

# Inter Lab Final Report on Model:OTE15

FCC ID: BCE-OTE15 IC: 2386C-OTE15

Report Reference: MDE\_GNNET\_1305\_FCCa

According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

Date: May 13, 2013

# **Test Laboratory:**

7Layers AG Borsigstr. 11 40880 Ratingen Germany



The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

### **Administrative Data**

#### 1.1 **Project Data**

Patrick Lomax Project Responsible: Date Of Test Report: 2013/05/13 Date of first test: 2013/05/10 Date of last test: 2013/05/10

#### 1.2 **Applicant Data**

Company Name: GN Netcom A/S

Street: Lautrupbjerg 7 City: DK-2750 Ballerup

Country: Denmark

Contact Person: Mr. Tom Ringtved

Phone: +45 45 75 91 86 E-Mail: tringtved@gn.com

#### 1.3 **Test Laboratory Data**

The following list shows all places and laboratories involved for test result generation:

# 7 layers DE

7 layers AG Company Name : Street: Borsigstrasse 11 City: 40880 Ratingen Country: Germany

Contact Person : Mr. Michael Albert +49 2102 749 201 Phone: Fax : +49 2102 749 444

E Mail : michael.albert@7Layers.de

# **Laboratory Details**

Lab ID	Identification	Responsible	Accreditation Info
Lab 1	Conducted Emissions	Mr. Robert Machulec Mr. Andreas Petz	DAkkS-Registration no. D-PL-12140-01-01
Lab 2	Radiated Emissions	Mr. Robert Machulec Mr. Andreas Petz	DAkkS-Registration no. D-PL-12140-01-01

#### 1.4 Signature of the Testing Responsible

Patrick Lomax

responsible for tests performed in: Lab 1, Lab 2



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

# 1.5 Signature of the Accreditation Responsible

B. Peth [B. RETKA]

Accreditation scope responsible person responsible for Lab 1, Lab 2

# 2 Test Object Data

# 2.1 General OUT Description

The following section lists all OUTs (Object's Under Test) involved during testing.

**OUT: Jabra OTE15** 

Product Category:

Mobile Phone Accessory

Manufacturer:

Company Name:

Please see applicant data

Contact Person:

Please see applicant data

Parameter List:

Parameter name

Value

### 2.2 Detailed Description of OUT Samples

### Sample: A01

OUT Identifier

Sample Description

Serial No.

Low Voltage

Jabra OTE15

BT Radiated sample

BT Radio#1

Low Temp.

Low Voltage3.5 VLow Temp.-10 °CHigh Voltage4.2 VHigh Temp.60 °CNominal Voltage3.8 VNormal Temp.25 °C

### Parameter List:

Parameter Description Value

Parameter for Scope FCC\_v2

Antenna Gain 0 (dBi)

 Antenna Gain
 0 (dBi)

 Channel\_BW
 1 (MHz)

 Frequency\_high
 2480 (MHz)

 Frequency\_low
 2402 (MHz)

 Frequency\_mid
 2441 (MHz)



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# 2.3 OUT Features

Features for OUT: Jabra OTE15

Designation	Description	Allowed Values	Supported Value(s)
Features for	scope: FCC_v2		
AC	The OUT is powered by or connected to AC Mains		
ВТ	EUT supports Bluetooth data rate of 1 Mbps with GFSK modulation in the band 2400 MHz - 2483.5 MHz		
BTLE	Support of Bluetooth Low Energy		
EDR2	EUT supports Bluetooth using data rate of 2 Mbps with PI/4 DQPSK modulation in the band 2400 MHz - 2483.5 MHz		
EDR3	EUT supports Bluetooth using data rate of 3 Mbps with 8DPSK modulation in the band 2400 MHz - 2483.5 MHz		
lant	Integral Antenna: permanent fixed antenna, which may be built-in, designed as an indispensable part of the equipment		
TantC	temporary antenna connector, which may be only built-in for testing, designed as an example part of the equipment	3	

# 2.4 Auxiliary Equipment

AE No.	Type Designation	Serial No.	HW Status	SW Status	Description
AE 02	0335C2065	A30638114250			Fujitsu Siemens Power Supply
AE 01	AMILO Pro V3205	YK2H014267	110V / 60Hz AC		Fujitsu Siemens Laptop
AE 05	Flatron L1740BQ	509WANF1W607	110V / 60 Hz AC		LG TFT Display
AE 03	M-BB48	LZC90505478			Logitech Mouse
AE 04	RS 6000 USB ON	G 0000273 2P28			CHERRY Keyboard

# 2.5 Operating Mode(s)

RefNo.	Description
01	Data transfer via USB cable to Laptop computer. Bluesuite3 test softare is used to ensure that
01	Data transfer via USB cable to Laptop computer. Bluesuite3 test softare is used to ensur continuous data is transfered over USB between the Lapton and the DIIT



According to:

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# 2.6 Setups used for Testing

For each setup a relation is given to determine if and which samples and auxiliary equipment is used. The left side list all OUT samples and the right side lists all auxiliary equipment for the given setup.

Setup No.	List of OUT samples		List of auxiliary equipment	
Sample	e No.	Sample Description	AE No. AE Description	
PC1_A01	(Computer Eq	uipment Setup)		
Sample	e: A01	BT Radiated sample	AE 02	Fujitsu Siemens Power Supply
			AE 01	Fujitsu Siemens Laptop
			AE 05	LG TFT Display
			AE 03	Logitech Mouse
			AE 04	CHERRY Keyboard

### 3 Results

### 3.1 General

**Documentation of tested** 

devices:

Available at the test laboratory.

Interpretation of the

test results:

The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device is

conform to the applied standard.

In cases where 'Declaration' is printed, the required documents are available in the manufacturers product documentation.

In cases where 'not applicable' is printed, the test case requirements are not relevant to the specific equipment

implementation.

Note: The laboratory environmental conditions are recorded and

available in the Interlab system for each performed test.

# 3.2 List of the Applicable Body

(Body for Scope: FCC\_v2)

Designation Description

FCC47CFRChIPART15bRADIO FREQUENCY DEVICES

Part 15, Subpart B - Unintentional Radiators

# 3.3 List of Test Specification

Test Specification: FCC part 2 and 15
Version 10-1-11 Edition

Title: PART 2 - GENERAL RULES AND REGULATIONS

PART 15 - RADIO FREQUENCY DEVICES



Reference: MDE\_GNNET\_1305\_FCCa According to: FCC 47 CFR Ch.1 Part 15 Subpart B

#### 3.4 **Summary**

Test Case Identifier / Name			Lab	
Test (condition)	Result	Date of Test	Ref.	Setup
15b.1 Conducted Emissions (AC Power Line	e) §15.107			
15b.1; Mode = Charge via USB	Passed	2013/05/10	Lab 1	PC1_A01
	operating mo	ode: 01		
15b.2 Spurious Radiated Emissions §15.10	9			
15b.2; Mode = Charge via USB	Passed	2013/05/10	Lab 2	PC1_A01
	operating mo	ode: 01		



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#### 3.5 **Detailed Results**

#### 3.5.1 15b.1 Conducted Emissions (AC Power Line) §15.107

Test: 15b.1; Mode = Charge via USB

Result: Passed

Setup No.: PC1\_A01

Date of Test: 2013/05/10 15:47

Body: FCC47CFRChIPART15bRADIO FREQUENCY DEVICES

Test Specification: FCC part 2 and 15



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

### **Detailed Results:**

#### AC MAINS CONDUCTED

EUT: Jabra OTE15 (CJ230a01)

Manufacturer: GNNET Operating Condition: charging

Test Site: 7 layers Ratingen

Operator: Doe

Test Specification: ANSI C63.4; FCC 15.107 / 15.207

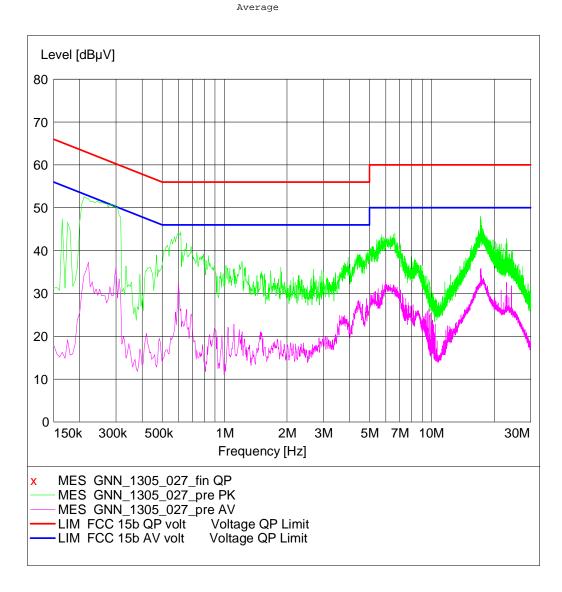
Comment:

10.05.2013 / 16:57:45 Start of Test:

### SCAN TABLE: "FCC Voltage"

Short Description: FCC Voltage

Start Stop Step Frequency Frequency Width 150.0 kHz 30.0 MHz 5.0 kHz Step Detector Meas. IF Time Bandw. Transducer 20.0 ms 9 kHz MaxPeak ESH3-Z5





FCC 47 CFR Ch.1 Part 15 Subpart B

#### 3.5.2 15b.2 Spurious Radiated Emissions §15.109

Test: 15b.2; Mode = Charge via USB

Result: Passed

Setup No.: PC1\_A01

Date of Test: 2013/05/10 15:48

Body: FCC47CFRChIPART15bRADIO FREQUENCY DEVICES

Test Specification: FCC part 2 and 15



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

### **Detailed Results:**

#### EMI RADIATED TEST

EUT: (CJ230a01)

Manufacturer: GNNET

Operating Condition: 120 V/ 60 Hz, comp. peri.

Test Site: 7 layers, Ratingen
Operator: Mit

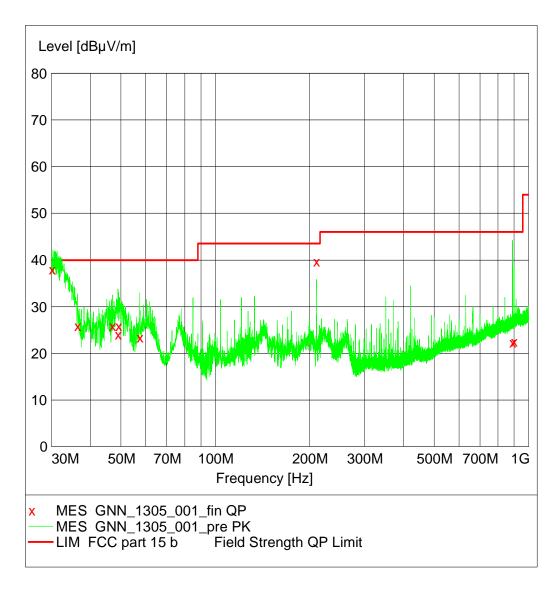
Operator: Mit

Test Specification: FCC part 15 b

Comment: Horizontal EUT position Start of Test: 30.04.2013 / 13:18:22

#### SCAN TABLE: "FCC part 15 b"

Short Description: FCC part 15 b
Start Stop Step Detector Meas. IF Transcription: Time Bandw.
30.0 MHz 1.0 GHz 60.0 kHz MaxPeak 1.0 ms 120 kHz HL562 Transducer





FCC 47 CFR Ch.1 Part 15 Subpart B

### MEASUREMENT RESULT: "GNN\_1305\_001\_fin QP"

30.04.2013 14	1:54						
Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dΒμV/m	dВ	dBµV/m	dB	cm	deg	
30.120000	38.00	20.4	40.0	2.0	100.0	21.00	VERTICAL
36.360000	25.90	17.0	40.0	14.1	110.0	202.00	VERTICAL
46.920000	25.80	10.8	40.0	14.2	100.0	157.00	VERTICAL
48.960000	24.00	9.5	40.0	16.0	112.0	61.00	VERTICAL
49.140000	25.80	9.4	40.0	14.2	100.0	67.00	VERTICAL
57.420000	23.40	4.7	40.0	16.6	213.0	112.00	VERTICAL
210.360000	39.70	9.3	43.5	3.8	155.0	59.00	HORIZONTAL
889.500000	22.30	23.8	46.0	23.7	125.0	149.00	VERTICAL
889.680000	22.30	23.8	46.0	23.7	175.0	158.00	HORIZONTAL
899.820000	22.50	24.0	46.0	23.5	155.0	0.00	VERTICAL



According to:

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# 4 Test Equipment Details

# 4.1 List of Used Test Equipment

The hardware and software states are shown for the testing period.

# **Test Equipment Anechoic Chamber**

Lab ID: Lab 2
Manufacturer: Frankonia

Description: Anechoic Chamber for radiated testing

*Type:* 10.58x6.38x6.00 m<sup>3</sup>

### Single Devices for Anechoic Chamber

Single Device Name	Туре	Serial Number	Manufacturer
Air compressor	none	-	Atlas Copco
Anechoic Chamber	10.58 x 6.38 x 6.00 m <sup>3</sup>	none	Frankonia
Controller Maturo	MCU	961208	Maturo GmbH
EMC camera	CE-CAM/1	-	CE-SYS
EMC camera Nr.2	CCD-400E	0005033	Mitsubishi
Filter ISDN	B84312-C110-E1		Siemens&Matsushita
Filter Universal 1A	BB4312-C30-H3	-	Siemens&Matsushita

# **Test Equipment Auxiliary Equipment for Conducted emissions**

Lab ID: Lab 1

Manufacturer: Rohde & Schwarz GmbH & Co.KG

Description: EMI Conducted Auxiliary Equipment

# Single Devices for Auxiliary Equipment for Conducted emissions

Single Device Name	Туре	Serial Number	Manufacturer
Cable "LISN to ESI"	RG214	W18.03+W48.03	Huber&Suhner
Two-Line V-Network	ESH 3-Z5	828304/029	Rohde & Schwarz GmbH & Co. KG
Two-Line V-Network	ESH 3-Z5	829996/002	Rohde & Schwarz GmbH & Co. KG



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# **Test Equipment Auxiliary Equipment for Radiated emissions**

Lab ID: Lab 2

Description: Equipment for emission measurements

Serial Number: see single devices

# Single Devices for Auxiliary Equipment for Radiated emissions

Single Device Name	Туре	Serial Number	Manufacturer
Antenna mast	AS 620 P	620/37	HD GmbH
Biconical dipole	VUBA 9117	9117-108	Schwarzbeck
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32-5P	849785	Miteq
Broadband Amplifier 1GHz-4GHz	AFS4-01000400-1Q-10P-4	-	Miteq
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35-5P	896037	Miteq
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01- 2+W38.01-2	Kabel Kusch
Cable "ESI to Horn Antenna"	UFB311A+UFB293C	W18.02- 2+W38.02-2	Rosenberger Micro-Coax
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic
High Pass Filter	WHKX 7.0/18G-8SS	09	Wainwright
Horn Antenna Schwarzbeck 15-26 GHz BBHA 9170	ВВНА 9170		
Logper. Antenna	HL 562 Ultralog	830547/003?	Rohde & Schwarz GmbH & Co. KG
Logper. Antenna 2013-05-10 13:00:20	HL 562 Ultralog	100609	Rohde & Schwarz GmbH & Co. KG
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG
Pyramidal Horn Antenna 26,5 GHz	3160-09	00083069	EMCO Elektronik GmbH
Pyramidal Horn Antenna 40 GHz	3160-10	00086675	EMCO Elektronik GmbH
Tilt device Maturo (Rohacell)	Antrieb TD1.5-10kg	TD1.5- 10kg/024/379070 9	Maturo GmbH



According to:

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# **Test Equipment Auxiliary Test Equipment**

Lab ID: Lab 2

Manufacturer: see single devices

Description: Single Devices for various Test Equipment

Type: various Serial Number: none

# **Single Devices for Auxiliary Test Equipment**

Single Device Name	Туре	Serial Number	Manufacturer
Broadband Power Divider N (Aux)	1506A / 93459	LM390	Weinschel Associates
Broadband Power Divider SMA	WA1515	A855	Weinschel Associates
Digital Multimeter 03 (Multimeter)	Fluke 177	86670383	Fluke Europe B.V.
Fibre optic link Satellite (Aux)	FO RS232 Link	181-018	Pontis
Fibre optic link Transceiver (Aux)	FO RS232 Link	182-018	Pontis
Isolating Transformer	LTS 604	1888	Thalheimer Transformatorenwerke GmbH
Notch Filter Ultra Stable (Aux)	WRCA800/960-6EEK	24	Wainwright
Vector Signal Generator	SMIQ 03B	832492/061	Rohde & Schwarz GmbH & Co.KG



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# **Test Equipment Digital Signalling Devices**

Lab ID: Lab 1, Lab 2

Description: Signalling equipment for various wireless technologies.

# **Single Devices for Digital Signalling Devices**

K62, K69

Single Device Name	Туре	Serial Number	Manufacturer
Bluetooth Signalling Unit CBT	СВТ	100589	Rohde & Schwarz GmbH & Co. KG
CMW500	CMW500	107500	Rohde & Schwarz GmbH & Co.KG
Universal Radio Communication Tester	CMU 200  HW/SW Status	102366	Rohde & Schwarz GmbH & Co. KG <i>Date of Start Date of End</i>
	Hardware: B11, B21V14, B21-2, B41, B52V14, B53-2, B56V14, B68 3v04, PCMCIA, Software: K21 4v21, K22 4v21, K23 4v21, K24 K43 4v21, K53 4v21, K56 4v22, K57 K59 4v22, K61 4v22, K62 4v22, K63 K65 4v22, K66 4v22, K67 4v22, K68 Firmware:  µP1 8v50 02.05.06	U65V04 4v21, K42 4v21, 4v22, K58 4v22, 4v22, K64 4v22,	2007/07/16
Universal Radio Communication Tester	CMU 200  HW/SW Status	837983/052	Rohde & Schwarz GmbH & Co. KG Date of Start Date of End
	HW options: B11, B21V14, B21-2, B41, B52V14, B54V14, B56V14, B68 3v04, B95, P0 SW options: K21 4v11, K22 4v11, K23 4v11, K24 K28 4v10, K42 4v11, K43 4v11, K53 K66 4v10, K68 4v10, Firmware: μP1 8v40 01.12.05	MCIA, U65V02 4v11, K27 4v10,	2007/01/02
	SW:		2008/11/03



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

### **Test Equipment Emission measurement devices**

Lab 1D: Lab 1, Lab 2

Description: Equipment for emission measurements

Serial Number: see single devices

# Single Devices for Emission measurement devices

Single Device Name	Туре	Serial Number	Manufacturer
Personal Computer	Dell	30304832059	Dell
Power Meter	NRVD	828110/016	Rohde & Schwarz GmbH & Co.KG
Sensor Head A	NRV-Z1	827753/005	Rohde & Schwarz GmbH & Co.KG
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG
Spectrum Analyzer	ESIB 26	830482/004	Rohde & Schwarz GmbH & Co. KG
	HW/SW Status		Date of Start Date of End
	Firmware-Update 4.34.4 from 3.45 during calibration		2009/12/03

# **Test Equipment Shielded Room 02**

Lab 1D: Lab 1
Manufacturer: Frankonia

Description: Shielded Room for conducted testing

Type: 12 qm Serial Number: none



Reference: MDE\_GNNET\_1305\_FCCa According to: FCC 47 CFR Ch.1 Part 15 Subpart B

- 5 **Annex**
- 5.1 **Additional Information for Report**



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

Test Description

Conducted emissions (AC power line)

The test was performed according to: ANSI C 63.4, 2009

FCC Part 15 Subpart B

#### Test Description

Standard

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2009. The Equipment Under Test (EUT) was setup in a shielded room to perform the conducted emissions measurements in a typical installation configuration. The EUT was powered from 50µH || 50 Ohm Line Impedance Stabilization Network (LISN) which meets the requirements of ANSI C63.4–2009, Annex B, in the frequency range of the measurements. The LISN's unused connections were terminated with 50 Ohm loads.

The measurement procedure consists of two steps. It is implemented into the EMI test software ES-K1 from R&S.

#### Step 1: Preliminary scan

Intention of this step is, to determine the conducted EMI-profile of the EUT.

#### EMI receiver settings:

- Detector: Peak Maxhold
- Frequency range: 150 kHz 30 MHz
- Frequency steps: 5 kHzIF-Bandwidth: 9 kHz
- Measuring time / Frequency step: 20 ms
- Measurement on phase + neutral lines of the power cords

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

# Step 2: Final measurement

Intention of this step is, to determine the highest emissions with the settings defined in the test specification for the frequencies identified in step 1.

EMI receiver settings:

- Detector: Quasi-Peak
- IF Bandwidth: 9 kHz
- Measuring time: 1 s / frequency

At each frequency determined in step 1, four measurements are performed in the following combinations:

- 1) Neutral lead reference ground (PE grounded)
- 2) Phase lead reference ground (PE grounded)
- 3) Neutral lead reference ground (PE floating)
- 4) Phase lead reference ground (PE floating)

The highest value is reported.

Test Requirements / Limits

If not stated within the measurement plot and/or test result, class B limits are applied.

FCC Part 15, Subpart B, §15.107, Class B Limit

Frequency Range (MHz) QP Limit (dBμV) AV Limit (dBμV) 0.15-0.5 66 to 56 56 to 46 0.5-5 56 46 60 50



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

FCC Part 15, Subpart B, §15.107, Class A Limit

Frequency Range (MHz) QP Limit (dBμV) AV Limit (dBμV)

0.15 - 0.5 79 66 0.5 - 30 73 60

Used conversion factor: Limit (dB $\mu$ V) = 20 log (Limit ( $\mu$ V)/1 $\mu$ V).

#### NOTES

A missing result table in the corresponding test report section means, that no final measurement was performed because no relevant frequencies (peaks) were found in the preliminary scan.

The chosen operating mode is selected as representative mode to generate "worst-case" conditions, i.e. high power consumption.

Spurious radiated emissions

Standard FCC Part 15, Subpart B

The test was performed according to: ANSI C 63.4, 2009

Test Description

# Measurement below 1 GHz:

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2009.

The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m in the semi-anechoic chamber. The influence of the EUT support table that is used between 30–1000 MHz was evaluated. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The measurement procedure is implemented into the EMI test software ES-K1 from R&S. The radiated emissions measurements were made in a typical installation configuration. Exploratory tests are performed at 3 orthogonal axes to determine the worst-case orientation of a body-worn or handheld EUT. The final test on all kind of EUTs is performed at 2 axes. A pre-check is also performed while the EUT is powered from both AC and DC (battery) power in order to find the worst-case operating condition.

Step 1: Preliminary scan (test to identify the highest amplitudes relative to the limit) Intention of this step is, to determine the radiated EMI-profile of the EUT.

Settings for step 1:

- Detector: Peak-Maxhold
- Frequency range: 30 1000 MHz
- Frequency steps: 60 kHz
- IF-Bandwidth: 120 kHz
- Measuring time / Frequency step: 100 μs
- Turntable angle range: -180° to +180°
- Turntable step size: 90°
- Height variation range: 1 3 m
- Height variation step size: 2 mPolarisation: Horizontal + Vertical
- On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are

considered.

#### Step 2:

A further measurement will be performed on the frequencies determined in step 1. Intention of this step is, to find out the approximate turntable angle and antenna height for each frequency. Settings for step 2:

- Detector: Peak Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF Bandwidth: 120 kHz - Measuring time: 100 ms
- Turntable angle range: -180° to +180°



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

- Turntable step size: 45°

Height variation range: 1 – 4 m
Height variation step size: 0.5 m
Polarisation: horizontal + vertical

After this step the EMI test system has determined the following values for each frequency (of step 1):

- Frequency
- Azimuth value (of turntable)
- Antenna height

The last two values have now the following accuracy:

- Azimuth value (of turntable): 45°
- Antenna height: 0.5 m

#### Step 3: final measurement

In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will be slowly varied by  $+/-22.5^{\circ}$  around this value. During this action the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position the antenna height is also slowly varied by +/-25 cm around the antenna height determined. During this action the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

- Detector: Peak Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range: -22.5° to +22.5° around the determined value
- Height variation range: -0.25 m to +0.25 m around the determined value

#### Step 4: Final measurement (with QP detector)

With the settings determined in step 3, the final measurement will be performed:

EMI receiver settings for step 4:

- Detector: Quasi-Peak(< 1GHz)
- Measured frequencies: in step 3 determined frequencies
- IF Bandwidth: 120 kHz
- Measuring time: 1 s

### Measurement above 1 GHz:

The following modifications apply to the measurement procedure for the frequency range above 1 GHz: The measurement distance was reduced to 1 m. The results were extrapolated by the extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements, inverse-linear-distance-squared for the power density measurements). Due to the fact that in this frequency range a double ridged wave guided horn antenna (up to 18 GHz) and a horn antenna (18–25 GHz) are used, the steps 2-4 as described before, are omitted. Step 1 was performed at one height of the receiving antenna only.

Detector: Peak, Average (simultaneously) RBW = VBW = 1 MHz; above 7 GHz 100 kHz

#### Test Requirements / Limits

If not stated within the measurement plot and/or test result, class B limits are applied.

FCC Part 15, Subpart B, §15.109, Radiated Emission Limits Frequency Range (MHz): Class B Limit (dBμV/m)

Frequency Range (MHz) Class B Limit (dBμV/m) 30 – 88 40.0 88 – 216 43.5 216 – 960 46.0 above 960 54.0

Frequency Range (MHz) Class A Limit (dBµV/m) / @ 3m !

30 - 88 49.5 88 - 216 54.0 216 - 960 56.9 above 960 60.0

§15.35(b)



According to:

FCC 47 CFR Ch.1 Part 15 Subpart B

..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.... Used conversion factor: Limit (dB $\mu$ V/m) = 20 log (Limit ( $\mu$ V/m)/1 $\mu$ V/m)

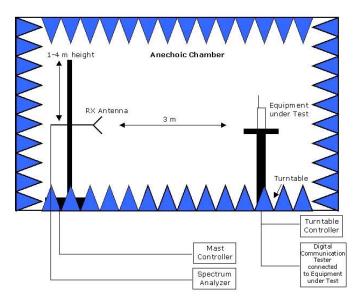
NOTE: A missing result table in the corresponding test report section means, that no final measurement was performed because no relevant frequencies (peaks) were found in the preliminary scan.



According to:

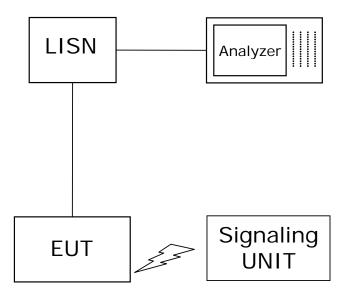
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**Setup Drawings** 



<u>Remark:</u> Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

Setup in the Anechoic chamber. For measurements below 1 GHz the ground was replaced by a conducting ground plane.



Setup in the shielded room for conducted measurements at AC mains port



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