

EMI - TEST REPORT



Test Report No. : T34715-04-01KG	26. April 2011
	Date of issue

Type / Model Name : 1 796 6167 WLAN-Karte #MPCI-DCMA-82-MMCX

Product Description : Option REC5 IP5K Basis prog.

Applicant : SEW-Eurodrive GmbH & Co KG

Address : Ernst-Blickle-Str. 42

76646 Bruchsal

Manufacturer : SEW-Eurodrive GmbH & Co KG

Address : Ernst-Blickle-Str. 42

76646 Bruchsal

Licence holder : SEW-Eurodrive GmbH & Co KG

Address : Ernst-Blickle-Str. 42

76646 Bruchsal

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:

- | | | | | | | |
|-------------------------------------|--|--------|--------------------------|---------|-------------------------------------|---------|
| <input type="checkbox"/> | VCCI V-3
Agreement of Voluntary Control Council for Interference by Information Technology Equipment | : 2008 | <input type="checkbox"/> | Class A | <input type="checkbox"/> | Class B |
| <input checked="" type="checkbox"/> | CISPR 22
Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement | : 2008 | <input type="checkbox"/> | Class A | <input checked="" type="checkbox"/> | Class B |
| <input checked="" type="checkbox"/> | AS/NZS CISPR22
Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement | : 2006 | <input type="checkbox"/> | Class A | <input checked="" type="checkbox"/> | Class B |
| <input checked="" type="checkbox"/> | 47 CFR Part 15 Subpart B (FCC)
Telecommunication – Radio Frequency Devices – Unintentional Radiators | : 2010 | <input type="checkbox"/> | Class A | <input checked="" type="checkbox"/> | Class B |
| <input checked="" type="checkbox"/> | ICES 003
Interference-Causing Equipment Standard – Digital Apparatus | : 2004 | <input type="checkbox"/> | Class A | <input checked="" type="checkbox"/> | Class B |

FCC Rules and Regulations Part 15 Subpart A - General (October, 2010)

- | | |
|-----------------------------------|---|
| 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, 2010)

- | | |
|------------------------------------|---|
| Part 15, Subpart B, Section 15.107 | AC Line conducted emissions
<input type="checkbox"/> Class A device <input checked="" type="checkbox"/> Class B device |
| Part 15, Subpart B, Section 15.109 | Radiated emissions, general requirements |
| 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. |
| CISPR 16-4-2: 2003 | Uncertainty in EMC measurement |

2 SUMMARY

2.1 General remarks

None

2.2 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 : 30. March 2011

Testing concluded on : 08. April 2011

Checked by:

Tested by:

Thomas Weise
Dipl. Ing.(FH)
Laboratory Manager

Klaus Gegenfurtner
Dipl. Ing.(FH)

3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EUT – See Attachment A

3.2 Power supply system utilised

Power supply voltage : 115 V / 60 Hz / 1 ϕ
230 V / 50 Hz / 1 ϕ

3.3 Short description of the Equipment under Test (EuT)

The EuT is an Ethernet converter. It connects the WLAN to the Ethernet.

The EUT includes 2 identical WLAN modules (Type: 1 796 6167 WLAN-Karte #MPCI-DCMA-82-MMCX) mounted on a dedicated host PCB.

Available Features:

The WLAN client module is compatible with 802.11a/h, 802.11b and 802.11g technology. It is able to operate in the 2.4 GHz and 5 GHz frequency band.

- 802.11a Mode	5.15 GHz – 5.25 GHz and 5.725 GHz – 5.850 GHz
- 802.11b/g Mode	2400 – 2483.5 MHz
- 802.11h Mode	5.25 GHz – 5.35 GHz and 5.47 GHz – 5.725 GHz

The module uses DSSS or OFDM modulation and is capable to provide following data rates:

- 802.11b Mode	11, 5.5, 2, 1 Mbps, auto-fallback
- 802.11g Mode	54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto-fallback
- 802.11g turbo Mode	108, 96, 72, 54, 48, 36, 24, 18, 12 Mbps, auto-fallback
- 802.11a/h	54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto-fallback

The tests have been carried out at data transmission in the frequency band 2400 MHz to 2483.5 MHz

Number of tested samples: 1
Serial number: Prototype

EuT operation mode:

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

- Data transmission at 2.4 GHz - 230V AC

- Data transmission at 2.4 GHz - 115V AC

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

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

- _____ Model : _____
- _____ Model : _____
- _____ Model : _____

Modifications during the EMC test:

- 1) Ferrites in 24V DC line (24V and Ground) and 1nF Kerko COG parallel to 24V & Ground line.
- 2) Connection of all created voltages with 1nF Kerko COG's.
- 3) Ferrites (742 701 13 WE) connected on the external antenna 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 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. 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 and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

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

In compliance with 47 CFR Part 15 Subpart A Section 15.38 testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

4.4.1.2 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 other thus obtaining 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 C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

4.4.3 Conducted Emission

4.4.3.1 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 centimetres above the floor and is positioned 40 centimetres 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.

4.4.4 Radiated Emission (Electrical Field 30 MHz - 1 GHz)

4.4.4.1 Description of Measurement

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 metre 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 is established in accordance with 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 that 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 screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres, measurement scans are made with both horizontal and vertical antenna polarization planes and the EuT is rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) 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. The FCC or CISPR limit is subtracted from this result in order to provide the limit margins listed in the measurement protocols.

The resolution bandwidth during the measurement is as follows:
30 MHz – 1000 MHz: ResBW: 120 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	CISPR Limit (dBµV/m)	=	Delta (dB)
719.0	75.0	+	32.6	=	107.6	-	110.0	=	-2.4

4.4.5 Radiated Emission (Electrical Field 1 GHz - 30 GHz)

4.4.5.1 Description of Measurement

Radiated emissions from the EuT are measured in the frequency range of 1 GHz to the maximum frequency as specified in 47 CFR Part 15 Subpart A section 15.33, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 metre 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 is established in accordance with 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 screened room located outside the test area. The antenna is positioned 3 metres horizontally from the EuT.

Measurements are made in both the horizontal and vertical polarization planes in a fully anechoic room using a spectrum analyzer set to a peak detector function and a resolution and video bandwidth of 1 MHz.

All tests are performed at a test-distance of 3 metres. Hand-held or body-worn devices are rotated around three orthogonal axes in order to determine the position, angle and configuration having the maximum emission. The cables and equipment are placed and moved within the range of their likely positioning to find the maximum emissions. These conditions will then be used for the final measurements. When the EuT is larger than the bandwidth of the measuring antenna it will be moved over the surface for the four sides of the equipment. Where appropriate, the test distance may be reduced in order to demonstrate that emissions are under the limits at the specified test distance.

5 TEST CONDITIONS AND RESULTS

5.1 Conducted emission

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

Legend for tables:

QP-L ... QuasiPeak reading including correction factor

AV-L ... Average reading including correction factor

D-Limit... Measured value to limit delta (margin)

5.1.1 Description of the test location

Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up



5.1.3 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin >10 dB

The requirements are **FULFILLED**.

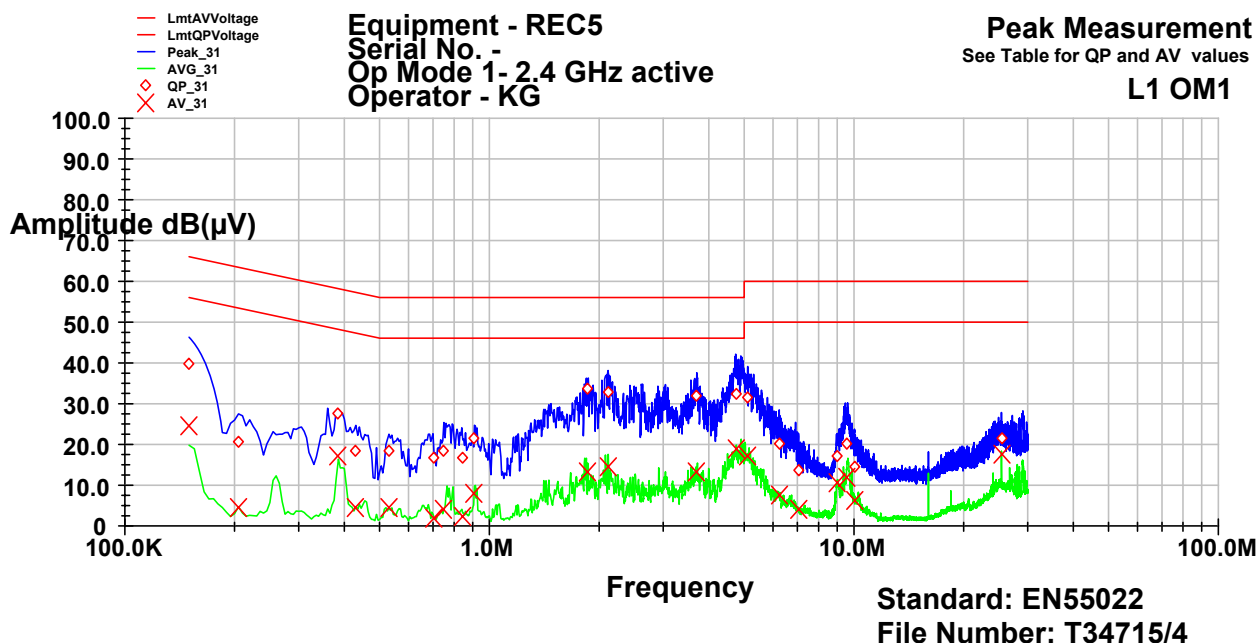
Remarks: For detailed results, please see the following page(s).
For description of the measurement see 4.5.3.

5.1.4 Test protocol

Test point: L1
 Operation mode: Data transmission at 2.4 GHz - 230V AC
 Remarks:
 Date: 30.03.2011
 Tested by: Gegenfurtner Klaus

Result: passed

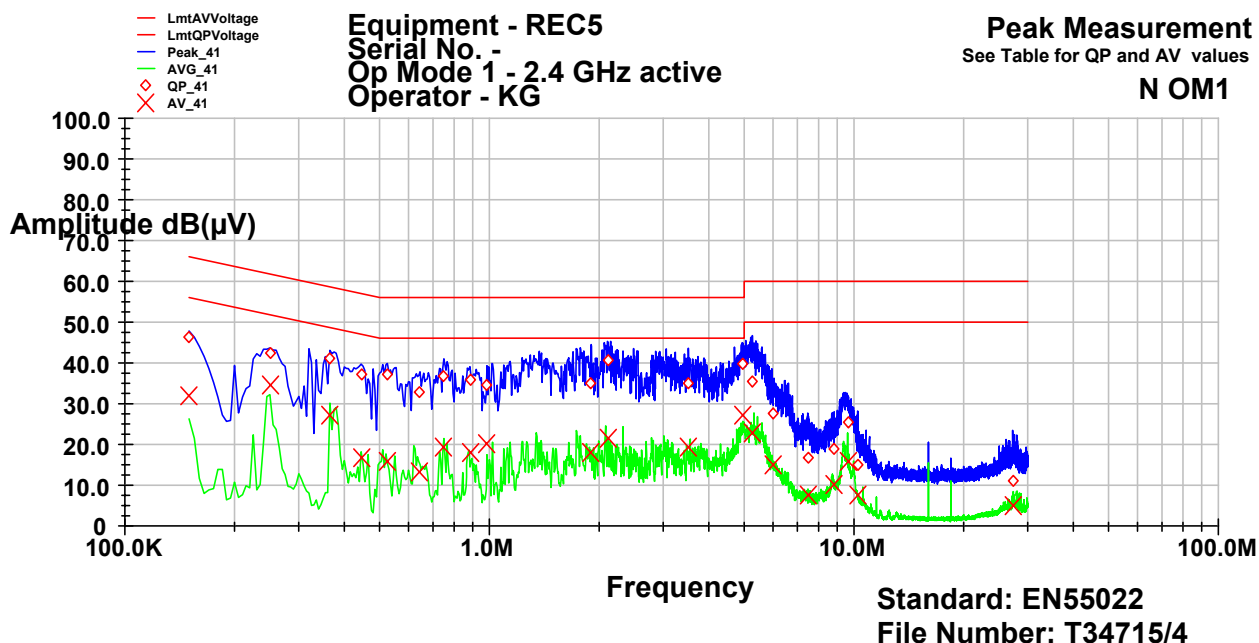
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.15	39.8	-26.2	66.0	24.5	-31.5	56.0
0.205	20.5	-42.9	63.4	4.5	-48.9	53.4
0.385	27.6	-30.6	58.2	17.2	-30.9	48.2
0.43	18.5	-38.7	57.3	4.4	-42.8	47.3
0.53	18.3	-37.7	56.0	4.5	-41.5	46.0
0.7	16.6	-39.4	56.0	2.1	-43.9	46.0
0.75	18.5	-37.5	56.0	4.2	-41.8	46.0
0.84	16.7	-39.3	56.0	2.2	-43.8	46.0
0.91	21.4	-34.6	56.0	7.9	-38.0	46.0
1.865	33.7	-22.3	56.0	13.2	-32.8	46.0
2.115	33.0	-23.0	56.0	14.6	-31.4	46.0
3.705	32.1	-23.9	56.0	13.2	-32.8	46.0
4.74	32.5	-23.5	56.0	19.1	-26.9	46.0
5.115	31.5	-28.5	60.0	17.1	-32.9	50.0
6.235	20.3	-39.7	60.0	7.5	-42.5	50.0
7.045	13.5	-46.5	60.0	4.0	-46.0	50.0
8.99	17.1	-42.8	60.0	10.8	-39.3	50.0
9.6	20.1	-39.9	60.0	11.8	-38.2	50.0
10.035	14.8	-45.3	60.0	6.1	-43.9	50.0
25.395	21.6	-38.4	60.0	17.7	-32.3	50.0



Test point: N
 Operation mode: Data transmission at 2.4 GHz - 230V AC
 Remarks:
 Date: 30.03.2011
 Tested by: Gegenfurtner Klaus

Result: passed

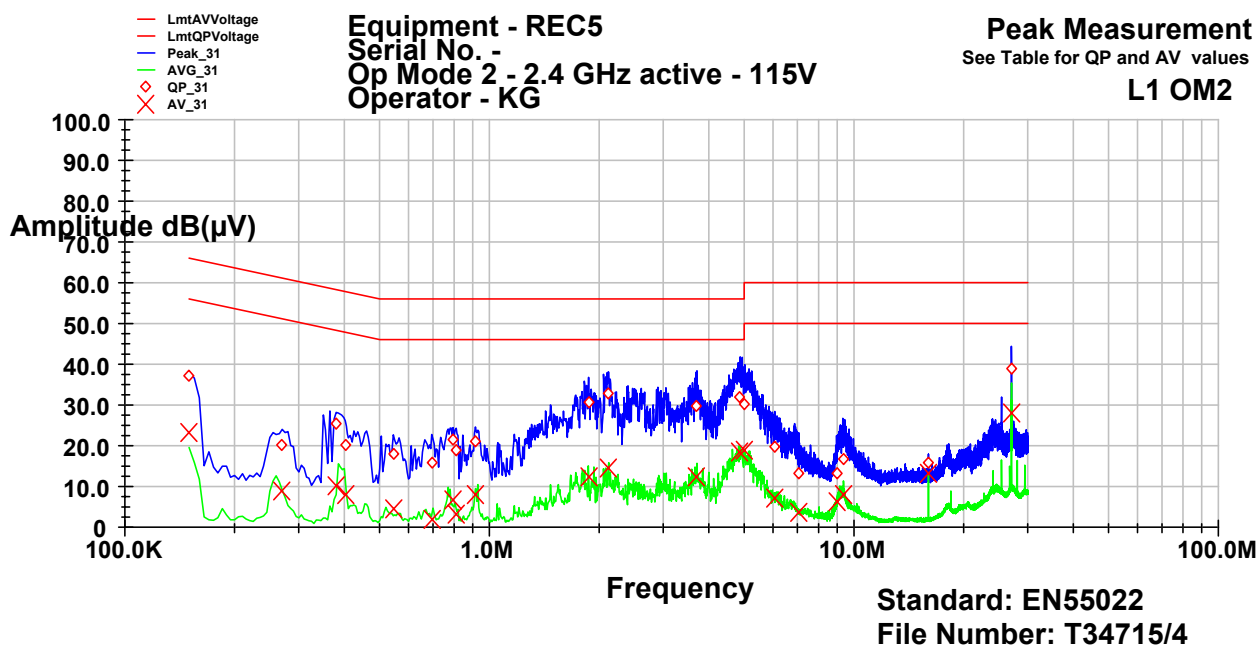
Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.15	46.4	-19.6	66.0	32.0	-24.0	56.0
0.25	42.4	-19.3	61.8	34.5	-17.2	51.8
0.365	41.2	-17.4	58.6	27.1	-21.5	48.6
0.445	37.2	-19.8	57.0	16.5	-30.4	47.0
0.525	37.3	-18.7	56.0	16.0	-30.0	46.0
0.645	32.9	-23.1	56.0	13.0	-33.0	46.0
0.75	36.6	-19.4	56.0	19.3	-26.7	46.0
0.885	35.7	-20.3	56.0	18.0	-28.0	46.0
0.985	34.4	-21.6	56.0	20.1	-25.9	46.0
1.9	34.8	-21.2	56.0	18.1	-27.9	46.0
2.11	40.5	-15.5	56.0	21.5	-24.5	46.0
3.51	35.0	-21.0	56.0	19.3	-26.7	46.0
4.94	39.6	-16.4	56.0	27.2	-18.8	46.0
5.265	35.3	-24.7	60.0	22.9	-27.1	50.0
6.03	27.5	-32.5	60.0	15.1	-34.9	50.0
7.47	16.8	-43.2	60.0	7.6	-42.4	50.0
8.825	19.0	-41.0	60.0	10.0	-40.0	50.0
9.605	25.3	-34.7	60.0	15.8	-34.2	50.0
10.235	15.0	-45.0	60.0	7.4	-42.6	50.0
27.255	10.9	-49.1	60.0	5.0	-45.0	50.0



Test point: L1
 Operation mode: Data transmission at 2.4 GHz - 230V AC
 Remarks:
 Date: 30.03.2011
 Tested by: Gegenfurtner Klaus

Result: passed

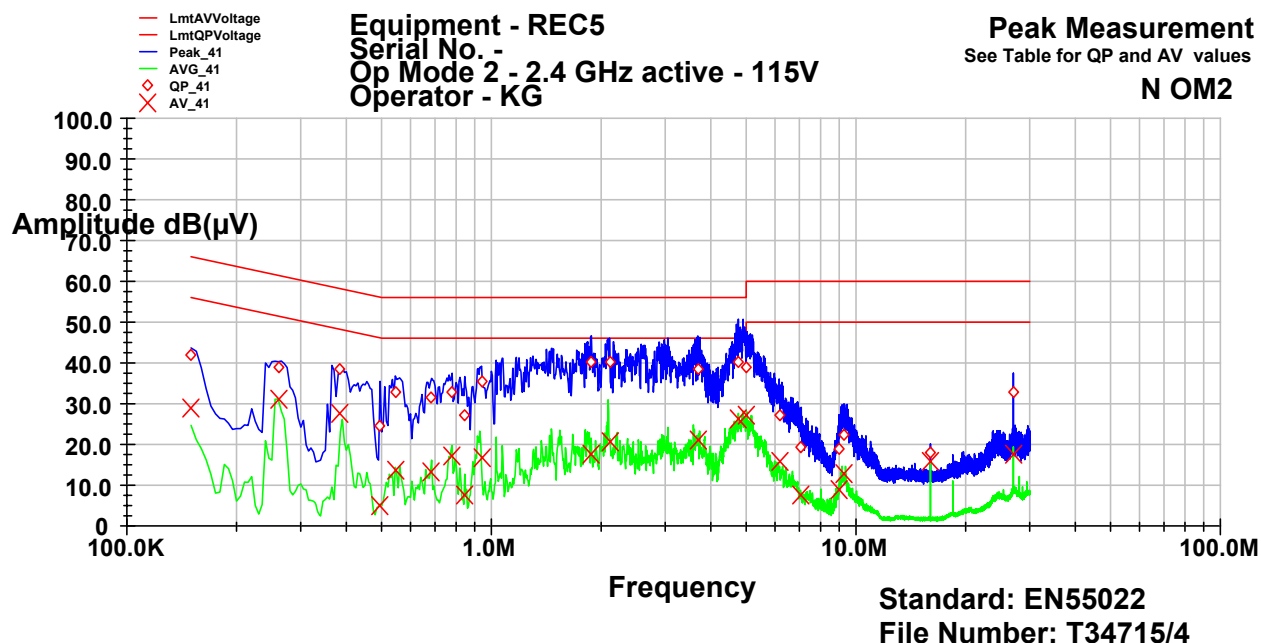
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.15	37.2	-28.8	66.0	23.4	-32.6	56.0
0.27	20.1	-41.0	61.1	8.8	-42.3	51.1
0.38	25.6	-32.7	58.3	10.1	-38.2	48.3
0.405	20.3	-37.4	57.8	8.2	-39.6	47.8
0.545	18.2	-37.8	56.0	4.5	-41.5	46.0
0.695	15.6	-40.3	56.0	2.1	-43.9	46.0
0.795	21.3	-34.7	56.0	6.5	-39.5	46.0
0.81	18.9	-37.1	56.0	3.2	-42.8	46.0
0.915	21.2	-34.8	56.0	8.0	-38.0	46.0
1.87	30.7	-25.3	56.0	12.5	-33.5	46.0
2.12	32.7	-23.3	56.0	14.4	-31.6	46.0
3.71	29.7	-26.3	56.0	12.5	-33.5	46.0
4.87	31.9	-24.1	56.0	18.4	-27.6	46.0
5.02	30.1	-29.9	60.0	18.9	-31.1	50.0
6.065	19.6	-40.4	60.0	7.2	-42.8	50.0
7.06	13.4	-46.6	60.0	3.6	-46.4	50.0
8.965	13.2	-46.8	60.0	6.3	-43.7	50.0
9.315	16.9	-43.1	60.0	7.9	-42.1	50.0
16	15.8	-44.2	60.0	13.4	-36.7	50.0
27.05	38.9	-21.1	60.0	27.8	-22.2	50.0



Test point: N
 Operation mode: Data transmission at 2.4 GHz - 230V AC
 Remarks:
 Date: 30.03.2011
 Tested by: Gegenfurtner Klaus

Result: passed

Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.15	41.9	-24.1	66.0	28.7	-27.3	56.0
0.26	38.9	-22.6	61.4	30.9	-20.5	51.4
0.385	38.5	-19.6	58.2	27.6	-20.6	48.2
0.495	24.4	-31.7	56.1	4.8	-41.2	46.1
0.545	33.0	-23.0	56.0	13.8	-32.2	46.0
0.685	31.4	-24.6	56.0	13.4	-32.6	46.0
0.78	32.9	-23.1	56.0	17.3	-28.7	46.0
0.845	27.1	-28.9	56.0	7.5	-38.5	46.0
0.94	35.3	-20.7	56.0	16.6	-29.4	46.0
1.88	40.1	-15.9	56.0	17.6	-28.4	46.0
2.11	40.0	-16.0	56.0	20.8	-25.2	46.0
3.68	38.4	-17.6	56.0	20.9	-25.1	46.0
4.755	40.1	-15.9	56.0	26.1	-19.9	46.0
5.025	38.7	-21.3	60.0	27.2	-22.8	50.0
6.155	26.9	-33.1	60.0	15.9	-34.1	50.0
7.075	19.4	-40.6	60.0	7.6	-42.4	50.0
8.99	18.7	-41.3	60.0	9.0	-41.0	50.0
9.28	22.5	-37.5	60.0	12.9	-37.1	50.0
16	18.1	-41.9	60.0	16.0	-34.0	50.0
27.03	32.8	-27.3	60.0	17.5	-32.5	50.0



5.2 Radiated emission (electric field)

For test instruments and accessories used see section 6 Part A 5.

Legend for tables:

Level vert. QuasiPeak reading including correction factor for vertically polarised antenna
 Level hor. QuasiPeak reading including correction factor for horizontally polarised antenna
 Limit Limit referred to the appropriate standard
 DLimit... Delta between limit and result (margin)
 Noise Characteristic of disturbance (narrowband or broadband)

5.2.1 Description of the test location

Test location: OATS 1
 Test distance: 10 metres

5.2.2 Photo documentation of the test set-up



5.2.3 Test result

Frequency range: 30 MHz - 1000 MHz
 Min. limit margin: 0.1 dB at 900.04 MHz

The requirements are **FULFILLED**.

Remarks: For detailed results, please see the following page(s).

For description of the measurement see 4.5.4.

No difference of emissions for power supply voltage 115V AC/60Hz and 230V AC/50Hz.

5.2.4 Test protocol

Operation mode: Data transmission at 2.4 GHz - 230V AC Result: passed
 Remarks:
 Date: 8.04.2011
 Tested by: Gegenfurtner Klaus

Radiation-Test

accd. EN 55022

Typ: REC5 **Test distance:** 10 m
Manufacturer: SEW-Eurodrive GmbH **Test receiver:** ESVS 30
Client: SEW-Eurodrive GmbH **Antenna:** VULB
Regulation: EN 55022 **Test engineer:** KG
Order No.: T34715/4 **Date:** 08.04.2011
Operation Mode: EN 55022 mode - 2,4 GHz active - Additional ferrites on antenna cables (742 701 13 WE)
Remarks: The limits are met.

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB/m)	Correct. Hor. (dB/m)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
633,35	2,8	3,0	25,0	24,8	27,8	27,8	37,0	-9,2
666,70	1,5	3,8	25,5	25,4	27,0	29,2	37,0	-7,8
700,04		1,0		25,9		26,9	37,0	-10,1
866,71	3,4	4,3	28,9	28,6	32,3	32,9	37,0	-4,1
875,04	2,1	3,7	29,0	28,7	31,1	32,4	37,0	-4,6
900,04	7,5	7,8	29,4	29,1	36,9	36,9	37,0	-0,1
966,71	2,4	2,2	30,0	29,8	32,4	32,0	37,0	-4,6

5.3 Radiated emission (electric field)

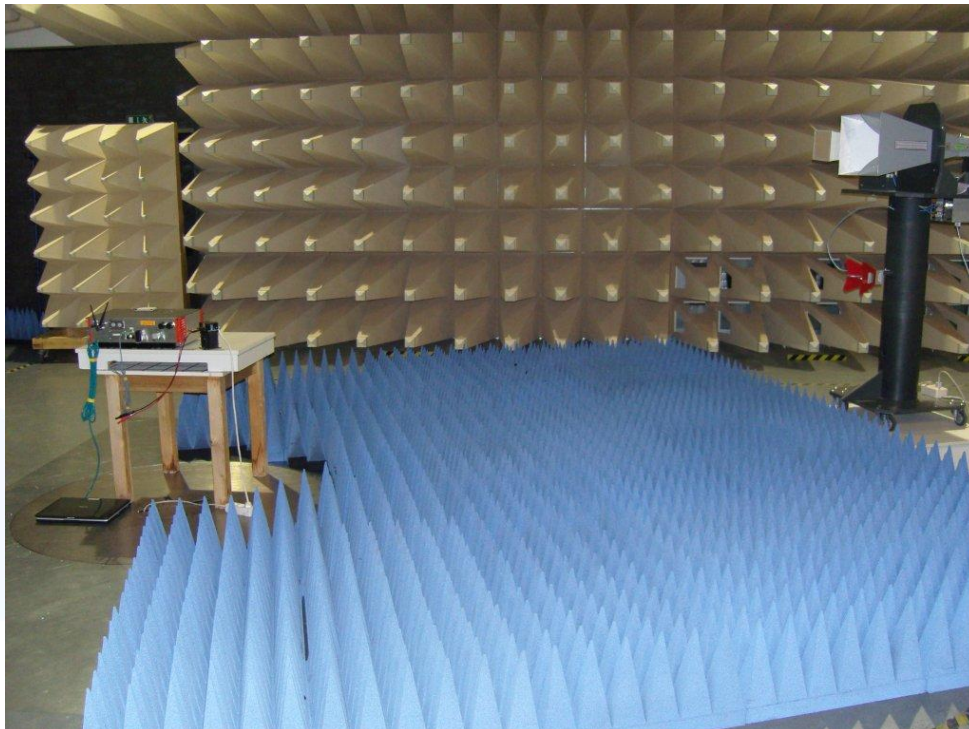
For test instruments and accessories used see section 6 Part **SER 3**.

5.3.1 Description of the test location

Test location: Anechoic Chamber A1

Test distance: 3 metres

5.3.2 Photo documentation of the test set-up



5.3.3 Test result

Frequency range: 1000 MHz - 6000 MHz

Min. limit margin AV-Limit 0.3 dB at 1966 MHz

The requirements are **FULFILLED**.

Remarks: For detailed results, please see the following page(s).

For description of the measurement see 4.5.5.

No difference of emissions for power supply voltage 115V AC/60Hz and 230V AC/50Hz.

5.3.4 Test protocol

Operation mode: Data transmission at 2.4 GHz - 230V AC Result: passed
 Remarks:
 Date: 05.04.2011
 Tested by: Knab Josef

Radiation-Test

accd. EN 55022

Typ: REC5 **Test distance:** 3 m
Manufacturer: SEW-Eurodrive GmbH **Test receiver:** FSP30
Client: SEW-Eurodrive GmbH **Antenna:** EMCO3117
Regulation: EN 55022 (AV Limit) **Test engineer:** KJ
Order No.: T34715/4 **Date:** 05.04.2011
Operation Mode: EN 55022 mode - 2.4 GHz active
Remarks: The limits are met! Ferrites (742 701 13 WE) on Antenna cables

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB/m)	Correct. Hor. (dB/m)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
1096,00	54,3	52,0	-14,1	-14,1	40,1	37,9	50,0	-9,9
1432,00	52,2	49,2	-13,9	-13,9	38,3	35,3	50,0	-11,7
1696,00	55,1	51,3	-14,0	-14,0	41,0	37,3	50,0	-9,0
1900,00	59,6		-10,4		49,2		50,0	-0,8
1966,00	60,4	51,3	-10,7	-10,7	49,7	40,6	50,0	-0,3
2326,00	58,8	52,4	-10,4	-10,4	48,4	42,0	50,0	-1,6
4312,00	39,9		3,5		43,5		54,0	-10,5
4428,00		39,2		3,4		42,6	54,0	-11,4

6 USED TEST EQUIPMENT AND ACCESSORIES

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

Test ID	Model / Type	Kind of Equipment	Manufacturer	Equipment No.
A 4	ESHS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-002
	ESH 2 - Z 5	LISN	Rohde & Schwarz München	02-02/20-05-004
	N-4000-BNC	RF Cable	mikes-testingpartners gmbh	02-02/50-05-138
	N-1500-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-140
	ESH 3 - Z 2	Pulse Limiter	Rohde & Schwarz München	02-02/50-05-155
A 5	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006
	VULB 9168	Trilog Broadband Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-005
	S10162-B	RF Cable 33 m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20 m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
SER 3	FSP 30	Spectrum Analyser	Rohde & Schwarz München	02-02/11-05-001
	AFS4-01000400-10-10P-4	RF Amplifier 1 - 4 GHz	PARZICH GMBH	02-02/17-05-003
	AMF-4F-04001200-15-10P	RF Amplifier 4 - 12 GHz	PARZICH GMBH	02-02/17-05-004
	3117	Horn Antenna 1 - 18 GHz	EMCO Elektronik GmbH	02-02/24-05-009
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-075
	Multiflex 141-SMA-N-1500	Coaxcable	novotronik Signalverarbeitung	02-02/50-09-015
	Multiflex 141-SMA-N-1500	Coaxcable	novotronik Signalverarbeitung	02-02/50-09-016