

**CETECOM™****CETECOM ICT Services**  
consulting - testing - certification >>>

## TEST REPORT

Test report no.: 1-4691/12-01-07-C

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

### Testing laboratory

**CETECOM ICT Services GmbH**Untertuerkheimer Strasse 6 – 10  
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Internet: <http://www.cetecom.com>  
e-mail: [ict@cetecom.com](mailto:ict@cetecom.com)**Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Area of Testing: Radio/Satellite Communications

### Applicant

**Philips Medizin Systeme Böblingen GmbH**Hewlett-Packard-Strasse 2  
71034 Böblingen / GERMANYPhone: -/-  
Fax: +49 7031 463-2944  
Contact: Hansjörg Geywitz  
e-mail: [hansjoerg.geywitz@philips.com](mailto:hansjoerg.geywitz@philips.com)  
Phone: +49 7031 463-1879

### Manufacturer

**Philips Medizin Systeme Böblingen GmbH**Hewlett-Packard-Strasse 2  
71034 Böblingen / GERMANY

### Test standard/s

47 CFR Part 95	Title 47 of the Code of Federal Regulations; Chapter I Subpart H—Wireless Medical Telemetry Service (WMTS); Part 95 - Personal radio services
RSS - 210 Issue 8	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:	Cableless Transducer
Model name:	866075 866076 866077
FCC ID:	PQC-OBRTBV1
IC:	3549C-OBRTBV1
Frequency:	608 MHz – 614 MHz Lowest Channel 3 (608.375 MHz) / Highest Channel 38 (613.625 MHz)
Antenna:	Integrated antenna
Power Supply:	3.70 V DC by Li-Ion battery
Temperature Range:	-20°C to +55 °C

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

**Test report authorised:**Marco Bertolino  
Testing Manager**Test performed:**Stefan Bös  
Senior Testing Manager

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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In no case this test report can be considered as a Letter of Approval.

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

### 2.2 Application details

Date of receipt of order:	2012-06-12
Date of receipt of test item:	2012-11-27
Start of test:	2012-11-27
End of test:	2013-02-13
Person(s) present during the test:	-/-

## 3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 95	2010-10	Title 47 of the Code of Federal Regulations; Chapter I Subpart H—Wireless Medical Telemetry Service (WMTS); Part 95 - Personal radio services
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

## 4 Test environment

Temperature:	$T_{\text{nom}}$	+22 °C during room temperature tests
	$T_{\text{max}}$	+55 °C during high temperature tests
	$T_{\text{min}}$	-20 °C during low temperature tests
Relative humidity content:		54 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	$V_{\text{nom}}$	3.70 V DC by Li-Ion battery
	$V_{\text{max}}$	3.50 V
	$V_{\text{min}}$	4.07 V

## 5 Test item

Kind of test item	:	Cableless Transducer
Type identification	:	866075 866076 866077
S/N serial number	:	866075: DE24800255 866076: DE24700282 866077: DE24900222
HW hardware status	:	Sensor PCB 866075: 1229 Sensor PCB 866076: 1228 Sensor PCB 866077: 1229 Sensor HF board: 1302
SW software status	:	Sensor PCB 866075: A.04.03 Sensor PCB 866076: A.04.03 Sensor PCB 866077: A.04.03
Frequency band [MHz]	:	608 MHz – 614 MHz Lowest Channel 3 (608.375 MHz) / Highest Channel 38 (613.625 MHz)
Type of modulation	:	GFSK
Antenna	:	Integrated antenna
Power supply	:	3.70 V DC by Li-Ion battery
Temperature range	:	-20°C to +55 °C

## 6 Test laboratories sub-contracted

None

## 7 Additional information

Test setup - and EUT - photos are included in the following test reports:

External EUT photos:	1-4695/12-01-03_AnnexA
Internal EUT photos:	1-4695/12-01-03_AnnexB
Test setup:	1-4695/12-01-03_AnnexC

## 8 Summary of measurement results



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



There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	47 CFR Part 2 47 CFR Part 95 H RSS Gen Issue 3 RSS 210 Issue 8 Annex 4	Passed	2013-07-09	-/-

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Remark
FCC 47 CFR § 2.1046 § 95.1115(a) RSS 210 Issue 8 A4.4	Radiated field strength	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
FCC 47 CFR § 2.1055 § 95.1115(e) RSS Gen Issue 3 4.7	Frequency stability	Nominal	Extreme	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
		Extreme	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
FCC 47 CFR § 2.1049 (1) RSS Gen Issue 3 4.6	Occupied bandwidth	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Pass/Fail criteria
FCC 47 CFR § 2.1053 § 95.1115(b) RSS Gen Issue 3 4.9	Field strength of spurious radiation Transmitter unwanted emissions	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
FCC 47 CFR § 15.209 RSS Gen Issue 3 4.10	Receiver spurious emissions (radiated)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies

**Note:** NA = Not Applicable; NP = Not Performed

## 9 RF measurements

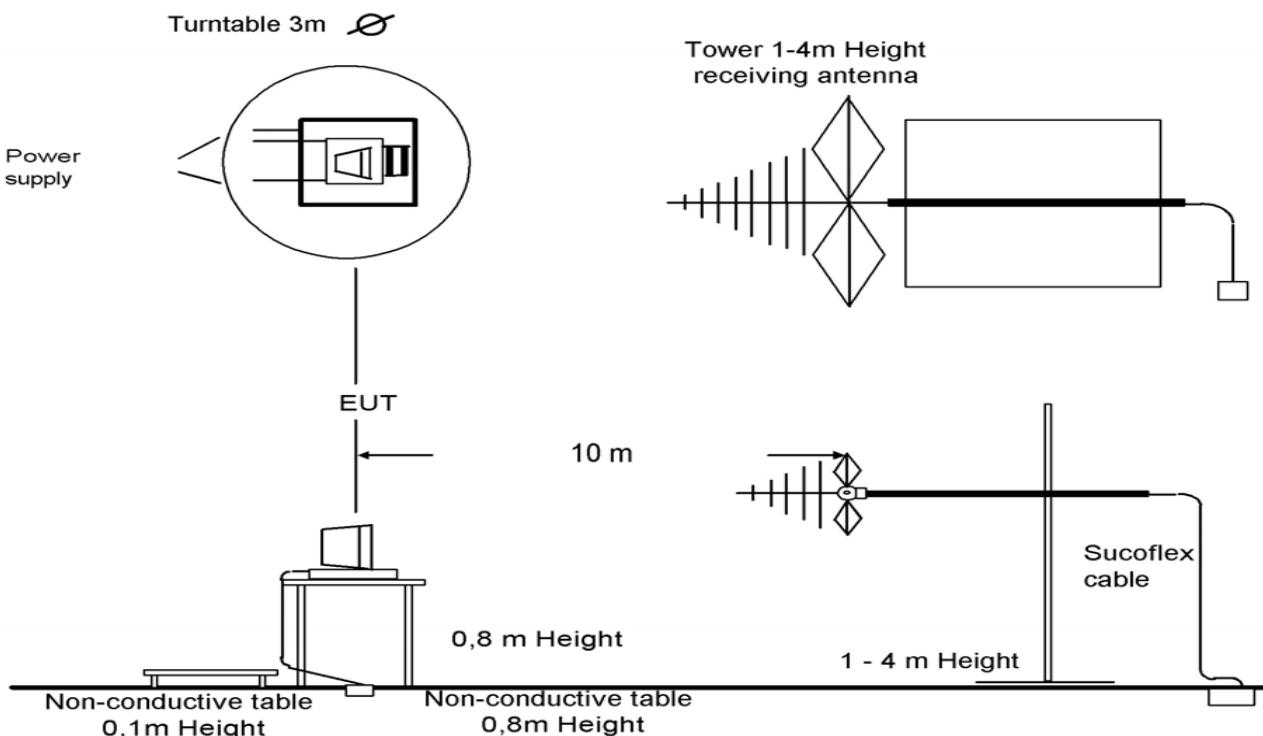
### 9.1 Description of test setup

#### 9.1.1 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 C63.4-2009 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 C63.4-2009 clause 4.2.

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

Semi anechoic chamber



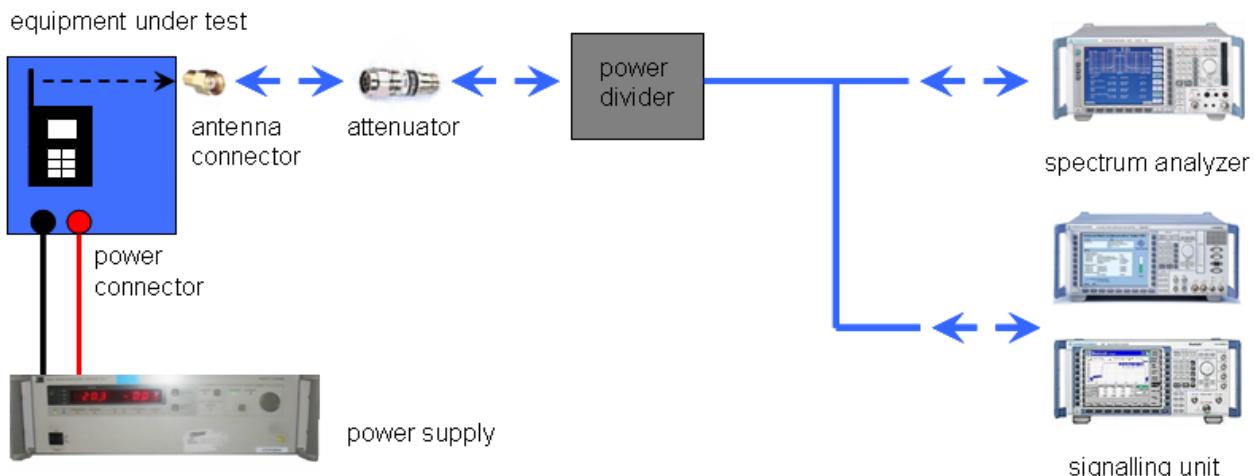
Picture 1: Diagram radiated measurements

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.

### 9.1.2 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**

### 9.2 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: The report covers three kinds of transducer:  
 866075 Avalon CL Toco+MP Transducer  
 866076 Avalon CL US Transducer  
 866077 Avalon CL EGP/IUP Transducer  
 They all contain the same PCB of the HF-part. The only difference is the used separate PCB with the sensors.

### 9.3 RSP100 test report cover sheet / performance test data

Test Report Number	:	1-4691/12-01-07-C
Equipment Model Number	:	866075 866076 866077
Certification Number	:	3549C-OBRTBV1
Manufacturer (complete Address)	:	Philips Medizin Systeme Böblingen GmbH Hewlett-Packard-Strasse 2 71034 Böblingen / GERMANY
Tested to radio standards specification no.	:	RSS 210, Issue 8, Annex 4
Open Area Test Site IC No.	:	IC 3462C-1
Frequency Range or fixed frequency	:	608 MHz – 614 MHz Lowest Channel 3 (608.375 MHz) / Highest Channel 38 (613.625 MHz)
Field Strength [dB $\mu$ V/m] (@ 3m)	:	866075 90.8 866076 91.5 866077 91.6
Occupied bandwidth (99%-BW) [kHz]	:	111.0 kHz
Type of modulation	:	GFSK
Emission Designator (TRC-43)	:	111KF1D
Antenna Information	:	Integrated antenna
Transmitter Spurious (worst case) [ $\mu$ V/m @ 3m]:		231.7 $\mu$ V/m @ 4295.4 MHz

#### 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:

2013-07-09	Stefan Bös	
Date	Name	Signature

## 10 Measurement results

### 10.1 Radiated field strength

#### Measurement:

Measurement parameter	
Detector:	Quasi peak
Sweep time:	Auto
Resolution bandwidth:	120 kHz
Video bandwidth:	Auto
Span:	> EBW
Trace-Mode:	Max. hold

#### Limits:

FCC	IC
CFR § 2.1046 CFR § 95.1115 (a)	RSS 210 Issue 8 A4.4
Radiated field strength	
200 mW/m @ 3 m (106 dB $\mu$ V/m @ 3 m)	

#### Result: 866075

Frequency	Radiated field strength
608.375 MHz	90.8 dB $\mu$ V/m @ 3m
610.925 MHz	90.2 dB $\mu$ V/m @ 3m
613.625 MHz	89.5 dB $\mu$ V/m @ 3m

#### Result: 866076

Frequency	Radiated field strength
608.375 MHz	91.5 dB $\mu$ V/m @ 3m
610.925 MHz	90.6 dB $\mu$ V/m @ 3m
613.625 MHz	89.5 dB $\mu$ V/m @ 3m

#### Result: 866077

Frequency	Radiated field strength
608.375 MHz	91.6 dB $\mu$ V/m @ 3m
610.925 MHz	91.4 dB $\mu$ V/m @ 3m
613.625 MHz	90.6 dB $\mu$ V/m @ 3m

#### Result: Passed.

## 10.2 Frequency stability

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 Hz
Video bandwidth:	100 Hz
Span:	1 kHz
Trace-Mode:	Max. hold

### Limits:

FCC	IC
CFR § 2.1055 CFR § 95.1115 (e)	RSS Gen Issue 3 4.7
Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions.	

### Results: lowest channel

Temperature	Deviation (kHz)	Emission within band
-20 °C	-0.26	Yes
-10 °C	-0.38	Yes
0 °C	-0.34	Yes
10 °C	-0.29	Yes
20 °C (V nom)	-0.33	Yes
30 °C	-0.74	Yes
40 °C	-1.14	Yes
55 °C	-1.55	Yes
Voltage		
90 %	-0.33	Yes
110 %	-0.33	Yes

**Results: highest channel**

Temperature	Deviation (kHz)	Emission within band
-20 °C	-0.26	Yes
-10 °C	-0.38	Yes
0 °C	-0.34	Yes
10 °C	-0.29	Yes
20 °C (V nom)	-0.35	Yes
30 °C	-0.77	Yes
40 °C	-1.17	Yes
55 °C	-1.55	Yes
Voltage		
90 %	-0.35	Yes
110 %	-0.35	Yes

**Result: Passed.**

### 10.3 Occupied bandwidth

#### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 kHz
Video bandwidth:	300 kHz
Span:	300 kHz
Trace-Mode:	Max. hold

#### Limits:

FCC	IC
47 CFR § 2.1049 (1)	RSS Gen Issue 3 4.6
When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.	
Not limited	

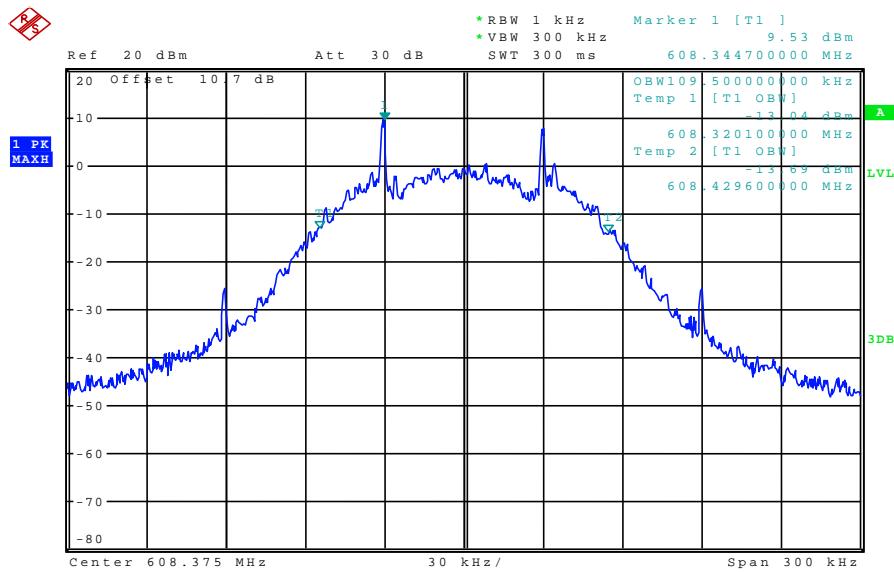
#### Result:

Frequency	99% Bandwidth
608.375 MHz	109.5 kHz
610.925 MHz	111.0 kHz
613.625 MHz	110.7 kHz

Result: Not rated.

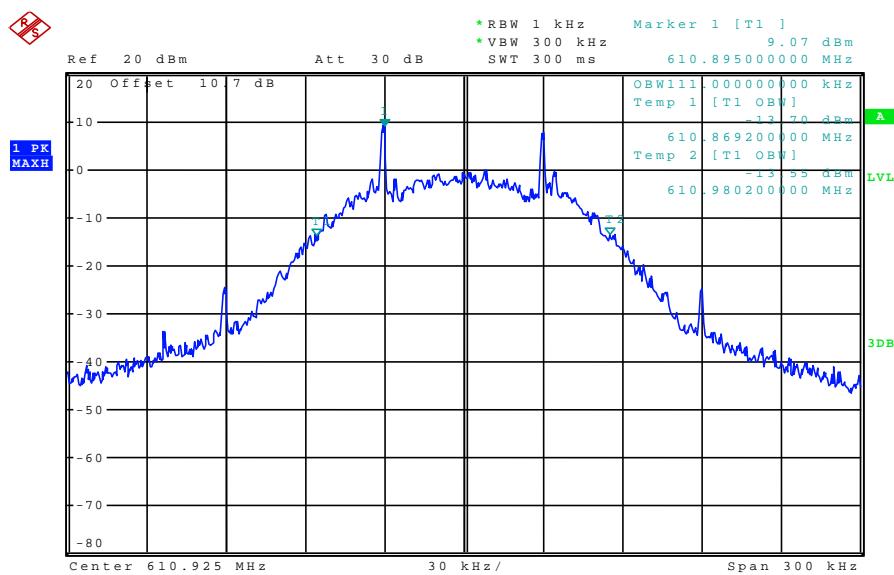
## Plots of the measurements

Plot 1: low channel



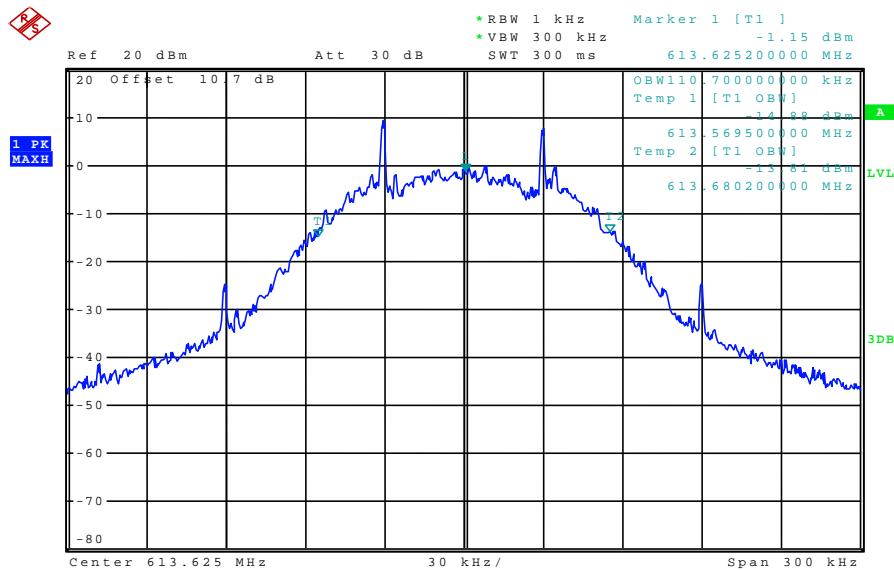
Date: 14.JAN.2013 11:09:39

Plot 2: middle channel



Date: 14.JAN.2013 11:10:41

Plot 3: high channel



Date: 14.JAN.2013 11:02:23

## 10.4 Field strength of spurious radiation

### Measurement:

Measurement parameter	
Detector:	Peak / AVG
Sweep time:	Auto
Resolution bandwidth:	$f < 1 \text{ GHz} : 100 \text{ kHz}$ $f \geq 1 \text{ GHz} : 1 \text{ MHz}$
Video bandwidth:	$f < 1 \text{ GHz} : 100 \text{ kHz}$ $f \geq 1 \text{ GHz} : 1 \text{ MHz}$
Trace-Mode:	Max. hold

### Limits:

FCC	IC
47 CFR § 2.1053 47 CFR § 95.1115 (b)	RSS Gen Issue 3 4.9
Out-of band emissions below 960 MHz are limited to 200 microvolts/meter, as measured at a distance of 3 meters, using measuring instrumentation with a CISPR quasi-peak detector. Out-of-band emissions above 960 MHz are limited to 500 microvolts/meter as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth.	

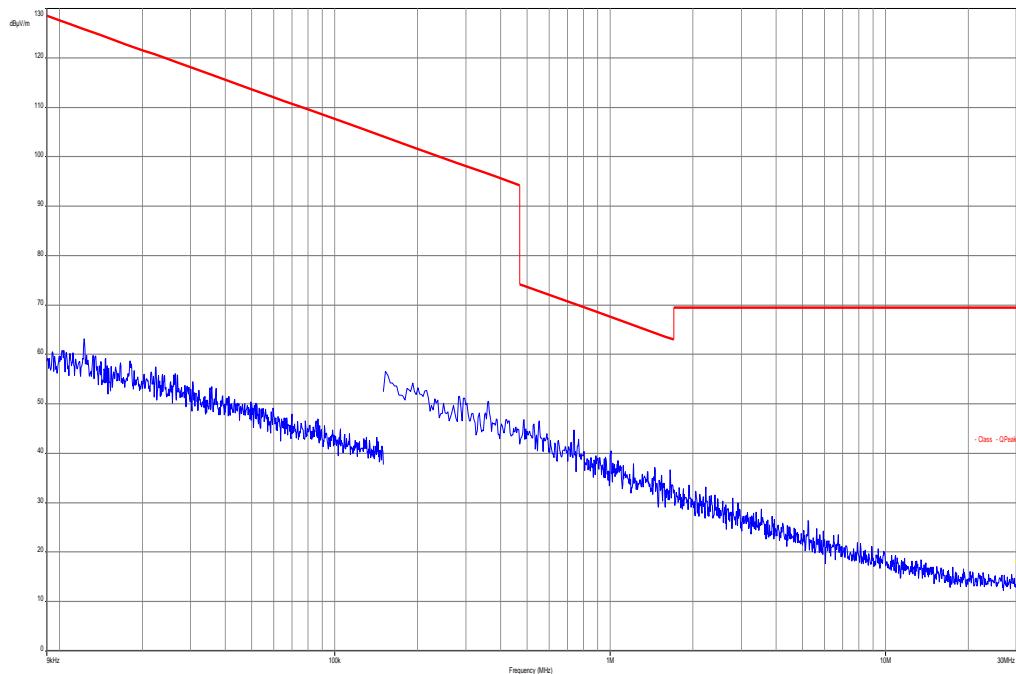
### Result: (worst case)

SPURIOUS EMISSIONS LEVEL (dB $\mu$ V/m)								
Lowest channel			Middle channel			Highest channel		
Frequency [MHz]	Detector	Level [dB $\mu$ V/m]	Frequency [MHz]	Detector	Level [dB $\mu$ V/m]	Frequency [MHz]	Detector	Level [dB $\mu$ V/m]
2433.5	PK	54.7	2443.6	PK	54.8	2454.5	PK	54.5
	AVG	42.8		AVG	42.9		AVG	42.6
3650.3	PK	59.1	3665.5	PK	58.2	3681.8	PK	58.9
	AVG	47.2		AVG	46.3		AVG	47.0
4258.6	PK	58.4	4276.5	PK	54.9	4295.4	PK	59.2
	AVG	46.5		AVG	43.0		AVG	47.3
4867.0	PK	47.0						
	AVG	35.1						
Measurement uncertainty ± 3 dB								

**Result: Passed.**

**Plots of the measurements (worst case plots)**

Plot 1: 150 kHz – 30 MHz, low channel



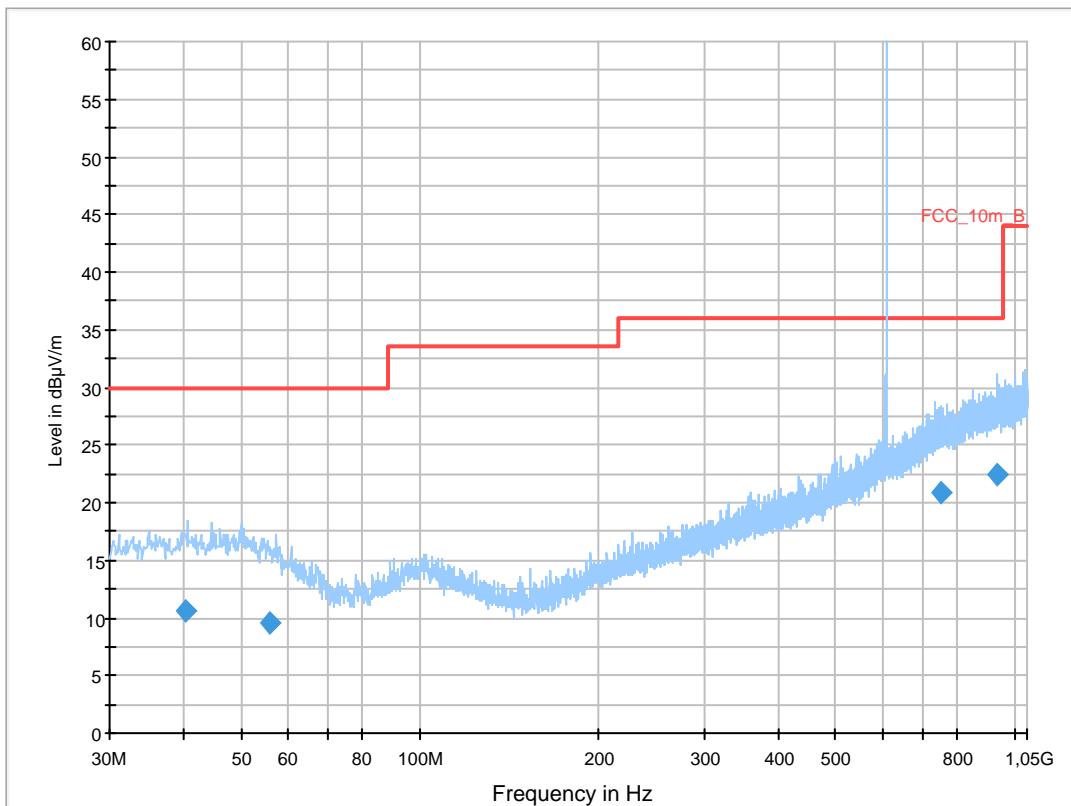
Plot 2: 30 MHz – 1 GHz, low channel

## Common Information

EUT: 866075  
 Serial Number: DE24800255  
 Test Description: FCC part 15  
 Operating Conditions: TX channel 3  
 Operator Name: Kraus  
 Comment: battery powered

## Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)				
Receiver:	[ESCI 3]				
Level Unit:	dB $\mu$ V/m				
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamplifier
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
40.353150	10.5	1000.0	120.000	400.0	V	16.0	13.4	19.5	30.0	
56.013750	9.6	1000.0	120.000	200.0	H	348.0	12.6	20.4	30.0	
751.701150	20.8	1000.0	120.000	200.0	V	296.0	23.7	15.2	36.0	
931.362150	22.4	1000.0	120.000	200.0	V	160.0	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 4.42

Signal Path:

without Notch

FW 1.0

Antenna:

VULB 9163

SN 9163-295, FW ---

Correction Table (vertical): VULP6113

Correction Table (horizontal): VULP6113

Correction Table (vertical): Cable\_EN\_1GHz (1005)

Correction Table (horizontal): Cable\_EN\_1GHz (1005)

Antenna Tower:

Tower [EMCO 2090 Antenna Tower]

@ GPIB0 (ADR 8), FW REV 3.12

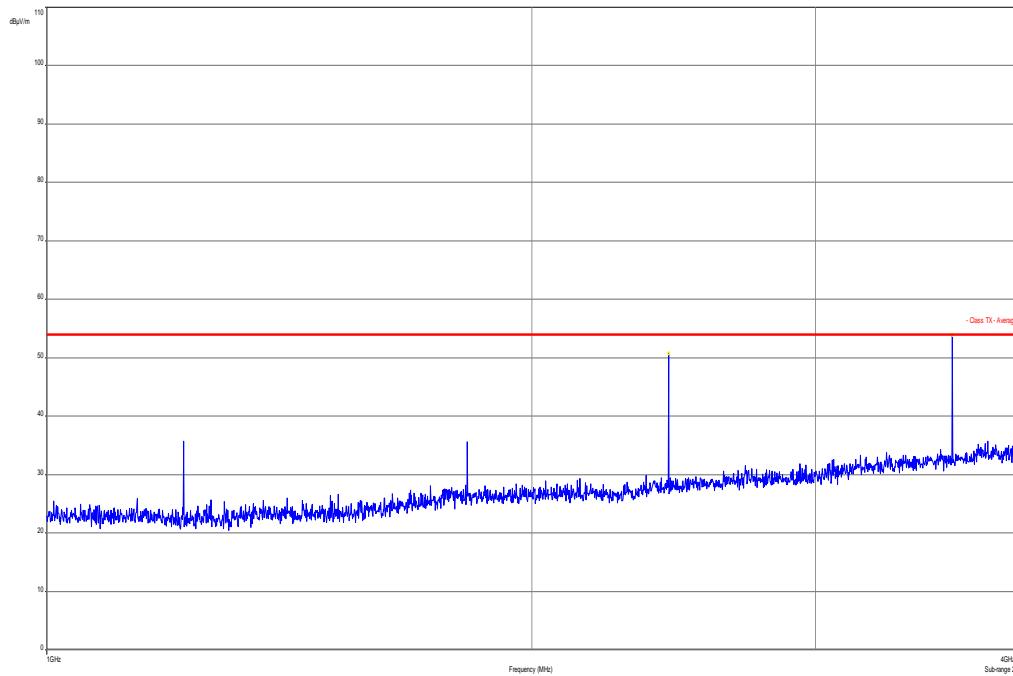
Turntable:

Turntable [EMCO Turntable]

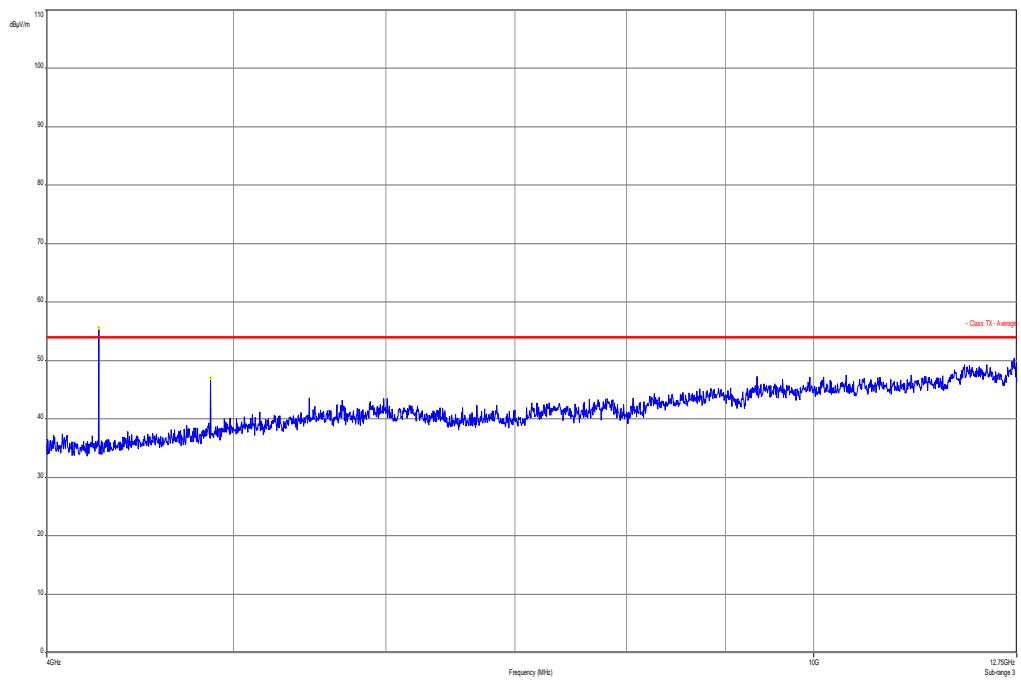
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

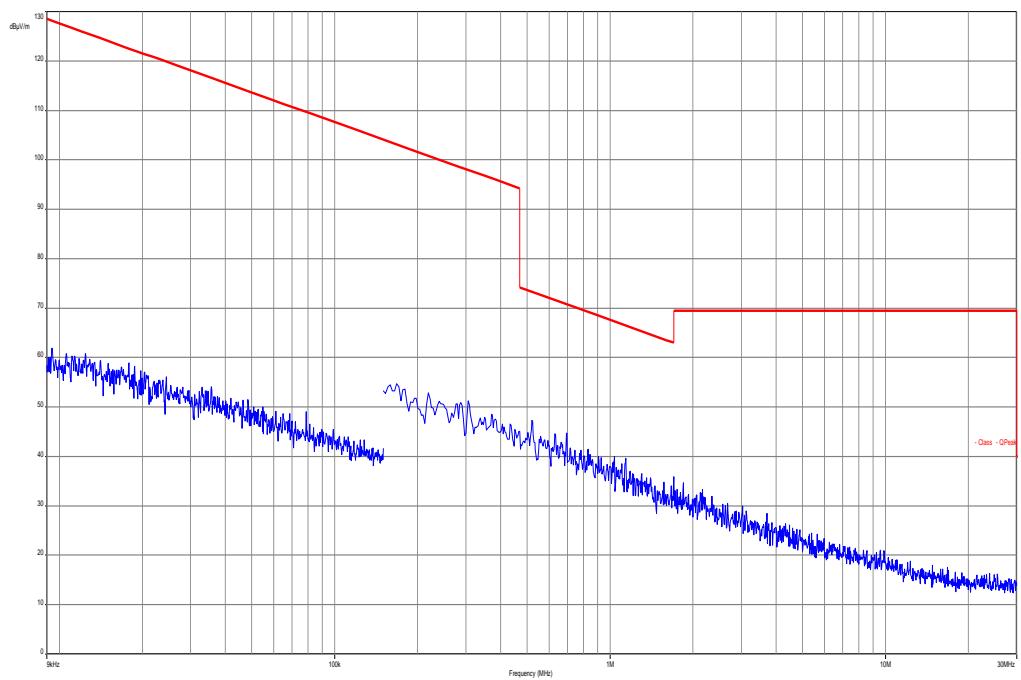
Plot 3: 1 GHz – 4 GHz, low channel, antenna horizontal/vertical



Plot 4: 4 GHz – 12.75 GHz, low channel, antenna horizontal/vertical



Plot 5: 150 kHz – 30 MHz, middle channel



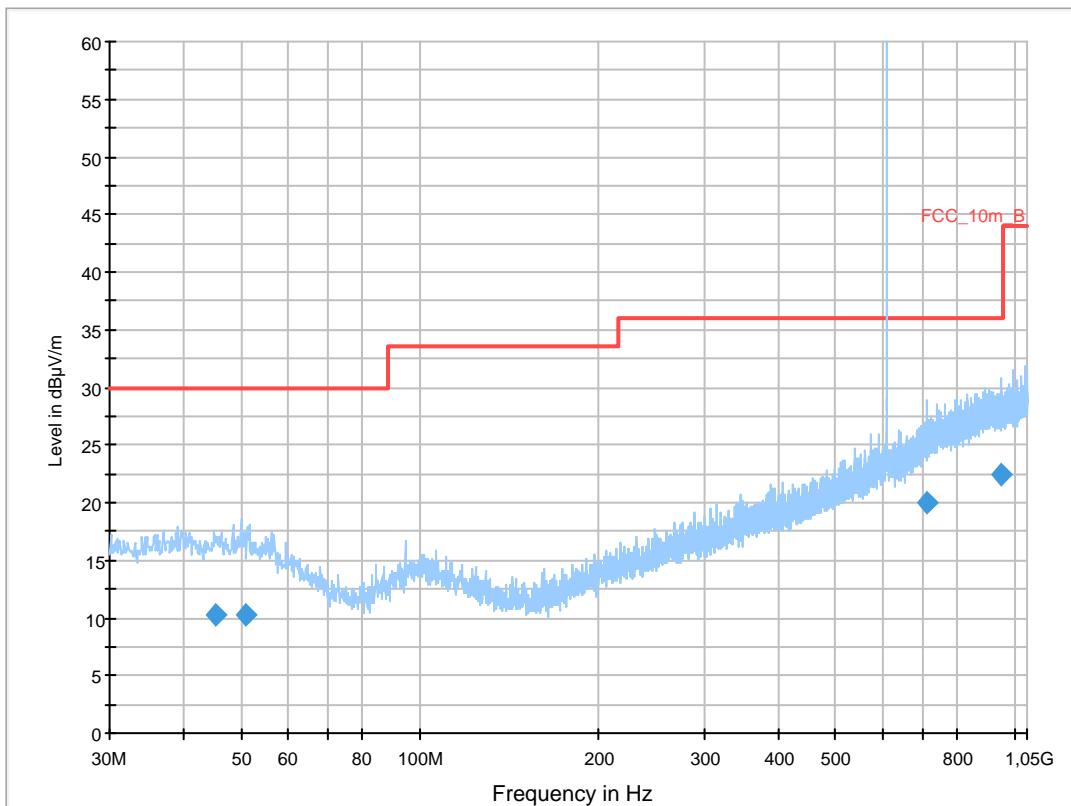
Plot 6: 30 MHz – 1 GHz, middle channel

## Common Information

EUT: 866075  
 Serial Number: DE24800255  
 Test Description: FCC part 15  
 Operating Conditions: TX channel 20  
 Operator Name: Kraus  
 Comment: battery powered

## Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)				
Receiver:	[ESCI 3]				
Level Unit:	dB $\mu$ V/m				
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamplifier
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
45.277350	10.2	1000.0	120.000	400.0	V	221.0	13.3	19.8	30.0	
51.001350	10.2	1000.0	120.000	157.0	V	320.0	13.3	19.8	30.0	
712.610100	20.0	1000.0	120.000	200.0	H	95.0	22.8	16.0	36.0	
946.736700	22.5	1000.0	120.000	200.0	H	226.0	25.3	13.5	36.0	

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

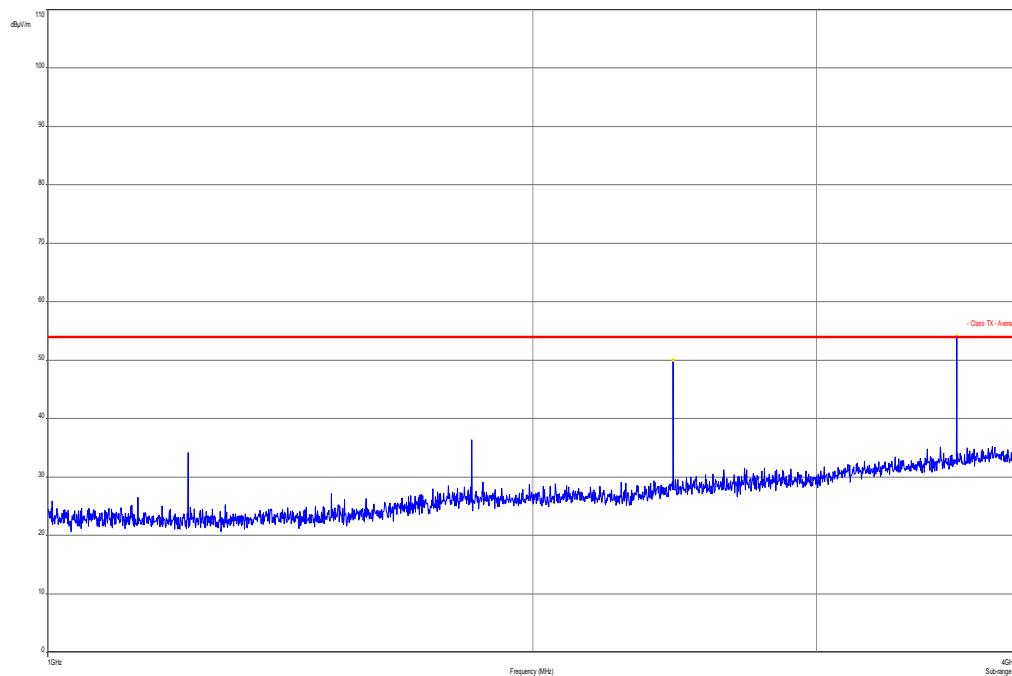
Subrange 1

Frequency Range: 30 MHz - 2 GHz

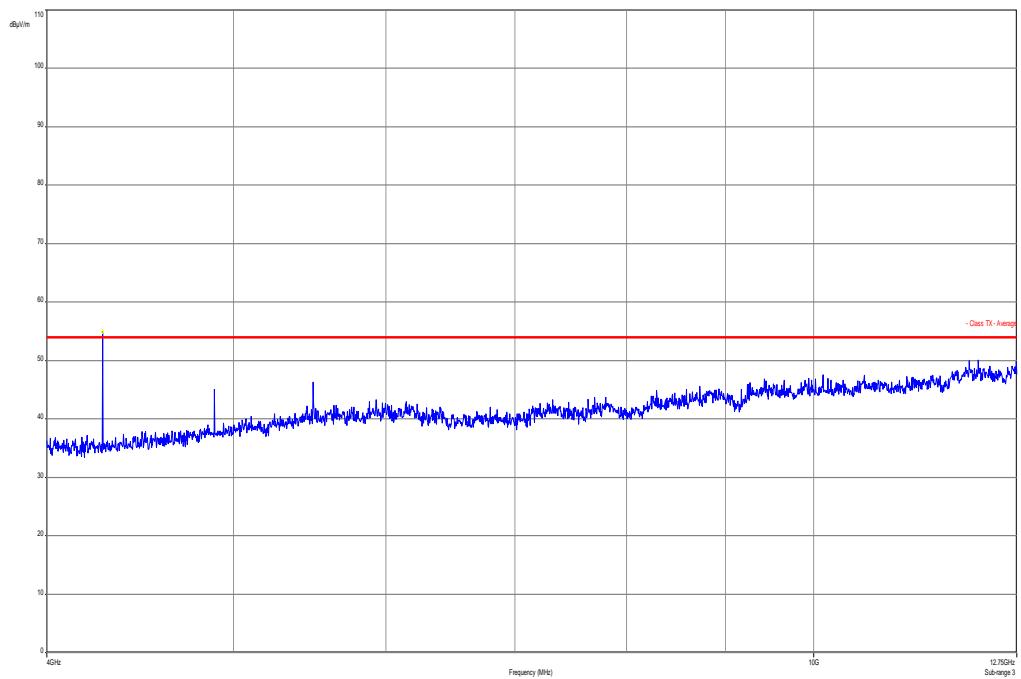
Receiver: Receiver [ESCI 3]  
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42Signal Path: without Notch  
FW 1.0Antenna: VULB 9163  
SN 9163-295, FW ---  
Correction Table (vertical): VULP6113Correction Table (horizontal): VULP6113  
Correction Table (vertical): Cable\_EN\_1GHz (1005)Correction Table (horizontal): Cable\_EN\_1GHz (1005)  
Antenna Tower: Tower [EMCO 2090 Antenna Tower]  
@ GPIB0 (ADR 8), FW REV 3.12Turntable: Turntable [EMCO Turntable]  
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

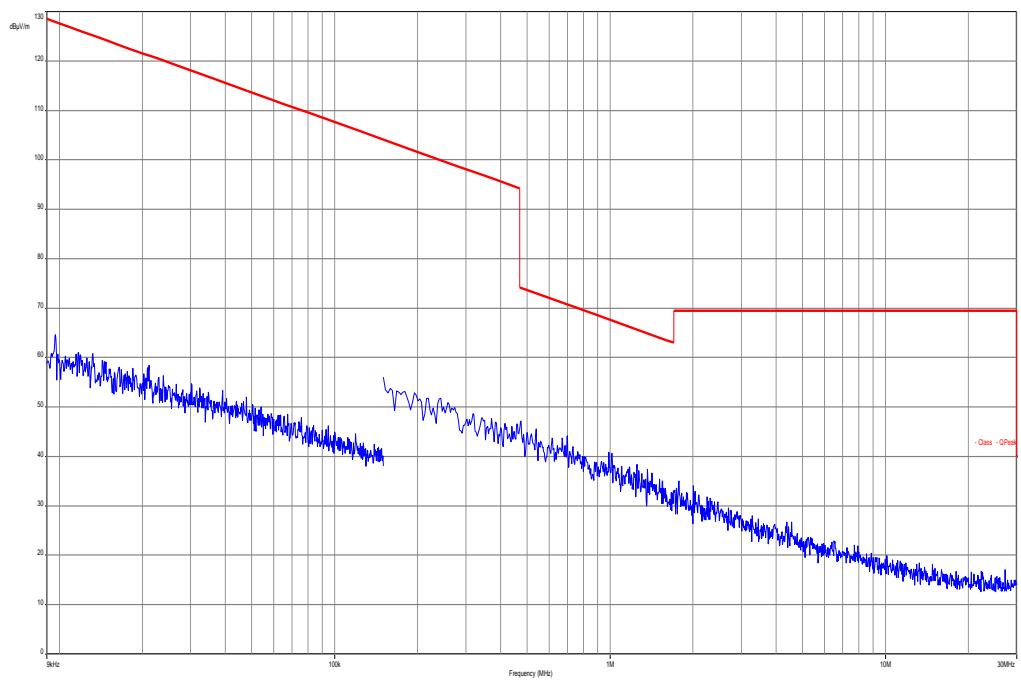
Plot 7: 1 GHz – 4 GHz, middle channel, antenna horizontal/vertical



Plot 8: 4 GHz – 12.75 GHz, middle channel, antenna horizontal/vertical



Plot 9: 150 kHz – 30 MHz, high channel



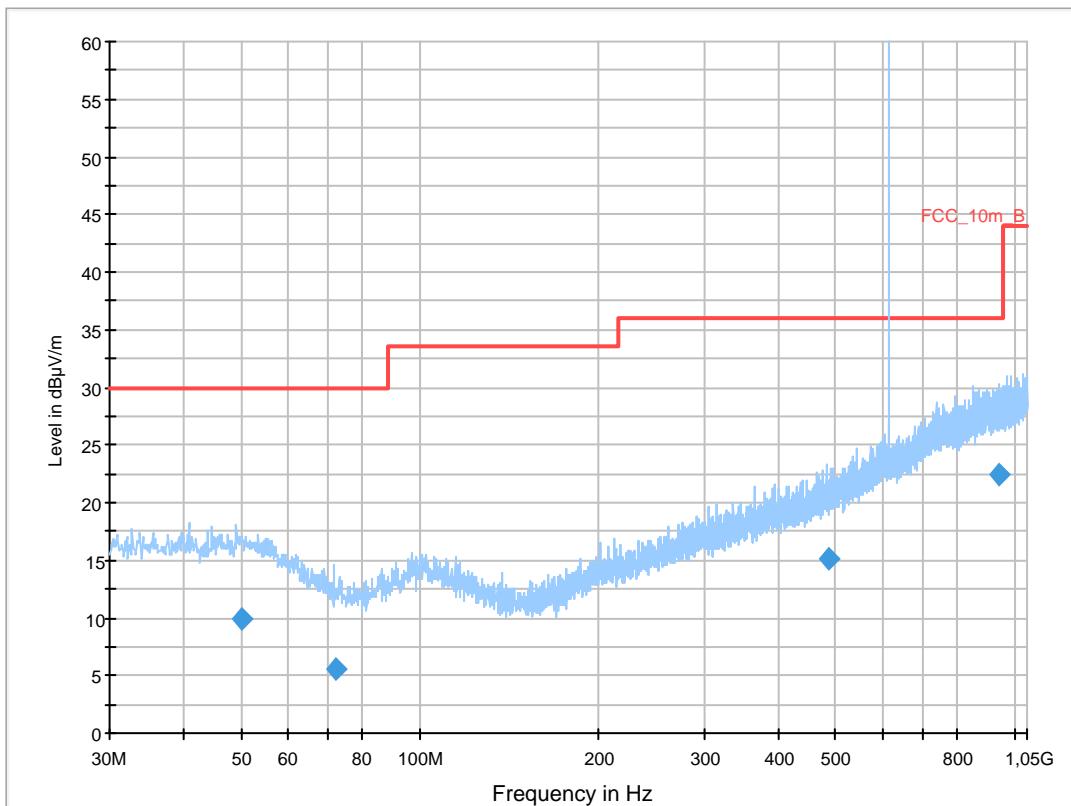
Plot 10: 30 MHz – 1 GHz, high channel

## Common Information

EUT: 866075  
 Serial Number: DE24800255  
 Test Description: FCC part 15  
 Operating Conditions: TX channel 38  
 Operator Name: Kraus  
 Comment: battery powered

## Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)				
Receiver:	[ESCI 3]				
Level Unit:	dB $\mu$ V/m				
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
49.905750	10.0	1000.0	120.000	235.0	V	219.0	13.4	20.0	30.0	
71.982750	5.5	1000.0	120.000	323.0	H	46.0	9.2	24.5	30.0	
488.500800	15.1	1000.0	120.000	400.0	V	288.0	18.5	20.9	36.0	
942.084900	22.4	1000.0	120.000	194.0	V	260.0	25.3	13.6	36.0	

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

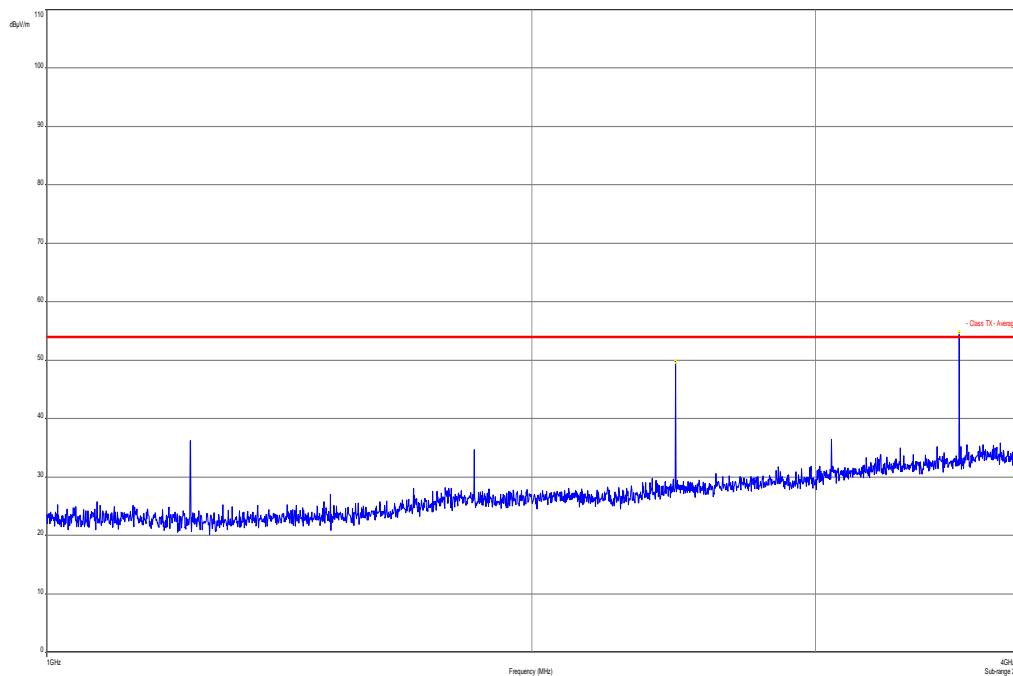
Subrange 1

Frequency Range: 30 MHz - 2 GHz

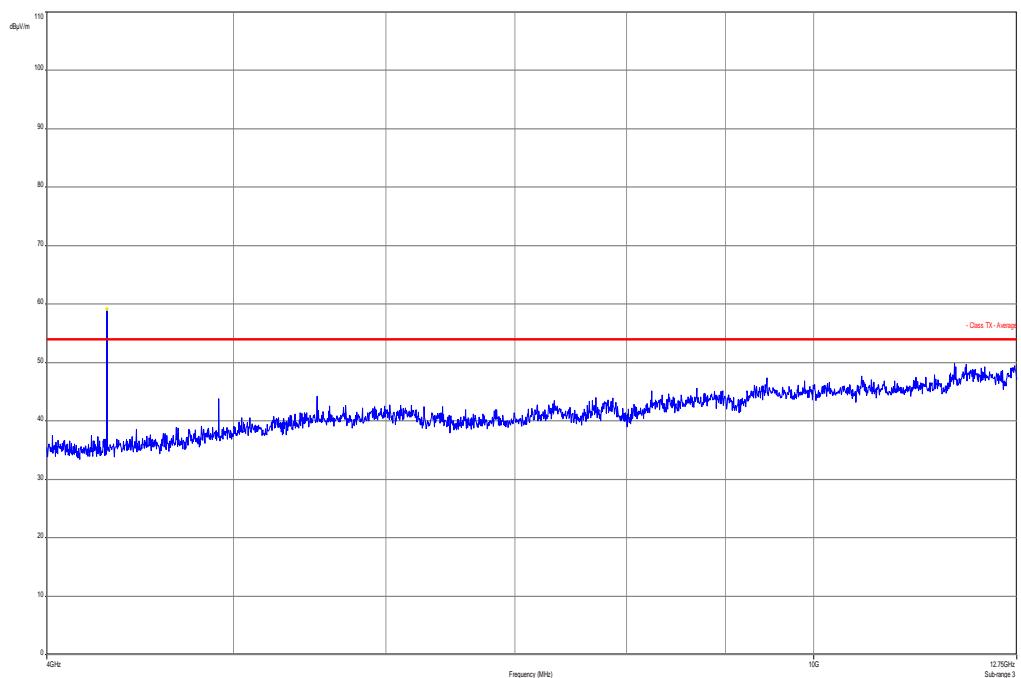
Receiver: Receiver [ESCI 3]  
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42Signal Path: without Notch  
FW 1.0Antenna: VULB 9163  
SN 9163-295, FW ---  
Correction Table (vertical): VULP6113  
Correction Table (horizontal): VULP6113  
Correction Table (vertical): Cable\_EN\_1GHz (1005)  
Correction Table (horizontal): Cable\_EN\_1GHz (1005)Antenna Tower: Tower [EMCO 2090 Antenna Tower]  
@ GPIB0 (ADR 8), FW REV 3.12Turntable: Turntable [EMCO Turntable]  
@ GPIB0 (ADR 9), FW REV 3.12

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Plot 11: 1 GHz – 4 GHz, high channel, antenna horizontal/vertical



Plot 12: 4 GHz – 12.75 GHz, high channel, antenna horizontal/vertical



## 10.5 Receiver spurious emissions (radiated)

### Measurement:

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

### Limits:

FCC	IC	
SUBCLAUSE § 15.109	RSS-GEN Issue 3 4.10	
Receiver Spurious Emission (radiated)		
Frequency (MHz)	Field strength ( $\mu$ V/m)	Measurement distance (m)
30 - 88	100 (40 dB $\mu$ V/m)	3
88 - 216	150 (43.5 dB $\mu$ V/m)	3
216 - 960	200 (46 dB $\mu$ V/m)	3
above 960	500 (54 dB $\mu$ V/m)	3

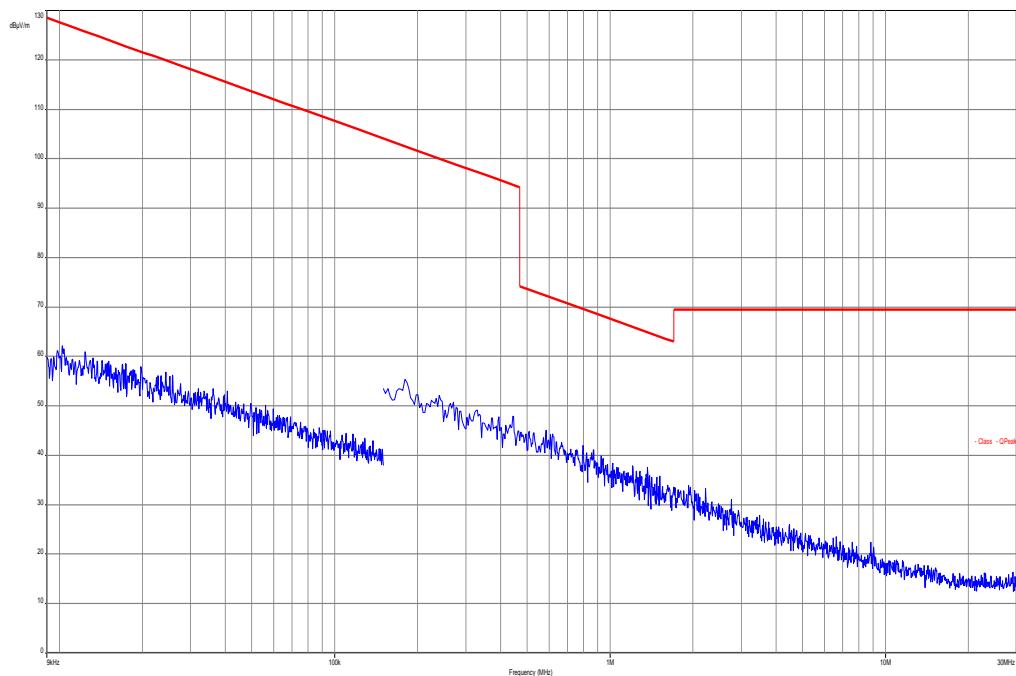
### Result:

SPURIOUS EMISSIONS LEVEL (dB $\mu$ V/m)								
Idle / RX								
Frequency [MHz]	Detector	Level [dB $\mu$ V/m]	Frequency [MHz]	Detector	Level [dB $\mu$ V/m]	Frequency [MHz]	Detector	Level [dB $\mu$ V/m]
All emissions measured with peak detector are more than 6 dB below the average limit								
Measurement uncertainty ± 3 dB								

**Result:** Passed.

### Plots of the measurements

Plot 1: 150 kHz – 30 MHz



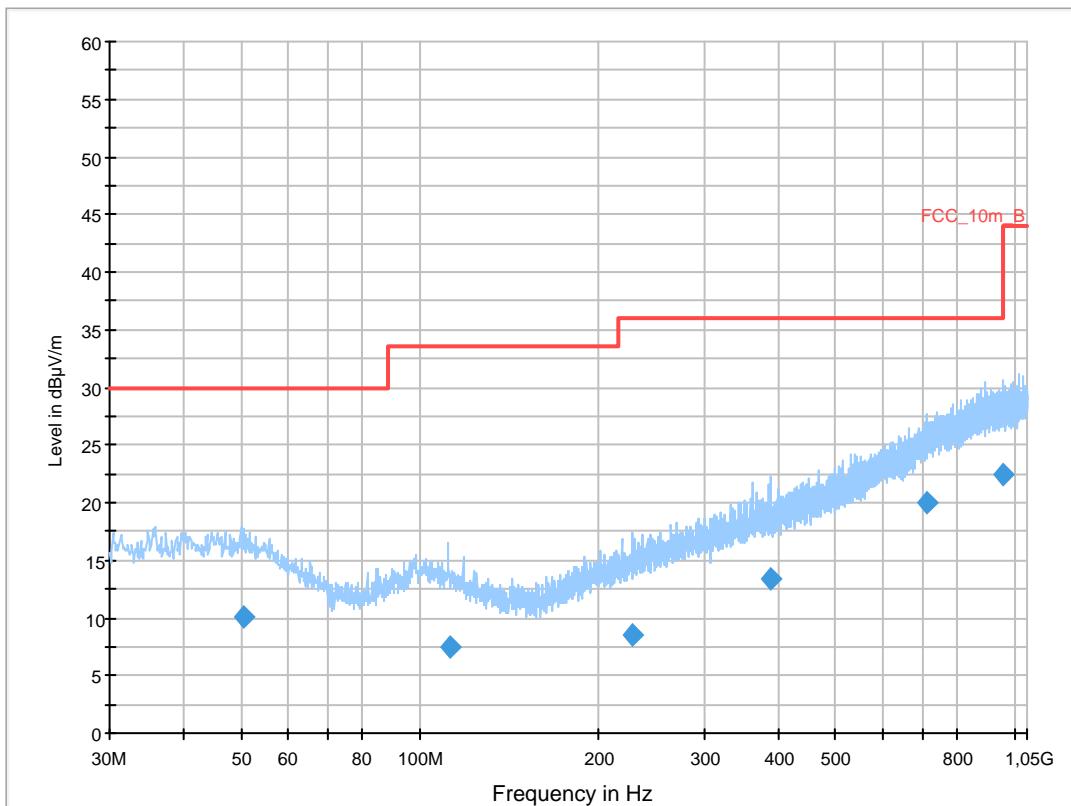
Plot 2: 30 MHz – 1 GHz

## Common Information

EUT: 866075  
 Serial Number: DE24800255  
 Test Description: FCC part 15  
 Operating Conditions: RX  
 Operator Name: Kraus  
 Comment: battery powered

## Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)				
Receiver:	[ESCI 3]				
Level Unit:	dB $\mu$ V/m				
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
50.319600	10.1	1000.0	120.000	400.0	H	212.0	13.3	19.9	30.0	
111.901200	7.4	1000.0	120.000	200.0	V	-11.0	10.9	26.1	33.5	
227.074950	8.5	1000.0	120.000	200.0	V	50.0	12.6	27.5	36.0	
390.147300	13.3	1000.0	120.000	200.0	V	95.0	16.7	22.7	36.0	

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

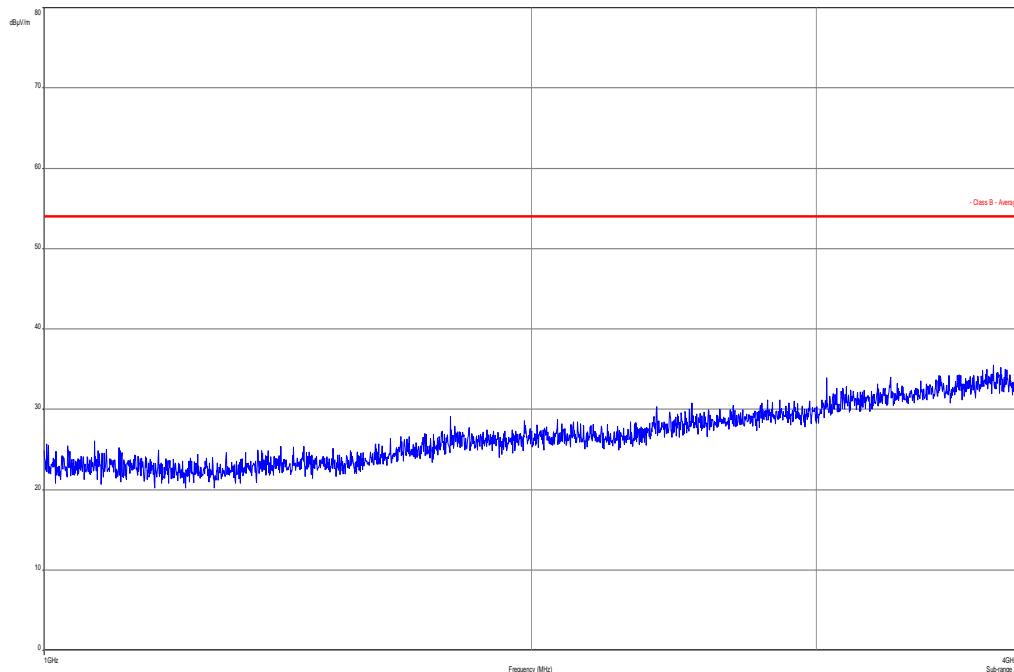
Subrange 1

Frequency Range: 30 MHz - 2 GHz

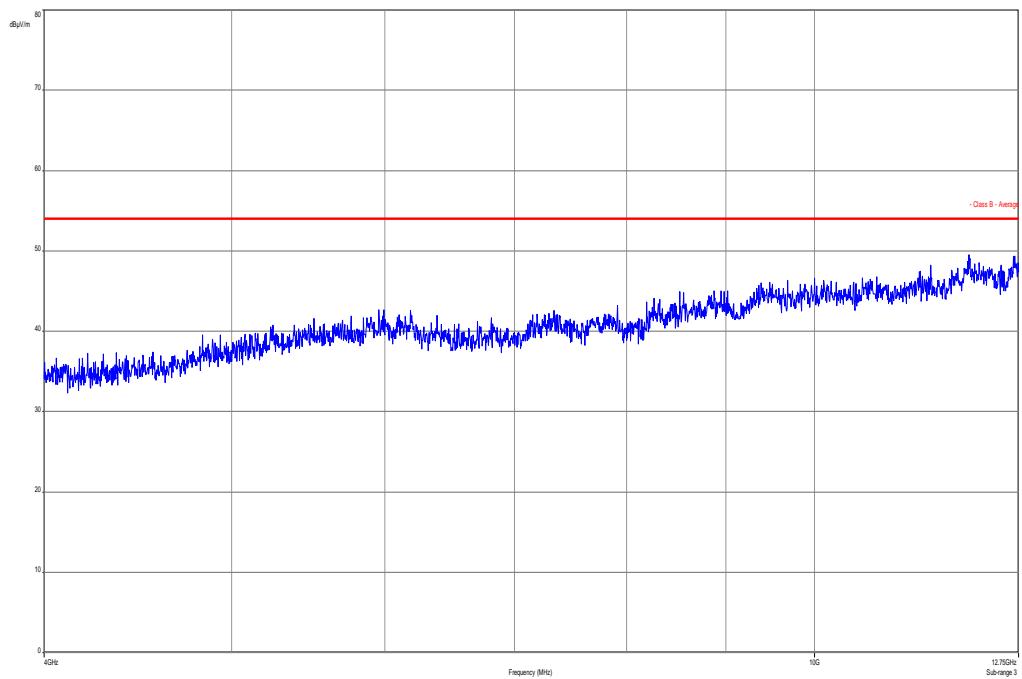
Receiver: Receiver [ESCI 3]  
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42Signal Path: without Notch  
FW 1.0Antenna: VULB 9163  
SN 9163-295, FW ---  
Correction Table (vertical): VULP6113  
Correction Table (horizontal): VULP6113  
Correction Table (vertical): Cable\_EN\_1GHz (1005)  
Correction Table (horizontal): Cable\_EN\_1GHz (1005)Antenna Tower: Tower [EMCO 2090 Antenna Tower]  
@ GPIB0 (ADR 8), FW REV 3.12Turntable: Turntable [EMCO Turntable]  
@ GPIB0 (ADR 9), FW REV 3.12

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Plot 3: 1 GHz – 4 GHz, antenna horizontal/vertical



Plot 4: 4 GHz – 12.75 GHz, antenna horizontal/vertical



## 11 Test equipment and ancillaries used for tests

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

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

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
2	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	11.05.2011	11.05.2013
3	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
4	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
5	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
6	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
7	9	Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155	ne		
8	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
9	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
10		Band Reject filter	WRCG240 0/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
11	n. a.	Highpass Filter	WHDX7.0/1 8G-8SS	Wainwright	18	300003789	ne		
12	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vIKI!	14.10.2011	14.10.2014
13	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	19.12.2011	19.12.2014

### Agenda: Kind of Calibration

k calibration / calibrated  
 ne not required (k, ev, izw, zw not required)  
 ev periodic self verification  
 Ve long-term stability recognized  
 vIKI! Attention: extended calibration interval  
 NK! Attention: not calibrated

EK limited calibration  
 zw cyclical maintenance (external cyclical maintenance)  
 izw internal cyclical maintenance  
 g blocked for accredited testing

\*) next calibration ordered / currently in progress

## 12 Observations

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

## Annex A Document history

Version	Applied changes	Date of release
1.0	Initial release	2013-03-21
-A	Editorial corrections	2013-04-18
-B	FCC-ID and IC-number corrected	2013-05-14
-C	Model name changed and photos extracted from test report	2013-07-09

## Annex B Further information

### Glossary

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

## Annex C Accreditation Certificate

Front side of certificate

Back side of certificate



Deutsche Akkreditierungsstelle GmbH  
German Accreditation Body

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV  
Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

### Accreditation



The Deutsche Akkreditierungsstelle GmbH (German Accreditation Body) attests that the testing laboratory

CETECOM ICT Services GmbH  
Untertürkheimer Straße 6-10  
66117 Saarbrücken

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Wired communications and DECT  
Acoustic  
Radio  
Short Range Devices (SRD)  
RFID  
WiMax and Richtfunk  
Mobile radio (GSM / DCS), Over the Air (OTA) Performance  
Electromagnetic Compatibility (EMC) incl. Automotive  
Product safety  
SAR and Hearing Aid Compatibility (HAC)  
Environmental simulation  
Smart Card Terminals  
Bluetooth  
Wi-Fi-Services

The accreditation certificate shall only apply in connection with the notice of accreditation of 13.04.2011 with the accreditation number D-PL-12076-01 and is valid until 03.09.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 82 pages.

Registration number of the certificate: D-PL-12076-01-01

Frankfurt am Main, 13.04.2011

  
Dr. Ing. (FH) Jörg Eigner  
Head of Division 2

This document is a translation. The definitive version is the original German accreditation certificate.  
See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Office Berlin  
Spittelmarkt 10  
10117 Berlin

Office Frankfurt am Main  
Gartenstraße 6  
60594 Frankfurt am Main

Office Braunschweig  
Bundesallee 100  
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:  
EA: [www.european-accreditation.org](http://www.european-accreditation.org)  
ILAC: [www.ilac.org](http://www.ilac.org)  
IAF: [www.iaf.nu](http://www.iaf.nu)

### Note:

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

[http://www.cetecom.com/fileadmin/de/CETECOM\\_D\\_Saarbruecken/accreditations\\_Jan\\_2010/DAKKs\\_Akkreditierung\\_URK\\_EN17025-En\\_incl\\_Annex.pdf](http://www.cetecom.com/fileadmin/de/CETECOM_D_Saarbruecken/accreditations_Jan_2010/DAKKs_Akkreditierung_URK_EN17025-En_incl_Annex.pdf)