APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
LEEDARSON LIGHTING CO., LTD.

Multi-Protocol Gateway

Model No.: 6AA-GW-ZB-H0

FCC ID: 2AB2Q6AAGWZBH0

Prepared for	:	LEEDARSON LIGHTING CO., LTD.
Address	:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China.
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
Address	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.
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Report No.	:	ATE20181352
Date of Test	:	May 25, 2018-June 14, 2018
Date of Report	:	June 23, 2018

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Test Report Certification

Applicant	:	LEEDARSON LIGHTING CO., LTD.
Address	:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China
Manufacturer	:	LEEDARSON LIGHTING CO., LTD.
Address	:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China
Product	:	Multi-Protocol Gateway
Model No.	:	6AA-GW-ZB-H0
Trade name	:	n.a

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB558074 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements

The device described above is tested by SHENZHEN ACCURATE TECHNOLOGY CO., LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and SHENZHEN ACCURATE TECHNOLOGY CO., LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of SHENZHEN ACCURATE TECHNOLOGY CO., LTD.

Date of Test : May 25, 2018-June 14, 2018
Date of Report: June 23, 2018

Prepared by : (Tim Zhang, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Multi-Protocol Gateway
Model Number	:	6AA-GW-ZB-H0
Frequency Range	:	802.11b/g/n(20MHz): 2412-2462MHz 802.11n(40MHz): 2422-2452MHz
Number of Channels	:	802.11b/g/n (20MHz): 11 802.11n (40MHz): 7
Antenna Gain	:	2.5dBi
Type of Antenna	:	IFA Antenna
Power Supply	:	DC 5V(Powered by Adapter)
Adapter information	:	Model: DSA-6PFG-05 FUS 050100 Input: AC100-240V 50/60Hz 0.2A Output: 5V⎓1A
Data Rate	:	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: up to 150Mbps
Modulation Type	:	DSSS, OFDM
Applicant	:	LEEDARSON LIGHTING CO., LTD.
Address	:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China.
Manufacturer	:	LEEDARSON LIGHTING CO., LTD.
Address	:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China.
Date of sample received	:	May 25, 2018
Date of Test	:	May 25, 2018-June 14, 2018

1.2.Carrier Frequency of Channels

802.11b, 802.11g, 802.11n (20MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	---	---

802.11n (40MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
03	2422	09	2452
04	2427	---	---
05	2432	---	---
06	2437	---	---

1.3.Accessory and Auxiliary Equipment

Notebook PC	Manufacturer: LENOVO M/N: ThinkPad X240 S/N: N/A
Zigbee Lamp	Manufacturer: LEEDARSON M/N: 7ZB-A806ST-Q1Z S/N: N/A
Wireless Router	Manufacturer: MERCURY M/N: MW323R S/N: N/A

1.4.Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISEDC) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.5.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 06, 2018	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 06, 2018	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 06, 2018	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	1 Year
Open Switch and Control Unit	Rohde&Schwarz	OSP120 + OSP-B157	101244 + 100866	Jan. 06, 2018	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 06, 2018	1 Year

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **1.802.11b Transmitting mode**

Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

2.802.11g Transmitting mode
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

3.802.11n (20MHz) Transmitting mode
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

4.802.11n (40MHz) Transmitting mode
Low Channel: 2422MHz
Middle Channel: 2437MHz
High Channel: 2452MHz

3.2.Configuration and peripherals

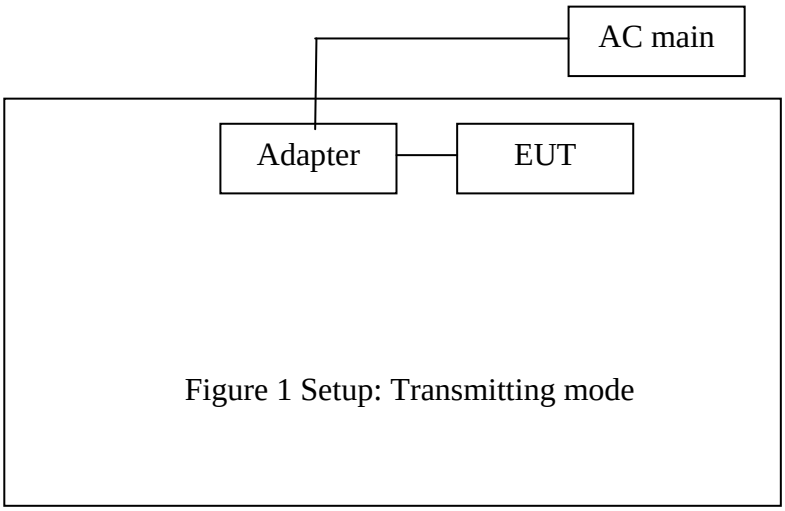


Figure 1 Setup: Transmitting mode

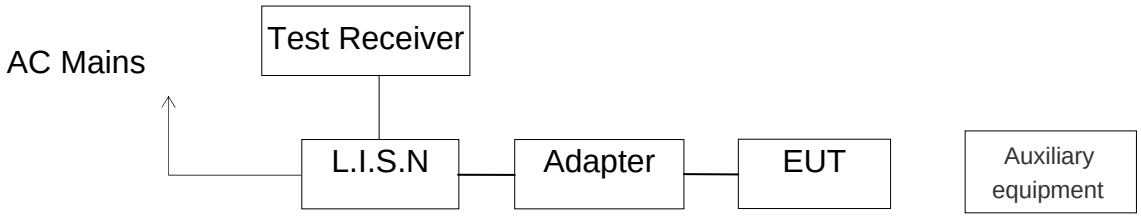
4. TEST PROCEDURES AND RESULTS

FCC&IC Rules	Description of Test	Result
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
KDB558074 D01 DTS Meas Guidance v04	Duty cycle	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.247(d)	Conducted Spurious Emission Test	Compliant
KDB558074 D01 DTS Meas Guidance v04	99% Occupied Bandwidth	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

Note: There are two kinds of shells (round and square shell) and two PCB board (one with the power key and the another is removed) for the product, and this does not affect testing, so we choose the round shell with power key as representative model to test

5. POWER LINE CONDUCTED MEASUREMENT

5.1.Block Diagram of Test Setup



(EUT: Multi-Protocol Gateway)

5.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies. NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

5.3.Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in test mode and measure it.

5.5.Test Procedure

The EUT is put on the plane 0.8 m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

5.6.DATA SAMPLE

Frequency (MHz)	Quasi Peak Level (dBμv)	Average Level (dBμv)	Transducer value (dB)	QuasiPeak Result (dBμv)	Average Result (dBμv)	Quasi Peak Limit (dBμv)	Average Limit (dBμv)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	29.4	18.3	11.1	40.5	29.4	56.0	56.0	15.5	16.6	Pass

Transducer value = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Level/Average Level + Transducer value
Limit = Limit stated in standard

Calculation Formula:

Margin = Limit – Reading level value – Transducer value

5.7.Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150kHz to 30MHz is checked.

Test mode : WIFI operation (worse case)
Test Voltage: 120V/60Hz

MEASUREMENT RESULT: "TUV-0614-1_fin"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.410000	41.20	10.7	58	16.4	QP	L1	GND
2.830000	37.50	11.0	56	18.5	QP	L1	GND
6.200000	42.30	11.2	60	17.7	QP	L1	GND
10.720000	38.60	11.3	60	21.4	QP	L1	GND

MEASUREMENT RESULT: "TUV-0614-1_fin2"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.410000	33.00	10.7	48	14.6	AV	L1	GND
2.830000	27.40	11.0	46	18.6	AV	L1	GND
6.200000	32.00	11.2	50	18.0	AV	L1	GND
23.125000	35.20	11.4	50	14.8	AV	L1	GND

MEASUREMENT RESULT: "TUV-0614-2_fin"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.415000	37.30	10.7	58	20.2	QP	N	GND
1.970000	34.40	11.0	56	21.6	QP	N	GND
3.020000	32.50	11.1	56	23.5	QP	N	GND
6.330000	37.90	11.2	60	22.1	QP	N	GND

MEASUREMENT RESULT: "TUV-0614-2_fin2"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.415000	27.10	10.7	48	20.4	AV	N	GND
1.970000	23.10	11.0	46	22.9	AV	N	GND
3.020000	20.10	11.1	46	25.9	AV	N	GND
16.225000	30.40	11.4	50	19.6	AV	N	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.
The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

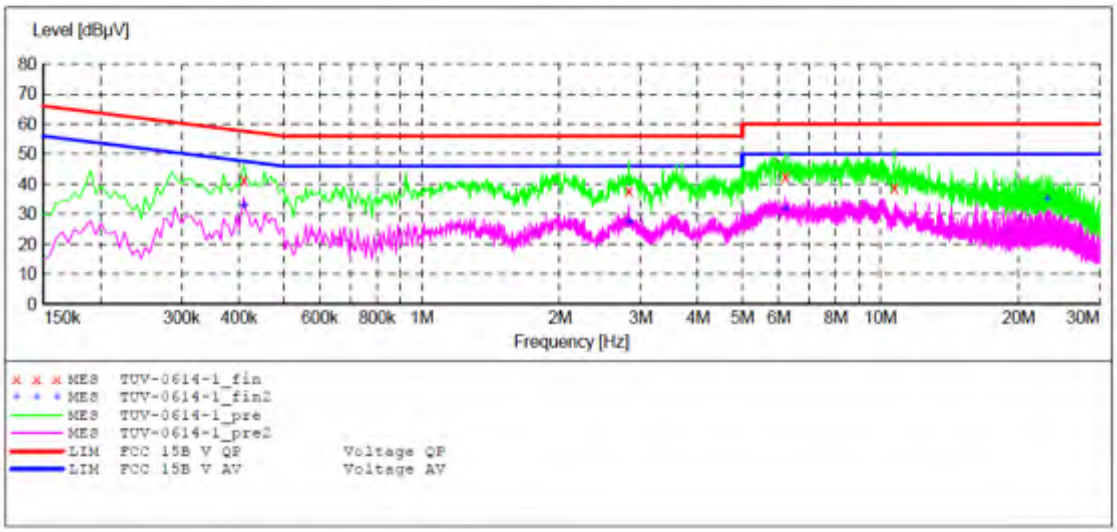
CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer: Leedarson
Operating Condition: WiFi operation
Test Site: 1#Shielding Room
Operator: WADE
Test Specification: L 120V/60Hz
Comment: Mains port
Start of Test: 6/14/2018 /

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "TUV-0614-1_fin"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.410000	41.20	10.7	58	16.4	QP	L1	GND
2.830000	37.50	11.0	56	18.5	QP	L1	GND
6.200000	42.30	11.2	60	17.7	QP	L1	GND
10.720000	38.60	11.3	60	21.4	QP	L1	GND

MEASUREMENT RESULT: "TUV-0614-1_fin2"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.410000	33.00	10.7	48	14.6	AV	L1	GND
2.830000	27.40	11.0	46	18.6	AV	L1	GND
6.200000	32.00	11.2	50	18.0	AV	L1	GND
23.125000	35.20	11.4	50	14.8	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

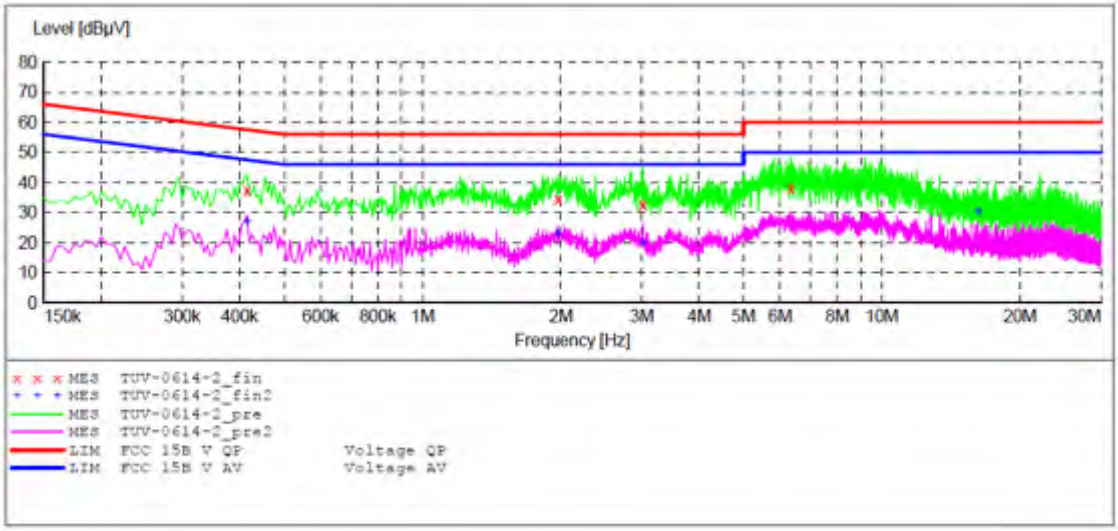
CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer: Leedarson
Operating Condition: WiFi operation
Test Site: 1#Shielding Room
Operator: WADE
Test Specification: N 120V/60Hz
Comment: Mains port
Start of Test: 6/14/2018 /

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "TUV-0614-2_fin"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.415000	37.30	10.7	58	20.2	QP	N	GND
1.970000	34.40	11.0	56	21.6	QP	N	GND
3.020000	32.50	11.1	56	23.5	QP	N	GND
6.330000	37.90	11.2	60	22.1	QP	N	GND

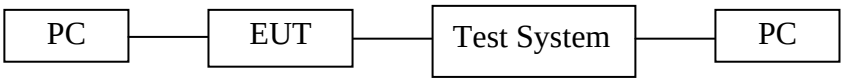
MEASUREMENT RESULT: "TUV-0614-2_fin2"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.415000	27.10	10.7	48	20.4	AV	N	GND
1.970000	23.10	11.0	46	22.9	AV	N	GND
3.020000	20.10	11.1	46	25.9	AV	N	GND
16.225000	30.40	11.4	50	19.6	AV	N	GND

6. 6DB BANDWIDTH MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. The Requirement For Section 15.247(a)(2)

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.3. The Requirement for 5.2(1)

The minimum -6 dB bandwidth shall be 500 kHz.

6.4. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.5. Operating Condition of EUT

6.5.1. Setup the EUT and simulator as shown as Section 6.1.

6.5.2. Turn on the power of all equipment.

6.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

6.6. Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies

associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.7.Test Result

The test was performed with 802.11b			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	10.203	> 0.5MHz
Middle	2437	10.115	> 0.5MHz
High	2462	10.159	> 0.5MHz

The test was performed with 802.11g			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	16.498	> 0.5MHz
Middle	2437	16.498	> 0.5MHz
High	2462	16.498	> 0.5MHz

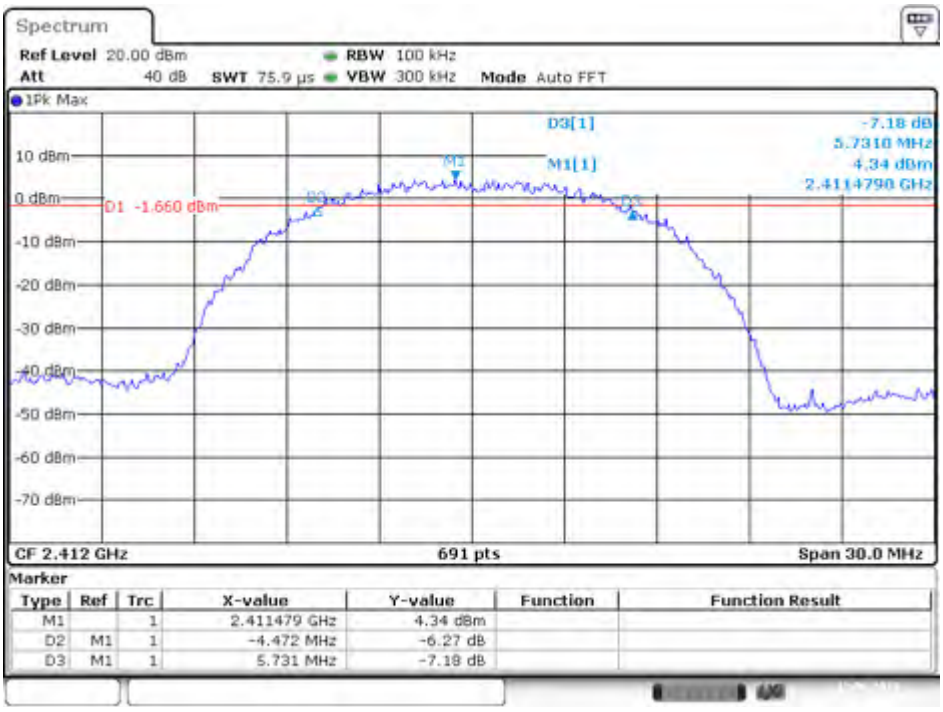
The test was performed with 802.11n (Bandwidth: 20 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	17.670	> 0.5MHz
Middle	2437	17.757	> 0.5MHz
High	2462	17.757	> 0.5MHz

The test was performed with 802.11n (Bandwidth: 40 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2422	36.469	> 0.5MHz
Middle	2437	36.469	> 0.5MHz
High	2452	36.469	> 0.5MHz

The spectrum analyzer plots are attached as below.

6dB Bandwidth

802.11b Channel Low 2412MHz



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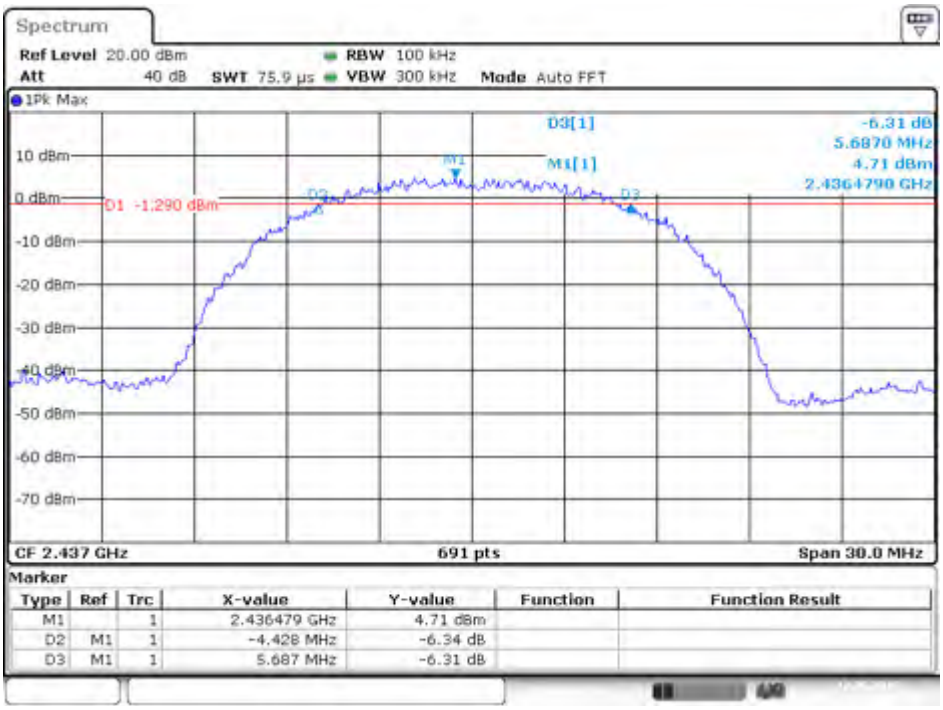
802.11b Channel Middle 2437MHz



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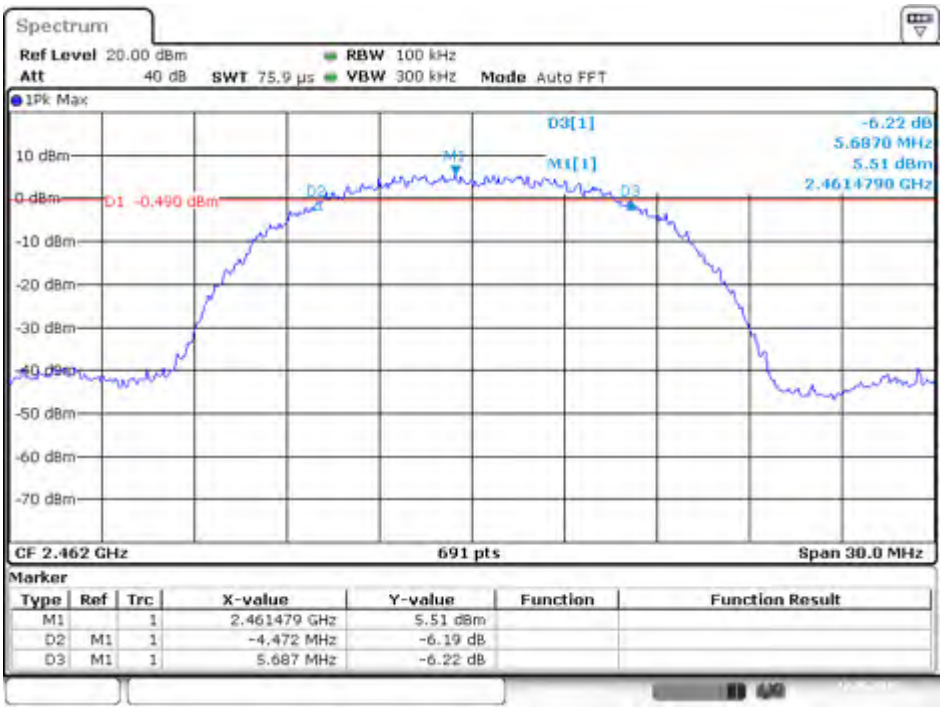
802.11b Channel High 2462MHz



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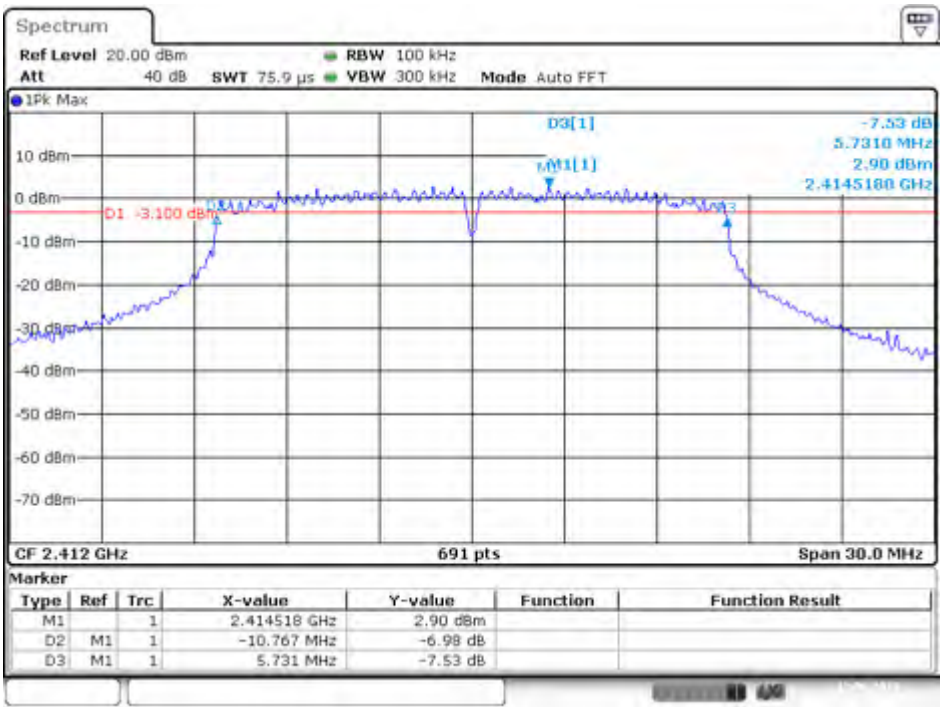
802.11g Channel Low 2412MHz



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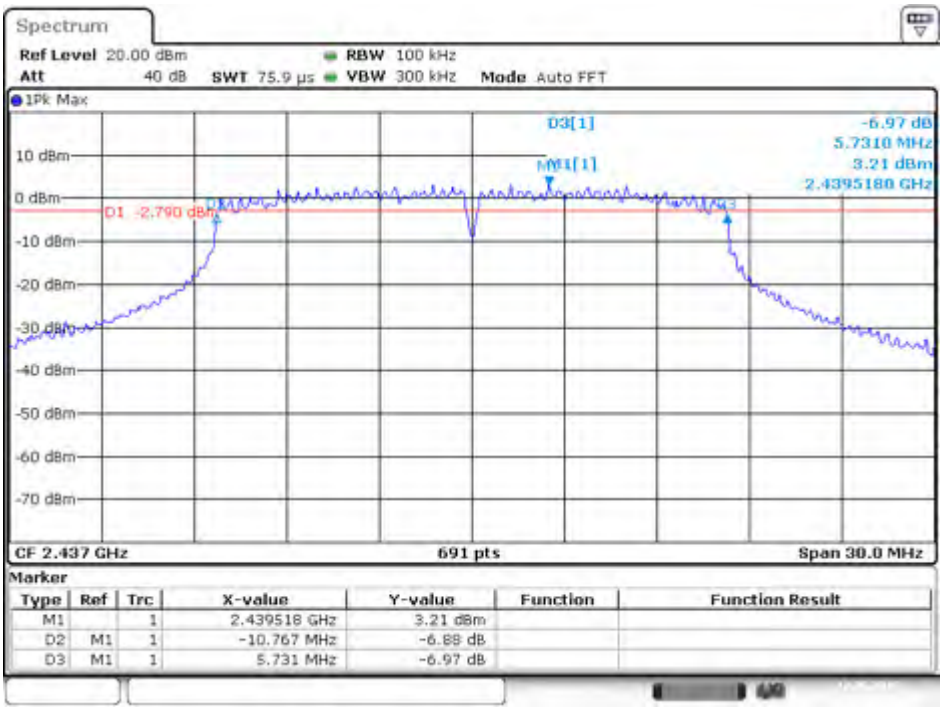
802.11g Channel Middle 2437MHz



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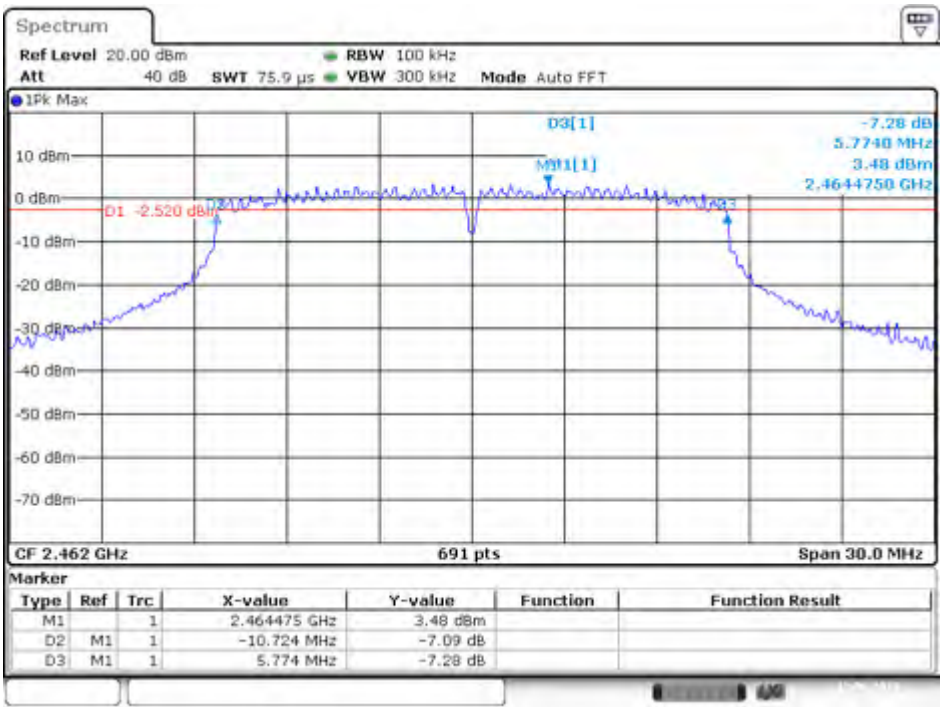
802.11g Channel High 2462MHz



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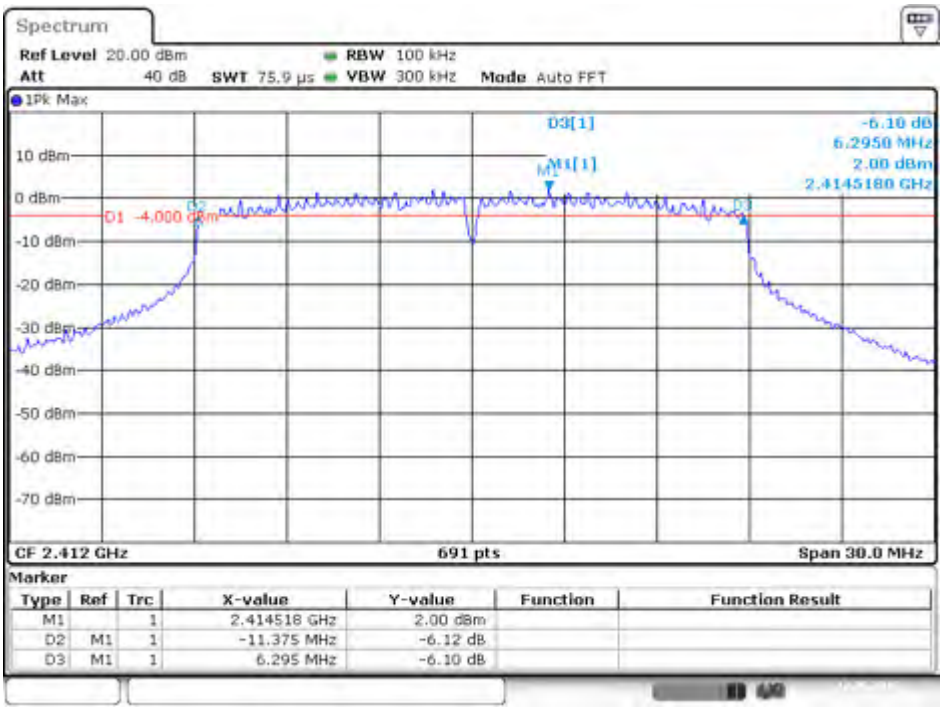
802.11n Channel Low 2412MHz (20MHz)



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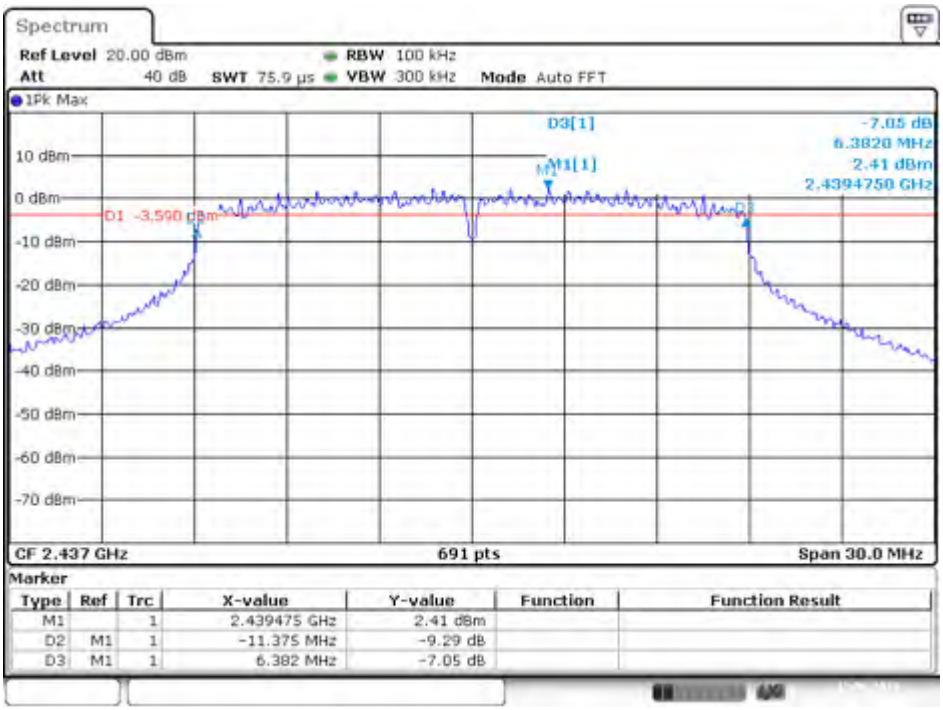
802.11n Channel Middle 2437MHz(20MHz)



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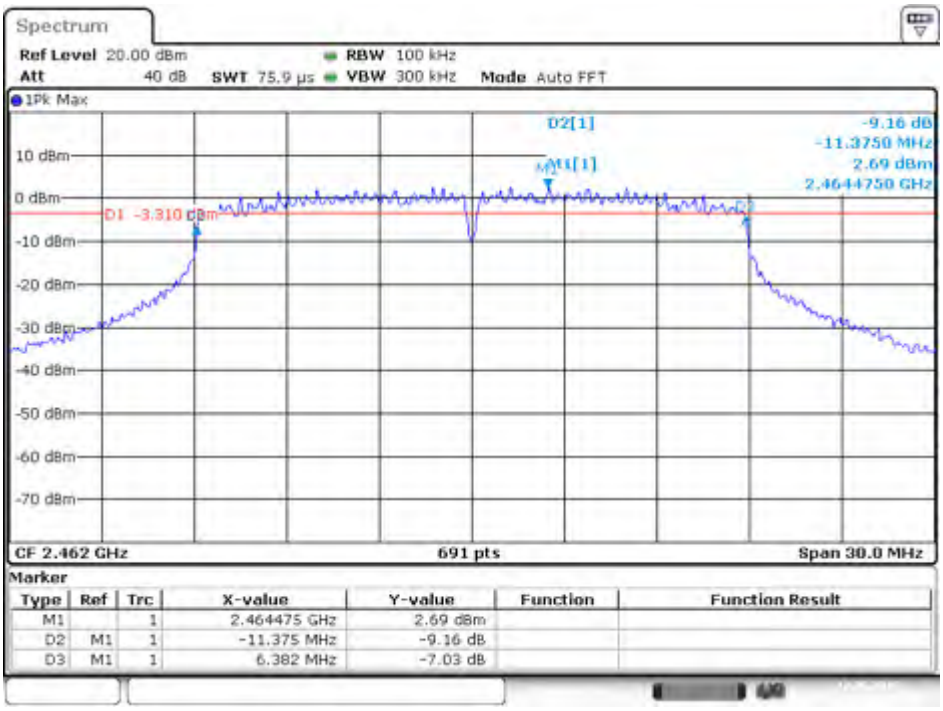
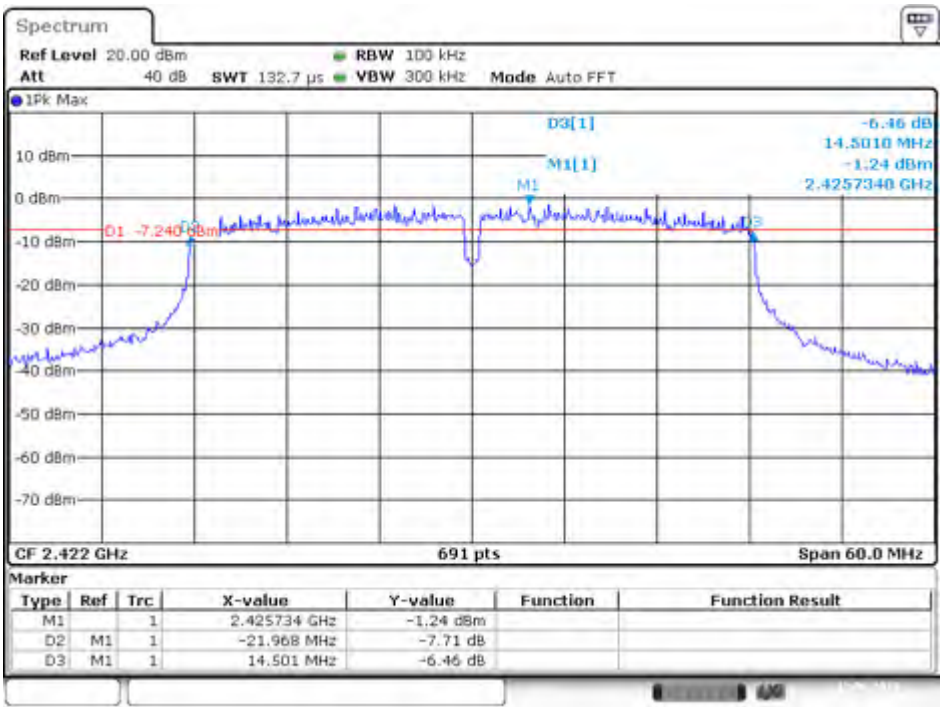
802.11n Channel High 2462MHz(20MHz)



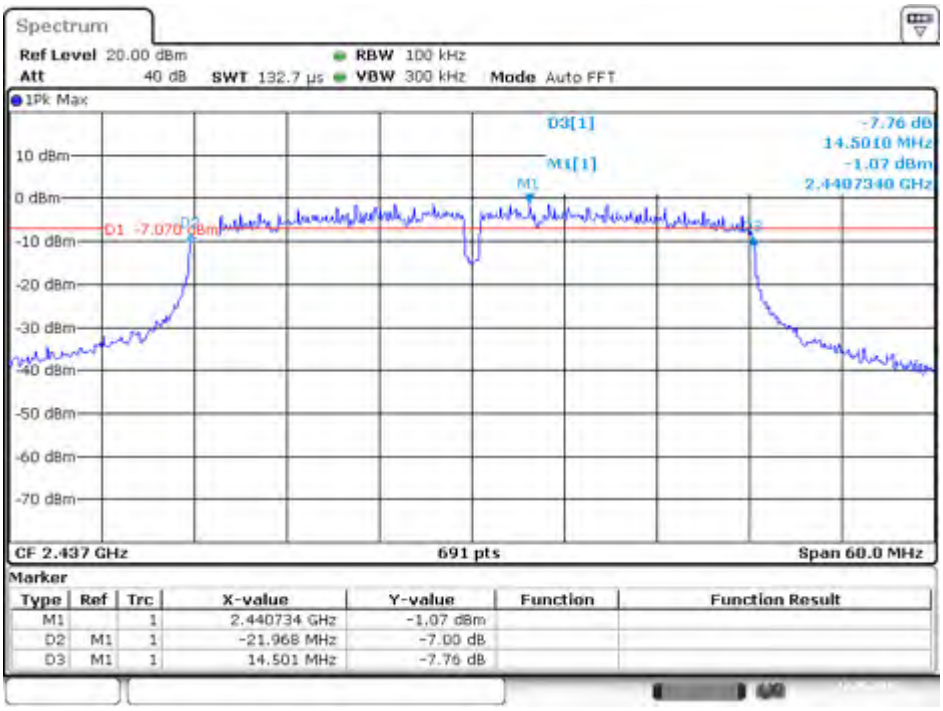
Date: 12.JUN.2018 10:58:44

802.11n Channel Low 2422MHz (40MHz)



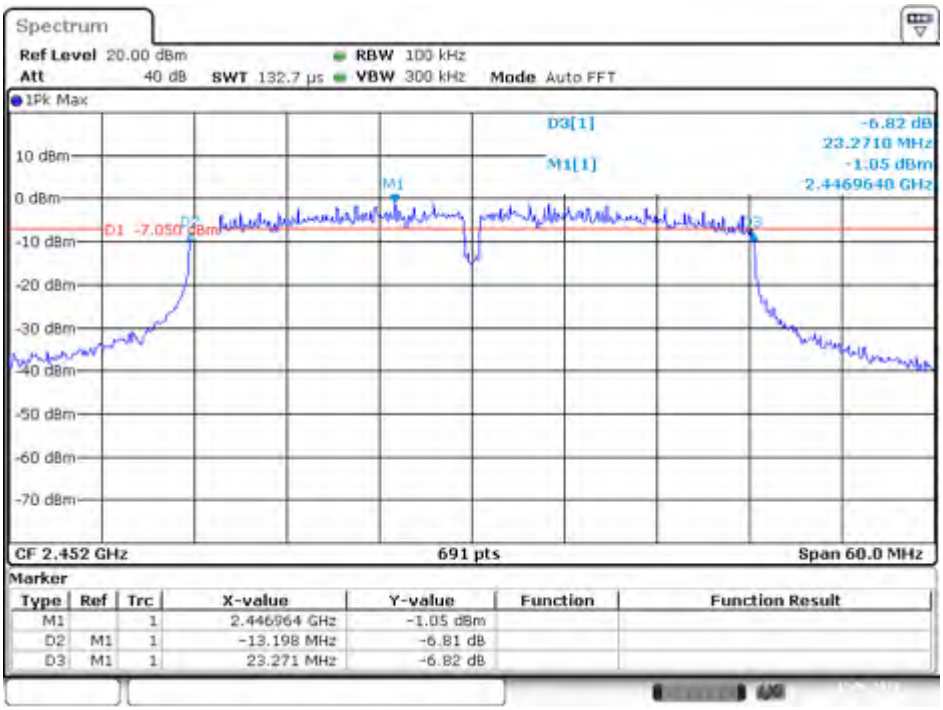
Date: 12.JUN.2018 11:22:55

802.11n Channel Middle 2437MHz (40MHz)



Date: 12.JUN.2018 11:24:17

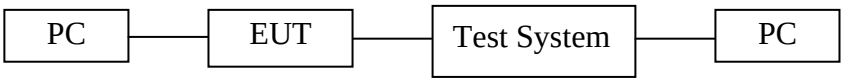
802.11n Channel High 2452MHz(40MHz)



Date: 12.JUN.2018 11:25:30

7. DUTY CYCLE MEASUREMENT

7.1.Block Diagram of Test Setup



7.2.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.Operating Condition of EUT

7.3.1.Setup the EUT and simulator as shown as Section 7.1.

7.3.2.Turn on the power of all equipment.

7.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

7.4.Test Procedure

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:
1. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on- and off-times of the transmitted signal.
2. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on- and off-times of the transmitted signal
a. Set the center frequency of the instrument to the centre frequency of the transmission
b. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value(10MHz).
c. Set detector = Peak or average.
d. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.
(For example, if VBW and/or RBW are limited to 3MHz, then the zero-span method of measuring duty cycle shall not be used if T≤16.7 microseconds.)

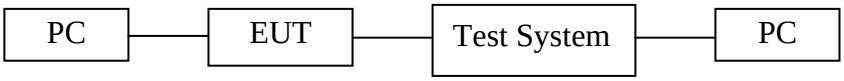
7.5. Test Result

The manufacturer can set up the duty cycle of 100%,

So we tested the power and PSD at 100% of the duty cycle.

8. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

8.1.Block Diagram of Test Setup



8.2.The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

8.3.EUT Configuration on Measurement

The equipment is installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 8.1.

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

8.5.Test Procedure

8.5.1.The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB5580 74 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements.

8.5.2.The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.3.Set RBW = 1-5% of the OBW, not to exceed 1 MHz, VBW $\geqslant$ 3 x RBW, Sweep time = auto, Set span to at least 1.5 times the OBW, Detector = RMS.

8.5.4.Measurement the Maximum conducted (average) output power.

8.6.Test Result

Final power= Ave output power+10log(1/ duty cycle)

The test was performed with 802.11b					
Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	FCC Limits dBm / W
2412	12.60	0.00	12.60	0.018	30 dBm / 1 W
2437	13.00	0.00	13.00	0.020	30 dBm / 1 W
2462	13.35	0.00	13.35	0.022	30 dBm / 1 W

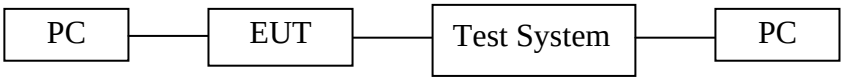
The test was performed with 802.11g					
Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	FCC Limits dBm / W
2412	14.01	0.00	14.01	0.025	30 dBm / 1 W
2437	14.35	0.00	14.35	0.027	30 dBm / 1 W
2462	14.33	0.00	14.33	0.027	30 dBm / 1 W

The test was performed with 802.11n(20MHz)					
Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	FCC Limits dBm / W
2412	12.94	0.00	12.94	0.020	30 dBm / 1 W
2437	13.44	0.00	13.44	0.022	30 dBm / 1 W
2462	13.16	0.00	13.16	0.021	30 dBm / 1 W

The test was performed with 802.11n(40MHz)					
Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	FCC Limits dBm / W
2422	12.01	0.00	12.01	0.016	30 dBm / 1 W
2437	11.93	0.00	11.93	0.016	30 dBm / 1 W
2452	12.74	0.00	12.74	0.019	30 dBm / 1 W

9. POWER SPECTRAL DENSITY MEASUREMENT

9.1.Block Diagram of Test Setup



9.2.The Requirement For Section 15.247(e)

Section 15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

9.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4.Operating Condition of EUT

9.4.1.Setup the EUT and simulator as shown as Section 9.1.

9.4.2.Turn on the power of all equipment.

9.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

9.5.Test Procedure

9.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2.Measurement Procedure AVGPSD-2:

This procedure is applicable when the EUT cannot be configured to transmit continuously(i.e., duty cycle<98%), and when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level, and when the transmission duty is constant(i.e., duty cycle variations are less than ±2%):

Measure the dyty cycle(x) of the transmitter output signal as described in Section 6.0.
Set instrument center frequency to DTS channel center frequency.
Set span to at least 1.5×OBW.
Set RBW to: 3kHz≤ RBW≤100kHz.
Set VBW≥ 3×RBW
Detector=power averaging(RMS) or sample detector(when RMS not available).
Ensure that the number of measurement points in sweep≥2×span/RBW.
Sweep time=auto couple.
Do not use sweep triggering. Allow sweep to “free run”.
Employ trace averaging(RMS) mode over a minimum of 100 traces.
Use the peak maker function to determine the maximum amplitude level.
Add 10log(1/x), where x is the duty cycle measured in step(a, to the measured PSD to compute the average PSD during the actual transmission time.
If resultant value exceeds the limit, then reduce RBW(no less than 3kHz) and repeat(note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

9.6.Test Result

Note: Single antenna transmit in 820.11b and 802.11g mode

Both antennas are transmitted at the same time in 802.11n mode.

We have recorded the worst case value in the report.

The test was performed with 802.11b					
Channel	Frequency (MHz)	Power Spectral Density(dBm)	10log(1/ duty cycle)	Final Power Spectral Density(dBm)	Limits (dBm)
Low	2412	-15.54	0.00	-15.54	8 dBm
Middle	2437	-15.04	0.00	-15.04	8 dBm
High	2462	-14.67	0.00	-14.67	8 dBm

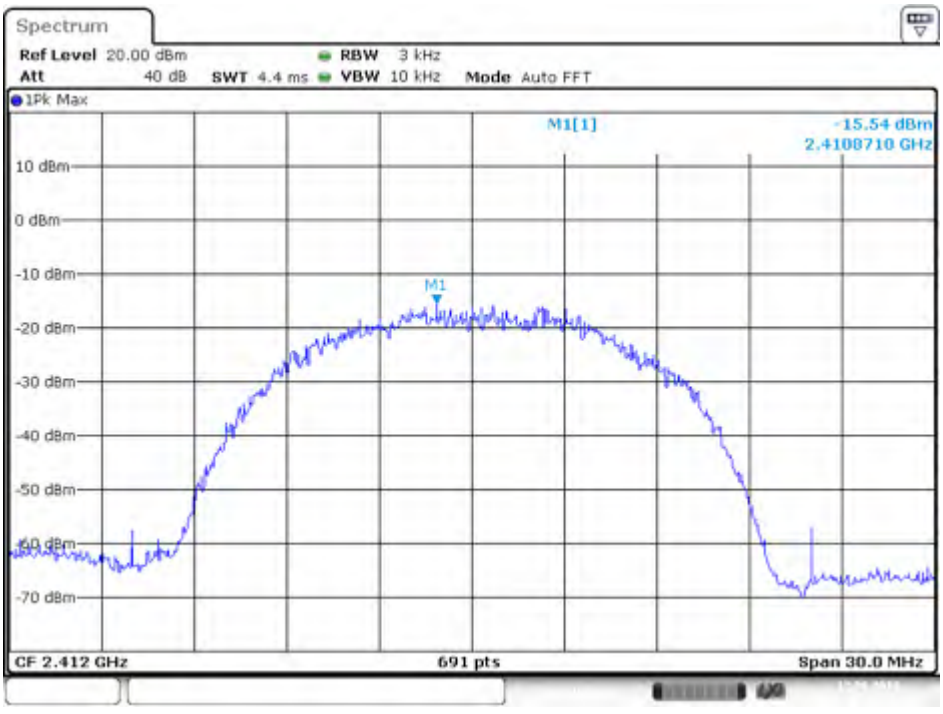
The test was performed with 802.11g					
Channel	Frequency (MHz)	Power Spectral Density(dBm)	10log(1/ duty cycle)	Final Power Spectral Density(dBm)	Limits (dBm)
Low	2412	-15.11	0.00	-15.11	8 dBm
Middle	2437	-14.66	0.00	-14.66	8 dBm
High	2462	-14.67	0.00	-14.67	8 dBm

The test was performed with 802.11n(20MHz)					
Channel	Frequency (MHz)	Power Spectral Density(dBm)	10log(1/ duty cycle)	Final Power Spectral Density(dBm)	Limits (dBm)
Low	2412	-16.53	0.00	-16.53	8 dBm
Middle	2437	-16.12	0.00	-16.12	8 dBm
High	2462	-15.09	0.00	-15.09	8 dBm

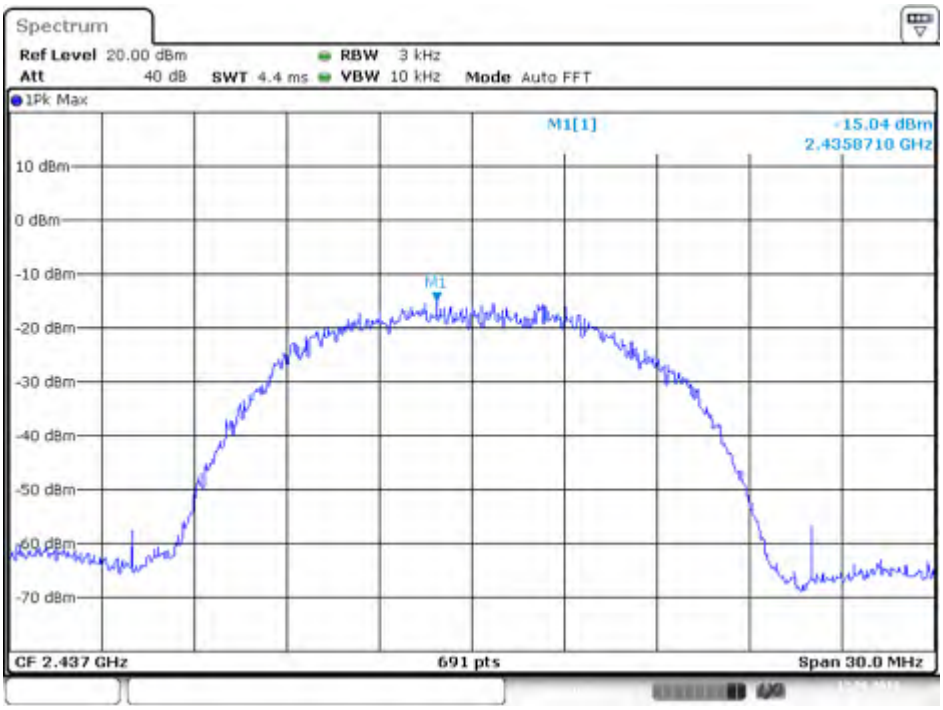
The test was performed with 802.11n(40MHz)					
Channel	Frequency (MHz)	Power Spectral Density(dBm)	10log(1/ duty cycle)	Final Power Spectral Density(dBm)	Limits (dBm)
Low	2422	-20.41	0.00	-20.41	8 dBm
Middle	2437	-20.67	0.00	-20.67	8 dBm
High	2452	-20.51	0.00	-20.51	8 dBm

The spectrum analyzer plots are attached as below.

802.11b Low Channel 2412MHz

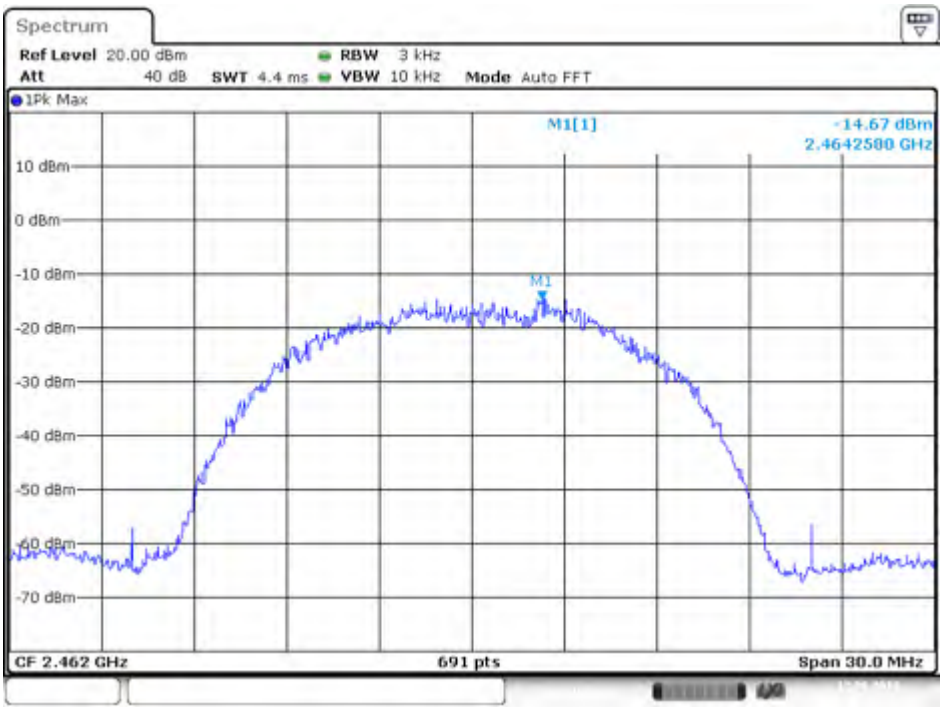


802.11b Middle Channel 2437MHz



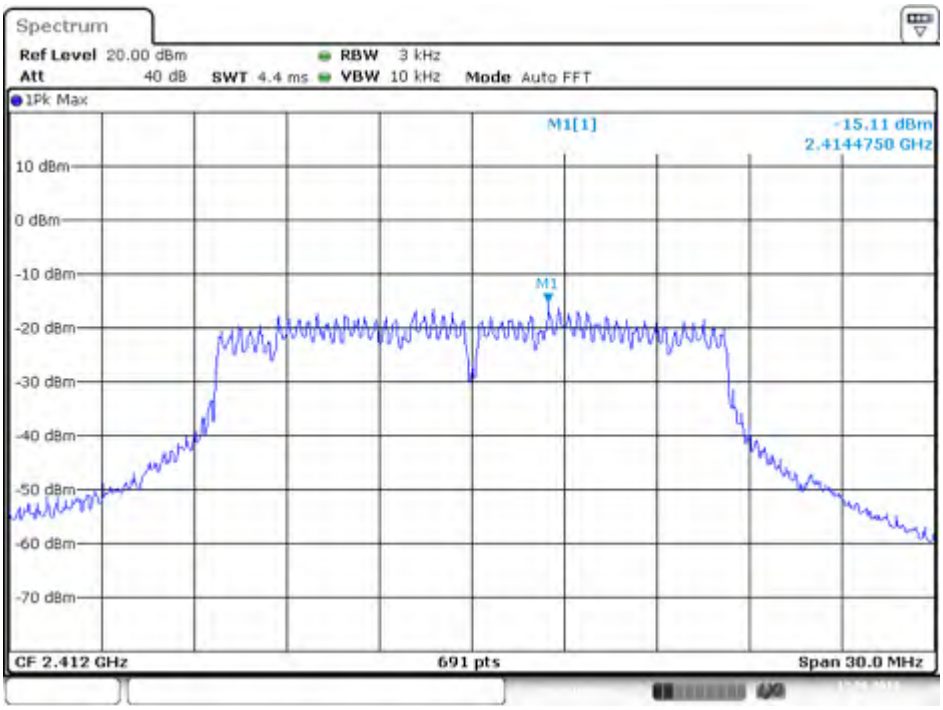
Date: 12.JUN.2018 10:32:38

802.11b High Channel 2462MHz



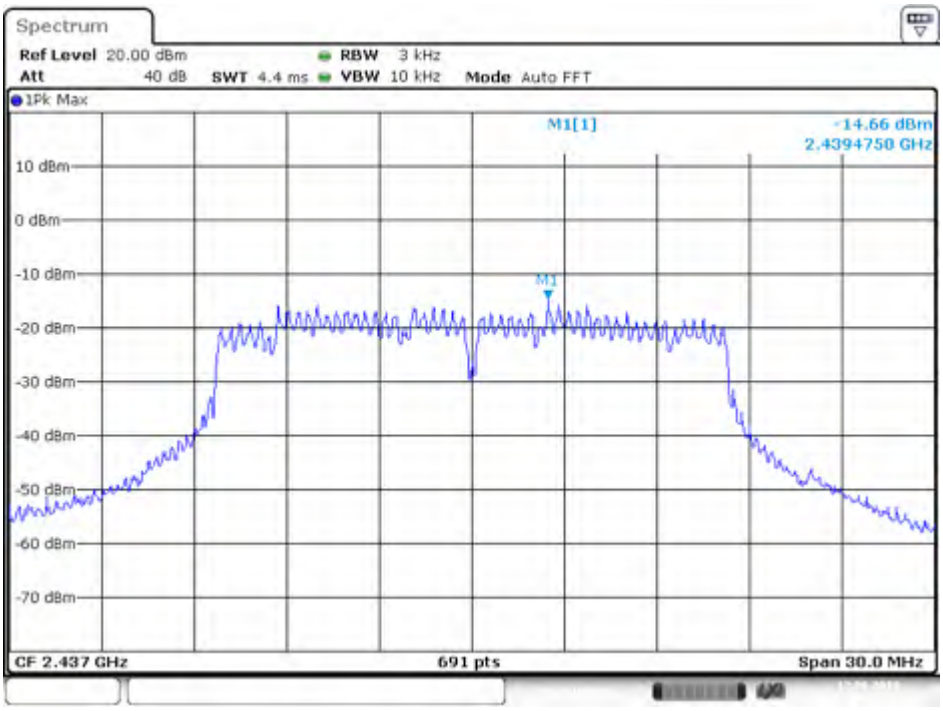
Date: 12.JUN.2018 10:32:10

802.11g Low Channel 2412MHz



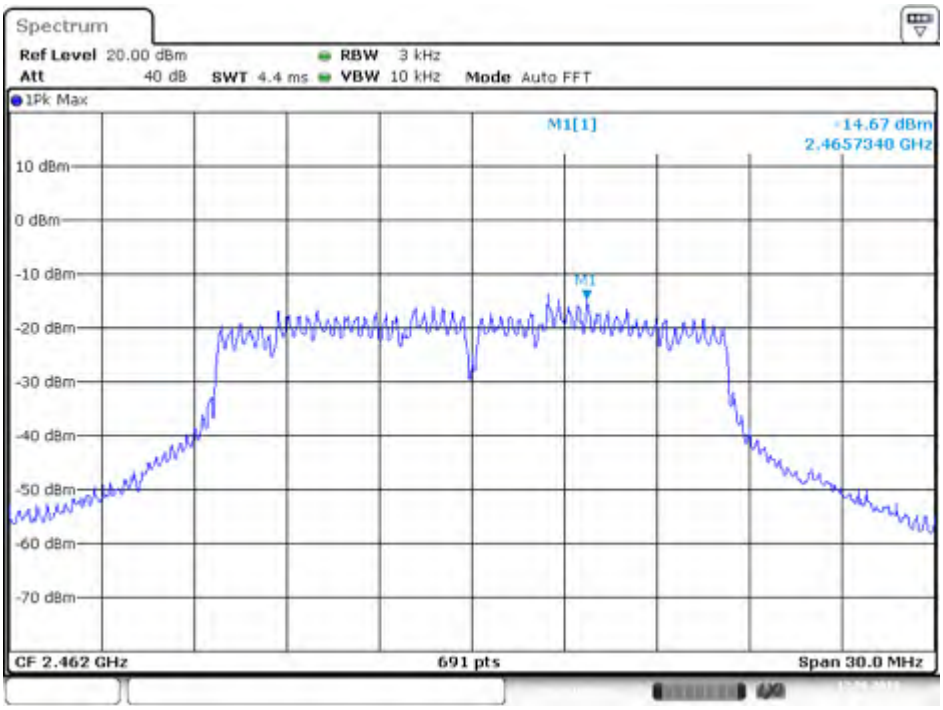
Date: 12.JUN.2018 10:52:53

802.11g Middle Channel 2437MHz



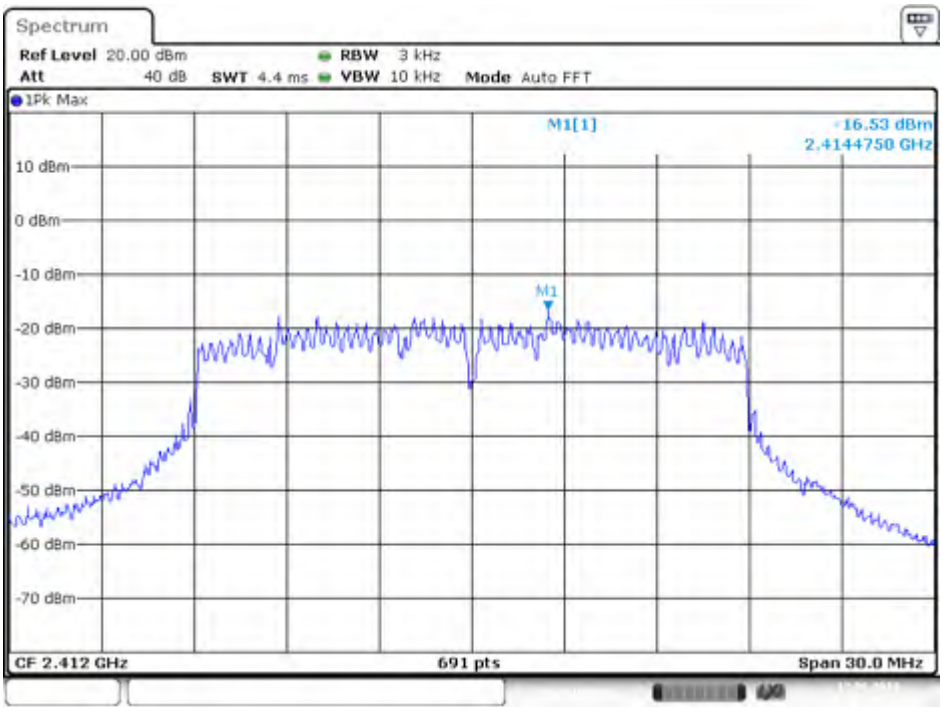
Date: 12.JUN.2018 10:52:15

802.11g High Channel 2462MHz



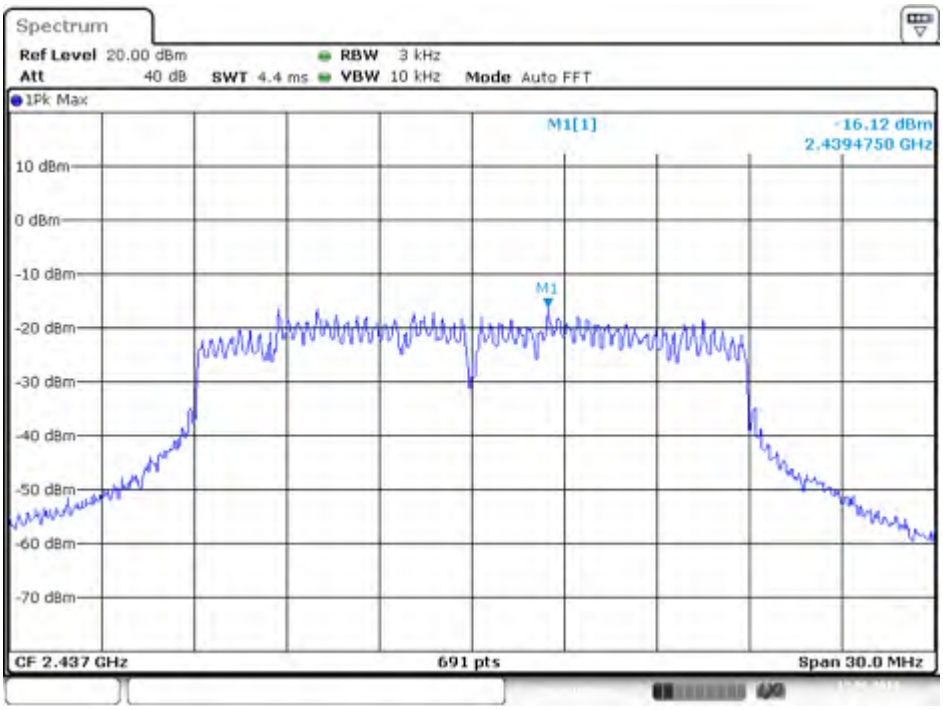
Date: 12.JUN.2018 10:51:23

802.11n(20MHz) Low Channel 2412MHz



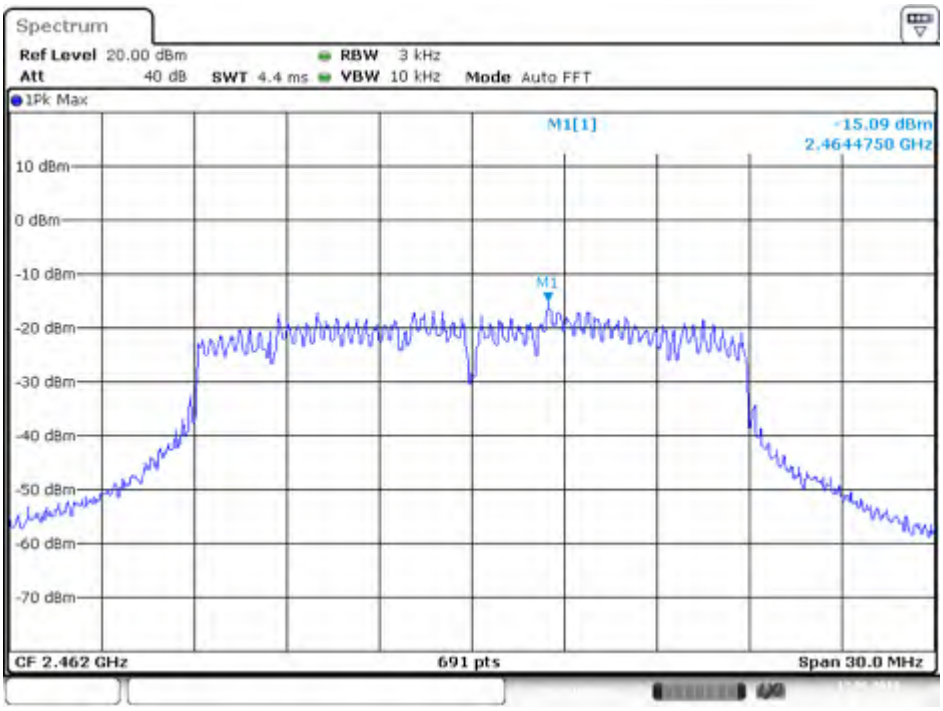
Date: 12.JUN.2018 11:14:03

802.11n(20MHz) Middle Channel 2437MHz



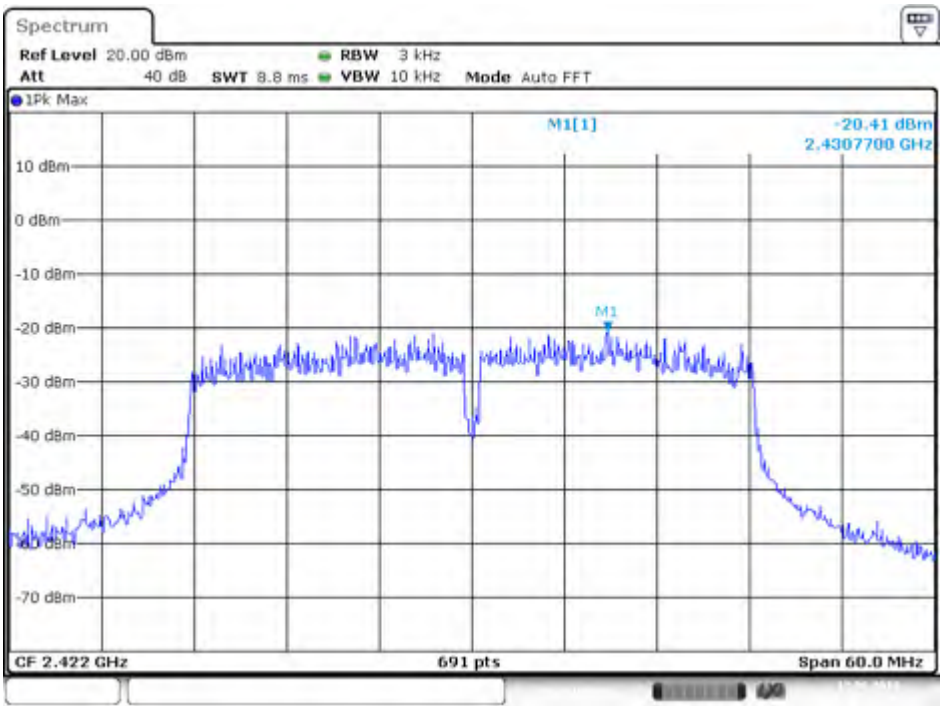
Date: 12.JUN.2018 11:13:24

802.11n(20MHz) High Channel 2462MHz



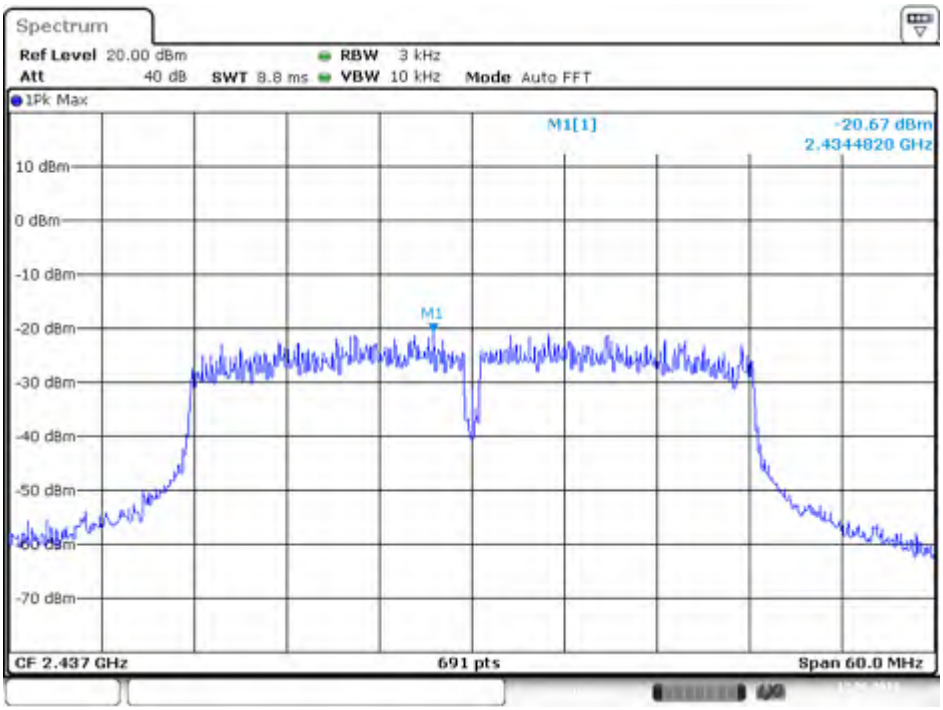
Date: 12.JUN.2018 11:12:42

802.11n(40MHz) Low Channel 2422MHz



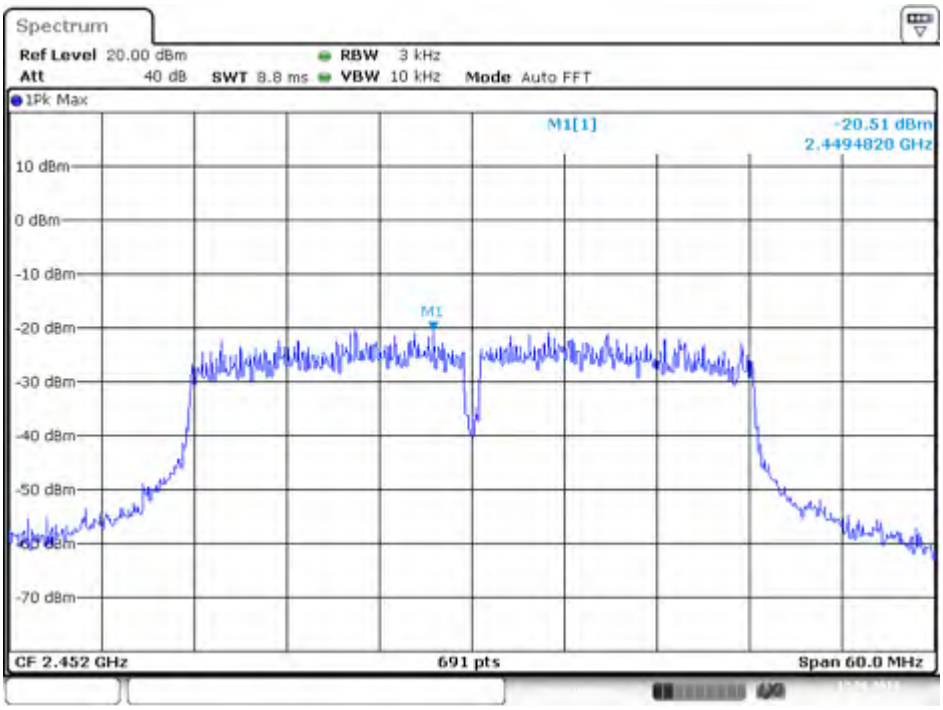
Date: 12.JUN.2018 11:40:35

802.11n(40MHz) Middle Channel 2437MHz



Date: 12.JUN.2018 11:40:00

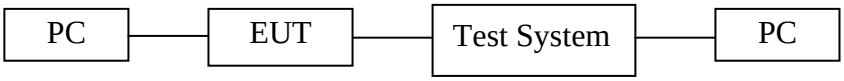
802.11n(40MHz) High Channel 2452MHz



Date: 12.JUN.2018 11:39:19

10.BAND EDGE COMPLIANCE TEST

10.1.Block Diagram of Test Setup



10.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.4.Operating Condition of EUT

10.4.1.Setup the EUT and simulator as shown as Section 10.1.

10.4.2.Turn on the power of all equipment.

10.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

10.5.Test Procedure

Conducted Band Edge:

10.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

10.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

10.5.3.The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.

10.5.4.The turntable was rotated for 360 degrees to determine the position of maximum emission level.

10.5.5.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

10.5.6.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

10.5.7.RBW=1MHz, VBW=1MHz

10.5.8.The band edges was measured and recorded.

10.6.Test Result

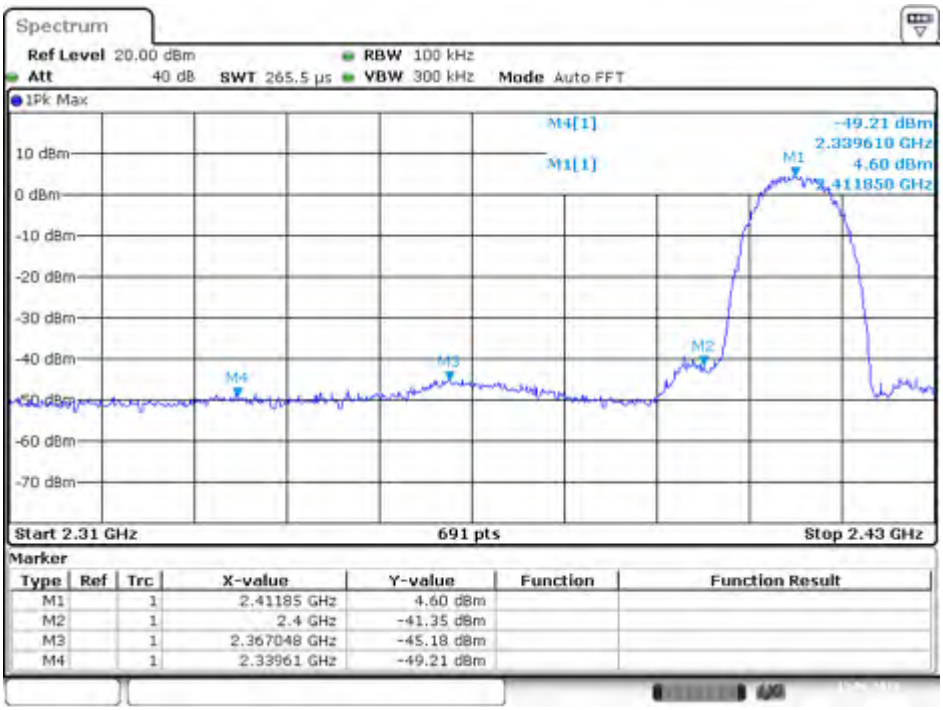
The test was performed with 802.11b		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400.0	45.95	> 20dBc
2497.1	50.84	> 20dBc

The test was performed with 802.11g		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400.0	31.08	> 20dBc
2483.5	49.06	> 20dBc

The test was performed with 802.11n (20MHz)		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400.0	32.39	> 20dBc
2483.5	47.09	> 20dBc

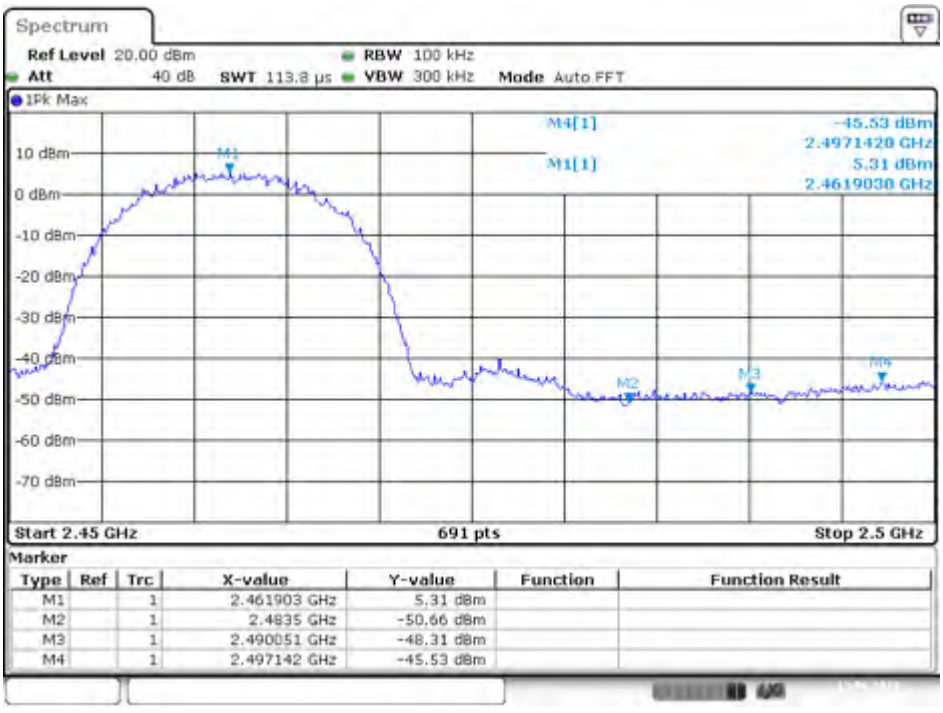
The test was performed with 802.11n (40MHz)		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400.0	29.98	> 20dBc
2489.5	36.92	> 20dBc

802.11b Low Channel 2412MHz



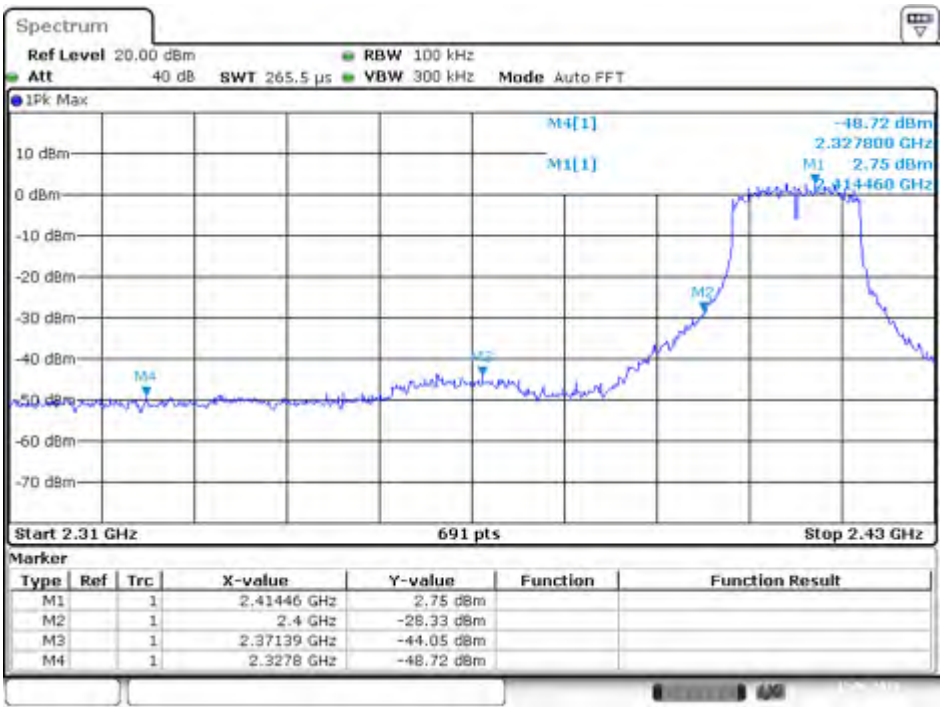
Date: 12.JUN.2018 10:22:26

802.11b High Channel 2462MHz



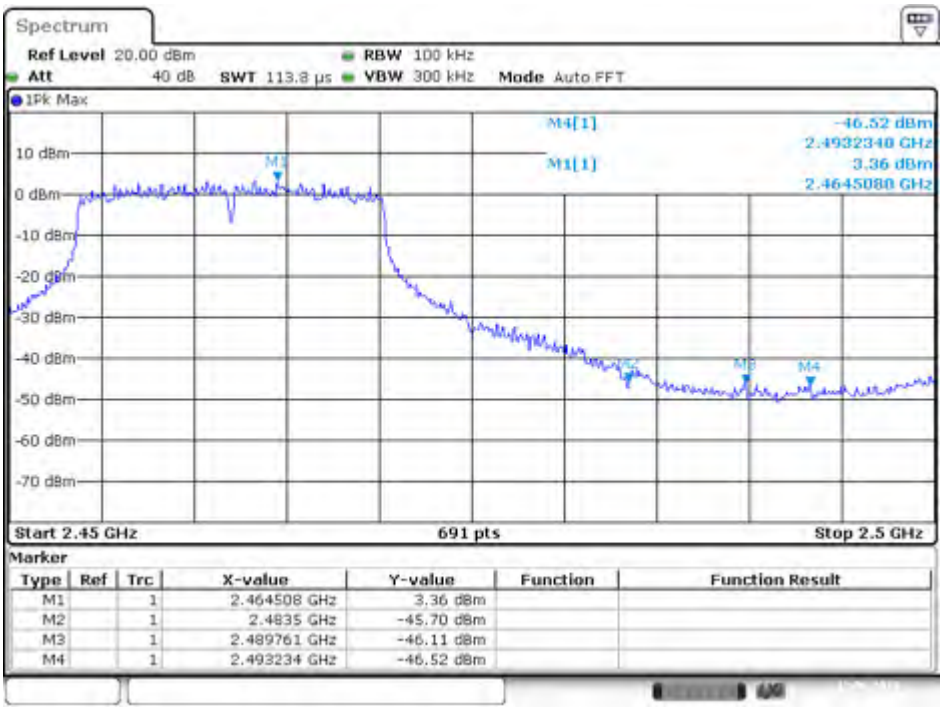
Date: 12.JUN.2018 10:24:57

802.11g Low Channel 2412MHz



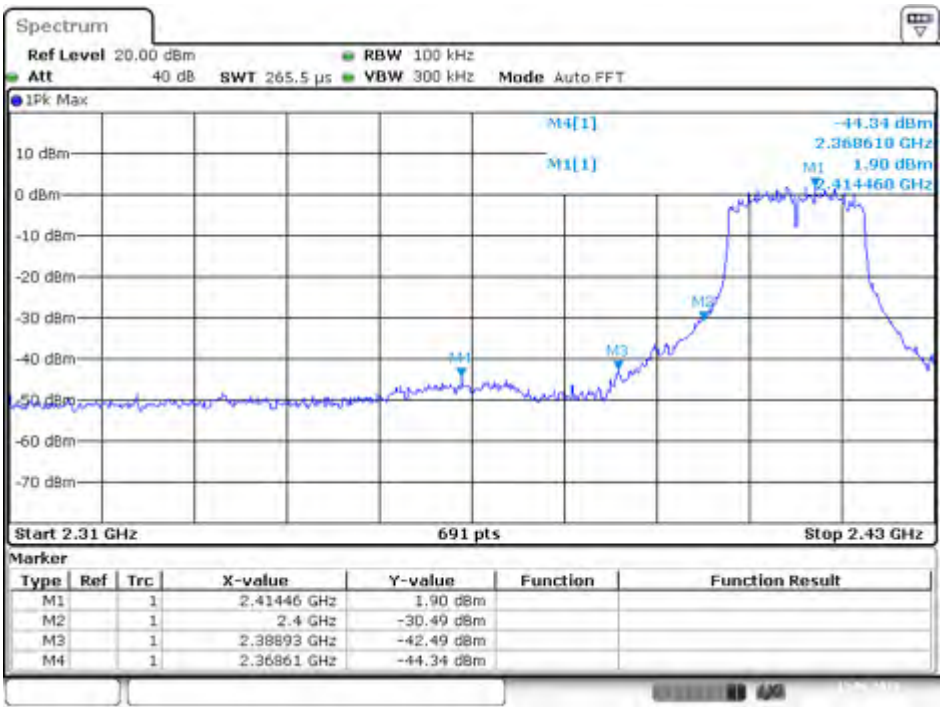
Date: 12.JUN.2018 10:43:11

802.11g High Channel 2462MHz



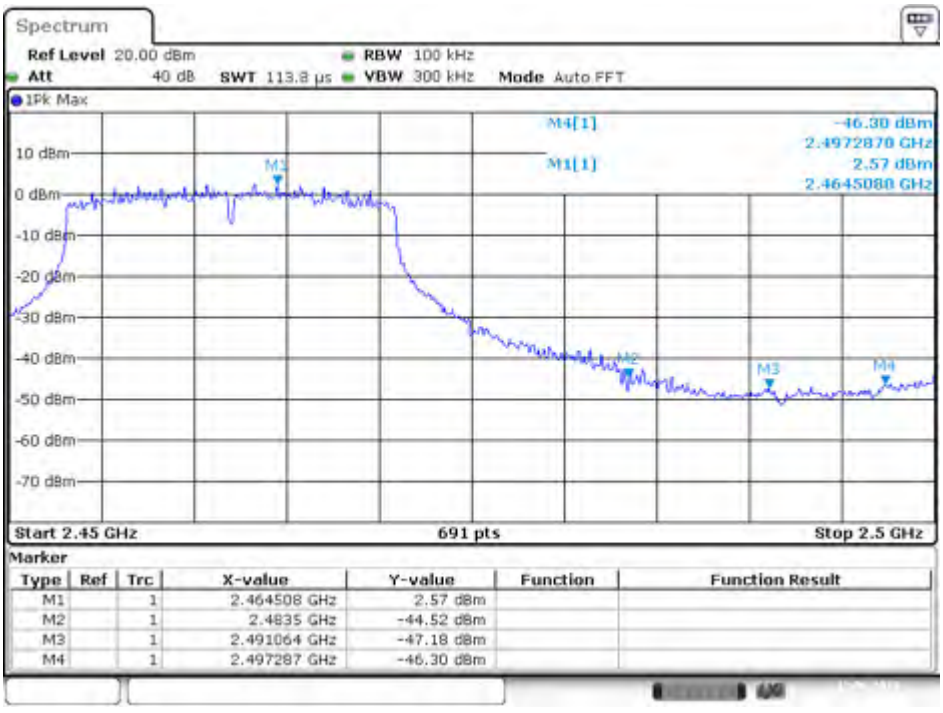
Date: 12.JUN.2018 10:44:25

802.11n(20MHz) Low Channel 2412MHz



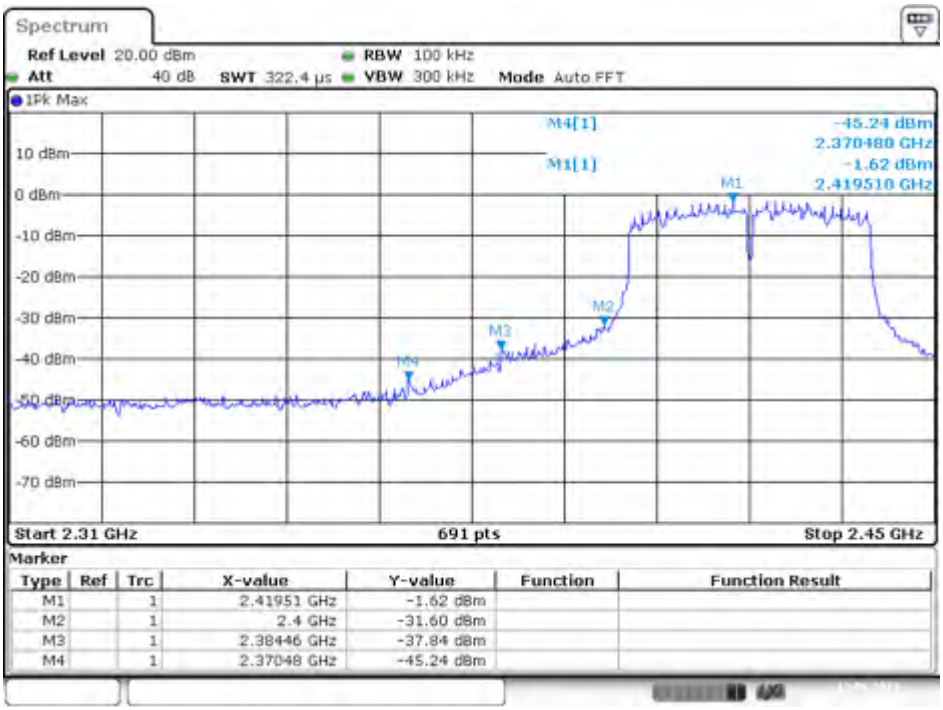
Date: 12.JUN.2018 11:02:51

802.11n(20MHz) High Channel 2462MHz



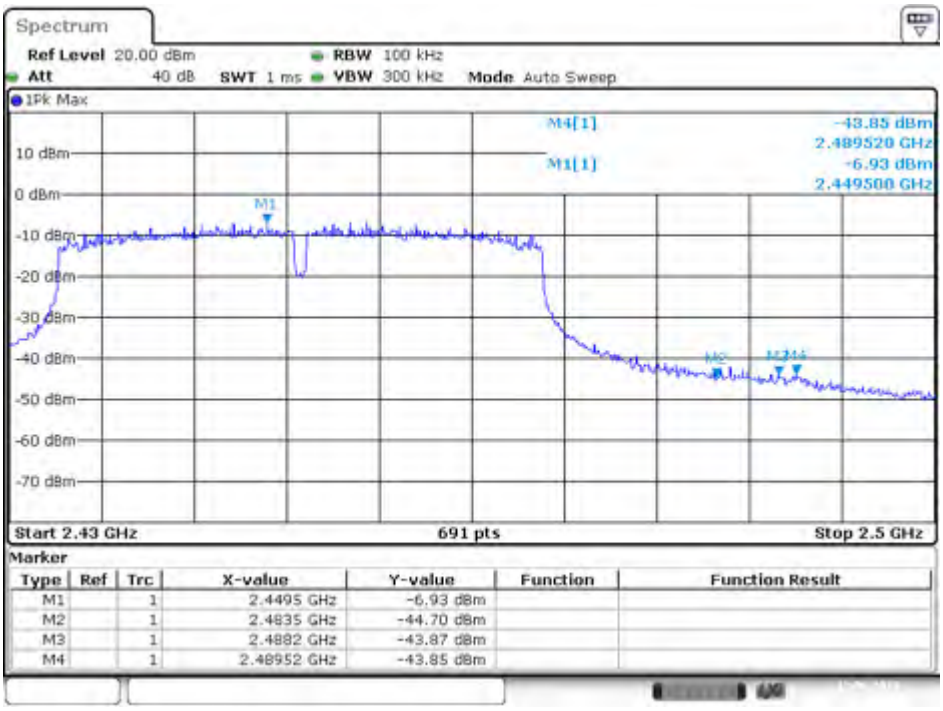
Date: 12.JUN.2018 11:04:06

802.11n(40MHz) Low Channel 2422MHz



Date: 12.JUN.2018 11:29:48

802.11n(40MHz) High Channel 2452MHz



Date: 12.JUN.2018 11:31:21

Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor
3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX modes then measure it.
We select 2412MHz, 2462MHz TX frequency to transmit(802.11b/g/n20 mode).
We select 2422MHz, 2452MHz TX frequency to transmit(802.11n40 mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:
1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
3.All modes of operation were investigated and the worst-case emissions are reported.

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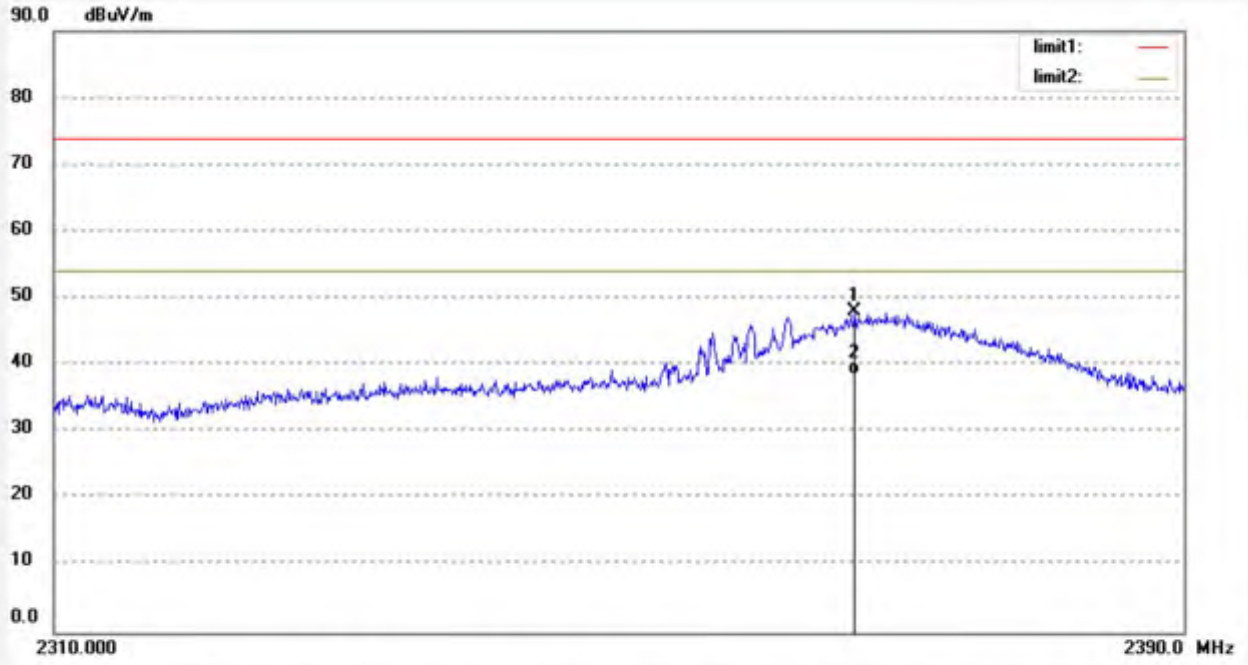
Job No.: LGW2018 #1263	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2366.480	47.40	0.61	48.01	74.00	-25.99	peak			
2	2366.480	37.93	0.61	38.54	54.00	-15.46	AVG			

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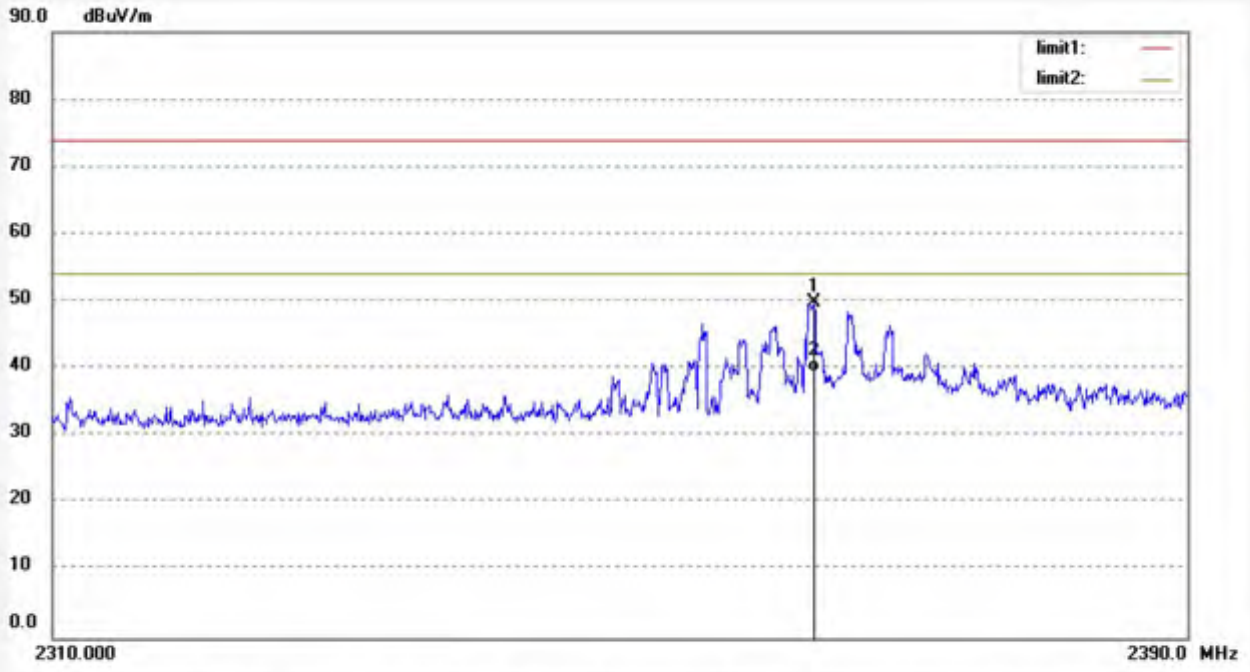
Job No.: LGW2018 #1262	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2363.440	49.19	0.57	49.76	74.00	-24.24	peak			
2	2363.440	38.84	0.57	39.41	54.00	-14.59	AVG			

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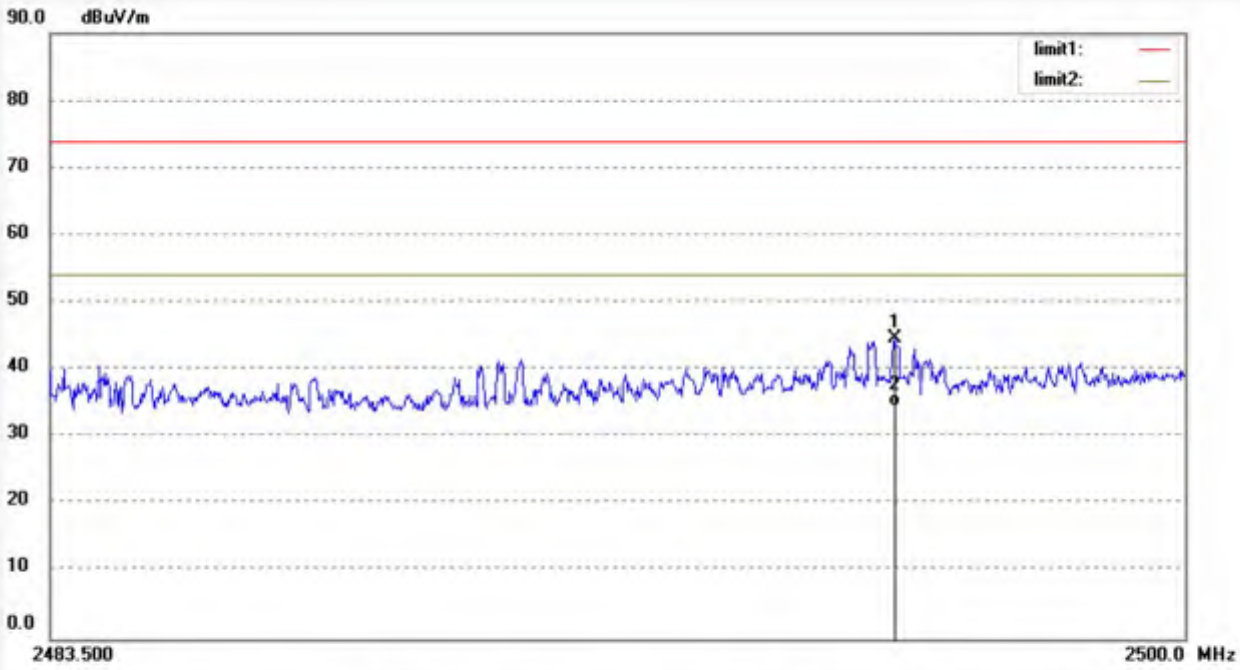
Job No.: LGW2018 #1268	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2495.776	43.54	1.10	44.64	74.00	-29.36	peak			
2	2495.776	33.41	1.10	34.51	54.00	-19.49	AVG			

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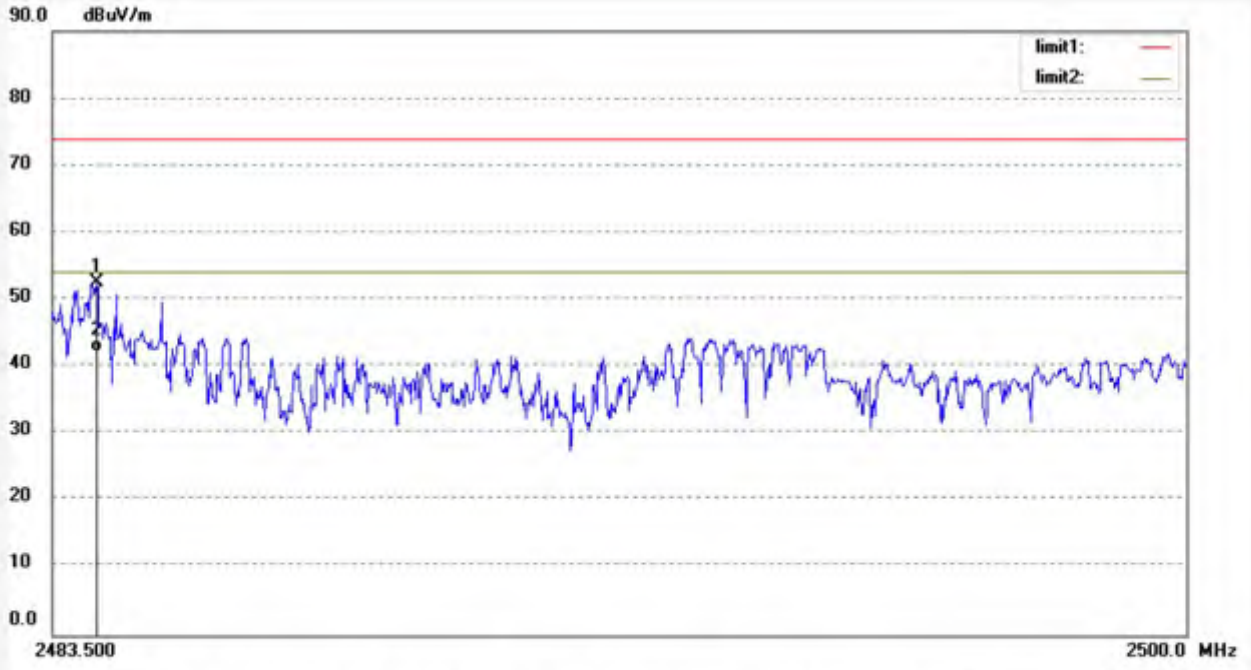
Job No.: LGW2018 #1269	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2484.144	51.47	1.09	52.56	74.00	-21.44	peak			
2	2484.144	41.02	1.09	42.11	54.00	-11.89	AVG			

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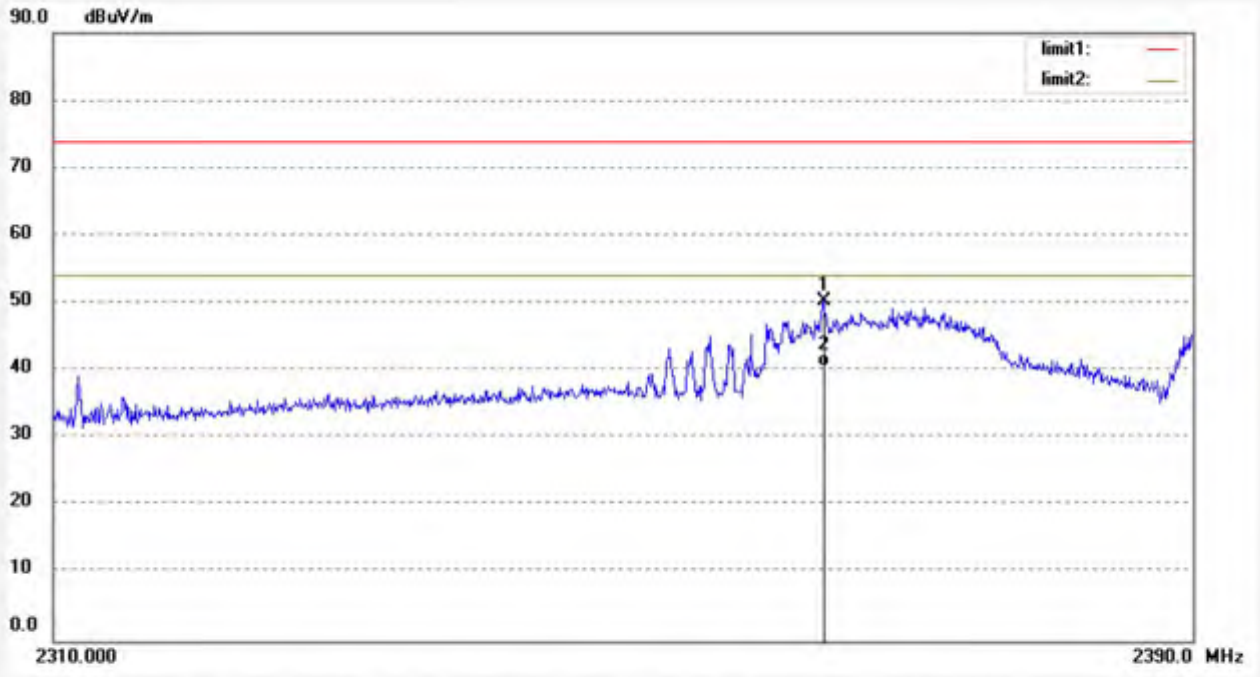
Job No.: LGW2018 #1279	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2363.840	49.73	0.59	50.32	74.00	-23.68	peak			
2	2363.840	39.98	0.59	40.57	54.00	-13.43	AVG			

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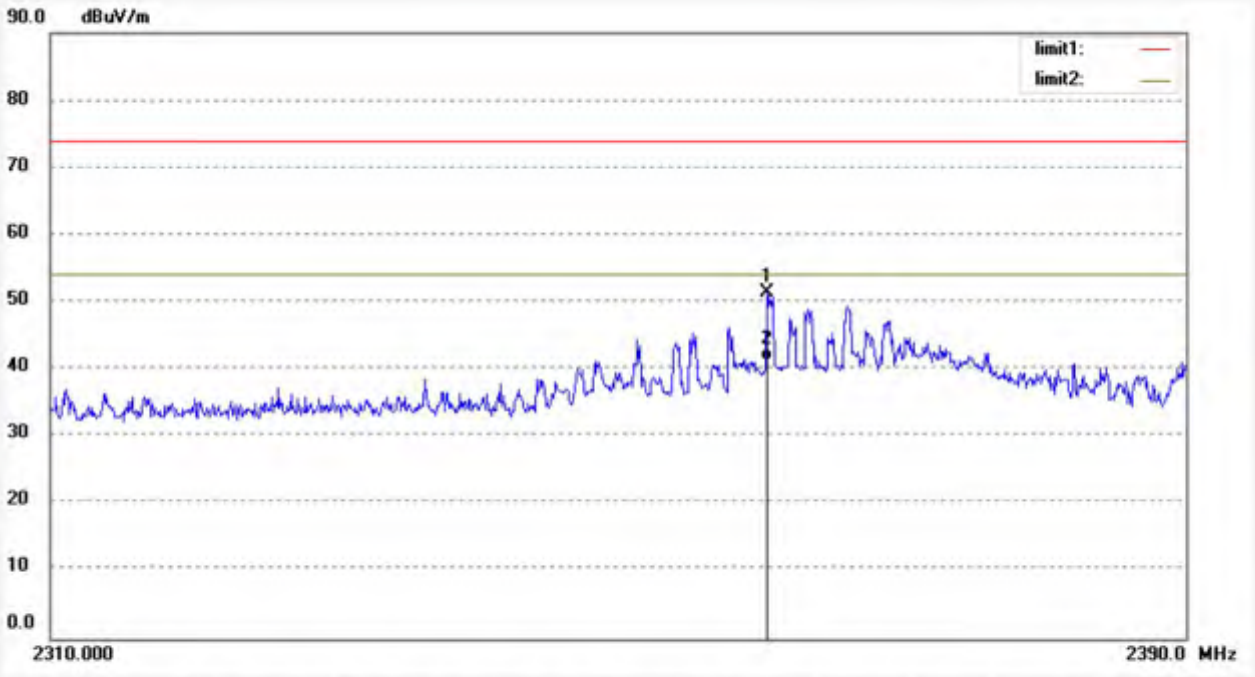
Job No.: LGW2018 #1278	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2360.240	50.78	0.56	51.34	74.00	-22.66	peak			
2	2360.240	40.67	0.56	41.23	54.00	-12.77	AVG			

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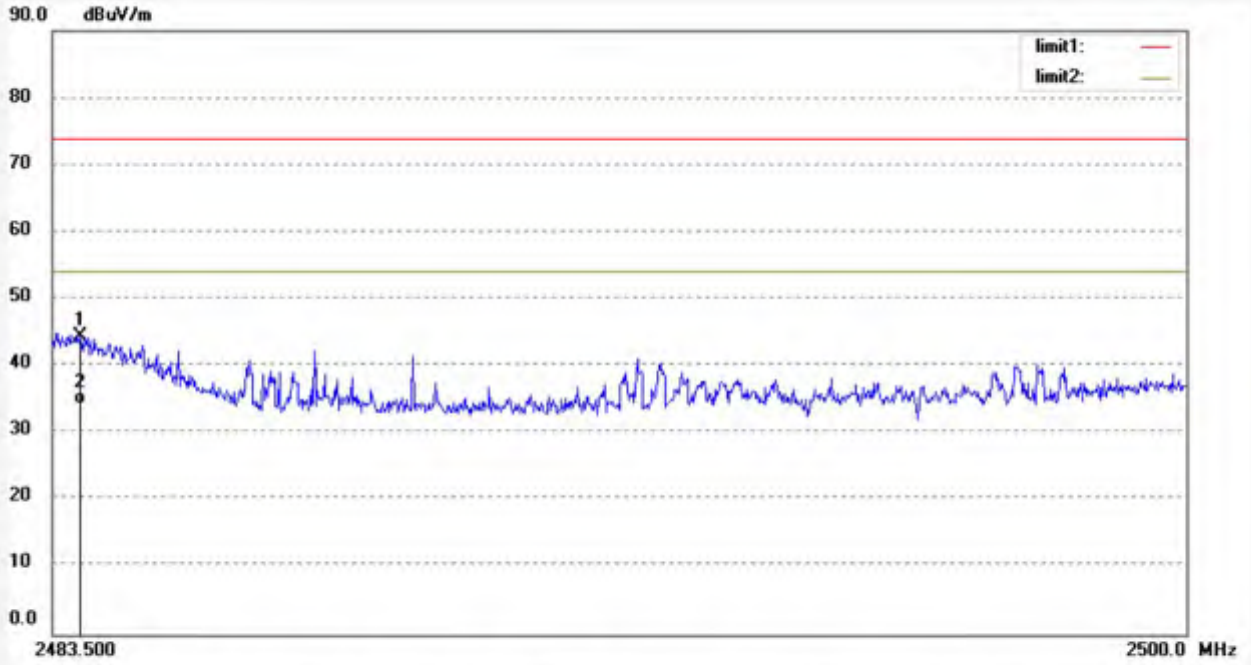
Job No.: LGW2018 #1284	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.896	43.39	1.09	44.48	74.00	-29.52	peak			
2	2483.896	33.15	1.09	34.24	54.00	-19.76	AVG			

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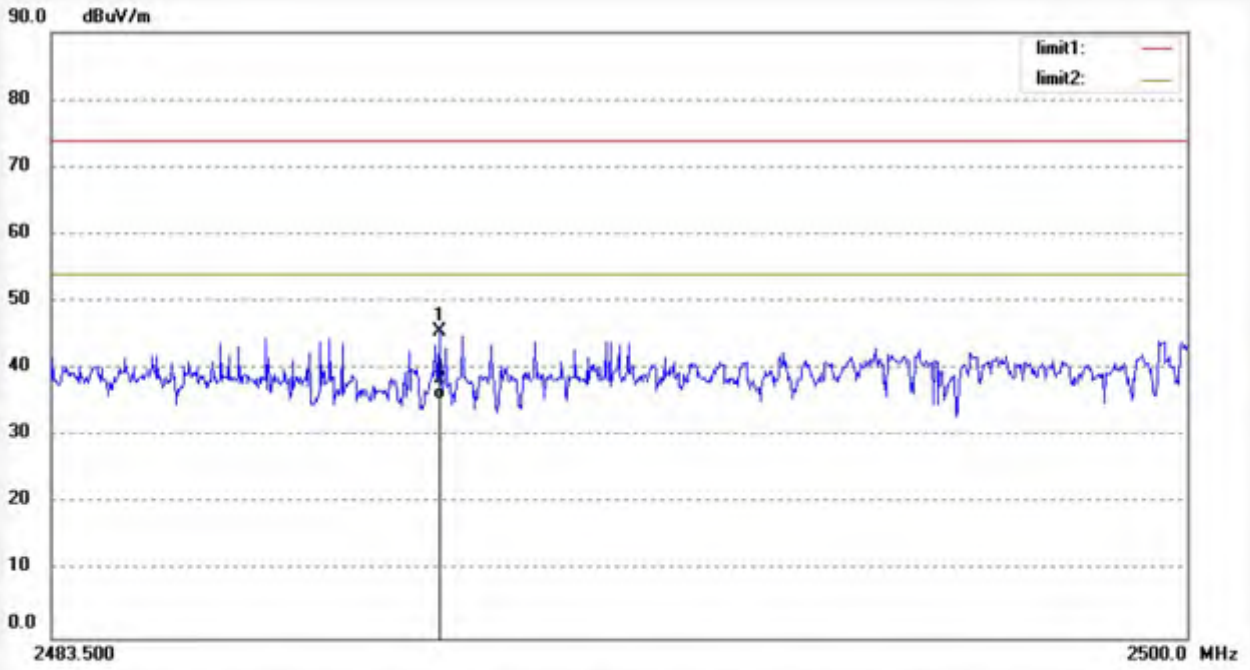
Job No.: LGW2018 #1285	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2489.143	44.38	1.09	45.47	74.00	-28.53	peak			
2	2489.143	34.37	1.09	35.46	54.00	-18.54	AVG			

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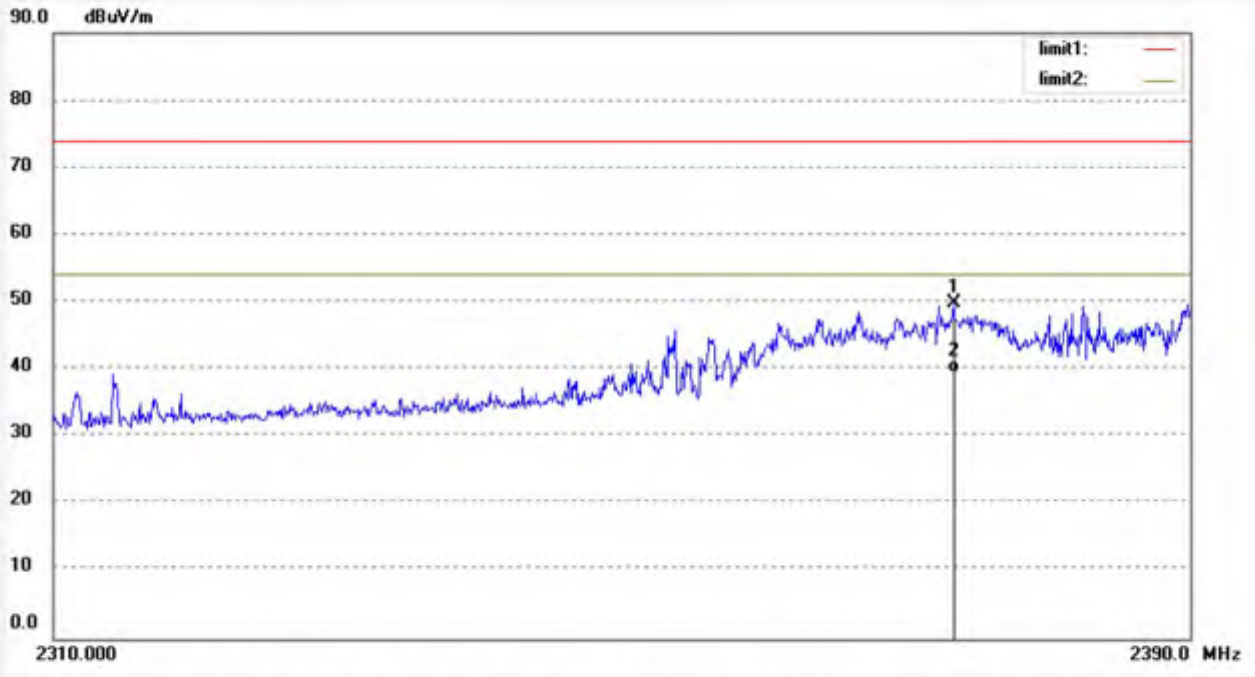
Job No.: LGW2018 #1295	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2373.200	49.13	0.66	49.79	74.00	-24.21	peak			
2	2373.200	38.88	0.66	39.54	54.00	-14.46	AVG			

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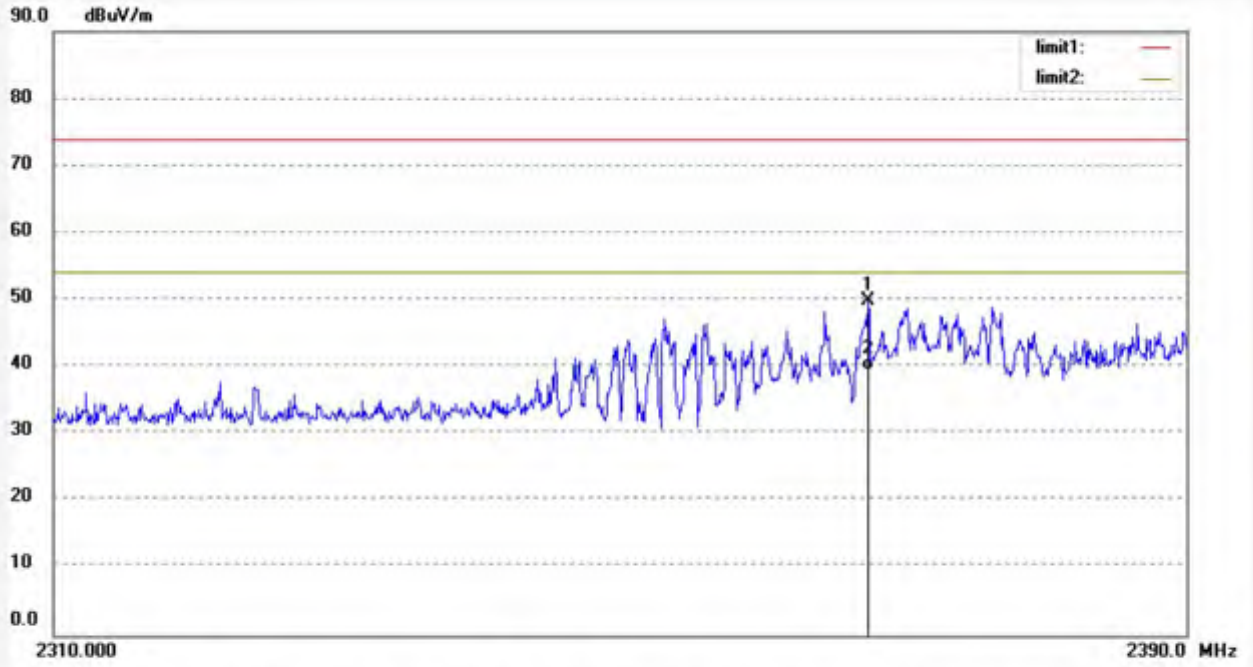
Job No.: LGW2018 #1294	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2367.280	49.33	0.61	49.94	74.00	-24.06	peak			
2	2367.280	38.80	0.61	39.41	54.00	-14.59	AVG			

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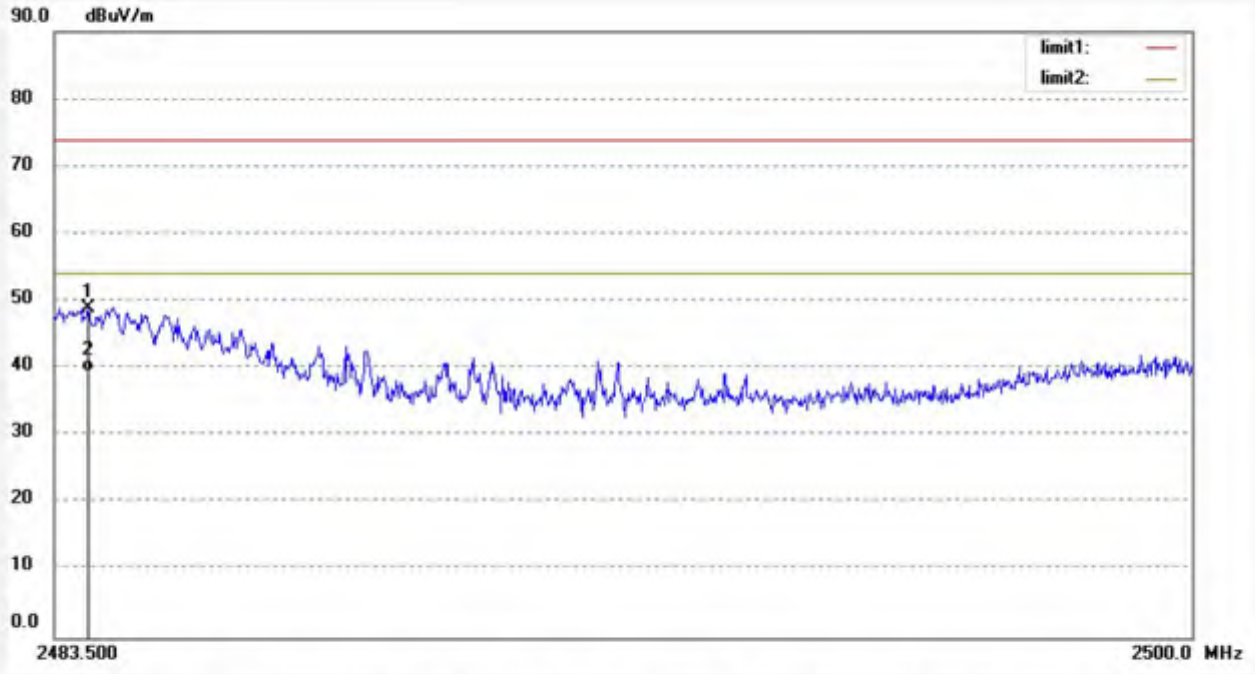
Job No.: LGW2018 #1300	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.995	47.94	1.09	49.03	74.00	-24.97	peak			
2	2483.995	38.32	1.09	39.41	54.00	-14.59	AVG			

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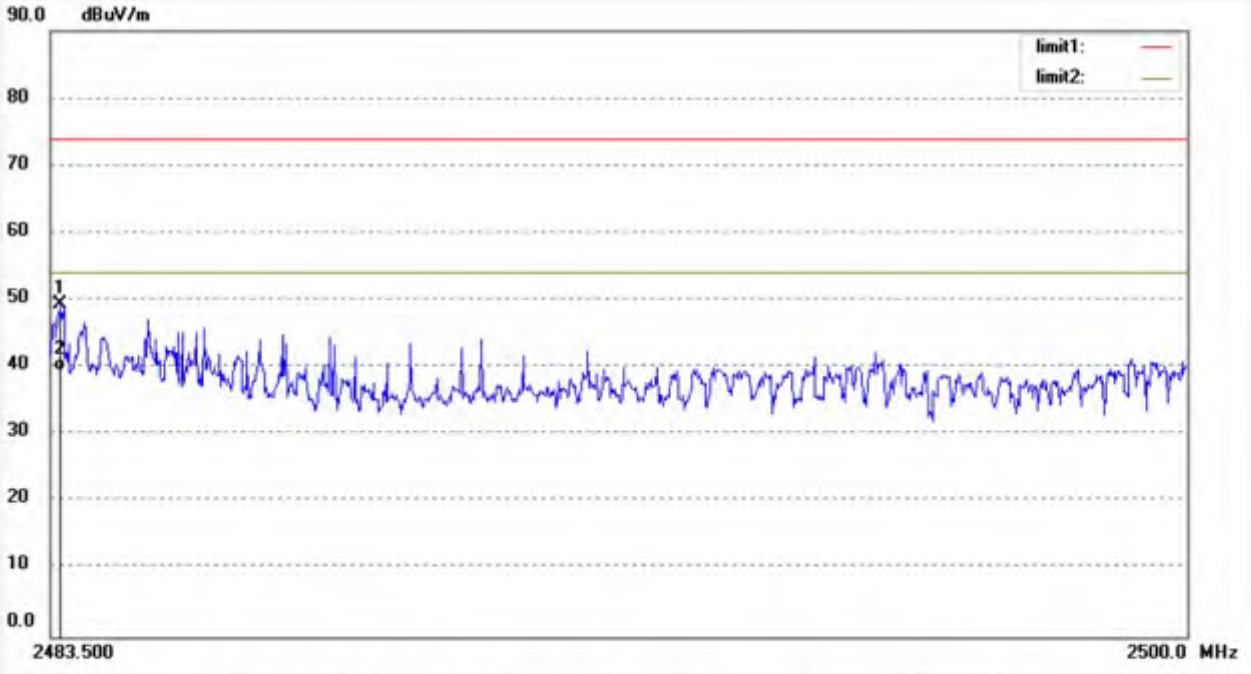
Job No.: LGW2018 #1301	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.648	48.18	1.10	49.28	74.00	-24.72	peak			
2	2483.648	38.45	1.10	39.55	54.00	-14.45	AVG			

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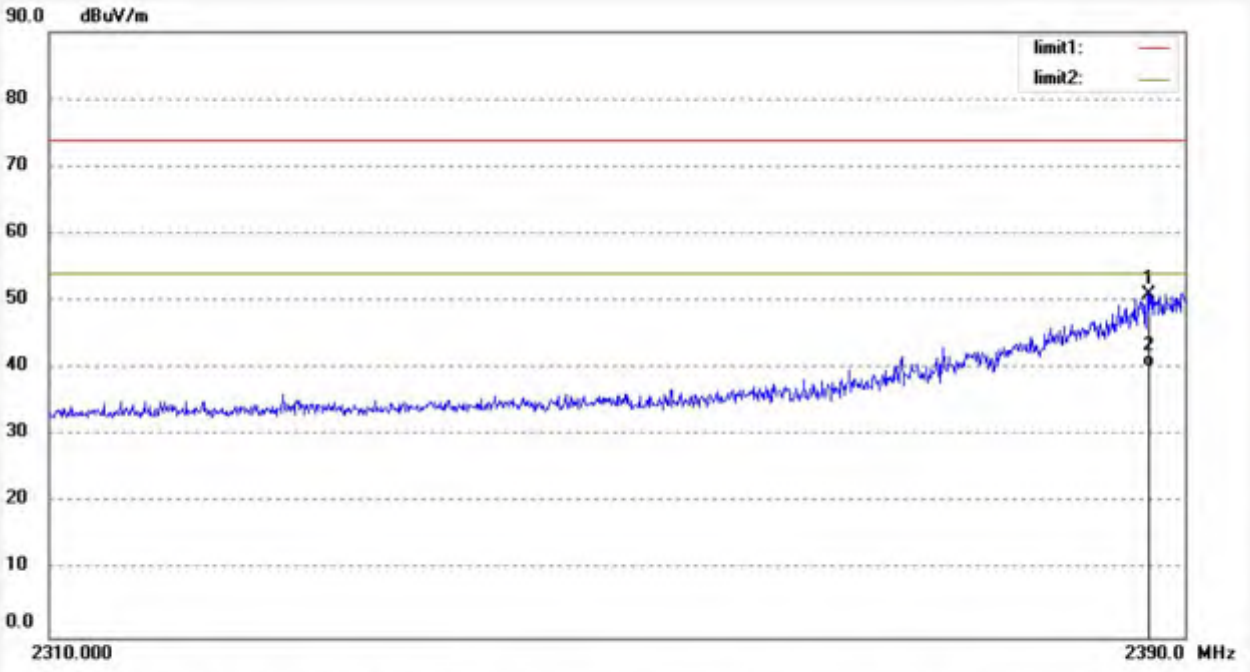
Job No.: LGW2018 #1311	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2422MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2387.440	50.16	0.78	50.94	74.00	-23.06	peak			
2	2387.440	39.45	0.78	40.23	54.00	-13.77	AVG			

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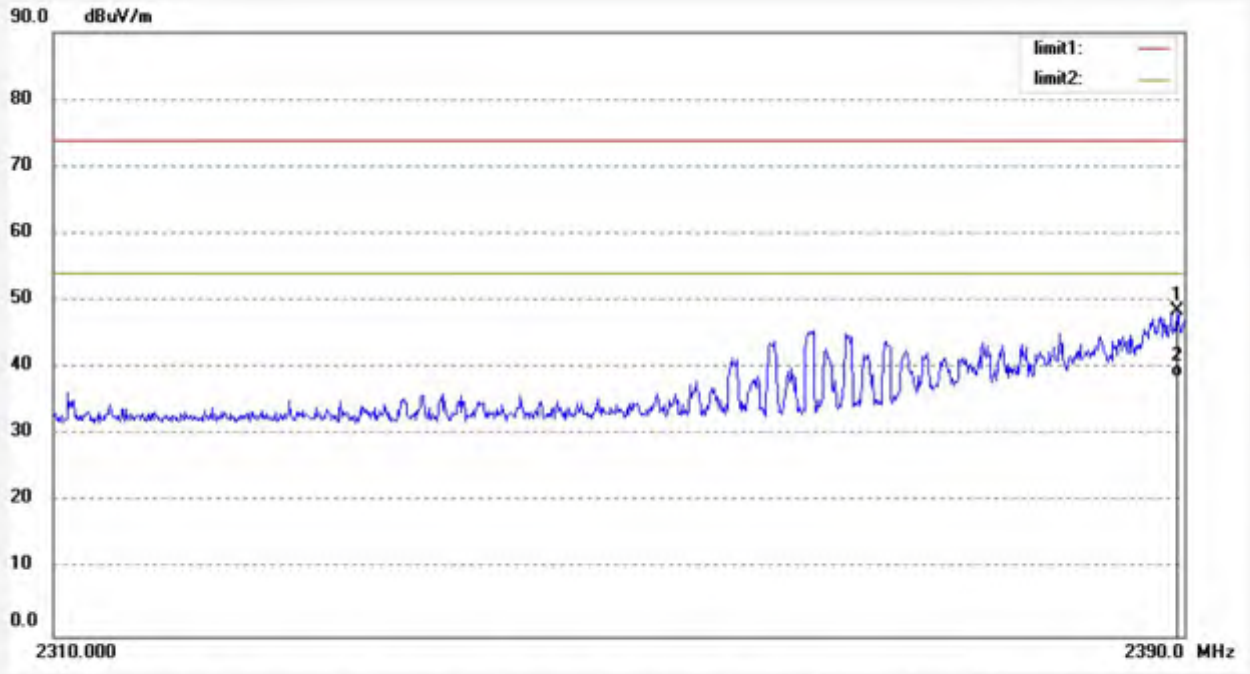
Job No.: LGW2018 #1310	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2422MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2389.520	47.75	0.79	48.54	74.00	-25.46	peak			
2	2389.520	37.89	0.79	38.68	54.00	-15.32	AVG			

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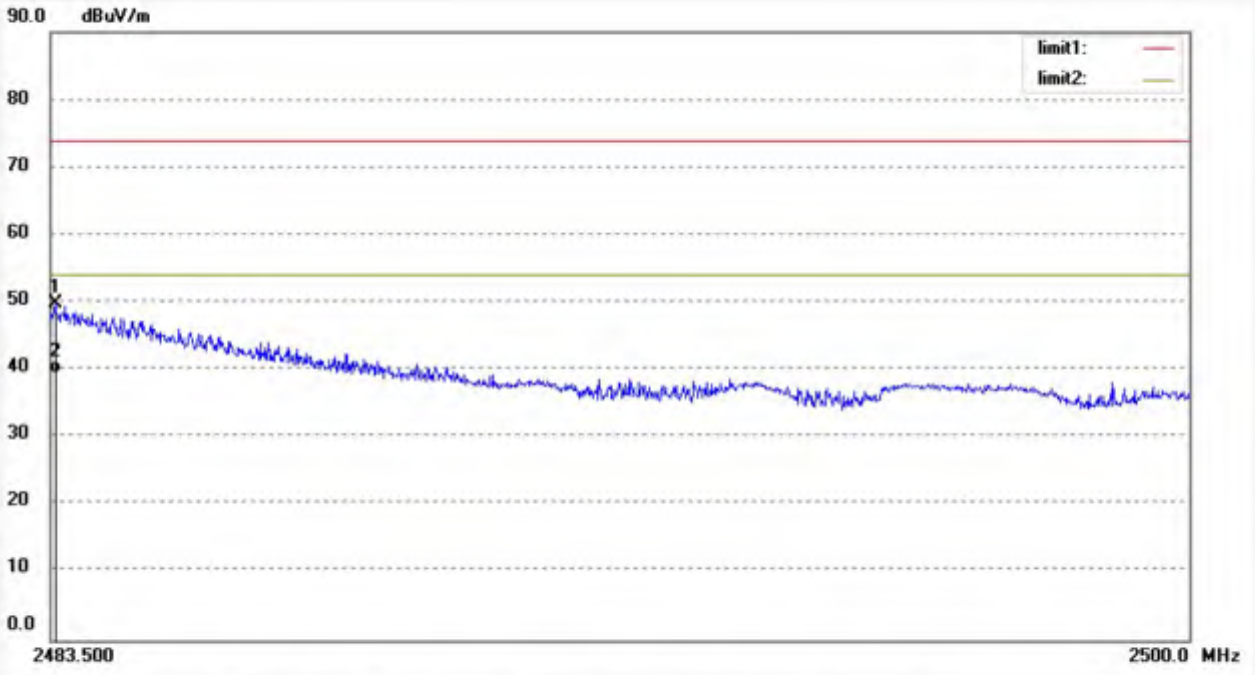
Job No.: LGW2018 #1316	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2452MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.566	48.69	1.10	49.79	74.00	-24.21	peak			
2	2483.566	38.32	1.10	39.42	54.00	-14.58	AVG			

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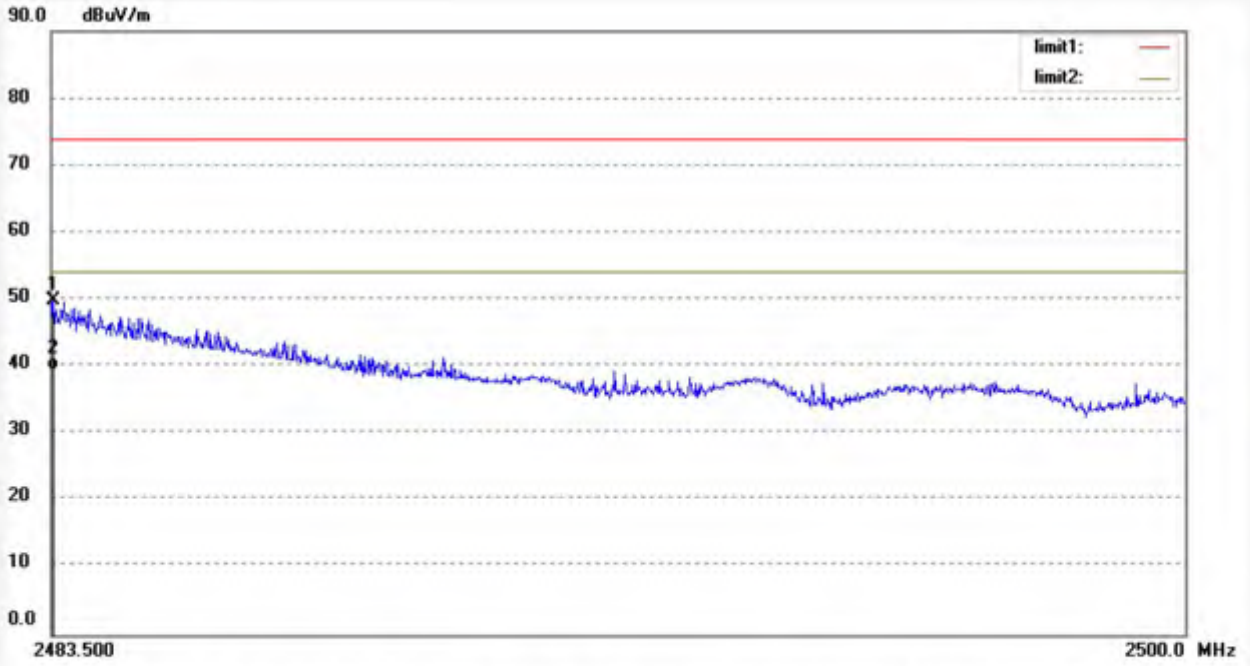
Job No.: LGW2018 #1317	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2452MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.533	48.76	1.10	49.86	74.00	-24.14	peak			
2	2483.533	38.44	1.10	39.54	54.00	-14.46	AVG			

11.RADIATED SPURIOUS EMISSION TEST

11.1.Block Diagram of Test Setup

11.1.1.Block diagram of connection between the EUT and peripherals

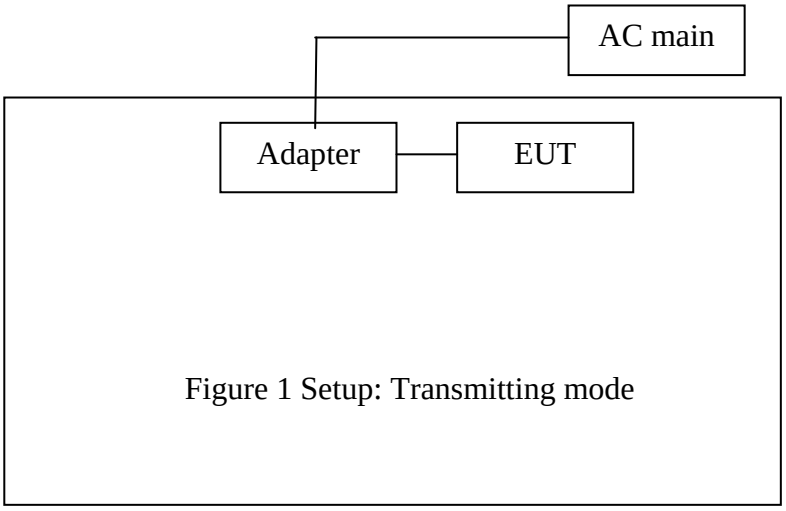
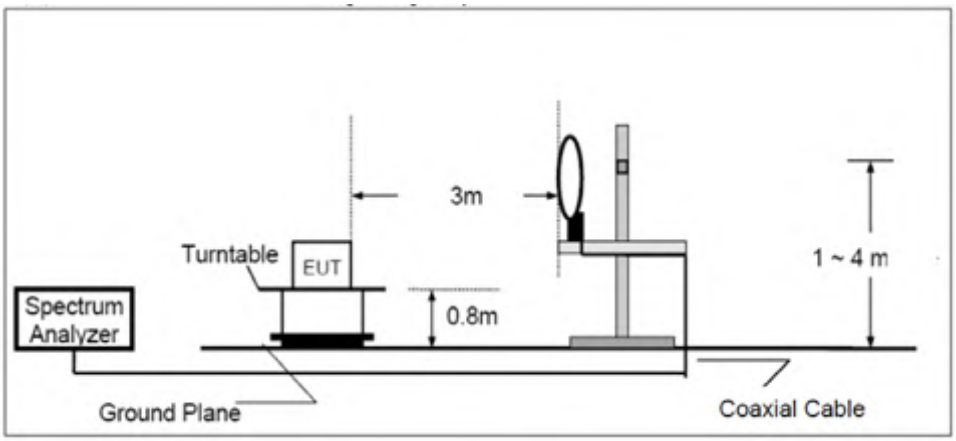


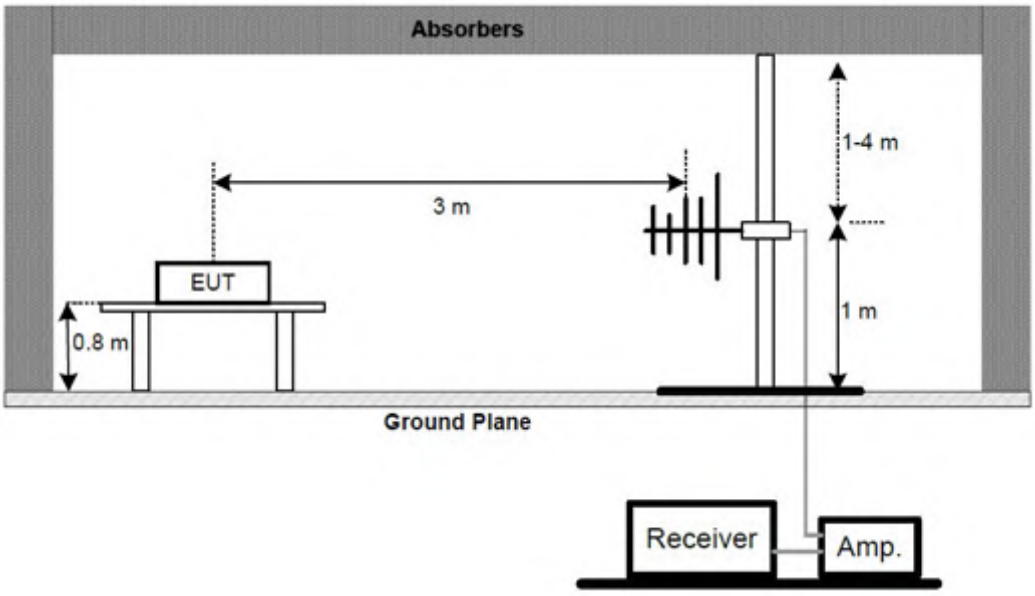
Figure 1 Setup: Transmitting mode

11.1.2.Semi-Anechoic Chamber Test Setup Diagram

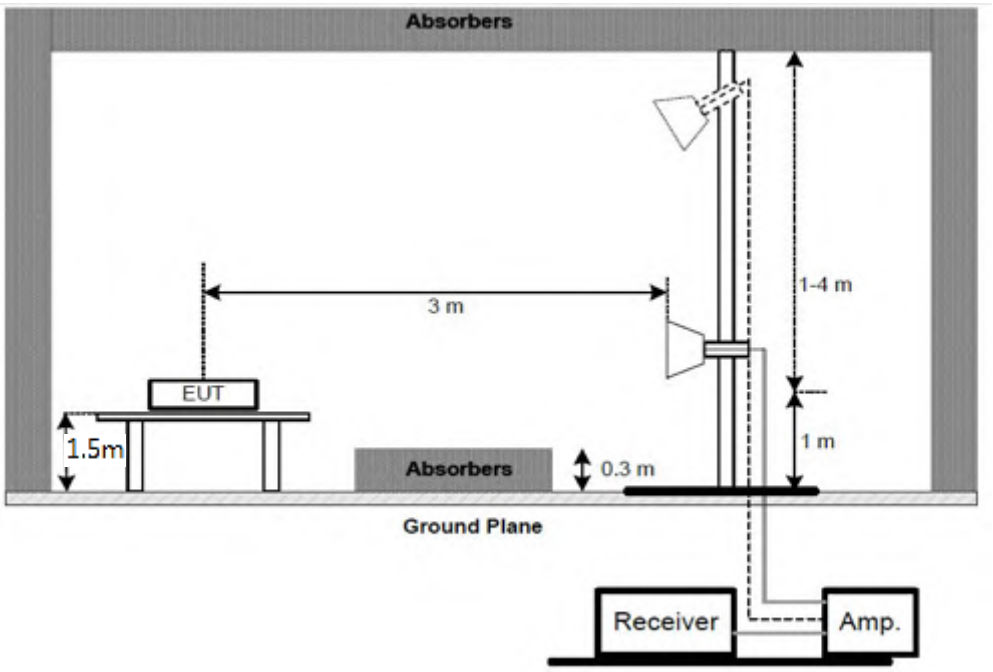
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



11.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.Restricted bands of operation

11.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

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

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

11.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.5.Operating Condition of EUT

11.5.1.Setup the EUT and simulator as shown as Section 11.1.

11.5.2.Turn on the power of all equipment.

11.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

11.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.1 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The worst-case data rate for this channel to be 1Mbps for 802.11b mode and 6Mbps for 802.11g mode and 150Mbps for 802.11n mode, based on previous with 802.11 WLAN product design architectures.

The frequency range from 30MHz to 25000MHz is checked.
Result = Reading + Corrected Factor
Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain
During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.

4. All modes of operation were investigated and the worst-case emissions are reported.

11.7.The Field Strength of Radiation Emission Measurement Results

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

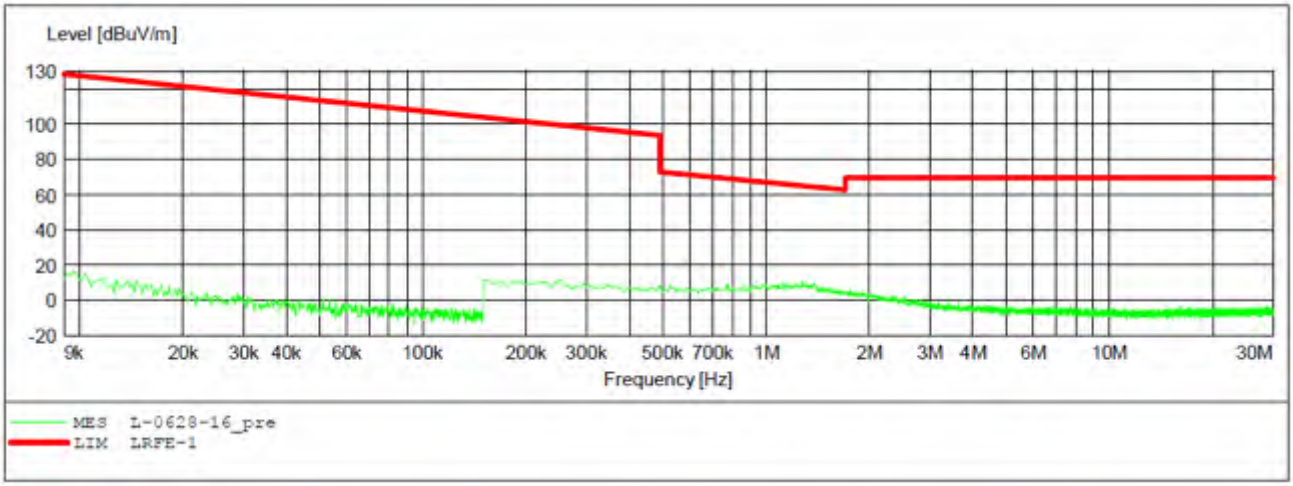
2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission at each test mode (802.11 b/g/n) in three axes. The worst emissions are reported in all test mode and channels.

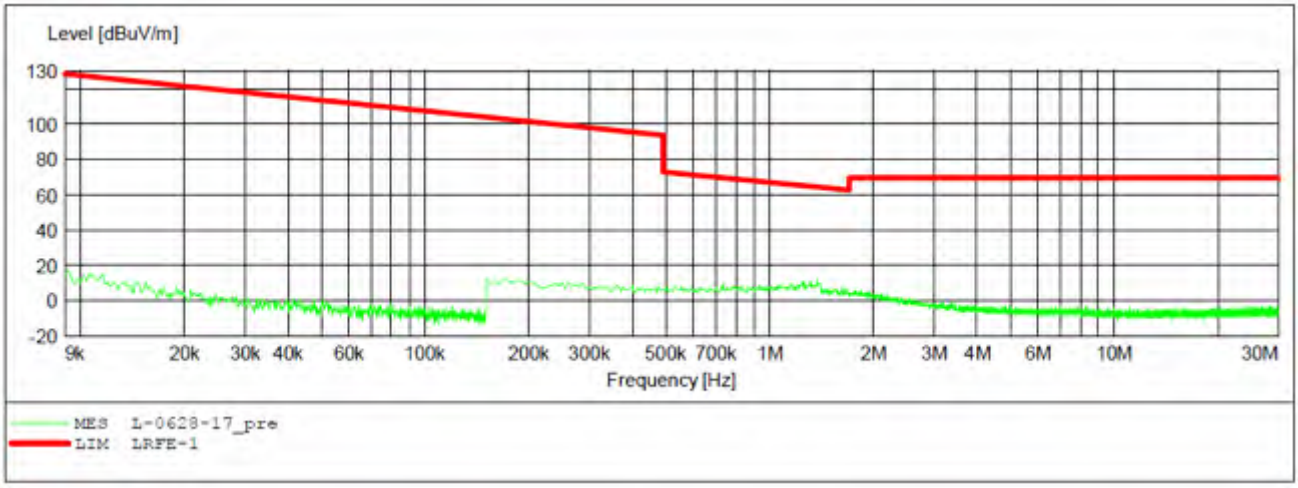
4.We tested 802.11b,g,n mode and recorded the worst case data(802.11b) for radiated emission test below 1GHz.

5. The ZigBee, Z-Wave and wifi can transmitting simultaneously and we tested simultaneously mode only the worse case were recorded.

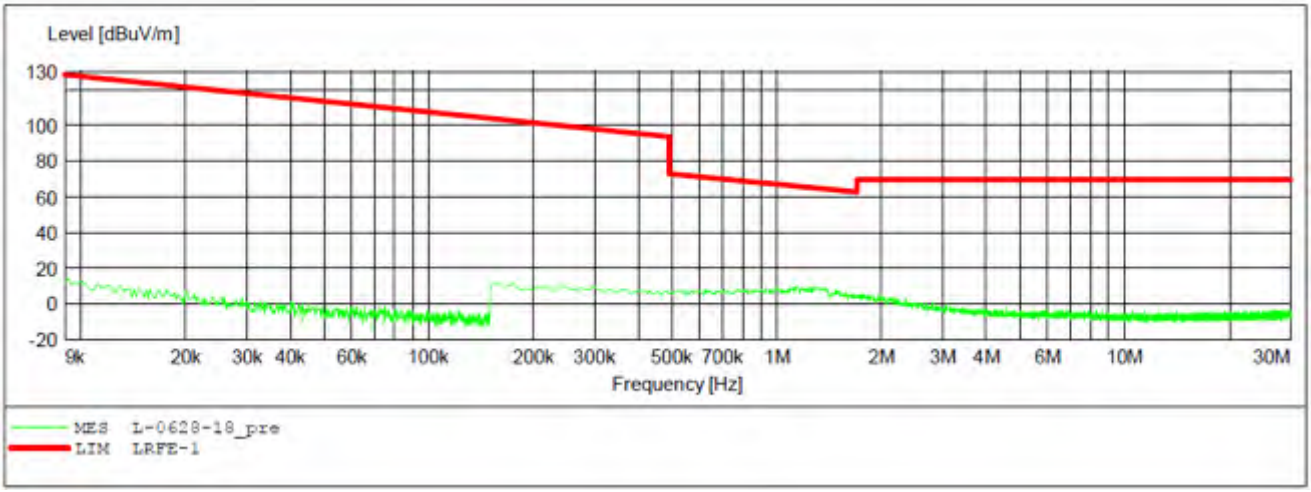
9kHz-30MHz test data



X axis test data(worse case)



Y axis test data(worse case)



Z axis test data(worse case)

30MHz-1000MHz test data(worse case)

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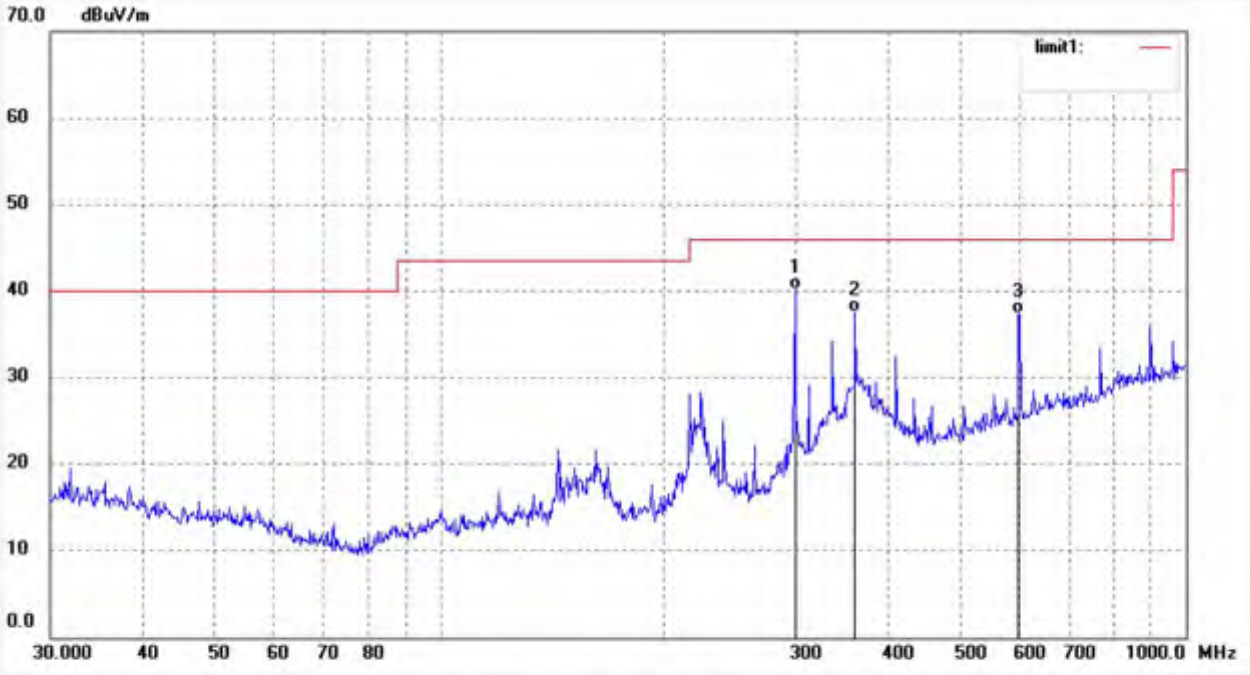
Job No.: LGW2018 #1324
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2412MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/06/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	299.3158	49.21	-9.01	40.20	46.00	-5.80	QP			
2	360.4476	44.80	-7.26	37.54	46.00	-8.46	QP			
3	597.2233	39.77	-2.43	37.34	46.00	-8.66	QP			

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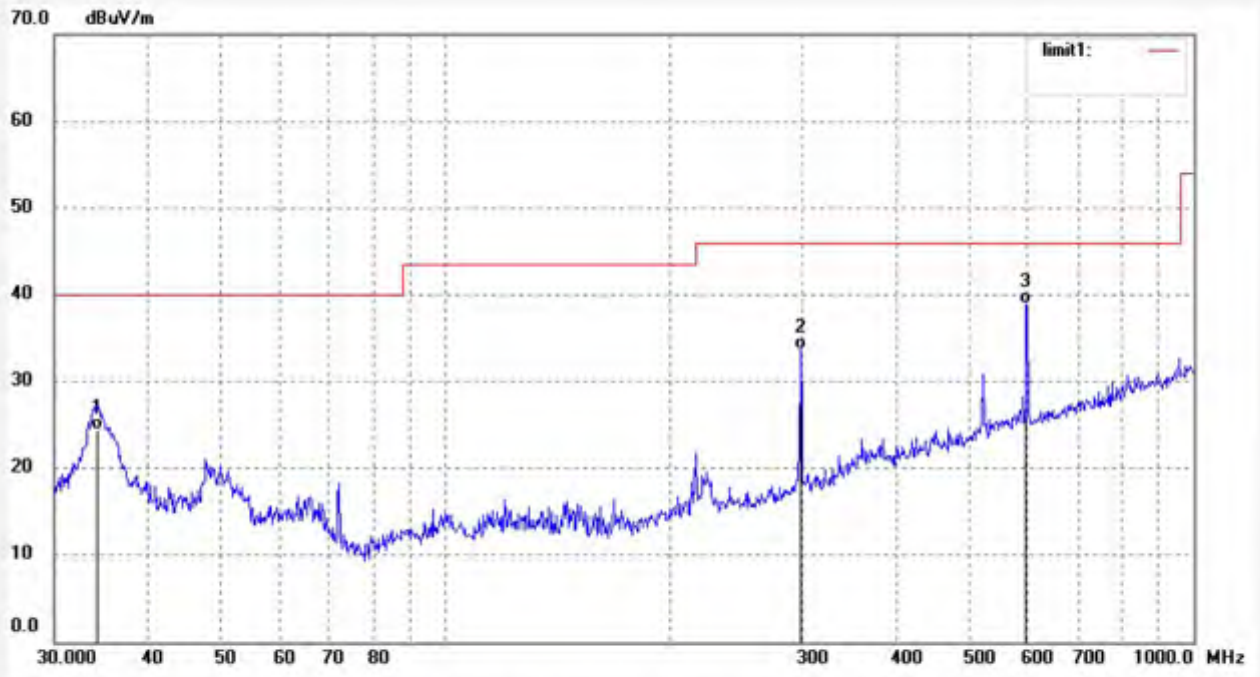
Job No.: LGW2018 #1325
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2412MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/06/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.2760	34.56	-10.20	24.36	40.00	-15.64	QP			
2	298.2681	42.74	-9.04	33.70	46.00	-12.30	QP			
3	597.2233	41.35	-2.43	38.92	46.00	-7.08	QP			

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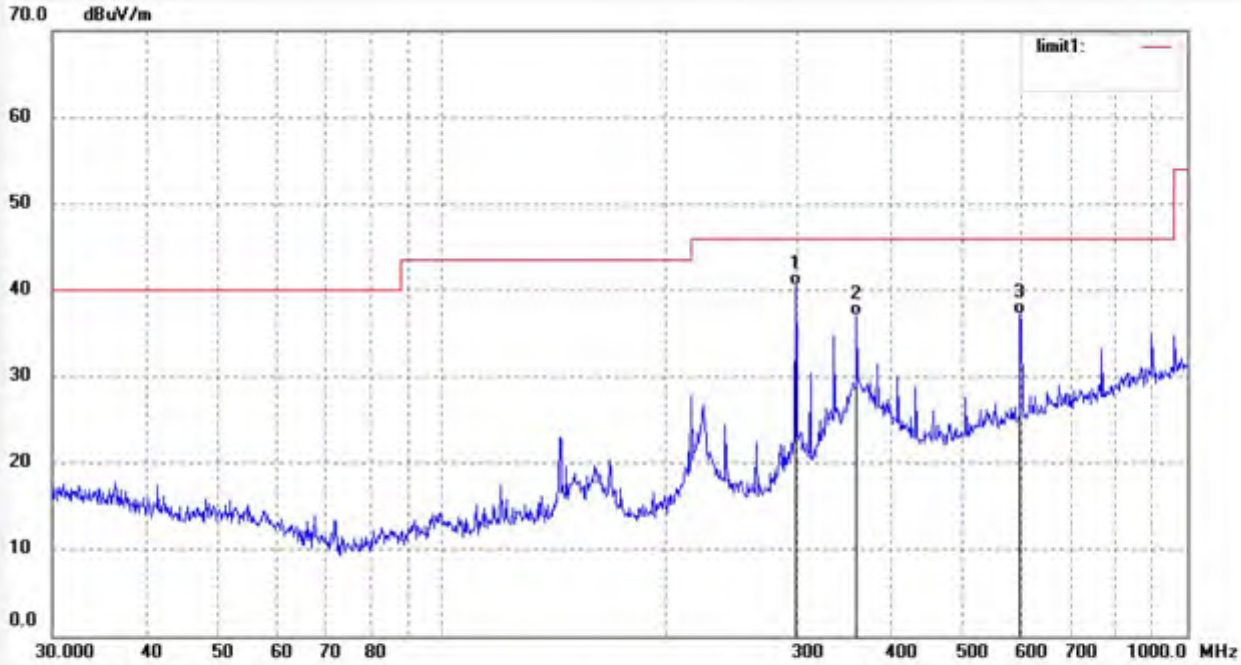
Job No.: LGW2018 #1327
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/06/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	298.2681	49.52	-9.04	40.48	46.00	-5.52	QP			
2	360.4476	44.35	-7.26	37.09	46.00	-8.91	QP			
3	597.2233	39.60	-2.43	37.17	46.00	-8.83	QP			

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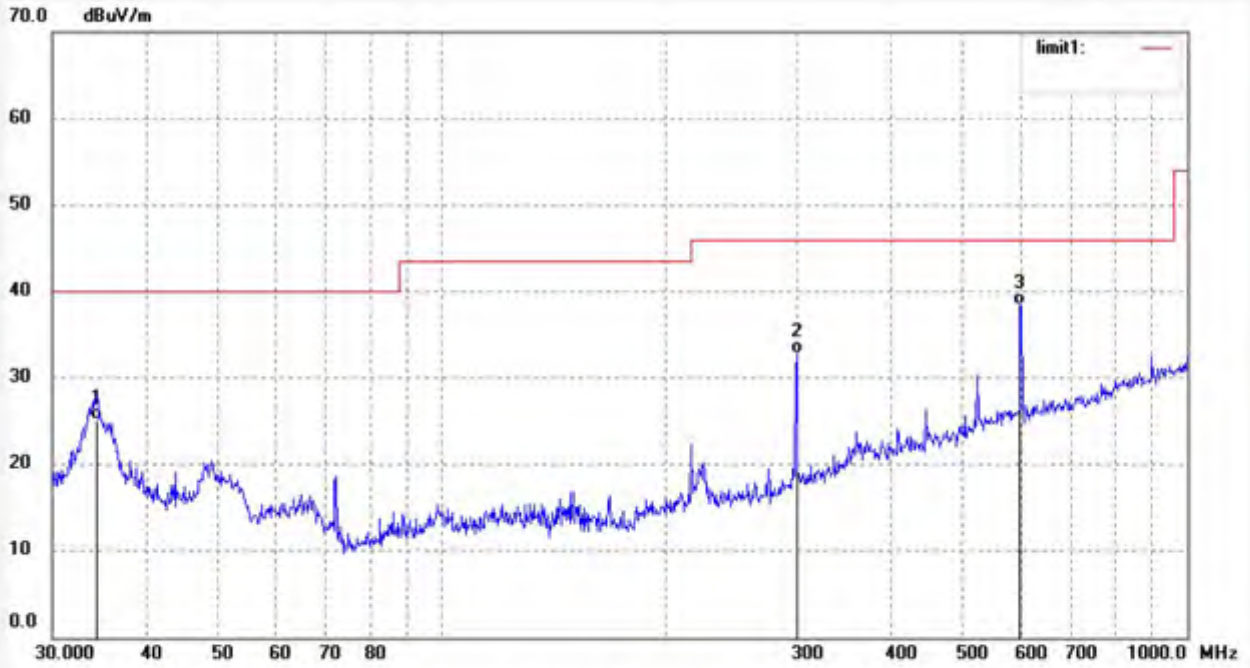
Job No.: LGW2018 #1326
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/06/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.3963	35.32	-10.24	25.08	40.00	-14.92	QP			
2	299.3158	41.80	-9.01	32.79	46.00	-13.21	QP			
3	597.2233	40.92	-2.43	38.49	46.00	-7.51	QP			

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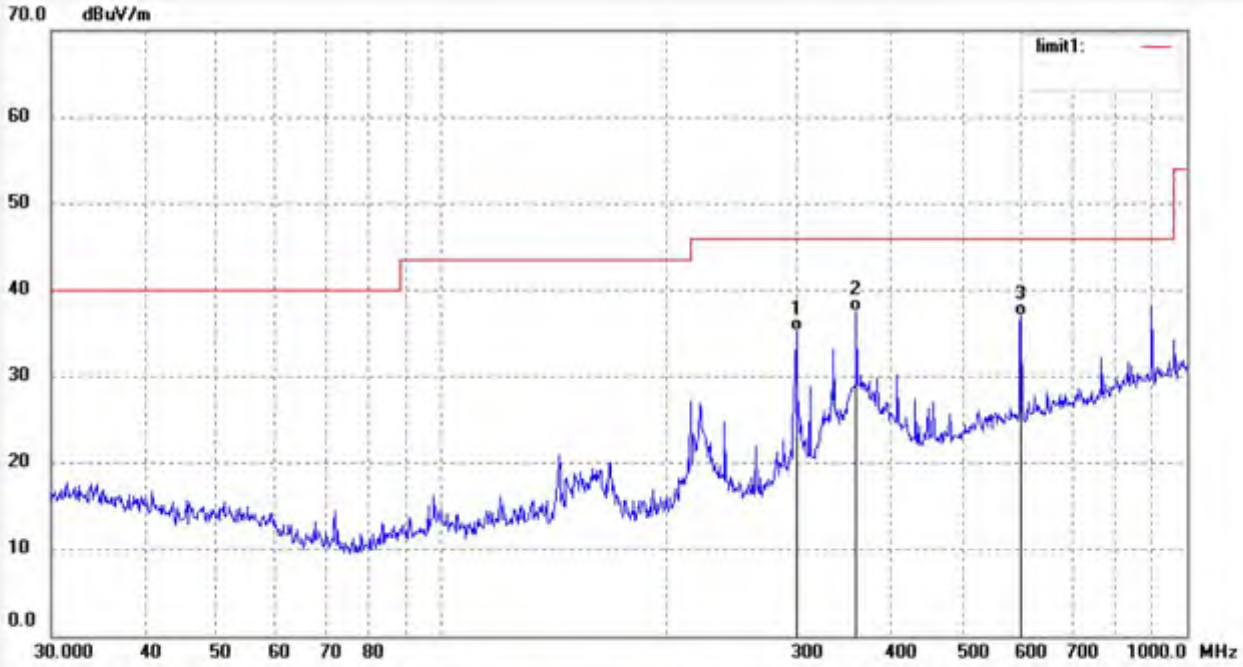
Job No.: LGW2018 #1328
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/06/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	299.3158	44.31	-9.01	35.30	46.00	-10.70	QP			
2	360.4476	44.71	-7.26	37.45	46.00	-8.55	QP			
3	599.3212	39.40	-2.38	37.02	46.00	-8.98	QP			

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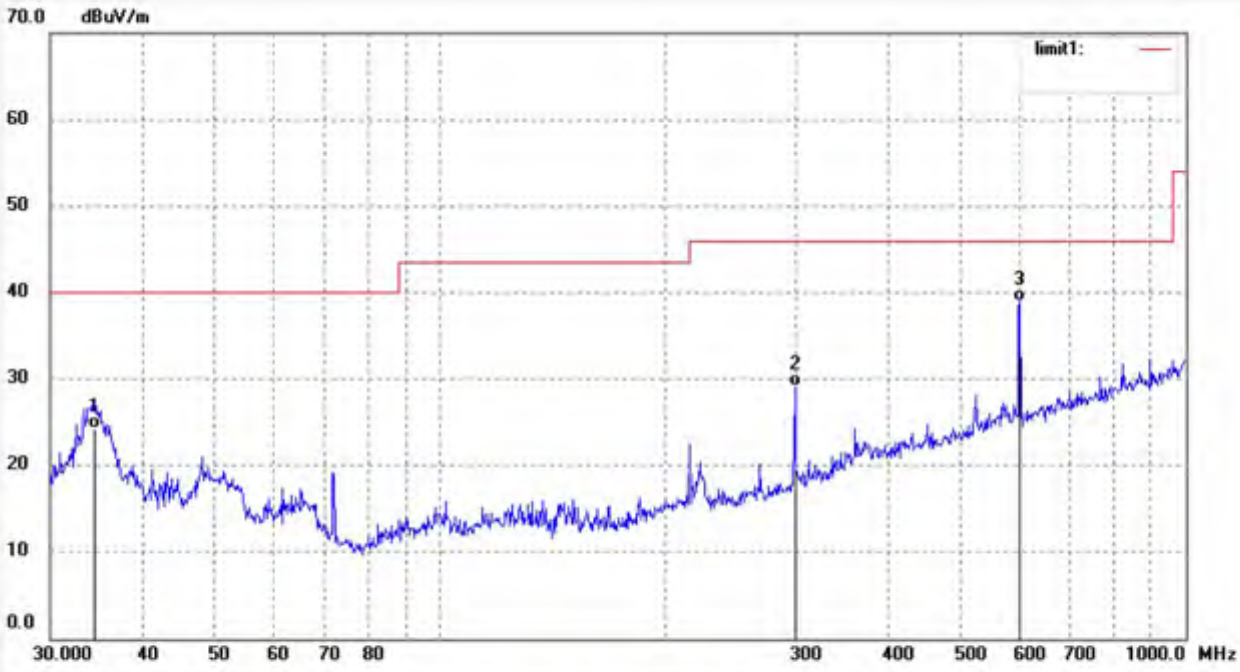
Job No.: LGW2018 #1329
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/06/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.3963	34.55	-10.24	24.31	40.00	-15.69	QP			
2	299.3158	38.20	-9.01	29.19	46.00	-16.81	QP			
3	599.3212	41.36	-2.38	38.98	46.00	-7.02	QP			

1GHz-18GHz test data

Mode:802.11b

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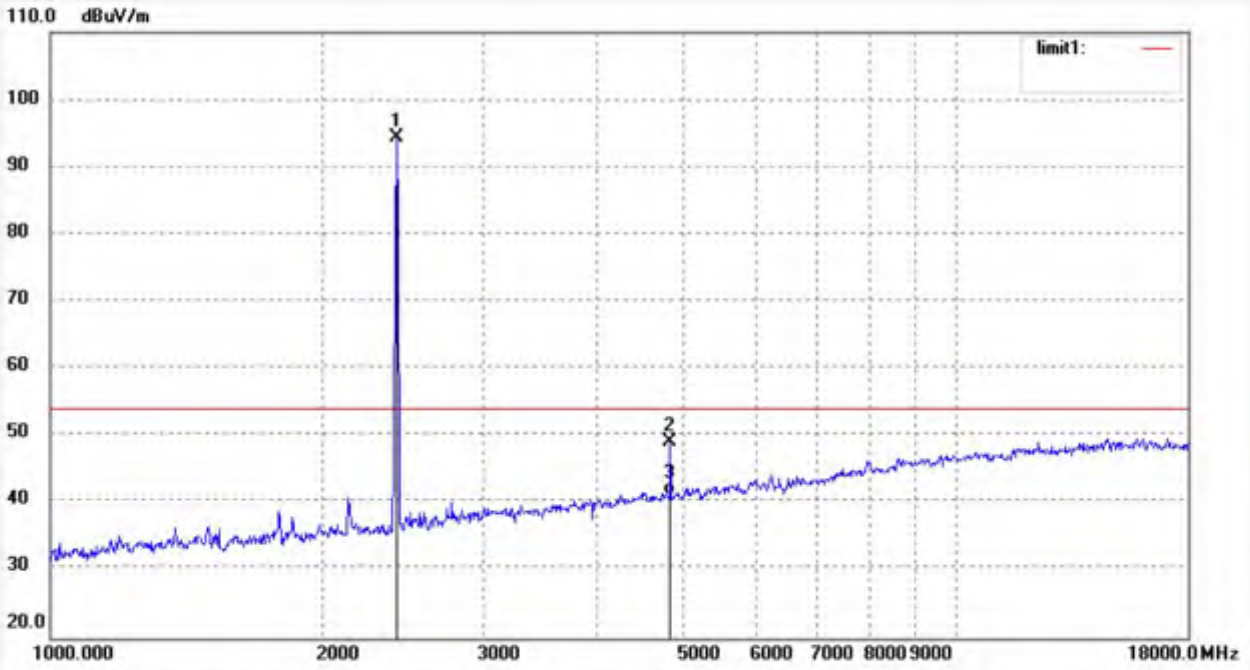
Job No.: LGW2018 #1260	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.000	93.52	0.93	94.45	/	/	peak			
2	4824.225	41.47	7.58	49.05	74.00	-24.95	peak			
3	4824.225	33.74	7.58	41.32	54.00	-12.68	AVG			

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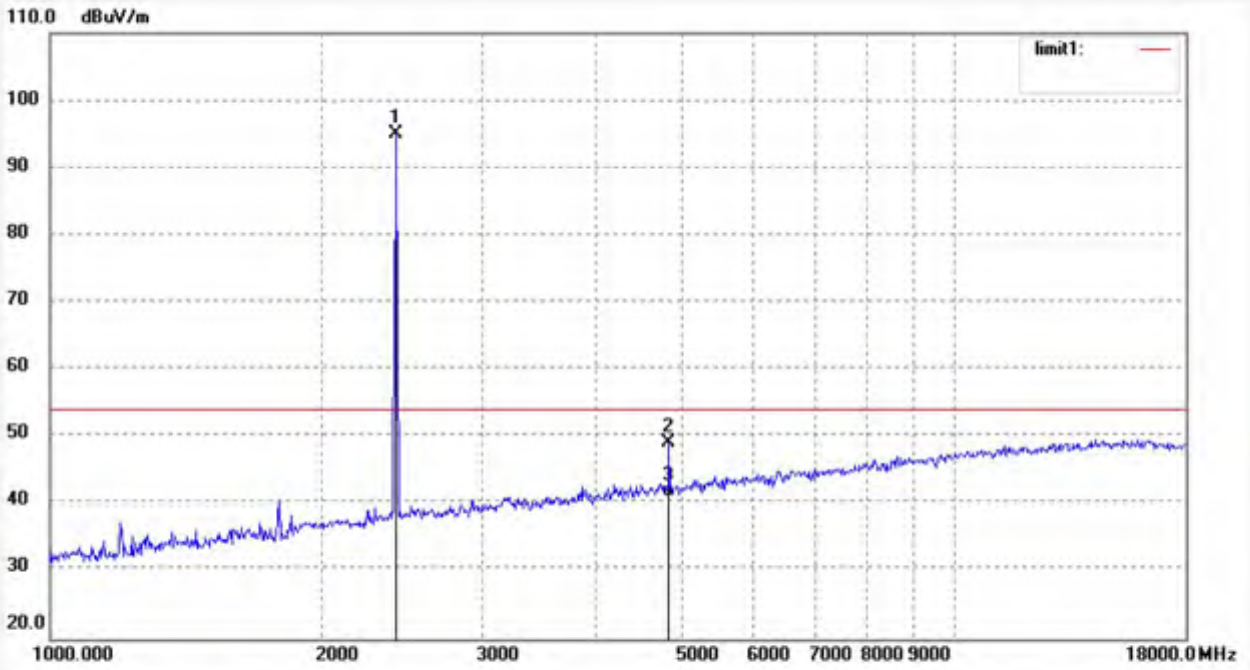
Job No.: LGW2018 #1261
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2412MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.000	94.16	0.93	95.09	/	/	peak			
2	4824.224	41.53	7.58	49.11	74.00	-24.89	peak			
3	4824.224	33.44	7.58	41.02	54.00	-12.98	AVG			

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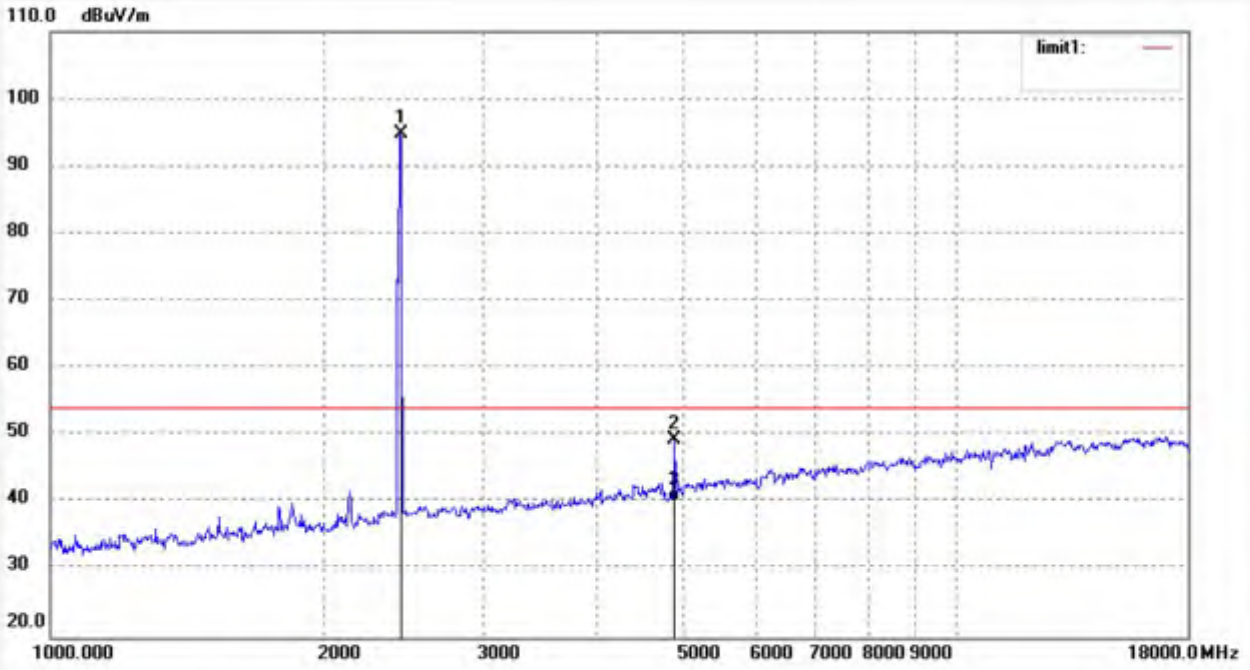
Job No.: LGW2018 #1264
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	93.75	1.04	94.79	/	/	peak			
2	4874.227	41.38	8.04	49.42	74.00	-24.58	peak			
3	4874.227	32.17	8.04	40.21	54.00	-13.79	AVG			

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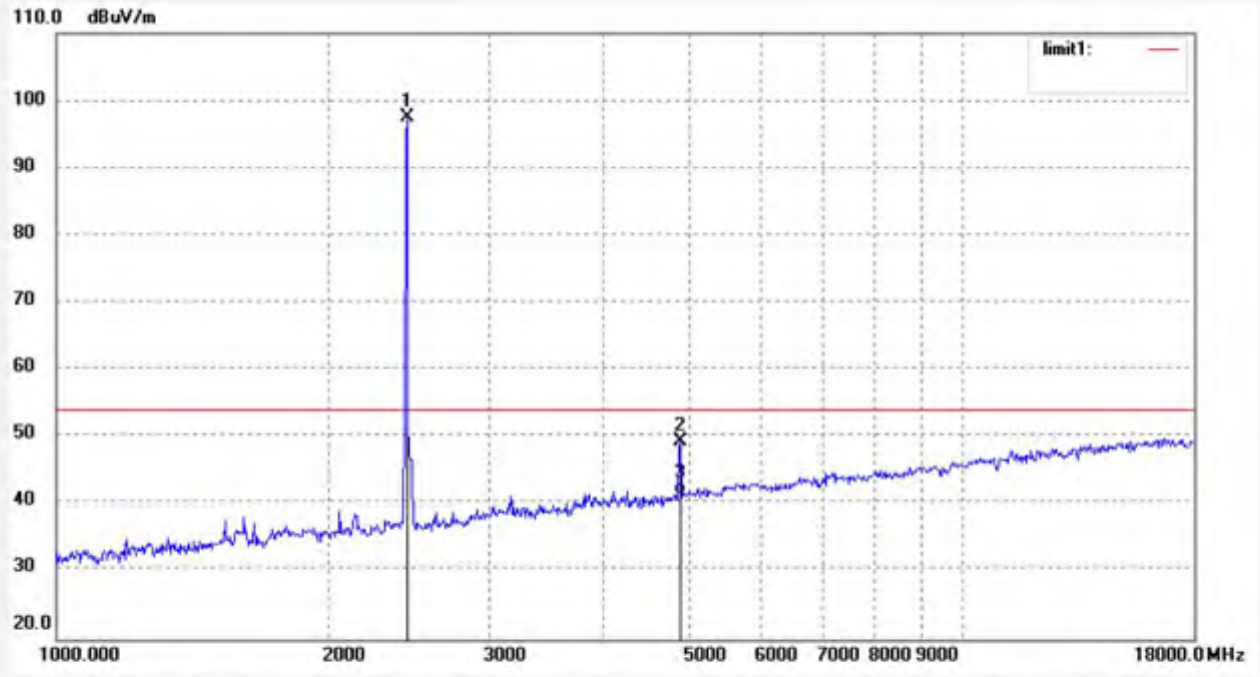
Job No.: LGW2018 #1265
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	96.50	1.04	97.54	/	/	peak			
2	4874.229	41.27	8.04	49.31	74.00	-24.69	peak			
3	4874.229	33.53	8.04	41.57	54.00	-12.43	AVG			

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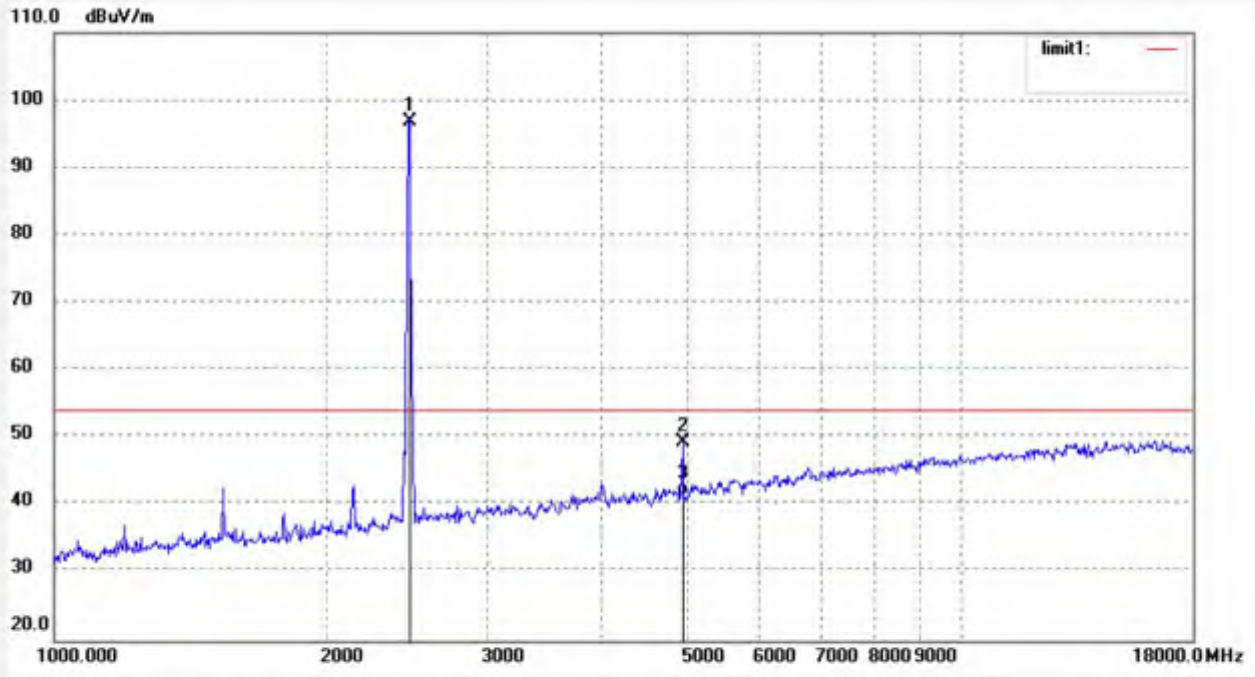
Job No.: LGW2018 #1267
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.000	95.86	1.09	96.95	/	/	peak			
2	4924.235	40.89	8.40	49.29	74.00	-24.71	peak			
3	4924.235	33.17	8.40	41.57	54.00	-12.43	AVG			

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Site: 2# Chamber
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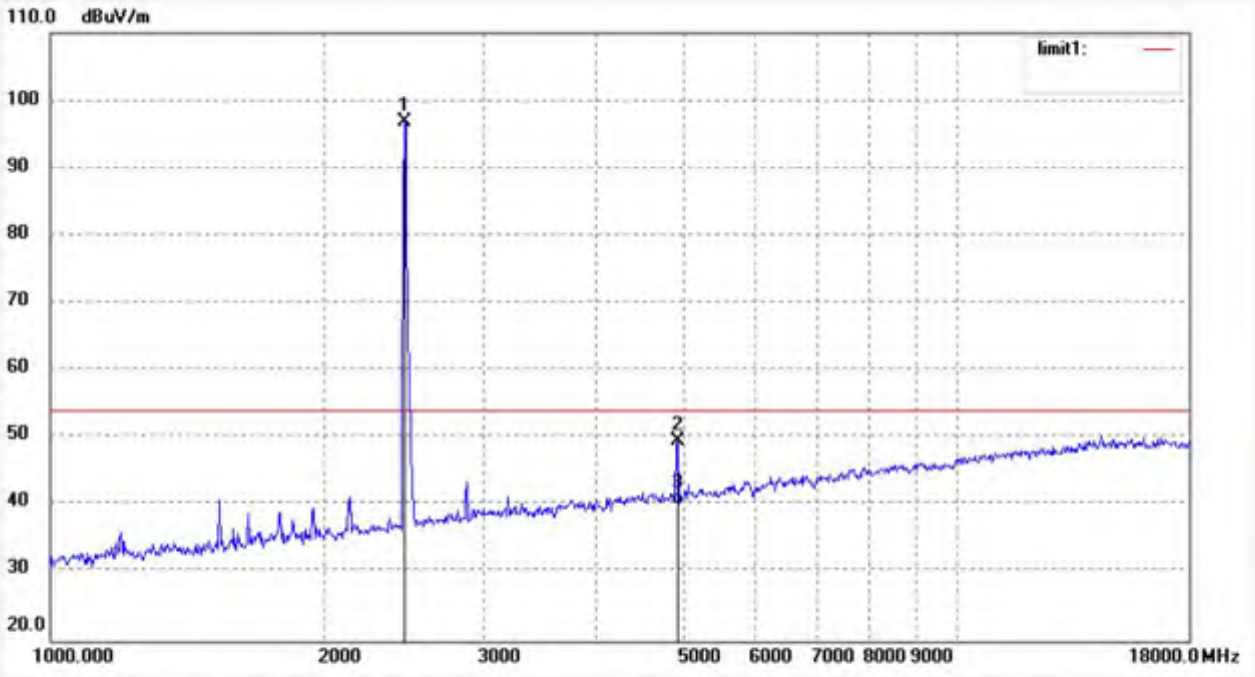
Fax:+86-0755-26503396

Job No.: LGW2018 #1266	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.000	95.66	1.09	96.75	/	/	peak			
2	4924.231	41.09	8.40	49.49	74.00	-24.51	peak			
3	4924.231	31.82	8.40	40.22	54.00	-13.78	AVG			

1GHz-18GHz test data

Mode:802.11g

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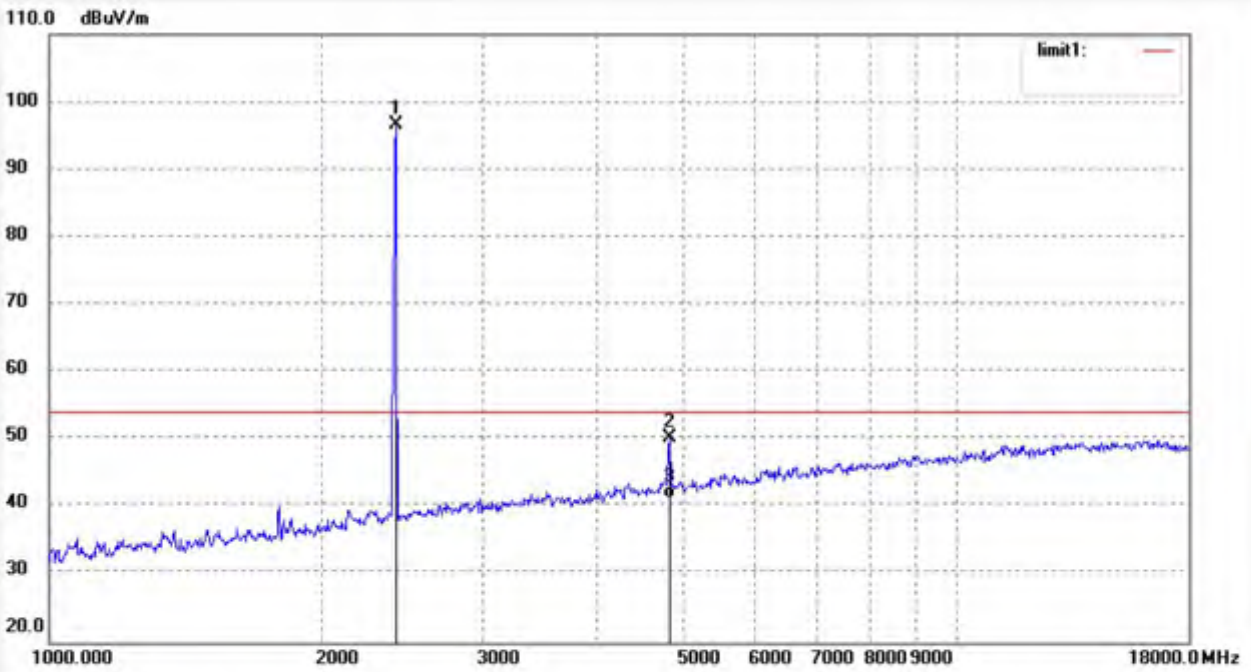
Job No.: LGW2018 #1276
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2412MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.000	95.73	0.93	96.66	/	/	peak			
2	4824.230	42.59	7.58	50.17	74.00	-23.83	peak			
3	4824.230	33.65	7.58	41.23	54.00	-12.77	AVG			

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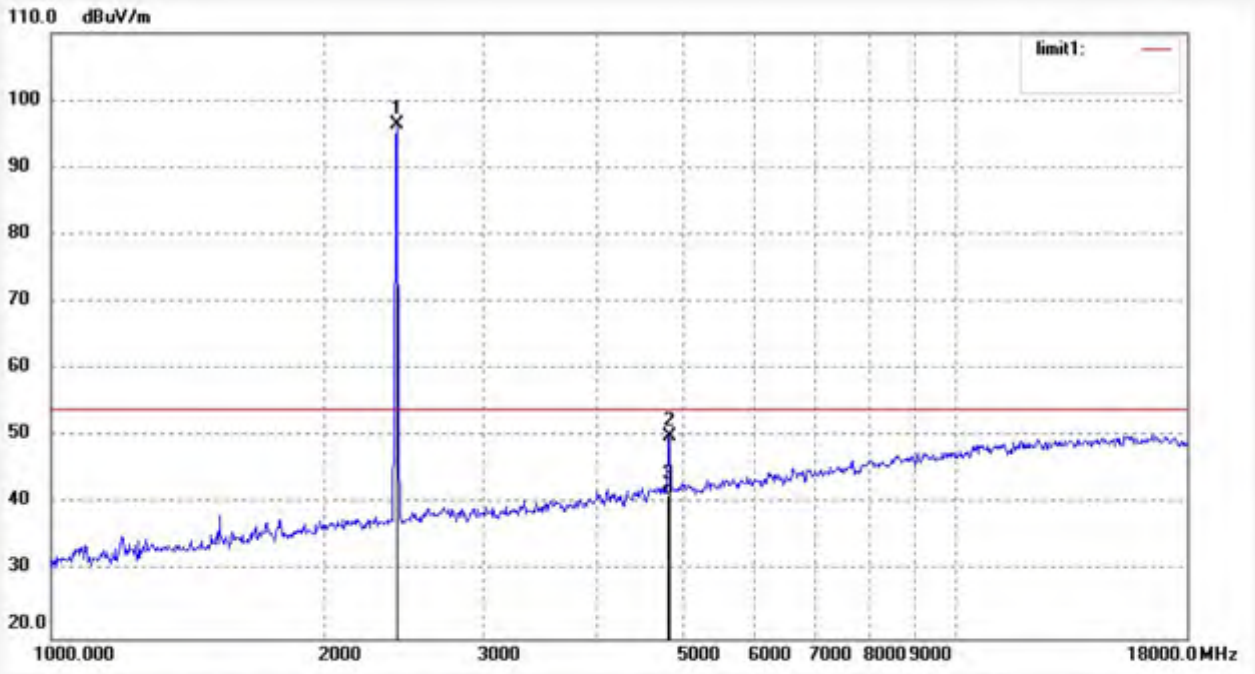
Job No.: LGW2018 #1277	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.000	95.44	0.93	96.37	/	/	peak			
2	4824.228	42.36	7.58	49.94	74.00	-24.06	peak			
3	4824.228	33.66	7.58	41.24	54.00	-12.76	AVG			

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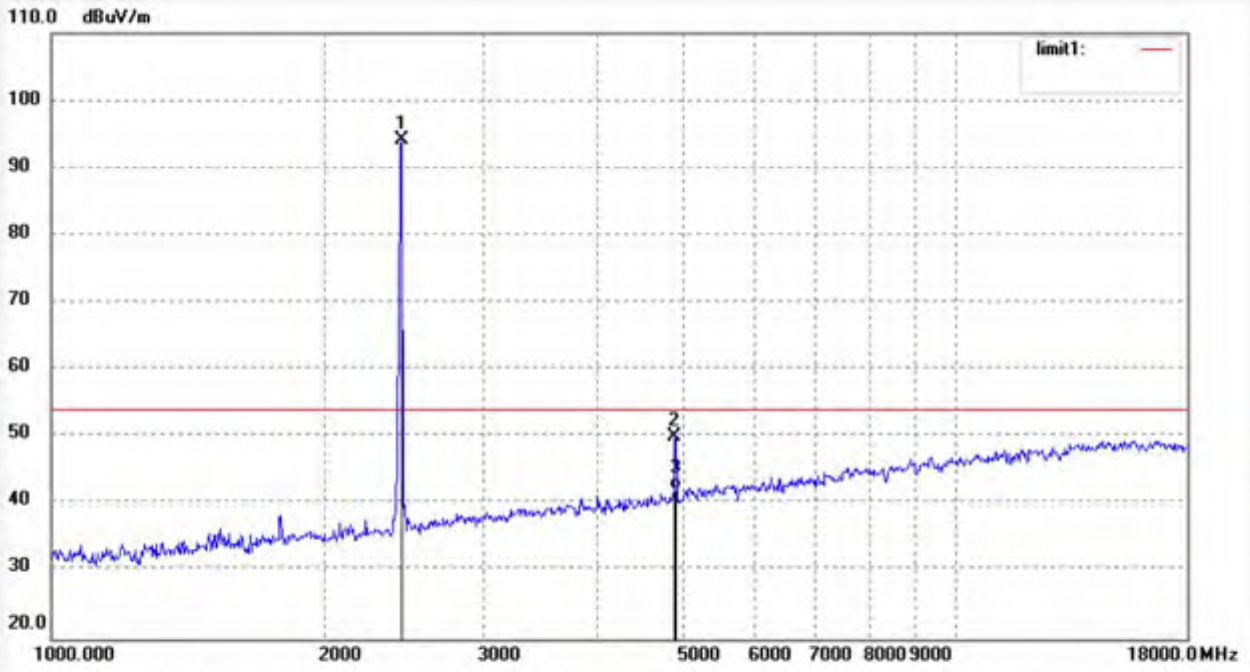
Job No.: LGW2018 #1280
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.232	93.12	1.04	94.16	/	/	peak			
2	4874.232	42.01	8.04	50.05	74.00	-23.95	peak			
3	4874.232	34.21	8.04	42.25	54.00	-11.75	AVG			

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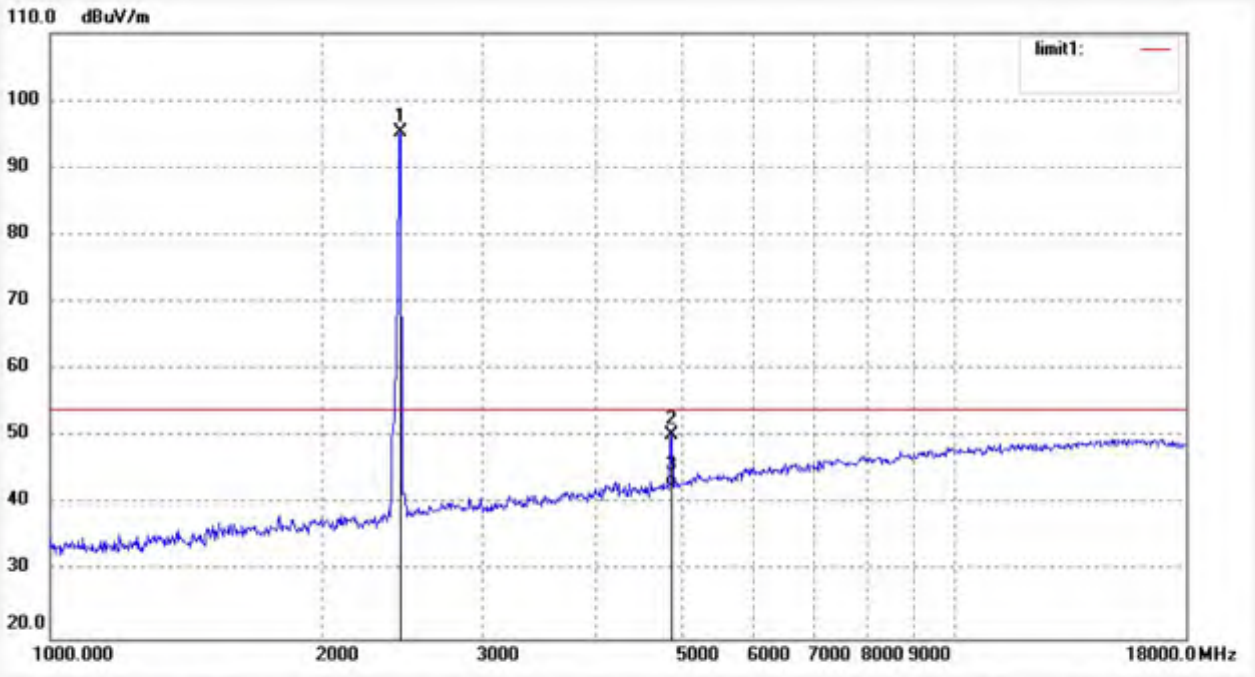
Job No.: LGW2018 #1281	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	94.30	1.04	95.34	/	/	peak			
2	4874.235	42.29	8.04	50.33	74.00	-23.67	peak			
3	4874.235	34.53	8.04	42.57	54.00	-11.43	AVG			

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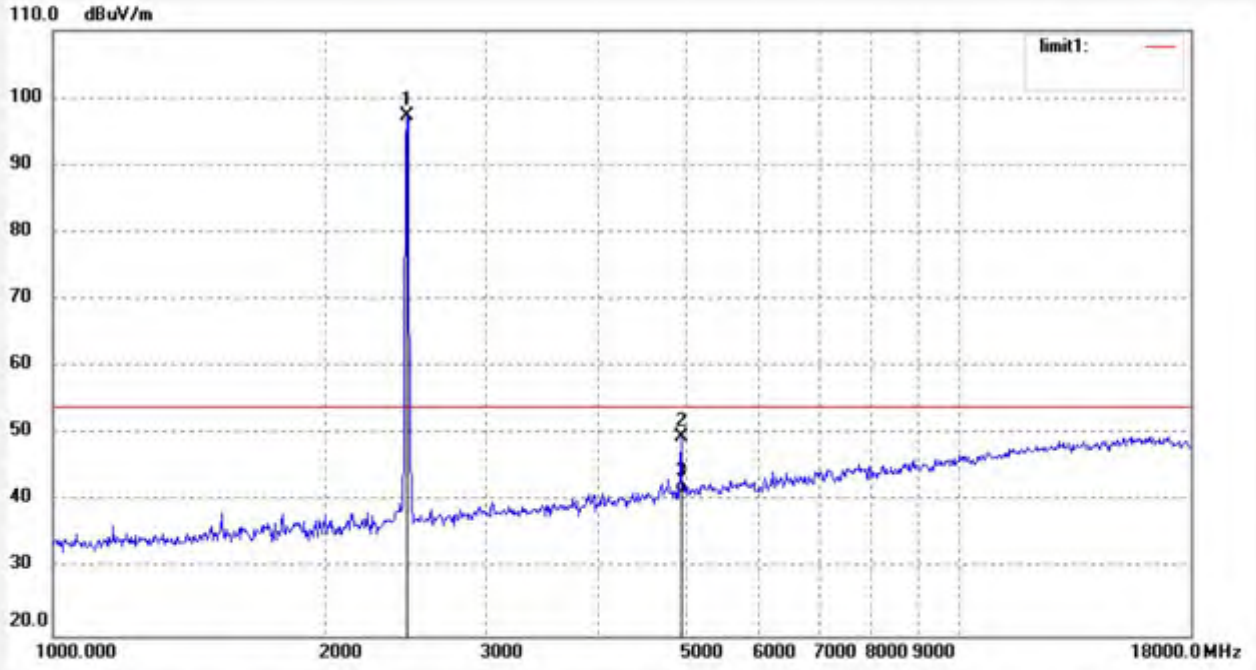
Job No.: LGW2018 #1283
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.000	96.27	1.09	97.36	/	/	peak			
2	4924.240	41.14	8.40	49.54	74.00	-24.46	peak			
3	4924.240	32.96	8.40	41.36	54.00	-12.64	AVG			

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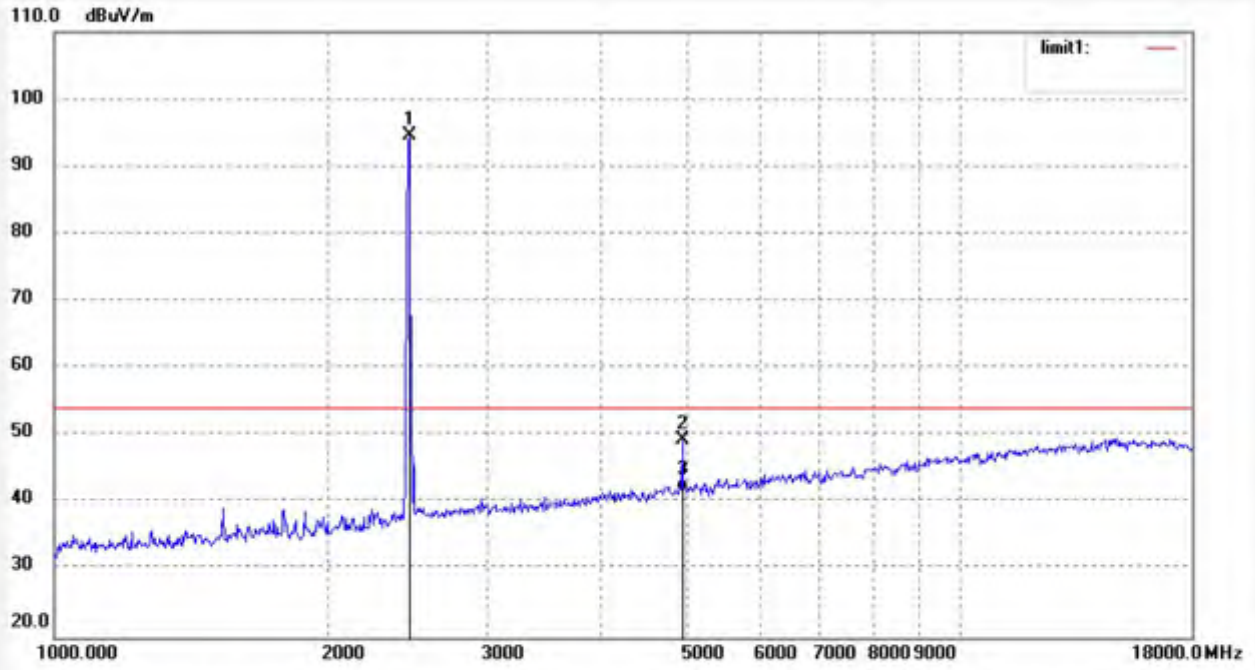
Job No.: LGW2018 #1282
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.000	93.41	1.09	94.50	/	/	peak			
2	4924.238	41.06	8.40	49.46	54.00	-4.54	peak			
3	4924.238	33.34	8.40	41.74	54.00	-12.26	AVG			

1GHz-18GHz test data

Mode:802.11n HT20

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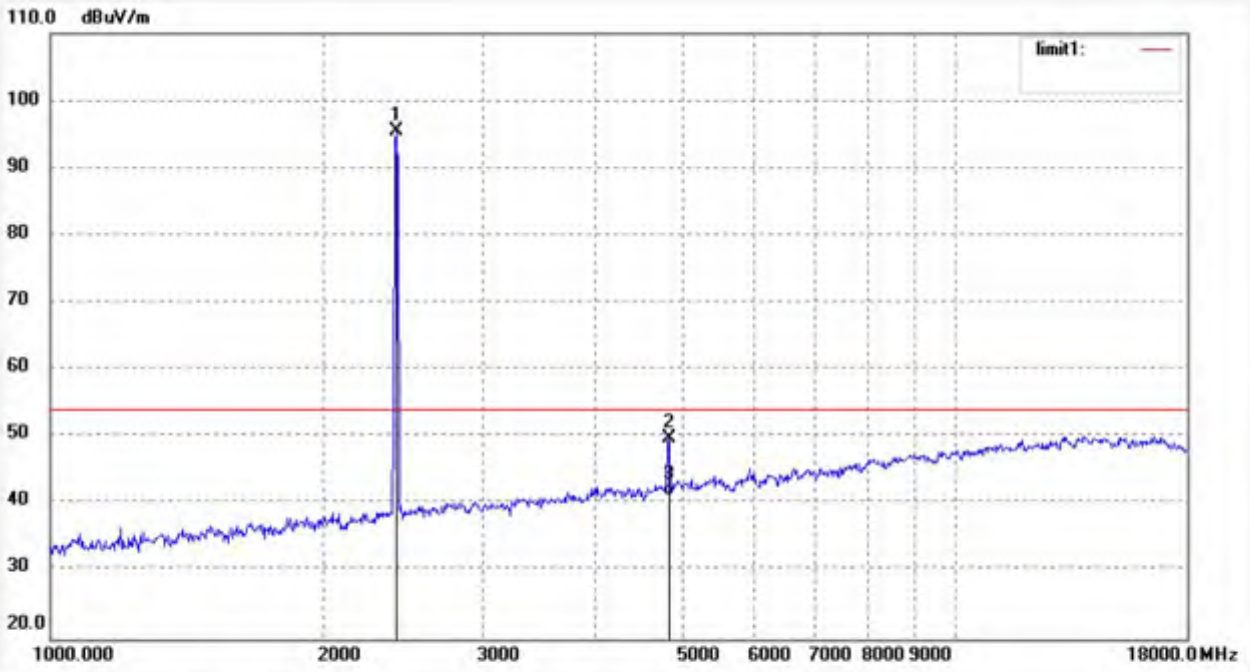
Job No.: LGW2018 #1292	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.000	94.60	0.93	95.53	/	/	peak			
2	4824.236	42.26	7.58	49.84	74.00	-24.16	peak			
3	4824.236	33.78	7.58	41.36	54.00	-12.64	AVG			

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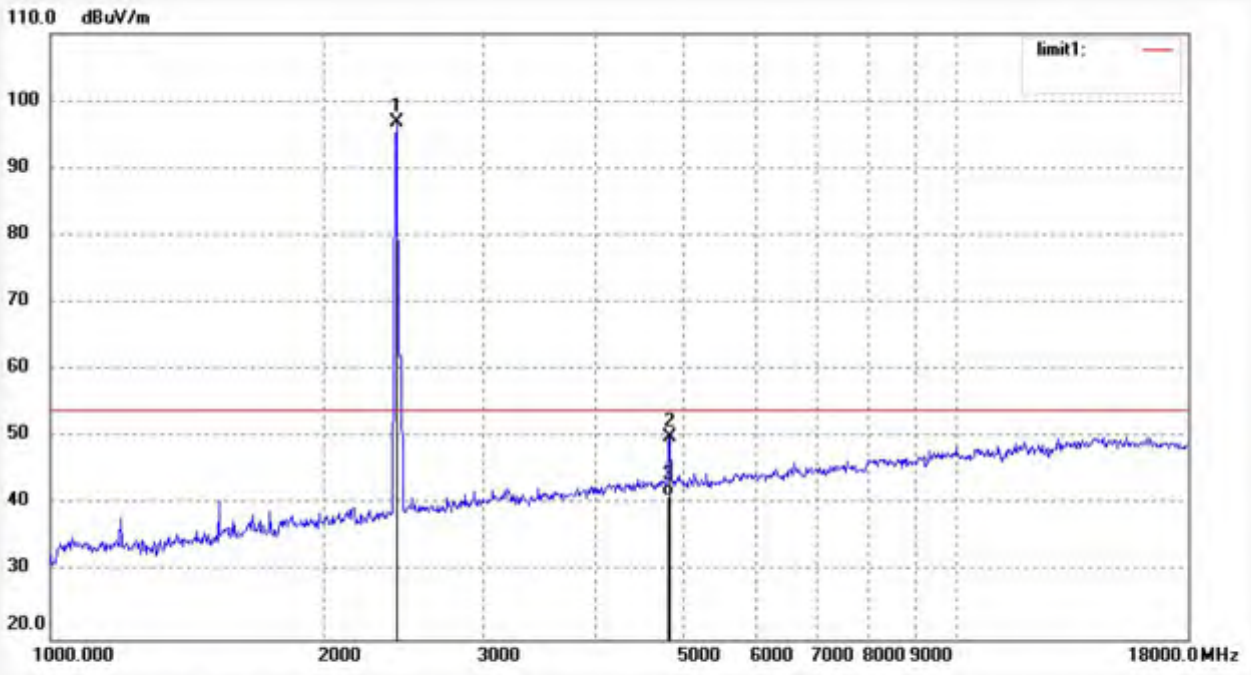
Job No.: LGW2018 #1293	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.000	95.88	0.93	96.81	/	/	peak			
2	4824.243	42.48	7.58	50.06	74.00	-23.94	peak			
3	4824.243	33.66	7.58	41.24	54.00	-12.76	AVG			

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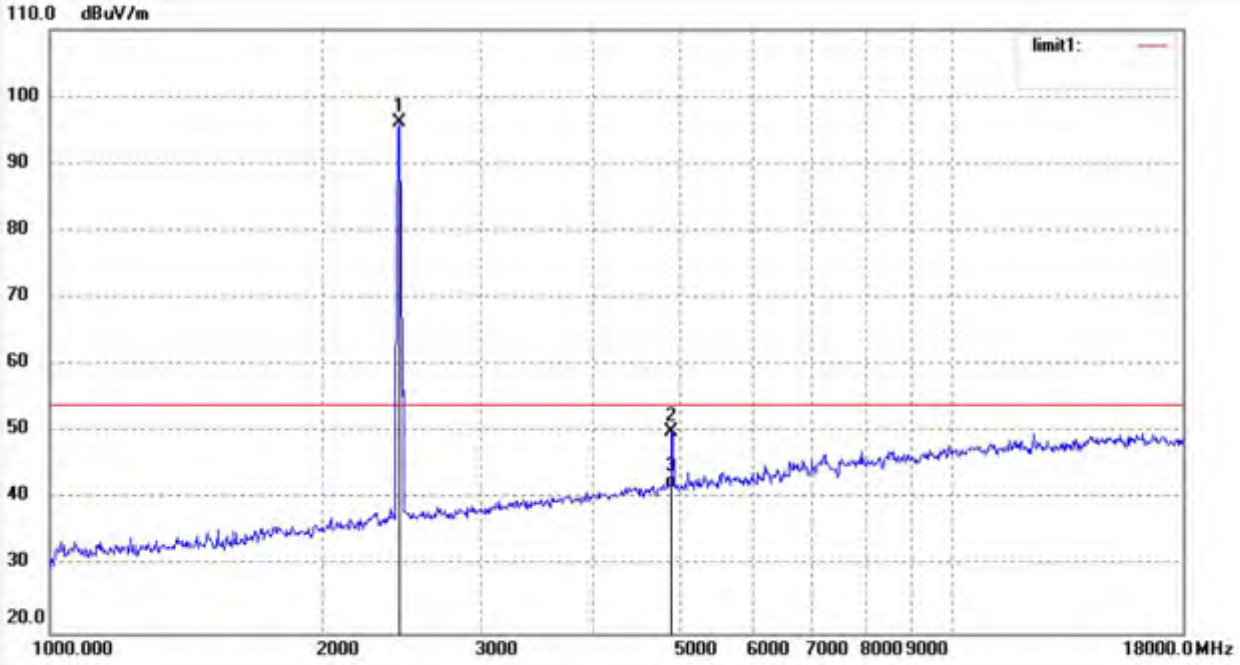
Job No.: LGW2018 #1296
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	95.19	1.04	96.23	/	/	peak			
2	4874.241	42.07	8.04	50.11	74.00	-23.89	peak			
3	4874.241	33.73	8.04	41.77	54.00	-12.23	AVG			

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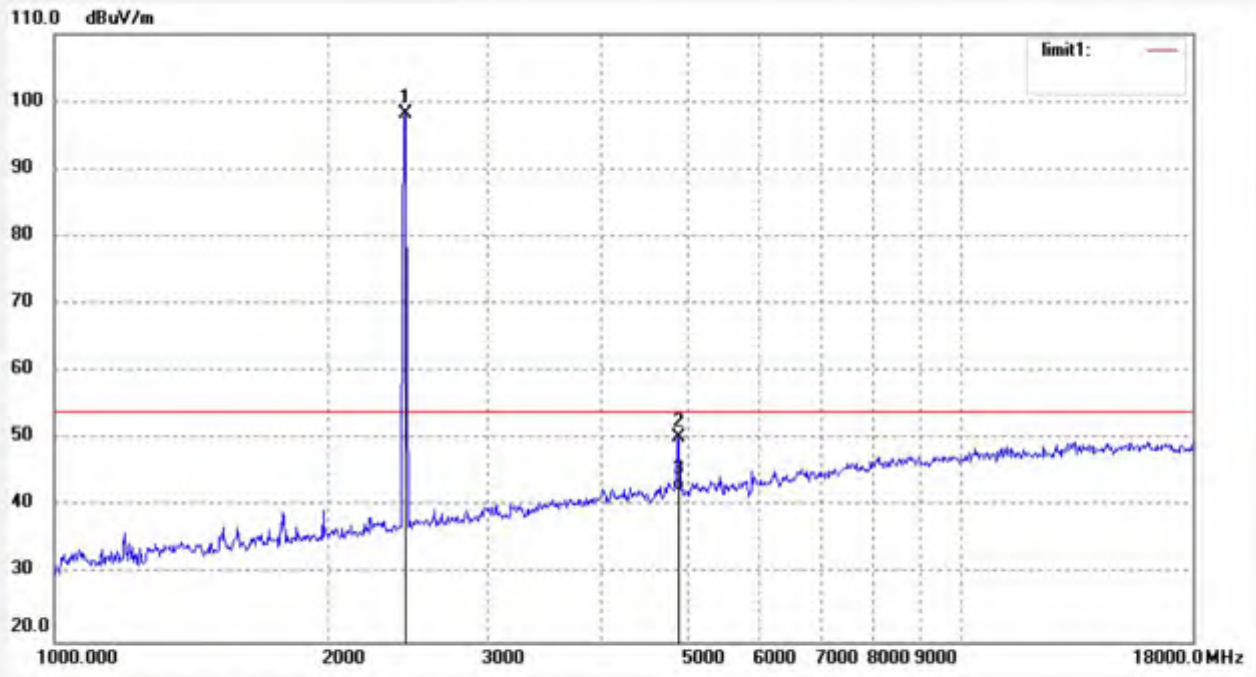
Job No.: LGW2018 #1297
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	97.12	1.04	98.16	/	/	peak			
2	4874.248	42.17	8.04	50.21	74.00	-23.79	peak			
3	4874.248	34.31	8.04	42.35	54.00	-11.65	AVG			

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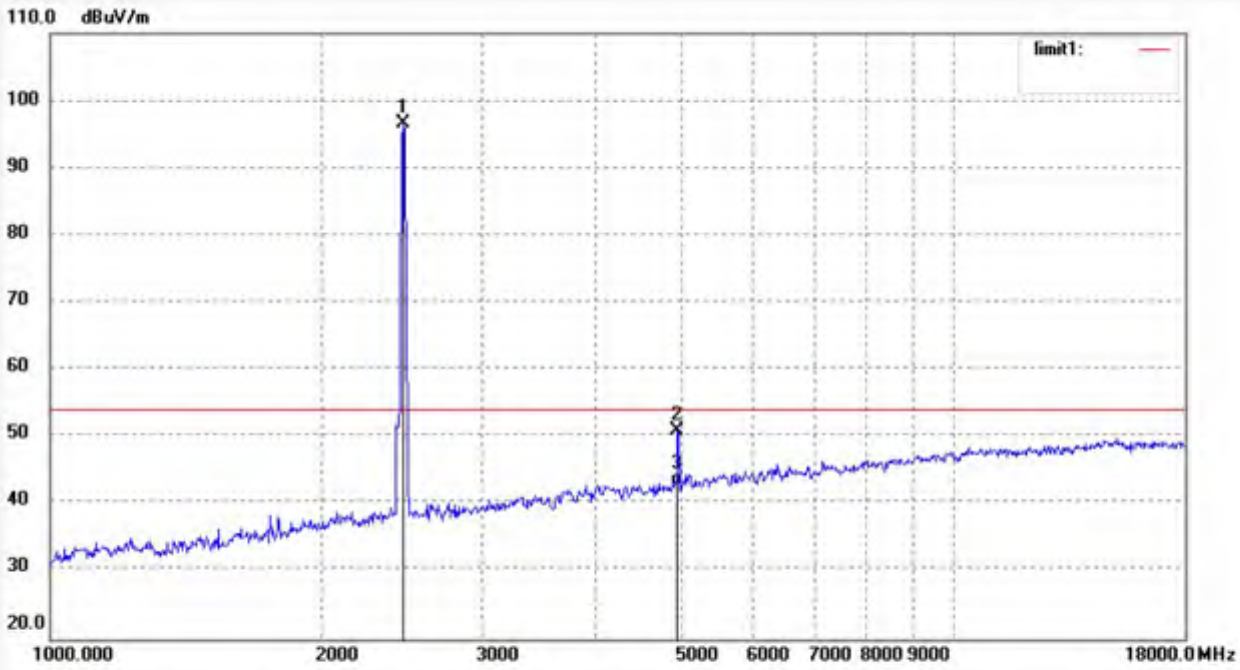
Job No.: LGW2018 #1299
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.000	95.42	1.09	96.51	/	/	peak			
2	4924.249	42.43	8.40	50.83	74.00	-23.17	peak			
3	4924.249	34.34	8.40	42.74	54.00	-11.26	AVG			

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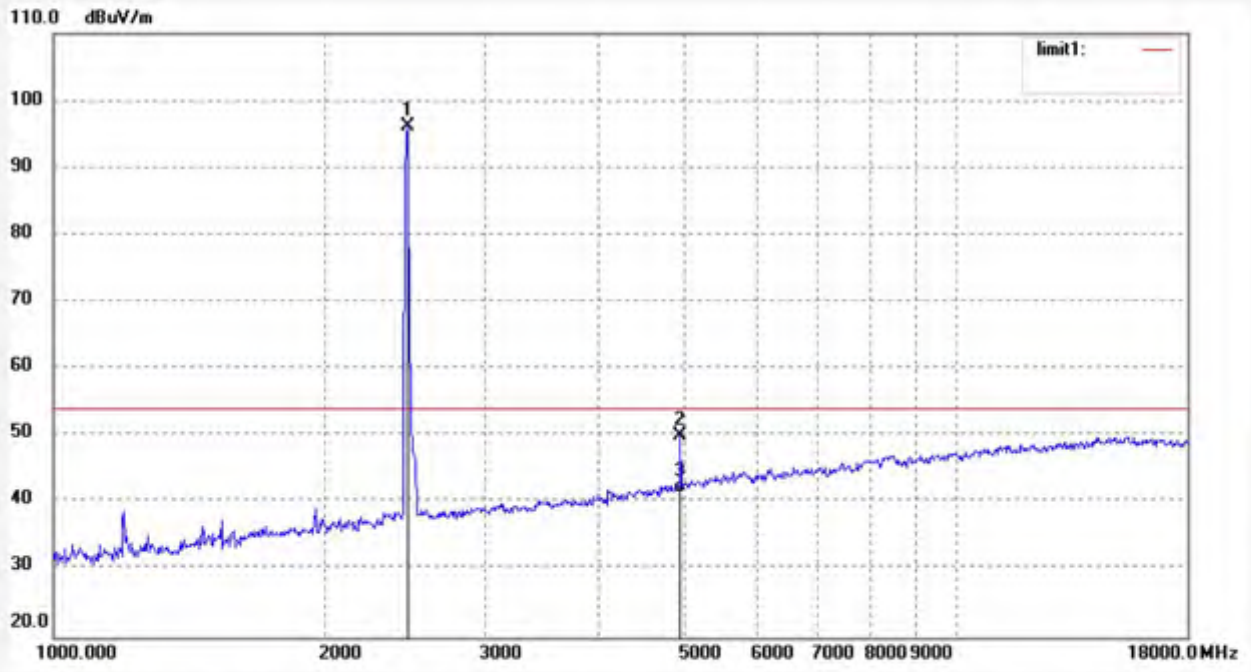
Job No.: LGW2018 #1298
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.000	95.01	1.09	96.10	/	/	peak			
2	4924.245	41.56	8.40	49.96	74.00	-24.04	peak			
3	4924.245	33.07	8.40	41.47	54.00	-12.53	AVG			

1GHz-18GHz test data

Mode:802.11n HT40

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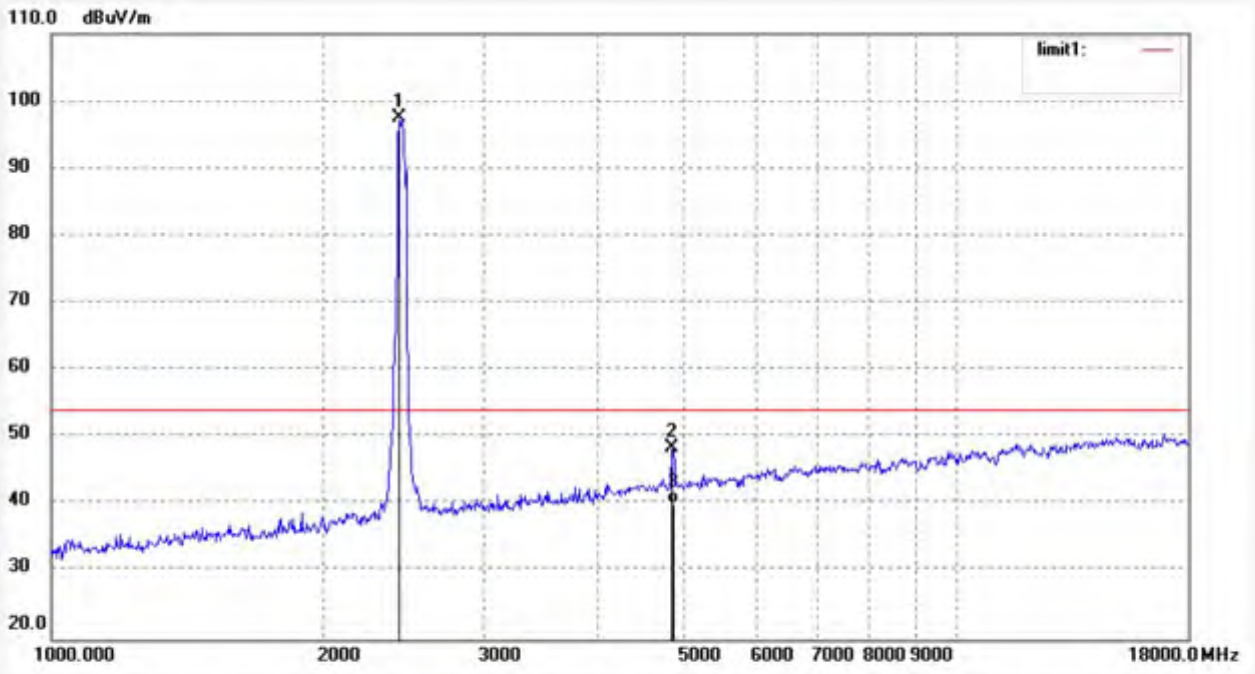
Job No.: LGW2018 #1308	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2422MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2422.000	96.63	0.98	97.61	/	/	peak			
2	4844.324	40.61	7.76	48.37	74.00	-25.63	peak			
3	4844.324	32.45	7.76	40.21	54.00	-13.79	AVG			

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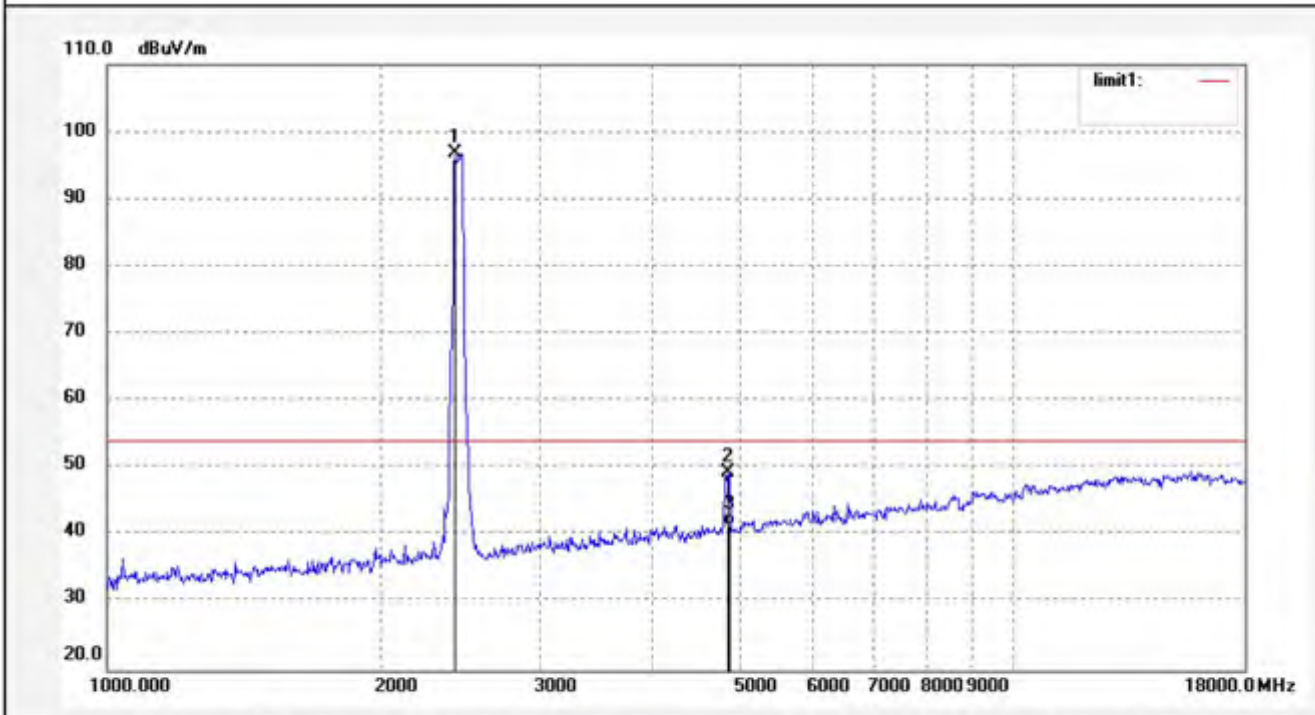
Job No.: LGW2018 #1309	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2422MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2422.000	95.82	0.97	96.79	/	/	peak			
2	4844.330	41.65	7.76	49.41	74.00	-24.59	peak			
3	4844.330	33.75	7.76	41.51	54.00	-12.49	AVG			

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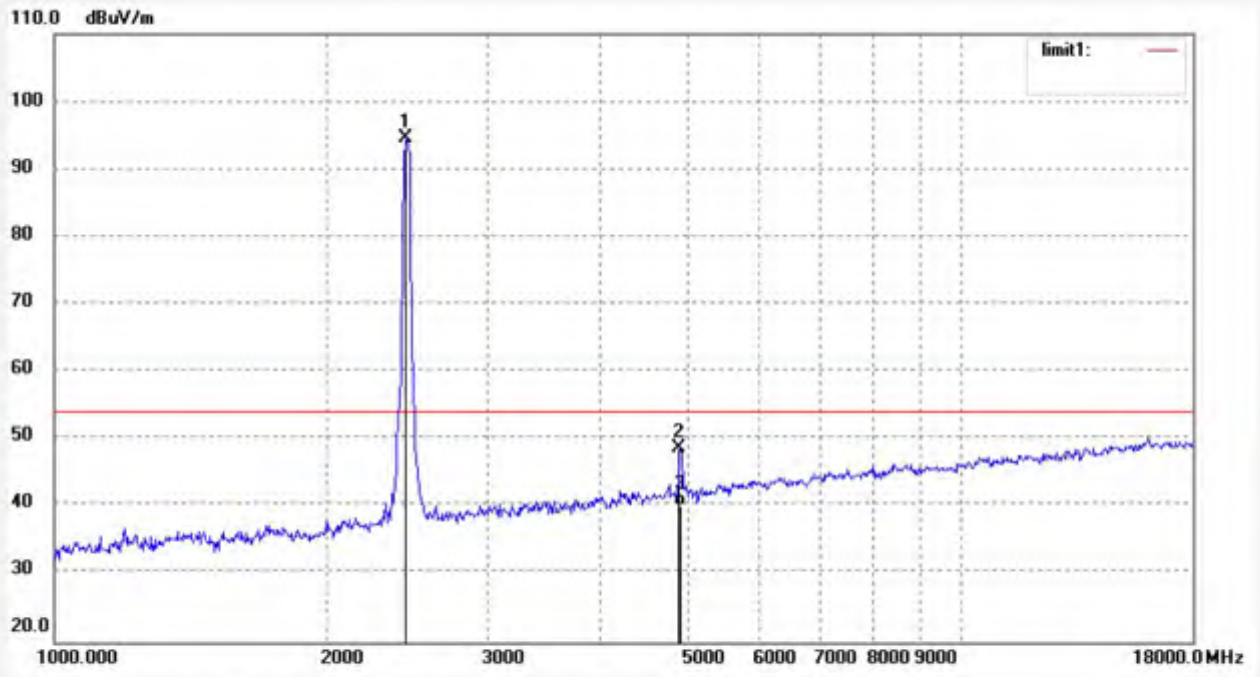
Job No.: LGW2018 #1312
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	93.45	1.04	94.49	/	/	peak			
2	4874.345	40.67	8.04	48.71	74.00	-25.29	peak			
3	4874.345	32.20	8.04	40.24	54.00	-13.76	AVG			

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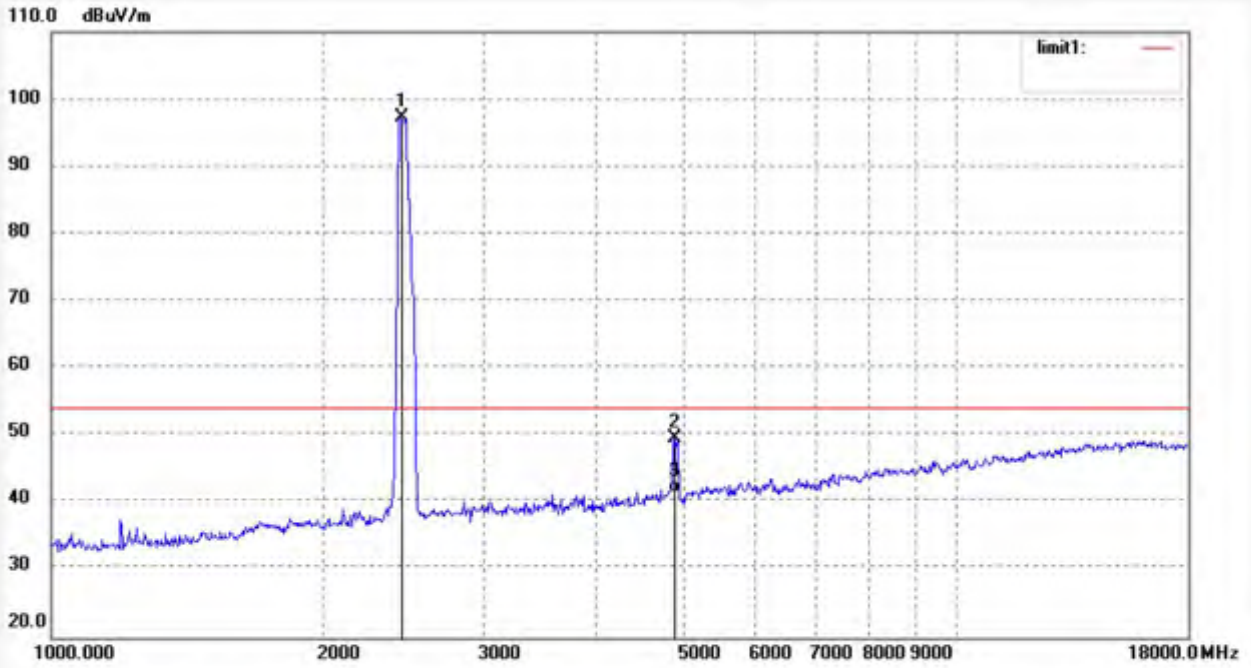
Job No.: LGW2018 #1313
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.000	96.20	1.04	97.24	/	/	peak			
2	4874.347	41.63	8.04	49.67	74.00	-24.33	peak			
3	4874.347	33.51	8.04	41.55	54.00	-12.45	AVG			

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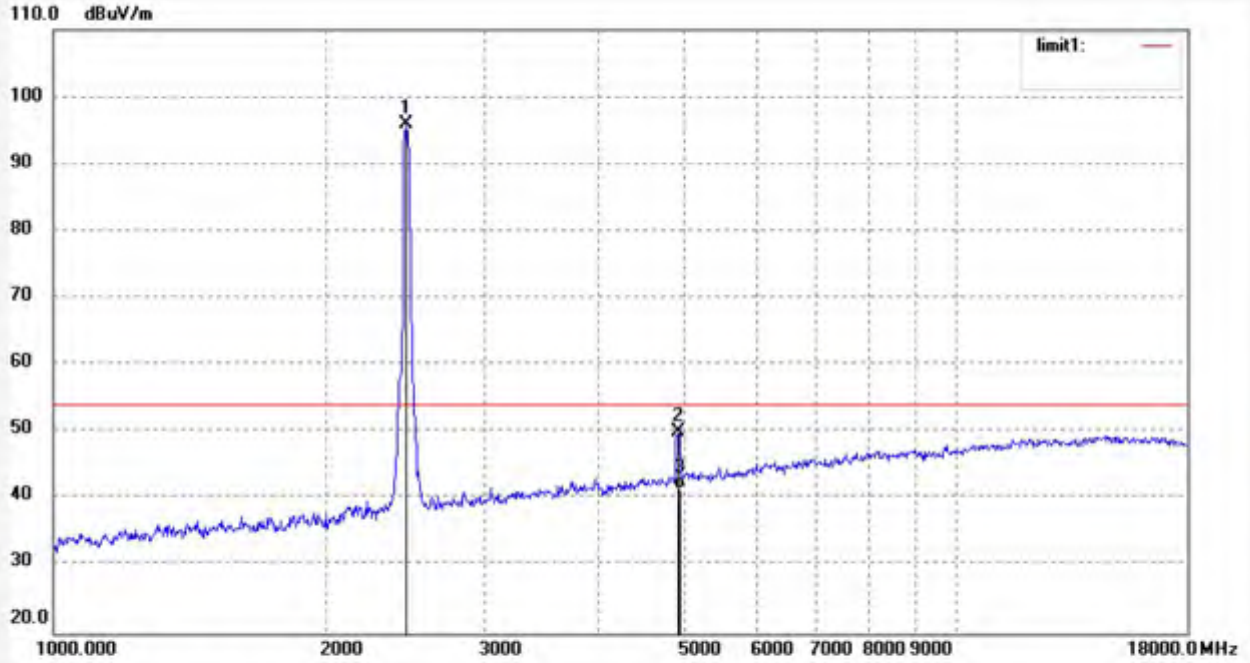
Job No.: LGW2018 #1315
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2452MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2452.000	94.74	1.09	95.83	/	/	peak			
2	4904.355	41.81	8.30	50.11	74.00	-23.89	peak			
3	4904.355	33.21	8.30	41.51	54.00	-12.49	AVG			

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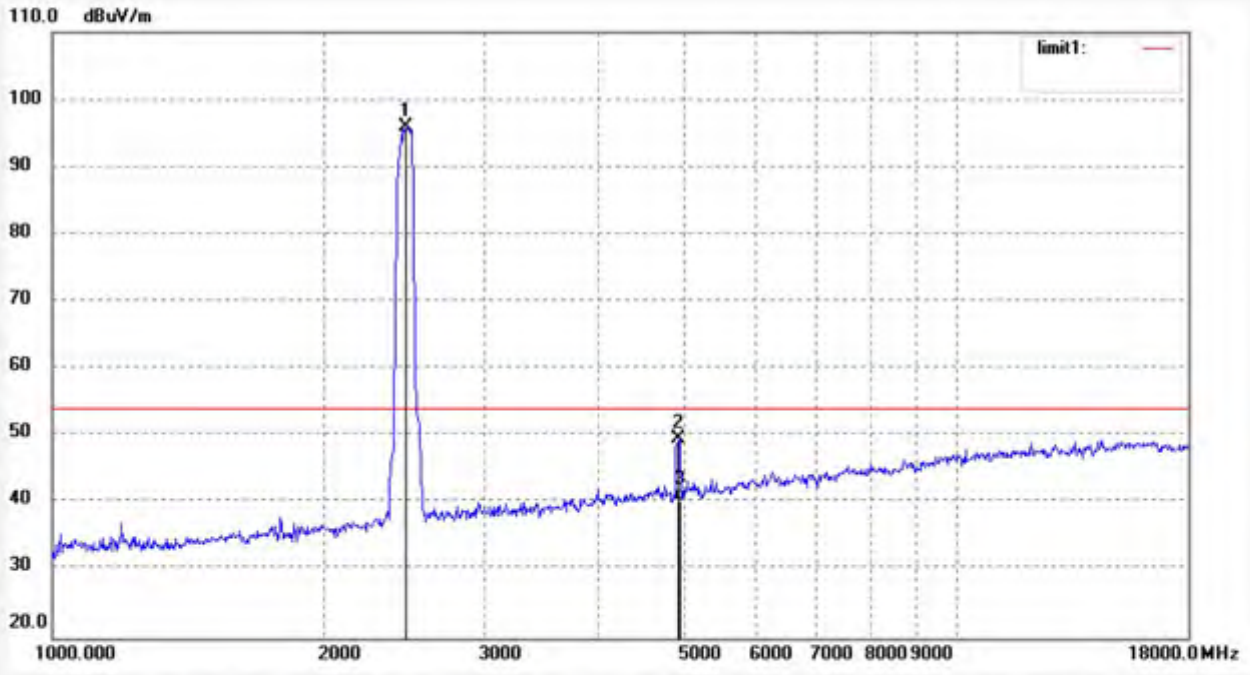
Job No.: LGW2018 #1314	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2452MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2452.000	94.82	1.09	95.91	/	/	peak			
2	4904.348	41.29	8.30	49.59	74.00	-24.41	peak			
3	4904.348	32.05	8.30	40.35	54.00	-13.65	AVG			

18GHz-26.5GHz test data

Mode:802.11b

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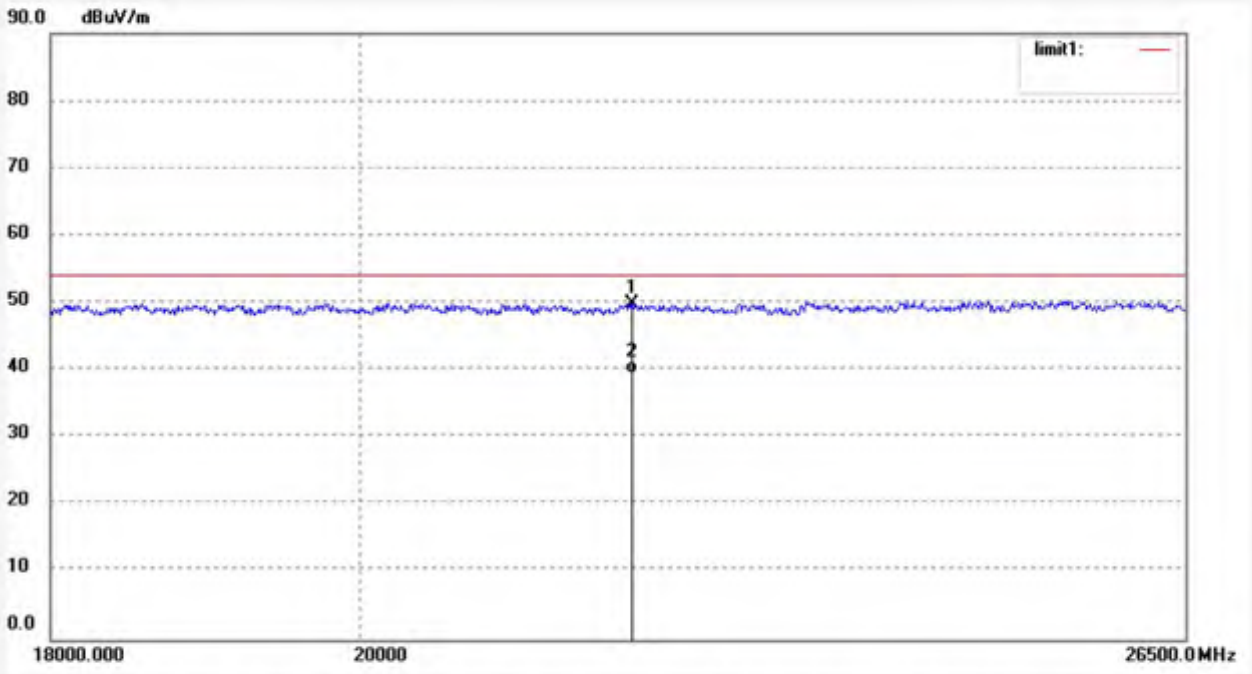
Job No.: LGW2018 #1271	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21950.420	10.46	39.31	49.77	74.00	-24.23	peak			
2	21950.420	0.23	39.31	39.54	54.00	-14.46	AVG			

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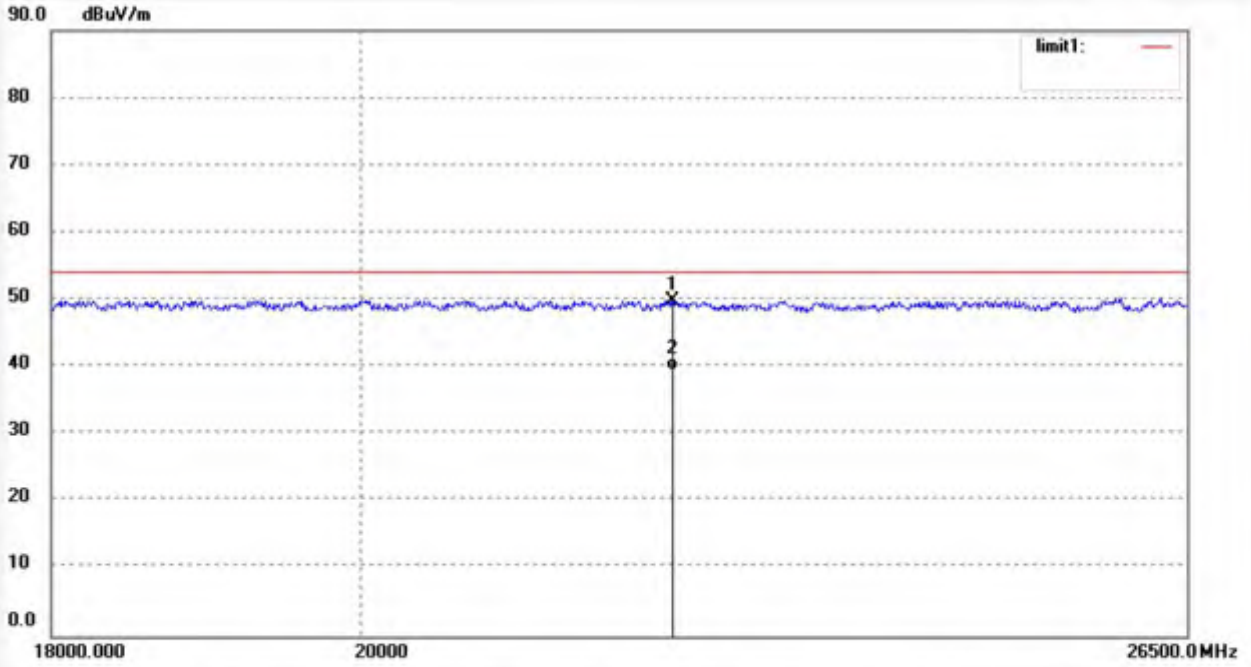
Job No.: LGW2018 #1270	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22240.981	10.56	39.29	49.85	74.00	-24.15	peak			
2	22240.981	0.12	39.29	39.41	54.00	-14.59	AVG			

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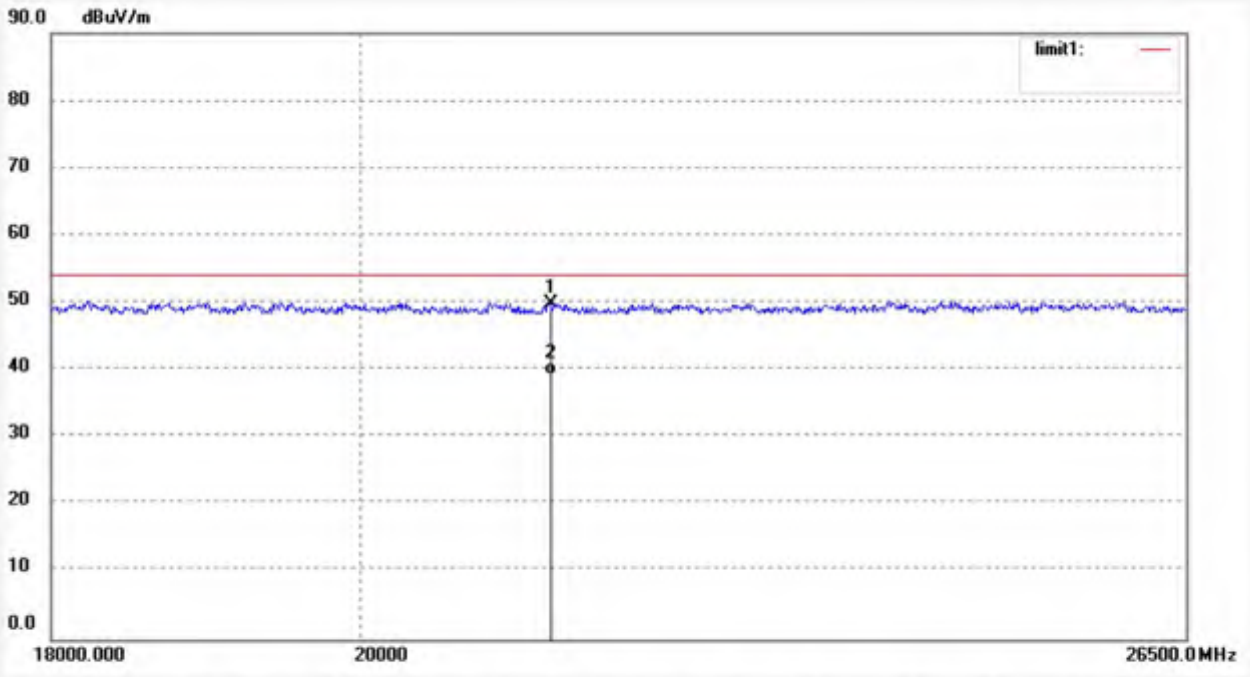
Job No.: LGW2018 #1272	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21339.330	11.27	38.49	49.76	74.00	-24.24	peak			
2	21339.330	0.75	38.49	39.24	54.00	-14.76	AVG			

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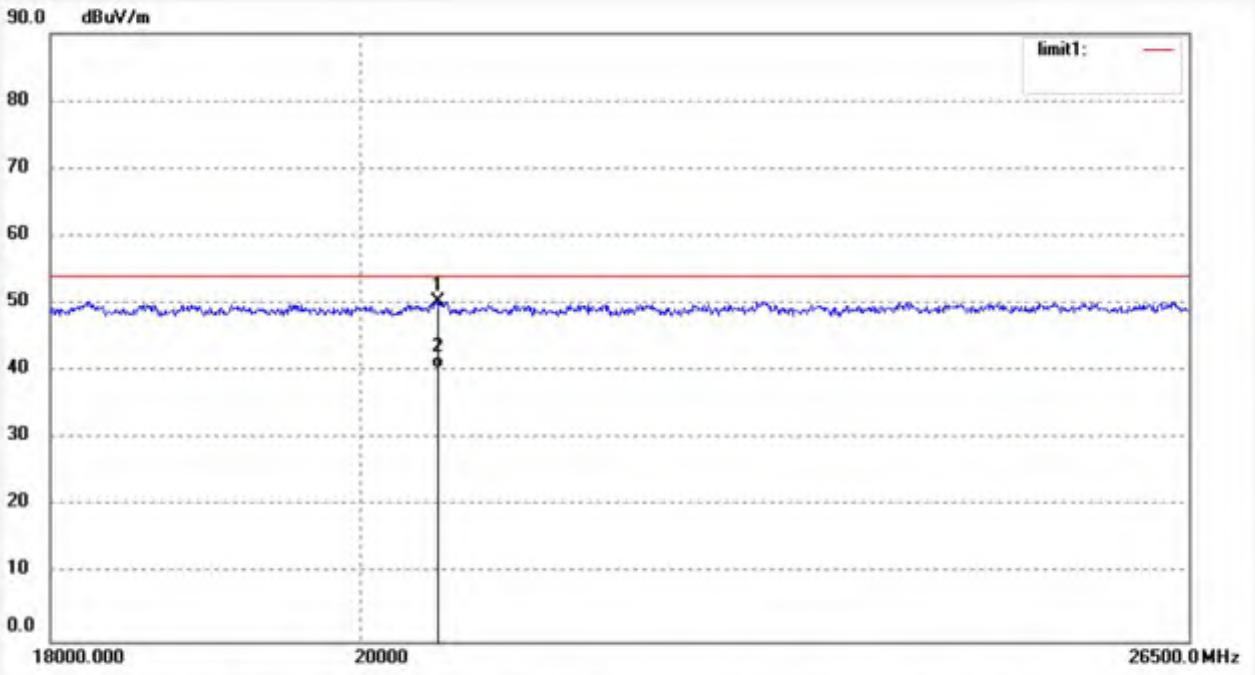
Job No.: LGW2018 #1273	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	20529.740	11.90	38.32	50.22	74.00	-23.78	peak			
2	20529.740	1.99	38.32	40.31	54.00	-13.69	AVG			

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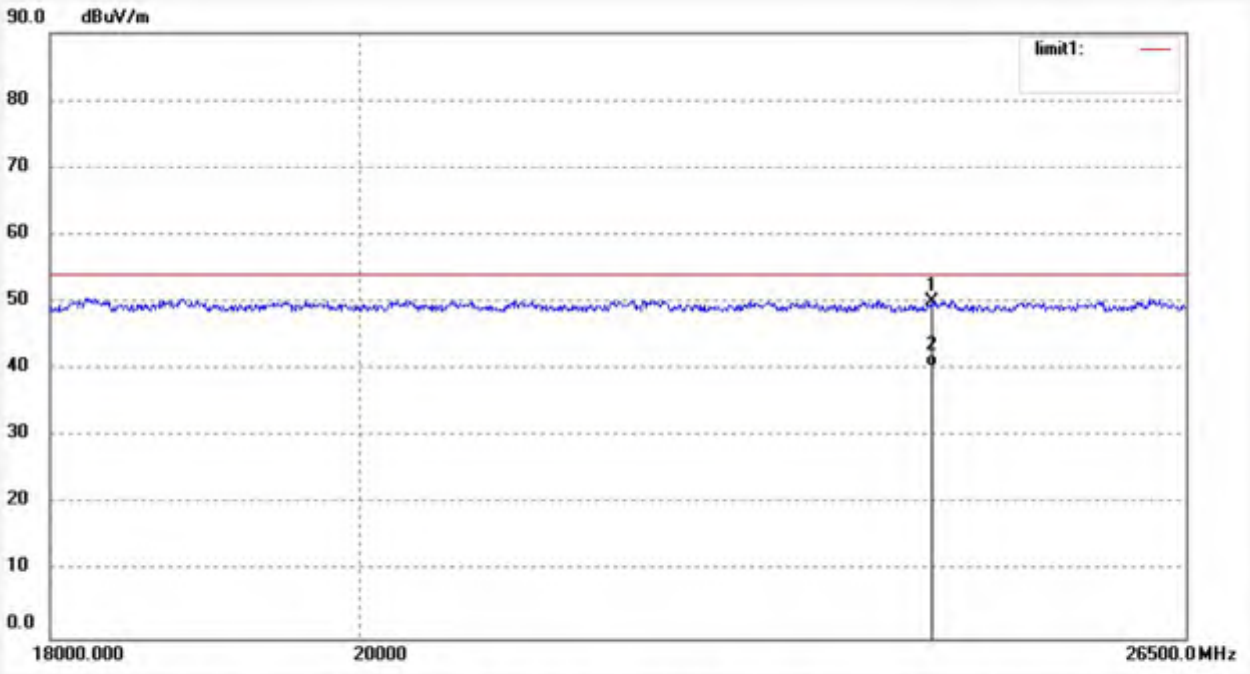
Job No.: LGW2018 #1275
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	24310.160	10.00	40.04	50.04	74.00	-23.96	peak			
2	24310.160	0.37	40.04	40.41	54.00	-13.59	AVG			

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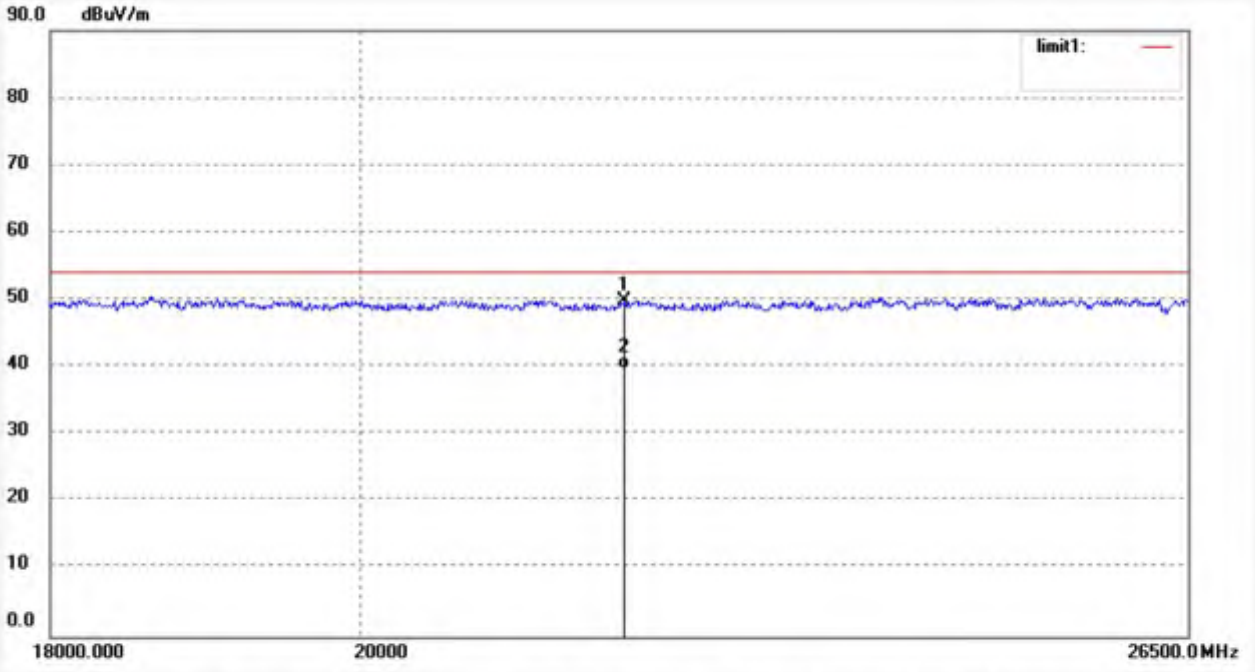
Job No.: LGW2018 #1274
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11b



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21882.607	10.61	39.23	49.84	74.00	-24.16	peak			
2	21882.607	0.41	39.23	39.64	54.00	-14.36	AVG			

18GHz-26.5GHz test data

Mode:802.11g

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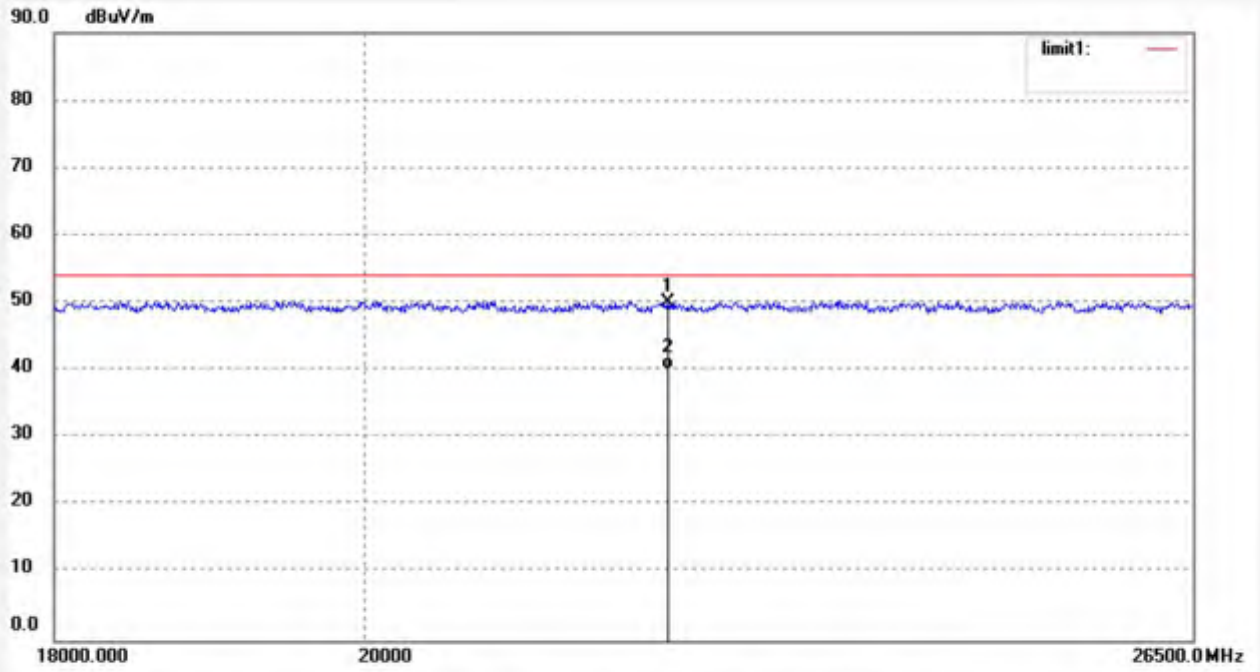
Job No.: LGW2018 #1287
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2412MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22172.269	10.53	39.55	50.08	74.00	-23.92	peak			
2	22172.269	0.70	39.55	40.25	54.00	-13.75	AVG			

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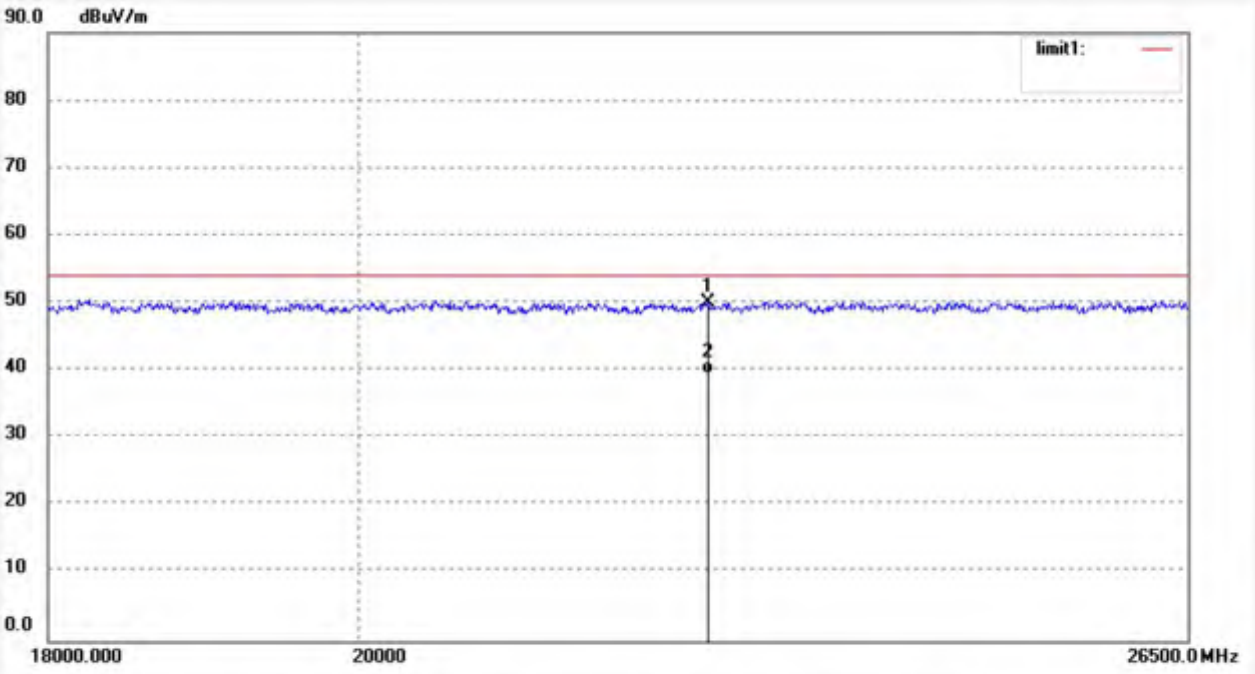
Job No.: LGW2018 #1286	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22517.962	10.57	39.39	49.96	74.00	-24.04	peak			
2	22517.962	0.15	39.39	39.54	54.00	-14.46	AVG			

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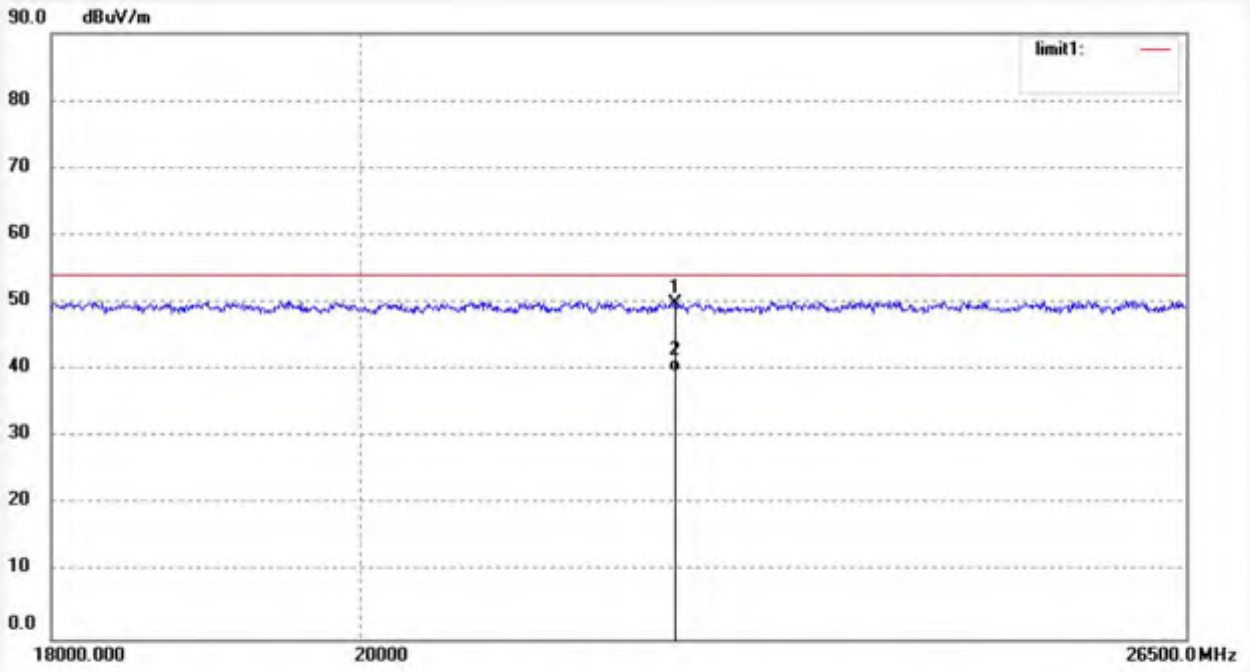
Job No.: LGW2018 #1288	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/26/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22266.803	10.27	39.64	49.91	74.00	-24.09	peak			
2	22266.803	0.01	39.64	39.65	54.00	-14.35	AVG			

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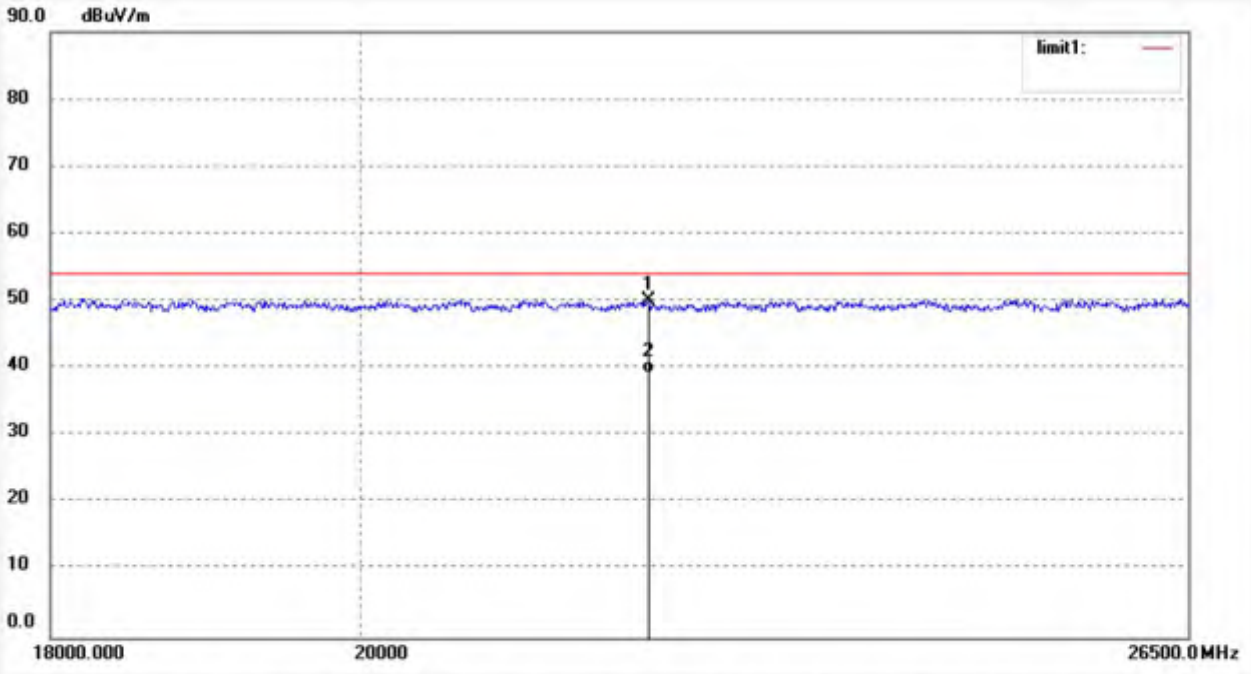
Job No.: LGW2018 #1289
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22061.066	10.75	39.24	49.99	74.00	-24.01	peak			
2	22061.066	0.10	39.24	39.34	54.00	-14.66	AVG			

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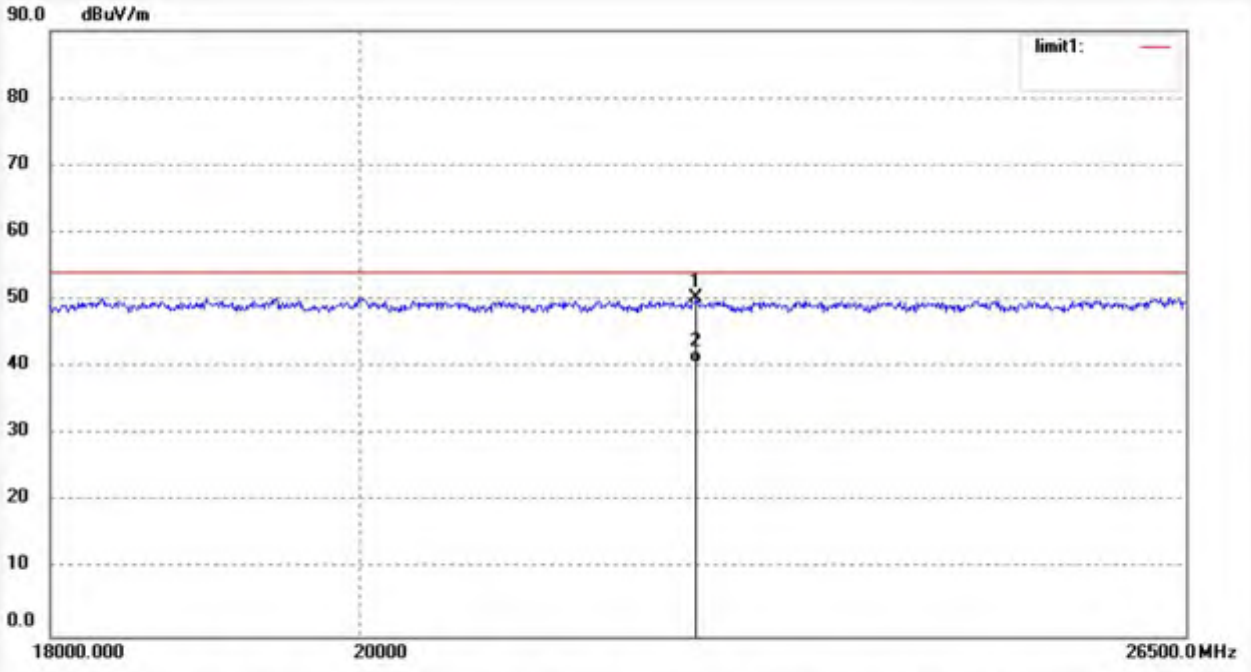
Job No.: LGW2018 #1291
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22431.037	10.45	39.77	50.22	74.00	-23.78	peak			
2	22431.037	0.80	39.77	40.57	54.00	-13.43	AVG			

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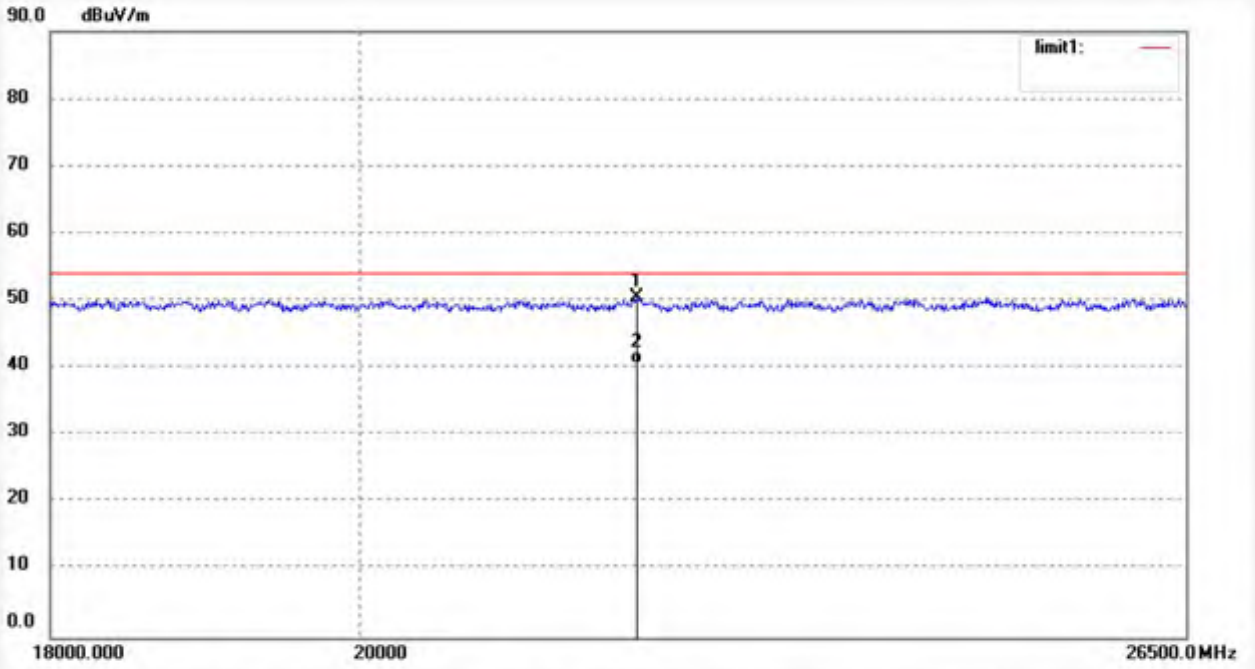
Job No.: LGW2018 #1290
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/26/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11g



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21984.406	11.27	39.22	50.49	74.00	-23.51	peak			
2	21984.406	1.43	39.22	40.65	54.00	-13.35	AVG			

18GHz-26.5GHz test data

Mode:802.11n HT20

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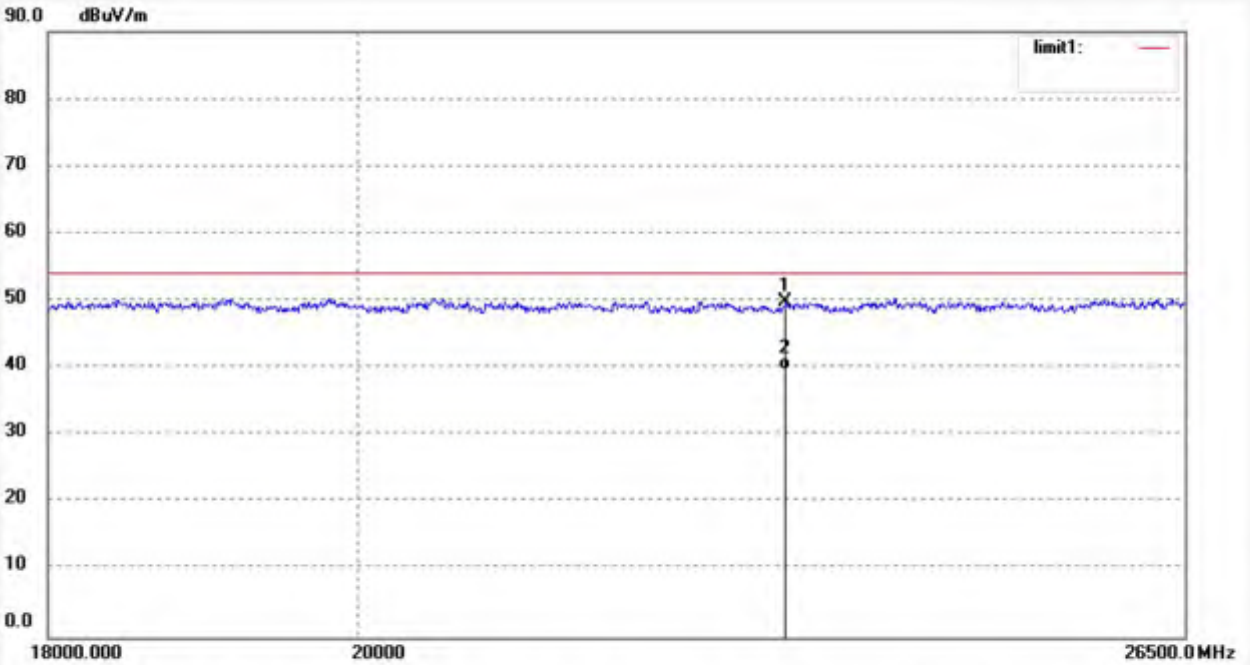
Job No.: LGW2018 #1303	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2412MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	23135.944	10.03	39.71	49.74	74.00	-24.26	peak			
2	23135.944	-0.06	39.71	39.65	54.00	-14.35	AVG			

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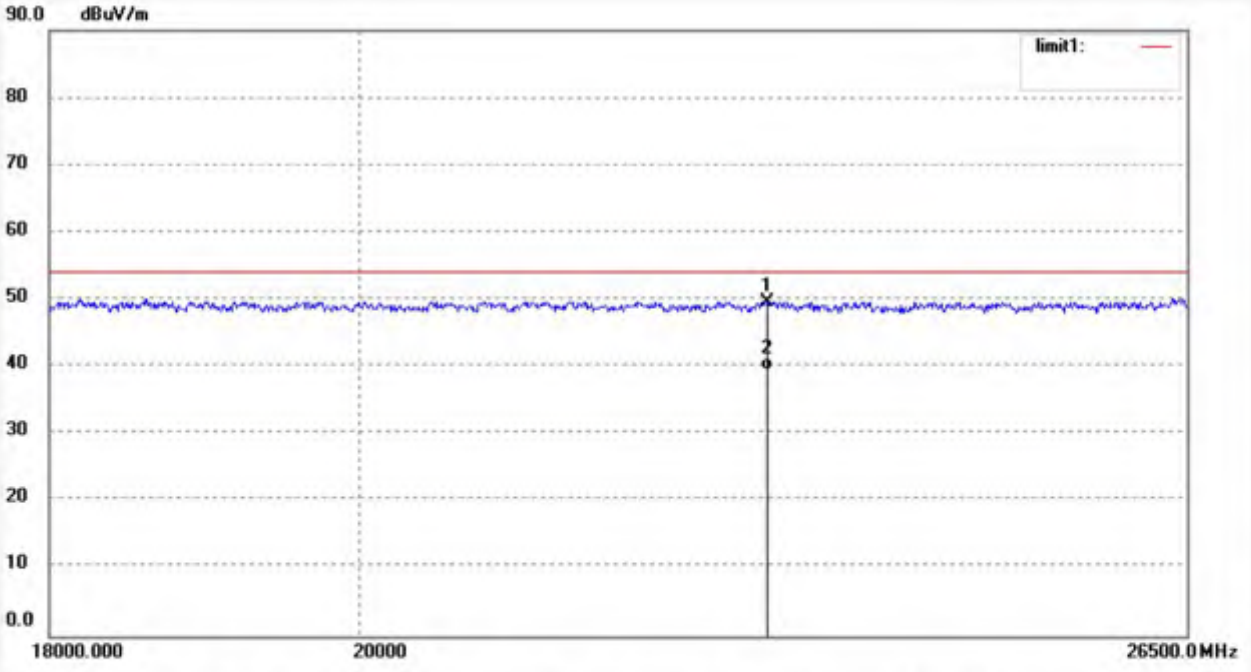
Job No.: LGW2018 #1302
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2412MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22975.433	9.90	39.80	49.70	74.00	-24.30	peak			
2	22975.433	-0.26	39.80	39.54	54.00	-14.46	AVG			

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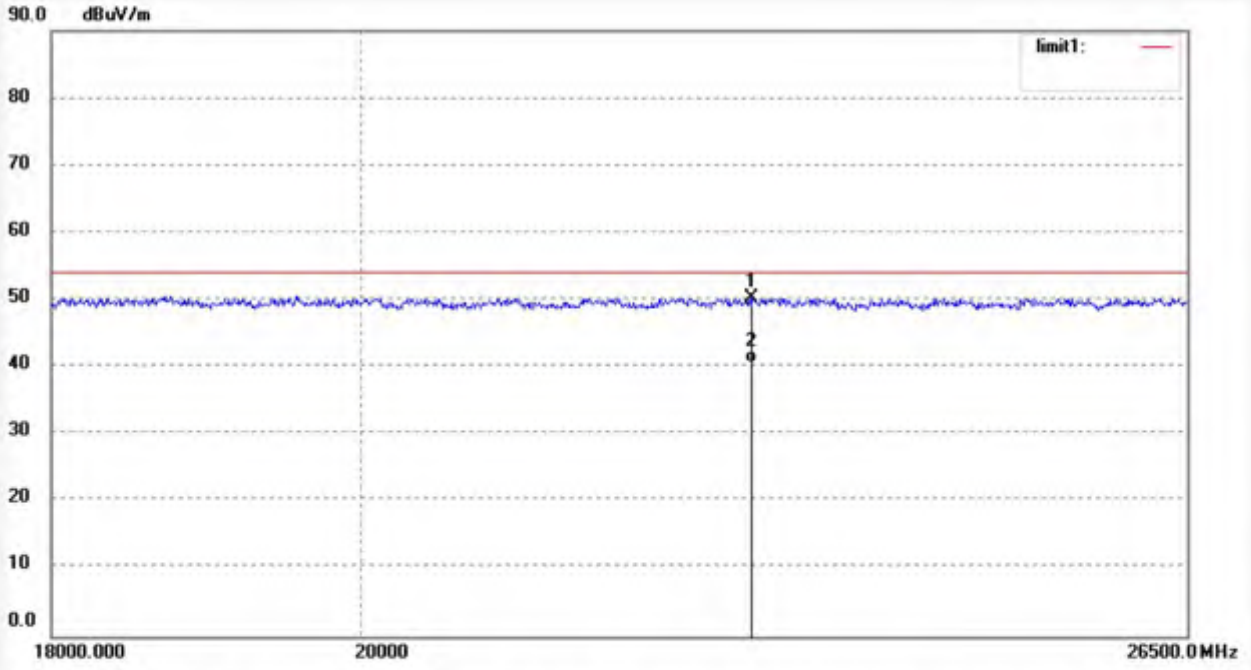
Job No.: LGW2018 #1304	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22851.361	10.67	39.65	50.32	74.00	-23.68	peak			
2	22851.361	0.92	39.65	40.57	54.00	-13.43	AVG			

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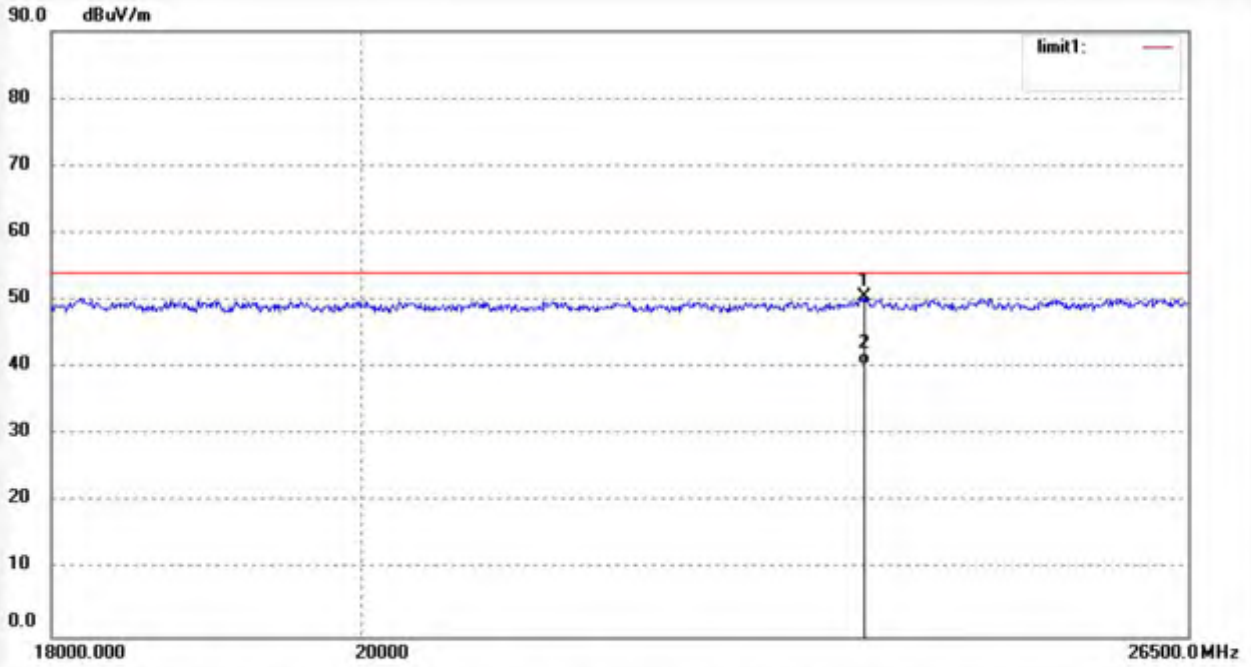
Job No.: LGW2018 #1305
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2437MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	23734.138	10.74	39.71	50.45	74.00	-23.55	peak			
2	23734.138	0.62	39.71	40.33	54.00	-13.67	AVG			

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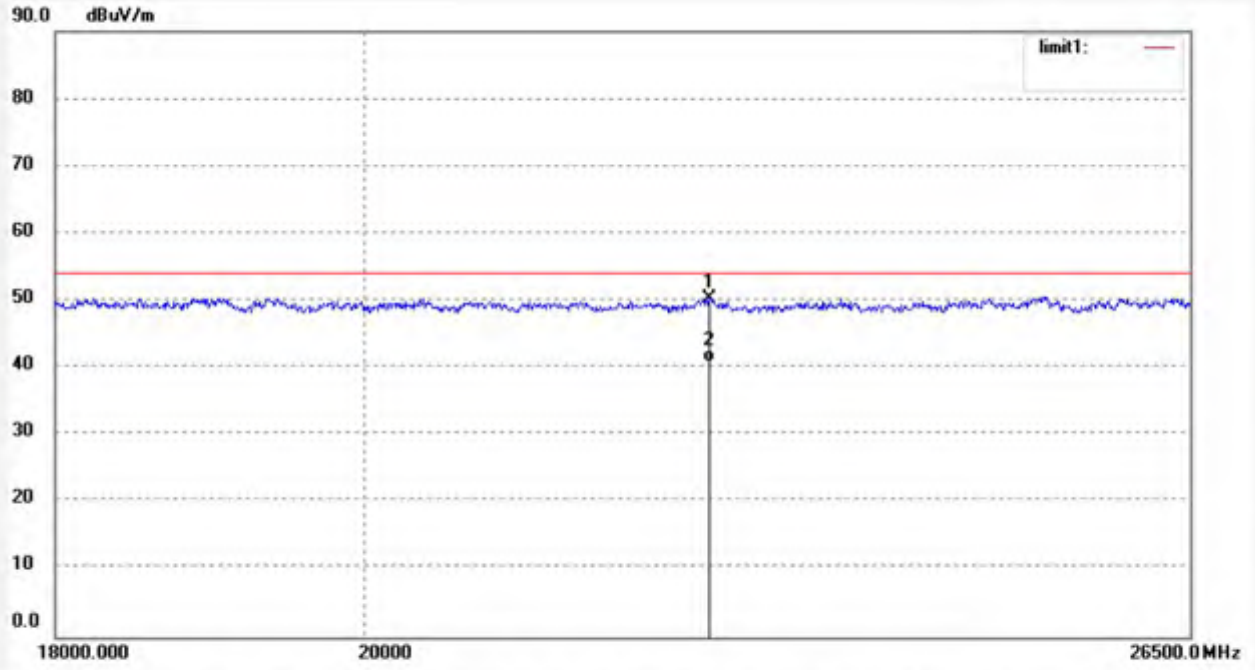
Job No.: LGW2018 #1307
Standard: FCC 15.247 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 2462MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/01/
Time:
Engineer Signature: WADE
Distance: 3m

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22491.849	10.38	39.83	50.21	74.00	-23.79	peak			
2	22491.849	0.94	39.83	40.77	54.00	-13.23	AVG			

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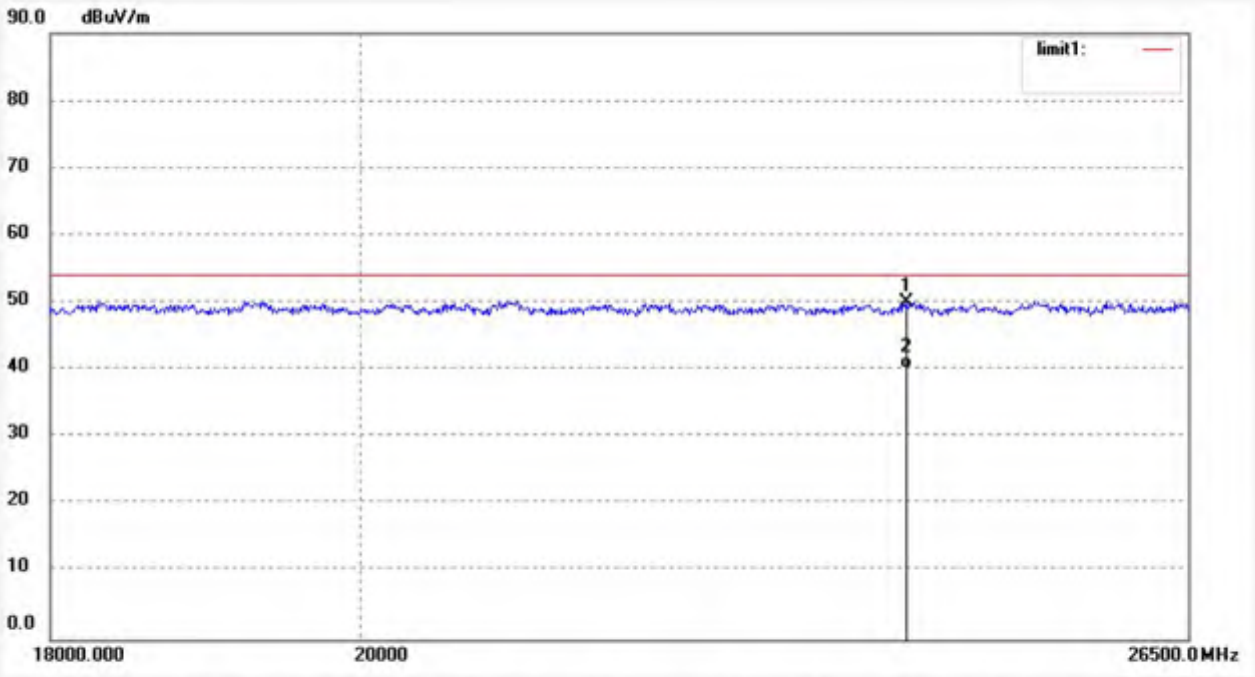
Job No.: LGW2018 #1306	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2462MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT20



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	24076.230	10.24	39.80	50.04	74.00	-23.96	peak			
2	24076.230	0.47	39.80	40.27	54.00	-13.73	AVG			

18GHz-26.5GHz test data

Mode:802.11n HT40

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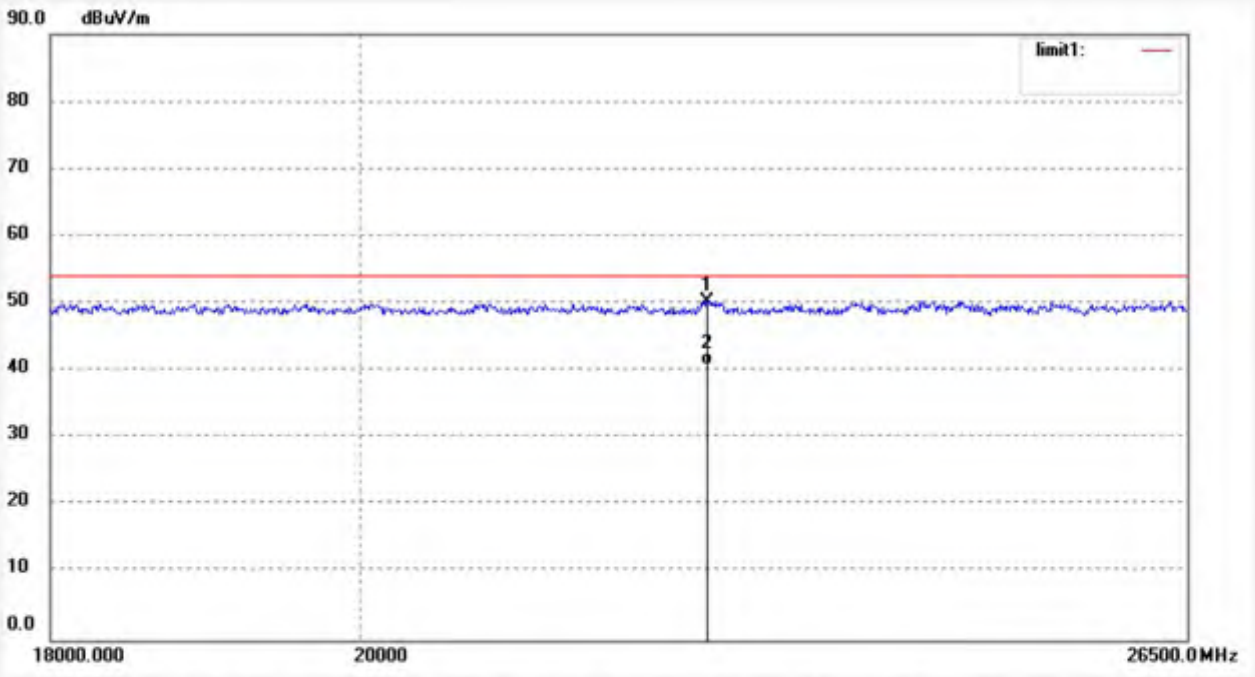
Job No.: LGW2018 #1319	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2422MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22509.254	10.54	39.83	50.37	74.00	-23.63	peak			
2	22509.254	0.95	39.83	40.78	54.00	-13.22	AVG			

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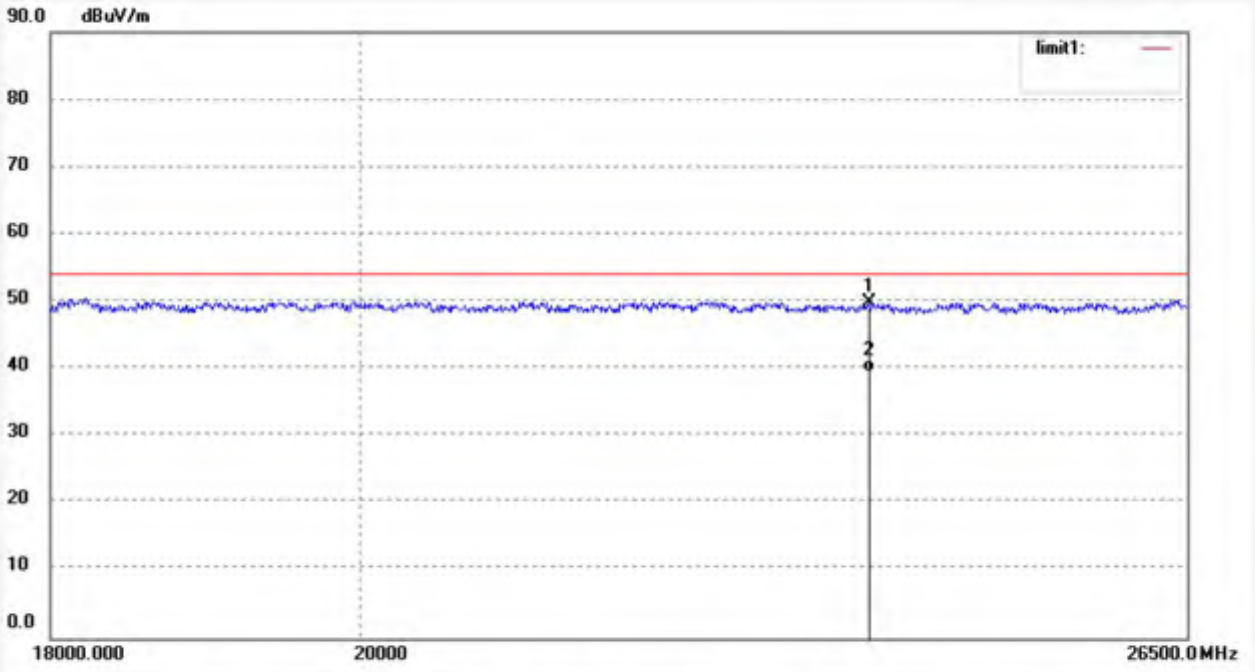
Job No.: LGW2018 #1318	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2422MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	23780.081	10.03	39.71	49.74	74.00	-24.26	peak			
2	23780.081	-0.26	39.71	39.45	54.00	-14.55	AVG			

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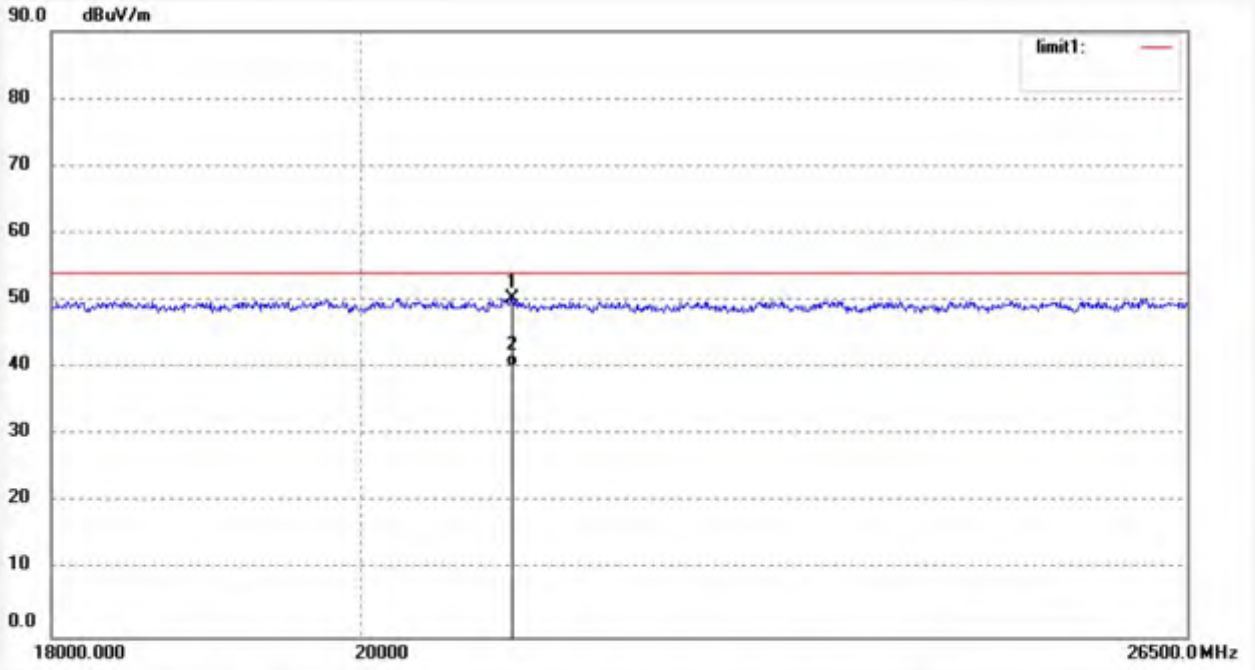
Job No.: LGW2018 #1320	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21060.549	11.83	38.42	50.25	74.00	-23.75	peak			
2	21060.549	1.79	38.42	40.21	54.00	-13.79	AVG			

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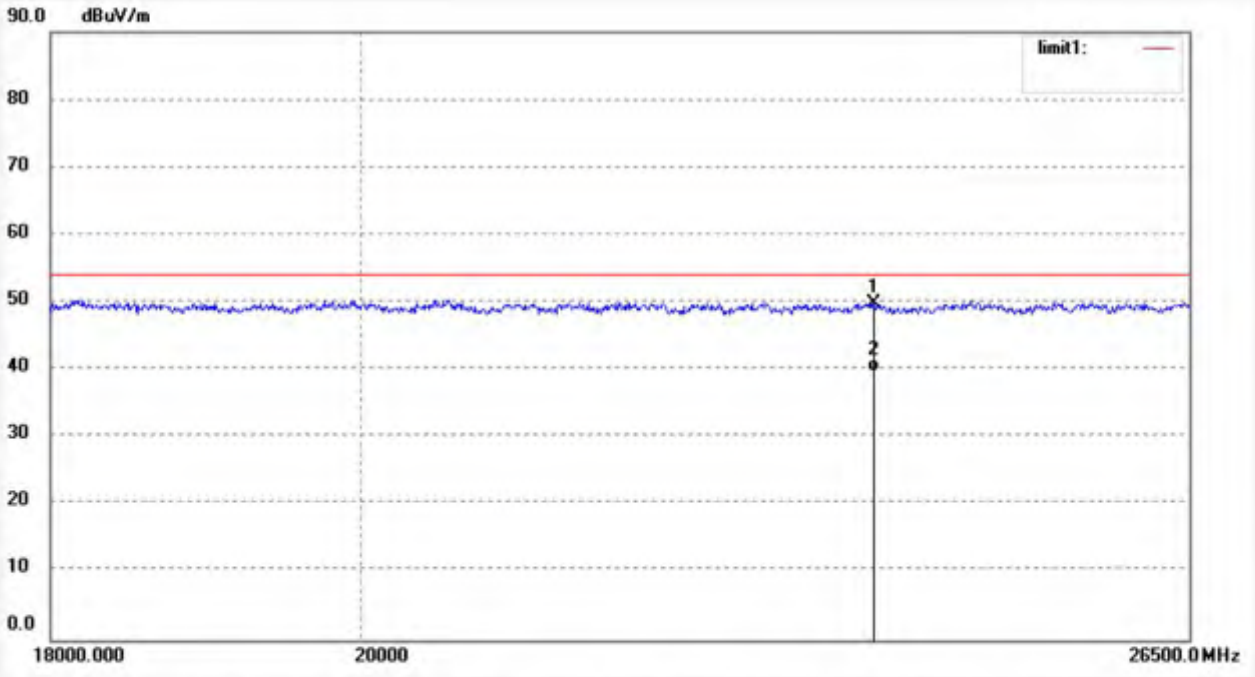
Job No.: LGW2018 #1321	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2437MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	23807.690	10.04	39.72	49.76	74.00	-24.24	peak			
2	23807.690	-0.08	39.72	39.64	54.00	-14.36	AVG			

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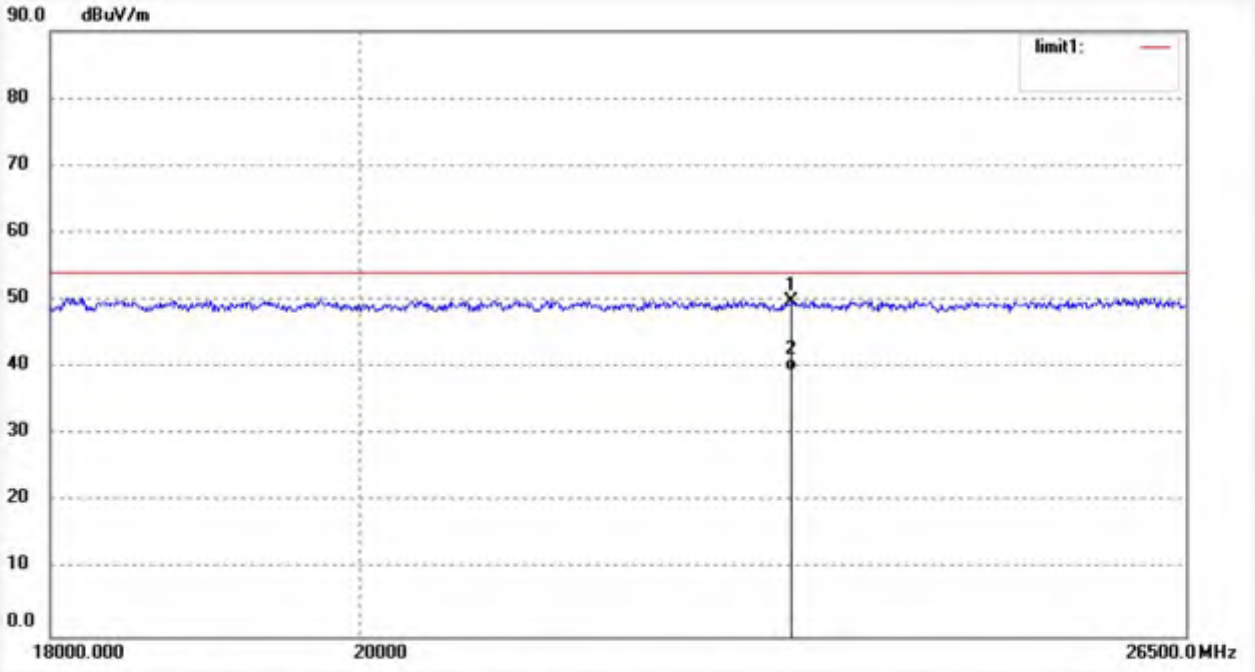
Job No.: LGW2018 #1323	Polarization: Horizontal
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2452MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	23171.765	10.10	39.73	49.83	74.00	-24.17	peak			
2	23171.765	-0.19	39.73	39.54	54.00	-14.46	AVG			

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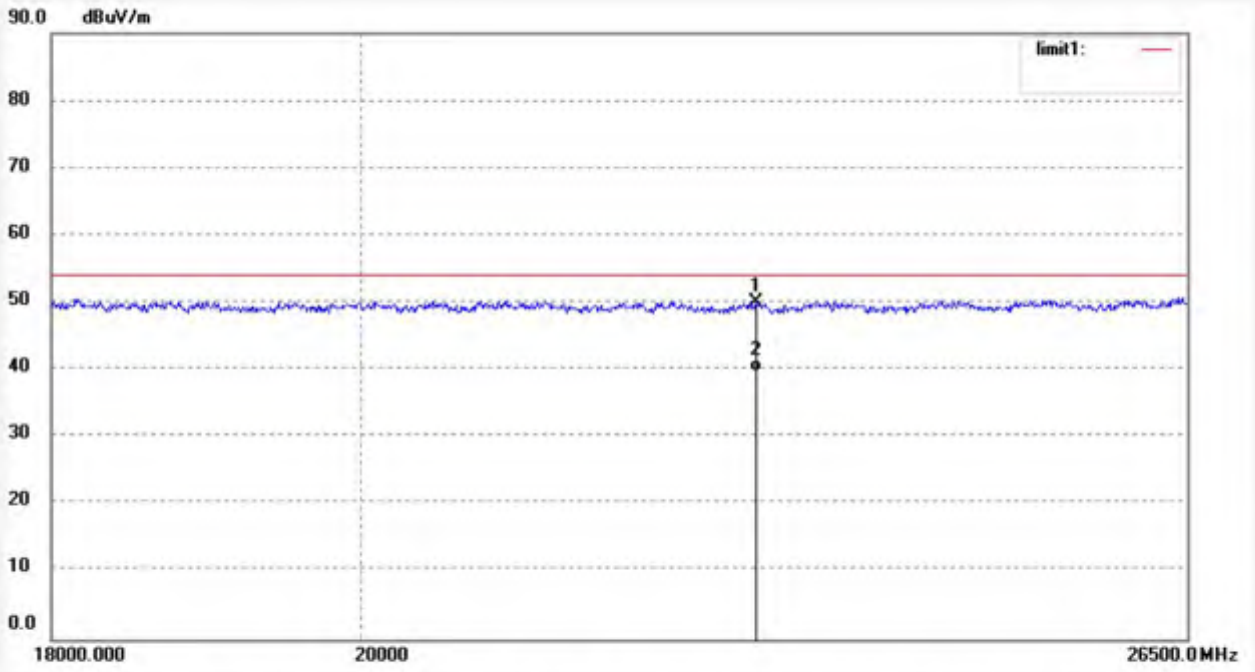
Job No.: LGW2018 #1322	Polarization: Vertical
Standard: FCC 15.247 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/01/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 2452MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

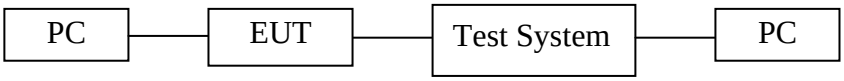
Note: 802.11n HT40



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22877.891	10.28	39.71	49.99	74.00	-24.01	peak			
2	22877.891	-0.03	39.71	39.68	54.00	-14.32	AVG			

12.99% OCCUPIED BANDWIDTH

12.1.Block Diagram of Test Setup



12.2.EUT Configuration on Measurement

The following equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

12.3.Operating Condition of EUT

12.3.1.Setup the EUT and simulator as shown as Section 12.1.

12.3.2.Turn on the power of all equipment.

12.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

12.4.Test Procedure

12.4.1.The transmitter output was connected to the spectrum analyzer through a low loss cable. The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

12.4.2.The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

12.4.3.A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

12.4.4.Set SPA “Meas” function, Select “Occupied Bandwidth” function, Select “99% Power Bandwidth”. The frequency of the upper and lower markers indicating the edges of the transmitters “99% Power” emission bandwidth shall be recorded to automate by SPA.

12.5.Measurement Result

The test was performed with 802.11b		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2412	13.242
Middle	2437	13.242
High	2462	13.242

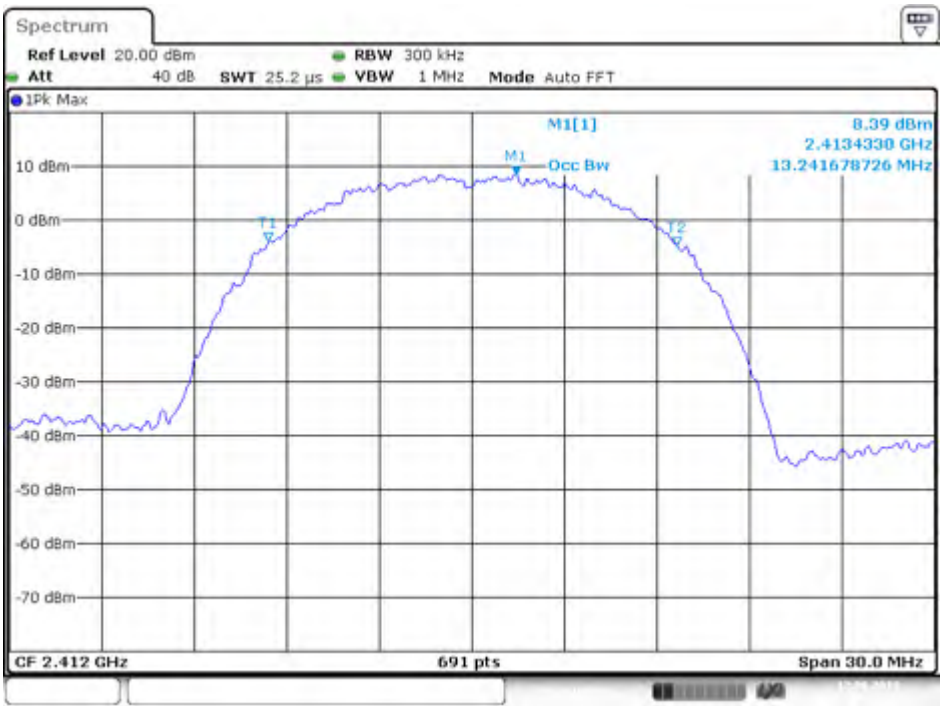
The test was performed with 802.11g		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2412	16.715
Middle	2437	16.628
High	2462	16.628

The test was performed with 802.11n (Bandwidth: 20 MHz)		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2412	17.670
Middle	2437	17.713
High	2462	17.713

The test was performed with 802.11n (Bandwidth: 40 MHz)		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2422	36.990
Middle	2437	36.903
High	2452	36.990

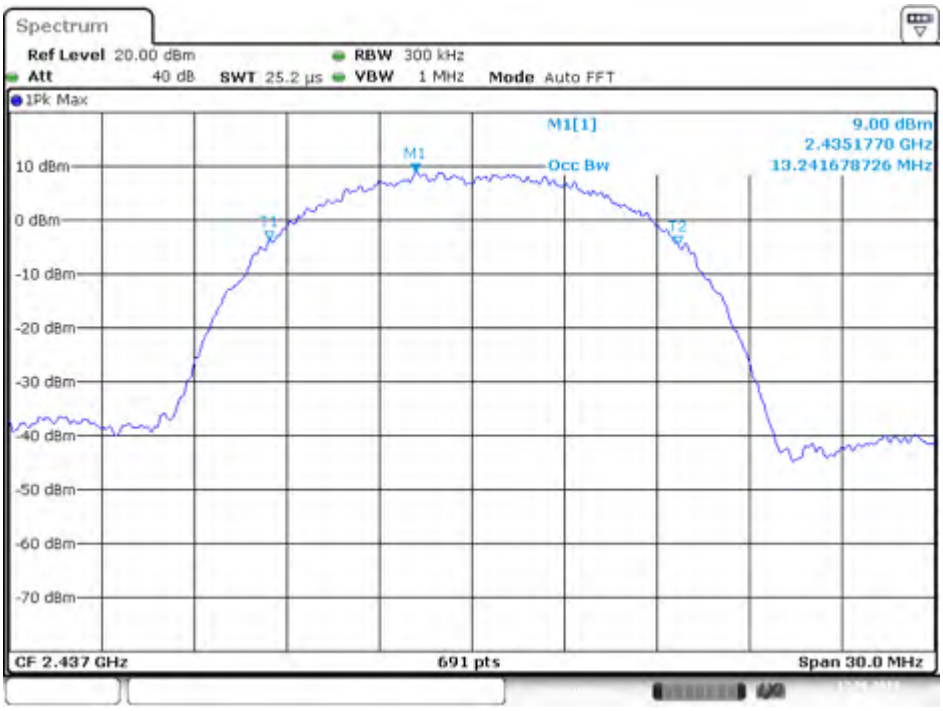
The spectrum analyzer plots are attached as below.

802.11b Low Channel 2412MHz



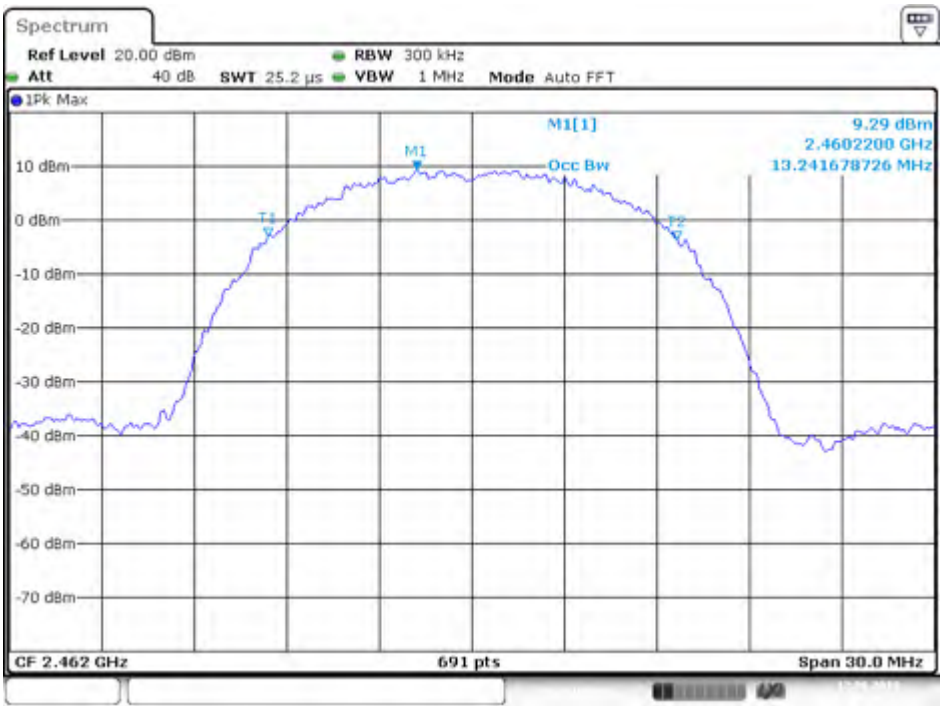
Date: 12.JUN.2018 10:20:43

802.11b Middle Channel 2437MHz



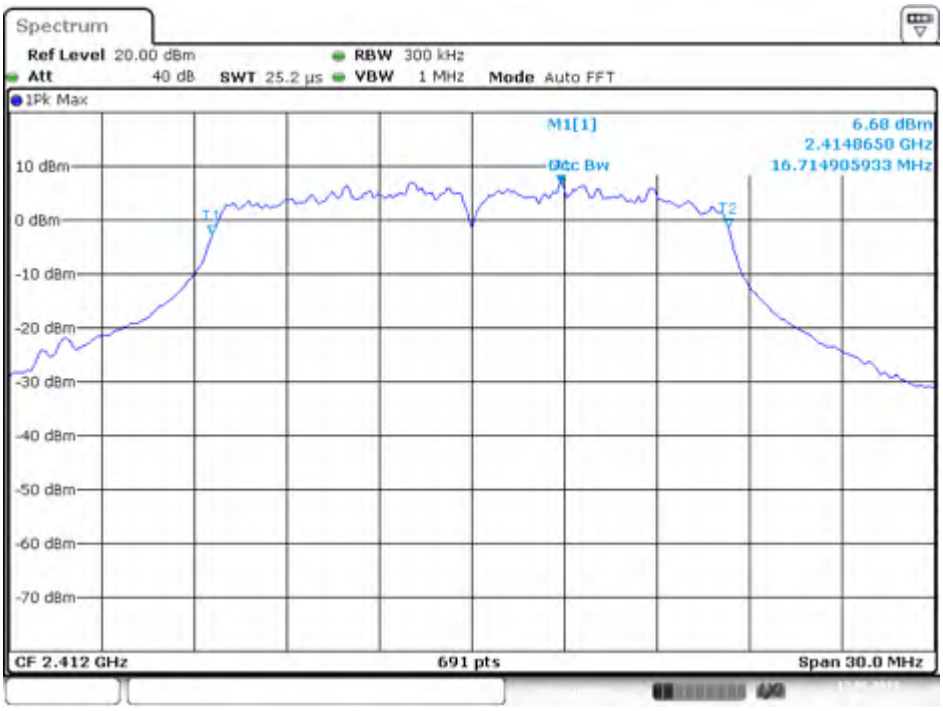
Date: 12.JUN.2018 10:20:10

802.11b High Channel 2462MHz



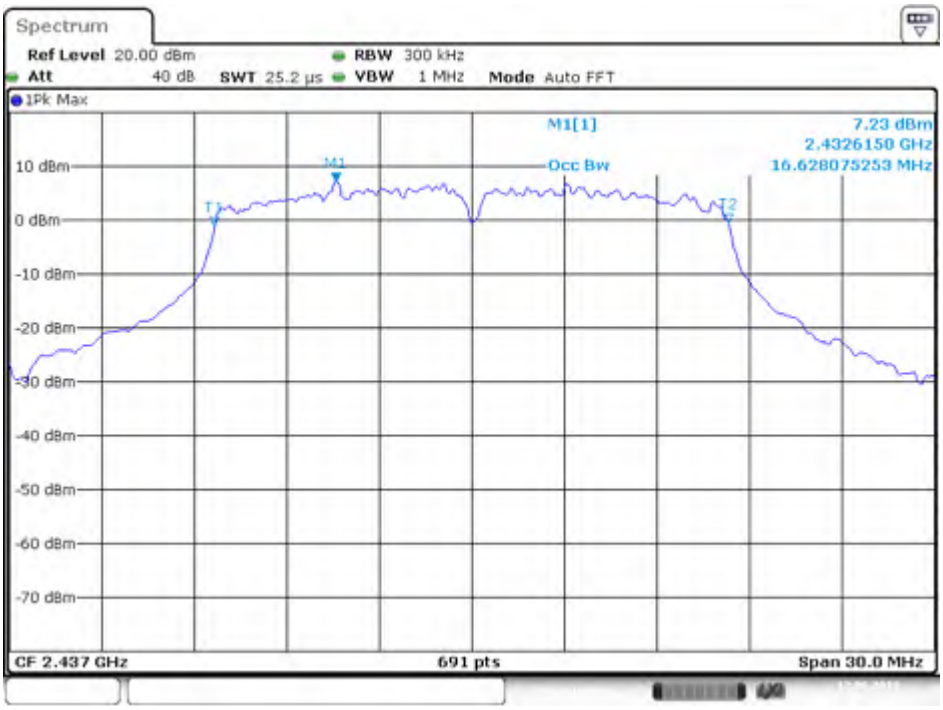
Date: 12.JUN.2018 10:19:20

802.11g Channel Low 2412MHz



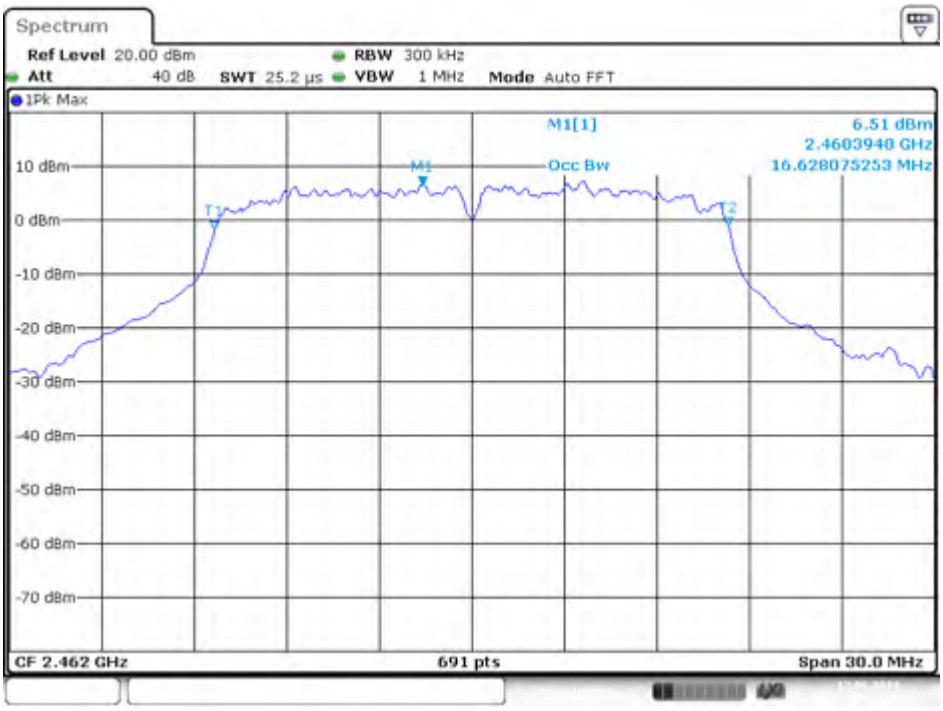
Date: 12.JUN.2018 10:41:39

802.11g Middle Channel 2437MHz



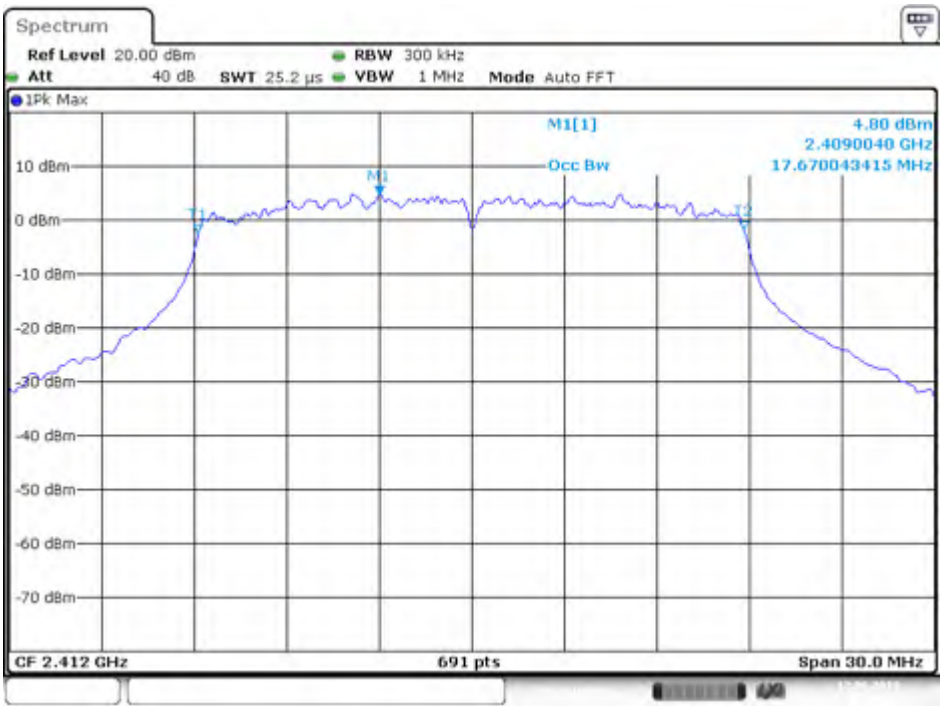
Date: 12.JUN.2018 10:40:58

802.11g High Channel 2462MHz



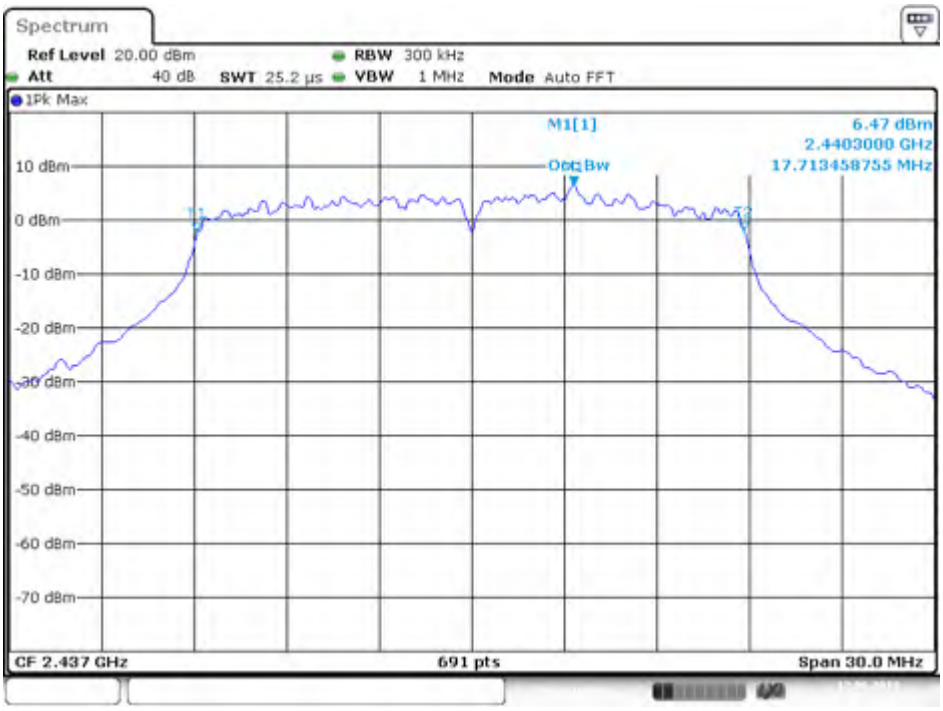
Date: 12.JUN.2018 10:40:08

802.11n(20MHz) Low Channel 2412MHz



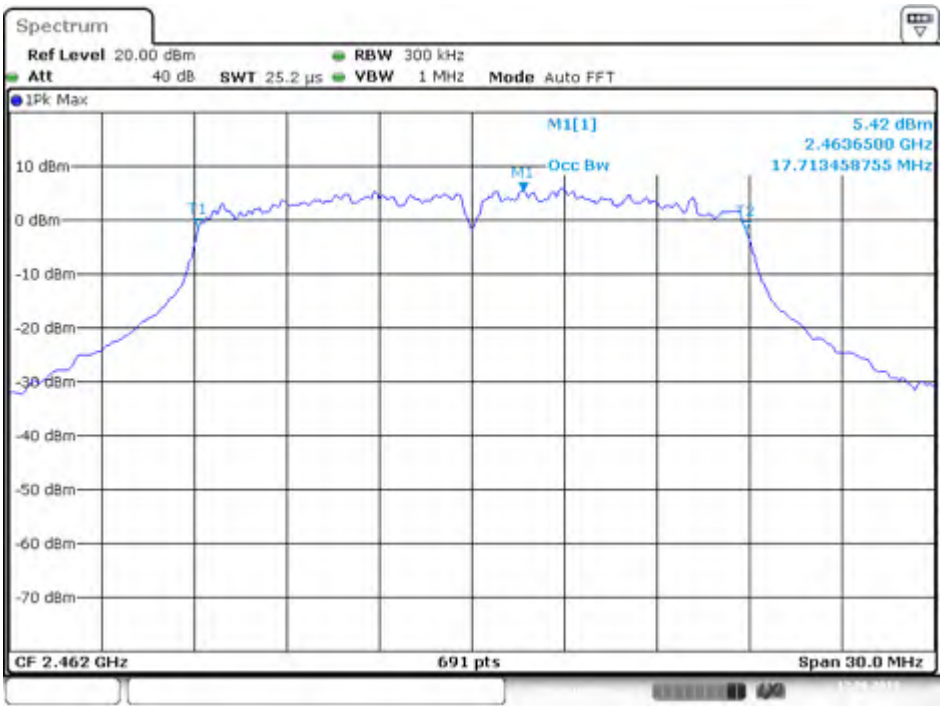
Date: 12.JUN.2018 11:00:52

802.11n(20MHz) Middle Channel 2437MHz



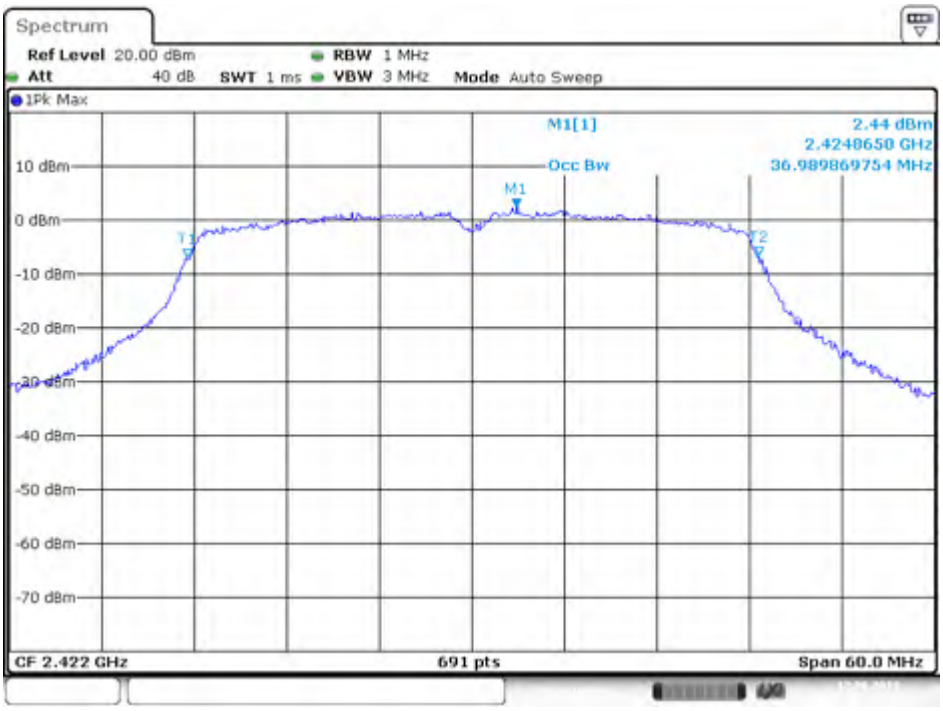
Date: 12.JUN.2018 11:00:17

802.11n(20MHz) High Channel 2462MHz



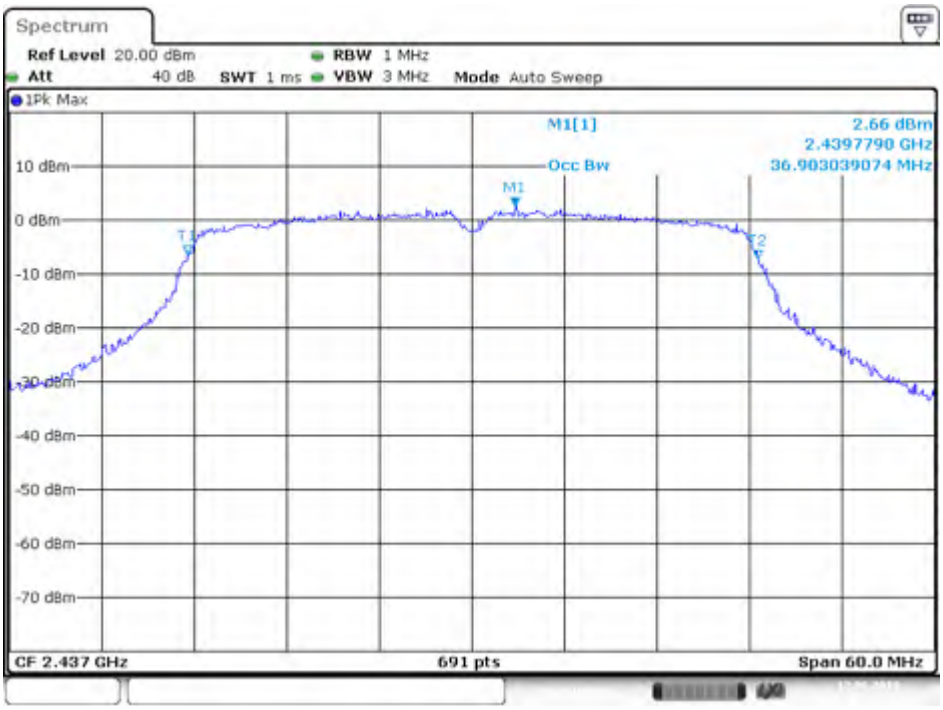
Date: 12.JUN.2018 10:59:41

802.11n(40MHz) Low Channel 2422MHz



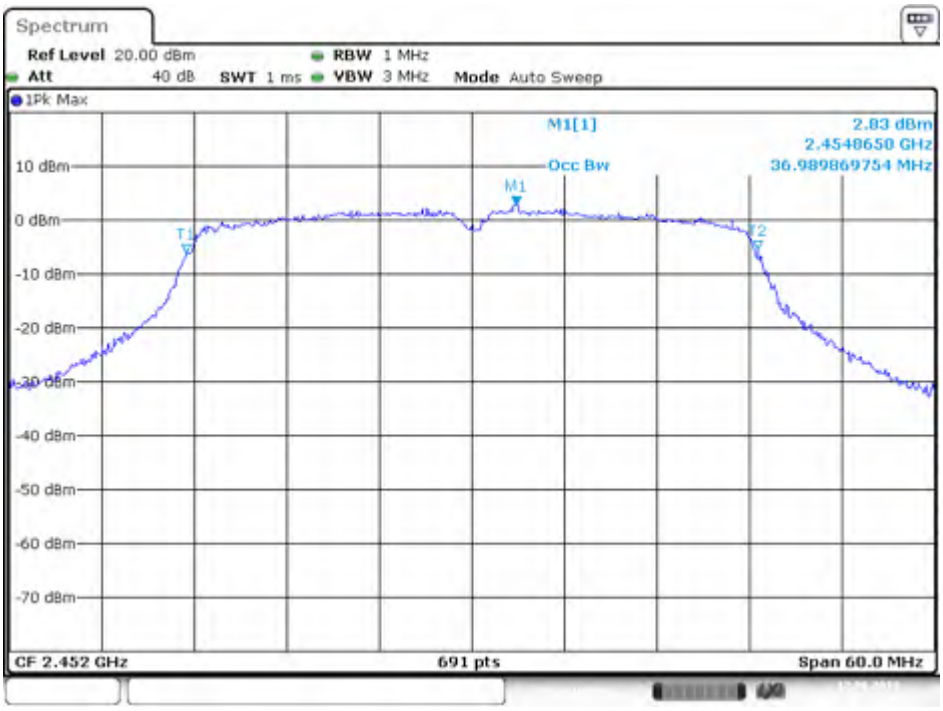
Date: 12.JUN.2018 11:27:50

802.11n(40MHz) Middle Channel 2437MHz



Date: 12.JUN.2018 11:27:18

802.11n(40MHz) High Channel 2452MHz



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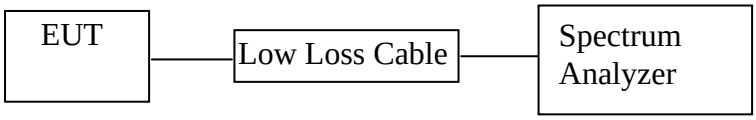
13. CONDUCTED SPURIOUS EMISSION COMPLIANCE TEST

13.1. Block Diagram of Test Setup



13.2. The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

13.3. EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

13.4. Operating Condition of EUT

13.4.1. Setup the EUT and simulator as shown as Section 13.1.

13.4.2. Turn on the power of all equipment.

13.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

13.5.Test Procedure

13.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

13.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz

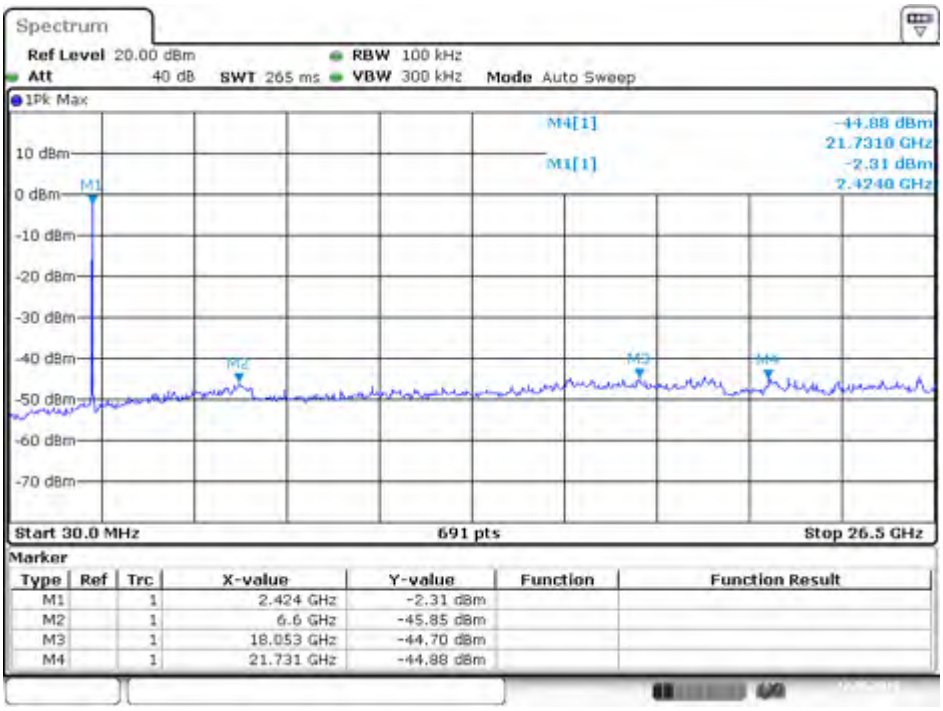
13.5.3.The Conducted Spurious Emission was measured and recorded.

13.6.Test Result

Pass.

The spectrum analyzer plots are attached as below.

802.11b Low Channel 2412MHz



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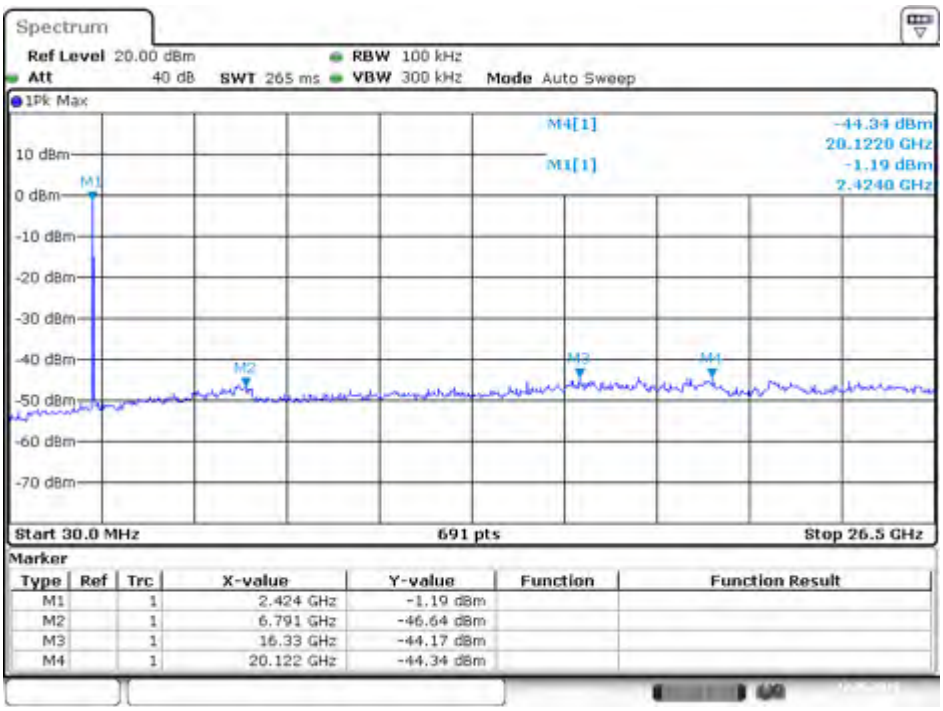
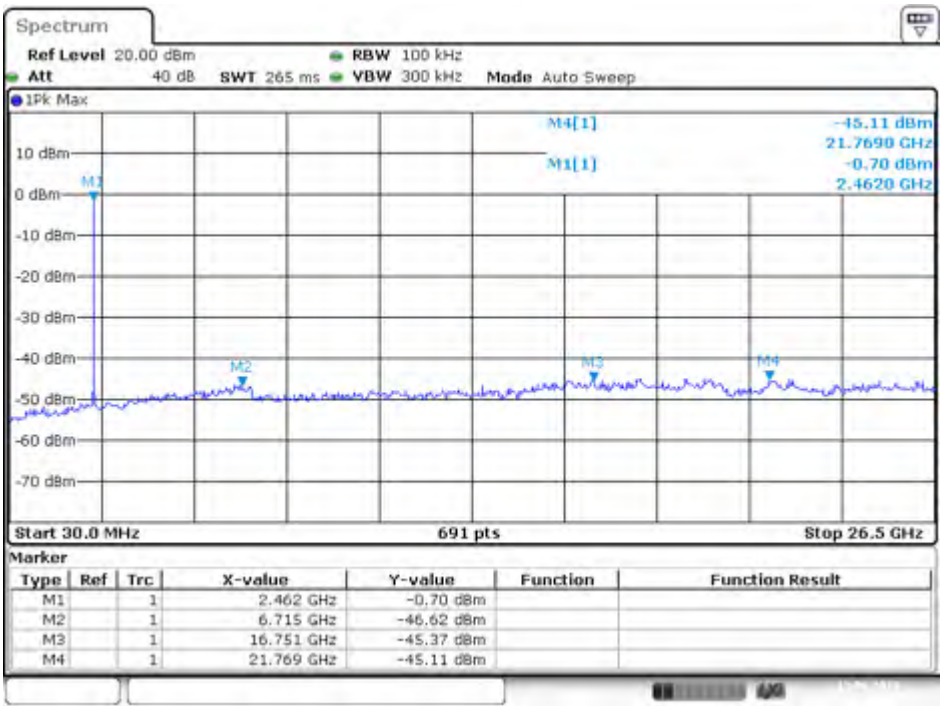
802.11b Middle Channel 2437MHz



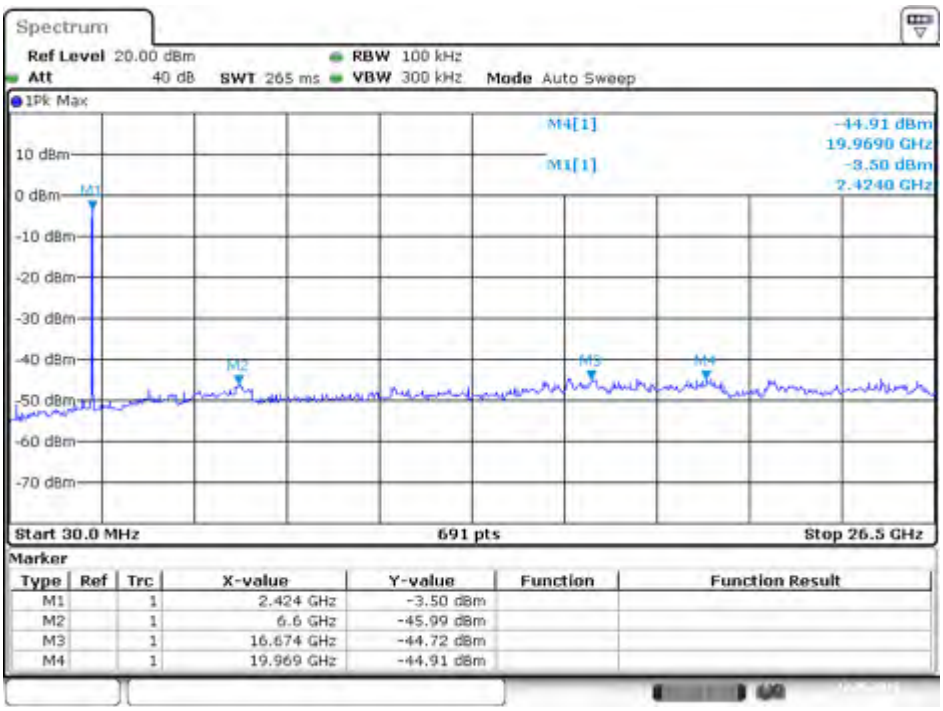
Date: 12.JUN.2018 10:27:28

802.11b High Channel 2462MHz



Date: 12.JUN.2018 10:26:28

802.11g Low Channel 2412MHz



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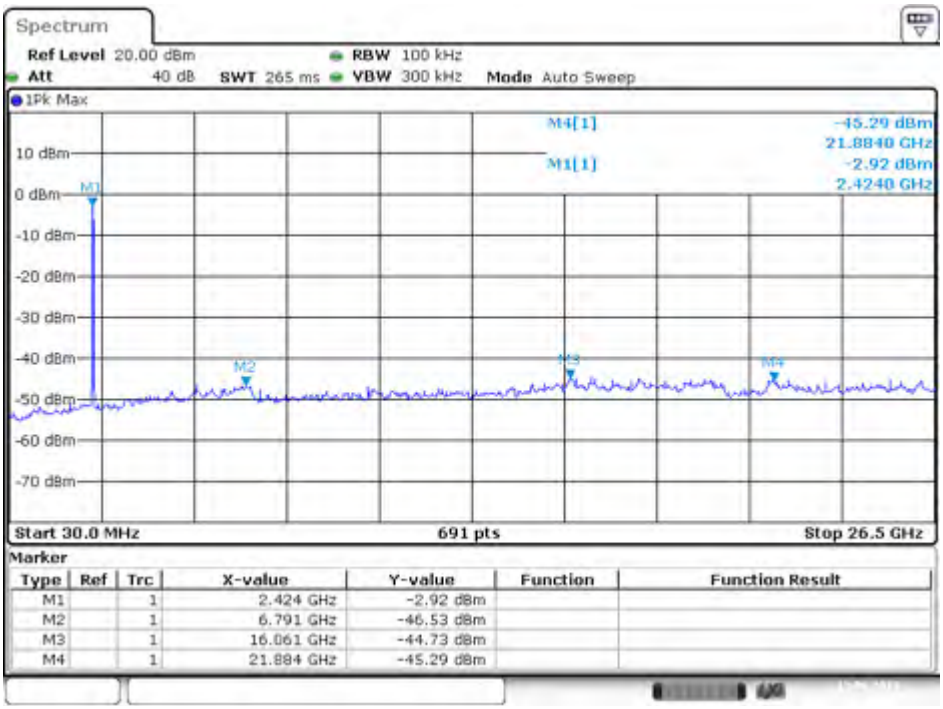
802.11g Middle Channel 2437MHz



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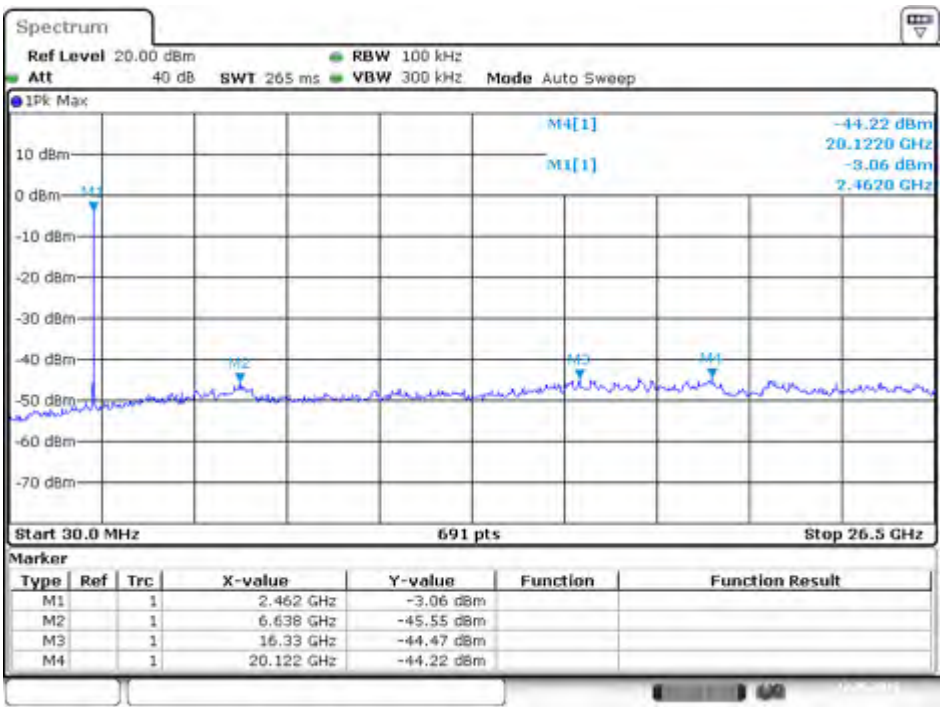
802.11g High Channel 2462MHz



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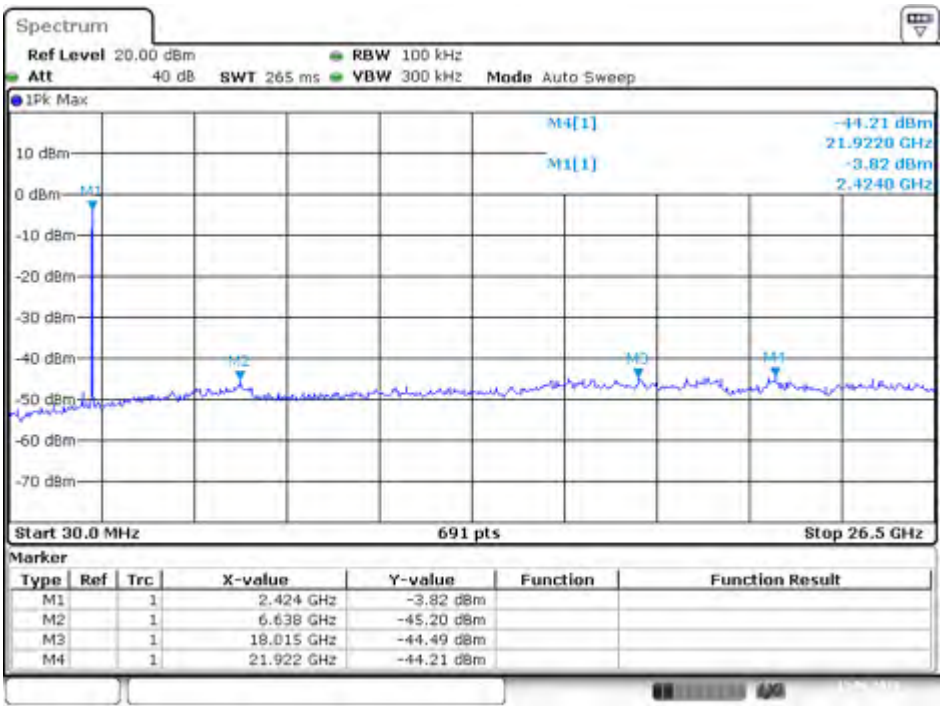
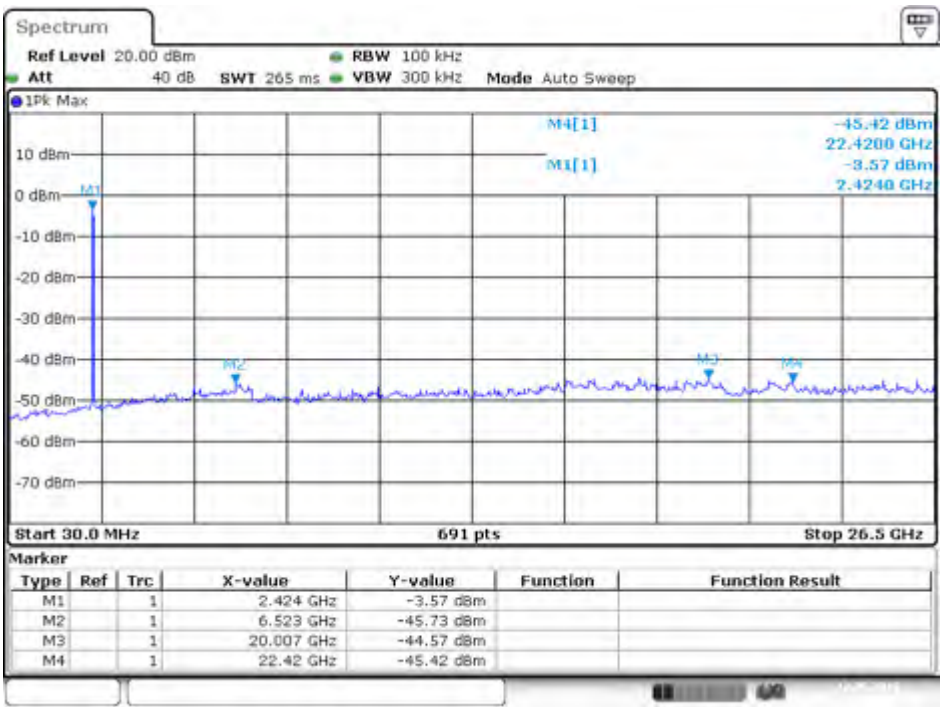
802.11n(20MHz) Low Channel 2412MHz



Date: 12.JUN.2018 11:08:21

802.11n(20MHz) Middle Channel 2437MHz



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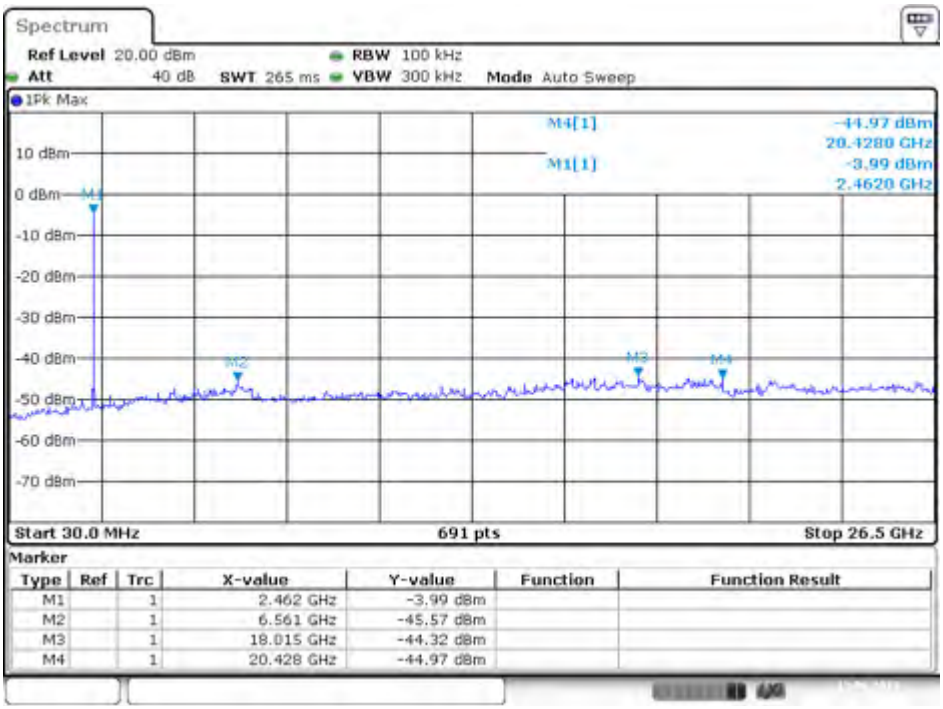
802.11n(20MHz) High Channel 2462MHz



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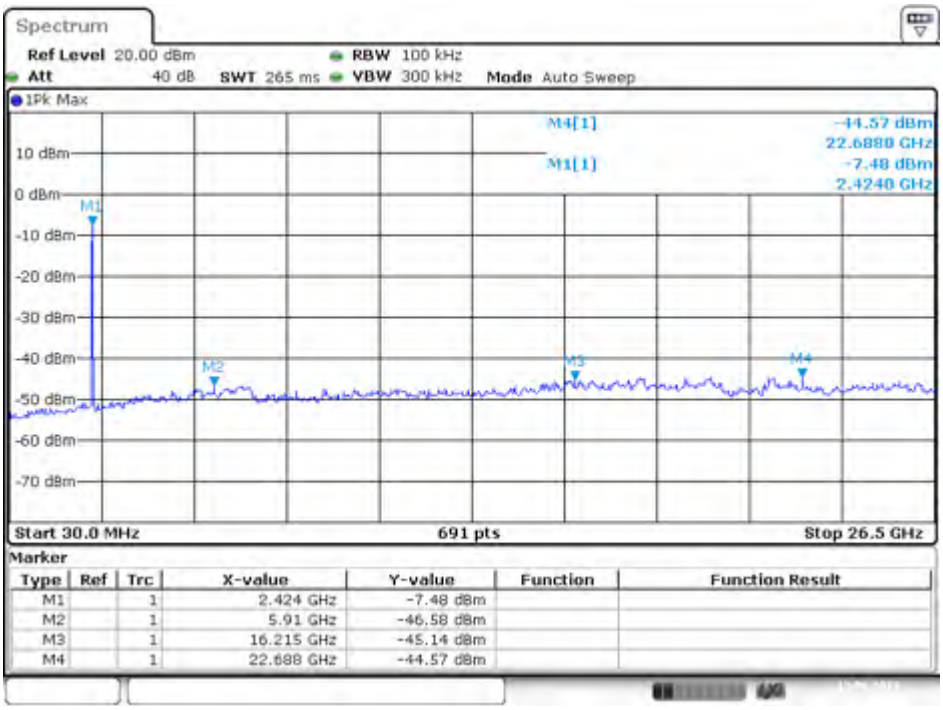
802.11n(40MHz) Low Channel 2422MHz



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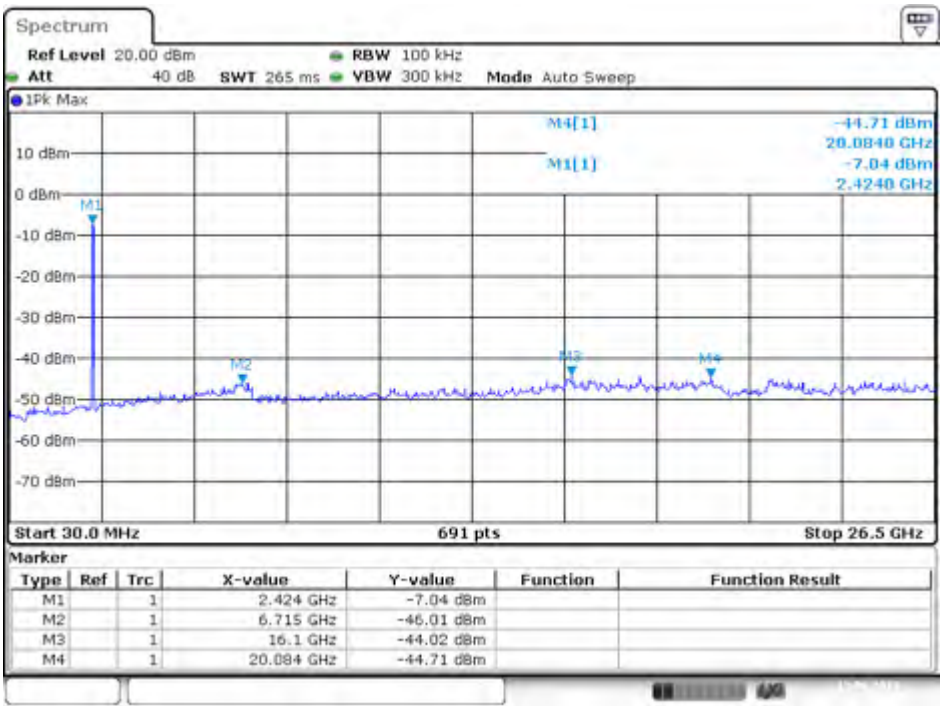
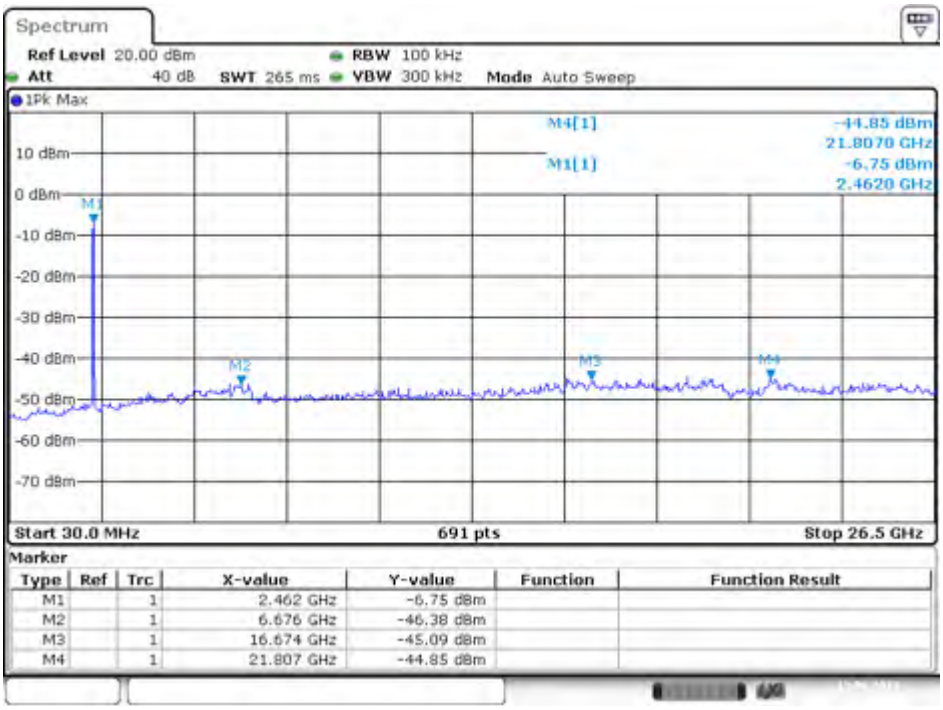
802.11n(40MHz) Middle Channel 2437MHz



Date: 12.JUN.2018 11:33:47

802.11n(40MHz) High Channel 2452MHz



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14. ANTENNA REQUIREMENT

14.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

14.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 2.5dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.