

TEST REPORT

Test report no.: 1-3824/11-01-03-A



Testing laboratory

CETECOM ICT Services GmbH
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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

Sonic Innovations Inc.
 2501 Cottontail Lane
 Postleitzahl Somerset, NJ 08873 / UNITED STATES
 Contact: Joe Lugara
 e-mail: joe@sonici.com
 Phone: +1 73 25 60 32 20

Manufacturer

Sonic Innovations Inc.
 2501 Cottontail Lane
 PLZ Somerset, NJ 08873 / UNITED STATES

Test standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
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:	Air Conduction Hearing Aid with wireless functionality
Model name:	Flip Rite BTE (FL100 MNR / FL80 MNR / FL60 MNR)
FCC ID:	ZTOFLIP1
IC:	9799A-FLIP1
Frequency [MHz]:	3.8 MHz
Technology tested:	-/-
Antenna:	Integrated coil antenna
Power Supply:	1.4 V DC by zinc – air battery
Temperature Range:	+5 °C to +35 °C



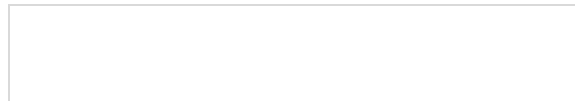
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:



Andreas Keller
 Testing Manager

Test performed:



Marco Bertolino
 Testing Manager

1 Table of contents

1 Table of contents2

2 General information3

 2.1 Notes and disclaimer3

 2.2 Application details.....3

3 Test standard/s3

4 Test environment.....4

5 Test item4

6 Test laboratories sub-contracted4

7 Summary of measurement results5

8 RF measurement testing.....6

 8.1 Description of test setup6

 8.1.1 Radiated measurements.....6

 8.1.2 Conducted measurements.....7

 8.2 Additional comments8

9 Measurement results.....9

 9.1 Timing of the transmitter9

 9.2 Bandwidth of the modulated carrier10

 9.3 Field strength of the fundamental12

 9.4 Fieldstrength of the harmonics and spurious13

 9.5 Receiver spurious emissions.....17

 9.6 Conducted limits20

10 Test equipment and ancillaries used for tests21

11 Observations22

2 General information

2.1 Notes and disclaimer

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

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

2.2 Application details

Date of receipt of order:	2011-10-07
Date of receipt of test item:	2011-10-28
Start of test:	2011-10-28
End of test:	2011-11-02
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2010-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+21 °C during room temperature tests
	T_{max}	+35 °C
	T_{min}	+5 °C
Relative humidity content:		55 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	1.4 V DC by zinc – air battery
	V_{max}	1.5 V
	V_{min}	1.1 V

5 Test item

Kind of test item	:	Air Conduction Hearing Aid with wireless functionality
Type identification	:	Flip Rite BTE (FL100 MNR / FL80 MNR / FL60 MNR)
S/N serial number	:	FL100MNR 18927788 (transmit mode), FL100MNR 18941503 (transmit mode) FL100MNR 18949193 (receive mode)
HW hardware status	:	Accord 114938 Rev 0
SW software status	:	No information provided!
Frequency band [MHz]	:	3.8MHz
Type of radio transmission	:	-/-
Use of frequency spectrum	:	-/-
Channel access method	:	-/-
Type of modulation	:	A1D
Number of channels	:	1
Antenna	:	Integrated coil antenna
Power supply	:	1.4 V DC by zinc – air battery (type 13)
Temperature range	:	+5 °C to +35 °C

6 Test laboratories sub-contracted

None

7 Summary of measurement results

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

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8	Passed	2011-11-03	-/-

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Results
§ 15.35 (c) / RSS-GEN Issue 2 Section 4.5	Timing of the transmitter (Duty cycle correction factor)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.223 / RSS-210 Issue 8	Bandwidth of the modulated carrier	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.223 / RSS-210 Issue 78	Fieldstrength of fundamental	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.209 (a) / RSS-210 Issue 8	Fieldstrength of harmonics and spurious	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.109 / RSS-210 Issue 8	Receiver spurious emissions	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§ 15.109 / § 15.207	Conducted limits	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-/-

Note: NA = Not Applicable; NP = Not Performed

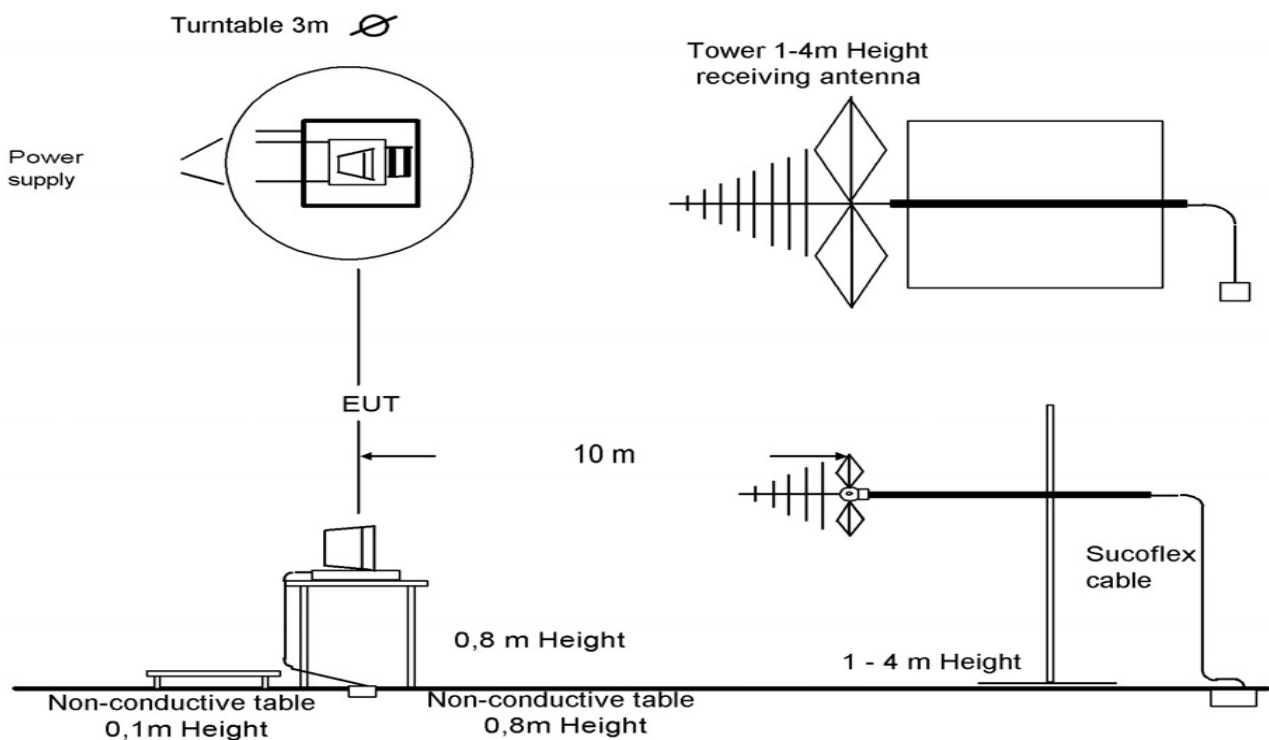
8 RF measurement testing

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 and ANSI C63.4-2009. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2003. Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



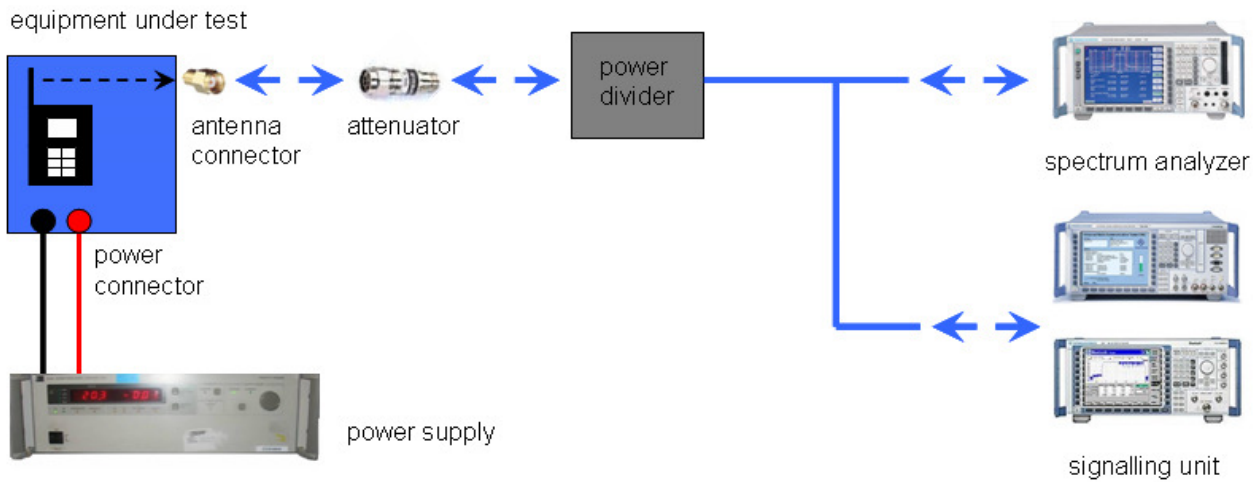
Picture 1: Diagram radiated measurements

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 (if needed) is performed from outside the chamber with a signalling unit by air link using signalling antenna.

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, and the spectrum analyzer are impedance matched on 50 Ohm.



Picture 2: Diagram conducted measurements

8.2 Additional comments

Reference documents:

1-3824_11-01-03 ANNEX A.pdf
1-3824_11-01-03 ANNEX B.pdf
1-3824_11-01-03 ANNEX C.pdf
1-3824_11-01-03-A ANNEX D, E & F.pdf
1-3824_11-01-03 RF Exposure Appendix C.pdf
1-3824_11-01-03-A RSP 100.pdf

Special test descriptions:

Special test samples provided with permanent transmit mode and permanent receive mode.

Configuration descriptions: None

9 Measurement results

9.1 Timing of the transmitter

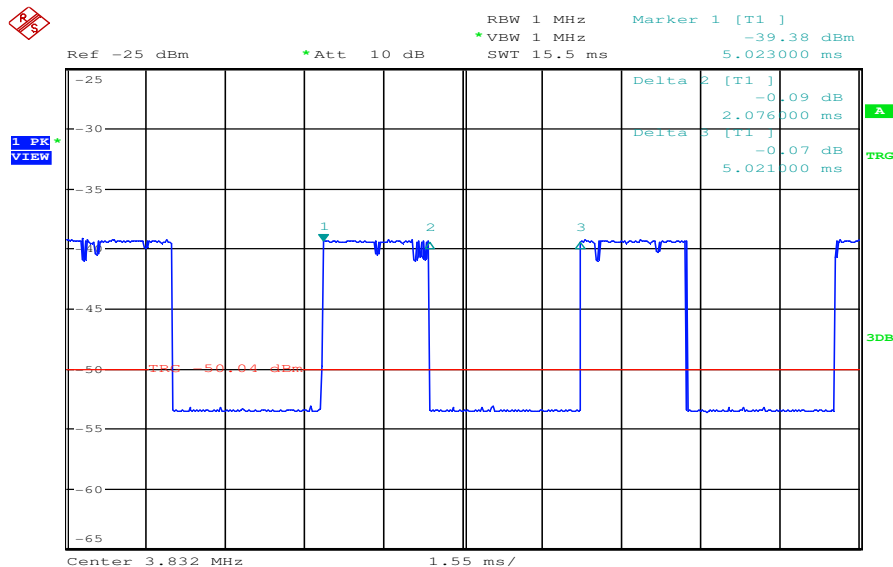
Limits:

FCC	IC
CFR Part SUBCLAUSE § 15.35 (c)	RSS-GEN Issue 2 Section 4.5
Timing of the transmitter	
<p>(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.</p>	

Duty cycle of the sample with test mode: 42%
 For normal use the duty cycle was not declared by the manufacturer.

Result: The result of the measurement is passed.

Plot 1: Timing of the test sample 18927788



Date: 31.OCT.2011 13:45:04

9.2 Bandwidth of the modulated carrier

Limits:

FCC	IC
CFR Part SUBCLAUSE § 15.223	RSS-210 Issue 8
Bandwidth of the modulated carrier	

Measured with the integrated OBW-function of the spectrum analyser Rohde&Schwarz FSIQ26 (measurement criteria is the integrated power in %)

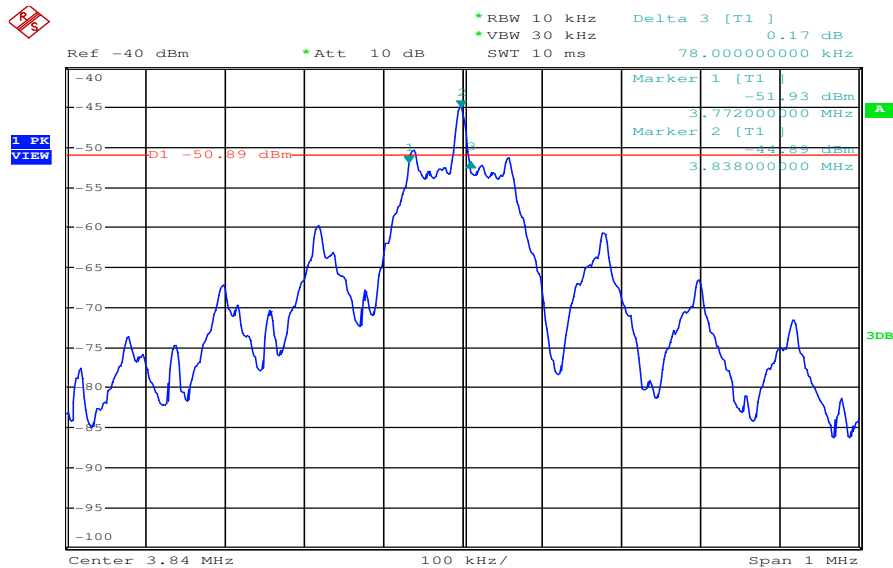
Result:

Sample 18927788

	Occupied Bandwidth (kHz)
6 dB	78
20 dB	386

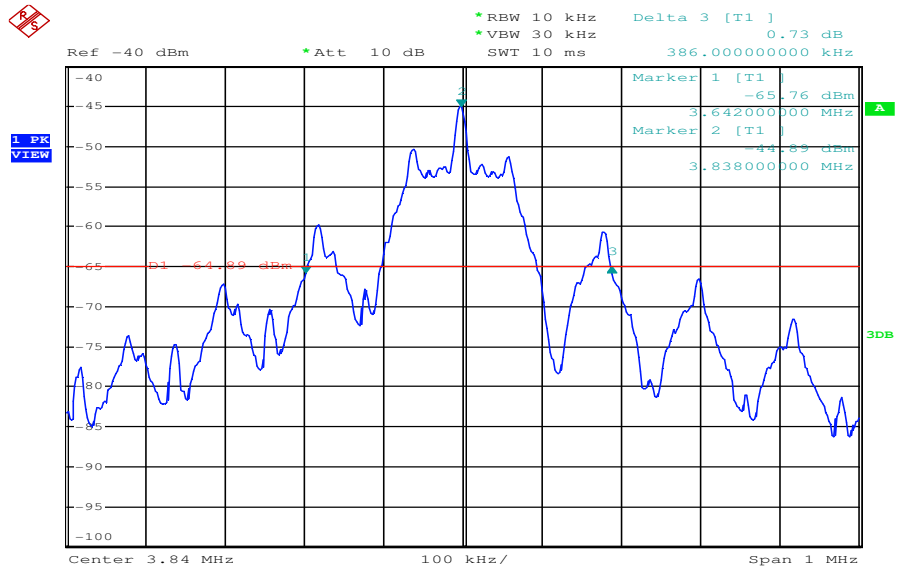
Plots of the measurement

Plot 1: 6dB – bandwidth



Date: 31.OCT.2011 14:24:57

Plot 2: 20dB - bandwidth



Date: 31.OCT.2011 14:25:51

9.3 Field strength of the fundamental

Measurement:

Measurement parameter	
Detector:	Quasi Peak (CISPR)
Resolution bandwidth:	10kHz
Trace-Mode:	Max Hold

Limits:

FCC		IC	
CFR Part SUBCLAUSE § 15.223		RSS-210 Issue 8	
Fundamental Frequency (MHz)	Field strength of Fundamental ($\mu\text{V/m}$)	Measurement distance (m)	
1.705 – 10.0	[15] or [6dB-BW(kHz) / F(MHz)] Whichever is higher	30	

Result:

Sample 18927788 and 18941503 verified

TEST CONDITIONS		MAXIMUM POWER ($\text{dB}\mu\text{V/m}$)	
Frequency		3.8 MHz	3.8 MHz
Mode		at 1 m distance	at 10 m distance
T_{nom}	V_{nom}	28.0 *	28.0 *
Measurement uncertainty		$\pm 3\text{dB}$	

*Noise floor level (As no signal was detected, the noise floor level is stated to show compliance).

Result: The result of the measurement is passed.

9.4 Fieldstrength of the harmonics and spurious

Measurement:

Measurement parameter	
Detector:	Average / Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	3kHz – 120kHz
Video bandwidth:	Comparable to RBW
Trace-Mode:	Max hold

Limits:

FCC	IC	
SUBCLAUSE § 15.209 (a)	RSS-210 Issue 8	
Field strength of the harmonics and spurious.		
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	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

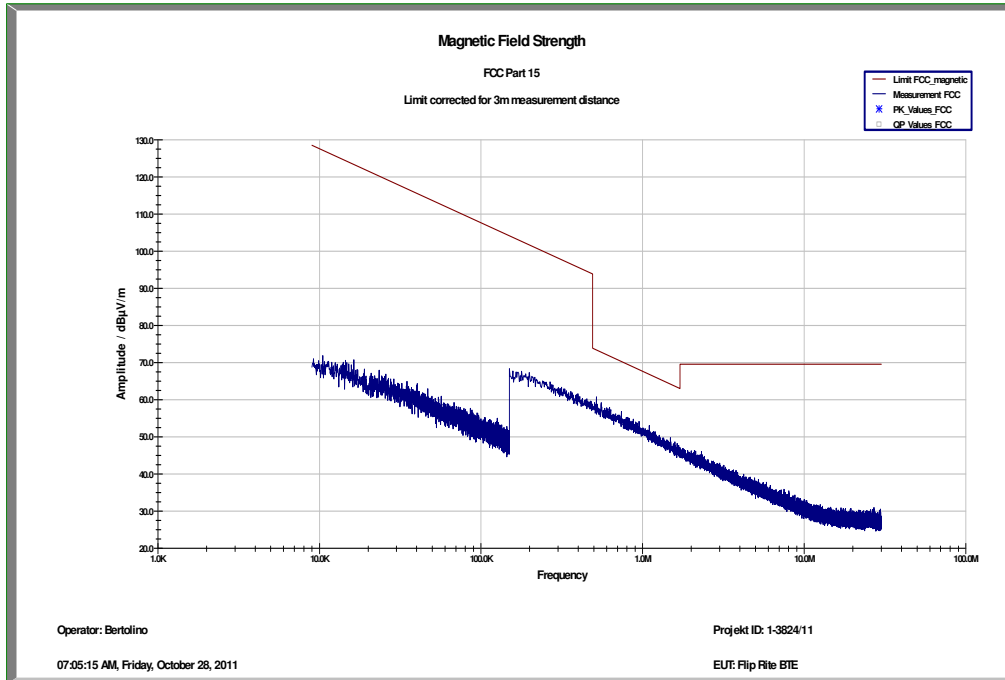
Result:

EMISSION LIMITATIONS				
f [MHz]	Detector	Limit max. allowed [dBµV/m]	Amplitude of emission [dBµV/m]	Results
No emissions detected!				

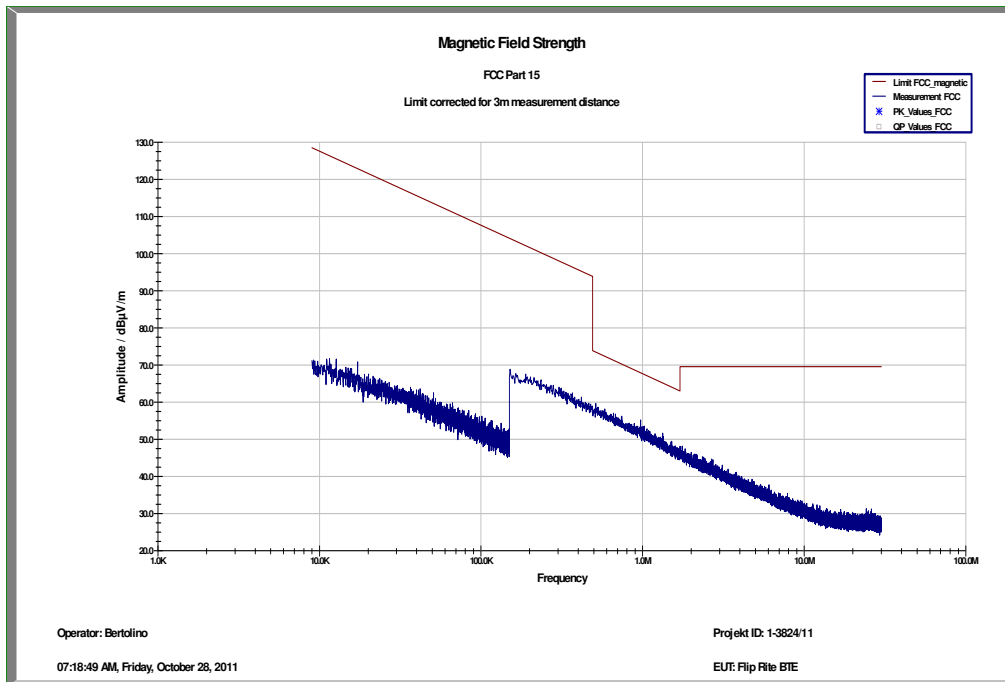
Result: The result of the measurement is passed.

Plots of the measurements

Plot 1: 9 kHz – 30 MHz, DUT 0°



Plot 2: 9 kHz – 30 MHz, DUT 90°



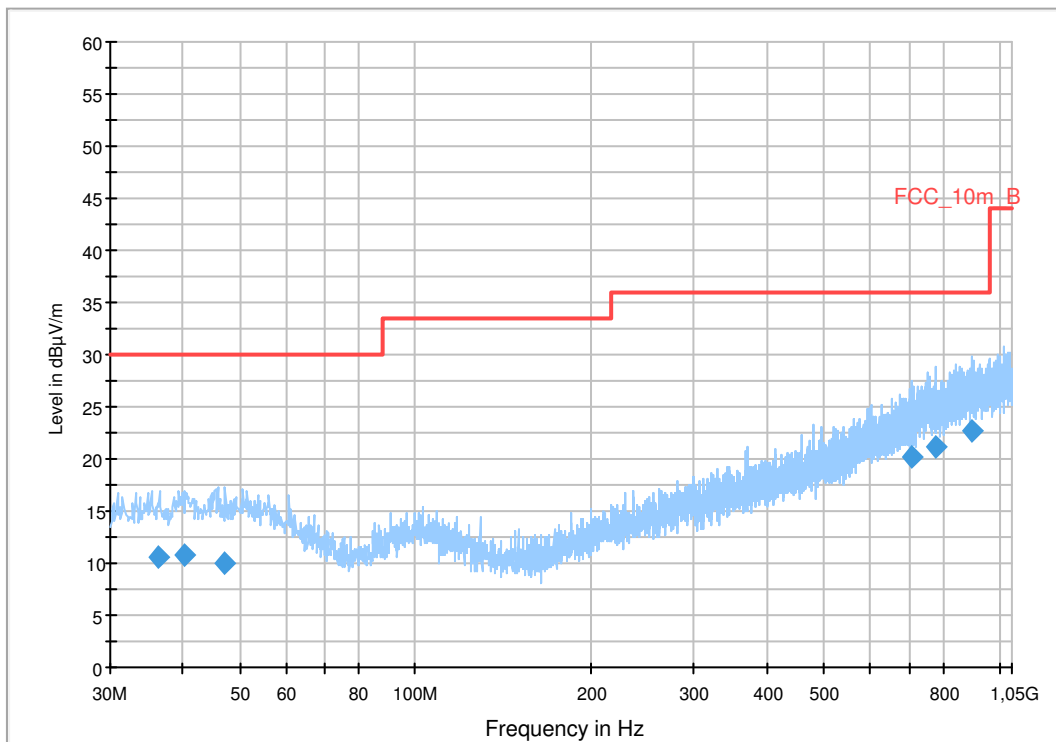
Plot 3: 30 MHz – 1000 MHz

Common Information 13824110114F_AA
 EUT: Flip Rite BTE (FL100 MNR)
 Serial Number: 18927788
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: TX
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

FCC_10m(B)_3



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
36.256350	10.5	1000.0	120.000	170.0	H	82.0	13.1	19.5	30.0	
40.242600	10.8	1000.0	120.000	162.0	V	85.0	13.4	19.2	30.0	
46.893450	10.0	1000.0	120.000	170.0	V	272.0	13.3	20.0	30.0	
707.767500	20.2	1000.0	120.000	126.0	H	258.0	22.7	15.8	36.0	
776.207400	21.2	1000.0	120.000	170.0	V	178.0	23.7	14.8	36.0	
896.463150	22.7	1000.0	120.000	170.0	V	273.0	25.2	13.3	36.0	

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

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.42
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 8.10.00

9.5 Receiver spurious emissions

Measurement:

Measurement parameter	
Detector:	Average / Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	3kHz – 120kHz
Video bandwidth:	Comparable to RBW
Trace-Mode:	Max hold

Limits:

FCC		IC	
SUBCLAUSE § 15.109		RSS-210 Issue 7	
Field strength of the harmonics and spurious.			
Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)	
0.009 – 0.490	$2400/F(\text{kHz})$	300	
0.490 – 1.705	$24000/F(\text{kHz})$	30	
1.705 – 30	30 (29.5 dB $\mu\text{V/m}$)	30	
30 – 88	100 (40 dB $\mu\text{V/m}$)	3	
88 – 216	150 (43.5 dB $\mu\text{V/m}$)	3	
216 – 960	200 (46 dB $\mu\text{V/m}$)	3	

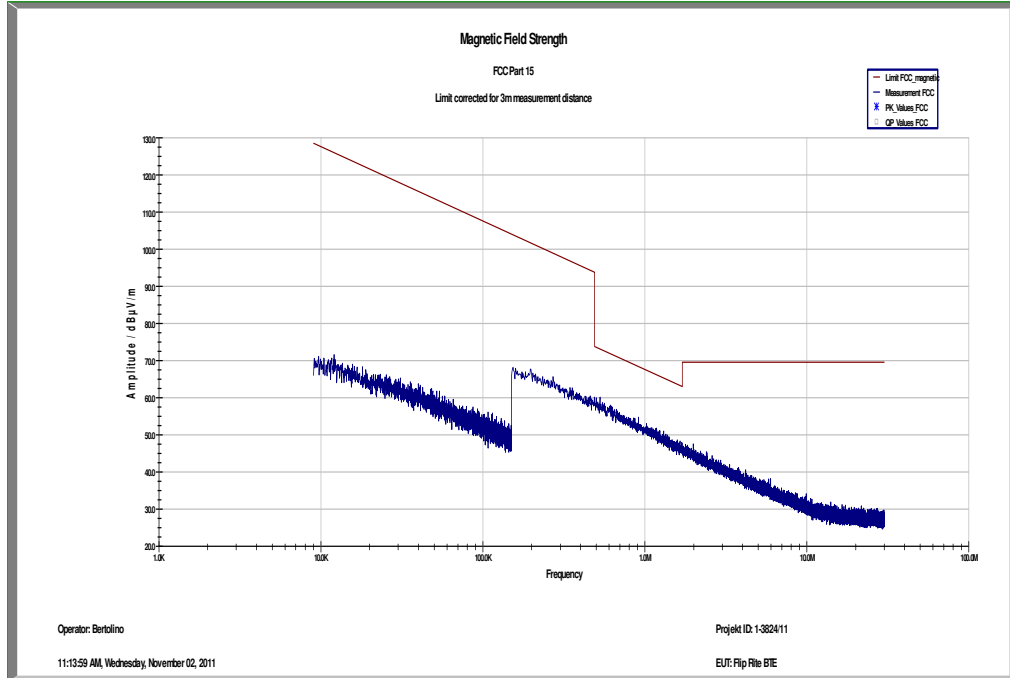
Result:

EMISSION LIMITATIONS				
f [MHz]	Detector	Limit max. allowed [dB $\mu\text{V/m}$]	Amplitude of emission [dB $\mu\text{V/m}$]	Results
No emissions detected!				

Result: The result of the measurement is passed.

Plots of the measurements

Plot 1: 9 kHz – 30 MHz



Plot 2: 30 MHz – 1000 MHz

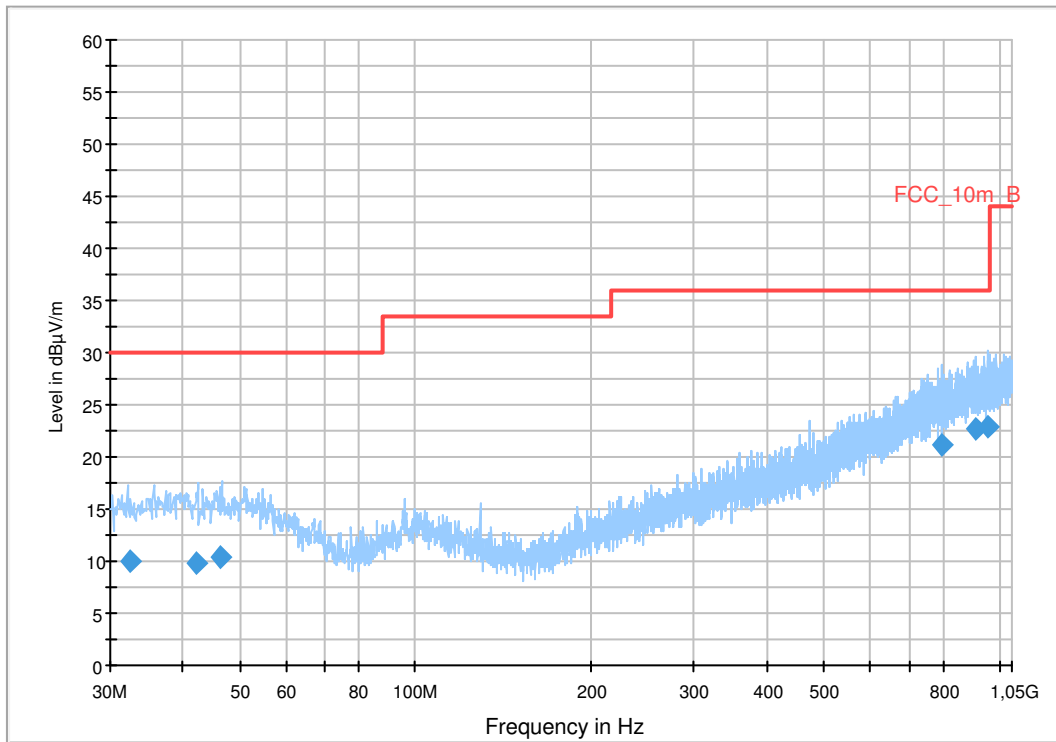
Common Information 13824110114F_AB
 EUT: Flip Rite BTE (FL100 MNR)
 Serial Number: 18949193
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: RX
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

FCC_10m(B)_3



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
32.569800	10.0	1000.0	120.000	134.0	V	181.0	12.8	20.0	30.0	
42.064800	9.9	1000.0	120.000	170.0	H	196.0	13.4	20.1	30.0	
46.164750	10.5	1000.0	120.000	135.0	H	91.0	13.3	19.5	30.0	
797.937750	21.2	1000.0	120.000	170.0	H	186.0	23.8	14.8	36.0	
910.604400	22.7	1000.0	120.000	170.0	H	258.0	25.2	13.3	36.0	
957.635100	22.8	1000.0	120.000	170.0	V	284.0	25.4	13.2	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 8.10.00

9.6 Conducted limits

Not applicable!

10 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.	Test Receiver	ESH2	R&S	871921/095	300002505	Ve	12.02.2010	12.02.2012
2	n. a.	Loop Antenna 9 KHz - 30 MHz	HFH2-Z2	R&S	872096/61	300001824	vlKI!	18.11.2008	18.11.2011
3	n. a.	EMI Test Receiver 9 kHz - 3 GHz incl. Preselector	ESPI3	R&S	101713	300004059	k	16.08.2011	16.08.2012
4	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
5	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
6	n. a.	Coaxial Attenuator 30dB/500W	8325	Bird	1530	300001595	ev		
7	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKI!	11.05.2011	11.05.2013
8	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
9	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
10	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
11	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
12	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
13	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
14	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
15	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
16	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
17	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
18	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
19	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
20	n. a.	TILE -Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
21	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
22	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
23	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
24	n. a.	PSA Spectrum	E4440A	Agilent	MY48250080	300003812	k	08.09.2010	08.09.2012

		Analyzer 3 Hz - 26.5 GHz		Technologies					
25	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	13.09.2010	13.09.2012
26	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vkI!	08.09.2010	08.09.2012
27	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vkI!	14.10.2011	14.10.2014
28	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
29	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
30	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
31	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	05.01.2011	05.01.2013
32	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	14.07.2011	14.07.2013
33	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
34	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
35	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
36	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
37	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	01.04.2010	01.04.2012
38	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	10.01.2011	10.01.2013

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vkI!	Attention: extended calibration interval	*	next calibration ordered / currently in progress
NK!	Attention: not calibrated		

11 Observations

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