



RF Test Report

FCC ID: 2AW68-NP3081GC

Change II

Report No. : TBR-C-202407-0114-6

Applicant : Shenzhen SDMC Technology Co., Ltd.

Equipment Under Test (EUT)

EUT Name : AX3000 Dual Band Wi-Fi6 GPON Terminal

Model No. : NP3081GC

Series Model No. : NP3081GB

Brand Name : N/A

Sample ID : HC-C-202407-0114-03-01&HC-C-202407-0114-06-01

Receipt Date : 2024-11-05

Test Date : 2024-11-05 to 2024-11-07

Issue Date : 2024-11-08

Standards : FCC Part 15 Subpart C 15.247

Test Method : ANSI C63.10: 2013
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

Conclusions : **PASS**

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

Test By : ZKN Zhou

Reviewed By : Wade Lv

Approved By : Ivan Su



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TBR-C-202407-0114-3	Rev.01	Initial issue of report	2024-10-22
TBR-C-202407-0114-6	Rev.02	Change II	2024-11-08

Note: (1)Change the AC/DC adapter, 5.8Gbuilt-in antenna and the 2.5G port is deleted, As there is no change regard RF transmitter portion, the change will not have effect on Radiated emission above 1GHz by judging for experience, thus testing is performed up to 1GHz and Conducted Emission of AC Power.

(2) This report is a change II report, and only the change part of NP3081GB has been evaluated and tested, More information about the test data please refer to the original test report.



1. General Information about EUT

1.1 Client Information

Applicant	:	Shenzhen SDMC Technology Co., Ltd.
Address	:	Floor 1, Building 5, Hengtongfa Industrial Zone, Tangtou Industrial Park, Tangtou Community, Shiyan Street, Baoan District, Shenzhen, China
Manufacturer	:	Shenzhen SDMC Technology Co., Ltd.
Address	:	Floor 1, Building 5, Hengtongfa Industrial Zone, Tangtou Industrial Park, Tangtou Community, Shiyan Street, Baoan District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	AX3000 Dual Band Wi-Fi6 GPON Terminal	
Models No.	:	NP3081GB, NP3081GC	
Model Different	:	NP3081GB and NP3081GC models are identical in the same PCB, layout and electrical circuit, The only difference is adapter and 5.8G built-in antenna. NP3081GB without 2.5G port.	
Product Description	:	Operation Frequency:	2412MHz~2462MHz
	:	Number of Channel:	802.11b/g/n(HT20)/ax(HE20): 11 channels 802.11n(HT40)/ax(HE40): 7 channels
	:	Antenna Gain:	5.08dBi Dipole Antenna 1 5.05dBi Dipole Antenna 2
	:	Modulation Type:	802.11b: DSSS (DQPSK, DBPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Power Rating (NP3081GC)	:	AC Adapter (Model: AD-0181200150NOM): Input: 100-240V~, 50/60Hz, 0.6A Output: 12.0V=1.5A	
Power Rating (NP3081GB)	:	AC Adapter (Model: F24L15-120300SPAU): Input: 100-240V~, 50/60Hz, 0.6A Output: 12.0V=2.0A 24.0W	
Software Version	:	N/A	
Hardware Version	:	N/A	
Remark:			
(1)The antenna gain and adapter provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.			
(2)The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.			
(3) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			



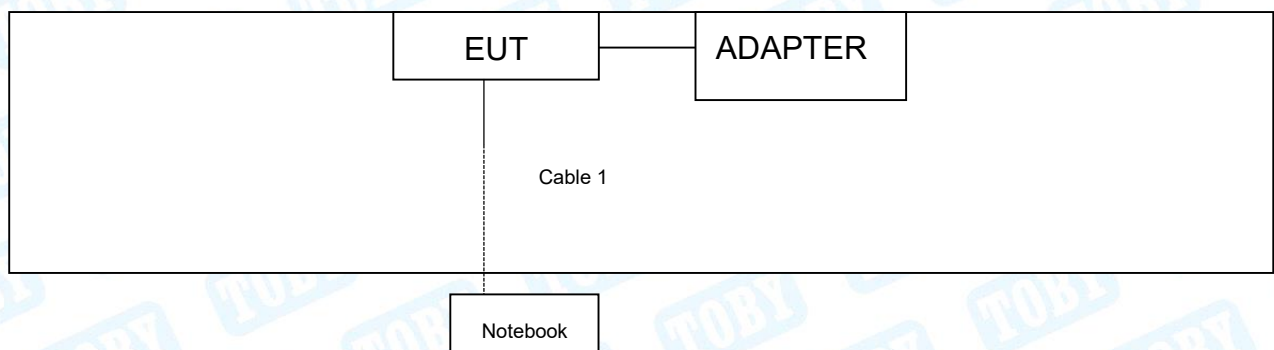
(4) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		
Note: CH 01~CH 11 for 20MHz Bandwidth CH 03~CH 09 for 40MHz Bandwidth					

(5) Antenna Information:

Band	Antenna Gain(dBi)	
	Antenna 1	Antenna 2
2.4G	5.08	5.05

1.3 Block Diagram Showing the Configuration of System Tested



1.4 Description of Support Units

Equipment Information				
Name	Model	FCC ID/VOC	Manufacturer	Used “√”
Notebook	Inspiron 5493	-----	DELL	√
Cable Information				
Number	Shielded Type	Ferrite Core	Length	Note
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1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Emission Test	
Final Test Mode	Description
Mode 1	TX b Mode Channel 01
For Radiated and RF Conducted Test	
Final Test Mode	Description
Mode 2	TX Mode b Mode Channel 01/06/11
Mode 3	TX Mode g Mode Channel 01/06/11
Mode 4	TX Mode n(HT20) Mode Channel 01/06/11
Mode 5	TX Mode n(HT40) Mode Channel 03/06/09
Mode 6	TX Mode ax(HE20) Mode Channel 01/06/11
Mode 7	TX Mode ax(HE40) Mode Channel 03/06/09

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

Mode	Data Rate
B Mode-SISO	1Mbps
B Mode-CDD	1Mbps
G Mode-SISO	6Mbps
G Mode-CDD	6Mbps
N(HT20) Mode-CDD	MCS0
N(HT40) Mode-CDD	MCS0
AX(HE20) Mode-CDD	MCS0
AX(HE40) Mode-CDD	MCS0

(2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.

(3) The EUT is considered a Mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.



1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software: QATool_Dbg.exe					
Test Mode: Continuously transmitting					
Mode	Channel	Parameters			
		SISO		CDD	
		Ant.1	Ant.2	Ant.1	Ant.2
802.11b	01	7	7	7	
	06	7	7	7	
	11	7	7	7	
802.11g	01	15	15	14	
	06	15	15	14	
	11	15	15	14	
802.11n(HT20)	01	/		14	
	06	/		14	
	11	/		14	
802.11n(HT40)	03	/		13	
	06	/		13	
	09	/		13	
802.11ax(HE20)	01	/		14	
	06	/		14	
	11	/		14	
802.11ax(HE40)	03	/		13	
	06	/		13	
	09	/		13	



1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	± 3.50 dB ± 3.10 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	± 4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 4.50 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.20 dB
RF Power-Conducted	/	± 0.95 dB
Power Spectral Density-Conducted	/	± 3 dB
Occupied Bandwidth	/	$\pm 3.8\%$
Unwanted Emission-Conducted	/	± 2.72 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351. Designation Number: CN1223.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A. CAB identifier: CN0056.



2. Test Summary

Standard Section	Test Item	Test Sample(s)	Judgment
FCC 15.207(a)	Conducted Emission	HC-C-202407-0114-06-02	PASS
FCC 15.209 & 15.247(d)	Radiated Unwanted Emissions	HC-C-202407-0114-06-02	PASS
FCC 15.203	Antenna Requirement	HC-C-202407-0114-03-01	PASS*
FCC 15.247(a)(2)	6dB Bandwidth	HC-C-202407-0114-03-01	PASS*
FCC 15.247(b)(3)	RF Output Power	HC-C-202407-0114-03-01	PASS*
FCC 15.247(e)	Power Spectral Density	HC-C-202407-0114-03-01	PASS*
FCC 15.247(d)	Band Edge Measurements	HC-C-202407-0114-03-01	PASS*
FCC 15.207(a)	Conducted Unwanted Emissions	HC-C-202407-0114-03-01	PASS*
FCC 15.247(d) FCC 15.205	Emissions in Restricted Bands	HC-C-202407-0114-03-02	PASS*
/	On Time and Duty Cycle	HC-C-202407-0114-03-01	/

Note: (1) N/A is an abbreviation for Not Applicable.

(2) PASS*: Change the AC/DC adapter, 5.8G built-in antenna and the 2.5G port is deleted, As there is no change regard RF transmitter portion, For 2.4G the change will not have effect on Radiated emission above 1GHz by judging for experience, thus testing is performed up to 1GHz and Conducted Emission of AC Power. More information about the test data please refer to the original test report.

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE
Radiation Emission	EZ-EMC	EZ	FA-03A2RE+
RF Test System	JS1120-3	Tonscend	V3.2.22



4. Test Equipment and Test Site

Test Site				
No.	Test Site	Manufacturer	Specification	Used
TB-EMCSR001	Shielding Chamber #1	YIHENG	7.5*4.0*3.0 (m)	✓
TB-EMCSR002	Shielding Chamber #2	YIHENG	8.0*4.0*3.0 (m)	✓
TB-EMCCA001	3m Anechoic Chamber #A	ETS	9.0*6.0*6.0 (m)	X
TB-EMCCB002	3m Anechoic Chamber #B	YIHENG	9.0*6.0*6.0 (m)	✓

Conducted Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jun. 17, 2024	Jun. 16, 2025
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jun. 17, 2024	Jun. 16, 2025
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jun. 17, 2024	Jun. 16, 2025
LISN	Rohde & Schwarz	ENV216	101131	Jun. 17, 2024	Jun. 16, 2025

Radiation Emission Test(B Site)					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 29, 2024	Aug. 28, 2025
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jun. 17, 2024	Jun. 16, 2025
EMI Test Receiver	Rohde & Schwarz	ESU-8	100472/008	Feb. 23, 2024	Feb.22, 2025
Bilog Antenna	SCHWARZBECK	VULB 9168	1225	Nov. 13, 2023	Nov. 12, 2025
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2463	Jun. 14, 2024	Jun. 13, 2026
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Feb. 27, 2024	Feb.26, 2026
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jun. 14, 2024	Jun. 13, 2026
HF Amplifier	Tonscend	TAP9E6343	AP21C806117	Aug. 29, 2024	Aug. 28, 2025
HF Amplifier	Tonscend	TAP051845	AP21C806141	Aug. 29, 2024	Aug. 28, 2025
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Aug. 29, 2024	Aug. 28, 2025
Pre-amplifier	HP	8449B	3008A00849	Feb. 23, 2024	Feb.22, 2025
Highpass Filter	CD	HPM-6.4/18G	---	N/A	N/A
Highpass Filter	CD	HPM-2.8/18G	---	N/A	N/A
Highpass Filter	XINBO	XBLBQ-HTA67(8-25G)	22052702-1	N/A	N/A



5. Conducted Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.207

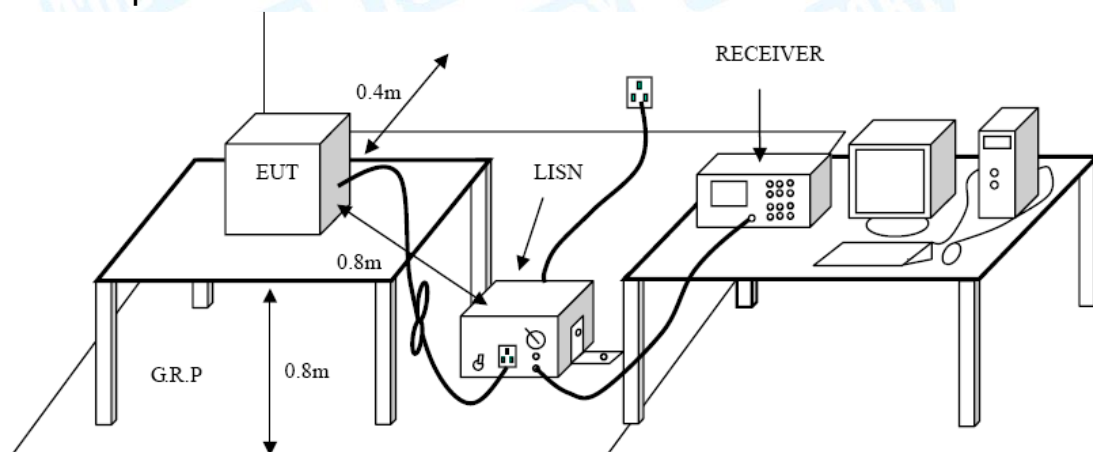
5.1.2 Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.2 Test Setup



5.3 Test Procedure

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- The bandwidth of EMI test receiver is set at 9 kHz, and the test frequency band is from



0.15MHz to 30MHz.

5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Mode

Please refer to the description of test mode.

5.6 Test Data

Please refer to the Attachment A inside test report.



6. Radiated Unwanted Emissions

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC Part 15.209 & FCC Part 15.247(d)

6.1.2 Test Limit

General field strength limits at frequencies Below 30MHz		
Frequency (MHz)	Field Strength (microvolt/meter)**	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30

Note: 1, The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

General field strength limits at frequencies above 30 MHz		
Frequency (MHz)	Field strength (µV/m at 3 m)	Measurement Distance (meters)
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

General field strength limits at frequencies Above 1000MHz		
Frequency (MHz)	Distance of 3m (dBuV/m)	
	Peak	Average
Above 1000	74	54

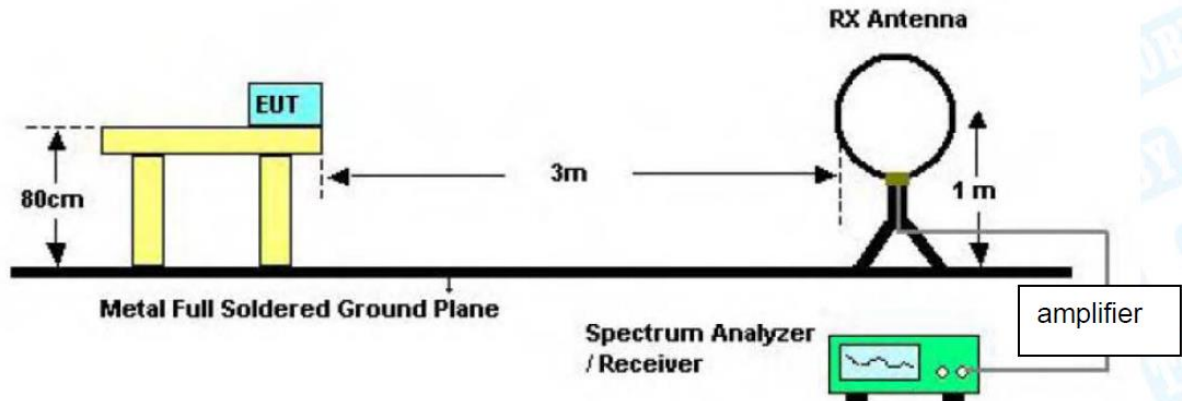
Note:
(1) The tighter limit applies at the band edges.
(2) Emission Level(dBuV/m)=20log Emission Level(µV/m)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

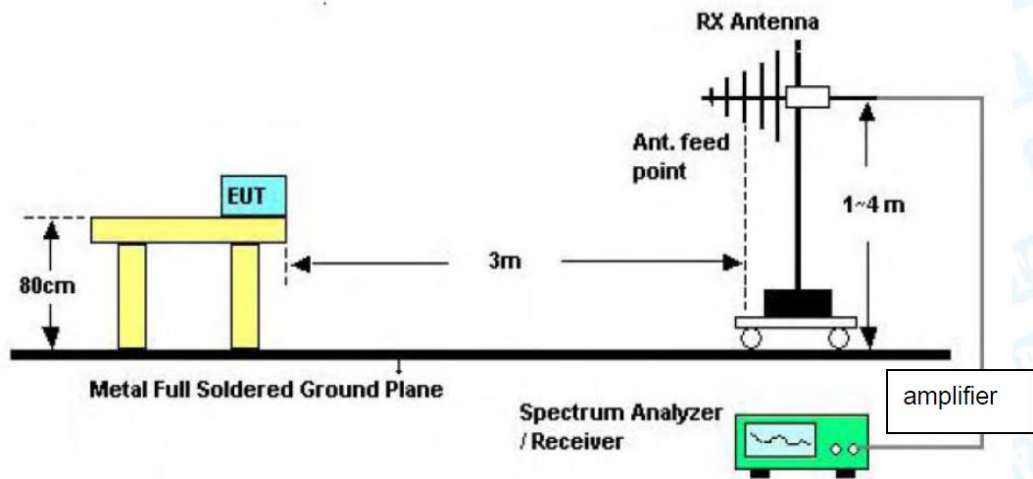


6.2 Test Setup

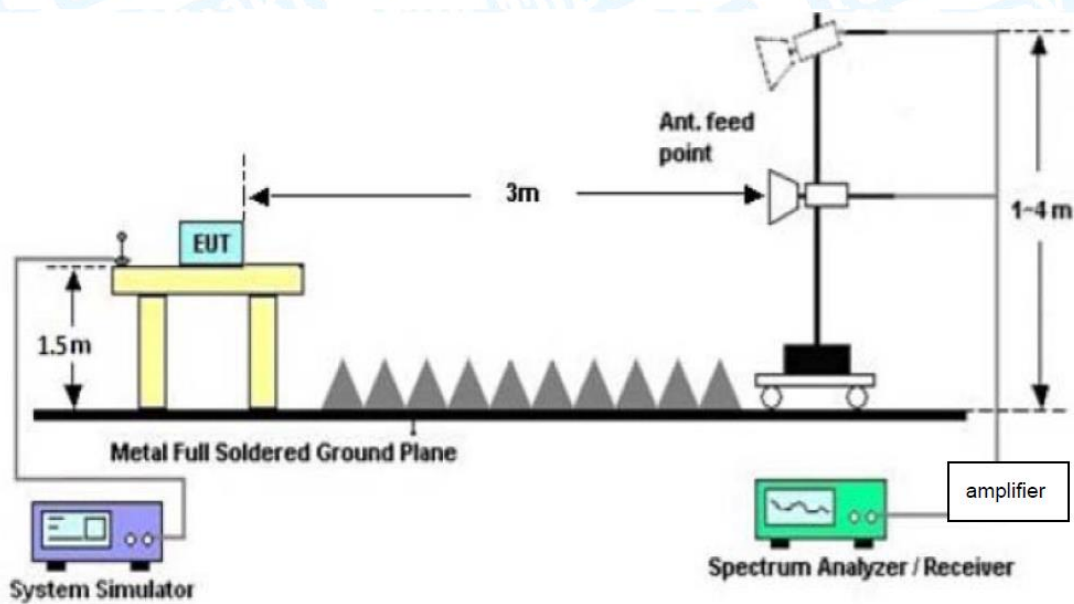
Radiated measurement



Below 30MHz Test Setup



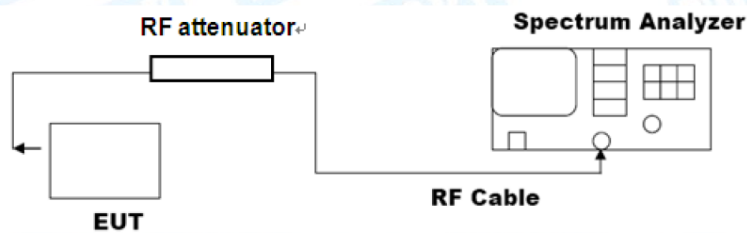
Below 1000MHz Test Setup



Above 1GHz Test Setup



Conducted measurement



6.3 Test Procedure

---Radiated measurement

- The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Below 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- Testing frequency range 30MHz-1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection. Testing frequency range 9KHz-150Hz the measuring instrument use VBW=200Hz with Quasi-peak detection. Testing frequency range 9KHz-30MHz the measuring instrument use VBW=9kHz with Quasi-peak detection.
- Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- For the actual test configuration, please see the test setup photo.



--- Conducted measurement**● Reference level measurement**

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to ≥ 1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW $\geq [3 \times \text{RBW}]$.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

● Emission level measurement

Establish an emission level by using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW $\geq [3 \times \text{RBW}]$.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Mode

Please refer to the description of test mode.

6.6 Test Data

Radiated measurement please refer to the Attachment B inside test report.



7. Antenna Requirement

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 15.203

7.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

7.2 Deviation From Test Standard

No deviation

7.3 Antenna Connected Construction

The gains of the antenna used for transmitting is Ant.1: 5.08dBi; Ant.2: 5.05dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

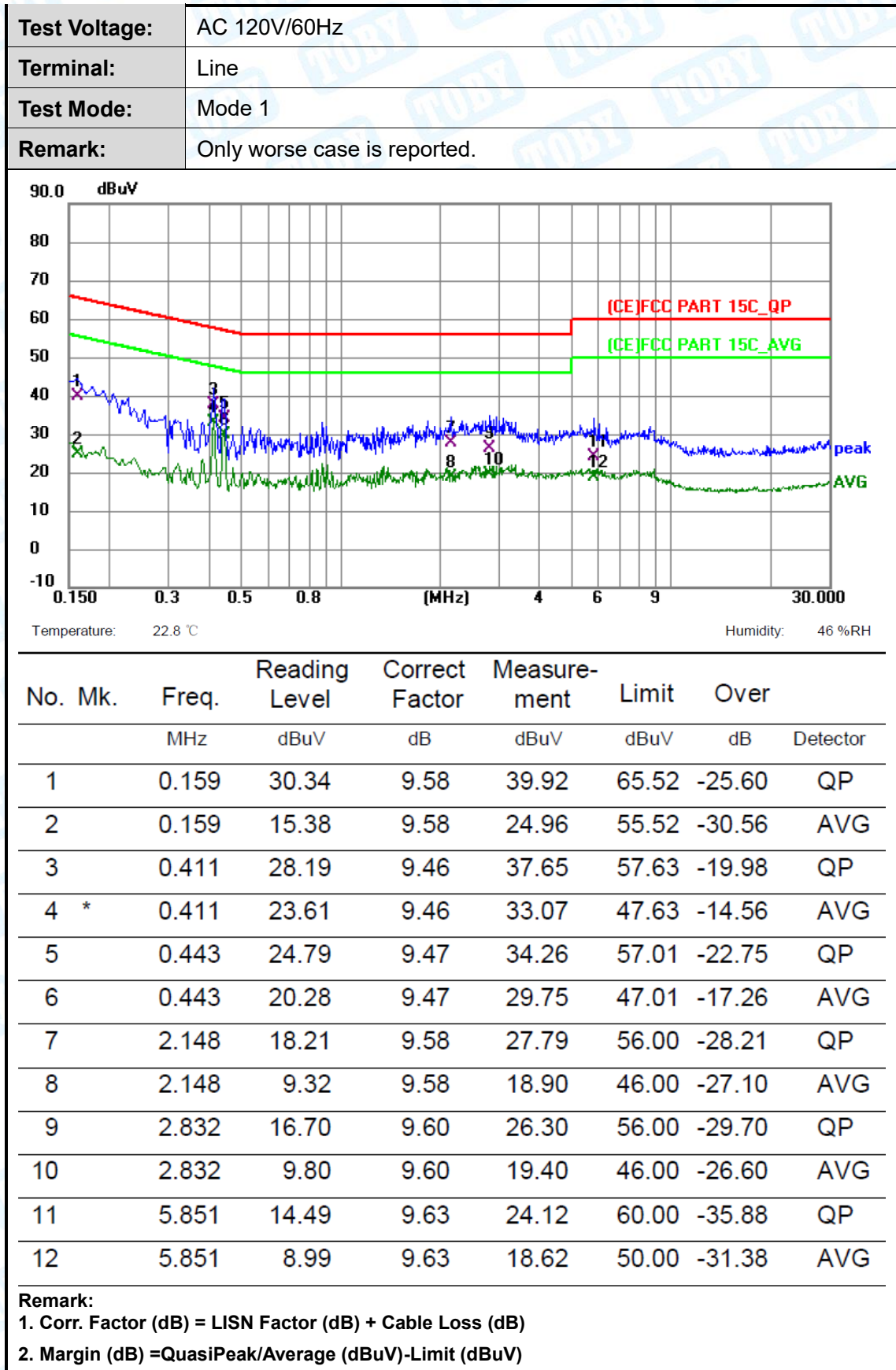
7.4 Test Data

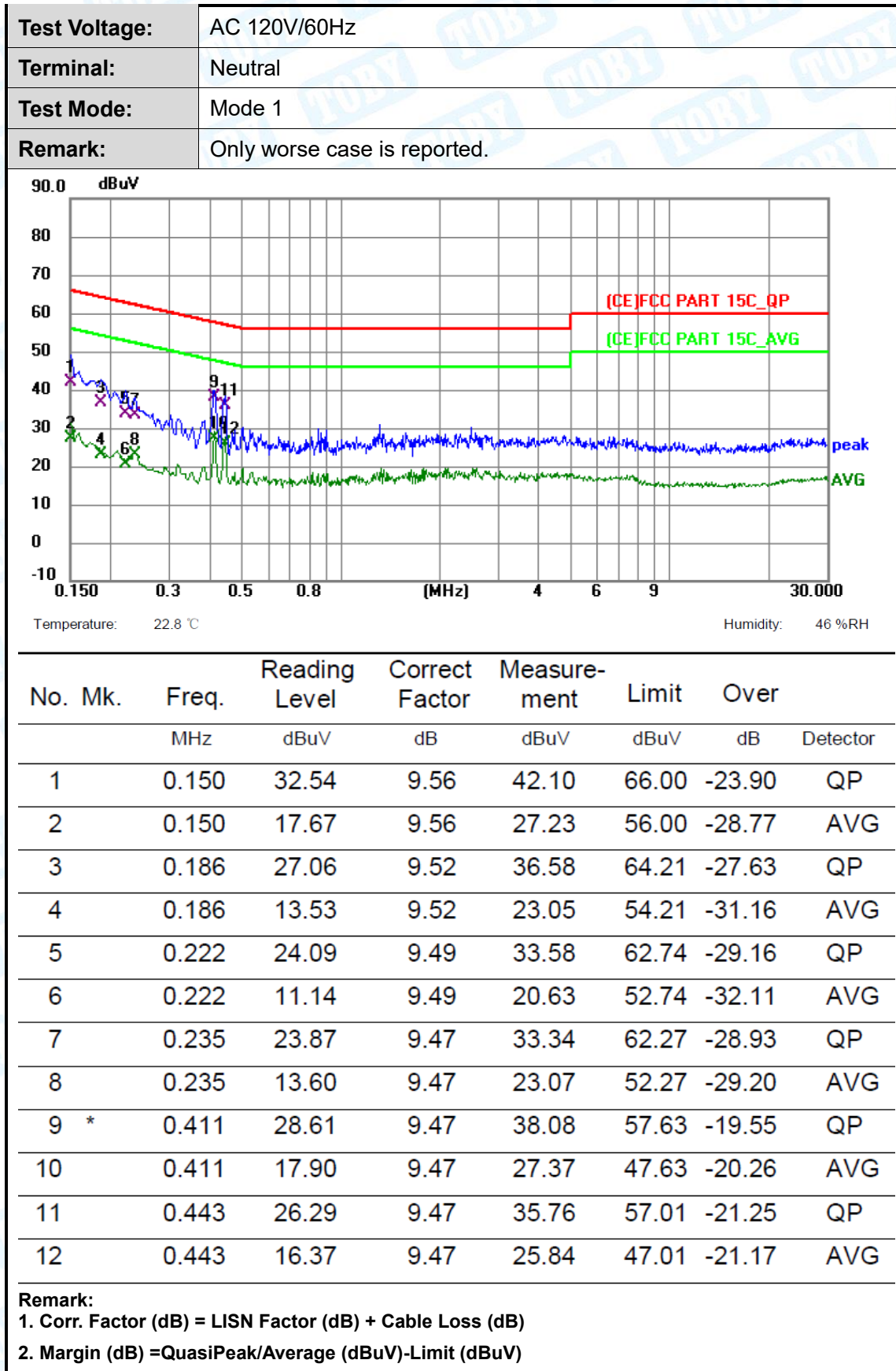
The EUT antenna is a Dipole Antenna. It complies with the standard requirement.

Antenna Type
<input type="checkbox"/> Permanent attached antenna
<input checked="" type="checkbox"/> Unique connector antenna
<input type="checkbox"/> Professional installation antenna



Attachment A-- Conducted Emission Test Data





Attachment B--Unwanted Emissions Data

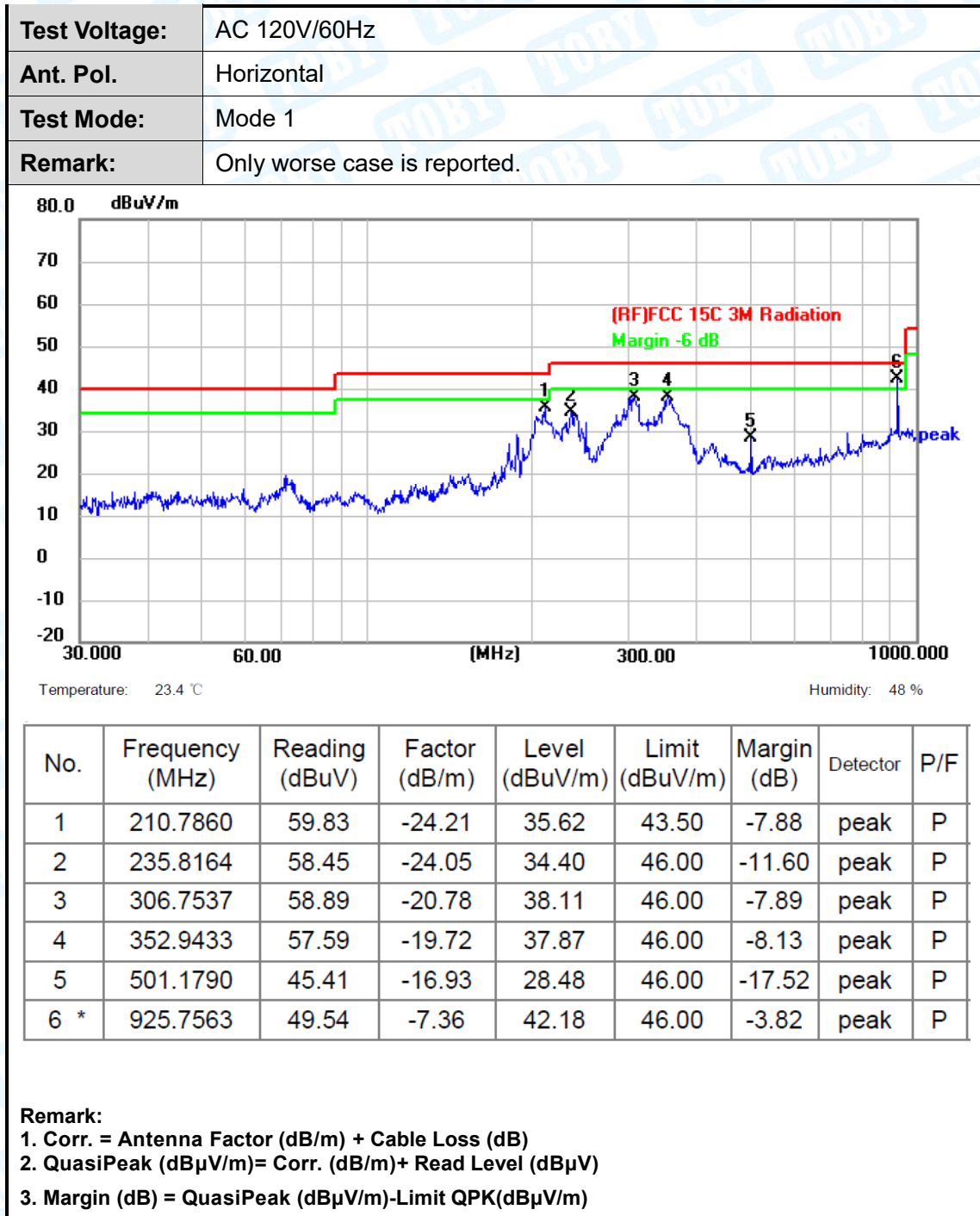
---Radiated Unwanted Emissions

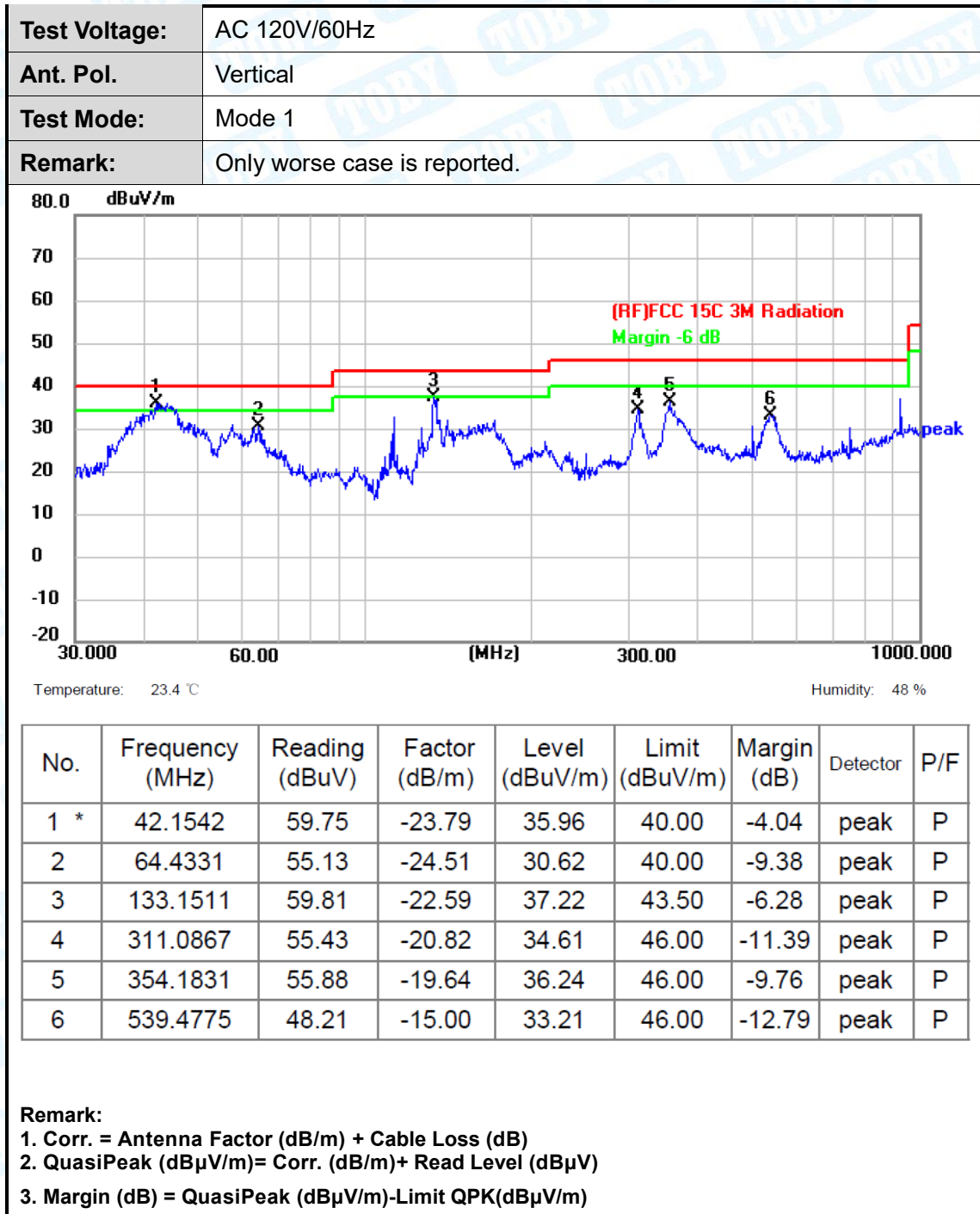
9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB
Below the permissible value has no need to be reported.

30MHz~1GHz





-----END OF THE REPORT-----

