

FCC 15.247 2.4 GHz Test Report

for

Chungear Industrial Co., Ltd

**12 Jingke 8th Rd Nantun District Taichung
40852 Taiwan**

Product Name : Ceiling Fan Remote Controller
Model Name : MR101W
FCC ID : KUJCE10602

**Prepared by: : AUDIX Technology Corporation,
EMC Department**



TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION.....	4
1. REVISION RECORD OF TEST REPORT.....	5
2. SUMMARY OF TEST RESULTS.....	6
3. GENERAL INFORMATION.....	7
3.1. Description of Application.....	7
3.2. Description of EUT.....	8
3.3. EUT Specifications Assessed in Current Report.....	9
3.4. Antenna Information.....	10
3.5. Descriptions of Key Components.....	10
3.6. Data Rate Relative to Output Power.....	11
3.7. Test Configuration.....	12
3.8. Tested Supporting System List.....	13
3.9. Setup Configuration.....	14
3.10. Operating Condition of EUT.....	14
3.11. Description of Test Facility.....	15
3.12. Measurement Uncertainty.....	15
4. MEASUREMENT EQUIPMENT LIST.....	16
4.1. Conducted Emission Measurement.....	16
4.2. Radiated Emission Measurement.....	16
4.3. RF Conducted Measurement.....	16
5. CONDUCTED EMISSION.....	17
5.1. Block Diagram of Test Setup.....	17
5.2. Conducted Emission Limit.....	17
5.3. Test Procedure.....	18
5.4. Test Results.....	18
6. RADIATED EMISSION.....	19
6.1. Block Diagram of Test Setup.....	19
6.2. Radiated Emission Limits.....	20
6.3. Test Procedure.....	21
6.4. Measurement Result Explanation.....	22
6.5. Test Results.....	22
7. 6dB BANDWIDTH.....	23
7.1. Block Diagram of Test Setup.....	23
7.2. Specification Limits.....	23
7.3. Test Procedure.....	23
7.4. Test Results.....	23
8. MAXIMUM PEAK OUTPUT POWER.....	24
8.1. Block Diagram of Test Setup.....	24
8.2. Specification Limits.....	24
8.3. Test Procedure.....	25
8.4. Test Results.....	25
9. EMISSION LIMITATIONS.....	26
9.1. Block Diagram of Test Setup.....	26

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9.2. Specification Limits	26
9.3. Test Procedure	26
9.4. Test Results	27
10. POWER SPECTRAL DENSITY	28
10.1. Block Diagram of Test Setup	28
10.2. Specification Limits	28
10.3. Test Procedure	28
10.4. Test Results	28
11. DEVIATION TO TEST SPECIFICATIONS	29

APPENDIX A TEST DATA AND PLOTS

APPENDIX B TEST PHOTOGRAPHS

TEST REPORT CERTIFICATION

Applicant : Chungear Industrial Co., Ltd
Manufacturer #1 : Chungear Industrial Co., Ltd
Manufacturer #2 : Satellite Electronic (Zhongshan) Ltd.
Manufacturer #3 : Zhongshan Amity Electronic Ltd.
EUT Description
(1) Product : Ceiling Fan Remote Controller
(2) Model : MR101W
(3) Power Supply : AC 120V 60Hz

Applicable Standards:

47 CFR FCC Part 15 Subpart C
ANSI C63.10:2013
KDB 558074 D01 DTS Meas Guidance v04

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

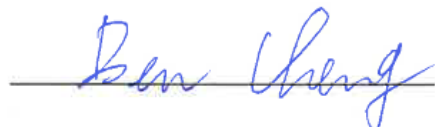
Date of Report: 2017. 09. 20

Reviewed by:



(Tina Huang/Administrator)

Approved by:



(Ben Cheng/Manager)

1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2017. 09. 20	Original Report	EM-F170604

2. SUMMARY OF TEST RESULTS

Rule	Description	Results
15.207	Conducted Emission	PASS
15.247(d)/15.205	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(2)	6dB Bandwidth	PASS
15.247(b)(3)	Maximum Peak Output	PASS
15.247(d)	Conducted Band Edges and Conducted Spurious Emission	PASS
15.247 (e)	Peak Power Spectral Density	PASS
15.203	Antenna Requirement	Compliance

3. GENERAL INFORMATION

3.1. Description of Application

Applicant	Chungear Industrial Co., Ltd 12 Jingke 8th Rd Nantun District Taichung 40852 Taiwan
Manufacture	#1 Chungear Industrial Co., Ltd 12 Jingke 8th Rd Nantun District Taichung 40852 Taiwan #2 Satellite Electronic (Zhongshan) Ltd. 8 CHUANG YE RD.TORCH DEVELOPMENT ZONE..ZHONGSHAN.GUANGDONG.528437 CHINA #3 Zhongshan Amity Electronic Ltd. No. 16 Torch Hi-Tech Industrial Development Zone, Zhong Shan City Guangdong Province China.
Product	Ceiling Fan Remote Controller
Model	MR101W

3.2. Description of EUT

Test Model	MR101W
Serial Number	N/A
Power Rating	AC 120V 60Hz
RF Features	WLAN: 802.11b/g/n-HT20 304MHz (RX only) NFC (Passive)
Transmit Type	1T1R
Sample Status	Production
Date of Receipt	2017. 07. 13
Date of Test	2017. 09. 11 ~ 18
I/O Ports List	• AC power cable x2 (Unshielded, Undetachable, 0.1m) • Light cable x1 (Unshielded, Undetachable, 0.1m) • Fan cable x2 (Unshielded, Undetachable, 0.1m) • Antenna cable (For 304MHz) x1 • WIFI Antenna cable (For 2.4GHz) x1
Accessories Supplied	None

3.3. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number
802.11b	2412-2462	11
802.11g		11
802.11n-HT20		11

Mode	Modulation	Data Rate (Mbps)
802.11b	DSSS (DBPSK/DQPSK/CCK)	Up to 11
802.11g	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 54
802.11n-HT20		Up to 72.2

Channel List	
802.11 b/g/n-HT20	
Channel Number	Frequency (MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

RMS Output Power (dBm)			
Channel	802.11b	802.11g	802.11n-HT20
1	14.26	10.91	10.71
2	14.33	10.98	10.78
3	14.51	11.13	10.81
4	14.68	11.31	10.86
5	14.73	11.48	10.94
6	14.96	11.53	11.01
7	14.92	11.58	11.04
8	14.94	11.67	11.18
9	14.86	11.84	11.24
10	14.91	11.89	11.36
11	14.95	11.96	11.39

3.4. Antenna Information

Antenna					
No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	5002170	ETHERTRONICS, INC.	PCB	2400-2500	3.4

Second Source Antenna					
No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	290-80076	HONGBO Telecommunication	PCB	2400-2500	1.82

3.5. Descriptions of Key Components

None.

3.6. Data Rate Relative to Output Power

802.11b			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)
1	DBPSK	1	17.75
1	DQPSK	2	17.58
1	CCK	5.5	17.64
1	CCK	11	17.72
802.11g			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)
1	BPSK	6	23.23
1	BPSK	9	23.11
1	QPSK	12	23.18
1	QPSK	18	23.08
1	16-QAM	24	23.15
1	16-QAM	36	23.17
1	64-QAM	48	23.09
1	64-QAM	54	23.14
802.11n-HT20			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)
1	BPSK	MCS0	21.66
1	QPSK	MCS1	21.54
1	QPSK	MCS2	21.49
1	16-QAM	MCS3	21.56
1	16-QAM	MCS4	21.59
1	64-QAM	MCS5	21.62
1	64-QAM	MCS6	21.48
1	64-QAM	MCS7	21.53

Note: Above results are assessed in peak power.

3.7. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
802.11b	0.92	1.305	0.36
802.11g	0.66	0.24	1.80
802.11n-HT20	0.94	1.91	0.27

Note: When duty cycle is less than 98% (0.98) that duty cycle factor $10\log(1/x)$ is needed to add in conducted test items measured in average detector.

AC Conduction	
Test Case	Normal operation

Item		Mode	Data Rate	Antenna P/N	Test Channel
Radiated Test Case	Radiated Band Edge ^{Note1}	802.11b	1Mbps	5002170	1/11
		802.11g	6Mbps		1/11
		802.11n-HT20	MCS1		1/11
		802.11b	1Mbps	290-80076	1/11
		802.11g	6Mbps		1/11
		802.11n-HT20	MCS1		1/11
	Radiated Spurious Emission ^{Note1 & 2}	802.11b	1 Mbps	5002170	11
		802.11g	6Mbps		11
		802.11n-HT20	MCS1		11
		802.11b	1 Mbps	290-80076	11
		802.11g	6Mbps		11
		802.11n-HT20	MCS1		11
Conducted Test Case	6dB Bandwidth	802.11b	1Mbps		1/6/11
		802.11g	6Mbps		1/6/11
		802.11n-HT20	MCS1		1/6/11
	Peak Power Spectral Density	802.11b	1Mbps		1/6/11
		802.11g	6Mbps		1/6/11
		802.11n-HT20	MCS1		1/6/11
	Peak Output Power	802.11b	1Mbps		1/6/11
		802.11g	6Mbps		1/6/11
		802.11n-HT20	MCS1		1/6/11
	Band Edge	802.11b	1Mbps		1/11
		802.11g	6Mbps		1/11
		802.11n-HT20	MCS1		1/11
	Spurious Emission	802.11b	1Mbps		1/6/11
		802.11g	6Mbps		1/6/11
		802.11n-HT20	MCS1		1/6/11

Note 1:

■ Mobile Device

☐ Portable Device, and 3 axis were assessed.

☐ Lie

☐ Side

☐ Stand

Note 2: Low, mid, and high channels were measured, only the worst channel of each modulation was presented in this report.

3.8. Tested Supporting System List

3.8.1. Support Peripheral Unit

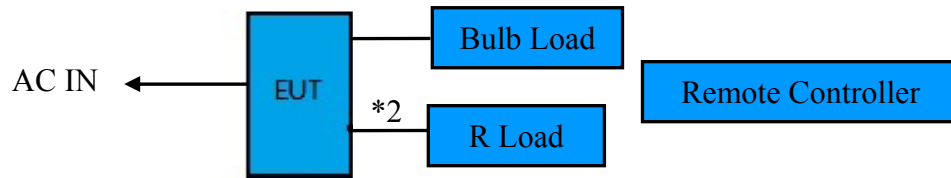
No.	Product	Brand	Model No.	Serial No.	Approval
AC Power Line Test					
1.	R Load (150W, 100Ω)	N/A	N/A	N/A	N/A
2.	Bulb Load(100W)	N/A	N/A	N/A	N/A
3.	Remote Controller	Chungear	TR262A	N/A	N/A
Radiated Emission and RF Conducted					
1.	Notebook PC	ASUS	X5502E	N/A	Contains FCC ID: PPD-AAR5B225
2.	Test Jig	N/A	N/A	N/A	N/A
3.	Isolation Transformer Set	Chungear	N/A	N/A	N/A

3.8.2. Cable Lists

No.	Cable Description Of The Above Support Units
AC Power Line Test	
1.	Cable*2: Unshielded, Detachable, 0.3m
2.	Cable*1: Unshielded, Detachable, 1.0m
3.	AC Power Cable: Unshielded, Detachable, 1.5m
Radiated Emission and RF Conducted	
1.	USB Cable: Unshielded, Detachable, 1.2m Adapter: Enerironix, M/N EXA1208UH, DC Cord: Shielded, Undetachable, 1.8m, Bonded a ferrite core AC Power Cord: Unshielded, Detachable, 1.8m
2.	Cable: Unshielded, Detachable, 0.5m
3.	Power Cord: Unshielded, Detachable, 1.5m
4.	Power Cable: Unshielded, Detachable, 0.3m

3.9. Setup Configuration

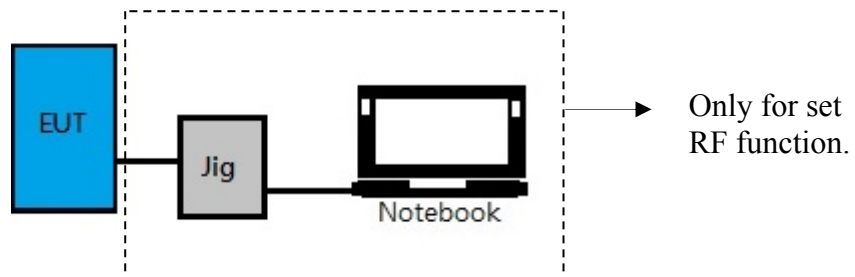
3.9.1. EUT Configuration for AC Power Line



3.9.2. EUT Configuration for Radiated Emission



3.9.3. EUT Configuration for RF Conducted Test Items



3.10. Operating Condition of EUT

Test program “teraterm” is used for enabling EUT WLAN function under continues transmitting and choosing data rate/ channel.

3.11. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: sales@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation No. TW1004 & TW1090 & TW1724
Test Facilities	(1) No. 8 Shielding Room (2) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (3) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4)

3.12. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.50dB
Radiation Test (Distance: 3m)	30MHz~1000MHz	± 3.68dB
	Above 1GHz	± 5.98dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Maximum peak output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Test Receiver	R&S	ESR3	101772	2017. 01. 18	1 Year
2.	A.M.N.	Kyoritsu	KNW-244C	8-1373-5	2017. 04. 14	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-1370-9	2017. 02. 20	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	100041	2017. 01. 16	1 Year
5.	Test Software	Audix	e3	V.120703a	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2017. 09. 13	1 Year
2.	Spectrum Analyzer	Agilent	E4446A	US44300366	2017. 08. 23	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2017. 06. 19	1 Year
4.	Amplifier	HP	8447D	2944A06305	2017. 02. 16	1 Year
5.	Amplifier	Sonoma	310N	187161	2017. 06. 08	1 Year
6.	Bilog Antenna	CHASE	CBL6112D	33821	2017. 01. 21	1 Year
7.	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2017. 03. 08	1 Year
8.	Horn Antenna	COM-POWER	AH-840	101092	2017. 05. 04	1 Year
9.	2.4GHz Notch Filter	K&L	7NSL10-244 1.5E130.5-00	1	2017. 07. 26	1 Year
10.	3GHz Notch Filter	Microwave	H3G018G1	484798	2017. 08. 25	1 Year
11.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-507	MY52220264	2017. 08. 10	1 Year
2.	Power Meter	Anritsu	ML2495A	1145008	2016. 10. 27	1 Year
3.	Power Sensor	Anritsu	MA2411B	1126096	2016. 10. 27	1 Year

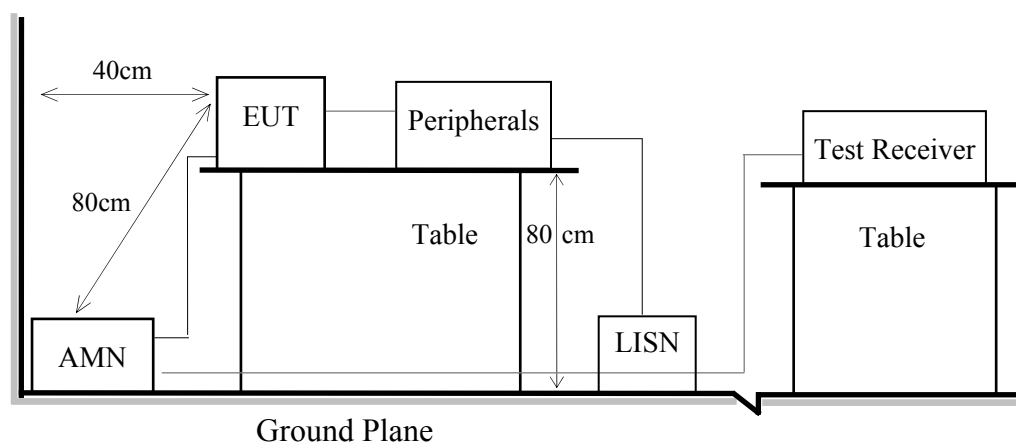
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.9

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C 63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Test Results

Please refer to Appendix A.

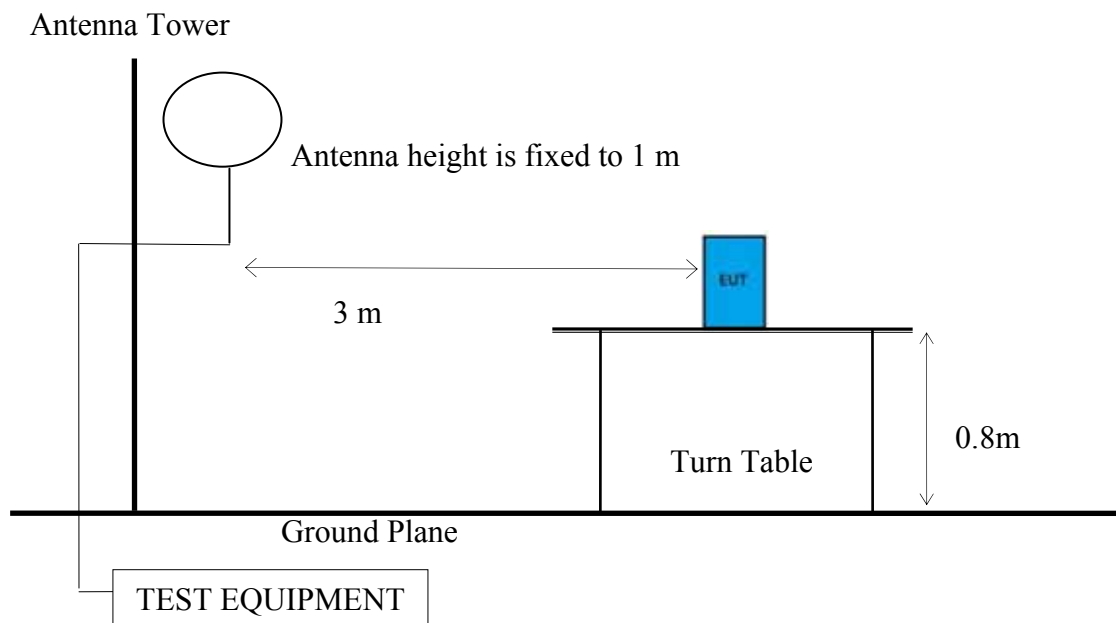
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

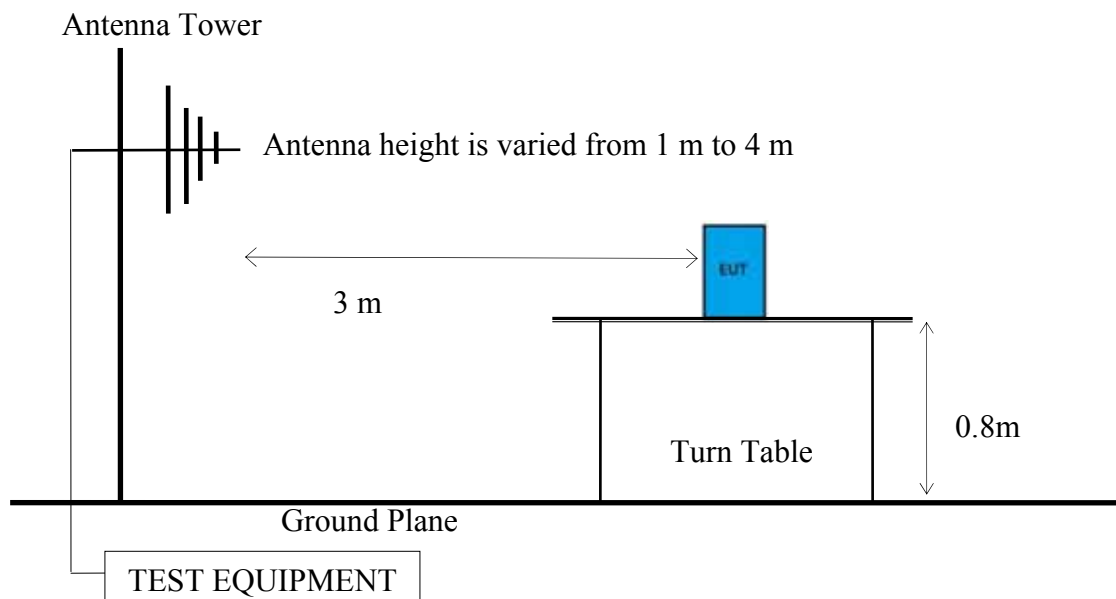
6.1.1. Block Diagram of EUT

Indicated as section 3.9

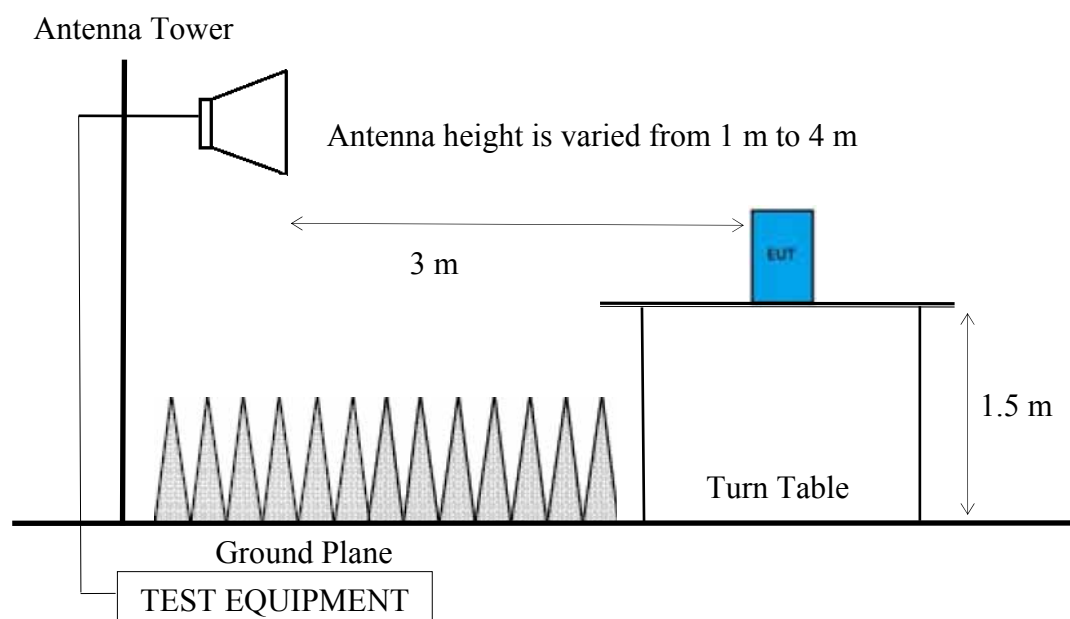
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205 must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance (m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6	2400/kHz
0.490 - 1.705	30	87.6	24000/kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn find table which has 80 cm (for 30-1000 MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic (up to 25 GHz):

Peak Detector:

- (1) RBW = 1MHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average detector for finally measurement.

Average Detector:**■ Option 1:**

(1) RBW = 1MHz

(2) VBW $\geq 1/T$.

Modulation Type	T (ms)	1/T (kHz)	VBW Setting (kHz)
802.11b	1.305	0.766	0.75
802.11g	0.24	4.167	4.3
802.11n-HT20	1.91	0.524	0.51

N/A: 1/T is not implemented when duty cycle presented in section 3.7 is $\geq 98\%$.

(1) Detector = Peak.

(2) Sweep time = auto.

(3) Trace mode = max hold.

(4) Allow sweeps to continue until the trace stabilizes.

□ Option 2:

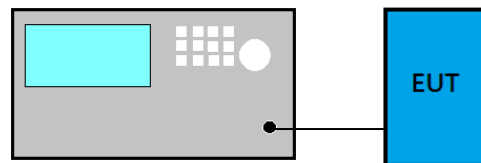
Average Emission Level = Peak Emission Level + D.C.C.F.

6.4. Measurement Result Explanation**■** Peak Emission Level = Antenna Factor + Cable Loss + Meter Reading**■** Average Emission Level = Antenna Factor + Cable Loss + Meter Reading**□** Average Emission Level = Peak Emission Level + DCCFDuty Cycle Correction Factor (DCCF) = $20\log(TX_{on}/TX_{on+off})$ presented in section 3.7**□** ERP = Peak Emission Level - 95.2dB - 2.14dB**6.5. Test Results**

Please refer to Appendix A.

7. 6dB BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

The minimum 6dB bandwidth shall be at least 500kHz.

7.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

8. MAXIMUM PEAK OUTPUT POWER

8.1. Block Diagram of Test Setup



8.2. Specification Limits

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1 Watt. (30dBm)

8.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

■ PKPM1 Peak power meter method:

EUT is connected to power sensor and record the maximum output power.

□ Method AVGPM (Measurement using an RF average power meter):

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

□ Method AVGSA-2 (Spectrum channel power)

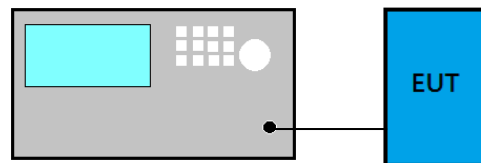
- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 -5% of OBW
- (3) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
- (8) Duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

8.4. Test Results

Please refer to Appendix A

9. EMISSION LIMITATIONS

9.1. Block Diagram of Test Setup



9.2. Specification Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in 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)).

9.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

■ Reference Level

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max PSD as reference level.

■ Emission Level Measurement

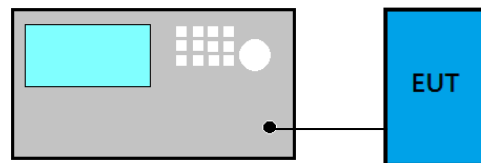
- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to: 100 kHz.
- (4) Set the VBW $\geq 3 \times$ RBW.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize to find the max level.

9.4. Test Results

Please refer to Appendix A

10. POWER SPECTRAL DENSITY

10.1. Block Diagram of Test Setup



10.2. Specification Limits

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

10.3. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v04:

■ Method PKPSD (peak PSD)

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth.
- (3) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- (4) Set the VBW $\geq 3 \times \text{RBW}$.
- (5) Detector = peak.
- (6) Sweep time = auto couple.
- (7) Trace mode = max hold.
- (8) Allow trace to fully stabilize.
- (9) Use the peak marker function to determine the maximum amplitude level.
- (10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

□ Method AVGPSD-2

- (1) Using peak PSD procedure step 1 to step 4.
- (2) Detector = RMS detector
- (3) Sweep time = auto couple
- (4) Trace mode = trace averaging over a minimum of 100 traces
- (5) Use the peak marker function to determine the maximum amplitude level.
- (6) Duty cycle factor is added when duty cycle presented in section 3.7 < 98%.
- (7) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

10.4. Test Results

Please refer to Appendix A

11.DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPENDIX A

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APPDNDIX A

TEST DATA AND PLOTS

(Model: MR101W)

TABLE OF CONTENTS

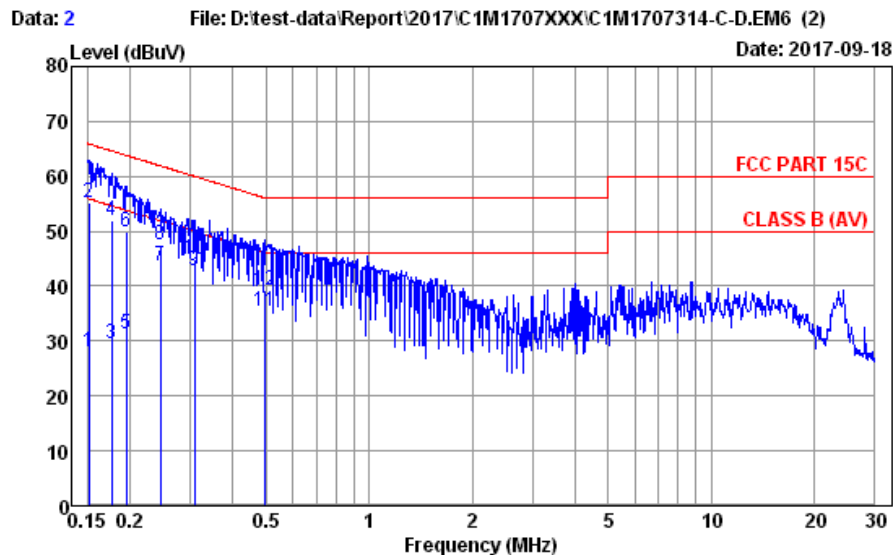
A.1 CONDUCTED EMISSION	2
A.2 RADIATED EMISSION	4
A.2.1 Emissions within Restricted Frequency Bands.....	4
A.2.2 Emissions outside the frequency band:.....	30
A.2.3 Emissions in Non-restricted Frequency Bands:.....	33
A.3 6dB BANDWIDTH	34
A.3.1 6dB Bandwidth Result.....	34
A.3.2 Measurement Plots	35
A.4 MAXIMUM PEAK OUTPUT POWER	37
A.4.1 Peak Output Power	37
A.4.2 Average Output Power (Reporting only).....	37
A.5 EMISSION LIMITATIONS	38
A.6 POWER SPECTRAL DENSITY	47
A.6.1 Power Spectral Density Result	47
A.6.2 Measurement Plots	48

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A.1 CONDUCTED EMISSION

Test Date	2017/09/18	Temp./Hum.	24°C/42%
Test Voltage	AC 120V, 60Hz		

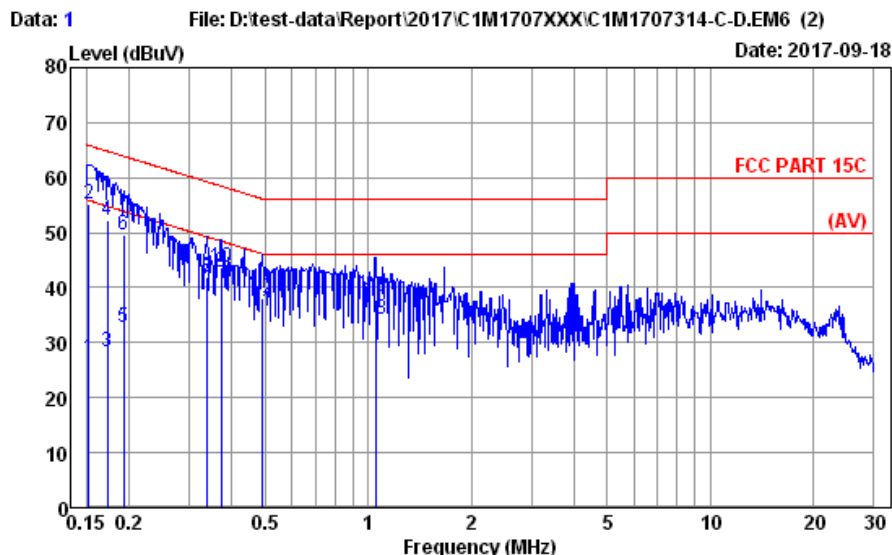


Site no. : No.3 Shielded Room Data no. : 2
Condition : KMW-244C 8-1373-5 LISN Phase : NEUTRAL
Limit : FCC PART 15C
Env. / Ins. : 24°C / 42% ESR3 (101772) Engineer : Fate LO
EUT : MR101W
Power Rating : 120Vac / 60Hz
Test Mode : FULL SYSTEM(OPERATING)

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.152	0.15	0.03	9.86	17.87	27.91	55.91	28.00	Average
2	0.152	0.15	0.03	9.86	45.09	55.13	65.91	10.78	QP
3	0.177	0.14	0.03	9.86	19.63	29.66	54.64	24.98	Average
4	0.177	0.14	0.03	9.86	41.90	51.93	64.64	12.71	QP
5	0.195	0.14	0.03	9.86	21.13	31.16	53.80	22.64	Average
6	0.195	0.14	0.03	9.86	39.80	49.83	63.80	13.97	QP
7	0.246	0.14	0.03	9.86	33.65	43.68	51.90	8.22	Average
8	0.246	0.14	0.03	9.86	37.43	47.46	61.90	14.44	QP
9	0.310	0.13	0.04	9.86	32.70	42.73	49.98	7.25	Average
10	0.310	0.13	0.04	9.86	34.84	44.87	59.98	15.11	QP
11	0.494	0.13	0.04	9.86	25.54	35.57	46.11	10.54	Average
12	0.494	0.13	0.04	9.86	29.33	39.36	56.11	16.75	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

Test Date	2017/09/18	Temp./Hum.	24°C/42%
Test Voltage	AC 120V, 60Hz		



Site no. : No.3 Shielded Room Data no. : 1
Condition : KMW-244C 8-1373-5 LISN Phase : LINE
Limit : FCC PART 15C
Env. / Ins. : 24°C / 42% ESR3 (101772) Engineer : Fate LO
EUT : MR101W
Power Rating : 120Vac / 60Hz
Test Mode : FULL SYSTEM(OPERATING)

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.152	0.04	0.03	9.86	17.23	27.16	55.87	28.71	Average
2	0.152	0.04	0.03	9.86	45.16	55.09	65.87	10.78	QP
3	0.173	0.03	0.03	9.86	18.46	28.38	54.81	26.43	Average
4	0.173	0.03	0.03	9.86	42.34	52.26	64.81	12.55	QP
5	0.193	0.02	0.03	9.86	22.82	32.73	53.89	21.16	Average
6	0.193	0.02	0.03	9.86	39.62	49.53	63.89	14.36	QP
7	0.339	0.02	0.04	9.86	31.81	41.73	49.22	7.49	Average
8	0.339	0.02	0.04	9.86	32.03	41.95	59.22	17.27	QP
9	0.371	0.02	0.04	9.86	32.83	42.75	48.47	5.72	Average
10	0.371	0.02	0.04	9.86	33.72	43.64	58.47	14.83	QP
11	0.491	0.02	0.04	9.86	25.89	35.81	46.14	10.33	Average
12	0.491	0.02	0.04	9.86	28.19	38.11	56.14	18.03	QP
13	1.049	0.04	0.05	9.86	24.37	34.32	46.00	11.68	Average
14	1.049	0.04	0.05	9.86	27.89	37.84	56.00	18.16	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

A.2 RADIATED EMISSION

Test Date	2017/09/15	Temp./Hum.	23°C/51%
Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)		

A.2.1 Emissions within Restricted Frequency Bands

A.2.1.1 Frequency 9kHz~30MHz

The emissions (9kHz~30MHz) not reported for there is no emission be found.

A.2.1.2 Frequency Below 1 GHz

Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
116.33	18.59	2.46	10.70	31.75	43.50	11.75	Peak
252.13	19.17	3.83	11.66	34.66	46.00	11.34	Peak
401.51	22.09	5.57	14.19	41.85	46.00	4.15	Peak
617.82	24.69	6.82	3.32	34.83	46.00	11.17	Peak
849.65	26.39	7.90	1.23	35.52	46.00	10.48	Peak
957.32	27.42	8.57	2.55	38.54	46.00	7.46	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
116.33	18.59	2.46	10.98	32.03	43.50	11.47	Peak
326.82	20.25	4.68	3.19	28.12	46.00	17.88	Peak
456.80	22.72	6.08	6.58	35.38	46.00	10.62	Peak
594.54	24.58	6.74	7.33	38.65	46.00	7.35	Peak
812.79	26.04	7.68	2.08	35.80	46.00	10.20	Peak
962.17	27.46	8.59	1.42	37.47	54.00	16.53	Peak

Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
116.33	18.59	2.46	10.18	31.23	43.50	12.27	Peak
344.28	20.72	4.90	5.83	31.45	46.00	14.55	Peak
394.72	21.94	5.50	14.89	42.33	46.00	3.67	Peak
558.65	24.06	6.62	5.87	36.55	46.00	9.45	Peak
659.53	24.78	6.95	5.37	37.10	46.00	8.90	Peak
968.96	27.52	8.63	1.74	37.89	54.00	16.11	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
116.33	18.59	2.46	11.67	32.72	43.50	10.78	Peak
325.85	20.21	4.66	4.05	28.92	46.00	17.08	Peak
385.99	21.76	5.41	7.60	34.77	46.00	11.23	Peak
589.69	24.50	6.72	11.62	42.84	46.00	3.16	Peak
740.04	25.31	7.30	4.10	36.71	46.00	9.29	Peak
992.24	27.76	8.79	1.69	38.24	54.00	15.76	Peak

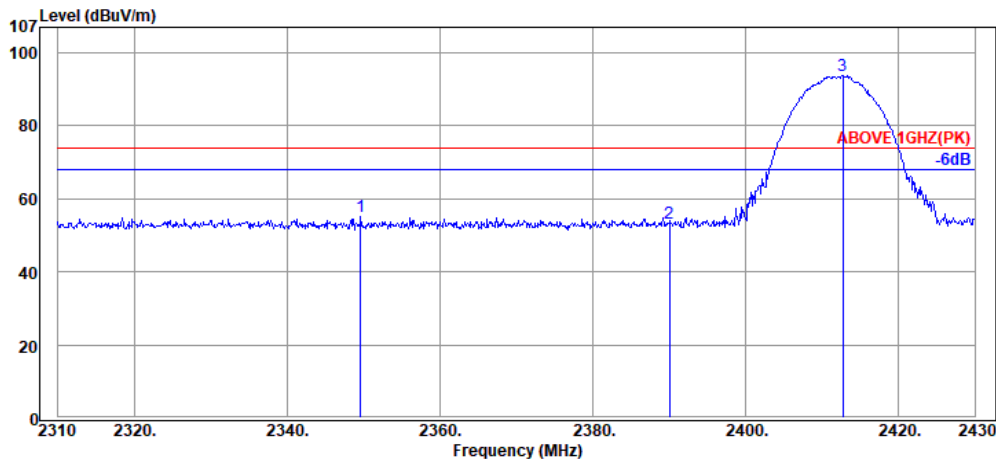
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A.2.1.3 Frequency Above 1 GHz to 10th harmonics

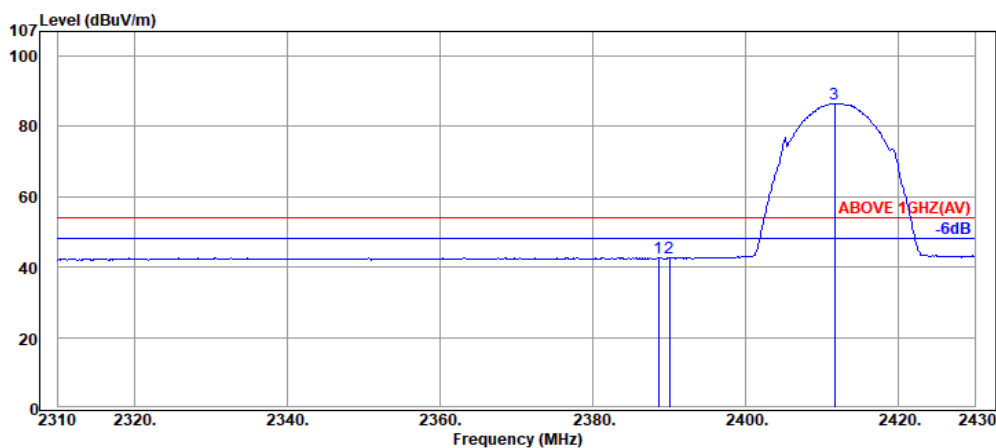
Band Edge:

Mode	802.11b	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2349.60	32.08	6.51	16.39	54.98	74.00	19.02	Peak
2390.04	32.16	6.57	14.54	53.27	74.00	20.73	Peak
2412.72	32.18	6.59	54.98	93.75	---	---	Peak



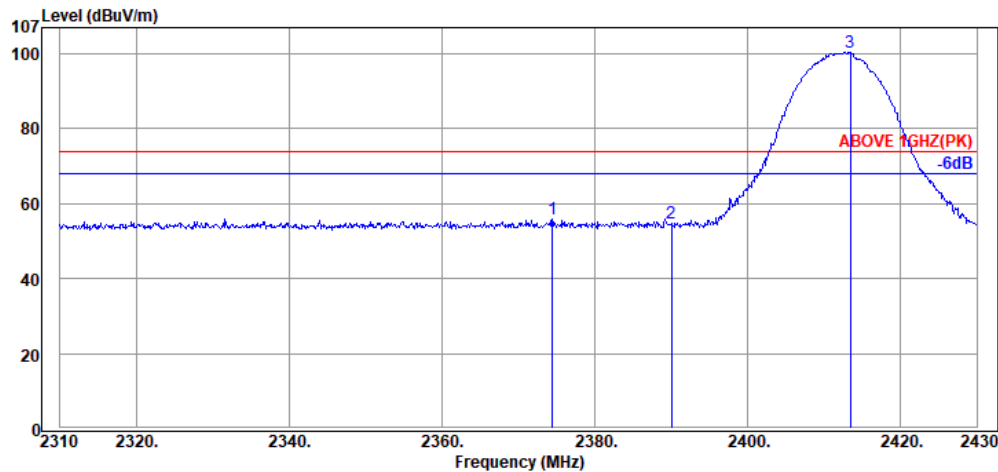
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2388.60	32.16	6.57	4.07	42.80	54.00	11.20	Average
2390.04	32.16	6.57	3.81	42.54	54.00	11.46	Average
2411.64	32.18	6.59	47.66	86.43	---	---	Average

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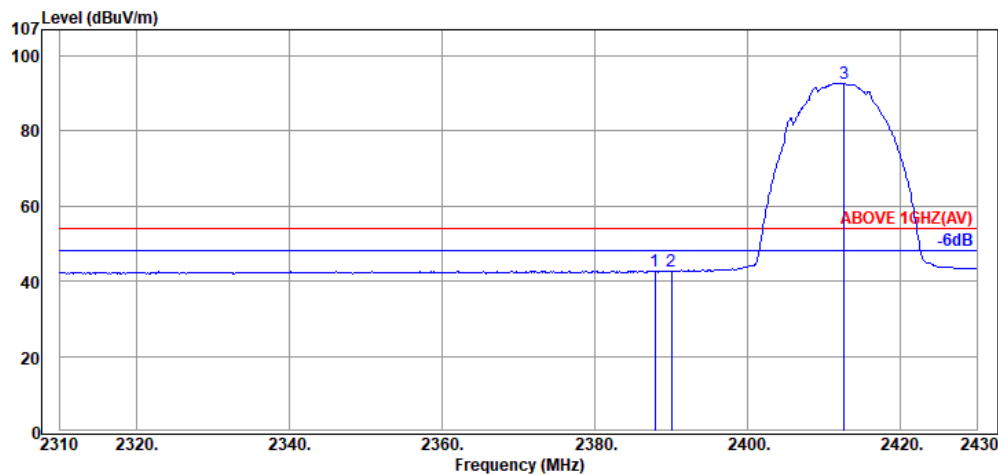
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Mode	802.11b	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2374.44	32.13	6.55	17.15	55.83	74.00	18.17	Peak
2390.04	32.16	6.57	16.18	54.91	74.00	19.09	Peak
2413.44	32.18	6.59	61.75	100.52	---	---	Peak



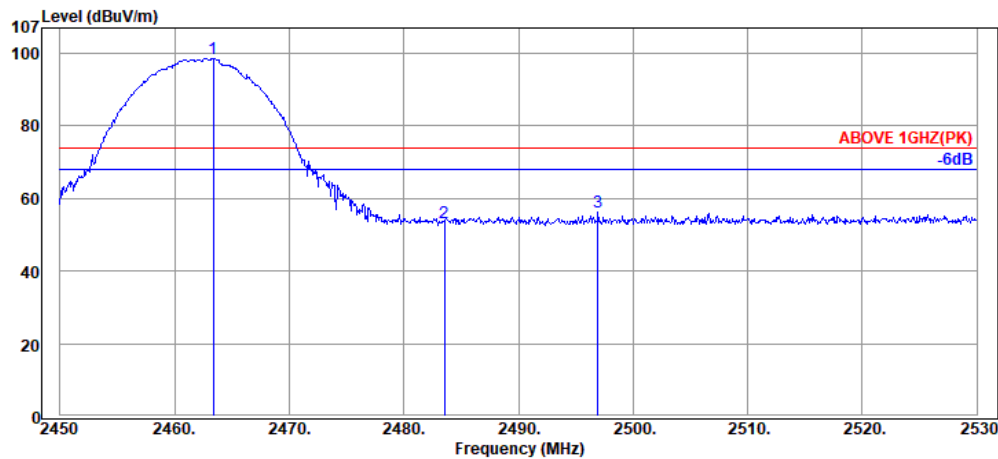
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.88	32.16	6.57	4.02	42.75	54.00	11.25	Average
2390.04	32.16	6.57	3.90	42.63	54.00	11.37	Average
2412.60	32.18	6.59	53.88	92.65	---	---	Average

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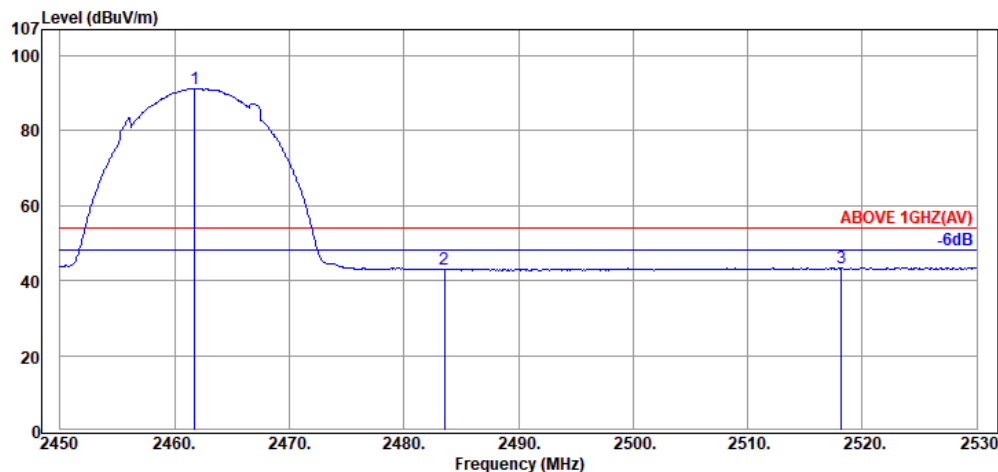
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Fax: +886 2 26099303

Mode	802.11b	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2463.36	32.25	6.65	59.81	98.71	---	---	Peak
2483.52	32.28	6.67	14.39	53.34	74.00	20.66	Peak
2496.96	32.30	6.69	17.24	56.23	74.00	17.77	Peak



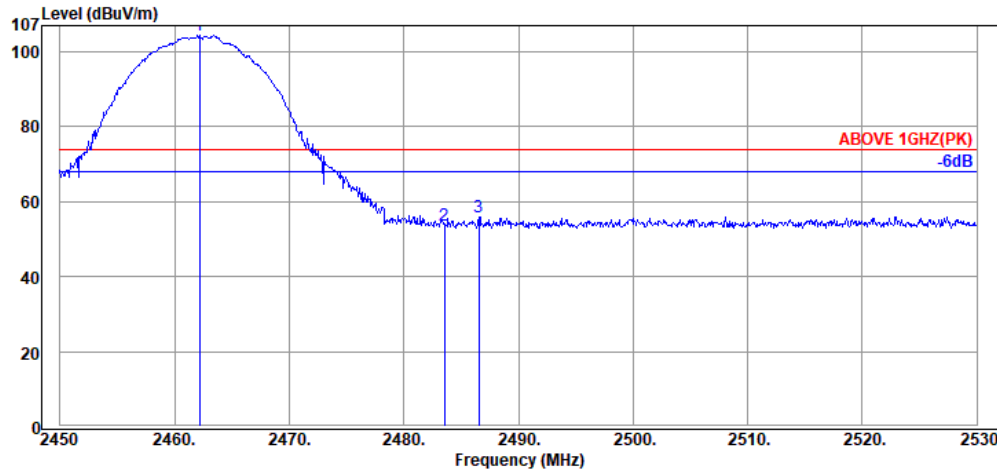
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2461.76	32.25	6.65	52.35	91.25	---	---	Average
2483.52	32.28	6.67	3.97	42.92	54.00	11.08	Average
2518.16	32.32	6.72	4.36	43.40	54.00	10.60	Average

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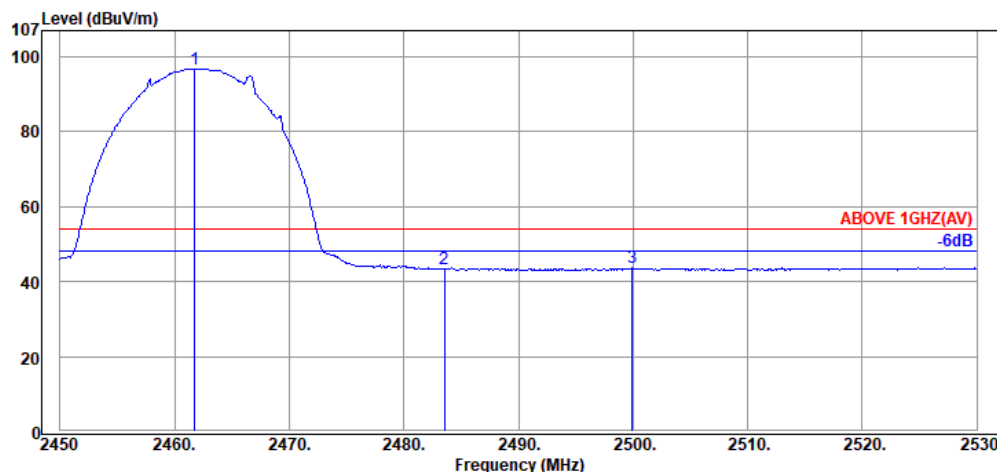
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Mode	802.11b	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2462.16	32.25	6.65	65.62	104.52	---	---	Peak
2483.52	32.28	6.67	14.86	53.81	74.00	20.19	Peak
2486.56	32.28	6.67	17.10	56.05	74.00	17.95	Peak



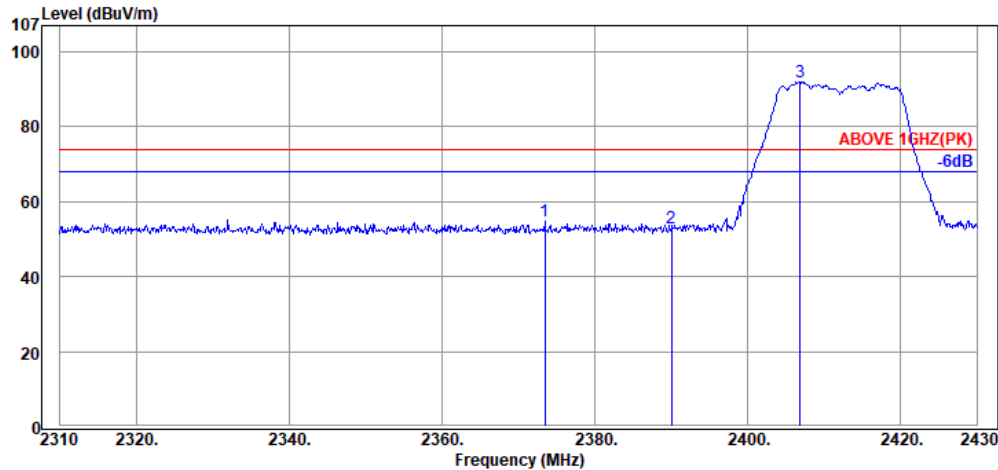
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2461.76	32.25	6.65	57.97	96.87	---	---	Average
2483.52	32.28	6.67	4.32	43.27	54.00	10.73	Average
2499.92	32.30	6.69	4.65	43.64	54.00	10.36	Average

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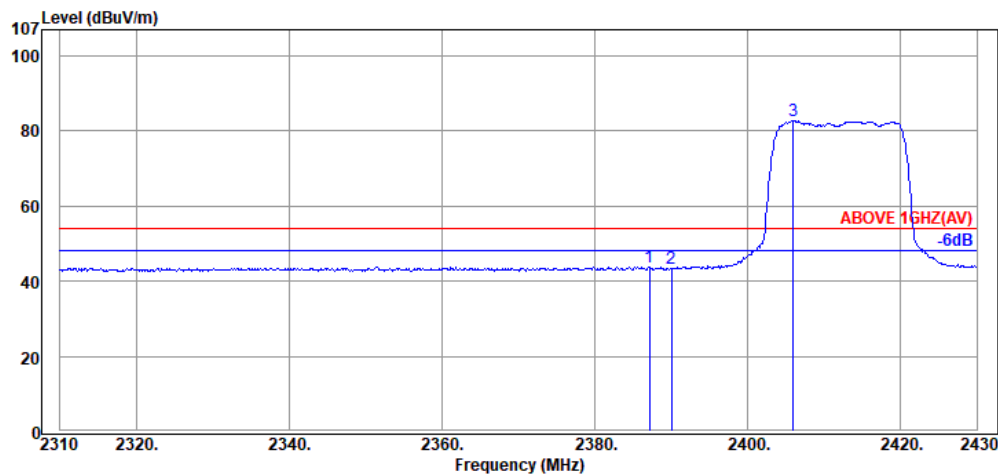
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Mode	802.11g	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Horizontal Polarization

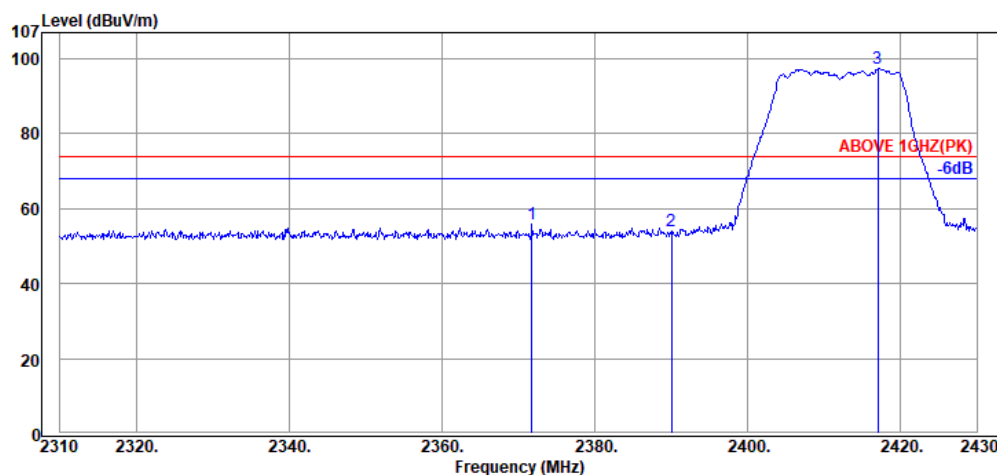
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2373.48	32.13	6.55	16.22	54.90	74.00	19.10	Peak
2390.04	32.16	6.57	14.21	52.94	74.00	21.06	Peak
2406.84	32.18	6.59	53.11	91.88	---	---	Peak



Antenna at Horizontal Polarization

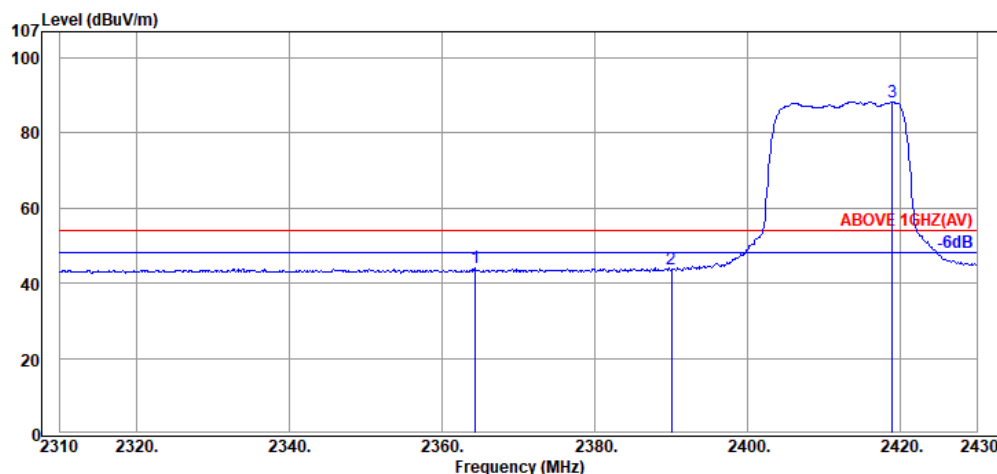
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.16	32.16	6.57	5.20	43.93	54.00	10.07	Average
2390.04	32.16	6.57	4.53	43.26	54.00	10.74	Average
2406.00	32.18	6.59	44.10	82.87	---	---	Average

Mode	802.11g	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2371.80	32.13	6.55	17.25	55.93	74.00	18.07	Peak
2390.04	32.16	6.57	15.19	53.92	74.00	20.08	Peak
2417.04	32.18	6.59	58.61	97.38	---	---	Peak



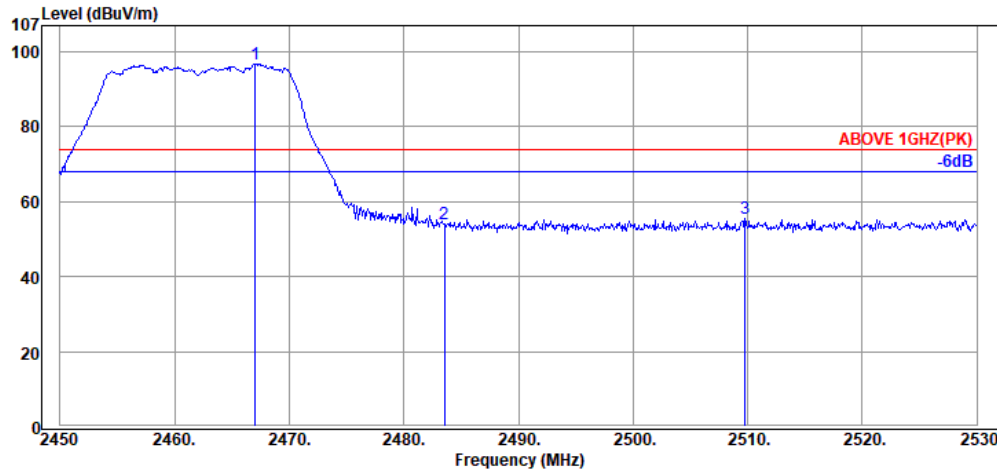
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2364.36	32.11	6.53	5.55	44.19	54.00	9.81	Average
2390.04	32.16	6.57	4.88	43.61	54.00	10.39	Average
2418.96	32.18	6.59	49.48	88.25	---	---	Average

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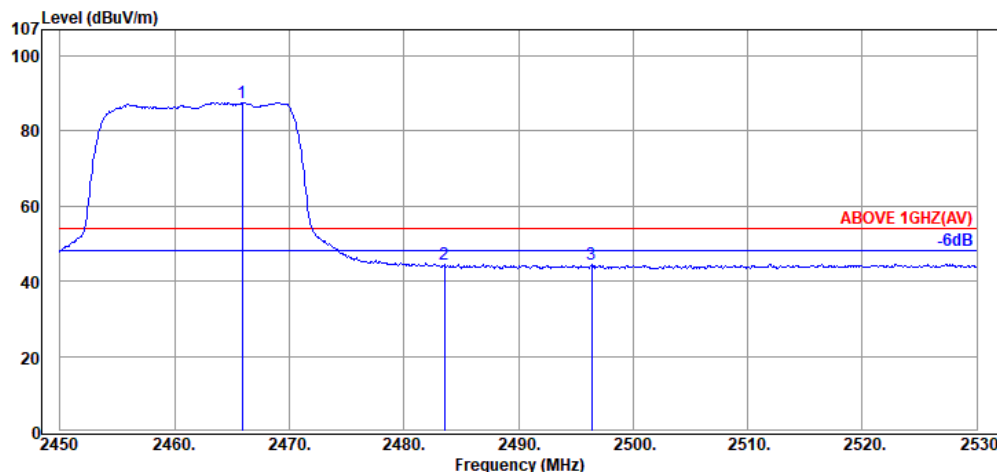
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Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.04	32.25	6.65	57.86	96.76	---	---	Peak
2483.52	32.28	6.67	14.97	53.92	74.00	20.08	Peak
2509.76	32.32	6.72	16.32	55.36	74.00	18.64	Peak



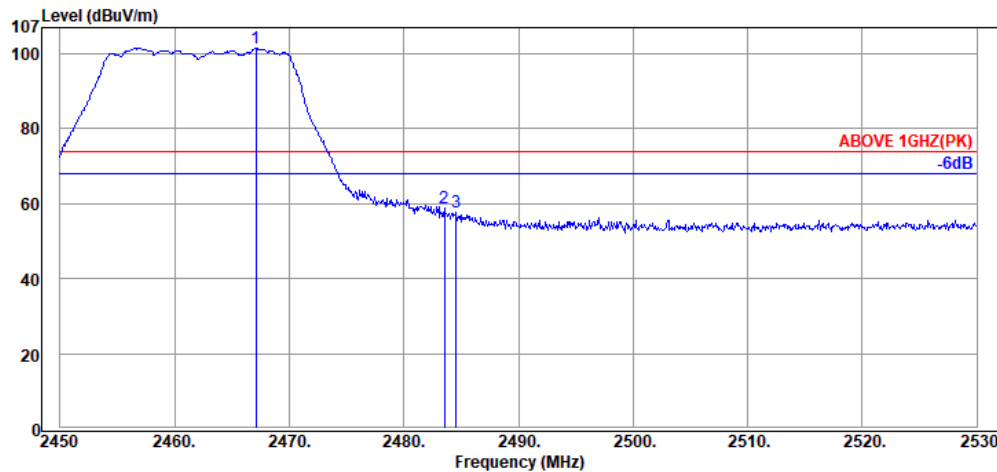
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2465.92	32.25	6.65	48.70	87.60	---	---	Average
2483.52	32.28	6.67	5.41	44.36	54.00	9.64	Average
2496.40	32.30	6.69	5.51	44.50	54.00	9.50	Average

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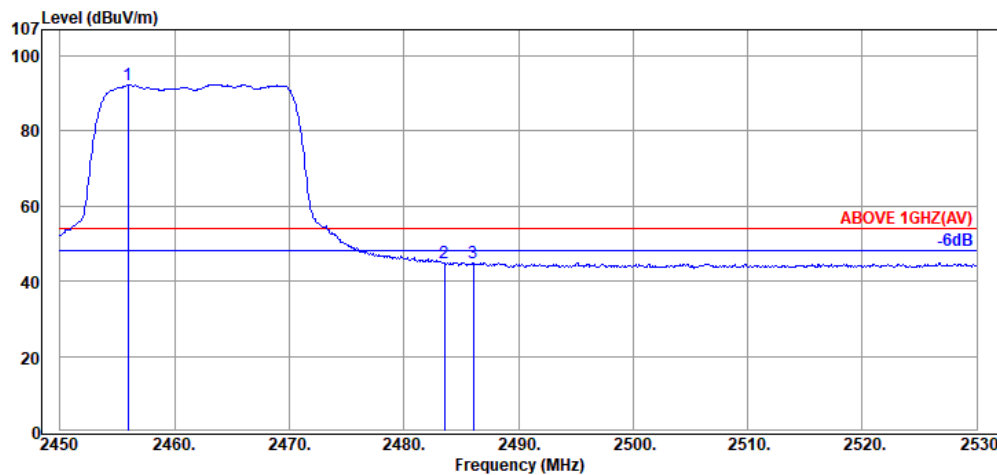
Tel: +886 2 26099301
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Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.12	32.25	6.65	62.64	101.54	---	---	Peak
2483.52	32.28	6.67	19.73	58.68	74.00	15.32	Peak
2484.56	32.28	6.67	18.85	57.80	74.00	16.20	Peak



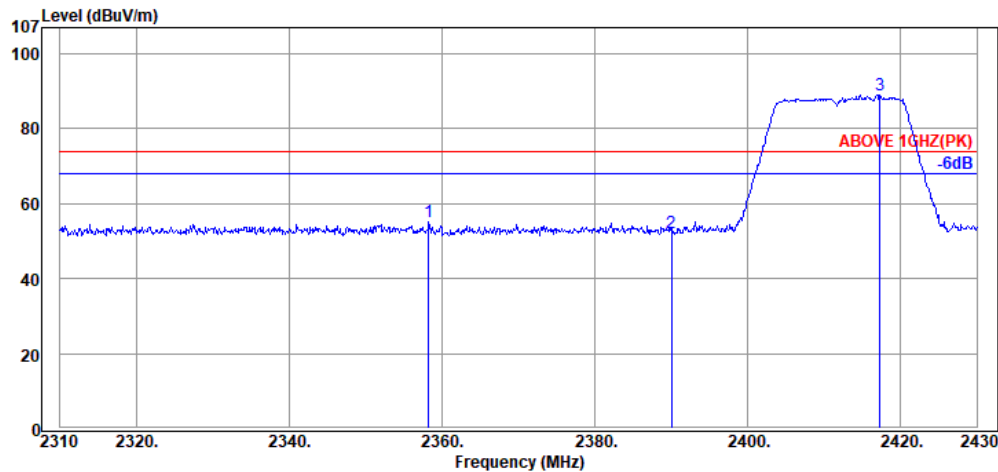
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2455.92	32.25	6.65	53.39	92.29	---	---	Average
2483.52	32.28	6.67	5.77	44.72	54.00	9.28	Average
2486.08	32.28	6.67	6.06	45.01	54.00	8.99	Average

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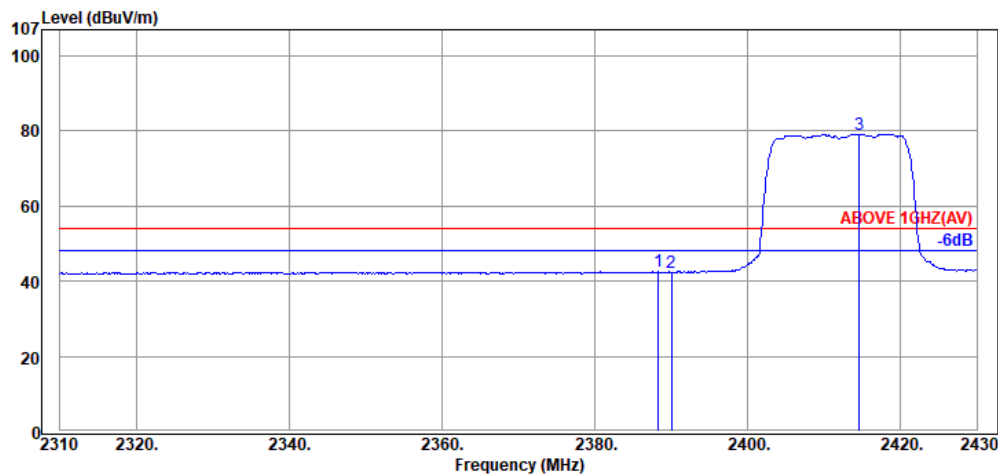
Tel: +886 2 26099301
Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2358.24	32.11	6.53	16.46	55.10	74.00	18.90	Peak
2390.04	32.16	6.57	13.65	52.38	74.00	21.62	Peak
2417.28	32.18	6.59	50.36	89.13	---	---	Peak



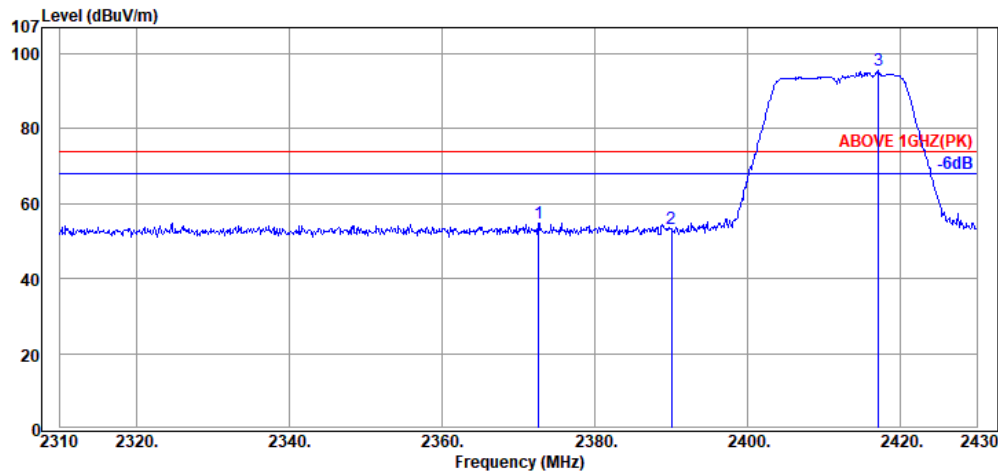
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2388.36	32.16	6.57	3.83	42.56	54.00	11.44	Average
2390.04	32.16	6.57	3.57	42.30	54.00	11.70	Average
2414.64	32.18	6.59	40.33	79.10	---	---	Average

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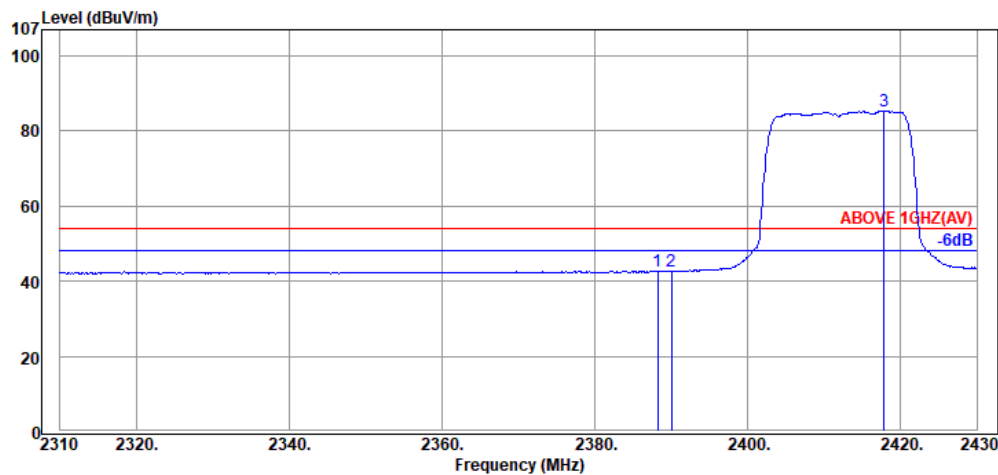
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Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2372.64	32.13	6.55	16.18	54.86	74.00	19.14	Peak
2390.04	32.16	6.57	14.62	53.35	74.00	20.65	Peak
2417.16	32.18	6.59	56.91	95.68	---	---	Peak



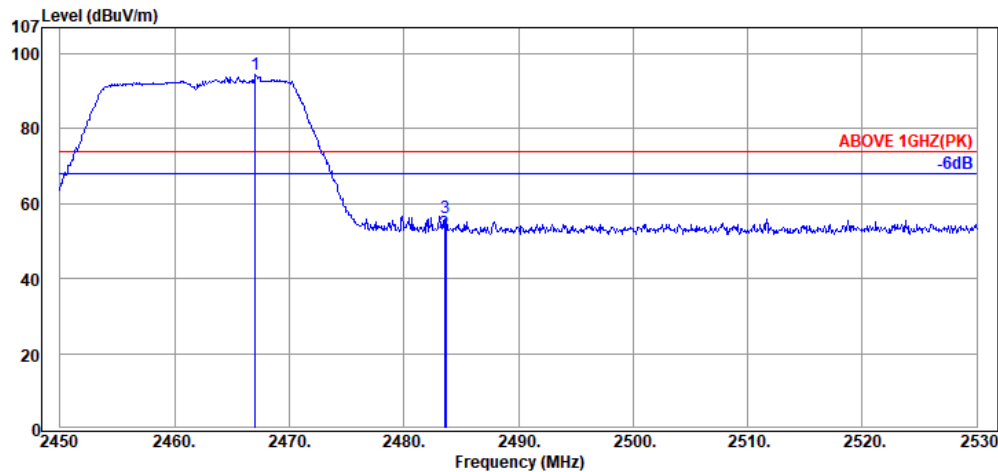
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2388.24	32.16	6.57	4.02	42.75	54.00	11.25	Average
2390.04	32.16	6.57	3.95	42.68	54.00	11.32	Average
2417.88	32.18	6.59	46.49	85.26	---	---	Average

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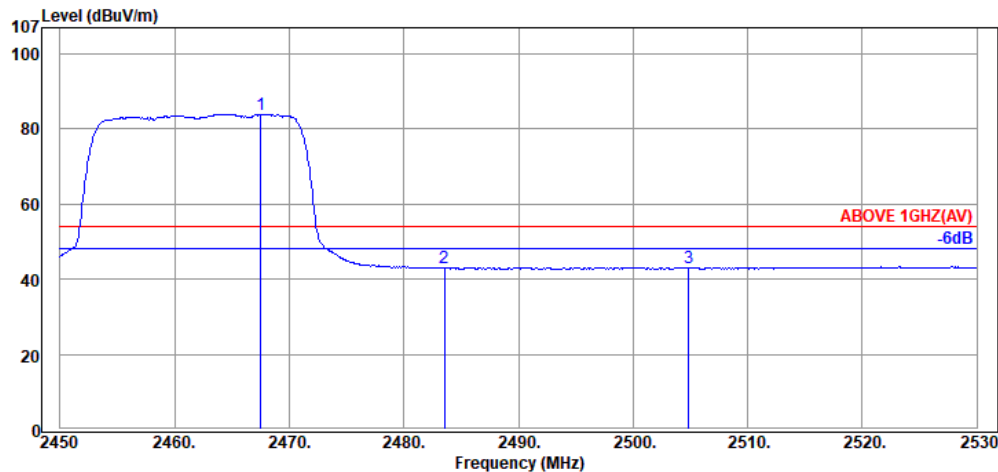
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Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.04	32.25	6.65	55.43	94.33	---	---	Peak
2483.52	32.28	6.67	13.11	52.06	74.00	21.94	Peak
2483.68	32.28	6.67	17.14	56.09	74.00	17.91	Peak



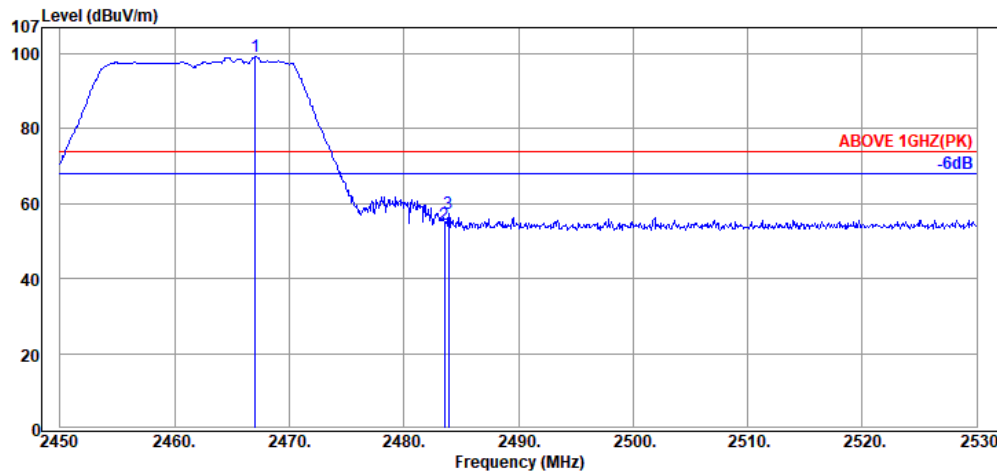
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.52	32.25	6.65	45.03	83.93	---	---	Average
2483.52	32.28	6.67	4.01	42.96	54.00	11.04	Average
2504.88	32.32	6.72	4.10	43.14	54.00	10.86	Average

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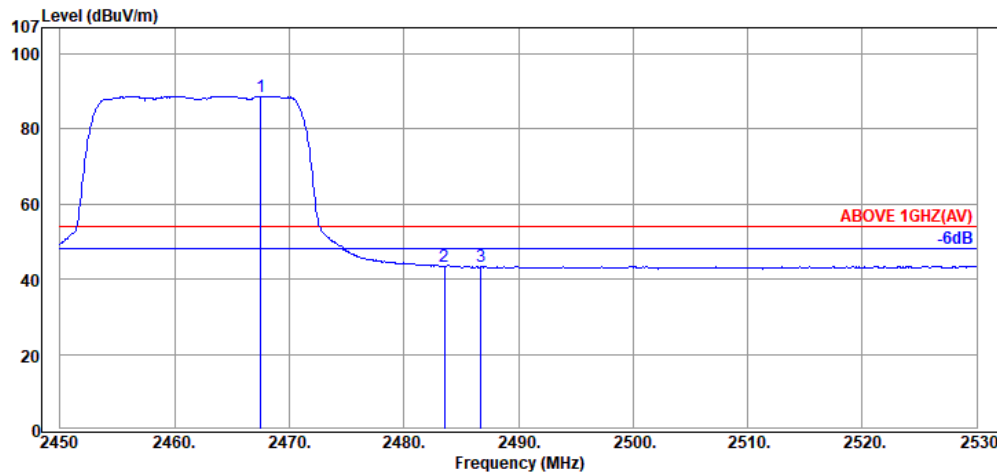
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Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.04	32.25	6.65	60.36	99.26	---	---	Peak
2483.52	32.28	6.67	15.54	54.49	74.00	19.51	Peak
2483.92	32.28	6.67	18.26	57.21	74.00	16.79	Peak



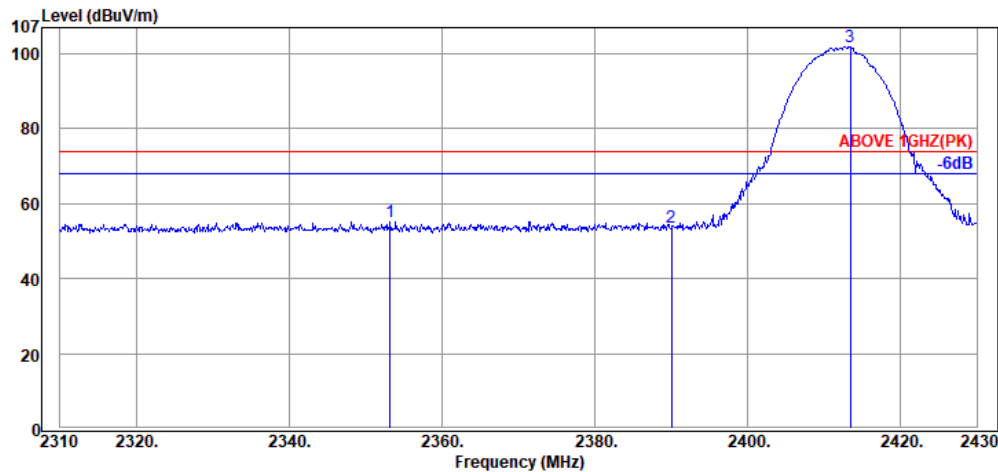
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.52	32.25	6.65	49.88	88.78	---	---	Average
2483.52	32.28	6.67	4.56	43.51	54.00	10.49	Average
2486.72	32.28	6.67	4.44	43.39	54.00	10.61	Average

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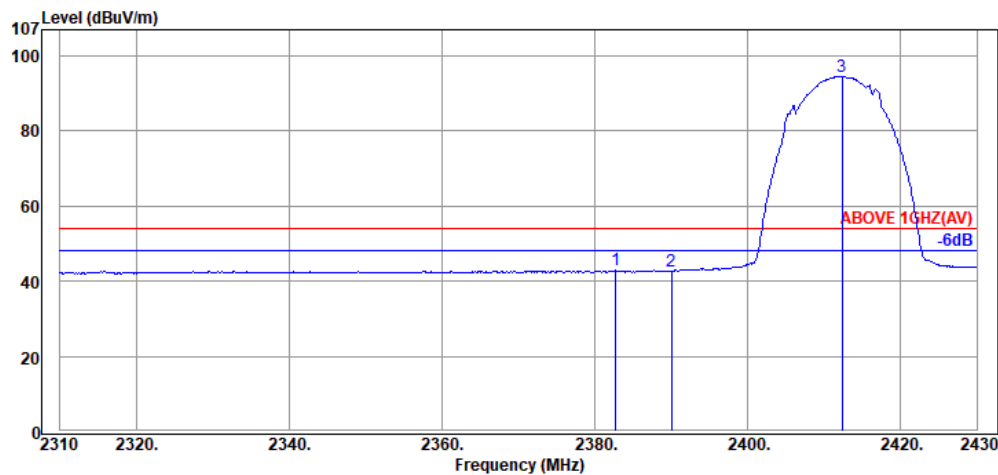
Tel: +886 2 26099301
Fax: +886 2 26099303

Mode	802.11b	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Horizontal Polarization

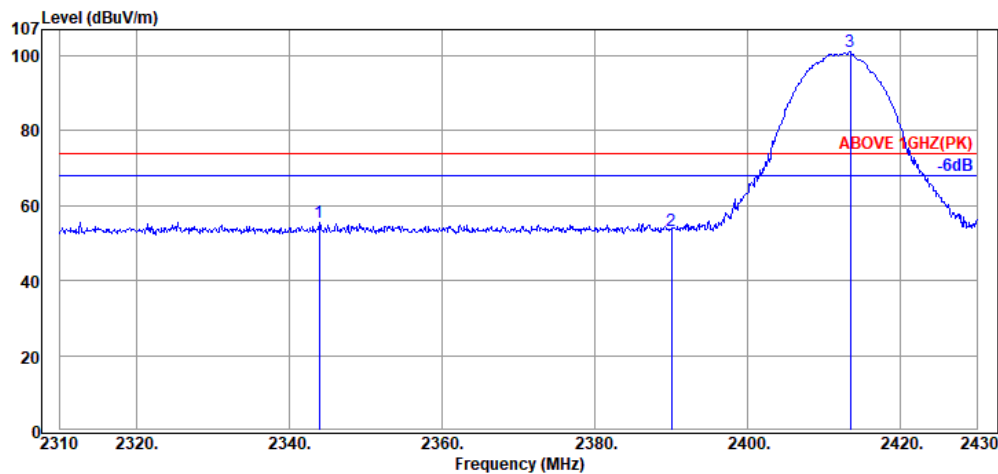
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2353.20	32.11	6.53	16.61	55.25	74.00	18.75	Peak
2390.04	32.16	6.57	14.96	53.69	74.00	20.31	Peak
2413.44	32.18	6.59	63.24	102.01	---	---	Peak



Antenna at Horizontal Polarization

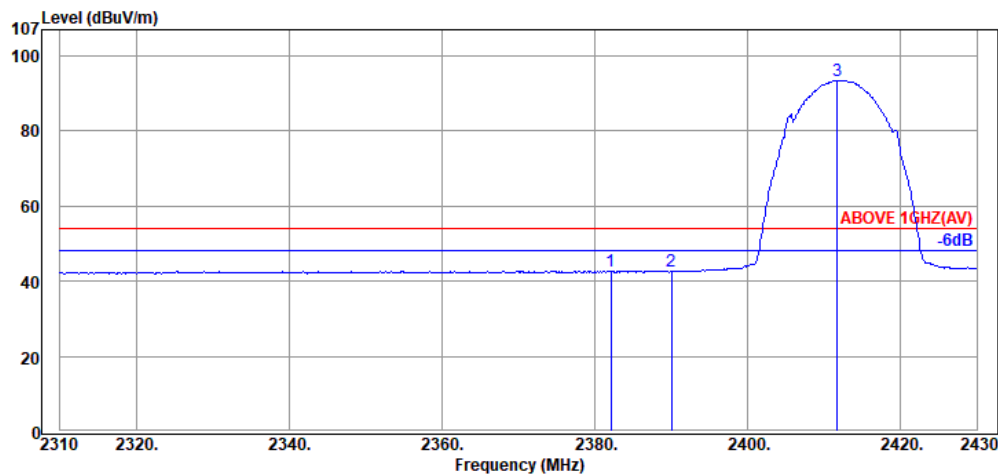
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2382.72	32.13	6.55	4.25	42.93	54.00	11.07	Average
2390.04	32.16	6.57	3.95	42.68	54.00	11.32	Average
2412.36	32.18	6.59	55.66	94.43	---	---	Average

Mode	802.11b	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2343.96	32.08	6.51	17.02	55.61	74.00	18.39	Peak
2390.04	32.16	6.57	14.62	53.35	74.00	20.65	Peak
2413.44	32.18	6.59	62.20	100.97	---	---	Peak



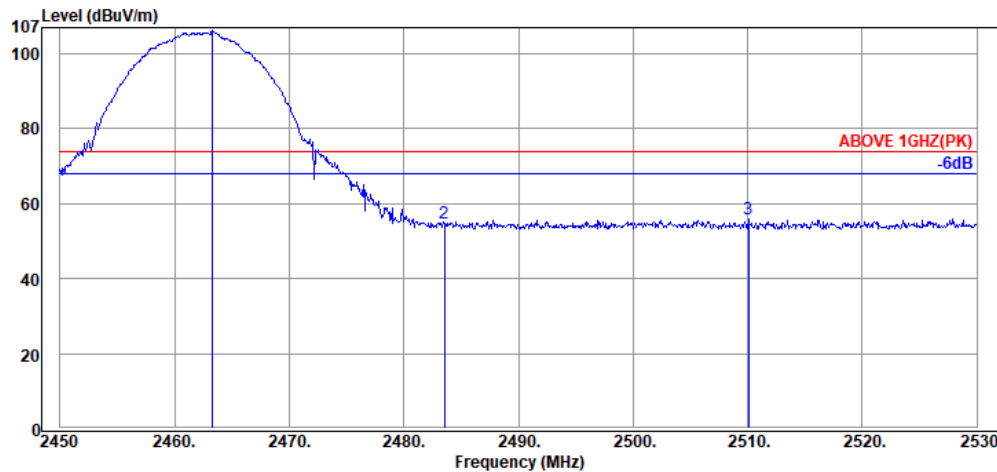
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2382.12	32.13	6.55	4.12	42.80	54.00	11.20	Average
2390.04	32.16	6.57	3.89	42.62	54.00	11.38	Average
2411.76	32.18	6.59	54.62	93.39	---	---	Average

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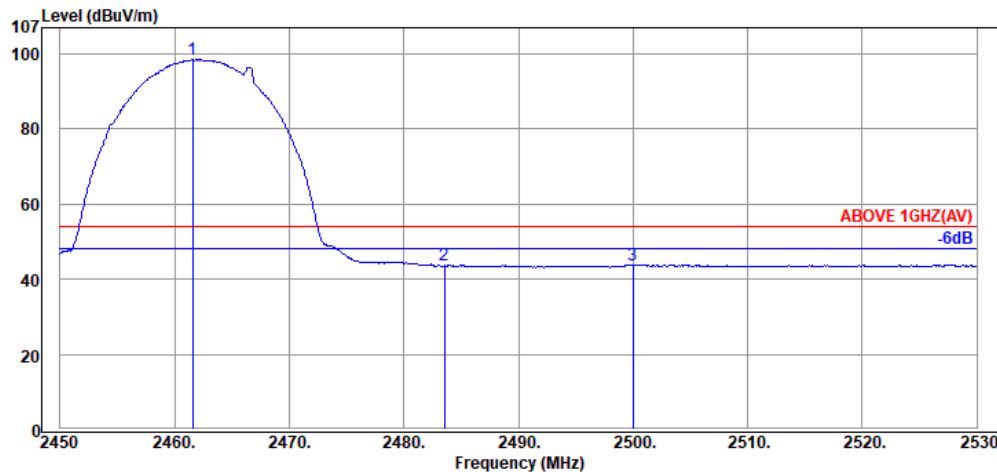
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Mode	802.11b	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2463.28	32.25	6.65	67.23	106.13	---	---	Peak
2483.52	32.28	6.67	15.80	54.75	74.00	19.25	Peak
2510.08	32.32	6.72	16.92	55.96	74.00	18.04	Peak



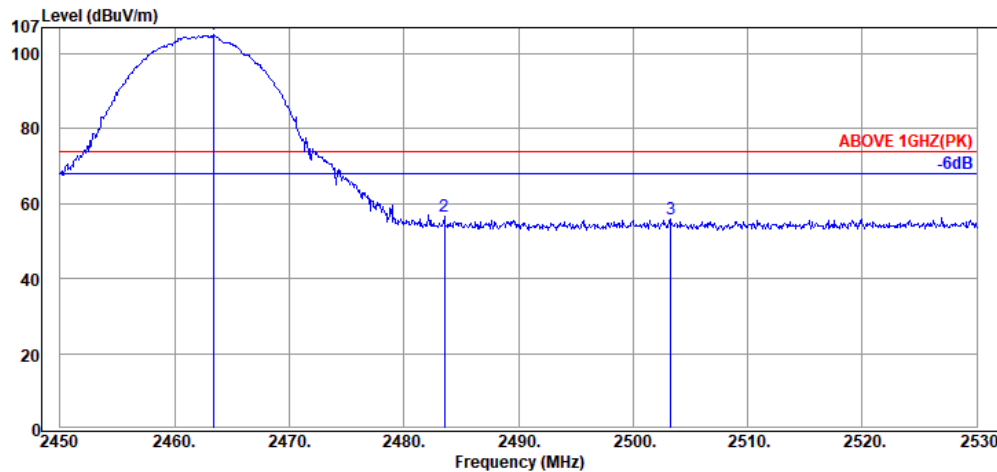
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2461.60	32.25	6.65	59.51	98.41	---	---	Average
2483.52	32.28	6.67	4.71	43.66	54.00	10.34	Average
2500.00	32.30	6.69	4.92	43.91	54.00	10.09	Average

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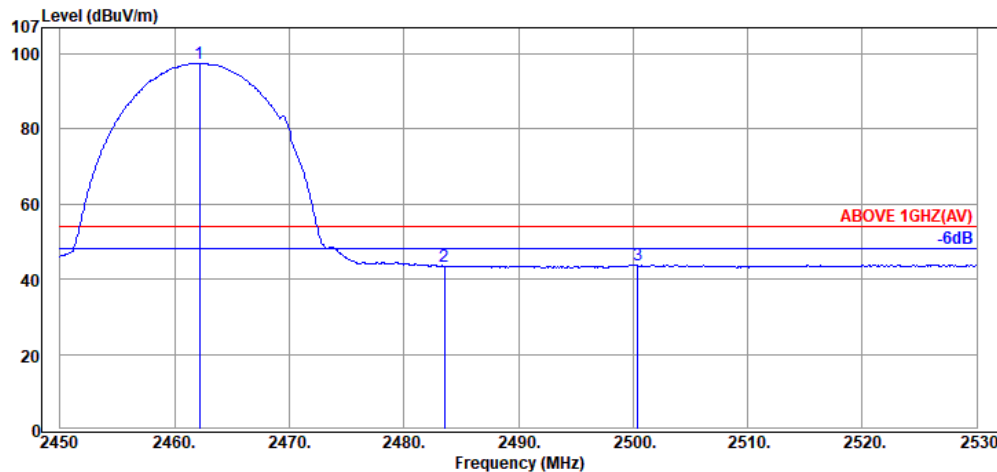
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Fax: +886 2 26099303

Mode	802.11b	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2463.36	32.25	6.65	66.10	105.00	---	---	Peak
2483.52	32.28	6.67	17.72	56.67	74.00	17.33	Peak
2503.28	32.30	6.69	17.07	56.06	74.00	17.94	Peak



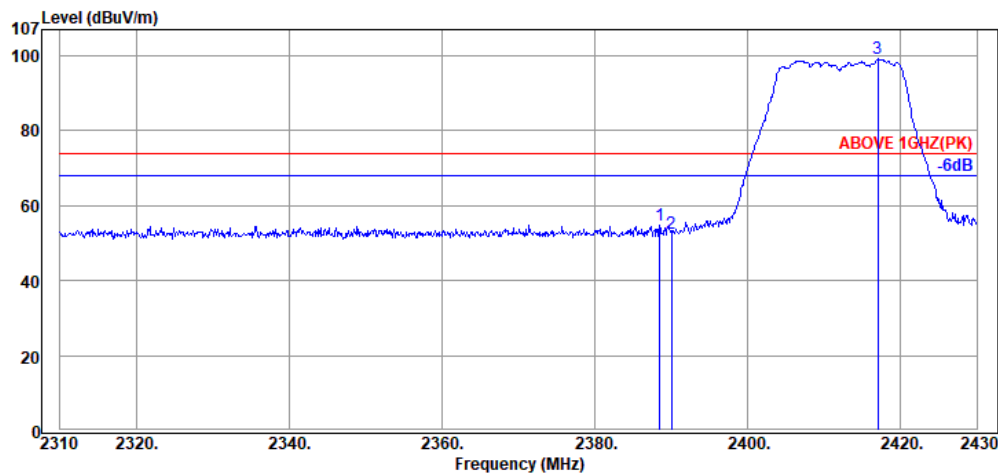
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2462.16	32.25	6.65	58.56	97.46	---	---	Average
2483.52	32.28	6.67	4.43	43.38	54.00	10.62	Average
2500.40	32.30	6.69	4.82	43.81	54.00	10.19	Average

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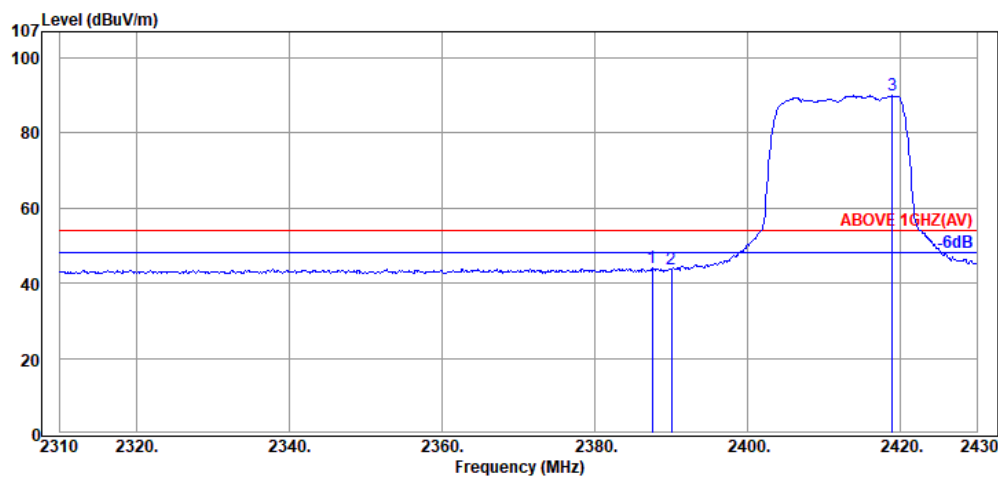
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Mode	802.11g	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Horizontal Polarization

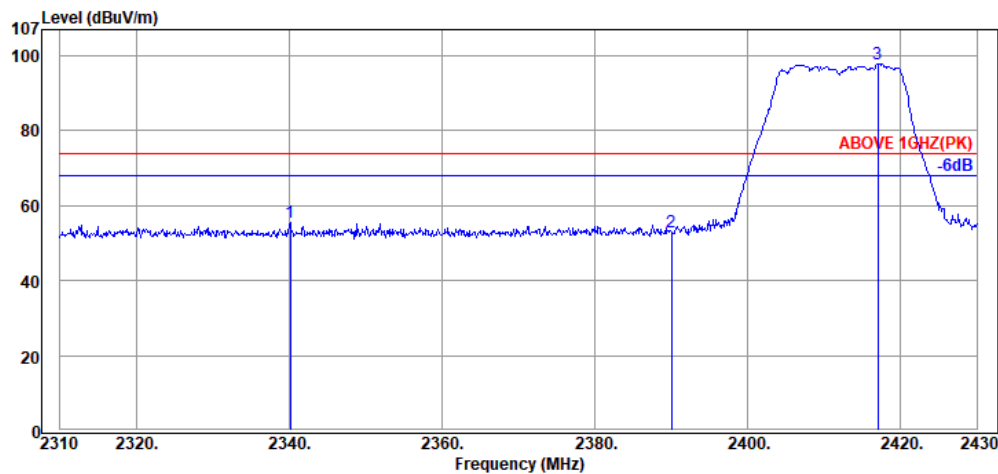
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2388.48	32.16	6.57	16.08	54.81	74.00	19.19	Peak
2390.04	32.16	6.57	13.76	52.49	74.00	21.51	Peak
2417.04	32.18	6.59	60.37	99.14	---	---	Peak



Antenna at Horizontal Polarization

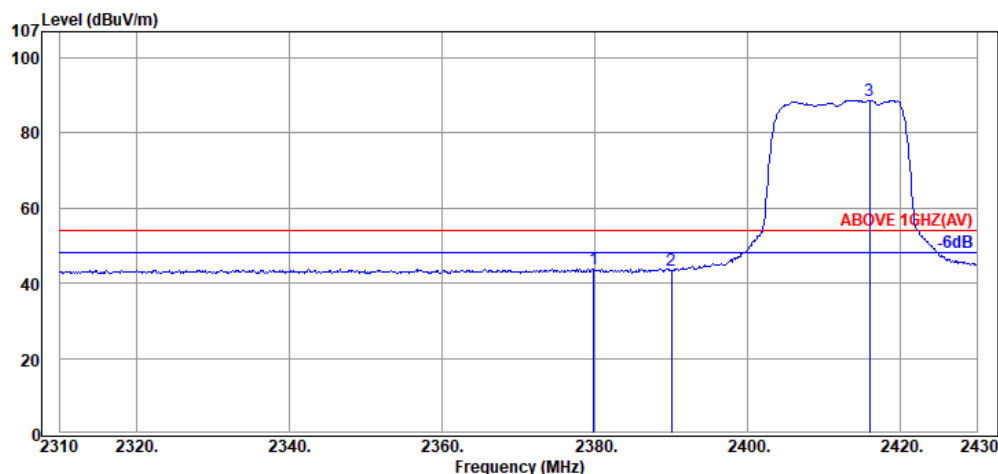
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.52	32.16	6.57	5.22	43.95	54.00	10.05	Average
2390.04	32.16	6.57	5.17	43.90	54.00	10.10	Average
2418.96	32.18	6.59	51.17	89.94	---	---	Average

Mode	802.11g	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2340.12	32.08	6.51	16.99	55.58	74.00	18.42	Peak
2390.04	32.16	6.57	14.32	53.05	74.00	20.95	Peak
2417.04	32.18	6.59	59.14	97.91	---	---	Peak



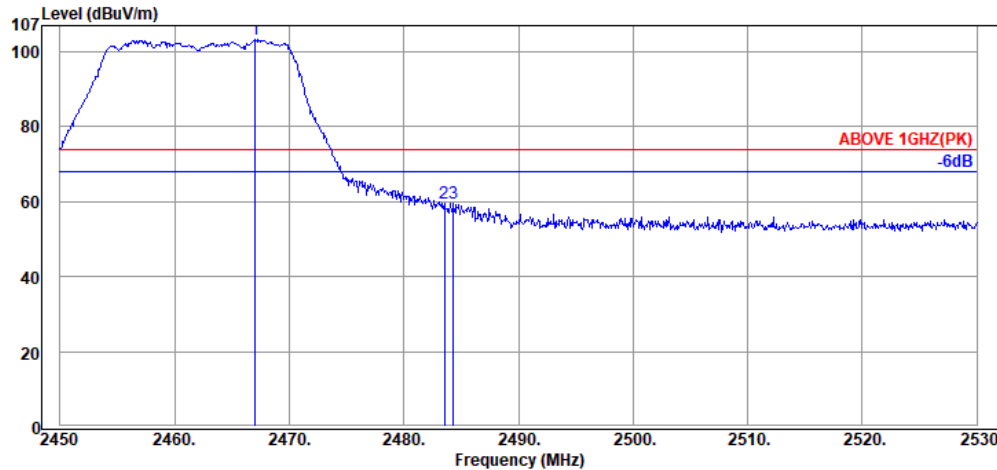
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2379.84	32.13	6.55	5.12	43.80	54.00	10.20	Average
2390.04	32.16	6.57	4.82	43.55	54.00	10.45	Average
2415.96	32.18	6.59	49.98	88.75	---	---	Average

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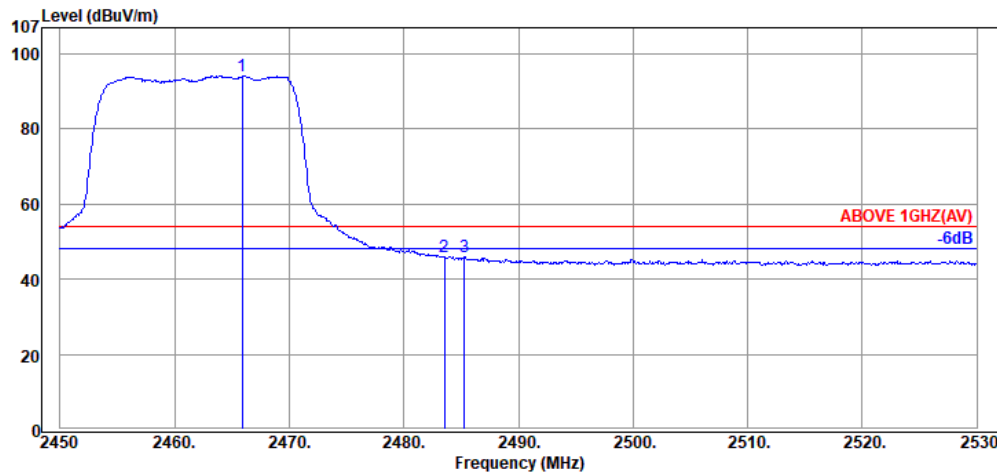
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Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.04	32.25	6.65	64.36	103.26	---	---	Peak
2483.52	32.28	6.67	20.64	59.59	74.00	14.41	Peak
2484.32	32.28	6.67	20.76	59.71	74.00	14.29	Peak



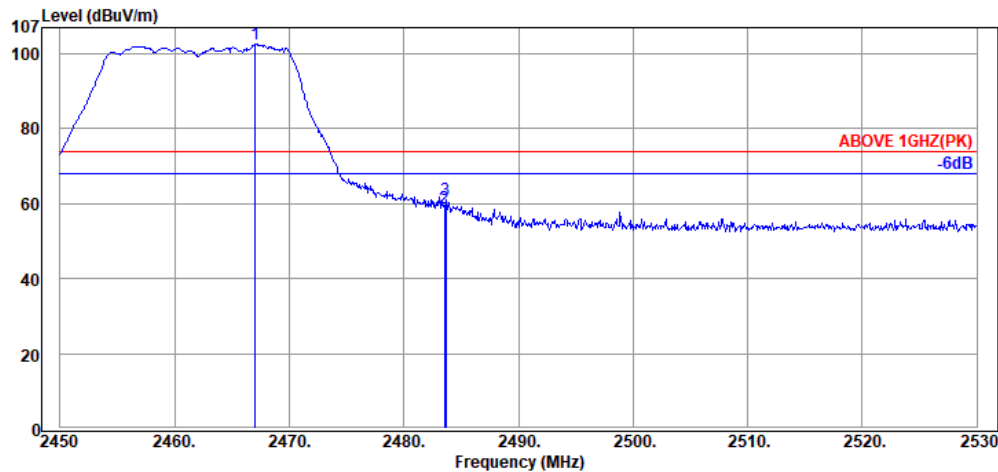
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2465.92	32.25	6.65	55.18	94.08	---	---	Average
2483.52	32.28	6.67	6.97	45.92	54.00	8.08	Average
2485.28	32.28	6.67	7.05	46.00	54.00	8.00	Average

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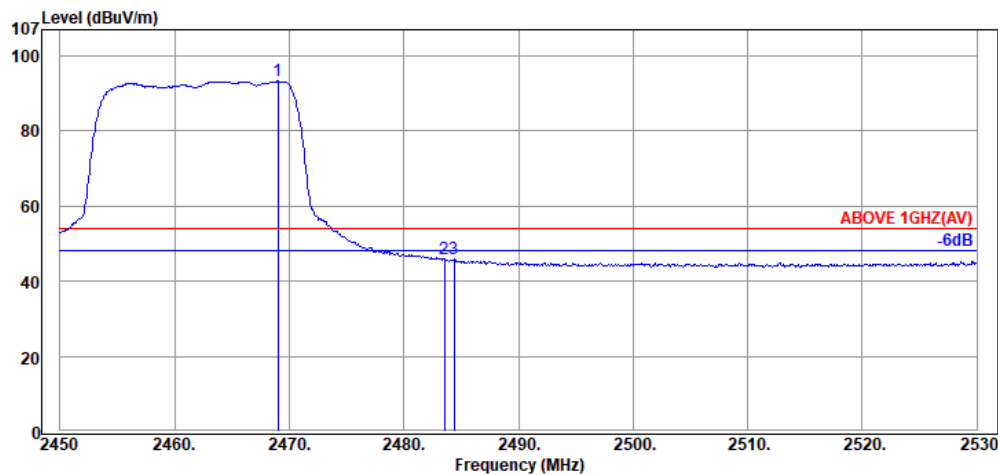
Tel: +886 2 26099301
Fax: +886 2 26099303

Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.04	32.25	6.65	63.62	102.52	---	---	Peak
2483.52	32.28	6.67	19.84	58.79	74.00	15.21	Peak
2483.68	32.28	6.67	21.98	60.93	74.00	13.07	Peak



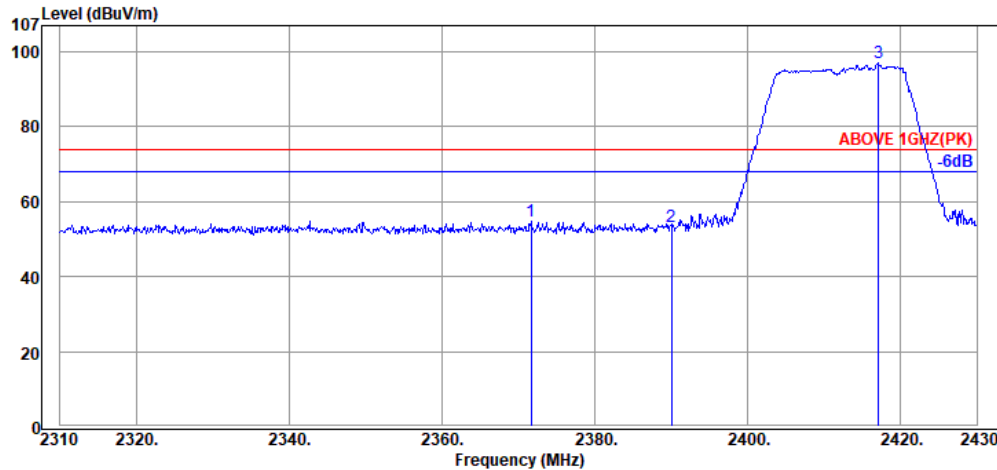
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2469.04	32.25	6.65	54.32	93.22	---	---	Average
2483.52	32.28	6.67	6.98	45.93	54.00	8.07	Average
2484.40	32.28	6.67	6.85	45.80	54.00	8.20	Average

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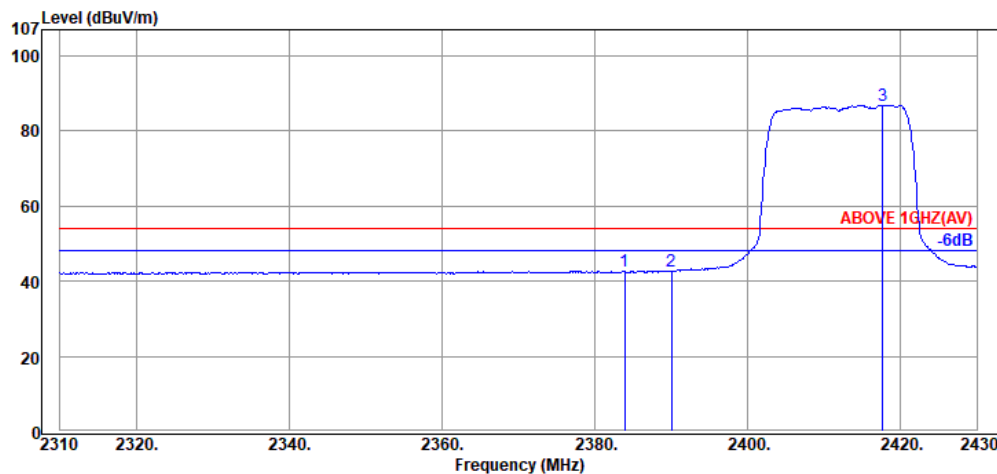
Tel: +886 2 26099301
Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2371.68	32.13	6.55	15.97	54.65	74.00	19.35	Peak
2390.04	32.16	6.57	14.52	53.25	74.00	20.75	Peak
2417.16	32.18	6.59	58.42	97.19	---	---	Peak



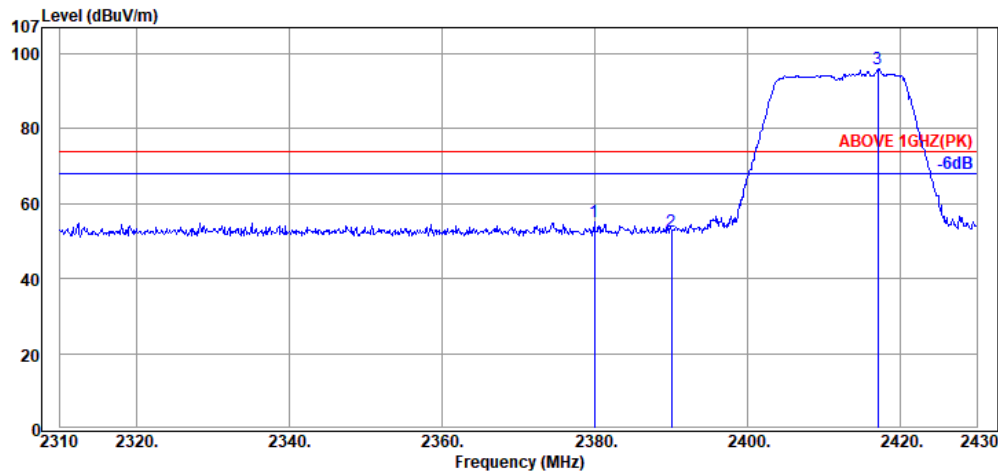
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2383.92	32.13	6.55	4.03	42.71	54.00	11.29	Average
2390.04	32.16	6.57	4.03	42.76	54.00	11.24	Average
2417.64	32.18	6.59	48.06	86.83	---	---	Average

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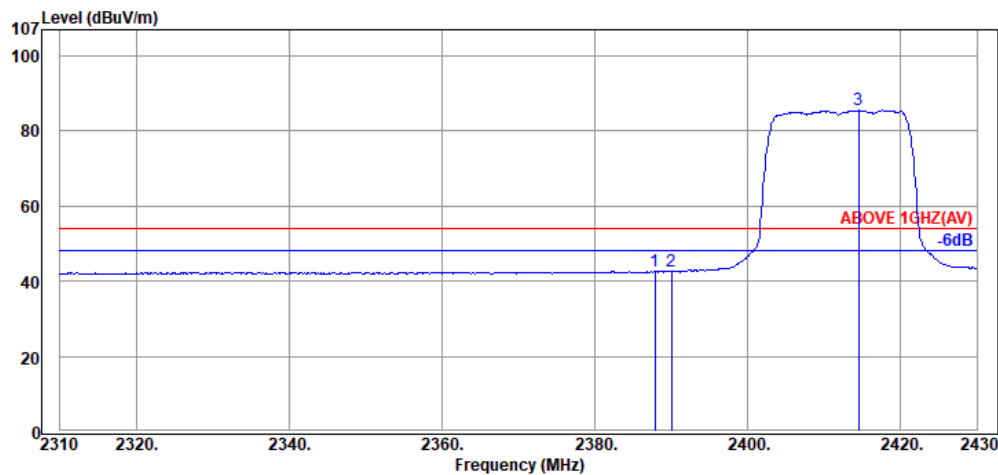
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Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2412MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2379.96	32.13	6.55	16.35	55.03	74.00	18.97	Peak
2390.04	32.16	6.57	13.69	52.42	74.00	21.58	Peak
2417.04	32.18	6.59	57.09	95.86	---	---	Peak



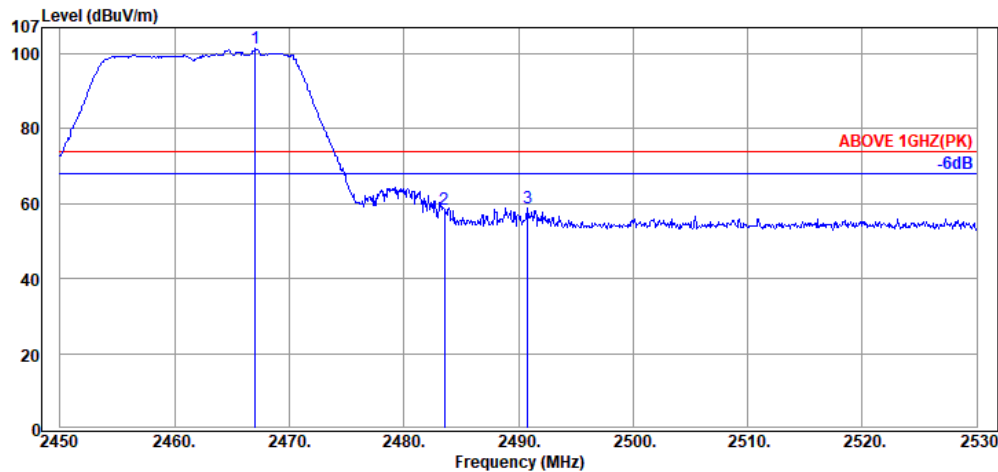
Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2387.88	32.16	6.57	3.85	42.58	54.00	11.42	Average
2390.04	32.16	6.57	3.77	42.50	54.00	11.50	Average
2414.52	32.18	6.59	46.77	85.54	---	---	Average

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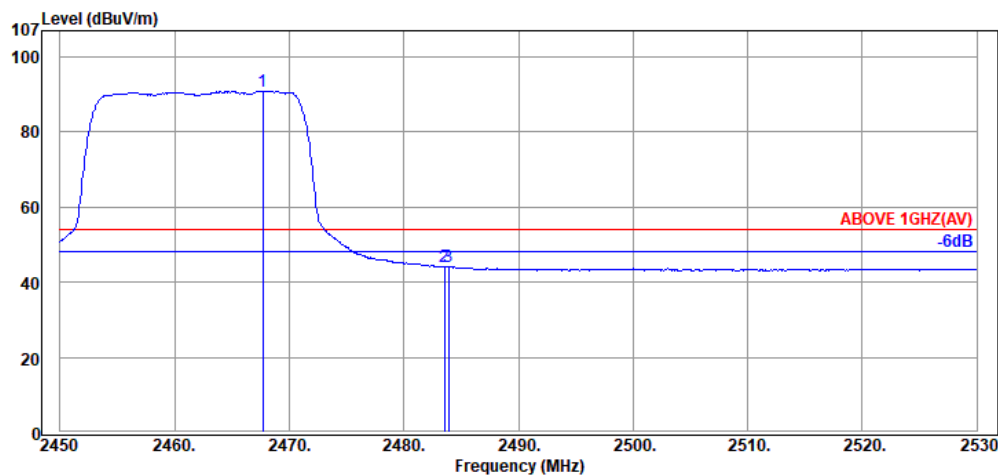
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Fax: +886 2 26099303

Mode	802.11n-HT20	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.04	32.25	6.65	62.41	101.31	---	---	Peak
2483.52	32.28	6.67	19.39	58.34	74.00	15.66	Peak
2490.80	32.30	6.69	19.98	58.97	74.00	15.03	Peak



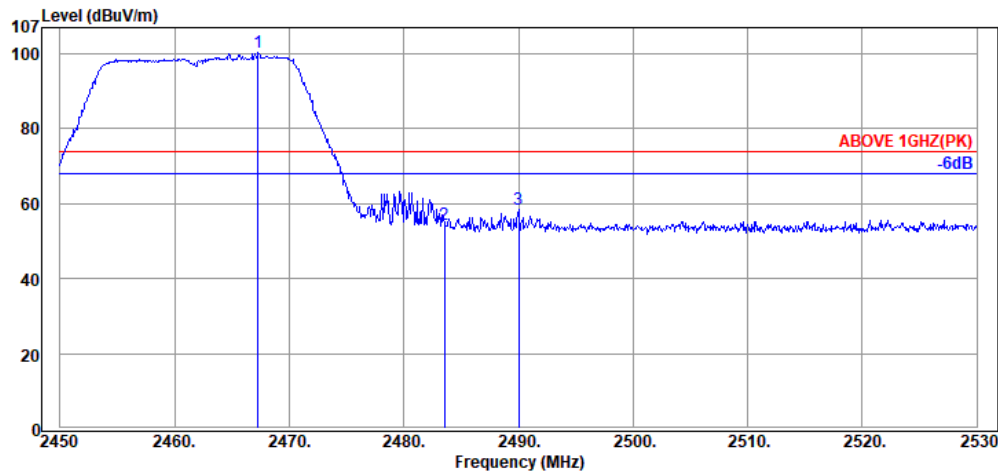
Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.68	32.25	6.65	51.95	90.85	---	---	Average
2483.52	32.28	6.67	5.16	44.11	54.00	9.89	Average
2483.92	32.28	6.67	5.12	44.07	54.00	9.93	Average

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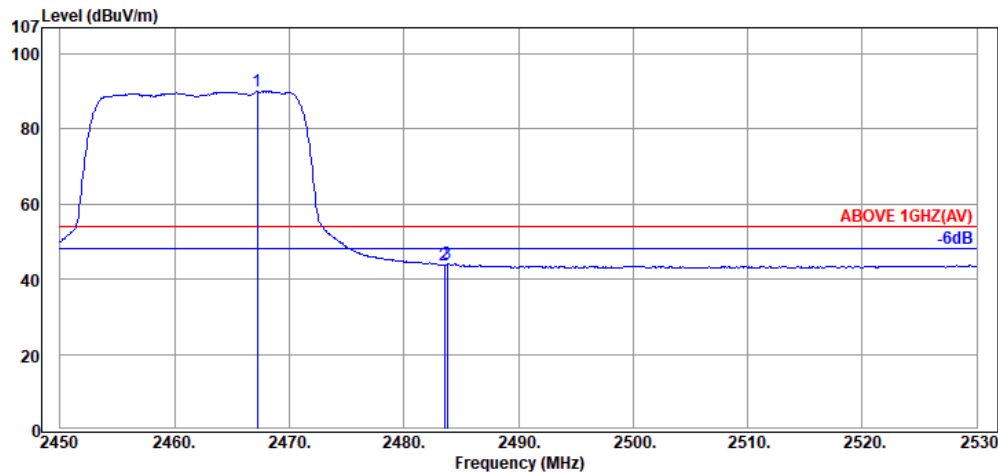
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Mode	802.11n-HT20	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.28	32.25	6.65	61.37	100.27	---	---	Peak
2483.52	32.28	6.67	15.44	54.39	74.00	19.61	Peak
2490.00	32.30	6.69	19.46	58.45	74.00	15.55	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2467.20	32.25	6.65	51.06	89.96	---	---	Average
2483.52	32.28	6.67	4.90	43.85	54.00	10.15	Average
2483.76	32.28	6.67	5.13	44.08	54.00	9.92	Average

A.2.2 Emissions outside the frequency band:

The emissions (up to 25GHz) not reported for there is no emission be found.

Mode	802.11b	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	7.11	50.96	54.00	3.04	Peak
7385.00	35.80	11.99	2.57	50.36	54.00	3.64	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	4.89	48.74	54.00	5.26	Peak
7385.00	35.80	11.99	1.25	49.04	54.00	4.96	Peak

Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4915.00	34.27	9.58	2.29	46.14	54.00	3.04	Peak
7380.00	35.80	11.97	2.24	50.01	54.00	3.64	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4920.00	34.27	9.58	1.44	45.29	54.00	5.26	Peak
7380.00	35.80	11.97	0.06	47.83	54.00	4.96	Peak

Mode	802.11n-HT20	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	5001270

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	0.72	44.57	54.00	9.43	Peak
7385.00	35.80	11.99	-1.39	46.40	54.00	7.60	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	-0.62	43.23	54.00	10.77	Peak
7385.00	35.80	11.99	-0.79	47.00	54.00	7.00	Peak

Mode	802.11b	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	6.70	50.55	54.00	3.04	Peak
7385.00	35.80	11.99	2.89	50.68	54.00	3.64	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	6.64	50.49	54.00	5.26	Peak
7385.00	35.80	11.99	0.45	48.24	54.00	4.96	Peak

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Mode	802.11g	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	2.64	46.49	54.00	10.99	Peak
7380.00	35.80	11.97	2.04	49.81	54.00	8.24	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4920.00	34.27	9.58	2.54	46.39	54.00	9.46	Peak
7385.00	35.80	11.99	-0.10	47.69	54.00	6.99	Peak

Mode	802.11n-HT20	Frequency	TX 2462MHz
Test Model	MR101W	Antenna P/N	290-80076

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	1.80	45.65	54.00	8.35	Peak
7385.00	35.80	11.99	0.17	47.96	54.00	6.04	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4925.00	34.27	9.58	-0.26	43.59	54.00	10.41	Peak
7380.00	35.80	11.97	0.95	48.72	54.00	5.28	Peak

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A.2.3 Emissions in Non-restricted Frequency Bands:

Pursuant to KDB 558074 D01 DTS Meas Guidance v04 that emission levels below the 15.209 general radiated emissions limits is not required.

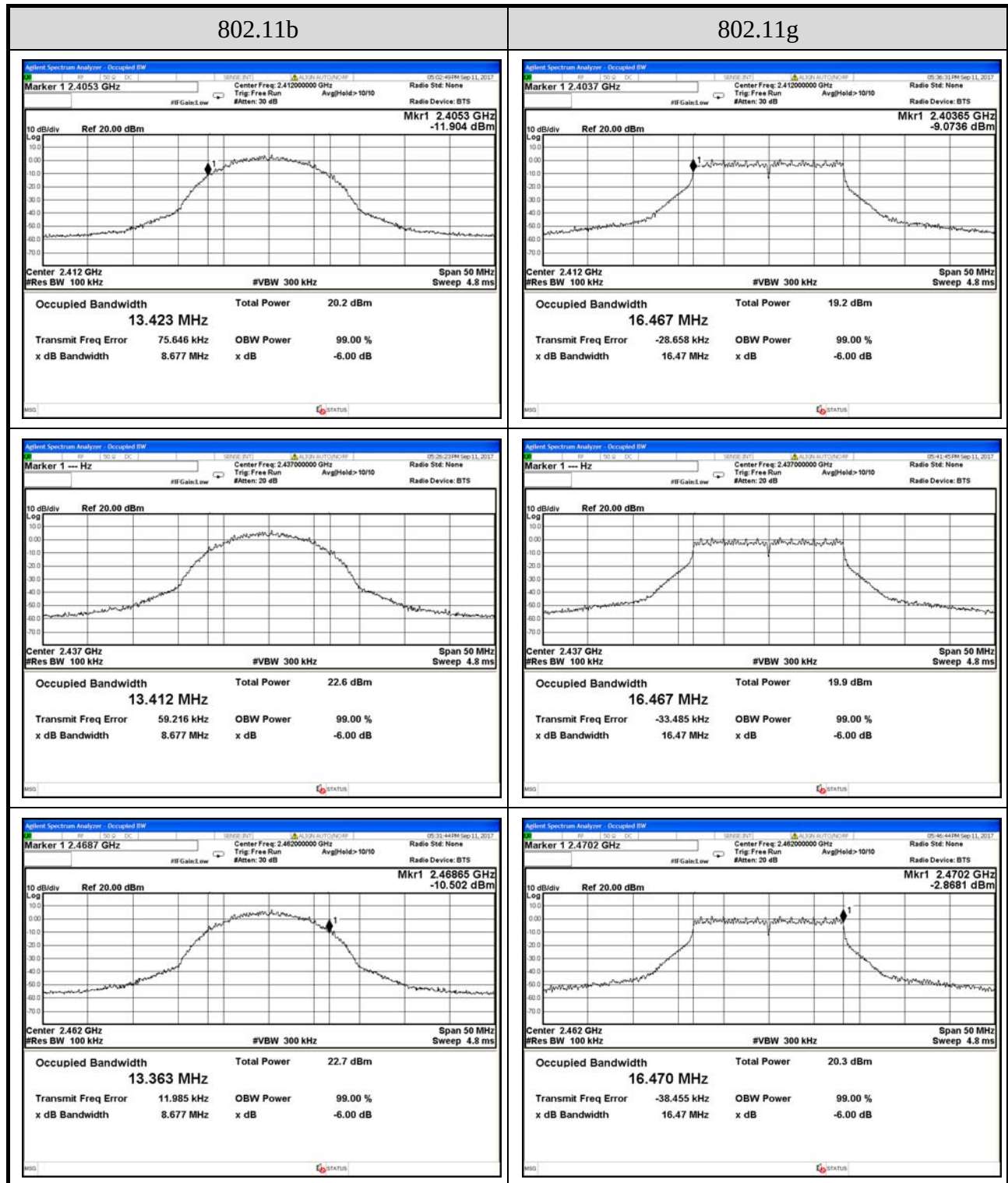
A.3 6dB BANDWIDTH

Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	N/A	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)

A.3.1 6dB Bandwidth Result

Mode	Centre Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
802.11b	2412	8.677	>500kHz
	2437	8.677	
	2462	8.677	
802.11g	2412	16.47	
	2437	16.47	
	2462	16.47	
802.11n-HT20	2412	17.55	
	2437	17.55	
	2462	17.57	

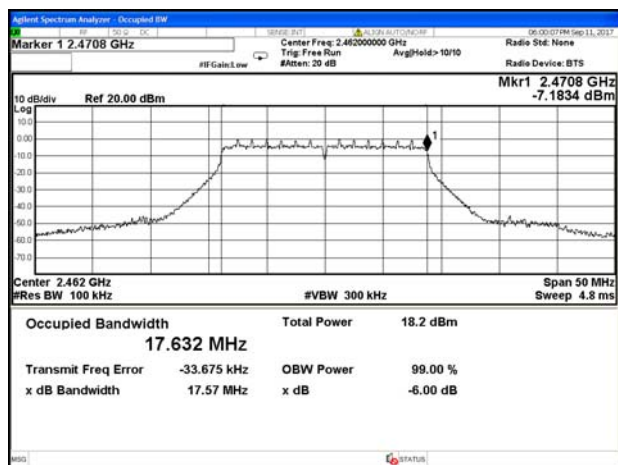
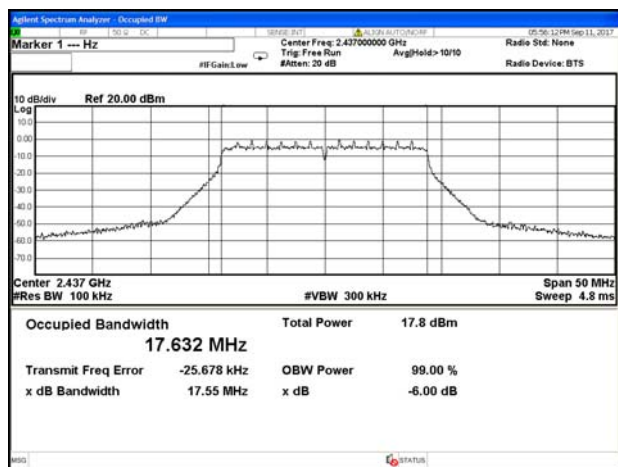
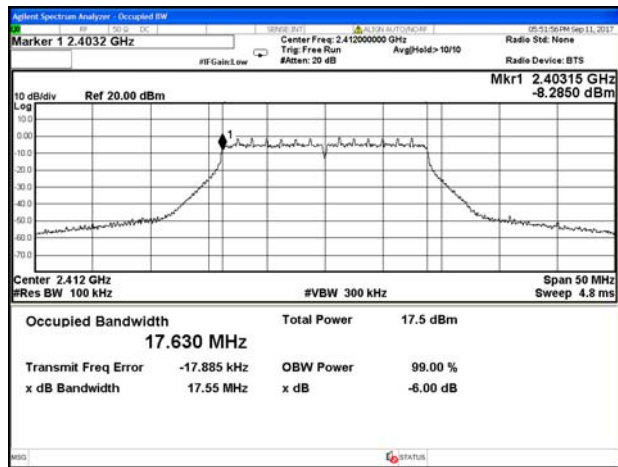
A.3.2 Measurement Plots



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802.11n-HT20



A.4 MAXIMUM PEAK OUTPUT POWER

Test Date	2017/09/14	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)

A.4.1 Peak Output Power

Mode	Centre Frequency (MHz)	Peak Output Power		Limit
		(dBm)	(W)	
802.11b	2412	17.75	0.059566	< 30dBm (1W)
	2437	18.34	0.068234	
	2462	18.36	0.068549	
802.11g	2412	23.23	0.210378	
	2437	23.72	0.235505	
	2462	23.98	0.250035	
802.11n-HT20	2412	21.66	0.146555	
	2437	21.86	0.153462	
	2462	22.01	0.158855	

Note: The results have been included cable loss.

A.4.2 Average Output Power (Reporting only)

Mode	Centre Frequency (MHz)	Average Output Power (dBm)	10log (1/X)	Total Average Output Power		Limit
				(dBm)	(W)	
802.11b	2412	14.26	0.36	14.62	0.028973	< 30dBm (1W)
	2437	14.96		15.32	0.034041	
	2462	14.95		15.31	0.033963	
802.11g	2412	10.91	1.80	12.71	0.018664	
	2437	11.53		13.33	0.021528	
	2462	11.96		13.76	0.023768	
802.11n-HT20	2412	10.71	0.27	11.66	0.014655	
	2437	11.01		11.92	0.015560	
	2462	11.39		12.25	0.016788	

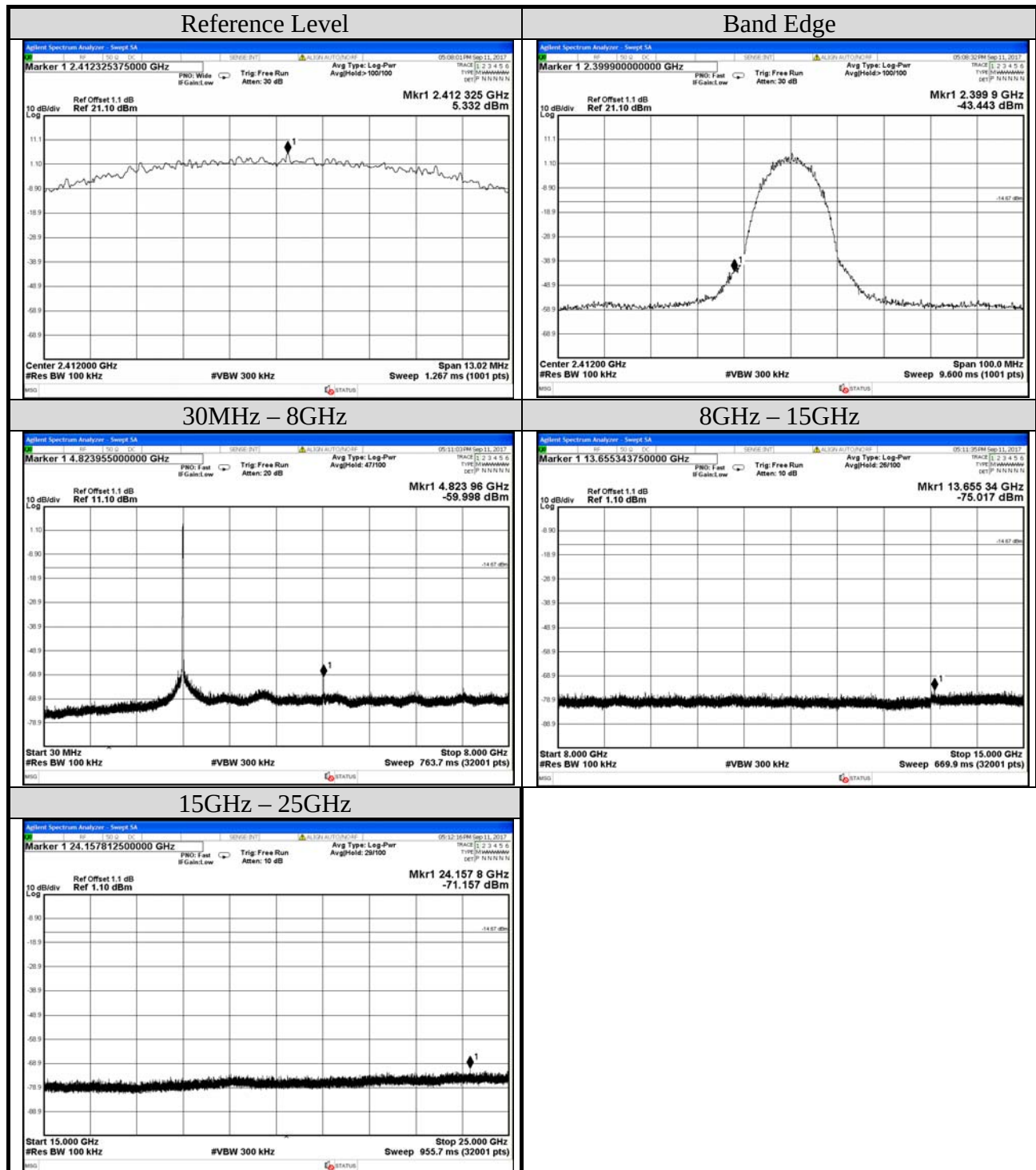
Note: The results have been included cable loss.

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A.5 EMISSION LIMITATIONS

Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11b	Frequency	TX 2412MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



File Number: C1M1707314

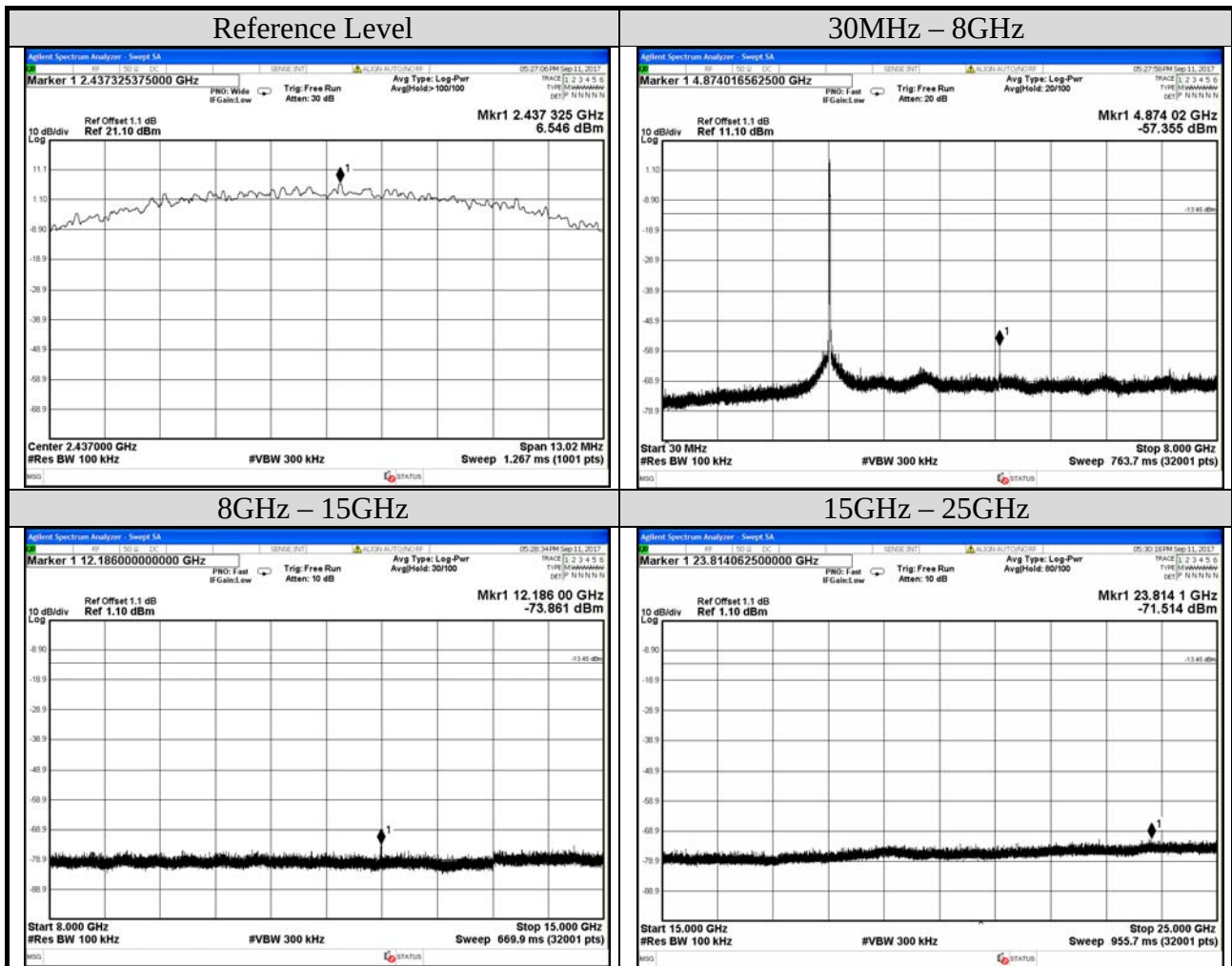
Report Number: EM-F170604

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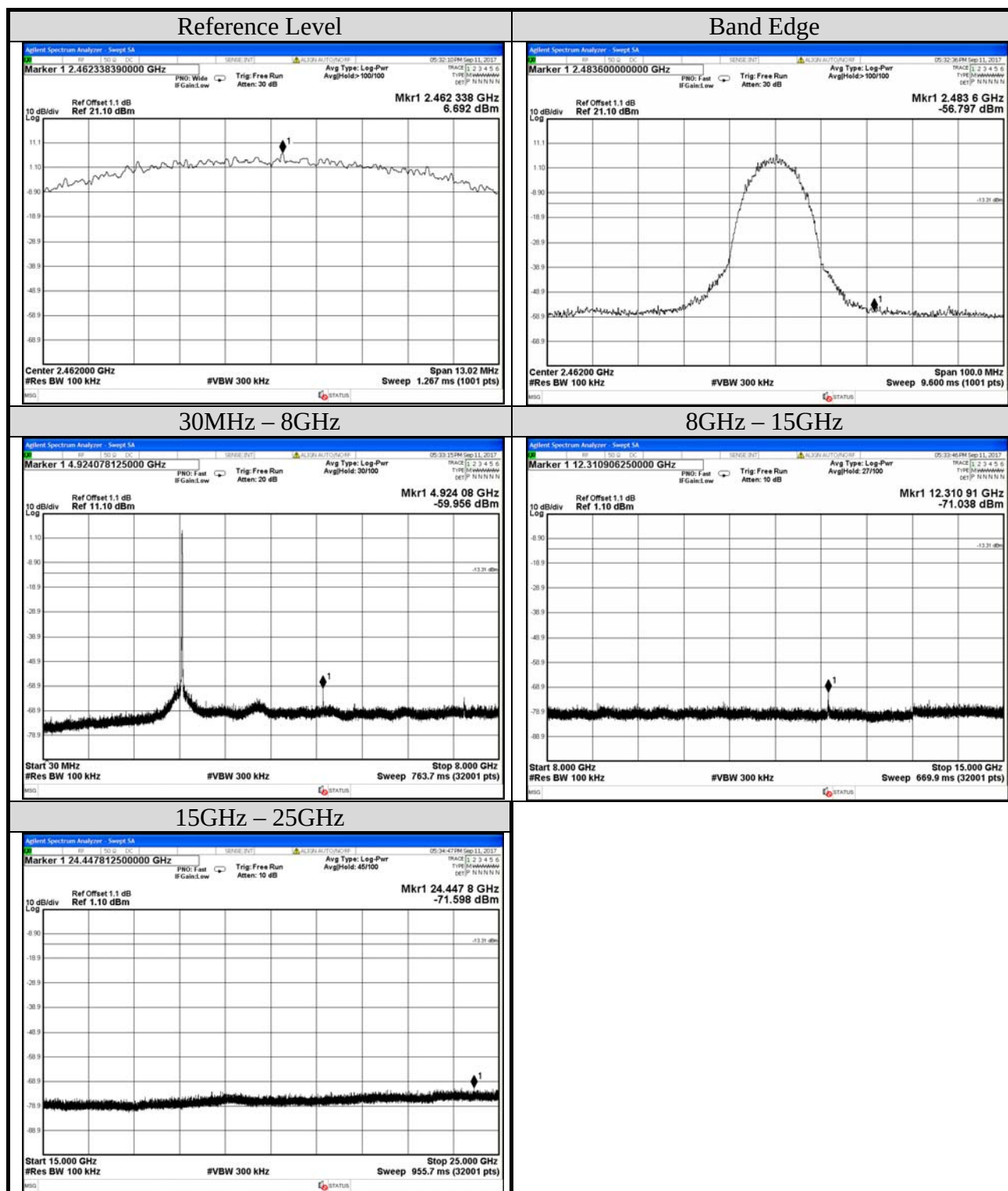
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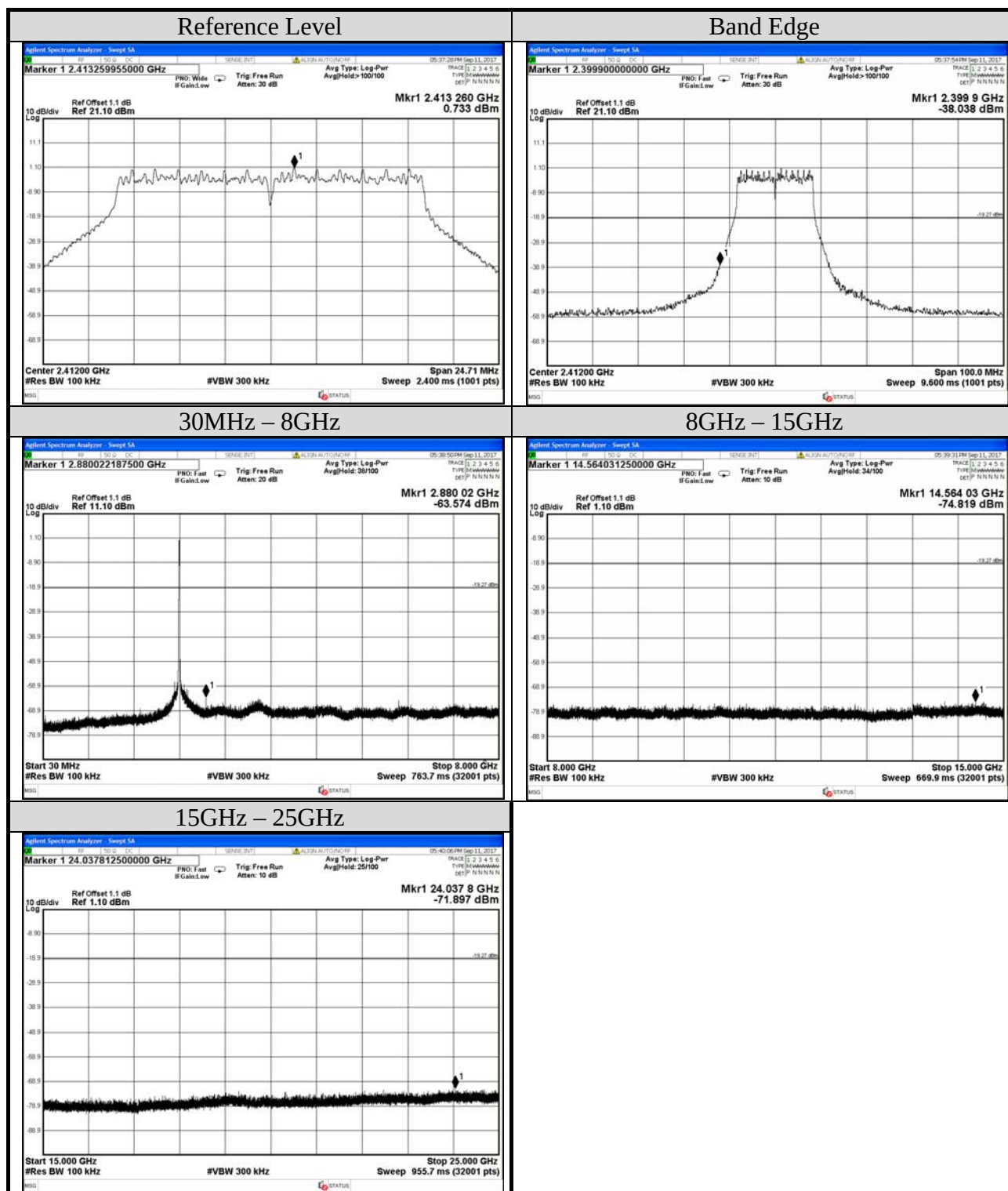
Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11b	Frequency	TX 2437MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11b	Frequency	TX 2462MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



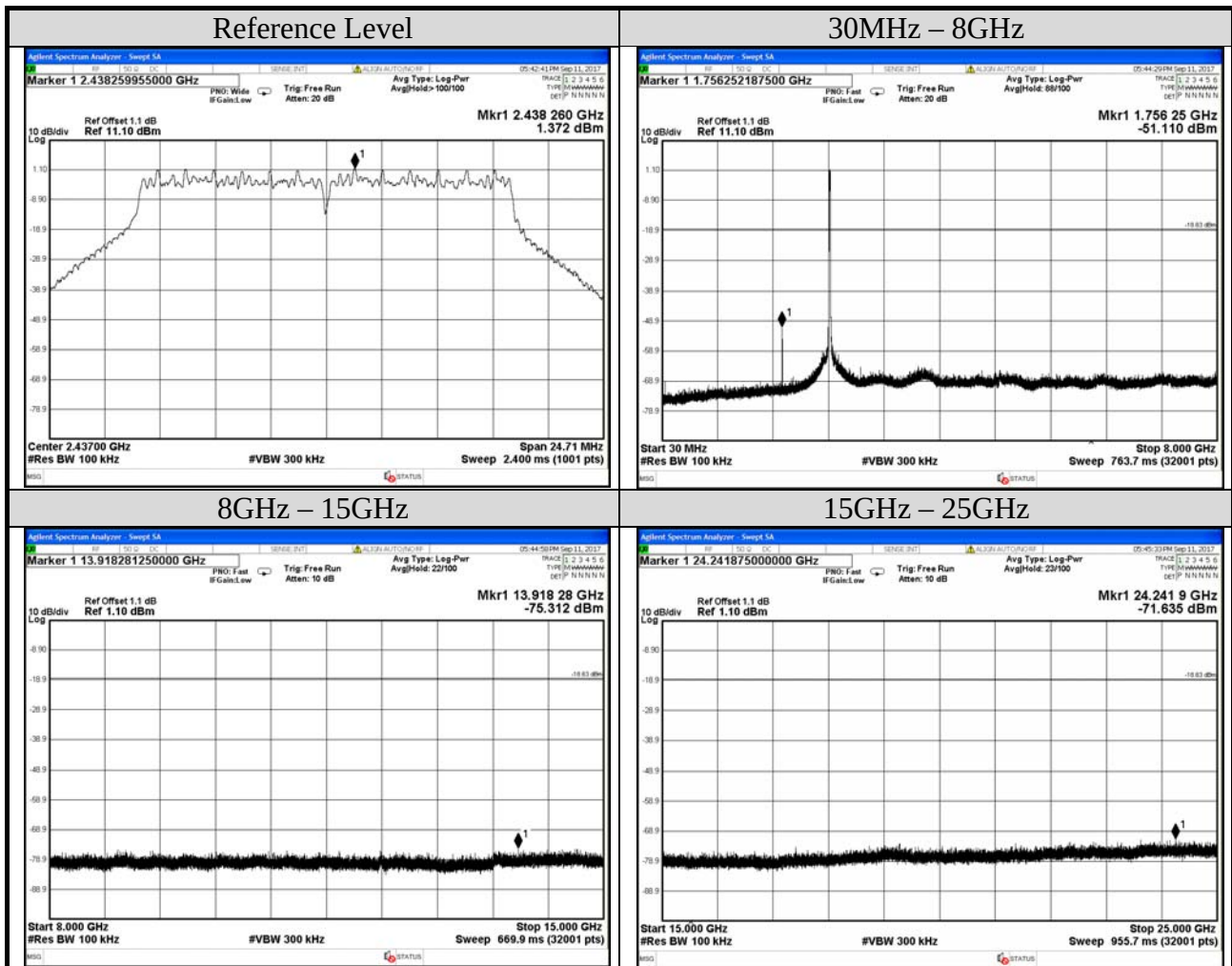
Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11g	Frequency	TX 2412MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)		0	



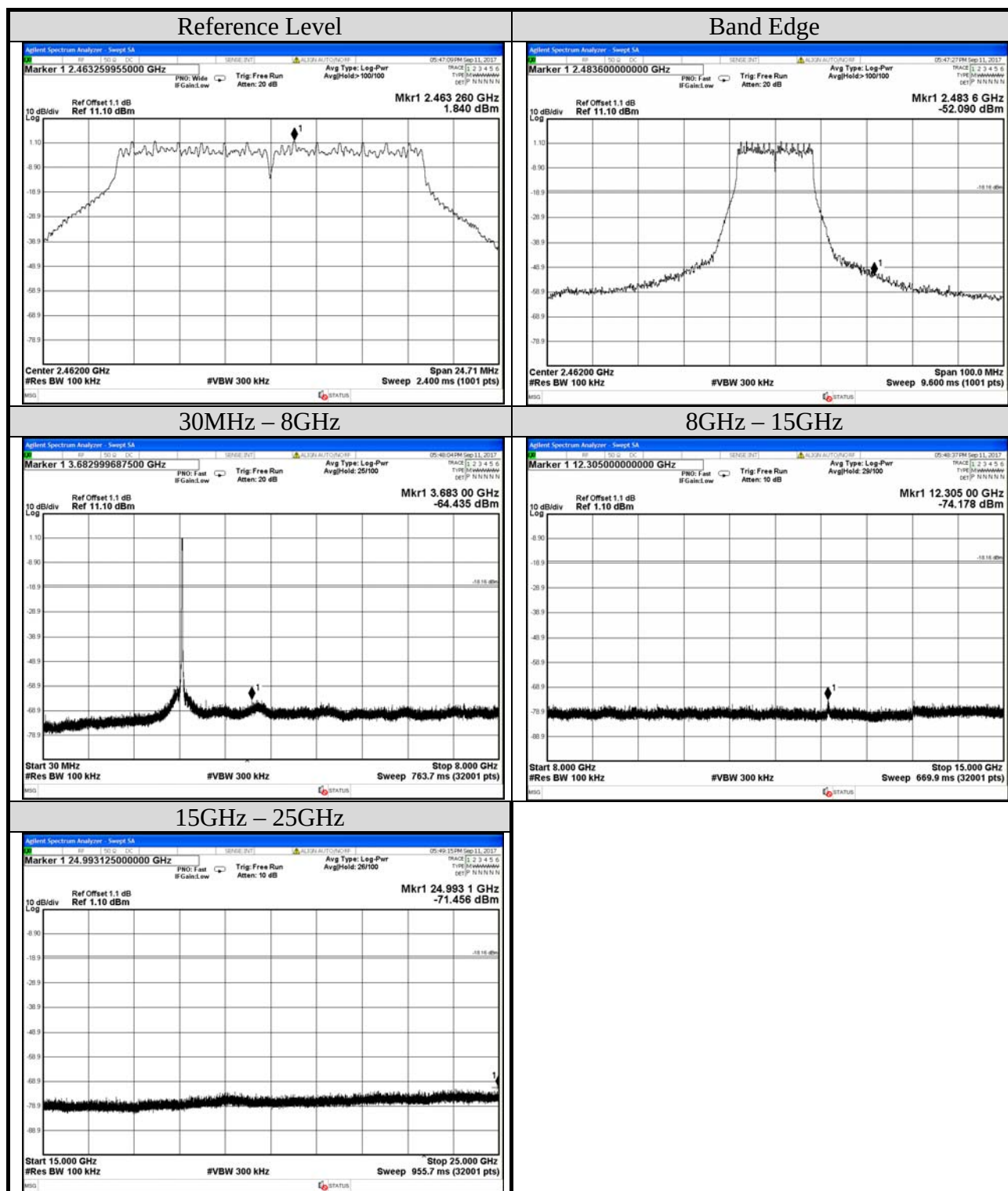
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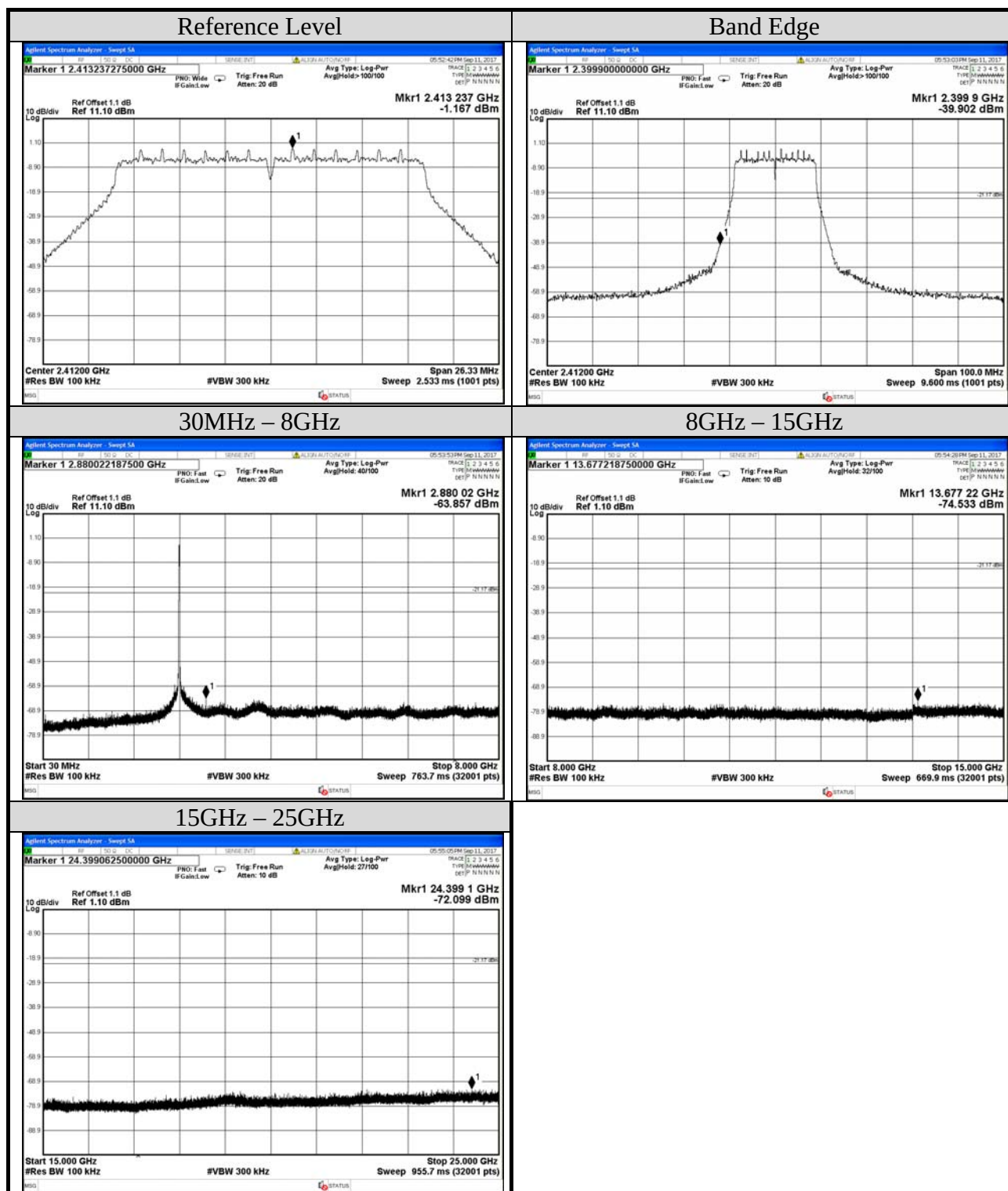
Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11g	Frequency	TX 2437MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11g	Frequency	TX 2462MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



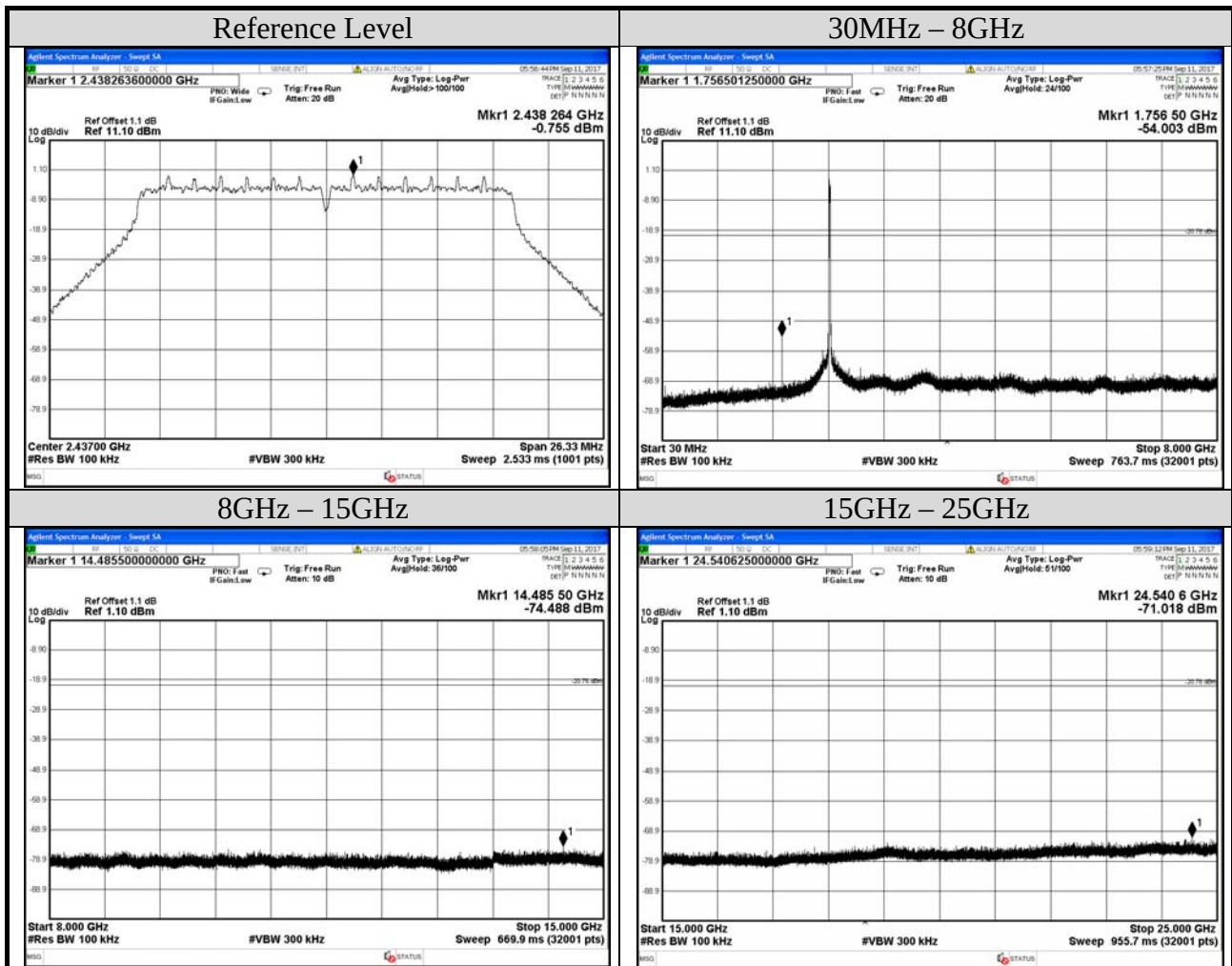
Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11n-HT20	Frequency	TX 2412MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



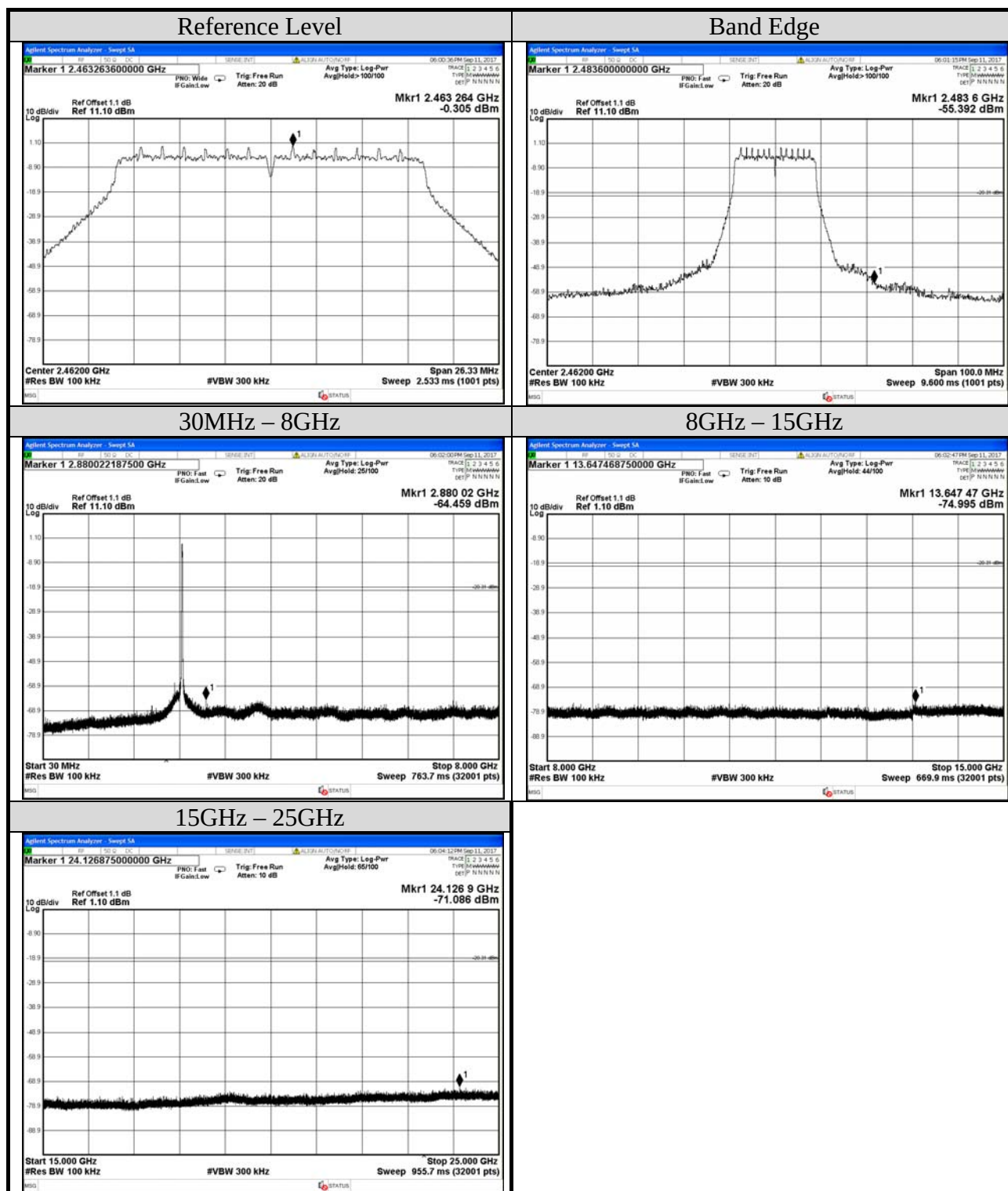
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Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11n-HT20	Frequency	TX 2437MHz
Simultaneous Factor	10 log(n) (Note: "n" is antenna number)		0



Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Mode	802.11n-HT20	Frequency	TX 2462MHz
Simultaneous Factor10 log(n) (Note: “n” is antenna number)		0	



A.6 POWER SPECTRAL DENSITY

Test Date	2017/09/11	Temp./Hum.	23°C/50%
Cable Loss	1.1dB	Test Voltage	AC 120V, 60Hz (with Isolation Transformer Set)
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)			0

A.6.1 Power Spectral Density Result

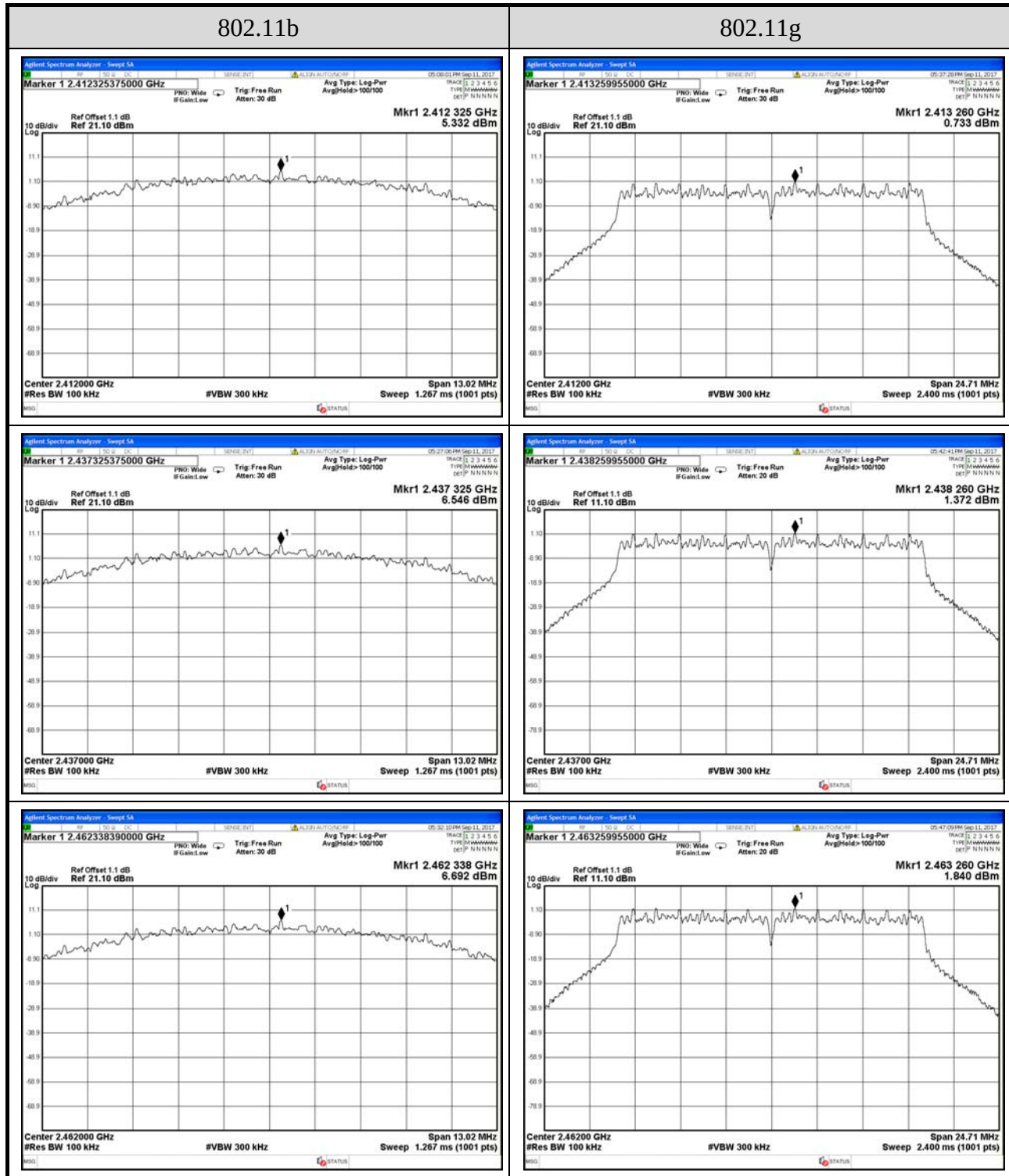
Mode	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
802.11b	2412	5.332	< 8 dBm/3kHz
	2437	6.546	
	2462	6.692	
802.11g	2412	0.733	
	2437	1.372	
	2462	1.840	
802.11n-HT20	2412	-1.167	
	2437	-0.755	
	2462	-0.305	

Note: All results have been included cable loss and Simultaneous Factor.

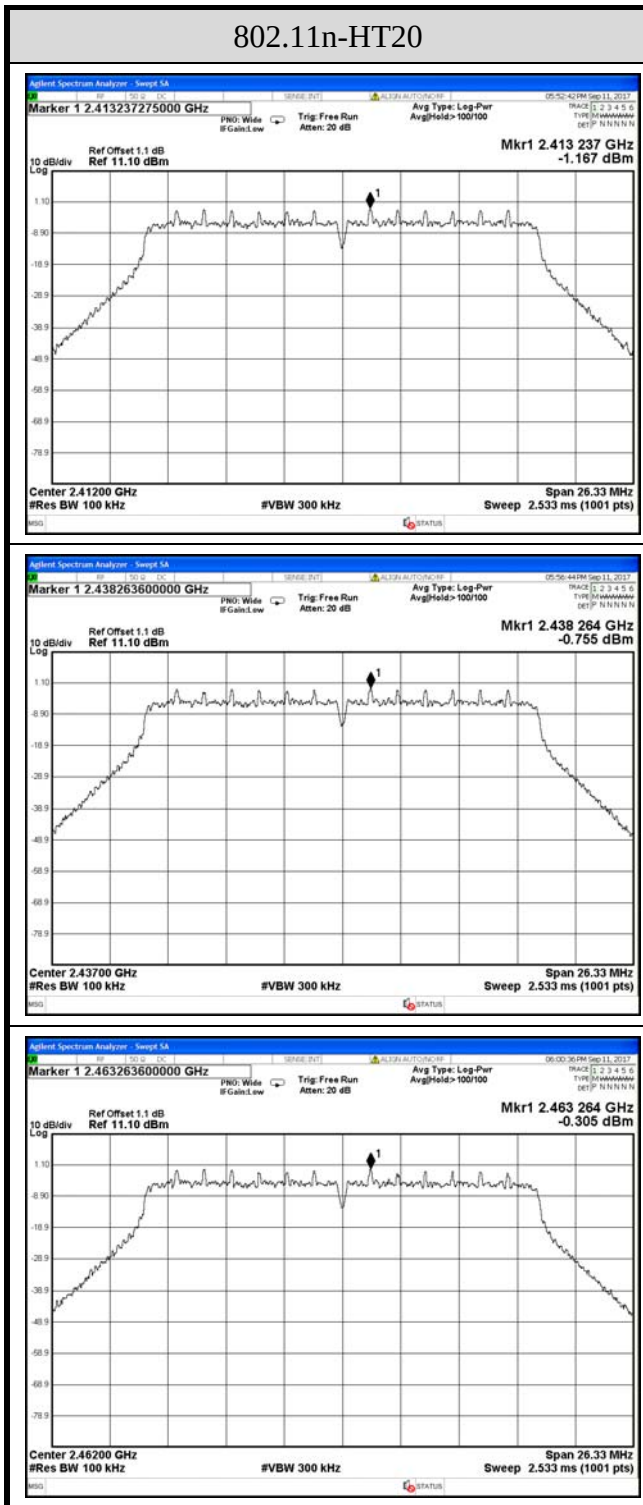
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A.6.2 Measurement Plots



Note: All results have been included cable loss and Simultaneous Factor.

802.11n-HT20

Note: All results have been included cable loss and Simultaneous Factor.



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APPENDIX B

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APPDNDIX B

TEST PHOTOGRAPHS

(Model: MR101W)