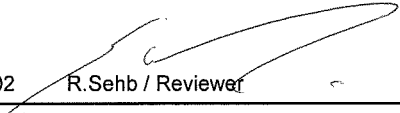


Produkte
Products

Prüfbericht - Nr.: 12604515 002		Seite 1 von 47 <i>Page 1 of 47</i>			
<i>Test Report No.:</i>					
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 [Receiver]			
Bezeichnung: <i>Identification:</i>	VGP-WRC4	Serien-Nr.: <i>Serial No.:</i>	218, 228, 269		
Wareneingangs-Nr.: <i>Receipt No.:</i>	213080532-1	Eingangsdatum: <i>Date of receipt:</i>	2008-06-05		
Prüfart: <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				
Prüfresultat: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). The test item passed the test specification(s).				
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>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:					
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>					

Prüfbericht - Nr.:
*Test Report No.:***12604515 002****Seite 2 von 47**
Page 2 of 47

TEST SUMMARY

3.2.1 ANTENNA REQUIREMENTS FCC 15.203, FCC 15.204 AND RSS-210 A8.4*RESULT: PASS***5.1.1 CONDUCTED OUTPUT POWER AT ANTENNA TERMINALS FCC 15.247(B)(3) AND RSS-210 A8.4***RESULT: PASS***5.1.2 6dB BANDWIDTH FCC 15.247(A)(2) AND RSS-210 A8.2(A)***RESULT: PASS***5.1.3 CONDUCTED SPURIOUS EMISSIONS FCC 15.247(D) AND RSS-210 A8.5***RESULT: PASS***5.1.4 PEAK POWER SPECTRAL DENSITY FCC 15.247(E) AND RSS-210 A8.2(B)***RESULT: PASS***6.1.1 BAND EDGE RADIATED EMISSION FCC 15.247(D) AND RSS- 210 A2.2***RESULT: Pass***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***7.1.1 RADIATED EMISSION RECEIVING / DIGITAL INTERFACE FCC 15.109 AND RSS-210 A2.6***RESULT: PASS***8.1.1 AC CONDUCTED EMISSION***RESULT: PASS*

Prüfbericht - Nr.: 12604515 002
 Test Report No.:

 Seite 3 von 47
 Page 3 of 47

Contents

1.	GENERAL REMARKS	5
1.1	COMPLEMENTARY MATERIALS	5
1.2	FCC CROSS-REFERENCE TABLE	5
2.	TEST SITES	6
2.1	TEST FACILITIES	6
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	7
2.3	MEASUREMENT UNCERTAINTY	7
3.	GENERAL PRODUCT INFORMATION	8
3.1	PRODUCT FUNCTION AND INTENDED USE	8
3.2	SYSTEM DETAILS	8
3.2.1	<i>Antenna Requirements FCC 15.203, FCC 15.204 and RSS-210 A8.4</i>	<i>9</i>
3.3	CLOCK FREQUENCIES	9
3.4	INDEPENDENT OPERATION MODES	9
3.5	NOISE SUPPRESSING PARTS	9
3.6	BLOCK DIAGRAM	10
4.	TEST SET-UP AND OPERATION MODES	11
4.1	TEST METHODOLOGY	11
4.2	PHYSICAL CONFIGURATION FOR TESTING	11
4.3	TEST OPERATION AND TEST SOFTWARE	11
4.4	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	12
4.5	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE	12
5.	TEST RESULTS CONDUCTED TESTING AT ANTENNA PORT	13
5.1.1	<i>Conducted Output Power at Antenna Terminals FCC 15.247(b)(3) and RSS-210 A8.4</i>	<i>13</i>
5.1.2	<i>6dB Bandwidth FCC 15.247(a)(2) and RSS-210 A8.2(a)</i>	<i>14</i>
5.1.3	<i>Conducted Spurious Emissions FCC 15.247(d) and RSS-210 A8.5</i>	<i>18</i>
5.1.4	<i>Peak Power Spectral Density FCC 15.247(e) and RSS-210 A8.2(b)</i>	<i>25</i>
6.	TEST RESULTS RADIATED EMISSIONS	28
6.1.1	<i>Band edge Radiated Emission FCC 15.247(d) and RSS- 210 A2.2</i>	<i>28</i>
6.1.2	<i>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</i>	<i>33</i>
7.	TEST RESULTS RECEIVER / DIGITAL SPURIOUS	36
7.1.1	<i>Radiated Emission Receiving / Digital Interface FCC 15.109 and RSS-210 A2.6</i>	<i>36</i>
8.	TEST RESULTS AC CONDUCTED EMISSION	39
8.1.1	<i>AC Conducted Emission</i>	<i>39</i>

Prüfbericht - Nr.:	12604515 002	Seite 4 von 47
<i>Test Report No.:</i>		<i>Page 4 of 47</i>
9.	PHOTOGRAPHS OF TEST SETUP	41
10.	LIST OF TABLES.....	46
11.	LIST OF FIGURES	47
12.	LIST OF PHOTOGRAPHS	47

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 5 von 47**
Page 5 of 47

1. General Remarks

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

Prüfbericht - Nr.:
*Test Report No.:***12604515 002****Seite 6 von 47**
Page 6 of 47

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.

Prüfbericht - Nr.: 12604515 002

Test Report No.:

Seite 7 von 47

Page 7 of 47

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

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 8 von 47**
Page 8 of 47

3. General Product Information

3.1 Product Function and Intended Use

The **EUT (Equipment Under Test)** VGP-WRC4 is used for Wireless Keyboard System intended to be produced for the general market. VGP-WRC4 is plugged inside a PC for wireless connectivity from a wireless keyboard, VGP-WKB9XX. Limited modular approval is applied to VGP-WRC4.

3.2 System Details

Radio Standard:	IEEE 802.15.4
Power output:	-1.25dBm (max. peak power: 0.75mW)
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 5.0V (via PC)
Typical Nominal Voltage:	DC 5.0V (via PC)
Protection Class:	III

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 9 von 47**
Page 9 of 47

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: 12MHz

3.4 Independent Operation Modes

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

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 2003. 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);

- B1. EUT transmits at lowest Channel (2402MHz) with modulation.
- B2. EUT transmits at middle Channel (2440MHz) with modulation.
- B3. EUT transmits at highest Channel (2479MHz) with modulation.

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

- b1. EUT receives packets.
- b2. Communication with PC.

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

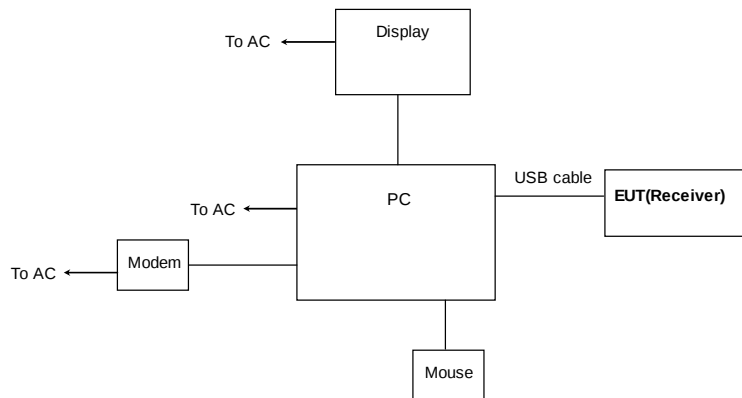
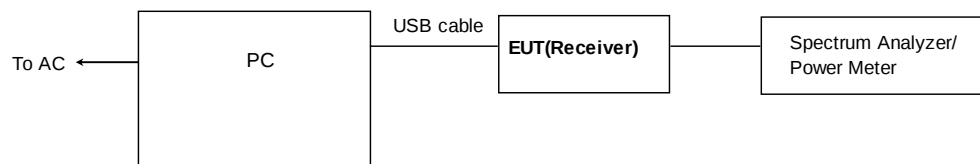


Figure 2: Block diagram for Conducted testing set up



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

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 11 von 47**
Page 11 of 47

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.

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 12 von 47**
Page 12 of 47

4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessory

1. Product: Note PC
Manufacturer: Dell
Model: LATITUDE D520
Serial Number: 35509191261
2. Product: Network Adapter
Manufacturer: Daintree Networks
Model: 2400E
Serial Number: AU02001013
3. Product: Display
Manufacturer: Samsung
Model: 740N
Serial Number: HA17H9NP128385P
4. Product: Mouse
Manufacturer: Lenovo
Model: M032B0A
Serial Number: 4430190

4.5 Countermeasures to achieve EMC Compliance

No additional measures were employed to achieve compliance.

Prüfbericht - Nr.: 12604515 002
Test Report No.:
Seite 13 von 47
Page 13 of 47

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: 2008-06-03

Ambient temperature: 25.0 °C

Relative humidity: 44 %

Atmospheric pressure: 1010hPa

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 PC and DC 5.0V was supplied via USB cable.

Table 2: Conducted output power

Frequency (MHz)	Limit (dBm)	Limit (mW)	Output (dBm)	Output (mW)	Margin (dB)
2402	30	1000	-1.25	0.75	31.25
2440	30	1000	-1.56	0.70	31.56
2479	30	1000	-2.06	0.62	32.06

Prüfbericht - Nr.: 12604515 002
Test Report No.:
Seite 14 von 47
Page 14 of 47
5.1.2 6dB Bandwidth FCC 15.247(a)(2) and RSS-210 A8.2(a)
RESULT:
PASS

Date of testing: 2008-06-03

Ambient temperature: 25.0 °C

Relative humidity: 44 %

Atmospheric pressure: 1010hPa

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.

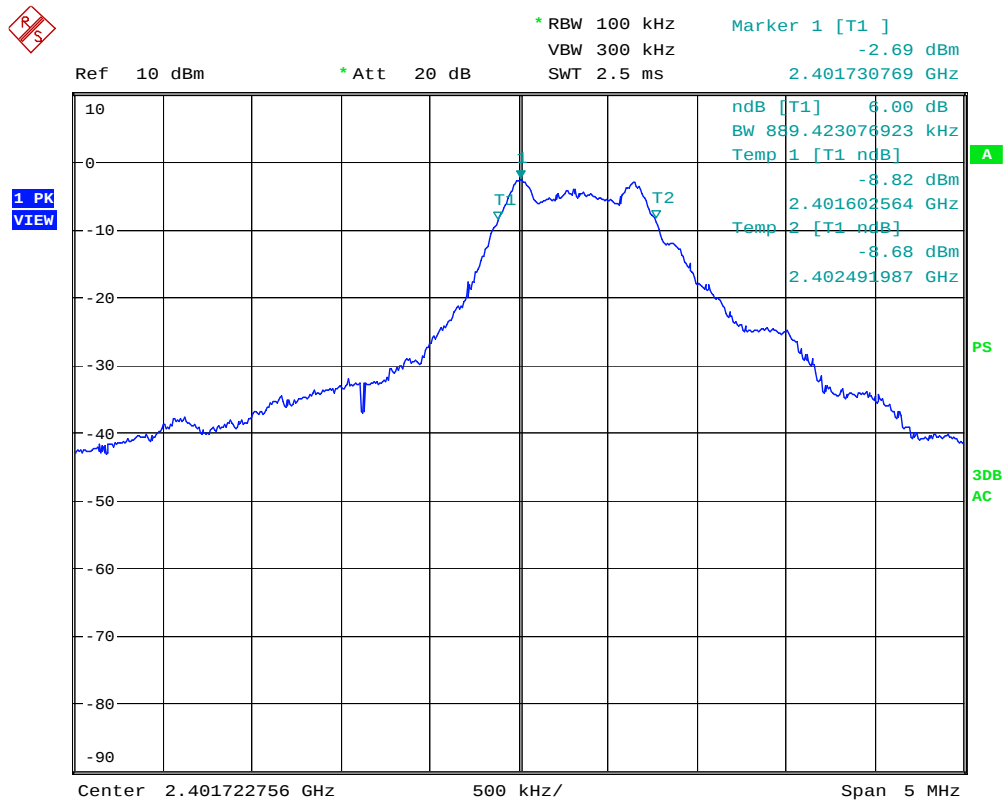
The EUT was connected to a PC and DC 5.0V was supplied via USB cable.

Table 3: 6dB Bandwidth

Frequency (MHz)	Limit (kHz)	6dB Bandwidth (kHz)
2402	500	889.4
2440	500	905.4
2479	500	865.3

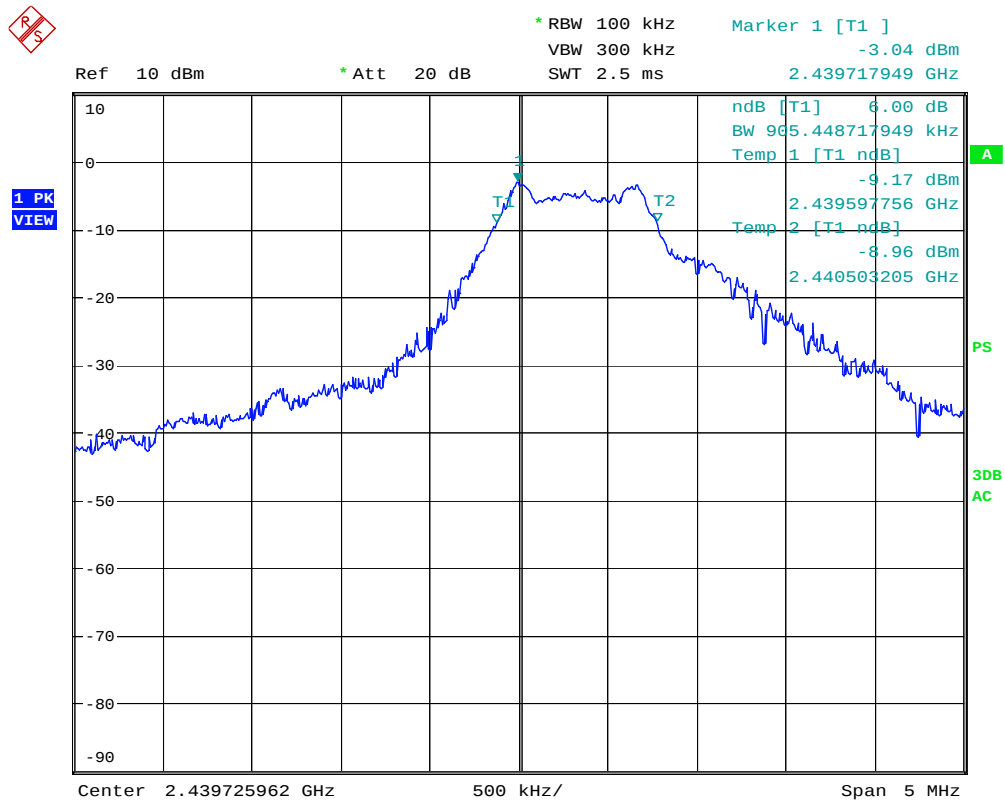
Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 15 von 47
Page 15 of 47

Figure 3: 6dB Bandwidth of 2402MHz (Mode B1)



6dB Bandwidth 2402MHz

Date: 3.JUN.2008 12:01:38

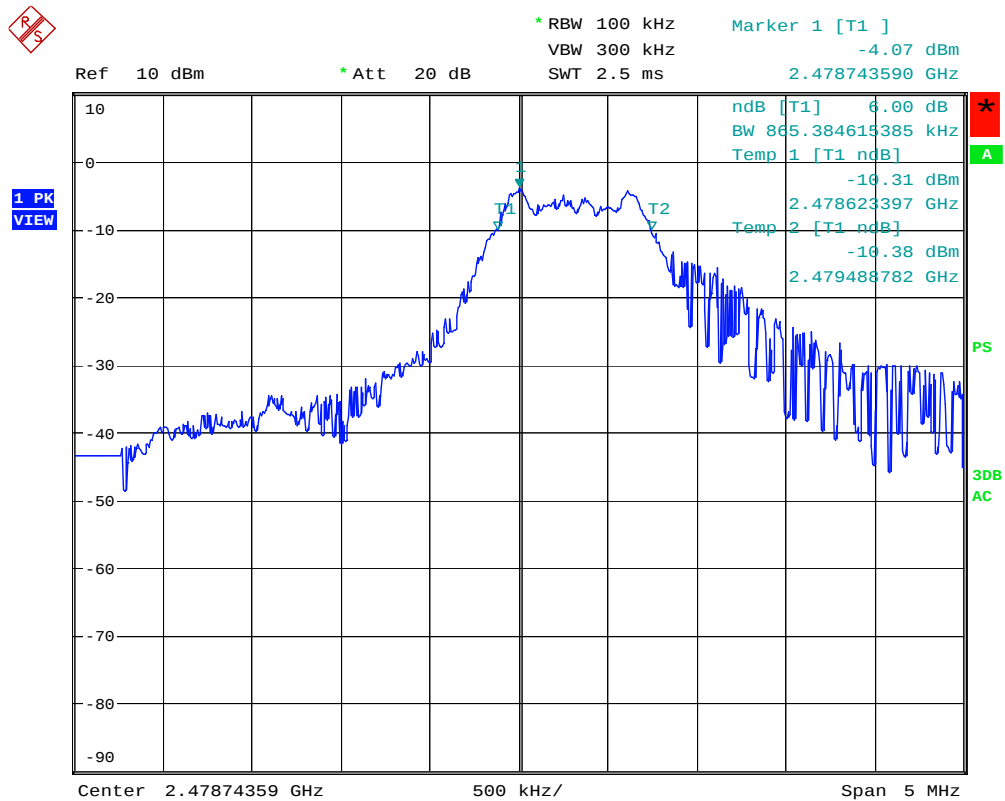
Prüfbericht - Nr.: **12604515 002**
Test Report No.:Seite 16 von 47
Page 16 of 47**Figure 4: 6dB Bandwidth of 2440MHz (Mode B2)**

6dB Bandwidth 2440MHz

Date: 3.JUN.2008 12:07:36

Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 17 von 47
Page 17 of 47

Figure 5: 6dB Bandwidth of 2479MHz (Mode B3)



6dB Bandwidth 2479MHz

Date: 3.JUN.2008 12:09:03

Prüfbericht - Nr.: 12604515 002

Test Report No.:

Seite 18 von 47

Page 18 of 47

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

Date of testing: 2008-06-03

Ambient temperature: 25.0 °C

Relative humidity: 44 %

Atmospheric pressure: 1010hPa

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 PC and DC 5.0V was supplied via USB cable.

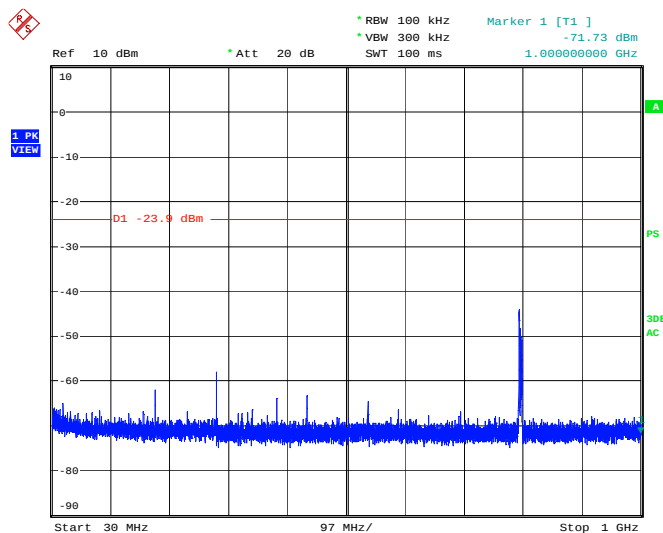
Prüfbericht - Nr.: 12604515 002
 Test Report No.:

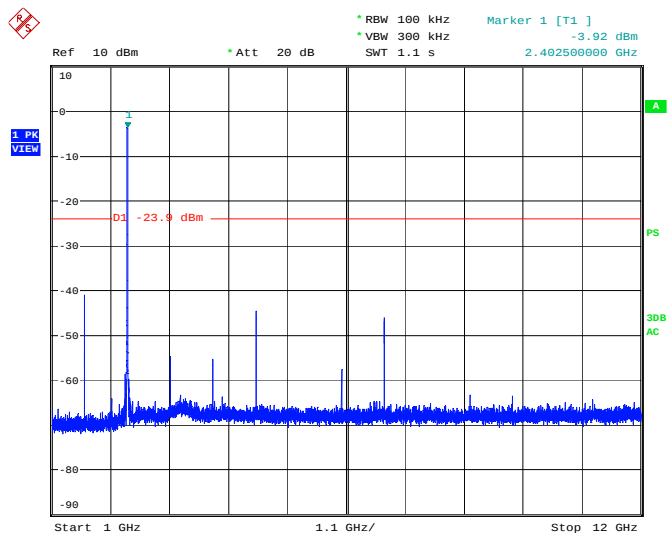
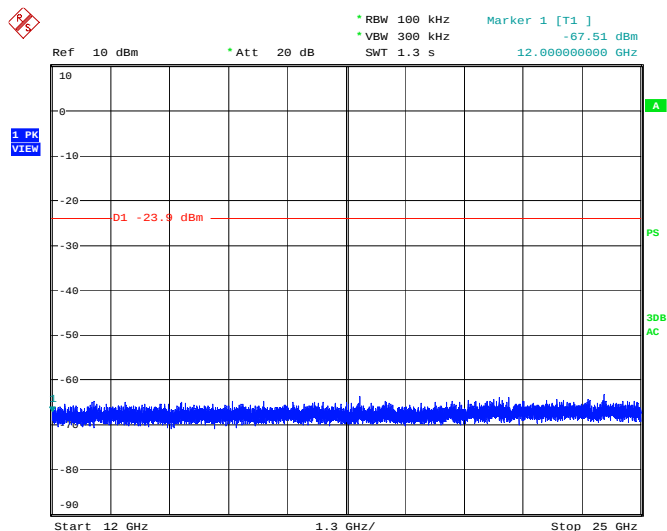
 Seite 19 von 47
 Page 19 of 47

Table 4: Conducted Spurious Emissions of 2402MHz (Mode B1)

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Emission level (dBm)	Margin (dB)
2402.50	N/A	-3.92	-0.61	-4.53	N/A
300.04	-24.53	-58.1	-0.19	-58.29	33.76
799.69	-24.53	-44.37	-0.37	-44.74	20.21
1598.20	-24.53	-42.90	-0.53	-43.43	18.89
3201.40	-24.53	-54.38	-0.80	-55.18	30.65
4804.80	-24.53	-44.38	-0.88	-45.26	20.73
6402.40	-24.53	-57.00	-1.06	-58.06	33.53
7207.2	-24.53	-44.26	-1.15	-45.41	20.88

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

Figure 6: Operating 2402MHz (Mode B1) spurious from 30MHz to 1GHz

 Spurious 2402MHz 30-1000MHz
 Date: 3.JUN.2008 13:39:59

Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 20 von 47
Page 20 of 47**Figure 7: Operating 2402MHz (Mode B1) spurious from 1GHz to 12GHz**Spurious 2402MHz 1-12GHz
Date: 3.JUN.2008 13:30:11**Figure 8: Operating 2402Hz (Mode B1) spurious from 12GHz to 25GHz**Spurious 2402MHz 12-25GHz
Date: 3.JUN.2008 13:38:33

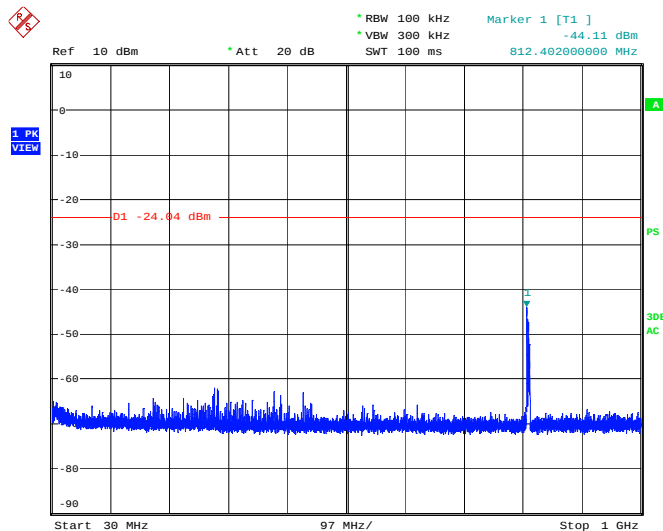
Prüfbericht - Nr.: 12604515 002
 Test Report No.:

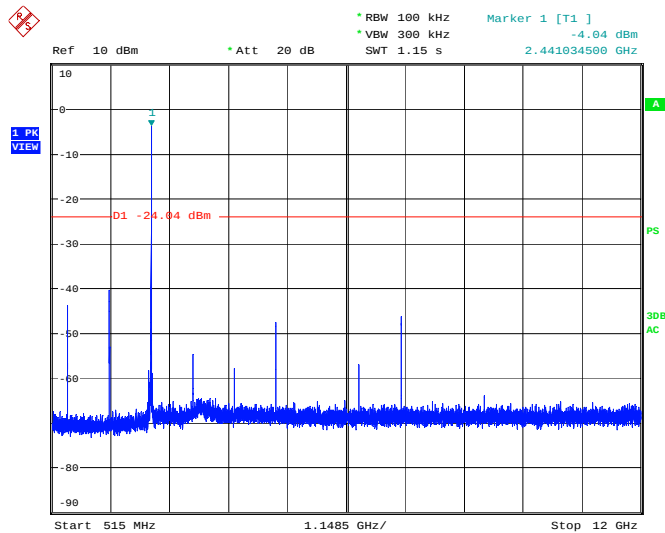
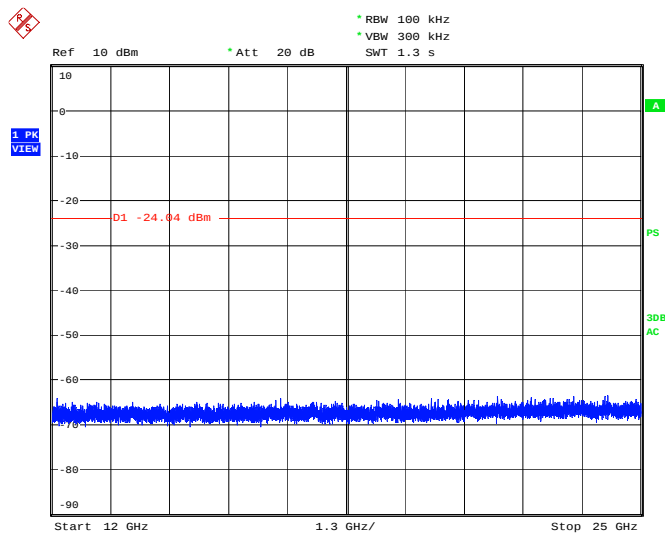
 Seite 21 von 47
 Page 21 of 47

Table 5: Conducted Spurious Emissions of 2440MHz (Mode B2)

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Emission level (dBm)	Margin (dB)
2441.03	N/A	-4.04	-0.64	-4.68	N/A
812.4	-24.68	-44.11	-0.38	-44.49	19.81
1626.10	-24.68	-40.45	-0.47	-40.92	16.24
3252.10	-24.68	-54.10	-0.76	-54.86	30.18
4063.60	-24.68	-58.07	-0.87	-58.94	34.26
4879.20	-24.68	-45.01	-0.96	-45.97	21.29
6504.40	-24.68	-56.34	-1.13	-57.47	32.79
7319.6	-24.68	-44.03	-1.28	-45.31	20.63

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

Figure 9: Operating 2440MHz (Mode B2) spurious from 30MHz to 1GHz

 Spurious 2440MHz 30-1000MHz
 Date: 3.JUN.2008 13:51:31

Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 22 von 47
Page 22 of 47**Figure 10: Operating 2440MHz (Mode B2) spurious from 1GHz to 12GHz**Spurious 2440MHz 1-12GHz
Date: 3.JUN.2008 13:43:29**Figure 11: Operating 2440MHz (Mode B2) spurious from 12GHz to 25GHz**Spurious 2440MHz 12-25GHz
Date: 3.JUN.2008 13:49:52

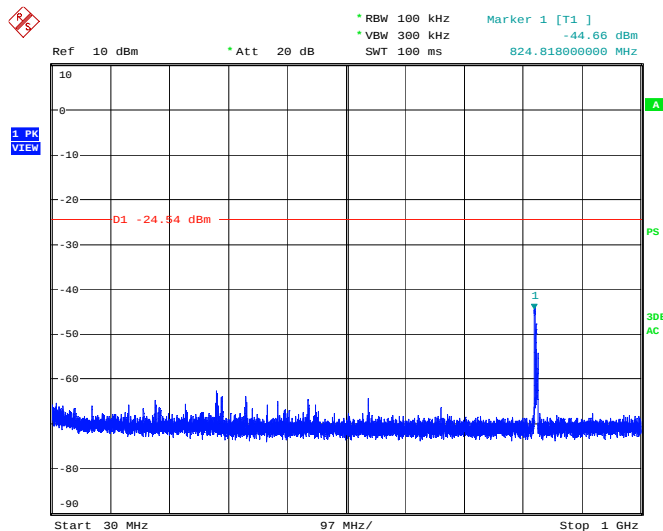
Prüfbericht - Nr.: 12604515 002
 Test Report No.:

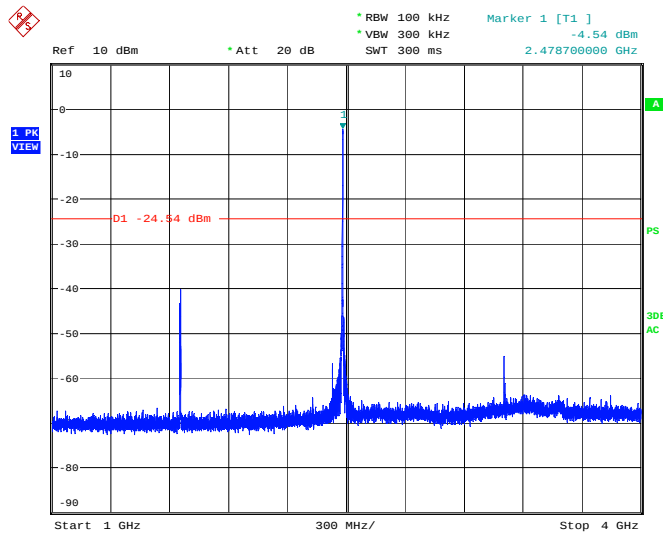
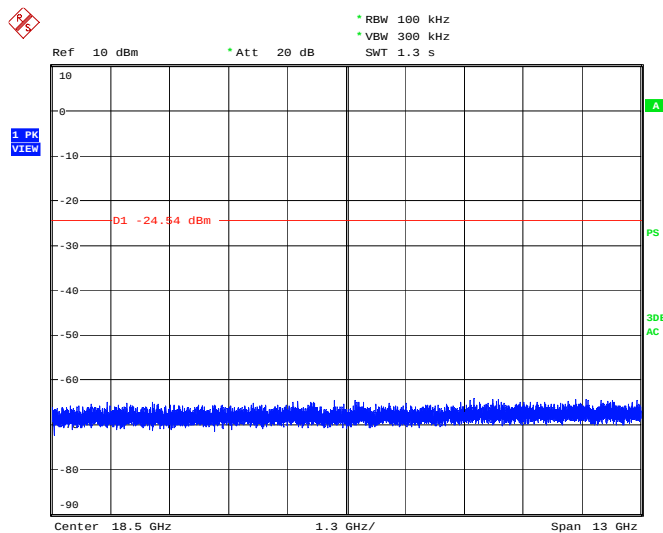
 Seite 23 von 47
 Page 23 of 47

Table 6: Conducted Spurious Emissions of 2479MHz (Mode B3)

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Emission level (dBm)	Margin (dB)
2478.70	N/A	-4.54	-0.66	-5.20	N/A
824.81	-25.20	-44.66	-0.37	-45.03	19.83
1651.90	-25.20	-40.32	-0.58	-40.90	15.70
3304.30	-25.20	-54.80	-0.76	-55.56	30.36
4129.20	-25.20	-58.41	-0.90	-59.31	34.11
4957.60	-25.20	-45.92	-1.02	-46.94	21.74
6608.4	-25.20	-55.67	-1.14	-56.81	31.61
7436.4	-25.20	-46.36	-1.19	-47.55	22.35

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

Figure 12: Operating 2479MHz (Mode B3) spurious from 30MHz to 1GHz

 Spurious 2479MHz 30-1000MHz
 Date: 3.JUN.2008 13:57:56

Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 24 von 47
Page 24 of 47**Figure 13: Operating 2475MHz (Mode B3) spurious from 1GHz to 12GHz**Spurious 2479MHz 1-12GHz
Date: 3.JUN.2008 13:52:44**Figure 14: Operating 2479MHz (Mode B3) spurious from 12GHz to 25GHz**Spurious 2479MHz 12-25GHz
Date: 3.JUN.2008 13:56:55

Prüfbericht - Nr.: 12604515 002

Test Report No.:

Seite 25 von 47

Page 25 of 47

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

Date of testing: 2008-06-03

Ambient temperature: 25.0 °C

Relative humidity: 44 %

Atmospheric pressure: 1010hPa

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 PC and DC 5.0V was supplied via USB cable.

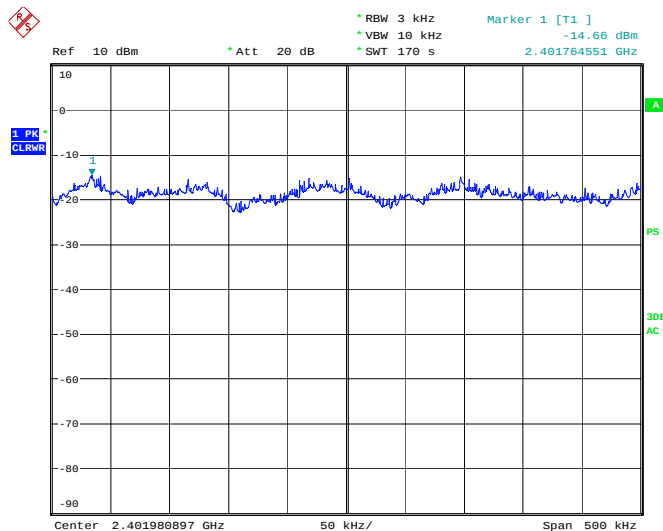
Prüfbericht - Nr.: 12604515 002
 Test Report No.:

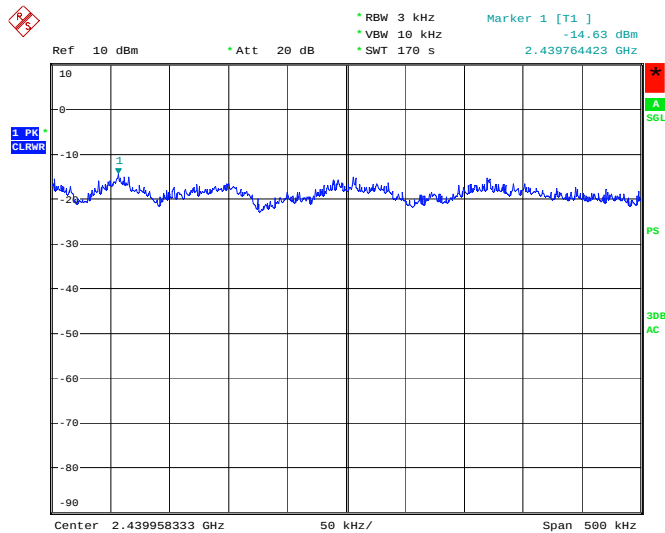
 Seite 26 von 47
 Page 26 of 47

Table 7: Peak Power Spectral Density

Frequency (MHz)	Limit (dBm)	Reading (dBm)	Correction factor (dB)	Power Density (dBm)	Margin (dB)
2402	8	-14.66	-0.61	-15.27	23.27
2440		-14.63	-0.64	-15.27	23.27
2479		-15.86	-0.66	-16.52	24.52

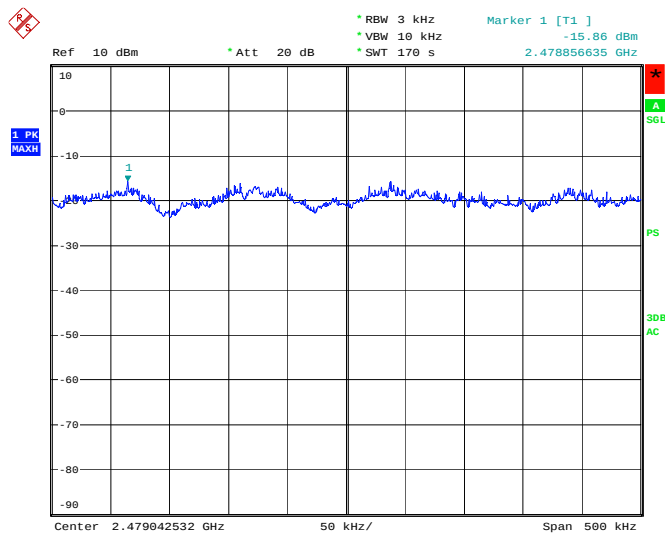
Notes : 1) Power density = (Reading) + (Correction factor)
 2) Correction factor = Cable loss

Figure 15: Power Spectral Density of 2402MHz (Mode B1)

 PSD 2402MHz
 Date: 3. JUN. 2008 12:43:45

Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 27 von 47
Page 27 of 47**Figure 16: Power Spectral Density of 2440MHz (Mode B2)**

PSD 2440MHz

Date: 3.JUN.2008 12:54:05

Figure 17: Power Spectral Density of 2475MHz (Mode B3)

PSD 2479MHz

Date: 3.JUN.2008 13:01:19

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 28 von 47**
Page 28 of 47

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: 53%

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 3 EUT positions (X, Y, and Z-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 EUT was connected to a PC and DC 5.0V was supplied via USB cable.

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

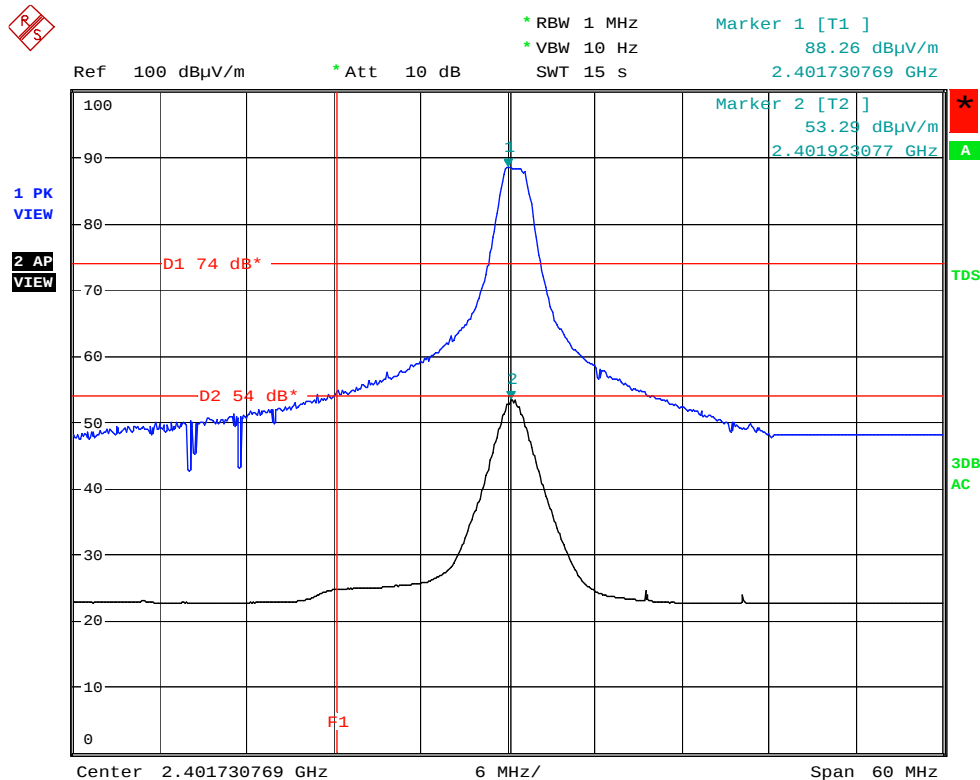
Prüfbericht - Nr.: 12604515 002
 Test Report No.:

 Seite 29 von 47
 Page 29 of 47

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	88.26	53.29	39.36	74.0	54.0	48.90	13.93
2479	88.14	55.06	29.79	74.0	54.0	58.35	25.27

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

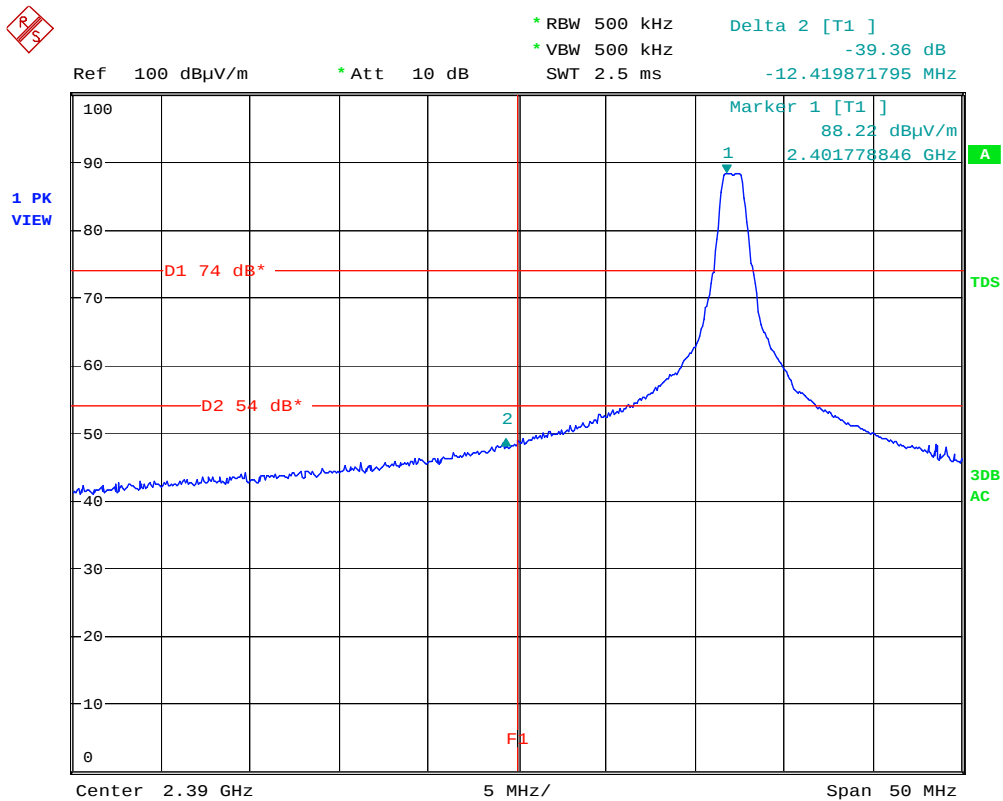
Figure 18: Band edge radiated emission of 2402MHz(Mode A), Peak and average (Step 1)


Band Edge (Lo), Vert, Mode A, Position X
 Direct/Fundamental
 Date: 5.JUN.2008 12:01:24

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

Prüfbericht - Nr.: 12604515 002
Test Report No.:Seite 30 von 47
Page 30 of 47

Figure 19: Band edge radiated emission of 2402MHz(Mode B1), Peak (Step 2)



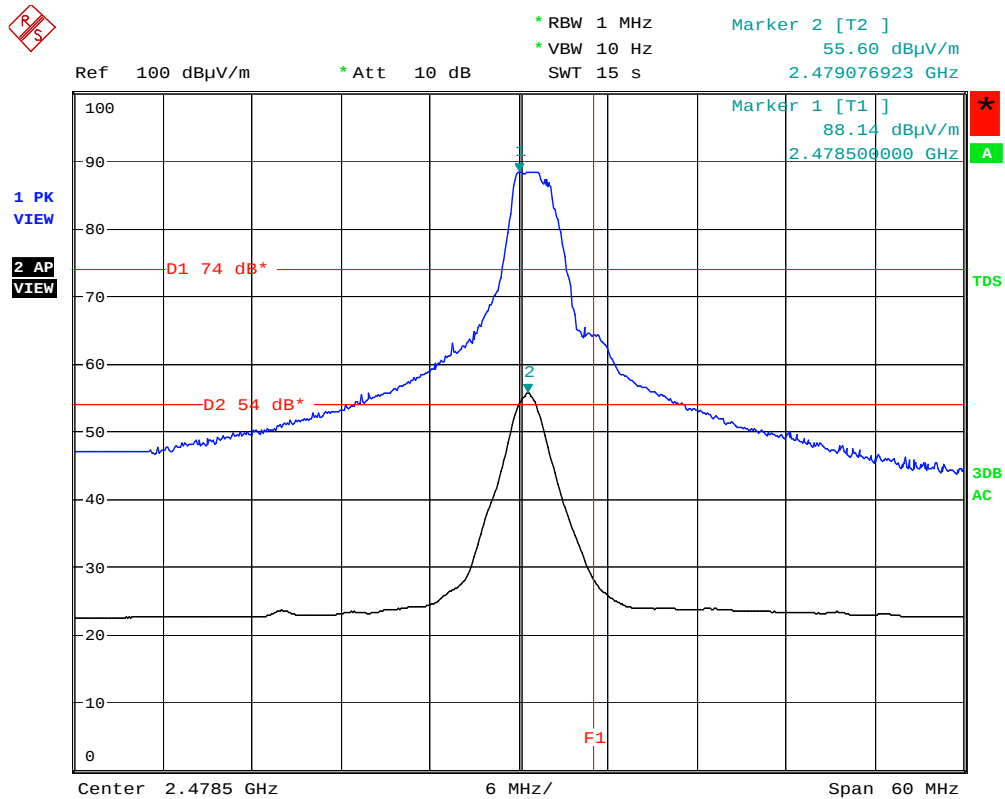
Band Edge (Lo), Vert, Mode A, Position Y

Direct/Fundamental

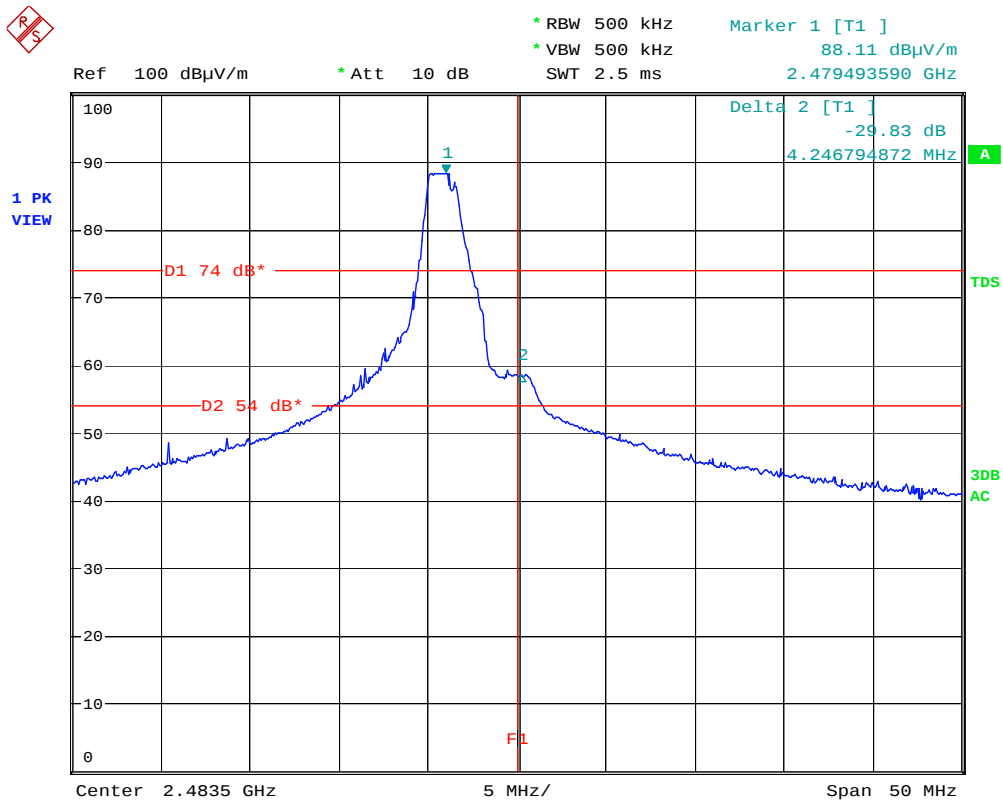
Date: 5.JUN.2008 12:04:23

Prüfbericht - Nr.: 12604515 002
 Test Report No.:

 Seite 31 von 47
 Page 31 of 47

Figure 20: Band edge radiated emission of 2479MHz(Mode B3), Peak and average (Step 1)

 Band Edge (Hi), Hor, Mode B, Position Y
 Direct/Fundamental
 Date: 5.JUN.2008 12:48:59

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

Prüfbericht - Nr.: **12604515 002**
Test Report No.:Seite 32 von 47
Page 32 of 47**Figure 21: Band edge radiated emission of 2479MHz(Mode B3), Peak (Step 2)**

Band Edge (Hi), Hor, Mode B, Position Y

Direct/Fundamental

Date: 5.JUN.2008 12:40:35

Prüfbericht - Nr.: 12604515 002*Test Report No.:***Seite 33 von 47***Page 33 of 47*

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:	2008-06-04
Ambient temperature:	20.0°C
Relative humidity:	54%
Atmospheric pressure:	1011hPa
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 3 EUT positions(X, Y, and Z-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 EUT was connected to a PC and DC 5.0V was supplied via USB cable.

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

Prüfbericht - Nr.: 12604515 002

Test Report No.:

Seite 34 von 47

Page 34 of 47

Table 9: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode B1, Y-axis

Freq. [MHz]	Antenna Orientation	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
35.8333	V	20.8	40	19.2	100	154
47.8365	V	25.1	40	14.9	100	228
59.8397	V	28.9	40	11.1	100	230
71.8429	V	33.0	40	7.0	100	232
83.8463	V	27.7	40	12.3	100	234
95.8494	V	20.5	43.5	23	100	236
239.4232	V	23.7	46	22.3	100	164

Table 10: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode B2, X-axis

Freq. [MHz]	Antenna Orientation	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
35.8333	V	21.3	40	18.7	100	124
47.8365	V	25.6	40	14.4	100	247
59.8397	V	29.5	40	10.5	100	241
71.8429	V	32.3	40	7.7	100	244
83.8463	V	27.3	40	12.7	100	252
95.8494	V	21.4	43.5	22.1	100	216
239.4232	V	22.3	46	23.7	100	178

Table 11: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode B3, Z-axis

Freq. [MHz]	Antenna Orientation	Level QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
35.8333	V	20.7	40	19.3	100	113
47.8365	V	26.8	40	13.2	100	225
59.8397	V	29.0	40	11.0	100	236
71.8429	V	33.0	40	7.0	100	253
83.8463	V	27.8	40	12.2	100	229
95.8494	V	20.6	43.5	22.9	100	239
239.4232	V	24.7	46	21.3	100	163

Prüfbericht - Nr.: 12604515 002

Test Report No.:

Seite 35 von 47

Page 35 of 47

Table 12: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode B1

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	V	40.5	58.39	54.0	74.0	13.5	15.61

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 Z-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 B2

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]
4880	V	43.59	60.75	54.0	74.0	10.41	13.25

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 Z-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 B3

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]
7439	V	43.78	62.61	54.0	74.0	10.22	11.39

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 Z-axis.

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

Prüfbericht - Nr.: 12604515 002
*Test Report No.:*Seite 36 von 47
Page 36 of 47

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 / 2008-06-25

Ambient temperature: 23.0 / 23.0°C

Relative humidity: 53 / 56%

Atmospheric pressure: 1007 / 1001hPa

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.

The physical arrangement of the test system and associated cabling was varied 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 3 EUT positions (X, Y and Z). 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 EUT was connected to a PC and DC 5.0V was supplied via USB cable.

Prüfbericht - Nr.: 12604515 002

Test Report No.:

Seite 37 von 47

Page 37 of 47

Table 15: Radiated Emission Receiver 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode b1 (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 [°]
48.001	V	60.9	-23.2	37.7	40	2.3	112	231
60.254	V	58.6	-23.9	34.7	40	5.3	107	241
74.383	V	62.8	-26	36.8	40	3.2	102	222
156.019	H	46.6	-22.4	24.2	43.5	19.3	126	224
167.975	H	53.2	-22.7	30.5	43.5	13	115	196
192.001	H	57.9	-25.3	32.6	43.5	10.9	174	187
199.985	H	67	-25.6	41.4	43.5	2.1	100	194
199.985	V	62.9	-24.5	38.4	43.5	5.1	101	129
796.422	H	48.7	-11.6	37.1	46	8.9	102	278

Notes : 1) AV: average, PK: peak

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

Table 16: Radiated Emission Receiver 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode b1 (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]
1440	V	29.3	40.59	54.0	74.0	24.7	39.62

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 Z-axis.

Table 17: Radiated Emission Receiver 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode b2 (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 [°]
67.292	V	59.2	-24.8	34.4	40	5.6	100	239
199.977	V	66.6	-24.5	42.1	43.5	1.4	100	351
199.987	H	68.2	-25.6	42.6	43.5	0.9	114	272
231.585	V	60.4	-23.7	36.7	46	9.3	192	173
239.962	H	68.3	-23.9	44.4	46	1.6	114	253

Notes : 1) AV: average, PK: peak

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

Prüfbericht - Nr.: 12604515 002
Test Report No.:
Seite 38 von 47
Page 38 of 47
Table 18: Radiated Emission Receiver 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode b2 (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	V	40.5	58.39	54.0	74.0	13.5	15.61

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 Z-axis.

Prüfbericht - Nr.: 12604515 002
*Test Report No.:***Seite 39 von 47**
Page 39 of 47

8. Test Results AC Conducted Emission

8.1.1 AC Conducted Emission

RESULT:**PASS**

Date of testing: 2008-06-03

Ambient temperature: 25.0°C

Relative humidity: 44%

Atmospheric pressure: 1010hPa

Frequency range: 0.15MHz – 30MHz

Equipment classification: class B

Kind of test site: Shielded Room

Requirements:

The emissions from the AC power line shall not exceed the radio frequency specified in 15.107, 15.207, and RSS-GEN 7.7.2.

Test procedure:

ANSI C63.4-2003, RSS-Gen 7.7.2 and Measurement of Digital Transmission Systems Operating under Section 15.107 and Section 15.207 March 23, 2005

The physical arrangement of the test system and associated cabling was varied in order to ensure that maximum emission amplitudes were attained.

The EUT shall be placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of a screened room shall be located 40 cm to the rear of the EUT. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, shall be individually connected through a LISN to the input power source.

Exploratory measurements shall be used to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement.

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 EUT was connected to a PC and DC 5.0V was supplied via USB cable.

Prüfbericht - Nr.: 12604515 002
Test Report No.:
Seite 40 von 47
Page 40 of 47
Table 19: Conducted Emission, 150kHz - 30MHz, Quasi Peak and Average Data, Mode B1, Phase N (N) and L1 (L)

Freq. [MHz]	Phase	Reading QP [dB(μV)]	Reading AV [dB(μV)]	Factor [dB]	Level QP [dB(μV)]	Level AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
0.18137	N	38.6	23.8	9.6	48.2	33.4	64.4	54.4	16.2	21
0.18305	L1	41.6	25.6	9.6	51.2	35.2	64.3	54.3	13.1	19.1
0.6006	N	30.4	14.9	9.7	40.1	24.6	56	46	15.9	21.4
0.65372	L1	32.2	15.9	9.7	41.9	25.6	56	46	14.1	20.4
0.65812	N	33.8	17.3	9.7	43.5	27	56	46	12.5	19
0.79479	N	27.8	13.8	9.7	37.5	23.5	56	46	18.5	22.5

Table 20: Conducted Emission, 150kHz - 30MHz, Quasi Peak and Average Data, Mode b1, Phase N (N) and L1 (L)

Freq. [MHz]	Phase	Reading QP [dB(μV)]	Reading AV [dB(μV)]	Factor [dB]	Level QP [dB(μV)]	Level AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
0.18165	N	38.2	24.3	9.6	47.8	33.9	64.4	54.4	16.6	20.5
0.18345	L1	40.5	26.1	9.6	50.1	35.7	64.3	54.3	14.2	18.6
0.69808	N	34.8	18.7	9.7	44.5	28.4	56	46	11.5	17.6
0.71123	L1	32.9	17.7	9.7	42.6	27.4	56	46	13.4	18.6
0.72964	L1	32.8	14.6	9.7	42.5	24.3	56	46	13.5	21.7
4.4327	N	25.3	11.1	9.8	35.1	20.9	56	46	20.9	25.1

Table 21: Conducted Emission, 150kHz - 30MHz, Quasi Peak and Average Data, Mode b2, Phase N (N) and L1 (L)

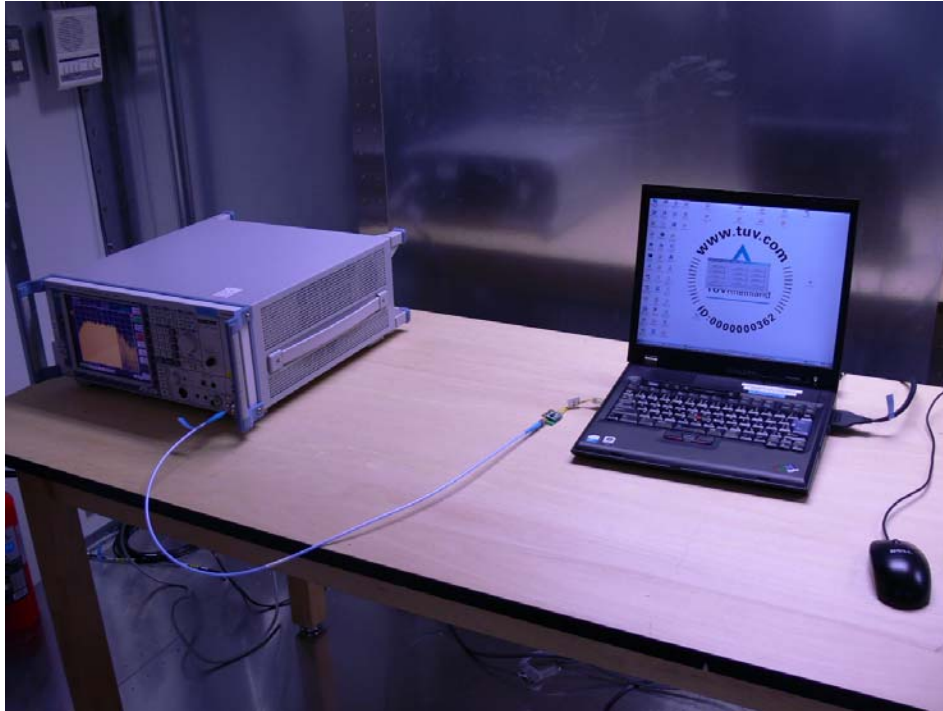
Freq. [MHz]	Phase	Reading QP [dB(μV)]	Reading AV [dB(μV)]	Factor [dB]	Level QP [dB(μV)]	Level AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
0.18265	N	38.6	25.9	9.6	48.2	35.5	64.4	54.4	16.2	18.9
0.18541	L1	40.8	27.5	9.6	50.4	37.1	64.2	54.2	13.8	17.1
0.59308	N	28.4	15.8	9.7	38.1	25.5	56	46	17.9	20.5
0.71179	L1	33	16.6	9.7	42.7	26.3	56	46	13.3	19.7
0.73495	N	34.3	16.1	9.7	44	25.8	56	46	12	20.2
0.73559	L1	32.6	14.9	9.7	42.3	24.6	56	46	13.7	21.4

Prüfbericht - Nr.: 12604515 002
Test Report No.:

Seite 41 von 47
Page 41 of 47

9. Photographs of test setup

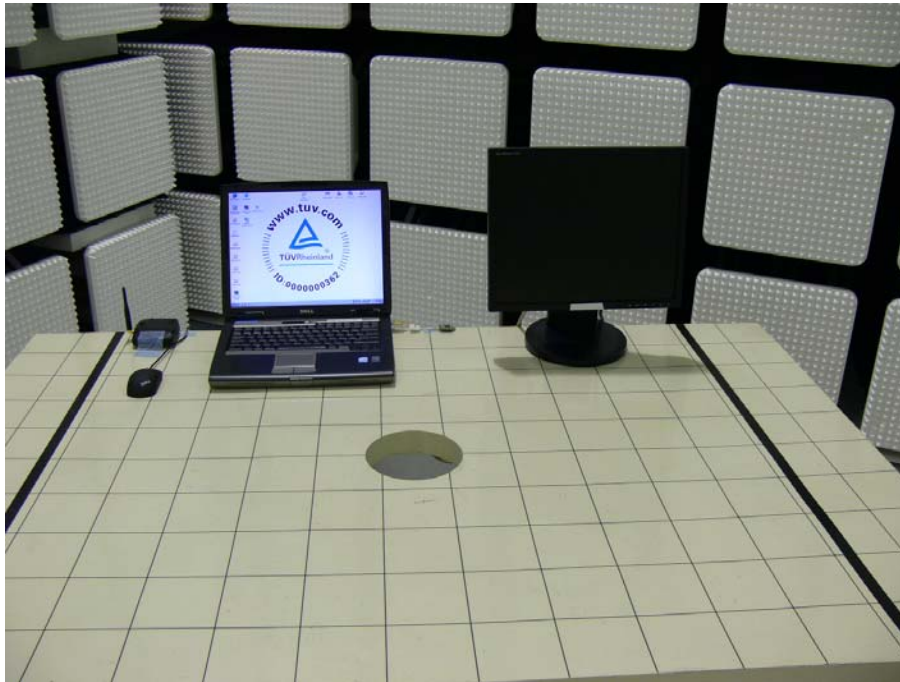
Photograph 1: Set-up for Conducted Testing



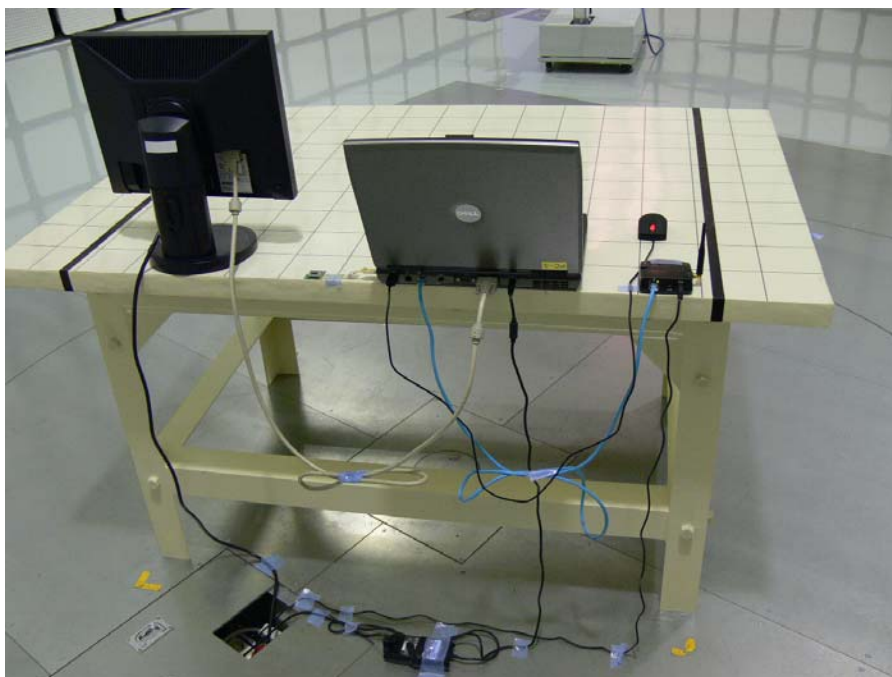
Prüfbericht - Nr.: 12604515 002
Test Report No.:

Seite 42 von 47
Page 42 of 47

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



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

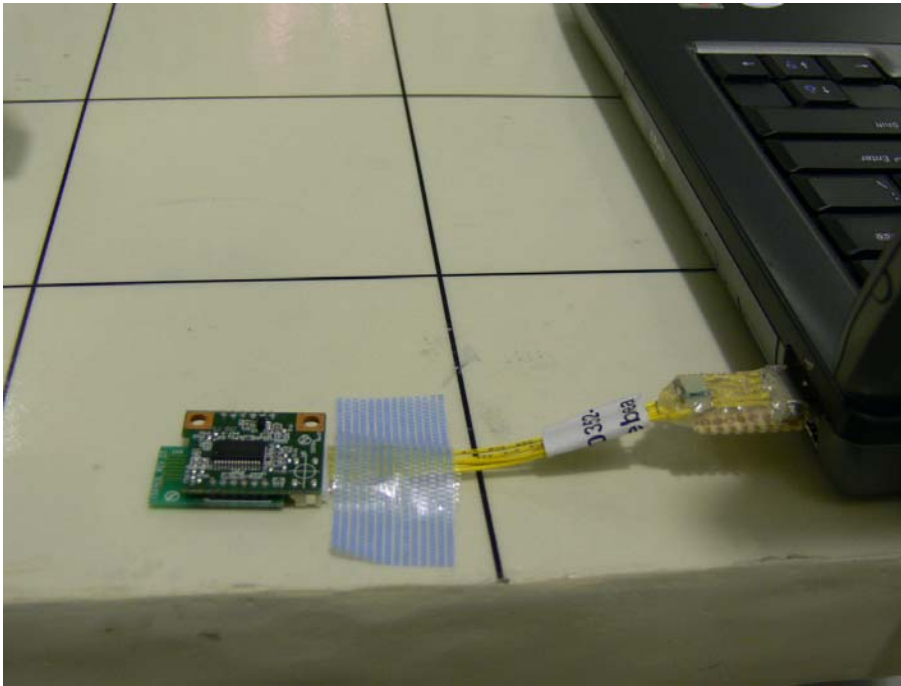


Prüfbericht - Nr.:
Test Report No.:

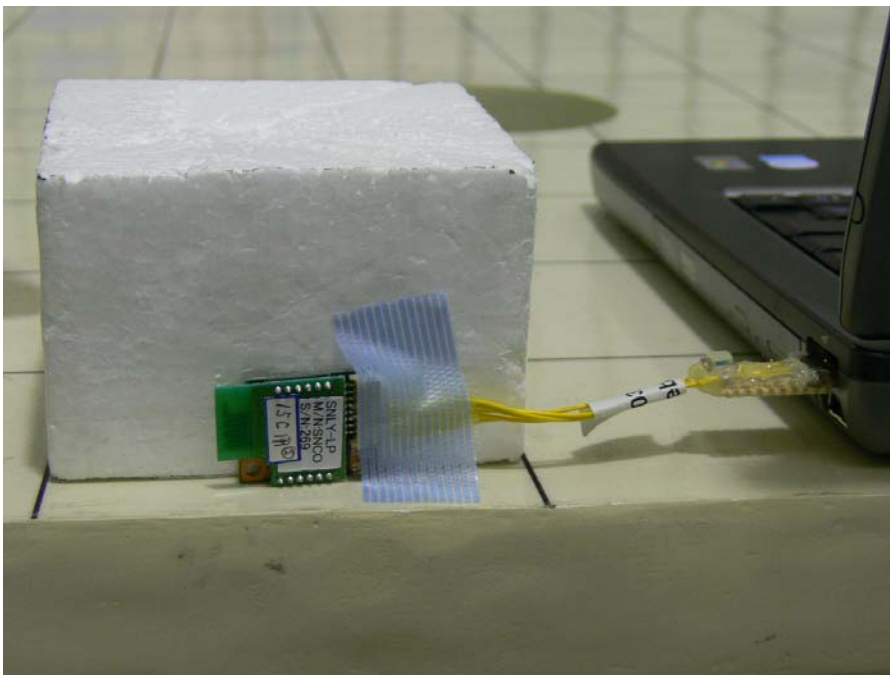
12604515 002

Seite 43 von 47
Page 43 of 47

Photograph 4: Set-up for Radiated Emission, EUT Configuration, X-axis



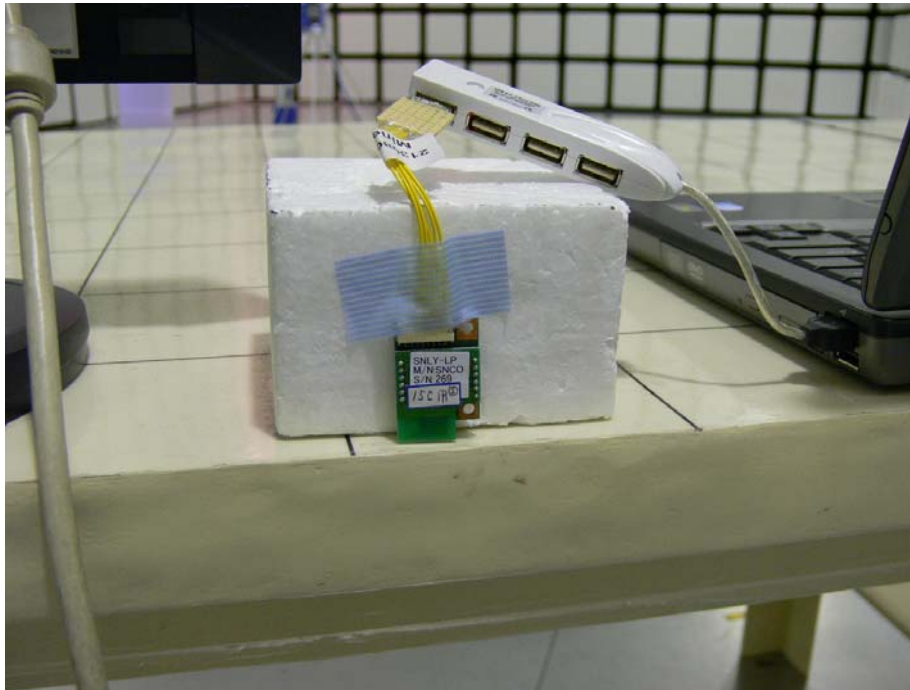
Photograph 5: Set-up for Radiated Emission, EUT Configuration, Y-axis



Prüfbericht - Nr.: 12604515 002
Test Report No.:

Seite 44 von 47
Page 44 of 47

Photograph 6: Set-up for Radiated Emission, EUT Configuration, Z-axis



Photograph 7: Set-up for Conducted Emission, EUT Configuration



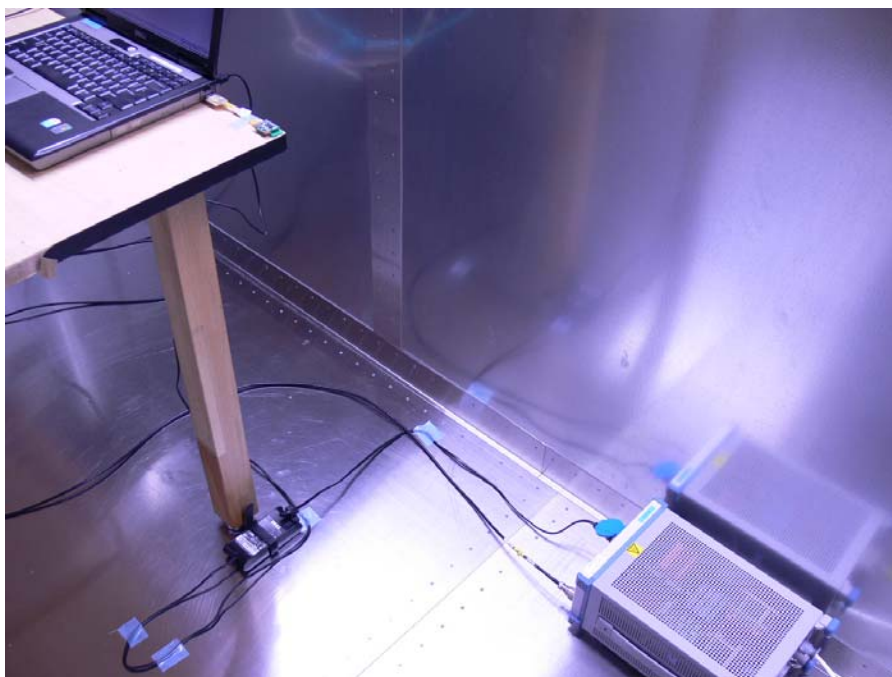
Prüfbericht - Nr.: 12604515 002
Test Report No.:

Seite 45 von 47
Page 45 of 47

Photograph 8: Set-up for Conducted Emission, EUT Configuration



Photograph 9: Set-up for Conducted Emission, EUT Configuration



10. List of Tables

Table 1: List of Test and Measurement Equipment.....	7
Table 2: Conducted output power	13
Table 3: 6dB Bandwidth.....	14
Table 4: Conducted Spurious Emissions of 2402MHz (Mode B1).....	19
Table 5: Conducted Spurious Emissions of 2440MHz (Mode B2).....	21
Table 6: Conducted Spurious Emissions of 2479MHz (Mode B3).....	23
Table 7: Peak Power Spectral Density.....	26
Table 8: Band Edge Radiated Emission	29
Table 9: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode B1, Y-axis	34
Table 10: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode B2, X-axis.....	34
Table 11: Radiated Emission 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode B3, Z-axis	34
Table 12: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode B1	35
Table 13: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode B2	35
Table 14: Radiated Emission 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode B3	35
Table 15: Radiated Emission Receiver 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode b1 (Receive Mode).....	37
Table 16: Radiated Emission Receiver 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode b1 (Receive Mode).....	37
Table 17: Radiated Emission Receiver 30MHz - 1GHz, Horizontal & Vertical Antenna Orientations, Quasi Peak Data, Mode b2 (Host Mode).....	37
Table 18: Radiated Emission Receiver 1GHz-25GHz, Horizontal & Vertical Antenna Orientations, Peak and Average Data, Mode b2 (Host Mode).....	38
Table 19: Conducted Emission, 150kHz - 30MHz, Quasi Peak and Average Data, Mode B1, Phase N (N) and L1 (L)	40
Table 20: Conducted Emission, 150kHz - 30MHz, Quasi Peak and Average Data, Mode b1, Phase N (N) and L1 (L)	40
Table 21: Conducted Emission, 150kHz - 30MHz, Quasi Peak and Average Data, Mode b2, Phase N (N) and L1 (L)	40

11. List of Figures

Figure 1: Block diagram for Radiated testing set up.....	10
Figure 2: Block diagram for Conducted testing set up.....	10
Figure 3: 6dB Bandwidth of 2402MHz (Mode B1).....	15
Figure 4: 6dB Bandwidth of 2440MHz (Mode B2).....	16
Figure 5: 6dB Bandwidth of 2479MHz (Mode B3).....	17
Figure 6: Operating 2402MHz (Mode B1) spurious from 30MHz to 1GHz	19
Figure 7: Operating 2402MHz (Mode B1) spurious from 1GHz to 12GHz.....	20
Figure 8: Operating 2402Hz (Mode B1) spurious from 12GHz to 25GHz.....	20
Figure 9: Operating 2440MHz (Mode B2) spurious from 30MHz to 1GHz	21
Figure 10: Operating 2440MHz (Mode B2) spurious from 1GHz to 12GHz.....	22
Figure 11: Operating 2440MHz (Mode B2) spurious from 12GHz to 25GHz.....	22
Figure 12: Operating 2479MHz (Mode B3) spurious from 30MHz to 1GHz	23
Figure 13: Operating 2475MHz (Mode B3) spurious from 1GHz to 12GHz.....	24
Figure 14: Operating 2479MHz (Mode B3) spurious from 12GHz to 25GHz.....	24
Figure 15: Power Spectral Density of 2402MHz (Mode B1).....	26
Figure 16: Power Spectral Density of 2440MHz (Mode B2).....	27
Figure 17: Power Spectral Density of 2475MHz (Mode B3).....	27
Figure 18: Band edge radiated emission of 2402MHz(Mode A), Peak and average (Step 1)	29
Figure 19: Band edge radiated emission of 2402MHz(Mode B1), Peak (Step 2)	30
Figure 20: Band edge radiated emission of 2479MHz(Mode B3), Peak and average (Step 1)	31
Figure 21: Band edge radiated emission of 2479MHz(Mode B3), Peak (Step 2)	32

12. List of Photographs

Photograph 1: Set-up for Conducted Testing.....	41
Photograph 2: Set-up for Radiated Emission, EUT Configuration.....	42
Photograph 3: Set-up for Radiated Emission, EUT Configuration.....	42
Photograph 4: Set-up for Radiated Emission, EUT Configuration, X-axis.....	43
Photograph 5: Set-up for Radiated Emission, EUT Configuration, Y-axis.....	43
Photograph 6: Set-up for Radiated Emission, EUT Configuration, Z-axis.....	44
Photograph 7: Set-up for Conducted Emission, EUT Configuration.....	44
Photograph 8: Set-up for Conducted Emission, EUT Configuration.....	45
Photograph 9: Set-up for Conducted Emission, EUT Configuration.....	45