



**FCC 47 CFR PART 15 SUBPART C 15.249**

**TEST REPORT**

**FOR**

**SMART OUTLET**

Model : 4200-C; 4200-G

Issued to

Centralite Systems, Inc.  
1000 Cody Road S. Ste-A Mobile Alabama United States 36695

Issued by  
WH Technology Corp.



<b>Open Site</b>		<b>No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)</b>
<b>EMC Test Site</b>	<b>Xizhi Office and Lab</b>	<b>7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)</b>
<b>Tel.: +886-7729-7707 Fax: +886-2- 8648-1311</b>		

*Note: This test refers exclusively to the test presented test model and sample. This report shall not be reproduced except in full, without the written approval of WH Technology Corp.. This document may be altered or revised by WH Technology Corp.. Personnel only, and shall be noted in the revision section of the document.*



---

<b>1. GENERAL INFORMATION.....</b>	<b>3</b>
<b>2. REPORT OF MEASUREMENTS AND EXAMINATIONS.....</b>	<b>4</b>
2.1 LIST OF MEASUREMENTS AND EXAMINATIONS.....	4
<b>3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST.....</b>	<b>5</b>
3.1 DESCRIPTION OF THE TESTED SAMPLES.....	5
3.2 CARRIER FREQUENCY OF CHANNELS.....	5
3.3 TEST MODE AND TEST SOFTWARE.....	6
3.4 TEST METHODOLOGY & GENERAL TEST PROCEDURES.....	7
<b>4. TEST AND MEASUREMENT EQUIPMENT.....</b>	<b>9</b>
4.1 CALIBRATION.....	9
4.2 EQUIPMENT.....	9
<b>5. ANTENNA REQUIREMENTS.....</b>	<b>11</b>
5.1 STANDARD APPLICABLE.....	11
5.2 ANTENNA CONSTRUCTION AND DIRECTIONAL GAIN.....	11
<b>6. TEST OF CONDUCTED EMISSION.....</b>	<b>12</b>
6.1 TEST LIMIT.....	12
6.2 TEST PROCEDURES.....	12
6.3 TYPICAL TEST SETUP.....	13
6.4 TEST RESULT AND DATA.....	14
<b>7. TEST OF RADIATED EMISSION.....</b>	<b>16</b>
7.1 TEST LIMIT.....	16
7.2 TEST PROCEDURES.....	16
7.3 TYPICAL TEST SETUP.....	17
7.4 TEST RESULT AND DATA (9KHz ~ 30MHz).....	18
7.5 TEST RESULT AND DATA (30MHz ~ 1GHz, WORST EMISSIONS FOUND).....	19
7.6 TEST RESULT AND DATA (ABOVE 1GHz).....	21
7.7 RESTRICT BAND EMISSION MEASUREMENT DATA.....	23
<b>8. BANDWIDTH TEST.....</b>	<b>24</b>
8.1 TEST LIMIT.....	24
8.2 TEST PROCEDURES.....	24
8.3 TEST SETUP LAYOUT.....	24
8.4 TEST RESULT AND DATA.....	24
<b>9. RESTRICTED BANDS OF OPERATION.....</b>	<b>28</b>
9.1 LABELING REQUIREMENT.....	28



## 1. GENERAL INFORMATION

**Applicant** : Centralite Systems, Inc.  
**Address** : 1000 Cody Road S. Ste-A Mobile Alabama United States 36695  
**Manufacturer/ Factory** : MOKO TECHNOLOGY LIMITED  
**Address** : 2F, Building1, No.37 Xiaxintang Xintang village, Fucheng Street, Longhua District, Shenzhen, Guangdong Province, China  
**EUT** : Smart Outlet  
**Model Name** : 4200-C;4200-G  
**Trade Name** : N/A  
**Model Differences** : Only model name is different, the other exactly the same. Model name difference is only for different customer needs.

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating

### FCC part 15 Subpart C

Receipt Date : 04/19/2018

Final Test Date :04/19/2018

**Tested By:**


April 19, 2018  
(Date)

  
\_\_\_\_\_  
Bing Chang/ Engineer

April 19, 2018  
(Date)



**Reviewed by:**

  
\_\_\_\_\_  
Bell Wei / Manager  
Designation Number: TW2954



## 2. REPORT OF MEASUREMENTS AND EXAMINATIONS

### 2.1 LIST OF MEASUREMENTS AND EXAMINATIONS

Standard		Item	Result
15.249	RSS-GEN		
15.207	8.8	AC Power Conducted Emission	PASS
Standard		Item	Result
15.249	RSS-210		
15.249(a)	A2.9 (a)	Transmitter Radiated Emissions	PASS
15.249(d)	A2.9 (b)	Band Edge Measurement	PASS
15.249(e)	-	20dB RF Bandwidth & Occupied Bandwidth Measurement	PASS
15.203	-	Antenna Requirement	PASS



### 3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

#### 3.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name	:	Smart Outlet
Model Number	:	4200-C
FCC ID	:	T3L-SS044
IC	:	12192A-SS044
Receipt Date	:	16 March 2018
Input Voltage	:	100-120V~AC, 60Hz, 15A
Output	:	120V~AC, 15A Total Max
Operate Frequency	:	2405~2480MHz
Modulation Technique	:	QPSK
Number of Channels	:	16 CH
Standards	:	IEEE 802.15.4
Antenna Type	:	PCB Antenna
Channel Space	:	5MHz
Antenna gain	:	0dBi

#### 3.2 CARRIER FREQUENCY OF CHANNELS

Zigbee	
IEEE 802.15.4	
Channel	Frequency (MHz)
1	2405
2	2410
3	2415
4	2420
5	2425
6	2430
7	2435
8	2440
9	2445
10	2450
11	2455
12	2460
13	2465
14	2470
15	2475
16	2480



### **3.3 TEST MODE AND TEST SOFTWARE**

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10-2013.
- b. The complete test system included Notebook and EUT for RF test.
- c. An executive “PuTTY\_0.67.0.0” under Win 7 was executed to keep transmitting and receiving data via Wireless.
- d. The following test modes were performed for test:  
—IEEE 802.15.4: CH01: 2405MHz, CH08: 2440MHz, CH16: 2480MHz
- e. only the worst case was recorded in this report



### 3.4 TEST METHODOLOGY & GENERAL TEST PROCEDURES

All testing as described bellowed were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 Part 15 Subpart C & RSS-GEN;RSS-210.

#### Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.10:2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

#### Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

- 1)Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
- 2)Setting test channel described as “Channel setting and operating condition” , and testing channel by channel.
- 3)For the maximum output power measurement, we followed the method of measurement ANSI C63.10.
- 4)For the spurious emission test based on ANSI C63.10, at the frequency where below 1GHz used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.

### 3.5 MEASUREMENT UNCERTAINTY

Measurement Item	Uncertainty
Radiated emission	±4.11dB
Peak Output Power(conducted)	±1.38dB
Peak Output Power(Radiated)	±1.70dB
Power Spectral Density	±1.39dB
Radiated emission(3m)	±4.11dB
Radiated emission(10m)	±3.89dB



### 3.6 DESCRIPTION OF THE SUPPORT EQUIPMENTS

#### Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

#### Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Date Cable	Power Cord
1.	Lap top	14q-by00 1AX	N/A	FCC DOC	HP	N/A	N/A
2.	AC adapter	QX6.5W7 5100FG	N/A	VOC	Stos	N/A	N/A
INSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Date Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Note:** All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

**Grounding:** Grounding was in accordance with the manufacturer' s requirement and conditions for the intended use.





## **4. TEST AND MEASUREMENT EQUIPMENT**

### **4.1 CALIBRATION**

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### **4.2 EQUIPMENT**

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and other required standards. Calibration of all test and measurement, including any accessories that may affect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.



**TABLELIST OF TEST AND MEASUREMENT EQUIPMENT**

Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
EMI Receiver	R&S	ESHS10	830223/008	2018/06/06
LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2018/06/11
ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158- 0094	2018/09/21
RF Cable	N/A	N/A	EMI-3	2018/10/19
Bilog antenna(30M-1G)	ETC	MCTD2786 B	BLB16M040 04/JB-5-004	2018/05/18
Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N020 09	2018/11/23
Horn antenna (18G-26G)	com-power	AH-826	81000	2018/08/16
LOOP Antenna (Below 30M)	com-power	AL-130	17117	2018/10/04
Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2018/05/03
Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC05184 5	980108&AT -18001	2018/10/23
Pre amplifier (18G~26G)	MITEQ	JS4-180026 00-30-5A	808329	2018/08/09
EMI Test Receiver	R&S	ESVS30 (20M-1000 MHz)	826006/002	2018/11/28
RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2018/10/19
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(4 M+4M)	NA	2019/04/16
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(7 M)	NA	2018/08/09
Spectrum (9K--7GHz)	R&S	FSP7	830180/006	2019/04/13
Spectrum (9K--40GHz)	AGILENT	8564EC	4046A0032	2019/03/01
e3	AUDIX	N/A	N/A	N/A
SINGAL GENERATOR (100k-1GHz)	HP	8648A	3619U0042 6	N/A
Power Meter	ANRITSU	ML2487	6K00001574	2018/08/09

**\*CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**



## **5. ANTENNA REQUIREMENTS**

### **5.1 STANDARD APPLICABLE**

According to the FCC Part 15 Paragraph 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.

### **5.2 ANTENNA CONSTRUCTION AND DIRECTIONAL GAIN**

Zigbee		
Antenna Type	:	PCB Antenna
Antenna Gain	:	0 dBi



## 6. TEST OF CONDUCTED EMISSION

### 6.1 TEST LIMIT

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013 The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Average (dB $\mu$ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

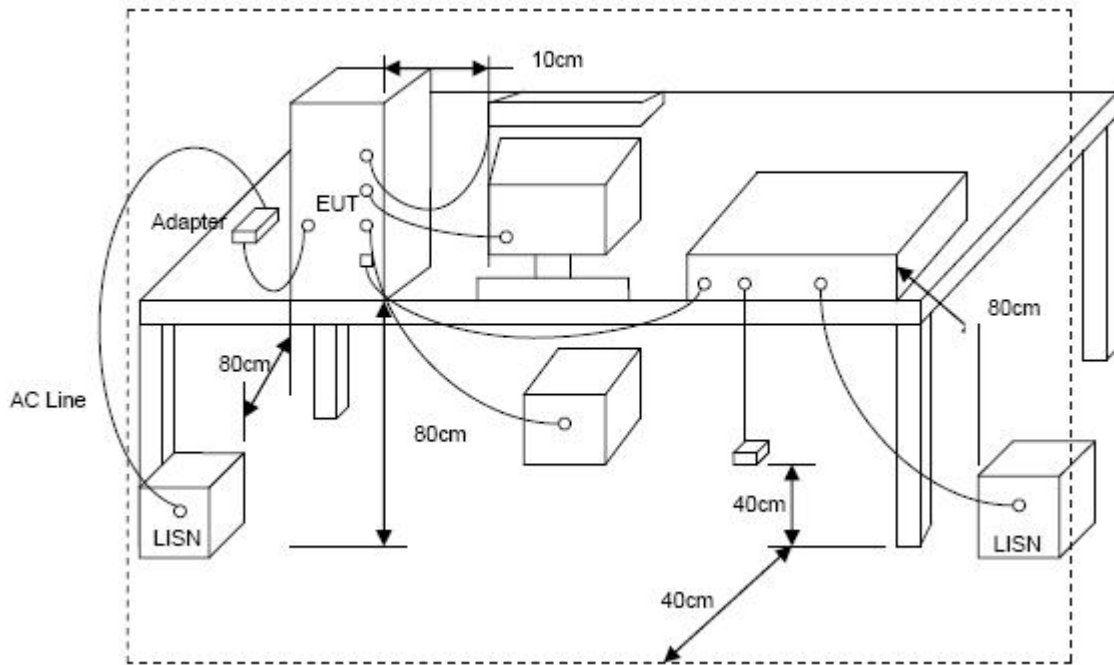
\*Decreases with the logarithm of the frequency.

### 6.2 TEST PROCEDURES

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



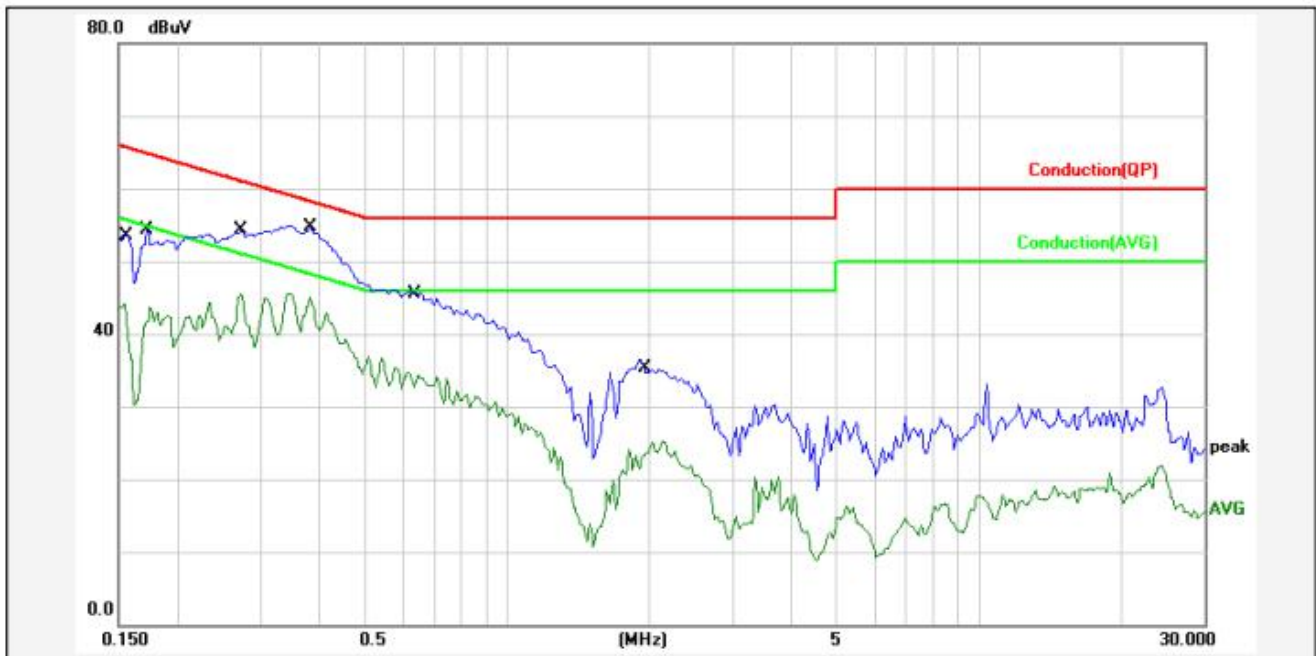
**6.3 TYPICAL TEST SETUP**





**6.4 TEST RESULT AND DATA**

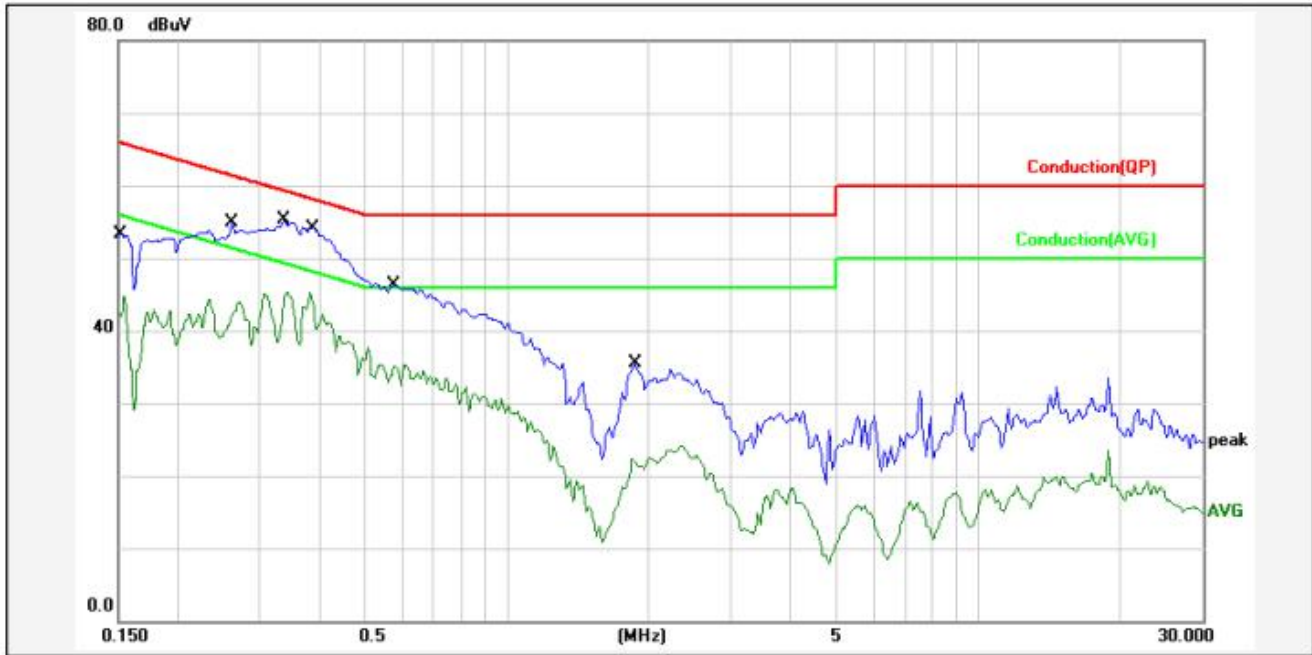
M/N :	4200-C	Test Voltage:	AC 120V/60Hz
Test Date :	April 09, 2018	Phase:	L1
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Low channel		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1547	9.62	44.08	53.70	65.74	-12.04	QP	P	
2	0.1547	9.62	34.52	44.14	55.74	-11.60	AVG	P	
3	0.1730	9.62	44.74	54.36	64.82	-10.46	QP	P	
4	0.1730	9.62	34.00	43.62	54.82	-11.20	AVG	P	
5	0.2741	9.62	44.62	54.24	60.99	-6.75	QP	P	
6	0.2741	9.62	35.92	45.54	50.99	-5.45	AVG	P	
7	0.3825	9.62	45.18	54.80	58.22	-3.42	QP	P	
8	0.3825	9.62	35.47	45.09	48.22	-3.13	AVG	P	
9	0.6461	9.63	35.98	45.61	56.00	-10.39	QP	P	
10	0.6461	9.63	24.70	34.33	46.00	-11.67	AVG	P	
11	1.9696	9.67	26.67	36.34	56.00	-19.66	QP	P	
12	1.9696	9.67	13.94	23.61	46.00	-22.39	AVG	P	



M/N :	4200-C	Test Voltage:	AC 120V/60Hz
Test Date :	April 09, 2018	Phase:	Neutral
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Low channel		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1524	9.60	43.74	53.34	65.87	-12.53	QP	P	
2	0.1524	9.60	35.19	44.79	55.87	-11.08	AVG	P	
3	0.2614	9.60	45.38	54.98	61.39	-6.41	QP	P	
4	0.2614	9.60	34.06	43.66	51.39	-7.73	AVG	P	
5	0.3370	9.61	45.75	55.36	59.28	-3.92	QP	P	
6	0.3370	9.61	35.63	45.24	49.28	-4.04	AVG	P	
7	0.3887	9.61	43.53	53.14	58.09	-4.95	QP	P	
8	0.3887	9.61	34.14	43.75	48.09	-4.34	AVG	P	
9	0.5781	9.61	36.62	46.23	56.00	-9.77	QP	P	
10	0.5781	9.61	25.45	35.06	46.00	-10.94	AVG	P	
11	1.8715	9.66	25.92	35.58	56.00	-20.42	QP	P	
12	1.8715	9.66	12.91	22.57	46.00	-23.43	AVG	P	





## 7. TEST OF RADIATED EMISSION

### 7.1 TEST LIMIT

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

### 7.2 TEST PROCEDURES

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported,

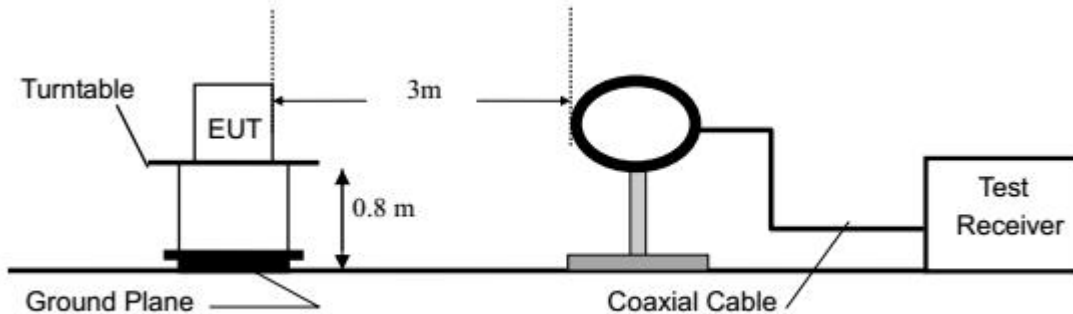




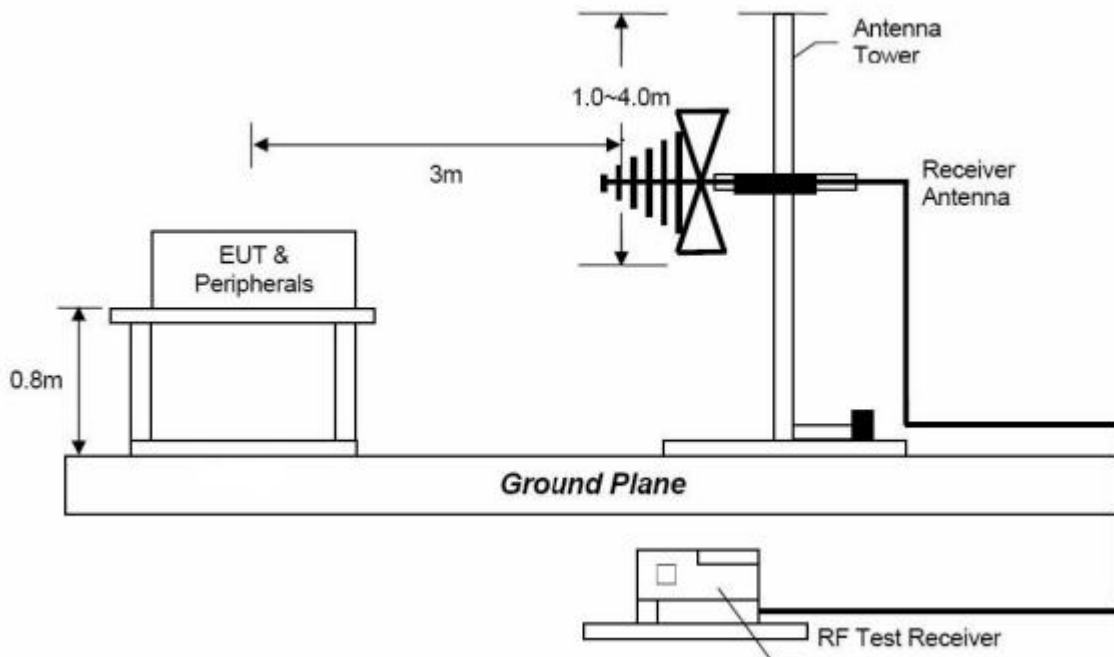
- otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
  - i. “ Cone of radiation ” has been considered to be 3dB bandwidth of the measurement antenna.

### 7.3 TYPICAL TEST SETUP

#### Radiated Emission Test Set-Up, Frequency Below 30MHz

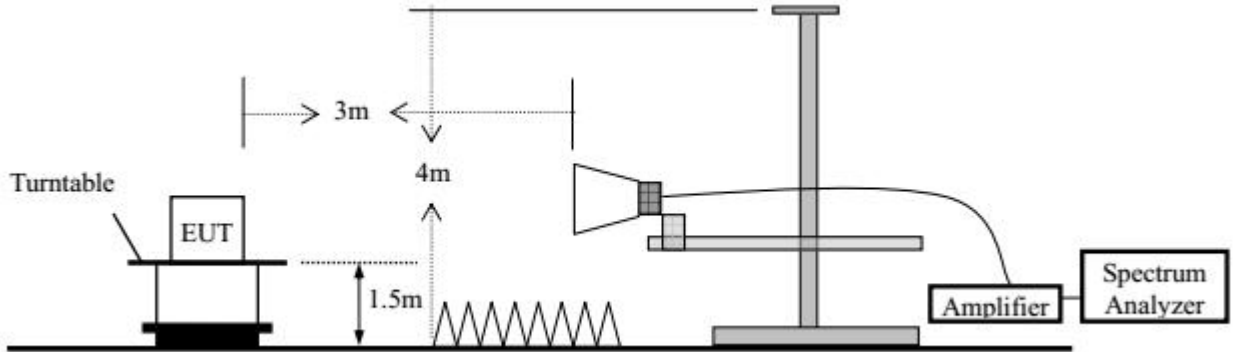


#### Radiated Emission Test Set-Up, Frequency 30MHz-1000MHz





**Radiated Emission Test Set-Up, Frequency above 1GHz**



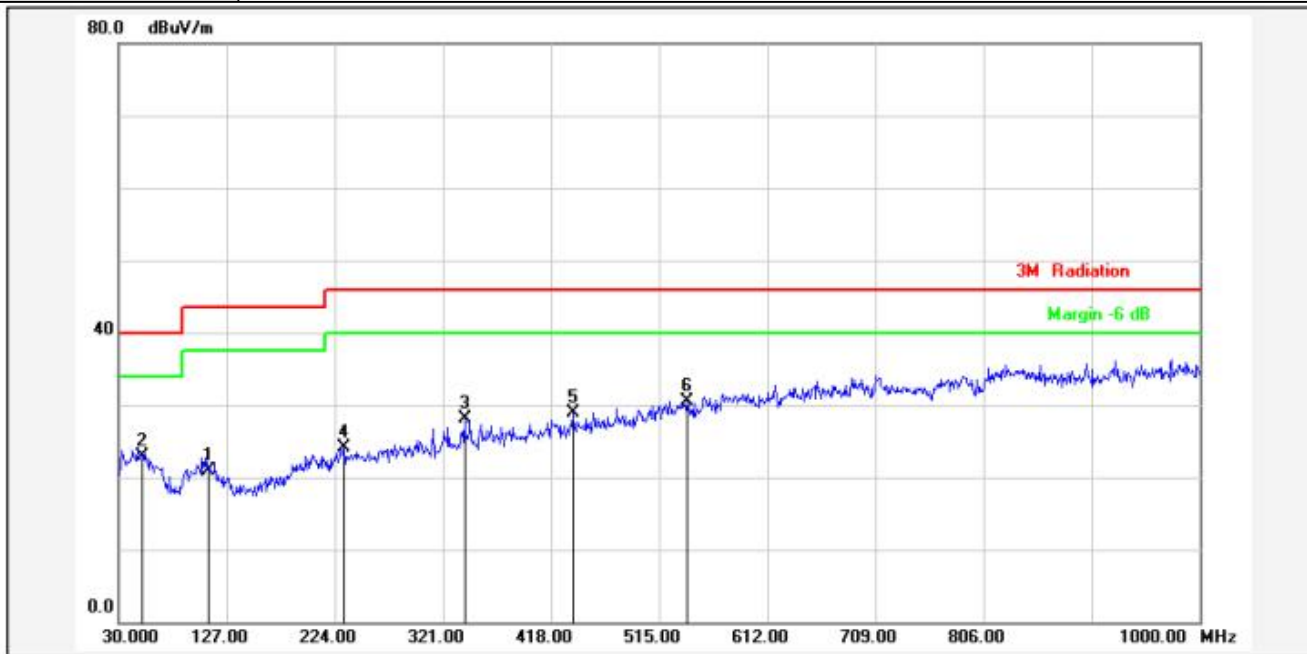
**7.4 TEST RESULT AND DATA (9KHZ ~ 30MHZ)**

The 9kHz - 30MHz spurious emission is under limit 20dB more.



**7.5 TEST RESULT AND DATA (30MHZ ~ 1GHZ, WORST EMISSIONS FOUND)**

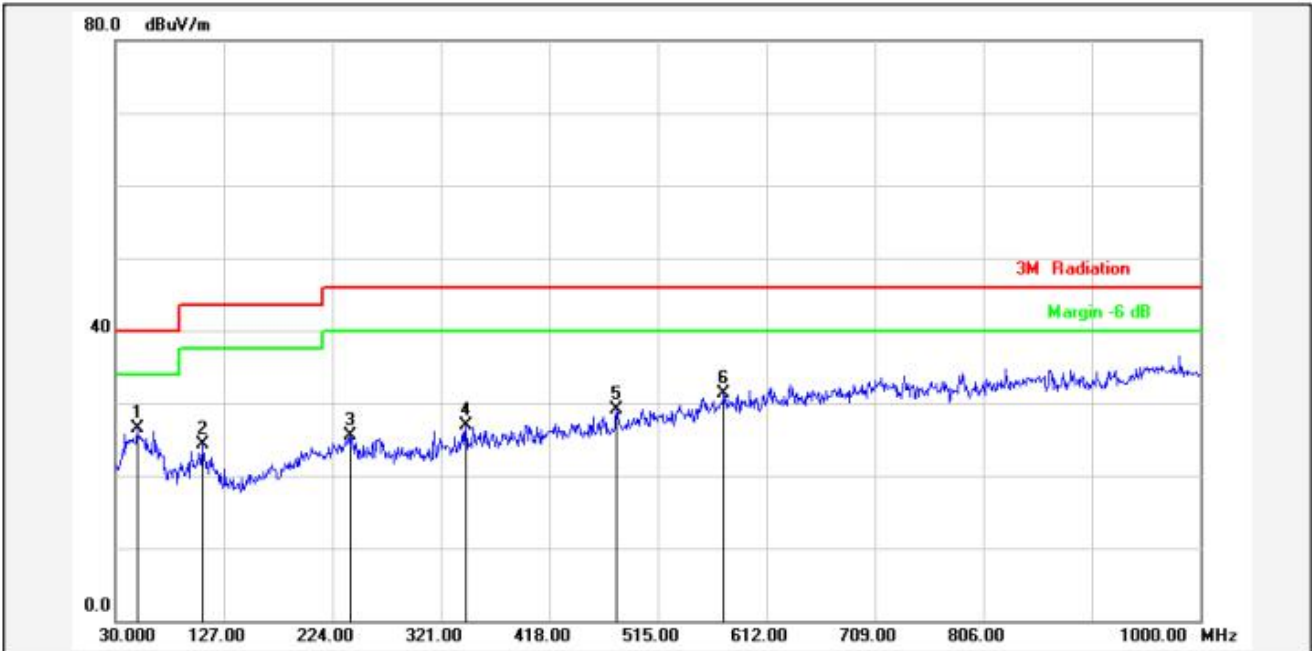
M/N :	4200-C	Test Voltage:	AC 120V/60Hz
Test Date :	April 09, 2018	Phase:	Vertical
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Low channel		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	110.5100	14.06	6.84	20.90	43.50	-22.60	QP			P	
2	51.3400	16.10	6.84	22.94	40.00	-17.06	QP			P	
3	340.4000	17.44	10.70	28.14	46.00	-17.86	QP			P	
4	232.7300	14.47	9.71	24.18	46.00	-21.82	QP			P	
5	437.4000	19.02	9.96	28.98	46.00	-17.02	QP			P	
6	540.2200	21.14	9.41	30.55	46.00	-15.45	QP			P	



M/N :	4200-C	Test Voltage:	AC 120V/60Hz
Test Date :	April 09, 2018	Phase:	Horizontal
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Low channel		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	49.4000	16.12	10.36	26.48	40.00	-13.52	QP			P	
2	107.6000	19.15	5.24	24.39	43.50	-19.11	QP			P	
3	240.4900	14.84	10.66	25.50	46.00	-20.50	QP			P	
4	343.3100	17.54	9.38	26.92	46.00	-19.08	QP			P	
5	478.1400	19.81	9.26	29.07	46.00	-16.93	QP			P	
6	574.1700	21.87	9.39	31.26	46.00	-14.74	QP			P	



**7.6 TEST RESULT AND DATA (ABOVE 1GHZ)**

M/N :	4200-C			Test Voltage:	AC 120V/60Hz					
Test Date :	April 10, 2018			Phase:	Vertical					
Temperature:	20°C			Relative Humidity:	54%					
Pressure:	101.0KPa			Test by:	Bing					
Test Mode:	TX									
Operation Mode:Channel 1										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4810.23	V	48.61	30.22	14.55	63.16	44.77	74.00	54.00	-10.84	-9.23
7215.35	V	39.46	26.11	15.23	54.69	41.34	74.00	54.00	-19.31	-12.66
---										
4810.76	H	47.24	30.71	14.21	61.45	44.92	74.00	54.00	-12.55	-9.08
7215.29	H	41.56	25.97	14.55	56.11	40.52	74.00	54.00	-17.89	-13.48
---										
Operation Mode:Channel 8										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4880.52	V	46.40	31.05	14.21	60.61	45.26	74.00	54.00	-13.39	-8.74
7320.81	V	42.68	28.96	15.03	57.71	43.99	74.00	54.00	-16.29	-10.01
---										
4880.76	H	45.26	30.28	14.20	59.46	44.48	74.00	54.00	-14.54	-9.52
7320.77	H	38.47	26.04	18.55	57.02	44.59	74.00	54.00	-16.98	-9.41
---										
Operation Mode:Channel 16										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4960.26	V	45.59	29.97	14.19	59.78	44.16	74.00	54.00	-14.22	-9.84
7440.81	V	41.66	26.89	15.03	56.69	41.92	74.00	54.00	-17.31	-12.08
---										
4960.29	H	46.87	32.01	14.55	61.42	46.56	74.00	54.00	-12.58	-7.44
7440.45	H	38.77	26.56	18.05	56.82	44.61	74.00	54.00	-17.18	-9.39
---										



**FUNDAMENTAL FREQUENCY:**

M/N :	4200-C	Test Voltage:	AC 120V/60Hz
Test Date :	April 10, 2018	Phase:	Vertical
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	TX		

Operation Mode:QPSK										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2405	V	75.09	54.74	13.75	88.84	68.49	114	94	-25.16	-25.51
2405	H	74.07	53.24	13.75	87.82	66.99	114	94	-26.18	-27.01
---										
2440	V	66.52	48.05	14.01	80.53	62.06	114	94	-33.47	-31.94
2440	H	63.95	44.84	14.01	77.96	58.85	114	94	-36.04	-35.15
---										
2480	V	69.45	51.61	14.32	83.77	65.93	114	94	-30.23	-28.07
2480	H	67.41	48.62	14.32	81.73	62.94	114	94	-32.27	-31.06

NOTE: RBW>20BW; VBW=3\*RBW



## 7.7 RESTRICT BAND EMISSION MEASUREMENT DATA

M/N :	4200-C	Test Voltage:	AC 120V/60Hz							
Test Date :	April 10, 2018	Phase:	Vertical							
Temperature:	20°C	Relative Humidity:	54%							
Pressure:	101.0KPa	Test by:	Bing							
Test Mode:	QPSK									
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2390.000	H	32.98	17.25	13.55	46.53	30.80	74	54	-27.47	-23.20
2390.000	V	37.44	20.15	13.55	50.99	33.70	74	54	-23.01	-20.30
2483.500	H	31.07	15.57	14.63	45.70	30.20	74	54	-28.30	-23.80
2483.500	V	36.68	21.57	14.63	51.31	36.20	74	54	-22.69	-17.80

### Note:

1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting:1 MHz RBW with 1 MHz VBW (Peak Detector).
5. Measurements above 1000 MHz, Average detector setting:1 MHz RBW with 10Hz VBW (RMS Detector).
6. Peak detector measurement data will represent the worst case results.
7. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.



## 8. BANDWIDTH TEST

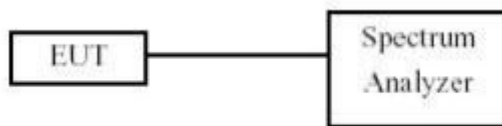
### 8.1 TEST LIMIT

No Limit.

### 8.2 TEST PROCEDURES

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 30KHz, VBW $\cong$ RBW, Sweep time = Auto.

### 8.3 TEST SETUP LAYOUT



### 8.4 TEST RESULT AND DATA

**PASS**

Please refer to following table.





Temperature :	22 °C	Humidity:	56%	Pressure:	101.45KPa
Test By:		Bing	Test Date :	April 13, 2018	
Frequency MHz		20dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	Limit	
IEEE 802.15.4					
Low Channel: 2405		2.518	2.229	---	
Middle Channel: 2440		2.532	2.241	---	
High Channel: 2480		2.529	2.239	---	



## Low Channel



## Middle Channel





### High Channel





## 9. RESTRICTED BANDS OF OPERATION

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

\*\* : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

### 9.1 LABELING REQUIREMENT

The device shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**--END---**