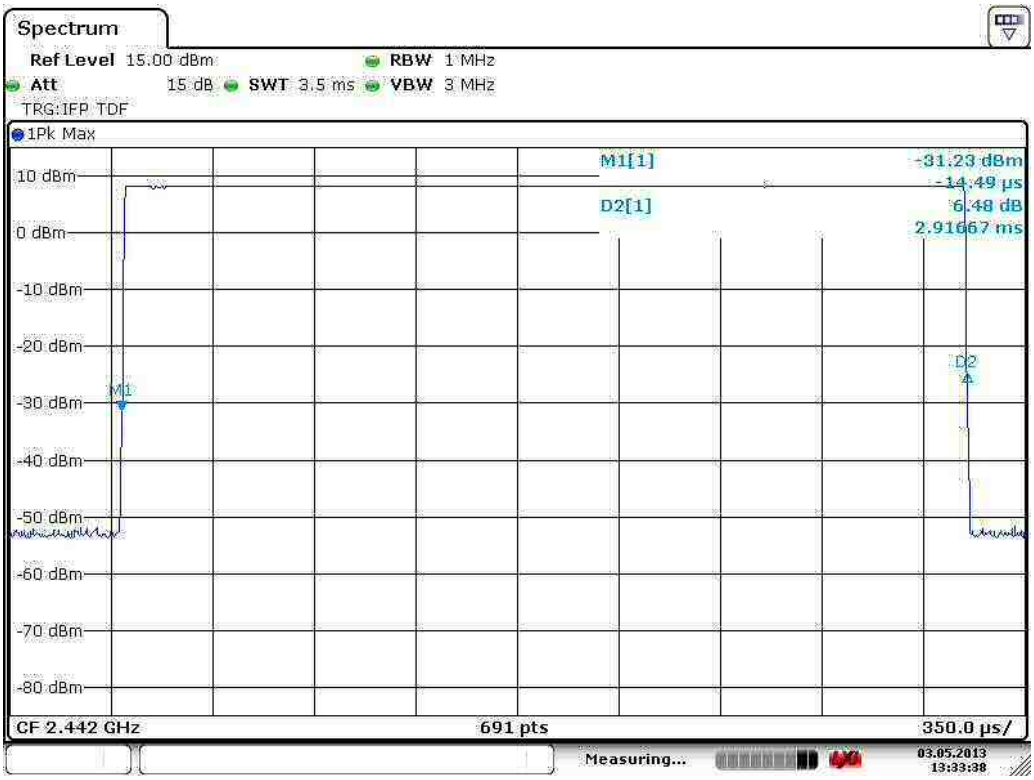
Standard:	ANSI C63.10	(2009)
Tested by:	RRE	
Date:	3.5.2013	
Temperature:	21 °C	
Humidity:	13 % RH	

FCC Rule: 15.247(a)(1)(iii)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

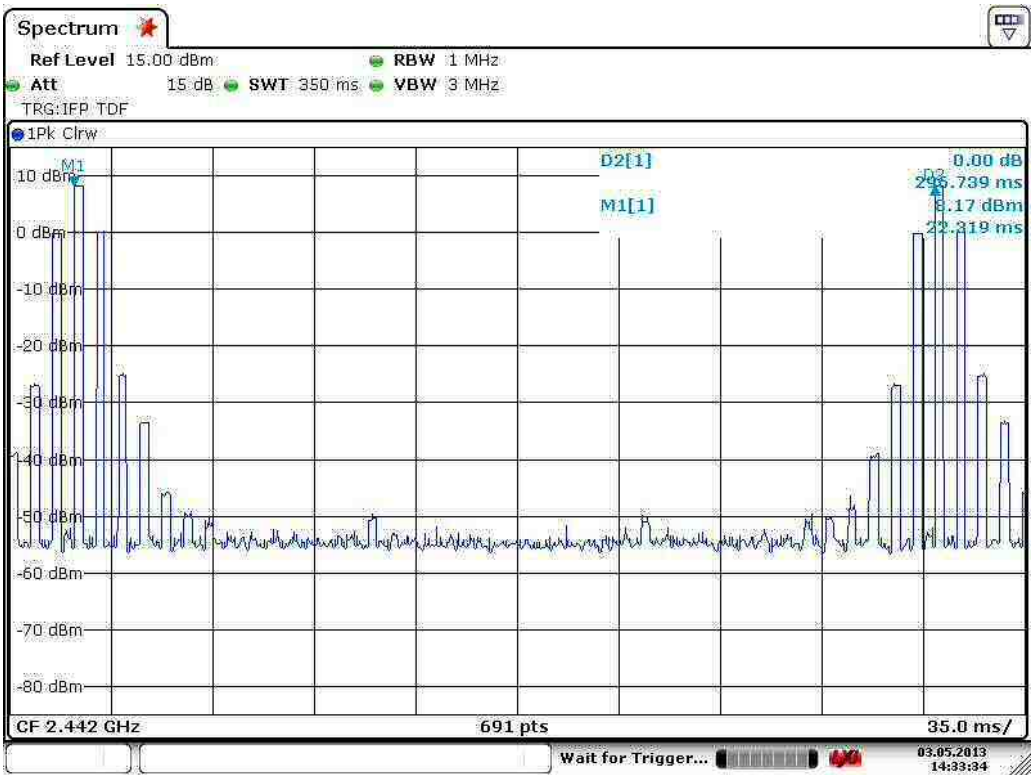
Test was performed in each data rate mode to insure that the all modes are identical.

Time of occupancy calculation:
Number of channels = 79
Measurement period = 0.4 s x 79 = 31.6 s
One channel occupancy time = 296.7 ms
Number of transmission cycles in measurement period = 31.6 / 0.2967 = 106.5
Time of occupancy = (single duration) x (repetition) = 2.91667 ms x 106.5 times = 311 ms



Date: 3.MAY.2013 13:33:38

Figure 103. One channel dwell time.



Date: 3.MAY.2013 14:33:33

Figure 104. Measured repetition of the channel occupancy

99% Occupied Power Bandwidth

Standard:	RSS-GEN	(2010)
Tested by:	RRE	
Date:	3.5.2013	
Temperature:	21 °C	
Humidity:	13 % RH	

RSS-GEN 4.7.

Table 39. Data rate 1 Mbps

Channel	99% BW [MHz]	Limit	Result
Low	0.955137481910	-	PASS
Mid	0.955137481911	-	PASS
High	0.955137481911	-	PASS

Table 40. Data rate 2 Mbps

Channel	99% BW [MHz]	Limit	Result
Low	1.215629522	-	PASS
Mid	1.230101302	-	PASS
High	1.259044863	-	PASS

Table 41. Data rate 3 Mbps

Channel	99% BW [MHz]	Limit	Result
Low	1.230101302	-	PASS
Mid	1.230101302	-	PASS
High	1.244573082	-	PASS

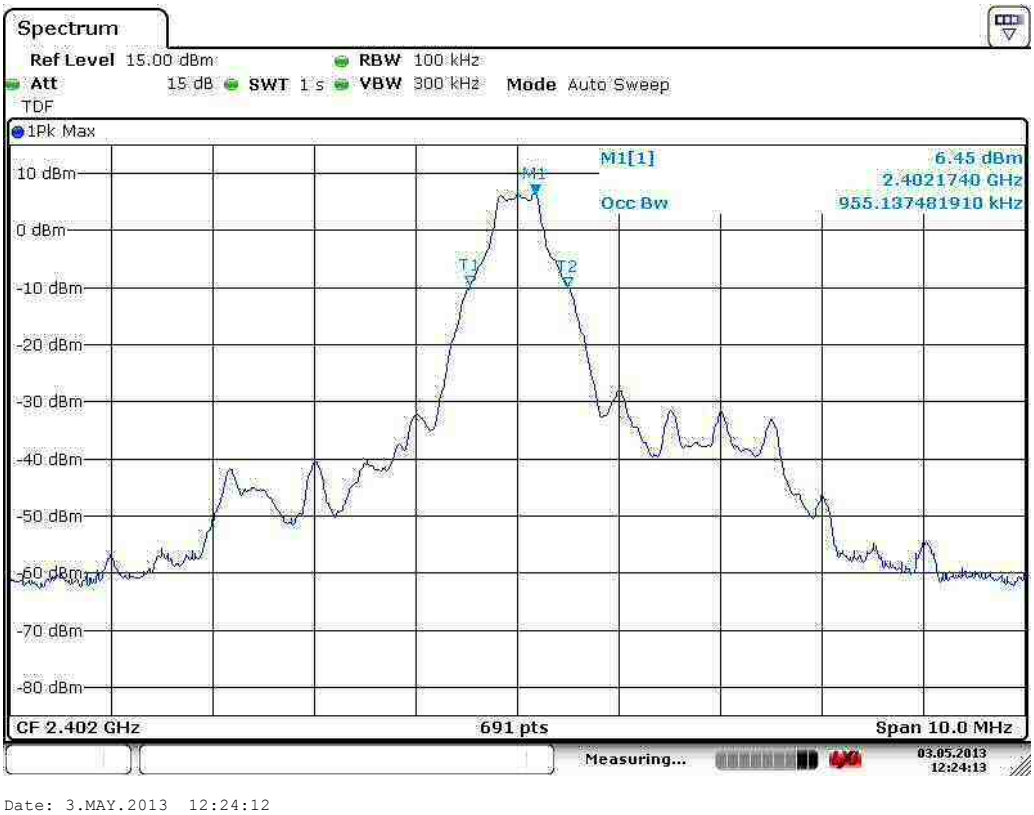


Figure 105. Low channel 99% Occupied Power Bandwidth (1 Mbps).

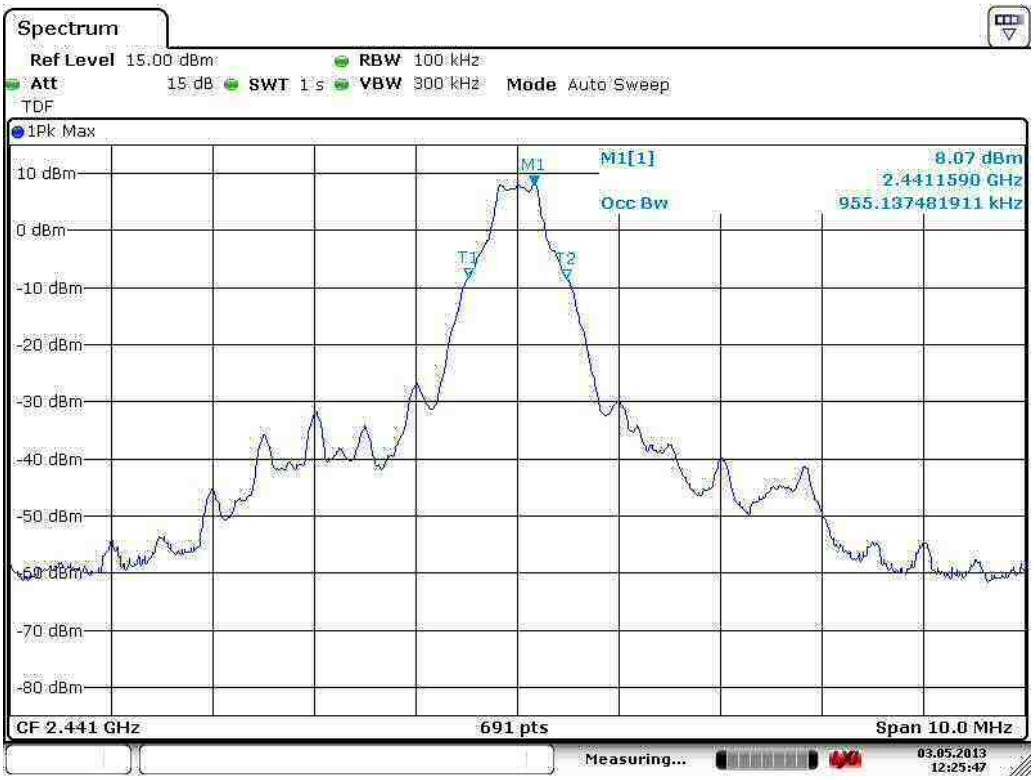


Figure 106. Mid channel 99% Occupied Power Bandwidth (1 Mbps).

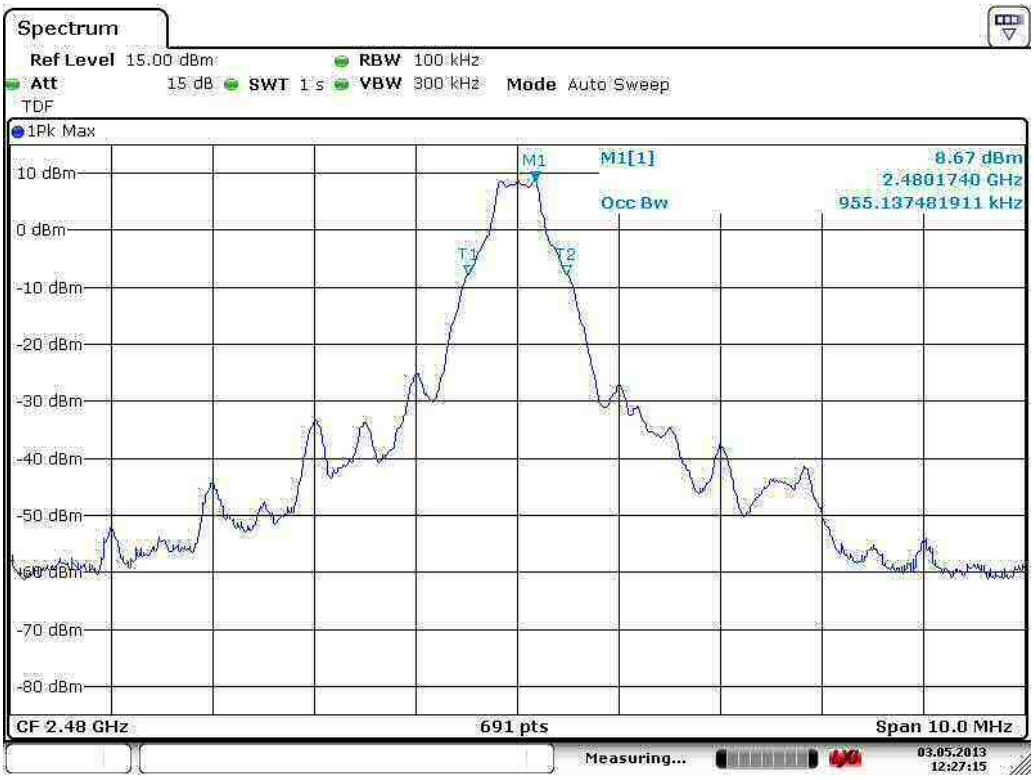


Figure 107. High channel 99% Occupied Power Bandwidth (1 Mbps).

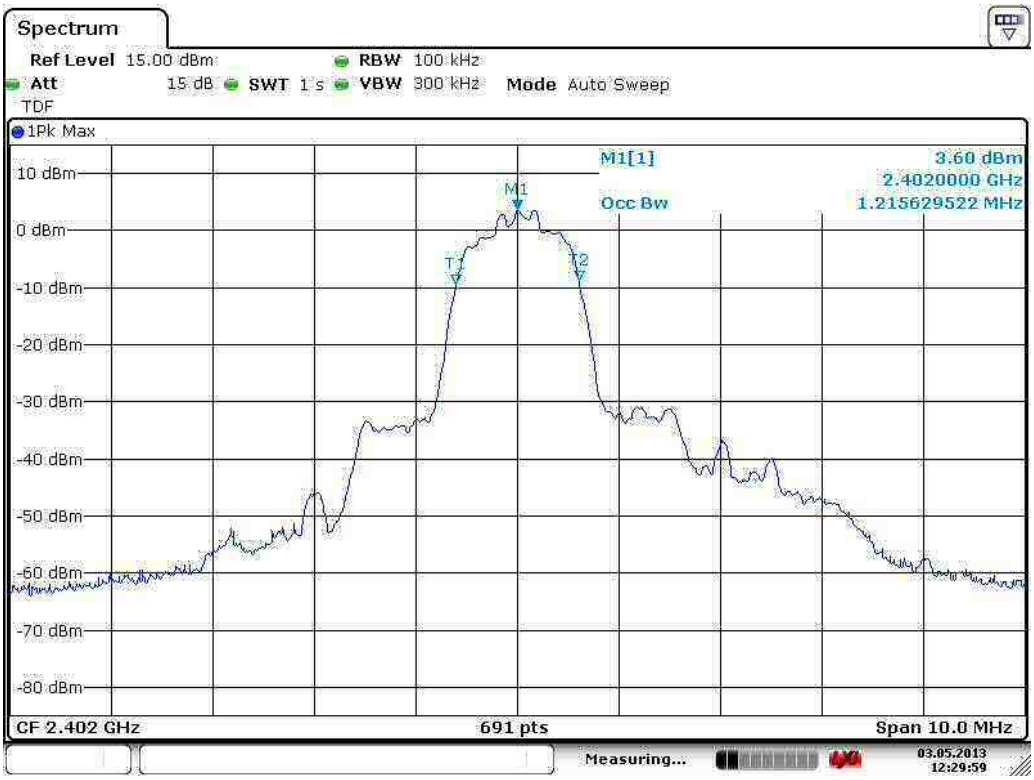


Figure 108. Low channel 99% Occupied Power Bandwidth (2 Mbps).

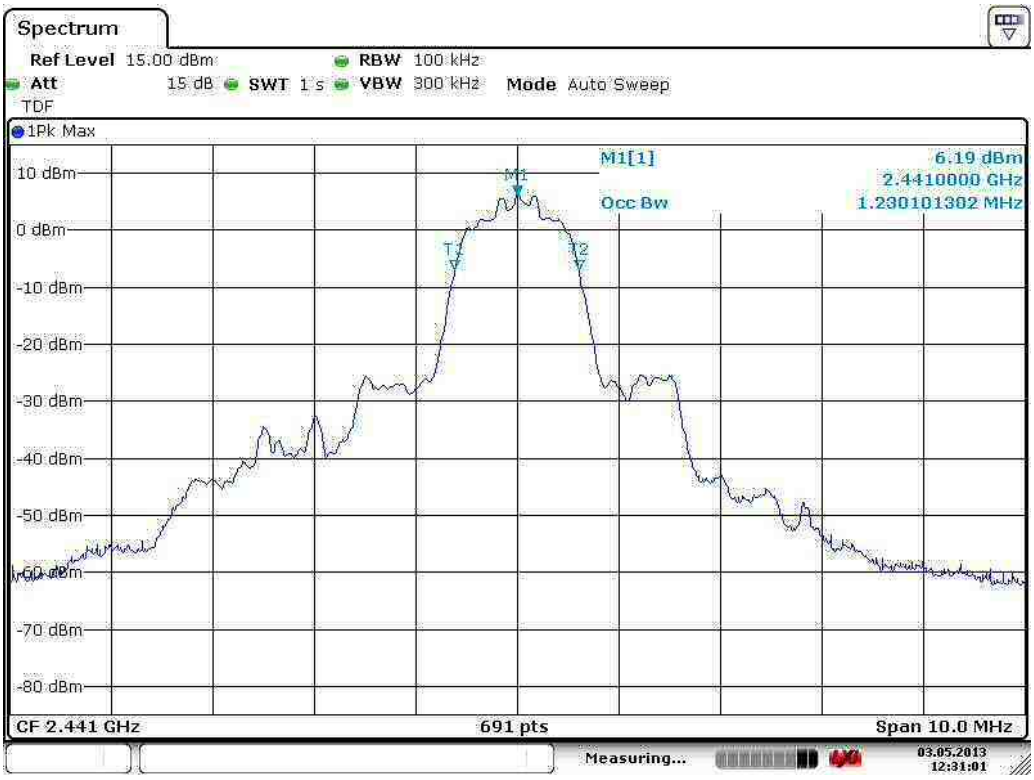
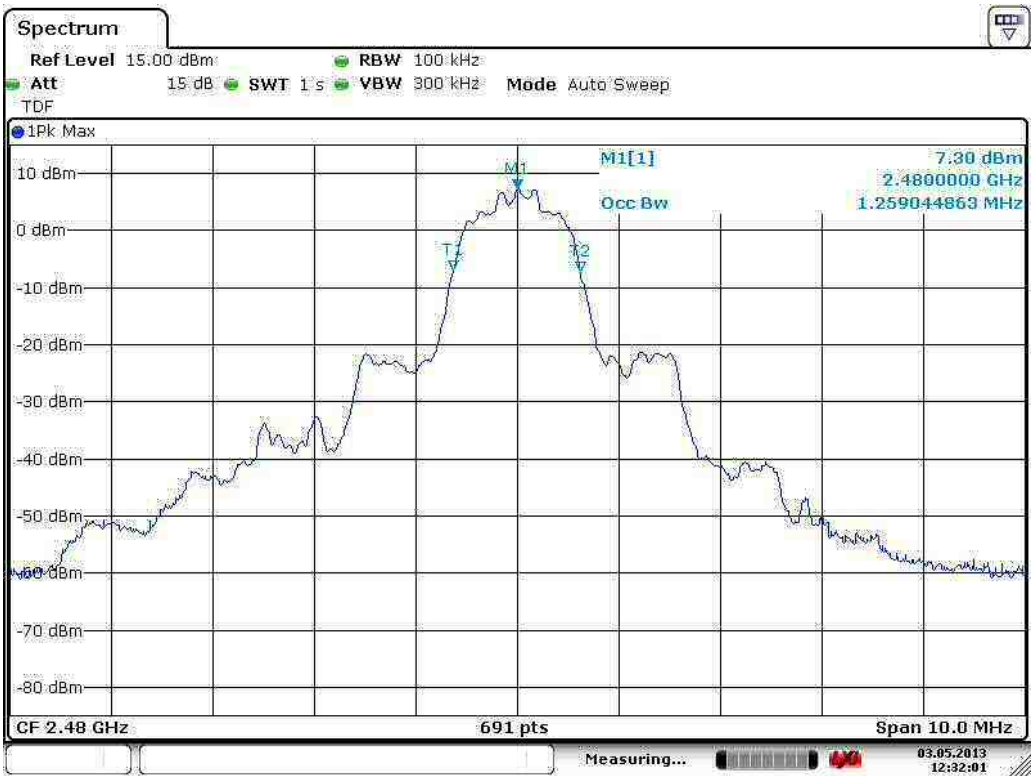
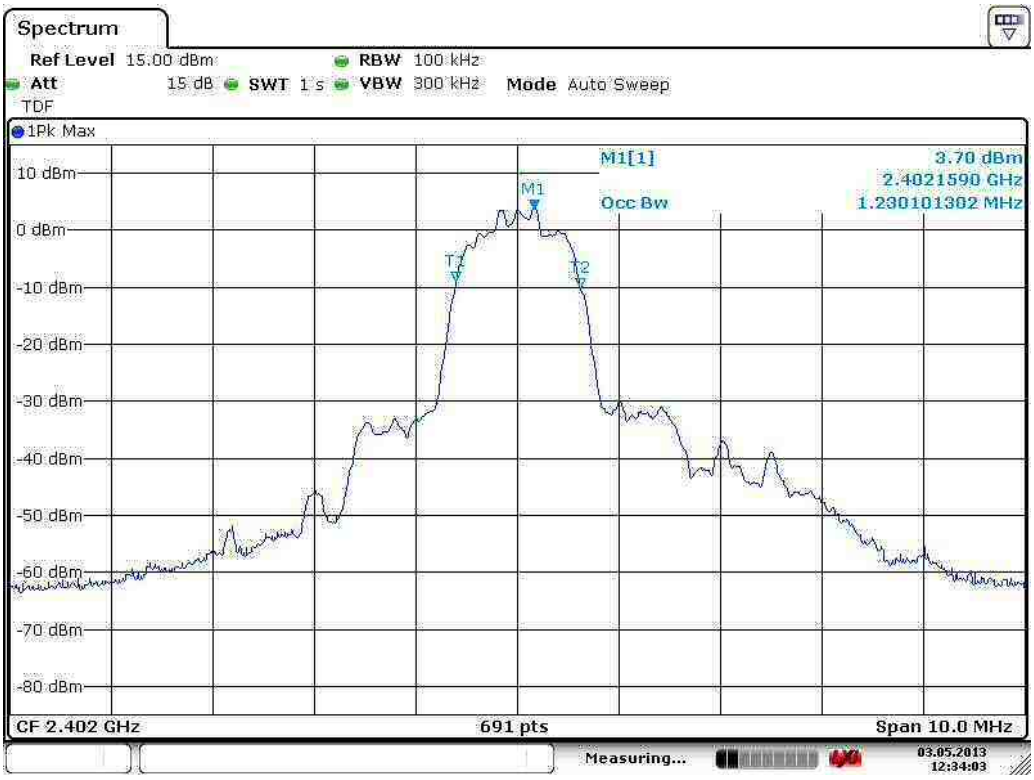


Figure 109. Mid channel 99% Occupied Power Bandwidth (2 Mbps).



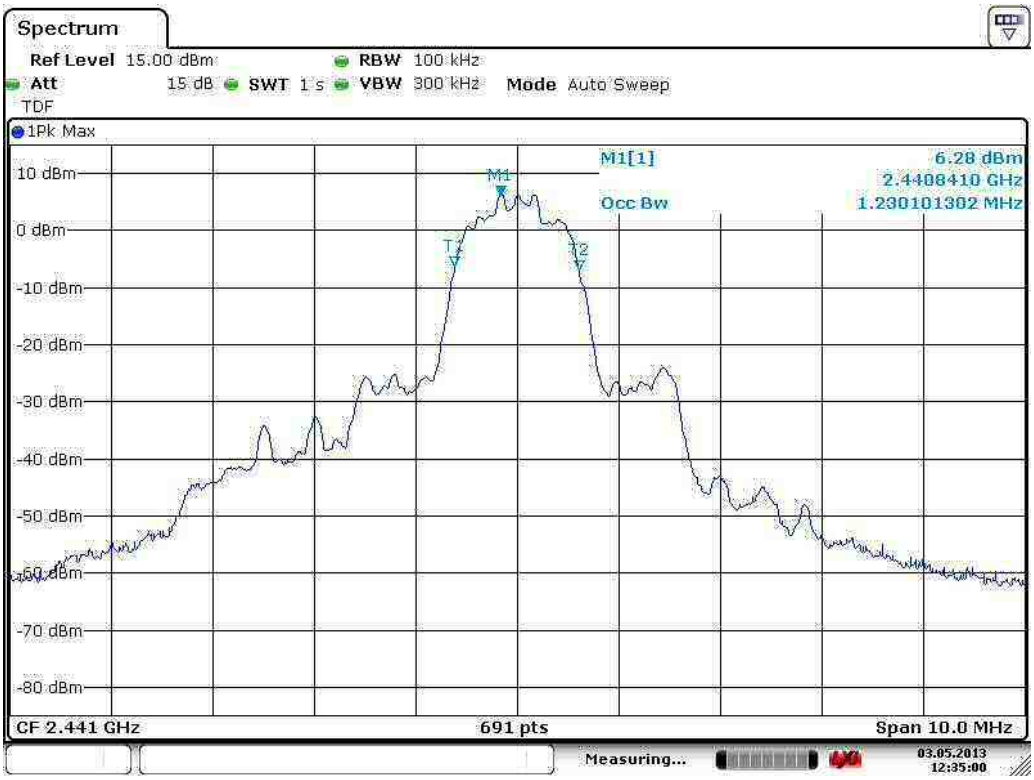
Date: 3.MAY.2013 12:32:01

Figure 110. High channel 99% Occupied Power Bandwidth (2 Mbps).



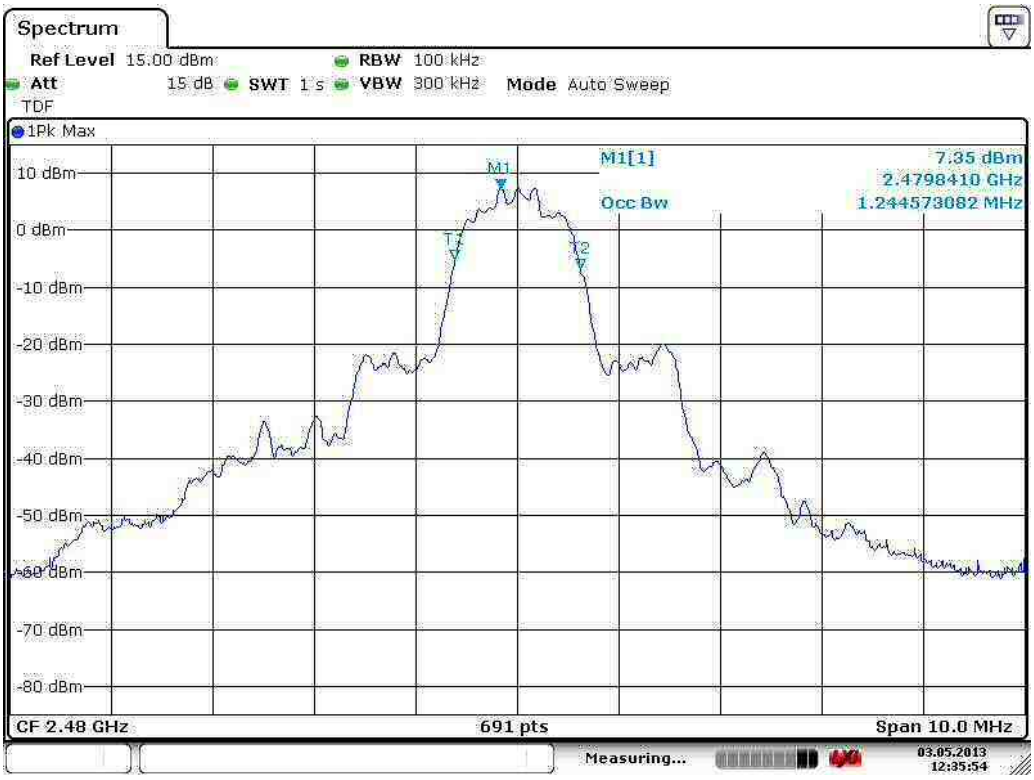
Date: 3.MAY.2013 12:34:03

Figure 111. Low channel 99% Occupied Power Bandwidth (3 Mbps).



Date: 3.MAY.2013 12:35:00

Figure 112. Mid channel 99% Occupied Power Bandwidth (3 Mbps).



Date: 3.MAY.2013 12:35:54

Figure 113. High channel 99% Occupied Power Bandwidth (3 Mbps).

LIST OF TEST EQUIPMENT

Manufacturer	Type	Serial no	Inv. no
ROHDE & SCHWARZ			
Signal Analyzer	FSV40	101068	9093
EMI Test receiver	ESU 26	100185	8453
Test software	EMC32	-	-
DAVIS			
Weather station	Vantage Pro	-	5297
EMCO			
Antenna (1 - 18 GHz)	3117	29617	7293
ETS-LINDGREN			
Antenna (18 GHz – 26 GHz)	3160-09	28535	7294
SCHWARZBECK			
Antenna (30 MHz - 1 GHz)	VULB 9168	9168-503	8911
HEWLETT- PACKARD			
Microwave amplifier	83017A	-	5226
HUBER-SUHNER			
Attenuator 10dB	6810.17B	-	-
DEISEL			
Antenna mast	MA 240	240/455	7896
Turntable	DS 430	-	-
WAINWRIGHT			
High Pass Filter	WHKX	10	8267

All used measurement equipment was calibrated (if required).