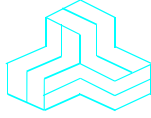


# ENGINEERING TEST REPORT



**Wireless POS Terminal**  
**Model No.: NBS5700T001**

**FCC ID: O3JNBS5700**

*Applicant:*

**NBS Payment Solutions**  
703 Evans Ave., Suite 400  
Toronto, Ontario  
Canada, M9C 5E9

*In Accordance With*

**FEDERAL COMMUNICATIONS COMMISSION (FCC)**  
**PART 15, SUBPART C, SECTION 15.247**  
**Frequency Hopping (Bluetooth)**  
**Operating in the Frequency Band 2402-2480 MHz**

**UltraTech's File No.: MIS-068F15C247\_A**

This Test report is Issued under the Authority of  
Tri M. Luu, Professional Engineer,  
Vice President of Engineering  
UltraTech Group of Labs



Date: October 25, 2007

Report Prepared by: JaeWook Choi

Tested by: Hung Trinh, RFI Technologist

Issued Date: October 25, 2007

Test Dates: September 07, 10, 11 & 13, 2007

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

## UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4

Tel.: (905) 829-1570 Fax.: (905) 829-8050

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31040/SIT



C-1376



46390-2049



200093-0



SL2-IN-E-1119R

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## EXHIBIT 1 INTRODUCTION

### 1.1 SCOPE

<b>Reference:</b>	Part 15, Subpart C, Section 15.247
<b>Title:</b>	Telecommunication - Code of Federal Regulations, CFR 47, Part 15
<b>Purpose of Test:</b>	To gain FCC Equipment Authorization for Frequency Hopping (Bluetooth) Operating in the Frequency Band 2402-2480 MHz.
<b>Test Procedures:</b>	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
<b>Environmental Classification:</b>	Commercial, light industry & heavy industry

### 1.2 RELATED SUBMITTAL(S)/GRANT(S)

None.

### 1.3 NORMATIVE REFERENCES

Publication	Year	Title
FCC 47CFR Parts 0-19	2006	Code of Federal Regulations, Title 47 – Telecommunication
ANSI C63.4	2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CISPR 22 +A1 EN 55022	2003-04-10 2004-10-14 2003	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-2-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-1: Conducted disturbance measurement
CISPR 16-2-3	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-3: Radiated disturbance measurement
FCC Public Notice DA 00-705	2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
KDB Publication No. 558074	2005	Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)

#### ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
 Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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 October 25, 2007

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

## EXHIBIT 2 PERFORMANCE ASSESSMENT

### 2.1 CLIENT INFORMATION

<b>APPLICANT:</b>	
<b>Name:</b>	NBS Payment Solutions
<b>Address:</b>	703 Evans Ave., Suite 400 Toronto, ON Canada, M9C 5E9
<b>Contact Person:</b>	Mr. Dragoslav Jovanovic Phone #: 905-812-6200 (3358) Fax #: 905-812-6301 Email Address: <a href="mailto:djovanovic@nbsps.com">djovanovic@nbsps.com</a>

<b>MANUFACTURER:</b>	
<b>Name:</b>	SAGEM Monetel
<b>Address:</b>	1, Rue Claude Chappe – BP346 Guilherand-Granges France, 07503
<b>Contact Person:</b>	Clement Lormeau, Customer Service Phone #: +33.4.75.81.40.47 Fax #: +33.4.75.81.41.57 Email Address: <a href="mailto:clement.lormeau@sagem.com">clement.lormeau@sagem.com</a>

### 2.2 EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

<b>Brand Name:</b>	NBS Payment Solutions
<b>Product Name:</b>	Wireless POS Terminal
<b>Model Name or Number:</b>	NBS5700T001
<b>Serial Number:</b>	10221334
<b>Type of Equipment:</b>	Bluetooth (FHSS)
<b>Input Power Supply Type:</b>	3.6V DC Battery
<b>Primary User Functions of EUT:</b>	Financial Transactions

#### ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050 Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

File #: MIS-068F15C247\_A  
October 25, 2007

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

### 2.3 EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	Portable
Intended Operating Environment:	Commercial, light industry & heavy industry
Power Supply Requirement:	3.6V DC battery
RF Output Power Rating:	17.62 dBm peak conducted
Operating Frequency Range:	2402-2480 MHz
RF Output Impedance:	50 Ω
Channel Spacing:	1 MHz
Duty Cycle:	100%
Modulation Type:	Bluetooth (FHSS)
Antenna Connector Type:	U.FL-R-SMT (internal)
Antenna Description:	Manufacturer: SAGEM Monetel Type: Bluetooth Model No.: 25160390AC Frequency Range: 2.4 – 2.5 GHz

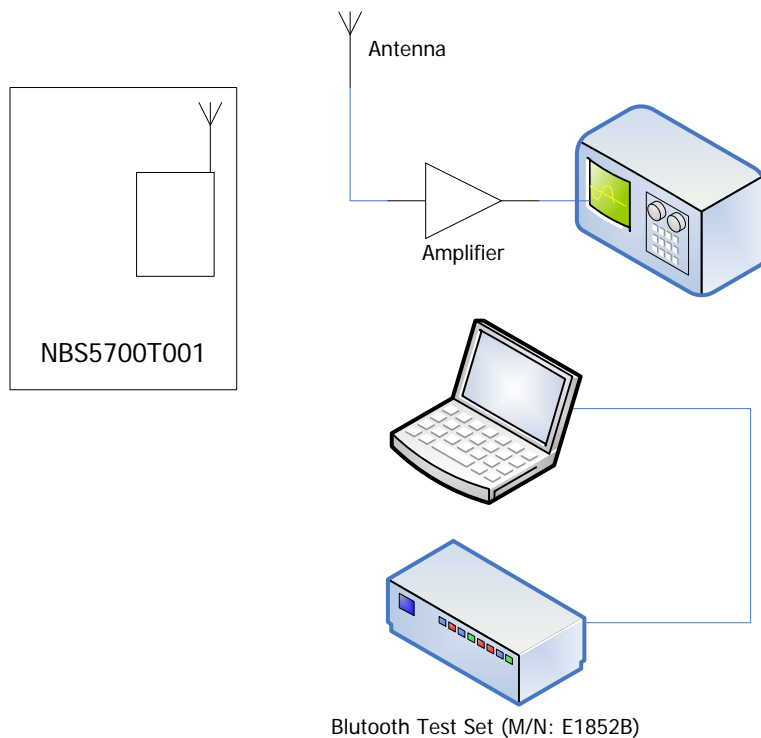
### 2.4 LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	USB port	1	Mini USB Type B	Shielded
2	USB port	1	Mini USB Type B	Shielded

### 2.5 ANCILLARY EQUIPMENT

	Description	Manufacturer	Model Number	Serial Number
1	Bluetooth Test Set	Agilent	E1852B	DK42050131
2	Laptop	Toshiba	160SCDS/43	1027387CU

## 2.6 TEST SETUP BLOCK DIAGRAM



## EXHIBIT 3 EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

### 3.1 OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

<b>Operating Modes:</b>	Each of lowest, middle and highest channel frequencies transmits continuously for emissions measurements.  The EUT operates in frequency hopping mode and direct sequence or digital modulation mode.
<b>Special Test Software:</b>	Special software is provided by the applicant to put the EUT into the test mode and Bluetooth test set was used to select and operate the EUT at each channel frequency continuously and mode of operation such as frequency hopping and direct sequence or digital modulation for testing purpose.
<b>Special Hardware Used:</b>	N/A
<b>Transmitter Test Antenna:</b>	The EUT is tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment.

<b>Transmitter Test Signals</b>	
<b>Frequency Band(s):</b>	2402 - 2480 MHz
<b>Frequency(ies) Tested:</b>	2402, 2441 & 2480 MHz.  (Near lowest, near middle & near highest frequencies in the frequency range of operation.)
<b>RF Power Output:</b>	17.62 dBm peak conducted
<b>Normal Test Modulation:</b>	Bluetooth (FHSS)
<b>Modulating Signal Source:</b>	Internal

## EXHIBIT 4 SUMMARY OF TEST RESULTS

### 4.1 LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).

Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049A-2). Last Date of Site Calibration: June 20, 2006.

### 4.2 APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.107(a) /15.207(a)	AC Power Conducted Emissions	N/A
15.109(a)	Class B Radiated Emissions	Yes (Note 1)
15.247(a)(1)	Channel Separation & 20dB Bandwidth	Yes
15.247(a)(1)(iii)	Number of Hopping Channel & Average Time of Occupancy	Yes
15.247(b)(1)	Peak Output Power	Yes
15.247(d), 15.209 & 15.205	Spurious Radiated Emissions	Yes
15.247(d)	Spurious Conducted Emissions	Yes
15.247(i), 1.1310 & 2.1091	RF Exposure	Yes (Note 2)

#### Notes:

- (1) A separate engineering test report for compliance with FCC Part 15, Subpart B – Class B Unintentional Radiators will be provided upon request.
- (2) See the separate SAR test report for compliance with RF exposure requirement.

### 4.3 MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.



## EXHIBIT 5 MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

### 5.1 TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in ANSI C63.4; KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247); FCC Public Notice DA 00-705: Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

### 5.2 MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document LAB 34 with a confidence level of 95%. Please refer to Exhibit 6 for Measurement Uncertainties.

### 5.3 MEASUREMENT EQUIPMENT USED

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4 and CISPR 16-1.

### 5.4 COMPLIANCE WITH FCC PART 15 – GENERAL TECHNICAL REQUIREMENTS

FCC Section	FCC Rules	
15.203	<p>Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.</p> <p>The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:</p> <ul style="list-style-type: none"> <li>• The application (or intended use) of the EUT</li> <li>• The installation requirements of the EUT</li> <li>• The method by which the EUT will be marketed</li> </ul>	The integral antenna is permanently mounted on the printed circuit board and located inside the enclosure
15.204	<p>Provided the information for every antenna proposed for use with the EUT:</p> <p>(a) type (e.g. Yagi, patch, grid, dish, etc...),                      (b) manufacturer and model number                      (c) gain with reference to an isotropic radiator</p>	Manufacturer: TAIYO YUDEN Co., LTD Type: 2.4GHz Multilayer Antenna Model No.: AH 104F2450S1 Frequency Range: 2.4 – 2.5 GHz Gain: > 0 dBi

## 5.5 CHANNEL SEPARATION & 20 DB BANDWIDTH [§15.247(a)(1)]

### 5.5.1. Limits

- **§15.247(a)(1):** 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, provided the systems operate with an output power no greater than 125 mW.

### 5.5.2. Method of Measurements

Refer to FCC Public Notice DA 00-705, KDB Publication No. 558074 and ANSI C63.4 for measurement methods.

### 5.5.3. Test Arrangement

See Section 2.6 of this test report.

### 5.5.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz
Amplifier	Hewlett Packard	8449B	3008A00769	1 GHz – 26.5 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Biconilog Antenna	EMCO	3143	1029	20 MHz – 2 GHz

### 5.5.5. Test Data

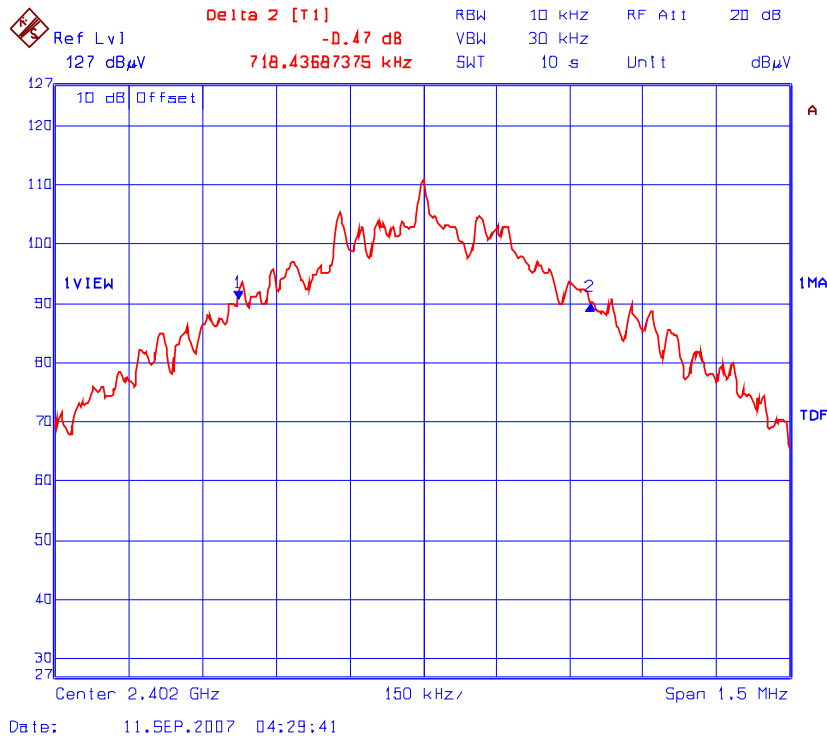
**Note:** Bandwidth measurements were done using the built-in auto function of the analyzer.

#### 5.5.5.1. For Frequency Hopping Spread Spectrum Mode

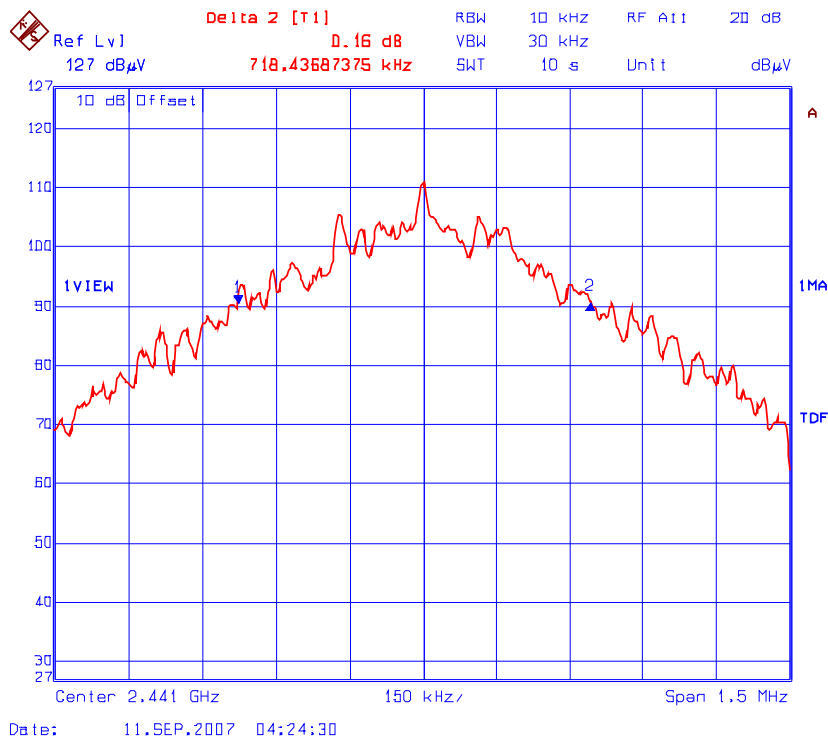
Frequency (MHz)	20 dB Bandwidth (kHz)
2402	718.44
2441	718.44
2480	724.44

See the following plots for detailed measurements.

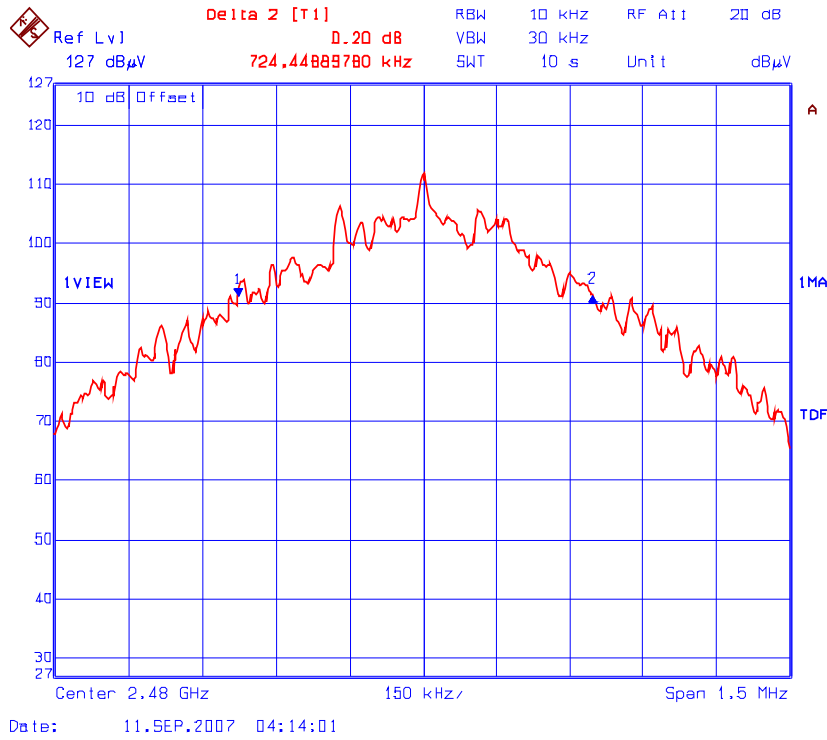
Plot 5.5.5.1.1.: 20 dB Bandwidth  
2402 MHz, Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



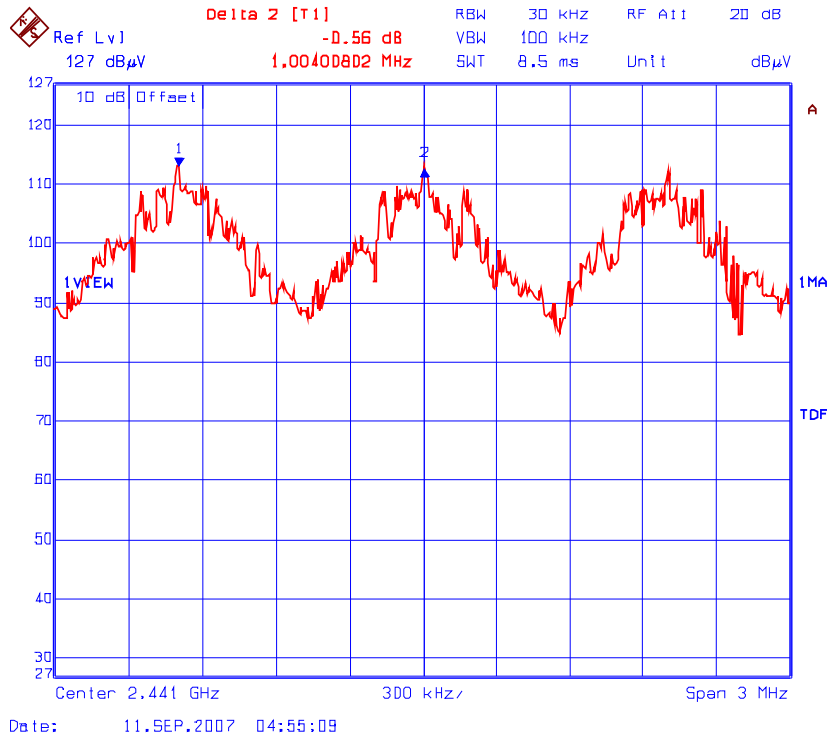
Plot 5.5.5.1.2.: 20 dB Bandwidth  
2441 MHz, Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



Plot 5.5.5.1.3.: 20 dB Bandwidth  
2480 MHz, Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



Plot 5.5.5.1.4.: Channel Separation  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), Hopping mode



## 5.6 NUMBER OF HOPPING CHANNEL & AVERAGE TIME OF OCCUPANCY [§ 15.247(a)(1)(iii)]

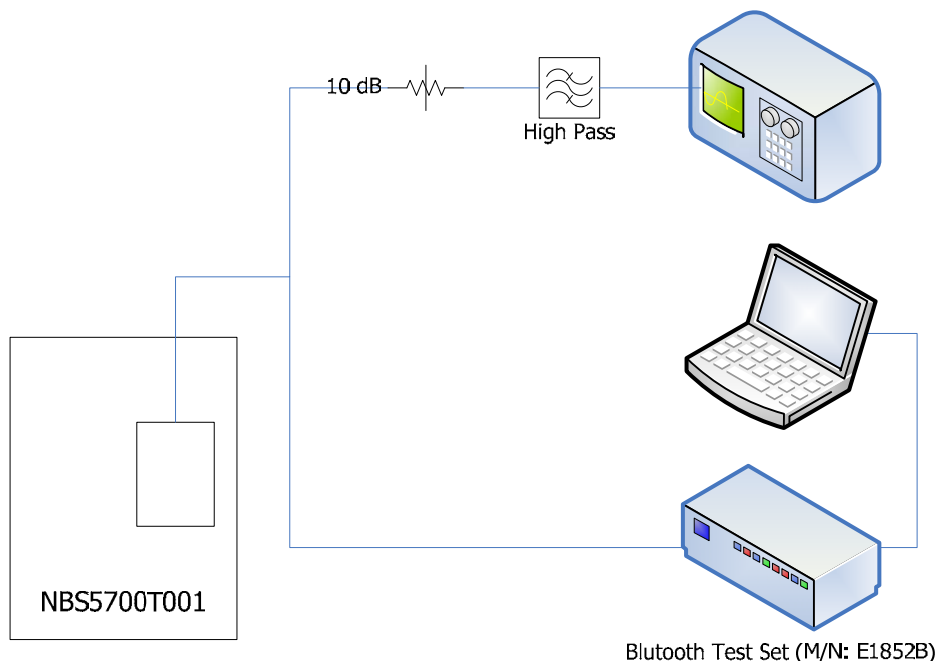
### 5.6.1. Limits

- **FCC 15.247(a)(1)(iii):** Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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.

### 5.6.2. Method of Measurements

Refer to FCC Public Notice DA 00-705, KDB Publication No. 558074 and ANSI C63.4 for measurement methods.

### 5.6.3. Test Arrangement

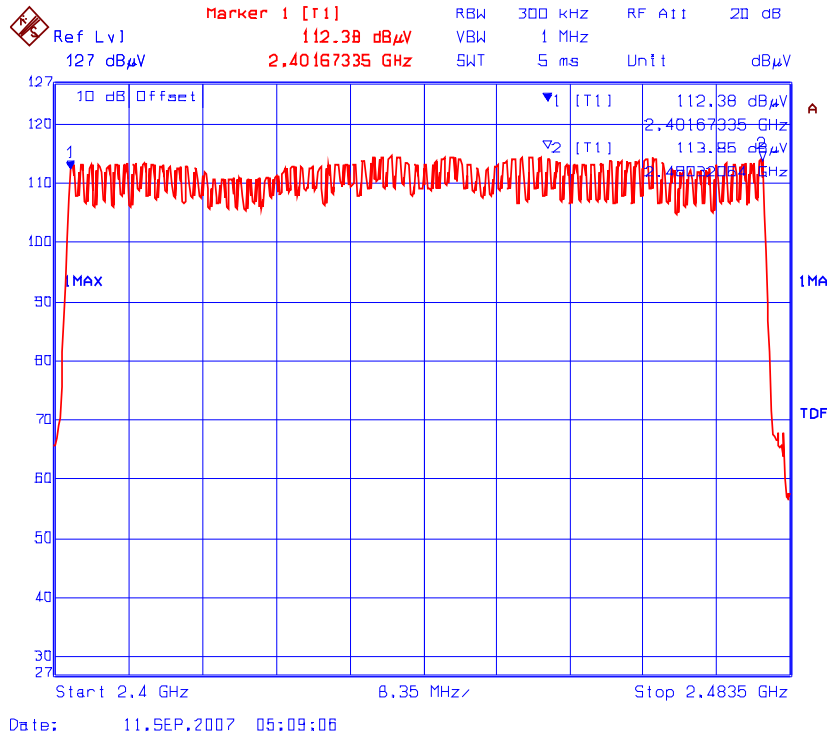


### 5.6.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz
Attenuator	Narda	4768-10	0702	DC – 40 GHz
High Pass Filter	K&L	11SH10-4000	T12000	DC – 26 GHz

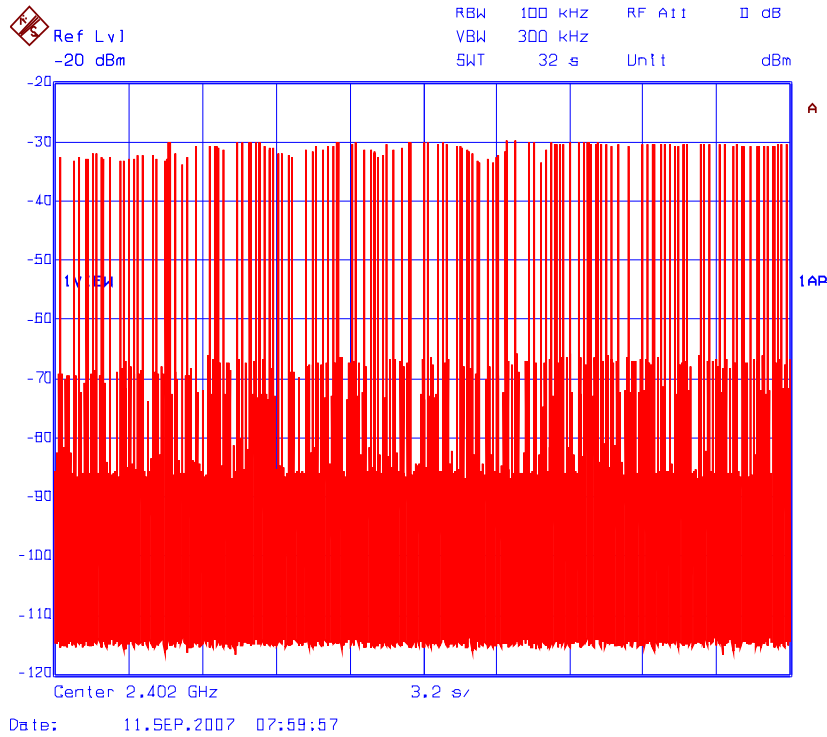
5.6.5. Test Data

Plot 5.6.5.1.: Number of hopping channel  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), Hopping mode - 79 channels

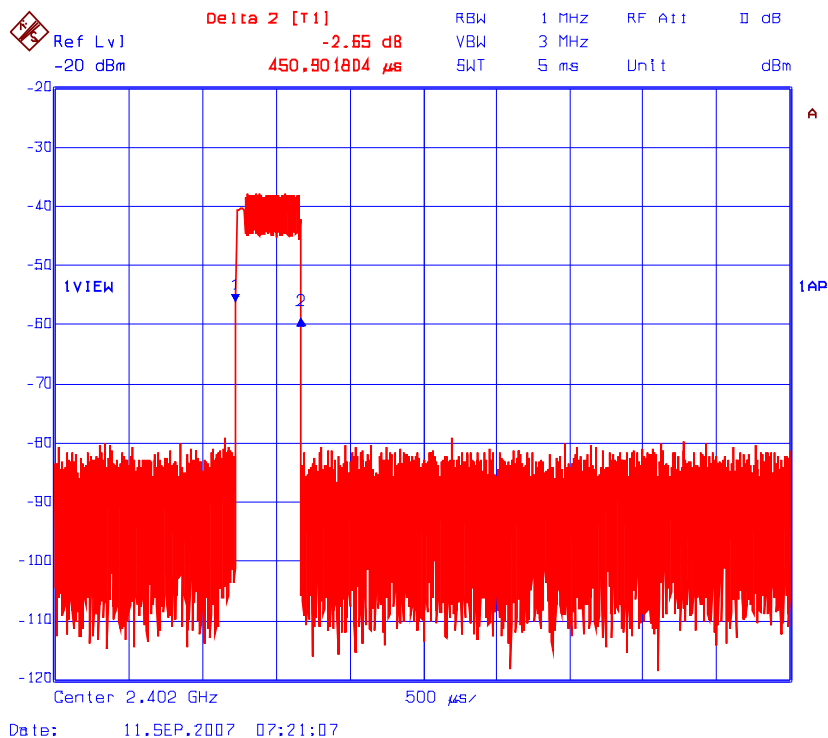




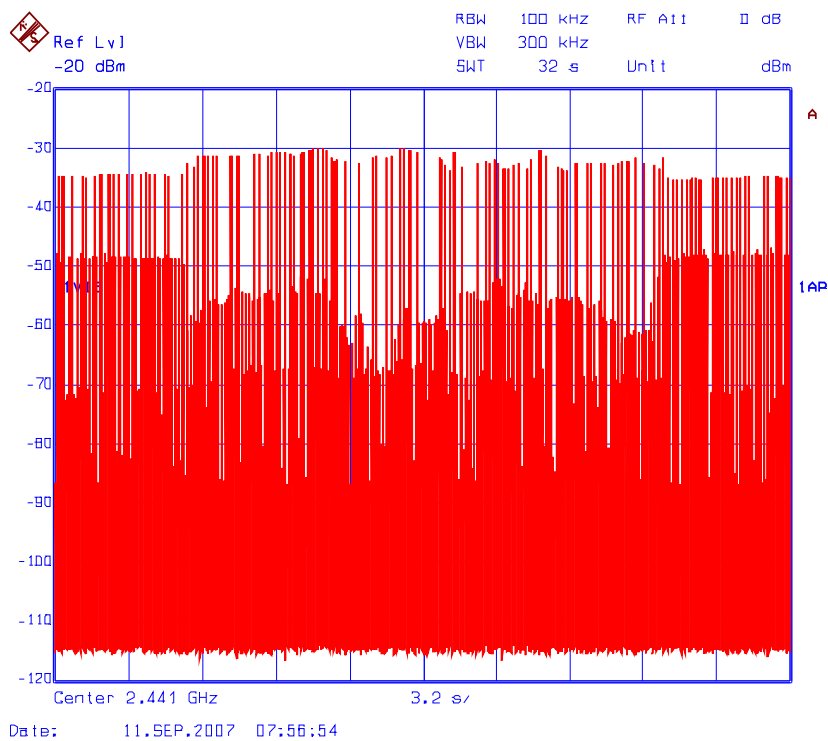
Plot 5.6.5.2.: Time of Occupancy at 2402 MHz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)  
 $115 * 450.90\mu s = 51.85ms < 400ms$  within 31.6s ( $0.4s * 79$ )



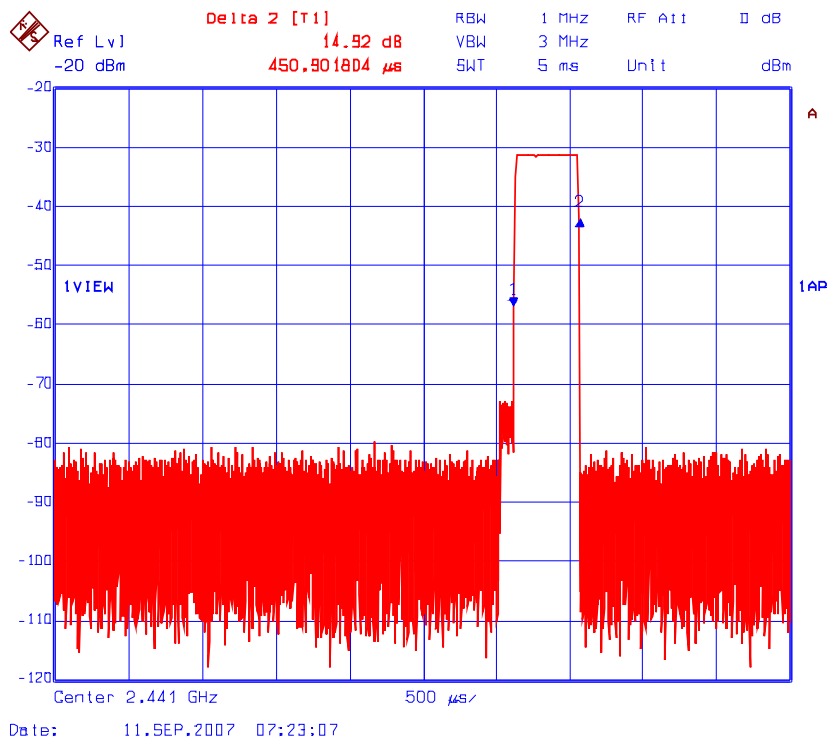
Plot 5.6.5.3.: Time of Occupancy at 2402 MHz #2  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



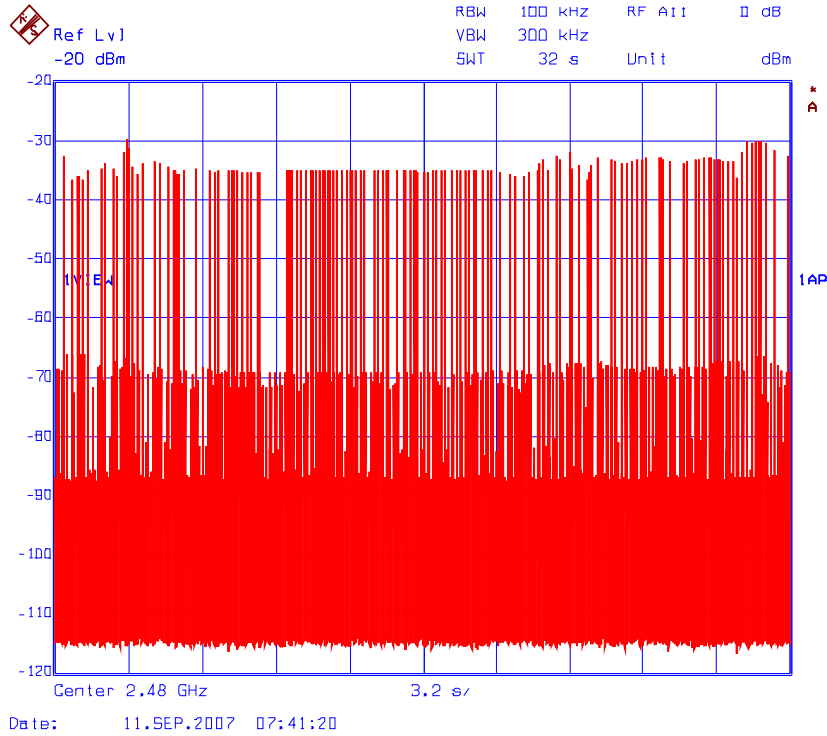
Plot 5.6.5.4.: Time of Occupancy at 2441Hz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)  
 $115 * 450.90\mu s = 51.85ms < 400ms$  within 31.6s ( $0.4s * 79$ )



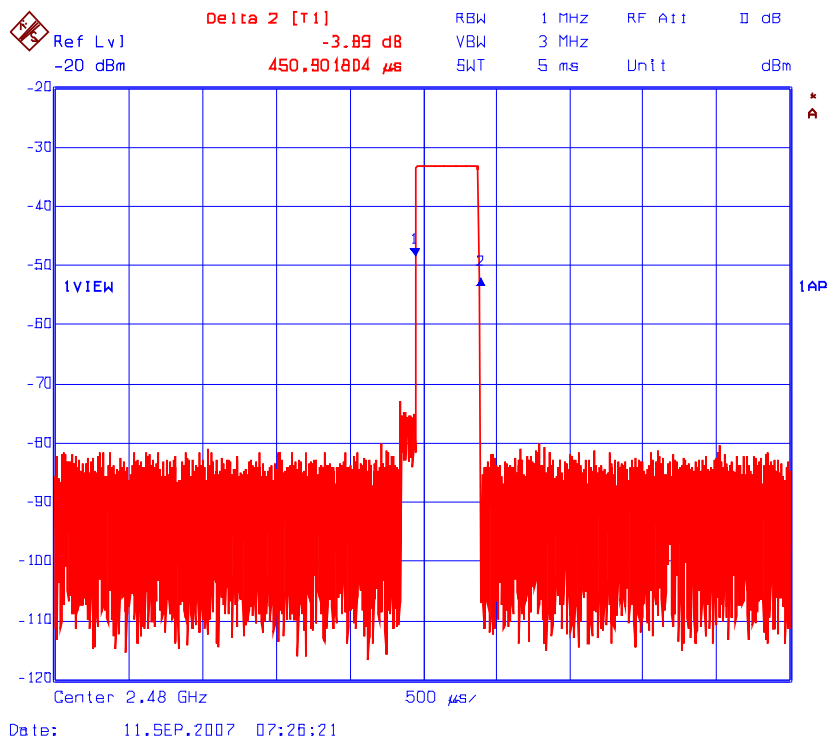
Plot 5.6.5.5.: Time of Occupancy at 2441Hz #2  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



Plot 5.6.5.6.: Time of Occupancy at 2480 MHz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)  
 $115 * 450.90\mu s = 51.85ms < 400ms$  within 31.6s (0.4s \* 79)



Plot 5.6.5.7.: Time of Occupancy at 2480 MHz #2  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



## 5.7 PEAK OUTPUT POWER [§§ 15.247(b)(1)]

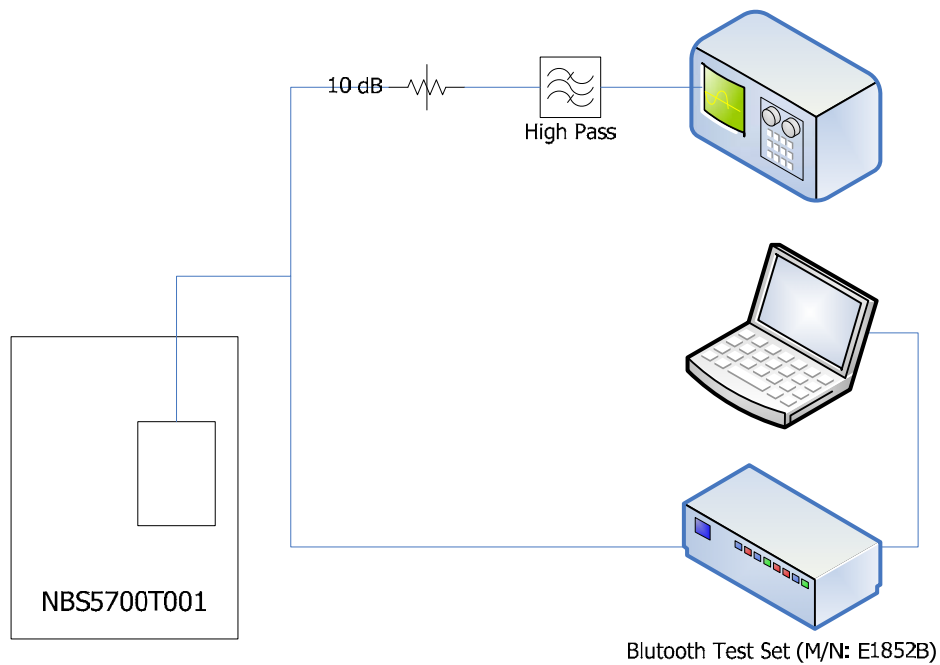
### 5.7.1. Limits

- **FCC 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 watts.

### 5.7.2. Method of Measurements

Refer to FCC Public Notice DA 00-705, KDB Publication No. 558074 and ANSI C63.4 for measurement methods.

### 5.7.3. Test Arrangement



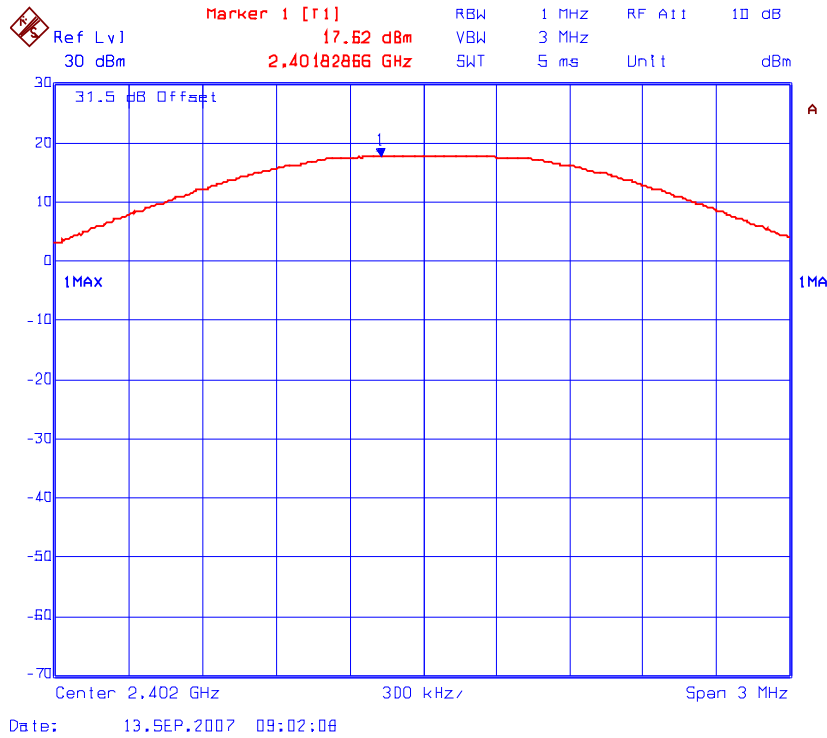
### 5.7.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz
Attenuator	Narda	4768-10	0702	DC – 40 GHz
High Pass Filter	K&L	11SH10-4000	T12000	DC – 26 GHz

5.7.5. Test Data

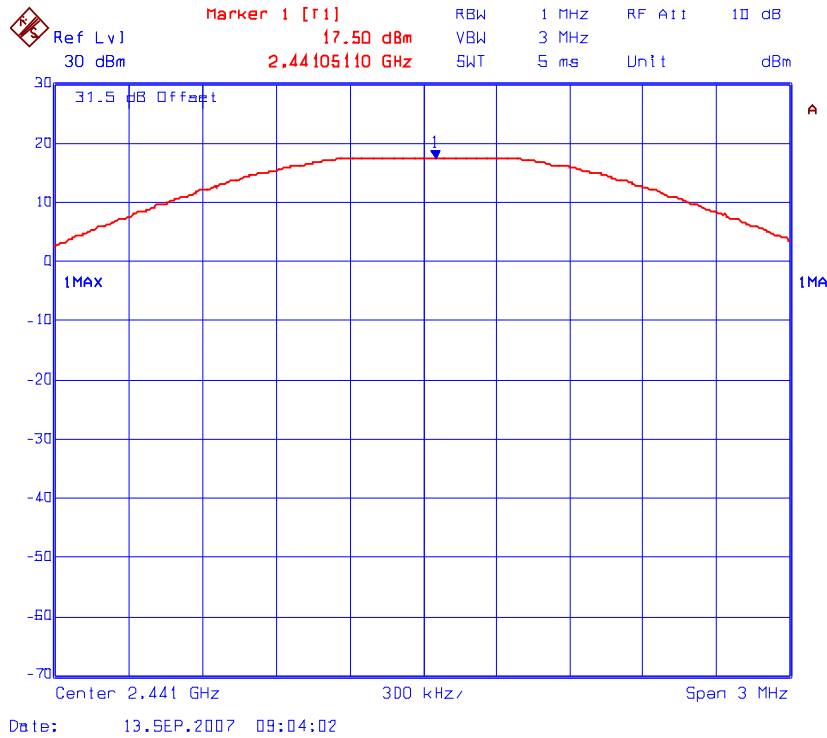
Frequency (MHz)	Peak Output Power Conducted (dBm)	Limit (dBm)	Margin (dB)
2402	17.62	30	-12.38
2441	17.50	30	-12.50
2480	17.33	30	-12.67

Plot 5.7.5.1.: Peak Power Output at 2402 MHz  
 Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)

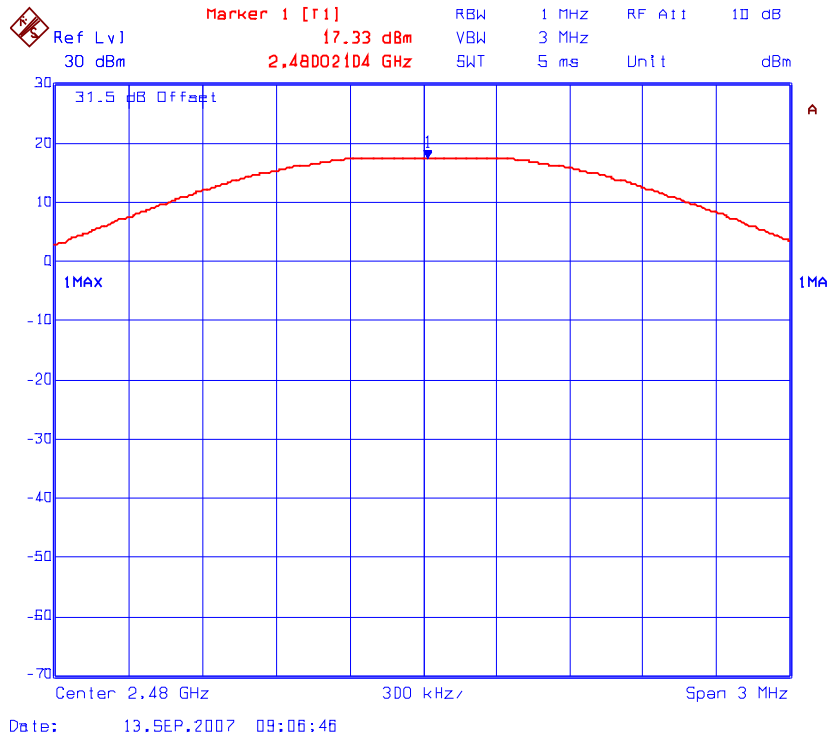




Plot 5.7.5.2.: Peak Power Output at 2441 MHz  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



Plot 5.7.5.3.: Peak Power Output at 2480 MHz  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



**5.8 SPURIOUS RADIATED EMISSIONS @ 3 METERS [§ 15.209 & § 15.247(d)]**

**5.8.1. Limits**

- FCC 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.
- FCC 15.209:** In addition, radiated emissions 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) (see Section 15.205(c)).

**47 CFR 15.205(a) - Restricted Bands of Operation**

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(2)
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

**47 CFR 15.209(a) - Radiated emission limits, general requirements**

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

**5.8.2. Method of Measurements**

Refer to Ultratech Test Procedures, Files # ULTR P002-2004 or ULTR P003-2004 and ANSI C63.4 for measurement methods

**5.8.3. Test Arrangement**

Refer to Section 2.6 of this test report for test setup.

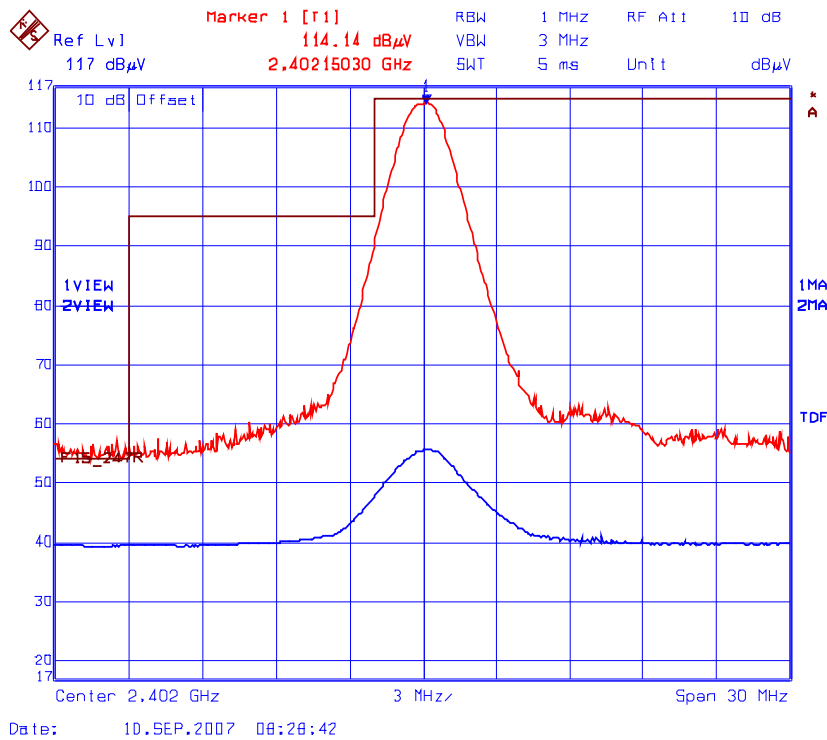
**5.8.4. Test Equipment List**

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz
Amplifier	Hewlett Packard	8449B	3008A00769	1 GHz – 26.5 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Biconilog Antenna	EMCO	3143	1029	20 MHz – 2 GHz

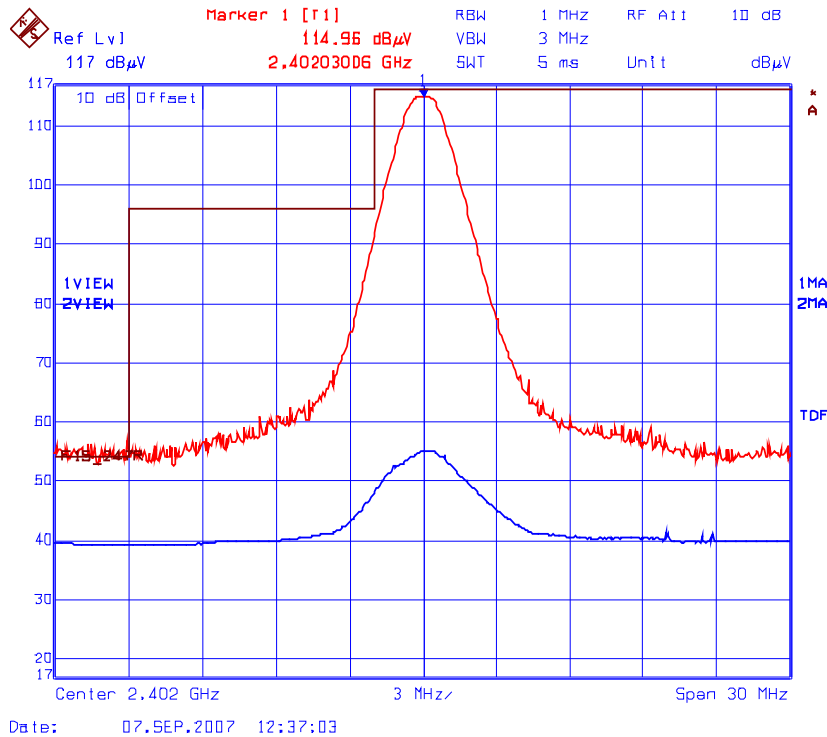
### 5.8.5. Test Data

#### 5.8.5.1. Band-edge Radiated Emissions

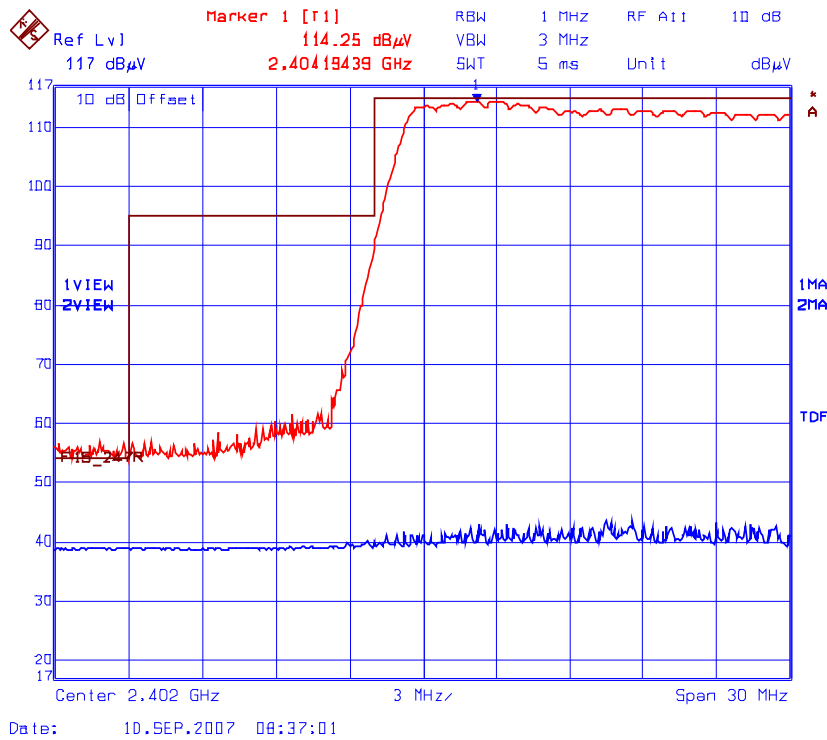
Plot 5.8.5.1.1.: Band-Edge Radiated Emissions @ 3 meters  
2402MHz, Lower Band-Edge Radiated Emissions Vertical Polarization, Continuous  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT lay flat  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)



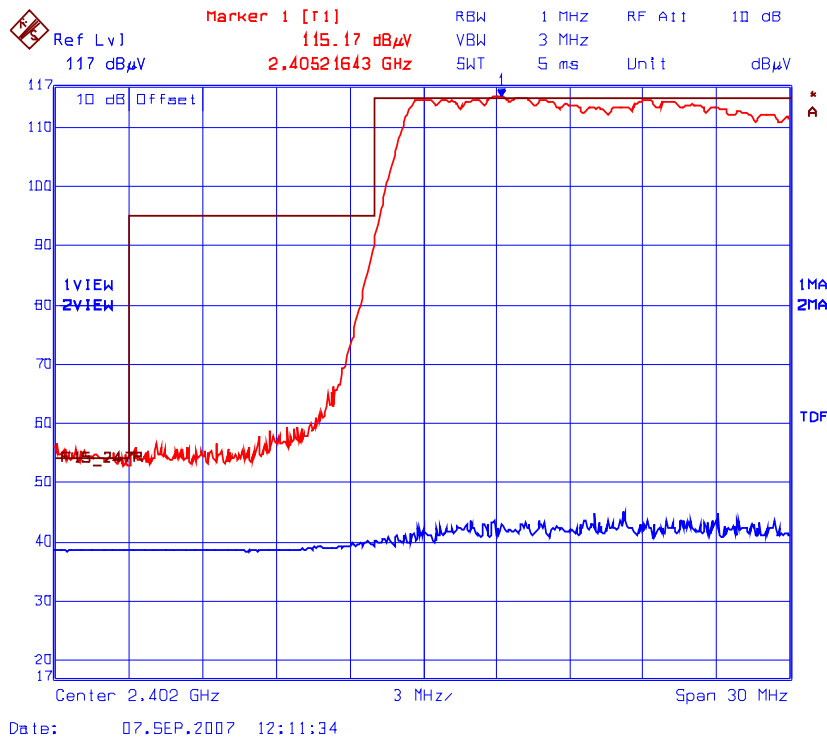
Plot 5.8.5.1.2.: Band-Edge Radiated Emissions @ 3 meters  
2402MHz, Lower Band-Edge Radiated Emissions Horizontal Polarization, Continuous  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT Left side down  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)



Plot 5.8.5.1.3.: Band-Edge Radiated Emissions @ 3 meters,  
2402MHz, Lower Band-Edge Radiated Emissions Vertical Polarization, Hopping  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT lay flat  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)

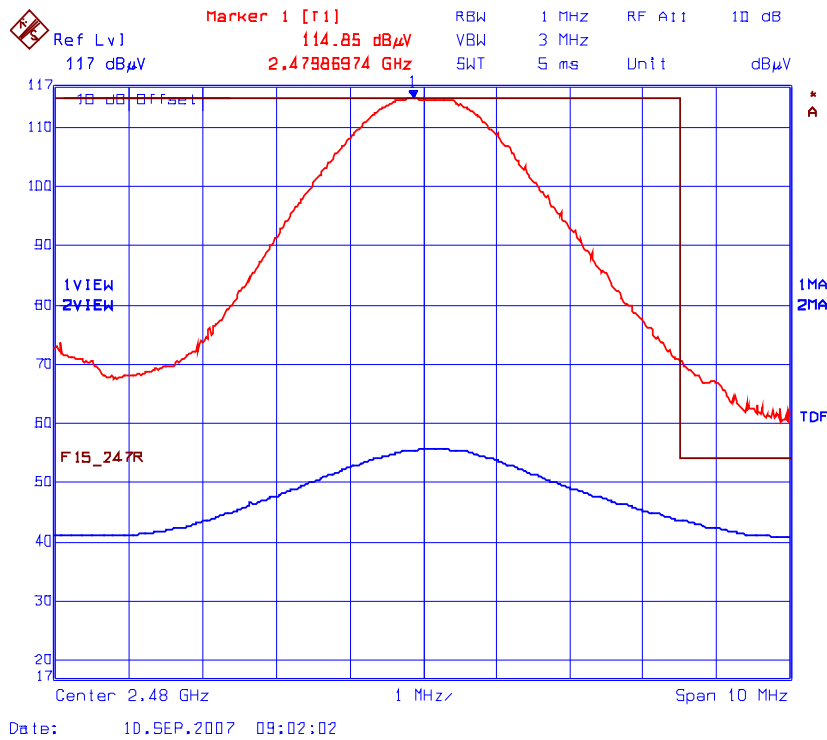


Plot 5.8.5.1.4.: Band-Edge Radiated Emissions @ 3 meters  
2402MHz, Lower Band-Edge Radiated Emissions Horizontal Polarization, Hopping  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT Right side down  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)

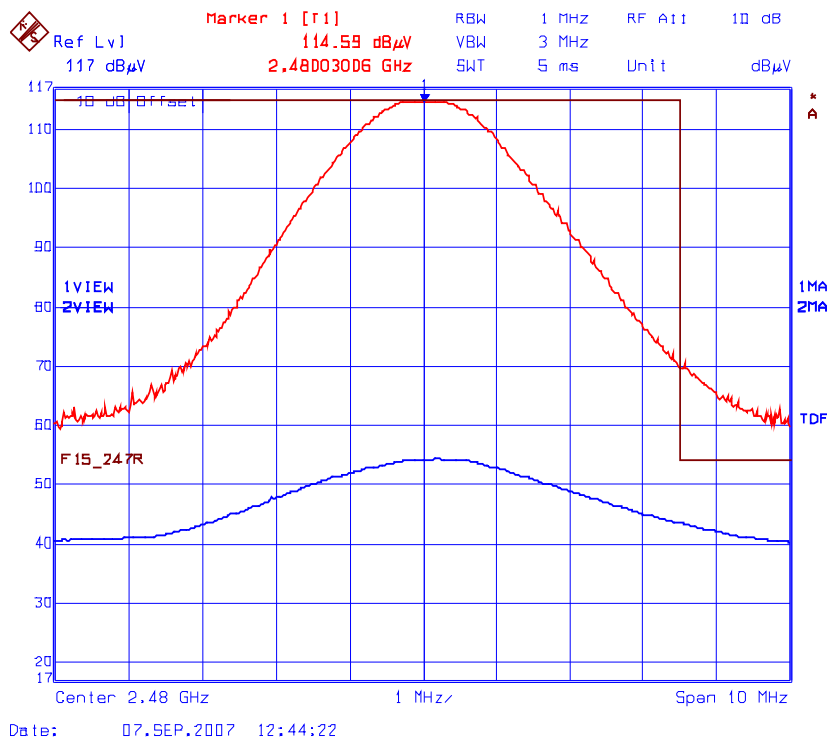




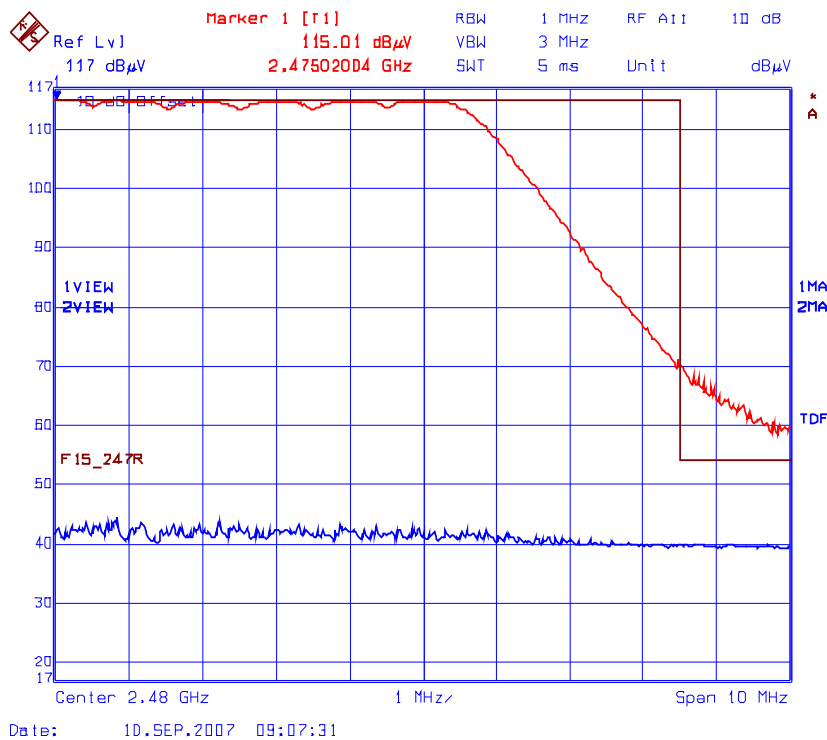
Plot 5.8.5.1.5.: Band-Edge Radiated Emissions @ 3 meters  
2480MHz, Upper Band-Edge Radiated Emissions Vertical Polarization, Continuous  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT lay flat  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)



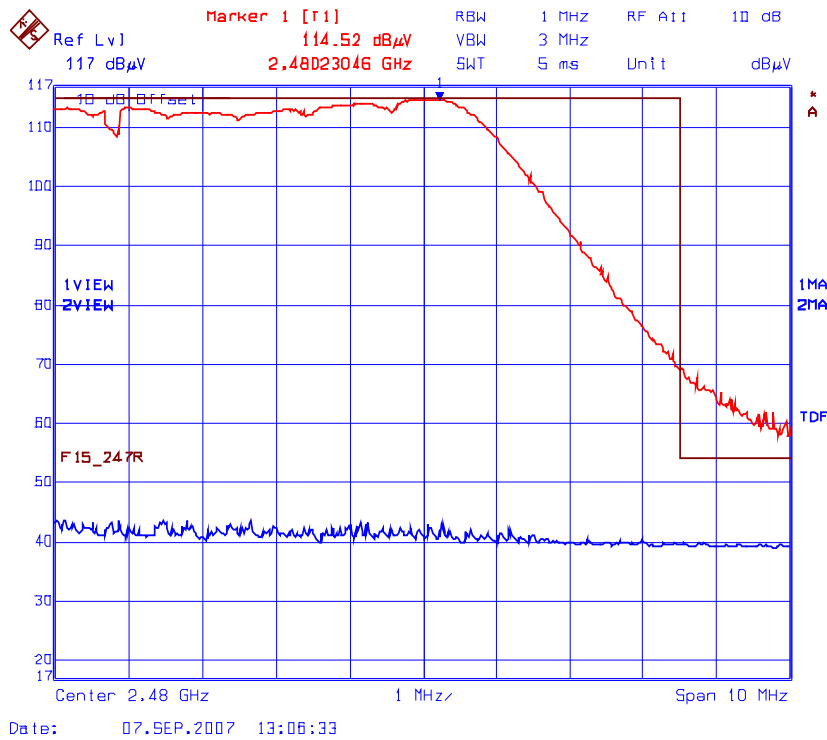
Plot 5.8.5.1.6.: Band-Edge Radiated Emissions @ 3 meters  
2480MHz, Upper Band-Edge Radiated Emissions Horizontal Polarization, Continuous  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT Left side down  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)



Plot 5.8.5.1.7.: Band-Edge Radiated Emissions @ 3 meters  
2480MHz, Upper Band-Edge Radiated Emissions Vertical Polarization, Hopping  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT lay flat  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)



Plot 5.8.5.1.8.: Band-Edge Radiated Emissions @ 3 meters  
2480MHz, Upper Band-Edge Radiated Emissions Horizontal Polarization, Hopping  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo), EUT Left side down  
Trace 1: RBW= 1MHz, VBW= 3MHz (Peak)  
Trace 2: RBW= 1MHz, VBW= 10Hz (Average)



**5.8.5.2. Transmitter Spurious Radiated Emissions**

The emissions were scanned from 30 MHz to 25 GHz; all signals within 20 dB below the permissible limit were recorded in the table below.

Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
<b>Fundamental Frequency: 2402 MHz</b>							
2402	114.25	-	V	-	-	-	-
2402	115.17	-	H	-	-	-	-
4804	57.03	37.29	V	54.0	95.17	-16.71	Pass*
4804	55.23	36.95	H	54.0	95.17	-17.05	Pass*
7206	57.35	38.03	V	54.0	95.17	-57.14	Pass
7206	56.31	38.22	H	54.0	95.17	-56.95	Pass
9608	61.50	42.26	V	54.0	95.17	-52.91	Pass
9608	54.94	40.97	H	54.0	95.17	-54.20	Pass
12010	56.92	42.74	V	54.0	95.17	-11.26	Pass*
12010	56.92	42.06	H	54.0	95.17	-11.94	Pass*
<b>Fundamental Frequency: 2441 MHz</b>							
2441	114.84	-	V	-	-	-	-
2441	114.68	-	H	-	-	-	-
4882	53.34	35.99	V	54.0	94.84	-18.01	Pass*
4882	49.72	35.51	H	54.0	94.84	-18.49	Pass*
7323	57.26	38.35	V	54.0	94.84	-15.65	Pass*
7323	58.08	38.36	H	54.0	94.84	-15.64	Pass*
9764	58.70	42.08	V	54.0	94.84	-52.76	Pass
9764	56.81	41.44	H	54.0	94.84	-53.40	Pass
12205	57.41	42.69	V	54.0	94.84	-11.31	Pass*
12205	57.05	42.12	H	54.0	94.84	-11.88	Pass*
<b>Fundamental Frequency: 2480 MHz</b>							
2480	115.01	-	V	-	-	-	-
2480	114.59	-	H	-	-	-	-
4960	58.70	37.73	V	54.0	95.01	-16.27	Pass*
4960	55.37	37.37	H	54.0	95.01	-16.63	Pass*
7440	59.25	39.07	V	54.0	95.01	-14.93	Pass*
7440	58.92	39.10	H	54.0	95.01	-14.90	Pass*
9920	60.62	42.98	V	54.0	95.01	-52.03	Pass
9920	59.68	42.63	H	54.0	95.01	-52.38	Pass
12400	57.72	42.56	V	54.0	95.01	-11.44	Pass*
12400	57.41	42.20	H	54.0	95.01	-11.80	Pass*

\* Emission in restricted bands.

## 5.9 SPURIOUS CONDUCTED EMISSIONS [§ 15.247(d)]

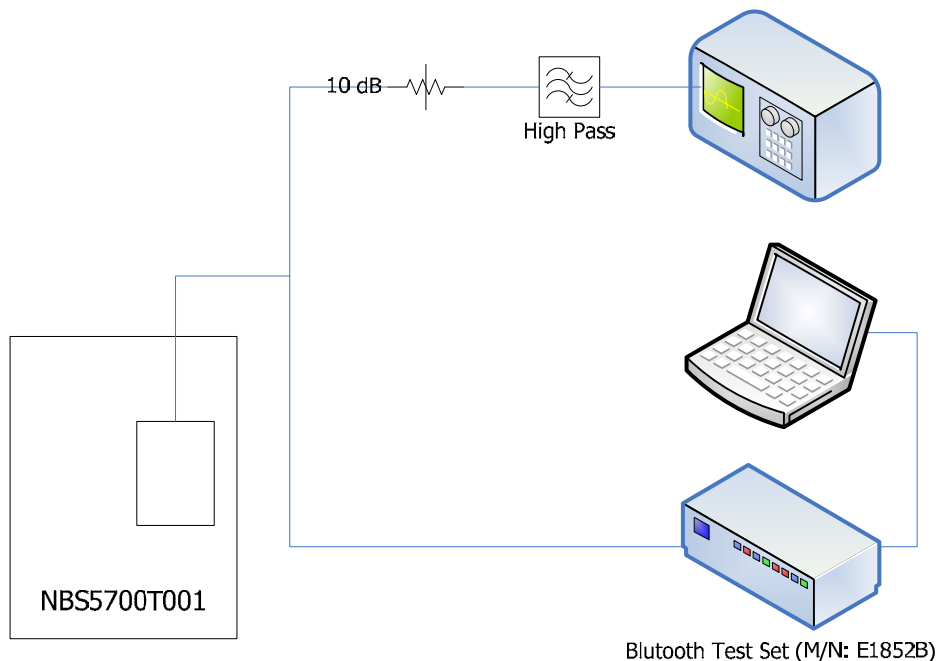
### 5.9.1. Limits

- FCC 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.

### 5.9.2. Method of Measurements

KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247), using Alternative Test Procedures.

### 5.9.3. Test Arrangement



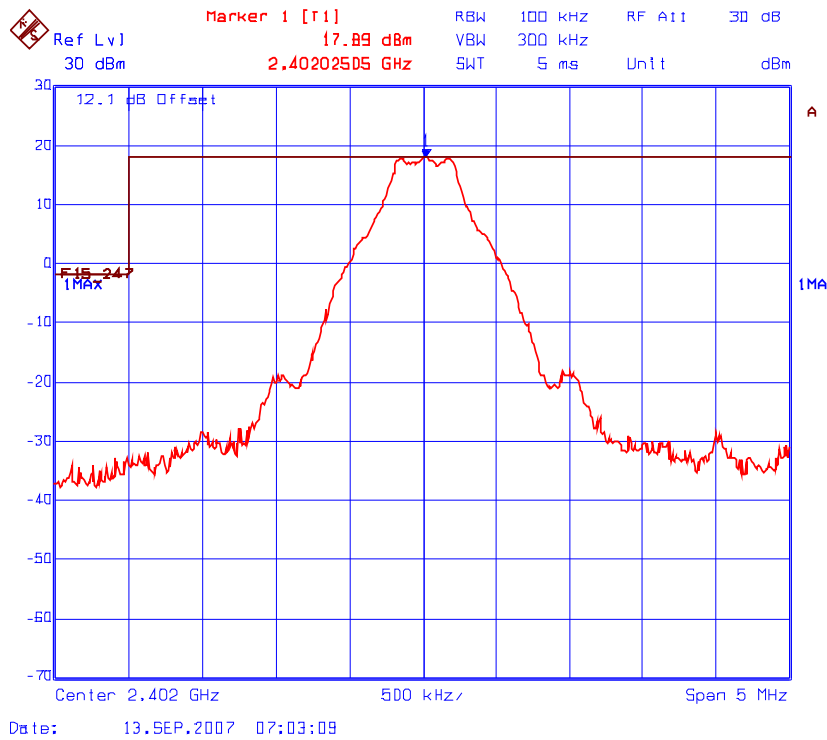
### 5.9.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz
Attenuator	Narda	4768-10	0702	DC – 40 GHz
High Pass Filter	K&L	11SH10-4000	T12000	DC – 26 GHz

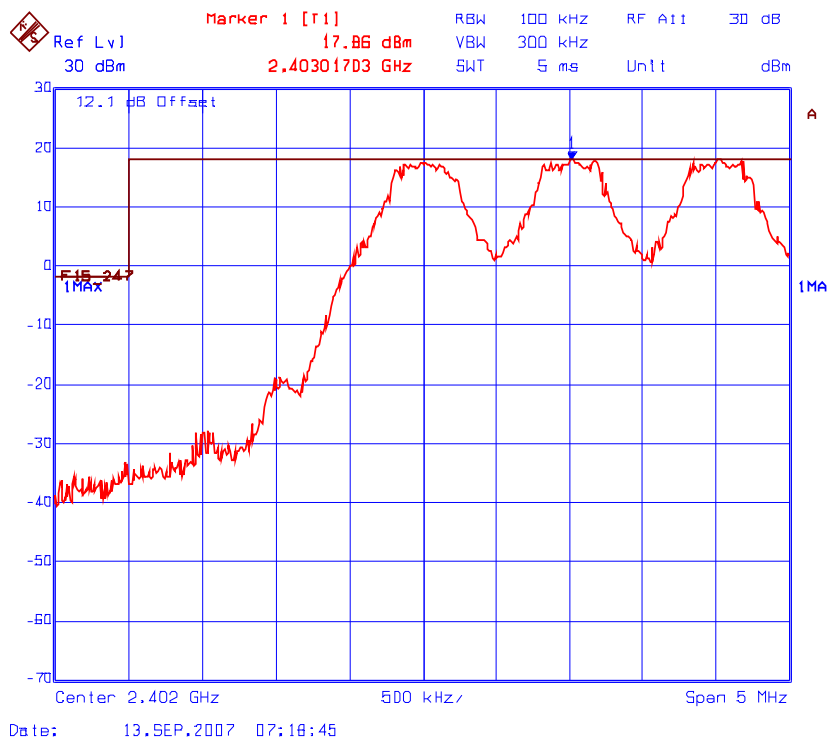
### 5.9.5. Test Data

#### 5.9.5.1. Band-edge Conducted Emissions

Plot 5.9.5.1.1.: Band-Edge Conducted Emissions  
2402MHz, Lower Band-Edge Conducted Emissions, Continuous  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)

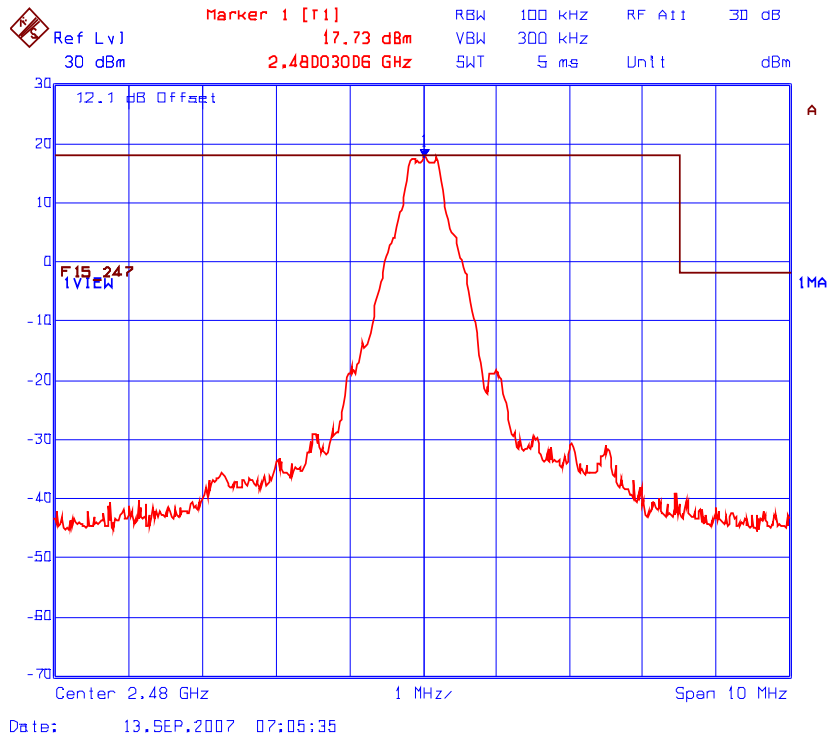


Plot 5.9.5.1.2.: Band-Edge Conducted Emissions  
2402MHz, Lower Band-Edge Conducted Emissions, Hopping  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)

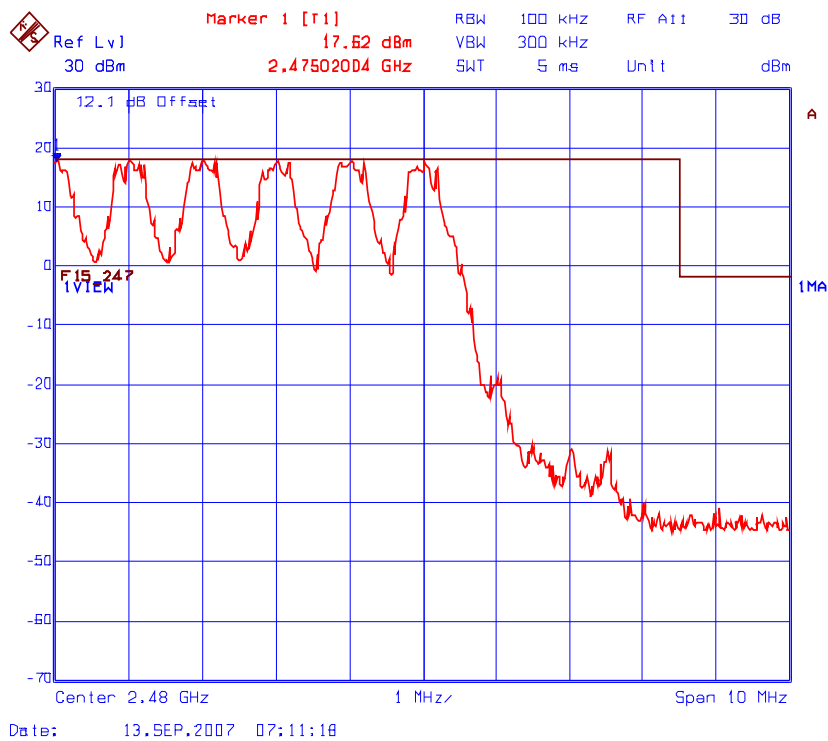




Plot 5.9.5.1.3.: Band-Edge Conducted Emissions  
2480MHz, Upper Band-Edge Conducted Emissions, Continuous  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



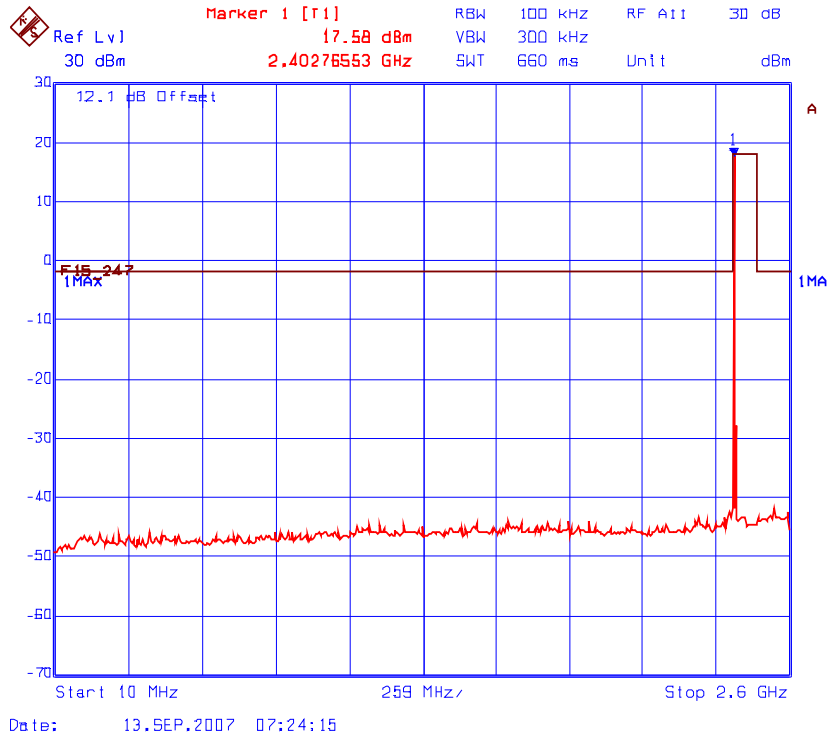
Plot 5.9.5.1.4.: Band-Edge Conducted Emissions  
2480MHz, Upper Band-Edge Conducted Emissions, Hopping  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



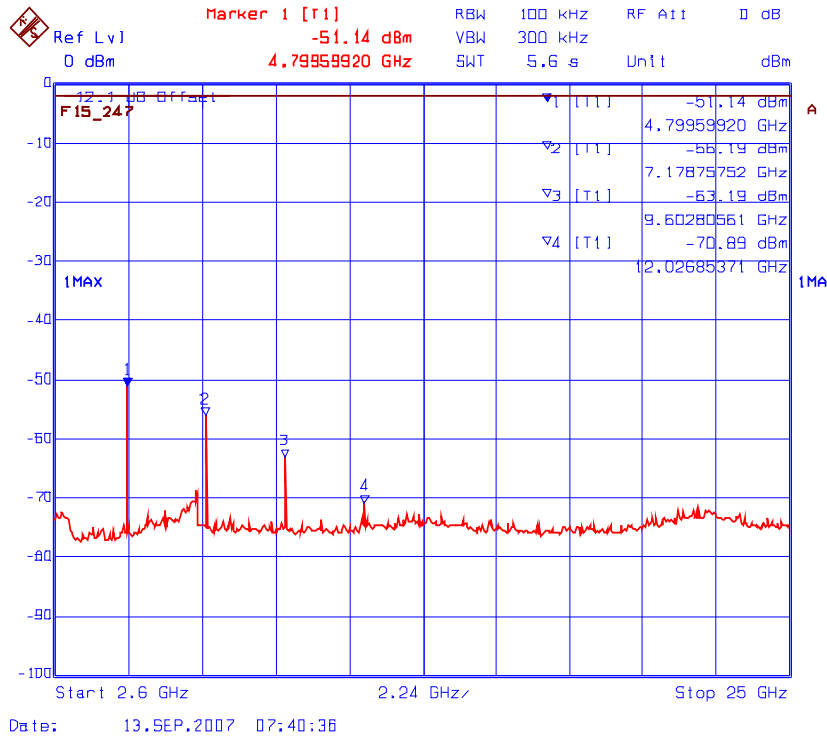
### 5.9.5.2. Transmitter Spurious Conducted Emissions

The emissions were scanned from 10 MHz to 25 GHz; all signals within 20 dB below the permissible limit were recorded in the table.

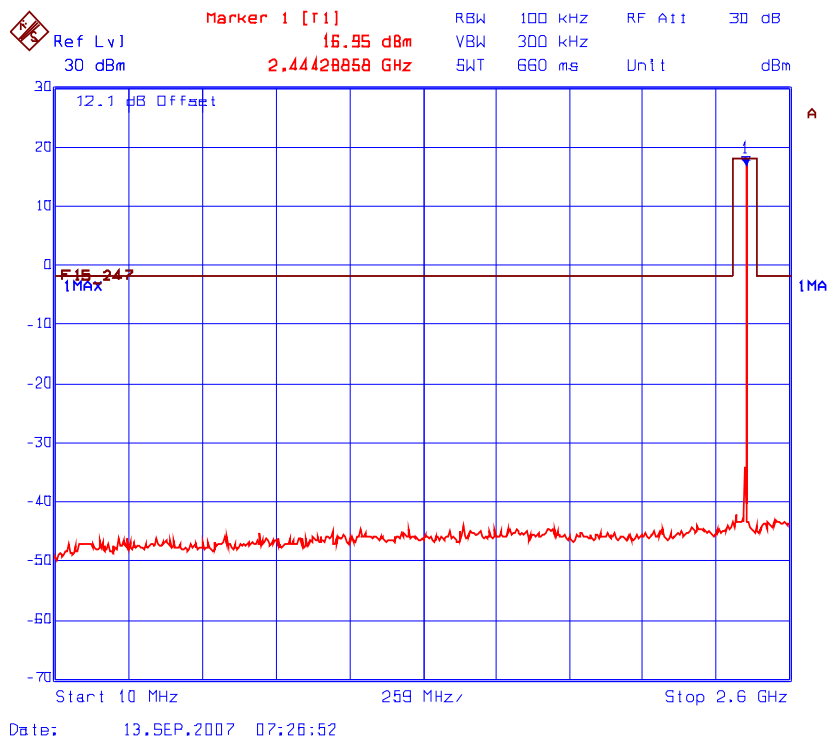
Plot 5.9.5.2.1.: Spurious Conducted Emissions at 2402 MHz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



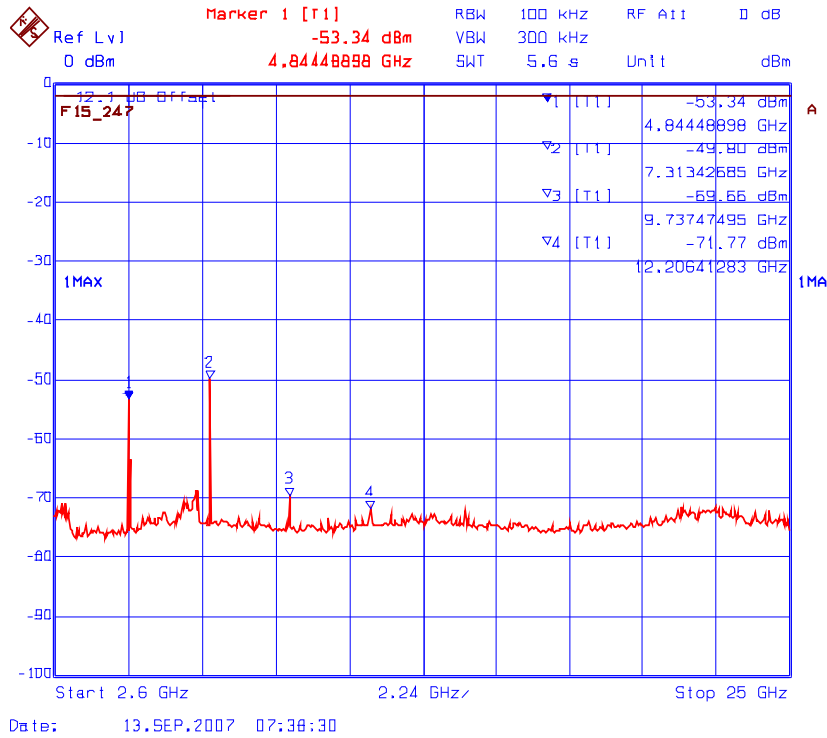
Plot 5.9.5.2.2.: Spurious Conducted Emissions at 2402 MHz #1  
 Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



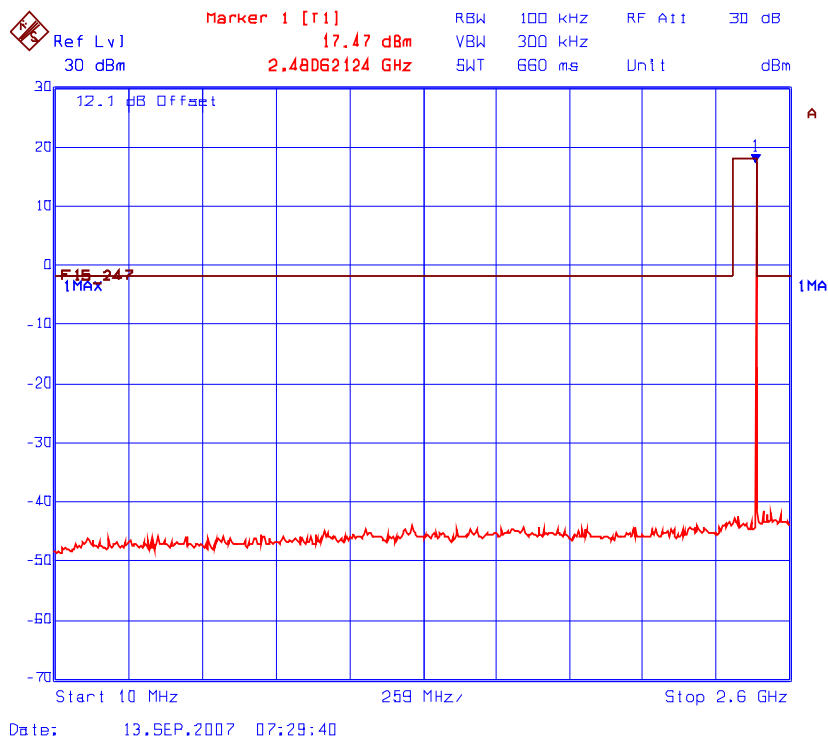
Plot 5.9.5.2.3.: Spurious Conducted Emissions at 2441 MHz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



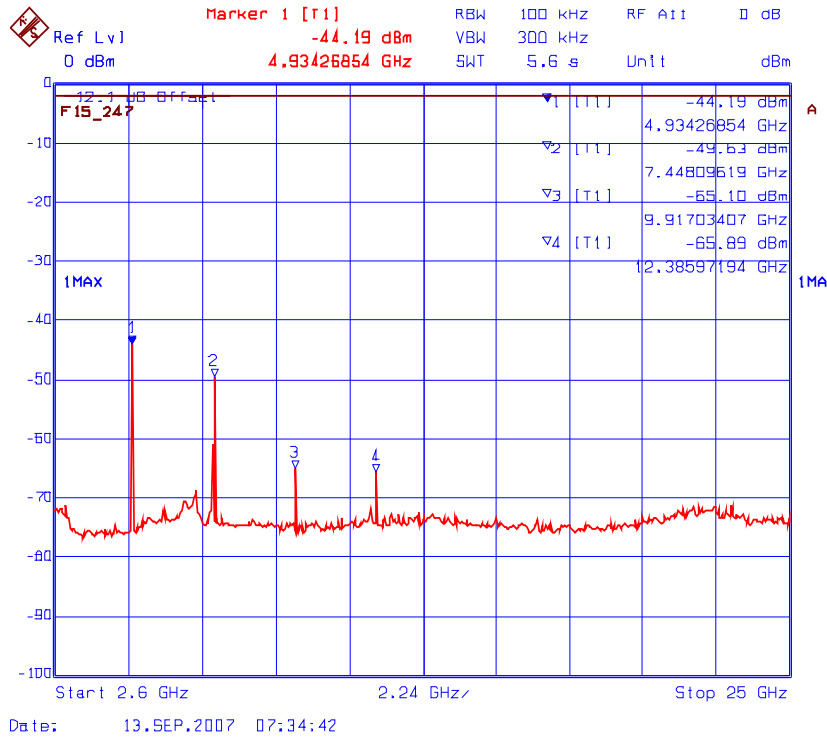
Plot 5.9.5.2.4.: Spurious Conducted Emissions at 2441 MHz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



Plot 5.9.5.2.5.: Spurious Conducted Emissions at 2480 MHz #1  
Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)



Plot 5.9.5.2.6.: Spurious Conducted Emissions at 2480 MHz #1  
 Packet Type: DH1, Random Modulation: SPSR (Static Pseudo)





## EXHIBIT 6 MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994)

### 6.1 LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Line Conducted)	PROBABILITY DISTRIBUTION	UNCERTAINTY (dB)	
		9-150 kHz	0.15-30 MHz
EMI Receiver specification	Rectangular	$\pm 1.5$	$\pm 1.5$
LISN coupling specification	Rectangular	$\pm 1.5$	$\pm 1.5$
Cable and Input Transient Limiter calibration	Normal (k=2)	$\pm 0.3$	$\pm 0.5$
Mismatch: Receiver VRC $\Gamma_1 = 0.03$ LISN VRC $\Gamma_R = 0.8(9 \text{ kHz}) 0.2 (30 \text{ MHz})$ Uncertainty limits $20\text{Log}(1 \pm \Gamma_1 \Gamma_R)$	U-Shaped	$\pm 0.2$	$\pm 0.3$
System repeatability	Std. deviation	$\pm 0.2$	$\pm 0.05$
Repeatability of EUT	--	--	--
Combined standard uncertainty	Normal	$\pm 1.25$	$\pm 1.30$
Expanded uncertainty U	Normal (k=2)	$\pm 2.50$	$\pm 2.60$

Sample Calculation for Measurement Accuracy in 450 kHz to 30 MHz Band:

$$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)} = \pm \sqrt{(1.5^2 + 1.5^2)/3 + (0.5/2)^2 + (0.05/2)^2 + 0.35^2} = \pm 1.30 \text{ dB}$$

$$U = 2u_c(y) = \pm 2.6 \text{ dB}$$

## 6.2 RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (+ dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	$\pm 1.0$	$\pm 1.0$
Cable Loss Calibration	Normal (k=2)	$\pm 0.3$	$\pm 0.5$
EMI Receiver specification	Rectangular	$\pm 1.5$	$\pm 1.5$
Antenna Directivity	Rectangular	+0.5	+0.5
Antenna factor variation with height	Rectangular	$\pm 2.0$	$\pm 0.5$
Antenna phase center variation	Rectangular	0.0	$\pm 0.2$
Antenna factor frequency interpolation	Rectangular	$\pm 0.25$	$\pm 0.25$
Measurement distance variation	Rectangular	$\pm 0.6$	$\pm 0.4$
Site imperfections	Rectangular	$\pm 2.0$	$\pm 2.0$
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67(Bi) 0.3 (Lp)$ Uncertainty limits $20\text{Log}(1 \pm \Gamma_1 \Gamma_R)$	U-Shaped	+1.1 -1.25	$\pm 0.5$
System repeatability	Std. Deviation	$\pm 0.5$	$\pm 0.5$
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k = 2 is used:

$$U = 2u_c(y) = 2x(+2.19) = +4.38 \text{ dB} \quad \text{And} \quad U = 2u_c(y) = 2x(-2.21) = -4.42 \text{ dB}$$