9.8 Band edge compliance conducted

Description:

Measurement of the conducted band edge compliance. EUT is measured at the lower and upper band edge in both modes.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	Lower Band Edge: 2300 – 2425 MHz Upper Band Edge: 2450 – 2550 MHz
Trace-Mode:	Max hold

Limits:

FCC	IC
Band Edge Compliance Conducted	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.	

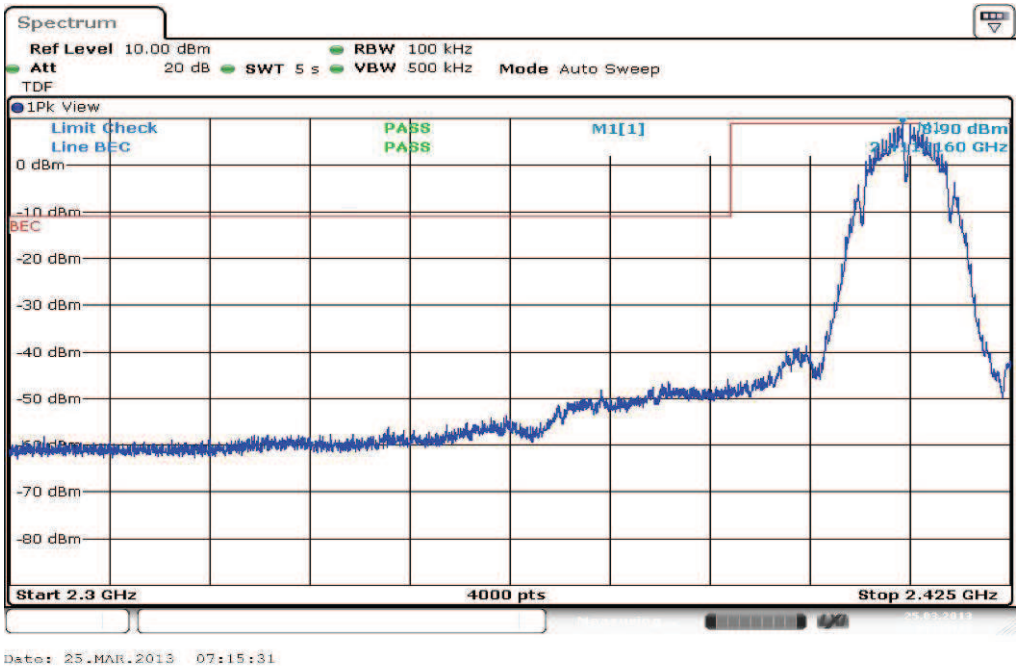
Results:

Scenario	Band Edge Compliance Conducted [dB]		
Modulation	DSSS / b – mode	OFDM / g – mode	OFDM / n – mode
Lower Band Edge – Channel 1	> 20 dB	> 20 dB	> 20 dB
Upper Band Edge – Channel 11	> 20 dB	> 20 dB	> 20 dB
Measurement uncertainty	± 1.5 dB		

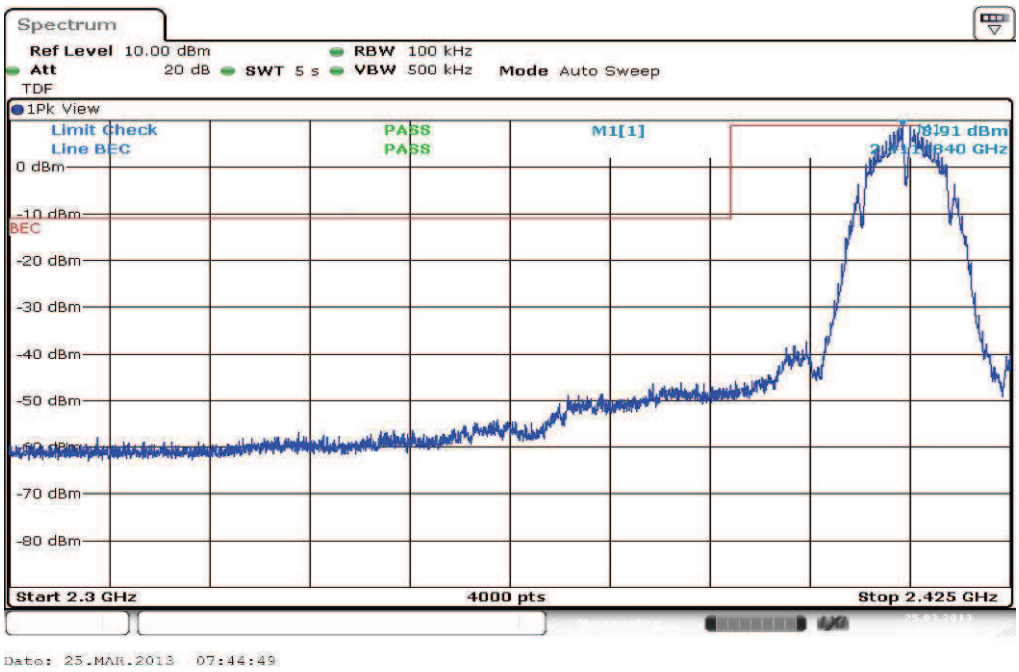
Result: Passed

Plots:

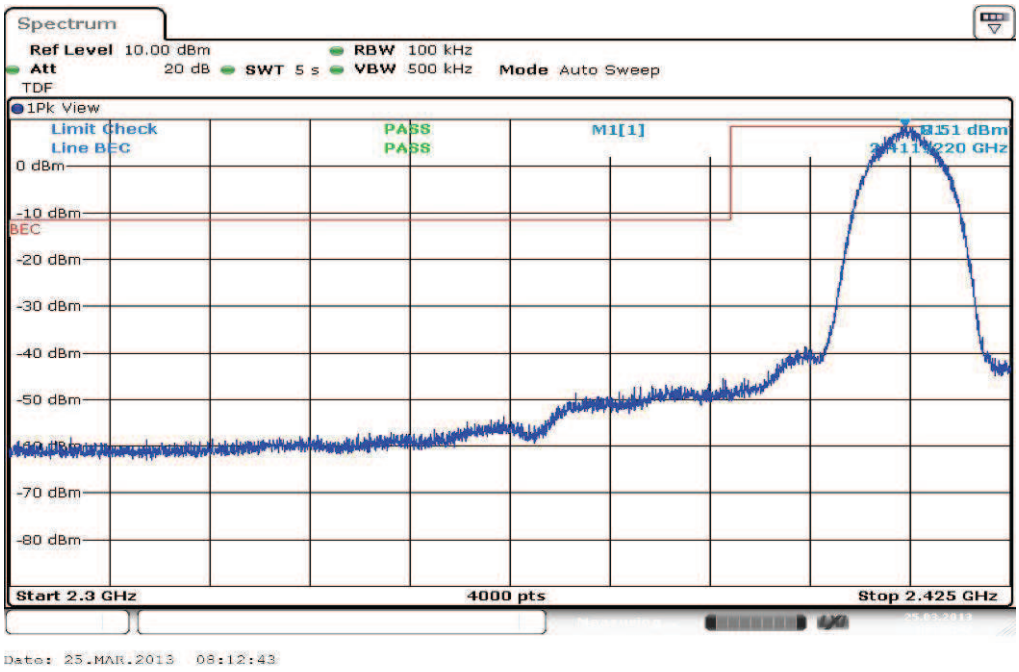
Plot 1: lowest channel, b – mode, 1 Mbps



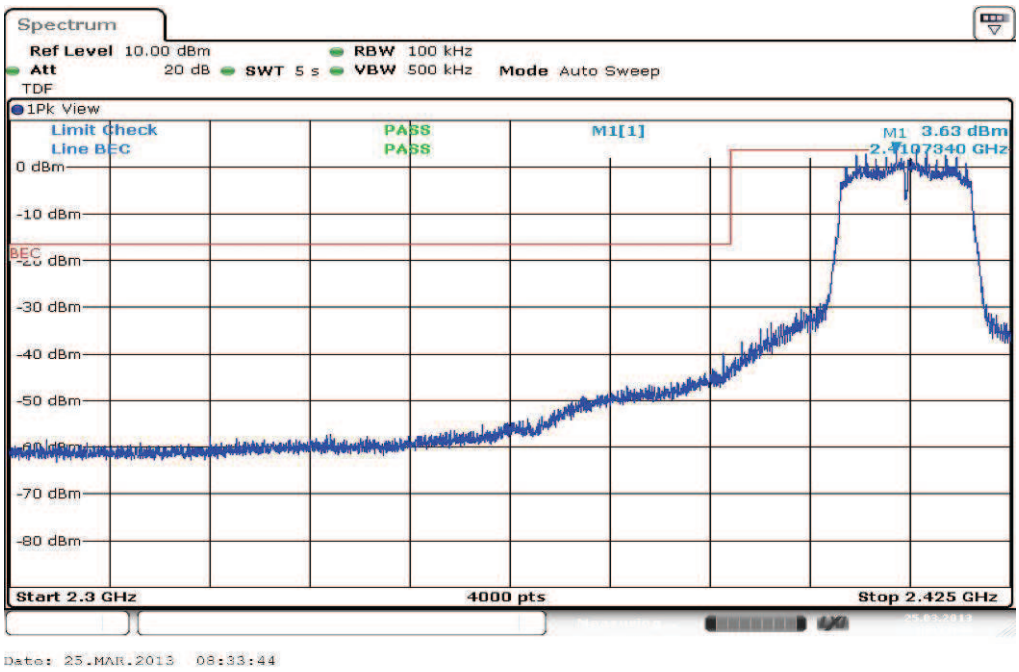
Plot 2: lowest channel, b – mode, 5.5 Mbps



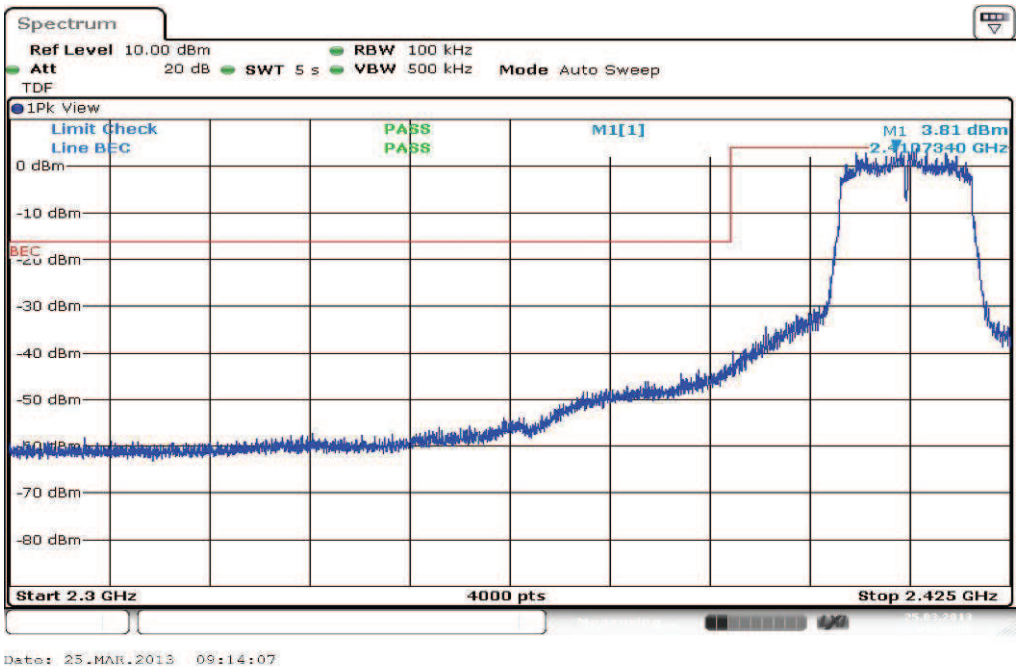
Plot 3: lowest channel, b – mode, 11 Mbps



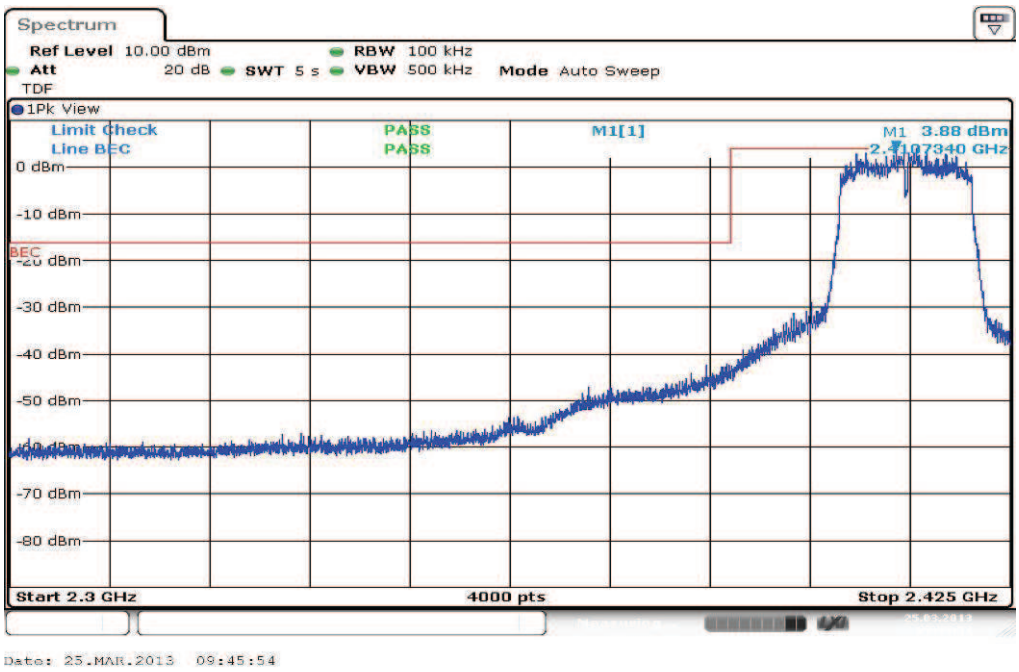
Plot 4: lowest channel, g – mode, 6 Mbps



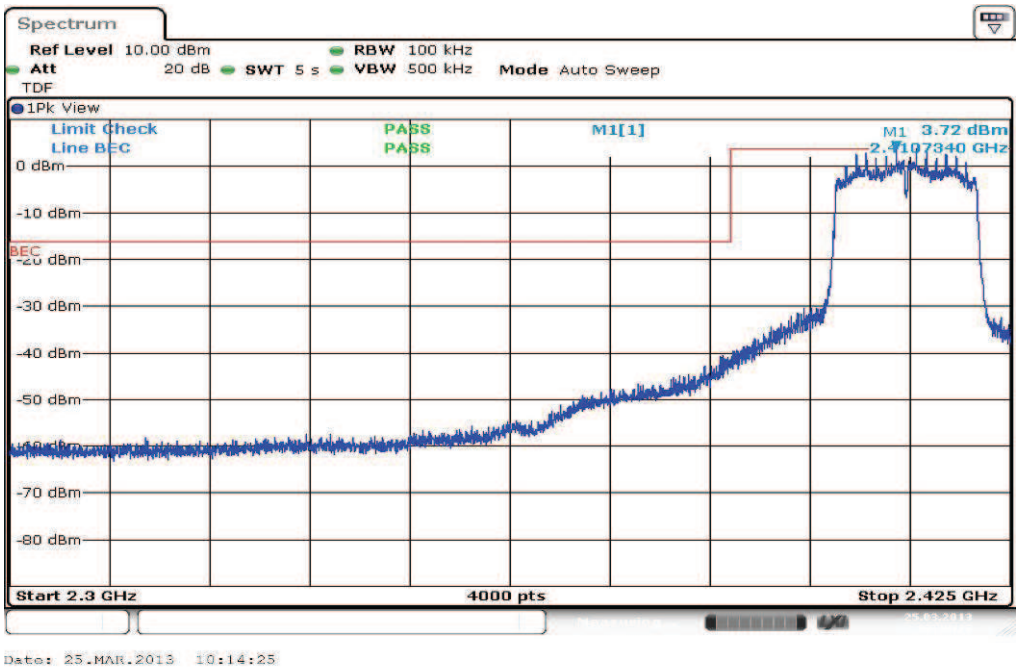
Plot 5: lowest channel, g – mode, 24 Mbps



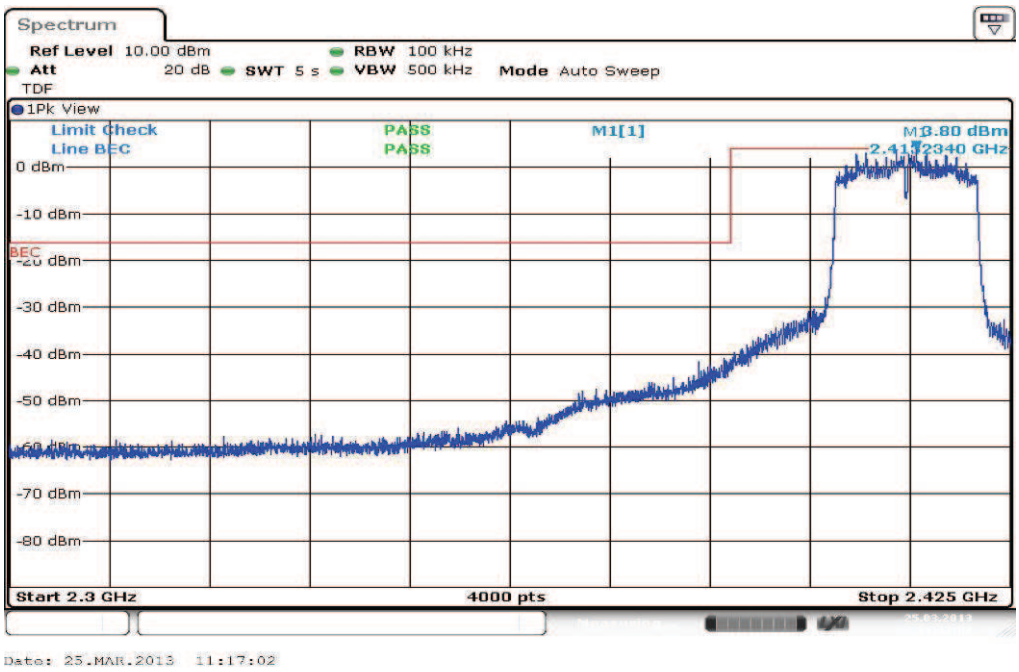
Plot 6: lowest channel, g – mode, 54 Mbps



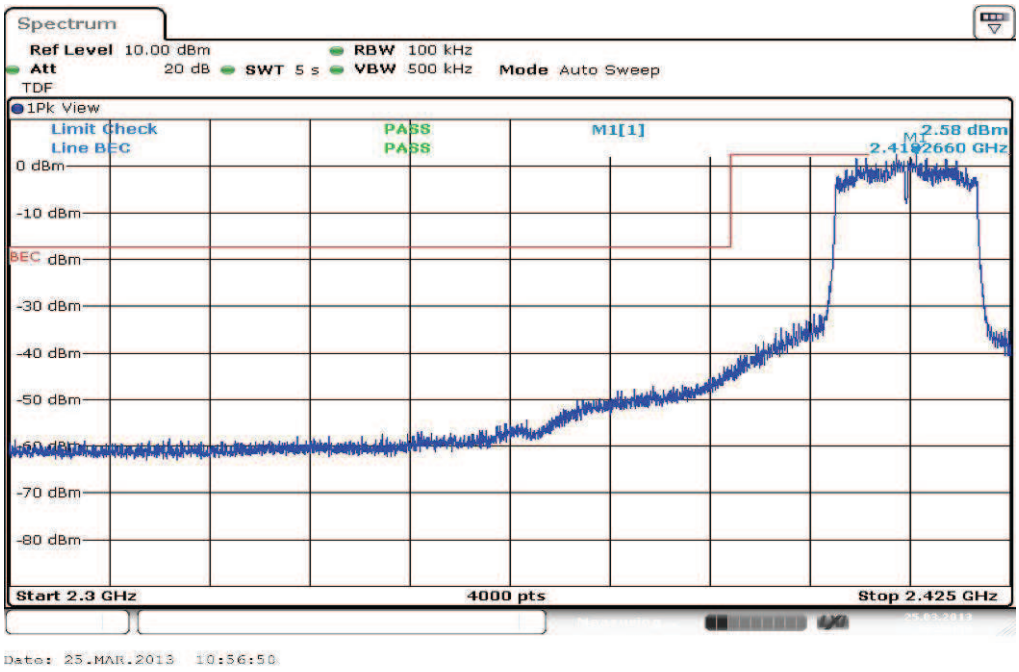
Plot 7: lowest channel, n – mode, MCS 0



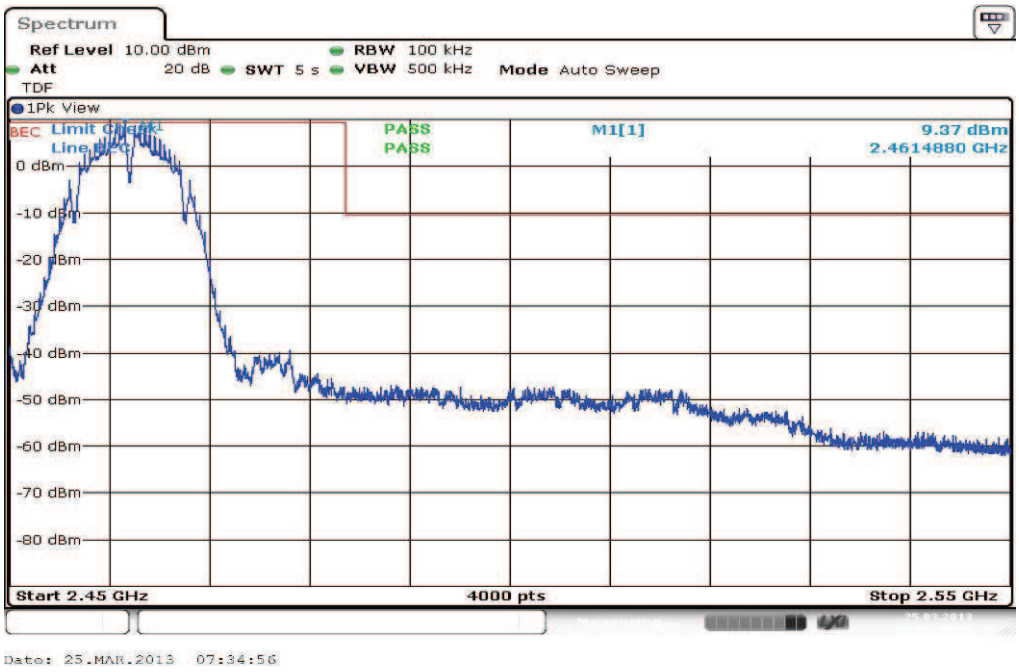
Plot 8: lowest channel, n – mode, MCS 4



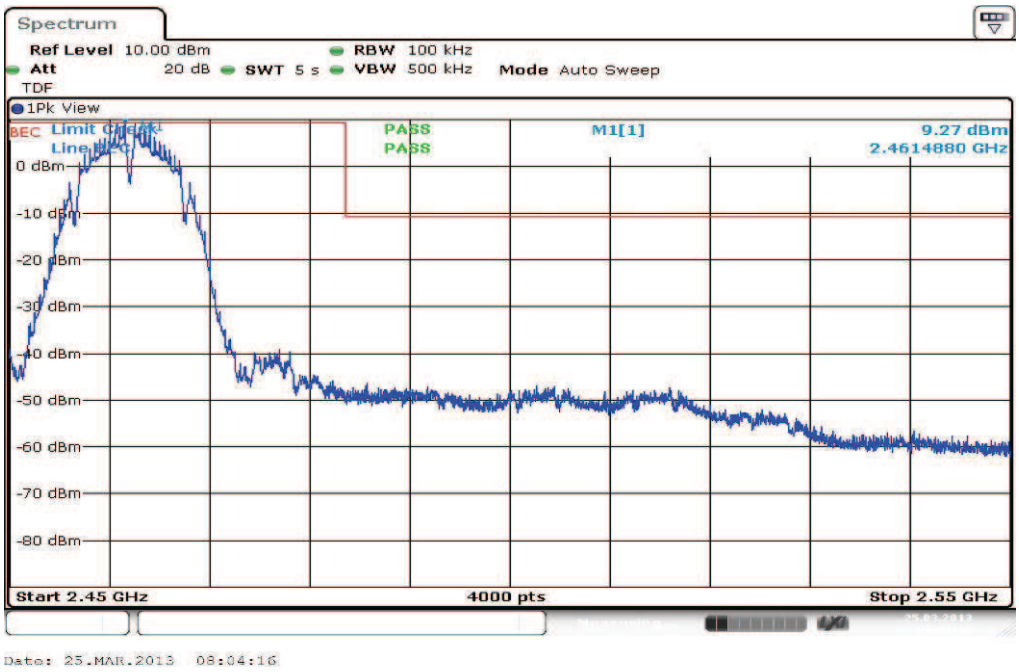
Plot 9: lowest channel, n – mode, MCS 7



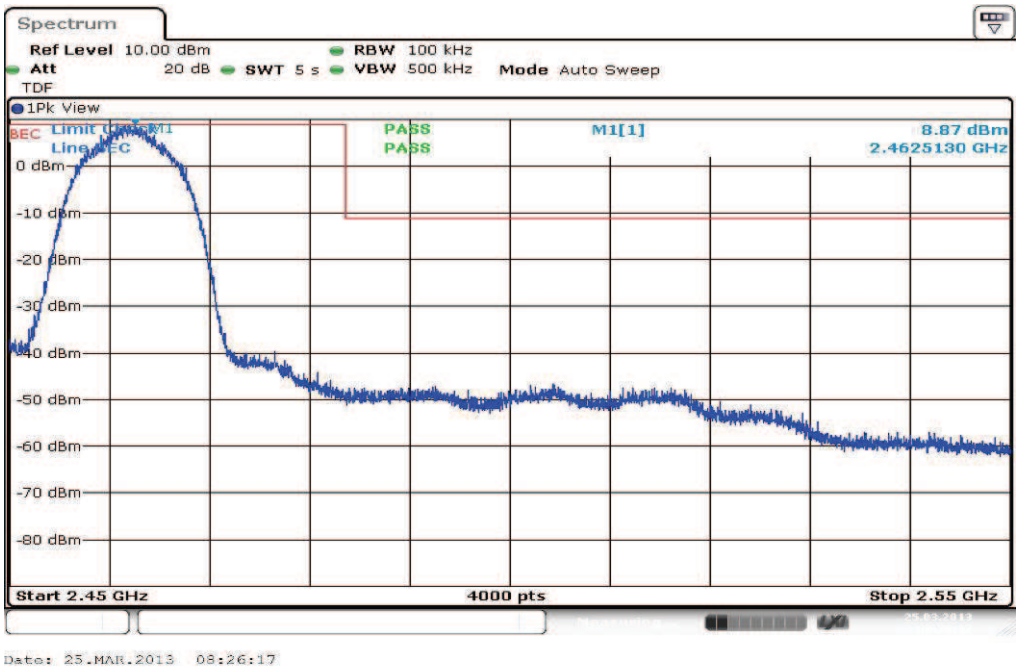
Plot 10: highest channel, b – mode, 1 Mbps



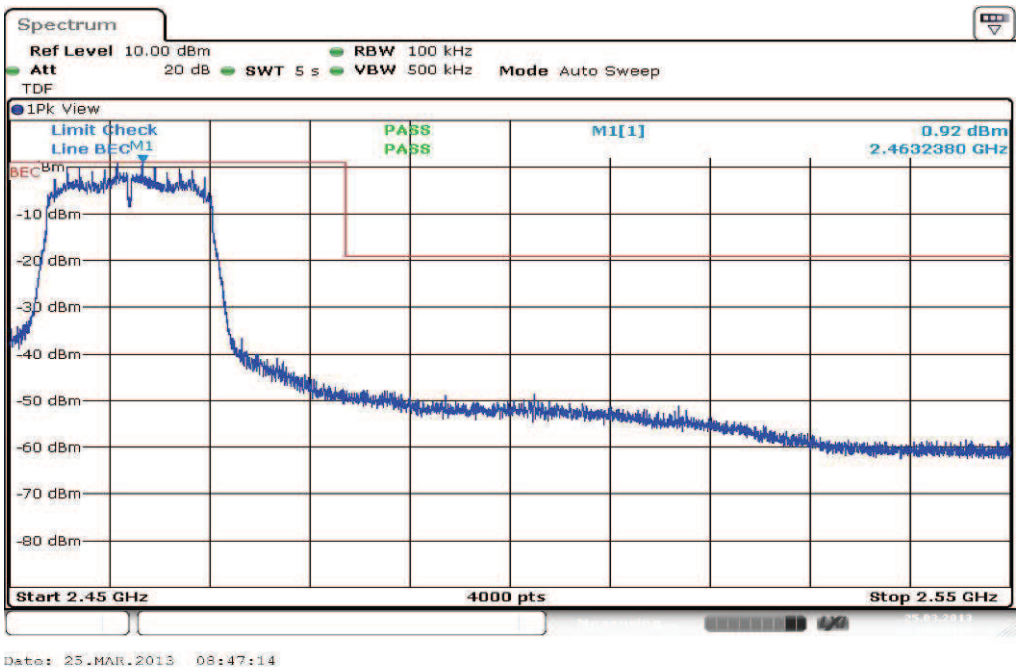
Plot 11: highest channel, b – mode, 5.5 Mbps



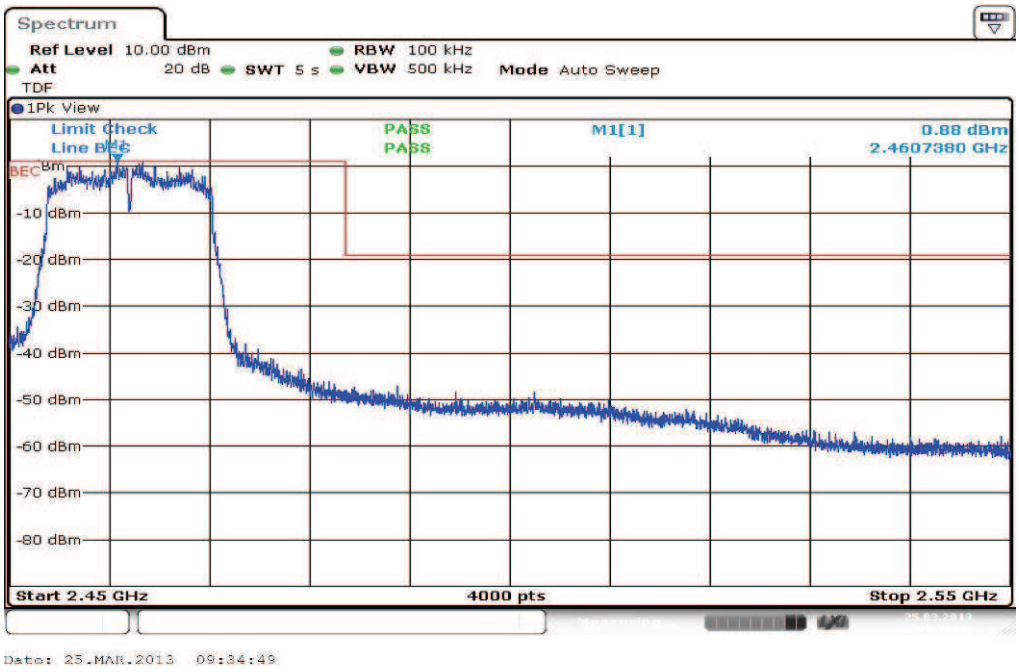
Plot 12: highest channel, b – mode, 11 Mbps



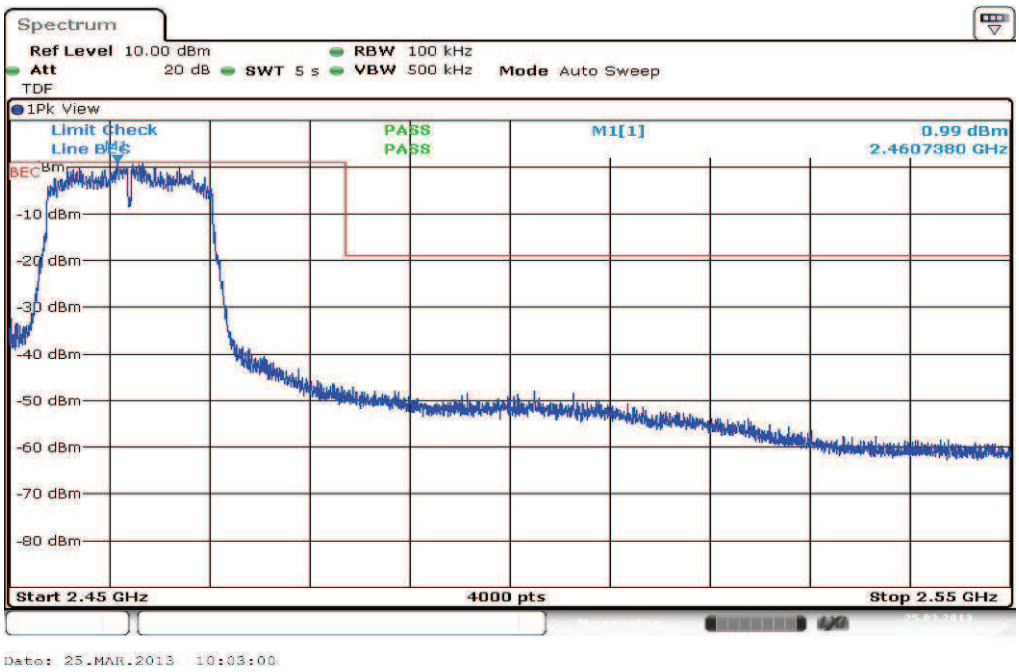
Plot 13: highest channel, g – mode, 6 Mbps



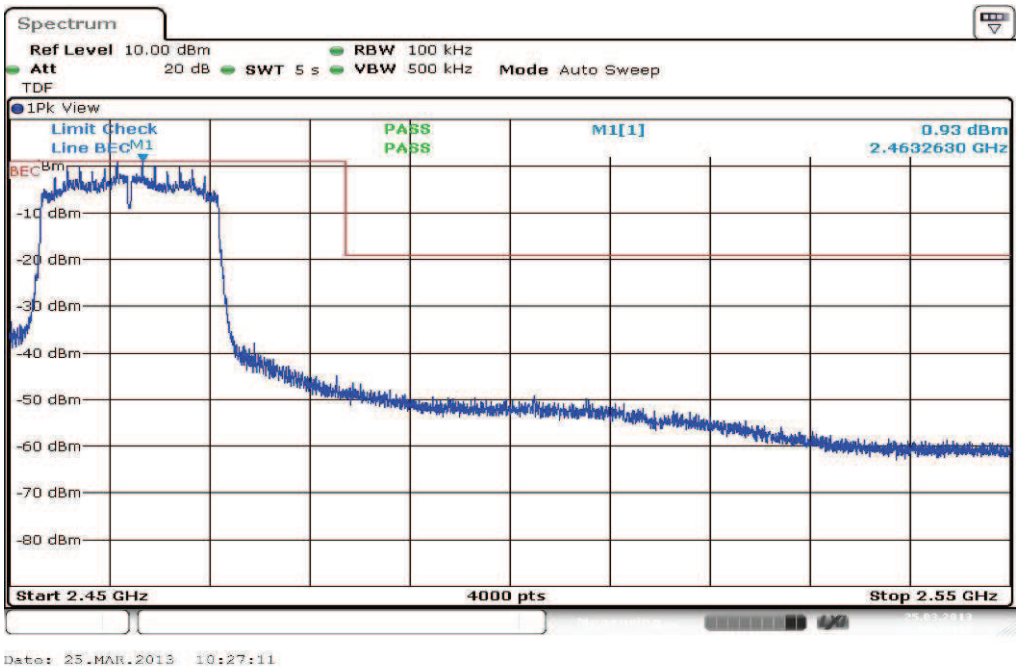
Plot 14: highest channel, g – mode, 24 Mbps



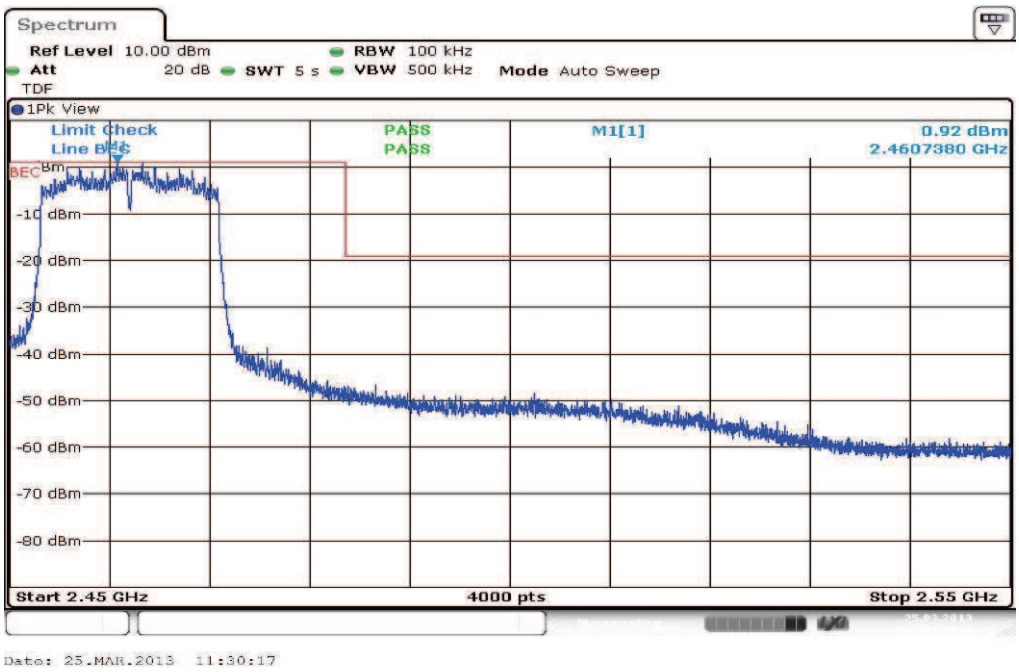
Plot 15: highest channel, g – mode, 54 Mbps



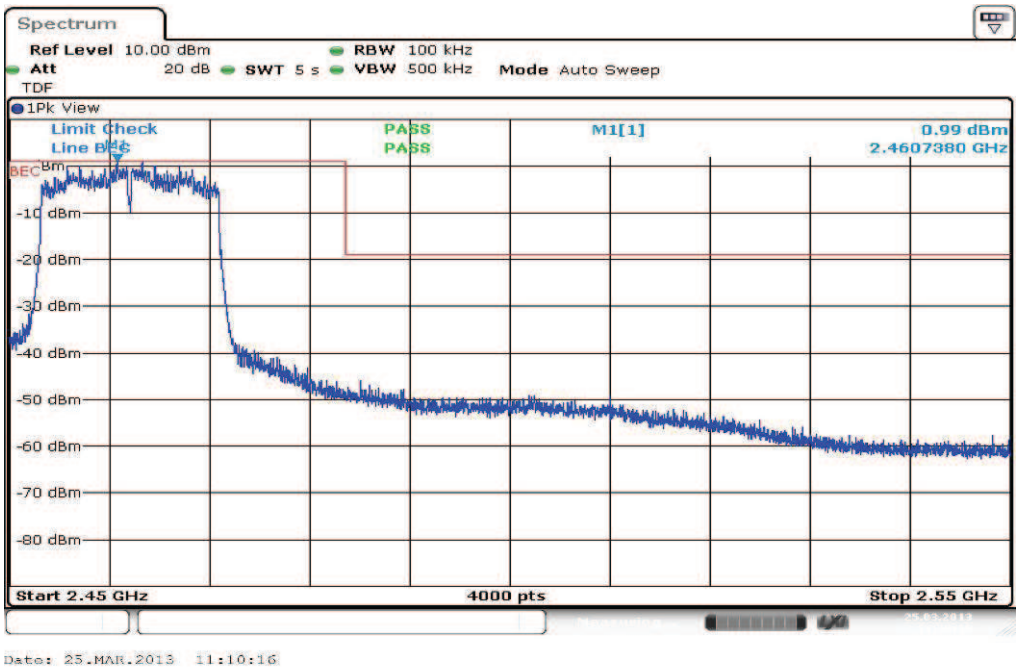
Plot 16: highest channel, n – mode, MCS 0



Plot 17: highest channel, n – mode, MCS 4



Plot 18: highest channel, n – mode, MCS 7



9.9 Band edge compliance radiated

Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to channel 1 for the lower restricted band and to channel 11 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3m.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz / 1 MHz
Video bandwidth:	1 MHz / 10 Hz
Span:	See plot!
Trace-Mode:	Max Hold

Limits:

FCC	IC
Band Edge Compliance Radiated	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).	
54 dBµV/m AVG 74 dBµV/m PEAK	

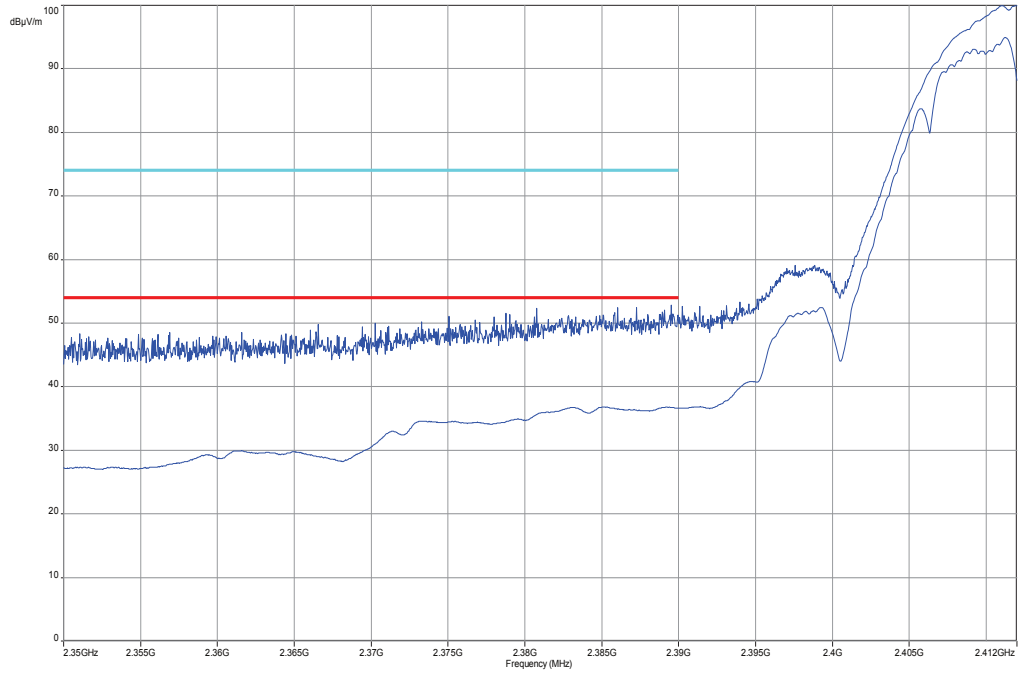
Results:

Scenario	Band Edge Compliance Radiated [dB]		
Modulation	DSSS / b – mode	OFDM / g – mode	OFDM / n – mode
Lower Band Edge – Channel 1	> 20 dB (Peak) > 15 dB (AVG)	> 12 dB (Peak) > 10 dB (AVG)	> 8 dB (Peak) > 8 dB (AVG)
Upper Band Edge – Channel 11	> 20 dB (Peak) > 14 dB (AVG)	> 12 dB (Peak) > 10 dB (AVG)	> 8 dB (Peak) > 8 dB (AVG)
Measurement uncertainty	± 3 dB		

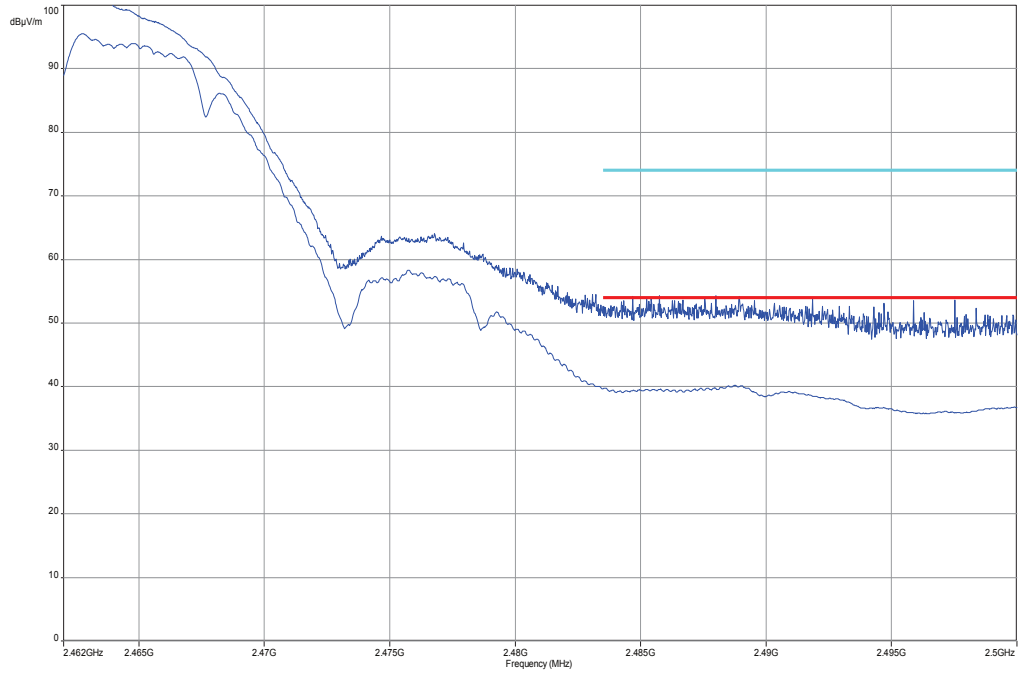
Result: Passed

Plots: DSSS/ b – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization

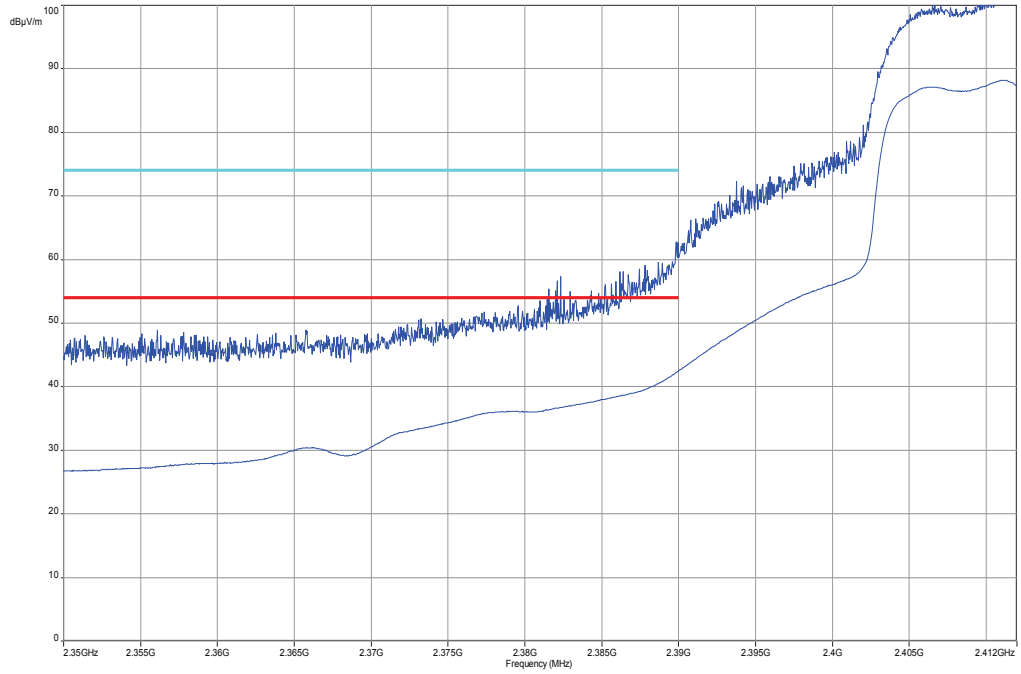


Plot 2: TX mode, upper band edge, vertical & horizontal polarization

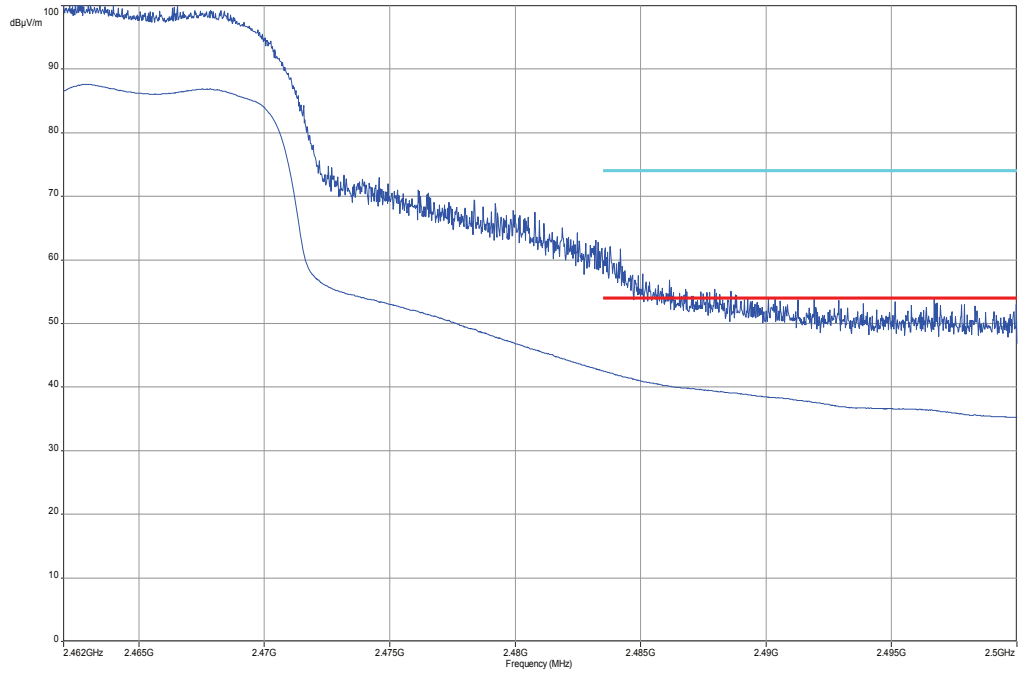


Plots: OFDM / g – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization

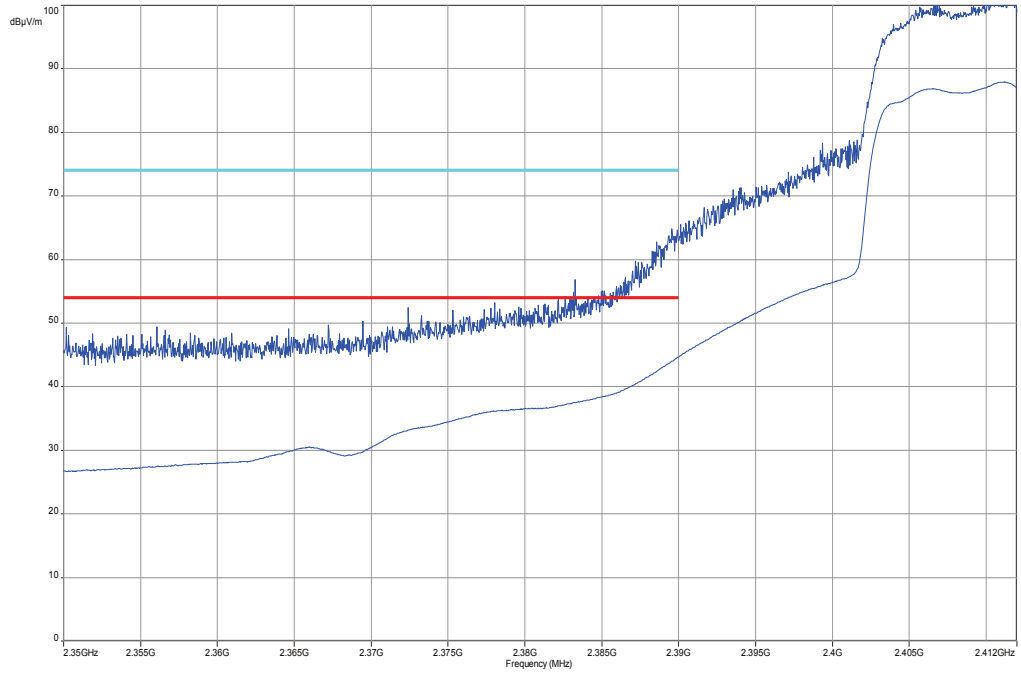


Plot 2: TX mode, upper band edge, vertical & horizontal polarization

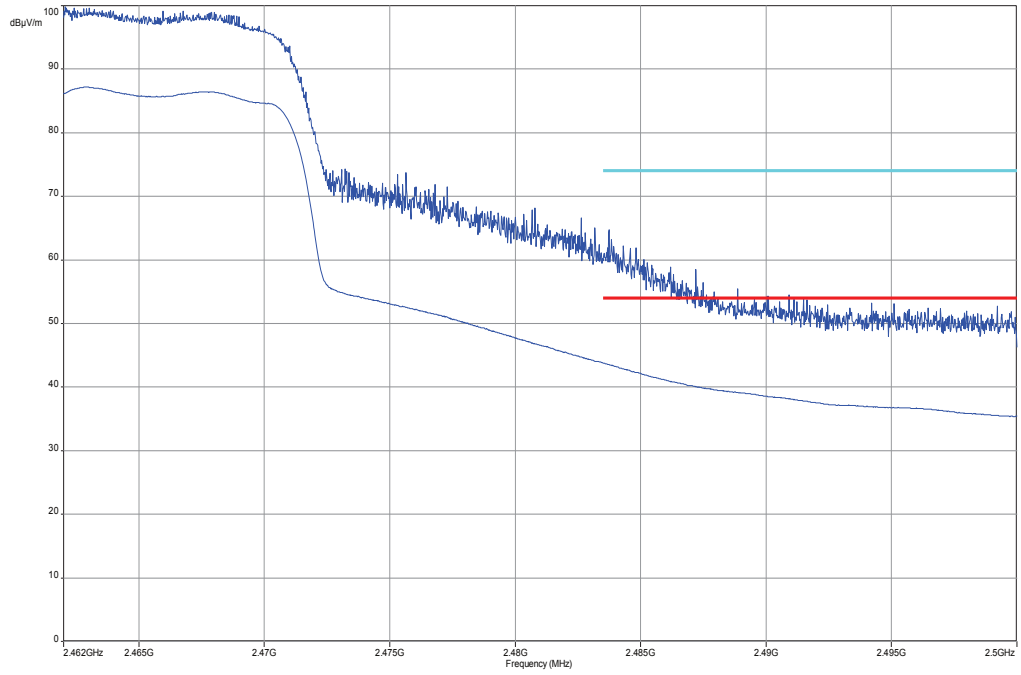


Plots: OFDM / n – mode peak / average

Plot 1: TX mode, lower band edge, vertical & horizontal polarization



Plot 2: TX mode, upper band edge, vertical & horizontal polarization



9.10 TX spurious emissions conducted

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	See plots!
Resolution bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Video bandwidth:	f <= 1GHz : 10 kHz f > 1GHz : 10 kHz
Span:	See plots!
Trace-Mode:	Max Hold
Additional EUT parameters:	Test mode (modulated carrier) Max power

Results:

DSSS b – mode	lowest channel 2412 MHz		middle channel 2437 MHz		highest channel 2462 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	No critical peaks found (see plots)!					
OFDM g – mode	lowest channel 2412 MHz		middle channel 2437 MHz		highest channel 2462 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	No critical peaks found (see plots)!					
OFDM n – mode HT20	lowest channel 2412 MHz		middle channel 2437 MHz		highest channel 2462 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	No critical peaks found (see plots)!					

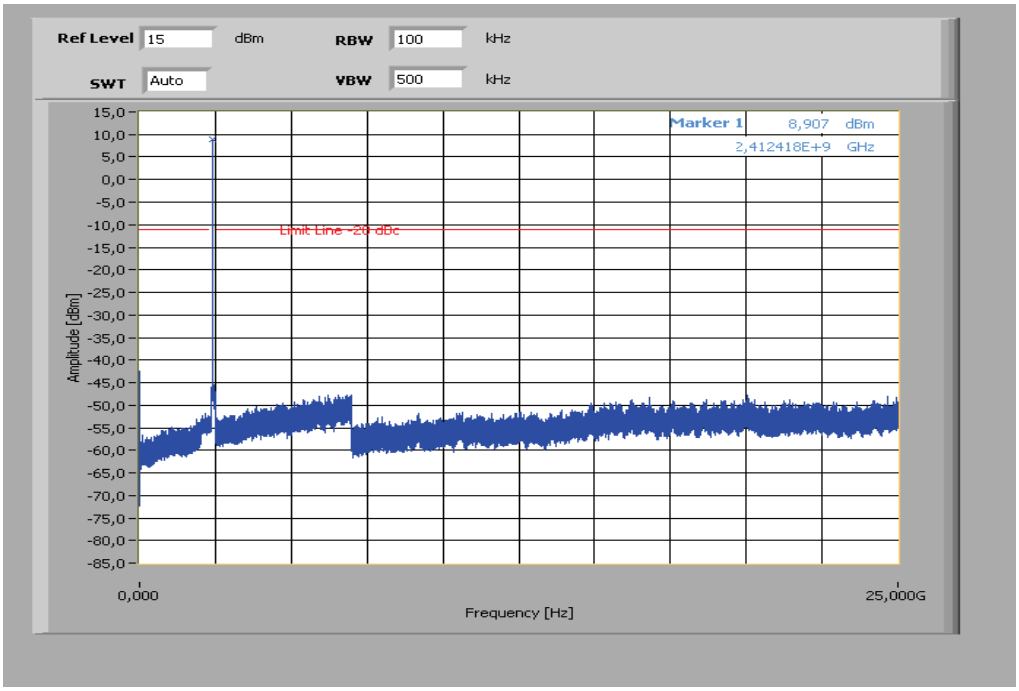
Limit:

Limit	30 MHz ≥ f ≤ 2387 MHz: 2.5 µW (-26.02 dBm) 2387 MHz ≥ f ≤ 2400 MHz: 25 µW (-16.02 dBm) 2483.5 MHz ≥ f ≤ 2496.5 MHz: 25 µW (-16.02 dBm) 2496.5 MHz ≥ f ≤ 12.5 GHz: 2.5 µW (-26.02 dBm)

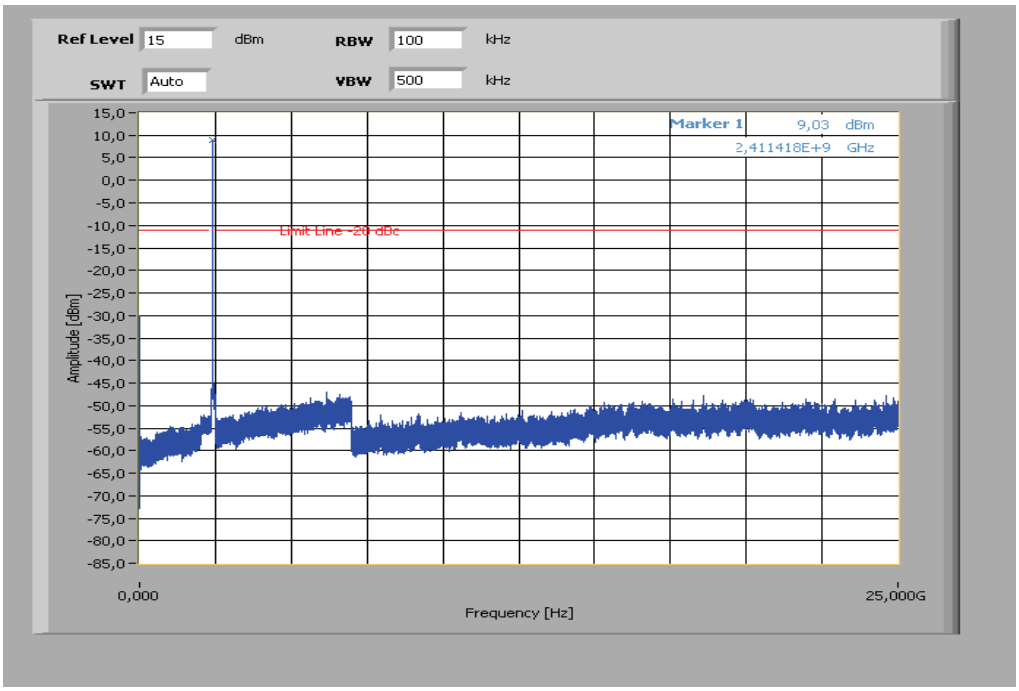
Result: **Passed**

Plots:

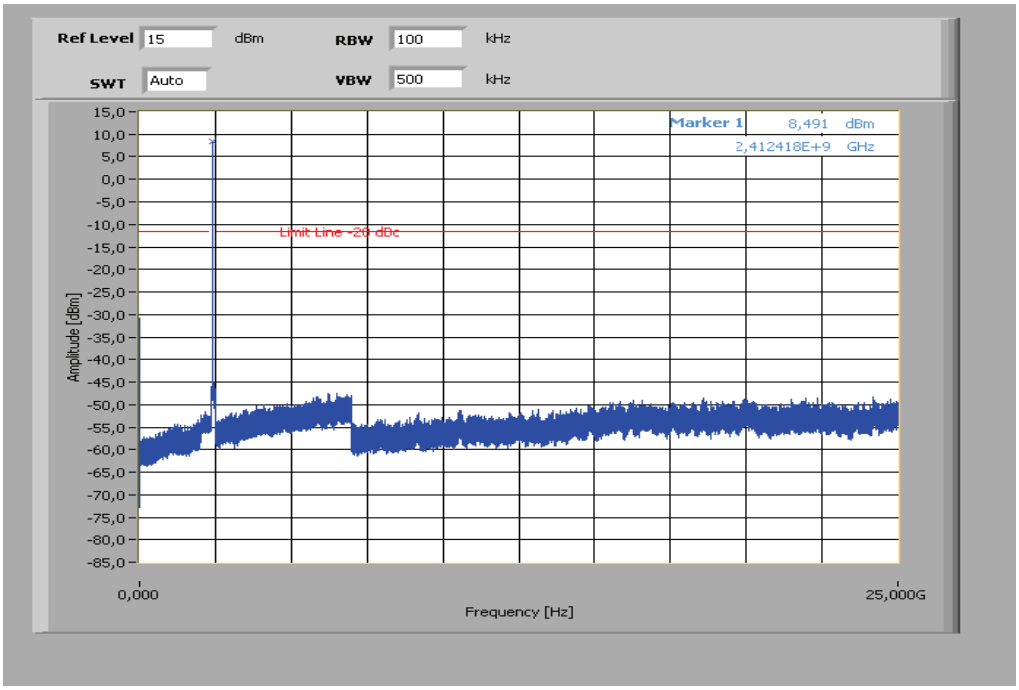
Plot 1: lowest channel, b – mode, 1 Mbps



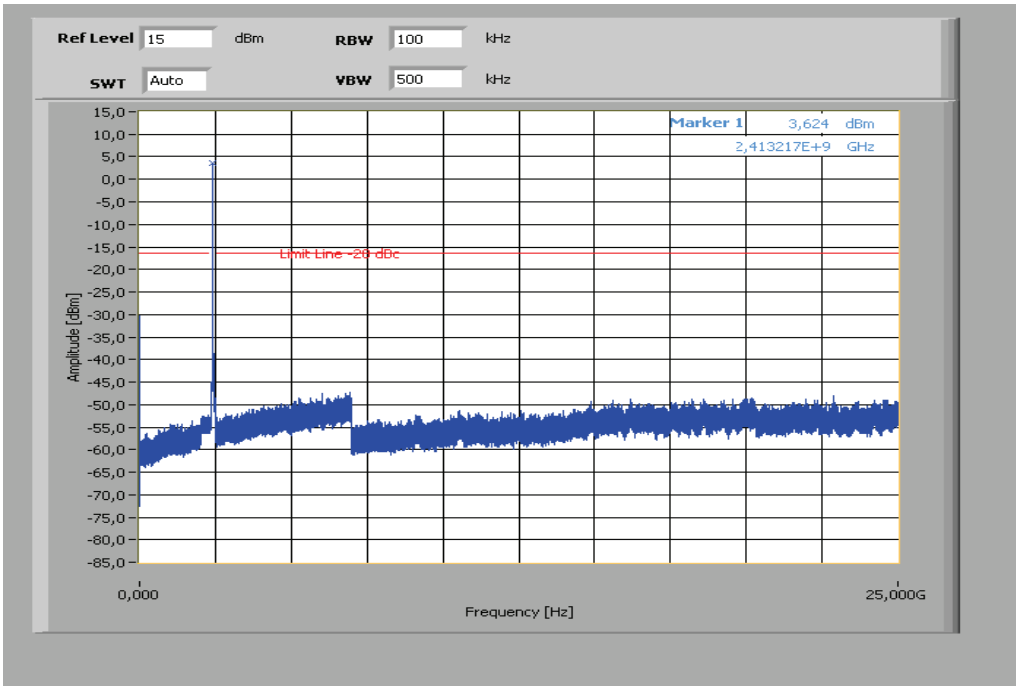
Plot 2: lowest channel, b – mode, 5.5 Mbps



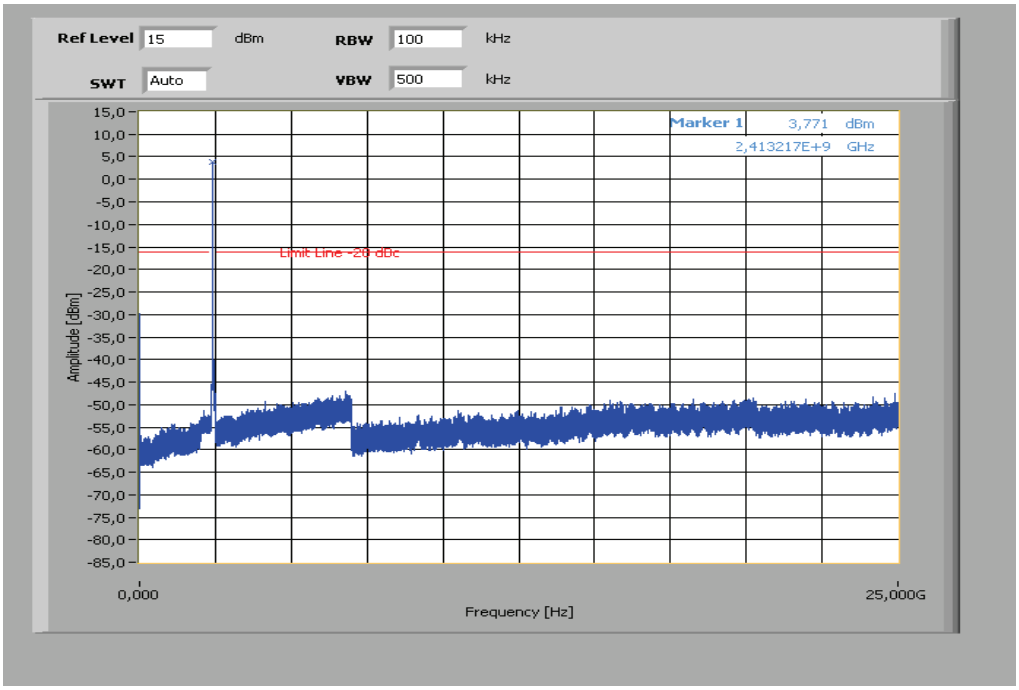
Plot 3: lowest channel, b – mode, 11 Mbps



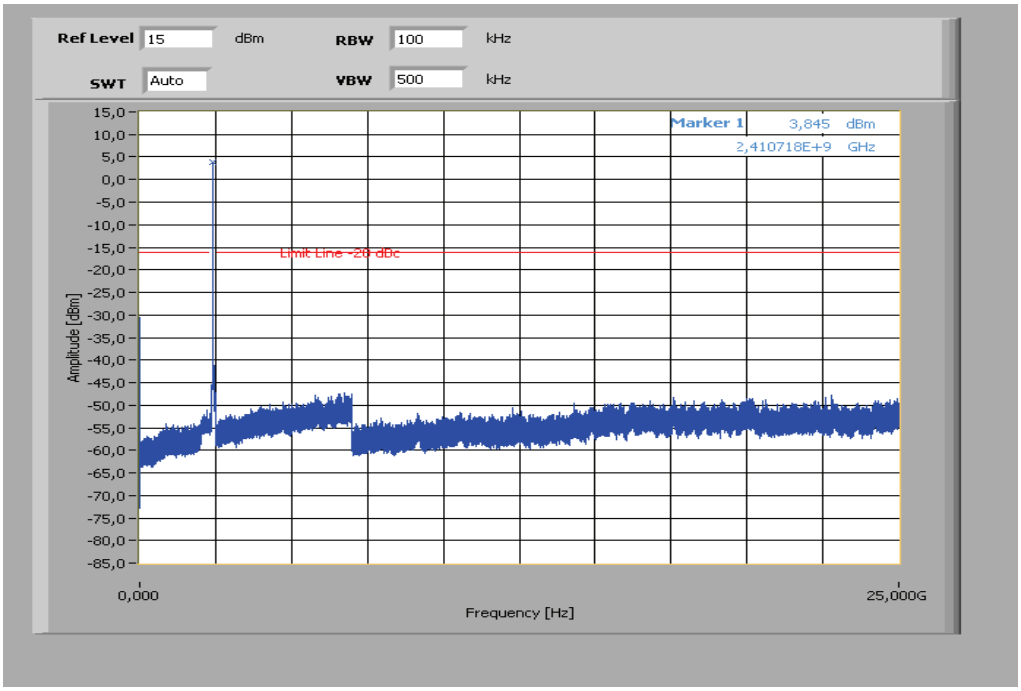
Plot 4: lowest channel, g – mode, 6 Mbps



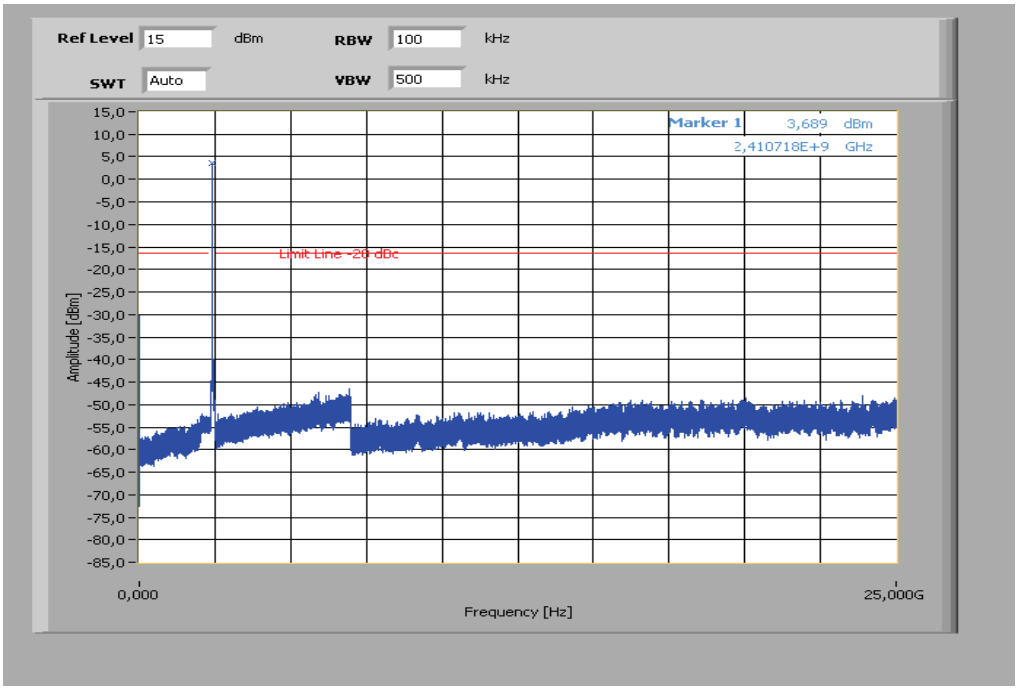
Plot 5: lowest channel, g – mode, 24 Mbps



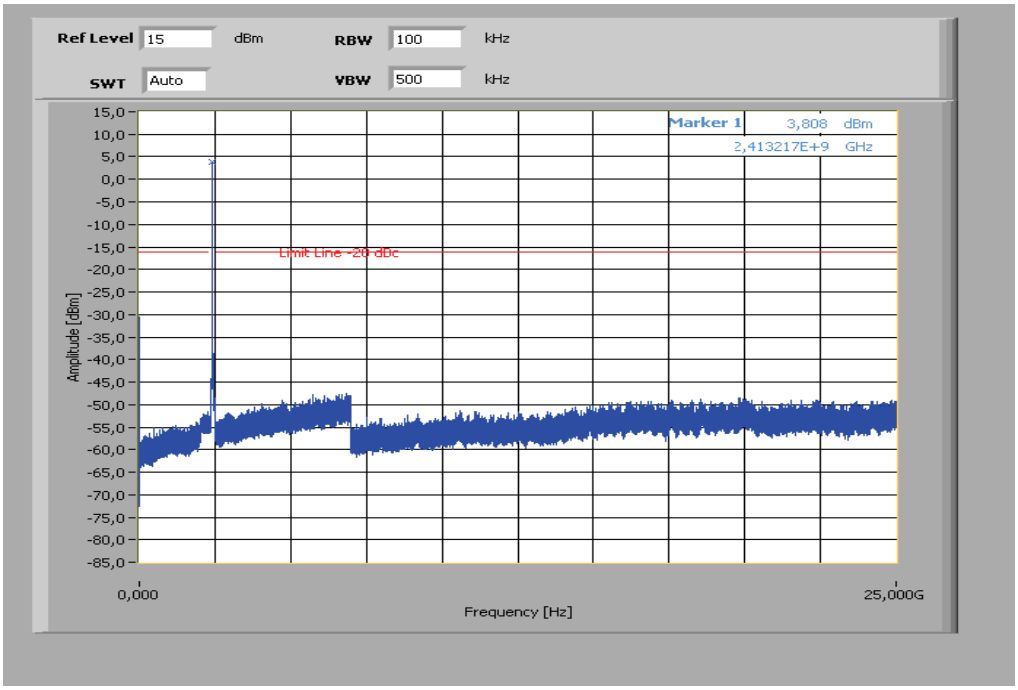
Plot 6: lowest channel, g – mode, 54 Mbps



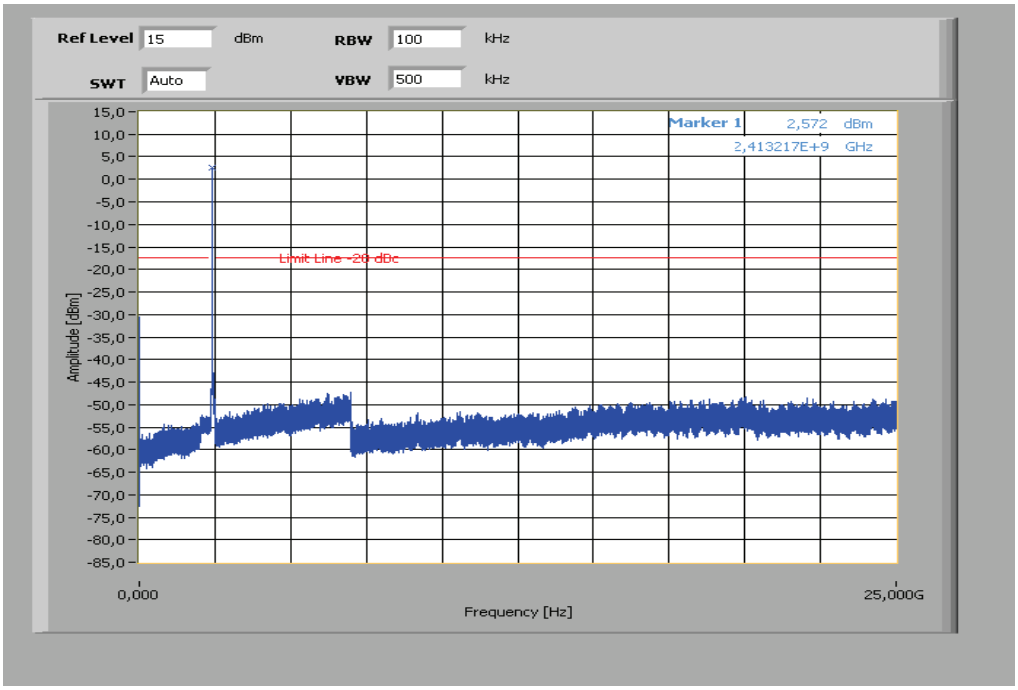
Plot 7: lowest channel, n – mode, MCS 0



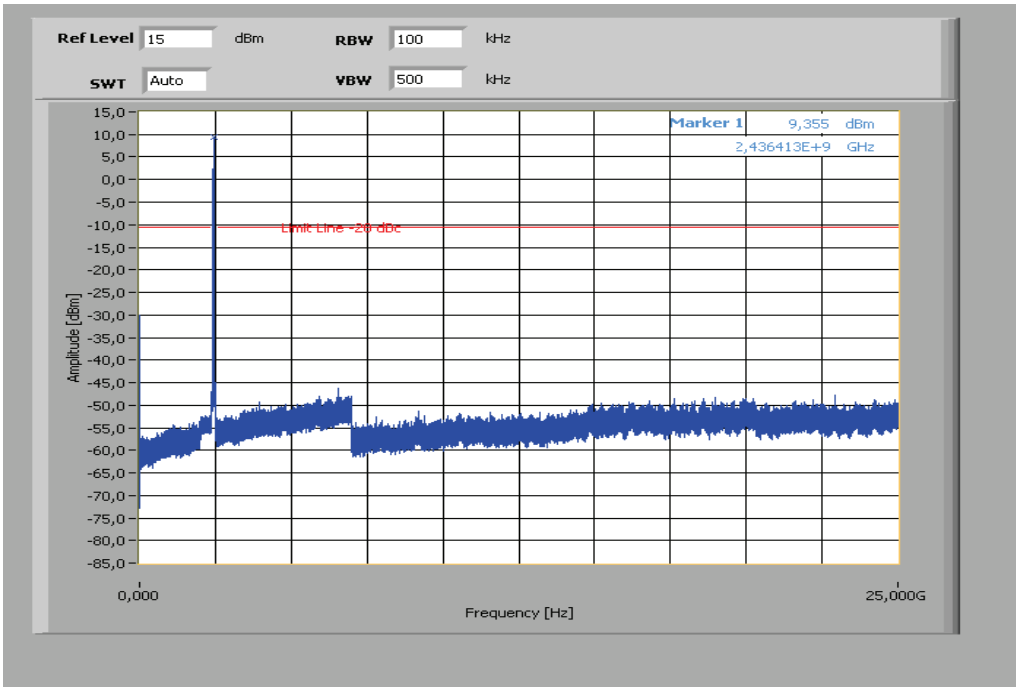
Plot 8: lowest channel, n – mode, MCS 4



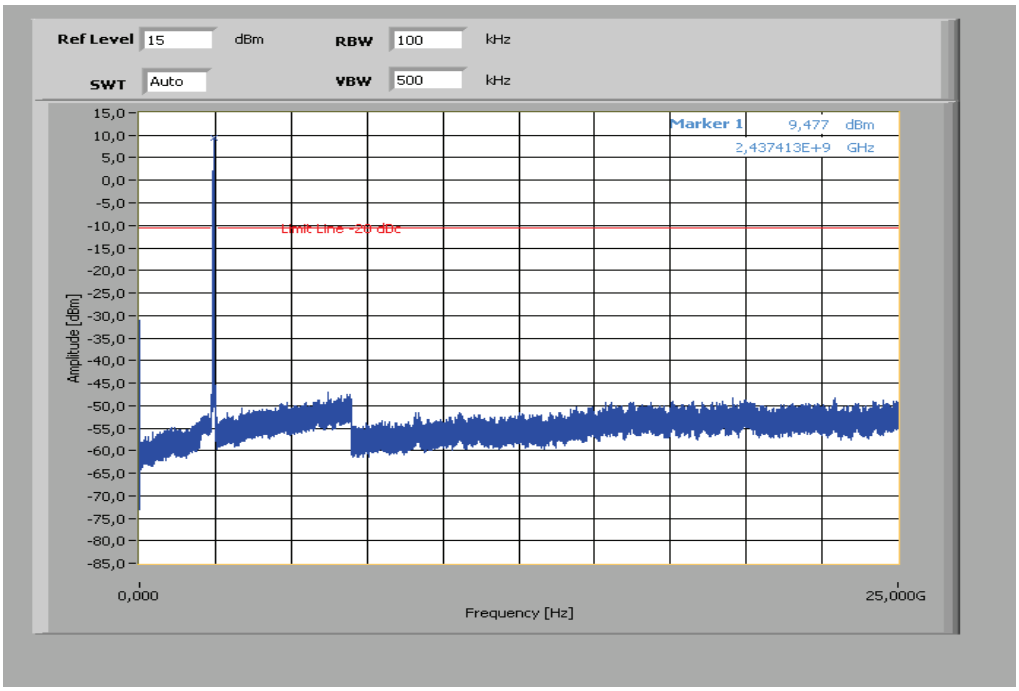
Plot 9: lowest channel, n – mode, MCS 7



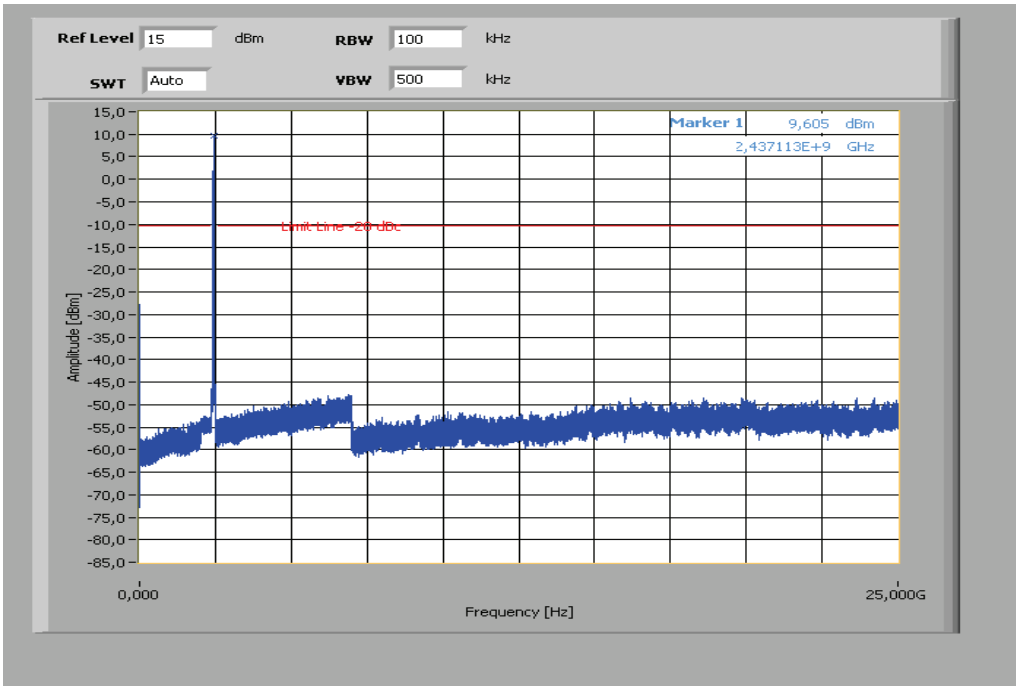
Plot 10: middle channel, b – mode, 1 Mbps



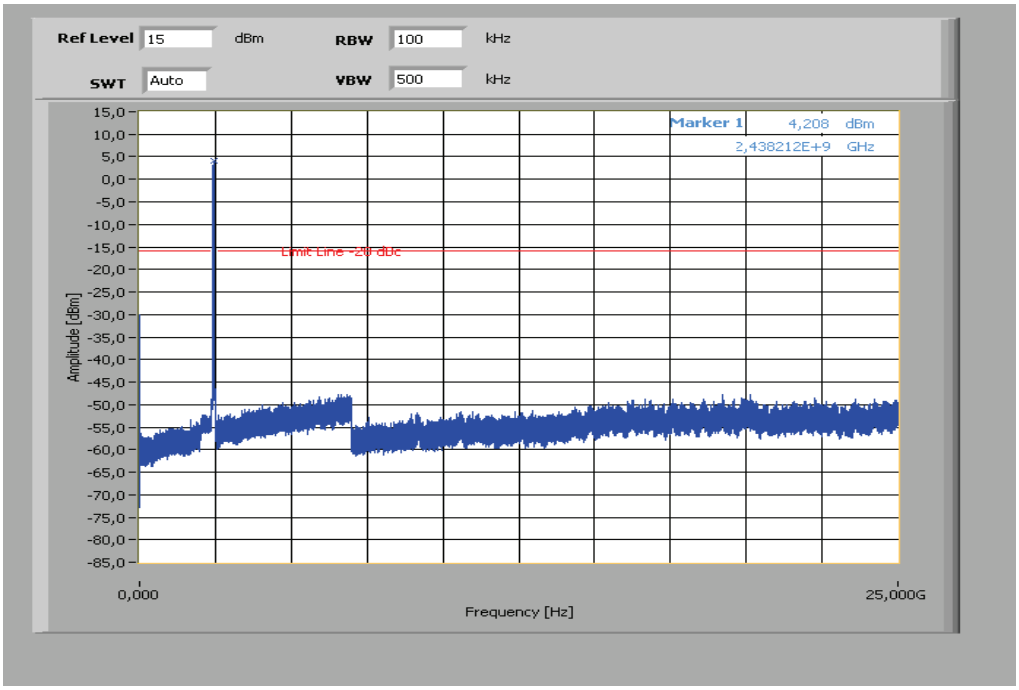
Plot 11: middle channel, b – mode, 5.5 Mbps



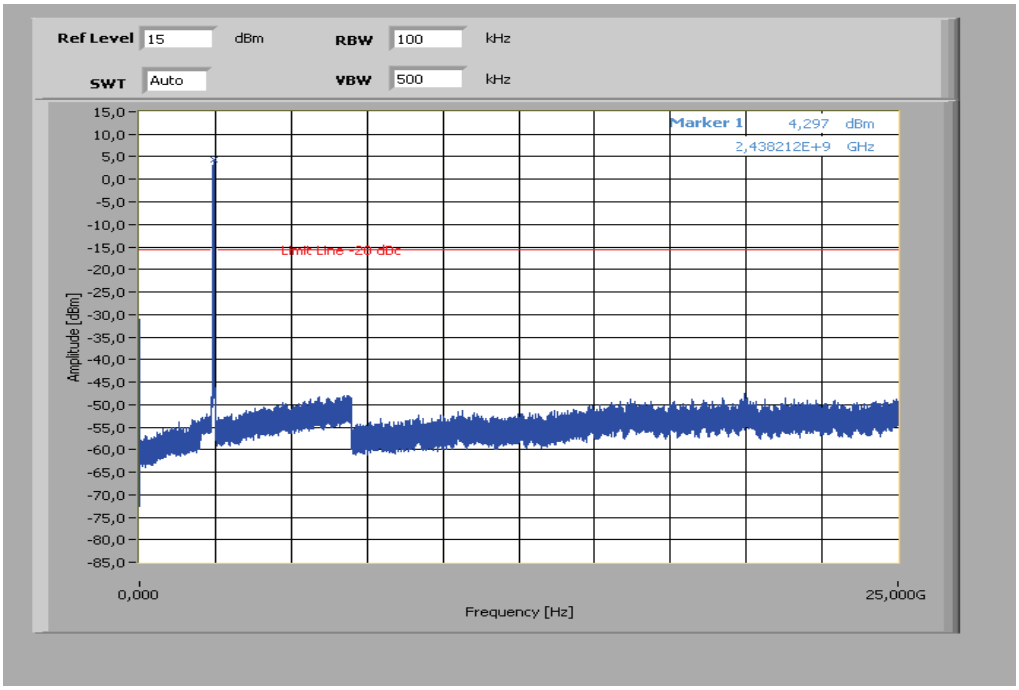
Plot 12: middle channel, b – mode, 11 Mbps



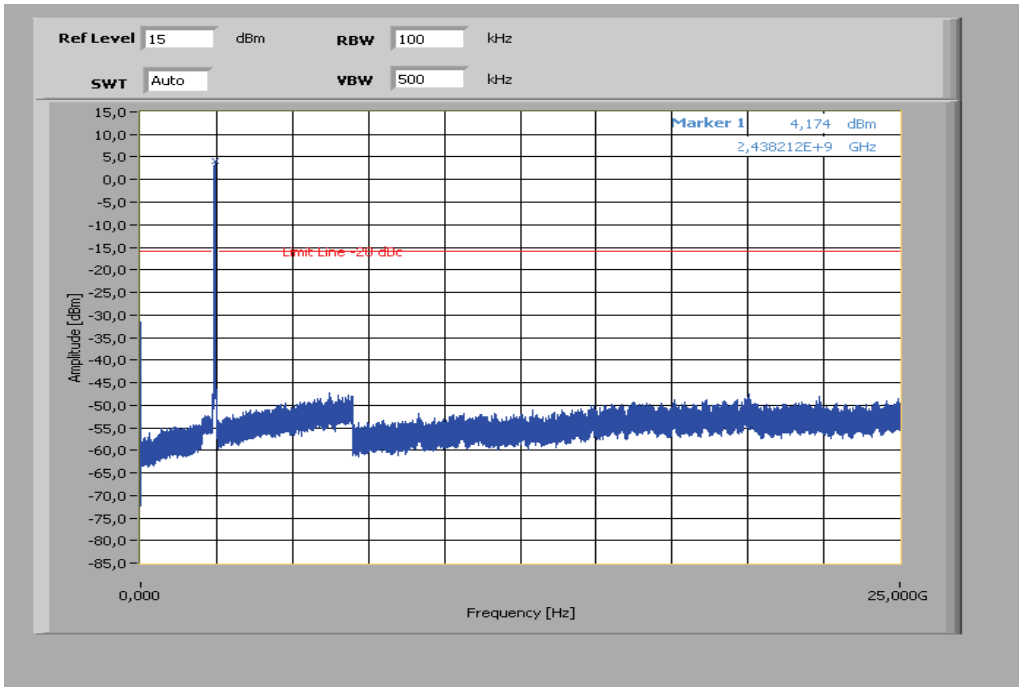
Plot 13: middle channel, g – mode, 6 Mbps



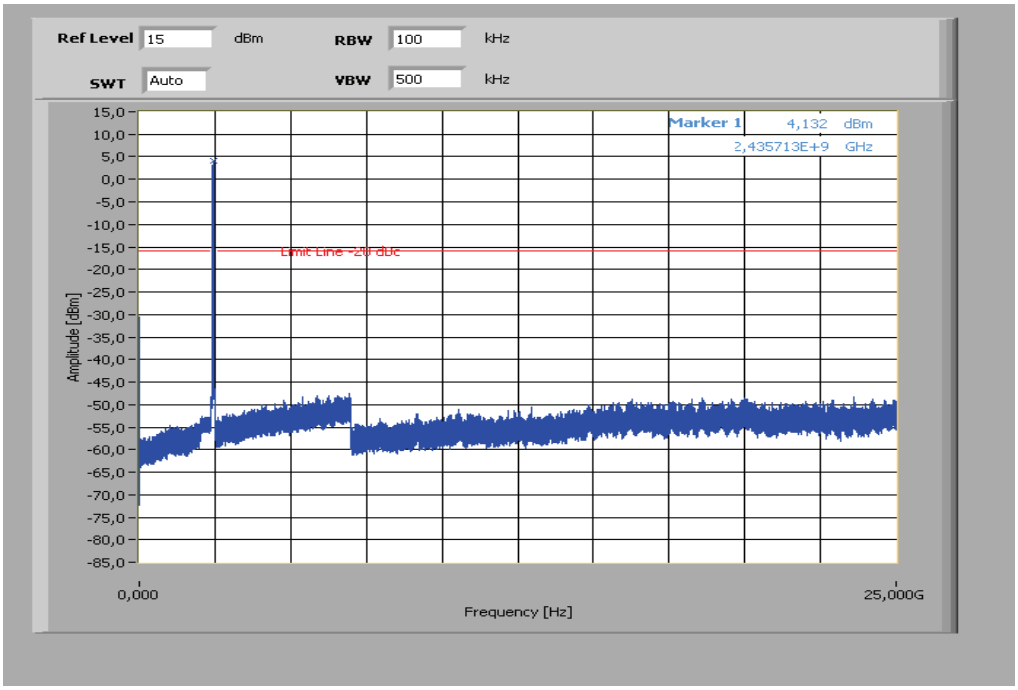
Plot 14: middle channel, g – mode, 24 Mbps



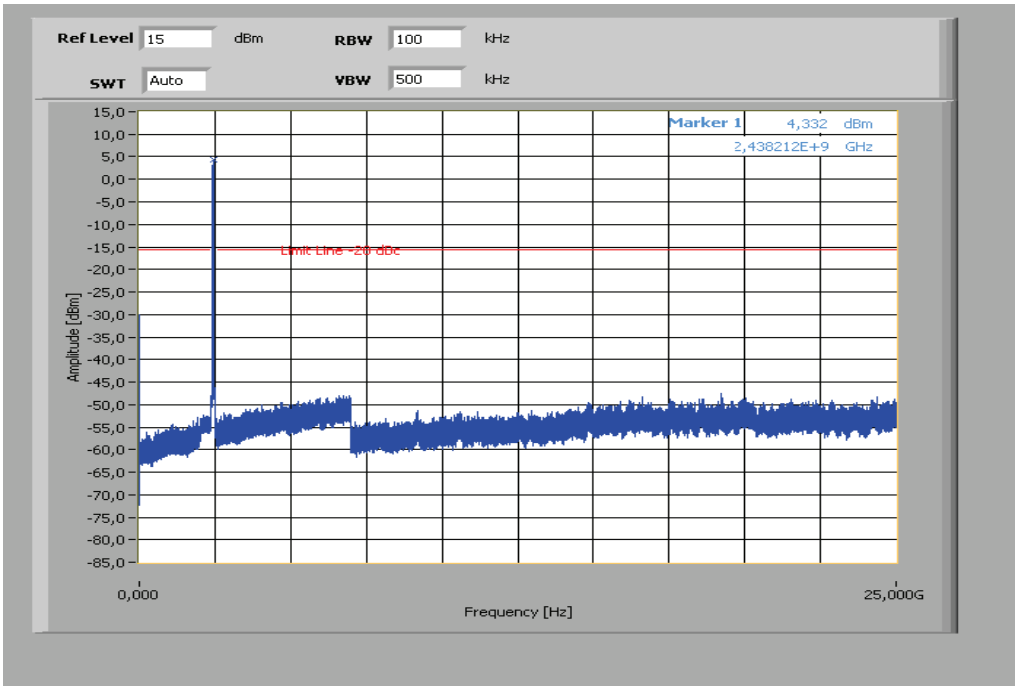
Plot 15: middle channel, g – mode, 54 Mbps



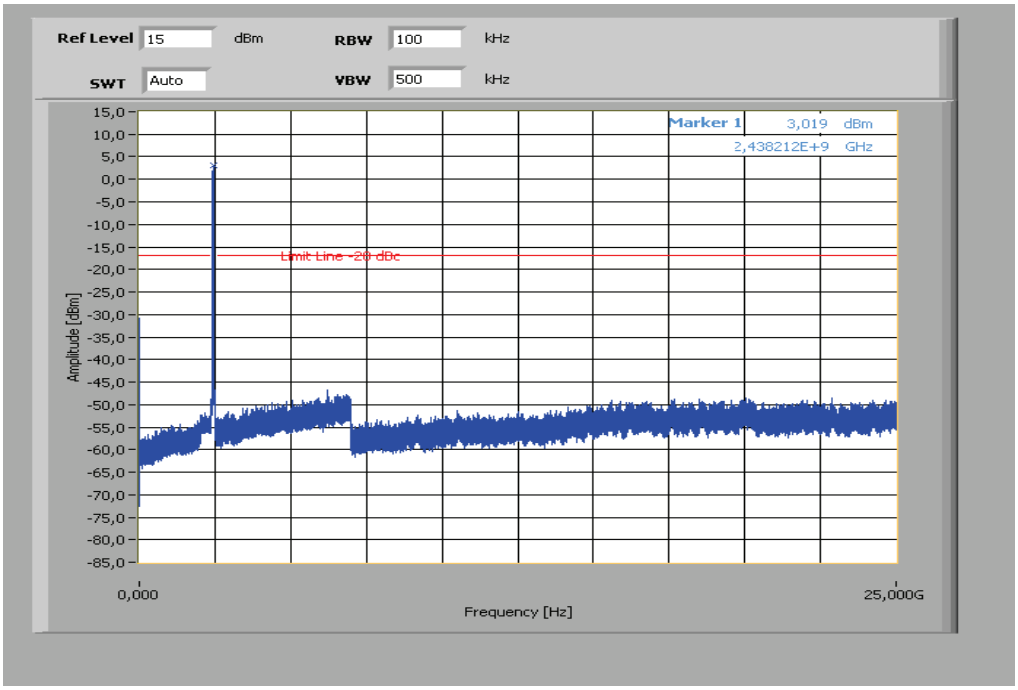
Plot 16: middle channel, n – mode, MCS 0



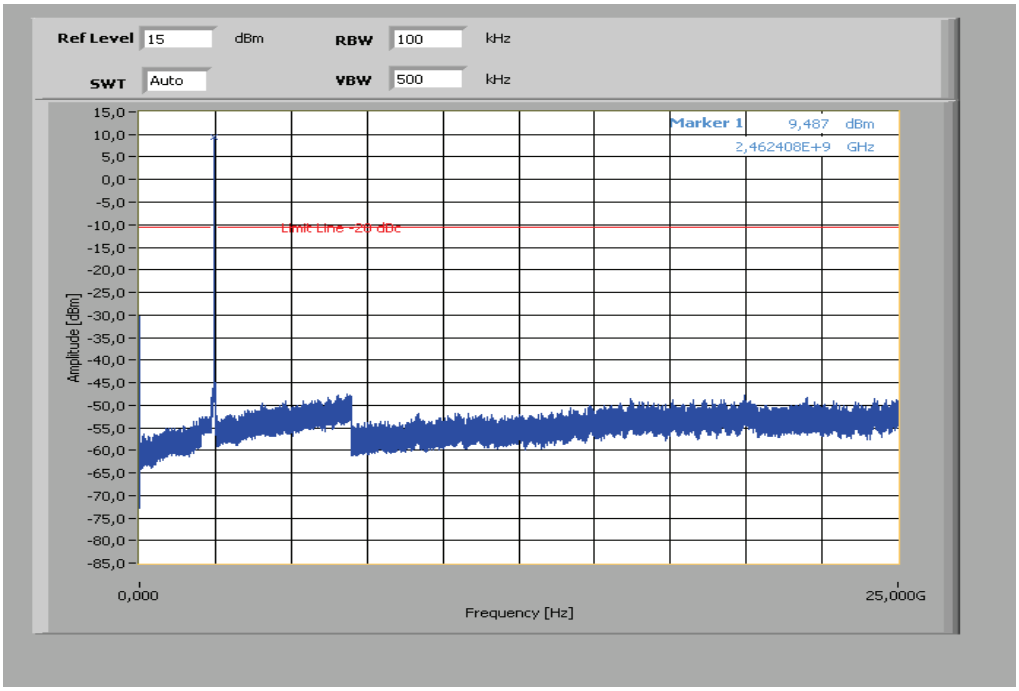
Plot 17: middle channel, n – mode, MCS 4



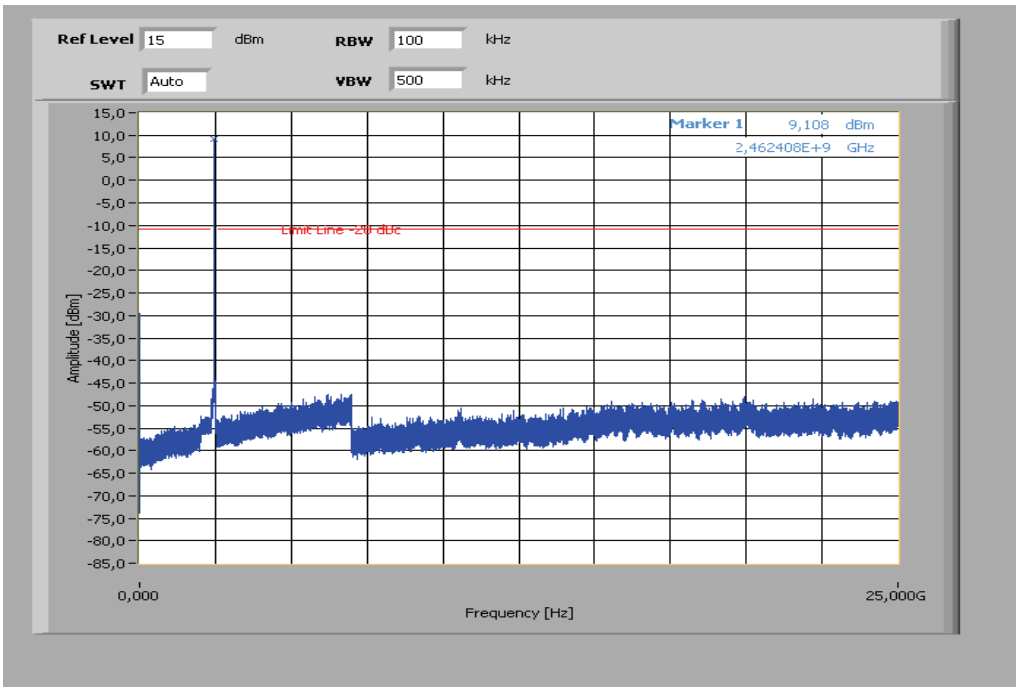
Plot 18: middle channel, n – mode, MCS 7



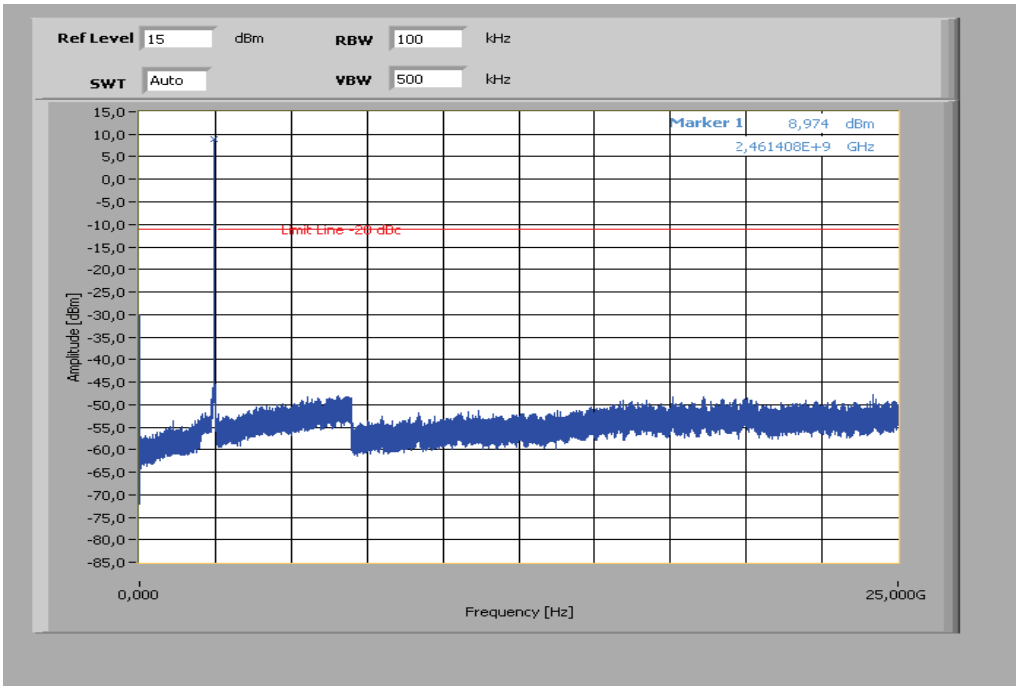
Plot 19: highest channel, b – mode, 1 Mbps



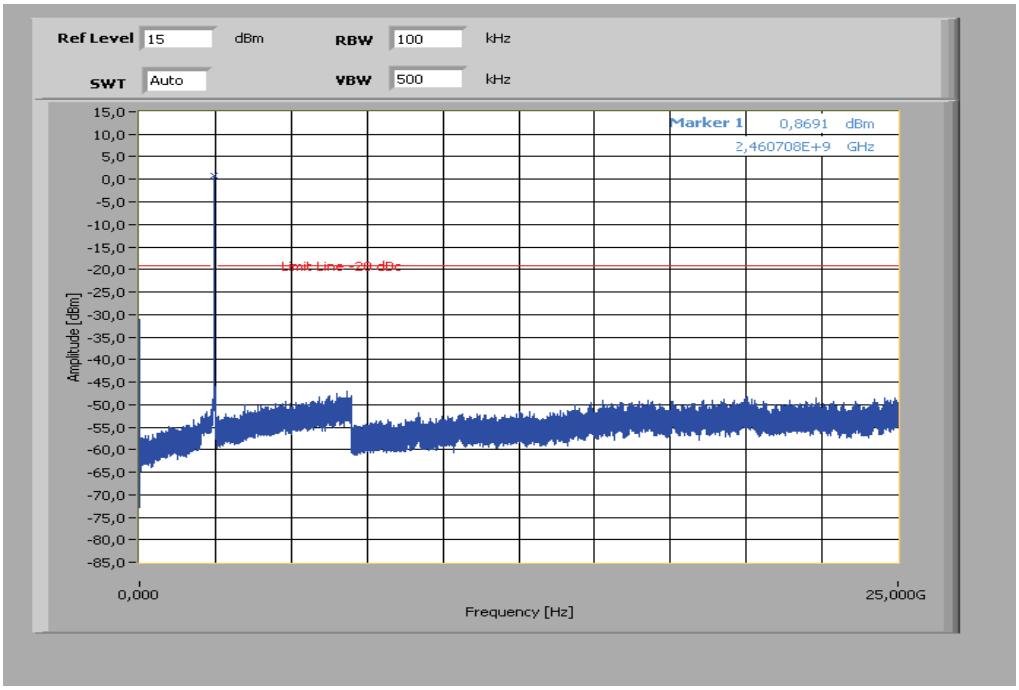
Plot 20: highest channel, b – mode, 5.5 Mbps



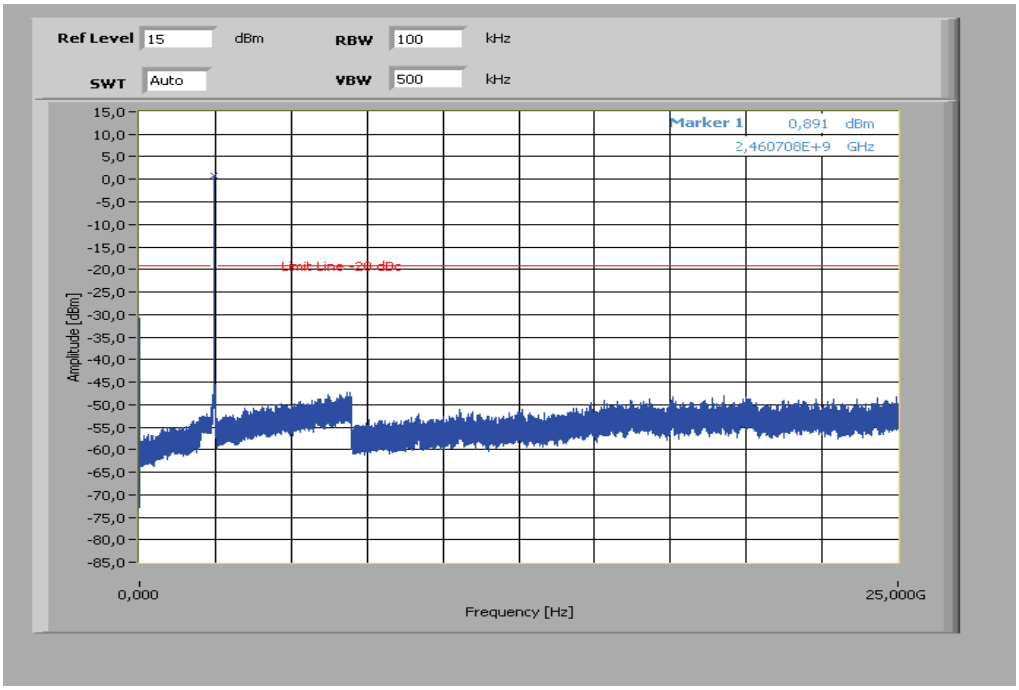
Plot 21: highest channel, b – mode, 11 Mbps



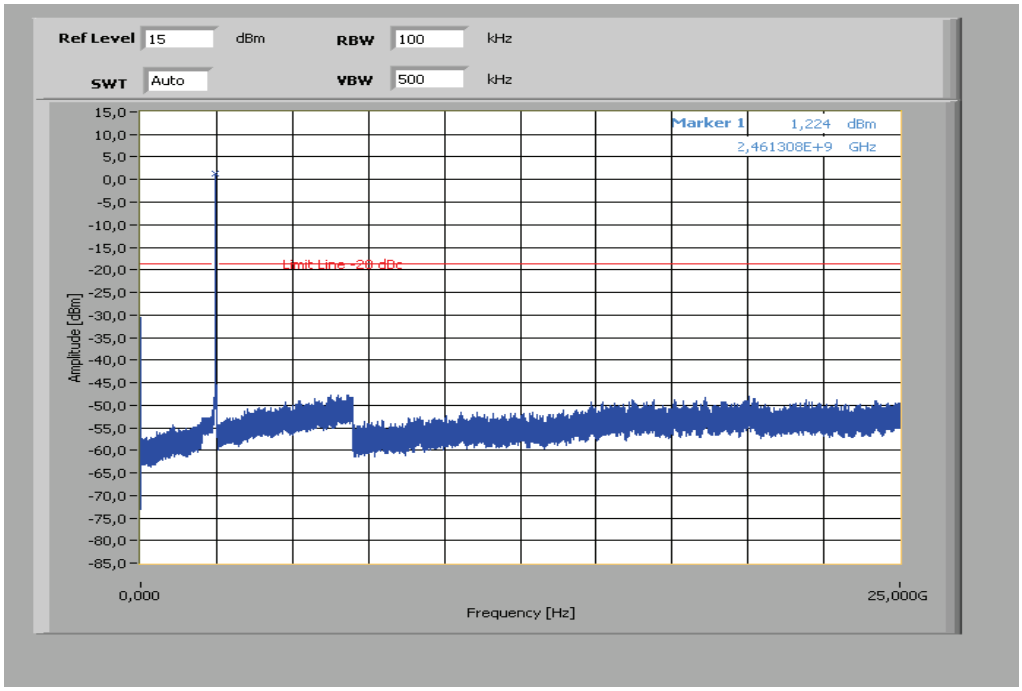
Plot 22: highest channel, g – mode, 6 Mbps



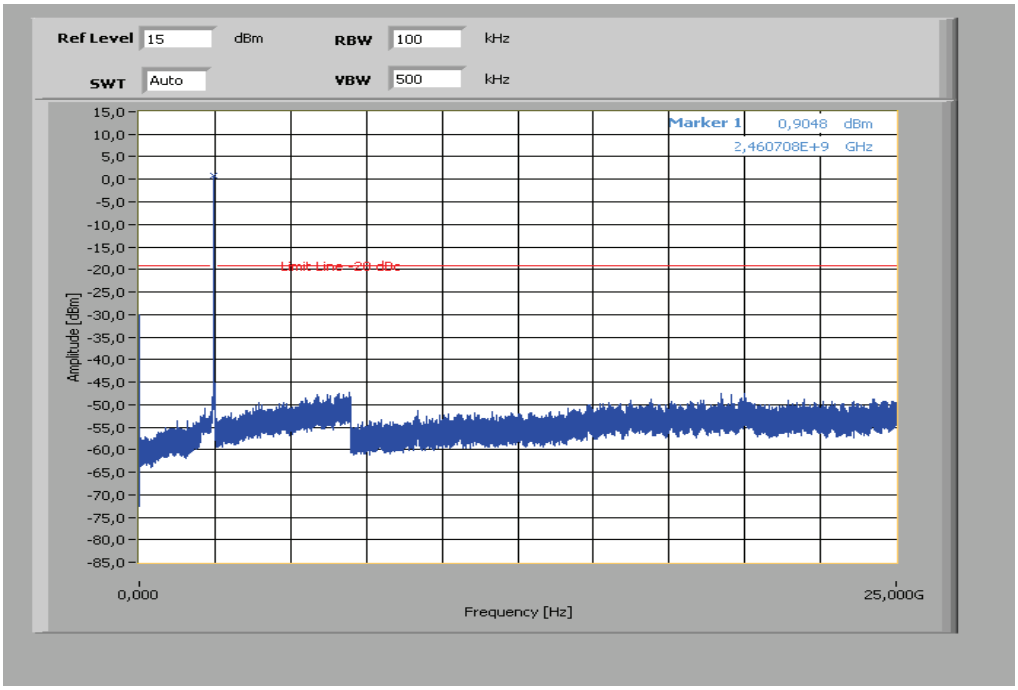
Plot 23: highest channel, g – mode, 24 Mbps



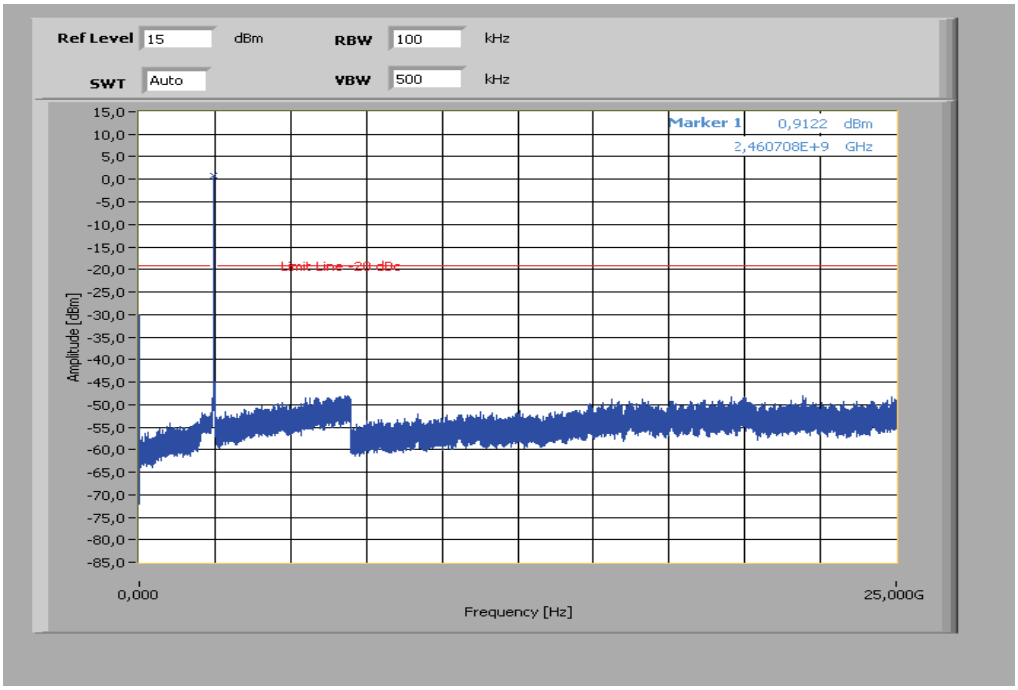
Plot 24: highest channel, g – mode, 54 Mbps



Plot 25: highest channel, n – mode, MCS 0



Plot 26: highest channel, n – mode, MCS 4



Plot 27: highest channel, n – mode, MCS 7