FCC 47 CFR PART 15 SUBPART C

TEST REPORT

for

Wireless Kitchen Thermometer

Model: RT-40, XR-40

Brand: N/A

Test Report Number:
C171121Z02-RP1

Issued for

Maverick Industries, Inc.

94 Mayfied Avenue Edison, New Jersey 08837, U.S.A

Issued By

Compliance Certification Services (Shenzhen) Inc.
No.10-1 Mingkeda Logistics park, No.18 Huanguan South Rd.,
Guan Lan Town, Baoan District, Shenzhen, China
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Issued Date: December 1, 2017

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检测
TESTING
CNAS L4818

Certificate Number: 2861.01

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 1, 2017	Initial Issue	ALL	Amzula Chen

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1. TEST RESULT CERTIFICATION

Product	Wireless Kitchen Thermometer
Model	RT-40, XR-40
Brand	N/A
Tested	November 21~December 6, 2017
Applicant	**Maverick Industries, Inc.** 94 Mayfied Avenue Edison, New Jersey 08837, U.S.A
Manufacturer	**Maverick Industries, Inc.** 94 Mayfied Avenue Edison, New Jersey 08837, U.S.A

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
DEVIATION FROM APPLICABLE STANDARD	
None	

We hereby certify that:

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.209 and Part 15.231.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Eve. Wang

Eve Wang
Supervisor of EMC Dept.
Compliance Certification Service (Shenzhen) Inc.

Reviewed by:

Nancy Fu

Nancy Fu
Supervisor of Report Dept.
Compliance Certification Service (Shenzhen) Inc.

2. EUT DESCRIPTION

Product	Wireless Kitchen Thermometer
Model	RT-40, XR-40
Brand	N/A
Model Difference	The models are identical to each other except the model name diffrence.
Power Supply	DC 1.5V*2(supplied by dry cell)
Frequency Range	433.92 MHz
Transmit Power	Peak: 79.01dBuV/m (Max.) Average: 71.93dBuV/m (Max.)
Modulation Technique	GFSK
Number of Channels	1 Channel
Antenna Designation	spring antenna with -1.5dBi gain (Max)
Temperature Range	0℃- 50℃
Hardware Version	V0
Software Version	V1.08

Remark: *This submittal(s) (test report) is intended for FCC ID: TKCXR-40 filing to comply with Section 15.209 and 15.231 of the FCC Part 15, Subpart C Rules.*

3. TEST METHODOLOGY

3.1 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.
The following test mode(s) were scanned during the preliminary test below 1G:

Test Item	Test mode	Worse mode
Conducted Emission	Not applicable since the EUT supplied by the dry cell.	☐
Radiated Emission	Mode 1: TX	☒

Above 1G, TX mode with the highest data rate (worst case) are chosen for full testing.

4. FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.10:2013, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

4.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	FCC
Japan	VCCI(C-4815,R-4320,T-2317, G-10624)
Canada	INDUSTRY CANADA

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccssz.com

4.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	*Uncertainty*
Radiated Emission, 30 to 200 MHz Test Site : 966(2)	+/-3.6880dB
Radiated Emission, 200 to 1000 MHz Test Site : 966(2)	+/-3.6695dB
Radiated Emission, 1 to 8 GHz	+/-5.1782dB
Radiated Emission, 8 to 18 GHz	+/-5.2173dB
Conducted Emissions	+/-3.6836dB
Band Width	178kHz
Peak Output Power MU	+/-1.906dB
Band Edge MU	+/-0.182dB
Channel Separation MU	416.178Hz
Duty Cycle MU	0.054ms
Frequency Stability MU	226Hz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.

5. SETUP OF EQUIPMENT UNDER TEST

5.1 SETUP CONFIGURATION OF EUT

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

5.2 SUPPORT EQUIPMENT

No	Equipment	Model	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1.	Battery*2	R6PUN	N/A	N/A	Panasonic	N/A	N/A
2	Wireless Kitchen Thermometer	RT-40	N/A	N/A	N/A	N/A	N/A

Remark:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

6. FCC PART 15.231 REQUIREMENTS

6.1 20 DB BANDWIDTH

LIMIT

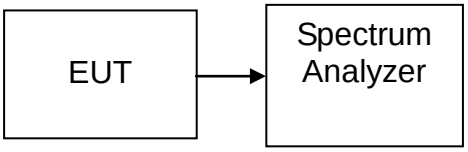
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10 kHz and VBW is set 30kHz.

TEST RESULTS

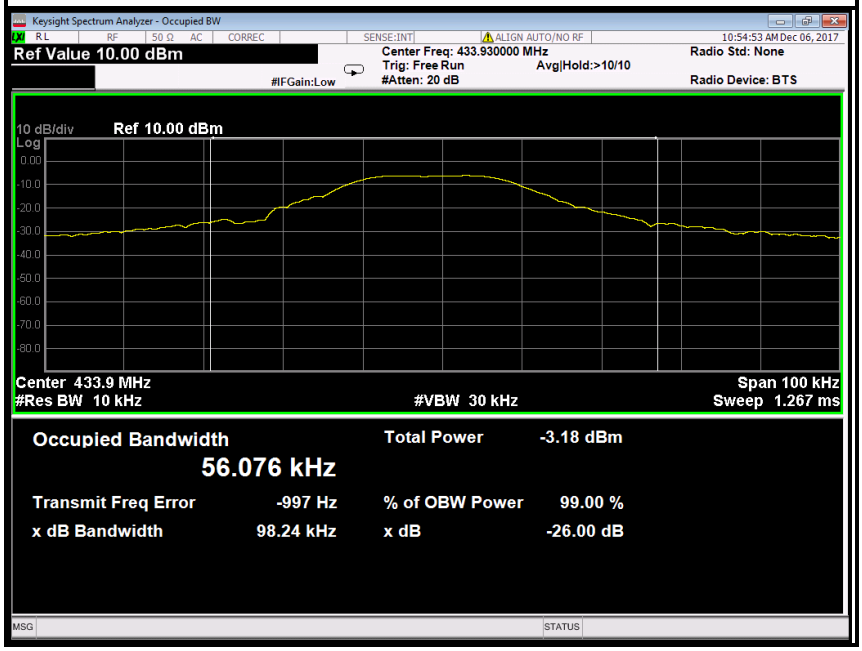
No non-compliance noted.

Test Data

Frequency (MHz)	20 dB Bandwidth (MHz)	Limit (MHz)	Result
433.92	0.089	1.0848	PASS

Test Plot

20dB Bandwidth



6.2 LIMIT OF TRANSMISSION TIME

LIMIT

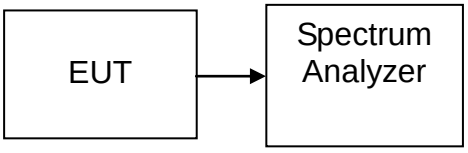
According to 15.231 (e) Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018
Spectrum Analyzer	R&S	FSU	200409	09/23/2017	09/22/2018

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 1MHz.

TEST RESULTS

No non-compliance noted

Test Data

Frequency (MHz)	Transmission Time (s)	Limit (s)	Result
433.92	0.151	1	Pass

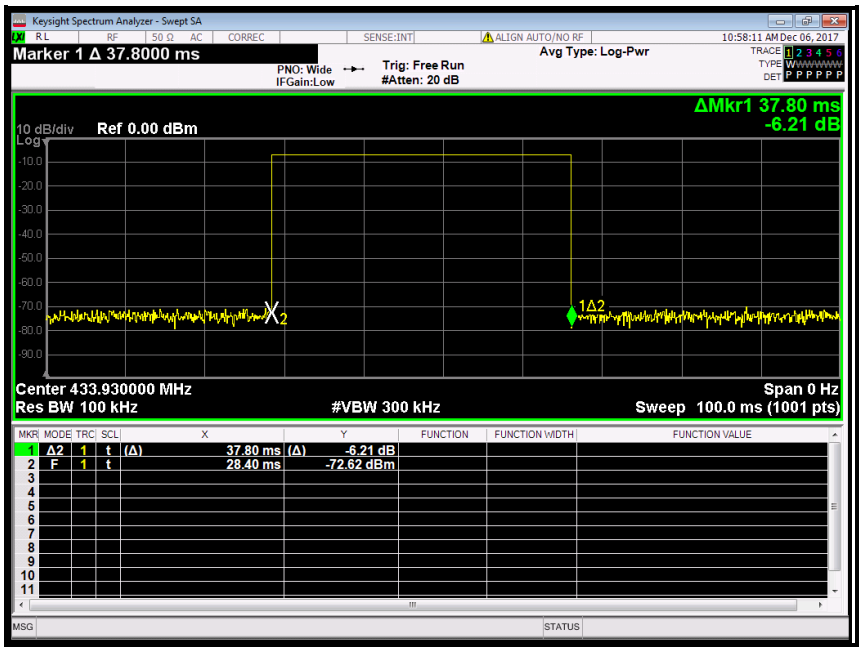
Frequency (MHz)	Silent Period (s)	Limit (s)	Result
433.92	12	10	Pass

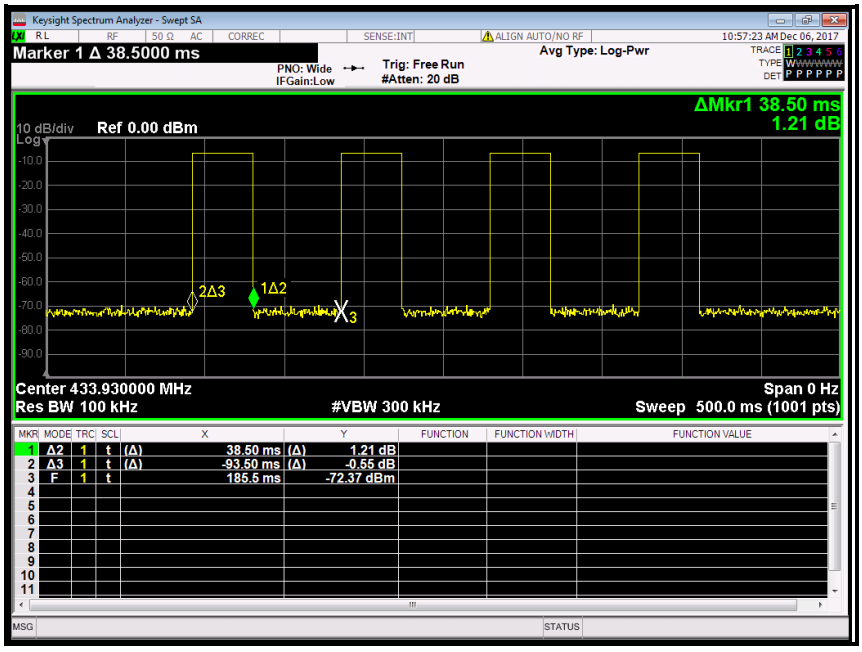
Limit: 1. >30 times of the transmission = 30*0.151 = 4.53 s

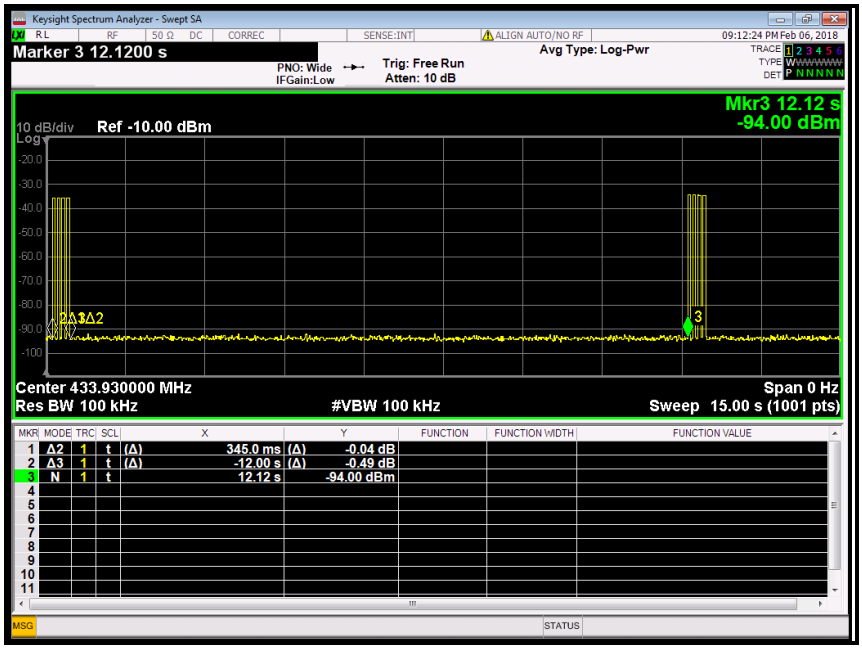
(only relevant if greater than 10s)

2. >10 s

Test Plot







6.3 DUTY CYCLE

LIMIT

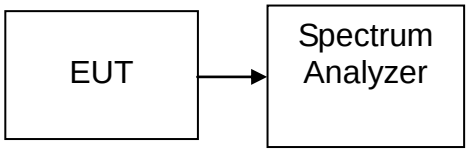
Nil (No dedicated limit specified in the Rules)

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Adjust Sweep = 20ms
5. Repeat above procedures until all frequency measured were complete.

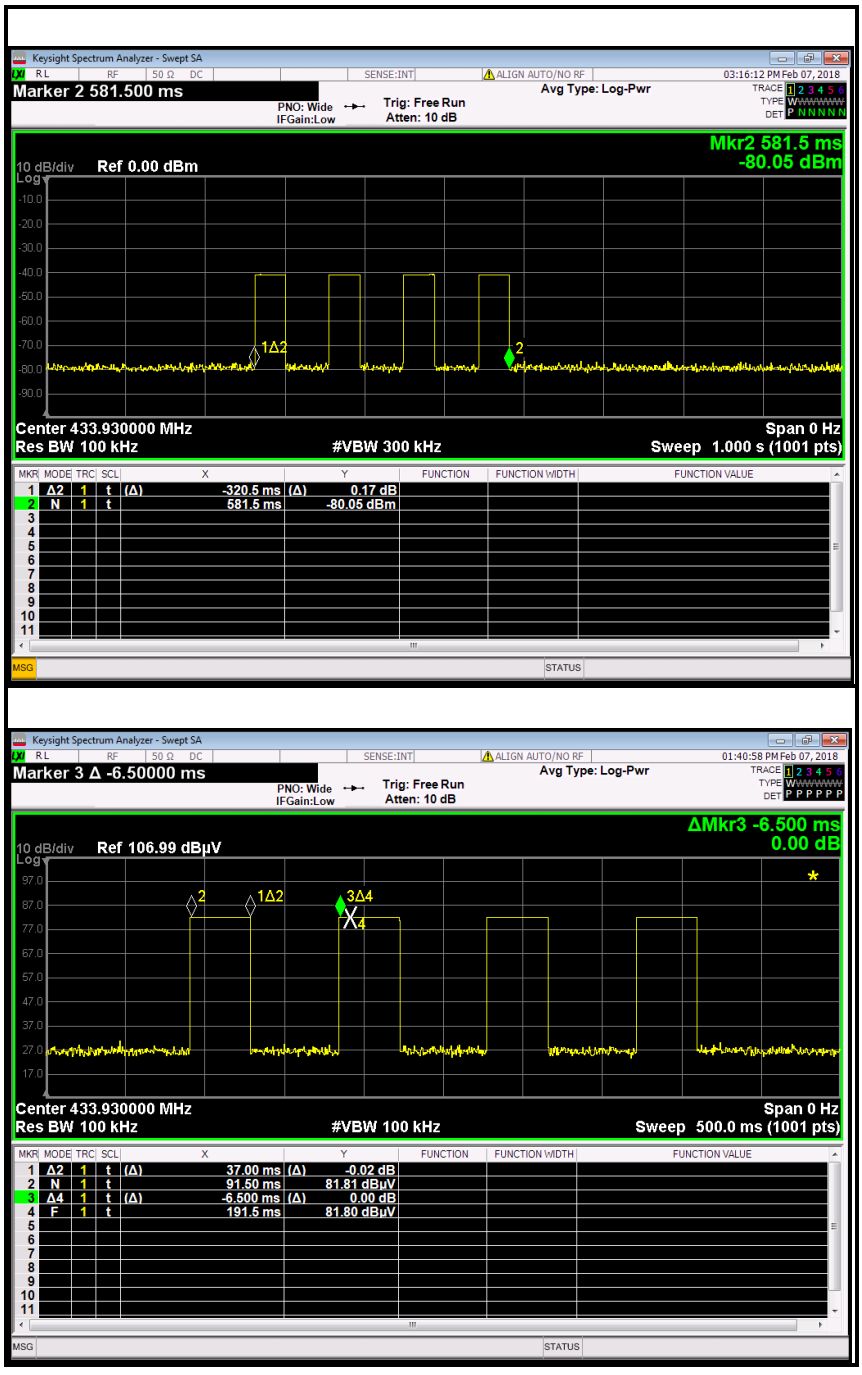
TEST RESULTS

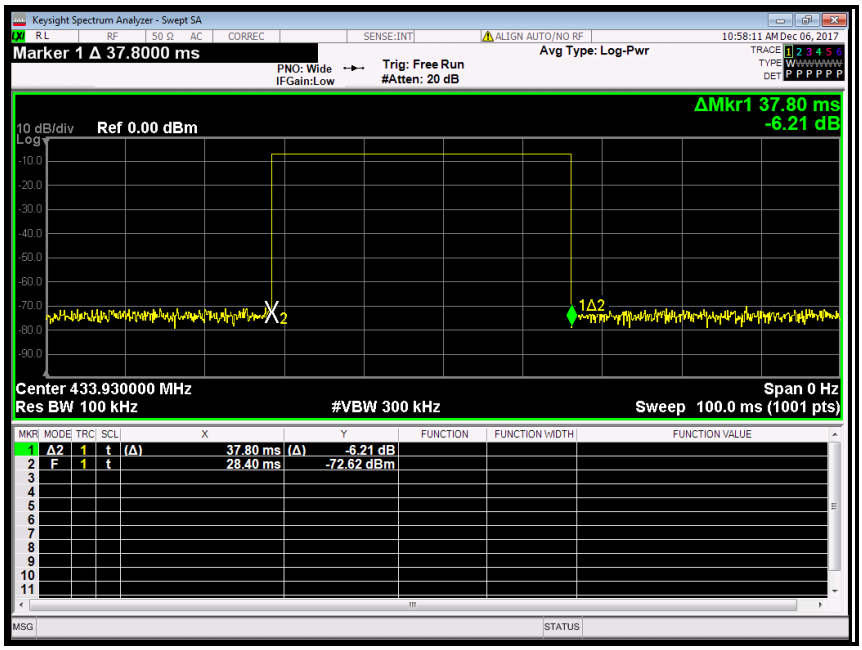
No non-compliance noted

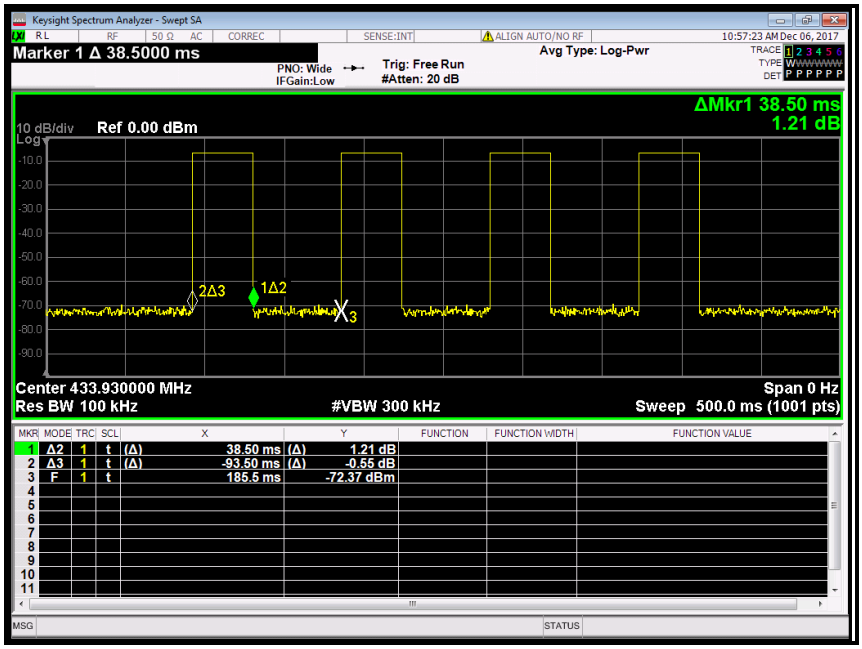
Test Data

*Duty Cycle Correction Factor = 20*log(1/x)=20*log(1/0.435)=7.07*
【X=(37.8+6.5)/100=0.443】

Test Plot







6.4 RADIATED EMISSIONS

LIMIT

According to §15.231 (e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500[1]	50 to 150[1]
174-260	1,500	150
260-470	1,500 to 5,000[1]	150 to 500[1]
Above 470	5,000	500

1. ** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site 966（2）					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2017	02/20/2018
Amplifier	EMEC	EM330	060661	03/18/2017	03/17/2018
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2017	02/20/2018
Loop Antenna	COM-POWER	AL-130	121044	09/25/2017	09/24/2018
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2017	02/20/2018
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/21/2017	02/20/2018
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/21/2017	02/20/2018
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2017	02/20/2018
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

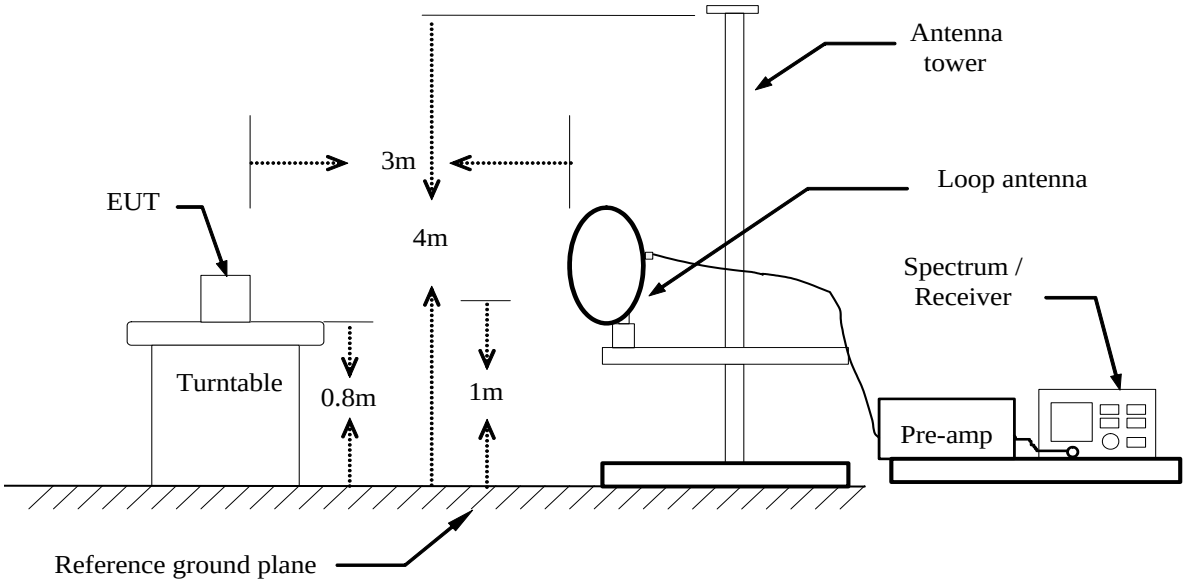
   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

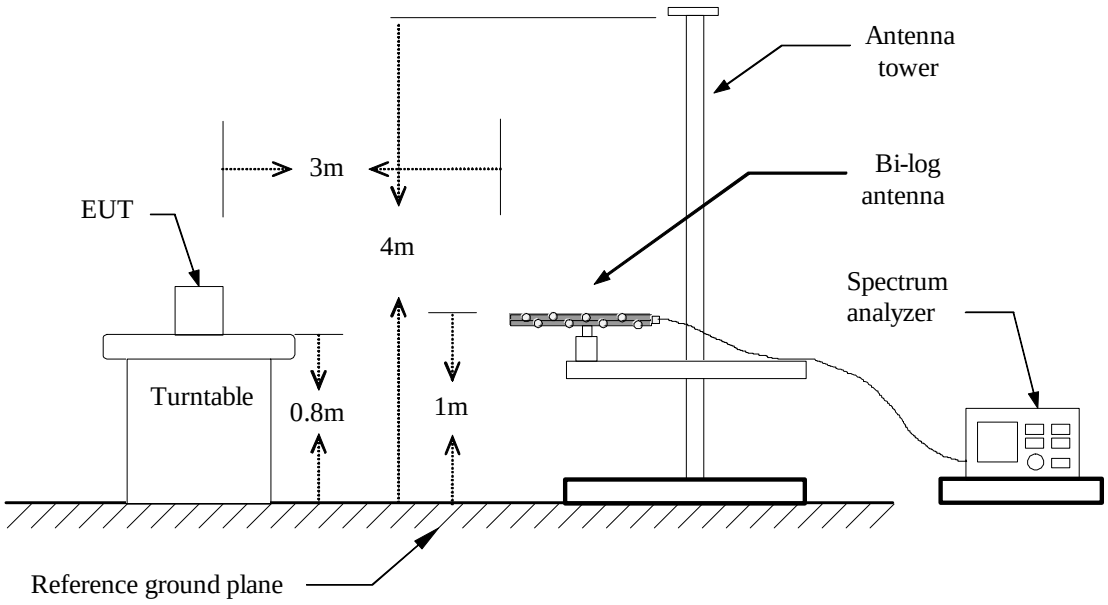
   (b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

TEST CONFIGURATION

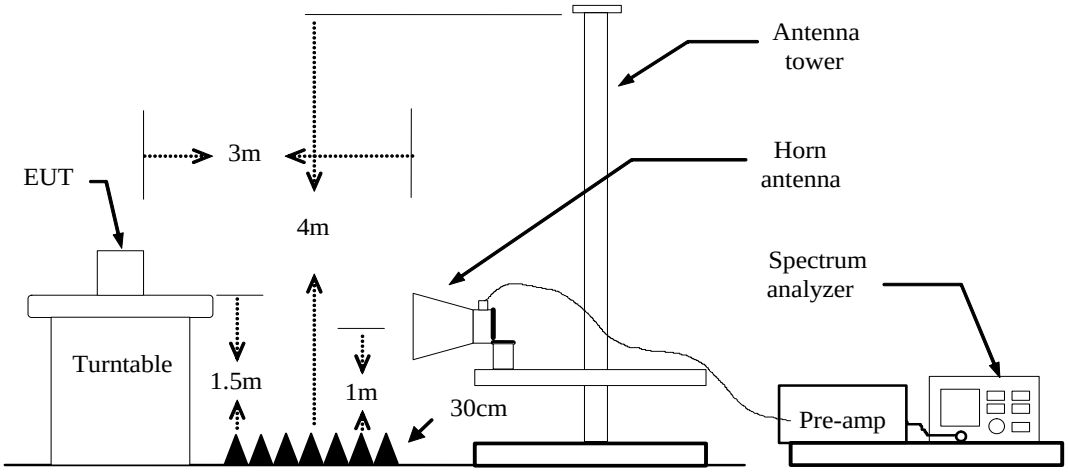
Below 30MHz



Below 1 GHz



Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

DATA SAMPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	37.47	-16.41	21.06	40.00	-18.94	V	QP

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	55.54	4.56	60.10	74.00	-13.90	V	Peak
XXXX.XXXX	29.66	4.56	34.22	54.00	-19.78	V	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-peak Reading
Peak = Peak Reading
AVG = Average Reading

TEST RESULTS

Operation Mode: TX **Test Date:** November 22, 2017

Temperature: 24°C **Tested by:** Fade Zhong

Humidity: 52 % RH **Polarity:** Ver. / Hor.

Fundamental:

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
433.52	94.63	-15.62	79.01	92.87	-13.86	V	Peak
433.52	87.40	-15.62	71.94	72.87	-0.93	V	AVG
433.52	94.62	-15.62	79.00	92.87	-13.87	H	Peak
433.52	87.40	-15.62	71.93	72.87	-0.94	H	AVG

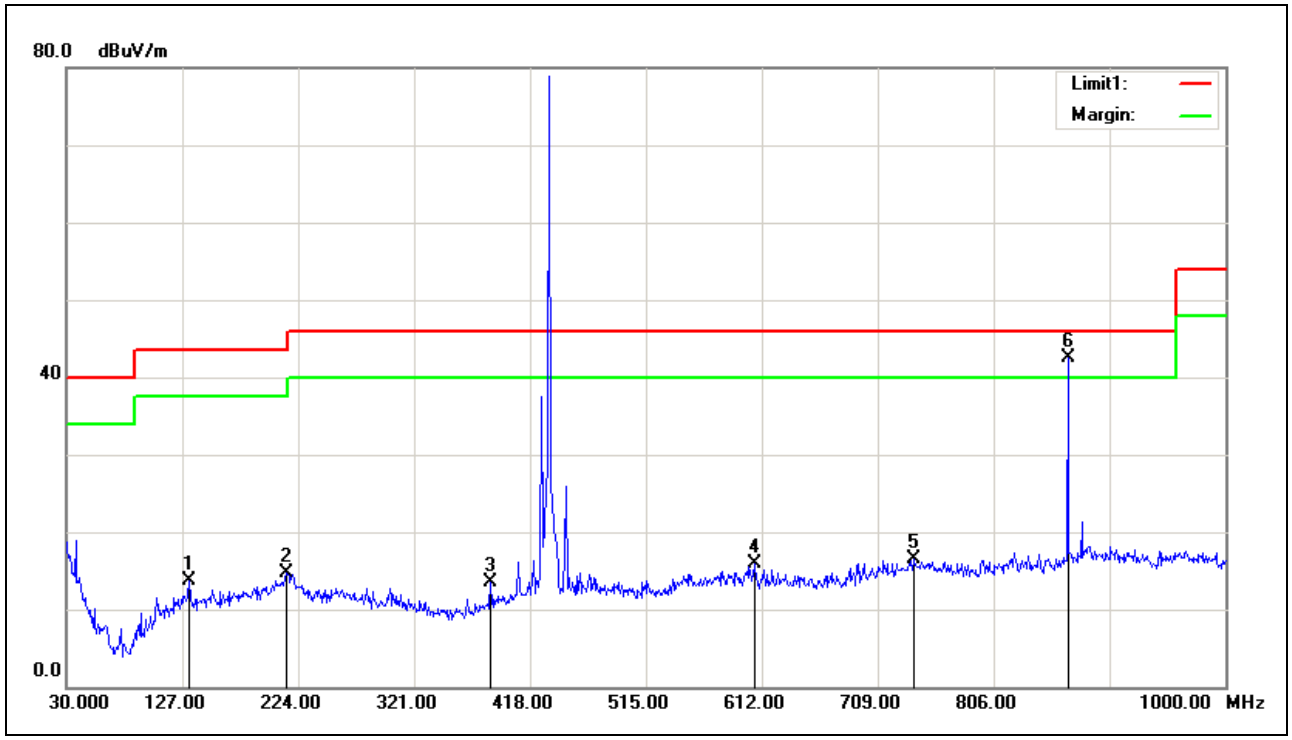
Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
132.8200	34.57	-20.89	13.68	43.50	-29.82	V	peak
214.3000	35.71	-21.01	14.70	43.50	-28.80	V	peak
385.0200	29.90	-16.44	13.46	46.00	-32.54	V	peak
606.1800	28.57	-12.71	15.86	46.00	-30.14	V	peak
739.0700	27.83	-11.37	16.46	46.00	-29.54	V	peak
868.0800	52.93	-10.36	42.57	46.00	-3.43	V	peak
132.8200	34.41	-20.89	13.52	43.50	-29.98	H	peak
211.3900	36.29	-21.35	14.94	43.50	-28.56	H	peak
306.4500	31.53	-19.32	12.21	46.00	-33.79	H	peak
468.4400	31.67	-14.79	16.88	46.00	-29.12	H	peak
630.4300	28.32	-12.50	15.82	46.00	-30.18	H	peak
868.0800	52.91	-10.36	42.55	46.00	-3.45	H	peak

Remark: AVG = peak - duty factor

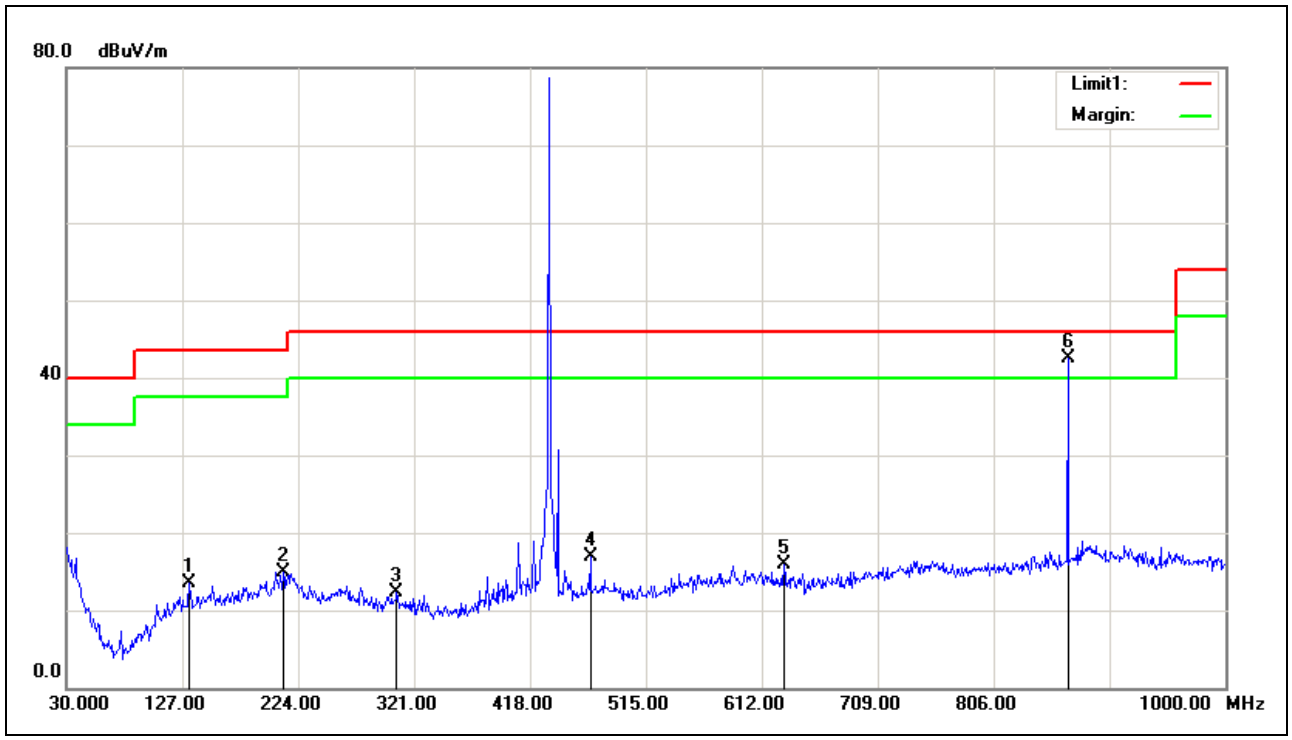
Notes:

1. *Measuring frequencies from 9KHz to the 1000MHz.*
2. *Radiated emissions measured in frequency range from 9KHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

Vertical



Horizontal



Above 1 GHz

Operation Mode:	TX	**Test Date:**	November 22, 2017
Temperature:	24°C	**Humidity:**	52 %, H
Tested by:	Fade Zhong		

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1304.000	48.78	-7.41	41.37	74.00	-32.63	V	peak
1744.000	53.67	-6.39	47.28	74.00	-26.72	V	peak
1912.000	50.74	-5.56	45.18	74.00	-28.82	V	peak
2500.000	42.43	-2.26	40.17	74.00	-33.83	V	peak
3036.000	43.43	-1.30	42.13	74.00	-31.87	V	peak
3688.000	41.37	0.27	41.64	74.00	-32.36	V	peak
1304.000	49.50	-7.41	42.09	74.00	-31.91	H	peak
1744.000	53.44	-6.39	47.05	74.00	-26.95	H	peak
2172.000	45.54	-4.06	41.48	74.00	-32.52	H	peak
3036.000	45.52	-1.30	44.22	74.00	-29.78	H	peak
3904.000	41.90	1.18	43.08	74.00	-30.92	H	peak
4224.000	41.43	2.38	43.81	74.00	-30.19	H	peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
a. Spectrum Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
b. AVG=peak- duty factor.

6.5 POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/11/2017	02/10/2018
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	02/11/2017	02/10/2018
LISN	EMCO	3825/2	8901-1459	02/12/2017	02/11/2018
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	02/15/2017	02/14/2018
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST CONFIGURATION

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

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

Not applicable (Since the EUT is powered by dry cell)