







Prüfbericht-Nr.: Auftrags-Nr.: CN232F2W (P15C-Seite 1 von 22 48219940 Order no .: Page 1 of 22 915MHz) 001 Test report no.: Kunden-Referenz-Nr.: N/A Auftragsdatum: 2023-05-31 Order date: Client reference no.: Auftraggeber: Condoplex Monitoring Systems Inc Client: 75 Horner Avenue Unit #7 Etobicoke. ON. M8Z 4X5 CANADA Prüfgegenstand: Transmitter Test item: Bezeichnung / Typ-Nr.: CD915TX Identification / Type no.: Auftrags-Inhalt: FCC Part 15C Test report(915MHz) Order content: Prüfgrundlage: Test specification: FCC 47CFR Part 15: Subpart C Section 15.249 Wareneingangsdatum: 2023-06-05 Date of sample receipt: Prüfmuster-Nr.: A003489228-002 Test sample no: Prüfzeitraum: 2023-06-17 - 2023-06-19 Testing period: Ort der Prüfung: EMC/RF Taipei Testing Site Place of testing: Prüflaboratorium: Taipei Testing Laboratories Testing laboratory: Prüfergebnis*: Pass Test result*: zusammengestellt von: genehmigt von: reviewed by: authorized by: Breila CL Ethan Shao Ausstellungsdatum: Datum: Date: 2023-06-21 Issue date: 2023-06-21 Brenda Chen **Stellung** / Position: Assistant Project Engineer Stellung / Position: Senior Project Manager Sonstiges / Other: Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt Condition of the test item at delivery: Test item complete and undamaged * Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet 2 = good3 = satisfactory 4 = sufficient 5 = poor* Legend: 1 = very goodP(ass) = passed a.m. test specification(s)N/A = not applicable F(ail) = failed a.m. test specification(s) N/T = not tested

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

This test report only relates to the a.m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.



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TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.203	Antenna Requirement	Pass
5.1.2	15.215	20 dB bandwidth	Pass
5.1.3	15.249 (a)	Field Strength of Fundamental Emissions	Pass
5.1.4	15.249 (d)	Radiated Spurious Emissions	Pass
-	15.207	Mains Conducted Emission	Not Applicable

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.



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HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
CN232F2W (P15C-915MHz) 001	Original Release	2023-06-21



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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A - Test Result of Radiated Spurious Emissions

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio

FCC 47CFR Part 15: Subpart C Section 15.249 ANSI C63.10:2013

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.



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2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist. Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,

New Taipei City 244 Taiwan (R.O.C.)

FCC Registration No.: 180491 ISED Registration No.: 25563



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2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

All measurement uncertainty values are shown with a coverage factor of k=2 to indicate a 95% level of confidence.

Emission Measurement Uncertainty

Parameter	Uncertainty
Radiated Emission (9 kHz ~ 30 MHz)	± 1.15 dB
Radiated Emission (30 MHz ~ 200 MHz)	± 1.30 dB
Radiated Emission (200 MHz ~ 1 GHz)	± 1.30 dB
Radiated Emission (1 GHz ~ 18 GHz)	± 1.54 dB
Radiated Emission (18 GHz ~ 40 GHz)	± 2.52 dB
Mains Conducted Emission	± 1.65 dB



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3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Transmitter working at 915MHz with SRD function. For details refer to the User Guide, Data Sheet and Circuit Diagram.

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	Transmitter
Type Identification	CD915TX
FCC ID	ZJM-CD915TX

Technical Specification of EUT

Item	EUT information
Operating Frequency	915 MHz
Operation Voltage	3Vdc
Modulation	FSK
Antenna Information	Refer to 5.1.1
Accessory Device	Refer to 4.3



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3.2 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.3 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description



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4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: The EUT has a modified firmware, which makes it possible to continuous transmit when active by magnet.

The samples were used as follows:

A003489228-002

Full test was applied on all test modes, but only worst case was shown.

EUT	Applicable To				
Configure Mode	20 dB Bandwidth	Field Strength of Fundamental Emissions	Radiated Spurious Emissions	Mains Conducted Emission	Description
-	V	V	V	=	=

Note:

- 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on X-plane.
- 2. "-" means no effect.

20 dB Bandwidth

Pre-Scan full test was applied on all test modes, but only worst case was shown.

Following channel(s) was (were) selected for the final test as listed below.

	(11010) 001001001001001001001001001001001001001	2.2/ 22.22.23.23		
EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)		
=	915	915		

Field Strength of Fundamental Emissions

Pre-Scan full test was applied on all test modes, but only worst case was shown.

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)	
-	915	915	

Radiated Spurious Emission

Pre-Scan full test was applied on all test modes, but only worst case was shown.

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)	
-	915	915	

Test Condition

1001 CONTRACTOR			
Test Item	Ambient Temperature	Relative Humidity	Tested by
20 dB bandwidth	23.7-24.6 °C	52-55 %	Ray Huang
Field Strength of Fundamental Emissions	23.7-24.6 °C	52-55 %	Ray Huang
Radiated Spurious Emissions	23.7-24.6 °C	52-55 %	Ray Huang



Prüfbericht - Produkte

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4.3 Special Ac	ccessories and Auxiliary Equipment	
The product has been te	ested together with the following additional accessories:	
Accessory of EUT		
None.		
Support Unit		
None.		
4.4 Test Setu <radiated er<="" p="" spurious=""></radiated>		



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5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the antenna information is as listed below. The antenna is with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Brand Name	Model No.	Antenna Type
Nutek Corpation.	ITXA_Antenna	PCB Loop Antenna

Refer to EUT photo for details.



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5.1.2 20 dB Bandwidth

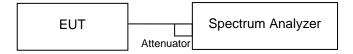
Limit

According to 15.215, for the intentional radiators have to ensure that the 20dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated.

Kind of Test Site

Shielded room

Test Setup



Test Instruments

Kind of	Manufacturer	Tuno	S/N	Calibration	Calibration	Test Date	
Equipment	Manufacturer	Туре	3/IN	Date	Due Date	From	Until
Signal Analyzer	R&S	FSV40	101509	2023/4/26	2024/4/24	2023/6/19	2023/6/19

Test Procedure

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.
- e. The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

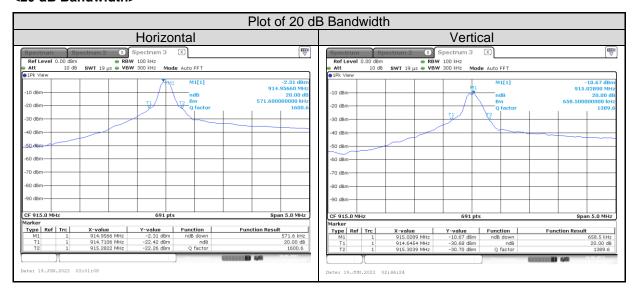


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Test Results

<20 dB Bandwidth>





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5.1.3 Field Strength of Fundamental Emissions

Limit

The field strength of emissions from intentional radiators operated within these frequency bands shall

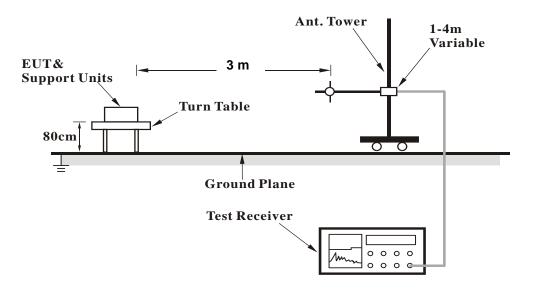
comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meters)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

Kind of Test Site

3m Semi-Anechoic Chamber

Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).



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Test Instruments

Test Date: 2023/6/17

Kind of Equipment	Manufacturer	Туре	S/N	Calibration Date	Calibration Due Date	
	Above 1GHz					
Signal Analyzer	R&S	FSV40	101509	2023/4/26	2024/4/24	
Horn Antenna	ETS-Lindgren	3117	00218929	2022/11/17	2023/11/16	
Horn Antenna	SCHWARZBECK	BBHA 9170	00890	2023/5/4	2024/5/2	
	30MHz ~ 1GHz					
Receiver	R&S	ESR7	102109	2023/2/24	2024/2/23	
Bilog Antenna	SCHWARZBECK	VULB-9168	00951	2023/3/31	2024/3/29	
LF-AMP	Agilent	8447D	2944A107722	2023/3/22	2024/3/20	
Below 30MHz						
Receiver	R&S	ESR7	102109	2023/2/24	2024/2/23	
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2023/1/4	2024/1/3	



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Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) or 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
- 3. All modes of operation were investigated and the worst-case emissions are reported.
- 4. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.
- 5. The emission levels of other frequencies (including the 10th harmonic of the highest fundamental frequency) are very lower than the limit and are not shown in the test report.

Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Please refer to Appendix A.



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5.1.4 Radiated Spurious Emissions

Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation.

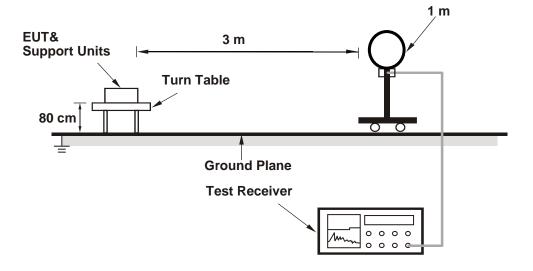
Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Kind of Test Site

3m Semi-Anechoic Chamber

Test Setup

<Radiated Emissions below 30 MHz>

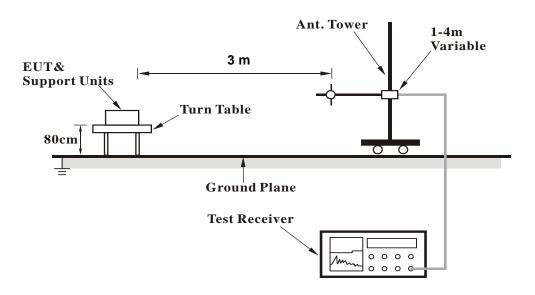




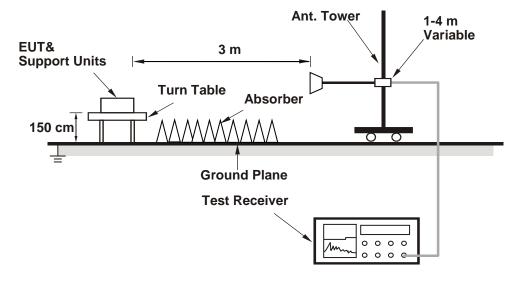
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<Radiated Emissions 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments

Please refer to 5.1.3 Instruments



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Test Procedures

For Radiated Emissions below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency are 9-90 kHz, 110-490 kHz and above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.
- 2. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated Emissions above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
- 3. All modes of operation were investigated and the worst-case emissions are reported.
- 4. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.



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5. The emission levels of other frequencies (including the 10th harmonic of the highest fundamental frequency) are very lower than the limit and are not shown in the test report.

Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

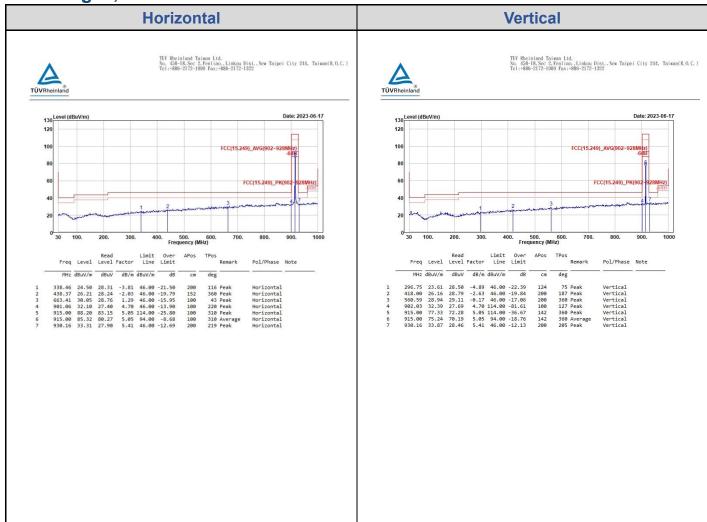
Please refer to Appendix A.

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Appendix A: Test Results of Radiated Spurious Emissions

Band Edges, 915MHz

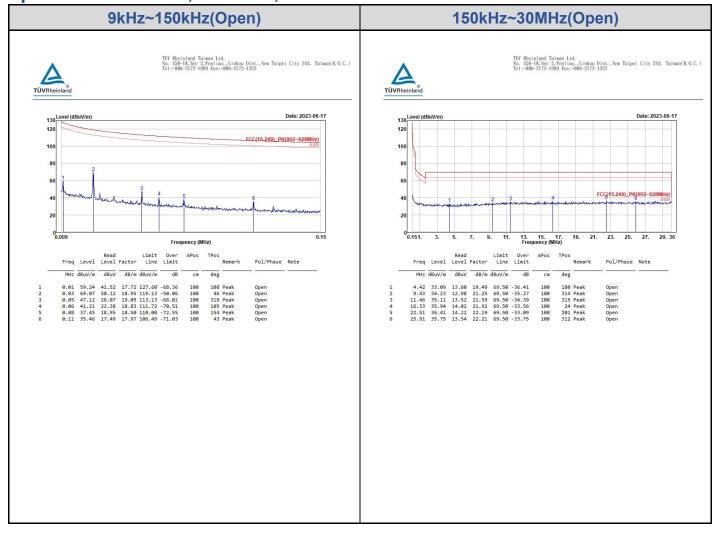




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Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

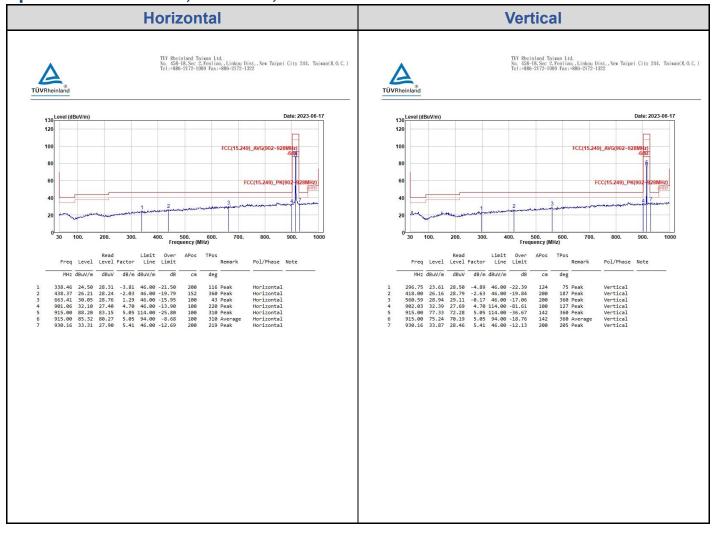




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Spurious Emissions, Tx Mode, 30MHz ~ 1GHz





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Spurious Emissions, Tx Mode, 1GHz ~ 10GHz

