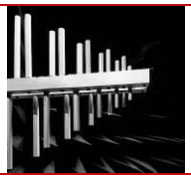
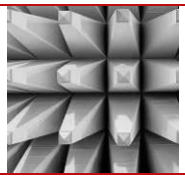

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CETECOM ICT Services
consulting - testing - certification >>>

TEST REPORT

Test report no.: 1-6965/13-05-48

DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01
Area of Testing:
Radio Communications & Compatibility Testing (RCT)

Applicant

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund / SWEDEN
Phone: +46 46 19 30 00
Fax: -/-
Contact: Mikael Nilsson
e-mail: Micke.nilsson@sonymobile.com
Phone: +46 7 03 22 75 03

Manufacturer

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund / SWEDEN

Test standard/s

RSS - 210 Issue 8	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	**Tablet PC GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/II/IV/V/VIII; LTE FDD1/2/3/4/5/7/8/13/17/20; WLAN b/g/n/a/ac; BT 4.0; RFID; A-GPS**
Type name:	**TM-0040-BV**
Model name:	**SGP521**
IC:	**4170B-TM0040**
Frequency:	DTS band 5150 MHz to 5725 MHz (lowest channel 36 – 5180 MHz; highest channel 140 – 5700 MHz)
Technology tested:	WLAN (OFDM/a – mode; n/ac HT20 / HT40 – mode and ac HT80 – mode)
Antenna:	Integrated antenna
Power supply:	3.7 V DC by Li - polymer battery
Temperature range:	-20°C to +55°C

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:

p. o.

cn=Andreas Luckenbill, o=CETECOM ICT Services GmbH, ou=LUC-111202, email=andreas.luckenbill@cetecom.com, c=DE
2014.02.07 14:31:36 +01'00'

Stefan Bös
Senior Testing Manager

Test performed:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2014.02.07 14:30:59 +01'00'

Marco Bertolino
Testing Manager

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.
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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

2.2 Application details

Date of receipt of order:	2013-12-09
Date of receipt of test item:	2013-12-02
Start of test:	2013-12-17
End of test:	2014-01-08
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
RSS - 210 Issue 8	01.12.2010	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

3.1 Measurement guidance

UNII: KDB 789033	2013-04	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E

4 Test environment

Temperature:	T_{nom}	+22 °C	during room temperature tests
	T_{max}	+55 °C	during high temperature tests
	T_{min}	-20 °C	during low temperature tests
Relative humidity content:		43 %	
Barometric pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	3.7 V	DC by Li - polymer battery
	V_{max}	4.2 V	
	V_{min}	3.3 V	

5 Test item

Kind of test item	**:**	**Tablet PC GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/II/IV/V/VIII; LTE FDD1/2/3/4/5/7/8/13/17/20; WLAN b/g/n/a/ac; BT 4.0; RFID; A-GPS**
Type name	**:**	**TM-0040-BV**
Model name	**:**	**SGP521**
S/N serial number	**:**	**Conducted unit: CB51267QQY** **Radiated units: CB51267Q5X; CB51267Q47**
HW hardware status	**:**	**Prototype build: AP1**
SW software status	**:**	**RF test software**
Frequency band [MHz]	**:**	**DTS band 5150 MHz to 5725 MHz** **(lowest channel 36 – 5180 MHz; highest channel 140 – 5700 MHz)**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**OFDM**
Type of modulation	**:**	**BPSK, QPSK, 16 – QAM, 64 – QAM and 256 – QAM**
Number of channels	**:**	**19**
Antenna	**:**	**Integrated antenna**
Power supply	**:**	**3.7 V DC by Li - polymer battery**
Temperature range	**:**	**-20°C to +55 °C**

5.1 Additional information

Test setup- and EUT-photos are included in test report: 1-6965/13-05-01_AnnexA
1-6965/13-05-01_AnnexB
1-6965/13-05-01_AnnexD

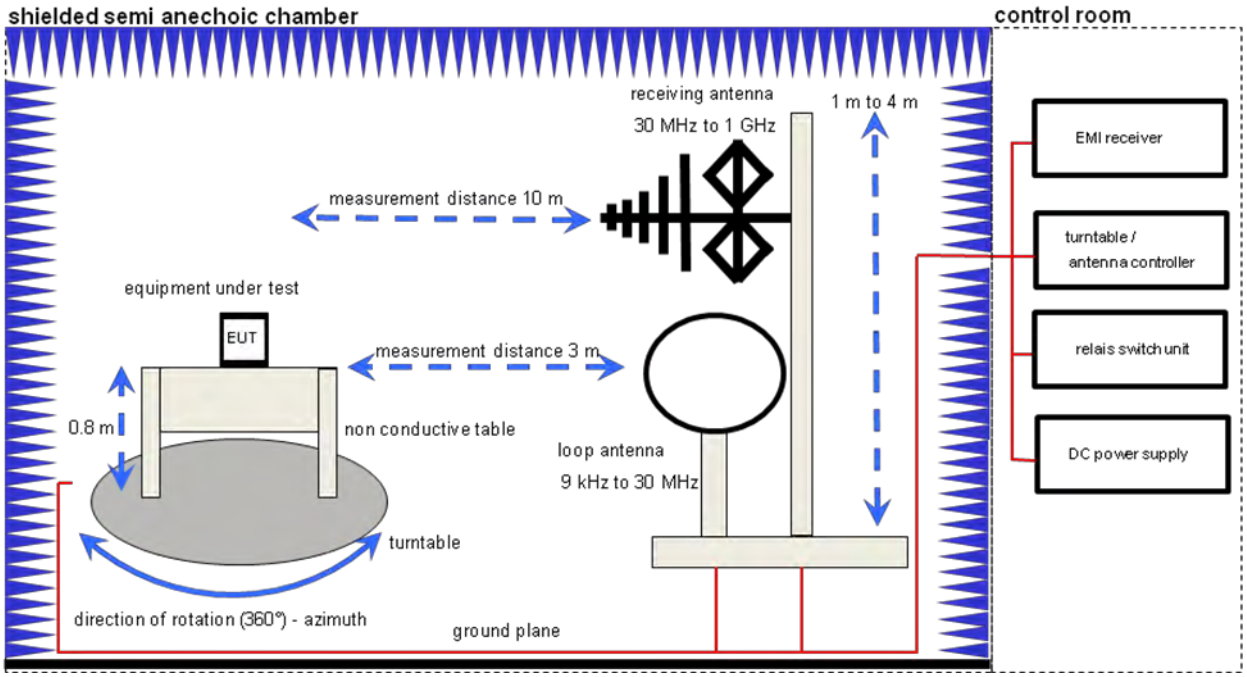
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements

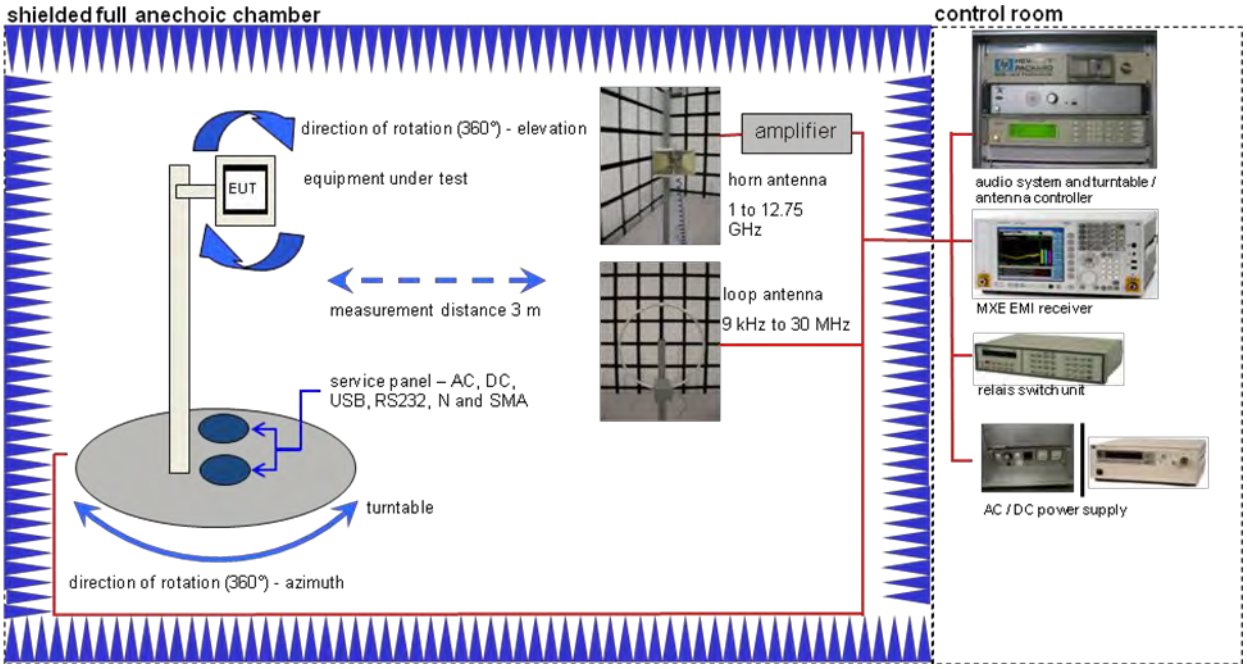
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787
Test Receiver	ESH2	R&S	871921/095	300002505
Loop Antenna 9 KHz - 30 MHz	HFH2-Z2	R&S	872096/61	300001824
EMI Test Receiver 9 kHz - 3 GHz incl. Preselector	ESPI3	R&S	101713	300004059

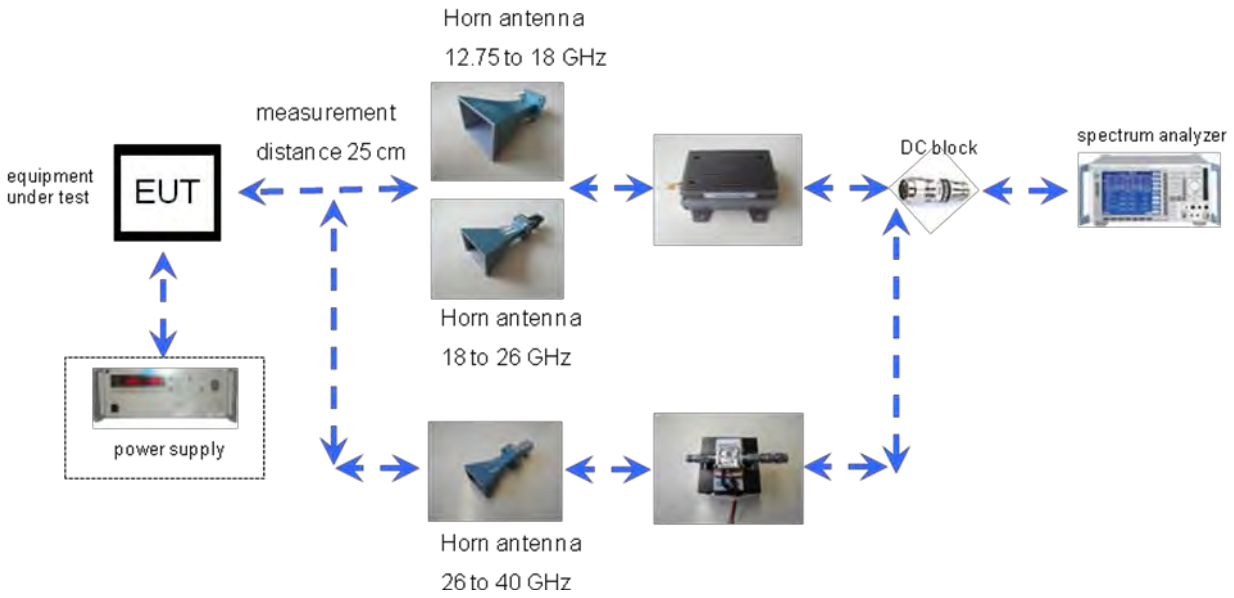
7.2 Radiated measurements chamber C



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789
Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032
Active Loop Antenna	6502	EMCO	8905-2342	300000256
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143

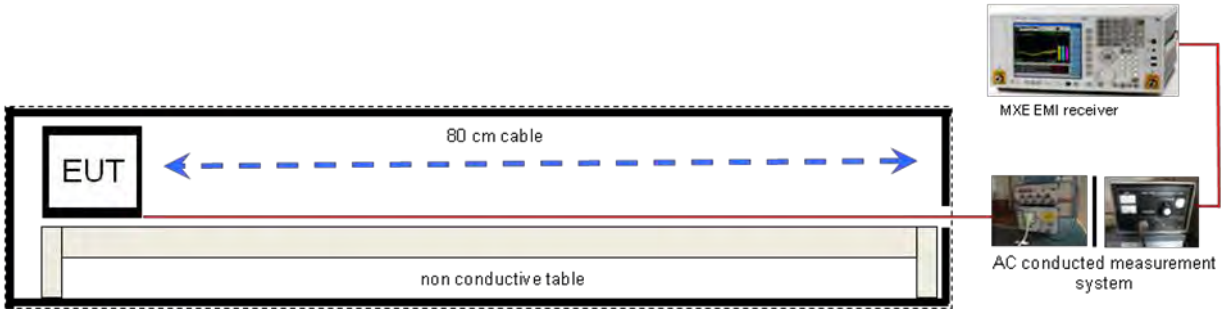
7.3 Radiated measurements 12.75 GHz to 40 GHz



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787
Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442
Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268
Std. Gain Horn Antenna 26.5 to 40.0 GHz	637	Narda	GB42110541	300000510
Broadband Low Noise Amplifier 18-50 GHz	CBL18503070-XX	CERNEX	19338	300004273
Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

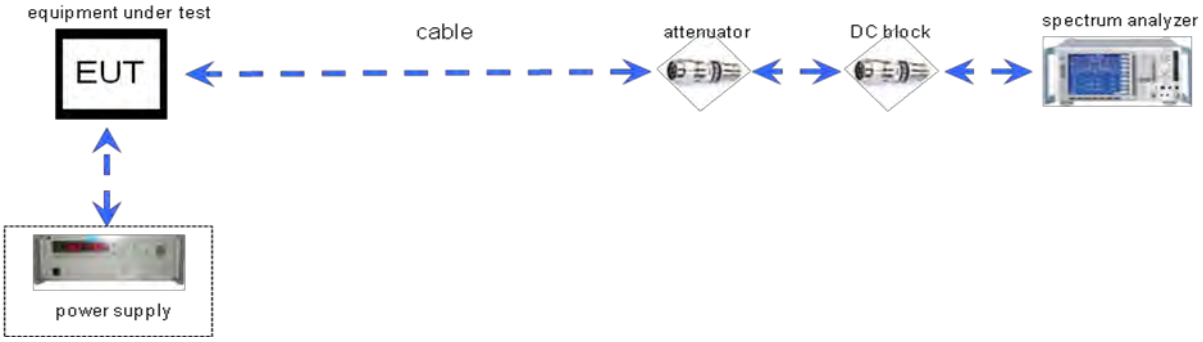
7.4 AC conducted



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001168
Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210

7.5 Conducted measurements



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

8 Summary of measurement results

☒	**No deviations from the technical specifications were ascertained**
☐	There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	RSS 210, Issue 8, Annex 9	Passed	2014-02-07	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Remark
-/-	Output power verification (conducted)	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria!
-/-	Gain	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria!
U-NII Part 15	Duty cycle	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria!
RSS-210	Maximum output power (conducted & radiated)	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-210	Power spectral density	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-210	Spectrum bandwidth 26dB bandwidth	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-210	Peak excursion measurements	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-210	Band edge compliance radiated	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-210	TX spurious emissions radiated	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	☒	☐	☐	☐	complies
RSS-Gen	Spurious emissions radiated < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	complies
-/-	Spurious emissions conducted emissions < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

Test mode: ☐ No test mode available.

☒ Special software is used.
EUT is transmitting pseudo random data by itself

10 RSP100 test report cover sheet / performance test data

Test report number :	1-6965/13-05-48			
Equipment model number:	SGP521			
Certification number :	4170B-TM0040			
Manufacturer (complete address) :	Sony Mobile Communications AB Nya Vattentornet 22188 Lund / SWEDEN			
Tested to radio standards Specification no. :	RSS 210, Issue 8, Annex 9			
Open area test site IC No. :	IC 3462C-1			
Frequency range :	UNII bands: 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz 5470 MHz to 5600 MHz; 5650 MHz to 5725 MHz			
RF-power (max.) :	Conducted values:			
	Band	a	n/ac HT20	n/ac HT40
	5180 – 5240 MHz	6.4 mW	6.6 mW	
	5190 – 5230 MHz			6.5 mW
	5260 – 5320 MHz	6.1 mW	6.0 mW	
	5270 – 5310 MHz			5.9 mW
	5500 – 5700 MHz	6.4 mW	6.4 mW	
	5510 – 5670 MHz			6.9 mW
	5210 – 5290 MHz / ac HT80 – mode	5.4 mW		
	5530 – 5610 MHz / ac HT80 – mode	5.0 mW		
	Radiated values:			
	Band	a	n/ac HT20	n/ac HT40
	5180 – 5240 MHz	10.8 mW	11.1 mW	
	5190 – 5230 MHz			10.5 mW
	5260 – 5320 MHz	11.1 mW	10.9 mW	
	5270 – 5310 MHz			10.8 mW
	5500 – 5700 MHz	9.6 mW	9.3 mW	
	5510 – 5670 MHz			10.1 mW
	5210 – 5290 MHz / ac HT80 – mode	9.2 mW		
	5530 – 5610 MHz / ac HT80 – mode	7.6 mW		
Occupied bandwidth (99%-BW) :	Band	a	n/ac HT20	n/ac HT40
	5180 – 5240 MHz	21.93 MHz	21.78 MHz	
	5190 – 5230 MHz			39.64 MHz
	5260 – 5320 MHz	21.88 MHz	21.73 MHz	
	5270 – 5310 MHz			39.80 MHz
	5500 – 5700 MHz	21.98 MHz	21.78 MHz	
	5510 – 5670 MHz			39.80 MHz
	5210 – 5290 MHz / ac HT80 – mode	81.54 MHz		
	5530 – 5610 MHz / ac HT80 – mode	81.54 MHz		
Necessary bandwidth (calculated) :	Band	a	n/ac HT20	n/ac HT40
	5180 – 5240 MHz	16.88 MHz	16.88 MHz	
	5190 – 5230 MHz			33.75 MHz
	5260 – 5320 MHz	16.88 MHz	16.88 MHz	
	5270 – 5310 MHz			33.75 MHz
	5500 – 5700 MHz	16.88 MHz	16.88 MHz	
	5510 – 5670 MHz			33.75 MHz
	5210 – 5290 MHz / ac HT80 – mode	80 MHz		
	5530 – 5610 MHz / ac HT80 – mode	80 MHz		
Emission classification :	(according TRC-43)	G7D		
Type of modulation :	QPSK, 16 – QAM, 64 – QAM and 256 – QAM			
Antenna information :	Integrated PCB antenna			
Transmitter spurious [dBµV/m @ 3m] :	44.1 @ 15.7 GHz (peak)			

ATTESTATION:
DECLARATION OF COMPLIANCE:

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory manager:

2014-02-07	Marco Bertolino	cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE 2014.02.07 14:30:25 +01'00'
Date	Name	Signature

11 Measurement results

11.1 Output power verification (conducted)

Description:

Measurement of the maximum output power conducted. This measurement is performed only at the middle channel in all modes and all data rates to determine the data rate per mode which results in the highest output power. This mode will be selected for all further measurements.

Measurement:

Channel power measurement function

Results:

OFDM / a – mode	**Maximum Output Power Conducted [dBm]**							
Data Rate [MBit/s]	6	9	12	18	24	36	48	54
Ch 36	23.4	23.3	22.8	22.9	23.3	23.4	23.2	23.4
Ch 48	23.3	23.2	22.7	22.8	23.2	23.0	23.2	22.9
Ch 52	23.3	23.3	22.7	22.9	23.1	23.2	22.8	23.2
Ch 64	23.1	22.9	22.5	22.6	23.0	23.0	23.0	22.7
Ch 100	23.9	23.5	23.2	23.2	23.5	23.7	23.4	23.4
Ch 120	23.6	23.5	23.1	23.1	23.2	23.3	23.4	23.4
Ch 140	23.7	23.6	23.1	23.1	23.3	23.3	23.4	23.3
Measurement uncertainty	± 0.5 dB							

OFDM / ac – mode HT 20	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 36	23.7	23.5	23.4	23.8	24	24.1	24.3	24.1
Ch 48	23.3	23.3	23.3	23.9	24.0	24.0	24.0	23.6
Ch 52	23.7	23.5	23.3	23.9	23.9	23.8	24.0	23.8
Ch 64	23.3	23.4	23.4	23.8	23.8	23.6	23.7	23.5
Ch 100	23.8	23.9	23.7	24.2	24.2	24.2	24.3	24.1
Ch 120	23.7	23.8	23.7	24.2	24.1	24.0	24.3	24.0
Ch 140	23.7	23.9	23.6	24.0	24.2	23.9	24.0	24.2
Measurement uncertainty	± 0.5 dB							

OFDM / ac – mode HT 40	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 38	20.3	20	19.9	20.3	20.4	20.5	20.4	20.6
Ch 46	20.5	20.4	20.2	20.6	20.1	20.4	20.4	20.4
Ch 54	20.2	20.1	20.1	20.6	20.4	20.5	20.6	20.5
Ch 62	19.9	20.0	20.2	20.3	20.0	20.2	20.1	20.0
Ch 102	22.4	22.3	22.3	22.7	22.7	22.7	22.7	22.6
Ch 118	22.2	22.4	22.1	22.8	22.8	22.9	22.5	22.8
Ch 134	22.2	22.2	22.1	22.8	22.7	22.5	22.6	22.8
Measurement uncertainty	± 0.5 dB							

Measurement:

AVG-powermeter

OFDM / ac – mode HT 80	Maximum Output Power Conducted [dBm]									
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Ch 42	6.52	6.12	5.90	5.92	5.55	5.37	5.34	5.25	5.02	5.02
Ch 58	6.42	6.03	5.57	5.74	5.37	5.16	5.06	5.06	4.84	4.86
Ch 106	5.97	5.70	5.27	5.36	5.00	4.68	4.70	4.75	4.42	4.54
Ch 122	6.35	5.88	5.50	5.64	5.35	5.10	4.98	5.00	4.58	4.58
Measurement uncertainty	± 0.5 dB									

11.2 Gain

Limits

Antenna Gain
Maximum 6 dBi

Result:

OFDM Band 5150 MHz to 5250 MHz Channel	**Gain**		
	Lowest 5180 MHz	-/-	Highest 5240 MHz
Gain Declared by the manufacturer	2.3	-/-	2.1
Measurement uncertainty	± 3 dB		

OFDM Band 5250 MHz to 5350 MHz Channel	**Gain**		
	Lowest 5260 MHz	-/-	Highest 5320 MHz
Gain Declared by the manufacturer	2.0	-/-	2.6
Measurement uncertainty	± 3 dB		

OFDM Band 5470 MHz to 5725 MHz Channel	**Gain**		
	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz
Gain Declared by the manufacturer	2.0	1.8	1.5
Measurement uncertainty	± 3 dB		

Result: **Passed**

11.3 Duty cycle

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	10 MHz
Video bandwidth:	10 MHz
Span:	Zero
Trace-Mode:	Video trigger / view / single sweep

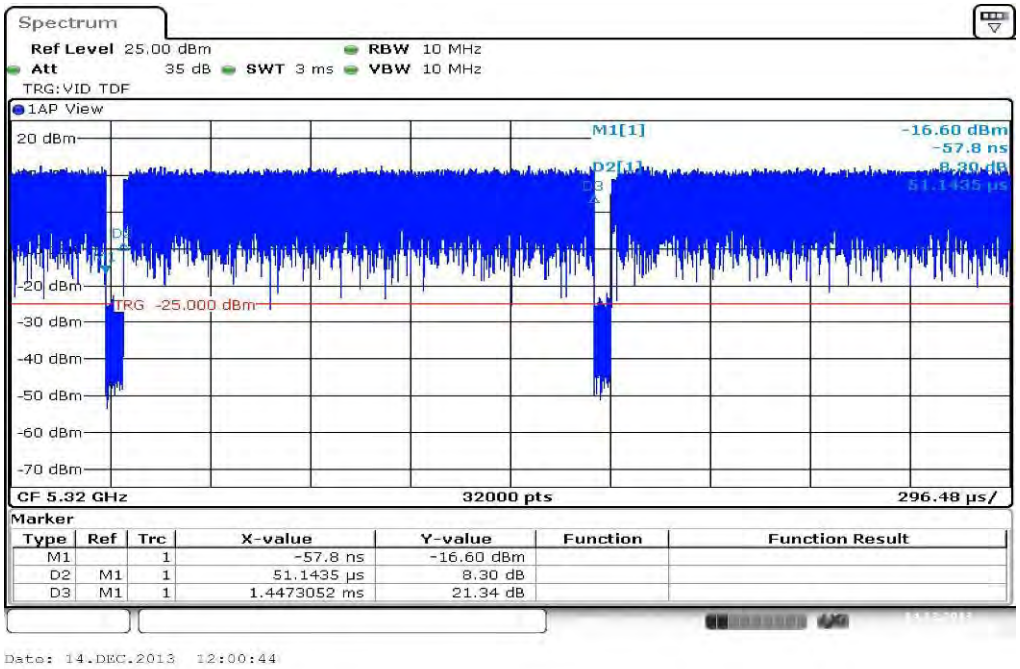
Results:

Duty cycle and correction factor:

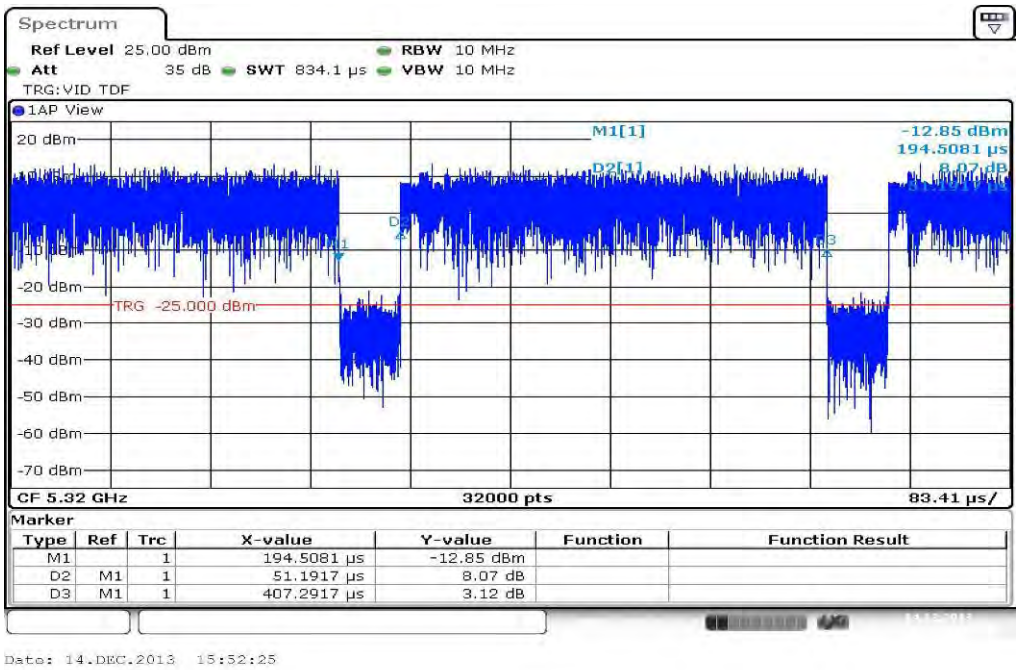
OFDM / a – mode:	96.47 % duty cycle	=>	0.16 dB
OFDM / ac – mode HT20:	87.43 % duty cycle	=>	0.58 dB
OFDM / ac – mode HT40:	78.98 % duty cycle	=>	1.02 dB
OFDM / ac – mode HT80:	86.78 % duty cycle	=>	0.62 dB

Plots:

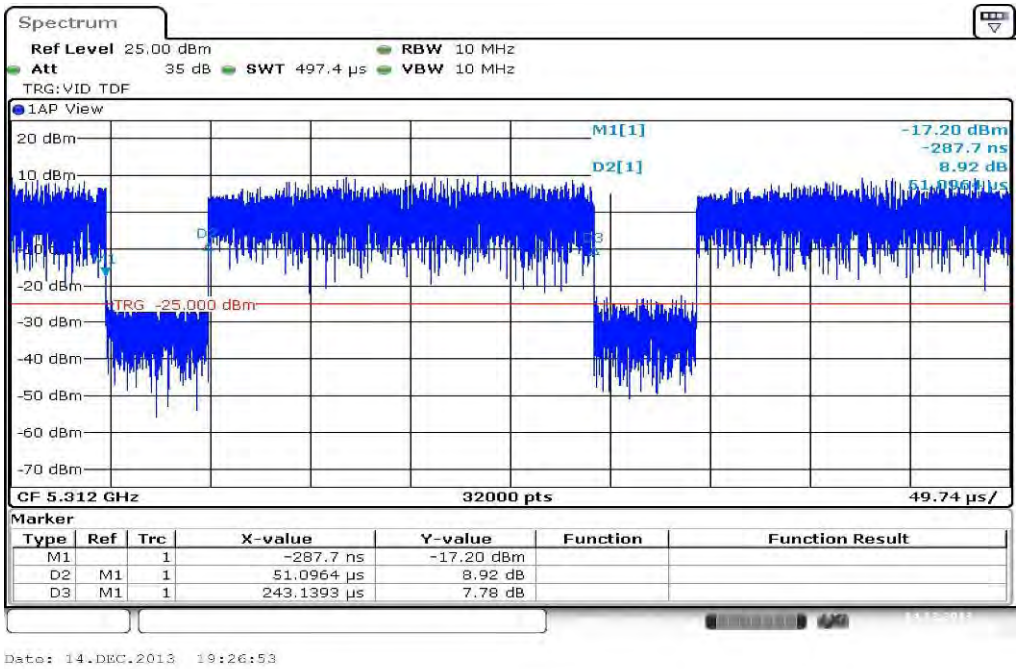
Plot 1: duty cycle of the transmitter – OFDM / a – mode



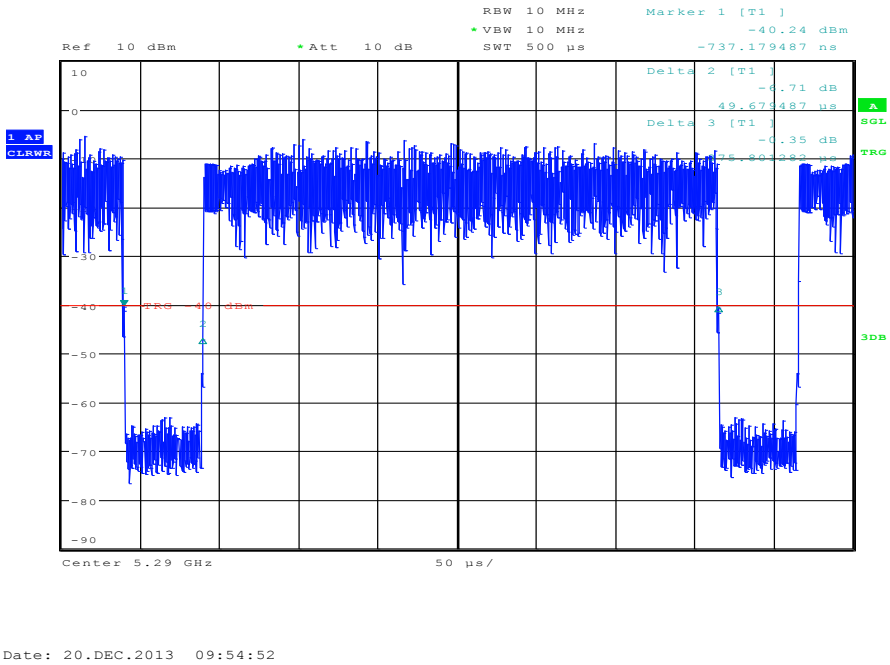
Plot 2: duty cycle of the transmitter – OFDM / n/ac – mode HT20



Plot 3: duty cycle of the transmitter – OFDM / n/ac – mode HT40



Plot 4: duty cycle of the transmitter – OFDM / ac – mode HT80



11.4 Maximum output power conducted and radiated

Description:

Measurement of the maximum output power conduced and radiated

Measurement:

Measurement parameter	
Detector:	RMS
Sweep time:	60s
Resolution bandwidth:	1 MHz
Video bandwidth:	≥ 3 MHz
Span:	> EBW
Trace-Mode:	Max hold
Analyzer function	Band power / channel power Interval > 26 dB EBW

Limits:

Radiated output power	Conducted output power
Conducted power + 6dBi antenna gain	The lesser one of 50mW or 4 dBm + 10 log Bandwidth 5.150-5.250 GHz 250mW or 11 dBm + 10 log Bandwidth 5.250-5.350 GHz 250mW or 11 dBm + 10 log Bandwidth 5.470-5.725 GHz 1W or 17 dBm + 10 log Bandwidth 5.725-5.825 GHz (where Bandwidth is the 26dB Bandwidth [MHz])

Result: OFDM / a – mode

OFDM / a – mode	Maximum output power conducted [dBm]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
duty cycle correction included	8.04	7.86	7.52	7.85
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
duty cycle correction included	6.97	8.00	8.05	-/-
Measurement uncertainty	± 1 dB			

Result: **Passed**

OFDM / a – mode	Maximum output power radiated - EIRP [dBm]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
duty cycle correction included	10.34	9.96	9.52	10.45
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
duty cycle correction included	8.97	9.80	9.55	-/-
Measurement uncertainty	± 3 dB			

Result: **Passed**

Result: OFDM / n/ac – mode HT20

OFDM / n/ac – mode HT20	Maximum output power conducted [dBm]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
duty cycle correction included	8.16	7.98	7.47	7.79
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
duty cycle correction included	7.08	7.88	8.09	-/-
Measurement uncertainty	± 1 dB			

Result: **Passed**

OFDM / n/ac – mode HT20	Maximum output power radiated - EIRP [dBm]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
duty cycle correction included	10.46	10.08	9.47	10.39
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
duty cycle correction included	9.08	9.68	9.59	-/-
Measurement uncertainty	± 3 dB			

Result: **Passed**

Result: OFDM / n/ac – mode HT40

OFDM / n/ac – mode HT40	Maximum output power conducted [dBm]			
Channel	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
duty cycle correction included	7.72	8.10	7.33	7.72
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
duty cycle correction included	7.58	8.24	8.37	-/-
Measurement uncertainty	± 1 dB			

Result: **Passed**

OFDM / n/ac – mode HT40	Maximum output power radiated - EIRP [dBm]			
Channel	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
duty cycle correction included	10.02	10.20	9.33	10.32
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
duty cycle correction included	9.58	10.04	9.87	-/-
Measurement uncertainty	± 3 dB			

Result: **Passed**

Result: OFDM / ac – mode HT80

OFDM / ac – mode HT80	Maximum output power conducted [dBm]			
Channel	Lowest 5210 MHz	Highest 5290 MHz	Lowest 5530 MHz	Highest 5610 MHz
duty cycle correction included	7.32	6.50	6.80	6.97
Measurement uncertainty	± 1 dB			

Result: **Passed**

OFDM / ac – mode HT80	Maximum output power radiated - EIRP [dBm]			
Channel	Lowest 5210 MHz	Highest 5290 MHz	Lowest 5530 MHz	Highest 5610 MHz
duty cycle correction included	9.62	9.10	8.80	8.77
Measurement uncertainty	± 3 dB			

Result: **Passed**

11.5 Power spectral density

Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated at the lowest, middle and highest channel.

Measurement:

Measurement parameter	
Detector:	RMS
Sweep time:	60 s / 120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	≥ 3 MHz
Span:	> EBW
Trace-Mode:	Max hold

Limits:

Power Spectral Density
power spectral density conducted ≤ 4 dBm in any 1 MHz band (band 5150 – 5250 MHz) power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5250 – 5350 MHz) power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5470 – 5725 MHz)

Result: OFDM / a – mode

OFDM / a – mode	Power Spectral density [dBm/MHz]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
duty cycle correction included	-3.58	-3.77	-4.15	-3.82
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
duty cycle correction included	-4.46	-3.69	-3.57	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

Result: OFDM / n/ac – mode HT20

OFDM / n/ac – mode HT20	Power Spectral density [dBm/MHz]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
duty cycle correction included	-3.57	-3.79	-4.32	-4.01
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
duty cycle correction included	-4.74	-3.88	-3.67	-/-
Measurement uncertainty	± 1 dB			

Result: **Passed**

Result: OFDM / n/ac – mode HT40

OFDM / n/ac – mode HT40	Power Spectral density [dBm/MHz]			
Channel	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
duty cycle correction included	-6.88	-6.46	-7.47	-7.03
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
duty cycle correction included	-7.11	-6.36	-6.52	-/-
Measurement uncertainty	± 1 dB			

Result: **Passed**

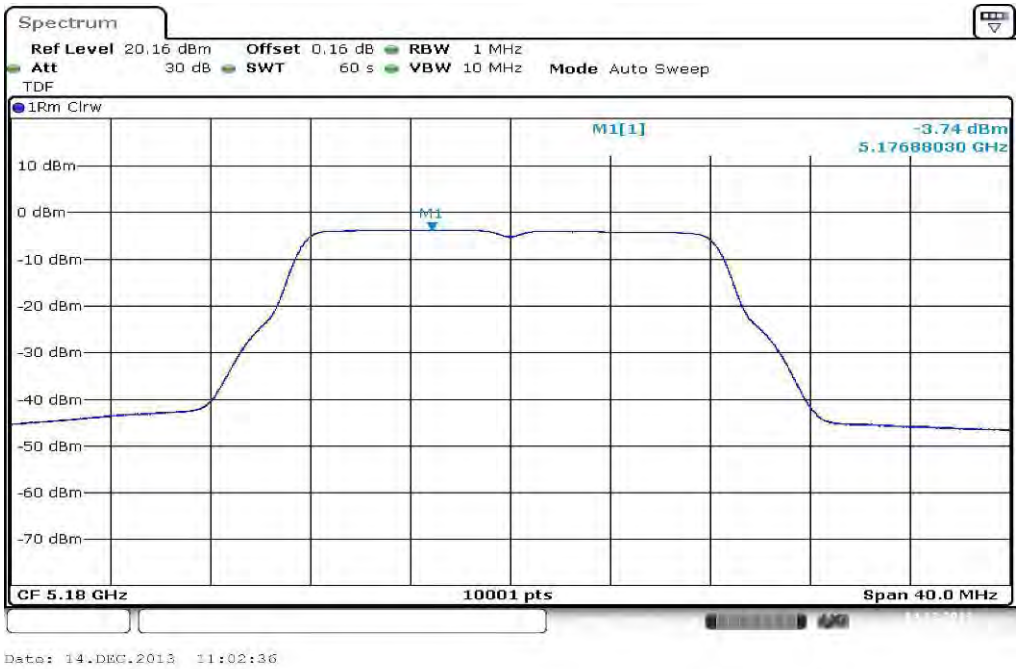
Result: OFDM / ac – mode HT80

OFDM / ac – mode HT80	Maximum output power conducted [dBm]			
Channel	Lowest 5210 MHz	Highest 5290 MHz	Lowest 5530 MHz	Highest 5610 MHz
duty cycle correction included	-9.52	-10.34	-10.73	-10.29
Measurement uncertainty	± 1 dB			

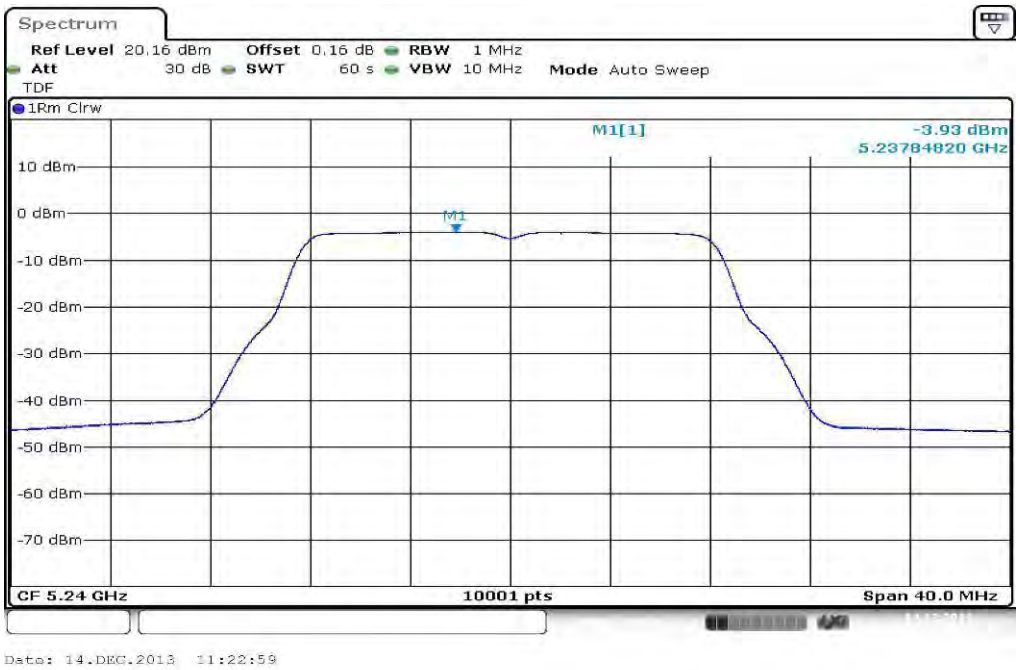
Result: **Passed**

Plots: OFDM / a – mode

Plot 1: 5180 MHz

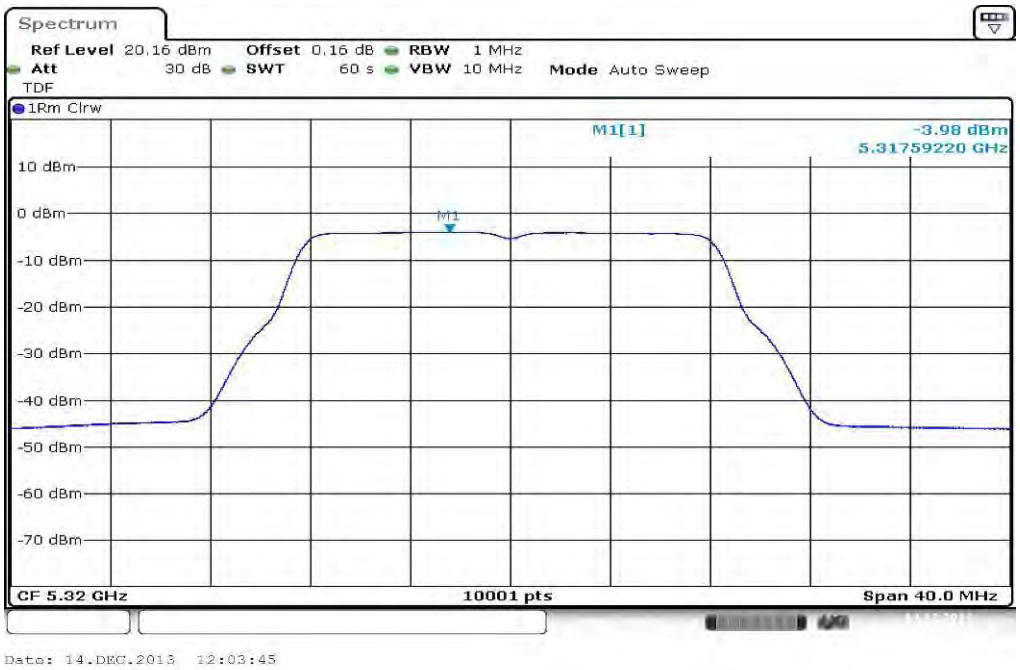


Plot 2: 5240 MHz



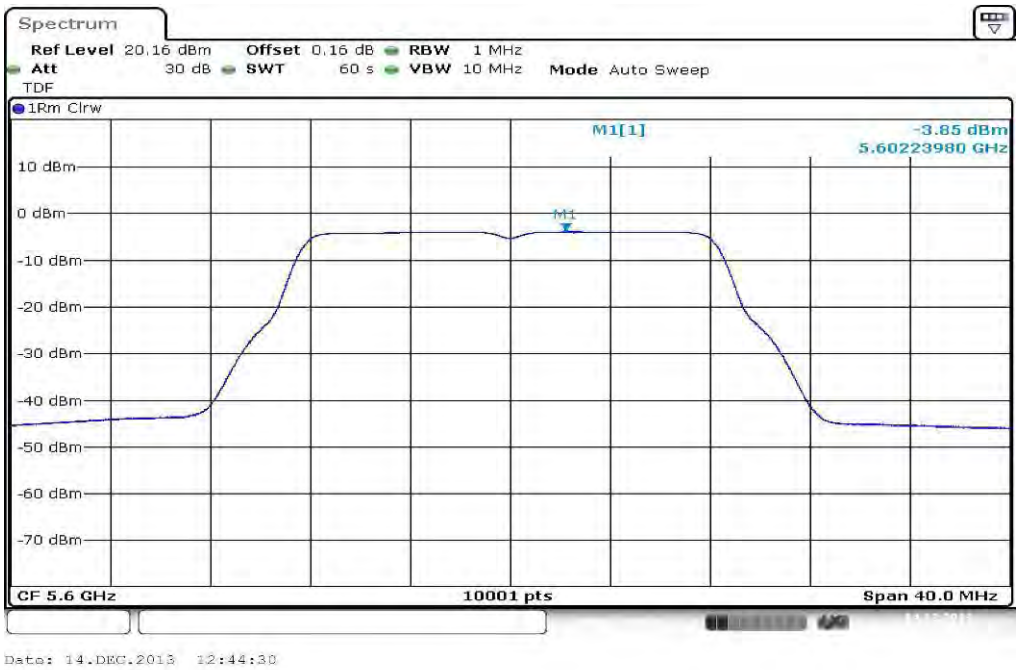
Plot 3: 5260 MHz

Plot 4: 5320 MHz

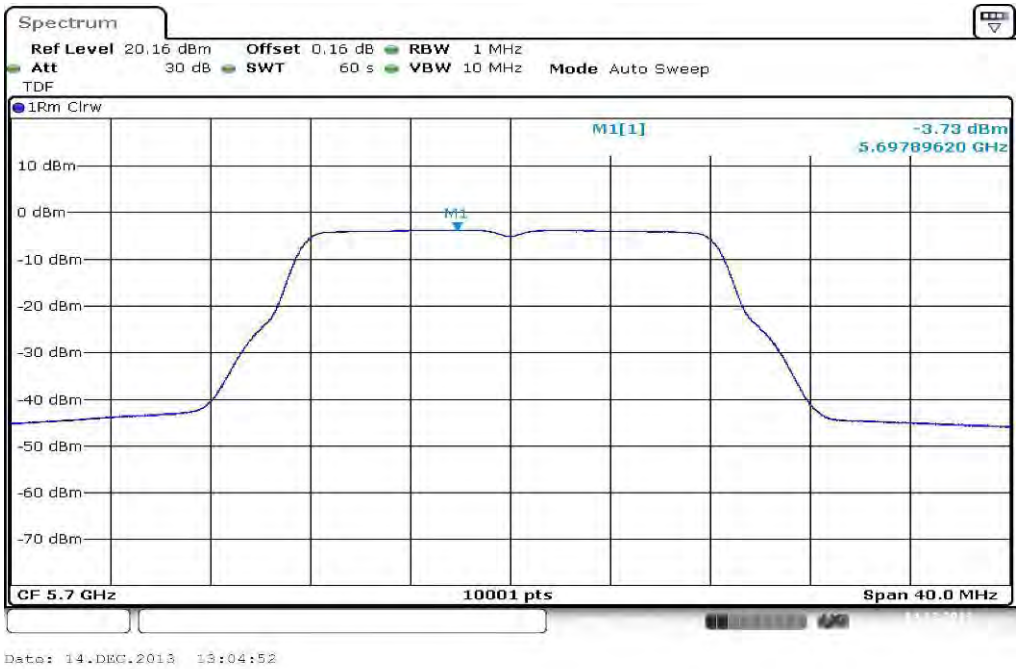


Plot 5: 5500 MHz

Plot 6: 5600 MHz



Plot 7: 5700 MHz



Plots: OFDM / n/ac – mode HT20

Plot 1: 5180 MHz

Plot 2: 5240 MHz

Plot 3: 5260 MHz

Plot 4: 5320 MHz

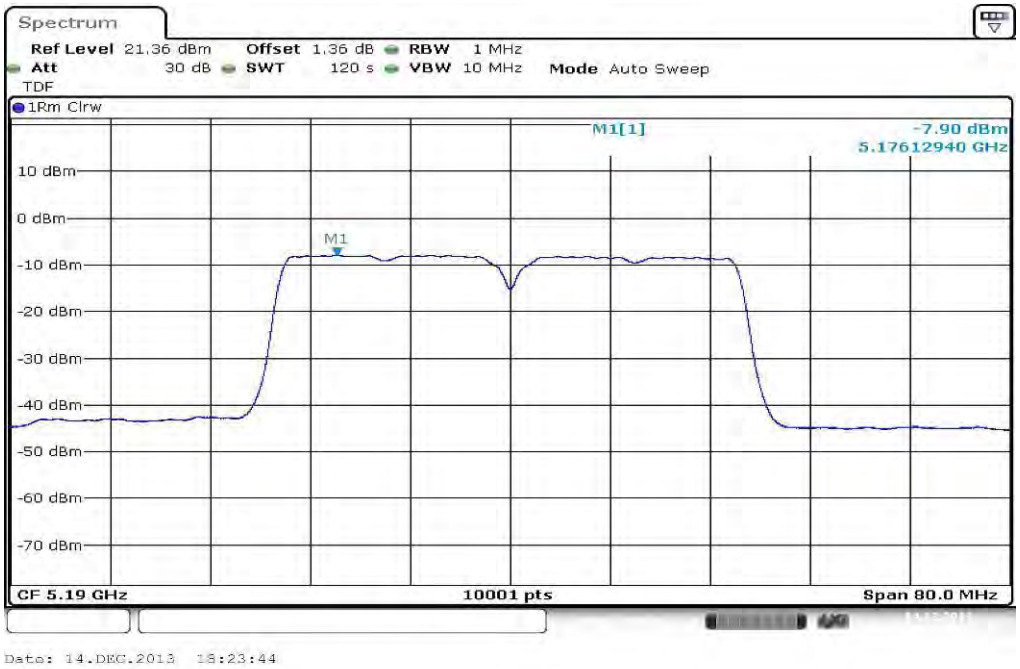
Plot 5: 5500 MHz

Plot 6: 5600 MHz

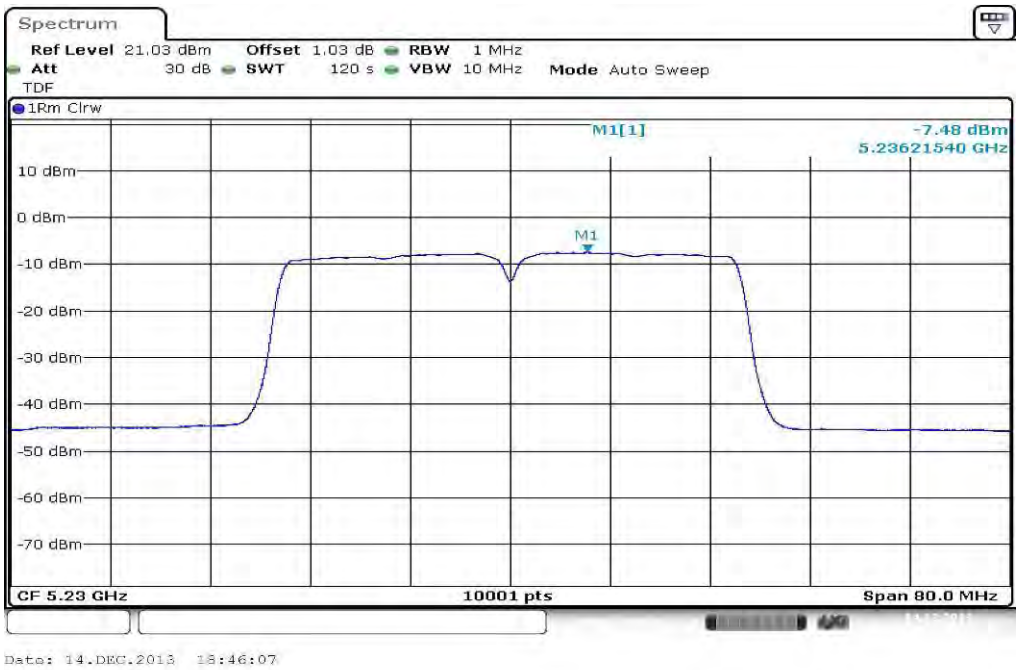
Plot 7: 5700 MHz

Plots: OFDM / n/ac – mode HT40

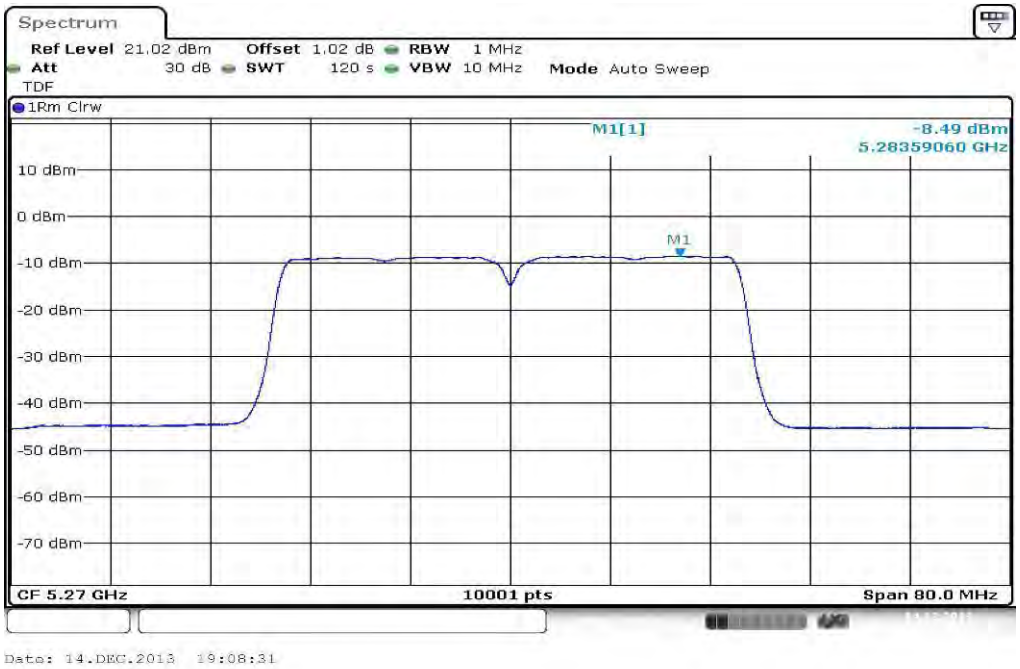
Plot 1: 5190 MHz



Plot 2: 5230 MHz

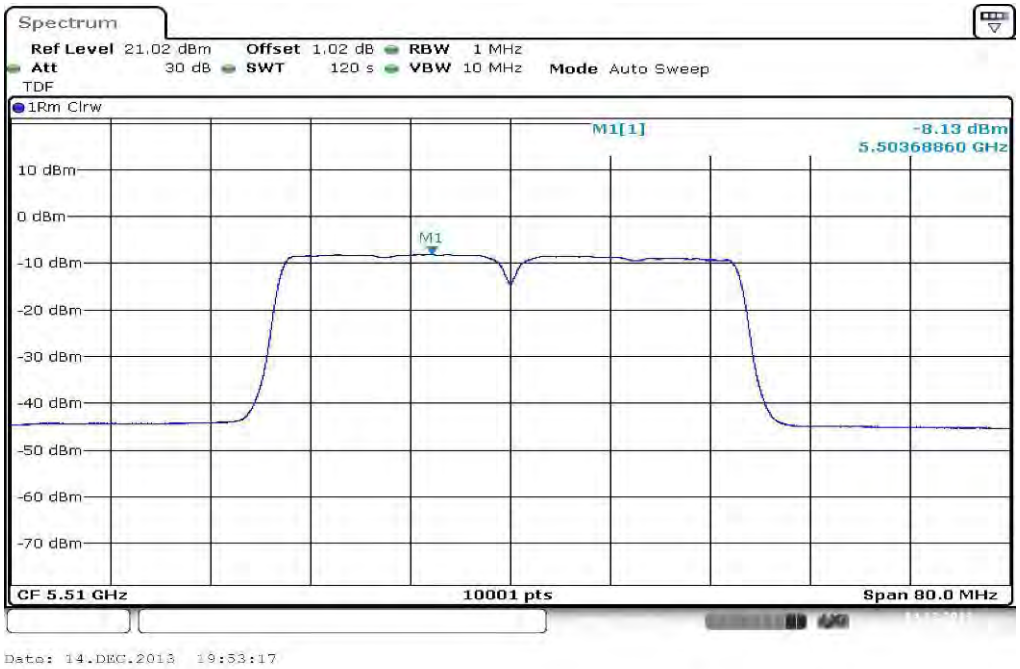


Plot 3: 5270 MHz

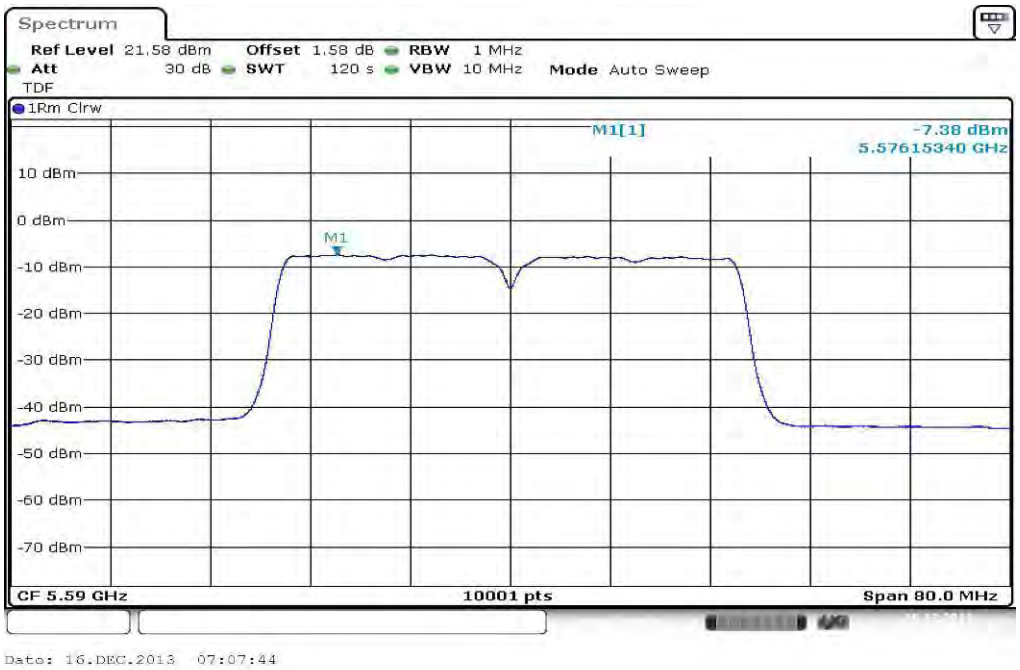


Plot 4: 5310 MHz

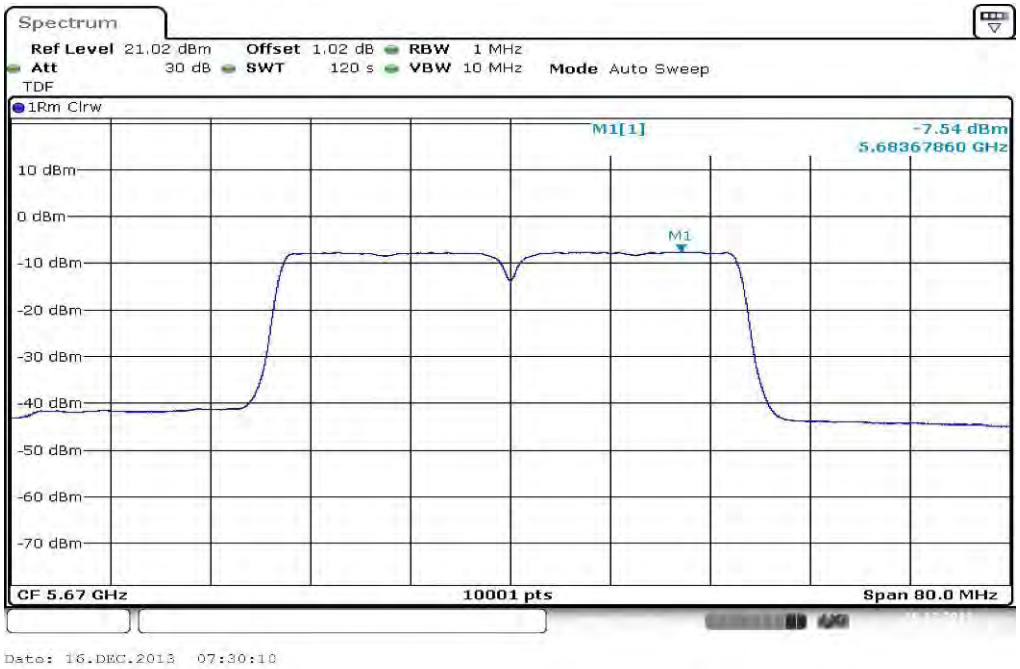
Plot 5: 5510 MHz



Plot 6: 5590 MHz

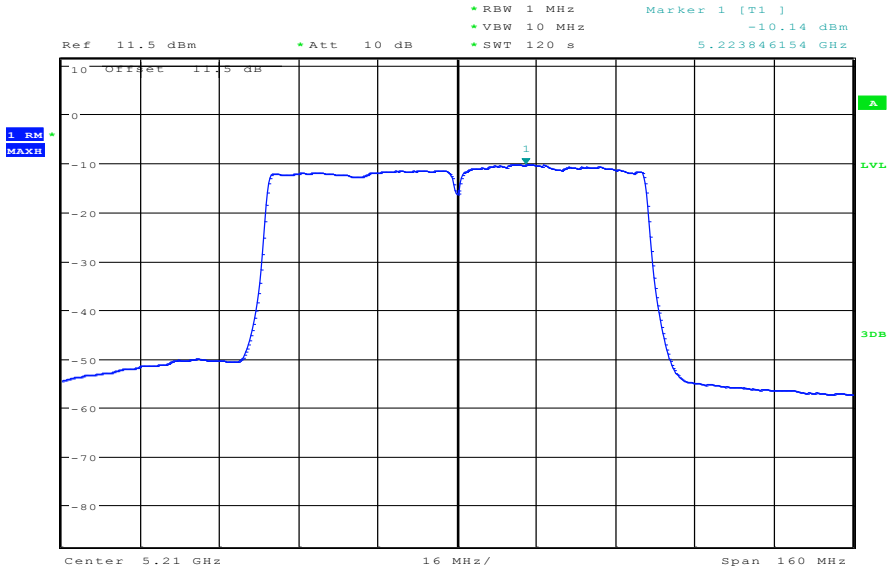


Plot 7: 5670 MHz



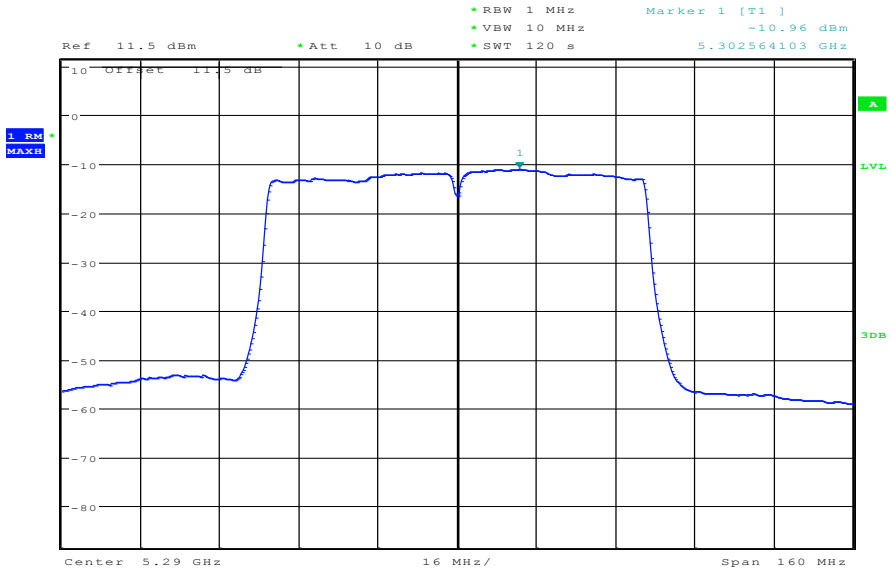
Plots: OFDM / ac – mode HT80

Plot 1: 5210 MHz



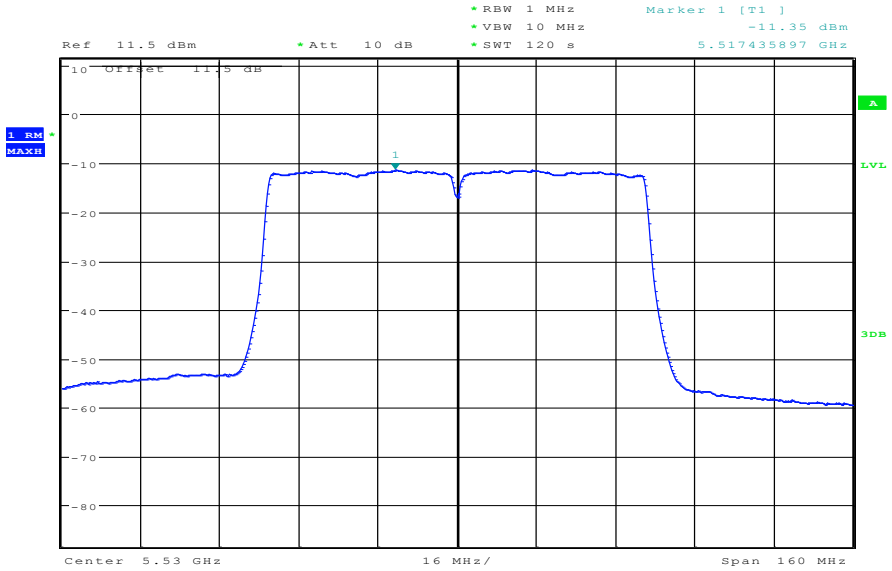
Date: 20.DEC.2013 10:37:47

Plot 2: 5290 MHz



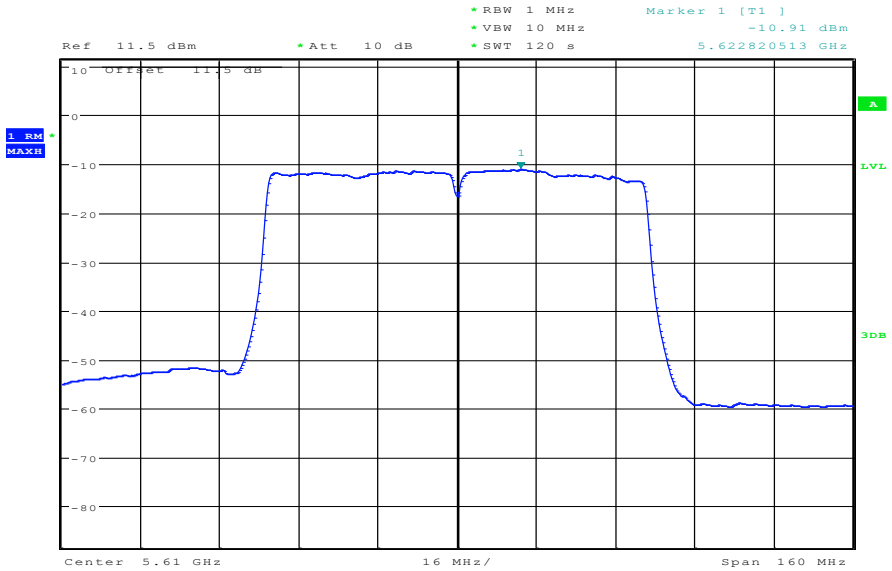
Date: 20.DEC.2013 10:43:10

Plot 3: 5530 MHz



Date: 20.DEC.2013 10:48:15

Plot 4: 5610 MHz



Date: 20.DEC.2013 10:53:16

11.6 Spectrum bandwidth – 26 dB bandwidth

Description:

Measurement of the 26 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1% EBW
Video bandwidth:	≥ RBW
Span:	> complete signal!
Trace-Mode:	Max hold

Limits:

Spectrum Bandwidth – 26 dB Bandwidth
-/-

Result: OFDM / a – mode

OFDM / a – mode	26 dB BANDWIDTH [MHz]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
	21.93	21.88	21.83	21.88
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
	21.93	21.98	21.83	-/-
Measurement uncertainty	± RBW			

Result: **Passed**

Result: OFDM / n/ac – mode HT20

OFDM / n/ac – mode HT20	26 dB BANDWIDTH [MHz]			
Channel	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
	21.68	21.78	21.63	21.73
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
	21.73	21.78	21.78	-/-
Measurement uncertainty	± RBW			

Result: **Passed**

Result: OFDM / n/ac – mode HT40

OFDM / n/ac – mode HT40	26 dB BANDWIDTH [MHz]			
Channel	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
	39.64	39.40	39.80	39.64
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
	39.56	39.72	39.80	-/-
Measurement uncertainty	± RBW			

Result: **Passed**

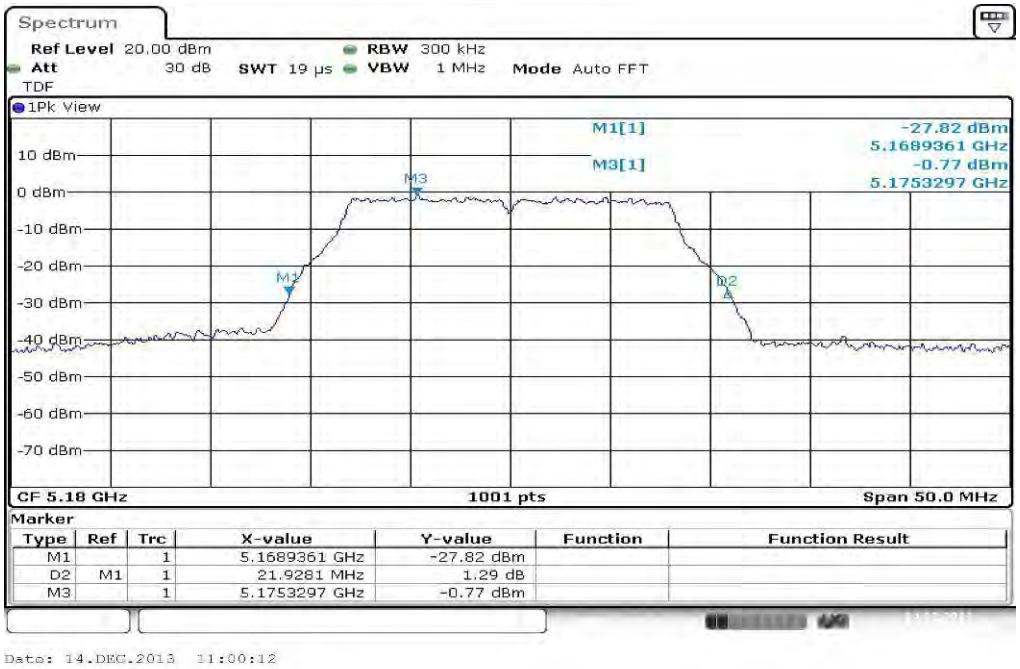
Result: OFDM / ac – mode HT80

OFDM / ac – mode HT80	26 dB BANDWIDTH [MHz]			
Channel	Lowest 5210 MHz	Highest 5290 MHz	Lowest 5530 MHz	Highest 5610 MHz
	81.54	81.28	81.54	81.28
Measurement uncertainty	± RBW			

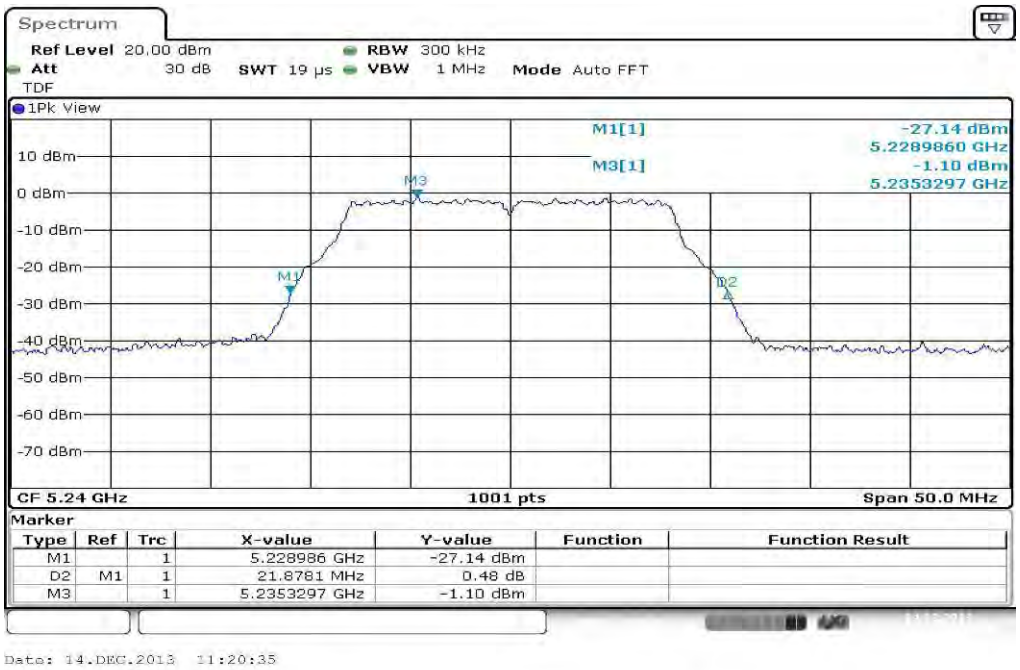
Result: **Passed**

Plots: OFDM / a – mode

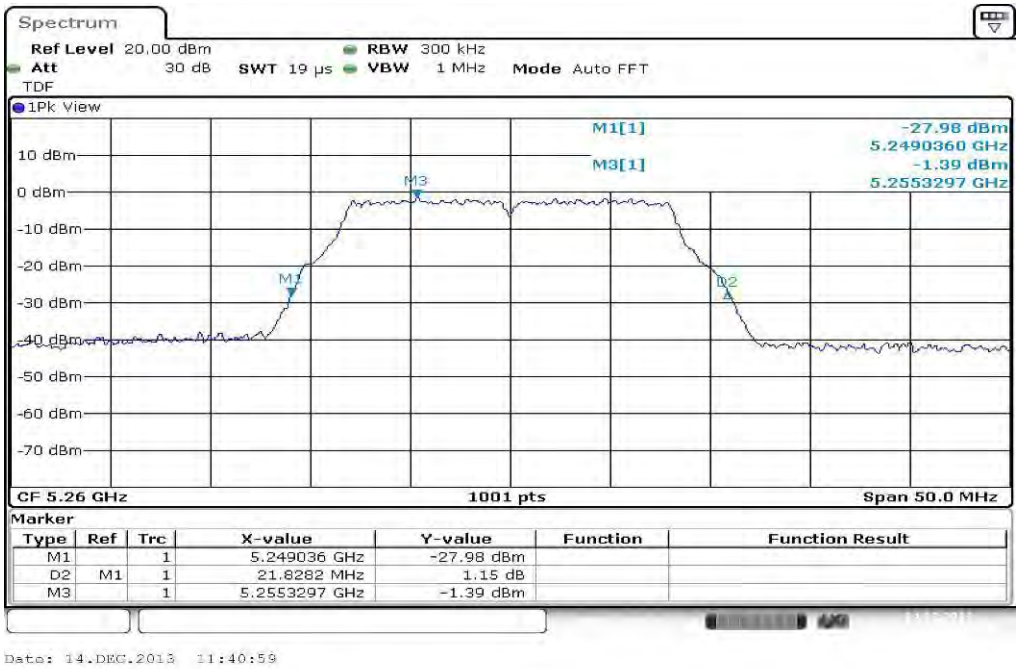
Plot 1: 5180 MHz



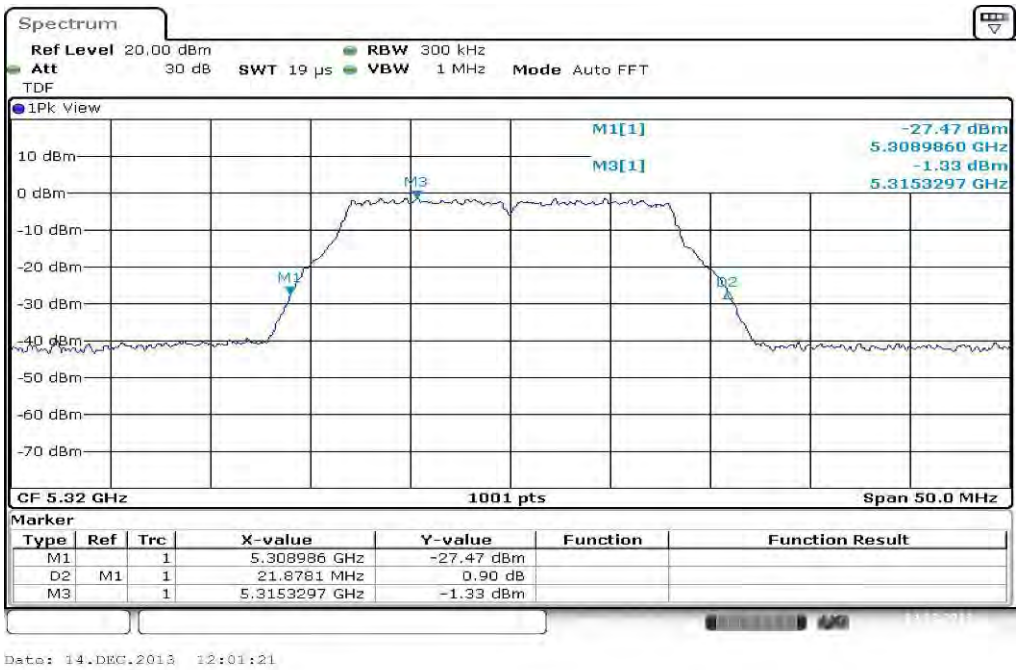
Plot 2: 5240 MHz



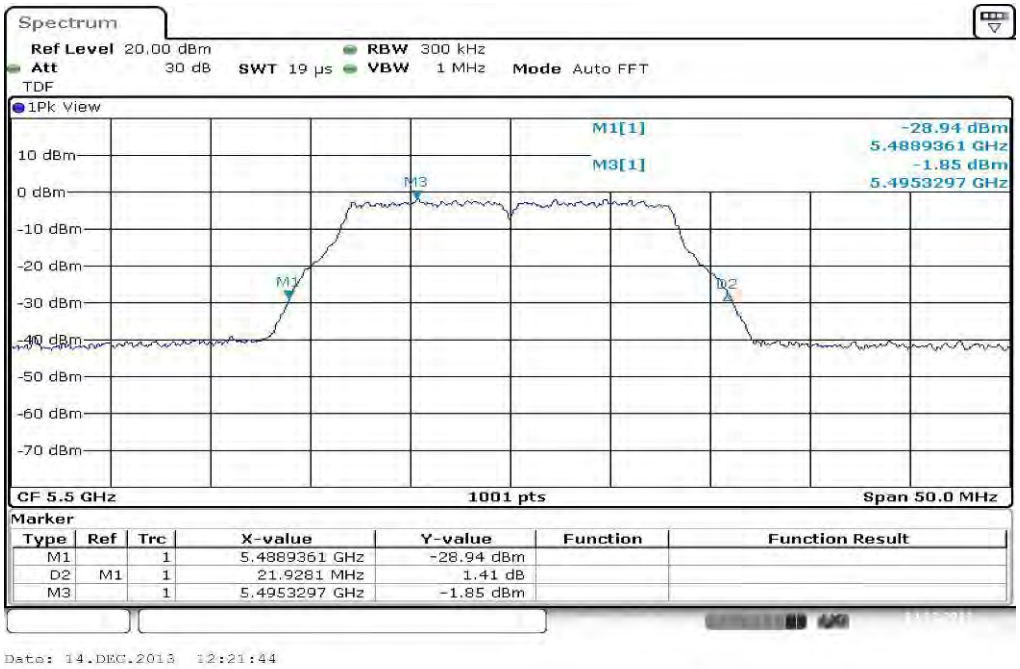
Plot 3: 5260 MHz



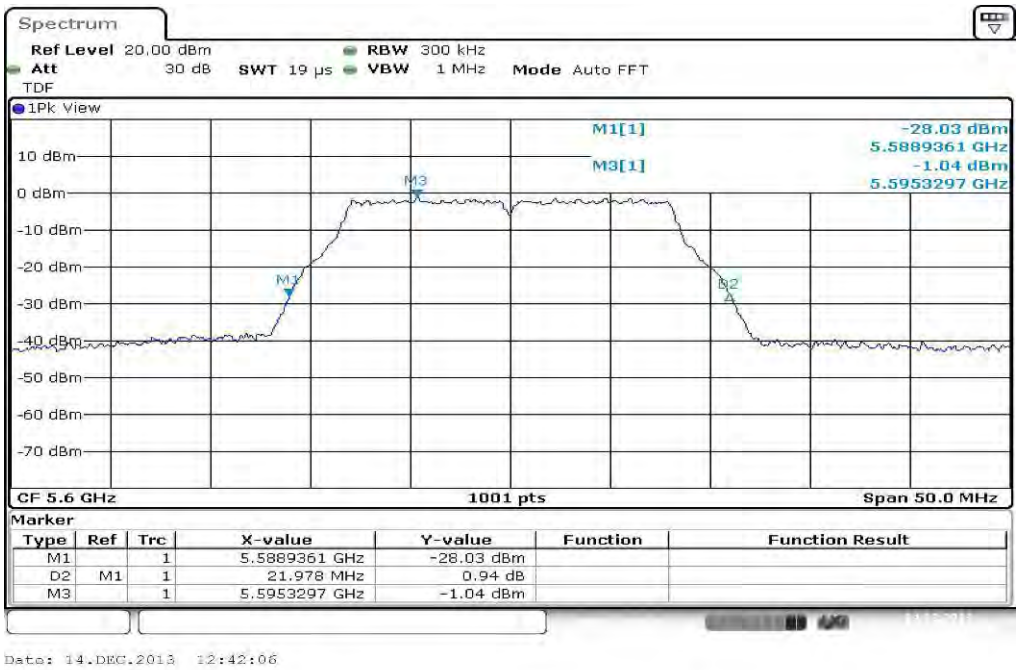
Plot 4: 5320 MHz



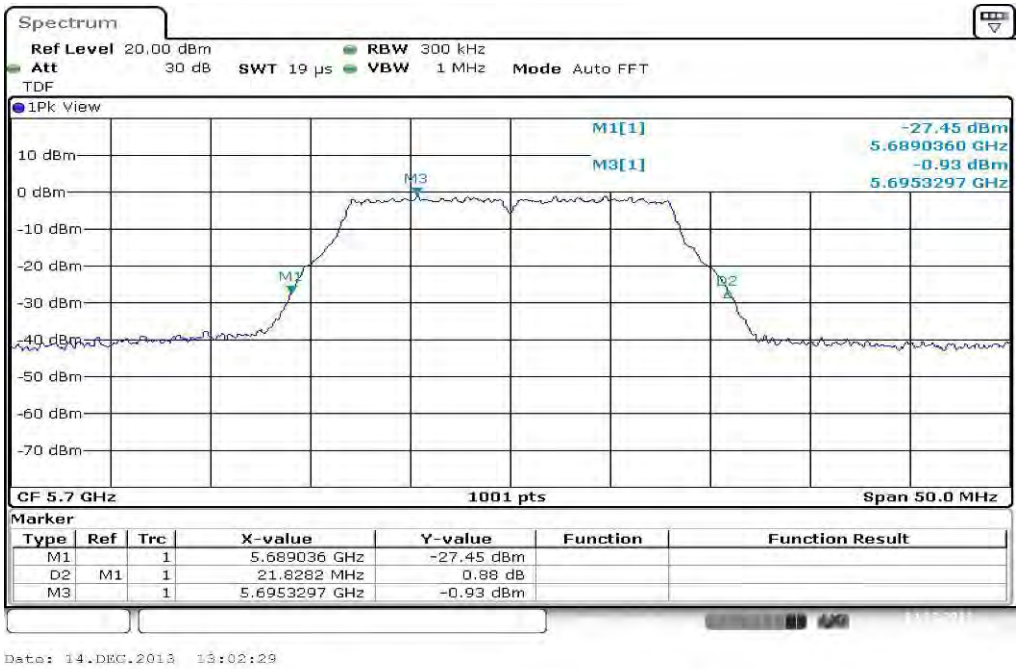
Plot 5: 5500 MHz



Plot 6: 5600 MHz

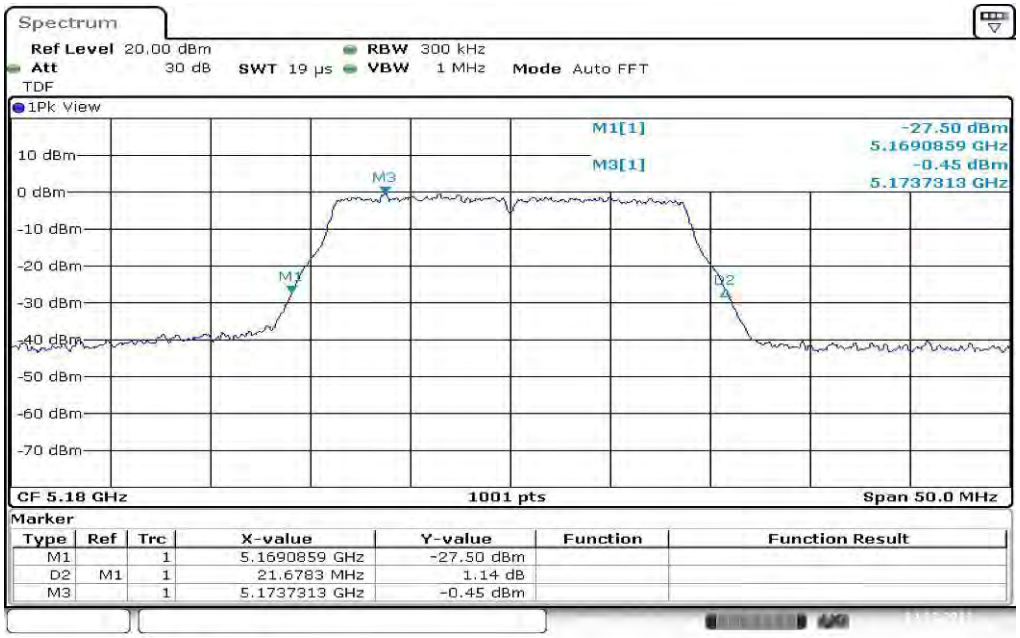


Plot 7: 5700 MHz

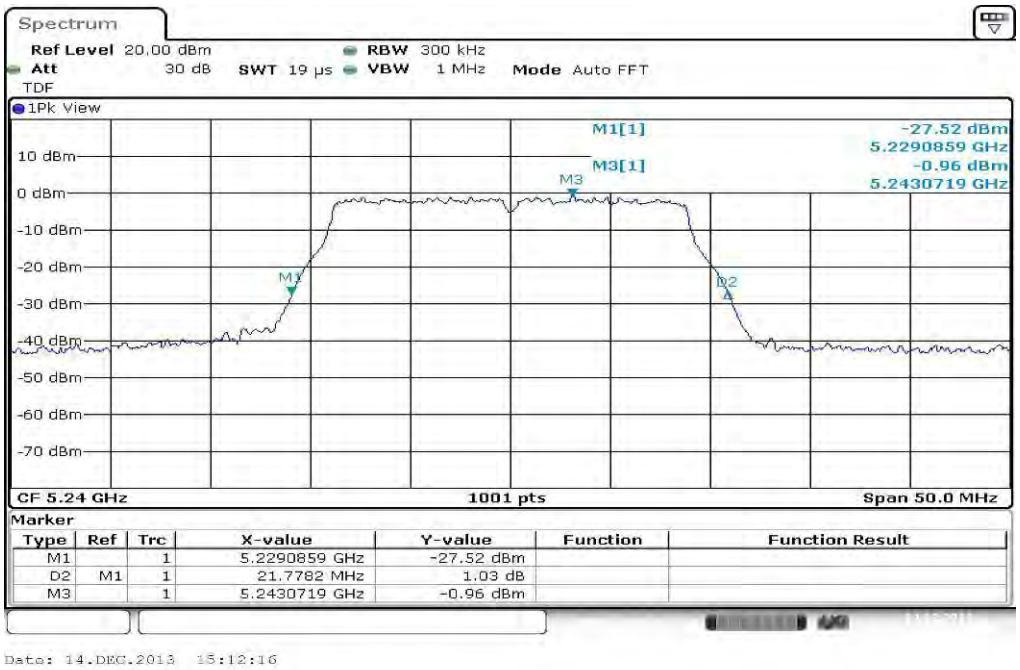


Plots: OFDM / n/ac – mode HT20

Plot 1: 5180 MHz

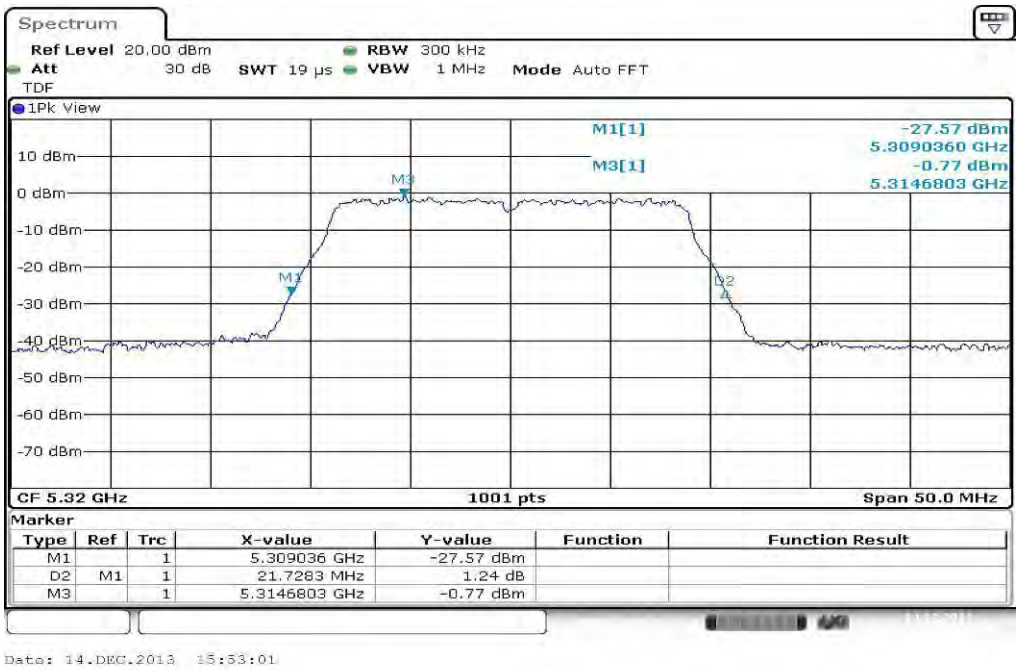


Plot 2: 5240 MHz

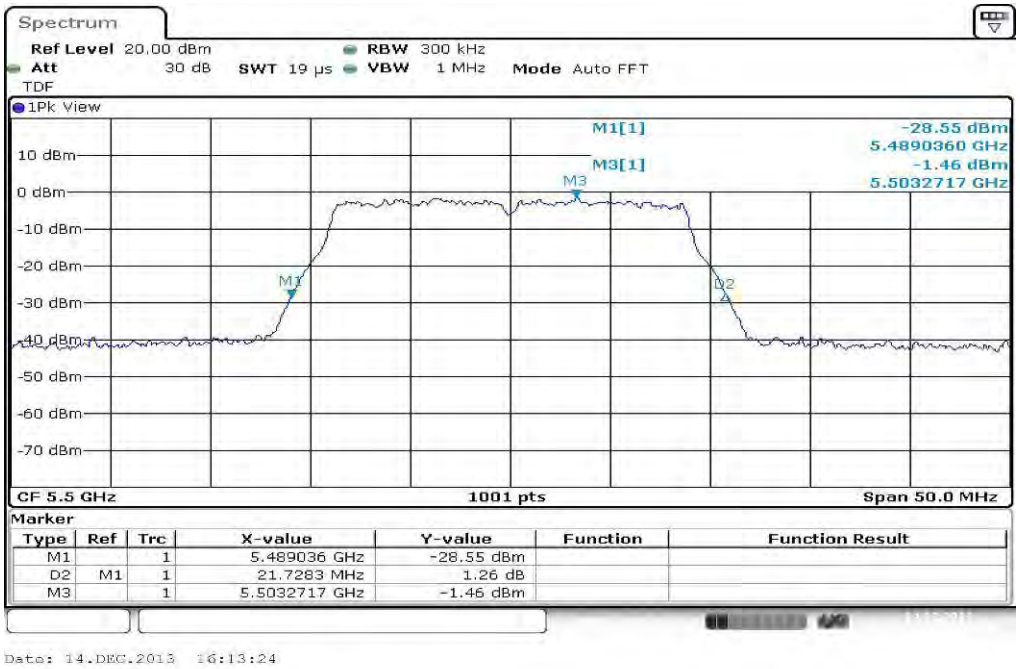


Plot 3: 5260 MHz

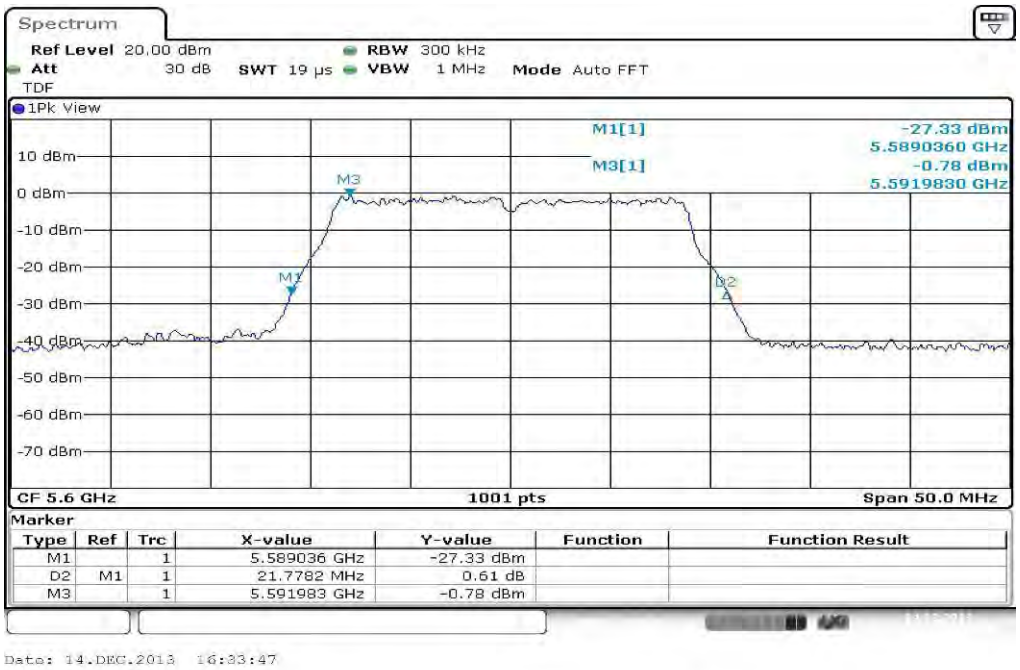
Plot 4: 5320 MHz



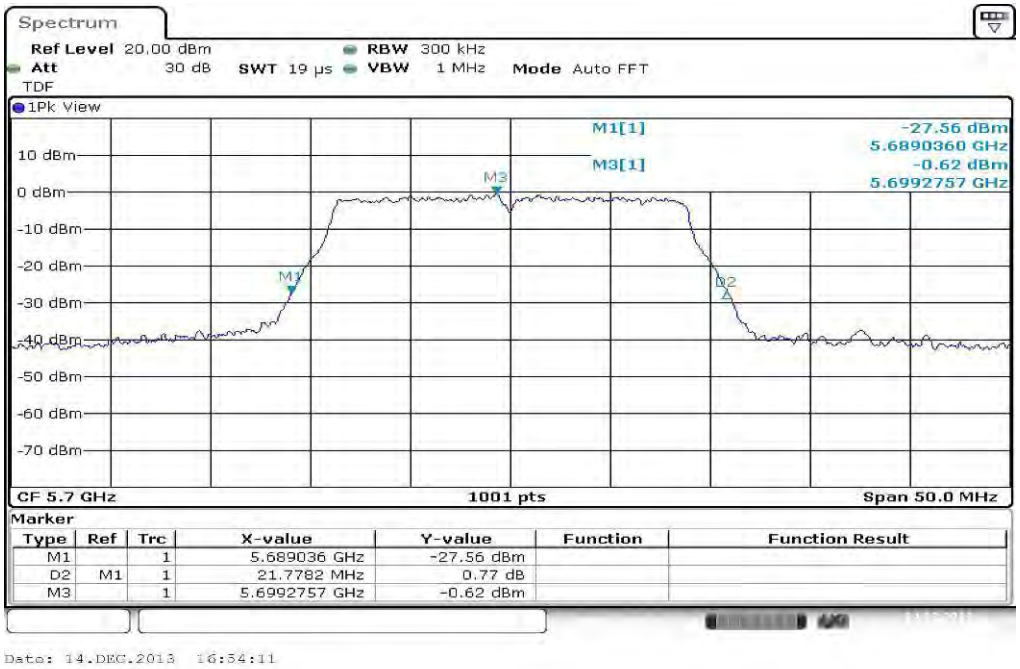
Plot 5: 5500 MHz



Plot 6: 5600 MHz

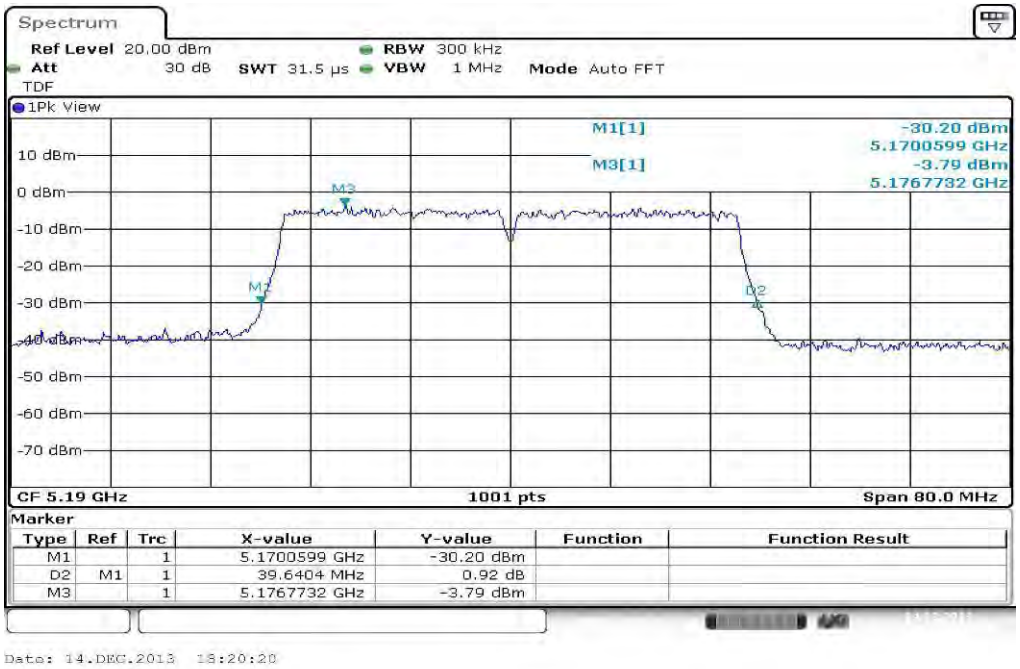


Plot 7: 5700 MHz

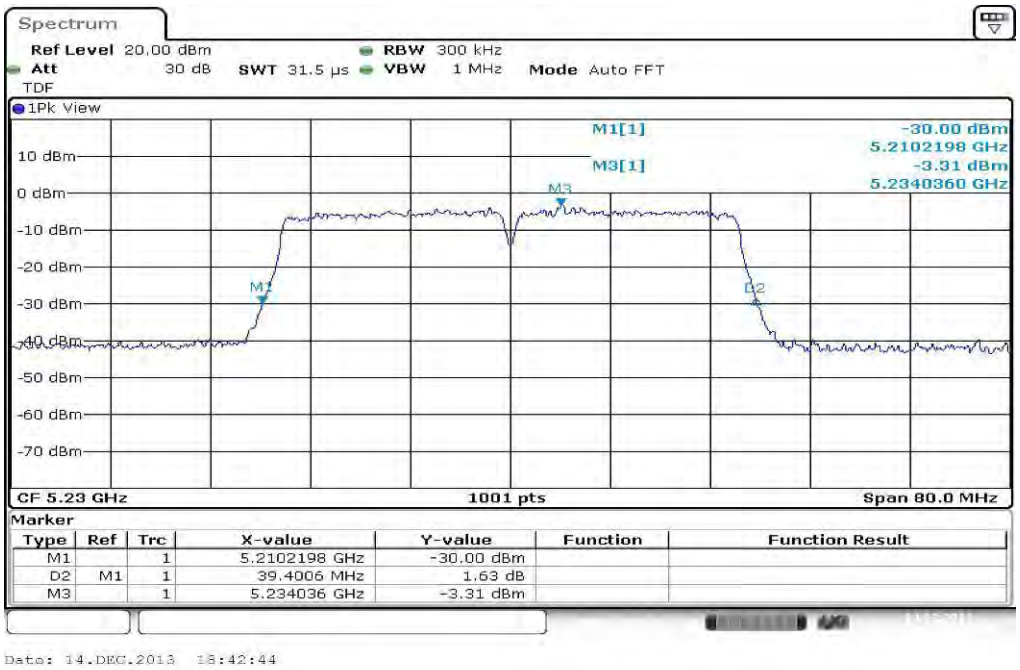


Plots: OFDM / n/ac – mode HT40

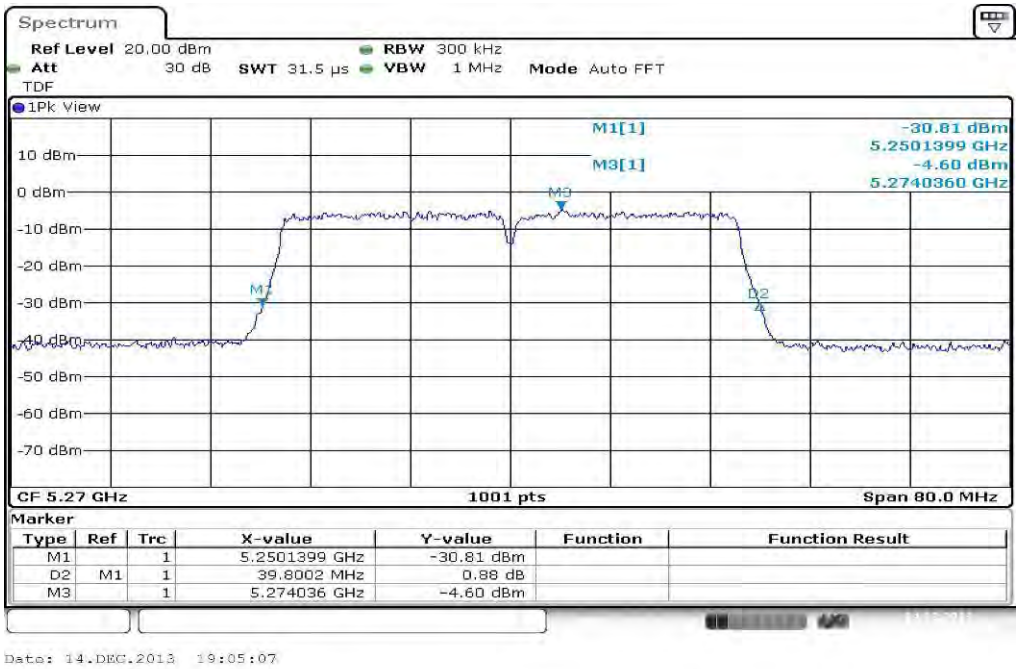
Plot 1: 5190 MHz



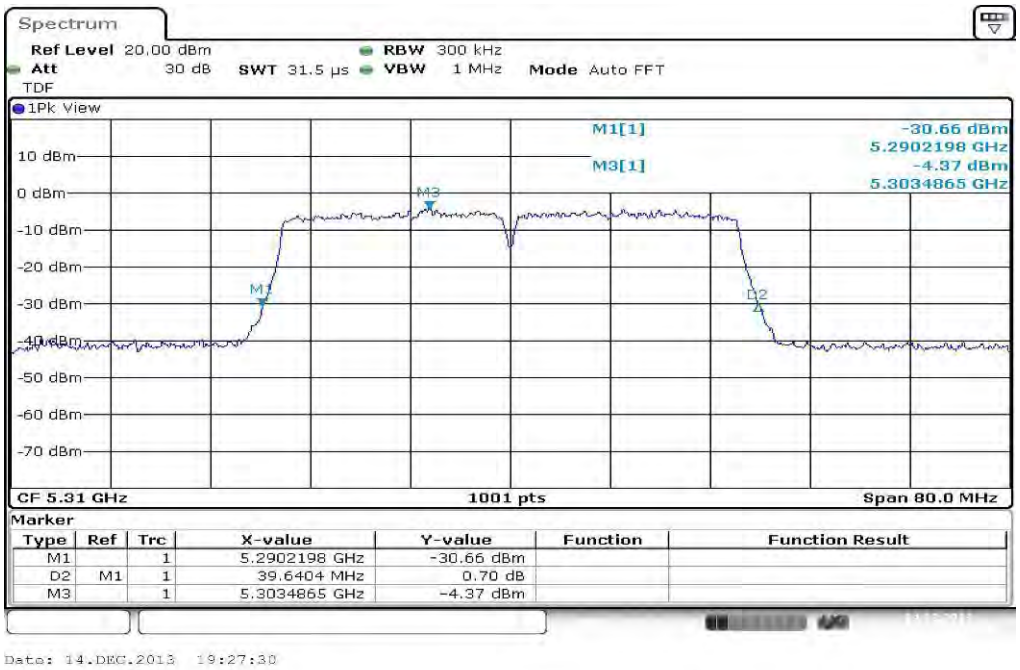
Plot 2: 5230 MHz



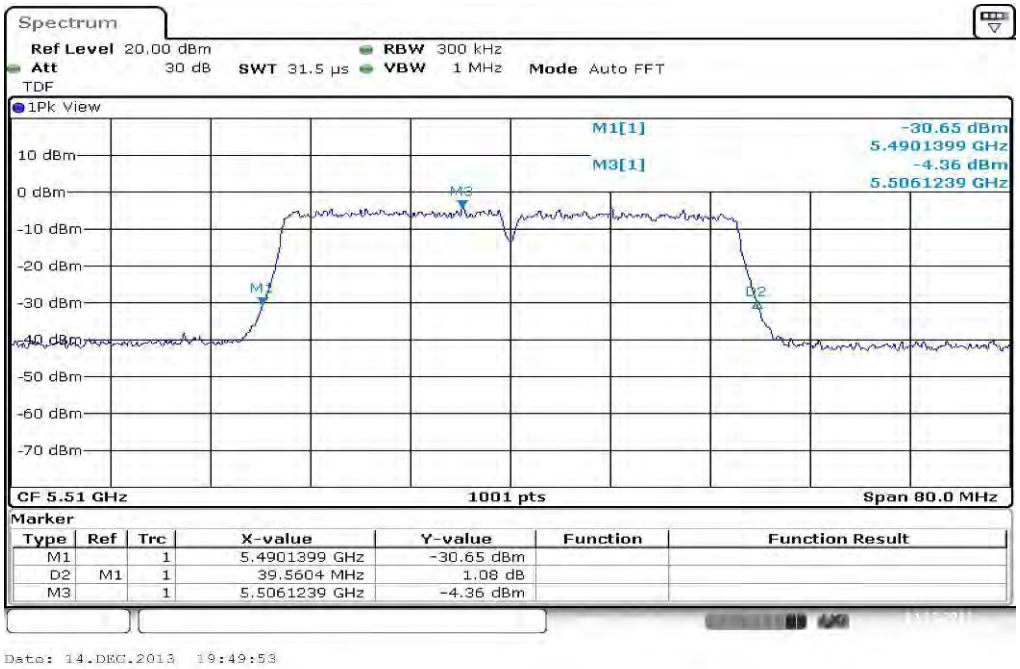
Plot 3: 5270 MHz



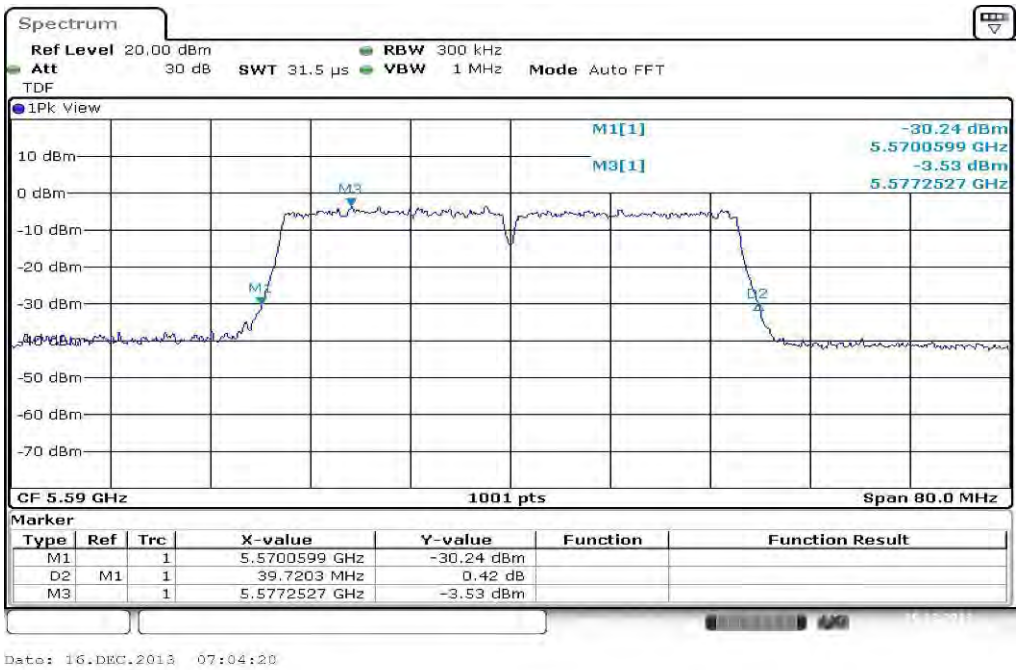
Plot 4: 5310 MHz



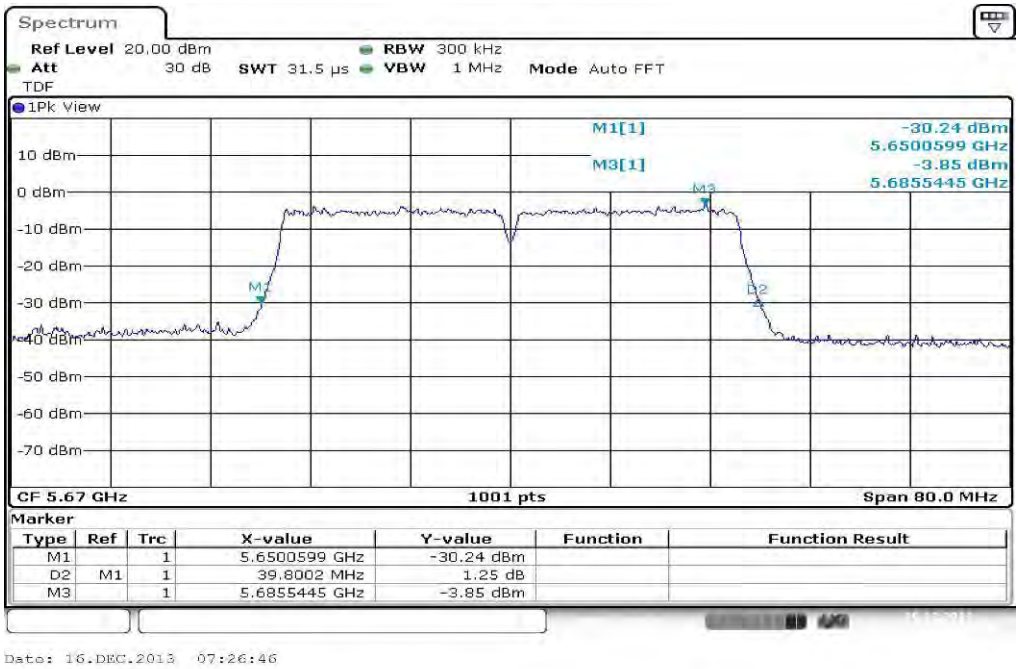
Plot 5: 5510 MHz



Plot 6: 5590 MHz

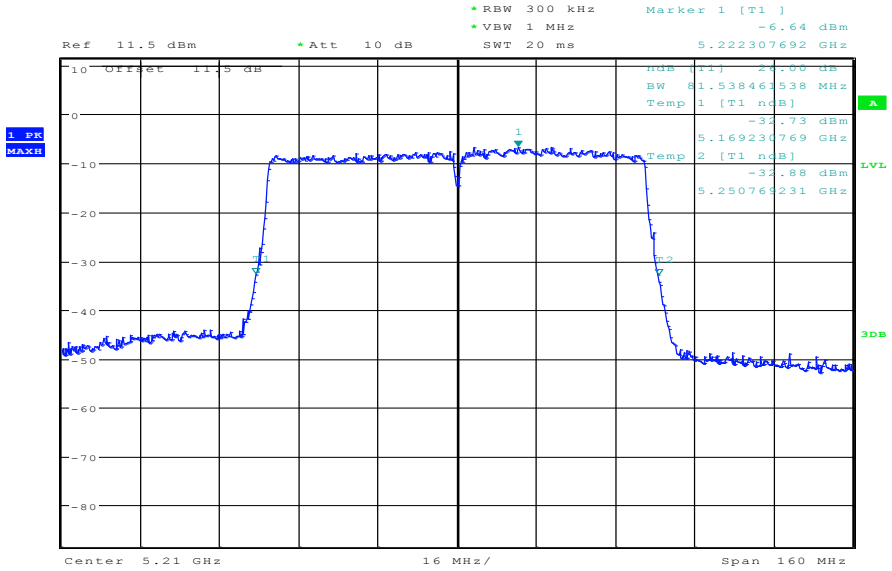


Plot 7: 5670 MHz



Plots: OFDM / ac – mode HT80

Plot 1: 5210 MHz



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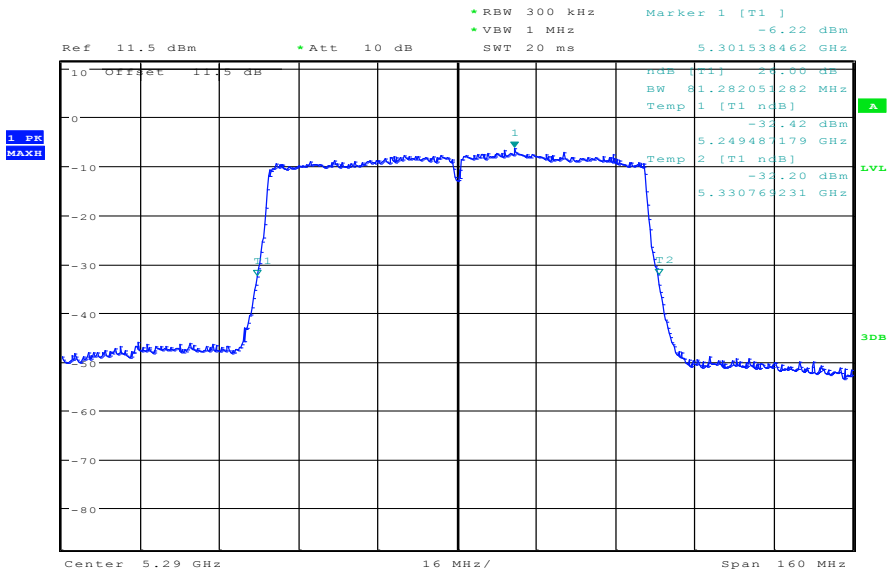
Plot 2: 5290 MHz



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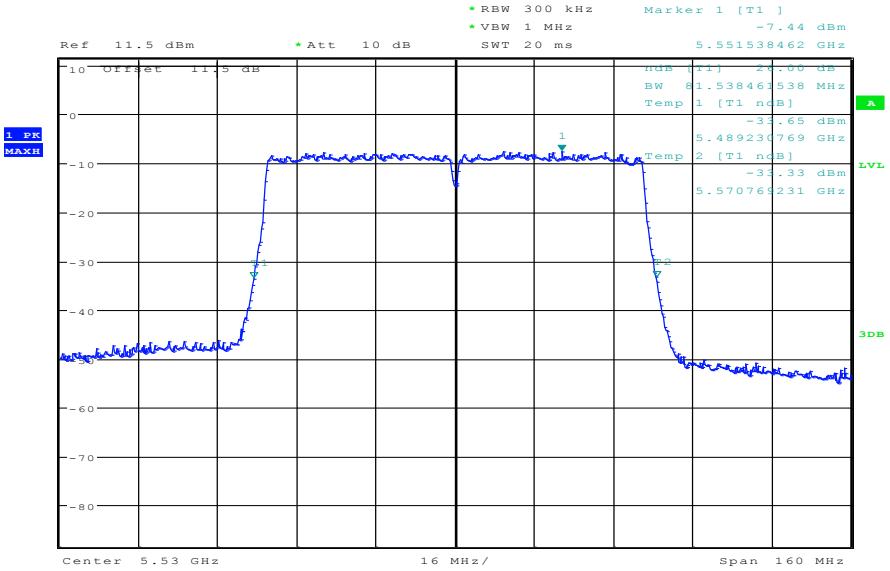
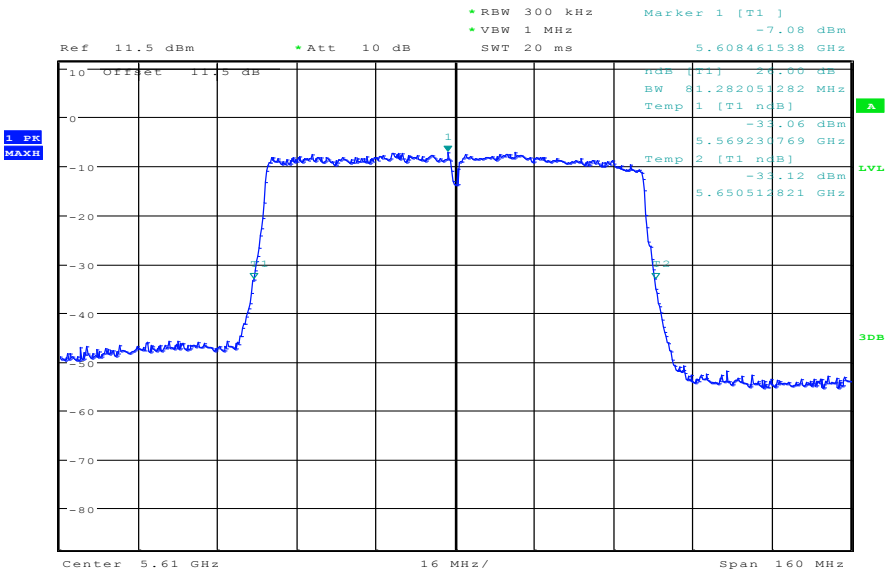
Plot 3: 5530 MHz



Date: 20.DEC.2013 10:07:12

Plot 4: 5610 MHz



Date: 20.DEC.2013 10:07:41

11.7 Peak excursion measurements

Description:

Peak to average value.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	60 s / 120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	≥ 3 MHz
Span:	> Complete signal
Trace-Mode:	Max hold

Limits:

Peak excursion value
Does not exceed 13 dB.

Results:

Modulation OFDM / a – mode	Peak excursion value		
Channel	5180 MHz	-/-	5240 MHz
RMS	-3.74	-/-	-3.93
Peak	5.01	-/-	4.81
Peak excursion value	8.75	-/-	8.74
Channel	5260 MHz	-/-	5320 MHz
RMS	-4.31	-/-	-3.98
Peak	4.27	-/-	4.59
Peak excursion value	8.58	-/-	8.57
Channel	5500 MHz	5600 MHz	5700 MHz
RMS	-4.62	-3.85	-3.73
Peak	3.96	4.74	4.77
Peak excursion value	8.58	8.59	8.50
Measurement uncertainty	± 1 dB		

Result: **Passed**

Results:

Modulation OFDM / n/ac – mode HT20	Peak excursion value		
Channel	5180 MHz	-/-	5240 MHz
RMS	-4.15	-/-	-4.37
Peak	5.87	-/-	6.63
Peak excursion value	10.02	-/-	11.00
Channel	5260 MHz	-/-	5320 MHz
RMS	-4.90	-/-	-4.59
Peak	5.40	-/-	6.00
Peak excursion value	10.30	-/-	10.59
Channel	5500 MHz	5600 MHz	5700 MHz
RMS	-5.32	-4.46	-4.25
Peak	4.63	5.65	6.20
Peak excursion value	9.95	10.11	10.45
Measurement uncertainty	± 1 dB		

Result: **Passed**

Results:

Modulation OFDM / n/ac – mode HT40	Peak excursion value		
Channel	5190 MHz	5230 MHz	5270 MHz
RMS	-7.90	-7.48	-8.49
Peak	2.53	2.77	1.85
Peak excursion value	10.43	10.25	10.34
Channel	5310 MHz	5510 MHz	5590 MHz
RMS	-8.05	-8.13	-7.38
Peak	2.53	2.41	3.00
Peak excursion value	10.58	10.54	10.38
Channel	5670 MHz	-/-	-/-
RMS	-7.54	-/-	-/-
Peak	2.84	-/-	-/-
Peak excursion value	10.38	-/-	-/-
Measurement uncertainty	± 1 dB		

Result: **Passed**

Results:

Modulation OFDM / ac – mode HT80	Peak excursion value		
Channel	5210 MHz	5290 MHz	5530 MHz
RMS	-10.14	-10.96	-11.35
Peak	0.27	-0.57	-1.25
Peak excursion value	10.41	10.39	10.10
Channel	5610 MHz	-/-	-/-
RMS	-10.91	-/-	-/-
Peak	-0.51	-/-	-/-
Peak excursion value	10.40	-/-	-/-
Measurement uncertainty	± 1 dB		

Result: **Passed**

Plots: OFDM / a – mode

Plot 1: 5180 MHz

Date: 14.DEC.2013 11:03:53

Plot 2: 5240 MHz

Date: 14.DEC.2013 11:24:16

Plot 3: 5260 MHz

Plot 4: 5320 MHz

Plot 5: 5500 MHz

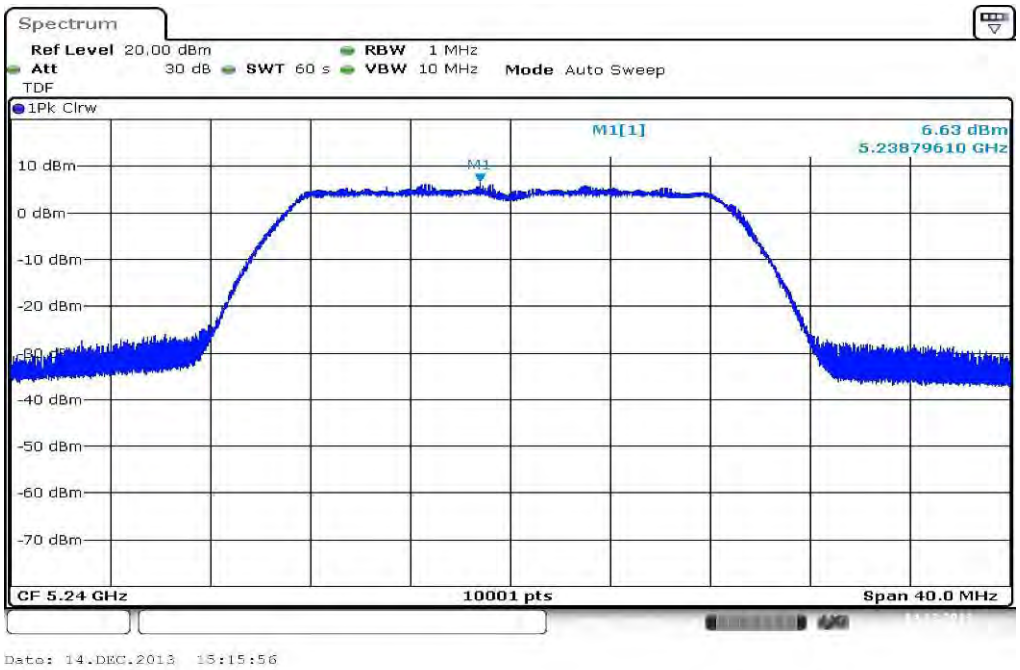
Plot 6: 5600 MHz

Plot 7: 5700 MHz

Plots: OFDM / n/ac – mode HT20

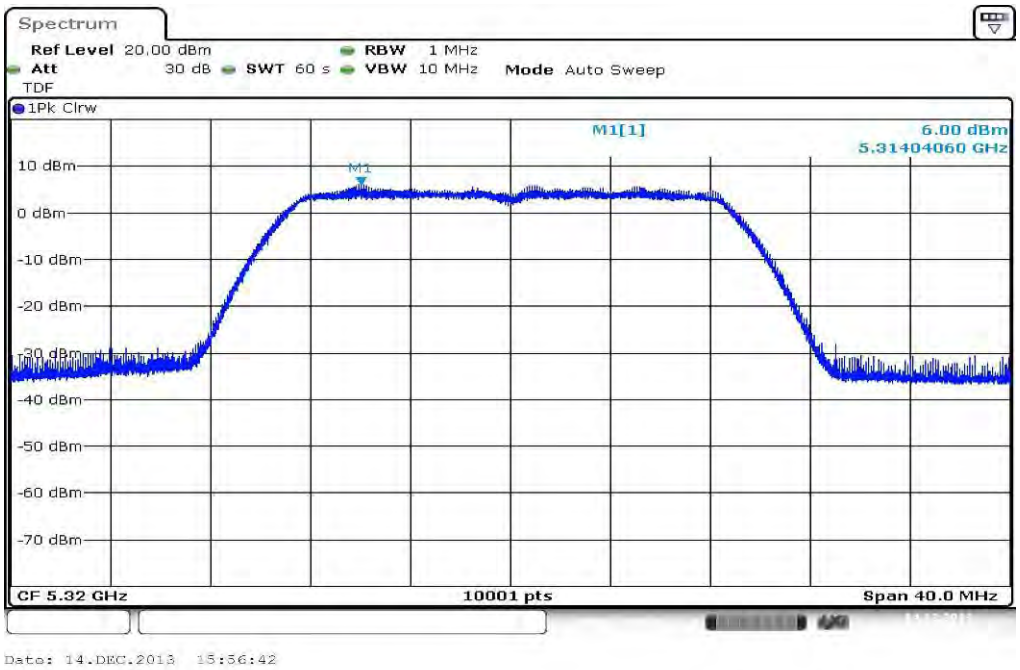
Plot 1: 5180 MHz

Plot 2: 5240 MHz

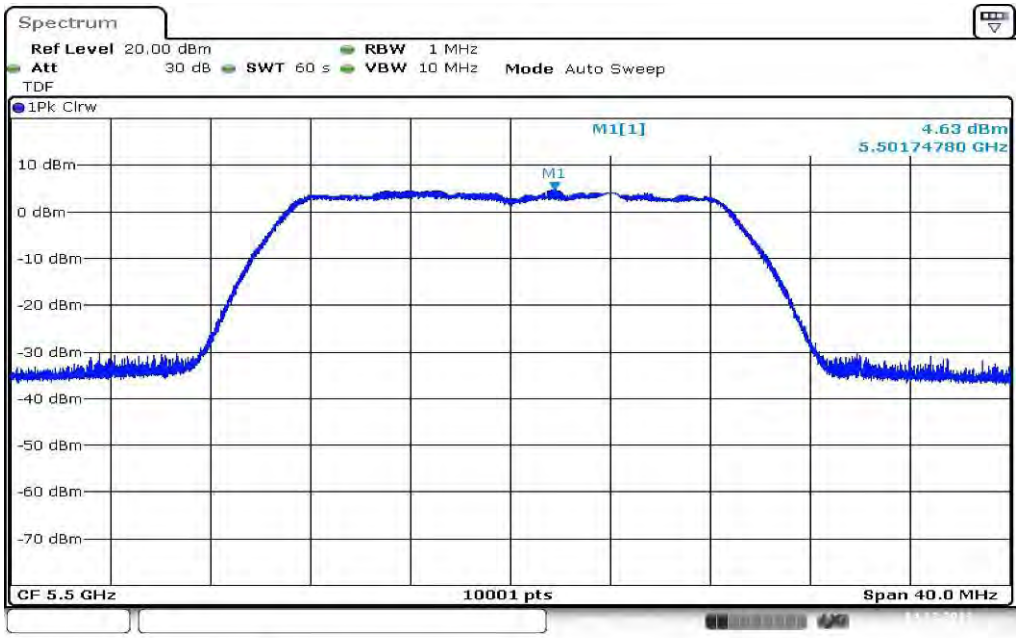


Plot 3: 5260 MHz

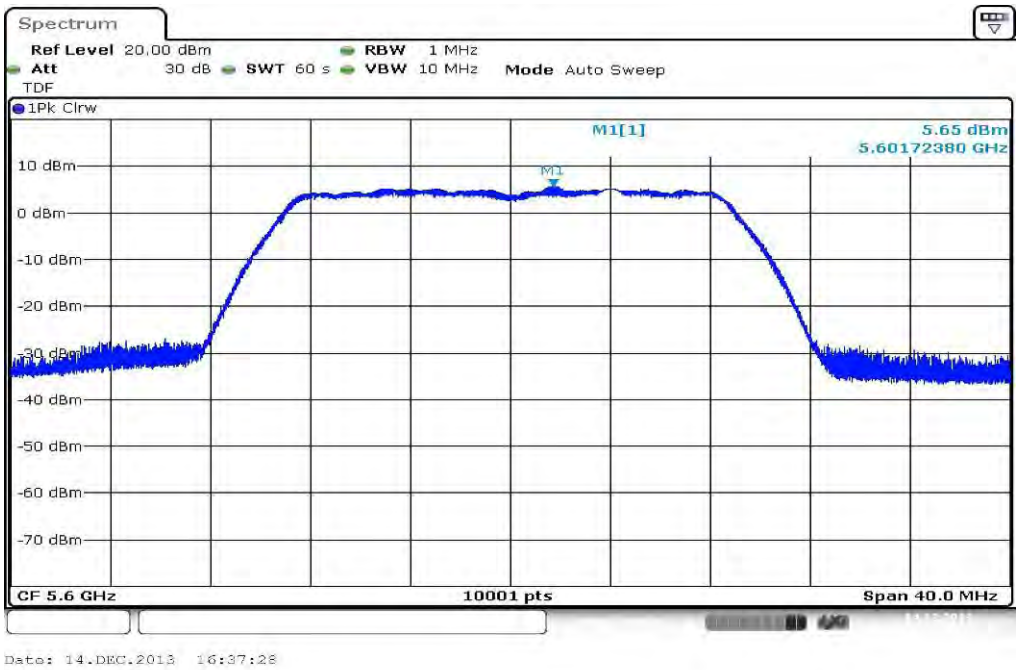
Plot 4: 5320 MHz



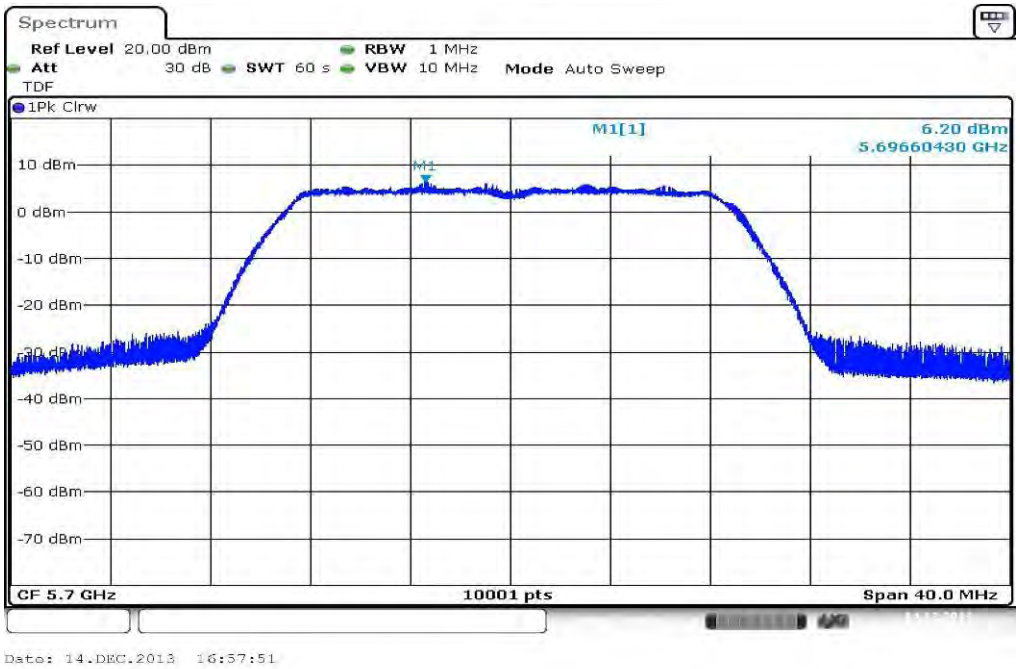
Plot 5: 5500 MHz



Plot 6: 5600 MHz



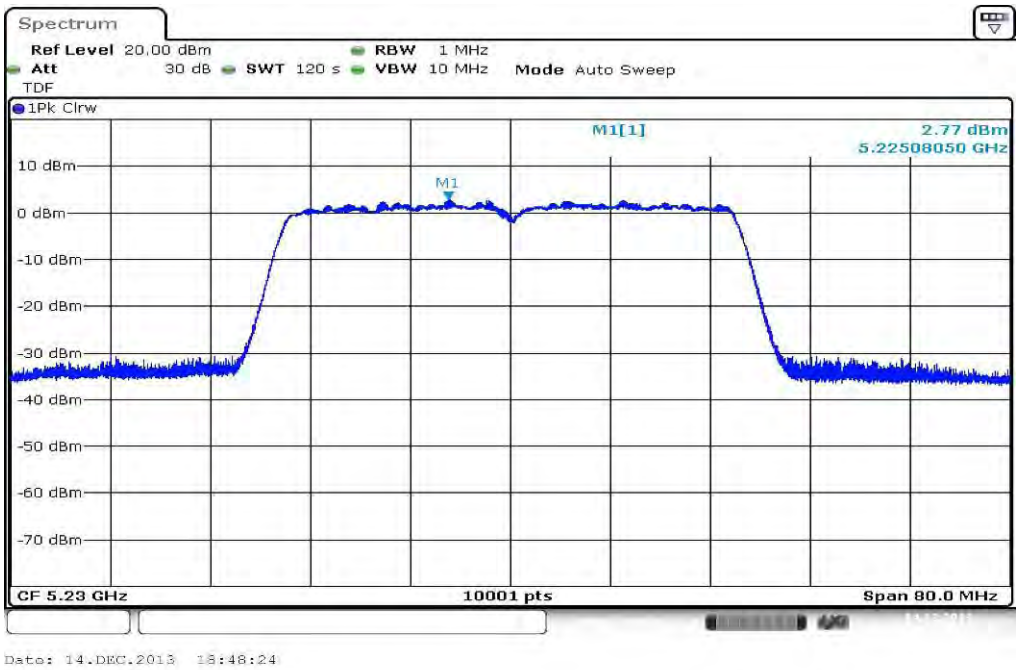
Plot 7: 5700 MHz



Plots: OFDM / n/ac – mode HT40

Plot 1: 5190 MHz

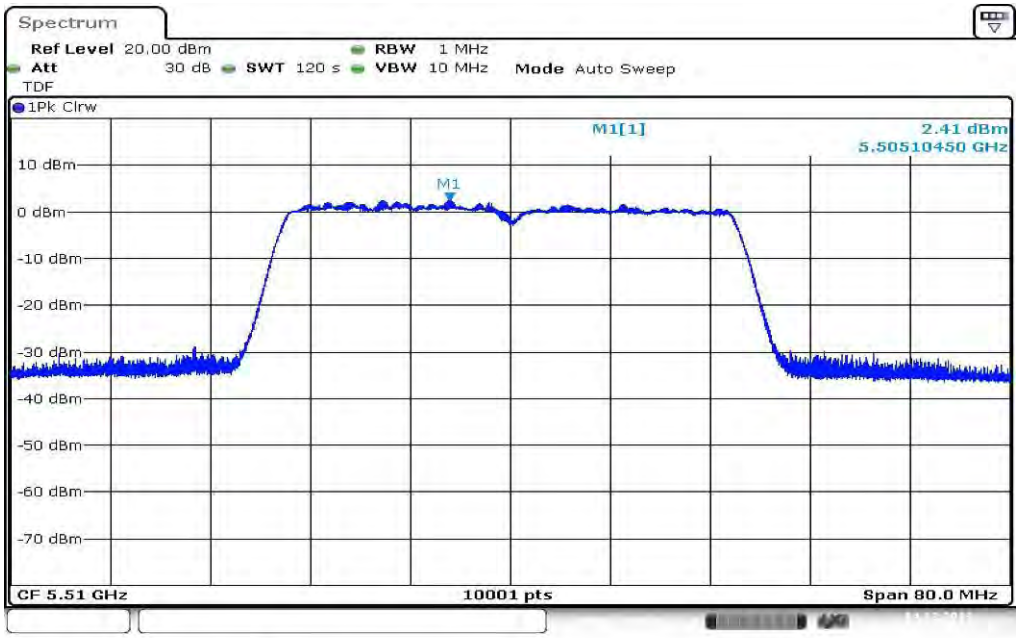
Plot 2: 5230 MHz



Plot 3: 5270 MHz

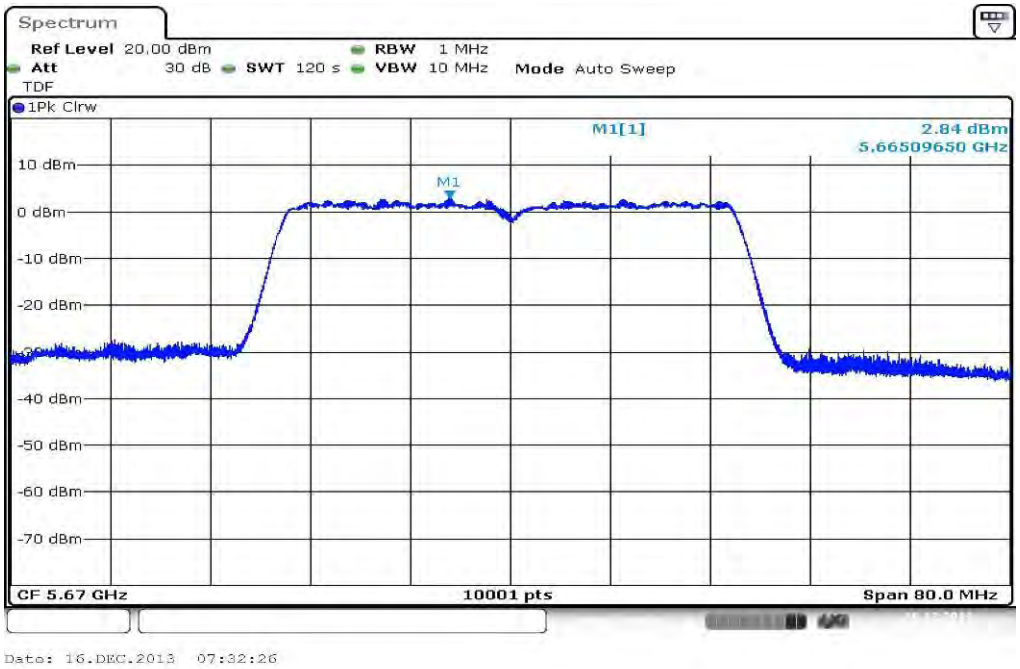
Plot 4: 5310 MHz

Plot 5: 5510 MHz



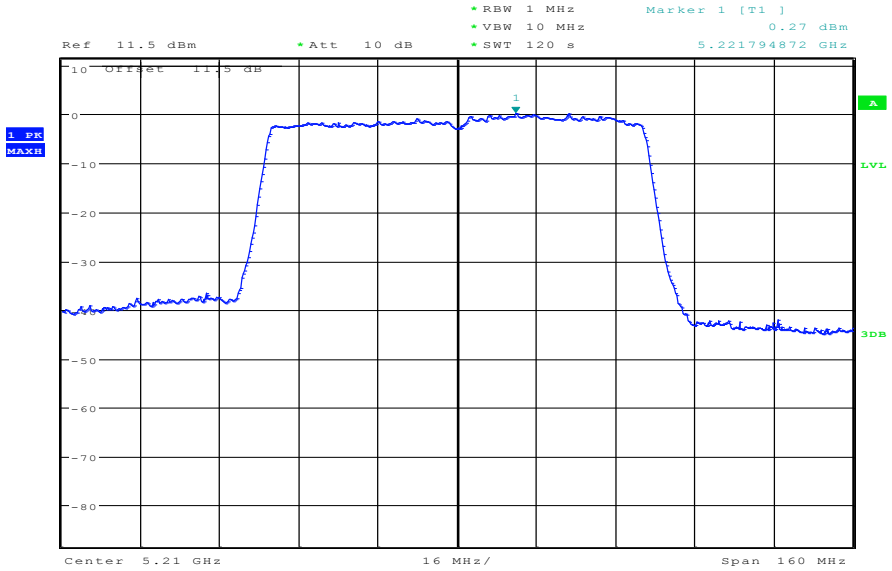
Plot 6: 5590 MHz

Plot 7: 5670 MHz



Plots: OFDM / ac – mode HT80

Plot 1: 5210 MHz



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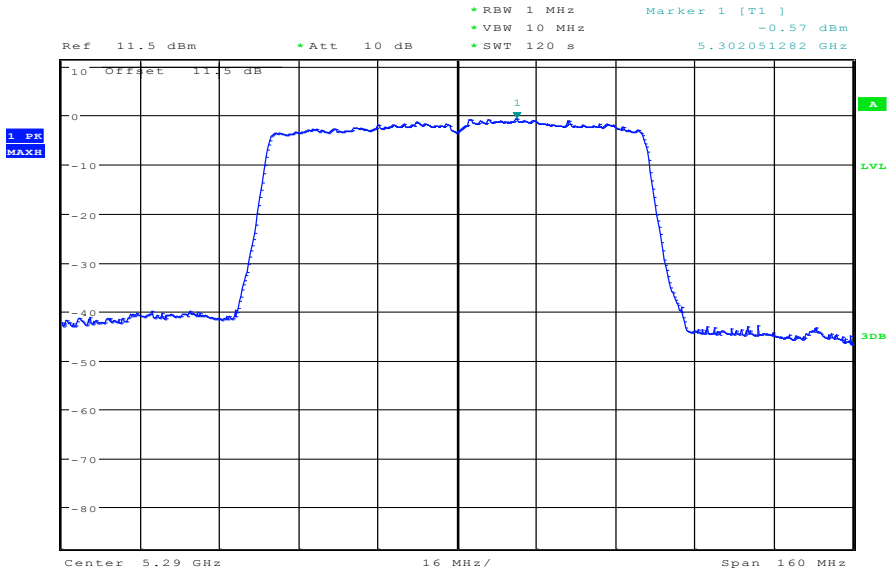
Plot 2: 5290 MHz



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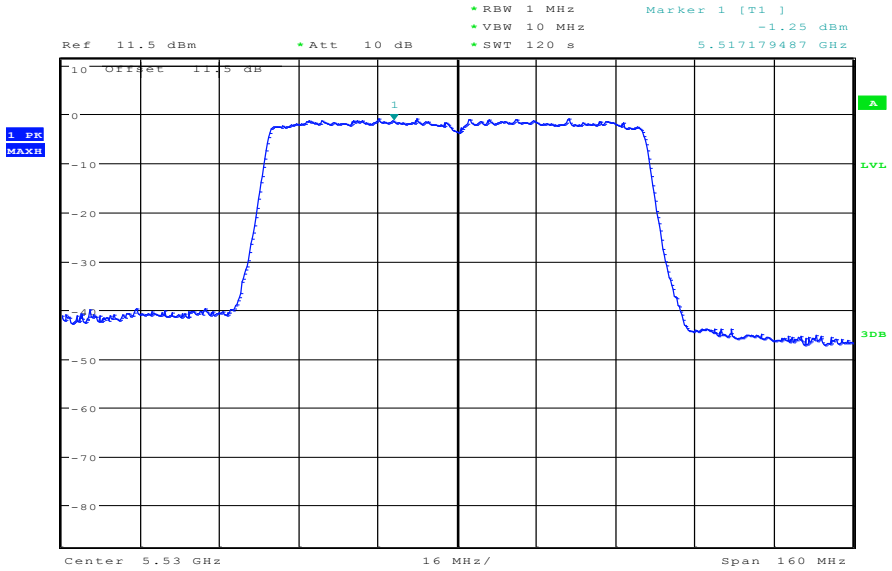
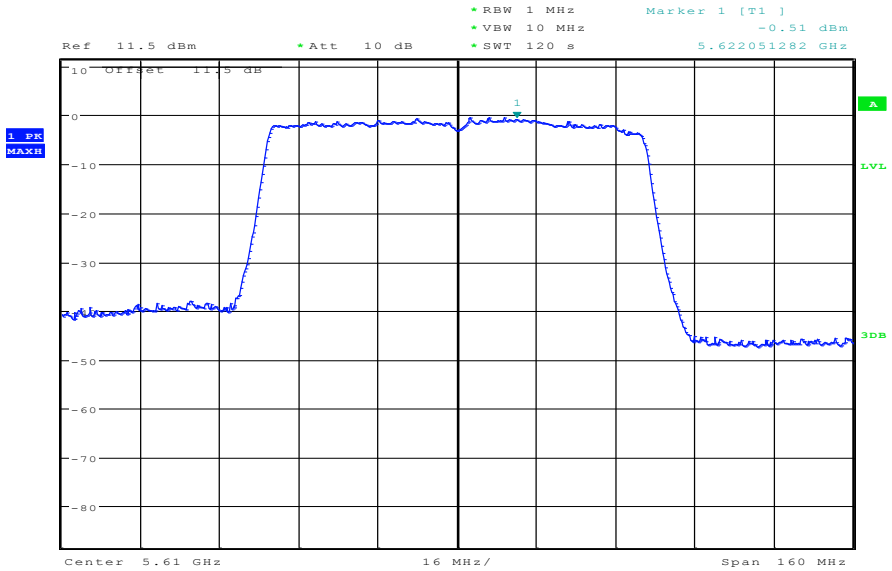
Plot 3: 5530 MHz



Date: 20.DEC.2013 10:50:40

Plot 4: 5610 MHz



Date: 20.DEC.2013 10:57:41