

APPLICATION CERTIFICATION FCC PART 15C  
On Behalf of  
Watchman Door SL

wMOT  
Model No.: wMOT

FCC ID: 2ATNBWMOT

Prepared for : Watchman Door SL  
Address : Torrent Tortuguer 42, Nave 8, Barberà del Vallès, 08210 Spain  
  
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

Tel: (0755) 26503290  
Fax: (0755) 26503396

Report No. : ATE20190881  
Date of Test : May 14-June 10, 2019  
Date of Report : June 11, 2019

## TABLE OF CONTENTS

Description	Page
Test Report Certification	
<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
1.1. Description of Device (EUT).....	5
1.2. Carrier Frequency of Channels .....	5
1.3. Special Accessory and Auxiliary Equipment .....	6
1.4. Description of Test Facility .....	6
1.5. Measurement Uncertainty .....	6
<b>2. MEASURING DEVICE AND TEST EQUIPMENT .....</b>	<b>7</b>
<b>3. OPERATION OF EUT DURING TESTING .....</b>	<b>8</b>
3.1. Operating Mode.....	8
3.2. Configuration and peripherals .....	8
<b>4. TEST PROCEDURES AND RESULTS .....</b>	<b>9</b>
<b>5. 6DB BANDWIDTH TEST.....</b>	<b>10</b>
5.1. Block Diagram of Test Setup.....	10
5.2. The Requirement For Section 15.247(a)(2).....	10
5.3. EUT Configuration on Measurement .....	10
5.4. Operating Condition of EUT .....	10
5.5. Test Procedure .....	10
5.6. Test Result .....	11
<b>6. MAXIMUM PEAK OUTPUT POWER TEST .....</b>	<b>13</b>
6.1. Block Diagram of Test Setup.....	13
6.2. The Requirement For Section 15.247(b)(3).....	13
6.3. EUT Configuration on Measurement .....	13
6.4. Operating Condition of EUT .....	13
6.5. Test Procedure .....	13
6.6. Test Result .....	14
<b>7. POWER SPECTRAL DENSITY TEST.....</b>	<b>16</b>
7.1. Block Diagram of Test Setup.....	16
7.2. The Requirement For Section 15.247(e).....	16
7.3. EUT Configuration on Measurement .....	16
7.4. Operating Condition of EUT .....	16
7.5. Test Procedure .....	17
7.6. Test Result .....	17
<b>8. BAND EDGE COMPLIANCE TEST .....</b>	<b>20</b>
8.1. Block Diagram of Test Setup.....	20
8.2. The Requirement For Section 15.247(d) .....	20
8.3. EUT Configuration on Measurement .....	20
8.4. Operating Condition of EUT .....	20
8.5. Test Procedure .....	21
8.6. Test Result .....	21
<b>9. RADIATED SPURIOUS EMISSION TEST .....</b>	<b>27</b>
9.1. Block Diagram of Test Setup.....	27
9.2. The Limit For Section 15.247(d) .....	28
9.3. Restricted bands of operation .....	29
9.4. Configuration of EUT on Measurement .....	29

9.5.	Operating Condition of EUT .....	30
9.6.	Test Procedure .....	30
9.7.	Data Sample .....	31
9.8.	Test Result .....	31
<b>10.</b>	<b>CONDUCTED SPURIOUS EMISSION COMPLIANCE TEST .....</b>	<b>59</b>
10.1.	Block Diagram of Test Setup.....	59
10.2.	The Requirement For Section 15.247(d) .....	59
10.3.	EUT Configuration on Measurement .....	59
10.4.	Operating Condition of EUT .....	59
10.5.	Test Procedure .....	60
10.6.	Test Result .....	60
<b>11.</b>	<b>AC POWER LINE CONDUCTED EMISSION TEST .....</b>	<b>62</b>
11.1.	Block Diagram of Test Setup.....	62
11.2.	Test System Setup.....	62
11.3.	Test Limits .....	63
11.4.	Configuration of EUT on Measurement .....	63
11.5.	Operating Condition of EUT .....	63
11.6.	Test Procedure .....	63
11.7.	Data Sample.....	64
11.8.	Test Result .....	64
<b>12.</b>	<b>ANTENNA REQUIREMENT.....</b>	<b>67</b>
12.1.	The Requirement .....	67
12.2.	Antenna Construction .....	67

## Test Report Certification

Applicant : Watchman Door SL  
Address : Torrent Tortuguer 42, Nave 8, Barberà del Vallès, 08210 Spain  
Product name : wMOT  
Model No. : wMOT

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 August 24, 2018 KDB558074 D01 DTS Meas Guidance v05 for compliance to FCC 47CFR 15.247 requirements

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

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : May 14-June 10, 2019  
Date of Report : June 11, 2019

Prepared by :



Approved & Authorized Signer :

Sean Liu  
(Sean Liu, Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : wMOT  
Model Number : wMOT  
Bluetooth Version : V4.2  
Frequency Range : 2402-2480MHz  
Modulation Type : GFSK  
Number of Channels : 40 channels  
Channel Spacing : 2MHz  
Antenna Gain : 5.3dBi  
Antenna Type : Integral Antenna  
Power Supply : 24V DC/AC

### 1.2. Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channe 1	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

### 1.3.Special Accessory and Auxiliary Equipment

N/A

### 1.4.Description of Test Facility

EMC Lab : Recognition of accreditation by Federal Communications Commission (FCC)  
The Designation Number is CN1189  
The Registration Number is 708358

Listed by Innovation, Science and Economic Development Canada (ISED)  
The Registration Number is 5077A-2

Accredited by China National Accreditation Service for Conformity Assessment (CNAS)  
The Registration Number is CNAS L3193

Accredited by American Association for Laboratory Accreditation (A2LA)  
The Certificate Number is 4297.01

Name of Firm : Shenzhen Accurate Technology Co., Ltd.  
Site Location : 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

### 1.5.Measurement Uncertainty

Radiated Emission Expanded Uncertainty (9kHz-30MHz) :  $U=2.66\text{dB}$ ,  $k=2$

Radiated Emission Expanded Uncertainty (30MHz-1000MHz) :  $U=4.28\text{dB}$ ,  $k=2$

Radiated Emission Expanded Uncertainty (1G-18GHz) :  $U=4.98\text{dB}$ ,  $k=2$

Radiated Emission Expanded Uncertainty (18G-26.5GHz) :  $U=5.06\text{dB}$ ,  $k=2$

Conduction Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz) :  $U=2.72\text{dB}$ ,  $k=2$

## 2. MEASURING DEVICE AND TEST EQUIPMENT

**Table 1: List of Test and Measurement Equipment**

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	One Year
EMI Test Receiver	Rohde&Schwarz	ESR	101817	Jan. 05, 2019	One Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 05, 2019	One Year
Pre-Amplifier	Agilent	8447D	294A10619	Jan. 05, 2019	One Year
Pre-Amplifier	Compliance Direction	RSU-M2	38322	Jan. 05, 2019	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10S S	N/A	Jan. 05, 2019	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-23 75/2510-60/11SS	N/A	Jan. 05, 2019	One Year
Conducted Emission Measurement Software: ES-K1 V1.71					
Radiated Emission Measurement Software: EZ_EMCA V1.1.4.2					

### 3. OPERATION OF EUT DURING TESTING

#### 3.1. Operating Mode

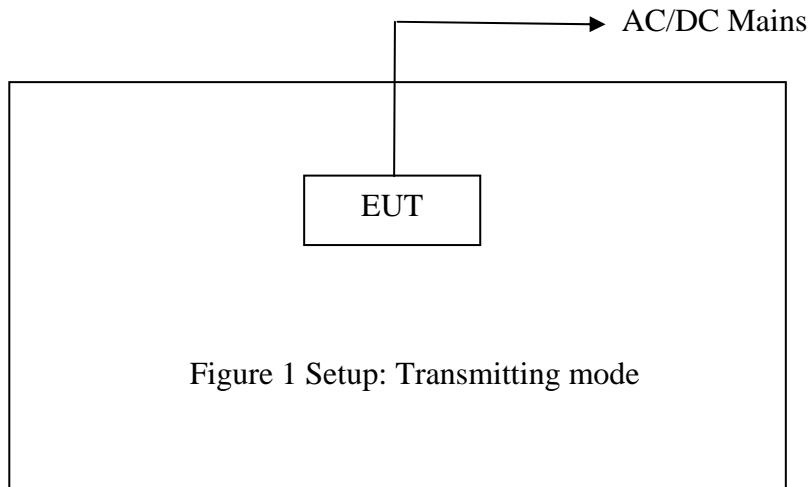
The mode is used: **Transmitting mode**

Low Channel: 2402MHz

Middle Channel: 2440MHz

High Channel: 2480MHz

#### 3.2. Configuration and peripherals



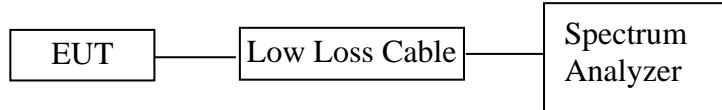
Note: We tested the AC/DC voltage input and only recorded the worst-case data.

#### 4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

## 5. 6DB BANDWIDTH TEST

### 5.1. Block Diagram of Test Setup



### 5.2. The Requirement For 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 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.

### 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 measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

### 5.5. Test Procedure

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

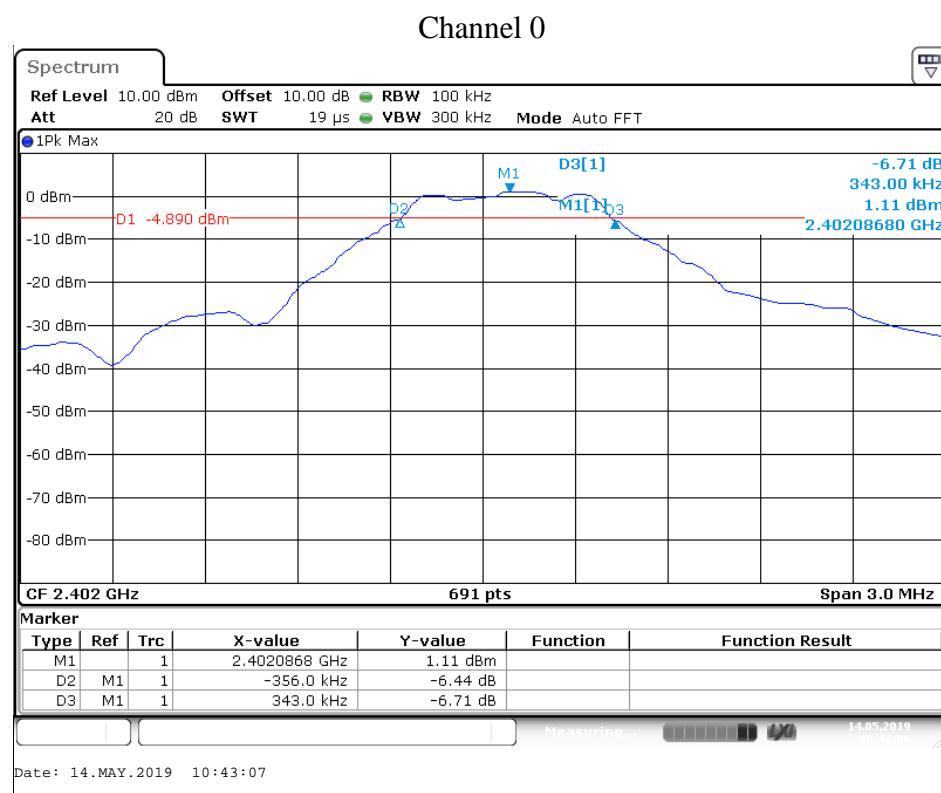
5.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

5.5.3. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

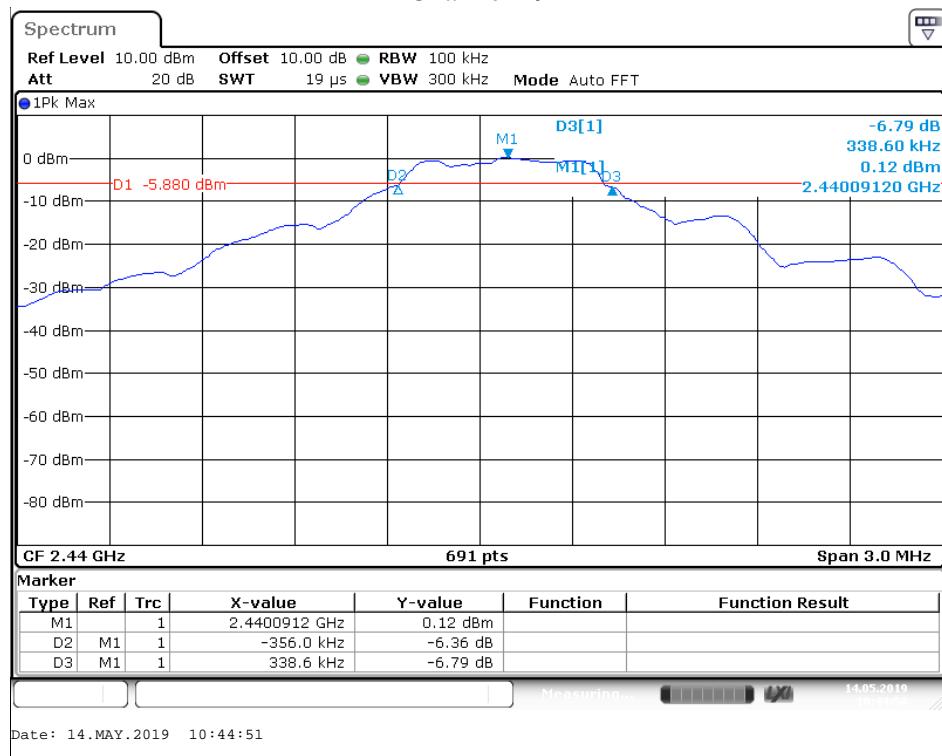
## 5.6. Test Result

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit(MHz)	Result
0	2402	0.699	0.5	Pass
19	2440	0.695	0.5	Pass
39	2480	0.881	0.5	Pass

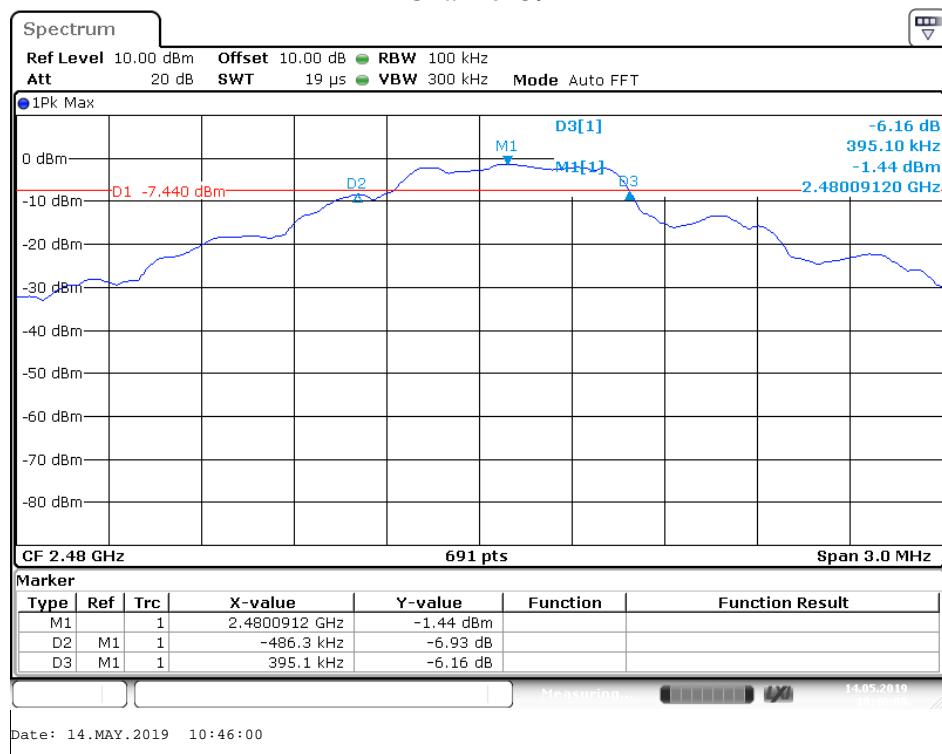
The spectrum analyzer plots are attached as below.



## Channel 19



## Channel 39



## 6. MAXIMUM PEAK OUTPUT POWER TEST

### 6.1. Block Diagram of Test Setup



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

### 6.4. 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 measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

### 6.5. Test Procedure

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

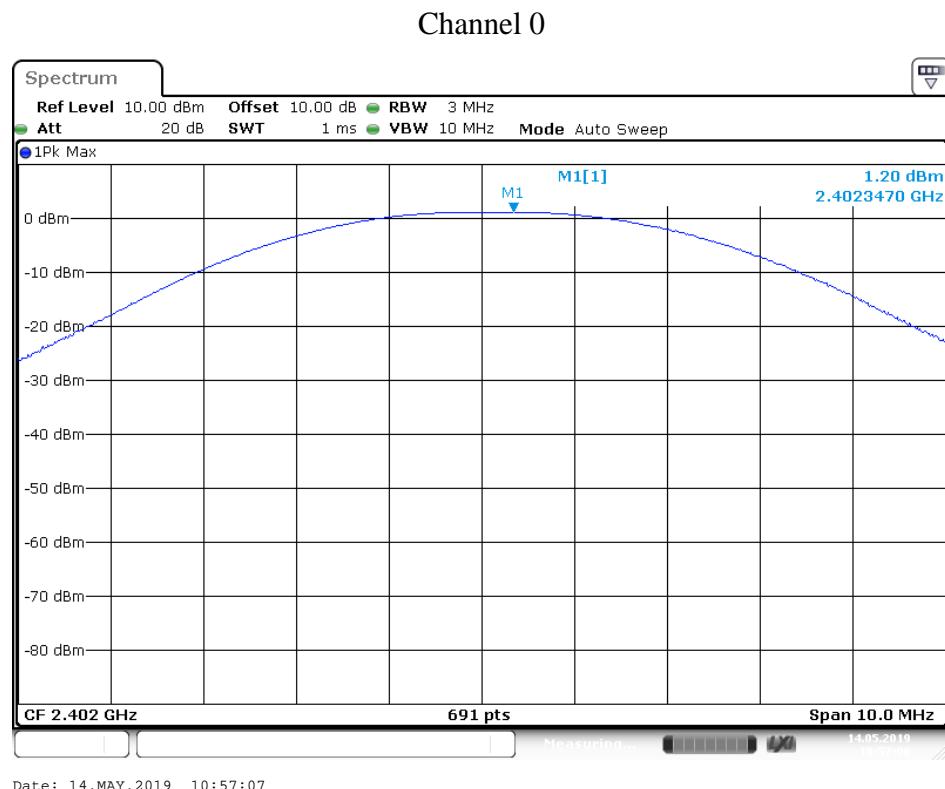
6.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz.

6.5.3. Measurement the maximum peak output power.

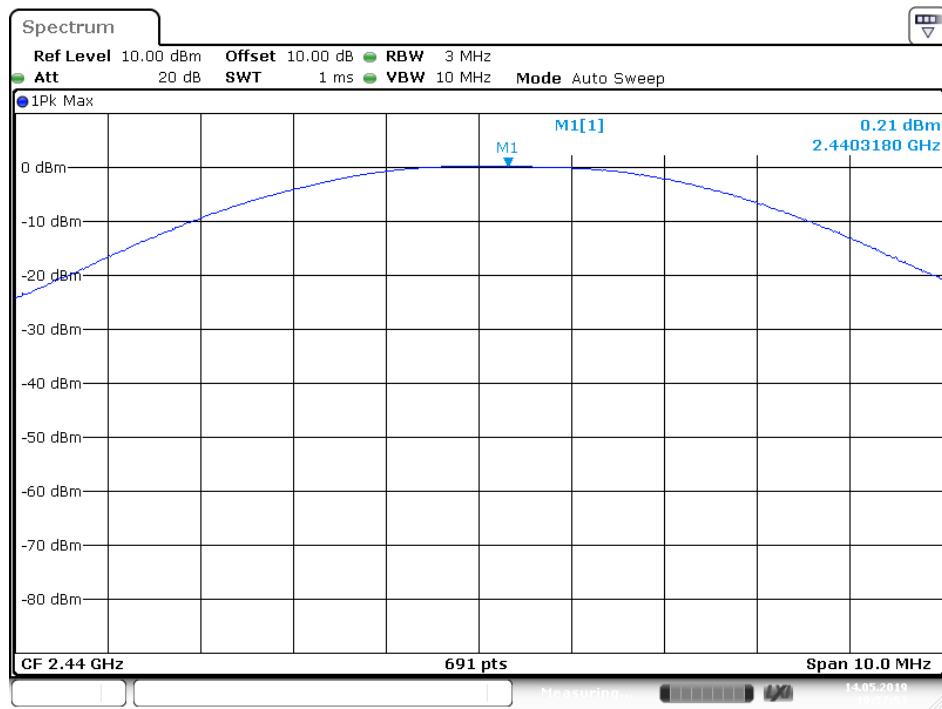
## 6.6. Test Result

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Result
0	2402	1.20	30	Pass
19	2440	0.21	30	Pass
39	2480	-1.37	30	Pass

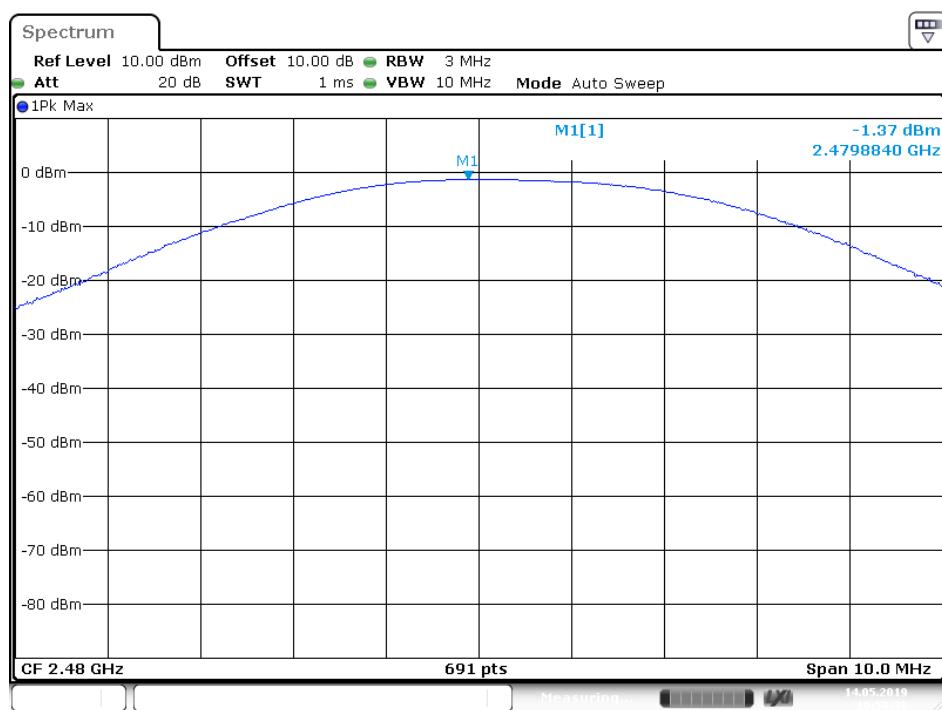
The spectrum analyzer plots are attached as below.



## Channel 19

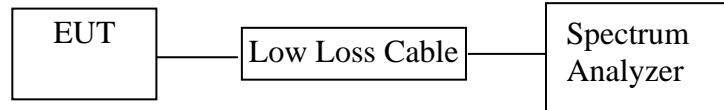


## Channel 39



## 7. POWER SPECTRAL DENSITY TEST

### 7.1. Block Diagram of Test Setup



### 7.2. The Requirement For 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 measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, 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  $\geq 3 \times \text{RBW}$ .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

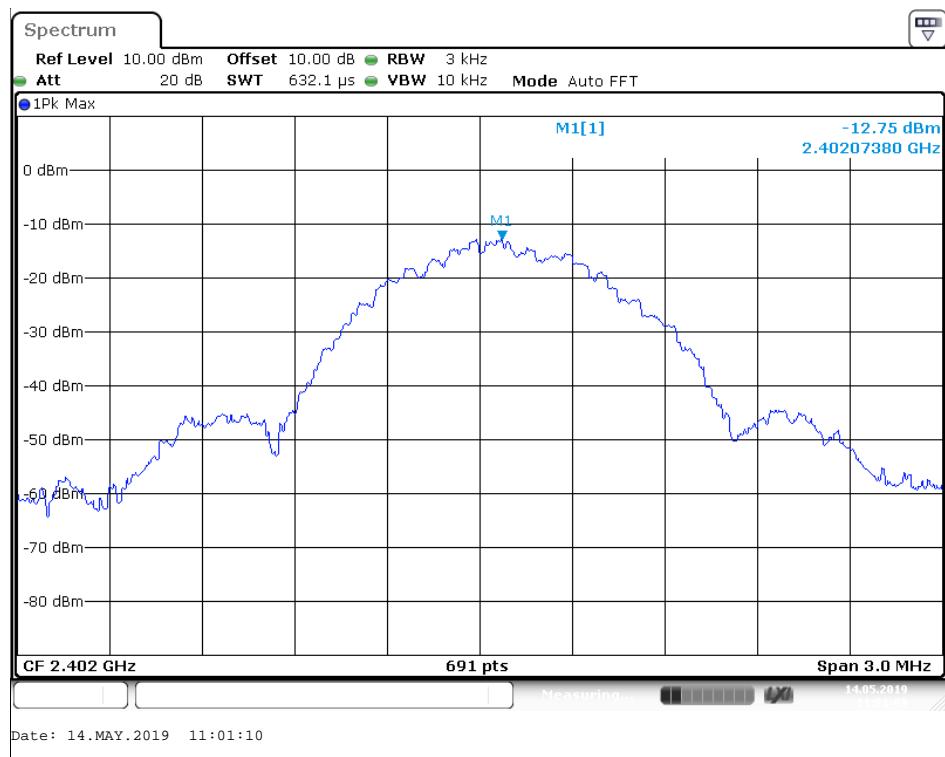
7.5.4. Measurement the maximum power spectral density.

## 7.6. Test Result

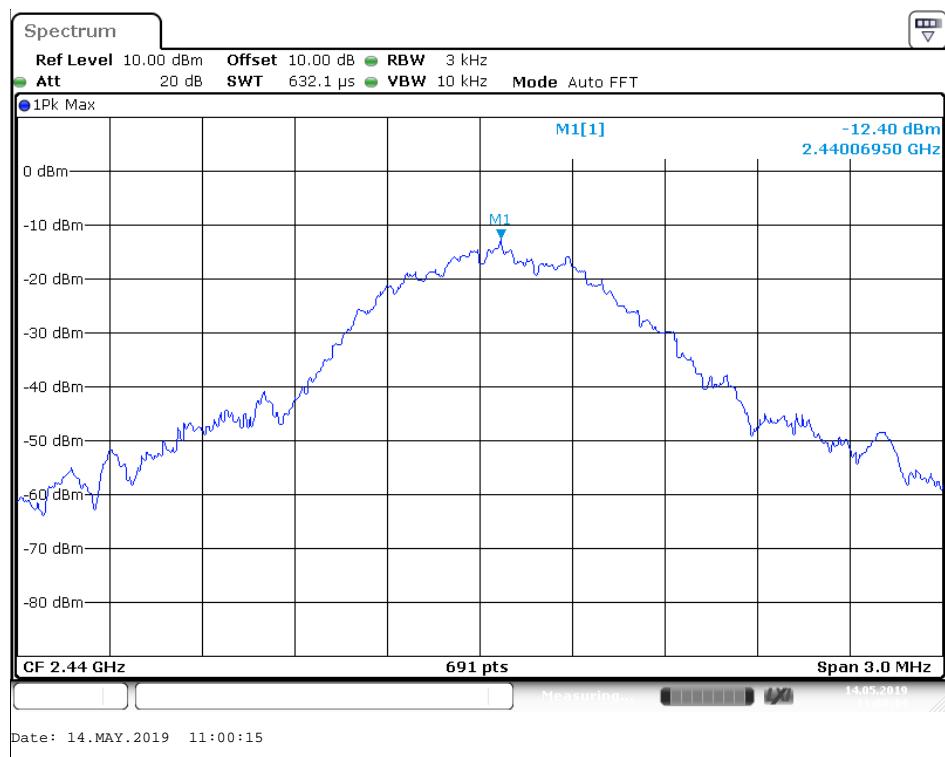
Channel	Frequency (MHz)	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
0	2402	-12.75	8	Pass
19	2440	-12.40	8	Pass
39	2480	-15.21	8	Pass

The spectrum analyzer plots are attached as below.

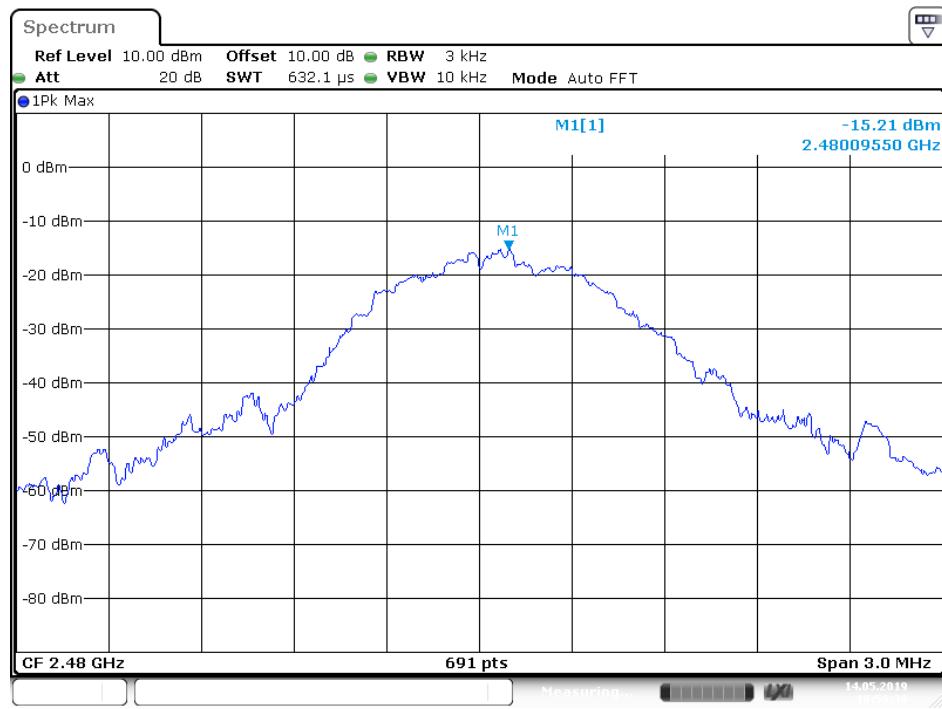
## Channel 0



## Channel 19

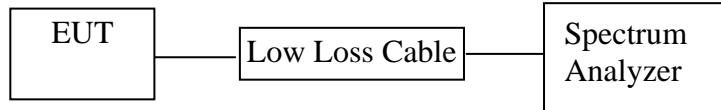


## Channel 39



## 8. BAND EDGE COMPLIANCE TEST

### 8.1. Block Diagram of Test Setup



### 8.2. The Requirement For 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 measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 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 100 kHz and VBW to 300 kHz.

### 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

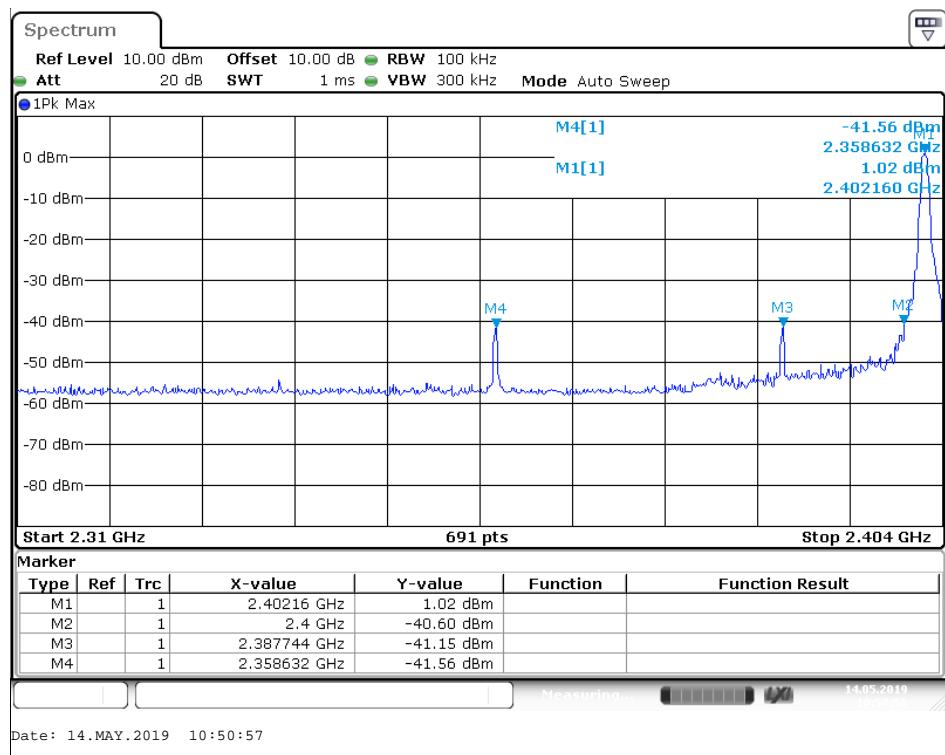
Pass.

### Conducted Band Edge Result

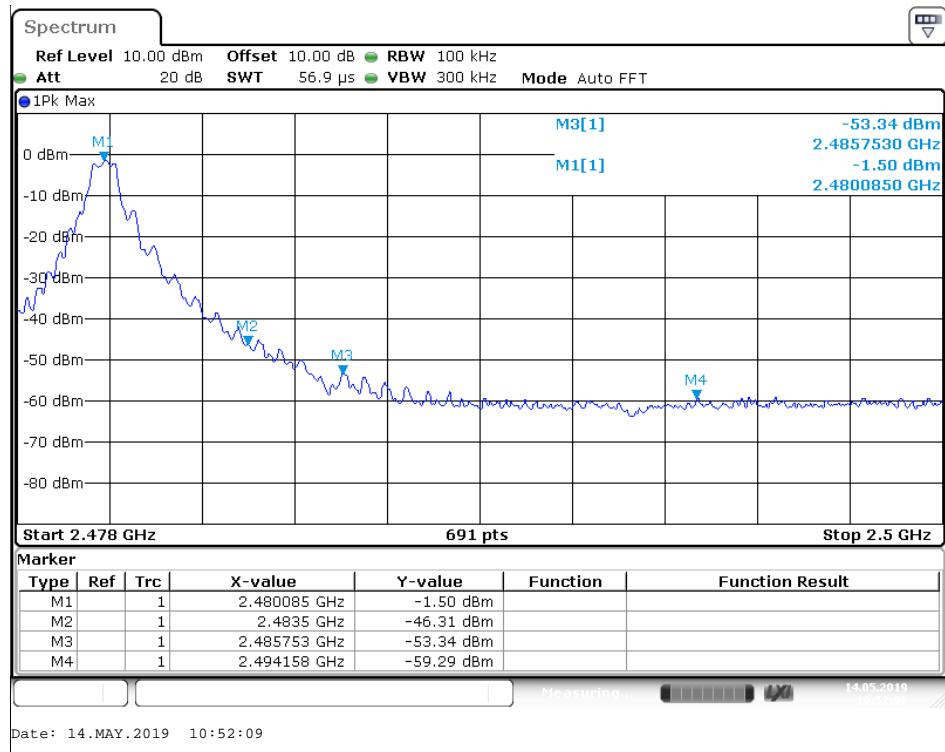
Channel	Frequency	Delta peak to band emission	Limit(dBc)
0	2402MHz	41.62	>20
39	2480MHz	44.81	>20

The spectrum analyzer plots are attached as below.

## Channel 0



## Channel 39





# Radiated Band Edge Result

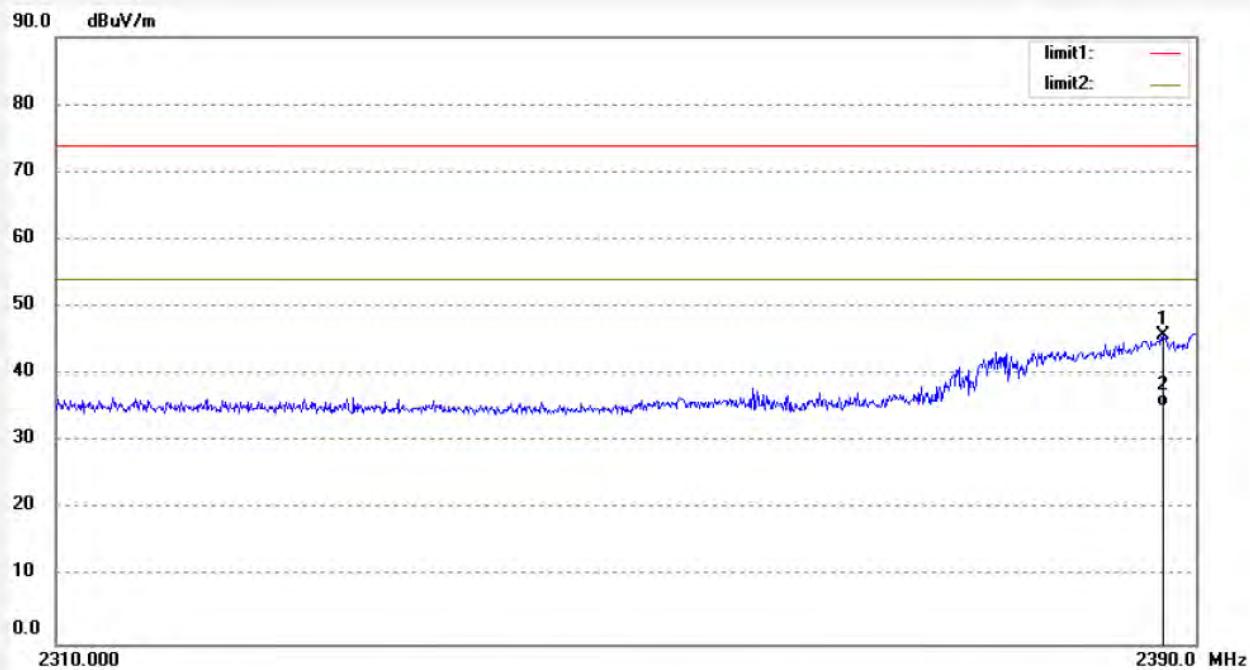
## ACCURATE TECHNOLOGY CO., LTD.

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.:	LGW2019 #1677	Polarization:	Horizontal
Standard:	FCC (Band Edge)	Power Source:	DC 5V
Test item:	Radiation Test	Date:	19/05/17/
Temp.( C)/Hum.(%)	23 C / 48 %	Time:	
EUT:	wMOT	Engineer Signature:	WADE
Mode:	TX 2402MHz	Distance:	3m
Model:	wMOT		
Manufacturer:	Watchman Door SL		

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2387.680	45.00	0.78	45.78	74.00	-28.22	peak			
2	2387.680	34.51	0.78	35.29	54.00	-18.71	AVG			



## ACCURATE TECHNOLOGY CO., LTD.

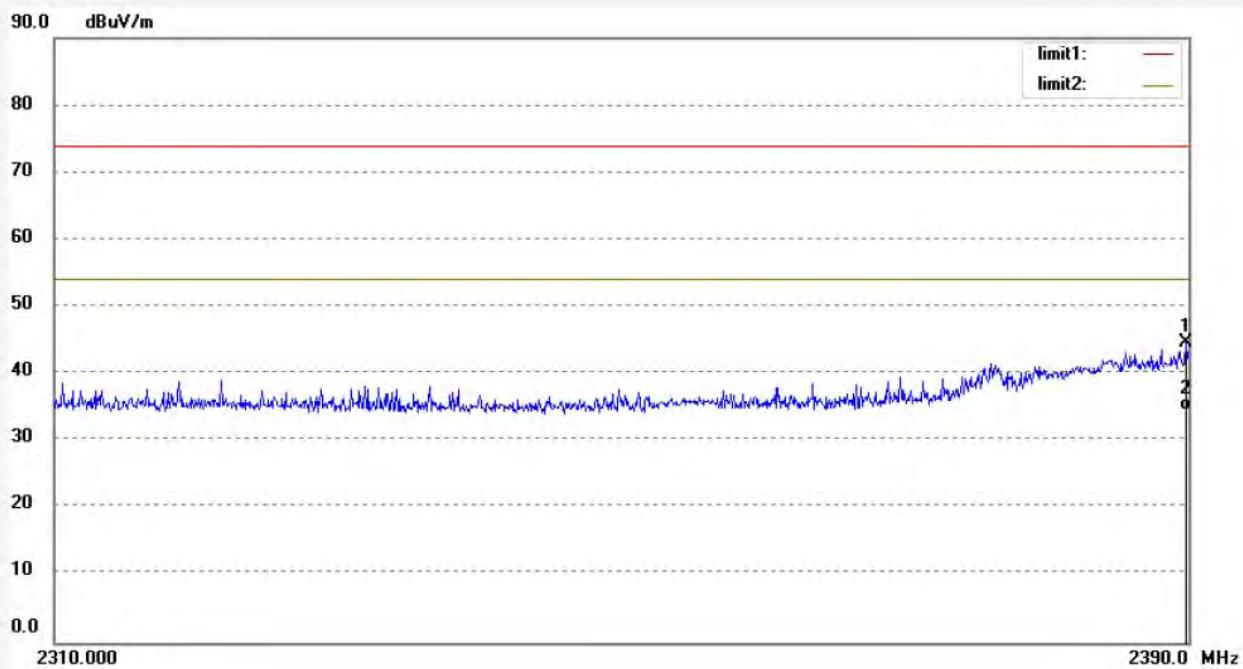
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: LGW2019 #1676  
Standard: FCC (Band Edge)  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 23 C / 48 %  
EUT: wMOT  
Mode: TX 2402MHz  
Model: wMOT  
Manufacturer: Watchman Door SL

Polarization: Vertical  
Power Source: DC 5V  
Date: 19/05/17/  
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	2389.840	43.87	0.79	44.66	74.00	-29.34	peak			
2	2389.840	33.78	0.79	34.57	54.00	-19.43	AVG			



## ACCURATE TECHNOLOGY CO., LTD.

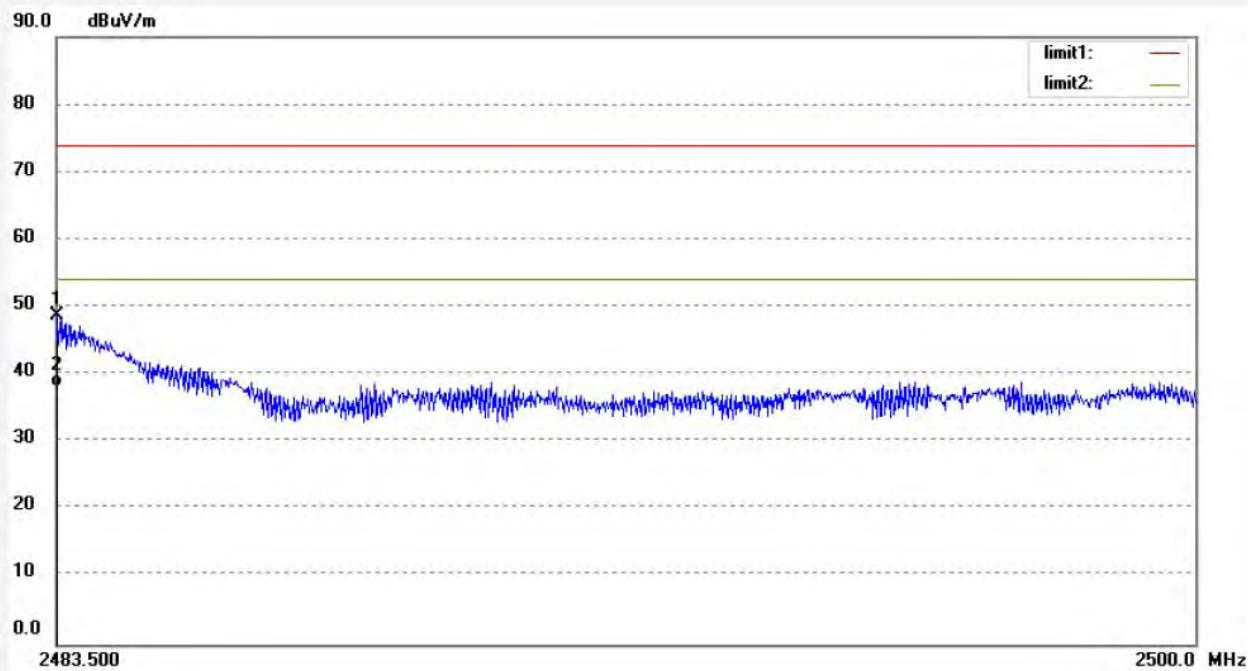
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: LGW2019 #1682  
Standard: FCC (Band Edge)  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 23 C / 48 %  
EUT: wMOT  
Mode: TX 2480MHz  
Model: wMOT  
Manufacturer: Watchman Door SL

Polarization: Horizontal  
Power Source: DC 5V  
Date: 19/05/17/  
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	2483.517	47.72	1.10	48.82	74.00	-25.18	peak			
2	2483.517	37.02	1.10	38.12	54.00	-15.88	AVG			



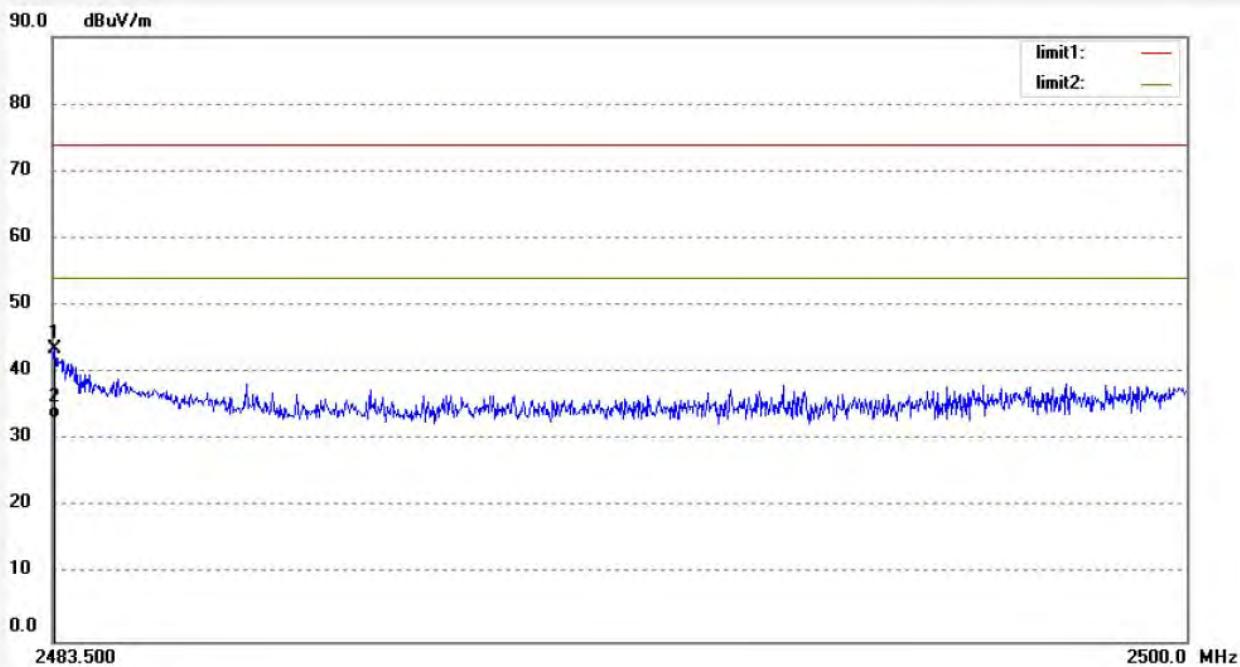
## ACCURATE TECHNOLOGY CO., LTD.

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

Job No.: LGW2019 #1683  
 Standard: FCC (Band Edge)  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: wMOT  
 Mode: TX 2480MHz  
 Model: wMOT  
 Manufacturer: Watchman Door SL

Polarization: Vertical  
 Power Source: DC 5V  
 Date: 19/05/17/  
 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	2483.533	42.47	1.10	43.57	74.00	-30.43	peak			
2	2483.533	32.14	1.10	33.24	54.00	-20.76	AVG			

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:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

## 9. RADIATED SPURIOUS EMISSION TEST

### 9.1. Block Diagram of Test Setup

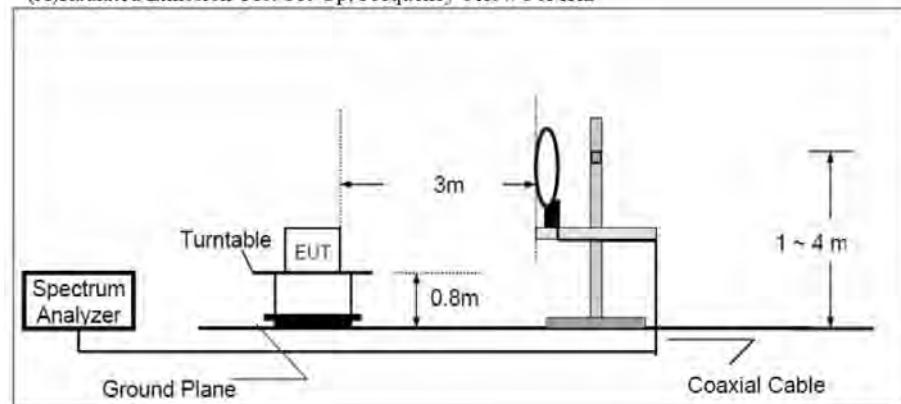
#### 9.1.1. Block diagram of connection between the EUT and peripherals



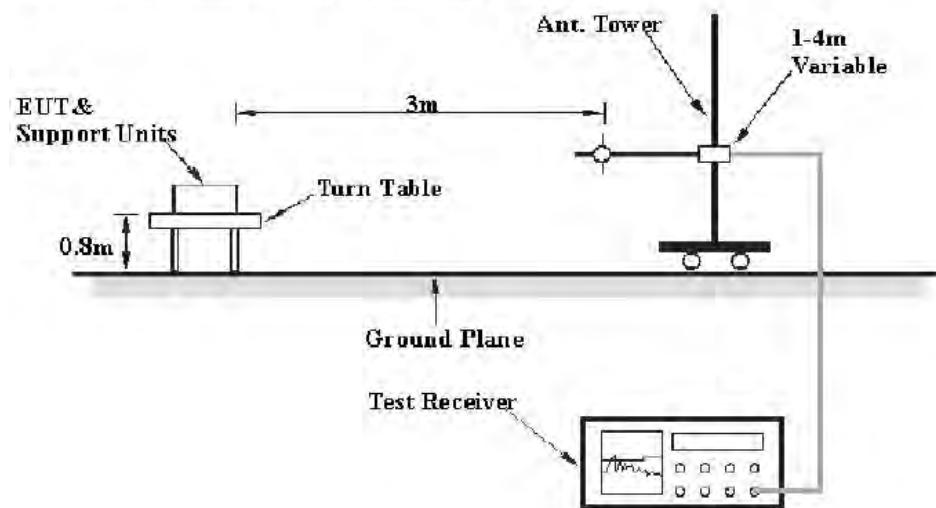
Setup: Transmitting mode

#### 9.1.2. Semi-Anechoic Chamber Test Setup Diagram

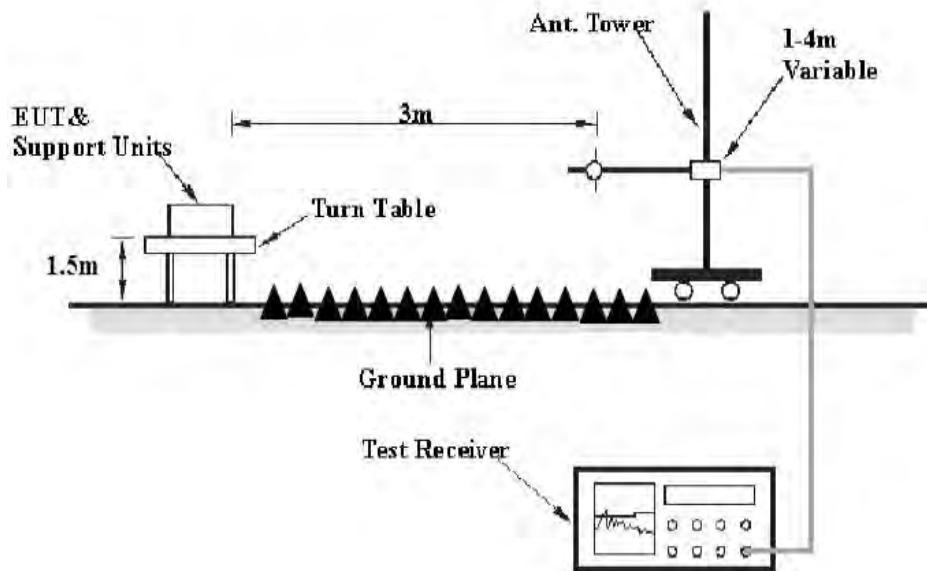
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



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



## 9.2.The Limit For 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:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 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	( <sup>2</sup> )
13.36-13.41			

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510

<sup>2</sup>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 Section 15.209 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 are 2402-2480MHz. We select 2402MHz, 2440MHz, 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. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector. The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading.

## 9.7.Data Sample

Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Remark
X.XX	43.85	-22.22	21.63	43.5	-21.87	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB $\mu$ V) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB $\mu$ V/m) = Reading(dB $\mu$ V) + Factor(dB/m)

Limit (dB $\mu$ V/m) = Limit stated in standard

Margin (dB) = Result(dB $\mu$ V/m) - Limit (dB $\mu$ V/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB $\mu$ V/m)–Limit(dB $\mu$ V/m)

Result(dB $\mu$ V/m)= Reading(dB $\mu$ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

## 9.8.Test Result

**Pass.**

The frequency range from 9kHz to 26.5GHz is checked.

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

The spectrum analyzer plots are attached as below.

## 9kHz-30MHz test data

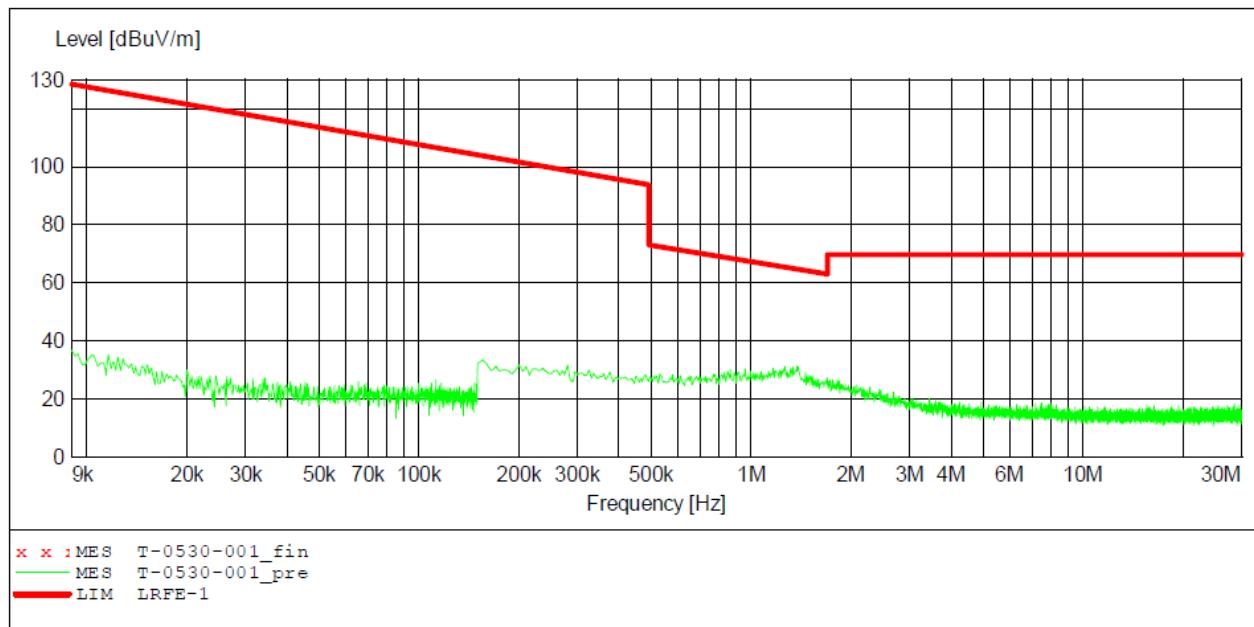
ACCURATE TECHNOLOGY CO., LTD

## FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2402MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: X  
Start of Test: 2019-5-30 /

## SCAN TABLE: "LFRE (E) Fin"

Short Description:		- SUB_STD_VTERM2 1.70		IF	Transducer	
Start	Stop	Step	Detector			
Frequency	Frequency	Width	Meas.	Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516E
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E



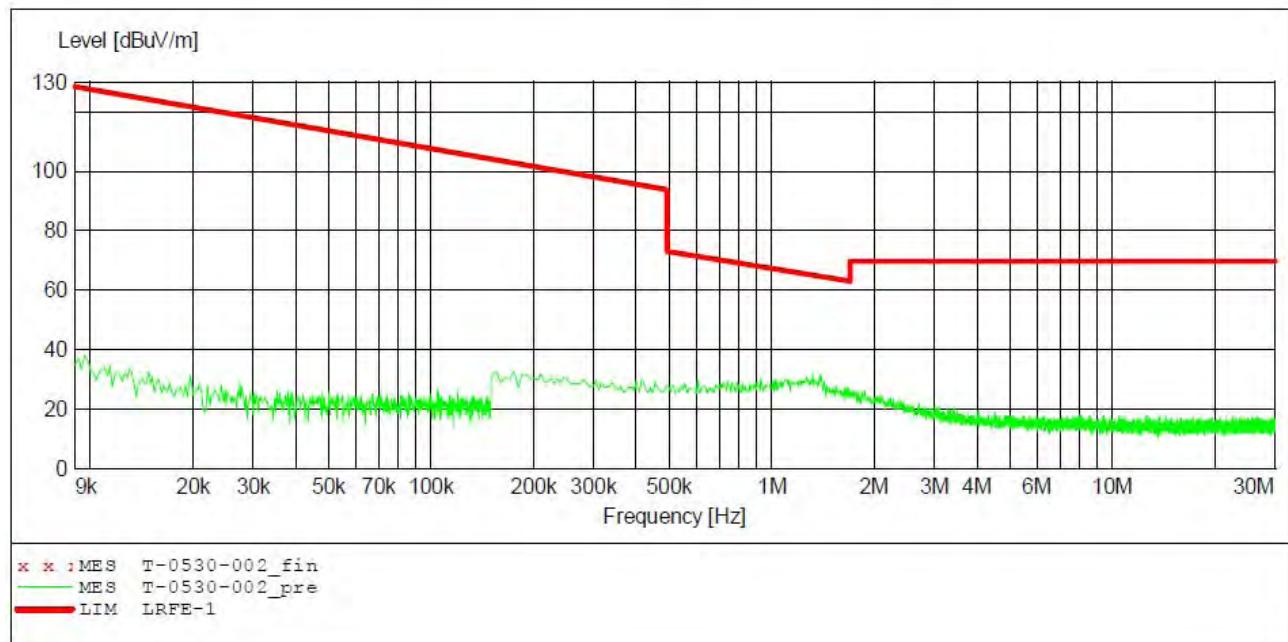
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2402MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: Y  
Start of Test: 2019-5-30 /

**SCAN TABLE: "LFRE (E) 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	1516E	
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E	



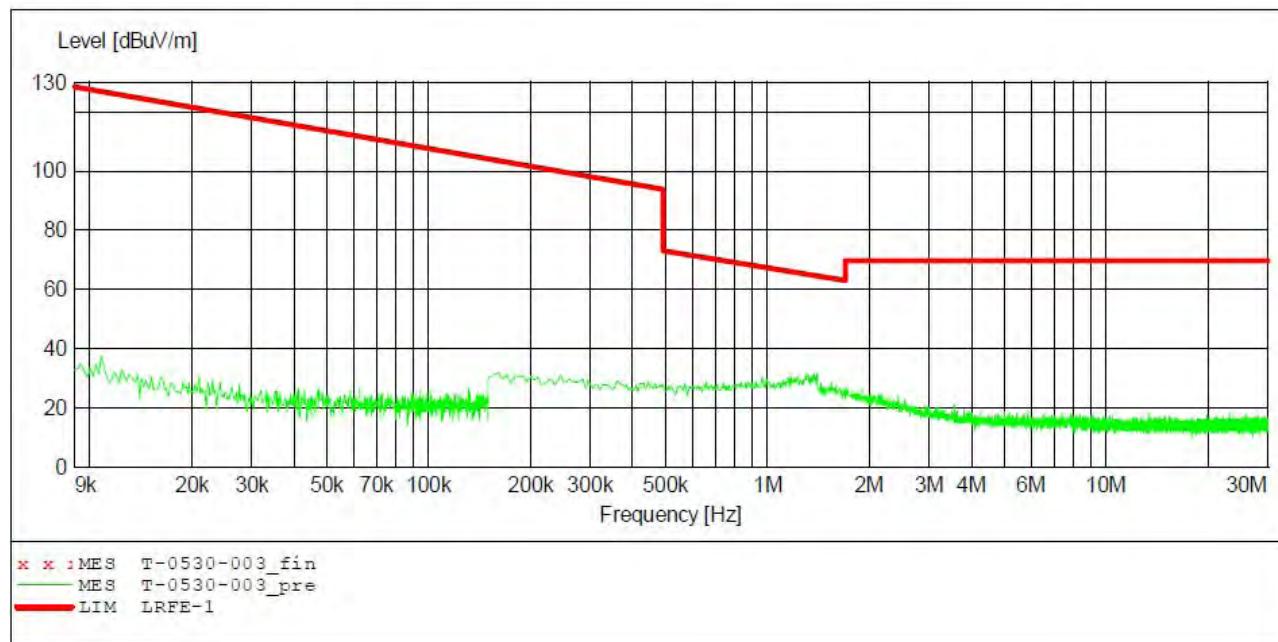
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2402MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: Z  
Start of Test: 2019-5-30 /

**SCAN TABLE: "LFRE (E) Fin"**

Short Description:		_SUB_STD_VTERM2 1.70			
Start	Stop	Step	Detector	Meas.	IF
Frequency	Frequency	Width		Time	Bandw.
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz



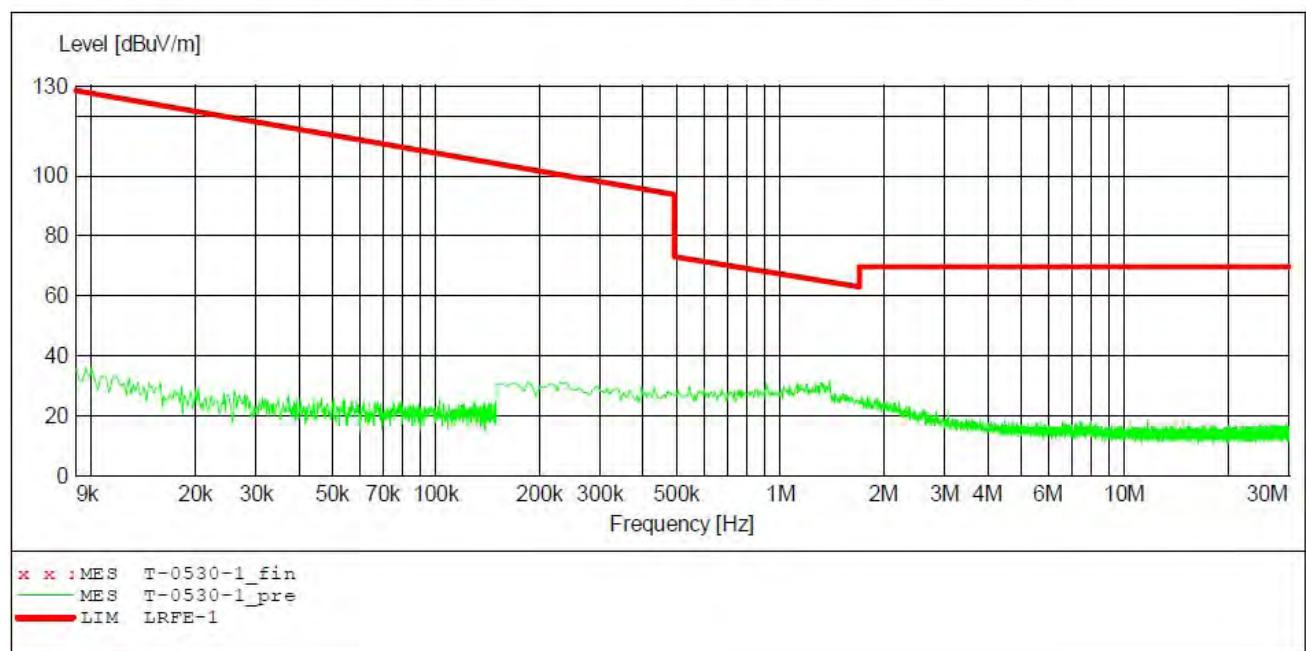
## ACCURATE TECHNOLOGY CO., LTD

## FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2440MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: X  
Start of Test: 2019-5-30 /

## SCAN TABLE: "LFRE (E) Fin"

Short Description:		_SUB_STD_VTERM2 1.70		Detector	Meas.	IF	Transducer
Start	Stop	Step	Width				
Frequency	Frequency	Width		Time		Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz		QuasiPeak	1.0 s	200 Hz	1516E
150.0 kHz	30.0 MHz	5.0 kHz		QuasiPeak	1.0 s	9 kHz	1516E



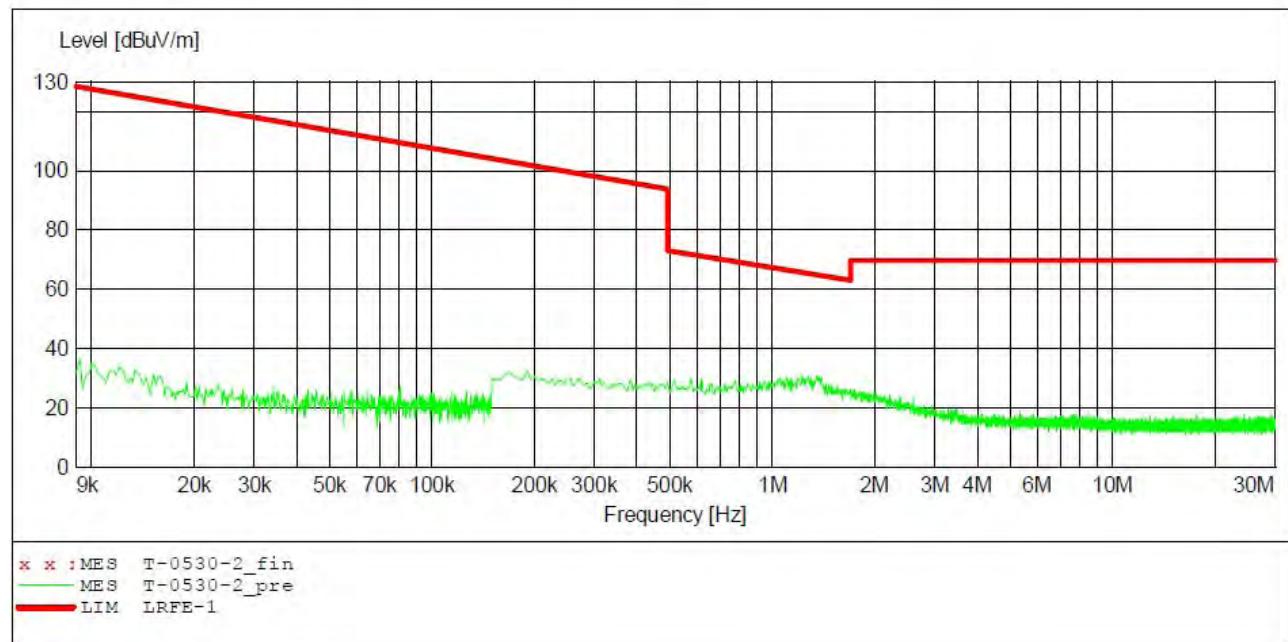
ACCURATE TECHNOLOGY CO., LTD

## FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2440MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: Y  
Start of Test: 2019-5-30 /

## SCAN TABLE: "LFRE (E) Fin"

Short Description:		SUB_STD_VTERM2 1.70				
Start	Stop	Step	Déctor	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516E
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E



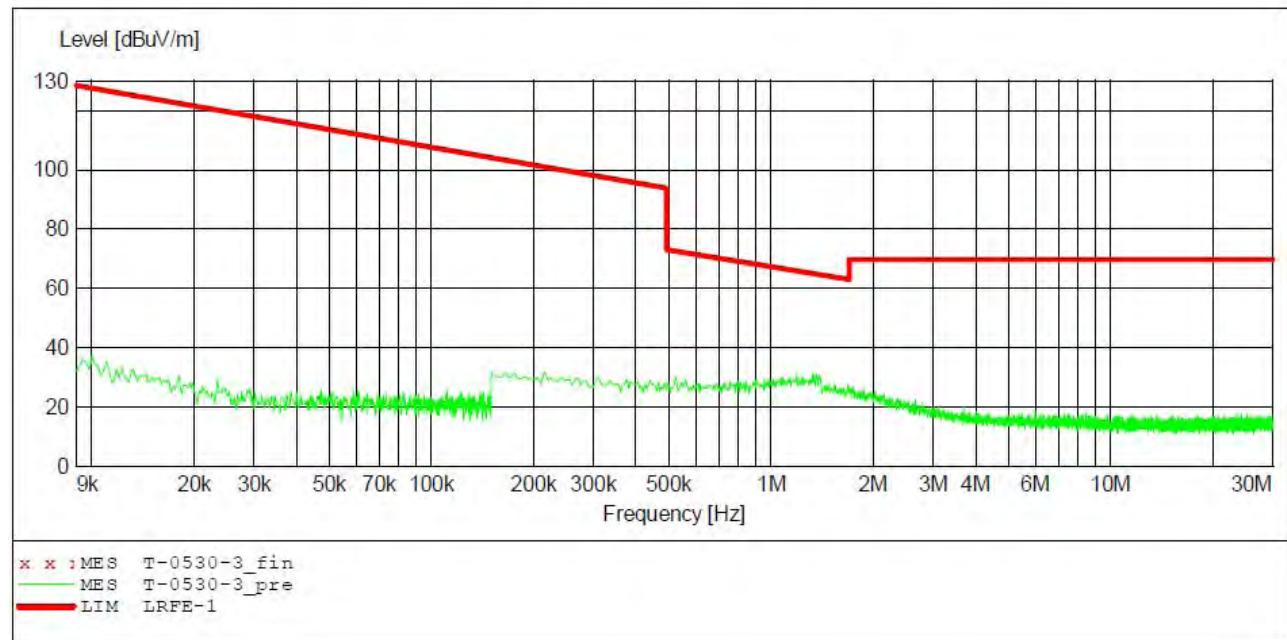
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2440MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: Z  
Start of Test: 2019-5-30 /

**SCAN TABLE: "LFRE (E) 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	1516E	
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E	



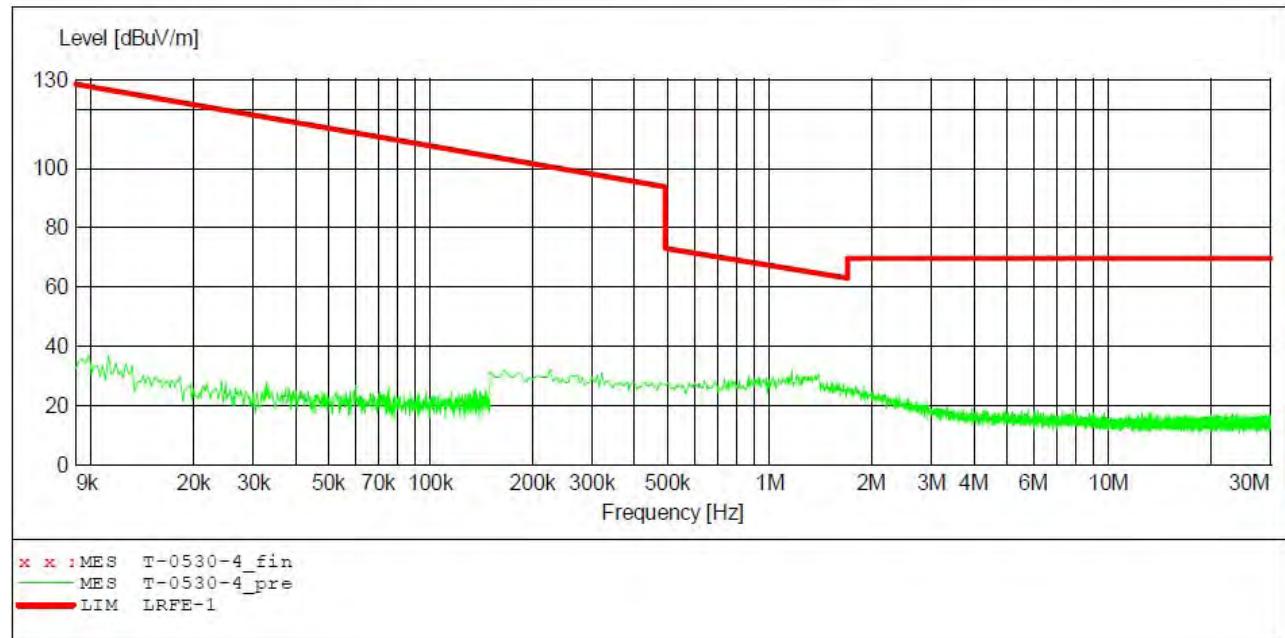
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2480MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: X  
Start of Test: 2019-5-30 /

**SCAN TABLE: "LFRE (E) Fin"**

Short Description:		SUB_STD_VTERM2 1.70				
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF Time	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516E
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E



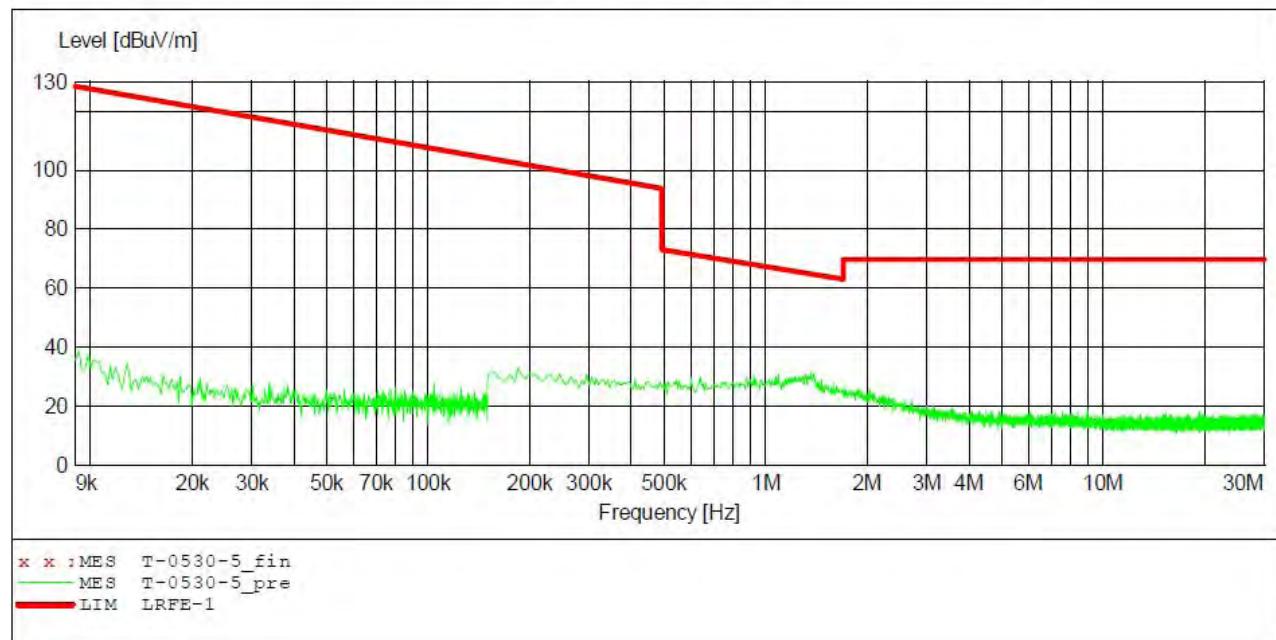
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3m Radiated

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2480MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: Y  
Start of Test: 2019-5-30 /

**SCAN TABLE: "LFRE (E) Fin"**

Short Description:		SUB_STD VTERM2 1.70					
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF Time	Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516E	
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E	

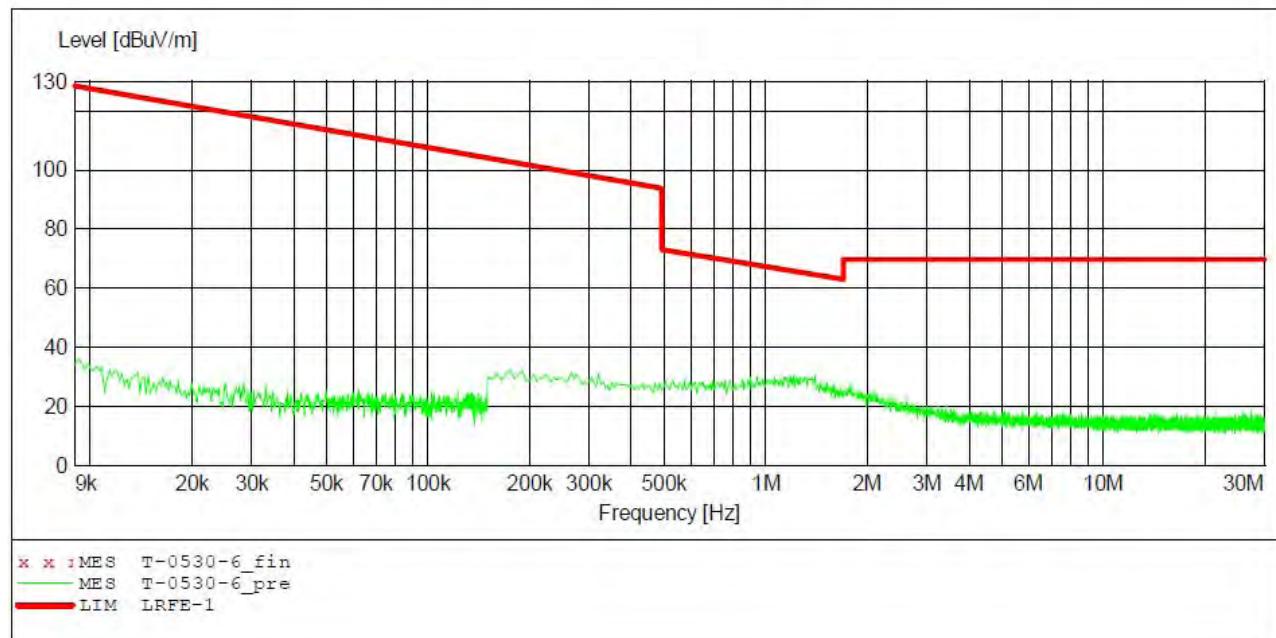


**ACCURATE TECHNOLOGY CO., LTD****FCC Part 15C 3m Radiated**

EUT: wMOT M/N:wMOT  
Manufacturer: Watchman Door SL  
Operating Condition: TX 2480MHz  
Test Site: 2# Chamber  
Operator: WADE  
Test Specification: DC 5V  
Comment: Z  
Start of Test: 2019-5-30 /

**SCAN TABLE: "LFRE (E) Fin"**

Short Description:		SUB_STD_VTERM2 1.70					
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF Time	Transducer	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516E	
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E	



## 30MHz-1000MHz test data



ACCURATE TECHNOLOGY CO., LTD.

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

Job No.: LGW2019 #1690

Polarization: Horizontal

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

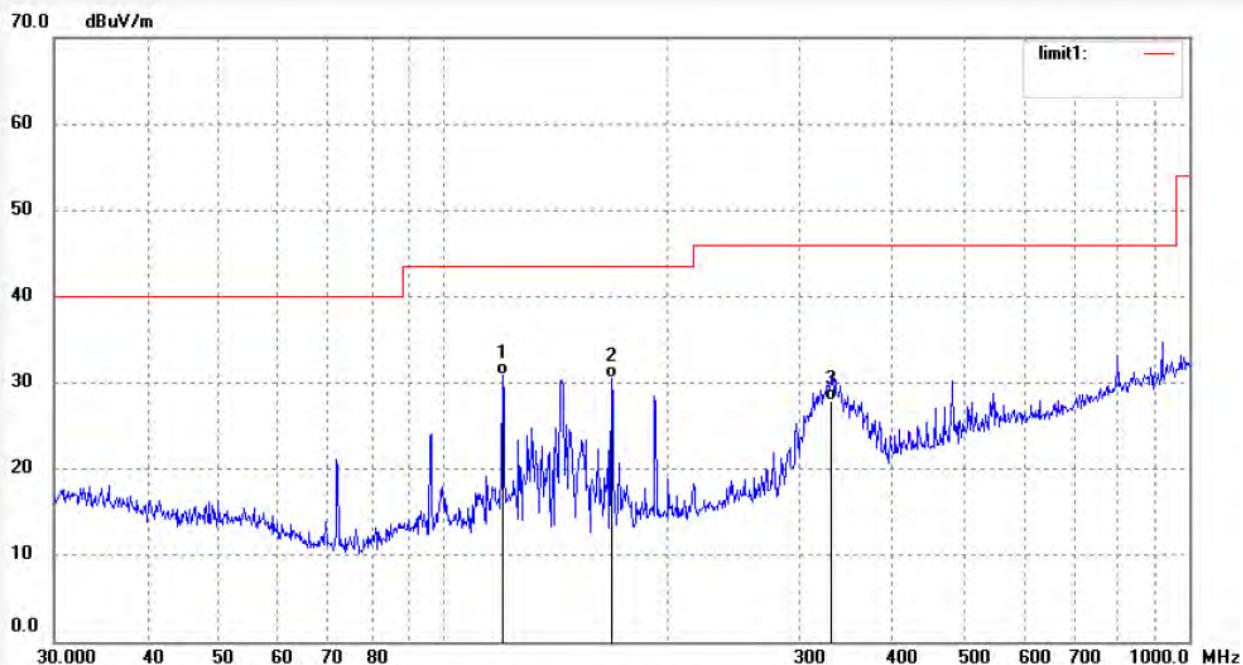
Mode: TX 2402MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	119.8555	44.02	-13.06	30.96	43.50	-12.54	QP			
2	167.8242	44.40	-13.88	30.52	43.50	-12.98	QP			
3	331.3546	35.90	-8.01	27.89	46.00	-18.11	QP			

Job No.: LGW2019 #1691

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

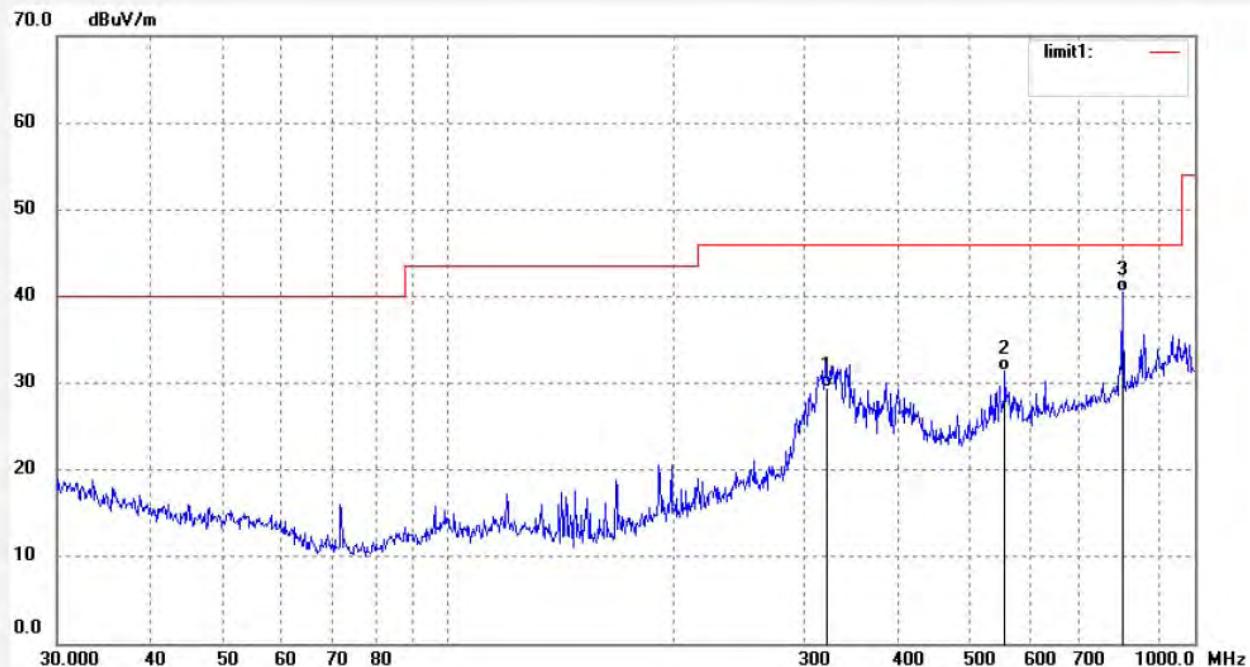
Mode: TX 2402MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

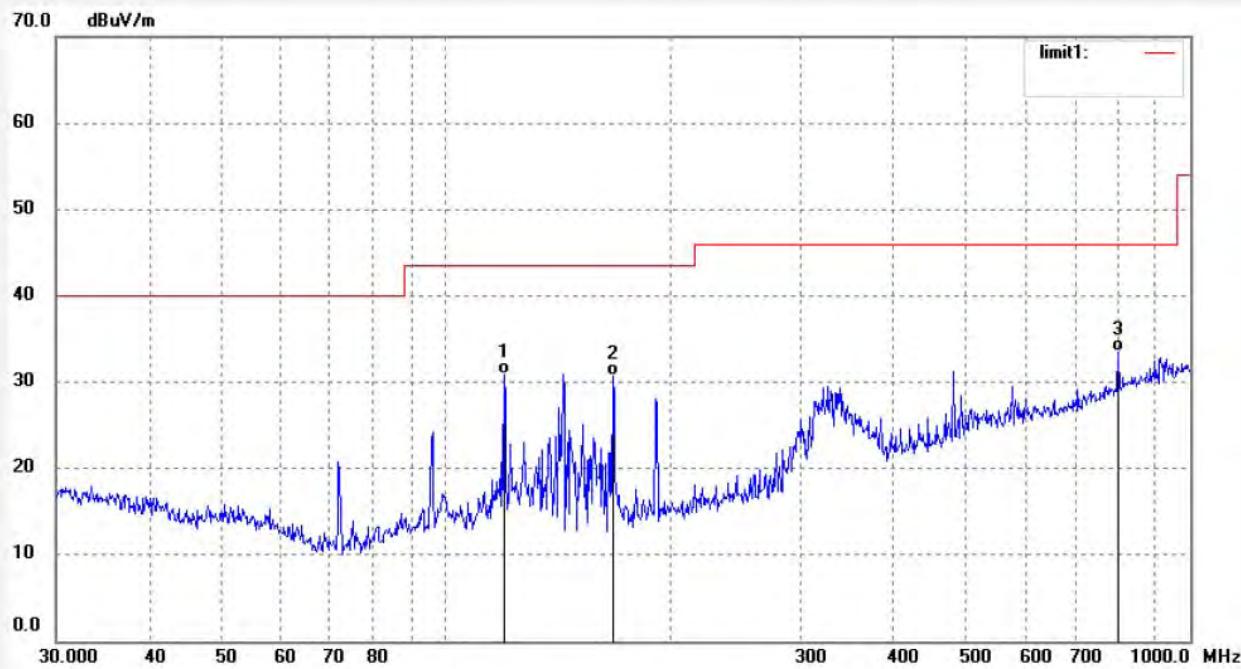
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	321.0607	37.84	-8.40	29.44	46.00	-16.56	QP			
2	556.7744	34.27	-2.94	31.33	46.00	-14.67	QP			
3	798.9796	39.62	0.81	40.43	46.00	-5.57	QP			

Job No.: LGW2019 #1693	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp. (C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2440MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	119.8555	43.95	-13.06	30.89	43.50	-12.61	QP			
2	167.8242	44.53	-13.88	30.65	43.50	-12.85	QP			
3	798.9796	32.70	0.81	33.51	46.00	-12.49	QP			



## 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.: LGW2019 #1692

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

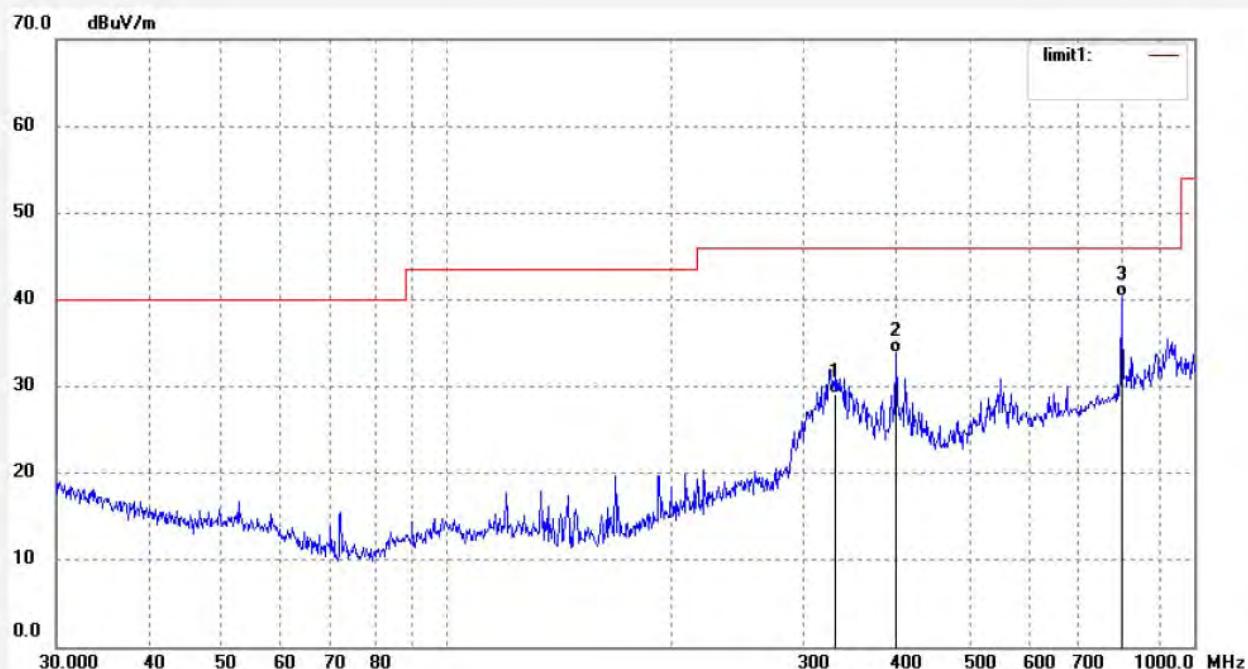
Mode: TX 2440MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	331.3546	37.10	-8.01	29.09	46.00	-16.91	QP			
2	399.0300	40.26	-6.48	33.78	46.00	-12.22	QP			
3	798.9796	39.49	0.81	40.30	46.00	-5.70	QP			

Job No.: LGW2019 #1694

Polarization: Horizontal

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

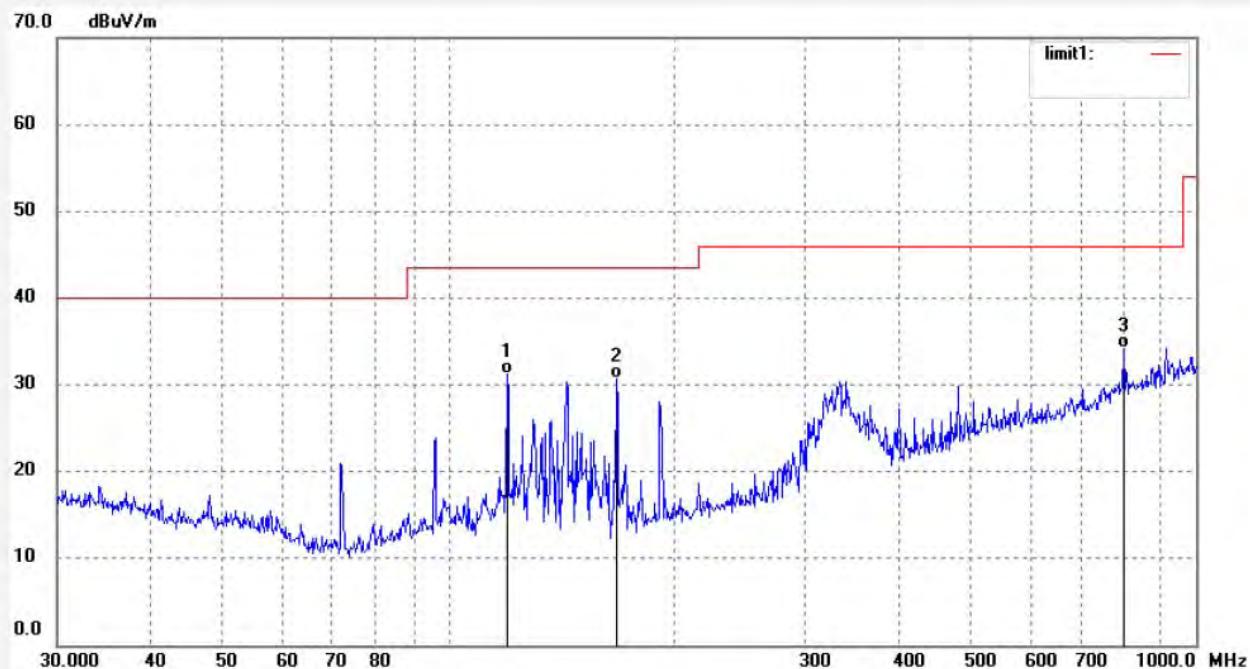
Mode: TX 2480MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	119.8555	44.25	-13.06	31.19	43.50	-12.31	QP			
2	167.8242	44.56	-13.88	30.68	43.50	-12.82	QP			
3	801.7862	33.33	0.87	34.20	46.00	-11.80	QP			

Job No.: LGW2019 #1695

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp. (C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

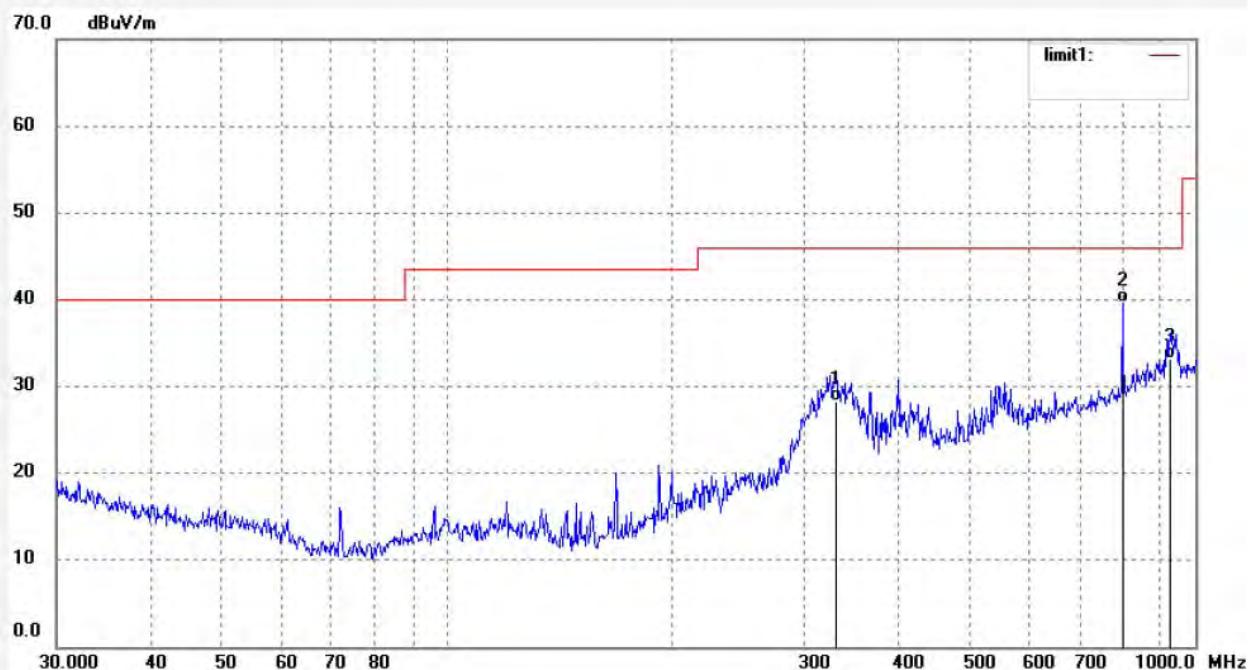
Mode: TX 2480MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	331.3546	36.28	-8.01	28.27	46.00	-17.73	QP			
2	798.9796	38.82	0.81	39.63	46.00	-6.37	QP			
3	925.7563	30.49	2.66	33.15	46.00	-12.85	QP			

## 1GHz-18GHz test data



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.: LGW2019 #1674

Polarization: Horizontal

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17

Temp. ( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

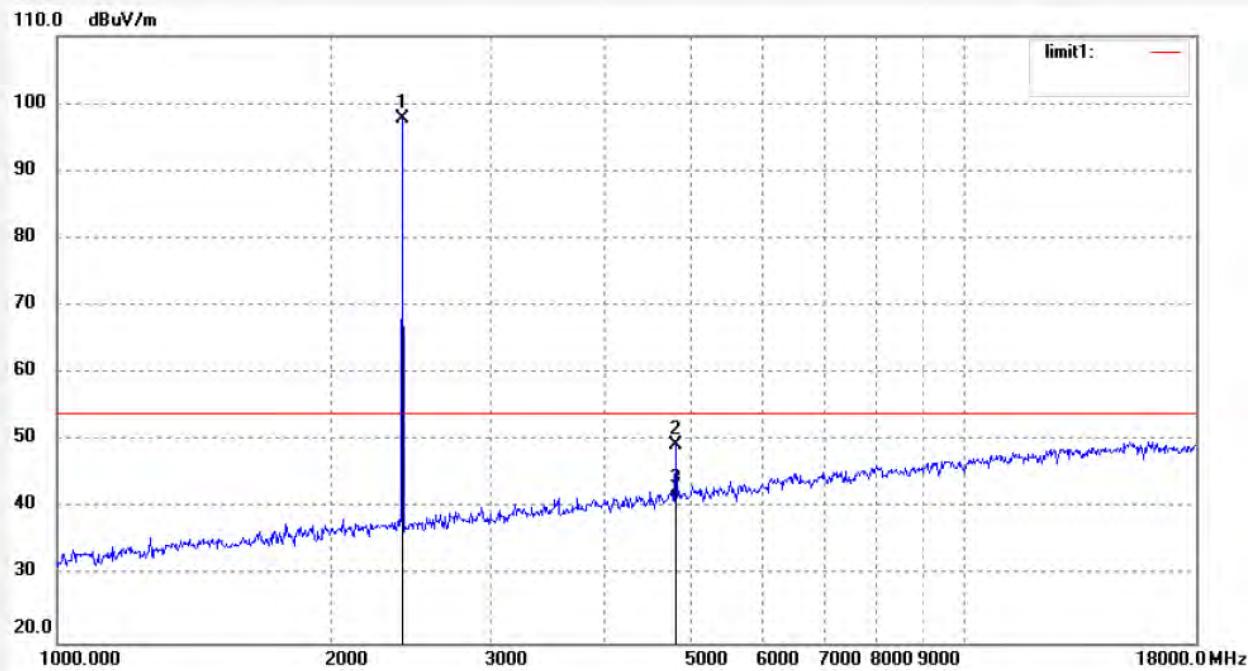
Mode: TX 2402MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

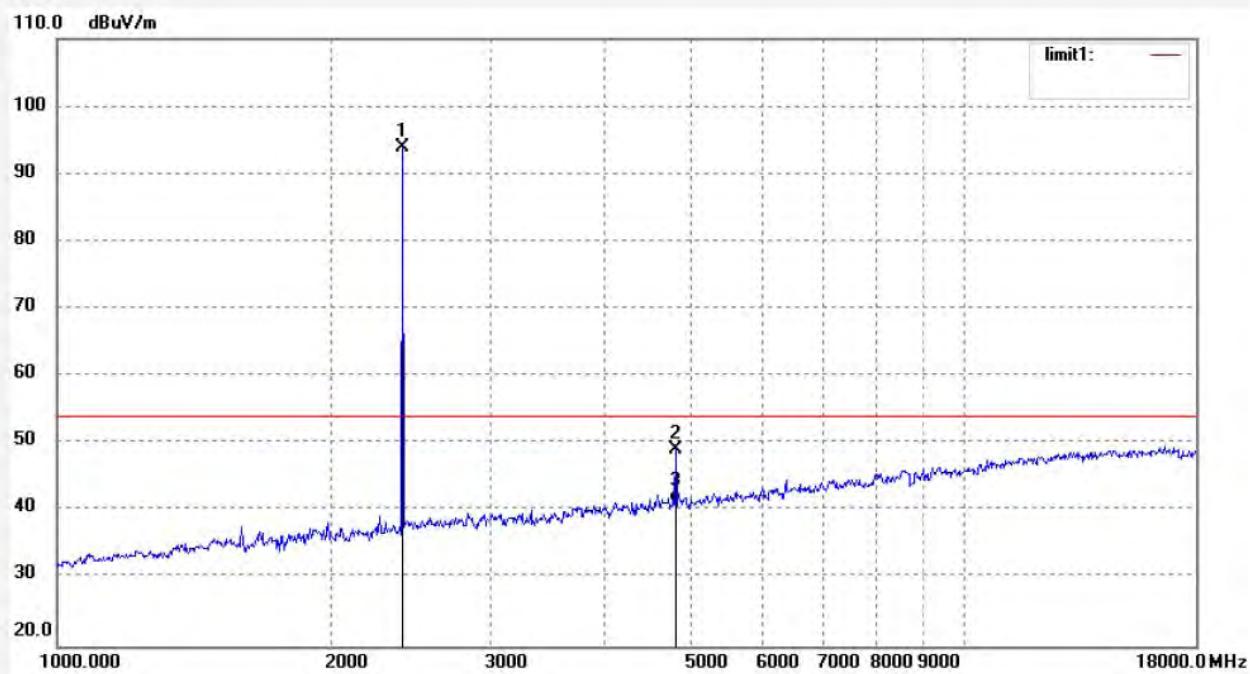
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	96.86	0.89	97.75	/	/	peak			
2	4804.025	41.98	7.40	49.38	74.00	-24.62	peak			
3	4804.025	33.83	7.40	41.23	54.00	-12.77	AVG			

Job No.: LGW2019 #1675	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp.( C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2402MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

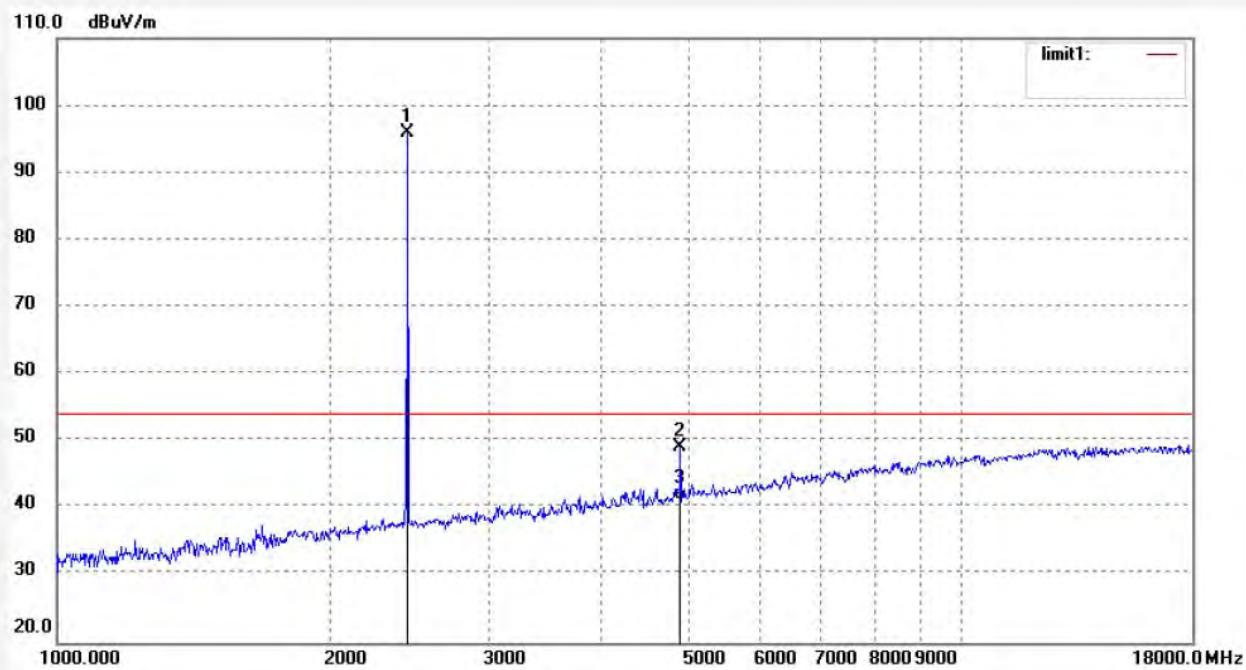
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	93.07	0.89	93.96	/	/	peak			
2	4804.027	41.63	7.40	49.03	74.00	-24.97	peak			
3	4804.027	33.84	7.40	41.24	54.00	-12.76	AVG			

Job No.: LGW2019 #1678	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp. (C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2440MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

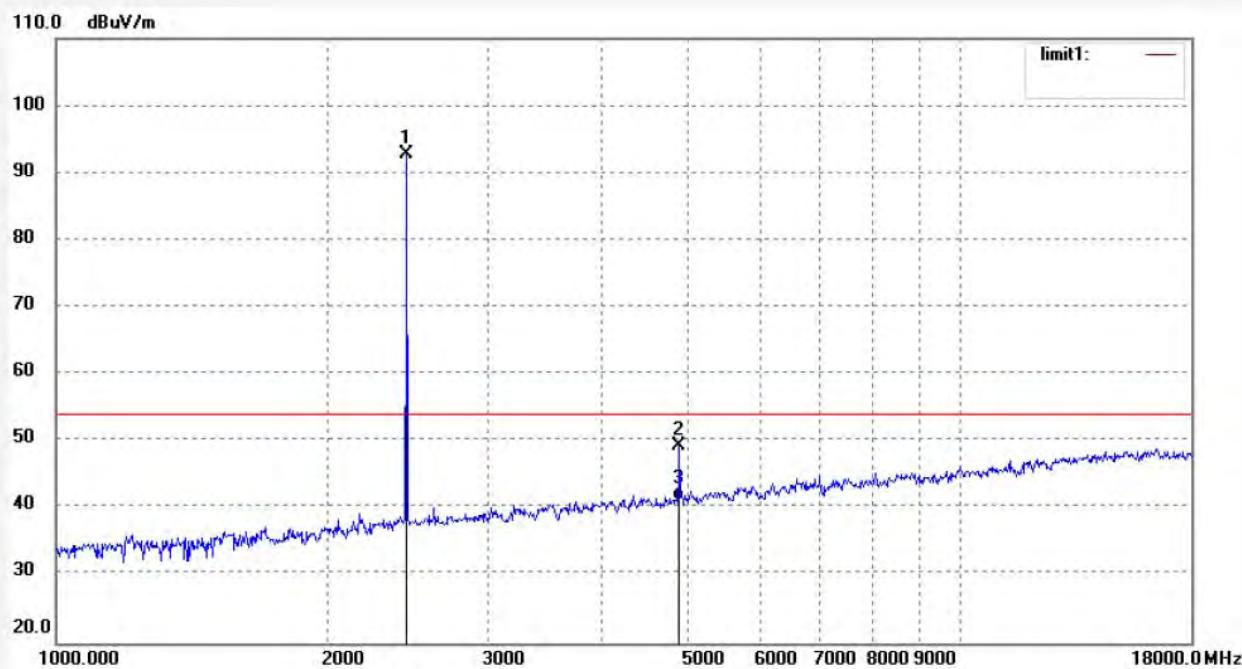
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	94.92	1.04	95.96	/	/	peak			
2	4880.026	41.15	8.10	49.25	74.00	-24.75	peak			
3	4880.026	33.27	8.10	41.37	54.00	-12.63	AVG			

Job No.: LGW2019 #1679	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp.( C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2440MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

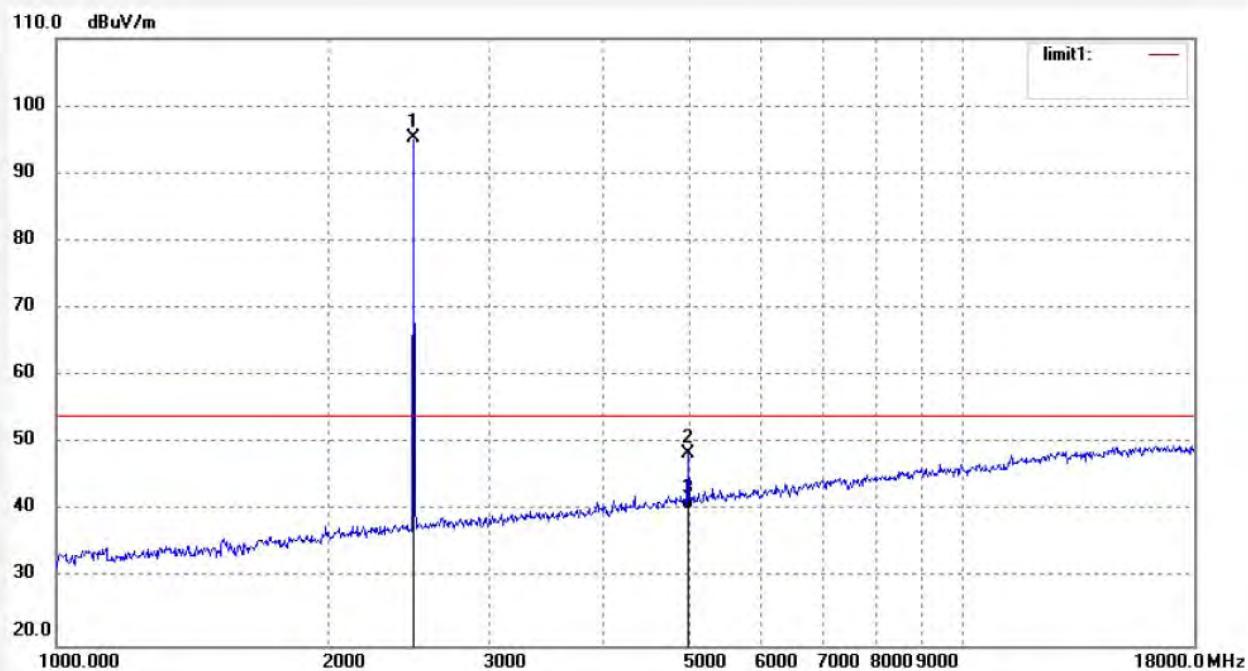
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	91.81	1.04	92.85	/	/	peak			
2	4880.028	41.17	8.10	49.27	74.00	-24.73	peak			
3	4880.028	33.26	8.10	41.36	54.00	-12.64	AVG			

Job No.: LGW2019 #1681	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp.( C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2480MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	94.05	1.10	95.15	/	/	peak			
2	4960.028	39.81	8.60	48.41	74.00	-25.59	peak			
3	4960.028	31.61	8.60	40.21	54.00	-13.79	AVG			

Job No.: LGW2019 #1680

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

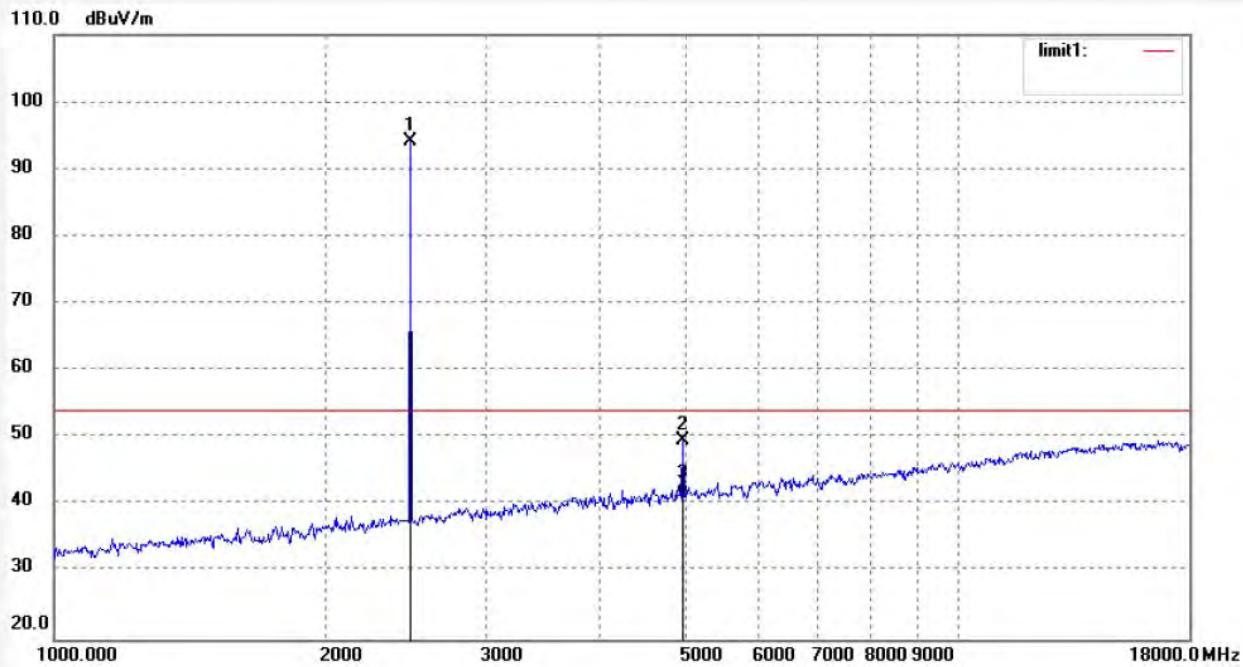
Mode: TX 2480MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	93.13	1.10	94.23	/	/	peak			
2	4960.029	41.00	8.60	49.60	74.00	-24.40	peak			
3	4960.029	32.94	8.60	41.54	54.00	-12.46	AVG			

## 18GHz-26.5GHz test data

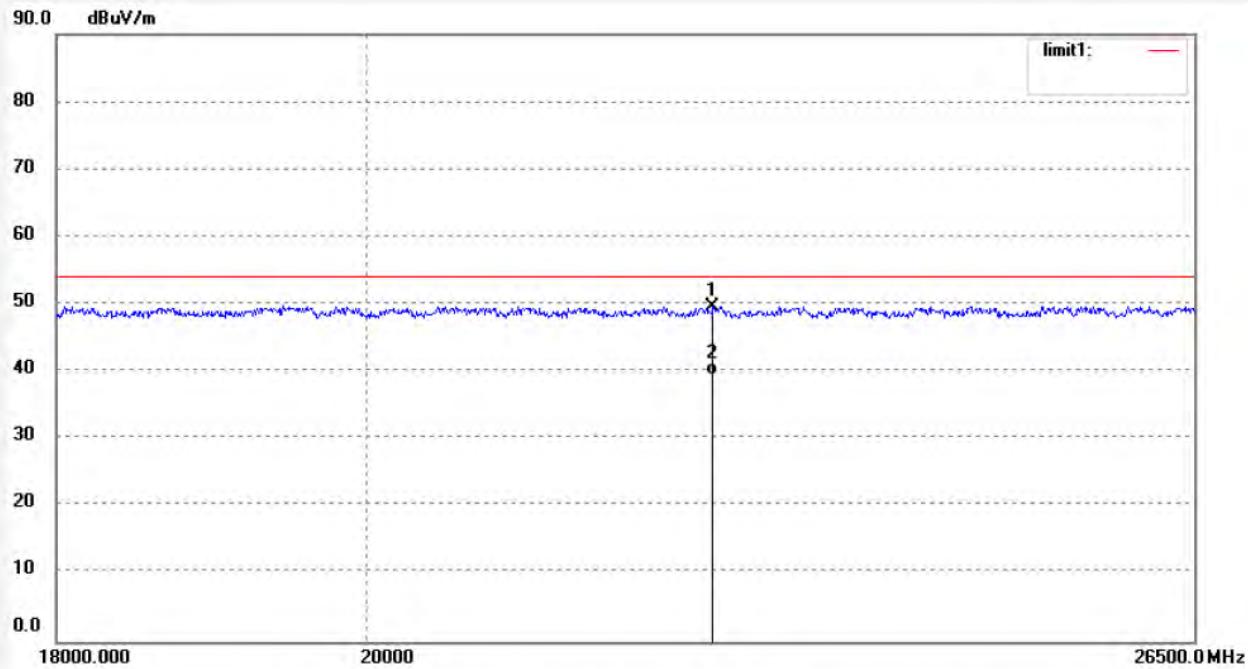


ACCURATE TECHNOLOGY CO., LTD.

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

Job No.: LGW2019 #1685	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17
Temp.( C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2402MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

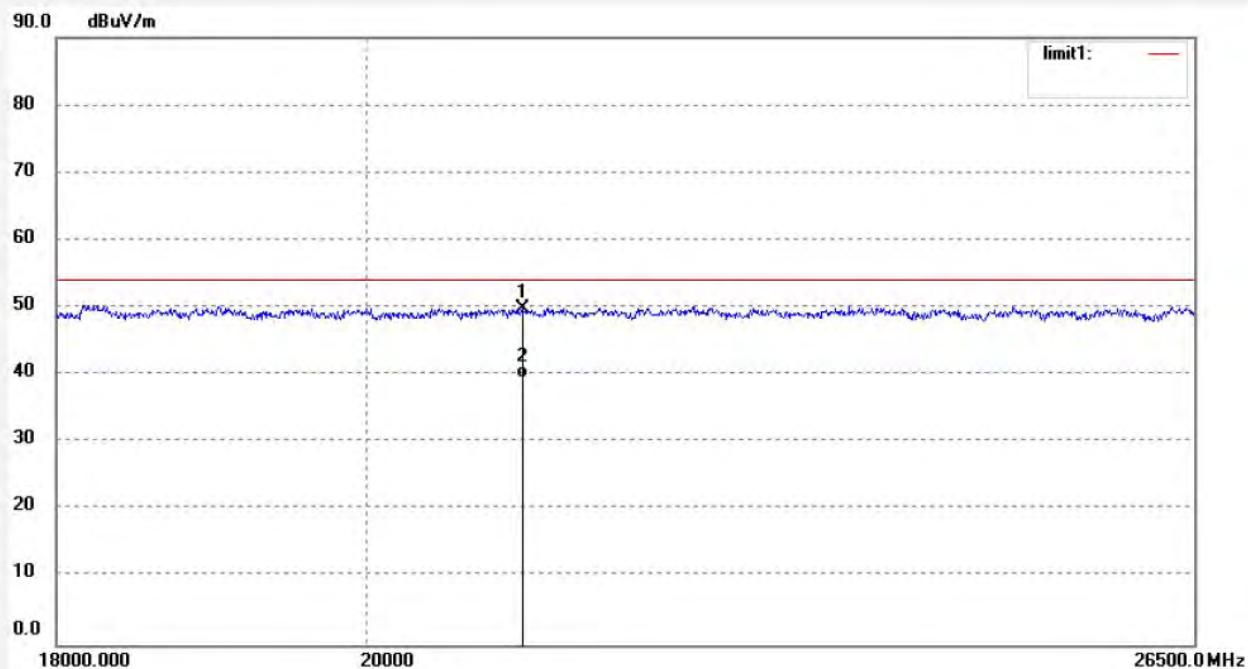
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22500.550	16.99	32.53	49.52	74.00	-24.48	peak			
2	22500.550	6.92	32.53	39.45	54.00	-14.55	AVG			

Job No.: LGW2019 #1684	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp.( C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2402MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

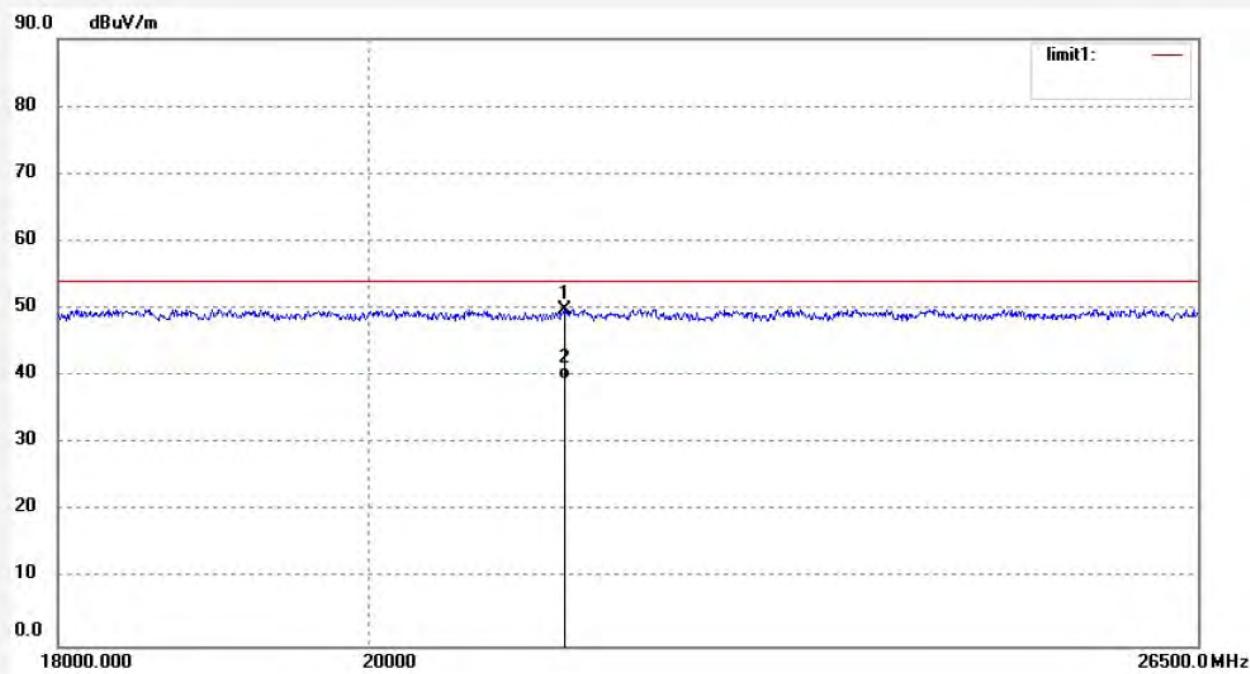
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21093.157	17.44	32.33	49.77	74.00	-24.23	peak			
2	21093.157	7.12	32.33	39.45	54.00	-14.55	AVG			

Job No.: LGW2019 #1686	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 19/05/17/
Temp.( C)/Hum.(%) 23 C / 48 %	Time:
EUT: wMOT	Engineer Signature: WADE
Mode: TX 2440MHz	Distance: 3m
Model: wMOT	
Manufacturer: Watchman Door SL	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21372.370	18.44	31.38	49.82	74.00	-24.18	peak			
2	21372.370	8.07	31.38	39.45	54.00	-14.55	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.: LGW2019 #1687

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

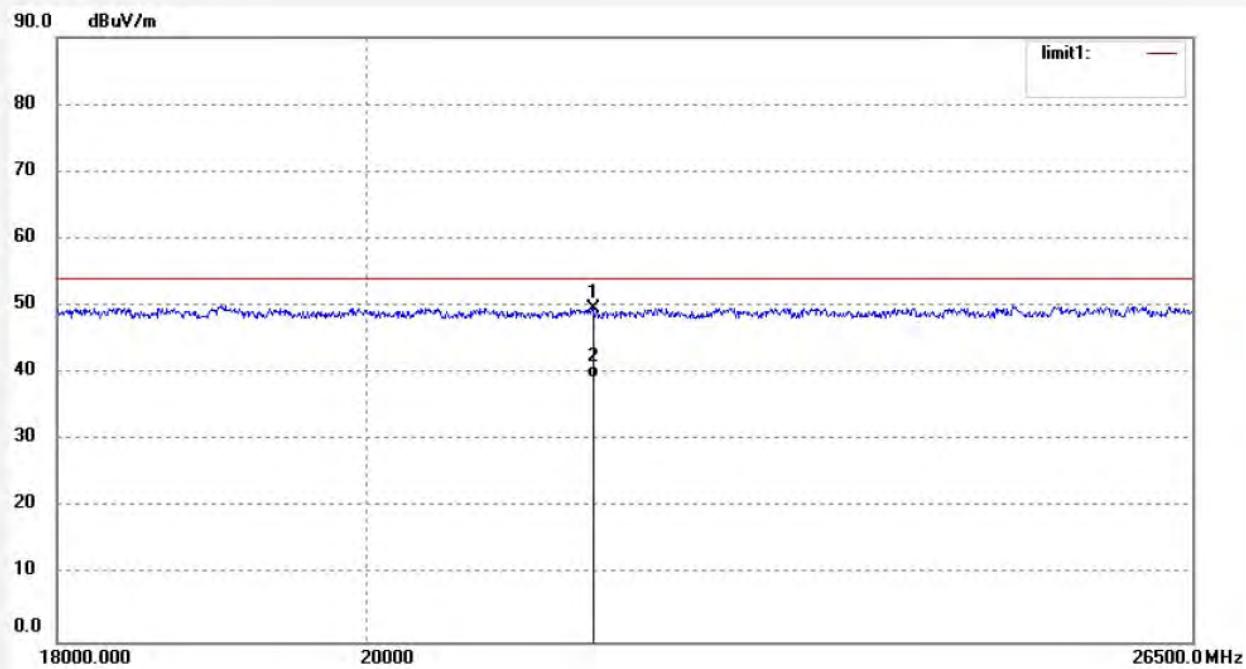
Mode: TX 2440MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21605.083	17.54	32.11	49.65	74.00	-24.35	peak			
2	21605.083	7.14	32.11	39.25	54.00	-14.75	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.: LGW2019 #1689

Polarization: Horizontal

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

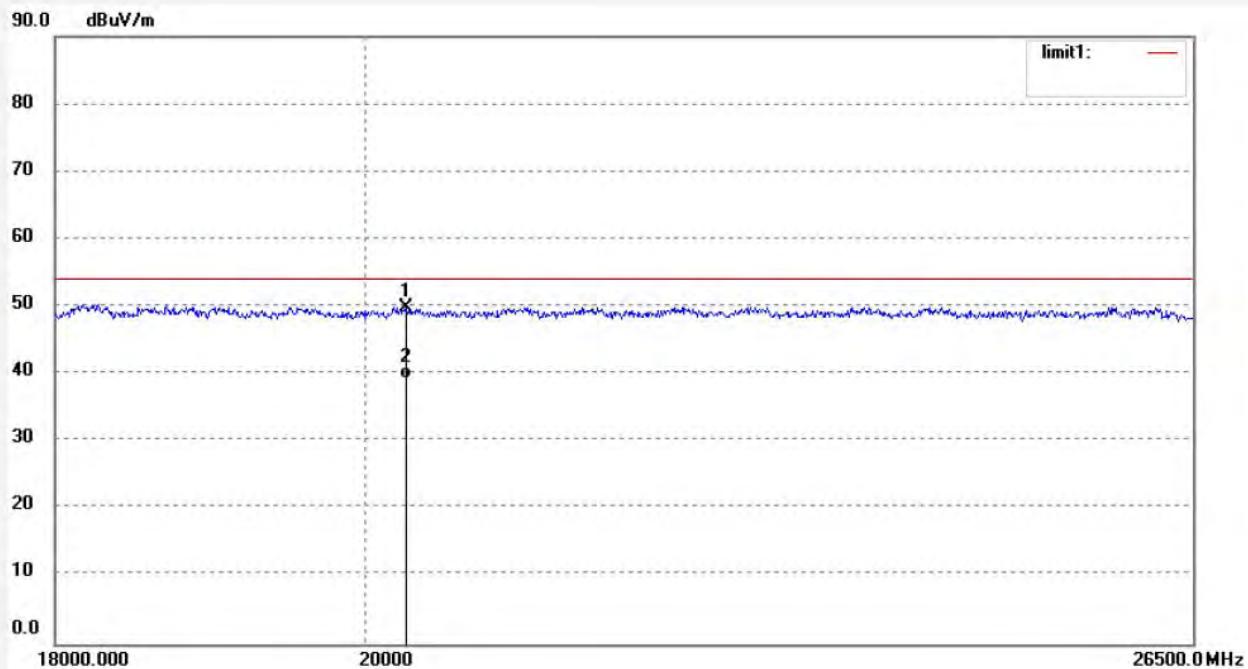
Mode: TX 2480MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	20285.059	18.44	31.38	49.82	74.00	-24.18	peak			
2	20285.059	7.86	31.38	39.24	54.00	-14.76	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.: LGW2019 #1688

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 19/05/17/

Temp.( C)/Hum.(%) 23 C / 48 %

Time:

EUT: wMOT

Engineer Signature: WADE

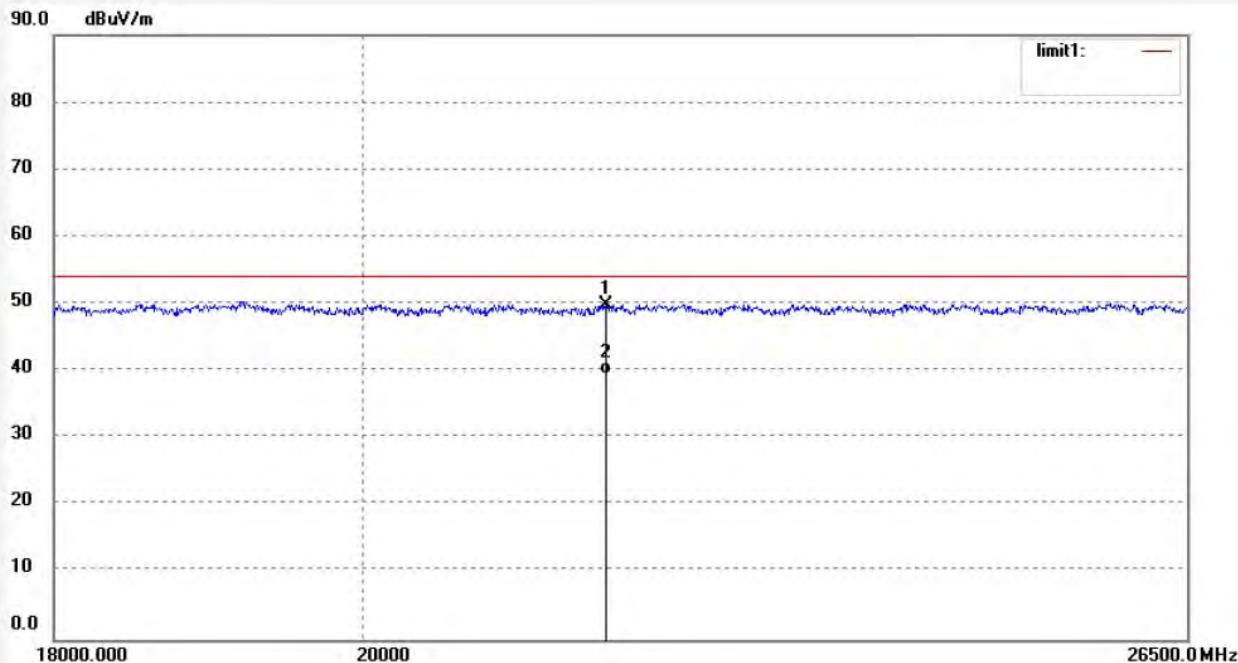
Mode: TX 2480MHz

Distance: 3m

Model: wMOT

Manufacturer: Watchman Door SL

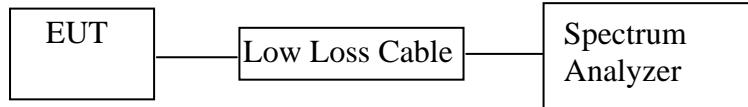
Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21730.791	17.69	32.07	49.76	74.00	-24.24	peak			
2	21730.791	7.39	32.07	39.46	54.00	-14.54	AVG			

## 10. CONDUCTED SPURIOUS EMISSION COMPLIANCE TEST

### 10.1. Block Diagram of Test Setup



### 10.2. The Requirement For Section 15.247(d)

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

### 10.3. EUT Configuration on Measurement

The equipment 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.

### 10.4. Operating Condition of EUT

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

10.4.2. Turn on the power of all equipment.

10.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

## 10.5. Test Procedure

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

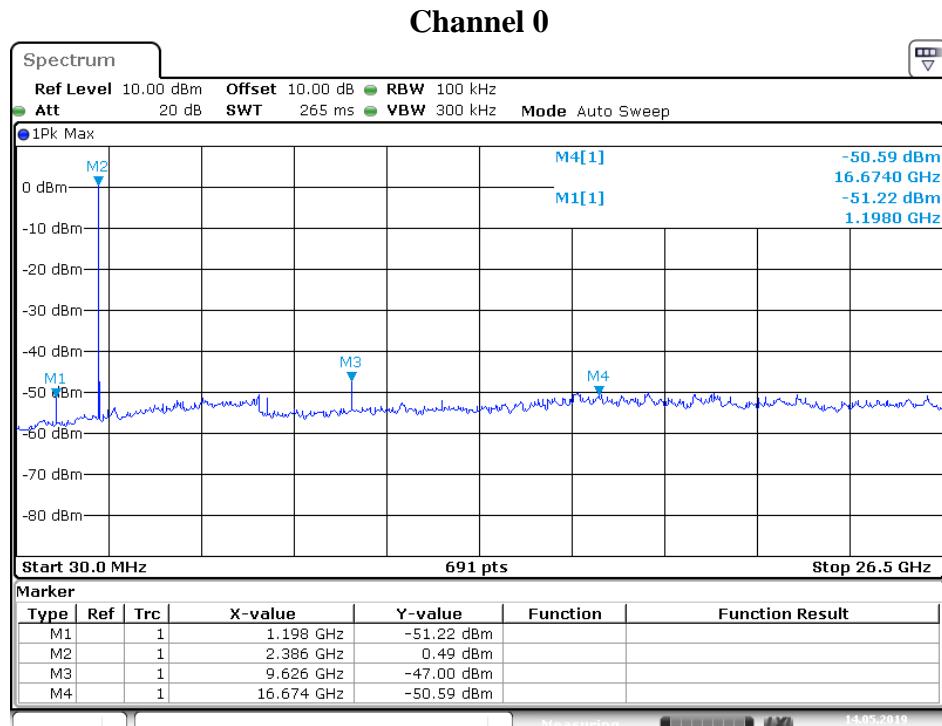
10.5.2. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz

10.5.3. The Conducted Spurious Emission was measured and recorded.

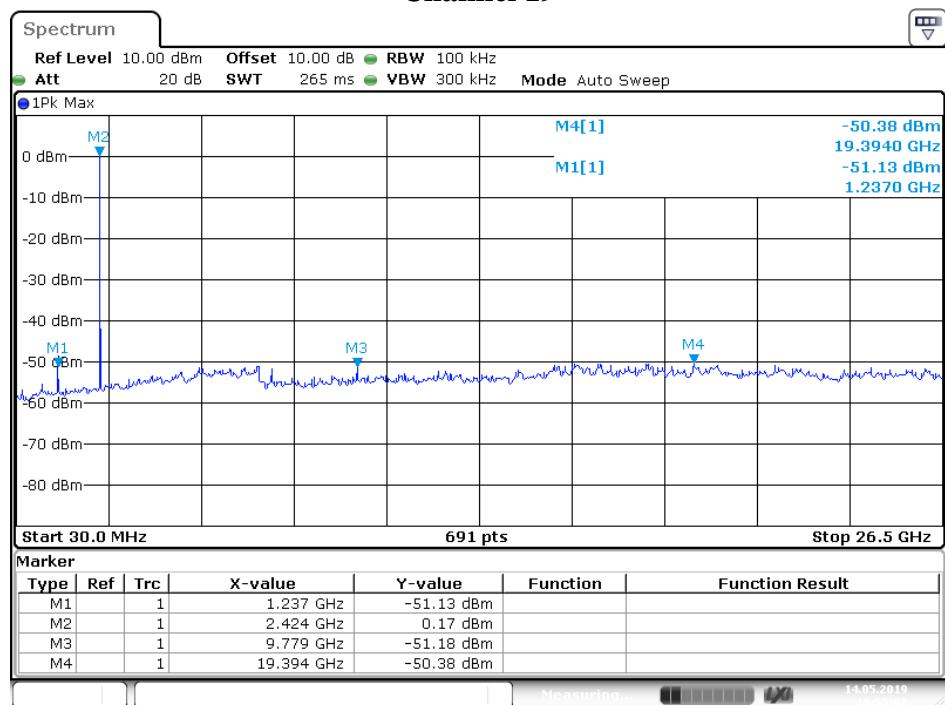
## 10.6. Test Result

**Pass.**

The spectrum analyzer plots are attached as below.

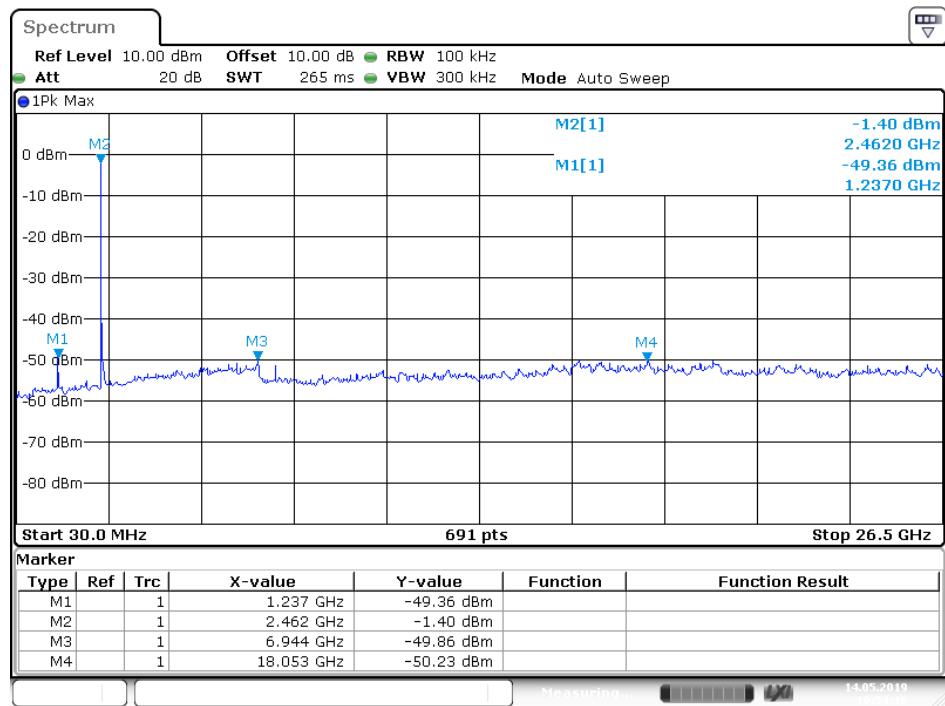


## Channel 19



Date: 14.MAY.2019 10:55:09

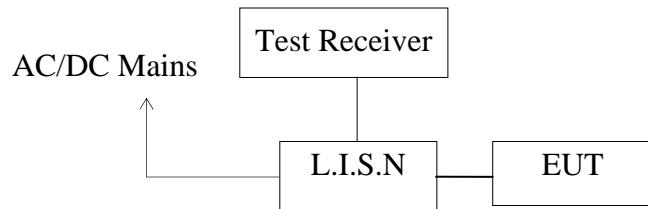
## Channel 39



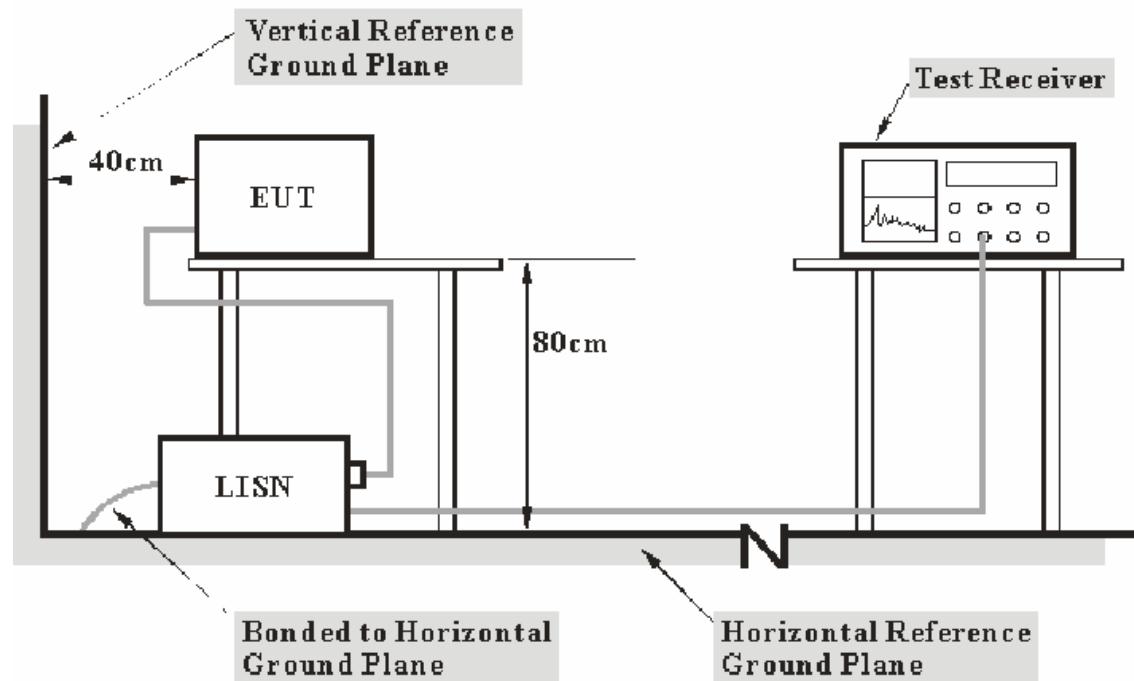
Date: 14.MAY.2019 10:54:19

## 11.AC POWER LINE CONDUCTED EMISSION TEST

### 11.1. Block Diagram of Test Setup



### 11.2. Test System Setup



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

### 11.3. Test 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.

### 11.4. Configuration of EUT on Measurement

The 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.

### 11.5. Operating Condition of EUT

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

11.5.2. Turn on the power of all equipment.

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

### 11.6. 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 C63.10: 2013 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

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

## 11.7.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dB $\mu$ V)	Average Level (dB $\mu$ V)	QuasiPeak Limit (dB $\mu$ V)	Average Limit (dB $\mu$ V)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.5	51.1	34.2	56.0	46.0	4.9	11.8	Pass

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dB $\mu$ V) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dB $\mu$ V) = Limit stated in standard

Calculation Formula:

Margin = Limit (dB $\mu$ V) - Level (dB $\mu$ V)

## 11.8.Test Result

**Pass.**

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

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

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

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO., LTD

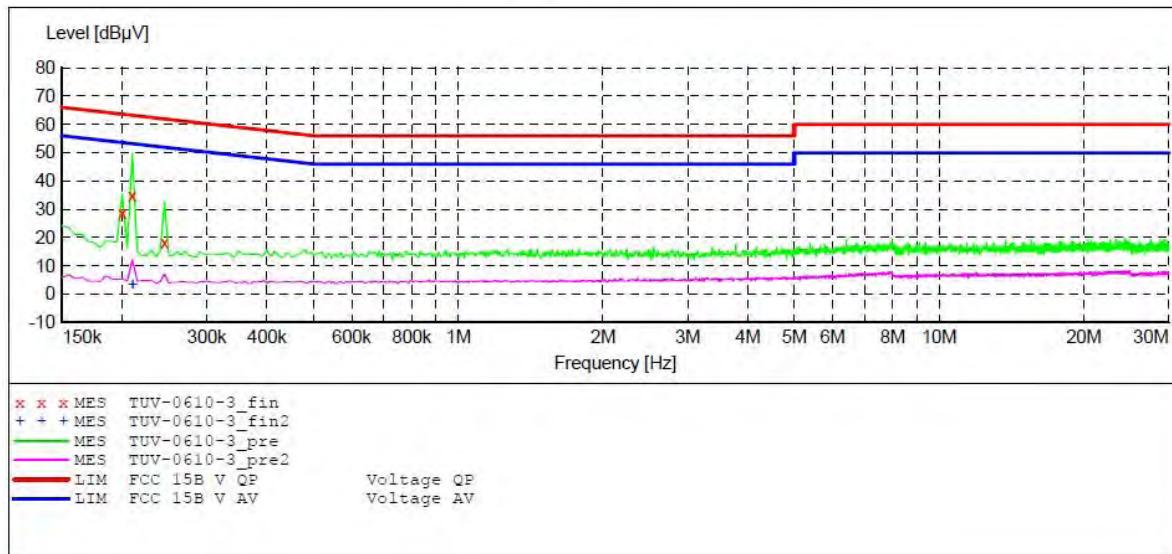
## CONDUCTED EMISSION STANDARD FCC PART 15 C

EUT: wMOT M/N:wMOT  
 Manufacturer: Watchman Door SL  
 Operating Condition: BT Communication  
 Test Site: 1#Shielding Room  
 Operator: WADE  
 Test Specification: L AC 24V  
 Comment: Mains port  
 Start of Test: 6/10/2019 /

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

Short Description: SUB\_STD\_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF	Transducer
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-0610-3\_fin"

6/10/2019

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.200000	28.50	10.5	64	35.1	QP	L1	GND
0.210000	35.00	10.5	63	28.2	QP	L1	GND
0.245000	18.10	10.6	62	43.8	QP	L1	GND

## MEASUREMENT RESULT: "TUV-0610-3\_fin2"

6/10/2019

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.210000	13.10	10.5	53	40.1	AV	L1	GND
4.990000	7.60	11.2	46	38.4	AV	L1	GND
24.895000	7.00	11.5	50	43.0	AV	L1	GND

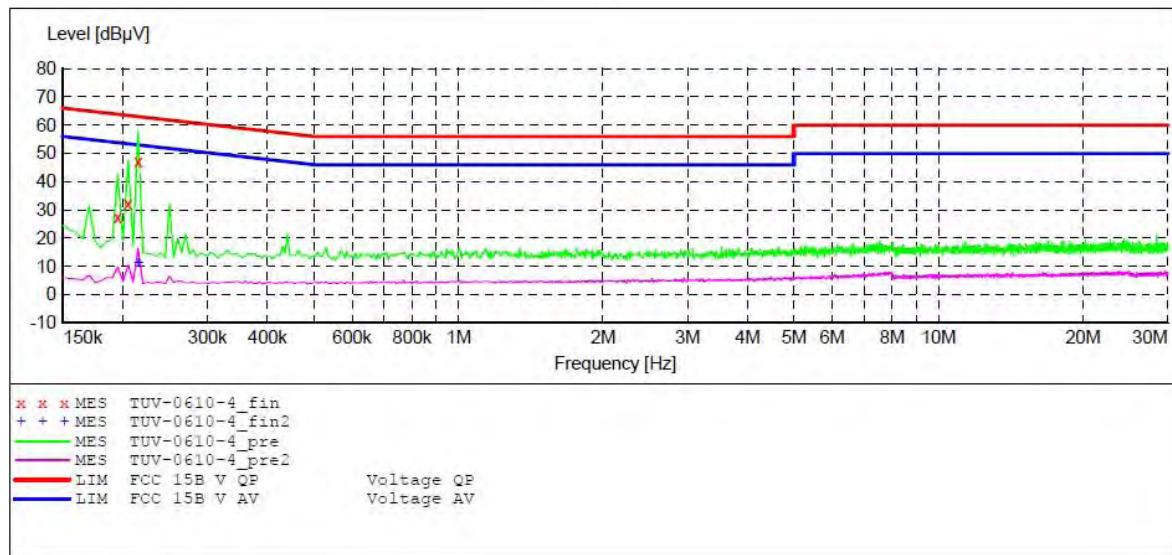
ACCURATE TECHNOLOGY CO., LTD

## CONDUCTED EMISSION STANDARD FCC PART 15 C

EUT: wMOT M/N:wMOT  
 Manufacturer: Watchman Door SL  
 Operating Condition: BT Communication  
 Test Site: 1#Shielding Room  
 Operator: WADE  
 Test Specification: N AC 24V  
 Comment: Mains port  
 Start of Test: 6/10/2019 /

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

Short Description: SUB_STD_VTERM2 1.70					
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF 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-0610-4\_fin"

6/10/2019

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.195000	27.60	10.5	64	36.2	QP	N	GND
0.205000	32.30	10.5	63	31.1	QP	N	GND
0.215000	47.20	10.5	63	15.8	QP	N	GND

## MEASUREMENT RESULT: "TUV-0610-4\_fin2"

6/10/2019

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.215000	11.10	10.5	53	41.9	AV	N	GND
4.480000	7.90	11.1	46	38.1	AV	N	GND
25.015000	7.70	11.5	50	42.3	AV	N	GND

## 12. ANTENNA REQUIREMENT

### 12.1. 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.

### 12.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 5.3dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.

\*\*\*\*\* End of Test Report \*\*\*\*\*