10.8 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at the lowest, middle and highest channel. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 40 GHz
Trace-Mode:	Max Hold
Measured Modulation	☒ OFDM a – mode ☒ OFDM n/ac – mode HT20 ☒ OFDM n/ac – mode HT40 ☒ OFDM ac – mode HT80

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

Limits:

FCC	-/-	
TX Spurious Emissions 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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results: OFDM / a – mode

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / a – mode								
5745 MHz			5785 MHz			5825 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
Above 1 GHz: No emissions detected.			Above 1 GHz: No emissions detected.			Above 1 GHz: No emissions detected.		
Measurement uncertainty			± 3 dB					

Results: OFDM / ac – mode HT20

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / ac – mode HT20								
5745 MHz			5785 MHz			5825 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
Above 1 GHz: No emissions detected.			Above 1 GHz: No emissions detected.			Above 1 GHz: No emissions detected.		
Measurement uncertainty			± 3 dB					

Results: OFDM / ac – mode HT40

TX Spurious Emissions Radiated [dBµV/m]					
OFDM / ac – mode HT40					
5755 MHz			5795 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
Above 1 GHz: No emissions detected.			Above 1 GHz: No emissions detected.		
Measurement uncertainty		± 3 dB			

Results: OFDM / ac – mode HT80

TX Spurious Emissions Radiated [dBµV/m]		
OFDM / ac – mode HT80		
5775 MHz		
F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
Above 1 GHz: No emissions detected.		
Measurement uncertainty	± 3 dB	

Result: **Passed**

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

Plots: OFDM / a – mode

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

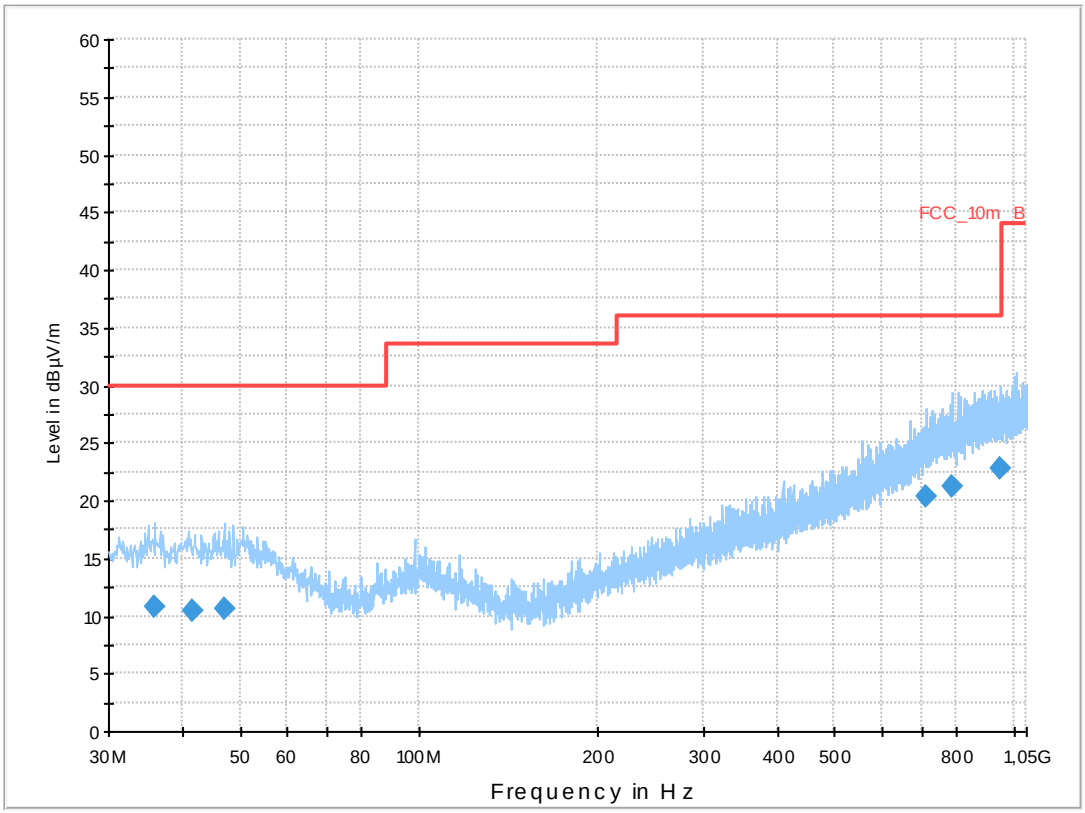
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan a-mode tx ch 149
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

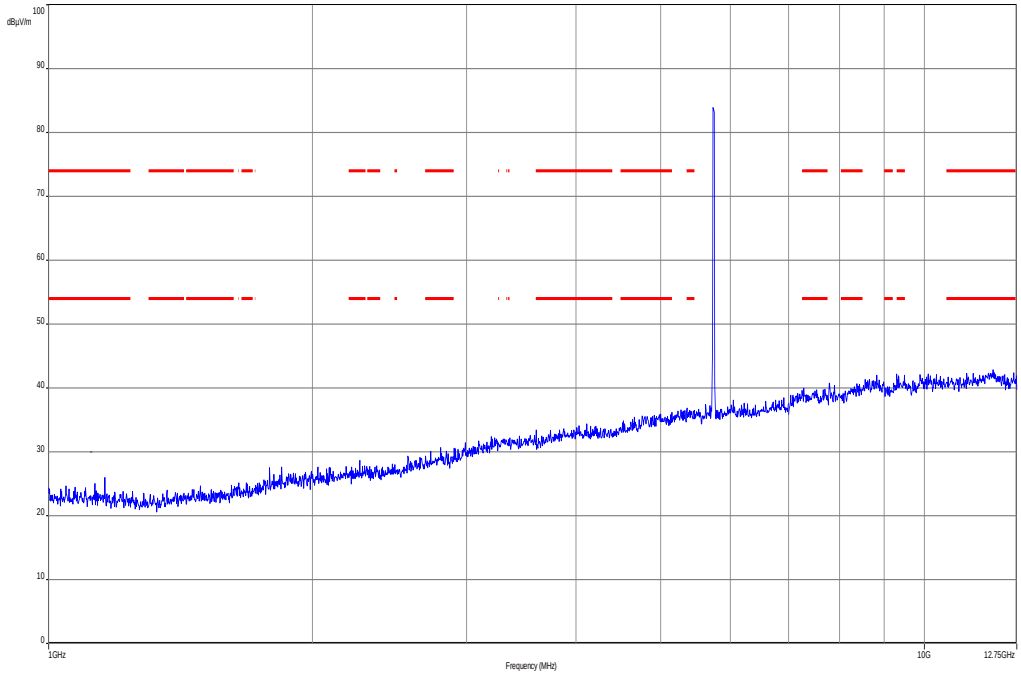
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



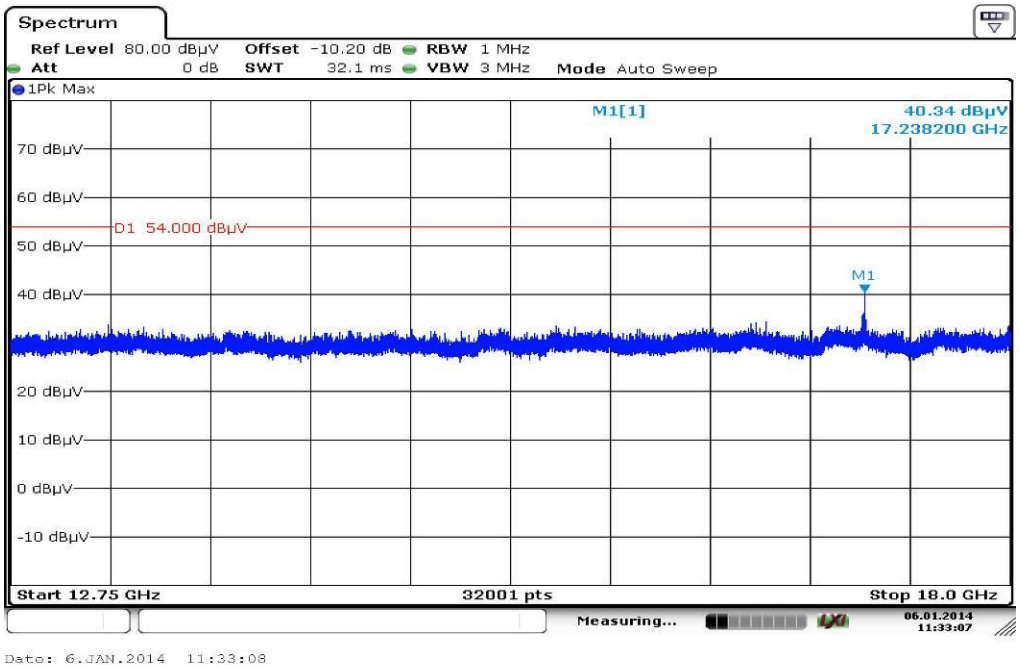
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.896800	10.7	1000.0	120.000	170.0	H	100.0	13.1	19.3	30.0	
41.483850	10.5	1000.0	120.000	134.0	H	10.0	13.4	19.5	30.0	
47.106000	10.7	1000.0	120.000	98.0	V	190.0	13.3	19.3	30.0	
714.422700	20.4	1000.0	120.000	170.0	H	81.0	22.8	15.6	36.0	
790.054650	21.2	1000.0	120.000	155.0	H	88.0	23.8	14.8	36.0	
947.282550	22.7	1000.0	120.000	143.0	V	10.0	25.3	13.3	36.0	

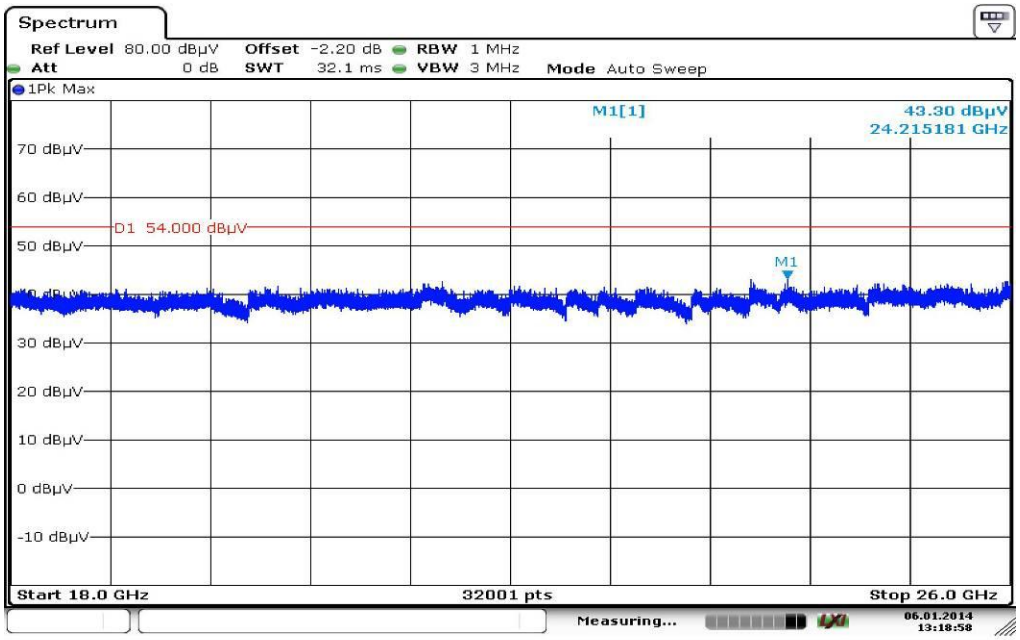
Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

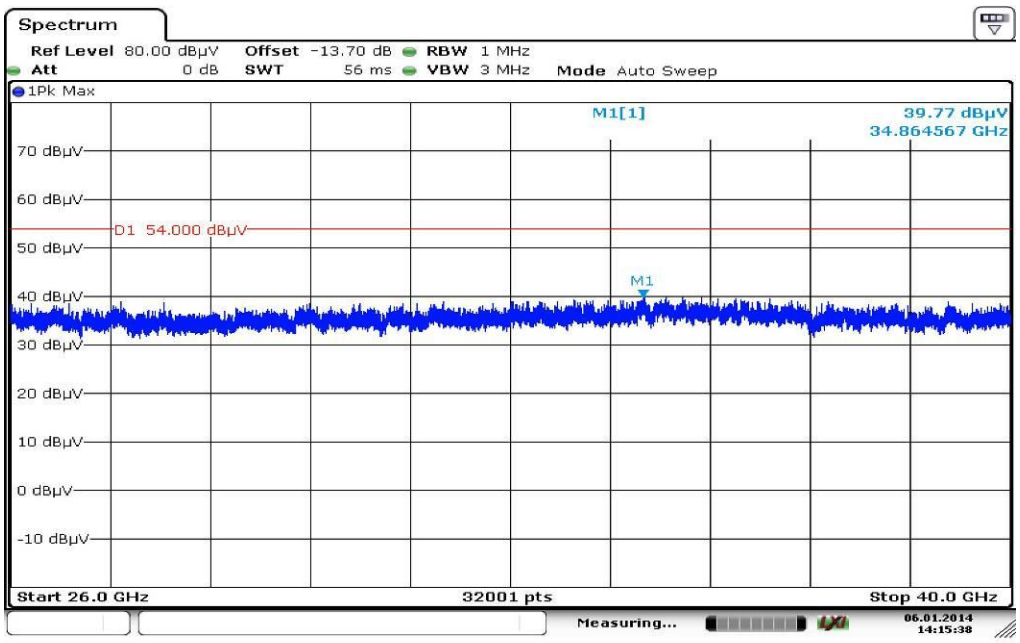


Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:18:58

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 14:15:39

Plot 6: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

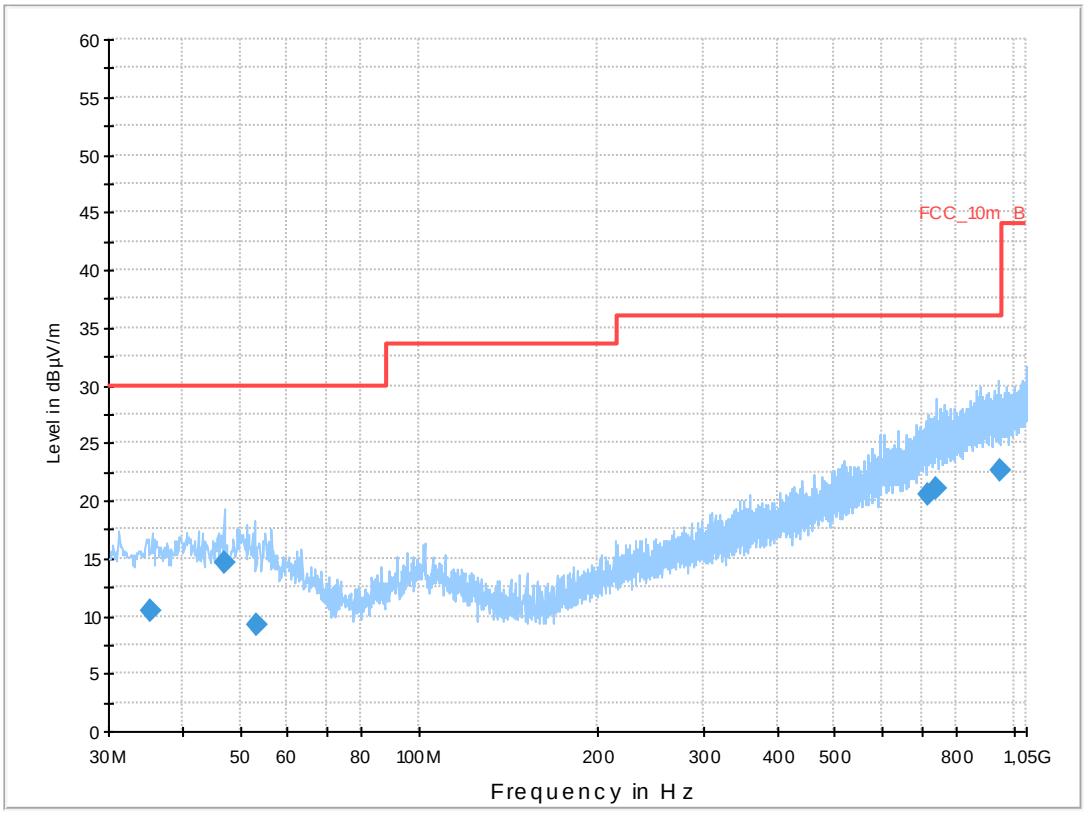
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan a-mode tx ch 157
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

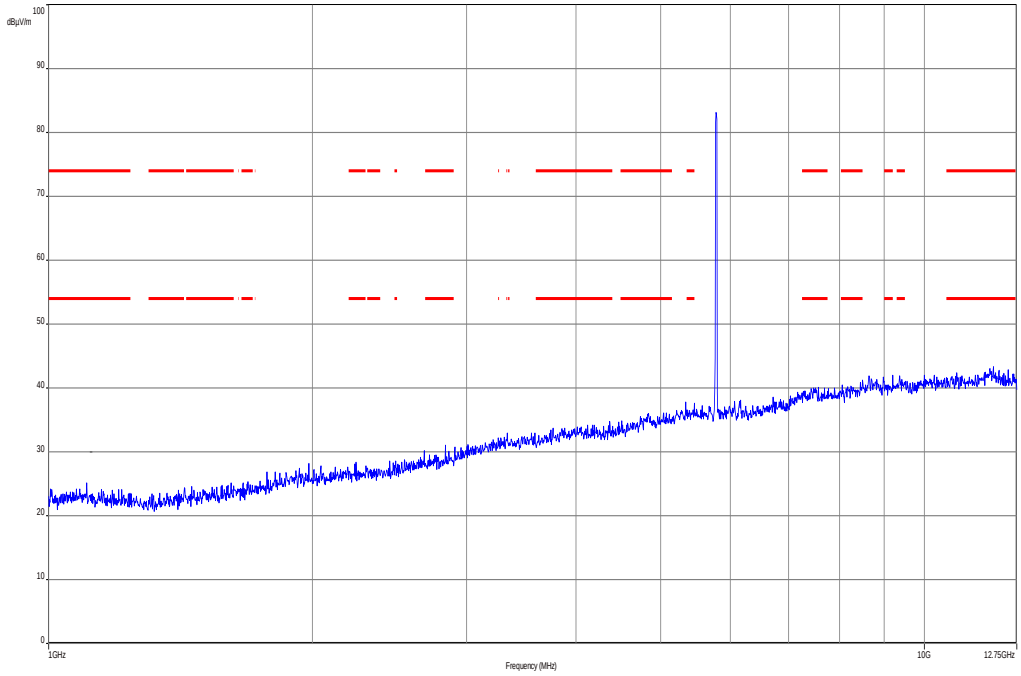
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



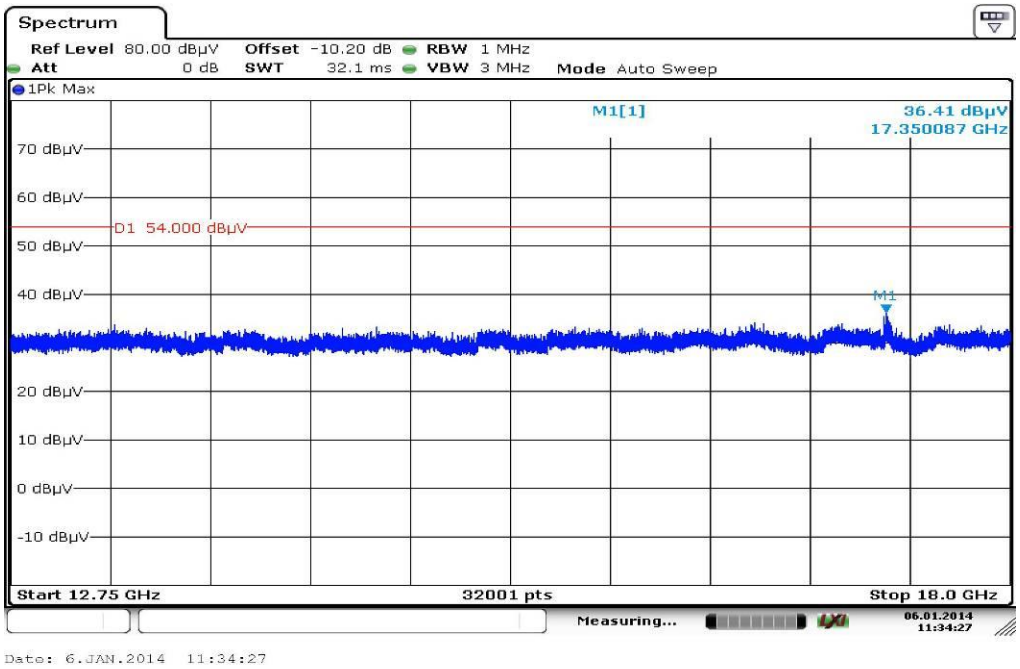
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.324550	10.4	1000.0	120.000	170.0	H	270.0	13.1	19.6	30.0	
46.982700	14.5	1000.0	120.000	98.0	V	10.0	13.3	15.5	30.0	
53.487600	9.2	1000.0	120.000	112.0	H	3.0	13.0	20.8	30.0	
717.559800	20.6	1000.0	120.000	170.0	H	175.0	22.9	15.4	36.0	
741.541950	21.0	1000.0	120.000	170.0	H	-10.0	23.5	15.0	36.0	
945.786000	22.7	1000.0	120.000	98.0	H	100.0	25.3	13.3	36.0	

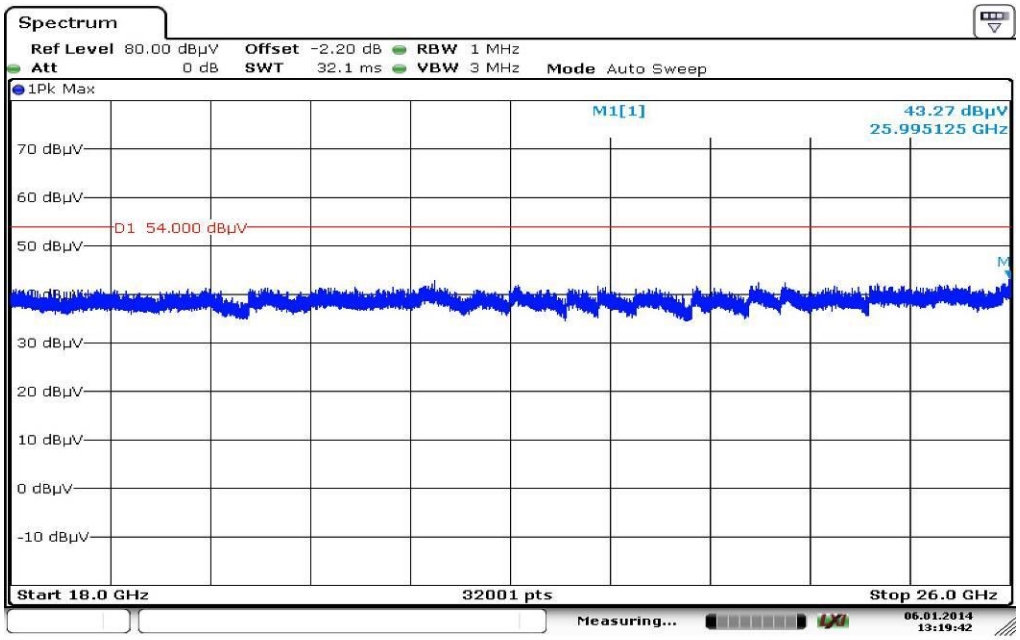
Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 8: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 9: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



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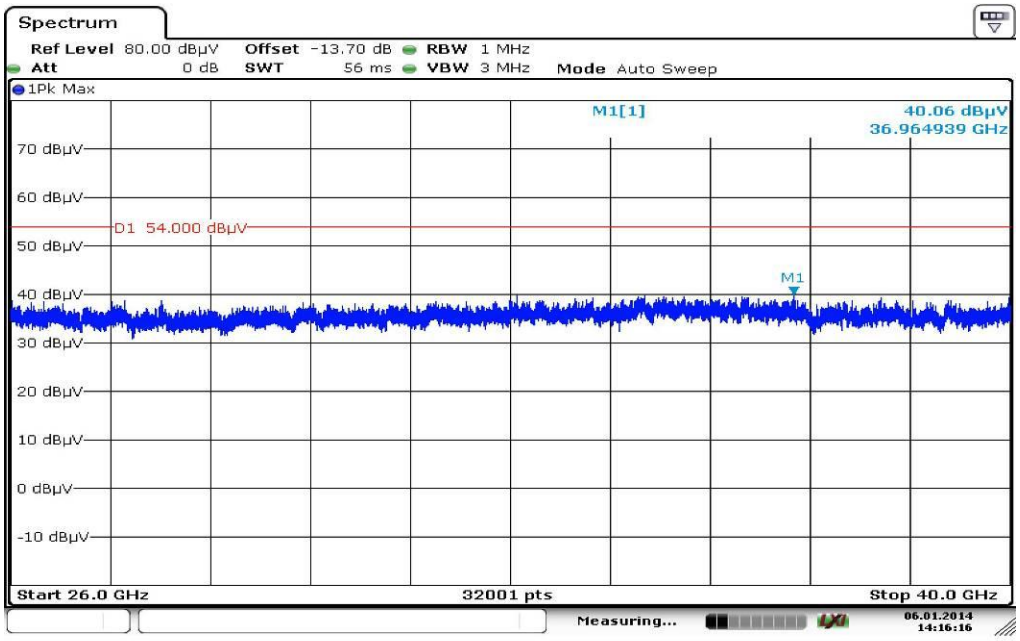
Plot 10: Middle channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 14:16:16

Plot 11: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

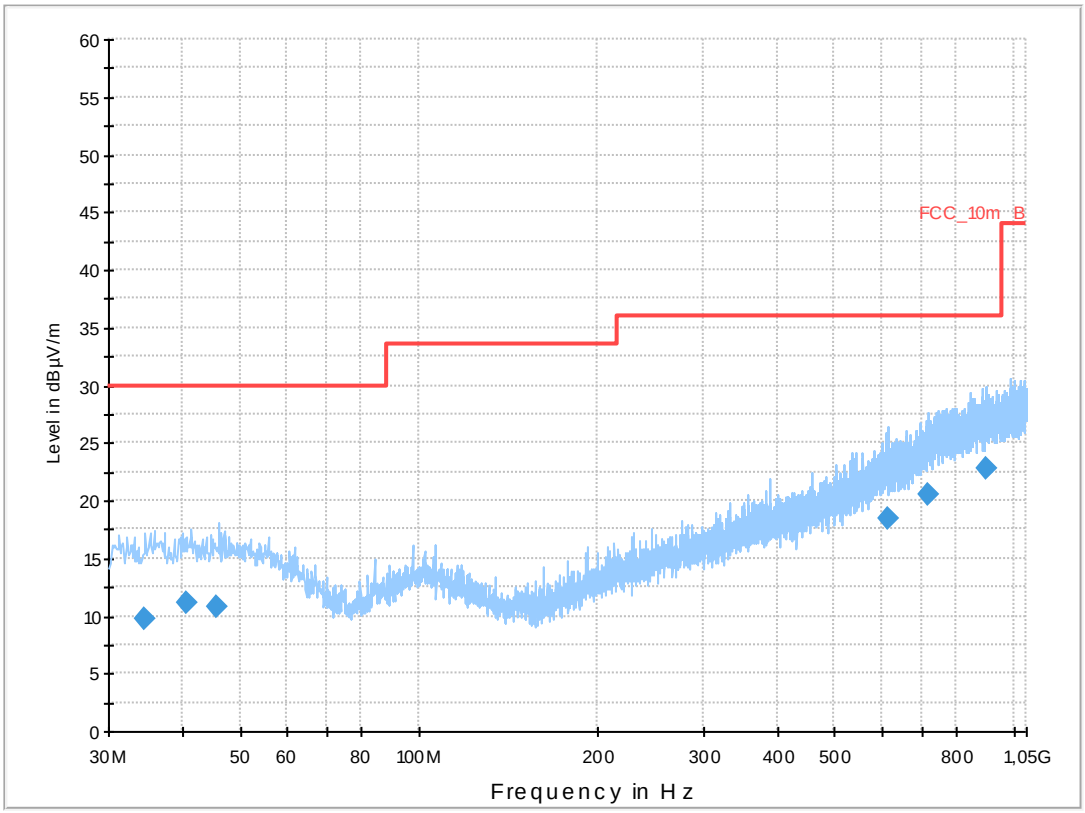
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan a-mode tx ch 165
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

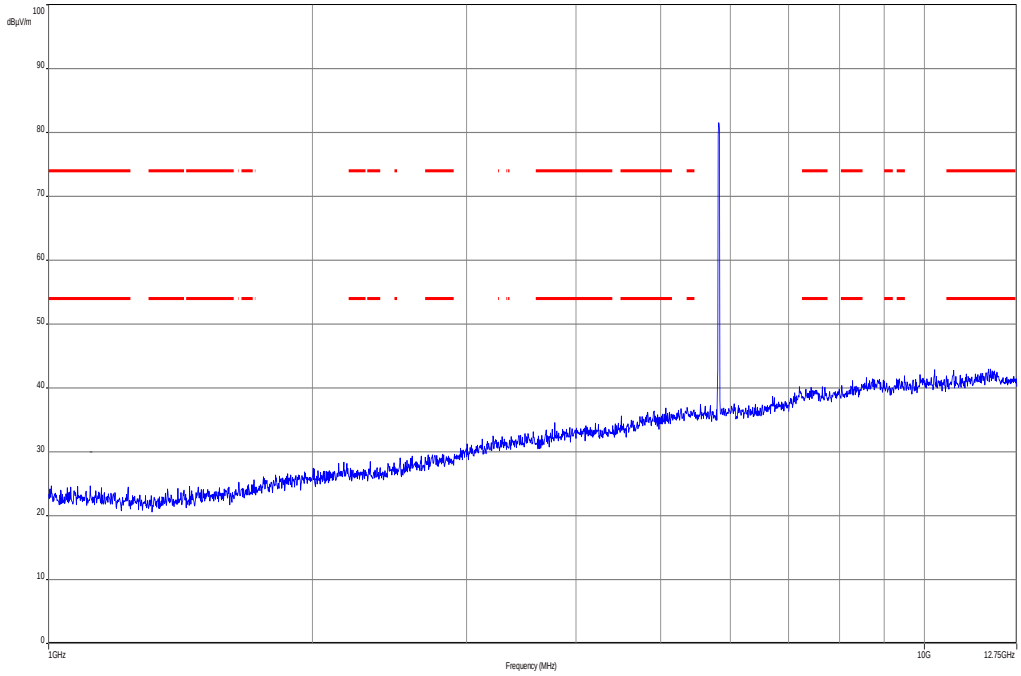
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



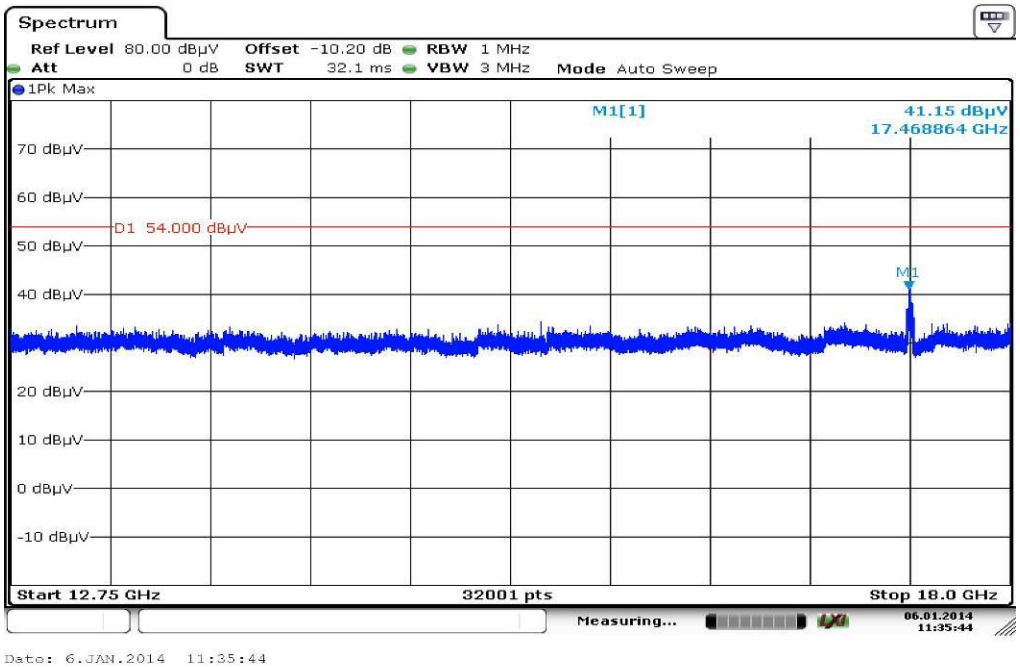
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
34.605000	9.8	1000.0	120.000	170.0	H	0.0	13.0	20.2	30.0	
40.506600	11.1	1000.0	120.000	170.0	V	260.0	13.4	18.9	30.0	
45.560250	10.7	1000.0	120.000	120.0	V	170.0	13.3	19.3	30.0	
613.808100	18.4	1000.0	120.000	146.0	H	183.0	20.9	17.6	36.0	
720.241800	20.5	1000.0	120.000	170.0	H	190.0	23.0	15.5	36.0	
901.266450	22.8	1000.0	120.000	170.0	V	171.0	25.2	13.2	36.0	

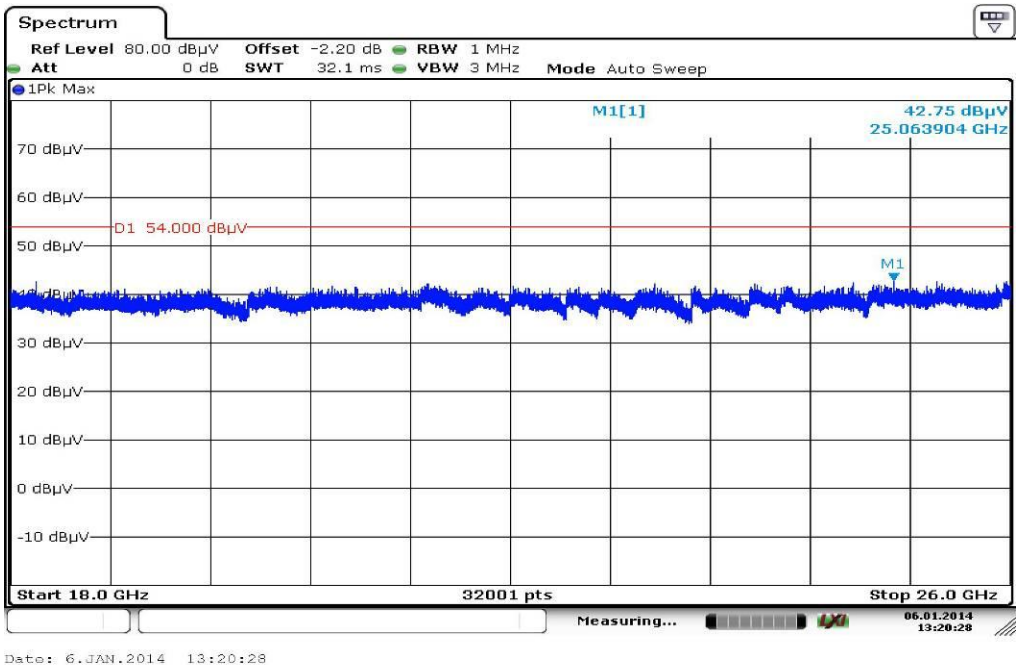
Plot 12: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



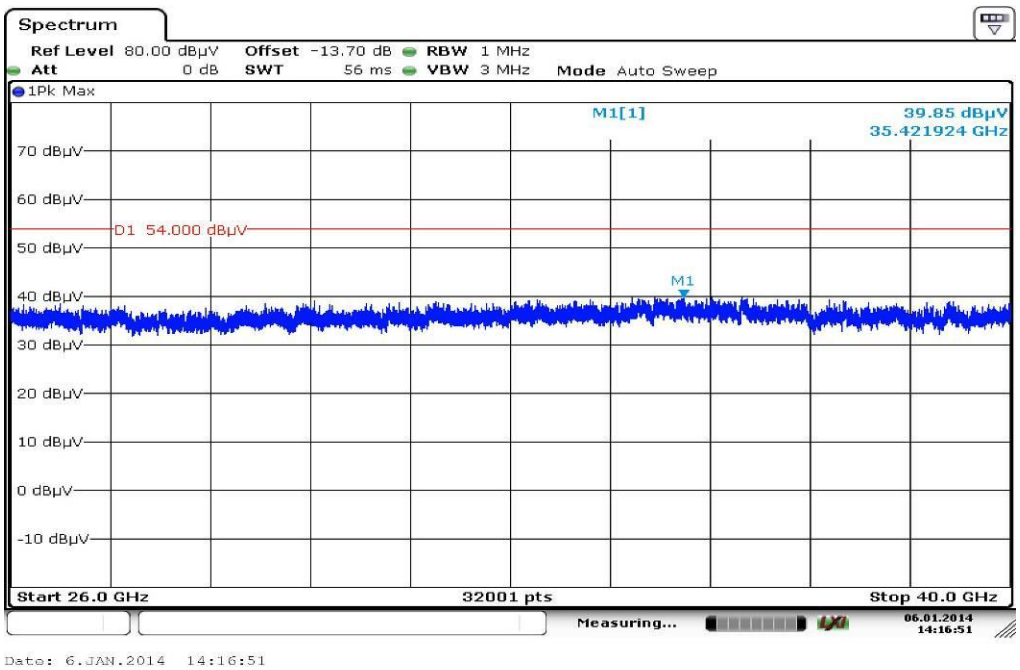
Plot 13: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 14: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plot 15: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Plots: OFDM / ac – mode 20MHz

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

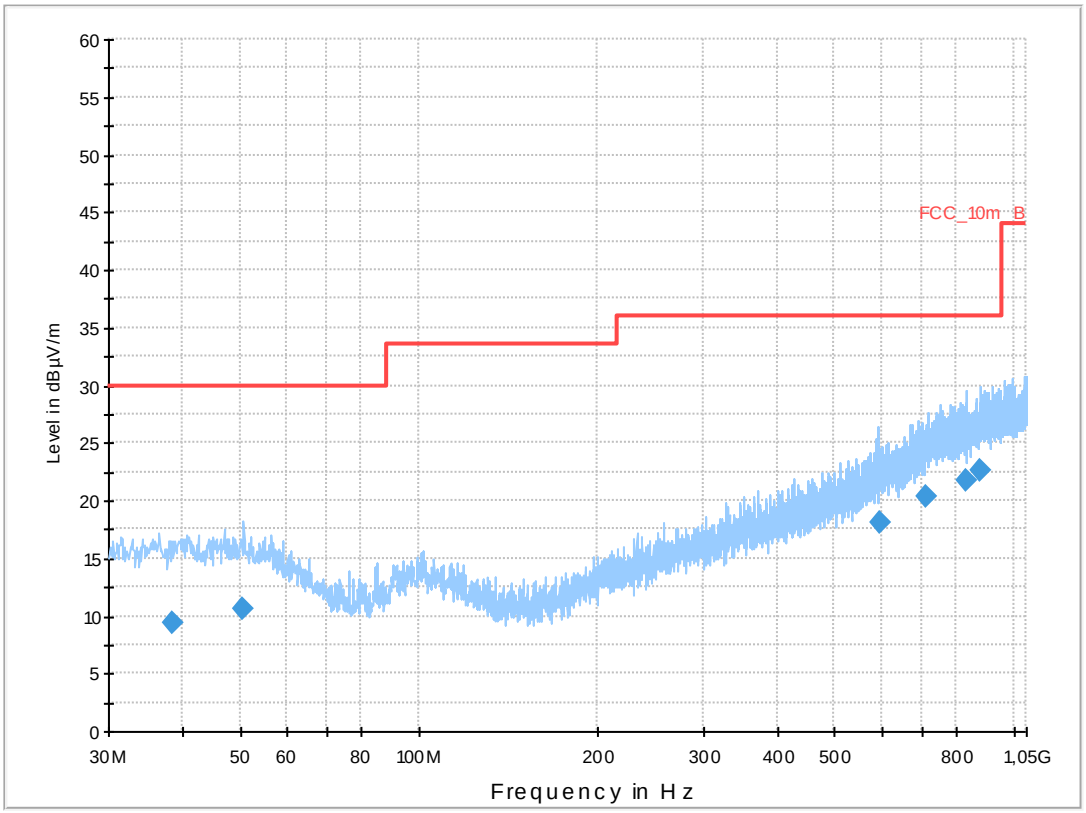
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan n-mode (HT20) tx ch 149
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

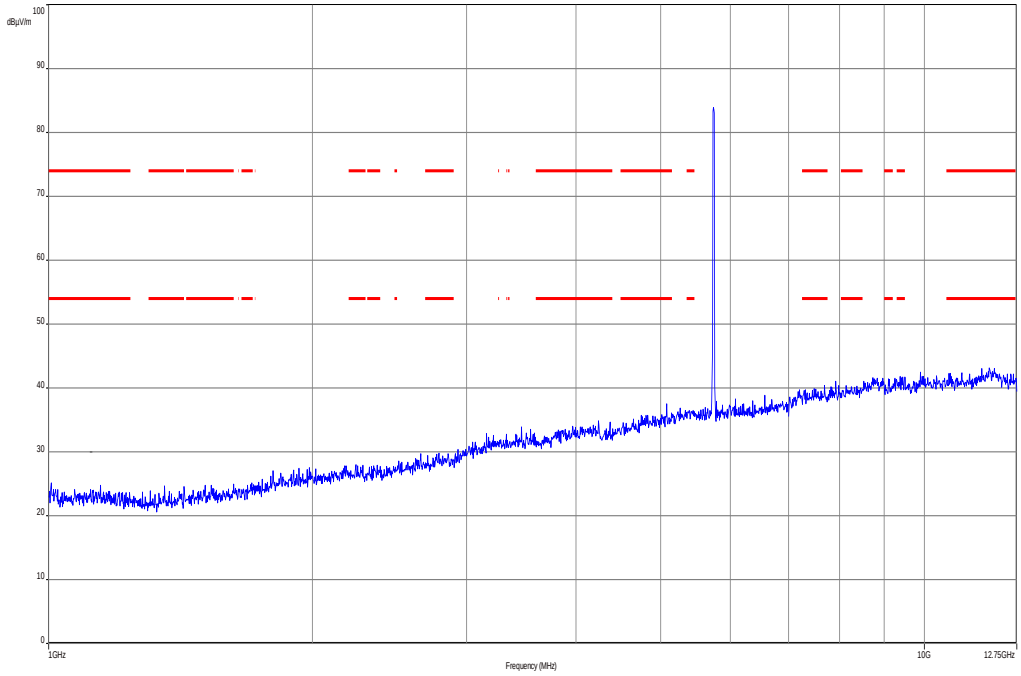
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



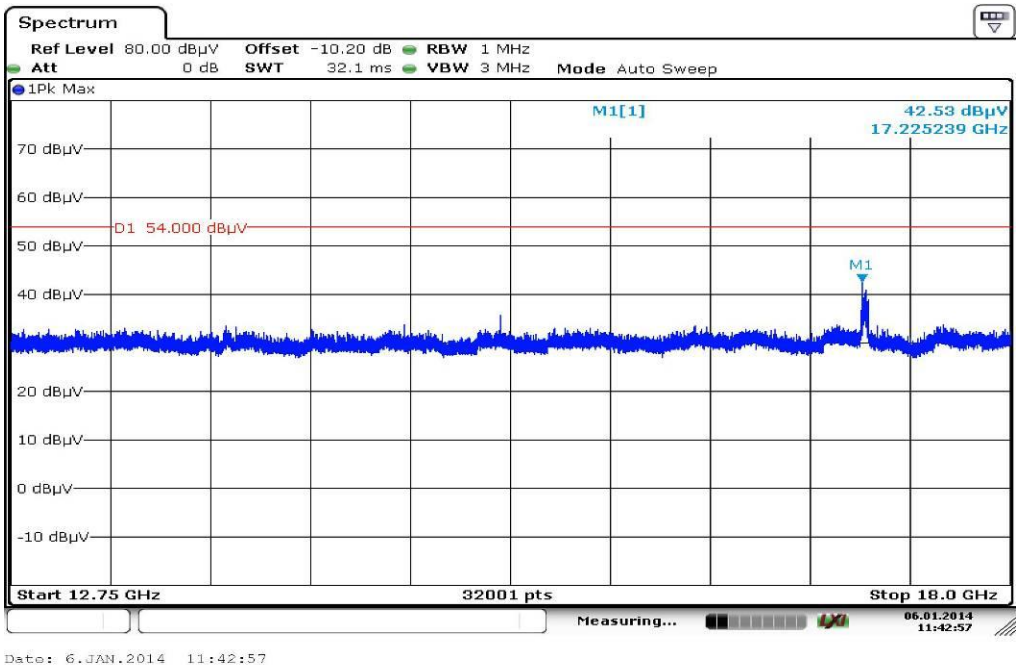
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
38.520900	9.5	1000.0	120.000	170.0	H	170.0	13.3	20.5	30.0	
50.568750	10.6	1000.0	120.000	170.0	V	272.0	13.3	19.4	30.0	
593.725800	18.1	1000.0	120.000	170.0	H	2.0	20.6	17.9	36.0	
714.991200	20.4	1000.0	120.000	120.0	V	80.0	22.9	15.6	36.0	
830.477550	21.8	1000.0	120.000	170.0	H	268.0	24.3	14.2	36.0	
879.280350	22.6	1000.0	120.000	170.0	V	86.0	24.9	13.4	36.0	

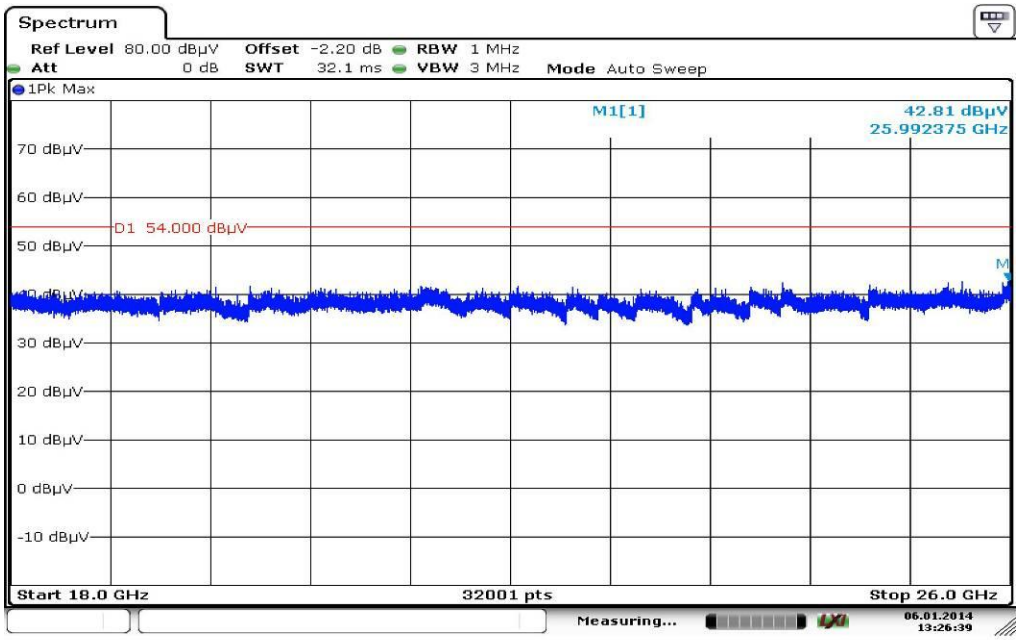
Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

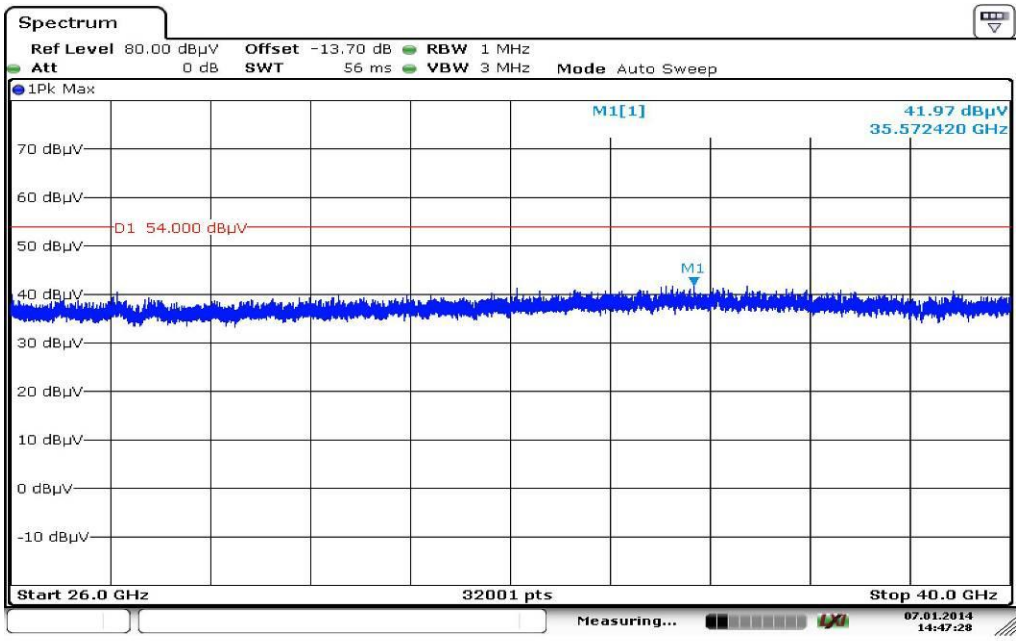


Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:26:39

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 7.JAN.2014 14:47:29

Plot 6: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

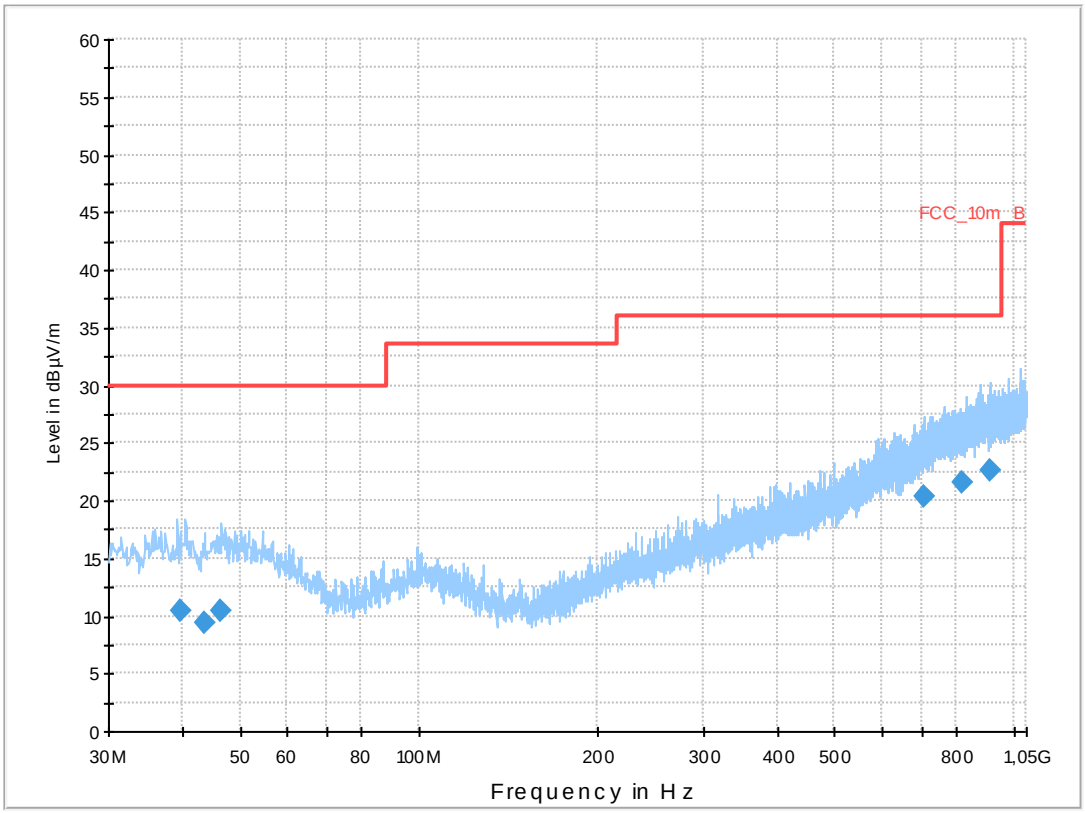
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan n-mode (HT20) tx ch 157
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

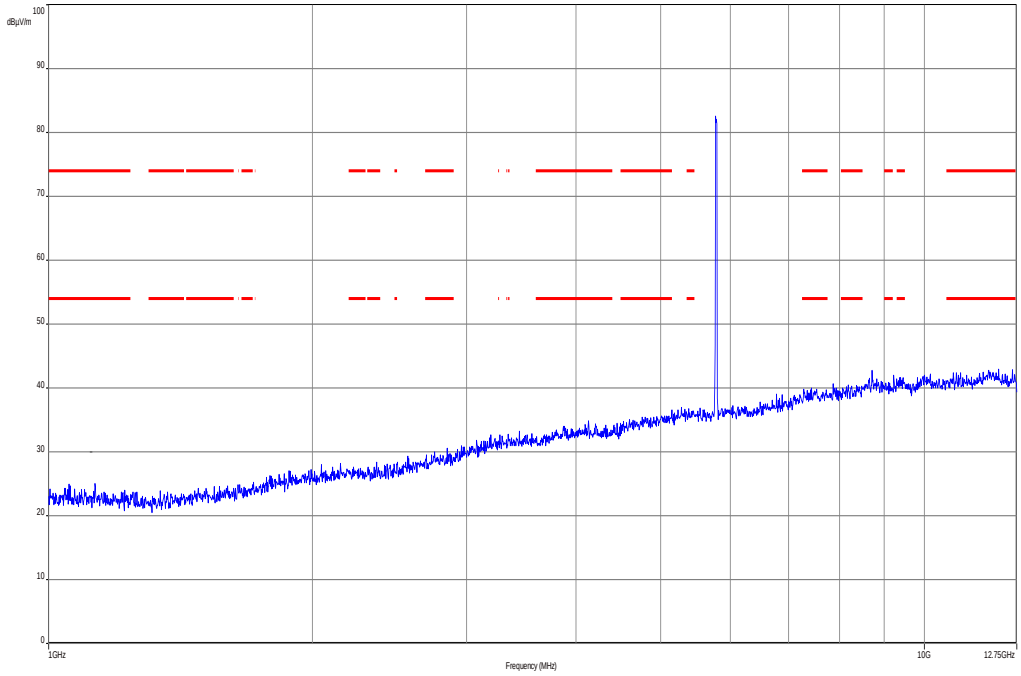
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



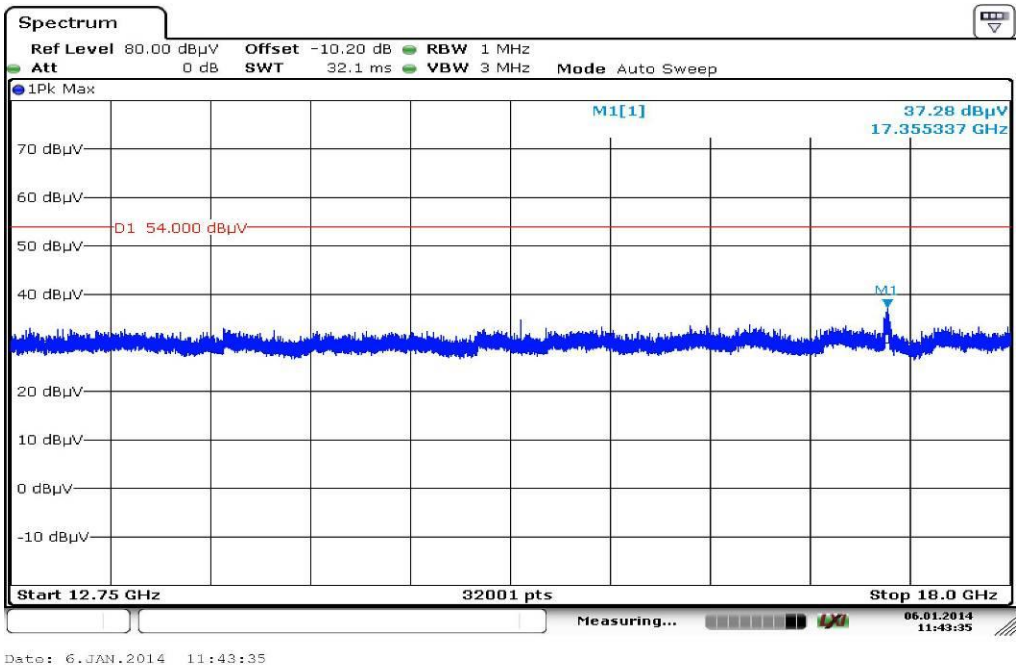
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
39.744900	10.5	1000.0	120.000	170.0	H	268.0	13.4	19.5	30.0	
43.495950	9.3	1000.0	120.000	170.0	H	175.0	13.3	20.7	30.0	
46.467900	10.4	1000.0	120.000	170.0	H	175.0	13.3	19.6	30.0	
705.552450	20.3	1000.0	120.000	170.0	V	100.0	22.6	15.7	36.0	
822.092850	21.6	1000.0	120.000	170.0	H	-5.0	24.1	14.4	36.0	
913.230300	22.7	1000.0	120.000	151.0	H	10.0	25.2	13.3	36.0	

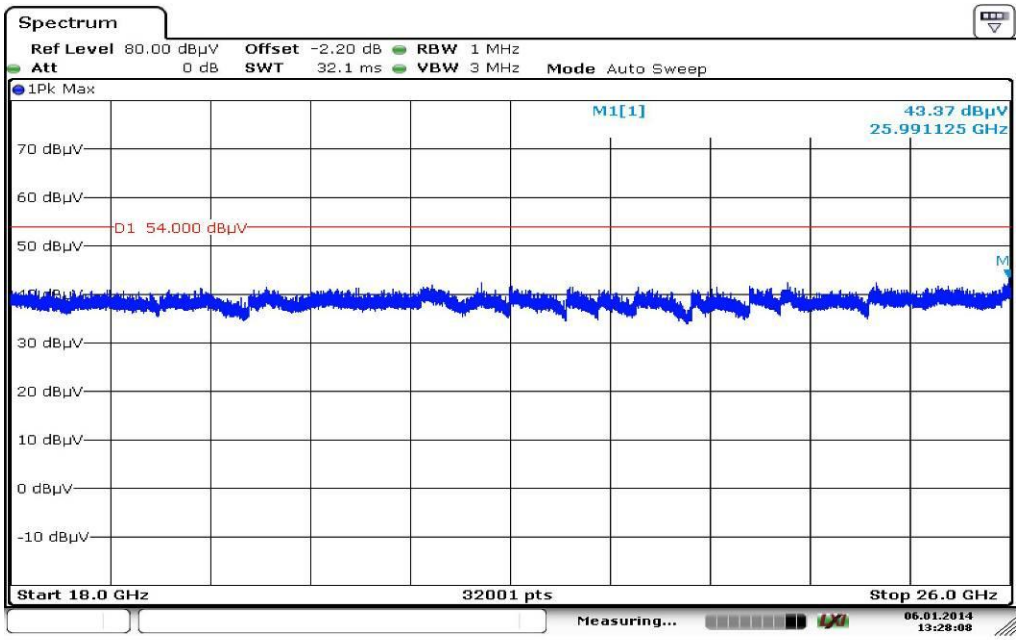
Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 8: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 9: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



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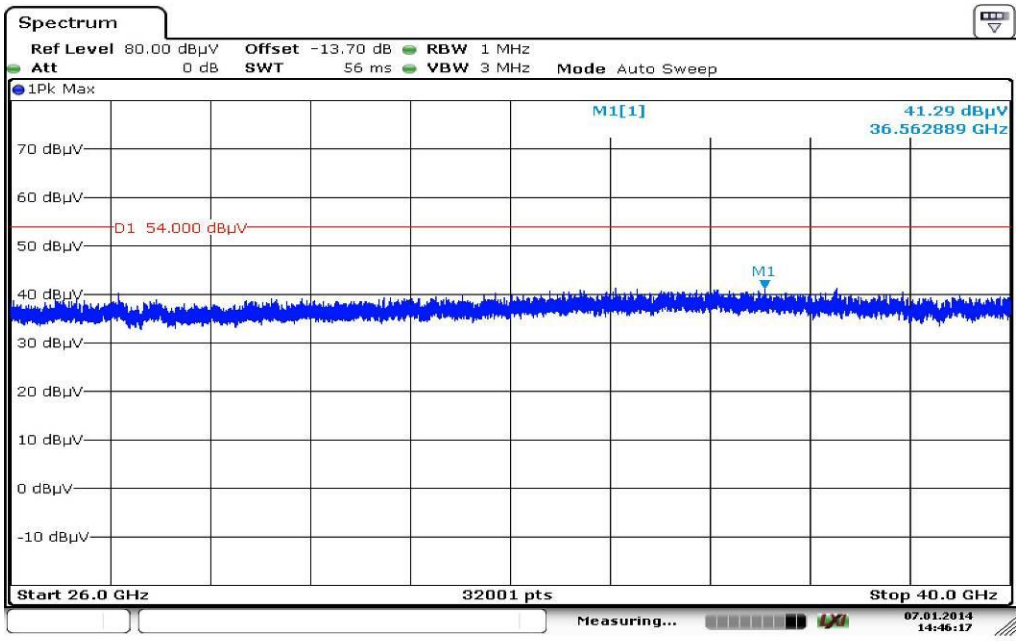
Plot 10: Middle channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 7.JAN.2014 14:46:17

Plot 11: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

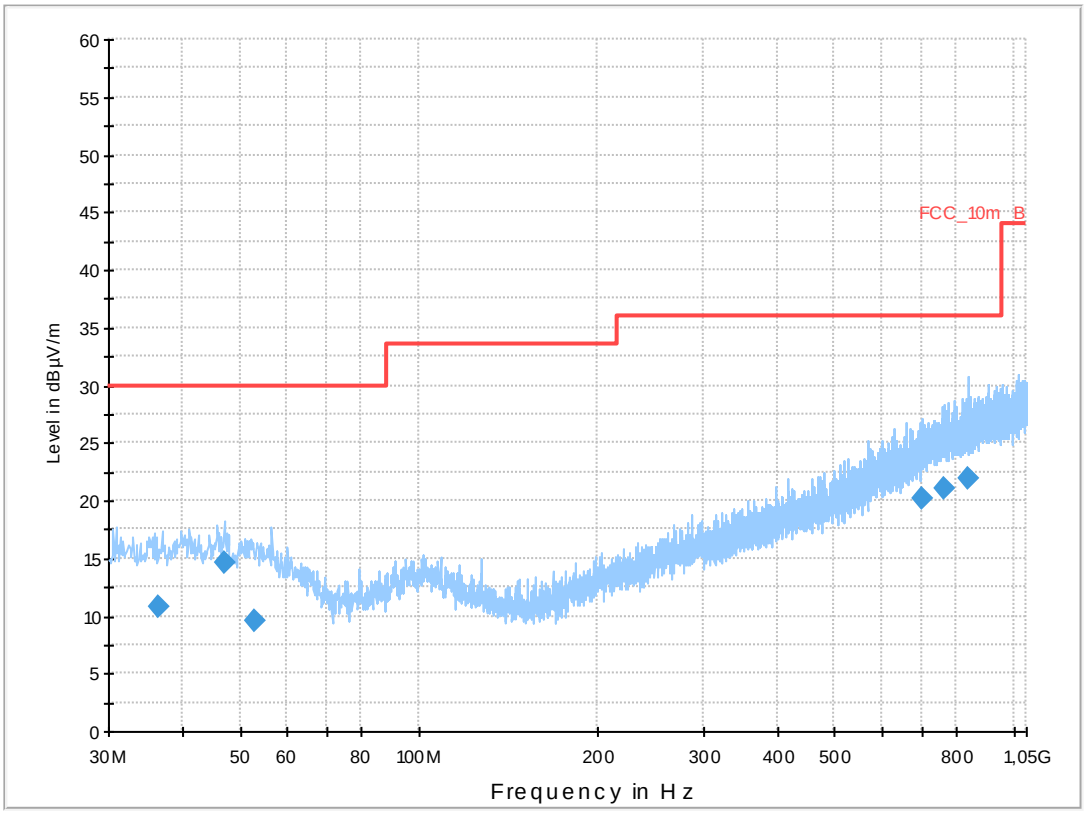
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan n-mode (HT20) tx ch 165
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

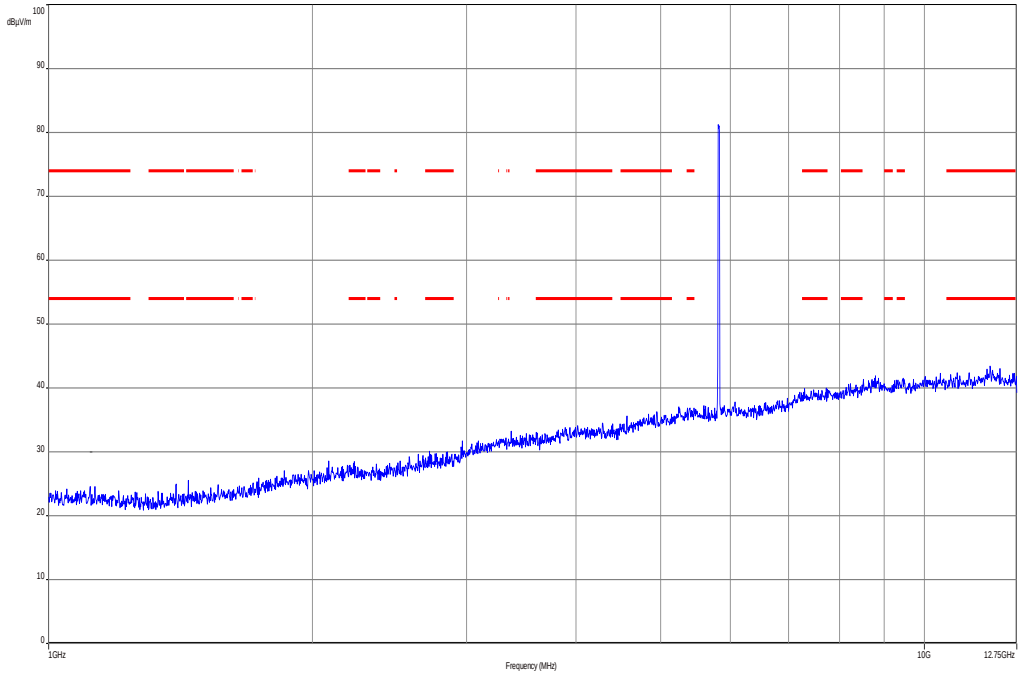
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



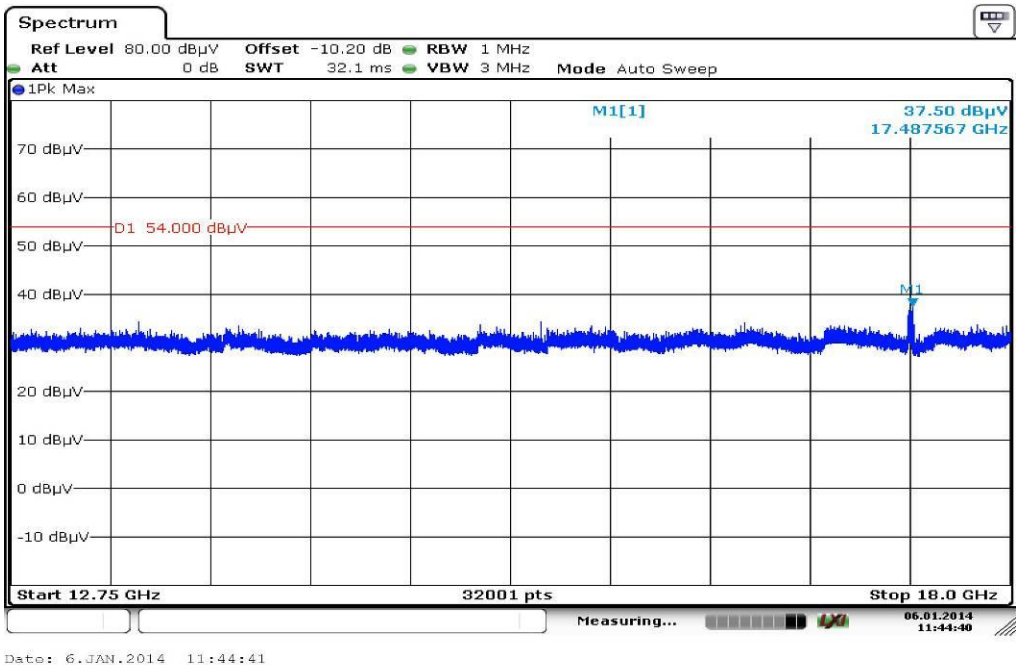
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.350400	10.8	1000.0	120.000	170.0	V	2.0	13.1	19.2	30.0	
46.987050	14.6	1000.0	120.000	98.0	V	90.0	13.3	15.4	30.0	
53.023800	9.5	1000.0	120.000	111.0	V	280.0	13.1	20.5	30.0	
699.849000	20.1	1000.0	120.000	170.0	H	270.0	22.5	15.9	36.0	
764.683500	21.1	1000.0	120.000	170.0	V	3.0	23.7	14.9	36.0	
840.129000	21.9	1000.0	120.000	170.0	H	81.0	24.4	14.1	36.0	

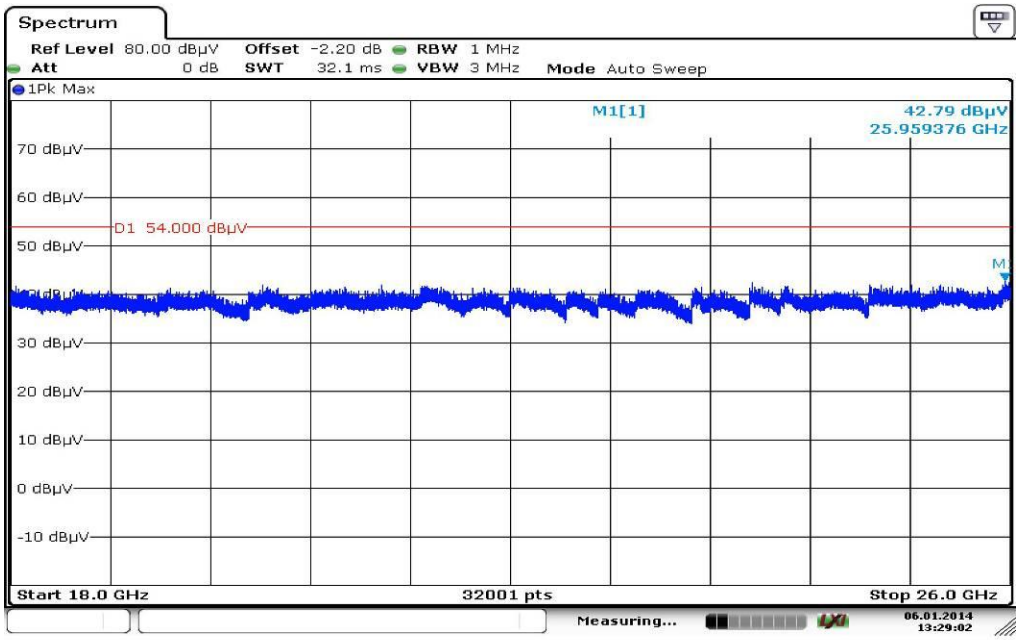
Plot 12: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 13: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

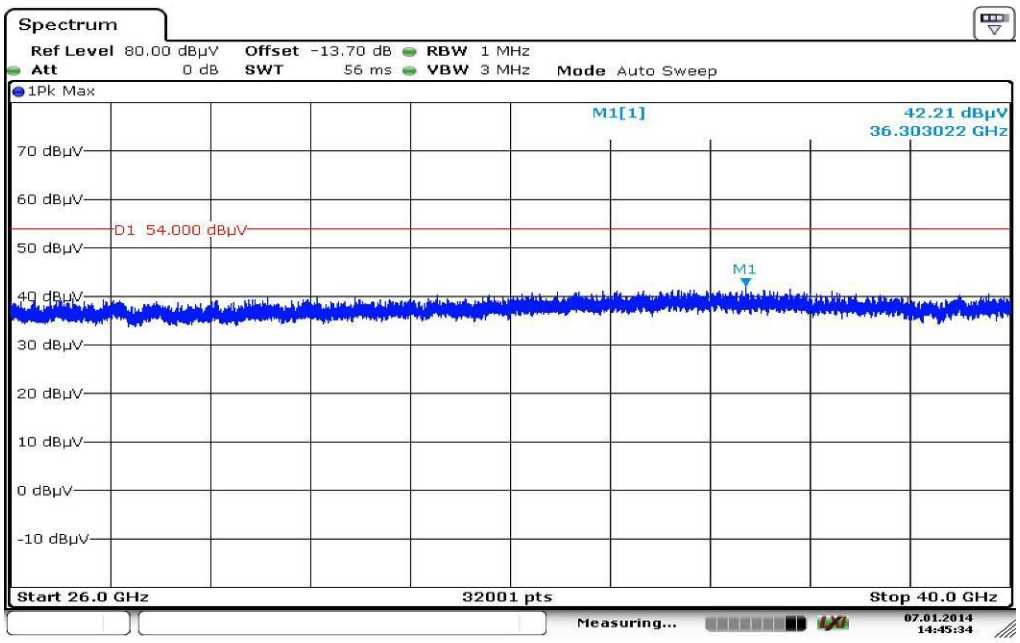


Plot 14: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:29:02

Plot 15: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 7.JAN.2014 14:45:35

Plots: OFDM / ac – mode 40 MHz

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

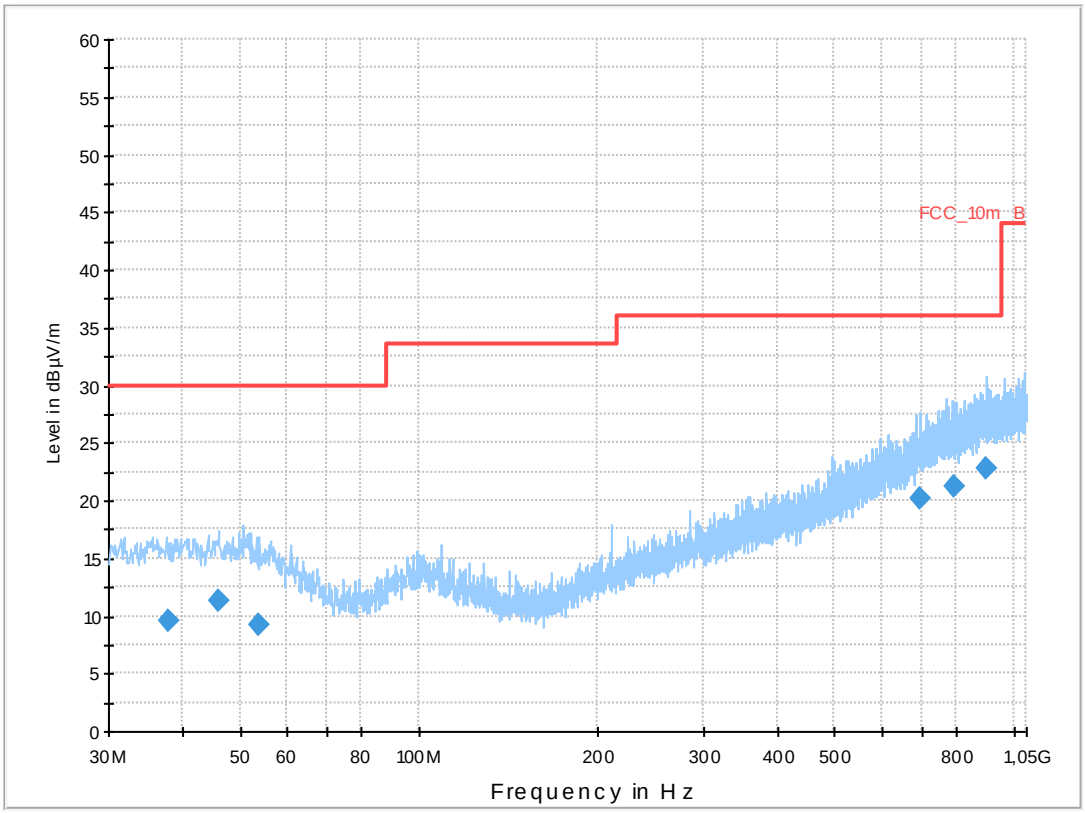
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan n-mode (HT40) tx ch 151
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

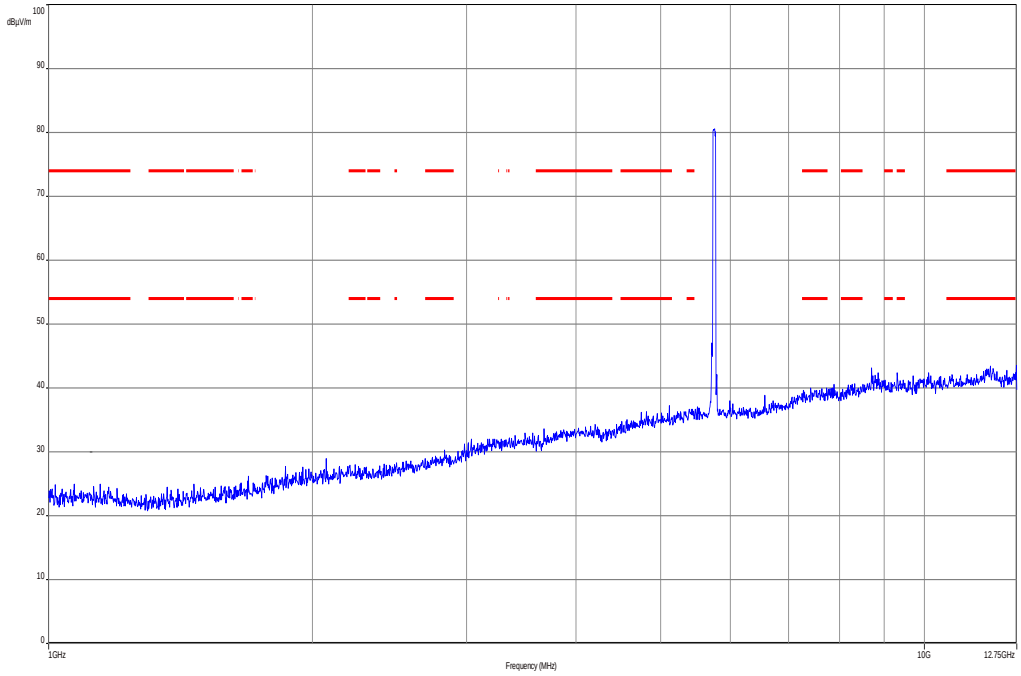
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



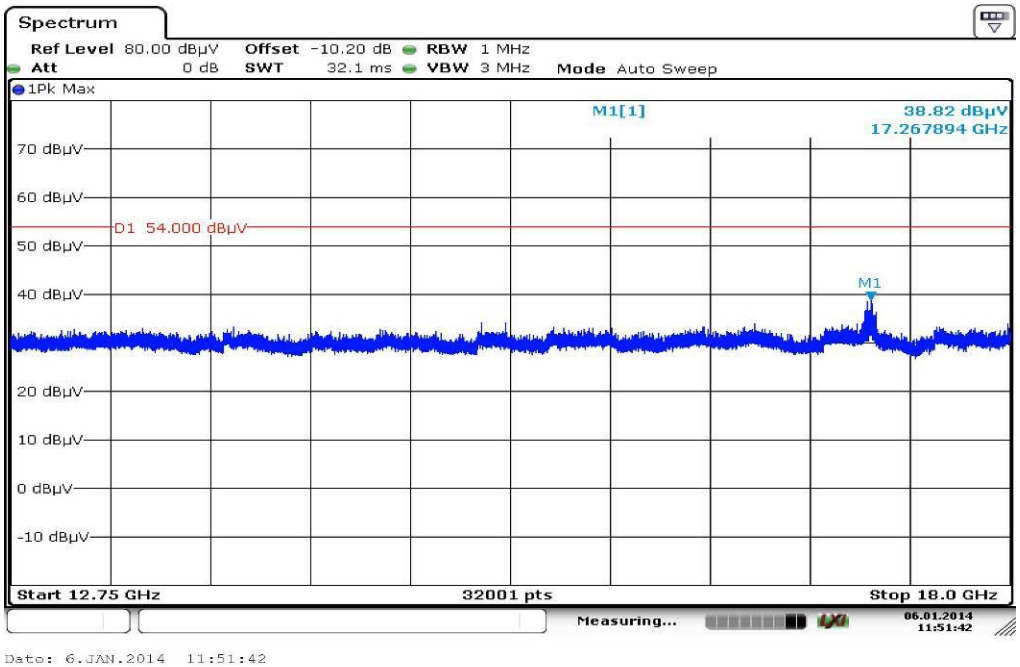
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
37.928850	9.5	1000.0	120.000	170.0	H	10.0	13.3	20.5	30.0	
46.066050	11.2	1000.0	120.000	98.0	V	86.0	13.3	18.8	30.0	
53.529150	9.3	1000.0	120.000	104.0	H	260.0	13.0	20.8	30.0	
698.406750	20.1	1000.0	120.000	170.0	V	190.0	22.5	15.9	36.0	
793.497000	21.2	1000.0	120.000	170.0	H	280.0	23.8	14.8	36.0	
899.641500	22.8	1000.0	120.000	170.0	H	100.0	25.2	13.2	36.0	

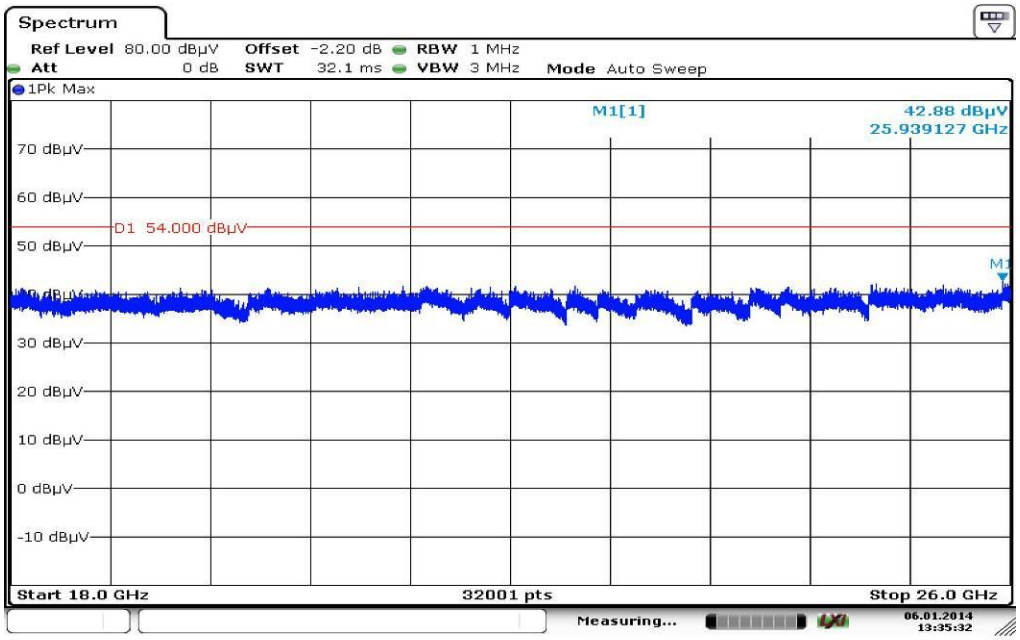
Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

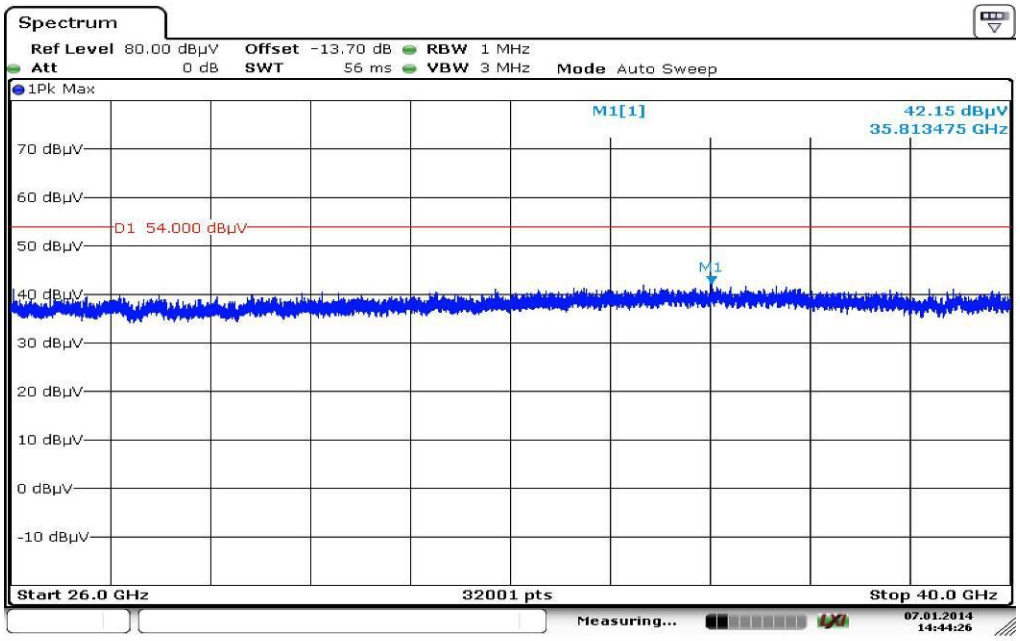


Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:35:33

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 7.JAN.2014 14:44:27

Plot 6: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

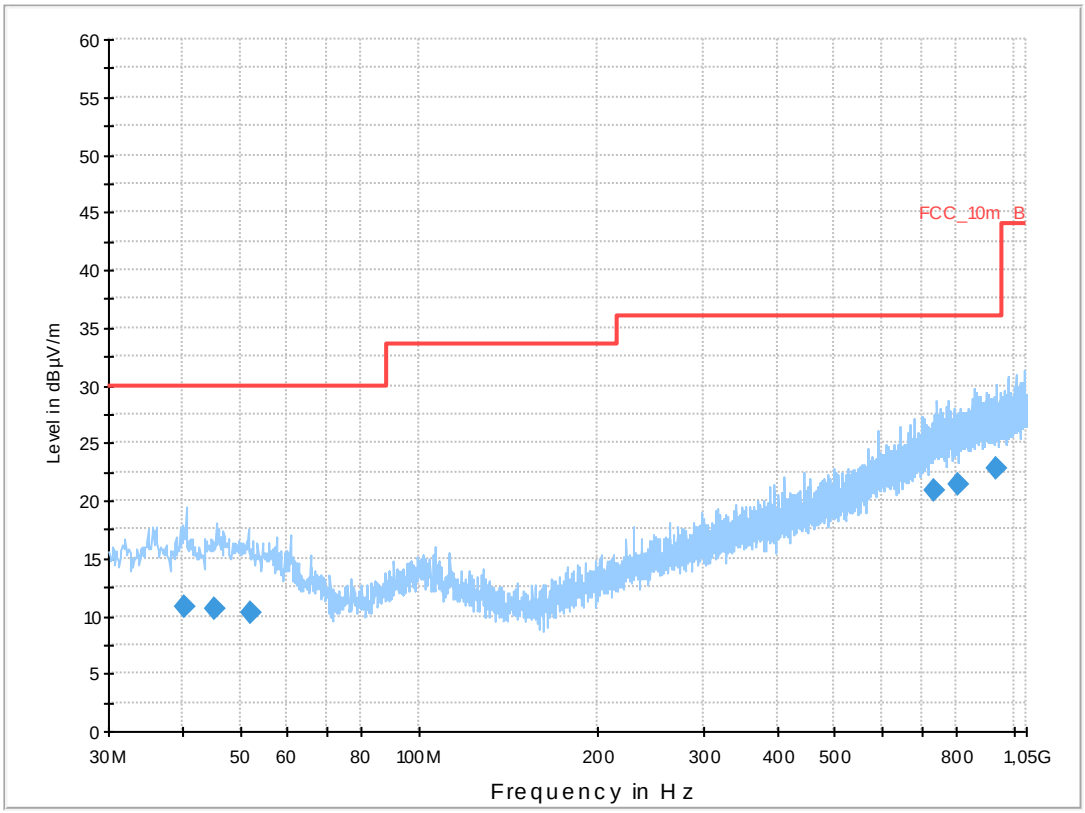
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan n-mode (HT40) tx ch 159
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

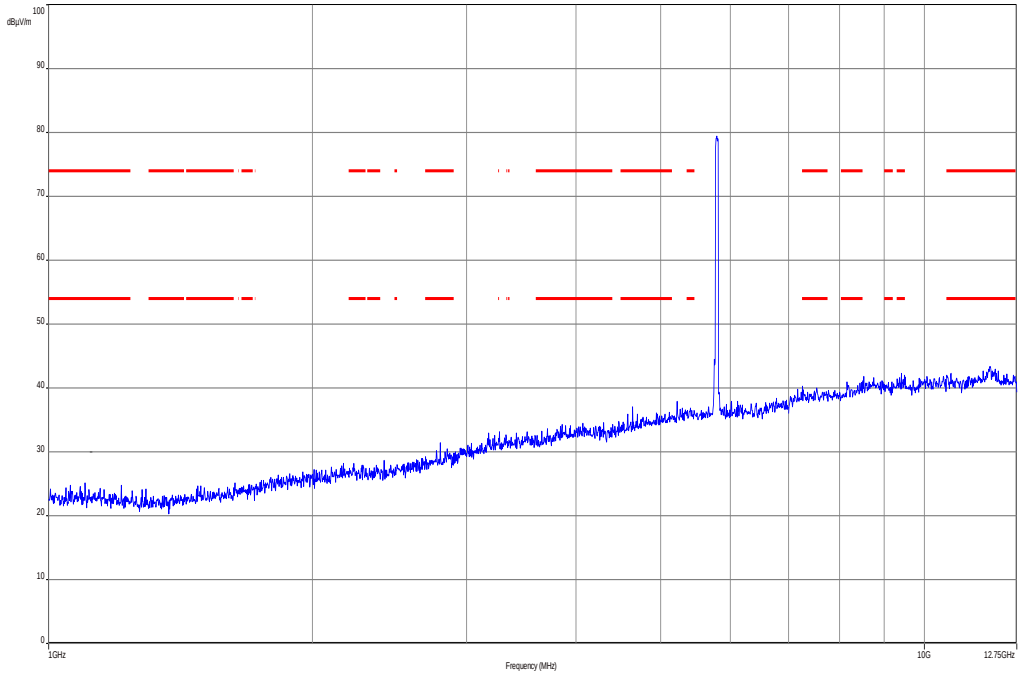
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



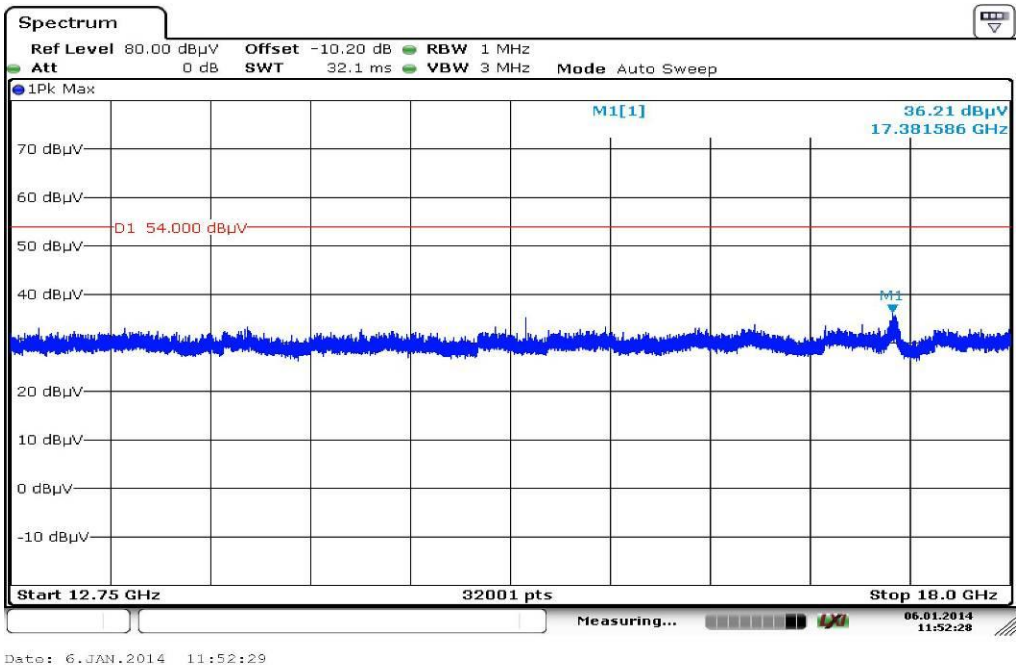
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
40.145250	10.8	1000.0	120.000	170.0	H	280.0	13.4	19.2	30.0	
45.398700	10.7	1000.0	120.000	170.0	H	81.0	13.3	19.3	30.0	
52.008900	10.2	1000.0	120.000	105.0	V	3.0	13.2	19.8	30.0	
732.823800	20.9	1000.0	120.000	170.0	H	280.0	23.3	15.1	36.0	
805.861200	21.4	1000.0	120.000	170.0	V	3.0	23.9	14.6	36.0	
932.280300	22.8	1000.0	120.000	170.0	H	100.0	25.3	13.2	36.0	

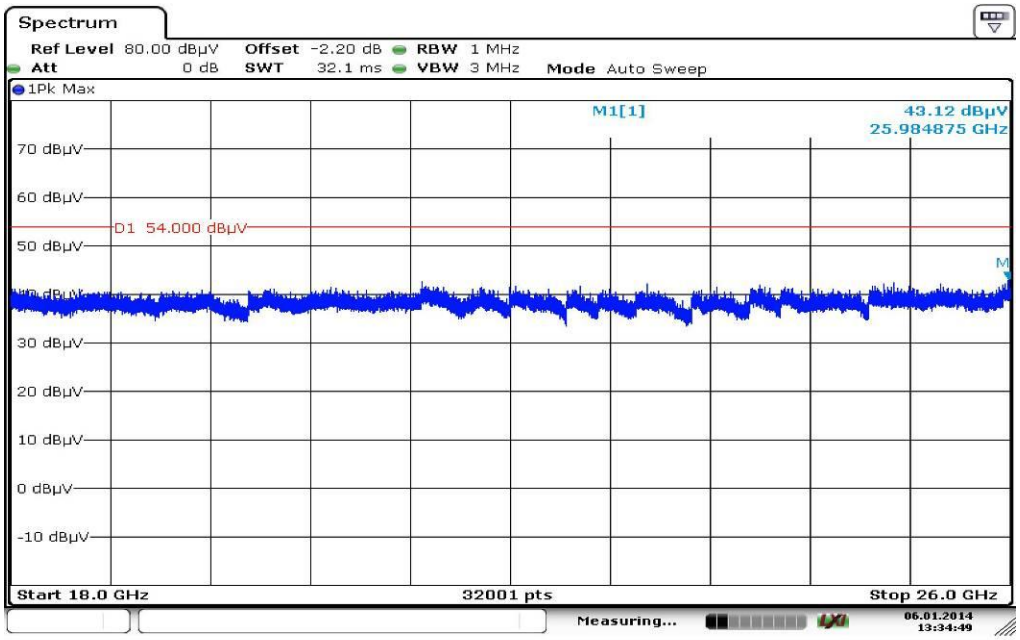
Plot 7: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 8: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

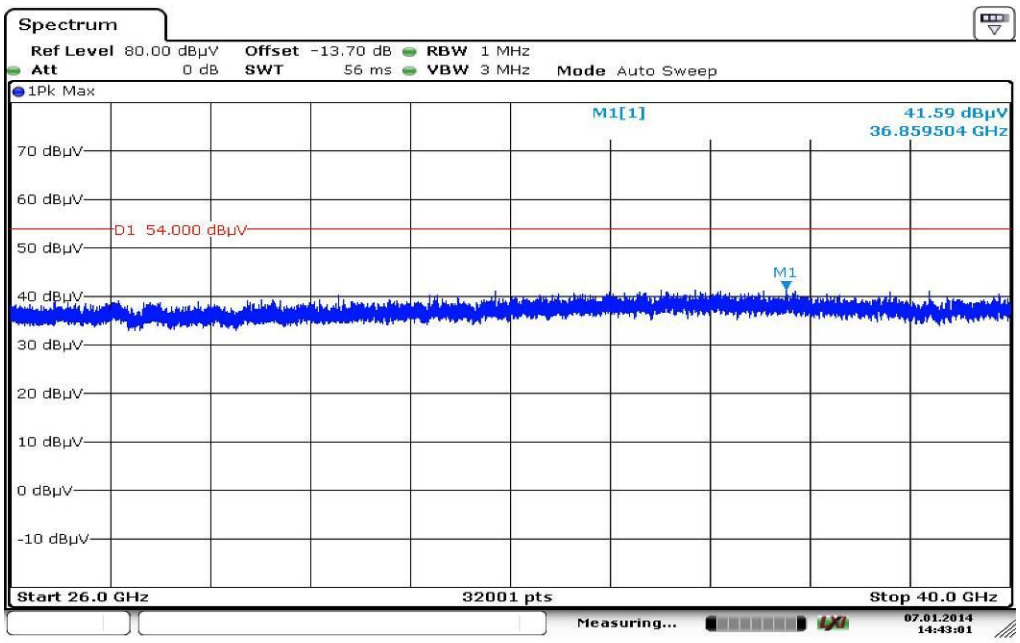


Plot 9: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:34:49

Plot 10: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 7.JAN.2014 14:43:01

Plots: OFDM / ac – mode 80 MHz

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

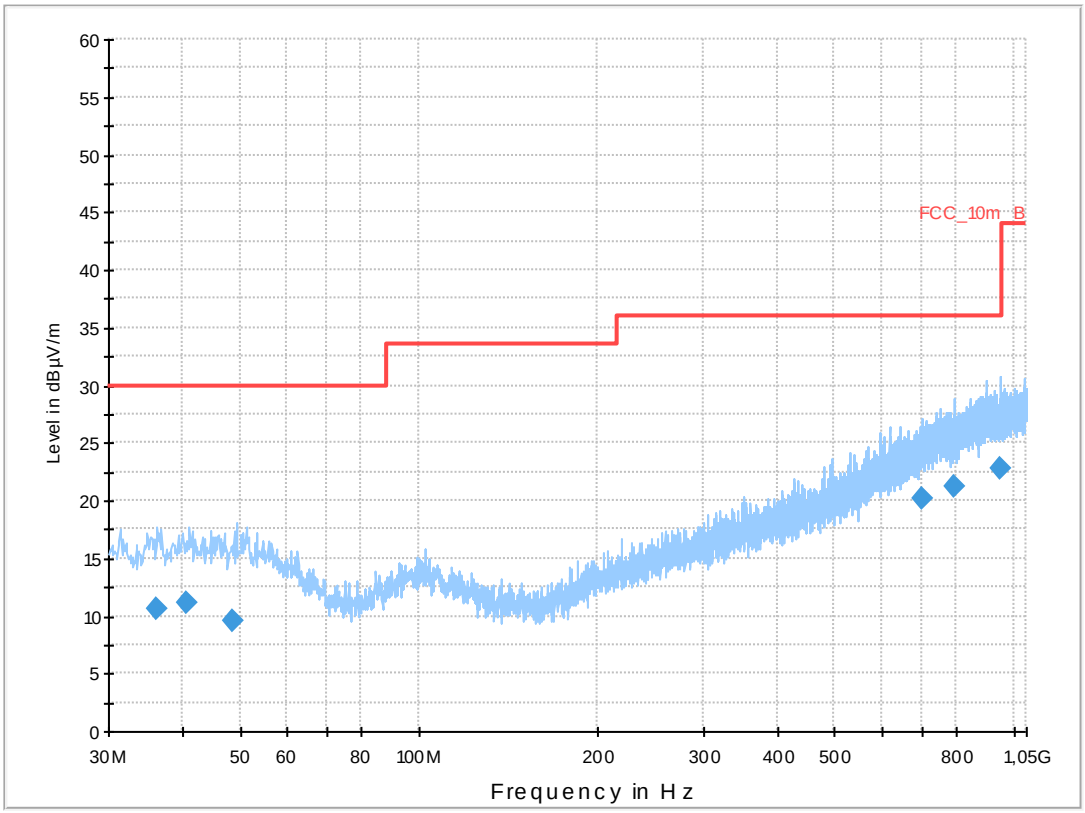
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q67
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan ac-mode (HT80) tx ch 155
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

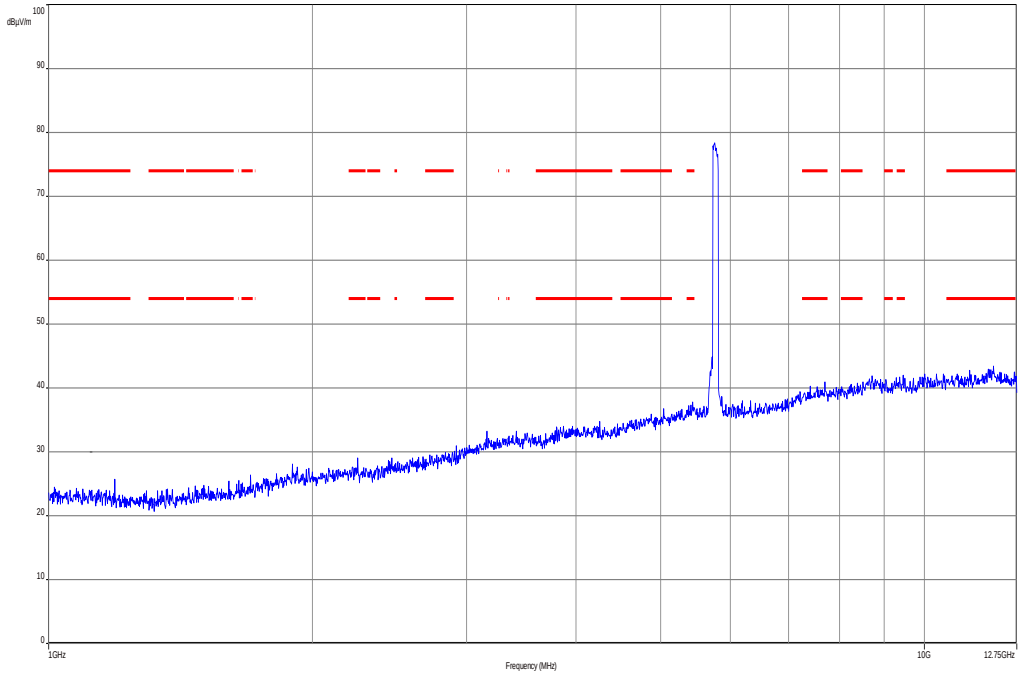
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



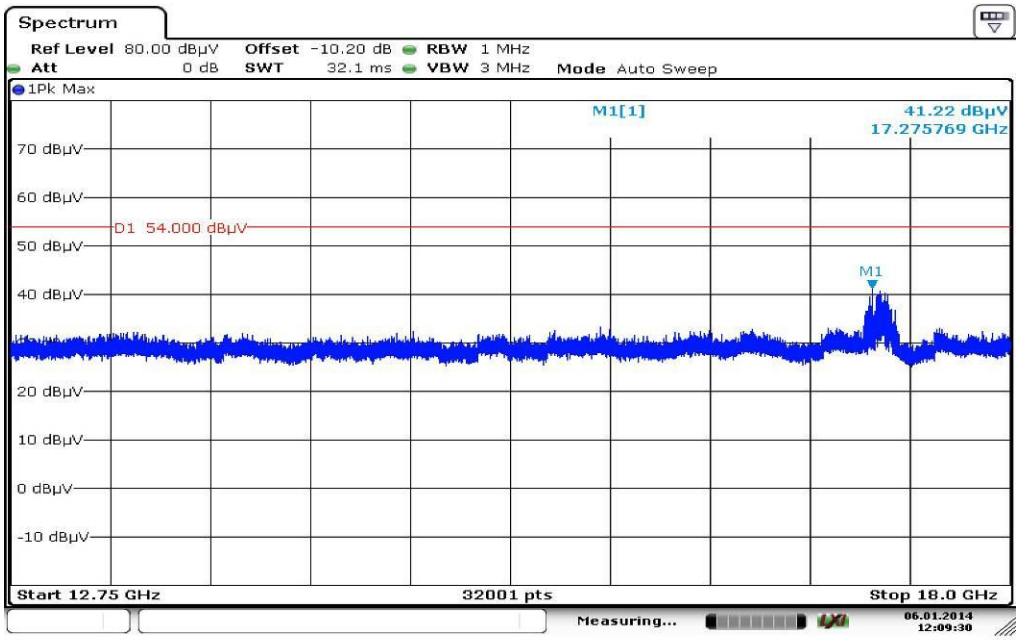
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.275250	10.7	1000.0	120.000	170.0	H	100.0	13.1	19.3	30.0	
40.485750	11.1	1000.0	120.000	98.0	V	10.0	13.4	18.9	30.0	
48.723150	9.5	1000.0	120.000	170.0	V	87.0	13.3	20.5	30.0	
702.923400	20.2	1000.0	120.000	170.0	V	270.0	22.6	15.8	36.0	
796.561200	21.2	1000.0	120.000	170.0	H	190.0	23.8	14.8	36.0	
948.120300	22.8	1000.0	120.000	143.0	H	10.0	25.3	13.2	36.0	

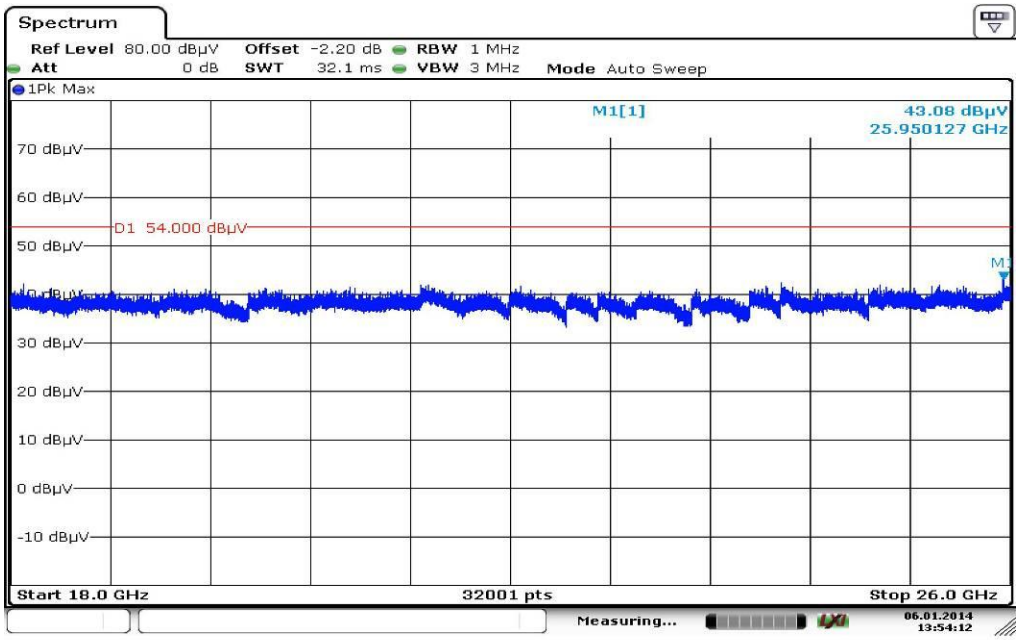
Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization

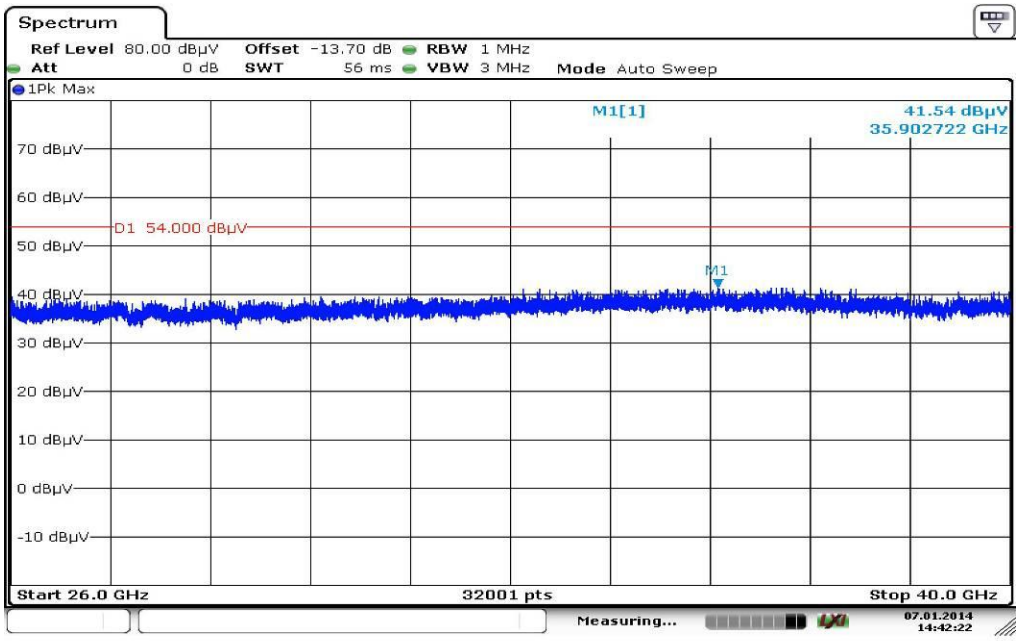


Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:54:12

Plot 5: 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 7.JAN.2014 14:42:22

10.9 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode. The results are valid for both modes.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 40 GHz
Trace-Mode:	Max Hold

Limits:

FCC		-/-
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results:

RX Spurious Emissions Radiated [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
Above 1 GHz: No emissions detected.		
Measurement uncertainty	± 3 dB	

Result: **Passed.**

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

Plots: RX / Idle – mode

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

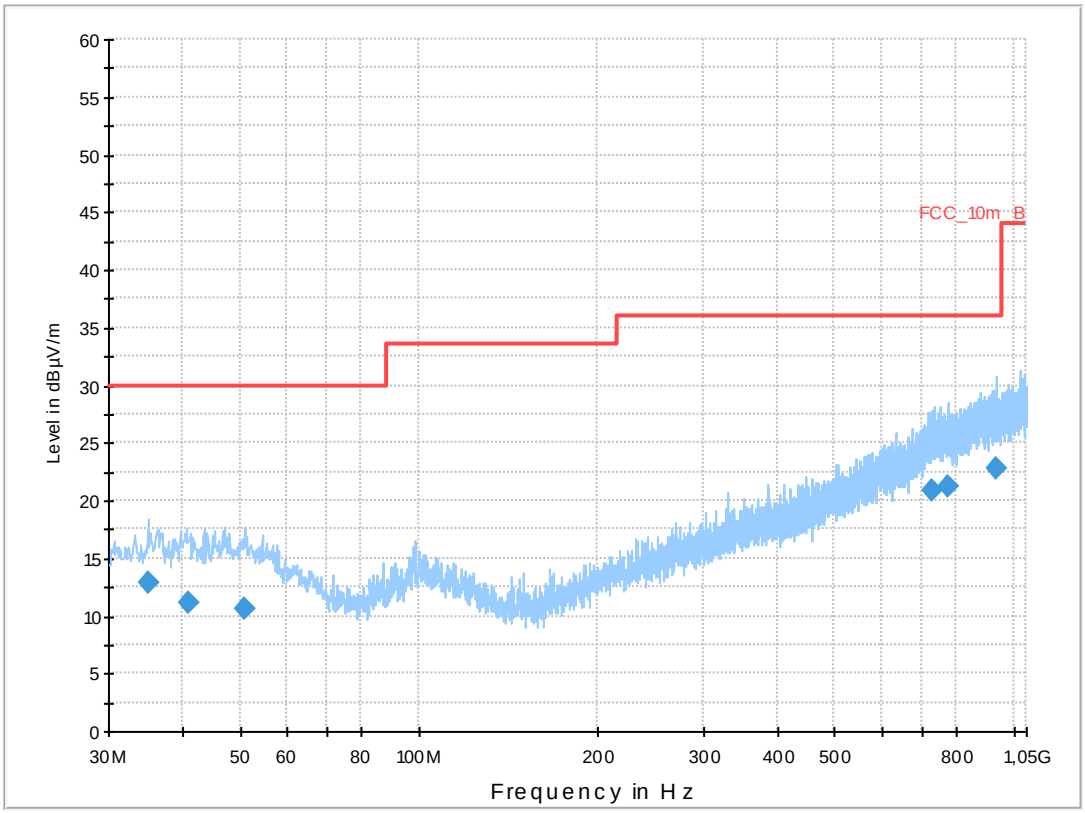
Common Information

EUT:	TM-0040-BV
Serial Number:	CB51267Q5X
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	w-lan idle
Operator Name:	Hennemann
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

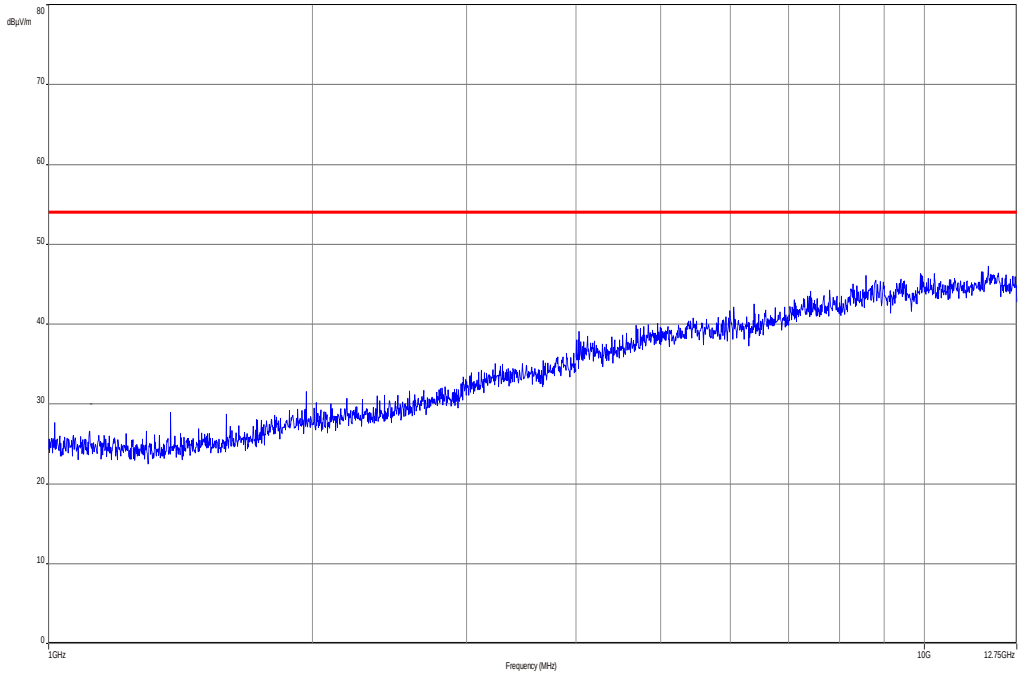
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



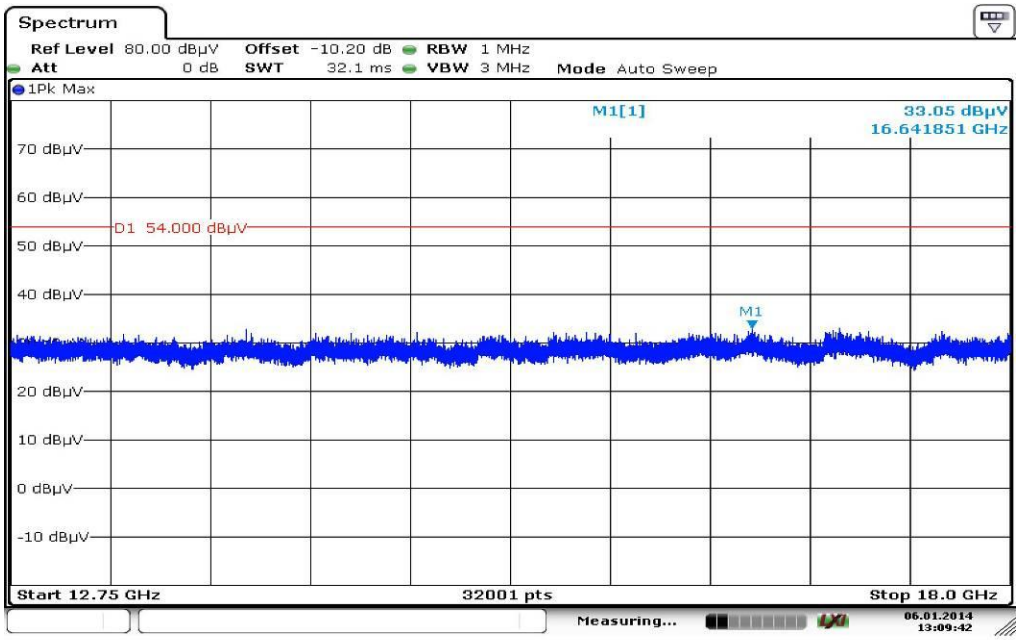
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.043300	12.9	1000.0	120.000	111.0	V	100.0	13.0	17.1	30.0	
40.978500	11.1	1000.0	120.000	104.0	V	170.0	13.4	18.9	30.0	
51.018600	10.7	1000.0	120.000	105.0	V	182.0	13.3	19.3	30.0	
730.311300	20.8	1000.0	120.000	120.0	H	-5.0	23.2	15.2	36.0	
773.669700	21.3	1000.0	120.000	170.0	V	10.0	23.7	14.7	36.0	
937.372650	22.8	1000.0	120.000	170.0	V	80.0	25.3	13.2	36.0	

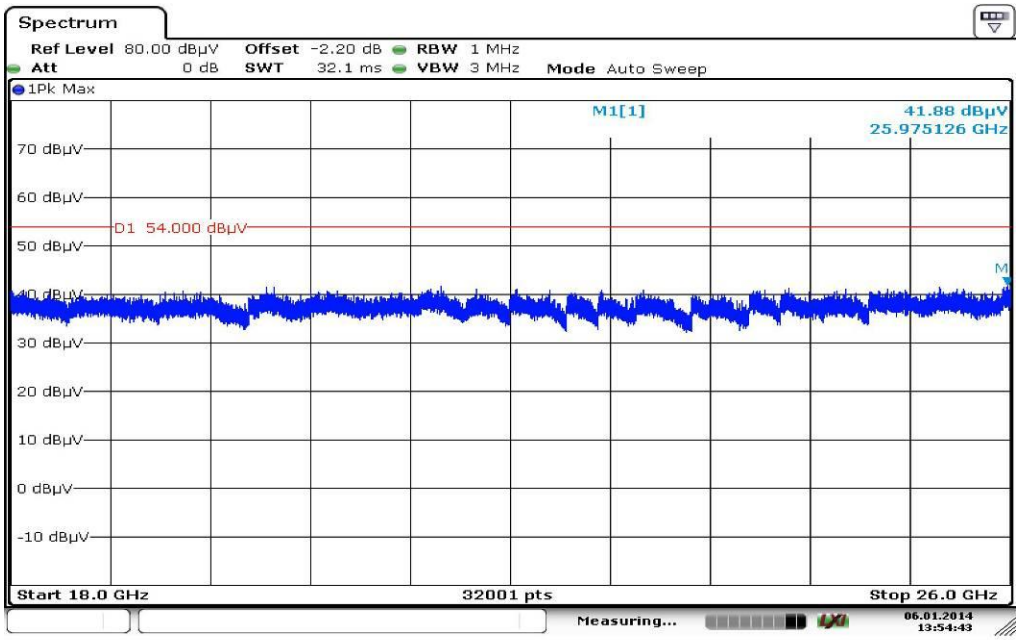
Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization

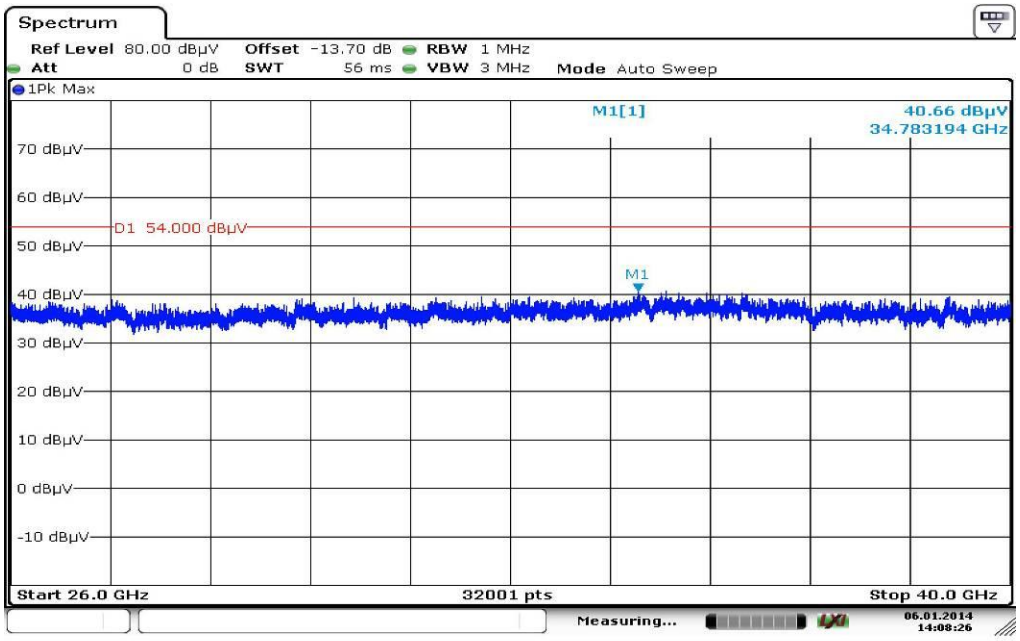


Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 13:54:43

Plot 5: 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 6.JAN.2014 14:08:27

10.10 Spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to mid channel. This measurement is representative for all channels and modes. If peaks are found the lowest channel and the highest channel will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		-/-
TX Spurious Emissions Radiated < 30 MHz		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

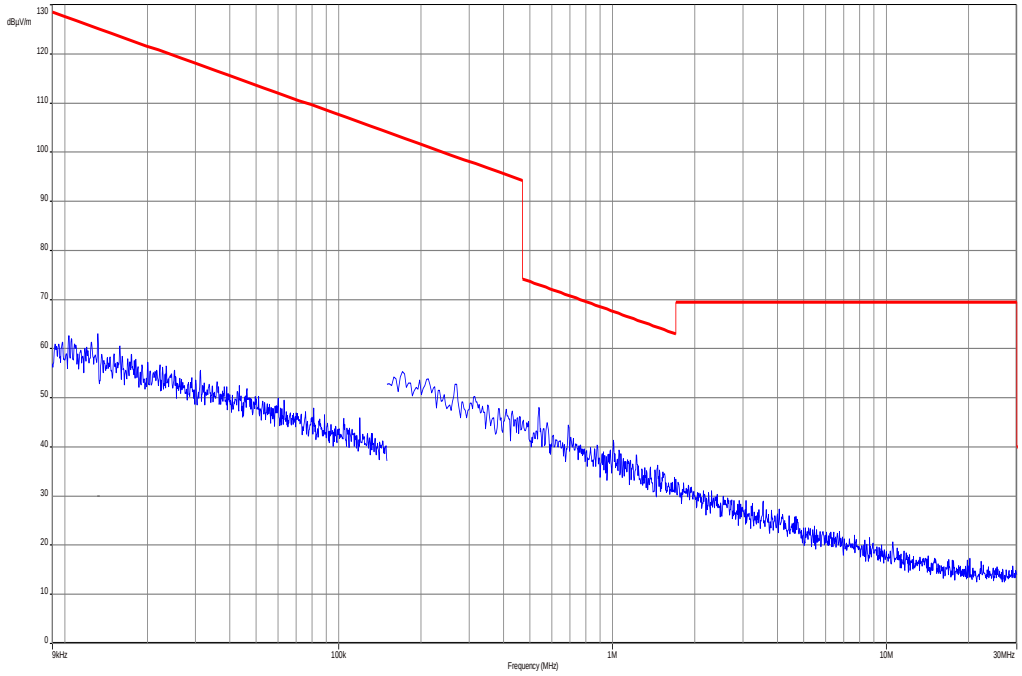
Results:

TX Spurious Emissions Radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No peaks found.		
Measurement uncertainty	± 3 dB	

Result: **Passed**

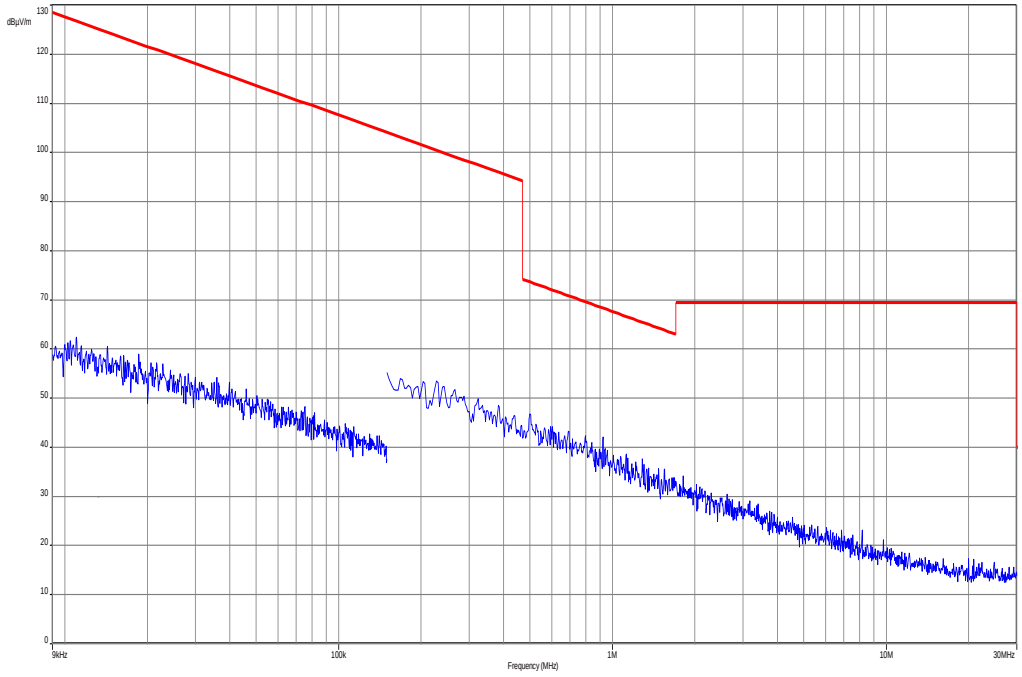
Plots: TX mode

Plot 1: 9 kHz to 30 MHz



Plots: RX / Idle – mode

Plot 1: 9 kHz to 30 MHz



10.11 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to mid channel. If peaks are found the lowest channel and the highest channel will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are re-measured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		-/-
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBµV/m)	Average (dBµV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

*Decreases with the logarithm of the frequency

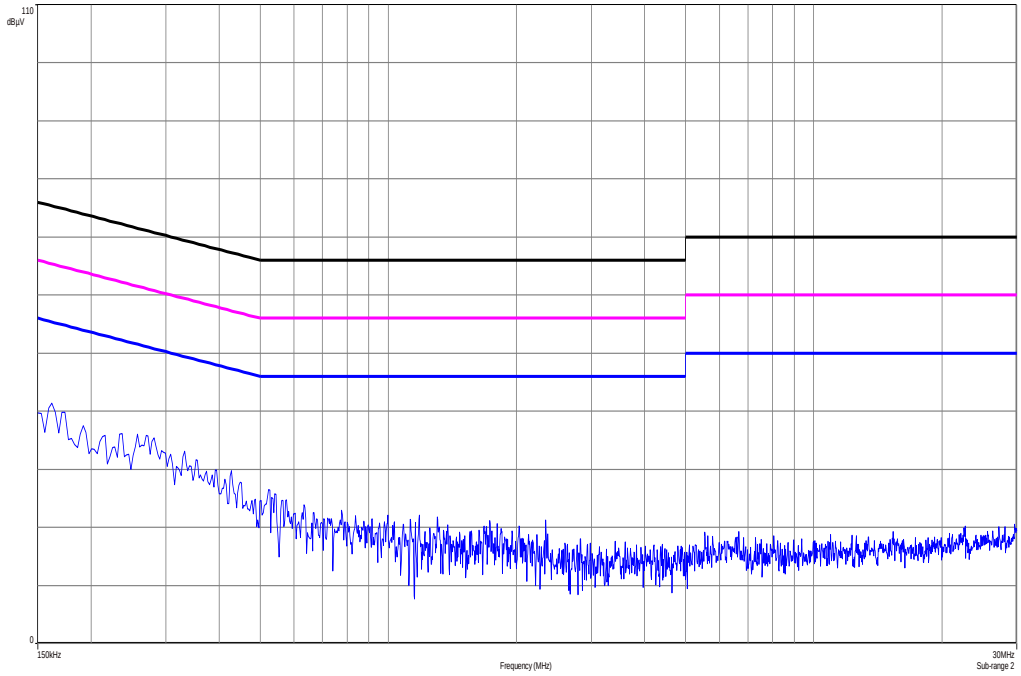
Results:

TX Spurious Emissions Conducted < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No peaks detected. All detected peak values are below the average limits.		
Measurement uncertainty	± 3 dB	

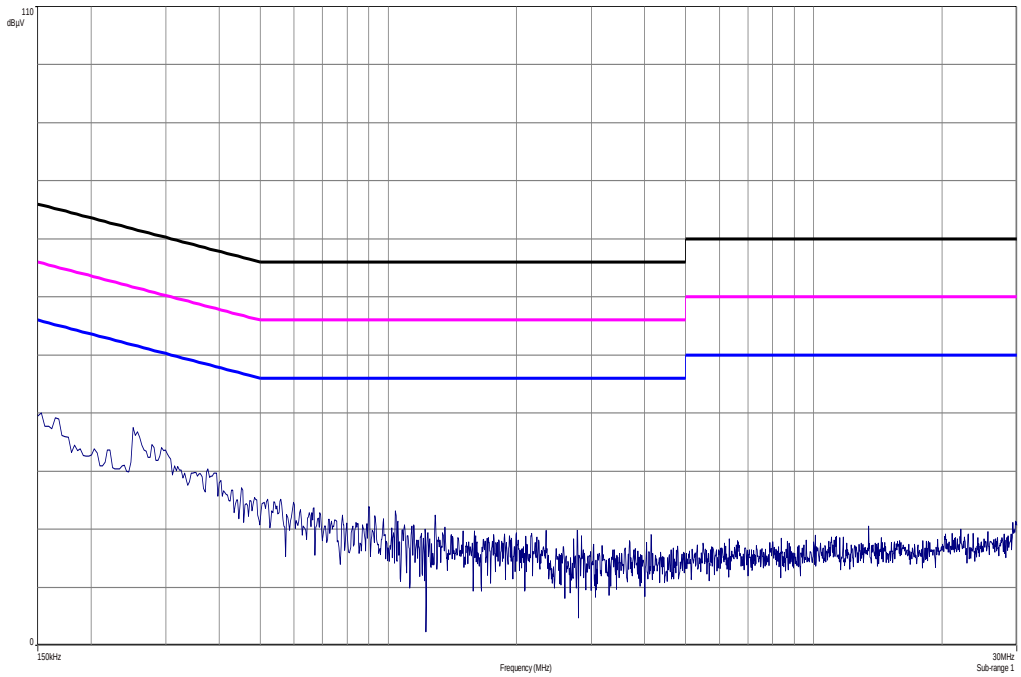
Result: **Passed**

Plots:

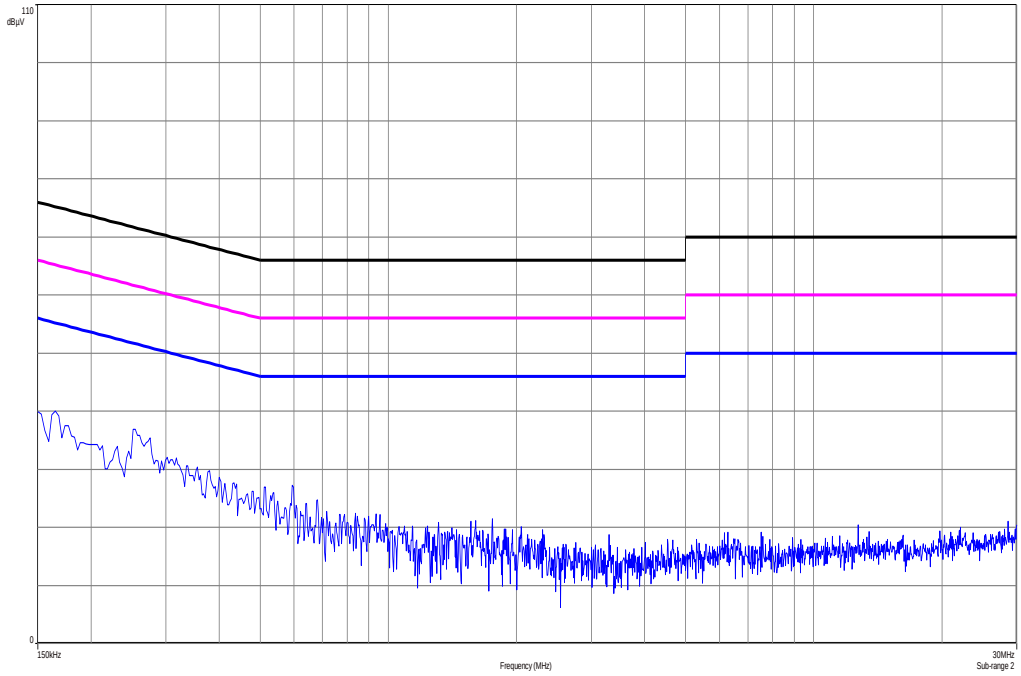
Plot 1: TX mode, 150 kHz to 30 MHz, phase line



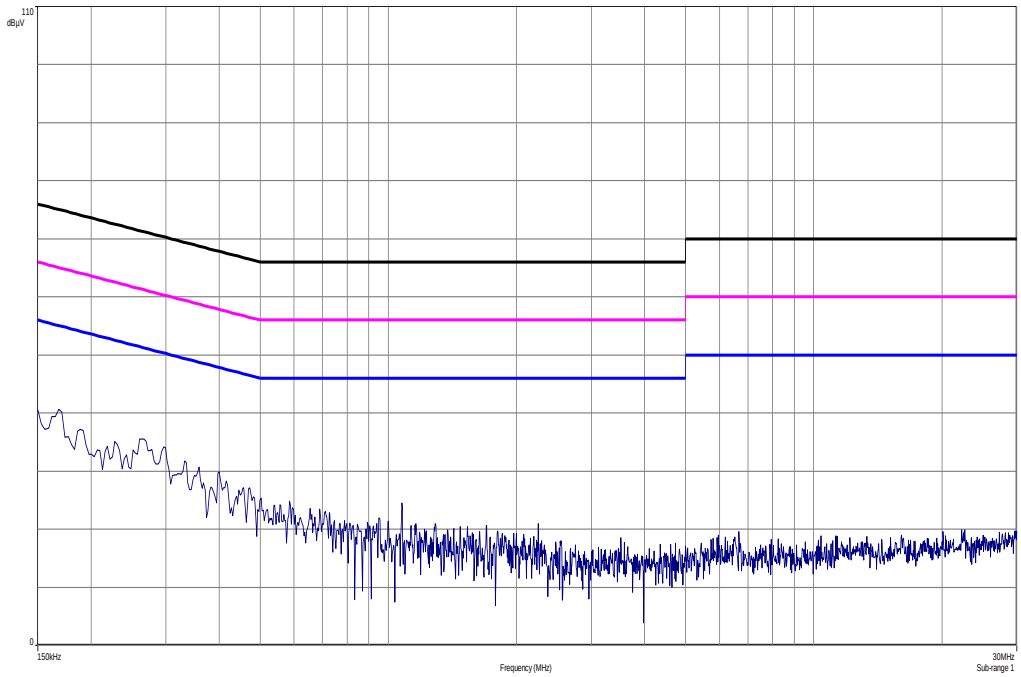
Plot 2: TX mode, 150 kHz to 30 MHz, neutral line



Plot 3: RX / Idle – mode, 150 kHz to 30 MHz, phase line



Plot 4: RX / Idle – mode, 150 kHz to 30 MHz, neutral line



11 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	Ve	14.07.2011	14.01.2014
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	12.04.2012	12.04.2014
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	16.01.2013	16.01.2014
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
13	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKl!	08.05.2013	08.05.2015
14	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
15	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
16	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
17	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
18	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
19	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
20	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
21	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	14.10.2011	14.10.2014
22	n. a.	MXE EMI Receiver 20 Hz	N9038A	Agilent Technologi	MY51210197	300004405	k	21.02.2013	21.02.2014

		bis 26,5 GHz		es					
23	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
24	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
25	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
26	A031	Std. Gain Horn Antenna 26.5 to 40.0 GHz	637	Narda	GB42110541	300000510	k	19.07.2013	19.07.2015
27	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
28	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		
29	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.10.2012	22.01.2014
30	n. a.	Power Supply 0-20V, 0-5A	6632B	Agilent Technologi es	GB42110541	400000562	vlKl!	10.01.2013	10.01.2016

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

12 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2014-01-13
A	Canada removed / EUT name changed	2014-01-22

Annex B Further information

Glossary

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software

Annex C Accreditation Certificate

Front side of certificate

DAkkS Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Beliehene gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung

Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

Drahtgebundene Kommunikation einschließlich xDSL
VoIP und DECT
Akustik
Funk einschließlich WLAN
Short Range Devices (SRD)
RFID
WiMax und Richtfunk
Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
Produktsicherheit
SAR und Hearing Aid Compatibility (HAC)
Umweltsimulation
Smart Card Terminals
Bluetooth
Wi-Fi- Services

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 18.01.2013 mit der Akkreditierungsnummer D-PL-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 80 Seiten.

Registrierungsnummer der Urkunde: **D-PL-12076-01-01**

Frankfurt am Main, 18.01.2013

Siehe Hinweise auf der Rückseite

Im Auftrag
Dipl.-Ing. (FH) Axel Egner
Abteilungsleiter

Back side of certificate

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10117 Berlin

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Gartenstraße 6
60594 Frankfurt am Main

Standort Braunschweig
Rundesallee 100
38116 Braunschweig

Die auszugsweise Veröffentlichung der Akkreditierungsurkunde bedarf der vorherigen schriftlichen Zustimmung der Deutsche Akkreditierungsstelle GmbH (DAkkS). Ausgenommen davon ist die separate Weiterverbreitung des Deckblattes durch die umseitig genannte Konformitätsbewertungsstelle in unveränderter Form.

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt, die über den durch die DAkkS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten (Abl. L 218 vom 9. Juli 2008, S. 30).
Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Note:

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html