

TEST REPORT

Product Name : eHandle
Model Number : EH01, EH02
FCC ID : 2AVVS-EH01

Prepared for : CIS GLOBAL L L C
Address : 1791 W DAIRY PL SUITE 185 TUCSON AZ 85705 UNITED STATES

Prepared by : EMTEK (SHENZHEN) CO., LTD.
Address : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

Tel: (0755) 26954280
Fax: (0755) 26954282

Report Number : ES191126025W
Date(s) of Tests : November 26, 2019 to April 10, 2020
Date of issue : April 13, 2020

Table of Contents

1 EUT TECHNICAL DESCRIPTION.....	5
2 SUMMARY OF TEST RESULT	6
3 TEST METHODOLOGY	7
3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS	7
3.2 MEASUREMENT EQUIPMENT USED.....	7
3.3 DESCRIPTION OF TEST MODES	8
4 FACILITIES AND ACCREDITATIONS	9
4.1 FACILITIES.....	9
4.2 LABORATORY ACCREDITATIONS AND LISTINGS	9
5 TEST SYSTEM UNCERTAINTY.....	10
6 SETUP OF EQUIPMENT UNDER TEST.....	11
6.1 RADIO FREQUENCY TEST SETUP 1	11
6.2 RADIO FREQUENCY TEST SETUP 2	11
6.3 CONDUCTED EMISSION TEST SETUP	12
6.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM	13
6.5 SUPPORT EQUIPMENT	13
7 TEST REQUIREMENTS	14
7.1 20DB BANDWIDTH	14
7.2 FREQUENCY STABILITY.....	16
7.3 CONDUCTED EMISSION TEST	18
7.4 RADIATED SPURIOUS EMISSION.....	21
8 ANTENNA APPLICATION.....	28

TEST RESULT CERTIFICATION

Applicant: CIS GLOBAL L L C
1791 W DAIRY PL SUITE 185 TUCSON AZ 85705 UNITED STATES

Manufacturer: ASIA PACIFIC CIS (WUXI) CO., LTD. SHUOFANG PLANT
B1 Building, No. 5 Feifeng Road, High-Tech Zone Wuxi City Jiangsu China

Product Description: eHandle

Model Number: EH01, EH02

Trademark:

enLOGIC

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C	PASS

The above equipment was tested by EMTEK(SHENZHEN) CO., LTD. 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 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.225.

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

Date of Test : November 26, 2019 to April 10, 2020

Prepared by : Abel Wu
Abel Wu/Editor

Reviewer : Joe Xia
Joe Xia/Supervisor*

Approved & Authorized Signer : Lisa Wang
Lisa Wang/Manager



Modified History

Version	Report No.	Revision date	Summary
Ver.1.0	ES191126025W	\	Original Report



1 EUT TECHNICAL DESCRIPTION

Characteristics	Description
EUT Description:	eHandle
Model Number:	EH01, EH02 (Note: There are 10 openings on the surface of EH02 rotation handle for installing keys buttons, EH01 does not has this. EH02 use a PCBA board with a microprocessor and communication interface, EH01 does not has this. EH02 has 10 metal keys buttons on the rotation handle surface, EH01 does not has this. 3 metal pins installed in EH02 for motor and PCBA board communication, EH01 does not has this.. We prepared model EH02 foe EMC test.)
Modulation:	ASK
Operating Frequency Range(s):	13.56MHz
Number of Channels:	1 channel
Antenna Type /Gain:	Onboard Trace Loop Antenna / -2.3 dBi
Radio SW/HW version:	HW: V1.3 SW: V1.1
Radio SW/HW version:	HW: V1.3 SW: V1.1
Power supply:	☒ DC supply: DC 5V from Power Adaptor
	☐ Adapter supply:

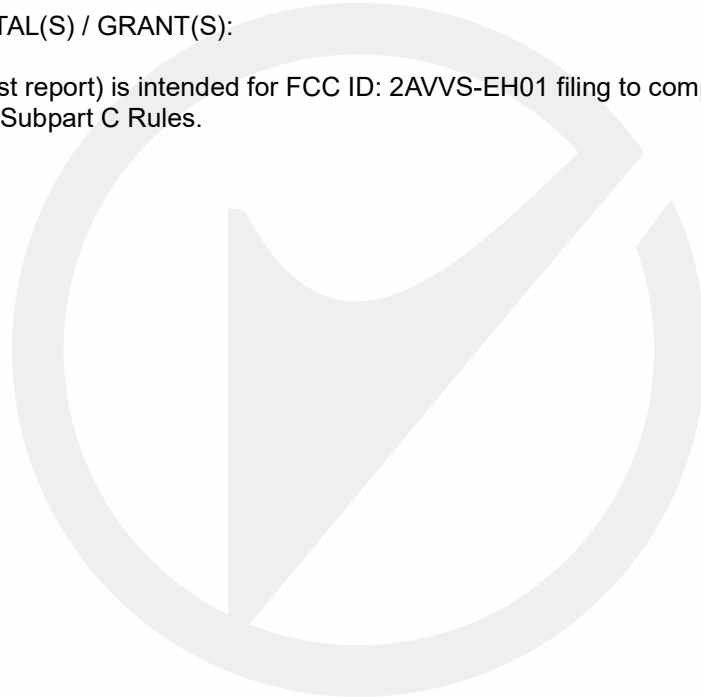
Note: for more details, please refer to the User's manual of the EUT.

2 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
2.1049	20dB Bandwidth	PASS	
15.225(e)	Frequency stability	PASS	
15.225(a) (b) (c) (d) 15.209	Radiated Spurious Emissions	PASS	
15.207	Conducted Emission	PASS	
15.203	Antenna Requirement	PASS	
NOTE1: N/A (Not Applicable) NOTE2: The report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2AVVS-EH01 filing to comply with Section 15.225 of the FCC Part 15, Subpart C Rules.



3 TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C

3.2 MEASUREMENT EQUIPMENT USED

3.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LASTCAL.	DUE CAL.
Test Receiver	Rohde & Schwarz	ESCI	26115-010-0027	May 18, 2019	May 17, 2020
L.I.S.N.	Rohde & Schwarz	ENV216	101161	May 18, 2019	May 17, 2020
50Ω Coaxial Switch	Anritsu	MP59B	6100175589	May 19, 2019	May 18, 2020
Voltage Probe	Rohde & Schwarz	ESH2-Z3	100122	May 19, 2019	May 18, 2020
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 18, 2019	May 17, 2020
I.S.N	Teseq GmbH	ISN T800	30327	May 19, 2019	May 18, 2020

3.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2019	May 18, 2020
Pre-Amplifier	HP	8447F	2944A07999	May 18, 2019	May 17, 2020
Bilog Antenna	Schwarzbeck	VULB9163	142	May 18, 2019	May 17, 2020
Loop Antenna	ARA	PLA-1030/B	1029	May 18, 2019	May 17, 2020
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 19, 2019	May 18, 2020
Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 18, 2019	May 17, 2020
Cable	Schwarzbeck	AK9513	ACRX1	May 19, 2019	May 18, 2020
Cable	Rosenberger	N/A	FP2RX2	May 19, 2019	May 18, 2020
Cable	Schwarzbeck	AK9513	CRPX1	May 19, 2019	May 18, 2020
Cable	Schwarzbeck	AK9513	CRRX2	May 19, 2019	May 18, 2020

3.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LASTCAL.	DUE CAL.
Spectrum Analyzer	Agilent	E4407B	88156318	May 19, 2019	May 18, 2020
Signal Analyzer	Agilent	N9010A	My53470879	May 19, 2019	May 18, 2020
Power meter	Anritsu	ML2495A	0824006	May 19, 2019	May 18, 2020
Power sensor	Anritsu	MA2411B	0738172	May 19, 2019	May 18, 2020

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

3.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

☒ Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	13.56	/	/	/	/

☒ Test Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	13.56	/	/	/	/

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

4.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2013.10.29

The certificate is valid until 2016.10.28

The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)

The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2015.4

The Laboratory has been assessed according to the requirements
ISO/IEC 17025.

Accredited by FCC, August 06, 2018

The certificate is valid until August 07, 2020

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0008.

Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

Site Location

: Building 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

5 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 3\%$

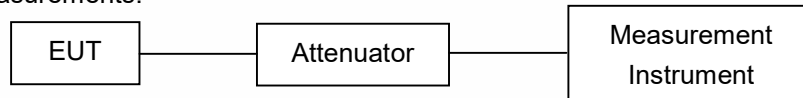
Measurement Uncertainty for a level of Confidence of 95%



6 SETUP OF EQUIPMENT UNDER TEST

6.1 RADIO FREQUENCY TEST SETUP 1

The component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



6.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

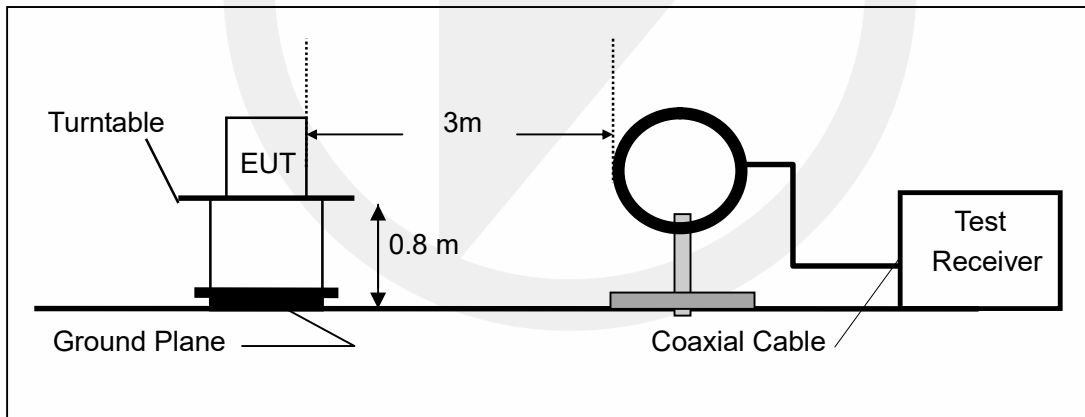
Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

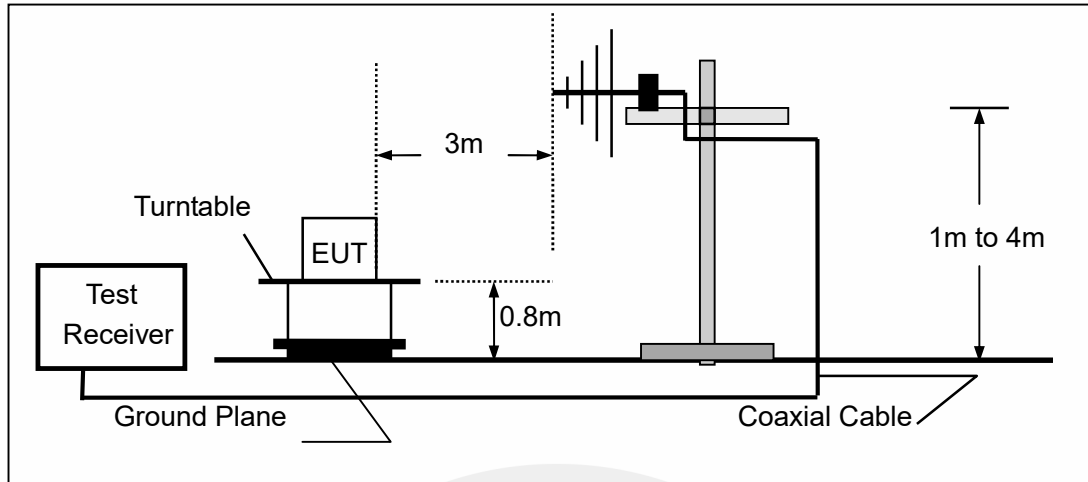
Above 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz

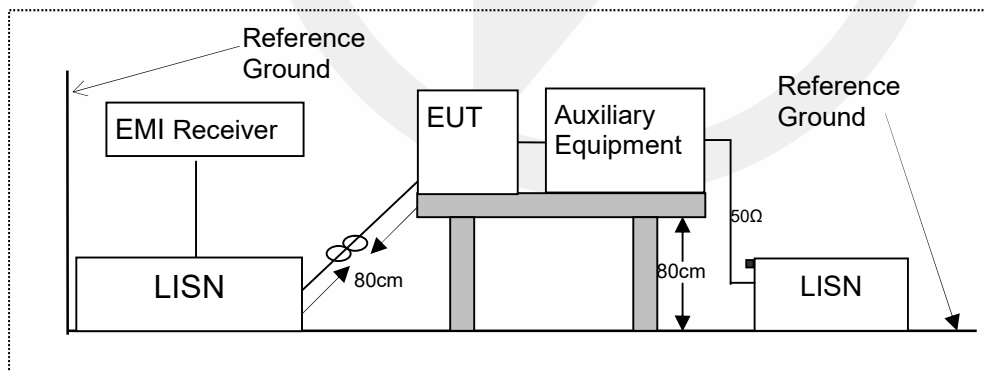


6.3 CONDUCTED EMISSION TEST SETUP

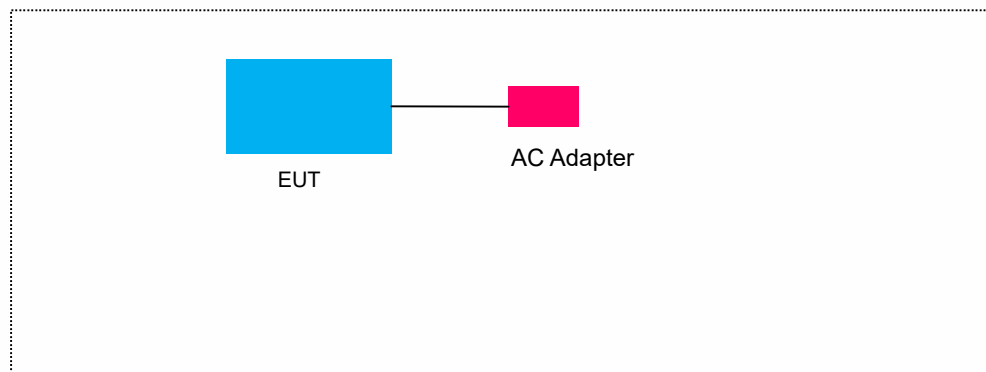
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



6.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



6.5 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	Note
1	Power Adaptor	WAHL	ETS-AD0105-U050200	N/A

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7 TEST REQUIREMENTS

7.1 20DB BANDWIDTH

7.1.1 Applicable Standard

According to FCC Part 2.1049

7.1.2 Conformance Limit

No limit requirement.

7.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup 1

7.1.4 Test Procedure

The EUT was operating in transmit mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 1% occupied bandwidth (3 kHz).

Set the video bandwidth (VBW) = 3 times RBW (10 kHz).

Set Span = approximately 2 to 4 times the occupied bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the markerdelta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20dB bandwidth of the emission.

If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

Measure and record the results in the test report.

7.1.5 Test Results

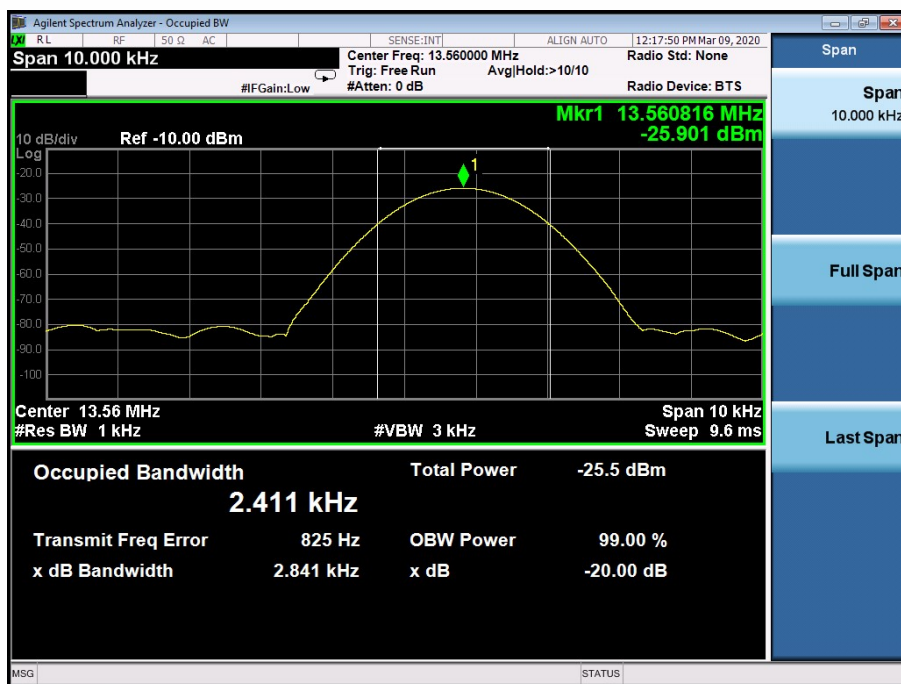
Temperature :	28°C	Test By:	Andy
Humidity :	65 %		

Modulation Mode	Channel Number	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Verdict
ASK	1	13.56	2.841	N/A	PASS
Note: N/A (Not Applicable)					

Test Model

20dB Bandwidth
Channel 0: 13.56MHz

ASK Modulation



7.2 FREQUENCY STABILITY

7.2.1 Applicable Standard

According to FCC Part 2.1055

7.2.2 Conformance Limit

According to part 15.225(a) (b) (c) (d), The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

7.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

7.2.4 Test Procedures

Connect the EUT to frequency analyzer via the antenna connector.

EUT was placed at temperature chamber and connected to an external power supply.

Temperature and voltage condition shall be tested to confirm frequency stability.

(a) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(b) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point, which shall be specified by the manufacturer.

7.2.5 Test Results

Operation Mode	Channel Number	Test Condition		Channel Frequency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (°C)				
ASK	CH0	Vnom	-20	13.56	8	0.59	10
			-10	13.56	12	0.88	10
			0	13.56	9	0.66	10
			10	13.56	10	0.74	10
			20	13.56	11	0.81	10
			30	13.56	11	0.81	10
			40	13.56	12	0.88	10
			50	13.56	9	0.66	10
		5.75V	20	13.56	13	0.96	10
		5.0V	20	13.56	11	0.81	10
		4.25V	20	13.56	10	0.74	10
VERDICT				PASS			

7.3 CONDUCTED EMISSION TEST

7.3.1 Applicable Standard

According to FCC Part 15.207(a)

7.3.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

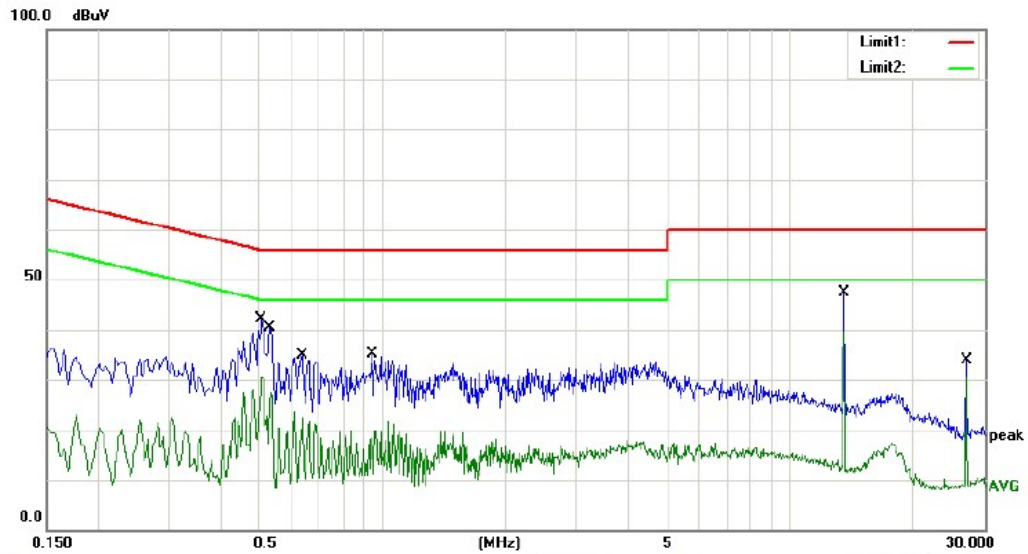
7.3.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

7.3.4 Test Procedure

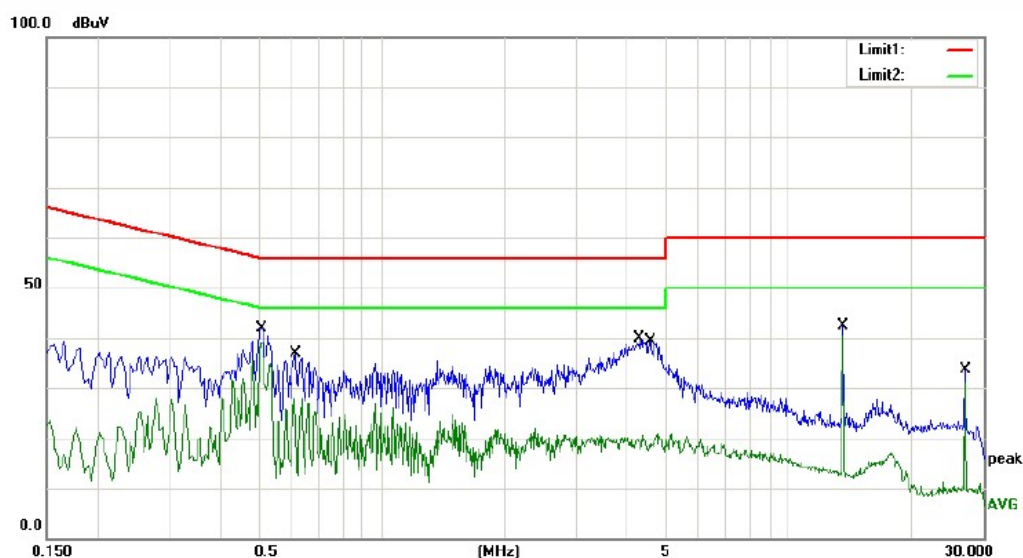
The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

7.3.5 Test Result



Site site #1 Phase: **N** Temperature: 24
 Limit: (CE)FCC PART 15.207_QP Power: AC 120V/60Hz Humidity: 50 %
 Mode: 13.56MHz
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.5060	31.90	10.11	42.01	56.00	-13.99	QP	
2		0.5060	20.20	10.11	30.31	46.00	-15.69	AVG	
3		0.5300	30.20	10.09	40.29	56.00	-15.71	QP	
4		0.5300	17.30	10.09	27.39	46.00	-18.61	AVG	
5		0.6340	24.90	10.04	34.94	56.00	-21.06	QP	
6		0.6340	11.10	10.04	21.14	46.00	-24.86	AVG	
7		0.9460	25.20	9.89	35.09	56.00	-20.91	QP	
8		0.9460	7.00	9.89	16.89	46.00	-29.11	AVG	
9		13.5600	36.70	10.60	47.30	60.00	-12.70	QP	
10	*	13.5600	29.10	10.60	39.70	50.00	-10.30	AVG	
11		27.1240	23.40	10.45	33.85	60.00	-26.15	QP	
12		27.1240	20.00	10.45	30.45	50.00	-19.55	AVG	



Site site #1 Phase: **L1** Temperature: 24
Limit: (CE)FCC PART 15.207_QP Power: AC 120V/60Hz Humidity: 50 %
Mode: 13.56MHz
Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.5100	31.80	10.07	41.87	56.00	-14.13	QP	
2	*	0.5100	29.10	10.07	39.17	46.00	-6.83	AVG	
3		0.6140	26.90	10.05	36.95	56.00	-19.05	QP	
4		0.6140	12.70	10.05	22.75	46.00	-23.25	AVG	
5		4.2940	29.50	10.29	39.79	56.00	-16.21	QP	
6		4.2940	8.40	10.29	18.69	46.00	-27.31	AVG	
7		4.5700	29.00	10.32	39.32	56.00	-16.68	QP	
8		4.5780	8.00	10.32	18.32	46.00	-27.68	AVG	
9		13.5600	31.70	10.53	42.23	60.00	-17.77	QP	
10		13.5600	29.70	10.53	40.23	50.00	-9.77	AVG	
11		27.1200	22.90	10.76	33.66	60.00	-26.34	QP	
12		27.1200	20.30	10.76	31.06	50.00	-18.94	AVG	

7.4 RADIATED SPURIOUS EMISSION

7.4.1 Applicable Standard

According to FCC Part 15.225 and 15.209

7.4.2 Conformance Limit

Field Strength of Fundamental Emissions and Spectrum Mask					
Emissions	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
Fundamental	15848	84.0	103.1	124.0	143.1
Quasi peak measurement of the fundamental.					

Spectrum Mask					
Freq. of Emission (MHz)	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
1.705~13.110	30	29.5	48.6	69.5	88.6
13.110~13.410	106	40.5	59.6	80.5	99.6
13.410~13.553	334	50.5	69.6	90.5	109.6
13.553~13.567	15848	84.0	103.1	124.0	143.1
13.567~13.710	334	50.5	69.6	90.5	109.6
13.710~14.010	106	40.5	59.6	80.5	99.6
14.010~30.000	30	29.5	48.6	69.5	88.6

According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	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	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	48.5 - 13.8	300
0.490-1.705	24000/F(KHz)	33.8 - 23.0	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

7.4.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2

7.4.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for $f < 1$ GHz(30MHz to 1GHz), 200Hz for $f < 150$ KHz(9KHz to 150KHz), 9KHz for $f < 30$ MHz(150KHz to 30KHz)

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

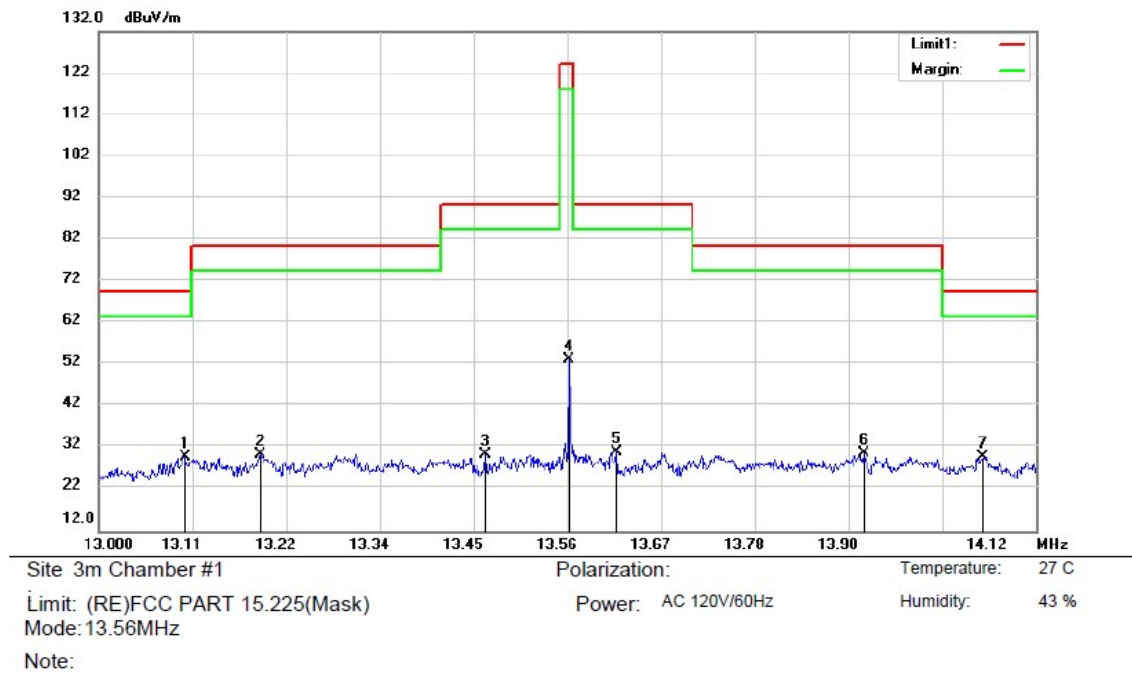
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

7.4.5 Test Results

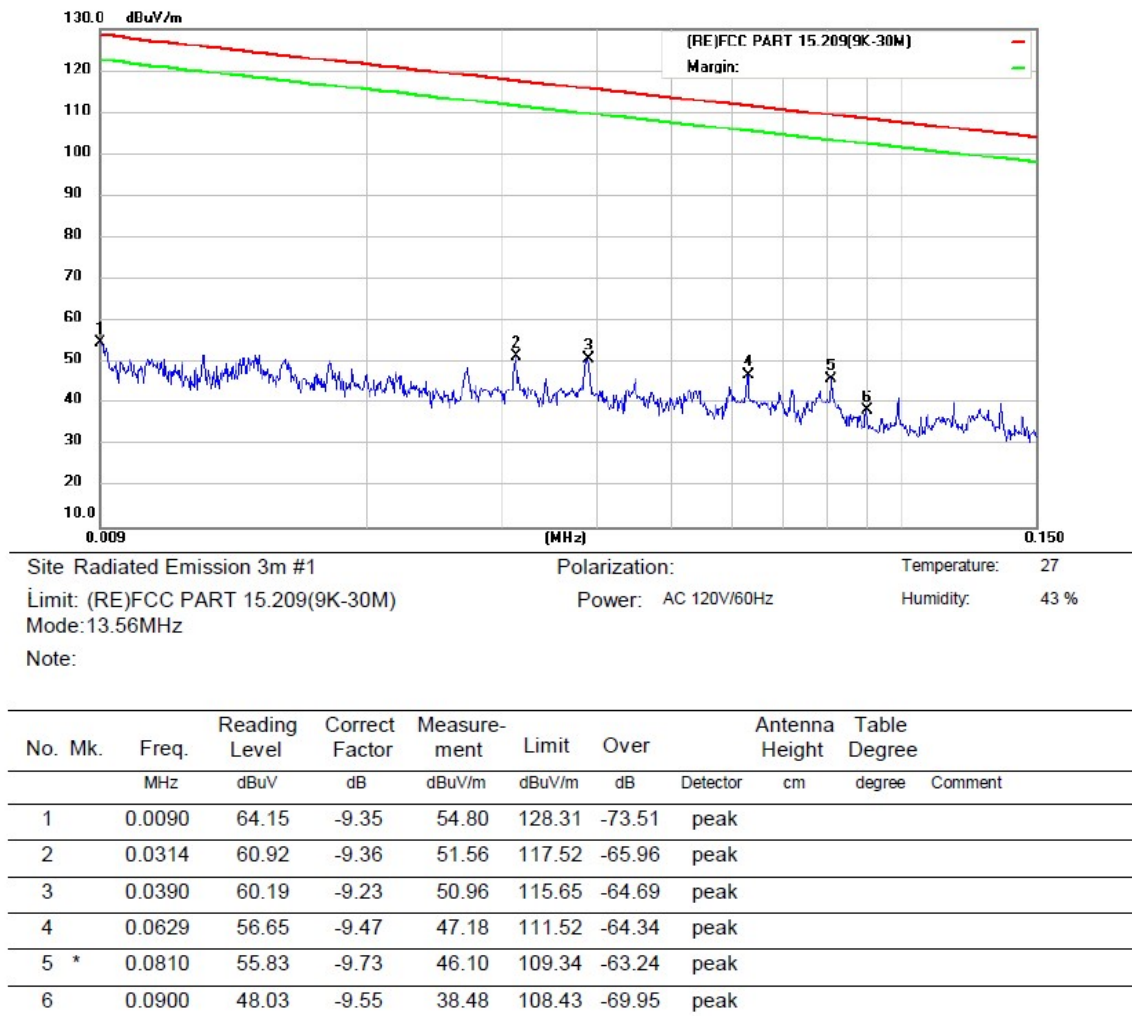
Field Strength of Fundamental Emissions and Spectrum Mask



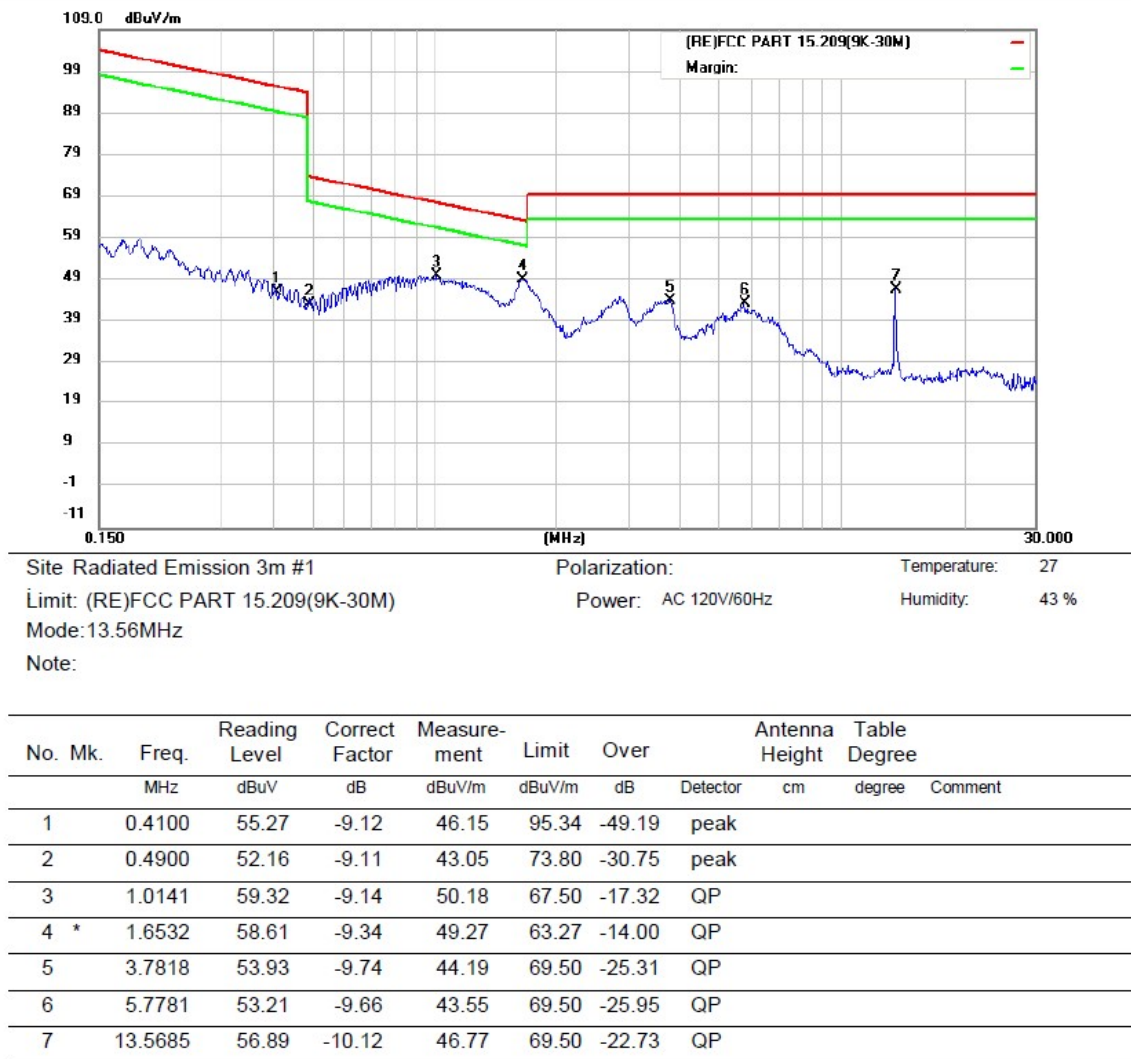
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		13.1043	39.95	-10.06	29.89	69.50	-39.61	QP		
2		13.1943	40.66	-10.07	30.59	80.50	-49.91	QP		
3		13.4624	40.66	-10.11	30.55	90.50	-59.95	QP		
4		13.5622	63.48	-10.12	53.36	124.00	-70.64	QP		
5		13.6190	41.08	-10.12	30.96	90.50	-59.54	QP		
6		13.9146	40.82	-10.15	30.67	80.50	-49.83	QP		
7	*	14.0571	40.12	-10.17	29.95	69.50	-39.55	QP		

■ Spurious Emission below 150kHz (9KHz to 150kHz)

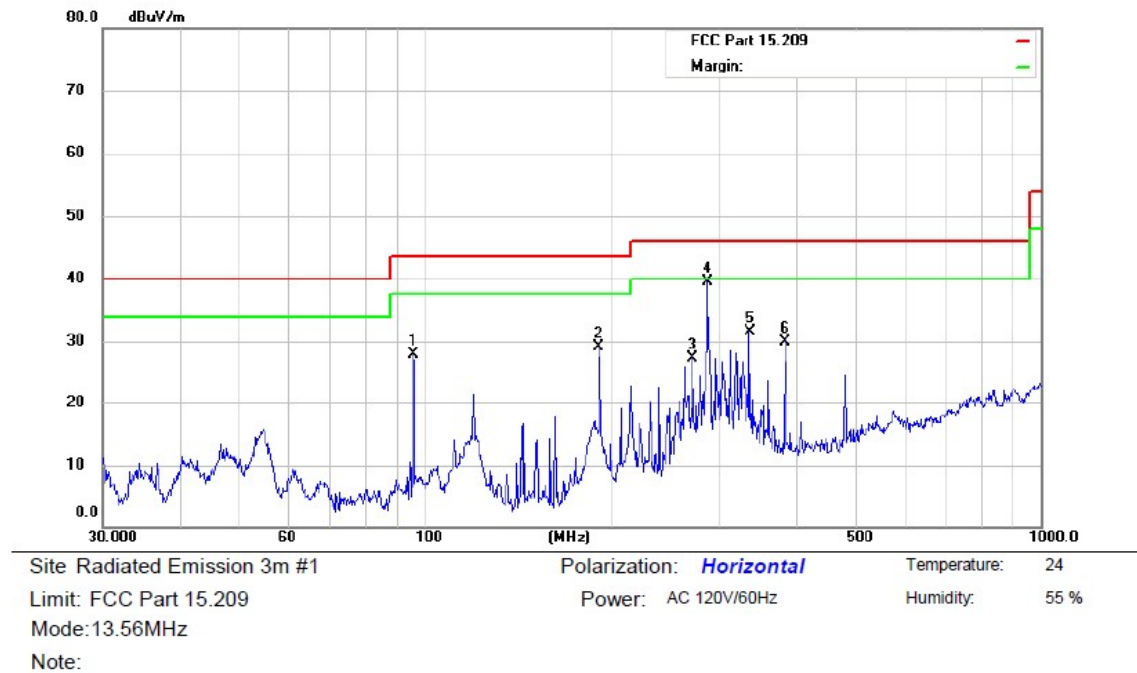
All mode have been tested, and the worst result was report as below:



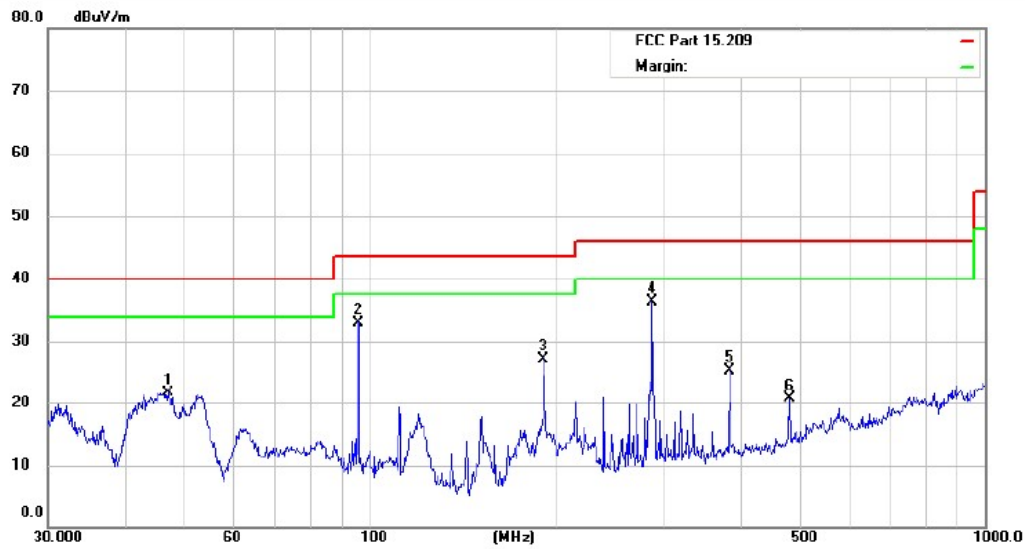
■ Spurious Emission below 30MHz (150KHz to 30MHz)
All mode have been tested, and the worst result was report as below:



■ Spurious Emission Above 30MHz (30MHz to 1GHz)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		95.7622	52.26	-24.36	27.90	43.50	-15.60	QP		
2		191.7450	52.58	-23.38	29.20	43.50	-14.30	QP		
3		272.2776	48.50	-21.10	27.40	46.00	-18.60	QP		
4	*	287.9904	60.07	-20.57	39.50	46.00	-6.50	QP		
5		336.0352	50.64	-19.04	31.60	46.00	-14.40	QP		
6		383.9318	48.13	-18.13	30.00	46.00	-16.00	QP		



Site Radiated Emission 3m #1

Polarization: **Vertical**

Temperature: 24

Limit: FCC Part 15.209

Power: AC 120V/60Hz

Humidity: 55 %

Mode: 13.56MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		46.9948	42.80	-21.10	21.70	40.00	-18.30	QP		
2		95.7622	57.36	-24.36	33.00	43.50	-10.50	QP		
3		191.7450	50.58	-23.38	27.20	43.50	-16.30	QP		
4	*	287.9904	56.87	-20.57	36.30	46.00	-9.70	QP		
5		383.9318	43.53	-18.13	25.40	46.00	-20.60	QP		
6		480.5276	37.29	-16.59	20.70	46.00	-25.30	QP		

8 ANTENNA APPLICATION

8.1.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR 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.

8.1.2 Result

PASS.

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

*** End of Report ***

声 明 Statement

1. 本报告无授权批准人签字及“检验报告专用章”无效；

This report will be void without authorized signature or special seal for testing report.

2. 未经许可本报告不得部分复制；

This report shall not be copied partly without authorization.

3. 本报告的检测结果仅对送测样品有效，委托方对样品的代表性和资料的真实性负责；

The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.

4. 本检测报告中检测项目标注有特殊符号则该项目不在资质认定范围内，仅作为客户委托、科研、教学或内部质量控制等目的使用；

The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

5. 本检测报告以实测值进行符合性判定，未考虑不确定度所带来的风险，本实验室不承担相关责任，特别约定、标准或规范中有明确规定的除外；

The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6. 对本检测报告若有异议，请于收到报告之日起 20 日内提出；

Objections shall be raised within 20 days from the date receiving the report.