



# EMC Test Report

Product Name : Electronic stamp

Model No. : KEYMO

Applicant : BYSTAMP SAS

Address : 3 RUE LOUIS DE BROGLIE, 56000 VANNES, FRANCE

Date of Receipt : 2023-02-15

Test Date : 2023-02-17 to 2023-02-20

Issued Date : 2023-04-12

Report No. : 2320418R-IT-US-P01V01

Report Version : TRF\_FCC Part 15 Subpart 15B\_EMC\_V1.3

The test results presented in this report relate only to the object tested.

This report is not used for social proof in China (or Mainland China) market

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result.

This report must not be used to claim product endorsement by TAF or any agency of the government.

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Issued Date : 2023-04-12  
Report No. : 2320418R-IT-US-P01V01



Product Name : Electronic stamp  
Applicant : BYSTAMP SAS  
Address : 3 RUE LOUIS DE BROGLIE, 56000 VANNES, FRANCE  
Manufacturer : BYSTAMP SAS  
Address : 3 RUE LOUIS DE BROGLIE, 56000 VANNES, FRANCE  
Model No. : KEYMO  
Brand Name : BYSTAMP  
EUT Voltage : DC 1.5V  
Test Voltage : DC 1.5V  
Applicable Standard : FCC CFR Title 47 Part 15 Subpart B: 2022  
ANSI C63.4: 2014  
ICES-003 Issue 7: 2020  
Test Result : Complied  
Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.  
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006,  
Jiangsu, China  
TEL: +86-512-62515088 / FAX: +86-512-62515098  
FCC Designation : CN1199  
Number  
ISED CAB identifier : CN0040

This report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

Documented By :



(Project Engineer: Tony Guo)

Approved By :



(Manager: Oscar Shi)

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### Document History

Report NO.	Date	Description
2320418R-IT-US-P01V01	2023-04-12	First release

## 1. General Information

### 1.1. EUT Description

Product Name	Electronic stamp
Model No.	KEYMO
Brand Name	BYSTAMP

Note 1: The EUT information is from customer declaration.

Note 2: For the range of 216MHz to 960MHz, the limit of FCC Part 15.109 is more stringent than the limit of ICES-003 Issue 7, so only the limit of FCC Part 15.109 is shown in the test data.

## 1.2. Mode of Operation

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

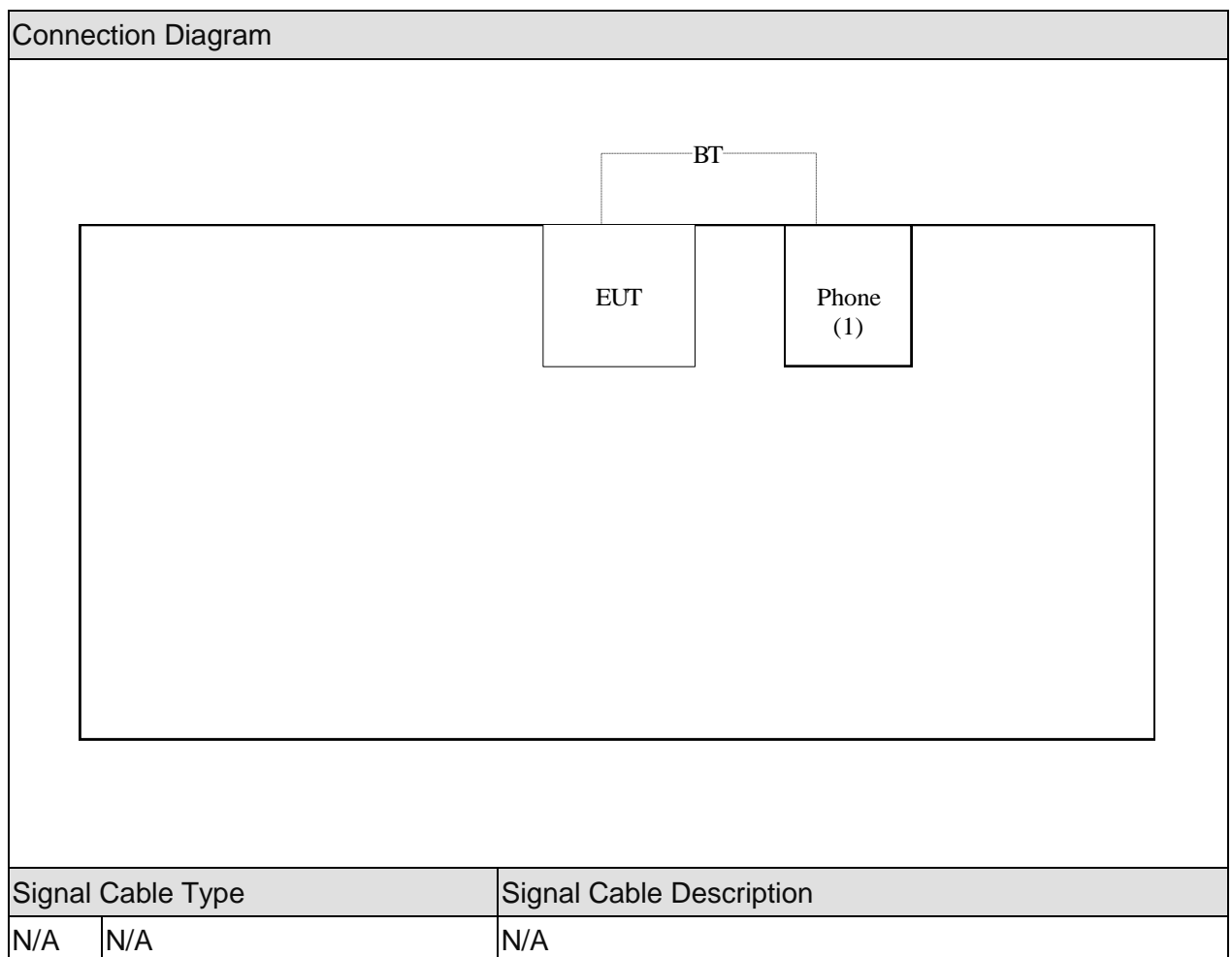
Final Test Mode
Mode 1: Normal operation

### 1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Phone	Samsung	N/A	N/A	N/A

### 1.4. Configuration of Tested System



### **1.5. EUT Exercise Software**

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipments.
3	Adjust EUT to the desired mode.
4	Start testing.



## 2. Technical Test

### 2.1. Summary of Test Result

- ☒ No deviations from the test standards  
☐ Deviations from the test standards as below description:

Emission			
Performed Test Item	Normative References	Test Performed	Deviation
Conducted disturbance	FCC CFR Title 47 Part 15 Subpart B: 2022 Class B ANSI C63.4: 2014 ICES-003 Issue 7: 2020	No	N/A
Radiated disturbance	FCC CFR Title 47 Part 15 Subpart B: 2022 Class B ANSI C63.4: 2014 ICES-003 Issue 7: 2020	Yes	No

## 2.2. List of Test Equipment

### Radiated Emission / AC2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100176	2022.08.15	2023.08.14
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2022.08.19	2023.08.18
TRILOG Broadband Antenna	SCHWARZBEC K	VULB 9168	01100	2022.05.19	2023.05.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2022.03.31	2023.03.30
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2022.07.09	2023.07.08

### Radiated Emission / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Receiver	Agilent	N9038A	MY51210196	2023.01.09	2024.01.08
low Noise Amplifier	SKET	LNPA_0118 G-45	SK20210412 01	2022.04.15	2023.04.14
DRG Horn Antenna	ETS-Lindgren	3117	00167055	2022.08.23	2023.08.22
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2022.03.31	2023.03.30
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2022.04.18	2023.04.17
Pre-Amplifier	ChengYi	EMC18404 5SE	980263	2022.05.21	2023.05.20
Coaxial Cable	ROSENBERG ER	LA1-C011-2 000/3000	AC5-40G-2	2022.05.21	2023.05.20
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2022.07.09	2023.07.08

### 2.3. Test Environment

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained within the applicable ranges.

Performed Item	Items	Required	Actual
Radiated Emission (30~1000MHz)	Temperature (°C)	10-40	23
	Humidity (%RH)	25-75	40
	Barometric pressure (mbar)	860-1060	1014
Radiated Emission (1~40GHz)	Temperature (°C)	10-40	18
	Humidity (%RH)	25-75	41
	Barometric pressure (mbar)	860-1060	1018

## 2.4. Measurement Uncertainty

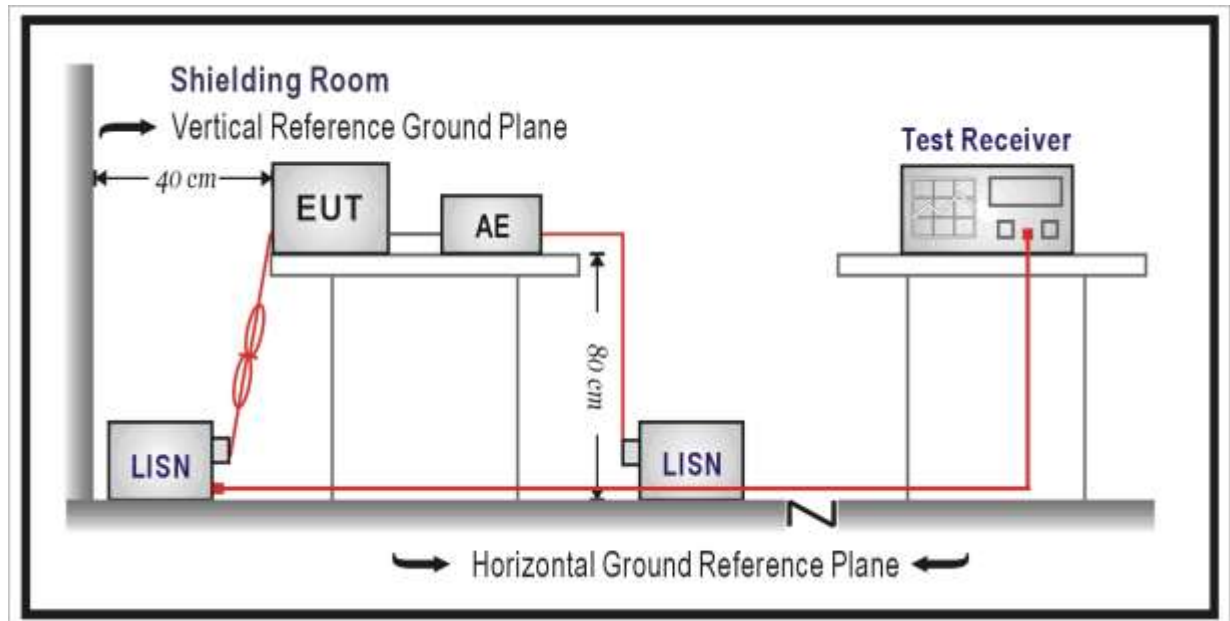
Radiated Emission / AC2	
The maximum measurement uncertainty is evaluated as:	
Horizontal:	30MHz~200MHz: 4.70 dB 200MHz~1GHz: 4.36 dB
Vertical:	30MHz~200MHz: 4.92 dB 200MHz~1GHz: 4.30 dB
Radiated Emission / AC5	
The maximum measurement uncertainty is evaluated as:	
Horizontal:	1GHz~18GHz: 4.98 dB
Vertical:	1GHz~18GHz: 4.79 dB
Horizontal:	18GHz~40GHz: 4.72 dB
Vertical:	18GHz~40GHz: 4.60 dB

### 3. Conducted disturbance

#### 3.1. Test Specification

According to Standard: FCC Part 15.107 Class B, ANSI C63.4

#### 3.2. Test Setup



### 3.3. Limit

Limits for conducted disturbance of class A ITE		
Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	79	66
0.50 to 30	73	60
NOTE: The lower limit shall apply at the transition frequency.		

Limits for conducted disturbance of class B ITE		
Frequency range MHz	Limits dB(μV)	
	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
NOTE 1: The lower limit shall apply at the transition frequencies.		
NOTE 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

### 3.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50Ω / 50μH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω / 50μH coupling impedance with 50Ω termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 3.5. Deviation from Test Standard

No deviation.

### **3.6. Test Result**

N/A

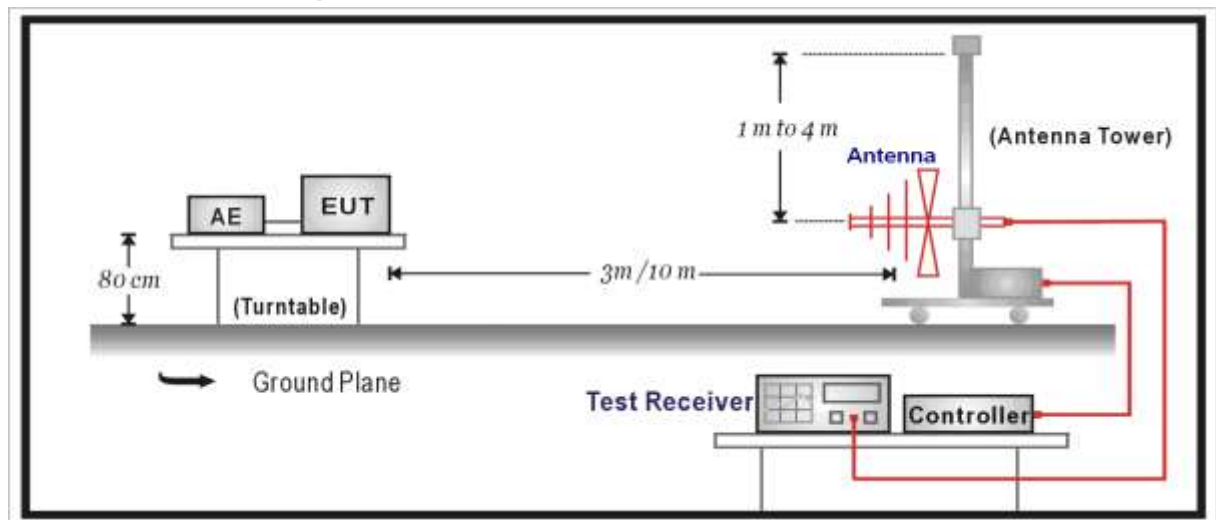
## 4. Radiated disturbance

### 4.1. Test Specification

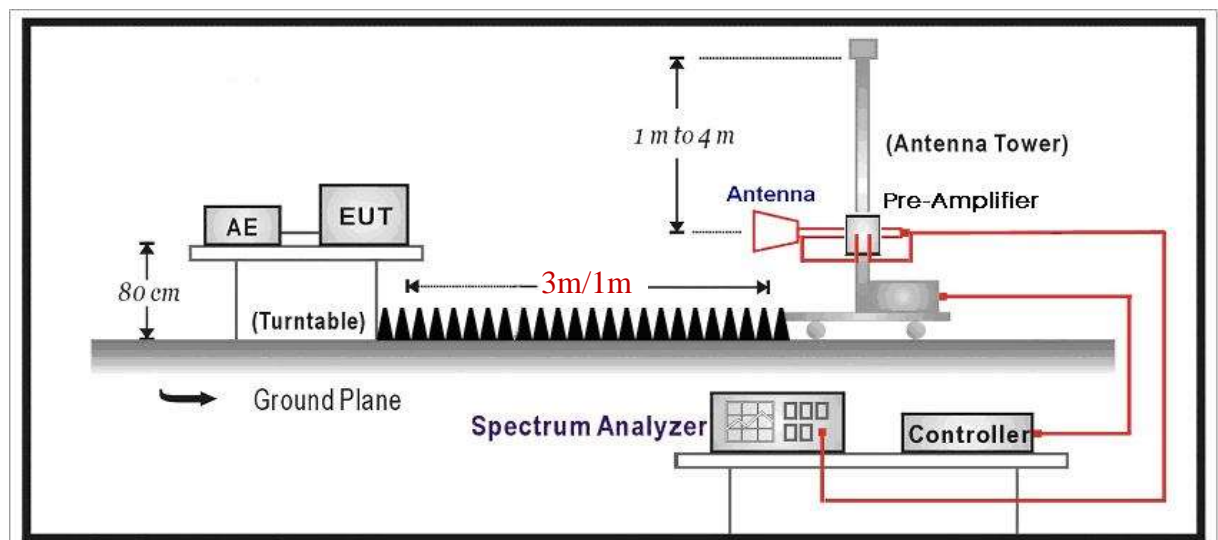
According to Standard: FCC Part 15.109 Class B, ANSI C63.4

### 4.2. Test Setup

#### Below 1GHz Test Setup



#### Above 1GHz Test Setup





### 4.3. Limit

Limits for Radiated disturbance of class A ITE at a measuring distance of 10m	
Frequency of Emission (MHz)	Field Strength dB(μV/m)
30 to 88	39
88 to 216	43.5
216 to 960	46.4
Above 960	49.5
NOTE: The lower limit shall apply at the transition frequency.	

Limits for Radiated disturbance of class A ITE at a measuring distance of 3m	
Frequency of Emission (MHz)	Field Strength dB(μV/m)
1000 to 18000	60
NOTE: The lower limit shall apply at the transition frequency.	

Limits for Radiated disturbance of class A ITE at a measuring distance of 1m	
Frequency of Emission (MHz)	Field Strength dB(μV/m)
18000 to 40000	69.5
NOTE: The lower limit shall apply at the transition frequency.	

Limits for Radiated disturbance of class B ITE at a measuring distance of 3m	
Frequency of Emission (MHz)	Field Strength dB(μV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
960 to 18000	54
NOTE: The lower limit shall apply at the transition frequency.	

Limits for Radiated disturbance of class B ITE at a measuring distance of 1m	
Frequency of Emission (MHz)	Field Strength dB( $\mu$ V/m)
18000-40000	63.5
NOTE: The lower limit shall apply at the transition frequency.	

#### 4.4. Test Procedure

The EUT and its simulators are placed on a turntable which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be changed during radiated measurement.

The bandwidth below 1GHz setting on the receiver is 120kHz and above 1GHz is 1MHz.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1000
108 to 500	2000
500 to 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40GHz, whichever is lower

On any frequency or frequencies below or equal to 1000MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000MHz, the radiated limits shown are based measuring equipment employing an average detector function.

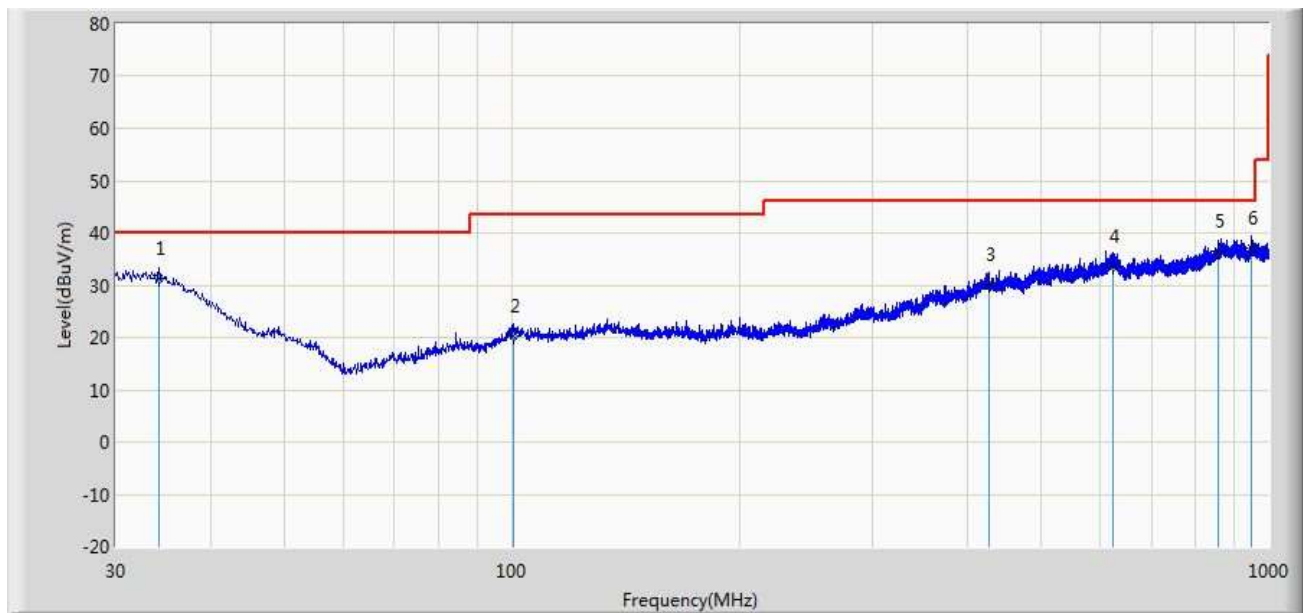
When average radiated emission measurement are included emission measurement Above 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

#### 4.5. Deviation from Test Standard

No deviation.

## 4.6. Test Result

Engineer: Jim	
Site: AC2	Time: 2023/02/17
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: Electronic stamp	Power: DC 1.5V
Note: Mode 1	

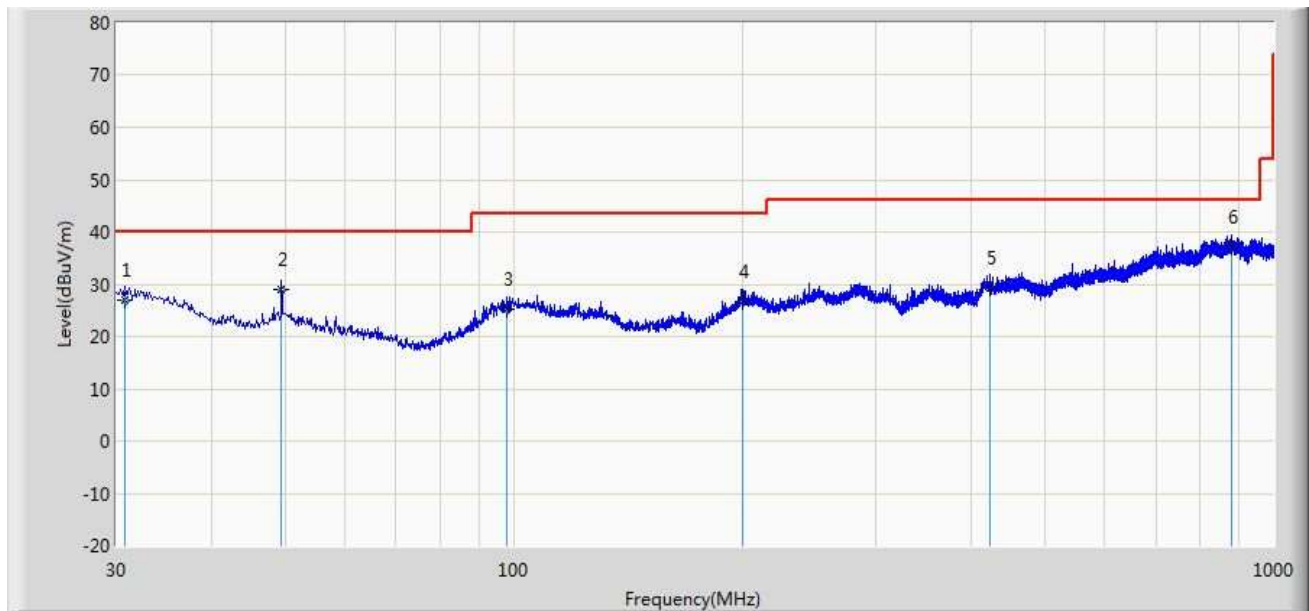


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	34.244	31.427	4.369	-8.573	40.000	20.691	6.367	0.000	100	250	QP
2		100.567	20.186	3.049	-23.314	43.500	10.353	6.784	0.000	205	300	QP
3		427.215	30.125	3.192	-15.875	46.000	18.951	7.983	0.000	202	230	QP
4		622.670	33.739	3.012	-12.261	46.000	22.216	8.511	0.000	110	360	QP
5		858.622	36.446	4.011	-9.554	46.000	23.347	9.088	0.000	106	45	QP
6		948.105	37.242	4.210	-8.758	46.000	23.749	9.283	0.000	400	140	QP

Note:

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Jim	
Site: AC2	Time: 2023/02/17
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: Electronic stamp	Power: DC 1.5V
Note: Mode 1	

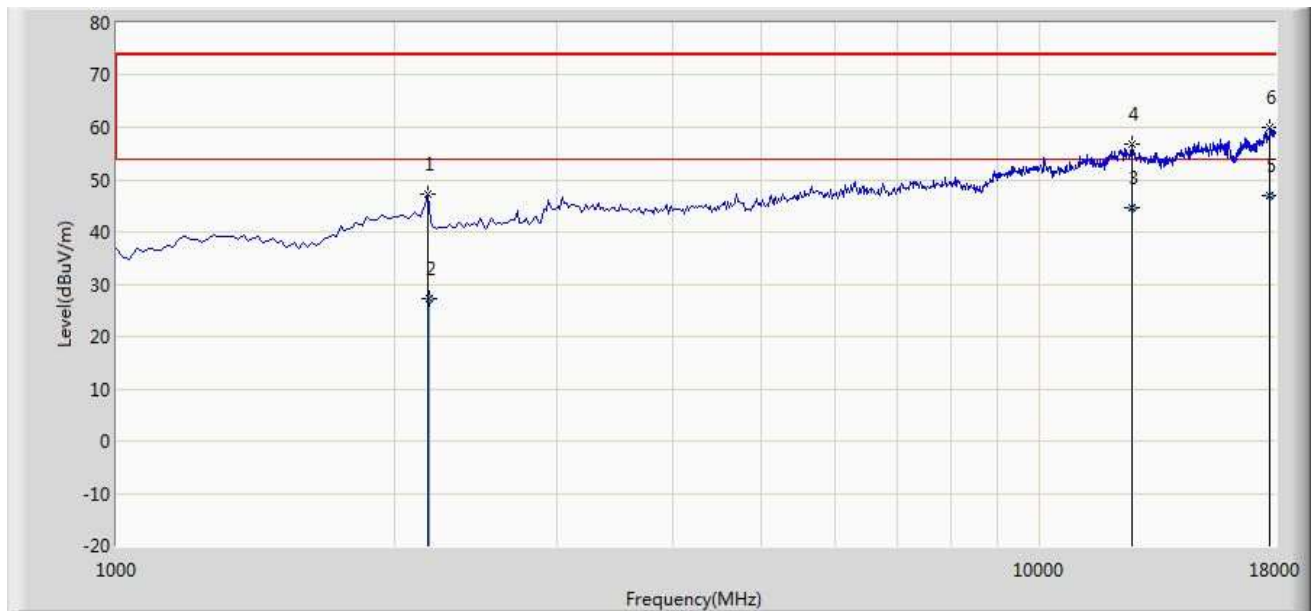


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		30.849	26.879	3.102	-13.121	40.000	17.436	6.342	0.000	200	35	QP
2		49.521	29.110	9.692	-10.890	40.000	12.932	6.485	0.000	304	60	QP
3		98.021	25.172	4.105	-18.328	43.500	14.292	6.775	0.000	205	90	QP
4		200.477	26.576	3.102	-16.924	43.500	16.251	7.223	0.000	210	280	QP
5		423.820	29.380	3.093	-16.620	46.000	18.316	7.971	0.000	208	300	QP
6	*	881.539	37.162	3.601	-8.838	46.000	24.424	9.136	0.000	106	330	QP

**Note:**

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Jeffery	
Site: AC5	Time: 2023/02/20
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Electronic stamp	Power: DC 1.5V
Note: Mode 1	

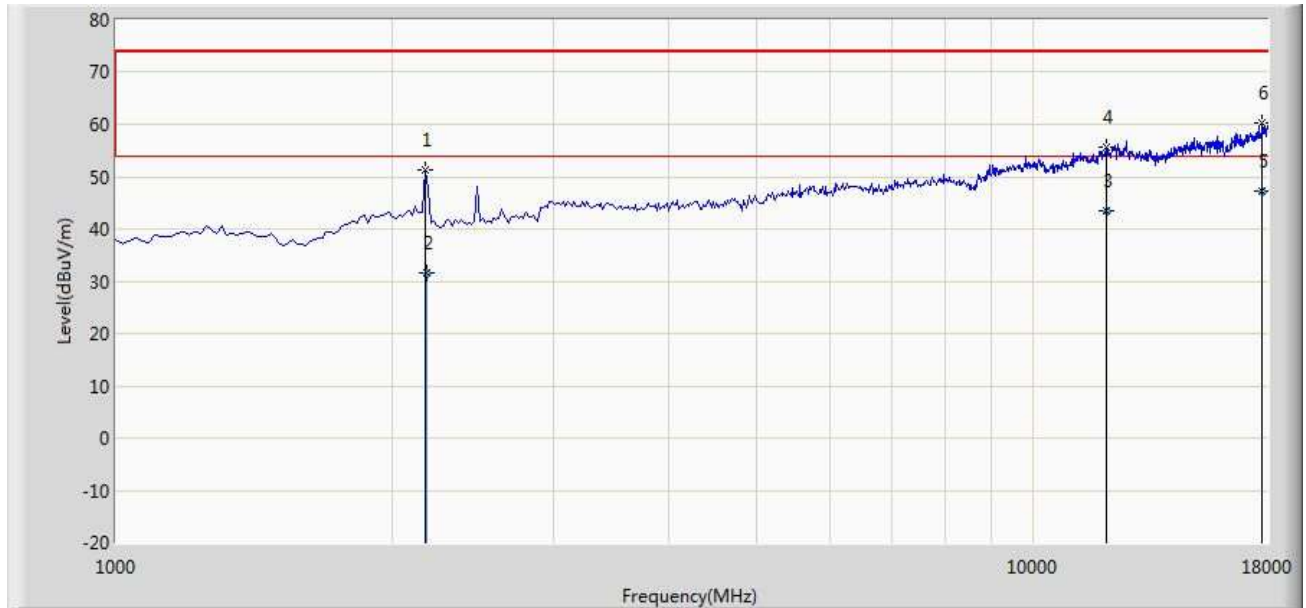


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		2173.000	47.367	65.034	-26.633	74.000	31.540	4.323	53.531	120	25	PK
2		2179.360	27.369	45.021	-26.631	54.000	31.533	4.328	53.512	120	25	AV
3		12567.366	44.571	42.001	-9.429	54.000	39.548	17.211	54.190	148	36	AV
4		12577.000	56.830	54.148	-17.170	74.000	39.582	17.342	54.243	148	36	PK
5	*	17740.360	46.969	39.022	-7.031	54.000	41.233	19.561	52.847	200	145	AV
6		17745.000	59.916	51.538	-14.084	74.000	41.244	19.865	52.731	200	145	PK

**Note:**

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Jeffery	
Site: AC5	Time: 2023/02/20
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Electronic stamp	Power: DC 1.5V
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		2173.000	51.405	69.072	-22.595	74.000	31.540	4.323	53.531	131	221	PK
2		2179.360	31.708	49.360	-22.292	54.000	31.533	4.328	53.512	131	221	AV
3		12010.330	43.615	42.033	-10.385	54.000	39.126	16.165	53.709	122	36	AV
4		12016.000	55.627	53.904	-18.373	74.000	39.138	16.224	53.639	122	36	PK
5	*	17740.336	47.281	39.336	-6.719	54.000	41.233	19.560	52.848	200	251	AV
6		17745.000	60.292	51.914	-13.708	74.000	41.244	19.865	52.731	200	251	PK

**Note:**

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

\_\_\_\_\_ The End \_\_\_\_\_