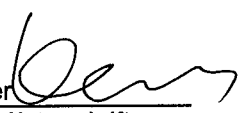
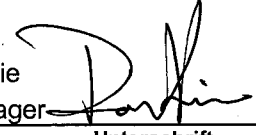


<b>Prüfbericht - Nr.:</b> <b>16014799 001</b>		Seite 1 von 32 Page 1 of 32			
<i>Test Report No.:</i>					
<b>Auftraggeber:</b> <i>Client:</i>	Philips Consumer Lifestyle 3029 East Governor John Sevier Highway, Knoxville, TN, 37914, Tennessee, USA				
<b>Gegenstand der Prüfung:</b> 7" TFT DVD PLAYER / AV SYSTEM In-Car Entertainment <i>Test item:</i>					
<b>Bezeichnung:</b> <i>Identification:</i>	CED750/55	<b>FCC ID:</b> <i>FCC ID</i>	BOUCED750		
<b>Wareneingangs-Nr.:</b> <i>Receipt No.:</i>	173040299	<b>Eingangsdatum:</b> <i>Date of receipt:</i>	Sep. 26, 2008		
<b>Prüfört:</b> <i>Testing location:</i>	TÜV Rheinland (Guangdong) Ltd. EMC Laboratory Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China	Listed test laboratory according to FCC rules section 2.948 for measuring devices under Parts 15			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	ANSI C63.4: 2003 FCC Part 15: Oct. 01, 2007 Subpart B section 15.109 FCC Part 15: Oct. 01, 2007 Subpart C section 15.209 and 15.247				
<b>Prüfergebnis:</b> <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>				
<b>Prüflaboratorium:</b> <i>Testing Laboratory:</i>	TÜV Rheinland (Guangdong) Ltd.				
<b>geprüft/ tested by:</b>		<b>kontrolliert/ reviewed by:</b>			
Nov. 04, 2008 Ken Kuang Project Engineer 		Nov. 04, 2008 Liangdong Xie Project Manager 			
<i>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
<b>Sonstiges/ Other Aspects:</b>					
<b>Abkürzungen:</b> P(ass) = entspricht Prüfgrundlage F(all) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet					
<b>Abbreviations:</b> P(ass) = passed F(all) = failed N/A = not applicable N/T = not tested					
<b>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.</b> <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.:*

**16014799 001**

**Seite 2 von 32**  
*Page 2 of 32*

## Test Summary

<b>FCC Rules</b>		<b>Test items</b>	<b>Result</b>
<b>Paragraph</b>	<b>Released Date</b>		
<b>Part 15 Per Section 15.209(a)</b>	<b>Oct. 01, 2007</b>	<b>Radiated Spurious Emission</b>	<b>Pass</b>
<b>Part 15 Per Section 15.203</b>	<b>Oct. 01, 2007</b>	<b>Antenna requirement</b>	<b>Pass</b>
<b>Part 15 Per Section 15.247(b)(1)</b>	<b>Oct. 01, 2007</b>	<b>Maximum Peak Output power</b>	<b>Pass</b>
<b>Part 15 Per Section 15.247(a)(1)</b>	<b>Oct. 01, 2007</b>	<b>20dB Bandwidth</b>	<b>Pass</b>
<b>Part 15 Per Section 15.247(a)(1)</b>	<b>Oct. 01, 2007</b>	<b>Hopping Channel Carrier Frequency Separation</b>	<b>Pass</b>
<b>Part 15 Per Section 15.247(a)(1)(iii)</b>	<b>Oct. 01, 2007</b>	<b>Number of Hopping Frequency Used</b>	<b>Pass</b>
<b>Part 15 Per Section 15.247(a)(1)(iii)</b>	<b>Oct. 01, 2007</b>	<b>Time of Occupancy (Dwell Time)</b>	<b>Pass</b>
<b>Part 15 Per Section 15.247(d)</b>	<b>Oct. 01, 2007</b>	<b>Out-Of-Band Emission measurement</b>	<b>Pass</b>

## Contents

<b>1</b>	<b>GENERAL REMARKS.....</b>	<b>5</b>
1.1	COMPLEMENTARY MATERIALS.....	5
<b>2</b>	<b>TEST SITES.....</b>	<b>5</b>
2.1	TEST FACILITIES.....	5
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	6
2.3	TRACE ABILITY.....	6
2.4	CALIBRATION.....	6
2.5	MEASUREMENT UNCERTAINTY.....	7
2.6	LOCATION OF ORIGINAL DATA.....	7
2.7	STATUS OF FACILITY USED FOR TESTING.....	7
<b>3</b>	<b>GENERAL PRODUCT INFORMATION.....</b>	<b>8</b>
3.1	PRODUCT FUNCTION AND INTENDED USE.....	8
3.2	RATINGS AND SYSTEM DETAILS.....	8
3.3	INDEPENDENT OPERATION MODES.....	9
3.4	SUBMITTED DOCUMENTS.....	9
<b>4</b>	<b>TEST SET-UP AND OPERATION MODE.....</b>	<b>10</b>
4.1	PRINCIPLE OF CONFIGURATION SELECTION.....	10
4.2	TEST OPERATION AND TEST SOFTWARE.....	10
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT.....	10
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	10
4.5	TEST SET-UP.....	11
<b>5</b>	<b>TEST RESULTS EMISSION.....</b>	<b>13</b>
5.1	RADIATED SPURIOUS EMISSION.....	13
5.2	ANTENNA REQUIREMENT.....	18
5.3	MAXIMUM PEAK OUTPUT POWER.....	19
5.4	20DB BANDWIDTH.....	20
5.5	HOPPING CHANNEL CARRIER FREQUENCY SEPARATION.....	21
5.6	NUMBER OF HOPPING FREQUENCY USED.....	23
5.7	TIME OF OCCUPANCY (DWELL TIME).....	24
5.8	OUT-OF-BAND EMISSION MEASUREMENT.....	26

**Prüfbericht - Nr.:**  
*Test Report No.:***16014799 001****Seite 4 von 32**  
*Page 4 of 32*

<b>6</b>	<b>PHOTOGRAPHS OF THE TEST SET-UP.....</b>	<b>28</b>
<b>7</b>	<b>LIST OF TABLES.....</b>	<b>32</b>
<b>8</b>	<b>LIST OF PHOTOGRAPHS.....</b>	<b>32</b>

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 5 von 32**  
*Page 5 of 32*

## **1 General Remarks**

### **1.1 Complementary Materials**

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result

## **2 Test Sites**

### **2.1 Test Facilities**

**TÜV Rheinland (Guangdong) Ltd. EMC Laboratory**

Guangzhou Auto Market, Yuan Gang Section of Guangshan Road  
Guangzhou 510650

P. R. China

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

Kind of Equipment	Type	Manufacturer	S/N	Calibrated until	Calibrated Interval
EMI Test Receiver	ESCI-3	Rohde & Schwarz	100216	26.Nov.2008	1 year
Spectrum Analyzer	FSP30	Rohde & Schwarz	100286	27.Aug.2009	1 year
Trilog-Broadband Antenna	VULB9168	SCHWARZBECK MESS-ELEKTRONIK	210	08.May.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100385	18.Jul.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100407	08.May.2009	2 year
Pre-amplifier	AFS42- 00101800- 25-S-42	MITEQ	1101599	31.Jul.2009	2 year
Band Reject Filter	BRM50702	Micro-Tronics	023	14.Mar.2010	2 year
Standard Gain Horn Antenna	3160-09	EMCO	21642	--	--
Standard Gain Horn Antenna	3160-09	EMCO	21645	--	--
Pre-amplifier	AFS33- 18002650- 30-8P-44	MITEQ	1108282	31.Jul.2009	2 year
3m Anechoic Chamber	N/A	Albatross Project GmbH	N/A	16.Apr.2009	3 year

## 2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

**Prüfbericht - Nr.:**

**16014799 001**

**Seite 7 von 32**

*Test Report No.:*

*Page 7 of 32*

## **2.5 Measurement Uncertainty**

Uncertainty for conducted emissions measurements is  $\pm 2.51$ dB.

Uncertainty for radiated emissions measurements is  $\pm 4.9$ dB (30MHz-1GHz),  $\pm 4.84$ dB (>1GHz).

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

## **2.6 Location of original data**

The original copies of test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Guangdong) file for certification follow-up purposes.

## **2.7 Status of facility used for testing**

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory; Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements, the register no. 833845

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 8 von 32**  
*Page 8 of 32*

### 3 General Product Information

The EUT is a DVD player with AM/FM radio and built-in Bluetooth for vehicular use.

#### 3.1 Product Function and Intended Use

Refer to the Technical Documentation and user manual.

#### 3.2 Ratings and System Details

Frequency range	:	2402.0MHz – 2480.0MHz (unlicensed ISM band)
Number of employed channels	:	79 channels
Total Number of channels	:	79 channels
Modulation Type	:	Frequency Hopping Spread Spectrum (Bluetooth V2.0 Class II product)
Type of antenna	:	Integral antenna
Power supply	:	12V DC (the EUT is powered by vehicle power system)
Ports	:	Vehicle ISO connectors (Refer to user manual for detail information)
Protection Class	:	III

Refer to the Technical Documentation for further information



**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 9 von 32**  
*Page 9 of 32*

### **3.3 Independent Operation Modes**

Off

On:

1. Audio/Video play
2. Bluetooth connection with mobile phones.

The basic operation modes for the Bluetooth Function:  
Operating: Transmitting and receiving

For further information refer to User Manual

### **3.4 Submitted Documents**

Block Diagram

Schematics

Operation Description

Components List

FCC label and location

User Manual

Internal Photos

External Photos

Application form

## **4 Test Set-up and Operation Mode**

### **4.1 Principle of Configuration Selection**

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### **4.2 Test Operation and Test Software**

Refer to test set-up in chapter 5.

### **4.3 Special Accessories and Auxiliary Equipment**

The products have been tested together with the following device:

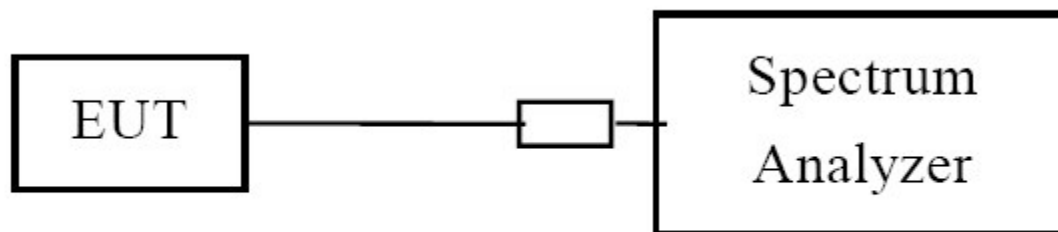
Device	Manufacture	Model	Serial no./ Version
Laptop notebook	IBM R40e	2684	99-CYY55
Bluetooth test Software	CSR	BlueTest	1.22

### **4.4 Countermeasures to achieve EMC Compliance**

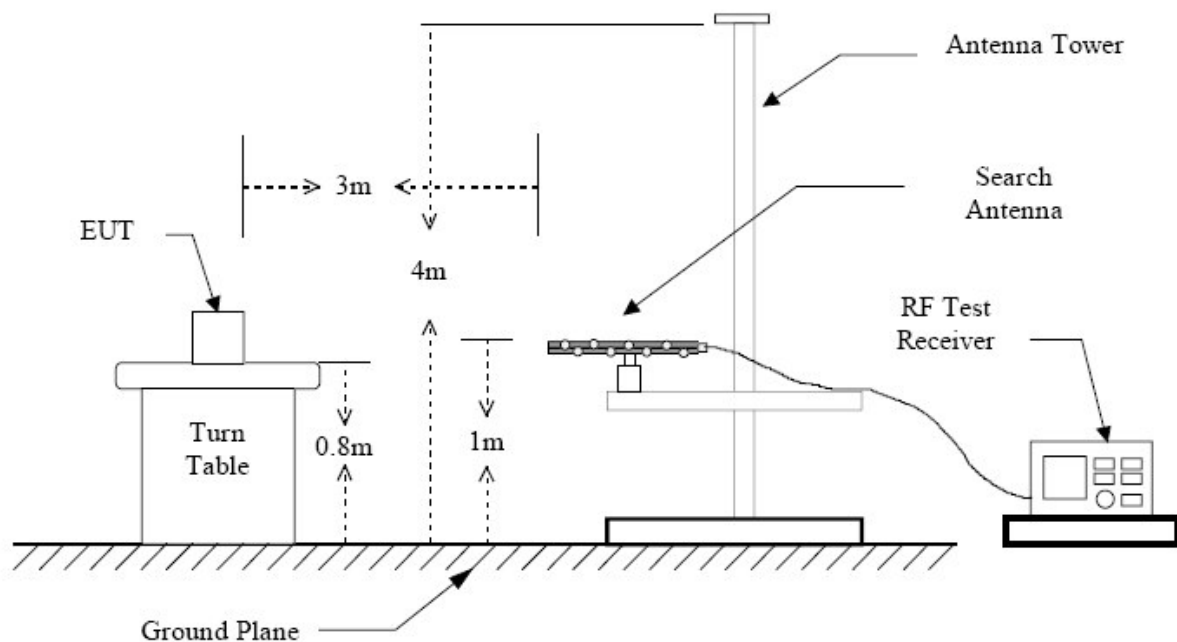
The test sample, which has been tested, contained the noise suppression parts as described in the technical document. No additional measures were employed to achieve compliance.

## 4.5 Test set-up

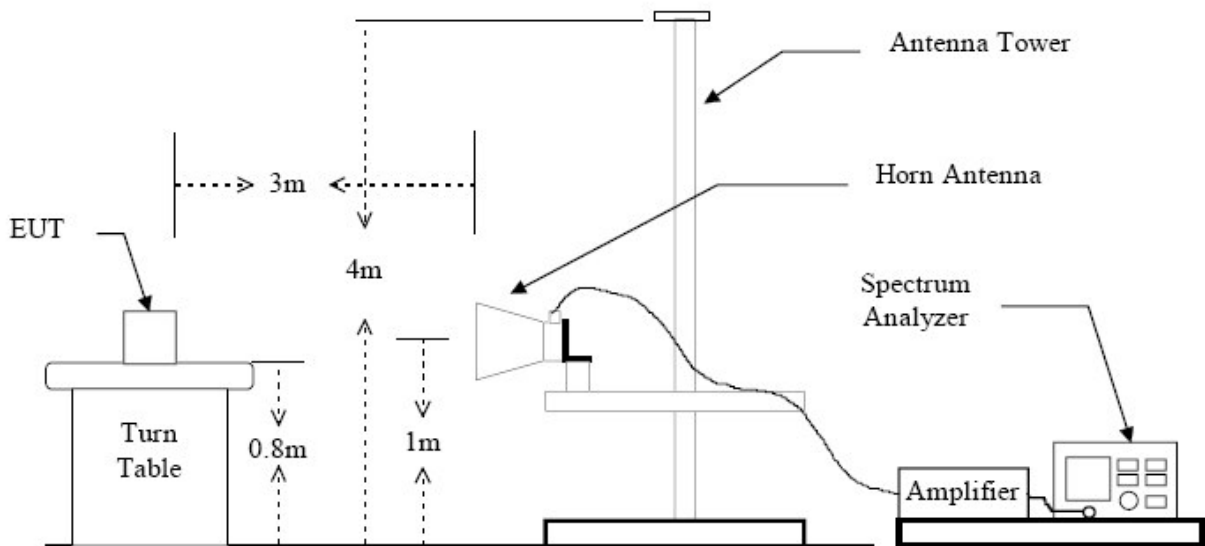
**Diagram 1 of Configuration for Testing hopping channel Separation, channel bandwidth, number of hopping frequency used, output power measurement, out-of-band conducted emission measurement and peak power spectral density measurement**



**Diagram 2 of Configuration for Testing Radiated Emission below 1 GHz**



**Diagram 3 of Configuration for Testing Radiated Emission above 1 GHz**



## 5 Test Results EMISSION

### 5.1 Radiated Spurious Emission

**RESULT:**

**Pass**

Date of testing	:	Oct. 9, 2008
Test specification	:	FCC Part 15 Per Section 15.247(a)
Limits	:	FCC Part 15 Per Section 15.209(a)
Deviations from Standard Test procedures	:	None
Test procedure	:	<ol style="list-style-type: none"><li>1. The EUT was placed on the top of a rotatable table 0.8 meters above the ground with 3-orthogonal direction and be kept close enough to the receiving antenna. The table was rotated 360 degrees to determine the suspected emission frequency and the position of the worst radiation case with both horizontal and vertical antenna polarization.</li><li>2. The EUT was then set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower.</li><li>3. For each suspected emission frequency recorded in step 1, the EUT was arranged to its worst case that the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to read the maximum emission with peak detector.</li><li>4. Also record the value of the emission level by specified detector and resolution bandwidth. *</li></ol>

**Prüfbericht - Nr.:****16014799 001****Seite 14 von 32***Test Report No.:**Page 14 of 32*

Kind of test site	:	3m Semi-anechoic chamber
Frequency range	:	30MHz to 25GHz
Operation mode	:	Continuously transmitting (channel low, mid, high)
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

**\*Note:**

The final measurement for frequencies below 1000MHz is performed with Quasi Peak detector; the final measurement for frequencies above 1000MHz is performed with Average and Peak detector.

The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency below 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz at frequency above 1GHz.

Disturbances other than those mentioned are small or not detectable.

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 15 von 32**  
*Page 15 of 32*

**Table 2: Radiated Emission (Transmitting at channel low)**

<b>Frequency</b> [MHz]	<b>QP</b> [dB $\mu$ V/m]	<b>AV</b> [dB $\mu$ V/m]	<b>Polarity</b> (H/V)	<b>Limit</b> [dB $\mu$ V/m]
191.929	32.4	--	H	43.5
224.440	37.0	--	H	46
240.005	35.3	--	H	46
367.985	34.6	--	H	46
448.859	28.7	--	V	46
477.830	29.5	--	V	46

<b>Frequency</b> [MHz]	<b>PK</b> [dB $\mu$ V/m]	<b>AV</b> [dB $\mu$ V/m]	<b>Polarity</b> (H/V)	<b>PK Limit</b> [dB $\mu$ V/m]	<b>AV limit</b> [dB $\mu$ V/m]
1602.000	47.1	44.9	H	74	54
4804.000	45.1	32.6	H	74	54
12010.000	49.9	37.1	H	74	54
16814.000	56.0	43.3	H	74	54
1144.500	49.5	31.8	V	74	54
1602.000	45.3	42.7	V	74	54
3204.000	47.9	32.6	V	74	54
4804.000	47.0	35.1	V	74	54

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 16 von 32**  
*Page 16 of 32*

**Table 3: Radiated Emission (Transmitting at channel mid)**

<b>Frequency</b> [MHz]	<b>QP</b> [dB $\mu$ V/m]	<b>AV</b> [dB $\mu$ V/m]	<b>Polarity</b> (H/V)	<b>Limit</b> [dB $\mu$ V/m]
191.850	32.2	--	H	43.5
208.850	34.1	--	H	43.5
224.450	36.5	--	H	46
304.000	37.1	--	H	46
368.400	36.9	--	H	46
214.050	24.4	--	V	43.5
224.45	25.9	--	V	46

<b>Frequency</b> [MHz]	<b>PK</b> [dB $\mu$ V/m]	<b>AV</b> [dB $\mu$ V/m]	<b>Polarity</b> (H/V)	<b>PK Limit</b> [dB $\mu$ V/m]	<b>AV limit</b> [dB $\mu$ V/m]
1628.000	45.8	43.2	H	74	54
4882.000	42.6	29.6	H	74	54
12205.000	49.6	36.6	H	74	54
17087.000	56.5	43.8	H	74	54
1136.000	50.5	31.0	V	74	54
1628.000	43.6	40.2	V	74	54
3256.000	44.2	36.2	V	74	54
12205.000	49.8	36.3	V	74	54



**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 17 von 32**  
*Page 17 of 32*

**Table 4: Radiated Emission (Transmitting at channel high)**

Frequency [MHz]	QP [dB $\mu$ V/m]	AV [dB $\mu$ V/m]	Polarity (H/V)	Limit [dB $\mu$ V/m]
208.600	34.2	--	H	43.5
214.500	35.0	--	H	43.5
224.400	36.1	--	H	46
240.000	35.0	--	H	46
304.000	37.2	--	H	46
368.400	36.4	--	H	46
448.850	27.5	--	V	46
476.800	29.1	--	V	46

Frequency [MHz]	PK [dB $\mu$ V/m]	AV [dB $\mu$ V/m]	Polarity (H/V)	PK Limit [dB $\mu$ V/m]	AV limit [dB $\mu$ V/m]
1654.000	46.6	44.0	H	74	54
7440.000	48.1	34.5	H	74	54
9920.000	48.8	36.5	H	74	54
17360.000	58.1	45.2	H	74	54
1138.000	50.3	31.1	V	74	54
1654.000	43.2	39.5	V	74	54
3307.500	42.4	31.5	V	74	54
12400.000	50.9	37.7	V	74	54

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 18 von 32**  
*Page 18 of 32*

## 5.2 Antenna requirement

**RESULT:**

**Pass**

Date of testing : ---  
Test specification : FCC Part 15 Per Section 15.203  
FCC Part 15 Per Section 15.247(b)

For intentional device, according to 15.203, and intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to 15.247(b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by amount in dB than the directional gain of the antenna exceeds of 6dBi.

As the antenna is permanently mounted on RF Board, there is no consideration of replacement.

And the max gain of the antenna is 4dBi.

### 5.3 Maximum Peak Output Power

**RESULT:**
**Pass**

Date of testing : Oct. 16, 2008  
 Test specification : FCC Part 15 Per Section 15.247(b)(1)  
 Limits : FCC Part 15 Per Section 15.247(b)(1)  
 For frequency hopping systems operating in 2400-2483.5MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1watt. Fore all other frequency hopping systems in the 2400-2483.5MHz band: 0.125watts.

Deviations from Standard Test procedures :

None

Test procedure :

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: Centered Frequency= measured channel, RBW=1MHz, VBW≥RBW.
4. Mark the peak power output frequency and record the max reading.
5. Repeat step 2 to 4 until all the channels measured are finished.

Kind of test site :

Shielded room

Operation mode :

Continuously transmitting on the measured channel.

Power supply :

DC 12V

Temperature :

22°C

Humidity :

50%

**Table 5: Peak Conducted Power**

Channel	Frequency (MHz)	Power Reading(dBm)	Cable Loss (dB)	Output Power		Limit (W) *
				(dBm)	(mW)	
Low	2402.0	-8.66	0.4	-8.26	0.15	1
Mid	2441.0	-8.02	0.4	-7.62	0.17	1
High	2480.0	-8.37	0.4	-7.97	0.16	1

\*Note: Refer to the test result of "Number of Hopping Channel Used" for the non-overlap channel number.

## 5.4 20dB Bandwidth

**RESULT:**

**Pass**

Date of testing : Oct. 14, 2008  
 Test specification : FCC Part 15 Per Section 15.247(a)(1)  
 Deviations from Standard Test procedures : None  
 Test procedure :  
 1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.  
 2. Set the EUT to proper test mode with relative test software and hardware.  
 3. Spectrum analyzer setting: Centered Frequency= measured channel, RBW=10kHz, VBW=30kHz.  
 4. Mark the peak power frequency point and the -20dB upper and lower frequency points.  
 5. Read the frequency delta value between the -20dB upper and lower frequency points.  
 6. Repeat step 2 to 5 until all the channels required are finished.

Operation mode : Continuously transmitting on the measured channel.  
 Kind of test site : Shielded room  
 Power supply : DC 12V  
 Temperature : 22°C  
 Humidity : 50%

**Table 6: 20dB Bandwidth**

Channel	Frequency (GHz)	Test Result (kHz)
Low	2402.0	872
Mid	2441.0	908
High	2480.0	868

Please refer to Appendix 1 for measurement data.

## 5.5 Hopping Channel Carrier Frequency Separation

**RESULT:****Pass**

Date of testing	:	Oct. 14, 2008
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)
Limits	:	FCC Part 15 Per Section 15.247(a)(1) Frequency hopping system shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater
Deviations from Standard Test procedures	:	None
Test procedure	:	<ol style="list-style-type: none"><li>1. Connect the antenna port of the EUT to the spectrum analyzer by a low loss cable.</li><li>2. Set the EUT to proper test mode with relative test software and hardware.</li><li>3. Spectrum analyzer setting: Centered Frequency = measured channel, RBW = 100kHz, VBW = 100kHz, Frequency Span = wide enough to cover the adjacent channel.</li><li>4. Mark the peak power frequency point of the measured channel and its adjacent channel(s)</li><li>5. Read the frequency delta value between the measured channel and its adjacent channel(s)</li><li>6. Repeat step 3 to 5 until all the channels measured are finished.</li></ol>
Kind of test site	:	Shielded room
Operation mode	:	Transmitting with hopping function enabled
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 22 von 32**  
*Page 22 of 32*

**Table 7: Hopping Channel Carrier Frequency Separation**

<b>Channel</b>	<b>Adjacent Hopping channel separation (kHz)</b>	<b>Limit</b>
Low	1002	At least 25kHz or tow-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.  Note: refer to table 6 for the value of 20dB bandwidth
Mid	1002	
High	1002	

Please refer to Appendix 1 for measurement data.

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 23 von 32**  
*Page 23 of 32*

## 5.6 Number of Hopping Frequency Used

**RESULT:**

**Pass**

Date of testing	:	Oct. 14, 2008
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)(iii)
Limits	:	FCC Part 15 Per Section 15.247(a)(1)(iii) Frequency hopping system in the 2400-2483.5 MHz band shall use at least 15 non-overlapping channels
Deviations from Standard Test procedures	:	None
Test procedure	:	1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable. 2. Set the EUT to proper test mode with relative test software and hardware. 3. Spectrum analyzer setting: RBW = 300kHz, VBW≥RBW, Frequency Span = wide enough to cover the channels to be plotted. 4. Set the spectrum analyzer to Max-hold mode and plot the result(s) with record of all hopping channel.
Kind of test site	:	Shielded room
Operation mode	:	Transmitting with hopping function enabled
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

**Table 8: Number of hopping frequency**

Number of hopping frequency:	79
Limit:	At least 15 non-overlapping channels

Please refer to Appendix 1 for measurement data.

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 24 von 32**  
*Page 24 of 32*

## 5.7 Time of Occupancy (Dwell Time)

**RESULT:**

**Pass**

Date of testing	:	Oct. 14, 2008
Test specification	:	FCC Part 15 Per Section 15.247(a)(1)(iii)
Limits	:	FCC Part 15 Per Section 15.247(a)(1)(iii) For frequency hopping system operating in the 2400-2483.5MHz band, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
Deviations from Standard Test procedures	:	None
Test Procedure	:	<ol style="list-style-type: none"><li>1. Connect the antenna port of the EUT to the spectrum analyzer by a low loss cable.</li><li>2. Set the EUT to proper test mode with relative test software and hardware.</li><li>3. Spectrum analyzer setting: Centered Frequency = measured channel, RBW = 1MHz, VBW ≥ RBW, Frequency Span = 0.</li><li>4. Set sweep time properly to capture the entire dwell time per hopping channel.</li><li>5. Set detector type to Peak and trace mode to Max Hold and make the measurement.</li><li>6. Repeat step 3-5 until all channels measured were complete.</li></ol>
Kind of test site	:	Shielded room
Operation mode	:	Frequency hopping with Max. Dwell time (DH5 mode)
Power supply	:	DC 12V
Temperature	:	22°C
Humidity	:	50%

**Period = 0.4 (seconds) x 79 (channels) = 31.6 seconds**



**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 25 von 32**  
*Page 25 of 32*

**Table 9: Dwell Time (DH5 mode)**

channel	Frequency (GHz)	Dwell time of one signal Burst (ms)	Total Dwell Time (ms)	Limit (ms)
Low	2.402	2.960	$(2.960 \times 106.81) = 316.16$	$\leq 400$
Mid	2.441	2.940	$(2.940 \times 106.81) = 314.02$	$\leq 400$
High	2.480	2.940	$(2.940 \times 106.81) = 314.02$	$\leq 400$

**Note:**

For Bluetooth system, there are 1600 timeslots in one second. The DH5 mode operates on a 5-slot transmission and 1-slot receiving basis. Thus there are  $1600 / (5+1) = 266.7$  transmission per second. In one period for each particular channel there are  $(266.7/79) \times 31.6 = 106.81$  times of transmission.

Dwell Time in one period(ms) = Dwell time of one-slot transmission(ms) multiplexes 106.81

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 26 von 32**  
*Page 26 of 32*

## 5.8 Out-of-Band Emission

**RESULT:**

**Pass**

Date of testing : Oct. 14, 2008

Test specification : FCC Part 15 Per Section 15.247(d)

Limits : FCC Part 15 Per Section 15.247(d)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

In addition, radiated emission which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).

Deviations from Standard Test procedures :

None

Test Procedure :

1. Connect the antenna port of the EUT to the spectrum analyzer by a low lost cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: RBW = 100kHz, VBW≥RBW.
4. Set the proper frequency span respectively for out-of-band emission measurement of the band edge and the whole range (up to 10 times of the carrier frequency.)
5. Set the trace mode to Max Hold and mark the peak reading of any spurious emission recorded.

Kind of test site : Shielded room

Operation mode : Transmitting at the highest and lowest channel (band edge)  
Transmitting at low, middle and high channel (whole rang)

Power supply : DC 12V

Temperature : 22°C

Humidity : 50%

**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 27 von 32**  
*Page 27 of 32*

**Table 10: Band Edges Emission**

<b>Emission</b>	<b>Attenuation (dB)</b>	<b>Limit (dB)</b>
Lower Band Edge	All emission in this 100kHz bandwidth are attenuated more than 20dB from the carrier	/20
Upper Band Edge	All emission in this 100kHz bandwidth are attenuated more than 20dB from the carrier	/20

**Table 11: Out-Of-Band Emission measurement (conducted)**

<b>Emission (Carrier operating at Channel low, mid and high)</b>	<b>Attenuation</b>	<b>Limit (dB)</b>
30MHz to 25GHz	All emission in this 100kHz bandwidth are attenuated more than 20dB from the carrier	/20

**Table 12: Band Edges Emission in the Restricted Bands 2310-2390MHz and 2483.5-2500MHz**

<b>Restricted band</b>	<b>Frequency [MHz]</b>	<b>dBc</b>	<b>PK [dB<math>\mu</math>V/m]</b>	<b>Polarity (H/V)</b>	<b>PK limit [dB<math>\mu</math>V/m]</b>	<b>AV limit [dB<math>\mu</math>V/m]</b>
Low band	2386.2	54.7	27.1	V	74	54
High band	2484.0	48.3	40.3	V	74	54

**NOTE:**

1. The Peak carrier field strength of channel 0 and channel 78 is 81.8dBuV/m and 88.6dBuV/m.
2. The dBc value between the carrier maximum power and band edge emission power of the frequency listed in the table is calculated from the test record showed in Appendix 1.
3. Peak value of the low band edge emission listed in the table is calculated by the below formula:  
PK value of band edge emission = Peak carrier field strength – dBc value in item2

Please refer to Appendix 1 for measurement data.

## 6 Photographs of the Test Set-Up

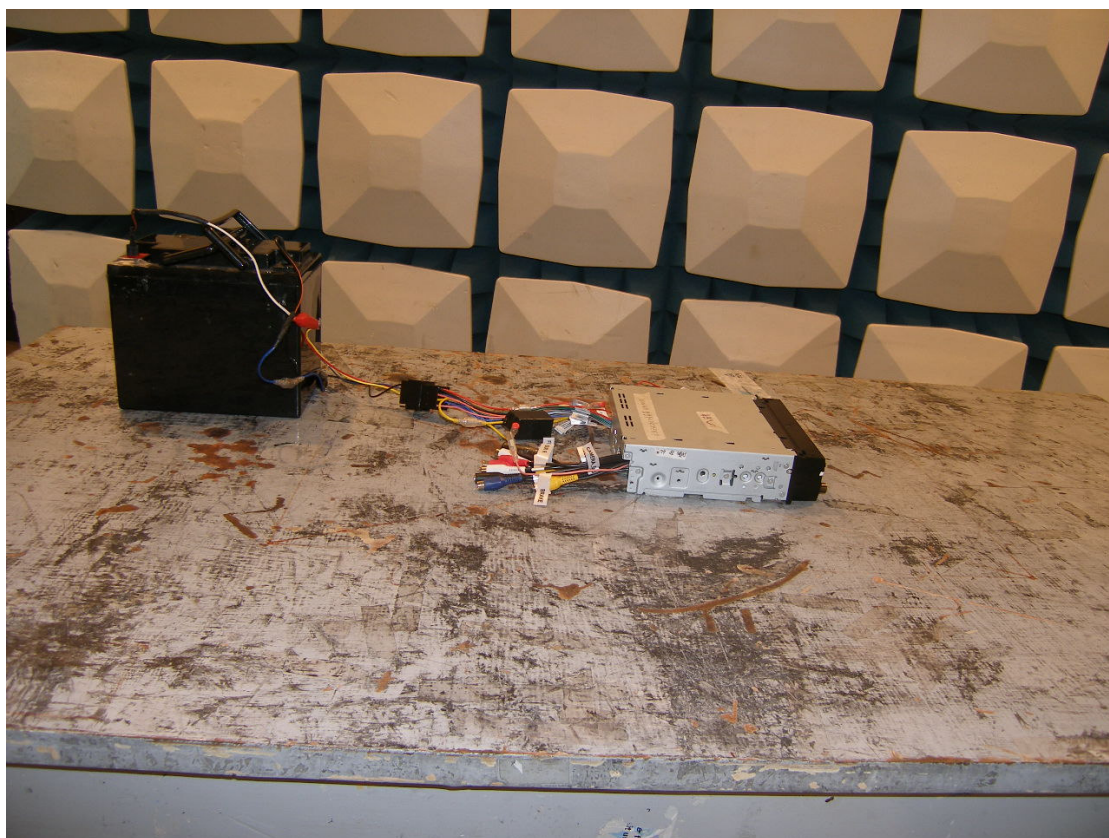
**Photograph 1: Set-up for Radiation Measurement below 1GHz**



**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 29 von 32**  
*Page 29 of 32*

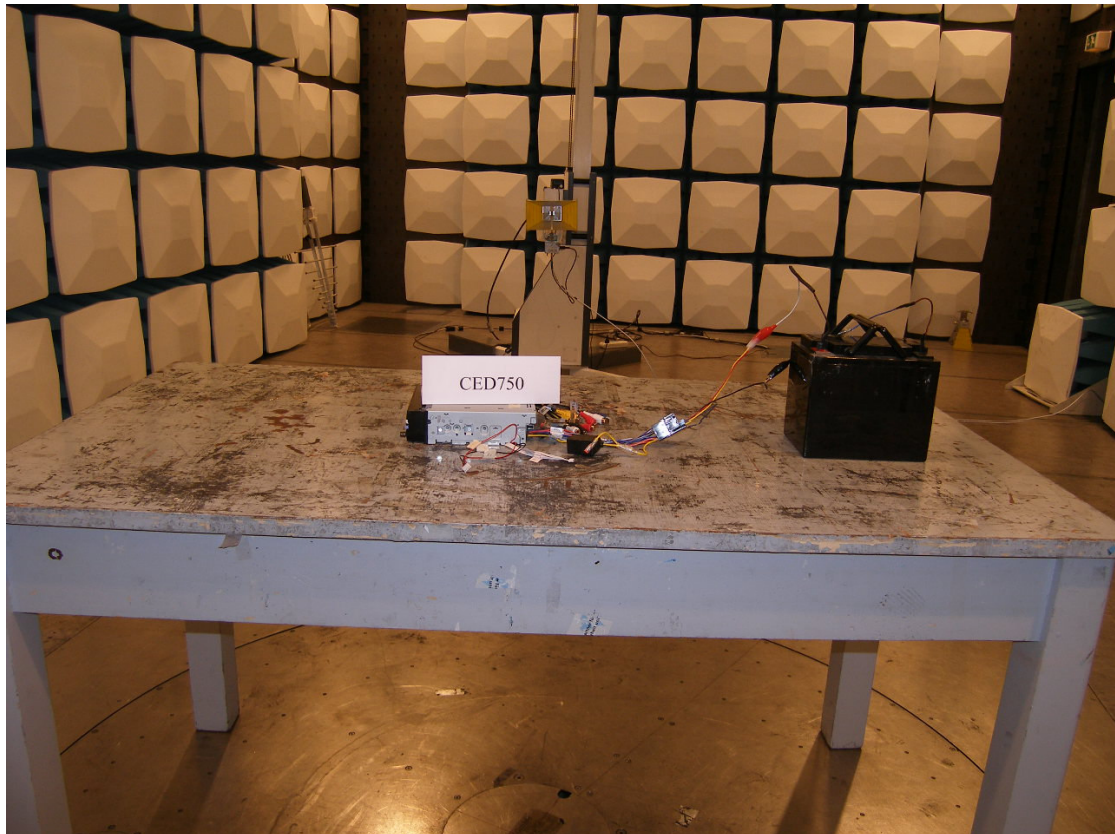


**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 30 von 32**  
*Page 30 of 32*

**Photograph 2: Set-up for Radiation Measurement 1-18GHz**

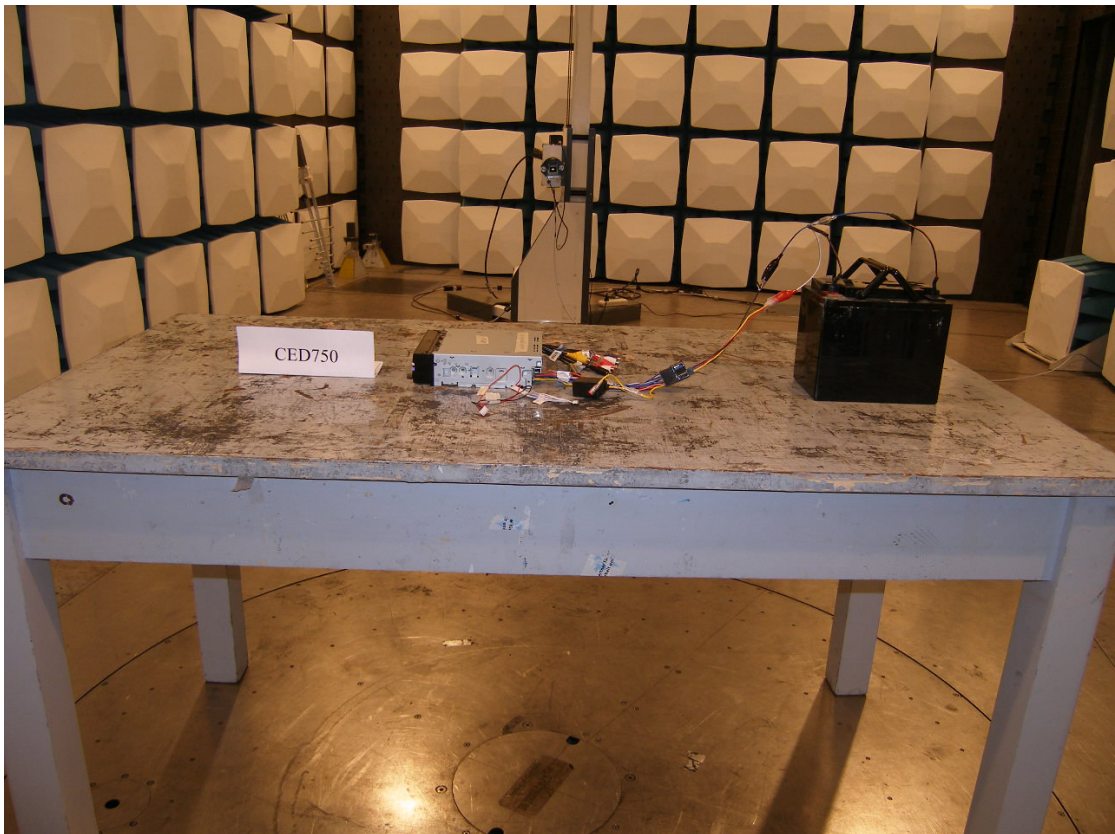


**Prüfbericht - Nr.:**  
*Test Report No.:*

**16014799 001**

**Seite 31 von 32**  
*Page 31 of 32*

**Photograph 3: Set-up for Radiation Measurement 18-25GHz**



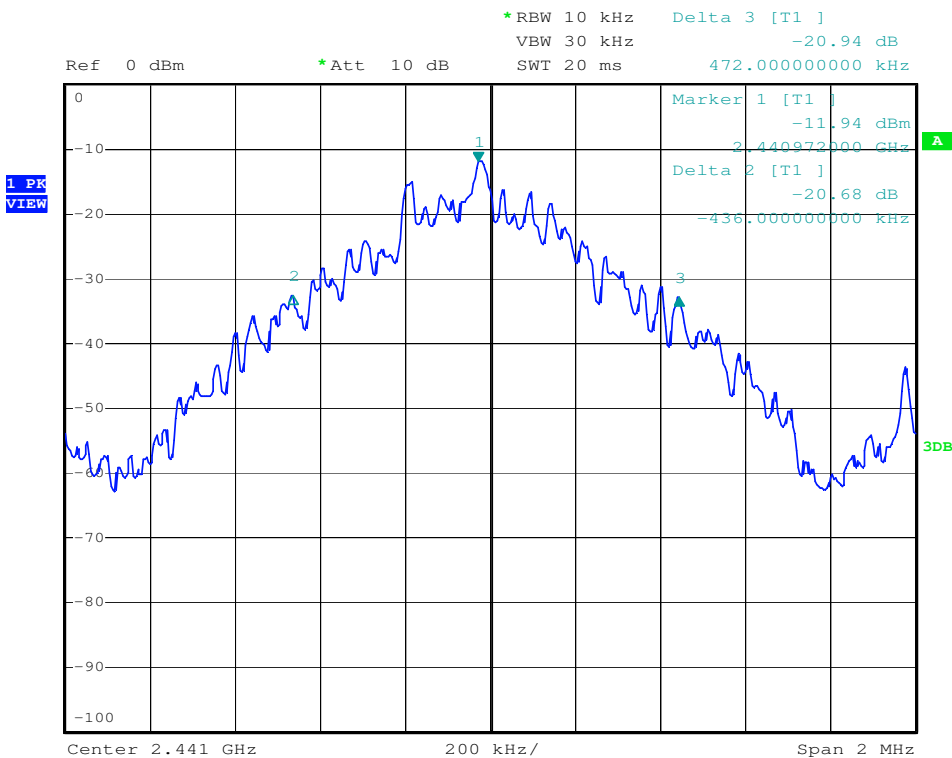
## List of Tables

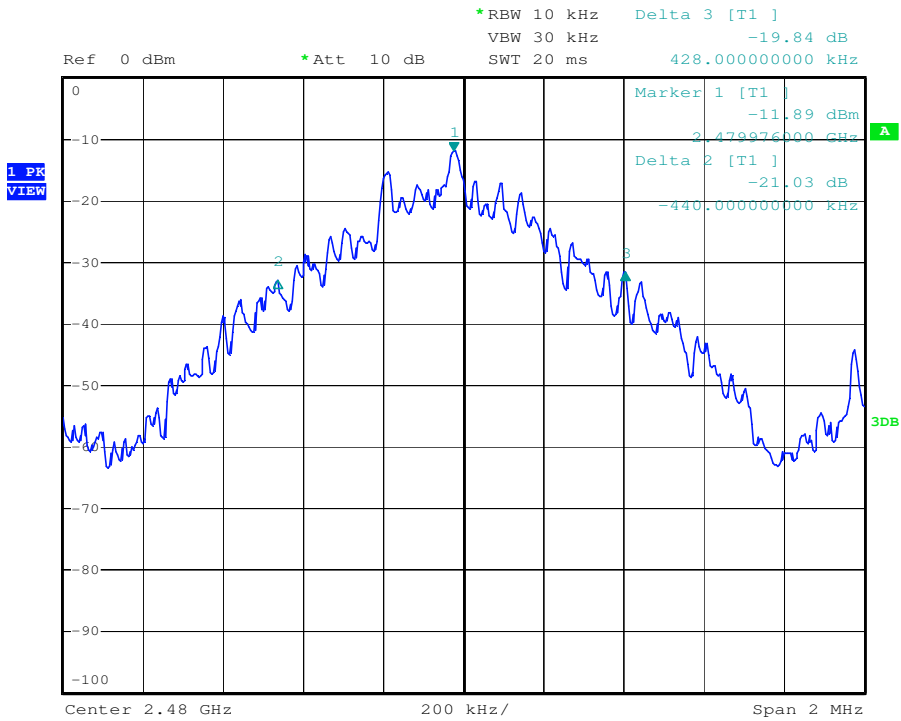
Table 1: List of Test and Measurement Equipment .....	6
Table 2: Radiated Emission (Transmitting at channel low) .....	15
Table 3: Radiated Emission (Transmitting at channel mid) .....	16
Table 4: Radiated Emission (Transmitting at channel high) .....	17
Table 5: Peak Conducted Power .....	19
Table 6: 20dB Bandwidth.....	20
Table 7: Hopping Channel Carrier Frequency Separation .....	22
Table 8: Number of hopping frequency.....	23
Table 9: Dwell Time (DH5 mode).....	25
Table 10: Band Edges Emission .....	27
Table 11: Out-Of-Band Emission measurement (conducted) .....	27
Table 12: Band Edges Emission in the Restricted Bands 2310-2390MHz and 2483.5-2500MHz.....	27

## 7 List of Photographs

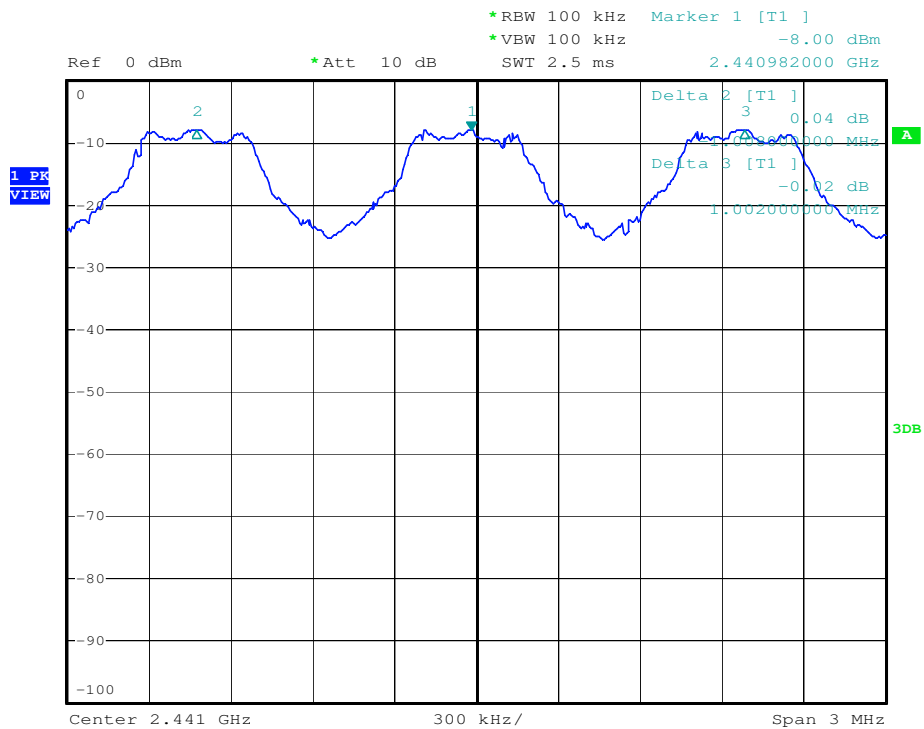
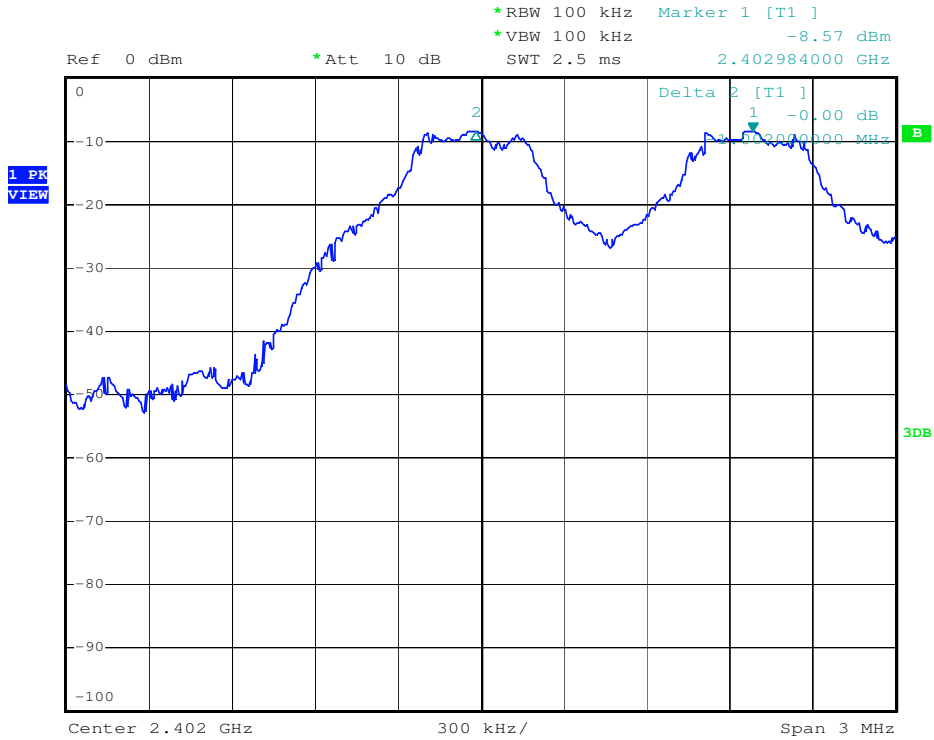
Photograph 1: Set-up for Radiation Measurement below 1GHz.....	28
Photograph 2: Set-up for Radiation Measurement 1-18GHz .....	30
Photograph 3: Set-up for Radiation Measurement 18-25GHz .....	31

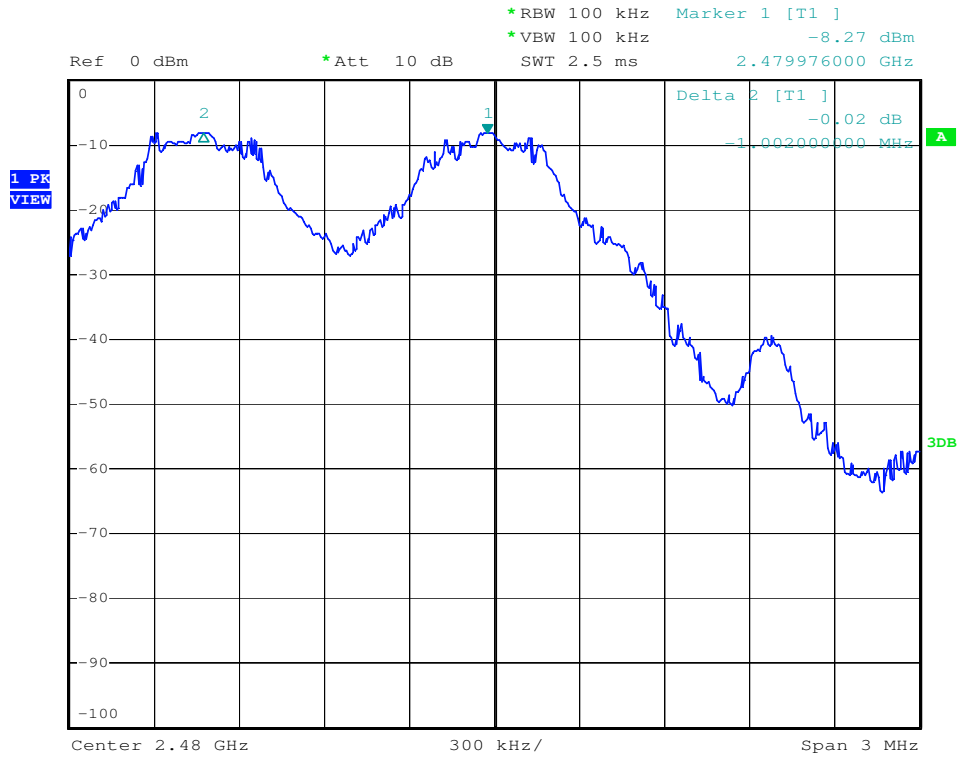


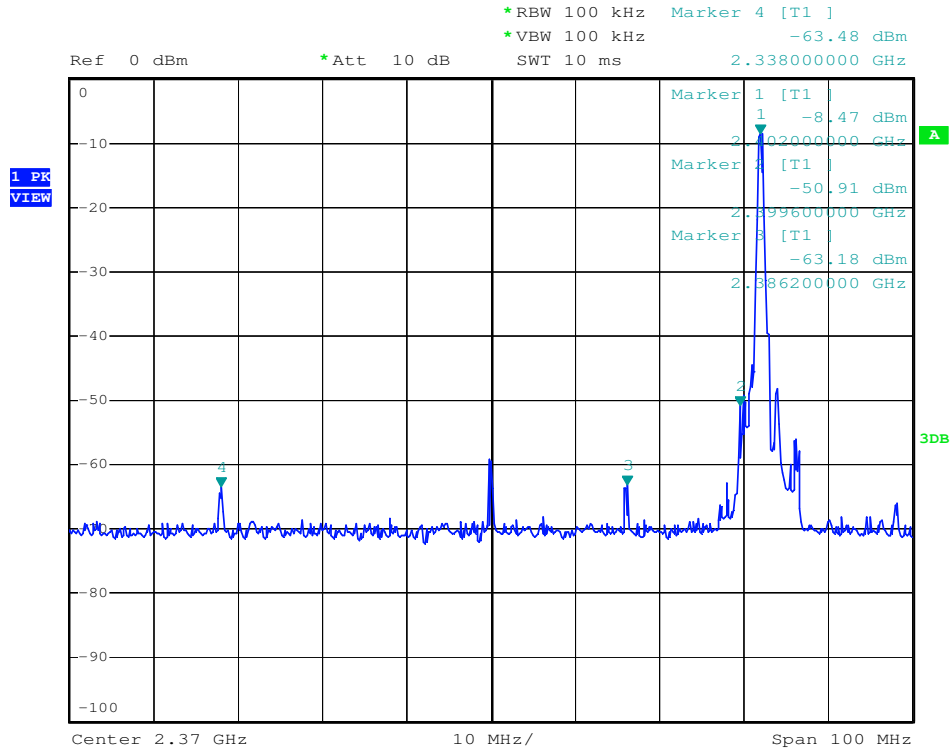
**20dB Bandwidth**




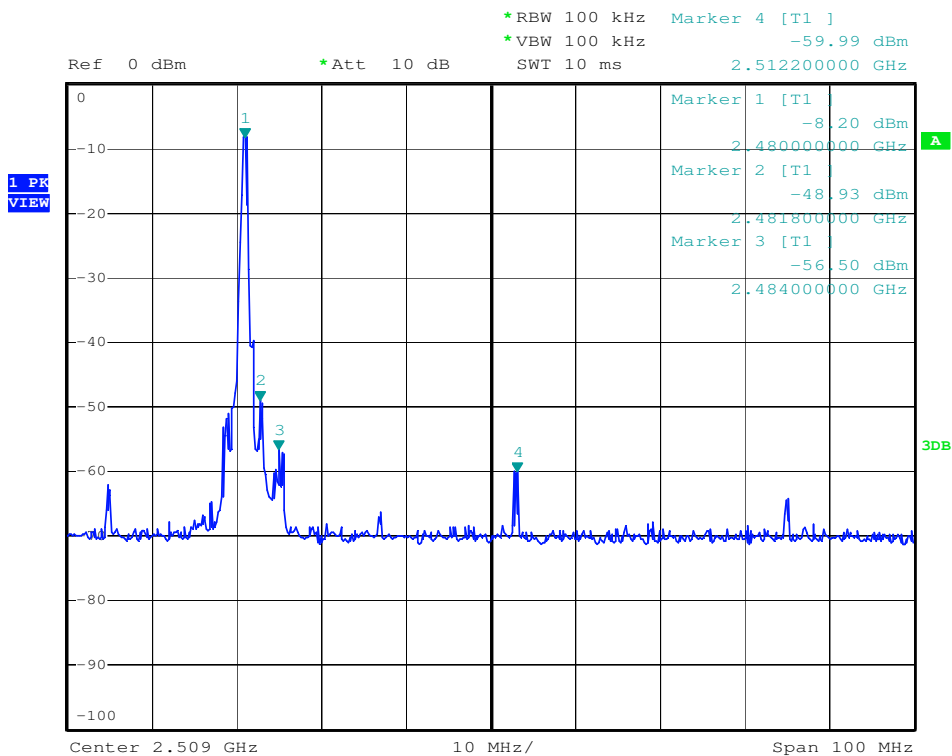


**Hopping Channel Carrier Frequency Separation**




**Out-of-Band Emission**


(Restricted Band 2310-2390MHz)

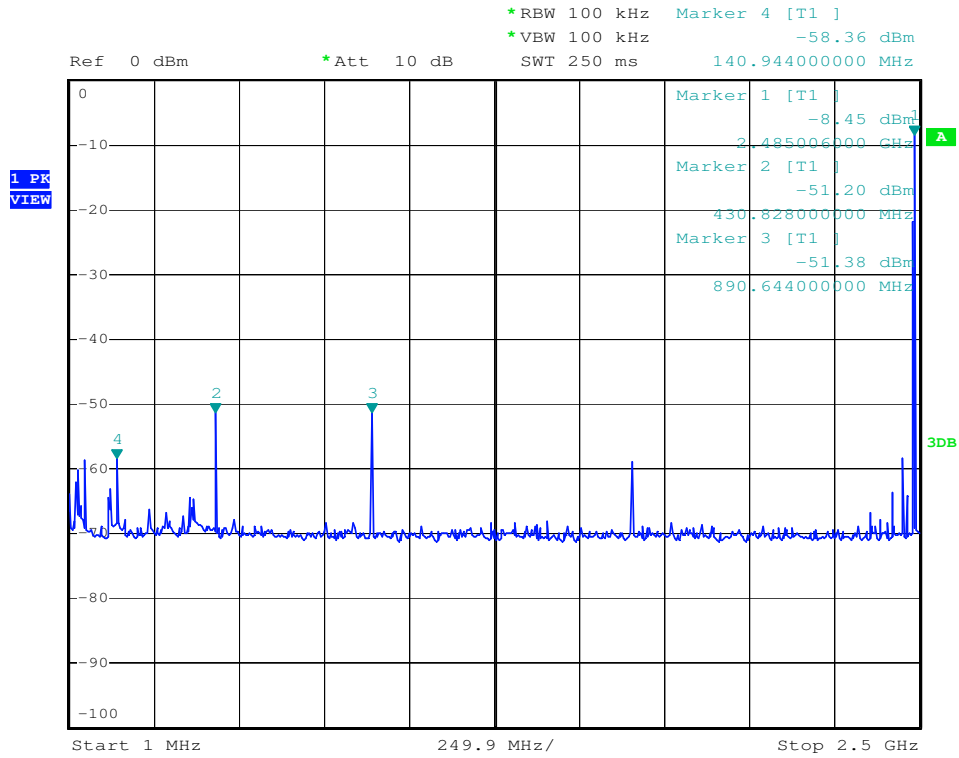


(Restricted Band 2483.5-2500MHz)

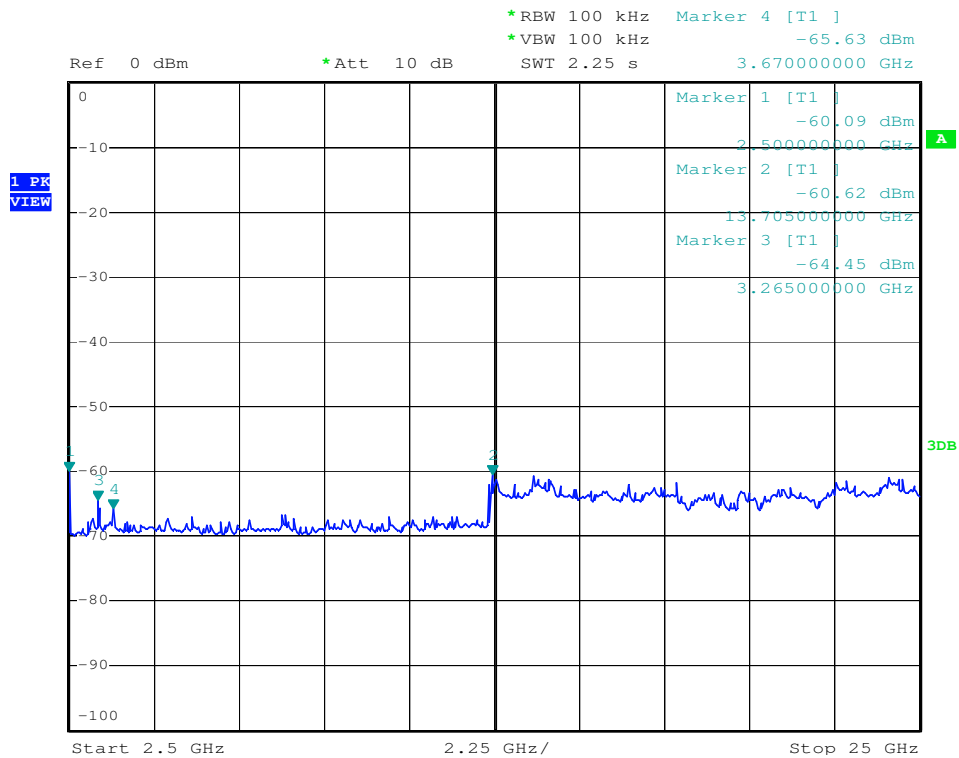








(Transmitting at high channel)



(Transmitting at high channel)