TIMCO ENGINEERING, Inc.

An IIA Company

Test Report - FCC Part 73/ TBC
Applicant: Transamerica International Broadcasting Inc.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 2/10/2023

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1 Customer Information

Applicant: Transamerica International Broadcasting Inc.
Address: 3100 NW 72nd Avenue
Unit 112
Miami, Florida, 33122, United States

1.1 Test Result Summary

The following test procedure and guidance were used for measuring Licensed FM Broadcast Stations (TBC); FCC KDB 442401 and ANSI C63.26-2015. 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.

FCC Clauses	Description of the requirements	Result (Pass, Fail or N/A)
Applicable Clauses from Part 2		
2.1033 (c)(8)	The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range.	For Info Only
2.202(g)(III)(3)	Necessary bandwidth (Sound Broadcasting)	Pass
2.1046 (a)	RF Power Output	Pass
2.1047 (a)	Modulation characteristics	N/A
2.1047 (b)	Modulation Limiting	N/A
2.1049 (e)(4)	FM broadcast transmitters for multiplex operation (SCA)	N/A
2.1049 (e)(5)	FM broadcast transmitter for stereophonic operation	N/A
2.202	Bandwidths	Pass
2.1051	Spurious emissions at antenna terminals.	Pass [Note 1]
2.1053	Field strength of spurious radiation.	Pass
2.1055	Frequency stability.	Pass
Applicable Clauses from Part 73		
73.267	Determining operating power.	Pass
73.317	FM transmission system requirements	Pass
73.840	Operating power and mode tolerances.	Pass

Note 1: see referenced exhibit in this section

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2 Location of Testing

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: 7/19/2022-7/20/2022

Signature: Sr. EMC Engineer EMC-003838-NE

Name & Title: Tim Royer, EMC Engineer

Date of Signature 2/10/2023

Signature:

Name & Title: Kristoffer Costa, EMC Technician

Date of Signature 2/10/2023

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3 Test Sample(s) (EUT/DUT)

The test sample was received: 7/19/2022

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:	KEUEM1KDIG
Brief Description	1 kW FM Broadcast Transmitter
Model(s) #	EM 1K HE CMT DIG PLUS
Firmware version	2.1.1
Software version	N/A
Serial Number	22806011

Technical Characteristics	
Technology	Broadcast Transmitter
Frequency Range	87.5-108 MHz
RF O/P Power (Max.)	1 kW
Bandwidth & Emission Class	Mono; 180KF3E Stereo; 256KF3E
Duty Cycle	100%
Antenna Connector	EIA 7/16" Connector
Voltage Rating (AC or Batt.)	230 VAC ±15%, 50/60 Hz

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.

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3.2 Configuration of EUT

Test Modes

Band (MHz)	Test Frequencies (MHz)	Modulation	Number of Ant
87.5-108 MHz	88 MHz 98 MHz 108 MHz	FM	1

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:

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.

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4 Test methods & Applicable Regulatory Limits

Test methods/Standards/Guidance:

Test procedures and guidance for measuring Licensed FM Broadcast Stations (TBC); FCC KDB 442401 and ANSI C63.26-2015.

1) ANSI C63.26-2015;
2) FCC KDB 442401

Limits and Regulatory Limits:

1) FCC CFR 47 Part 73

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
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

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.	

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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	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
Antenna	Double-Ridged Horn/ETS Horn 1	ETS-Lindgren	3117	00035923	2/25/20	2/24/2023
CHAMBER	CHAMBER	Panashield	3M	N/A	3/12/19	12/21/2023
Receiver	EMI Test Receiver R&S ESW44	Rohde & Schwarz	ESW44	103049	10/13/21	10/12/2024
Pre-amp	Pre-amp	RF-LAMBDA	RLNA00M45GA	NA	2/27/19	9/26/2022
Function Generator	Function Generator	Standford	DS340	25200	1/13/21	1/13/2024
Receiver	EMI Test Receiver R&S ESU 40	Rohde & Schwarz	ESU 40	100320	5/27/21	5/26/2024
Frequency Counter	Frequency Counter Small	HP	5385A	3242A07460	9/9/20	9/9/2023
Thermometer	Type K J Thermometer	Martel	303	080504494	1/18/20	1/17/2023
Signal Generator	Signal Generator HP 8648C	HP	8648C	35537A01679	3/29/19	8/03/2025

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

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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

EIRP = Pcond (dBm) + dBi

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8.1. Necessary bandwidth (Sound Broadcasting)

Requirement from Test procedures and guidance for measuring Licensed FM Broadcast Stations (TBC); FCC KDB 442401 and ANSI C63.26-2015.

Mono Type of Emission: 180KF3E

Bn = 2M + 2DK
M = 15000
D = 75 KHz (Peak Deviation)
K = 1
Bn = 2(15K) + 2(75K) (1) = 180K

Where:

M = 15 (Modulation Frequency, kHz)
D = 75 (Peak Deviation, kHz)
K = 1 (constant value)

Stereo Type of Emission: 256KF3E

Bn = 2M + 2DK
M = 15
D = 113 KHz (Peak Deviation)
K = 1
Bn = 2(15K) + 2(113K) (1) = 256K

Where:

M = 15 (Modulation Frequency, kHz)
D = 113 (Peak Deviation, kHz)
K = 1 (constant value)

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8.2 RF Power Output

Requirement from FCC KDB 442401 and ANSI C63.26-2015.

Method of Measurement: RF power was measured by Indirect Method as described in the standard listed above.

Test Method:

$$\text{Transmitter output power} = Ep \times Ip \times F$$

Where:

Ep = DC input voltage of final radio stage.

Ip = Total DC input current of final radio stage.

F = Efficiency factor.

Test Data: RF Output Power

Test Results, Mode 1			
Mode	Tuned Frequency (MHz)	Power Output (dBm)	Power Output (W)
1	88	58.59	722.76
1	98	58.65	732.82
1	108	58.54	714.49

OUTPUT POWER: 732.82 Watts

Part 2.1033 (C) (8) DC Input into the final amplifier

POWER SETTING INPUT POWER: (230.0V) (20) = 4600 Watts

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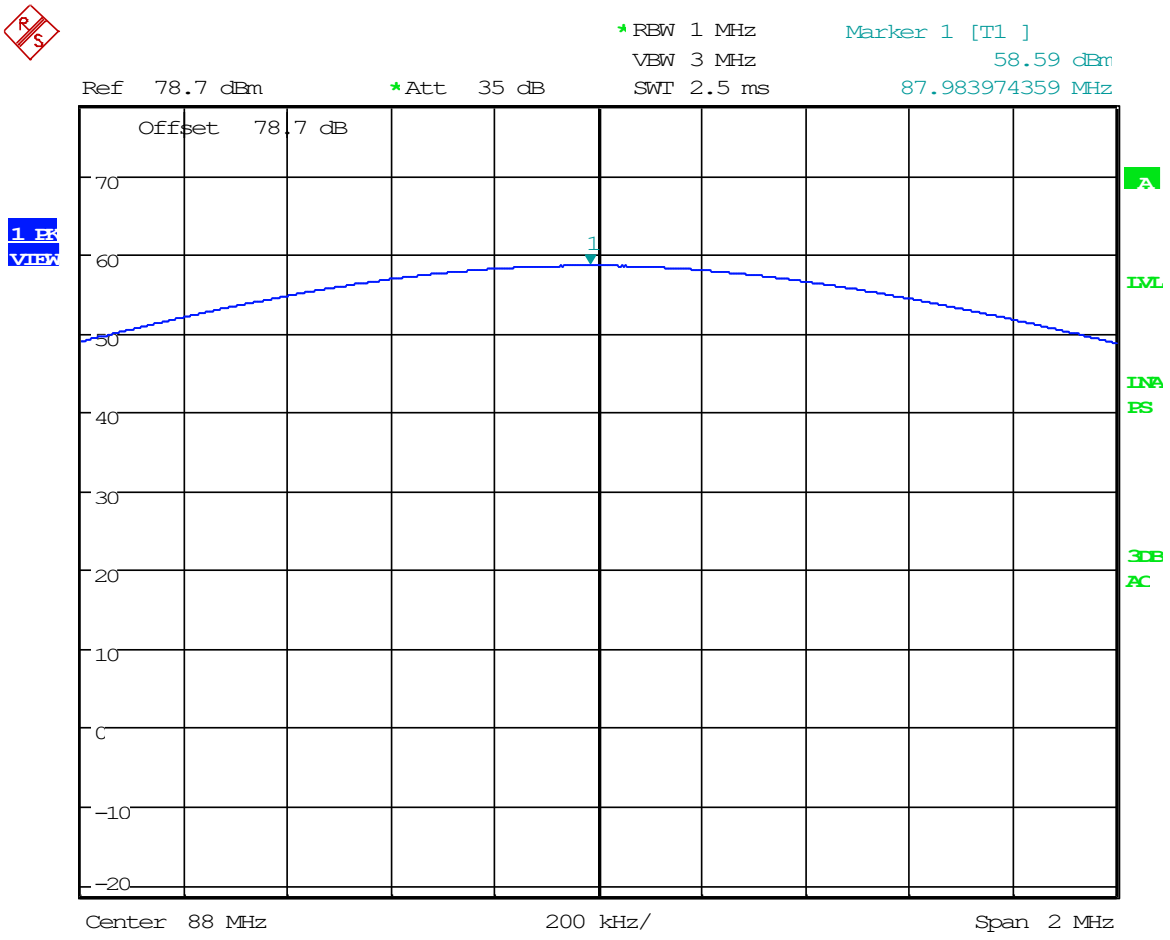
8.2.1 RF Output Power Plot, 88 MHz



Date: 9.SEP.2022 16:39:57

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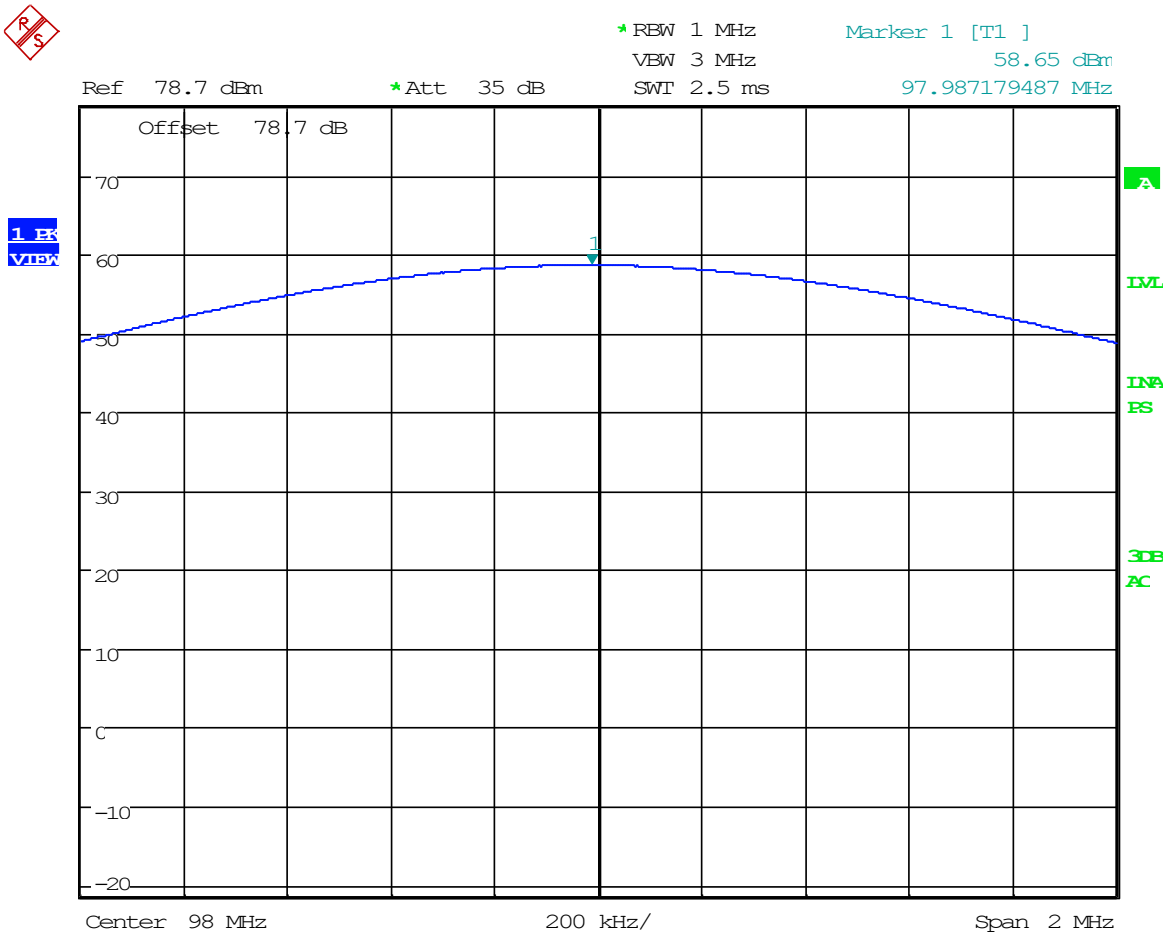
8.2.2 RF Output Power Plot, 98 MHz



Date: 9.SEP.2022 16:40:51

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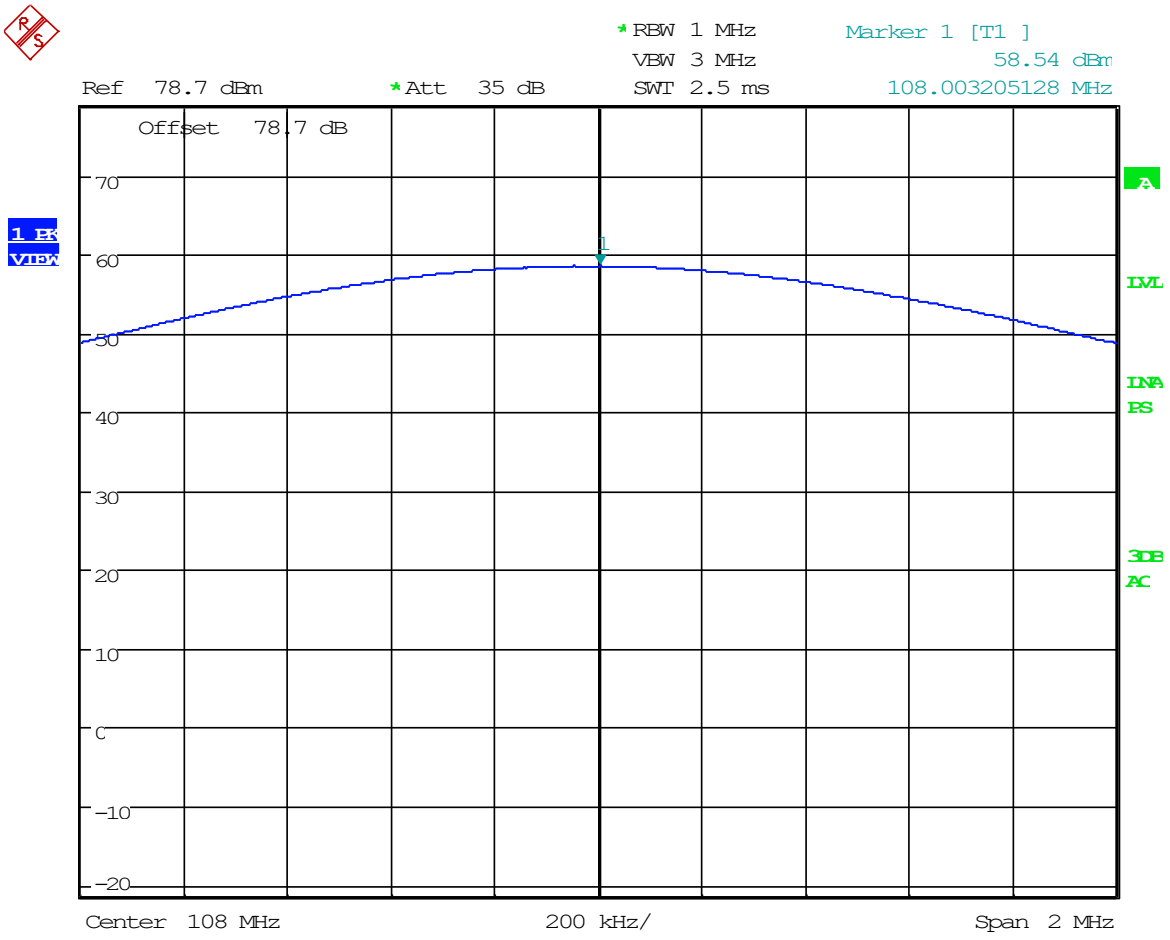
8.2.3 RF Output Power Plot, 108 MHz



Date: 9.SEP.2022 16:41:37

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8.3 Modulation characteristics

Limits from FCC Part 2.1047 (a) and test procedure from ANSI C63.26-2015

Setup

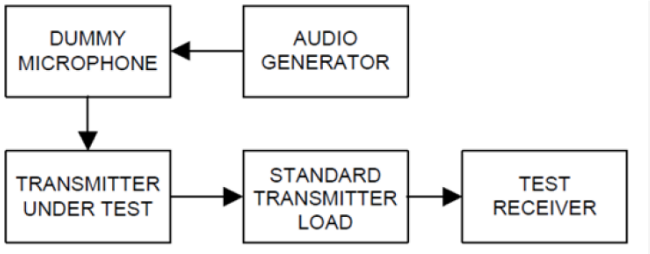

Figure 3 —Equipment set-up audio frequency response (constant input)

8.3.1 Results

N/A

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8.4 Modulation Limiting

Limits from FCC Part 2.1047 (b) and test procedure from ANSI C63.26-2015

Setup

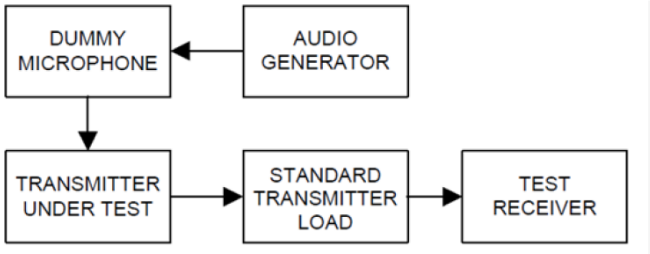

Figure 3 —Equipment set-up audio frequency response (constant input)

8.4.1 Test Data / Spectrum Plots

N/A

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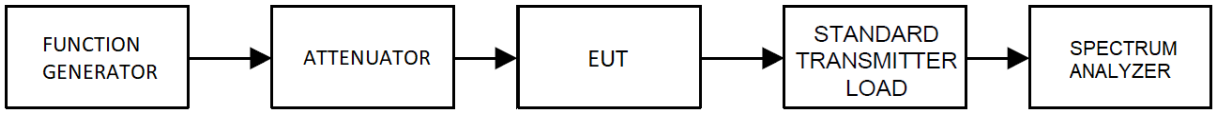
8.5 Occupied Bandwidth & Emission Mask

Limits from FCC Part 2.1049 (e)(3) – (5), Part 73.317(b), (c) and test procedure from ANSI C63.26-2015

Setup



Test Data/ Spectrum Plots

Frequency (MHz)	20dB OBW (kHz)
88	194.24
98	181.74
108	172.13

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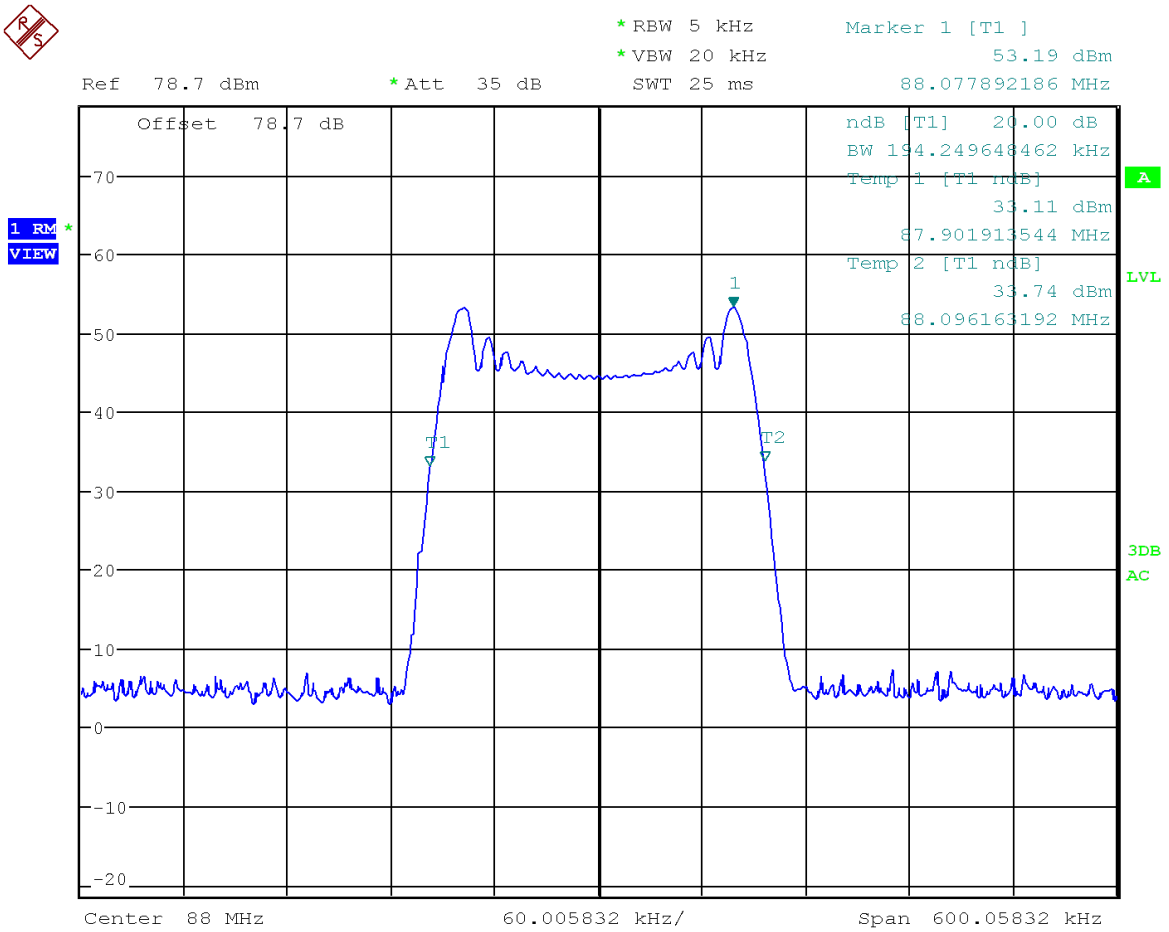
8.5.1 20dB Bandwidth Plot, 88 MHz



Date: 13.SEP.2022 11:46:59

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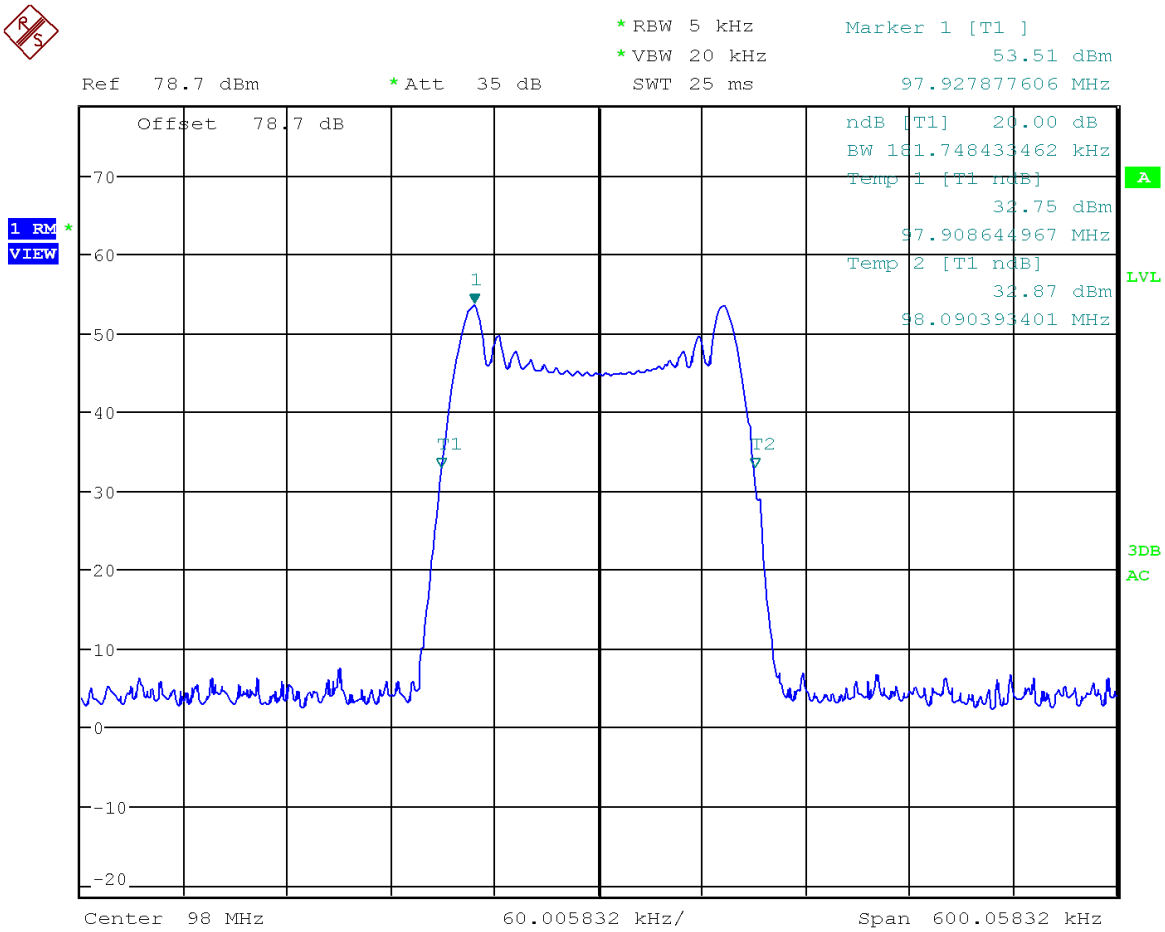
8.5.2 20dB Bandwidth Plot, 98 MHz



Date: 13.SEP.2022 11:48:16

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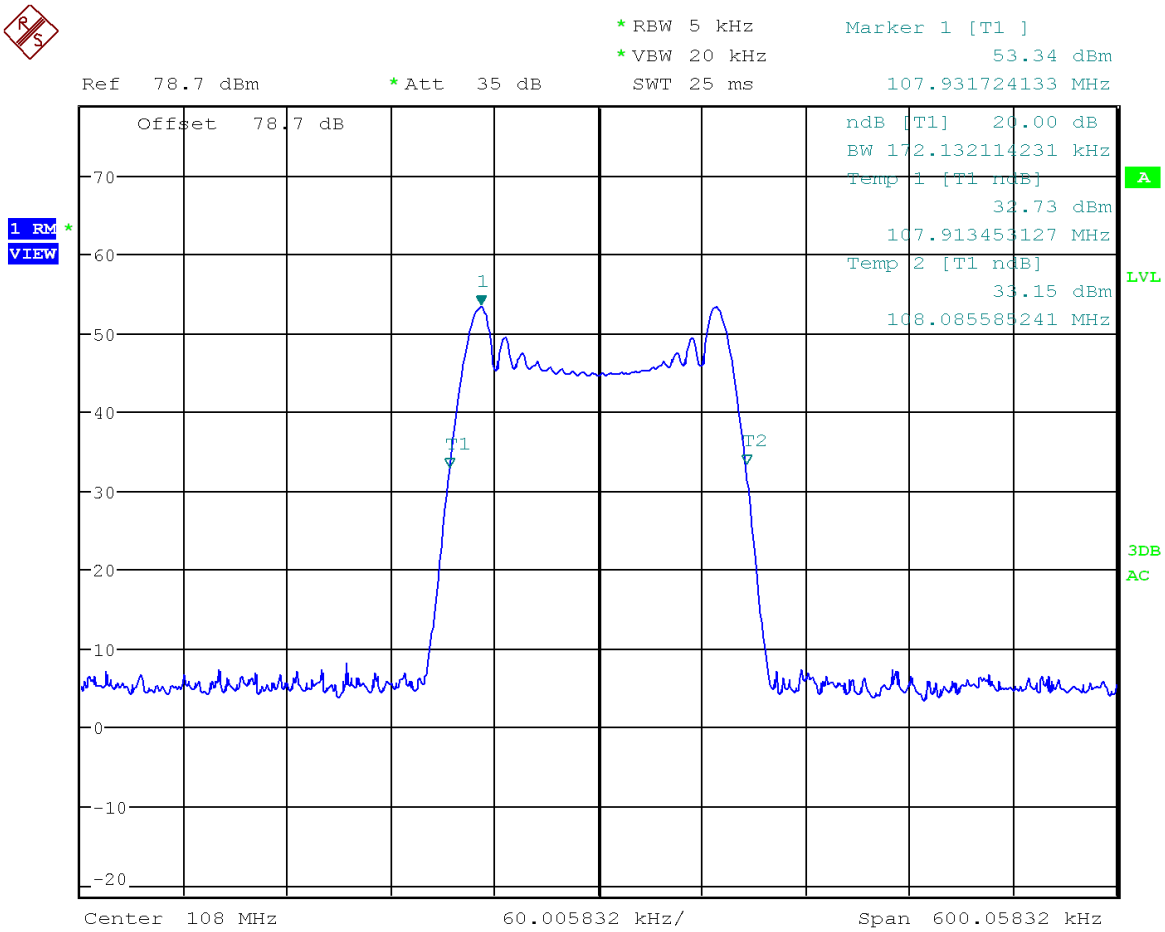
8.5.3 20dB Bandwidth Plot, 108 MHz



Date: 13.SEP.2022 11:49:01

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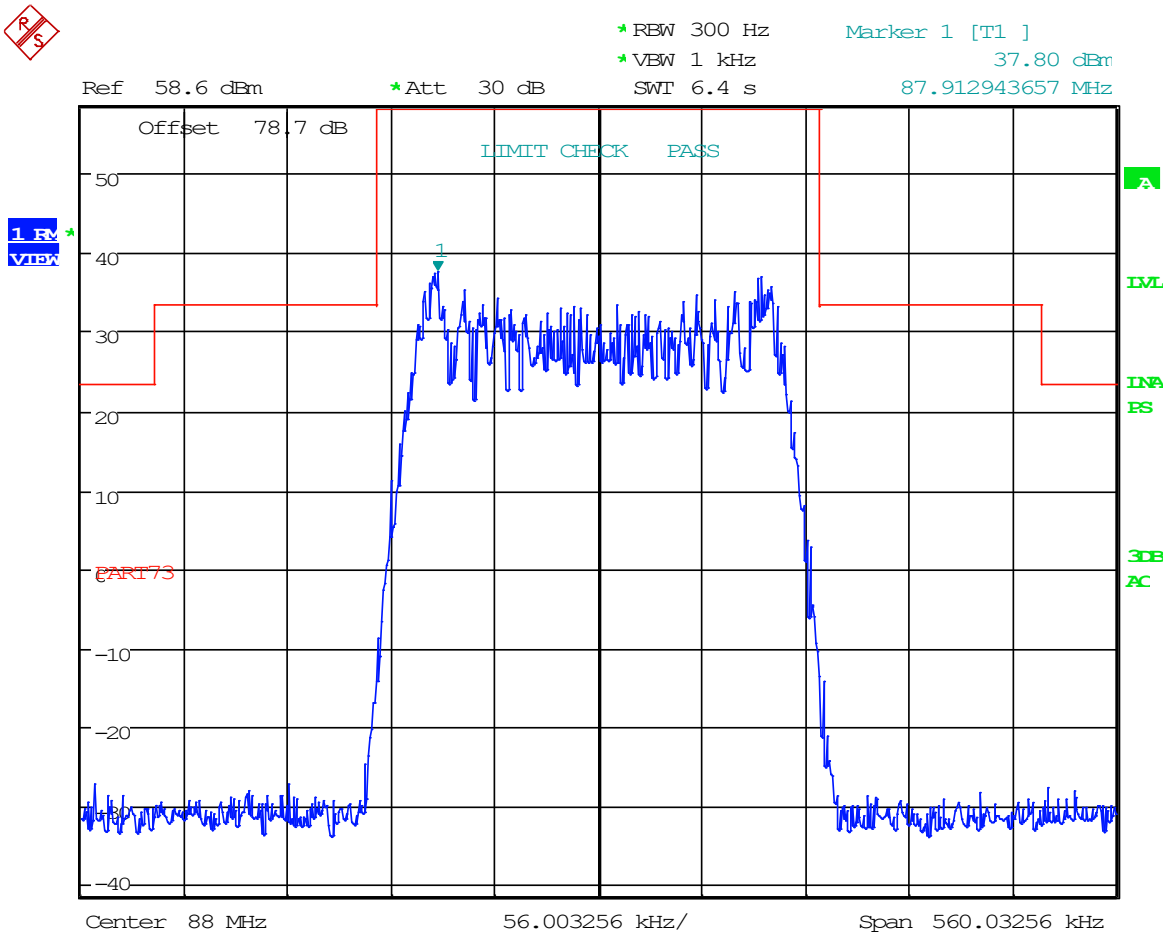
8.5.4 Emission Mask Plot, 88 MHz



Date: 12.SEP.2022 10:47:51

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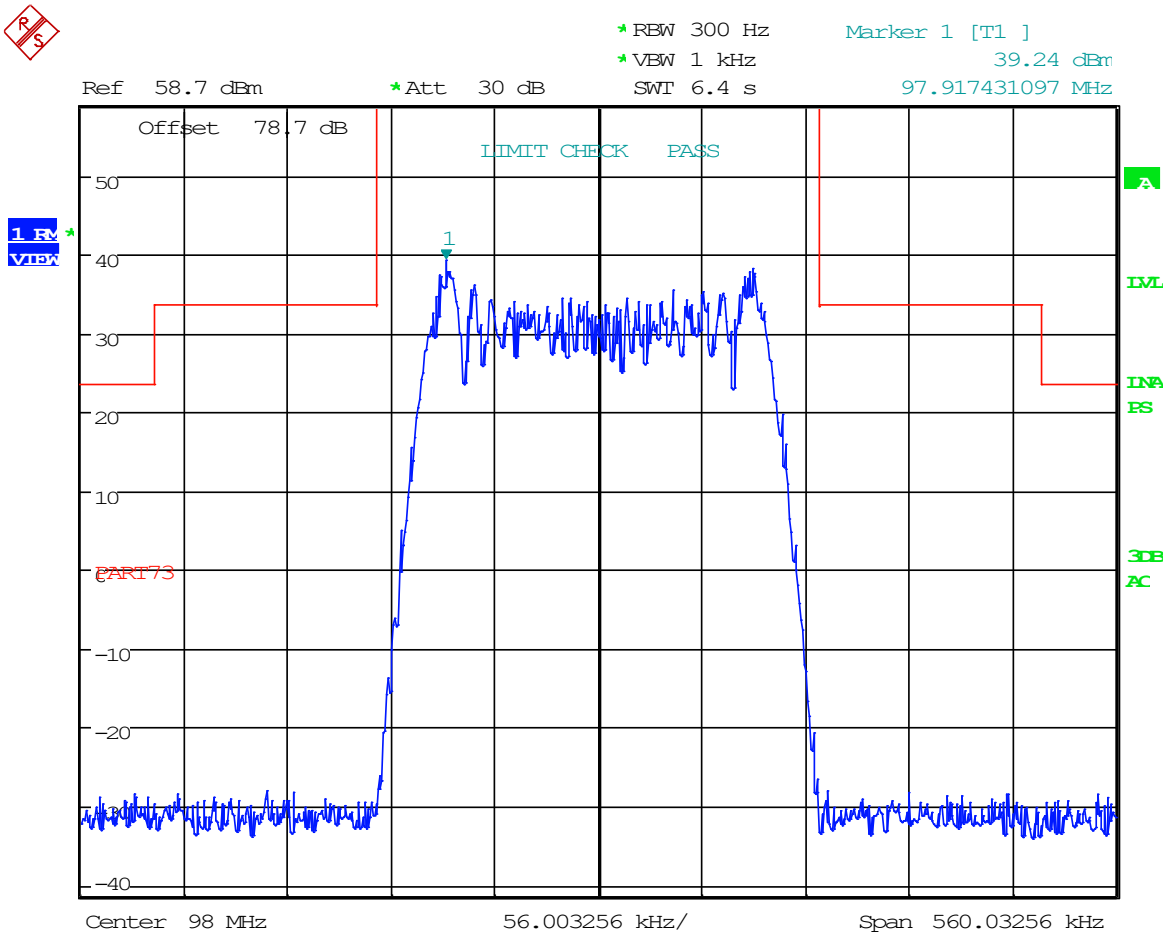
8.5.5 Emission Mask Plot, 98 MHz



Date: 12.SEP.2022 10:48:51

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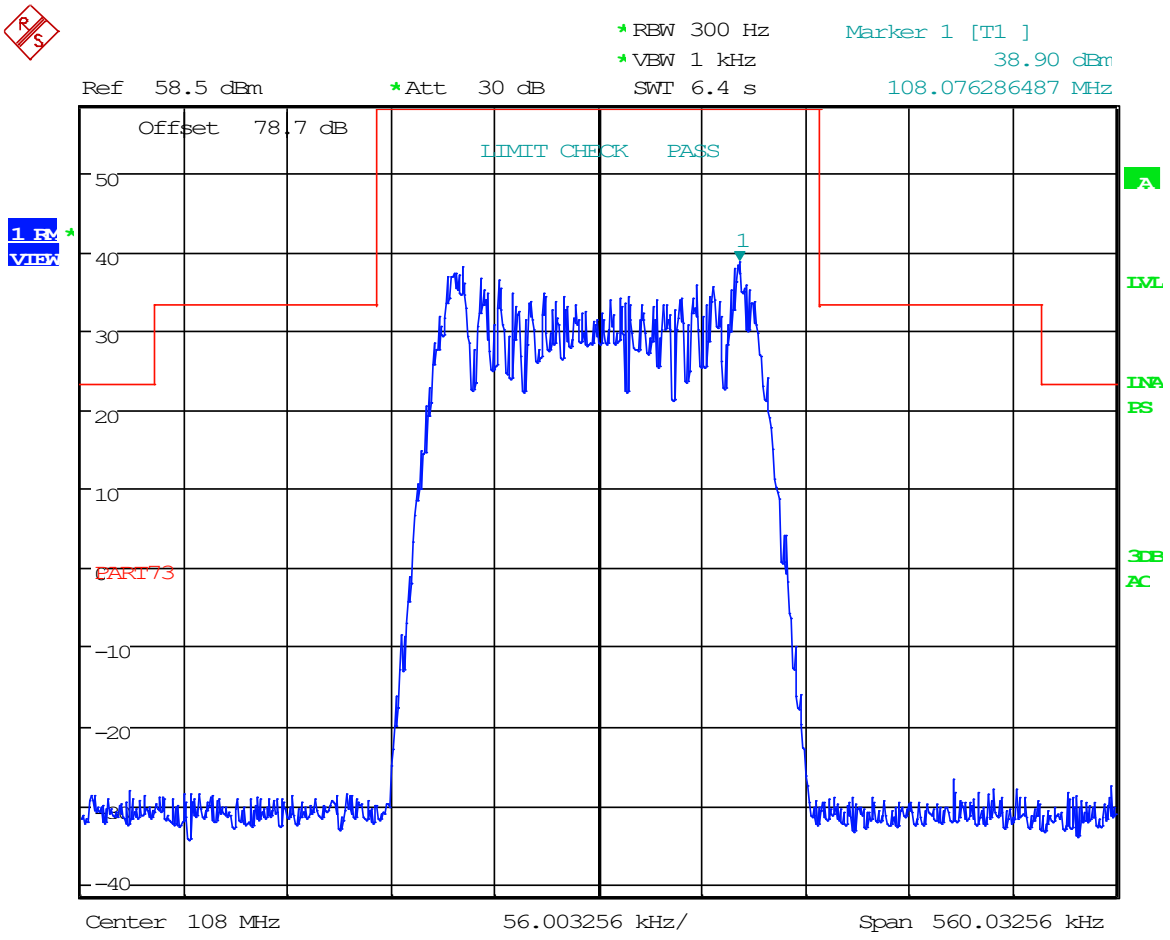
8.5.6 Emission Mask Plot, 108 MHz



Date: 12.SEP.2022 10:50:01

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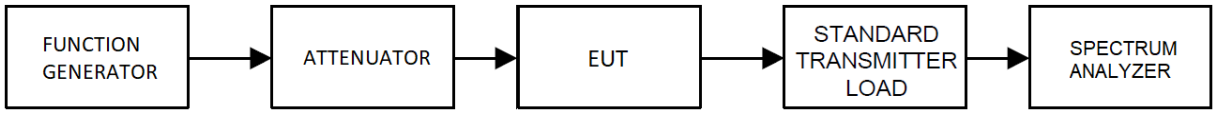
8.6 SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Limits from FCC Part 2.1051 & 73.317(d) and test procedure from ANSI C63.26-2015

Setup



Testing Data attached in separate exhibit: Test Report 2 IT-2023011001 KEUEM1KDIG

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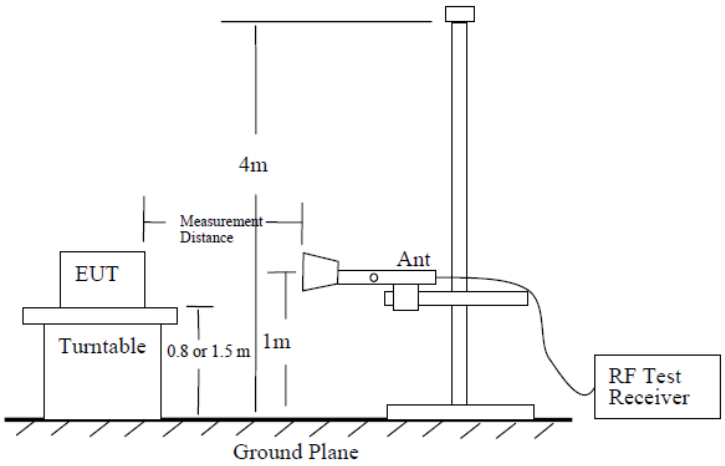
8.7 FIELD STRENGTH OF SPURIOUS EMISSIONS

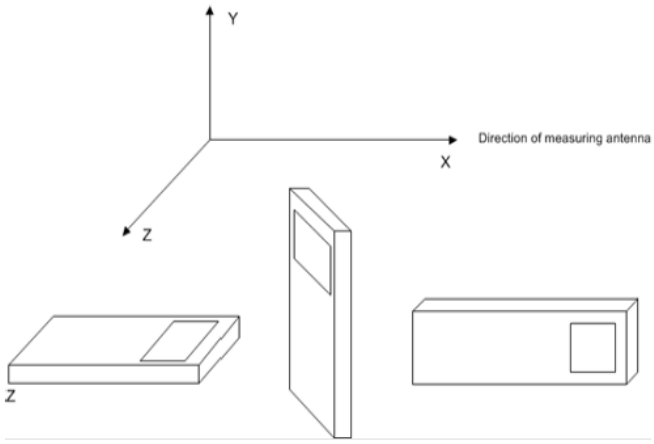
Limits from FCC Part 2.1051 & 73.317(d) and test procedure from ANSI C63.26-2015

Setup

Test Site Setup:



EUT Orientation(s):



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FIELD STRENGTH OF SPURIOUS EMISSIONS Tabular Data

8.7.1 Test Data, 88 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 (dBµV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
88.00	176.00	PK	37.12	H	1.54	14.40	3.00	53.06	-44.31	-13.00	31.31
88.00	176.00	PK	40.55	V	1.54	14.40	3.00	56.49	-40.88	-13.00	27.88
88.00	264.00	PK	47.16	H	2.03	11.88	3.00	61.07	-36.30	-13.00	23.30
88.00	264.00	PK	41.14	V	2.03	11.88	3.00	55.05	-42.32	-13.00	29.32
88.00	352.00	PK	30.28	H	2.12	14.16	3.00	46.56	-50.82	-13.00	37.82
88.00	352.00	PK	36.23	V	2.12	14.16	3.00	52.51	-44.87	-13.00	31.87
88.00	440.00	PK	23.55	H	2.40	15.70	3.00	41.65	-55.73	-13.00	42.73
88.00	440.00	PK	32.20	V	2.40	15.70	3.00	50.30	-47.08	-13.00	34.08
88.00	528.00	PK	21.19	H	2.76	16.94	3.00	40.89	-56.49	-13.00	43.49
88.00	528.00	PK	22.88	V	2.76	16.94	3.00	42.58	-54.80	-13.00	41.80
88.00	616.00	PK	25.13	H	2.90	18.72	3.00	46.75	-50.63	-13.00	37.63
88.00	616.00	PK	26.95	V	2.90	18.72	3.00	48.57	-48.81	-13.00	35.81
88.00	704.00	PK	28.56	H	3.11	20.60	3.00	52.27	-45.11	-13.00	32.11
88.00	704.00	PK	32.75	V	3.11	20.60	3.00	56.46	-40.92	-13.00	27.92
88.00	792.00	PK	18.53	H	3.32	20.68	3.00	42.53	-54.85	-13.00	41.85
88.00	792.00	PK	18.86	V	3.32	20.68	3.00	42.86	-54.52	-13.00	41.52
88.00	880.00	PK	18.24	H	3.54	22.60	3.00	44.38	-53.00	-13.00	40.00
88.00	880.00	PK	22.25	V	3.54	22.60	3.00	48.39	-48.99	-13.00	35.99

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8.7.2 Test Data, 98 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 (dBµV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
98.00	196.00	PK	31.01	H	1.61	15.40	3.00	48.02	-49.36	-13.00	36.36
98.00	196.00	PK	32.26	V	1.61	15.40	3.00	49.27	-48.11	-13.00	35.11
98.00	294.00	PK	37.63	H	2.08	13.12	3.00	52.83	-44.55	-13.00	31.55
98.00	294.00	PK	38.37	V	2.08	13.12	3.00	53.57	-43.81	-13.00	30.81
98.00	392.00	PK	37.26	H	2.27	14.60	3.00	54.13	-43.25	-13.00	30.25
98.00	392.00	PK	42.20	V	2.27	14.60	3.00	59.07	-38.31	-13.00	25.31
98.00	490.00	PK	22.37	H	2.62	16.80	3.00	41.79	-55.59	-13.00	42.59
98.00	490.00	PK	24.95	V	2.62	16.80	3.00	44.37	-53.01	-13.00	40.01
98.00	588.00	PK	17.83	H	2.87	18.48	3.00	39.18	-58.20	-13.00	45.20
98.00	588.00	PK	20.91	V	2.87	18.48	3.00	42.26	-55.12	-13.00	42.12
98.00	686.00	PK	18.47	H	3.06	20.64	3.00	42.17	-55.21	-13.00	42.21
98.00	686.00	PK	24.09	V	3.06	20.64	3.00	47.79	-49.59	-13.00	36.59
98.00	784.00	PK	22.29	H	3.30	21.68	3.00	47.27	-50.10	-13.00	37.10
98.00	784.00	PK	27.75	V	3.30	21.68	3.00	52.73	-44.64	-13.00	31.64
98.00	882.00	PK	31.90	H	3.54	22.44	3.00	57.88	-39.49	-13.00	26.49
98.00	882.00	PK	32.05	V	3.54	22.44	3.00	58.03	-39.34	-13.00	26.34
98.00	980.00	PK	19.80	H	3.69	22.50	3.00	45.99	-51.39	-13.00	38.39
98.00	980.00	PK	23.68	V	3.69	22.50	3.00	49.87	-47.51	-13.00	34.51

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8.7.3 Test Data, 108 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 (dBµV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
108.00	216.00	PK	31.03	H	1.67	10.38	3.00	43.08	-54.30	-13.00	41.30
108.00	216.00	PK	35.64	V	1.67	10.38	3.00	47.69	-49.69	-13.00	36.69
108.00	324.00	PK	43.42	H	2.09	13.74	3.00	59.25	-38.13	-13.00	25.13
108.00	324.00	PK	46.21	V	2.09	13.74	3.00	62.04	-35.34	-13.00	22.34
108.00	432.00	PK	25.21	H	2.38	15.88	3.00	43.47	-53.90	-13.00	40.90
108.00	432.00	PK	31.55	V	2.38	15.88	3.00	49.81	-47.56	-13.00	34.56
108.00	540.00	PK	22.13	H	2.78	17.40	3.00	42.31	-55.07	-13.00	42.07
108.00	540.00	PK	22.91	V	2.78	17.40	3.00	43.09	-54.29	-13.00	41.29
108.00	648.00	PK	22.13	H	2.96	19.72	3.00	44.81	-52.57	-13.00	39.57
108.00	648.00	PK	18.28	V	2.96	19.72	3.00	40.96	-56.42	-13.00	43.42
108.00	756.00	PK	18.68	H	3.23	20.98	3.00	42.89	-54.49	-13.00	41.49
108.00	756.00	PK	18.19	V	3.23	20.98	3.00	42.40	-54.98	-13.00	41.98
108.00	864.00	PK	22.13	H	3.50	22.36	3.00	47.99	-49.39	-13.00	36.39
108.00	864.00	PK	25.63	V	3.50	22.36	3.00	51.49	-45.89	-13.00	32.89
108.00	972.00	PK	19.29	H	3.66	22.72	3.00	45.67	-51.71	-13.00	38.71
108.00	972.00	PK	20.48	V	3.66	22.72	3.00	46.86	-50.52	-13.00	37.52
108.00	1080.00	PK	18.65	H	3.82	27.00	3.00	49.48	-47.90	-13.00	34.90
108.00	1080.00	PK	22.46	V	3.82	27.00	3.00	53.29	-44.09	-13.00	31.09

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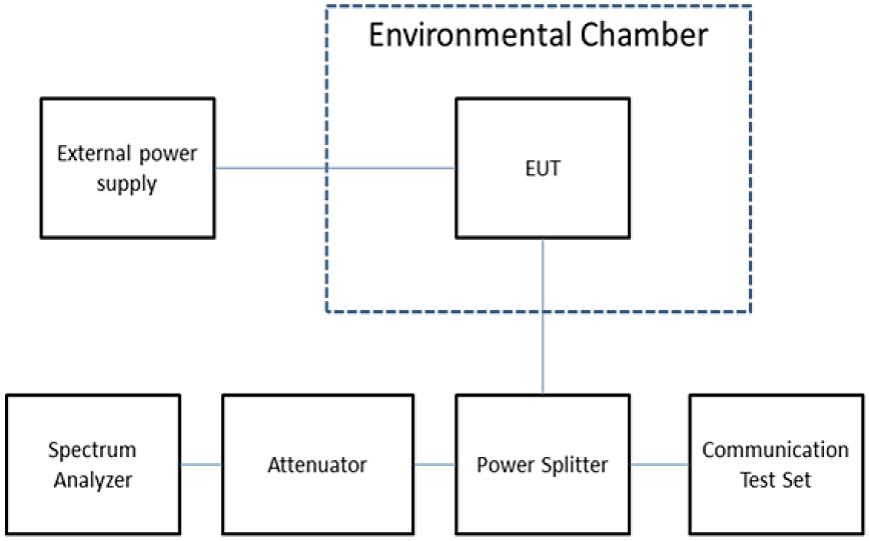
8.8 FREQUENCY STABILITY

Limits from FCC Part 2.1055(a)(3), Part 73.1545(b) and test procedure from ANSI C63.26-2015

Test Setup



Test Results, Mode 1		
Tuned Frequency (MHz)	Max Deviation (kHz)	Limit
88	0.025	+/- 2 kHz

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8.8.1 Frequency Stability Data

FCC Part 73 Limit	2	+/- kHz
FCC Part 73 Lower Limit	87.998008	MHz
FCC Part 73 Upper Limit	88.002008	MHz
Rated Supply Voltage	230.0	◉ AC ○ DC

Temperature / Voltage Variation			
Temperature (°C)	**Supplied Voltage (V)**	**Frequency (MHz)**	**Deviation (kHz)**
0	230.0	87.999983	0.025
+10	230.0	87.999996	0.012
+20 (reference)	230.0	88.000008	0.000
+20	195.5	87.999996	0.012
+20	264.5	88.000001	0.007
+30	230.0	87.999985	0.023
+40	230.0	87.999997	0.011
+50	230.0	88.000006	0.002

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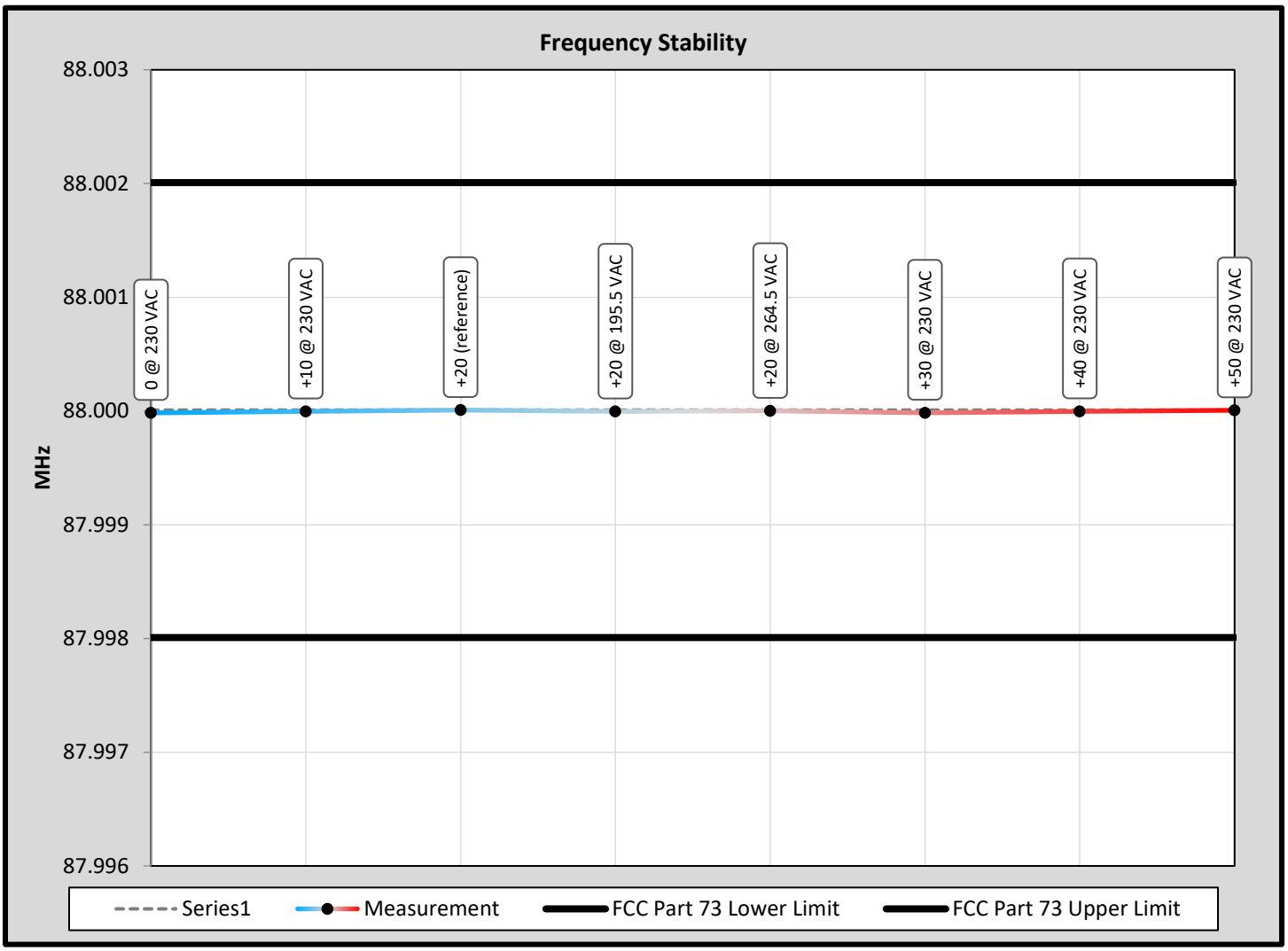
8.8.2 Frequency Stability Plot



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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 a separate supplementary ANNEX-A document.

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_4063-22_FCC 73_	1	Initial release	1/17/2023

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END of Test Report

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