



Test Report – FCC Part 74H Low Power Licensed Wireless Microphone Applicant: Wisycom s.r.l.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 7/21/2023

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1. Applicant Information

Applicant: Wisycom s.r.l.
Address: Via Tiepolo, 7/E
Tombolo, 35019, Italy

1.1 Test Result Summary

The following test procedure was used ANSI C63.26 and KDB 206256 D01 Wireless Microphone Certification. Full test results are available in this report.

No additions to the test methods were needed. There were no deviations, or exclusions from the test methods. No test results are from external providers or from the customer. The test results relate only to the items tested. Timco does not offer opinions and interpretations, only a pass/fail statement.

Cluses	Description of the Requirements	Result (Pass, Fail or N/A)
PART 2.1046(a), 74.861(e) (1) (ii), (iii)	Conducted Power	Pass
2.1049(c), 74.861(d)(4)(i)	Occupied Bandwidth	n/a
PART 74.861(e)(7), ETSI EN 300-422-1 s. 8.3.2	Unwanted Emissions	Pass
2.1051(a), 74.861(e)(6)(iii)	Spurious Emissions at Antenna Terminal (Conducted)	Pass
2.1053, 74.861(e)(6)(iii)	Radiated Field Strength of Spurious Emissions	Pass
2.1053, 74.861(e) (4)	Frequency Stability	n/a



Timco Engineering, Inc., an IIA Company
 849 NW State Road 45, Newberry, Florida 32669
 (352) 472-5500 / testing@timcoengr.com

2. Location of Testing

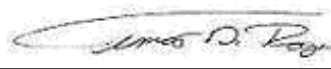

2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at Timco's permanent laboratory located at 849 NW State Road 45, Newberry, Florida 32669

FCC test firm # 578780
 FCC Designation # US1070
 FCC site registration is under A2LA certificate # 0955.01
 ISED Canada test site registration # 2056A
 EU Notified Body # 1177
 For all designations see A2LA scope # 0955.01

2.2 Testing was performed, reviewed by

Dates of Testing: 5/29/2023– 6/6/2023

Signature:   Sr. EMC Engineer
 EMC-003838-NE

Name & Title: Tim Royer, EMC Engineer

Date of Signature 7/21/2023

Signature: 

Name & Title: Kristoffer Costa, EMC Technician

Date of Signature 7/21/2023



3. Test Sample(s) (EUT/DUT)

The test sample was received: 5/25/2023

3.1 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
FCC ID:	POUMTK982
Brief Description	Dual UHF Transmitter
Model(s) #	MTK982
Firmware version	N/A
Software version	N/A
Serial Number	29900009, T4046177

Technical Characteristics	
Frequency Range	941- 952 MHz, 952.85- 956.25 MHz, 956.45- 959.85 MHz
RF O/P Power (Max.)	1000mW Max
Modulation	FM
Bandwidth & Emission Class	F3E, F8E
Number of Channels	N/A
Duty Cycle	100%
Antenna Connector	BNC
Voltage Rating (AC or Batt.)	90 - 264 V AC, 47/63 Hz; 10-28 Vdc

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
1	n/a	n/a	3 dBi

- Note: Information such as antenna gain, firmware/software numbers are provided by manufacturer and cannot be validated by the test lab.



3.2 Configuration of EUT

Test Modes				
Mode (#)	Mode (Type)	Test Frequencies (MHz)	BW (nominal) (kHz)	Emission Designator
1	Transmit	941 MHz 954 MHz 959.85 MHz	N/A	F3E, F8E

Operating conditions during Testing:

No modifications of the device under test (including firmware, specific software settings, and input/output signal levels to the EUT).

Peripherals used during Testing:

CSA121T Passive Combiner

3.3 Test Setup of EUT

Equipment, antenna, and cable arrangement. The setup of the equipment and cable or wire placement on the test site that produces the highest radiated and the highest ac power-line conducted emissions shall be shown clearly and described. Information on the orientation of portable equipment during testing shall be included. Drawings or photographs may be used for this purpose.

Test Setups are included in the test report.



4. Test methods & Applicable Regulatory Limits

4.1 Test methods/Standards/Guidance

The measurement was performed as per ANSI C63.2 and KDB 206256 D01 Wireless Microphone Certification. Full test results are available in this report.

Limits and Regulatory Limits:

- 1) FCC Part 74 H

5. Measurement Uncertainty

Parameter	Uncertainty (dB)
Conducted Emissions	± 3.14 dB
Radiated Emissions (9kHz – 30 MHz)	± 3.08 dB
Radiated Emissions (30 – 200 MHz)	± 2.16 dB
Radiated Emissions (200 – 1000 MHz)	± 2.15 dB
Radiated Emissions (1 GHz – 18 GHz)	± 2.14 dB
Radiated Emissions (18 GHz – 40 GHz)	± 2.31 dB
Note: The uncertainties provided in this table represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of K=2.	

6. Environmental Conditions

Temperature & Humidity

Measurements performed at the test site did not exceed the following:

Parameter	Measurement
Temperature	23 C +/- 5%
Humidity	55% +/- 5%
Barometric Pressure	30.05 in Hg
Note: Specific environmental conditions that are applicable to a specific test are available in the test result section.	



7. List of Test Equipment and Test Facility

The test equipment used identified by type, manufacturer, serial number, or other identification and the date on which the next calibration or service check is due.

Description of the firmware or software used to operate EUT for testing purposes.

A complete list of all test equipment used shall be included with the test report. The manufacturer’s model and serial numbers, and date of last calibration, and calibration interval shall be included. Measurement cable loss, measuring instrument bandwidth and detector function, video bandwidth, if appropriate, and antenna factors shall also be included where applicable.

List of Test Equipment

Test Equipment						
Type	Device	Manufacturer	Model	SN#	Current Cal	Cal Due
Antenna	Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	00041534	10/14/20	10/14/2023
CHAMBER	CHAMBER	Panashield	3M	N/A	3/12/19	12/21/2023
Pre-amp	Pre-amp	RF-LAMBDA	RLNA00M45GA	NA	2/27/19	7/26/2025
Receiver	EMI Test Receiver R&S ESU 40	Rohde & Schwarz	ESU 40	100320	5/27/21	5/26/2024
Receiver	EMI Test Receiver R&S ESW44	Rohde & Schwarz	ESW44	103049	10/13/21	10/12/2024
Function Generator	Function Generator	Standford	DS340	25200	1/13/21	1/13/2024
Signal Generator	Signal Generator HP 8648C	HP	8648C	35537A01679	3/29/19	8/03/2025
Thermometer	Type K J Thermometer	Martel	303	080504494	1/18/20	1/16/2026

Software			
Software	Author	Version	Validation on
ESU Firmware	Rohde & Schwarz	4.43 SP3; BIOS v5.1-24-3	2018
RSCCommander	Rohde & Schwarz	1.6.4	2014
ScopeExplorer	LeCroy	v2.25.0.0	2009
Field Strength	Timco	v4.10.7.0	2016



8. Test Results

The results of the test are usually indicated in the form of tables, spectrum analyzer plots, charts, sample calculations, as appropriate for each test procedure.

A description and/or a block diagram of the test setup is usually provided.

The measurement results, along with the appropriate limits for comparison, may be presented in tabular or graphical form. In addition, any variation in the measurement environment may be reported if applicable (e.g., a significant change of temperature that could affect the cable loss and amplifier response).

Units of measurement

Unless noted otherwise in the referenced standard, the measurements of ac power-line conducted emissions and conducted power output will be reported in units of dBµV. Unless noted otherwise in the referenced standard, the measurements of radiated emissions will be reported in units of decibels, referenced to one microvolt per meter (dBµV/m) for electric fields, or to one ampere per meter (dBA/m) for magnetic fields, at the distance specified in the appropriate standards or requirements. The measurements of antenna-conducted power for receivers may be reported in units of dBµV if the impedance of the measuring instrument is also reported. Otherwise, antenna-conducted power will be reported in units of decibels referenced to one milliwatt (dBm). All formulas for data conversions and conversion factors, if used, will be included in this measurement report.

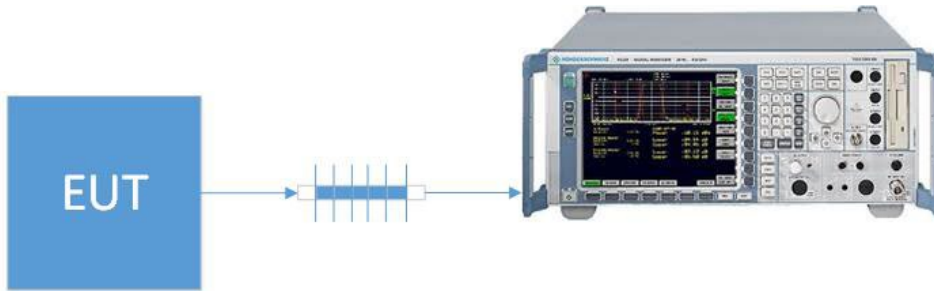
Example:

Freq (MHz)	Meter Reading	+ ACF	+CL	= FS
33	20 dBµV	+ 10.36 dB/m	+0.40 dB	=30.36 dBµV/m @ 3m

$$\text{EIRP} = \text{Pcond (dBm)} + \text{dBi}$$

8.1 RF POWER OUTPUT

Limits from 2.1046(a), 74.861(e) (1) (ii) and test procedure from ANSI C63.26 and KDB 206256 D01 Wireless Microphone Certification.



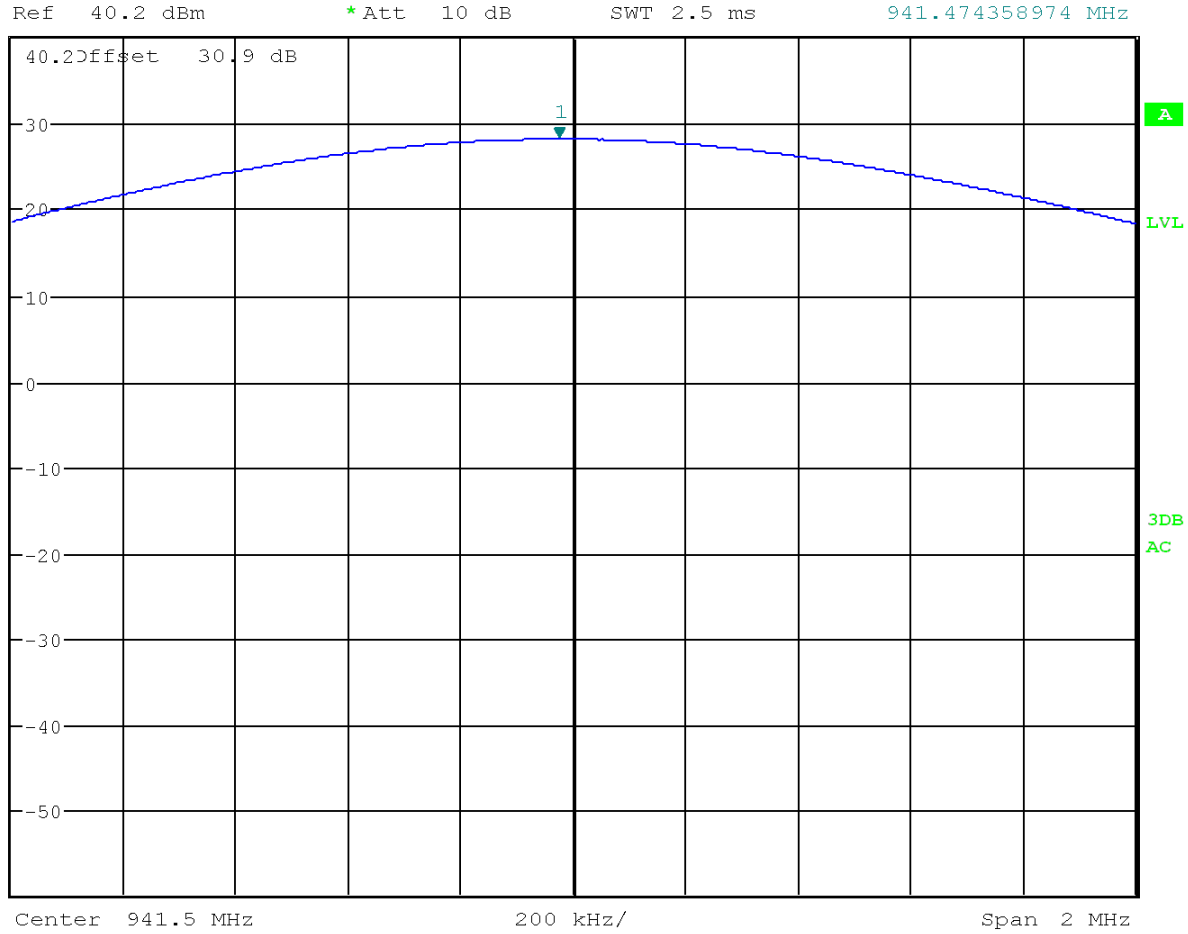
Test Results, Mode 1			
Mode	Tuned Frequency (MHz)	Power Output (dBm)	Power Output (W)
1	941.5	28.30	0.67
1	954	27.84	0.60
1	959.85	28.04	0.63



8.1.1 RF Power Output Plot, 941.5 MHz



* RBW 1 MHz Marker 1 [T1]
VEW 3 MHz 28.30 dBm
SWT 2.5 ms 941.474358974 MHz



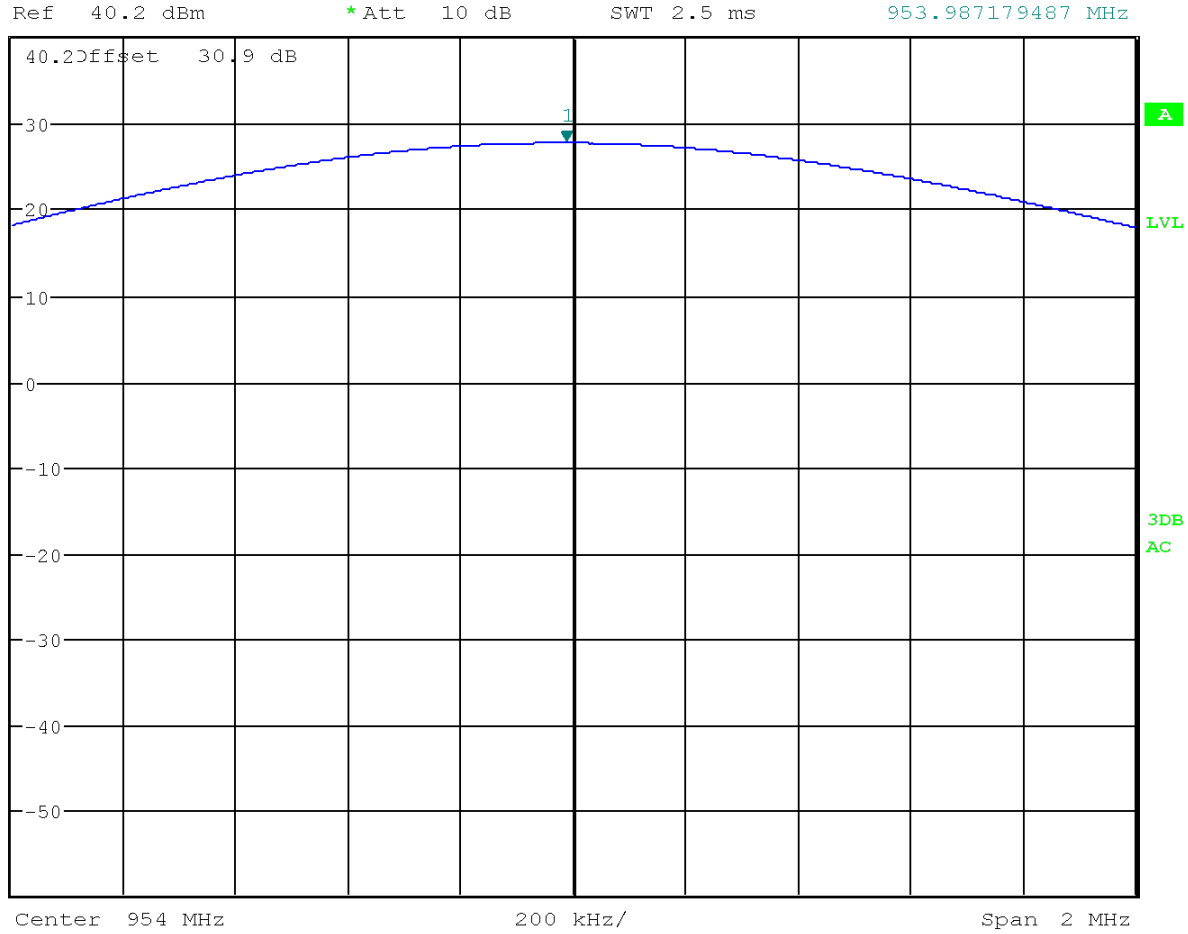
Date: 12.JUL.2023 15:37:14



8.1.2 RF Power Output Plot, 954 MHz



* RBW 1 MHz Marker 1 [T1]
VBW 3 MHz 27.84 dBm
SWT 2.5 ms 953.987179487 MHz



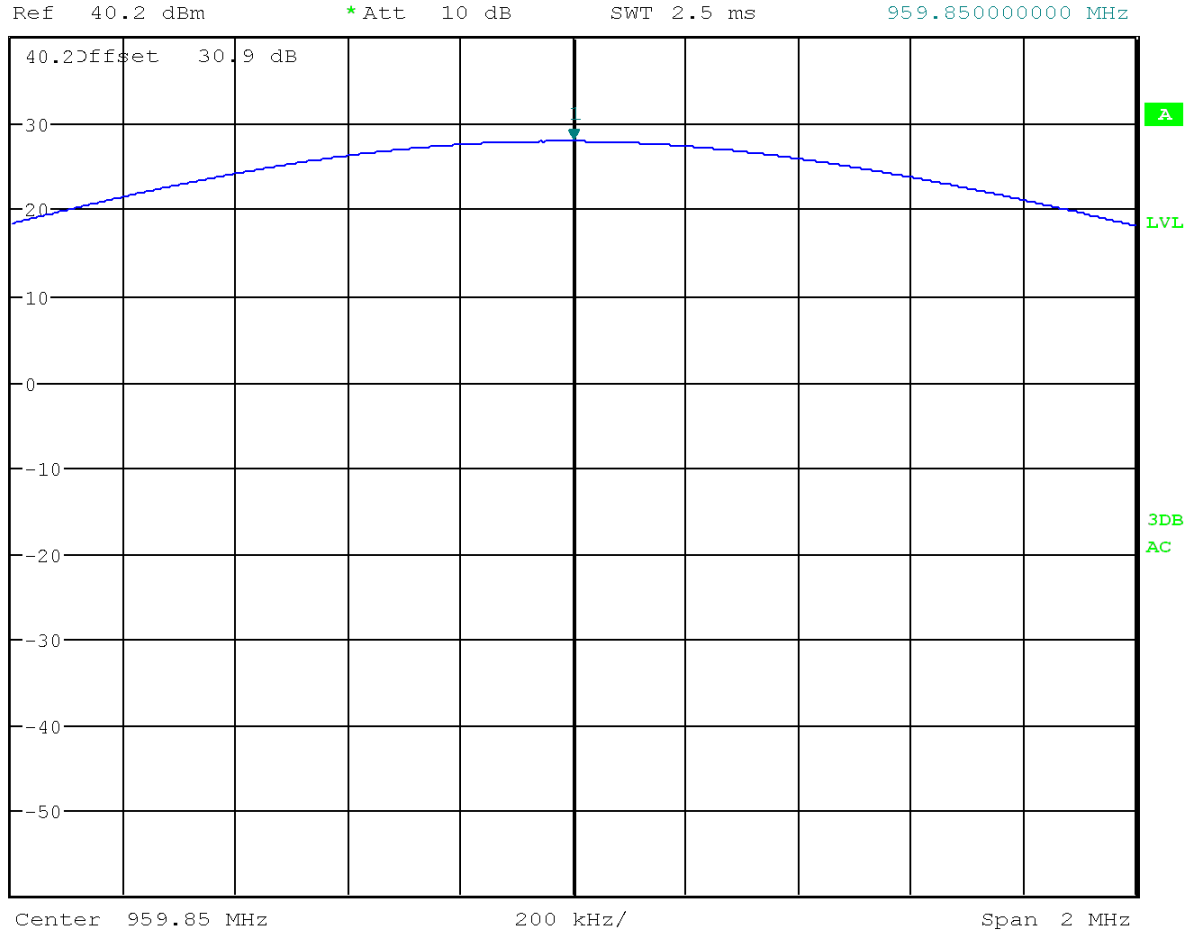
Date: 12.JUL.2023 15:36:28



8.1.3 RF Power Output Plot, 959.85 MHz



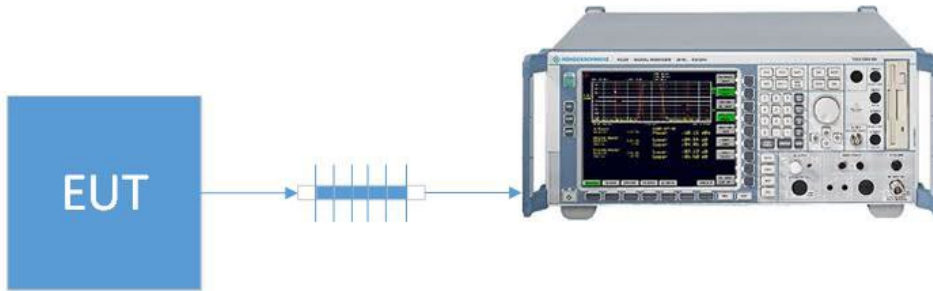
* RBW 1 MHz Marker 1 [T1]
VEW 3 MHz 28.04 dBm
SWT 2.5 ms 959.850000000 MHz



Date: 12.JUL.2023 15:35:38

8.2 Spurious Emissions at antenna terminals (Conducted)

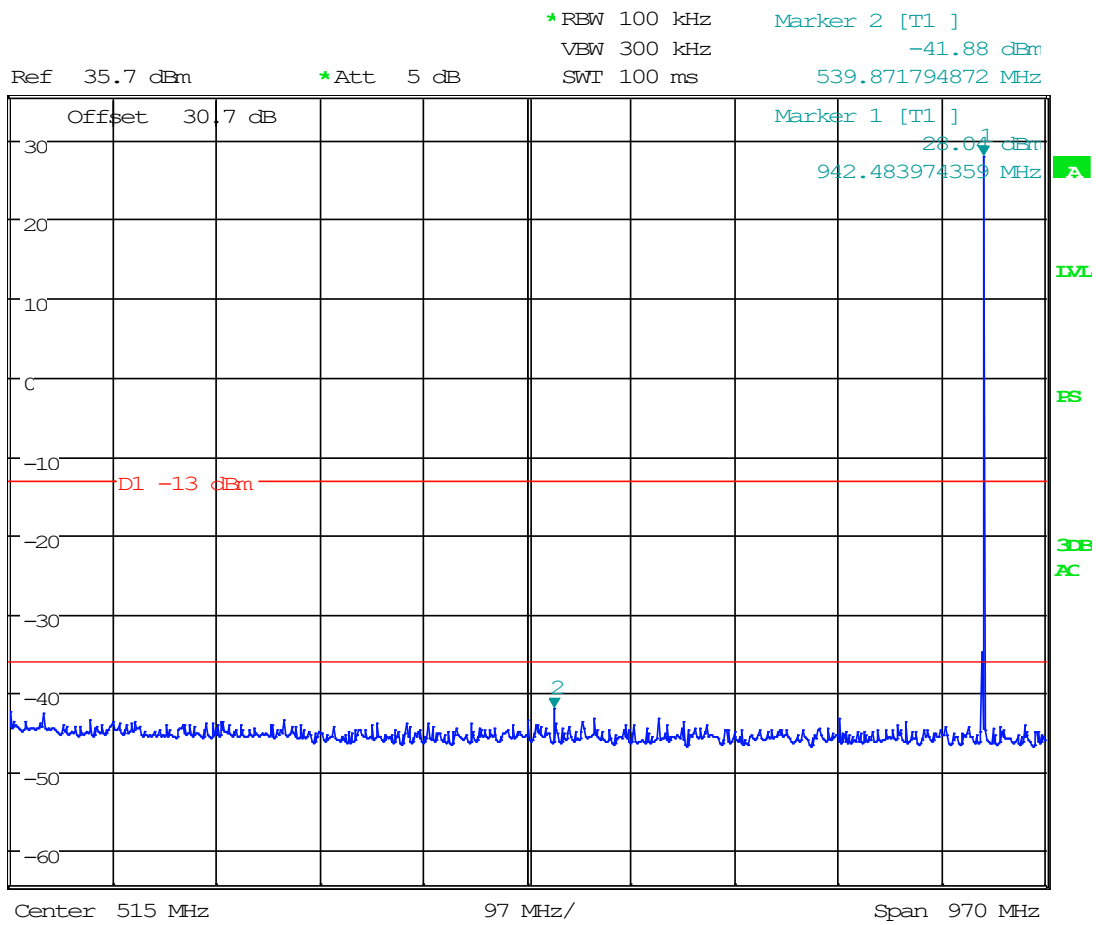
Limits from 2.1051(a), 74.861(e)(6)(iii) and test procedure from ANSI C63.26 and KDB 206256 D01 Wireless Microphone Certification.



8.2.1 Conducted Emissions Below 1G, 941.5 MHz



1.0K
V/div



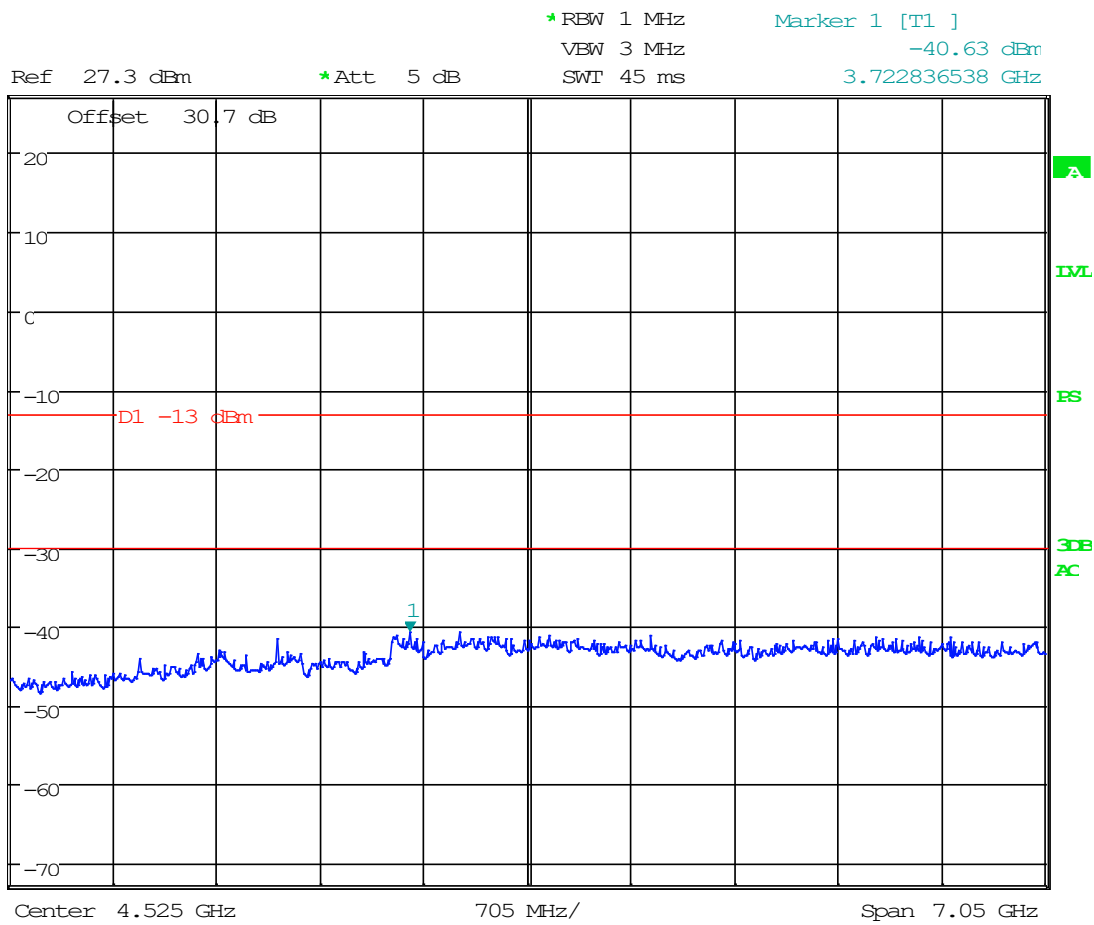
Date: 30.MAY.2023 12:57:37



8.2.2 Conducted Emissions Above 1G, 941.5 MHz



1.8K
V100

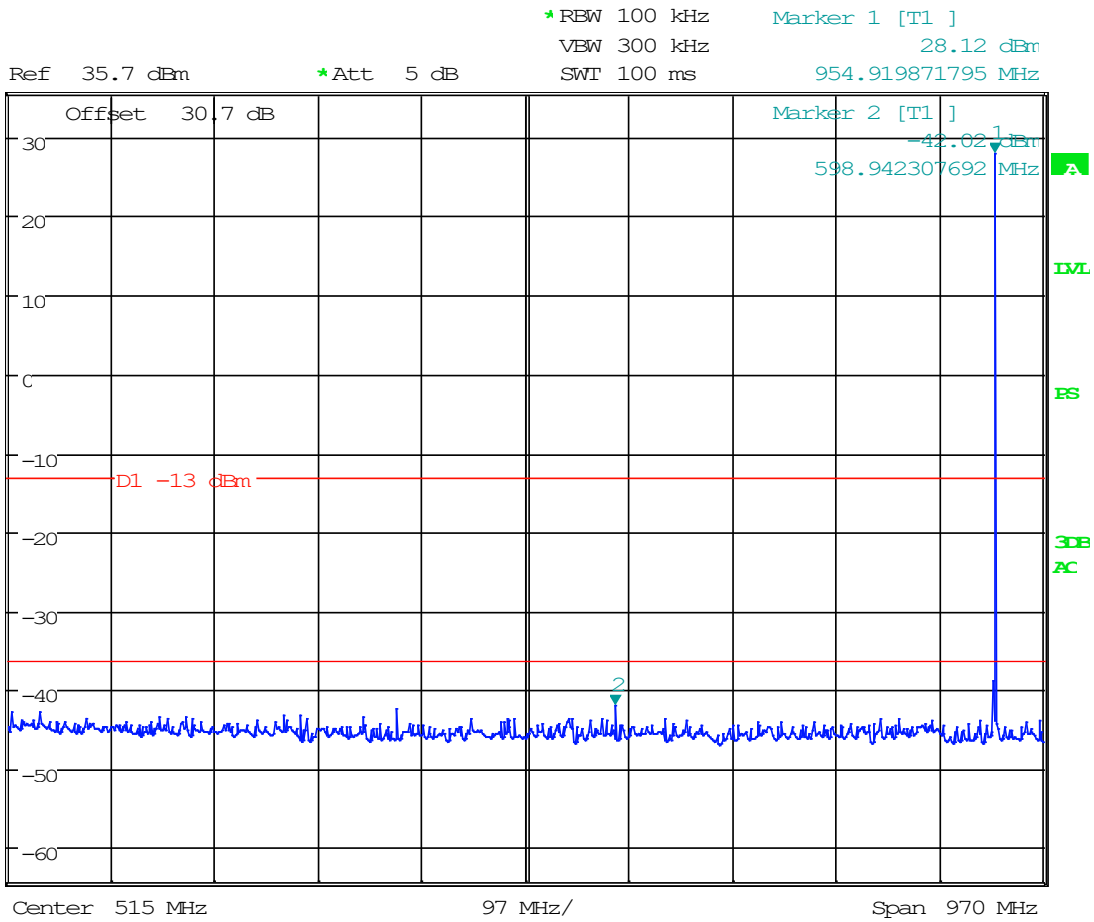


Date: 30.MAY.2023 13:07:26

8.2.3 Conducted Emissions Below 1G, 954 MHz

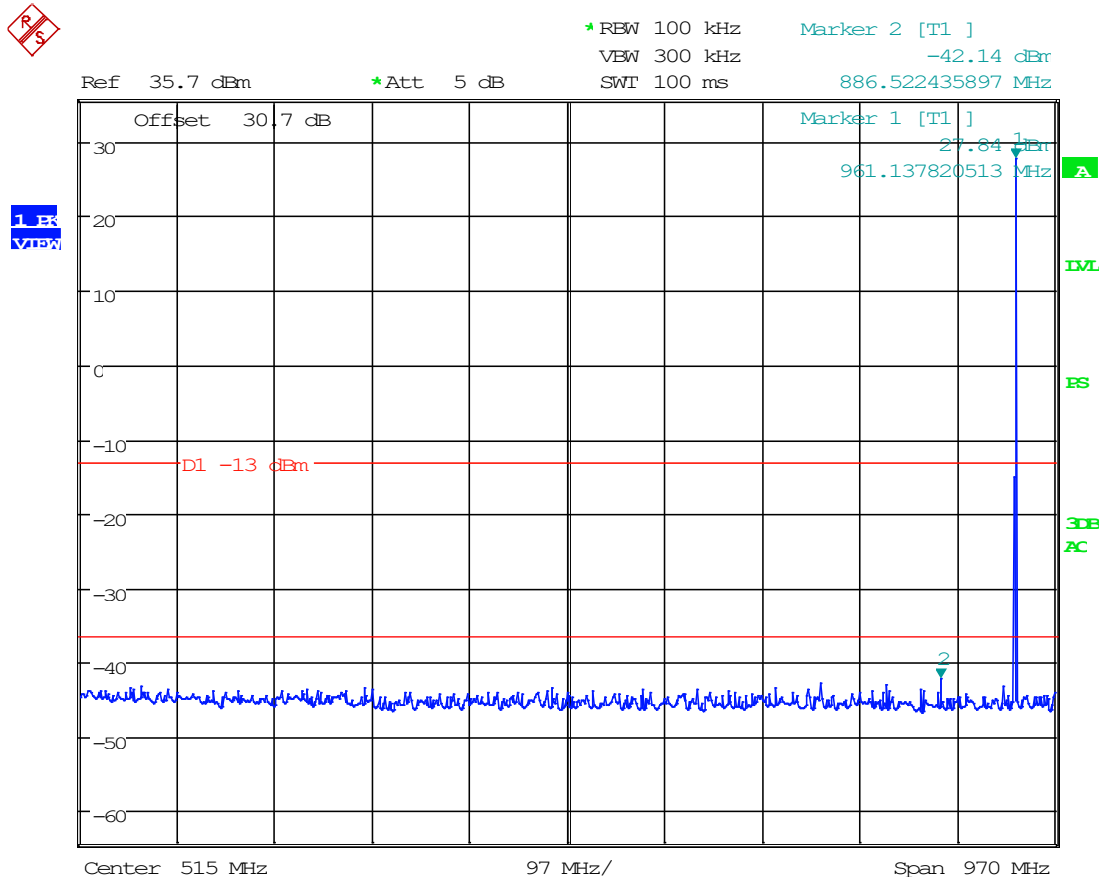


1 BK
VIEW



Date: 30.MAY.2023 12:59:06

8.2.5 Conducted Emissions Below 1G, 959.85 MHz

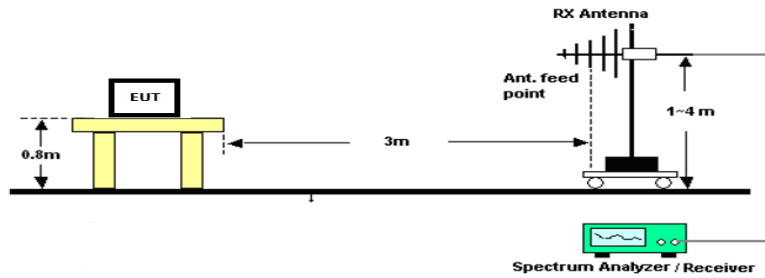


Date: 30.MAY.2023 13:00:06

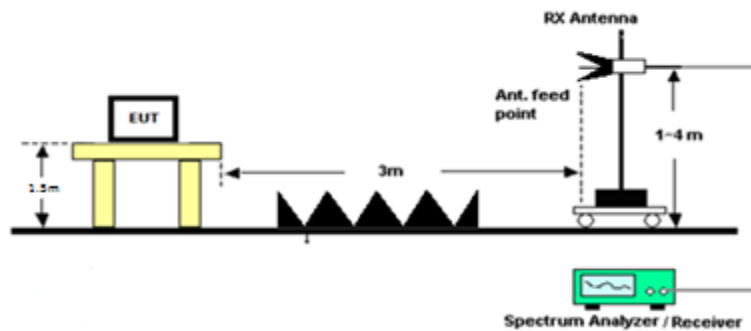
8.3 Radiated Emissions

Limits from 2.1053, 74.861(e)(6)(iii) and test procedure from ANSI C63.26 and KDB 206256 D01 Wireless Microphone Certification.

Radiated Test Setup, 30 – 1000 MHz



Radiated Test Setup, Above 1000 MHz





Radiated Emissions Tabular Data

8.3.1 Radiated Emissions Table, 941.5 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBuV)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBuV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
941.50	1883.00	PK	13.30	H	-5.11	23.98	3.00	32.17	-65.21	-30.00	35.21
941.50	1883.00	PK	16.80	V	-5.11	23.98	3.00	35.67	-61.71	-30.00	31.71
941.50	2824.50	PK	12.20	H	-6.34	29.36	3.00	35.22	-62.15	-30.00	32.15
941.50	2824.50	PK	12.50	V	-6.34	29.36	3.00	35.52	-61.85	-30.00	31.85
941.50	3766.00	PK	14.90	H	-7.30	33.13	3.00	40.73	-56.65	-30.00	26.65
941.50	3766.00	PK	15.10	V	-7.30	33.13	3.00	40.93	-56.45	-30.00	26.45
941.50	4707.50	PK	14.30	H	-8.20	33.88	3.00	39.98	-57.39	-30.00	27.39
941.50	4707.50	PK	15.20	V	-8.20	33.88	3.00	40.88	-56.49	-30.00	26.49
941.50	5649.00	PK	14.50	H	-9.02	34.54	3.00	40.02	-57.36	-30.00	27.36
941.50	5649.00	PK	14.90	V	-9.02	34.54	3.00	40.42	-56.96	-30.00	26.96
941.50	6590.50	PK	14.30	H	-9.78	35.65	3.00	40.17	-57.21	-30.00	27.21
941.50	6590.50	PK	14.50	V	-9.78	35.65	3.00	40.37	-57.01	-30.00	27.01
941.50	7532.00	PK	14.40	H	-10.38	35.89	3.00	39.91	-57.47	-30.00	27.47
941.50	7532.00	PK	14.60	V	-10.38	35.89	3.00	40.11	-57.27	-30.00	27.27
941.50	8473.50	PK	14.80	H	-11.03	35.94	3.00	39.70	-57.67	-30.00	27.67
941.50	8473.50	PK	14.50	V	-11.03	35.94	3.00	39.40	-57.97	-30.00	27.97
941.50	9415.00	PK	14.70	H	-11.56	36.39	3.00	39.53	-57.84	-30.00	27.84
941.50	9415.00	PK	14.50	V	-11.56	36.39	3.00	39.33	-58.04	-30.00	28.04



8.3.2 Radiated Emissions Table, 954 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBuV)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBuV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
954.00	1908.00	PK	13.20	H	-5.13	24.12	3.00	32.19	-65.19	-30.00	35.19
954.00	1908.00	PK	16.20	V	-5.13	24.12	3.00	35.19	-62.19	-30.00	32.19
954.00	2862.00	PK	12.30	H	-6.38	29.58	3.00	35.50	-61.88	-30.00	31.88
954.00	2862.00	PK	12.60	V	-6.38	29.58	3.00	35.80	-61.58	-30.00	31.58
954.00	3816.00	PK	15.30	H	-7.36	33.16	3.00	41.10	-56.28	-30.00	26.28
954.00	3816.00	PK	16.10	V	-7.36	33.16	3.00	41.90	-55.48	-30.00	25.48
954.00	4770.00	PK	14.10	H	-8.24	33.91	3.00	39.78	-57.60	-30.00	27.60
954.00	4770.00	PK	14.40	V	-8.24	33.91	3.00	40.08	-57.30	-30.00	27.30
954.00	5724.00	PK	14.40	H	-9.05	34.62	3.00	39.97	-57.41	-30.00	27.41
954.00	5724.00	PK	14.70	V	-9.05	34.62	3.00	40.27	-57.11	-30.00	27.11
954.00	6678.00	PK	14.30	H	-9.84	35.69	3.00	40.16	-57.22	-30.00	27.22
954.00	6678.00	PK	15.20	V	-9.84	35.69	3.00	41.06	-56.32	-30.00	26.32
954.00	7632.00	PK	14.30	H	-10.44	35.91	3.00	39.77	-57.61	-30.00	27.61
954.00	7632.00	PK	14.00	V	-10.44	35.91	3.00	39.47	-57.91	-30.00	27.91
954.00	8586.00	PK	15.50	H	-11.07	36.02	3.00	40.45	-56.93	-30.00	26.93
954.00	8586.00	PK	15.40	V	-11.07	36.02	3.00	40.35	-57.03	-30.00	27.03
954.00	9540.00	PK	14.60	H	-11.59	36.51	3.00	39.52	-57.85	-30.00	27.85
954.00	9540.00	PK	15.10	V	-11.59	36.51	3.00	40.02	-57.35	-30.00	27.35



8.3.3 Radiated Emissions Table, 959.85 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBuV)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBuV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
959.85	1919.70	PK	12.80	H	-5.17	24.19	3.00	31.82	-65.56	-30.00	35.56
959.85	1919.70	PK	15.70	V	-5.17	24.19	3.00	34.72	-62.66	-30.00	32.66
959.85	2879.55	PK	12.30	H	-6.40	29.68	3.00	35.58	-61.80	-30.00	31.80
959.85	2879.55	PK	12.70	V	-6.40	29.68	3.00	35.98	-61.40	-30.00	31.40
959.85	3839.40	PK	15.90	H	-7.40	33.19	3.00	41.70	-55.68	-30.00	25.68
959.85	3839.40	PK	15.80	V	-7.40	33.19	3.00	41.60	-55.78	-30.00	25.78
959.85	4799.25	PK	14.60	H	-8.26	33.93	3.00	40.27	-57.11	-30.00	27.11
959.85	4799.25	PK	14.30	V	-8.26	33.93	3.00	39.97	-57.41	-30.00	27.41
959.85	5759.10	PK	14.60	H	-9.08	34.67	3.00	40.19	-57.19	-30.00	27.19
959.85	5759.10	PK	15.10	V	-9.08	34.67	3.00	40.69	-56.69	-30.00	26.69
959.85	6718.95	PK	14.40	H	-9.86	35.77	3.00	40.31	-57.07	-30.00	27.07
959.85	6718.95	PK	14.10	V	-9.86	35.77	3.00	40.01	-57.37	-30.00	27.37
959.85	7678.80	PK	14.80	H	-10.47	35.90	3.00	40.23	-57.15	-30.00	27.15
959.85	7678.80	PK	14.40	V	-10.47	35.90	3.00	39.83	-57.55	-30.00	27.55
959.85	8638.65	PK	16.10	H	-11.12	36.02	3.00	41.00	-56.38	-30.00	26.38
959.85	8638.65	PK	14.60	V	-11.12	36.02	3.00	39.50	-57.88	-30.00	27.88
959.85	9598.50	PK	15.00	H	-11.58	36.59	3.00	40.01	-57.36	-30.00	27.36
959.85	9598.50	PK	15.30	V	-11.58	36.59	3.00	40.31	-57.06	-30.00	27.06



9. ANNEX-A - Photographs of the EUT

Photographs of the EUT and any manufacturer supplied accessories to be used with the EUT are in a separate document.

10. ANNEX-B – Test Setup Photographs

Test setup photographs are located in a separate document.

11. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_8114-23_FCC 74H_	1	Initial release	7/13/2023



Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

END OF TEST REPORT
