



Report No: SYBH(R) 82072007EB-2  
FCC ID: QISV720

**FCC TEST REPORT OF  
HUAWEI WCDMA/GPRS/GSM  
Mobile Phone for 47CFR part15  
subpart C**

**M/N: V720/Vodafone 720/U5700**

**Jun. 20, 2007**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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**REPORT ON**

FCC 47CFR part 15 subpart C Test of HUAWEI  
WCDMA/GPRS/GSM Mobile Phone

M/N: V720/Vodafone 720/U5700

Report No: SYBH (R)82072007EB-2

**REGULATION**

**FCC CFR47 Part 2: Subpart J;**

**FCC CFR47 Part 15: Subpart C;**

**CONCLUSION**

There are 9 items need to be tested, 9 items have been tested. The sample of the model completely meets the requirements

**Final Judgement: Pass**

**General Manager**

2007.07.20

Date

Guo Xiaoqi

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**Technical Responsibility  
For Area of Testing**

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# 1 Summary

The table below summarizes the measurements and results for the HUAWEI V720/Vodafone 720/U5700 WCDMA/GPRS/GSM mobile phone. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

<b>FCC Measurement Specification</b>	<b>Description</b>	<b>Result</b>
15.247 a (1)	20dB bandwidth measurement	PASS
15.247 a (1)	Carrier frequency separation measurement	PASS
15.247 a (1) iii	Number of hopping channel	PASS
15.247 a (1) iii	Time of occupancy	PASS
15.247 b (1)	Peak output power	PASS
15.247 d	Band edge compliance measurement	PASS
15.247 d	Conducted RF spurious	PASS
15.247 d / 15.205 & 15.209	Radiated spurious emission & Radiated restricted band measurement	PASS
15.207	Conducted emission test for power port	PASS

## 2 Product Description

### 2.1 Production Information

#### 2.1.1 General Description

Huawei WCDMA/GPRS/GSM Mobile Phone V720/Vodafone 720/U5700 is subscriber equipment in the WCDMA/GSM system. The frequency band is WCDMA/GSM/DCS/PCS. The Mobile Phone implements such functions as RF signal receiving / Transmitting, WCDMA protocol processing, voice, video and MMS service etc. Externally it provides micro SD card interface, earphone port(to provide voice service), USIM card interface .It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

#### 2.1.2 Support function and Service

The Mobile Phone V720/Vodafone 720/U5700 support the function and service as follows:

Table 2 Service and Test mode List

Service Name	Characteristic	Corresponding Test Mode	Note
Data and Voice	Modulation: GFSK	TM1	

### 2.2 Modification Information

For original equipment, following table is not application.

Table 3 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information
Not applicable!				

### **3 Test Site Description**

The test site of:

***Huawei Technologies Co. Ltd.  
P.O. Box 518129  
Huawei base, bantian,  
Longgang District, Shenzhen, China***

The test site description has been submitted to  and registration granted under the registration number **97456** on March 11, 2003. The test site has been accredited by  and the accredited number is **2174.01** in Jan of 2004.

#### **3.1 Testing Period**

The test have been performed during the period of

Jun. 12, 2007 to Jun.15, 2007

#### **3.2 General Set up Description**

The Bluetooth hopping frequency system of Mobile Phone V720/Vodafone 720/U5700 can Support 2.4GHz Band. For compliance with FCC regulation 47CFR part15 subpart C, we set the mobile phone as following test mode to do all compliance tests.

**Bluetooth MODE:**

**TM1:** GFSK Modulation

## 4 Product Description

### 4.1 Technical Characteristics

#### 4.1.1 Frequency Range

Table 4 Frequency Range

Uplink band:	2400 to 2483.5 MHz	
Downlink band:	2400 to 2483.5 MHz	
Hop frequency support:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

#### 4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

Channel spacing:	1 MHz
Channel separation:	1 MHz

#### 4.1.3 Type of Emission

Table 6 Type of Emission

Emission Designation:	-
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According to CFR 47 (FCC) part 2, subpart C, section 2.201 and 2.202

#### 4.1.4 Antenna Information

Table 7 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	0.09 (from 2400MHz to 2500MHz)

#### 4.1.5 Environmental Requirements

Table 8 Environmental Requirements

Minimum temperature:	- 10 °C
Maximum temperature:	+ 55 °C
Relative Humidity:	5%-95%

#### 4.1.6 Power Source

Table 9 Power Source

AC voltage nominal:	~120V
AC voltage range	~100V-240V
AC current maximal:	650mA

#### 4.1.7 Tune-up Procedure

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (9).

Please reference the document Tune-up Procedure in TCF.

#### 4.1.8 Applied DC Voltages and Currents

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8).

The voltage and current in the final RF stage is:

Table 10 Applied DC Voltages and Currents

Voltage:	 +2.8V
Current:	45mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)

## 4.2 EUT Identification List

### 4.2.1 Board Information

Table 11 Board Information

WCDMA/GPRS/GSM Mobile Phone		
V720/Vodafone 720/U5700		
Board and Module		
Equipment Designation / Description	Serial Number	Remarks
-Main board	V720M-10	HD1V720M Ver.D
-Battery	FMT732600391Y	V720

Table 12

### 4.2.2 Adapter Technical Data

Not Applicable.

### 4.2.3 Battery Technical Data

Not Applicable.

### 4.2.4 FCC Identification

Grantee Code: QIS  
 Product Code: V720  
 FCC Identification: QISV720

## 5 Main Test Instruments

Table 13 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)
3m Semi Anechoic Chamber	S+M	N/A	N/A	12.24.2007
3m Full Anechoic Chamber	S+M	N/A	N/A	12.05.2007
Signal Analyzer	R&S	FSQ 26	100266	07.18.2008
Test Receiver Display Unit	R&S	ESMI 804.8932.52	829214/011	07.30.2007
Test Receiver RF Unit	R&S	ESMI 1032.5640.53	829550/008	07.30.2007
Receiver	R&S	ESIB 26	100318	08.17.2007
Receiver	R&S	ESCS30	830245/018	07.30.2007
Pre-Amplifier	Agilent	8447D	2944A10146	07.30.2007
Pre-Amplifier	Agilent	83017A	3950M00246	07.03.2008
Loop Antenna	Schwarzbeck	FMZB1516	1516115	08.08.2007
BiLog Antenna	Schaffner	CBL 6112B	2747	08.30.2007
BiLog Antenna	Schaffner	CBL 6112B	2536	08.30.2007
Horn Antenna	R&S	HF906 4044.4507.02	359287/005	12.05.2007
Horn Antenna	R&S	HF906 4044.4507.02	359287/006	12.05.2007
Horn Antenna	ETS-Lindgren	3117	00062533	09.14.2007
Horn Antenna	ETS-Lindgren	3117	00062549	09.14.2007
Horn Antenna	ETS-Lindgren	3116	00031541	07.15.2008
Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	08.28.2007
Signal Generator	R&S	SMT06	830264/009	09.29.2007
Signal Generator	R&S	SMR 40	100325	12.09.2007
Artificial Mains Network	R&S	ENV4200	100001	09.29.2007
Climate Chamber	WEISS	ACS-1	3604040034	08.24.2007
Universal Radio Communication Tester	R&S	CMU200	108035	07.03.2008
Wireless communication test set	Agilent	8960	GB43461081	09.24.2007

## 6 Transmitter Measurements

### 6.1 20dB bandwidth measurement

#### 6.1.1 Test Conditions

Table 14 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	23.5°C
Relative humidity:	55%
Test Configurations:	TM1 at channel No.0、40、78

#### 6.1.2 Test Specifications and Limits

##### 6.1.2.1 Specification

CFR 47 (FCC) part 15.247 a (1)

##### 6.1.2.2 Supporting Standards

Table 15 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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##### 6.1.2.3 Limits

Not Applicable.

#### 6.1.3 Test Method and Setup

- (a) Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- (b) Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number and test the 20dB bandwidth with spectrum analyzer.

**Test setup**

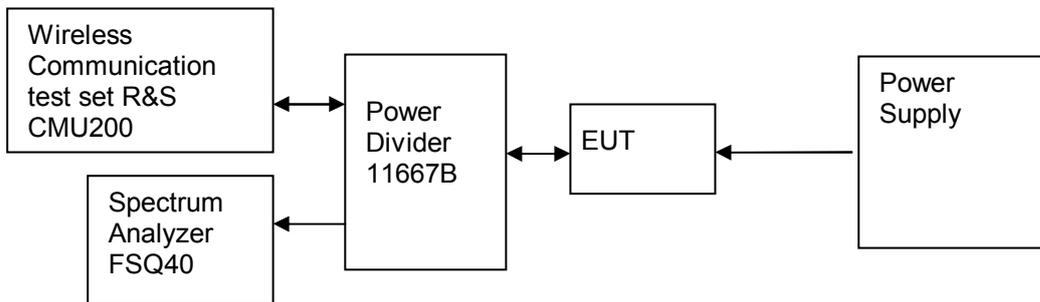


Figure 1. Test Set-up

**6.1.4 Measurement Results**

Table 16 Measurement Results

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	0.849	Pass
20dB	M	40	2.442	0.849	Pass
20dB	T	78	2.480	0.846	Pass

**6.1.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix A.

## 6.2 Carrier frequency separation measurement

### 6.2.1 Test Conditions

Table 17 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	23.5°C
Relative humidity:	55%
Test Configurations:	TM1 at channel No.38、39、40

### 6.2.2 Test Specifications and Limits

#### 6.2.2.1 Specification

CFR 47 (FCC) part15.247 a (1)

#### 6.2.2.2 Supporting Standards

Table 18 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.2.2.3 Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Table 19 Limits

Regulation:	$\geq 0.025$ or $2/3$ of the 20 dB bandwidth
Limit:	$2/3 \times 0.849 = 0.566$

### 6.2.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

**Test setup**

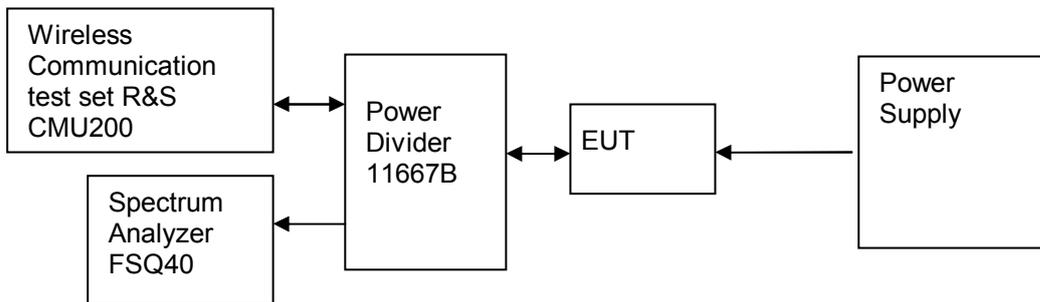


Figure 2. Test Set-up

**6.2.4 Measurement Results**

Table 20 Measurement Results

Channel No.1	Frequency [GHz]	Channel No.2	Frequency [GHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
39	2.441	38	2.442	1.0096	0.566	Pass
39	2.441	40	2.440	1.0256	0.566	Pass

**6.2.5 Conclusion**

For the measurement results refer to appendix B with.

## 6.3 Number of hopping channel

### 6.3.1 Test Conditions

Table 21 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	22 °C
Relative humidity:	52 %
Test Configurations:	TM1 at hopping frequency state

### 6.3.2 Test Specifications and Limits

#### 6.3.2.1 Specification

CFR 47 (FCC) part15.247 a (1) iii

#### 6.3.2.2 Supporting Standards

Table 22 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.3.2.3 Limits

Number of hopping channel should be compliance with the requirements in part15.247 a (1) iii.

Table 23 Limits

Limits	$\geq 15$ hopping frequency channel
--------	-------------------------------------

### 6.3.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch on frequency hopping function, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
- Count the quantity of peaks to get the number of hopping channels.

**Test setup**

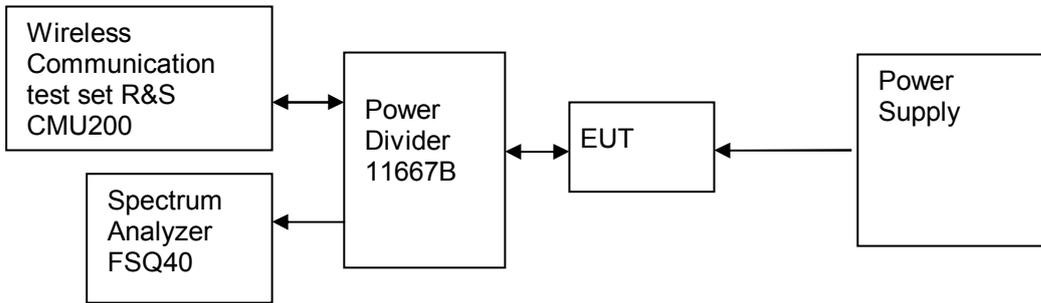


Figure 3. Test Set-up

**6.3.4 Measurement Results**

Table 24 Measurement Results

Measured frequency range [MHz]	Channel No. range	Measured Channel No.	Limit	Result
2400 to 2483.5	0-78	79	>15	Pass

**6.3.5 Conclusion**

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix C.

## 6.4 Time of occupancy

### 6.4.1 Test Conditions

Table 25 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55 %
Test Configurations:	TM1 at hopping frequency state

### 6.4.2 Test Specifications and Limits

#### 6.4.2.1 Specification

CFR 47 (FCC) part 15.247 a (1) iii

#### 6.4.2.2 Supporting Standards

Table 26 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.4.2.3 Limits

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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Table 27 Limits

Limits for time of occupancy	$\leq 0.4s$
------------------------------	-------------

### 6.4.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch on frequency hopping function.
- Set the span of spectrum analyzer to 0, and get the time domain measured diagram.
- Set the sweep time to 2 times of one burst occupancy time, and measure the time of occupancy of one burst. Then set the sweep time to a period (0.4 seconds multiplied by the number of hopping channels employed), and count the number of the bursts.
- Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts.

**Test setup**

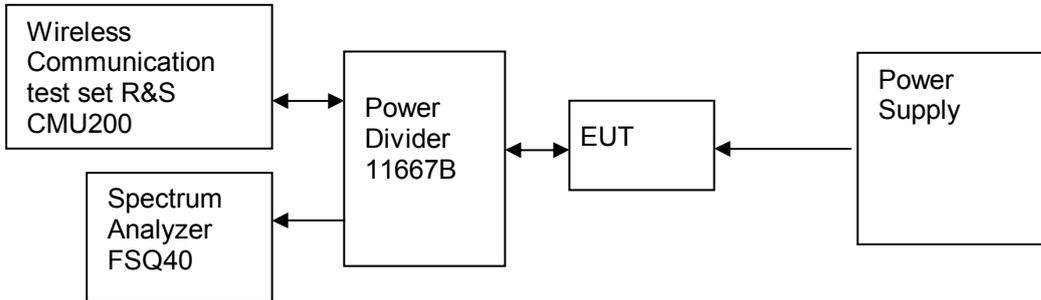


Figure 4. Test Set-up

**6.4.4 Measurement Results**

Table 28 Measurement Results

Time of Single Slot [ms]	Numbers of slots in a period theory	Time of occupied in a period [s]	Limit [s]	Result
2.948718	116.7	0.3441153906	≤ 0.4	Pass

Table 29

Table 30 Note: The result is measured at DH5 mode in GFSK modulation, which has longest time in one transmission burst.

**6.4.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix D.

## 6.5 Peak output power

### 6.5.1 Test Conditions

Table 31 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	23.5°C
Relative humidity:	55 %
Test Configurations:	TM1 at channel No.0、40、78

### 6.5.2 Test Specifications and Limits

#### 6.5.2.1 Specification

CFR 47 (FCC) part 15.247 b (1)

#### 6.5.2.2 Supporting Standards

Table 32 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.5.2.3 Limits

Compliance with part 15.247 b (1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watt.

Table 33 Limits

2.4GHz and 5.8GHz hopping frequency system	1 Watt / 30 dBm
Other frequency hopping systems	0.125 Watts / 21 dBm

### 6.5.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- Then set the mobile phone to transmit at high, middle and low frequency and measure the conducted output power separately.

**Test setup**

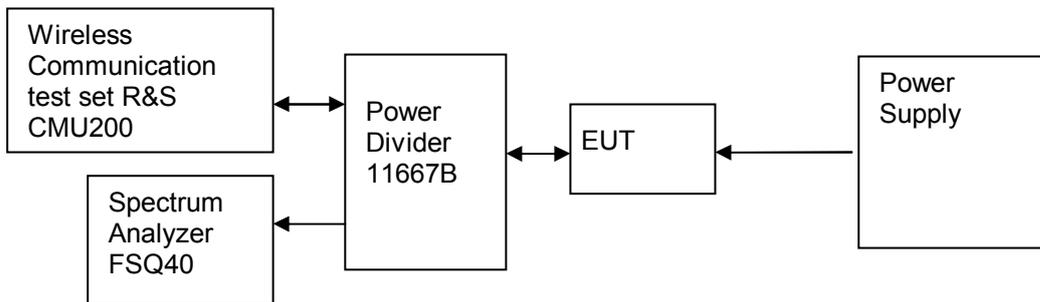


Figure 5. Test Set-up

**6.5.4 Measurement Results**

Table 34 Measurement Results

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Top	0	2402	-2.52	< 30	Pass
Middle	40	2442	-1.02	< 30	Pass
Bottom	78	2480	-0.32	< 30	Pass

**6.5.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix E.

## 6.6 Band edge spurious emission

### 6.6.1 Test Conditions

Table 35 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	20°C
Relative humidity:	50 %
Test Configurations:	TM1 at channel No. 0, 78 and frequency hopping state

### 6.6.2 Test Specifications and Limits

#### 6.6.2.1 Specification

CFR 47 (FCC) part 15.247 d

#### 6.6.2.2 Supporting Standards

Table 36 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.6.2.3 Limits

Compliance with part 15.247 (d), in any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 37 Limits

Band edge spurious:	20 dBc/100kHz
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### 6.6.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- Then set the mobile phone to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.
- Switch on the frequency hopping function, and repeat above measurement.
- The Peak detector was used.

**Test setup**

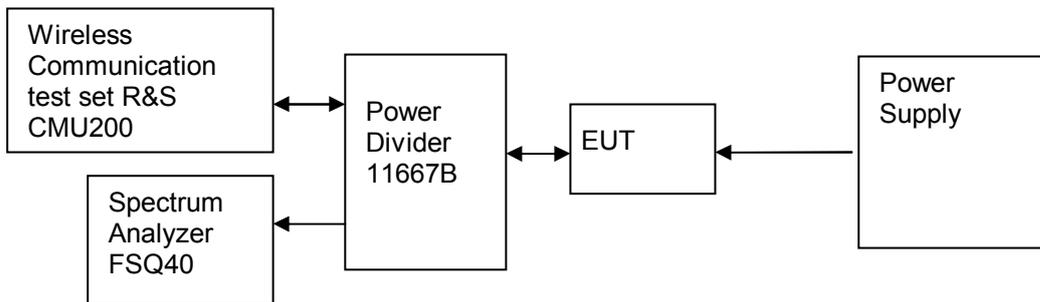


Figure 6. Test Set-up

**6.6.4 Measurement Results**

Table 38 Measurement Results

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	-3.11	Off	<-40	-23.11	Pass
	-	-	-3.18	On	<-40	-23.18	Pass
High Edge	78	2480	-0.40	Off	-38.40	-20.40	Pass
	-	-	-0.62	On	-40.16	-20.62	Pass

**6.6.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix F.

## 6.7 Conducted RF spurious

### 6.7.1 Test Conditions

Table 39 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	22 °C
Relative humidity:	53 %
Test Configurations:	TM1 at channel No.0、40、78

### 6.7.2 Test Specifications and Limits

#### 6.7.2.1 Specification

CFR 47 (FCC) part 15.247 d

#### 6.7.2.2 Supporting Standards

Table 40 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.7.2.3 Limits

Compliance with part 15.247 (d), in any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 41 Limits

Band edge spurious:	20 dBc/100kHz
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### 6.7.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- Then set the mobile phone to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.
- Switch on the frequency hopping function, and repeat above measurement.

**Test setup**

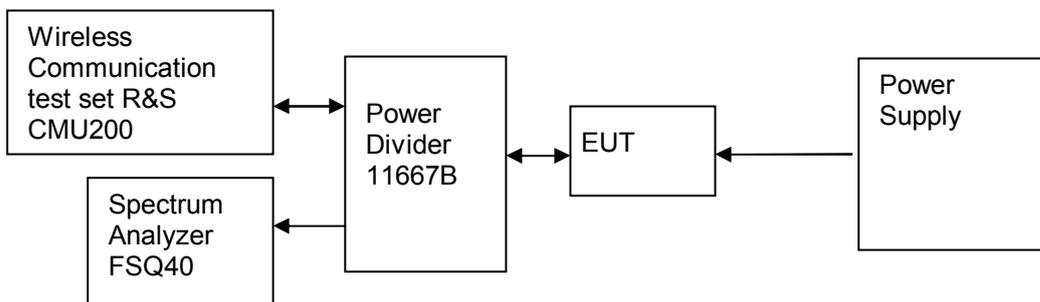


Figure 7. Test Set-up

**6.7.4 Measurement Results**

**6.7.4.1 Measurement Results**

Table 42 Measurement Results

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-26GHz	0	2402	-0.7	Off	<-30	-20.7	Pass
9kHz-26GHz	40	2442	-1.8	Off	<-30	-21.8	Pass
9kHz-26GHz	78	2480	-1.8	Off	<-30	-21.8	Pass

**6.7.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix G.

## 6.8 Radiated spurious emission & spurious in restricted band

### 6.8.1 Test Conditions

Table 43 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55 %
Test Configurations:	TM1 at channel No.0、40、78

### 6.8.2 Test Specifications and Limits

#### 6.8.2.1 Specification

CFR 47 (FCC) part 15.247 d, 15.205 & 15.209

#### 6.8.2.2 Supporting Standards

Table 44 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

#### 6.8.2.3 Limits

According to part 15.247 d / 15.205 & 15.209, all spurious emission in the frequency range from 30MHz to 10<sup>th</sup> harmonics of carrier frequency should be meet the requirement of following table.

Table 45 Limits

Frequency (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance (meters)	Detector
30 – 88	100	40	3	QP
88 – 216	150	43.5	3	QP
216 – 960	200	46	3	QP
960 -1000	500	54	3	QP
Above 1000	500	54	3	PK

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table 42).

### 6.8.3 Test Method and Setup

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2003). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4. The Radiated Disturbance measurements were made using a Rohde and Schwarz Test Receiver and control software.

A preliminary scan and a final scan of the emissions were made by using test script of software; the

emissions were measured using a Quasi-Peak Detector below 1GHz, and PK detector above 1GHz. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

Huawei Mobile Phone was communicated with the BTS simulator through Air interface. The Mobile Phone operated on the typical channel and the Mobile Phone worked in idle mode, transmitter was not work in this test.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 k Hz  
 Measurement bandwidth: 1000 MHz – 10<sup>th</sup> Carrier Frequency: 1 MHz

**Test set up**

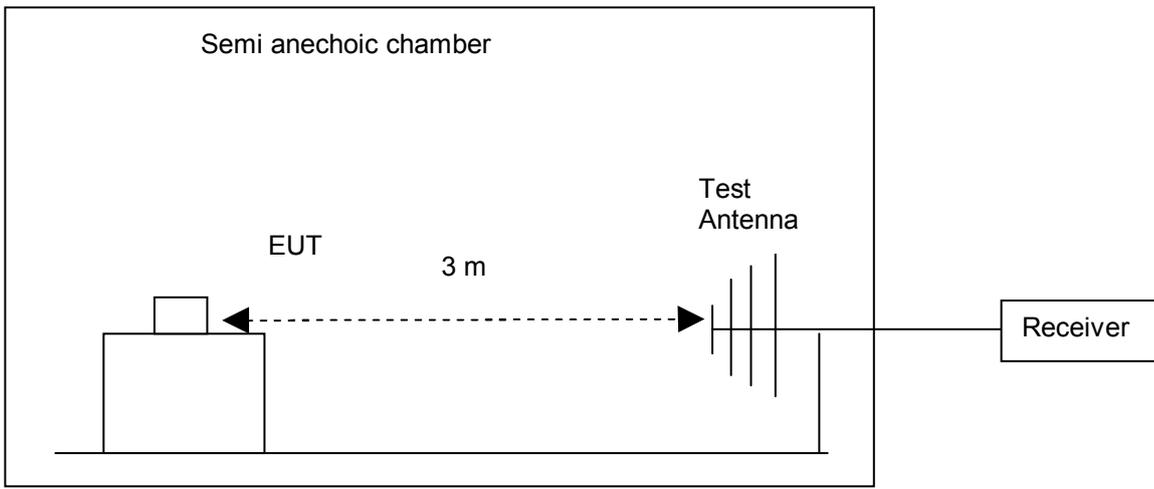


Figure 8. Test Set up

**6.8.4 Measurement Results**

**6.8.4.1 Measurement Result**

Note: The following measurement results exceed the limit line is the carrier frequency.

**Measured Result of channel: 0 (2402MHz)**

Table 46 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
40.200000	33.50	-9.7	40.0	6.5	100.0	90.00	VERTICAL
60.000000	24.20	-16.4	40.0	15.8	100.0	90.00	VERTICAL
120.300000	21.60	-9.5	43.5	21.9	100.0	0.00	VERTICAL
216.300000	26.70	-11.5	46.0	19.3	100.0	90.00	HORIZONTAL
408.888889	43.60	-3.9	46.0	2.4	100.0	270.00	HORIZONTAL
744.888889	35.10	-0.2	46.0	11.9	100.0	90.00	HORIZONTAL
1175.500000	40.20	-6.5	54.0	13.8	100.0	300.00	HORIZONTAL
2402.000000	74.80	2.0	54.0	-20.8	100.0	50.00	VERTICAL
4805.000000	46.50	10.0	54.0	7.5	100.0	0.00	VERTICAL
6000.500000	47.10	12.7	54.0	6.9	200.0	325.00	HORIZONTAL
12921.000000	48.20	31.6	54.0	5.8	100.0	120.00	HORIZONTAL
25300.000000	50.80	51.0	54.0	3.2	300.0	300.00	VERTICAL

**Measured Result of channel: 40 (2442MHz)**

Table 47 MEASUREMENT RESULT

Frequency (MHz)	Level (dB $\mu$ V/m)	Transd (dB)	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
37.800000	30.20	-8.5	40.0	9.8	100.0	0.00	VERTICAL
60.300000	24.50	-16.4	40.0	15.5	100.0	270.00	VERTICAL
168.300000	22.90	-11.8	43.5	20.6	100.0	180.00	VERTICAL
216.300000	23.70	-11.5	46.0	22.3	100.0	90.00	HORIZONTAL
408.888889	41.20	-3.9	46.0	4.8	100.0	270.00	HORIZONTAL
696.666667	35.50	-1.3	46.0	10.5	100.0	90.00	HORIZONTAL
1100.000000	39.30	-6.5	54.0	14.7	220.0	305.00	HORIZONTAL
2442.000000	72.80	2.1	54.0	-18.8	100.0	266.00	VERTICAL
3750.000000	42.00	7.0	54.0	12.0	106.0	4.00	VERTICAL
5925.500000	49.90	12.7	54.0	4.1	112.0	26.00	VERTICAL
12924.500000	45.10	31.6	54.0	8.9	300.0	275.00	HORIZONTAL
25998.000000	50.90	52.1	54.0	3.1	200.0	115.00	VERTICAL

**Measured Result of channel: 78 (2480MHz)**

Table 48 MEASUREMENT RESULT

Frequency (MHz)	Level (dB $\mu$ V/m)	Transd (dB)	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
38.400000	34.30	-8.7	40.0	5.7	100.0	0.00	VERTICAL
60.300000	27.30	-16.4	40.0	12.7	100.0	270.00	VERTICAL
168.300000	22.30	-11.8	43.5	21.2	200.0	0.00	HORIZONTAL
216.600000	23.10	-11.5	46.0	22.9	100.0	90.00	HORIZONTAL
408.888889	41.30	-3.9	46.0	4.7	100.0	90.00	HORIZONTAL
648.444444	36.90	-1.6	46.0	9.1	100.0	90.00	HORIZONTAL
1100.000000	39.50	-6.5	54.0	14.5	130.0	125.00	VERTICAL
2480.000000	74.50	2.3	54.0	-20.5	90.0	250.00	VERTICAL
5087.500000	43.60	12.1	54.0	10.4	180.0	240.00	VERTICAL
22248.500000	49.00	48.8	54.0	5.0	100.0	200.00	VERTICAL

Table 49 Measurement Results for Band Edge(2310 MHz -2390MHz, 2483.5 MHz -2500MHz)

Channel No	Channel No	Carrier Frequency [MHz]	Max. Delta Spurious Level [dB]	Carrier Frequency Level test in 3 meters [dB $\mu$ V/m]	Band Edge Max. Spurious Level [dB $\mu$ V/m]	Limit (AV) [dB $\mu$ V/m]	Result
Low Edge	0	2310-2390	47.75-3.12= 44.63	74.80	30.17	54	Pass
High Edge	78	2483.5-2500	37.41-0.41= 37	74.50	37.50	54	Pass

## Notes:

1. Band Edge Max. Spurious Level= Carrier Frequency Level test in 3 meters- Max. Delta Spurious Level;
2. Max. Delta Spurious Level is got from the Band Edge test result appendix F;
3. The Carrier Frequency Levels test in 3 meters are got from the radiated spurious emission which is appendix H;
4. Because the PK value is smaller than AV Limit line, so the AV value is certainly smaller than AV limit line.

### 6.8.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix H.

## 6.9 Conducted Emission at Power Port

### 6.9.1 Test Conditions

Table 50 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	23.5°C
Relative humidity:	55 %
Test Configurations:	TM1 at channel No. 40

### 6.9.2 Test Specifications and Limits

#### 6.9.2.1 Specification

CFR 47 (FCC) part 15.207

#### 6.9.2.2 Supporting Standards

Table 51 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
------------------	--

#### 6.9.2.3 Limits

Compliance with part15.207, conducted emission must meet the requirement of following table.

Table 52 Limits

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: \* Decreases with the logarithm of the frequency.

### 6.9.3 Test Method and Setup

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4: 2003.

Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

Huawei Mobile phone was communicated with the BTS simulator through Air interface, the BTS simulator controls the Mobile Phone to transmitter the maximum power which defined in specification of product. The Mobile Phone operated on the typical channel.

Measurement bandwidth (RBW) for 150 kHz to 30 MHz: 9 kHz;

**Test Set-up**

The Mobile Phone was setup in the screened chamber and operated under nominal conditions.

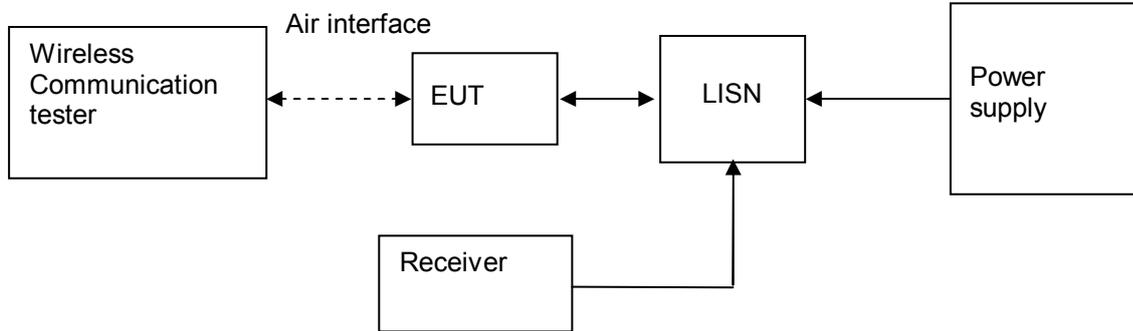


Figure 9. Test Set-up

**6.9.4 Measurement Results**

Table 53 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.312000	47.20	10.2	60	12.7	QP	L3	FLO
0.487500	42.70	10.0	56	13.5	QP	L3	FLO
1.396500	43.20	10.0	56	12.8	QP	L3	FLO
2.184000	42.00	10.1	56	14.0	QP	L3	FLO
5.185500	37.00	10.2	60	23.0	QP	L3	FLO
24.247500	43.20	15.1	60	16.8	QP	N	FLO

Table 54 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.186000	30.00	10.6	54	24.2	AV	L3	FLO
0.501000	25.50	10.0	46	20.5	AV	L3	FLO
1.351500	23.40	10.0	46	22.6	AV	L3	FLO
2.553000	26.00	10.1	46	20.0	AV	L3	FLO
5.163000	20.10	10.1	50	29.9	AV	L3	FLO
23.995500	28.60	15.2	50	21.4	AV	N	FLO

**6.9.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix I.

## 7 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 55 System Measurement Uncertainty

Items		Extended Uncertainty
20dB bandwidth measurement	Magnitude (%)	U= 0.2%; k=2
Carrier frequency separation measurement	Magnitude (%)	U= 0.2%; k=2
Time of occupancy	Magnitude (%)	U= 0.2%; k=2
Peak output power	Power(dBm)	U=0.39dB; k=2
Band edge compliance measurement	Disturbance Power(dBm)	U= 2.0dB; k=2
Conducted RF spurious	Disturbance Power(dBm)	U= 2.0dB; k=2
Radiated spurious emission & Radiated restricted band measurement	Field strength (dB $\mu$ V/m)	U=2.2dB; k=2
		U=5dB; k=2
Conducted emission test for power port	Disturbance Voltage(dB $\mu$ V)	U=4dB; k=2

## 8 Appendices

Appendix A	Measurement Results 20dB bandwidth measurement	4 pages
Appendix B	Measurement Results Carrier frequency separation measurement	2 pages
Appendix C	Measurement Results Number of hopping channel	2 pages
Appendix D	Measurement Results Time of occupancy	3 pages
Appendix E	Measurement Results Peak output power	4 pages
Appendix F	Measurement Results Band edge compliance measurement	9 pages
Appendix G	Measurement Results Conducted RF spurious	10 pages
Appendix H	Measurement Results Radiated spurious emission	7 pages
Appendix I	Measurement Results Conducted emission test for power port	2 pages
Appendix J	Photos of Test Setup	5 pages

# Appendix A

## 20dB bandwidth measurement

According to FCC Part 15.247 a (1)

# Channel 0 (2402MHz)

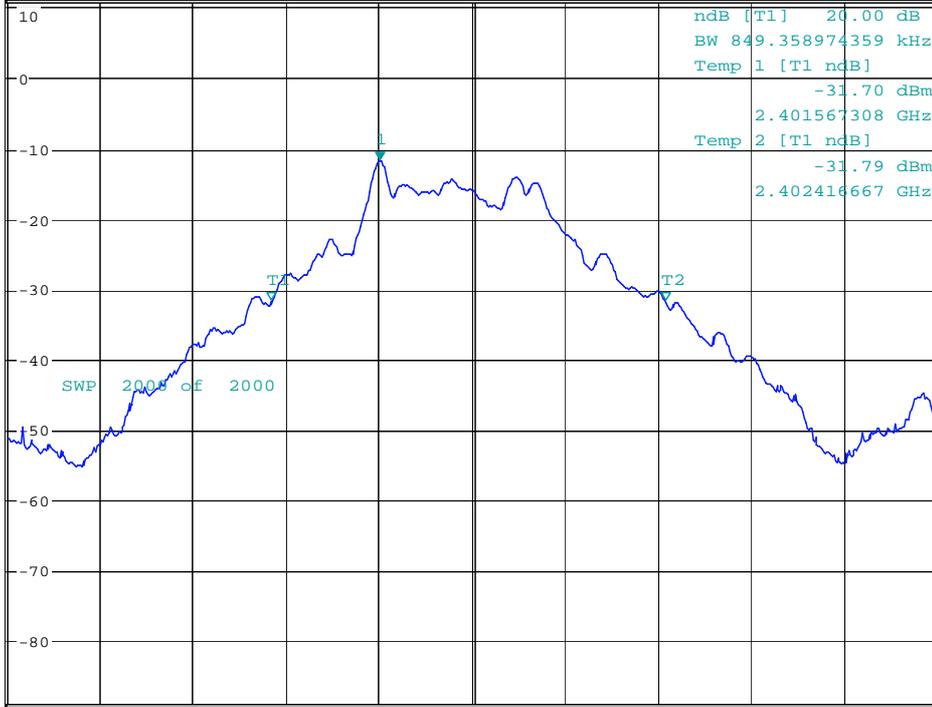


\*RBW 30 kHz      Marker 1 [T1 ]  
VBW 100 kHz      -11.83 dBm  
SWT 10 ms      2.401801282 GHz

Ref 11 dBm

Att 40 dB

1 PK  
MAXH



Center 2.402 GHz

200 kHz/

Span 2 MHz

Date: 25.JUL.2007 17:05:40

# Channel 40 (2442MHz)

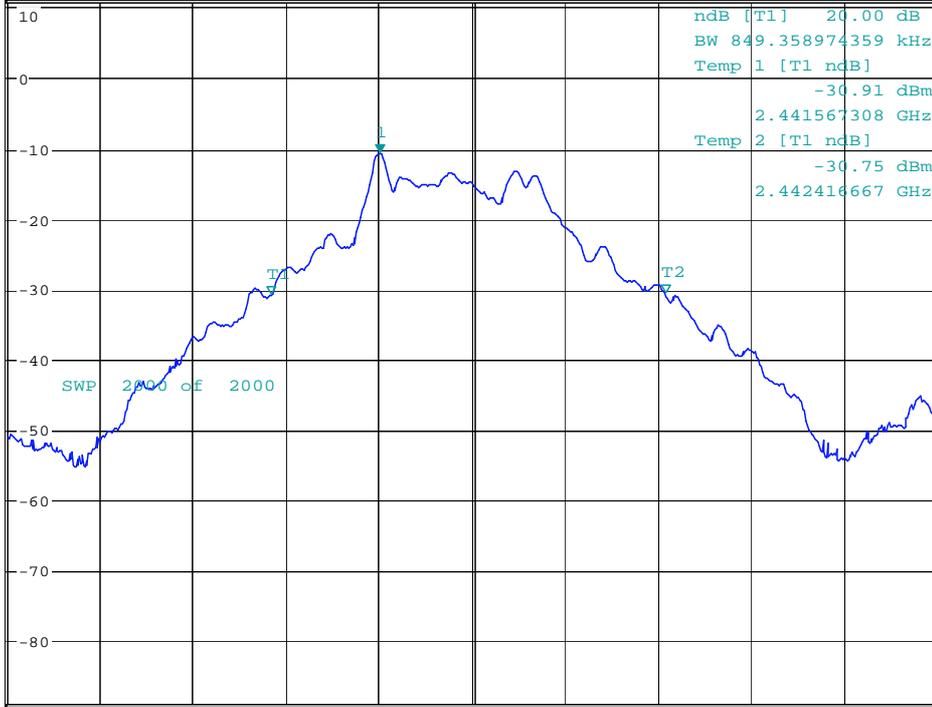


\*RBW 30 kHz      Marker 1 [T1]  
VBW 100 kHz      -10.74 dBm  
SWT 10 ms      2.441801282 GHz

Ref 11 dBm

Att 40 dB

1 PK  
MAXH



Center 2.442 GHz      200 kHz/      Span 2 MHz

Date: 25.JUL.2007 17:14:32

# Channel 78 (2480MHz)

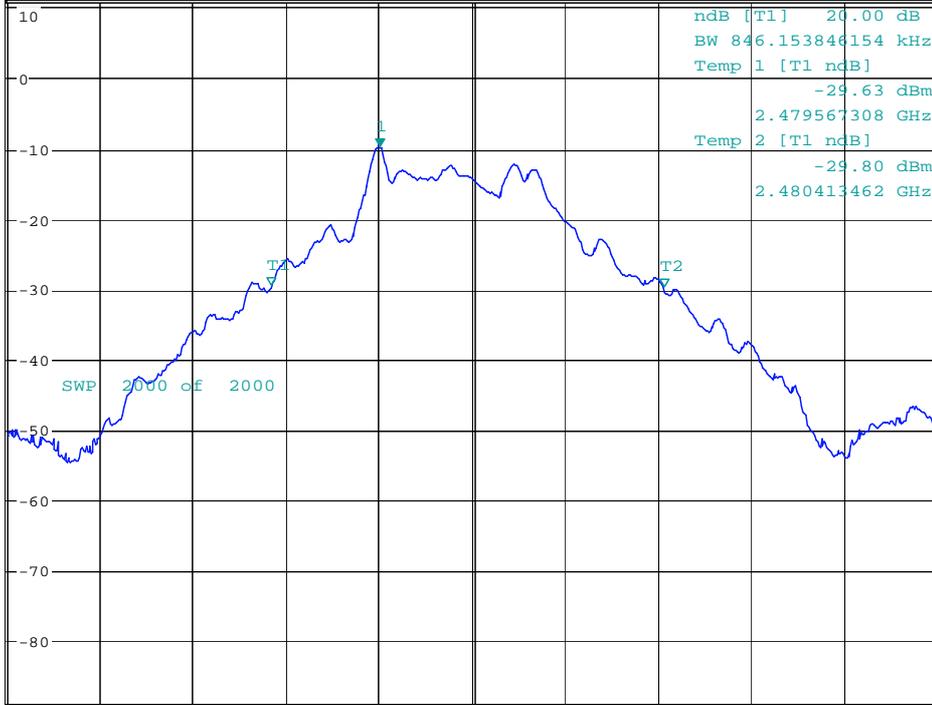


\* RBW 30 kHz      Marker 1 [T1 ]  
VBW 100 kHz      -9.80 dBm  
SWT 10 ms      2.479801282 GHz

Ref 11 dBm

Att 40 dB

1 PK  
MAXH



Center 2.48 GHz

200 kHz/

Span 2 MHz

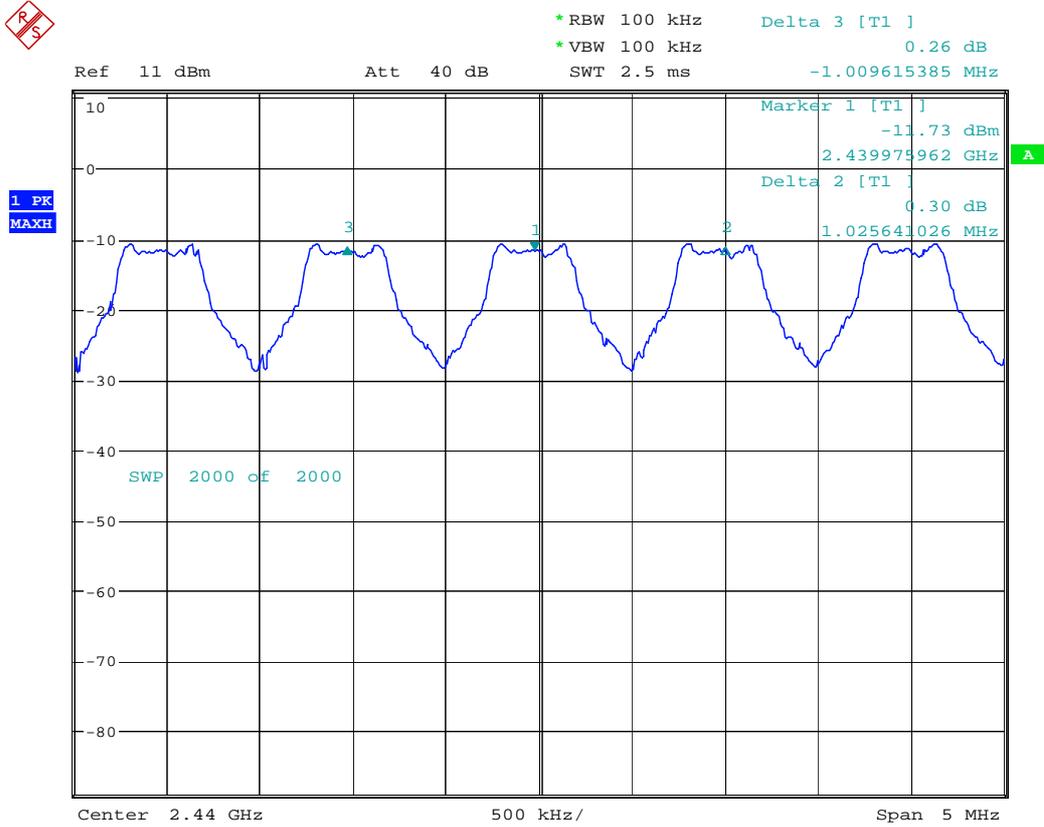
Date: 25.JUL.2007 17:19:03

## Appendix B

# Carrier frequency separation measurement

According to FCC Part 15.247 a (1)

# Centred at Channel 39



Date: 25.JUL.2007 17:45:20

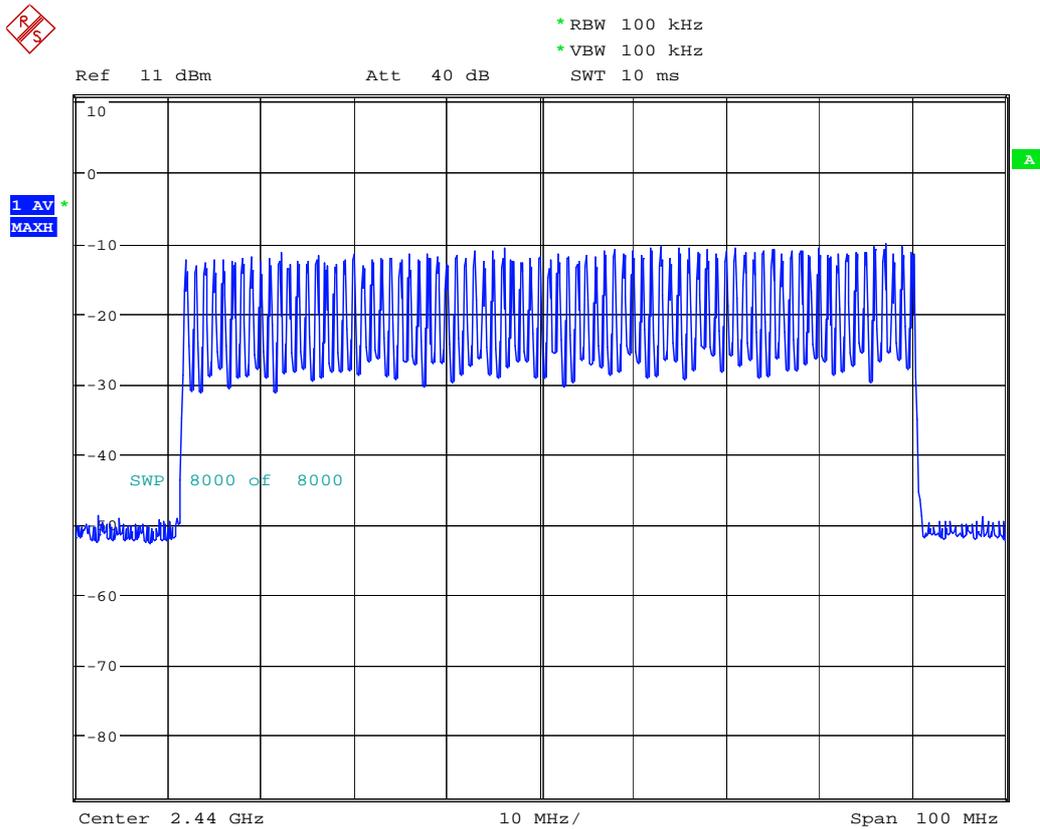
## Appendix C

### Number of hopping channel

According to FCC Part 15.247 a (1) iii

# Total hopping channels = 79

There are 41 peaks between marker1 and marker3



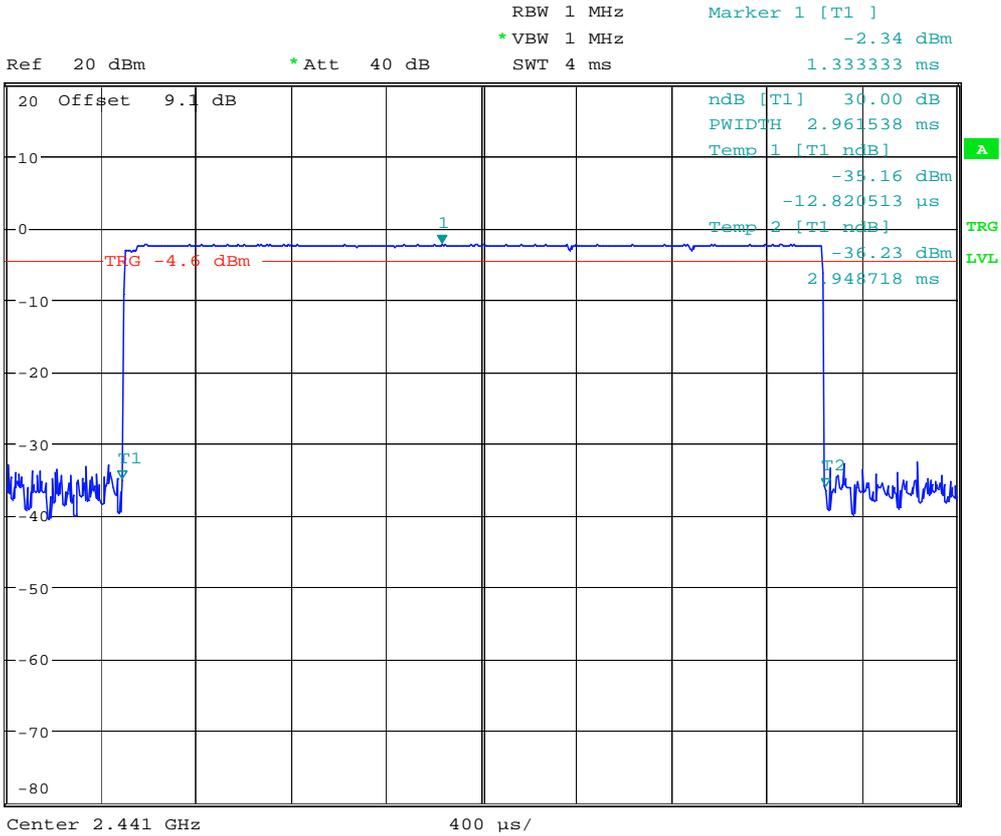
Date: 25.JUL.2007 18:03:46

# Appendix D

## Time of occupancy

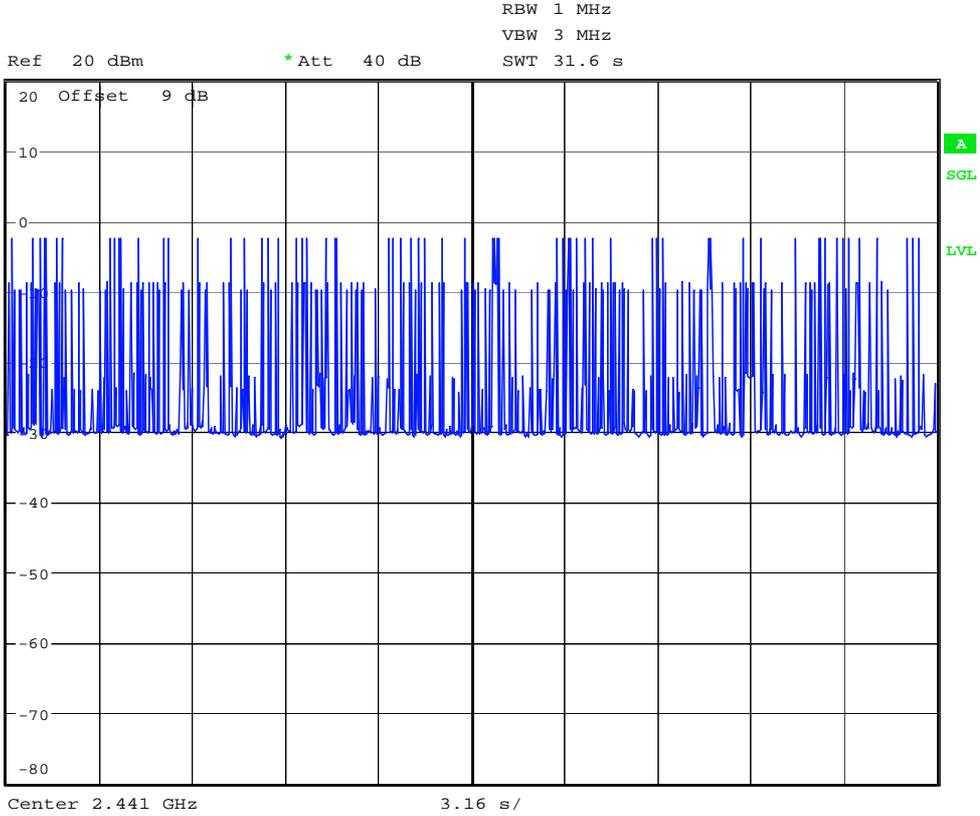
According to FCC Part 15.247 a (1) iii

# A burst (One time slot)



Report No: SYBH (R) 82072007EB-2

# A period (less than 116.7burst)



# Appendix E

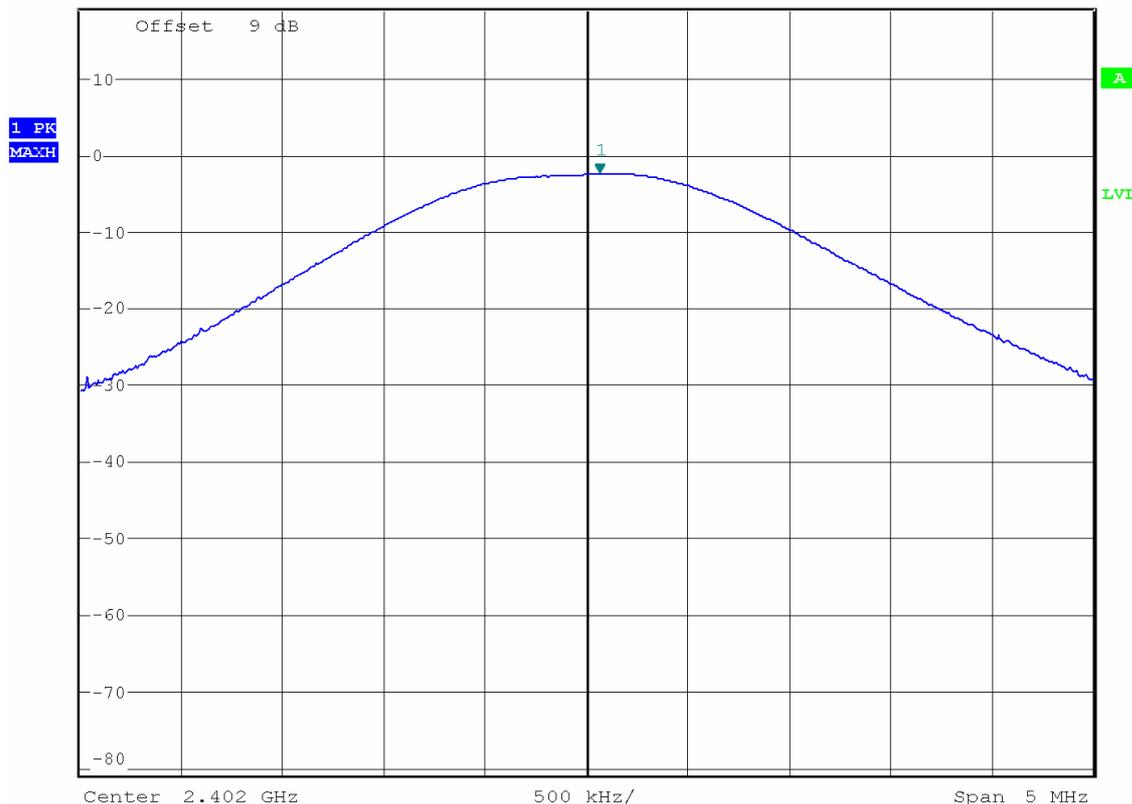
## Peak output power

According to FCC Part 15.247 b (1)

# Channel 0 (2402MHz)

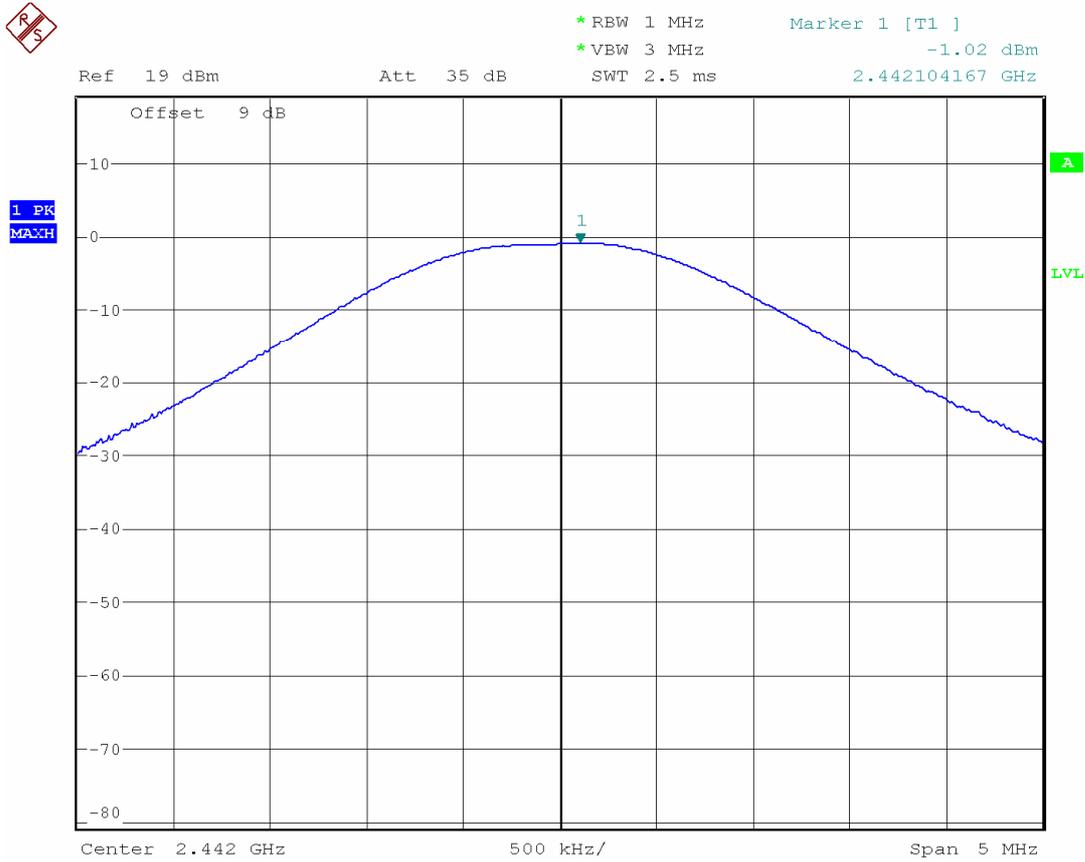


Ref 19 dBm      Att 35 dB      \*RBW 1 MHz      Marker 1 [T1]      -2.52 dBm  
\*VBW 3 MHz      2.402064103 GHz  
SWT 2.5 ms



Date: 30.AUG.2007 23:05:53

# Channel 40 (2442MHz)



Date: 30.AUG.2007 23:09:06



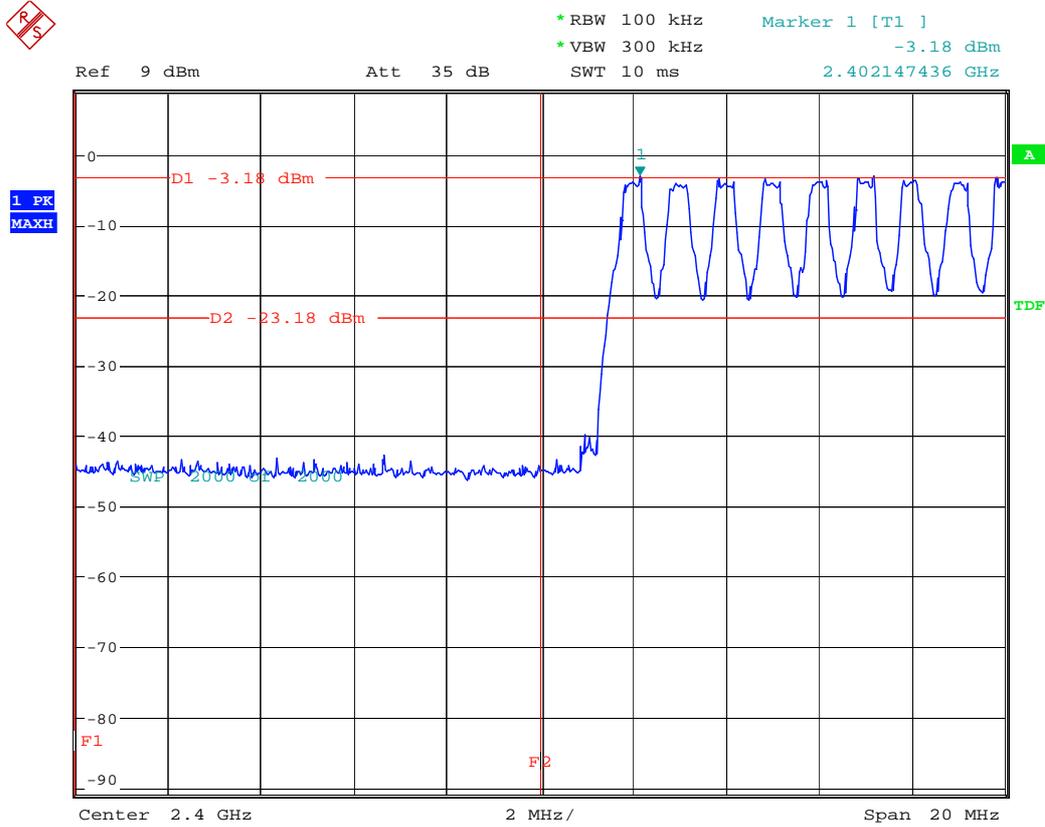
# Appendix F

## Band edge spurious emission

According to FCC Part 15.247 d

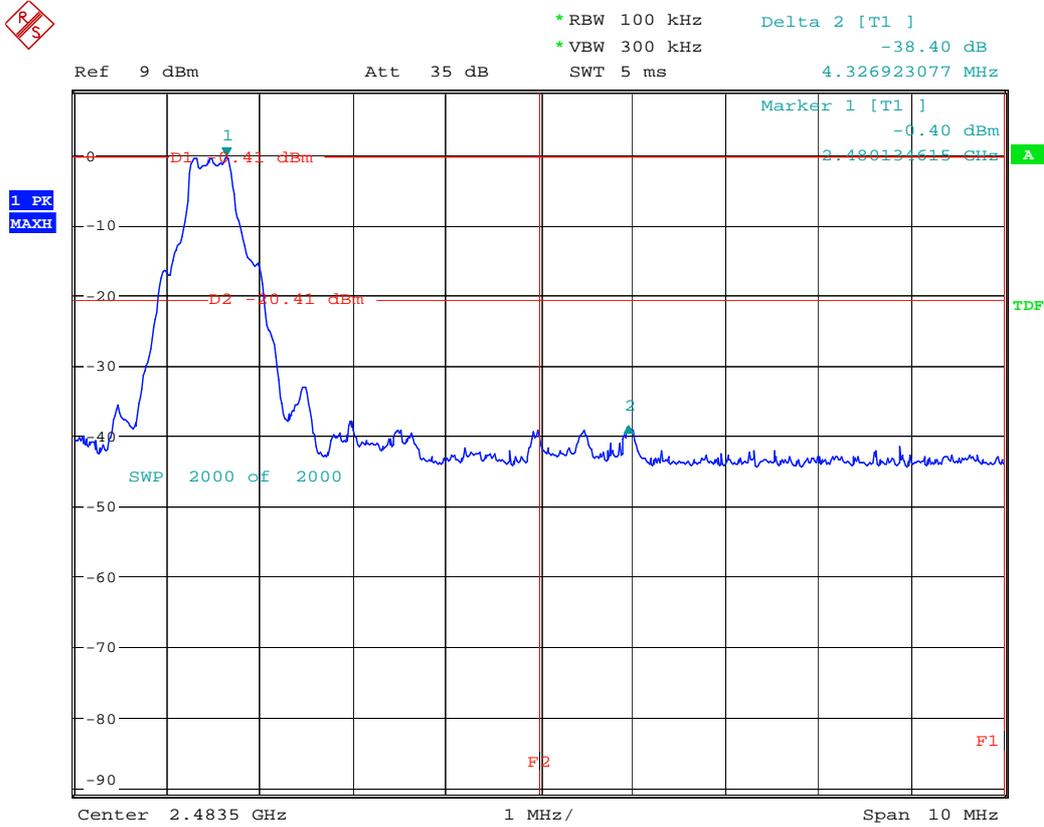


# Low edge (with hopping)



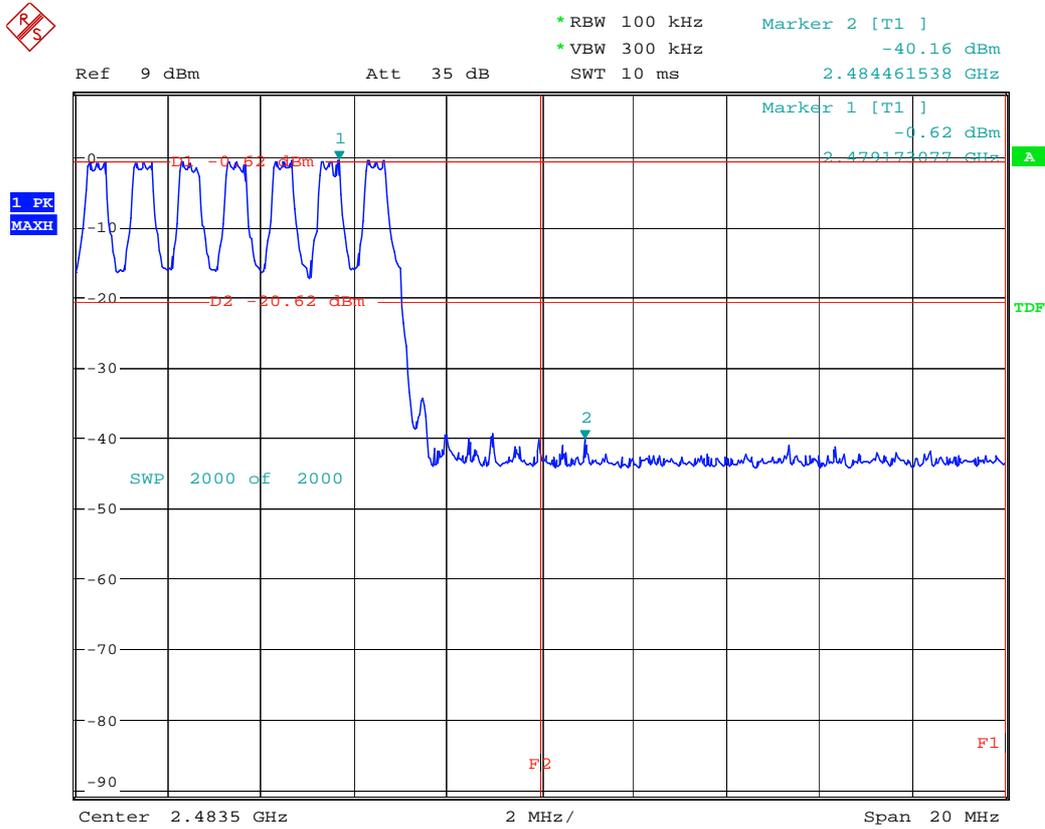
Date: 25.JUL.2007 20:28:38

# High edge (Channel 78, no hopping)



Date: 25.JUL.2007 20:54:43

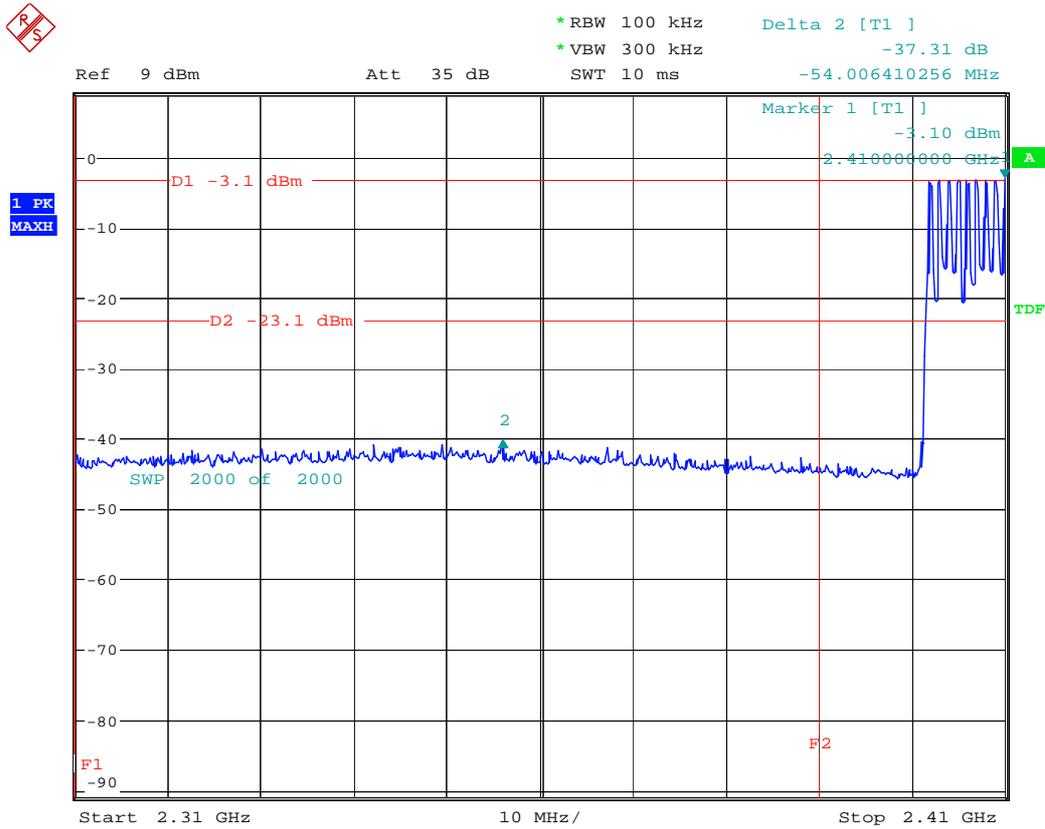
# High edge (with hopping)



Date: 25.JUL.2007 21:03:32

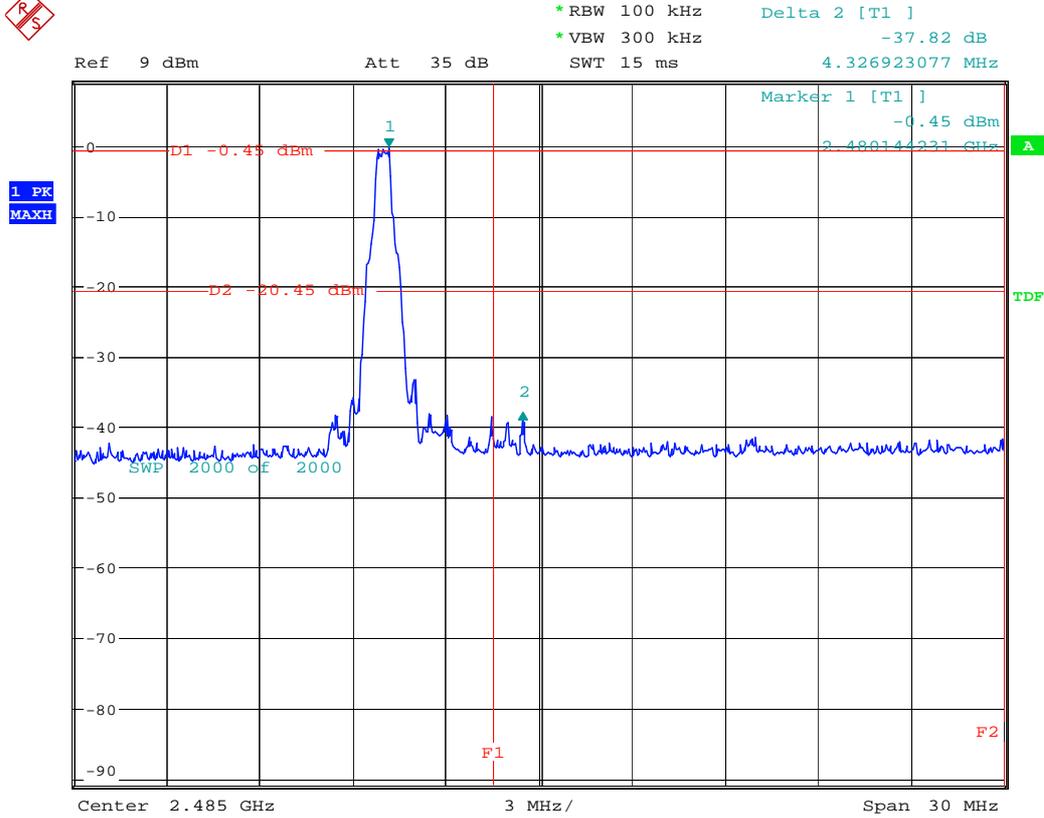


# Restrict band 2310MHz to 2390MHz (with hopping)



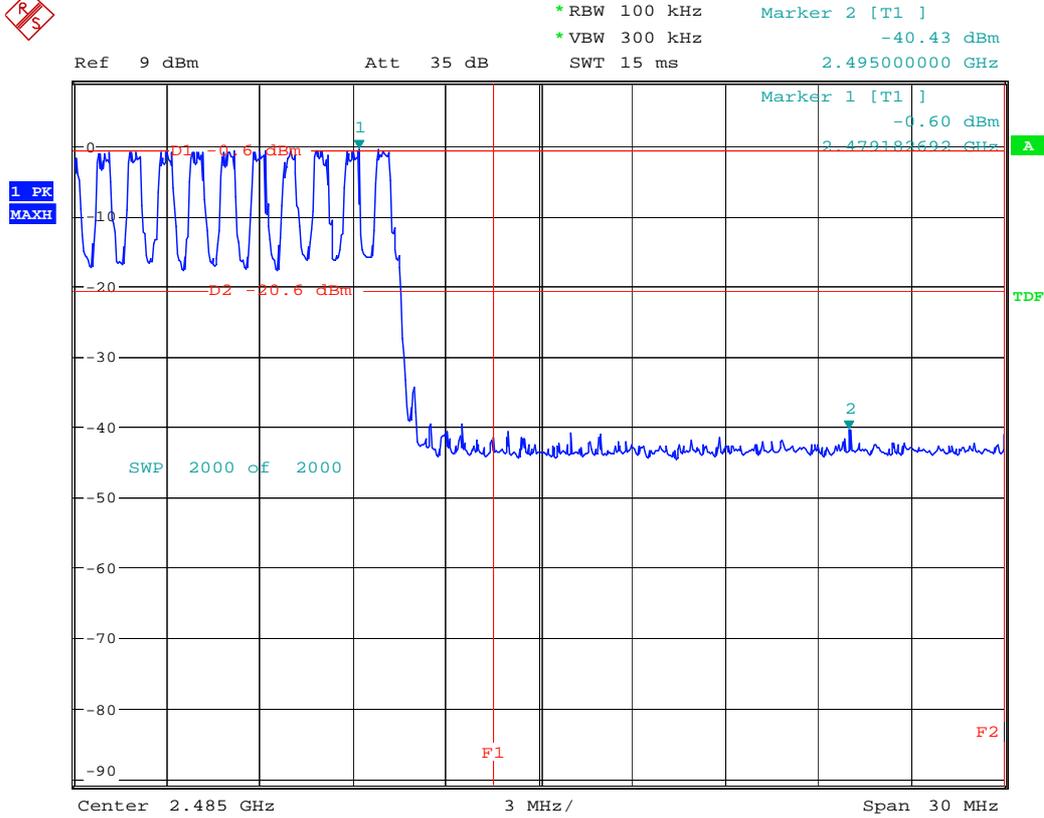
Date: 25.JUL.2007 21:32:25

# Restrict band 2483.5MHz to 2500MHz (channel 78, no hopping)



Date: 25.JUL.2007 21:13:16

# Restrict band 2483.5MHz to 2500MHz (channel 78, with hopping)



Date: 25.JUL.2007 21:18:12

# Appendix G

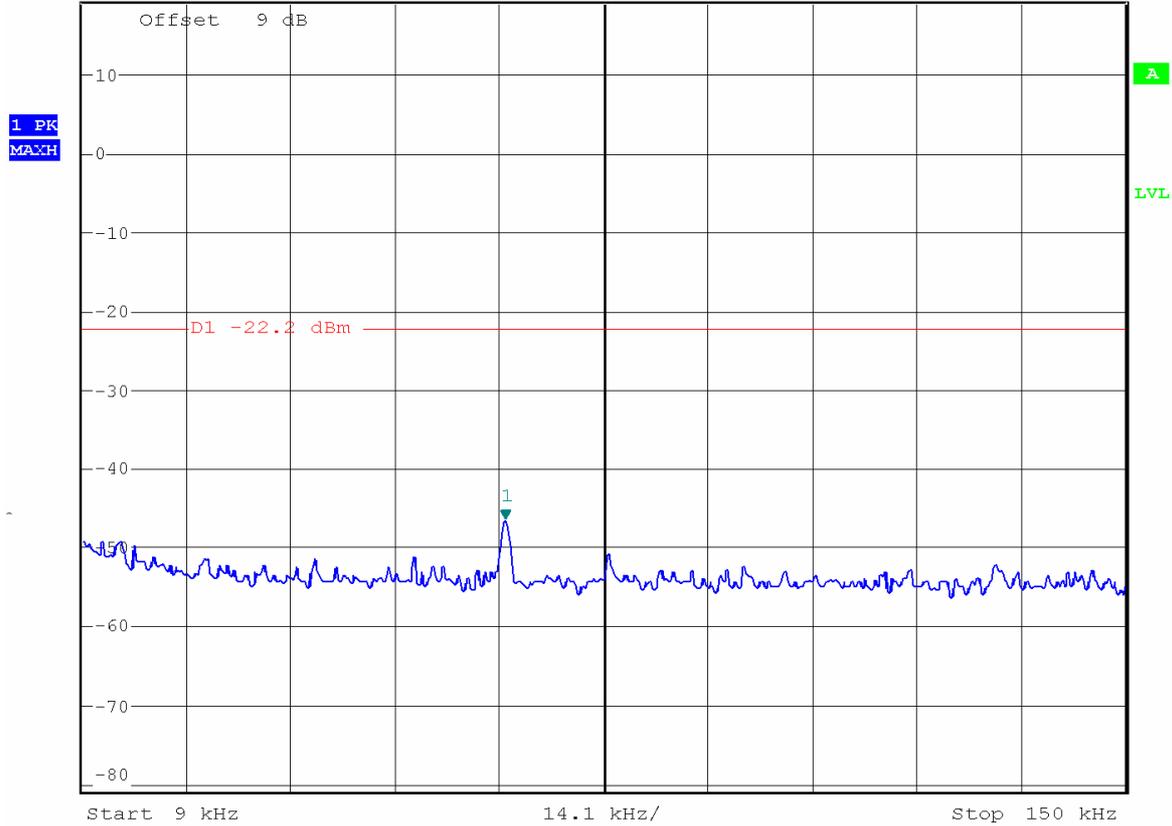
## Conducted RF spurious

According to FCC Part 15.247 d

# Channel 0



Ref 19 dBm      \* Att 40 dB      SWT 145 ms      Marker 1 [T1]      -46.76 dBm  
\* RBW 1 kHz      \* VBW 3 kHz      66.168269231 kHz



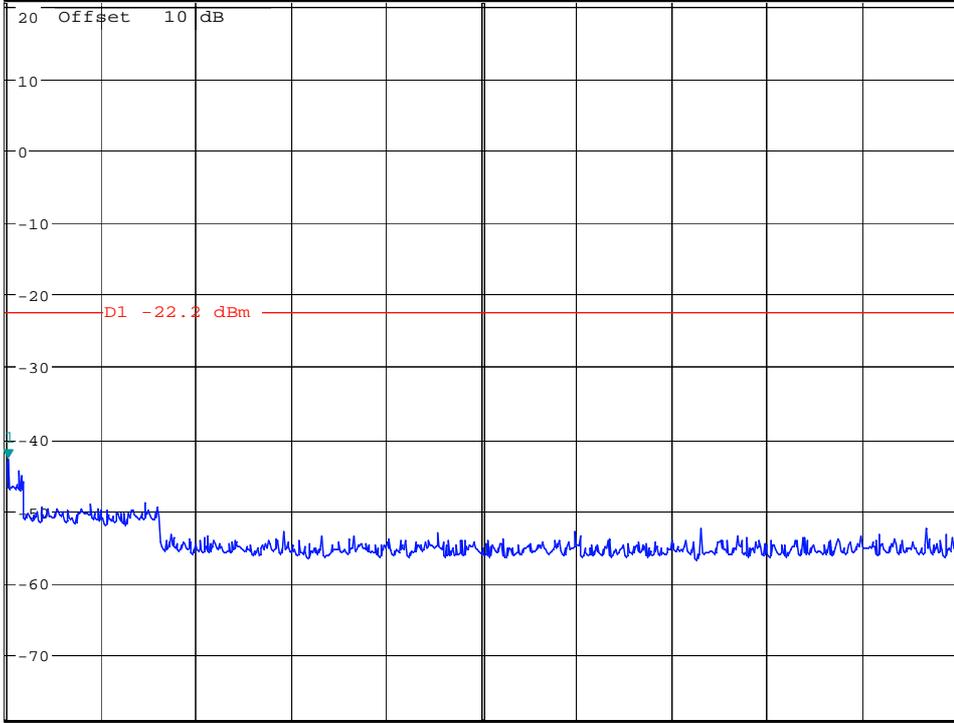


\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -42.82 dBm  
SWT 300 ms      197.836538462 kHz

Ref 20.9 dBm

\*Att 40 dB

1 PK  
MAXH



A

LVL

Start 150 kHz

2.985 MHz/

Stop 30 MHz

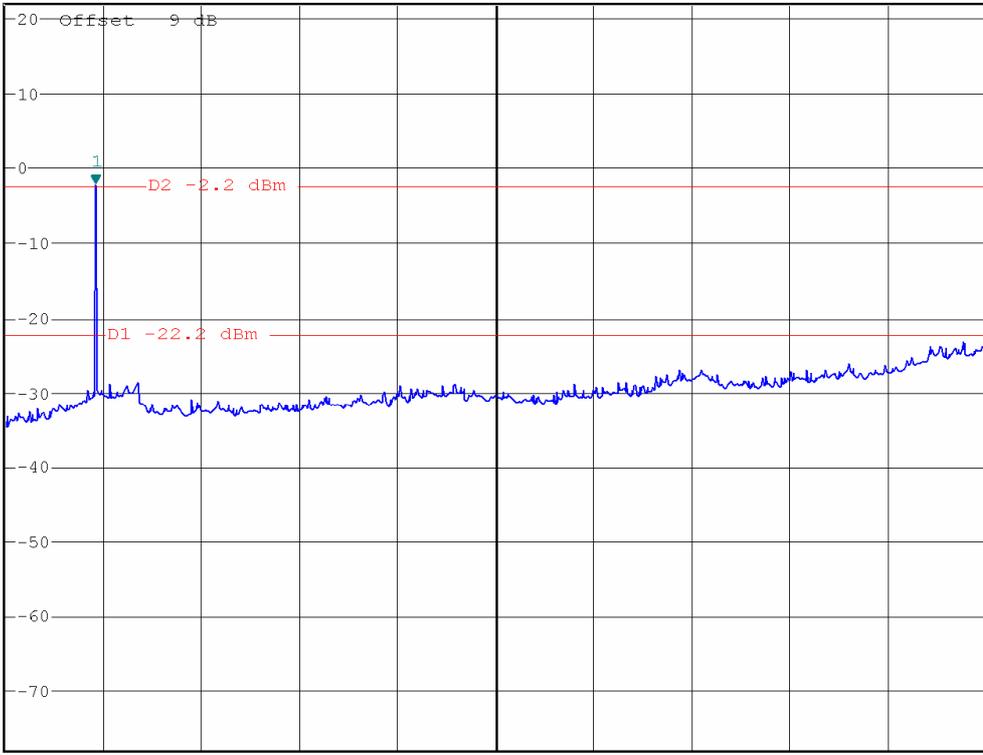


\* RBW 1 MHz  
\* VBW 3 MHz  
\* SWT 150 ms

Marker 1 [T1 ]  
-2.31 dBm  
2.402259615 GHz

Ref 22 dBm

Att 40 dB



Start 30 MHz

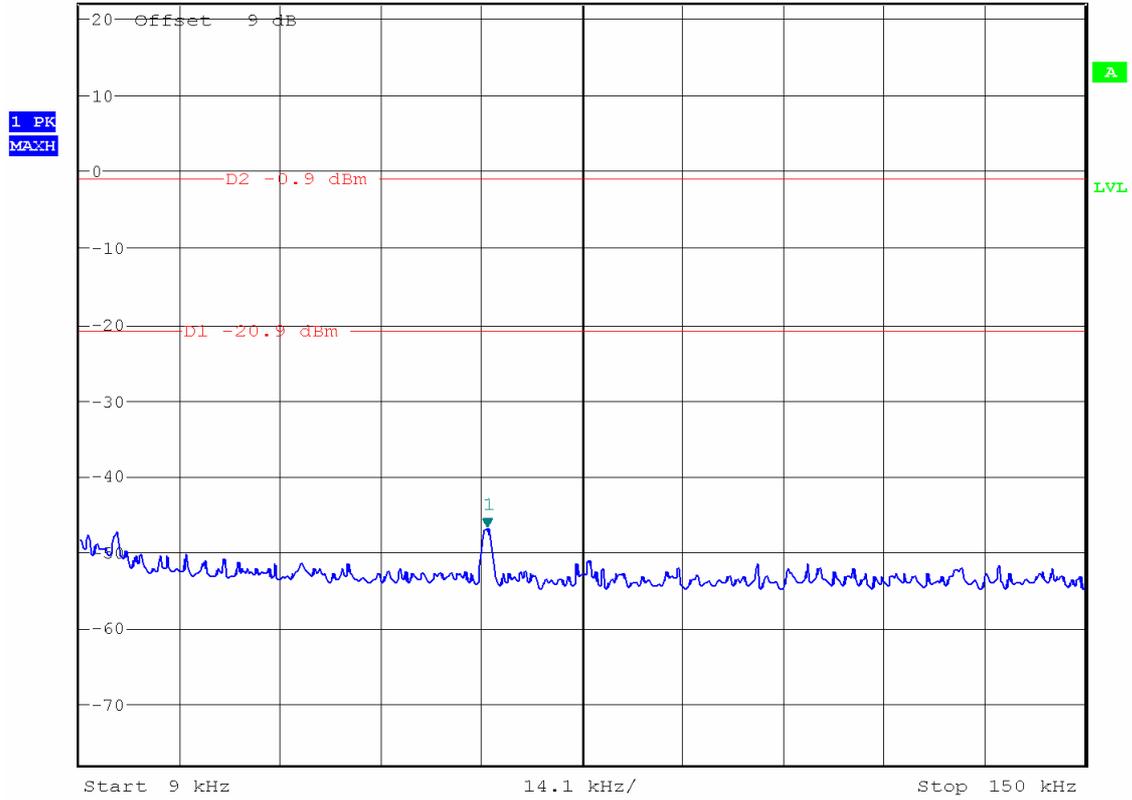
2.597 GHz/

Stop 26 GHz

# Channel 40



Ref 22 dBm      Att 40 dB      \*RBW 1 kHz      Marker 1 [T1]      -46.95 dBm  
\*SWT 150 ms      66.168269231 kHz



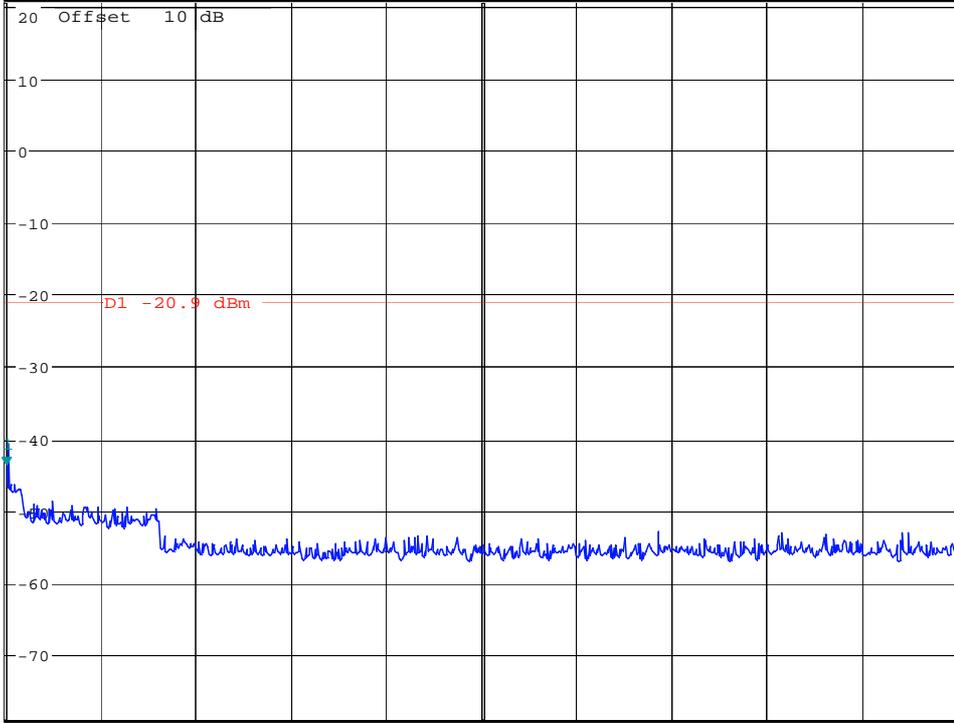


\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -43.83 dBm  
SWT 300 ms      150.00000000 kHz

Ref 20.9 dBm

\*Att 40 dB

1 PK  
MAXH



Start 150 kHz

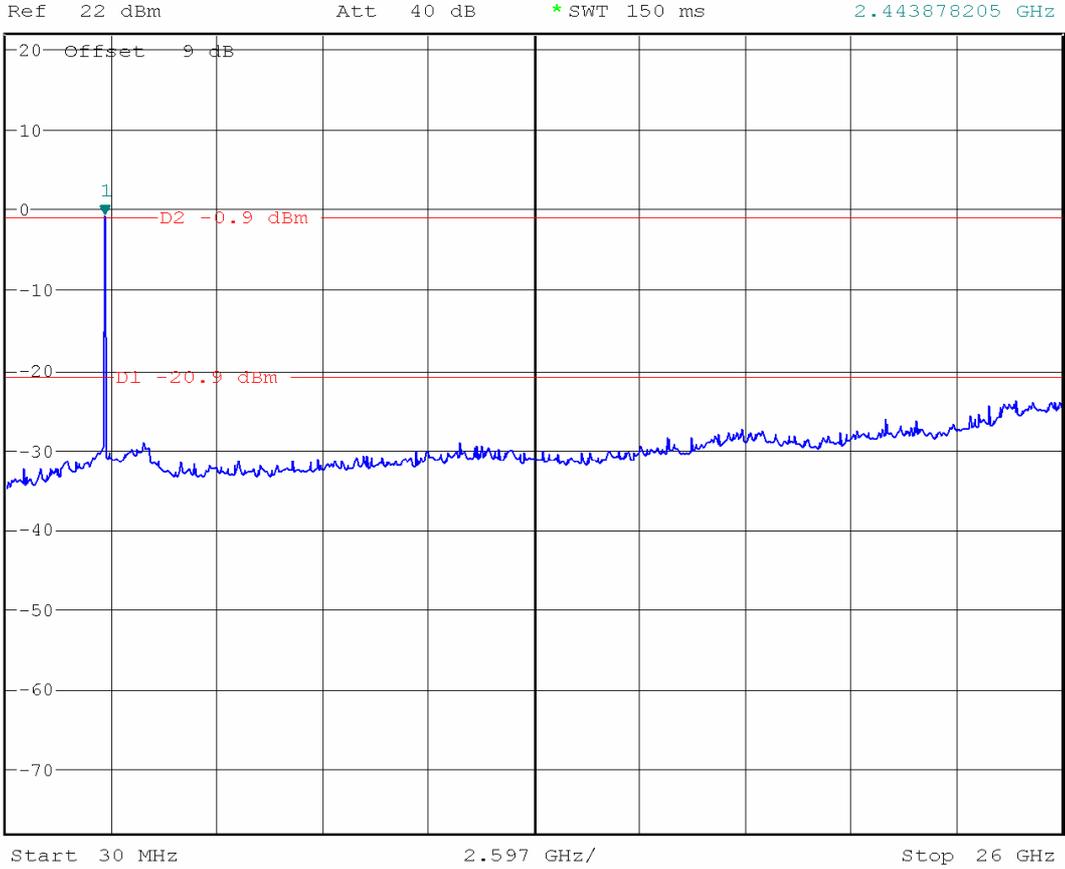
2.985 MHz/

Stop 30 MHz



\* RBW 1 MHz  
\* VBW 3 MHz  
\* SWT 150 ms

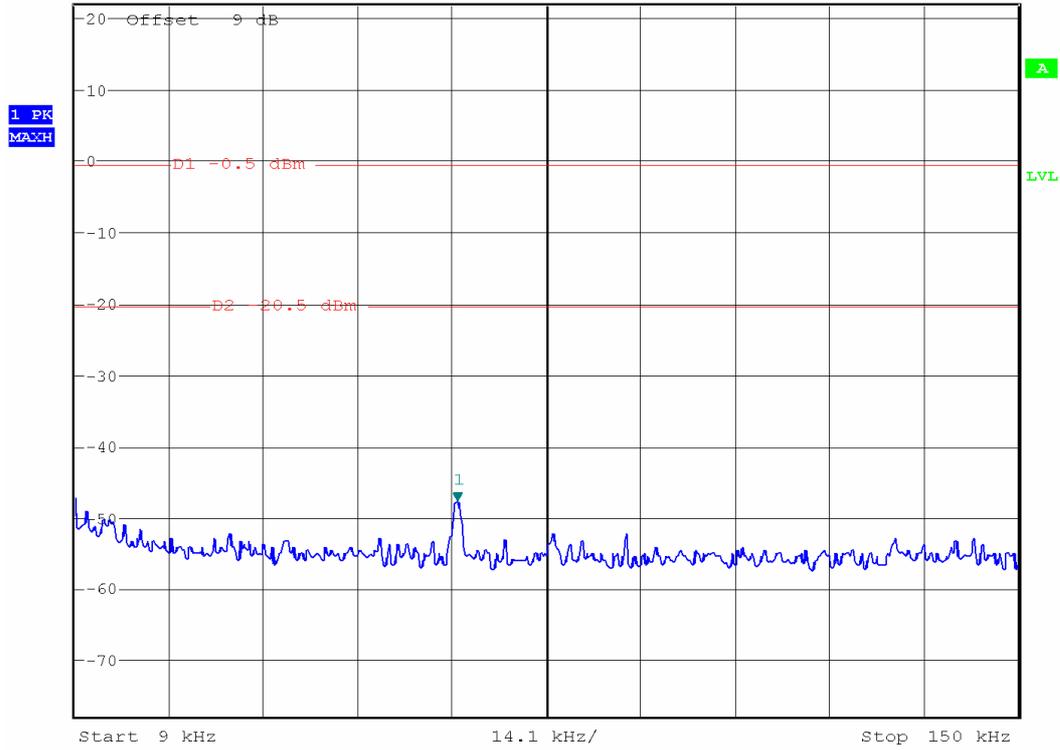
Marker 1 [T1 ]  
-0.88 dBm  
2.443878205 GHz



# Channel 78



Ref 22 dBm Att 40 dB \* RBW 1 kHz Marker 1 [T1 ]  
VBW 3 kHz -47.91 dBm  
\* SWT 150 ms 66.168269231 kHz



Date: 31.AUG.2007 03:05:23

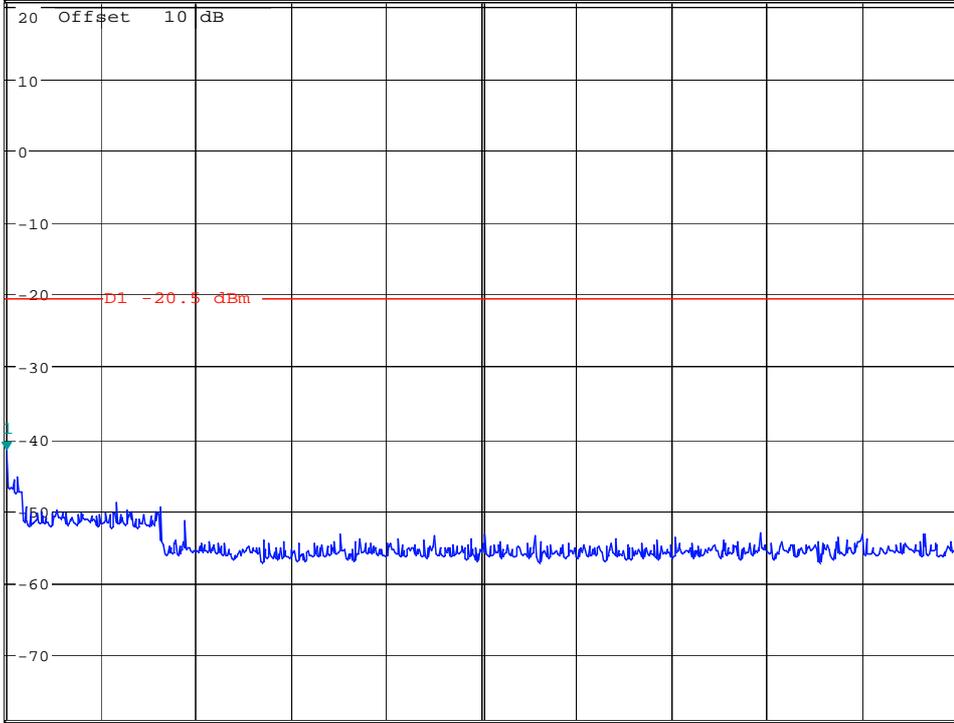


\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -41.72 dBm  
SWT 300 ms      150.00000000 kHz

Ref 20.9 dBm

\*Att 40 dB

1 PK  
MAXH



Start 150 kHz

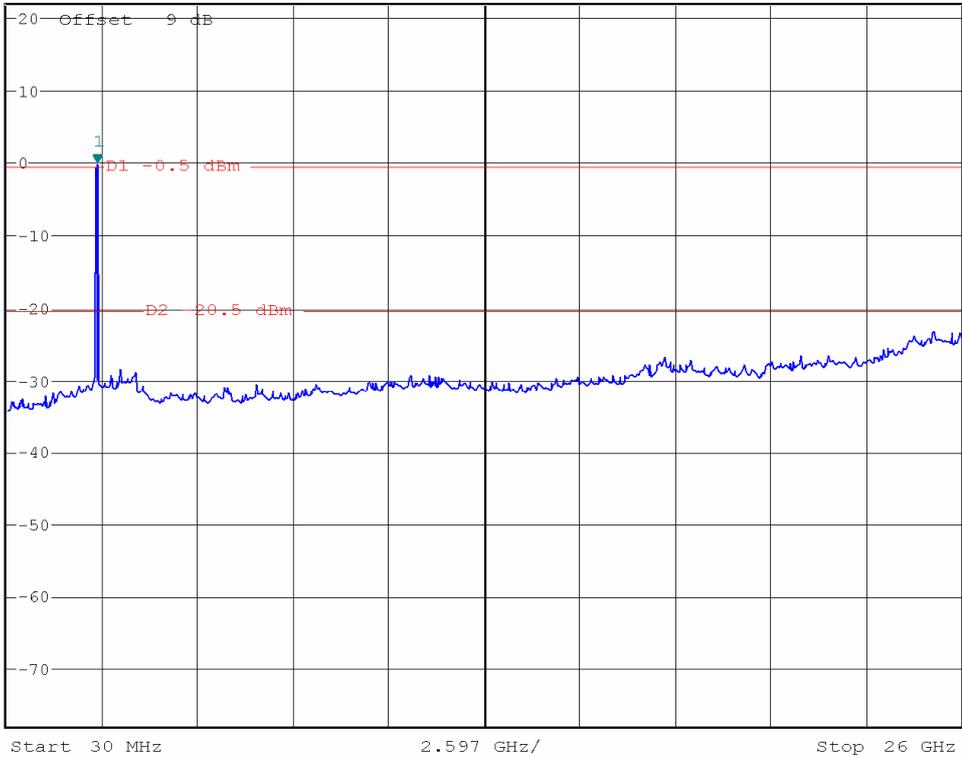
2.985 MHz/

Stop 30 MHz

Date: 3.SEP.2007 18:27:08



Ref 22 dBm Att 40 dB \* RBW 1 MHz Marker 1 [T1 ]  
VBW 3 MHz -0.24 dBm  
\* SWT 150 ms 2.485496795 GHz

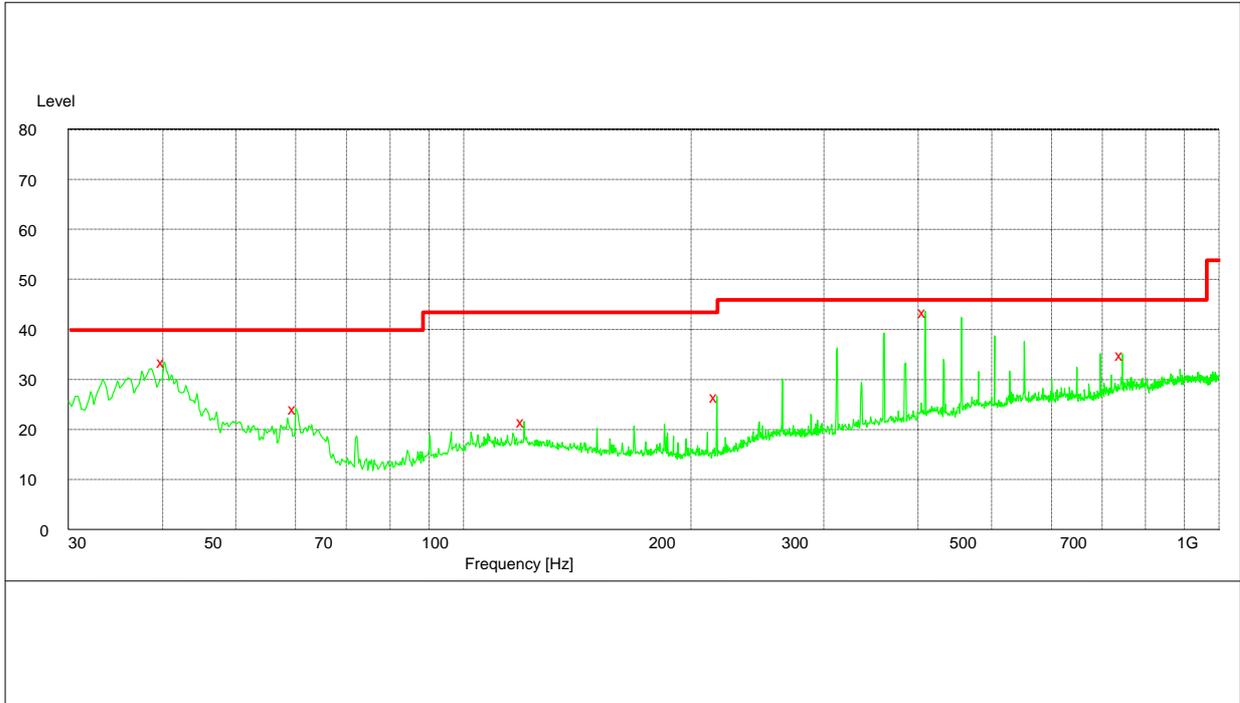


## Appendix H

# Radiated spurious emission & spurious in restricted band

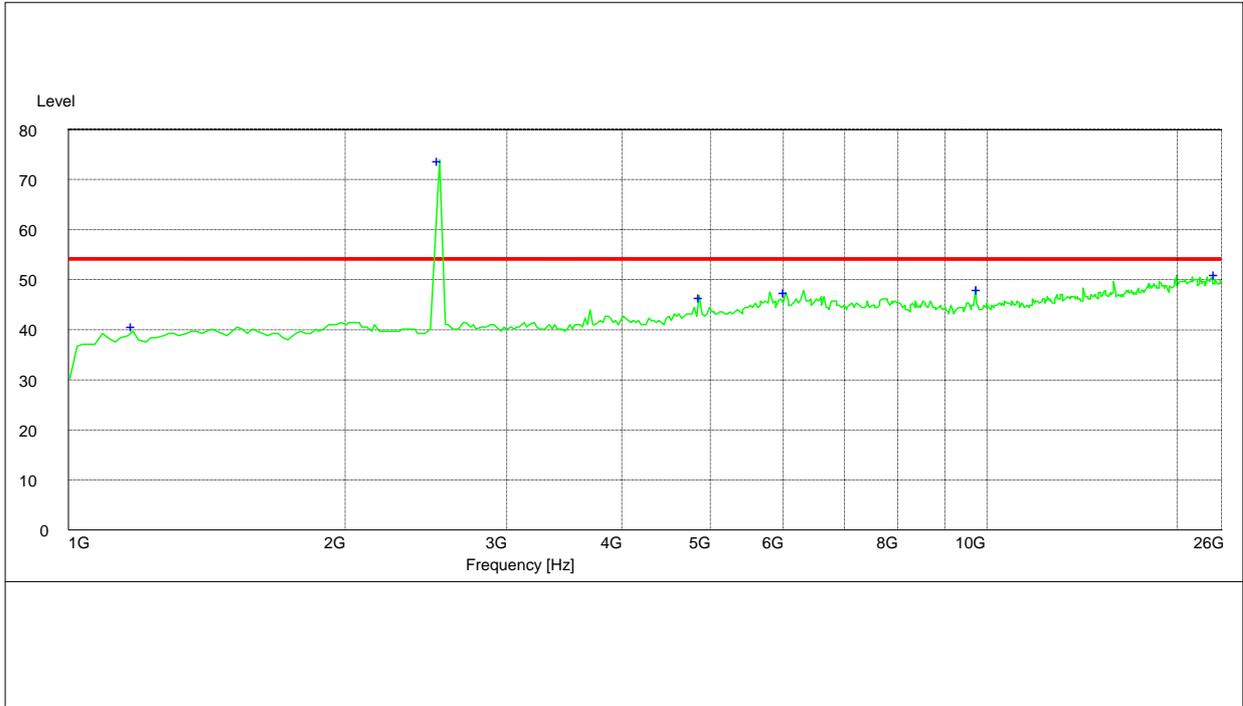
According to FCC Part 15.247 d & 15.205 & 15.209

# Channel 0 30MHz to 1GHz



Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
40.200000	33.50	-9.7	40.0	6.5	100.0	90.00	VERTICAL
60.000000	24.20	-16.4	40.0	15.8	100.0	90.00	VERTICAL
120.300000	21.60	-9.5	43.5	21.9	100.0	0.00	VERTICAL
216.300000	26.70	-11.5	46.0	19.3	100.0	90.00	HORIZONTAL
408.888889	43.60	-3.9	46.0	2.4	100.0	270.00	HORIZONTAL
744.888889	35.10	-0.2	46.0	11.9	100.0	90.00	HORIZONTAL

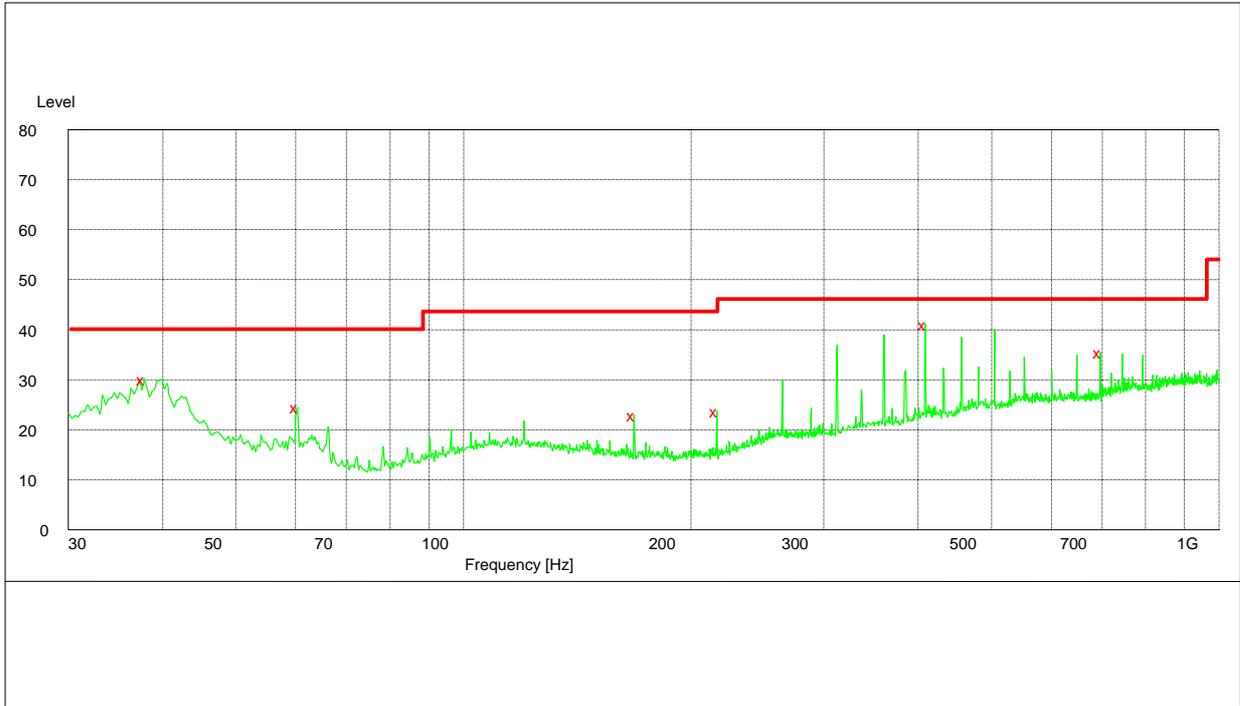
# 1GHz to 26GHz



Note: The peak exceeds the limit line is carrier frequency.

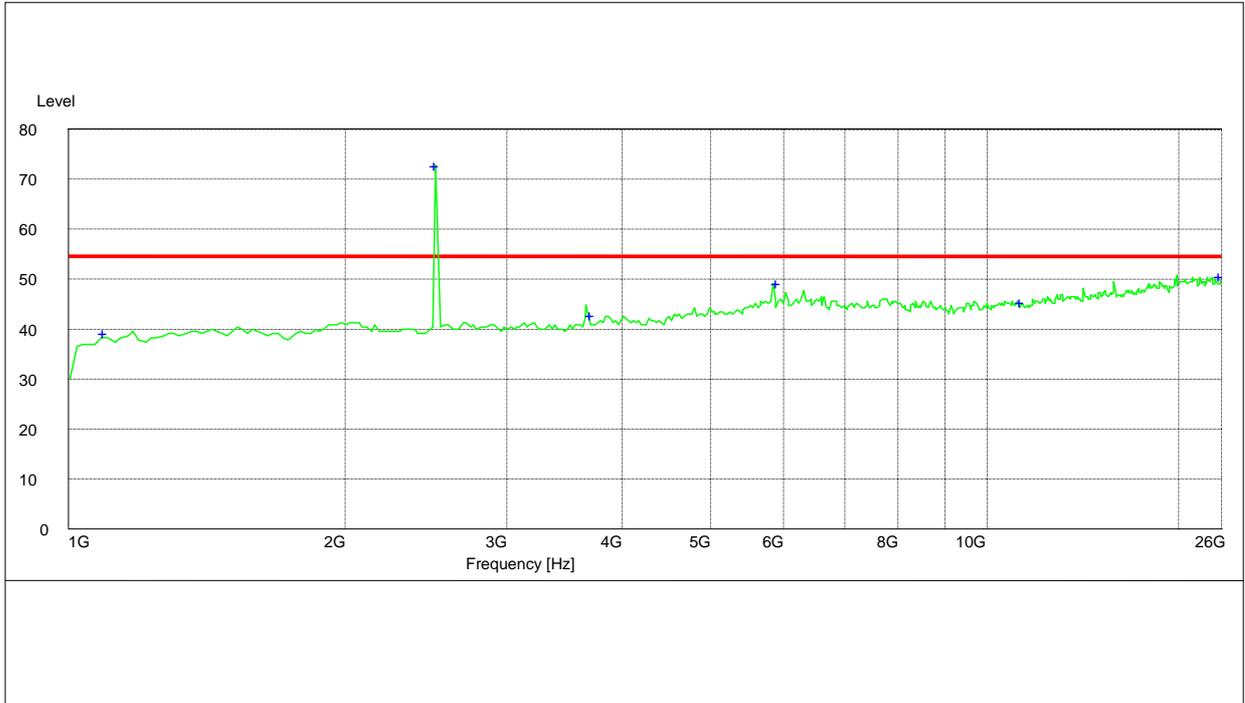
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
1175.500000	40.20	-6.5	54.0	13.8	100.0	300.00	HORIZONTAL
2402.000000	74.80	2.0	54.0	-20.8	100.0	50.00	VERTICAL
4805.000000	46.50	10.0	54.0	7.5	100.0	0.00	VERTICAL
6000.500000	47.10	12.7	54.0	6.9	200.0	325.00	HORIZONTAL
12921.000000	48.20	31.6	54.0	5.8	100.0	120.00	HORIZONTAL
25300.000000	50.80	51.0	54.0	3.2	300.0	300.00	VERTICAL

## Channel 40 30MHz to 1GHz



Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
37.800000	30.20	-8.5	40.0	9.8	100.0	0.00	VERTICAL
60.300000	24.50	-16.4	40.0	15.5	100.0	270.00	VERTICAL
168.300000	22.90	-11.8	43.5	20.6	100.0	180.00	VERTICAL
216.300000	23.70	-11.5	46.0	22.3	100.0	90.00	HORIZONTAL
408.888889	41.20	-3.9	46.0	4.8	100.0	270.00	HORIZONTAL
696.666667	35.50	-1.3	46.0	10.5	100.0	90.00	HORIZONTAL

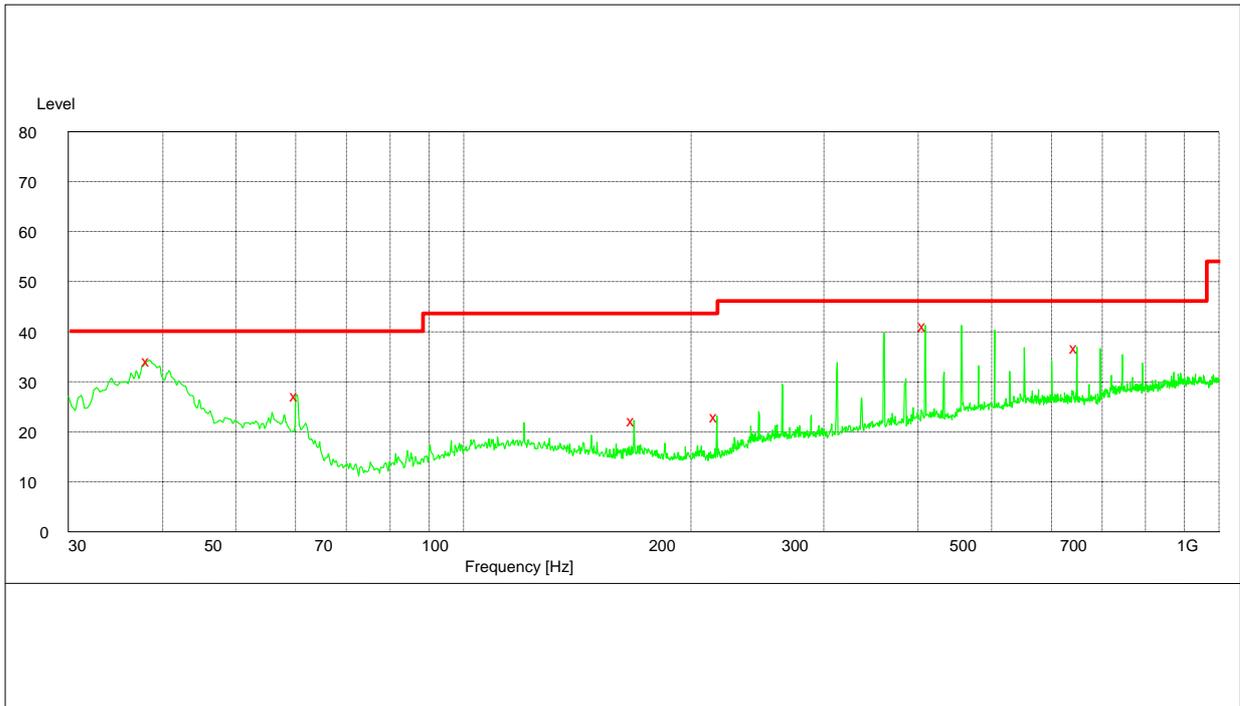
# 1GHz to 26GHz



Note: The peak exceeds the limit line is carrier frequency.

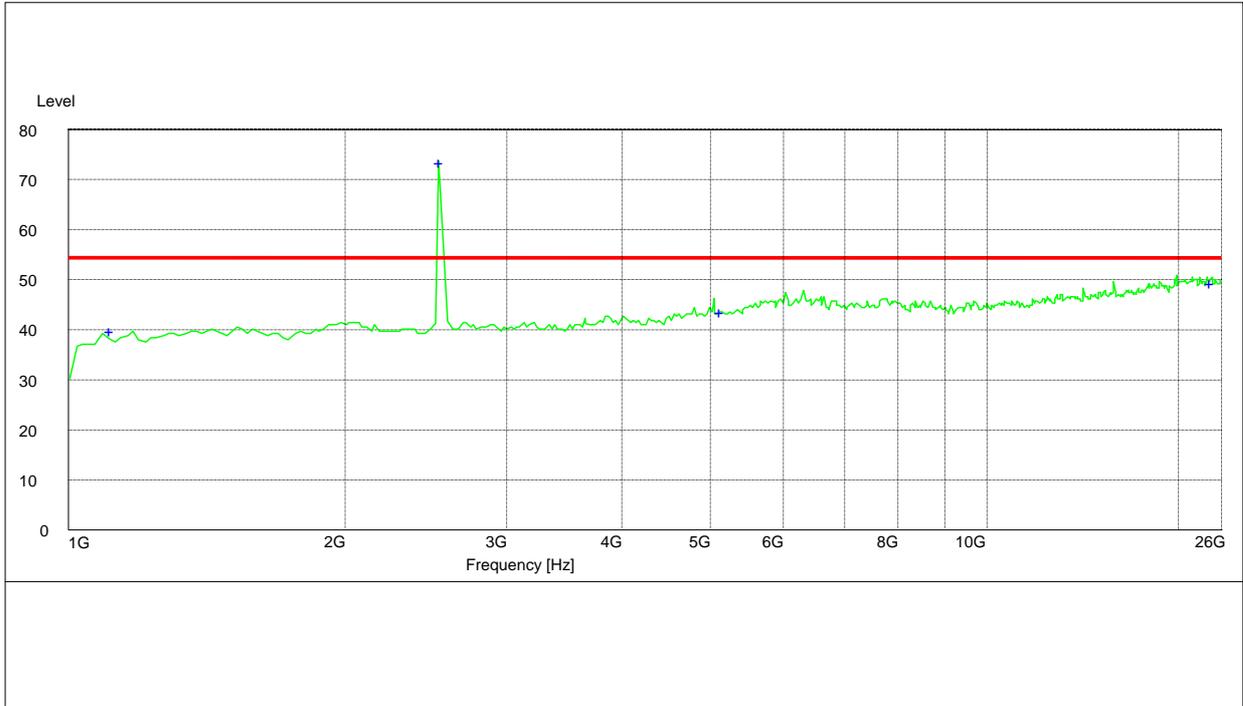
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
1100.000000	39.30	-6.5	54.0	14.7	220.0	305.00	HORIZONTAL
2442.000000	72.80	2.1	54.0	-18.8	100.0	266.00	VERTICAL
3750.000000	42.00	7.0	54.0	12.0	106.0	4.00	VERTICAL
5925.500000	49.90	12.7	54.0	4.1	112.0	26.00	VERTICAL
12924.500000	45.10	31.6	54.0	8.9	300.0	275.00	HORIZONTAL
25998.000000	50.90	52.1	54.0	3.1	200.0	115.00	VERTICAL

## Channel 78 30MHz to 1GHz



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
38.400000	34.30	-8.7	40.0	5.7	100.0	0.00	VERTICAL
60.300000	27.30	-16.4	40.0	12.7	100.0	270.00	VERTICAL
168.300000	22.30	-11.8	43.5	21.2	200.0	0.00	HORIZONTAL
216.600000	23.10	-11.5	46.0	22.9	100.0	90.00	HORIZONTAL
408.888889	41.30	-3.9	46.0	4.7	100.0	90.00	HORIZONTAL
648.444444	36.90	-1.6	46.0	9.1	100.0	90.00	HORIZONTAL

# 1GHz to 26GHz



Note: The peak exceeds the limit line is carrier frequency.

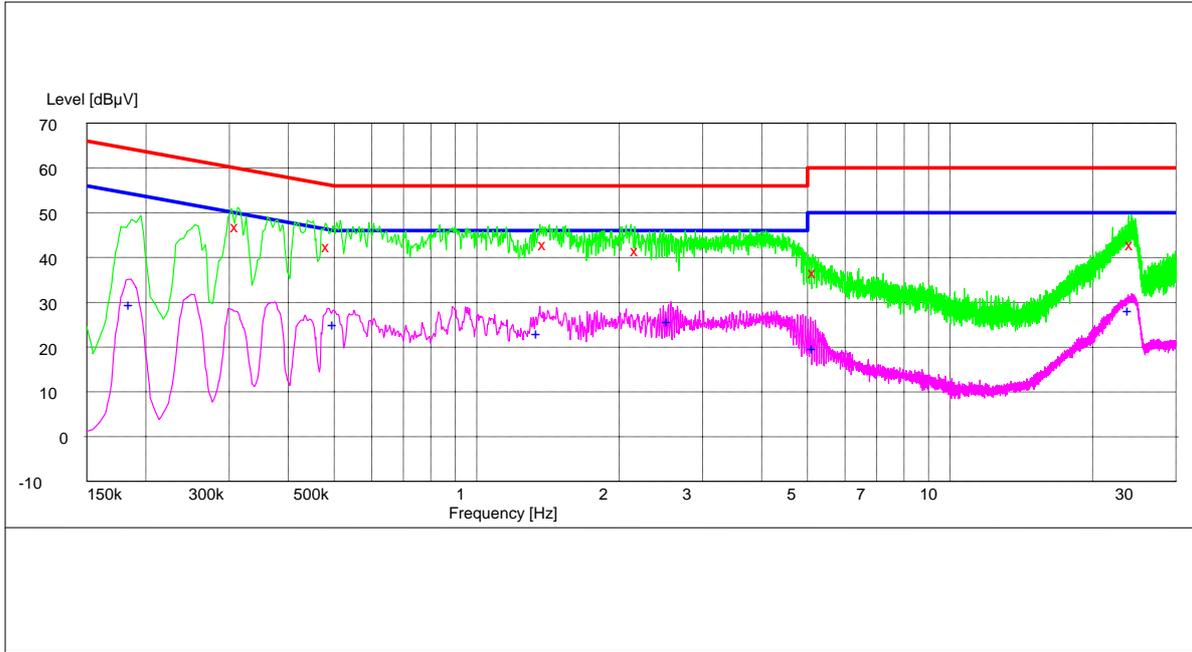
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
1100.000000	39.50	-6.5	54.0	14.5	130.0	125.00	VERTICAL
2480.000000	74.50	2.3	54.0	-20.5	90.0	250.00	VERTICAL
5087.500000	43.60	12.1	54.0	10.4	180.0	240.00	VERTICAL
22248.500000	49.00	48.8	54.0	5.0	100.0	200.00	VERTICAL

# Appendix I

## Conducted Emission at Power Port

According to FCC Part 15.207

# Channel 40



**MEASUREMENT RESULT:**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.312000	47.20	10.2	60	12.7	QP	L3	FLO
0.487500	42.70	10.0	56	13.5	QP	L3	FLO
1.396500	43.20	10.0	56	12.8	QP	L3	FLO
2.184000	42.00	10.1	56	14.0	QP	L3	FLO
5.185500	37.00	10.2	60	23.0	QP	L3	FLO
24.247500	43.20	15.1	60	16.8	QP	N	FLO

**MEASUREMENT RESULT:**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.186000	30.00	10.6	54	24.2	AV	L3	FLO
0.501000	25.50	10.0	46	20.5	AV	L3	FLO
1.351500	23.40	10.0	46	22.6	AV	L3	FLO
2.553000	26.00	10.1	46	20.0	AV	L3	FLO
5.163000	20.10	10.1	50	29.9	AV	L3	FLO
23.995500	28.60	15.2	50	21.4	AV	N	FLO