

TEST REPORT

Test Report No.: 1-1977-01-04/10-A

Testing Laboratory

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Accredited Test Laboratory:

The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025

DAR registration number: DGA-PL-176/94-D1

Area of Testing: Radio Satellite Communications

Applicant

Hirschmann Automation & Control GmbH

Stuttgarter Straße 45-51

72654 Neckartenzlingen/GERMANY

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Manufacturer

Hirschmann Automation & Control GmbH

Stuttgarter Straße 45-51

72654 Neckartenzlingen/GERMANY

Test Standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission

subchapter A - general, Part 15-Radio frequency devices

RSS - 210 Issue 7

Spectrum Management and Telecommunications - Radio Standards Specification
Low-power Licence-exempt Radiocommunication Devices (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: WLAN Access Point (IEEE 802.11 a/b/g)

Model name: BAT54-Rail

FCC ID: U99BAT54RAIL

IC: 4019A-BAT54R

Frequency [MHz]: ISM band 5150 MHz – 5250 MHz
(low channel 5180 MHz / high channel 5240 MHz)

Power supply: 115 V AC by mains adapter SMP – 120 W

Temperature range: -30 °C to +55 °C



Test performed:

2010-08-25 Marco Bertolino

Test Report authorised:

2010-08-25 Andreas Keller

1 Table of contents

1	Table of contents	2
2	General Information	3
2.1	Notes	3
2.2	Application details	3
3	Test standard/s	3
4	Test Environment.....	3
5	Test item.....	4
6	Test Laboratories sub-contracted.....	4
7	Summary of measurement results	5
8	RF measurement testing	6
8.1	Description of test setup	6
8.1.1	Radiated measurements	6
8.1.2	Conducted measurements	7
8.2	Additional comments	8
8.3	RSP100 Test Report Cover Sheet / Performance Test Data	12
9	Measurement Results	13
9.1	Antenna Gain	13
9.2	Maximum Output Power	17
9.3	Band Edge Compliance Radiated	21
9.4	TX Spurious Emissions Radiated	29
9.5	RX Spurious Emissions Radiated.....	107
10	Test equipment and ancillaries used for tests.....	133
Annex A	Document history.....	135
Annex B	Further information	135

2 General Information

2.1 Notes

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 generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

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.

2.2 Application details

Date of receipt of order:	2010-02-04
Date of receipt of test item:	2010-07-26
Start of test:	2010-07-28
End of test:	2010-07-30
Person(s) present during the test:	-/-

3 Test standard/s

Test Standard	Version	Test Standard Description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
RSS - 210 Issue 7	2007-06	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

4 Test Environment

Temperature:	T_{nom} +22 °C during room temperature tests T_{max} +55 °C during high temperature test T_{min} -30 °C during low temperature test
Relative humidity content:	52 %
Air pressure:	not relevant for this kind of testing
Power supply:	V_{nom} 115.00 V AC by mains adapter SMP – 120 W V_{max} 132.25 V V_{min} 97.75 V

5 Test item

Kind of test item	:	WLAN Access Point (IEEE 802.11 a/b/g)
Type identification	:	BAT54-Rail
S/N serial number	:	S/N: 943926021000110207 MAC: 008063AE6E64
HW hardware status	:	No information available!
SW software status	:	No information available!
Frequency Band [MHz]	:	ISM band 5150 MHz – 5250 MHz (low channel 5180 MHz / high channel 5240 MHz)
Type of Modulation	:	OFDM technology with QPSK; 16-QAM; 64-QAM
Number of channels	:	4
Antenna	:	3 external antennas: BAT-ANT-N-9A-DS-IP65 BAT-ANT-N-5A-IP65 BAT-ANT-N-6ABG-IP65 For more information, please take a look at the references documents and annex B – external photos of the EUT!
Power Supply	:	115.00 V AC by mains adapter SMP – 120 W
Temperature Range	:	-30 °C to +55 °C

6 Test Laboratories sub-contracted

None

7 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	CFR Part 15 RSS 210, Issue 7, Annex 8	Passed	2010-08-25	Delta tests only!

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Mode	Pass	Fail	NA	NP	Results (max.)
§15.407(a)(1) RSS 210 / A8.4(2)	Antenna Gain	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.407(a)(1) RSS-210 / A8.4(4)	Maximum output power	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.407(b)(1) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.109 RSS-Gen.	RX spurious emissions radiated	Nominal	Nominal	-/-	☒	☐	☐	☐	complies
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

8 RF measurement testing

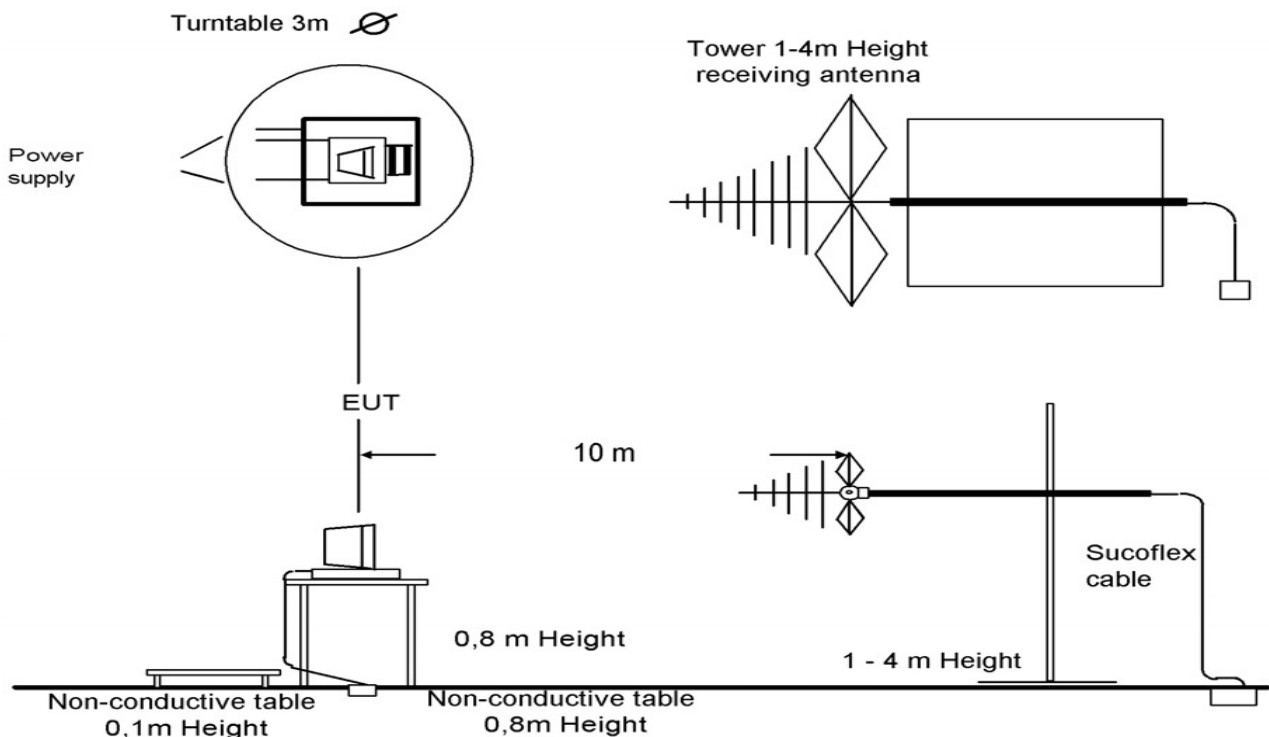
8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 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 C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. 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 C63-4-2003 clause 4.2.

Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



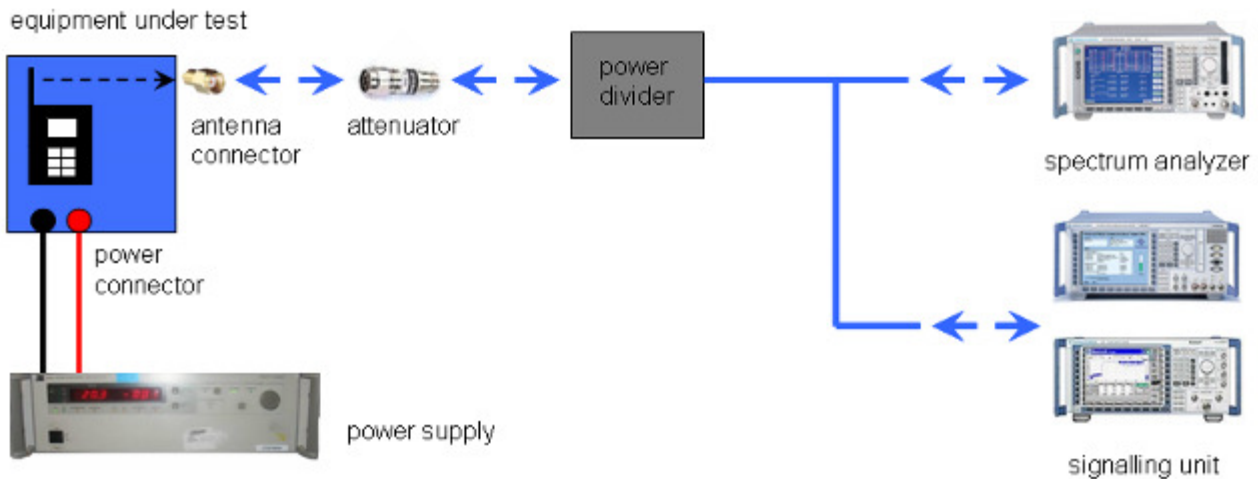
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.



Picture 2: Diagram conducted measurements

8.2 Additional comments

Reference documents:



Omni-Directional Antenna for 5 GHz

BAT-ANT-N-5A-IP65

Order Number: 943 981-003

Electrical Specification

Frequency range	5150 MHz - 5875 MHz
Gain	5 dBi
VSWR	1,5
Polarization	Linear, vertical
HPBW /	horizontal 360°
HPBW /	vertical 25°
Max. Power	6 W
Impedance	50 Ω
Connector	N female

Environmental & Mechanical Characteristics

Temperature	- 45°C to +70°C
Radome color	Gray-white
Radome material	Polypropylene
Weight	0,3 kg
Dimension	16 x 160 mm
IP	IP65

Cable, Accessories

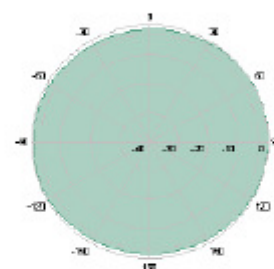
1m with N male connectors at both ends.
Pigtail, R-SMA male to N female
Mounting material

Purpose

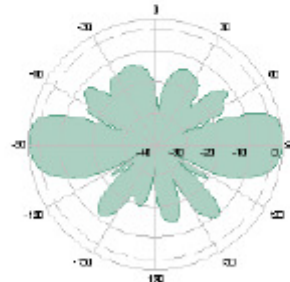
To be placed in the middle of the illuminated area. Halls or outdoor areas.



Radiation Pattern



horizontal 5470 MHz



vertical 5470 MHz

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HIRSCHMANN

A BELDEN BRAND

Omni-Directional Antenna for 2.4/ 5 GHz

BAT-ANT-N-6ABG-IP65

Order Number: 943 981 004

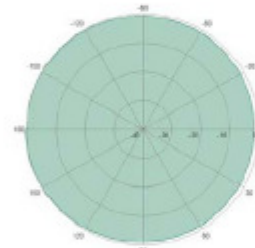
Electrical Specification

Electrical Specification

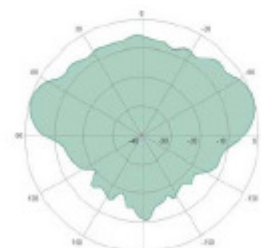
Frequency range	2300 - 2500 and 4900 - 5935 MHz
Impedance	50 Ω
VSWR	1.8
Polarization	linear, vertical
Gain	6dBi @2.4GHz, 8dBi @5GHz
3 dB beam width horizontal @ 2.4GHz	360°
3 dB beam width horizontal @ 5GHz	173°
Max. power	75 W (CW) at 25°C



Radiation Pattern



horizontal 2450 MHz



vertical 2450 MHz

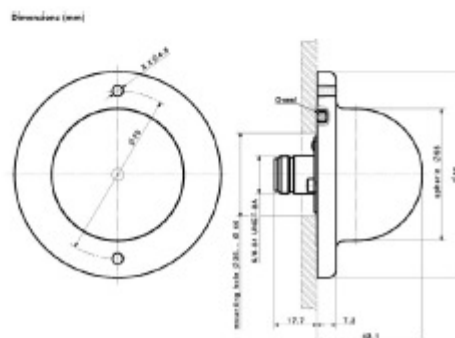
Cable, Accessories

1m with N male connectors at both ends.

Pigtail, R-SMA male to N female

Purpose

To be placed on moving parts, vehicles or boxes.


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11



Sectoral Diversity Antenna for 5 GHz

BAT-ANT-N-9A-DS-IP65

Order Number: 943 981-010

Electrical Properties

Frequency range	5150 - 5925 MHz
Impedance	50 Ω
VSWR	2
Polarization	dual linear, $\pm 45^\circ$ slant
Gain	9 dBi
3 dB beamwidth horizontal	70°
3 dB beamwidth vertical	60°
Downtilt	0°
Isolation between ports	20 dB
Front to back ratio	20 dB
Max. power	10 W (CW) at 25°C
Connectors	2x N female

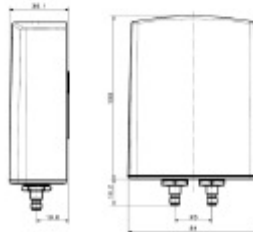
Mechanical Properties

Dimensions	101 x 80 x 35 mm
Weight	0.11 kg
Housing material	ASA and aluminum
Radome material	ASA
Radome material	LEXAN EXL 9330
Radome color	RAL 7044 (silk gray)
Operating temperature range	- 40°C to + 80°C
Storage temperature range	- 40°C to + 80°C
Windload	15 N at 160km/h
IP	66 / 67

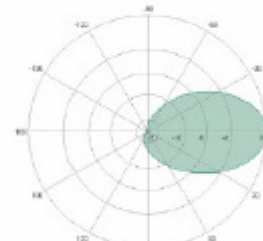
Cable, Accessories

2x 1m with N male connectors at both ends.
 2x Pigtail, R-SMA male to N female
 Mounting material

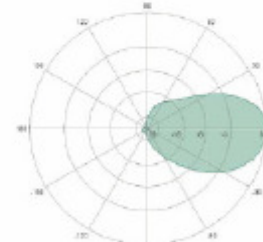
Very well usable with BAT300



Radiation Pattern



horizontal



vertical

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Special test descriptions:

Plot: Test software

[illegible]

Max detected output power under 6M - lowest data rate! All tests are performed under this condition.

Configuration descriptions: None

Test mode:

- ☐ No test mode available.
Iperf was used to ping an other device with the largest support packet size
- ☒ Special software is used.
EUT is transmitting pseudo random data by itself

8.3 RSP100 Test Report Cover Sheet / Performance Test Data

Test Report Number	:	1-1977-01-04/10-A
Equipment Model Number	:	BAT54-Rail
Certification Number	:	4019A-BAT54R
Manufacturer (complete Address)	:	Hirschmann Automation & Control GmbH Stuttgarter Straße 45-51 72654 Neckartenzlingen / GERMANY
Tested to radio standards specification no.	:	RSS 210, Issue 7, Annex 8
Open Area Test Site IC No.	:	IC 3462C-1
Frequency Range	:	ISM band 5150 MHz – 5250 MHz (low channel 5180 MHz / high channel 5240 MHz)
RF-power [W] (max.)	:	cond.: 15.58 dBm 36.14 mW EIRP: BAT-ANT-N-5A-IP65 22.36 dBm 172.19 mW EIRP: BAT-ANT-N-9A-DS-IP65 23.00 dBm 199.53 mW EIRP: BAT-ANT-N-6ABG-IP65 21.44 dBm 139.32 mW
Occupied bandwidth (99%-BW) [kHz]	:	Not performed! Delta tests only!
Type of modulation	:	OFDM - QPSK, 16 QAM, 64 QAM
Emission Designator (TRC-43)	:	Not performed! Delta tests only!
Antenna Information	:	3 external antennas: BAT-ANT-N-9A-DS-IP65 BAT-ANT-N-5A-IP65 BAT-ANT-N-6ABG-IP65 For more information, please take a look at the references documents and annex B – external photos of the EUT!
Transmitter Spurious (worst case) [dBμV/m @ 3m]:		BAT-ANT-N-5A-IP65: 48.97 BAT-ANT-N-9A-DS-IP65: 48.99 BAT-ANT-N-6ABG-IP65: 49.08
Receiver Spurious (worst case) [dBμV/m @ 3m]:		BAT-ANT-N-5A-IP65: 48.73 BAT-ANT-N-9A-DS-IP65: 48.76 BAT-ANT-N-6ABG-IP65: 48.41

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:

2010-08-25

Marco Bertolino

Date

Name

Signature

9 Measurement Results

9.1 Antenna Gain

Measurement:

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the DSSS mode is used.

Measurement parameters:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	1 MHz
Resolution bandwidth:	1 MHz
Span:	30 MHz
Trace-Mode:	Max hold

Limits:

FCC	IC
CFR Part 15.407 (a)(1)	RSS 210, Issue 7, A 8.4(2)
Antenna Gain	
6 dBi	

Results: BAT-ANT-N-5A-IP65

T_{nom}	V_{nom}	lowest channel 5180 MHz	middle channel 5220 MHz	highest channel 5240 MHz
Conducted power [dBm] Measured with OFDM modulation		2.36	2.29	2.05
Radiated power [dBm] Measured with OFDM modulation		8.51	8.37	8.83
Gain [dBi] Calculated		6.15	6.08	6.78

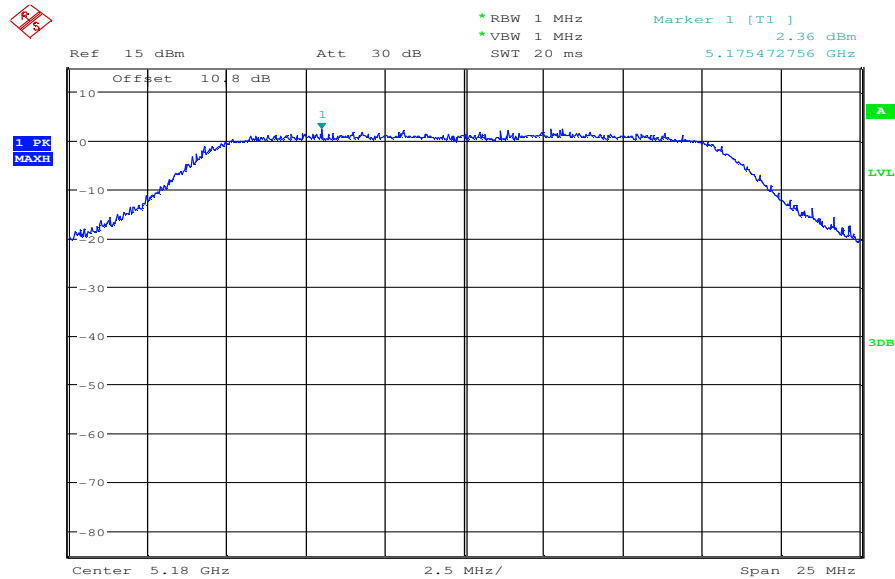
Results: BAT-ANT-N-9A-DS-IP65

T_{nom}	V_{nom}	lowest channel 5180 MHz	middle channel 5220 MHz	highest channel 5240 MHz
Conducted power [dBm] Measured with OFDM modulation		2.36	2.29	2.05
Radiated power [dBm] Measured with OFDM modulation		10.01	10.04	9.40
Gain [dBi] Calculated		7.65	7.75	7.35

Results: BAT-ANT-N-6ABG-IP65

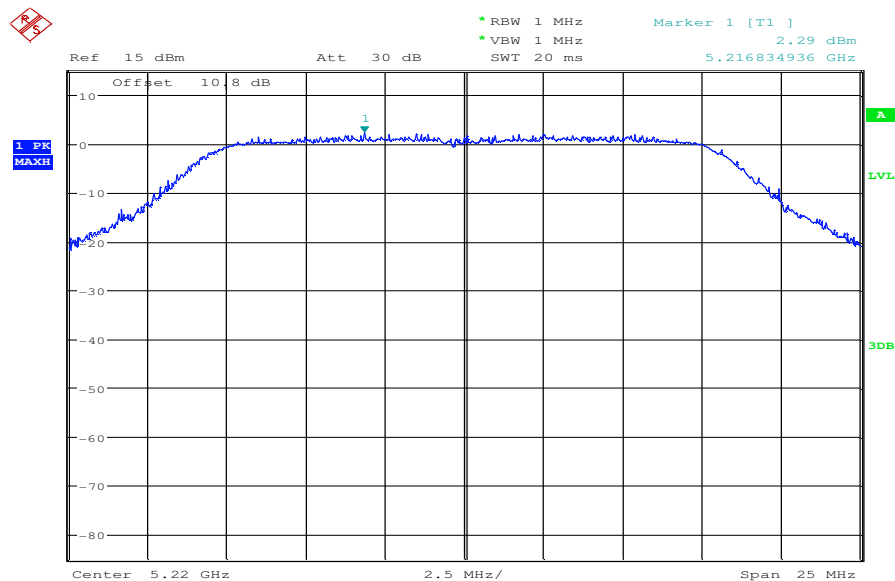
T_{nom}	V_{nom}	lowest channel 5180 MHz	middle channel 5220 MHz	highest channel 5240 MHz
Conducted power [dBm] Measured with OFDM modulation		2.36	2.29	2.05
Radiated power [dBm] Measured with OFDM modulation		8.35	8.39	7.91
Gain [dBi] Calculated		5.99	6.10	5.86

Plot 1: TX mode, low channel – 5180 MHz, power @ 1 MHz (conducted)

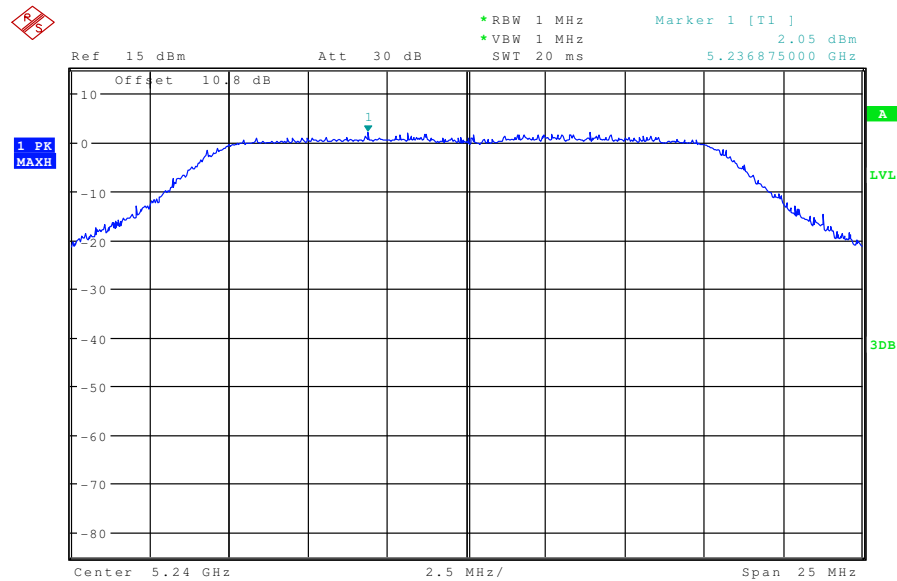


Date: 5.AUG.2010 08:28:09

Plot 2: TX mode, mid channel – 5220 MHz, power @ 1 MHz (conducted)



Date: 5.AUG.2010 08:29:10

Plot 3: TX mode, high channel – 5240 MHz, power @ 1 MHz (conducted)

Result: The result of the measurement is passed.

9.2 Maximum Output Power

Description:

Measurement of the maximum output power conducted and radiated. The measurements are performed using the data rate producing the highest conducted output power. The determination of these data rates was performed at the beginning of the tests. Additionally the average power is measured using a wideband power meter.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	30 MHz
Resolution bandwidth:	50 MHz
Span:	30 MHz
Trace-Mode:	Max Hold

Limits:

FCC	IC
CFR Part 15.407 (a)(1)	RSS 210, Issue 7, A 8.4(4)
Maximum Output Power	
Conducted: 1.0 W – Antenna Gain max. 6 dBi	

Result: BAT-ANT-N-5A-IP65

DSSS Frequency	Maximum Output Power [dBm]		
	lowest channel 5180 MHz	middle channel 5220 MHz	highest channel 5240 MHz
Peak Output Power Conducted	15.33	15.25	15.58
Output Power Radiated - EIRP	21.48	21.33	22.36
Measurement uncertainty	± 0.5 dB (cond.) / ± 2 dB (rad.)		

Result: BAT-ANT-N-9A-DS-IP65

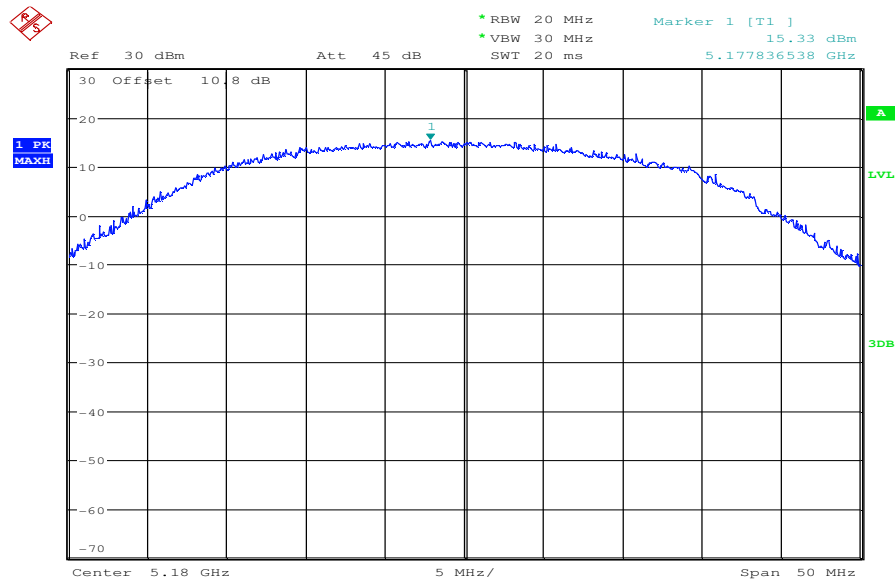
DSSS Frequency	Maximum Output Power [dBm]		
	lowest channel 5180 MHz	middle channel 5220 MHz	highest channel 5240 MHz
Peak Output Power Conducted	15.33	15.25	15.58
Output Power Radiated - EIRP	22.98	23.00	22.93
Measurement uncertainty	± 0.5 dB (cond.) / ± 2 dB (rad.)		

Result: BAT-ANT-N-6ABG-IP65

DSSS Frequency	Maximum Output Power [dBm]		
	lowest channel 5180 MHz	middle channel 5220 MHz	highest channel 5240 MHz
Peak Output Power Conducted	15.33	15.25	15.58
Output Power Radiated - EIRP	21.32	21.35	21.44
Measurement uncertainty	± 0.5 dB (cond.) / ± 2 dB (rad.)		

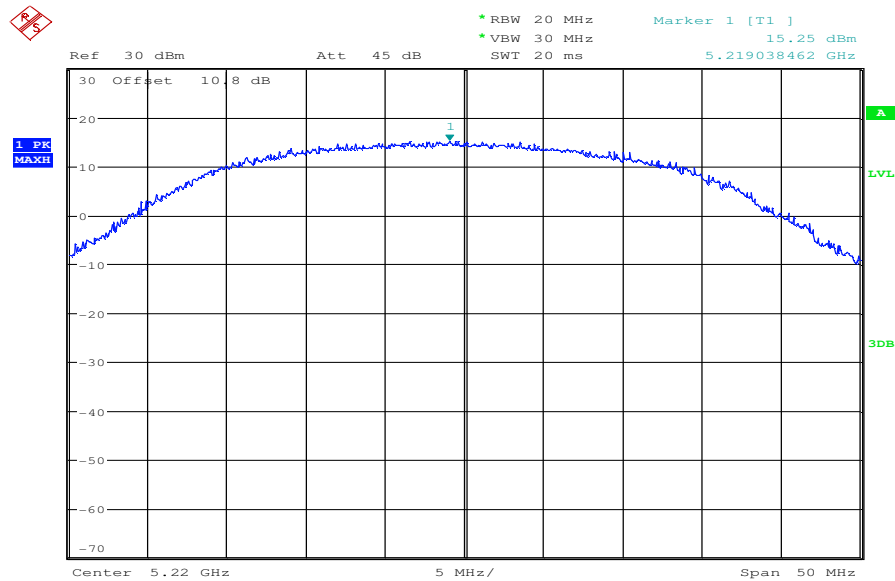
Result: The result of the measurement is passed.

Plot 1: TX mode, low channel – 5180 MHz, power @ 20 MHz (conducted)



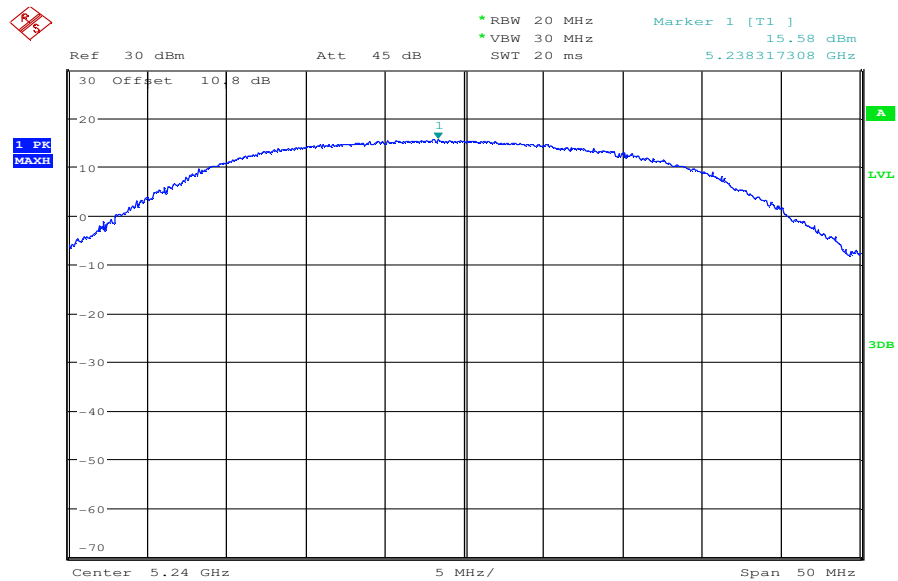
Date: 5.AUG.2010 08:49:05

Plot 2: TX mode, mid channel – 5220 MHz, power @ 20 MHz (conducted)



Date: 5.AUG.2010 08:48:20

Plot 3: TX mode, high channel – 5240 MHz, power @ 20 MHz (conducted)



Date: 5.AUG.2010 08:47:10

9.3 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
Video bandwidth:	10 Hz
Resolution bandwidth:	1 MHz
Span:	100 MHz
Trace-Mode:	Max Hold

Limits:

FCC	IC
CFR Part 15.205	RSS 210, Issue 7, A 8.5
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 dB μ V/m AVG	

Result:

Szenario Modulation	Band Edge Compliance Radiated [dB μ V/m]	
	Vertical	Horizontal
Lower Band Edge BAT-ANT-N-5A-IP65	46.06	44.24
Lower Band Edge BAT-ANT-N-9A-DS-IP65	45.76	45.02
Lower Band Edge BAT-ANT-N-6ABG-IP65	42.87	42.07
Measurement uncertainty	± 3 dB	

Result: The result of the measurement is passed.

Results:Section 15.205 Restricted bands of operation.

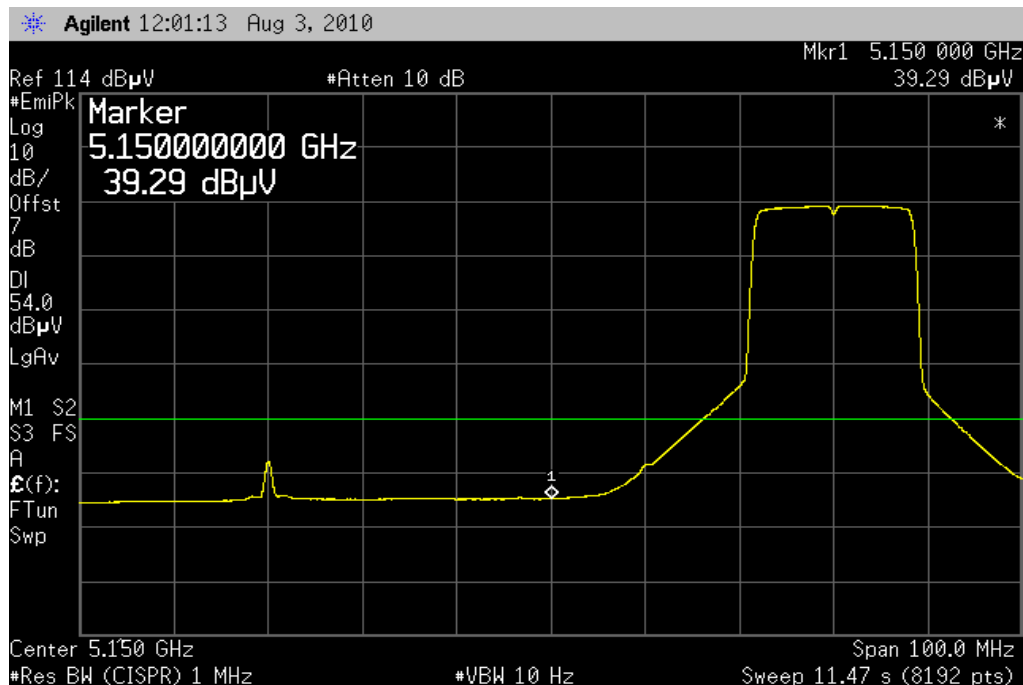
(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

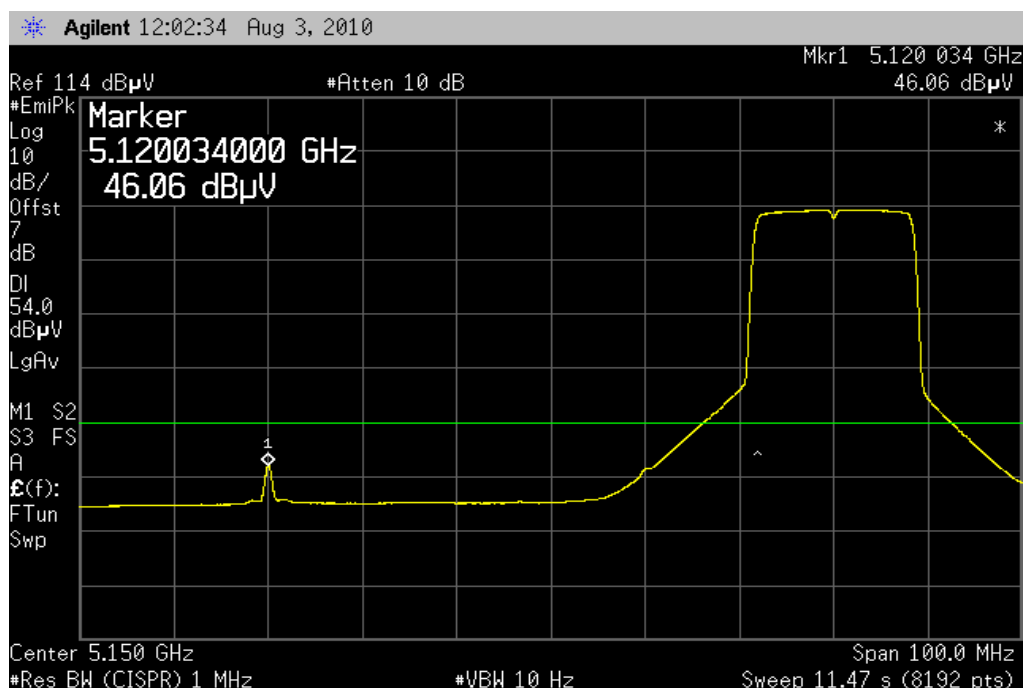
No restricted band in the range ± 2 channel bandwidths of the upper band edge of the specified emission band! (5.35 GHz – 5.46 GHz)

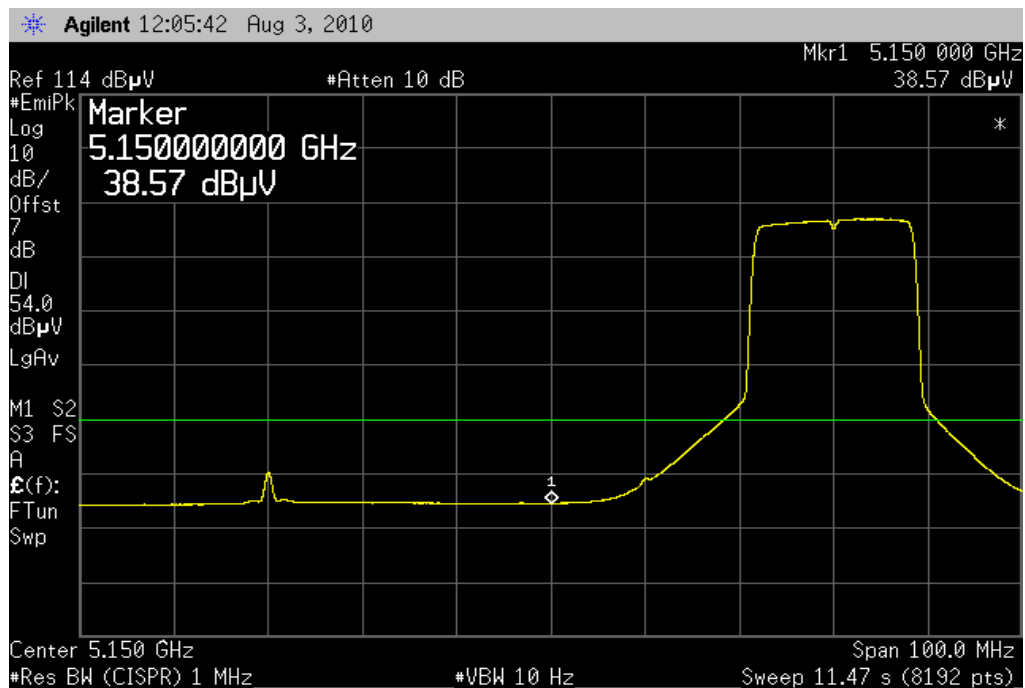
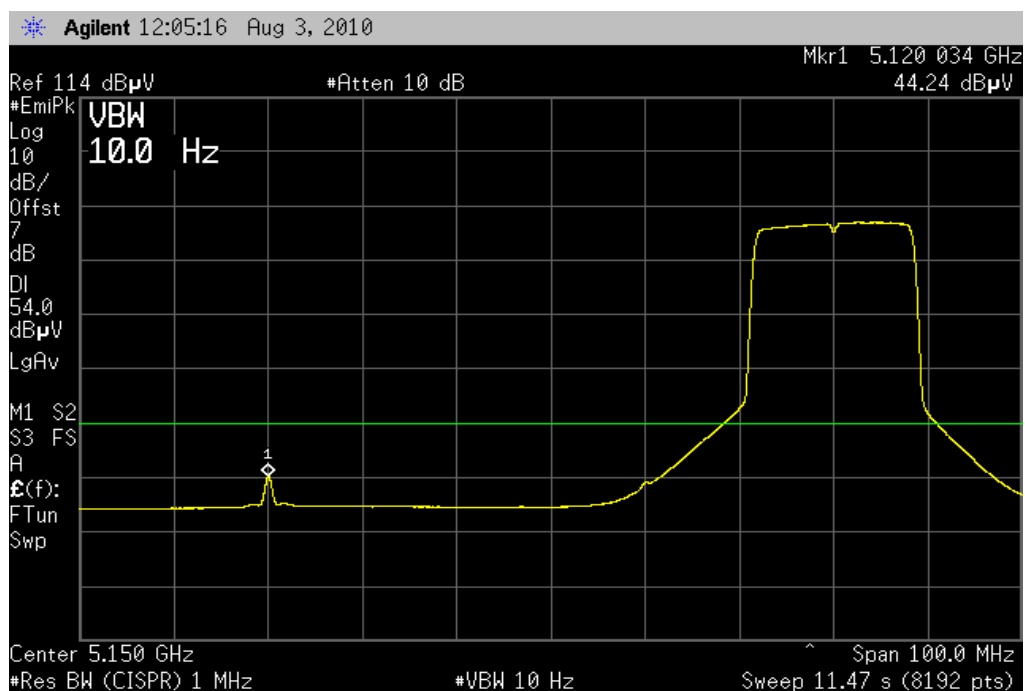
Antenna: BAT-ANT-N-5A-IP65

Plot 1: lower band edge, vertical polarization



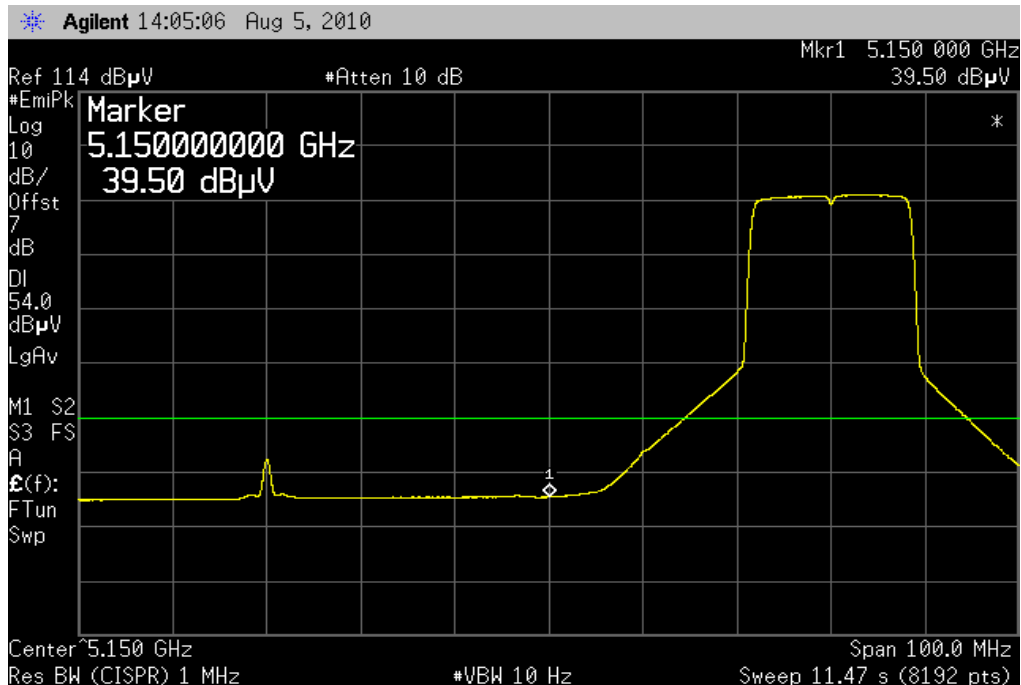
Plot 2: lower band edge, detected peak, vertical polarization



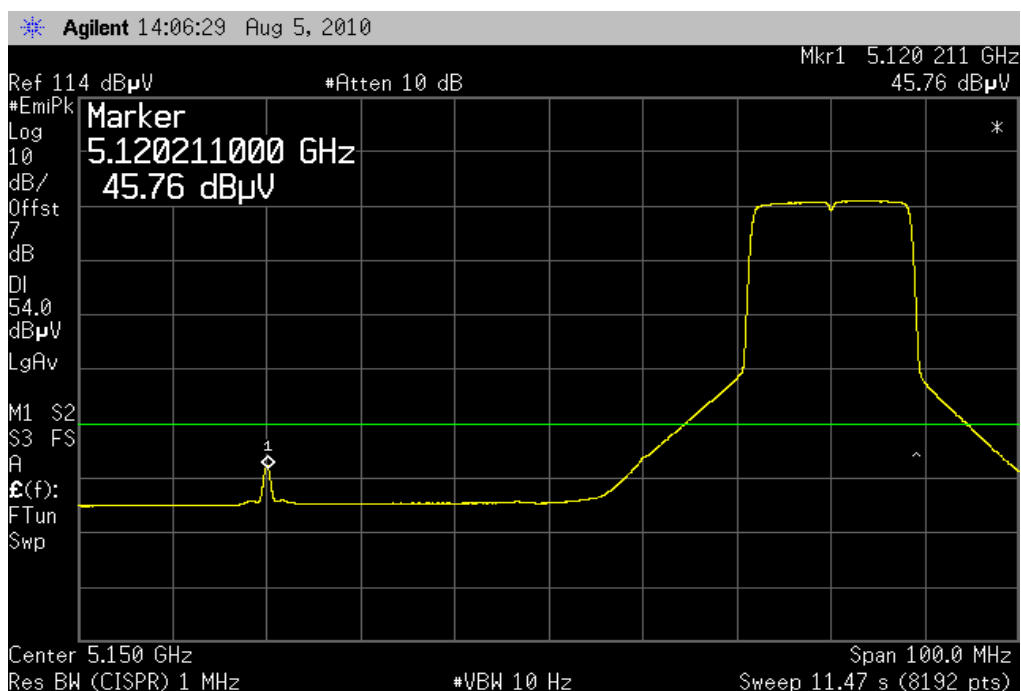
Plot 3: lower band edge, horizontal polarization**Plot 4:** lower band edge, detected peak, horizontal polarization

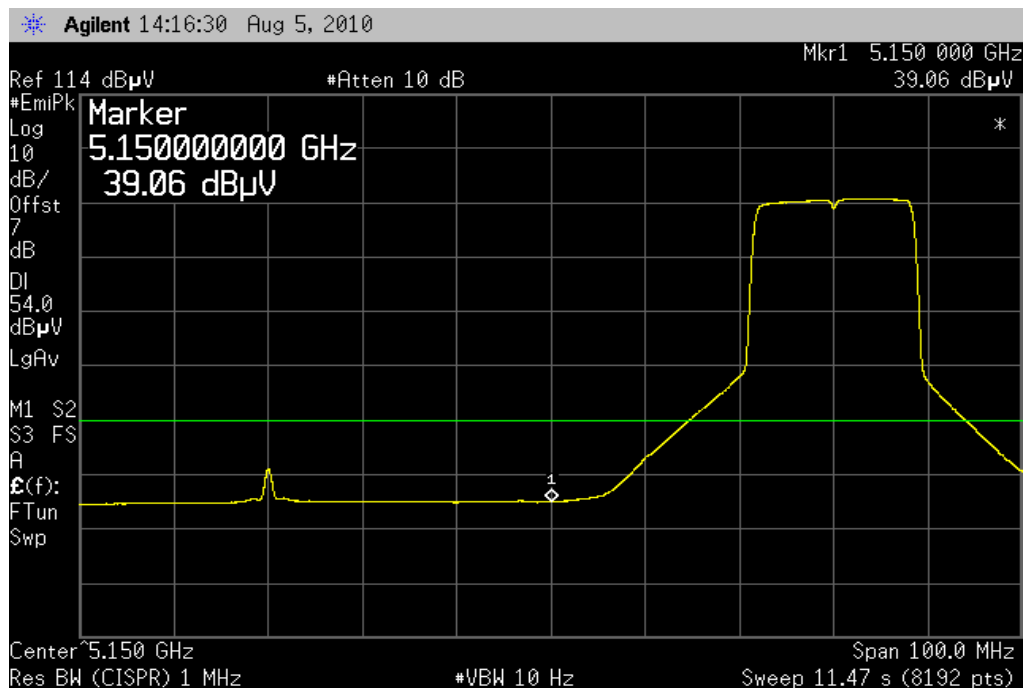
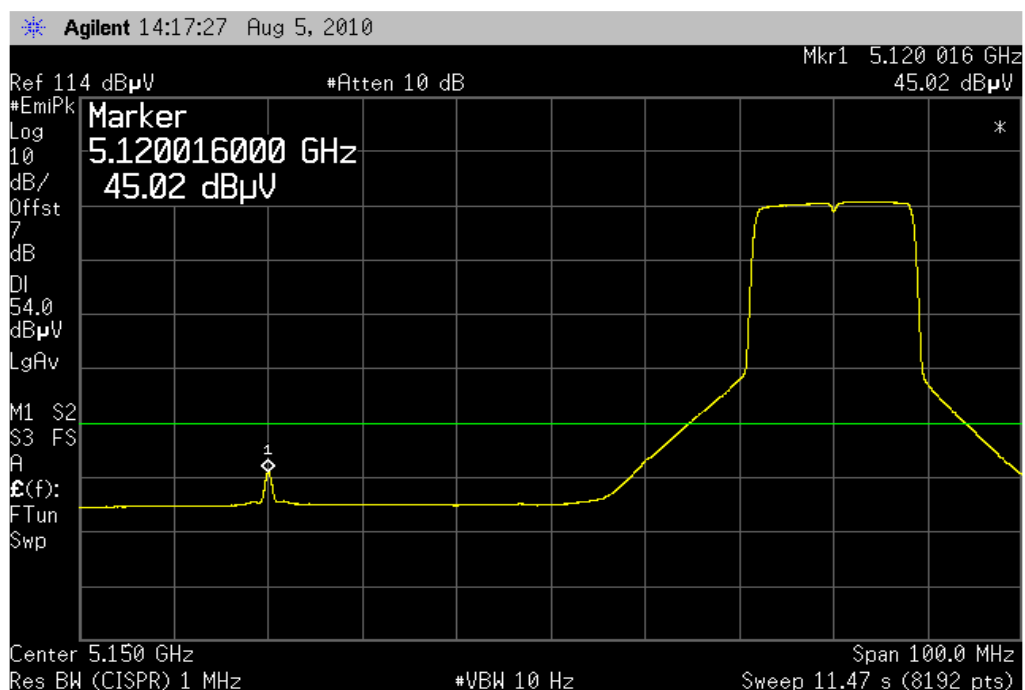
Antenna: BAT-ANT-N-9A-DS-IP65

Plot 1: lower band edge, vertical polarization



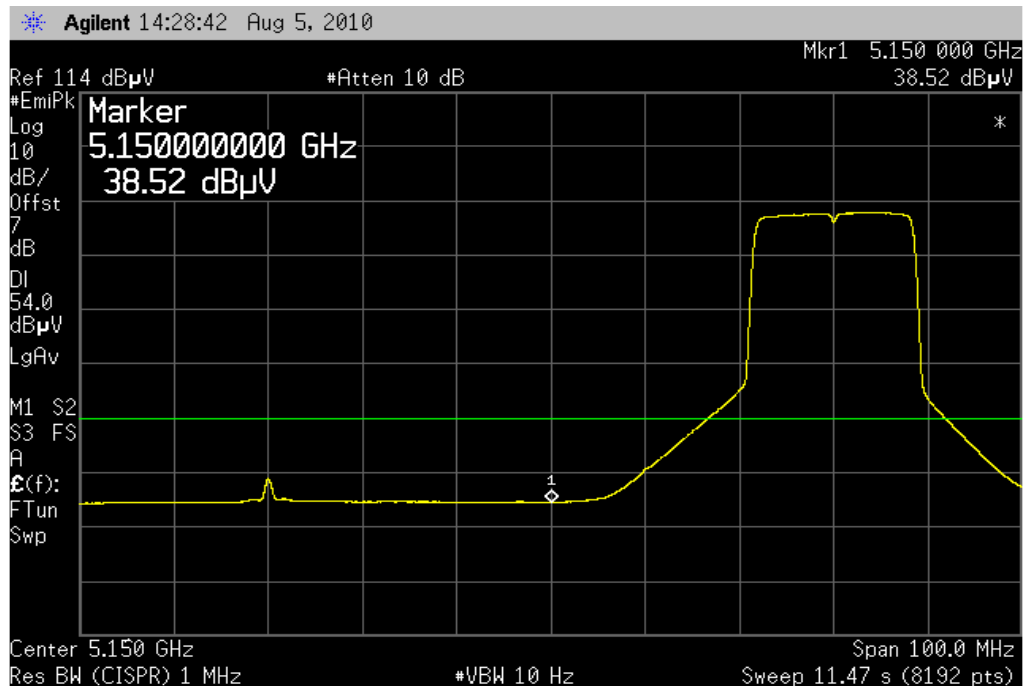
Plot 2: lower band edge, detected peak, vertical polarization



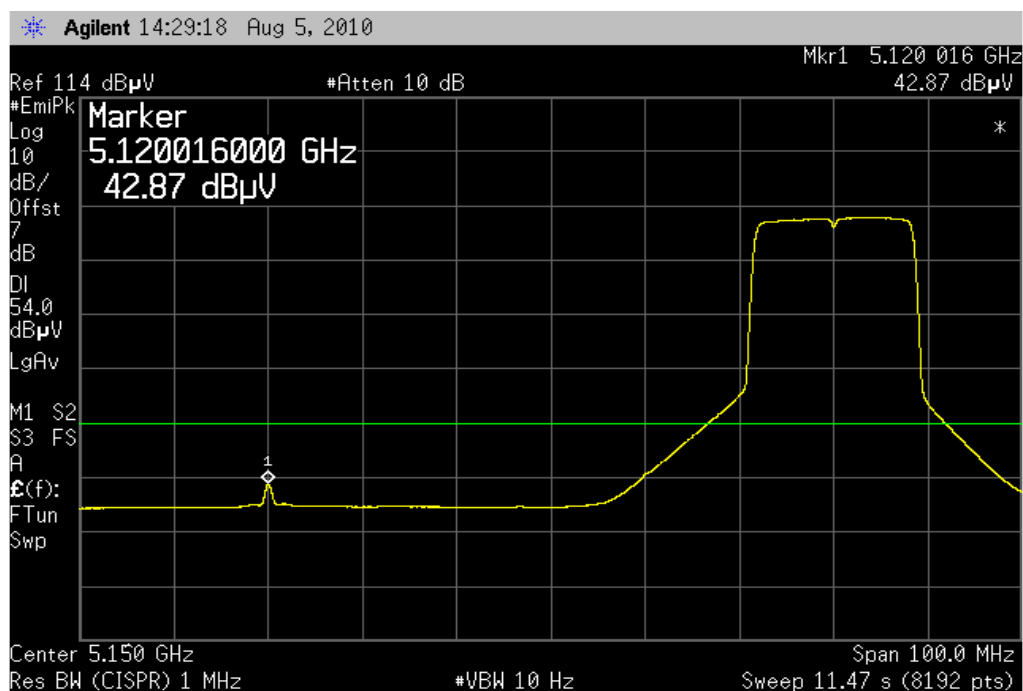
Plot 3: lower band edge, horizontal polarization**Plot 4:** lower band edge, detected peak, horizontal polarization

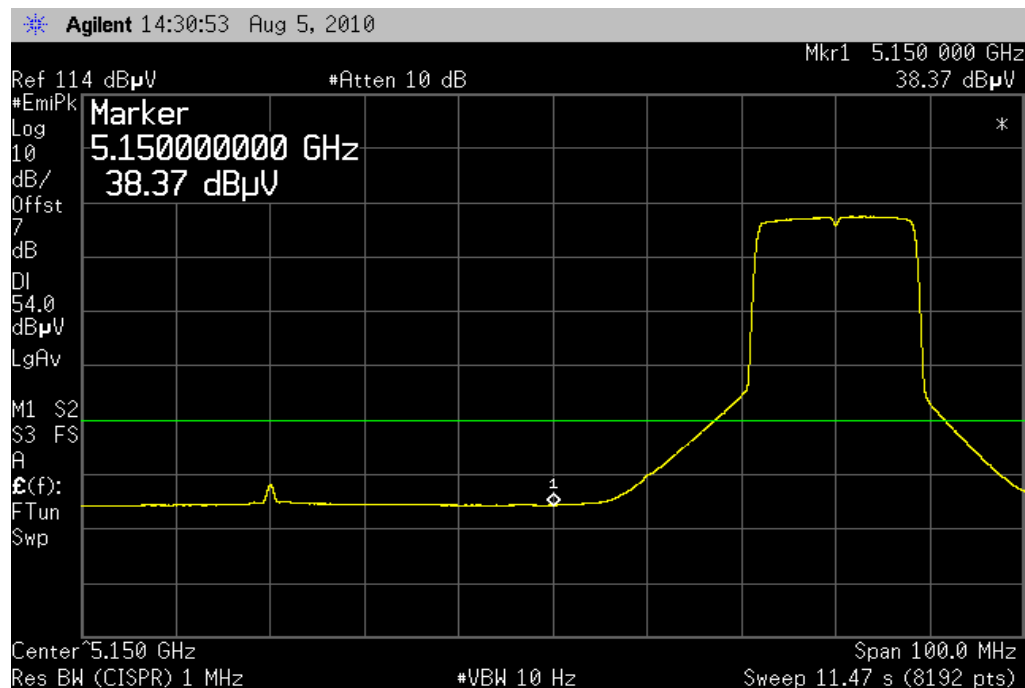
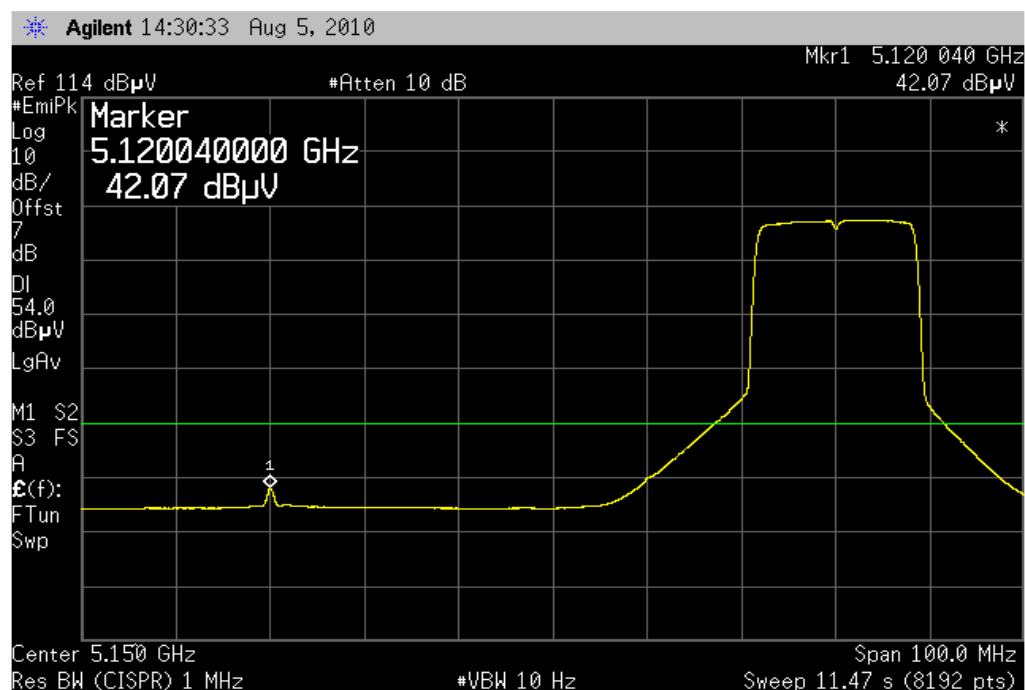
Antenna: BAT-ANT-N-6ABG-IP65

Plot 1: lower band edge, vertical polarization



Plot 2: lower band edge, detected peak, vertical polarization



Plot 3: lower band edge, horizontal polarization**Plot 4:** lower band edge, detected peak, horizontal polarization

9.4 TX Spurious Emissions Radiated

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold
Measured Modulation	☐ DSSS ☒ OFDM

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		IC
CFR Part 15.407(d)(1) & Part 15.247 / 209 Restricted bands		RSS 210, Issue 7, A 8.5
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)).		
§15.209 / § 15.407		
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
Above 1 GHz	-27 dBm	-/-

Result: BAT-ANT-N-5A-IP65

TX Spurious Emissions Radiated								
OFDM - mode								
5180 MHz			5220 MHz			5240 MHz		
F	Detector	Level [dB μ V/m]	F	Detector	Level [dB μ V/m]	F	Detector	Level [dB μ V/m]
For up to 1 GHz, please take a look at the table below the plot!			For up to 1 GHz, please take a look at the table below the plot!			For up to 1 GHz, please take a look at the table below the plot!		
4800 MHz	1 MHz / 1 MHz	50.25 vertical 49.92 horizontal	4800 MHz	1 MHz / 1 MHz	50.82 vertical 49.86 horizontal	4800 MHz	1 MHz / 1 MHz	52.73 vertical 51.22 horizontal
5120 MHz	1 MHz / 1 MHz	51.85 vertical 50.37 horizontal	5120 MHz	1 MHz / 1 MHz	52.85 vertical 51.79 horizontal	5120 MHz	1 MHz / 1 MHz	51.99 vertical 52.39 horizontal
Measurement uncertainty			± 3 dB					

Result: BAT-ANT-N-9A-DS-IP65

TX Spurious Emissions Radiated								
OFDM - mode								
5180 MHz			5220 MHz			5240 MHz		
F	Detector	Level [dB μ V/m]	F	Detector	Level [dB μ V/m]	F	Detector	Level [dB μ V/m]
For up to 1 GHz, please take a look at the table below the plot!			For up to 1 GHz, please take a look at the table below the plot!			For up to 1 GHz, please take a look at the table below the plot!		
5120 MHz	1 MHz / 10 Hz	43.51 vertical 42.55 horizontal	5120 MHz	1 MHz / 10 Hz	44.91 vertical 44.27 horizontal	4800 MHz	1 MHz / 10 Hz	49.11 vertical 47.93 horizontal
						5120 MHz	1 MHz / 10 Hz	45.39 vertical 44.81 horizontal
Measurement uncertainty			± 3 dB					

Result: BAT-ANT-N-6ABG-IP65

TX Spurious Emissions Radiated								
OFDM - mode								
5180 MHz			5220 MHz			5240 MHz		
F	Detector	Level [dB μ V/m]	F	Detector	Level [dB μ V/m]	F	Detector	Level [dB μ V/m]
For up to 1 GHz, please take a look at the table below the plot!			For up to 1 GHz, please take a look at the table below the plot!			For up to 1 GHz, please take a look at the table below the plot!		
4800 MHz	1 MHz / 10 Hz	40.32 vertical 41.88 horizontal	4800 MHz	1 MHz / 10 Hz	40.94 vertical 42.20 horizontal	4800 MHz	1 MHz / 10 Hz	40.72 vertical 41.22 horizontal
5120 MHz	1 MHz / 10 Hz	41.66 vertical 42.49 horizontal	5120 MHz	1 MHz / 10 Hz	44.07 vertical 44.01 horizontal	5120 MHz	1 MHz / 10 Hz	39.79 vertical 41.95 horizontal
Measurement uncertainty			± 3 dB					

Result: The result of the measurement is passed.

Antenna: BAT-ANT-N-5A-IP65

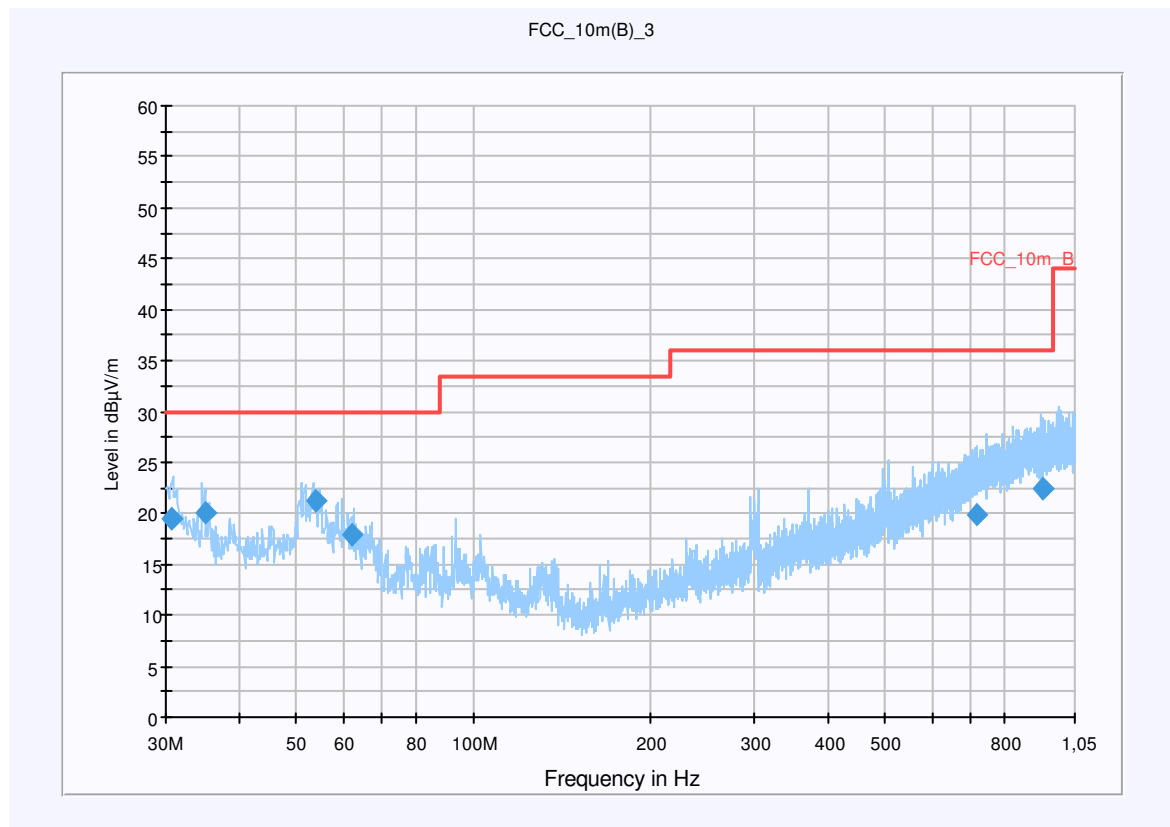
Plot 1: TX mode, low channel – 5180 MHz, 30 MHz – 1GHz, vertical & horizontal polarization (Part 15.209)

Common Information

EUT: BAT-ANT-N-5A-IP65 + BAT54-F
 Serial Number: SOA-5600/360/5/0/V + 943926022010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 36
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
Subrange **Detectors** **IF Bandwidth** **Meas. Time** **Receiver**
 30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



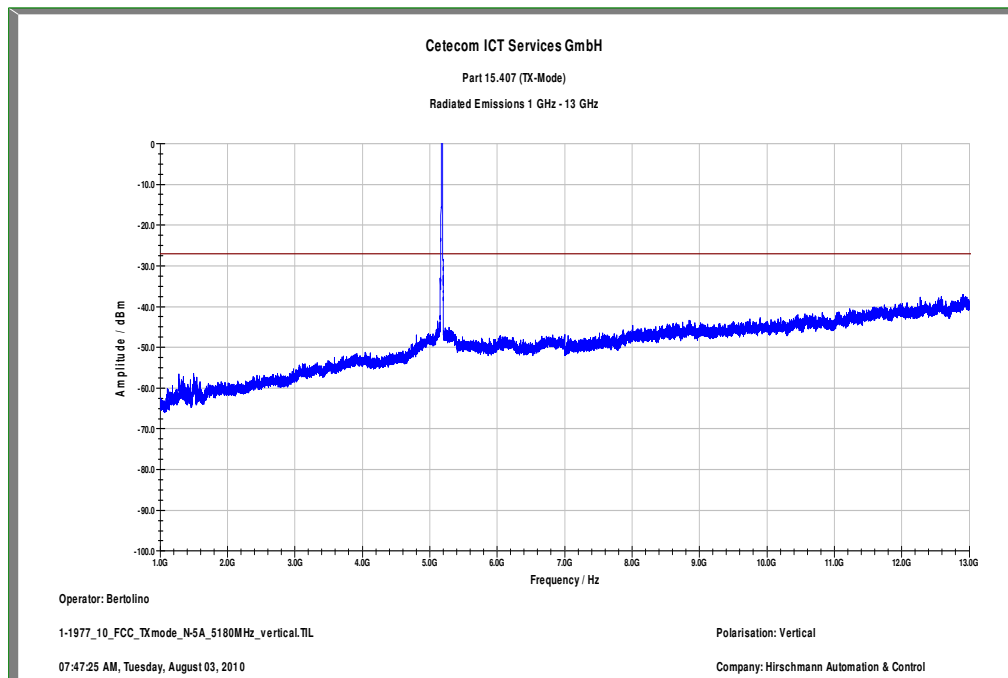
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.609150	19.5	15000.000	120.000	98.0	V	315.0	12.6	10.5	30.0	
35.029800	20.0	15000.000	120.000	151.0	V	-3.0	13.0	10.0	30.0	
53.991450	21.3	15000.000	120.000	117.0	V	301.0	13.0	8.7	30.0	
62.214150	18.0	15000.000	120.000	206.0	V	94.0	11.1	12.0	30.0	
716.562000	19.9	15000.000	120.000	220.0	H	53.0	22.8	16.1	36.0	
922.813800	22.4	15000.000	120.000	220.0	V	236.0	25.3	13.6	36.0	

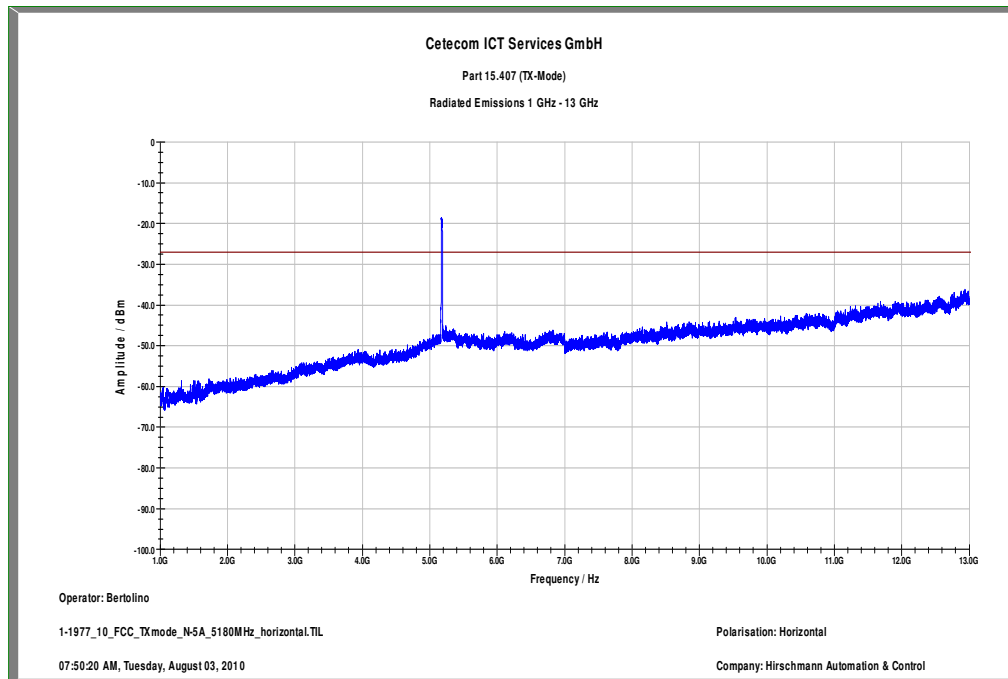
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

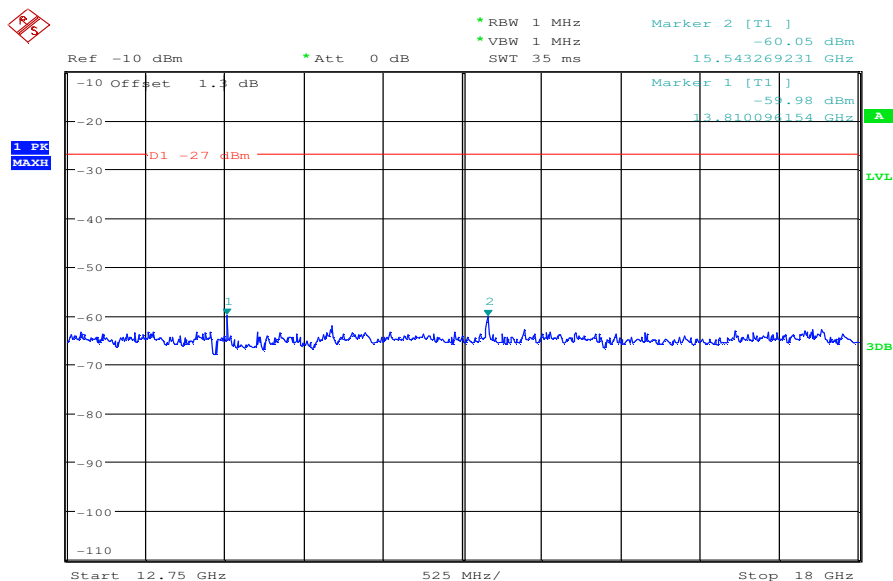
EMC 32 Version 8.10.00

Plot 2: TX mode, low channel – 5180 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 3: TX mode, low channel – 5180 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

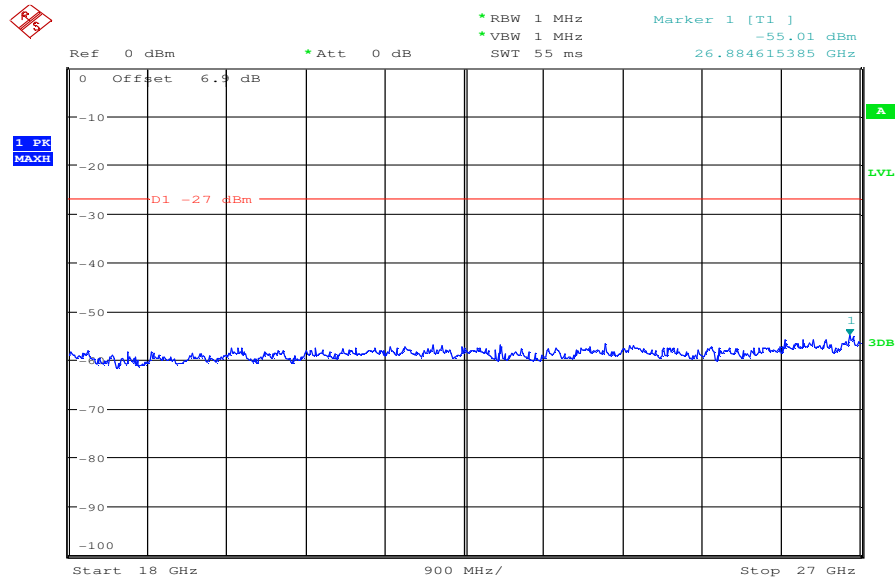


Plot 4: TX mode, low channel – 5180 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



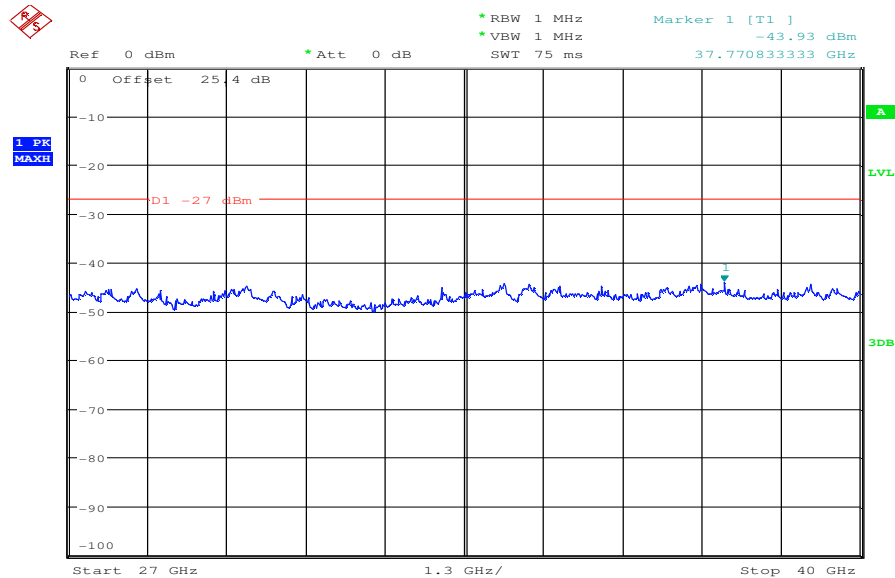
Date: 5.AUG.2010 07:12:09

Plot 5: TX mode, low channel – 5180 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)

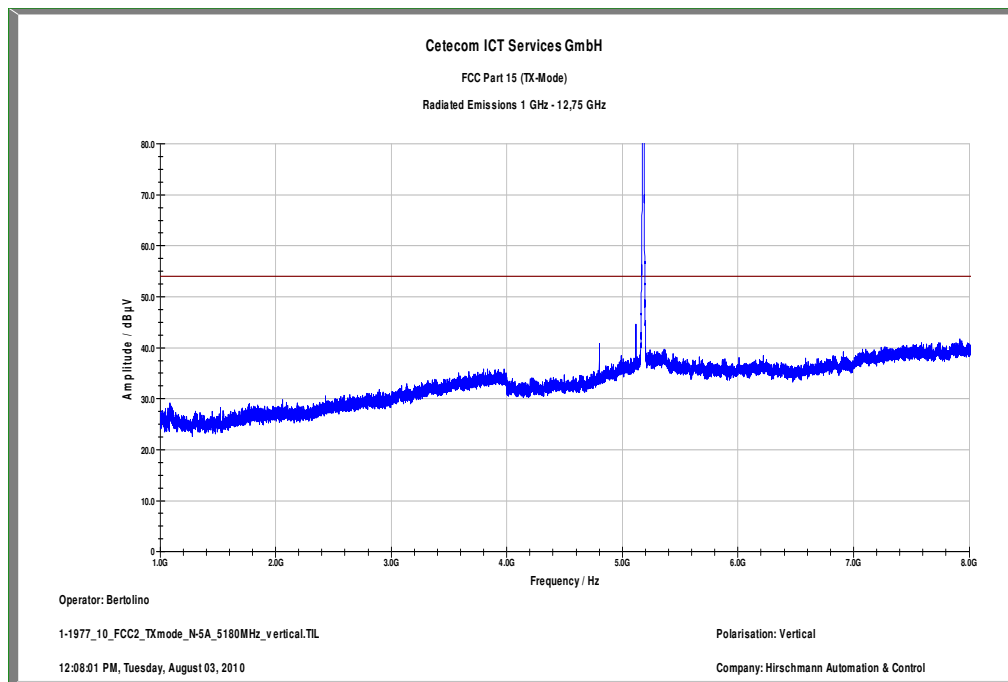
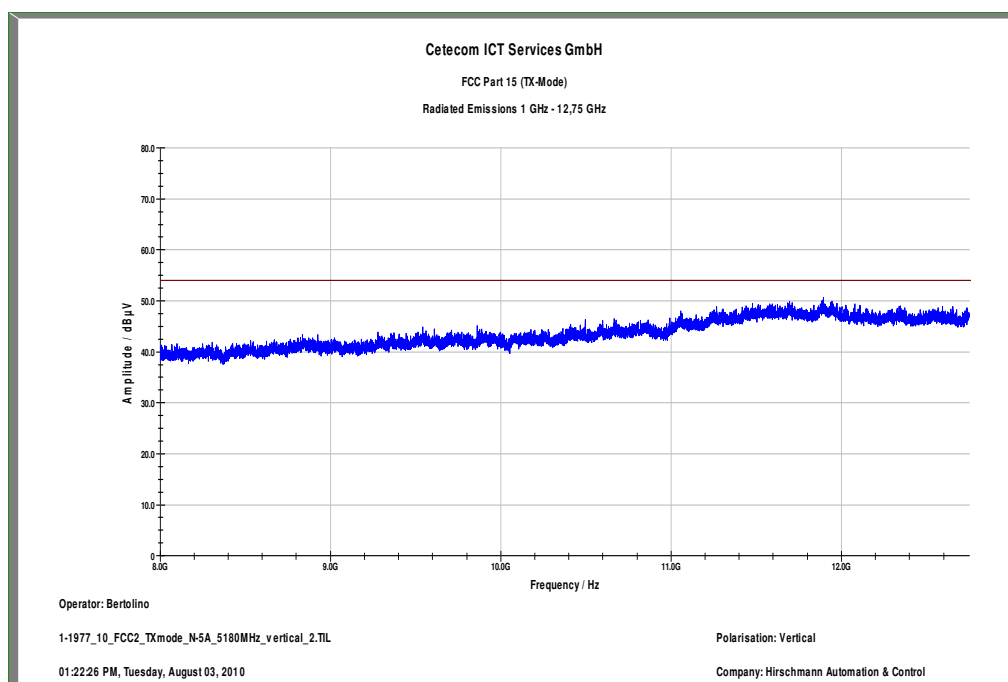


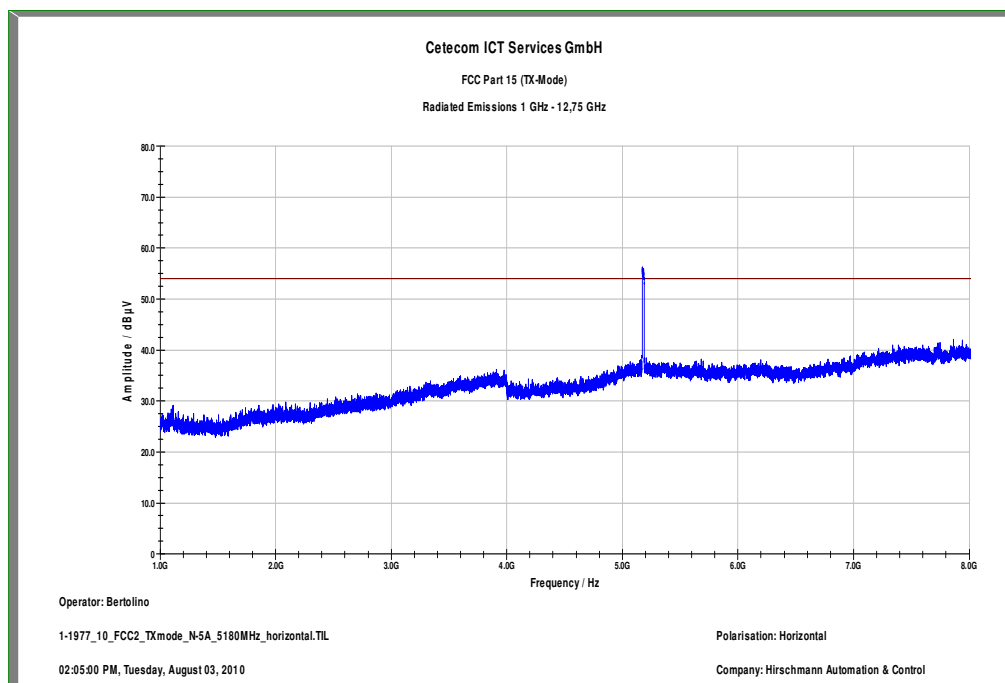
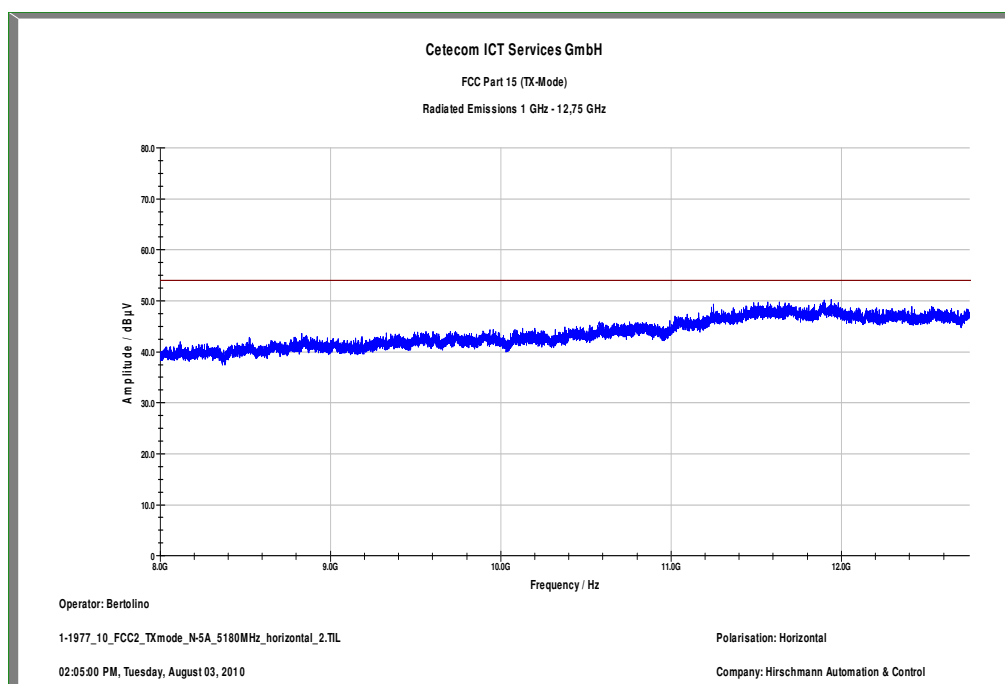
Date: 5.AUG.2010 07:29:57

Plot 6: TX mode, low channel – 5180 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

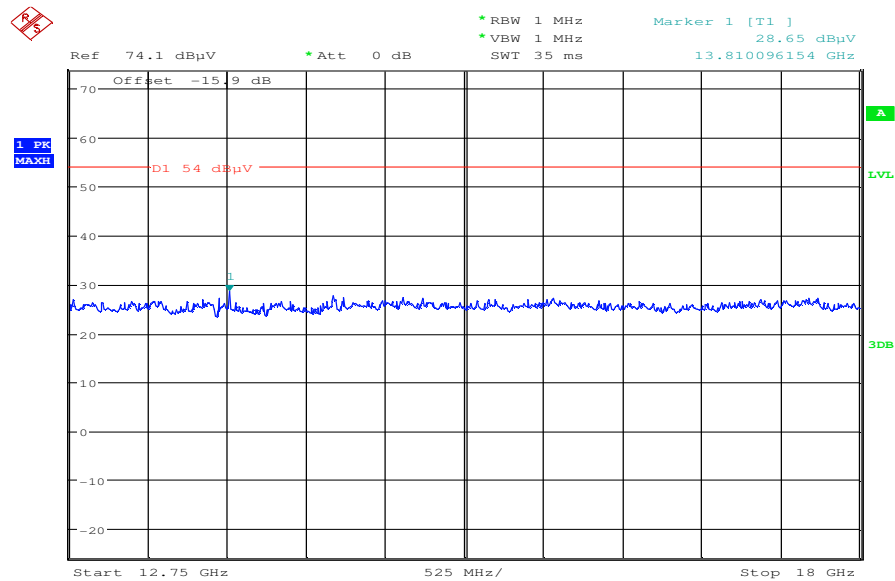


Date: 5.AUG.2010 07:45:30

Plot 7: TX mode, low channel – 5180 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)**Plot 8:** TX mode, low channel – 5180 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)

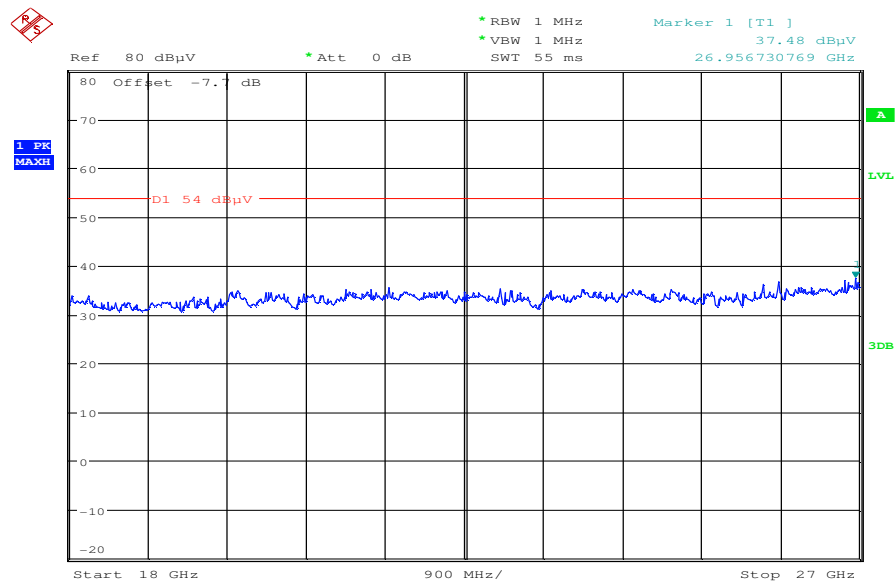
Plot 9: TX mode, low channel – 5180 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 10:** TX mode, low channel – 5180 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 11: TX mode, low channel – 5180 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



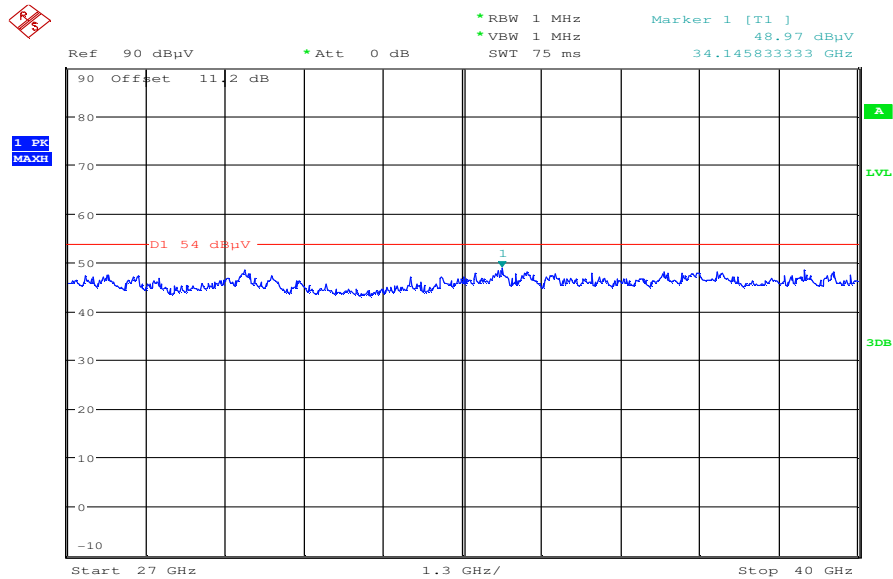
Date: 4.AUG.2010 09:31:43

Plot 12: TX mode, low channel – 5180 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



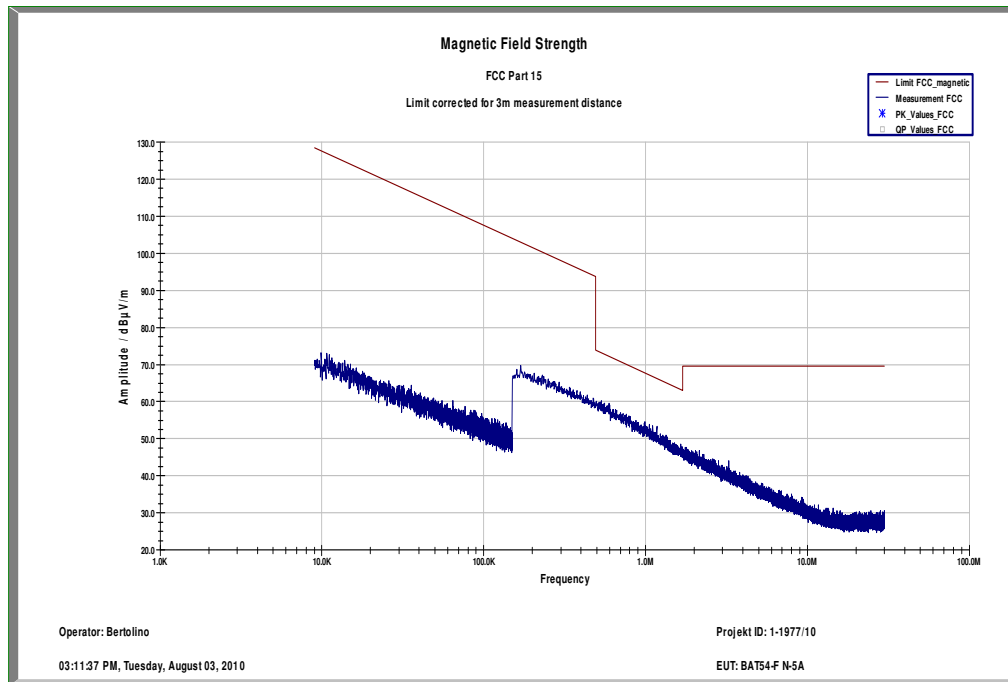
Date: 4.AUG.2010 09:52:59

Plot 13: TX mode, low channel – 5180 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:59:20

Plot 14: TX mode, mid channel – 5220 MHz, 9 kHz – 30 MHz, magnetic



Plot 15: TX mode, mid channel – 5220 MHz, 30 MHz – 1GHz, vertical & horizontal polarization

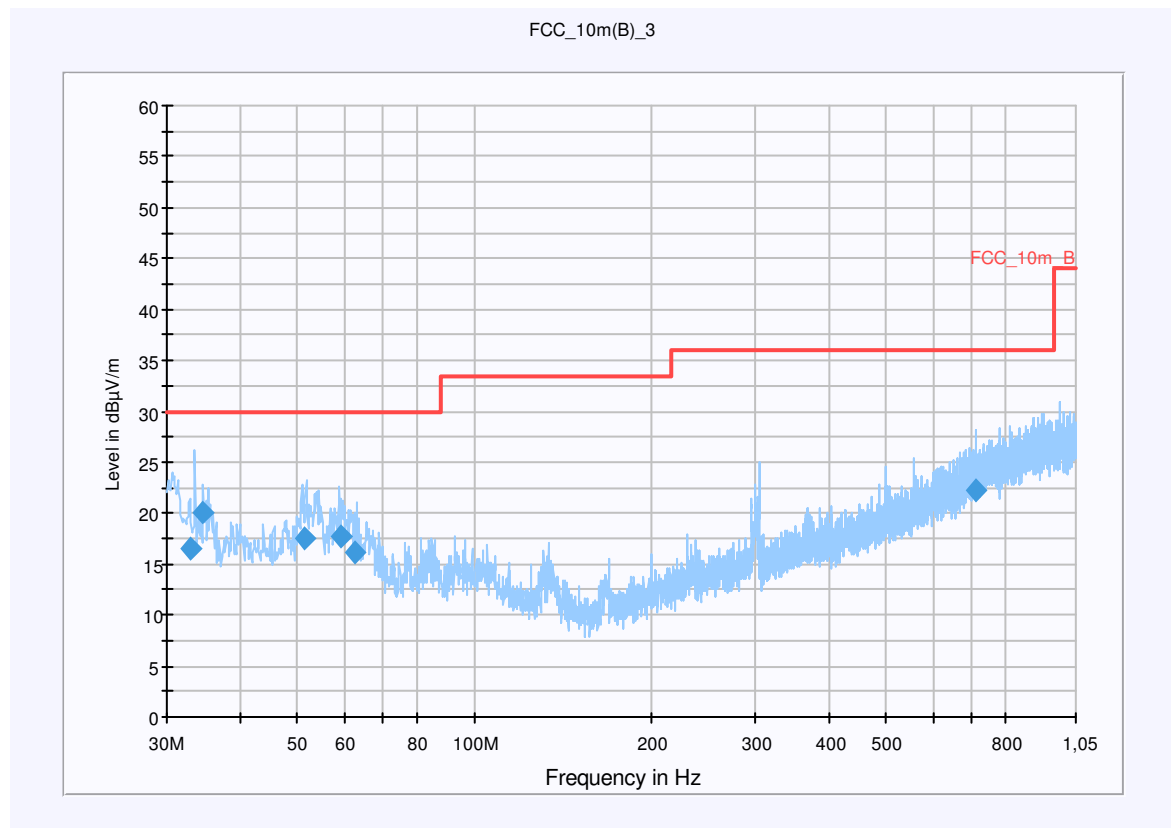
Common Information

EUT: BAT-ANT-N-5A-IP65 + BAT54-F
 Serial Number: SOA-5600/360/5/0/V + 943926022010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 44
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Tim	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



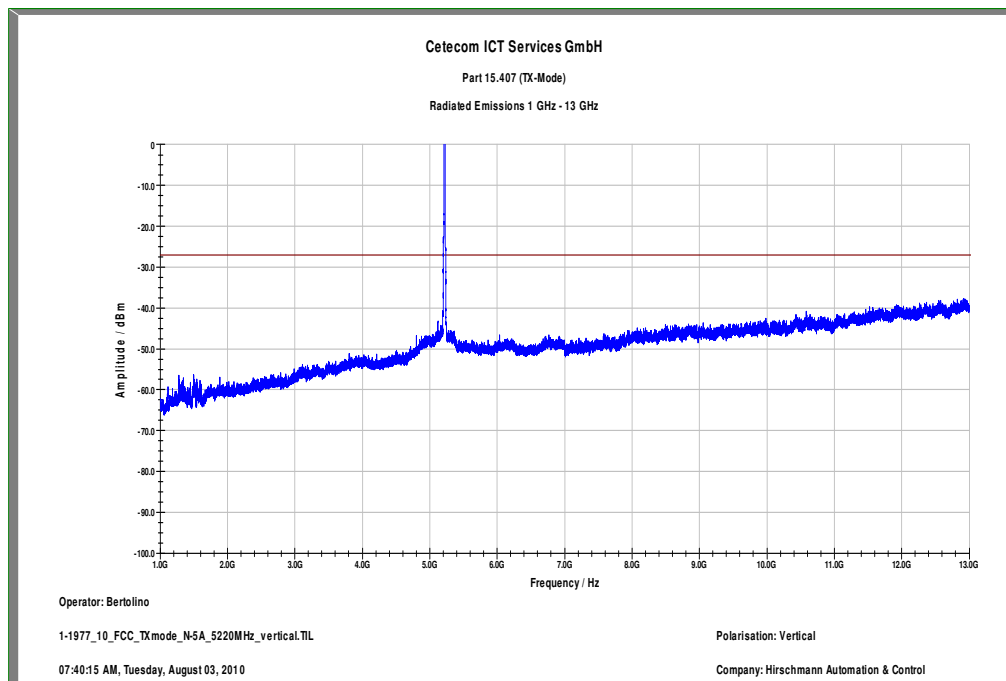
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
33.003900	16.6	15000.000	120.000	130.0	V	236.0	12.8	13.4	30.0	
34.676700	20.0	15000.000	120.000	133.0	V	86.0	13.0	10.0	30.0	
51.693000	17.5	15000.000	120.000	158.0	V	297.0	13.2	12.5	30.0	
59.090700	17.7	15000.000	120.000	175.0	V	206.0	11.8	12.3	30.0	
62.854200	16.2	15000.000	120.000	185.0	V	79.0	10.9	13.8	30.0	
709.937400	22.2	15000.000	120.000	157.0	H	297.0	22.6	13.8	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

Plot 16: TX mode, mid channel – 5220 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Cetecom ICT Services GmbH
Part 15.407 (TX-Mode)
Radiated Emissions 1 GHz - 13 GHz

The figure is a line graph titled 'Radiated Emissions 1 GHz - 13 GHz' for 'Part 15.407 (TX-Mode)' by 'Cetecom ICT Services GmbH'. The y-axis is labeled 'Amplitude / dBm' and ranges from -100.0 to 0.0 in increments of 10.0. The x-axis is labeled 'Frequency / Hz' and ranges from 1.0G to 13.0G in increments of 1.0G. A blue line represents the measured emission spectrum, showing a noisy baseline that rises from approximately -65 dBm at 1 GHz to about -35 dBm at 13 GHz. A sharp, narrow peak is visible at approximately 5.2 GHz, reaching an amplitude of about -20 dBm. A horizontal red line is drawn across the plot at -26 dBm. A yellow shaded region highlights the area between -40 dBm and -50 dBm, spanning from approximately 4.5 GHz to 7.5 GHz.

Operator: Bertolino

1-1977_10_FCC_TXmode_N5A_5220MHz_horizontal.TIL

07:43:13 AM, Tuesday, August 03, 2010

Polarisation: Horizontal
Company: Hirschmann Automation & Control

1 PK
MAXR

Ref -10 dBm

* Att 0 dB

* RBW 1 MHz

* VBW 1 MHz

SWT 35 ms

Marker 2 [T1]

-61.89 dBm

15.728365385 GHz

-10 Offset 1.5 dB

D1 -27 dBm

Marker 1 [T1]

-61.57 dBm

13.96995921 GHz

A

LVL

3DB

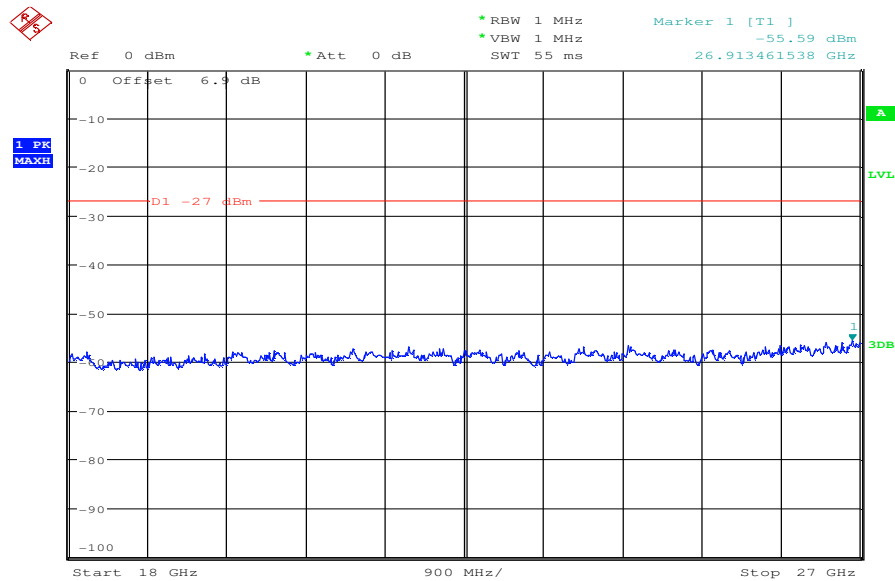
Start 12.75 GHz

525 MHz/

Stop 18 GHz

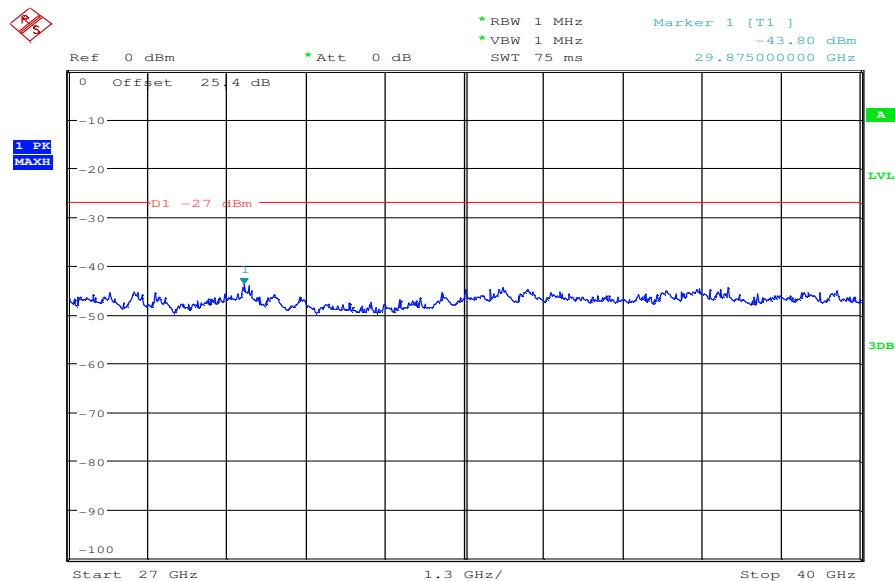
Date: 5.AUG.2010 07:11:04

Plot 19: TX mode, mid channel – 5220 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)



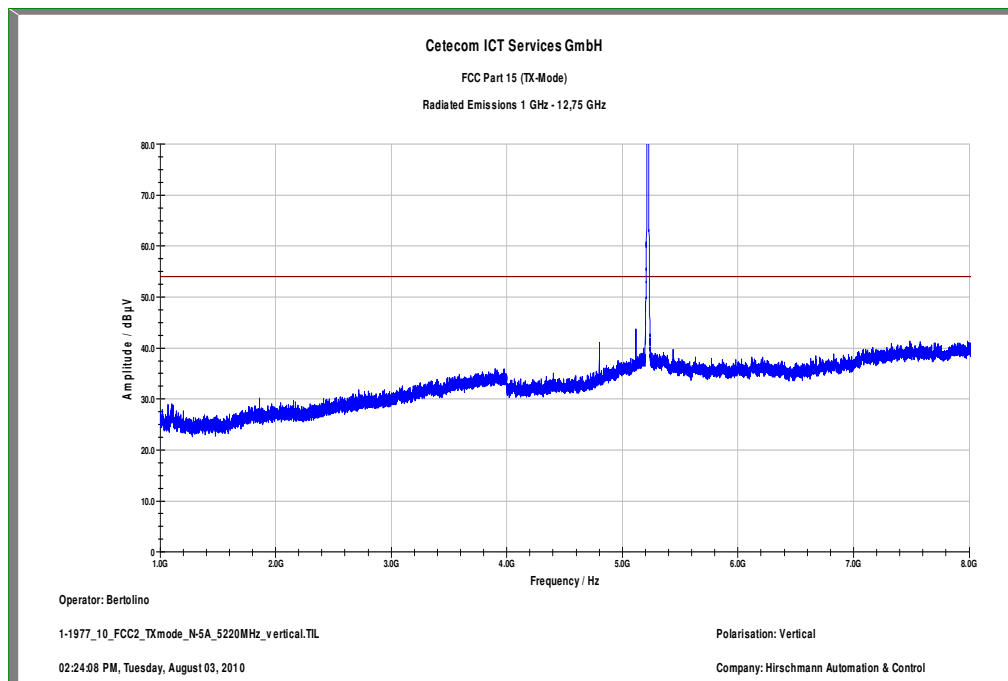
Date: 5.AUG.2010 07:30:57

Plot 20: TX mode, mid channel – 5220 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

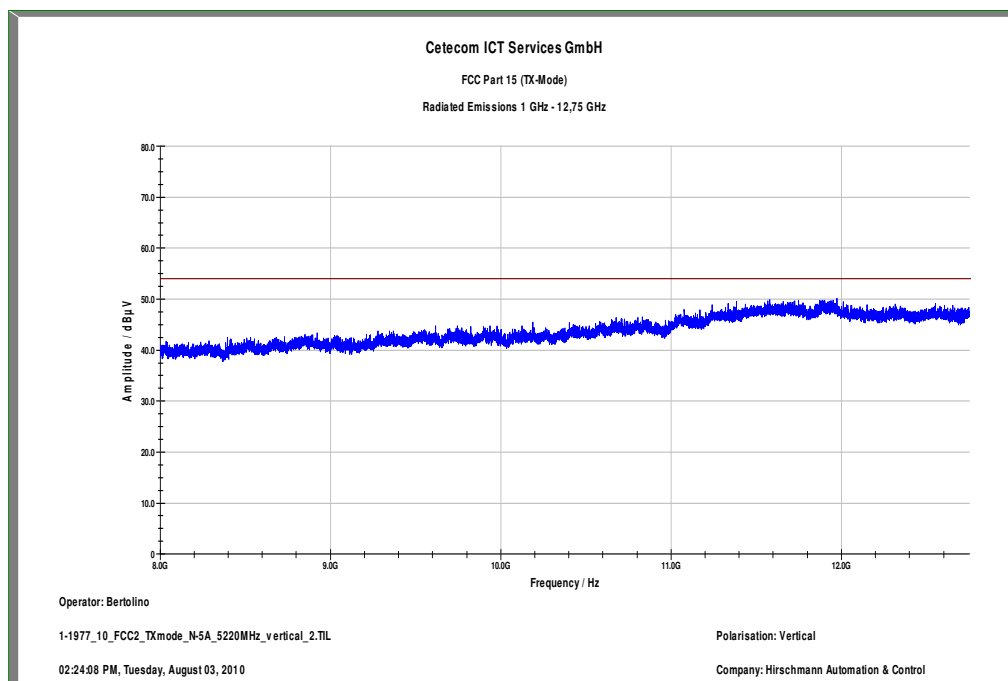


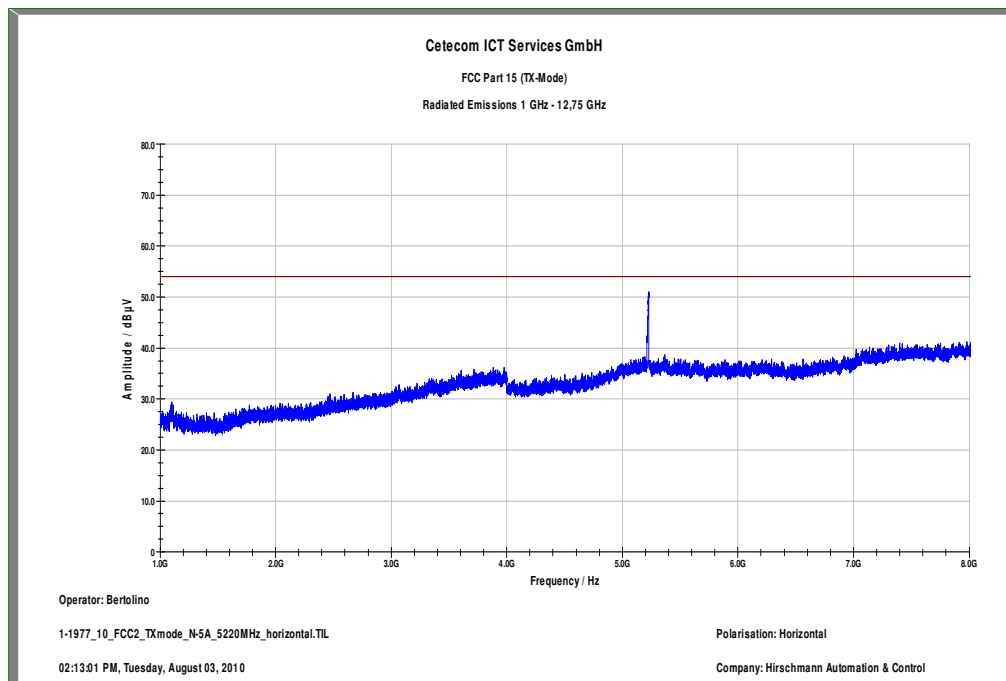
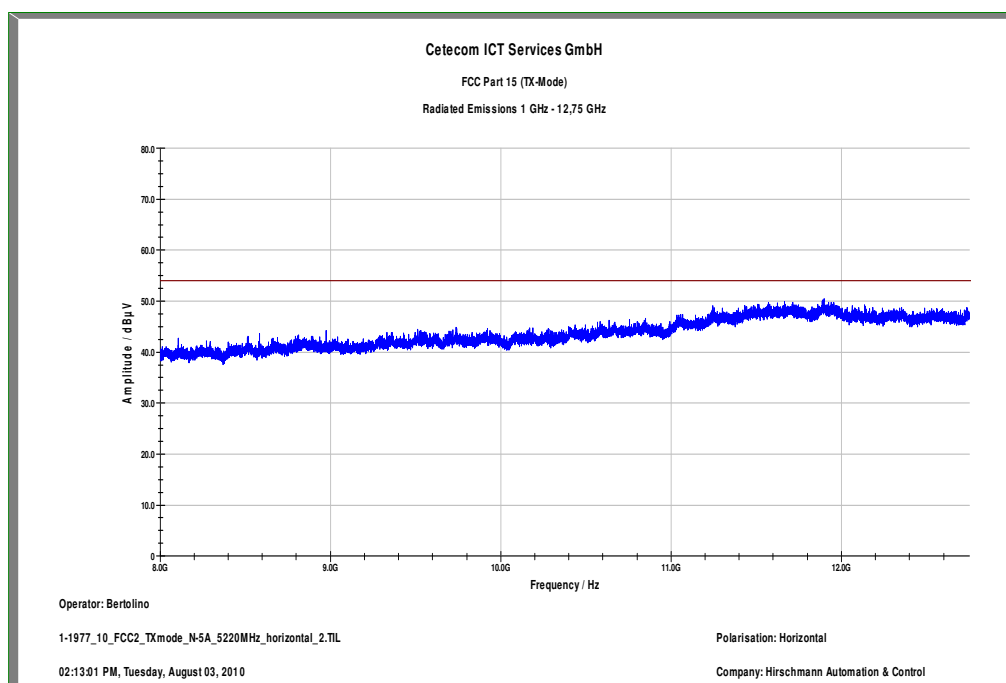
Date: 5.AUG.2010 07:46:32

Plot 21: TX mode, mid channel – 5220 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)

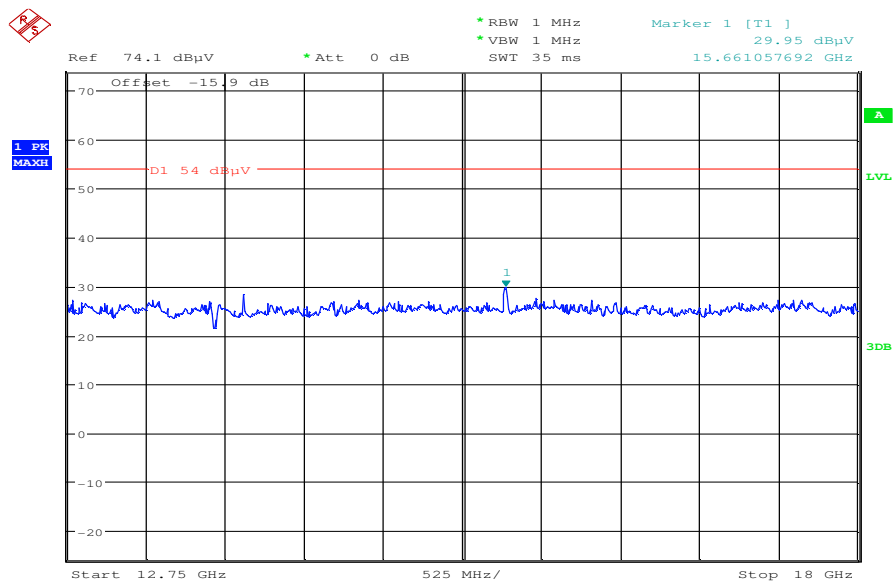


Plot 22: TX mode, mid channel – 5220 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)



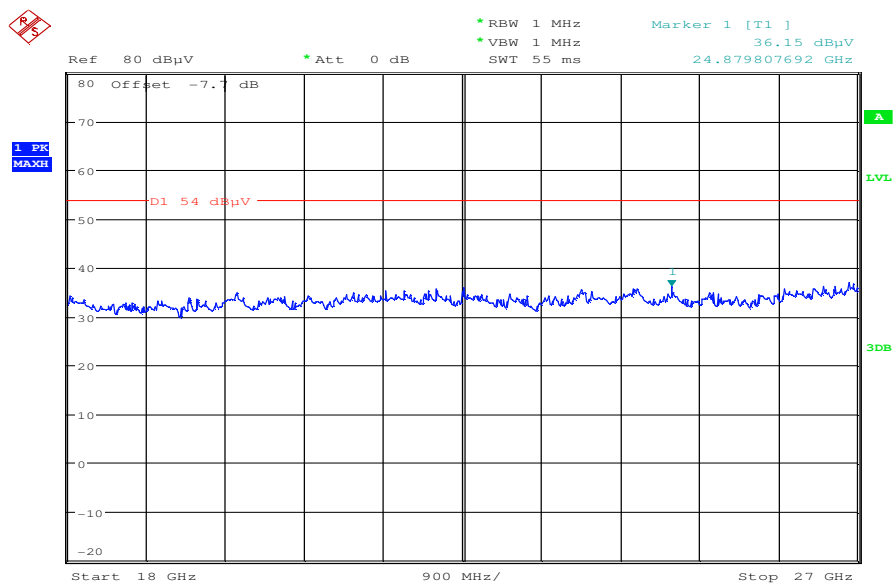
Plot 23: TX mode, mid channel – 5220 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 24:** TX mode, mid channel – 5220 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 25: TX mode, mid channel – 5220 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



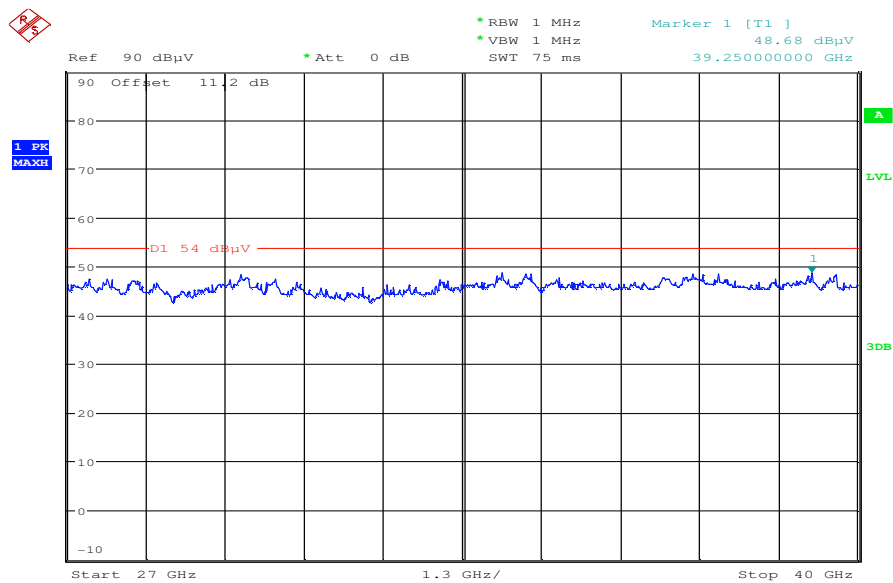
Date: 4.AUG.2010 09:33:31

Plot 26: TX mode, mid channel – 5220 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:54:22

Plot 27: TX mode, mid channel – 5220 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:58:20

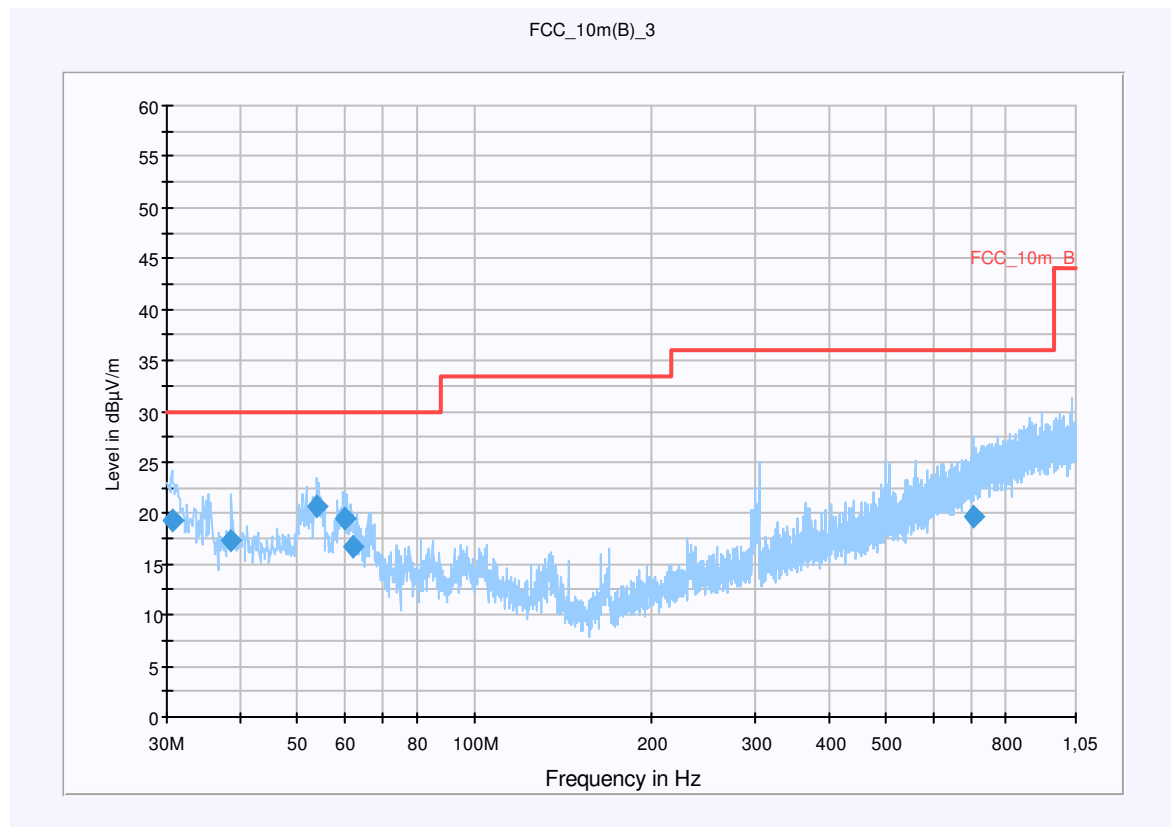
Plot 28: TX mode, high channel – 5240 MHz, 30 MHz – 1GHz, vertical & horizontal polarization

Common Information

EUT: BAT-ANT-N-5A-IP65 + BAT54-F
 Serial Number: SOA-5600/360/5/0/V + 943926022010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 48
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
 Subrange: 30 MHz - 1,05 GHz
 Detectors: QuasiPeak
 IF Bandwidth: 120 kHz
 Meas. Time: 15 s
 Receiver: Receiver



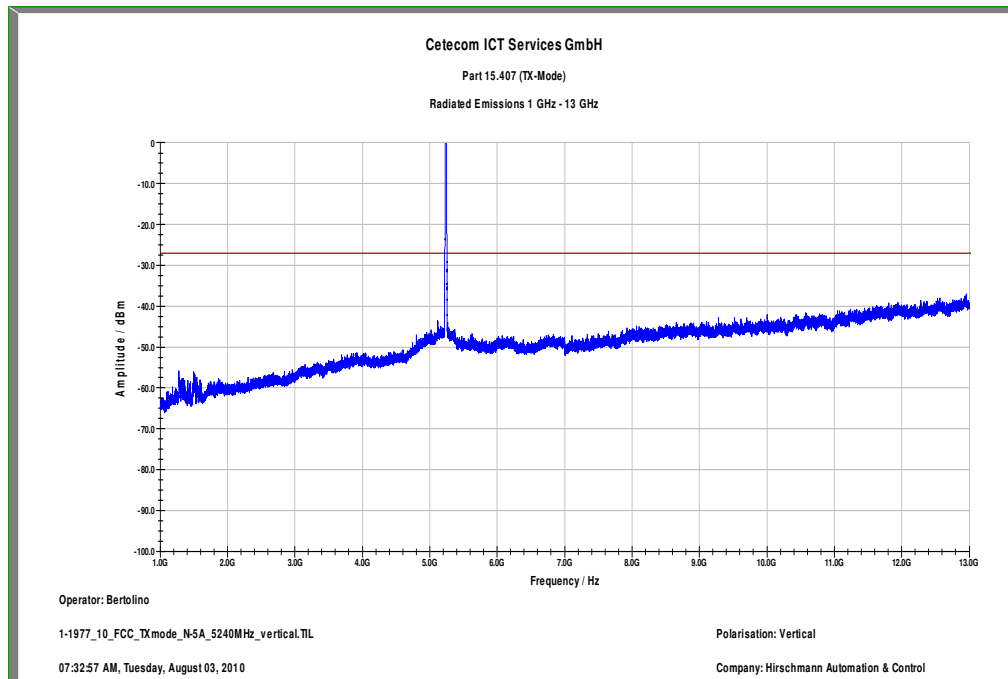
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.685800	19.3	15000.000	120.000	143.0	V	234.0	12.6	10.7	30.0	
38.674350	17.2	15000.000	120.000	98.0	V	50.0	13.3	12.8	30.0	
54.005100	20.7	15000.000	120.000	220.0	V	325.0	13.0	9.3	30.0	
60.197250	19.4	15000.000	120.000	158.0	V	210.0	11.6	10.6	30.0	
62.170050	16.6	15000.000	120.000	220.0	V	146.0	11.1	13.4	30.0	
704.109300	19.6	15000.000	120.000	202.0	V	48.0	22.5	16.4	36.0	

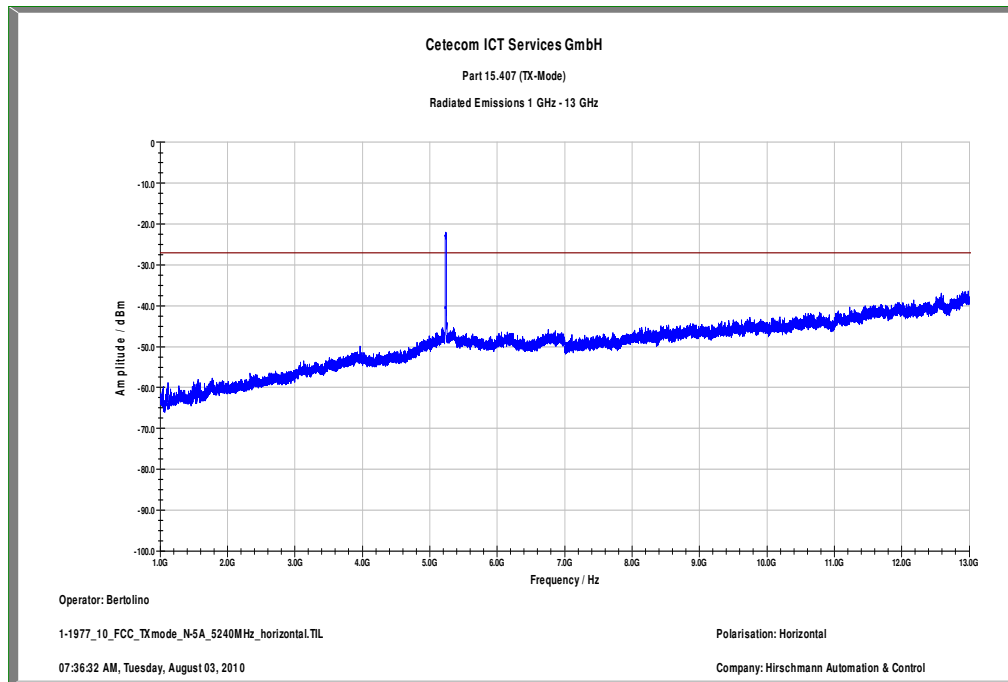
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

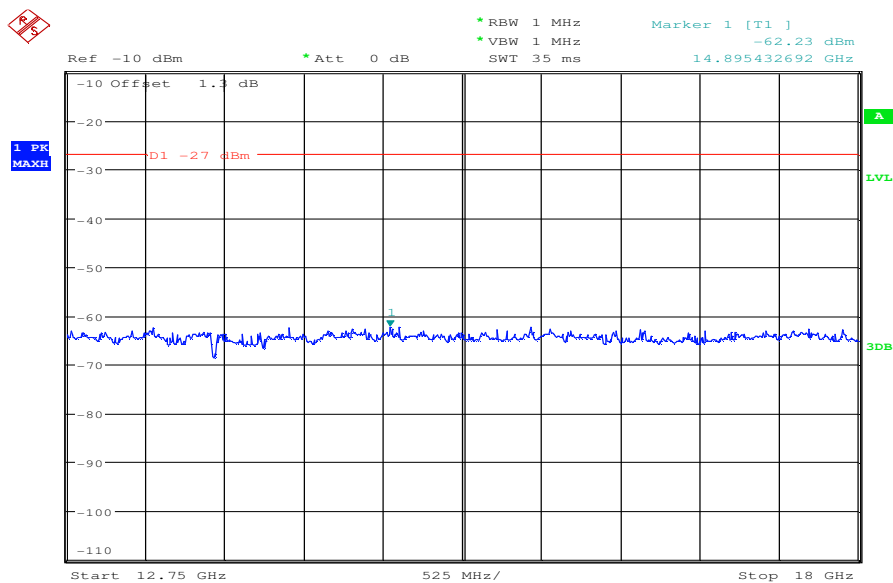
EMC 32 Version 8.10.00

Plot 29: TX mode, mid channel – 5240 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 30: TX mode, mid channel – 5240 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

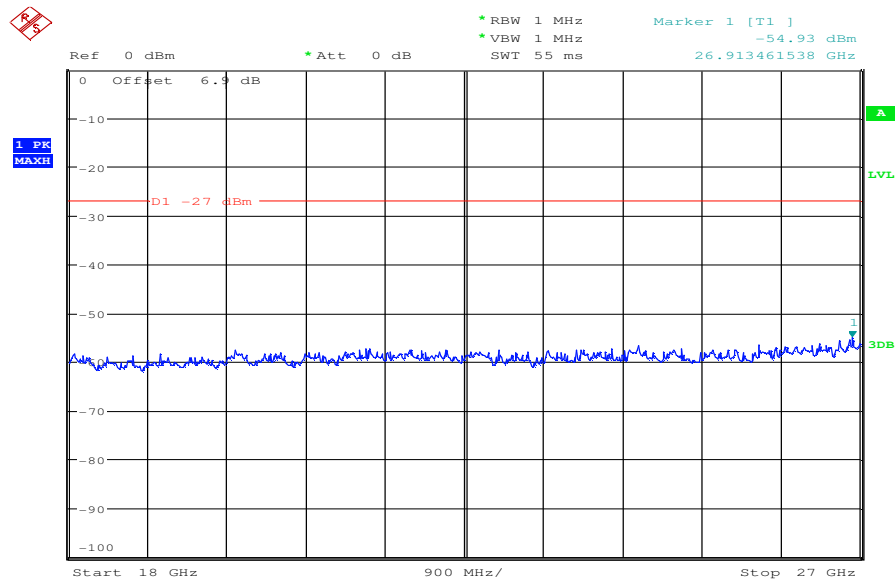


Plot 31: TX mode, mid channel – 5240 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



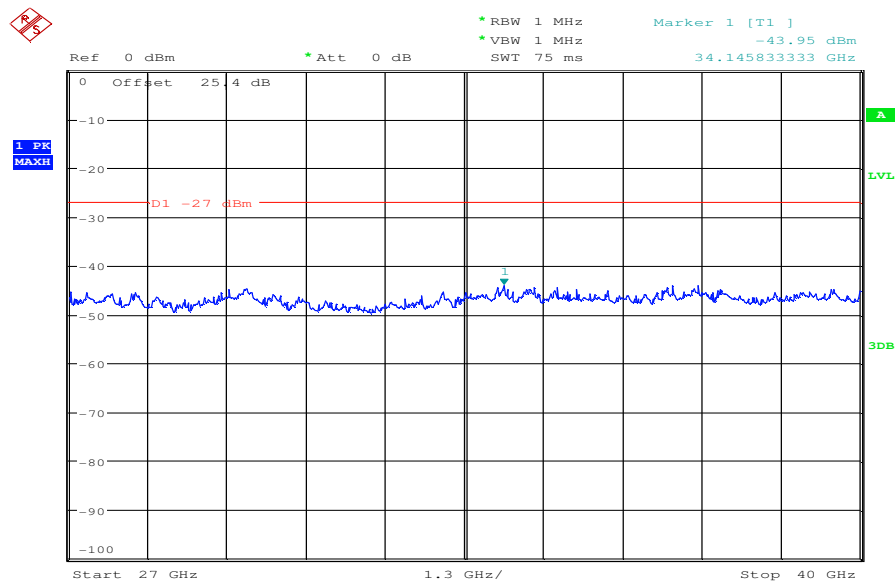
Date: 5.AUG.2010 07:10:18

Plot 32: TX mode, mid channel – 5240 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)

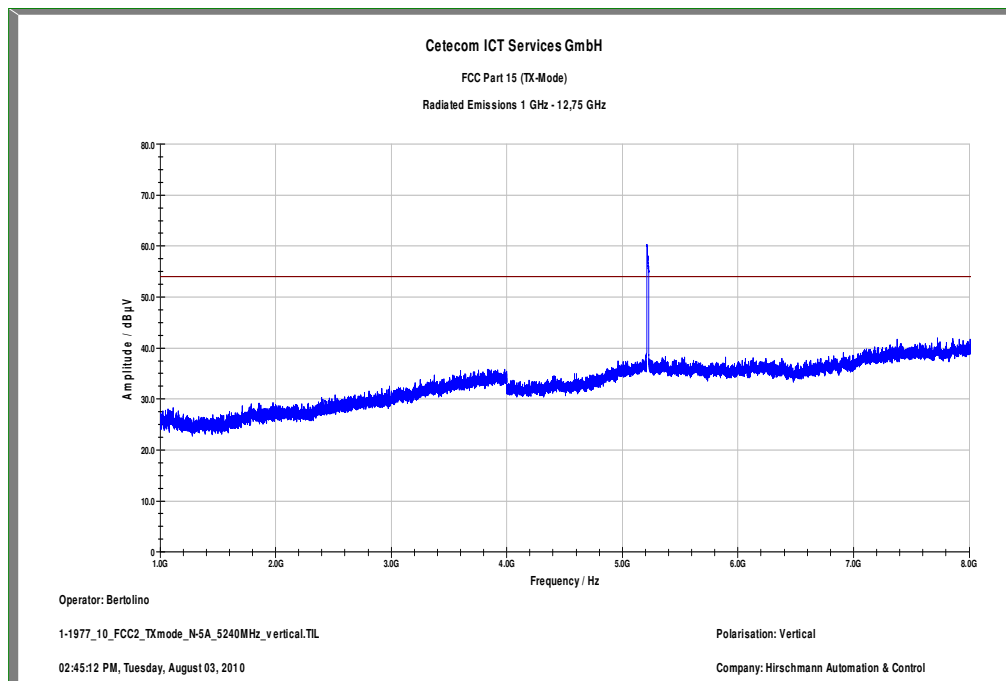
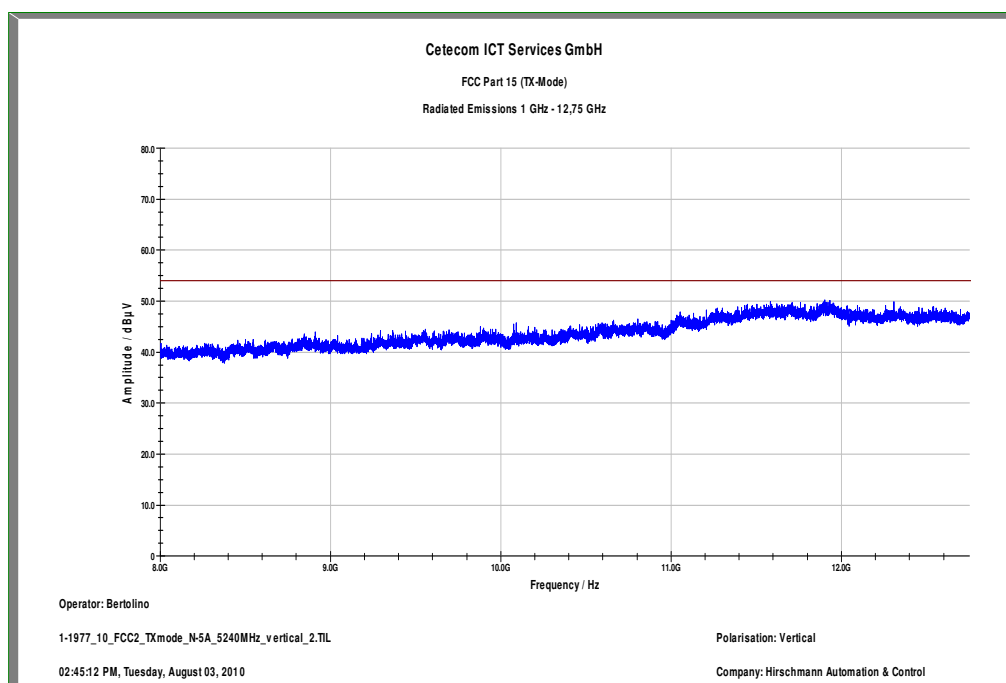


Date: 5.AUG.2010 07:31:51

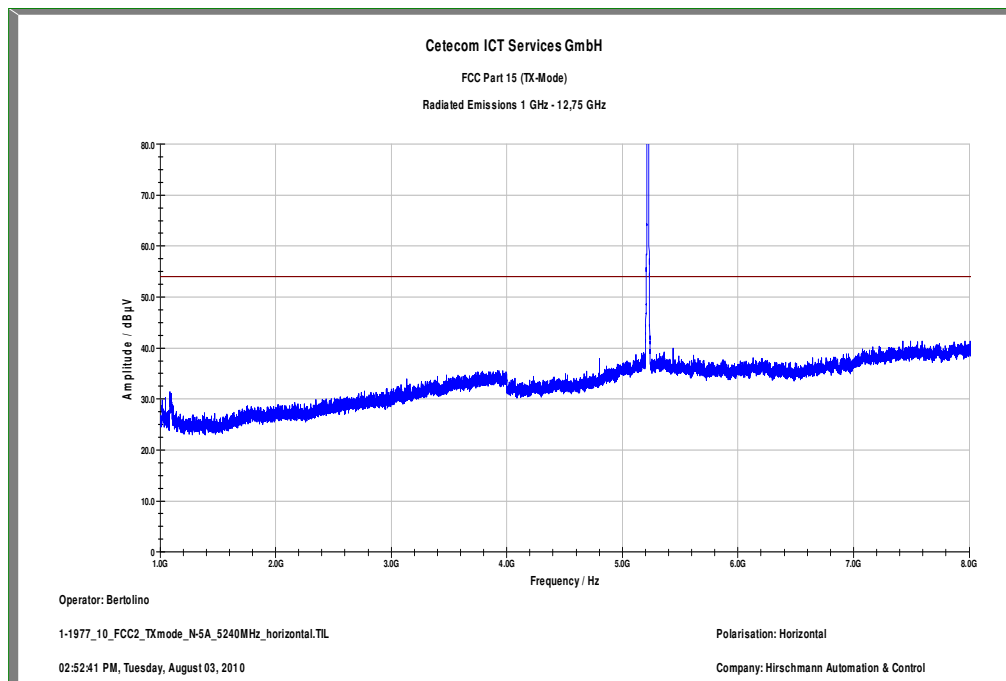
Plot 33: TX mode, mid channel – 5240 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)



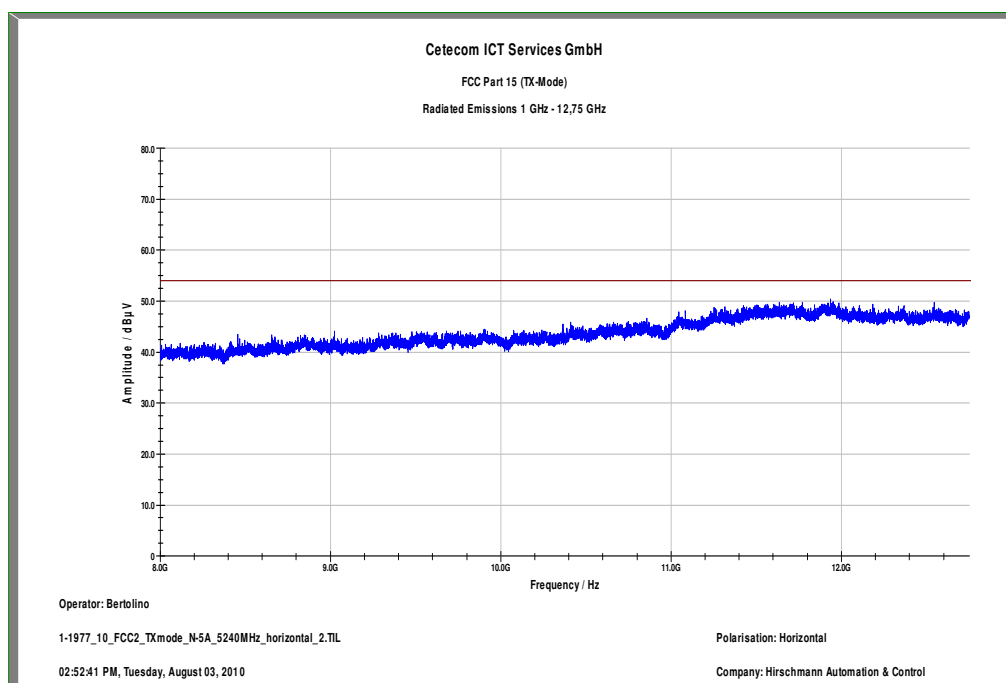
Date: 5.AUG.2010 07:47:52

Plot 34: TX mode, mid channel – 5240 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)**Plot 35:** TX mode, mid channel – 5240 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)

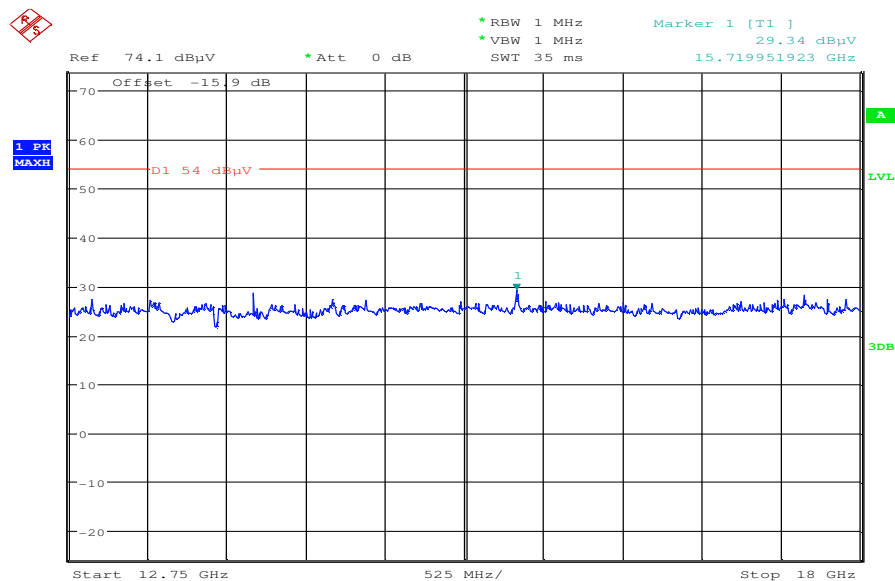
Plot 36: TX mode, mid channel – 5240 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)



Plot 37: TX mode, mid channel – 5240 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

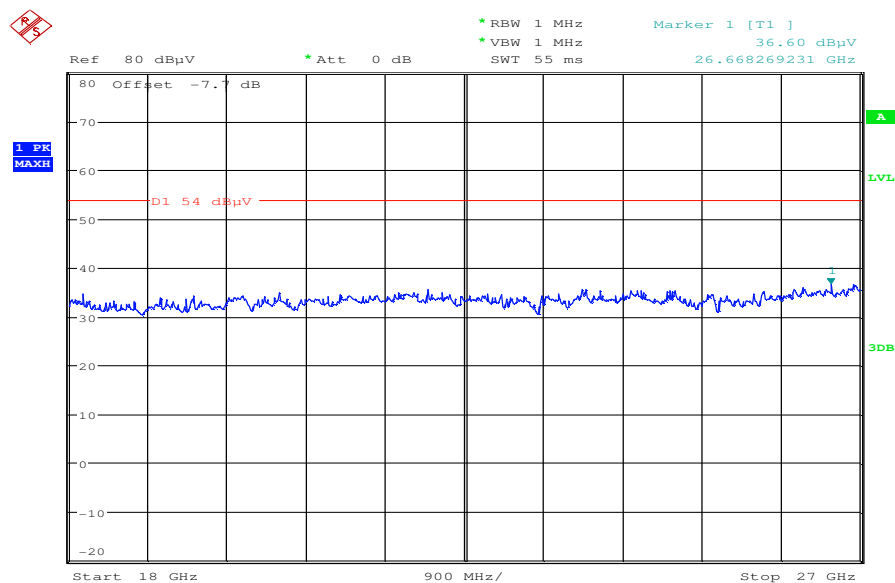


Plot 38: TX mode, mid channel – 5240 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



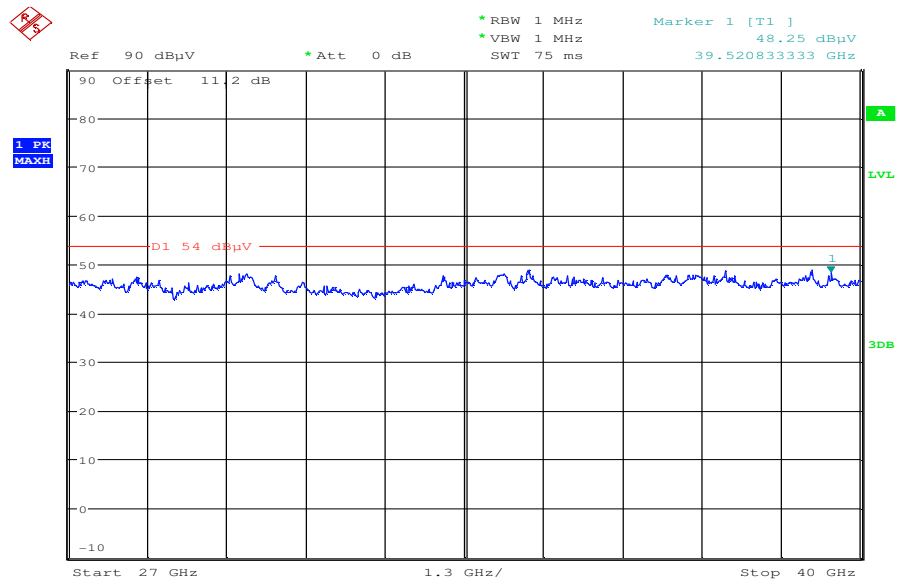
Date: 4.AUG.2010 09:35:20

Plot 39: TX mode, mid channel – 5240 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:55:12

Plot 40: TX mode, mid channel – 5240 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:57:26

Antenna: BAT-ANT-N-9A-DS-IP65

Plot 1: TX mode, low channel – 5180 MHz, 30 MHz – 1GHz, vertical & horizontal polarization (Part 15.209)

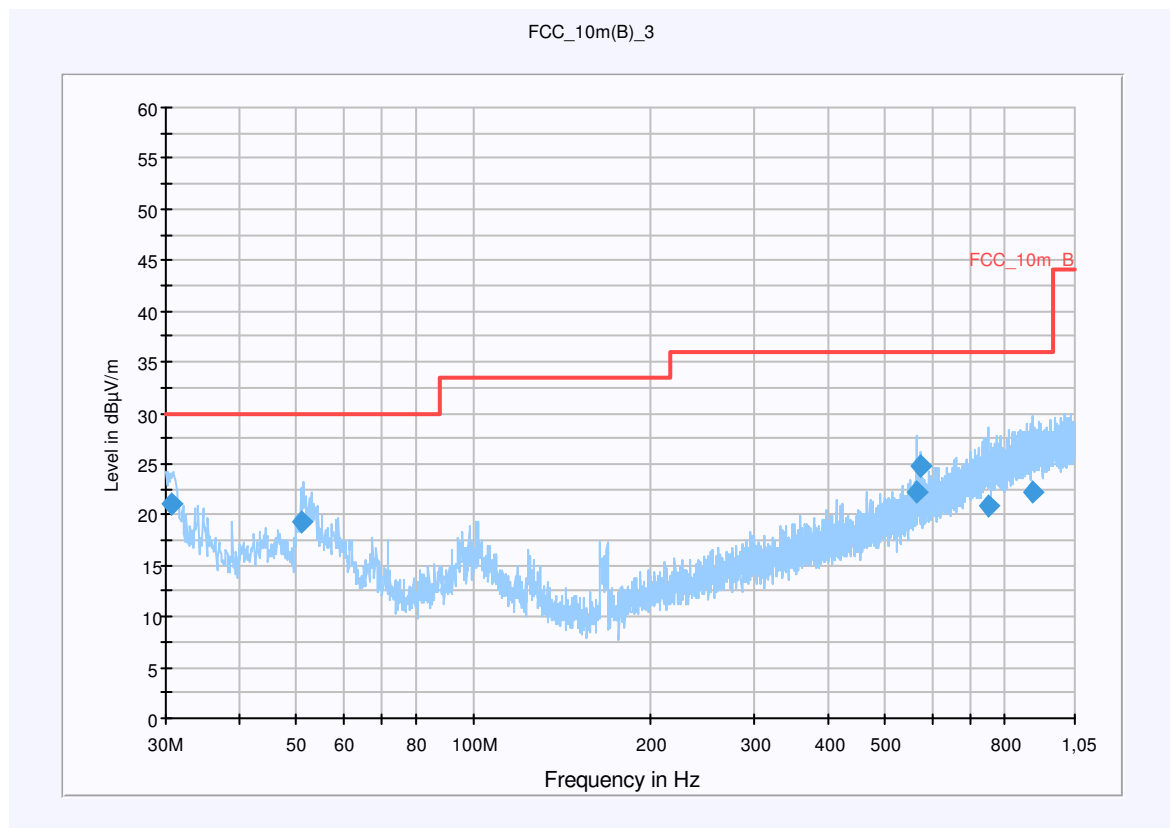
Common Information

EUT: BAT-ANT-N-9A-DS-IP65 + BAT54-F
 Serial Number: 84078980 + 9439260220010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 36
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



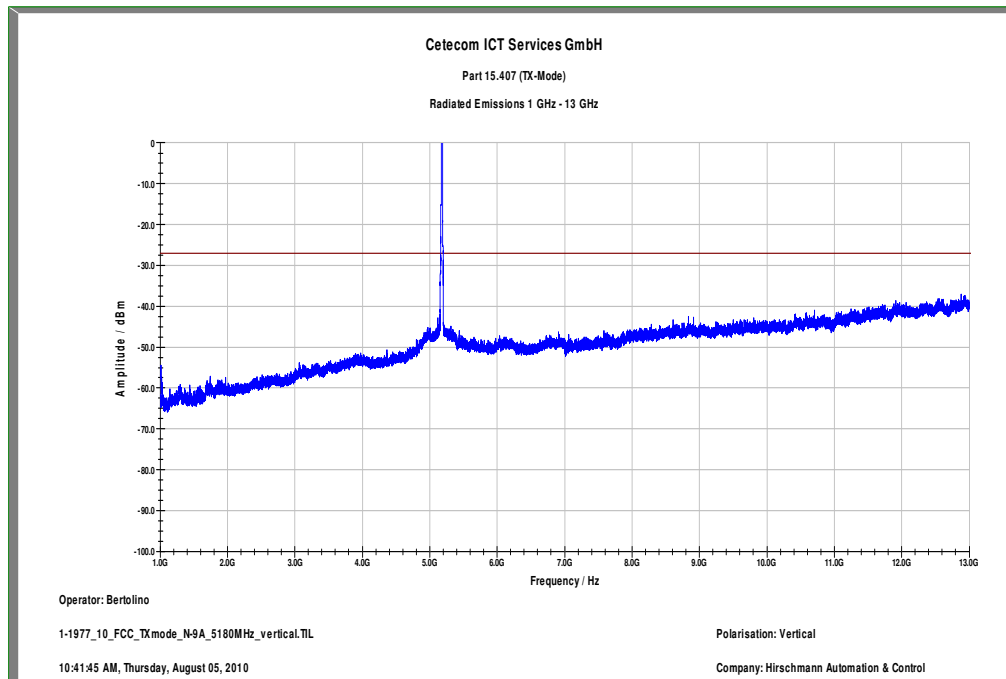
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.637723	21.0	15000.000	120.000	109.0	V	224.0	12.6	9.0	30.0	
51.177150	19.3	15000.000	120.000	98.0	V	71.0	13.3	10.7	30.0	
566.154900	22.3	15000.000	120.000	220.0	H	245.0	19.8	13.7	36.0	
574.770000	24.8	15000.000	120.000	98.0	V	18.0	20.1	11.2	36.0	
751.803900	20.8	15000.000	120.000	98.0	V	146.0	23.6	15.2	36.0	
890.034900	22.3	15000.000	120.000	106.0	V	91.0	25.1	13.7	36.0	

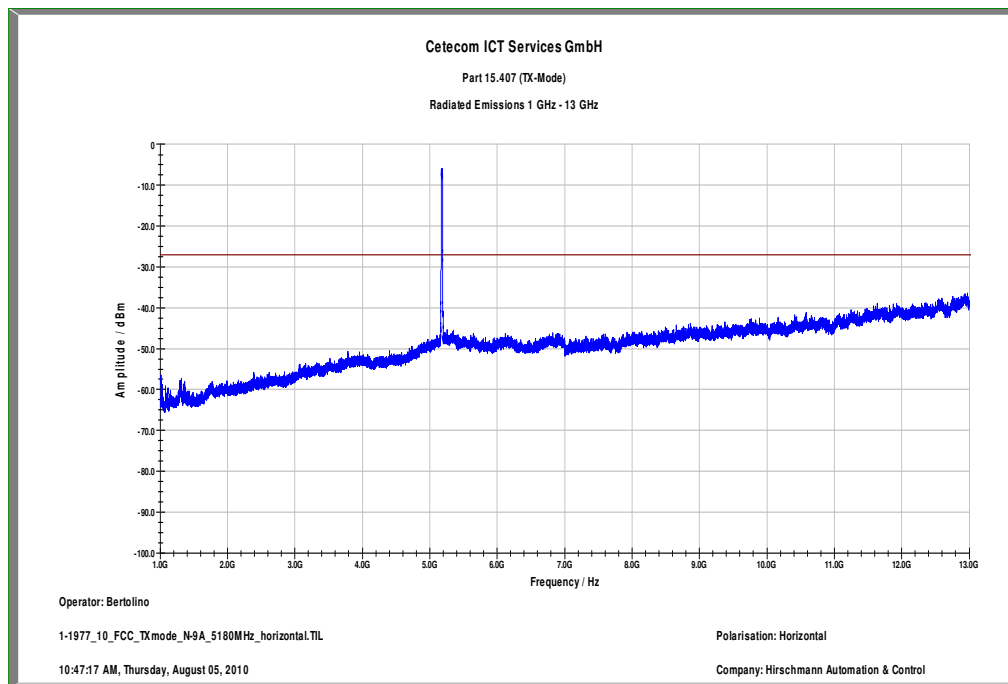
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

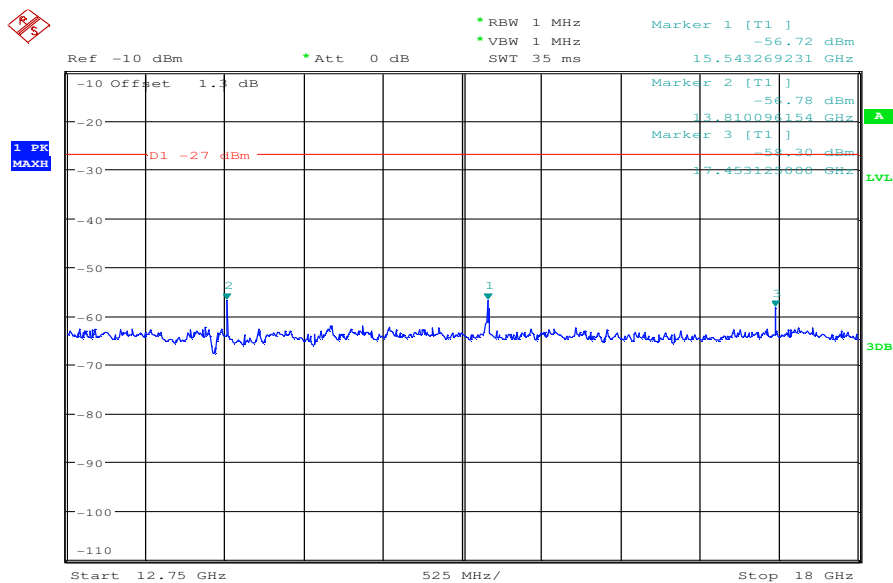
EMC 32 Version 8.10.00

Plot 2: TX mode, low channel – 5180 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 3: TX mode, low channel – 5180 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

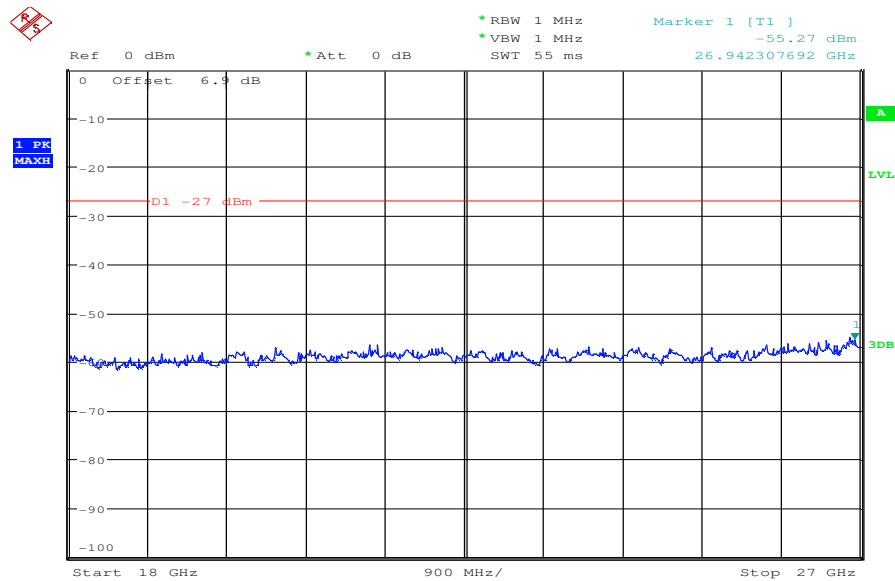


Plot 4: TX mode, low channel – 5180 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



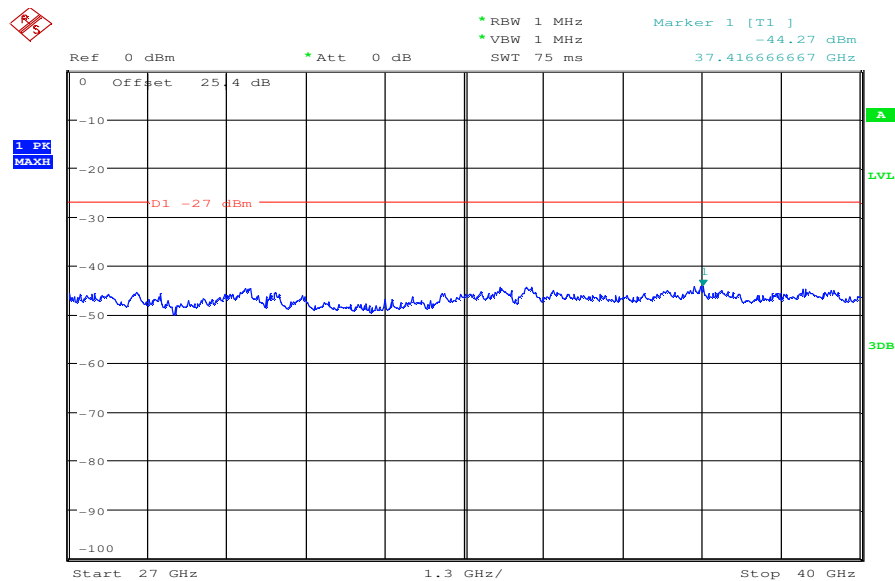
Date: 5.AUG.2010 07:02:44

Plot 5: TX mode, low channel – 5180 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)

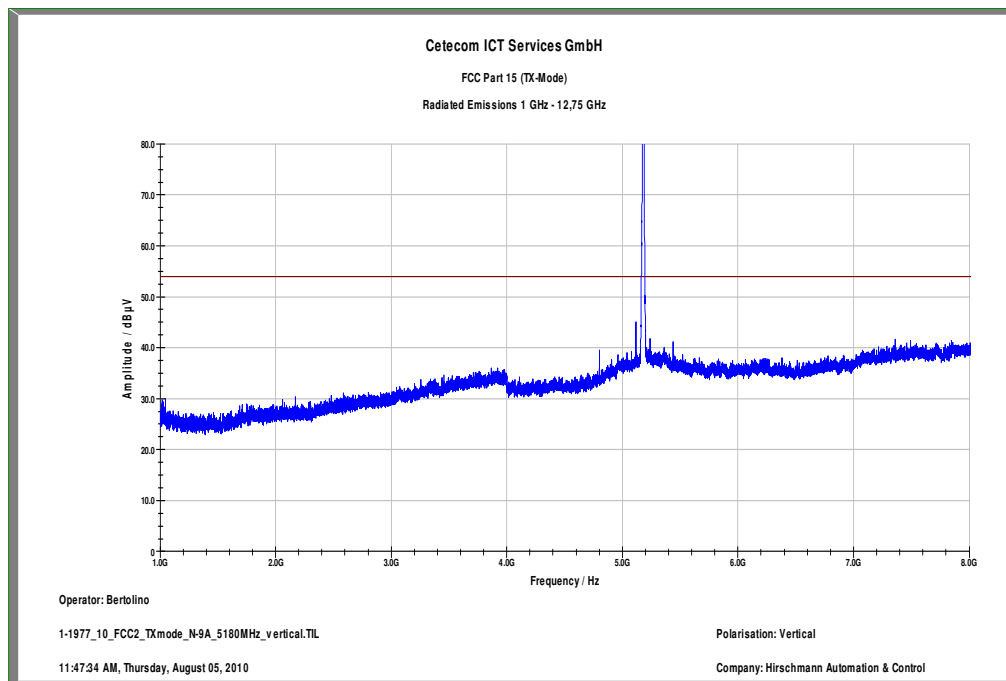
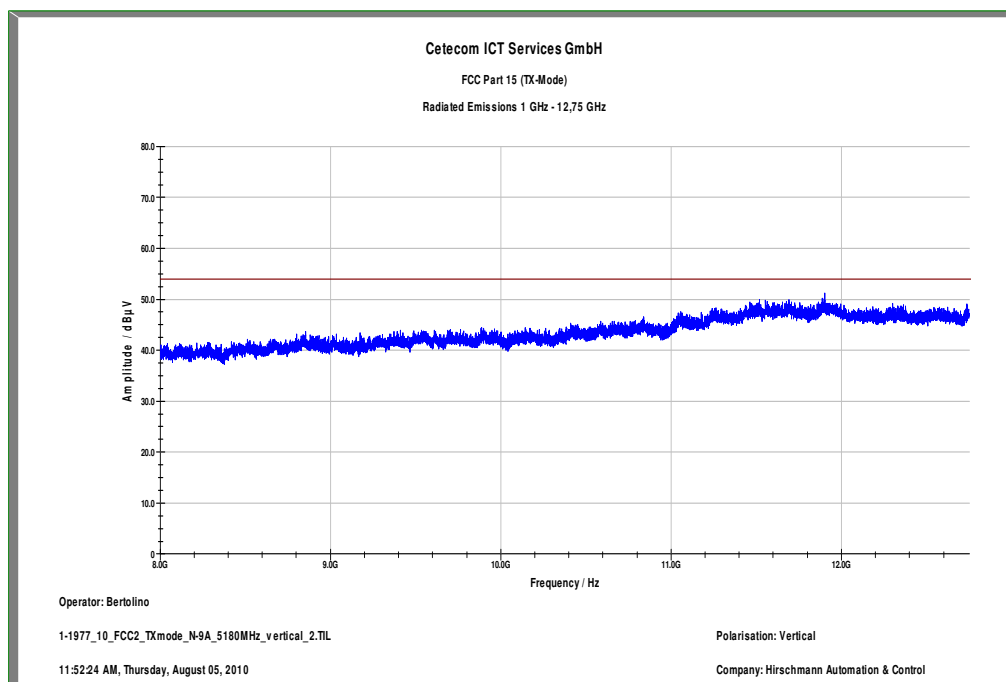


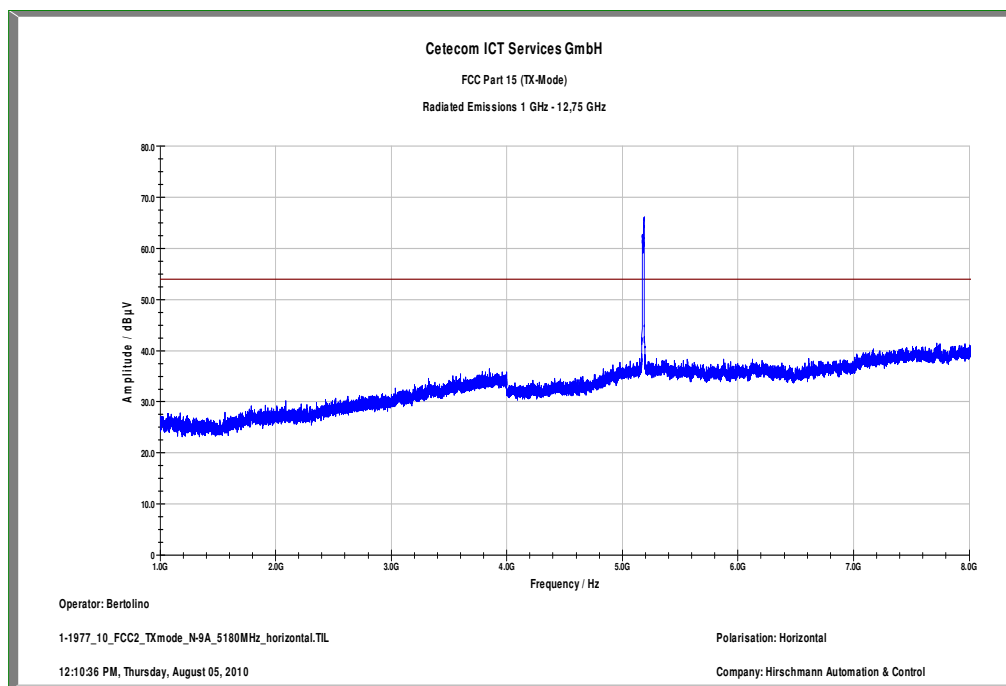
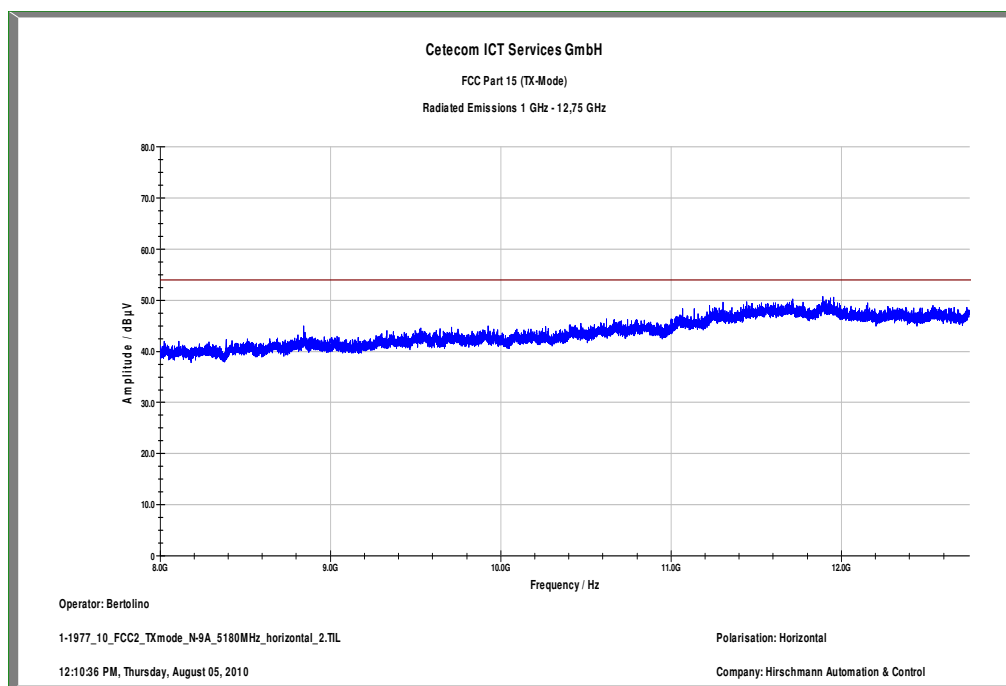
Date: 5.AUG.2010 07:36:01

Plot 6: TX mode, low channel – 5180 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

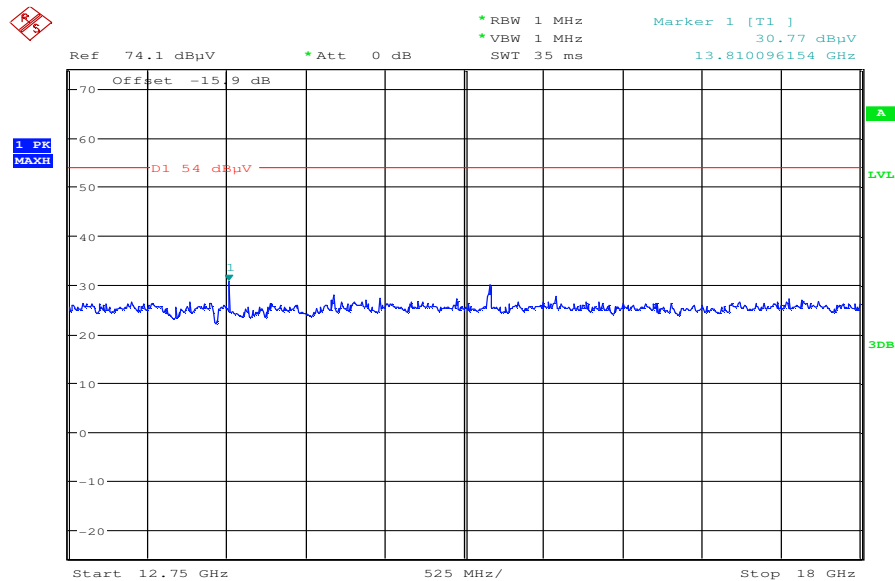


Date: 5.AUG.2010 07:41:23

Plot 7: TX mode, low channel – 5180 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)**Plot 8:** TX mode, low channel – 5180 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)

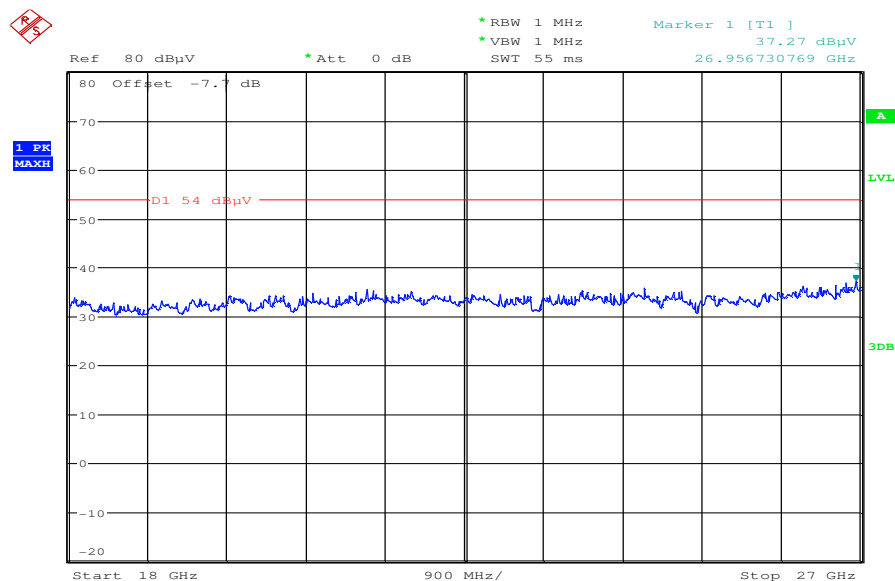
Plot 9: TX mode, low channel – 5180 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 10:** TX mode, low channel – 5180 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 11: TX mode, low channel – 5180 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



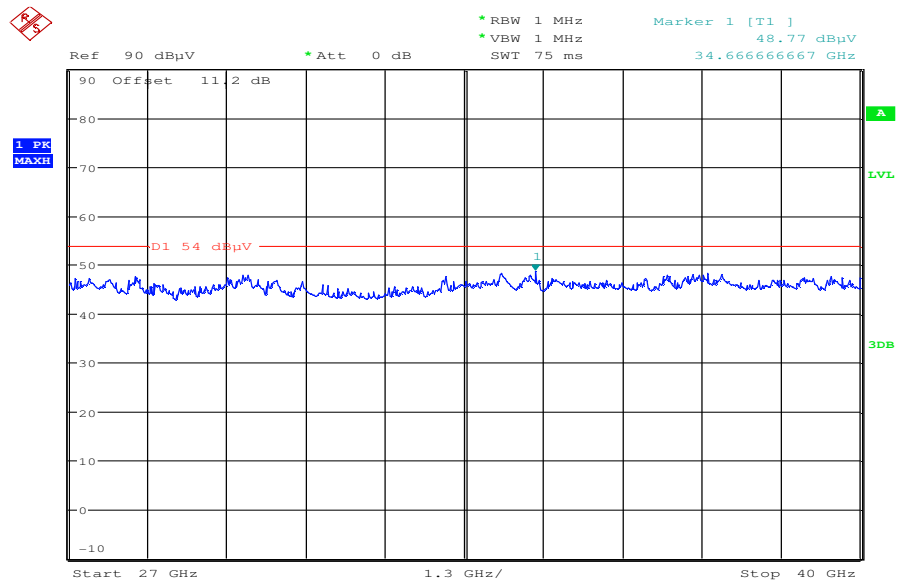
Date: 4.AUG.2010 09:41:31

Plot 12: TX mode, low channel – 5180 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)

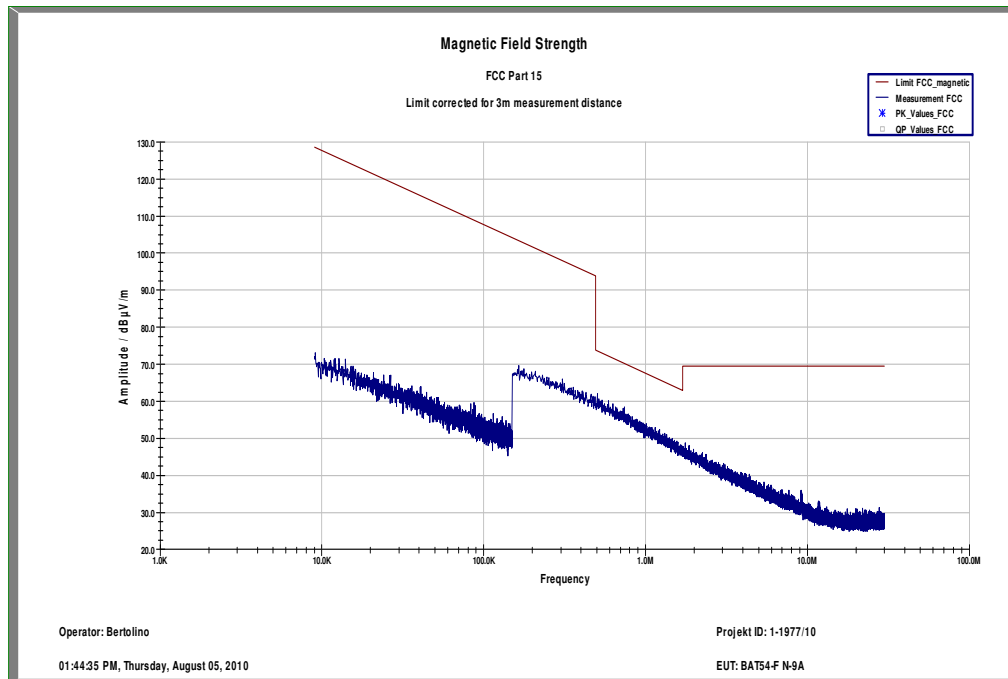


Date: 4.AUG.2010 09:48:28

Plot 13: TX mode, low channel – 5180 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:06:21

Plot 14: TX mode, mid channel – 5220 MHz, 9 kHz – 30 MHz, magnetic

Plot 15: TX mode, mid channel – 5220 MHz, 30 MHz – 1GHz, vertical & horizontal polarization

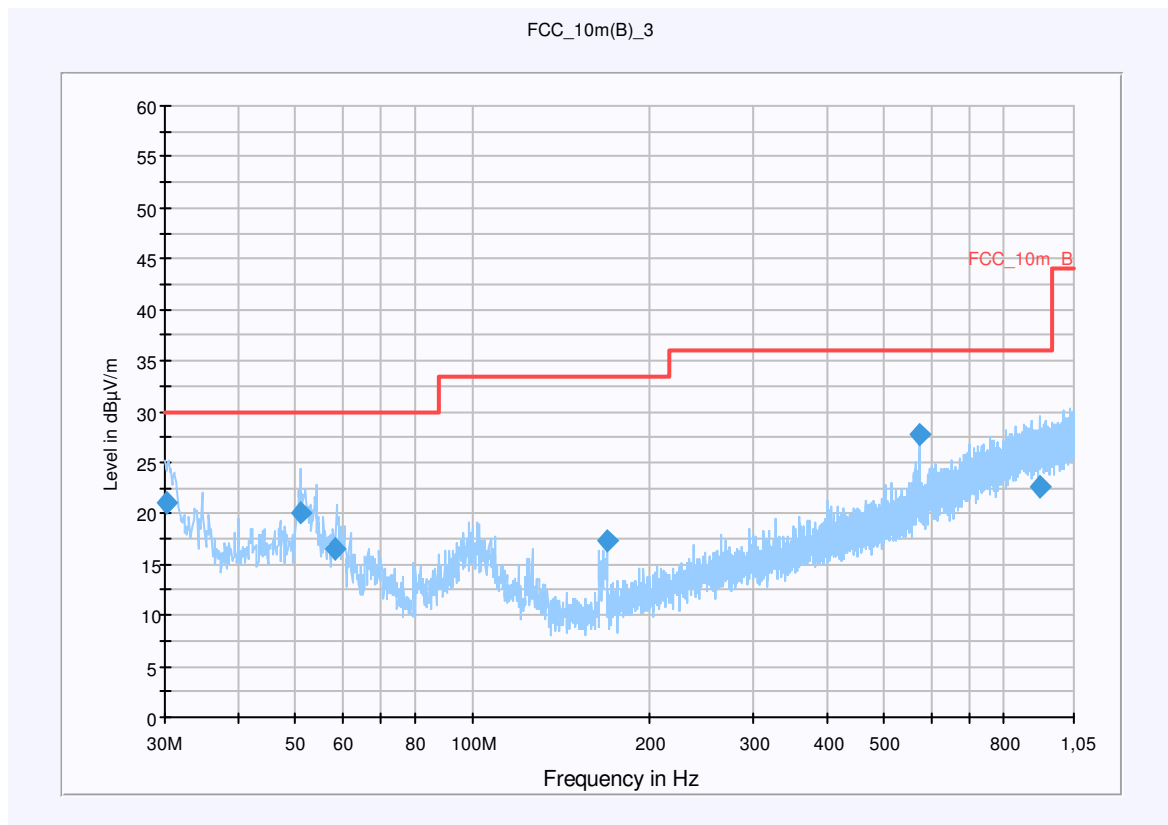
Common Information

EUT: BAT-ANT-N-9A-DS-IP65 + BAT54-F
 Serial Number: 84078980 + 9439260220010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 44
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit:

30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



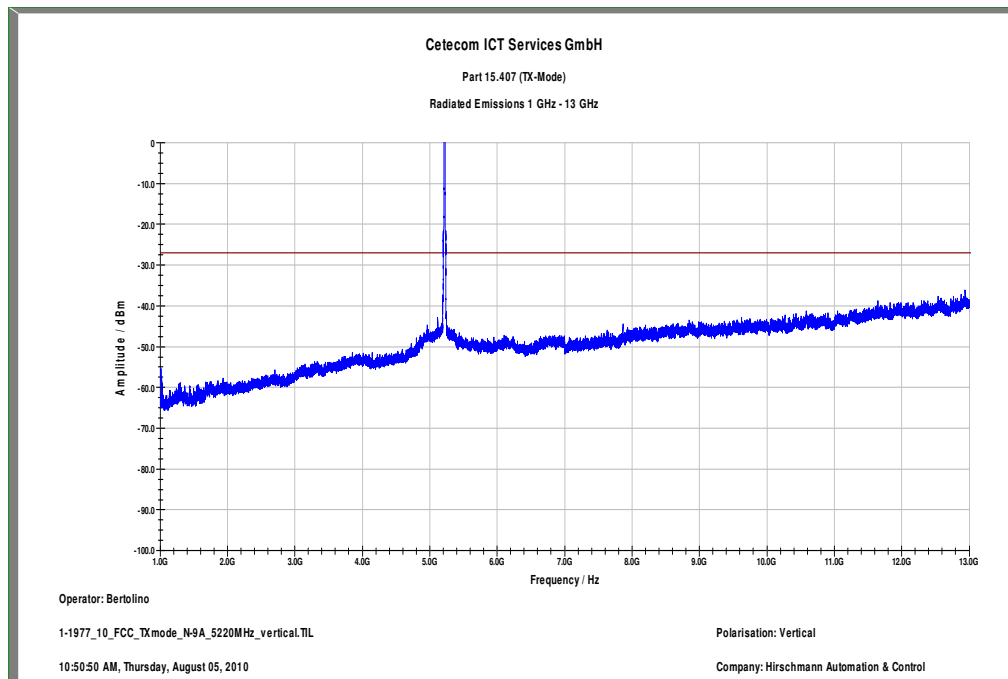
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
30.279750	21.0	15000.000	120.000	116.0	V	21.0	12.5	9.0	30.0	
51.225450	20.1	15000.000	120.000	98.0	V	74.0	13.3	9.9	30.0	
58.507500	16.4	15000.000	120.000	142.0	V	214.0	12.0	13.6	30.0	
168.990300	17.3	15000.000	120.000	117.0	V	4.0	9.7	16.2	33.5	
574.653000	27.8	15000.000	120.000	151.0	H	231.0	20.1	8.2	36.0	
921.629400	22.5	15000.000	120.000	195.0	H	212.0	25.3	13.5	36.0	

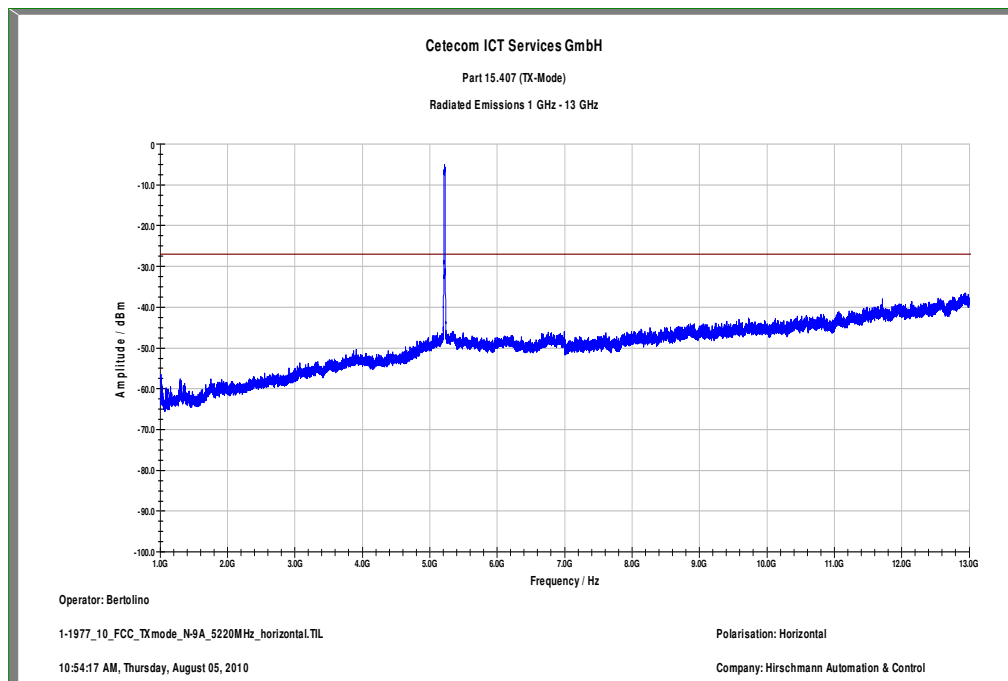
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

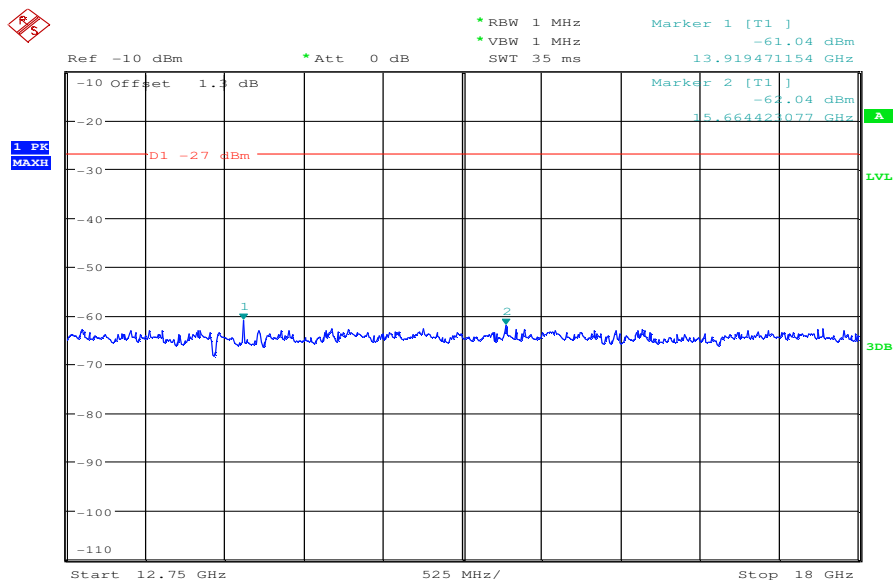
EMC 32 Version 8.10.00

Plot 16: TX mode, mid channel – 5220 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 17: TX mode, mid channel – 5220 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

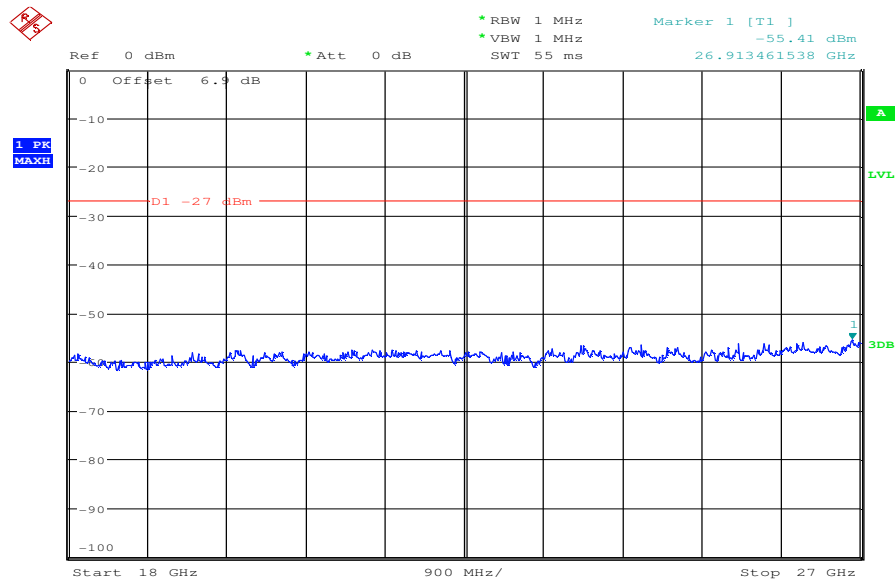


Plot 18: TX mode, mid channel – 5220 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



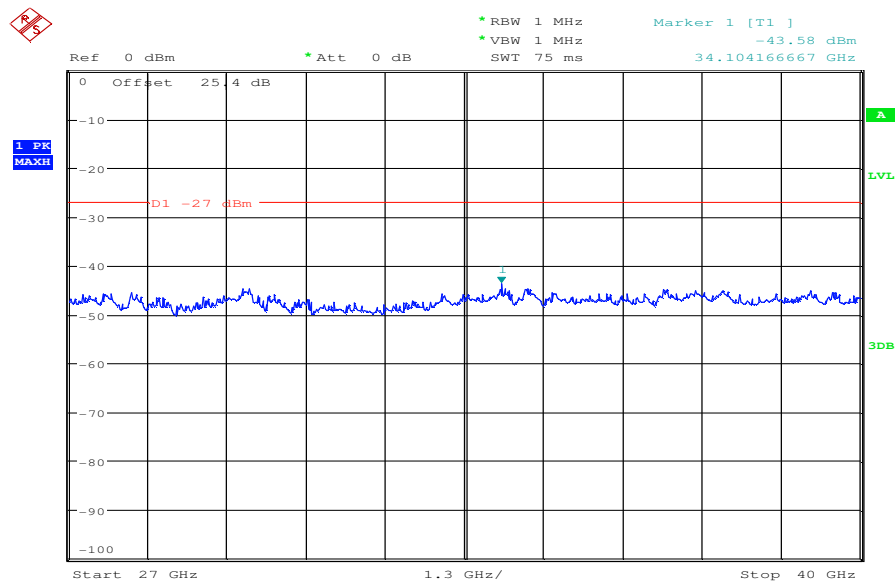
Date: 5.AUG.2010 07:05:46

Plot 19: TX mode, mid channel – 5220 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)



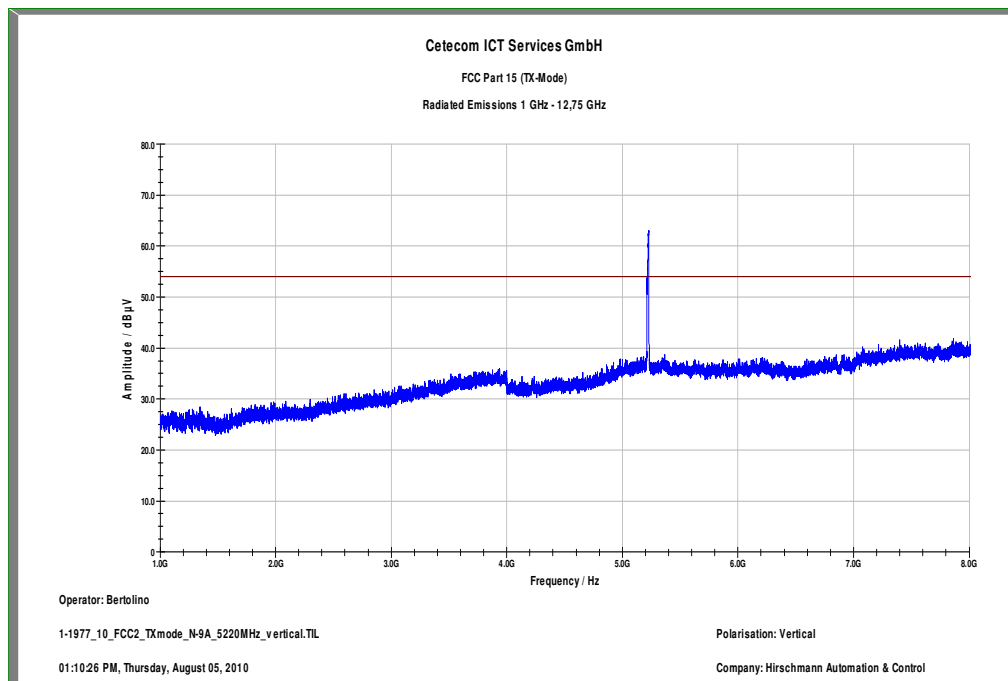
Date: 5.AUG.2010 07:34:54

Plot 20: TX mode, mid channel – 5220 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

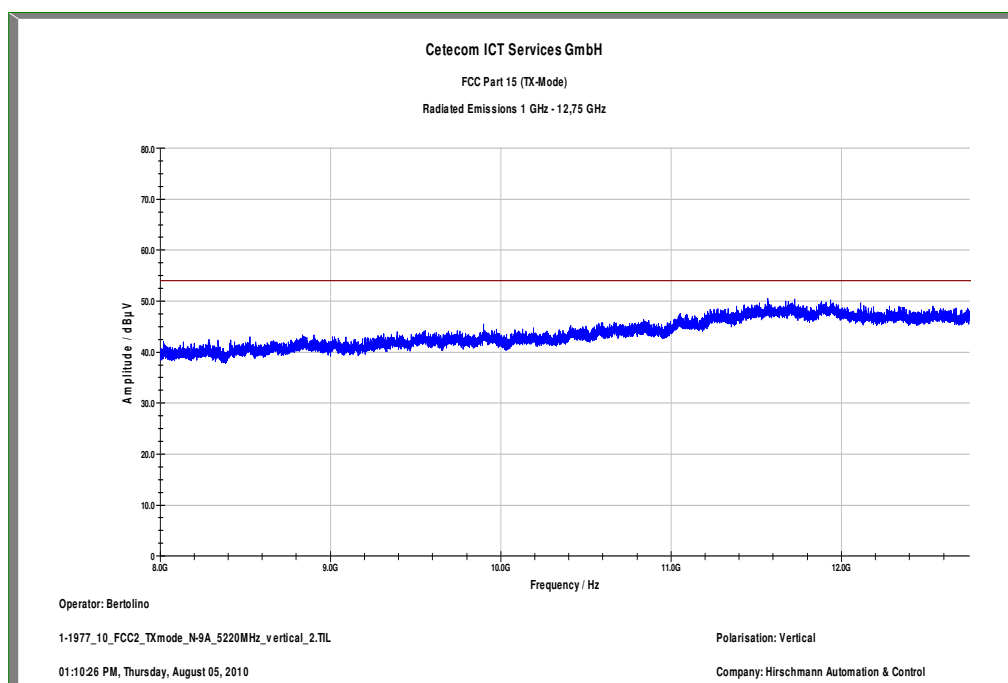


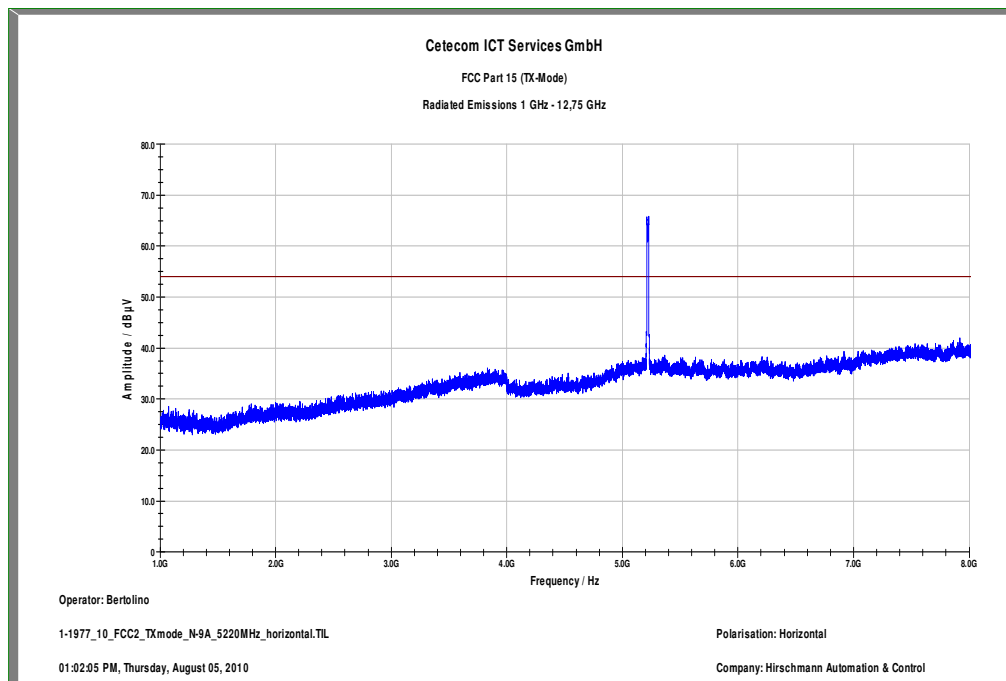
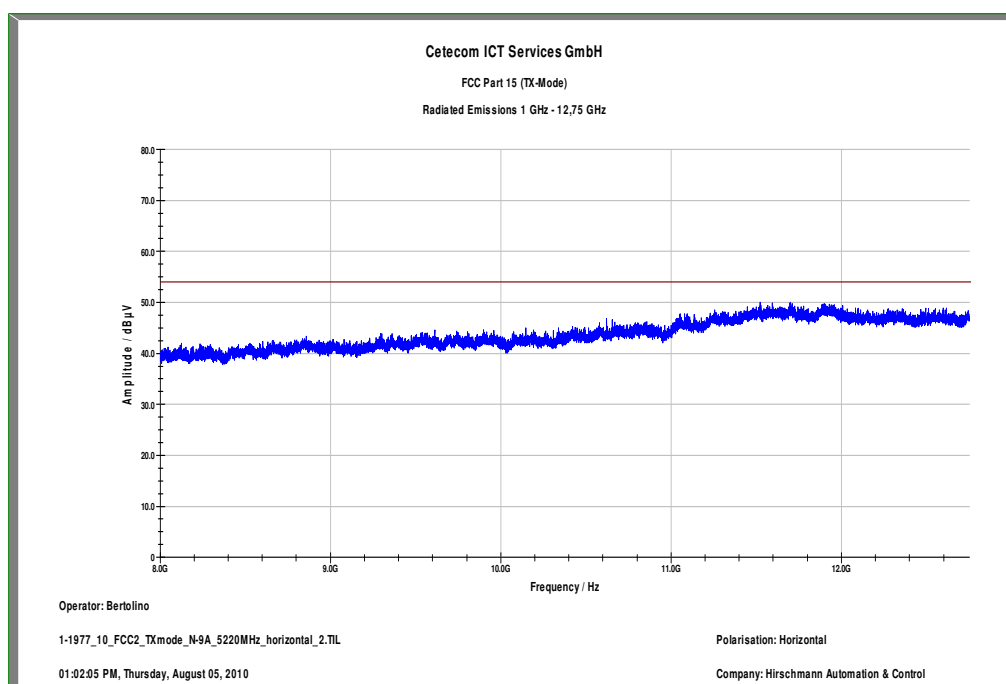
Date: 5.AUG.2010 07:42:02

Plot 21: TX mode, mid channel – 5220 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)

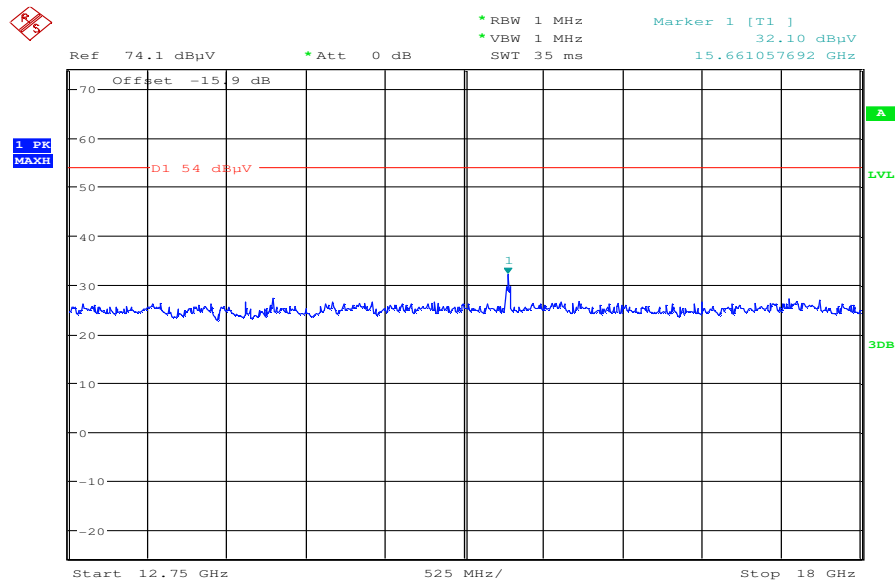


Plot 22: TX mode, mid channel – 5220 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)



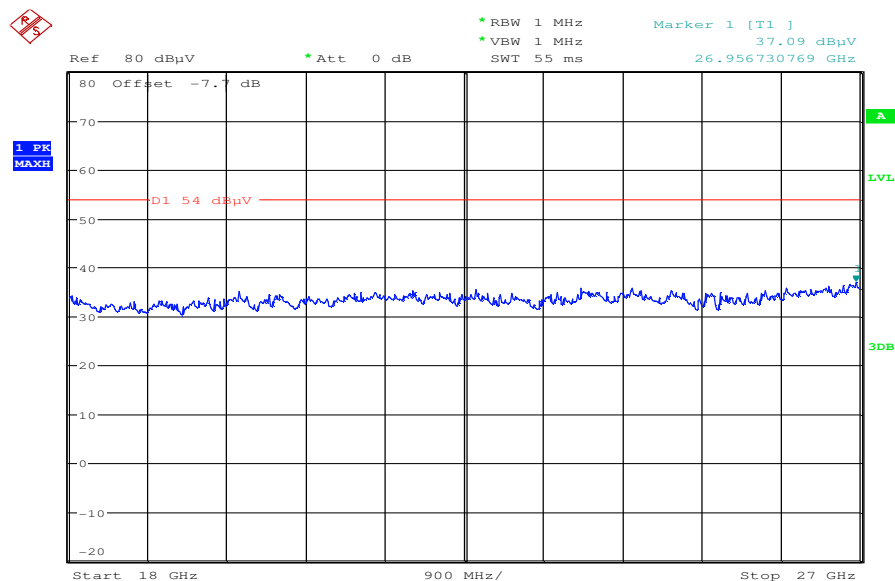
Plot 23: TX mode, mid channel – 5220 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 24:** TX mode, mid channel – 5220 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 25: TX mode, mid channel – 5220 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



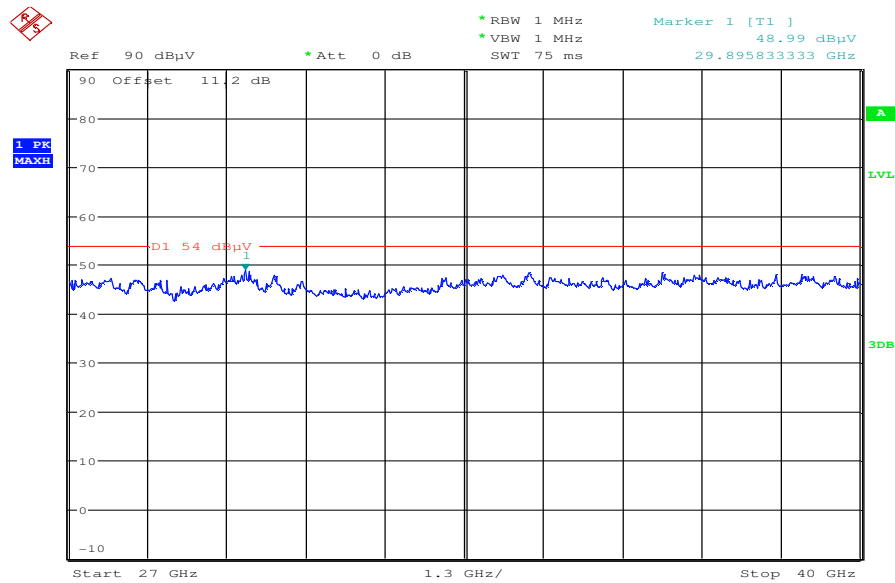
Date: 4.AUG.2010 09:42:16

Plot 26: TX mode, mid channel – 5220 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:47:47

Plot 27: TX mode, mid channel – 5220 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:03:45

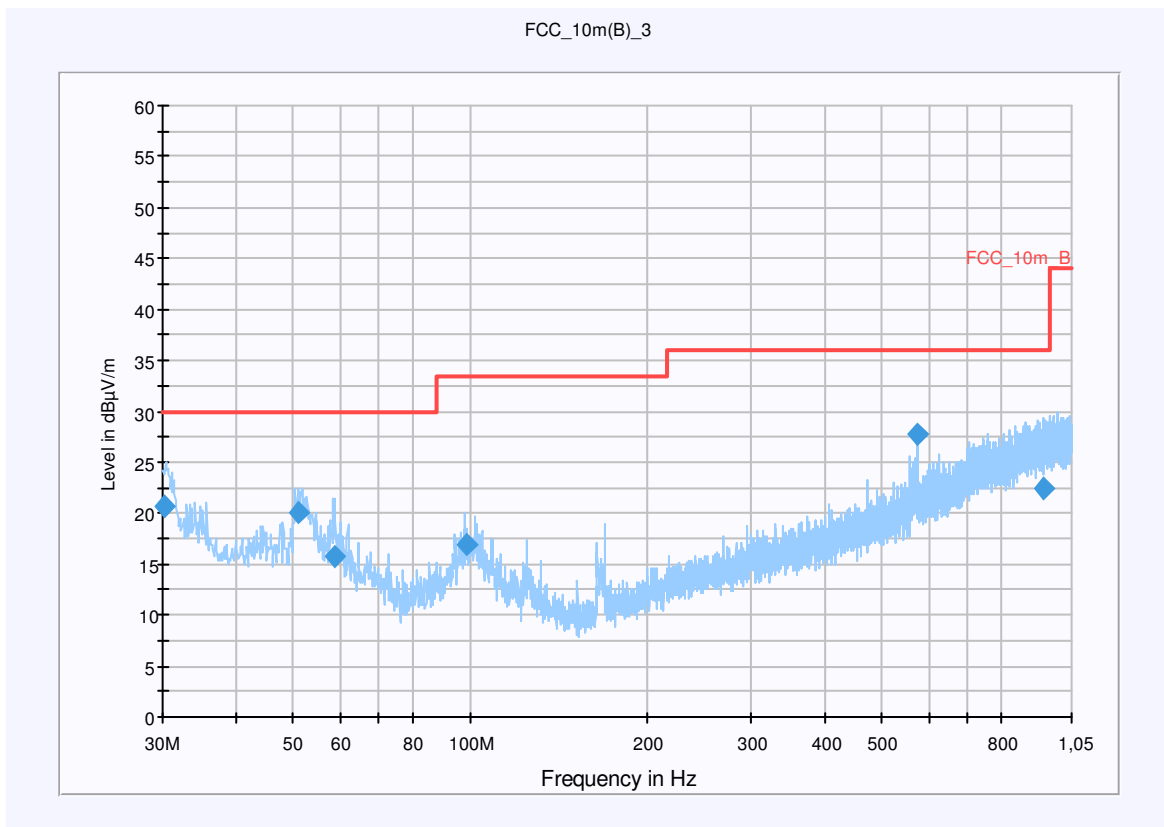
Plot 28: TX mode, high channel – 5240 MHz, 30 MHz – 1GHz, vertical & horizontal polarization

Common Information

EUT: BAT-ANT-N-9A-DS-IP65 + BAT54-F
 Serial Number: 84078980 + 9439260220010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 48
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
Subrange **Detectors** **IF Bandwidth** **Meas. Time** **Receiver**
 30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



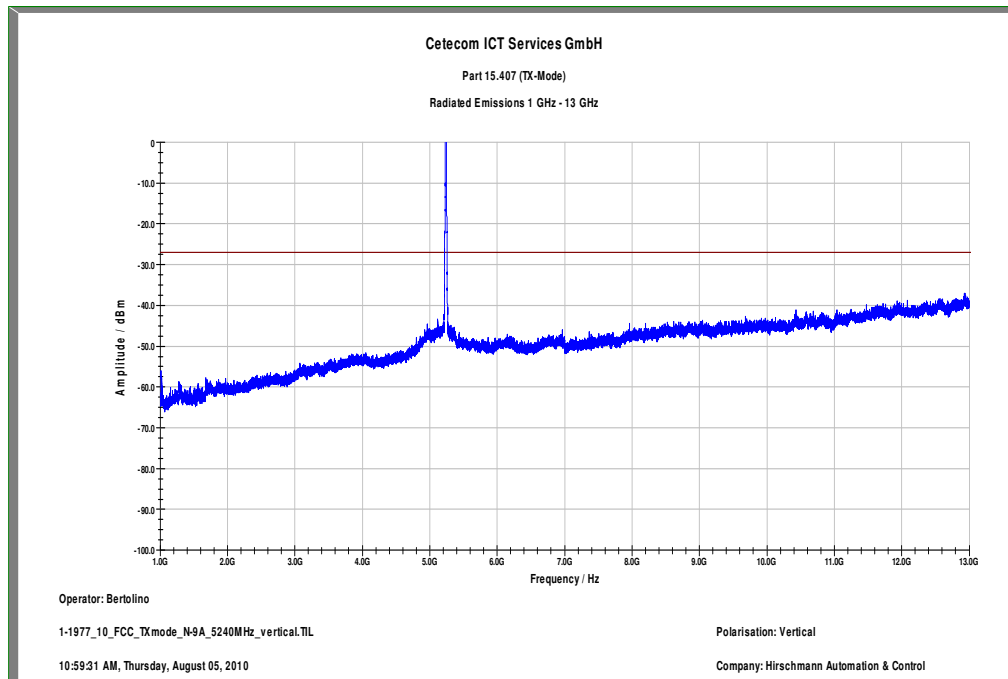
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.318453	20.7	15000.000	120.000	120.0	V	121.0	12.5	9.3	30.0	
50.998650	20.1	15000.000	120.000	161.0	V	23.0	13.3	9.9	30.0	
58.825650	15.7	15000.000	120.000	98.0	V	232.0	11.9	14.3	30.0	
98.383200	16.9	15000.000	120.000	108.0	V	76.0	11.7	16.6	33.5	
574.800000	27.7	15000.000	120.000	135.0	H	226.0	20.1	8.3	36.0	
942.109050	22.5	15000.000	120.000	120.0	H	33.0	25.3	13.5	36.0	

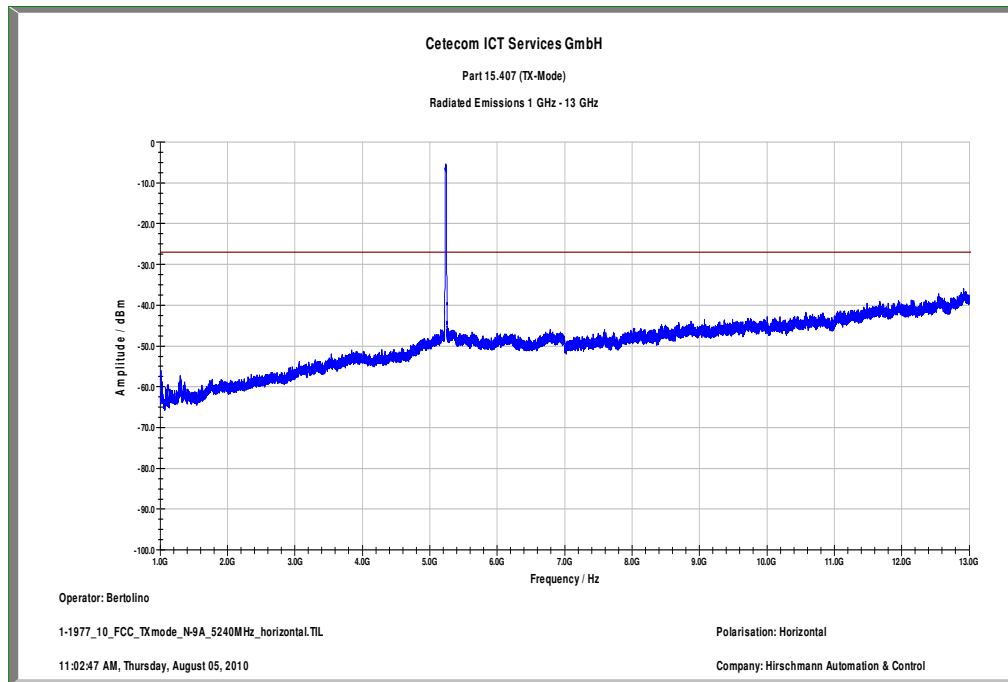
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

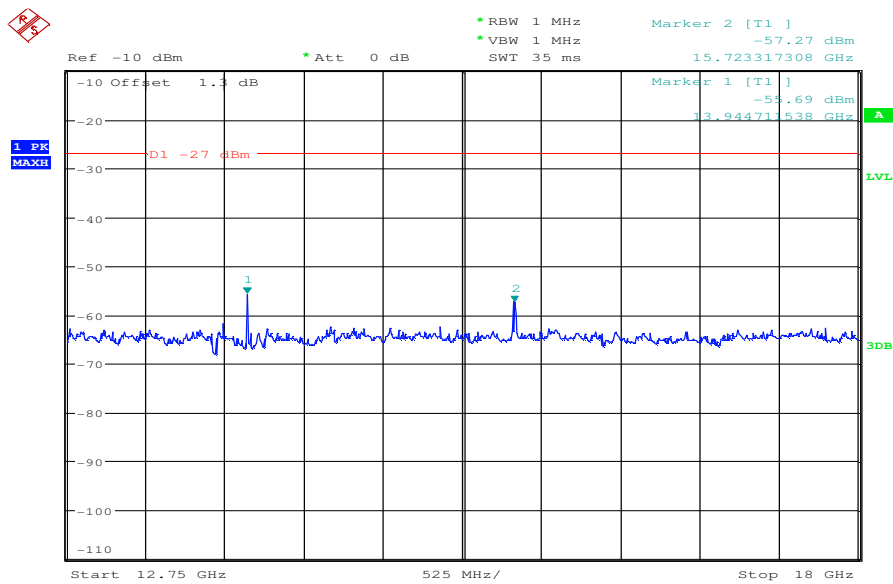
EMC 32 Version 8.10.00

Plot 29: TX mode, mid channel – 5240 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 30: TX mode, mid channel – 5240 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

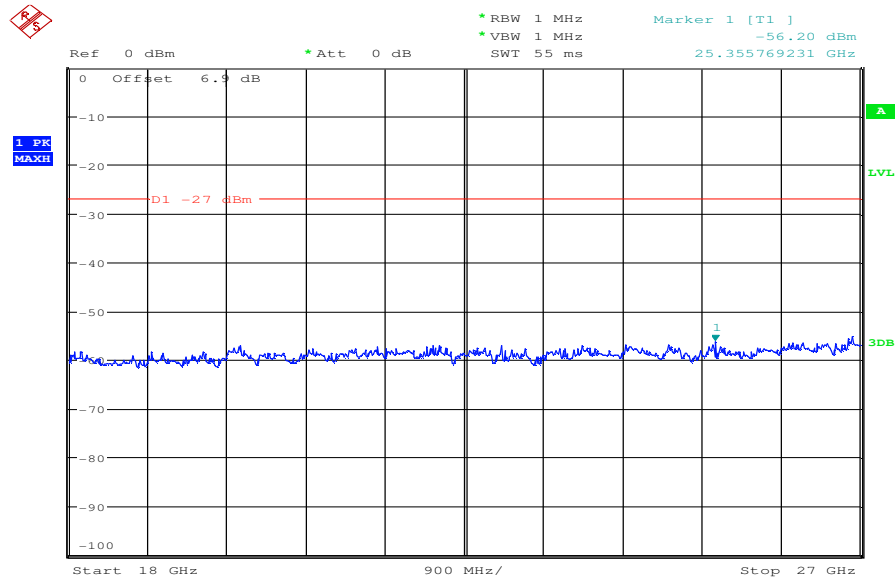


Plot 31: TX mode, mid channel – 5240 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



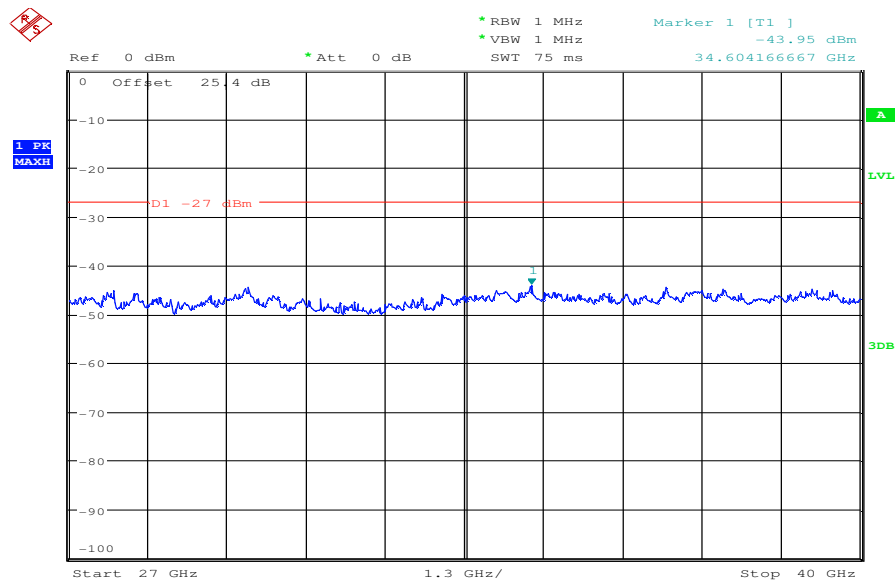
Date: 5.AUG.2010 07:07:16

Plot 32: TX mode, mid channel – 5240 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)



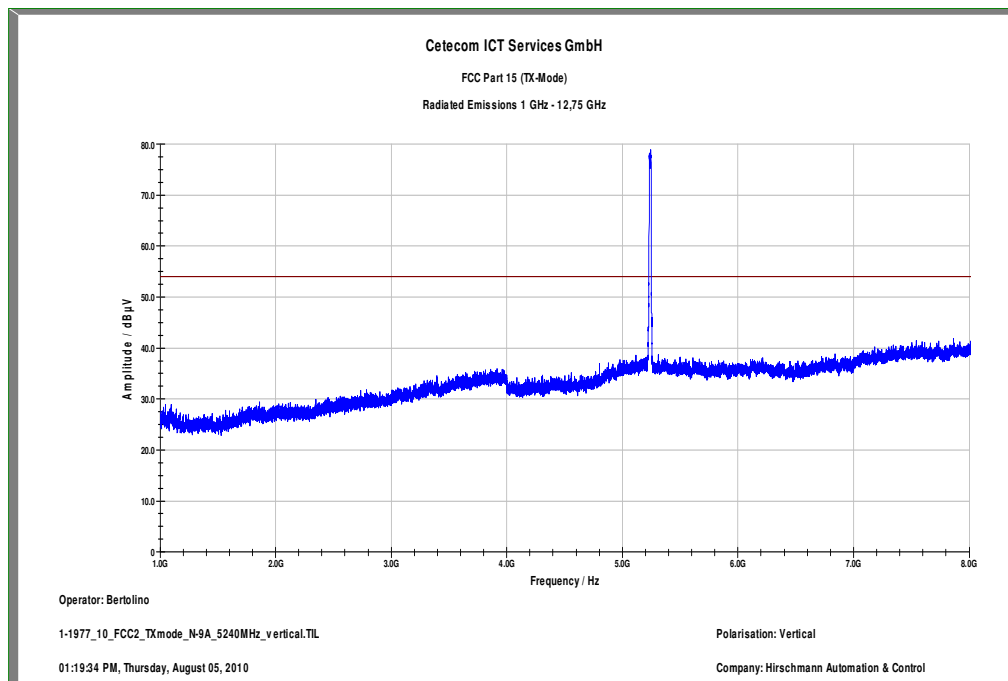
Date: 5.AUG.2010 07:33:49

Plot 33: TX mode, mid channel – 5240 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

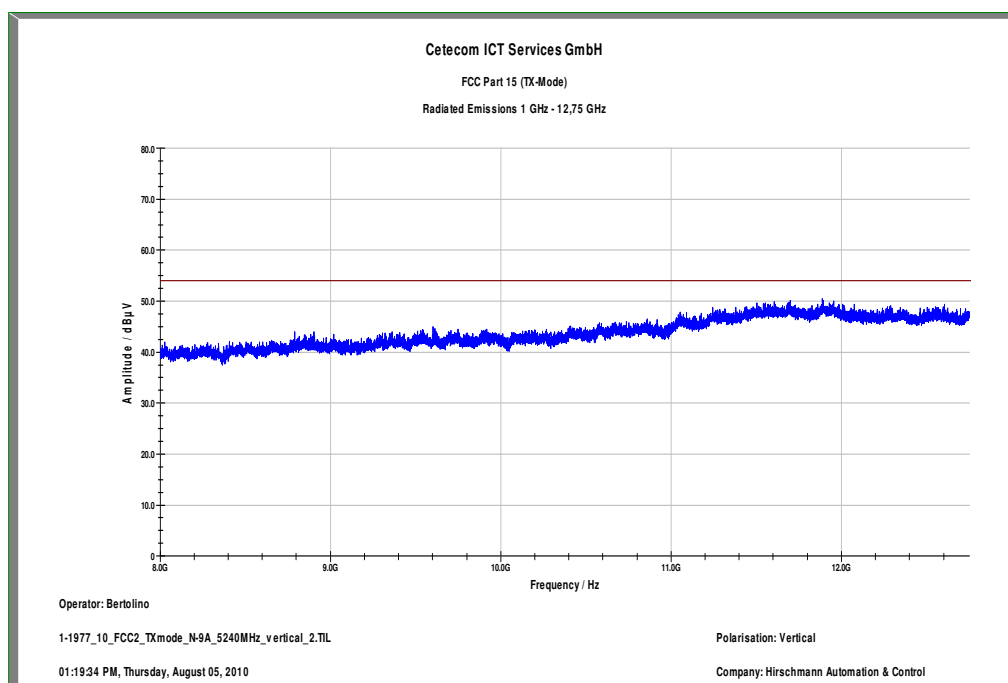


Date: 5.AUG.2010 07:43:02

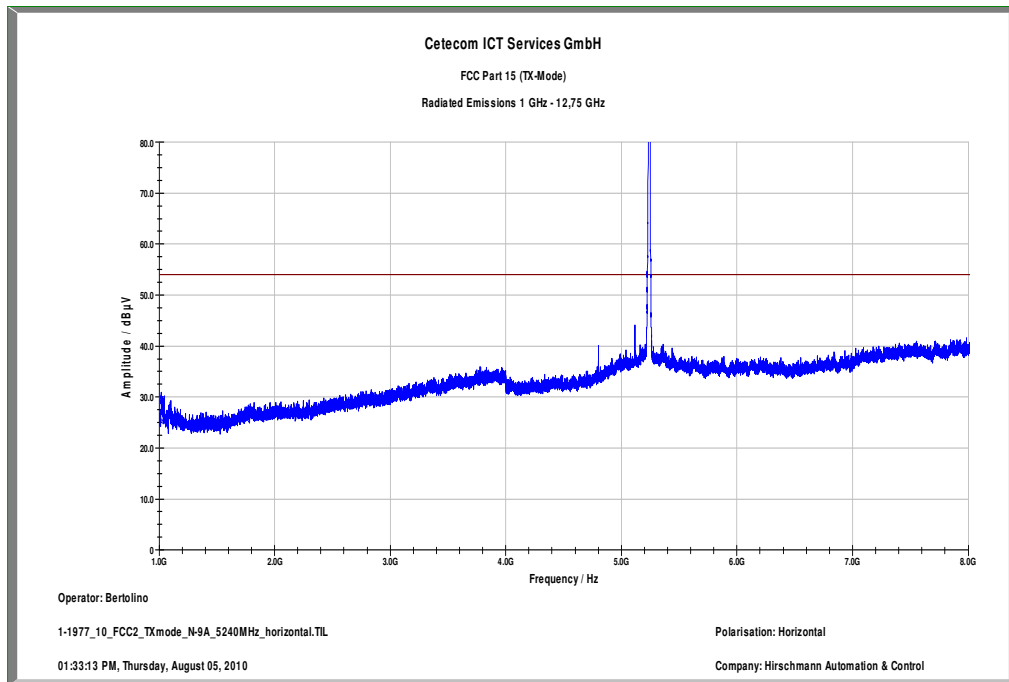
Plot 34: TX mode, mid channel – 5240 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)



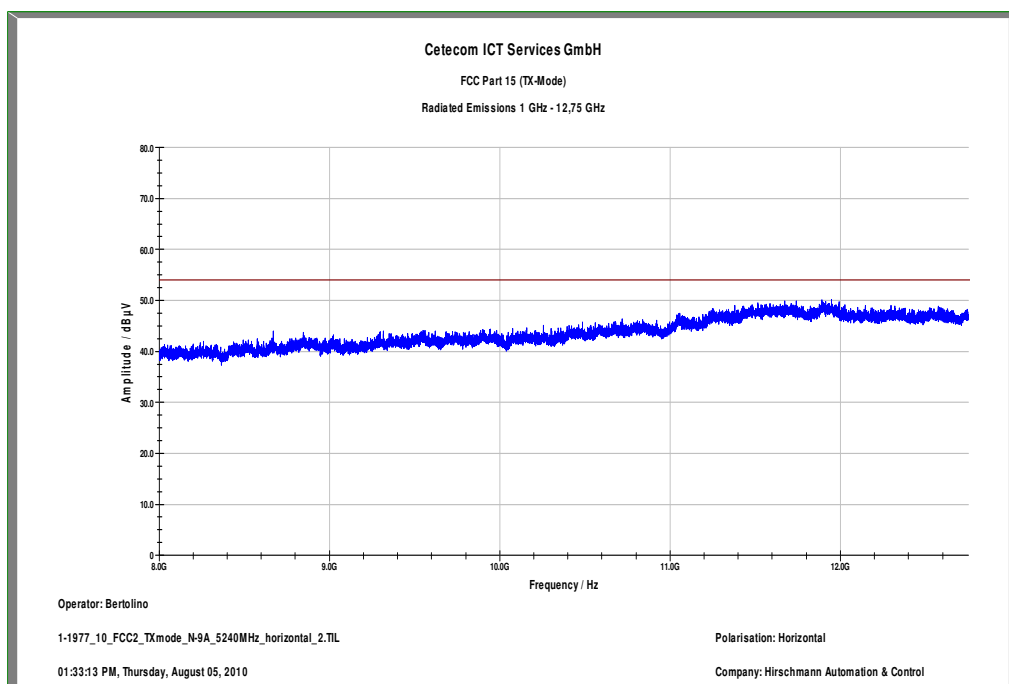
Plot 35: TX mode, mid channel – 5240 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)



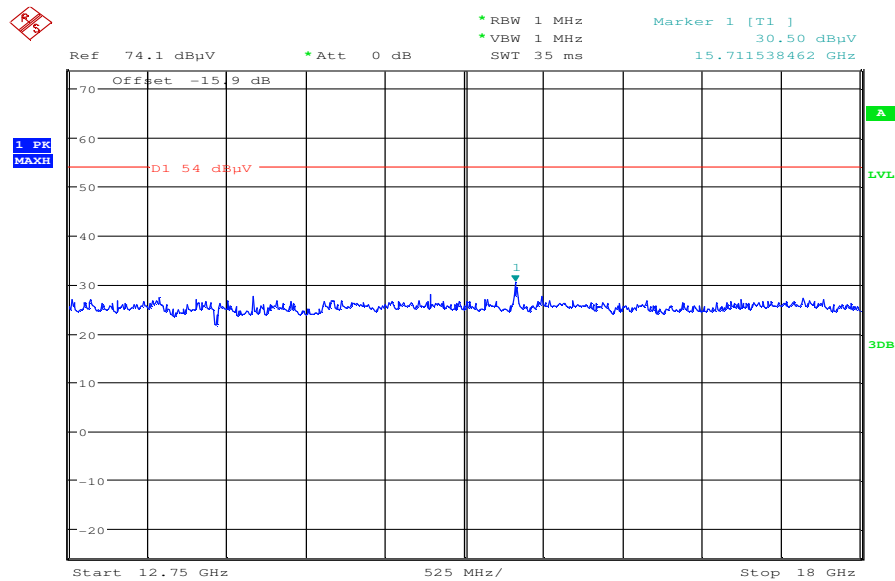
Plot 36: TX mode, mid channel – 5240 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)



Plot 37: TX mode, mid channel – 5240 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

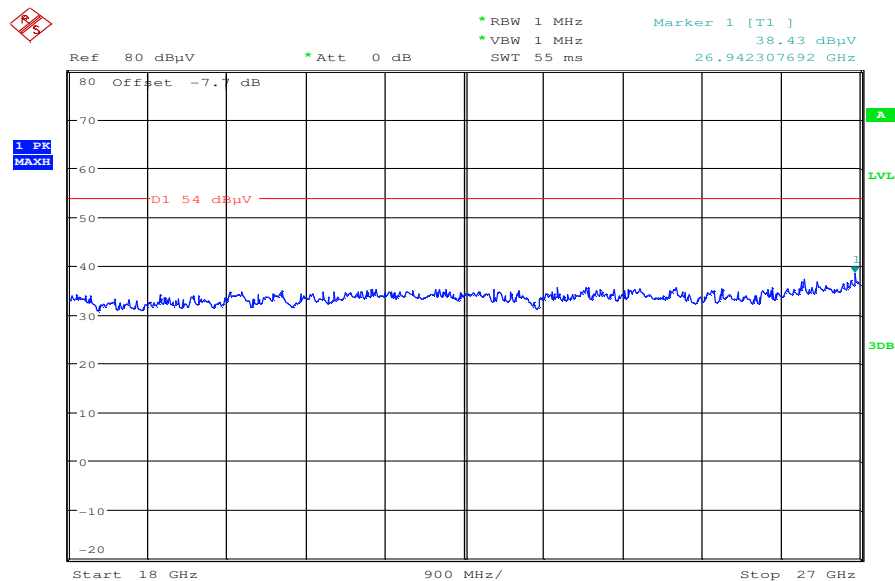


Plot 38: TX mode, mid channel – 5240 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



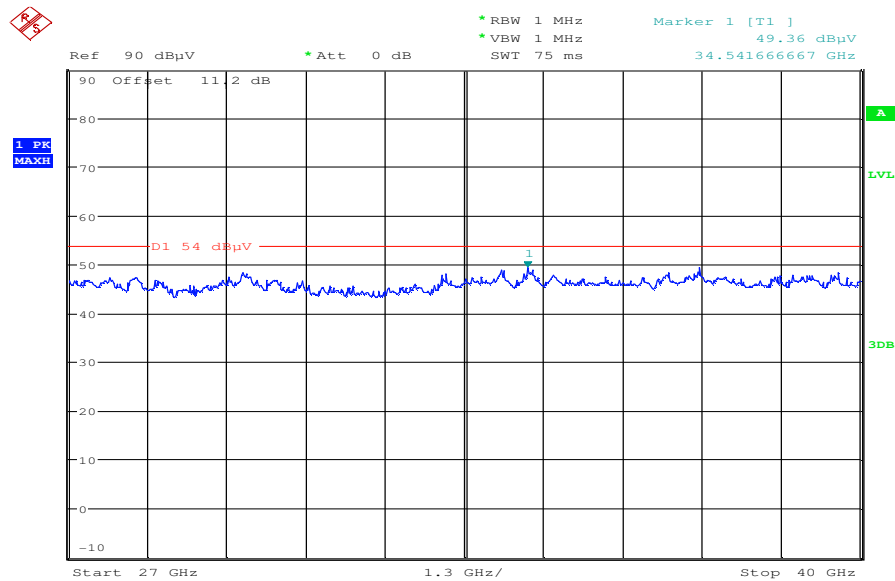
Date: 4.AUG.2010 09:43:47

Plot 39: TX mode, mid channel – 5240 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:46:15

Plot 40: TX mode, mid channel – 5240 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:05:25

Antenna: BAT-ANT-N-6ABG-IP65

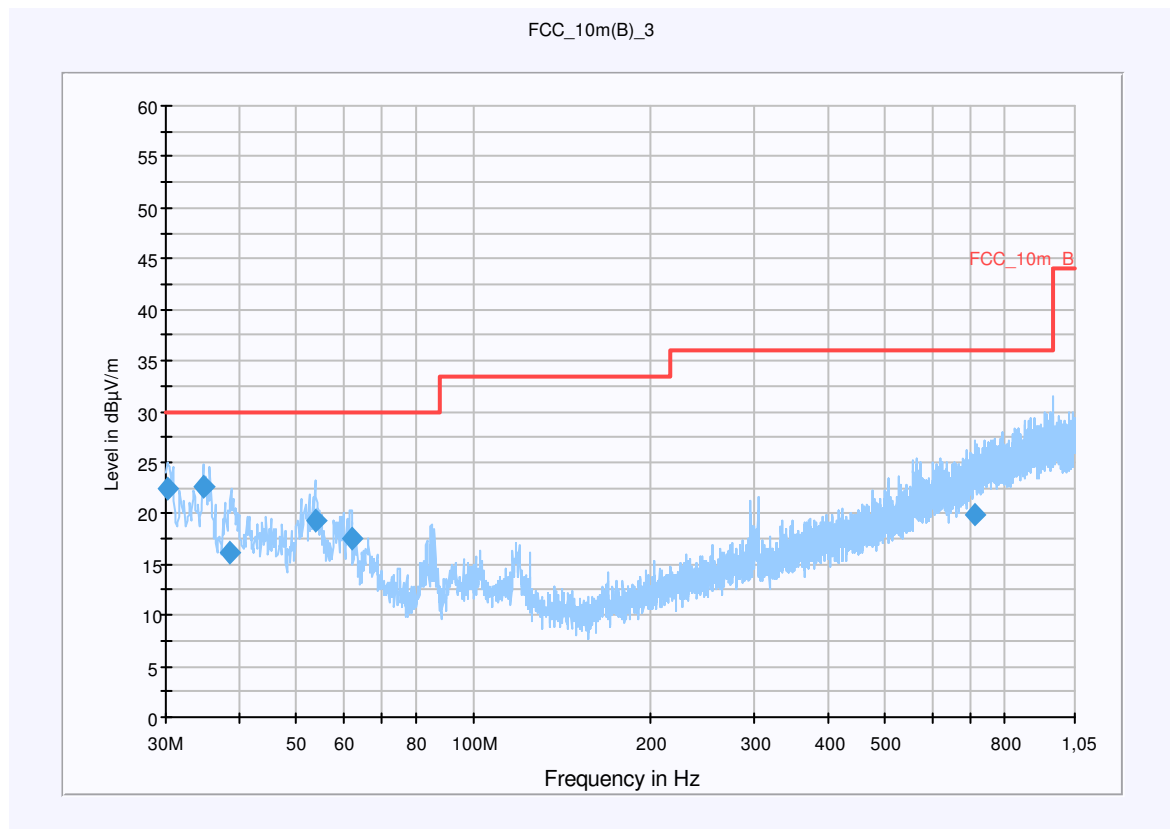
Plot 1: TX mode, low channel – 5180 MHz, 30 MHz – 1GHz, vertical & horizontal polarization (Part 15.209)

Common Information

EUT: BAT-ANT-N-6ABG-IP65 + BAT54-F
 Serial Number: + 943926022010110004
 Test Description: FCC part 15 Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 36
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
Subrange **Detectors** **IF Bandwidth** **Meas. Time** **Receiver**
 30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



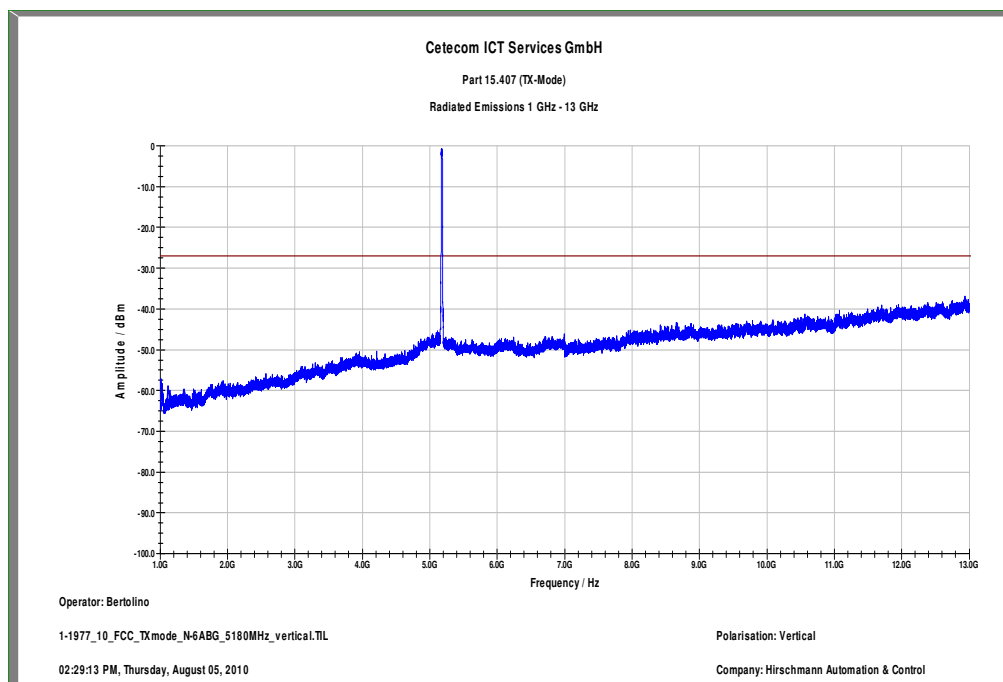
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.294456	22.4	15000.000	120.000	98.0	V	17.0	12.5	7.6	30.0	
34.789950	22.6	15000.000	120.000	115.0	V	301.0	13.0	7.4	30.0	
38.627700	16.0	15000.000	120.000	212.0	V	45.0	13.3	14.0	30.0	
54.160350	19.3	15000.000	120.000	220.0	V	316.0	13.0	10.7	30.0	
62.016600	17.4	15000.000	120.000	98.0	V	312.0	11.1	12.6	30.0	
711.984450	19.9	15000.000	120.000	140.0	H	299.0	22.7	16.1	36.0	

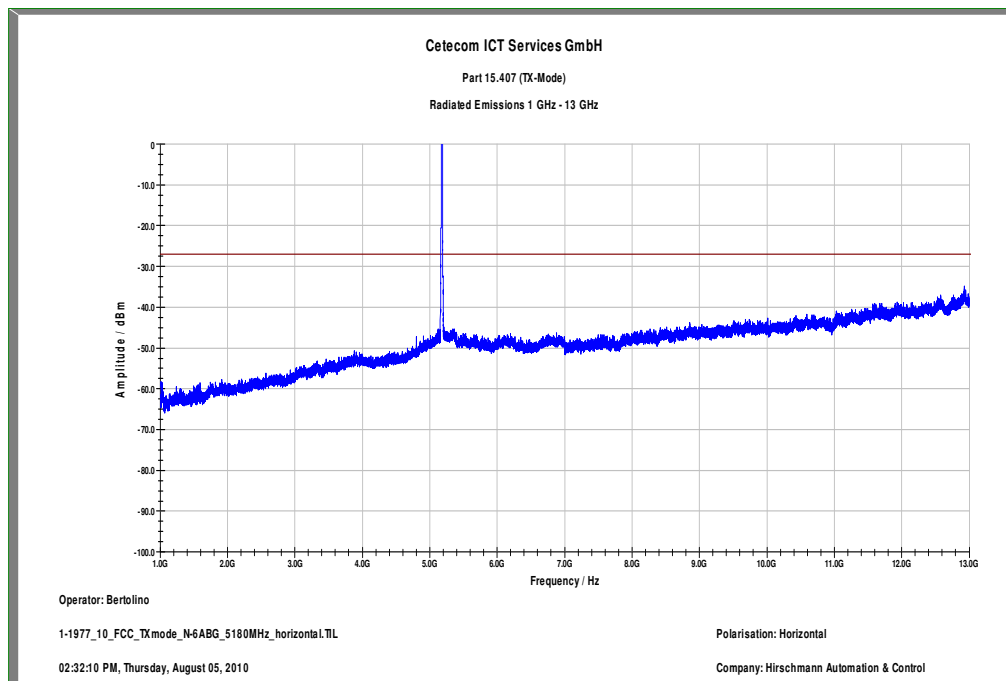
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

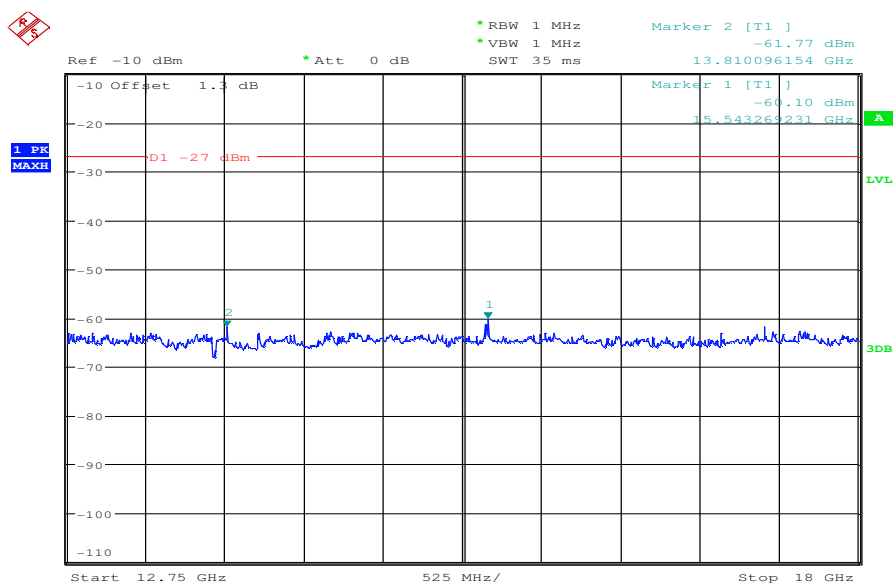
EMC 32 Version 8.10.00

Plot 2: TX mode, low channel – 5180 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 3: TX mode, low channel – 5180 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

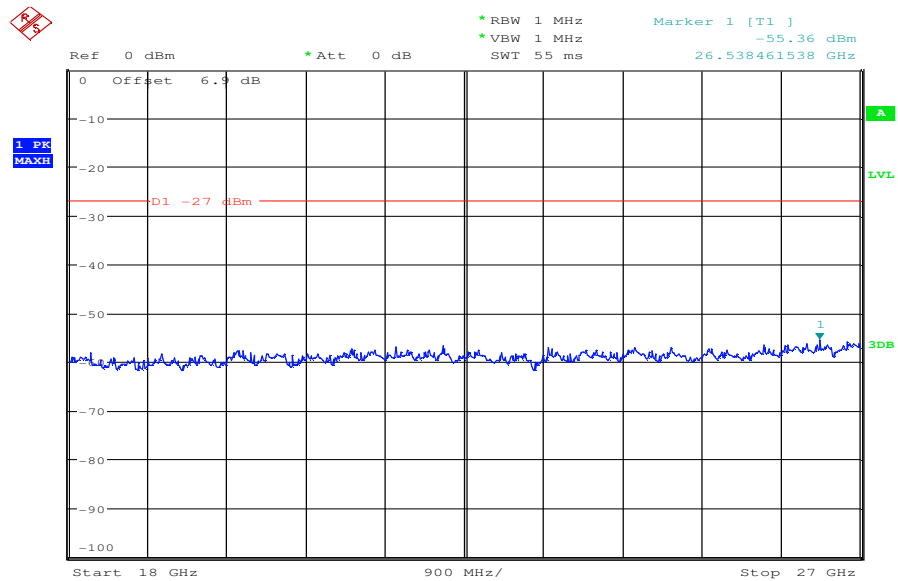


Plot 4: TX mode, low channel – 5180 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



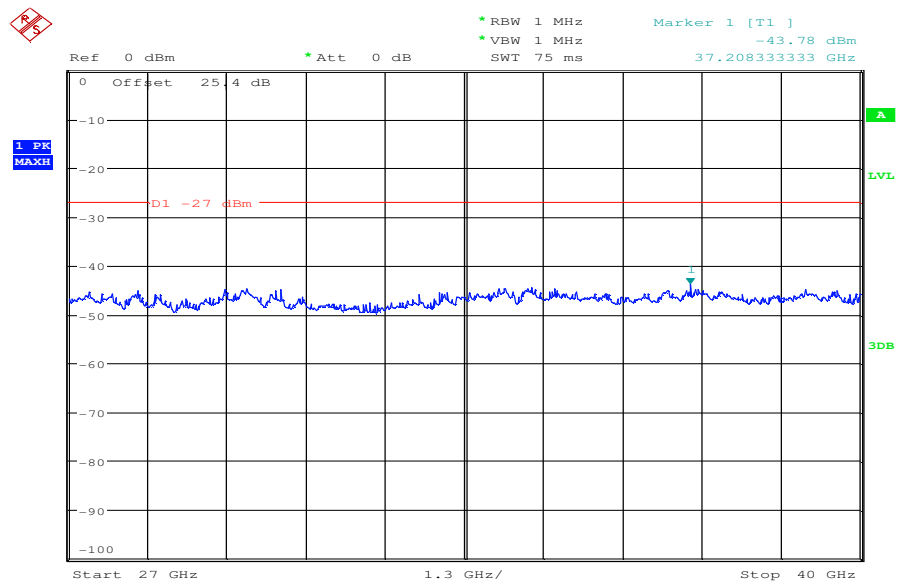
Date: 5.AUG.2010 07:14:36

Plot 5: TX mode, low channel – 5180 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)



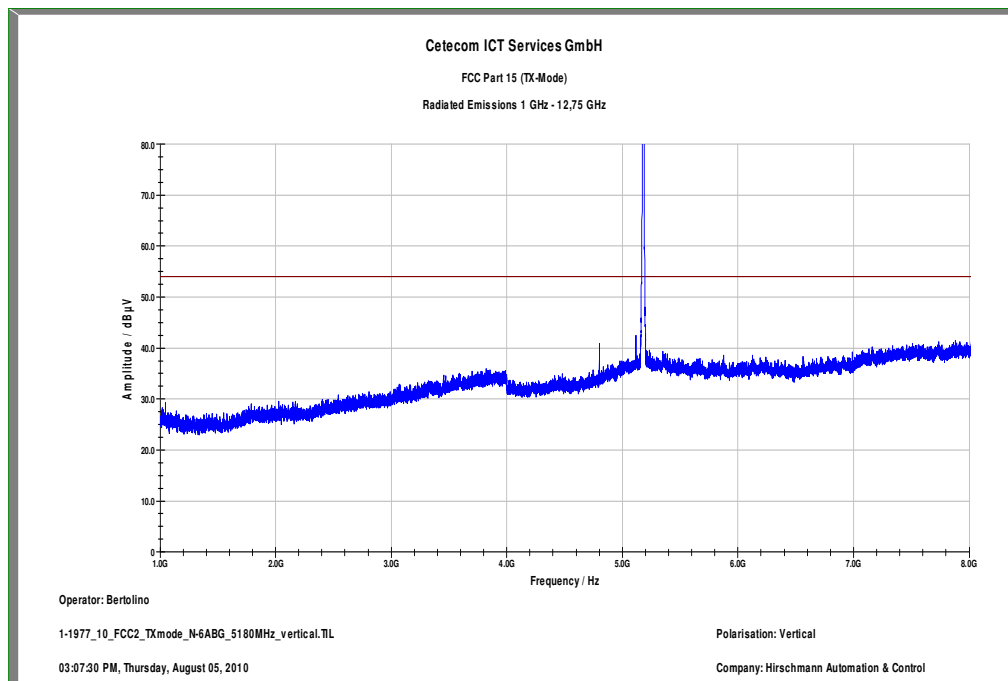
Date: 5.AUG.2010 07:25:35

Plot 6: TX mode, low channel – 5180 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

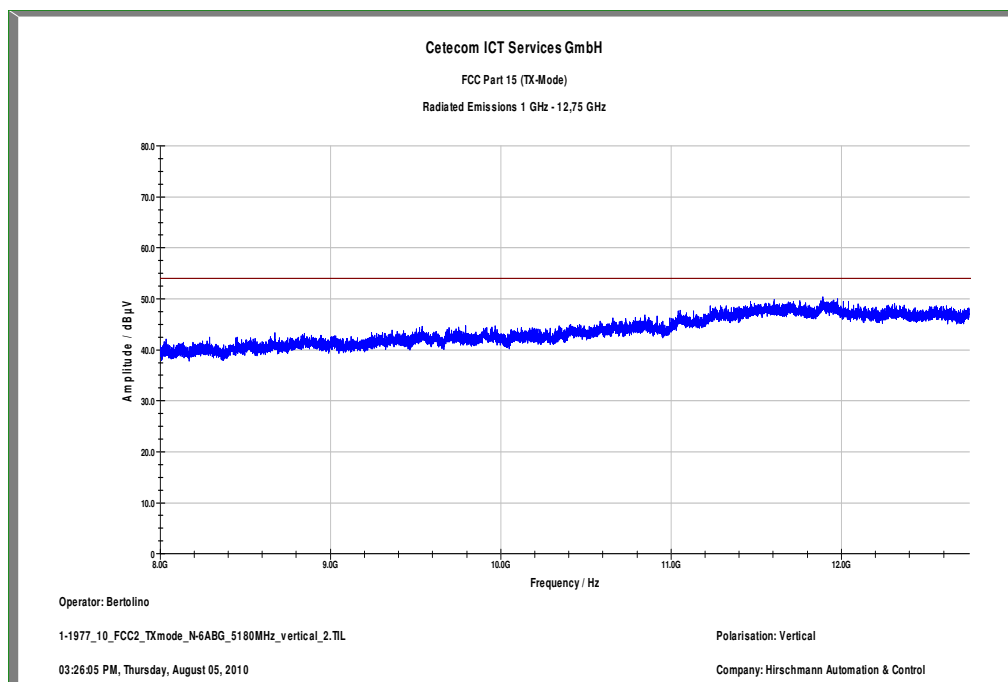


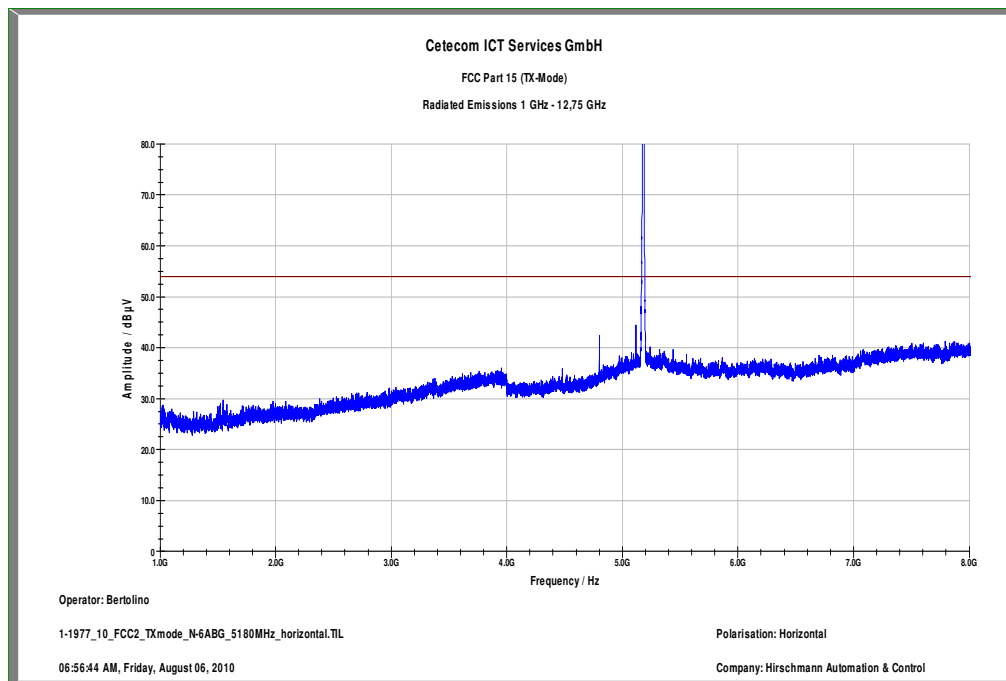
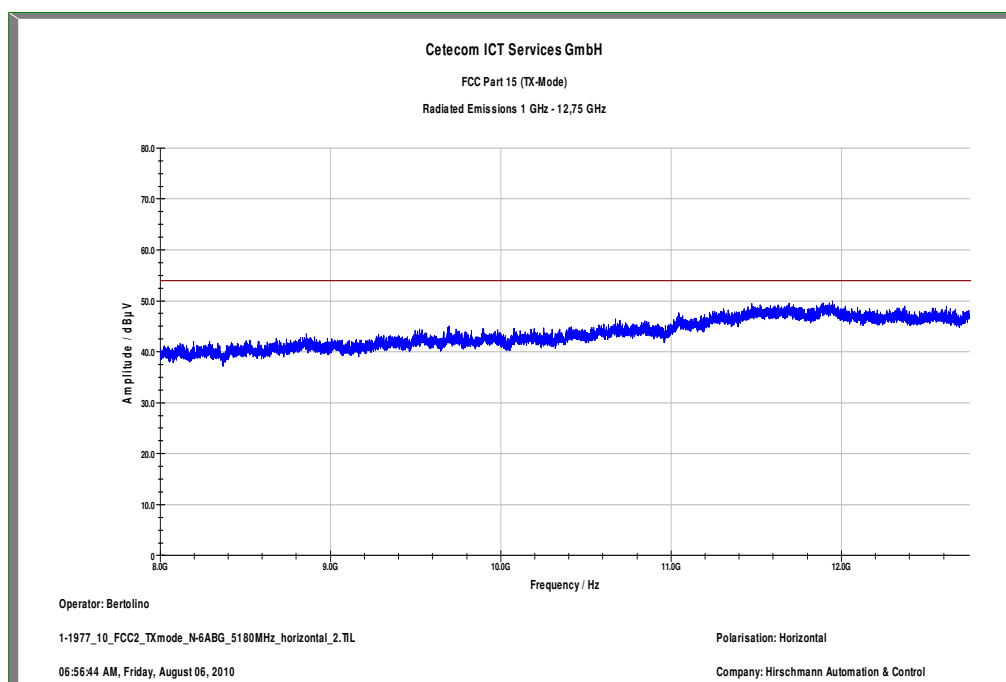
Date: 5.AUG.2010 07:52:55

Plot 7: TX mode, low channel – 5180 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)

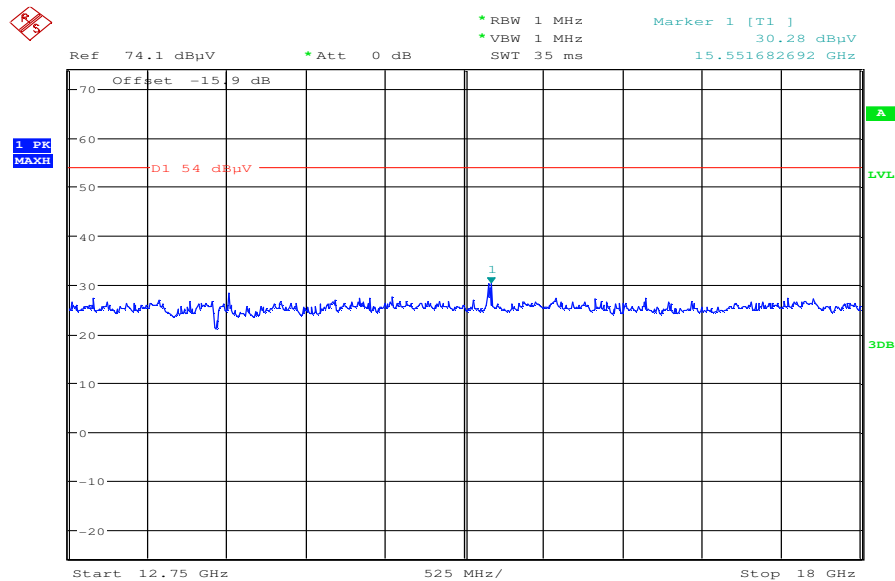


Plot 8: TX mode, low channel – 5180 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)



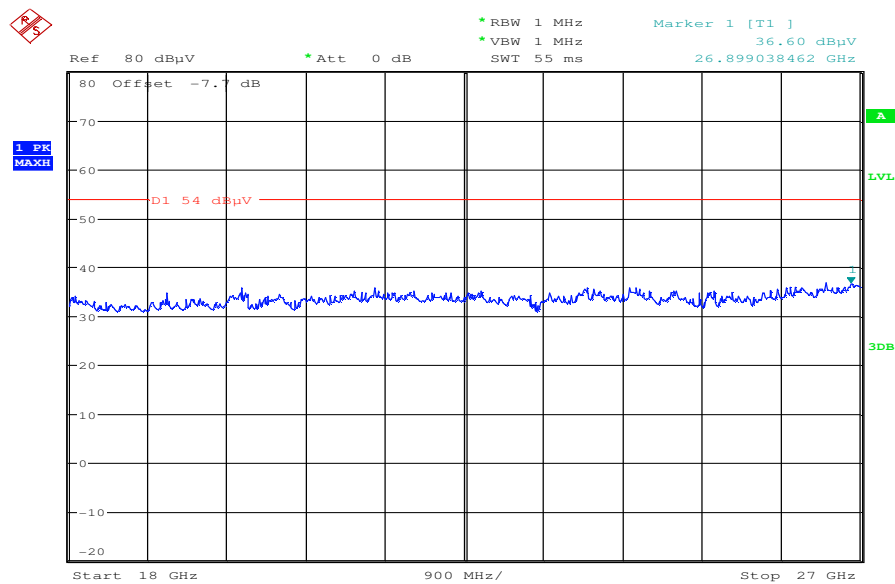
Plot 9: TX mode, low channel – 5180 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 10:** TX mode, low channel – 5180 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 11: TX mode, low channel – 5180 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



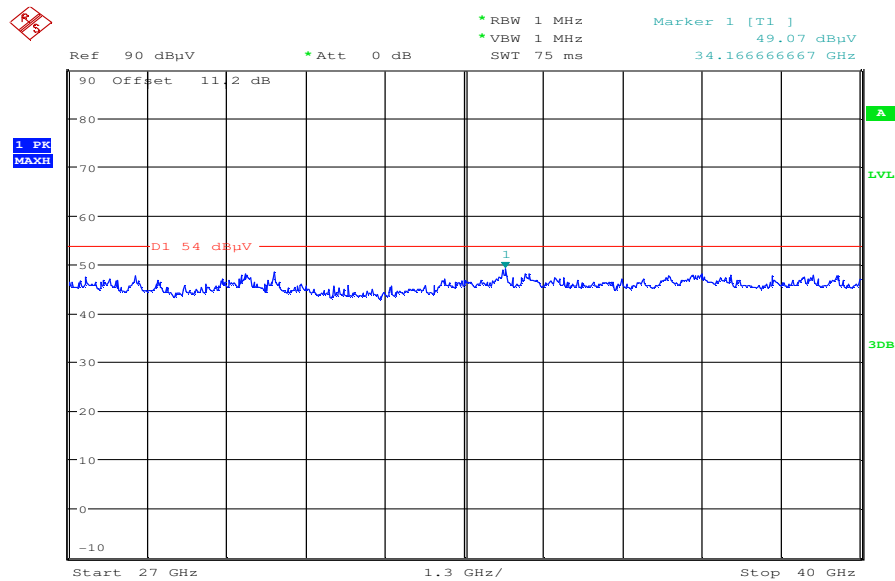
Date: 4.AUG.2010 09:39:37

Plot 12: TX mode, low channel – 5180 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



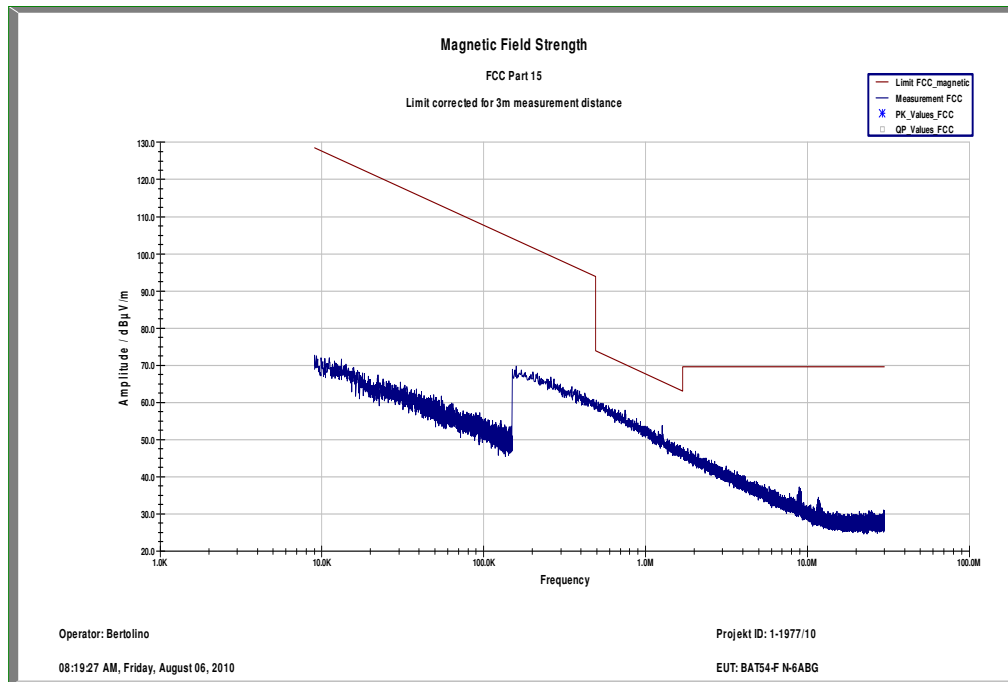
Date: 4.AUG.2010 09:49:54

Plot 13: TX mode, low channel – 5180 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:00:26

Plot 14: TX mode, mid channel – 5220 MHz, 9 kHz – 30 MHz, magnetic



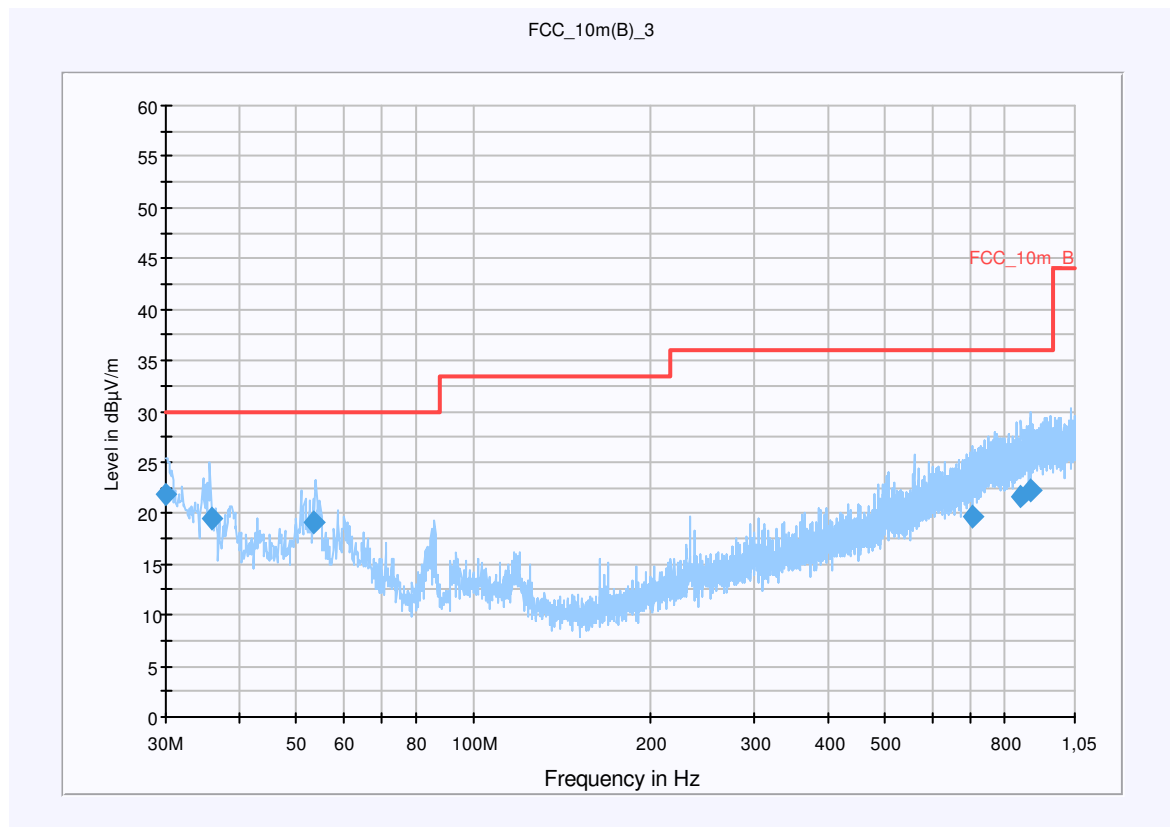
Plot 15: TX mode, mid channel – 5220 MHz, 30 MHz – 1GHz, vertical & horizontal polarization

Common Information

EUT: BAT-ANT-N-6ABG-IP65 + BAT54-F
 Serial Number: + 943926022010110004
 Test Description: FCC part 15 Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 44
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
 Subrange: 30 MHz - 1,05 GHz
 Detectors: QuasiPeak
 IF Bandwidth: 120 kHz
 Meas. Time: 15 s
 Receiver: Receiver



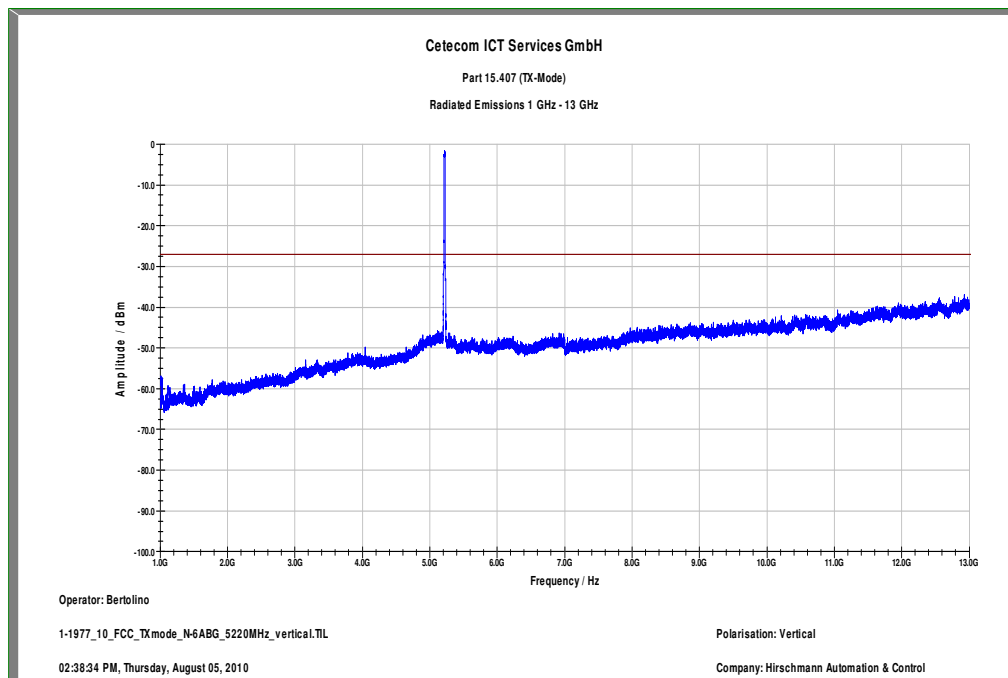
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.064475	21.8	15000.000	120.000	174.0	V	141.0	12.5	8.2	30.0	
35.842800	19.4	15000.000	120.000	108.0	V	172.0	13.1	10.6	30.0	
53.551050	19.2	15000.000	120.000	220.0	V	48.0	13.0	10.8	30.0	
706.127100	19.8	15000.000	120.000	121.0	H	286.0	22.6	16.2	36.0	
852.963150	21.7	15000.000	120.000	160.0	H	288.0	24.6	14.3	36.0	
885.511650	22.2	15000.000	120.000	220.0	H	213.0	25.0	13.8	36.0	

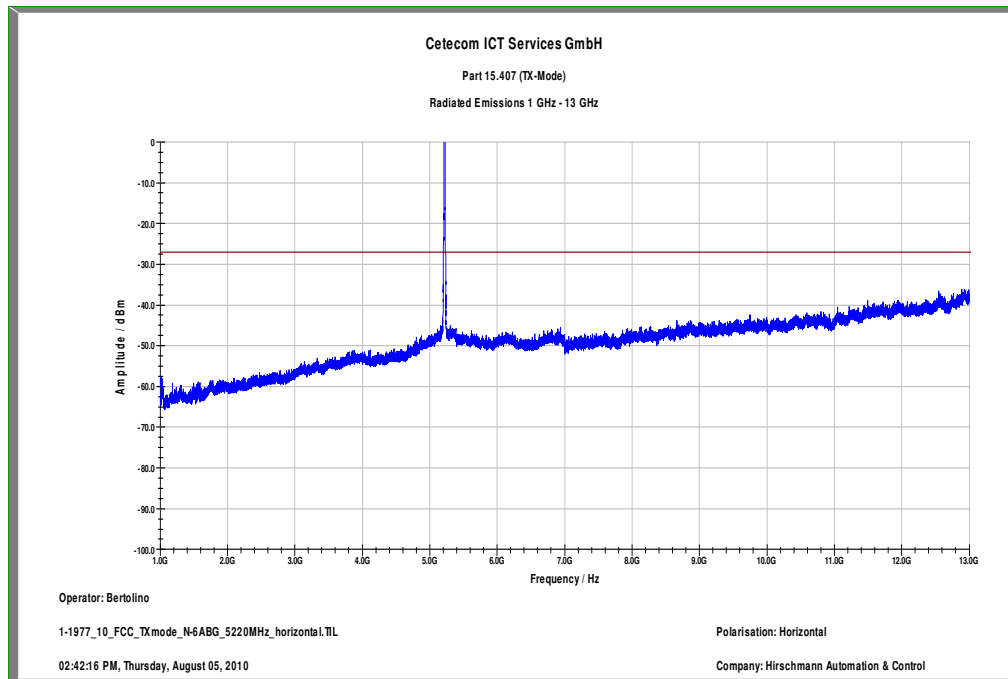
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

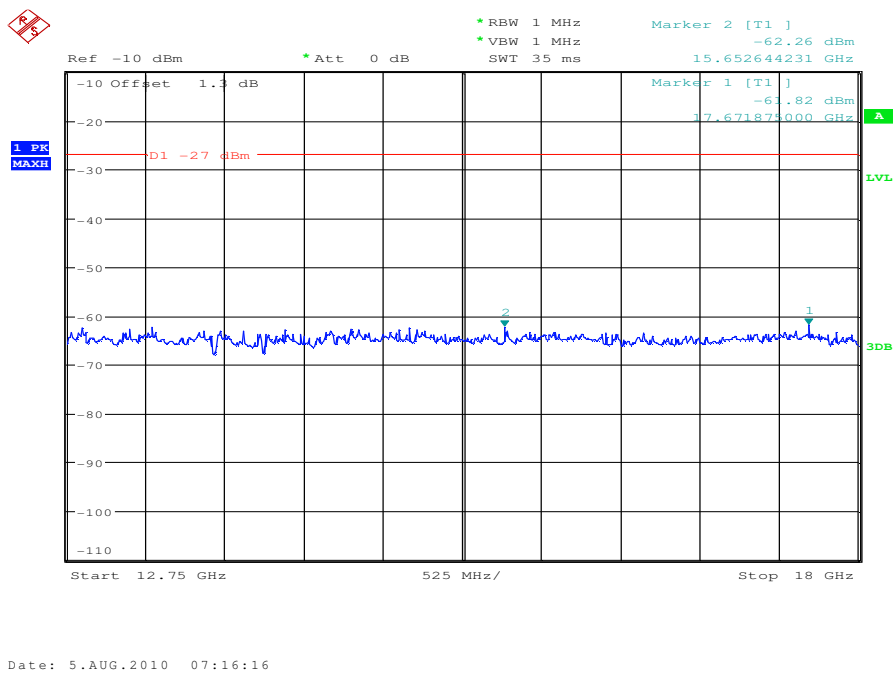
EMC 32 Version 8.10.00

Plot 16: TX mode, mid channel – 5220 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

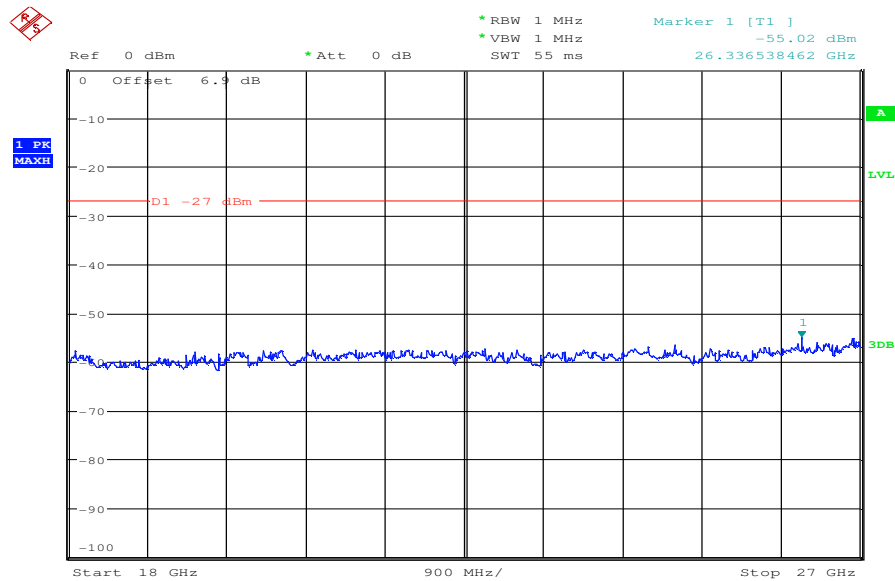
Plot 17: TX mode, mid channel – 5220 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)



Plot 18: TX mode, mid channel – 5220 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)

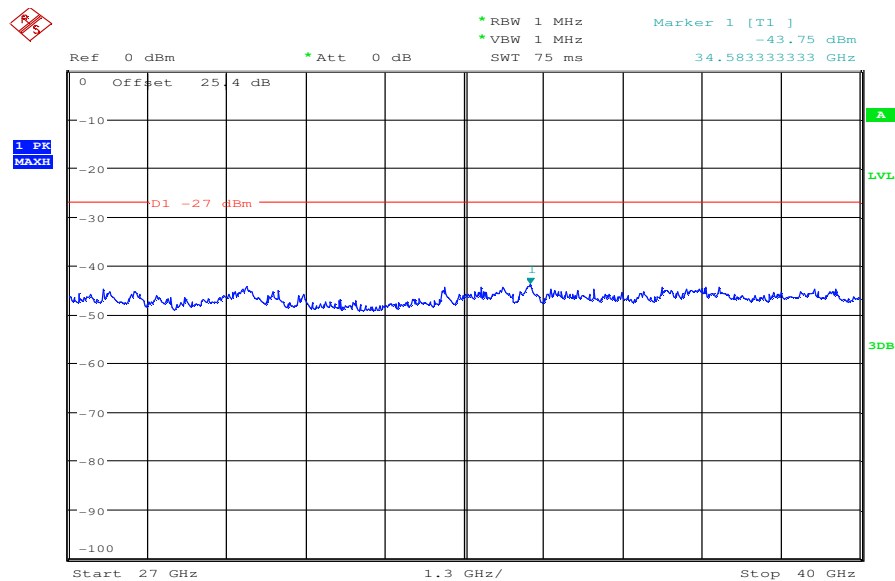


Plot 19: TX mode, mid channel – 5220 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)

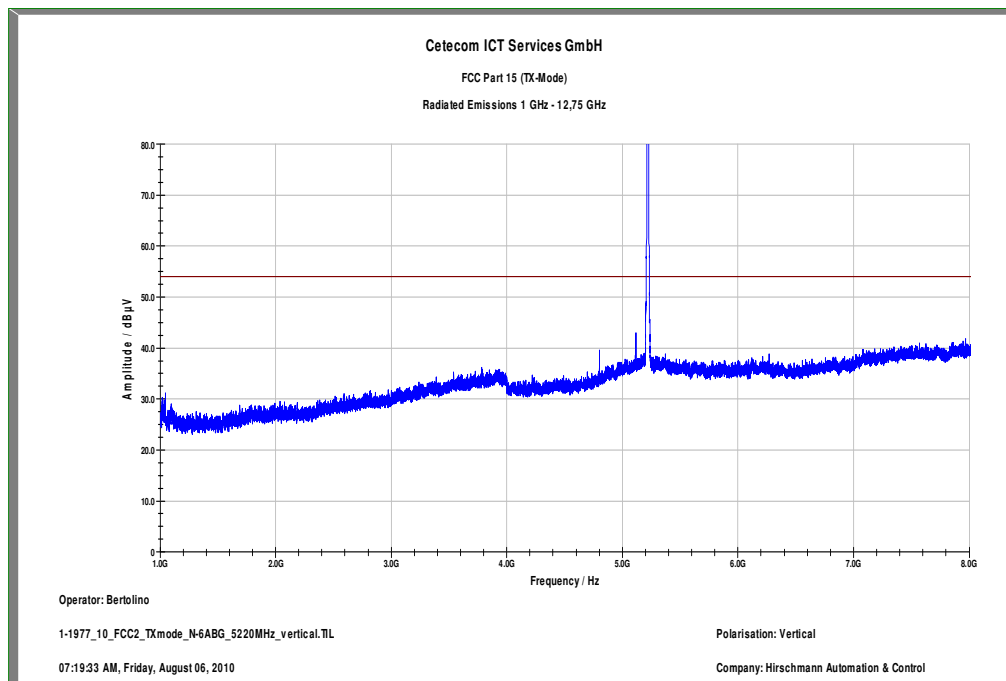
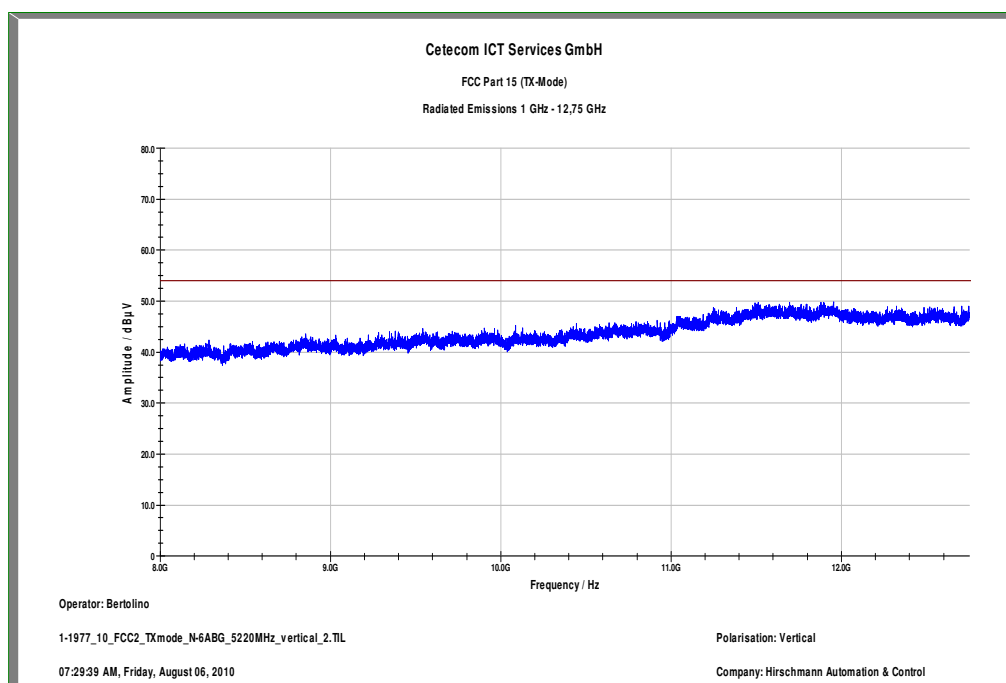


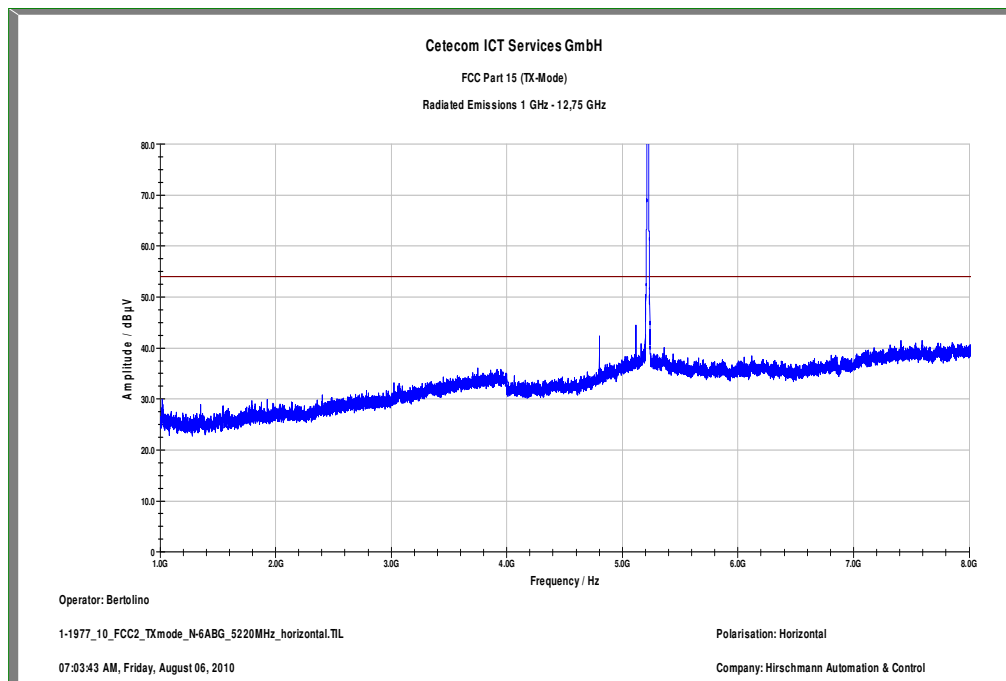
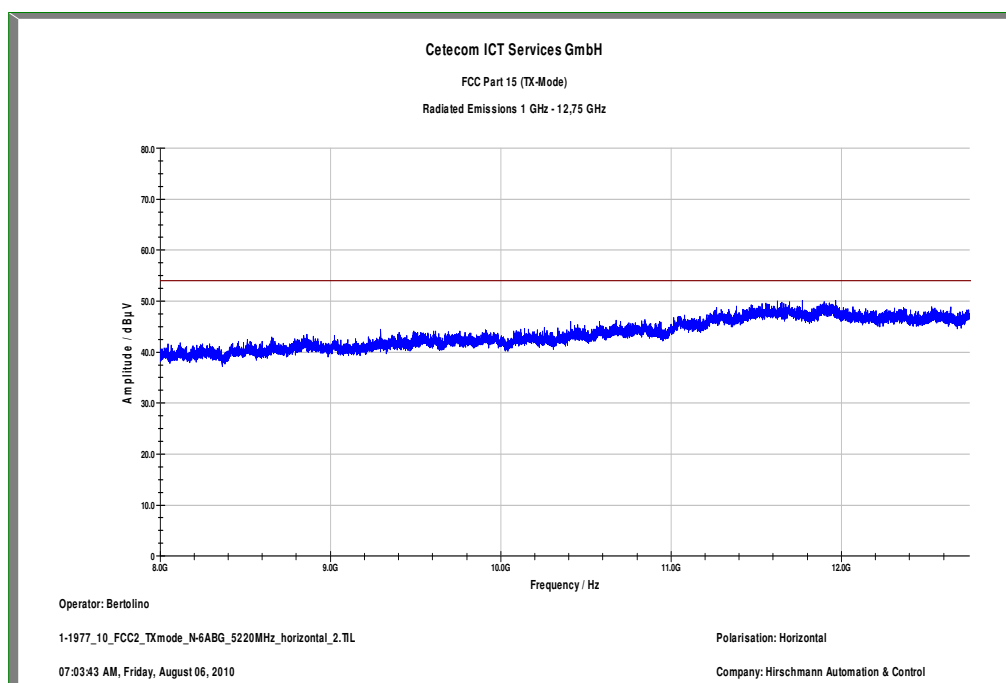
Date: 5.AUG.2010 07:24:37

Plot 20: TX mode, mid channel – 5220 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

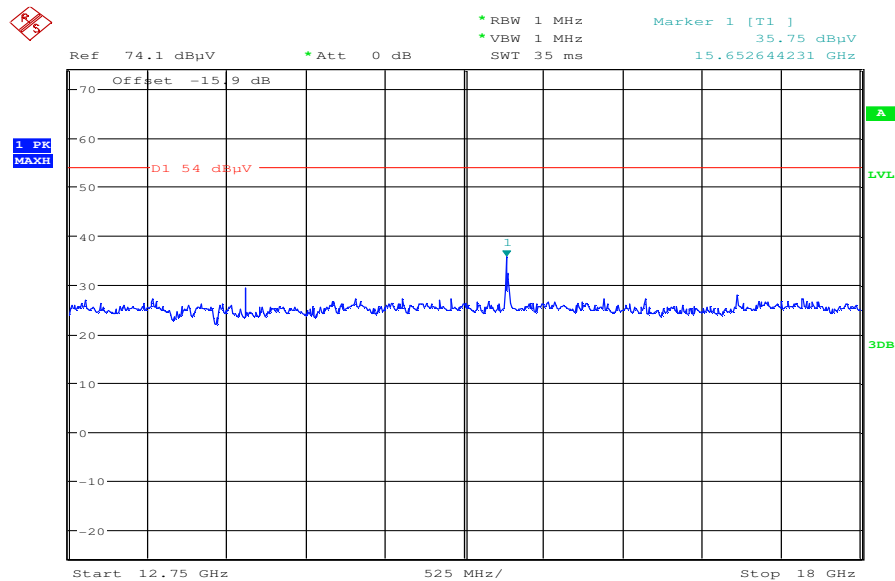


Date: 5.AUG.2010 07:51:35

Plot 21: TX mode, mid channel – 5220 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)**Plot 22:** TX mode, mid channel – 5220 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)

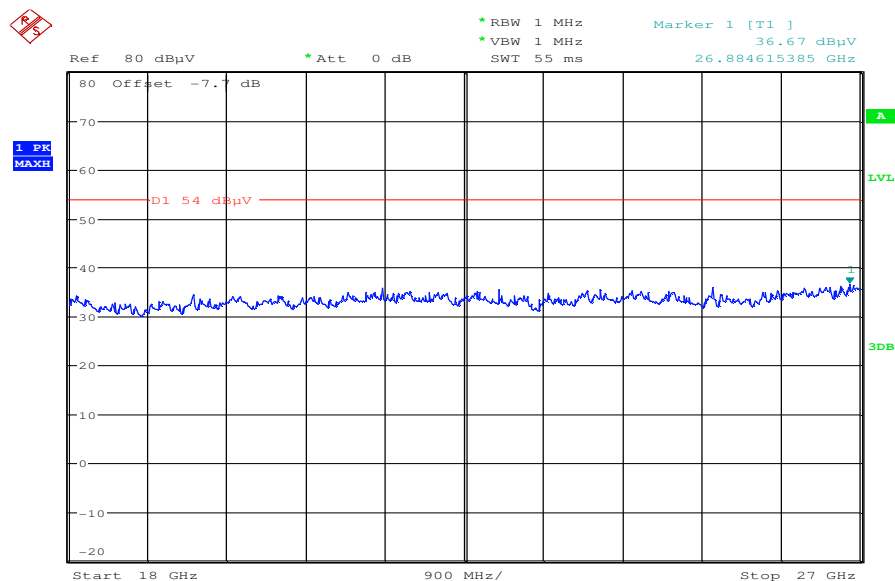
Plot 23: TX mode, mid channel – 5220 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 24:** TX mode, mid channel – 5220 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 25: TX mode, mid channel – 5220 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



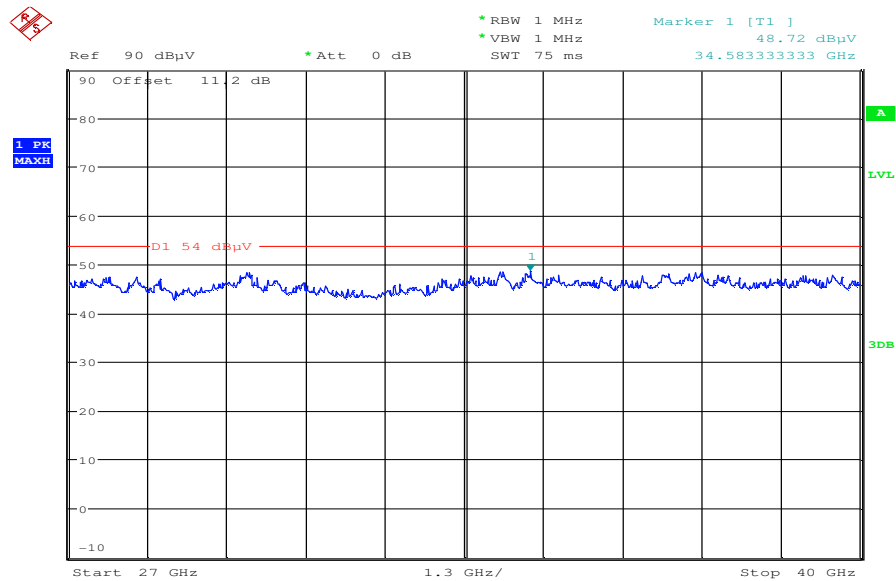
Date: 4.AUG.2010 09:38:10

Plot 26: TX mode, mid channel – 5220 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 09:51:05

Plot 27: TX mode, mid channel – 5220 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:01:28

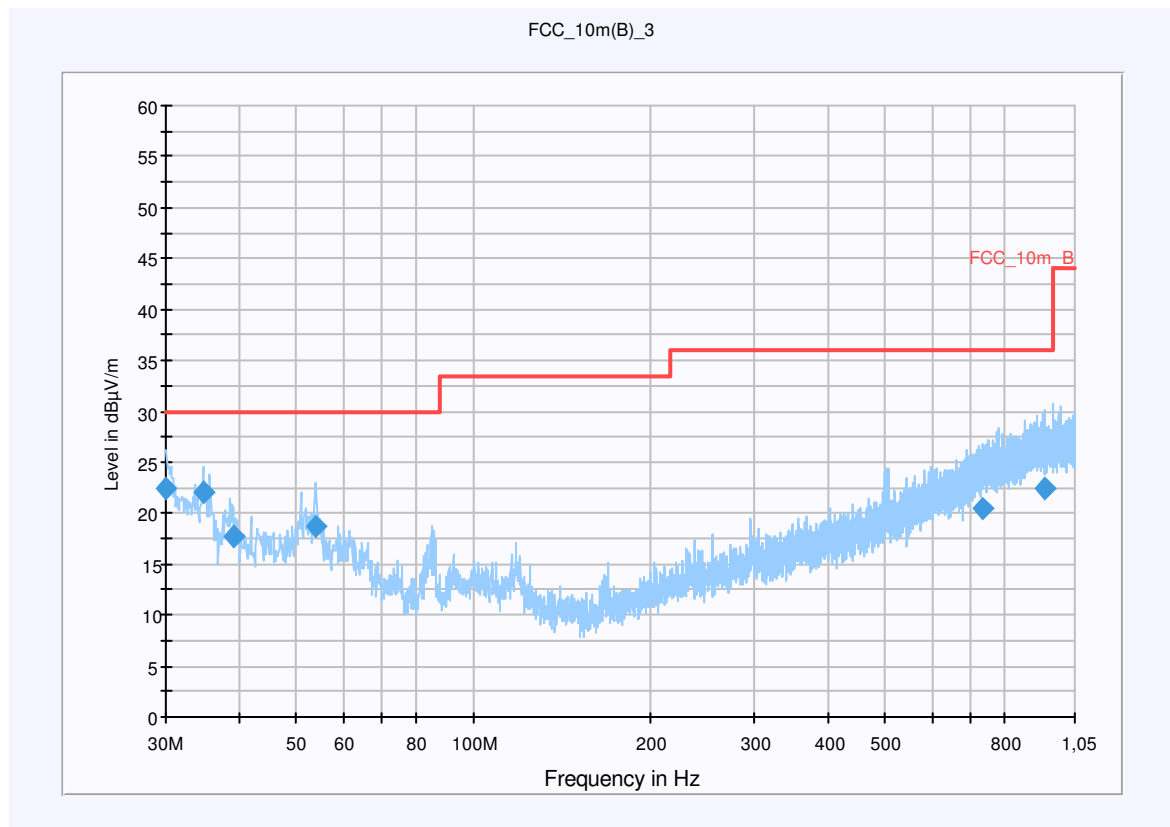
Plot 28: TX mode, high channel – 5240 MHz, 30 MHz – 1GHz, vertical & horizontal polarization

Common Information

EUT: BAT-ANT-N-6ABG-IP65 + BAT54-F
 Serial Number: + 943926022010110004
 Test Description: FCC part 15 Class B @ 10m
 Operating Conditions: WLAN-Testmode; Cont. Tx, Ch: 48
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
 Subrange: 30 MHz - 1,05 GHz
 Detectors: QuasiPeak
 IF Bandwidth: 120 kHz
 Meas. Time: 15 s
 Receiver: Receiver



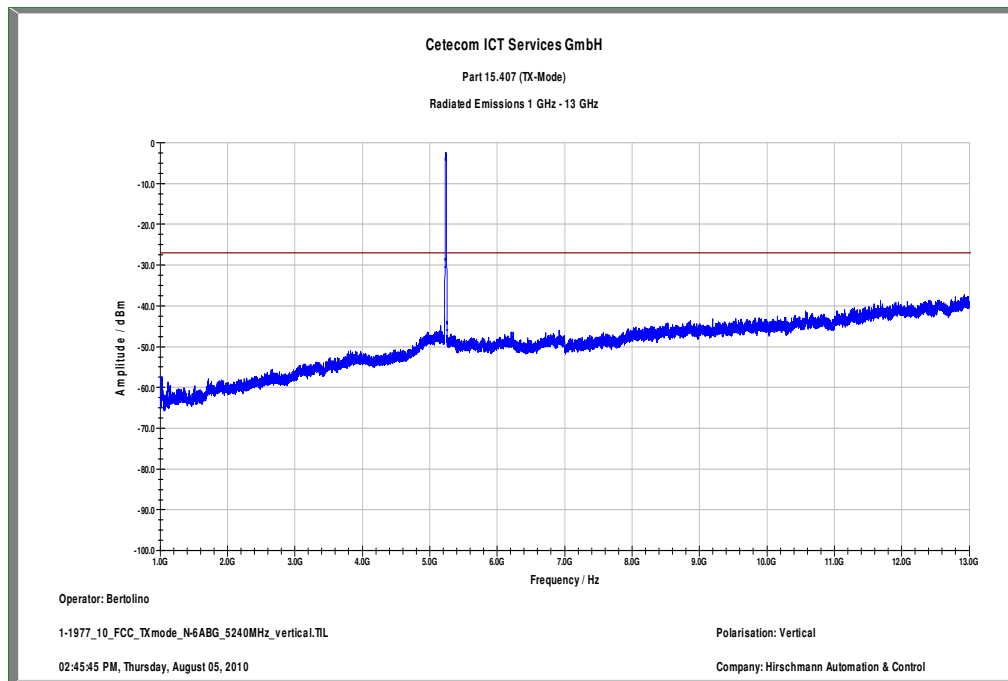
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.087825	22.5	15000.000	120.000	179.0	V	59.0	12.5	7.5	30.0	
34.747950	21.9	15000.000	120.000	136.0	V	223.0	13.0	8.1	30.0	
39.013500	17.8	15000.000	120.000	98.0	V	80.0	13.4	12.2	30.0	
53.880450	18.6	15000.000	120.000	220.0	V	63.0	13.0	11.4	30.0	
733.282500	20.4	15000.000	120.000	220.0	V	214.0	23.2	15.6	36.0	
932.062800	22.4	15000.000	120.000	98.0	H	66.0	25.3	13.6	36.0	

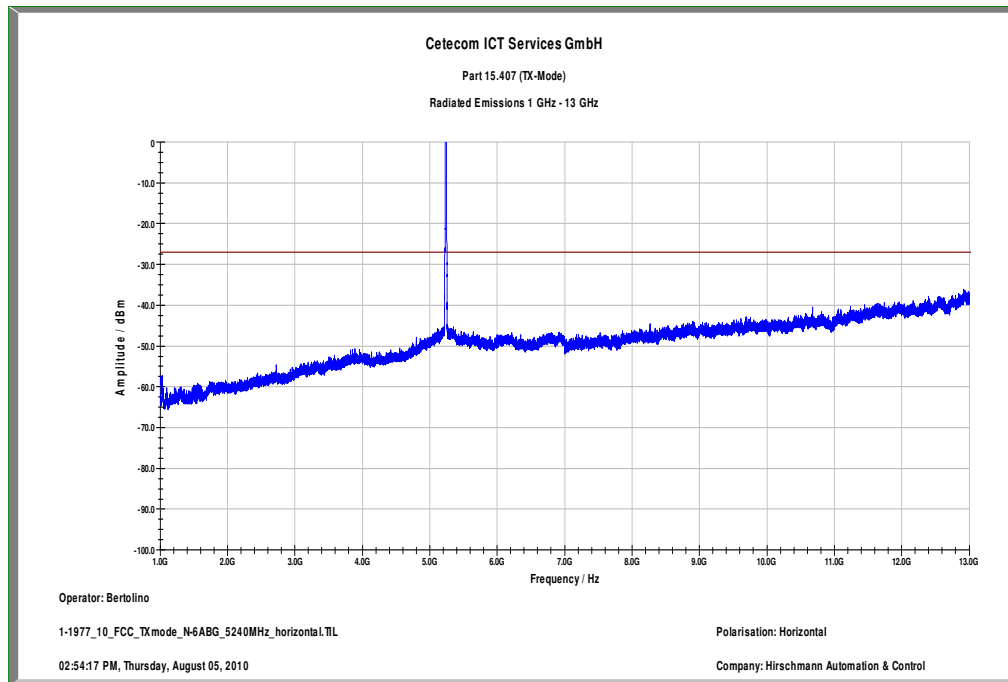
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

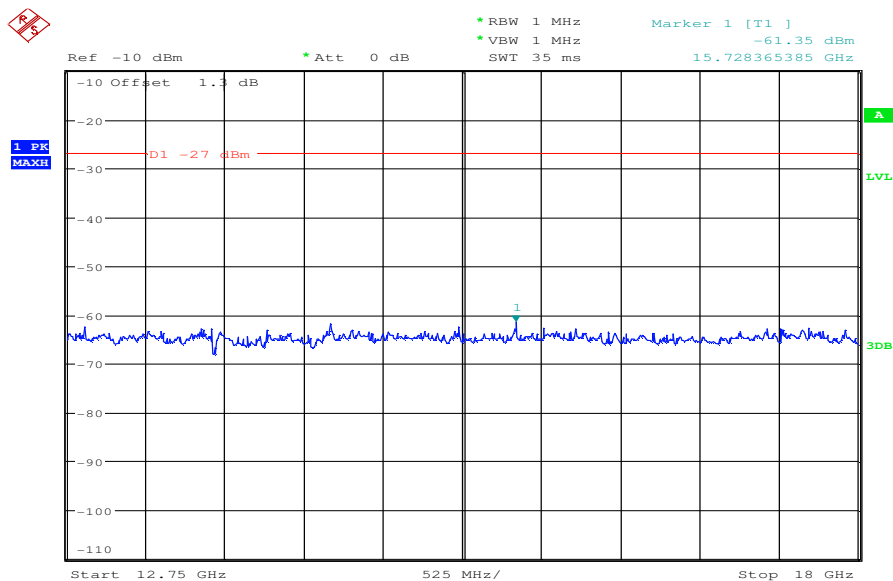
EMC 32 Version 8.10.00

Plot 29: TX mode, mid channel – 5240 MHz, 1 GHz – 13 GHz, vertical polarization (Part 15.407)

Plot 30: TX mode, mid channel – 5240 MHz, 1 GHz – 13 GHz, horizontal polarization (Part 15.407)

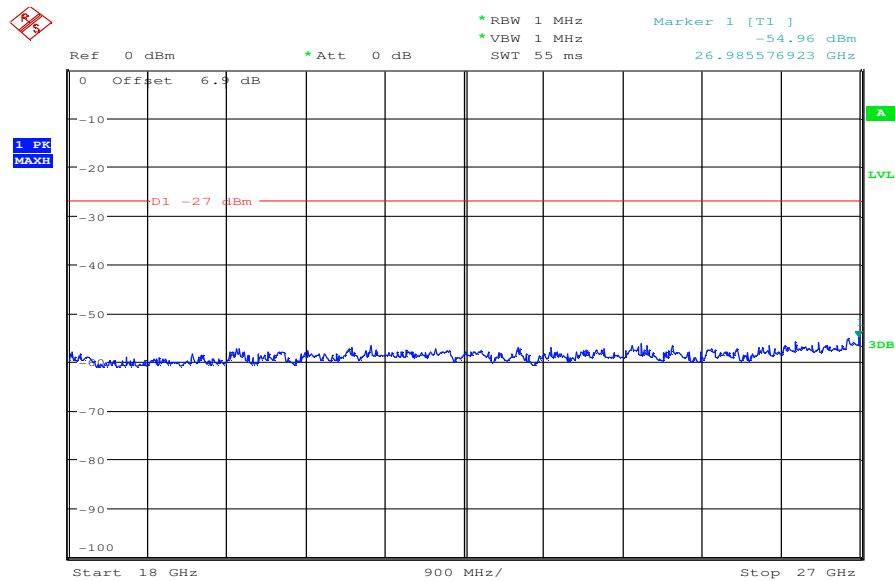


Plot 31: TX mode, mid channel – 5220 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



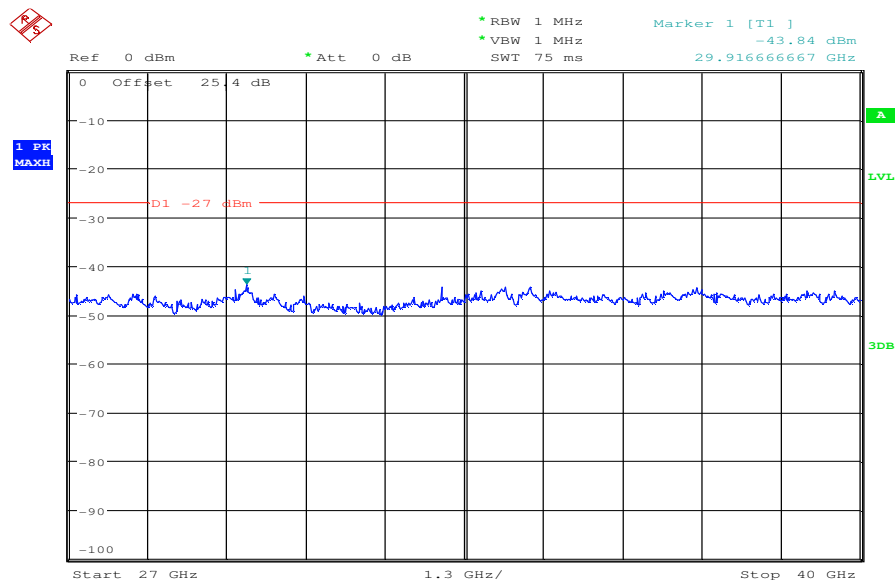
Date: 5.AUG.2010 07:17:23

Plot 32: TX mode, mid channel – 5240 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)

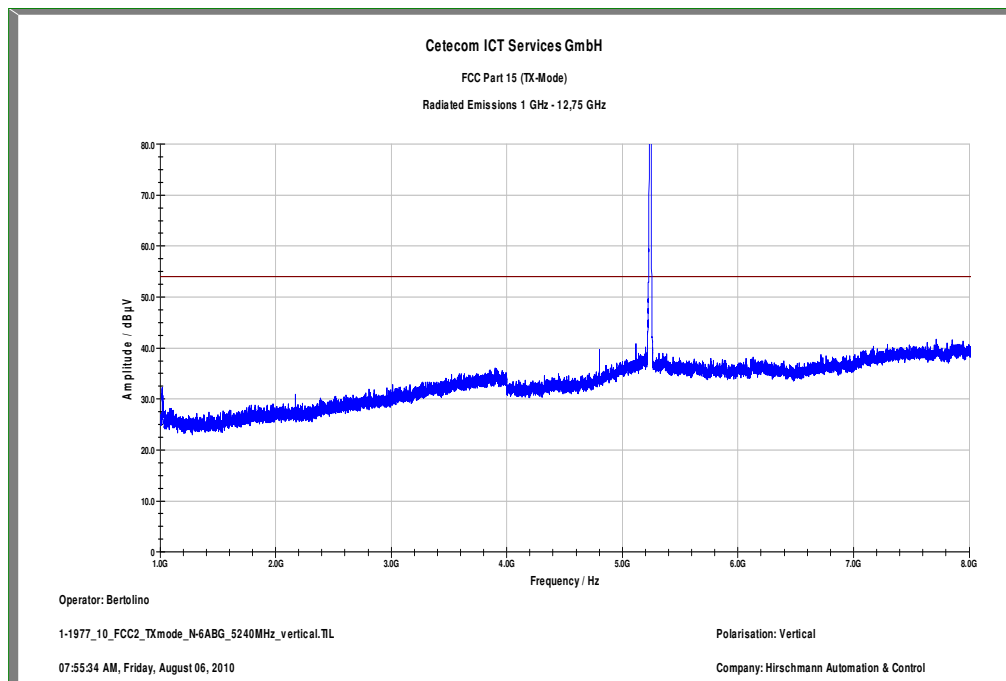
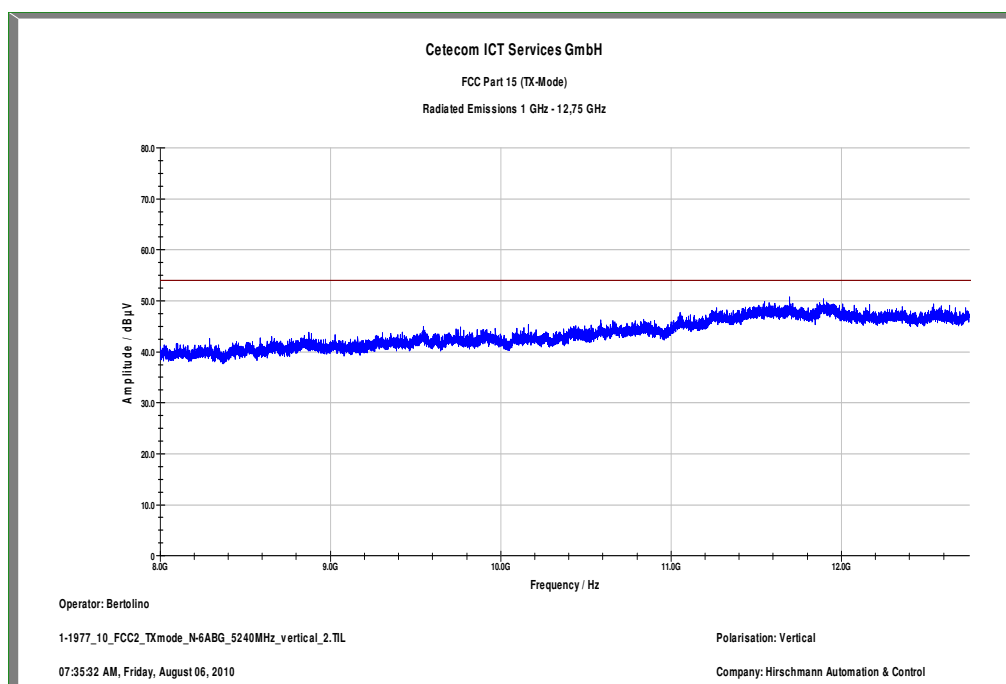


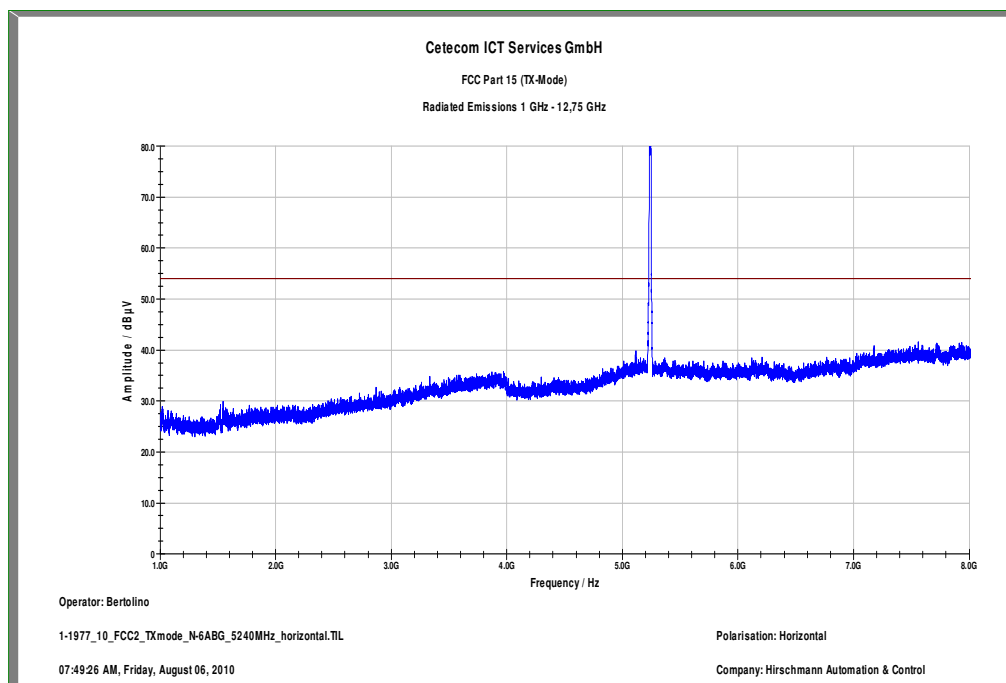
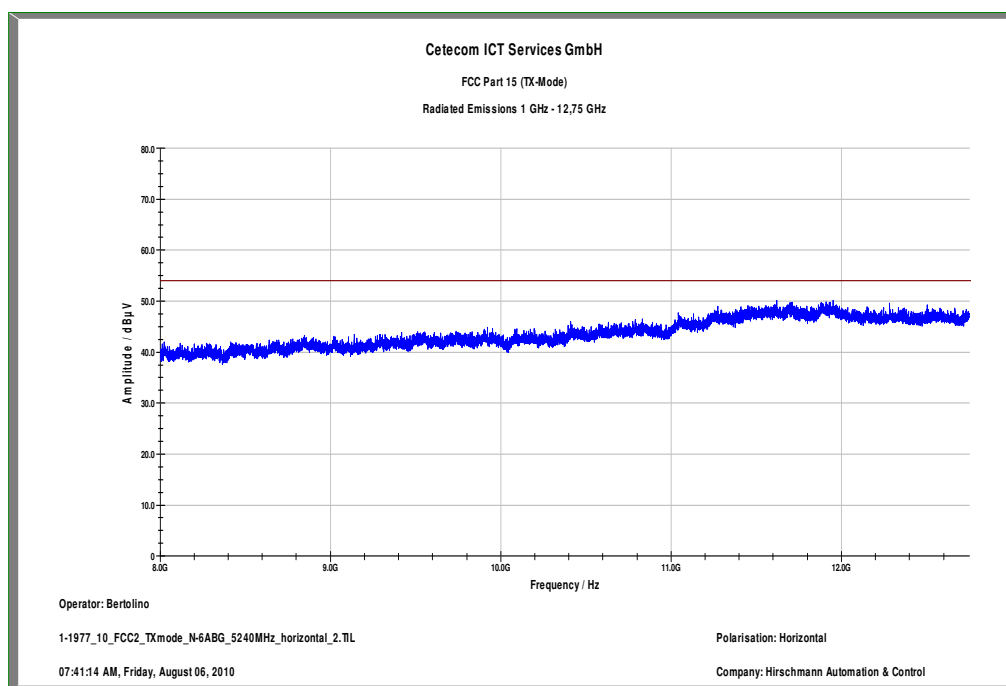
Date: 5.AUG.2010 07:23:18

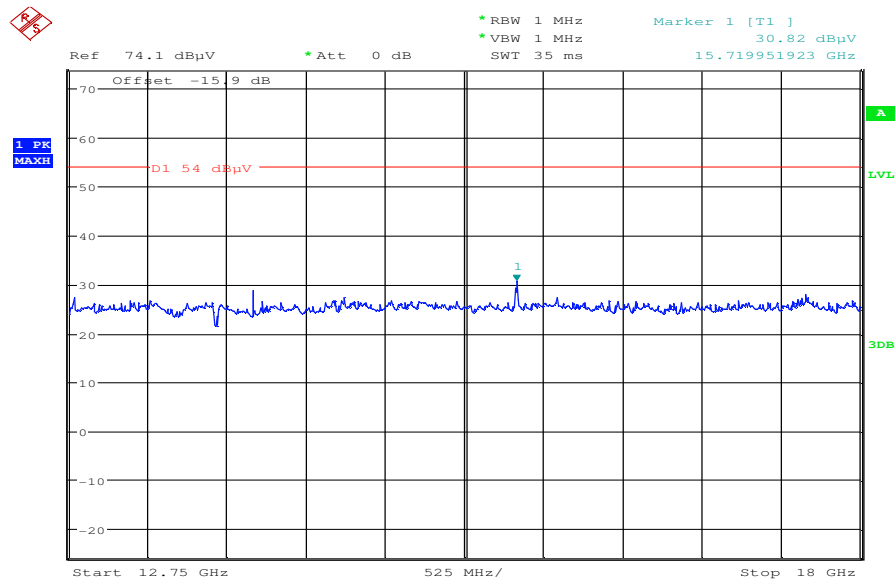
Plot 33: TX mode, mid channel – 5240 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)



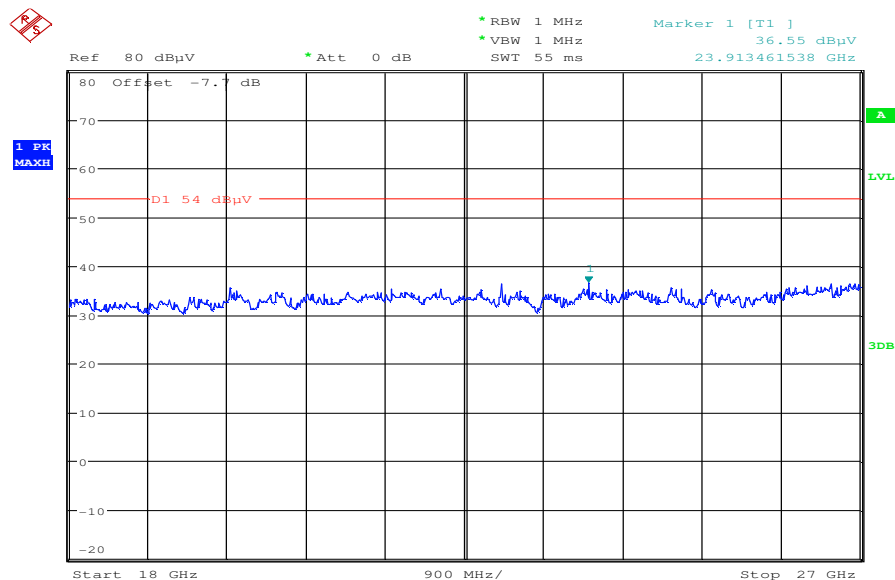
Date: 5.AUG.2010 07:49:30

Plot 34: TX mode, mid channel – 5240 MHz, 1 GHz – 8 GHz, vertical polarization (Part 15.209)**Plot 35:** TX mode, mid channel – 5240 MHz, 8 GHz – 12.75 GHz, vertical polarization (Part 15.209)

Plot 36: TX mode, mid channel – 5240 MHz, 1 GHz – 8 GHz, horizontal polarization (Part 15.209)**Plot 37:** TX mode, mid channel – 5240 MHz, 8 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

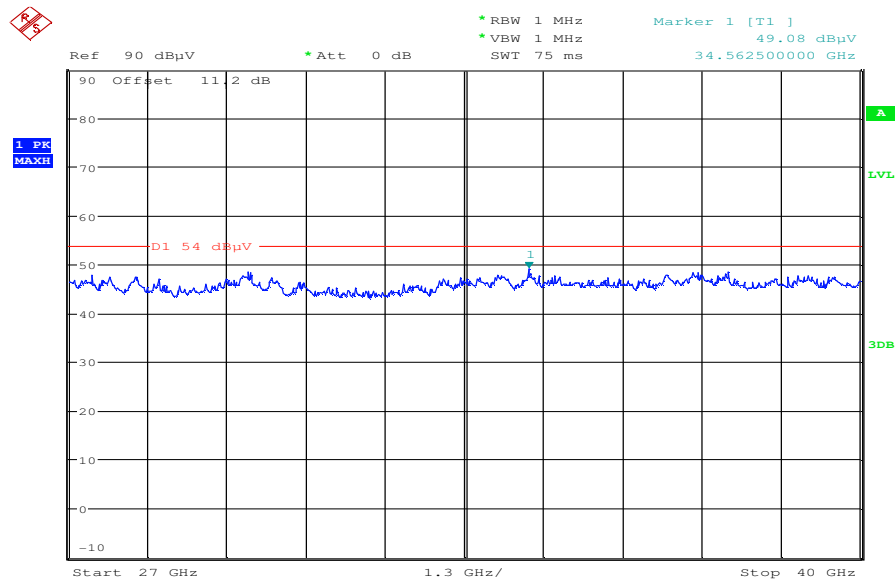
Plot 38: TX mode, mid channel – 5240 MHz, 13 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)

Date: 4.AUG.2010 09:37:09

Plot 39: TX mode, mid channel – 5240 MHz, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)

Date: 4.AUG.2010 09:51:51

Plot 40: TX mode, mid channel – 5240 MHz, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:02:11

9.5 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
Sweep time:	Auto
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
CFR Part 15.109		RSS Gen, Issue 2, 4.10
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dB μ V/m)	Measurement distance
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
Above 960	54.0	3

Result: BAT-ANT-N-5A-IP65

RX Spurious Emissions Radiated [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
No peaks found over 1 GHz! Below 1 GHz, please take a look at the tale below the plot!		
Measurement uncertainty	± 3 dB	

Result: BAT-ANT-N-9A-DS-IP65

RX Spurious Emissions Radiated [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
No peaks found over 1 GHz! Below 1 GHz, please take a look at the tale below the plot!		
Measurement uncertainty	± 3 dB	

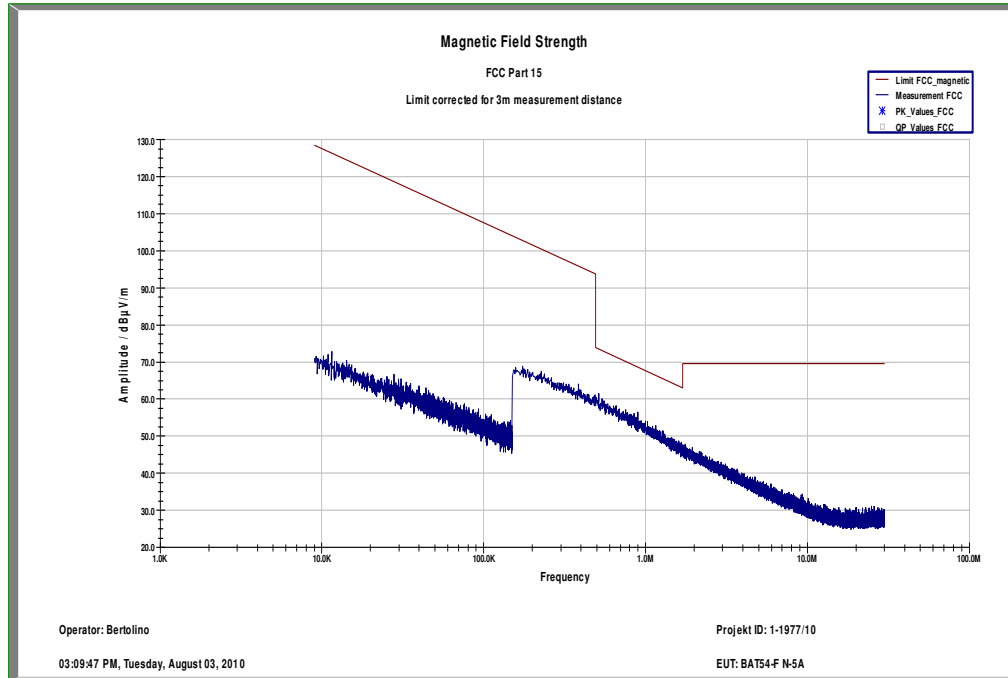
Result: BAT-ANT-N-6ABG-IP65

RX Spurious Emissions Radiated [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
No peaks found over 1 GHz! Below 1 GHz, please take a look at the tale below the plot!		
Measurement uncertainty	± 3 dB	

Result: The result of the measurement is passed.

Antenna: BAT-ANT-N-5A-IP65

Plot 1: RX mode, 9 kHz – 30 MHz, magnetic (Part 15.209)



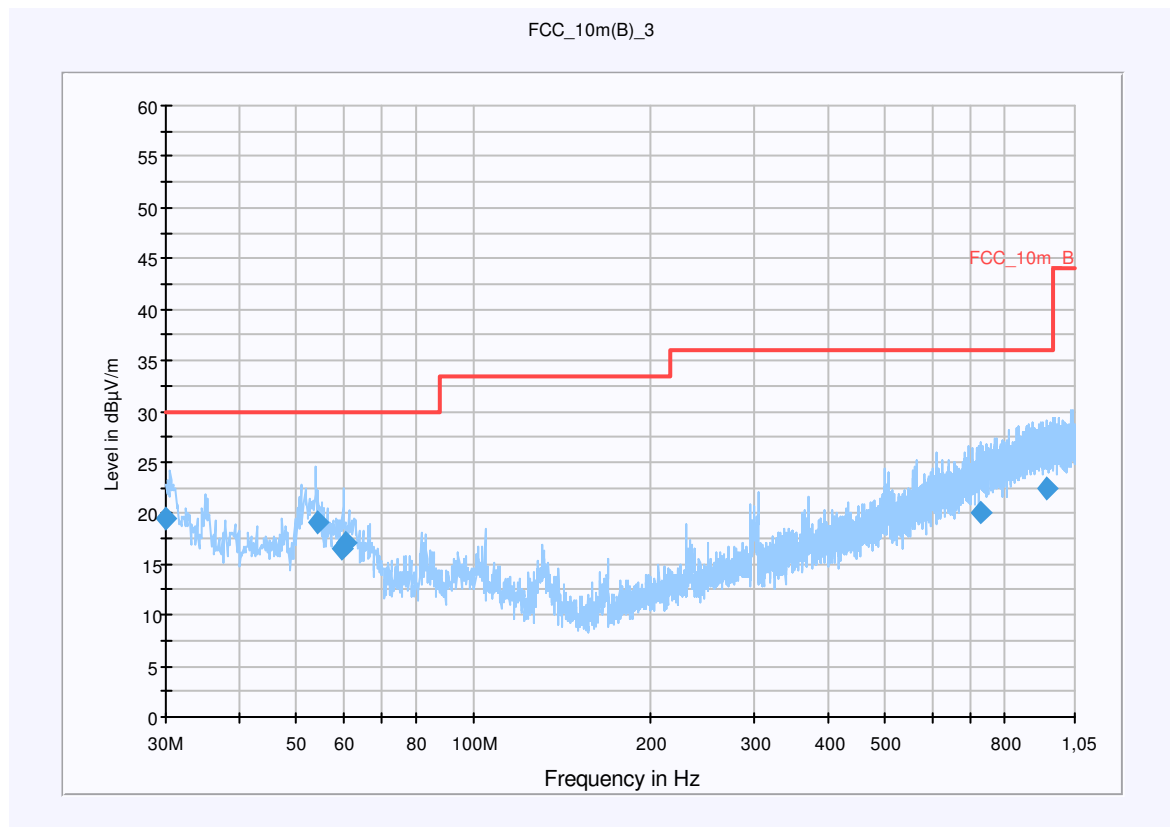
Plot 2: RX mode, 30 MHz – 1GHz, vertical & horizontal polarization (Part 15.209)

Common Information

EUT: BAT-ANT-N-5A-IP65 + BAT54-F
 Serial Number: SOA-5600/360/5/0/V + 943926022010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Rx
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
Subrange **Detectors** **IF Bandwidth** **Meas. Time** **Receiver**
 30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



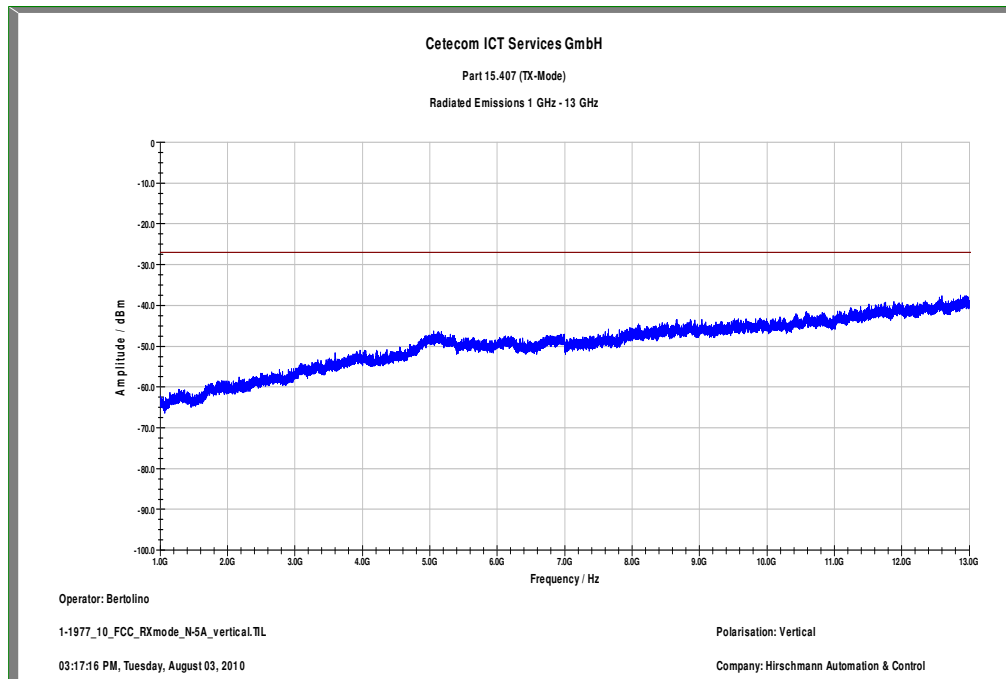
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.007215	19.4	15000.000	120.000	108.0	V	252.0	12.5	10.6	30.0	
54.219000	19.0	15000.000	120.000	220.0	V	55.0	13.0	11.0	30.0	
59.896050	16.6	15000.000	120.000	220.0	V	29.0	11.6	13.4	30.0	
60.904050	17.0	15000.000	120.000	168.0	V	236.0	11.4	13.0	30.0	
725.202600	20.1	15000.000	120.000	220.0	V	184.0	23.0	15.9	36.0	
939.511350	22.5	15000.000	120.000	124.0	H	236.0	25.3	13.5	36.0	

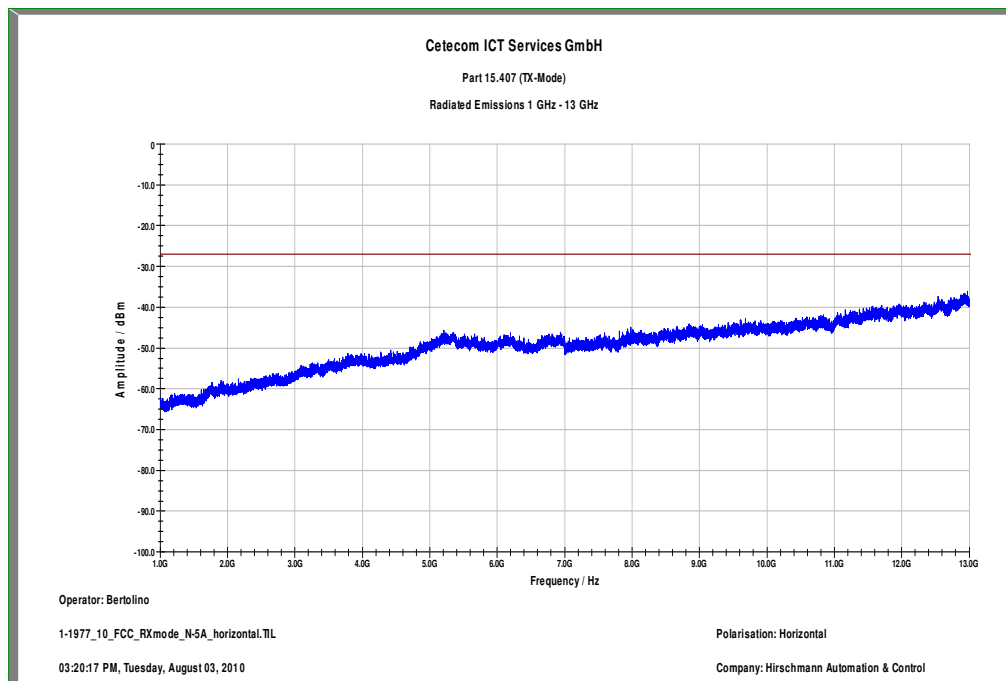
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

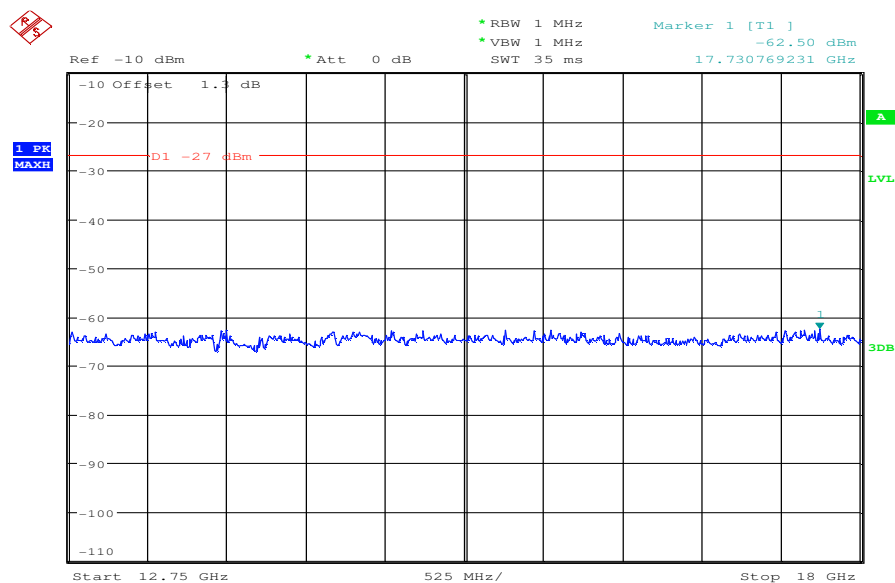
EMC 32 Version 8.10.00

Plot 3: RX mode, 1 GHz – 12.75 GHz, vertical polarization (Part 15.407)

Plot 4: RX mode, 1 GHz – 12.75 GHz, horizontal polarization (Part 15.407)

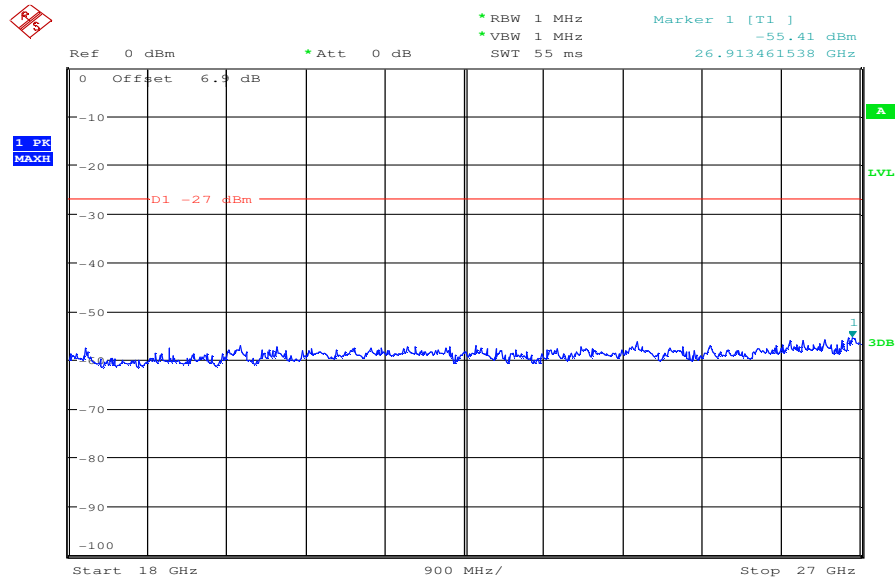


Plot 5: RX mode, 12.75 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



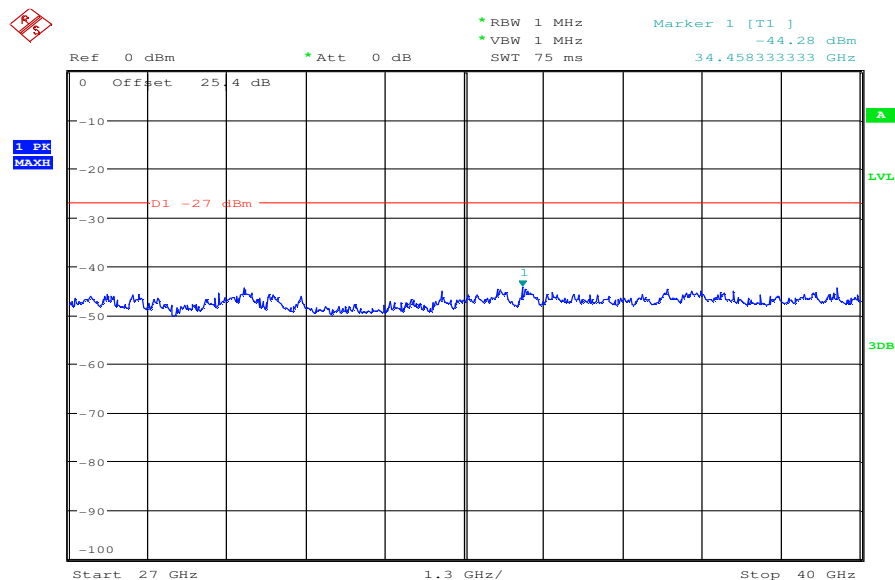
Date: 5.AUG.2010 07:19:14

Plot 6: RX mode, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)



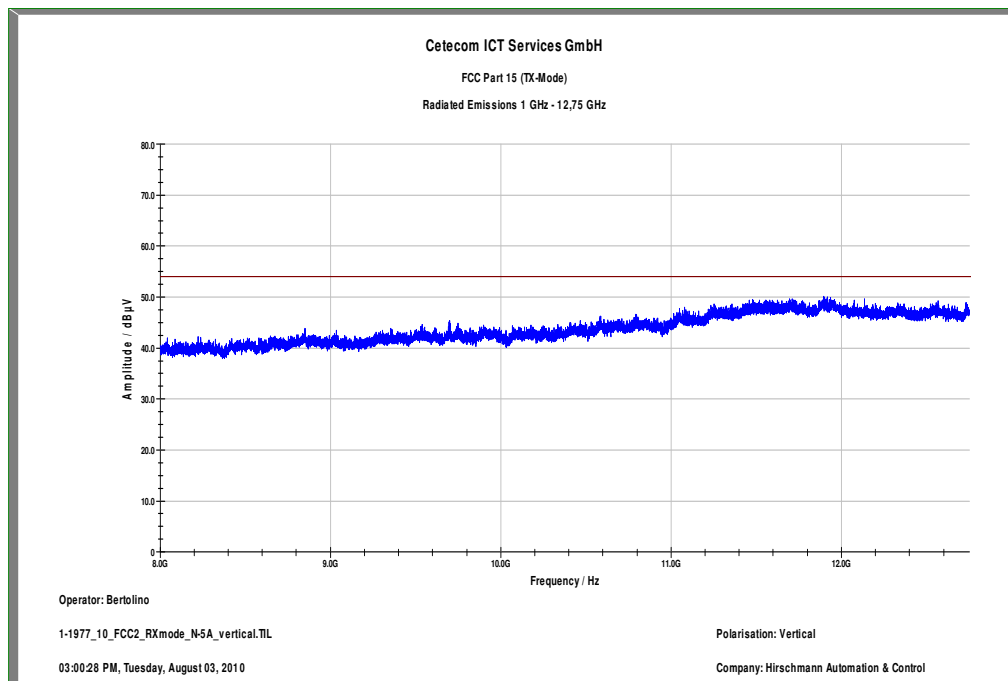
Date: 5.AUG.2010 07:27:48

Plot 7: RX mode, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

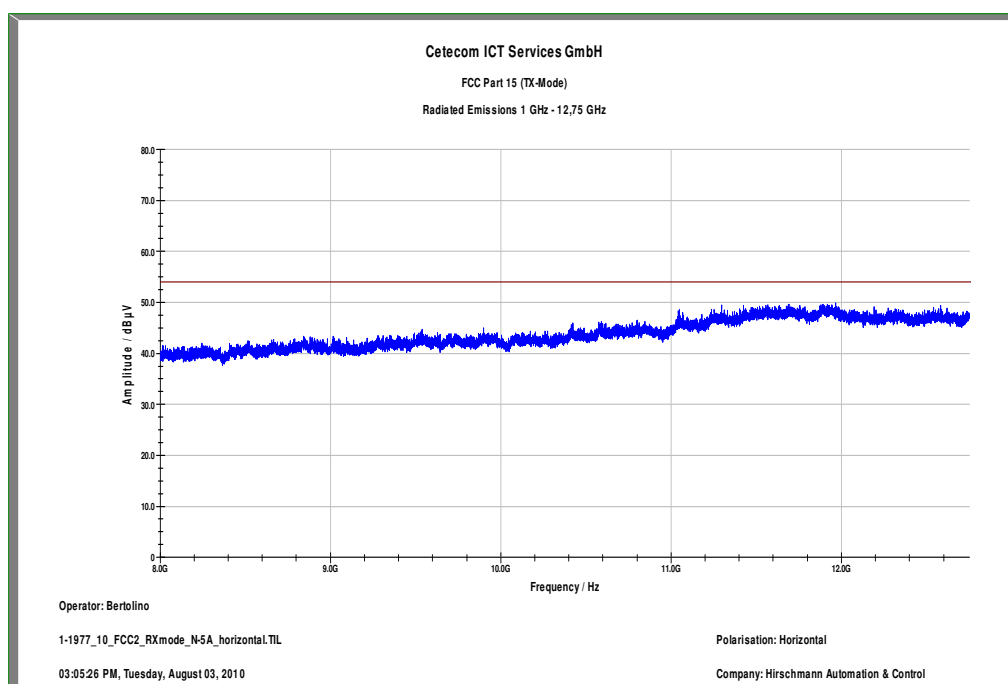


Date: 5.AUG.2010 07:44:35

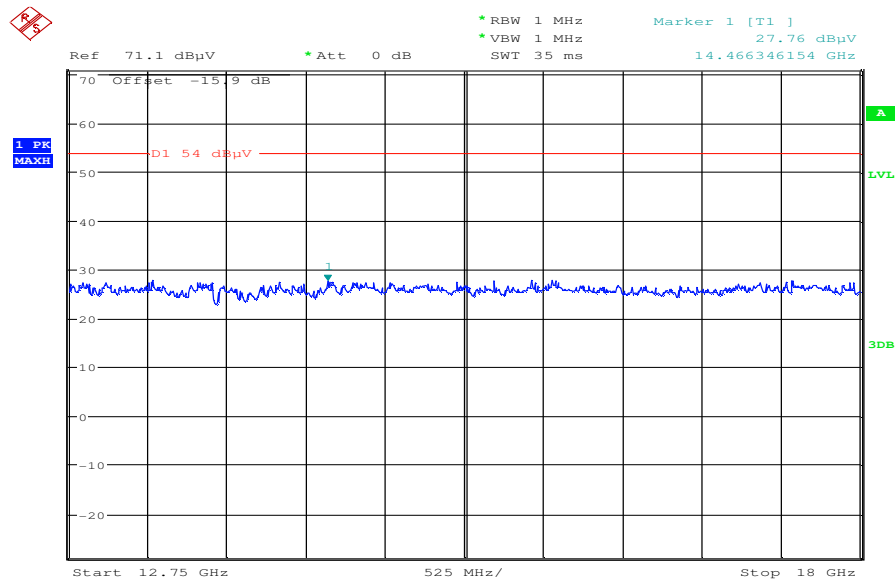
Plot 8: RX mode, 1 GHz – 12.75 GHz, vertical polarization (Part 15.209)



Plot 9: RX mode, 1 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

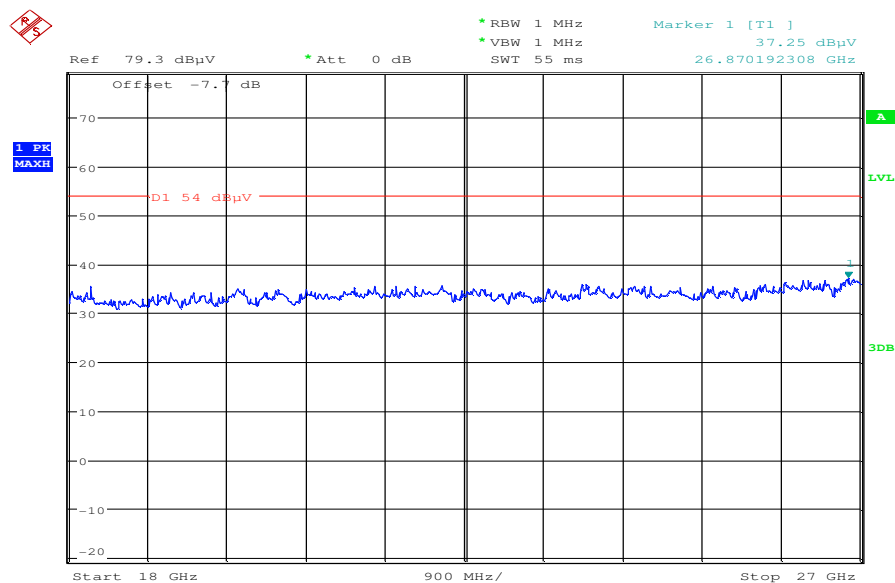


Plot 10: RX mode, 12.75 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



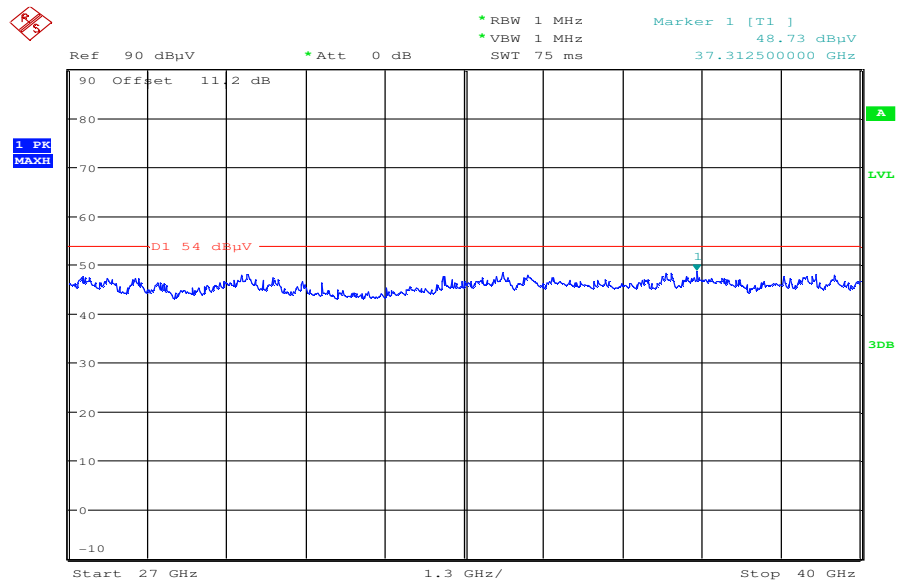
Date: 5.AUG.2010 06:46:16

Plot 11: RX mode, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 5.AUG.2010 06:54:20

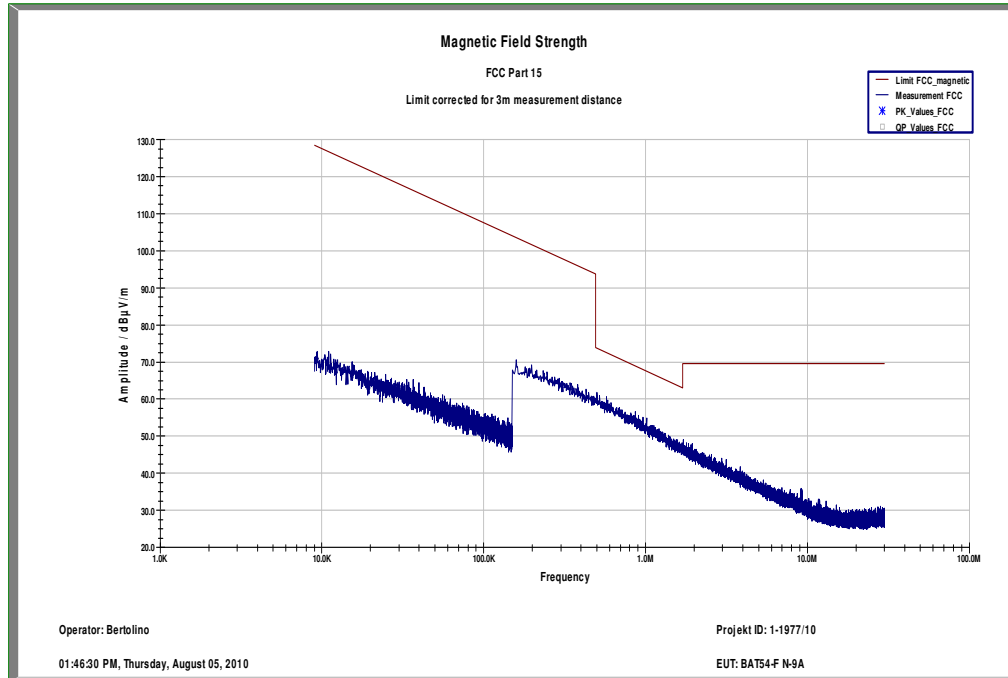
Plot 12: RX mode, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:08:23

Antenna: BAT-ANT-N-9A-DS-IP65

Plot 1: RX mode, 9 kHz – 30 MHz, magnetic (Part 15.209)



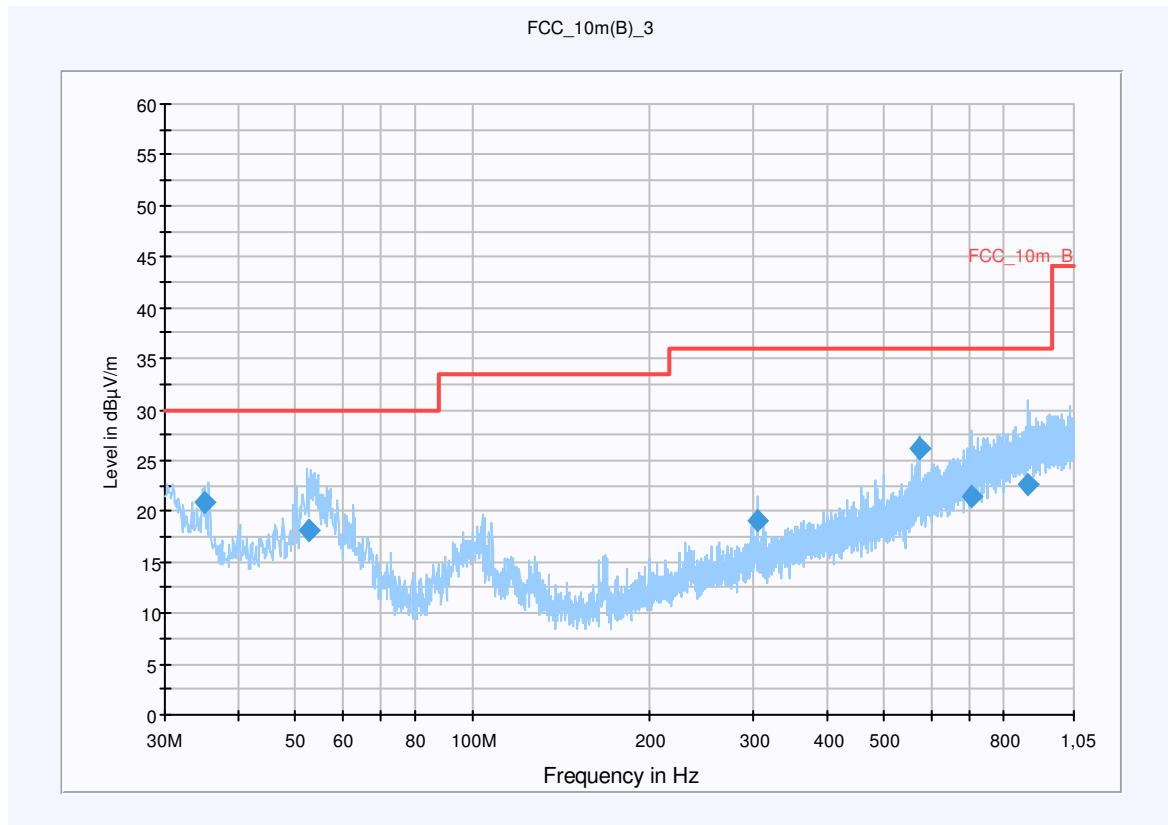
Plot 2: RX mode, 30 MHz – 1GHz, vertical & horizontal polarization (Part 15.209)**Common Information**

EUT: BAT-ANT-N-9A-DS-IP65
 Serial Number: 84078980 + 9439260220010110004
 Test Description: FCC part 15 C Class B @ 10m
 Operating Conditions: WLAN-Testmode; Rx
 Operator Name: Lang
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit:

30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver

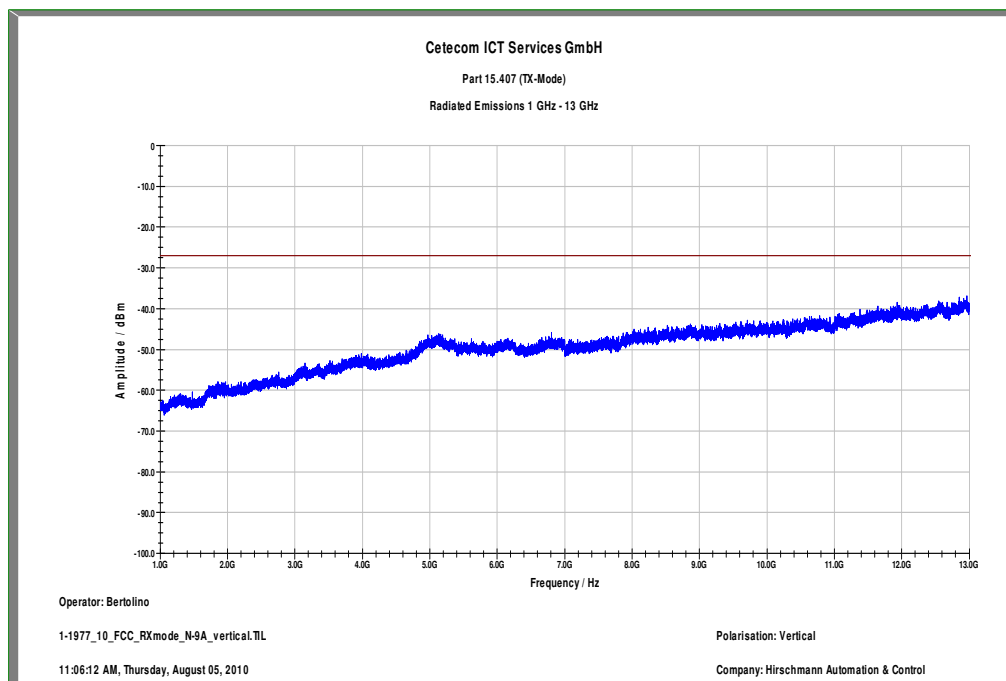
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.143200	20.9	15000.000	120.000	98.0	V	272.0	13.0	9.1	30.0	
52.695300	18.1	15000.000	120.000	98.0	V	97.0	13.1	11.9	30.0	
304.240200	19.1	15000.000	120.000	98.0	V	-7.0	14.5	16.9	36.0	
574.682250	26.1	15000.000	120.000	120.0	H	244.0	20.1	9.9	36.0	
705.709050	21.5	15000.000	120.000	115.0	H	238.0	22.5	14.5	36.0	
879.250950	22.7	15000.000	120.000	98.0	H	224.0	24.9	13.3	36.0	

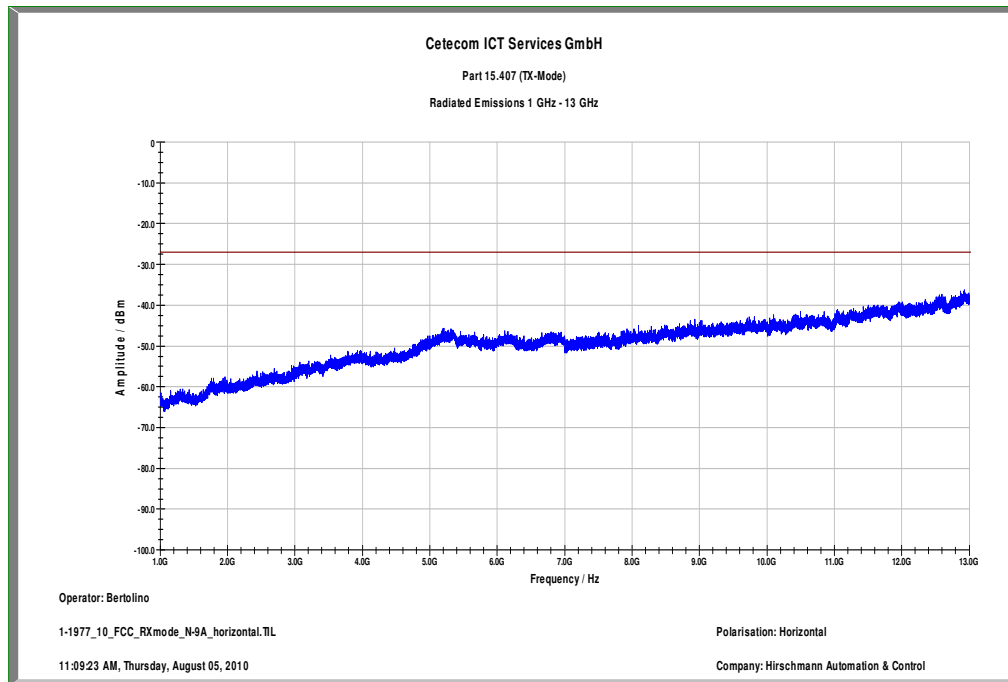
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

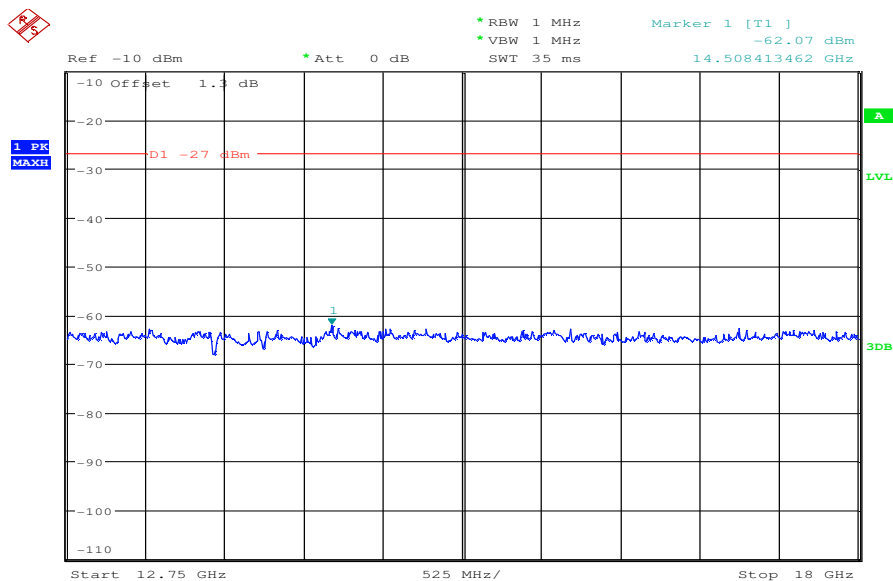
EMC 32 Version 8.10.00

Plot 3: RX mode, 1 GHz – 12.75 GHz, vertical polarization (Part 15.407)

Plot 4: RX mode, 1 GHz – 12.75 GHz, horizontal polarization (Part 15.407)

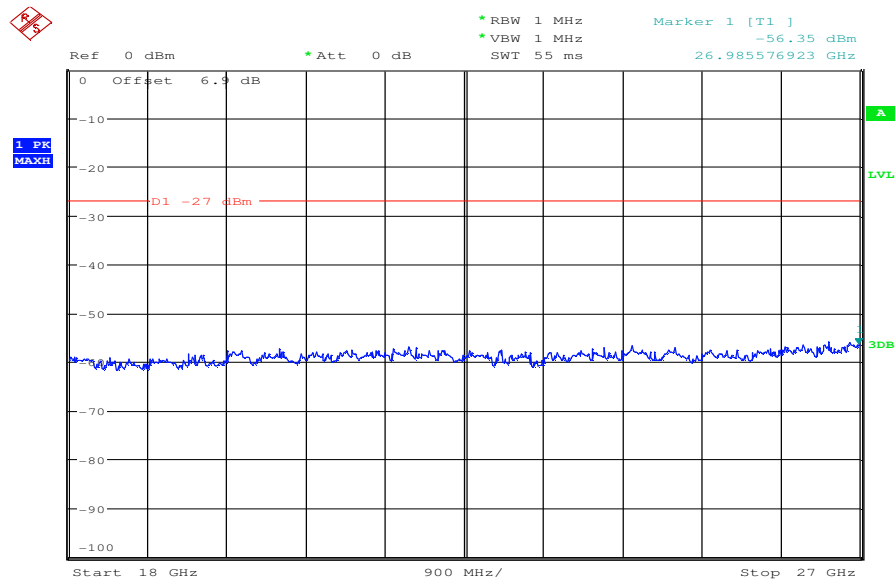


Plot 5: RX mode, 12.75 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



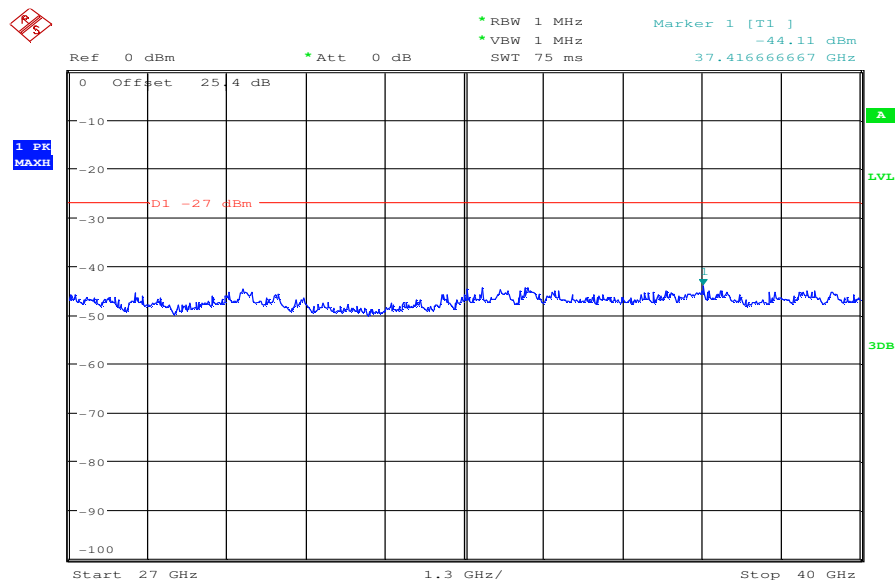
Date: 5.AUG.2010 07:21:05

Plot 6: RX mode, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)

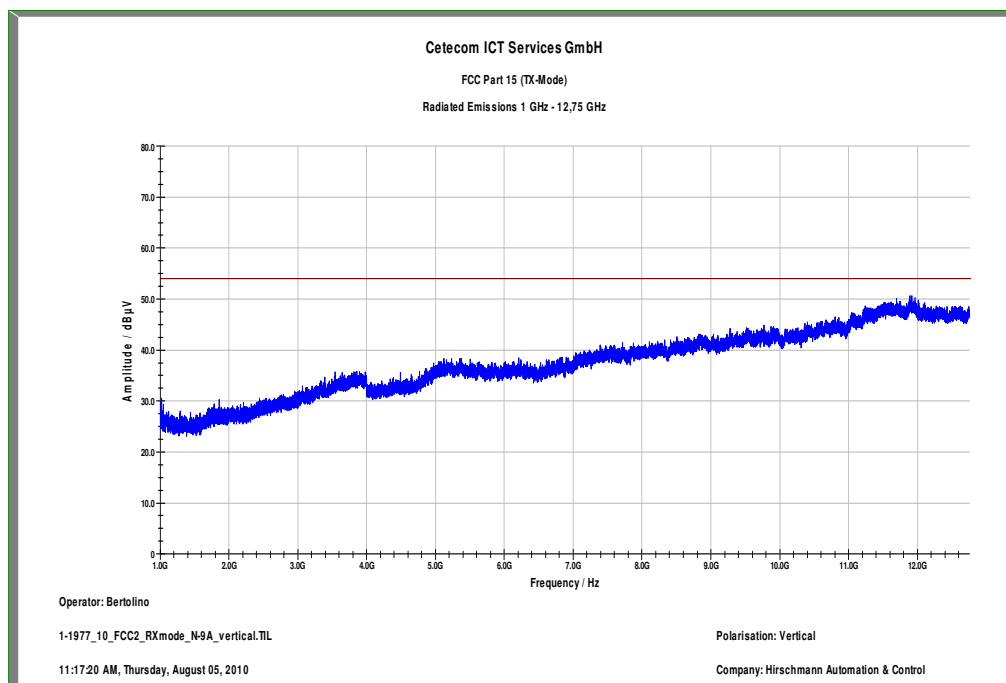
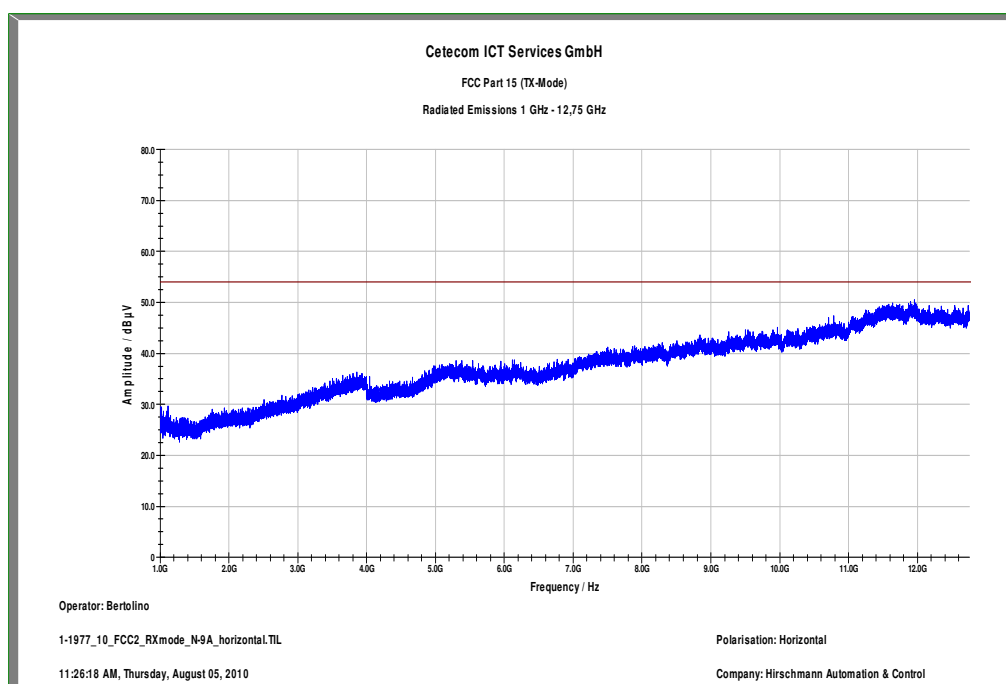


Date: 5.AUG.2010 07:36:55

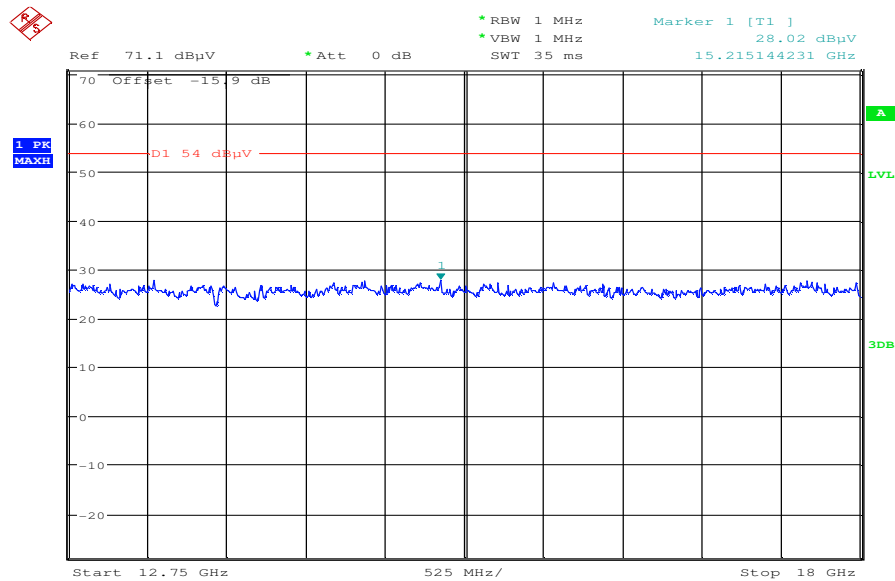
Plot 7: RX mode, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)



Date: 5.AUG.2010 07:43:39

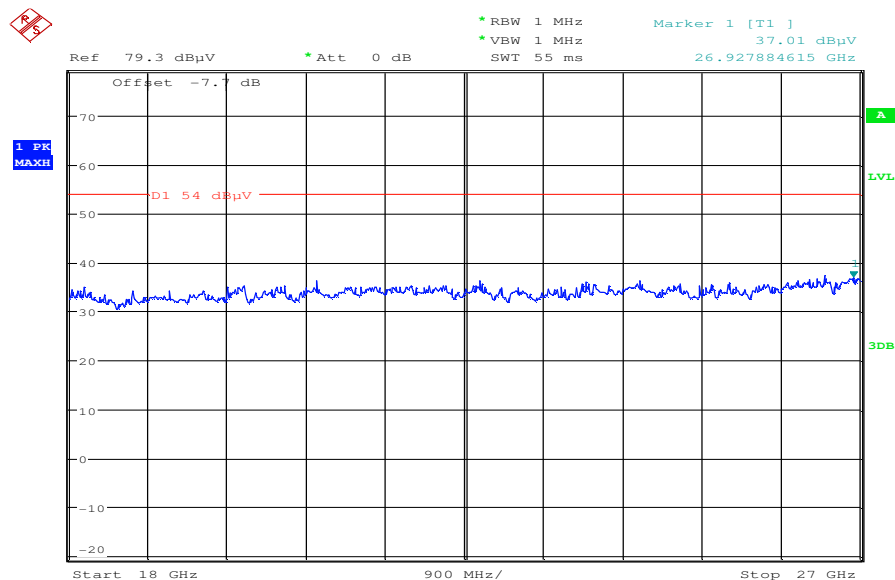
Plot 8: RX mode, 1 GHz – 12.75 GHz, vertical polarization (Part 15.209)**Plot 9:** RX mode, 1 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

Plot 10: RX mode, 12.75 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



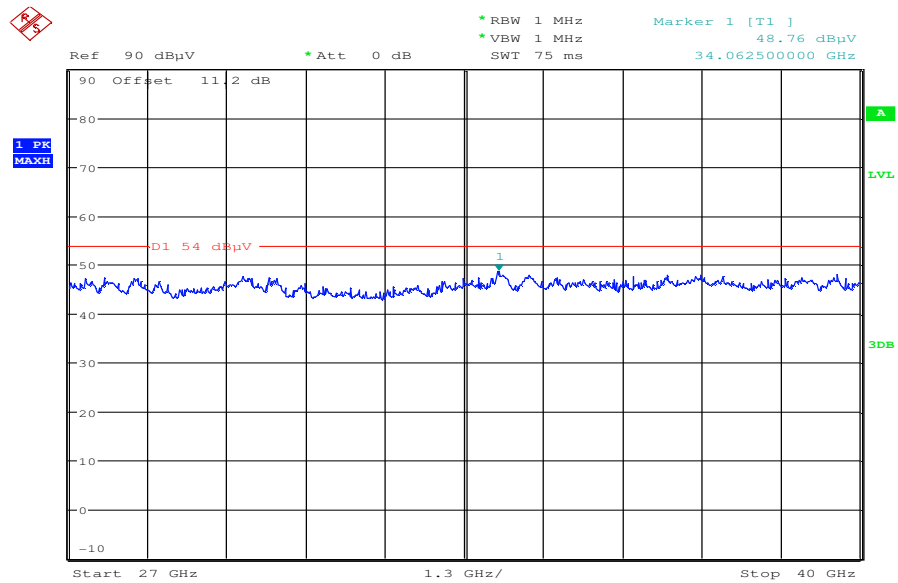
Date: 5.AUG.2010 06:49:22

Plot 11: RX mode, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 5.AUG.2010 06:51:47

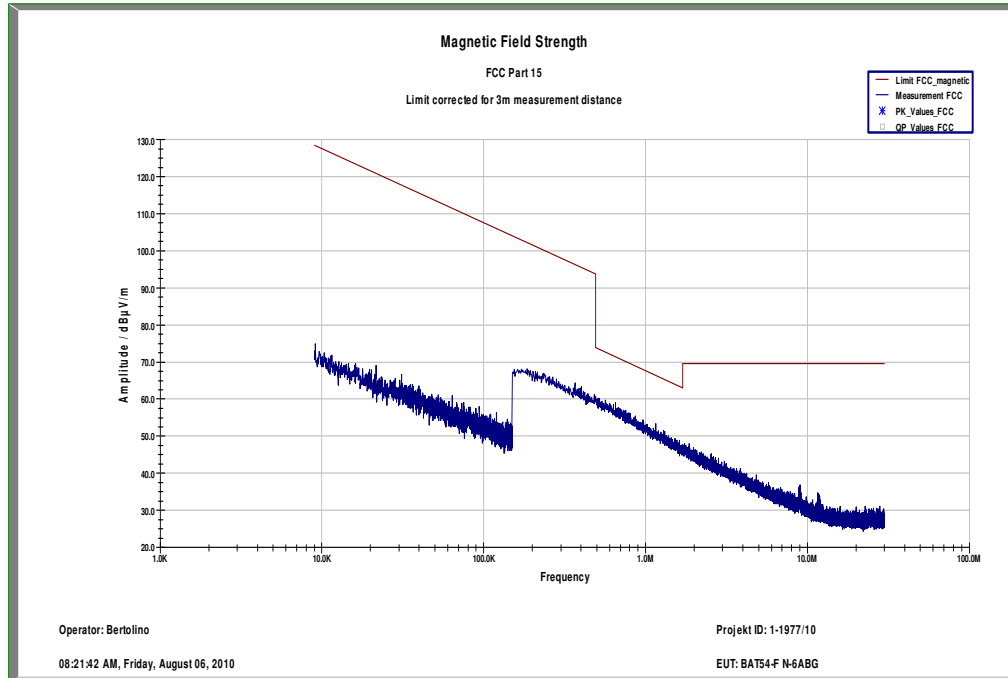
Plot 12: RX mode, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:06:55

Antenna: BAT-ANT-N-6ABG-IP65

Plot 1: RX mode, 9 kHz – 30 MHz, magnetic (Part 15.209)



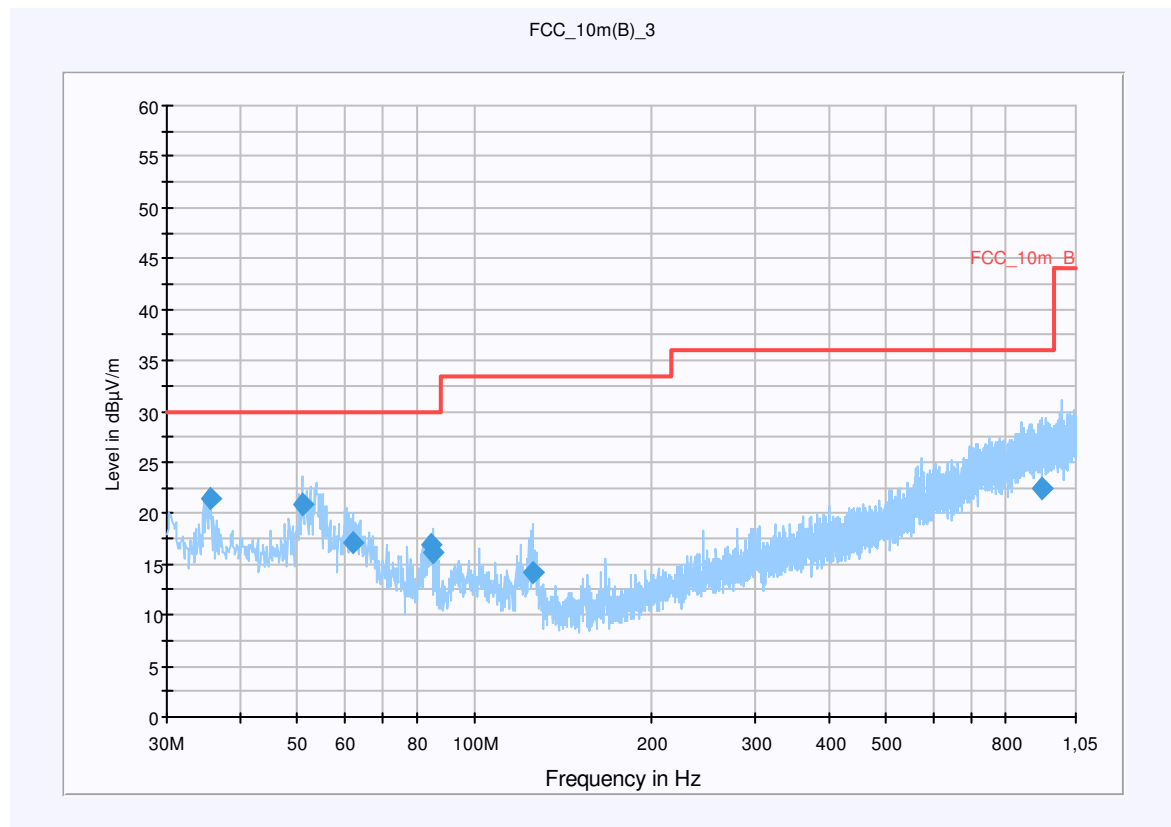
Plot 2: RX mode, 30 MHz – 1GHz, vertical & horizontal polarization (Part 15.209)

Common Information

EUT: BAT-ANT-N-6ABG-IP65 + BAT54-F
 Serial Number: + 943926022010110004
 Test Description: FCC part 15 Class B @ 10m
 Operating Conditions: WLAN-Testmode; Rx
 Operator Name: Langer
 Comment:

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m
Subrange **Detectors** **IF Bandwidth** **Meas. Time** **Receiver**
 30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



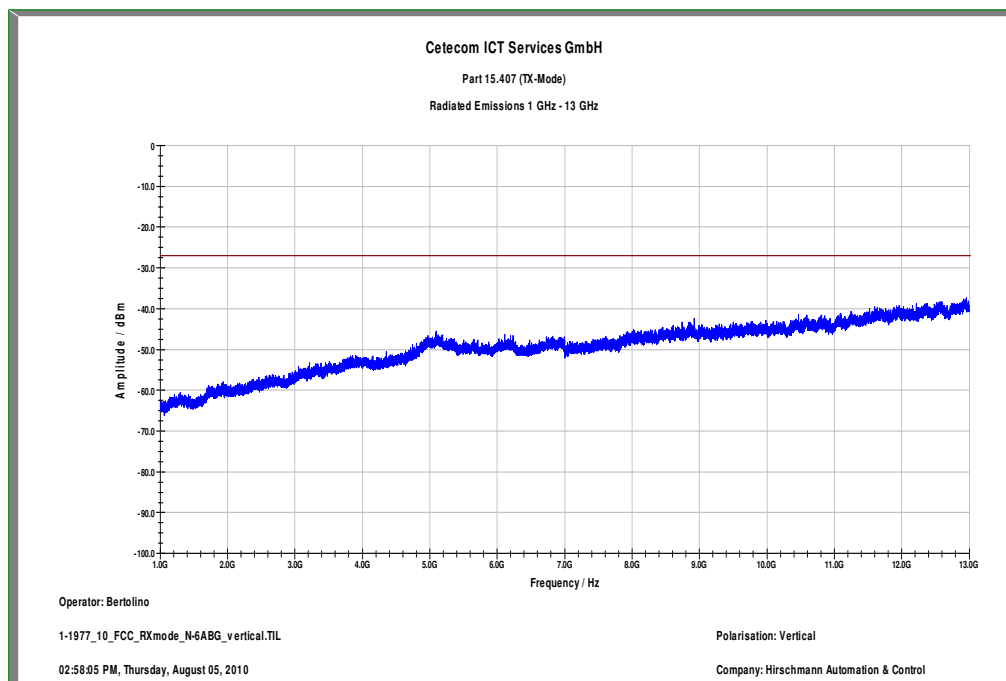
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.761800	21.4	15000.000	120.000	98.0	V	52.0	13.1	8.6	30.0	
51.008100	20.9	15000.000	120.000	98.0	V	225.0	13.3	9.1	30.0	
61.987350	17.2	15000.000	120.000	220.0	V	186.0	11.1	12.8	30.0	
84.662850	17.0	15000.000	120.000	189.0	V	88.0	9.8	13.0	30.0	
84.676800	16.1	15000.000	120.000	220.0	V	84.0	9.8	13.9	30.0	
125.354100	14.2	15000.000	120.000	118.0	V	236.0	9.8	19.3	33.5	
...	...	...	...	...	...	...	...	...	...	...

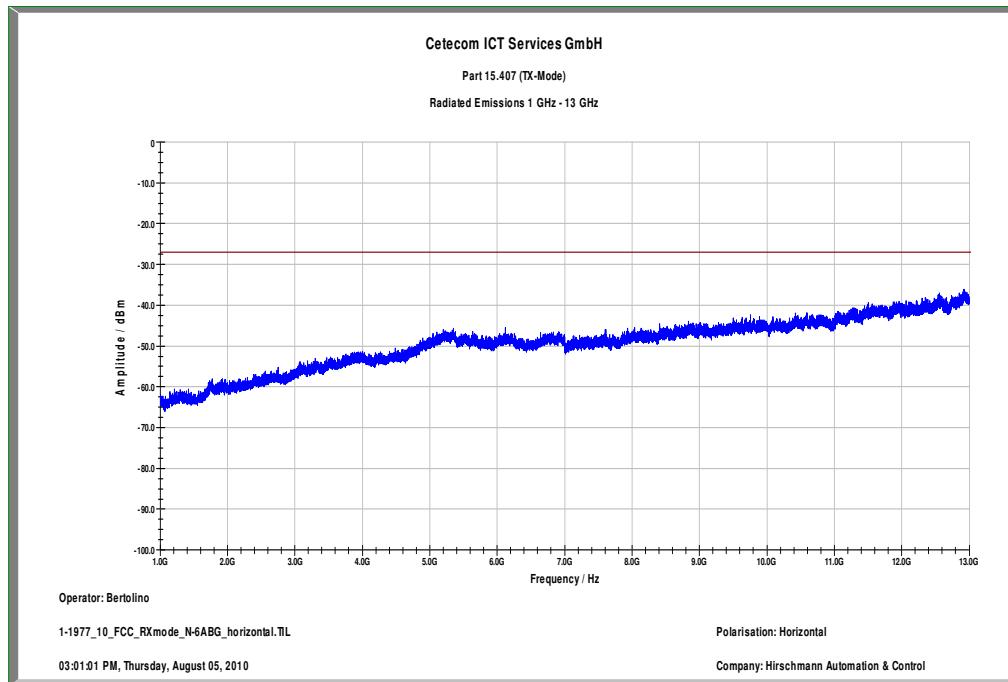
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

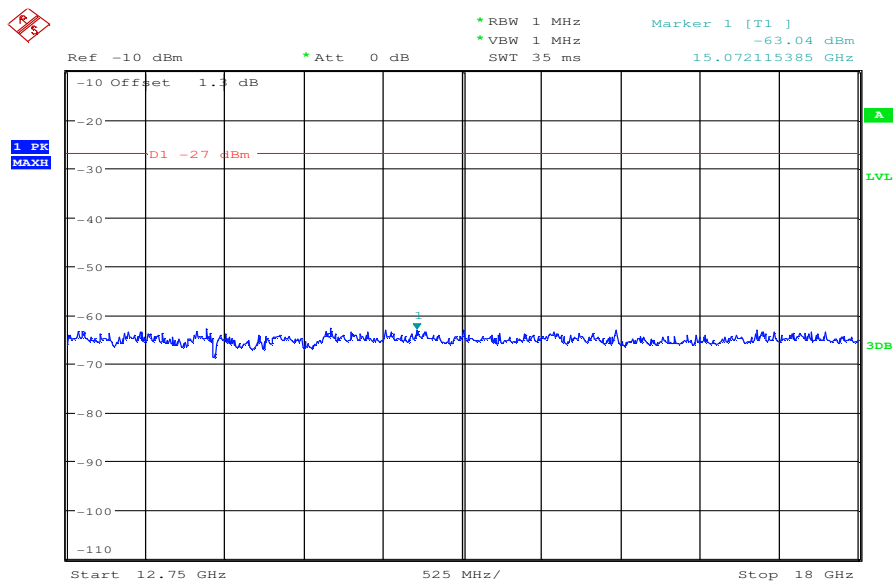
EMC 32 Version 8.10.00

Plot 3: RX mode, 1 GHz – 12.75 GHz, vertical polarization (Part 15.407)

Plot 4: RX mode, 1 GHz – 12.75 GHz, horizontal polarization (Part 15.407)

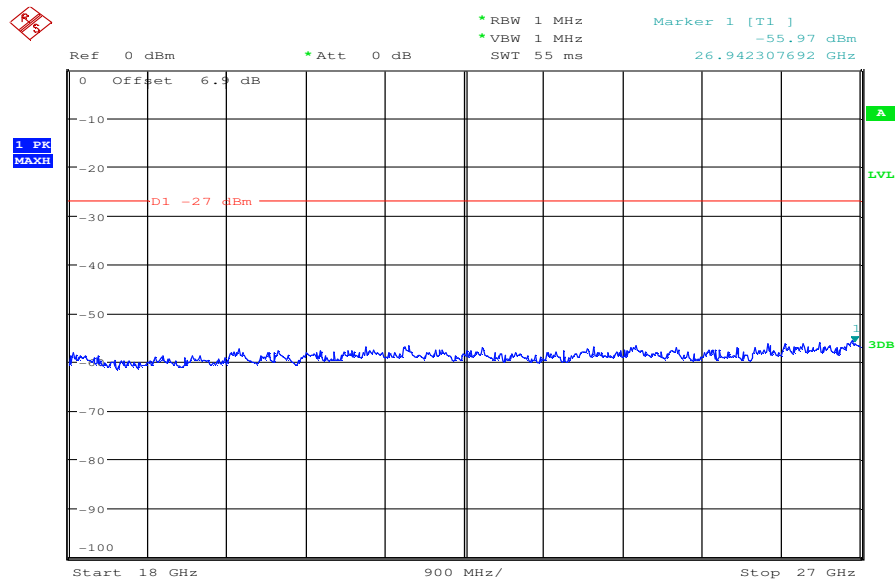


Plot 5: RX mode, 12.75 GHz – 18 GHz, vertical & horizontal polarization (Part 15.407)



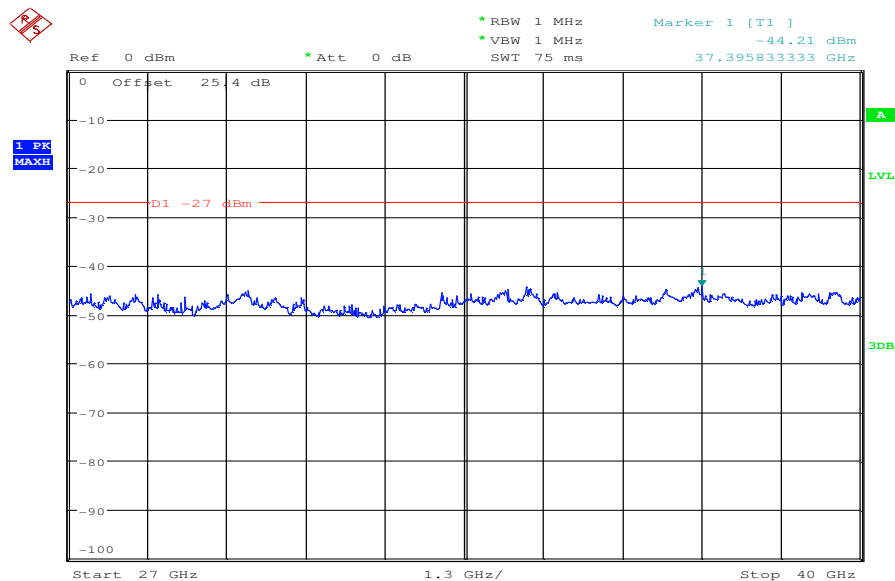
Date: 5.AUG.2010 07:18:00

Plot 6: RX mode, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.407)



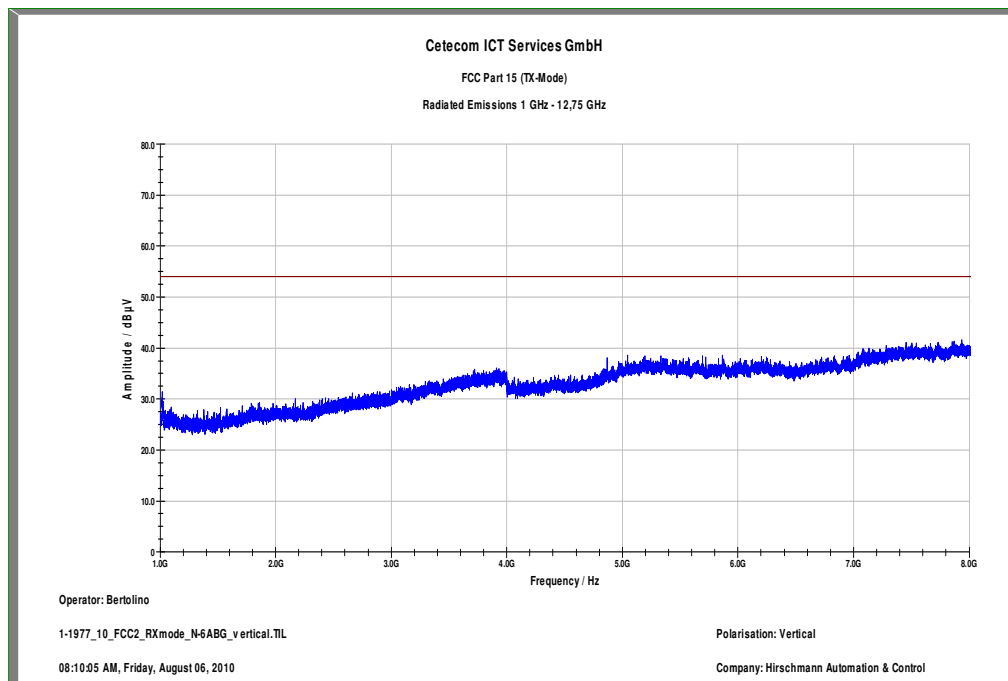
Date: 5.AUG.2010 07:26:49

Plot 7: RX mode, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.407)

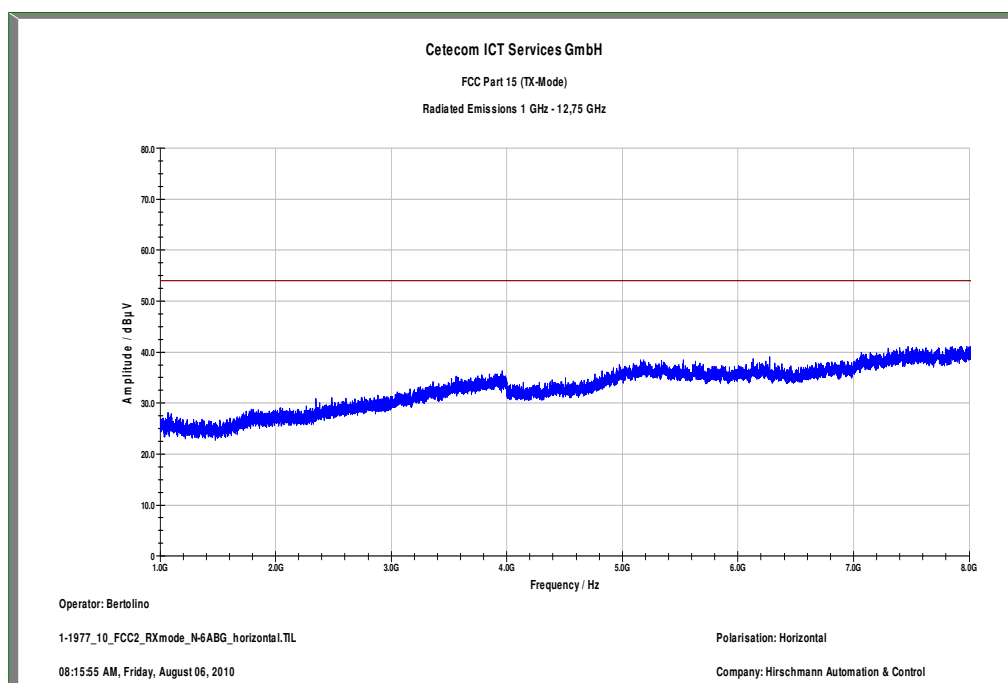


Date: 5.AUG.2010 07:53:36

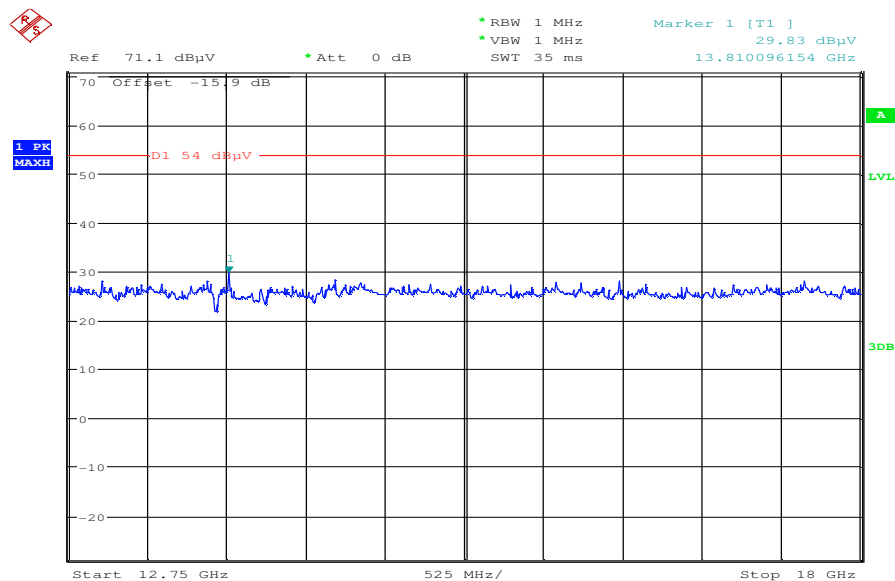
Plot 8: RX mode, 1 GHz – 12.75 GHz, vertical polarization (Part 15.209)



Plot 9: RX mode, 1 GHz – 12.75 GHz, horizontal polarization (Part 15.209)

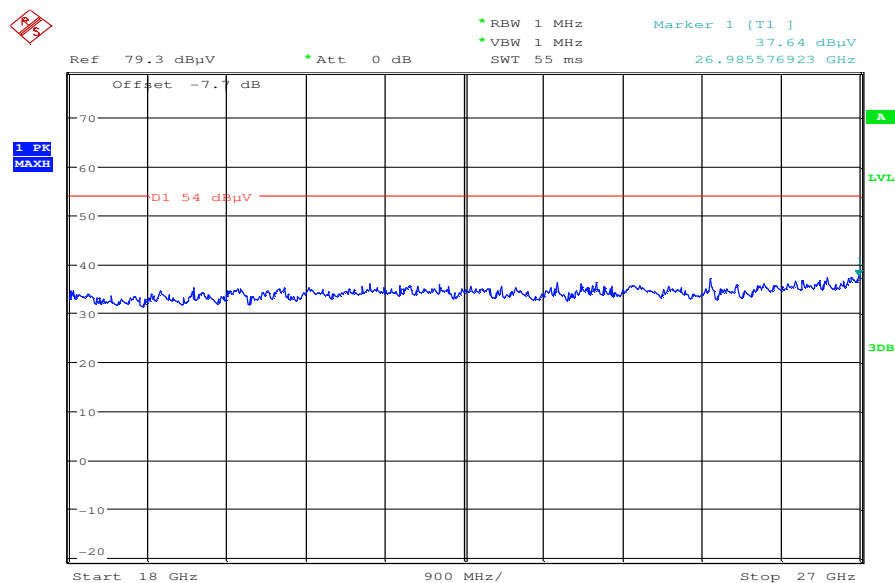


Plot 10: RX mode, 12.75 GHz – 18 GHz, vertical & horizontal polarization (Part 15.209)



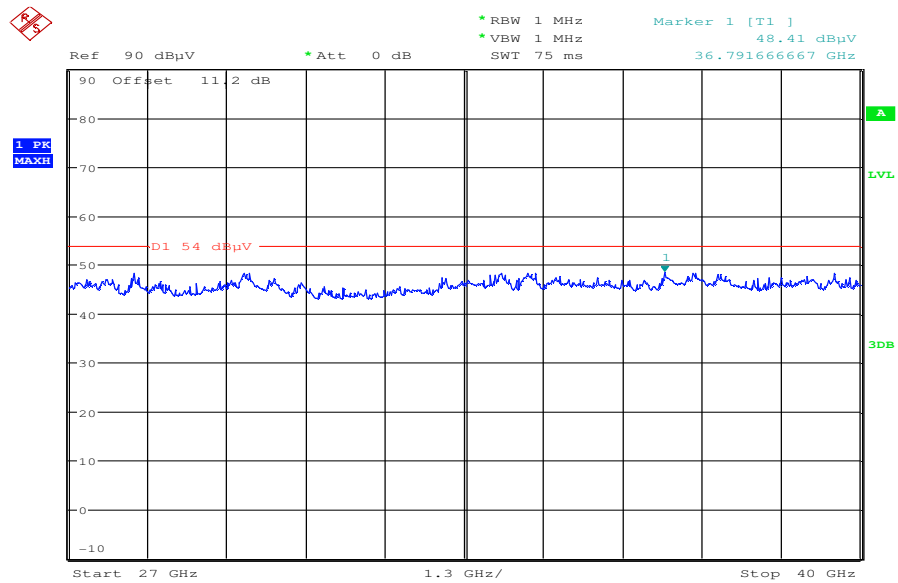
Date: 5.AUG.2010 06:47:54

Plot 11: RX mode, 18 GHz – 27 GHz, vertical & horizontal polarization (Part 15.209)



Date: 5.AUG.2010 06:53:39

Plot 12: RX mode, 27 GHz – 40 GHz, vertical & horizontal polarization (Part 15.209)



Date: 4.AUG.2010 10:07:39

10 Test equipment and ancillaries used for tests

In order to simplify the identification of the equipment used at each specific test, each item of test equipment and ancillaries are provided with an identifier or number in the equipment list below.

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).

No.	Labor / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kal. Art	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	k	06.01.2009	06.01.2011
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	08.01.2010	08.01.2012
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	01.06.2009	01.06.2011
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	01.04.2010	01.04.2012
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	08.01.2010	08.01.2012
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
13	n. a.	PowerAttenuator	8325	Byrd	1530	300001595			
14	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKI	05.03.2009	05.03.2011
15	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
16	n. a.	Anechoic chamber		MWB	87400/02	300000996			
17	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
18	9	Artificial Mains 9 kHz to 30 MHz, 4 x 25 Ampere	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
19	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
20	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
21	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
22	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
23	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
24	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
25	n. a.	Band Reject	WRCG2400/2483-	Wainwright	11	300003351	ev		

		filter	2375/2505-50/10SS						
26	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
27	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
28	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
29	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
30	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k		
31	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k		
32	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	viKI!		
33	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	viKI!	17.12.2008	17.12.2010
34	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
35	19	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	9107-3697	300001605	Ve	30.06.2008	30.06.2010
36	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000787	ne		
37	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
38	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve	01.07.2010	01.07.2012

Annex A Document history

Version	Applied changes	Date of release
1.0	Initial release	2010-08-25

Annex B Further information**Glossary**

DUT	-	Device under Test
EMC	-	Electromagnetic Compatibility
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software