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Test Report

T-0329-4295-01 JP

Type / Model Name:	**LPR-2DB**
FCC ID	**W5ILPR-2DB**
Product Description:	**LPR-2D**
Applicant:	**Symeo GmbH**

EMC -- TEST REPORT

Test Report No. : T-0329-4295-01 JP	2012-04-26 Date of issue

Type / Model Name : LPR-2DB

FCC ID W5ILPR-2DB

Product Description : LPR-2D

Applicant : Symeo GmbH

Address : Professor-Messerschmitt-Str. 3

85579 Neubiberg / München

Germany

Manufacturer : Symeo GmbH

Address : Professor-Messerschmitt-Str. 3

85579 Neubiberg / München

Germany

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

DAkkS Deutsche Akkreditierungsstelle D-PL-12141-01-01

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Part 15 Subpart A October 2010	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communications Commision (FCC)
FCC Part 15 Subpart C October 2010	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communications Commision (FCC) Applied Paragraphs: §15.207, §15.209, §15.249
ANSI C63.4-2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz – 40 GHz

2 OVERVIEW TEST RESULT

Performed test(s)	Result		
	Passed	Failed	Not performed
Conducted disturbance	X		
Radiated disturbance (9kHz – 30MHz)	X		
Radiated disturbance (30MHz – 1000MHz)	X		
Radiated disturbance (1GHz – 40GHz)	X		
Bandedges	X		
Field strength of emission within band	X		

3 SUMMARY

GENERAL REMARKS:

The EUT has a TX mode and a RX mode but RX is without TX beacons not possible therefore the measurements were performed in TX mode only.

FINAL ASSESSMENT:

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

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

Testing commenced on : 2012-04-03

Testing concluded on : 2012-04-11

Checked by:

Wolfgang Straubinger
2012.04.26 15:24:01
+02'00'

Wolfgang Straubinger

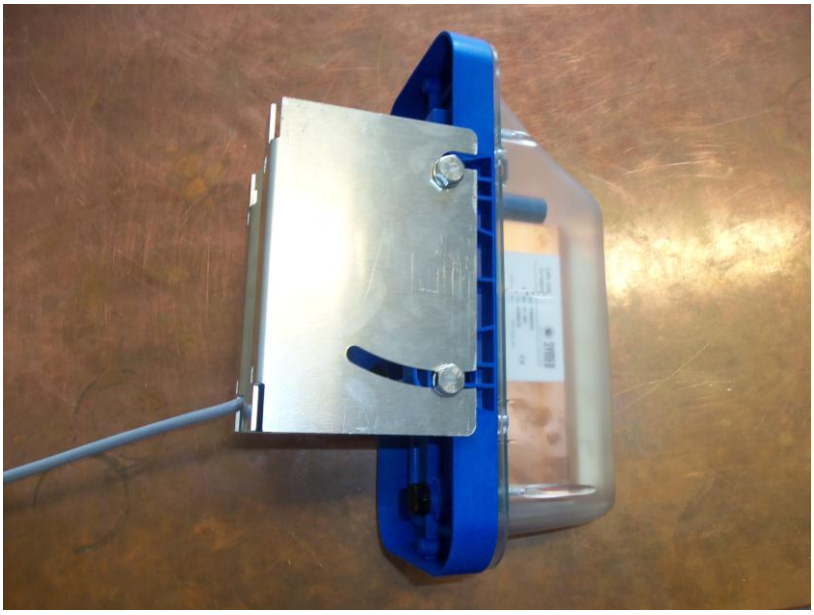
Tested by:

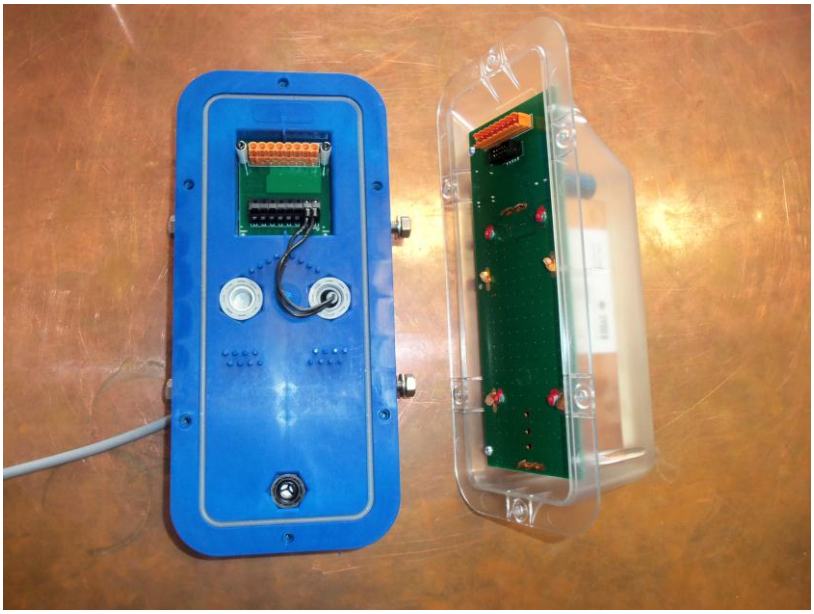
Jürgen Pessinger
2012.04.26
14:52:05 +02'00'

Jürgen Pessinger

4 EQUIPMENT UNDER TEST

4.1 Photo documentation of the EuT





4.2 Power supply system

Power supply voltage: 10-36V DC

4.3 Short description of the Equipment under Test (EuT)

The EuT is a wireless system used in systems for contactless, real time determination of distances and positions.

Number of tested samples: 1
Serial number: none

Dimensions: L: 28cm W: 12,5cm H: 15cm

Radio equipment characteristics

FSK Channel

Frequency band(s):	5725MHz – 5875MHz
Operating frequency:	5729MHz – 5871MHz
Channel spacing:	1MHz
Number of RF-channels:	54 channels (CH00 – CH53)
Comments:	None

Measurement band

Frequency band(s):	5725MHz – 5875MHz
Operating frequency:	Depends on FSK channel usage*
Channel spacing:	variable
Number of RF-channels:	1 distance measurement band
Comments:	None

*measurement band is located between last available FSK channel in upper FSK frequency range and the first available FSK channel in the lower FSK frequency range, with a clearance of 3MHz.

EuT operation mode:

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

- test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB

- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB

- test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

EuT configuration:

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

Interface cables:

Interface cable	Length [m]	Type	Line		Line termination
			shielded	unshielded	
DC power line*	1,8	2-wires	☐	☒	Power supply or 12V battery

Peripheral devices:

Kind of equipment		Model and/or Manufacturer
Power supply		EA-PS 3032-10B, emitel ID: 01-05/50-11-014

5 TEST ENVIRONMENT

5.1 Address of the test laboratory

emitel AG
Ohmstrasse 1
94342 STRASSKIRCHEN
DEUTSCHLAND

Laboratory registration numbers:

DAkkS Registration number:	D-PL-12141-01-01
KBA Registration number:	KBA-P 00057-01
SNCH Registration number:	SNCH 001/2005
FCC Registration number:	765810
IC Registration number:	IC 5066A-1

5.2 Statement regarding the usage of logos at test reports

The logos of accreditation- and notification bodies displayed at this test reports are only valid for standards listed at the accreditation- or notification scope of emitel AG.

5.3 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

All atmospheric pressure values refer to our Laboratory altitude of 324m.

5.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer does have the sole responsibility for the continued compliance of the device.

5.5 Measurement Protocol for FCC, VCCI and AUSTEL

5.5.1 GENERAL INFORMATION

5.5.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1997+A1:2000+A2:2002), European Standard EN 55022 (1998+A1:2000+A2:2003)and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1997+A1:2000 +A2:2002). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

5.5.1.2 Measurement Error

The data and results referenced in this document are true and accurate. The reader is cautioned that there is some measurement variability due to the tolerances of the test equipment that can contribute to a nominal product measurement uncertainty. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16-4-2 and is documented in the emitel AG quality system according to DIN EN ISO/IEC 17025. Furthermore, component differences and manufacturing process variability of production units similar to that tested may result in additional product uncertainty. 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 device.

5.5.1.3 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 into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum disturbances from the unit.

5.5.2 CONDUCTED DISTURBANCE

The final level, expressed in dBµV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dBµV and µV, the following conversions apply:
dBµV = 20(log µV)
µV = Inverse log(dBµV/20)

5.5.3 RADIATED DISTURBANCE

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factor are stored. This result then has the CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in section 5.2. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:	CISPR B		Delta						
	Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Final (dBµV/m)	-	Limit (dBµV/m)	=	CISPR B (dB)
	37.19	10.2	+	12.0	=	22.2	-	40.0	=	-17.8

5.5.4 DETAILS OF TEST PROCEDURES

5.5.4.1 General Standard Information

The test methods used comply with CISPR Publication 22 (1997+A1:2000+A2:2002), EN 55022 (1998+A1:2000+A2:2003) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with 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."

5.5.4.2 Conducted disturbance

Conducted disturbance 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 50Ω/50 µH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum passing 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.

5.5.4.3 Radiated disturbance

Radiated disturbance from the EUT are measured in the frequency range of 30 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 and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and average/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. 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 polarizations and the EUT are rotated 360 degrees.

6 TEST CONDITIONS AND RESULTS

6.1 Conducted disturbance

For test instruments and accessories used see section 7 Part **A 4**.

6.1.1 Description of the test location

Test location: Shielded Room SK4

6.1.2 Photo documentation of the test set-up

6.1.3 Test specification

Environmental conditions: Temperature: 22 ° C Humidity: 38 % Atmospheric pressure: 98 kPa

Frequency range: 0.15 MHz - 30 MHz

The test was carried out in the following operation mode(s):
- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB

6.1.4 Test result

Minimal margin to limit 40 dB at 0,5 MHz

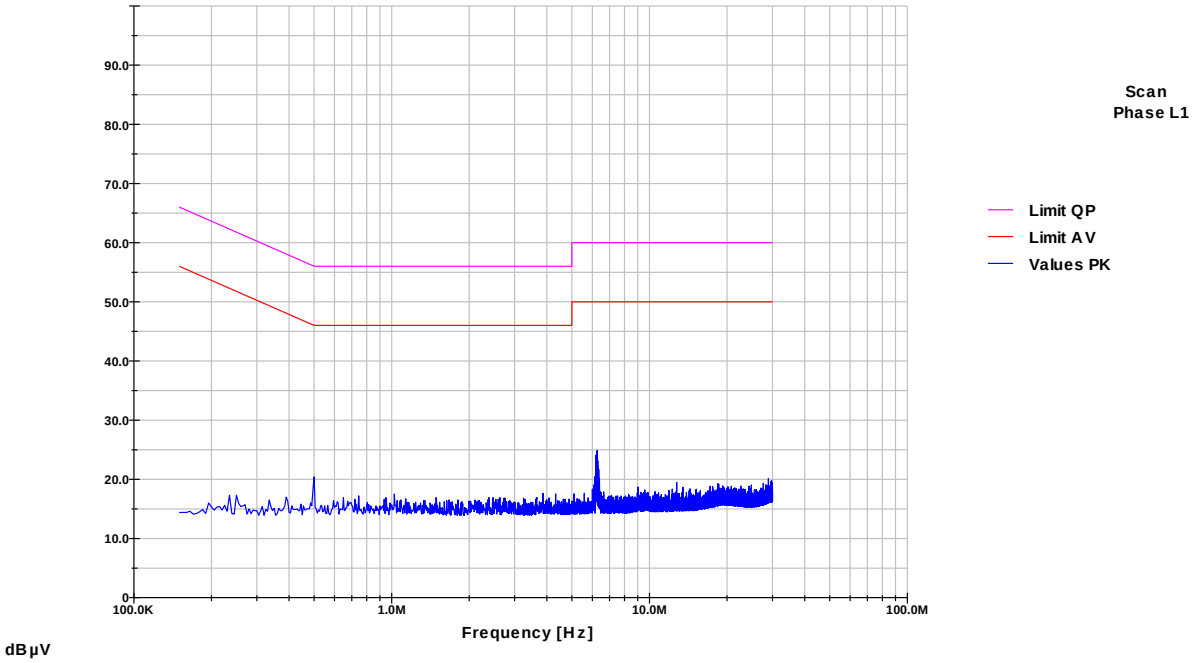
The requirements are **FULFILLED.**

Remarks: none

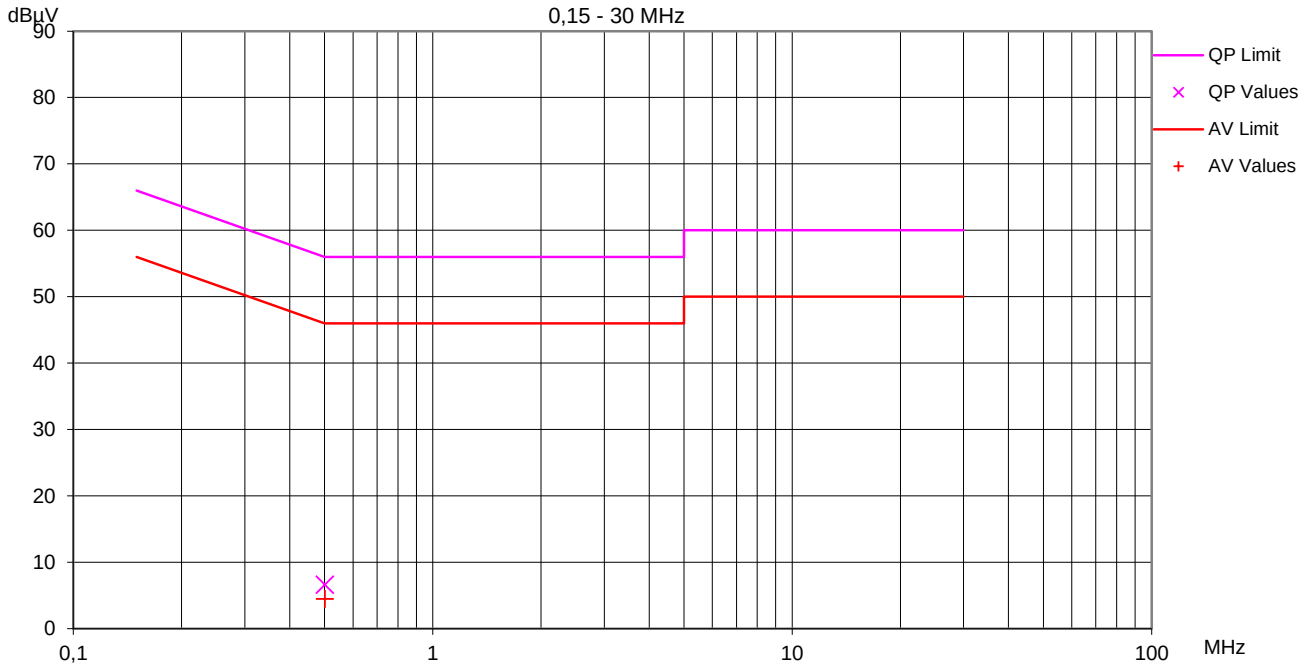
6.1.5 Test protocol

Test point	L1	Result: SCAN
Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	
Remarks:	The measurement was made at AC input port of the DC Power supply	
Date:	2012-04-03	
Tested by:	Pessinger Jürgen	

Start frequency [MHZ]	Stop frequency [MHZ]	Resolution bandwidth	step size	Measurement time	Detector
0.15	30	10 kHz	5 kHz	10 ms	Peak



Test point	L1	Result: PASS
Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	
Remarks:	The measurement was made at AC input port of the DC Power supply	
Date:	2012-04-03	
Tested by:	Pessinger Jürgen	

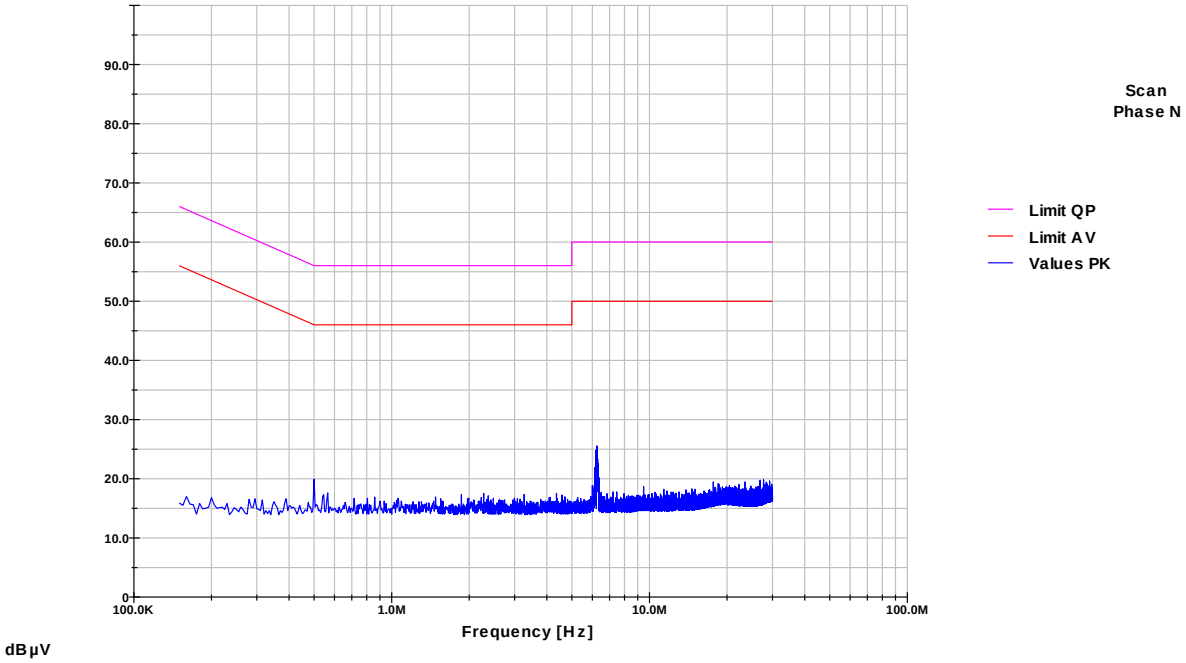


Minimum margin to limit: 41,5 dB

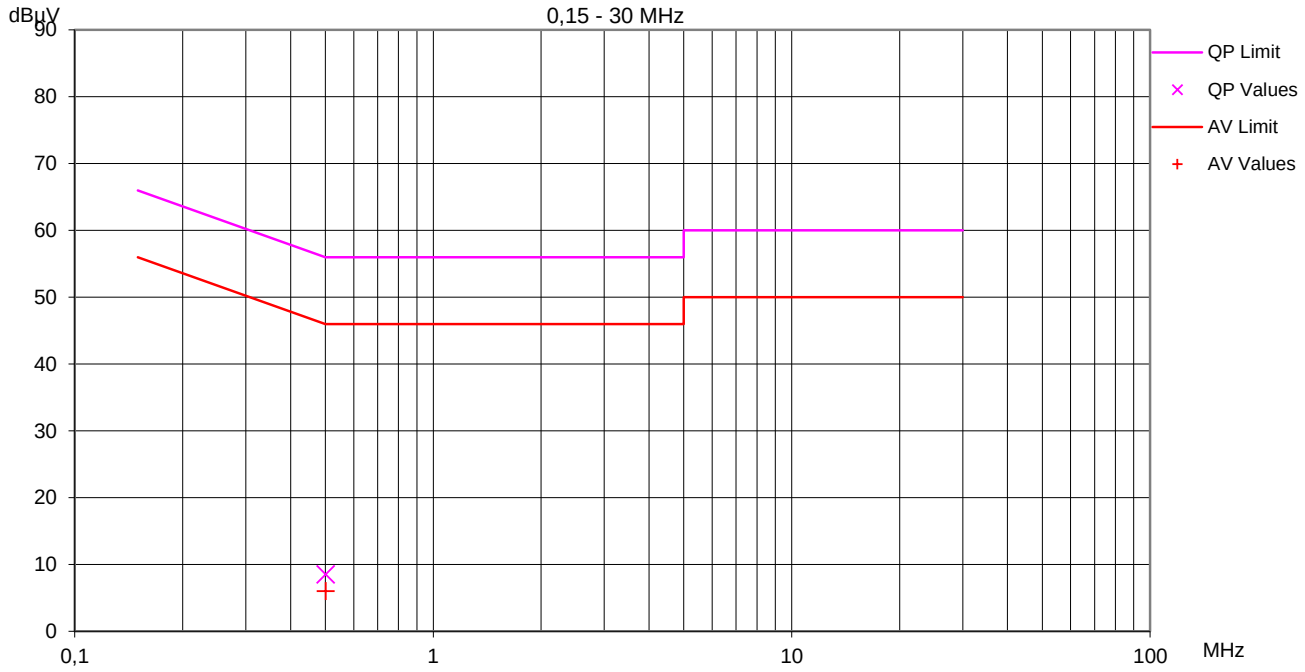
Frequency [MHz]	Reading [dBµV] QP	Reading [dBµV] AV	Correction [dB]	Values [dBµV] QP	Values [dBµV] AV	Limit [dBµV] QP	Limit [dBµV] AV	Margin [dB] QP	Margin [dB] AV
0,501	6,4	4,3	0,2	6,6	4,5	56,0	46,0	49,4	41,5

Test point:	N	Result: SCAN
Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	
Remarks:	The measurement was made at AC input port of the DC Power supply	
Date:	2012-04-03	
Tested by:	Pessinger Jürgen	

Start frequency [MHZ]	Stop frequency [MHZ]	Resolution bandwidth	step size	Measurement time	Detector
0.15	30	10 kHz	5 kHz	10 ms	Peak



Test point:	N	Result: PASS
Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	
Remarks:	The measurement was made at AC input port of the DC Power supply	
Date:	2012-04-03	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 40,0 dB

Frequency [MHz]	Reading [dBµV] QP	Reading [dBµV] AV	Correction [dB]	Values [dBµV] QP	Values [dBµV] AV	Limit [dBµV] QP	Limit [dBµV] AV	Margin [dB] QP	Margin [dB] AV
0,502	8,3	5,8	0,2	8,5	6,0	56,0	46,0	47,5	40,0

6.2 Radiated disturbance (9kHz – 30MHz)

For test instruments and accessories used see section 7 Part **SER 1**.

6.2.1 Description of the test location

Test location: OATS 3

Test distance: 3 metres

6.2.2 Photo documentation of the test set-up

6.2.3 Test specification

Environmental conditions: Temperature: 20 ° C Humidity: 40 % Atmospheric pressure: 99 kPa

Frequency range: 0,009 MHz - 30 MHz

The test was carried out in the following operation mode(s):
- test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB
- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB
- test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

6.2.4 Test result

The requirements are **FULFILLED.**

Remarks: The prescan shows that the Peak value is below the Average / QuasiPeak limit, therefore no final measurement was made.

6.2.5 Test protocol

Operation mode: test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB — Result: PASS
Remarks: none
Date: 2012-04-11
Tested by: Pessinger Jürgen

Minimum margin to limit: -- dB

Frequency [MHz]	Reading [dBµV] QP	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] QP	Values [dBµV/m] AV	Limit [dBµV/m] QP	Limit [dBµV/m] AV	Margin [dB] QP	Margin [dB] AV
--	--								

No emission (peak detector) exceeds the AV/QP limit of section 15.209 in the frequency range 0,009MHz to 30MHz.

Operation mode: test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB — Result: PASS
Remarks: none
Date: 2012-04-11
Tested by: Pessinger Jürgen

Minimum margin to limit: -- dB

Frequency [MHz]	Reading [dBµV] QP	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] QP	Values [dBµV/m] AV	Limit [dBµV/m] QP	Limit [dBµV/m] AV	Margin [dB] QP	Margin [dB] AV
--	--								

No emission (peak detector) exceeds the AV/QP limit of section 15.209 in the frequency range 0,009MHz to 30MHz.

Operation mode: test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB — Result: PASS
Remarks: none
Date: 2012-04-11
Tested by: Pessinger Jürgen

Minimum margin to limit: -- dB

Frequency [MHz]	Reading [dBµV] QP	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] QP	Values [dBµV/m] AV	Limit [dBµV/m] QP	Limit [dBµV/m] AV	Margin [dB] QP	Margin [dB] AV
--	--								

No emission (peak detector) exceeds the AV/QP limit of section 15.209 in the frequency range 0,009MHz to 30MHz.

6.3 Radiated disturbance (30MHz – 1000MHz)

For test instruments and accessories used see section 7 Part **SER 2**.

6.3.1 Description of the test location

Test location: OATS 3

Test distance: 3 metres

6.3.2 Photo documentation of the test set-up

6.3.3 Test specification

Environmental conditions: Temperature: 20 ° C Humidity: 40 % Atmospheric pressure: 99 kPa

Frequency range: 30 MHz - 1000 MHz

The test was carried out in the following operation mode(s):
- test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB
- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB
- test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

6.3.4 Test result

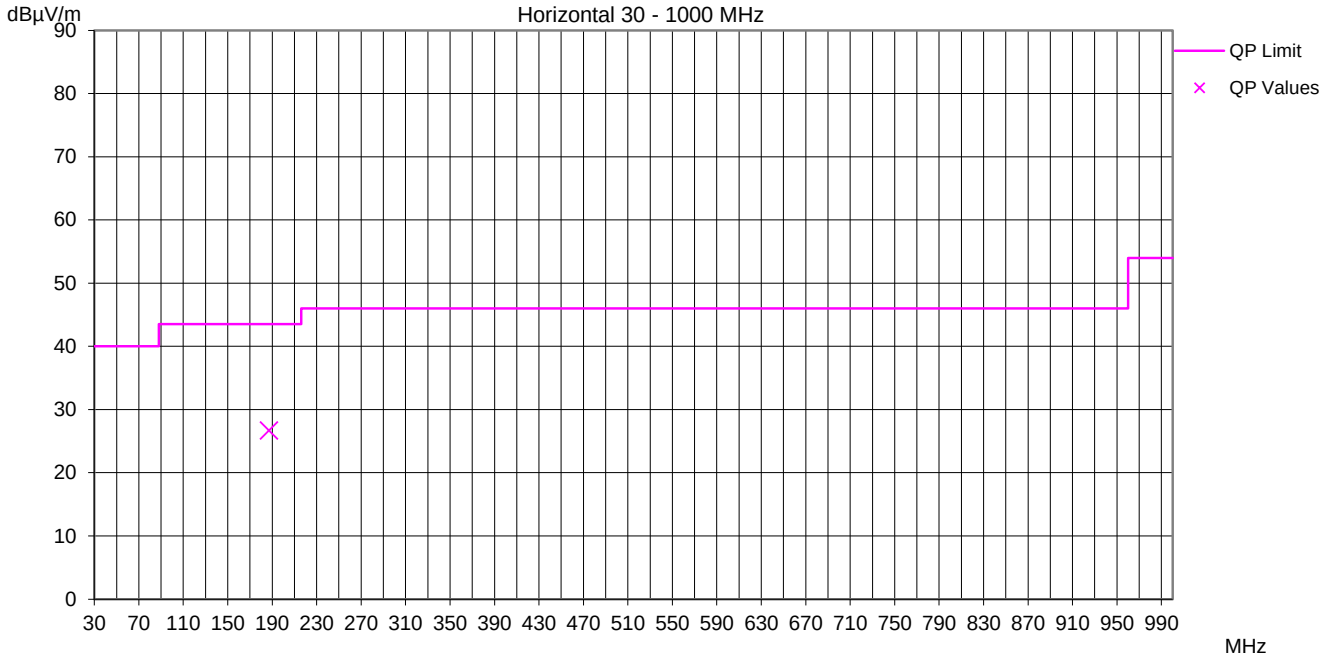
Minimal margin to limit 16,8 dB at 187 MHz

The requirements are **FULFILLED.**

Remarks: none

6.3.5 Test protocol

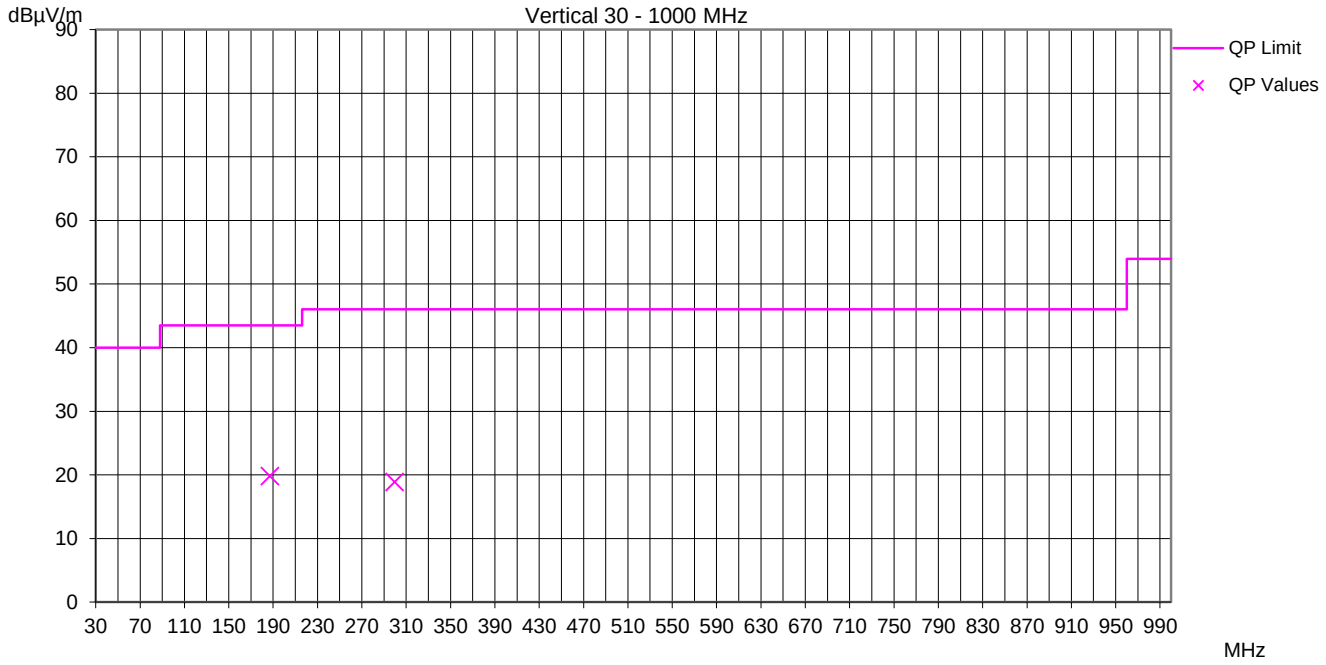
Operation mode:	test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-11	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 16,8 dB

Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
187,323	13,9	12,8	26,7	43,5	16,8

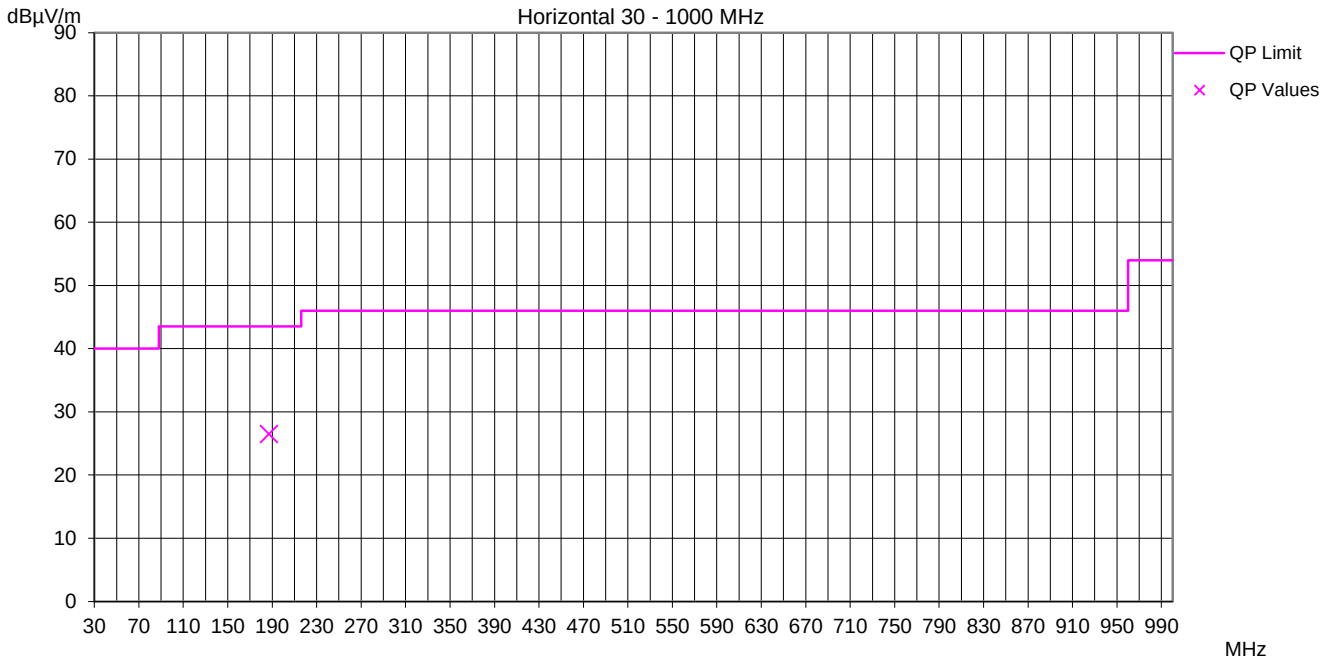
Operation mode:	test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-11	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 23,7 dB

Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
187,315	7,0	12,8	19,8	43,5	23,7
299,714	2,3	16,6	18,9	46,0	27,2

Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-11	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 17,0 dB

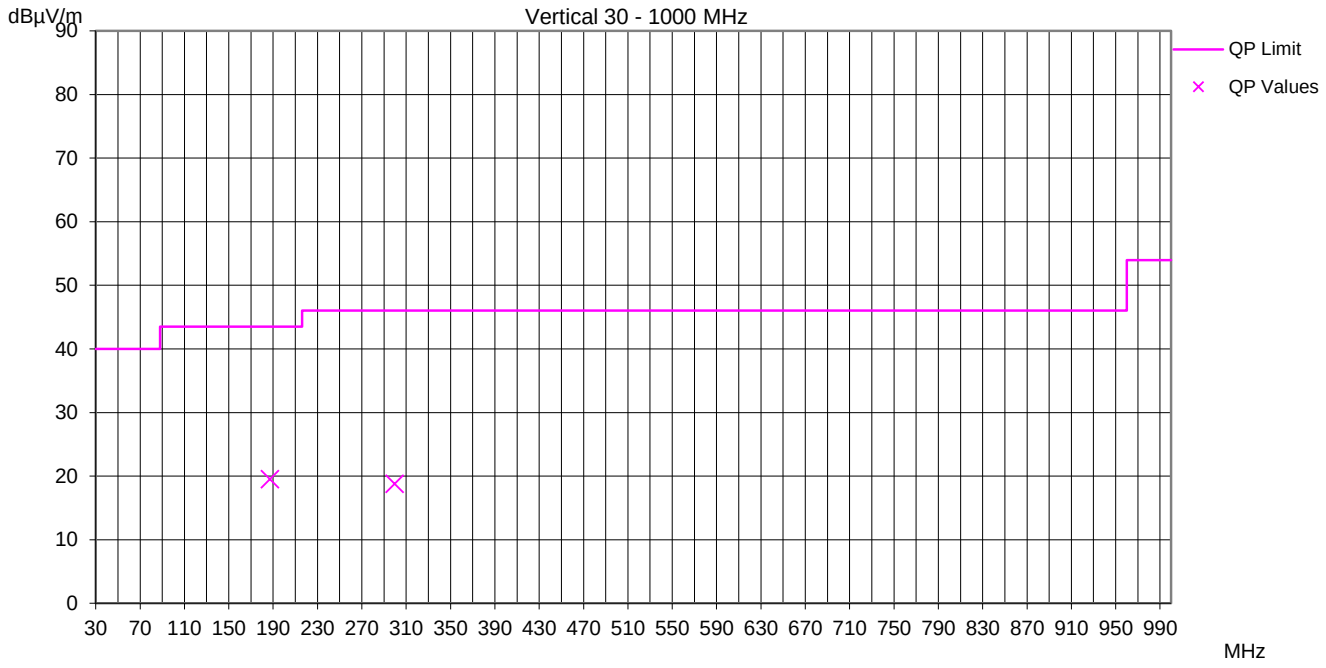
Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
187,323	13,7	12,8	26,5	43,5	17,0

Operation mode: test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB
Result: PASS

Remarks: none

Date: 2012-04-11

Tested by: Pessinger Jürgen



Minimum margin to limit: 24,0 dB

Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
187,315	6,7	12,8	19,5	43,5	24,0
299,714	2,2	16,6	18,8	46,0	27,3

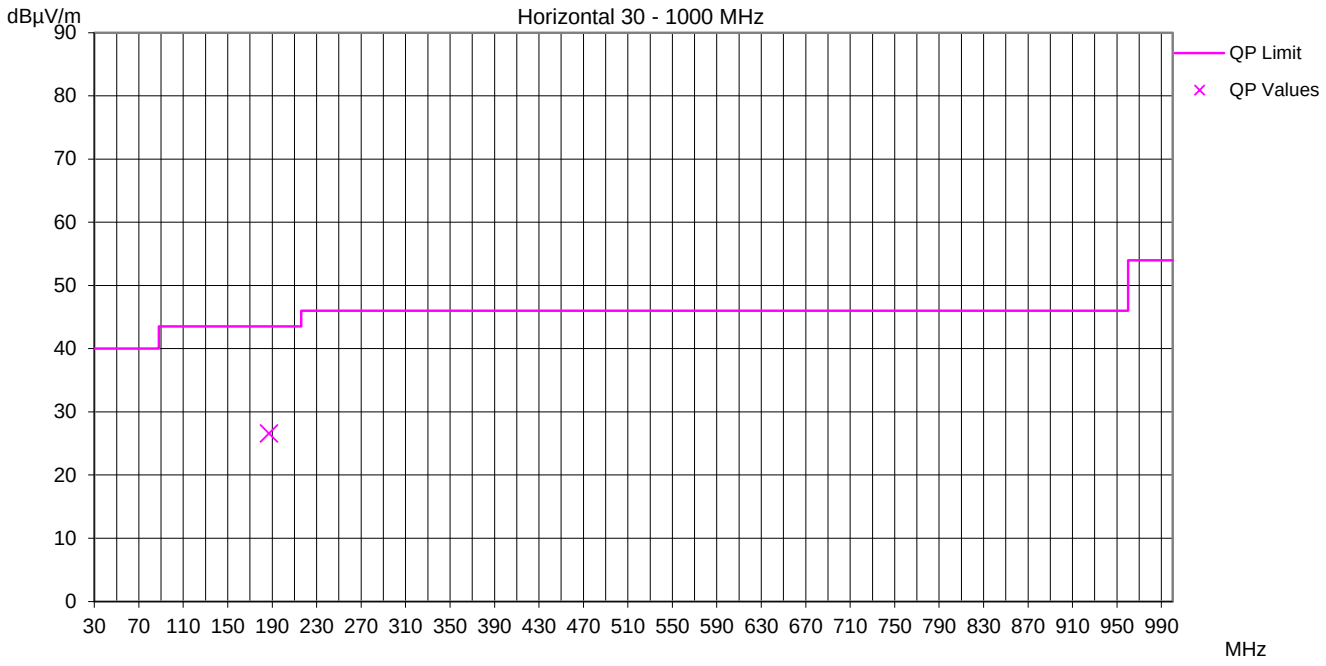
Operation mode: test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

Result: PASS

Remarks: none

Date: 2012-04-11

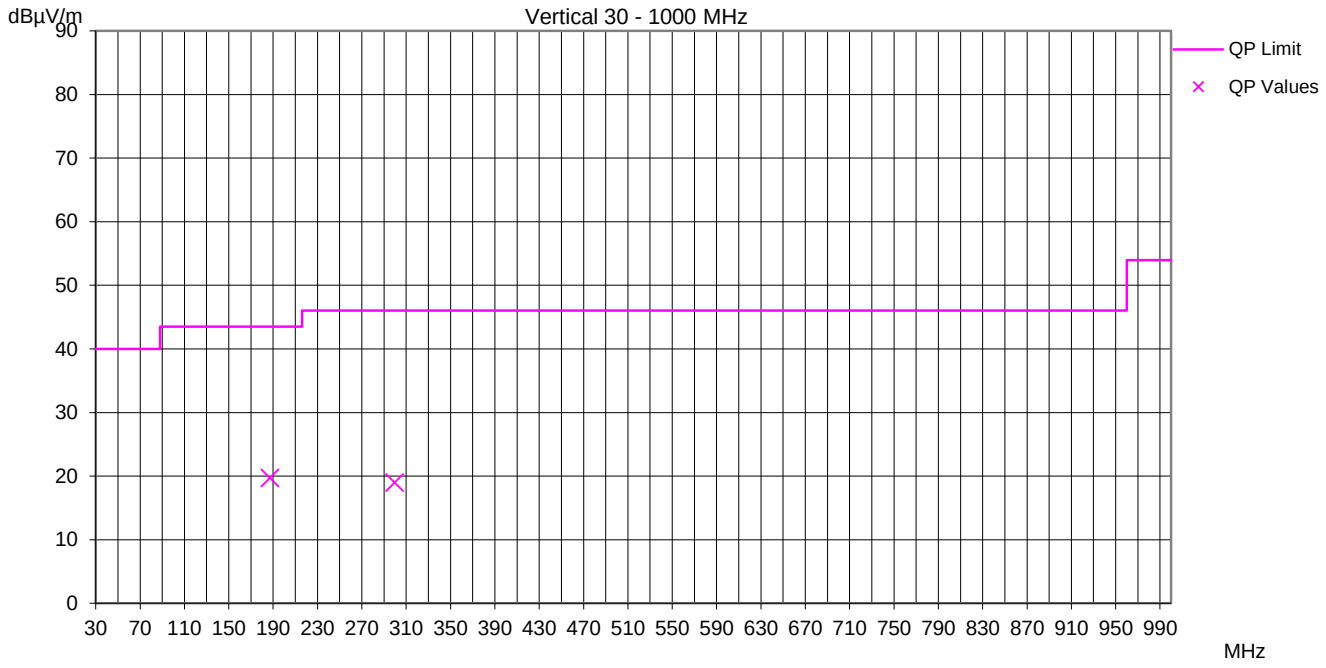
Tested by: Pessinger Jürgen



Minimum margin to limit: 16,9 dB

Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
187,323	13,8	12,8	26,6	43,5	16,9

Operation mode:	test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-11	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 23,8 dB

Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
187,315	6,9	12,8	19,7	43,5	23,8
299,714	2,4	16,6	19,0	46,0	27,1

6.4 Radiated disturbance (1GHz – 40GHz)

For test instruments and accessories used see section 7 Part **SER 3**.

6.4.1 Description of the test location

Test location: Anechoic Chamber A4

Test distance: 3 metres

6.4.2 Photo documentation of the test set-up

6.4.3 Test specification

Environmental conditions: Temperature: 24 ° C Humidity: 37 % Atmospheric pressure: 98 kPa

Frequency range: 1 GHz – 40GHz

The test was carried out in the following operation mode(s):
- test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB
- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB
- test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

6.4.4 Test result

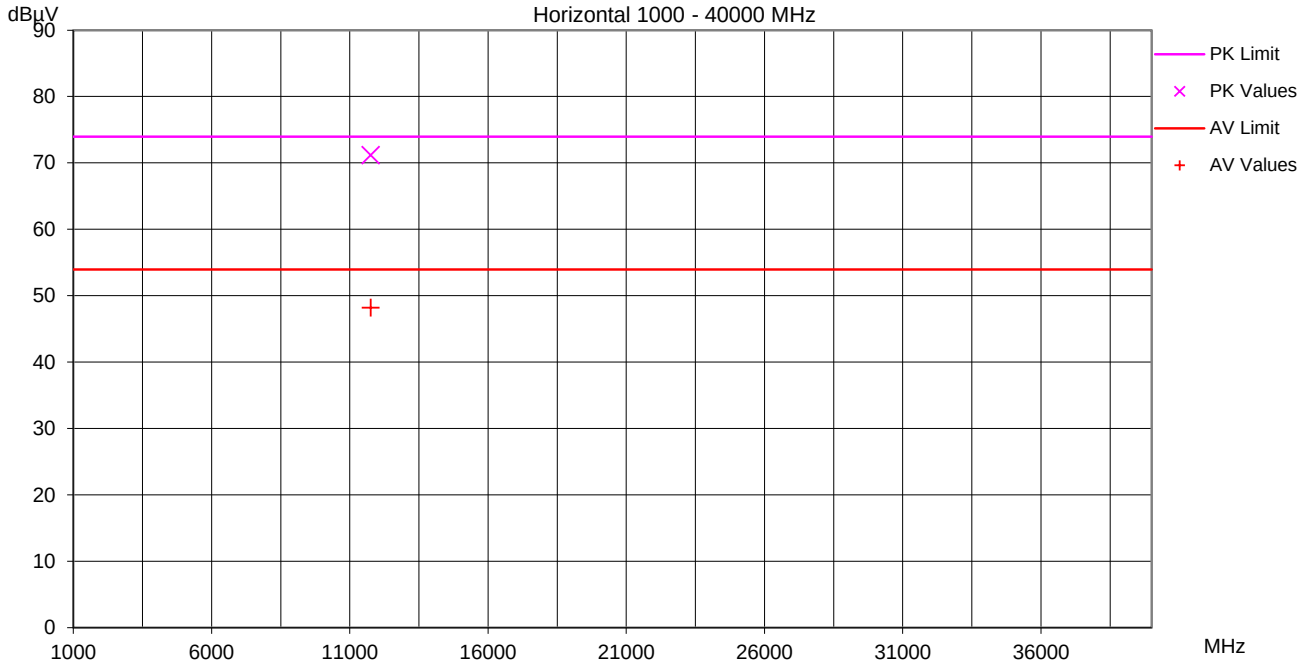
Minimal margin to limit 1,9 dB at 11,4 GHz

The requirements are **FULFILLED.**

Remarks: none

6.4.5 Test protocol

Operation mode:	test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 2,8 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
11763,000	62,2	39,2	9,0	71,1	48,2	74,0	54,0	2,8	5,8

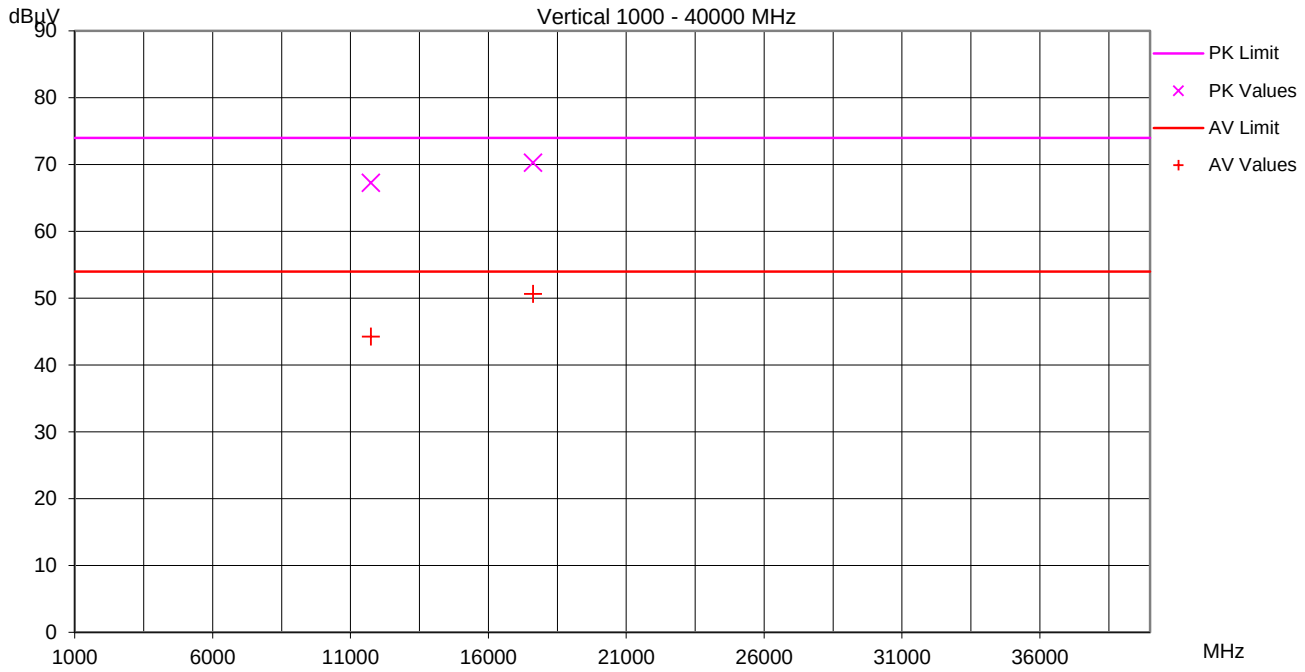
Operation mode: test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB

Result: PASS

Remarks: none

Date: 2012-04-10

Tested by: Pessinger Jürgen



Minimum margin to limit: 3,3 dB

Frequency	Reading [dBµV]		Correction	Values [dBµV]		Limit [dBµV]		Margin [dB]	
[MHz]	PK	AV	[dB]	PK	AV	PK	AV	PK	AV
11742,000	58,3	35,2	9,0	67,3	44,2	74,0	54,0	6,7	9,7
17622,000	51,1	31,5	19,1	70,3	50,6	74,0	54,0	3,7	3,3

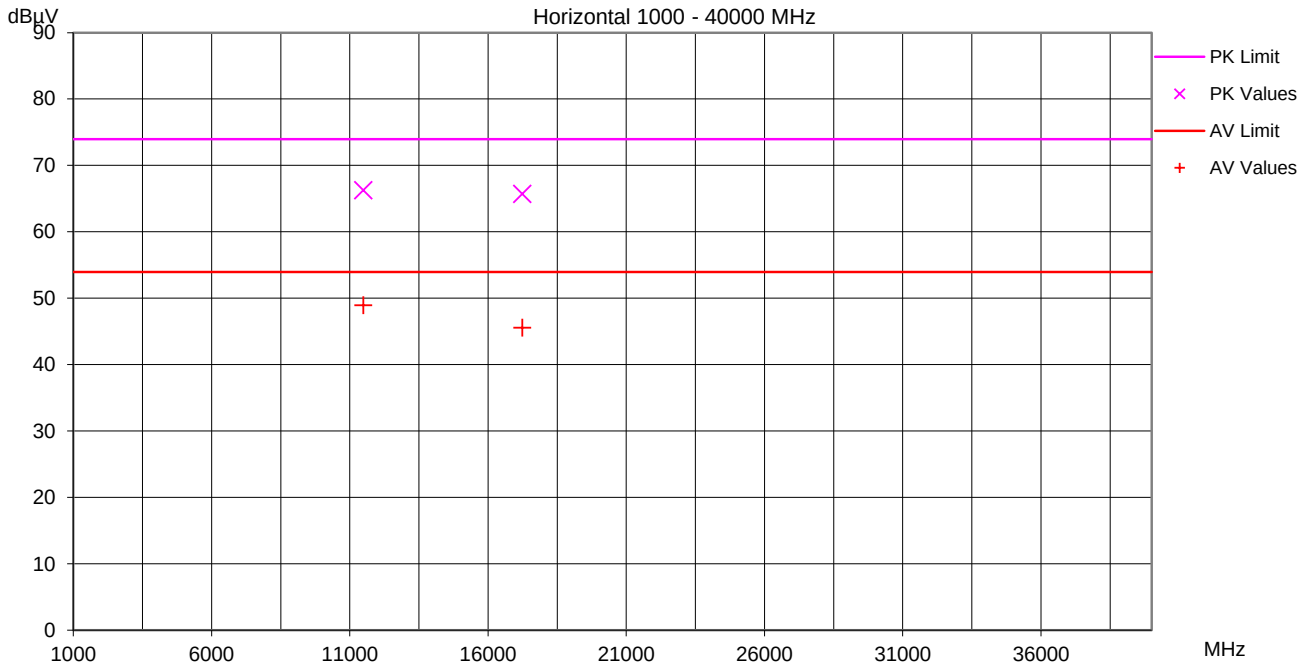
Operation mode: test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB

Result: PASS

Remarks: none

Date: 2012-04-10

Tested by: Pessinger Jürgen



Minimum margin to limit: 5,1 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
11490,000	57,5	40,1	8,8	66,2	48,9	74,0	54,0	7,7	5,1
17244,000	51,0	30,8	14,7	65,7	45,5	74,0	54,0	8,3	8,4

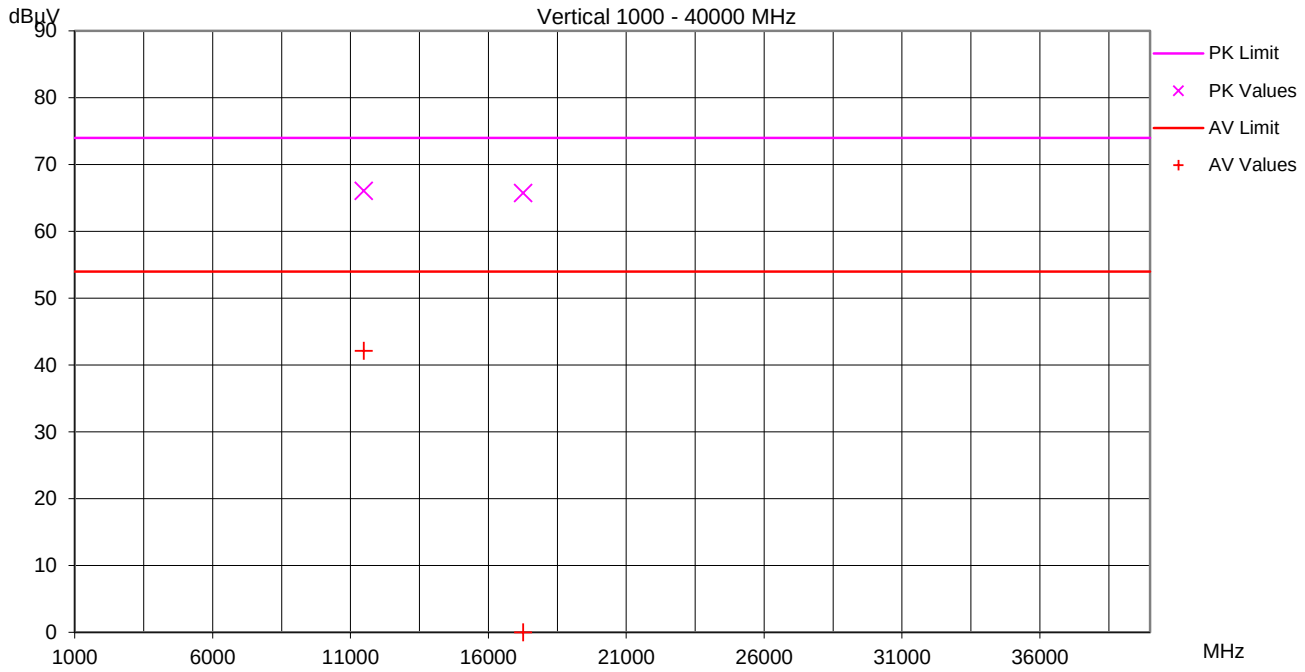
Operation mode: test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB

Result: PASS

Remarks: none

Date: 2012-04-10

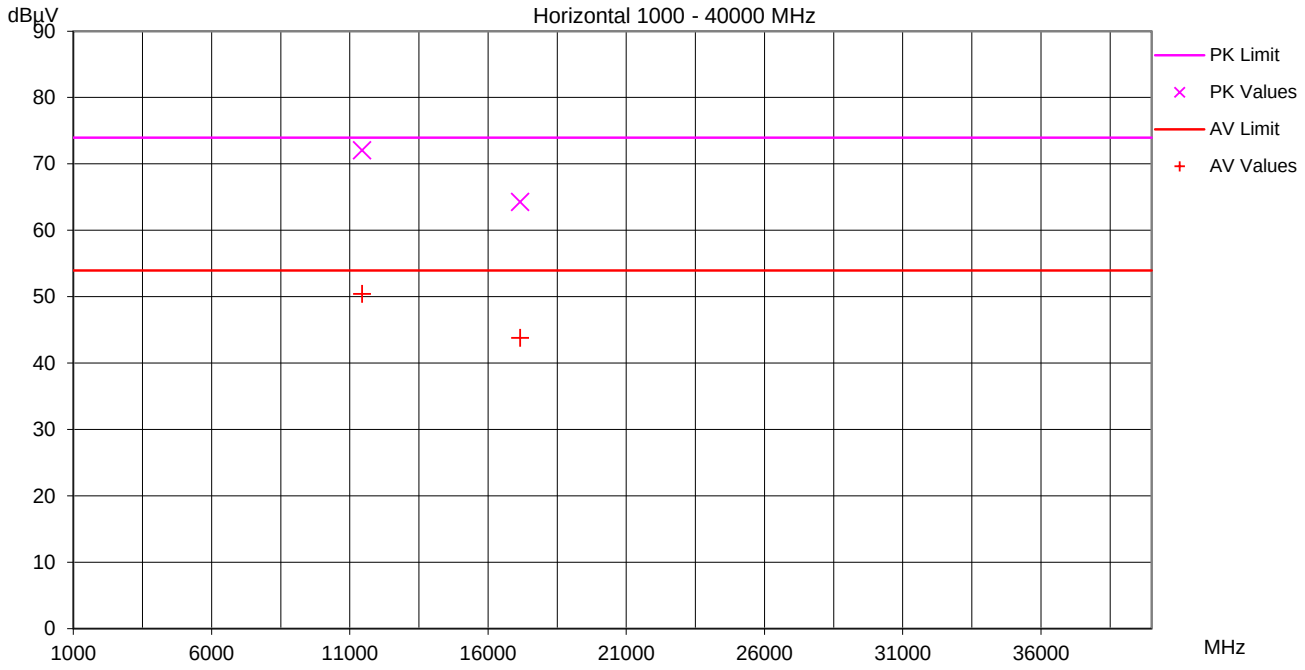
Tested by: Pessinger Jürgen



Minimum margin to limit: 7,9 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
11490,000	57,3	33,4	8,8	66,0	42,1	74,0	54,0	7,9	11,8
17265,000	50,8		14,9	65,7		74,0	54,0	8,3	

Operation mode:	test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	



Minimum margin to limit: 1,9 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
11448,000	63,2	41,6	8,8	72,0	50,4	74,0	54,0	1,9	3,5
17160,000	50,2	29,7	14,0	64,2	43,8	74,0	54,0	9,7	10,2

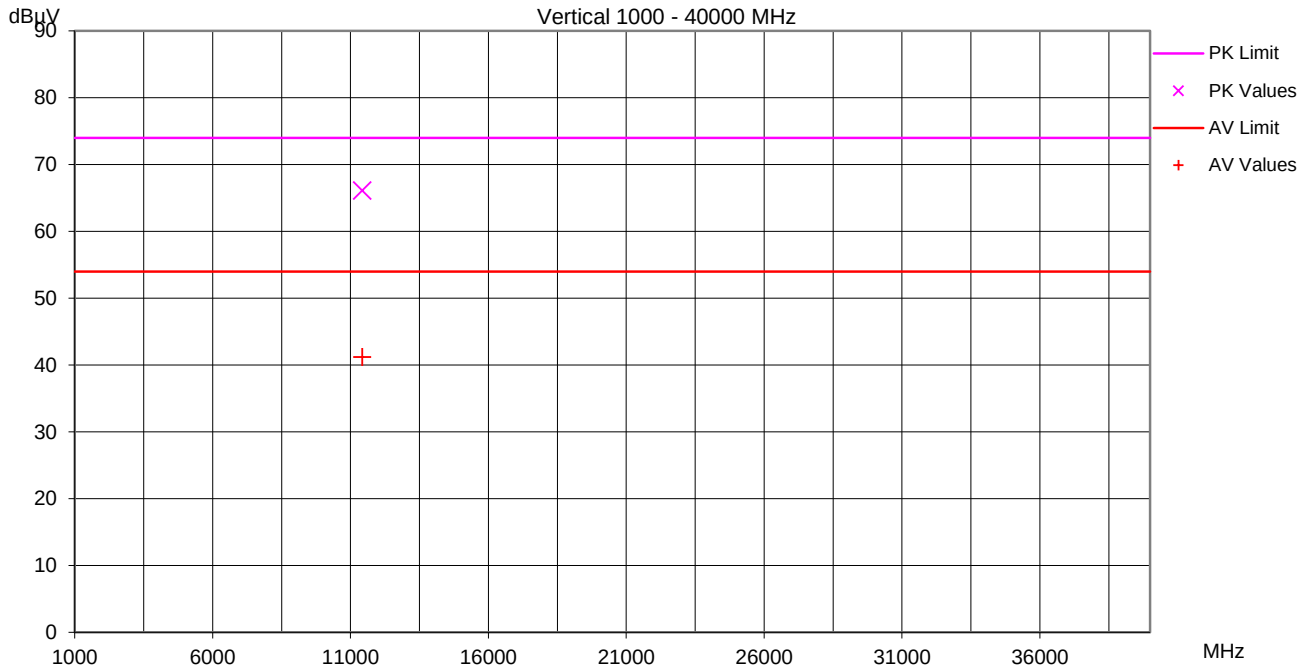
Operation mode: test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

Result: PASS

Remarks: none

Date: 2012-04-10

Tested by: Pessinger Jürgen



Minimum margin to limit: 7,9 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
11427,000	57,3	32,3	8,9	66,1	41,2	74,0	54,0	7,9	12,8

6.5 Bandedges

For test instruments and accessories used see section 7 Part **SER 3**.

6.5.1 Description of the test location

Test location: Anechoic Chamber A4

Test distance: 3 metres

6.5.2 Photo documentation of the test set-up

6.5.3 Test specification

Environmental conditions: Temperature: 24 ° C Humidity: 37 % Atmospheric pressure: 98 kPa

Frequency range: 5725MHz – 5875MHz

The test was carried out in the following operation mode(s):
- test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB
- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB
- test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

6.5.4 Test result

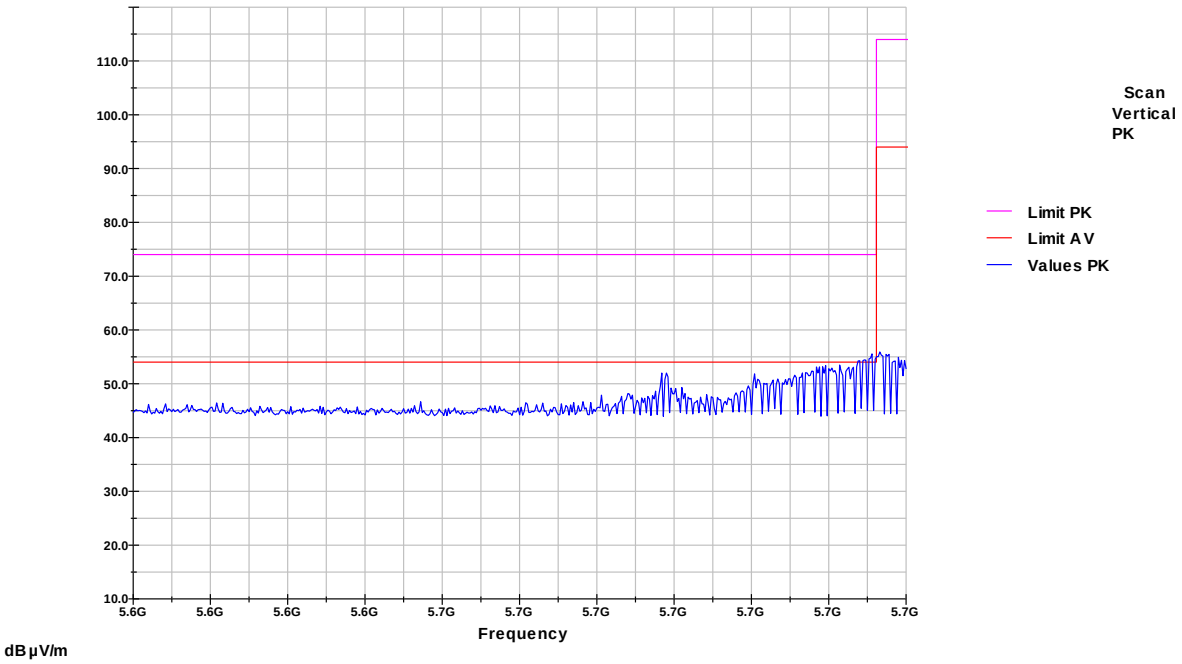
The requirements are **FULFILLED.**

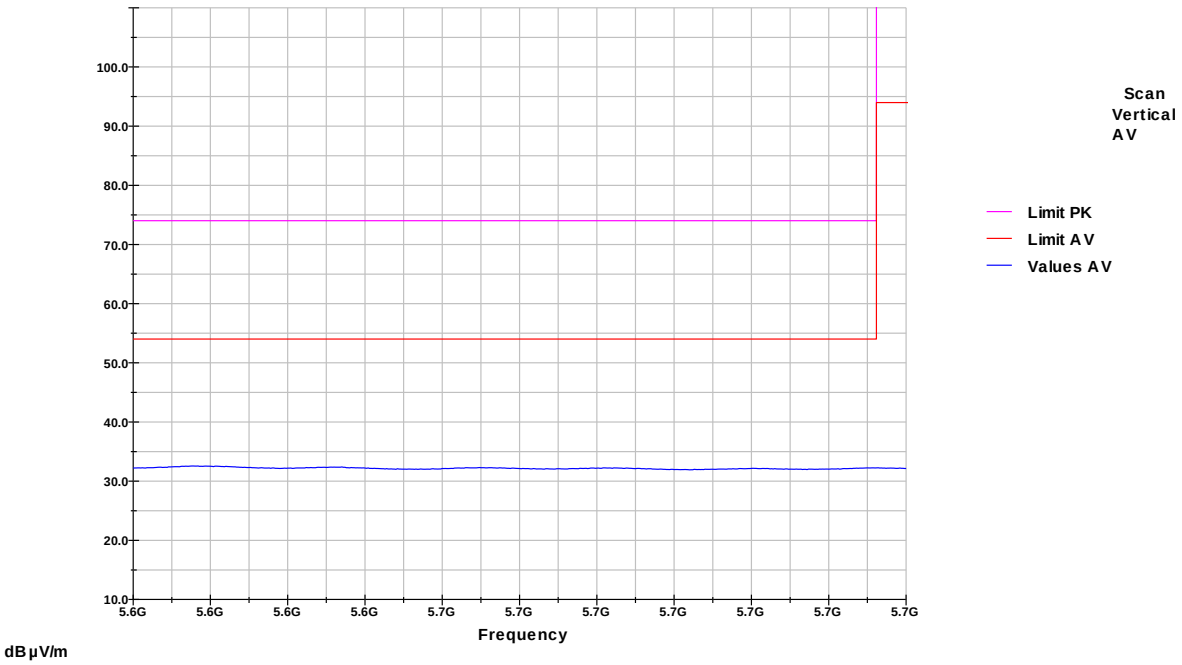
Remarks: The testing was performed in vertical polarization only, pretests show the highest emission occurs in vertical polarization.

6.5.5 Test protocol

Operation mode:	test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	

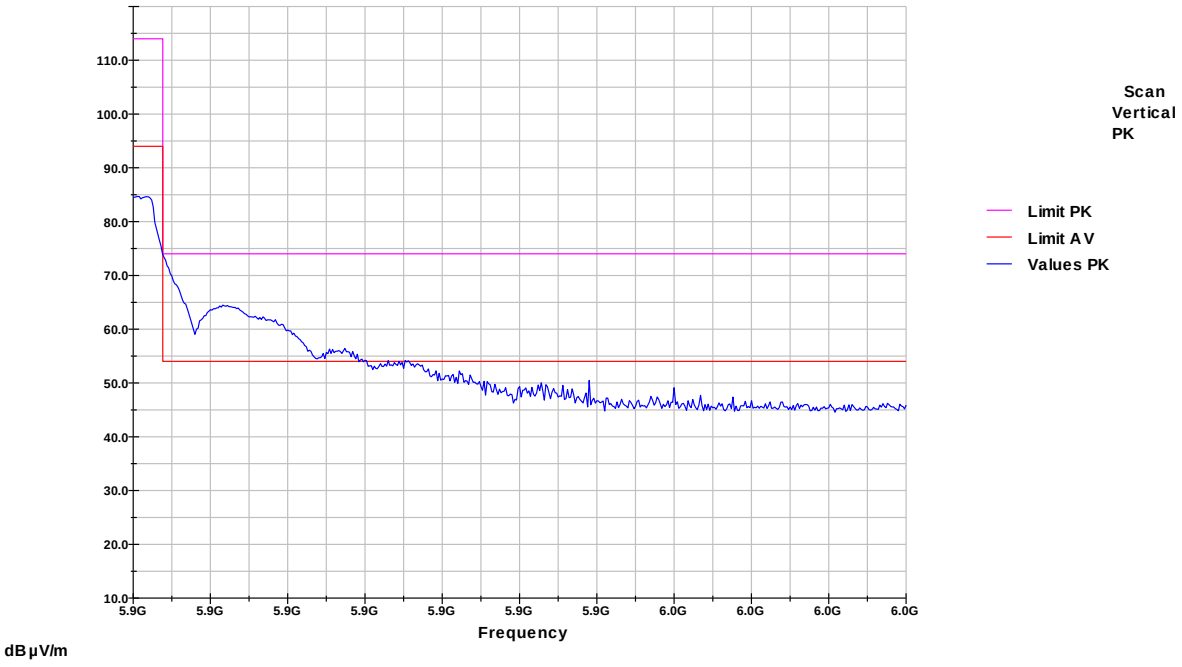
Band edge low

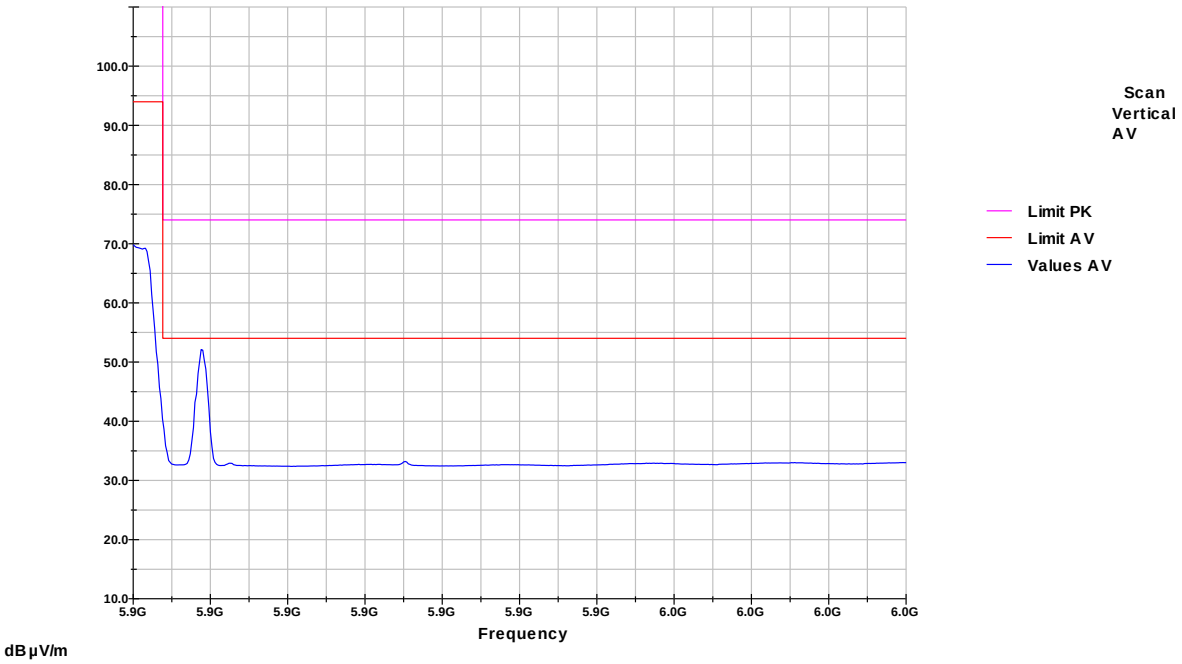




Operation mode:	test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	

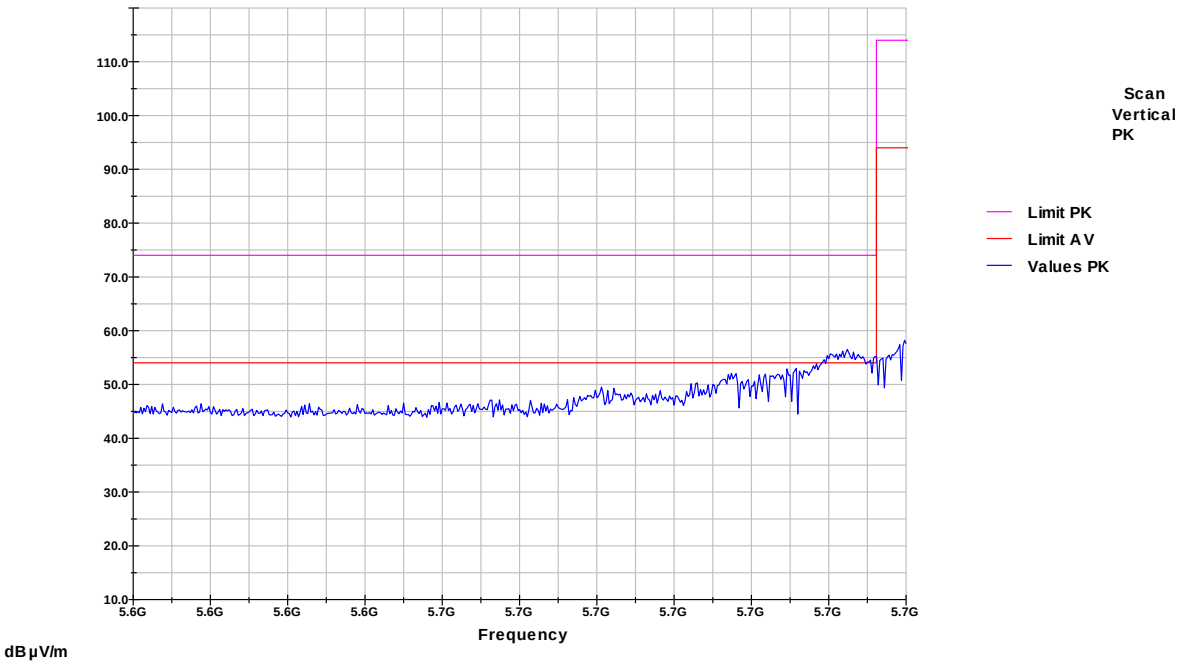
Band edge high

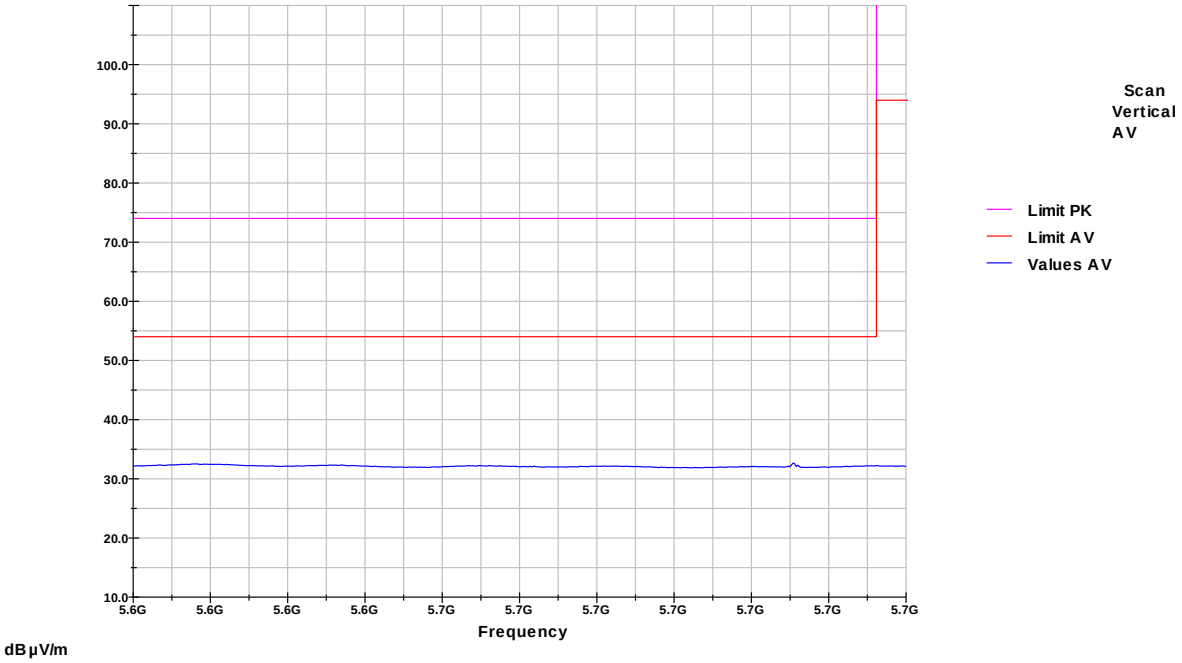




Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	

Band edge low

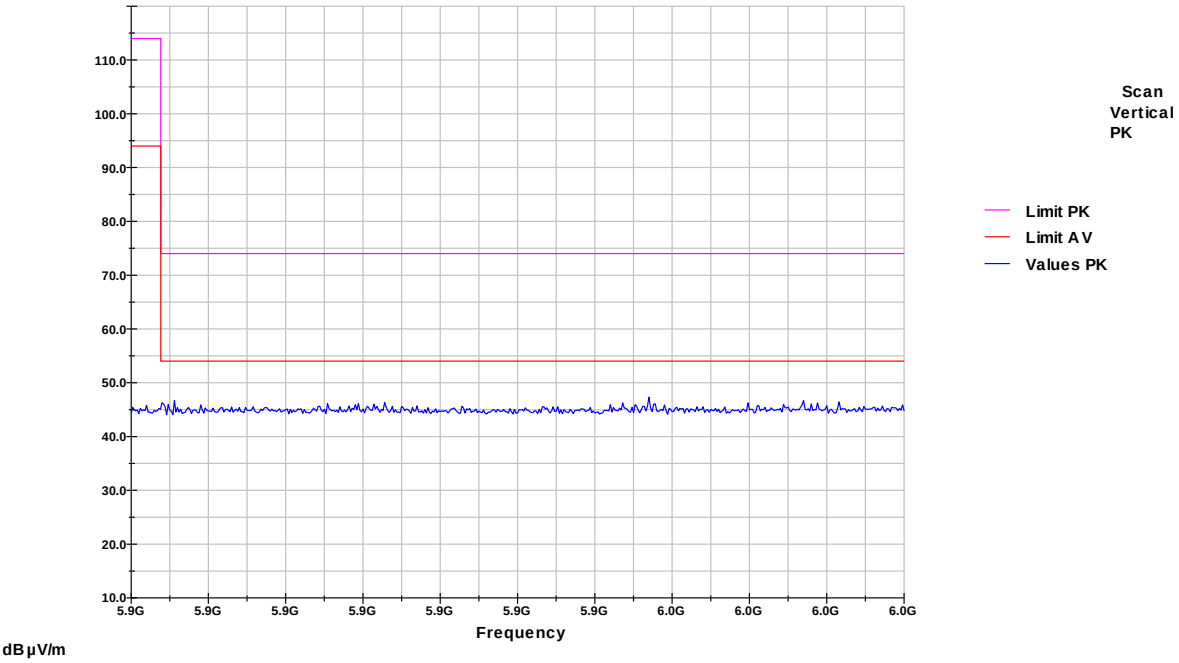


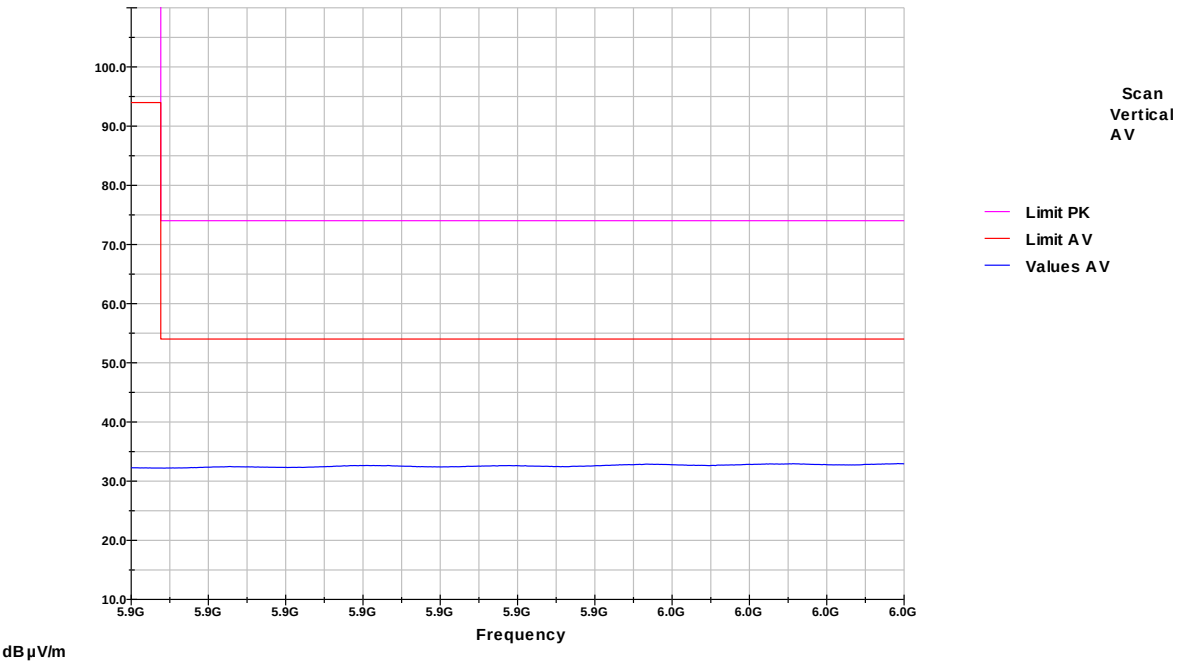


File No. **T-0329-4295-01 JP**

Operation mode:	test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	

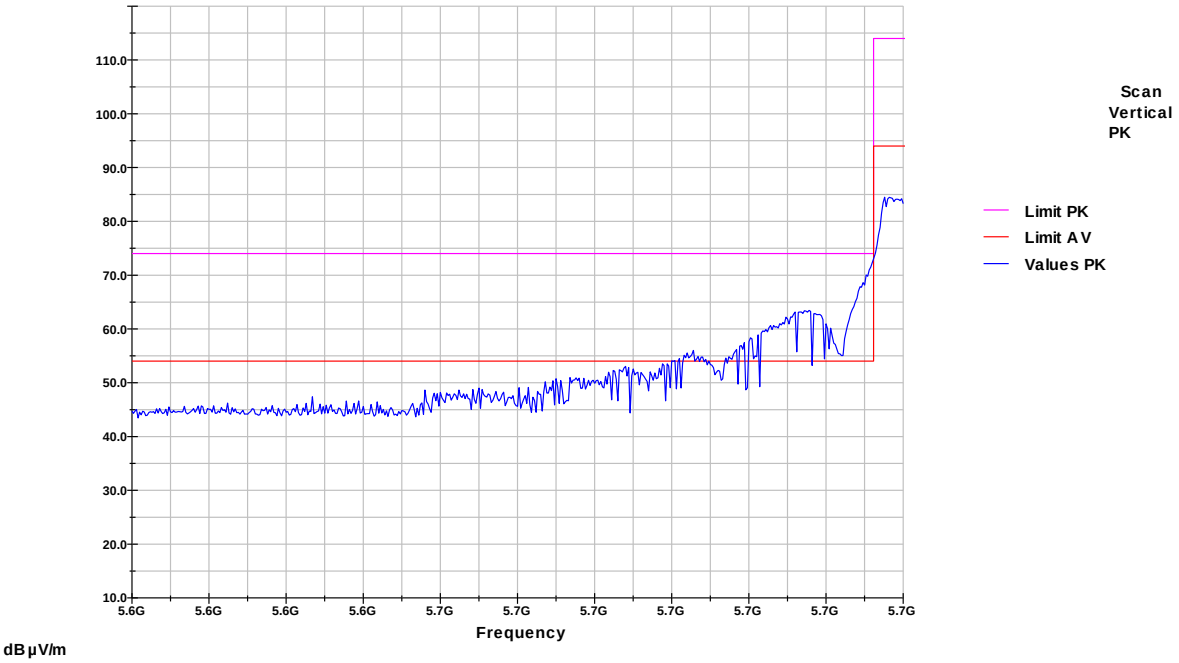
Band edge high

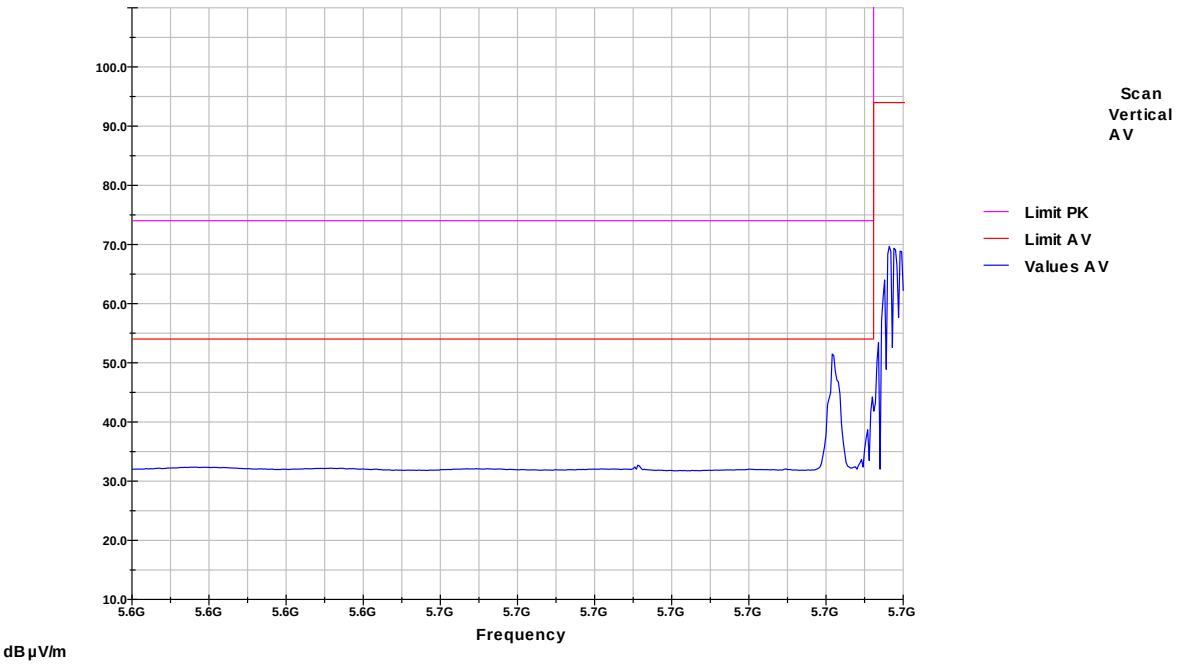




Operation mode:	test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	

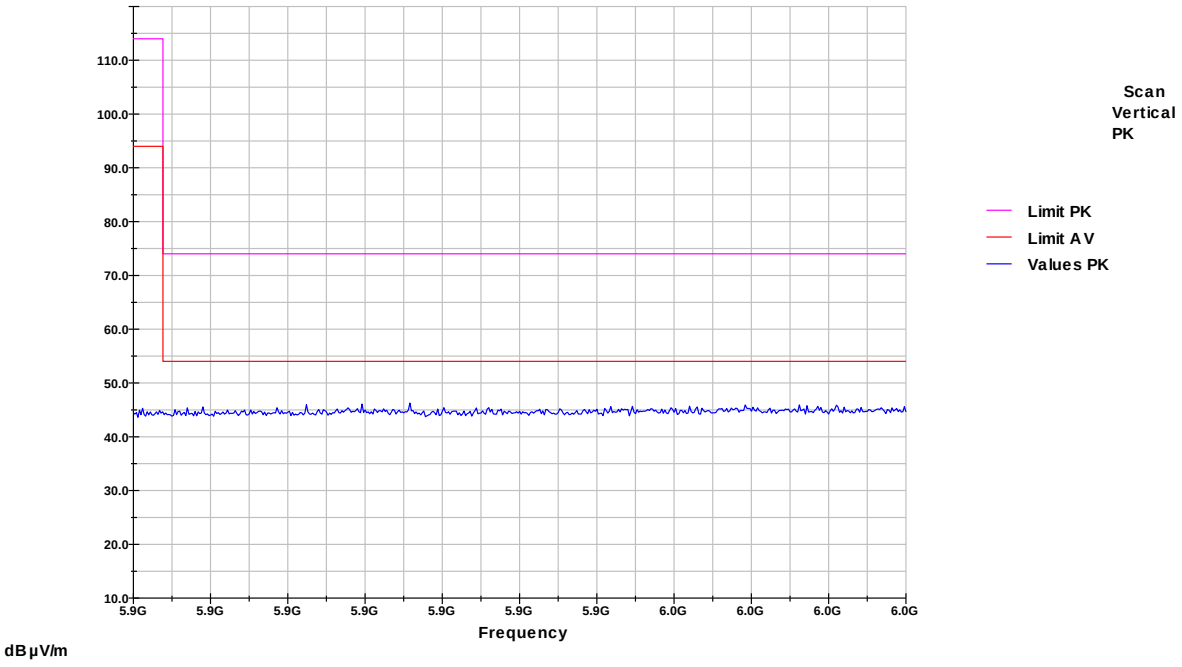
Band edge low

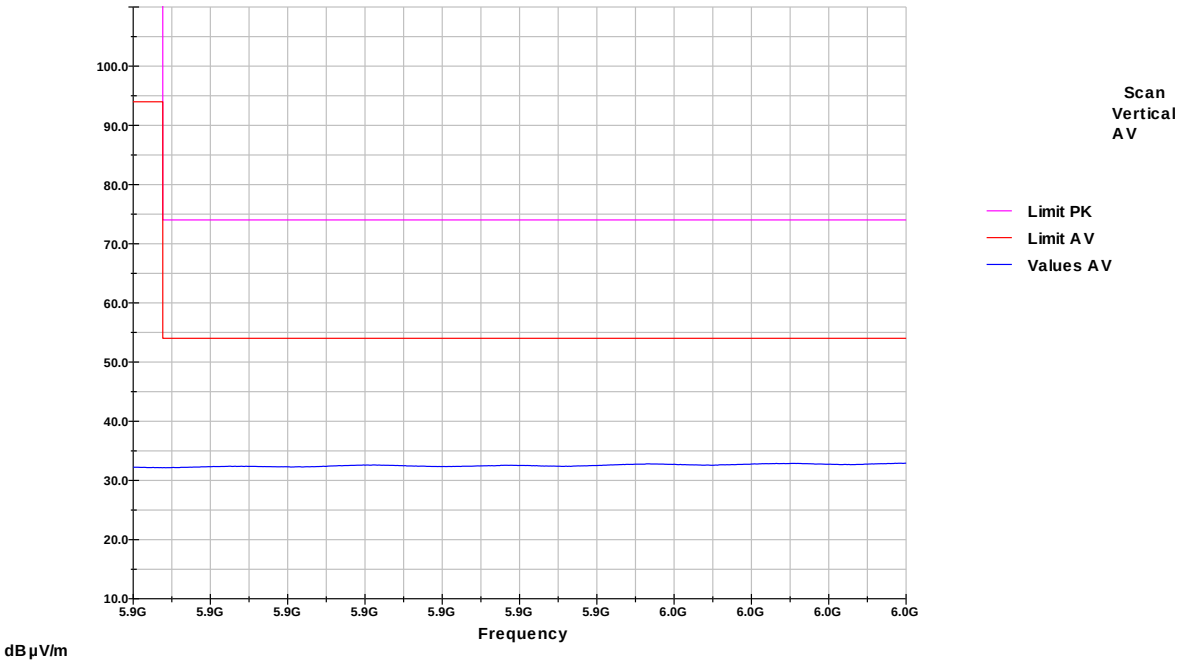




Operation mode:	test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	

Band edge high





6.6 Field strength of emission within band

For test instruments and accessories used see section 7 Part **SER 3**.

6.6.1 Description of the test location

Test location: Anechoic Chamber A4

Test distance: 3 metres

6.6.2 Photo documentation of the test set-up

6.6.3 Test specification

Environmental conditions: Temperature: 24 ° C Humidity: 37 % Atmospheric pressure: 98 kPa

Frequency range: 5725MHz – 5875MHz

The test was carried out in the following operation mode(s):
- test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB
- test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB
- test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

6.6.4 Test result

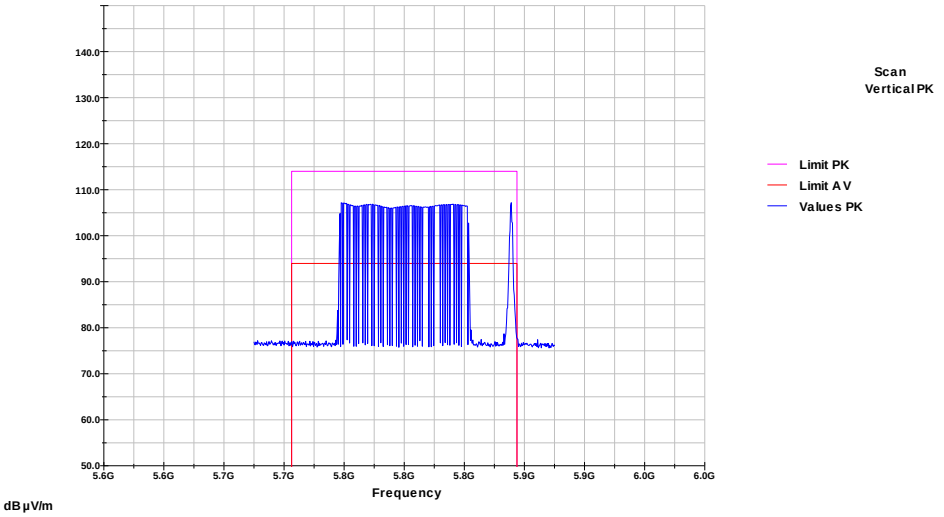
Minimal margin to limit 1,4 dB

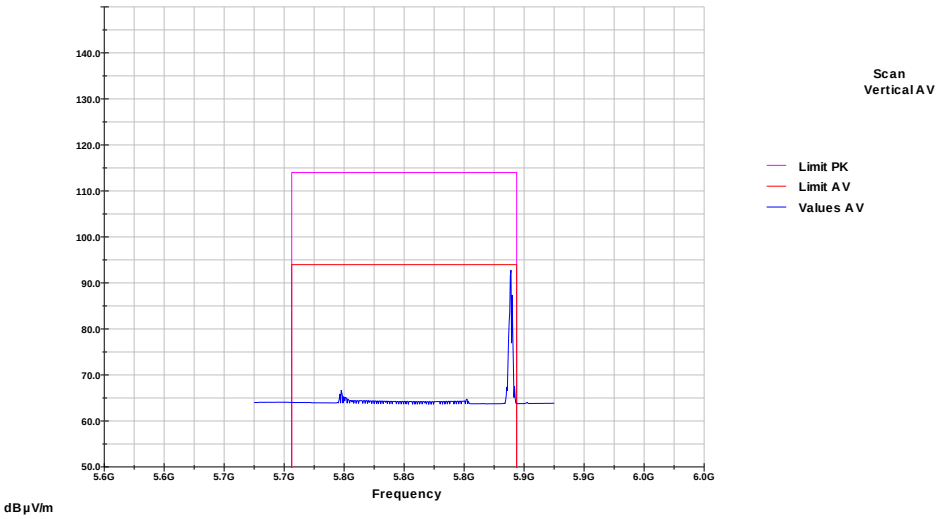
The requirements are **FULFILLED.**

Remarks: The testing was performed in vertical polarization only, pretests show the highest emission occurs in vertical polarization.

6.6.5 Test protocol

Operation mode:	test software active, CH00 (5871MHz) adjusted, attenuator set to 12dB	Result: PASS
Remarks:	none	
Date:	2012-04-10	
Tested by:	Pessinger Jürgen	





Maximum field strength measured:

Minimum margin to limit: 1,3 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
5871,2	69,4	55,0	37,8	107,2	92,7	114,0	94,0	6,8	1,3

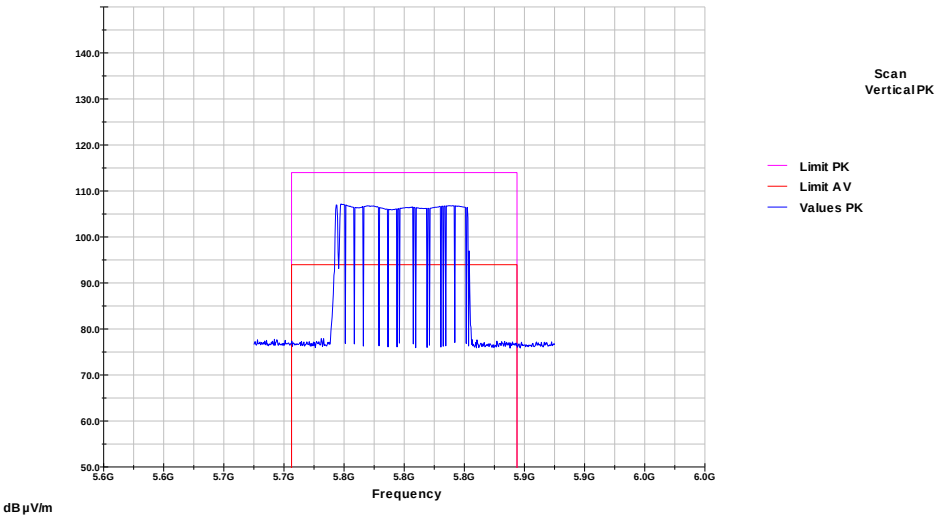
Operation mode: test software active, CH27 (5755MHz) adjusted, attenuator set to 12dB

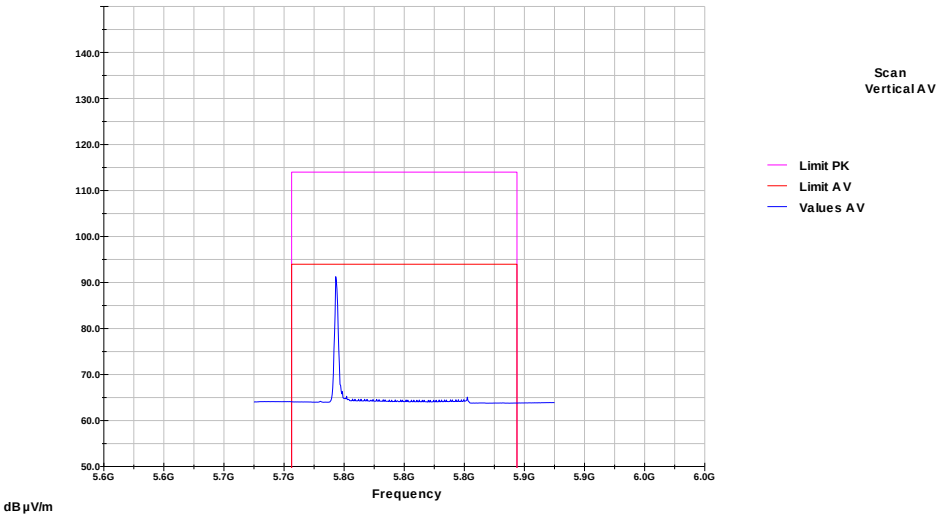
Result: PASS

Remarks: none

Date: 2012-04-10

Tested by: Pessinger Jürgen





Maximum field strength measured:

Minimum margin to limit: 2,7 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
5758,0	69,6	--	37,6	107,2	--	114,0	--	6,8	--
5754,4	--	53,7	37,6	--	91,3	--	94,0	--	2,7

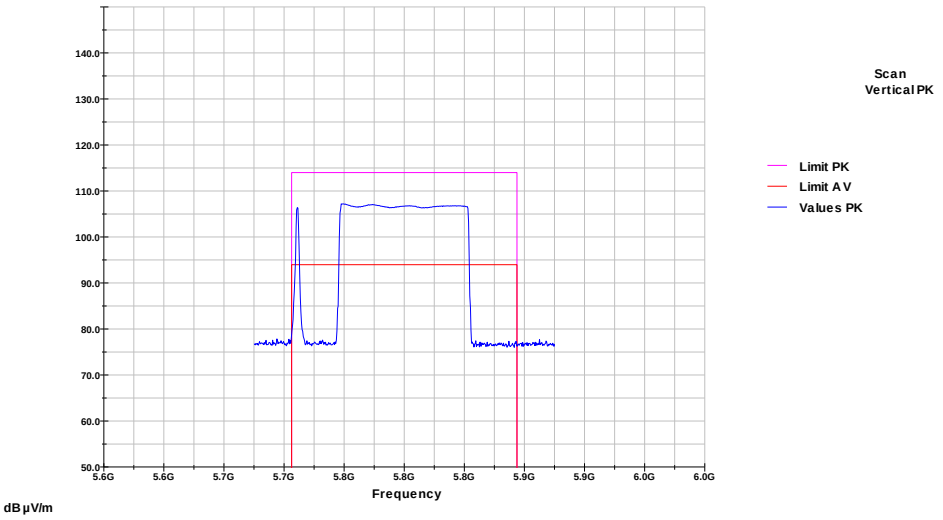
Operation mode: test software active, CH53 (5729MHz) adjusted, attenuator set to 12dB

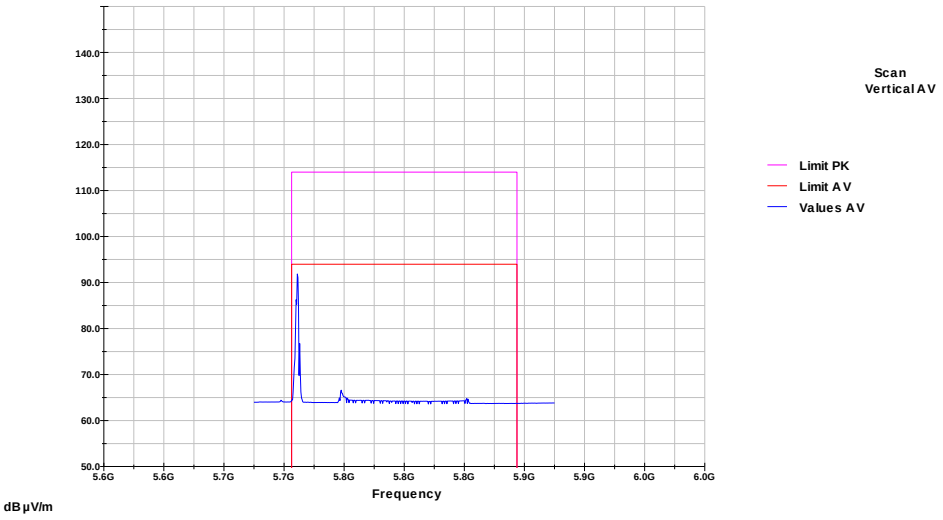
Result: PASS

Remarks: none

Date: 2012-04-10

Tested by: Pessinger Jürgen





Maximum field strength measured:

Minimum margin to limit: 2,1 dB

Frequency [MHz]	Reading [dBµV] PK	Reading [dBµV] AV	Correction [dB]	Values [dBµV/m] PK	Values [dBµV/m] AV	Limit [dBµV/m] PK	Limit [dBµV/m] AV	Margin [dB] PK	Margin [dB] AV
5728,8	69,6	54,3	37,6	107,2	91,9	114,0	94,0	6,8	2,1

7 USED TEST EQUIPMENT AND ACCESSORIES

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

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	ESH 3	01-02/03-01-005	02/01/2013	02/01/2012		
	ESH 2 - Z 5	01-02/20-01-001	26/01/2014	26/01/2011	02/02/2013	02/02/2012
	ESH 3 - Z 2	01-02/50-02-020	29/12/2012	29/12/2011		
	BNC-3000-N	01-02/50-07-008				
	N-5000-N	01-02/50-07-009				
	Tile Version 3.4K20	01-02/68-09-001				
	emitel ESW V31	01-02/68-09-002				
SER 1	ESH 3	01-02/03-01-005	02/01/2013	02/01/2012		
	FMZB 1516	01-02/24-01-018			16/02/2013	16/02/2012
	N-40000-N	01-02/50-05-043				
	N-30000-N	01-02/50-05-044				
	Tile Version 3.4K20	01-02/68-09-001				
	emitel ESW V31	01-02/68-09-002				
SER 2	ESVP	01-02/03-01-002	27/02/2013	27/02/2012		
	HM 5012	01-02/11-01-001				
	VULB 9163	01-02/24-01-006	09/11/2014	09/11/2011		
	HCC	01-02/50-01-021				
	N-40000-N	01-02/50-05-043				
	N-30000-N	01-02/50-05-044				
	Tile Version 3.4K20	01-02/68-09-001				
	emitel ESW V31	01-02/68-09-002				
	RST 070	01-05/60-02-003				
SER 3	AMF-40-005-180-24-10P	01-02/17-02-009			12/12/2012	12/12/2011
	HCC	01-02/50-01-021				
	FA210A0020000000	01-02/50-06-065				
	FA210A0050000000	01-02/50-10-005				
	Tile Version 3.4K20	01-02/68-09-001				
	emitel ESW V31	01-02/68-09-002				
	RST 070	01-05/60-02-003				
	FSP 40	02-02/11-11-001	02/09/2012	02/09/2011		
	3117	02-02/24-05-009	16/02/2013	16/02/2012		
	R1 _ 18 - 40 GHz	02-02/30-09-002			19/12/2012	19/12/2011