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TESTING
CNAS L15505

Report No.: E202410081312-2

RTCA/DO-160G Airborne Equipment Electromagnetic Compatibility test report

Total 19 pages

Sample Description : Multi-Use USB Temp Data Logger

Model : TempU04

S/N : TZ0424090251

Applicant : Tzone Digital Technology CO.,Ltd

Manufacturer : Tzone Digital Technology CO.,Ltd

Test Type : Commissioning Test

Application No. : E202410081312



广电计量检测（西安）有限公司

GRG METROLOGY & TEST (XI' AN) CO.,LTD.

GRGTEST

1 Test Results

Equipment		Multi-Use USB Temp Data Logger		
Model		TempU04	S/N	TZ0424090251
Applicant	Tzone Digital Technology CO.,Ltd	Address	2nd Floor, Building L, Chengdexuan Science and Technology Park, Second Industrial Zone, Lisonglang Community, Gongming Street, Guangming District, Shenzhen, China.	
Manufacturer	Tzone Digital Technology CO.,Ltd	Address	2nd Floor, Building L, Chengdexuan Science and Technology Park, Second Industrial Zone, Lisonglang Community, Gongming Street, Guangming District, Shenzhen, China.	
Received Date	2024-10-11		Test Date	2024-10-11
Client Test Participant	/			
Test address	No. 9, Chuanzitai Road, New Industrial Park, High-tech Zone, Xi 'an, Shaanxi			
Test Standard	1. RTCA/DO-160G: 2010 Environmental Conditions and Test Procedures for Airborne Equipment 2. The test condition and working state of the sample are confirmed by the E202410081312-2electromagnetic compatibility testing status form of the customer.			

Test Results

No.	Test Items		Equipment Category	Test Results	Report Sections	Limits	Comment
1	Section 21 Emission of Radio Frequency Energy	Radiated RF Emission	Category H	Pass	3.1.1	Category H	100MHz~6GHz

Test Result: PASS

Prepared by

Wangke

Reviewed by

Kou Jin Jiang

Approved by

Bin Rong

Position

Director

Test Location: GRG METROLOGY & TEST (XI'AN) CO., LTD (Special Seal)

Issue Date: 2024-10-18

DIRECTIONS OF TEST

1. The technical parameters of the equipment used in the testing/testing work carried out at this site can be traced to the national Metrology standards and the International Bureau of Metrology (BIPM).
2. Report no inspection unit certificate report seal is invalid.
3. The report shall be invalid without the signature of the signatory authorized by the testing unit.
4. This test report is only applicable to the tested equipment. Without written approval of the laboratory, it is not allowed to partially copy the report.
5. The report is invalid.
6. If the entrusted unit has any objection to this test/test, it shall raise it to the laboratory within 15 days from the date of receiving the test report.



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2 EUT Information

Basic information of EUT							
1. Component of Test Equipment and Paternity Equipment							
1.1 Basic description of test equipment							
No.	Name	Model	S/N	Quantity	Technical Status	Manufacturer	Remark
1	Multi-Use USB Temp Data Logger	TempU04	TZ0424090251	1	/	Tzone Digital Technology CO.,Ltd	/
1.2 Assistive Equipment							
No.	Name	Model	S/N	Quantity	Manufacturer		Remark
1	/	/	/	/	/		/
1.3 Connection Wires							
No.	Name	Code	Model	Technical Status	Length	Shield or Not	Remark
1	/	/	/	/	/	/	/
2. Test Equipment and Paternity Equipment Connection Diagram							
Multi-Use USB Temp Data Logger							
3. Power Supply: Internal battery power							
4. Test Mode Working State 1: Internal battery power, EUT power on. The“OK”Led will flash in green once every 10s.							
5. Monitoring Method for Immunity Tests:/							



3 Test Item Information and Result

3.1Section21 Emission of Radio Frequency Energy

3.1.1 Radiated RF Emission(RE)

EUT name	Multi-Use USB Temp Data Logger	Model No.	TempU04	S/N	TZ0424090251
EUT appearance	The sample has no cracks and scratches.	Test site		2#Anechoic chamber	
Environmental conditions	Temperature: 22.5℃;Relative Humidity:49%; Atmospheric pressure: 96.5kPa;				
Power supply	Internal battery power				
Category	Category H				
Frequency Range	100MHz~6GHz				

Test Limit:

Table 21.5-1: Radiated RF Emission Test Levels

Frequency(MHz)	Levels(dBuV/m)	Note
100~108	44.6~45.13	/
108~15	25~27.5	
152~320	47.51~52.67	
320~340	37.7~38.1	
340~960	53.09~60.29	
960~1215	45.3~47	
1215~1525	61.92~63.5	
1525~1680	48.5~49.2	
1680~5020	64.17~71.76	
5020~5100	56.8~56.9	
5100~6000	71.87~73	

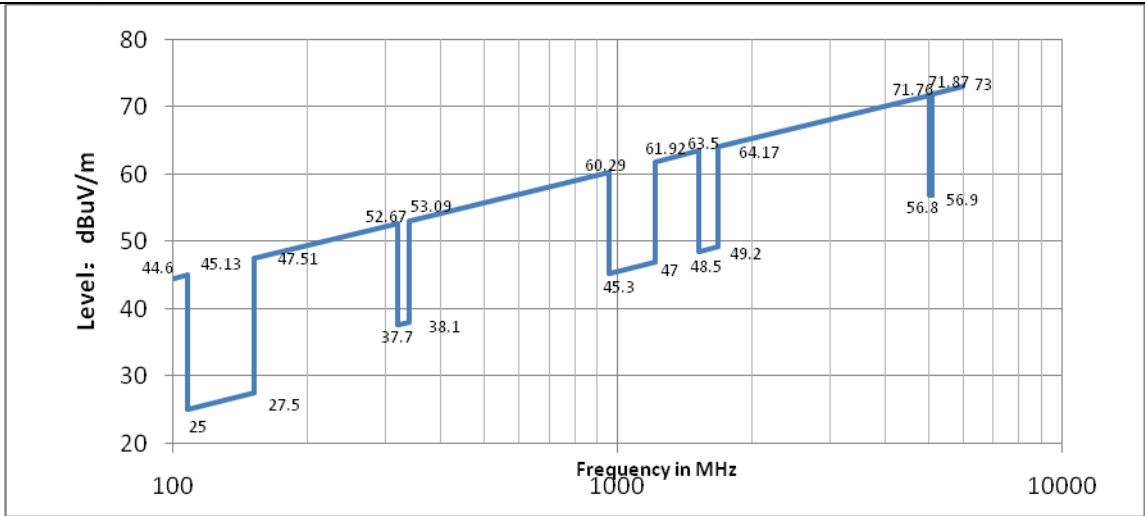


Figure 21.5-1: Radiated RF Emission Test Levels

Table 21.5-2 Bandwidth and Measurement Times

Frequency Band	6dB Bandwidth (BW)	Minimum Dwell Time (seconds)
150kHz~30MHz	1kHz	0.015
30MHz~100MHz	10kHz	0.015
100MHz~400MHz	10kHz	0.015
400MHz~960MHz	100kHz	0.015
960MHz~6GHz	1MHz	0.015

List of used test equipment :

Name of equipment	Model	Serial number	Manufacturer	Calibration due
Anechoic chamber	ASAC	SA180507	SAEMC	2026-04-01
Measure the receiver	ESU26	100526	R&S	2025-08-04
Bi-conical Antenna	BBA9106+VHBB9124	00950	Schwarzbeck	2025-08-20
Horn antenna	BBHA 9120F-N	169	Schwarzbeck	2025-08-20
Horn antenna	BBHA 9120D	01637	Schwarzbeck	2025-08-20
Preamplifier	DLNA-1M1G-G35	20201128001	YBCK	2024-12-01
Preamplifier	DLNA-1G18G-G35	20201128002	YBCK	2025-02-20

Does the test system meet the standard requirements: Pass

EUT Working state	Working state 1
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Test Setup:

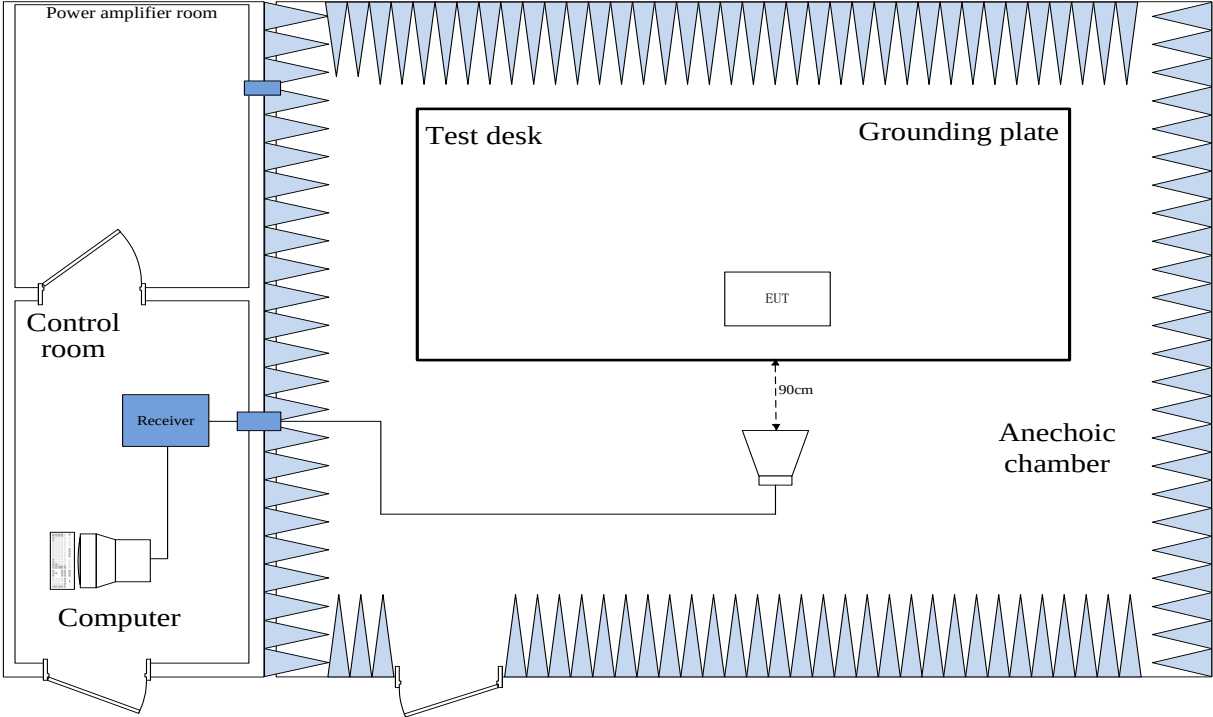


Figure 21.5-2: Radiated RF Emission Test Setup

Test Procedure:

1. Setup the EUT as indicated in Figure 21.5-2. Conduct a pre-test performance check of the EUT.
2. With The EUT operating, measure the horizontal radiated emissions from 100 MHz to 6 GHz. The EUT emissions shall not exceed the limits as shown in Figure 21.5-1.
3. With The EUT operating, measure the vertical radiated emissions from 100 MHz to 6 GHz. The EUT emissions shall not exceed the limits as shown in Figure 21.5-1.

State after the test	Working state 1,working normally.
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Test result

Working state	Test Levels	Frequency Range	Polarization Mode	Results	Test Curve	Beyond the limit
Working state 1	Category H	100MHz~6GHz	Vertical	Pass	See attached pages	/
			Horizontal	Pass	See attached pages	/

Conclusion: Pass

Test Engineer/ Date:Li Hang 2024-10-11

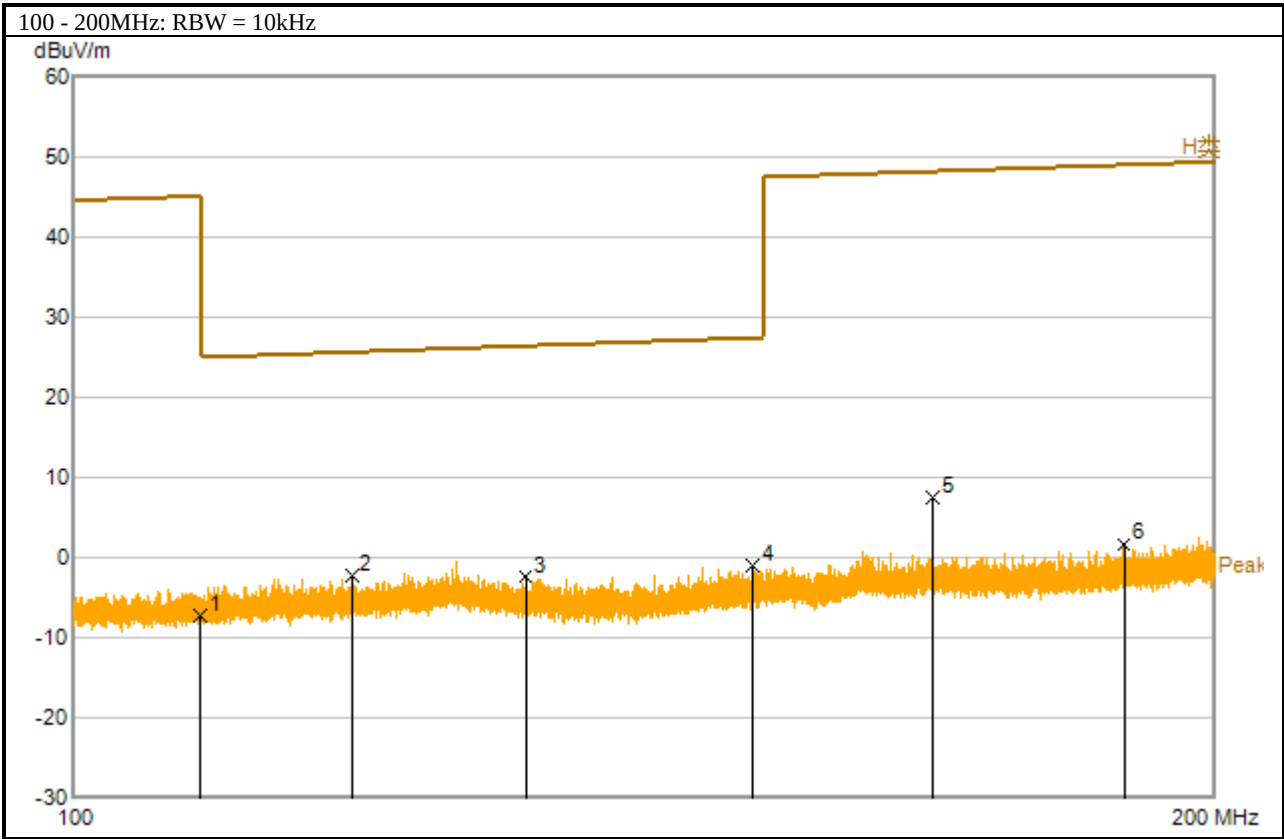
Reviewer/ Date: Wang Ke 2024-10-11



Test data and graphs

1) Record No. 1 (100 - 200MHz)

Test Result:	Pass	Test Position:	Vertical
Standard:	RTCA/DO-160G	Data:	2024-10-11
Test Item:	Radiated RF Emission	Temp./Hum.(%RH):	22.5℃/49%RH
Sample Name:	Multi-Use USB Temp Data Logger	Model:	TempU04
Sample No.	TZ0424090251	Test Mode:	Working State 1
Test Engineer:	Li Hang	Reviewers:	Wang Ke
Note:	/		



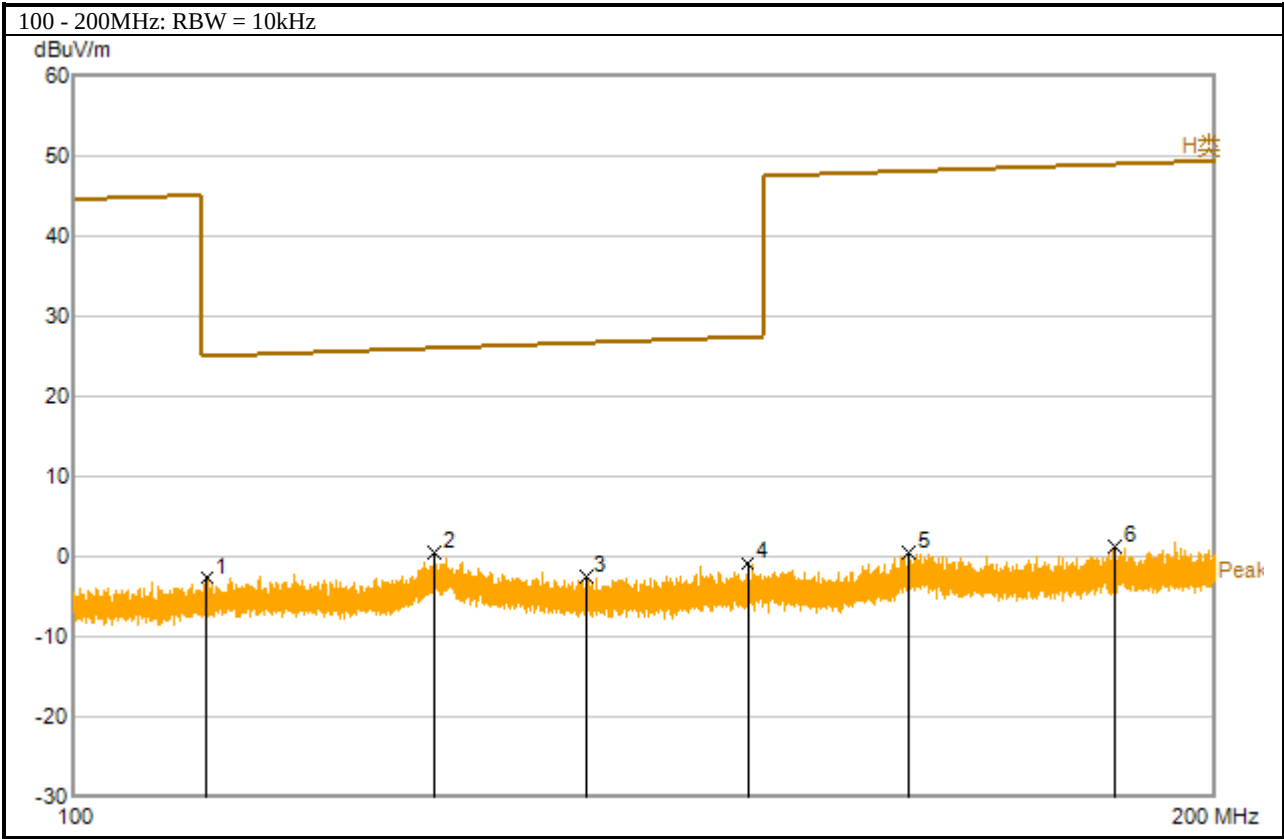
N0.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	108.01	12.72	-19.95	-7.23	25	32.23	Peak
2	118.375	17.61	-19.9	-2.29	25.67	27.96	Peak
3	131.56	16.64	-19.07	-2.43	26.44	28.87	Peak
4	151.03	16.53	-17.51	-0.98	27.45	28.43	Peak
5	168.49	24.19	-16.75	7.44	48.23	40.79	Peak
6	189.235	16.42	-14.77	1.65	49.04	47.39	Peak

Note: Result = Reading + Correct factor, Margin = Limit – Result



2) Record No. 2 (100 - 200MHz)

Test Result:	Pass	Test Position:	Horizontal
Standard:	RTCA/DO-160G	Data:	2024-10-11
Test Item:	Radiated RF Emission	Temp./Hum.(%RH):	22.5℃/49%RH
Sample Name:	Multi-Use USB Temp Data Logger	Model	TempU04
Sample No.	TZ0424090251	Test Mode:	Working State 1
Test Engineer:	Li Hang	Reviewers:	Wang Ke
Note:	/		



N0.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	108.42	16.79	-19.47	-2.68	25.03	27.71	Peak
2	124.495	19.71	-19.15	0.56	26.04	25.48	Peak
3	136.46	15.76	-18.27	-2.51	26.71	29.22	Peak
4	150.57	16.82	-17.59	-0.77	27.43	28.2	Peak
5	166.03	17.75	-17.33	0.42	48.13	47.71	Peak
6	188.2	16.25	-14.98	1.27	49	47.73	Peak

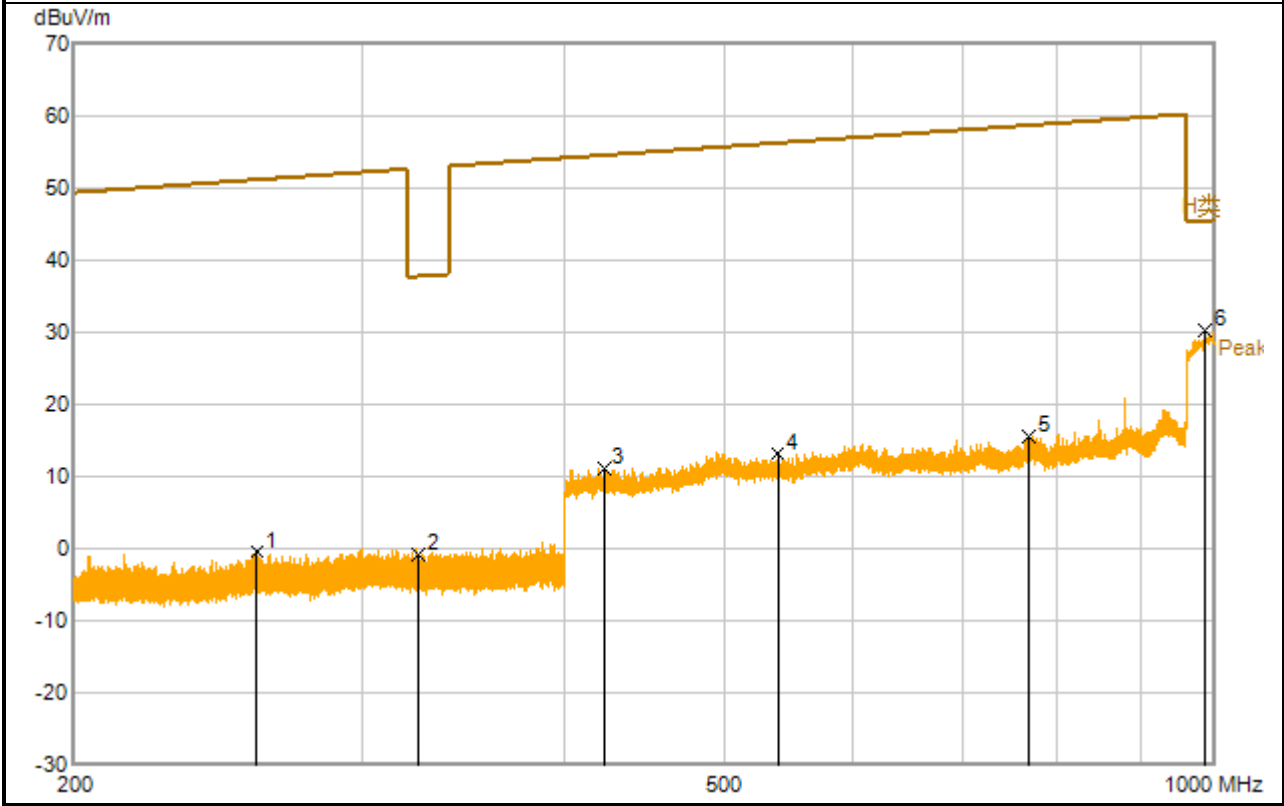
Note: Result = Reading + Correct factor, Margin = Limit – Result



3) Record No. 3 (200 - 1000MHz)

Test Result:	Pass	Test Position:	Vertical
Standard:	RTCA/DO-160G	Data:	2024-10-11
Test Item:	Radiated RF Emission	Temp./Hum.(%RH):	22.5℃/49%RH
Sample Name:	Multi-Use USB Temp Data Logger	Model:	TempU04
Sample No.	TZ0424090251	Test Mode:	Working State 1
Test Engineer:	Li Hang	Reviewers:	Wang Ke
Note:	/		

200 - 400MHz: RBW = 10kHz; 400 - 960MHz: RBW = 100kHz; 960 - 1000MHz: RBW = 1MHz



N0.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	258.895	17.42	-17.9	-0.48	51.21	51.69	Peak
2	324.99	16.17	-16.95	-0.78	37.8	38.58	Peak
3	422.2	27.12	-16	11.12	54.6	43.48	Peak
4	539.65	27.12	-13.94	13.18	56.3	43.12	Peak
5	769.05	27.88	-12.27	15.61	58.75	43.14	Peak
6	986.5	39.66	-9.41	30.25	45.5	15.25	Peak

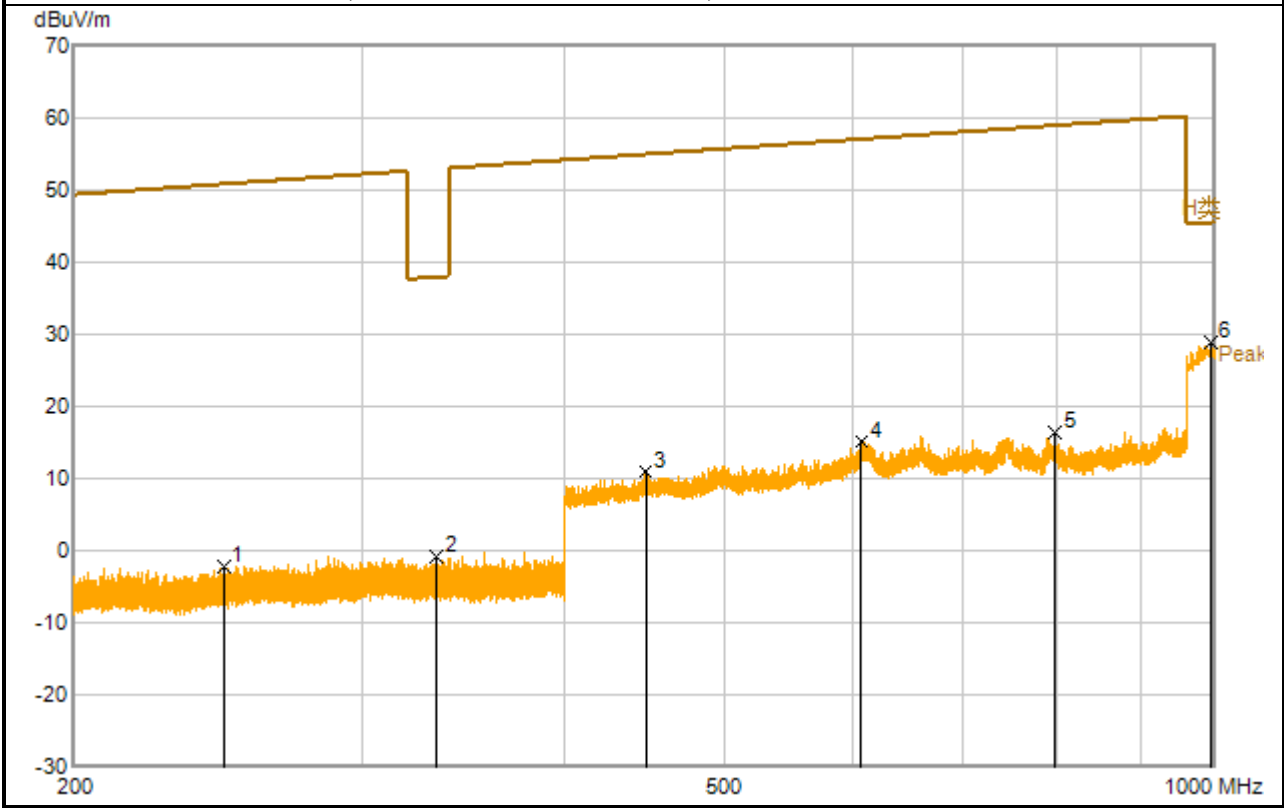
Note: Result = Reading + Correct factor, Margin = Limit – Result



4) Record No. 4 (200 - 1000MHz)

Test Result:	Pass	Test Position:	Horizontal
Standard:	RTCA/DO-160G	Data:	2024-10-11
Test Item:	Radiated RF Emission	Temp./Hum.(%RH):	22.5℃/49%RH
Sample Name:	Multi-Use USB Temp Data Logger	Model:	TempU04
Sample No.	TZ0424090251	Test Mode:	Working State 1
Test Engineer	Li Hang	Reviewers:	Wang Ke
Note:	/		

200 - 400MHz: RBW = 10kHz; 400 - 960MHz: RBW = 100kHz; 960 - 1000MHz: RBW = 1MHz



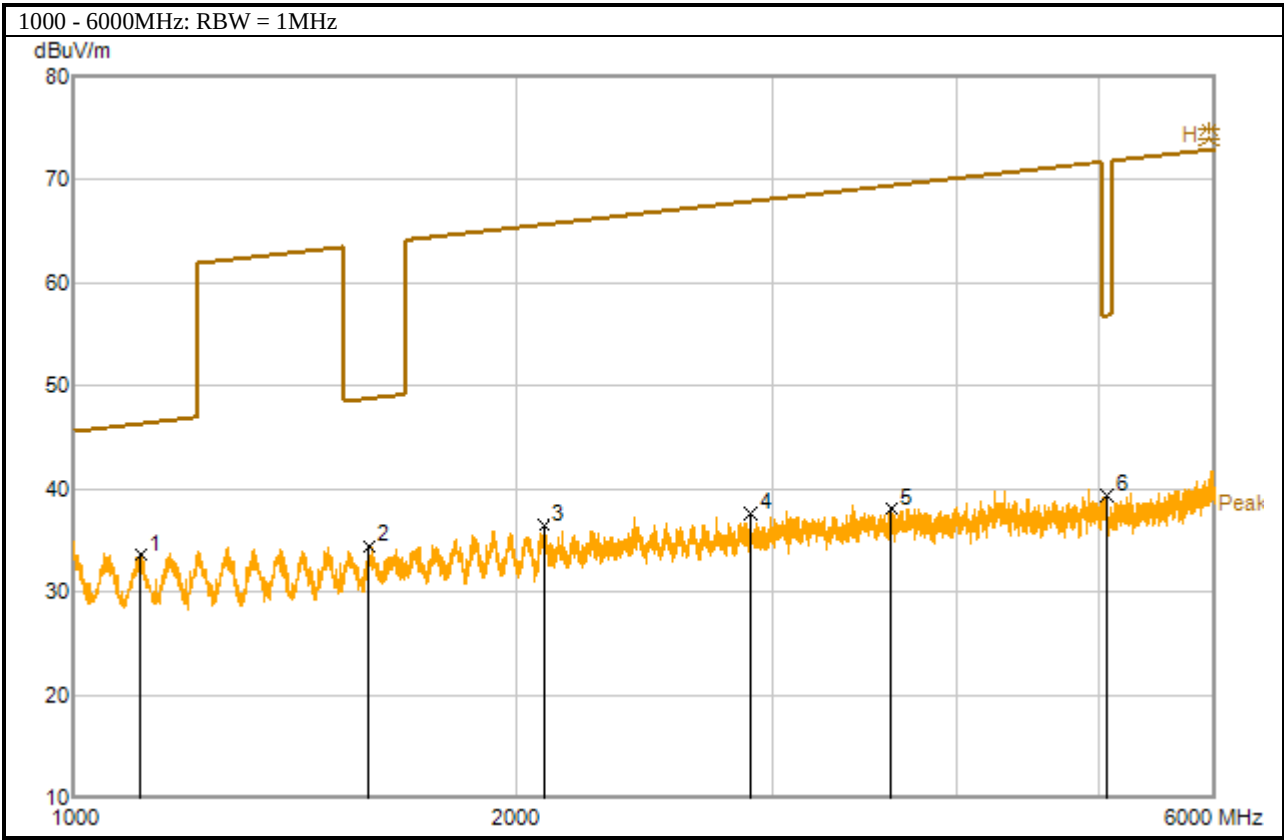
N0.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	246.975	15.84	-18.04	-2.2	50.88	53.08	Peak
2	333.445	16.19	-17.05	-0.86	37.97	38.83	Peak
3	447.85	26.38	-15.5	10.88	55.01	44.13	Peak
4	606.9	27.36	-12.25	15.11	57.11	42	Peak
5	797.75	28.98	-12.5	16.48	59.01	42.53	Peak
6	993.5	38.01	-9.11	28.9	45.55	16.65	Peak

Note: Result = Reading + Correct factor, Margin = Limit – Result



5) Record No. 5 (1000 - 6000MHz)

Test Result:	Pass	Test Position:	Vertical
Standard:	RTCA/DO-160G	Data:	2024-10-11
Test Item:	Radiated RF Emission	Temp./Hum.(%RH):	22.5℃/49%RH
Sample name:	Multi-Use USB Temp Data Logger	Model:	TempU04
Sample No.	TZ0424090251	Test Mode:	Working State 1
Test Engineer:	Li Hang	Reviewers:	Wang Ke
Note:	/		



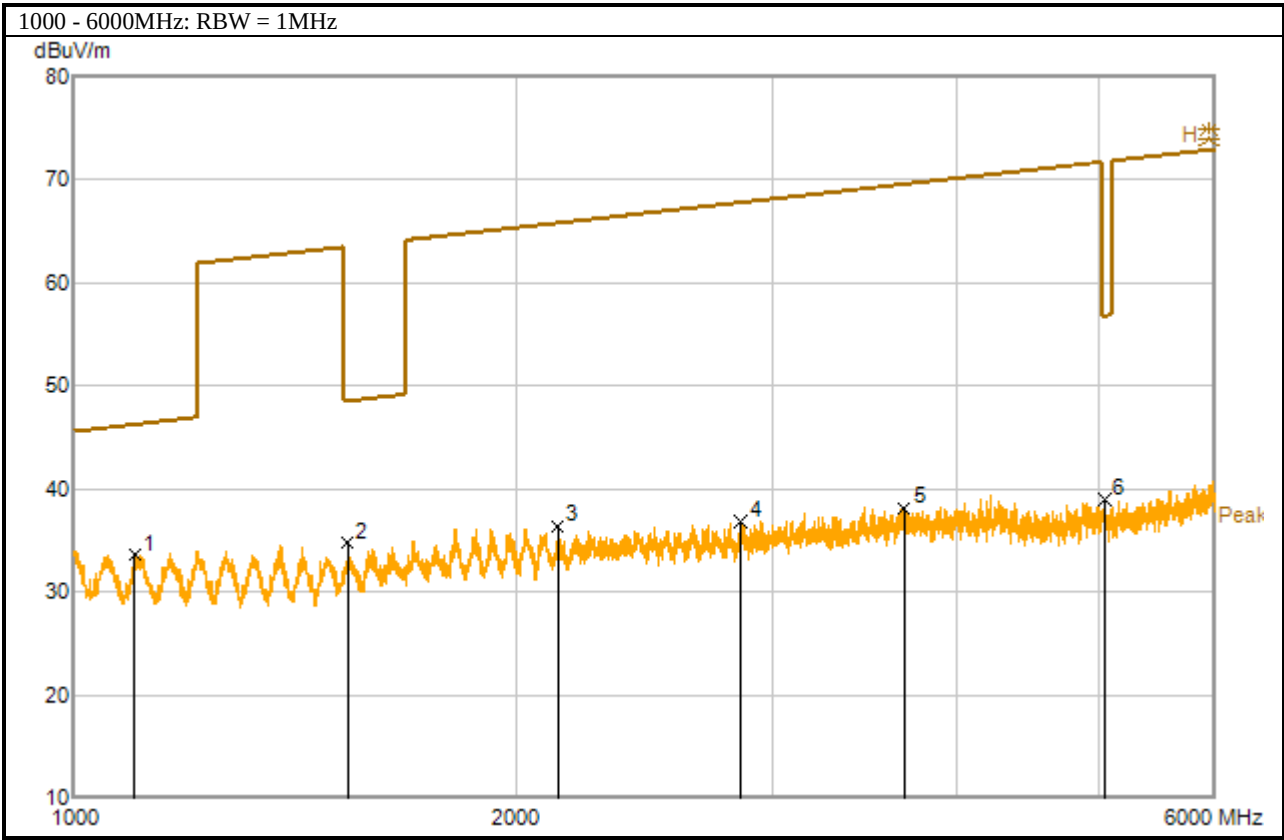
N0.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1110.5	51.43	-17.81	33.62	46.35	12.73	Peak
2	1589.5	50.79	-16.36	34.43	48.8	14.37	Peak
3	2091	50.07	-13.58	36.49	65.69	29.2	Peak
4	2894	48.35	-10.7	37.65	67.94	30.29	Peak
5	3610	46.12	-8.06	38.06	69.47	31.41	Peak
6	5061.5	42.1	-2.69	39.41	56.85	17.44	Peak

Note: Result = Reading + Correct factor, Margin = Limit – Result



6) Record No. 6 (1000 - 6000MHz)

Test Result:	Pass	Test Position:	Horizontal
Standard:	RTCA/DO-160G	Data:	2024-10-11
Test Item:	Radiated RF Emission	Temp./Hum.(%RH):	22.5℃/49%RH
Sample Name:	Multi-Use USB Temp Data Logger	Model:	TempU04
Sample No.	TZ0424090251	Test Mode:	Working State 1
Test Engineer:	Li Hang	Reviewers:	Wang Ke
Note:	/		



N0.	Frequency (MHz)	Reading (dBuV)	Correct F tor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1100.5	51.02	-17.46	33.56	46.29	12.73	Peak
2	1536.5	51.46	-16.71	34.75	48.55	13.8	Peak
3	2137	49.8	-13.42	36.38	65.84	29.46	Peak
4	2851.5	48	-11.15	36.85	67.84	30.99	Peak
5	3684.5	45.92	-7.81	38.11	69.62	31.51	Peak
6	5042	42.16	-3.2	38.96	56.83	17.87	Peak

Note: Result = Reading + Correct factor, Margin = Limit - Result

APPENDIX A:PHOTOS OF TEST ARRANGEMENT

1. Radiated RF Emission



100MHz~200MHz



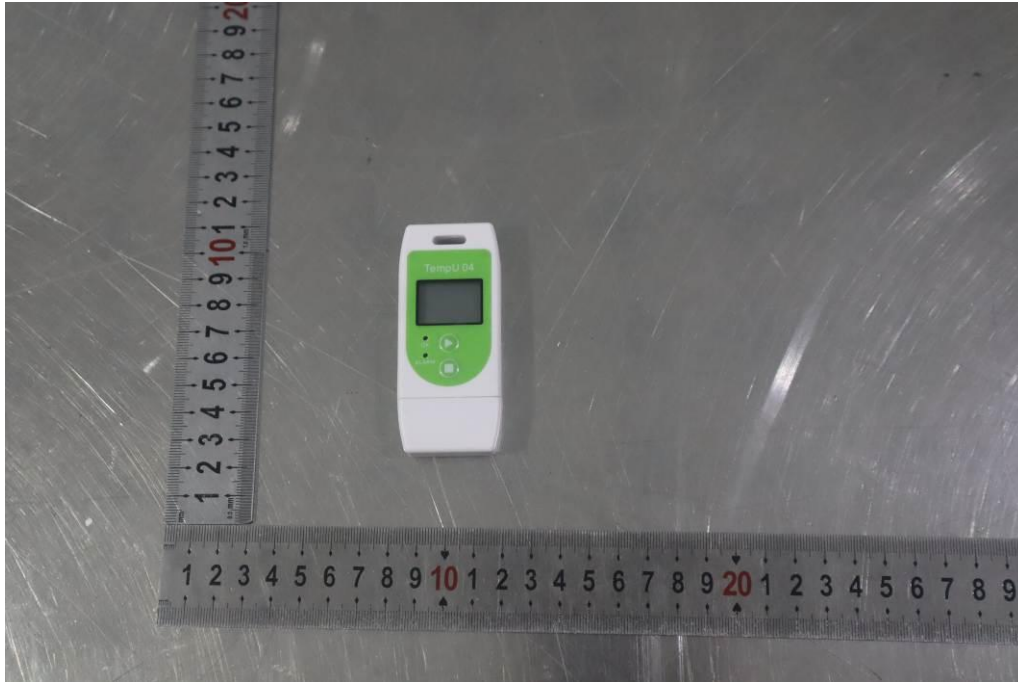
200MHz~1GHz

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1GHz~6GHz

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APPENDIX B:PHOTOS OF THE EUT

Front-side



Back-side

APPENDIX C: EMC TEST STATUS CONFIRMATION FORM

GRG/LWI-XAEMC-11-0005(1.0) Date of enactment: 2021/3/2 Date of implementation: 2021/3/2

TEST STATUS CONFIRMATION FORM

Application No: E202410081312

Report No: E202410081312-2

Client Name: Tzone Digital Technology CO.,Ltd

Client Test Participant: Cherry Chen

Test Method/Basic Standard: RTCA/DO-160G

Basic Description of EUT As Follows:

EUT Test Setup as Follow:

Multi-Use USB
Temp Data Logger

Figure 1 EUT Test Setup

Table 1 Description of EUT

NO.	*EUT Name	*Model NO.	Piece NO.	*S/N	Hardware version	Software version	Manufacturer	Remark
1	Multi-Use USB Temp Data Logger	TempU04	/	TZ0424090251	/	/	Tzone Digital Technology CO.,Ltd	/
Power supply requirements		☐ DC / V, Current: / A ☐ AC / V, / Hz, / Appearance, / Line, Current: / A ☒ Other: Internal battery powered						
Grounding situation		☐ The housing is grounded ☐ The ground terminal is grounded ☒ Not grounded ☐ other						
Chassis, cabinets, and other descriptions		☒ Desktop ☐ Floor						

Table 2 Summary of Paternity Equipments

NO.	Name	Model NO.	S/N	Specification/Quantity	Manufacturer	Remark
1	/	/	/	/	/	/

Table 3 Summary of Connecting Wires

NO.	Name	Code	*Model NO./Piece NO.	Length	Shield or Not	Remark
1	/	/	/	/	/	/

Table 4 Working State of EUT

NO.	Working State	Description of Working State	Remark
1	Working State 1	Internal battery power, EUT power on. The "OK" Led will flash in green once every 10s.	/



GRGJLWI-XAEMC-11-0005{1.0} Date of enactment: 2021/3/2 Date of implementation: 2021/3/2

Table5 TestItem

NO.	Item	Required Working State	Test Frequency Range	Remark
1	Section 21 Emission of Radio Frequency Energy	Radiated RF Emission	Working State 1	100MHz~6GHz

Table 6 FunctionalCheck of EUT (G)

Target	Content	Method	Result Criterion
1	/	/	/

Remark :The item marked with * required.If it cannot be confirmed ,Please explain the reason

GRGT Confirm:

We agree to test according to the requirement.

Sign: Wang ke 2024.12.11

Client Confirm:

We agree to test according to the requirement.

Sign: cherry chen 2024.12.11

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