47 CFR PART 15 SUBPART C TEST REPORT

for

Panel PC

Model No.: TD-107XXXXXX (where "X" may be any alphanumeric, blank "_" or "-" for marketing purpose only)

FCC ID: 2AF82-TD1070H

of

Applicant: QBIC TECHNOLOGY CO.,LTD
Address: 26F.-12,No.99,Sec.1,Xintai 5th Rd.,Xizhi Dist., New Taipei City Taiwan

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A

Report No.: W6M22203-21702-C-3

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com

Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H

TABLE OF CONTENTS

1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.
The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.
Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.
Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.
The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that is performance generally conforms to representative cases of communications equipment.

Laboratory disclaimer-
1. The test results of this test report relate exclusively to the item tested as specified in 1.5.
2. The test report may only be reproduced or published in full.
3. Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

Tester:

June 15, 2022		Sora Kuo	Sora
Date	WTS-Lab.	Name	Signature

Technical responsibility for area of testing:

June 15, 2022		Kevin Wang	Kevin Wang
Date	WTS	Name	Signature

Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H

1.2 Testing laboratory

1.2.1 Location

10m OATS
No.5-1, Lishui, Shuang Sing Village, Wanli Dist.,
New Taipei City 207, Taiwan (R.O.C.)

3 meter semi-anechoic chamber
No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist.,
Taipei City 114, Taiwan (R.O.C.)
Tel: 886-2-6613-0228

Worldwide Testing Services (Taiwan) Co., Ltd.
6F., No. 58, Ln. 188, Ruiguang Rd., Neihu Dist.,
Taipei City 114 , Taiwan (R.O.C.)
Tel: 886-2-6606-8877

1.2.2 Details of accreditation status

Accredited testing laboratory
FCC filed test laboratory Reg. No.: TW1477, TW1072
Industry Canada filed test laboratory Reg. No.: 20037, 5107A

Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :

Name:	./.
Accredited number:	./.
Street:	./.
Town:	./.
Country:	./.

1.3 Details of approval holder

Name:	QBIC TECHNOLOGY CO.,LTD
Street:	26F.-12,No.99,Sec.1,Xintai 5th Rd.,Xizhi Dist.,
Town:	New Taipei City
Country:	Taiwan

1.4 Application details

Date of receipt of test item:	March 29, 2022
Date of test:	From March 30, 2022 to June 01, 2022

1.5 General information of Test item

Type of test item:	Panel PC
Model number:	TD-107XXXXXX (where "X" may be any alphanumeric, blank "_" or "-" for marketing purpose only)
Multi-listing model number:	./.
Brand name:	Qbic
Technical data	
Transmitting frequency:	125 kHz
Operation modes:	Duplex
Modulation type:	ASK
Antenna type:	Coil antenna
Power supply:	Adaptor: (I/P: 100~240Va.c., 50~60Hz, 0.9A Max. O/P: 12Vd.c., 2.5A, 30.0W)
Sample no.:	#01

Manufacturer: (if different from Approval Holder)

Name:	./.
Street:	./.
Town:	./.
Country:	./.
Additional information:	./.

1.6 Test standards

Technical standard :

47 CFR PART 15 SUBPART C § 15.209 (2020-10)

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations were ascertained in the course of the tests performed. ☐

2.2 Test environment

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Details of power supply: Adaptor: (I/P: 100~240Va.c., 50~60Hz, 0.9A Max.
O/P: 12Vd.c., 2.5A, 30.0W)

Extreme conditions parameters: test voltage : -- extreme
min : -- V
max : -- V

Test item Name	Measurement Uncertainty
Estimation Result of Uncertainty of Conducted Emission (Power Line Conducted Emission)	Expanded Uncertainty： AMN：1.03 dB Voltage probe：1.05 dB
Estimation Result of Uncertainty of Radiated Emission(3M) (Peak Output Power, Spurious Emissions radiated – Transmitter operating, Radiated Emissions from Receiver Section of Receiver Part)	Expanded Uncertainty： 0.009-30 MHz：3.48 dB 30-1000 MHz：4.48 dB 1-18 GHz：4.15 dB 18-40 GHz：3.78 dB
Estimation Result of Uncertainty of Bandwidth Measurement (Occupied Bandwidth)	Expanded Uncertainty: 0.45 kHz

The decision rule is: Measurement uncertainty is not included in the calculation of test results.

2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2021/6/17	2022/6/16
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2021/11/9	2022/11/8
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2021/9/22	2022/9/21
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2021/7/29	2022/7/28
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2021/11/8	2022/11/7
ETSTW-CE 028	MXE EMI Receiver	N9038A	MY53220110	Agilent	2021/7/28	2022/7/27
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2021/6/17	2022/6/16
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2021/9/28	2022/9/27
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2021/8/4	2022/8/3
ETSTW-RE 019	MICROWAVE HORN ANTENNA	22240-25	121074	FM	2022/5/20	2023/5/19
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2021/6/16	2022/6/15
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2022/5/23	2023/5/22
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2022/3/4	2023/3/3
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2022/5/20	2023/5/19
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2021/7/14	2022/7/13
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2022/2/18	2023/2/17
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2022/2/18	2023/2/17
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2022/2/18	2023/2/17
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2022/3/28	2023/3/27
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2022/2/18	2023/2/17
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2022/5/13	2023/5/12
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2021/10/27	2022/10/26
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2021/9/17	2022/9/16
ETSTW-RE 091	Match Pad	MDCS1500	None	WOKEN	2022/5/20	2023/5/19
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2022/2/18	2023/2/17
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	

ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2022/1/5	2023/1/4
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	2021/10/29	2022/10/28
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2022/6/3	2023/6/2
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2021/8/6	2022/8/5
ETSTW-RE 126	5GHz Notch filter	5NSL12-5800/E221.3-O/O	1	K&L Microwave	2021/8/6	2022/8/5
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2022/2/18	2023/2/17
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2021/8/6	2022/8/5
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2021/8/6	2022/8/5
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 142	Amplifier	8447D	2805A03378	Agilent	2022/5/13	2023/5/12
ETSTW-RE 146	Preamplifier	JPA-10M1G	15090004	JPT	2022/5/27	2023/5/26
ETSTW-RE 152	Bi-log Hybrid Antenna	MCTD 2786B	BLB20J04029	ETC	2021/10/5	2022/10/4
ETSTW-RE 153	Signal Analyzer	FSV40	101929	R&S	2021/10/6	2022/10/5
ETSTW-RE 159	Bi-log Hybrid Antenna (30M~1000 MHz)	MCTD 2786B	BLB21N04035	ETC	2021/12/06	2022/12/05
ETSTW-RF 002	Electromagnetic field probe	LF-30	K-0007	STT	2021/7/19	2022/7/18
ETSTW-EMI 011	USB Compact Modulator	SFC-U	101689	R&S	2022/5/20	2023/5/19
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2022/3/28	2023/3/27
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2022/5/9	2023/5/8
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2021/10/29	2022/10/28
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2022/1/5	2023/1/4
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2022/1/5	2023/1/4
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2022/1/5	2023/1/4
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2022/1/5	2023/1/4
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2021/9/7	2022/9/6
ETSTW-GSM 024	Radio Communication Analyzer	MT8821C	None	Anritsu	2022/5/3	2023/5/2
ETSTW-GSM 025	Band Reject Filter	BRM19835	001	Micro-Tronics	2021/8/6	2022/8/5
ETSTW-Cable 011	SMA to N type Cable	RGU-400	None	THERMAX	Pre-test Use NCR	
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2022/2/18	2023/2/17
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2022/2/18	2023/2/17
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2022/2/18	2023/2/17
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2022/2/18	2023/2/17
ETSTW-Cable 020	N TYPE Cable	OATS Cable 1	N30N30-L335-15M	JYE BAO CO.,LTD.	2021/7/1	2022/6/30
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2022/5/6	2023/5/5
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2021/9/17	2022/9/16
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2021/9/17	2022/9/16
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 （S_Cable 9）	279067	HUBER+SUHNER	2022/2/18	2023/2/17

ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2022/5/13	2023/5/12
ETSTW-Cable 047	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2021/7/2	2022/7/1
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2022/5/27	2023/5/26
ETSTW-Cable 064	Microwave Cable	SUCOFLEX 104	MY28891	HUBER+SUHNER	2022/5/13	2023/5/12
ETSTW-Cable 071	N TYPE CABLE	EMCCFD400-NM-NM-25000	170239	EMCI	2022/5/27	2023/5/26
ETSTW-Cable 072	SMA type cable (8m)	SUCOFLEX 104	805800/4	HUBER+SUHNER	2022/5/13	2023/5/12
ETSTW-Cable 074	SMA type cable (2m)	SUCOFLEX 104	802563/4	HUBER+SUHNER	2022/5/13	2023/5/12
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version ETS-03A1 Version EMEC-3A1+	
WTSTW-SW 006	EMI TEST SOFTWARE	e3	None	AUDIX	Version 9.161014	
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	
ETSTW-TH 002	Thermohygrometer	608-H1	45204317	Testo	2021/10/18	2022/10/17
ETSTW-TH 003	Wireless weather station	GAIA	N/A	TFA	2021/10/18	2022/10/17

2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.10-2013 6.2 using a LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was according to ANSI STANDARD C63.10-2013 6.3 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBμV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dBμV + 10.36 dB + 6 dB = 36.36 dBμV/m @3m

ANSI STANDARD C63.10-2013 6.2.2 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm height and with dimensions of 1m by 1.5m (non metallic table). The EUT was placed in the centre of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

ANSI STANDARD C63.10-2013 B.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software ’EZ EMC’ was used for setting up different operation modes.

3 Test results (enclosure)

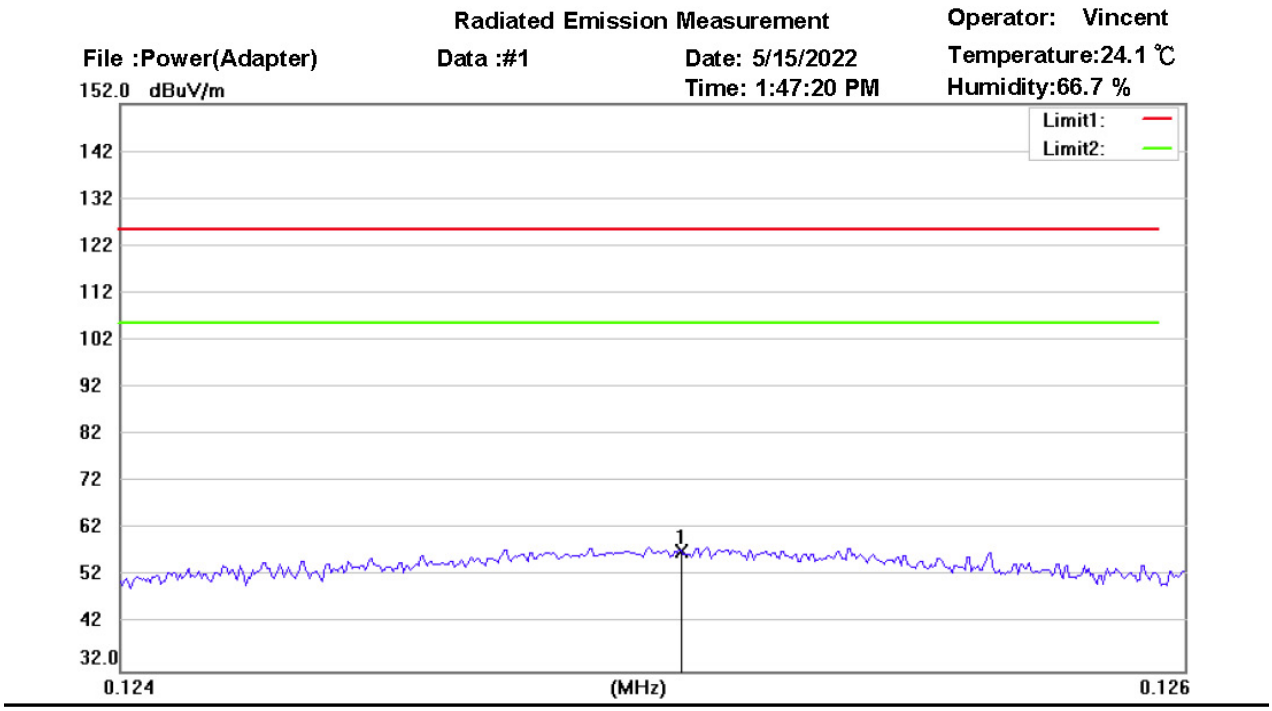
Test case	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.209	☒	☒	☐
Spurious Emissions radiated – Transmitter operating	15.209	☒	☒	☐
Spurious Emissions radiated – Receiver operating	15.109	☒	☒	☐
Occupied bandwidth	2.1049	☒	☒	☐
Antenna Requirement	15.203	☒	☒	☐
Power Line Conducted Emission	15.207	☒	☒	☐

The following is intentionally left blank.

3.1 Peak Output Power

FCC Rules: 15.209

The power was measured with modulation (declared by the applicant).

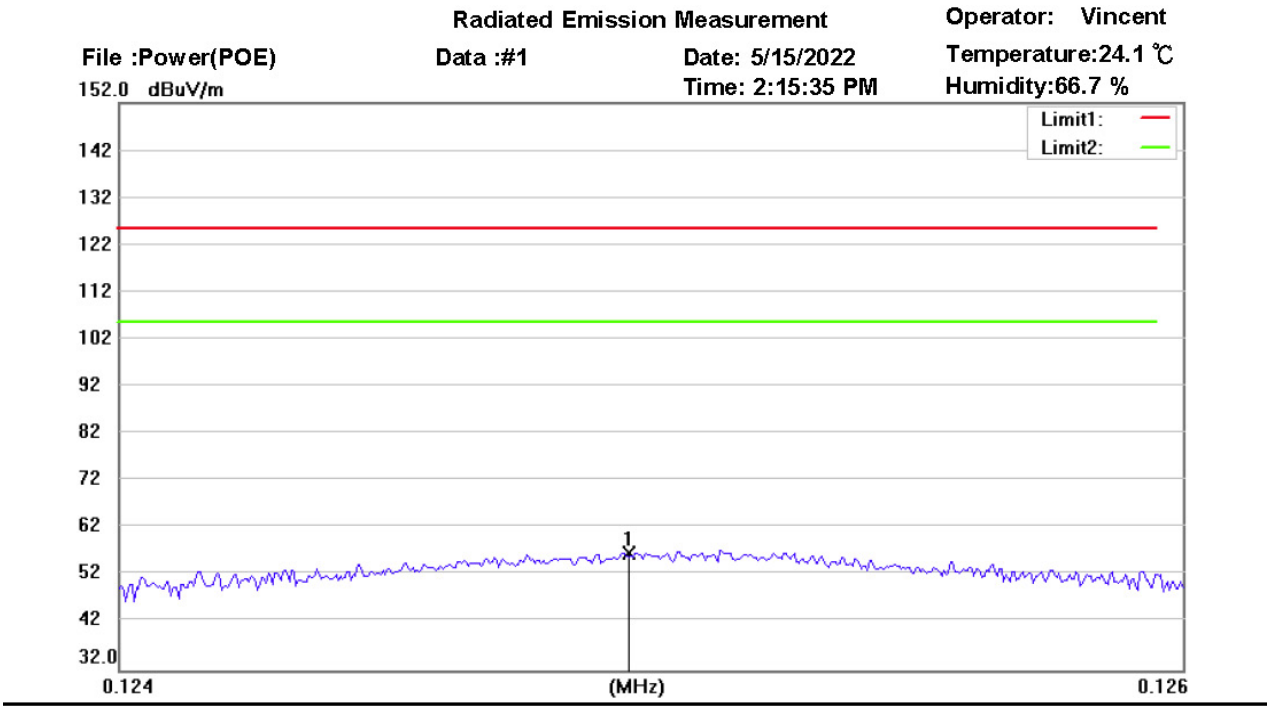


Site : Chamber
Condition : FCC 15.209 power (3m)(125k)(PK)
EUT : W6M22203-21702
M/N:
Test Mode : TX 125kHz
Note :

Polarization:
Power : 120 Va.c.
Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	0.1251	-6.53	peak	63.80	57.27	125.66	100	0	-68.39	

Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H



Site : Chamber
Condition : FCC 15.209 power (3m)(125k)(PK)
EUT : W6M22203-21702
M/N:
Test Mode : TX 125kHz
Note :

Polarization:
Power : POE
Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	0.1250	-7.17	peak	63.81	56.64	125.66	100	0	-69.02	

:

Limits: 15.209

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

The test was performed in the anechoic OATS at 3 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

DF (distance factor) = 40 log (D_1/D_2) = 80 dB, where

D_1 is the 300 meter specified measurement distance,
D_2 is the 3 meter test measurement distance.

For 125 kHz frequency the calculated limit is:
$Limit_{3m}$ = $Limit_{300m}$ + DF = 45.66 dBuV/m + 80 dB = 125.66 dBuV/m

Test equipment used: ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055.

3.2 Spurious Emissions radiated – Transmitter operating

FCC Rules: 15.209

The field strength of any emission appearing outside of the specific band shall not exceed the general radiated emission limits in 15.209.

Model:	TD-107XXXXXX (where "X" may be any alphanumeric, blank "_" or "-" for marketing purpose only)	Date:	--		
Mode:	--	Temperature:	-- °C	Engineer:	--
Polarization:	--	Humidity:	-- %		

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Note

1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **See attached diagrams in the Appendix.**

All other not noted test plots do not contain significant test results in relation to the limits.

TEST RESULT (Transmitter): The unit DOES meet the FCC requirements.

Limits: 15.209

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

* In the emission table above, the tighter limit applies at the band edges.

The test was performed in the anechoic chamber at 3 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

DF = 40 log (D_1/D_2) = 80 dB, where

For D_1 is the 300 meter specified measurement distance.
D_2 is the 3 meter test measurement distance.
The DF = 80 dB was applied for limit calculation at 3 meter test distance measurements.

For D_1 is the 30 meter specified measurement distance.
D_2 is the 3 meter test measurement distance.
The DF = 40 dB was applied for limit calculation at 3 meter test distance measurements.

If the frequency between 9 – 490 kHz,
Limit = 20log(2400/f(kHz)) + 80

If the frequency between 490 – 1705 kHz,
Limit = 20log(2400/f(kHz)) + 40

If the frequency between 1705 – 30000 kHz,
Limit = 20log30 + 40

For 125 kHz frequency the calculated limit is:
$Limit_{3m}$ = $Limit_{300m}$ + DF = 45.66 dBuV/m + 80 dB = 125.66 dBuV/m

Test equipment used: ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055,
ETSTW-RE 146, ETSTW-RE 159

3.3 Occupied Bandwidth

FCC Rules: 2.1049

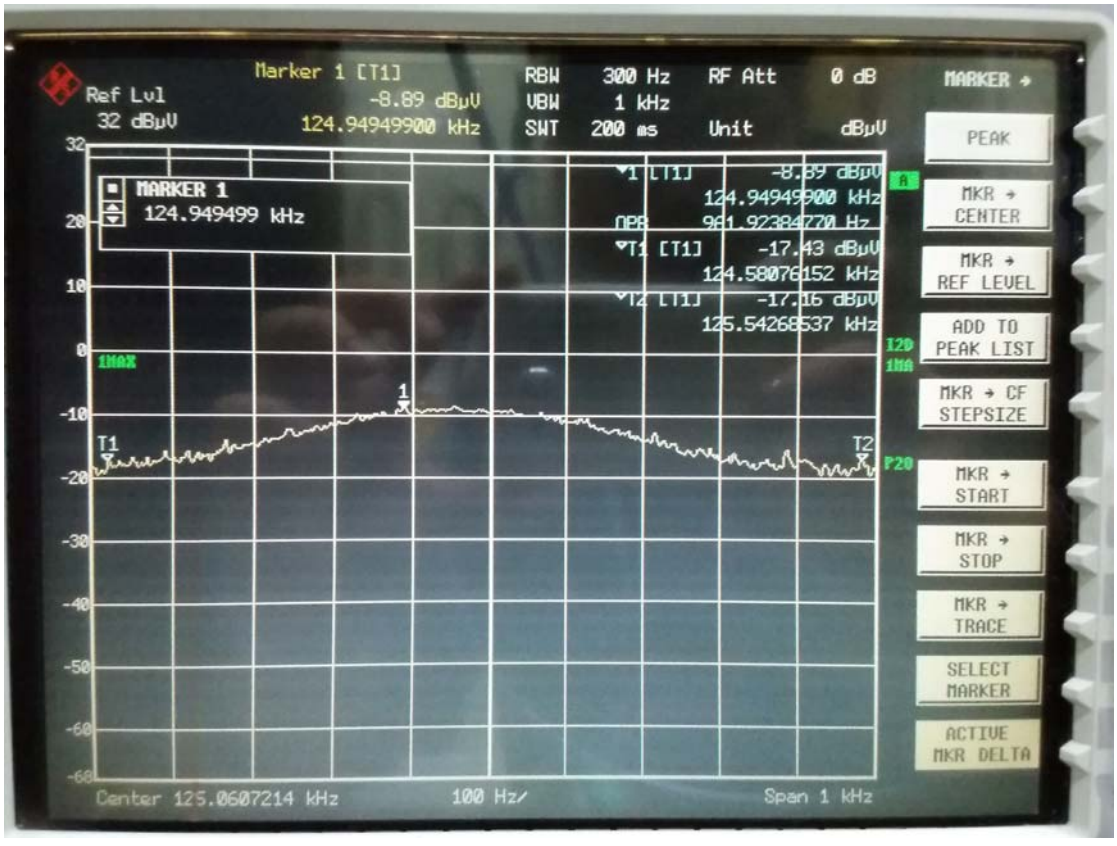
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated are each equal to 0.5% of the total mean power radiated by a given emission.

The resolution bandwidth of the spectrum analyzer shall be set to a value greater than 5.0% of the allowed bandwidth specifications are given, the following guidelines are used:

Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1 kHz
30 MHz to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

Test date: May 20, 2022
Temperature: 24.6 ˚C
Humidity: 56.0 %
Tester: Sora

Test result:



Test equipment: ETSTW-RE 055

3.4 Antenna 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Explanation: This antenna is Coil antenna which passes antenna requirement.

The equipment meets the requirements	yes ☒	no ☐

3.5 Radiated Emissions from Receiver Section of Receiver Part

For the frequency from 9 kHz to 30 MHz:

FCC Rule: 15.209
The field strength of any emission appearing outside of the specific band shall not exceed the general radiated emission limits in 15.209.

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

* In the emission table above, the tighter limit applies at the band edges.

Note: The above field strength limits are specified at a distance of 3 meters.

The test was performed in the anechoic chamber at 3 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

DF = 40 log (D_1/D_2) = 80 dB, where

For D_1 is the 300 meter specified measurement distance.
D_2 is the 3 meter test measurement distance.
The DF = 80 dB was applied for limit calculation at 3 meter test distance measurements.

For D_1 is the 30 meter specified measurement distance.
D_2 is the 3 meter test measurement distance.
The DF = 40 dB was applied for limit calculation at 3 meter test distance measurements.

If the frequency between 9 – 490 kHz, limit = 20log(2400/f(kHz)) + 80

If the frequency between 490 – 1705 kHz, limit = 20log(2400/f(kHz)) + 40

If the frequency between 1705 – 30000 kHz, limit = 20log30 + 40

For 125 kHz frequency the calculated limit is:
$Limit_{3m}$ = $Limit_{300m}$ + DF = 35.5dBuV/m + 80 dB = 115.5 dBuV/m

Test equipment used: ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055, ETSTW-RE 146, ETSTW-RE 159

Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H

For the frequency from 30 MHz to 1000 MHz.:

FCC Rule: 15.109

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Field Strength (dBmicrovolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Model: TD-107XXXXXX (where "X" may be any alphanumeric, blank "_" or "-" for marketing purpose only) Date: --

Mode: Temperature: -- °C Engineer: --
Polarization: Horizontal Humidity: -- %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 062, ETSTW-RE 064, ETSTW-RE 142, ETSTW-RE 152

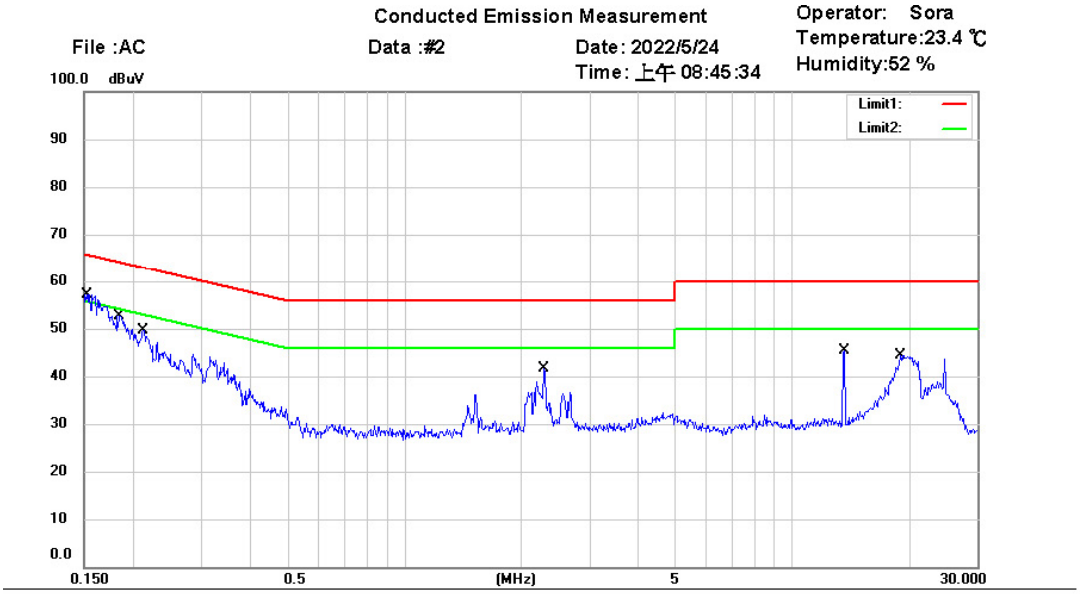
Note

1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **See attached diagrams in appendix.**

3.6 Power Line Conducted Emission

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.



Site : Chamber_03
Condition : FCC Part 15 Class B Conduction (QP)
Phase: N
EUT : W6M22203-21702
Power : 120 Va.c.
M/N:
Test Mode : Adaptor Mode
Note :

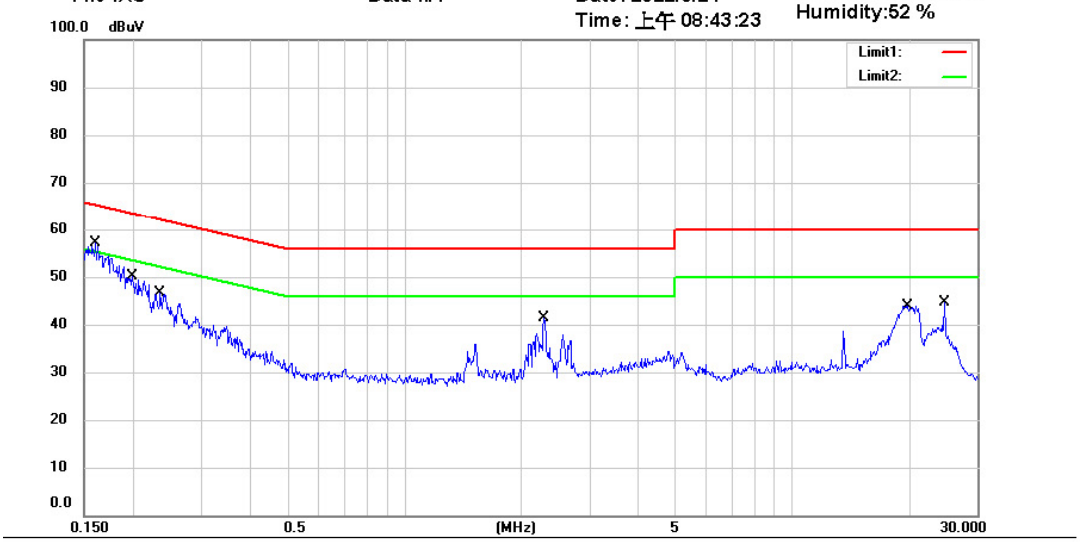
Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1520	39.11	QP	9.61	48.72	65.89	-17.17	
	0.1520	21.15	AVG	9.61	30.76	55.89	-25.13	
	0.1840	36.89	QP	9.61	46.50	64.30	-17.80	
	0.1840	20.94	AVG	9.61	30.55	54.30	-23.75	
	0.2120	32.31	QP	9.60	41.91	63.13	-21.22	
	0.2120	17.54	AVG	9.60	27.14	53.13	-25.99	
*	2.2820	29.84	QP	9.78	39.62	56.00	-16.38	
	2.2820	19.65	AVG	9.78	29.43	46.00	-16.57	
	13.5750	11.51	QP	10.15	21.66	60.00	-38.34	
	13.5750	3.24	AVG	10.15	13.39	50.00	-36.61	
	19.0162	26.64	QP	10.27	36.91	60.00	-23.09	
	19.0162	19.18	AVG	10.27	29.45	50.00	-20.55	

Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H

Conducted Emission Measurement

File :AC
Data :#1
Date: 2022/5/24
Time: 上午 08:43:23

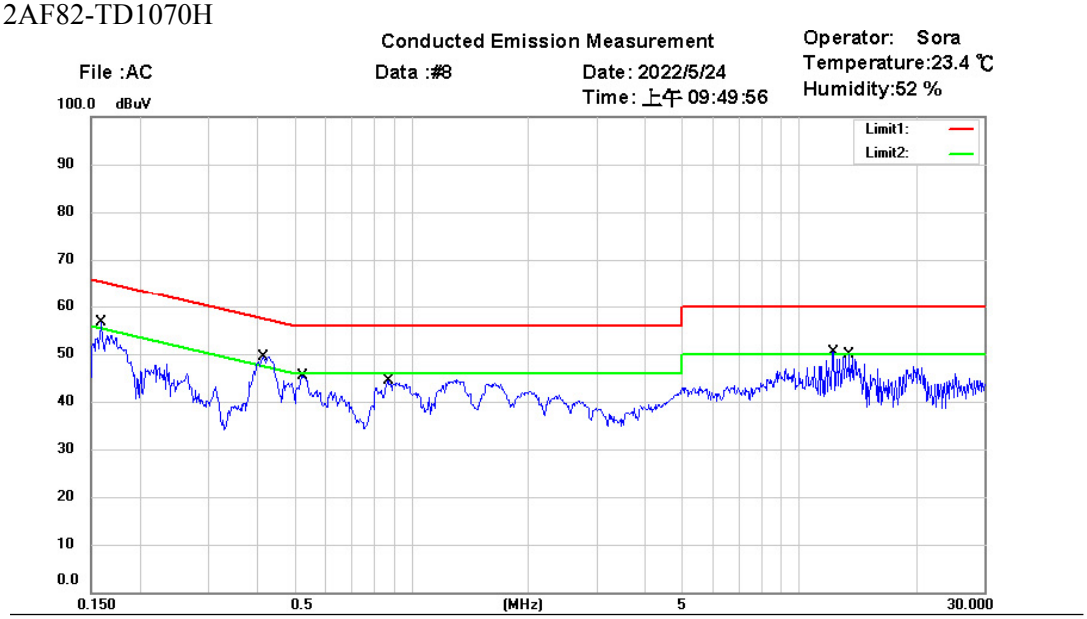
Operator: Sora
Temperature:23.4 ℃
Humidity:52 %



Site : Chamber_03
Condition : FCC Part 15 Class B Conduction (QP)
Phase: L1
EUT : W6M22203-21702
Power : 120 Va.c.
M/N:
Test Mode : Adaptor Mode
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1602	41.49	QP	9.62	51.11	65.45	-14.34	
	0.1602	24.05	AVG	9.62	33.67	55.45	-21.78	
	0.1995	31.04	QP	9.62	40.66	63.63	-22.97	
	0.1995	10.89	AVG	9.62	20.51	53.63	-33.12	
	0.2352	27.60	QP	9.59	37.19	62.26	-25.07	
	0.2352	10.52	AVG	9.59	20.11	52.26	-32.15	
	2.2843	28.19	QP	9.76	37.95	56.00	-18.05	
	2.2843	18.13	AVG	9.76	27.89	46.00	-18.11	
	19.8011	26.80	QP	10.11	36.91	60.00	-23.09	
	19.8011	18.87	AVG	10.11	28.98	50.00	-21.02	
	24.5750	32.52	QP	10.16	42.68	60.00	-17.32	
*	24.5750	26.57	AVG	10.16	36.73	50.00	-13.27	

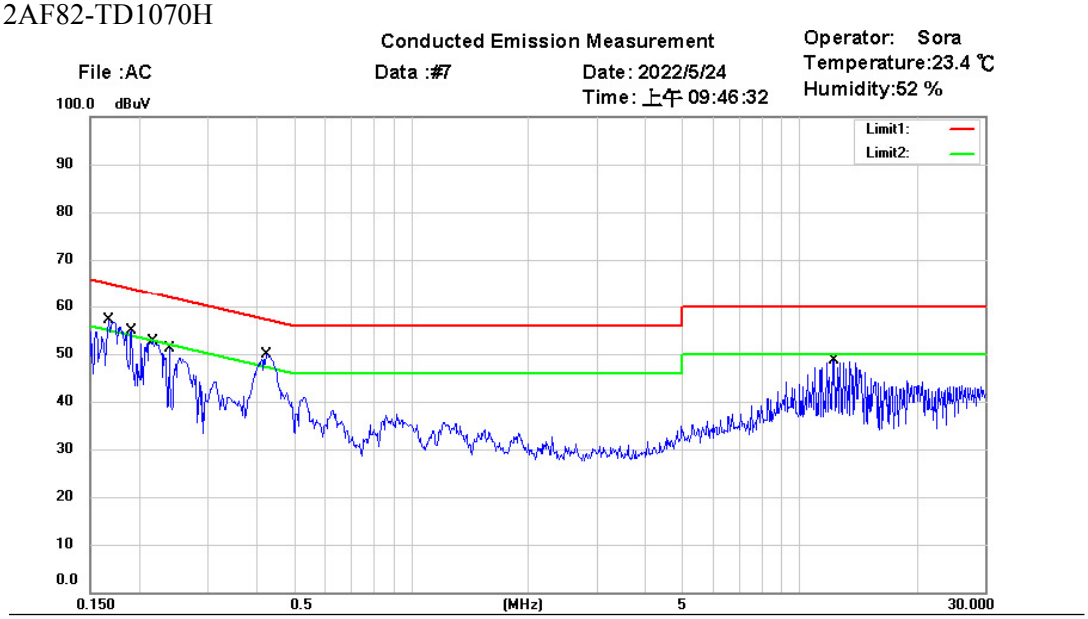
Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H



Site : Chamber_03
Condition : FCC Part 15 Class B Conduction (QP)
Phase: N
EUT : W6M22203-21702
Power : 120 Va.c.
M/N:
Test Mode : POE Mode
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1586	34.61	QP	9.61	44.22	65.54	-21.32	
	0.1586	27.74	AVG	9.61	37.35	55.54	-18.19	
	0.4150	34.83	QP	9.45	44.28	57.55	-13.27	
	0.4150	13.81	AVG	9.45	23.26	47.55	-24.29	
	0.5225	33.06	QP	9.49	42.55	56.00	-13.45	
	0.5225	22.86	AVG	9.49	32.35	46.00	-13.65	
	0.8667	31.47	QP	9.63	41.10	56.00	-14.90	
	0.8667	19.21	AVG	9.63	28.84	46.00	-17.16	
	12.1942	38.41	QP	10.11	48.52	60.00	-11.48	
*	12.1942	36.59	AVG	10.11	46.70	50.00	-3.30	
	13.4430	38.16	QP	10.14	48.30	60.00	-11.70	
	13.4430	35.57	AVG	10.14	45.71	50.00	-4.29	

Registration number: W6M22203-21702-C-3
FCC ID: 2AF82-TD1070H



Site : Chamber_03
Condition : FCC Part 15 Class B Conduction (QP)
Phase: L1
EUT : W6M22203-21702
Power : 120 Va.c.
M/N:
Test Mode : POE Mode
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1668	43.21	QP	9.62	52.83	65.12	-12.29	
	0.1668	23.45	AVG	9.62	33.07	55.12	-22.05	
	0.1908	35.37	QP	9.62	44.99	64.00	-19.01	
	0.1908	22.87	AVG	9.62	32.49	54.00	-21.51	
	0.2170	40.27	QP	9.61	49.88	62.93	-13.05	
	0.2170	26.87	AVG	9.61	36.48	52.93	-16.45	
	0.2386	28.74	QP	9.59	38.33	62.14	-23.81	
	0.2386	13.45	AVG	9.59	23.04	52.14	-29.10	
	0.4237	37.13	QP	9.46	46.59	57.38	-10.79	
	0.4237	18.47	AVG	9.46	27.93	47.38	-19.45	
	12.1928	37.87	QP	10.01	47.88	60.00	-12.12	
*	12.1928	36.86	AVG	10.01	46.87	50.00	-3.13	

Note

1. **The formula of measured value as: Test Result = Reading + Correction Factor**
2. **The Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **Up Line: QP Limit Line, Down Line: Ave Limit Line.**

Limits:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Test equipment used: ETSTW-CE 001, ETSTW-CE 016, ETSTW-RE 045.

Appendix

Measurement diagrams

Spurious Emissions Radiated

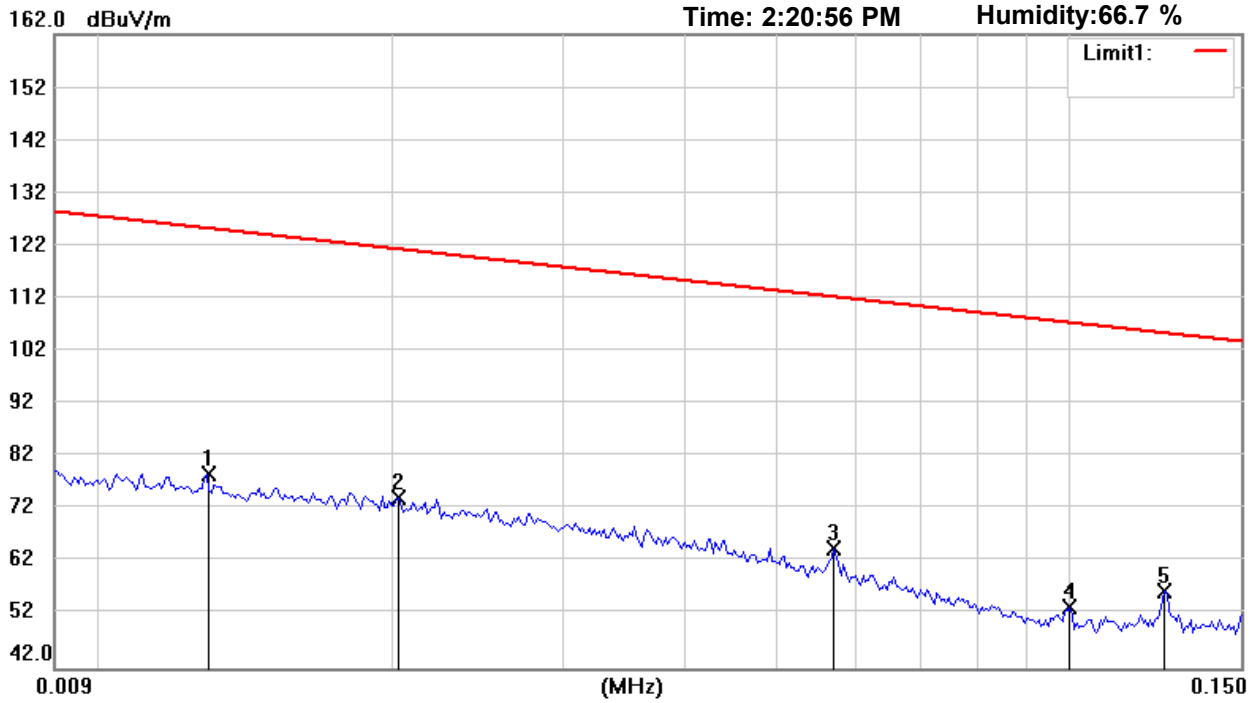
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :1 Data :#1 Date: 5/15/2022 Time: 2:20:56 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC 15.209 (3m)(<30MHz)

EUT : W6M22203-21702

M/N:

Test Mode : TX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	0.0130	-4.04	peak	82.79	78.75	125.32	100	211	-46.57	
	0.0204	-5.85	peak	79.97	74.12	121.40	100	60	-47.28	
	0.0572	-6.24	peak	70.75	64.51	112.45	100	92	-47.94	
	0.1000	-11.42	peak	64.92	53.50	107.60	100	0	-54.10	
	0.1252	-7.30	peak	63.80	56.50	105.65			-49.15	RF Power

*:Maximum data x:Over limit !:over margin

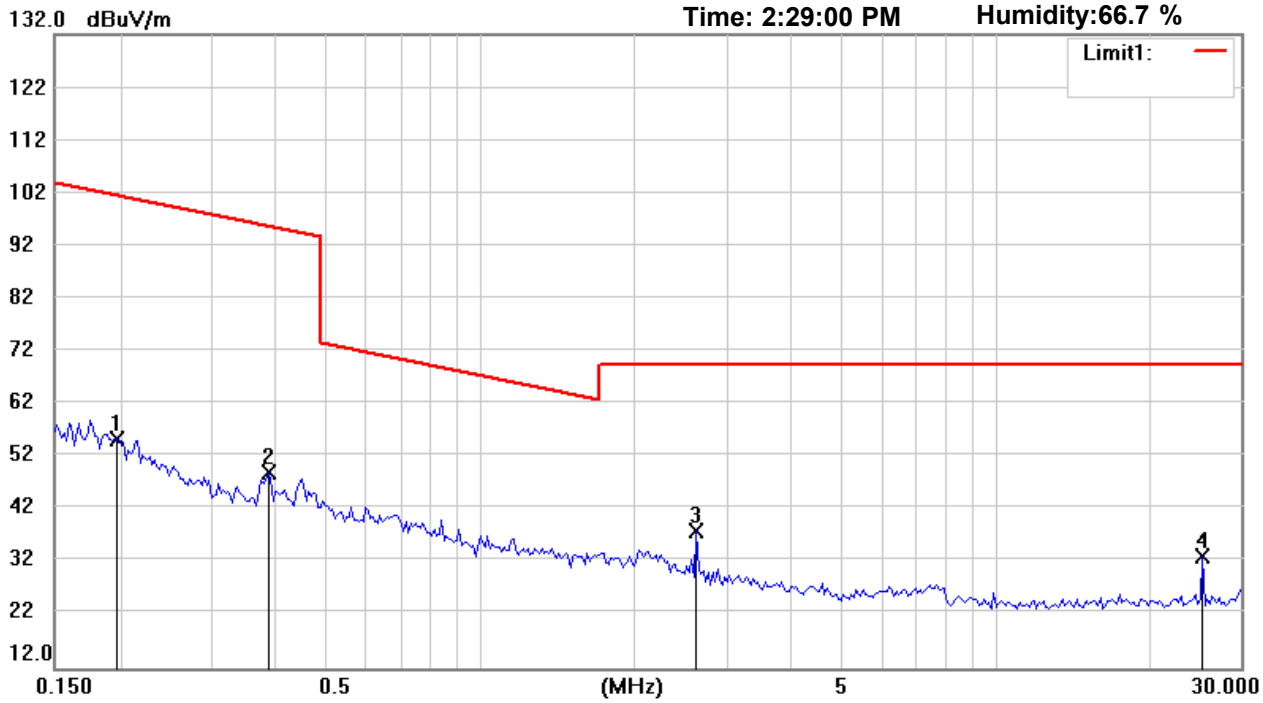
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :2 Data :#1 Date: 5/15/2022 Time: 2:29:00 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC 15.209 (3m)(<30MHz)

EUT : W6M22203-21702

M/N:

Test Mode : TX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	0.1977	-5.23	peak	60.57	55.34	101.68	100	116	-46.34	
	0.3900	-5.21	peak	54.17	48.96	95.78	100	0	-46.82	
*	2.6371	-1.81	peak	39.71	37.90	69.54	100	258	-31.64	
	25.3128	0.51	peak	32.77	33.28	69.54	100	90	-36.26	

*:Maximum data x:Over limit !:over margin

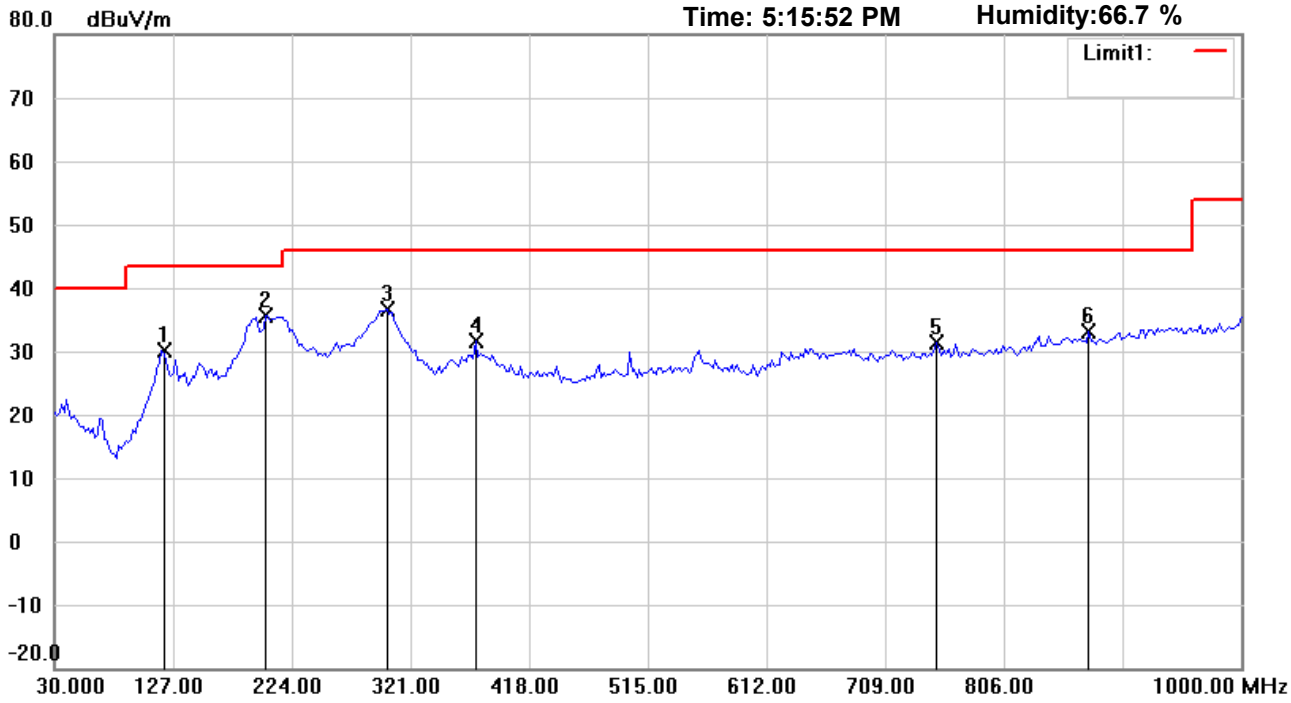
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :3 Data :#1 Date: 5/15/2022 Time: 5:15:52 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC_part 15 RE-Class C_30-1000MHz

EUT : W6M22203-21702

M/N:

Test Mode : TX 125kHz

Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	117.4750	36.57	peak	-6.46	30.11	43.50	100	326	-13.39	
*	203.0060	46.13	peak	-10.43	35.70	43.50	102	90	-7.80	
	302.1442	42.01	peak	-5.47	36.54	46.00	100	225	-9.46	
	374.0681	35.59	peak	-3.99	31.60	46.00	101	70	-14.40	
	751.1824	30.11	peak	1.33	31.44	46.00	100	142	-14.56	
	875.5911	29.00	peak	4.12	33.12	46.00	100	215	-12.88	

*:Maximum data x:Over limit !:over margin

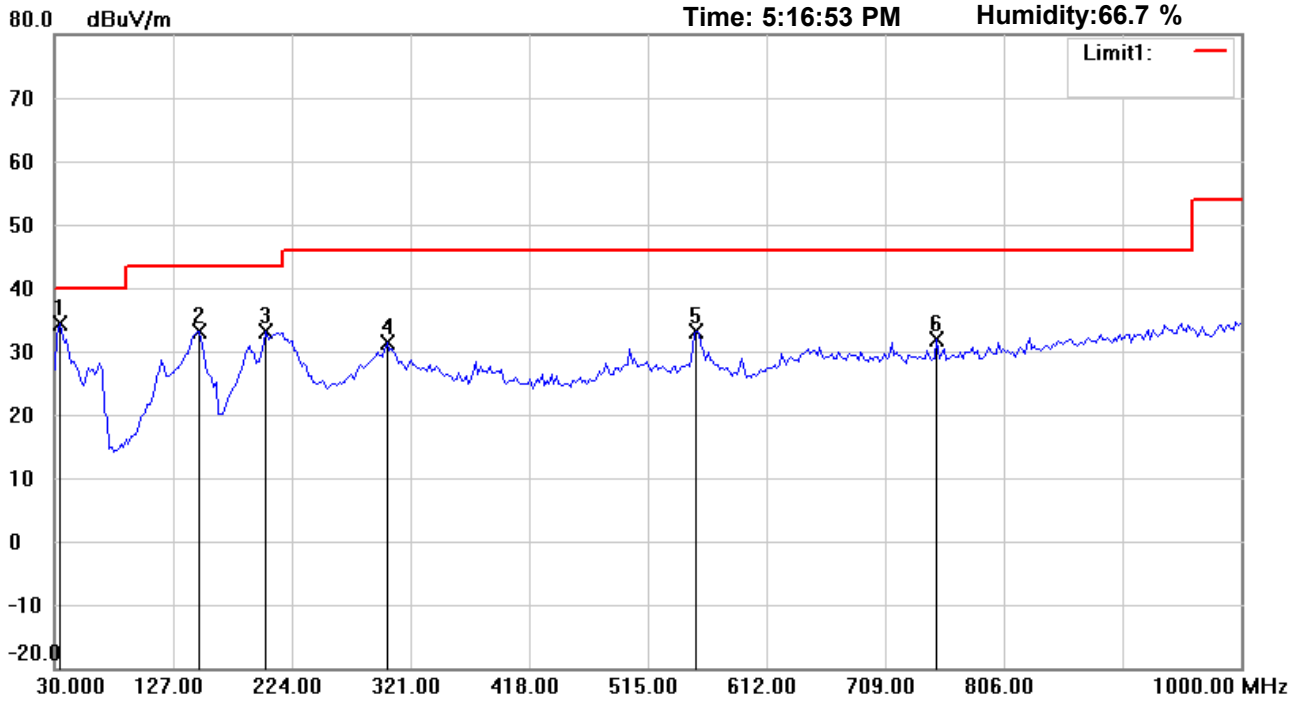
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :3 Data :#2 Date: 5/15/2022 Time: 5:16:53 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC_part 15 RE-Class C_30-1000MHz

Polarization: *Vertical*

EUT : W6M22203-21702

Power : 120 Va.c.

M/N:

Distance: 3m

Test Mode : TX 125kHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	33.8877	42.58	peak	-8.19	34.39	40.00	100	116	-5.61	
	148.5772	40.66	peak	-7.47	33.19	43.50	100	90	-10.31	
	203.0060	43.52	peak	-10.43	33.09	43.50	102	325	-10.41	
	302.1442	36.77	peak	-5.47	31.30	46.00	100	224	-14.70	
	554.8496	34.50	peak	-1.28	33.22	46.00	101	170	-12.78	
	751.1824	30.52	peak	1.33	31.85	46.00	100	246	-14.15	

*:Maximum data x:Over limit !:over margin

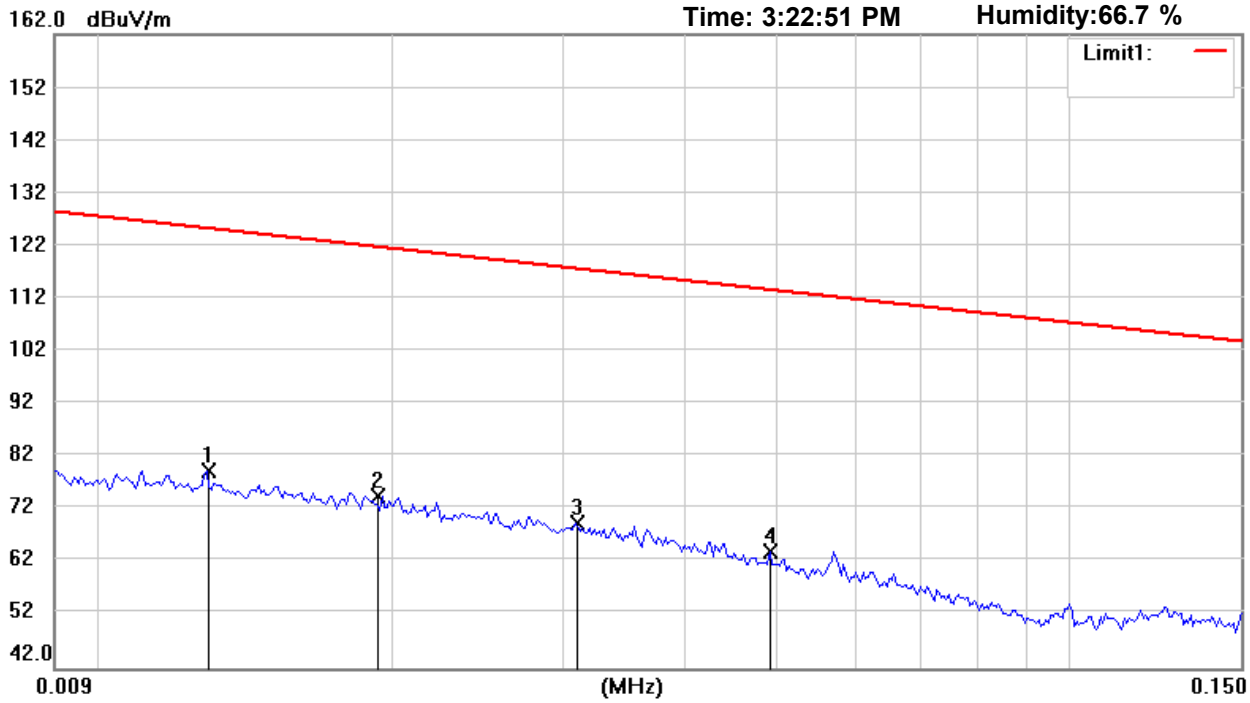
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :1 Data :#1 Date: 5/15/2022 Time: 3:22:51 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC 15.209 (3m)(<30MHz)

EUT : W6M22203-21702

M/N:

Test Mode : RX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	0.0130	-3.54	peak	82.79	79.25	125.32	100	69	-46.07	
	0.0194	-5.66	peak	80.35	74.69	121.84	100	217	-47.15	
	0.0310	-6.62	peak	76.09	69.47	117.77	100	220	-48.30	
	0.0490	-7.90	peak	71.96	64.06	113.79	100	132	-49.73	

*:Maximum data x:Over limit !:over margin

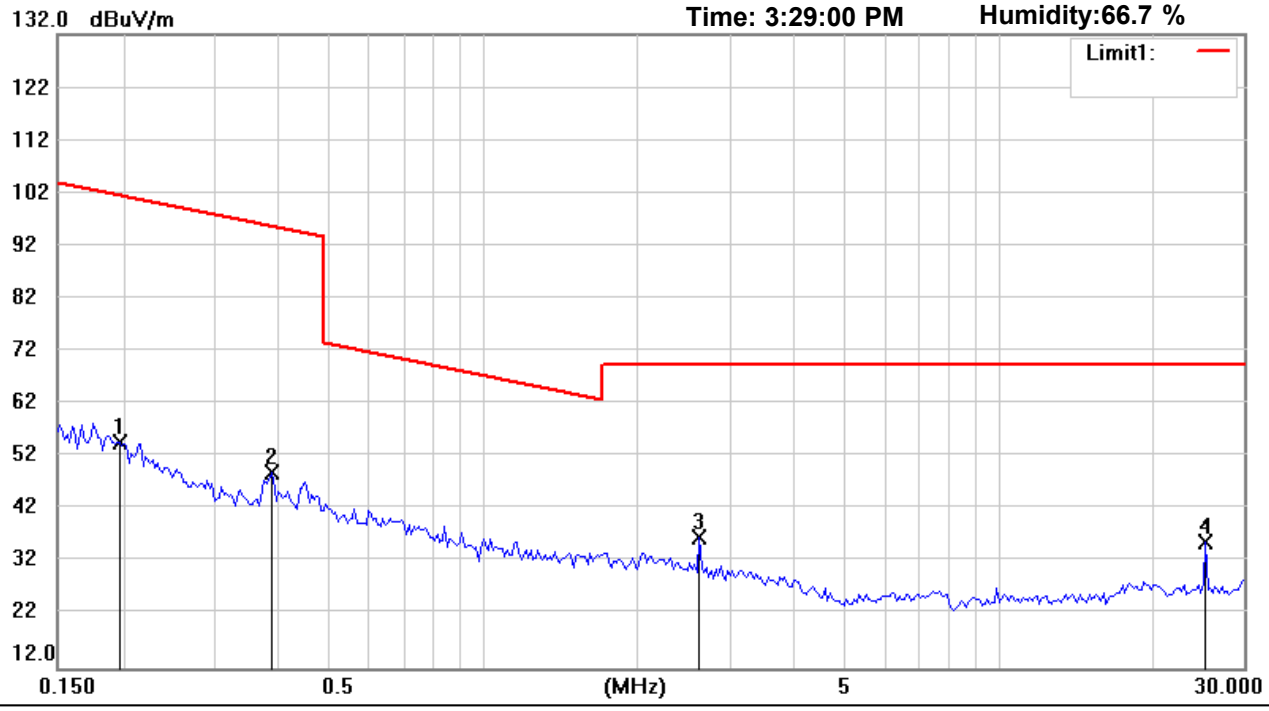
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :2 Data :#1 Date: 5/15/2022 Time: 3:29:00 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC 15.209 (3m)(<30MHz)

EUT : W6M22203-21702

M/N:

Test Mode : RX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	0.1975	-5.74	peak	60.58	54.84	101.69	100	223	-46.85	
	0.3900	-5.21	peak	54.17	48.96	95.78	100	85	-46.82	
*	2.6371	-2.81	peak	39.71	36.90	69.54	100	162	-32.64	
	25.3125	3.01	peak	32.77	35.78	69.54	100	44	-33.76	

*:Maximum data x:Over limit !:over margin

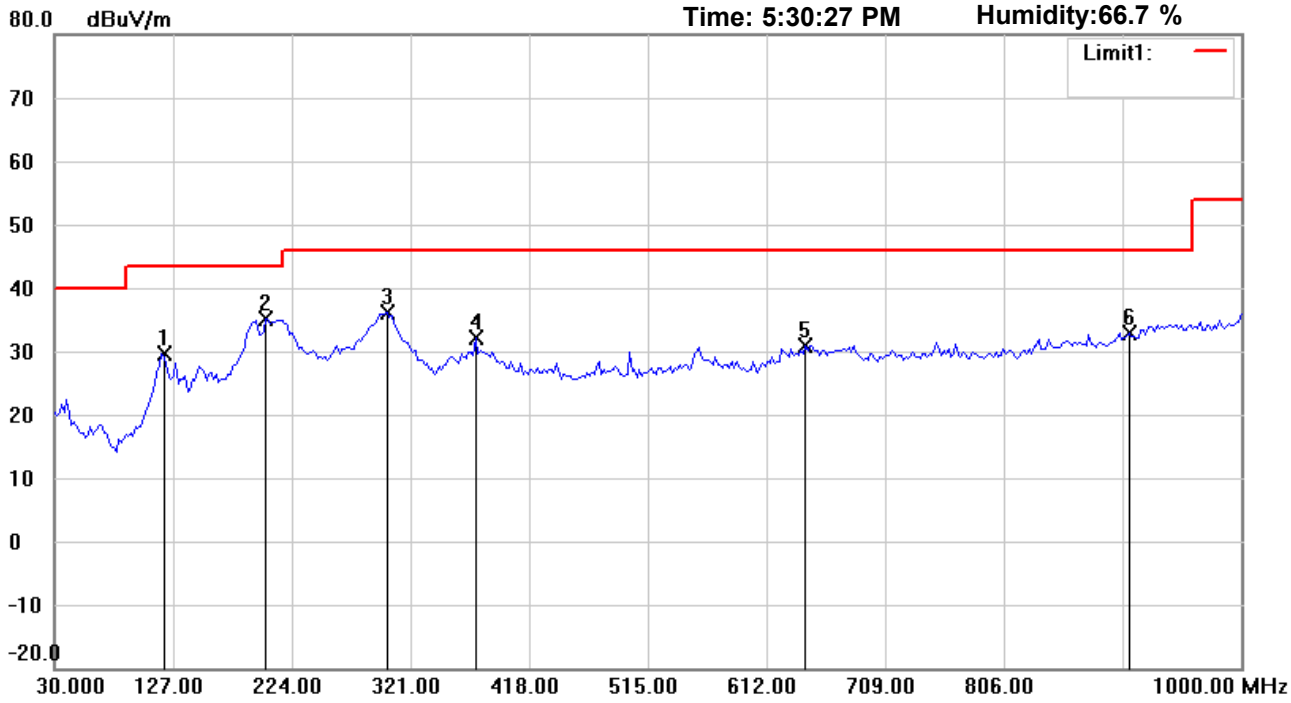
Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
Fax:+886-2-6606-8879

Radiated Emission Measurement

Operator: Vincent

File :3 Data :#1 Date: 5/15/2022 Time: 5:30:27 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC_part 15 RE-Class C_30-1000MHz

EUT : W6M22203-21702

M/N:

Test Mode : RX 125kHz

Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	117.4750	36.07	peak	-6.46	29.61	43.50	100	92	-13.89	
*	203.0060	45.63	peak	-10.43	35.20	43.50	100	60	-8.30	
	302.1442	41.51	peak	-5.47	36.04	46.00	102	133	-9.96	
	374.0681	36.09	peak	-3.99	32.10	46.00	101	225	-13.90	
	644.2685	29.94	peak	1.06	31.00	46.00	100	248	-15.00	
	908.6372	28.13	peak	4.75	32.88	46.00	100	70	-13.12	

*:Maximum data x:Over limit !:over margin

Address:6F.,No.58,Ln 188,Ruey Kuang Rd,Neihu,Taipei
Tel:+886-2-6606-8877
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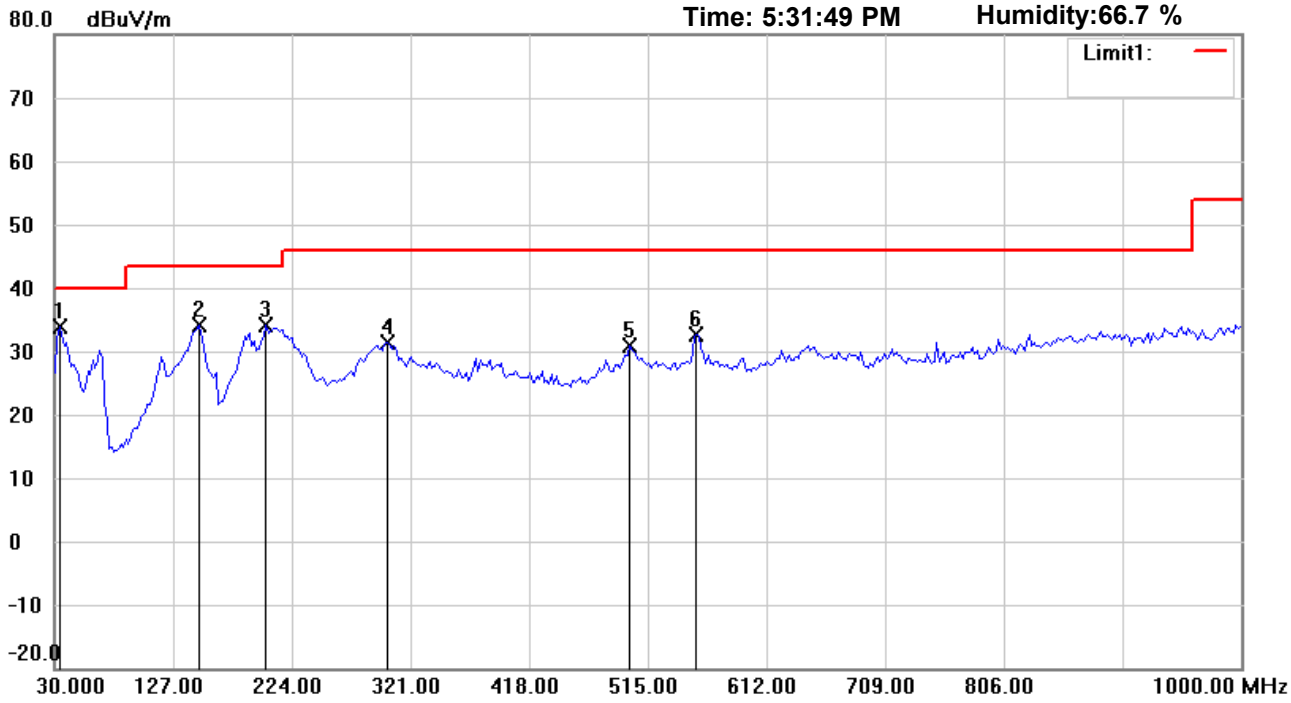
Radiated Emission Measurement

Operator: Vincent

File :3 Data :#2 Date: 5/15/2022 Time: 5:31:49 PM

Temperature:24.1 ℃ Humidity:66.7 %



Site : Chamber

Condition : FCC_part 15 RE-Class C_30-1000MHz

EUT : W6M22203-21702

M/N:

Test Mode : RX 125kHz

Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	33.8877	42.08	peak	-8.19	33.89	40.00	100	90	-6.11	
	148.5772	41.66	peak	-7.47	34.19	43.50	100	258	-9.31	
	203.0060	44.52	peak	-10.43	34.09	43.50	103	116	-9.41	
	302.1442	36.77	peak	-5.47	31.30	46.00	101	213	-14.70	
	500.4207	33.18	peak	-2.30	30.88	46.00	100	57	-15.12	
	554.8496	34.00	peak	-1.28	32.72	46.00	102	322	-13.28	

*:Maximum data x:Over limit !:over margin