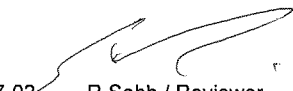


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Auftraggeber: <i>Client:</i>		Minebea Co., Ltd. 1-1-1 Katase Fujisawa City, Kanagawa 251-5831 Japan	
Gegenstand der Prüfung: <i>Test item:</i>		Wireless Keyboard System	
Bezeichnung: <i>Identification:</i>	VGP-WKB9US (representative sample)	Serien-Nr.: <i>Serial No.:</i>	2000232, 2000241, 2000236
Wareneingangs-Nr.: <i>Receipt No.:</i>	213080532-1	Eingangsdatum: <i>Date of receipt:</i>	2008-06-05
Prüfört: <i>Testing location:</i>	TÜV Rheinland Japan Ltd. - Global Technology Assessment Center 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan		
Prüfgrundlage: <i>Test specification:</i>	47 CFR Part 15 (Subpart: B) 47 CFR Part 15.247 (Subpart: C) ANSI C63.4-2003 Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005 RSS-210 (Issue 7): 2007 RSS-Gen (Issue 2): 2007		
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland Japan Ltd. - Global Technology Assessment Center 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan		
geprüft/ tested by:		kontrolliert/ reviewed by:	
 2008-07-02 T. Sauter / Inspector		 2008-07-02 R. Sehb / Reviewer	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
Sonstiges / Other Aspects:			
See Section 1.General Remarks.			
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet		Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			

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TEST SUMMARY

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1. General Remarks

This report is applicable for both VGP-WKB9US and VGP-WKB9CA, since they are the same products. The difference is only the suffix based on the country of destination.

1.1 Complementary Materials

All attachments are integral parts of this test report.

1.2 FCC Cross-Reference Table

The results of emission measurements and product related information contained in this test report and the attached materials relate to the contents of the FCC standard report in the following way:

FCC § / Heading

1.1 Product Description	See 3.1
1.2 Tested System Details	See 4.2
1.3 Test Methodology	See 4.1
1.4 Test Facility	See 2.1
3.2 EUT Exercise Software	See 4.3
3.3 Special Accessories	See 4.4
3.4 Equipment Modifications	See 4.5
3.5 Configuration of Tested System	See 4.2
4.1 Block Diagram	See 3.6

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2. Test Sites

2.1 Test Facilities

TÜV Rheinland Japan Ltd. - Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communication Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules.

The description of the test facility is listed under FCC registration number 299054

The Industry Canada has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance
The description of the test facility is listed under O.A.T.S filing number 3466B.

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2.2 List of Test and Measurement Instruments

Test Equipment calibration is traceable to NIST

Table 1: List of Test and Measurement Equipment

kind of equipment	manufacturer	type	S/N	calibrated until
RECEIVER	ROHDE & SCHWARZ	ESU8	100025	2009-02
RECEIVER	ROHDE & SCHWARZ	ESU40	100029	2009-01
SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSP30	10006/30	2008-08
ANTENNA	SCHWARZBECK	VULB9168 (30 - 1000M)	0245	2009-05
ANTENNA	SCHWARZBECK	BBHA9120B	419	2009-05
ANTENNA	TOYO	HAP06-18W	00000025	2009-05
ANTENNA	TOYO	HAP18-26N	00000010	2008-03
PRE AMPLIFIER	TSJ	MLA-10K01-B01-35	1370750	2009-04
PRE AMPLIFIER	TOYO	TPA0108-40	0634	2008-12
POWER METER	Agilent	N1911A	MY45101408	2009-01
POWER SENSOR	Agilent	N1921A	MY45241752	2009-01
DC POWER SUPPLY	Agilent	E3646A	MY40004642	N/A
RF SELECTOR	TOYO CORPORATION	NS4900	N/A	2009-01

2.3 Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emissions	< 1GHz	±0.39dB
	> 1GHz	±0.68dB
Radiated Emission	9kHz-30MHz	±4.77dB
	30-1000MHz	±5.11dB
	1000-40GHz	±5.19dB

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3. General Product Information

3.1 Product Function and Intended Use

The **EUT** (Equipment Under Test) VGP-WKB9US/VGP-WKB9CA is used for Wireless Keyboard System intended to be produced for the general market. VGP-WKB9US/VGP-WKB9CA is a keyboard and used with VGP-WRC4 which is plugged inside a PC for wireless keyboard connectivity.

3.2 System Details

Radio Standard:	IEEE 802.15.4
Power output:	-2.66dBm (max. peak power: 0.54mW)
Antenna gain:	+2.0 dBi
Antenna type:	Printed antenna
Mounting type:	Internal
Frequency range:	2402 – 2479 MHz
Number of channel:	78
Channel spacing:	1 MHz
Modulation type:	GFSK (Gaussian Frequency Shift Keying)
FCC Classification:	DTS – Part 15 Digital Telecommunication System
Emission Designator:	F1D
System Input Voltage:	DC 3.0V (2 x 2 AA Alkaline Battery)
Typical Nominal Voltage:	DC 3.0V (2 x 2 AA Alkaline Battery)
Protection Class:	III

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3.2.1 Antenna Requirements FCC 15.203, FCC 15.204 and RSS-210 A8.4

RESULT:**PASS**

The EUT has an internal antenna which is not user accessible. Hence it complies with the requirements.

3.3 Clock Frequencies

The EUT generates internally following clock frequencies:

- 32.768 kHz
- 8 MHz
- 12 MHz

3.4 Independent Operation Modes

The system was configured for testing in a typical fashion (as a customer would normally use it).

Testing was performed at the lowest operating frequency (2402 MHz), the operating frequency in the middle of the specified frequency band (2440 MHz) and the highest operating frequency (2479 MHz).

The basic operation modes are:

Operation modes for Radio (FCC part 15 subpart C);

- A1. EUT transmits at lowest Channel (2402MHz) with modulation.
- A2. EUT transmits at middle Channel (2440MHz) with modulation.
- A3. EUT transmits at highest Channel (2479MHz) with modulation.

Operation modes for Receiving/Digital Interface (FCC part 15 subpart B);

- a1. EUT receives packets.
- a2. Key entering mode

3.5 Noise Suppressing Parts

See the submitted schematic and block diagram.

3.6 Block Diagram

Figure 1: Block diagram for Radiated testing set up

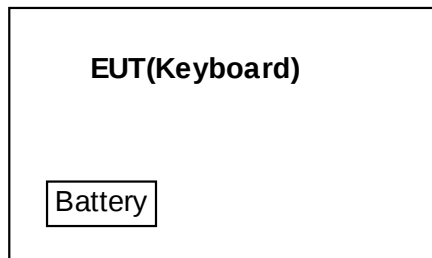
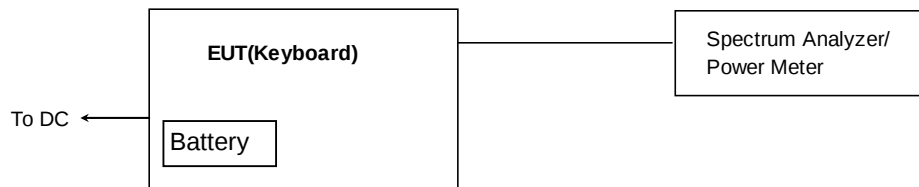


Figure 2: Block diagram for Conducted testing set up



For conducted tests, the antenna was replaced by a 50Ω antenna connector.

4. Test Set-up and Operation Modes

4.1 Test Methodology

The test methodology used is based on the requirements of 47 CFR Part 15 (2007-04-05), sections 15.31, 15.33, 15.35, 15.205, 15.209 and Measurement of Digital Transmission Systems Operating under Section 15.247.

The test methods, which have been used, are based on ANSI C63.4: 2003 and RSS-Gen.

4.2 Physical Configuration for Testing

Refer to section: Photographs of the Test Set-Up and Section 3.6.

4.3 Test Operation and Test Software

The EUT had built-in test modes.

The EUT was exercised in the operation modes listed in section 3.4 as appropriate.

4.4 Special Accessories and Auxiliary Equipment

None.

4.5 Countermeasures to achieve EMC Compliance

No additional measures were employed to achieve compliance.

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5. Test Results Conducted Testing At Antenna Port

For conducted tests, the antenna was replaced by a 50Ω antenna connector.

5.1.1 Conducted Output Power at Antenna Terminals FCC 15.247(b)(3) and RSS-210 A8.4

RESULT:
PASS

Date of testing: 2008-06-04

Ambient temperature: 20.0 °C

Relative humidity: 54 %

Atmospheric pressure: 1011hPa

Requirements:

For systems using digital modulation in the 2400-2483.5MHz band the maximum peak output power is 1 watt (30 dBm).

Test procedure:

ANSI C63.4-2003, RSS-Gen 4.8 and Measurement of Digital Transmission Systems Operating under Section 15.247.

The maximum peak output power (conducted) was measured directly (without additional cable) at the antenna connector with the power meter.

The EUT was connected to a DC power supply with a voltage of 3.0V simulating a full battery.

Table 2: Conducted output power

Frequency (MHz)	Limit (dBm)	Limit (mW)	Output (dBm)	Output (mW)	Margin (dB)
2402	30	1000	-2.66	0.54	32.66
2440	30	1000	-3.28	0.47	33.28
2479	30	1000	-4.03	0.40	34.03

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5.1.2 6dB Bandwidth FCC 15.247(a)(2) and RSS-210 A8.2(a)**RESULT:****PASS**

Date of testing: 2008-06-04

Ambient temperature: 20.0 °C

Relative humidity: 54 %

Atmospheric pressure: 1011hPa

Requirements:

For systems using digital modulation in the 2400-2483.5MHz band the minimum 6dB bandwidth shall be at least 500 kHz.

Test procedure:

ANSI C63.4-2003, RSS-Gen 4.6.2 and Measurement of Digital Transmission Systems Operating under Section 15.247.

The output connector is connected to a spectrum analyzer. The spectrum analyzer resolution bandwidth was set to 100kHz and SPAN is greater than RBW (5MHz). The 6dBc Bandwidth was measured by using the DELTA MARKER function of the spectrum analyzer.

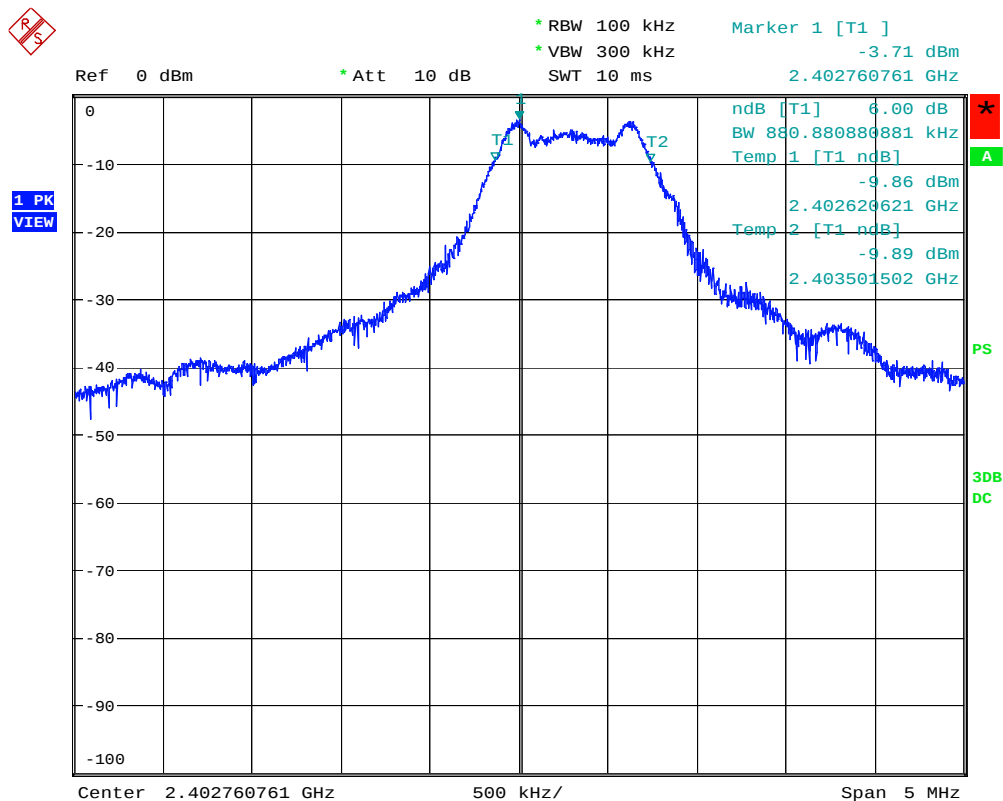
The EUT was connected to a DC power supply with a voltage of 3.0V simulating a full battery.

Table 3: 6dB Bandwidth

Frequency (MHz)	Limit (kHz)	6dB Bandwidth (kHz)
2402	500	880.9
2440	500	898.4
2479	500	883.4

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Figure 3: 6dB Bandwidth of 2402MHz (Mode A1)

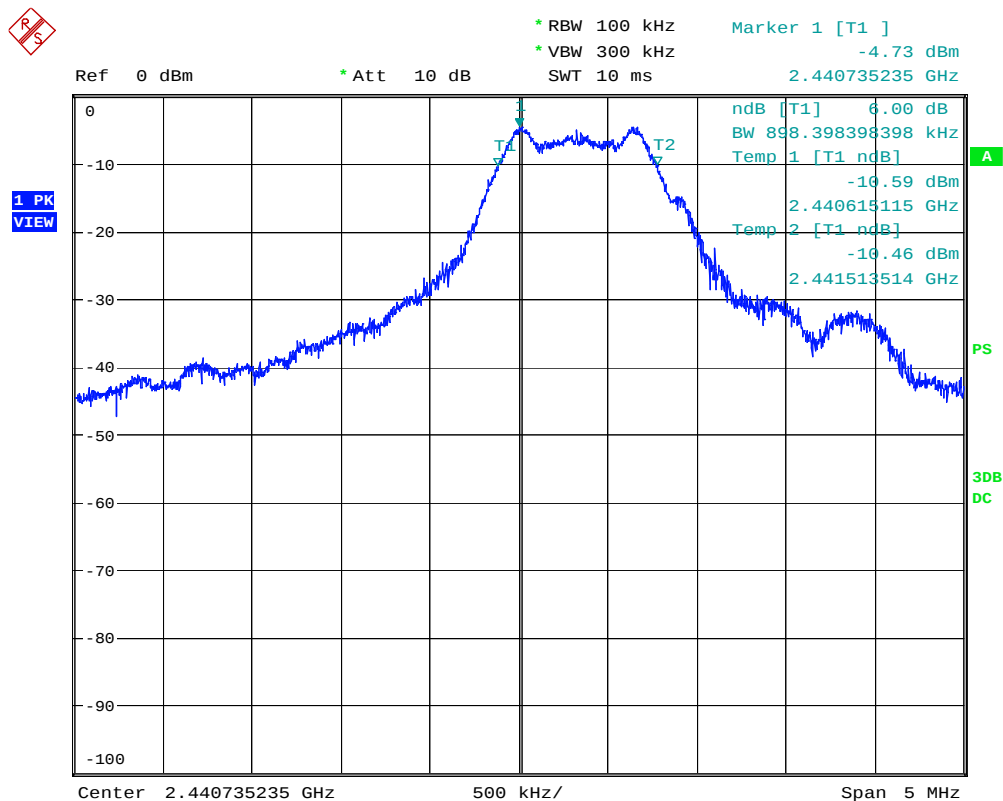


6dB bandwidth 2402MHz

Date: 4.JUN.2008 14:35:06

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Figure 4: 6dB Bandwidth of 2440MHz (Mode A2)

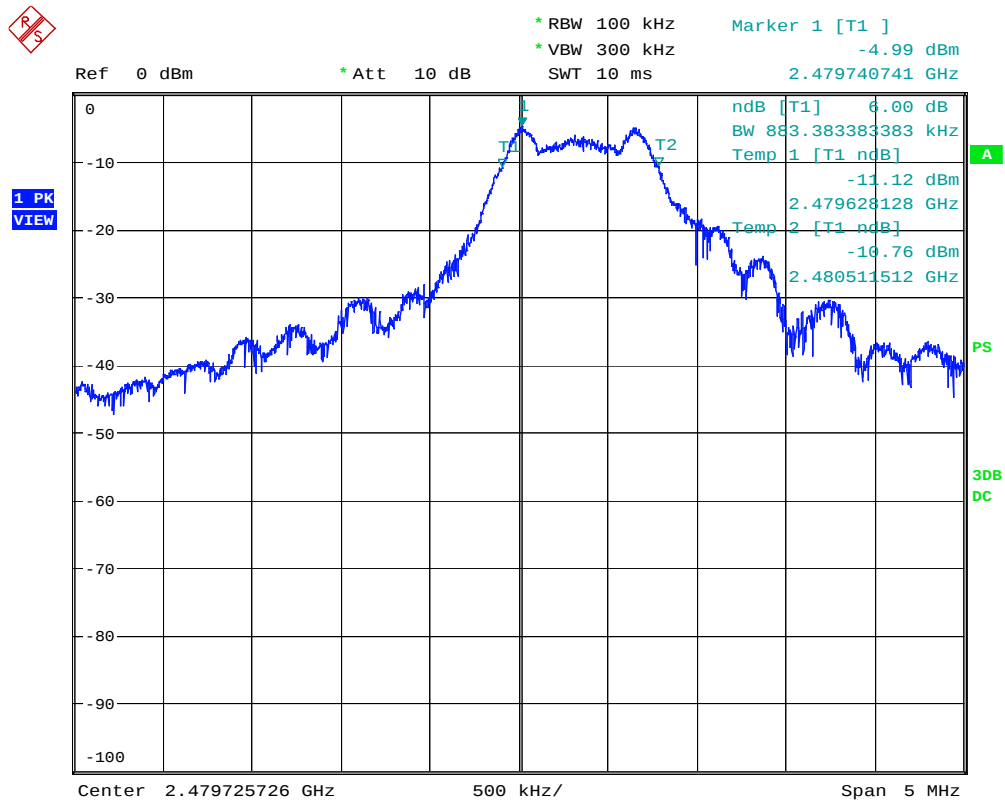


6dB bandwidth 2440MHz

Date: 4.JUN.2008 14:39:38

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Figure 5: 6dB Bandwidth of 2479MHz (Mode A3)



6dB bandwidth 2479MHz

Date: 4.JUN.2008 14:42:47

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5.1.3 Conducted Spurious Emissions FCC 15.247(d) and RSS-210 A8.5

RESULT:
PASS

Date of testing: 2008-06-04

Ambient temperature: 21.0 °C

Relative humidity: 50 %

Atmospheric pressure: 1011hPa

Requirements:

In any 100 kHz bandwidth outside the frequency band, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Test procedure:

ANSI C63.4-2003, RSS-Gen 4.9 and Measurement of Digital Transmission Systems Operating under Section 15.247

A spectrum analyzer was connected to the antenna port of the transmitter. Spectrum analyzer Resolution Bandwidth was set to 100 kHz. For each channel investigated, the in-band and out-of-band emission measurements were performed. The out-of-band emissions were measured from 30 MHz to 25 GHz (10th harmonics).

The EUT was connected to a DC power supply with a voltage of 3.0V simulating a full battery.

Table 4: Conducted Spurious Emissions of 2402MHz (Mode A1)

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Emission level (dBm)	Margin (dB)
2403.40	N/A	-4.97	-0.61	-5.58	N/A
299.93	-25.58	-58.04	-0.19	-58.23	32.65
801.92	-25.58	-44.63	-0.37	-45.00	19.42
1600.60	-25.58	-42.91	-0.53	-43.44	17.85
3202.20	-25.58	-55.16	-0.76	-55.92	30.34
4003.00	-25.58	-56.69	-0.86	-57.55	31.97
7210.00	-25.58	-46.68	-1.15	-47.83	22.25
9610.00	-25.58	-49.05	-1.33	-50.38	24.80

Notes : 1) Limit = (Reading fundamental) + (Correction factor) – 20

2) Emission level = (Reading) + (Correction factor)

3) Correction factor = Cable loss

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Figure 6: Operating 2402MHz (Mode A1) spurious from 30MHz to 1GHz

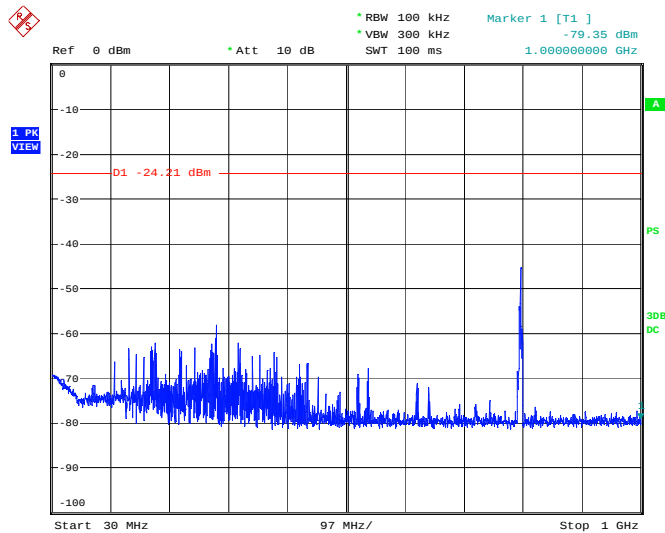
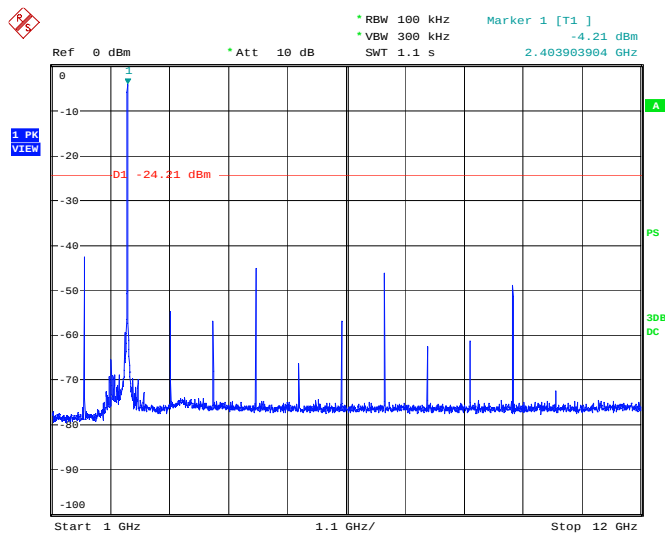
Spurious 2402MHz30-1000MHz
Date: 4.JUN.2008 16:05:22

Figure 7: Operating 2402MHz (Mode A1) spurious from 1GHz to 12GHz

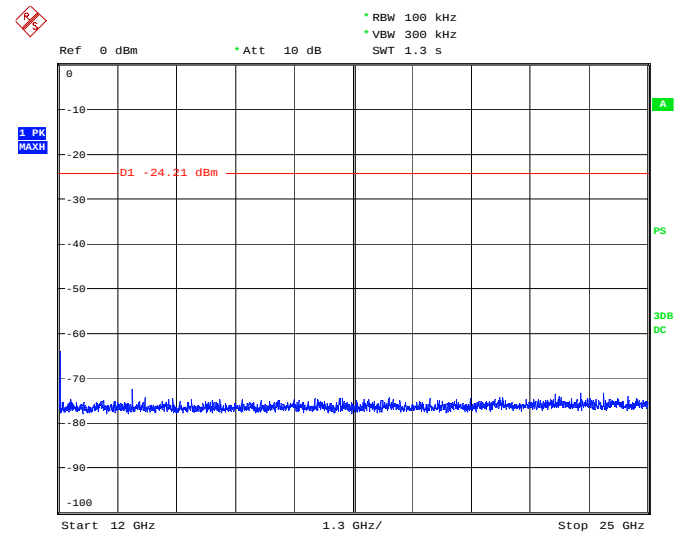
Spurious 2402MHz1-12GHz
Date: 4.JUN.2008 15:42:45

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Figure 8: Operating 2402Hz (Mode A1) spurious from 12GHz to 25GHz



Spurious 2402MHz12-25GHz
Date: 4.JUN.2008 15:45:27

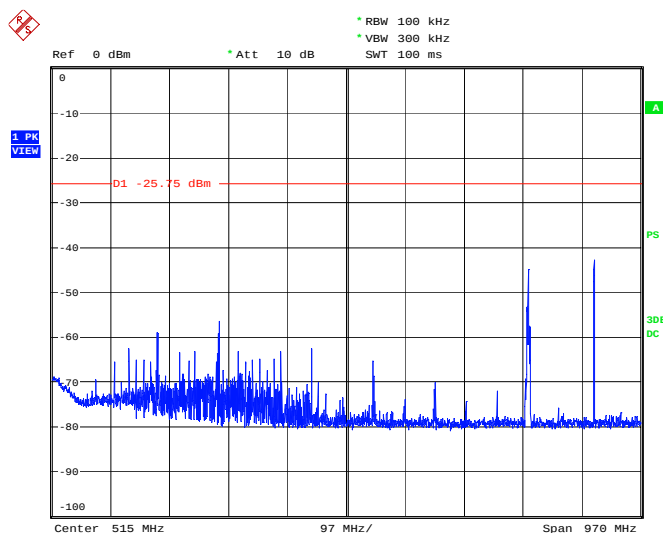
Prüfbericht - Nr.: 12604515 001
 Test Report No.:

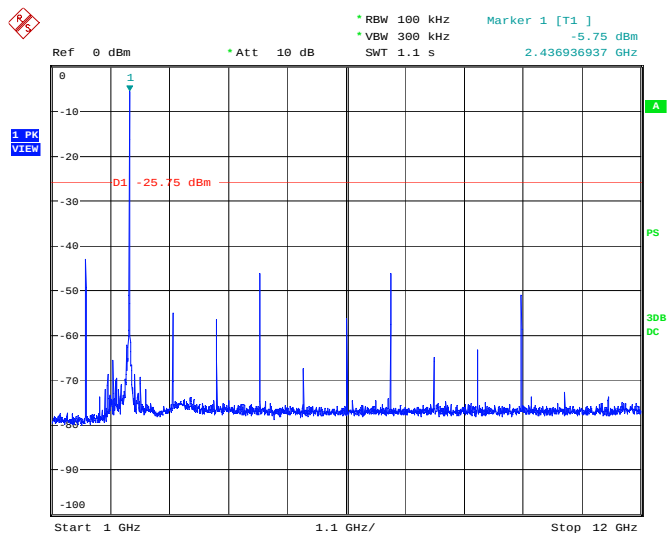
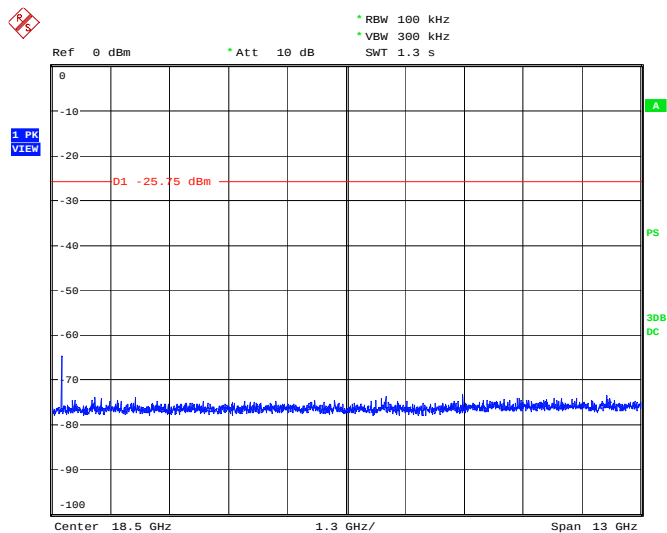
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Table 5: Conducted Spurious Emissions of 2440MHz (Mode A2)

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Emission level (dBm)	Margin (dB)
2436.94	N/A	-5.75	-0.64	-6.39	N/A
203.8	-26.39	-59.40	-0.17	-59.57	33.18
305.27	-26.39	-56.64	-0.21	-56.85	30.46
815.03	-26.39	-44.96	-0.38	-45.34	18.95
923.29	-26.39	-43.00	-0.39	-43.39	17.00
1622.12	-26.39	-43.14	-0.47	-43.61	17.22
3251.75	-26.39	-55.22	-0.76	-55.98	29.59
4066.57	-26.39	-56.60	-0.87	-57.47	31.08
4881.38	-26.39	-46.42	-0.96	-47.38	20.99
7325.83	-26.39	-46.39	-1.21	-47.60	21.21
9764.76	-26.39	-51.06	-1.33	-52.39	26.00
12201.7	-26.39	-64.80	-1.48	-66.28	39.89

Notes : 1) Limit = (Reading fundamental) + (Correction factor) – 20
 2) Emission level = (Reading) + (Correction factor)
 3) Correction factor = Cable loss

Figure 9: Operating 2440MHz (Mode A2) spurious from 30MHz to 1GHz

 Spurious 2440MHz30-1000MHz
 Date: 4.JUN.2008 16:03:13

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Page 21 of 41**Figure 10: Operating 2440MHz (Mode A2) spurious from 1GHz to 12GHz**Spurious 2440MHz1-12GHz
Date: 4.JUN.2008 15:53:05**Figure 11: Operating 2440MHz (Mode A2) spurious from 12GHz to 25GHz**Spurious 2440MHz12-25GHz
Date: 4.JUN.2008 15:56:25

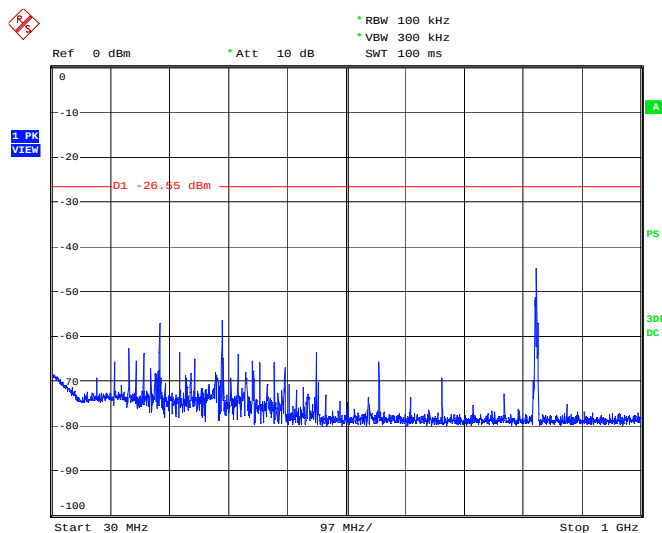
Prüfbericht - Nr.: 12604515 001
 Test Report No.:

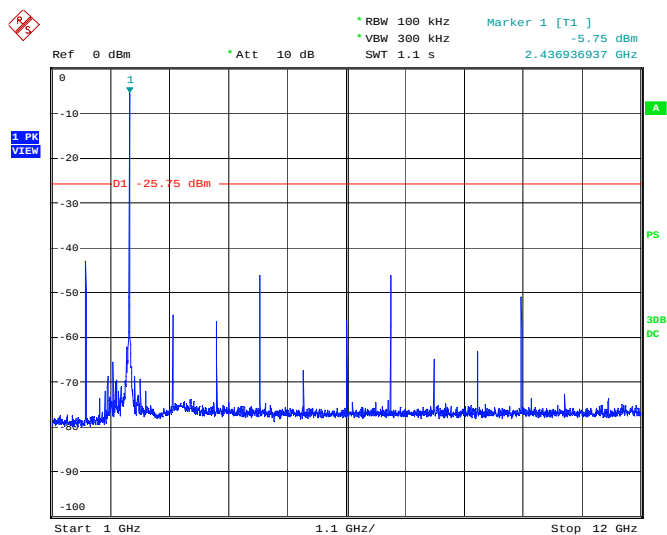
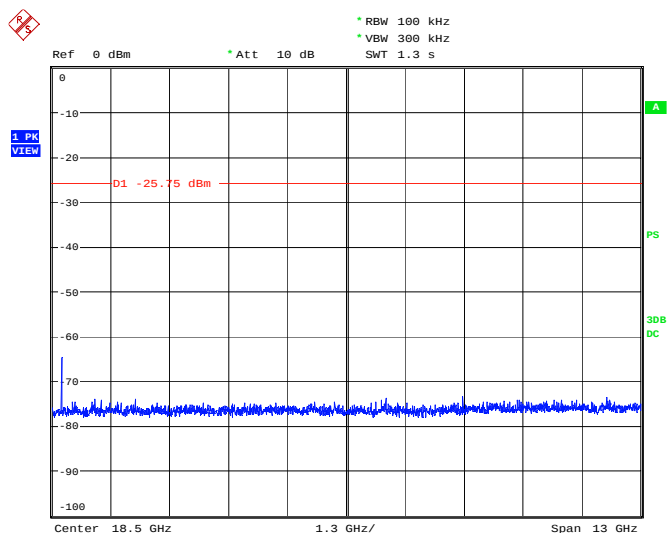
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Table 6: Conducted Spurious Emissions of 2479MHz (Mode A3)

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Emission level (dBm)	Margin (dB)
2480.98	N/A	-6.55	-0.66	-7.21	N/A
206.72	-27.21	-57.26	-0.17	-57.43	30.22
310.13	-27.21	-56.65	-0.21	-56.86	29.66
827.65	-27.21	-45.29	-0.37	-45.66	18.45
1649.65	-27.21	-42.32	-0.58	-42.90	15.69
3306.81	-27.21	-56.19	-0.78	-56.97	29.77
4127.13	-27.21	-56.80	-0.90	-57.70	30.49
4958.46	-27.21	-48.16	-1.02	-49.18	21.97
7441.44	-27.21	-47.54	-1.17	-48.71	21.50
9918.92	-27.21	-51.67	-1.33	-53.00	25.79
12396.9	-27.21	-66.85	-1.33	-68.18	40.97

Notes : 1) Limit = (Reading fundamental) + (Correction factor) – 20
 2) Emission level = (Reading) + (Correction factor)
 3) Correction factor = Cable loss

Figure 12: Operating 2479MHz (Mode A3) spurious from 30MHz to 1GHz

 Spurious 2479MHz30-1000MHz
 Date: 4.JUN.2008 16:17:11

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Page 23 of 41**Figure 13: Operating 2475MHz (Mode A3) spurious from 1GHz to 12GHz**Spurious 2440MHz1-12GHz
Date: 4.JUN.2008 15:53:05**Figure 14: Operating 2479MHz (Mode A3) spurious from 12GHz to 25GHz**Spurious 2440MHz12-25GHz
Date: 4.JUN.2008 15:56:25

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5.1.4 Peak Power Spectral Density FCC 15.247(e) and RSS-210 A8.2(b)

RESULT:
PASS

Date of testing: 2008-06-04

Ambient temperature: 21.0 °C

Relative humidity: 50 %

Atmospheric pressure: 1011hPa

Requirements:

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test procedure:

ANSI C63.4-2003 and Measurement of Digital Transmission Systems Operating under Section 15.247

A spectrum analyzer was connected to the antenna port of the transmitter. Spectrum Analyzer Resolution Bandwidth was set to 3 kHz. The Video Bandwidth was set to 10 kHz, and the sweep time was set to 500sec.

The EUT was connected to a DC power supply with a voltage of 3.0V simulating a full battery.

Table 7: Peak Power Spectral Density

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Power Density (dBm)	Margin (dB)
2402	8	-16.73	-0.61	-17.34	25.34
2440		-16.16	-0.64	-16.80	24.80
2479		-17.01	-0.66	-17.67	25.67

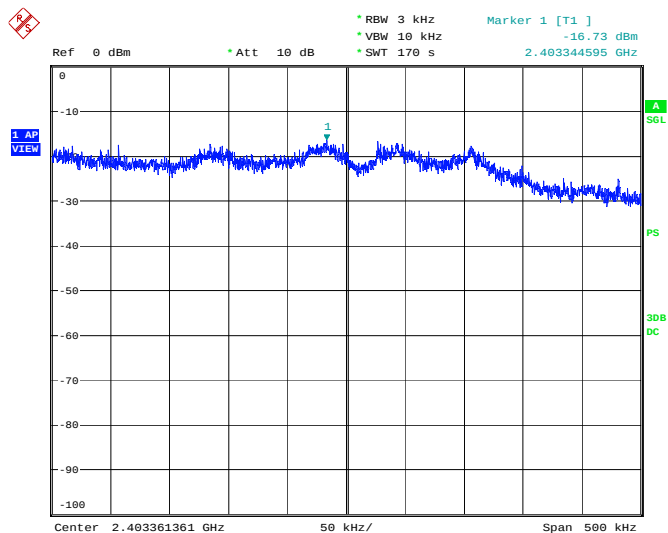
Notes : 1) Power density = (Reading) + (Correction factor)

2) Correction factor = Cable loss

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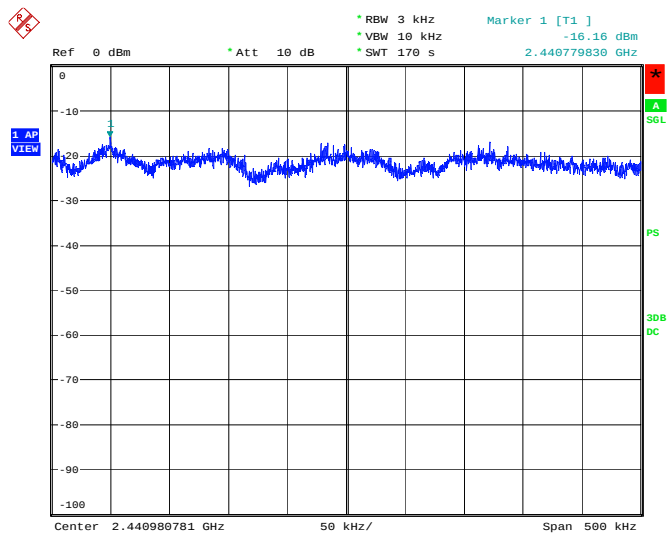
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Figure 15: Power Spectral Density of 2402MHz (Mode A1)

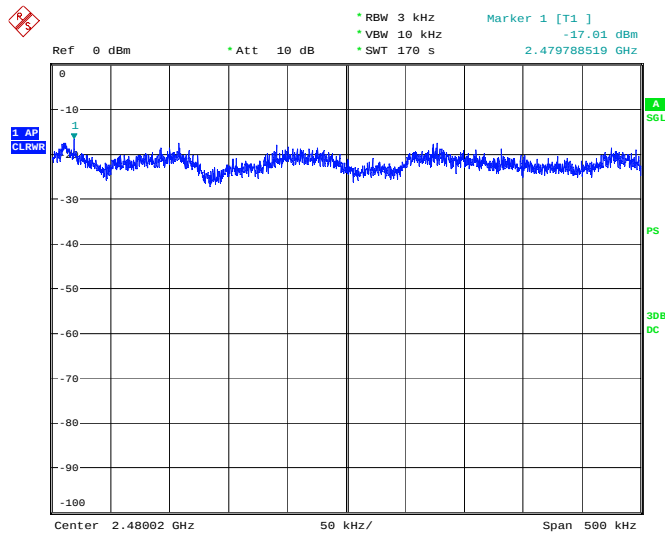


PSD 2402MHz
Date: 4.JUN.2008 14:57:22

Figure 16: Power Spectral Density of 2440MHz (Mode A2)



PSD 2440MHz
Date: 4.JUN.2008 15:06:16

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6. Test Results Radiated Emissions

6.1.1 Band edge Radiated Emission FCC 15.247(d) and RSS- 210 A2.2

RESULT:**Pass**

Date of testing: 2008-06-05

Ambient temperature: 23.0°C

Relative humidity: 52%

Atmospheric pressure: 1007hPa

Requirements:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) and RSS-210 2.7, must also comply with the radiated emission limits specified in Section 15.209(a) and RSS-210 2.7.

Test procedure:

ANSI C63.4-2003, RSS-Gen 4.9, 4.10 and Measurement of Digital Transmission Systems Operating under Section 15.247

Measurements were made in a Semi Anechoic Chamber at a measurement distance of 3m.

The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations at 1 EUT position (Y-axis).

The measurement was conducted according to Marker-Delta Method.

(Step1)

Peak (1 MHz RBW/VBW) and average (1 MHz RBW/10 Hz VBW) radiated measurements were taken with a suitable span to encompass the peak of the fundamental.

(Step2)

Then Peak (500 kHz RBW/VBW) radiated measurement was taken with a span to encompass both the peak of the fundamental and the band-edge emission. From this measurement, the amplitude delta between the peak of the fundamental and the peak of the band-edge emission was calculated.

The EUT was arranged in order to maximize emissions.

The test was performed using a new battery.

The highest emission amplitudes relative to the appropriate limit were recorded in this report.

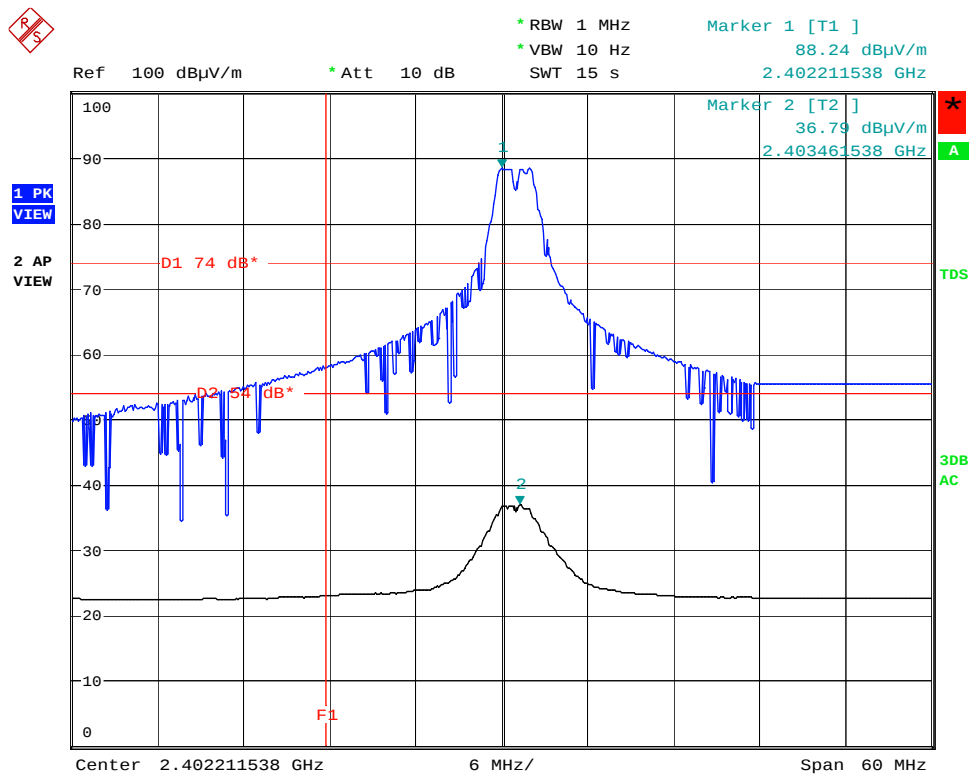
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Table 8: Band Edge Radiated Emission

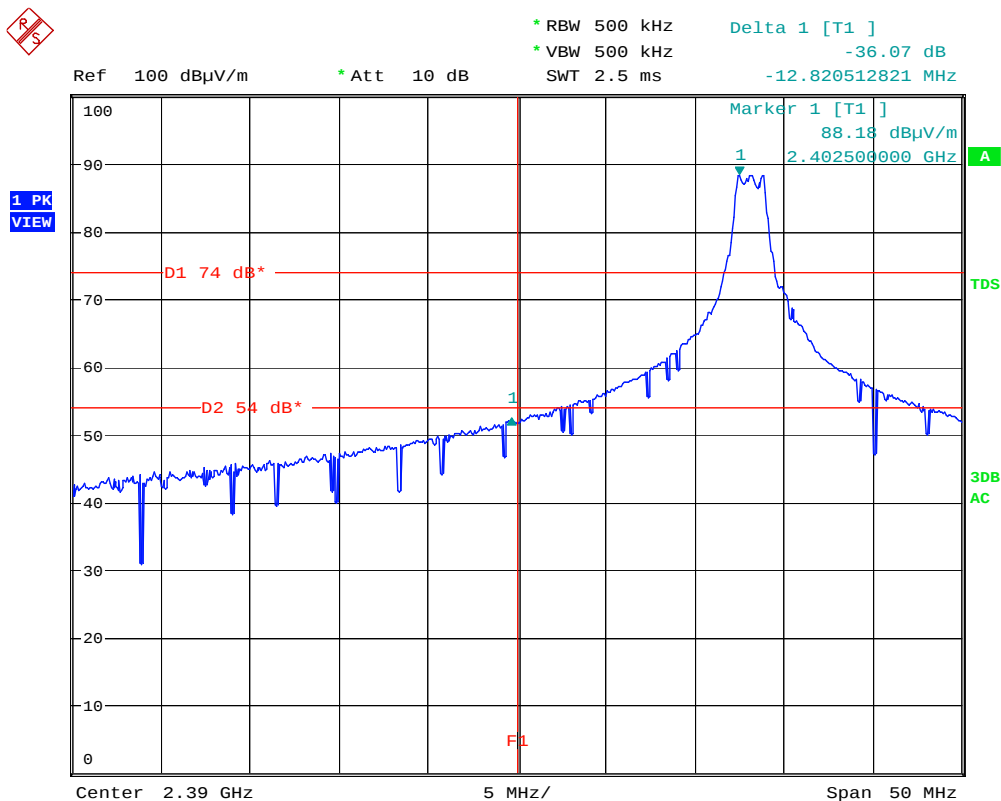
Operating Frequency (MHz)	In-band Fundamental (From Step 1)		Delta (dB) (From Step 2)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Band-edge Peak (dBuV/m)	Band-edge Average (dBuV/m)
	Peak Value (dBuV/m)	Average Value (dBuV/m)					
2402	88.24	36.79	36.07	74.0	54.0	52.17	0.72
2479	88.15	36.82	31.48	74.0	54.0	56.67	5.34

Notes : 1) All correction factors (antenna, cable, pre-amplifier) are included in the measurement values.

Figure 18: Band edge radiated emission of 2402MHz(Mode A1), Peak and average (Step 1)


Band Edge (Lo), Vert, Mode A, Position Y
 Direct/Fundamental
 Date: 5.JUN.2008 13:05:10

Note: The upper trace shows peak, the lower trace shows average value.

Prüfbericht - Nr.: **12604515 001**
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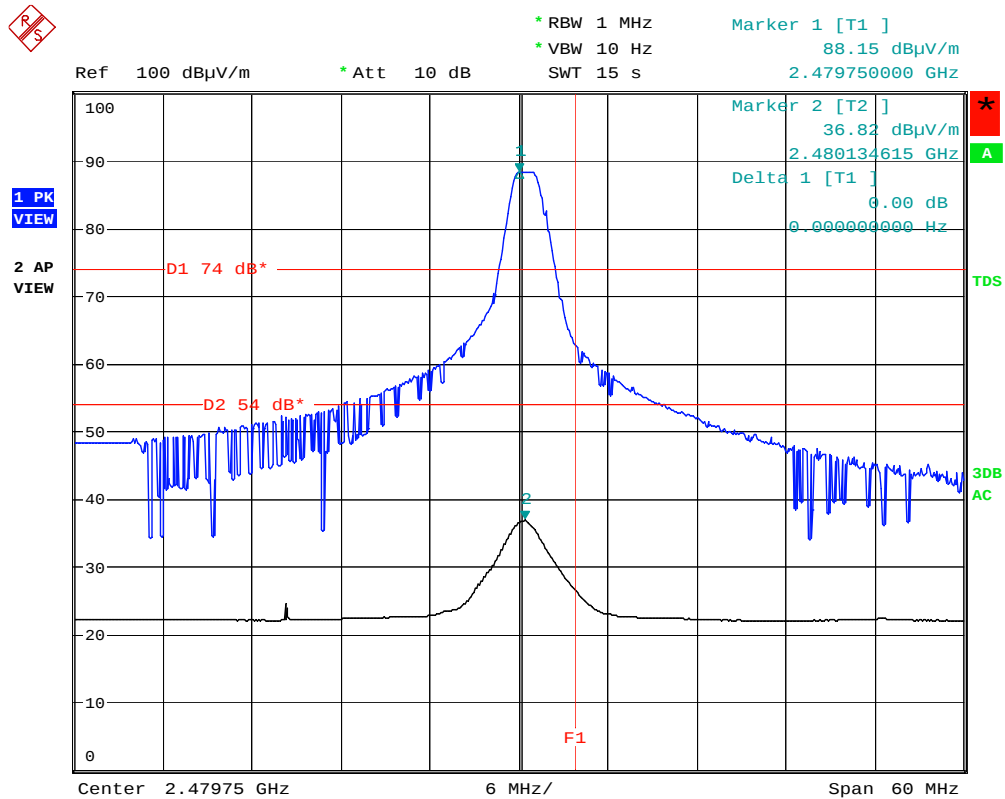
Band Edge (Lo), Vert, Mode A, Position Y

Direct/Fundamental

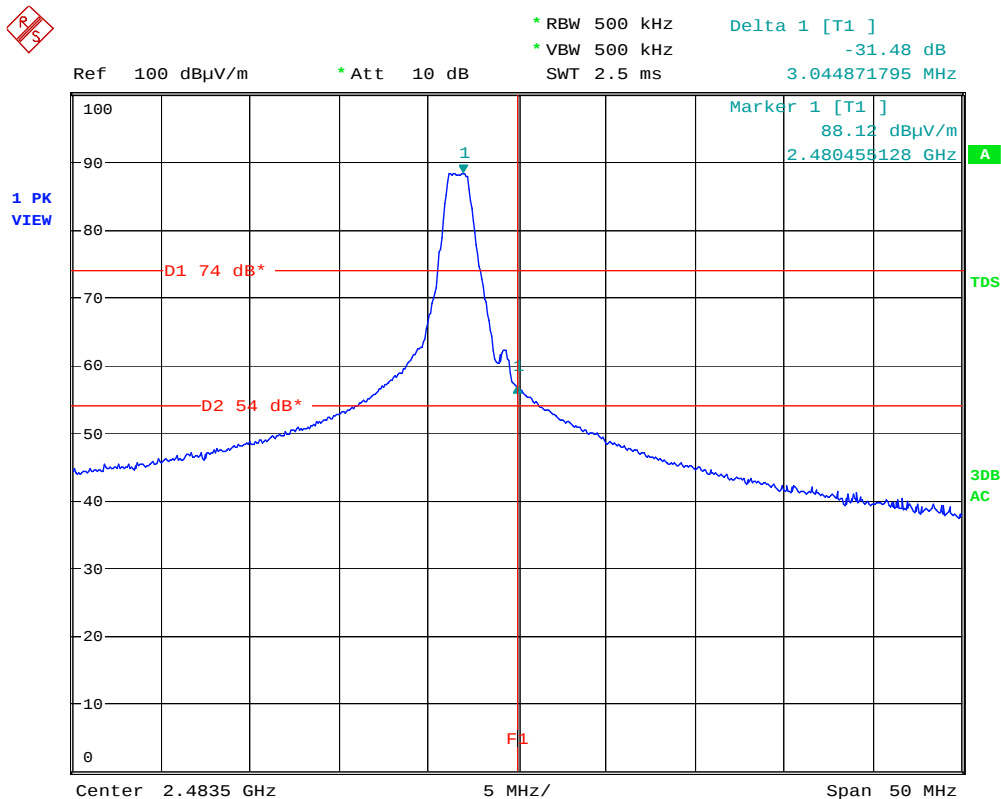
Date: 5.JUN.2008 13:08:06

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Figure 20: Band edge radiated emission of 2479MHz(Mode A3), Peak and average (Step 1)

 Band Edge (Hi), Vert, Mode A, Position Y
 Direct/Fundamental
 Date: 5.JUN.2008 13:16:55

Note: The upper trace shows peak, the lower trace shows average value.

Prüfbericht - Nr.: **12604515 001**
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Band Edge (Hi), Vert, Mode A, Position Y
Direct/Fundamental
Date: 5.JUN.2008 13:20:08

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6.1.2 Radiated Emission out-of-band and spurious emission FCC part 15.247(d)/15.205/15.209 and RSS-210 2.2/RSS-210 A.8.5 RSS-Gen 7.2.1/7.2.3**RESULT:****PASS**

Date of testing:	2008-06-05
Ambient temperature:	23.0°C
Relative humidity:	53%
Atmospheric pressure:	1007hPa
Frequency range:	30MHz – 25GHz
Measurement distance:	3m
Kind of test site:	Semi Anechoic Chamber

Requirements:

The emissions from the intentional radiator shall not exceed the field strength specified in 15.209(a) and RSS-210 2.7 and Measurement of Digital Transmission Systems Operating under Section 15.247

Test procedure:

ANSI C63.4-2003, RSS-Gen 4.9, 4.10 and Measurement of Digital Transmission Systems Operating under Section 15.247

Before final measurements of radiated emissions were made in Semi Anechoic Chamber, the EUT was scanned before final testing. This was done in order to determine its emissions spectrum profile. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made at 3meters. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 30 MHz to the 10th harmonic of the highest fundamental transmitter frequency (25 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations and 1 EUT position (Y-axis). For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the spectrum analyzer was operated in the CISPR quasi-peak detection mode.

For emissions above 1000 MHz, emissions are measured using following settings:

Peak: RBW=1MHz, VBW=1MHz

Average: RBW=1MHz, VBW=10Hz

The test was performed using a new battery.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Emissions other than those mentioned are small or not detectable.

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Table 9: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode A1

Freq. [MHz]	Antenna Orientation	Result (Measured) QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
79.983	V	37.6	-26.9	10.7	40	29.3	399	7
212.257	H	49.8	-25.3	24.5	43.5	19	158	1
276.000	H	49.8	-22.2	27.6	46	18.4	101	181
311.257	H	49.7	-20.9	28.8	46	17.2	100	167
567.003	H	40.8	-14.1	26.7	46	19.3	157	58
801.357	H	39.9	-11.5	28.4	46	17.6	102	308
924.011	V	31.2	-10.1	21.1	46	24.9	321	183

Table 10: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode A2

Freq. [MHz]	Antenna Orientation	Result (Measured) QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
79.984	H	37.9	-27.4	10.5	40	29.5	400	359
209.261	H	50	-25.4	24.6	43.5	18.9	164	359
274.485	H	47.6	-22.2	25.4	46	20.6	106	176
311.264	H	49.6	-20.9	28.7	46	17.3	101	169
564.021	H	41.3	-14.2	27.1	46	18.9	155	57
778.529	H	39.6	-11.7	27.9	46	18.1	101	95
814.698	H	40.5	-11.4	29.1	46	16.9	102	292

Table 11: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode A3

Freq. [MHz]	Antenna Orientation	Result (Measured) QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
79.981	H	37.5	-27.4	10.1	40	29.9	391	353
209.259	H	50	-25.4	24.6	43.5	18.9	162	1
276.025	H	49.2	-22.2	27	46	19	102	176
311.275	H	49.2	-20.9	28.3	46	17.7	101	165
573.009	H	40.5	-14	26.5	46	19.5	157	55
772.530	H	40.2	-11.8	28.4	46	17.6	101	95
925.543	H	31	-9.9	21.1	46	24.9	207	243

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Table 12: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode A1

Freq. [MHz]	Antenna Orientation	Level AV [dB(μV/m)]	Level PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]
4805.0	V	34.80	59.64	54.0	74.0	19.20	14.36

Notes : 1) All correction factors (antenna, cable, pre-amplifier) are included in the measurement values.

2) AV: average, PK: peak

3) Above mentioned value was measured at EUT Y-axis.

4) All other harmonics/spurious were found at 20dB below the limit.

Table 13: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode A2

Freq. [MHz]	Antenna Orientation	Level AV [dB(μV/m)]	Level PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]
4881.0	V	34.61	59.49	54.0	74.0	19.39	14.51

Notes : 1) All correction factors (antenna, cable, pre-amplifier) are included in the measurement values.

2) AV: average, PK: peak

3) Above mentioned value was measured at EUT Y-axis.

4) All other harmonics/spurious were found at 20dB below the limit.

Table 14: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode A3

Freq. [MHz]	Antenna Orientation	Level AV [dB(μV/m)]	Level PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]
4959.0	H	33.70	56.14	54.0	74.0	20.30	17.86

Notes : 1) All correction factors (antenna, cable, pre-amplifier) are included in the measurement values.

2) AV: average, PK: peak

3) Above mentioned value was measured at EUT Y-axis.

4) All other harmonics/spurious were found at 20dB below the limit.

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7. Test Results Receiver / Digital Spurious

7.1.1 Radiated Emission Receiving / Digital Interface FCC 15.109 and RSS-210 A2.6

RESULT:**PASS**

Date of testing:	2008-06-05
Ambient temperature:	23.0°C
Relative humidity:	53%
Atmospheric pressure:	1007hPa
Frequency range:	30MHz - 1GHz
Equipment classification:	class B
Measurement distance:	3m
Kind of test site:	Semi Anechoic Chamber

Requirements:

The emissions from the intentional radiator shall not exceed the field strength specified in 15.109 class B and RSS-210 Table 2 (and RSS-Gen Table 1).

Test procedure:

ANSI C63.4-2003, RSS-Gen 4.9, 4.10 and Measurement of Digital Transmission Systems Operating under Section 15.247.

Final radiated emissions measurements were made at 3meters. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 30 MHz to the 10th harmonic of the highest fundamental transmitter frequency (25 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations and a EUT position (Y-axis). For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the spectrum analyzer was operated in the CISPR quasi-peak detection mode.

For emissions above 1000 MHz, emissions are measured using following settings:

Peak: RBW=1MHz, VBW=1MHz

Average: RBW=1MHz, VBW=10Hz

The highest emission amplitudes relative to the appropriate limit were recorded in this report.

Emissions other than those mentioned are small or not detectable.

The test was performed using a new battery.

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Table 15: Radiated Emission Receiver 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode a1 (Receive Mode)

Freq. [MHz]	Antenna Orientation	Result (Measured) QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
79.995	H	38.2	-27.4	10.8	40	29.2	400	14
209.258	H	51	-25.4	25.6	43.5	17.9	157	1
277.51	H	49.2	-22.1	27.1	46	18.9	101	182
309.758	H	49.8	-20.9	28.9	46	17.1	100	168
559.523	H	42.9	-14.3	28.6	46	17.4	144	56
768.03	H	40.8	-11.9	28.9	46	17.1	102	224
898.978	V	31.4	-10.5	20.9	46	25.1	254	159

Notes : 1) AV: average, PK: peak

2) Above mentioned value was measured at EUT Y-axis.

Table 16: Radiated Emission Receiver 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode a1 (Receive Mode)

Freq. [MHz]	Antenna Orientation	Level AV [dB(μV/m)]	Level PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]
1602.0	H	32.86	39.62	54.0	74.0	21.14	34.38

Notes : 1) All correction factors (antenna, cable, pre-amplifier) are included in the measurement values.

2) AV: average, PK: peak

3) Above mentioned value was measured at EUT Y-axis.

Table 17: Radiated Emission Receiver 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode a2 (Host Mode)

Freq. [MHz]	Antenna Orientation	Result (Measured) QP [dB(μV)]	Factor [dB(1/m)]	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
79.991	H	38	-27.4	10.6	40	29.4	400	359
142.976	H	33.3	-22.9	10.4	43.5	33.1	262	153
166.688	H	34.5	-22.6	11.9	43.5	31.6	161	172
217.028	H	42.2	-25.1	17.1	46	28.9	127	193
285.513	H	42.1	-21.7	20.4	46	25.6	102	201
824.735	H	42.9	-11.3	31.6	46	14.4	104	286
923.987	H	31	-9.9	21.1	46	24.9	101	314

Notes : 1) AV: average, PK: peak

2) Above mentioned value was measured at EUT Y-axis.

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Table 18: Radiated Emission Receiver 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode a2 (Host Mode)

Freq. [MHz]	Antenna Orientation	Level AV [dB(μV/m)]	Level PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]
4805.0	V	34.80	59.64	54.0	74.0	19.20	14.36

Notes : 1) All correction factors (antenna, cable, pre-amplifier) are included in the measurement values.

2) AV: average, PK: peak

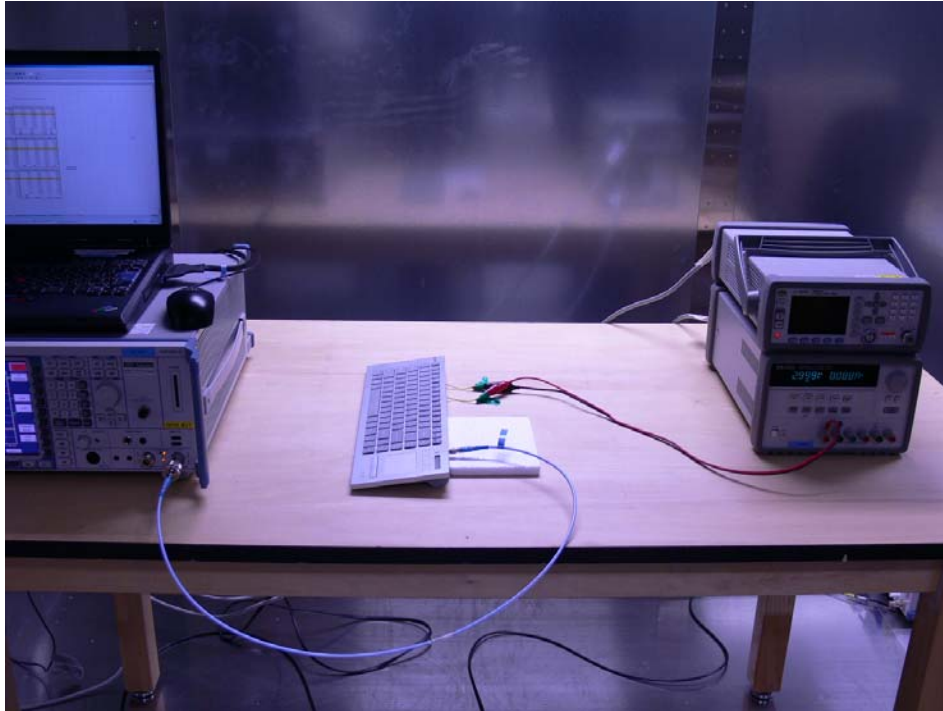
3) Above mentioned value was measured at EUT Y-axis.

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8. Photographs of test setup

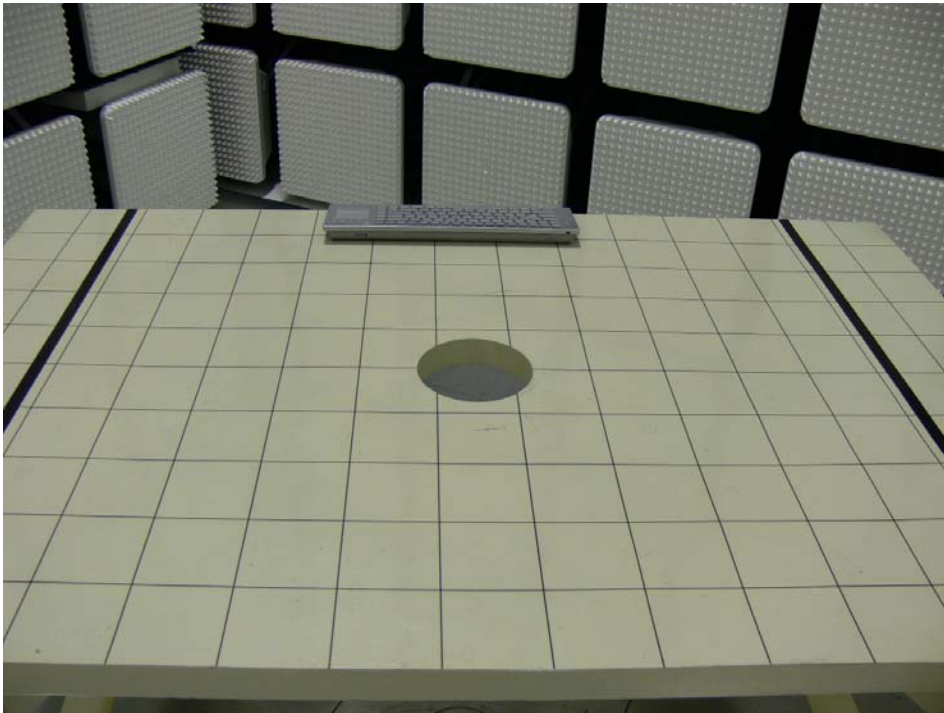
Photograph 1: Set-up for Conducted Testing



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Photograph 2: Set-up for Radiated Emission, EUT Configuration Y-axis



Photograph 3: Set-up for Radiated Emission, EUT Configuration Y-axis



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