

Test Report

T-0503-4729-00 JP

Type / Model Name: PRIO - CONTROL A

FCC ID RGMFLASHTRIGGER01

Product Description: Flash Trigger

Applicant: Priolite GmbH

EMC -- TEST REPORT

Test Report No. :	T-0503-4729-00 JP	2013-03-11
		Date of issue

Type / Model Name : PRIO - CONTROL A

FCC ID : RGMFLASHTRIGGER01

Product Description : Flash Trigger

Applicant : Priolite GmbH

Address : Gattinger Str. 7

97076 Würzburg

Germany

Manufacturer : Priolite GmbH

Address : Gattinger Str. 7

97076 Würzburg

Germany

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



Deutsche
Akkreditierungsstelle
D-PL-12141-01-01

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 Part 15 Subpart A
October 2010

Code of Regulations Part 15 (Radio Frequency Devices), Subpart A
(General) of the Federal Communications Commission (FCC)

FCC Part 15 Subpart C
October 2010

Code of Regulations Part 15 (Radio Frequency Devices), Subpart B
(Unintentional Radiators) of the Federal Communications Commission
(FCC)

Applied Paragraphs: §15.207, §15.209, §15.249

ANSI C63.4-2009

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

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2 OVERVIEW TEST RESULT

Performed test(s)	Result		
	Passed	Failed	Not performed
Radiated disturbance (9kHz – 30MHz)	X		
Radiated disturbance (30MHz – 1000MHz)	X		
Radiated disturbance (1GHz – 25GHz)	X		
Bandedges	X		
Field strength of emission within band	X		
20dB Bandwidth	X		

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3 SUMMARY

GENERAL REMARKS:

The EuT is equipped with switches to adjust the TX power to the maximum allowed limit. The found settings will be used for serial production. The enduser will not have acces to TXpower setting.

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 : 2013-01-11

Testing concluded on : 2013-01-14

Checked by:

Tested by:

Wolfgang Straubinger

Jürgen Pessinger

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4 EQUIPMENT UNDER TEST

4.1 Photo documentation of the EuT



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Periphery:



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emitel GmbH, Ohmstrasse 1, 94342 STRASSKIRCHEN, DEUTSCHLAND Tel. / Phone: +49 (0) 94 24 94 82-0 Fax: +49 (0) 94 24 94 82-640
emG_F510_02_Rev9_0 Freigabedatum / Date of release: 2012-02-07; Autor / Author: Martin Stern
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4.2 Power supply system

Power supply voltage: 4,5 V DC (Battery supplied)

4.3 Short description of the Equipment under Test (EuT)

The EuT is used in for photography as wireless trigger for flash lights. It is used together with a camera.

Number of tested samples: 1
 Serial number: none

Dimensions: L: 10 cm W: 7 cm H: 6 cm

Frequency band(s): 2400MHz – 2483,5MHz

Operating frequency: 2441,5MHz

Number of RF-channels: 1

Comments: None

EuT operation mode:

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

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

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	
connection cable	1,5	3-wires	☐	☒	Camera Signal Generator

Peripheral devices:

Kind of equipment	Model and/or Manufacturer
Camera Signal Generator	FCC Tester, supplied by client

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5 TEST ENVIRONMENT

5.1 Address of the test laboratory

**emitel GmbH
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 GmbH.

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.

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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 its 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 dB μ V, 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 dB μ V and μ V, the following conversions apply:

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

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

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5.5.3 RADIATED DISTURBANCE

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 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	Level	+	Factor	=	Final	-	Limit	=	CISPR B
(MHz)	(dB μ V)		(dB)		(dB μ V/m)		(dB μ V/m)		(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 50 Ω /50 μ H (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.

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6 TEST CONDITIONS AND RESULTS

6.1 Radiated disturbance (9kHz – 30MHz)

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

6.1.1 Description of the test location

Test location: OATS 3

Test distance: 3 metres

6.1.2 Photo documentation of the test set-up



6.1.3 Test specification

Environmental conditions: Temperature: 19 ° C Humidity: 47 % Atmospheric pressure: 97 kPa

Frequency range: 0,009 MHz - 30 MHz

The test was carried out in the following operation mode(s):

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

6.1.4 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.

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6.1.5 Test protocol

Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen

						Minimum margin to limit:		-- dB	
Frequency [MHz]	Reading [dBμV]		Correction [dB]	Values [dBμV/m]		Limit [dBμV/m]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
--	--								

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

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6.2 Radiated disturbance (30MHz – 1000MHz)

For test instruments and accessories used see section 7 Part A 5.

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: 19 ° C Humidity: 47 % Atmospheric pressure: 97 kPa

Frequency range: 30 MHz - 1000 MHz

The test was carried out in the following operation mode(s):

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

6.2.4 Test result

Minimal margin to limit 1,4 dB at 70,87 MHz

The requirements are **FULFILLED**.

Remarks: none

File No. **T-0503-4729-00 JP**

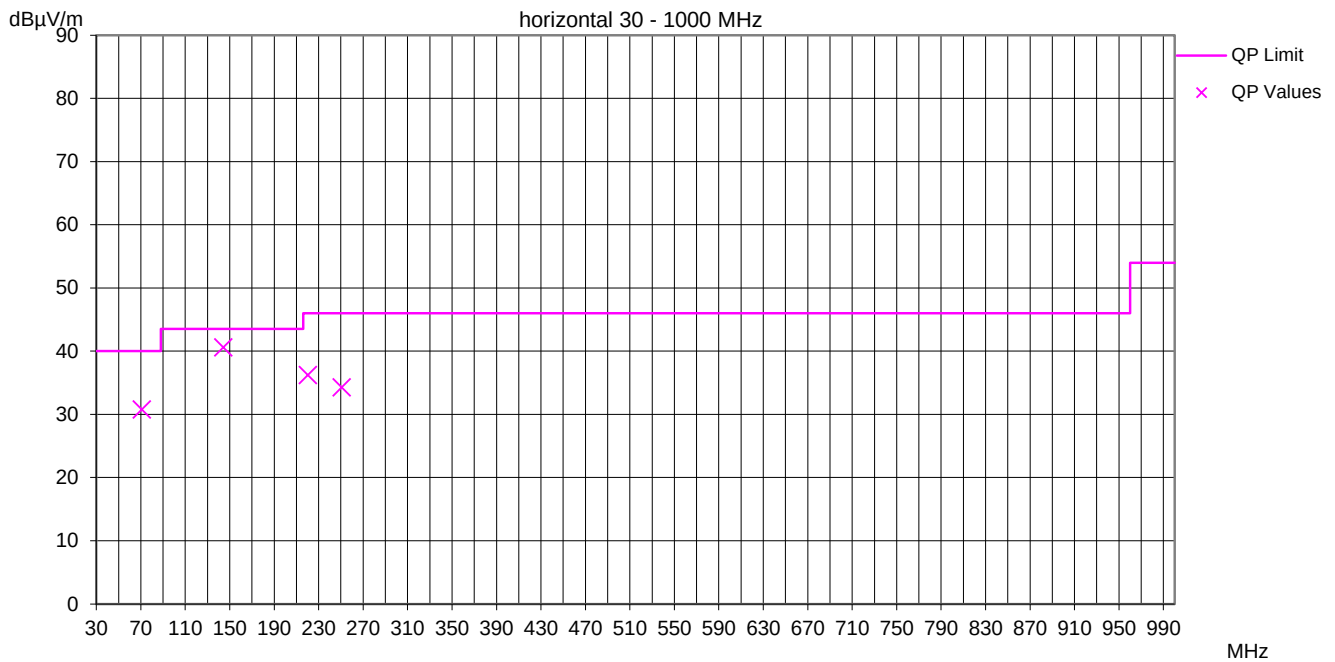
6.2.5 Test protocol

Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen



Minimum margin to limit: **2,9 dB**

Frequency [MHz]	Reading [dB μ V] QP	Correction [dB]	Values [dB μ V/m] QP	Limit [dB μ V/m] QP	Margin [dB] QP
70,890	16,9	13,9	30,8	40,0	9,2
144,399	24,8	15,8	40,6	43,5	2,9
220,531	23,2	13,0	36,2	46,0	9,8
250,724	19,7	14,5	34,2	46,0	11,8

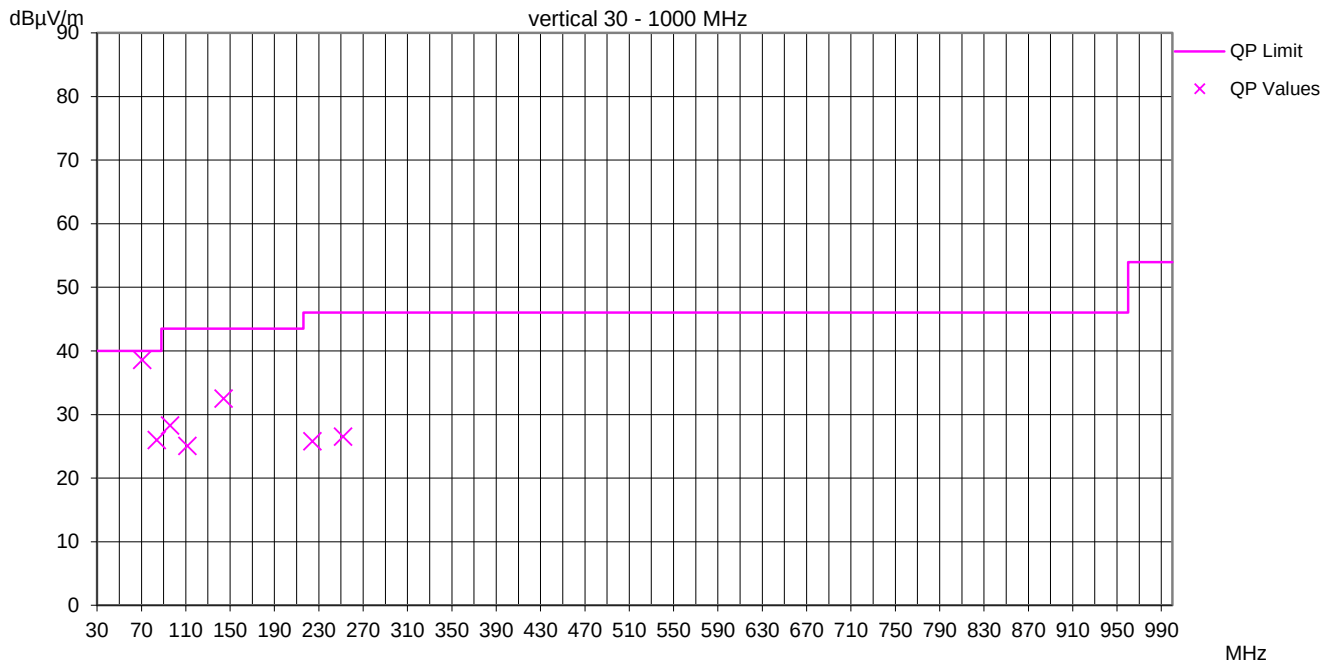
File No. **T-0503-4729-00 JP**

Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen



Minimum margin to limit: 1,4 dB					
Frequency [MHz]	Reading [dBµV] QP	Correction [dB]	Values [dBµV/m] QP	Limit [dBµV/m] QP	Margin [dB] QP
70,873	24,7	13,9	38,6	40,0	1,4
84,001	15,2	10,7	25,9	40,0	14,1
95,960	17,4	10,9	28,3	43,5	15,3
111,545	11,6	13,4	25,0	43,5	18,5
144,345	16,7	15,8	32,5	43,5	11,1
224,252	12,8	13,0	25,8	46,0	20,2
251,894	11,9	14,6	26,5	46,0	19,5

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6.3 Radiated disturbance (1GHz – 25GHz)

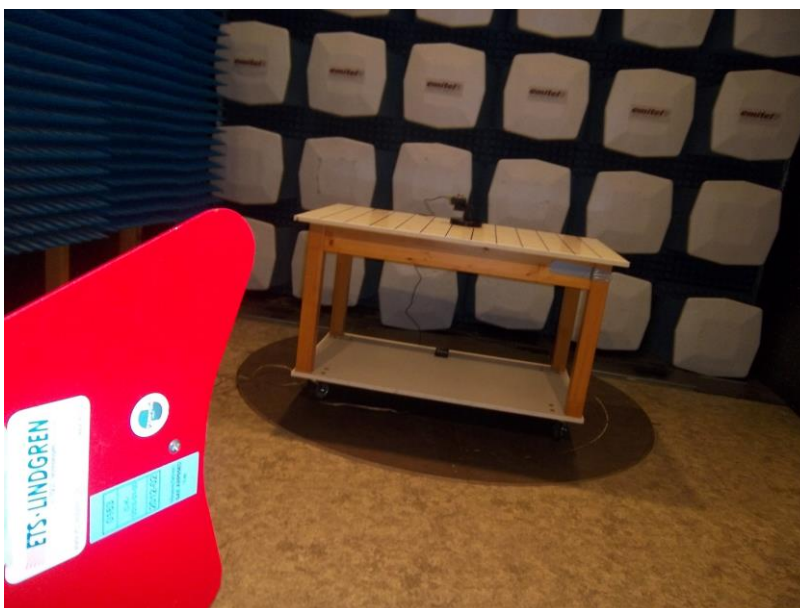
For test instruments and accessories used see section 7 Part SER 3.

6.3.1 Description of the test location

Test location: Anechoic Chamber A4

Test distance: 3 metres

6.3.2 Photo documentation of the test set-up



6.3.3 Test specification

Environmental conditions: Temperature: 22 ° C Humidity: 42 % Atmospheric pressure: 97 kPa

Frequency range: 1 GHz – 25GHz

The test was carried out in the following operation mode(s):

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

6.3.4 Test result

Minimal margin to limit 8,0 dB at 14664 MHz

The requirements are **FULFILLED**.

Remarks: none

File No. **T-0503-4729-00 JP**

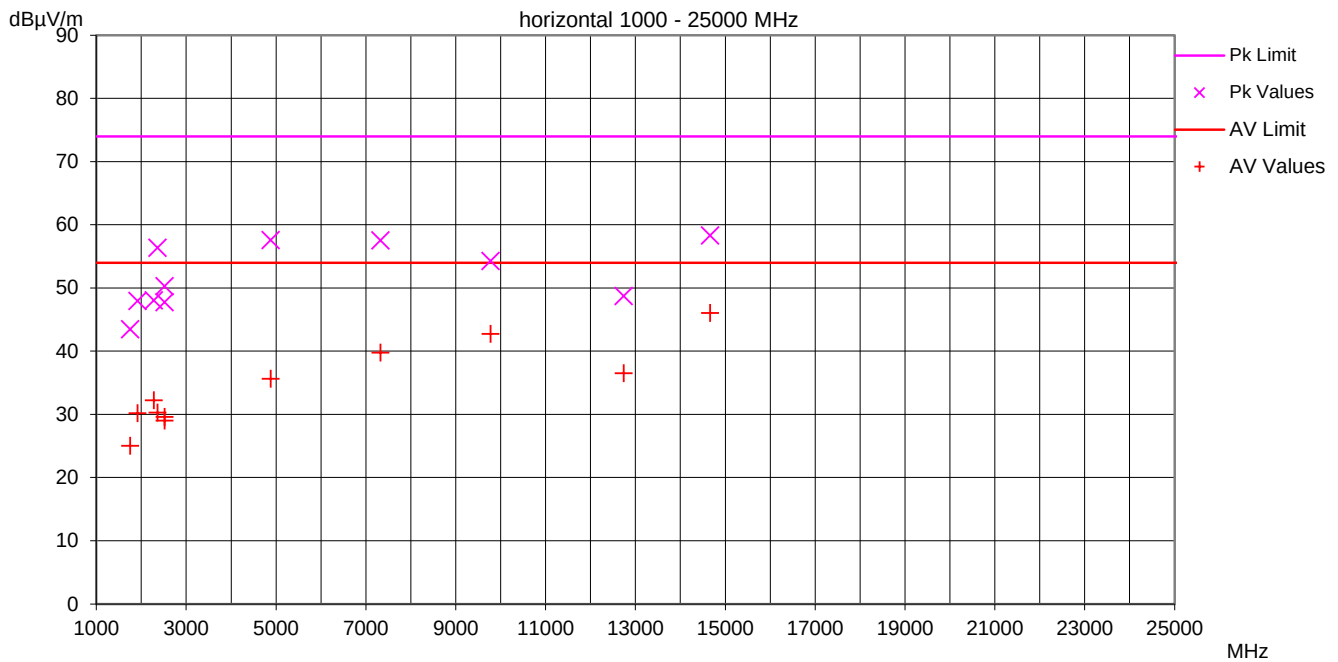
6.3.5 Test protocol

Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen



Minimum margin to limit: **8,0 dB**

Frequency [MHz]	Reading [dBµV]		Correction [dB]	Values [dBµV/m]		Limit [dBµV/m]		Margin [dB]	
	Pk	AV		Pk	AV	Pk	AV	Pk	AV
1756,000	54,9	36,4	-11,4	43,4	25,0	74,0	54,0	30,5	29,0
1918,000	57,4	39,6	-9,5	47,9	30,2	74,0	54,0	26,1	23,8
2284,000	57,2	41,4	-9,2	48,0	32,2	74,0	54,0	26,0	21,8
2362,000	65,3	39,2	-9,0	56,3	30,2	74,0	54,0	17,7	23,7
2518,000	58,0	36,8	-7,8	50,3	29,0	74,0	54,0	23,7	25,0
2524,000	55,5	37,4	-7,8	47,7	29,6	74,0	54,0	26,2	24,4
4880,000	51,0	29,0	6,6	57,6	35,6	74,0	54,0	16,4	18,4
7328,000	46,6	28,8	10,9	57,5	39,8	74,0	54,0	16,5	14,2
9774,000	40,3	28,7	14,0	54,2	42,7	74,0	54,0	19,7	11,3
12744,000	42,0	29,8	6,7	48,7	36,5	74,0	54,0	25,3	17,5
14664,000	48,6	36,4	9,6	58,3	46,0	74,0	54,0	15,7	8,0

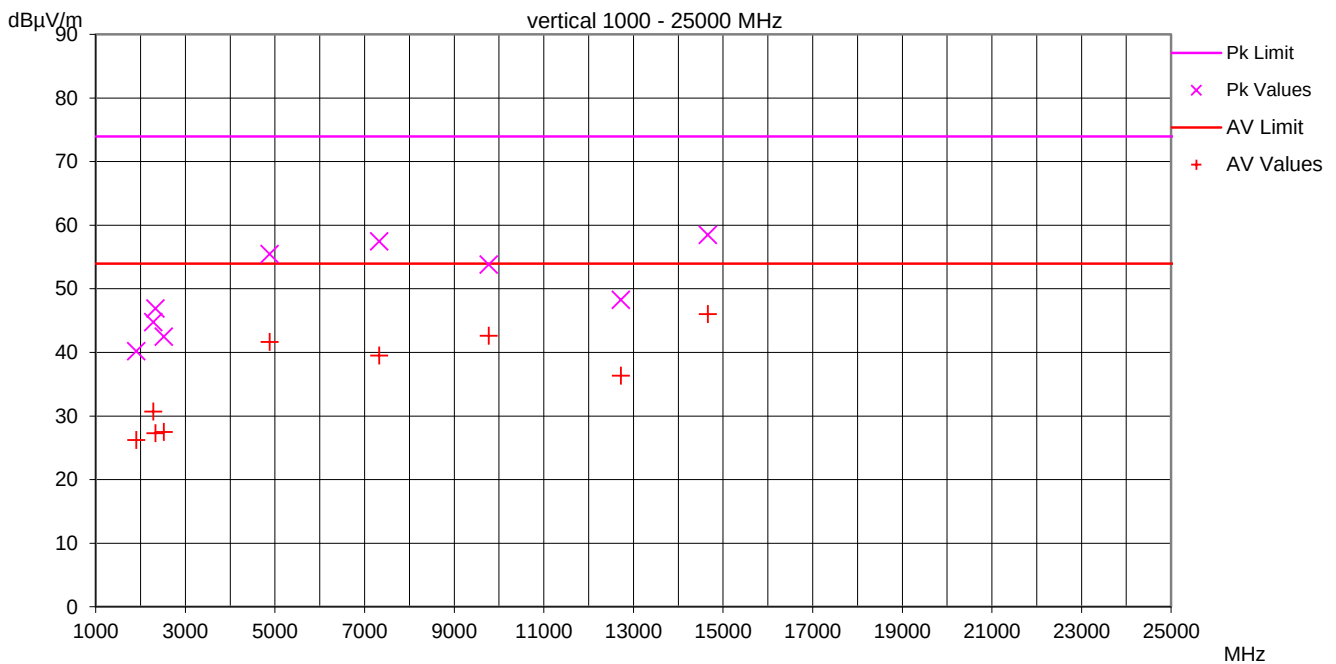
File No. **T-0503-4729-00 JP**

Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen



Minimum margin to limit: 8,0 dB

Frequency [MHz]	Reading [dBµV]		Correction [dB]	Values [dBµV/m]		Limit [dBµV/m]		Margin [dB]	
	Pk	AV		Pk	AV	Pk	AV	Pk	AV
1906,000	49,6	35,6	-9,4	40,2	26,2	74,0	54,0	33,8	27,8
2284,000	53,9	39,9	-9,2	44,7	30,7	74,0	54,0	29,2	23,3
2338,000	56,0	36,4	-9,1	46,9	27,3	74,0	54,0	27,1	26,7
2524,000	50,2	35,3	-7,8	42,4	27,5	74,0	54,0	31,5	26,5
4880,000	48,9	35,1	6,6	55,5	41,6	74,0	54,0	18,5	12,3
7328,000	46,5	28,5	10,9	57,5	39,5	74,0	54,0	16,5	14,5
9774,000	39,8	28,6	14,0	53,8	42,6	74,0	54,0	20,2	11,4
12723,000	41,5	29,6	6,8	48,2	36,3	74,0	54,0	25,7	17,6
14664,000	48,8	36,4	9,6	58,5	46,0	74,0	54,0	15,5	8,0

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6.4 Bandedges

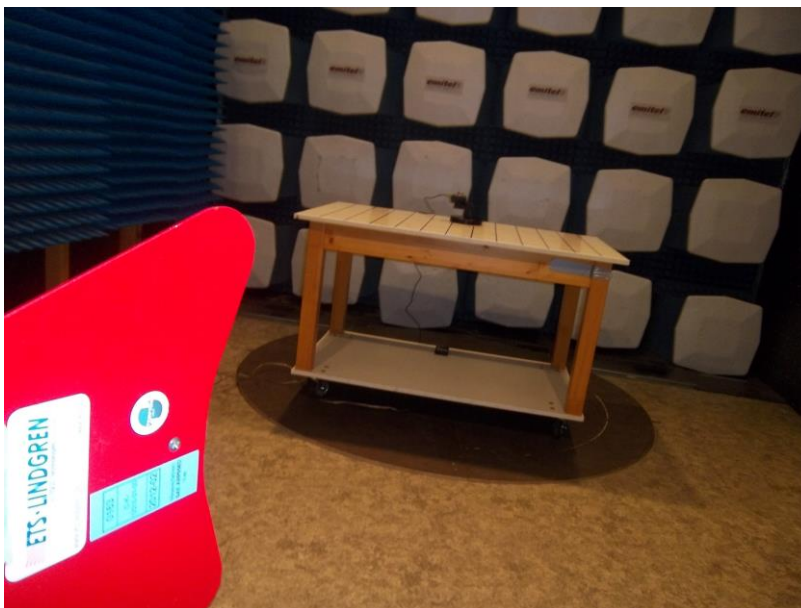
For test instruments and accessories used see section 7 Part SER 3.

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: 22 ° C Humidity: 42 % Atmospheric pressure: 97 kPa

Frequency range: 2,26 GHz – 2,625 GHz

The test was carried out in the following operation mode(s):

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

6.4.4 Test result

The requirements are **FULFILLED**.

Remarks: Pretests show the highest emissions occur in horizontal polarization.

The measurement was performed in horizontal polarization only.

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6.4.5 Test protocol

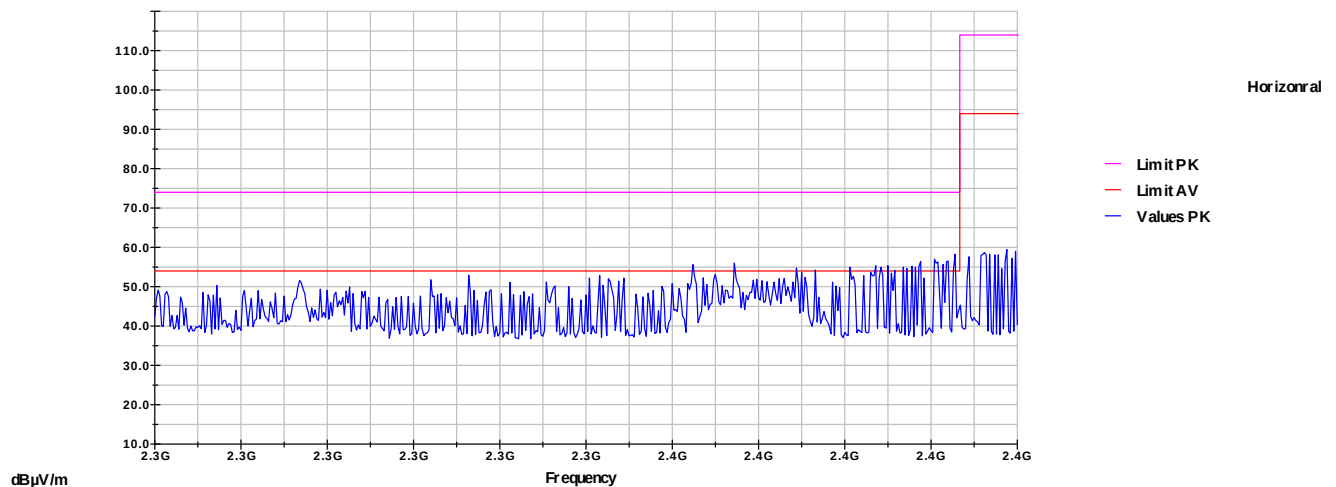
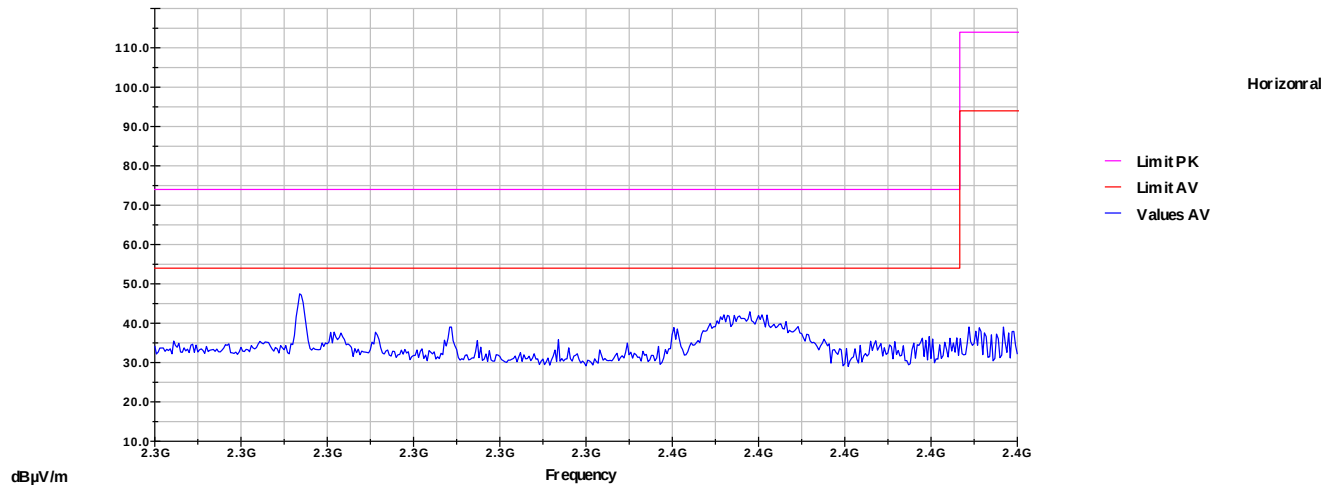
Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen

Band edge low



File No. **T-0503-4729-00 JP**

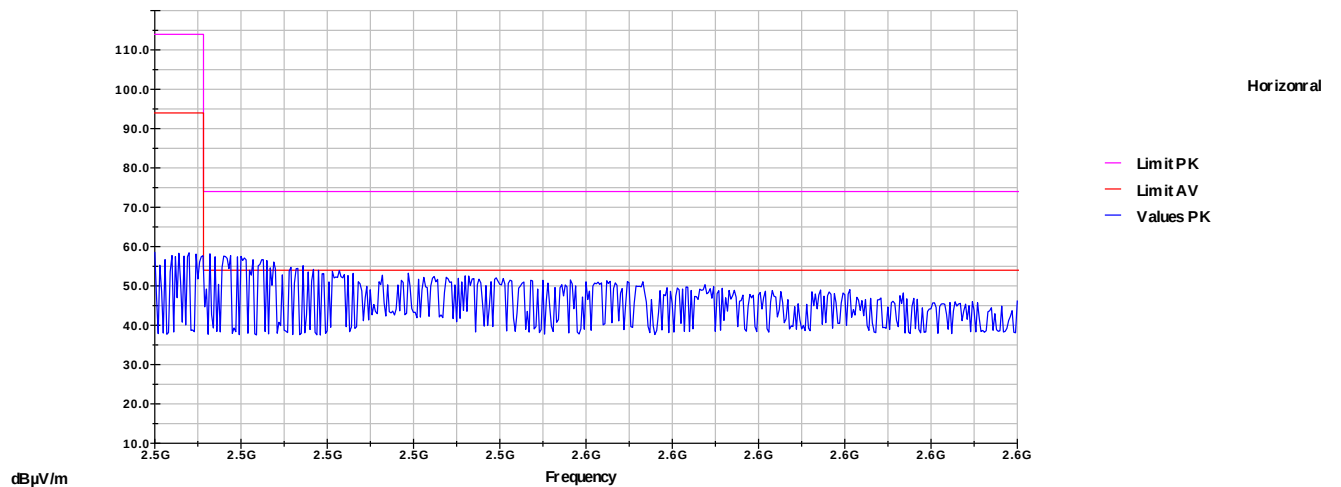
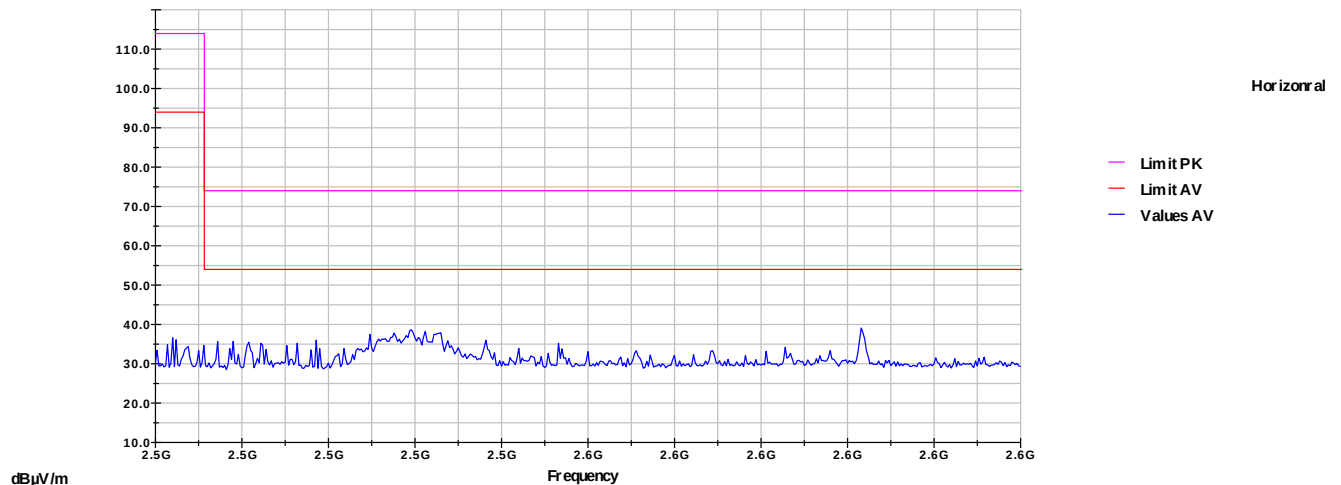
Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-14

Tested by: Pessinger Jürgen

Band edge high



File No. **T-0503-4729-00 JP**

6.5 Filed strength of emission within band

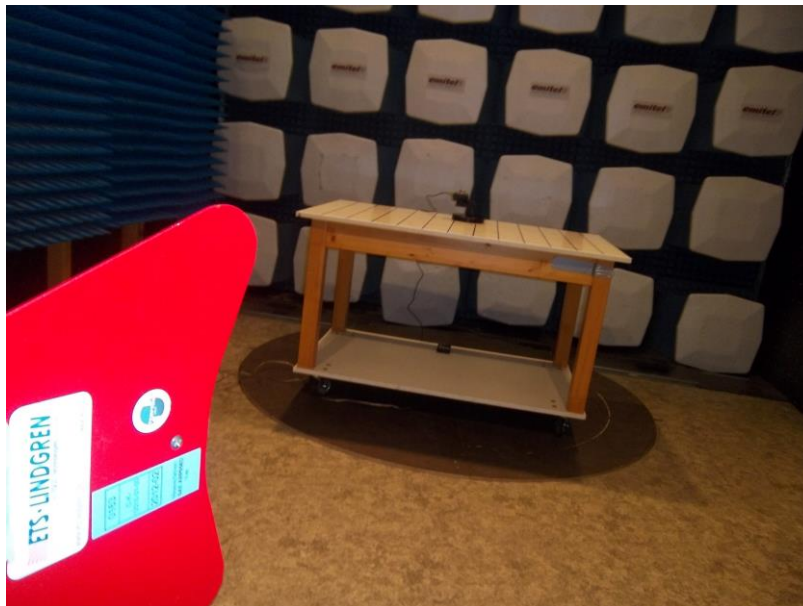
For test instruments and accessories used see section 7 Part CPR 3.

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: 22 ° C Humidity: 42 % Atmospheric pressure: 97 kPa

Frequency range: 2,4 GHz – 2,4835 GHz

The test was carried out in the following operation mode(s):

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

6.5.4 Test result

The requirements are **FULFILLED**.

Remarks: Pretests show the highest TX power occur in horizontal polarization.

The measurement was performed in horizontal polarization only.

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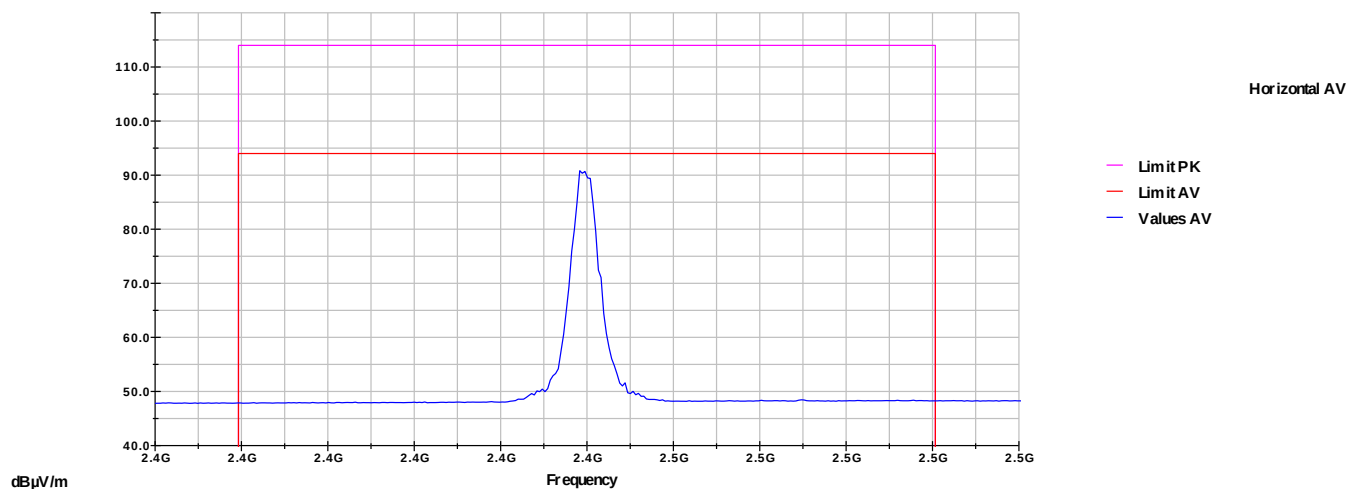
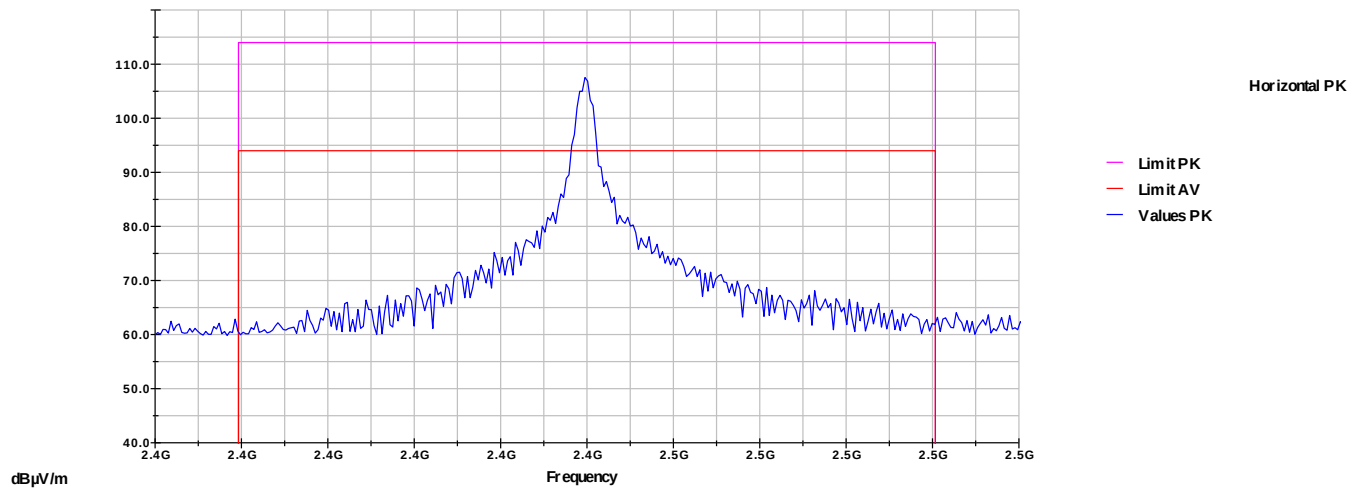
6.5.5 Test protocol

Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-11

Tested by: Pessinger Jürgen



Maximum field strength measured:

						Minimum margin to limit:		3,3 dB	
Frequency [MHz]	Reading [dBµV]		Correction [dB]	Values [dBµV/m]		Limit [dBµV/m]		Margin [dB]	
	Pk	AV		Pk	AV	Pk	AV	Pk	AV
2441,520	75,6	58,8	31,9	107,5	90,7	114,0	94,0	6,5	3,3

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6.6 20dB Bandwidth

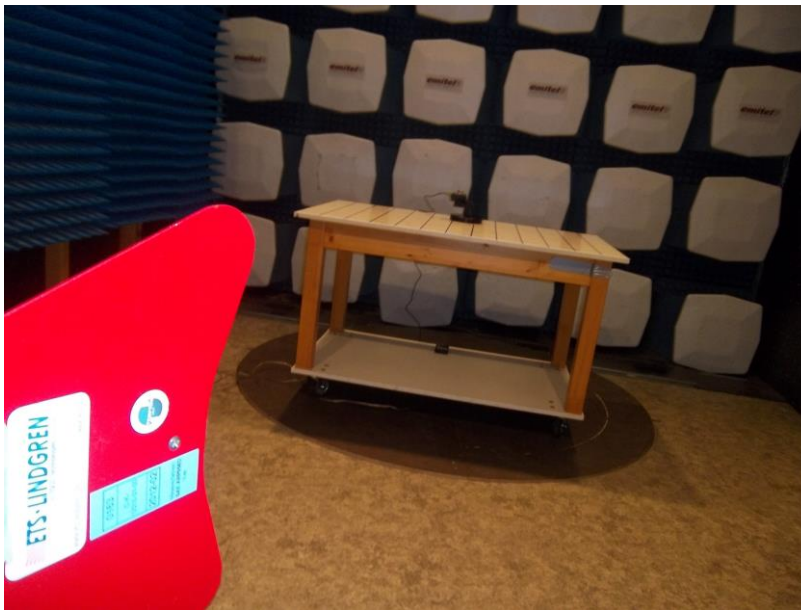
For test instruments and accessories used see section 7 Part CPR 3.

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: 22 ° C Humidity: 42 % Atmospheric pressure: 97 kPa

Frequency range: 2,4 GHz – 2,4835 GHz

The test was carried out in the following operation mode(s):

- Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6)

6.6.4 Test result

The requirements are **FULFILLED**.

Remarks: Pretests show the highest TX power occur in horizontal polarization.

The measurement was performed in horizontal polarization only.

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6.6.5 Test protocol

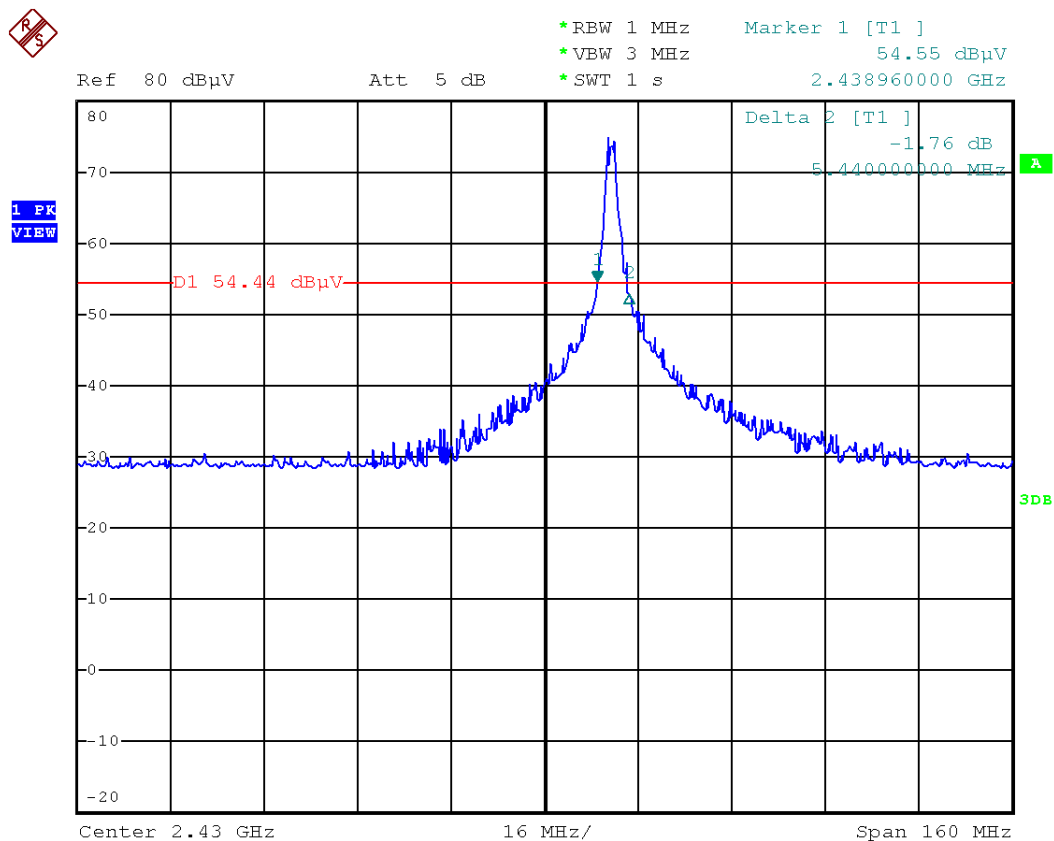
Operation mode: Flash Trigger is sent every second, power is adjusted to allowed maximum (Display shows 0,6) Result: PASS

Remarks: none

Date: 2013-01-11

Tested by: Pessinger Jürgen

Measured 20dB bandwidth: 5,44MHz



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Date: 11.JAN.2013 13:35:12

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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 3	ESH 3	01-02/03-01-005	08/01/2014	08/01/2013	16/02/2013	16/02/2012
	FMZB 1516	01-02/24-01-018				
	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				
A 5	ESVP	01-02/03-01-002	27/02/2013	27/02/2012		
	HM 5012	01-02/11-01-001				
	VULB 9168	01-02/24-03-007				
	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				
CPR 3	emitel ESW V31	01-02/68-09-002				
	FSP 7	01-02/11-05-002	25/07/2013	25/07/2012		
	FA210A0020000000	01-02/50-06-065				
	FA210A0050000000	01-02/50-10-005				
	3117	02-02/24-05-009				
SER 3			18/12/2013	18/12/2012		
	FA210A0050000000	01-02/50-10-005				
	FSP 30	02-02/11-05-001				
	AFS4-01000400-10-10P-4	02-02/17-05-003				
	AMF-4F-04001200-15-10P	02-02/17-05-004				
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	3117	02-02/24-05-009				
	R1 _ 18 - 40 GHz	02-02/30-09-002			08/01/2014	08/01/2013
	Sucoflex N-1000-SMA	02-02/50-05-072				
	Sucoflex N-1600-SMA	02-02/50-05-073				
	Sucoflex N-2000-SMA	02-02/50-05-075				

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