TEST REPORT

Date: 2013-10-29
Report No.: 68.870.13.105.01C

Applicant:	Widex A/S Nymoellevej 6, DK-3540 Lynge, Denmark	
Description of Samples:	Model name:	UNI-DEX, Audio Control
	Brand name:	WIDEX coselgi
	Model no.:	UNI-DEX, Audio Control
	IC:	5676B-UNID
Date Samples Received:	2013-10-11	
Date Tested:	2013-10-15 to 2013-10-24	
Investigation Requested:	RSS-210 Issue 8 RSS-102 Issue 4 RSS-Gen Issue 3	
Conclusions:	The submitted product COMPLIED with the requirements of RSS-210, RSS-102 and RSS-Gen. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.	
Remarks:	----	

Checked by:

Jim Huang
Project Engineer
Wireless & Telecom department

Approved by:-

John Zhi
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Wireless & Telecom department

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CONTENT:

Appendix A

Photos of Test Setup

Appendix B

External EUT Photos

Appendix C

Internal EUT Photos

1.0 General Details

1.1 Test Laboratory

Centre Testing International
EMC Laboratory registered by IC with
IC Registration Number: 7408B

Test By: 
Jim Huang

1.2 Applicant Details

Applicant

Widex A/S
Nymoellevej 6, DK-3540 Lynge, Denmark

Manufacturers

Widex A/S
Nymoellevej 6, DK-3540 Lynge, Denmark

1.3 Equipment Under Test [EUT]

Description of EUT

Product Description:	UNI-DEX, Audio Control
Model No.:	UNI-DEX, Audio Control
Brand Name:	
IC:	5676B-UNID
Rating:	Tenpao adaptor: S004YM0500055 Input:100~240Vac~50/60Hz 150mA output: 5.0Vdc, 550mA) Huntkey adaptor: HKA00605006-XH (Input: 100-240Vac~50/60Hz, 0.2A output: 5.0Vdc, 0.6A)
Operated Frequency:	10.6 MHz
No. of Operated Channel:	1
Modulation:	FSK
Accessories and Auxiliary Equipments:	AC/DC power adaptor.
Antenna Type:	Integrated coil antenna
Manufacture of Antenna:	LEOCO (D.G) LTD.
Antenna Gain:	0dBi
Antenna Model:	LC13-0874-AA000

General Operation of EUT

The EUT is the mobile phone hearing aid headset, which operate at 10.6MHz.

As client declaration, Audio Control utilize the identical circuit design, PCB layout, shielding and interface with UNI-DEX, only the Product name, model number and Trade mark is difference. Therefore this application can be regarded as identical in performance to the submitted test sample UNI-DEX.

1.4 Related Submittal(s) Grants

This is a signal application subject to Certificate Authorization.

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with RSS-210 Issue 8, RSS-Gen Issue 3 and RSS-102 Issue 4.

2.2 Test Standards and Results Summary Tables

Test Condition	Test Requirement	Test Result	
		Pass	N/A
Occupied bandwidth	RSS-Gen Issue 3	☒	☐
Field strength of fundamental	RSS-210 Issue 8	☒	☐
Filed strength of harmonics and spurious	RSS-210 Issue 8	☒	☐
Conducted Emission on AC Mains	RSS-Gen Issue 3	☒	☐
SAR Evaluation	RSS-102 Issue 4	☒	☐
RF Exposure Evaluation	RSS-102 Issue 4	☒	☐

Remark: N/A - Not Applicable

3.0 Test Methodology

3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

3.2 Field Strength Calculation

The field strength at 10 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

FS = R + System Factor
System Factor = AF + CF + FA – PA

Where FS = Net Field Strength in dBuV/m at 10 meters.
R = Reading of Spectrum Analyzer / Test Receiver in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

3.3 Conducted Emissions

The test was performed in accordance with ANSI C63.4: 2003, with the following: initial measurements were performed in peak and average detection modes on the live line of personal computer, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

4.0 Test Results

4.1 Occupied Bandwidth Measurement

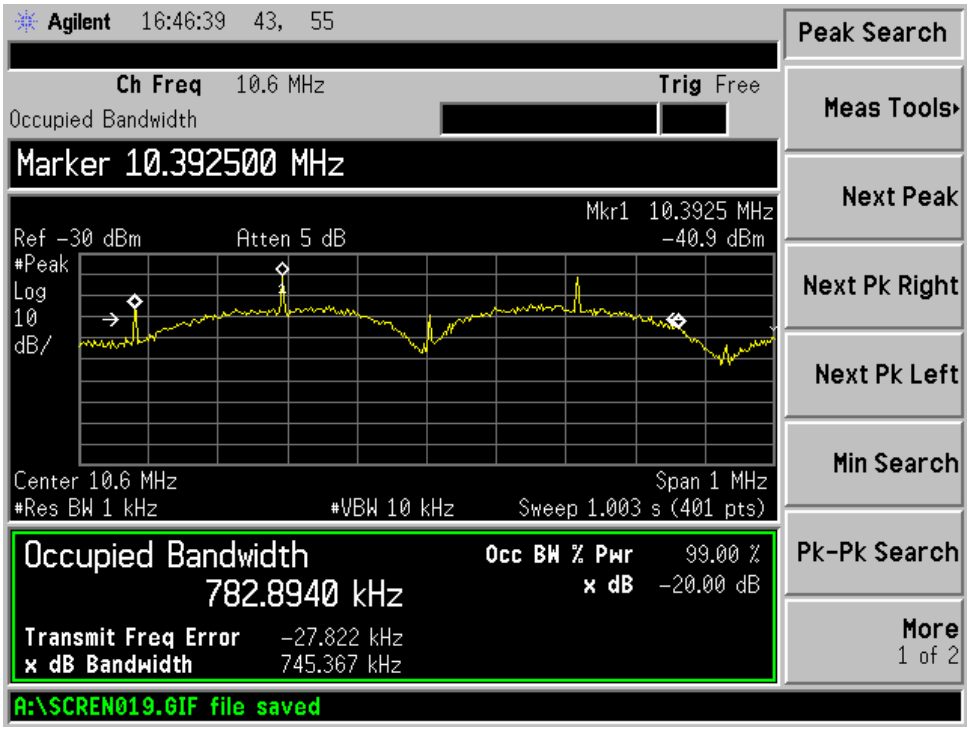
Test Requirement:	RSS-Gen Issue 3
Test Date:	2013-10-21
Mode of Operation:	Transmitting continuously mode
Detector Function:	Peak
Trace mode:	Max hold

Test setup:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

	Occupied Bandwidth(KHz)
20dB	745.367
99%	782.894

Plots of the measurement



Limits for occupied bandwidth:

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.

4.2 Filed strength of the fundamental

Test Requirement:	RSS 210, Issue 8 chapter 2.5
Test Date:	2013-10-21
Mode of Operation:	Transmitting continuously mode
Detector Function:	Quasi Peak(CISPR)
Measurement BW:	RBW 10KHz ; VBW 30KHz
Trace mode:	Max hold

Result:

Test conditions		Maximum power (dBμV/m)	
Frequency		10.797MHz	10.797MHz
Mode		At 10 m distance	At 30 m distance
T_{nom}	V_{nom}	23.70	3.70
Measurement uncertainty		±5.2dB	

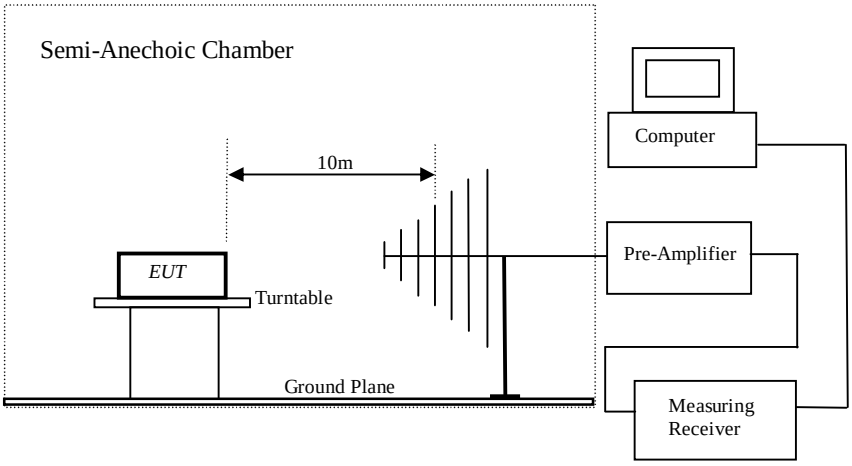
Limits for Filed strength of the fundamental :

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(29.5dBμV/m)	30
30-88	100(40dBμV/m)	3
88-216	150(43.5dBμV/m)	3
216-960	200(46dBμV/m)	3
Above 960	500(54dBμV/m)	3

4.3 Field strength of the harmonics and spurious

Test Requirement:	RSS 210, Issue 8 chapter 2.5
Test Method:	ANSI C63.4:2003
Test Date:	2013-10-21
Mode of Operation:	Transmitting continuously mode
Detector Function:	9 kHz – 90 kHz: Average 110 kHz – 490 kHz: Average All other frequencies: Quasi Peak
Measurement BW:	9 kHz – 150 kHz: RBW: 200 Hz 150 kHz– 30 MHz: RBW: 9 kHz 30 MHz– 1000 MHz: RBW:120 kHz
Trace mode:	Max hold

Test Setup:



Limit for Field strength of the harmonics and spurious [Section 15.209]:

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(29.5dBμV/m)	30
30-88	100(40dBμV/m)	3
88-216	150(43.5dBμV/m)	3
216-960	200(46dBμV/m)	3
Above 960	500(54dBμV/m)	3

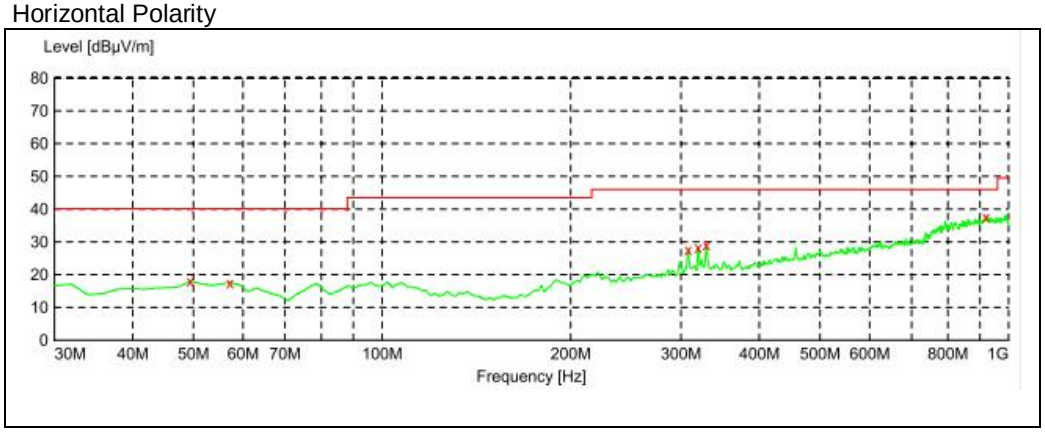
Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result : PASS

For Tenpao adaptor powered mode:

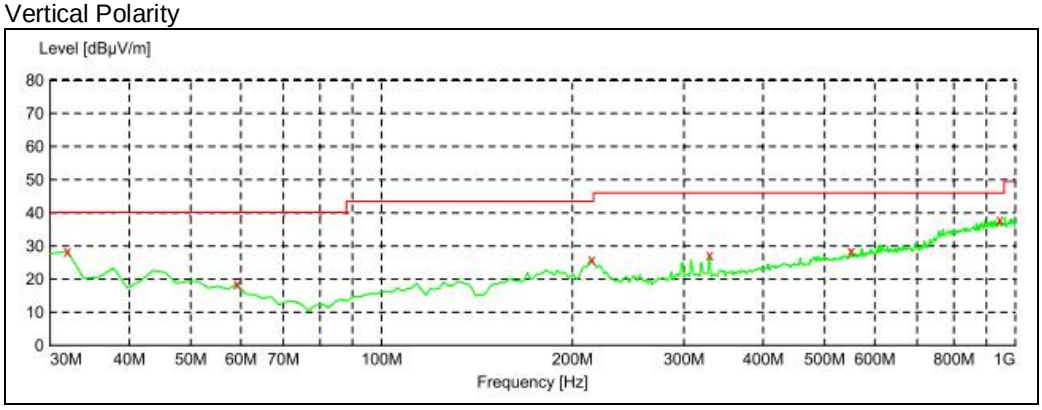
Below 1GHz emissions
Horizontal Polarity



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
49.438878	18.00	-9.1	40.0	22.0	---	100.0	287.00	HORIZONTAL
57.214429	17.50	-8.7	40.0	22.5	---	100.0	358.00	HORIZONTAL
307.975952	27.60	-4.9	46.0	18.4	---	100.0	59.00	HORIZONTAL
319.639279	28.30	-4.7	46.0	17.7	---	100.0	59.00	HORIZONTAL
329.358717	29.10	-4.3	46.0	16.9	---	100.0	42.00	HORIZONTAL
920.300601	37.60	9.6	46.0	8.4	---	100.0	216.00	HORIZONTAL

Result : PASS

Below 1GHz emissions
Vertical Polarity



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.943888	28.40	-12.4	40.0	11.6	---	100.0	284.00	VERTICAL
59.158317	18.50	-9.2	40.0	21.5	---	100.0	312.00	VERTICAL
214.669339	25.90	-8.6	43.5	17.6	---	100.0	220.00	VERTICAL
329.358717	27.30	-4.3	46.0	18.7	---	100.0	10.00	VERTICAL
550.961924	28.50	0.0	46.0	17.5	---	100.0	213.00	VERTICAL
945.571142	37.90	9.5	46.0	8.1	---	100.0	234.00	VERTICAL

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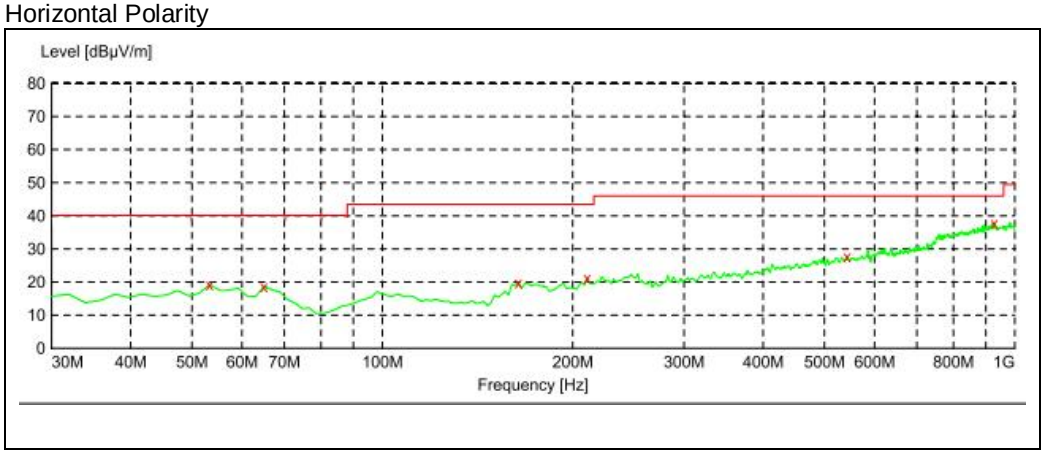
Result : PASS

For Huntkey adaptor powered mode :

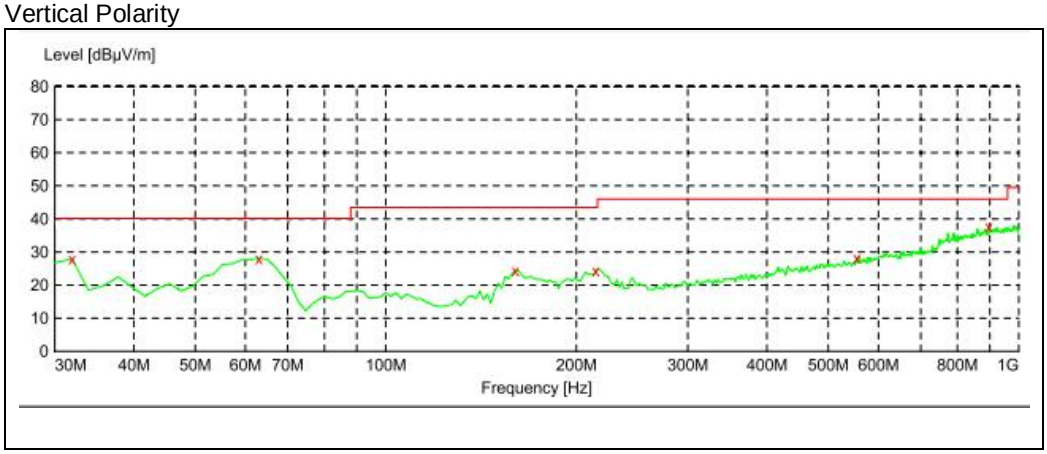
below 1GHz Emission test data
Horizontal Polarity



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.326653	19.20	-9.4	40.0	20.8	---	100.0	328.00	HORIZONTAL
64.989980	18.60	-11.3	40.0	21.4	---	100.0	185.00	HORIZONTAL
164.128257	19.80	-12.5	43.5	23.7	---	100.0	178.00	HORIZONTAL
210.781563	21.20	-8.8	43.5	22.3	---	100.0	150.00	HORIZONTAL
543.186373	27.70	0.0	46.0	18.3	---	100.0	206.00	HORIZONTAL
928.076152	37.80	9.6	46.0	8.2	---	100.0	135.00	HORIZONTAL

Result : PASS

below 1GHz Emission test data
Vertical Polarity



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.943888	27.90	-12.4	40.0	12.1	---	100.0	304.00	VERTICAL
63.046092	28.00	-10.6	40.0	12.0	---	100.0	40.00	VERTICAL
160.240481	24.40	-12.9	43.5	19.1	---	100.0	312.00	VERTICAL
214.669339	24.30	-8.6	43.5	19.2	---	100.0	254.00	VERTICAL
554.849699	28.20	0.1	46.0	17.8	---	100.0	183.00	VERTICAL
896.973948	37.70	9.2	46.0	8.3	---	100.0	225.00	VERTICAL

Result Summary:

1) Communication mode: All other emissions are more than 20dB below RSS 210 Issue 8 chapter 2.5 limits.
2) No further spurious emissions found between 30 MHz and lowest internal used/generated frequency and from 30MHz to 1GHz.

Remarks:

1. Emission level with more than 20dB below the FCC required limit is not mentioned in table.

2. Delta to Limit = Field strength (dBµV/m) – Limit (dBµV/m).

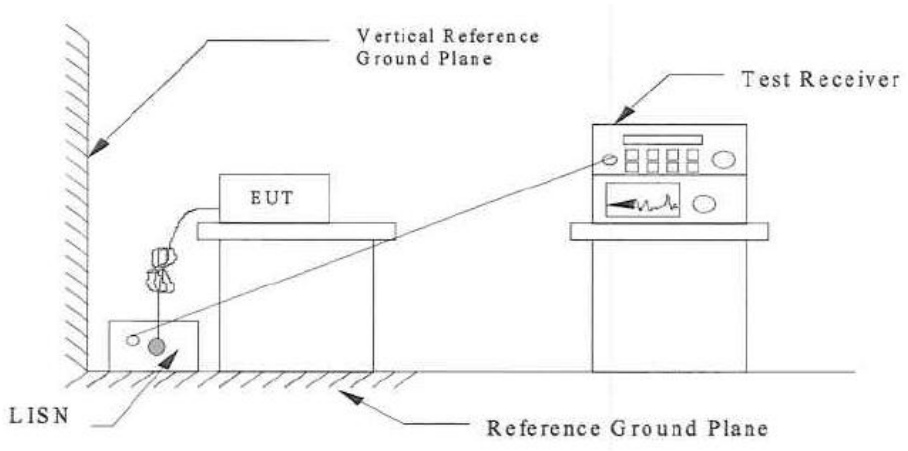
3. Calculated measurement uncertainty: 9kHz -30MHz: 1.8dB.
30MHz -1GHz: 5.2dB.

4.4 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	RSS-Gen Issue 3 chapter 7.2.4
Test Method:	ANSI C63.4:2003
Test Date:	2013-10-21
Mode of Operation:	Transmitting continuously mode
Detector Function:	CISPR Quasi Peak
Measurement BW:	100 kHz

Results : PASS

Test Setup:



Limits for Conducted Emission [Section 15.207]:

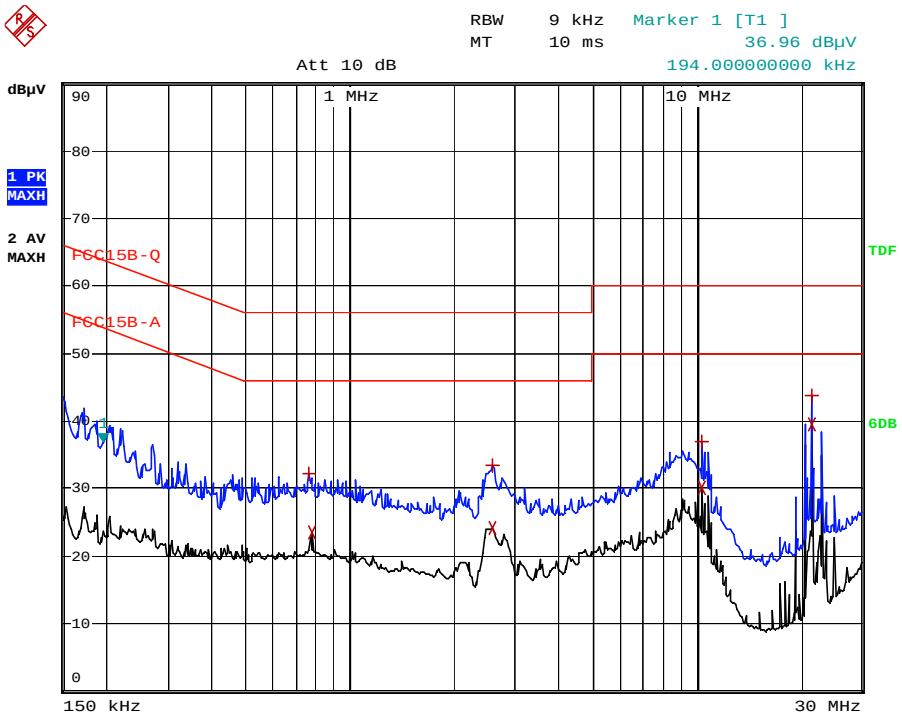
Frequency Range [MHz]	Quasi-Peak Limit [dBμV]	Average Limit [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Remarks:
Calculated measurement uncertainty: ±3.6dB

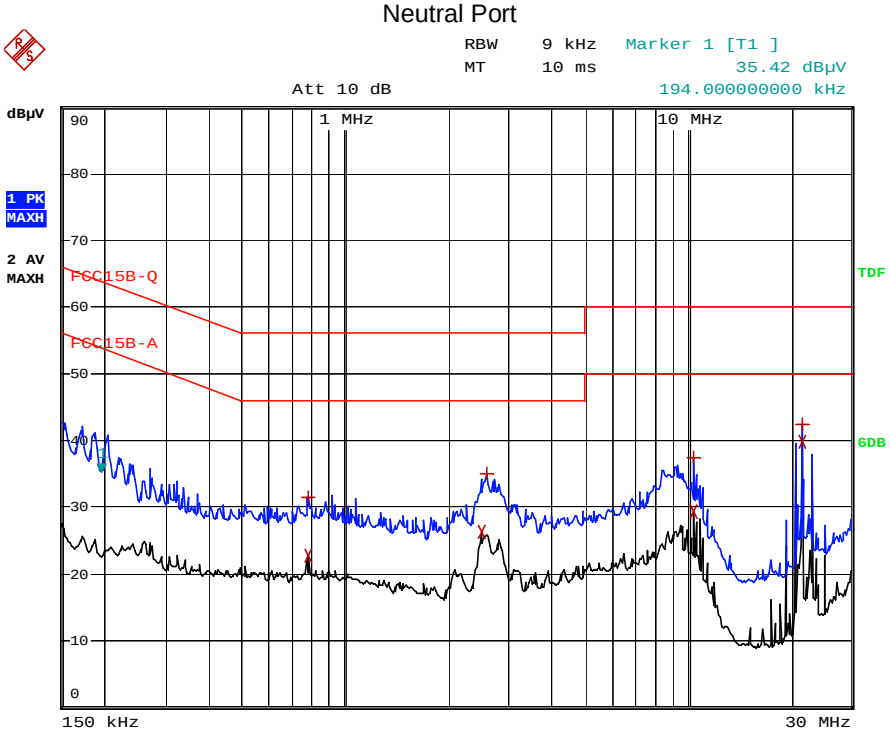
Result data graph shows the conducted emission (Line and Neutral).
For Tenpao adaptor powered mode:

Line Port



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCC15B-Q		
Trace2:	FCC15B-A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	762 kHz	32.19	-23.80
2 Average	778 kHz	23.39	-22.61
2 Average	2.578 MHz	24.10	-21.89
1 Max Peak	2.586 MHz	33.48	-22.51
1 Max Peak	10.394 MHz	36.87	-23.13
2 Average	10.394 MHz	30.07	-19.92
1 Max Peak	21.634 MHz	43.70	-16.29
2 Average	21.634 MHz	39.51	-10.48

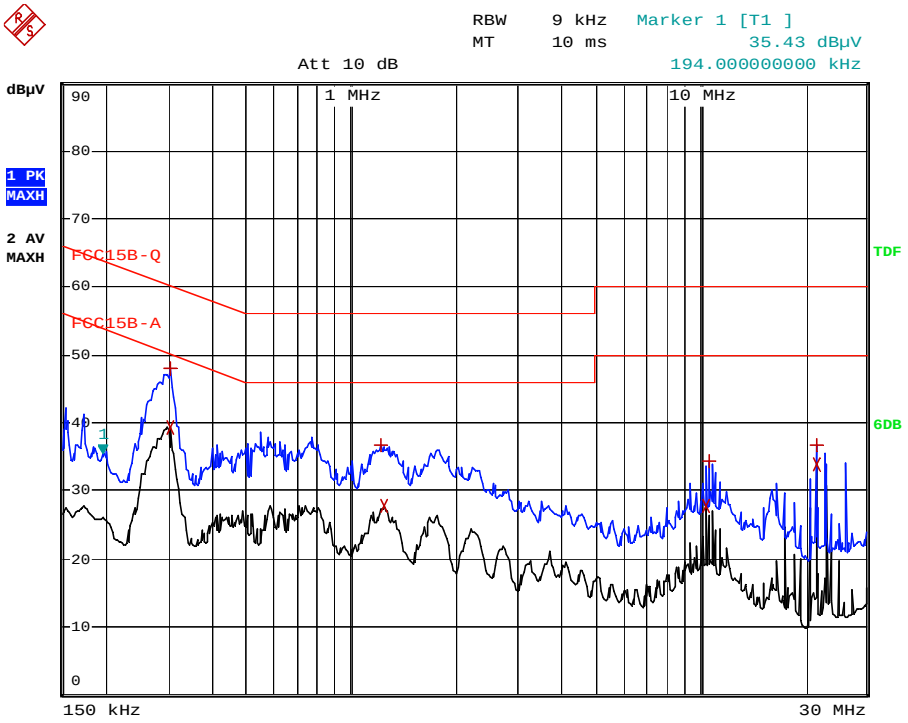
Neutral Port



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCC15B-Q		
Trace2:	FCC15B-A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	778 kHz	22.79	-23.20
1 Max Peak	782 kHz	31.61	-24.38
2 Average	2.502 MHz	26.29	-19.70
1 Max Peak	2.586 MHz	35.16	-20.83
1 Max Peak	10.394 MHz	37.35	-22.64
2 Average	10.394 MHz	29.30	-20.69
1 Max Peak	21.634 MHz	42.50	-17.49
2 Average	21.634 MHz	39.92	-10.07

Result data graph shows the conducted emission (Line and Neutral)
For Huntkey adaptor powered mode:

Line Port



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCC15B-Q		
Trace2:	FCC15B-A		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	302 kHz	48.05	-12.12
2 Average	302 kHz	39.34	-10.84
1 Max Peak	1.222 MHz	36.75	-19.24
2 Average	1.25 MHz	27.72	-18.27
2 Average	10.394 MHz	27.65	-22.34
1 Max Peak	10.606 MHz	34.28	-25.71
1 Max Peak	21.634 MHz	36.78	-23.21
2 Average	21.634 MHz	33.84	-16.16

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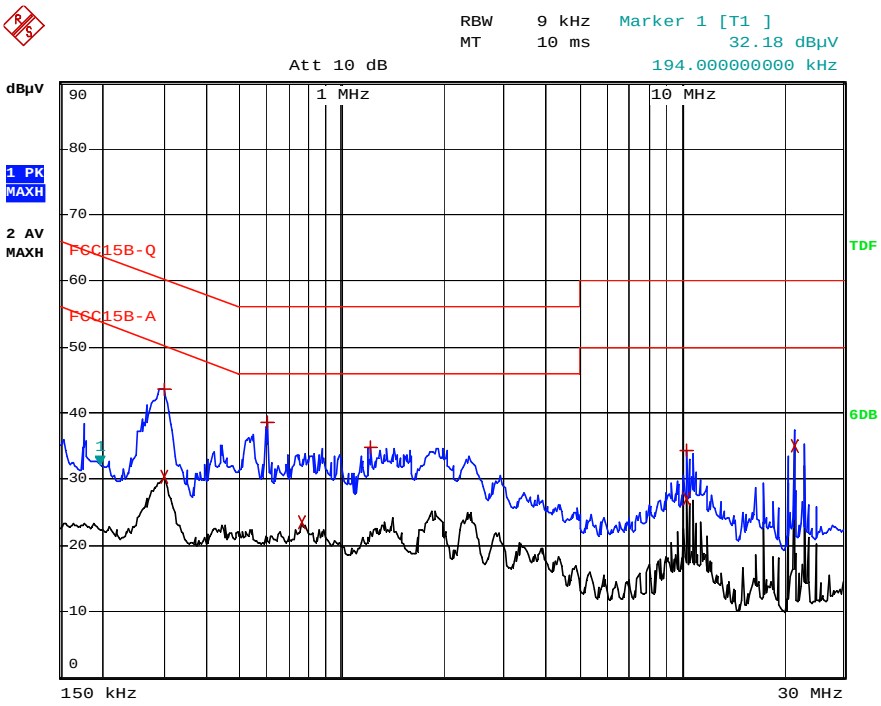
Neutral Port



EDIT PEAK LIST (Prescan Results)

Trace1:	FCC15B-Q
Trace2:	FCC15B-A
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Max Peak	298 kHz	43.52	-16.77
2	Average	298 kHz	30.44	-19.84
1	Max Peak	606 kHz	38.72	-17.27
2	Average	766 kHz	23.48	-22.51
1	Max Peak	1.222 MHz	34.91	-21.08
1	Max Peak	10.394 MHz	34.41	-25.58
2	Average	10.394 MHz	27.14	-22.85
2	Average	21.634 MHz	35.02	-14.97

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5.0 Radio Frequency Exposure Compliance of Radiocommunication Apparatus

RSS-102 Issue 4

5.1 Exemption from Routine Evaluation limits - SAR Evaluation

Test Requirement: RSS-102 Issue 4 section 2.5.1

Results: PASS

Refer the user manual, it shows that the operating distance between the devices to user is less than 20cm, but the output power is less than 200mW;hence the SAR Evaluation is not required.

5.2 Exemption from Routine Evaluation Limits – RF Exposure Evaluation

Test Requirement: RSS-102 Issue 4 section 2.5.2

Results: N/A

Refer the user manual, it shows that the operating distance between the devices to user is less than 20cm; hence RF Exposure Evaluation is not required.

6.0 List of Measurement Equipment

Radiated Emission

Manufacturer	Equipment	Model No.	Serial No.	Due Date
Rainford	10M Chamber & Accessory Equipment	10M	--	07 Jun 2015
R&S	Spectrum Analyzer	FSP40	100416	07 Jun 2014
R&S	EMI test receiver	ESIB40	2023282915	24 Jul 2014
schwarzbeck	TRILOG Broadband Antenna	VULB 9163	484	07 Jul 2014
ETS-LINGREN	Horn Antenna	3117	00044562	07 Jul 2015
HP	Microwave Preamplifier	HP 8447F	2805A03379	07 Jun 2014
CD	Microwave Preamplifier	PAP-1G18G	2001	05 Jul 2014

Line Conducted

Manufacturer	Equipment	Model No.	Serial No.	Due Date
R&S	EMI Test Receiver	ESPI	101611	06 May 2014
Schwarz beck	L.I.S.N	NSLK8126	8126-224	06 May 2014
R&S	Pulse Limiter	ESH3-Z2	100911	06 May 2014
EMCO	AMN	3825/2	11967C	06 May 2014
FCC	Current Probe	F-33-4	091684	06 May 2014

N/A Not Applicable or Not Available