



Test Report - FCC 95- CB Transceiver

Applicant: Uniden America Corporation

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 6/29/2022

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1. Customer Information

Applicant: Uniden America Corporation
Address: 6225 N. State Highway 161
Suite 300
Irving Texas, 75038-2224, United States

1.1 Part 95 Test Result Summary

The following test procedure and guidance were used for measuring FCC Part 95 (PERSONAL RADIO SERVICES) known as Licensed Land Mobile; ANSI C63.26-2015. Full test results are available in this report.

Applicable Clauses			
FCC/IC Rule Parts	Description of the requirements	Requirement	Result: (Pass, Fail, N/A)
2.1046(a), 95.967, RSS-236 5.2	RF Power Output	< 4 W	Pass
2.1047(a)(b), 95.975, RSS-236 5.3.2	Modulation Characteristics	85% < dev < 100%	Reported
2.1049(c)(1), 95.973, 95.979(1)(3), RSS-236 5.4.2, 5.4.4	Occupied Bandwidth	Comply with Mask	Pass
2.1051, 95.979(5)(6), RSS-236 5.4.2, 5.4.4	Antenna Conducted Emissions	Comply with Mask	Pass
2.1053, 95.979(5)(6), RSS-236 5.4.2, 5.4.4	Field Strength Spurious Emissions	Comply with Mask	Pass
2.1055(a)(b)(d), 95.965, RSS-236 5.3.2	Frequency Stability	< 50 ppm	Pass

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.



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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

2.1 Testing was performed, reviewed by

Dates of Testing: 5/18/2022 – 5/20/2022

Signature:

Sr. EMC Engineer
EMC-003838-NE



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

6/29/2022

Signature:

Name & Title:

Kristoffer Costa, EMC Technician

Date of Signature

6/29/2022



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

The test sample was received: 5/17/2022

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:	AMWUT433
Brief Description	Handheld FM CB Transceiver
Type of Modular	N/A
Model(s) #	PRO538HHFM
Firmware version	1.17
Software version	43a
Serial Number	N/A

Technical Characteristics	
Technology	CB Transceiver
Frequency Range	26.965-27.405 MHz
RF O/P Power (Max.)	4W
Modulation	N/A
Bandwidth & Emission Class	A3E, F3E
Number of Channels	40 CB, 10 Weather
Duty Cycle	100%
Antenna Connector	N Type
Voltage Rating (AC or Batt.)	13.8 VDC

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
1	n/a	n/a	0 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 (#)	Channel	Test Frequencies (MHz)	BW (nominal) (kHz)
1	1	26.965	8
	40	27.405	8

Operating conditions during Testing:

The device was operated without the provided antenna(s).

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

Peripherals used during Testing:

No peripherals used.

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:

Test procedures and guidance for measuring Licensed Part 95 & RSS 236 Licensed Devices

- 1) ANSI C63.10

4.2 Applied Limits and Regulatory Limits:

FCC CFR 47 Part 2, FCC CFR 47 Part 95 D, RSS-Gen Issue 4, RSS-236 Issue 5, EIA/TIA-382-A, ANSI C63.10, NOTICE 2012-DRS0126

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

6.1 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.

7.1 List of Test Equipment

Test Equipment						
Type	Device	Manufacturer	Model	SN#	Current Cal	Cal Due
Antenna	Biconical 1057	Eaton	94455-1	1057	10/16/20	10/16/2023
Antenna, NSA	Log-Periodic 1243	Eaton	96005	1243	5/4/21	5/3/2024
CHAMBER	CHAMBER	Panashield	3M	N/A	3/12/19	12/21/2023
Receiver	EMI Test Receiver R&S ESU 40	Rohde & Schwarz	ESU 40	100320	5/27/21	5/26/2024
Function Generator	Function Generator	Standford	DS340	25200	1/13/21	1/13/2024
Signal Generator	Signal Generator HP 8648C	HP	8648C	3847A04696	3/31/21	3/30/2024

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).

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 dB μ V. 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 (dB μ V/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 dB μ V 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 dB μ V	+ 10.36 dB/m	+0.40 dB	=30.36 dB μ V/m @ 3m

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



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8.1 Power at the Final Amplifier

Limits from FCC Part 2.1033 (c)(8). No method of measurement is specified.

Test Results		
EUT Operating Voltage (V)	EUT Current (A)	Power at the Final Amplifier (W)
13.8	0.289855072	4

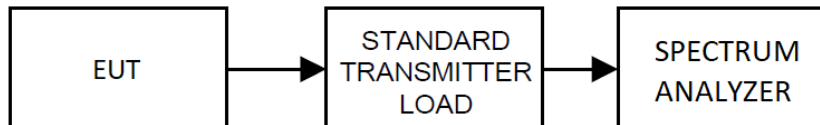


8.2 RF Output Power

Limits from FCC Parts 2.1046(a), 95.967; RSS-236 5.2 and test procedure from ANSI C63.10

Test Requirements: 4 W Mean Carrier power when transmitting emission type A1D or A3E

Test Setup



Test Results, High Power				
Channel	Tuned Frequency (MHz)	Power Output (dBm)	Power Output (W)	Limit (W)
1	26.965	34.97	3.14	4
40	27.405	34.73	2.97	4

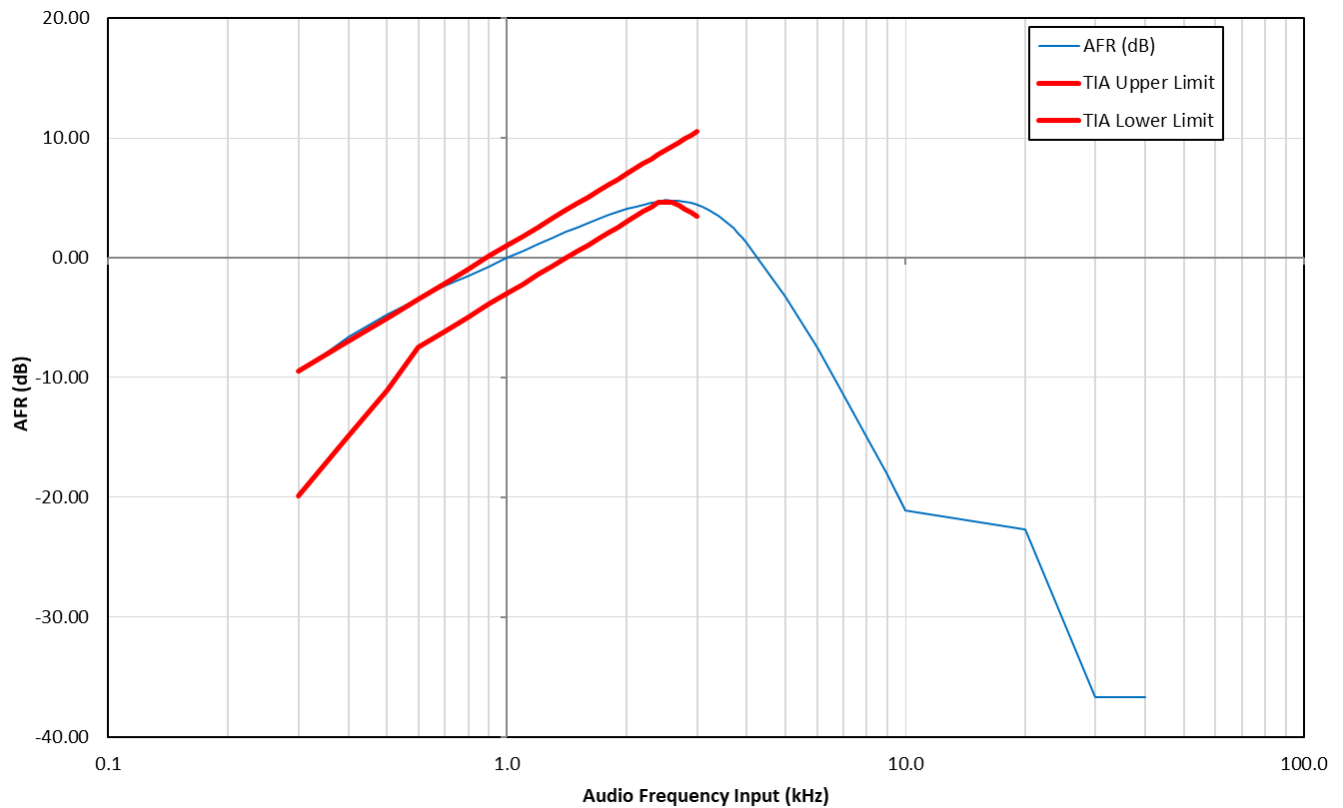
Test Results, Low Power				
Channel	Tuned Frequency (MHz)	Power Output (dBm)	Power Output (W)	Limit (W)
1	26.965	29.38	0.87	4
40	27.405	29.72	0.94	4



8.3 Audio Frequency Response

Limits from: FCC Pt. 2.1047(a), 95.975; RSS-236 5.3.2

Method of Measurement: The audio frequency response was measured in accordance with ANSI C63.26 with no exception. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000 Hz shall be submitted. The audio frequency response curve is shown below.



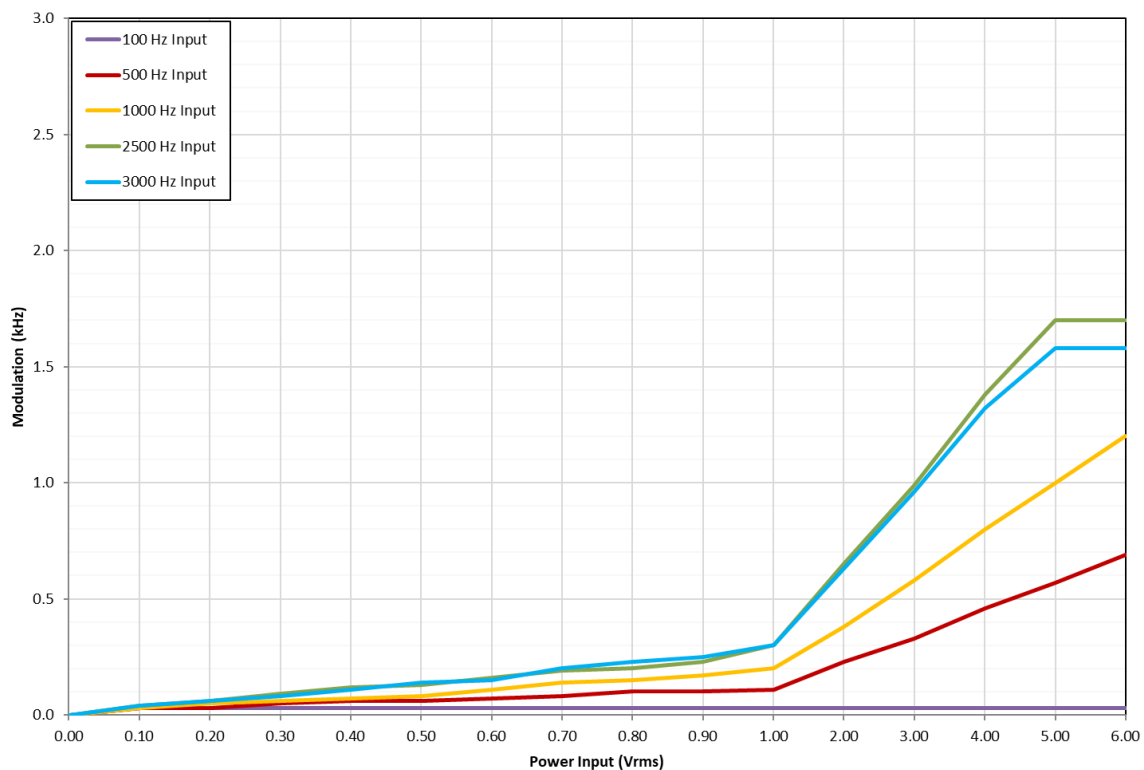


8.4 Audio Input Vs Modulation

Limits from: FCC Pt. 2.1047(b), 95.975; RSS-236 5.3.2

Test Requirements: Modulation must be greater than 85% and cannot exceed 100%

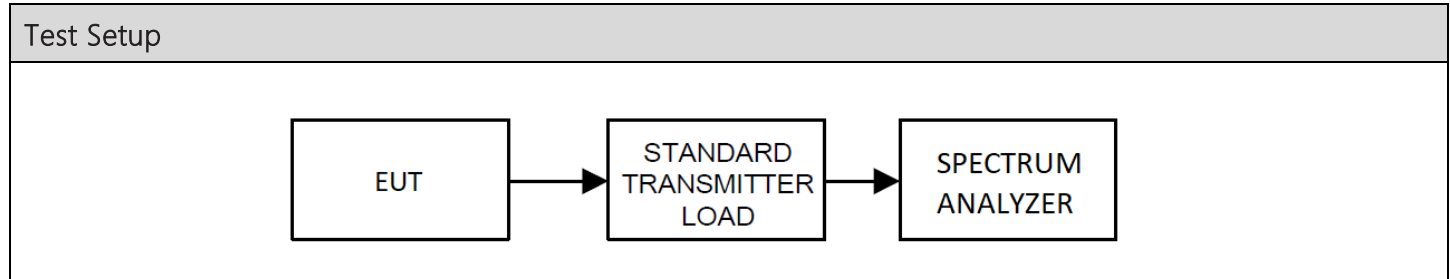
Method of Measurement: The audio input level needed for a particular percentage of modulation was measured in accordance with ANSI C63.26. The audio input curves versus modulation are shown below. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.





8.5 Occupied Bandwidth

Limits from FCC Parts 2.1049(c)(1), 95.973, RSS-236 5.4.2, and test procedure from ANSI C63.26-2015.



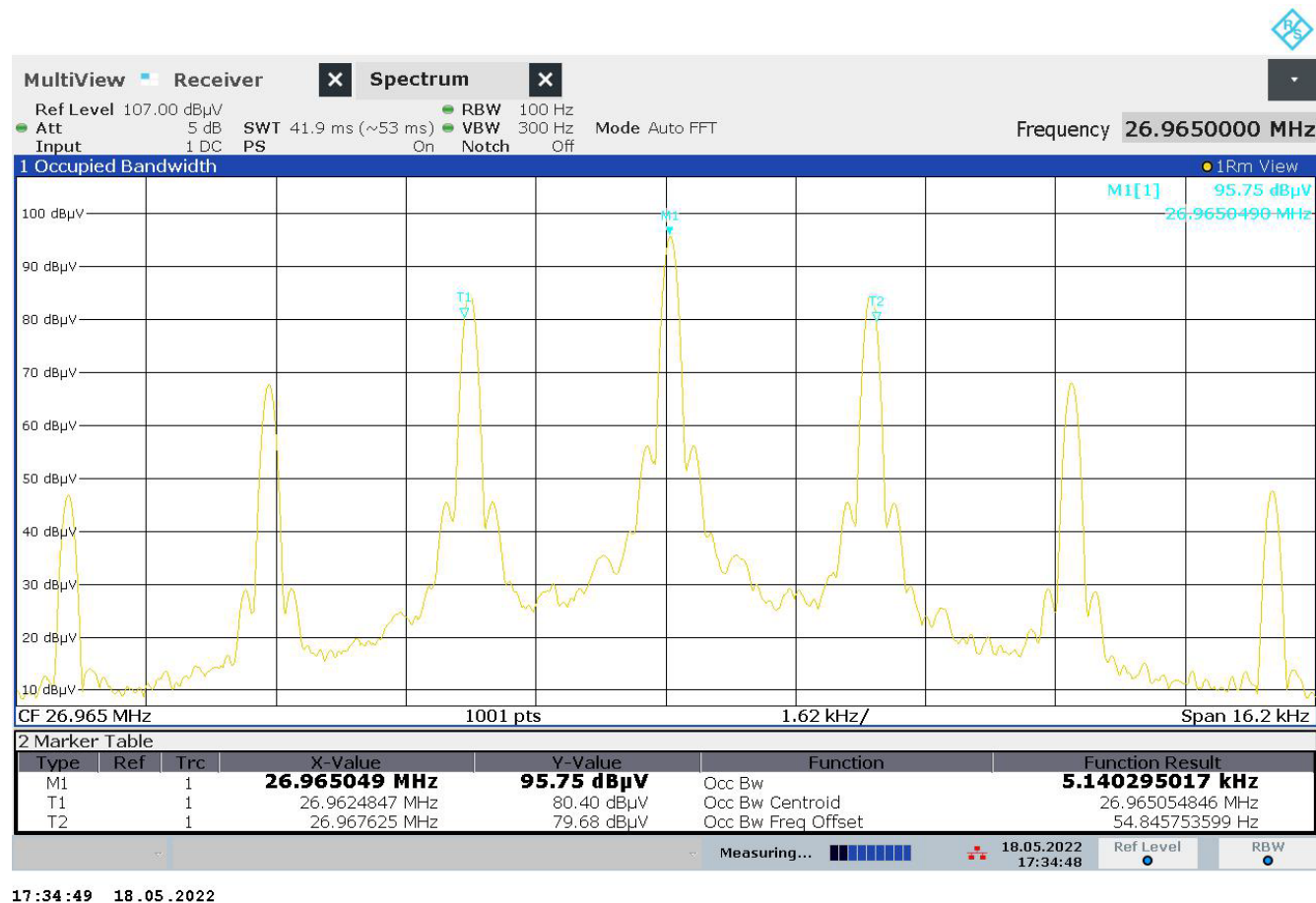
Test Results, Authorized Bandwidth		
Rule Part	Operating Range (MHz)	Authorized Bandwidth (kHz)
Part 95	26.965-27.405	8

Test Results, Occupied Bandwidth				
Tuned Frequency (MHz)	Mode	Emission Designator	Occupied Bandwidth (kHz)	Bandwidth Type
26.965	Ch 1 FM	5K14F3E	5.140	99%
	Ch 1 AM	5K15A3E	5.159	99%
27.405	Ch 40 FM	5K12F3E	5.125	99%
	Ch 40 AM	5K15A3E	5.159	99%



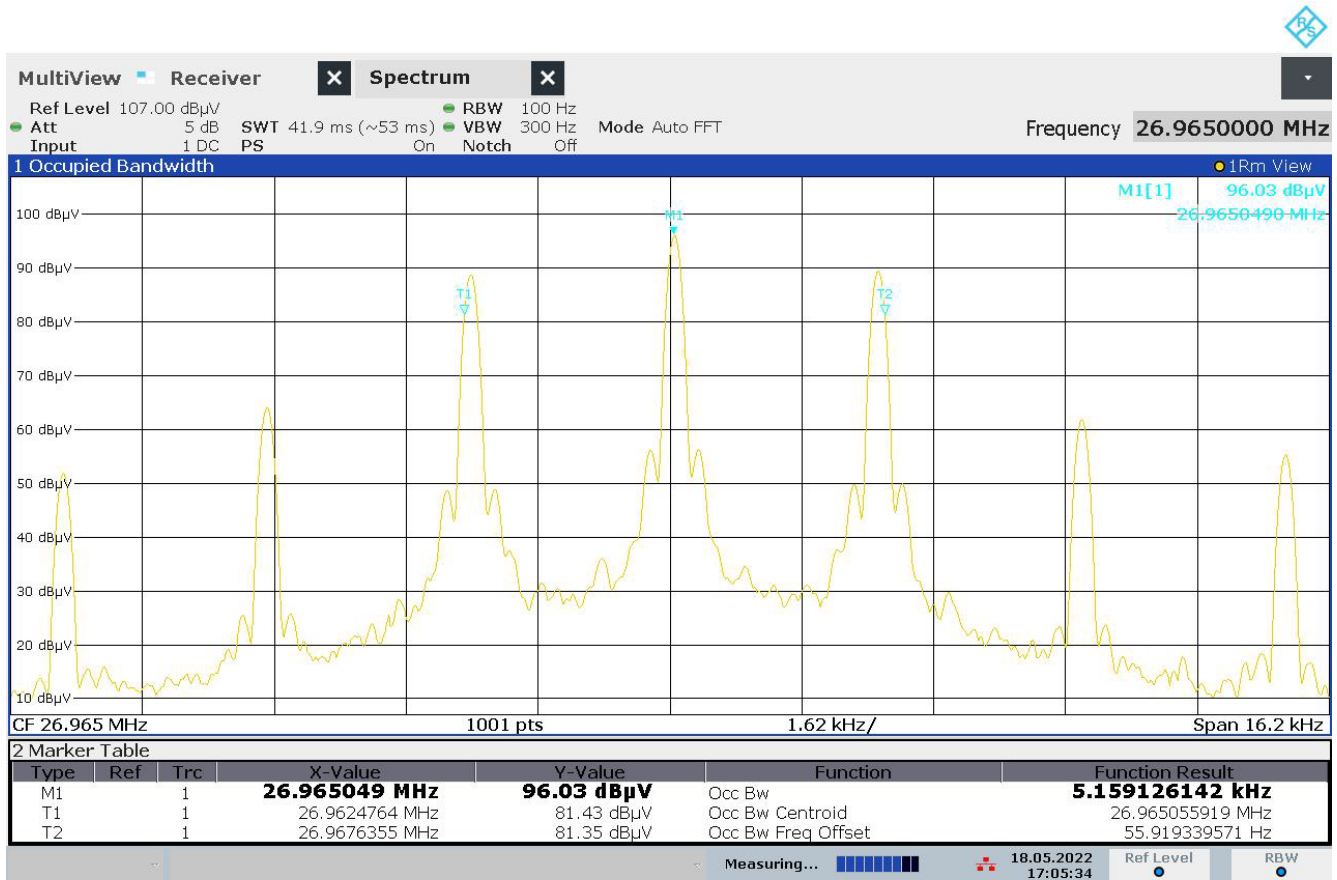
Occupied Bandwidth, Spectrum Plots

8.5.1 Bandwidth Plot, 99%, Ch 1 FM, 26.965 MHz





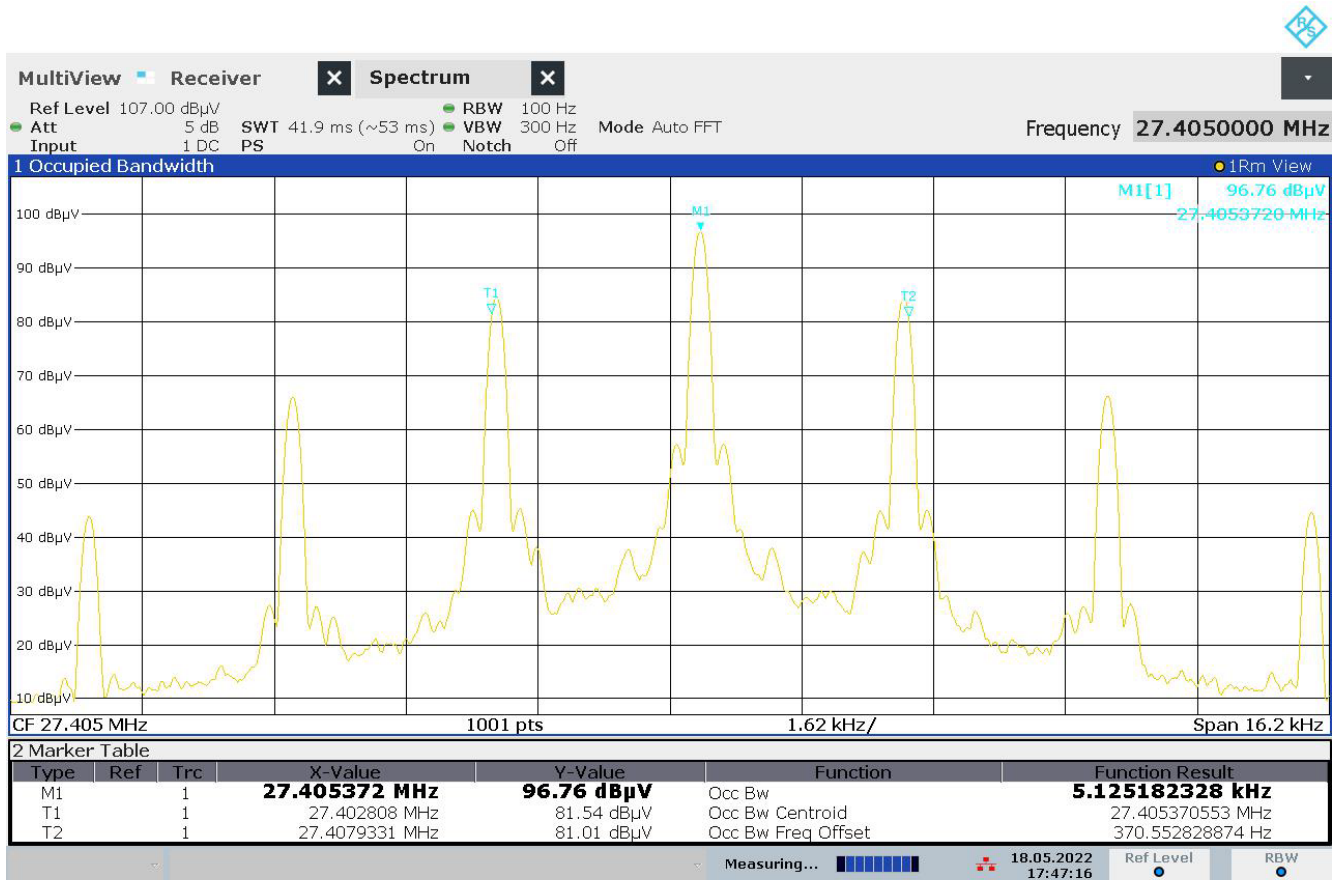
8.5.2 Bandwidth Plot, 99%, Ch 1 AM, 26.965 MHz



17:05:35 18.05.2022



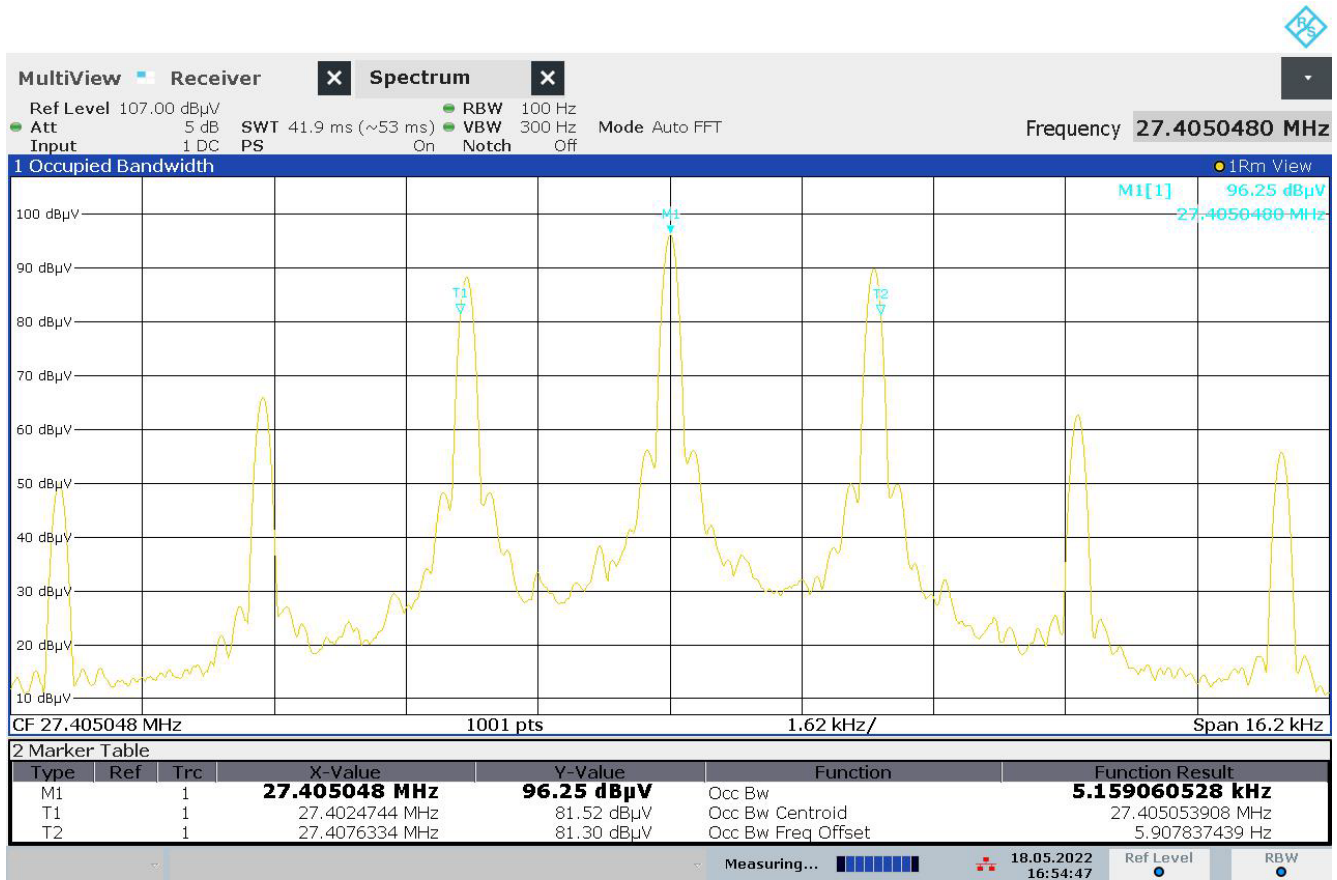
8.5.3 Bandwidth Plot, 99%, Ch 40 FM, 27.405 MHz



17:47:17 18.05.2022



8.5.4 Bandwidth Plot, 99%, Ch 40 AM, 27.405 MHz



16:54:47 18.05.2022

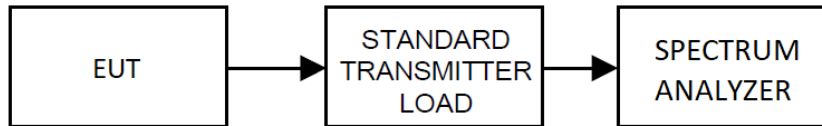


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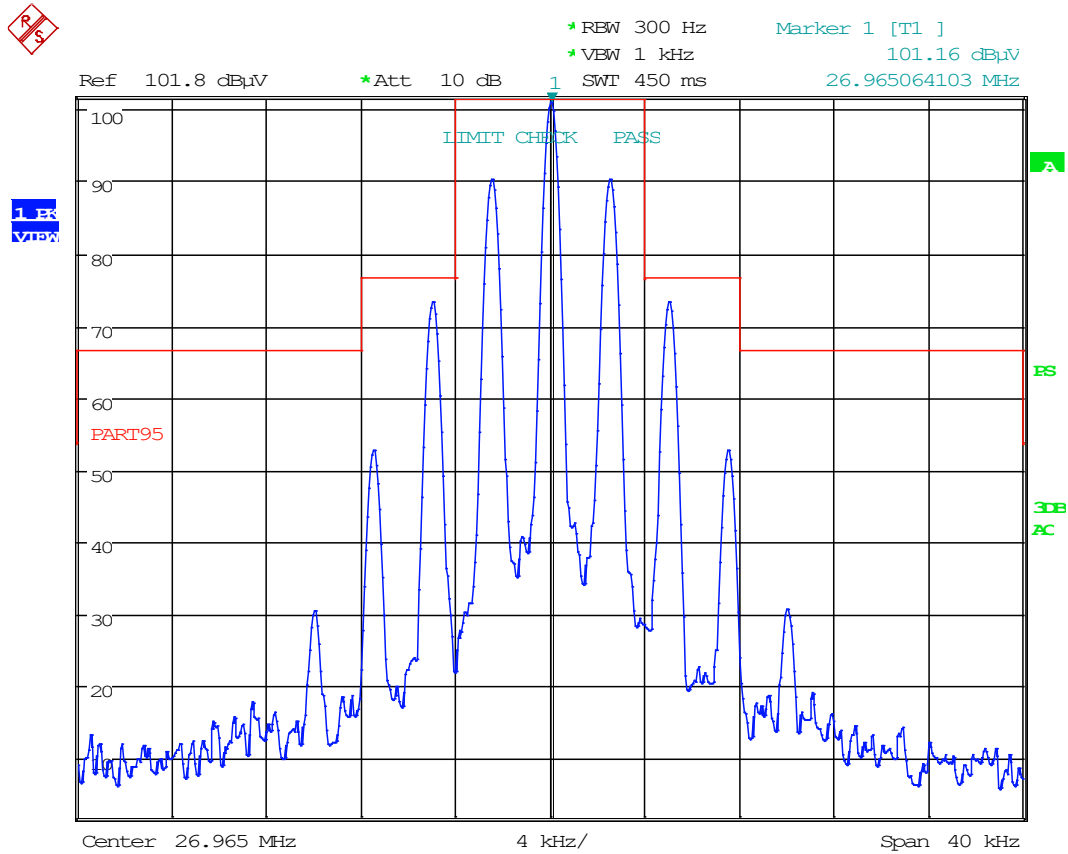
8.6 Occupied Bandwidth- Part 95 Mask

Limits from FCC 2.1049(c)(1), 95.979, RSS-236 5.4.2; and test procedure from ANSI C63.26-2015.

Conducted Test Setup

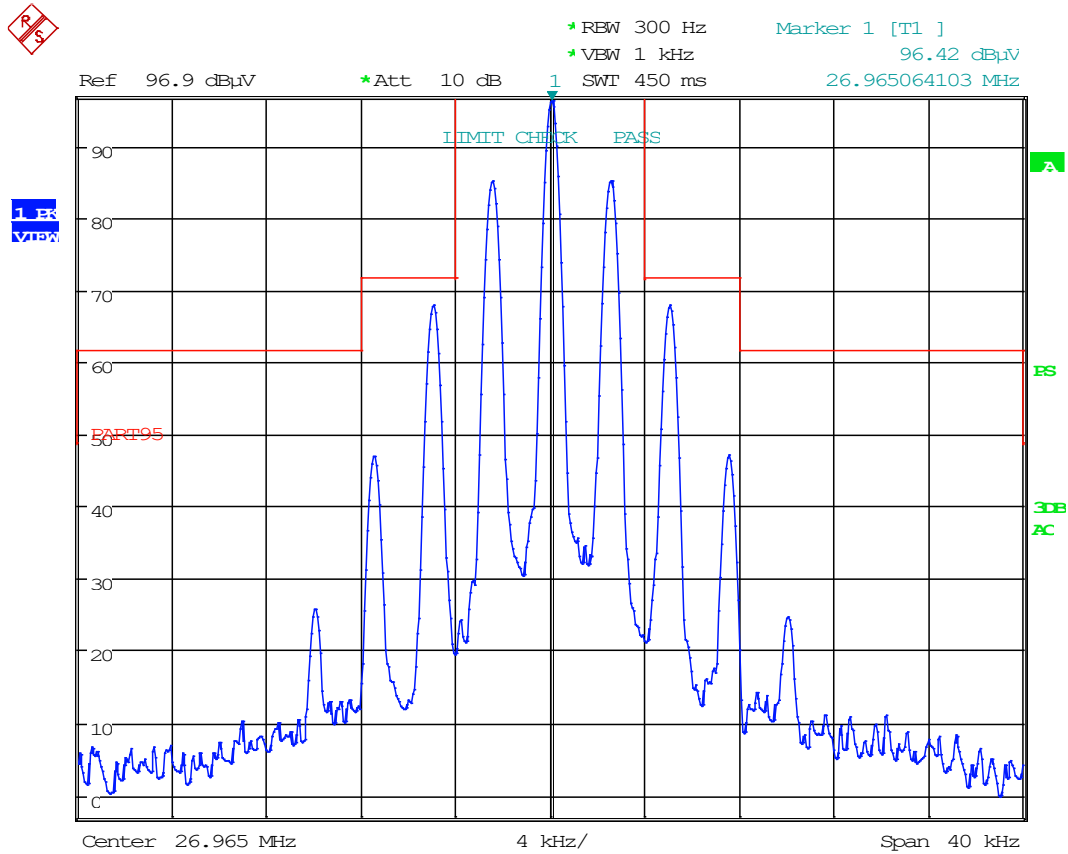


8.6.1 Emission Mask, Ch 1 FM, High Power, 26.965 MHz



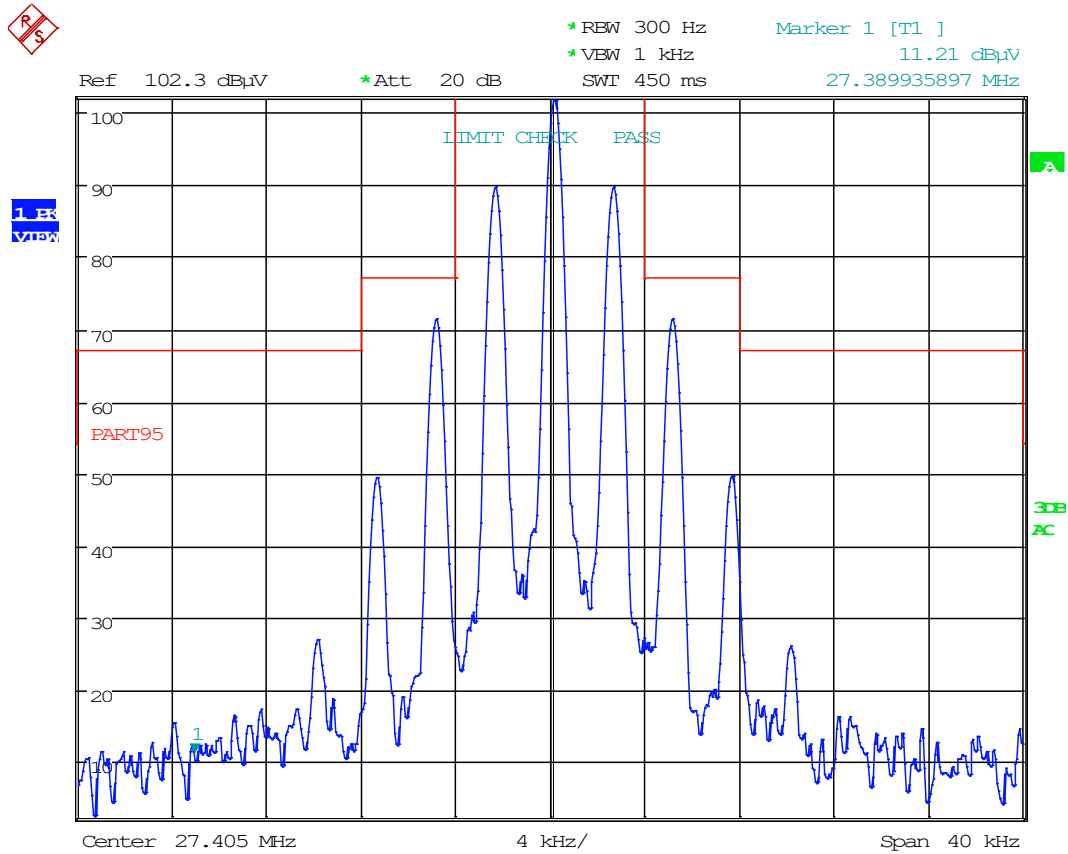
Date: 24.JUN.2022 14:17:38

8.6.2 Emission Mask, Ch 1 FM, Low Power, 26.965 MHz



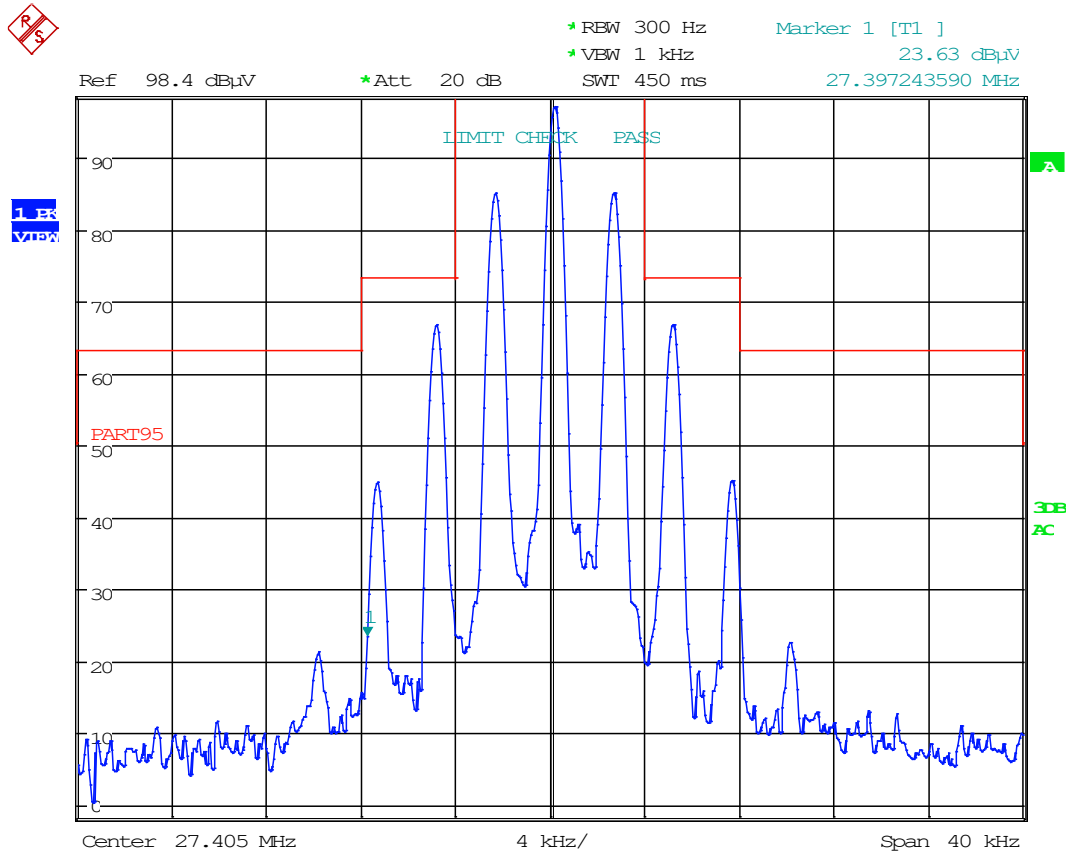
Date: 24.JUN.2022 14:20:12

8.6.3 Emission Mask, Ch 40 FM, High Power, 27.405 MHz

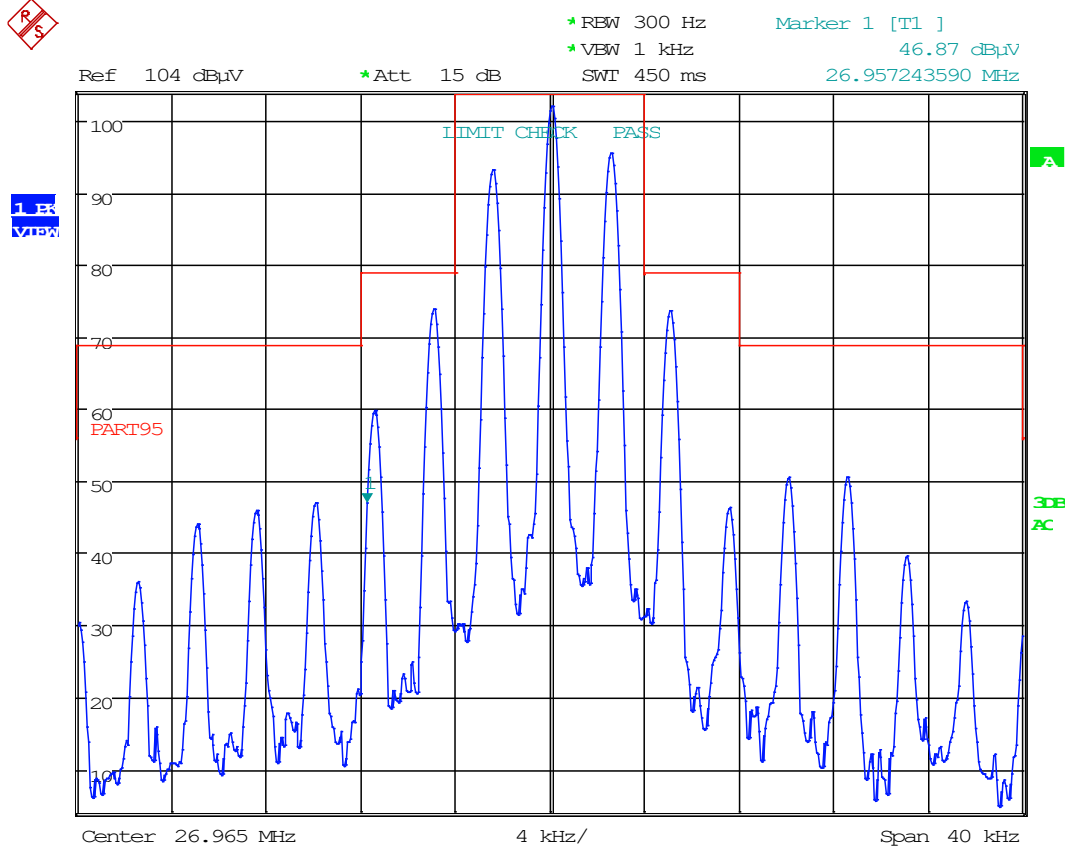


Date: 24.JUN.2022 14:24:31

8.6.4 Emission Mask, Ch 40 FM, Low Power, 27.405 MHz



Date: 24.JUN.2022 14:23:58



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Ref 99 dBμV *Att 10 dB RBW 300 Hz VEW 1 kHz SWT 450 ms Marker 1 [T1] 96.84 dBμV 26.965064103 MHz

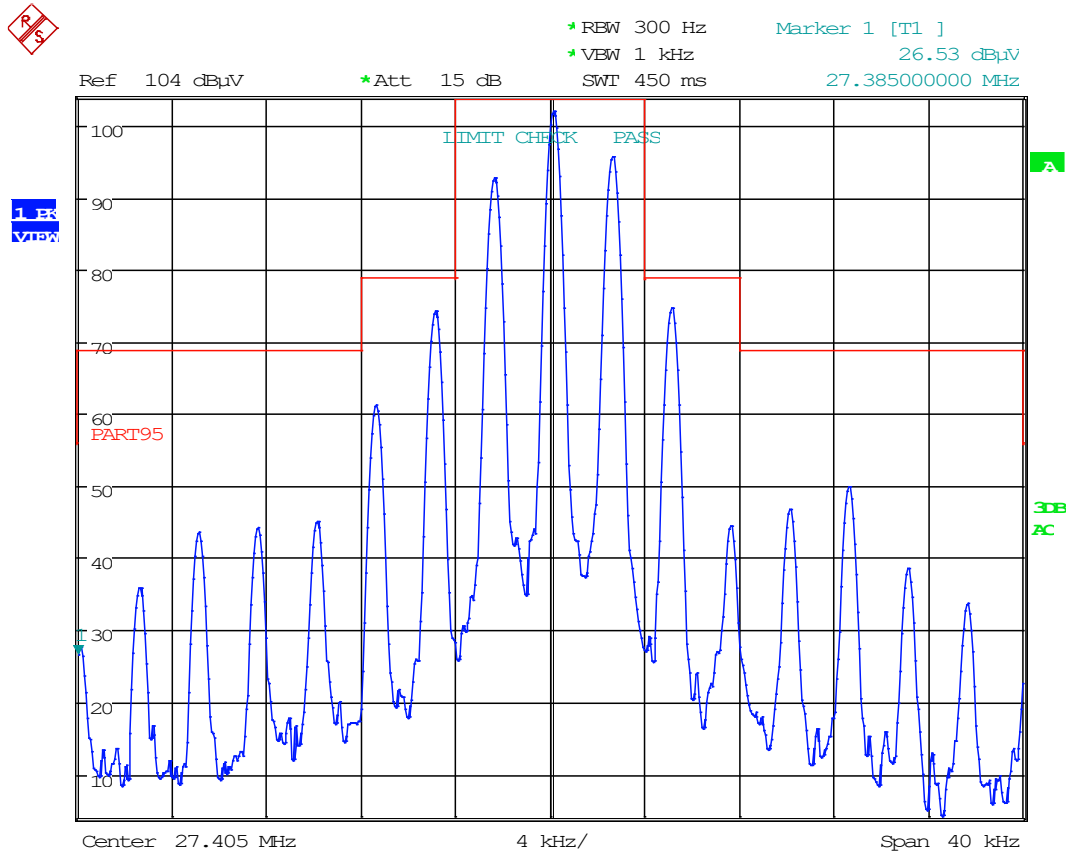
LIMIT CHECK PASS

PART95

Center 26.965 MHz 4 kHz/ Span 40 kHz

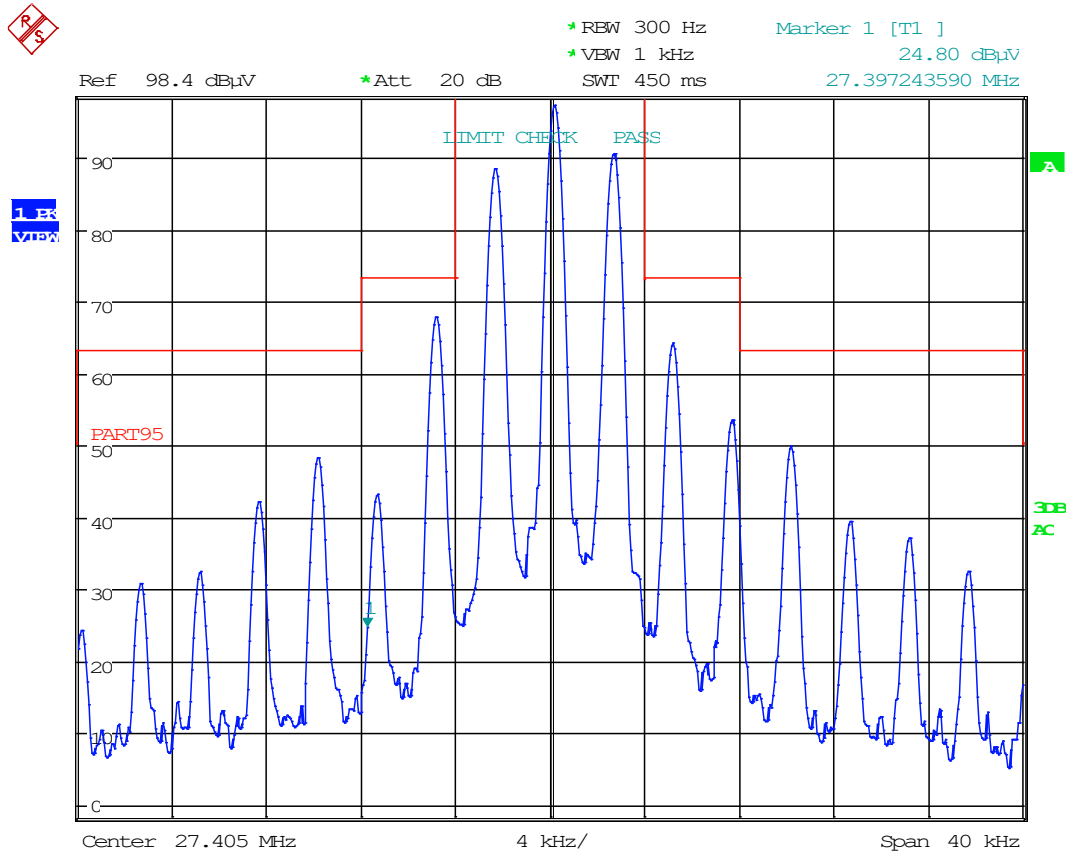
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8.6.7 Emission Mask, Ch 40 AM, High Power, 27.405 MHz



Date: 24.JUN.2022 14:22:33

8.6.8 Emission Mask, Ch 40 AM, Low Power, 27.405 MHz



Date: 24.JUN.2022 14:23:28



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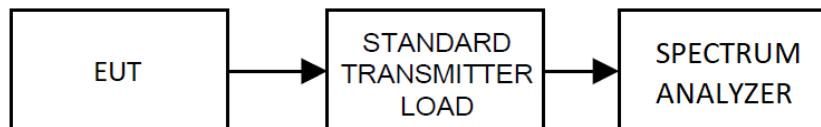
8.7 Spurious Emissions At Antenna Terminals (Conducted)

Limits from FCC Part 2.1051(a), 95.979(5)(6), RSS-236 5.4.4 and test procedure from ANSI C63.26-2015.

Requirements: $53 + 10\log(P)$ dBc. Any harmonic emissions must be > 60 dBc.

Method of Measurement: The carrier was modulated with a 2500 Hz tone at a level 16 dB above the level to produce 50% modulation at frequency of highest response. The spectrum was scanned from 9 KHz to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard ANSI C63.26.

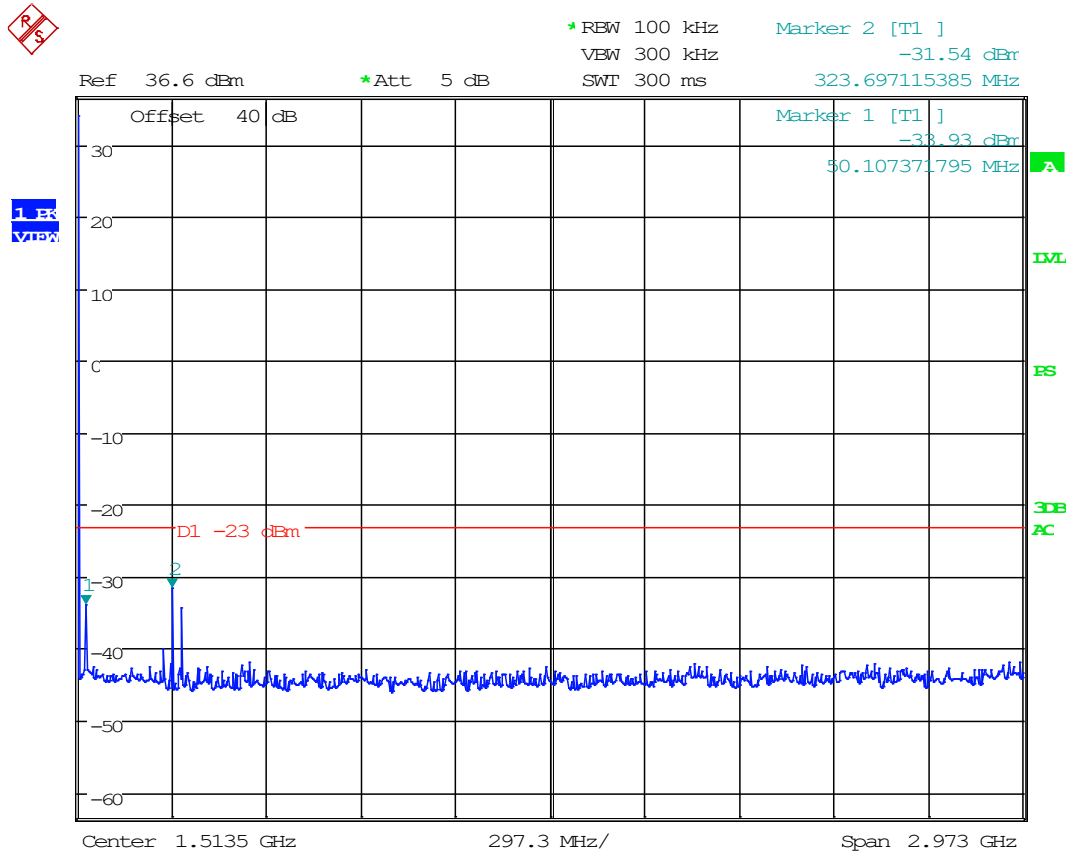
Conducted Test Setup





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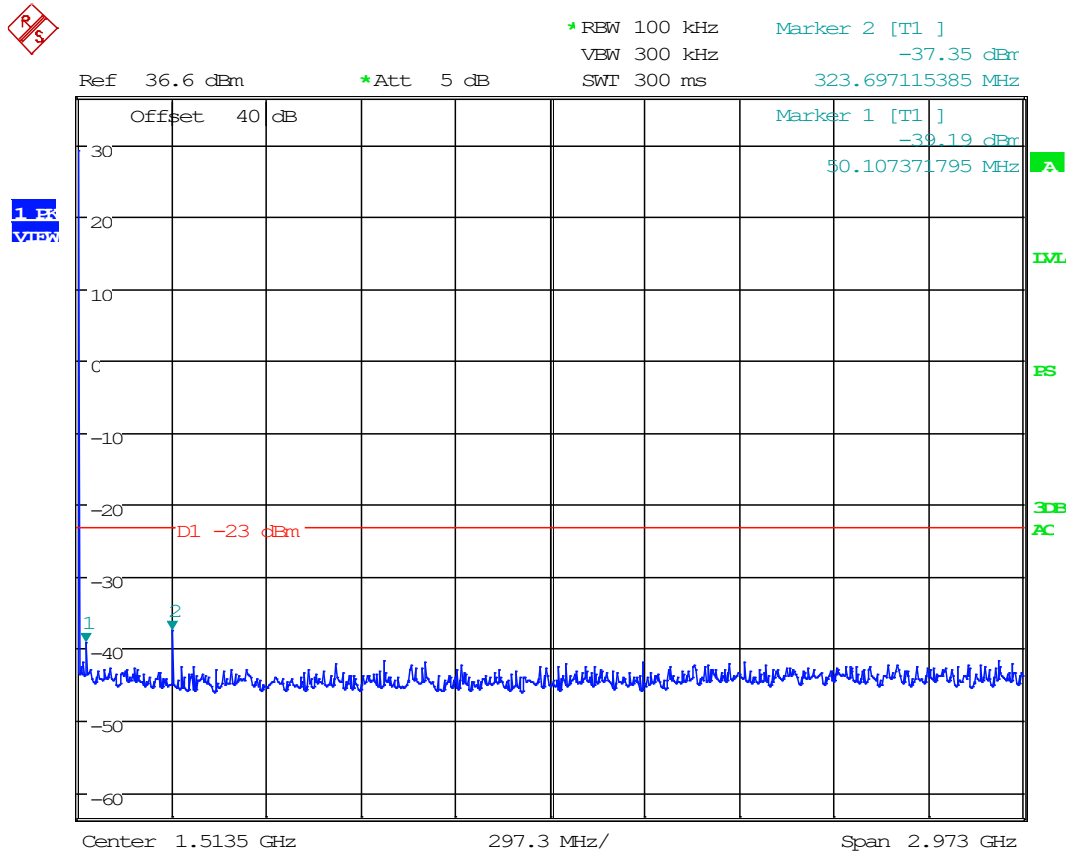
8.7.1 Spurious Emissions, Ch 1, High Power, 26.965 MHz



Date: 24.JUN.2022 14:29:19

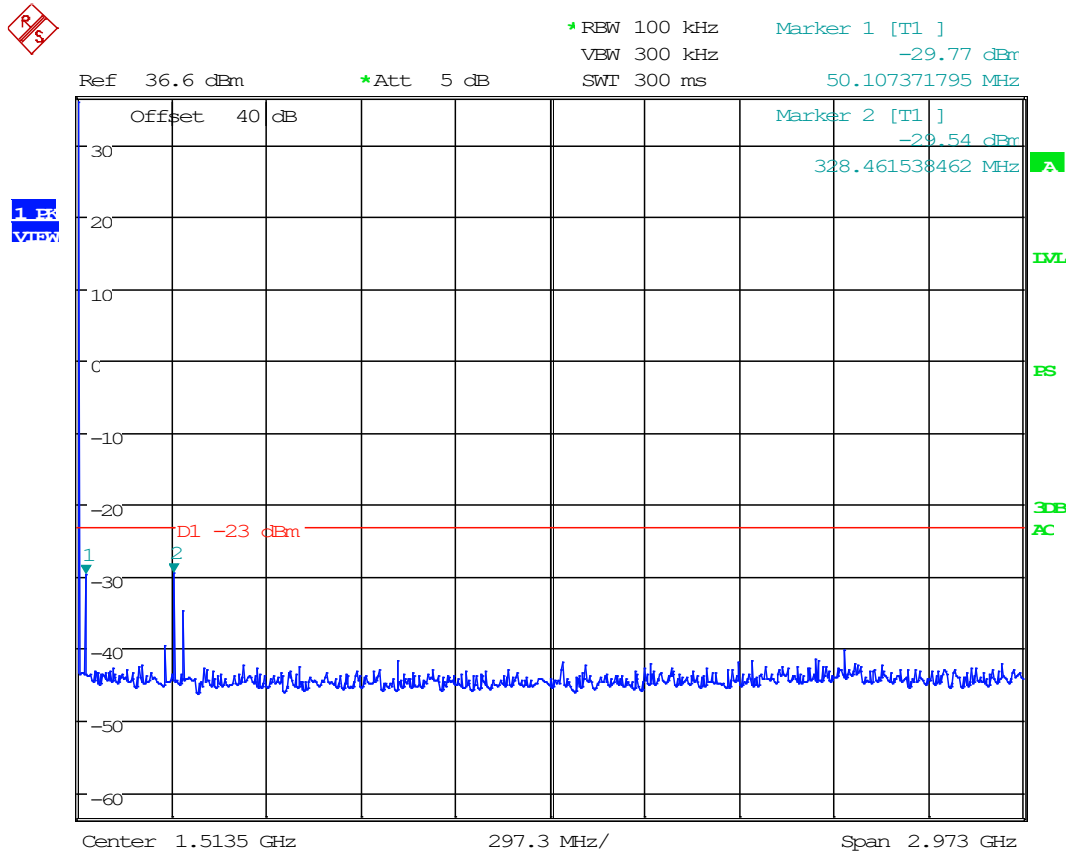


8.7.2 Spurious Emissions, Ch 1, Low Power, 26.965 MHz



Date: 24.JUN.2022 14:29:41

8.7.3 Spurious Emissions, Ch 40, High Power, 27.405 MHz

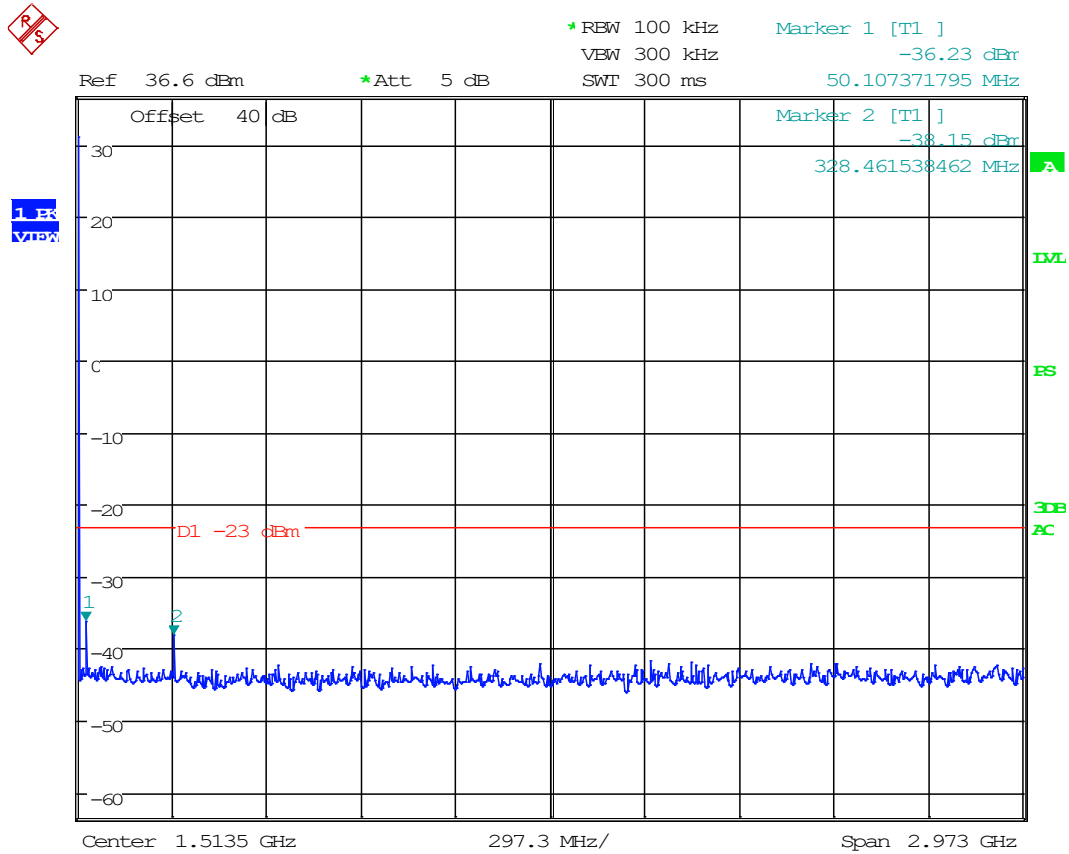


Date: 24.JUN.2022 14:28:55



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8.7.4 Spurious Emissions, Ch 40, Low Power, 27.405 MHz



Date: 24.JUN.2022 14:28:34

8.8 Field Strength of Spurious Emissions

Limits from FCC Part 2.1053, 95.979(5)(6), RSS-236 5.4.4 and test procedure from ANSI C63.26-2015.

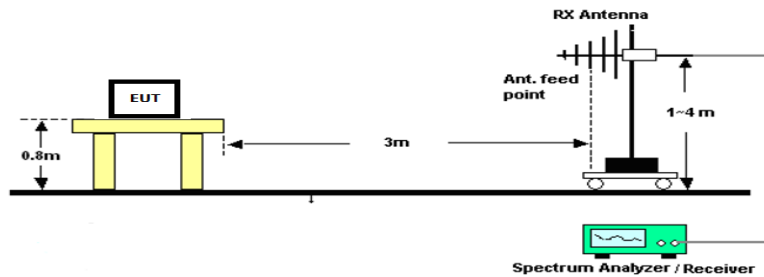
Requirements: Emissions must be attenuated by at least the following below the output of the transmitter.

At least $53 + 10 \log(P)$ dBc on any frequency removed from the center of the authorized bandwidth by more than 250%. At least 60dB on any harmonic frequency.

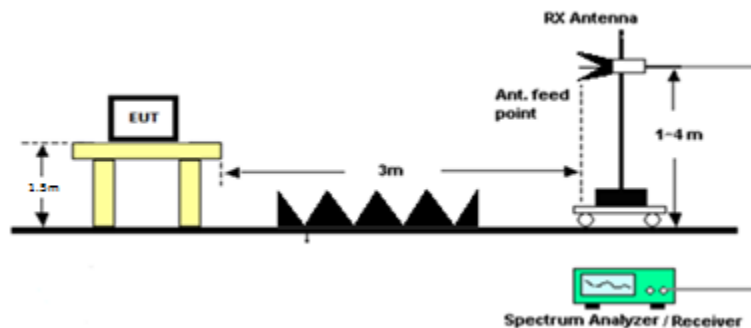
METHOD OF MEASUREMENT

The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 9 kHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI C63.26 using the substitution method

Radiated Test Setup, 30 – 1000 MHz



Radiated Test Setup, Above 1000 MHz





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Radiated Emissions Tabular Data

8.8.1 Radiated Emissions, 26.965 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)
26.96	53.92	PK	2.57	H	0.86	9.82	3.00	13.25	-84.13	-23.00	61.13
26.96	53.92	PK	5.33	V	0.86	9.82	3.00	16.01	-81.37	-23.00	58.37
26.96	80.88	PK	1.85	H	1.09	8.75	3.00	11.69	-85.69	-23.00	62.69
26.96	80.88	PK	3.33	V	1.09	8.75	3.00	13.17	-84.21	-23.00	61.21
26.96	107.84	PK	1.70	H	1.19	10.32	3.00	13.21	-84.17	-23.00	61.17
26.96	107.84	PK	1.82	V	1.19	10.32	3.00	13.33	-84.05	-23.00	61.05
26.96	134.80	PK	3.62	H	1.31	14.24	3.00	19.17	-78.20	-23.00	55.20
26.96	134.80	PK	3.00	V	1.31	14.24	3.00	18.55	-78.82	-23.00	55.82
26.96	161.76	PK	1.27	H	1.46	16.40	3.00	19.13	-78.24	-23.00	55.24
26.96	161.76	PK	-1.67	V	1.46	16.40	3.00	16.19	-81.18	-23.00	58.18
26.96	188.72	PK	7.51	H	1.59	13.67	3.00	22.77	-74.61	-23.00	51.61
26.96	188.72	PK	5.78	V	1.59	13.67	3.00	21.04	-76.34	-23.00	53.34
26.96	215.68	PK	13.55	H	1.67	10.39	3.00	25.61	-71.77	-23.00	48.77
26.96	215.68	PK	5.39	V	1.67	10.39	3.00	17.45	-79.93	-23.00	56.93
26.96	242.64	PK	3.60	H	1.80	10.66	3.00	16.06	-81.32	-23.00	58.32
26.96	242.64	PK	3.11	V	1.80	10.66	3.00	15.57	-81.81	-23.00	58.81
26.96	269.60	PK	8.87	H	2.07	12.08	3.00	23.02	-74.36	-23.00	51.36
26.96	269.60	PK	-2.39	V	2.07	12.08	3.00	11.76	-85.62	-23.00	62.62



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8.8.2 Radiated Emissions, 27.405 MHz

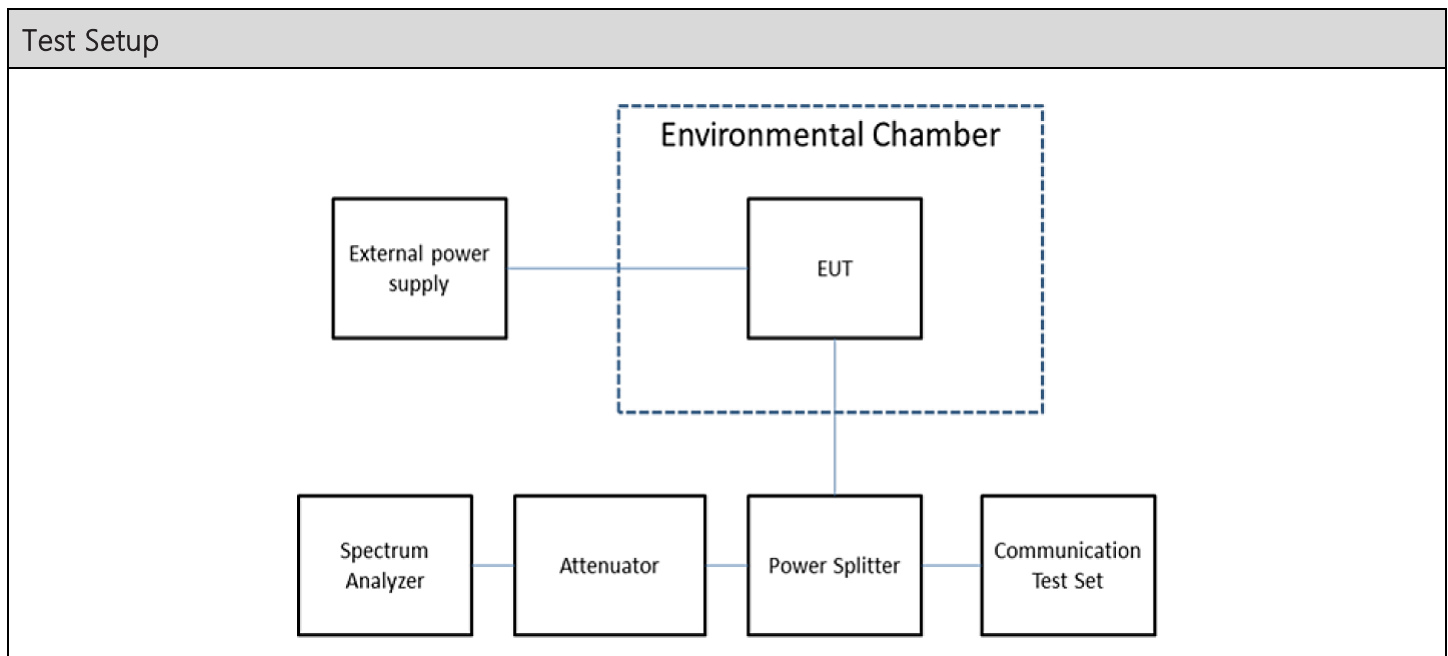
Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBuV)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBuV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
27.41	54.81	PK	3.05	H	0.86	9.48	3.00	13.39	-83.99	-23.00	60.99
27.41	54.81	PK	7.35	V	0.86	9.48	3.00	17.69	-79.69	-23.00	56.69
27.41	82.22	PK	-0.02	H	1.09	9.06	3.00	10.14	-87.24	-23.00	64.24
27.41	82.22	PK	-0.98	V	1.09	9.06	3.00	9.18	-88.20	-23.00	65.20
27.41	109.62	PK	-1.39	H	1.20	10.20	3.00	10.01	-87.37	-23.00	64.37
27.41	109.62	PK	-0.11	V	1.20	10.20	3.00	11.29	-86.09	-23.00	63.09
27.41	137.03	PK	1.80	H	1.33	14.70	3.00	17.83	-79.55	-23.00	56.55
27.41	137.03	PK	-1.89	V	1.33	14.70	3.00	14.14	-83.24	-23.00	60.24
27.41	164.43	PK	1.61	H	1.48	15.96	3.00	19.05	-78.33	-23.00	55.33
27.41	164.43	PK	1.80	V	1.48	15.96	3.00	19.24	-78.14	-23.00	55.14
27.41	191.84	PK	2.27	H	1.60	14.25	3.00	18.12	-79.26	-23.00	56.26
27.41	191.84	PK	2.89	V	1.60	14.25	3.00	18.74	-78.64	-23.00	55.64
27.41	219.24	PK	3.84	H	1.69	10.32	3.00	15.85	-81.53	-23.00	58.53
27.41	219.24	PK	5.99	V	1.69	10.32	3.00	18.00	-79.38	-23.00	56.38
27.41	246.65	PK	4.10	H	1.85	10.93	3.00	16.88	-80.50	-23.00	57.50
27.41	246.65	PK	2.36	V	1.85	10.93	3.00	15.14	-82.24	-23.00	59.24
27.41	274.05	PK	9.18	H	2.06	12.51	3.00	23.75	-73.63	-23.00	50.63
27.41	274.05	PK	7.93	V	2.06	12.51	3.00	22.50	-74.88	-23.00	51.88

8.9 Frequency Stability

Limits from FCC 2.1055(a) (b) (d), Part 95.965, RSS-236 5.3.2; and test procedure from ANSI C63.26-2015.

Requirements: Maintain a frequency tolerance of less than 50 ppm

Temperature and voltage tests were performed to verify that the frequency remains within the 50 ppm specification limit. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 °C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15-second intervals. The worst case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 °C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15-second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 °C.



Test Results, Mode 1		
Tuned Frequency (MHz)	Max Deviation (kHz)	Limit (ppm)
26.965	0.185	50

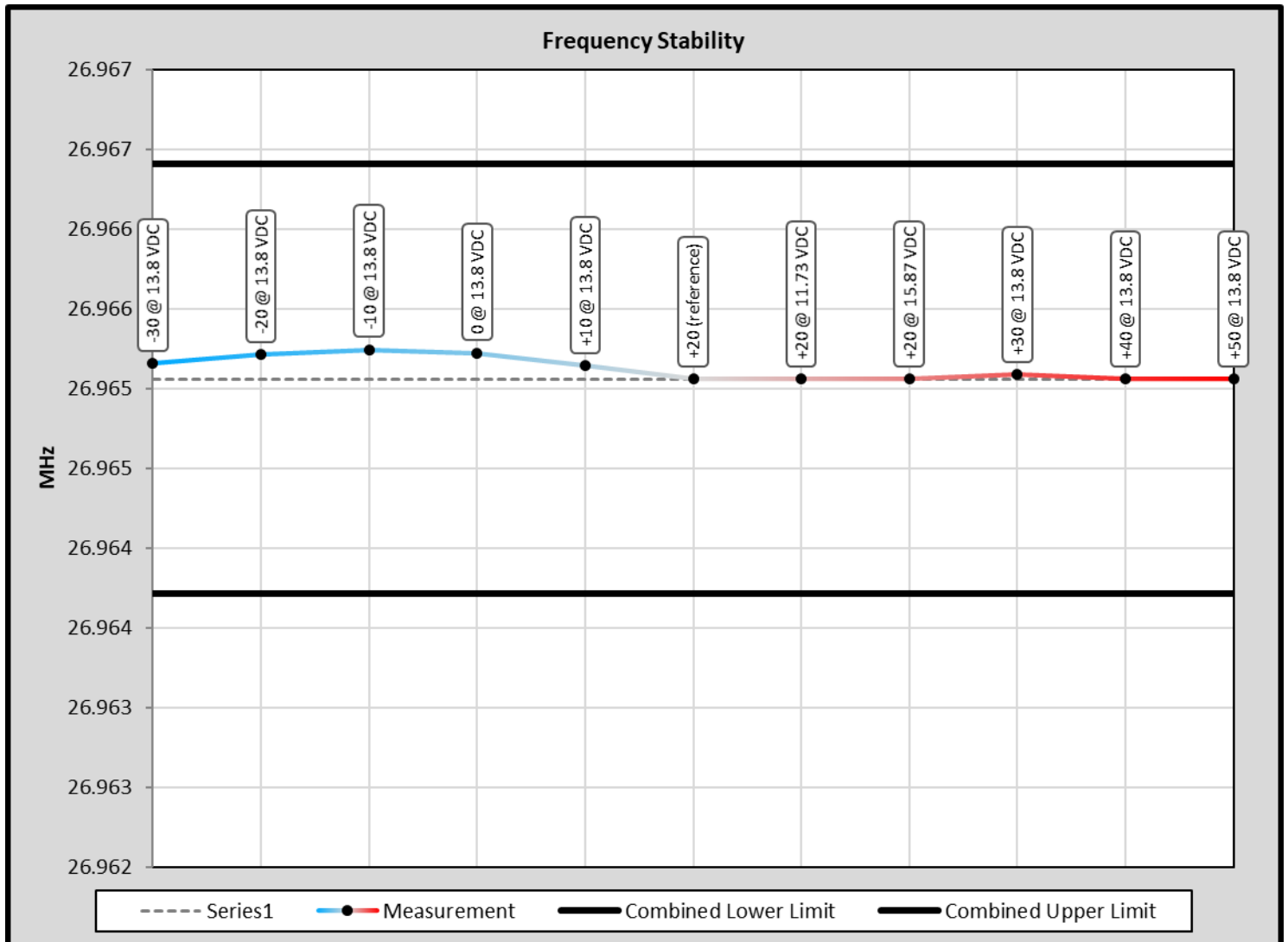


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8.9.1 Frequency Stability Data

FCC Part 95 Limit	50.0	ppm	
FCC Part 95 Limit, as ppb	50000	ppb (Parts per Billion)	
FCC Part 95 Limit, as %	0.00500	%	
Strictest Combined Limit, as Hz	1348.253	Hz	
Combined Lower Limit	26.963711	MHz	
Combined Upper Limit	26.966407	MHz	
Rated Supply Voltage	13.8	☐ AC ☒ DC	
Temperature / Voltage Variation			
Temperature (°C)	Supplied Voltage (V)	Frequency (MHz)	Deviation (kHz)
-30	13.8	26.965157	-0.098
-20	13.8	26.965210	-0.151
-10	13.8	26.965244	-0.185
0	13.8	26.965222	-0.162
+10	13.8	26.965144	-0.085
+20 (reference)	13.8	26.965059	0.000
+20	11.7	26.965059	0.000
+20	15.9	26.965059	0.000
+30	13.8	26.965085	-0.026
+40	13.8	26.965058	0.001
+50	13.8	26.965059	0.000

8.9.2 Frequency Stability Plot





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9. ANNEX-A - Photographs of the EUT

Photographs of the EUT and any manufacturer supplied accessories to be used with the EUT are in separate supplementary documents labelled EXTERNAL PHOTOS and INTERNAL PHOTOS.

10. ANNEX-B – Test Setup Photographs

Test setup photographs are located in a separate supplementary ANNEX-B document.

11. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_2300-22_FCC 95_	1	Initial release	5/20/2022
	2	Updated pages 4,21-28,30-33,35,36,38 & 39	6/24/2022
	3	Updated Pages 4 and 37	6/29/2022



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END OF TEST REPORT
