

Project No: TM-2607000368P
Report No.: TMWK2607003439KR

FCC ID: ELVNTZB

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FCC RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.249
Product name	Transmitter
Brand Name	EXCALIBUR
Model No.	1419
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10-2020 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Sehni, Hu

Sehni Hu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 13, 2026	Initial Issue	ALL	Peggy Tsai



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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Nutek Corporation No.167, Lane 235, Bauchiau Rd., Xindian District, New Taipei City, 23145, Taiwan
Manufacturer	Nutek Corporation No.167, Lane 235, Bauchiau Rd., Xindian District, New Taipei City, 23145, Taiwan
Equipment	Transmitter
Model Name	1419
Model Discrepancy	N/A
Brand Name	EXCALIBUR
Received Date	July 22, 2026
Date of Test	August 3 ~ September 18, 2026
Power Operation	Power by Battery (DC 3V) Brand / Model: Panasonic / CR2032

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.



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1.2 EUT CHANNEL INFORMATION

Frequency Range	909.366 MHz
Modulation Type	FSK
Number of channels	1 Channel

1.3 ANTENNA INFORMATION

Antenna Type	☐ CHIP ☐ PCB ☐ Dipole ☒ PCB Trace Antenna
Antenna Brand / Model	Brand: Nutek Corporation Model: ETZB
Antenna Gain	Gain: 0 dBi
Antenna Connector	N/A

Notes:

1.The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.



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1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	±2.654dB
Channel Bandwidth	±0.216dB
Radiated Emission_9kHz-30MHz	±2.998dB
Radiated Emission_30MHz-200MHz	±3.308dB
Radiated Emission_200MHz-1GHz	±3.506dB
Radiated Emission_1GHz-6GHz	±4.068dB
Radiated Emission_6GHz-18GHz	±4.120dB
Radiated Emission_18GHz-26GHz	±3.411dB
Radiated Emission_26GHz-40GHz	±3.410dB

Remark:

- 1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	-	Not applicable, because EUT doesn't connect to AC Main Source direct.
Radiation	Tony Chao	-
RF Conducted	Jerry Chang	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309.



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1.6 INSTRUMENT CALIBRATION

Conducted_FCC/IC/NCC (All)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
PXA Signal Analyzer	Keysight	N9030B	MY62291089	2026-09-15	2027-09-14
Software	N/A				

966A_Radiated					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	Agilent	N9010A	MY52220817	2026-03-13	2027-03-12
Active Loop Antenna	COM-POWER	AL-130	121051	2026-02-04	2027-02-03
Thermo-Hygro Meter	HTC	HTC-1	HTC-D06	2026-05-19	2027-05-18
Bi-Log Antenna	Sunol Sciences	JB3	A030105&532	2026-06-18	2027-06-17
Preamplifier	EMEC	EM330	060609	2026-02-13	2027-02-12
Cable	Huber+Suhner	104PEA	20995+21000+182330	2025-08-06 2026-08-05	2026-08-05 2027-08-04
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2025-12-19	2026-12-18
Preamplifier	HP	8449B	3008A00965	2025-12-17	2026-12-16
Cable	EMCI	EMC101G	150S0193+230206+24121740_20260903	2025-09-04 2026-09-03	2026-09-03 2027-09-02
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Software	e3 V9-210616c				

Remark:

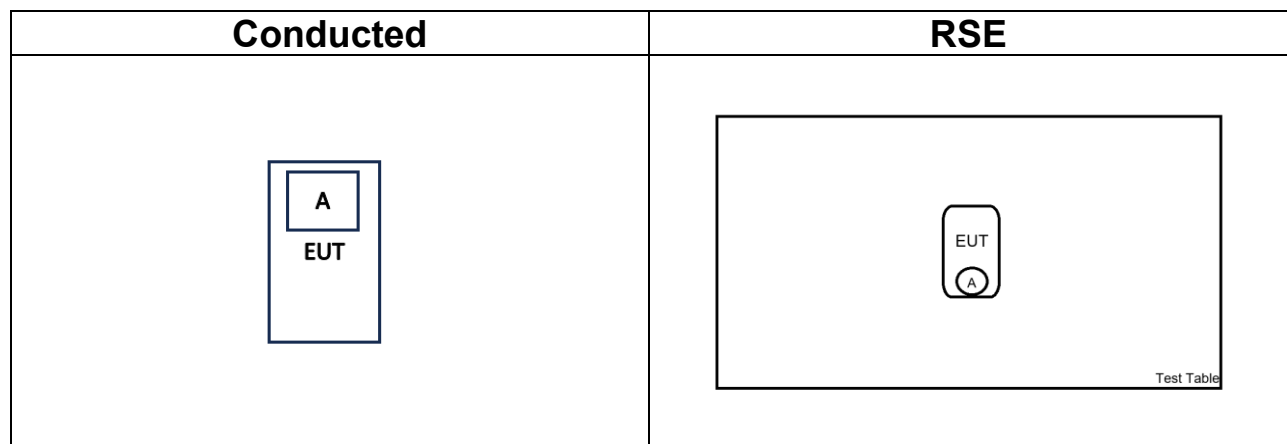
1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

Support Equipment (Conducted & Radiated)					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment (Conducted & Radiated)					
No.	Equipment	Brand	Model	Series No.	FCC ID
A	Battery	Panasonic	CR2032	N/A	N/A

1.8 TEST SET UP DIAGRAM



1.9 TEST PROGRAM

This EUT power on and power to allow the sample to continuously transmit.

1.10 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10-2020, FCC Part 15.249.



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2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	N/A
15.215	4.2	20dB Bandwidth and Occupied Bandwidth (99%)	Pass
15.249(a)	4.3	Filed strength of fundamental	Pass
15.249(a)	4.3	Radiation Spurious Emission	Pass



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3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Battery
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Battery
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. The EUT was pre-scanned in three planes (H, E1, and E2) with two polarizations for radiated emission measurements. The worst-case condition was identified in the H-plane and recorded in this report.



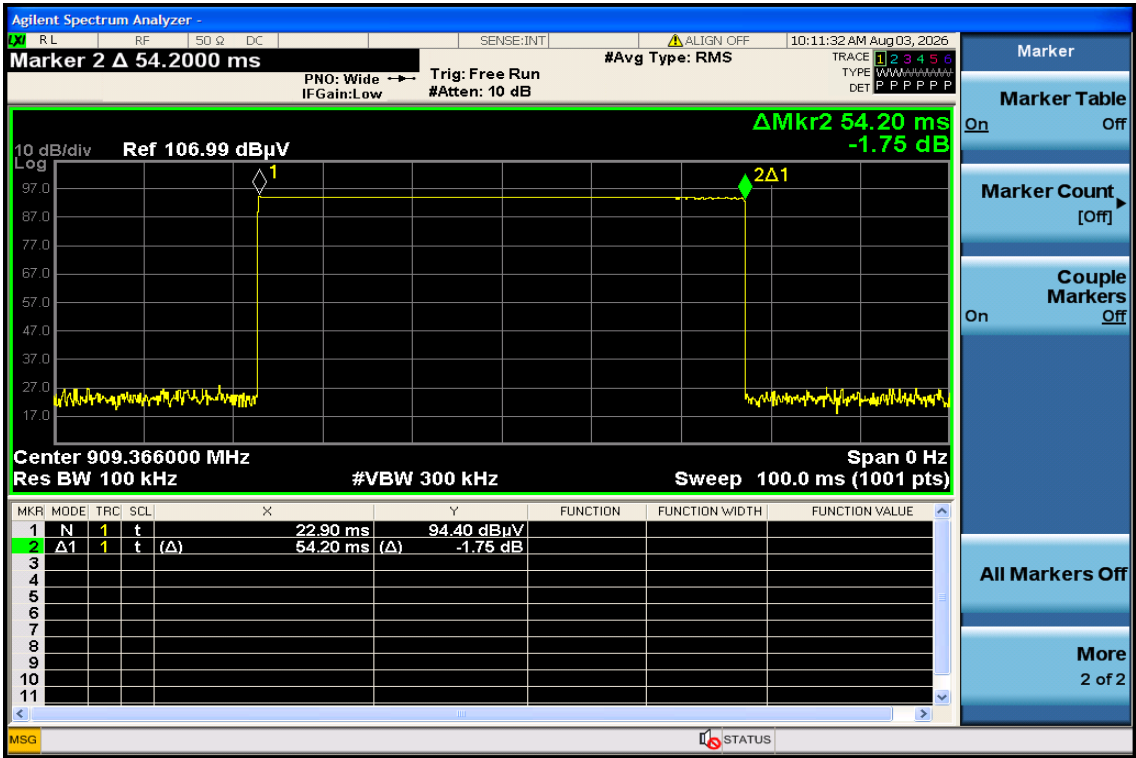
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3.2 EUT DUTY CYCLE

Temperature: 22.4 ~ 25.5°C Test date: August 3 ~ September 9, 2026
Humidity: 53 ~ 64% RH Tested by: Tony Chao

20log(D)			
Time On(ms)	Time On+Off(ms)	Duty cycle	20log(D)
54.2	100	0.542	-5.32



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

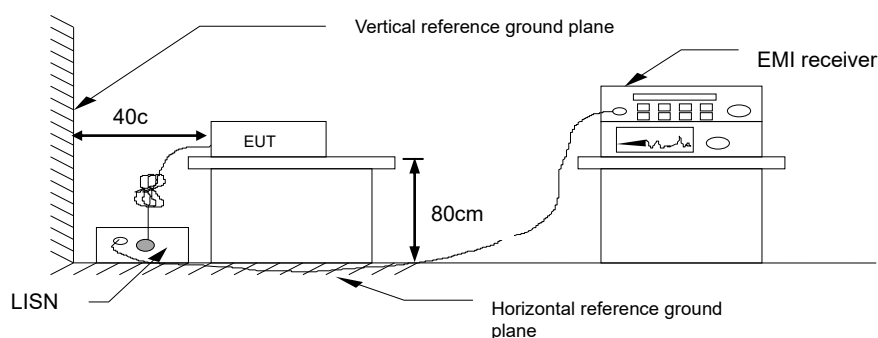
Frequency Range (MHz)	Limits(dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

Not applicable, because EUT not connect to AC Main Source direct.

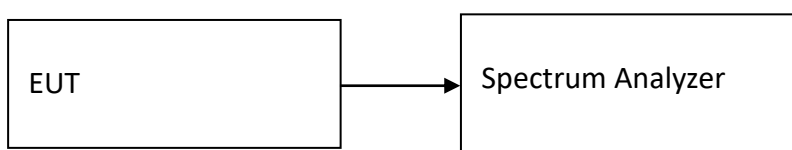
4.2 20dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

LIMIT

20 dB Bandwidth : For reporting purposes only.

Occupied Bandwidth(99%) : For reporting purposes only.

Test Configuration



TEST PROCEDURE

Test method Refer as ANSI C63.10-2020,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 10kHz and Detector = Peak, to measurement 20 dB Bandwidth.
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
5. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.



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TEST RESULTS

Compliance.

Temperature:	24.2°C	Test date:	September 18, 2026
Humidity:	59% RH	Tested by:	Jerry Chang

Frequency (MHz)	Occupied Bandwidth 99% (MHz)	20 dB Bandwidth (MHz)
909.366	0.069	0.068



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Test Plot
20dB Bandwidth & BANDWIDTH (99%)



4.3 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION

4.3.1 Test Limit

According to §15.249(a)

(1) 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/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

* Field strength limits are specified at a distance of 3 meters

Fundamental Limit Conversion		
Average (mV/m) at 3M	Average (dBuV/m) at 3M	Peak (dBuV/m) at 3M
50	93.98	113.98

Harmonic Limit Conversion		
Average (uV/m) at 3M	Average (dBuV/m) at 3M	Peak (dBuV/m) at 1M
500	53.97	73.97

*(Limit=20LOG(500)=53.79 dBuV/m)



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(2) 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 in §15.209(follow the table), whichever is the lesser attenuation

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	30
1.705-30 MHz	30	30

Above 30 MHz

Frequency	Field Strength (microvolts/m)	Measurement Distance (metres)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

4.3.2 Test Procedure

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m high and below 1 GHz is 0.8m high above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
 - (1) Peak:
 - Below 1GHz: RBW=100kHz / VBW=300kHz / Sweep=AUTO
 - Above 1GHz: RBW=1MHz / VBW=3MHz / Sweep=AUTO
 - (2) Average:
 - Below 1GHz: RBW=100kHz, and consider the duty cycle factor
(pulsed operation is employed)
 - Above 1GHz: RBW=1MHz, and consider the duty cycle factor.
(pulsed operation is employed)
7. Repeat above procedures until the measurements for all frequencies are complete.
8. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant.

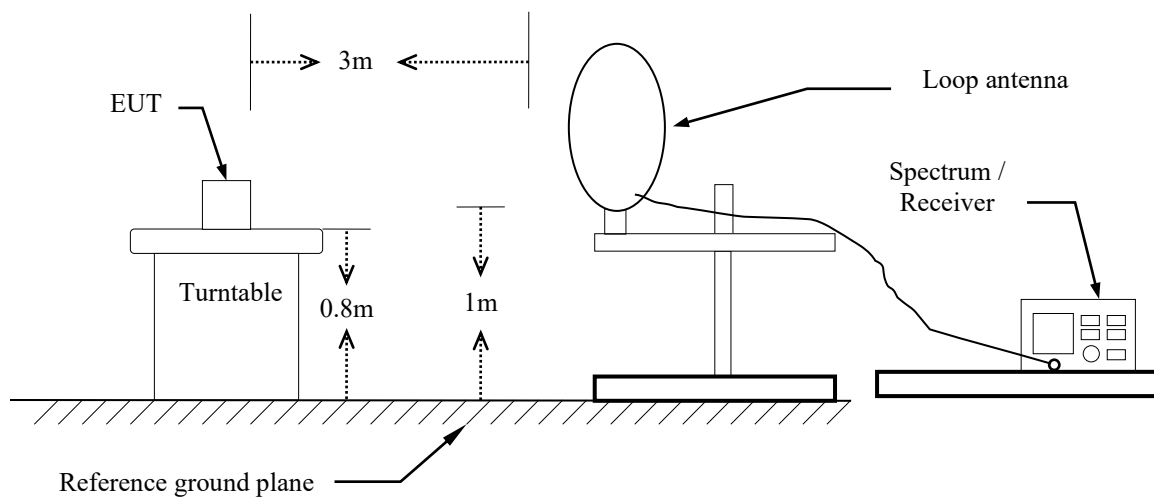
Note: We checked every harmonics frequencies from Fundamental frequencies with reduced VBW, and we mark a point to prove pass or not if we find any emission. For this case, there are no emissions hidden in the noise floor.

Remark:

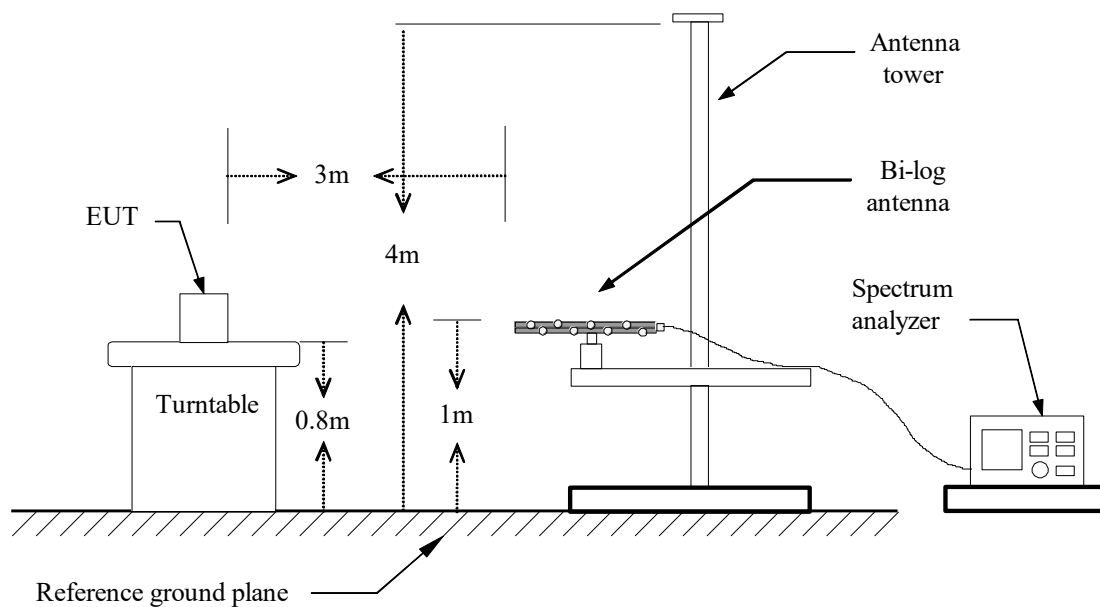
1. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 4147880.
2. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

4.3.3 Test Setup

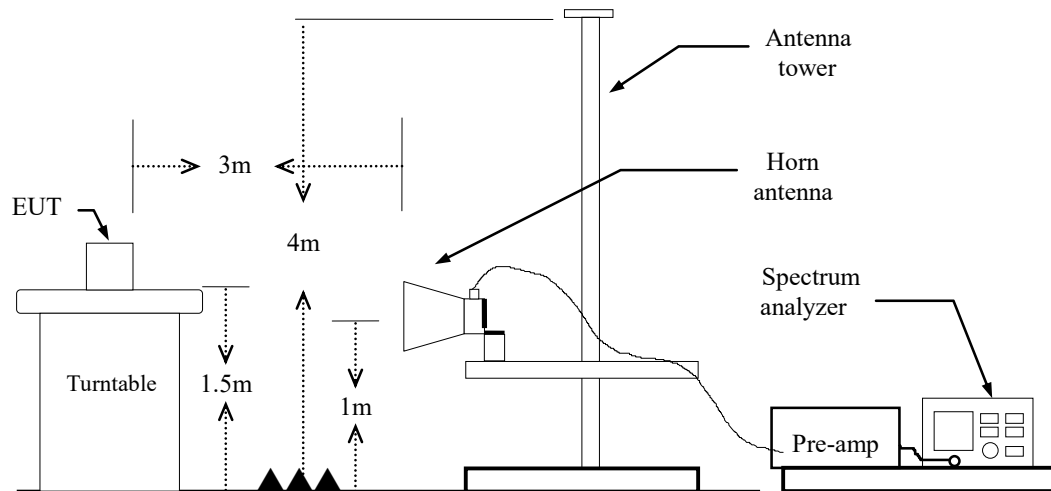
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz





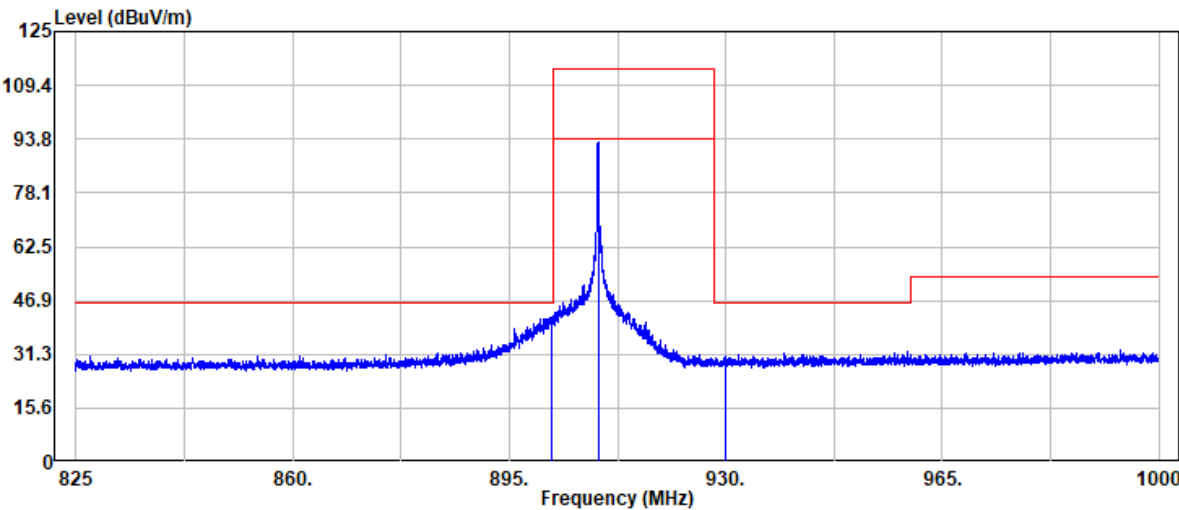
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4.3.4 Test Result

Main Test Data

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Operation Band	: 900 M	Temp./Humi.	: 25.5/54
Frequency	: 909.366 MHz	Antenna Pol.	: VERTICAL
Operation Mode	: Main	Engineer	: Tony.Chao
EUT Pol	: H	Test Chamber	: 966A
Setting	:		



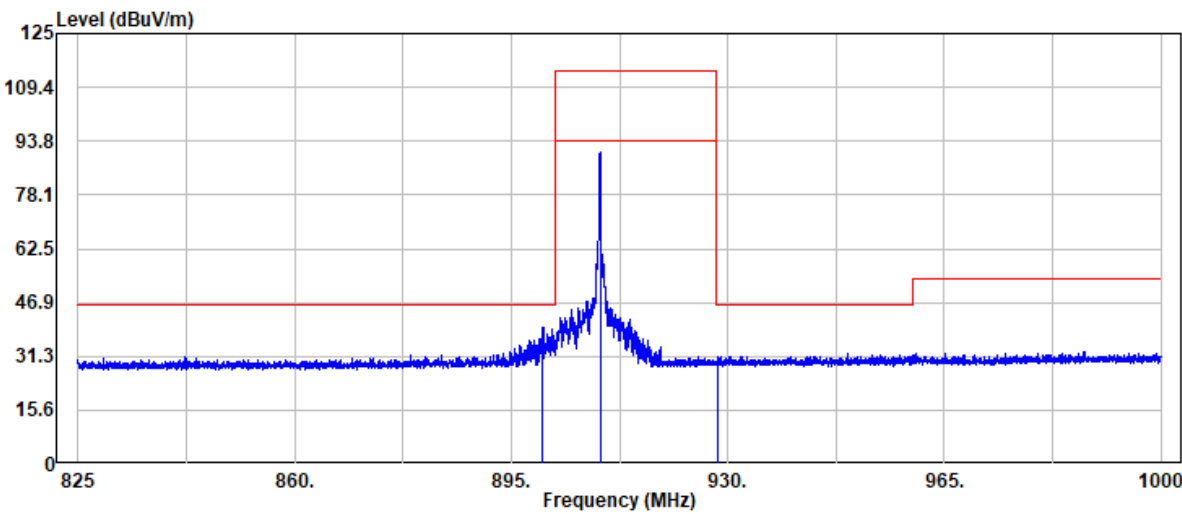
Freq	Read		Actual	Limit		Detector
-----	Level	Factor	FS	@3m	Margin	Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
901.76	40.67	1.54	42.21	46.00	-3.79	Peak
909.37	91.55	1.52	93.07	114.00	-20.93	Peak
909.37	93.07	-5.32	87.75	94.00	-6.25	Average
929.89	28.73	1.88	30.61	46.00	-15.39	Peak



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Project No	: TM-2607000368P	Test Date	: 2026-09-09
Operation Band	: 900 M	Temp./Humi.	: 25.5/54
Frequency	: 909.366 MHz	Antenna Pol.	: HORIZONTAL
Operation Mode	: Main	Engineer	: Tony.Chao
EUT Pol	: H	Test Chamber	: 966A
Setting	:		



Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
900.14	38.24	1.55	39.79	46.00	-6.21	Peak
909.37	88.90	1.52	90.42	114.00	-23.58	Peak
909.37	90.42	-5.32	85.10	94.00	-8.90	Average
928.43	29.09	1.86	30.95	46.00	-15.05	Peak

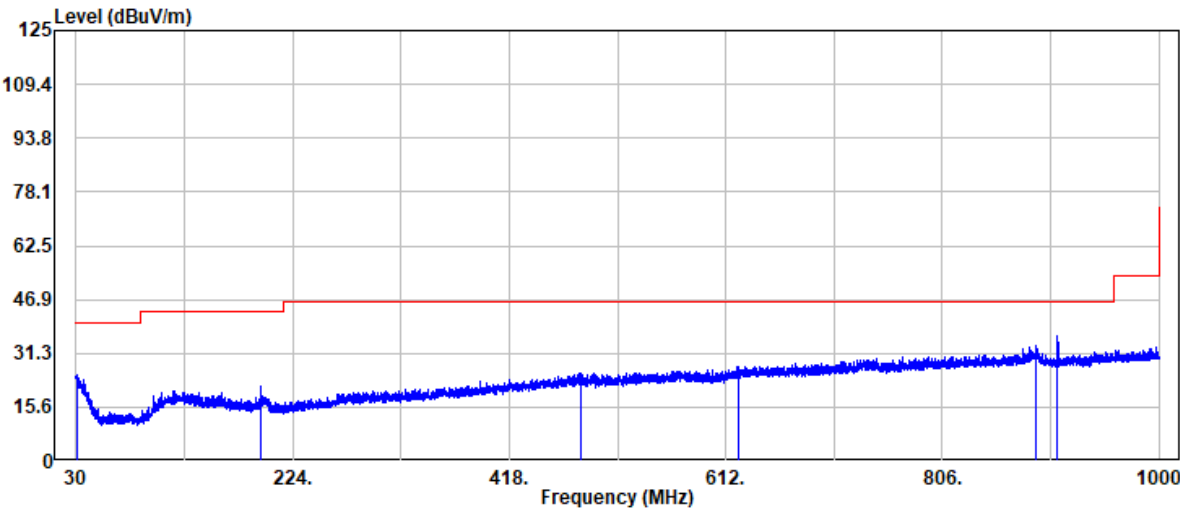


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TX Test Data

Project No	: TM-2607000368P	Test Date	: 2026-09-09
Operation Band	: 900 M	Temp./Humi.	: 25.5/54
Frequency	: 909.366 MHz	Antenna Pol.	: VERTICAL
Operation Mode	: TX	Engineer	: Tony.Chao
EUT Pol	: H	Test Chamber	: 966A
Setting	:		



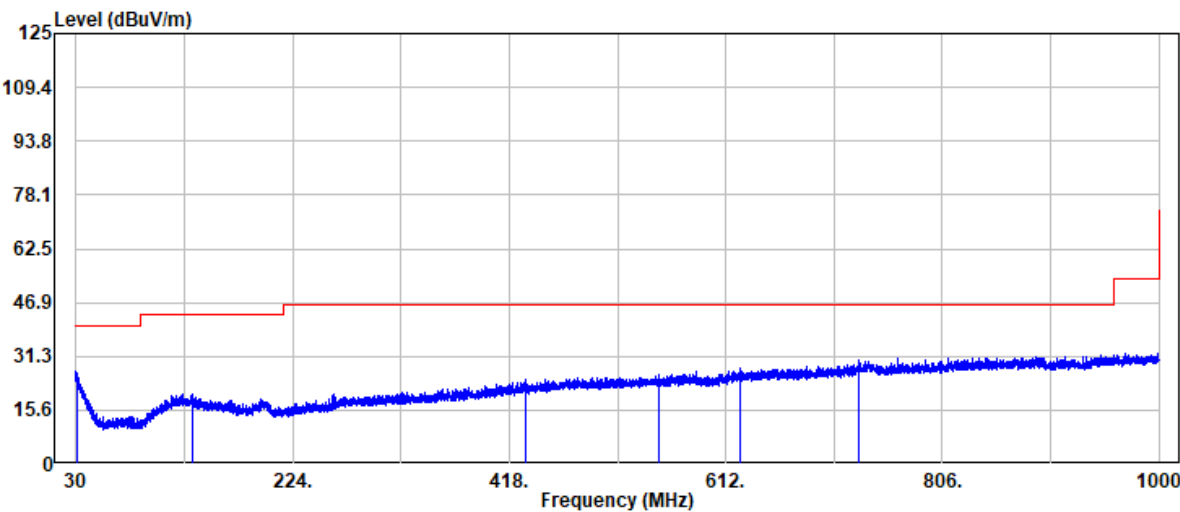
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
30.50	27.96	-3.03	24.93	40.00	-15.07	Peak
195.60	32.73	-10.87	21.86	43.50	-21.64	Peak
482.20	30.01	-4.41	25.60	46.00	-20.40	Peak
623.00	29.63	-2.15	27.48	46.00	-18.52	Peak
890.50	32.04	1.44	33.48	46.00	-12.52	Peak
909.40	34.67	1.52	36.19	46.00	-9.81	Peak



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Operation Band	: 900 M	Temp./Humi.	: 25.5/54
Frequency	: 909.366 MHz	Antenna Pol.	: HORIZONTAL
Operation Mode	: TX	Engineer	: Tony.Chao
EUT Pol	: H	Test Chamber	: 966A
Setting	:		



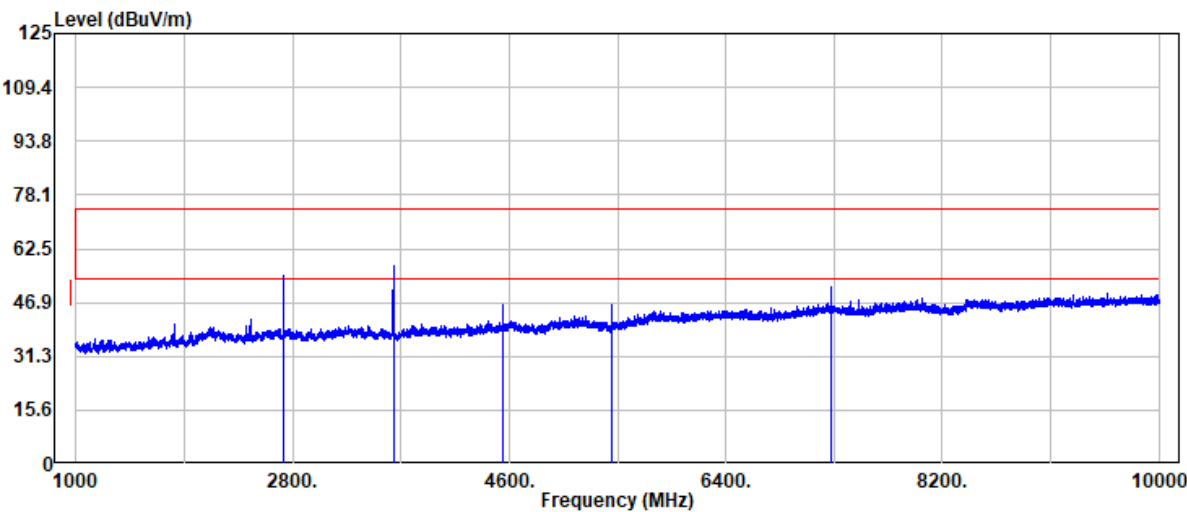
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
31.10	29.72	-3.39	26.33	40.00	-13.67	Peak
133.70	30.41	-9.95	20.46	43.50	-23.04	Peak
432.40	30.45	-5.82	24.63	46.00	-21.37	Peak
551.70	29.47	-3.65	25.82	46.00	-20.18	Peak
625.10	29.69	-2.07	27.62	46.00	-18.38	Peak
731.40	30.96	-0.62	30.34	46.00	-15.66	Peak



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Project No	: TM-2607000368P	Test Date	: 2026-09-07
Operation Band	: 900 M	Temp./Humi.	: 25.4/53
Frequency	: 909.366 MHz	Antenna Pol.	: VERTICAL
Operation Mode	: TX	Engineer	: Tony.Chao
EUT Pol	: H	Test Chamber	: 966A
Setting	:		



Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2728.10	56.78	-1.98	54.80	74.00	-19.20	Peak
2728.10	54.80	-5.32	49.48	54.00	-4.52	Average
3637.46	57.87	-0.48	57.39	74.00	-16.61	Peak
3637.46	57.39	-5.32	52.07	54.00	-1.93	Average
4546.83	43.26	2.99	46.25	74.00	-27.75	Peak
4546.83	46.25	-5.32	40.93	54.00	-13.07	Average
5456.20	41.49	4.52	46.01	74.00	-27.99	Peak
5456.20	46.01	-5.32	40.69	54.00	-13.31	Average
7274.93	41.85	9.67	51.52	74.00	-22.48	Peak
7274.93	51.52	-5.32	46.20	54.00	-7.80	Average

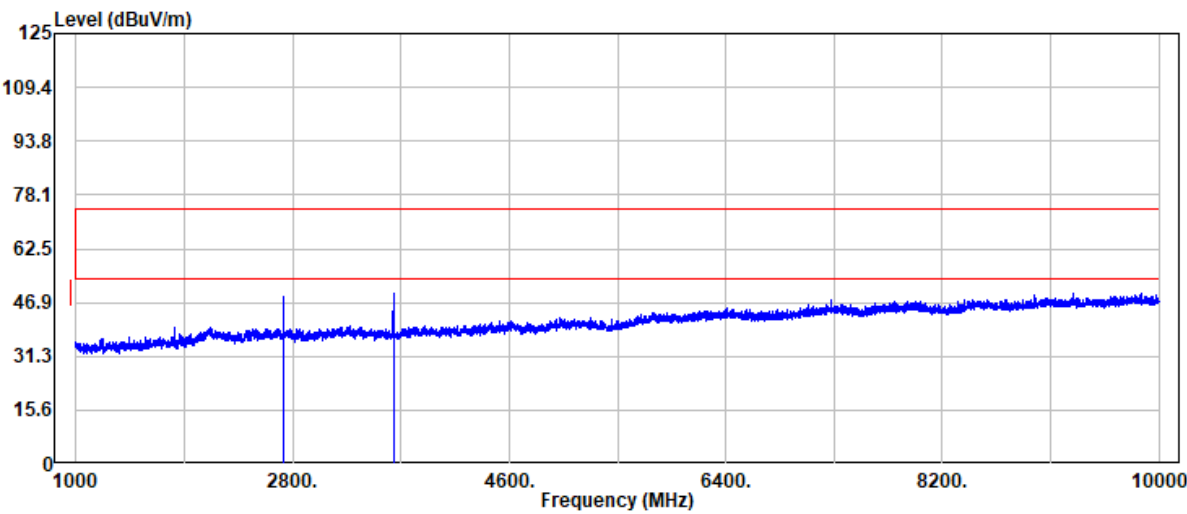
Remark:
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.



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Project No	: TM-2607000368P	Test Date	: 2026-09-07
Operation Band	: 900 M	Temp./Humi.	: 25.4/53
Frequency	: 909.366 MHz	Antenna Pol.	: HORIZONTAL
Operation Mode	: TX	Engineer	: Tony.Chao
EUT Pol	: H	Test Chamber	: 966A
Setting	:		



Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
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MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2728.10	50.63	-1.98	48.65	74.00	-25.35	Peak
2728.10	48.65	-5.32	43.33	54.00	-10.67	Average
3637.46	49.92	-0.48	49.44	74.00	-24.56	Peak
3637.46	49.44	-5.32	44.12	54.00	-9.88	Average

Remark:
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

- End of Test Report -