

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

Multi-Protocol Gateway

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

FCC ID: 2AB2Q6AAGWZBH0

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Report No.:ATE20181350Date of Test:June 05, 2018-June 14, 2018Date 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 :	June 05, 2018-June 14, 2018
Date of Report:	June 23, 2018
Prepared by :	(Time Sangerosen)
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	:	2405-2480MHz
Number of Channels	:	16
Antenna Gain	:	1dBi
Type of Antenna	:	PCB 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
Channel Spacing	:	5MHz
Modulation Type	:	O-QPSK
Applicant Address	:	LEEDARSON LIGHTING CO., LTD. Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China.
Manufacturer Address	:	LEEDARSON LIGHTING CO., LTD. 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. Carrier Frequency of Channels

Channel	Freq.(MHz)	Channel	Freq.(MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440	26	2480

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

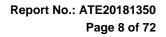


1.4.Description of Test Facility

EMC Lab	 Recognition of accreditation by Federal C Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 	ommunications
	Listed by Innovation, Science and Econon Canada (ISEDC) The Registration Number is 5077A-2	nic Development
	Accredited by China National Accreditation Conformity Assessment (CNAS) The Registration Number is CNAS L3193	
	Accredited by American Association for L Accreditation (A2LA) The Certificate Number is 4297.01	aboratory
Name of Firm Site Location	 Shenzhen Accurate Technology Co., Ltd 1/F., Building A, Changyuan New Materia & Industry Park, Nanshan District, Shenzh 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

					1
Kind of equipment	Manufacturer	Туре	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	CBLU118354 0-01	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	WHKX3.6/18 G-10SS	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 06, 2018	1 Year

Table 1: List of Test and Measurement Equipment

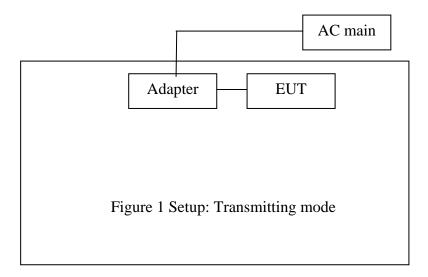


3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **Transmitting mode** Low Channel: 2405MHz Middle Channel: 2445MHz High Channel: 2480MHz

3.2. Configuration and peripherals





4. TEST PROCEDURES AND RESULTS

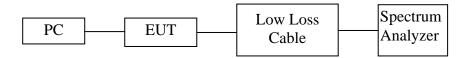
FCC Rules	Description of Test	Result
Section 15.207	Power Line Conducted Emission	Compliant
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
Section 15.247(d)	Conducted Spurious Emission Test	Compliant
KDB558074 D01 DTS Meas Guidance v04	OBW	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
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 15.203	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. 6DB BANDWIDTH MEASUREMENT

5.1.Block Diagram of Test Setup



5.2. 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.

5.3.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.

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 TX modes and measure it. The transmit frequency is 2405-2480MHz. We select 2405MHz, 2445MHz and 2480MHz TX frequency to transmit.

5.5.Test Procedure

- 1. Set resolution bandwidth (RBW) = 100 kHz.
- 2. Set the video bandwidth (VBW) \geq 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.

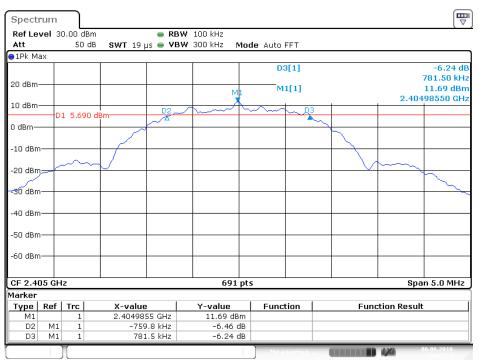


5.6.Test Result

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2405	1.5413	> 0.5MHz
Middle	2445	1.5557	> 0.5MHz
High	2480	1.5413	> 0.5MHz

The spectrum analyzer plots are attached as below.

6dB Bandwidth



Low Channel 2405MHz

Date: 6.JUN.2018 15:07:54



Spectrum	'								
Ref Level Att	30.00 dBm 50 dB			100 kHz					
1Pk Max	50 UB	SWI 19	us 👄 VBW	300 KHZ MO	de Auto FFT				
				T T	D3[1]				-6.40 dB
					50[1]				781.50 kHz
20 dBm				M1	M1[1]				11.75 dBm
10 dBm				L X				2.444	98550 GHz
	D1 5.750 di	1 3m	D2 ~	$\sim \sim \sim$	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ДЗ			
) dBm			~^			~			
						۲ T	\mathbf{i}		
10 dBm							\rightarrow		
	·						\rightarrow		
20 dBm 		Y		+					
30 dBm —									<u> </u>
10 -10									
40 dBm									
50 dBm									
30 abiii									
60 dBm									
CF 2.445 G	Hz			691 pt:				Sna	n 5.0 MHz
larker				001 pt.	-				
Type Ref	Trc	X-value		Y-value	Function	1	Func	tion Result	
M1	1	2.44498	55 GHz	11.75 dBm					
D2 M			1.2 kHz	-6.62 dB					
D3 M	1 1	781	L.5 kHz	-6.40 dB					
	Υ				Measurin			1/0	6.06.2018
					_	_			

Middle Channel 2445MHz

Date: 6.JUN.2018 15:10:04

High Channel 2480MHz

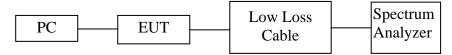
Spectr	um										
	vel 3	0.00 dBm			100 kHz						('
Att		50 dB	SWT 19 µ	us 👄 VBW	/ 300 kHz	Mod	e Auto	FFT			
⊖1Pk Ma	ax .										
							D	3[1]			-6.48 dB
20 dBm-						_	<u> </u>				781.50 kHz
						ML	IVI	1[1]			11.75 dBm 98550 GHz
10 dBm-	_					Ă-	~ ~	- DO	I	2.479	96330 GHZ
	— D	1 5.750 d	3m			$+\sim$					
0 dBm—			~	~		_		-~~	L		
-10 dBm						_					
		~~									
-20 dBm	~		Υ							· \	~
-30 dBm						-					
-40 dBm						-					
-50 dBm						+					
-60 dBm						+					
CF 2.48	3 GHz				69	1 pts			1	Spa	n 5.0 MHz
Marker											
	Ref	Trc	X-value		Y-value	1	Fund	tion	Fund	tion Result	
M1		1	2.47998		11.75 (. and		
D2	M1	1	-759	9.8 kHz	-6.51	dB					
D3	M1	1	781	.5 kHz	-6.48	dB					
	-						Mos	curina		4.464	6.06.2018
)			ages:	

Date: 6.JUN.2018 15:11:42



6. MAXIMUM CONDUCTED PEAK OUTPUT POWER

6.1.Block Diagram of Test Setup



6.2. 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.

6.3.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.

6.4. Operating Condition of EUT

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

- 6.4.2.Turn on the power of all equipment.
- 6.4.3.Let the EUT work in TX modes then measure it. The transmit frequency is 2405-2480MHz. We select 2405MHz, 2445MHz and 2480MHz TX frequency to transmit.

6.5.Test Procedure

- 6.5.1.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.
- 6.5.2.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 6.5.3.Set RBW \geq DTS bandwidth.

6.5.4.Set VBW $\geq 3 \times RBW$, VBW=10MHz.

- 6.5.5.Set span \geq 3 x RBW, Span=10MHz.
- 6.5.6. Detector = peak.

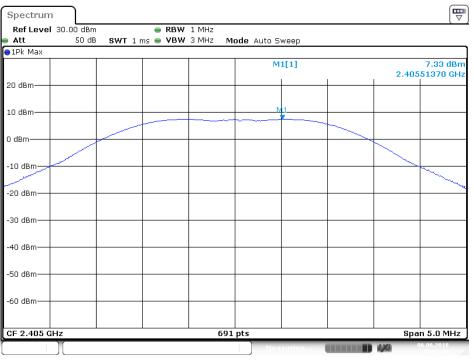


- 6.5.7.Sweep time =auto couple.
- 6.5.8.Trace mode = max hold.
- 6.5.9.Allow trace to fully stability, Use peak marker function to determine the peak amplitude level.

6.6.Test Result

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2405	7.33	30	PASS
Middle	2445	7.39	30	PASS
High	2480	7.40	30	PASS

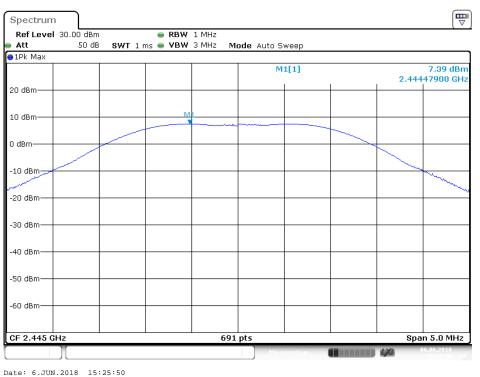
The spectrum analyzer plots are attached as below.



Low Channel 2405MHz

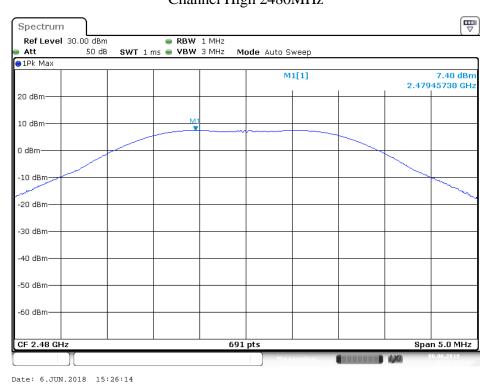
Date: 6.JUN.2018 15:25:11





Channel Middle 2445MHz

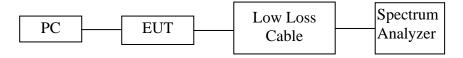
Channel High 2480MHz





7. POWER SPECTRAL DENSITY MEASUREMENT

7.1.Block Diagram of Test Setup



7.2. 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.

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 modes then measure it. The transmit frequency is 2405-2480MHz. We select 2405MHz, 2445MHz and 2480MHz TX frequency to transmit.

7.5.Test Procedure

- 7.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 7.5.2.Measurement Procedure PKPSD:
- 7.5.3.This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.



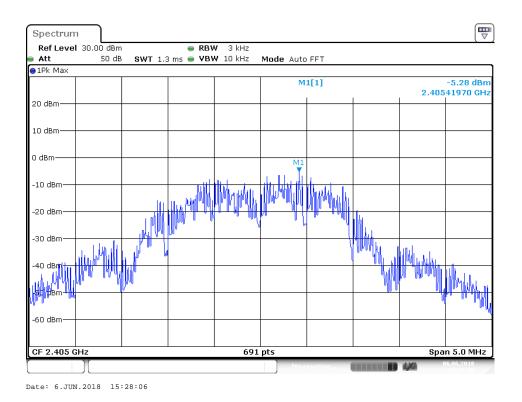
- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode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

7.6.Test Result

CHANNEL NUMBER	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS/FAIL
Low	2405	-5.28	8	PASS
Middle	2445	-5.27	8	PASS
High	2480	-5.34	8	PASS

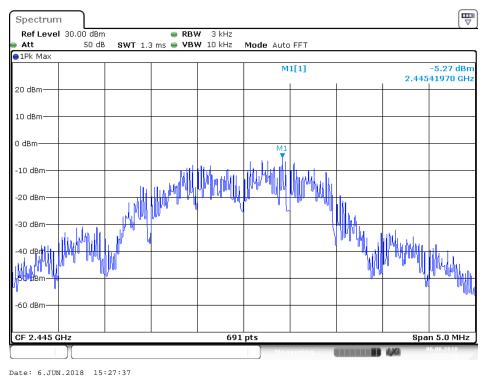
The spectrum analyzer plots are attached as below.

Low channel

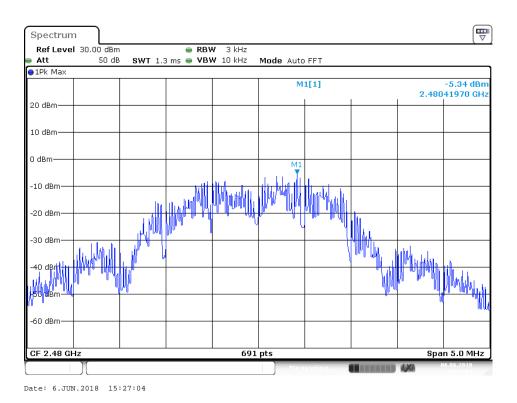




Middle channel



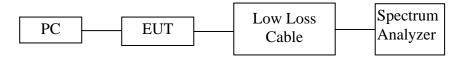
High channel





8. BAND EDGE COMPLIANCE TEST

8.1.Block Diagram of Test Setup



8.2. 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).

8.3.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.

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 then measure it. The transmit frequency is 2405-2480MHz. We select 2405MHz, 2445MHz and 2480MHz TX frequency to transmit.



8.5.Test Procedure

Conducted Band Edge:

- 8.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 8.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

- 8.5.3.The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.
- 8.5.4. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
- 8.5.5.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 8.5.6.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

8.5.7.RBW=1MHz, VBW=1MHz

8.5.8.The band edges was measured and recorded.

8.6.Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2347.27	45.66	> 20dBc
2483.5	47.74	> 20dBc



Low Channel 2405MHz

Spectrum										
Ref Level	30.00 c	dBm	-	RBW 100 kHz						
Att 🗧	50	dB SWT 1.:	1 ms 👄 '	VBW 300 kHz	Mode 4	uto Swe	ер			
⊖1Pk Max										
						M4[1]				40.15 dBm
20 dBm									2.3	47270 GHz
						M1[1]				5.51 dBm
10 dBm									Z.4	04960 GHz
										L J
0 dBm										h h
-10 dBm										1 14
-10 UBIII										
-20 dBm										
20 0.0										p y
-30 dBm						_				
				M4			мз			M2
-49 dBm	ساررياس	www.	meron	Jula samerana	mound			unnandun	unummen.	mount
-50 dBm										
-60 dBm										
-00 0011										
Start 2.31 G										
	iHZ			691	pts				stop	2.407 GHz
Marker	1 1	× !			1 =		1	-	- 1' P ''	
Type Ref M1	Trc 1	X-value	96 GHz	<u>Y-value</u> 5,51 dB		nction		Fun	ction Result	
M1 M2	1		96 GHZ	-41.88 dB						
M3	1		78 GHz	-41.75 dE						
M4	1		27 GHz	-40.15 dE						
	1					easuring			120	06.06.2018
									agent .	

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High Channel 2480MHz

20 dBm 2.4883630	Spectr	um												
1Pk Max M4[1] -39.51 20 dBm M1[1] 10.57 10 dBm 10.57 2.4799900 0 dBm 0 0 -10 dBm 0 0 -20 dBm 0 0 -30 dBm 0 0 -50 dBm 0 0 -60 dBm 0 0 1 1 2.47999 GHz 1 1 2.47999 GHz 1 2.47999 GHz 10.57 dBm M1 1 2.47999 GHz 1 2.4835 GHz -37.17 dBm M3 1 2.486262 GHz	Ref Le	vel :												
20 dBm M4[1] -39.51 20 dBm M1 10.57 10 dBm M1[1] 10.57 0 dBm 2.4799900 2.4799900 0 dBm 0 0 -10 dBm 0 0 -20 dBm 0 0 -20 dBm 0 0 -20 dBm 0 0 -30 dBm 0 0 -30 dBm 0 0 -60 dBm 0 0 -50 dBm 0 0 -50 dBm 0 0 -60 dBm 0 0 -70 dBm 0 0 -10 dBm 0 0 -20 dBm 0 0 -30 dBm 0 0 -40 dBm 0 0 -50 dBm 0 0 -60 dBm 0 0 -70 dBm 0 -70 dBm 0 <th>Att 🗧</th> <th></th> <th>50 d</th> <th>B SWT 56</th> <th>.9 µs 👄</th> <th>VBW</th> <th>300 kHz</th> <th>Mode A</th> <th>uto FFT</th> <th>-</th> <th></th> <th></th> <th></th> <th></th>	Att 🗧		50 d	B SWT 56	.9 µs 👄	VBW	300 kHz	Mode A	uto FFT	-				
20 dBm	⊖1Pk Ma	х												
20 dBm M1 10.57 model 10 dBm 2.4799900 0 dBm 0 -10 dBm 0 -20 dBm 0 -20 dBm 0 -30 dBm 0 -30 dBm 0 -50 dBm 0 -10 0 -50 dBm 0 0 0								I	M4[1]					·39.51 dBn
M1 10.57 /r 10 dBm 2.4799900 0 dBm 2.4799900 -10 dBm 2.4799900 -10 dBm 2.4799900 -10 dBm 2.4799900 -20 dBm 2.479900 -30 dBm 40 dBm -40 dBm 40 dBm -50 dBm 40 dBm -50 dBm 50 dBm -60 dBm 50 dBm -70 dBm 50 dBm -10 dBm 50 dBm	20 dBm-												2.48	
10 dBm 0 dBm		м1						ſ	M1[1]					10.57 dBn
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-20 dBm	0 dBm—		\leftarrow						-					
-20 dBm	10 10-													
-20 dBm	-10 aBm-													
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-50 dBm -60 dBm -60 dBm -60 dBm -60 dBm -70 dBm -60 dBm -70	-20 0011		٦											
-50 dBm -60 dBm -60 dBm -60 dBm -70	-30 dBm-			<u> </u>					_					
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-60 dBm										· · ·				
Start 2.478 GHz 691 pts Stop 2.5 C Marker Y-value Function Function Result M1 1 2.47999 GHz 10.57 dBm M2 1 2.4835 GHz -37.17 dBm M3 1 2.486262 GHz -39.15 dBm	-50 dBm-													
Start 2.478 GHz 691 pts Stop 2.5 C Marker Y-value Function Function Result M1 1 2.47999 GHz 10.57 dBm M2 1 2.4835 GHz -37.17 dBm M3 1 2.486262 GHz -39.15 dBm	60 dBm													
Marker Yorker Function Function Result Type Ref Trc X-value Y-value Function Function Result M1 1 2.47999 GHz 10.57 dBm M2 1 2.4835 GHz -37.17 dBm M3 1 2.486262 GHz -39.15 dBm	-00 ubiii-													
Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.47999 GHz 10.57 dBm	Start 2.	478 (GHz				691 r	ots					Sto	00 2.5 GHz
Type Ref Trc X-value Y-value Function Function Result M1 1 2.47999 GHz 10.57 dBm M2 1 2.4835 GHz -37.17 dBm M3 1 2.486262 GHz -39.15 dBm	Marker													
M2 1 2.4835 GHz -37.17 dBm M3 1 2.486262 GHz -39.15 dBm		Ref	Trc	X-value	9		Y-value	Fun	ction		F	unctio	n Result	t
M3 1 2.486262 GHz -39.15 dBm														
M4 I 2.4883b3 GHZ -39.51 dBm														
	M4		1	2.4883	o3 GHZ		-39.51 dBn	n						

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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 2405MHz, 2480MHz TX frequency to transmit.

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.





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

Standard: FCC (Band Edge) Power Source: AC 120V/60Hz Test item: Radiation Test Temp.(C)/Hum.(%) 23 C / 48 % Time: EUT: Multi-Protocol Gateway Mode: TX 2405MHz Model: 6AA-GW-ZB-H0 Manufacturer: Leedarson Note: 90.0 dBuV/m 1 <th></th>	
Temp.(C)/Hum.(%) 23 C / 48 % Time: EUT: Multi-Protocol Gateway Engineer Signature: WADE Mode: TX 2405MHz Distance: 3m Model: 6AA-GW-ZB-H0 Manufacturer: Leedarson Note: 90.0 dBuV/m 90.0 dBuV/m 90.0 dBuV/m 90.0 dBuV/m	
EUT: Multi-Protocol Gateway Engineer Signature: WADE Mode: TX 2405MHz Distance: 3m Model: 6AA-GW-ZB-H0 Manufacturer: Leedarson Note:	
Mode: TX 2405MHz Distance: 3m Model: 6AA-GW-ZB-H0 Manufacturer: Leedarson Note: 90.0 dBuV/m 80 70 60	
Model: 6AA-GW-ZB-H0 Manufacturer: Leedarson Note:	
Manufacturer: Leedarson Note:	
Note:	
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30	
20	
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2310.000 2390.0 M	
	Hz
No. Freq. Reading Factor Result Limit Margin (MHz) (dBuV/m) (dB) (dBuV/m) (dBuV/m) (dB) (dBuV/m) (dB) Remark	Hz
1 2388.240 39.43 0.78 40.21 74.00 -33.79 peak	Hz
2 2388.240 29.73 0.78 30.51 54.00 -23.49 AVG	Hz





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

bb No.: LGW201	8 #1350			P	olarization:	Vertica	al	
tandard: FCC (Ba	nd Edge)			P	ower Source	: AC 1	20V/60Hz	
est item: Radiati	on Test			D	ate: 18/06/0	6/		
emp.(C)/Hum.(%	6) 23 C/48%			т	ime:			
UT: Multi-Pr	otocol Gateway			E	ngineer Sign	ature:	WADE	
ode: TX 2405	ИНz			D	istance: 3r	m		
odel: 6AA-GW	ZB-H0							
anufacturer: Leed	darson							
ote:								
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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			austry Faik,i			olarizati		Horizonta	al
Standard: FCC (Ban						Power Sc			
Test item: Radiation						Date: 18/			
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	tocol Gatew					Ingineer	Signat	ure M	
Mode: TX 2480MI		uy)istance:			
Model: 6AA-GW-Z						notarioo.	om		
Manufacturer: Leeda									
Note:									
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				and a second			(cm)	(deg.)	Konun



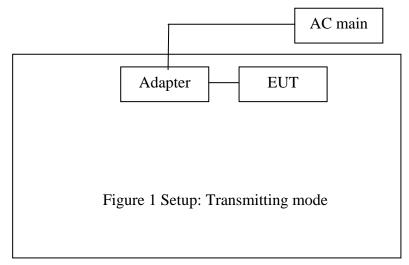
A	TC®	F1	,Bldg,A,Cl	TE TECH hangyuan Ne dustry Park,I	ew Material	Port Ke	yuan Rd	,		Site: 2# Chamber +86-0755-2650329 :+86-0755-2650339
lob No	o.: LGW2018	#1357				F	Polarizati	on: \	/ertical	
Standa	ard: FCC (Bar	nd Edge)				F	Power So	urce:	AC 120	V/60Hz
est it	em: Radiatio	n Test				[Date: 18/	06/06/		
emp.	(C)/Hum.(%) 23 C/4	8 %			٦	Time:			
EUT:	Multi-Pro	tocol Gatew	ay			E	Ingineer	Signat	ure: W	ADE
/lode:	TX 2480M	Hz				[Distance:	3m		
/lodel	: 6AA-GW-Z	ZB-H0								
/anuf	acturer: Leeda	arson								
80									limit1 limit2	
80									limit2	
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20										
10										
0.0	2483.500									2500.0 MHz
	Freq.	Reading	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
No.	(MHz)	(dBuV/m)		(ubu v/m)	(ubuv/iii)	(ub)		(0)	(009.)	
No.	(MHZ) 2485.249	(dBuV/m) 37.28	(uB) 1.10	38.38	74.00	-35.62	peak	(011)	(dog.)	



9. RADIATED SPURIOUS EMISSION TEST

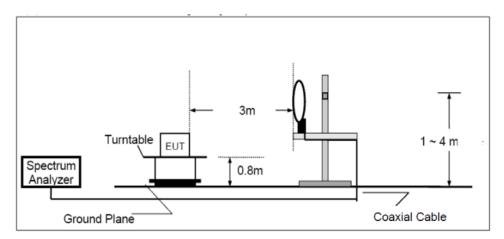
9.1.Block Diagram of Test Setup

9.1.1.Block diagram of connection between the EUT and peripherals

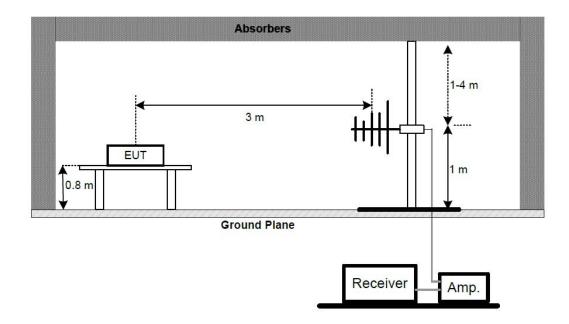


9.1.2.Semi-Anechoic Chamber Test Setup Diagram

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

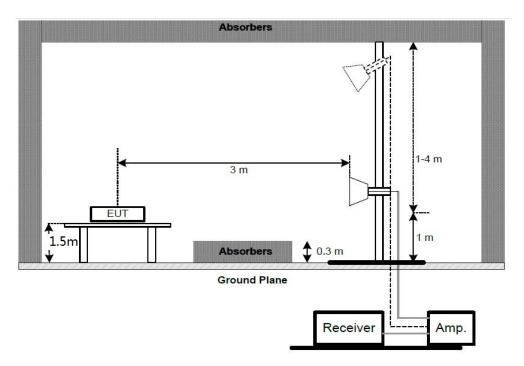






(B) Radiated Emission Test Set-Up, Frequency below 1GHz

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





9.2. 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).

9.3.Restricted bands of operation

9.3.1.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:

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							

¹Until 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.

9.4.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.

9.5. Operating Condition of EUT

- 9.5.1.Setup the EUT and simulator as shown as Section 9.1.
- 9.5.2.Turn on the power of all equipment.
- 9.5.3.Let the EUT work in TX modes measure it. The transmit frequency is 2405-2480MHz. We select 2405MHz, 2445MHz and 2480MHz TX frequency to transmit.

9.6.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 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.



9.7. 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 in three axes. The worst emissions are reported in all test mode.

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

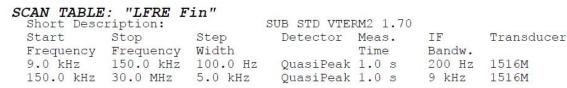


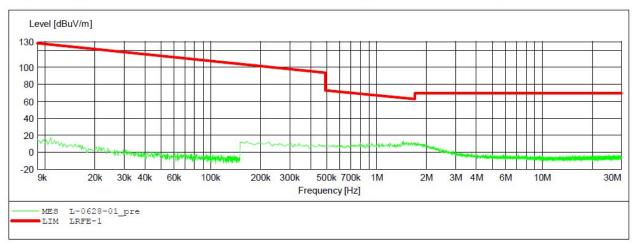
9kHz-30MHz

ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2405MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: X







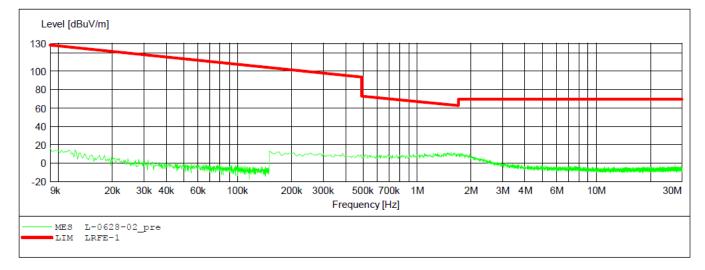
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2405MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: Y

SCAN TABLE: "LFRE Fin"

Short Desc	ription:		SUB STD VTE	RM2 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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M





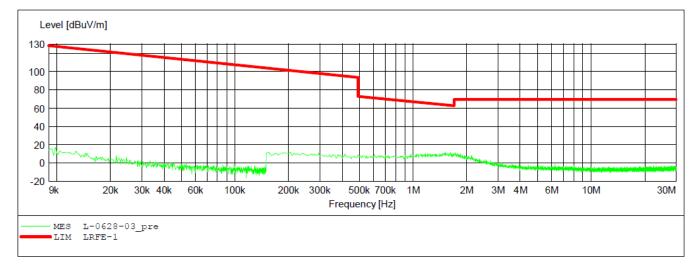
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2405MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: Z

SCAN TABLE: "LFRE Fin"

Short Desc	ription:		SUB STD VTE	RM2 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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M





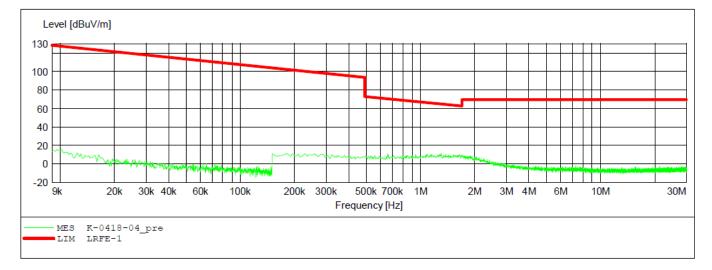
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2445MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: X

SCAN TABLE: "LFRE Fin"

Short Desc	ription:		SUB STD VTER	RM2 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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M

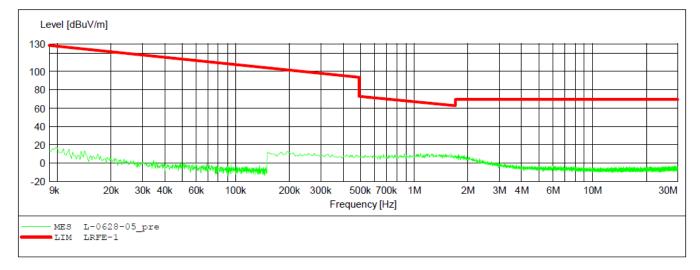




FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2445MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: Y

Short Desc	ription:		SUB STD VTER	RM2 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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M

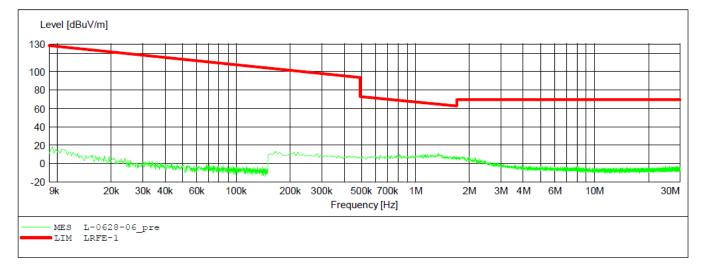




FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2445MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: Z

Short Desc	ription:		SUB STD VTE			
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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M

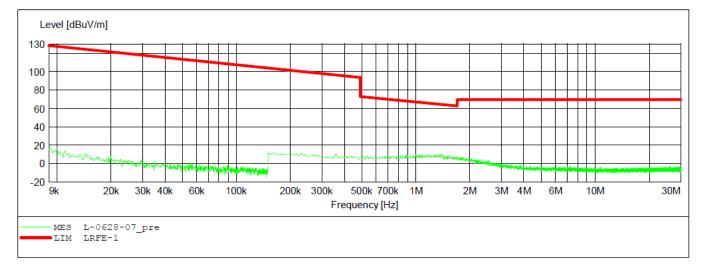




FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2480MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: X

Short Desci	ription:	2	SUB STD VTER			
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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M

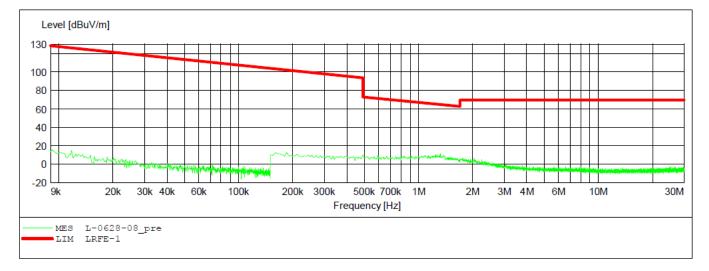




FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2480MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: Y

Short Desc	ription:	S	UB STD VTER	RM2 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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M

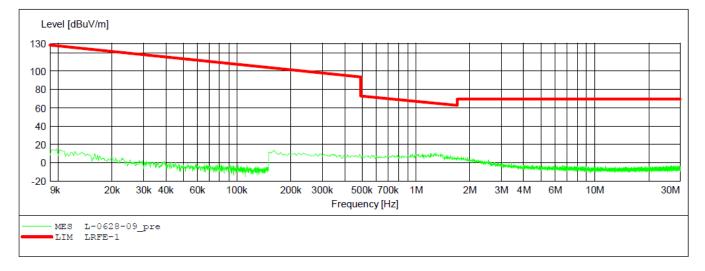




FCC Class B 3m Radiated

EUT: Multi-Protocol Gateway M/N:6AA-GW-ZB-H0 Manufacturer: Operating Condition: TX 2480MHz Test Site: 2# Chamber Operator: WADE Test Specification: AC 120V/60Hz Comment: Z

Short Desc	ription:		SUB STD VTER	RM2 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	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



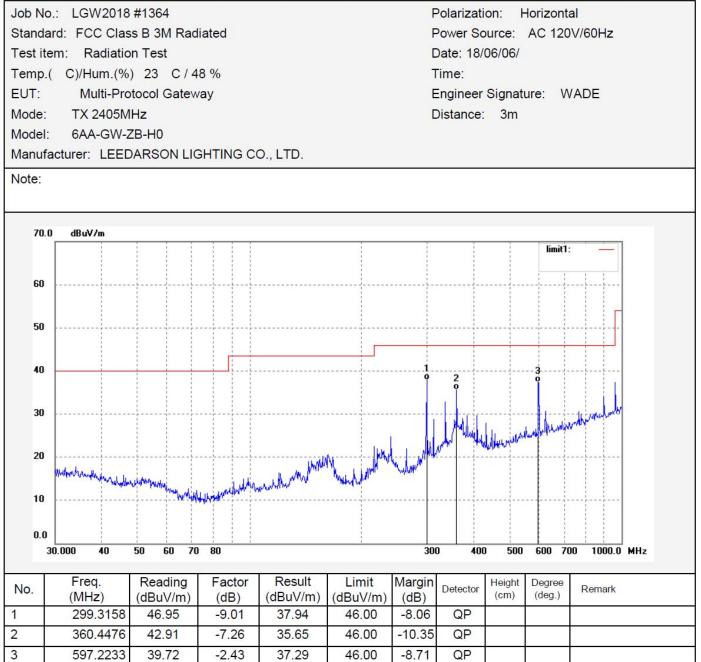


30MHz-1000MHz



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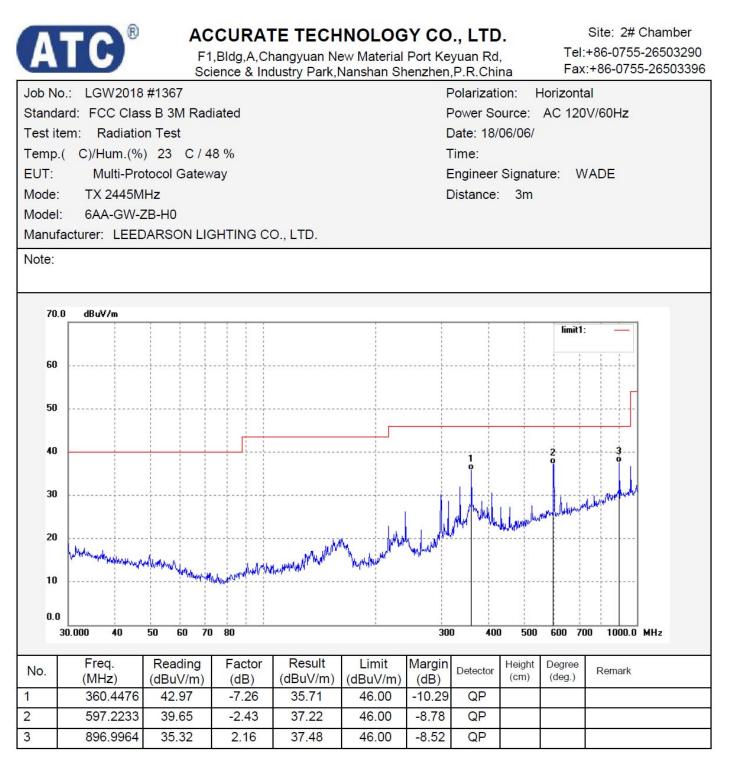
F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

























1GHz-18GHz

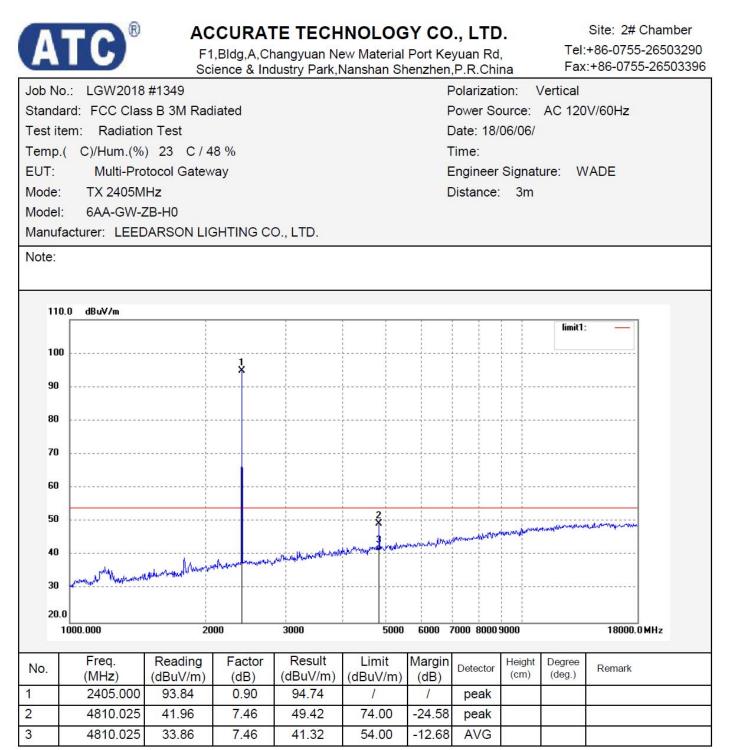


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F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Standa Test ite Temp. EUT: Mode: Model:	TX 2405M	#1348 ss B 3M Rad on Test) 23 C / 4 otocol Gatew Hz ZB-H0	iated 8 % ⁄ay	D., LTD.		F F C T E	Polarizati Power Sc Date: 18/ Time: Engineer Distance:	on: H ource: 06/06/ Signatu		V/60Hz
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No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2405.000	95.26	0.90	96.16	1	1	peak			
2	4810.026	42.06	7.46	49.52	74.00	-24.48	peak			
3	4810.026	34.11	7.46	41.57	54.00	-12.43	AVG			





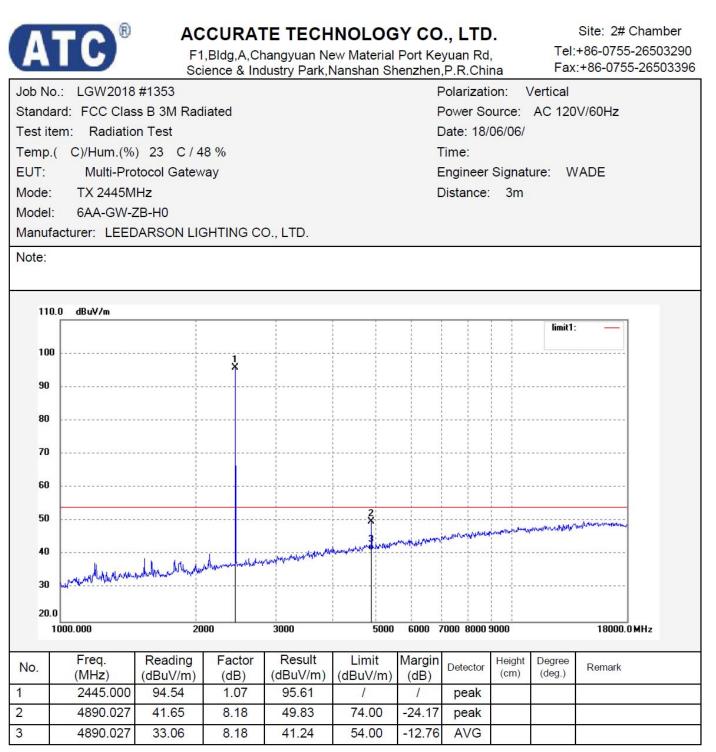




F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

	lo.: LGW2018						Polarizati			
	lard: FCC Clas		iated				Power Sc		AC 120	V/60Hz
	tem: Radiatio						Date: 18/	06/06/		
	o.(C)/Hum.(%						Time:			
EUT:			ay				Engineer		ure: W	ADE
Mode						[Distance:	3m		
Mode										
Manu	facturer: LEED	ARSON LIC	SHTING CO	D., LTD.						
Note:										
11	0.0 dBu∀/m									
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	1000.000	20	00	5000	5000	0000	000 0000			10000.0 MH2
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	(MHz) 2445.000	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg.)	
1	CARDY INNERCONSIGNER CO.	93.19	1.07	94.26 49.35	/ 74.00	/	peak			
2	4890.027	41.17	8.18			-24.65				
3	4890.027	33.39	8.18	41.57	54.00	- <mark>1</mark> 2.43	AVG			













F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Job	No	.: LGW2018	#1354				I	Polarization: Vertical	
Star	nda	rd: FCC Clas	s B 3M Rad	iated			I	Power Source: AC 120V/60Hz	
Test	t ite	em: Radiatio	n Test				1	Date: 18/06/06/	
Tem	np.(C)/Hum.(%) 23 C/4	8 %			-	īme:	
EUT	Γ:	Multi-Pro	tocol Gatew	ay			I	Engineer Signature: WADE	
Mod	le:	TX 2480M	Hz				[Distance: 3m	
Mod	lel:	6AA-GW-2	ZB-HO						
Man	nufa	acturer: LEED	ARSON LIC	SHTING C	O., LTD.				
Vote	e:								
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	20.0								
	1	000.000	20	00	3000	5000	6000	7000 8000 9000 18000.0 MHz	
No.	Т	Freq.	Reading	Factor	Result	Limit	Margin	Detector Height Degree Remark	
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm) (deg.)	
		2480.000	91.72	1.10	92.82	/	/	peak	
2		4960.028	41.01	8.60	49.61	74.00	-24.39	peak	
3		4960.028	33.05	8.60	41.65	54.00	-12.35	AVG	



18GHz-26.5GHz

6		2	R
V	A	6	

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Job No	.: LGW2018	#1359		i.		F	Polarizati	on: H	-lorizonta	al
Standa	rd: FCC Clas	s B 3M Rad	iated			F	ower So	ource:	AC 120	V/60Hz
Test ite	em: Radiatio	n Test				[Date: 18/	06/06/		
Temp.((C)/Hum.(%) 23 C/4	8 %			7	lime:			
EUT:		tocol Gatew				E	Engineer	Signat	ure: W	ADE
Mode:	TX 2405M						Distance:			
Model:	6AA-GW-2	ZB-H0								
Manufa	acturer: LEED	ARSON LIC	SHTING C	O., LTD.						
Note:				21.23.24 - 42.25.27.23.25.25						
Note.										
90.0) dBuV/m								1. 1.4	
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30										
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20										
10										
0.0	8000.000		20000							26500.0 MHz
No.	Freq.	Reading	Factor	Result		Margin	Detector	Height (cm)	Degree (deg.)	Remark
1	(MHz) 23100.178	(dBuV/m) 10.17	(dB) 39.67	(dBuV/m) 49.84	(dBuV/m) 74.00	(dB) -24.16	peak	(on)	(uog.)	
2	23100.178	-0.26	39.67	39.41	54.00	-14.59	Contraction and Contraction of Contr			



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F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Job N	o.: LGW2018	#1358				F	Polarizati	on: \	/ertical			
Stand	ard: FCC Clas	s B 3M Rad	liated			F	Power Source: AC 120V/60Hz					
Test if	tem: Radiatio	n Test				[Date: 18/	06/06/				
Temp	.(C)/Hum.(%) 23 C/4	8 %			-	Time:					
EUT:		tocol Gatew				E	Engineer	Signat	ure: W	ADE		
Mode	TX 2405M	Hz					Distance:					
Mode	: 6AA-GW-2	ZB-H0										
Manu	facturer: LEED	ARSON LIC	SHTING C	O., LTD.								
Note:												
Note.												
90	.0 dBuV/m											
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0.0	1											
	18000.000		20000							26500.0 MHz		
	Free	Deeding	Fastar	Desult	Limit	Marri	1					
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	39.38	49.92	74.00	-24.08	peak					
2	22509.254	0.16	39.38	39.54	54.00	-14.46	10 C					





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Job N	o.: LGW2018	#1360		Polarization: Horizontal							
Stand	ard: FCC Clas	s B 3M Rad	liated			F	Power Source: AC 120V/60Hz				
Test if	tem: Radiatio	on Test				C.	Date: 18/	06/06/			
Temp	.(C)/Hum.(%) 23 C/4	8 %			٦	Time:				
EUT:		otocol Gatew				E	Engineer	Signat	ure: W	/ADE	
Mode	TX 2445M	IHz				[Distance:	3m			
Mode	: 6AA-GW-2	ZB-H0									
Manut	facturer: LEED	ARSON LIC	SHTING C	O., LTD.							
Note:											
Hote.											
90	.0dBuV/m										
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60											
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	18000.000		20000							26500.0 MHz	
	Freq.	Reading	Factor	Result	Limit	Margin		Height	Degree		
No.	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Detector	(cm)	(deg.)	Remark	
1	23624.237	10.36	40.13	50.49	74.00	-23.51	peak				
2	23624.237	0.21	40.13	40.34	54.00	-13.66	AVG				



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F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

Job N	o.: LGW2018	#1361				F	Polarization: Vertical					
Stand	ard: FCC Clas	s B 3M Rad	liated			F	Power Sc	ource:	AC 120	V/60Hz		
Test if	em: Radiatic	on Test				[Date: 18/06/06/					
Temp	.(C)/Hum.(%) 23 C/4	8 %			٦	Time:					
EUT:	Multi-Pro	otocol Gatew	/ay			E	Engineer Signature: WADE					
Mode	TX 2445M	IHz				[Distance:	3m				
Mode	: 6AA-GW-2	ZB-H0										
Manut	facturer: LEED	DARSON LIC	SHTING C	O., LTD.								
Note:												
90	.0 dBuV/m								E_34			
			2 2 2 2						limit1:			
80												
70												
10												
60												
									1			
50	in manufacture and the	and the second second second	Procession and a second	en fillen and a state of the	and the second second second	munition	participation and the second	With the second second	are mouth			
40									2			
30			·¦									
20			· k									
10]									
0.0	18000.000		20000							26500.0 MHz		
	10000.000		20000							2000.0 MH2		
No.	Freq.	Reading	Factor	Result	Limit	Margin	Detector	Height	Degree	Remark		
and the second	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg.)			
1	24832.838	9.33	40.83	50.16	74.00	-23.84	peak					
2	24832.838	-0.62	40.83	40.21	54.00	-13.79	AVG					



ATC ATC[®]

ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

Job N	o.: LGW2018	#1363				F	Polarization: Horizontal						
Stand	ard: FCC Clas	s B 3M Rad	iated			F	Power Source: AC 120V/60Hz						
Test if	tem: Radiatio	n Test				[Date: 18/06/06/						
Temp	.(C)/Hum.(%) 23 C/4	8 %			1	Time:						
EUT:	Multi-Pro	tocol Gatew	ay			E	Engineer Signature: WADE						
Mode	TX 2480M		[Distance: 3m									
Mode	: 6AA-GW-2	ZB-H0											
Manu	facturer: LEED	DARSON LIC	SHTING CO	D., LTD.									
Note:													
90	.0 dBuV/m								limit1:				
										· · · · · · · · · · · · · · · · · · ·			
80													
70													
A	2												
60													
50						1							
50	marine manage	have an an an and the second	Annal and a second second	hard and a start a start and a start a start a start a start a	and the second second	monum	the work of the second	comphiles being an	and a special stand	and the second second			
40						2 9							
30													
20													
20													
10													
0.0	,												
	, 18000.000		20000							26500.0 MHz			
	_												
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark			
1	22931.044	10.43	39.61	50.04	74.00	-23.96	peak	(2.11)	(9.)				
2	22931.044	0.96	39.61	40.57	54.00	-13.43	•						



A	TC®	F1	,Bldg,A,Cl	TE TECH hangyuan Ne dustry Park,I	ew Material	Port Ke	yuan Rd	,		Site: 2# Chamber +86-0755-26503290 (:+86-0755-26503396			
Job No	b.: LGW2018	#1362				F	^o larizati	on: \	/ertical				
Standa	ard: FCC Clas	s B 3M Rad	iated			F	Power Sc	ource:	AC 120)V/60Hz			
Test ite	em: Radiatio	on Test				[Date: 18/	06/06/					
Temp.	Temp.(C)/Hum.(%) 23 C / 48 %						Time:						
EUT:	Multi-Pro	otocol Gatew	ay			E	Engineer	Signat	ure: W	VADE			
Mode:	TX 2480M	lHz					Distance:	3m					
Model:	6AA-GW-2	ZB-H0											
Manufa	acturer: LEED	DARSON LIC	GHTING C	O., LTD.									
90.0	0 dBu∀/m								limit1				
									miner	3			
80 70													
60													
50	for the second	Ward and a state of the second	www.aunaranana.com	alan adhread an an an an adh	2	allan sa sa shara a	with the replaced	en versen ander ander an	an any fear and a second	1000-000-0-000-0-0-000-0-0-000-0-0-000-0-			
40 30													
20													
10													
0.0													
1	18000.000		20000							26500.0 MHz			
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark			
1	21798.134	11.22	39.24	50.46	74.00	-23.54	peak						

21798.134

1.32

39.24

40.56

54.00

-13.44

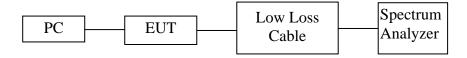
AVG

2



10.99% OCCUPIED BANDWIDTH

10.1.Block Diagram of Test Setup



10.2.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.

10.3.Operating Condition of EUT

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

10.3.2.Turn on the power of all equipment.

10.3.3.Let the EUT work in TX mode then measure it. We select 2405MHz, 2445MHz, 2480MHz TX frequency to transmit.

10.4.Test Procedure

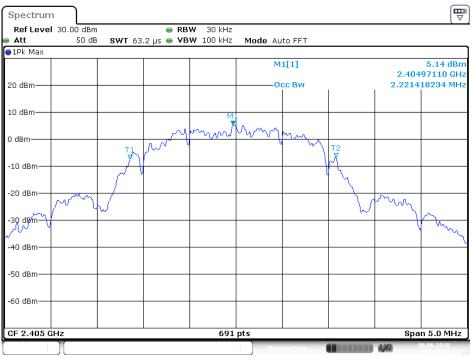
- 10.4.1.The transmitter output was connected to the spectrum analyzer through a low loss cable. The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- 10.4.2. 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.
- 10.4.3.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.
- 10.4.4.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.



10.5.Measurement Result

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2405	2.221
Middle	2445	2.221
High	2480	2.229

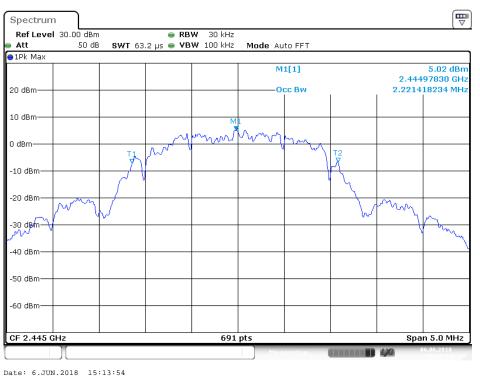
The spectrum analyzer plots are attached as below.



Low Channel 2405MHz

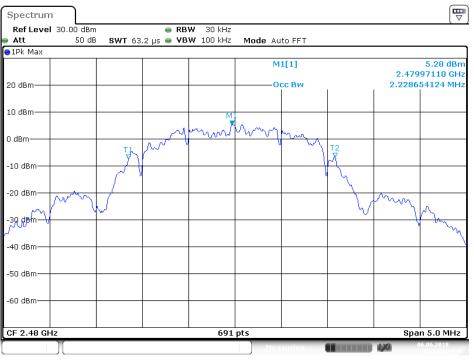
Date: 6.JUN.2018 15:14:27





Middle Channel 2445MHz

High Channel 2480MHz

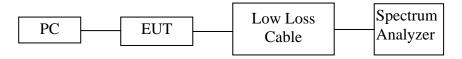


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11.CONDUCTED SPURIOUS EMISSION COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2. 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 15.209(a).

11.3.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.

11.4.Operating Condition of EUT

- 11.4.1.Setup the EUT and simulator as shown as Section 11.1.
- 11.4.2.Turn on the power of all equipment.
- 11.4.3.Let the EUT work in TX mode then measure it. We select 2405MHz, 2445MHz, 2480MHz TX frequency to transmit.



11.5.Test Procedure

- 11.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 11.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz
- 11.5.3.The Conducted Spurious Emission was measured and recorded.

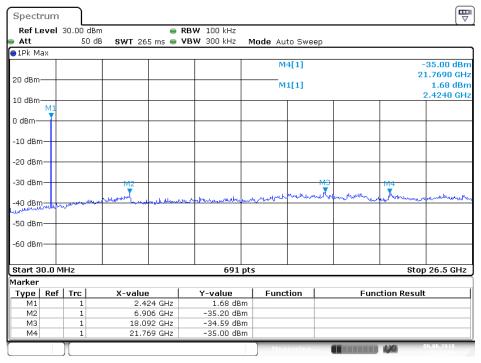
11.6.Test Result

Pass.

The spectrum analyzer plots are attached as below.

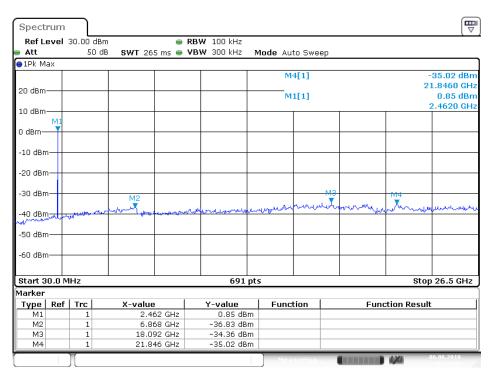


Low Channel



Date: 6.JUN.2018 15:23:56

Middle Channel



Date: 6.JUN.2018 15:22:44



High Channel

Spectr	um														
Ref Le	vel	30.00 d	Bm		•	RBW	100 kHz								
Att		50	dB SW	T 26	5 ms 👄	VBW	300 kHz	M	ode Au	to Swe	ер				
∍1Pk Ma	x														
									M	4[1]				-35.22 dBn	
20 dBm-													1	9.3940 GH	
20 00111									M	1[1]			1.28 dBm		
10 dBm-	_												1	2.4620 GH	
	М1														
0 dBm—	-		_												
-10 dBm-															
00 Jp															
-20 dBm-															
-30 dBm-															
-50 ubm			M	2							M3				
-40 dBm-		أسهامها مدوران	mont	ر. مود مها	-	alley the	mason	m	Marchanol	where	ales you	www.	a how we dere not	pulumente	
Johnson	~~p~	~													
-50 dBm-	_														
-60 dBm-															
Start 30	.0 M	IHz					691	pts					Sto	26.5 GHz	
/larker															
Type	Ref	Trc	Х-	value			Y-value	1	Fund	tion		Fun	ction Resul	t	
M1		1		2.4	52 GHz	1.28 di		m							
M2		1			.6 GHz		-36.70 dB								
			-35.10 dB												
M4		1		19.39	94 GHz		-35.22 dB	m							
									Mea	surina.	1		120	06.06.2018	

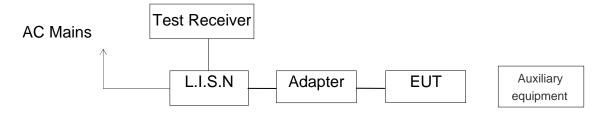
Date: 6.JUN.2018 15:21:24



12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

15 SECTION 15.207(A)

12.1.Block Diagram of Test Setup



(EUT: Multi-Protocol Gateway)

12.2. Power Line Conducted Emission Measurement Limits

Frequency	Limit dB(μV)								
(MHz)	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 sh	all apply at the transition fre	quencies.							
NOTE2: The limit decreases linearly with the logarithm of the frequency in the									
range 0.15MHz to	range 0.15MHz to 0.50MHz.								

12.3.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.



12.4.Operating Condition of EUT

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

12.4.2.Turn on the power of all equipment.

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

12.5.Test Procedure

The EUT is put on the plane 0.8m 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.

12.6.Power Line Conducted Emission Measurement Results

PASS.

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



Test mode : Zigbee OPERATION(AC 120V/60Hz)												
MEASUREMENT RESULT: "TUV-0614-4_fin"												
6/14/2018 Frequency MHz	Level dBµV		Limit dBµV	Margin dB	Detector	Line	PE					
0.305000 0.465000 1.865000 9.740000	38.00 37.80 36.00 39.00	10.6 10.7 11.0 11.3	57	22.1 18.8 20.0 21.0	QP QP	L1 L1 L1 L1	GND GND GND GND					
MEASUREMENT RESULT: "TUV-0614-4_fin2"												
6/14/2018 Frequency MHz	Level dBµV		Limit dBµV	Margin dB	Detector	Line	PE					
0.290000 0.410000 2.690000 16.165000	30.10 33.60 27.50 34.60	10.6 10.7 11.0 11.4	48 46	20.4 14.0 18.5 15.4	AV	L1 L1 L1 L1	GND GND GND GND					
MEASUREMENT	RESULT	: "TUV-	0614-3	_fin"								
6/14/2018 Frequency MHz			Limit dBµV	-	Detector	Line	PE					
0.410000 2.160000 4.990000 5.920000	38.60 32.70 34.80 39.30	11.0 11.2	58 56 50	19.0 23.3 21.2 20.7	QP QP QP QP	N N N	GND GND GND GND					
MEASUREMENT	RESULT	: "TUV-	0614-3	_fin2"								
6/14/2018 Frequency MHz	Level dBµV		Limit dBµV	2	Detector	Line	PE					
0.410000 2.050000 2.930000 23.125000	28.60 22.70 21.60 32.00	10.7 11.0 11.1 11.4	48 46 46 50	19.0 23.3 24.4 18.0	AV AV AV AV	N N N N	GND GND GND GND					

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

The spectral diagrams are attached as below.

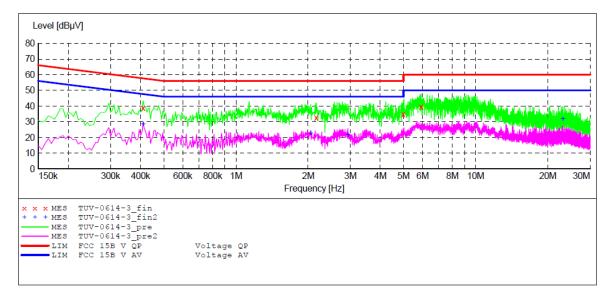


CONDUCTED EMISSION STANDARD FCC PART 15

EUT:Multi-Protocol Gateway M/N:6AA-GW-ZB-H0Manufacturer:LeedarsonOperating Condition:Zigbee OperationTest Site:1#Shielding RoomOperator:WADETest Specification:N 120V/60HzComment:Mains portStart of Test:6/14/2018 /

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

\sim	сам тарыы.						
	Short Desci	ription:	SI	UB STD VTE	RM2 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			



MEASUREMENT RESULT: "TUV-0614-3 fin"

6/14/2018 Frequency Level Transd Limit Margin Detector Line PE MHz dBµV dB dBµV dB 0.410000 38.60 10.7 58 19.0 QP Ν GND 32.70 56 23.3 QP 2.160000 11.0 Ν GND 11.2 21.2 QP 4.990000 34.80 56 Ν GND 5.920000 39.30 20.7 OP GND 11.2 60 Ν

MEASUREMENT RESULT: "TUV-0614-3 fin2"

6/14/2018 Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.410000	28.60	10.7	48		AV	N	GND
2.050000	22.70	11.0	46		AV	N	GND
2.930000	21.60	11.1	46		AV	N	GND
23.125000	32.00	11.4	50		AV	N	GND

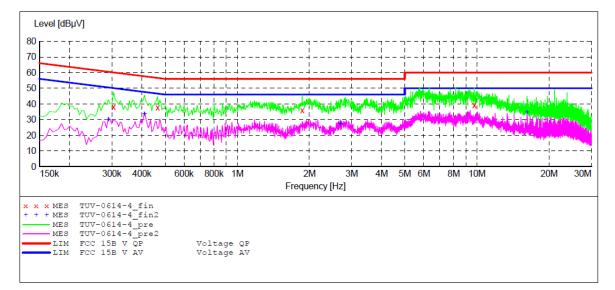


CONDUCTED EMISSION STANDARD FCC PART 15

EUT:Multi-Protocol Gateway M/N:6AA-GW-ZB-H0Manufacturer:LeedarsonOperating Condition:Zigbee OperationTest Site:1#Shielding RoomOperator:WADETest Specification:L 120V/60HzComment:Mains portStart of Test:6/14/2018 /

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

DOAN IADDD					
Short Desc	ription:	5	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		



MEASUREMENT RESULT: "TUV-0614-4 fin"

6/14/2018 Level Transd Limit Margin Detector Line PE Frequency MHz dBµV dB dBµV dB 10.6 38.00 0.305000 22.1 60 QP L1GND 0.465000 37.80 10.7 57 18.8 QP GND L120.0 QP 1.865000 36.00 11.0 56 GND L1 9.740000 39.00 11.3 60 21.0 QP L1GND

MEASUREMENT RESULT: "TUV-0614-4 fin2"

6/14/2018 Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.290000	30.10	10.6	51	20.4	AV	L1	GND
0.410000	33.60	10.7	48	14.0	AV	L1	GND
2.690000	27.50	11.0	46	18.5	AV	L1	GND
16.165000	34.60	11.4	50	15.4	AV	L1	GND



13.ANTENNA REQUIREMENT

13.1.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.

13.2.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.