APPLICATION CERTIFICATION
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 Number	:	ATE20181351
Date of Test	:	June 05, 2018-June 14, 2018
Date of Report	:	June 23, 2018

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Description Page

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 15.249
ANSI C63.10: 2013

The EUT was tested according to FCC 47CFR 15.249 for compliance to FCC 47CFR 15.249 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 15.249 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 : June 05, 2018-June 14, 2018
Date of Report : June 23, 2018

Prepared by : _____
(Tim[illegible]g 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
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
Modulation:	:	FSK/GFSK
Operation Frequency	:	908.4MHz-916MHz
Type of Antenna	:	IFA antenna
Max antenna gain	:	1dBi
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	:	June 05, 2018
Date of Test	:	June 05, 2018-June 14, 2018

1.2.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

1.3.Test Facilities

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

1.4.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: **Transmitting mode**

Low	Channel:	908.4MHz
Middle	Channel:	908.42MHz
High	Channel:	916.0MHz

3.2.Configuration and peripherals

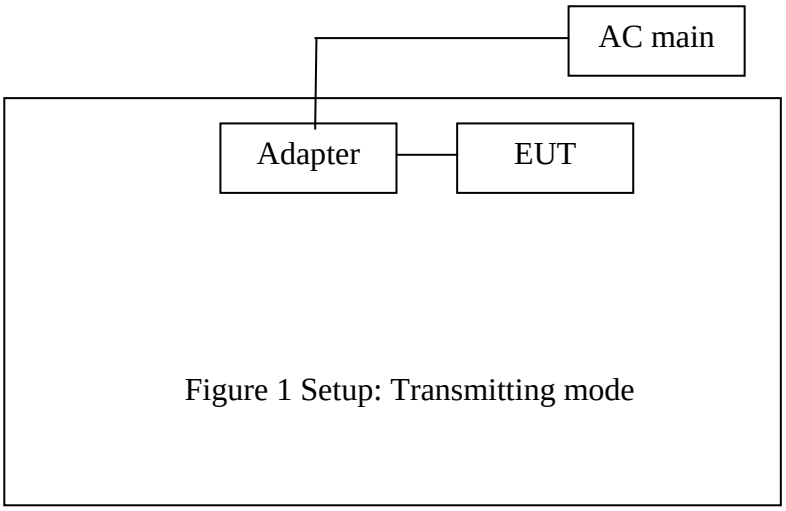


Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

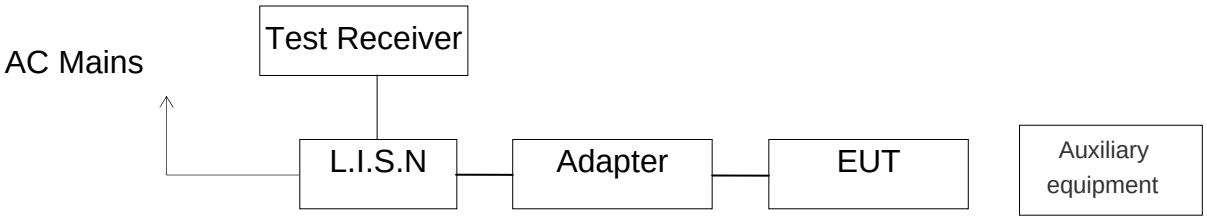
FCC Rules	Description of Test	Result
Section 15.215(c)	20dB Bandwidth	Compliant
Section 15.249(d)	Band Edge Compliance Test	Compliant
Section 15.205(a), Section 15.209(a), Section 15.249, Section 15.35	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
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 .

According to the Clause 5.6.1, table 4 of ANSI 63.10-2013, the frequency range of EUT operated is within 1MHz to 10MHz, so only the low channel and high channel were tested.

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 C63.4: 2014 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.Power Line Conducted Emission Measurement Results

PASS.

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

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

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

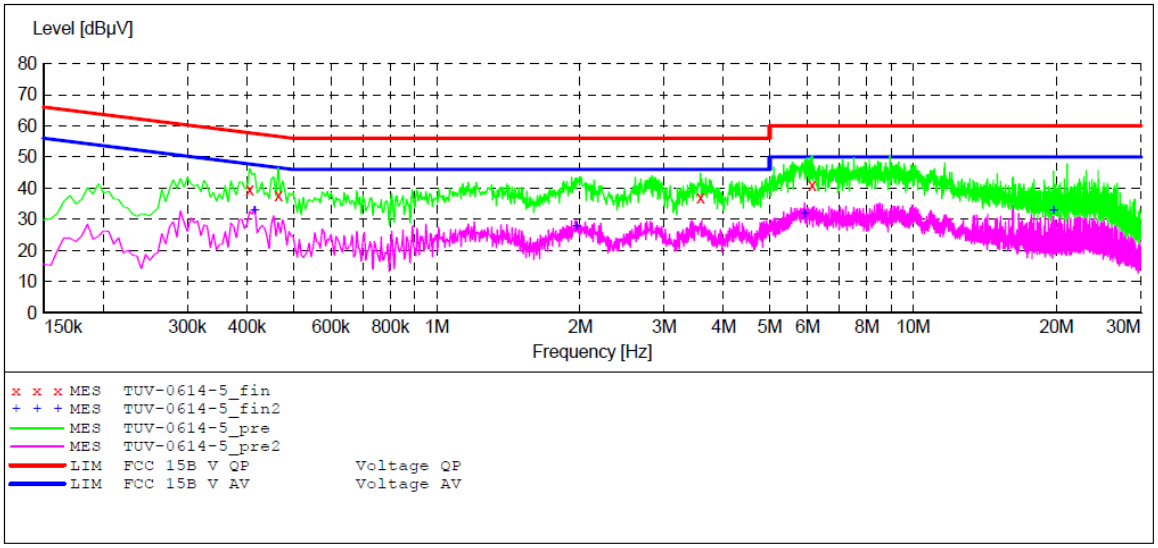
CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer: Leedarson
Operating Condition: On with Z-Wave
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-0614-5_fin"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.405000	39.40	10.7	58	18.4	QP	L1	GND
0.465000	37.80	10.7	57	18.8	QP	L1	GND
3.580000	37.10	11.1	56	18.9	QP	L1	GND
6.140000	40.90	11.2	60	19.1	QP	L1	GND

MEASUREMENT RESULT: "TUV-0614-5_fin2"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.415000	33.10	10.7	48	14.4	AV	L1	GND
1.965000	27.90	11.0	46	18.1	AV	L1	GND
5.920000	32.00	11.2	50	18.0	AV	L1	GND
19.705000	33.10	11.4	50	16.9	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:  On with Z-Wave
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      Stop       Step      Detector  Meas.     IF      Transducer
  Frequency  Frequency  Width               Time      Bandw.
  9.0 kHz    150.0 kHz  100.0 Hz  QuasiPeak 1.0 s     200 Hz  NSLK8126 2008
                                  Average
  150.0 kHz  30.0 MHz   5.0 kHz   QuasiPeak 1.0 s     9 kHz   NSLK8126 2008
                                  Average
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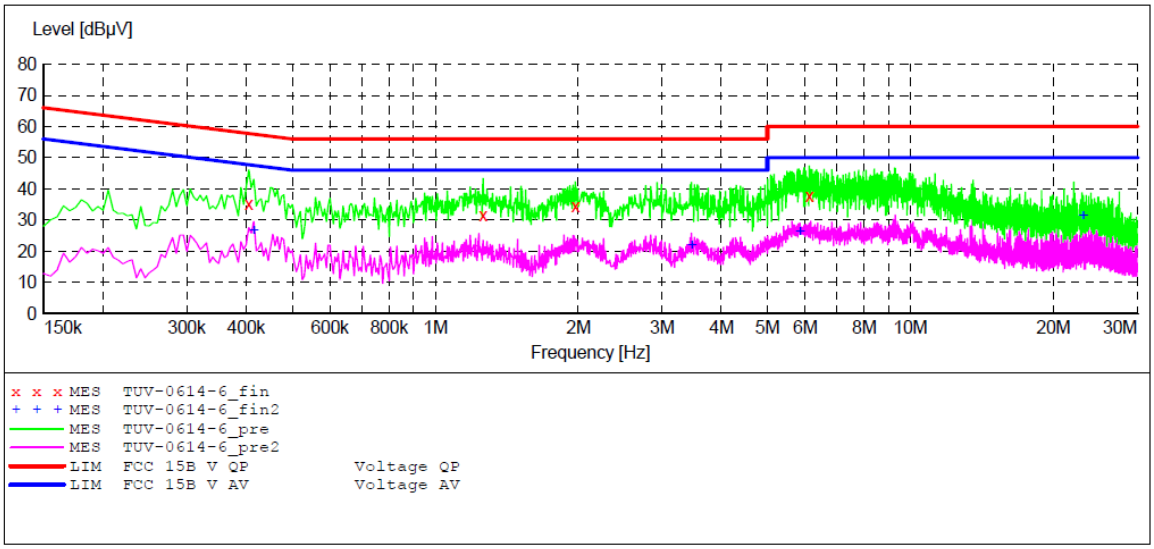


MEASUREMENT RESULT: "TUV-0614-6_fin"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.405000	35.00	10.7	58	22.8	QP	N	GND
1.260000	31.40	10.9	56	24.6	QP	N	GND
1.970000	34.50	11.0	56	21.5	QP	N	GND
6.120000	37.60	11.2	60	22.4	QP	N	GND

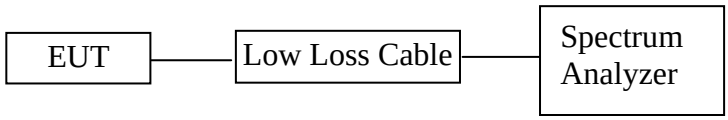
MEASUREMENT RESULT: "TUV-0614-6_fin2"

6/14/2018

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.415000	26.80	10.7	48	20.7	AV	N	GND
3.460000	22.20	11.1	46	23.8	AV	N	GND
5.850000	26.30	11.2	50	23.7	AV	N	GND
23.125000	31.40	11.4	50	18.6	AV	N	GND

6. 20DB BANDWIDTH MEASUREMENT

6.1.Block Diagram of Test Setup



6.2.The Requirement For Section 15.215(c)

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

6.3.Operating Condition of EUT

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

6.3.2.Turn on the power of all equipment.

6.3.3.Let the EUT work in TX mode then measure it.

6.4.Test Procedure

6.4.1.Place the EUT on the table and set it in transmitting mode.

6.4.2.Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.4.3.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz, Detector function=peak, Trace=max hold, Sweep=auto.

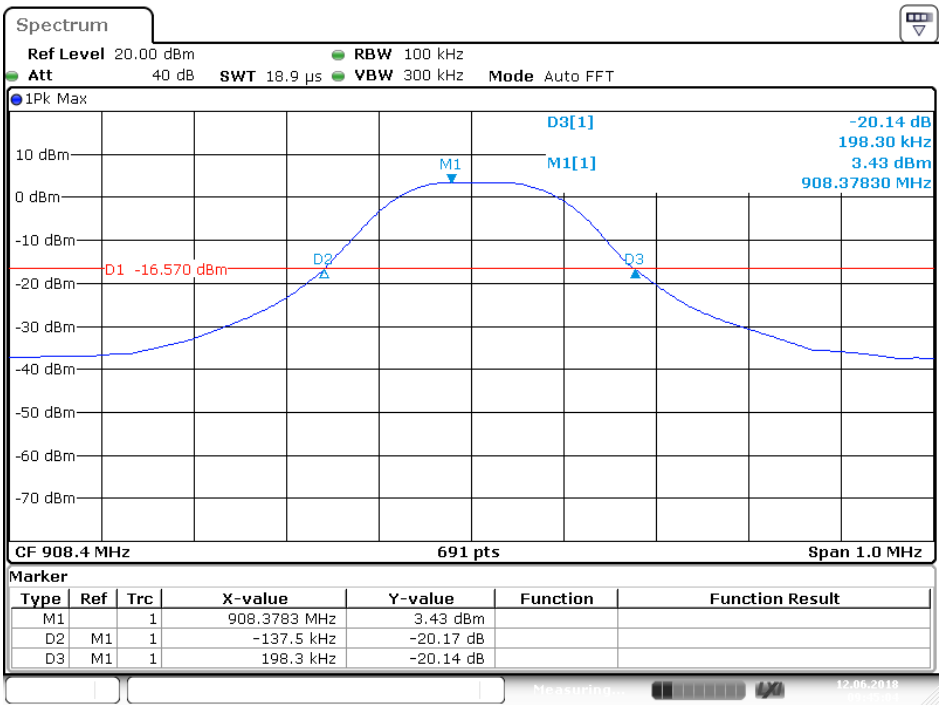
6.4.4.Set the measured low and high frequency and test 20dB bandwidth with spectrum analyzer.

6.5.Test Result

Channel	Frequency(MHz)	20 dB Bandwidth(MHz)
Low	908.4	0.3358
High	916.0	0.3574

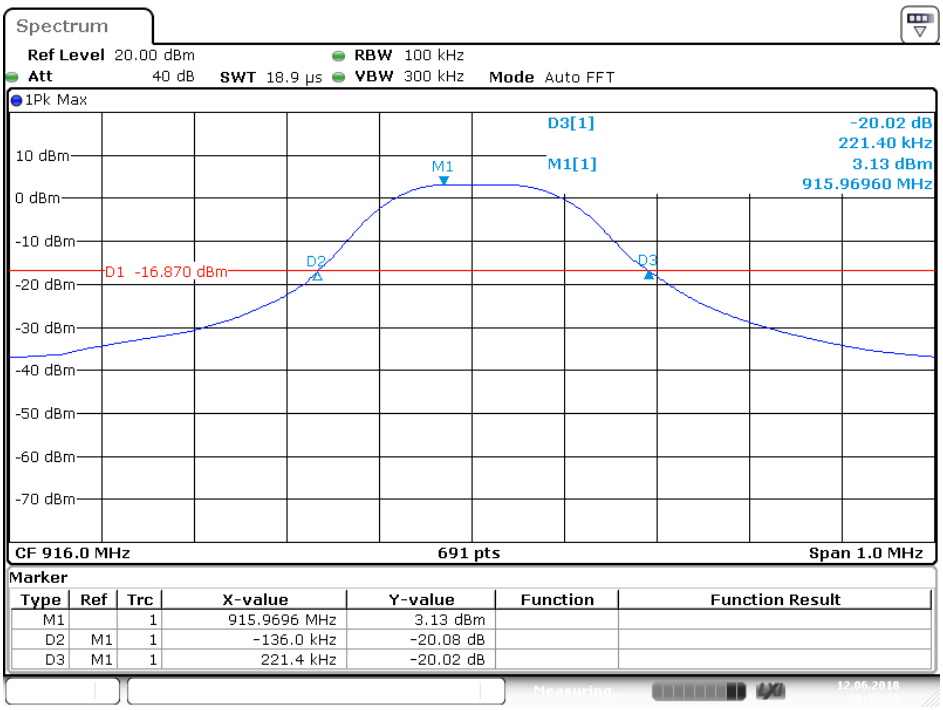
The spectrum analyzer plots are attached as below.

Low channel:



Date: 12.JUN.2018 09:45:04

High channel:



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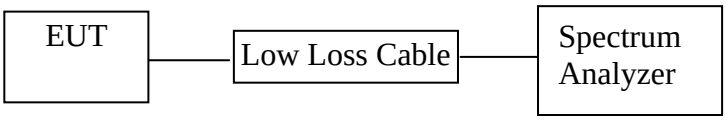
7. BAND EDGE COMPLIANCE TEST

7.1. Block Diagram of Test Setup (Conducted Band Edge)



7.2. The Requirement For Section 15.249

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 A8.4(4), the attenuation required 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).

7.3. 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.

7.4. Operating Condition of EUT

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

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX mode then measure it.

7.5. Test Procedure

Conducted Band Edge:

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

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

Radiated Band Edge:
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 0.8 meter high above ground(Below 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.

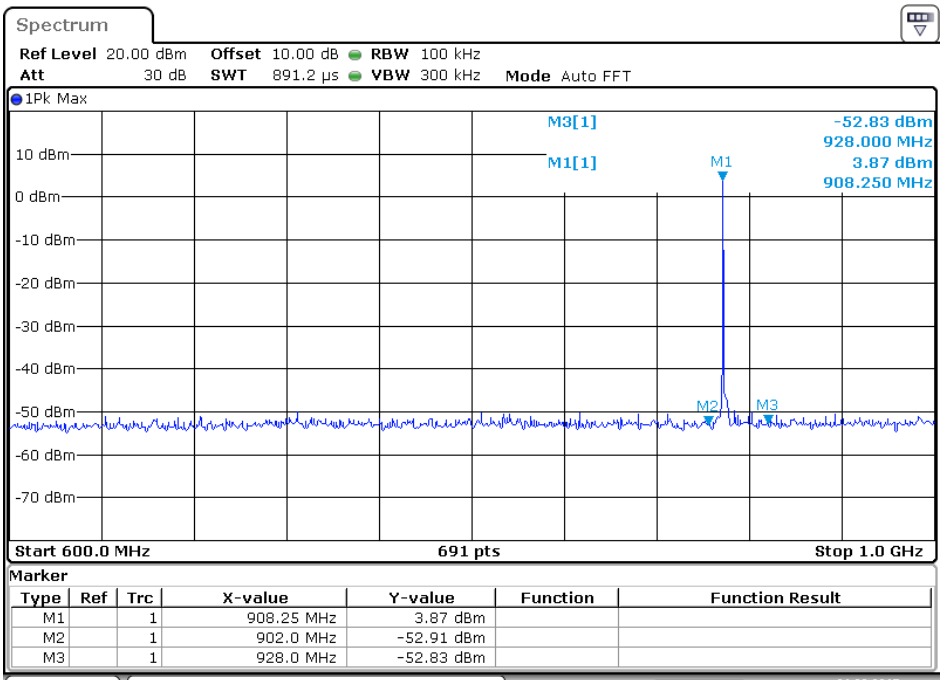
Let the EUT work in TX modes then measure it.

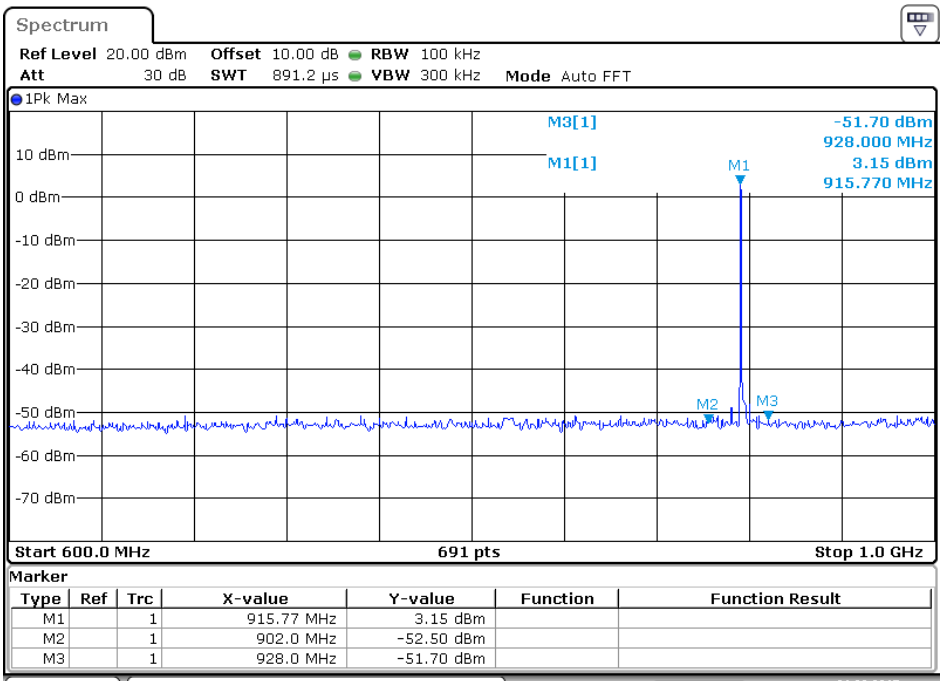
During the radiated emission test, the spectrum analyzer was set with the following configurations:
1.The resolution bandwidth of test receiver/spectrum analyzer is 100KHz and video bandwidth is 300KHz for peak measurement with peak detector at frequency Below 1GHz.
2.The resolution bandwidth of test receiver/spectrum analyzer is 100KHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency Below 1GHz.
3.All modes of operation were investigated and the worst-case emissions are reported.

7.6.Test Result

Pass

Conducted Band Edge Result





Radiated Band Edge Result

ACCURATE TECHNOLOGY CO., LTD.
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Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
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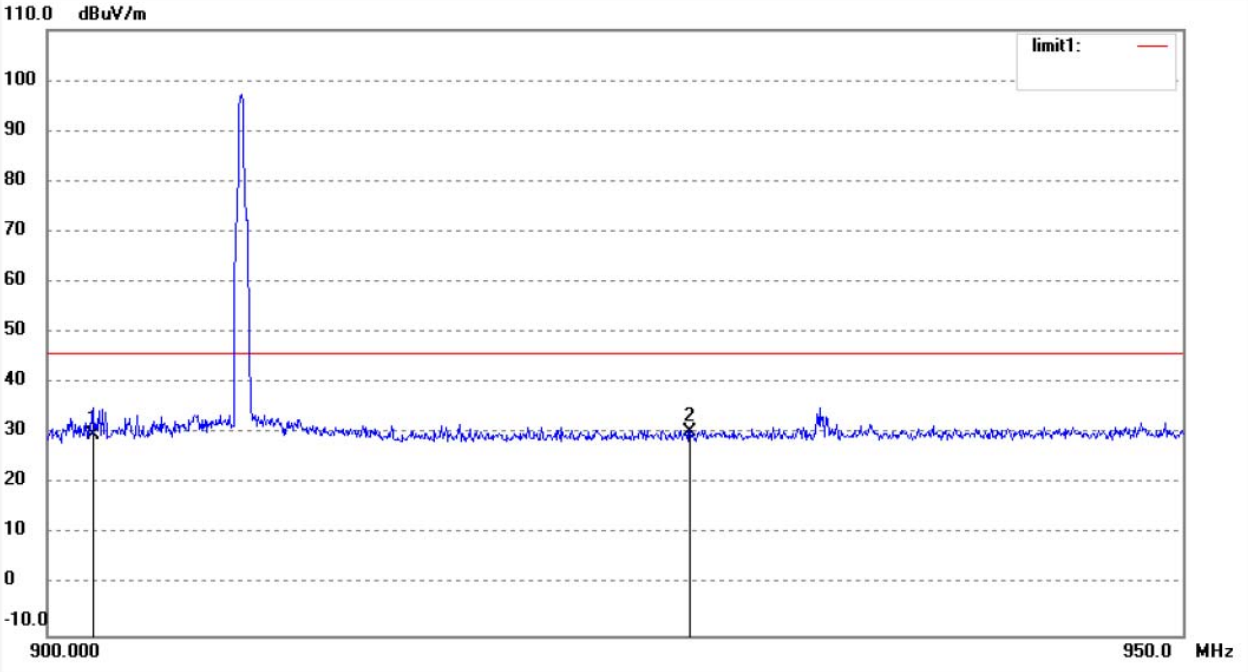
Fax:+86-0755-26503396

Job No.: LGW2018 #1373	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 908.4MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	902.0000	27.62	2.18	29.80	46.00	-16.20	QP			
2	928.0000	27.55	2.73	30.28	46.00	-15.72	QP			

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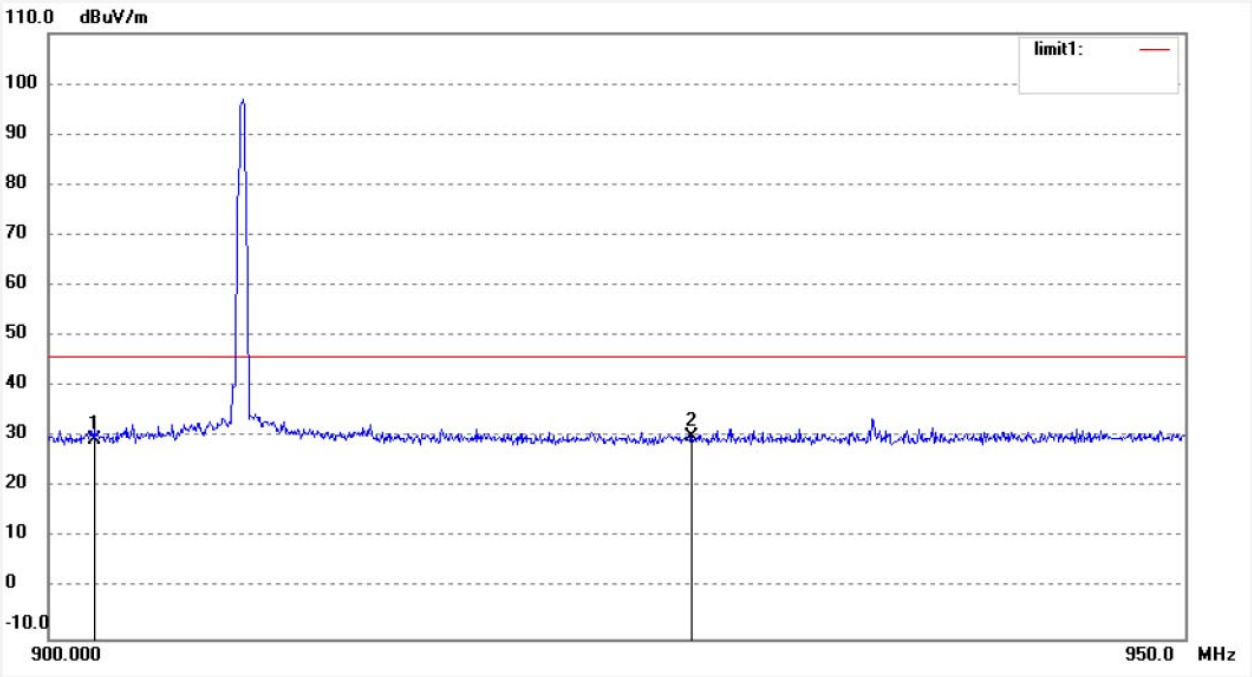
Job No.: LGW2018 #1372	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 908.4MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	902.0000	27.30	2.18	29.48	46.00	-16.52	QP			
2	928.0000	27.28	2.73	30.01	46.00	-15.99	QP			

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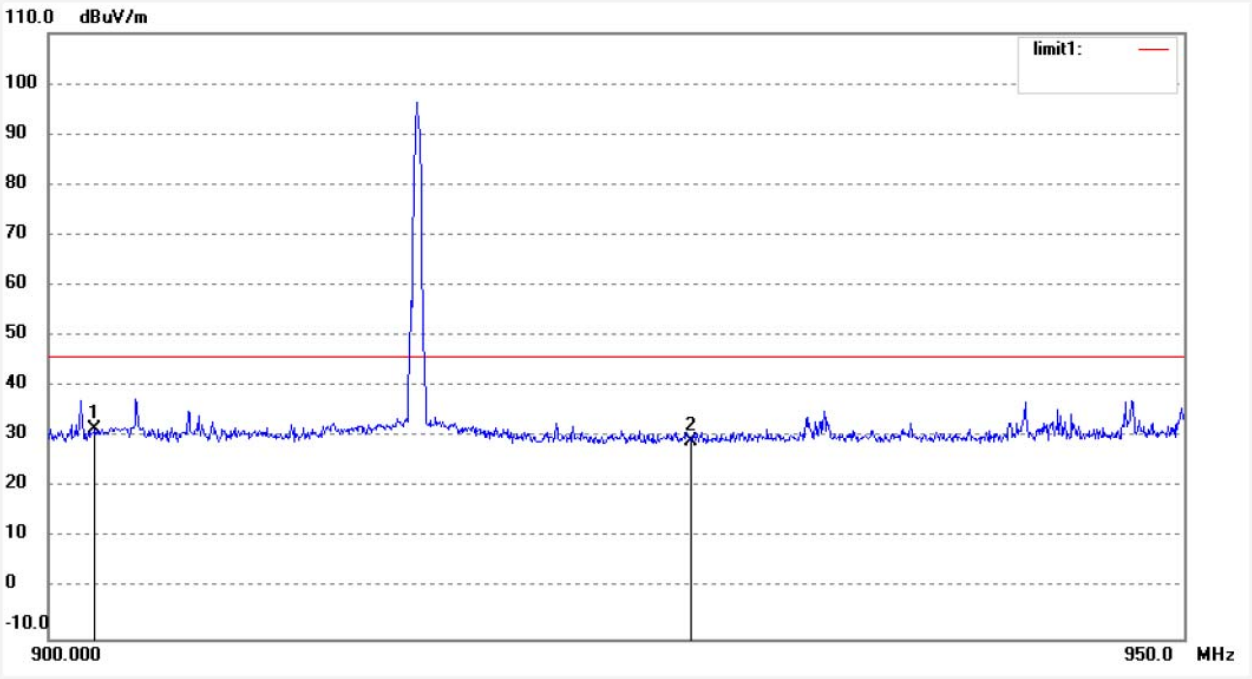
Job No.: LGW2018 #1381	Polarization: Horizontal
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 916MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	902.0000	29.27	2.18	31.45	46.00	-14.55	QP			
2	928.0000	26.42	2.73	29.15	46.00	-16.85	QP			

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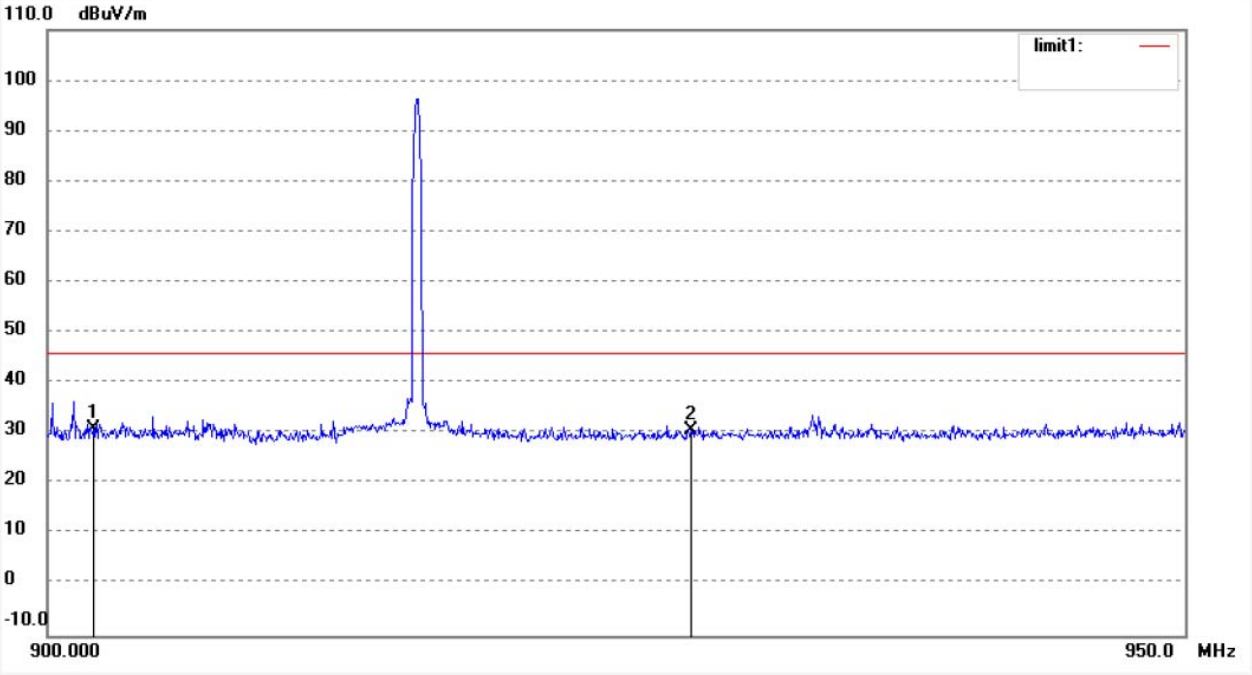
Fax:+86-0755-26503396

Job No.: LGW2018 #1380	Polarization: Vertical
Standard: FCC (Band Edge)	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 916MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	902.0000	28.87	2.18	31.05	46.00	-14.95	QP			
2	928.0000	27.86	2.73	30.59	46.00	-15.41	QP			

8. RADIATED SPURIOUS EMISSION TEST

8.1.Block Diagram of Test Setup

8.1.1.Block diagram of connection between the EUT and peripherals

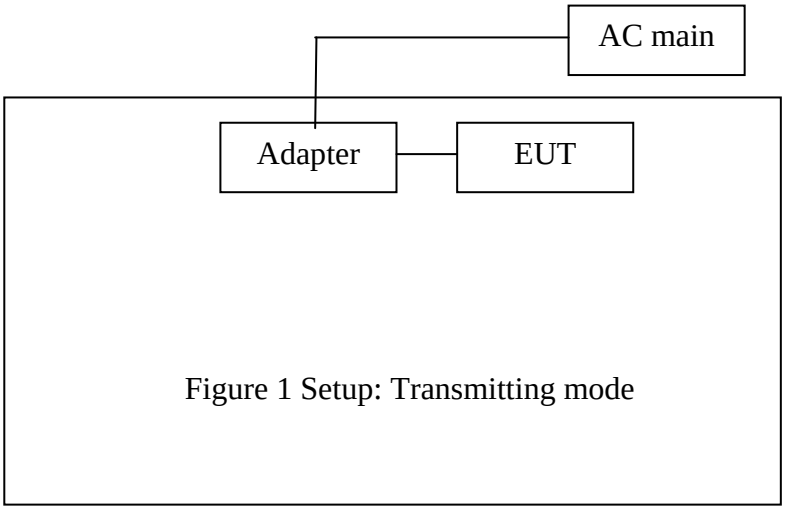
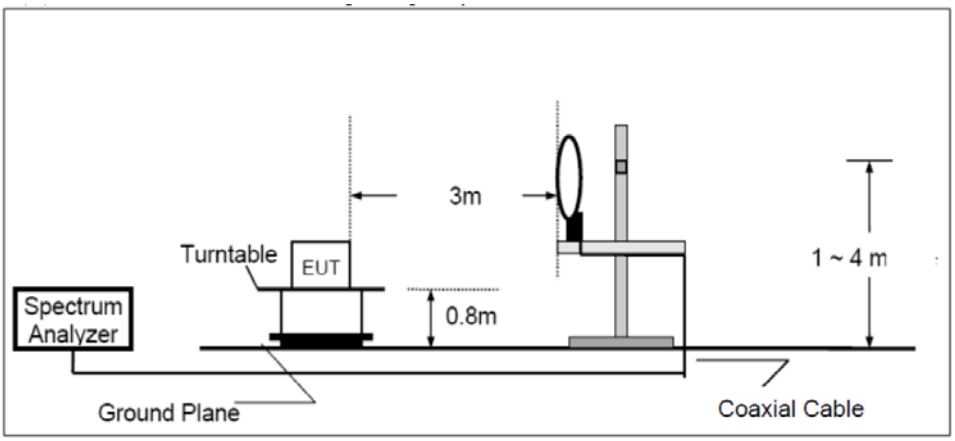


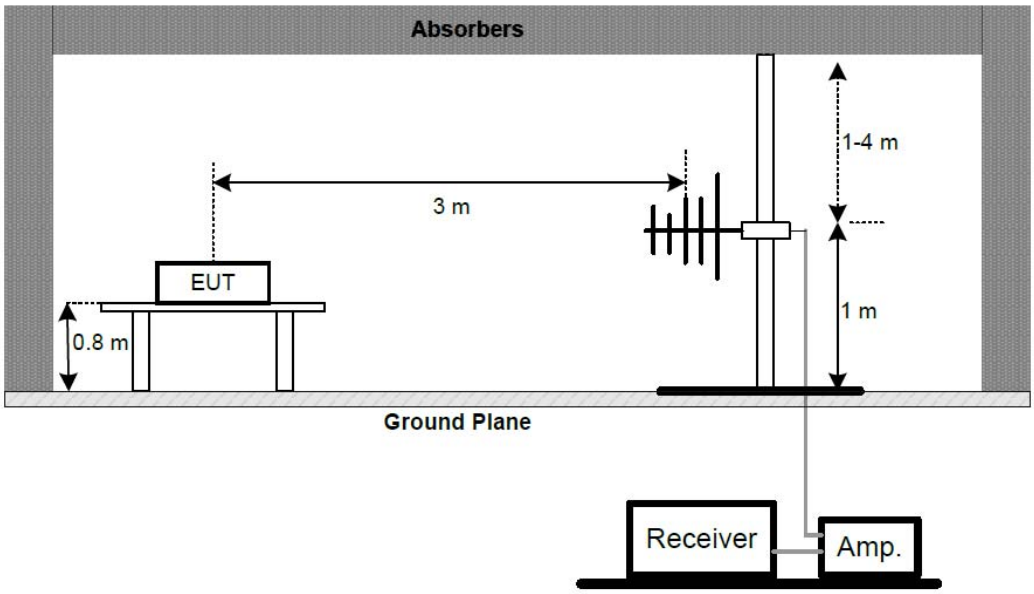
Figure 1 Setup: Transmitting mode

8.1.2.Semi-Anechoic Chamber Test Setup Diagram

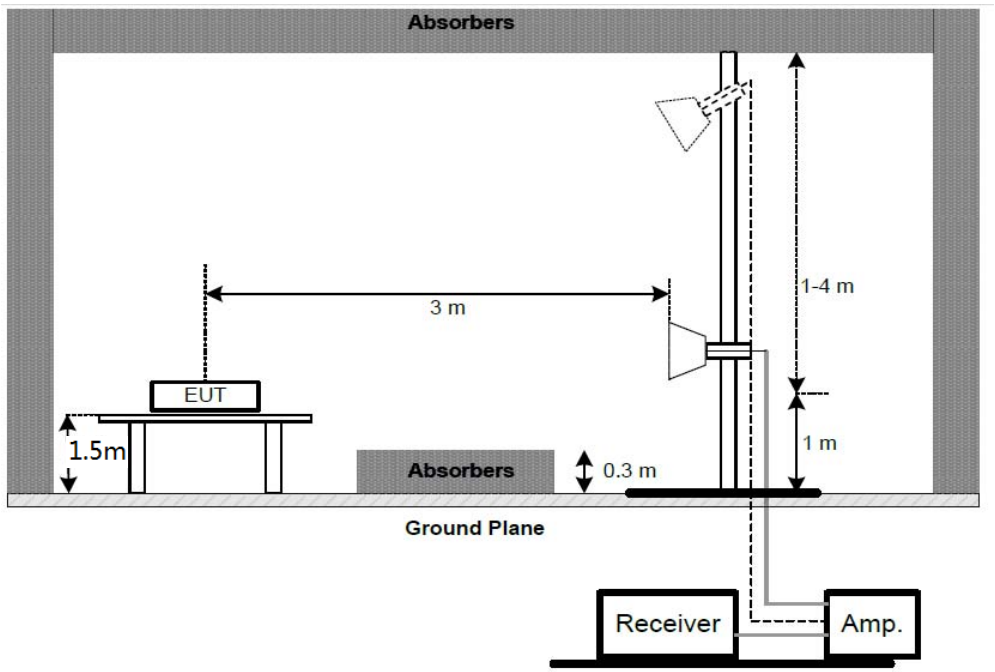
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



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



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



8.2.The Limit For Section 15.249

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Fundamental frequency	Field strength of fundamental (millivolts/ meter)	Field strength of harmonics (microvolts/ meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

8.3.Restricted bands of operation

8.3.1.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.

8.4.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.

8.5.Operating Condition of EUT

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

8.5.2.Turn on the power of all equipment.

8.5.3.Let the EUT work in TX mode then measure it.

8.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). 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.

The frequency range from 30MHz to 10000MHz 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.

8.7.The Field Strength of Radiation Emission Measurement Results

PASS.

Low channel(Fundamental frequency):

Frequency (MHz)	Reading (dBμV/m)	Reading (dBμV/m)	Factor Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	PEAK	AV	(dB)	AV	PEAK	AV	PEAK	AV	PEAK	
908.4	**94.96**	**86.96**	**2.24**	**89.20**	**97.20**	**94.0**	**114.0**	**-4.80**	**-16.80**	Horizontal
908.4	**93.17**	**85.17**	**2.24**	**87.41**	**95.41**	**94.0**	**114.0**	**-6.59**	**-20.00**	Vertical

High channel(Fundamental frequency):

Frequency (MHz)	Reading (dBμV/m)	Reading (dBμV/m)	Factor Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	PEAK	AV	(dB)	AV	PEAK	AV	PEAK	AV	PEAK	
916.0	**95.10**	**87.10**	**2.40**	**89.50**	**97.50**	**94.0**	**114.0**	**-4.50**	**-16.50**	Horizontal
916.0	**94.57**	**86.57**	**2.40**	**88.97**	**96.97**	**94.0**	**114.0**	**-5.03**	**-17.03**	Vertical

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

   Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

3. The spectral diagrams display the measurement of peak values.

4. If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

5. The EUT is tested radiation emission in three axes(X,Y,Z). The worst emissions are reported in three axes.

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

Low channel:

ACCURATE TECHNOLOGY CO.,LTD

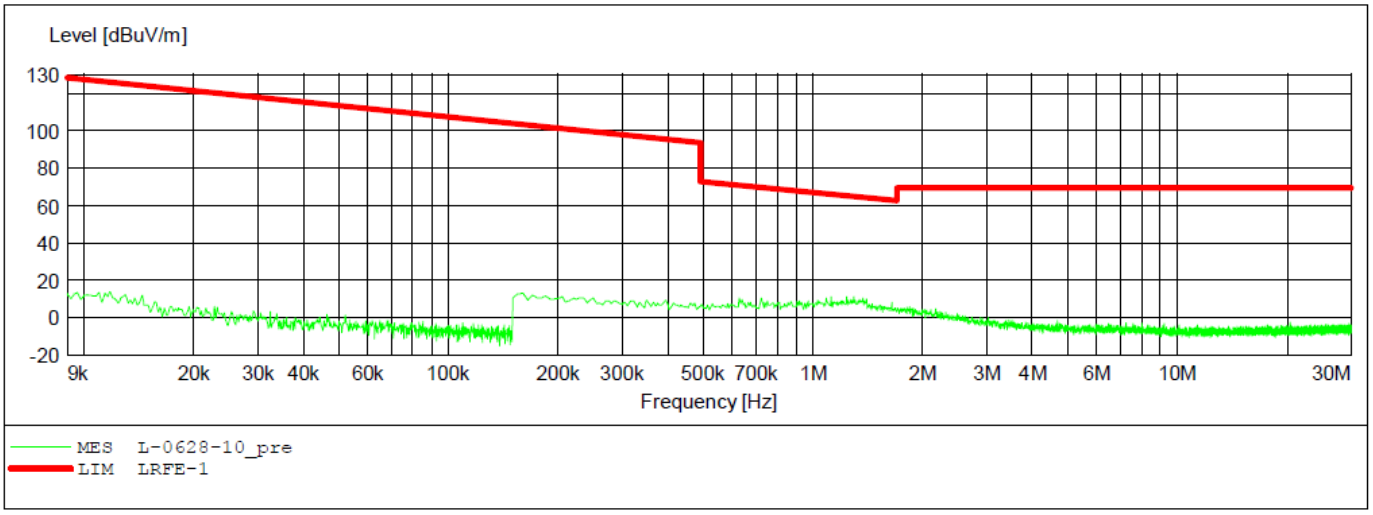
FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer:
Operating Condition: TX 908.4MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: AC 120V/60Hz
Comment: X

SCAN TABLE: "LFRE 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	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

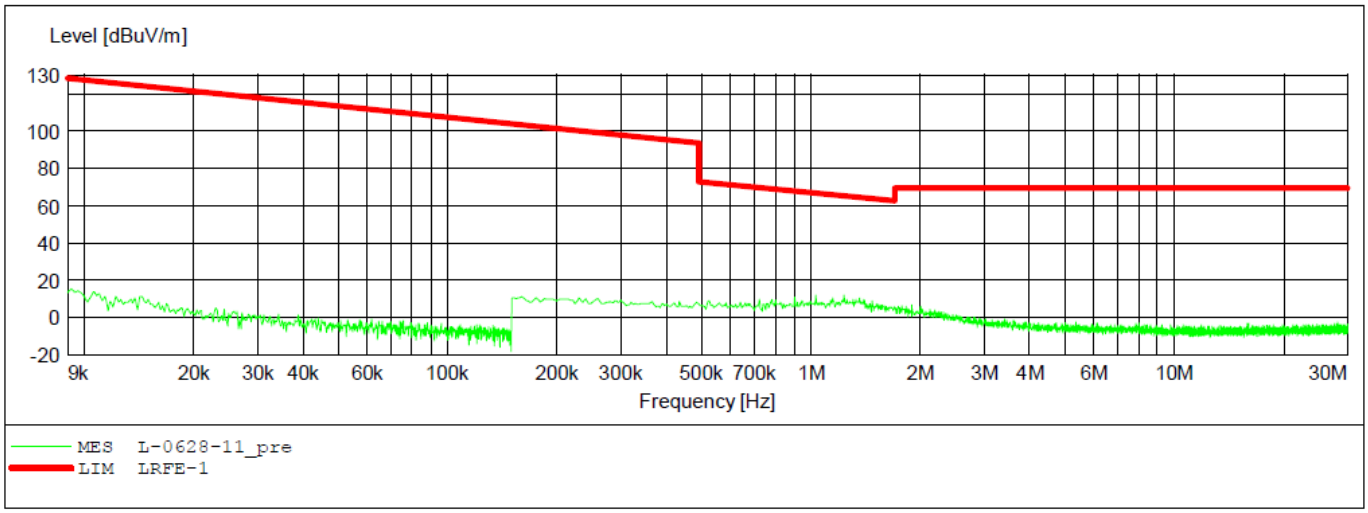
FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer:
Operating Condition: TX 908.4MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: AC 120V/60Hz
Comment: Y

SCAN TABLE: "LFRE 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	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

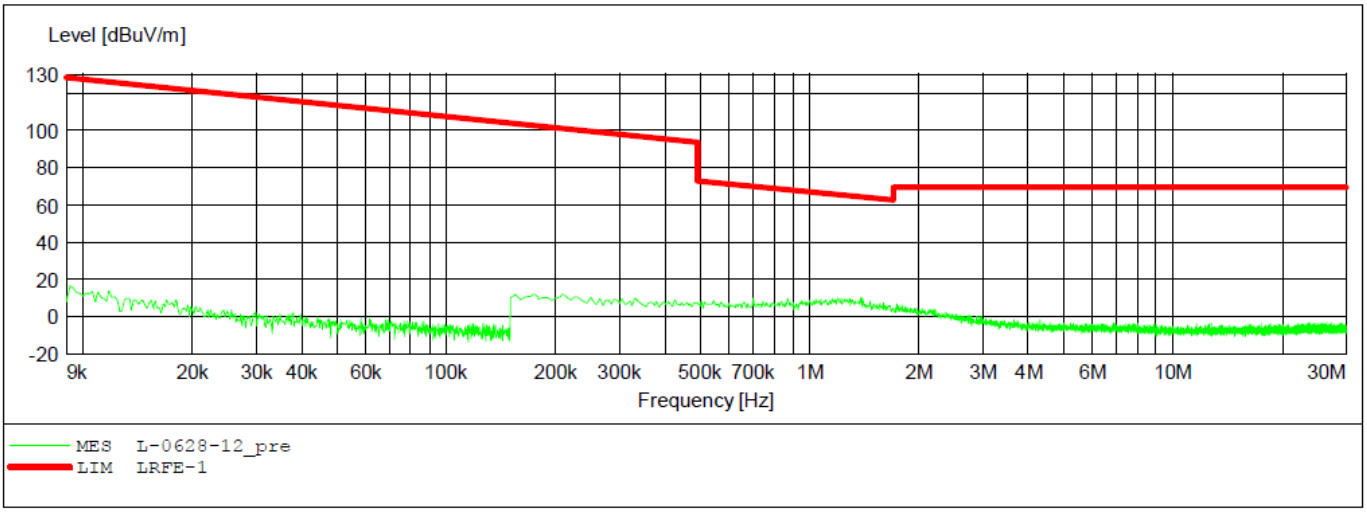
FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer:
Operating Condition: TX 908.4MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: AC 120V/60Hz
Comment: Z

SCAN TABLE: "LFRE 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	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M

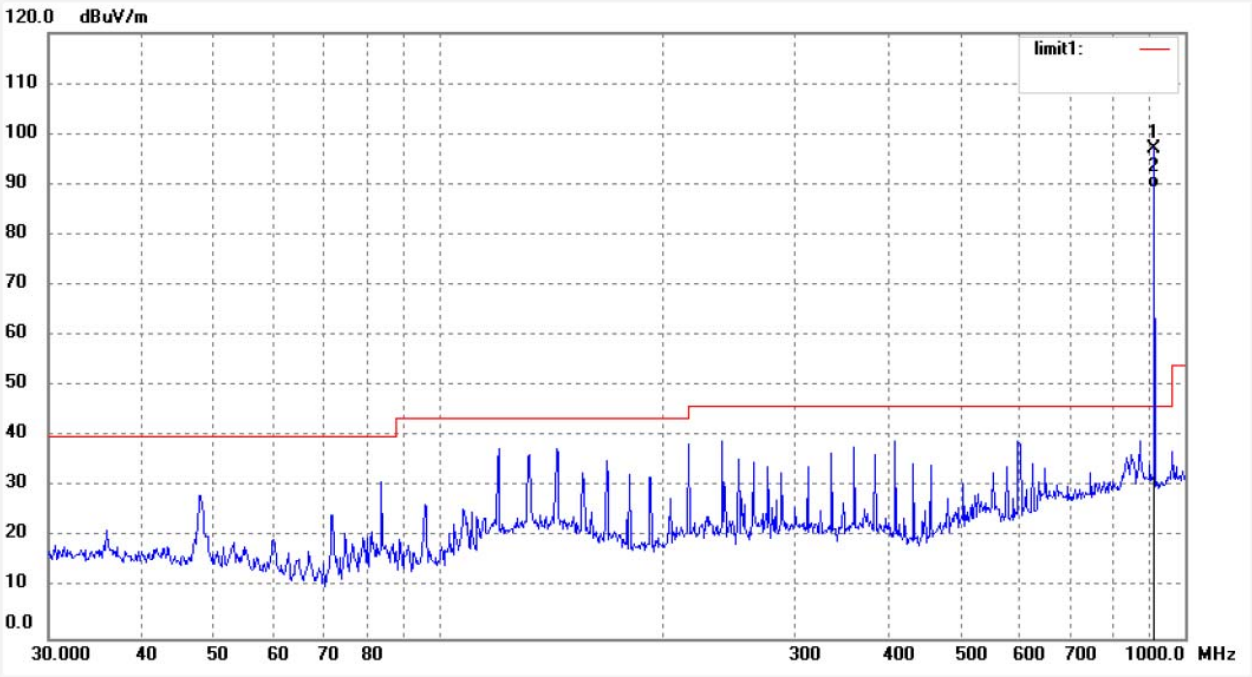


ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1370
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 908.4MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/13/
Time:
Engineer Signature: WADE
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	908.4000	94.96	2.24	97.20	/	/	peak			
2	908.4000	86.96	2.24	89.20	/	/	AVG			

ACCURATE TECHNOLOGY CO., LTD.
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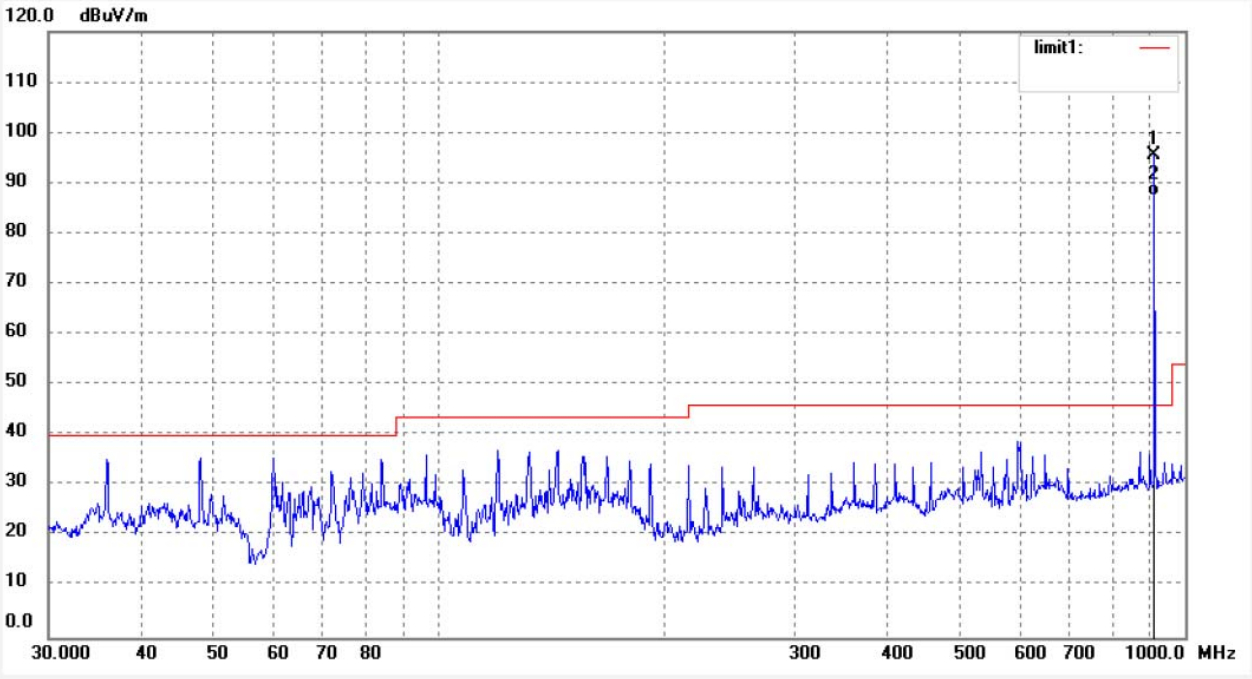
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1371	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 908.4MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



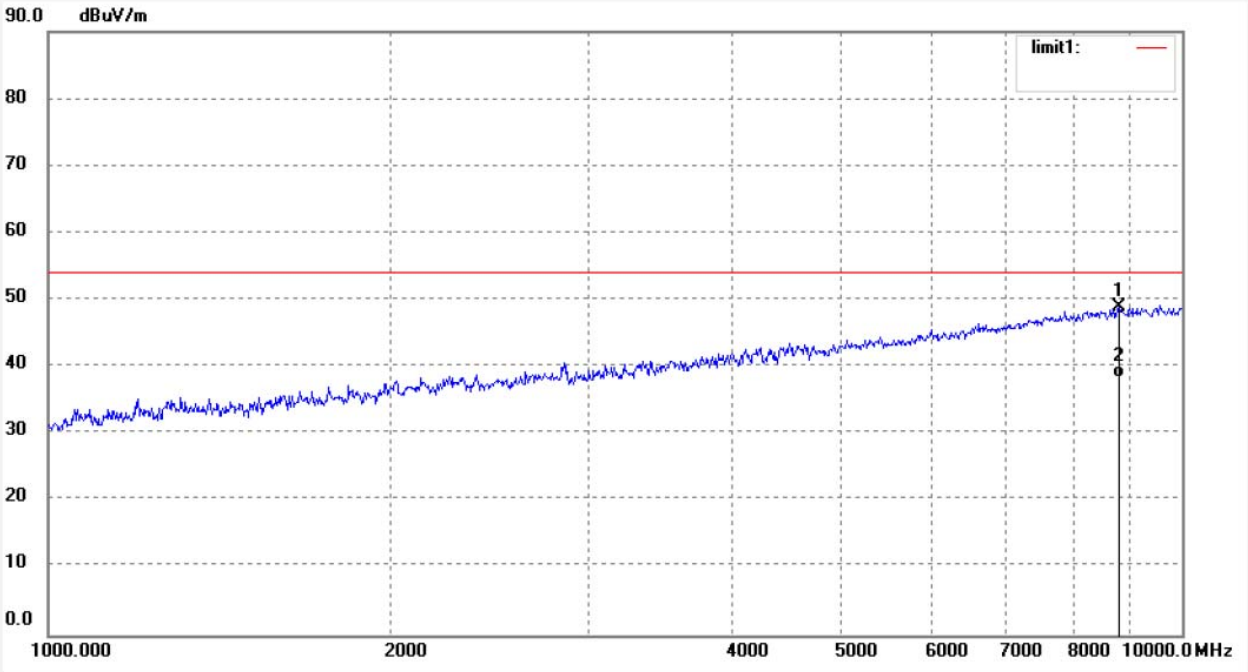
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	908.4000	93.17	2.24	95.41	/	/	peak			
2	908.4000	85.17	2.24	87.41	/	/	AVG			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1374
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 908.4MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/06/13/
Time:
Engineer Signature: WADE
Distance: 3m

Note:

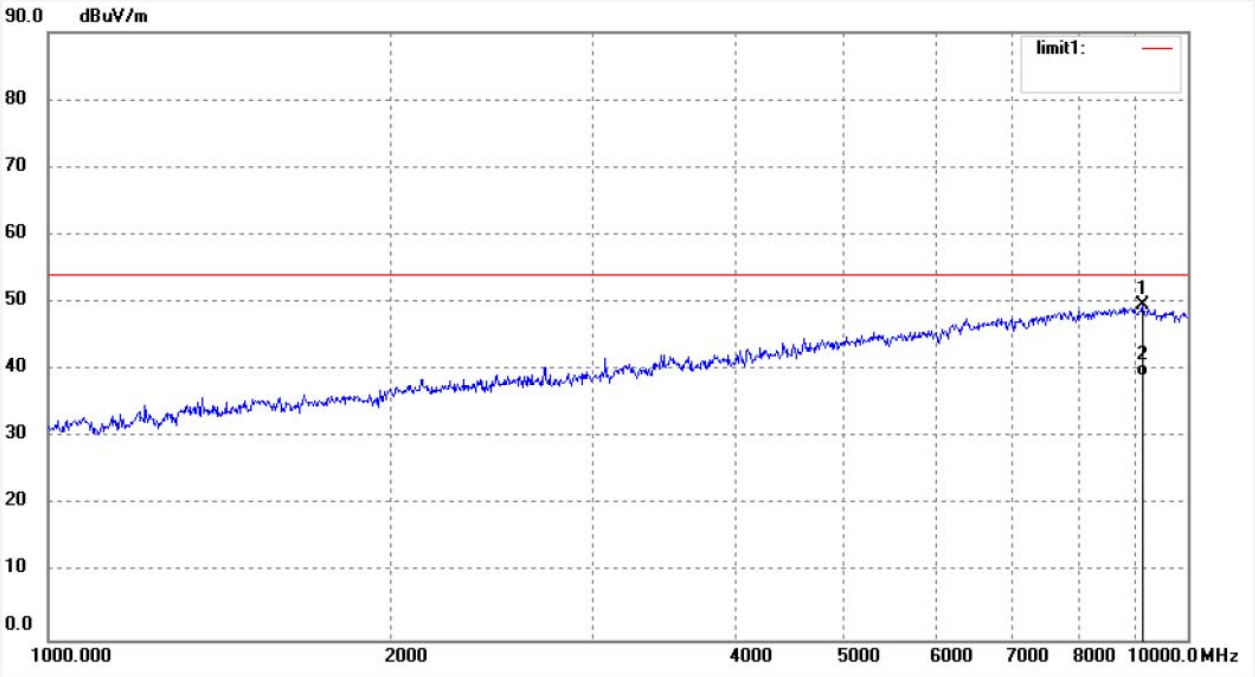


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8810.489	34.58	14.40	48.98	74.00	-25.02	peak			
2	8810.489	24.05	14.40	38.45	54.00	-15.55	AVG			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1375	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 908.4MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	9120.108	34.74	14.78	49.52	74.00	-24.48	peak			
2	9120.108	24.36	14.78	39.14	54.00	-14.86	AVG			

High channel:

ACCURATE TECHNOLOGY CO.,LTD

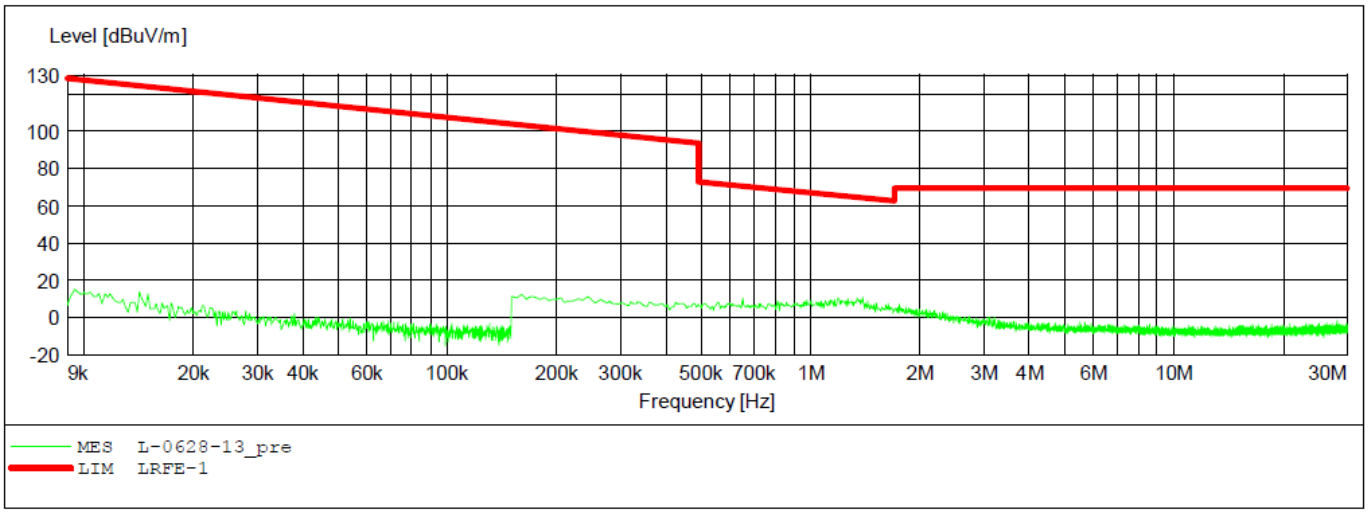
FCC Class B 3m Radiated

```
EUT:                    Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer:
Operating Condition:    TX 916MHz
Test Site:              2# Chamber
Operator:               WADE
Test Specification:     AC 120V/60Hz
Comment:                X
```

SCAN TABLE: "LFRE 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	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

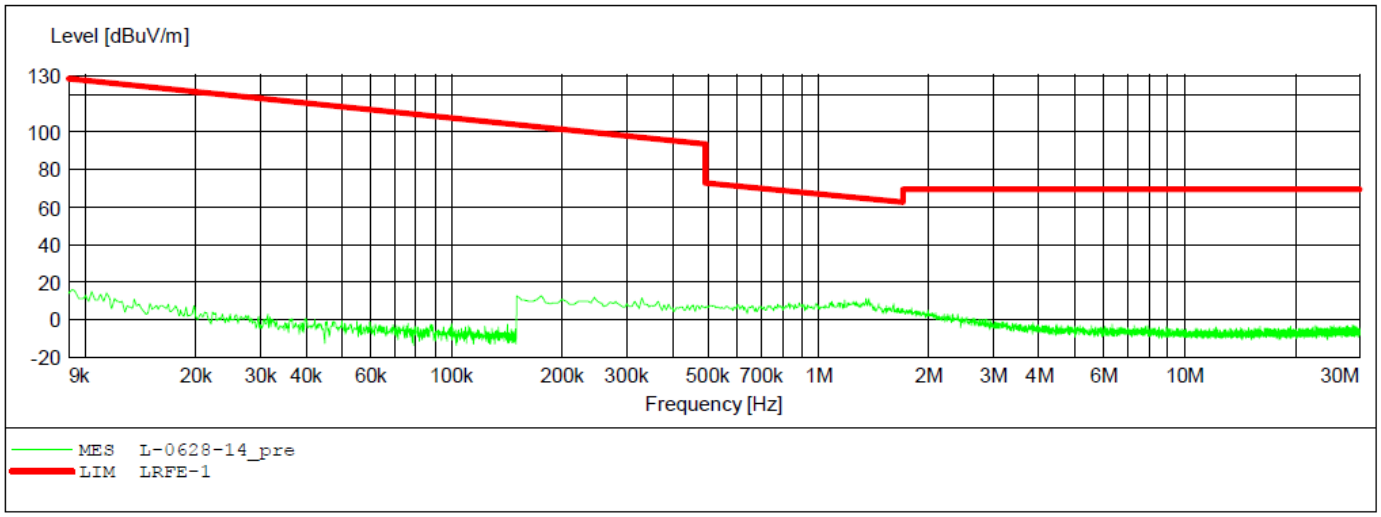
FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer:
Operating Condition: TX 916MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: AC 120V/60Hz
Comment: Y

SCAN TABLE: "LFRE 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	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

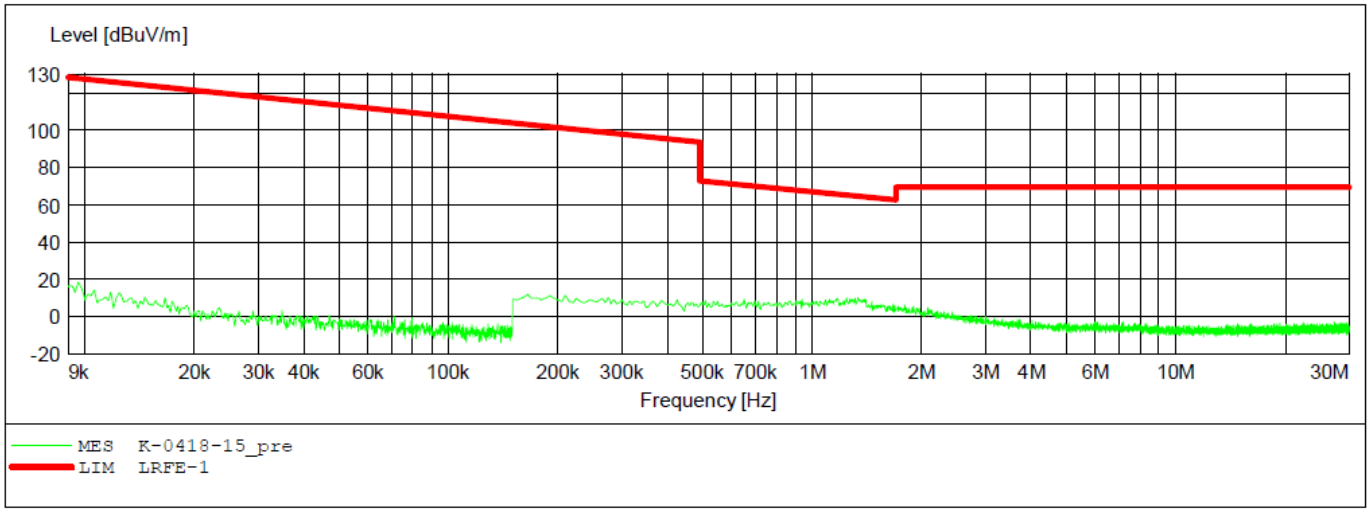
FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0
Manufacturer:
Operating Condition: TX 916MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: AC 120V/60Hz
Comment: Z

SCAN TABLE: "LFRE Fin"

Short Description: SUB STD VTERM2 1.70

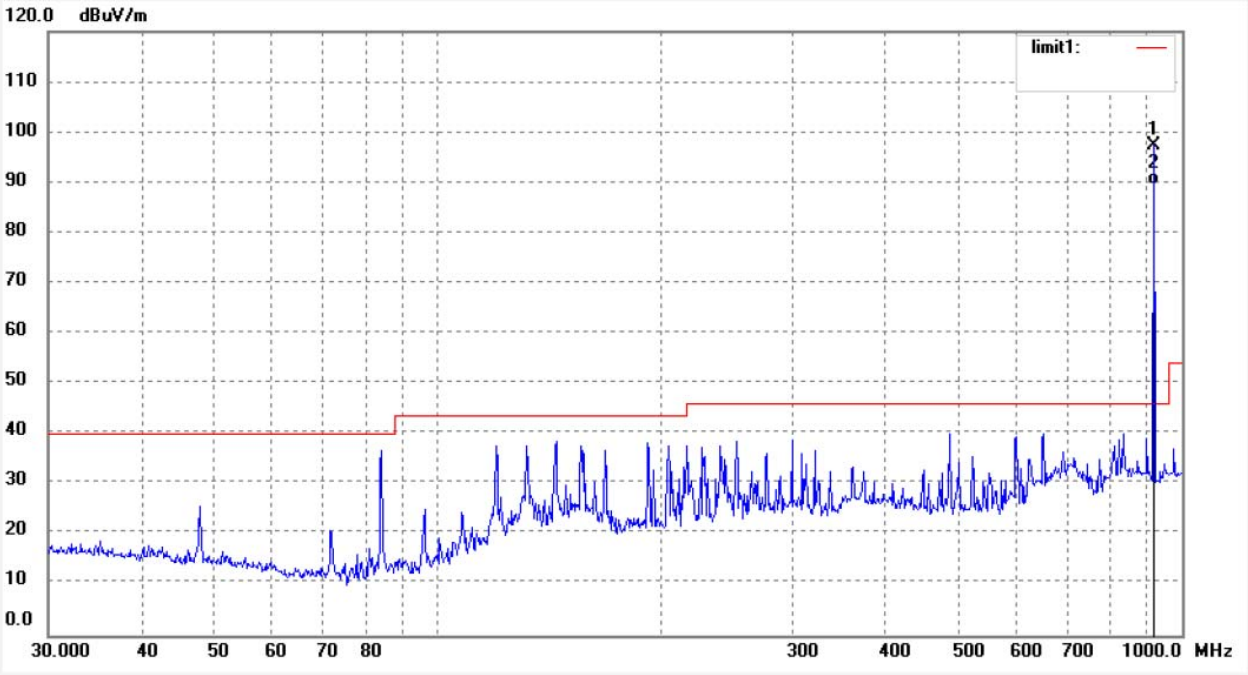
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1378	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 916MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	916.0000	95.10	2.40	97.50	/	/	peak			
2	916.0000	87.10	2.40	89.50	/	/	AVG			

ACCURATE TECHNOLOGY CO., LTD.
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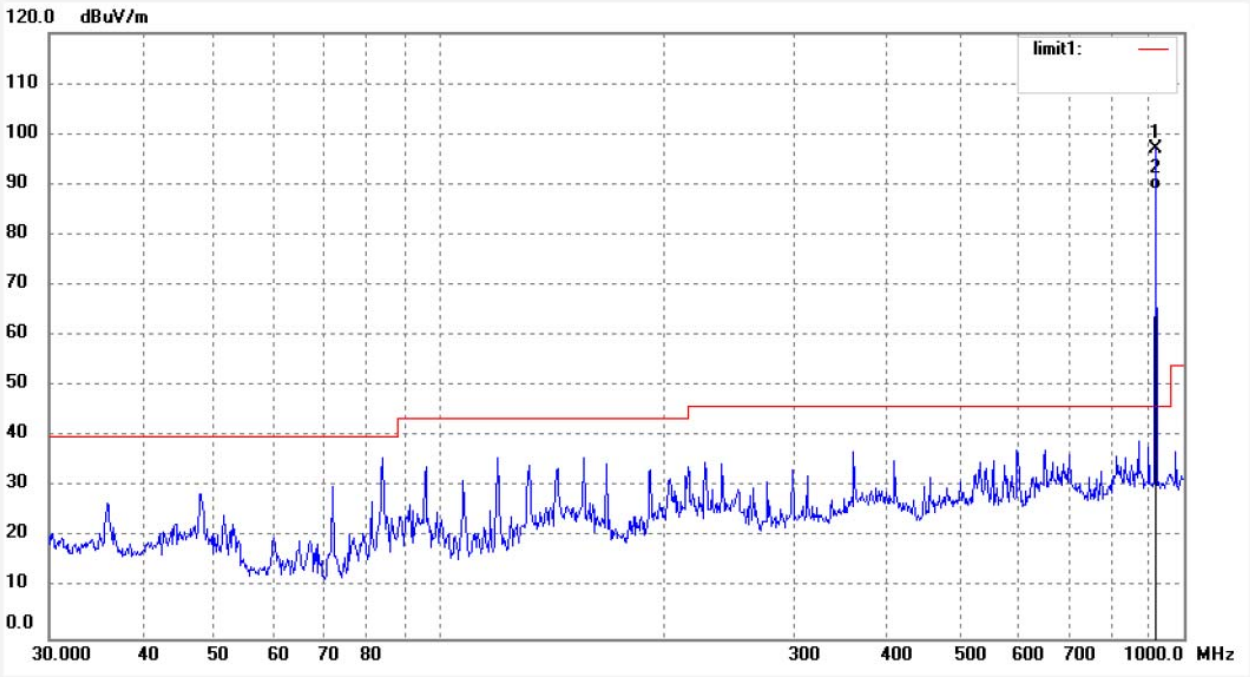
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1379
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Multi-Protocol Gateway
Mode: TX 916MHz
Model: 6AA-GW-ZB-H0
Manufacturer: Leedarson

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/06/13/
Time:
Engineer Signature: WADE
Distance: 3m

Note:

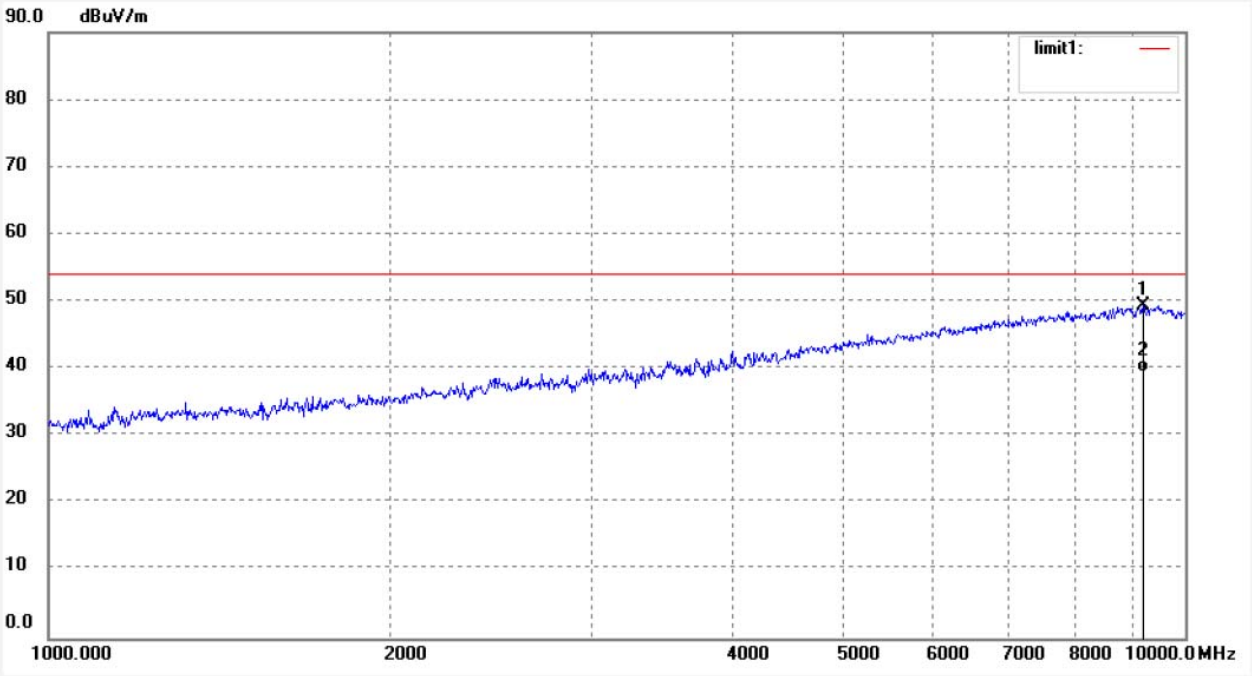


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	916.0000	94.57	2.40	96.97	/	/	peak			
2	916.0000	86.57	2.40	88.97	/	/	AVG			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2018 #1377	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 916MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	9183.326	34.31	15.07	49.38	74.00	-24.62	peak			
2	9183.326	24.34	15.07	39.41	54.00	-14.59	AVG			

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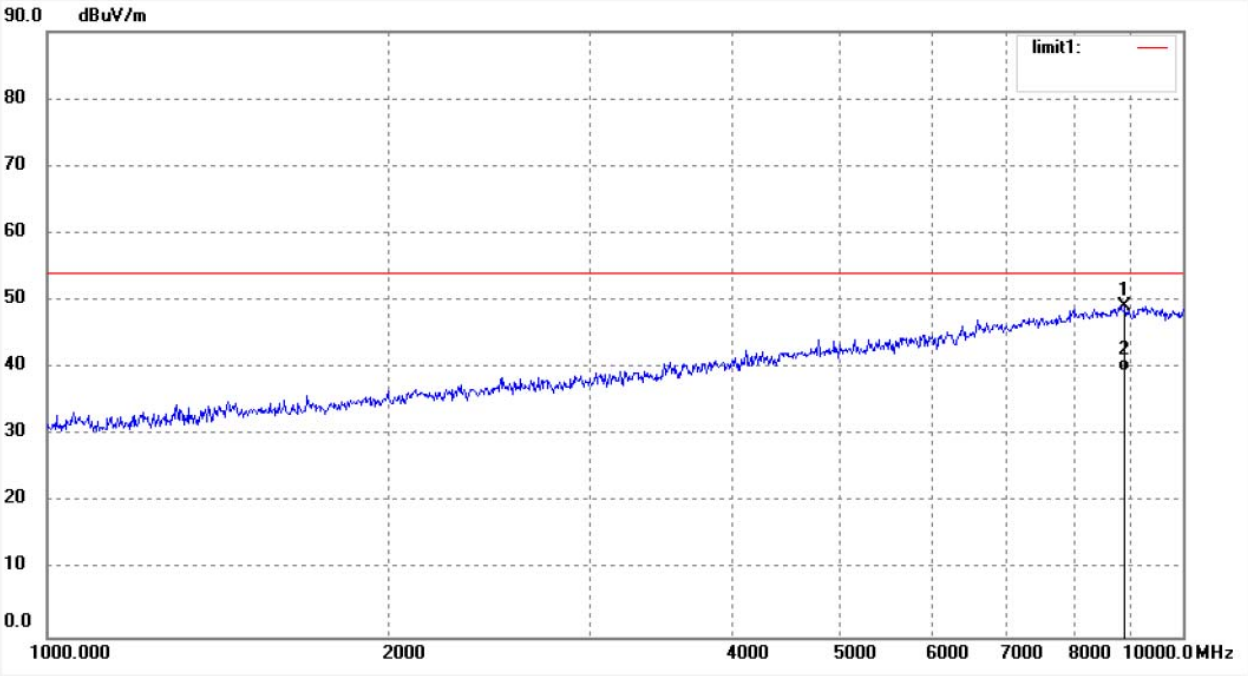
Job No.: LGW2018 #1376	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/06/13/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Multi-Protocol Gateway	Engineer Signature: WADE
Mode: TX 916MHz	Distance: 3m
Model: 6AA-GW-ZB-H0	
Manufacturer: Leedarson	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8892.011	34.87	14.32	49.19	74.00	-24.81	peak			
2	8892.011	25.12	14.32	39.44	54.00	-14.56	AVG			

9. ANTENNA REQUIREMENT

9.1. 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.

9.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 1dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.