



FCC 47 CFR Part 87 VHF Test Report

APPLICANT	Yaesu USA
FCC ID	K6650033X30
MODEL NUMBER	FTA-850
PRODUCT DESCRIPTION	Airband Radio Transceiver
DATE SAMPLE RECEIVED	SEP 9 2020
FINAL TEST DATE	SEP 14 2020
REPORT NUMBER	TR_3308-20_PT90 VHF TestReport_

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION
UNDER ISO/IEC 17025, AND ISO/IEC 17065



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SIGNATURE PAGE

Timco Engineering, Inc. attests that:

☒	The EUT tested herein fulfills all approval requirements and/or the customer requirements as identified in this test report.
☐	The EUT tested herein does not fulfill all approval requirements and/or the customer requirements as identified in this test report.

This report relates only to the Equipment Under Test (EUT) sample(s) tested.

This report shall not be reproduced except in full without the written approval of Timco Engineering, Inc.

To the best of my knowledge and belief, this device has been tested in accordance with the standards identified in this test report, and these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669



Name and Title Franklin Rose, Project Manager / EMC Specialist

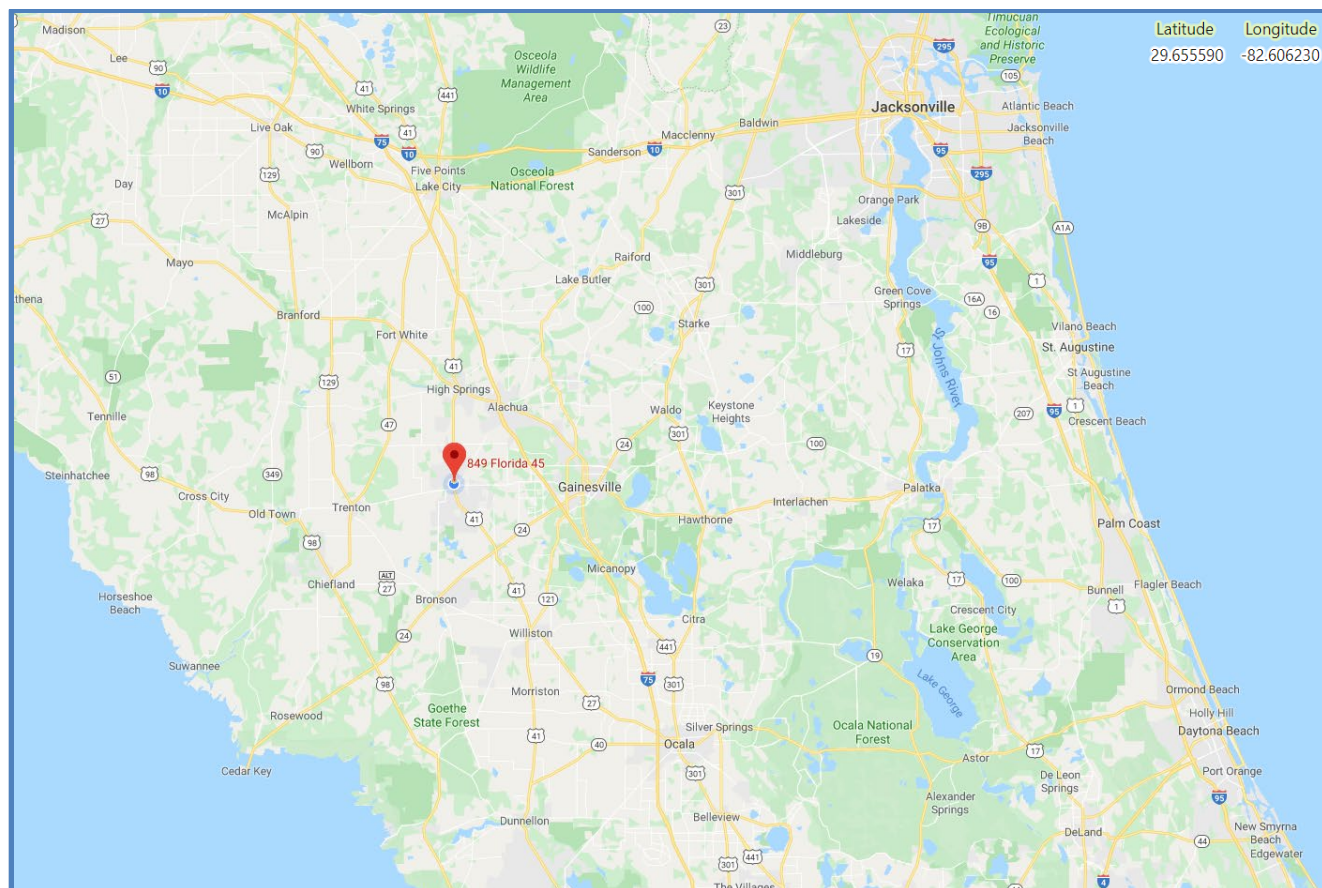


Name and Title Tim Royer, Project Manager / EMC Engineer

Date SEP 9 2020

TEST LABORATORY INFORMATION

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669, USA



United States	FCC Accredited and Recognized Test Lab & TCB # US1070
	DHS Recognized P25 CAP Test Facility # P25CAPTIMCO081016
Australia / New Zealand	U.S. CABs Recognized by Australia ACMA Under MRA
Canada	U.S. Lab & CB Recognized by Canada ISED, Designation # US0111, Test Site # 2056A
Chinese Taipei	U.S. CABs Recognized by Chinese Taipei BSMI/NCC Under MRA
European Union	U.S. EMC & RE Directive NB's, Designation # US0111, Notified Body # 1177
Hong Kong	U.S. Labs & CBs Recognized by Hong Kong OFCA Under MRA
Israel	U.S. CABs Recognized by Israel MOE/MOC Under MRA
Japan	U.S. RCBs Recognized by Japan MIC
Korea	U.S. CABs Recognized by Korea RRA Under MRA
Mexico	U.S. CABs Recognized by Mexico IFT Under MRA
Singapore	U.S. Labs & CBs Recognized by Singapore IMDA Under MRA
Vietnam	U.S. CABs Recognized by Vietnam MIC Under MRA

TEST INFORMATION

Report Version	Description	Issue Date
Rev1	Initial Issue	SEP 9 2020
Rev2	Updated pages 38-40	OCT 28 2020
Rev3	Clerical update	NOV 3 2020
Rev4		
Rev5		

Test Conditions	Temperature during testing: 26°C, Humidity during testing: 50%
Test Exercise	The EUT was operated in accordance with the service manual using software supplied by the manufacturer.
Applicable Standards	ANSI/TIA 603-E, March 2016 ANSI C63.26, December 11, 2015 FCC CFR 47 Part 2, December 5, 2019 FCC CFR 47 Part 87, September 21, 2020
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA

EUT INFORMATION

YAESU

EUT Description	Airband Radio Transceiver		
Model Number	FTA-850		
Frequency Range	Tx: 118 – 136.975MHz Rx: NAV band is 108-117.975MHz COM band 118 – 136.975MHz		
Modified for Testing	☐		
Modification	n/a		
Antenna Connector	☐ UHF	☒ BNC	☐ N
	☐ TNC	☐ SMA	☐ Other
EUT Power Source	☐ AC Power (110-120 V)	☐ DC Power (13.8 V)	☒ DC Battery (7.4 V)
Test Item	☐ Engineering Prototype	☒ Pre-Production	☐ Post-Production
Type of Equipment	☐ Fixed	☐ Mobile	☒ Portable

2.1033(c) APPLICATION REQUIREMENTS

Application Requirement	Requirement	Information
2.1033(c)(1)	The full name and mailing address of the applicant for certification	Yaesu USA 6125 PHYLLIS DRIVE CYPRESS CA 90630
2.1033(c)(2)	FCC Identifier	K6650033X30
2.1033(c)(4) 2.1033(c)(13)	Type(s) of Emission & description of Digital Modulation Techniques	☒
2.1033(c)(5)	Frequency Range	118 – 136.975 MHz
2.1033(c)(6),(7)	Range of operating power or specific operating power levels, and Maximum Power Rating.	1.8 W
2.1033(c)(6)	Description of means to vary power	n/a
2.1033(c)(8)	The DC voltage & current at the final amplifier for normal operation	7.4 V DC * 1.1 A = 8.14 W
2.1033(c)(14)	Test Results satisfying 2.1046 – 2.1057	☒
2.1033(c)(21)	Contain > 1 Drawing or Photograph of each test setup applicable to the device	☒

2.1041 MEASUREMENT PROCEDURE

§2.1041 Measurement procedure.

(a) For equipment operating under parts 15 and 18, the measurement procedures are specified in the rules governing the particular device for which certification is requested.

(b) For equipment operating in the authorized radio services, measurements are required as specified in §§2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057. The measurement procedures in ANSI C63.26-2015 (incorporated by reference, see §2.910) are acceptable for performing compliance measurements for equipment types covered by the measurement standard. See also §2.947 for acceptable measurement procedures.

2.1046 – 2.1055 TECHNICAL REQUIREMENTS

General Requirement (FCC PT 2)	Specific Requirement (FCC PT 90)	Requirement	Complies	N/A
2.1033(c)(4)	87.131, 87.137	Modulation Characteristics	☒	☐
2.1046	87.131	RF Power Output	☒	☐
2.1047		Audio Frequency Response	☒	☐
2.1047	87.141(f)	Audio Low Pass Filter Response	☒	☐
2.1047	87.141(a)	Modulation Limiting	☒	☐
2.1049	87.135	Occupied Bandwidth (99%)	☒	☐
	87.139	Conducted Emissions at Antenna Terminals In-Band	☒	☐
2.1051	87.139	Conducted Emissions at Antenna Terminals Out-of-Band	☒	☐
2.1053	87.139	Radiated Field Strength of Emissions	☒	☐
2.1055	87.133	Frequency Stability	☒	☐

2.1033 MODULATION CHARACTERISTICS

Requirements: 2.1033(c)(4), 2.1033(c)(13), 87.137

Referencing: 2.202(g)

§87.137 Types of emission.

(a) The assignable emissions, corresponding emission designators and authorized bandwidths are as follows:

Class of emission	Emission designator	Authorized bandwidth (kilohertz)		
		Below 50 MHz	Above 50 MHz	Frequency deviation
A3E ²	6K00A3E		50 ³	

²For use with an authorized bandwidth of 8.0 kilohertz at radiobeacon stations. A3E will not be authorized:

(i) At existing radiobeacon stations that are not authorized to use A3 and at new radiobeacon stations unless specifically recommended by the FAA for safety purposes.

(ii) At existing radiobeacon stations currently authorized to use A3, subsequent to January 1, 1990, unless specifically recommended by the FAA for safety purposes.

³In the band 117.975-136 MHz, the authorized bandwidth is 25 kHz for transmitters approved after January 1, 1974.

2.1046 RF POWER OUTPUT

87.131 RF POWER OUTPUT

§87.131 Power and emissions.

The following table lists authorized emissions and maximum power. Power must be determined by direct measurement.

Class of station	Frequency band/frequency	Authorized emission(s) ⁹	Maximum power ¹
Aeronautical advisory	VHF	A3E	10 watts. ¹⁰
Aeronautical multicom	VHF	A3E	10 watts.
Aeronautical enroute and aeronautical fixed	VHF	A3E, A9W G1D, A2D	
Aeronautical search and rescue	VHF	A3E	10 watts.
Flight test land	VHF	A3E	200 watts.
Aviation support	VHF	A3E	50 watts.
Airport control tower	VHF	A3E, G1D, G7D	50 watts.
Aeronautical utility mobile	VHF	A3E	10 watts.
Aeronautical Frequencies			
	VHF	A3E, A9W, G1D, G7D, A2D	55 watts.

¹The power is measured at the transmitter output terminals and the type of power is determined according to the emission designator as follows:

(i) Mean power (pY) for amplitude modulated emissions and transmitting both sidebands using unmodulated full carrier.

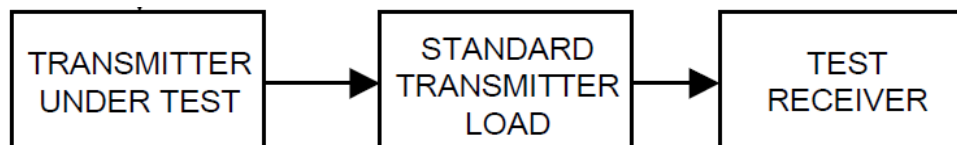
(ii) Peak envelope power (pX) for all emission designators other than those referred to in paragraph (i) of this note.

⁹Excludes automatic link establishment.

¹⁰Power is limited to 0.5 watt, but may not exceed 2 watts when station is used in an automatic unattended mode.

Test Procedure: ANSI C63.26 S 5.2.3.3

Test Setup Block Diagram:



2.1047 AUDIO FREQUENCY RESPONSE

Test Procedure: ANSI C63.26 S 5.3.3.1

Test Setup Block Diagram: ANSI C63.26 S 5.3.3.1

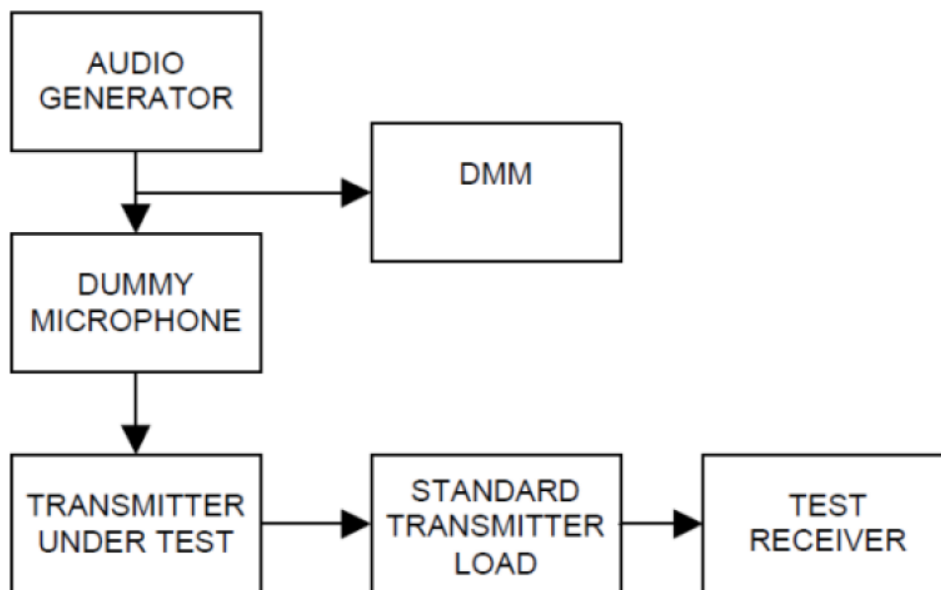


Figure 2—Equipment set-up for audio frequency response (constant deviation)

2.1047 LOW PASS FILTER RESPONSE

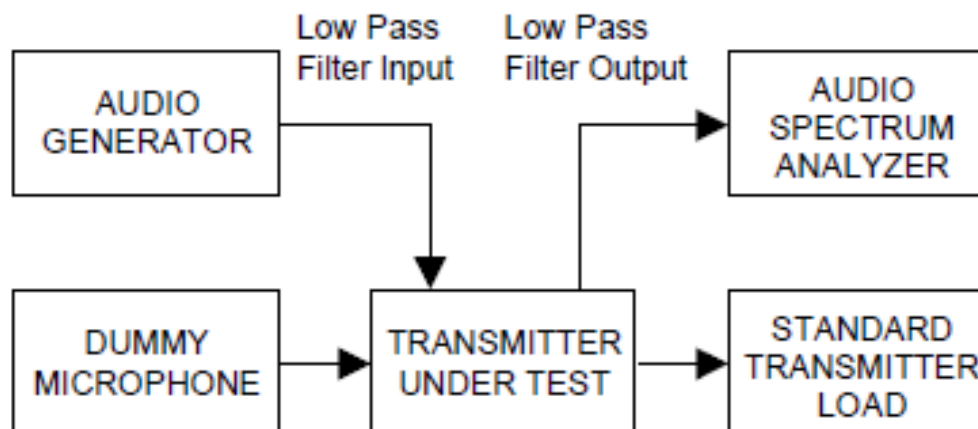
87.141(f) MODULATION REQUIREMENTS

§87.141 Modulation requirements.

(f) Each frequency modulated transmitter equipped with a modulation limiter must have a low pass filter between the modulation limiter and the modulated stage. At audio frequencies between 3 kHz and 15 kHz, the filter must have an attenuation greater than the attenuation at 1 kHz by at least $40 \log_{10} (f/3)$ db where "f" is the frequency in kilohertz. Above 15 kHz, the attenuation must be at least 28 db greater than the attenuation at 1 kHz.

Test Procedure: ANSI/TIA-603-E S 2.2.15

Test Setup Block Diagram: ANSI/TIA-603-E S 2.2.15.2



2.1047 MODULATION LIMITING

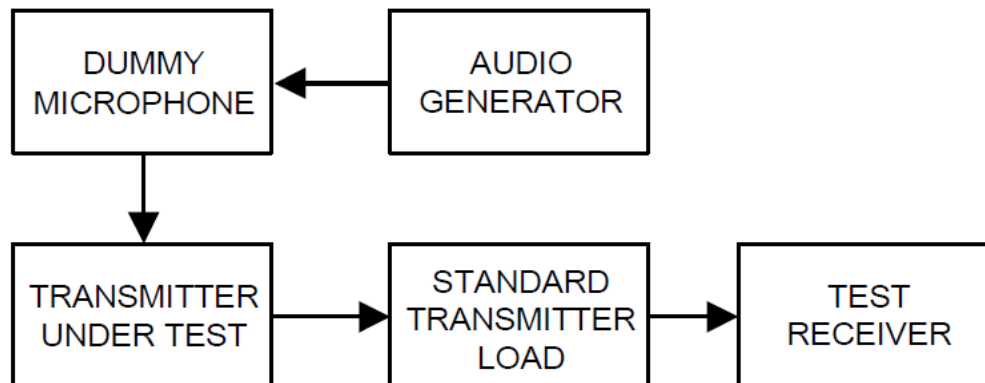
87.141(a) MODULATION REQUIREMENTS

§87.141 Modulation requirements.

(a) When A3E emission is used, the modulation percentage must not exceed 100 percent. This requirement does not apply to emergency locator transmitters or survival craft transmitters.

Test Procedure: ANSI C63.26 S 5.3.3.2

Test Setup Block Diagram: ANSI C63.26 S 5.3.3.2



2.1049 OCCUPIED BANDWIDTH

87.135 OCCUPIED BANDWIDTH

§87.135 Bandwidth of emission.

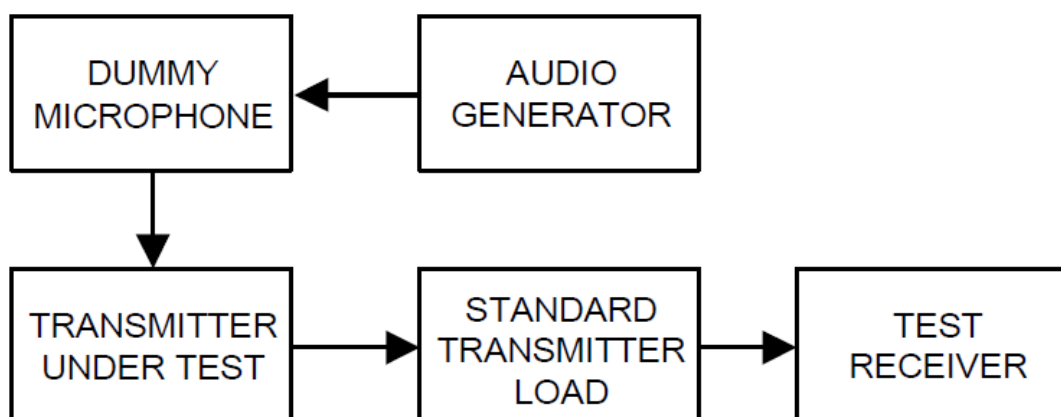
(a) Occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to 0.5 percent of the total mean power of a given emission.

(b) The authorized bandwidth is the maximum occupied bandwidth authorized to be used by a station.

(c) The necessary bandwidth for a given class of emission is the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

Test Procedure: ANSI C63.26 S 5.4

Test Setup Block Diagram:



2.1051 CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS

87.139 EMISSION LIMITATIONS

§87.139 Emission limitations.

(a) Except for ELTs and when using single sideband (R3E, H3E, J3E), or frequency modulation (F9) or digital modulation (F9Y) for telemetry or telecommand in the 1435-1525 MHz, 2345-2395 MHz, or 5091-5150 MHz band or digital modulation (G7D) for differential GPS, the mean power of any emissions must be attenuated below the mean power of the transmitter (pY) as follows:

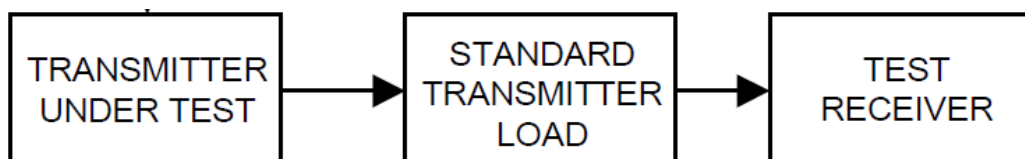
(1) When the frequency is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth the attenuation must be at least 25 dB;

(2) When the frequency is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth the attenuation must be at least 35 dB.

(3) When the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth the attenuation for aircraft station transmitters must be at least 40 dB; and the attenuation for aeronautical station transmitters must be at least $43 + 10 \log_{10} pY$ dB.

Test Procedure: ANSI C63.26 S 5.2.3.3

Test Setup Block Diagram:



2.1053 FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Procedure: ANSI C63.26 S 5.5

Test Setup Diagram: ANSI C63.26 S 5.5, Figure 4

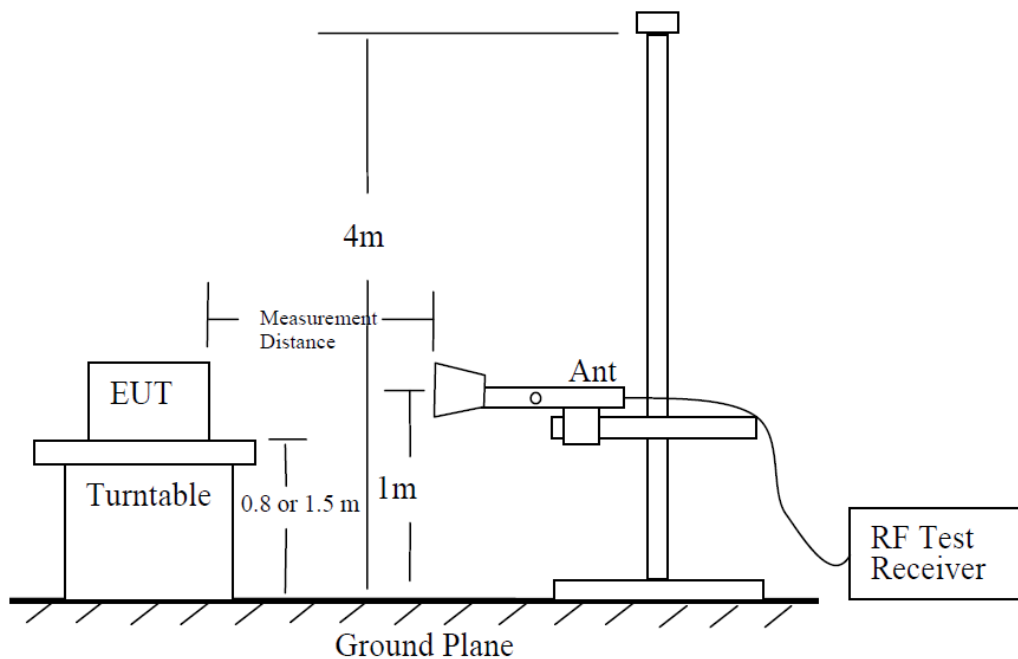
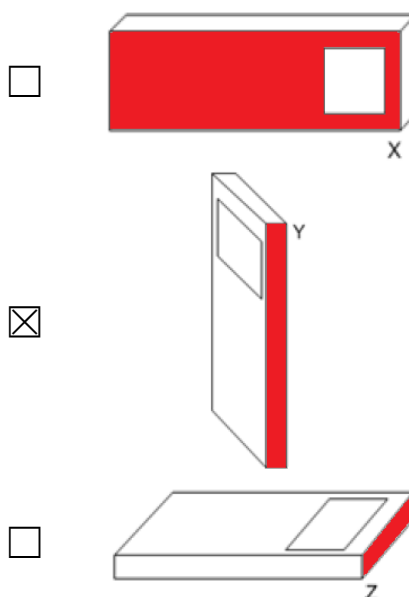


Figure 4—Test set-up for radiated spurious measurements

Worst-Case EUT Orientation



2.1055 FREQUENCY STABILITY

87.133 FREQUENCY STABILITY

§87.133 Frequency stability.

(a) Except as provided in paragraphs (c), (d), (f), and (g) of this section, the carrier frequency of each station must be maintained within these tolerances:

Frequency band (lower limit exclusive, upper limit inclusive), and categories of stations	Tolerance ¹	Tolerance ²
(5) Band-108 to 137 MHz:		
Aeronautical stations	⁴ ₅₀	¹² ₂₀
Aircraft and other mobile stations in the Aviation Services	⁵ ₅₀	¹³ ₃₀

¹This tolerance is the maximum permitted until January 1, 1990, for transmitters installed before January 2, 1985, and used at the same installation. Tolerance is indicated in parts in 10^6 unless shown as Hertz (Hz).

²This tolerance is the maximum permitted after January 1, 1985 for new and replacement transmitters and to all transmitters after January 1, 1990. Tolerance is indicated in parts in 10^6 unless shown as Hertz (Hz).

⁴The tolerance for transmitters approved between January 1, 1966, and January 1, 1974, is 30 parts in 10^6 . The tolerance for transmitters approved after January 1, 1974, and stations using offset carrier techniques is 20 parts in 10^6 .

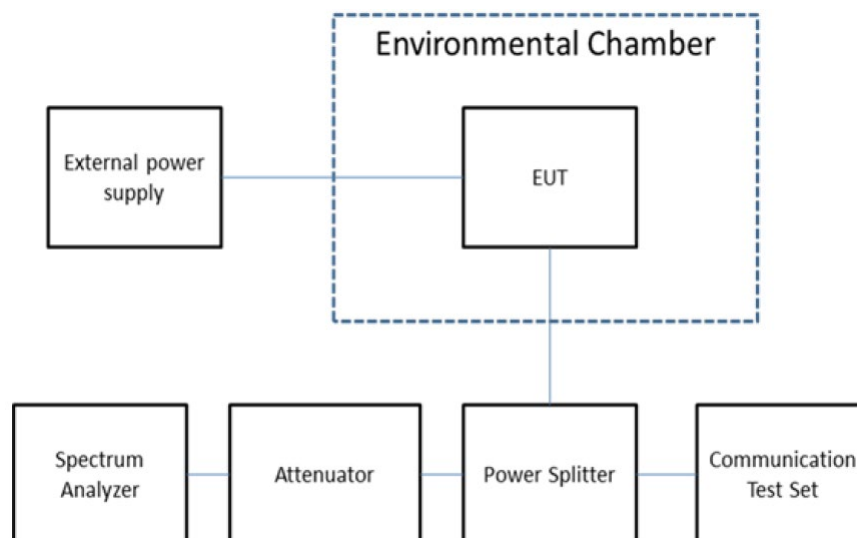
⁵The tolerance for transmitters approved after January 1, 1974, is 30 parts in 10^6 .

¹²For emissions G1D and G7D, the tolerance is 2 parts per 10^6 .

¹³For emissions G1D and G7D, the tolerance is 5 parts per 10^6 .

Test Procedure: ANSI C63.26 S 5.6.3

Test Setup Block Diagram:



STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4 or EN TR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: “Uncertainty in EMC Measurements” and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

Parameters	Measurement Uncertainty
CONDUCTED EMISSIONS 9 kHz – 150 kHz	± 3.14 dB
CONDUCTED EMISSIONS 150 kHz – 30 MHz	± 3.08 dB
RADIATED EMISSIONS 30 MHz – 200 MHz	± 2.16 dB
RADIATED EMISSIONS 200 MHz – 1 GHz	± 2.15 dB
RADIATED EMISSIONS 1 GHz – 18 GHz	± 2.14 dB
RADIATED EMISSIONS 18 GHz – 40 GHz	± 2.31 dB

Notes: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

EMC EQUIPMENT LIST

Device	Manufacturer	Model	SN #	Current Cal	Cal Due
Audio Analyzer	HP	8903B	3011A13084	2/20/18	2/19/2021
Function Generator	Standford	DS340	25200	2/21/18	2/20/2021
Modulation Analyzer	HP	8901A	3050A05856	4/23/20	4/23/2023
Signal Generator HP 8648C	HP	8648C	3847A04696	9/11/20	9/11/2023
Digital Multimeter	Fluke	FLUKE-77-3	79510408	9/9/20	9/9/2023
Active Loop	ETS-Lindgren	6502	00062529	12/11/17	12/10/2020
Biconical 1057	Eaton	94455-1	1057	12/13/17	12/12/2020
Log-Periodic 1243	Eaton	96005	1243	4/20/18	4/19/2021
Double-Ridged Horn/ETS Horn 1	ETS-Lindgren	3117	00035923	2/25/20	2/24/2023
CHAMBER	Panashield	3M	N/A	3/12/19	3/11/2021
Pre-amp	RF-LAMBDA	RLNA00M45GA	NA	2/27/19	2/26/2022
EMI Test Receiver R&S ESU 40	Rohde & Schwarz	ESU 40	100320	8/28/18	8/27/2021
Frequency Counter Small	HP	5385A	3242A07460	9/9/20	9/9/2023
Type K J Thermometer	Martel	303	080504494	11/6/17	11/5/2020

Software	Author	Version	Validation Or
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

ANNEX I – MANUFACTURER-PROVIDED INFORMATION

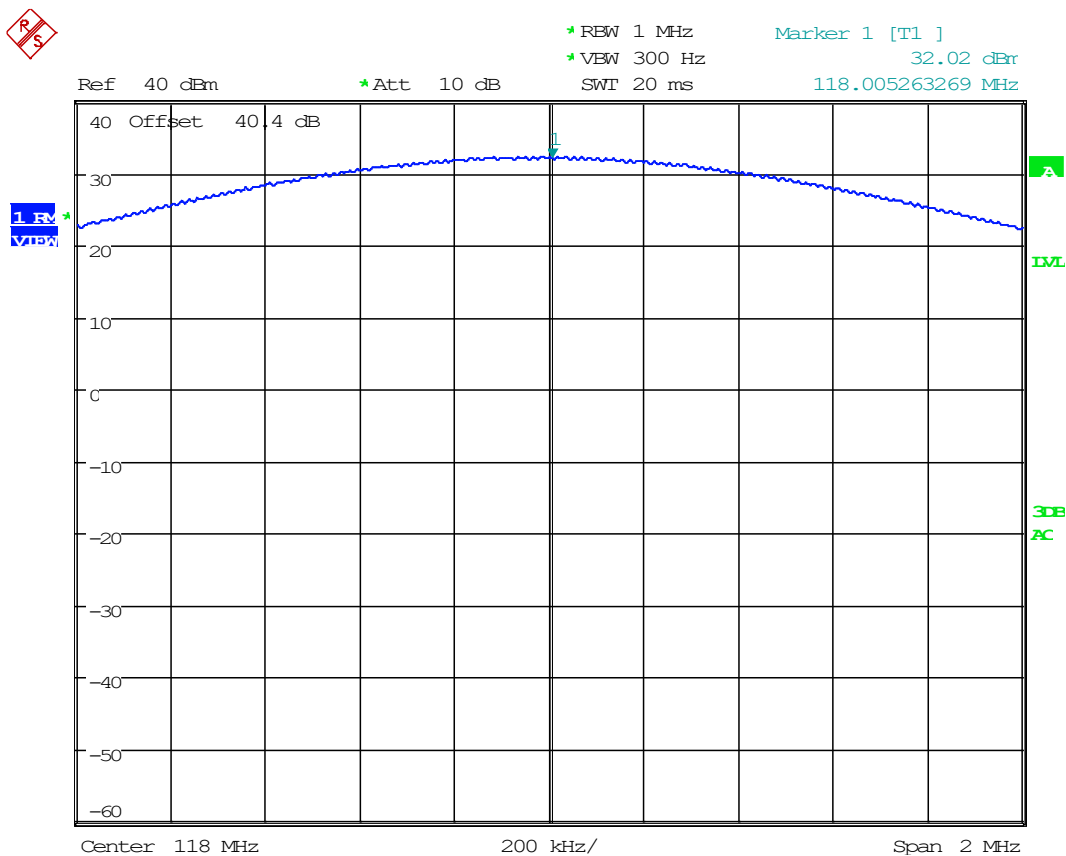
Note: The accuracy and precision of the following information provided by the manufacturer of the equipment under test has not been verified using test methods, cannot be verified, or is not necessary to verify.

n/a

ANNEX II – MEASUREMENT DATA**RF POWER OUTPUT**

Test Engineer: FR
 Test Date: SEP 11 2020

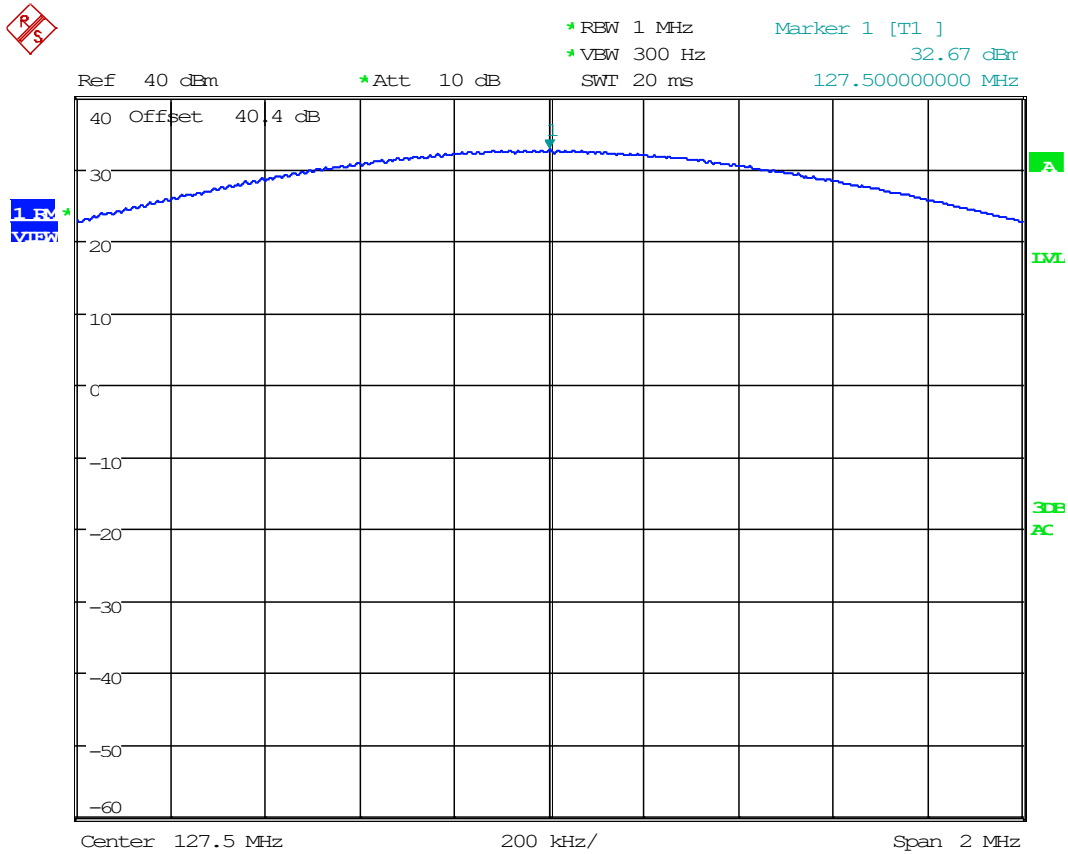
Frequency (MHz)	Power (dBm)	Power (W)
118.000	32.02	1.59
127.500	32.67	1.85
136.975	32.62	1.83

118.000 MHz

Date: 11.SEP.2020 17:34:11

RF POWER OUTPUT

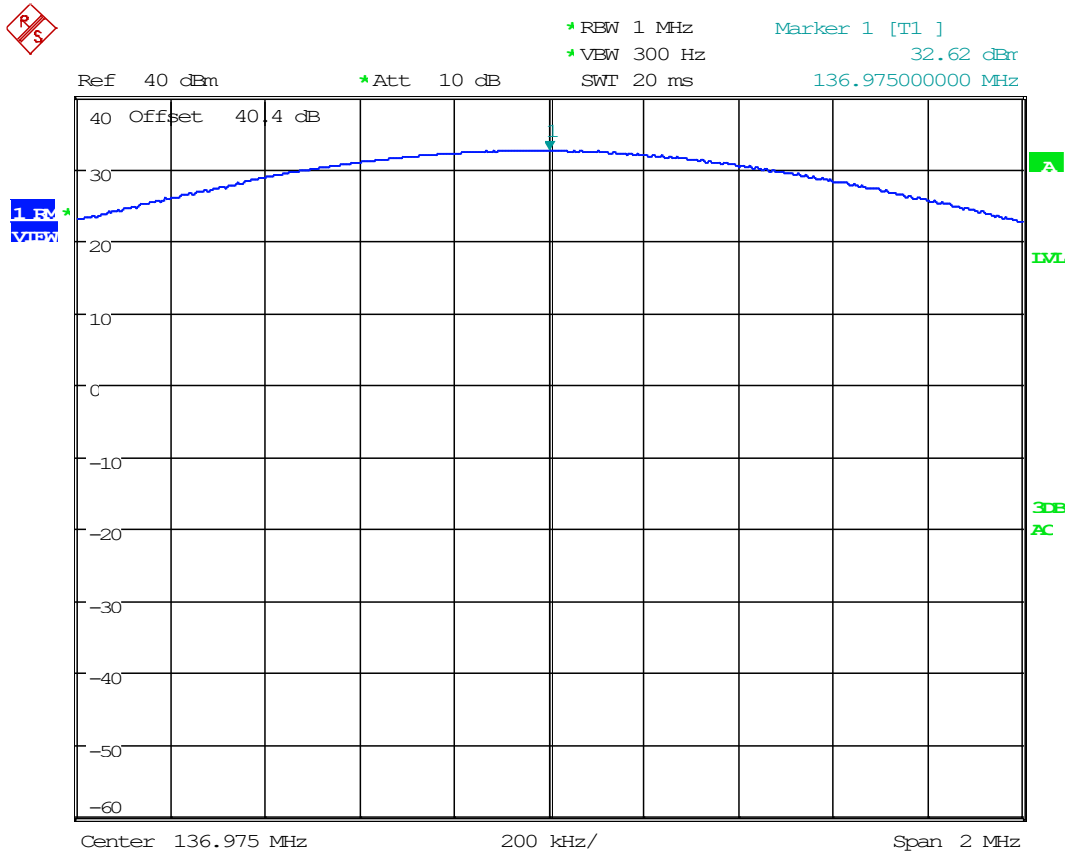
127.500 MHz



Date: 11.SEP.2020 17:34:32

RF POWER OUTPUT

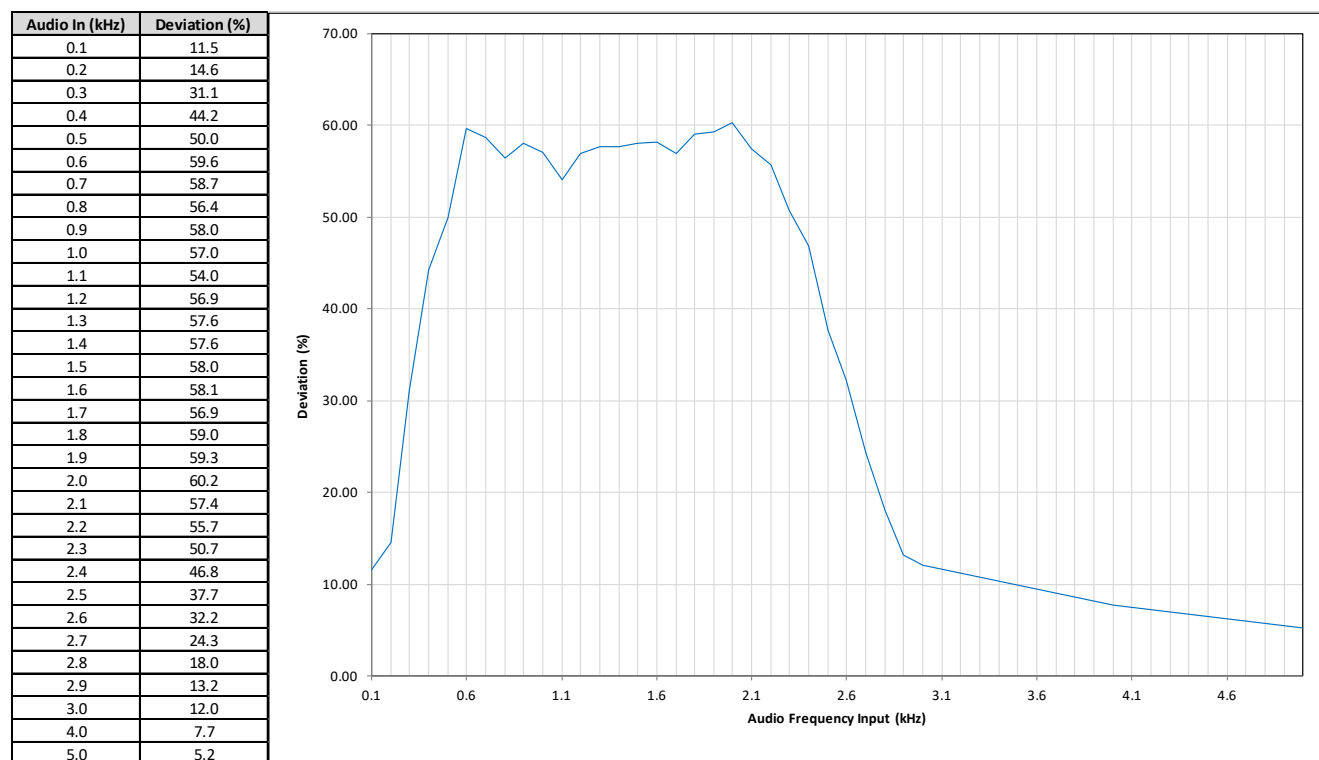
136.975 MHz



Date: 11.SEP.2020 17:34:52

AUDIO FREQUENCY RESPONSE

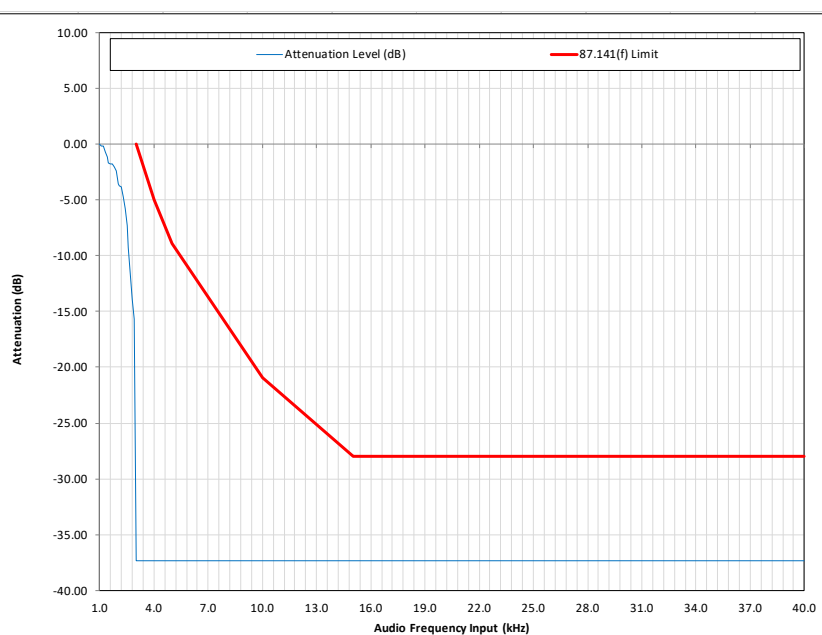
Test Engineer: FR
 Test Date: SEP 11 2020



LOW PASS FILTER RESPONSE

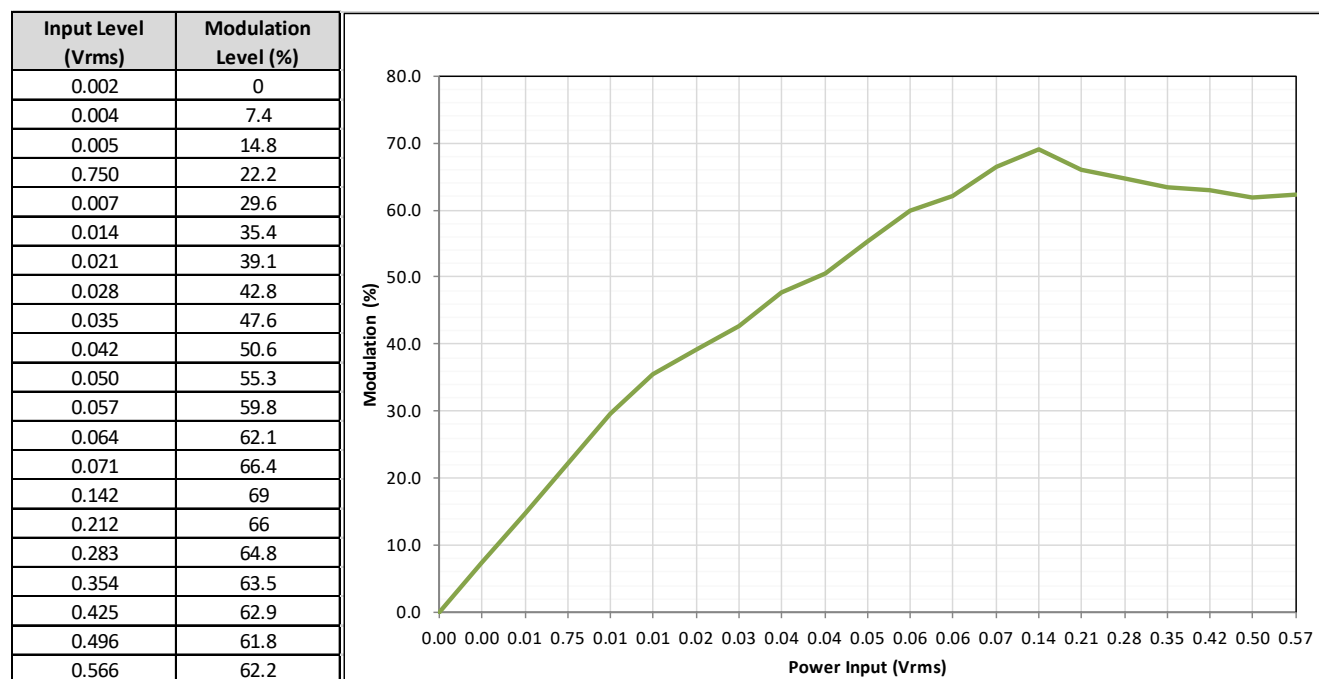
Test Engineer: FR
 Test Date: SEP 11 2020

Audio In (kHz)	Audio Level (dB)	Attenuation Level (dB)	87.141(f) Limit	Margin (dB)
1.0	-2.65	0.00	0.00	0.00
1.1	-2.80	-0.15		
1.2	-2.80	-0.15		
1.3	-3.40	-0.75		
1.4	-3.85	-1.20		
1.5	-4.36	-1.71		
1.6	-4.41	-1.76		
1.7	-4.47	-1.82		
1.8	-4.68	-2.03		
1.9	-5.05	-2.40		
2.0	-6.18	-3.53		
2.1	-6.35	-3.70		
2.2	-6.52	-3.87		
2.3	-7.33	-4.68		
2.4	-8.40	-5.75		
2.5	-9.96	-7.31		
2.6	-11.90	-9.25		
2.7	-14.23	-11.58		
2.8	-16.56	-13.91		
2.9	-18.36	-15.71		
3.0	-40.00	-37.35	0.00	37.35
4.0	-40.00	-37.35	-5.00	32.35
5.0	-40.00	-37.35	-8.87	28.48
10.0	-40.00	-37.35	-20.92	16.43
15.0	-40.00	-37.35	-28.00	9.35
20.0	-40.00	-37.35	-28.00	9.35
25.0	-40.00	-37.35	-28.00	9.35
30.0	-40.00	-37.35	-28.00	9.35
35.0	-40.00	-37.35	-28.00	9.35
40.0	-40.00	-37.35	-28.00	9.35



MODULATION LIMITING

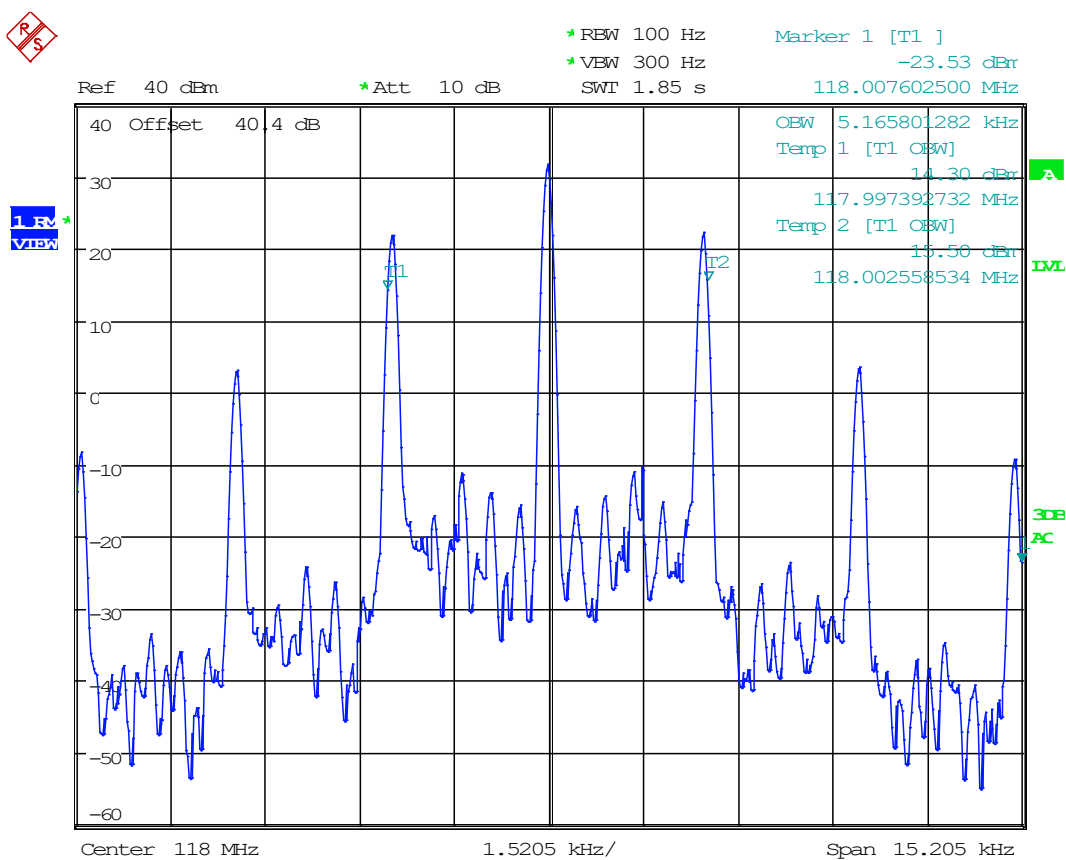
Test Engineer: FR
 Test Date: SEP 11 2020



OCCUPIED BANDWIDTH

Test Engineer: FR
 Test Date: SEP 11 2020

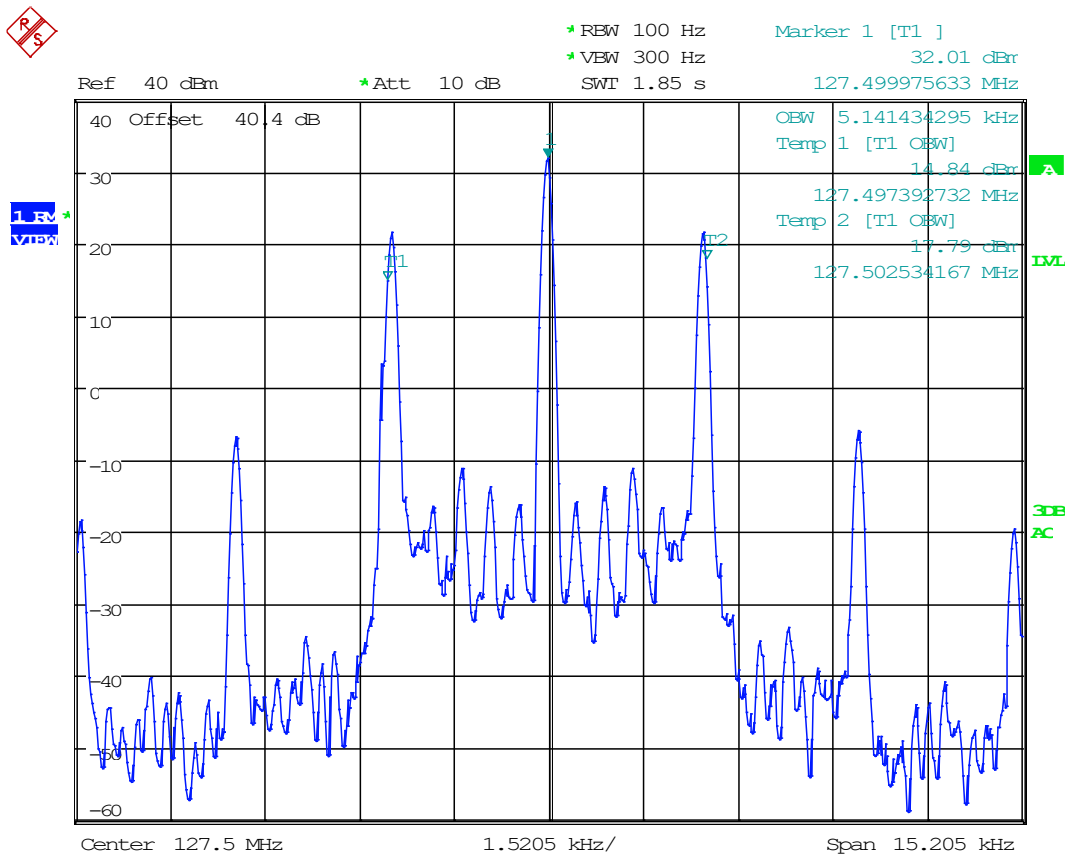
Frequency (MHz)	OBW 99% (kHz)
118.000	5.166
127.500	5.141
136.975	5.117

118.000 MHz

Date: 11.SEP.2020 17:31:13

OCCUPIED BANDWIDTH

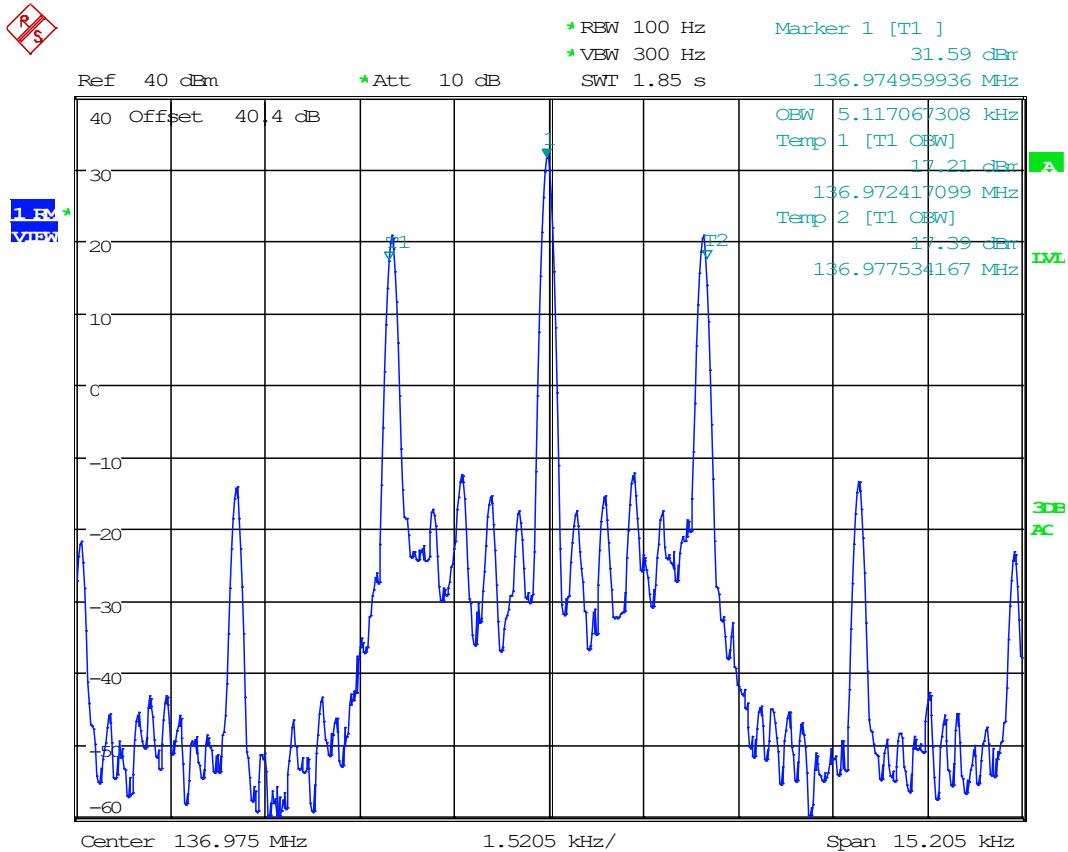
127.500 MHz



Date: 11.SEP.2020 17:30:37

OCCUPIED BANDWIDTH

136.975 MHz

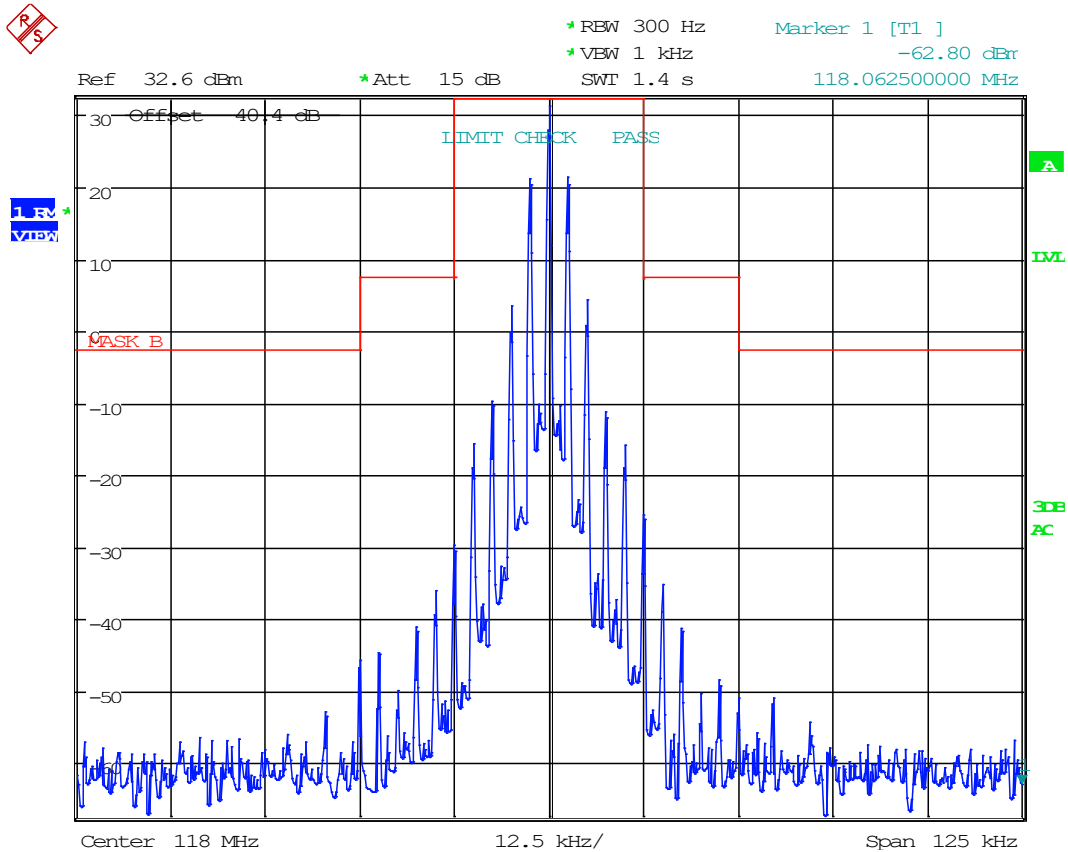


Date: 11.SEP.2020 17:27:57

EMISSION MASKS

Test Engineer: FR
Test Date: SEP 11 2020

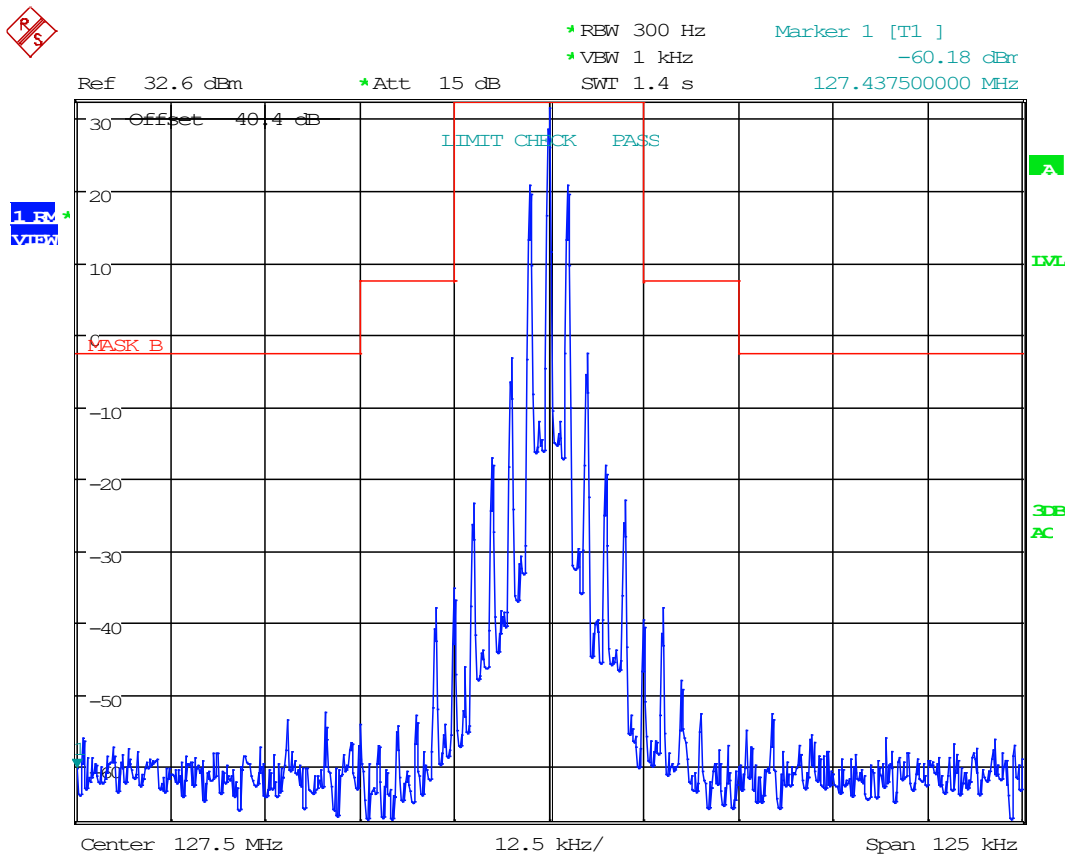
118.000 MHz



Date: 11.SEP.2020 17:40:34

EMISSION MASKS

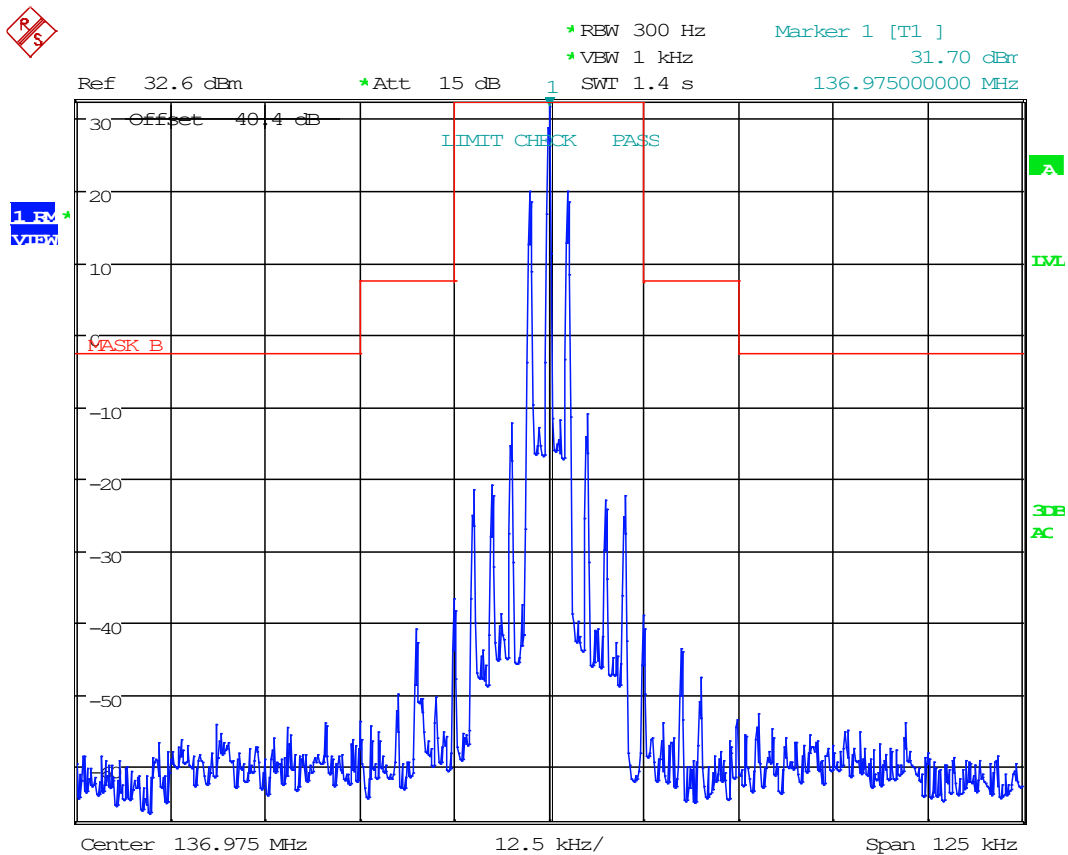
127.500 MHz



Date: 11.SEP.2020 17:41:00

OCCUPIED BANDWIDTH

136.975 MHz

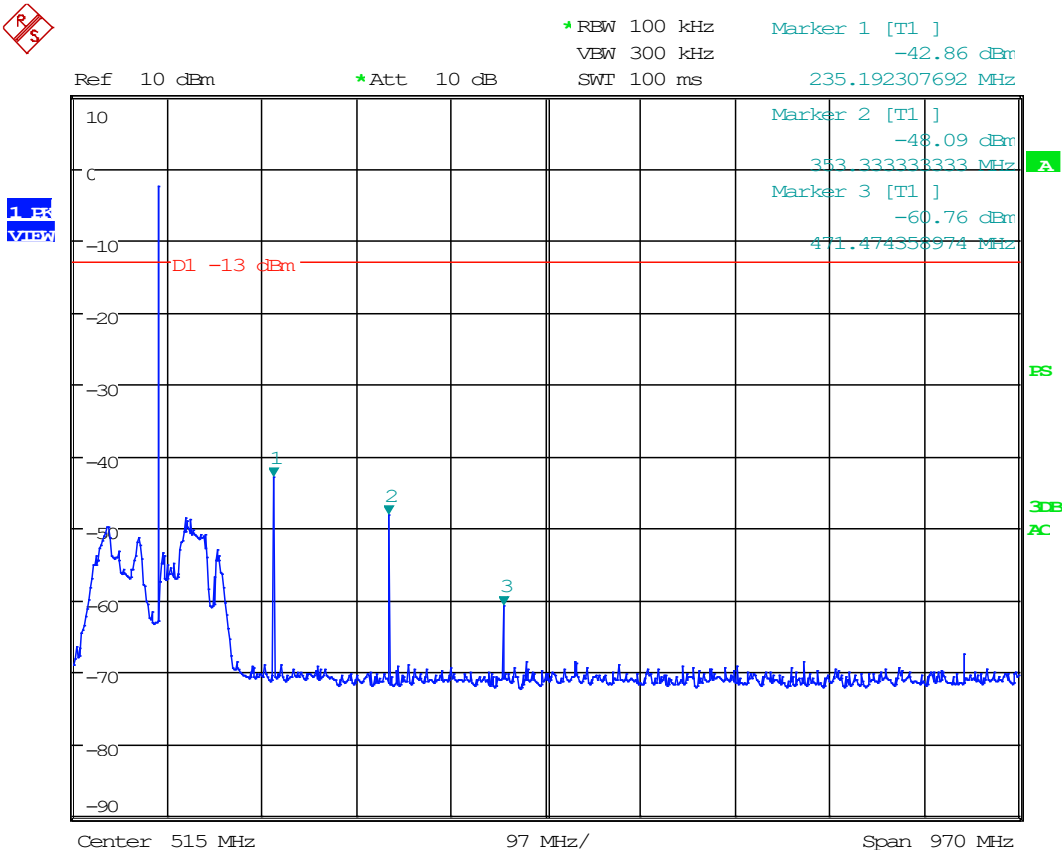


Date: 11.SEP.2020 17:38:23

CONDUCTED EMISSIONS

Test Engineer: FR
Test Date: SEP 11 2020

118.000 MHz, Below 1 GHz

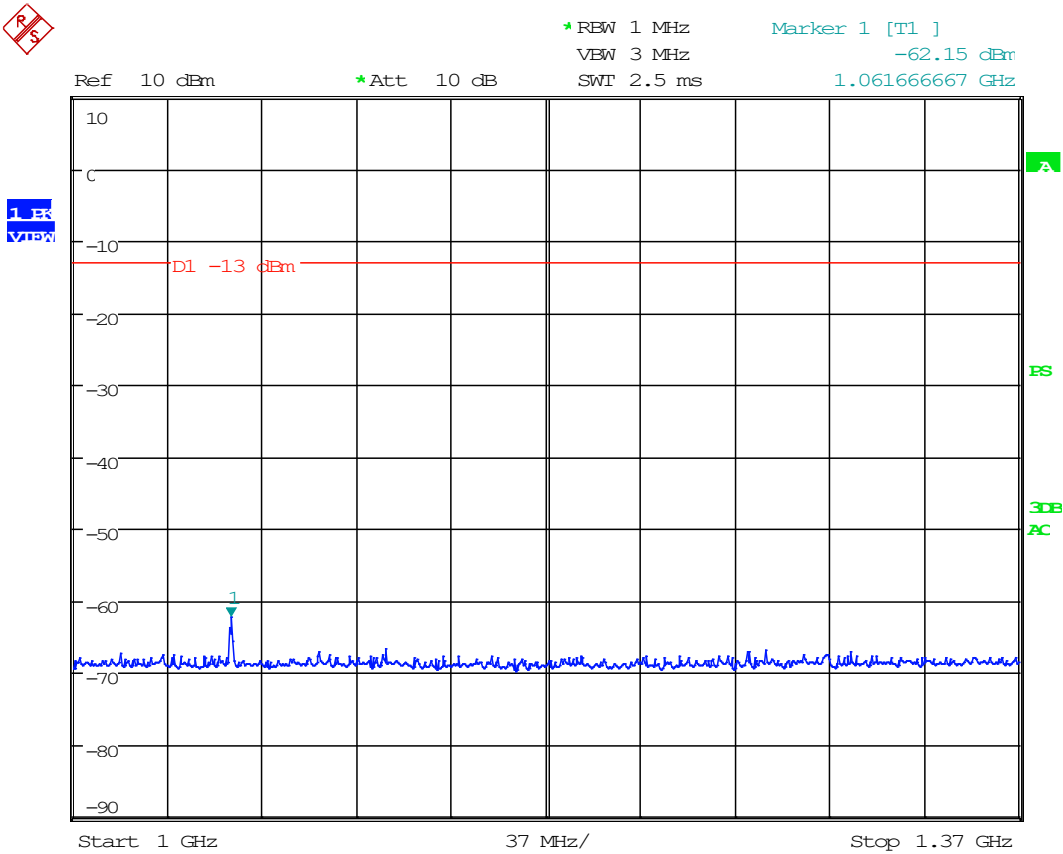


Date: 11.SEP.2020 17:54:25

Note: A Notch filter was used on the fundamental frequency.

CONDUCTED EMISSIONS

118.000 MHz, Above 1 GHz

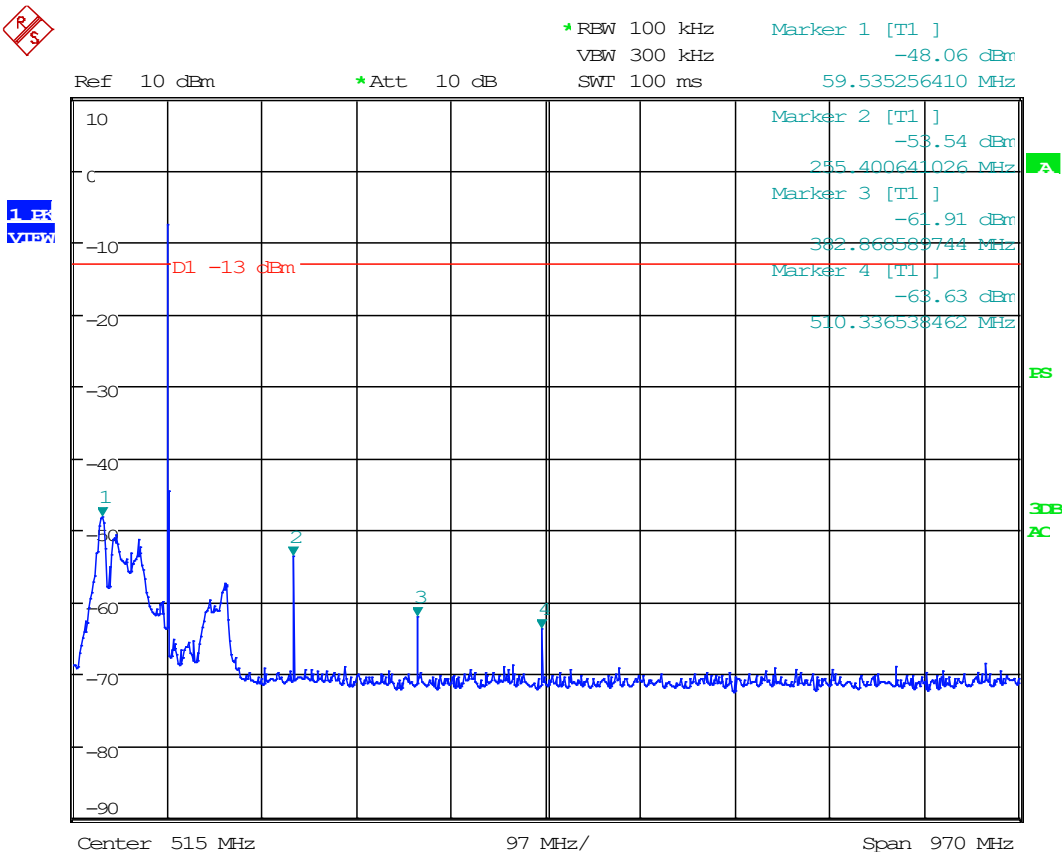


Date: 11.SEP.2020 17:56:02

Note: A Notch filter was used on the fundamental frequency.

CONDUCTED EMISSIONS

127.500 MHz, Below 1 GHz

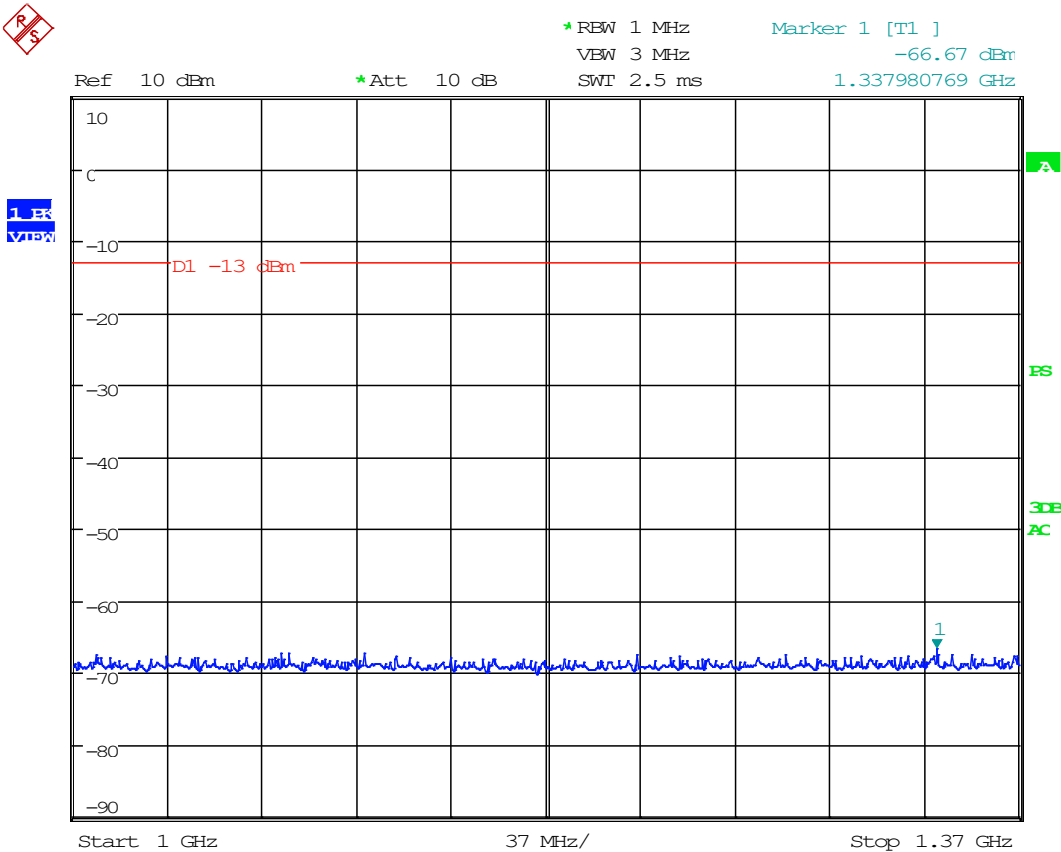


Date: 11.SEP.2020 17:48:35

Note: A Notch filter was used on the fundamental frequency.

CONDUCTED EMISSIONS

127.500 MHz, Above 1 GHz

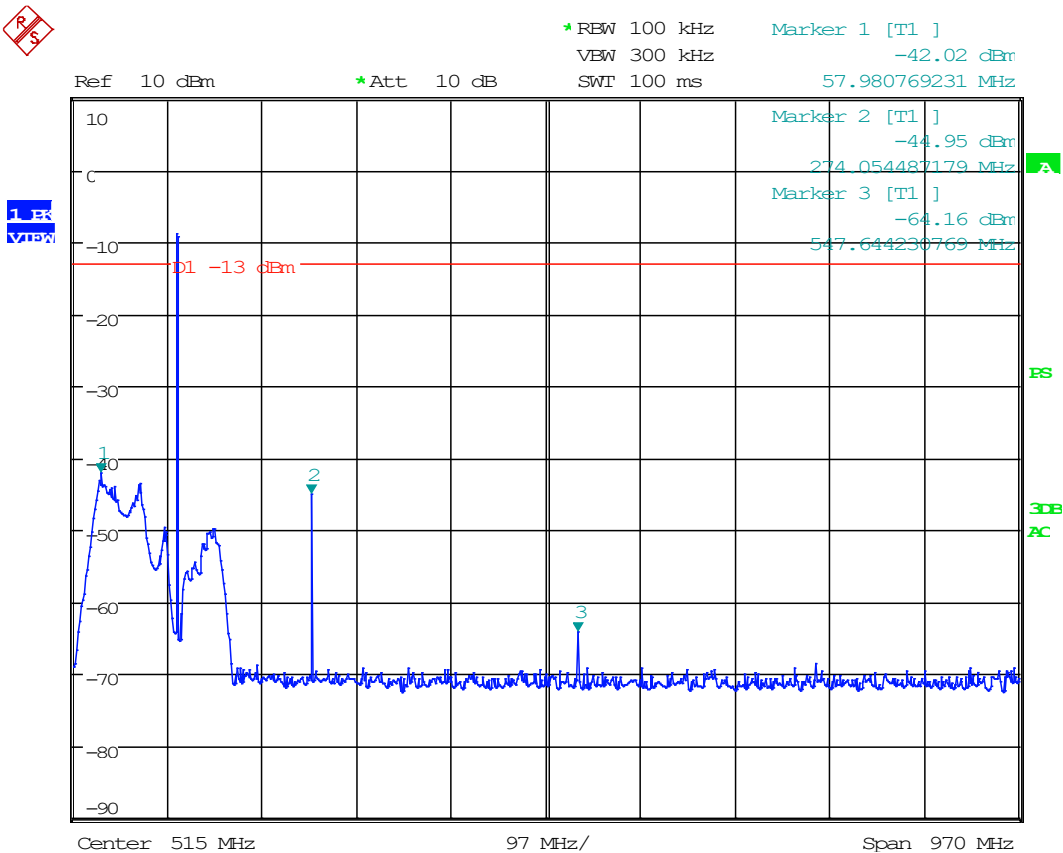


Date: 11.SEP.2020 17:50:11

Note: A Notch filter was used on the fundamental frequency.

CONDUCTED EMISSIONS

136.975 MHz, Below 1 GHz

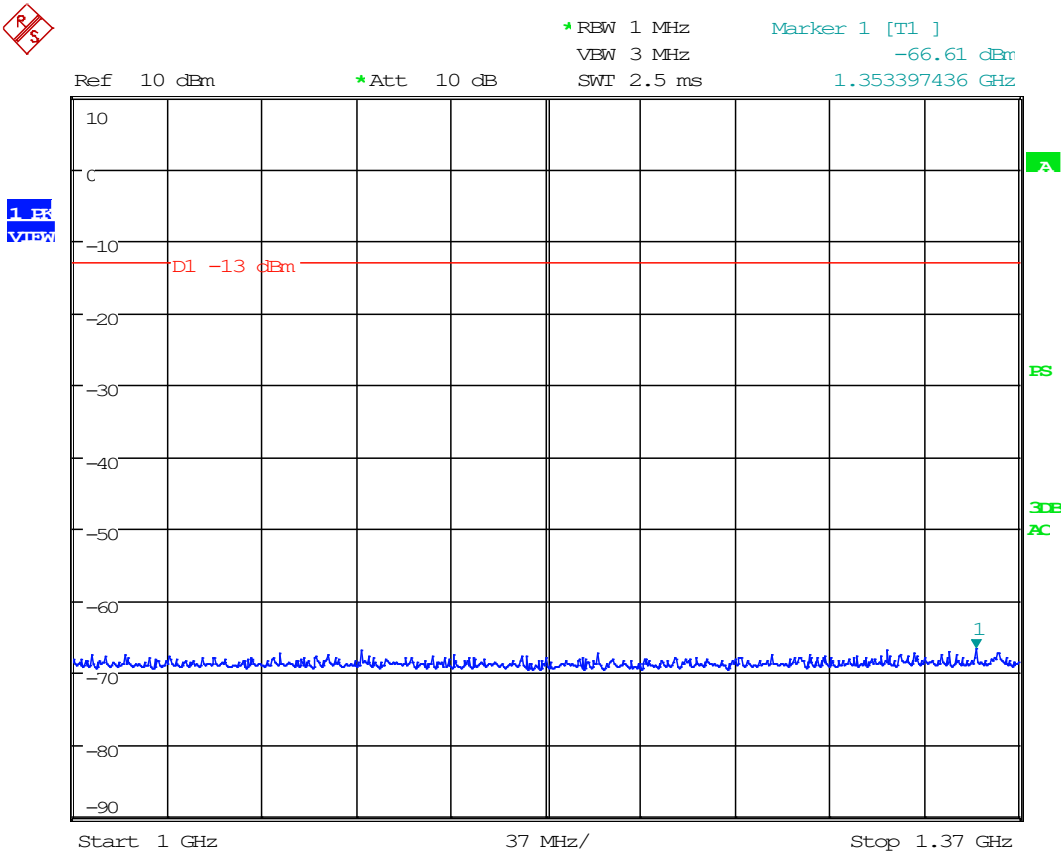


Date: 11.SEP.2020 18:03:54

Note: A Notch filter was used on the fundamental frequency.

CONDUCTED EMISSIONS

136.975 MHz, Above 1 GHz



Date: 11.SEP.2020 18:04:40

Note: A Notch filter was used on the fundamental frequency.

RADIATED EMISSIONS

Test Engineer: TR
 Test Date: SEP 14 2020

118.000 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBm)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBμV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
118.00	72.73	PK	14.78	H	1.01	6.45	3.00	22.24	-75.14	-13.00	62.14
118.00	66.50	PK	13.57	V	0.96	6.05	3.00	20.58	-76.80	-13.00	63.80
118.00	103.83	PK	12.00	H	1.18	10.62	3.00	23.79	-73.58	-13.00	60.58
118.00	103.80	PK	13.75	V	1.18	10.62	3.00	25.55	-71.83	-13.00	58.83
118.00	236.00	PK	20.14	H	1.76	10.42	3.00	32.32	-65.06	-13.00	52.06
118.00	236.00	PK	20.40	V	1.76	10.42	3.00	32.58	-64.80	-13.00	51.80
118.00	354.00	PK	20.17	H	2.13	14.32	3.00	36.62	-60.76	-13.00	47.76
118.00	354.00	PK	20.15	V	2.13	14.32	3.00	36.60	-60.78	-13.00	47.78
118.00	472.00	PK	11.92	H	2.54	16.88	3.00	31.34	-66.04	-13.00	53.04
118.00	472.00	PK	12.70	V	2.54	16.88	3.00	32.12	-65.26	-13.00	52.26
118.00	590.00	PK	12.45	H	2.87	18.40	3.00	33.72	-63.66	-13.00	50.66
118.00	590.00	PK	14.89	V	2.87	18.40	3.00	36.16	-61.22	-13.00	48.22
118.00	708.00	PK	12.23	H	3.12	20.48	3.00	35.83	-61.54	-13.00	48.54
118.00	708.00	PK	14.44	V	3.12	20.48	3.00	38.04	-59.33	-13.00	46.33
118.00	826.00	PK	12.90	H	3.40	20.94	3.00	37.24	-60.14	-13.00	47.14
118.00	826.00	PK	9.69	V	3.40	20.94	3.00	34.03	-63.35	-13.00	50.35
118.00	944.00	PK	12.11	H	3.60	22.60	3.00	38.31	-59.07	-13.00	46.07
118.00	944.00	PK	9.72	V	3.60	22.60	3.00	35.92	-61.46	-13.00	48.46
118.00	1062.00	PK	20.20	H	3.80	26.85	3.00	50.85	-46.53	-13.00	33.53
118.00	1062.00	PK	19.28	V	3.80	26.85	3.00	49.93	-47.45	-13.00	34.45
118.00	1180.00	PK	19.27	H	3.98	27.76	3.00	51.01	-46.37	-13.00	33.37
118.00	1180.00	PK	19.69	V	3.98	27.76	3.00	51.43	-45.95	-13.00	32.95

127.500 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBm)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBμV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
127.50	180.38	PK	16.10	H	1.56	13.82	3.00	31.49	-65.89	-13.00	52.89
127.50	103.56	PK	13.70	V	1.17	10.64	3.00	25.52	-71.86	-13.00	58.86
127.50	255.00	PK	18.00	H	1.95	11.70	3.00	31.65	-65.73	-13.00	52.73
127.50	255.00	PK	16.36	V	1.95	11.70	3.00	30.01	-67.37	-13.00	54.37
127.50	382.50	PK	16.78	H	2.25	14.70	3.00	33.73	-63.65	-13.00	50.65
127.50	382.50	PK	15.12	V	2.25	14.70	3.00	32.07	-65.31	-13.00	52.31
127.50	510.00	PK	15.50	H	2.68	17.80	3.00	35.98	-61.40	-13.00	48.40
127.50	510.00	PK	14.79	V	2.68	17.80	3.00	35.27	-62.11	-13.00	49.11
127.50	637.50	PK	14.44	H	2.95	19.35	3.00	36.74	-60.64	-13.00	47.64
127.50	637.50	PK	14.72	V	2.95	19.35	3.00	37.02	-60.36	-13.00	47.36
127.50	765.00	PK	11.16	H	3.25	21.00	3.00	35.41	-61.97	-13.00	48.97
127.50	765.00	PK	11.86	V	3.25	21.00	3.00	36.11	-61.27	-13.00	48.27
127.50	892.50	PK	12.28	H	3.56	21.80	3.00	37.64	-59.74	-13.00	46.74
127.50	892.50	PK	11.06	V	3.56	21.80	3.00	36.42	-60.96	-13.00	47.96
127.50	1020.00	PK	20.33	H	3.73	26.97	3.00	51.03	-46.35	-13.00	33.35
127.50	1020.00	PK	19.65	V	3.73	26.97	3.00	50.35	-47.03	-13.00	34.03
127.50	1147.50	PK	18.84	H	3.92	27.33	3.00	50.09	-47.29	-13.00	34.29
127.50	1147.50	PK	19.63	V	3.92	27.33	3.00	50.88	-46.50	-13.00	33.50
127.50	1275.00	PK	19.75	H	4.12	28.55	3.00	52.42	-44.96	-13.00	31.96
127.50	1275.00	PK	19.61	V	4.12	28.55	3.00	52.28	-45.10	-13.00	32.10

RADIATED EMISSIONS

136.975 MHz

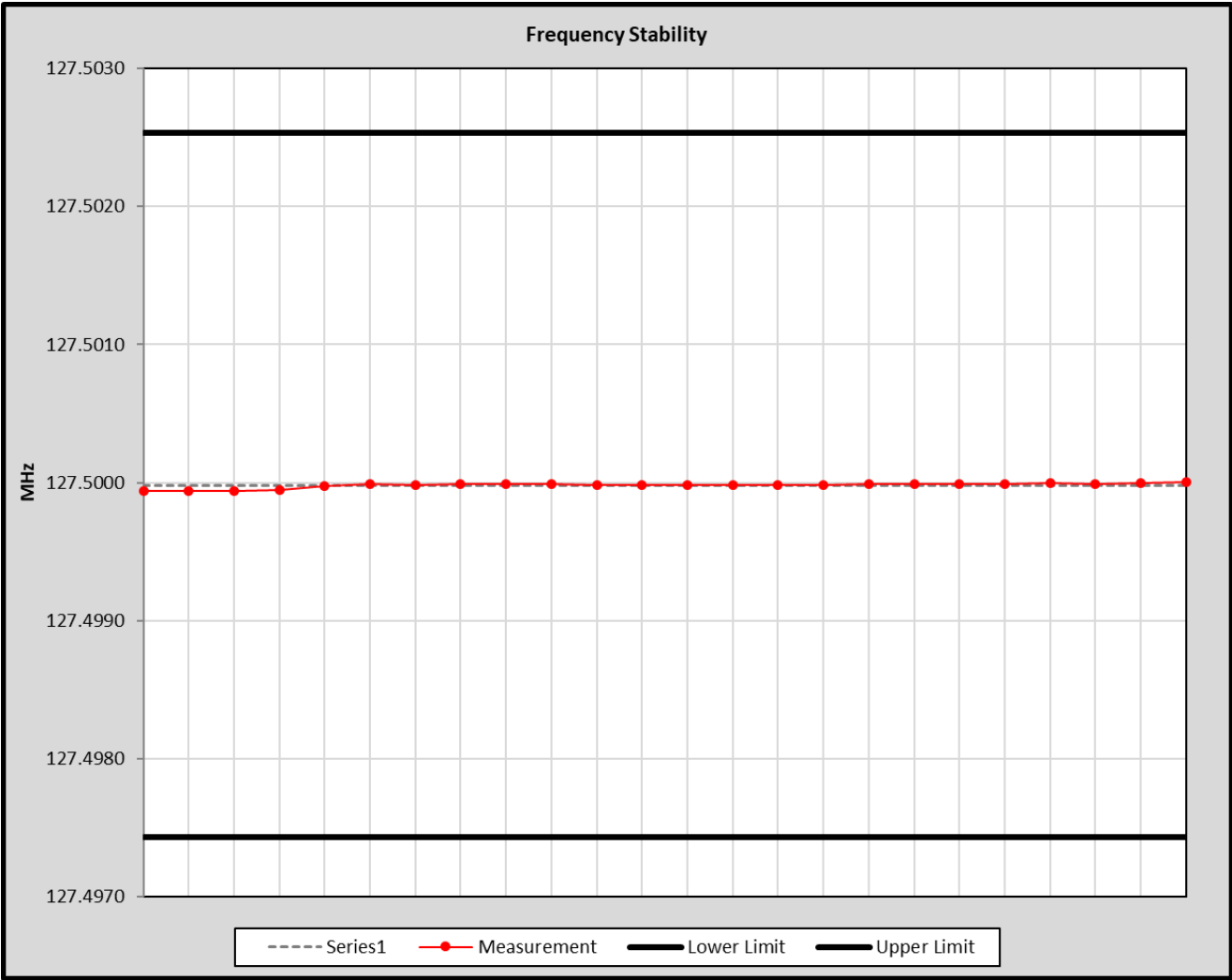
Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBm)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBμV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
136.98	180.38	PK	14.94	H	1.56	13.82	3.00	30.33	-67.05	-13.00	54.05
136.98	66.77	PK	14.17	V	0.96	6.02	3.00	21.16	-76.22	-13.00	63.22
136.98	273.95	PK	18.15	H	2.06	12.50	3.00	32.71	-64.67	-13.00	51.67
136.98	273.95	PK	15.55	V	2.06	12.50	3.00	30.11	-67.27	-13.00	54.27
136.98	410.93	PK	10.11	H	2.31	14.76	3.00	27.18	-70.20	-13.00	57.20
136.98	410.93	PK	10.35	V	2.31	14.76	3.00	27.42	-69.96	-13.00	56.96
136.98	547.90	PK	14.01	H	2.83	17.67	3.00	34.51	-62.87	-13.00	49.87
136.98	547.90	PK	9.76	V	2.83	17.67	3.00	30.26	-67.12	-13.00	54.12
136.98	684.88	PK	13.70	H	3.06	20.71	3.00	37.47	-59.91	-13.00	46.91
136.98	684.88	PK	15.55	V	3.06	20.71	3.00	39.32	-58.06	-13.00	45.06
136.98	821.85	PK	13.17	H	3.40	20.84	3.00	37.41	-59.97	-13.00	46.97
136.98	821.85	PK	8.97	V	3.40	20.84	3.00	33.21	-64.17	-13.00	51.17
136.98	958.83	PK	9.82	H	3.64	23.18	3.00	36.63	-60.74	-13.00	47.74
136.98	958.83	PK	11.60	V	3.64	23.18	3.00	38.41	-58.96	-13.00	45.96
136.98	1095.80	PK	19.97	H	3.84	27.14	3.00	50.95	-46.43	-13.00	33.43
136.98	1095.80	PK	20.81	V	3.84	27.14	3.00	51.79	-45.59	-13.00	32.59
136.98	1232.78	PK	20.10	H	4.05	28.29	3.00	52.44	-44.94	-13.00	31.94
136.98	1232.78	PK	18.28	V	4.05	28.29	3.00	50.62	-46.76	-13.00	33.76
136.98	1369.75	PK	20.73	H	4.29	28.64	3.00	53.66	-43.71	-13.00	30.71
136.98	1369.75	PK	19.87	V	4.29	28.64	3.00	52.80	-44.57	-13.00	31.57

FREQUENCY STABILITY

Test Engineer: FR
 Test Date: SEP 14 2020

Limit of FCC Pt 87		20.0	ppm
Limit, in Hz		2550.000	Hz
Lower Limit		127.497430	MHz
Upper Limit		127.502530	MHz
Rated Supply Voltage	7.4	☐ AC ☒ DC	
Temperature / Voltage Variation			
Temperature (°C)	Supplied Voltage (V)	Frequency (MHz)	Deviation (Hz)
-30	7.4	127.499939	41
-30	6.3	127.499936	44
-30	8.5	127.499939	41
-25	7.4	127.499944	36
-20	7.4	127.499976	4
-15	7.4	127.499993	-13
-10	7.4	127.499981	-1
-5	7.4	127.499988	-8
0	7.4	127.499993	-13
+5	7.4	127.499990	-10
+10	7.4	127.499981	-1
+15	7.4	127.499981	-1
+20 (reference)	7.4	127.499980	0
+20	6.3	127.499980	0
+20	8.5	127.499981	-1
+25	7.4	127.499980	0
+30	7.4	127.499986	-6
+35	7.4	127.499986	-6
+40	7.4	127.499993	-13
+45	7.4	127.499990	-10
+50	7.4	127.499996	-16
+55	7.4	127.499992	-12
+55	6.3	127.499999	-19
+55	8.5	127.500003	-23

FREQUENCY STABILITY



END OF TEST REPORT