

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No...... : **MTEB24120133/1-R2**
FCC ID..... : **2AB2Q13A21150WRGBWH**
Compiled by
(position+printed name+signature)..: File administrators Alisa Luo



Supervised by
(position+printed name+signature)..: Test Engineer Sunny Deng



Approved by
(position+printed name+signature)..: Manager Yvette Zhou



Date of issue..... : Jan.16,2025

Representative Laboratory Name.: **Shenzhen Most Technology Service Co., Ltd.**

Address..... : No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park,
Nanshan, Shenzhen, Guangdong, China.

Applicant's name..... : **LEEDARSON LIGHTING CO., LTD.**

Address..... : Xingda Road, Xingtai Industrial Zone,
Changtai County, Zhangzhou, Fujian, China

Test specification..... :

Standard..... : **FCC Part 15.247**

TRF Originator..... : Shenzhen Most Technology Service Co., Ltd.

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Test item description..... : Smart LED Lamp

Trade Mark..... : N/A

Model/Type reference..... : 14cSA-A2550ST-Q1G-01,

Listed Models : 14ySA-A2550ST-Q1G-xx, 13A21150WRGBWHx
Where "y" may be "a" to "z", which designates for different enclosure
pattern design;
"x and xx" may be "0" to "99", which designates for different package
of style.

Modulation Type..... : b: DSSS

g/n: OFDM

Operation Frequency..... : From 2412MHz~2462MHz

Rating..... : AC 120V/60Hz

Hardware version..... : V2.0

Software version : 1.0.2

Result..... : **PASS**

TEST REPORT

Equipment under Test	:	Smart LED Lamp
Model /Type	:	14cSA-A2550ST-Q1G-01
Listed Models	:	14ySA-A2550ST-Q1G-xx, 13A21150WRGBWHx Where “y” may be “a” to “z”, which designates for different enclosure pattern design; “x and xx” may be “0” to “99”, which designates for different package of style.
Remark		Only model number and enclosure pattern design is different for these model.
Applicant	:	LEEDARSON LIGHTING CO., LTD.
Address	:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China
Manufacturer 1	:	LEEDARSON LIGHTING CO., LTD.
Address 1	:	Xingtai Industrial Zone, Economic Development Zone, Changtai County, Zhangzhou city, Fujian Province, P.R.China
Manufacturer 2	:	LEEDARSON IOT TECHNOLOGY (THAILAND) CO., LTD.
Address 2	:	71, Moo5, Wellgrow Industrial Estate, Bang Samak, Bang Pakong District, Chachoengsao 24130

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 Revision History

Revision	Issue Date	Revisions	Revised By
00	2024.12.12	Initial Issue	Alisa Luo
01	2025.01.16	Filing case	Alisa Luo

Note:On the basis of the original report **MTEB24120133-R2**, report the spare shrapnel, which is connected to the rivet cover and mainly used for discharge without affecting RF performance. Re evaluate the radiation interference.

2 TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB558074 D01 v05r02](#): Guidance for Compliance Measurements on Digital Transmission Systems (DTS) ,Frequency Hopping Spread Spectrum System(HFSS), and Hybrid System Devices Operating Under §15.247 of The FCC rules.

3 SUMMARY

3.1 General Remarks

Date of receipt of test sample	:	2025.01.14
Testing commenced on	:	2025.01.15
Testing concluded on	:	2025.01.16

3.2 Product Description

Product Name:	Smart LED Lamp
Model/Type reference:	14cSA-A2550ST-Q1G-01
Power Supply:	AC 120V/60Hz
Testing sample ID:	MTYP07768/1
WIFI :	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	b: DSSS g/n: OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	Internal monopole antenna
Antenna gain:	-0.33 dBi

3.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	<input type="radio"/> 230V / 50 Hz	<input checked="" type="radio"/> 120V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input type="radio"/> Other (specified in blank below)	

3.4 Short description of the Equipment under Test (EUT)

This is a Smart LED Lamp For more details, refer to the user's manual of the EUT.

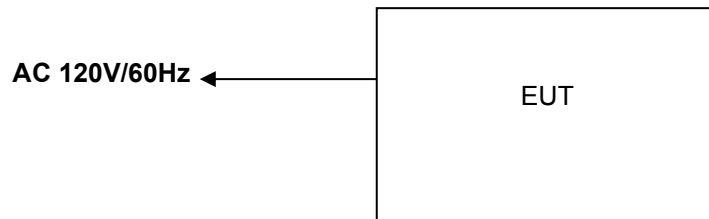
3.5 EUT operation mode

The application provider specific test software(AT command) to control sample in continuous TX and RX (Duty Cycle >98%) for testing meet KDB558074 test requirement.

IEEE 802.11b/g/n: Thirteen channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

3.6 Block Diagram of Test Setup



3.7 Test Item (Equipment Under Test) Description*

Short designation	EUT Name	EUT Description	Serial number	Hardware status	Software status
EUT A	/	/	/	/	/
EUT B	/	/	/	/	/

*: declared by the applicant. According to customers information EUTs A and B are the same devices.

3.8 Auxiliary Equipment (AE) Description

AE short designation	EUT Name (if available)	EUT Description	Serial number (if available)	Software (if used)
AE 1	/	/	/	/
AE 2	/	/	/	/

3.9 Antenna Information*

Short designation	Antenna Name	Antenna Type	Frequency Range	Serial number	Antenna Peak Gain
Antenna 1	---	Internal monopole antenna	2.4–2.5 GHz	---	-0.33 dBi
Antenna 2					

*: declared by the applicant.

3.10 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AB2Q13A21150WRGBWH** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

3.11 Modifications

No modifications were implemented to meet testing criteria.

3.12 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - Supplied by the lab

●	ADAPTER	M/N:	/
		Manufacturer:	/

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

Shenzhen Most Technology Service Co., Ltd.

No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

4.2 Test Facility

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

FCC-Registration No.: 0031192610

Shenzhen Most Technology Service Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

A2LA-Lab Cert. No.: 6343.01

Shenzhen Most Technology Service Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

4.3 Environmental conditions

Radiated Emission:

Temperature:	24 ° C
Humidity:	48 %
Atmospheric pressure:	950-1050mbar

AC Main Conducted testing:

Temperature:	24 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

Conducted testing:

Temperature:	24 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

4.4 Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	See Note 1
FCC Part 15.247(a)(2)	6dB Bandwidth	See Note 1
FCC Part 15.247(d)	Spurious RF Conducted Emission	See Note 1
FCC Part 15.247(b)	Maximum Conducted Output Power	See Note 1
FCC Part 15.247(e)	Power Spectral Density	See Note 1
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	See Note 1
FCC Part 15.203/15.247 (b)	Antenna Requirement	See Note 1

Note 1: Data can be found in the original report "MTEB24120133-R2"

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9KHz~1GHz& Radiated Emission 1GHz~10 th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
	11n(40MHz)/OFDM	6.5Mbps	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	6.5Mbps	3/9

4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Most Technology Service Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Most Technology Service Co., Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)
6dB Bandwidth	/	5%	(1)
Maximum Conducted Output Power	/	0.80dB	(1)
Spurious RF Conducted Emission	/	1.6dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.6 Equipments Used during the Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware versions	Last Cal.
1.	L.I.S.N.	R&S	ENV216	100093	/	2024/03/15
2	Three-phase artificial power network	Schwarzback Mess	NNLK8129	8129178	/	2024/03/15
3.	Receiver	R&S	ESCI	100492	V3.0-10-2	2024/03/15
4	Receiver	R&S	ESPI	101202	V3.0-10-2	2024/03/15
5	Spectrum analyzer	Agilent	9020A	MT-E306	A14.16	2024/03/15
6	Bilong Antenna	Sunol Sciences	JB3	A121206	/	2024/08/14
7	Horn antenna	HF Antenna	HF Antenna	MT-E158	/	2024/03/15
8	Loop antenna	Beijing Daze	ZN30900B	/	/	2024/03/15
9	Horn antenna	R&S	OBH100400	26999002	/	2024/03/15
10	Wireless Communication Test Set	R&S	CMW500	/	CMW-BASE-3.7.21	2024/03/15
11	Spectrum analyzer	R&S	FSP	100019	V4.40 SP2	2024/03/15
12	High gain antenna	Schwarzbeck	LB-180400KF	MT-E389	/	2024/03/15
13	Preamplifier	Schwarzbeck	BBV 9743	MT-E390	/	2024/03/15
14	Pre-amplifier	EMCI	EMC051845S E	MT-E391	/	2024/03/15
15	Pre-amplifier	Agilent	83051A	MT-E392	/	2024/03/15
16	High pass filter unit	Tonscend	JS0806-F	MT-E393	/	2024/03/15
17	RF Cable(below1GHz)	Times	9kHz-1GHz	MT-E394	/	2024/03/15
18	RF Cable(above 1GHz)	Times	1-40G	MT-E395	/	2024/03/15
19	RF Cable (9KHz-40GHz)	Tonscend	170660	N/A	/	2024/03/15
20	Power meter	R&S	NRVS	100444	/	2024/03/15

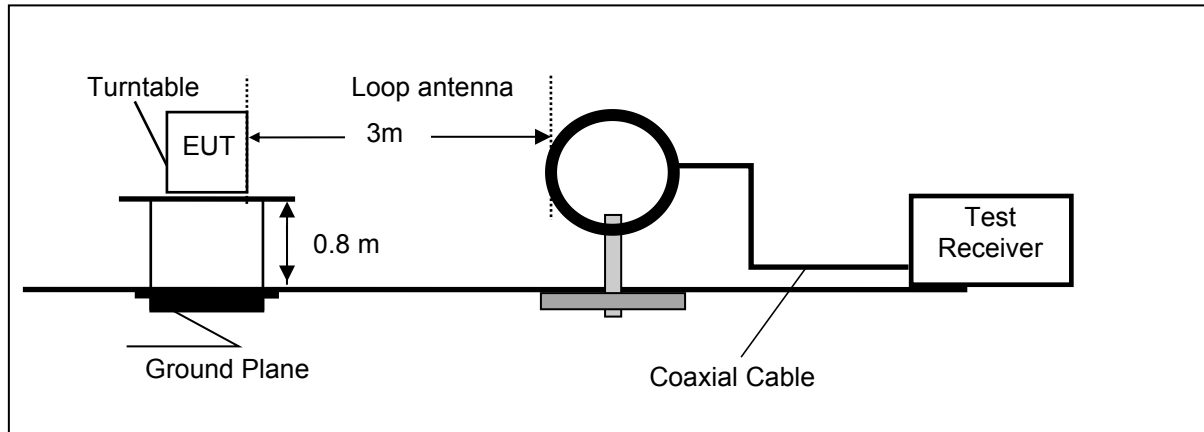
Note: The Cal.Interval was one year.

5 TEST CONDITIONS AND RESULTS

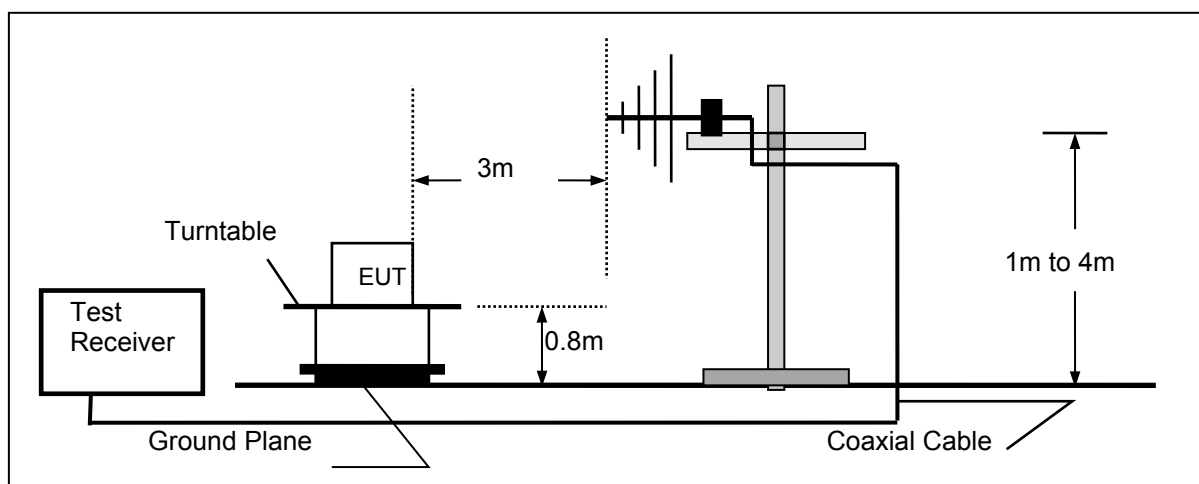
5.1 Radiated Emission

TEST CONFIGURATION

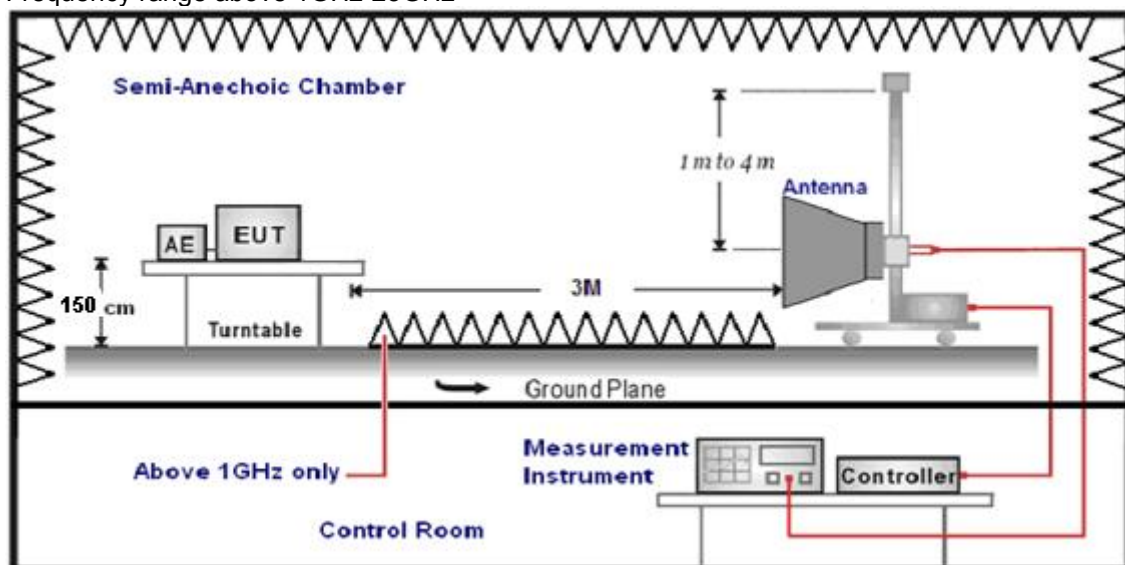
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Antenna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

$$\text{Transd}=AF +CL-AG$$

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

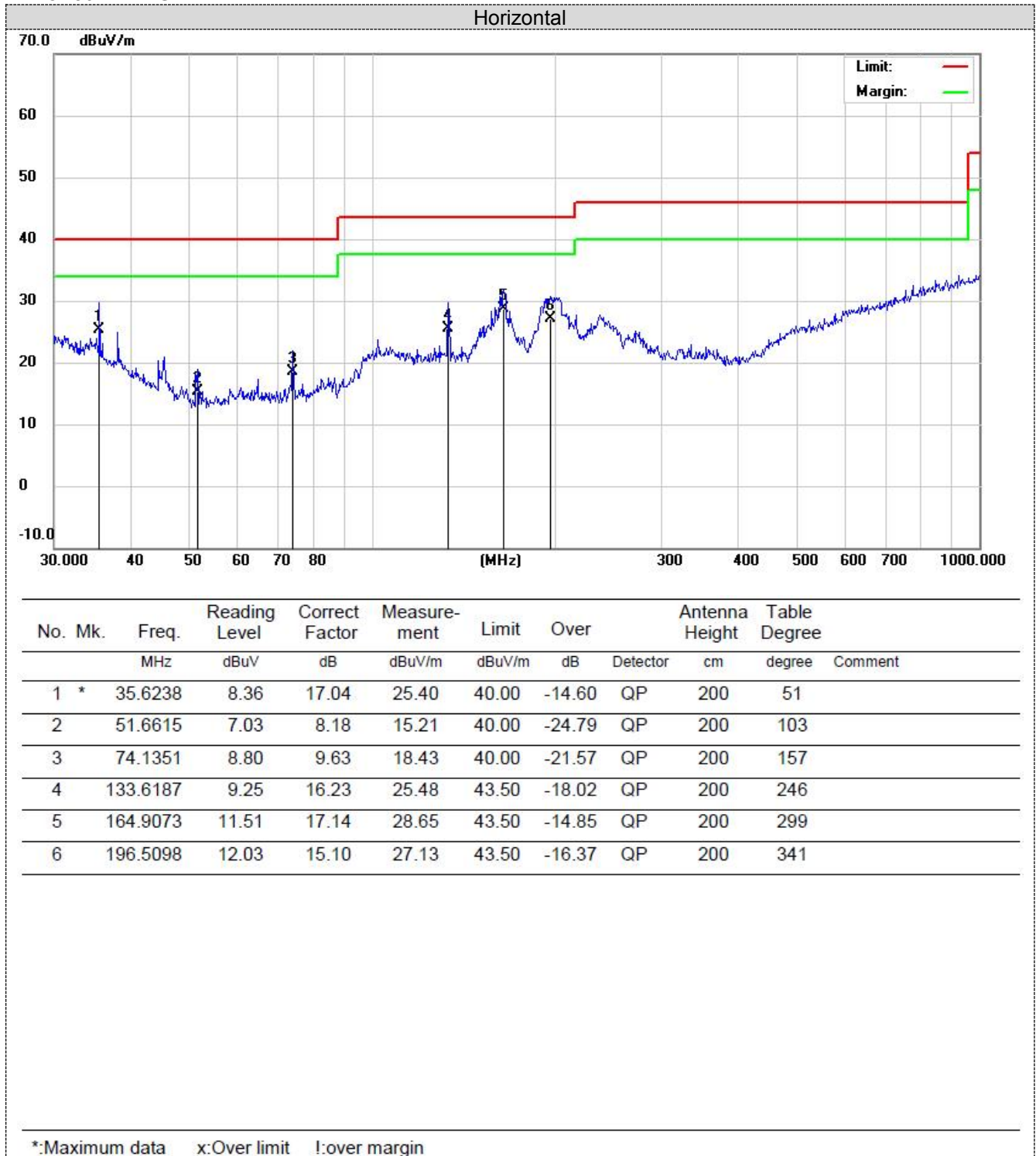
The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

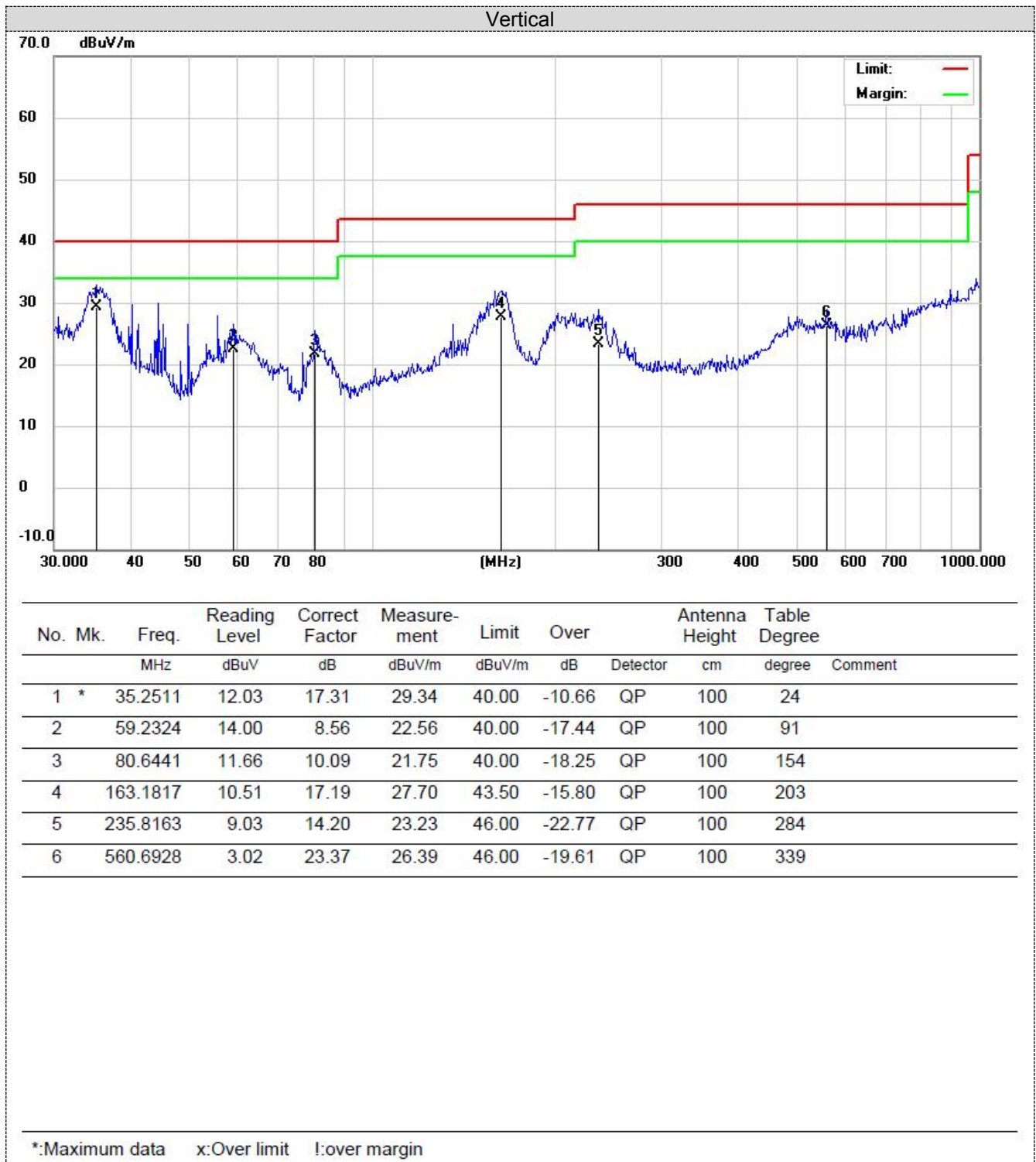
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST RESULTS

Remark:

1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. All three channels (lowest/middle/highest) of each mode were measured below 1GHz and recorded worst case at 802.11b low channel.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.
4. Remark: Result=Reading value+Factor

For 30MHz-1GHz



6 Test Setup Photos of the EUT



7 Photos of the EUT

See related photo report.

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