

TEST REPORT

Product Name: Bluetooth Thermometer

Trade Mark: 

Model No.: WNR004

HVIN: WNR004

Report Number: 25010715640EMC-1

Test Standards: FCC 47 CFR Part 15 Subpart B
ICES-003 Issue 7

FCC ID: 2AHSR-NBEX001

Test Result: PASS

Date of Issue: February 28, 2025

Prepared for:

Weber-Stephen Products LLC
1415 S.Roselle Road, Palatine, IL 60067, USA

Prepared by:

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Version

Version No.	Date	Description
V1.0	February 28, 2025	Original



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UTTR-EMC-ICES003-V1.2

CONTENTS

1. GENERAL INFORMATION	4
1.1 CLIENT INFORMATION	4
1.2 EUT INFORMATION	4
1.2.1 GENERAL DESCRIPTION OF EUT	4
1.3 DESCRIPTION OF SUPPORT UNITS	4
1.4 TEST LOCATION	4
1.5 TEST FACILITY	5
1.6 DEVIATION FROM STANDARDS	5
1.7 ABNORMALITIES FROM STANDARD CONDITIONS	5
1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	5
1.9 MEASUREMENT UNCERTAINTY	5
2. TEST SUMMARY	6
3. EQUIPMENT LIST	7
4. TEST CONFIGURATION	8
4.1 ENVIRONMENTAL CONDITIONS FOR TESTING	8
4.1.1 NORMAL OR EXTREME TEST CONDITIONS	8
4.1.2 RECORD OF NORMAL ENVIRONMENT AND TEST SAMPLE	8
4.2 TEST MODES	8
4.3 TEST SETUP	9
4.3.1 FOR RADIATED EMISSIONS TEST SETUP	9
4.3.2 FOR CONDUCTED EMISSIONS TEST SETUP	10
4.4 SYSTEM TEST CONFIGURATION	10
5. REFERENCE DOCUMENTS FOR TESTING	11
6. EMC REQUIREMENTS SPECIFICATION	11
6.1 RADIATED EMISSION	11
APPENDIX 1 PHOTOS OF TEST SETUP	17
APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS	17

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Weber-Stephen Products LLC
Address of Applicant:	1415 S.Roselle Road, Palatine, IL 60067, USA
Manufacturer:	TKC Progress CO.,LTD
Address of Manufacturer:	Rangsit Fortune Estate (RPE II) 64/16-19 Moo 3, Klongnueng,Klonglaurang, Pathumthani 12120, Thailand

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Bluetooth Thermometer
Model No.:	WNR004
HVIN:	WNR004
Trade Mark:	
DUT Stage:	Identical Prototype
EUT Supports Function: (Provided by the customer)	Bluetooth 5.0
Classification of digital devices:	Class B
Power Supply:	3.2Vdc Button Battery
Highest Internal Frequency:	2480 MHz
Sample Received Date:	January 7, 2025
Sample Tested Date:	January 11, 2025 to January 15, 2025

Remark: The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.

1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	Lenovo	E450	SL10G10780	UnionTrust

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

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UTTR-EMC-ICES003-V1.2

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9kHz-150kHz	±3.2 dB
2	Conducted emission 150kHz-30MHz	±2.7 dB
3	Radiated emission 9kHz-30MHz	± 4.7 dB
4	Radiated emission 30MHz-1GHz	± 4.6 dB
5	Radiated emission 1GHz-18GHz	± 4.4 dB
6	Radiated emission 18GHz-26GHz	± 4.6 dB
7	Radiated emission 26GHz-40GHz	± 4.6 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart B Test Cases			
Test Item	Test Requirement	Test Method	Result
Conducted Emission	FCC 47 CFR Part 15.107 ICES-003 Issue 7 Section 3.2.1	ANSI C63.4-2014	N/A (SEE NOTE 1, 2)
Radiated Emission	FCC 47 CFR Part 15.109 ICES-003 Issue 7 Section 3.2.2	ANSI C63.4-2014	PASS
Note: 1) N/A: In this whole report not applicable. 2) The EUT is powered by 3.2Vdc Button Battery.			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	3m SAC	ETS-LINDGREN	3M	Euroshiedpn-CT001270-1317	11-Nov-2023	10-Nov-2026
☒	Receiver	R&S	ESIB26	100114	25-Oct-2024	24-Oct-2025
☐	Loop Antenna	ETS-LINDGREN	6502	00202525	28-Oct-2024	27-Oct-2025
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	29-Oct-2024	28-Oct-2025
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	29-Oct-2024	28-Oct-2025
☒	Preamplifier	HP	8447F	2805A02960	25-Oct-2024	24-Oct-2025
☒	Double-Ridged Waveguide Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	01-Apr-2024	31-Mar-2025
☒	Pre-amplifier	ETS-LINDGREN	00118385	00201874	01-Apr-2024	31-Mar-2025
☒	Double-Ridged Waveguide Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	28-Oct-2024	27-Oct-2025
☒	Pre-amplifier	ETS-LINDGREN	00118384	00202652	28-Oct-2024	27-Oct-2025
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

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UTTR-EMC-ICES003-V1.2

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NV/NT	+15 to +35	3.2Vdc Button Battery	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment and Test sample

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (kPa)	Sample No.	Tested by
Radiated Emission	21.5	42.6	100.6	S202501075044-ZJA02/6	Fire

4.2 TEST MODES

Test Item	EMI Test Modes
Radiated Emission	Test Mode 1: Normal working +BT

4.3 TEST SETUP

4.3.1 For Radiated Emissions test setup

Figure 1. 30MHz to 1GHz

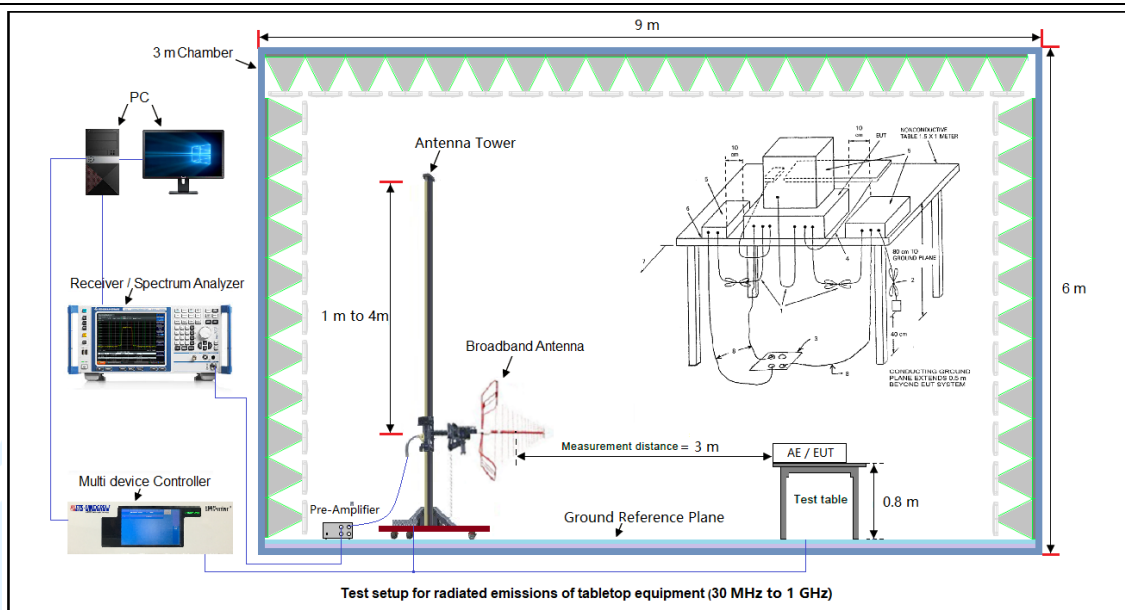
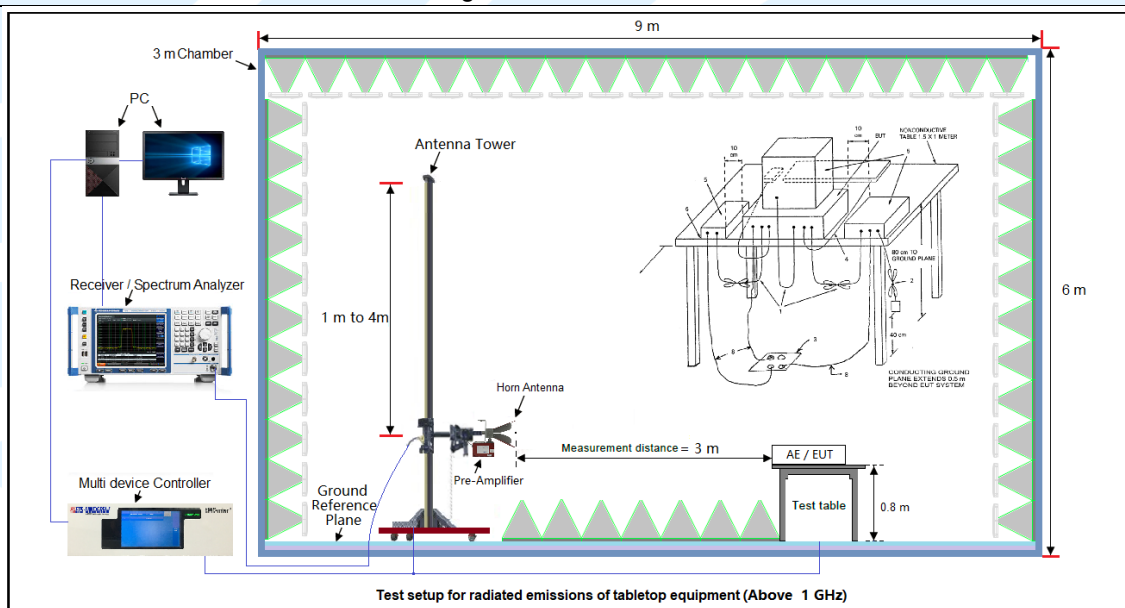
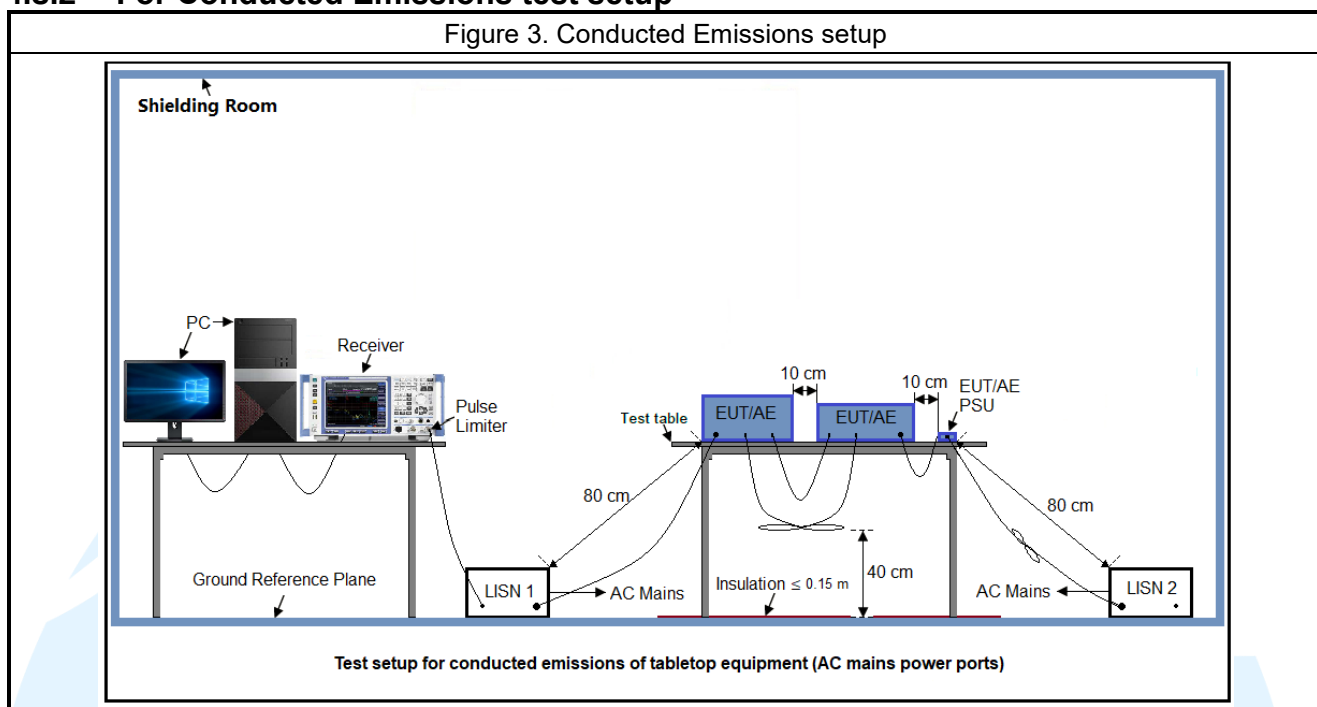


Figure 2. Above 1GHz



4.3.2 For Conducted Emissions test setup

Figure 3. Conducted Emissions setup



4.4 SYSTEM TEST CONFIGURATION

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic (according to KDB 896810 D02 SDoC FAQ v01r01) of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part15 Subpart B	Unintentional Radiators
2	ICES-003 Issue 7	Information Technology Equipment (Including Digital Apparatus)
3	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4	KDB 174176 D01 Line Conducted FAQ v01r01	AC power-line conducted emission frequency asked questions
5	KDB 896810 D02 SDoC FAQ v01r02	Supplier's Declaration of Conformity frequency asked questions

6. EMC REQUIREMENTS SPECIFICATION

6.1 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15.109
ICES-003 Issue 7 Clause 3.2.2

Test Method: ANSI C63.4-2014

Receiver Setup:

Frequency: (f) (MHz)	Detector type	Measurement receiver bandwidth	
		RBW	VBW
$30 \leq f \leq 1\,000$	Quasi Peak	120 kHz	300 kHz
$f \geq 1000$	Peak	1 MHz	3 MHz
	Average	1 MHz	3 MHz

Measured frequency range

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.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Limits:

Limits for Class B devices

FCC 47 CFR Part 15 Subpart B

Frequency (MHz)	limits at 3m (dBμV/m)		
	QP Detector	PK Detector	AV Detector
30 – 88	40.0	--	--
88 – 216	43.5	--	--
216 – 960	46.0		
960 – 1000	54.0	--	--
Above 1000	--	74.0	54.0

ICES-003 Issue 7

Frequency (MHz)	limits at 3m (dBμV/m)		
	QP Detector	PK Detector	AV Detector
30 – 88	40.0	--	--
88 – 216	43.5	--	--
216 – 230	46.0		

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230 – 960	47.0	--	--
960 – 1000	54.0	--	--
Above 1000	--	74.0	54.0

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB μ V/m) = 20 log Emission level (μ V/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Test Setup: Refer to section 4.3.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:
 - 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
 - 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
 - 3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.
2. Above 1GHz test procedure as below:
 - 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
 - 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
 - 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

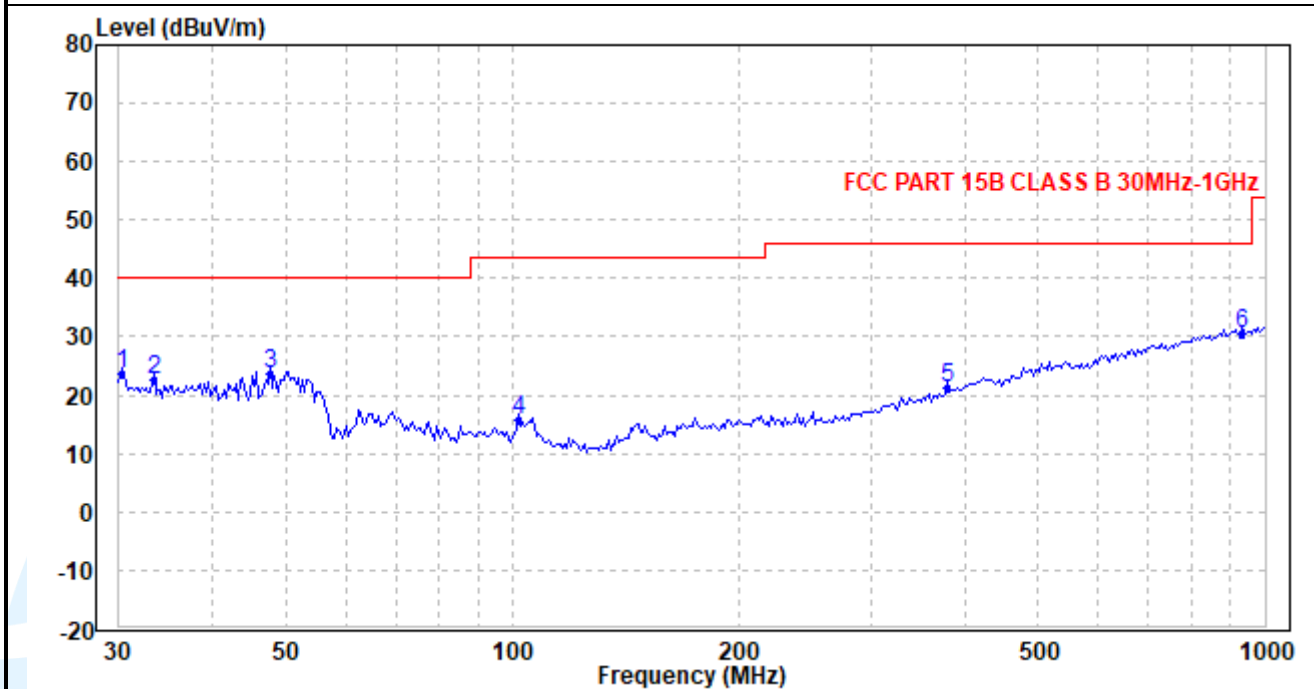
The measurement data as follows:

The worst measurement data for FCC 47 CFR Part 15 Subpart B as follows:

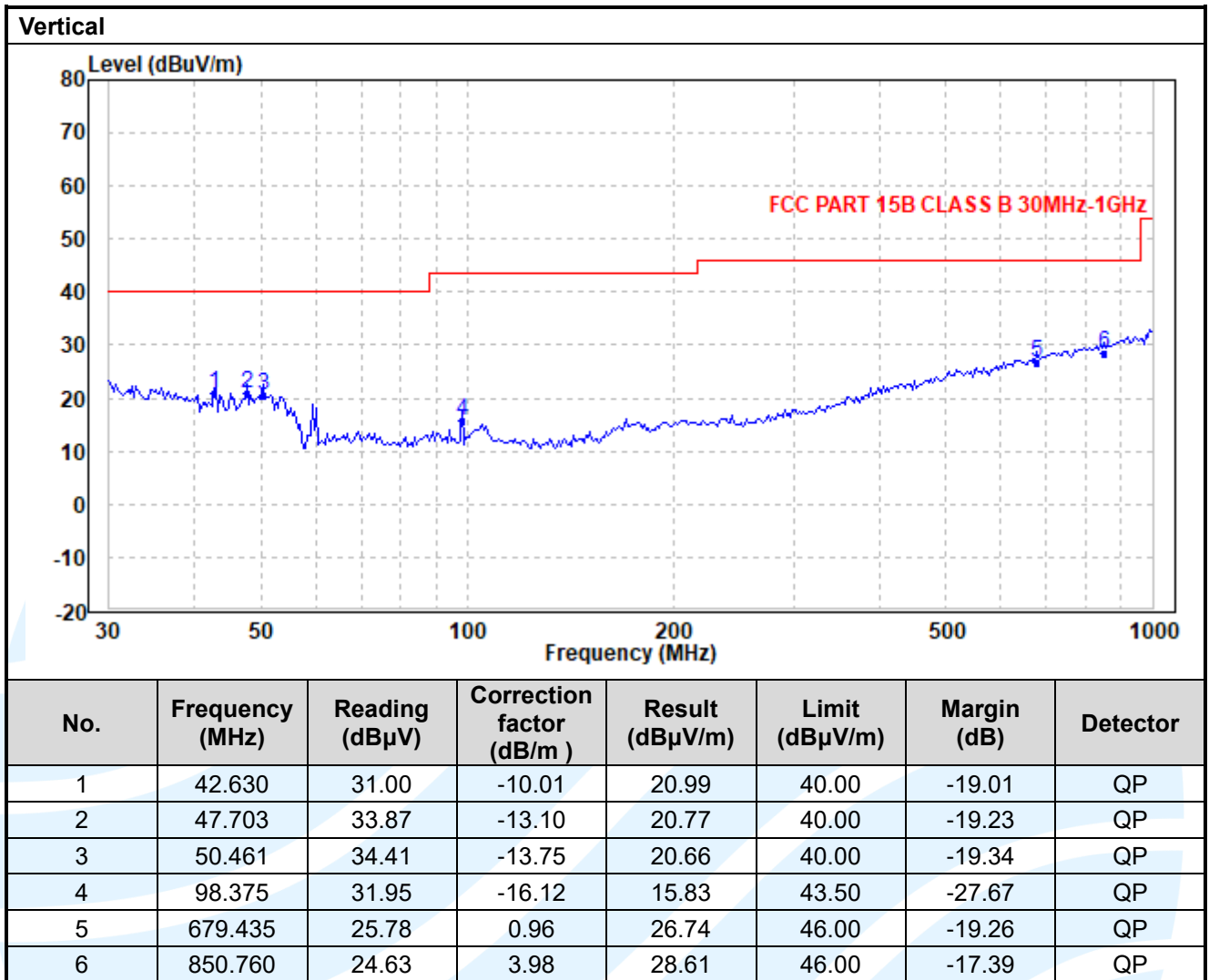
Below 1GHz(Quasi Peak):

Test Mode 1

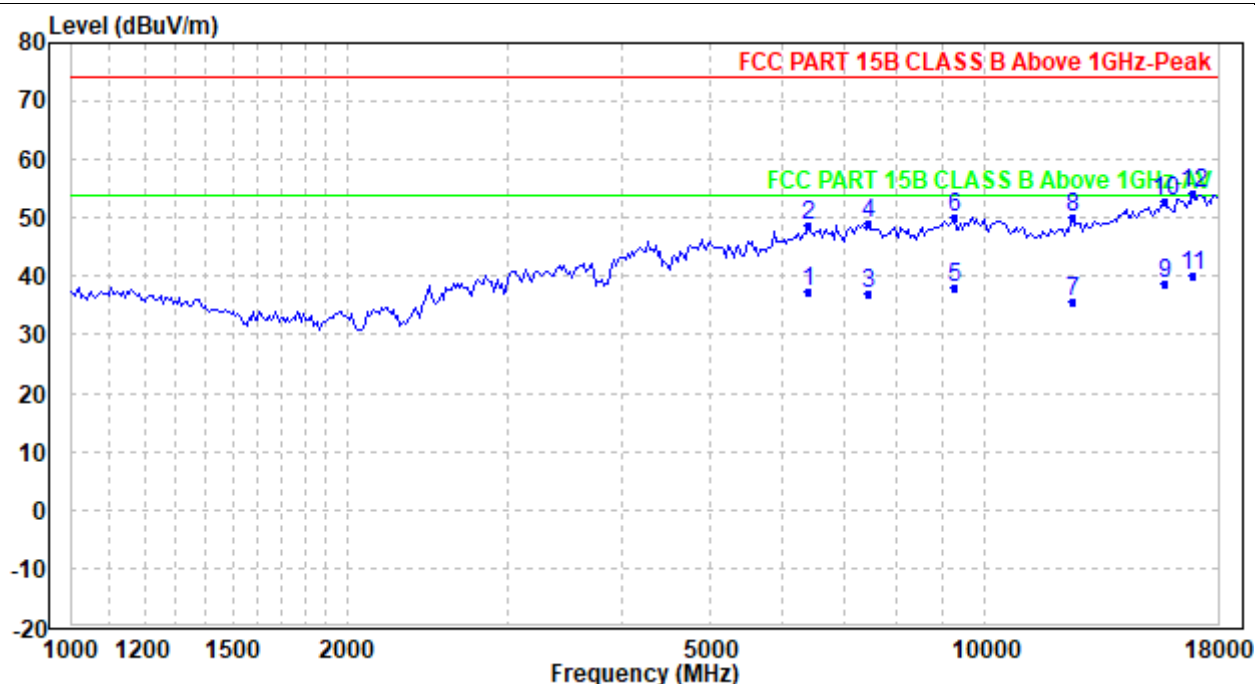
Horizontal



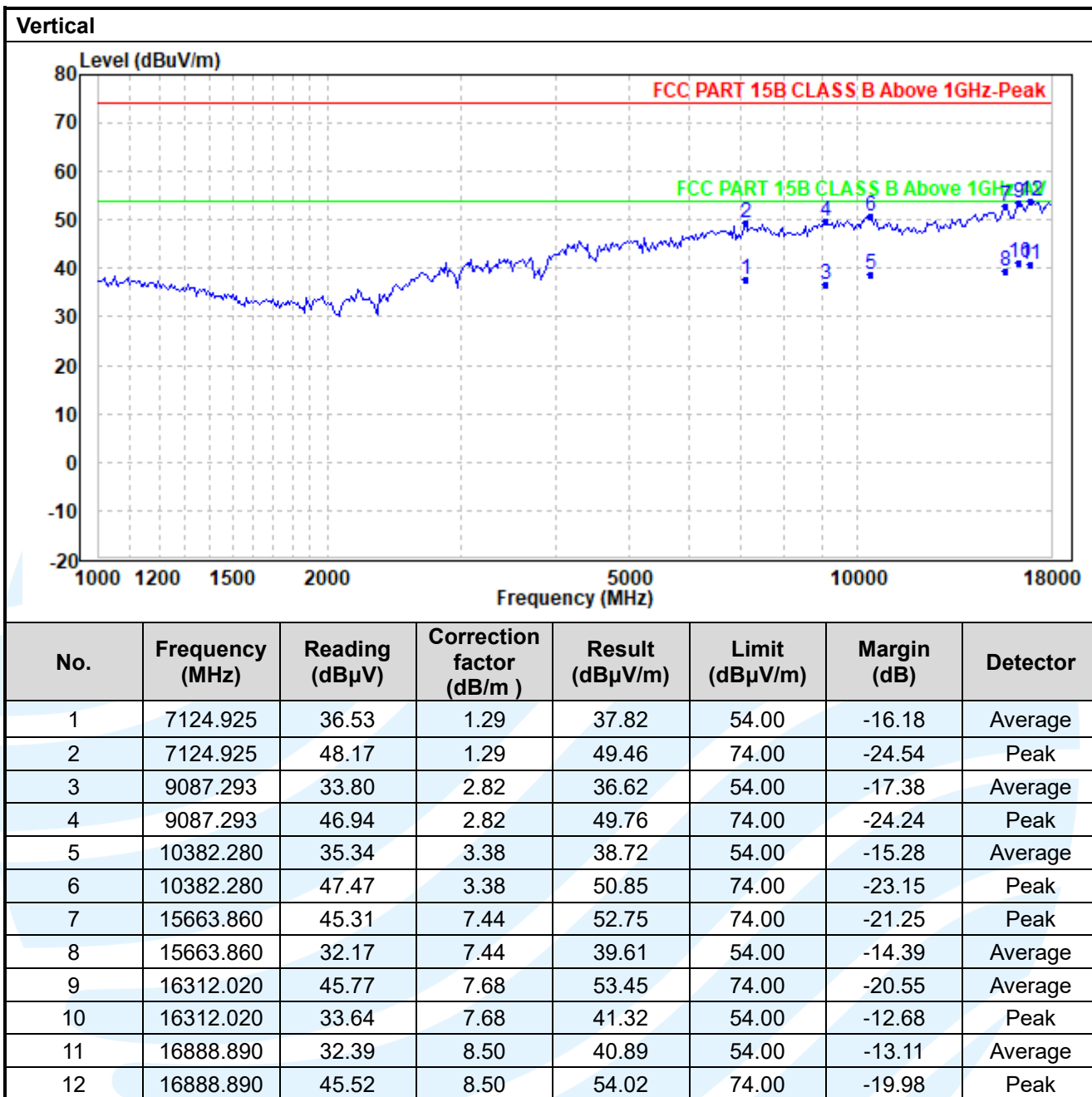
No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.212	28.09	-4.47	23.62	40.00	-16.38	QP
2	33.335	29.10	-6.46	22.64	40.00	-17.36	QP
3	47.703	36.76	-13.10	23.66	40.00	-16.34	QP
4	101.893	31.28	-15.67	15.61	43.50	-27.89	QP
5	379.178	26.84	-5.61	21.23	46.00	-24.77	QP
6	932.141	25.71	4.82	30.53	46.00	-15.47	QP



Above 1GHz(Peak & Average)
Test Mode 1
Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	6419.481	36.45	1.09	37.54	54.00	-16.46	Average
2	6419.481	47.49	1.09	48.58	74.00	-25.42	Peak
3	7462.854	35.64	1.33	36.97	54.00	-17.03	Average
4	7462.854	47.76	1.33	49.09	74.00	-24.91	Peak
5	9246.582	35.03	2.92	37.95	54.00	-16.05	Average
6	9246.582	47.16	2.92	50.08	74.00	-23.92	Peak
7	12496.580	31.98	3.85	35.83	54.00	-18.17	Average
8	12496.580	46.13	3.85	49.98	74.00	-24.02	Peak
9	15754.850	31.35	7.37	38.72	54.00	-15.28	Average
10	15754.850	45.50	7.37	52.87	74.00	-21.13	Peak
11	16888.890	31.62	8.50	40.12	54.00	-13.88	Average
12	16888.890	45.76	8.50	54.26	74.00	-19.74	Peak



Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit
4. For Radiated Emission above 18GHz, there was not any unwanted emission detected.
5. The limit of ICES-003 in the 230MHz to 960MHz band is higher than that of FCC Part 15B, so the radiation emission test data conform to the limit of ICES-003.

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APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

***** End of Report *****

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.
