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Report Template Version: V04
Report Template Revision Date: 2018-07-06

TEST REPORT

Report No. :	CQASZ20191001061E
Applicant:	CONTROL3, LLC
Address of Applicant:	12554 Galveston Rd, Suite B230, Webster, Texas, 77598, USA
Equipment Under Test (EUT):	
EUT Name:	ETHERNET DATALOGGING THERMOMETER
Model No.:	6600
Trade Mark:	TRACEABLE
FCC ID:	2AO2J66000710
Standards:	47 CFR Part 15, Subpart B, ClassA
Date of Receipt:	2019-10-23
Date of Test:	2019-10-23 to 2019-10-25
Date of Issue:	2019-10-25
Test Result :	**PASS***

***In the configuration tested, the EUT complied with the standards specified above**

Tested By: Martin Lee

(Martin Lee)

Reviewed By: Sheek Luo

(Sheek Luo)

Approved By:

(Jack Ai)

1 Version

Revision History of Report

Report No.	Version	Description	Issue Date
CQASZ20191001061E	Rev.01	Initial report	2019-10-25

2 Test Summary

Test Item	Test Requirement	Test method	Result
Radiated Emission (30MHz to 1GHz)	47 CFR Part 15B	ANSI C63.4-2014	PASS
Conducted Emission (150KHz to 30MHz)	47 CFR Part 15B	ANSI C63.4-2014	PASS

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	5th harmonic of the highest frequency or 40GHz, whichever is lower

Remark:
The highest frequency of the internal sources of the EUT is below 108 MHz.
The EUT belong to Class A digital device.

3 Contents

4 General Information

4.1 Client Information

Applicant:	CONTROL3, LLC
Address of Applicant:	12554 Galveston Rd, Suite B230, Webster, Texas, 77598, USA
Manufacturer:	CONTROL3, LLC
Address of Manufacturer:	12554 Galveston Rd, Suite B230, Webster, Texas, 77598, USA

4.2 General Description of EUT

EUT Name:	ETHERNET DATALOGGING THERMOMETER
Model No.:	6600
Trade Mark:	TRACEABLE
Adapter line:	150cm(Unshielded)
Power Supply:	BATTERY:“AAA”SIZE*3 ADAPTER: MODEL NO.:SCB0900500P INPUT:100-240~50-60Hz 300mA OUTPUT:9V 500mA
Test Mode:	
Normal working:	The EUT detects temperature and transmits data to computer.

4.3 Product Specification subjective to this standard

Frequency Range:	Below 108 MHz
Sample Type:	Portable production
Country of Origin:	USA
Country of Destination:	USA
Test voltage:	120V60Hz

4.4 Test Environment

Operating Environment:	
Radiated Emission	
Temperature:	25.3 °C
Humidity:	46 % RH
Atmospheric Pressure:	992mbar
Conducted Emission	
Temperature:	25.0 °C
Humidity:	48 % RH
Atmospheric Pressure:	992mbar

4.5 Description of Support Units

The EUT has been tested with associated equipment below.

1）Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
PC	Lenovo	ThinkPad E450c	/	CQA

4.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

No tests were sub-contracted:

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

4.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Conduction emission	3.74dB (9kHz to 150kHz)
		3.34dB (150kHz to 30MHz)
2	Radiated emission	5.12dB (Below 1GHz)
		4.60dB (Above 1GHz)
3	Temperature	0.8°C
4	Humidity	2.0%

5 Equipment List

Conducted Emissions (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No.**	**Cal Date**	**Cal Due Date**
EMI Test Receiver	R&S	ESR7	CQA-005	2018/10/28	2019/10/27
LISN	R&S	ENV216	CQA-003	2018/11/5	2019/11/4
Coaxial cable (9KHz~300MHz)	CQA	N/A	C009	2019/9/26	2020/9/25
ISN	R&S	ENY41	CQA-007	2018/12/5	2019/12/4

Radiated Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Horn Antenna	R&S	HF906	CQA-012	2019/9/26	2020/9/25
Bilog Antenna	R&S	HL562	CQA-011	2019/9/26	2020/9/25
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2018/10/28	2020/10/27
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2019/9/26	2020/9/25
EMI Test Receiver	R&S	ESR7	CQA-005	2018/10/28	2019/10/27
Spectrum analyzer	R&S	FSU26	CQA-038	2018/10/28	2019/10/27
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2019/9/26	2020/9/25
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2018/11/2	2019/11/1
Coaxial cable (1GHz~40GHz)	CQA	N/A	C019	2019/9/26	2020/9/25
Coaxial cable (9KHz~1GHz)	CQA	N/A	C020	2019/9/26	2020/9/25

6 Test results and Measurement Data

6.1 Conducted Emissions

Test Requirement: 47 CFR Part 15B

Test Method: ANSI C63.4

Test frequency range: 150kHz to 30MHz

Limit:

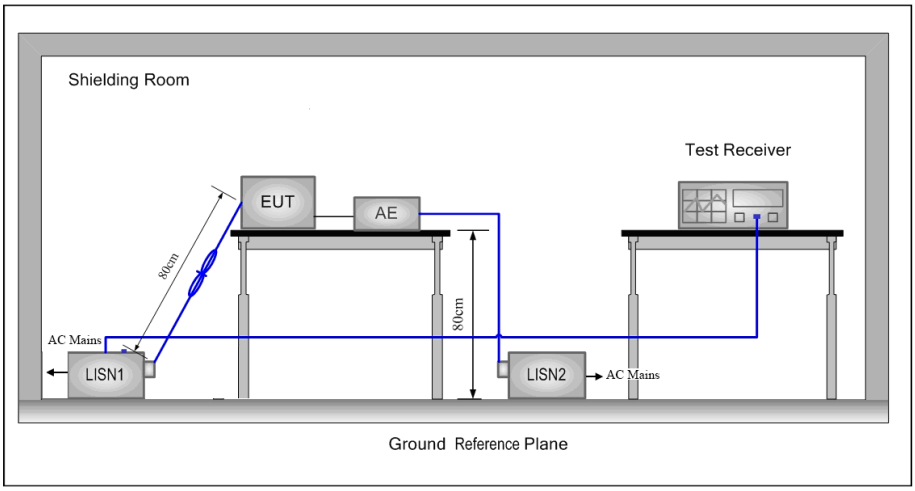
Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

* Decreases with the logarithm of the frequency.

Test Procedure:

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.

Test Setup:



Instruments Used: Refer to section 5 for details

Test Mode: Normal working

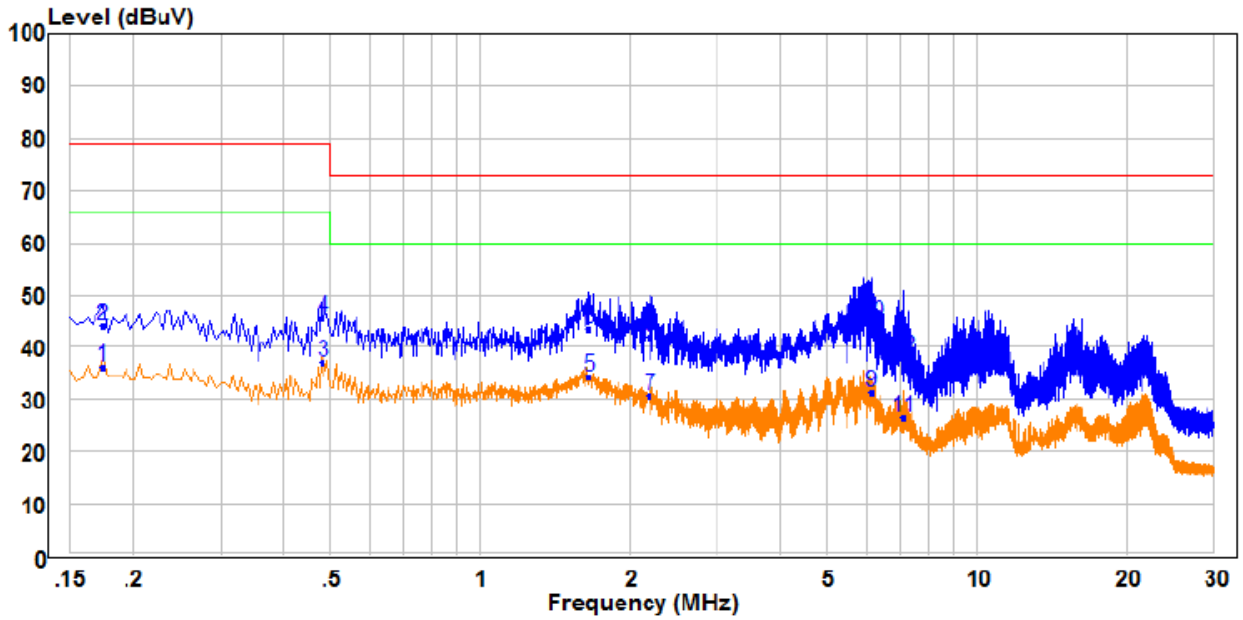
Test Results: Pass

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

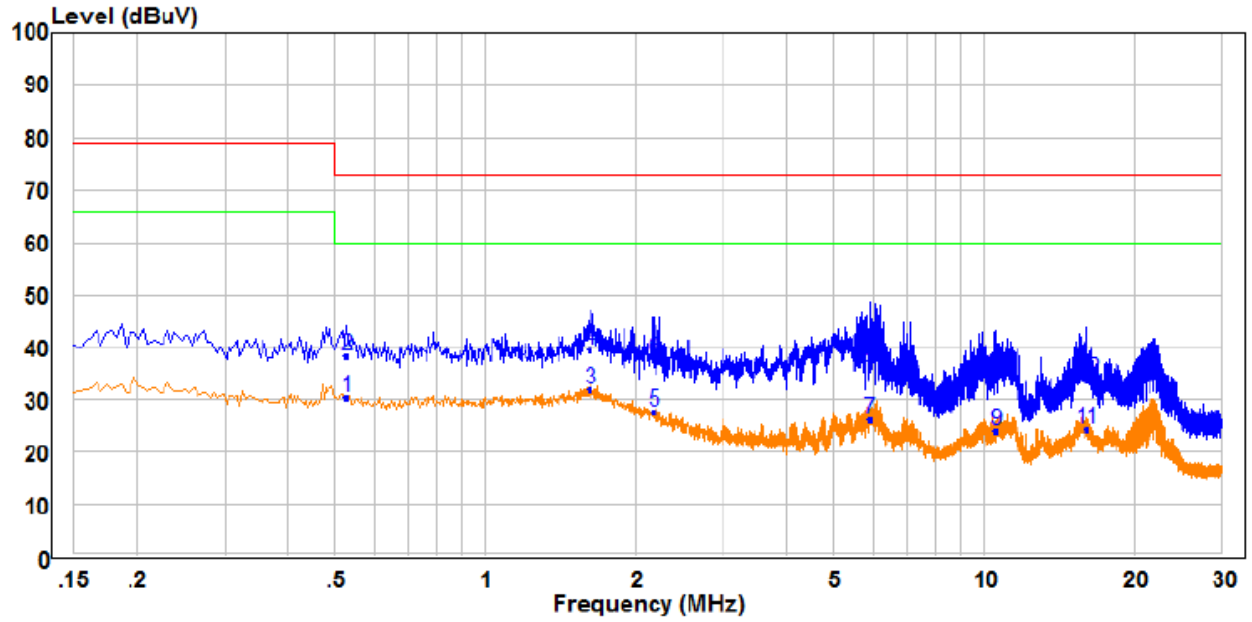
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.174	26.60	9.49	36.09	66.00	-29.91	Average	Line
2		0.174	34.51	9.49	44.00	79.00	-35.00	QP	Line
3		0.482	27.73	9.52	37.25	66.00	-28.75	Average	Line
4		0.482	36.06	9.52	45.58	79.00	-33.42	QP	Line
5	PP	1.658	24.71	9.52	34.23	60.00	-25.77	Average	Line
6		1.658	34.10	9.52	43.62	73.00	-29.38	QP	Line
7		2.194	21.22	9.55	30.77	60.00	-29.23	Average	Line
8		2.194	32.33	9.55	41.88	73.00	-31.12	QP	Line
9		6.130	21.47	9.72	31.19	60.00	-28.81	Average	Line
10	QP	6.130	34.96	9.72	44.68	73.00	-28.32	QP	Line
11		7.106	16.62	9.69	26.31	60.00	-33.69	Average	Line
12		7.106	28.41	9.69	38.10	73.00	-34.90	QP	Line

Neutral Line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.526	20.86	9.63	30.49	60.00	-29.51	Average	Neutral
2		0.526	28.54	9.63	38.17	73.00	-34.83	QP	Neutral
3	PP	1.622	22.09	9.72	31.81	60.00	-28.19	Average	Neutral
4	QP	1.622	29.84	9.72	39.56	73.00	-33.44	QP	Neutral
5		2.182	17.94	9.73	27.67	60.00	-32.33	Average	Neutral
6		2.182	27.94	9.73	37.67	73.00	-35.33	QP	Neutral
7		5.902	16.36	9.80	26.16	60.00	-33.84	Average	Neutral
8		5.902	27.71	9.80	37.51	73.00	-35.49	QP	Neutral
9		10.617	14.17	9.95	24.12	60.00	-35.88	Average	Neutral
10		10.617	24.43	9.95	34.38	73.00	-38.62	QP	Neutral
11		16.037	14.47	9.95	24.42	60.00	-35.58	Average	Neutral
12		16.037	23.75	9.95	33.70	73.00	-39.30	QP	Neutral

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

6.2 Radiated Emission

Test Requirement: 47 CFR Part 15B

Test Method: ANSI C63.4

Test site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver setup:

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value

Limit:

Frequency	Limit (dBμV/m @3m)	Remark
30MHz-88MHz	50.0	Quasi-peak Value
88MHz-216MHz	53.5	Quasi-peak Value
216MHz-960MHz	56.0	Quasi-peak Value
960MHz-1GHz	64.0	Quasi-peak Value
Above 1GHz	60.0	Average Value
	80.0	Peak Value

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test Setup:

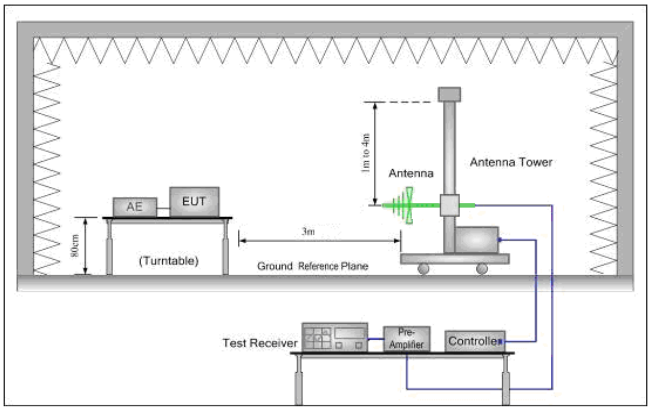


Figure 1. 30MHz to 1GHz

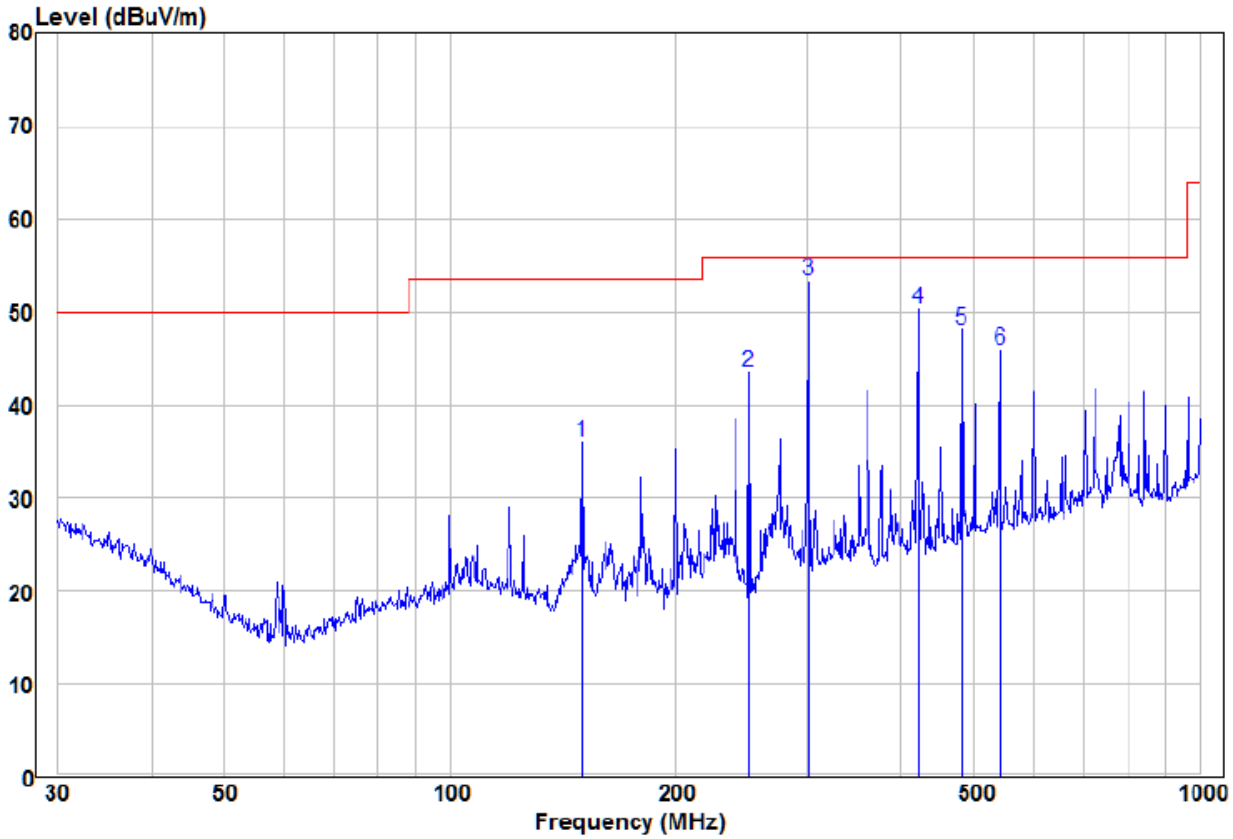
Instruments Used: Refer to section 5 for details

Test Mode: Normal working

Test Results: Pass

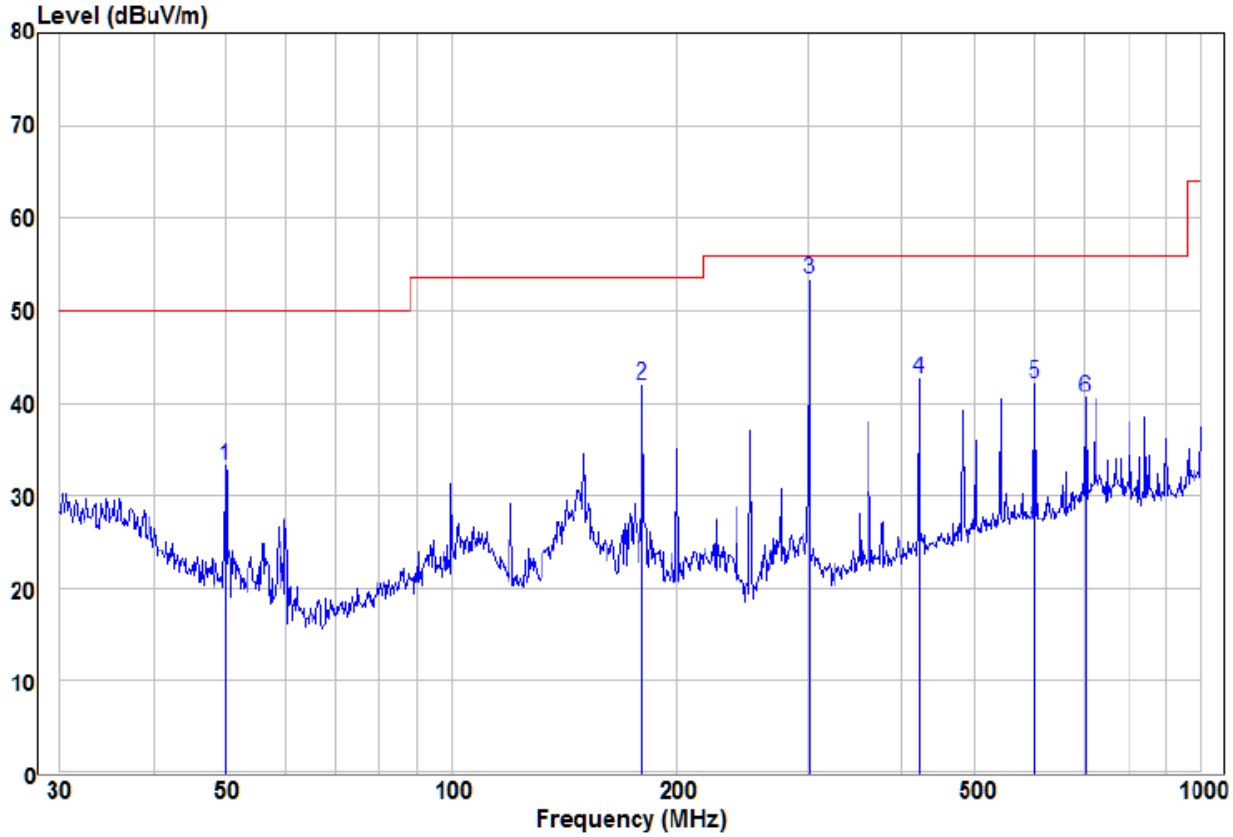
Below 1GHz

Horizontal



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		150.01	27.47	8.47	35.94	53.50	-17.56	QP	HORIZONTAL
2		250.30	33.40	10.09	43.49	56.00	-12.51	QP	HORIZONTAL
3	pp	300.37	41.70	11.74	53.44	56.00	-2.56	QP	HORIZONTAL
4		420.58	35.51	14.80	50.31	56.00	-5.69	QP	HORIZONTAL
5		480.53	31.50	16.68	48.18	56.00	-7.82	QP	HORIZONTAL
6		541.37	28.22	17.71	45.93	56.00	-10.07	QP	HORIZONTAL

Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	49.88	24.19	9.16	33.35	50.00	-16.65	QP	VERTICAL
2	180.02	33.64	8.34	41.98	53.50	-11.52	QP	VERTICAL
3 pp	300.37	41.70	11.74	53.44	56.00	-2.56	QP	VERTICAL
4	420.58	27.93	14.80	42.73	56.00	-13.27	QP	VERTICAL
5	601.43	23.79	18.32	42.11	56.00	-13.89	QP	VERTICAL
6	701.76	20.55	20.10	40.65	56.00	-15.35	QP	VERTICAL

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

   Final Test Level =Receiver Reading - Correct Factor

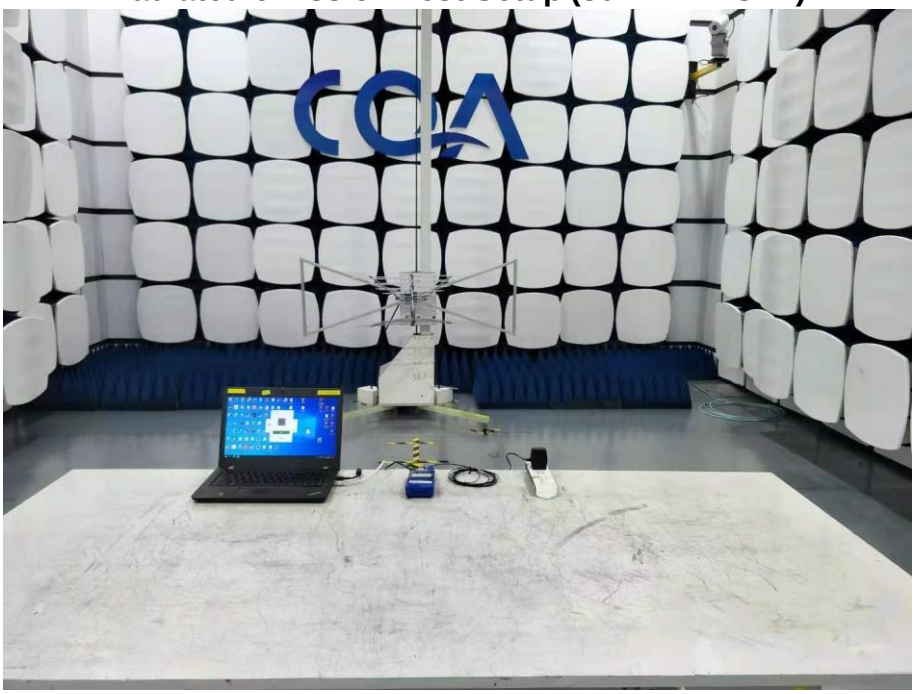
   Correct Factor = *Preamplifier Factor– Antenna Factor–Cable Factor*

2) *Scan from 9kHz to 1GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.*

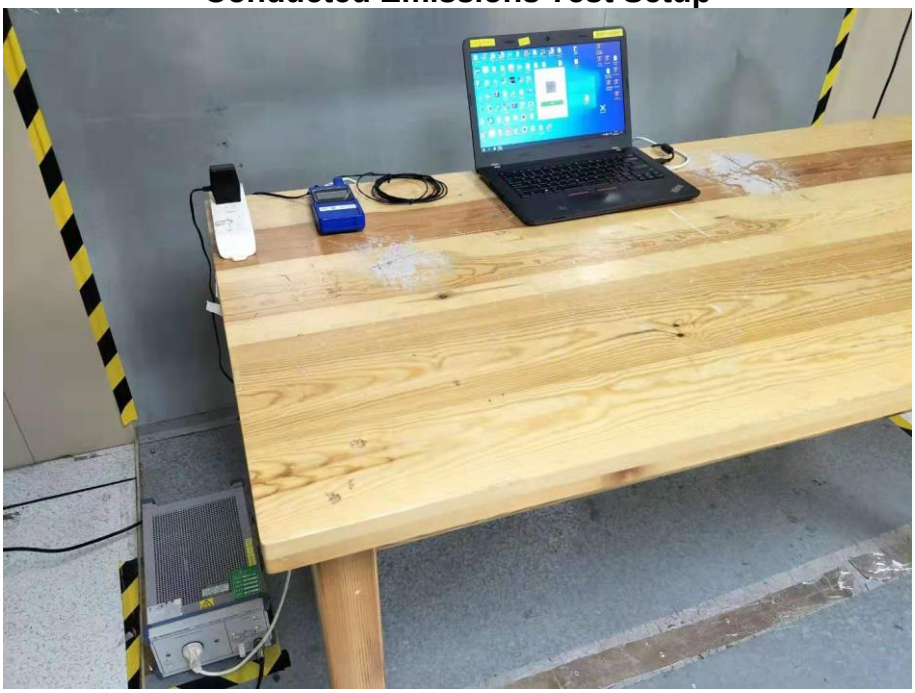
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Test Model No.: 6600

Radiated emission Test Setup (30MHz～1GHz)



Conducted Emissions Test Setup



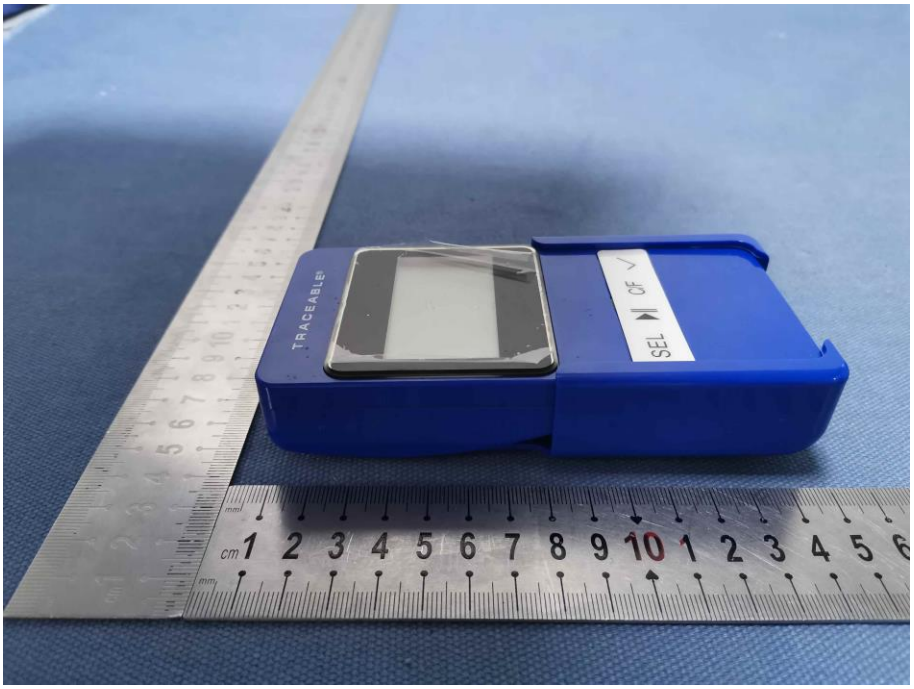
APPENDIX 2 PHOTOGRAPHS OF EUT

Test mode No.: 6600

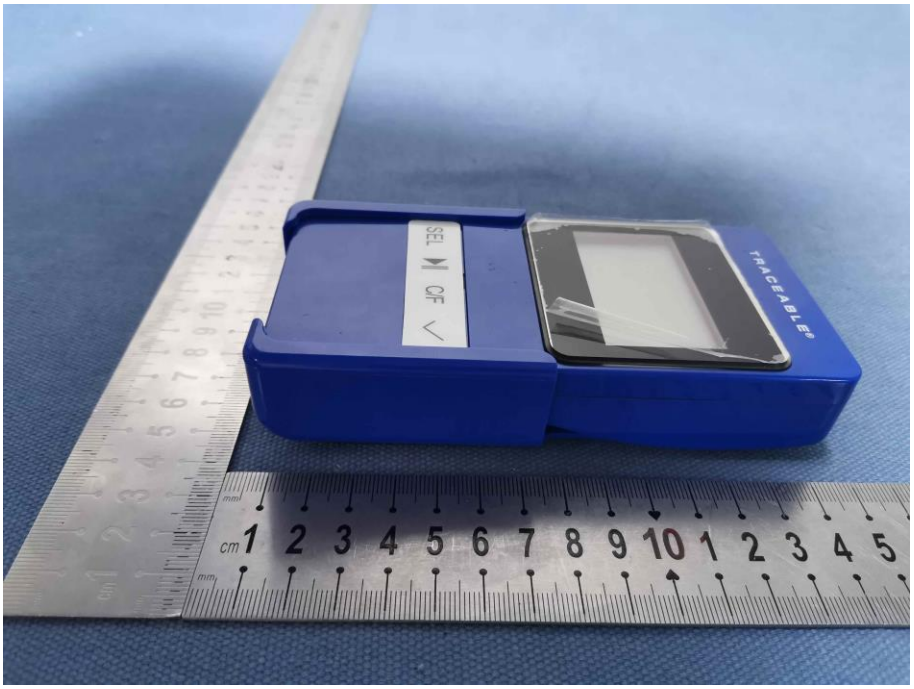

TRACEABLE®
SEL
C/F


TRACEABLE
RoHS
Compliant


SEL
C/F

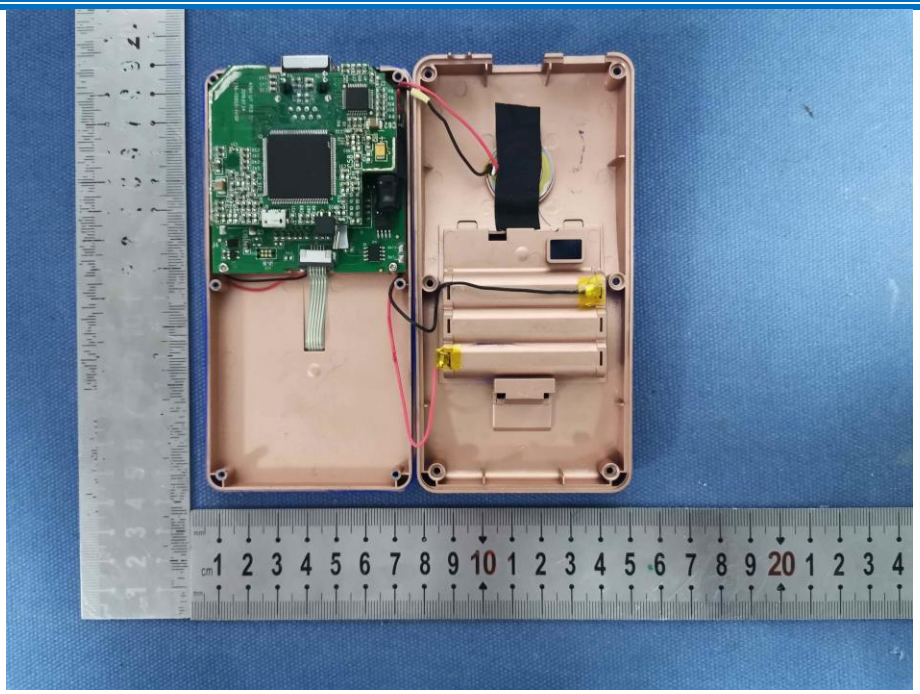

TRACEABLE
SEL
C/F

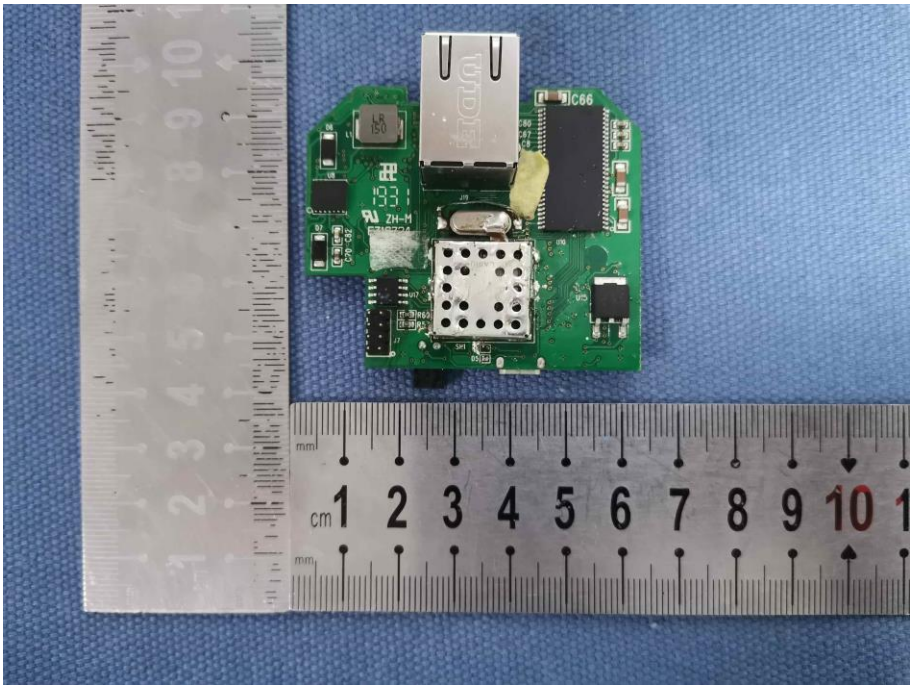

TRACEABLE®
cm 1 2 3 4 5 6 7 8 9 10 1

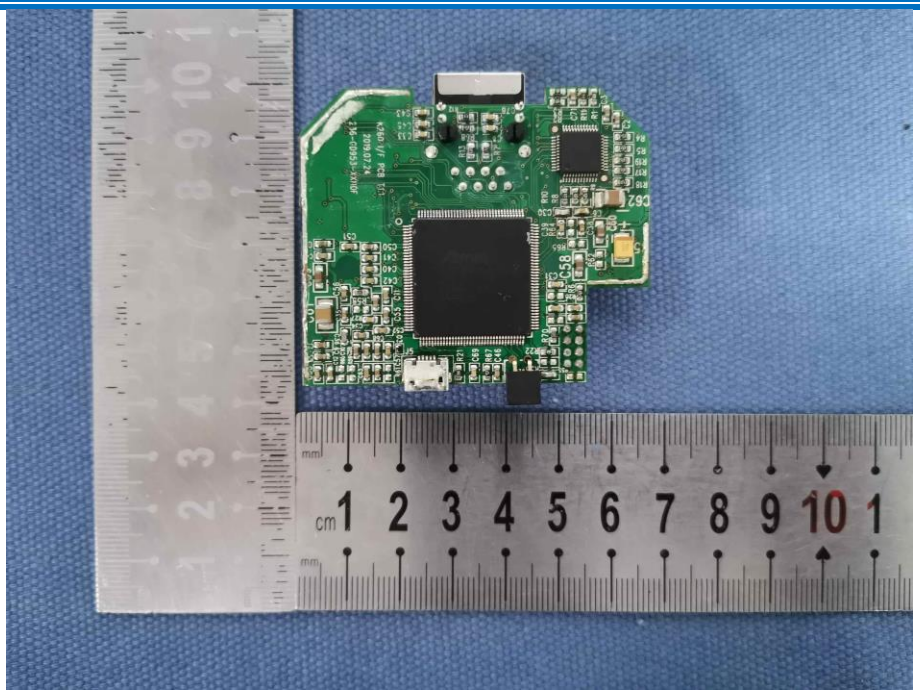

SEL
OFF
TRACEABLE®
cm 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5

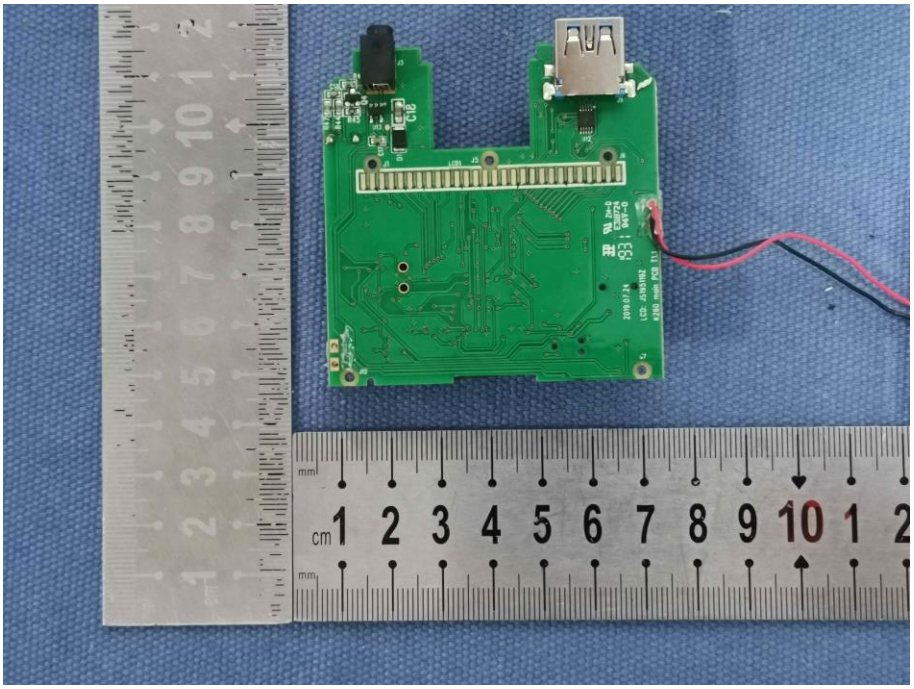

TRACEABLE®

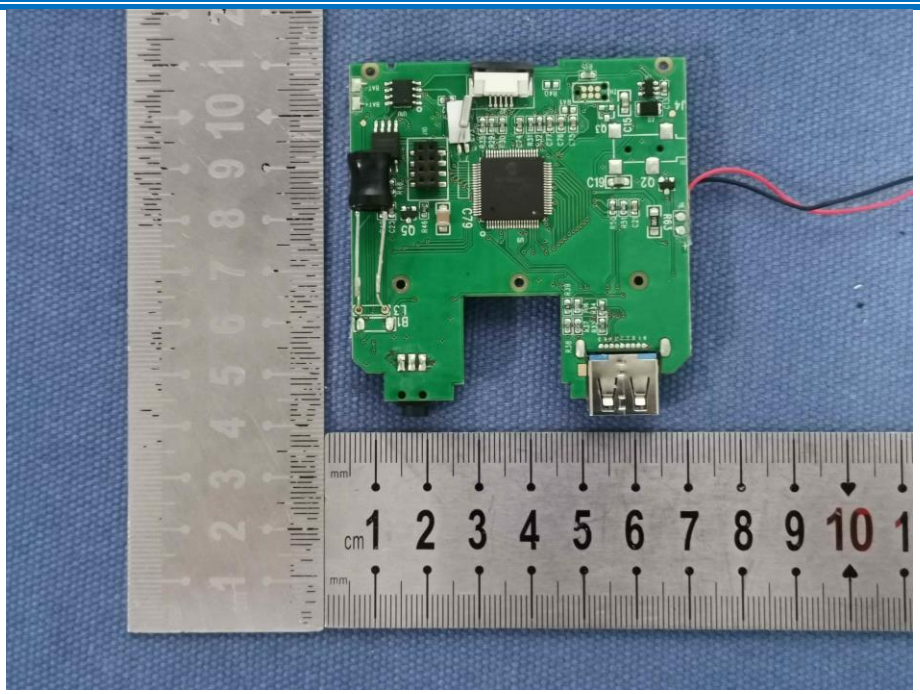

TRACEABLE
RoHS
1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 20 1 2 3 4 5 6 7 8











*** End of Report ***