

**FCC PART 15 SUBPART C TEST REPORT**

**For**

**Handheld Computer**

**Model No.: DB7**

**FCC ID: IR5DB7**

of

Applicant: MilDef Crete Inc.

Address: 7F, No.250, Sec.3, Pei Shen Rd., Shen Keng District,  
New Taipei City Taiwan R.O.C.

Tested and Prepared

by

**Worldwide Testing Services (Taiwan) Co., Ltd.**

**FCC Registration No.: 930600**

**Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-1**

**A2LA Accredited No.: 2732.01**



**Report No.: W6M21411-14649-C-1**

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.  
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: [wts@wts-lab.com](mailto:wts@wts-lab.com)



## TABLE OF CONTENTS

<b>1</b>	<b>GENERAL INFORMATION</b>	<b>2</b>
1.1	NOTES	2
1.2	TESTING LABORATORY	3
1.2.1	<i>Location</i>	3
1.2.2	<i>Details of accreditation status</i>	3
1.3	DETAILS OF APPROVAL HOLDER	3
1.4	APPLICATION DETAILS	4
1.5	GENERAL INFORMATION OF TEST ITEM	4
1.6	TEST STANDARDS	7
<b>2</b>	<b>TECHNICAL TEST</b>	<b>8</b>
2.1	SUMMARY OF TEST RESULTS	8
2.2	TEST ENVIRONMENT	8
2.3	TEST EQUIPMENT LIST	9
2.4	GENERAL TEST PROCEDURE	11
<b>3</b>	<b>TEST RESULTS (ENCLOSURE)</b>	<b>13</b>
3.1	PEAK OUTPUT POWER (TRANSMITTER)	14
3.2	RF EXPOSURE COMPLIANCE REQUIREMENTS	32
3.3	TRANSMITTER RADIATED EMISSIONS IN RESTRICTED BANDS	33
3.4	SPURIOUS EMISSIONS (TX)	34
3.5	CARRIER FREQUENCY SEPARATION	37
3.6	NUMBER OF HOPPING FREQUENCIES	40
3.6.1	<i>Pseudorandom Frequency Hopping Sequence</i>	42
3.6.2	<i>Coordination of hopping sequences to other transmitters</i>	42
3.6.3	<i>System Receiver Hopping Capability</i>	42
3.7	TIME OF OCCUPANCY (DWELL TIME)	43
3.8	20DB BANDWIDTH	49
3.8.1	<i>System Receiver Input Bandwidth</i>	52
3.9	MINIMUM 6 DB BANDWIDTH	53
3.10	RADIATED EMISSION ON THE BAND EDGE	68
3.11	PEAK POWER SPECTRAL DENSITY	82
3.12	RADIATED EMISSION FROM DIGITAL PART	97
3.13	POWER LINE CONDUCTED EMISSION	98
	APPENDIX	100



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## 1 General Information

### 1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

#### Specific Conditions:

Usage of the hereunder tested device in combination with other integrated or external antennas requires at least additional output power measurements, spurious emission measurements, conducted emission measurements (AC supply lines) and radio frequency exposure evaluations for each individual configuration performed, for certification by FCC.

#### **Tester:**

March 19, 2015

Mark Cheng

Date

WTS-Lab.

Name

Signature

#### **Technical responsibility for area of testing:**

March 19, 2015

Kevin Wang

Date

WTS

Name

Signature



Registration number: W6M21411-14649-C-1

FCC ID: IR5DB7

## **1.2 Testing laboratory**

### **1.2.1 Location**

OATS

No.5-1, Lishui, Shuang Sing Village,

Wanli Dist., New Taipei City 207,

Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

TEL:886-2-6613-0228

FAX:886-2-2791-5046

Company

Worldwide Testing Services(Taiwan) Co., Ltd.

6F, NO. 58, LANE 188, RUEY-KUANG RD.

NEIHU, TAIPEI 114, TAIWAN R.O.C.

Tel : 886-2-66068877

Fax : 886-2-66068879

### **1.2.2 Details of accreditation status**

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-1



**Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :**

Name: ./.

Accredited number: ./.

Street: ./.

Town: ./.

Country: ./.

Telephone: ./.

Fax: ./.

## **1.3 Details of approval holder**

Name: MilDef Crete Inc.

Street: 7F, No.250, Sec.3, Pei Shen Rd., Shen Keng District,

Town: New Taipei City

Country: Taiwan R.O.C.

Telephone: +886-2-2662-6074

Fax: +886-2-2662-6079



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## **1.4 Application details**

Date of receipt of test item: February 03, 2015  
Date of test: from February 03, 2015 to March 19, 2015

## **1.5 General information of Test item**

Type of test item: Handheld Computer  
Model Number: DB7  
Brand Name: ./.  
Multi-listing model number: ./.  
Photos: see Appendix

### **Technical data**

Frequency band: 2.4 GHz – 2.4835 GHz

#### **802.11b, g, n 20MHz**

Frequency ( ch 1): 2.412 GHz  
Frequency ( ch 6): 2.437 GHz  
Frequency ( ch 11): 2.462 GHz

#### **802.11n 40MHz**

Frequency ( ch 1): 2.422 GHz  
Frequency ( ch 4): 2.437 GHz  
Frequency ( ch 7): 2.452 GHz

#### **Bluetooth Normal, EDR**

Frequency ( ch 0): 2.402 GHz  
Frequency ( ch 39): 2.441 GHz  
Frequency ( ch 78): 2.480 GHz

#### **Bluetooth Low Energy**

Frequency ( ch 0): 2.402 GHz  
Frequency ( ch 19): 2.440 GHz  
Frequency ( ch 39): 2.480 GHz



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

Number of Channels: 11b, 11g, 11n 20MHz: 11 channels, 11n 40MHz: 7 channels  
Bluetooth: 79 channels(normal & EDR), 40channels(LE)

Operation modes: duplex

Modulation Type: DSSS/OFDM、GFSK、 $\pi/4$ DQPSK、8DPSK

Fixed point-to-point operation:  Yes /  No

Type of Antenna: PIFA antenna

Antenna gain: BT:2.56 dBi, WiFi: 2.58 dBi (Antenna A), 2.56 dBi (Antenna B)

Directional gain: 5.58 dBi

Power supply: Adaptor: (I/P: 100-240Vac, 1.5A, 50-60Hz  
O/P: 12V, 3.0A)  
Battery: 7.4V, 3900mAH, 29Wh  
DC 12-32V

Emission designator: 802.11b: DSSS: 15M8G1D  
802.11g: OFDM: 17M4D1D  
802.11n 20MHz: OFDM: 18M0D1D  
802.11n 40MHz: OFDM: 37M6D1D

Bluetooth (Normal): 968KF1D  
Bluetooth (EDR): 1M29G1D  
Bluetooth (Low Energy): 1M35G1D

Host device: none

Classification :

Fixed Device	<input type="checkbox"/>
Mobile Device (Human Body distance > 20cm)	<input type="checkbox"/>
Portable Device (Human Body distance < 20cm)	<input checked="" type="checkbox"/>
Modular Radio Device	<input type="checkbox"/>



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7

## Transmitter

## Unom

### **Antenna A**

#### **Mode A (802.11b)**

Power ( ch 1 or A): Conducted: 15.65 dBm  
 Power ( ch 6 or B): Conducted: 16.37 dBm  
 Power ( ch 11 or C): Conducted: 16.30 dBm

#### **Mode B (802.11g)**

Power ( ch 1 or A): Conducted: 18.56 dBm  
 Power ( ch 6 or B): Conducted: 21.49 dBm  
 Power ( ch 11 or C): Conducted: 18.62 dBm

#### **Mode C (802.11n 20 MHz)**

Power ( ch 1 or A): Conducted: 18.87 dBm  
 Power ( ch 6 or B): Conducted: 22.07 dBm  
 Power ( ch 11 or C): Conducted: 18.58 dBm

#### **Mode D (802.11n 40 MHz)**

Power ( ch 1 or A): Conducted: 18.10 dBm  
 Power ( ch 4 or B): Conducted: 20.55 dBm  
 Power ( ch 7 or C): Conducted: 21.59 dBm

### **Antenna B**

#### **Mode E (802.11b)**

Power ( ch 1 or A): Conducted: 16.30 dBm  
 Power ( ch 6 or B): Conducted: 16.10 dBm  
 Power ( ch 11 or C): Conducted: 15.79 dBm

#### **Mode F (802.11g)**

Power ( ch 1 or A): Conducted: 17.77 dBm  
 Power ( ch 6 or B): Conducted: 22.38 dBm  
 Power ( ch 11 or C): Conducted: 18.15 dBm

#### **Mode G (802.11n 20 MHz)**

Power ( ch 1 or A): Conducted: 17.81 dBm  
 Power ( ch 6 or B): Conducted: 22.13 dBm  
 Power ( ch 11 or C): Conducted: 18.17 dBm

#### **Mode H (802.11n 40 MHz)**

Power ( ch 1 or A): Conducted: 17.38 dBm  
 Power ( ch 4 or B): Conducted: 21.34 dBm  
 Power ( ch 7 or C): Conducted: 21.55 dBm

Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	137.48	324.37	137.72	21.38	25.11	21.39
802.11n 40MHz	119.27	249.64	287.1	20.77	23.97	24.58



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

### **Mode I (Bluetooth Normal mode)**

Power ( ch 0 or A):	Conducted: 5.70 dBm
Power ( ch 39 or B):	Conducted: 5.74 dBm
Power ( ch 78 or C):	Conducted: 6.34 dBm

### **Mode J (Bluetooth EDR mode)**

Power ( ch 0 or A):	Conducted: 4.16 dBm
Power ( ch 39 or B):	Conducted: 4.73 dBm
Power ( ch 78 or C):	Conducted: 5.54 dBm

### **Mode K (Bluetooth Low energy)**

Power ( ch 0 or A):	Conducted: 5.92 dBm
Power ( ch 39 or B):	Conducted: 5.89 dBm
Power ( ch 78 or C):	Conducted: 6.49 dBm

### **Manufacturer: (if applicable)**

Name:	./.
Street:	./.
Town:	./.
Country:	./.

## **1.6 Test standards**

Technical standard : FCC RULES PART 15 SUBPART C § 15.247 (2013-10)





Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## **2 Technical test**

### **2.1 Summary of test results**

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

**or**

The deviations as specified in 2.5 were ascertained in the course of the tests performed.

### **2.2 Test environment**

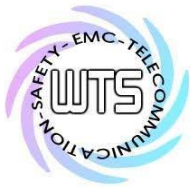
Temperature: 23 °C

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Power supply: Adaptor: (I/P: 100-240Vac, 1.5A, 50-60Hz  
O/P: 12V, 3.0A)  
Battery: 7.4V, 3900mAH, 29Wh  
DC 12-32V

Extreme conditions parameters: ./.



Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7

## 2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2014/9/2	2015/9/1
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 008	HF-EICHLITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2014/7/8	2015/7/7
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2014/10/13	2015/10/12
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2014/9/2	2015/9/1
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2014/9/2	2015/9/1
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2014/10/15	2015/10/14
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2014/7/01	2015/6/30
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2015/3/2	2016/3/1
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2015/2/17	2016/2/16
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2015/3/2	2016/3/1
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2015/3/2	2016/3/1
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2015/3/2	2016/3/1
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2014/6/05	2015/6/04
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2015/3/2	2016/3/1
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2014/11/26	2015/11/25
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2014/10/9	2015/10/8
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2014/9/22	2015/9/21
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2015/3/2	2016/3/1
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2014/11/7	2015/11/6
ETSTW-RE 111	TRILOG Super Broadband test Antenna	VULB 9160	9160-3309	Schwarz beck	2014/12/5	2015/12/4
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	None	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2015/1/7	2016/1/6
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2014/6/11	2015/6/10
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2014/8/12	2015/8/11



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

ETSTW-RE 126	5GHz Notch filter	5NSL11-5800/E221.3-O/O	1	K&L Microwave	2014/8/12	2015/8/11
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2015/3/2	2016/3/1
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2014/8/12	2015/8/11
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2014/8/12	2015/8/11
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2014/10/20	2015/10/19
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2015/1/7	2016/1/6
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2015/1/7	2016/1/6
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2015/1/7	2016/1/6
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2015/1/7	2016/1/6
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2014/9/17	2015/9/16
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2014/10/15	2015/10/14
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	Pre-test Use NCR	
ETSTW-Cable 012	N TYPE To SMA Cable	Cable 012	None	JYE BAO CO.,LTD.	2014/10/15	2015/10/14
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2015/2/25	2016/2/24
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2015/2/25	2016/2/24
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2015/2/25	2016/2/24
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2015/2/25	2016/2/24
ETSTW-Cable 022	N TYPE Cable	5006	0002	JYE BAO CO.,LTD.	2015/2/17	2016/2/16
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2015/3/2	2016/3/1
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2015/3/2	2016/3/1
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2015/1/16	2016/1/15
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2014/9/22	2015/9/21
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S Cable 9)	279067	HUBER+SUHNER	2015/3/2	2016/3/1
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 (S Cable 10)	238092	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 048	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 053	N TYPE To SMA Cable	RG142	None	JYE BAO CO.,LTD.	2015/2/17	2016/2/16
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2015/2/17	2016/2/16
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMG	None	Farad	Version ETS-03A1	



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## **2.4 General Test Procedure**

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.4-2009 5.2 using a 50 $\mu$ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**RADIATION INTERFERENCE:** The test procedure used was according to ANSI STANDARD C63.4-2009 6.4 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB $\mu$ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dB $\mu$ V + 10.36 dB + 6 dB = 36.36 dB $\mu$ V/m @3m

The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table) and arranged according to ANSI C63.4-2009 6.3.1. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

- (1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
- (3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
- (4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.

Measurements were made by Worldwide Testing Services(Taiwan) Co., Ltd. at the registered open field test site located at No.5-1, Lishui, Shuang Sing Village, Wanli Dist., New Taipei City 207, Taiwan (R.O.C.). The Registration Number: 930600.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

The formula is as follows:

Average = Peak + Duty Factor

Duty Factor =  $20 \log(\text{dwell time}/T)$

T = 100ms when the pulse train period is over 100 ms or the period of the pulse train.

Modified Limits for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

ANSI STANDARD C63.4-2009 10.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software 'EZ EMC' was used for setting up different operation modes.



Registration number: W6M21411-14649-C-1

FCC ID: IR5DB7

### 3 Test results (enclosure)

TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.247(b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Equivalent isotropically radiated Power	15.247(b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Transmitter operating	15.247(c)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions conducted – Transmitter operating	15.247	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carrier Frequency Separation	15.247(a) (1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Number of Hopping Frequencies	15.247(a) (1)(i)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Time of Occupancy (Dwell Time)	15.247(a) (1)(i)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20 dB Bandwidth	15.247(a) (1)(i)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimum 6 dB Bandwidth	15.247(a)(2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Band-edge Compliance of RF Emission	15.247(d)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Peak Power Spectral Density	15.247(e)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission from Digital Part	15.109	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission	15.207(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### Note:

1. This EUT incorporates a MIMO function with IEEE 802.11b, 802.11g, and 802.11n. Physically, this EUT includes two transmitters and two receivers with two incoherent streams. This device uses multiplexing and also employ cyclic delay diversity to improve range and throughput, and this device simultaneously operates on two adjacent channels.
2. This EUT is 2\*2 spatial MIMO (2Tx&2Rx) without beam forming function. That operates dual chain configuration. The Pre-test was performed to determine the worst case mode from all possible combinations between all available modulations, data rates, bandwidths, and spatial stream modes.
3. The detail of chosen mode for full testing are as below:

Mode	Available channel	Chosen Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1,6,11	DSSS	DBPSK, DQPSK, CCK	1
802.11g	1 to 11	1,6,11	OFDM	BPSK, QPSK, 16QAM, 64QAM	6
802.11n (20MHz)	1 to 11	1,6,11	OFDM	BPSK, QPSK, 16QAM, 64QAM	6.5
802.11n (40MHz)	1 to 7	1,4,7	OFDM	BPSK, QPSK, 16QAM, 64QAM	13.5



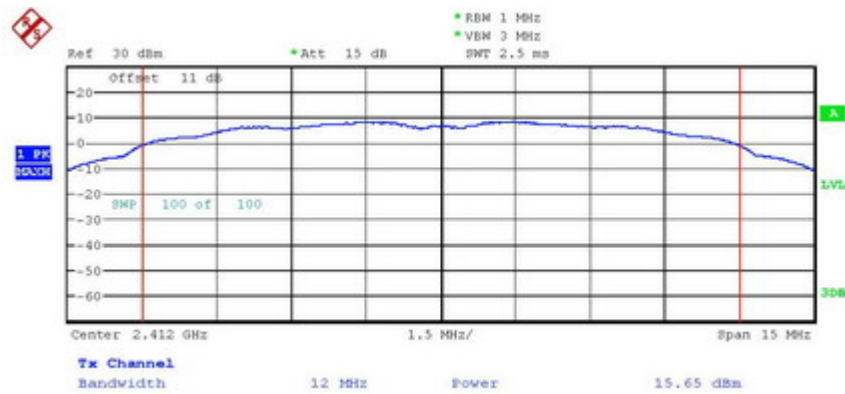
Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

### 3.1 Peak Output Power (transmitter)

FCC Rule: 15.247(b)(3)

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.  
The power was measured with modulation (declared by the applicant).

#### Mode A

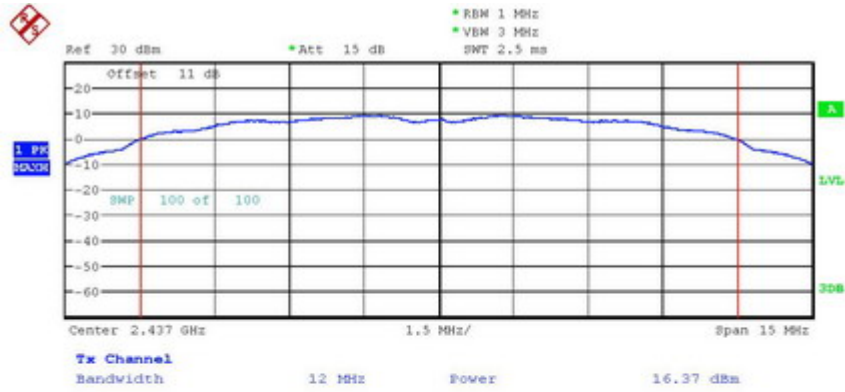


MAX OUTPUT POWER 802.11B CH01  
Date: 10.FEB.2015 13:13:02



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11B CH06

Date: 10.FEB.2015 13:13:43



MAX OUTPUT POWER 802.11B CH11

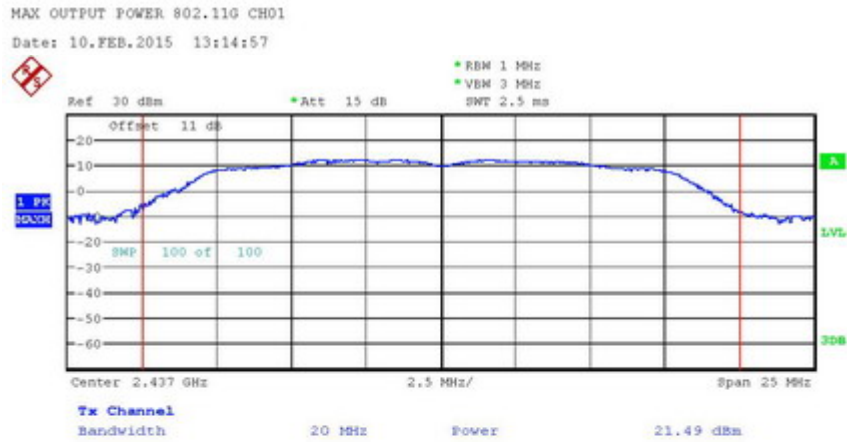
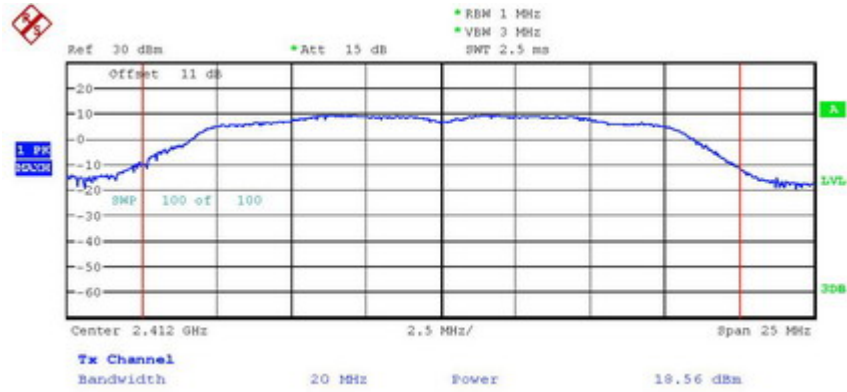
Date: 10.FEB.2015 13:14:14





Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

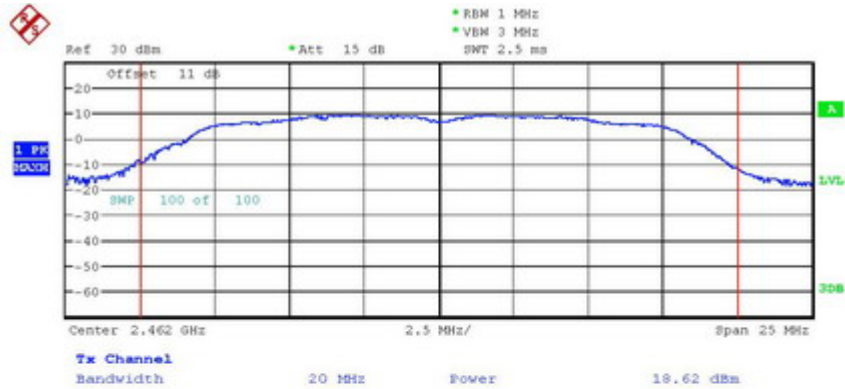
## Mode B



MAX OUTPUT POWER 802.11G CH06  
Date: 10.FEB.2015 13:15:30

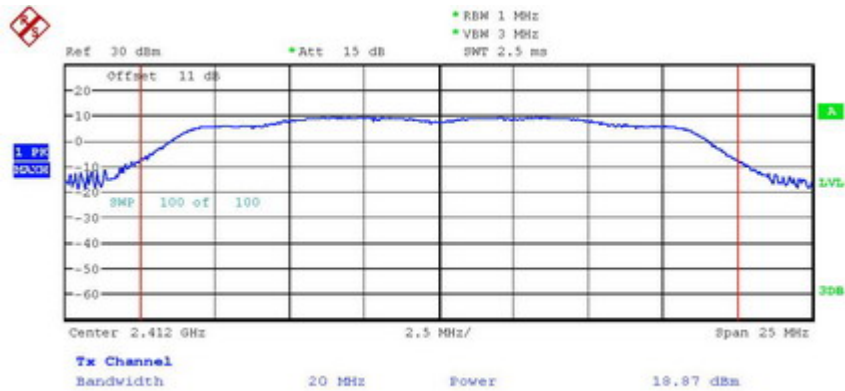


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11G CH11  
Date: 10.FEB.2015 13:15:59

## Mode C

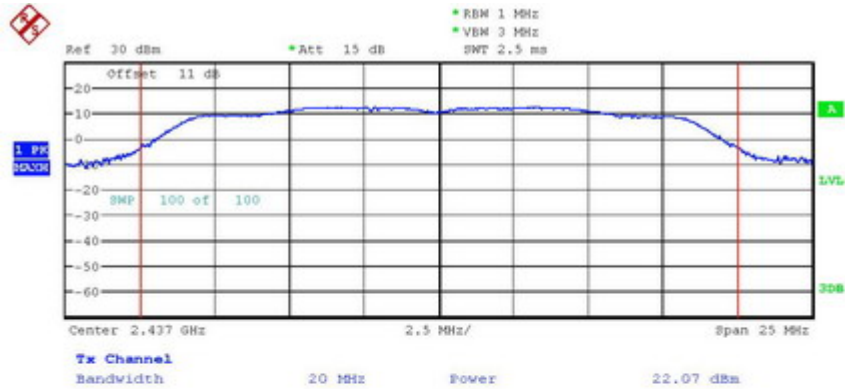


MAX OUTPUT POWER 802.11N 20MHZ CH01  
Date: 10.FEB.2015 13:16:36



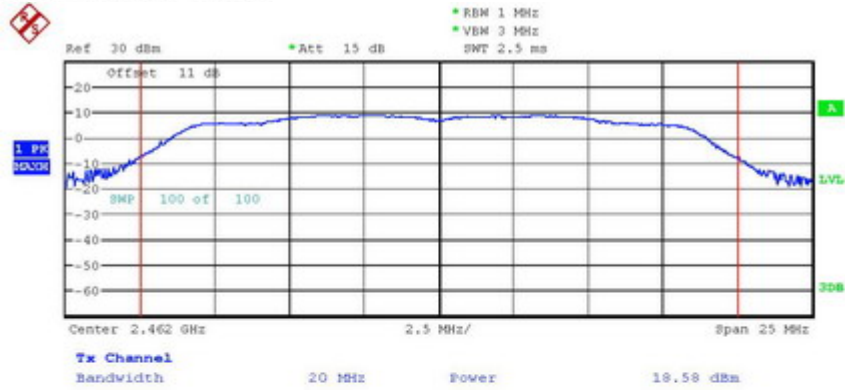
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11N 20MHZ CH06

Date: 10.FEB.2015 13:17:11



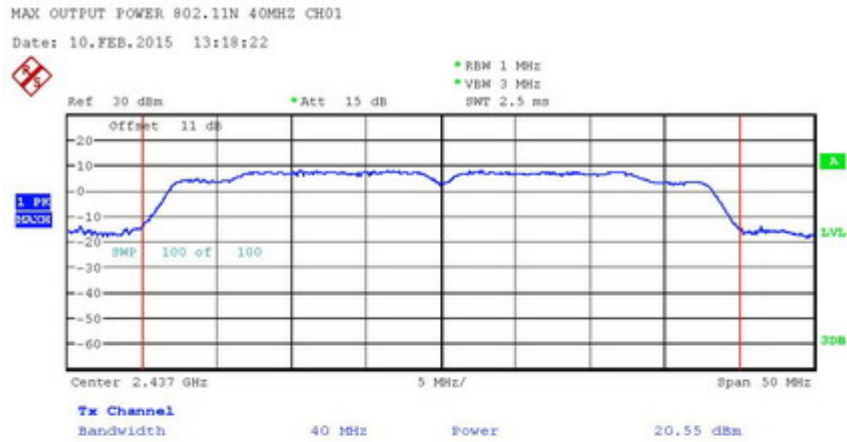
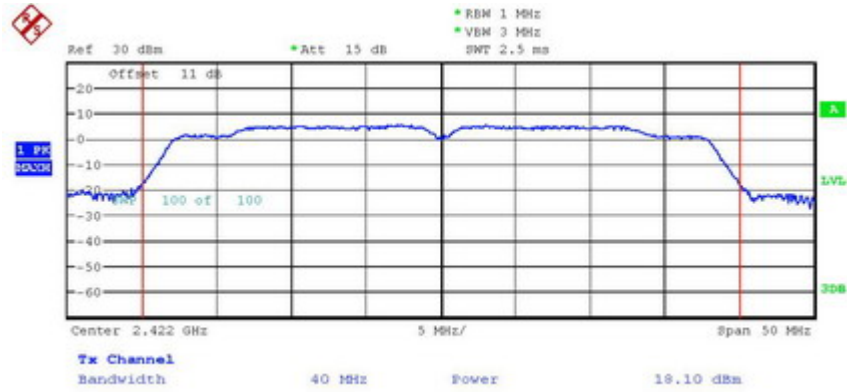
MAX OUTPUT POWER 802.11N 20MHZ CH11

Date: 10.FEB.2015 13:17:47



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Mode D



MAX OUTPUT POWER 802.11N 40MHZ CH04  
Date: 10.FEB.2015 13:19:00

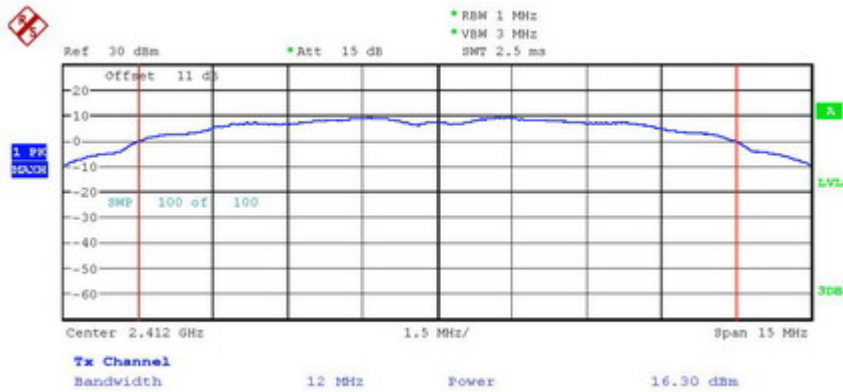


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11N 40MHZ CH07  
Date: 10.FEB.2015 13:19:33

## Mode E



MAX OUTPUT POWER 802.11B CH01  
Date: 10.FEB.2015 13:23:51



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11B CH06  
Date: 10.FEB.2015 13:24:24

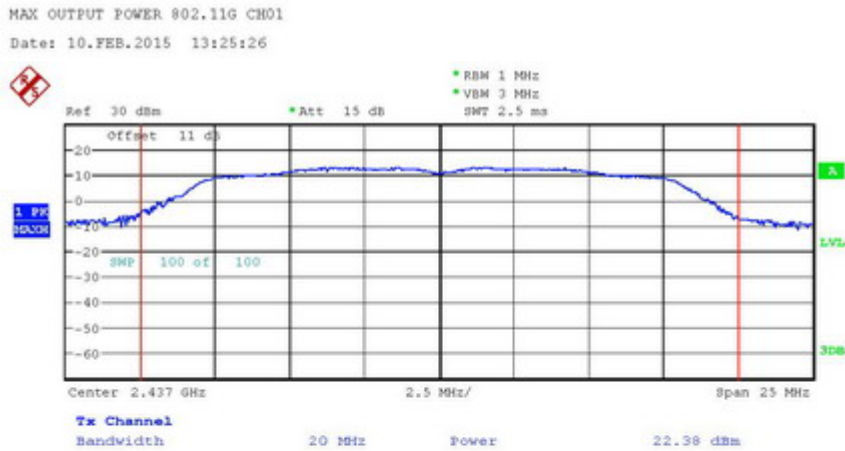
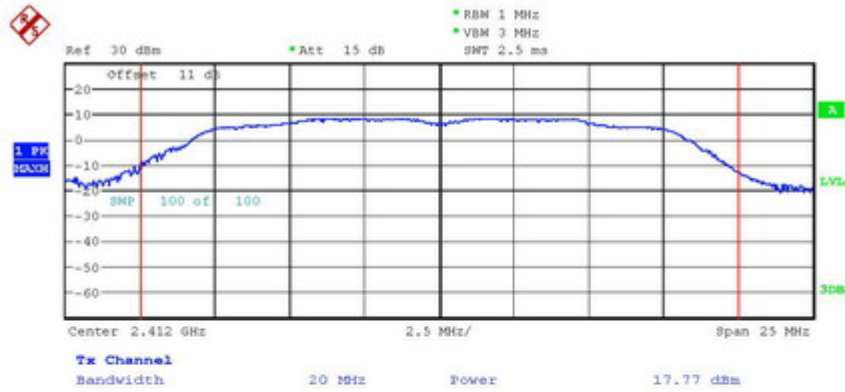


MAX OUTPUT POWER 802.11B CH11  
Date: 10.FEB.2015 13:24:51



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

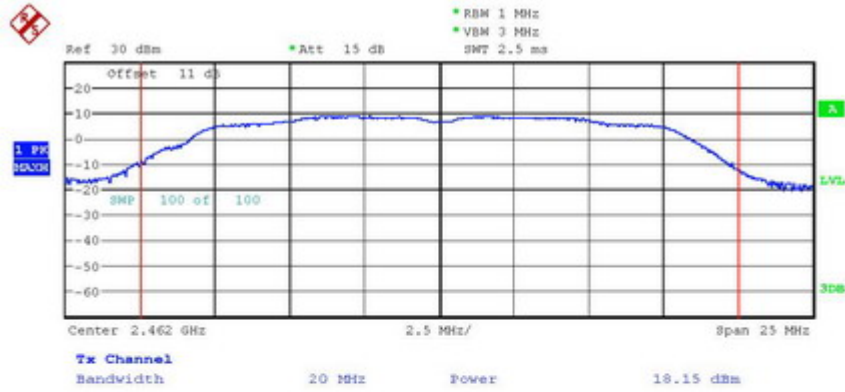
## Mode F



MAX OUTPUT POWER 802.11G CH06  
Date: 10.FEB.2015 13:25:56

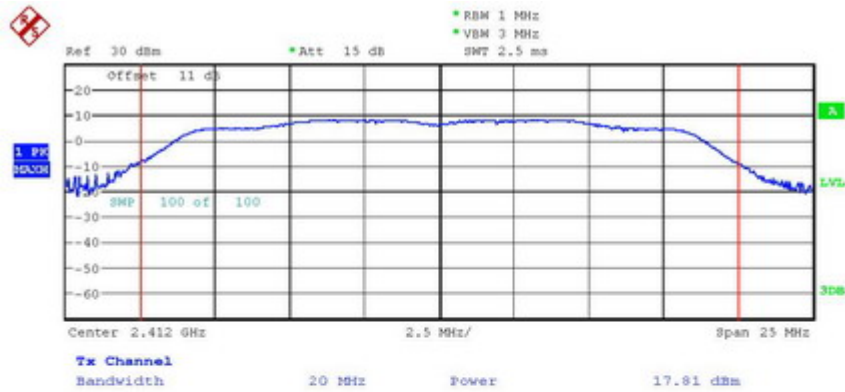


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11G CH11  
Date: 10.FEB.2015 13:26:23

## Mode G



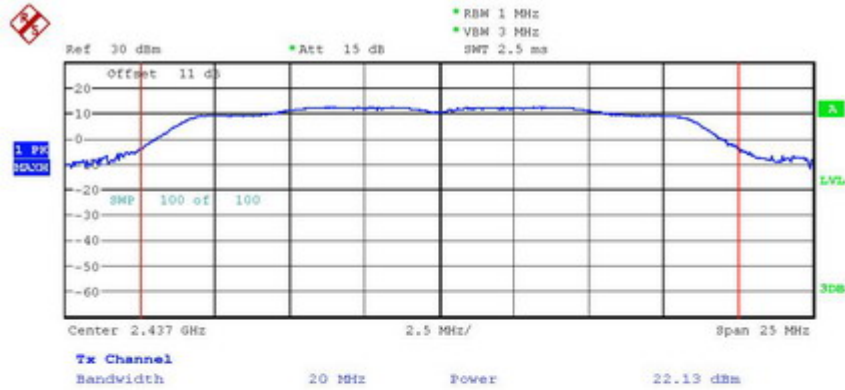
MAX OUTPUT POWER 802.11N 20MHz CH01  
Date: 10.FEB.2015 13:26:57



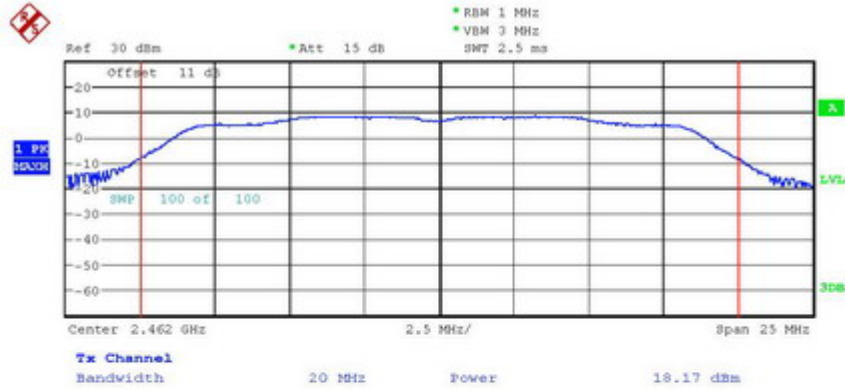


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11N 20MHE CH06  
Date: 10.FEB.2015 13:27:30



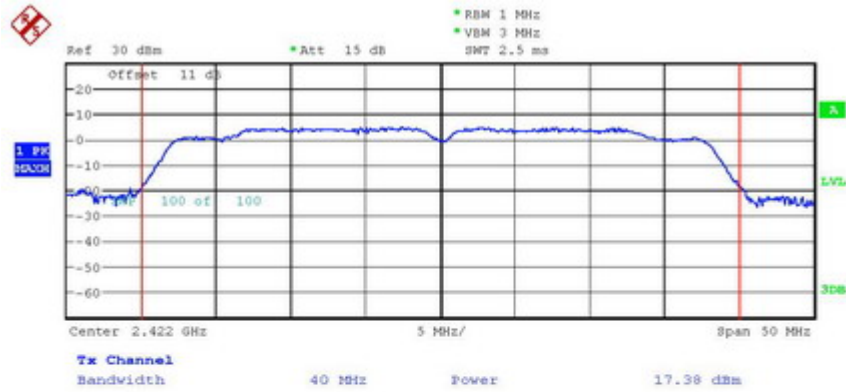
MAX OUTPUT POWER 802.11N 20MHE CH11  
Date: 10.FEB.2015 13:27:58



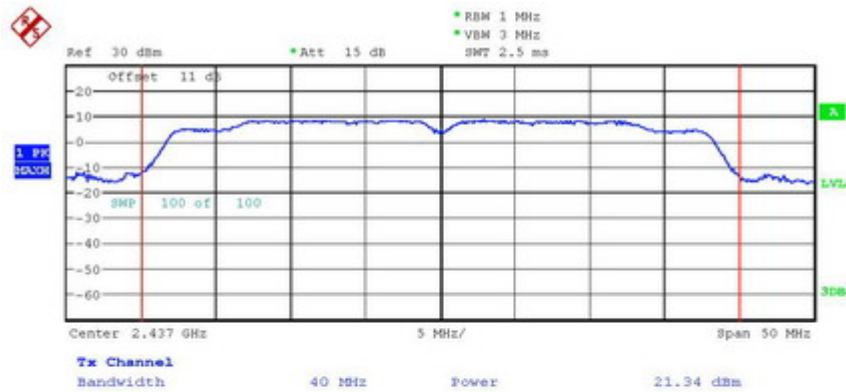
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Mode H



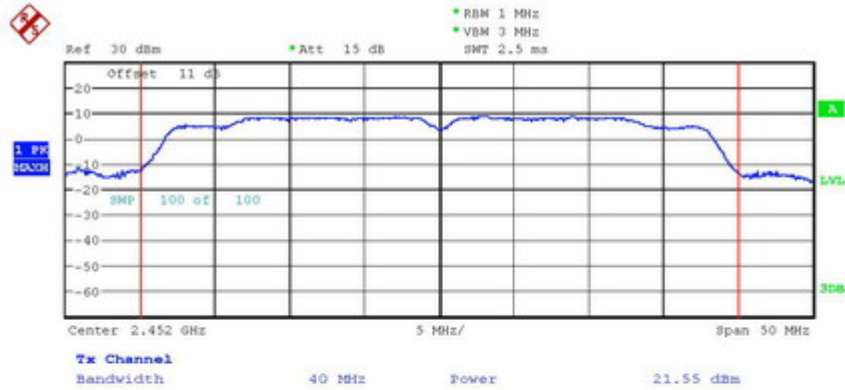
MAX OUTPUT POWER 802.11N 40MHZ CH01  
Date: 10.FEB.2015 13:28:31



MAX OUTPUT POWER 802.11N 40MHZ CH04  
Date: 10.FEB.2015 13:29:08

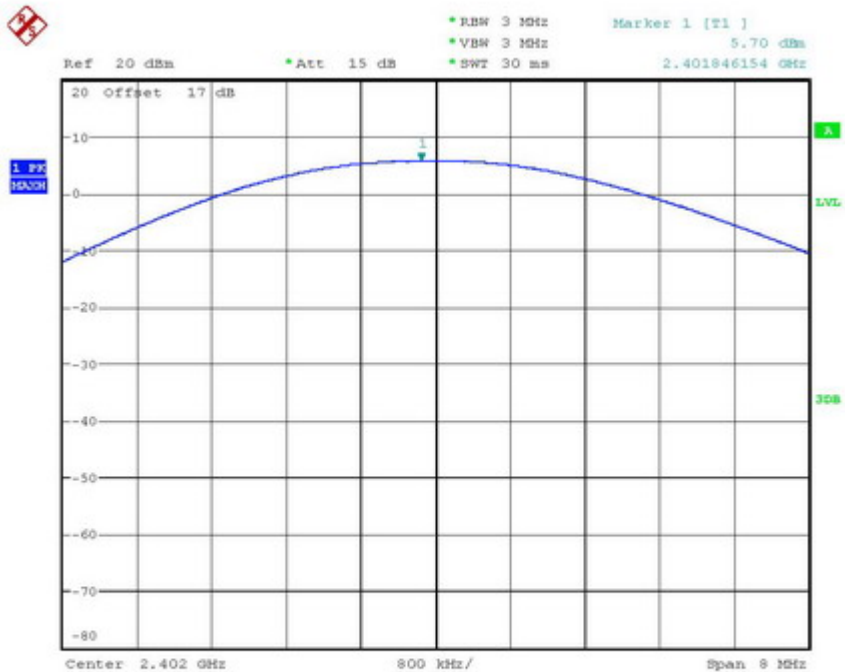


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER 802.11N 40MHz CH07  
Date: 10.FEB.2015 13:29:39

## Mode I

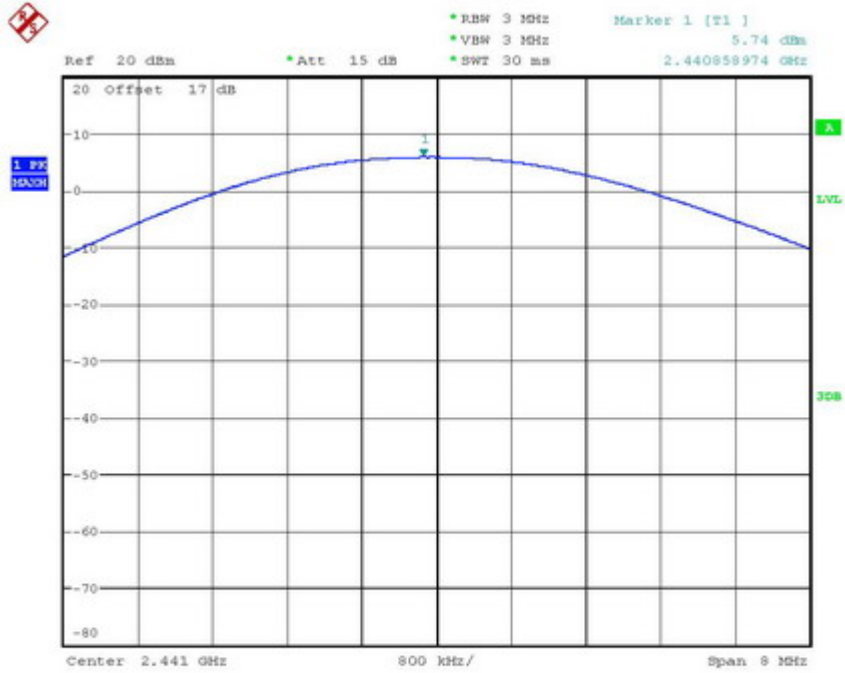


MAX OUTPUT POWER CH0  
Date: 9.FEB.2015 14:45:10

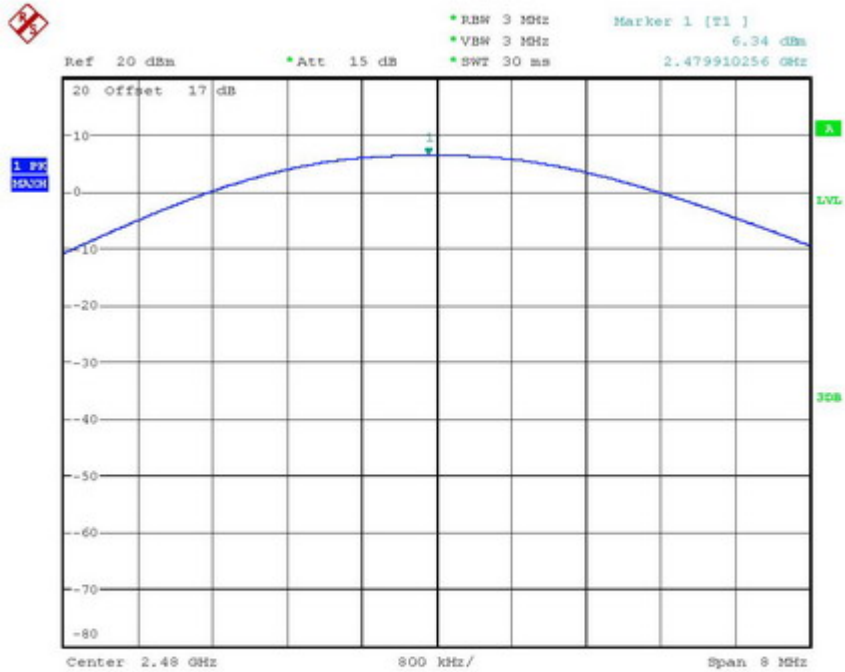


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER CH39  
Date: 9.FEB.2015 14:46:02

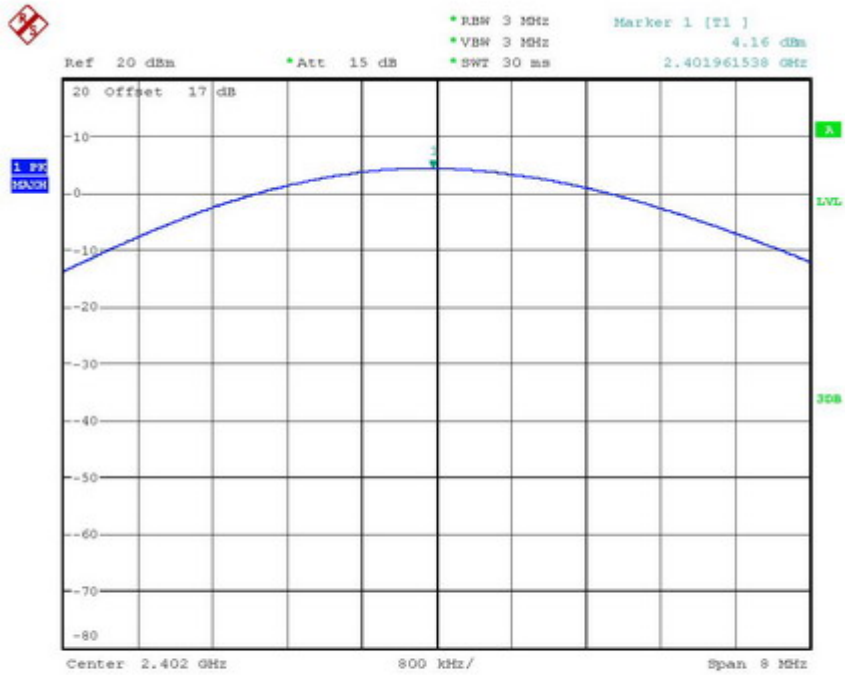


MAX OUTPUT POWER CH78  
Date: 9.FEB.2015 14:46:34

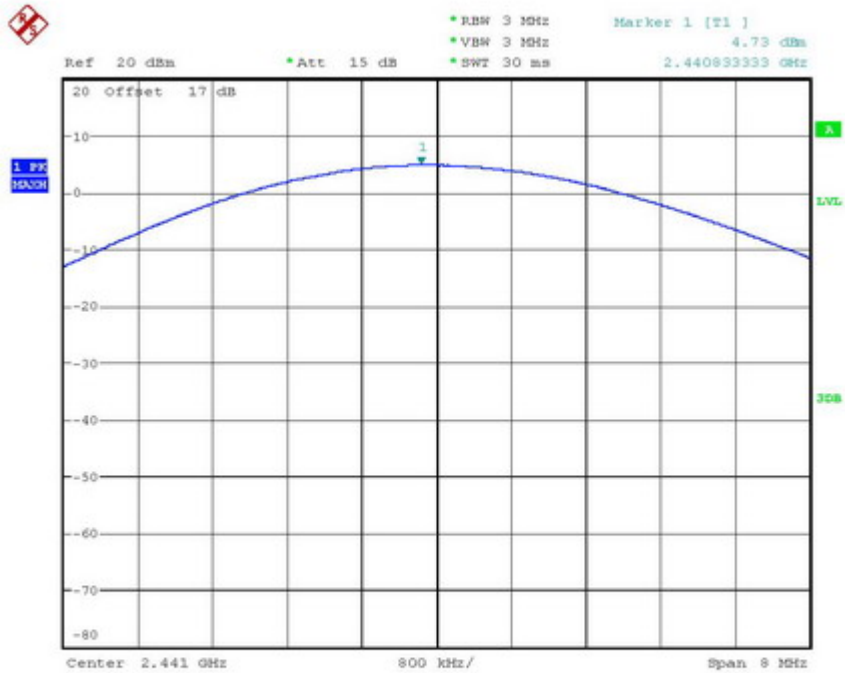


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Mode J



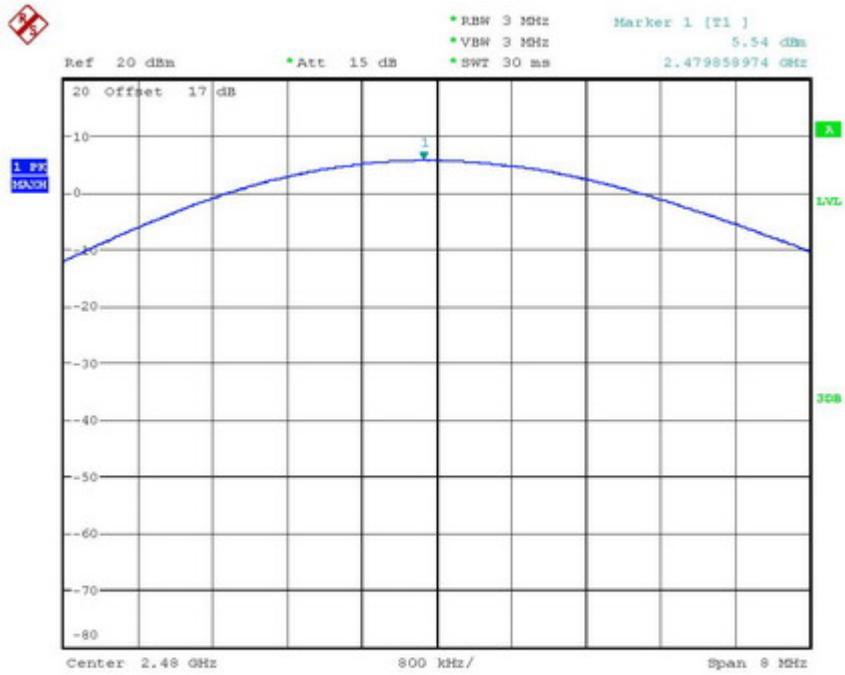
MAX OUTPUT POWER CH0 EDR MODE  
Date: 9.FEB.2015 14:52:54



MAX OUTPUT POWER CH39 EDR MODE  
Date: 9.FEB.2015 14:53:42



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER CH78 EDR MODE  
Date: 9.FEB.2015 14:54:18

## Mode K

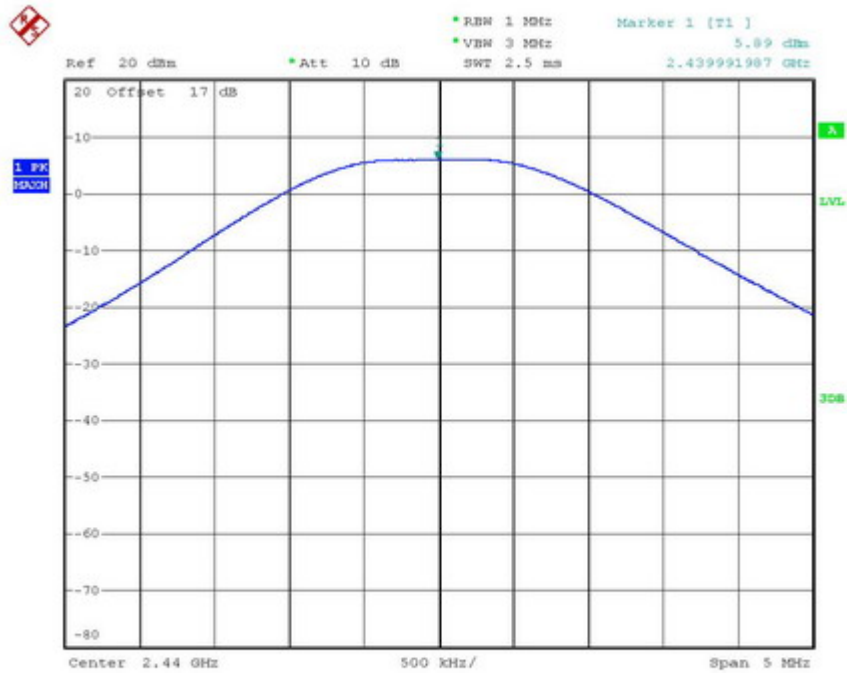


MAX OUTPUT POWER BT4.0 CH00  
Date: 9.FEB.2015 14:58:58

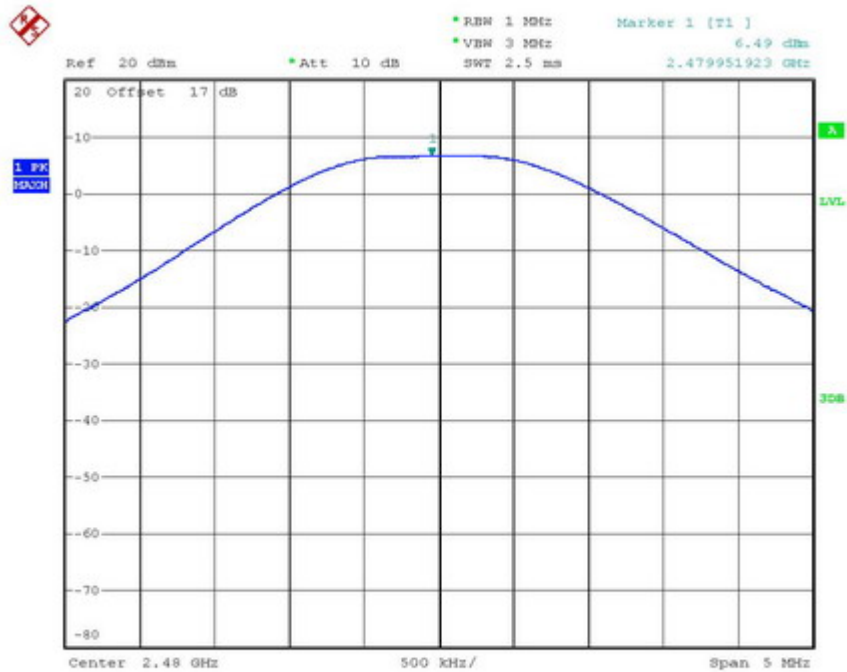


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



MAX OUTPUT POWER BT4.0 CH19  
Date: 9.FEB.2015 14:59:46



MAX OUTPUT POWER BT4.0 CH39  
Date: 9.FEB.2015 15:00:26



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7

Antenna A	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	77.09	161.06	72.11	18.87	22.07	18.58
802.11n 40MHz	64.57	113.50	144.21	18.10	20.55	21.59
Antenna B	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	60.39	163.31	65.61	17.81	22.13	18.17
802.11n 40MHz	54.70	136.14	142.89	17.38	21.34	21.55
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	137.48	324.37	137.72	21.38	25.11	21.39
802.11n 40MHz	119.27	249.64	287.10	20.77	23.97	24.58

**Limits:**

Frequency MHz	Power dBm
902 - 928	30
2400 – 2483.5	30
5725 – 5850	30

In case of employing transmitter antennas having antenna gain > 6 dBi and using fixed point-to point operation consider §15.247 (b)(4)

Test equipment used: ETSTW-RE 055, ETSTW-RE 050, ETSTW-RE 073, ETSTW-RE 074,  
 ETSTW-RE 064





Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7

**3.2 RF Exposure Compliance Requirements**

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

$$S = \frac{PG}{4 \pi R^2}$$

- S – Power Density
- P – Output power ERP
- R – Distance
- D – Cable Loss
- AG – Antenna Gain

Item	Unit	Value	Remarks
P	mW	--	Peak value
D	dB	--	--
AG	dBi	--	--
G	--	--	Calculated Value
R	cm	20	Assumed value
S	mW/cm <sup>2</sup>	--	Calculated value

Limits:

Limit for General Population / Uncontrolled Exposure	
Frequency (MHz)	Power Density (mW/cm <sup>2</sup> )
1500 – 100.000	1.0

Explanation: Please refer to SAR test report of DB7.



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

**3.3 Transmitter Radiated Emissions in Restricted Bands**

FCC Rules: 15.247 (c), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 26500 MHz.

For radiated emission tests, the analyzer setting was as followings:

Frequency  $\leq$  1 GHz, RBW:100 kHz, VBW: 100 kHz (Peak measurements)

Frequency  $>$  1 GHz, RBW: 1 MHz, VBW: 1 MHz (Peak measurements)

Frequency  $>$  1 GHz , RBW:1 MHz , VBW: 10 Hz (Average measurements)

Limits.

For frequencies below 1GHz:

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above	500	54.0

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of Digit Transmission Systems:

“If the emission is pulsed, modify the unit for continuous operation, use the setting shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction =  $20 \log (\text{dwell time}/ 100\text{ms})$

Note: No duty cycle correction was added to the reading of this EUT.

Explanation: See attached diagrams in Appendix.



Registration number: W6M21411-14649-C-1

FCC ID: IR5DB7

### **3.4 Spurious Emissions (tx)**

Spurious emission was measured with modulation (declared by manufacturer).

In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))

FCC Rule: 15.247(c), 15.35

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:

For frequencies above 1GHz (Peak measurements).

Modified Limit for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

For frequencies above 1GHz (Average measurements).

Max. reading – 20dB

Max. reading – 20 dB

Guidance on Measurement of Digit Transmission Systems:

“If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty Cycle correction =  $20 \log (\text{dwell time}/100\text{ms})$

Test equipment used: ETSTW-RE 003, ETSTW-RE 030, ETSTW-RE 111,  
ETSTW-RE 088, ETSTW-RE 018, ETSTW-RE 064

Note: No duty cycle correction was added to the reading of EUT.



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance with point 2.3.

Calculation of test results:  
 Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.  
 In the Table being listed the critical peak and average value and exhibit the compliance with the above calculated Limits.

If in the column's correction factor states a value then the max. Field strength in the same row is corrected by a value gained from the "Correction Factor".

## Summary table with radiated data of the test plots

Model: DB7 Date: --  
 Mode: TX Temperature: -- °C Engineer: --  
 Polarization: Horizontal -- %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

**Note**

1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **Measurement uncertainty for 3m measurement: 30-1000 MHz =  $\pm 4.32$  dB, 1-18 GHz =  $\pm 4.92$  dB, 18-40 GHz =  $\pm 2.94$  dB ; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.**
6. **See attached diagrams in appendix.**

**TEST RESULT (Transmitter):** The unit DOES meet the FCC requirements.

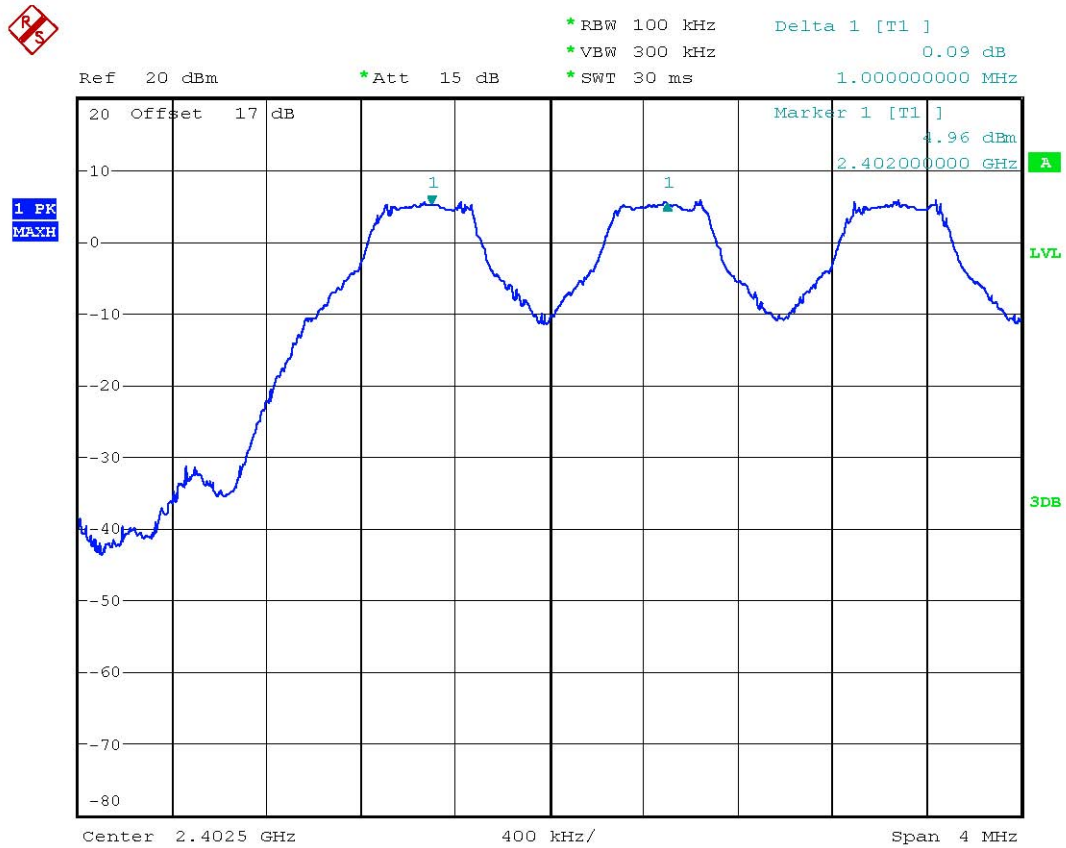
Test equipment used: ETSTW-RE 003, ETSTW-RE 030, ETSTW-RE 111,  
ETSTW-RE 088, ETSTW-RE 018, ETSTW-RE 064



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

### 3.5 Carrier Frequency Separation

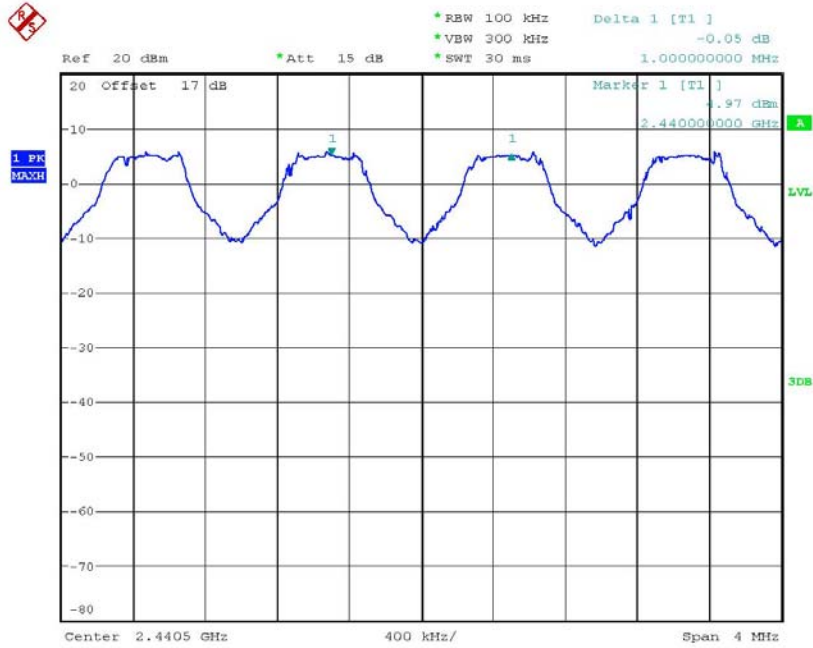
Carrier Frequency Separation was measured with modulation (declared by manufacturer). According to FCC rules part 15 subpart C §15.247 frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater.



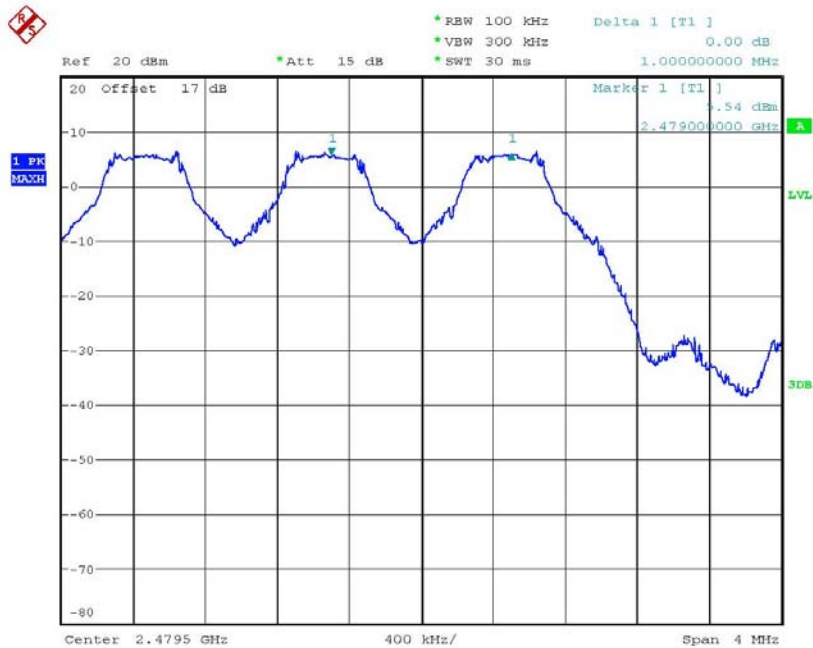
FREQUENCY SEPARATION CHO  
Date: 9.FEB.2015 14:50:22



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



FREQUENCY SEPARATION CH39  
Date: 9.FEB.2015 14:51:06



FREQUENCY SEPARATION CH78  
Date: 9.FEB.2015 14:51:54



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Limits:

Frequency Range MHz	Limits	
	20 dB bandwidth < 25 kHz	20 dB bandwidth > 25 kHz
902-928	25 kHz	20 dB bandwidth
2400-2483.5 5725-5850.0	25 kHz	20 dB bandwidth

Test equipment used: ETSTW-RE 055, ETSTW-RE 064



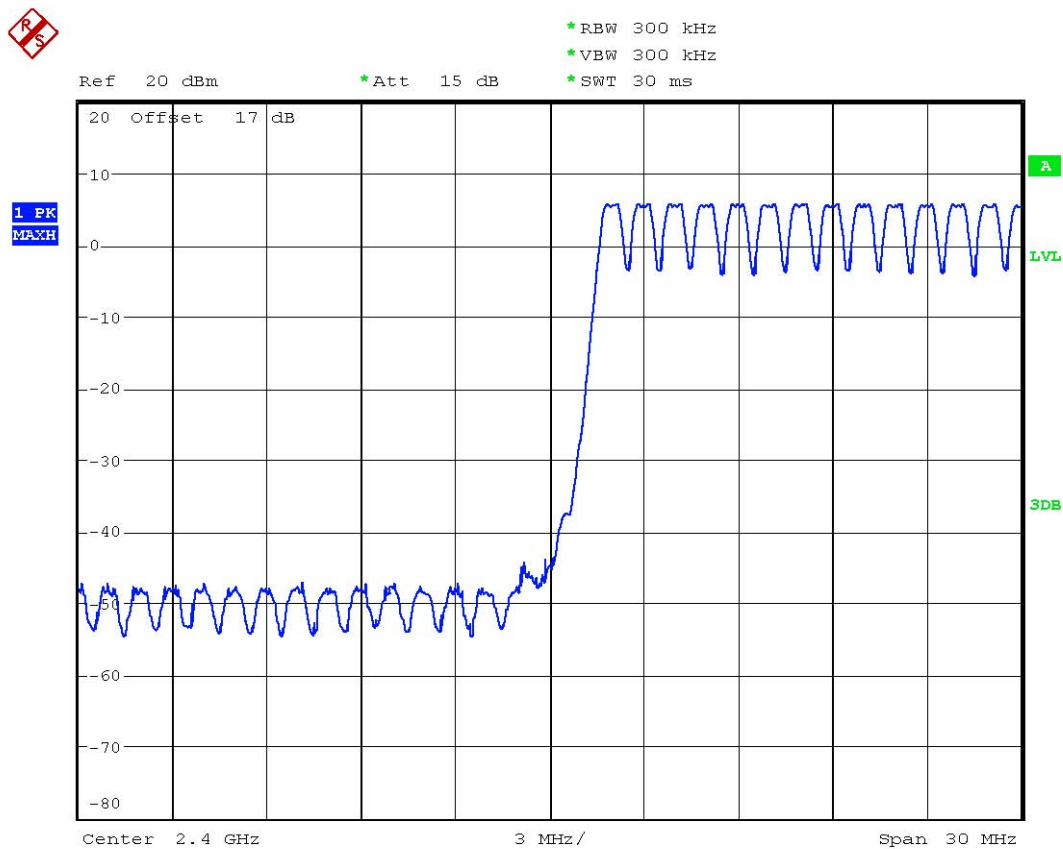


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

### 3.6 Number of Hopping Frequencies

According to FCC rules part 15 subpart C §15.247 frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies. Frequency hopping systems in 5725-5850 MHz bands shall use least 75 hopping frequencies.

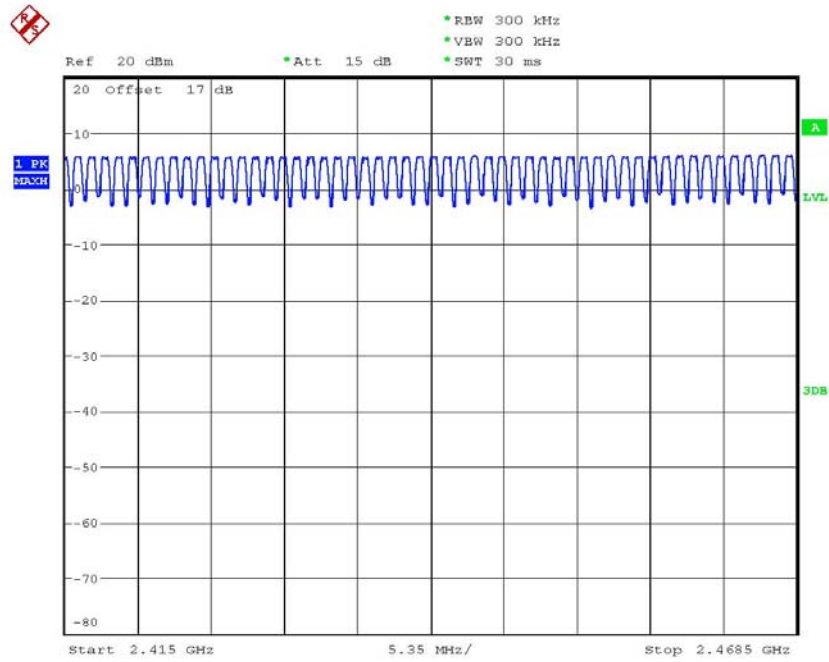
For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies; if the 20dB bandwidth of the hopping channel 250 kHz or greater, the system shall use at least 25 hopping frequencies.



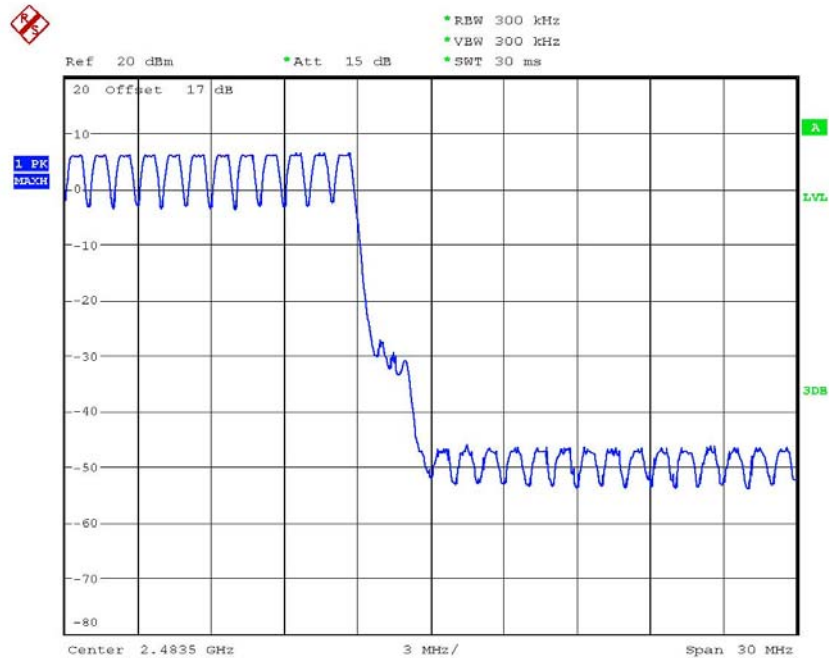
NUMBER OF HOPPING CH0-13  
Date: 9.FEB.2015 14:47:42



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



NUMBER OF HOPPING CH14-66  
Date: 9.FEB.2015 14:49:30



NUMBER OF HOPPING CH67-78  
Date: 9.FEB.2015 14:48:22



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Limits:

Frequency Range MHz	Limit	
	20dB Bandwidth	Number of Channels
902-928 MHz	Bandwidth < 250 kHz	≥ 50
	Bandwidth ≥ 250 kHz	≥ 25
2400-2483.5	not defined	15
5725-5850.0 MHz	1 MHz	75

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

### 3.6.1 Pseudorandom Frequency Hopping Sequence

The generation of the hopping sequence is determined by the Bluetooth cord specification and complies with the FCC requirements.

### 3.6.2 Coordination of hopping sequences to other transmitters

According to the Bluetooth core specification such a coordination is not possible. During scatternet function only one of the two hopping sequences will be used at a definite moment.

### 3.6.3 System Receiver Hopping Capability

According to the Bluetooth core specification. The system receivers shift frequencies in synchronization with the transmitted signals.



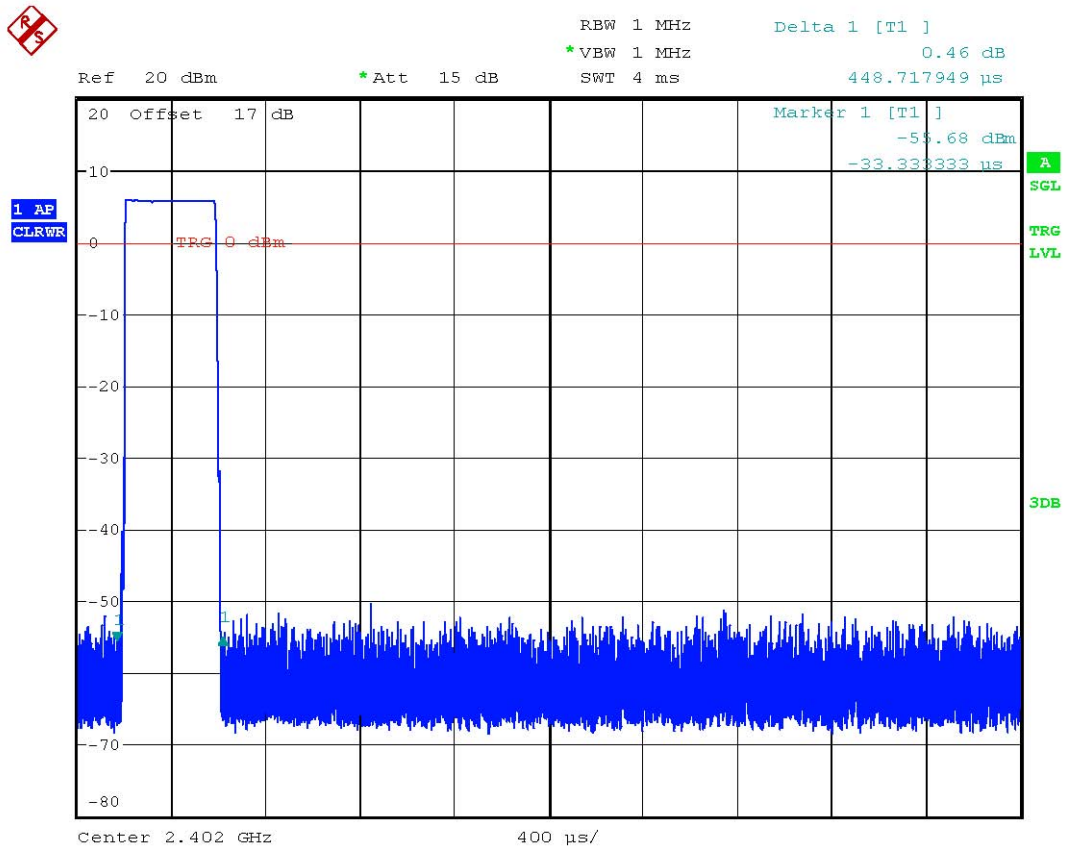
Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

### 3.7 Time of Occupancy (Dwell Time)

Frequency hopping systems operating in the 5725-5850 MHz band shall use an average time of occupancy on any frequency not greater than 0.4 seconds within a 30 second period.

In 2400-2483.5 MHz band the average time of occupancy on any channel shall not be greater than 0.4 seconds multiplied by the number of hopping channels employed.

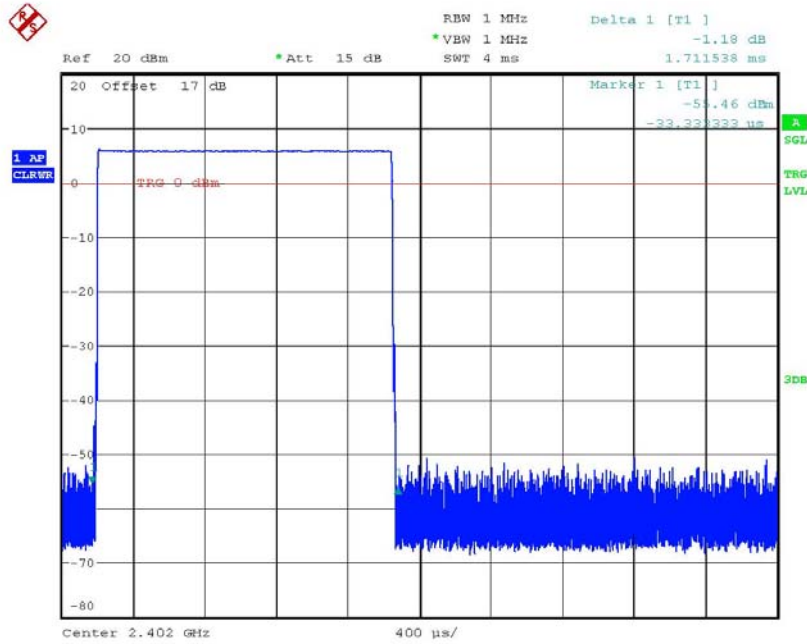
For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.



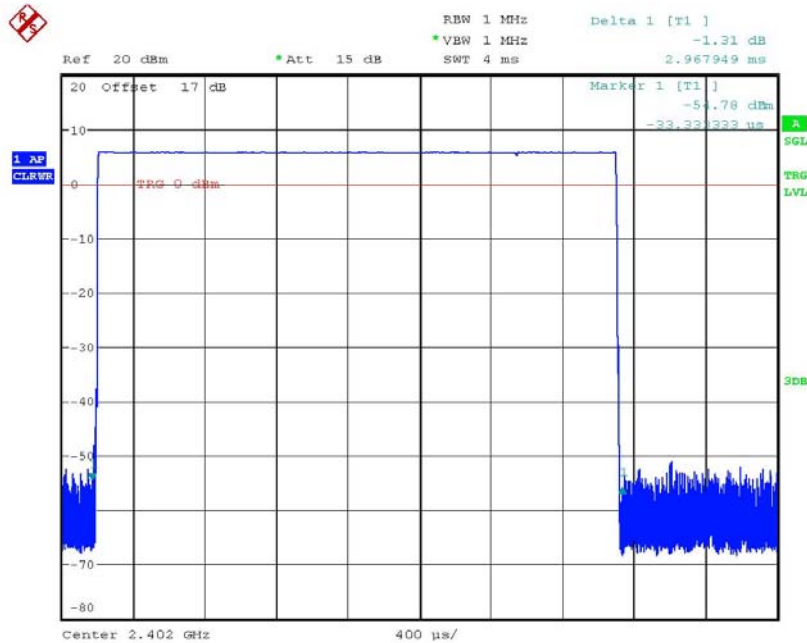
DWELL TIME CH0 DH1 (0.448ms \* 320event = 143.36ms)  
Date: 9.FEB.2015 15:06:09



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



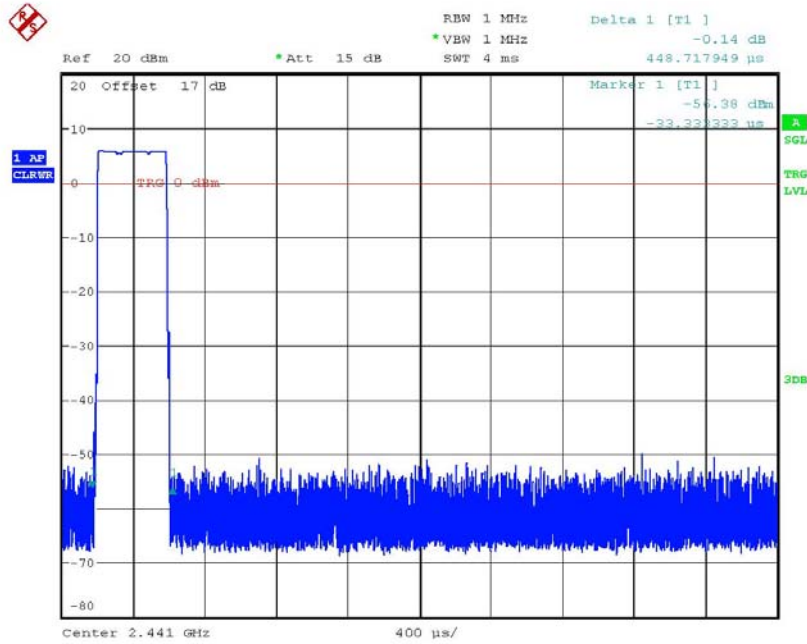
DWELL TIME CH0 DH3 (1.711ms \* 160event = 273.76ms)  
Date: 9.FEB.2015 15:09:01



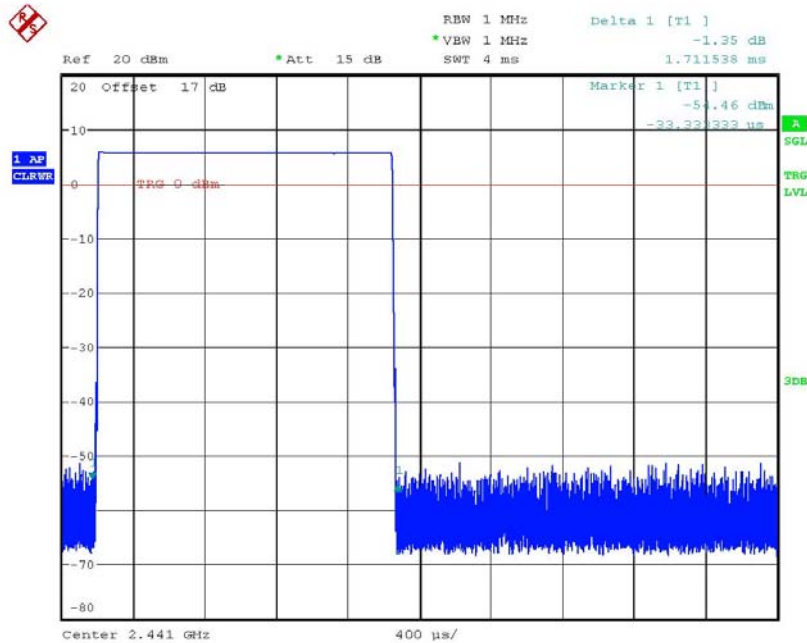
DWELL TIME CH0 DH5 (2.967ms \* 106event = 314.502ms)  
Date: 9.FEB.2015 15:12:54



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



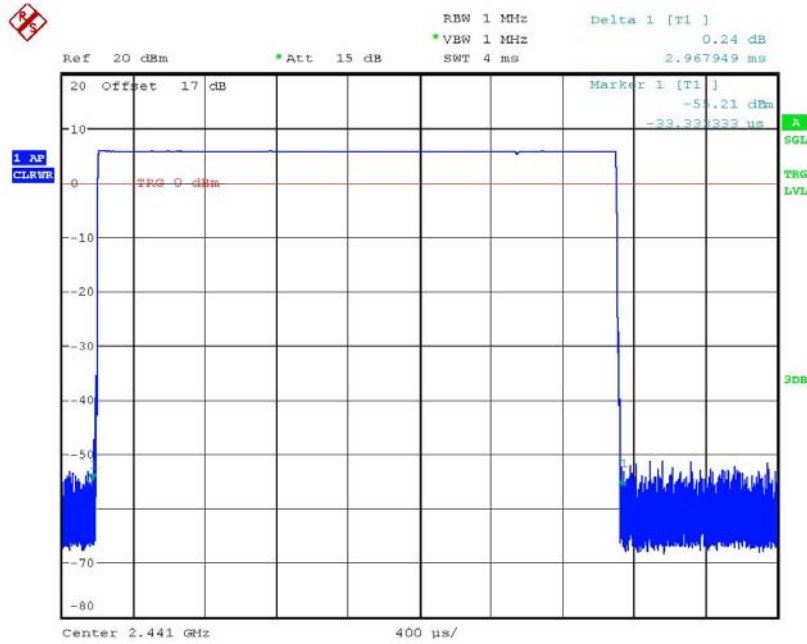
DWELL TIME CH39 DH1 (0.448ms \* 320event = 143.36ms)  
Date: 9.FEB.2015 15:06:57



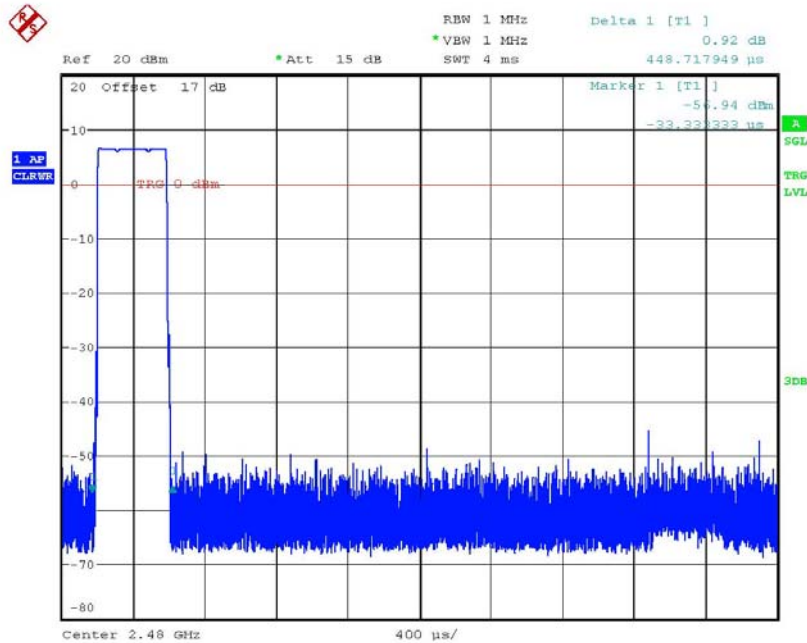
DWELL TIME CH39 DH3 (1.711ms \* 160event = 273.76ms)  
Date: 9.FEB.2015 15:09:40



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



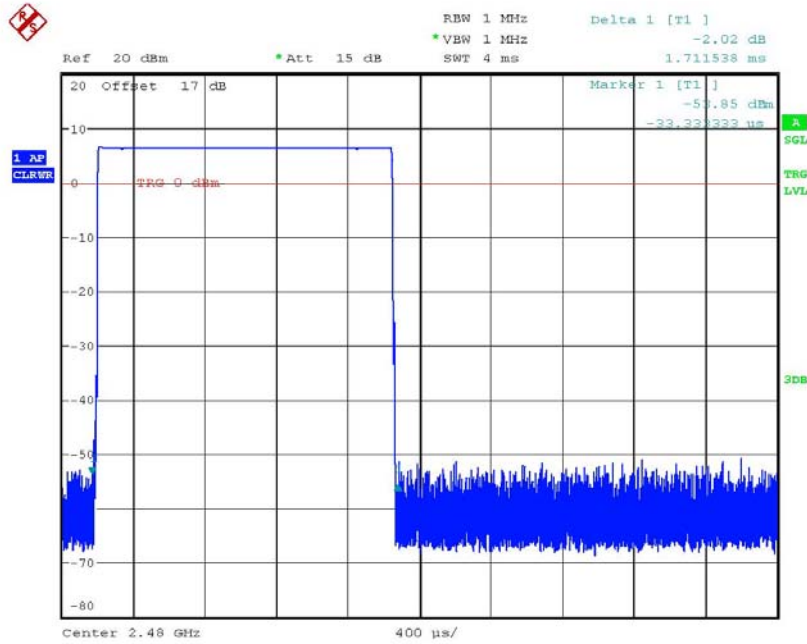
DWELL TIME CH39 DH5 (2.967ms \* 106event = 314.502ms)  
Date: 9.FEB.2015 15:12:25



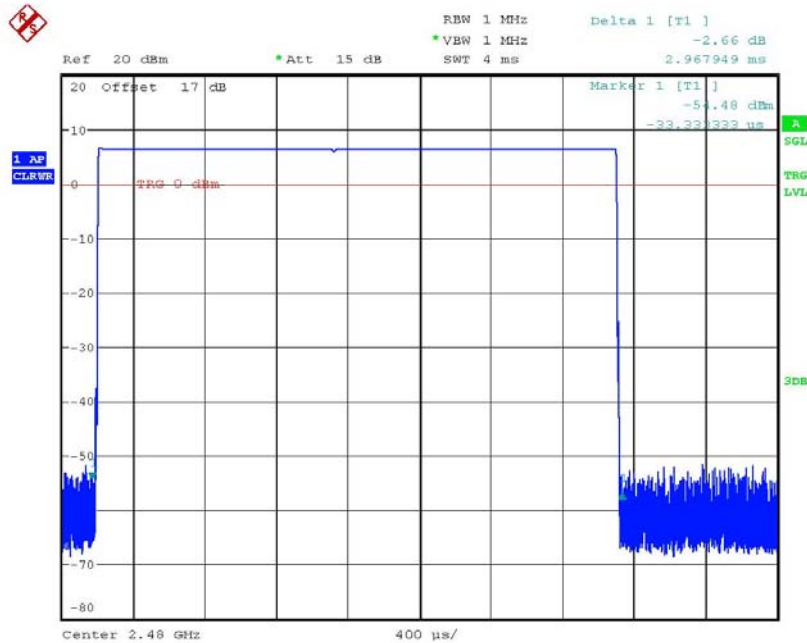
DWELL TIME CH78 DH1 (0.448ms \* 320event = 143.36ms)  
Date: 9.FEB.2015 15:07:31



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



DWELL TIME CH78 DH3 (1.711ms \* 160event = 273.76ms)  
Date: 9.FEB.2015 15:10:23



DWELL TIME CH78 DH5 (2.967ms \* 106event = 314.502ms)  
Date: 9.FEB.2015 15:11:41





Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

**Limits and measurement periods:**

Frequency MHz	Number of channels	Measurement Periode	Limit
902 – 928	$\geq 50$	20 s	0.4 s
	$49 \geq 25$	10 s	0.4 s
2400 – 2483.5	$\geq 15$	0.4 s * number of used channels	0.4 s
5725- 5850	$\geq 75$	30 s	0.4s

Test equipment used: ETSTW-RE 055, ETSTW-RE 064



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

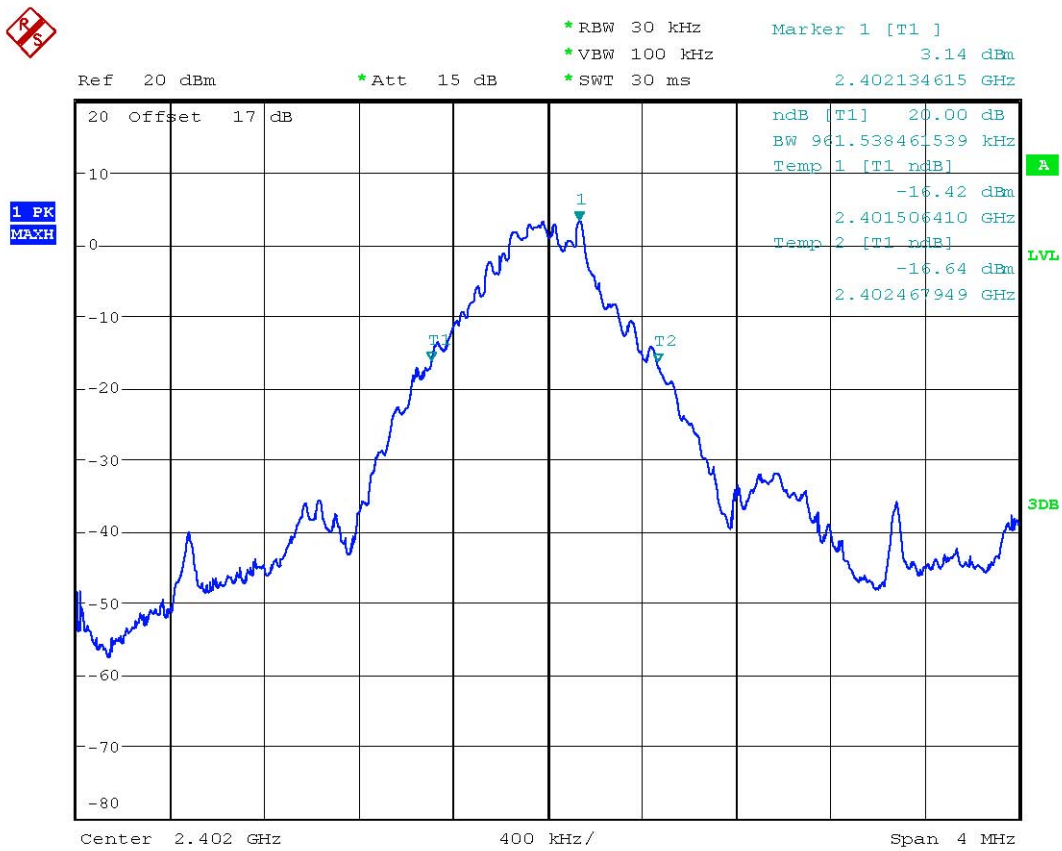
### 3.8 20dB Bandwidth

Frequency hopping systems operating in the 5725-5850 MHz bands shall use a maximum 20dB bandwidth of 1 MHz.

The 20dB bandwidth is measured on the lowest, middle and highest hopping channel.

For frequency hopping systems operating in the 902-928 MHz band the maximum 20dB bandwidth of the hopping channel is 500 kHz.

#### Mode I (Bluetooth Normal mode)

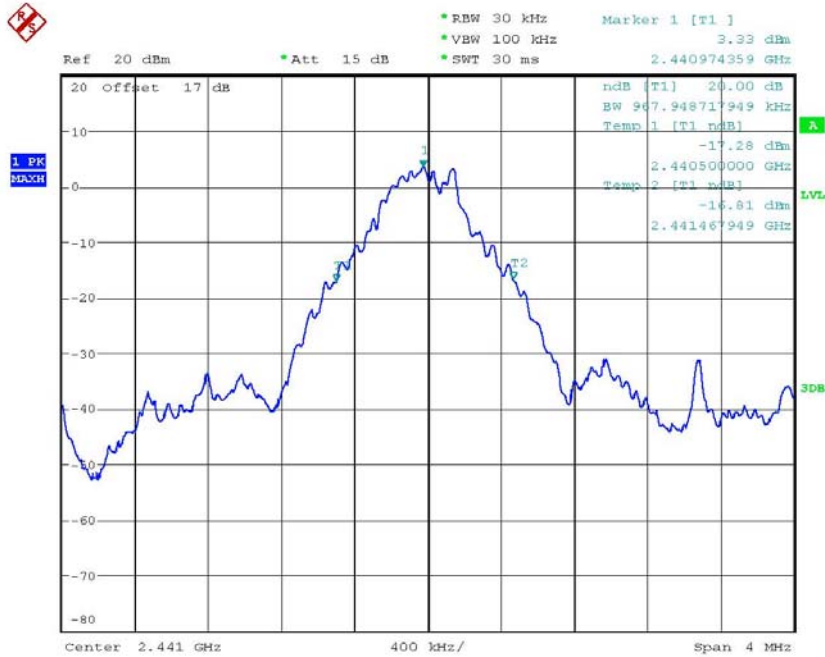


20DB BANDWIDTH CH0  
Date: 9.FEB.2015 14:45:18

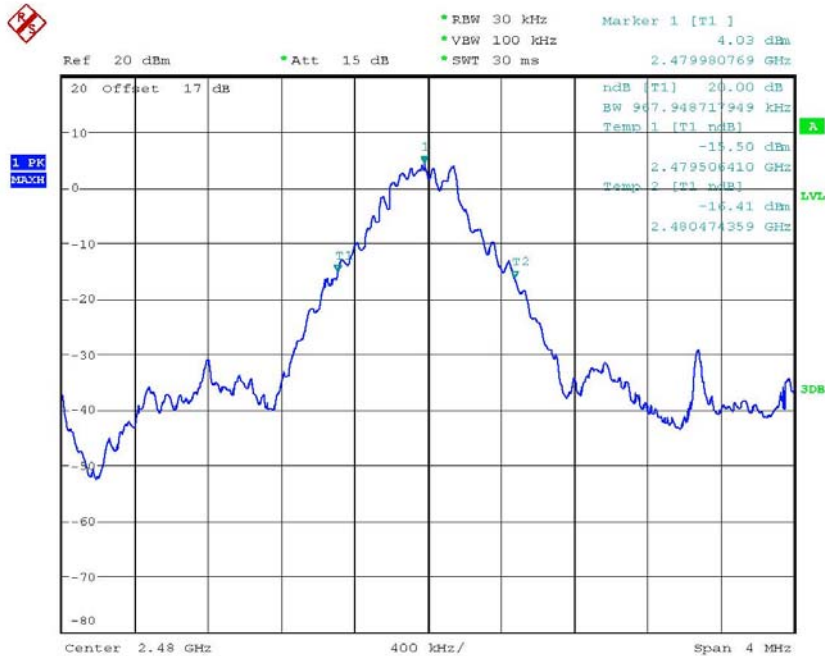


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7



20DB BANDWIDTH CH39  
 Date: 9.FEB.2015 14:46:10

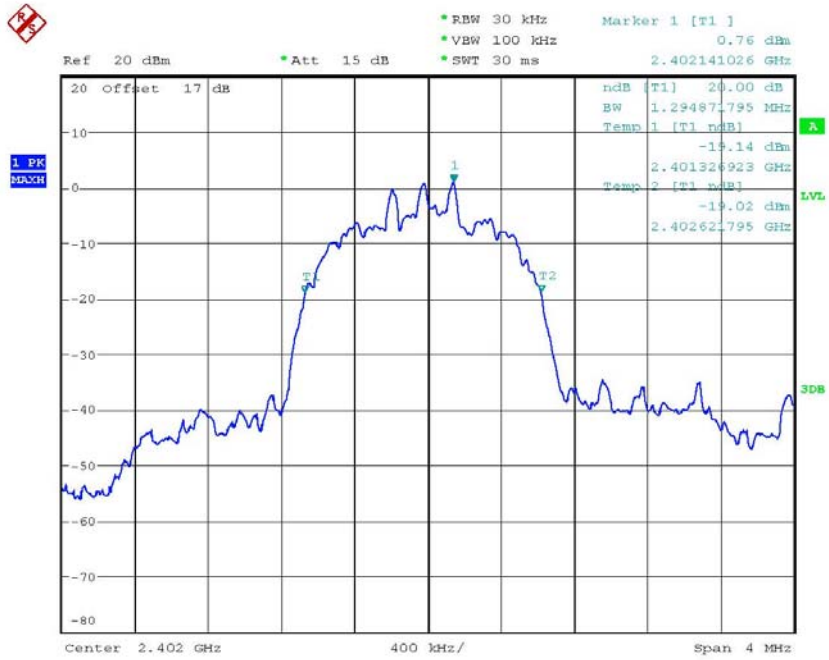


20DB BANDWIDTH CH78  
 Date: 9.FEB.2015 14:46:42

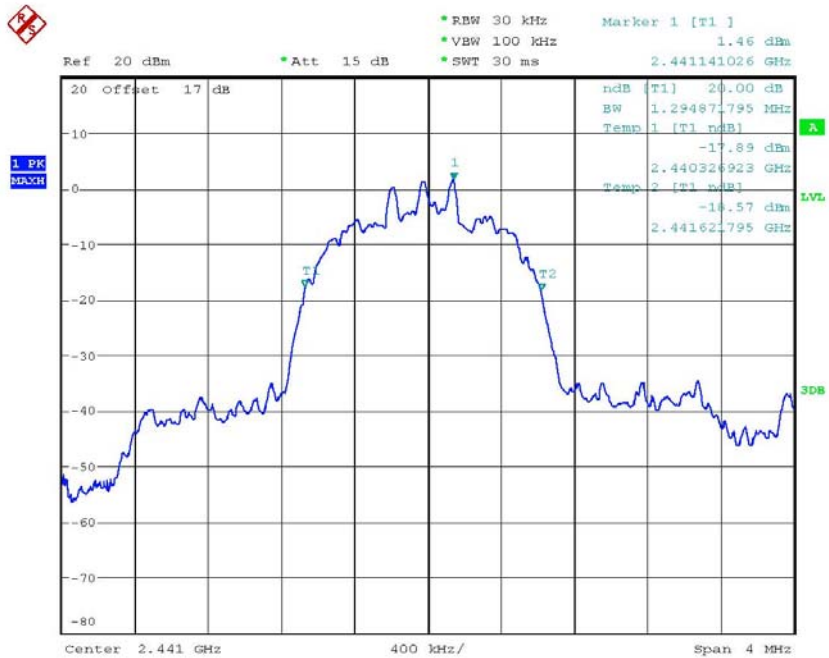


Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7

## Mode J (Bluetooth EDR mode)

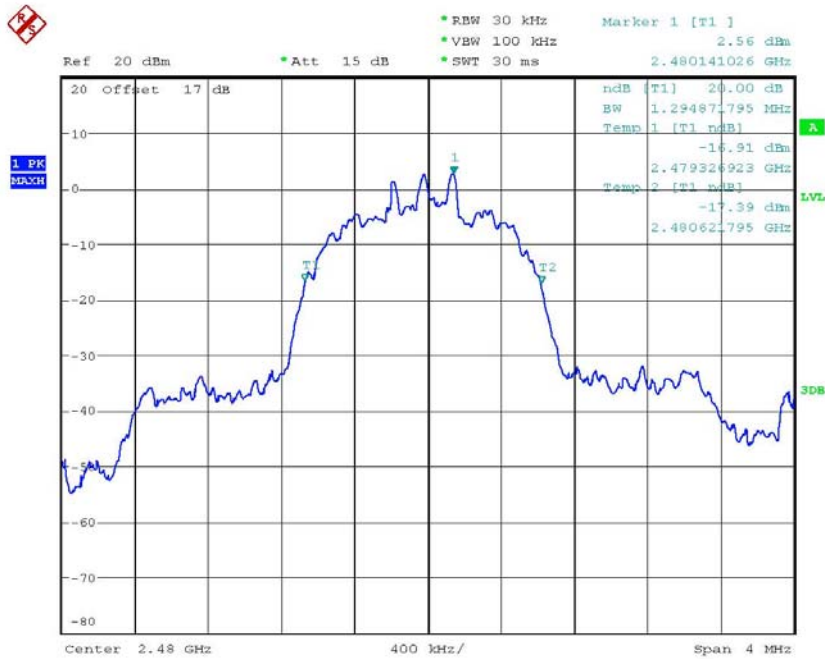


20DB BANDWIDTH CH0 EDR MODE  
 Date: 9.FEB.2015 14:53:02



20DB BANDWIDTH CH39 EDR MODE  
 Date: 9.FEB.2015 14:53:50

Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7



20DB BANDWIDTH CH78 EDR MODE  
 Date: 9.FEB.2015 14:54:26

### Limits:

Frequency Range / MHz	Limit
902-928	≤ 500 kHz
2400-2483.5	not defined
5725-5850	≤ 1 MHz

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

### 3.8.1 System Receiver Input Bandwidth

It is determined in the Bluetooth core specification. The value matches to the bandwidth of transmitter signal.

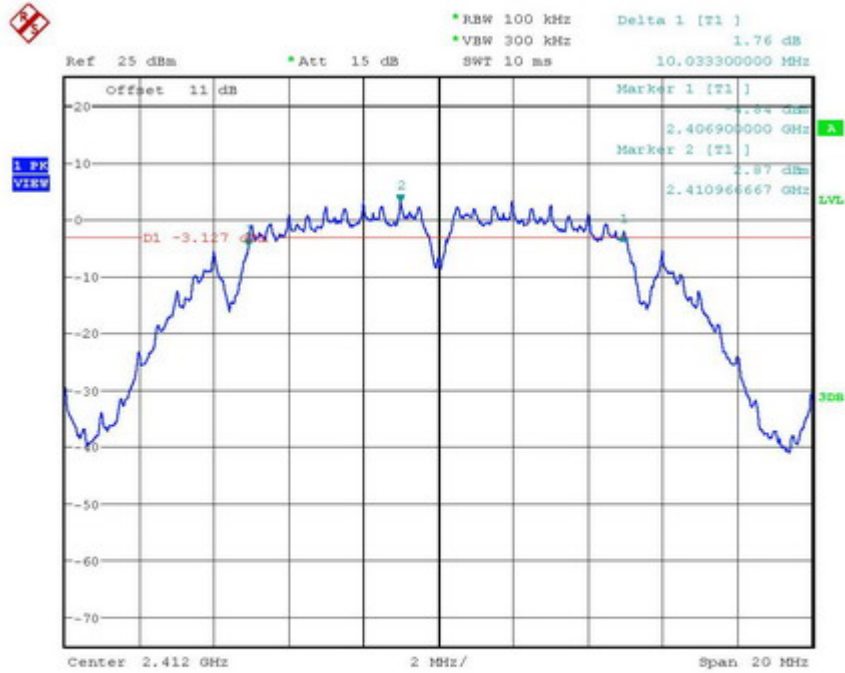


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

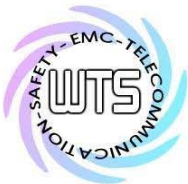
### 3.9 Minimum 6 dB Bandwidth

The analyzer ResBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK reading was taken, two markers were set 6 dB below the maximum level on the right and the left side of the emission. The 6 dB bandwidth is the frequency difference between the two markers.

#### Mode A

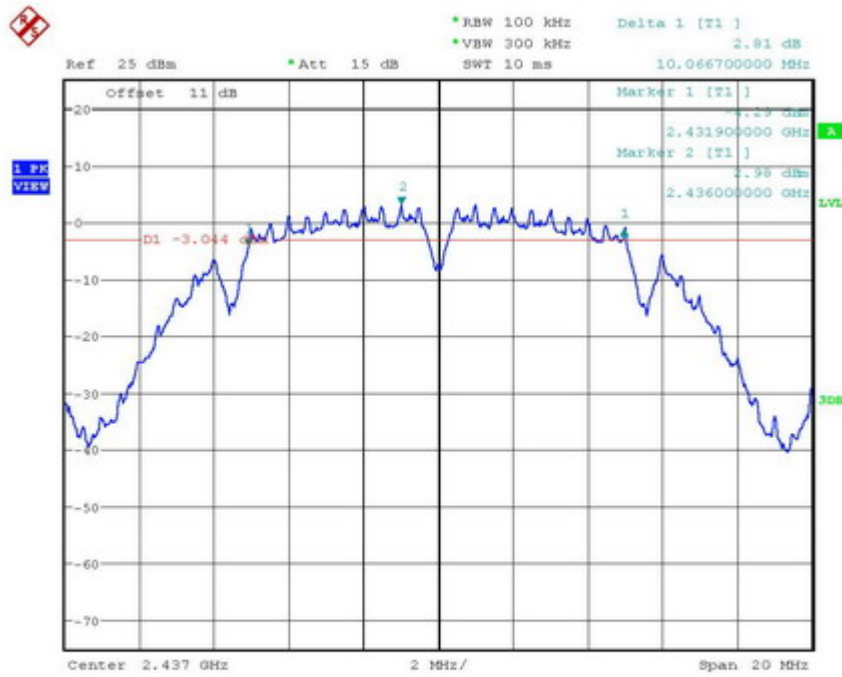


6DB BANDWIDTH 802.11B CH01  
Date: 10.FEB.2015 13:13:08

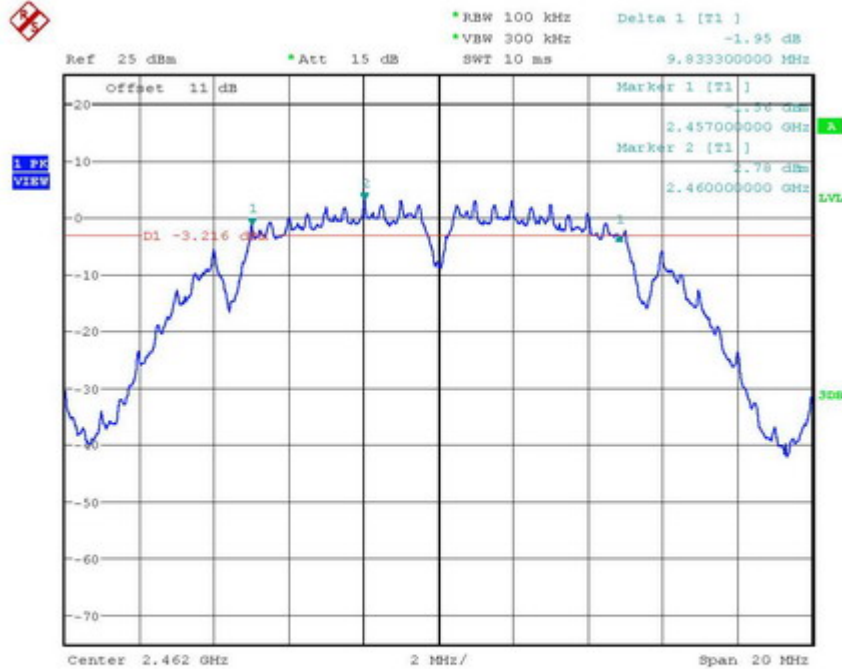


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



6DB BANDWIDTH 802.11B CH06  
Date: 10.FEB.2015 13:13:49

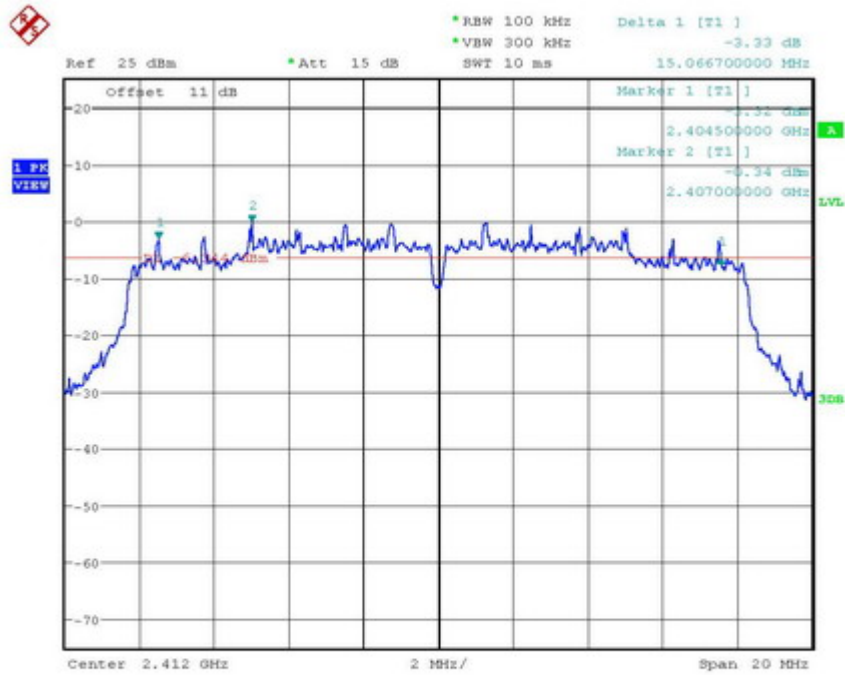


6DB BANDWIDTH 802.11B CH11  
Date: 10.FEB.2015 13:14:21

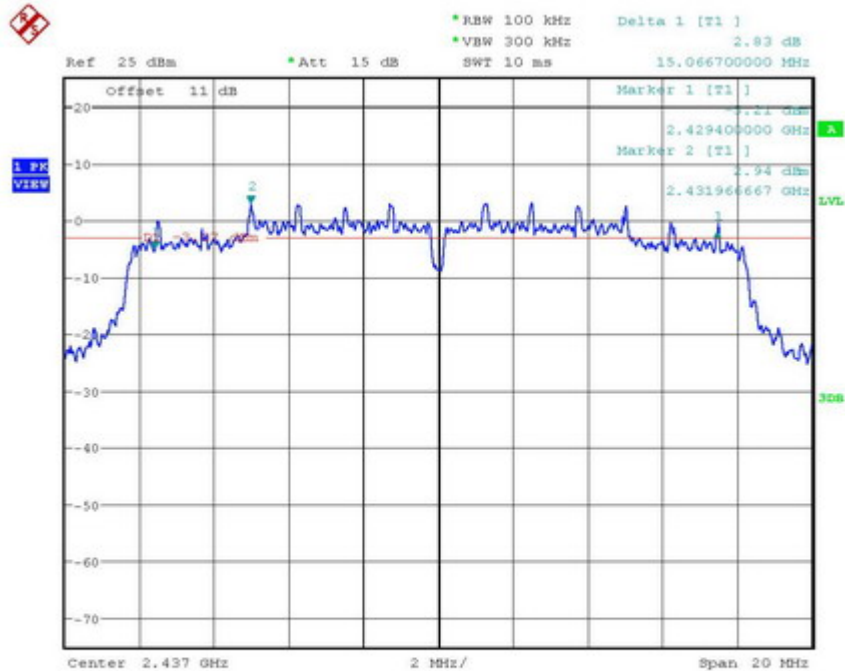


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Mode B



6DB BANDWIDTH 802.11G CH01  
Date: 10.FEB.2015 13:15:04

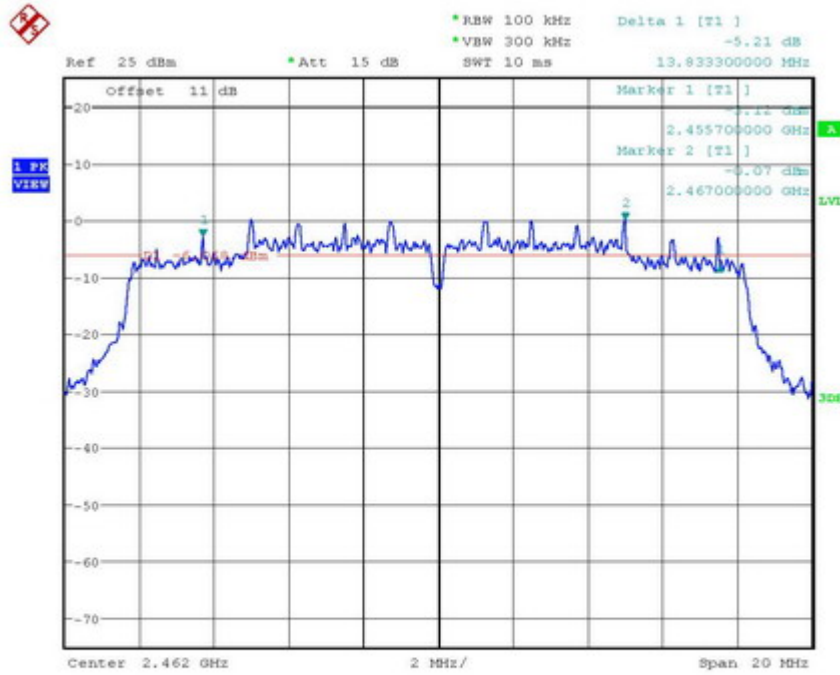


6DB BANDWIDTH 802.11G CH06  
Date: 10.FEB.2015 13:15:37



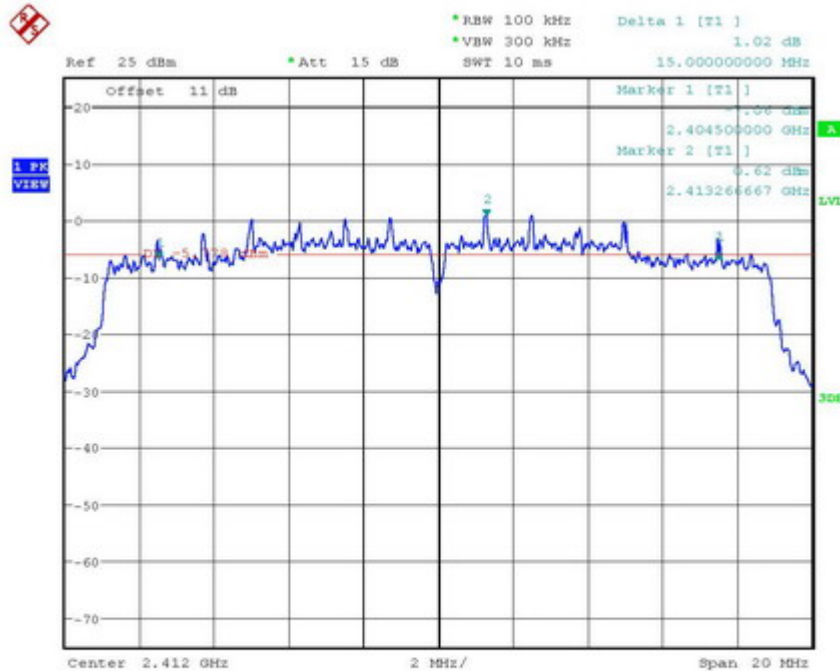


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



6DB BANDWIDTH 802.11G CH11  
Date: 10.FEB.2015 13:16:05

## Mode C

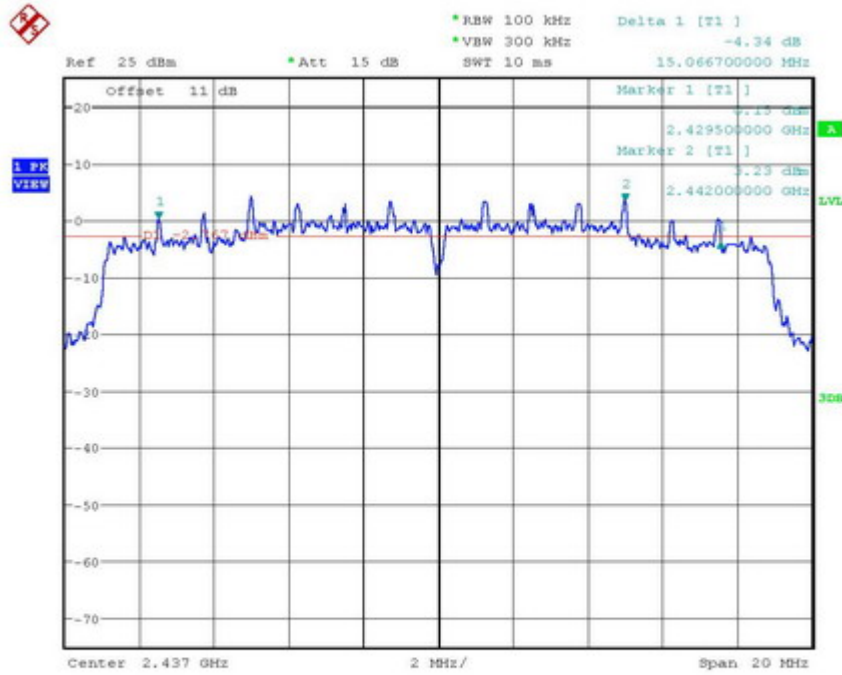


6DB BANDWIDTH 802.11N 20MHz CH01  
Date: 10.FEB.2015 13:16:42

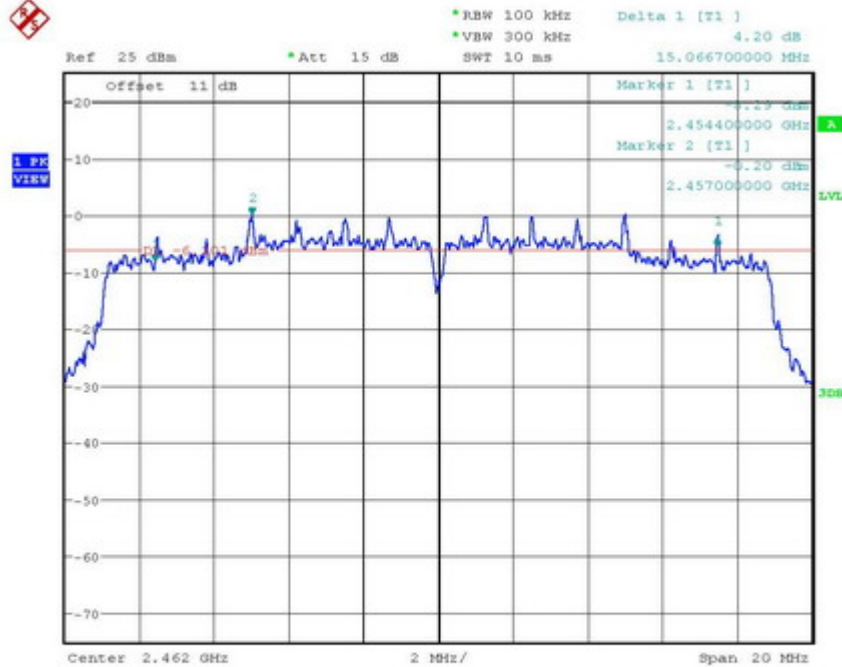


# Worldwide Testing Services(Taiwan) Co., Ltd.

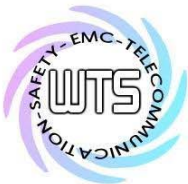
Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



6DB BANDWIDTH 802.11N 20MHZ CH06  
Date: 10.FEB.2015 13:17:17

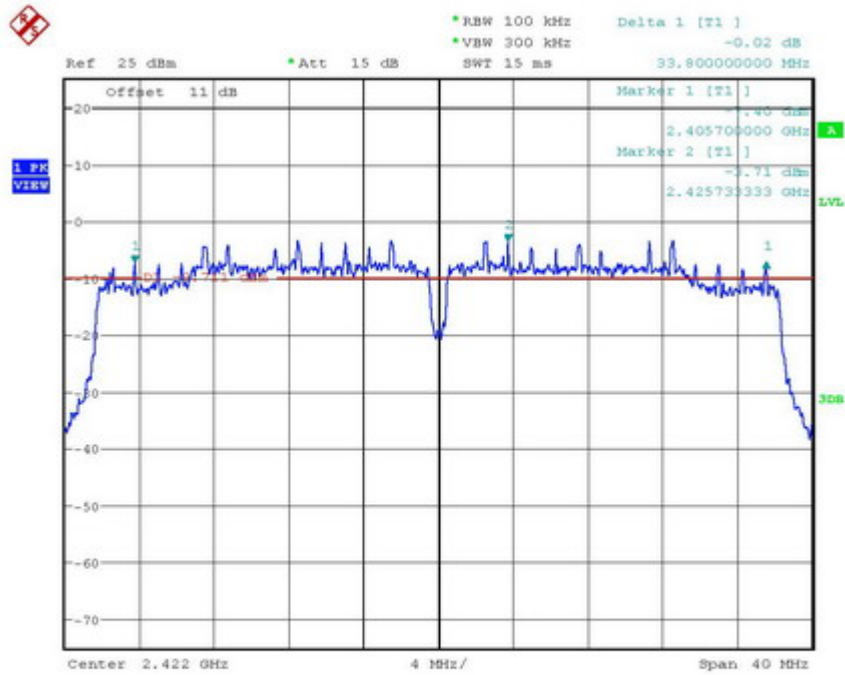


6DB BANDWIDTH 802.11N 20MHZ CH11  
Date: 10.FEB.2015 13:17:53

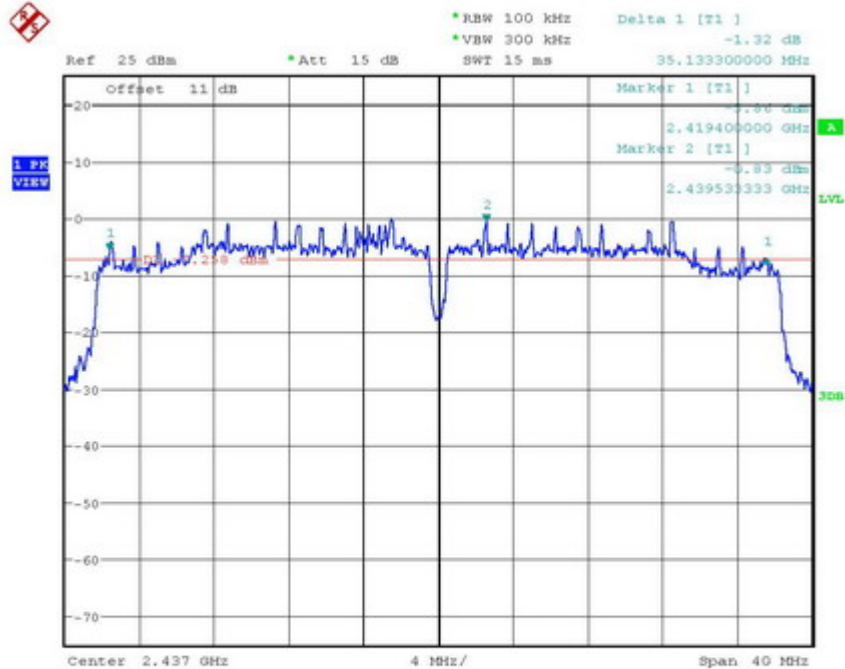


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

## Mode D



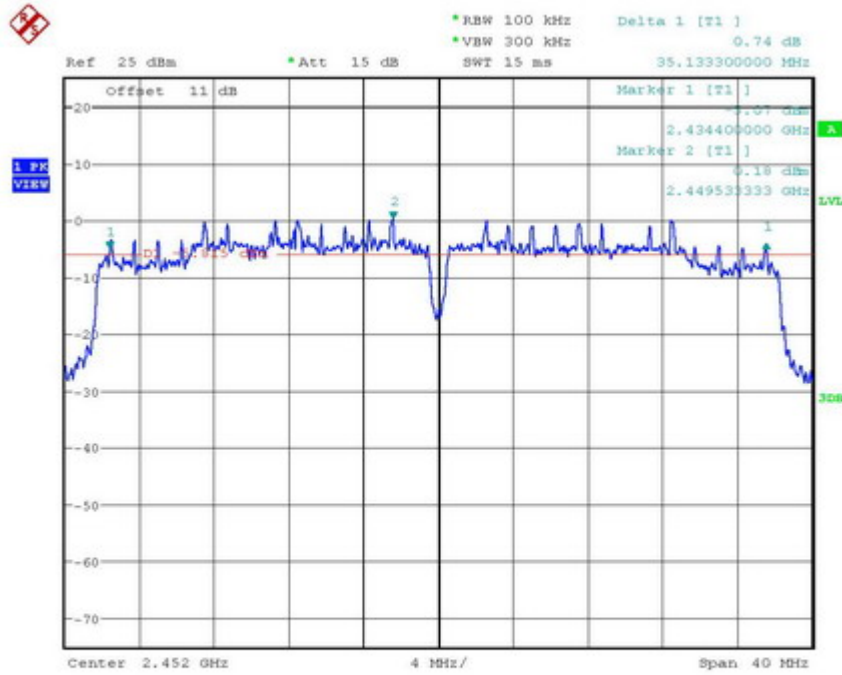
6DB BANDWIDTH 802.11N 40MHZ CH01  
Date: 10.FEB.2015 13:18:28



6DB BANDWIDTH 802.11N 40MHZ CH04  
Date: 10.FEB.2015 13:19:06

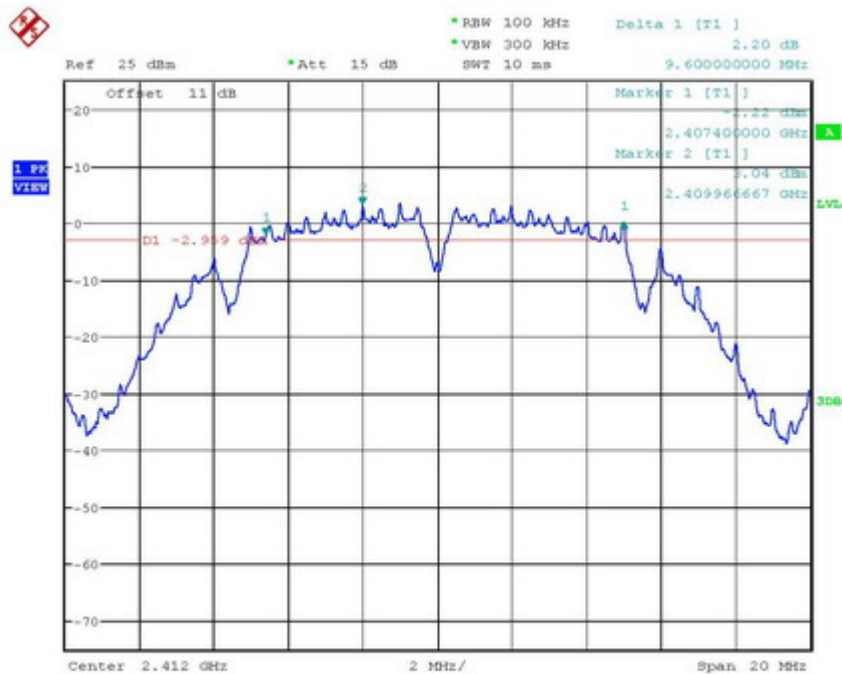


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



6DB BANDWIDTH 802.11N 40MHZ CH07  
Date: 10.FEB.2015 13:19:40

## Mode E

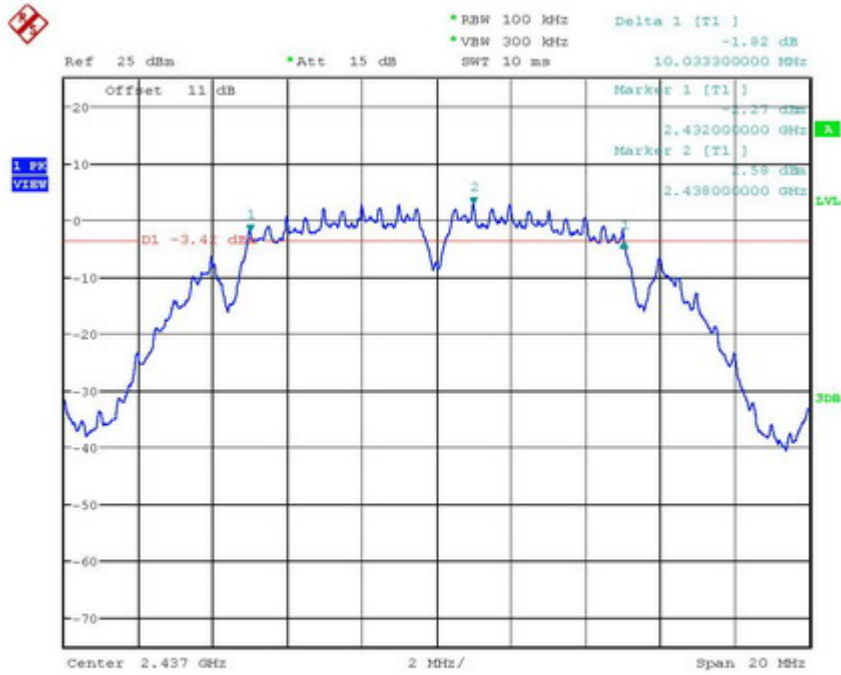


6DB BANDWIDTH 802.11B CH01  
Date: 10.FEB.2015 13:23:58

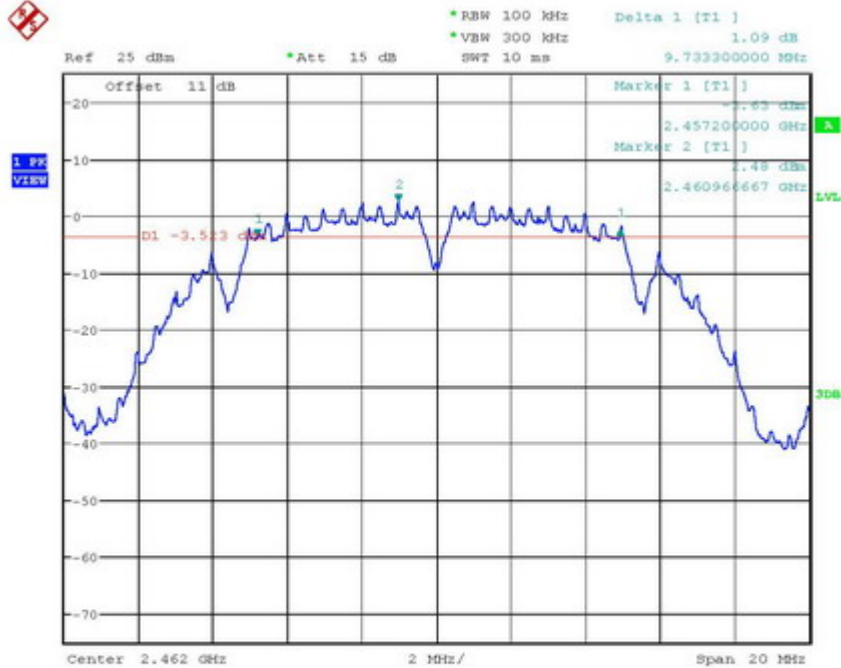


# Worldwide Testing Services(Taiwan) Co., Ltd.

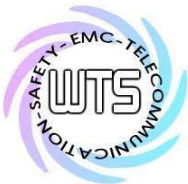
Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



6DB BANDWIDTH 802.11B CH06  
Date: 10.FEB.2015 13:24:30

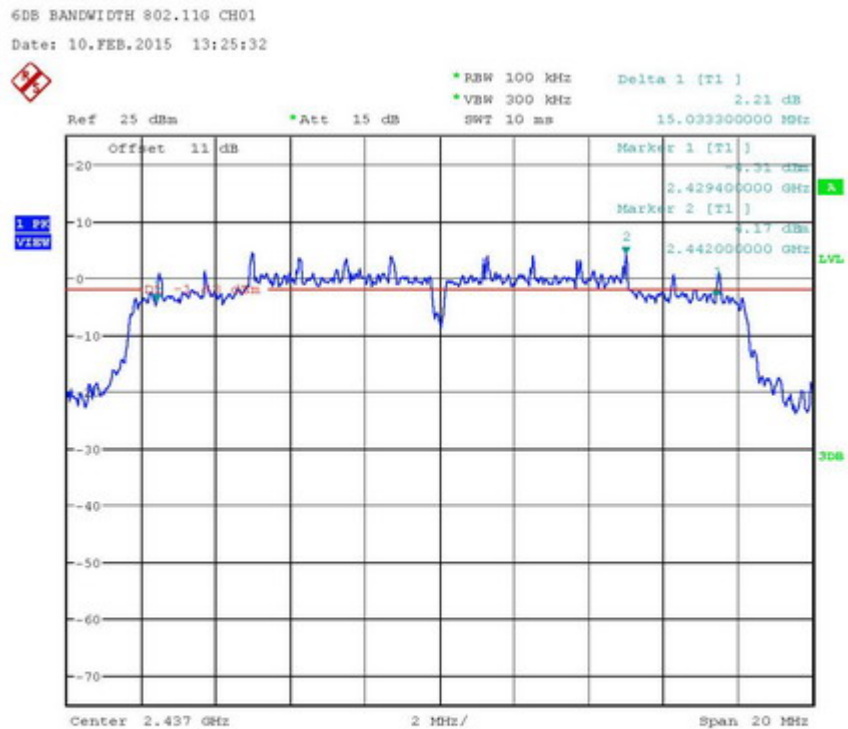
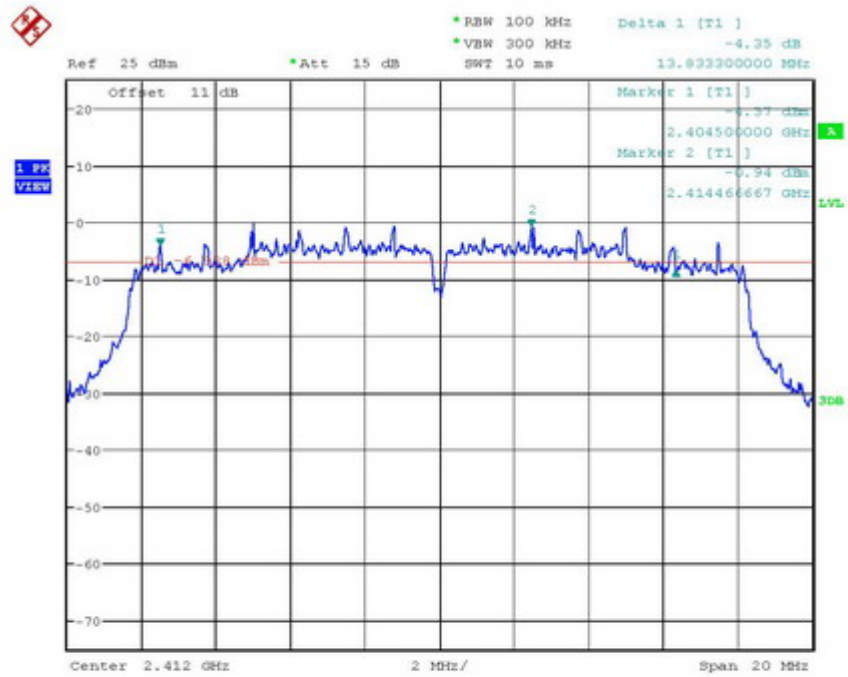


6DB BANDWIDTH 802.11B CH11  
Date: 10.FEB.2015 13:24:58



Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7

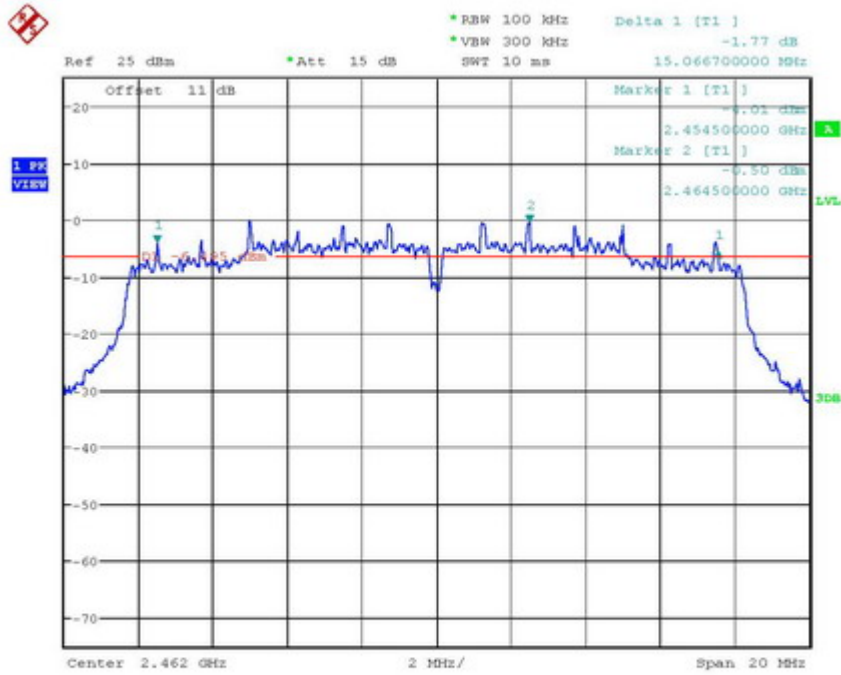
## Mode F



6DB BANDWIDTH 802.11G CH06  
Date: 10.FEB.2015 13:26:02

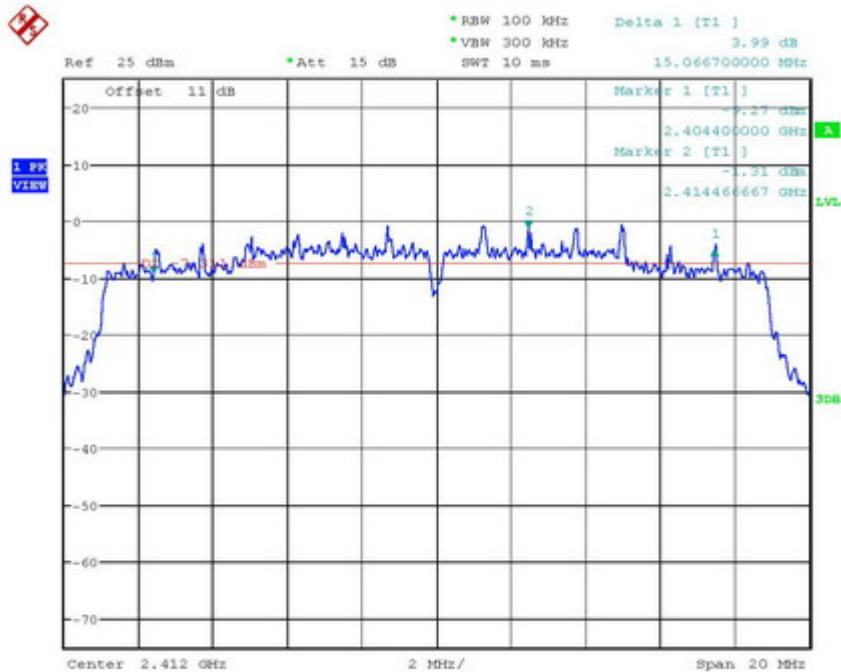


Registration number: W6M21411-14649-C-1  
FCC ID: IR5DB7



6DB BANDWIDTH 802.11G CH11  
Date: 10.FEB.2015 13:26:29

## Mode G

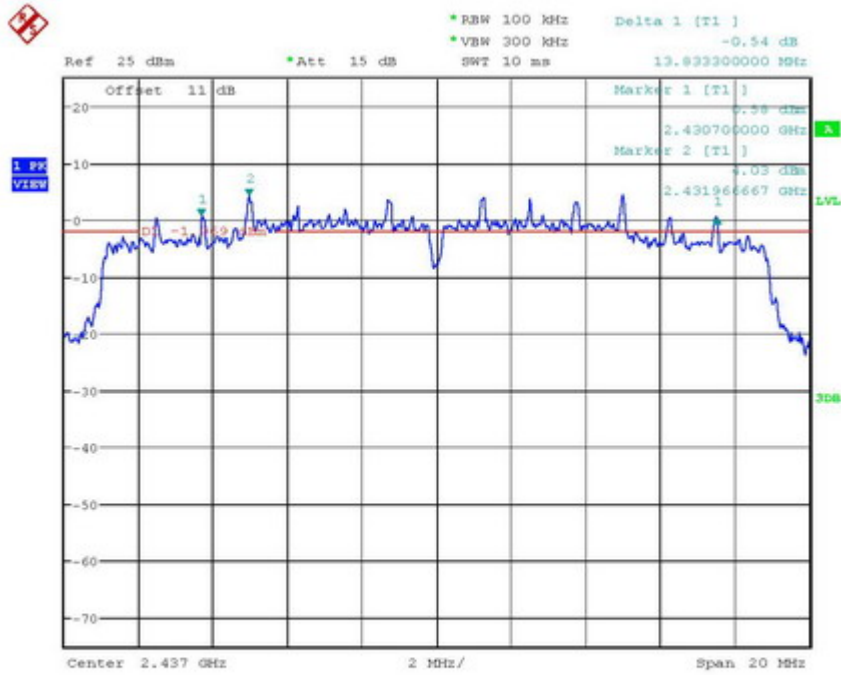


6DB BANDWIDTH 802.11N 20MHZ CH01  
Date: 10.FEB.2015 13:27:03

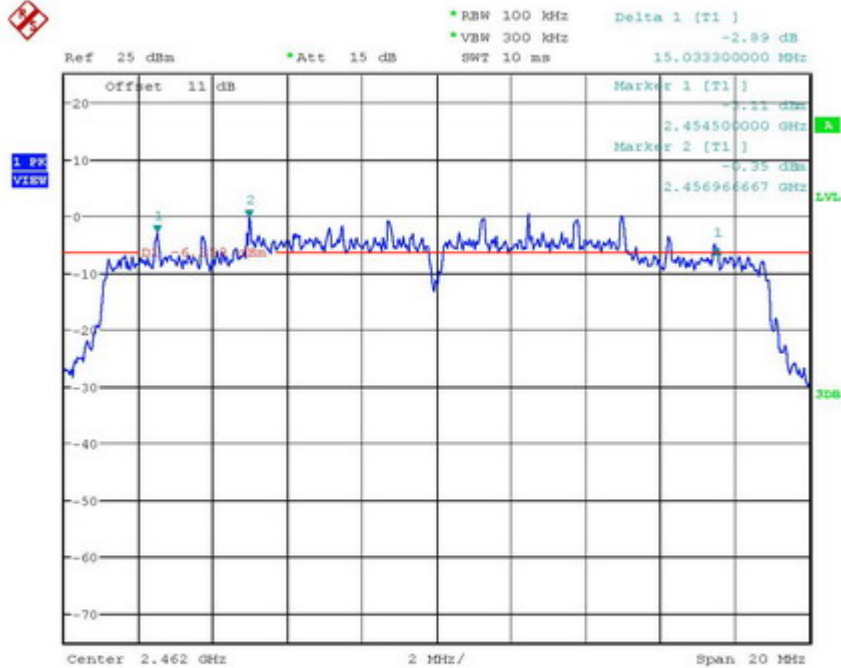


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21411-14649-C-1  
 FCC ID: IR5DB7



6DB BANDWIDTH 802.11N 20MHZ CH06  
 Date: 10.FEB.2015 13:27:37



6DB BANDWIDTH 802.11N 20MHZ CH11  
 Date: 10.FEB.2015 13:28:04