





FCC Radio Test Report

FCC ID: 2AOO6-WLT7150

This report concerns: Original Grant

Project No. : 2404H025 Equipment : NFC Moudle

Brand Name : N/A

Test Model : WLT7150 Series Model : N/A

Applicant: Wi-linktech Communication Technologies(Shanghai) Co.,Ltd.

Address : Room 602, Building 3, Lane 88, Shengrong Road, Pudong New Area,

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Manufacturer: Wi-linktech Communication Technologies(Shanghai) Co.,Ltd.

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Chuangyuan, Jiangbei Xinqu, Nanjing City, Jiangsu Province, China

Date of Receipt : May 06, 2024

Date of Test : May 11, 2024~ May 24, 2024

Issued Date : Jun. 26, 2024

Report Version : R01

Test Sample : Engineering Sample No.: SH202405062 for radiated and conducted.

Standard(s) : FCC CFR Title 47, Part 15, Subpart C

ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc. (Shanghai)

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

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BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.



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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2404H025	R00	Original Report.	Jun. 20, 2024	Invalid
BTL-FCCP-1-2404H025	R01	Revised report to address TCB's comments.	Jun. 26, 2024	Valid



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C					
Standard(s) Section Test Item Test Result Judgment Re					
15.207	AC Power Line Conducted Emissions	APPENDIX A	N/A		
15.225(a)-(d) 15.205(a) 15.209(a)	Radiated Emission	APPENDIX B APPENDIX C	PASS		
15.225(e)	Frequency Tolerance	APPENDIX D	PASS		
15.203	Antenna Requirement		PASS	Note(2)	

Note:

- (1) "N/A" denotes test is not applicable in this test report
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.



1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China

BTL's Test Firm Registration Number for FCC: 964234

BTL's Designation Number for FCC: CN1374

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

A. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9 KHz~30 MHz	-	2.72
		30 MHz~200 MHz	V	4.4
SH-CB02	CISPR	30 MHz~200 MHz	Ι	3.16
		200 MHz~1,000 MHz	V	4.6
		200 MHz~1,000 MHz	Η	4.2

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Radiated Emissions-9kHz to 30MHz	22.9°C	56%	AC 120V/60Hz	Nicole Yan
Radiated Emissions-30MHz to 1000MHz	22.9°C	56%	AC 120V/60Hz	Nicole Yan
Frequency Tolerance	Normal & Extreme	39%	Normal & Extreme	Nicole Yan



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	NFC Moudle
Brand Name	N/A
Test Model	WLT7150
Series Model	N/A
Model Difference(s)	N/A
Software Version	V1.0
Hardware Version	V1.3
Power Source	DC power supply.
Power Rating	DC 3.3V
Operation Frequency	13.56 MHz
Antenna Type	Loop antenna
Field Strength	63.82dBuV/m
Max. E.I.R.P	-31.38 dBm

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Test Channel	Test Frequency (MHz)
01	13.56

3. For d=3m EIRP(dBm)=E(dB_{\(\psi\)}V / m)-95.2 EIRP=63.82-95.2=-31.38



2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX Mode_13.56MHz

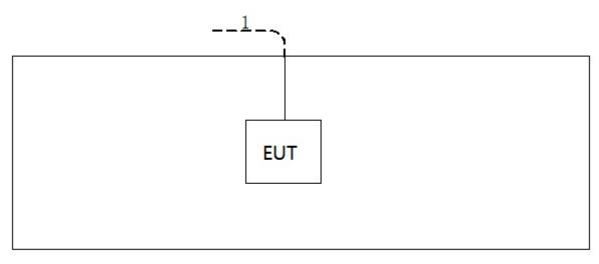
Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

Radiated emissions test - Below 1GHz		
Final Test Mode	Description	
Mode 1	TX Mode_13.56MHz	

Conducted test		
Final Test Mode	Description	
Mode 1	TX Mode_13.56MHz	



2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



Notebook A

2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
Α	Notebook	Dell	Inspiron 15-7559	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	RJ45 Cable	NO	NO	10m



3. RADIATED EMISSION

3.1 LIMIT

§15.225 (a)

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

§15.225 (b)

Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

§15.225 (c)

Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

§15.225 (d)

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

§15.209 (a)

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

- (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).



3.2 TEST PROCEDURE

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Spectrum Parameters	Setting	
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz	
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz	
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz	

Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

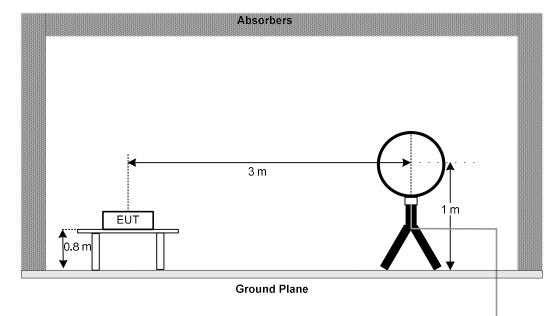
3.3 DEVIATION FROM TEST STANDARD

No deviation.



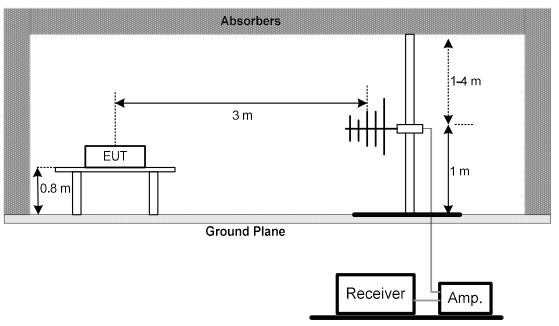
3.4 TEST SETUP

9 kHz to 30 MHz



30 MHz to 1000 MHz

Receiver







3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.6 TEST RESULTS - 9 kHz TO 30 MHz

Please refer to the APPENDIX A.

Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

3.7 TEST RESULTS - 30 MHz TO 1000 MHz

Please refer to the APPENDIX B.



4. FREQUENCY TOLERANCE

4.1 LIMIT

Section	Section Test Item	
FCC 15.225(e)	Frequency Tolerance	±1.356 kHz

4.2 TEST PROCEDURE

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of -20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

Please refer to the APPENDIX C.



5. BANDWIDTH

5.1 LIMIT

Section	Test Item
FCC Rule s2.1049	Bandwidth

5.2TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The bandwidth was performed in accordance with method 11.8.1 of ANSI C63.10-2013.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS

Please refer to the APPENDIX D.



5. MEASUREMENT INSTRUMENTS LIST

	Radiated Emissions - 9 kHz to 30 MHz						
Item	Item Kind of Equipment Manufacturer Type No. Serial No. Calibrat						
1	Loop Antenna	EMCI	EMCI LPA600	275	Mar. 12, 2025		
2	MXE EMI Receiver	Keysight	N9038A	MY56400088	Feb. 2, 2025		
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	N/A		
4	Pre-Amplifier	emci	EMC9135	980401	Feb. 2, 2025		

	Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Antenna	emci	VULB 9168	1467	Mar. 12, 2025	
2	Pre-Amplifier	emci	EMC9135	980401	Feb. 2, 2025	
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Feb. 2, 2025	
4	Test Cable	emci	EMC104-SM-SM-7 000	181020	May 21, 2024	
5	Test Cable	emci	EMC104-SM-SM-2 500	170618	May 21, 2024	
6	Test Cable	emci	RWP50-4.6A-SMS M-1M	20200928 002	May 21, 2024	
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	N/A	
8	Wideband Radio Communication Test	R&S	CMW500	129246	Jul. 21, 2024	

	Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Antenna	emci	VULB 9168	1467	Mar. 12, 2025	
2	Pre-Amplifier	emci	EMC9135	980401	Feb. 2, 2025	
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Feb. 2, 2025	
4	Test Cable	emci	EMC104-SM-NM-7 000	170330	May 31, 2025	
5	Test Cable	emci	EMC104-SM-SM-2 500	170618	May 31, 2025	
6	Test Cable	emci	RWP50-4.6A-SMS M-1M	20200928 002	May 31, 2025	
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	Mar. 12, 2025	
8	Wideband Radio Communication Test	R&S	CMW500	129246	Jul. 21, 2024	



	Frequency Tolerance							
Item	Item Kind of Equipment Manufacturer Type No. Serial No. Calibrated until							
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Jul. 23, 2024			
2	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Jul. 23, 2024			

	Bandwidth						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Jul. 21, 2024		

Remark "N/A" denotes no model name, serial no. or calibration specified.

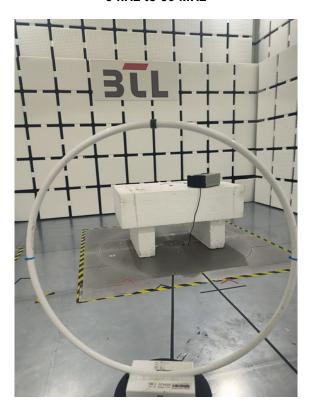
All calibration period of equipment list is one year.



6. EUT TEST PHOTO

Radiated Emissions Test Photos

9 kHz to 30 MHz







Radiated Emissions Test Photos

30 MHz to 1000 MHz

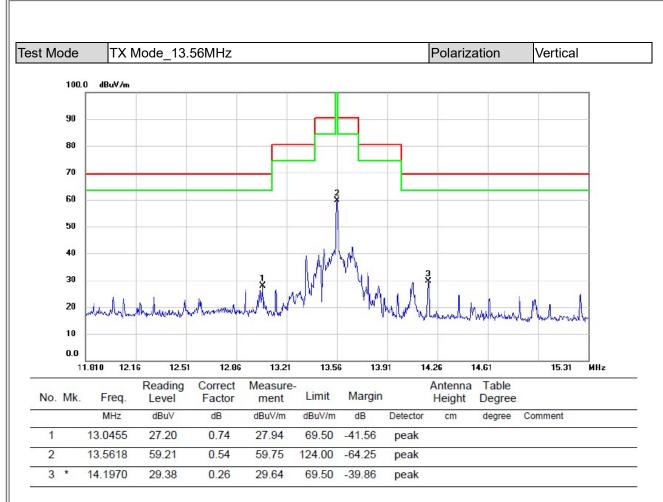




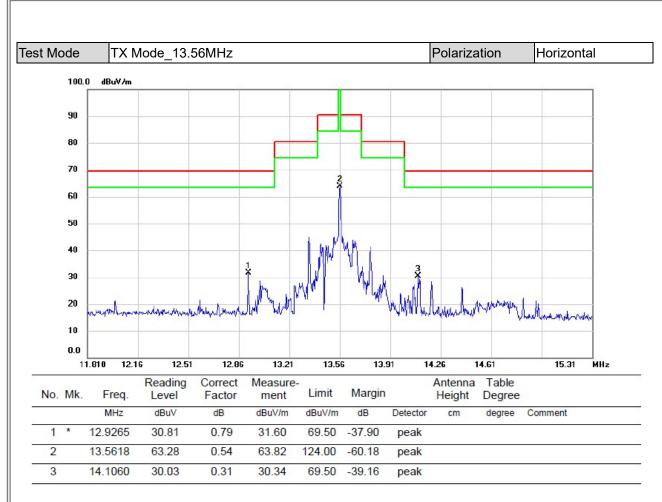


APPENDIX A - RADIATED EMISSION - 9 KHZ TO 30 MHZ

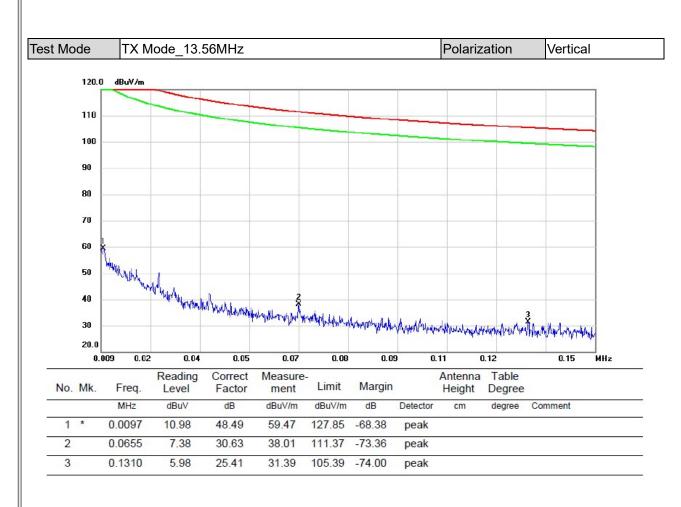






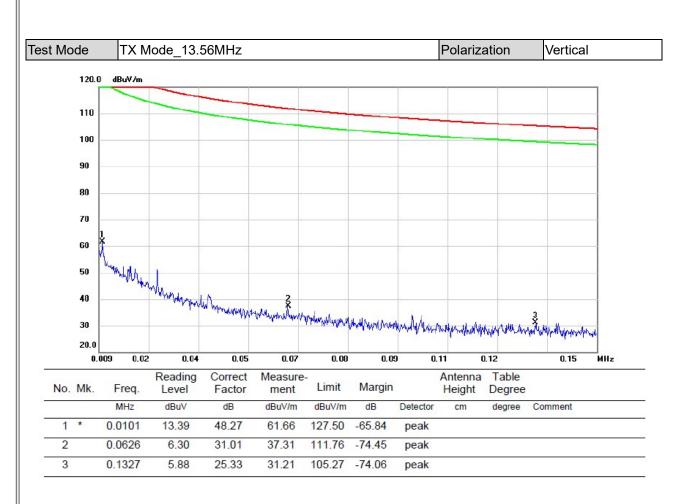






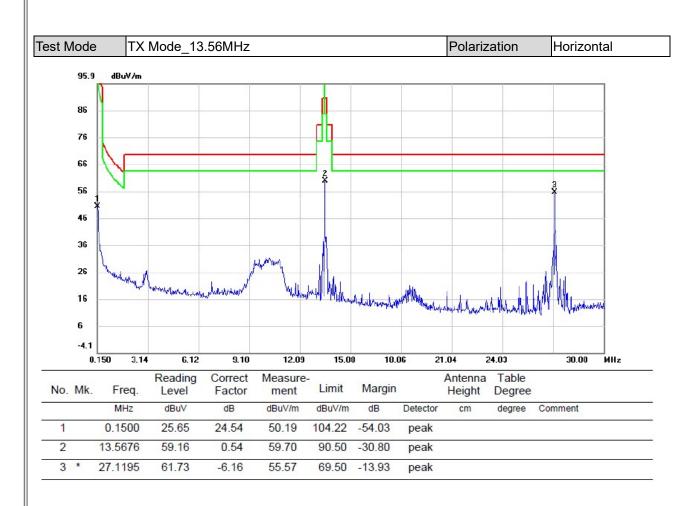
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.
- (3)The measurement points between 9-90 kHz, 110-490 KHz satisfy the peak limit and can also satisfy the AVG limit.





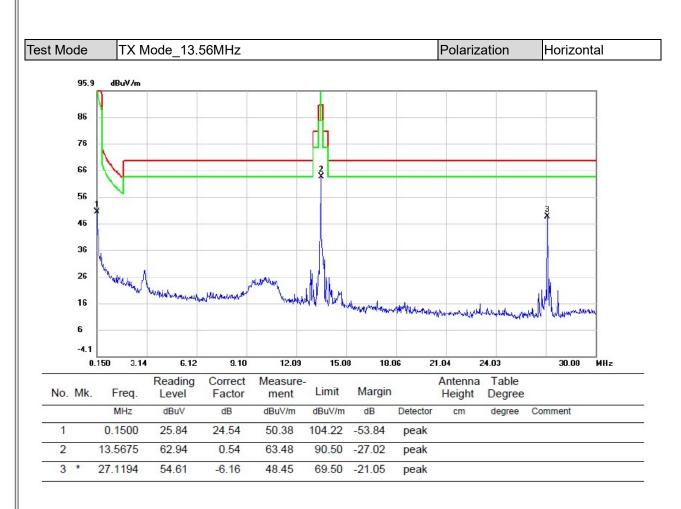
- (1) Measurement Value = Reading Level + Correct Factor.
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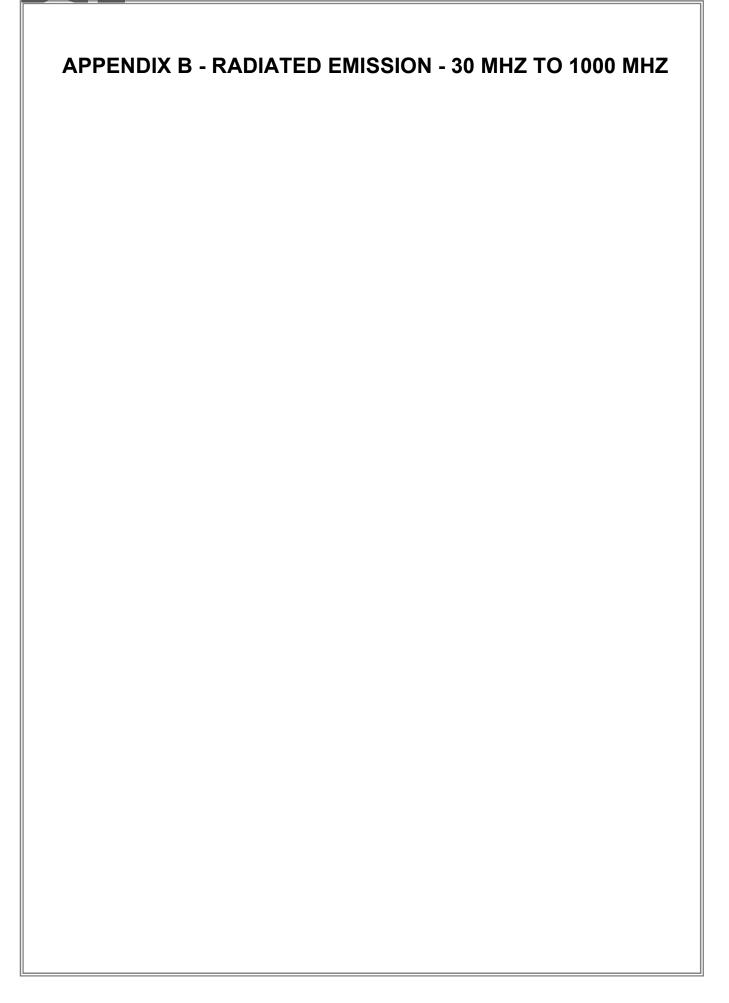
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.
- (3)The measurement points between 9-90 kHz, 110-490 KHz satisfy the peak limit and can also satisfy the AVG limit



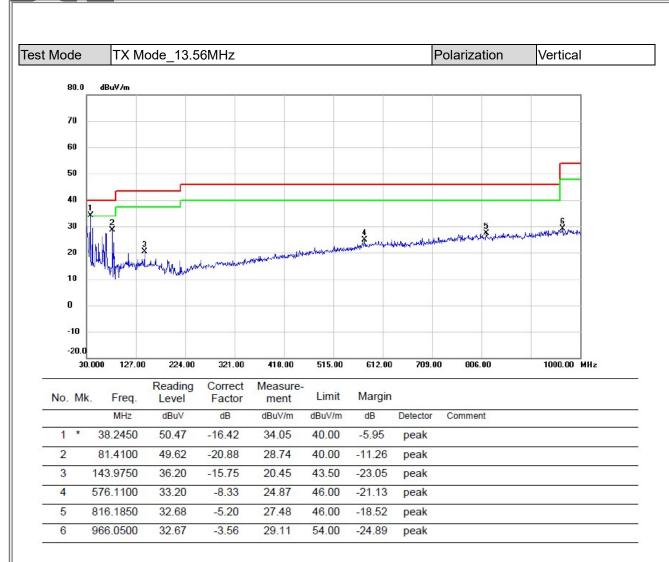


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.
- (3)The measurement points between 9-90 kHz, 110-490 KHz satisfy the peak limit and can also satisfy the AVG limit.



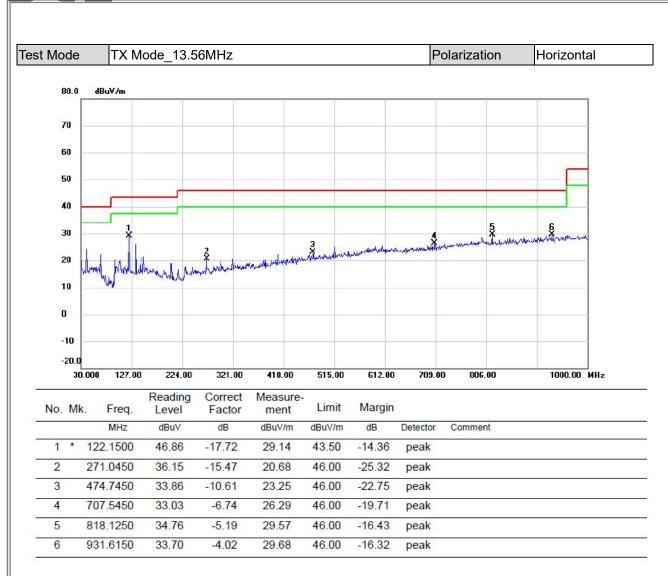






- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX C - FREQUENCY TOLERANCE



Test Mode TX Mode_13.56MHz

		Fre	equency Tole	rance Versus Envi	ronmental Temp	erature	
	Tempei (°C		Voltage (V)	Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result
	20)	3.3	13.561282	1.282	+/- 1.356	PASS
0 min	85	j	3.3	13.561282	1.282	+/- 1.356	PASS
	-30)	3.3	13.561121	1.121	+/- 1.356	PASS
2 min	85	j	3.3	13.561282	1.282	+/- 1.356	PASS
	-30)	3.3	13.561121	1.121	+/- 1.356	PASS
5 min	85	;	3.3	13.561282	1.282	+/- 1.356	PASS
	-30)	3.3	13.561121	1.121	+/- 1.356	PASS
10 min	85	;	3.3	13.561282	1.282	+/- 1.356	PASS
	-30)	3.3	13.561121	1.121	+/- 1.356	PASS
			Frequen	cy Tolerance Versi	us Input Voltage		
Temperature Voltage (°C) (V)		Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result		
2	0	V nom	3.3	13.561282	1.282	+/- 1.356	PASS
2	0	V min	1.7	13.561282	1.282	+/- 1.356	PASS
2	0	V _{max}	3.6	13.561282	1.282	+/- 1.356	PASS

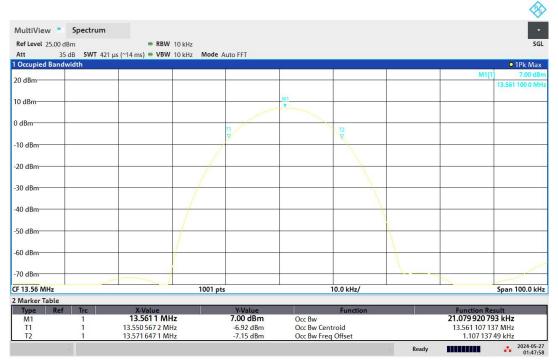


APPENDIX D - BANDWIDTH



Test Mode

Frequency	99% Bandwidth
(MHz)	(MHz)
13.56	0.021



01:47:59 AM 05/27/2024

End of Test Report