

EMI - TEST REPORT

- FCC Part 15B -

Test Report No. : T35824-08-00HU	10. June 2013
	Date of issue

Type / Model Name : EDAC EA11001A-120
 : XP Power AHM85PS12
 : EOS LFZVC60NP12E4

Product Description : Power Supplies for a UHF RFID-Reader

Applicant : Checkpoint Systems, Inc.

Address : 101 Wolf Drive, Thorofare

New Jersey, USA 08086

Manufacturer : See general remarks

Address :

Licence holder : Checkpoint Systems, Inc.

Address : 101 Wolf Drive, Thorofare

New Jersey, USA 08086

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart A - General (October, 2012)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

FCC Rules and Regulations Part 15 Subpart B - Unintentional Radiators (October, 2012)

Part 15, Subpart B, Section 15.107	AC Line conducted emissions
Part 15, Subpart B, Section 15.109	Radiated emissions, general requirements
Part 15, Subpart B, Section 15.111	Antenna power conduction

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
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ANSI C95.1:1992	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
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CISPR 16-4-2: 2003	Uncertainty in EMC measurement
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CISPR 22: 2005 EN 55022: 2006	Information technology equipment
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RSS-Gen Issue 3, Dec 2010	General Requirements and Information for the Certification of Radiocommunication Equipment
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RSS-102 Issue 4, March 2010	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
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2 SUMMARY

GENERAL REMARKS:

All tests were performed with all three Power Supply Units.

The Power Supplies has been tested with WRTZ 1500 UHF Reader which is built in in the Emotionline E10 antenna.

The Emotionline E10 antenna system is an Electronic Article Surveillance Detection System with UHF RFID-Reader.

Manufacturer of the Evolve Electronic: Pikatron Feinwerktechnik GmbH & Co. KG
Raiffeisenstrasse 10
D-61250 Usingen

Manufacturer of the WRTZ-1500: RM Gerätebau
Hirschbachstr. 47
64354 Reinheim, Germany

The frequency range was scanned from 9 kHz up to 1 GHz.

All emissions not reported in this test report were more than 10 dB below the specified limit.

The Emotionline E10 antenna consists of following systems:

- WRTZ-1500 (FCC ID: DO4WRTZ1500):

The UHF system is a frequency hopping system using 50 channels in the frequency band from 902 to 928 MHz. The device has a maximum of eight external antenna ports for connection of the transmission/reception antennas for communication with RFID tags.

Measurements have been made with power settings of 30.0 dBm.

For detailed information please refer to the user manual.

It is not possible to set the EuT only in receiving mode.

- TX Antenna Double Patch:

915 MHz	Ver. Pol	Hor. Pol
Gain	4,0 dBi	5,8 dBi
Beam width		
	53 deg.	

- Evolve Family (FCC ID: DO4EVOLVE):

The Evolve Electronic is a digital swept frequency hopping transmitter. The EUT hops on discrete frequencies. The hop cannot stop on one of the frequencies.

In practical use both systems (Evolve E10 and WRTZ-1500) are in continuous sweep mode at the same time (simultan transmission) in the two different frequency ranges.

FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 26. March 2013

Testing concluded on : 26. March 2013

Checked by:

Tested by:

Thomas Weise
Dipl. Ing.(FH)
Laboratory Manager

Huber Markus

3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EuT

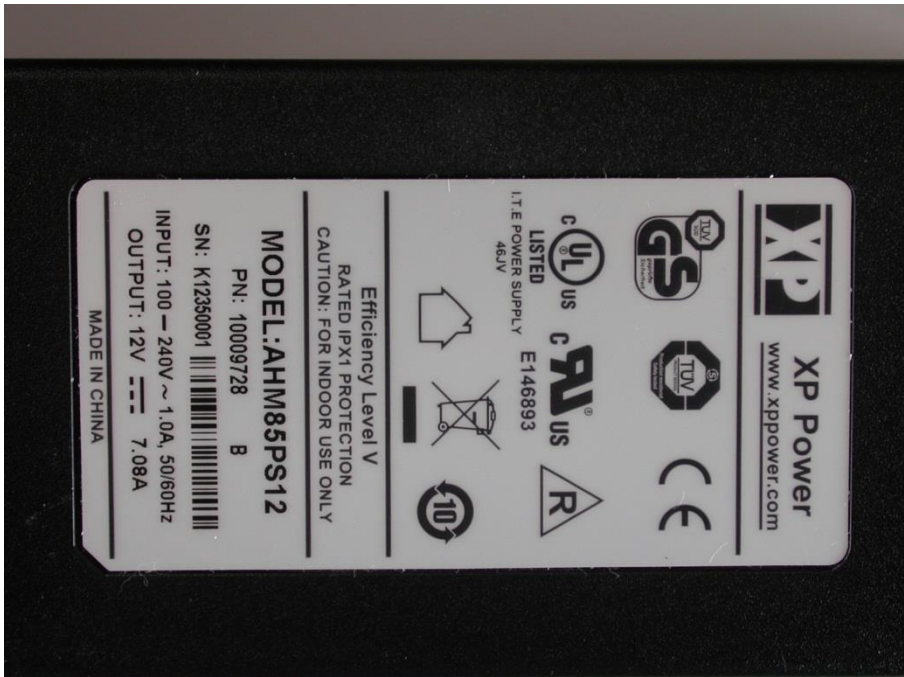
Test Setup:



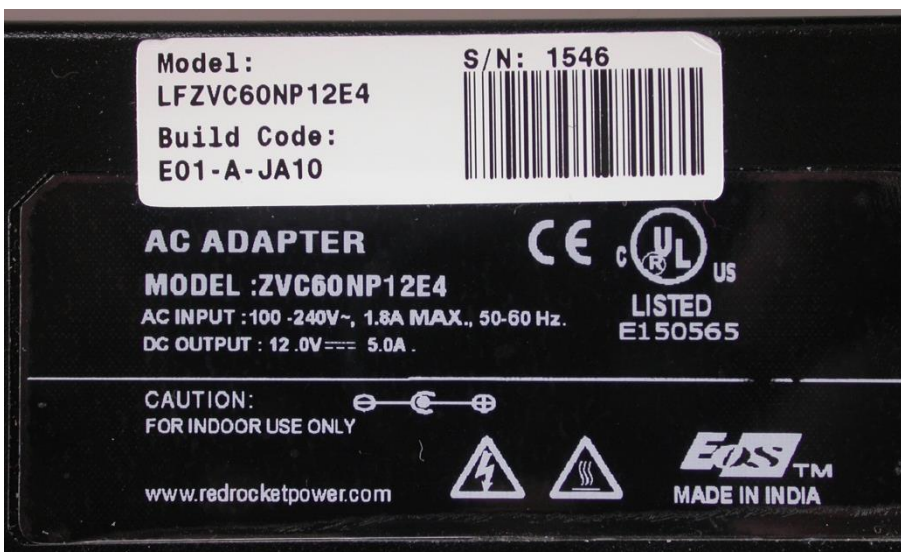
EDAC Power Supply:



XP Power Supply:



EOS Power Supply:



3.2 Power supply system utilised

Power supply voltage : Primary: 115 V / 60 Hz / 1 ϕ
Secondary: 12 V / DC

3.3 Short description of the Equipment under Test (EuT)

The EA11001A-12, AHM85PS12 and LFZVC60NP12E4 are power supplies for a UHF RFID Reader System. The power supply converts 115 V/60Hz into 12V/DC and can be used for all systems where the WRTZ 1500 UHF Reader will be built in or used as a standalone device.

Number of tested samples: 3
Serial number: see Photo documentation of the EuT under Point 3 / Equipment Under Test

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- Continuous sweep mode at 8.2 MHz Band

- TAG reading mode supplying 30.0 dBm

- Standby

EuT configuration:

The following peripheral devices and interface cables were connected during the measurements:

- Electronic Article Surveillance Detection System with UHF RFID-Reader	Model: Emotionline E10 antenna, Supplied by manufacturer
- Standard AC mains cable	Model: Supplied by manufacturer
- Lap Top	Model: Supplied by manufacturer
- Test Software	Model: Supplied by manufacturer
-	Model: _____
-	Model: _____
- customer specific cables	

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 Strasskirchen
Germany

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader may notice that tolerances within the calibration of the equipment and facilities may cause additional uncertainty. The measurement uncertainty is calculated for all measurements listed in this test report acc. to CISPR 16-4-2 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurement“ and documented in the mikes-testingpartners gmbh quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, mikes-testingpartners gmbh, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component diversity and modifications in production processes may result in additional deviation. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests. The manufacturer has the sole responsibility of continued compliance of the EUT.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

4.4.1.1 Justification

The Equipment under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each in order to obtain maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

4.4.2.1 General Standard Information

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

5 TEST CONDITIONS AND RESULTS

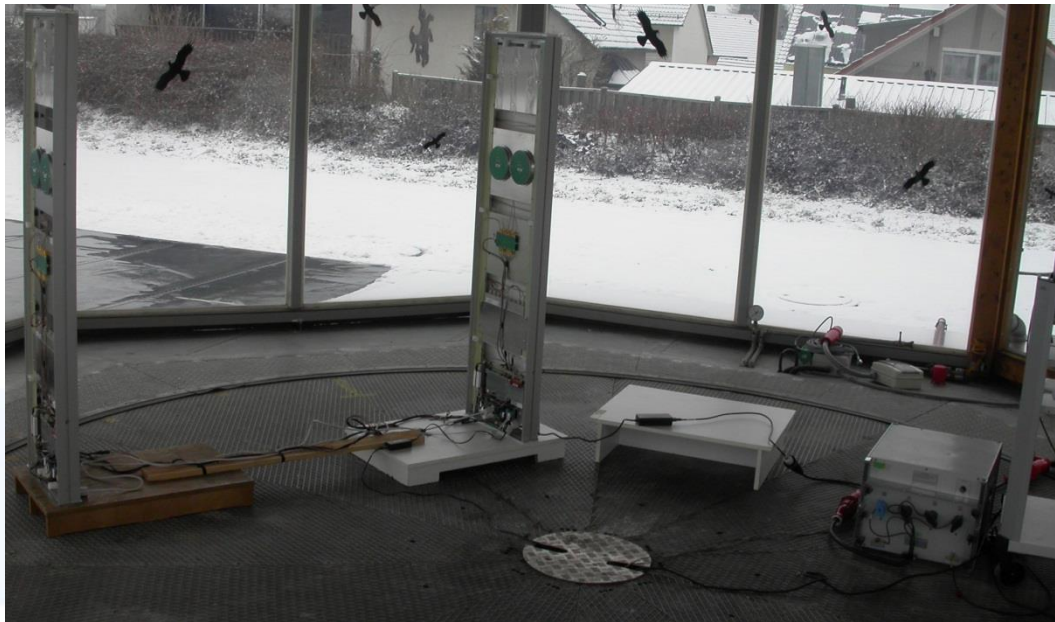
5.1 Conducted emissions

For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

Test location: OATS1

5.1.2 Photo documentation of the test set-up



5.1.3 Description of Measurement

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.4 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 1.2 dB at 11.70 MHz
XP Power Supply, Standby, Test point N

The requirements are **FULFILLED**.

Remarks:

mikes

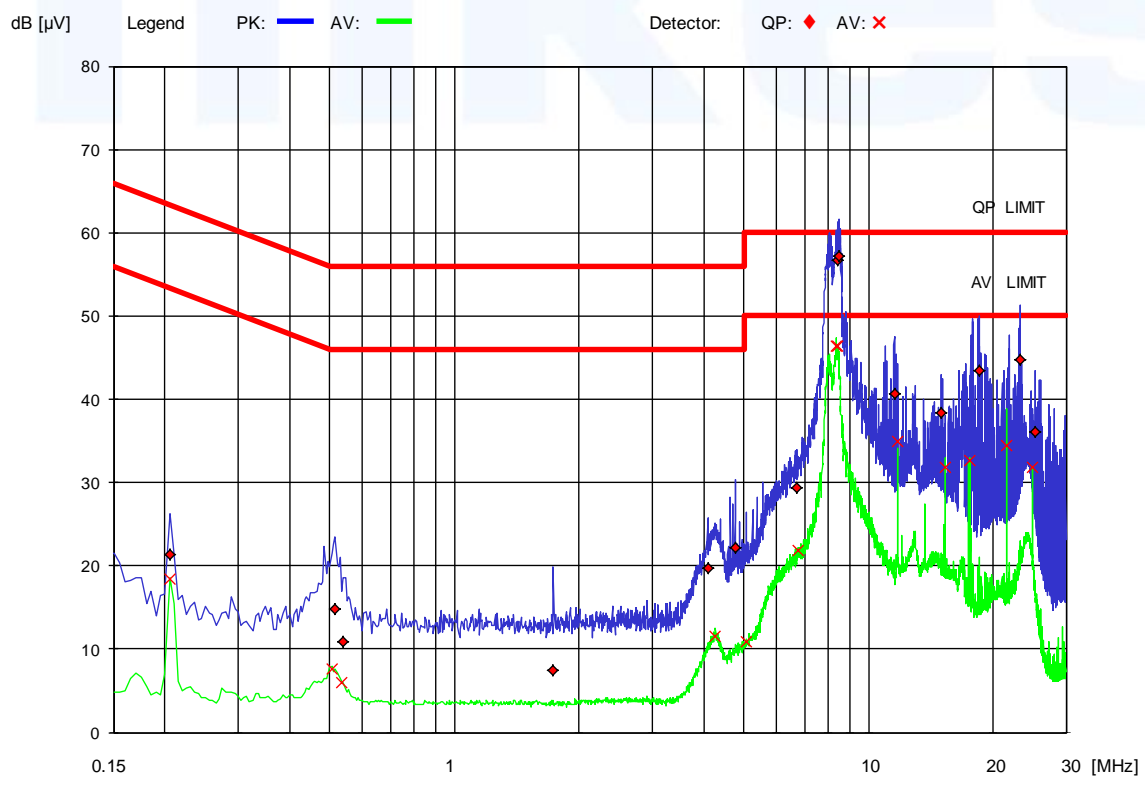
5.1.5 Test protocol

Test point: L1
Operation mode: Both systems cont. sweep mode
Remarks: EDAC Power Supply
Date: 26.03.2013
Tested by: Huber Markus

Result: passed

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μ V]	QP [dB]	kHz	dB[μ V]	AV [dB]
205	21,4	42,0	205	18,4	35,0
515	14,8	41,2	505	7,6	38,4
540	10,9	45,1	535	6	40,0
1735	7,5	48,5	4275	11,5	34,5
4090	19,7	36,3	5080	10,8	39,2
4765	22,2	33,8	6745	21,8	28,2
6695	29,3	30,7	8380	46,4	3,6
8405	56,7	3,3	8425	46,4	3,6
8470	57,1	2,9	11730	35	15,0
11545	40,7	19,3	15350	31,9	18,1
15025	38,3	21,7	17570	32,6	17,4
18505	43,4	16,6	21540	34,5	15,5
23330	44,8	15,2	25000	31,9	18,1
25345	36	24,0			

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μ V]	QP [dB]	kHz	dB[μ V]	AV [dB]

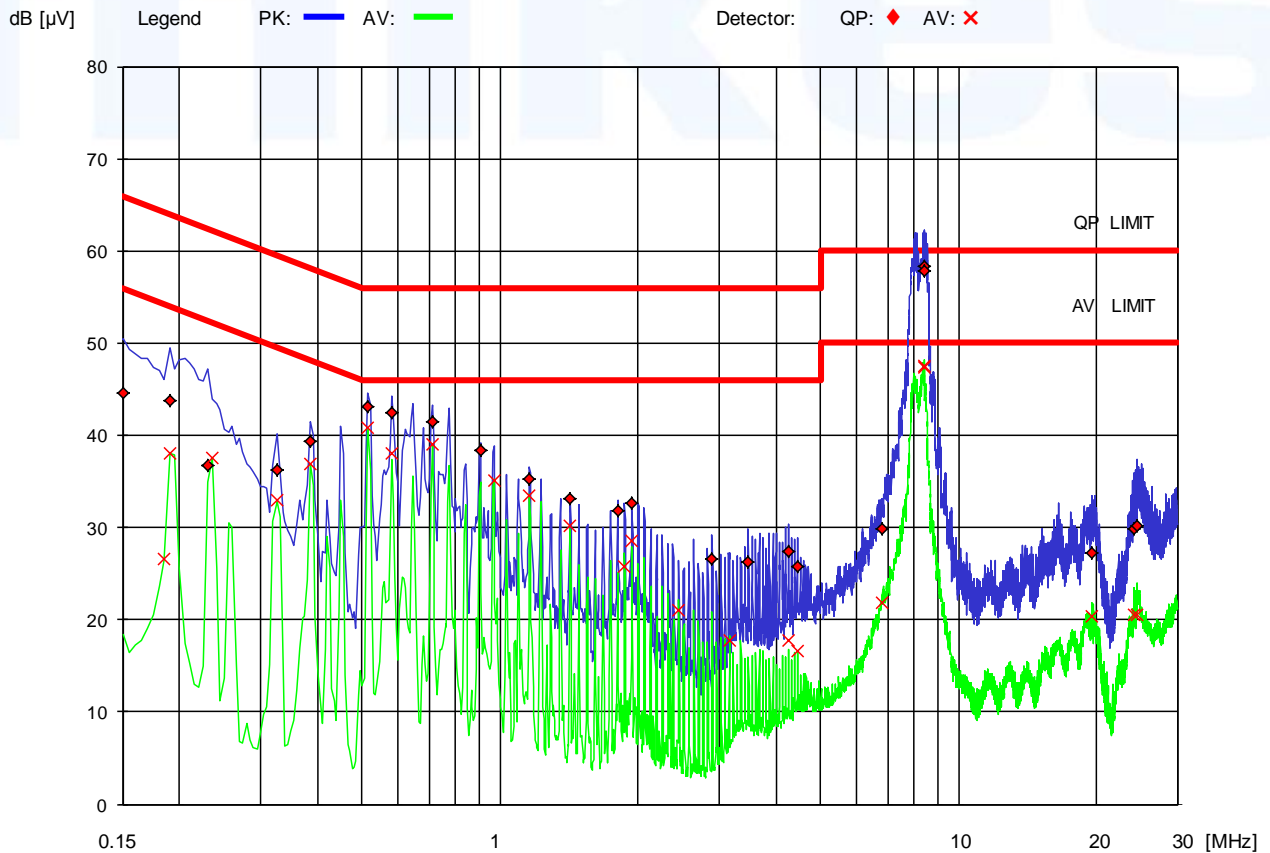


Test point: N
 Operation mode: Both systems cont. sweep mode
 Remarks: EDAC Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[μ V]	D -Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D -Limit AV [dB]
150	44,5	21,5	185	26,6	27,7
190	43,8	20,2	190	38,1	15,9
230	36,8	25,6	235	37,5	14,8
325	36,3	23,3	325	32,9	16,7
385	39,4	18,8	385	36,9	11,3
515	43,1	12,9	515	40,8	5,2
580	42,4	13,6	580	38,1	7,9
710	41,5	14,5	710	39,1	6,9
905	38,4	17,6	970	35,1	10,9
1160	35,2	20,8	1160	33,4	12,6
1420	33,2	22,8	1420	30,2	15,8
1805	31,8	24,2	1870	25,8	20,2
1935	32,6	23,4	1935	28,5	17,5
2905	26,6	29,4	2455	21,1	24,9
3485	26,2	29,8	3165	17,8	28,2

Freq kHz	QP- L dB[μ V]	D -Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D -Limit AV [dB]
4260	27,4	28,6	4260	17,7	28,3
4455	25,8	30,2	4455	16,6	29,4
6795	29,8	30,2	6795	21,8	28,2
8405	58,4	1,6	8405	47,5	2,5
8420	57,9	2,1	8425	47,4	2,6
19585	27,2	32,8	19585	20,4	29,6
24255	29,8	30,2	24210	20,6	29,4
24615	30,2	29,8	24625	20,5	29,5

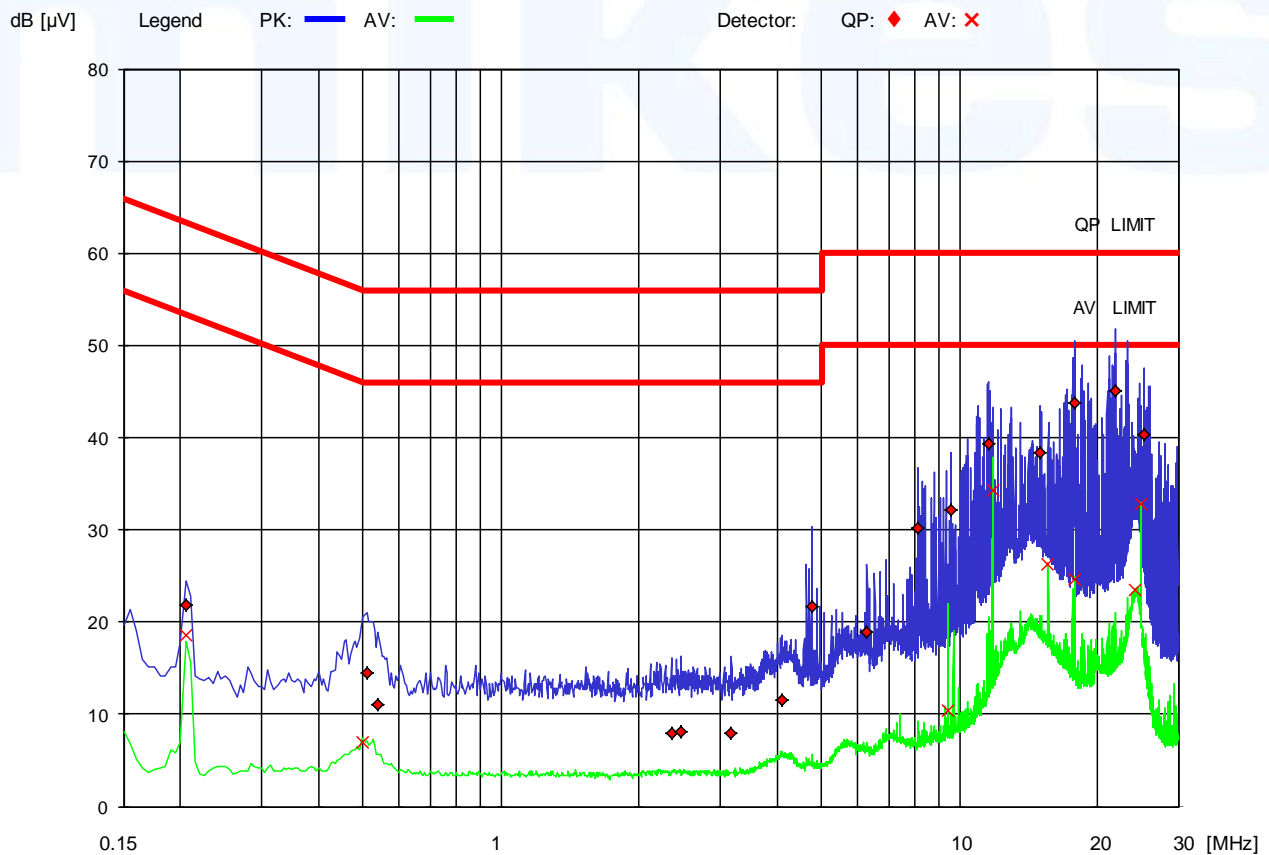


Test point: L1
 Operation mode: Standby
 Remarks: EDAC Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
205	21,8	41,6	205	18,5	34,9
510	14,5	41,5	500	7	39,0
540	11,1	44,9	9420	10,4	39,6
2350	8	48,0	11870	34,2	15,8
2470	8,1	47,9	15630	26,3	23,7
3180	8	48,0	17895	24,6	25,4
4090	11,6	44,4	24245	23,4	26,6
4765	21,7	34,3	25000	32,8	17,2
6290	18,9	41,1			
8125	30,2	29,8			
9590	32,1	27,9			
11545	39,3	20,7			
15025	38,3	21,7			
17835	43,8	16,2			
21865	45,1	14,9			

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
25345	40,4	19,6			

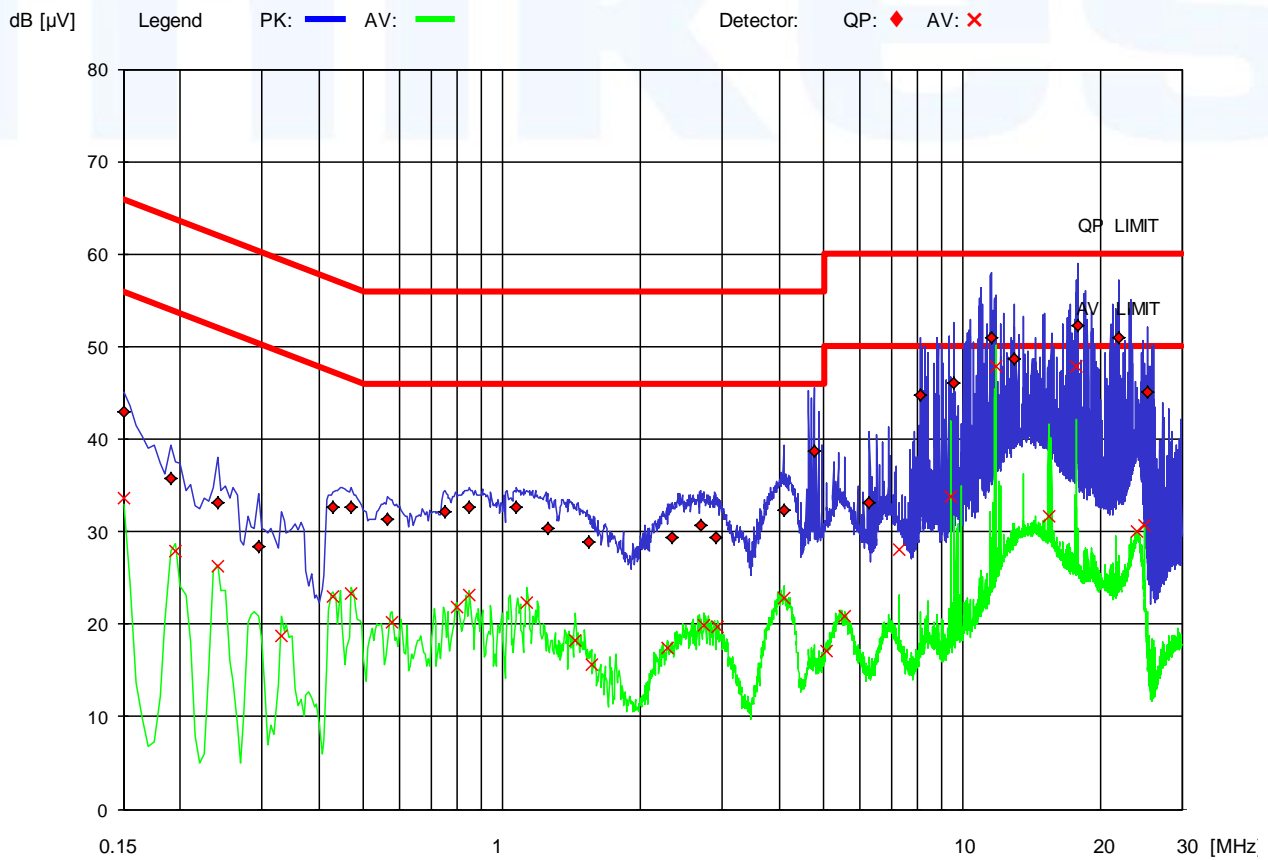


Test point: N
 Operation mode: Standby
 Remarks: EDAC Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μ V]	QP [dB]	kHz	dB[μ V]	AV [dB]
150	42,9	23,1	150	33,6	22,4
190	35,8	28,2	195	27,9	25,9
240	33,1	29,0	240	26,2	25,9
295	28,4	32,0	330	18,8	30,7
430	32,6	24,7	430	23	24,3
470	32,7	23,8	470	23,3	23,2
565	31,4	24,6	575	20,2	25,8
750	32,1	23,9	795	21,8	24,2
850	32,7	23,3	850	23,2	22,8
1075	32,6	23,4	1135	22,4	23,6
1255	30,4	25,6	1445	18,2	27,8
1545	28,8	27,2	1565	15,6	30,4
2345	29,3	26,7	2280	17,4	28,6
2695	30,6	25,4	2750	19,9	26,1
2925	29,3	26,7	2945	19,7	26,3

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μ V]	QP [dB]	kHz	dB[μ V]	AV [dB]
4090	32,3	23,7	4095	22,8	23,2
4760	38,7	17,3	5055	17,1	32,9
6290	33,2	26,8	5570	20,8	29,2
8125	44,7	15,3	7310	28	22,0
9590	46,1	13,9	9420	33,8	16,2
11545	51	9,0	11870	47,9	2,1
13010	48,7	11,3	15400	31,6	18,4
17835	52,2	7,8	17705	47,8	2,2
21865	50,9	9,1	23940	30	20,0
25345	45,1	14,9	25000	30,6	19,4

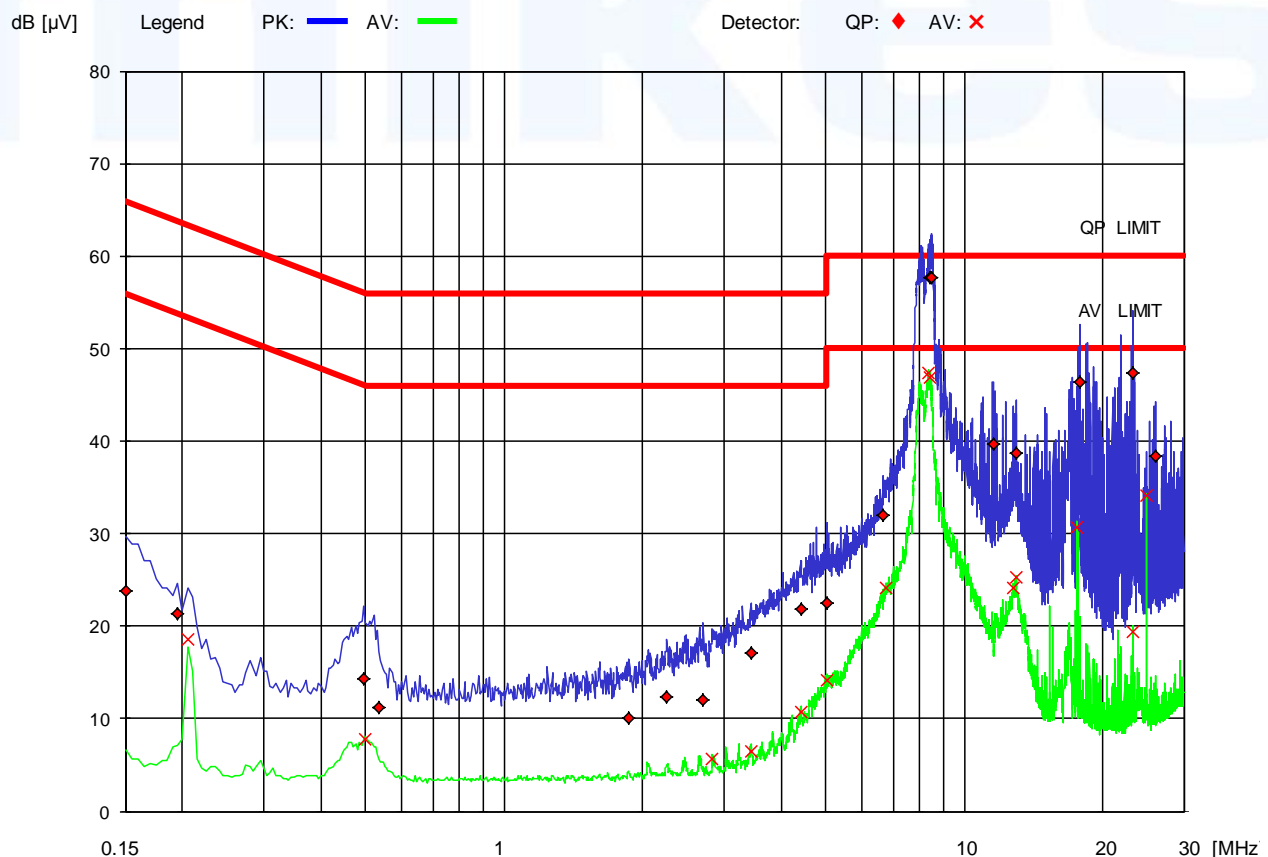


Test point: L1
 Operation mode: Both systems cont. sweep mode
 Remarks: XP Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μ V]	QP [dB]	kHz	dB[μ V]	AV [dB]
150	23,8	42,2	205	18,5	34,9
195	21,3	42,5	500	7,7	38,3
495	14,3	41,8	2840	5,6	40,4
535	11,2	44,8	3435	6,5	39,5
1870	10	46,0	4410	10,7	35,3
2260	12,3	43,7	5045	14,2	35,8
2710	12	44,0	6785	24,2	25,8
3435	17,1	38,9	8390	47,3	2,7
4425	21,9	34,1	8420	46,9	3,1
5030	22,5	37,5	12815	24,2	25,8
6680	32	28,0	12945	25,2	24,8
8405	57,7	2,3	17570	30,7	19,3
8470	57,7	2,3	23330	19,4	30,6
11545	39,6	20,4	25000	34,1	15,9
13010	38,7	21,3			

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μ V]	QP [dB]	kHz	dB[μ V]	AV [dB]
17895	46,4	13,6			
23330	47,4	12,6			
26015	38,3	21,7			

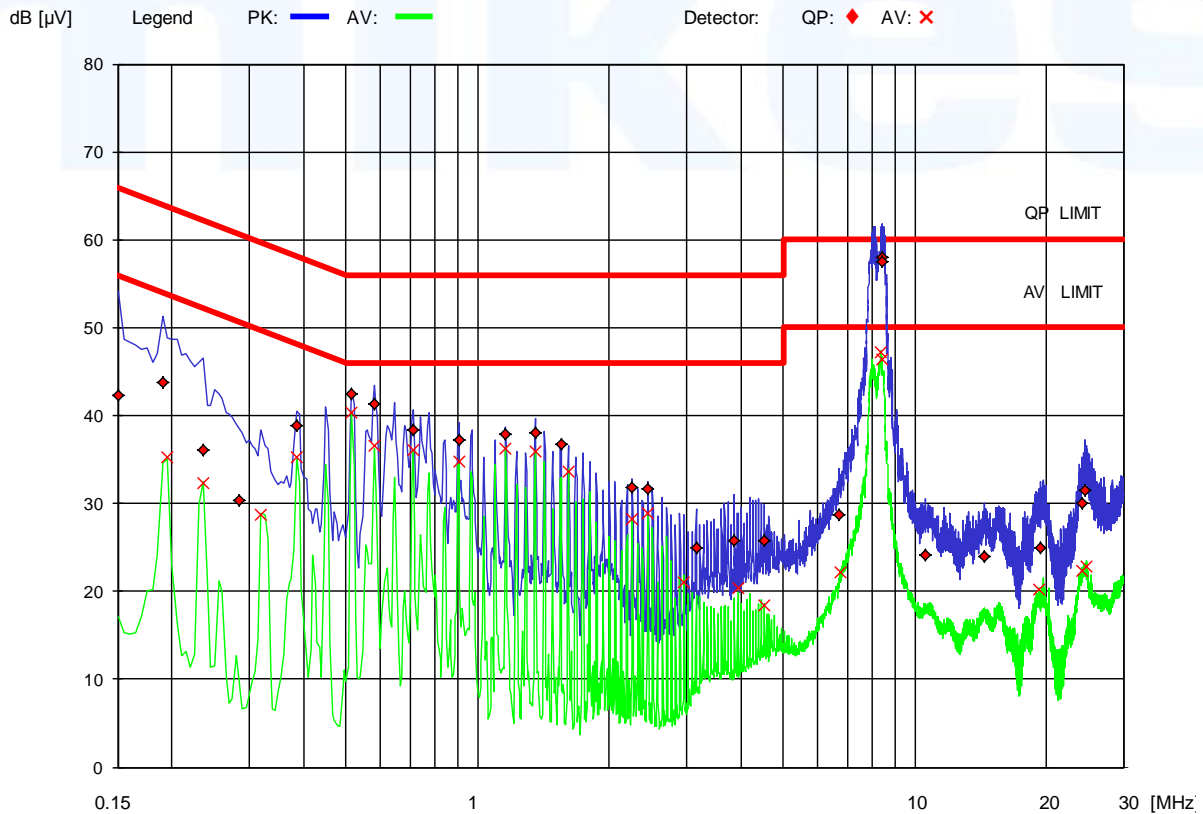


Test point: N
 Operation mode: Both systems cont. sweep mode
 Remarks: XP Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP-L dB[μ V]	D-Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D-Limit AV [dB]
150	42,3	23,7	195	35,3	18,5
190	43,7	20,3	235	32,3	20,0
235	36,1	26,2	320	28,7	21,0
285	30,3	30,4	385	35,2	13,0
385	38,8	19,4	515	40,3	5,7
515	42,4	13,6	580	36,6	9,4
580	41,3	14,7	710	36,1	9,9
710	38,3	17,7	905	34,7	11,3
905	37,3	18,7	1160	36,2	9,8
1160	37,8	18,2	1355	35,9	10,1
1355	38,1	17,9	1610	33,7	12,3
1550	36,7	19,3	2260	28,3	17,7
2260	31,9	24,1	2450	28,8	17,2
2450	31,6	24,4	2965	21	25,0
3160	24,9	31,1	3935	20,3	25,7

Freq kHz	QP-L dB[μ V]	D-Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D-Limit AV [dB]
3870	25,8	30,2	4515	18,4	27,6
4515	25,8	30,2	6755	22,1	27,9
6695	28,7	31,3	8380	47,2	2,8
8405	58	2,0	8440	46,4	3,6
8420	57,5	2,5	19225	20,2	29,8
10575	24,2	35,8	24235	22,4	27,6
14390	23,9	36,1	24705	22,8	27,2
19455	25	35,0			
24235	30,1	29,9			
24560	31,5	28,5			

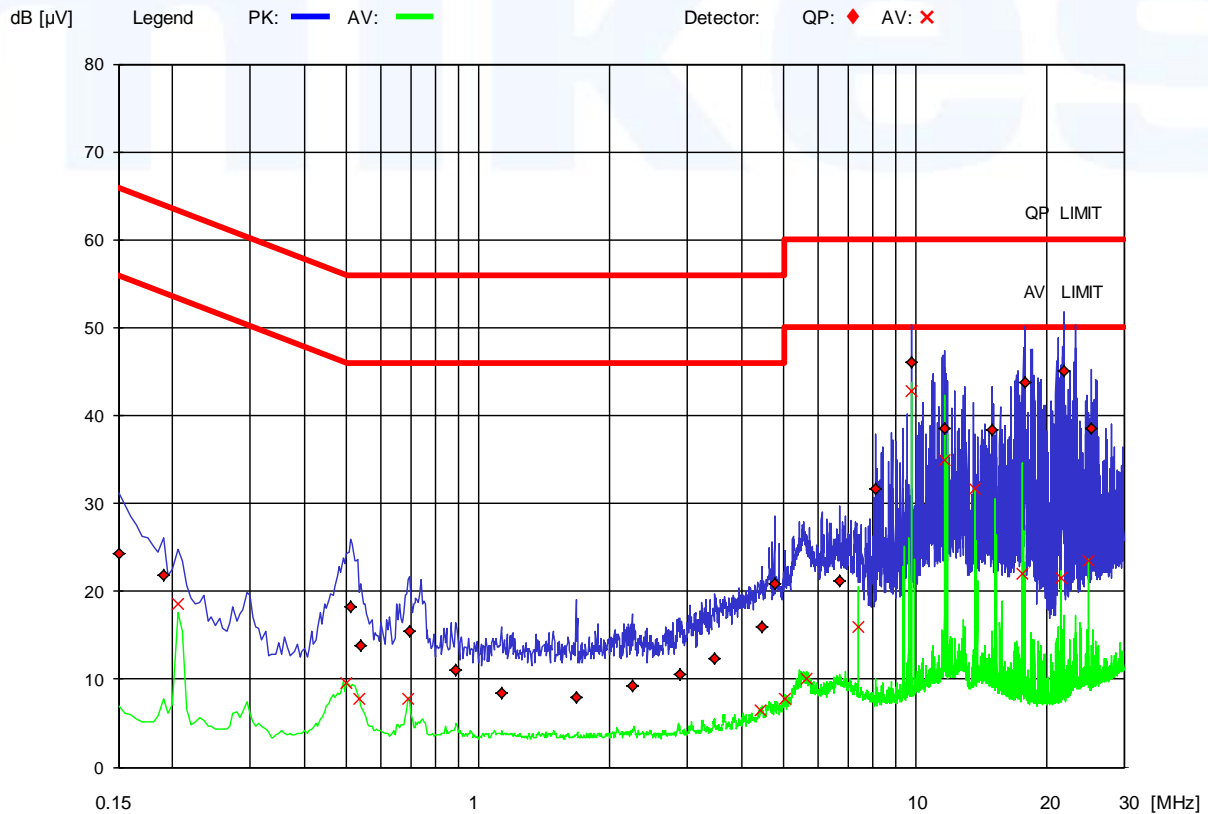


Test point: L1
 Operation mode: Standby
 Remarks: XP Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP-L dB[μV]	D-Limit QP [dB]	Freq kHz	AV-L dB[μV]	D-Limit AV [dB]
150	24,3	41,7	205	18,5	34,9
190	21,8	42,2	500	9,5	36,5
510	18,3	37,7	535	7,8	38,2
540	13,8	42,2	690	7,8	38,2
695	15,5	40,5	4440	6,4	39,6
890	11	45,0	5020	7,7	42,3
1130	8,4	47,6	5635	10	40,0
1675	7,9	48,1	7420	15,9	34,1
2250	9,3	46,7	9810	42,7	7,3
2885	10,6	45,4	11700	34,9	15,1
3485	12,3	43,7	13670	31,7	18,3
4450	16	40,0	17550	22	28,0
4765	20,9	35,1	21505	21,5	28,5
6720	21,2	38,8	25000	23,5	26,5
8125	31,6	28,4			

Freq kHz	QP-L dB[μV]	D-Limit QP [dB]	Freq kHz	AV-L dB[μV]	D-Limit AV [dB]
9810	46	14,0			
11700	38,5	21,5			
15025	38,3	21,7			
17835	43,7	16,3			
21865	45,1	14,9			
25345	38,5	21,5			

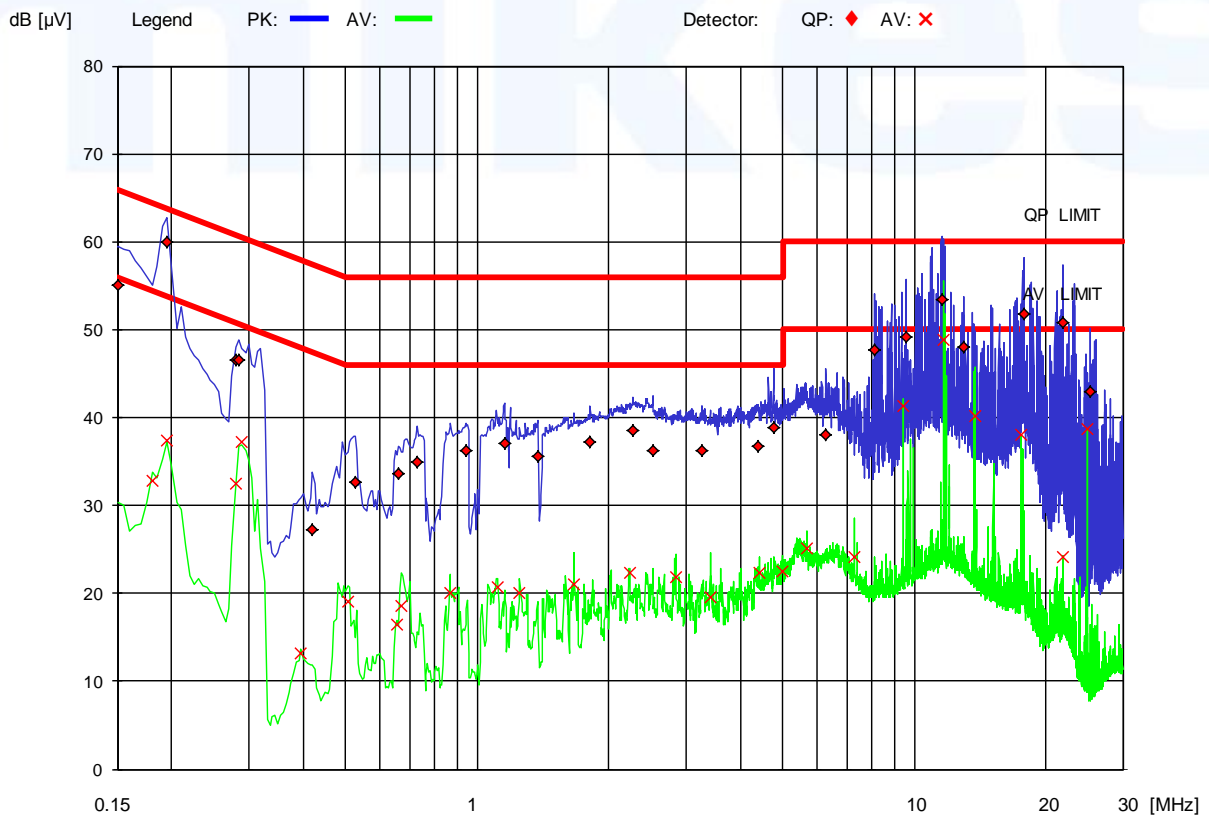


Test point: N
 Operation mode: Standby
 Remarks: XP Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
150	55	11,0	180	32,8	21,7
195	60	3,8	195	37,4	16,4
280	46,6	14,2	280	32,4	18,4
285	46,5	14,2	290	37,2	13,3
420	27,2	30,2	395	13,1	34,9
525	32,6	23,4	505	19,1	26,9
660	33,7	22,3	655	16,4	29,6
730	35	21,0	670	18,6	27,4
940	36,2	19,8	865	20,1	25,9
1155	37,1	18,9	1110	20,7	25,3
1375	35,6	20,4	1250	20	26,0
1815	37,3	18,7	1665	21	25,0
2270	38,6	17,4	2230	22,3	23,7
2525	36,3	19,7	2845	21,8	24,2
3265	36,2	19,8	3415	19,5	26,5

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
4385	36,8	19,2	4425	22,3	23,7
4765	38,9	17,1	4985	22,5	23,5
6290	38,1	21,9	5680	25,1	24,9
8125	47,7	12,3	7310	24,2	25,8
9590	49,2	10,8	9420	41,3	8,7
11545	53,4	6,6	11700	48,8	1,2
13010	48	12,0	13790	40,2	9,8
17835	51,7	8,3	17550	38,1	11,9
21865	50,8	9,2	21865	24,1	25,9
25345	43	17,0	25000	38,7	11,3



Test point: L1
 Operation mode: Both systems cont. sweep mode
 Remarks: EOS Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[μ V]	D -Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D -Limit AV [dB]
210	18,5	44,7	205	18,5	34,9
510	14,3	41,7	500	7	39,0
535	10,9	45,1	4220	12,7	33,3
1700	9,5	46,5	4535	13,1	32,9
2140	10	46,0	6680	16,4	33,6
2645	9,6	46,4	8390	43,1	6,9
3525	9	47,0	8425	42,9	7,1
4225	16	40,0	11730	36,4	13,6
4790	16,5	39,5	13665	24,7	25,3
6665	25,1	34,9	17755	33,3	16,7
8405	53,2	6,8	21540	12,7	37,3
8500	54,2	5,8	25000	30,8	19,2
11730	41,4	18,6			
13665	32	28,0			
16955	38,5	21,5			

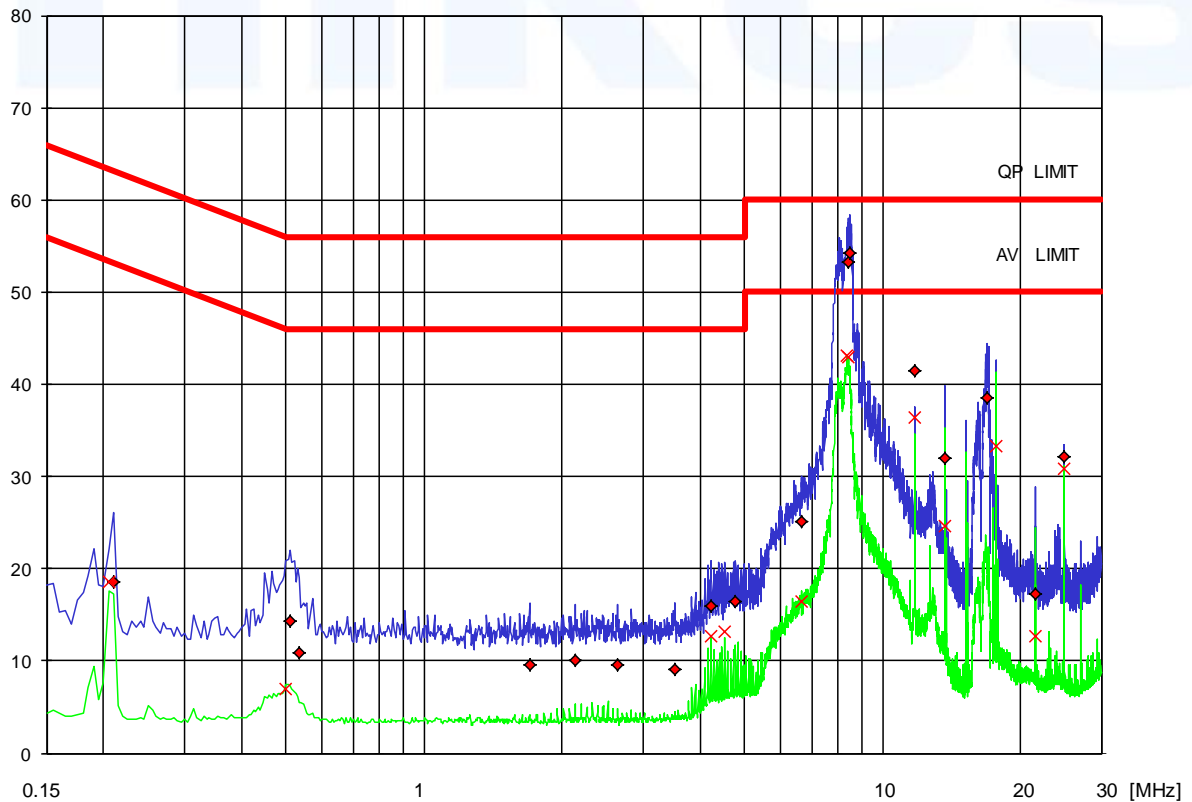
Freq kHz	QP- L dB[μ V]	D -Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D -Limit AV [dB]
21540	17,3	42,7			
25000	32,2	27,8			

dB [μ V]

Legend

PK: — AV: —

Detector: QP: ◆ AV: ×

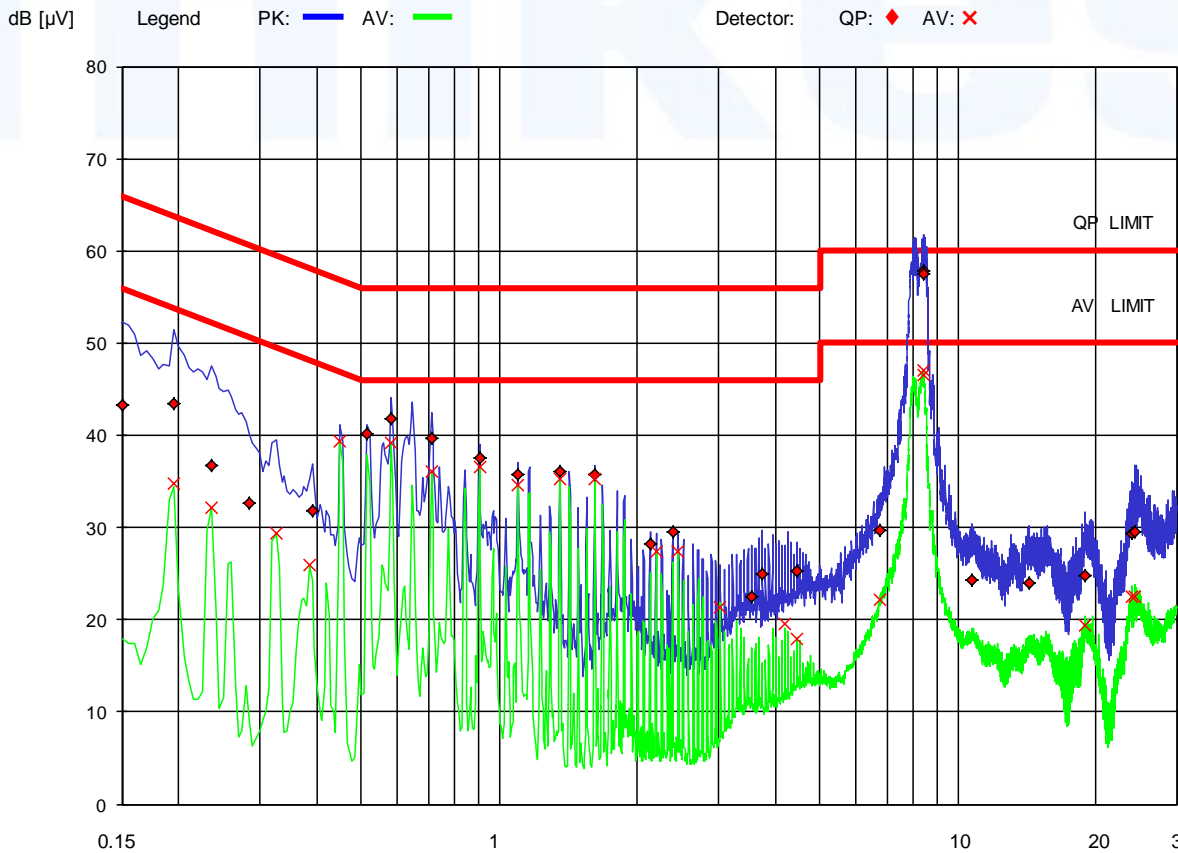


Test point: N
 Operation mode: Both systems cont. sweep mode
 Remarks: EOS Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[µV]	D -Limit QP [dB]	Freq kHz	AV-L dB[µV]	D -Limit AV [dB]
150	43,3	22,7	195	34,7	19,1
195	43,5	20,3	235	32,2	20,1
235	36,7	25,6	325	29,3	20,3
285	32,6	28,1	385	26	22,2
390	31,8	26,3	450	39,4	7,5
515	40,1	15,9	580	39,2	6,8
580	41,8	14,2	710	36	10,0
710	39,6	16,4	905	36,6	9,4
905	37,6	18,4	1100	34,6	11,4
1100	35,7	20,3	1355	35,3	10,7
1355	36,1	19,9	1615	35,3	10,7
1615	35,8	20,2	2195	27,4	18,6
2130	28,2	27,8	2455	27,4	18,6
2390	29,6	26,4	3035	21,3	24,7
3555	22,5	33,5	4200	19,5	26,5

Freq kHz	QP- L dB[µV]	D -Limit QP [dB]	Freq kHz	AV-L dB[µV]	D -Limit AV [dB]
3745	25	31,0	4460	17,9	28,1
4460	25,2	30,8	6790	22,1	27,9
6780	29,7	30,3	8405	47,1	2,9
8405	57,9	2,1	8435	46,5	3,5
8420	57,5	2,5	18990	19,4	30,6
10735	24,3	35,7	23910	22,5	27,5
14280	24	36,0	24355	22,5	27,5
18985	24,8	35,2			
24055	29,4	30,6			
24375	29,6	30,4			

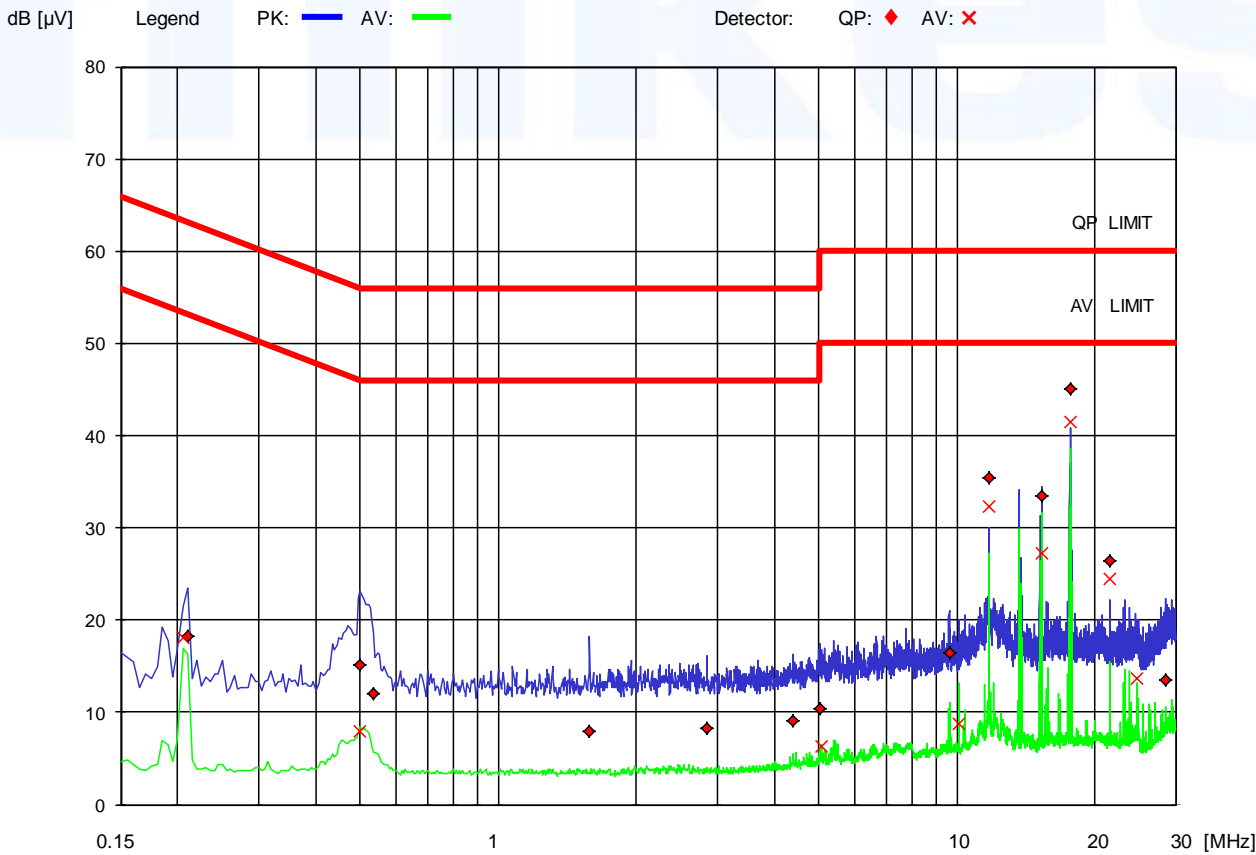


Test point L1
 Operation mode: Standby
 Remarks: EOS Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[μ V]	D -Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D -Limit AV [dB]
210	18,2	45,0	205	18	35,4
500	15,2	40,8	500	7,9	38,1
535	12,1	43,9	5080	6,3	43,7
1580	8	48,0	10100	8,8	41,2
2850	8,3	47,7	11730	32,3	17,7
4385	9	47,0	15350	27,3	22,7
5020	10,4	49,6	17755	41,4	8,6
9625	16,4	43,6	21540	24,5	25,5
11730	35,5	24,5	24665	13,7	36,3
15350	33,5	26,5			
17755	45,1	14,9			
21540	26,4	33,6			
28550	13,5	46,5			

Freq kHz	QP- L dB[μ V]	D -Limit QP [dB]	Freq kHz	AV-L dB[μ V]	D -Limit AV [dB]

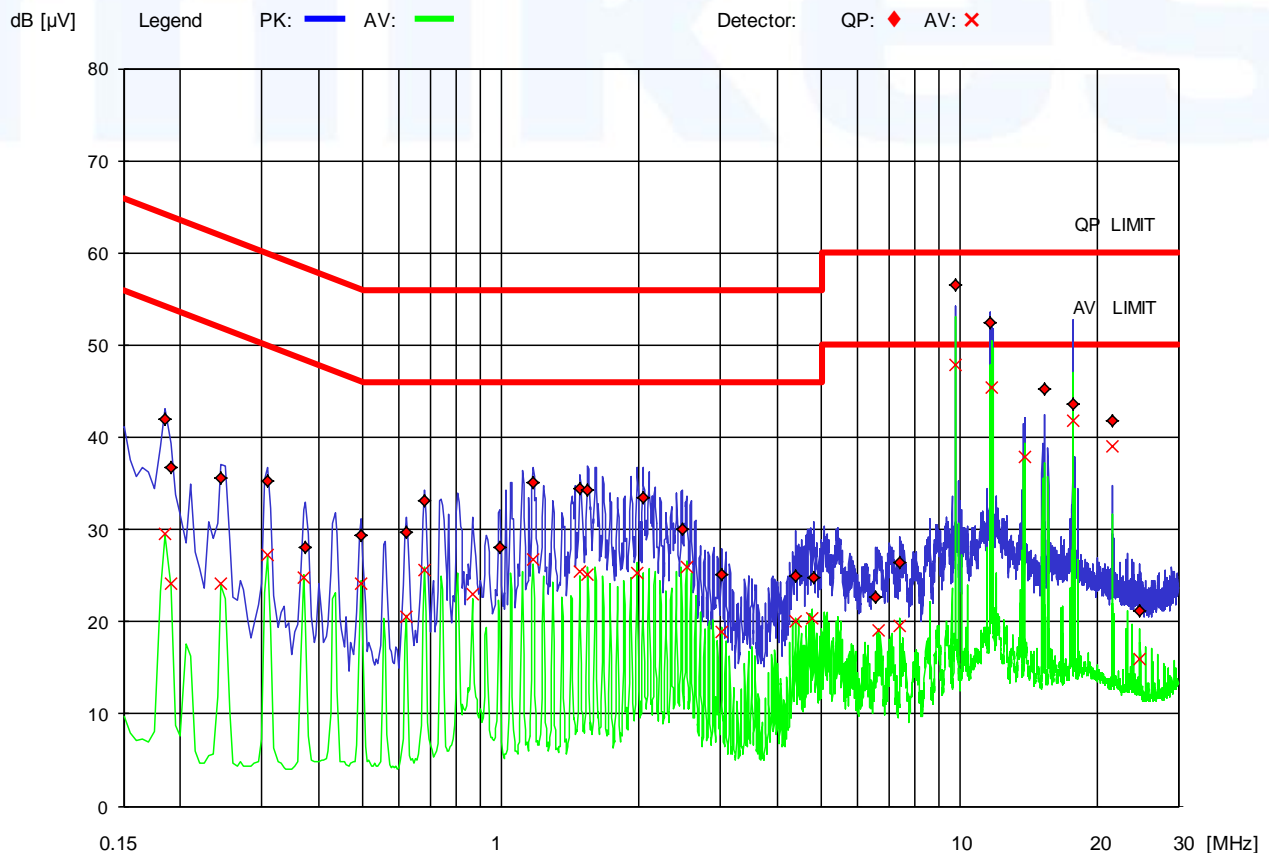


Test point: N
 Operation mode: Standby
 Remarks: EOS Power Supply
 Date: 26.03.2013
 Tested by: Huber Markus

Result: passed

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
185	42	22,3	185	29,5	24,8
190	36,7	27,3	190	24,2	29,8
245	35,6	26,3	245	24,2	27,7
310	35,3	24,7	310	27,3	22,7
375	28,1	30,3	370	24,8	23,7
495	29,3	26,8	495	24,2	21,9
620	29,7	26,3	620	20,5	25,5
680	33,1	22,9	680	25,6	20,4
995	28	28,0	865	23	23,0
1175	35,1	20,9	1175	26,7	19,3
1485	34,4	21,6	1485	25,4	20,6
1545	34,3	21,7	1545	25,1	20,9
2045	33,4	22,6	1980	25,3	20,7
2480	30,1	25,9	2535	25,9	20,1
3030	25,1	30,9	3030	18,9	27,1

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
4390	24,9	31,1	4390	20,1	25,9
4810	24,8	31,2	4765	20,3	25,7
6565	22,7	37,3	6675	19	31,0
7420	26,4	33,6	7420	19,5	30,5
9810	56,5	3,5	9810	47,8	2,2
11700	52,4	7,6	11730	45,4	4,6
15350	45,3	14,7	13855	37,8	12,2
17755	43,6	16,4	17755	41,8	8,2
21590	41,8	18,2	21590	39	11,0
24670	21,2	38,8	24665	15,9	34,1



5.2 Radiated emissions (electric field)

For test instruments and accessories used see section 6 Part **SER 1**, **SER 2**.

5.2.1 Description of the test location

Test location: OATS1

Test distance: 3m

5.2.2 Photo documentation of the test set-up



5.2.3 Description of Measurement

The spurious emissions from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the EMI receiver (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz

150 kHz – 30 MHz: ResBW: 9 kHz

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The resolution bandwidth during the measurement is as follows:

30 MHz – 1000 MHz: ResBW: 120 kHz

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

5.2.4 Test result

Test result in detail:(<30MHz)

Frequency [kHz]	L: QP [dBµV]	L: AV [dBµV]	Bandwidth [kHz]	Correct. [dB]	L: QP [dBµV/m]	L: AV [dBµV/m]	Limit [dBµV/m]	Delta [dB]
536.8	24.1	19.7	9.0	20	44.1	39.7	73.0	-33.3
1073.6	23.4	18.0	9.0	20	43.4	38.0	67.0	-29.0
1342.0	21.6	15.9	9.0	20	41.6	35.9	65.0	-29.1

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0.009-0.490	2400/F(kHz)	--	300
0.490-1.705	24000/F (kHz)	--	30
1.705-30.0	30	29.5	30

Test result in detail:(>30MHz)

Frequency [MHz]	L: QP [dBµV]	L: AV [dBµV]	Bandwidth [kHz]	Correct. [dB]	L: QP [dBµV/m]	L: AV [dBµV/m]	Limit [dBµV/m]	Delta [dB]
35.37	5.9		120	17.2	23.1		40.0	-16.9
179.73	6.1		120	18.3	24.4		43.5	-19.1
270.75	7.0		120	21.1	28.1		46.0	-17.9
437.59	7.9		120	21.1	29.0		46.0	-17.0
785.52	8.6		120	25.8	34.4		46.0	-11.6

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The requirements are **FULFILLED**.

Remarks: The spurious emissions which were produced by the Emotionline E10 antenna system
are not a part of assessment of this measurement.

Pre measurements in a shielded room shows no essential differences on the different power supplies.

So the test was performed with the power supply which has the max. highest output current.

Test was performed with EDAC Power Supply and max. Tx settings from the E10 antenna system.

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	ESCS 30	02-02/03-05-001	18/12/2013	18/12/2012		
	NNLK 8129	02-02/20-05-002			23/07/2013	23/01/2013
	N-1500-N	02-02/50-05-141				
	SP 103 /3.5-60	02-02/50-05-182				
	ESH 3 - Z 2	02-02/50-05-185			02/04/2013	02/10/2012
SER 1	FMZB 1516	01-02/24-01-018			14/02/2014	14/02/2013
	ESCS 30	02-02/03-05-001	18/12/2013	18/12/2012		
	S10162-B	02-02/50-05-031				
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
SER 2	ESVS 30	02-02/03-05-006	26/06/2013	26/06/2012		
	BBA 9106 / VHA 9103	02-02/24-05-001	13/09/2013	13/09/2012		
	UHALP 9108 A	02-02/24-05-004	23/09/2013	23/09/2012		
	S10162-B	02-02/50-05-031				
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				