Accredited testing-laboratory

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

Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

Recognized by the Federal Communications Commission
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: 3462C-1 (IC)
Certification ID: DE 0001
Accreditation ID: DE 0002

Accredited Bluetooth® Test Facility (BQTF)

Test report no.	**:**	**1-1775-01-24/09-A**
Type identification	**:**	**M3002-66480**
Applicant	**:**	**Philips Medizin Systeme Böblingen GmbH**
FCC ID	**:**	**PQC-WLANBV1**
IC Certification No	**:**	**3549C-WLANBV1**
Test standards	**:**	**47 CFR Part 2**
		47 CFR Part 15
		RSS - 210 Issue 7

Table of contents

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 3.1.1. The 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 the CETECOM ICT Services GmbH.
This test report is electronically signed and valid without handwriting signature. For verification of the electronical signatures, the public keys can be requested at the testing laboratory.

Test laboratory manager:

2010-08-03	**Meheza Kpelou Walla**	
Date	Name	Signature

Technical responsibility for area of testing:

2010-08-03	**Jakob Reschke**	
Date	Name	Signature

1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
e-mail: info@ICT.cetecom.de
Internet: http://www.cetecom-ict.de

State of accreditation:	**The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 DAR registration number: DGA-PL-176/94-D1**
Accredited by:	**Federal Motor Transport Authority (KBA) DAR registration number: KBA-P 00070-97**

Testing location, if different from CETECOM ICT Services GmbH:

Name :
Street :
Town :
Country :
Phone :
Fax :

1.3 Details of applicant

Name:	**Philips Medizin Systeme Böblingen GmbH**
Street:	**Hewlett-Packard-Strasse 2**
Town:	**71034 Böblingen**
Country:	**Germany**
Telephone:	**+49 (0)7031-463-2840**
Fax:	**+49 (0)7031-463-2442**
Contact:	**Markus Stacha**
E-mail:	**markus.stacha@philips.com**
Telephone:	**+49 (0)7031-463-2840**

1.4 Application details

Date of receipt of order:	**2009-11-18**
Date of receipt of test item:	**2010-05-27**
Date of start test:	**2010-05-27**
Date of end test	**2010-08-03**
Persons(s) who have been present during the test:	**-/-**

2 Test standard/s

47 CFR Part 2	**2006-10**	**Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission Frequency allocations and radio treaty matters; general rules and regulations**
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 Subchapter B—Unintentional Radiators Subchapter C—Intentional Radiators**
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**

3 Technical tests

3.1 Details of manufacturer

Name:	**Philips Medizin Systeme Böblingen GmbH**
Street:	**Hewlett-Packard-Strasse 2**
Town:	**71034 Böblingen**
Country:	**Germany**

3.1.1 Test item

Kind of test item	:	**ieee 802.3 a/b/g WLAN Module**
Type identification	:	**M3002-66480**
S/N serial number	:	**PN: 865221 / DE932Y0107**
HW hardware status	:	**0839**
SW software status	:	**ART6000 v1.0.9**
Frequency Band [MHz]	:	**5.15 GHz – 5.25 GHz (lower band)** **5.25 GHz – 5.35 GHz (middle band)**
Type of Modulation	:	**OFDM**
Number of channels	:	**4** **4**
Antenna	:	**PCB antenna, P/N 453564175981 Rev. 0933, modified to Rev. 1011**
Power Supply	:	**3.3 to 5.5 V DC from Interface Board**
Temperature Range	:	**+ 23°C (Only delta measurements performed)**

Max. power radiated(EIRP): **18.88 dBm**
Max. power conducted: **16.87 dBm (Refer to test report 1-0685-01-07/08-B)**

FCC ID: **PQC-WLANBV1**
IC: **3549C-WLANBV1**

3.1.2 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	**3549C-WLANBV1**
Model Name:	**M3002-66480**
Manufacturer (complete Address):	**Philips Medizin Systeme Böblingen GmbH** **Hewlett-Packard-Strasse 2** **71034 Böblingen** **Germany**
Tested to Radio Standards Specification (RSS) No.:	**RSS-210 Issue 7**
Open Area Test Site Industry Canada Number:	**IC 3462C-1**
Frequency Range (or fixed frequency) [MHz]:	**5.15 GHz – 5.25 GHz (lower band)** **5.25 GHz – 5.35 GHz (middle band)**
RF: Power [W] (max):	**OFDM:** **[5.150 GHz – 5.250 GHz]** **Rad. EIRP: 61.66 mW (measured)** **Conducted: 18.75 mW** **(Refer to test report 1-0685-01-07/08-B)** **[5.250 GHz – 5.350 GHz]** **Rad. EIRP: 77.27 mW (measured)** **Conducted: 48.64 mW** **(Refer to test report 1-0685-01-07/08-B)**
Antenna Type:	**External rod. antenna**
Occupied Bandwidth (99% BW) [kHz]:	**OFDM 6 dB: 18.236** **OFDM 20 dB: 20.962** **OFDM 26 dB: 25.671** **(Refer to test report 1-0685-01-07/08-B)**
Type of Modulation:	**OFDM**
Emission Designator (TRC-43):	**21M0G7D (OFDM) (20dB)** **(Refer to test report 1-0685-01-07/08-B)**
Transmitter Spurious (worst case) [dBµV/m in 3m]:	**50.49**
Receiver Spurious (worst case) [dBµV/m in 3m]:	**49.06**

ATTESTATION:

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

Signature:

Test engineer: Meheza K. Walla
Date: 2010-08-03

3.1.3 EUT operating modes

EUT operating mode no.*)	Description of operating modes	Additional information
Op. 0	Normal mode	Normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

*) EUT operating mode no. is used to simplify the test plan

3.1.4 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T_{nom}	°C	**23**
Nominal Humidity	H_{nom}	%	**42**
Nominal Power Source	V_{nom}	V	**5.0**

Type of power source: DC from Interface Board

4 Summary of Measurement Results and list of all performed test cases

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

☐ There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 15 §15.407 - CANADA RSS-210 FCC Part 15 - Radio frequency devices Subchapter B - Unintentional Radiators Subchapter C - Intentional Radiators	PASS	2010-08-03	-/-

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
Range:	5.150 GHz – 5.250 GHz; 5.250 GHz – 5.350 GHz.				
None	Antenna Gain	Yes			
§15.247	Max. peak output power (radiated)	Yes			
§15.205	Band-edge compliance of radiated emissions	Yes			
§ 15.209	Spurious Emission -radiated (TX)	Yes			
§ 15.209	Spurious Emission -radiated (RX)	Yes			
§ 15.107/207	Conducted Emissions <30 MHz	Yes			

5 RF measurement testing

5.1 Description of test set-up

5.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 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 set-ups 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.

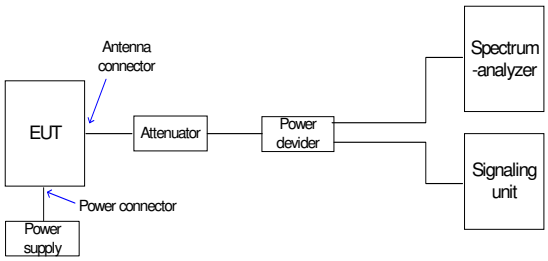
9 kHz - 150 MHz: Quasi Peak measurement, 200 Hz Bandwidth, active loop antenna.
150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, active loop antenna.
30 MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, trilog antenna
>1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

All measurement settings are according to FCC 15.209 and 15.207

5.1.2 Conducted measurements

Not performed!
Only delta measurements radiated

The EUT´s RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is connected to the spectrum analyzer. The specific losses for signal path are first checked within a calibration. The measurement readings on the 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.



5.2 Referenced Documents

Pre-certified WLAN-module used. Only delta-measurements performed.
Refer to test report number: 1-0685-01-07/08-B for the full tests.

5.3 Additional comments

The followings power settings are declared by the manufacture. All measurements are performed with the specified settings.

USA / Canada:

Band	Power setting
2.400 – 2.483 GHz	15 dBm
5.15 – 5.25 GHz	11 dBm
5.25 – 5.35 GHz	15 dBm
5.725 – 5.825 GHz	15 dBm

5.4 Antenna Gain

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Spectrum analyser:	RBW/VBW:	50/30 MHz
	Detector:	Positive peak (PK+)
	Span:	100 MHz
	Sweep Time:	Auto
	Trace Mode:	Max hold

	5180 MHz	5200 MHz	5240 MHz
Conducted power [dBm] *(Refer to test report 1-0685-01-07/08-B)*	12.73	12.58	12.64
Radiated power [dBm] *(measured)*	16.28	17.90	17.78
Gain [dBi] *(calculated)*	3.55	5.32	5.14

	5260 MHz	5280 MHz	5320 MHz
Conducted power [dBm] *(Refer to test report 1-0685-01-07/08-B)*	16.23	16.71	16.87
Radiated power [dBm] *(measured)*	17.55	18.63	18.88
Gain [dBi] *(calculated)*	1.32	1.92	2.01

5.5 Max. peak output power radiated §15.407

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		5180 MHz	5220 MHz	5240 MHz
T_{nom}	V_{nom}	16.28	17.90	17.78
Measurement uncertainty		±3dB		

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		5260 MHz	5280 MHz	5320 MHz
T_{nom}	V_{nom}	17.55	18.63	18.88
Measurement uncertainty		±3dB		

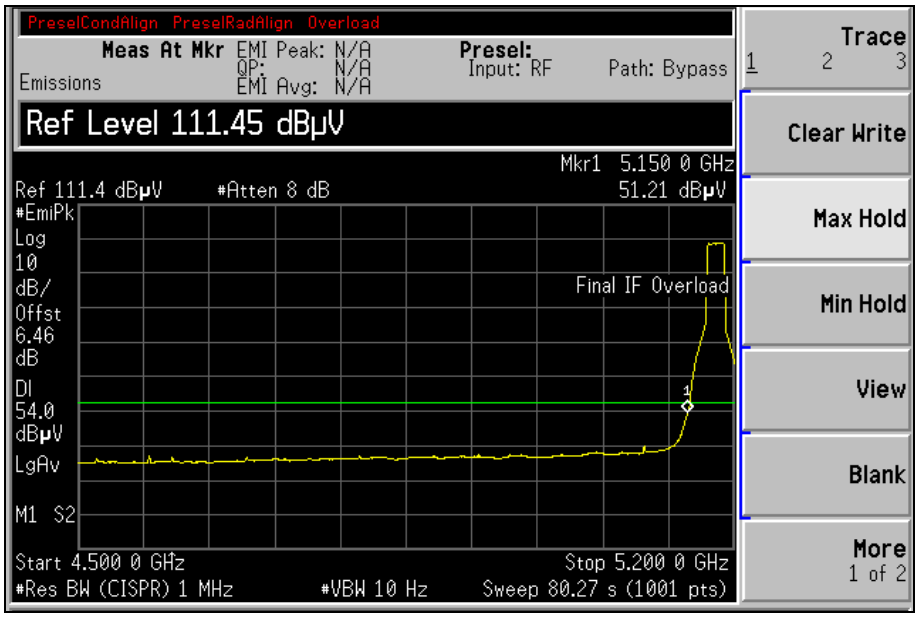
Limits:

for antennas with gain > 6 dBi	reduce the conducted output power by the amount in dB that the directional gain exceeds 6 dBi

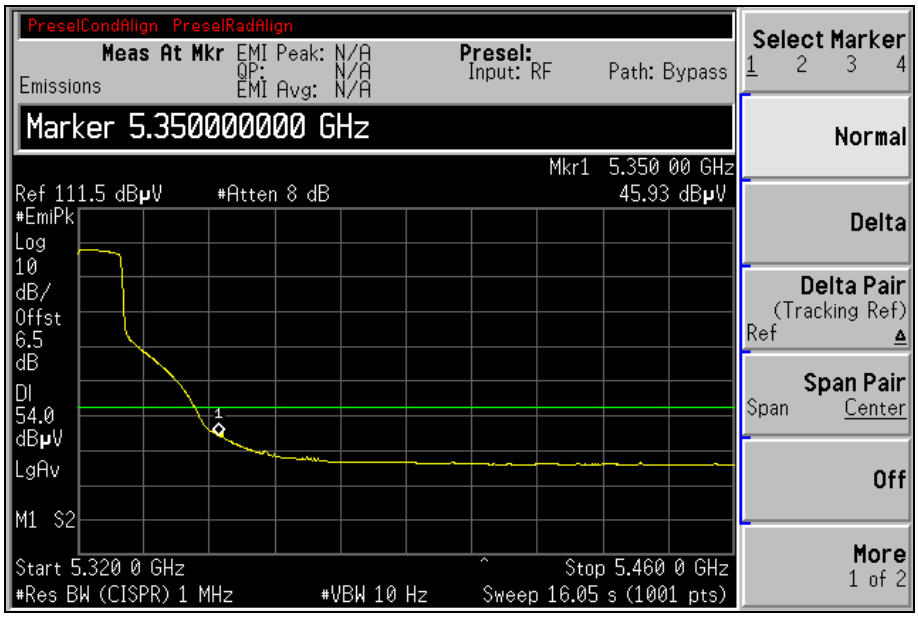
5.6 Band-edge compliance of radiated emissions §15.205

OFDM:

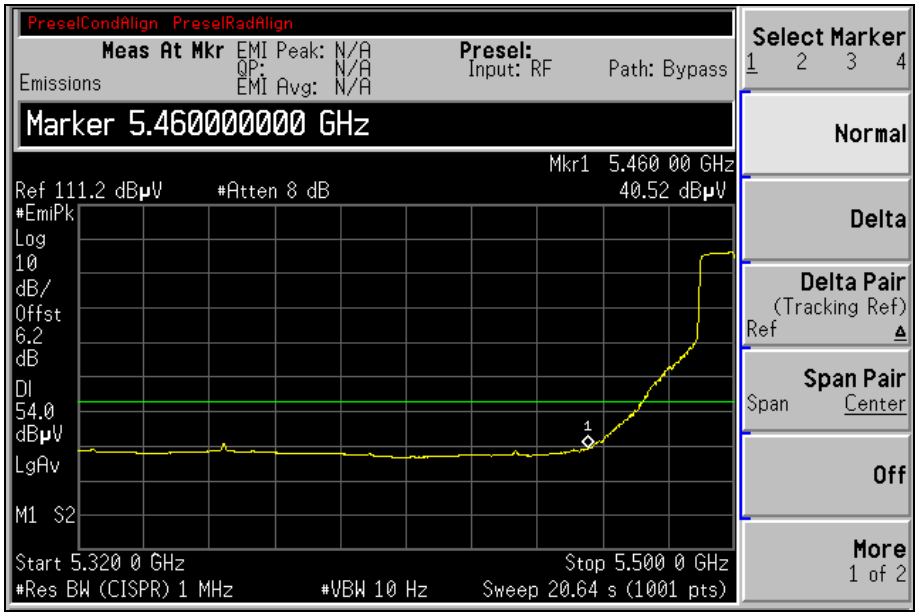
Plot 1 of 3:



Plot 2 of 3:



Plot 3 of 3:



Limit: 54 dBµV/m		**Complies**

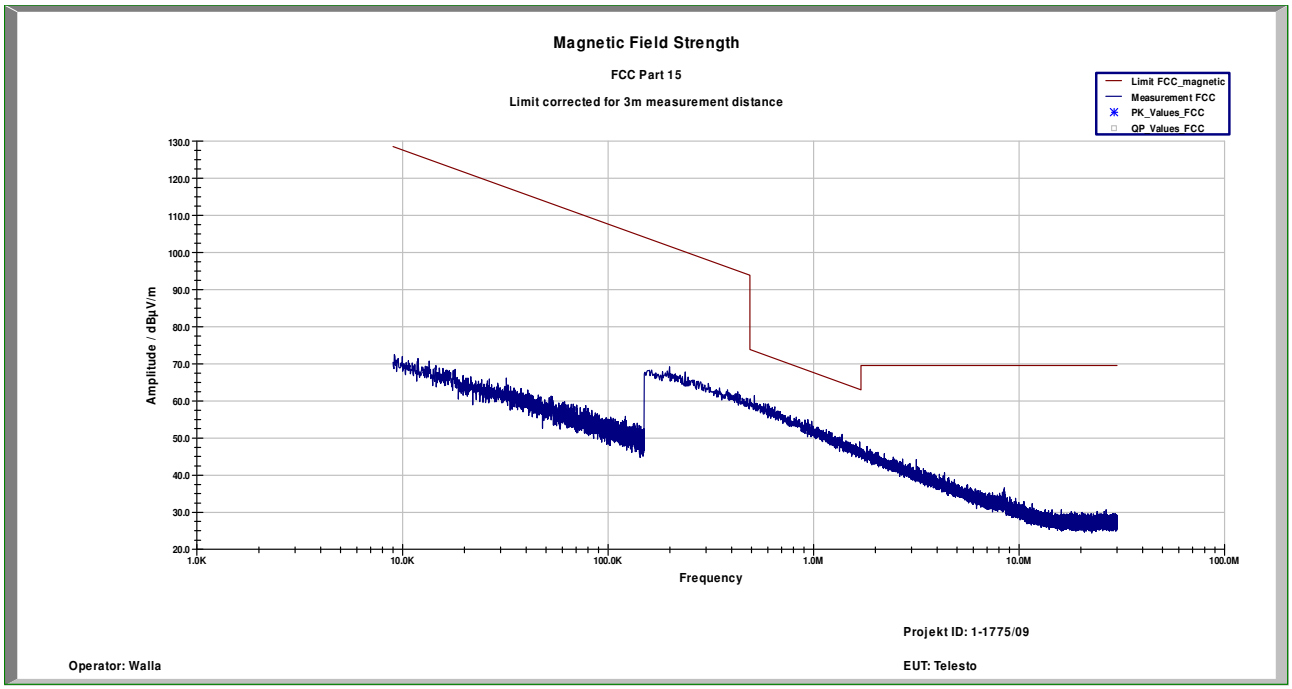
5.7 Spurious Emissions - radiated (Transmitter) §15.209

OFDM: TX-Mode, 5180 MHz

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.

Plot 1: < 30 MHz, valid for all channels

Measured at 3 m distance.
Values recalculated with 40 dB/decade according to FCC rules.



Limits:

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dBµV/m	30
30 - 88	100 / 40 dBµV/m	3
88 - 216	150 / 43.5 dBµV/m	3
216 - 960	200 / 46 dBµV/m	3
above 960	54 dBµV/m	3

Plot 2: 0.03 - 1 GHz, antenna vertical/horizontal @ 10 m

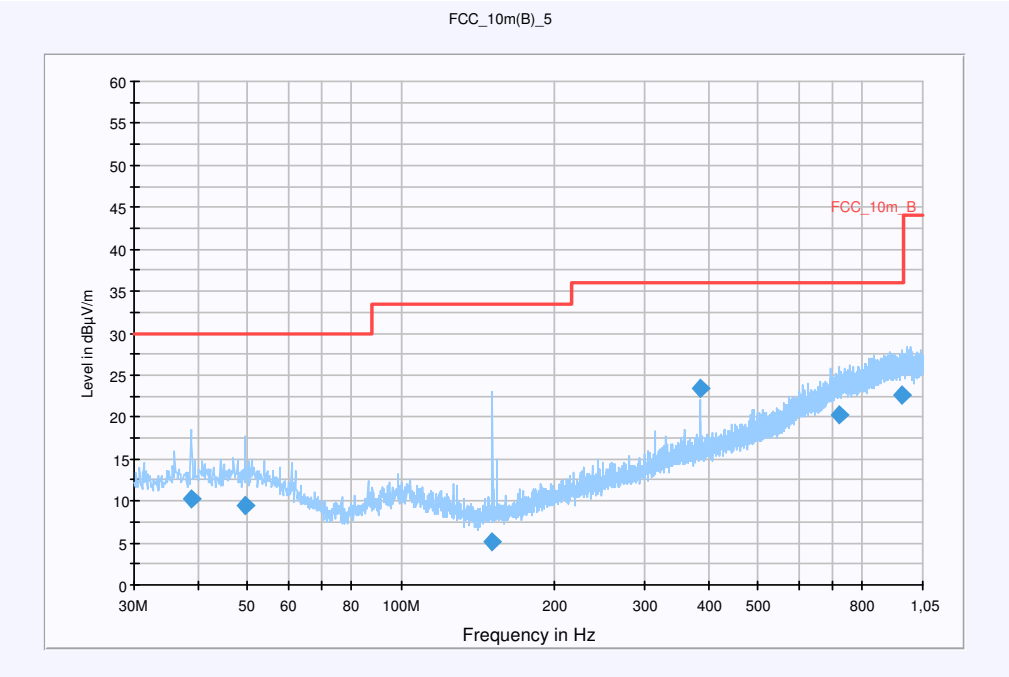
Information

EUT:	IntelliVue CL Family
Serial Number:	DE932Y0107
Test Description:	FCC Part 15 Subpart C
Operating Conditions:	WLAN test mode TX, Channel 36 / 5180 MHz
Operator Name:	Kraus
Comment:	-/-

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

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

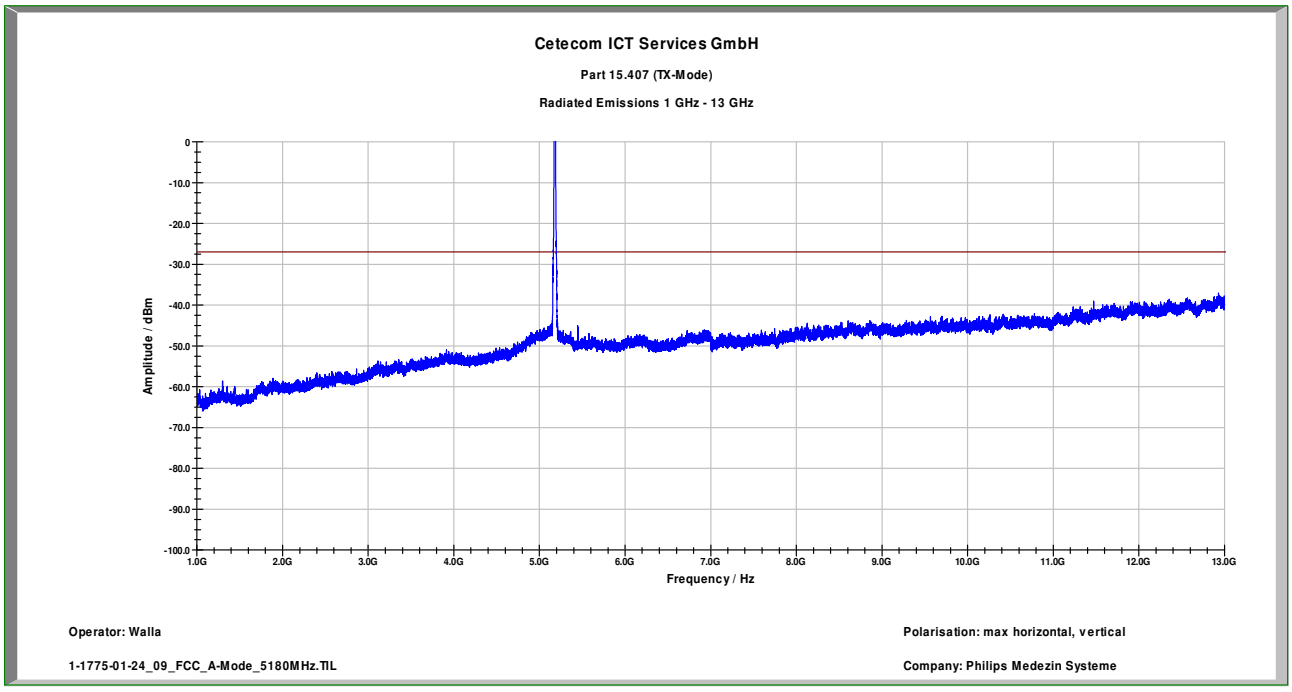


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
38.760000	10.1	15000.000	120.000	118.0	V	238.0	13.3	19.9	30.0
49.560000	9.5	15000.000	120.000	122.0	V	280.0	13.4	20.5	30.0
151.080000	5.1	15000.000	120.000	129.0	V	210.0	9.0	28.4	33.5
384.360000	23.4	15000.000	120.000	220.0	H	66.0	16.6	12.6	36.0
723.240000	20.2	15000.000	120.000	98.0	V	157.0	23.0	15.8	36.0
955.680000	22.6	15000.000	120.000	153.0	H	195.0	25.4	13.4	36.0

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

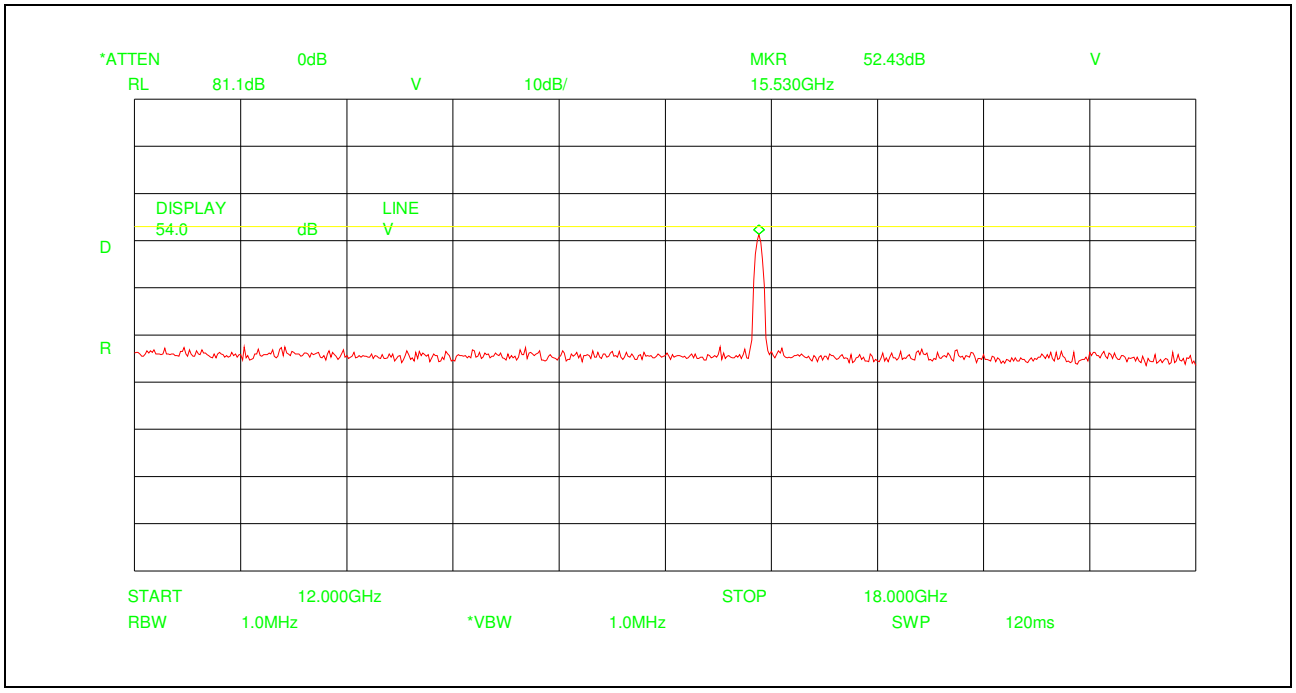
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3]
		@ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch
		FW 1.0
	Antenna:	VULB 9163
		SN 9163-295, FW ---
		Correction Table (vertical): VULP6113
		Correction Table (horizontal): VULP6113
		Correction Table: Cable_EN_1GHz (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 3: 1 - 12 GHz, antenna vertical/horizontal @ 3 m

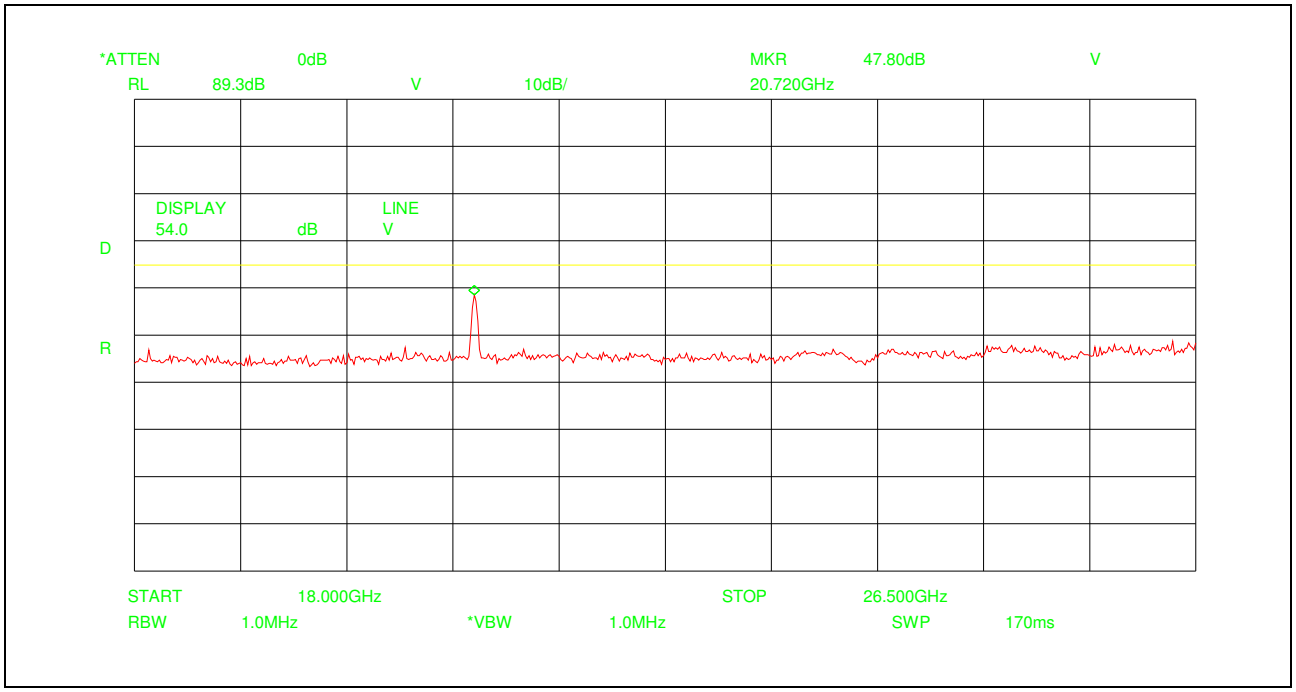


Plot 4: 12 – 18 GHz, antenna vertical/horizontal

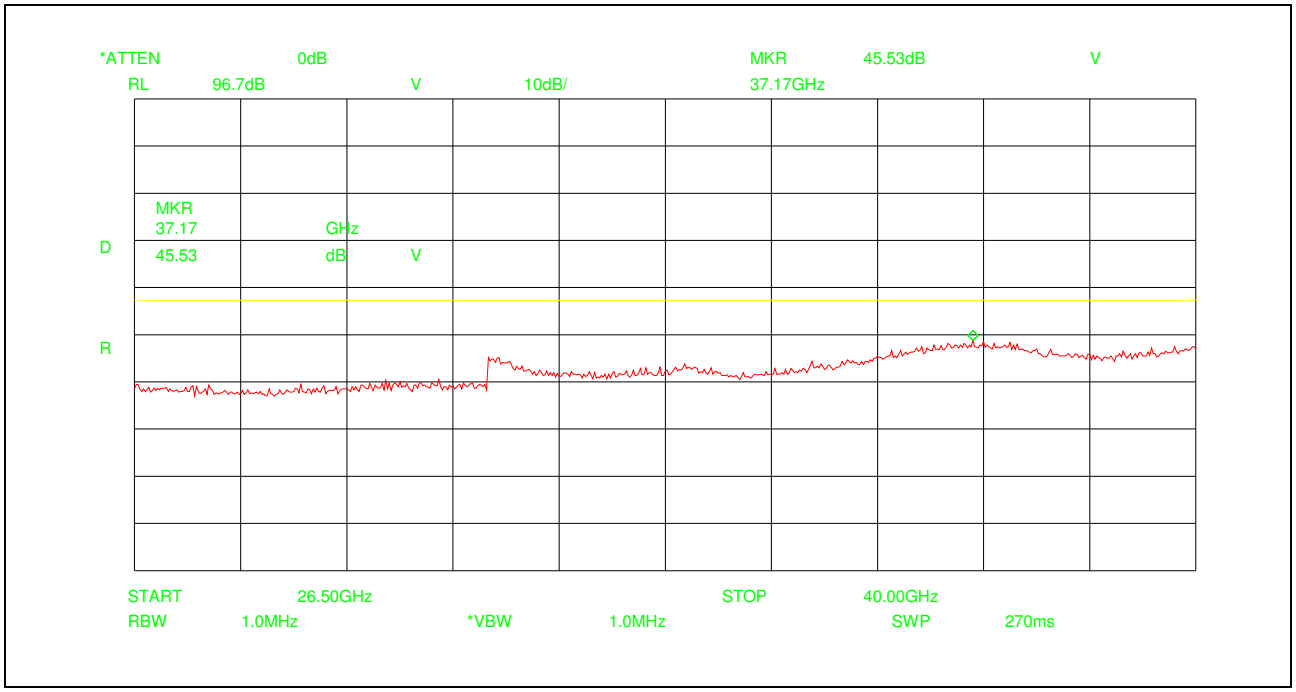
Only spurious emissions are permitted in the frequency band 15.35 GHz - 16.2 GHz; 17.7 GHz - 21.4 GHz, where the provisions of Section 15.205 of part 15 apply to intentional radiators operating under the section 15.407 (7)



Plot 5: 18 – 26.5 GHz, antenna vertical/horizontal



Plot 6: 26.5 – 40 GHz, antenna vertical/horizontal (Valid for all channels)



OFDM: TX-Mode, 5240 MHz

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.

Plot 7: 0.03 - 1 GHz, antenna vertical/horizontal @ 10 m

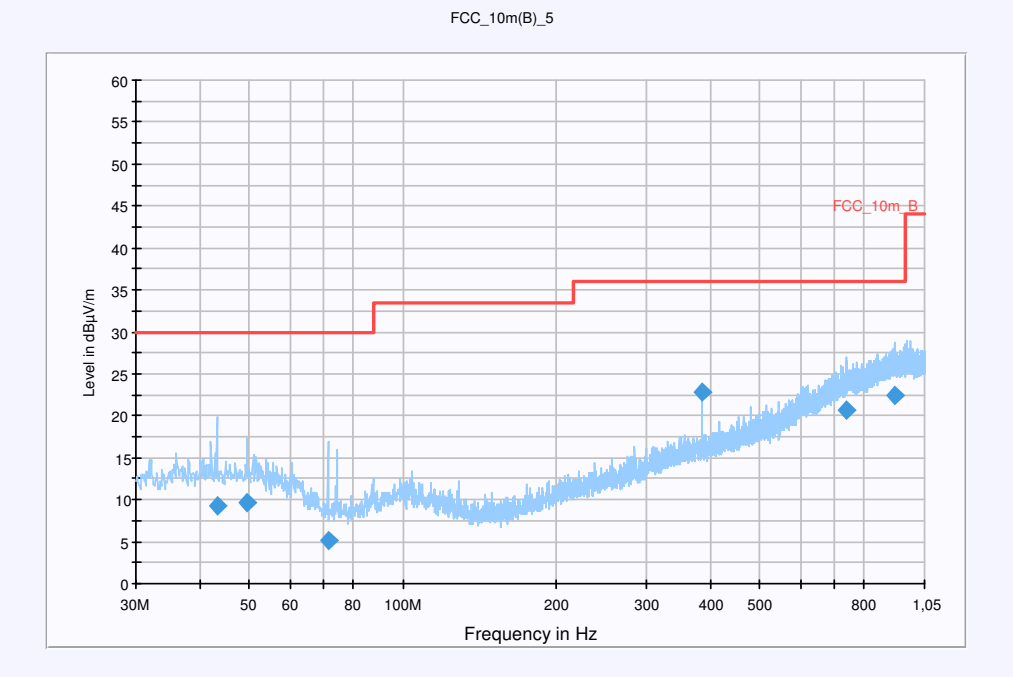
Information

EUT:	IntelliVue CL Family
Serial Number:	DE932Y0107
Test Description:	FCC Part 15 Subpart C
Operating Conditions:	WLAN test mode TX, Channel 48 / 5240 MHz
Operator Name:	Kraus
Comment:	-/-

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

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

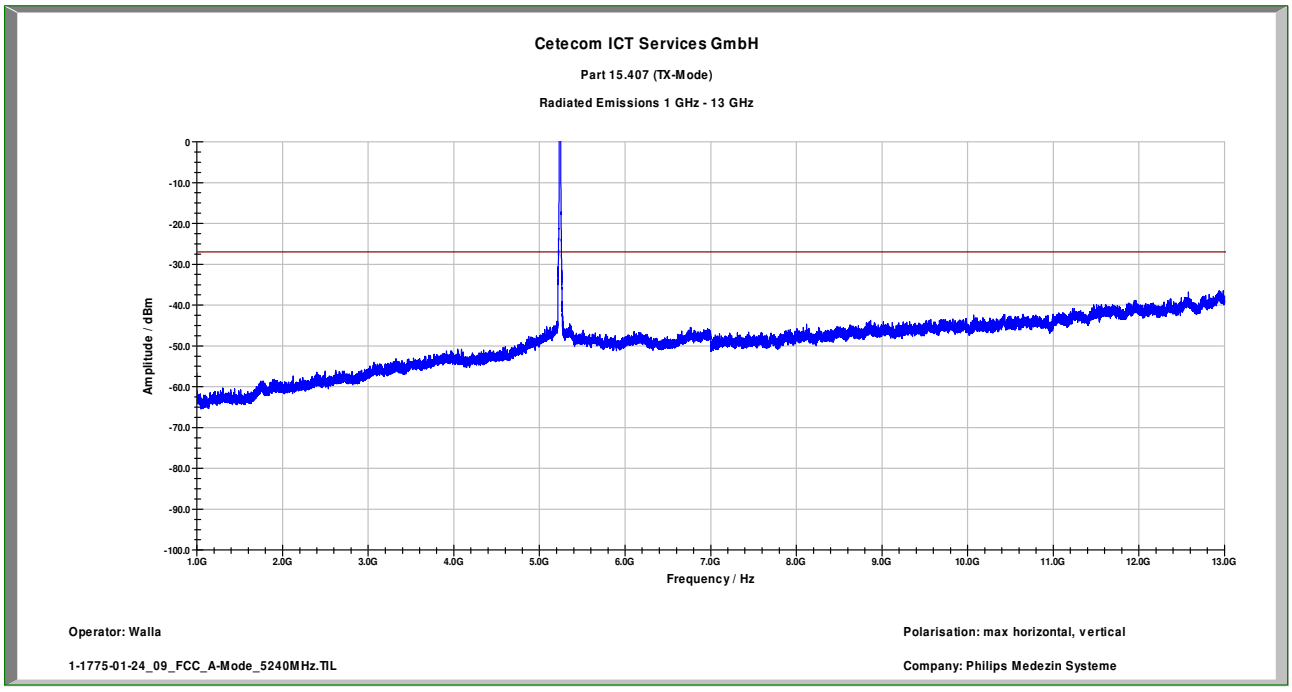


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
43.200000	9.2	15000.000	120.000	112.0	V	-2.0	13.3	20.8	30.0
49.560000	9.7	15000.000	120.000	98.0	V	149.0	13.4	20.3	30.0
71.280000	5.2	15000.000	120.000	119.0	V	237.0	9.3	24.8	30.0
384.360000	22.9	15000.000	120.000	222.0	H	290.0	16.6	13.1	36.0
739.440000	20.6	15000.000	120.000	222.0	H	199.0	23.4	15.4	36.0
916.920000	22.4	15000.000	120.000	185.0	V	81.0	25.3	13.6	36.0

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

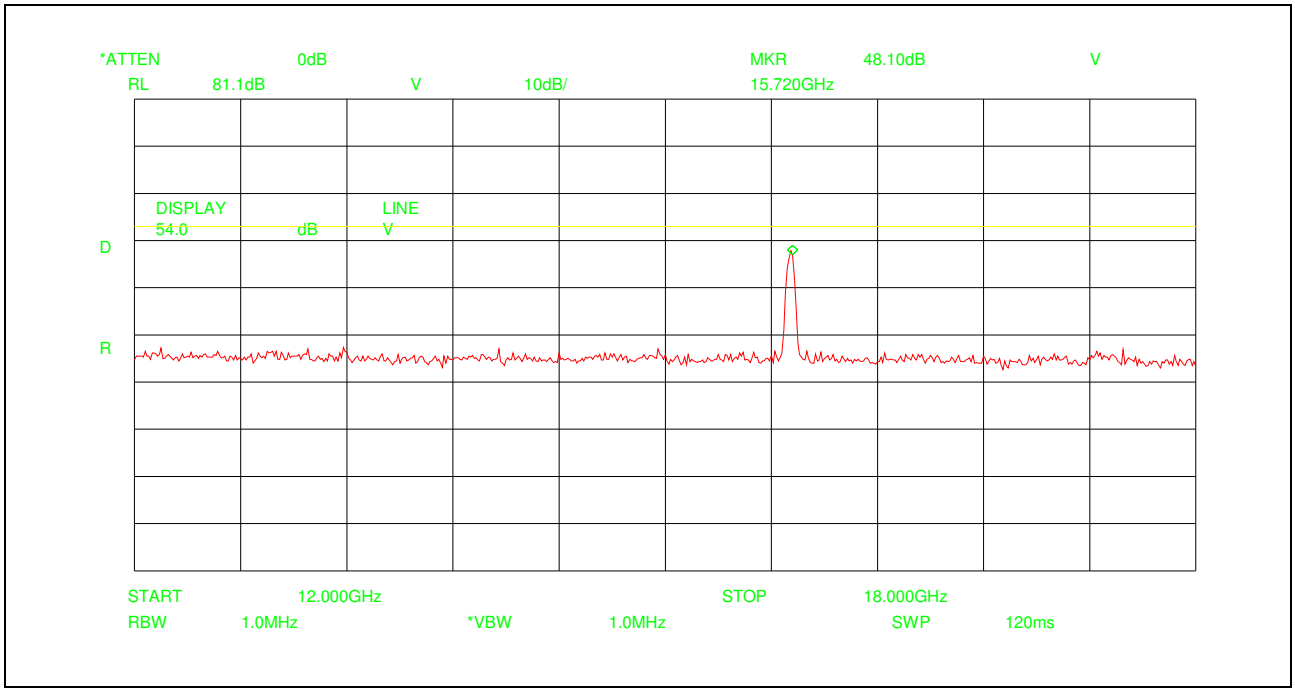
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3]
		@ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch
		FW 1.0
	Antenna:	VULB 9163
		SN 9163-295, FW ---
		Correction Table (vertical): VULP6113
		Correction Table (horizontal): VULP6113
		Correction Table: Cable_EN_1GHz (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 8: 1 - 12 GHz, antenna vertical/horizontal @ 3 m

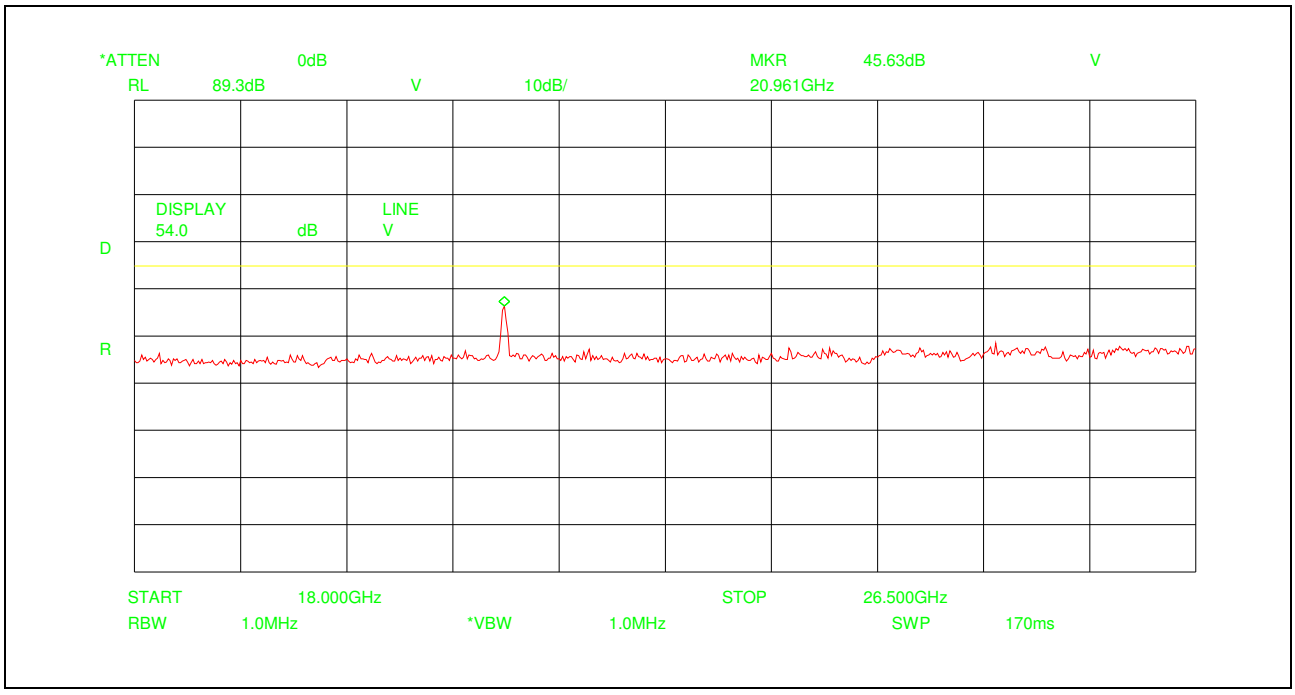


Plot 9: 12 – 18 GHz, antenna vertical/horizontal

Only spurious emissions are permitted in the frequency band 15.35 GHz - 16.2 GHz; 17.7 GHz - 21.4 GHz, where the provisions of Section 15.205 of part 15 apply to intentional radiators operating under the section 15.407 (7)



Plot 10: 18 – 26.5 GHz, antenna vertical/horizontal



OFDM: TX-Mode, 5260 MHz

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.

Plot 11: 0.03 - 1 GHz, antenna vertical/horizontal @ 10 m

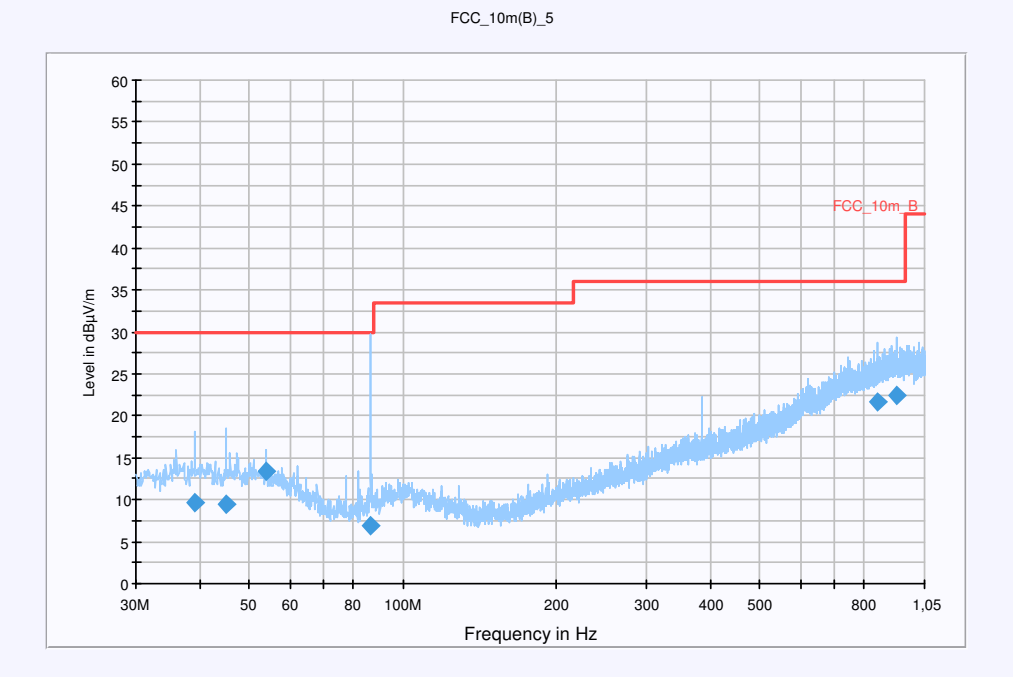
Information

EUT:	IntelliVue CL Family
Serial Number:	DE932Y0107
Test Description:	FCC Part 15 Subpart C
Operating Conditions:	WLAN test mode TX, Channel 52 / 5260 MHz
Operator Name:	Kraus
Comment:	-/-

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

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

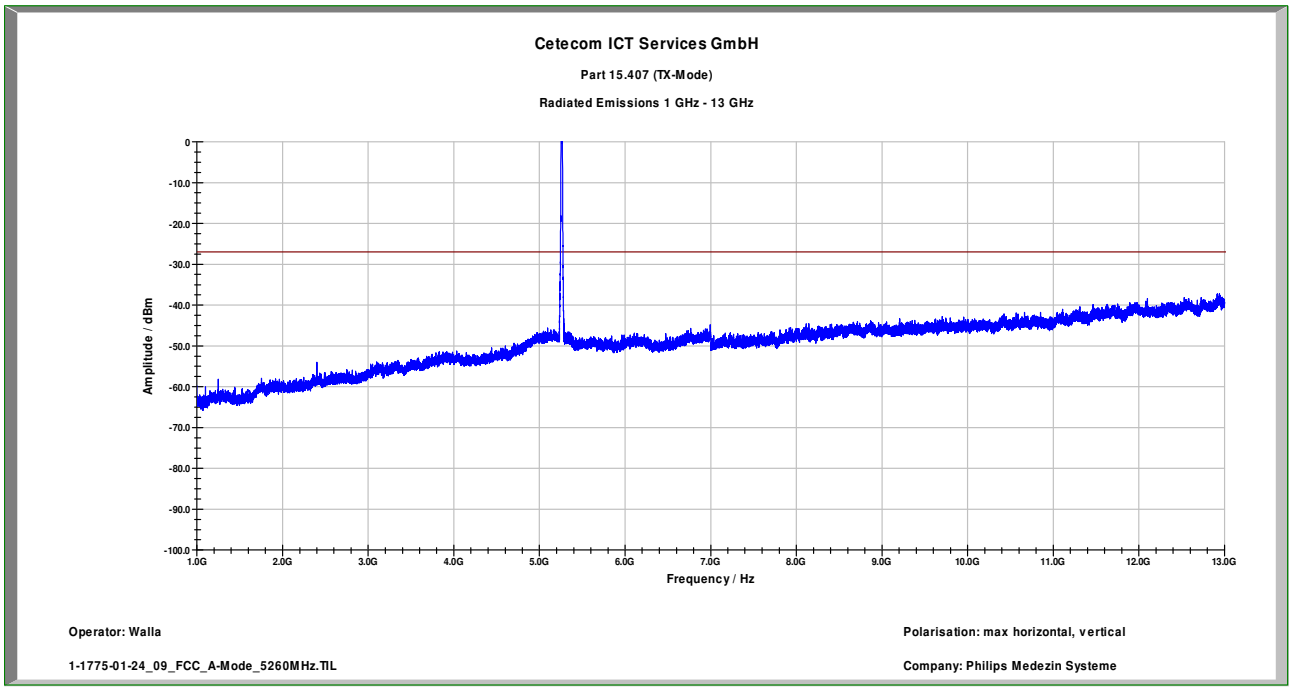


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
39.120000	9.6	15000.000	120.000	98.0	V	303.0	13.4	20.4	30.0
45.120000	9.4	15000.000	120.000	168.0	V	170.0	13.3	20.6	30.0
54.000000	13.3	15000.000	120.000	194.0	V	95.0	13.0	16.7	30.0
86.520000	6.8	15000.000	120.000	133.0	V	246.0	10.0	23.2	30.0
851.520000	21.6	15000.000	120.000	220.0	V	280.0	24.6	14.4	36.0
927.480000	22.4	15000.000	120.000	220.0	H	54.0	25.3	13.6	36.0

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

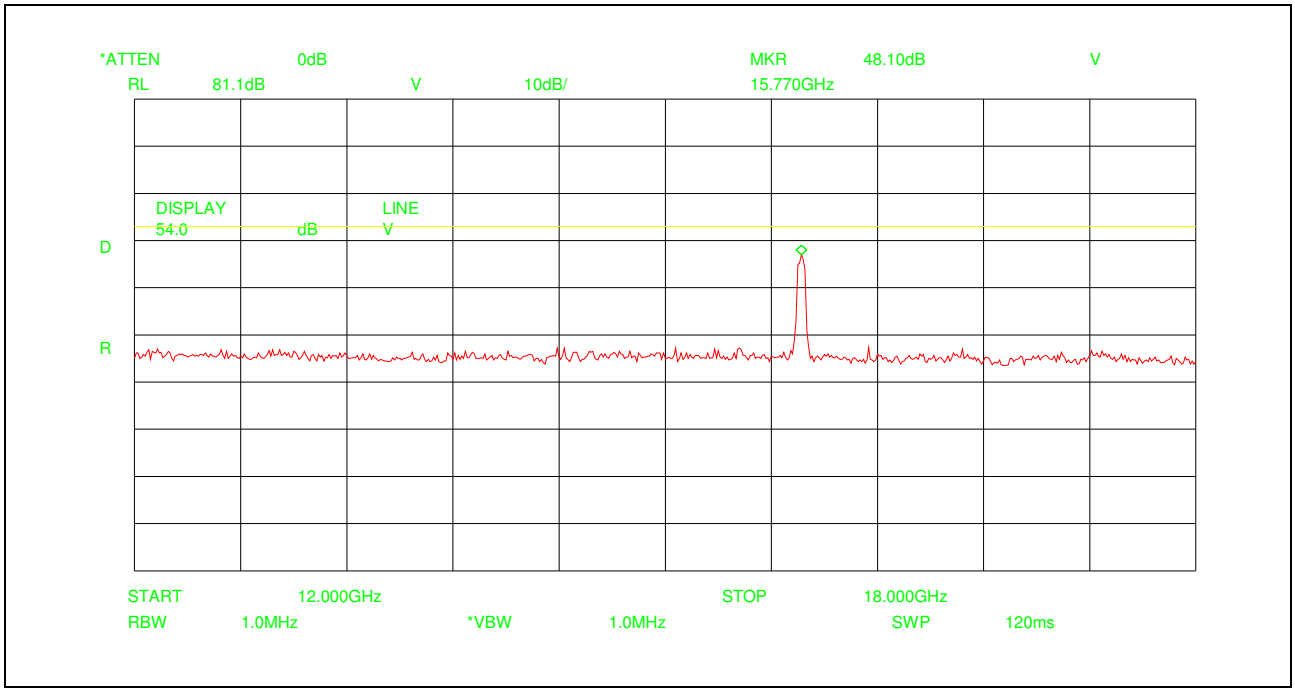
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3]
		@ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch
		FW 1.0
	Antenna:	VULB 9163
		SN 9163-295, FW ---
		Correction Table (vertical): VULP6113
		Correction Table (horizontal): VULP6113
		Correction Table: Cable_EN_1GHz (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 12: 1 - 12 GHz, antenna vertical/horizontal @ 3 m

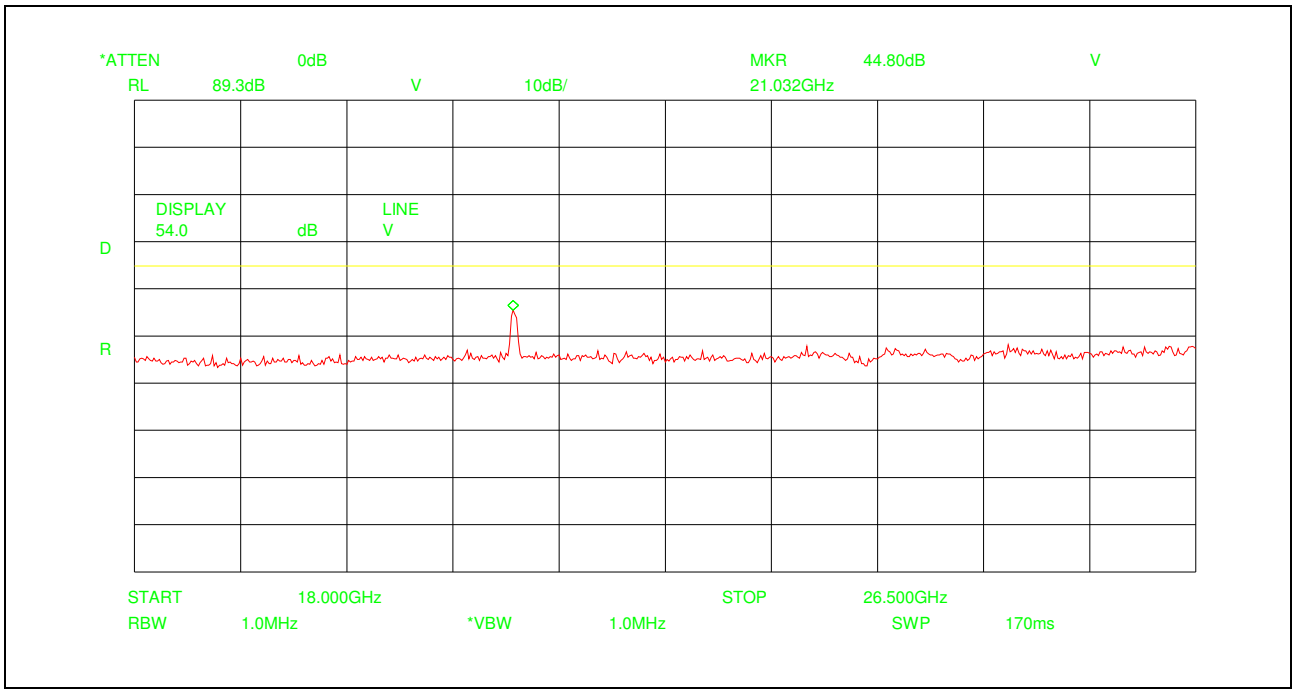


Plot 13: 12 – 18 GHz, antenna vertical/horizontal

Only spurious emissions are permitted in the frequency band 15.35 GHz - 16.2 GHz; 17.7 GHz - 21.4 GHz, where the provisions of Section 15.205 of part 15 apply to intentional radiators operating under the section 15.407 (7)



Plot 14: 18 – 26.5 GHz, antenna vertical/horizontal



OFDM: TX-Mode, 5320 MHz

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.

Plot 15: 0.03 - 1 GHz, antenna vertical/horizontal @ 10 m

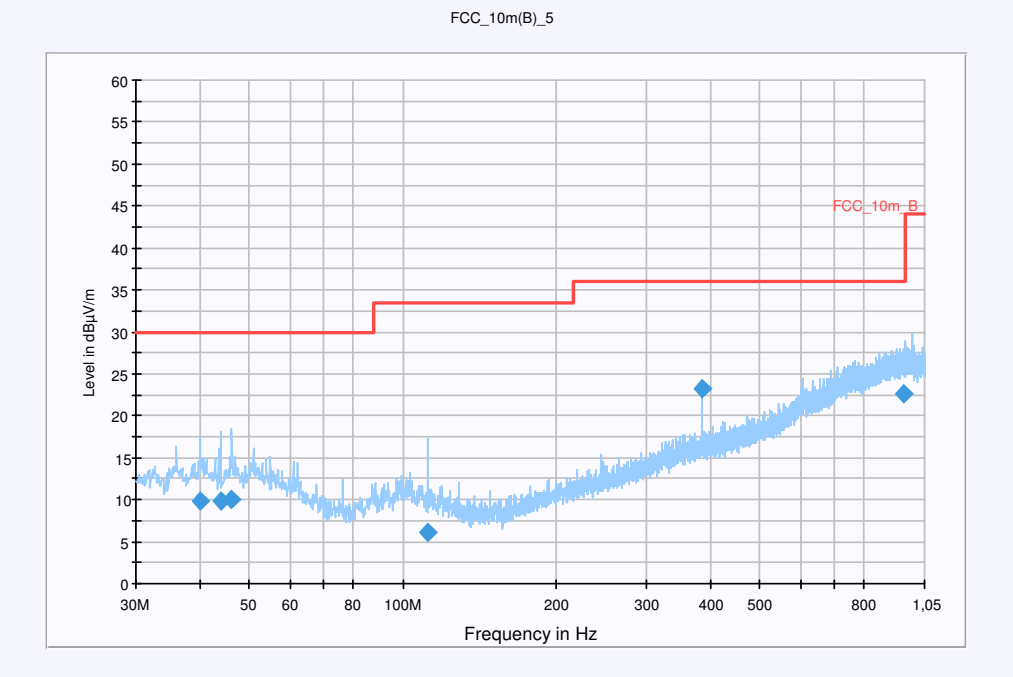
Information

EUT:	IntelliVue CL Family
Serial Number:	DE932Y0107
Test Description:	FCC Part 15 Subpart C
Operating Conditions:	WLAN test mode TX, Channel 64 / 5320 MHz
Operator Name:	Kraus
Comment:	-/-

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

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

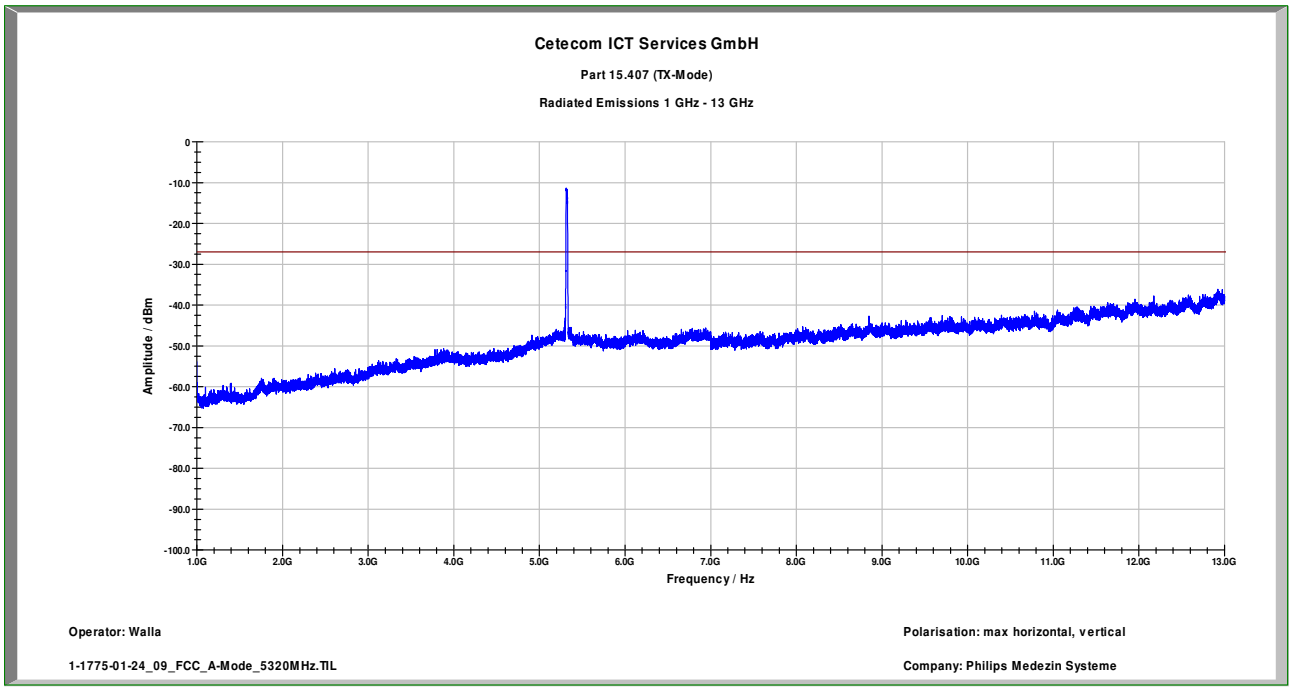


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
40.080000	9.9	15000.000	120.000	118.0	V	218.0	13.4	20.1	30.0
44.040000	9.8	15000.000	120.000	210.0	V	-2.0	13.3	20.2	30.0
46.320000	10.0	15000.000	120.000	220.0	V	72.0	13.3	20.0	30.0
111.720000	6.1	15000.000	120.000	212.0	V	139.0	10.9	27.4	33.5
384.360000	23.2	15000.000	120.000	220.0	H	259.0	16.6	12.8	36.0
954.960000	22.6	15000.000	120.000	192.0	H	161.0	25.4	13.4	36.0

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

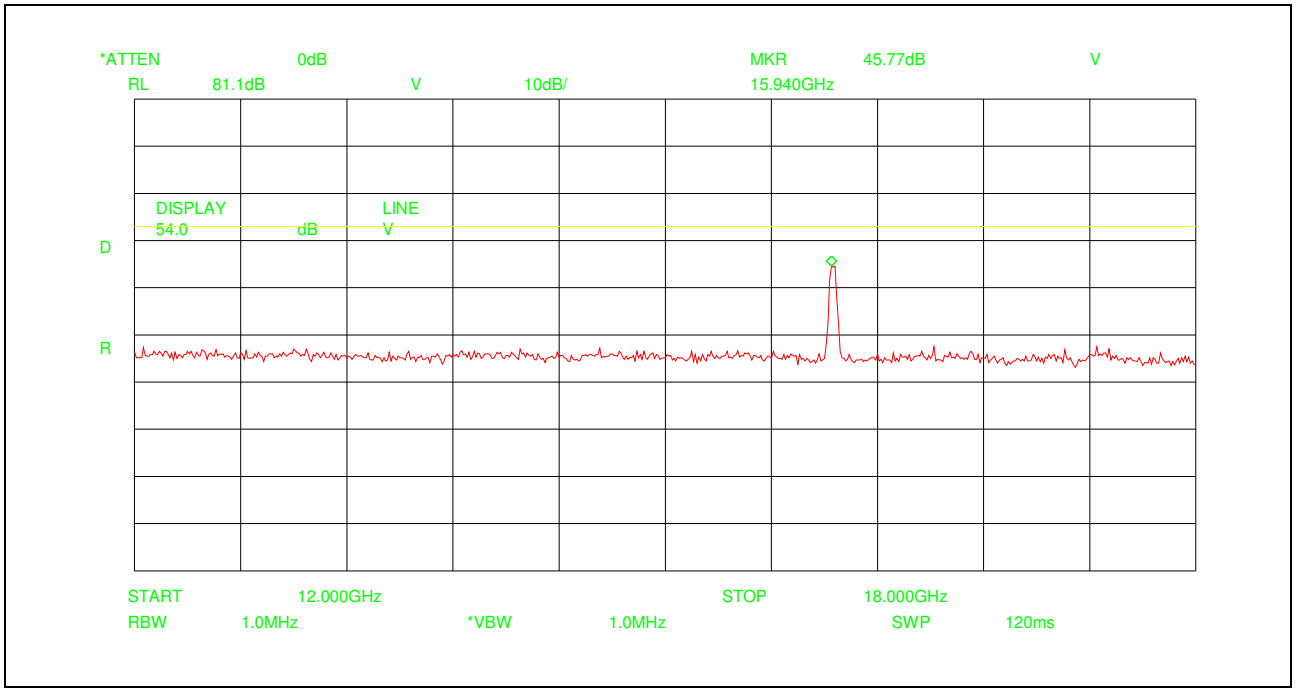
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3]
		@ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch
		FW 1.0
	Antenna:	VULB 9163
		SN 9163-295, FW ---
		Correction Table (vertical): VULP6113
		Correction Table (horizontal): VULP6113
		Correction Table: Cable_EN_1GHz (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 16: 1 - 12 GHz, antenna vertical/horizontal @ 3 m

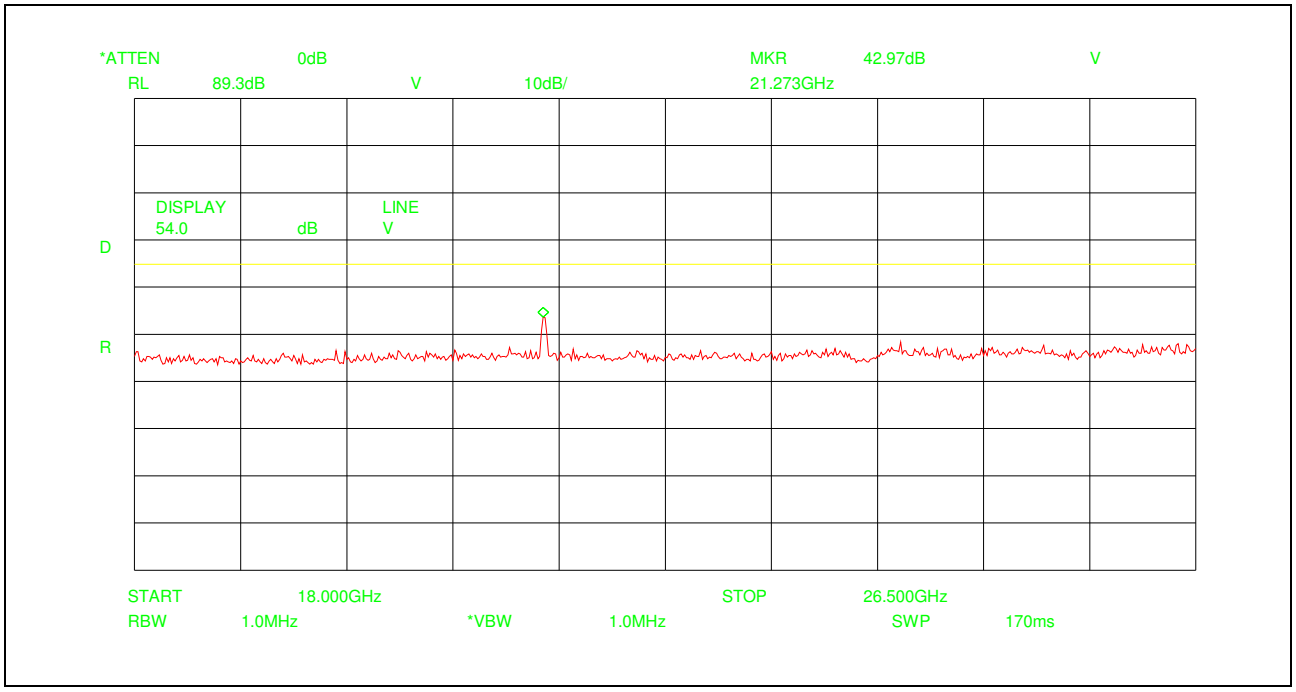


Plot 17: 12 – 18 GHz, antenna vertical/horizontal

Only spurious emissions are permitted in the frequency band 15.35 GHz - 16.2 GHz; 17.7 GHz - 21.4 GHz, where the provisions of Section 15.205 of part 15 apply to intentional radiators operating under the section 15.407 (7)



Plot 18: 18 – 26.5 GHz, antenna vertical/horizontal



Results:

SPURIOUS EMISSIONS LEVEL §15.209								
5180 MHz			5240 MHz			5260 MHz		
Frequency [MHz]	Detector	Level [dBµV/m]	Frequency [MHz]	Detector	Level [dBµV/m]	Frequency [MHz]	Detector	Level [dBµV/m]
15530	Peak	52.43	15.720	Peak	48.10	15770	Peak	48.10
20720	Peak	47.80	20961	Peak	45.63	21032	Peak	44.80
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

SPURIOUS EMISSIONS LEVEL §15.209								
5320 MHz			--			--		
Frequency [MHz]	Detector	Level [dBµV/m]	Frequency [MHz]	Detector	Level [dBµV/m]	Frequency [MHz]	Detector	Level [dBµV/m]
15940	Peak	45.77						
21273	Peak	42.97						
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Limits: **§ 15.247 (c)**

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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)).

Limits: **§ 15.407**

Under normal test conditions only	-27 dBm/MHz

Limits: **§ 15.109**

Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

5.8 Spurious emissions radiated (RX) § 15.209

Plot 19: 0.03 - 1 GHz, antenna vertical/horizontal (receiver) @ 10m

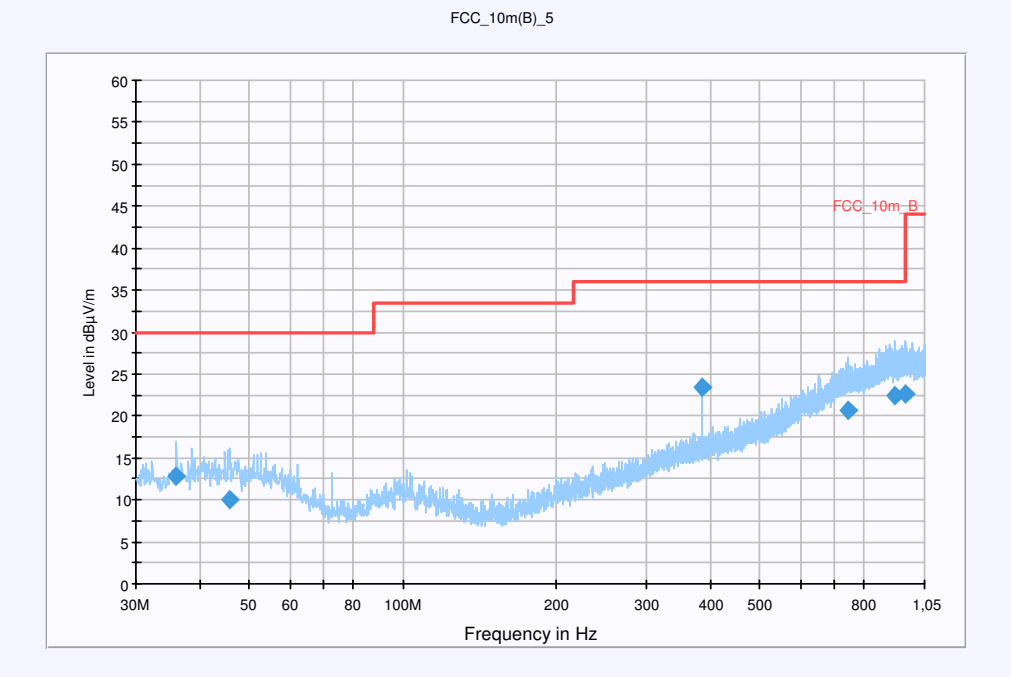
Information

EUT:	IntelliVue CL Family
Serial Number:	DE932Y0107
Test Description:	FCC Part 15 Subpart B Class B
Operating Conditions:	WLAN RX-Mode
Operator Name:	Kraus
Comment:	-/-

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

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

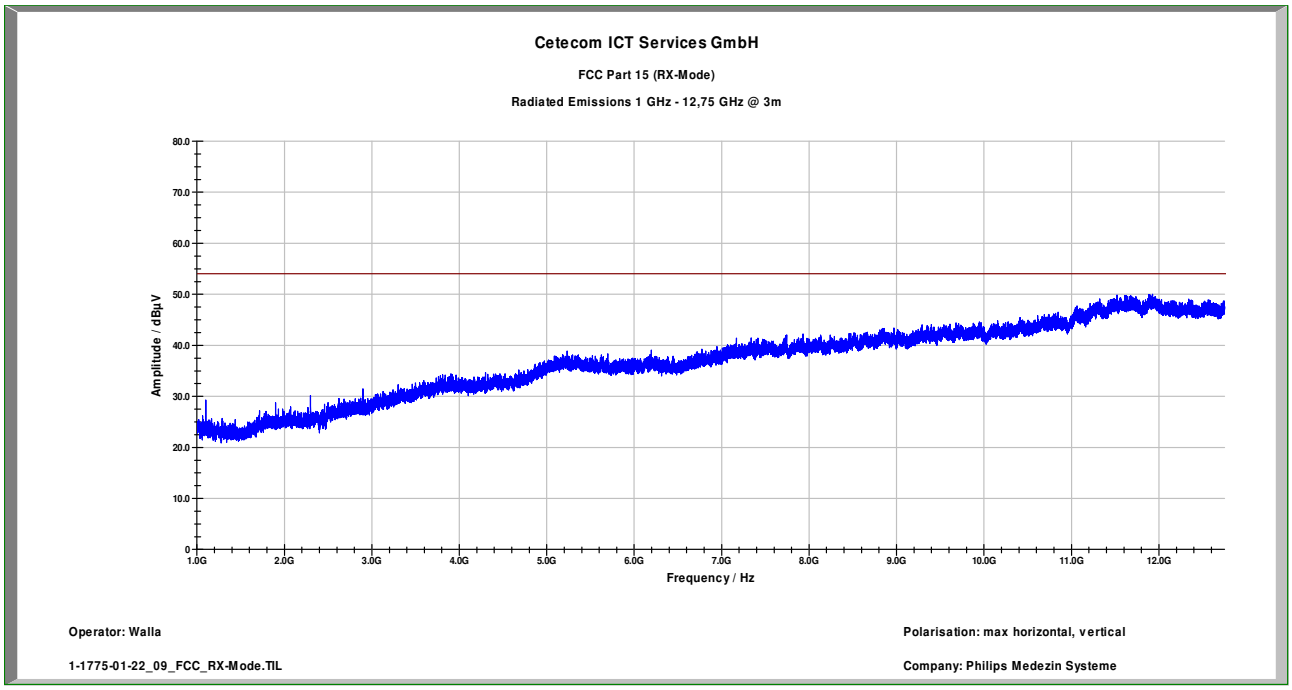


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
36.000000	12.9	15000.000	120.000	214.0	V	229.0	13.1	17.1	30.0
45.840000	10.0	15000.000	120.000	220.0	V	189.0	13.3	20.0	30.0
384.360000	23.5	15000.000	120.000	220.0	H	268.0	16.6	12.5	36.0
745.920000	20.6	15000.000	120.000	220.0	V	242.0	23.6	15.4	36.0
917.040000	22.4	15000.000	120.000	220.0	H	352.0	25.3	13.6	36.0
964.680000	22.7	15000.000	120.000	220.0	V	15.0	25.5	21.3	44.0

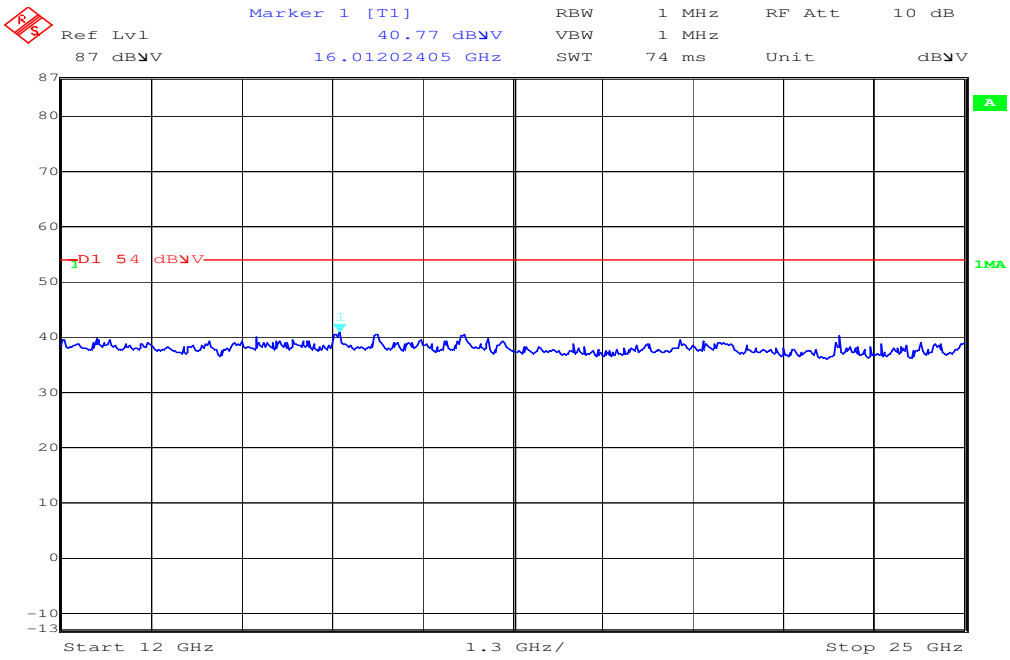
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

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 20: 1 - 12 GHz, antenna vertical/horizontal (receiver) @ 3m



Plot 21: 12- 25 GHz (receiver)



Results:

Spurious Emissions level [dBµV/m]		
Frequency [MHz]	Detector	Level [dBµV/m]
No critical peaks detected!		
Measurement uncertainty	±3 dB	

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz
See above plots

Measurement distance see table

Limits: **§ 15.109**

Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

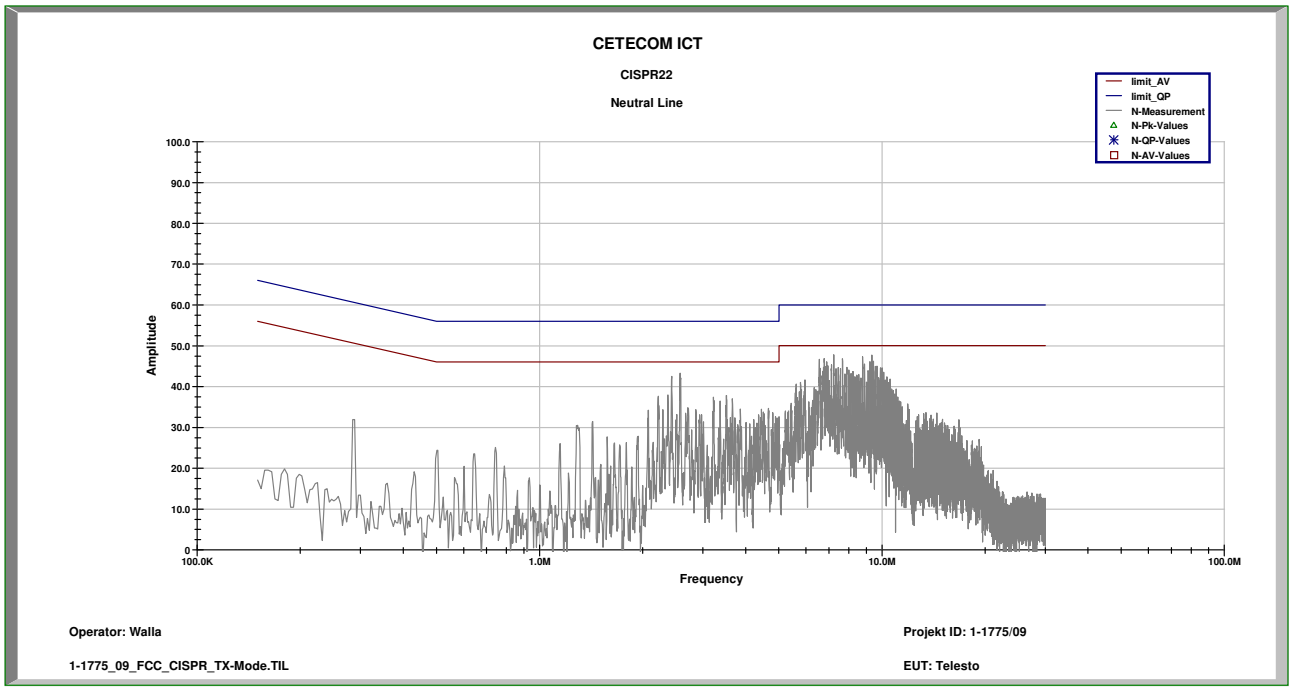
Limits:

Under normal test conditions only	See plots

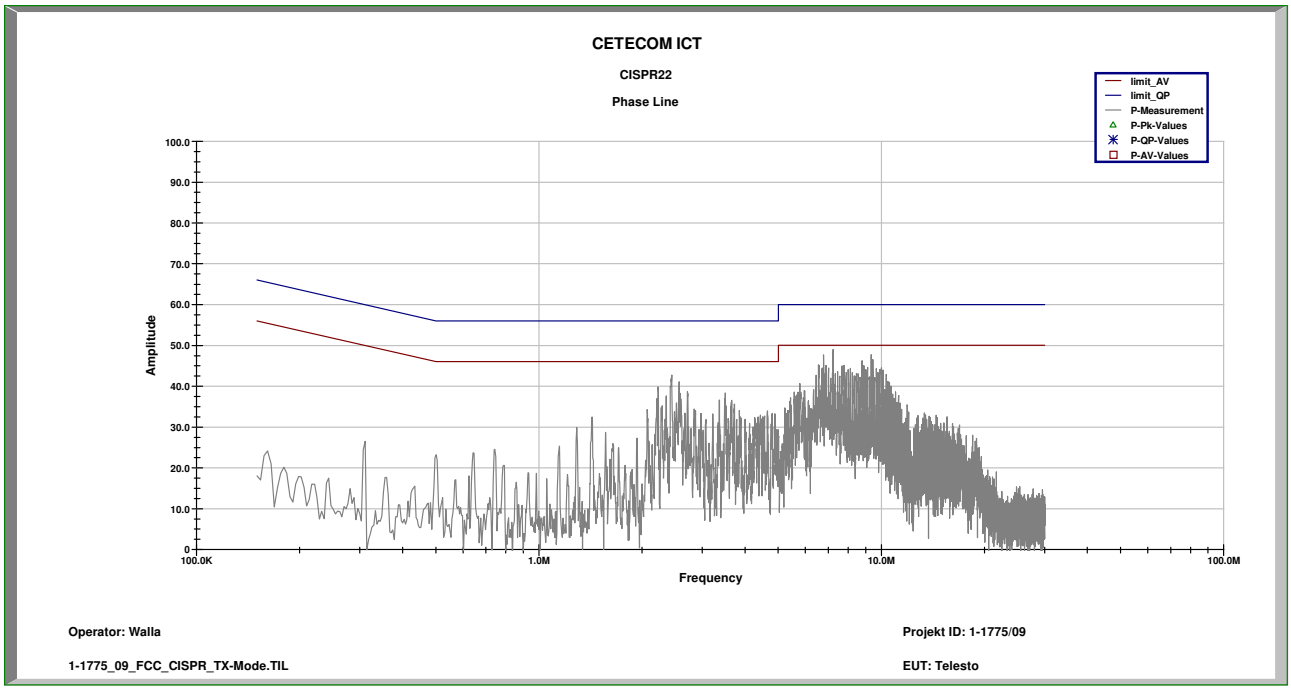
5.9 Conducted Emissions <30 MHz §15.107/207

OFDM:

Plot 22: TX – Mode, Neutral line



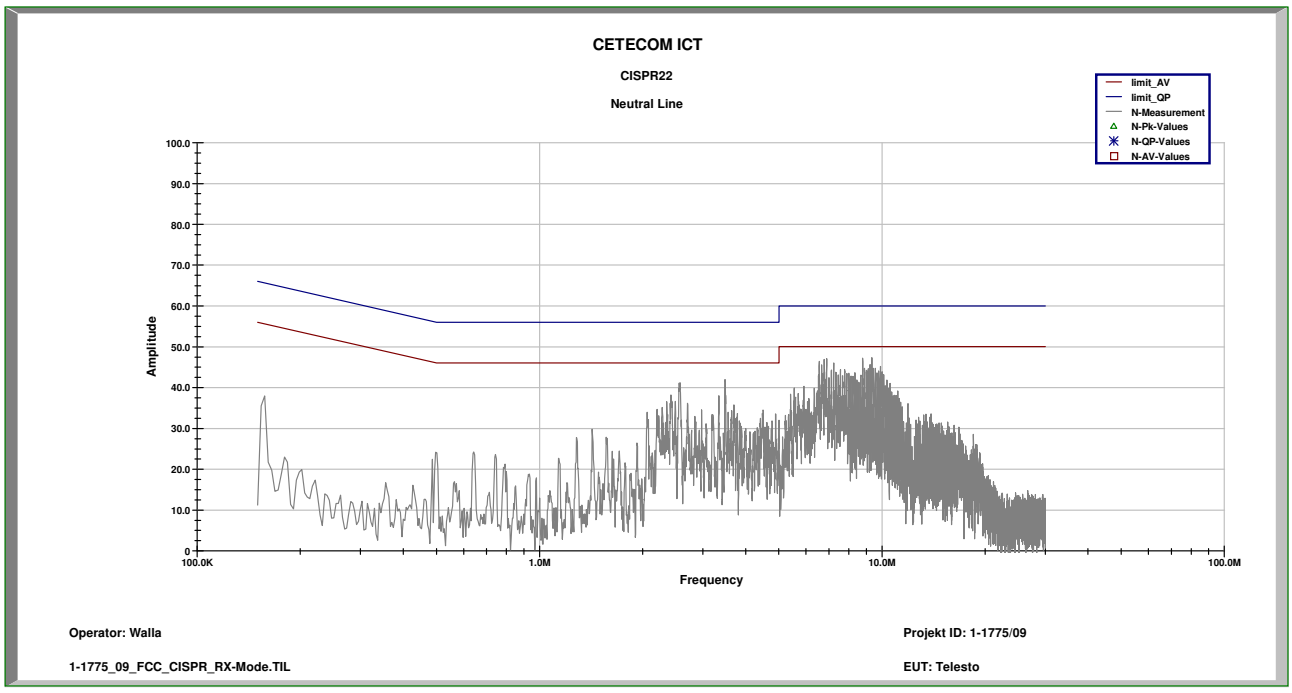
Plot 23: TX – Mode, Phase line



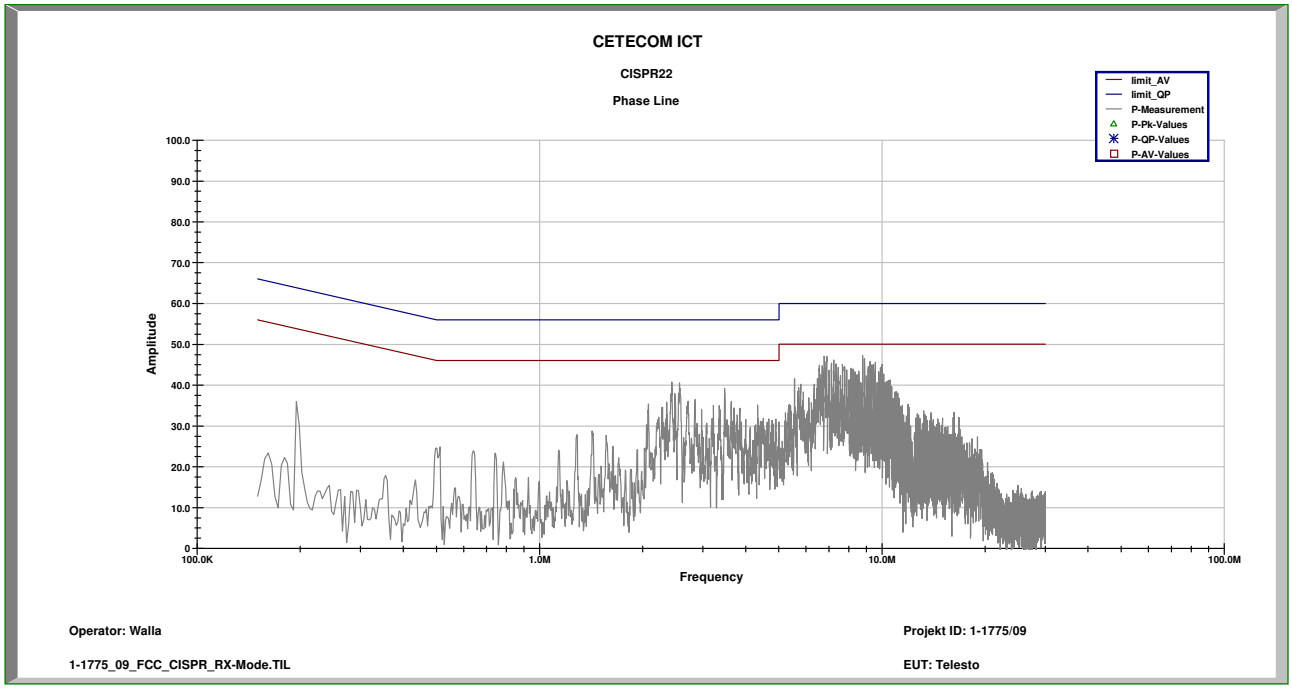
Limits:

Under normal test conditions only	See plots

Plot 24: RX – Mode, Neutral line



Plot 25: RX – Mode, Phase line



Limits:

Under normal test conditions only	See plots

6 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.	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Last Calibration	Next Calibration
1	System Autoranging DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	08.01.2009	08.01.2012
2	PowerAttenuator	8325	Byrd	1530	300001595		
3	Double-Ridged Waveguide Horn Antenna 1-26.5GHz	3115	EMCO	8812-3088	300001032	05.03.2009	05.03.2011
4	Active Loop Antenna	6502	EMCO	2210	300001015		
5	Anechoic chamber		MWB	87400/02	300000996		
6	System rack for EMI measurement solution	85900	HP I.V.	*	300000222		
7	Artificial Mains 9 kHz to 30 MHz, 4 x 25 Ampere	ESH3-Z5	R&S	828576/020	300001210	06.01.2010	06.01.2012
8	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156		
9	Relais Matrix	PSU	R&S	890167/024	300001168		
10	Isolating Transformer	RT5A	Grundig	9242	300001263		
11	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997		
12	Switch / Control Unit	3488A	HP	2605e08770	300001443		
13	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350		
14	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351		
15	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451		
16	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492		
17	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255		
18	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789		

19	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Vertr. Bad Hom	MY48250080	300003812	05.08.2008	05.08.2010
20	MXG Microwave Analog Signal Generator	N5183A	Agilent Vertr. Bad Hom	MY47420220	300003813	06.08.2008	06.08.2010
21	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Vertr. Bad Hom	MY48260003	300003825	19.08.2008	19.08.2010
22	TRILOG Super Breitband Antenne	VULB9163	Schwarzbeck	371	300003854	17.12.2008	17.12.2010
23	DC Power Supply 0 – 32V	1108-32	Heiden	1802	300001383		
24	Signal Analyzer 20Hz-26,5GHz-150 to + 30 DBM	FSiQ26	R&S	835111/0004	300002678	06.01.2009	06.01.2011
25	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368		
26	Netzgerät	6032A	HP Meßtechnik	2920A04466	300000580	06.01.2009	06.01.2011
27	EMI-Messempfänger	ESCI 1166.5950.03	R&S	100083	300003312	08.01.2010	08.01.2012
28	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379		
29	Antennenmast	Model 2175	ETS-LINDGREN	64762	300003745		
30	Steuergerät	Model 2090	ETS-LINDGREN	64672	300003746		
31	Interface-Box für Drehtisch	Model 105637	ETS-LINDGREN	44583	300003747		
32	Breitbandantenne	VULB9163	Schwarzbeck	295	300003787	01.04.2010	01.04.2012
33	Spectrum-Analyzer	FSU26	R&S	200809	300003874	08.01.2010	08.01.2012