



# FCC Test Report

Report No: FCS202502013W02

Issued for

Applicant:	Xthings Industry llc
Address:	47703 Fremont Blvd, Fremont, CA 94538
Product Name:	Smart Cloud-based Hybrid Biometric Intelligent Time Attendance and Access Control Terminal
Brand Name:	N/A
Model Name:	W2 Face
Series Model:	N/A
FCC ID:	2BKHH-W2
Issued By: Flux Compliance Service Laboratory Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan Tel: 769-27280901 Fax:769-27280901 <a href="http://www.fcs-lab.com">http://www.fcs-lab.com</a>	

## TEST RESULT CERTIFICATION

Applicant's Name.....: Xthings Industry llc

Address.....: **47703 Fremont Blvd, Fremont, CA 94538**

Manufacture's Name.....: Xthings Industry llc

Address.....: 47703 Fremont Blvd, Fremont, CA 94538

### Product Description

Product Name.....: Smart Cloud-based Hybrid Biometric Intelligent Time Attendance and Access Control Terminal

Brand Name .....: N/A

Model Name.....: W2 Face

Series Model.....: N/A

Test Standards.....: FCC Rules and Regulations Part 15 Subpart C, Section 209

Test Procedure.....: ANSI C63.10:2013

This device described above has been tested FCS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test**.....:

Date (s) of performance of tests.: February 6, 2025 ~ February 17, 2025

Date of Issue.....: February 28, 2025

Test Result.....: Pass

Tested by

:

*Scott Shen*

(Scott Shen)

Reviewed by

:

*Duke Qian*

(Duke Qian)

Approved by

:

*Jack Wang*

(Jack Wang)



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**Revision History**

Rev.	Issue Date	Effect Page	Contents
00	February 28, 2025	N/A	Initial Issue

## 1. SUMMARY OF TEST RESULTS

FCC Rules and Regulations Part 15 Subpart C, Section 209			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.209(a) (f)	Radiated Spurious Emission	PASS	--
15.215(c)	20dB Bandwidth	PASS	--
15.203	Antenna Requirement	PASS	--

## NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) All tests are according to ANSI C63.10-2013

## 1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Telephone:	+86-0769-27280901
Fax:	+86-0769-27280901
FCC Test Firm Registration Number: 514908 Designation number: CN0127 A2LA accreditation number: 5545.01	

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.71\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.98\text{ dB}$
3	Conducted Emission (9KHz-150KHz)	$\pm 4.13\text{ dB}$
4	Conducted Emission (150KHz-30MHz)	$\pm 4.74\text{ dB}$
5	All emissions,radiated (9KHz -30MHz)	$\pm 3.1\text{ dB}$
6	All emissions,radiated(<1G) 30MHz-1000MHz	$\pm 3.2\text{ dB}$
7	All emissions,radiated (1GHz -18GHz)	$\pm 3.66\text{ dB}$
8	All emissions,radiated (18GHz -40GHz)	$\pm 4.31\text{ dB}$
9	Occupied bandwidth	4(%)
10	Occupied bandwidth	$\pm 0.3\text{ dB}$
11	PSD	$\pm 0.48\text{dB}$

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Smart Cloud-based Hybrid Biometric Intelligent Time Attendance and Access Control Terminal
Trade Name	N/A
Model Name	W2 Face
Series Model	N/A
Model Difference	N/A
Channel List	Please refer to the Note 2.
Operation frequency	125KHz
Modulation Type	ASK
Antenna Type	Coil Antenna
Power supply	INPUT:100-240V 50/60Hz 0.5A Max OUTPUT:12V=1.0A
Battery	N/A
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- Operation frequency:125KHz
- Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	Coil Antenna	N/A	0.0dBi	Antenna

## 2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Tested mode, Description	
Mode	Description
Mode 1	TX Mode

Mark:Only the worst data is recorded in the report.Mode 4 is the worst mode.



## 2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

### Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	Adapter	Xthings Industry llc	XKD-C1000IC 12.0-12W	N/A	Product combination

### Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



## 2.4 EQUIPMENTS LIST

### Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2024.08.28	2025.08.27
Signal Analyzer	R&S	FSV40-N	FCS-E012	2024.08.28	2025.08.27
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2024.08.28	2025.08.27
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2024.08.28	2025.08.27
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2024.08.28	2025.08.27
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2024.08.28	2025.08.27
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2024.08.28	2025.08.27
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2024.08.28	2025.08.27
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2024.08.28	2025.08.27
Temperature & Humidity	HTC-1	victor	FCS-E005	2024.08.28	2025.08.27

### Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2024.08.28	2025.08.27
LISN	R&S	ENV216	FCS-E007	2024.08.28	2025.08.27
LISN	ETS	3810/2NM	FCS-E009	2024.08.28	2025.08.27
Temperature & Humidity	HTC-1	victor	FCS-E008	2024.08.28	2025.08.27

### RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
Spectrum Analyzer	Keysight	N9020A	FCS-E015	2024.08.28	2025.08.27
Spectrum Analyzer	Agilent	E4447A	MY50180039	2024.08.28	2025.08.27
Spectrum Analyzer	R&S	FSV-40	101499	2024.08.28	2025.08.27

### 3. RADIATED EMISSION MEASUREMENT

#### 3.1 LIMIT

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009mhz - 1000mhz)

Frequencies (MHz)	Field Strength (micorvolts/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

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- (5) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits inthese three bands are based on measurements employing an average detector.

### 3.2 TEST PROCEDURE

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted band)	PK=1MHz / 1MHz, AV=1 MHz /10 Hz

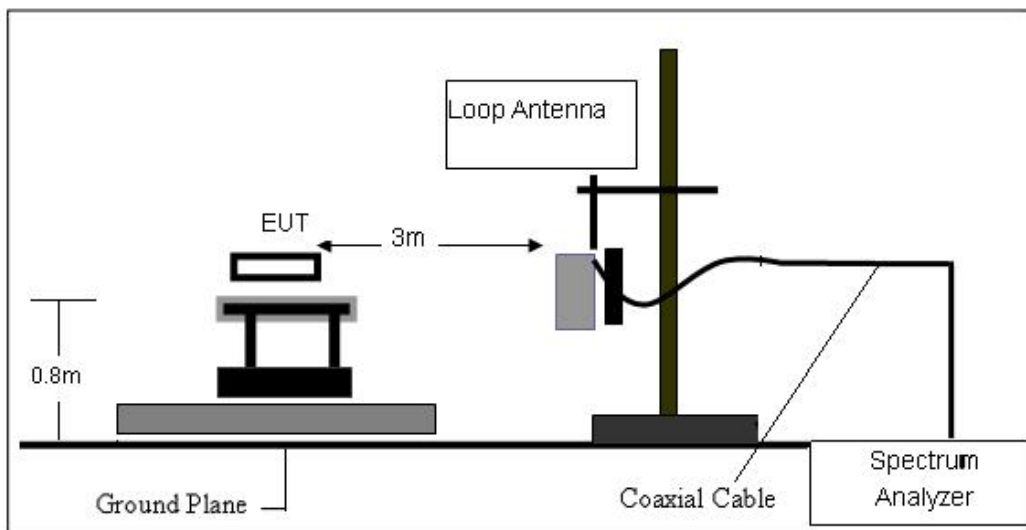
- The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then QuasiPeak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

**Note:**

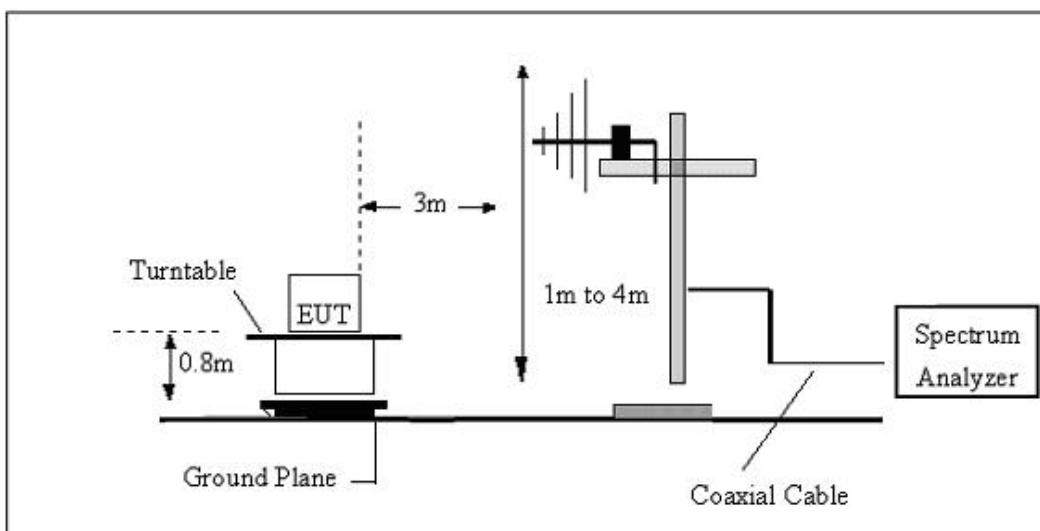
Both horizontal and vertical antenna polarities were tested. The worst case emissions were reported

### 3.3 TEST SETUP

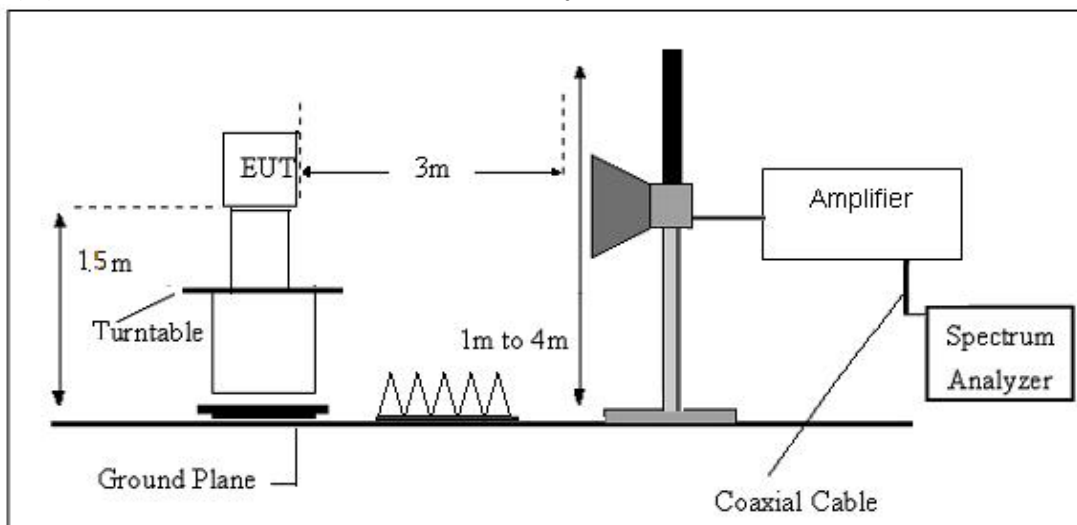
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



#### (C) Radiated Emission Test-Up Frequency Above 1GHz

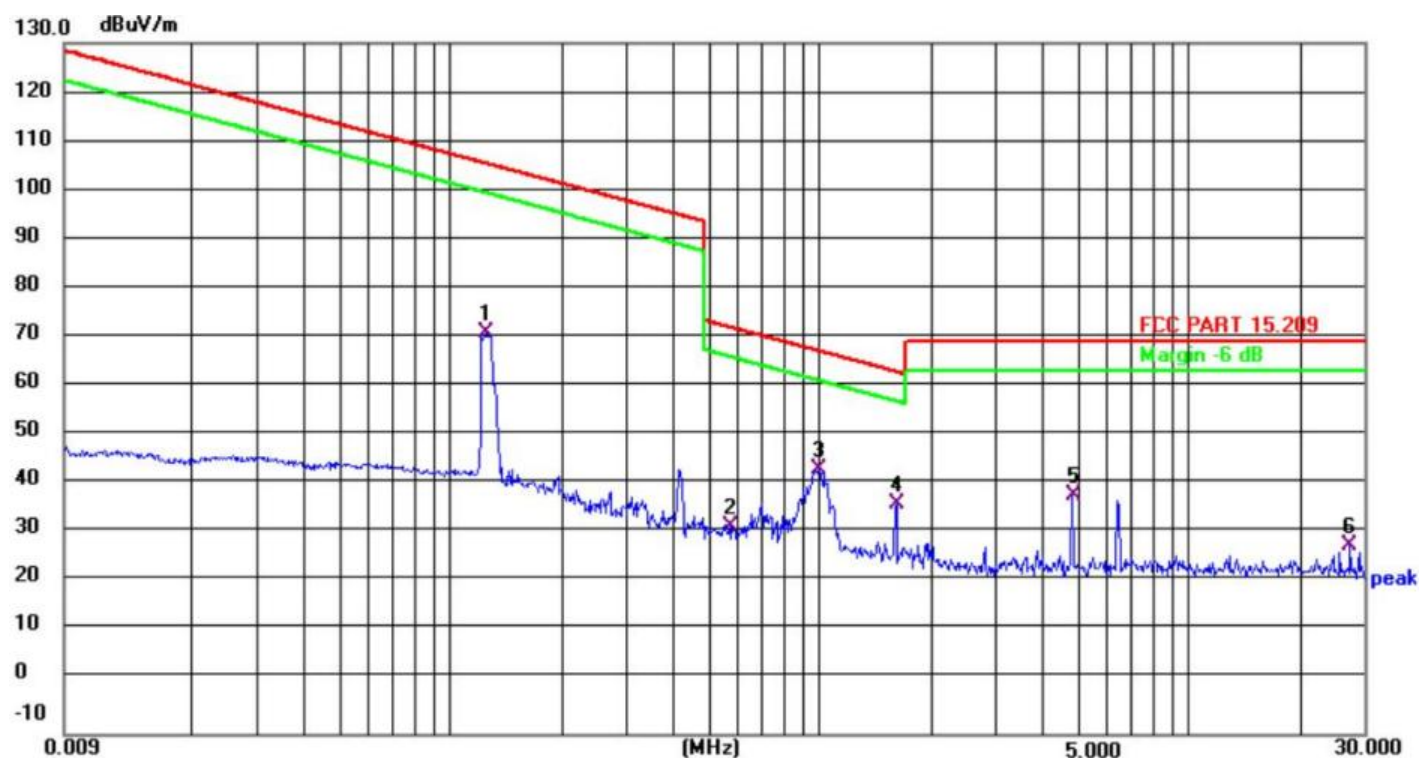


### 3.4 TEST RESULTS

For spurious emission

(9KHz-30MHz)

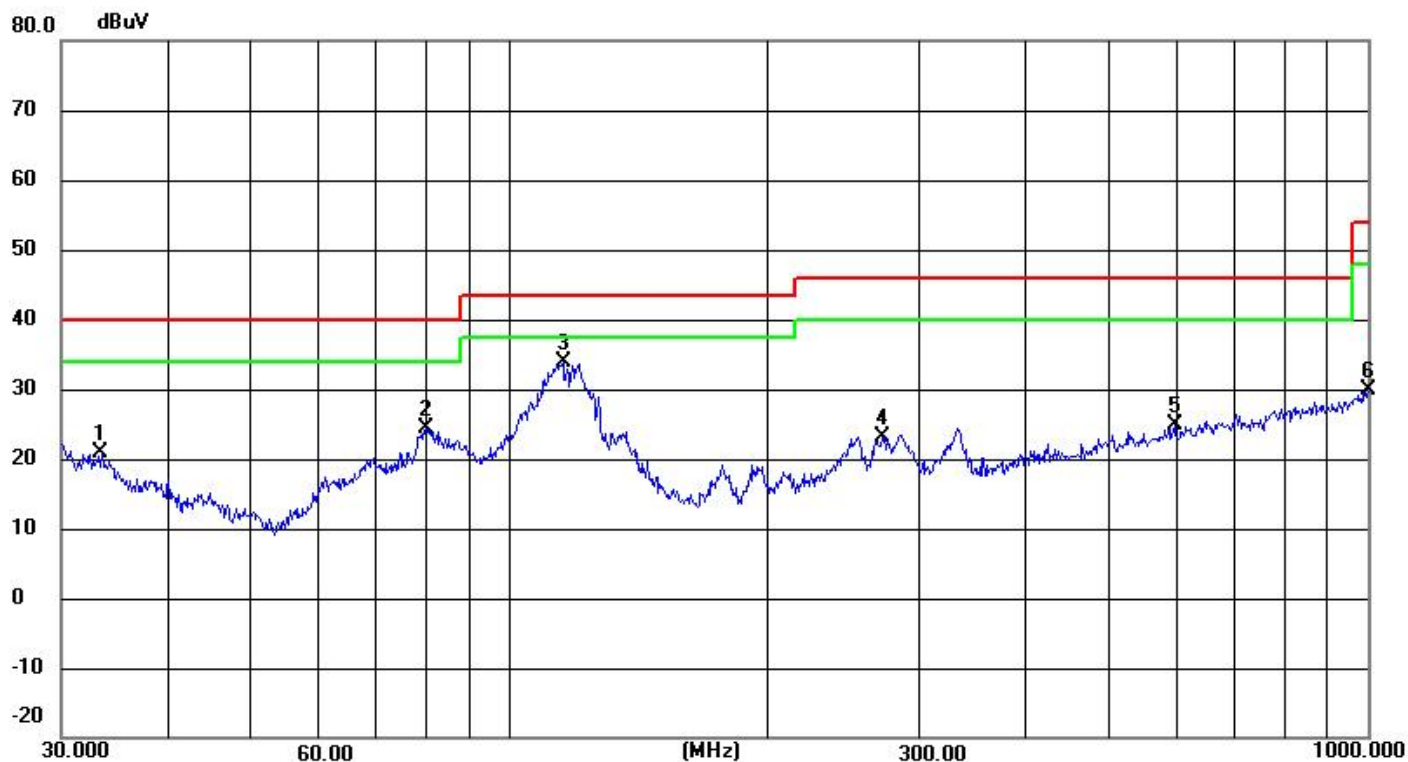
Temperature:	23.7°C	Relative Humidity:	61%
Test Voltage:	AC 120V/60Hz	Phase:	Coplanar
Test Mode:	Mode 1		



No.	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1255	80.98	-9.77	71.21	105.57	-34.36	Peak
2	0.1255	80.90	-9.77	71.13	105.57	-34.44	AVG
3	0.5774	41.70	-9.63	32.07	72.37	-40.30	QP
4	0.9942	52.93	-9.25	43.68	67.65	-23.97	QP
5	1.6176	45.88	-9.32	36.56	63.43	-26.87	QP
6	4.8358	47.74	-9.40	38.34	69.54	-31.20	QP
7	27.4390	38.71	-10.26	28.45	69.54	-41.09	QP

(30MHZ-1000MHZ)

Temperature:	23.7°C	Relative Humidity:	61%
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	Mode 1		

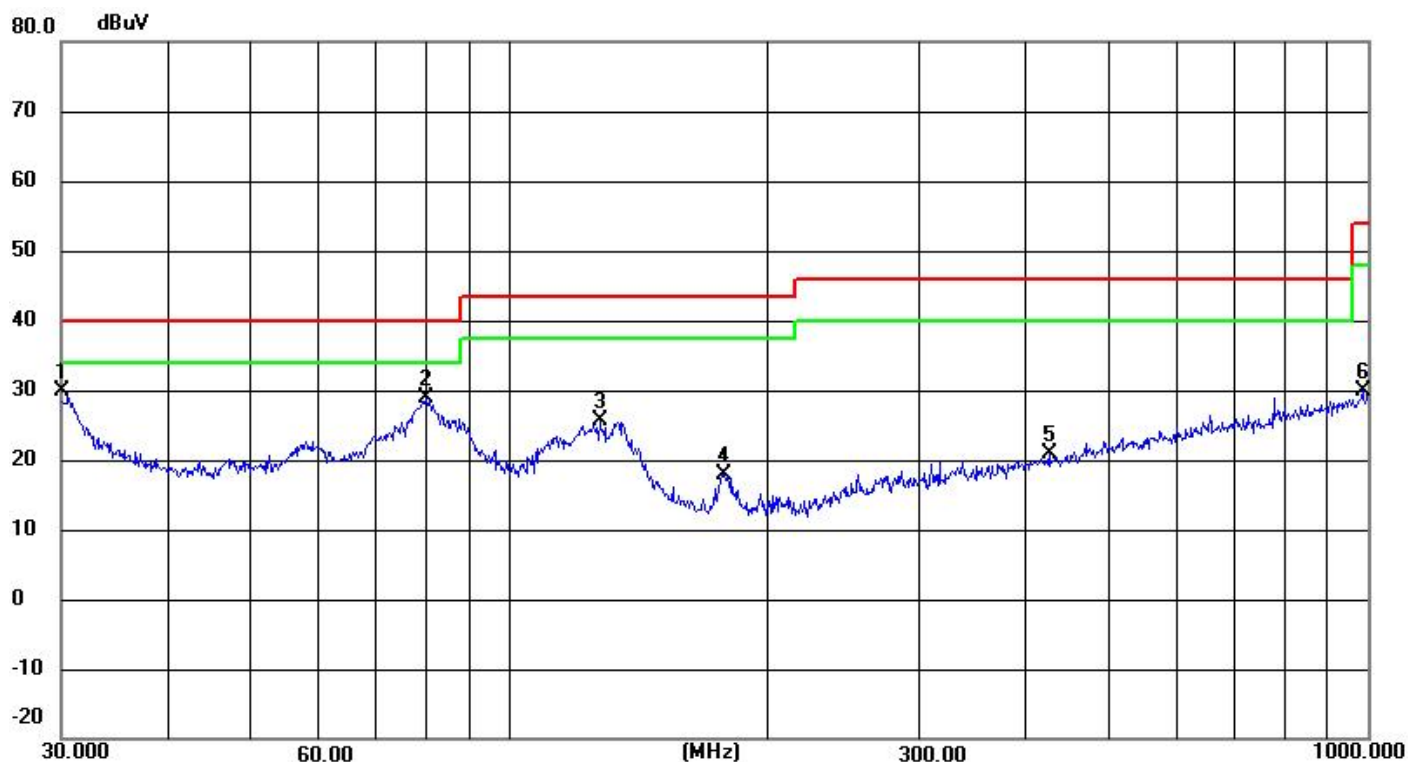


No.	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.4449	30.26	-9.50	20.76	40.00	-19.24	QP
2	79.8003	56.53	-32.16	24.37	40.00	-15.63	QP
3	115.3205	66.08	-32.18	33.90	43.50	-9.60	QP
4	272.2776	55.05	-31.94	23.11	46.00	-22.89	QP
5	595.1329	55.91	-31.14	24.77	46.00	-21.23	QP
6	1000.0000	60.40	-30.60	29.80	54.00	-24.20	QP

Remarks:

1. Final Level =Receiver Read level + Factor

Temperature:	22.7°C	Relative Humidity:	61%
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	Mode 1		



No.	Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	36.98	-7.17	29.81	40.00	-10.19	QP
2	79.8003	61.11	-32.16	28.95	40.00	-11.05	QP
3	127.2176	57.69	-32.16	25.53	43.50	-17.97	QP
4	177.5092	50.06	-32.08	17.98	43.50	-25.52	QP
5	425.0280	52.41	-31.52	20.89	46.00	-25.11	QP
6	986.0717	60.53	-30.61	29.92	54.00	-24.08	QP

Remarks:

1. Final Level =Receiver Read level + Factor

## 4. 20 DB BANDWIDTH TEST

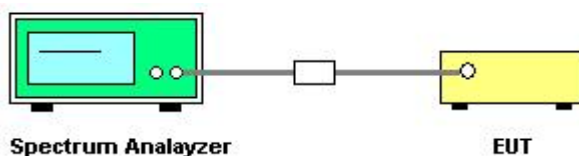
### 4.1 LIMIT

According to 15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation

### 4.2 TEST PROCEDURE

- Check the calibration of the measuring instrument using either an internal calibrator or a
- known signal from an external generator
  - Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
  - Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

### 4.3 TEST SETUP





#### 4.4 TEST RESULTS

Temperature:	25°C	Relative Humidity:	50%
Test Mode:	Mode 1	Test Voltage:	AC 120V/60Hz

Frequency (KHz)	20dB Bandwidth (KHz)	Result
125	5.336	PASS



## 4. CONDUCTED EMISSION TEST

### 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Conducted Emissionlimit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

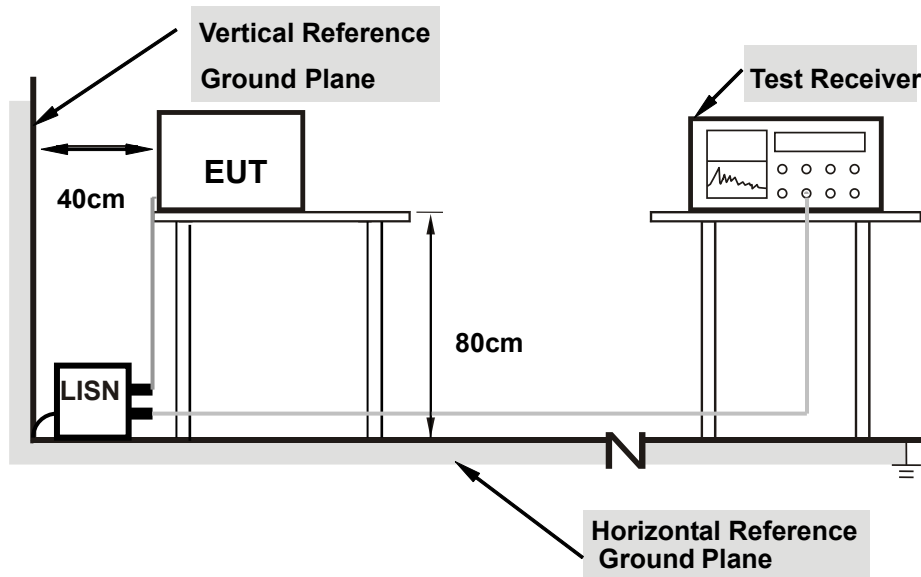
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 4.1.2 TEST PROCEDURE

- The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.3 TEST SETUP

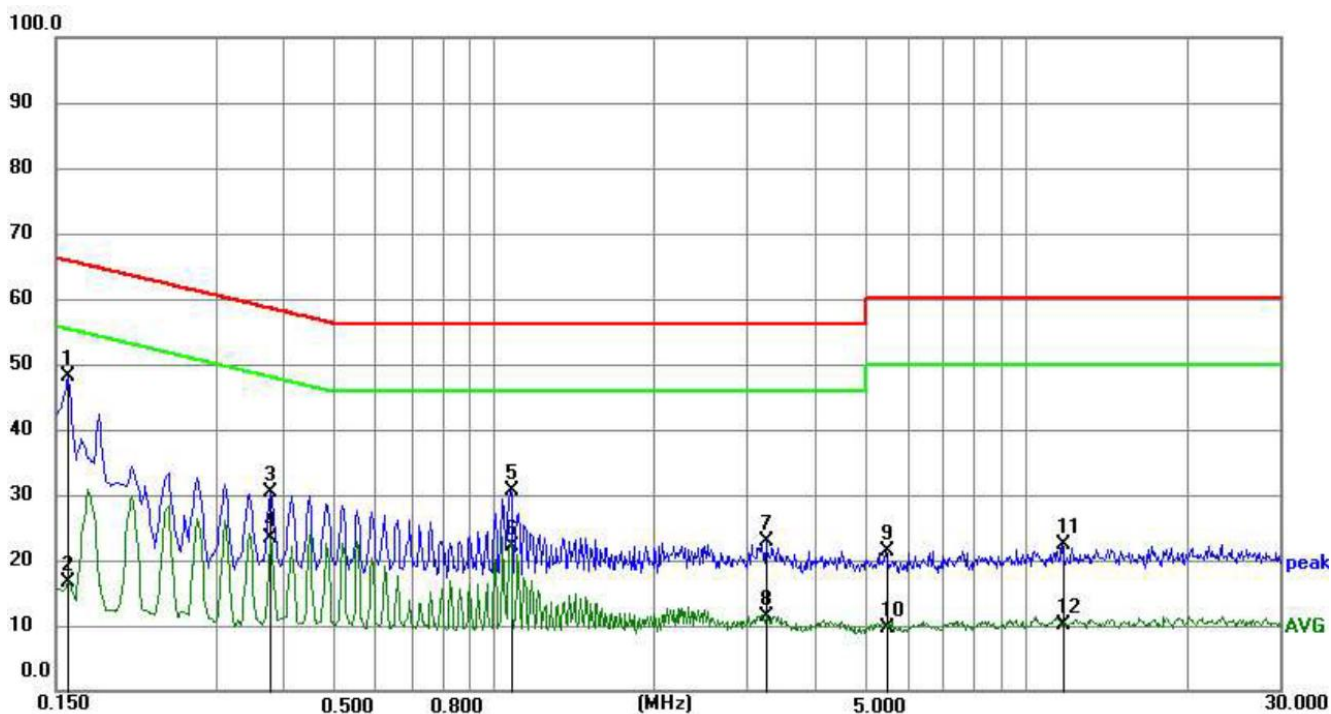


**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

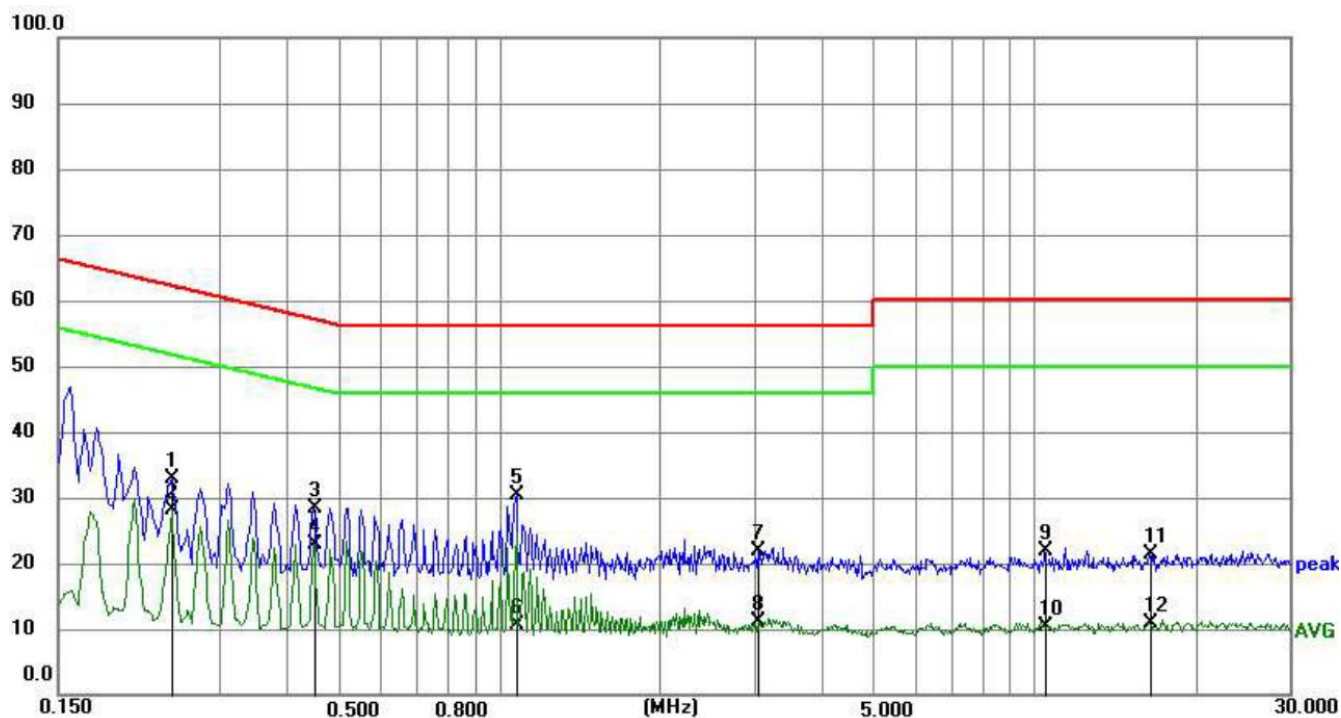
#### 4.1.4 TEST RESULT

Temperature:	22.1 °C	Relative Humidity:	56%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 1(worst)		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1770	48.79	10.11	58.90	64.63	5.73	QP
2	0.1770	15.28	10.11	25.39	54.63	29.24	AVG
3	0.3840	44.08	10.02	54.10	58.19	4.09	QP
4	0.3840	14.38	10.02	24.40	48.19	23.79	AVG
5	0.8295	27.66	9.99	37.65	56.00	18.35	QP
6	0.8295	0.32	9.99	10.31	46.00	35.69	AVG
7	1.7565	22.81	9.98	32.79	56.00	23.21	QP
8	1.7565	1.57	9.98	11.55	46.00	34.45	AVG
9	5.4240	20.77	9.87	30.64	60.00	29.36	QP
10	5.4240	-0.26	9.87	9.61	50.00	40.39	AVG
11	21.3360	22.57	9.94	32.51	60.00	27.49	QP
12	21.3360	2.77	9.94	12.71	50.00	37.29	AVG

Temperature:	22.1 °C	Relative Humidity:	56%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 1(worst)		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1905	52.46	10.06	62.52	64.01	1.49	QP
2	0.1905	14.19	10.06	24.25	54.01	29.76	AVG
3	0.2670	50.37	10.04	60.41	61.21	0.80	QP
4	0.2670	15.81	10.04	25.85	51.21	25.36	AVG
5	0.6583	24.42	9.99	34.41	56.00	21.59	QP
6	0.6583	8.65	9.99	18.64	46.00	27.36	AVG
7	1.9994	19.65	9.96	29.61	56.00	26.39	QP
8	1.9994	-0.68	9.96	9.28	46.00	36.72	AVG
9	4.4565	12.82	9.90	22.72	56.00	33.28	QP
10	4.4565	-1.08	9.90	8.82	46.00	37.18	AVG
11	13.1144	10.38	9.82	20.20	60.00	39.80	QP
12	13.1144	0.66	9.82	10.48	50.00	39.52	AVG

## 5. ANTENNA REQUIREMENT

### 5.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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 EUT ANTENNA

The antennas used for this product is Coil Antenna and no other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 0dBi.

\*\*\*\*\*END OF THE REPORT\*\*\*\*\*