ACCREDITED
CERT #0955.01

TIMCO ENGINEERING, Inc.

An IIA Company

Test Report - FCC PART 90 Booster Class B (B9B)
Applicant: Fiplex Communications Inc.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 5/23/2023

Table of Contents

1. Customer Information

Applicant: Fiplex Communications Inc.
Address: 2101 NW 79th Avenue
Miami, Florida, 33122, United States

1.1 Test Result Summary

The following test procedure and guidance were used for measuring FCC PART 90 (PRIVATE LAND MOBILE RADIO SERVICES) known as Licensed Land Mobile; ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters. 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.

Applicable Clauses from Part 2		
FCC Part 2 Clauses	Description of the requirements	Result: (Pass, Fail, N/A)
2.202	Bandwidth & Emission	Pass
2.1033 (c)(8)	Power at the Final Amplifier	Pass
2.1046 (a)	RF Output Power	Pass
2.1047	Modulation characteristics	n/a
2.1049	Occupied Bandwidth	Pass
2.1051	Spurious emissions at antenna terminals	Pass
2.1053	Field strength of spurious radiation	Pass
2.1055	Frequency stability	n/a

Applicable Clauses from Part 90 Subpart I		
FCC Part 90 Clauses	Description of the requirements	Result: (Pass, Fail, N/A)
90.205	Transmitter Power	Pass
90.207	Types of Emissions	Pass
90.209	Bandwidth limitations	Pass
90.210	Emission masks, In-band	Pass
90.210	Emission masks, Out-of-band	Pass
90.213	Frequency stability	n/a
90.214	Transient Frequency Behavior	n/a
90.219 (d)(6)(i)	ERP of intermodulation products	n/a[1]
90.219 (d)(6)(ii)	ERP of noise within the passband	n/a[1]
90.219 (d)(6)(iii)	ERP of noise on spectrum < 1 MHz outside of the passband	n/a[1]
90.219 (d)(3)(i), (e)(1)	ERP of Radiated Power	n/a[1]
90.219 (e)(2)	Noise figure	Pass
90.219 (e)(3)	Spurious emissions	Pass
90.219 (e)(4)(i)(ii)(iii)	Retransmitted Signals	n/a
90.221	Adjacent channel power limits	n/a

Note 1: Requirements in Part 90.219 (d) apply at deployment of this EUT, therefore are not applicable at certification.

KDB 935210 D05 v01r04		
FCC KDB 935210 D05 Clauses	Description of the requirements	Result: (Pass, Fail, N/A)
4.1	Test Signals for PLMRS (Input Signals)	Pass
4.2	AGC Threshold	Reported
4.3	Out-of-Band Rejection	Reported
4.4	Input-versus-Output Signal Comparison	Pass
4.5	Output Power	Pass
4.5	Amplifier/Booster Gain (optional)	Reported
4.6	Noise Figure	Pass
4.7.2	Out-of-band/Out-of-block Conducted Emissions (Intermodulation Products)	Pass
4.7.3	EUT Spurious Conducted Emissions	Pass
4.8	Frequency Stability	n/a
4.9	Spurious Radiated Emissions	Pass

2. Location of Testing

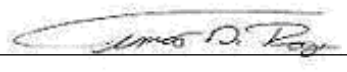
2.1 Test Laboratory

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

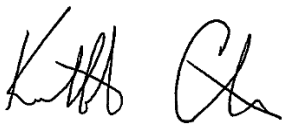
2.2 Testing was performed, reviewed by

Dates of Testing: 3/14/2023 – 3/27/2023

Signature:  Sr. EMC Engineer EMC-003838-NE

Name & Title: Tim Royer, EMC Engineer

Date of Signature 5/23/2023

Signature: 

Name & Title: Kristoffer Costa, EMC Technician

Date of Signature 5/23/2023

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

The test sample was received: 3/10/2023

3.1 Definitions

Signal booster: A device or system that automatically receives, amplifies, and retransmits signals from wireless stations into and out of building interiors, tunnels, shielded outdoor areas and other locations where these signals would otherwise be too weak for reliable communications. Signal booster systems may contain both Class A and Class B signal boosters as components.

Class A signal booster: A signal booster designed to retransmit signals on one or more specific channels. A signal booster is deemed to be a Class A signal booster if none of its passbands exceed 75 kHz.

Class B signal booster: A signal booster designed to retransmit any signals within a wide frequency band. A signal booster is deemed to be a Class B signal booster if it has a passband that exceeds 75 kHz.

3.2 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:	P3TDH14-11B
Brief Description	Low Band FLEX Remote
Model(s) #	HONBDA-RA
Firmware version	N/A
Software version	N/A
Serial Number	N/A

Technical Characteristics	
Frequency Range	406.1-439 MHz
RF O/P Power (Max.)	38.43 dBm/ 6.966W
Modulation	FM
Bandwidth & Emission Class	4K05F3E, 7K85F3E, 12K3F3E, 8K26F1D, 8K26F1E, 8K12F1W, 9K77F1D, 9K77F1E, 9K77D7W
Duty Cycle	100%
Antenna Connector	N type
Voltage Rating (AC or Batt.)	120 VAC

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.

3.3 Configuration of EUT

Test Modes		
Band (MHz)	Link Direction	Test Frequencies (MHz)
406.1-439 MHz	Downlink	425 MHz
		430 MHz

Operating conditions during Testing:

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:

A laptop was used to program the EUT.

3.4 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 90 Licensed device:

1) ANSI C63.26-2015
2) FCC KDB 935210 D05 v01r04 Industrial Signal Boosters

4.2 Applied Limits and Regulatory Limits:

1) FCC CFR 47 Part 90 Subpart I, 90.219

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, 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	4/25/2023
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

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

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 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

8.1 Power at the Final Amplifier

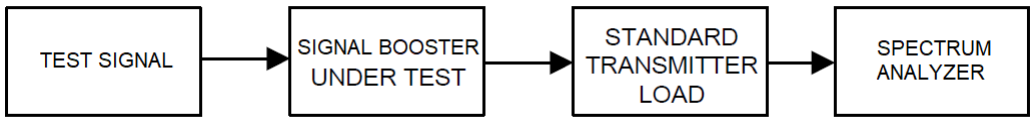
Limits from FCC Part 2.1033 (c)(8).

No method of measurement is specified. The result has been calculated based on all available information.

Test Results		
EUT Operating Voltage (V)	EUT Current (A)	Power at the Final Amplifier (W)
24	3.33	79.92

8.2 RF Output Power & Gain

Limits from FCC Parts 2.1046(a), and 90.205 and test procedure from ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Test Setup


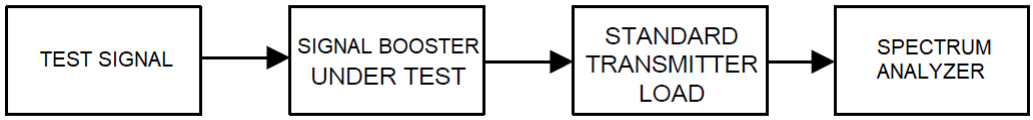
Test Results, Power Output		
Link Direction	Max Power Output (dBm)	Max Power Output (W)
Downlink	38.43	6.966

Gain

Test Results, Gain					
Link Direction	Tuned Frequency (MHz)	Input Level	Power Input (dBm)	Power Output (dBm)	Gain (dB)
Downlink	425	AGC	-41.5	36.07	77.57
		AGC+3	-38.5	38.43	76.93
	430	AGC	-41	35.59	76.59
		AGC+3	-38	37.10	75.1

8.3 Out-of-band Rejection

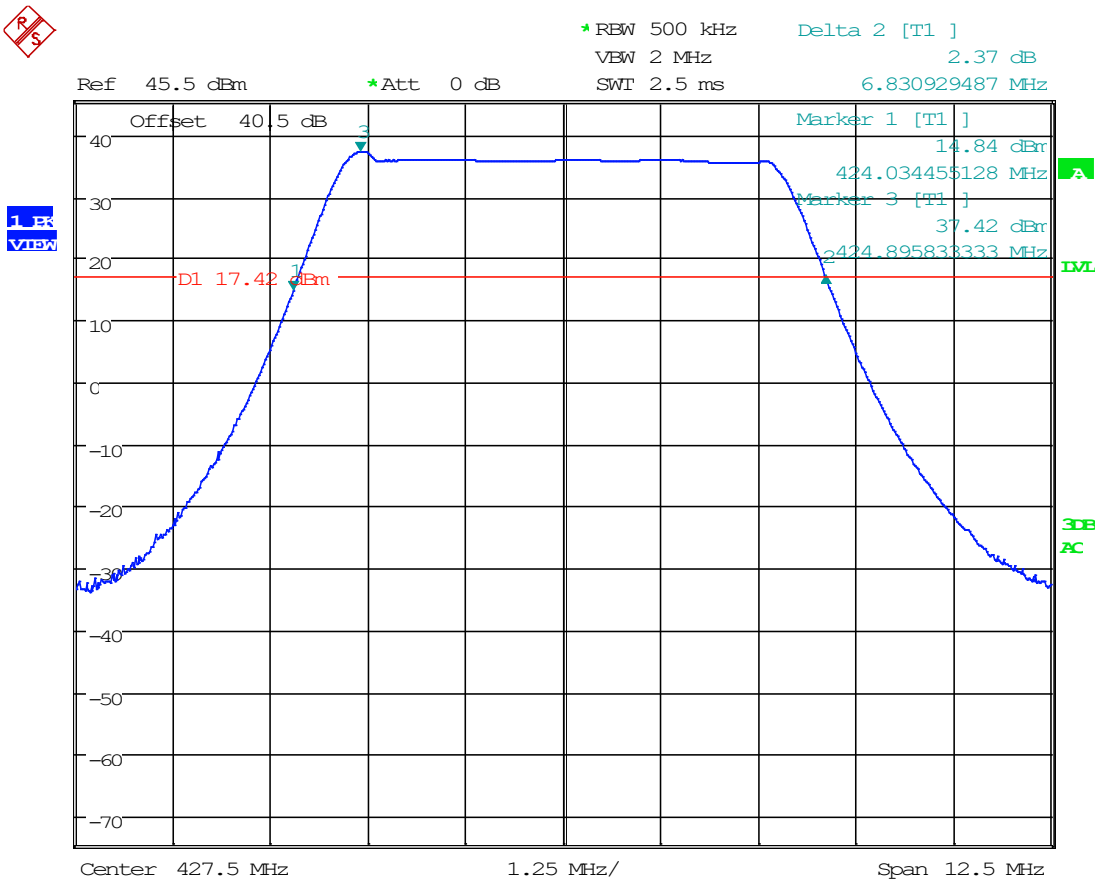
Limits and test method from FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Test Setup


Test Results, Out-of-band Rejection and Class of Operation			
Operating Band (MHz)	Link Direction	Passband (kHz)	Class of Operation
425-430 MHz	Downlink	> 75 kHz	Class B

Out-of-band Rejection, Spectrum Plots

8.3.1 Master, Downlink



Date: 21.MAR.2023 16:48:57

8.4 Bandwidth & Emission

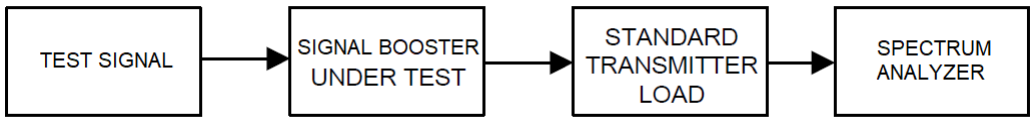
Limits from FCC Parts 90.209 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Authorized Bandwidth		
Rule Part	Operating Range	Authorized Bandwidth (kHz)
Part 90	425-430 MHz	6/11.25/20

Applicable Input Signals		
Signal	Occupied Bandwidth (kHz)	Representative Emission Designator(s)
CW	N/A	N/A
6.25 kHz FM	4.048	4K05F3E
12.5 kHz FM	7.847	7K85F3E
25 kHz FM	12.304	12K3F3E
C4FM (P25 Phase I)	8.263	8K26F1D, 8K26F1E
HCPM (P25 Phase II SU)	8.115	8K12F1W
HDQPSK (P25 Phase II BS)	9.773	9K77F1D, 9K77F1E, 9K77D7W

8.5 Input VS Output Signal Comparison

Limits from FCC Parts 90.210 and test procedure from ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

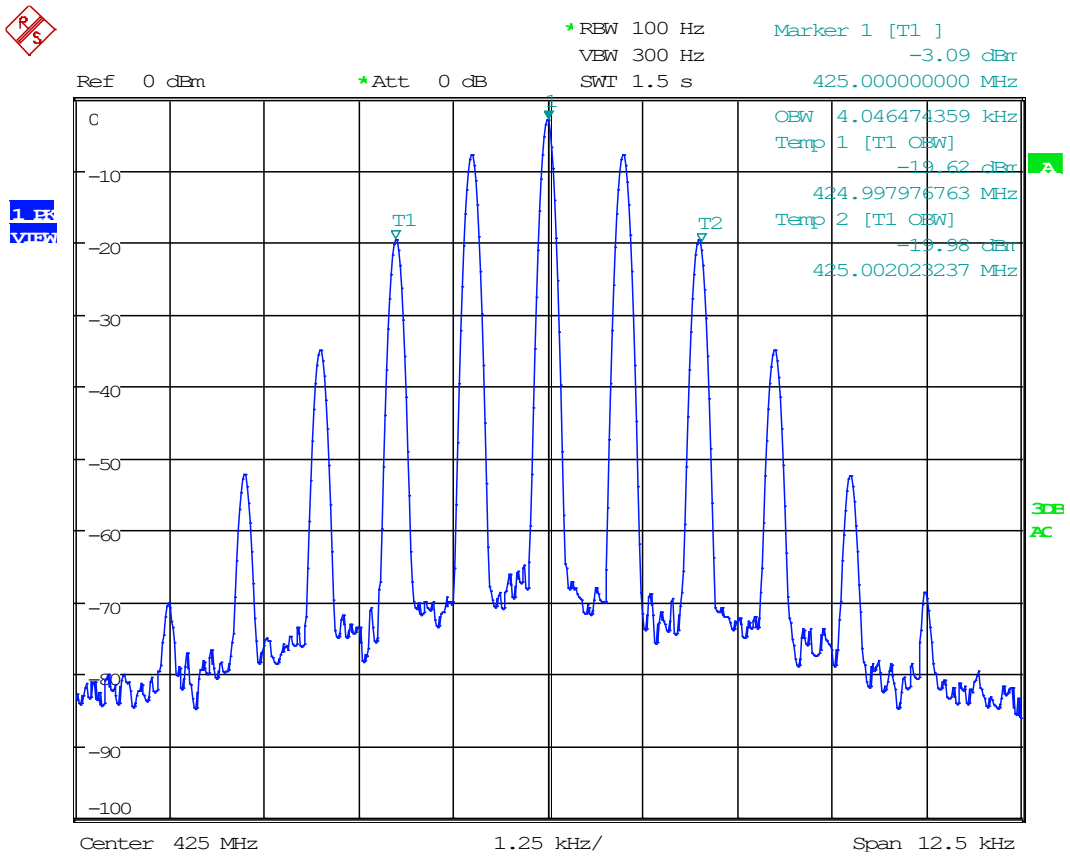
Test Setup


Input VS Output Comparison

Test Results, Input VS Output Comparison						
Link Direction	Tuned Frequency (MHz)	Input Signal	AGC Level	99% OBW of Input (kHz)	99% OBW of Output (kHz)	Change (%)
Downlink	425	6.25 kHz FM	@ AGC	4.046	4.048	0.002
		12.5 kHz FM	@ AGC	7.932	7.847	0.085
		25 kHz FM	@ AGC	12.319	12.304	0.015
		C4FM	@ AGC	8.133	8.142	0.009
		HCPM	@ AGC	8.213	8.063	0.15
		HDQPSK	@ AGC	9.895	9.907	0.012
	430	6.25 kHz FM	@ AGC	4.046	4.048	0.002
		12.5 kHz FM	@ AGC	7.932	7.847	0.085
		25 kHz FM	@ AGC	12.319	12.304	0.015
		C4FM	@ AGC	8.133	8.263	0.13
		HCPM	@ AGC	8.213	8.115	0.098
		HDQPSK	@ AGC	9.895	9.773	0.122

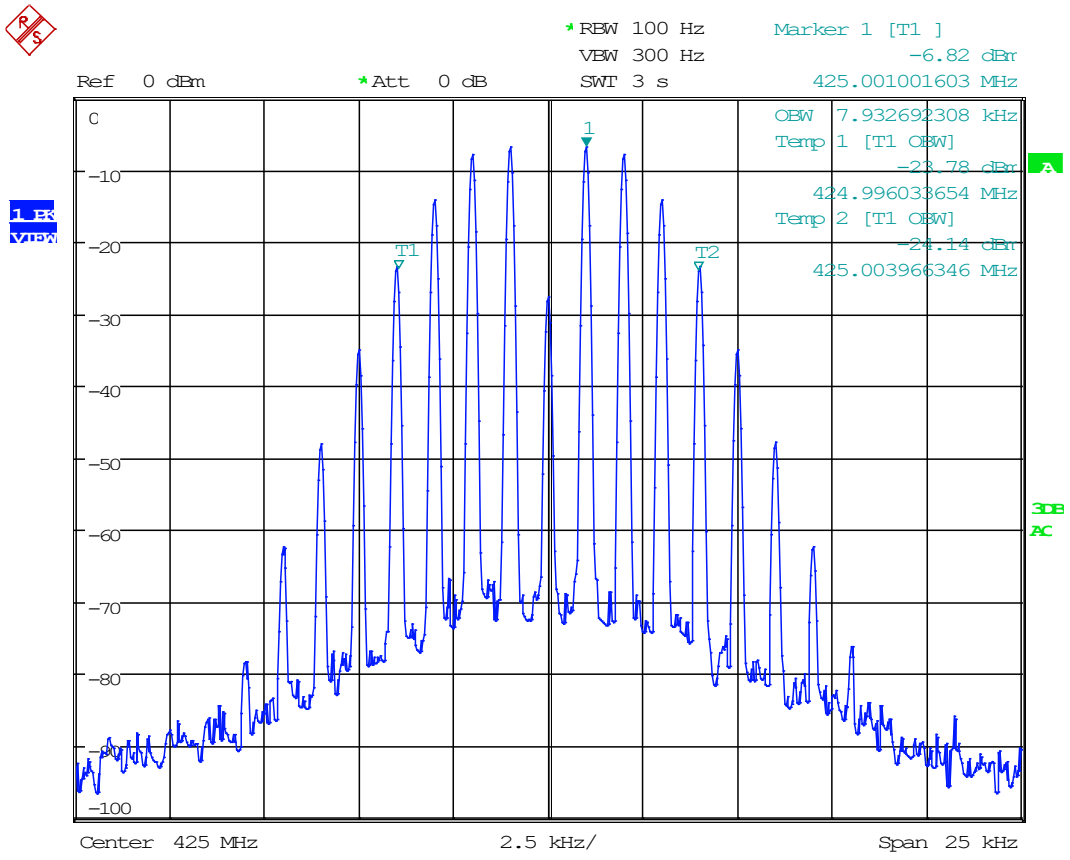
Input VS Output, Input Spectrum Plots

8.5.1 6.25 kHz FM, Input Signal



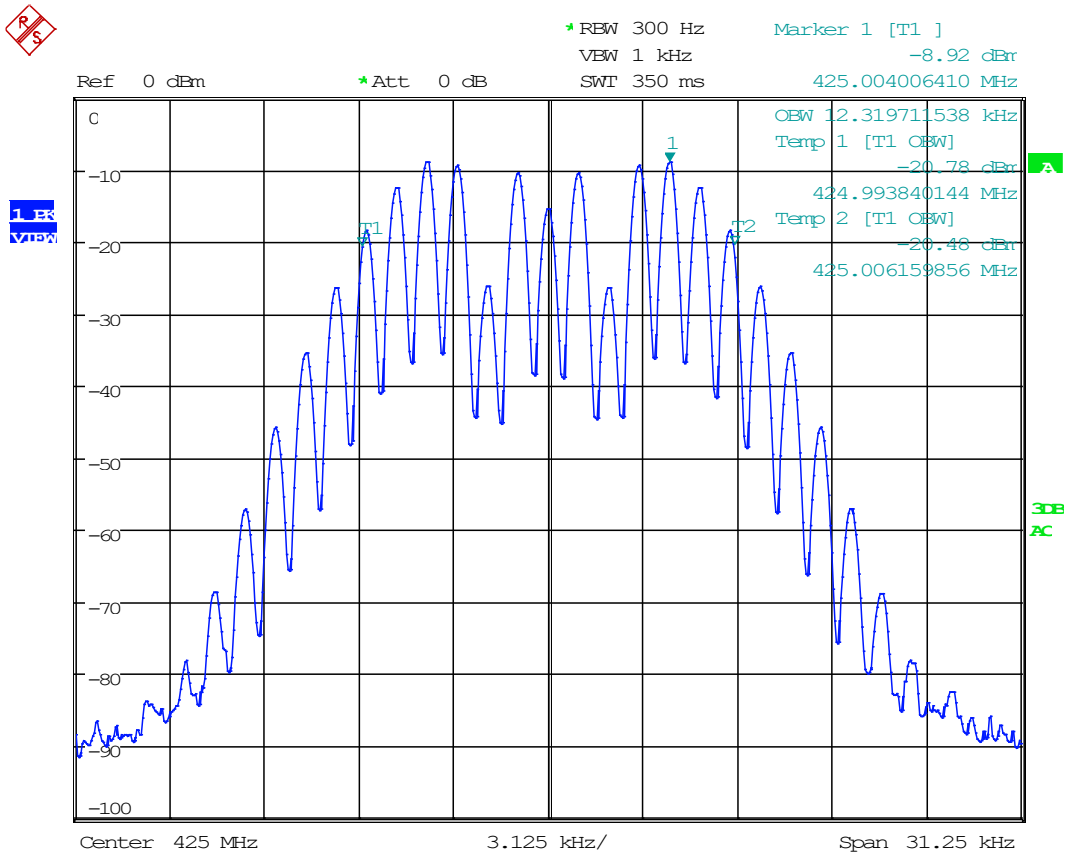
Date: 4.JAN.2021 11:51:31

8.5.2 12.5 kHz FM, Input Signal



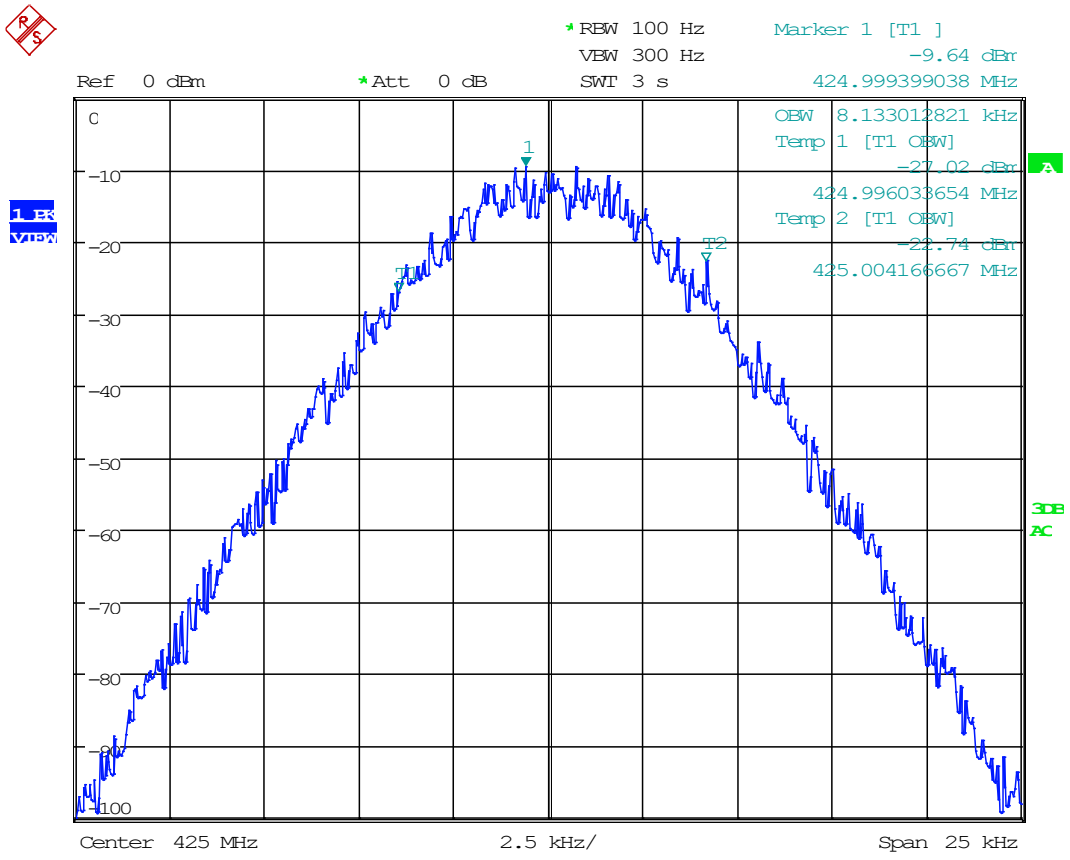
Date: 4.JAN.2021 11:49:22

8.5.3 25 kHz FM, Input Signal



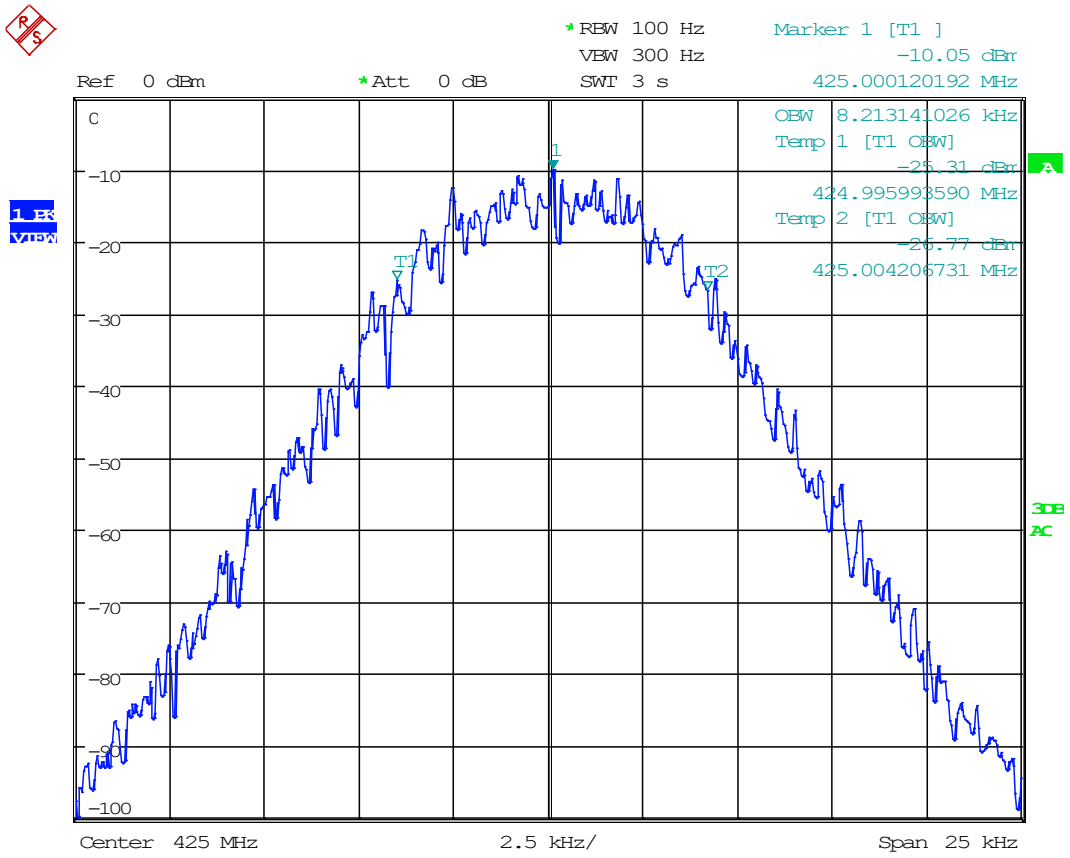
Date: 4.JAN.2021 11:50:26

8.5.4 C4FM, Input Signal



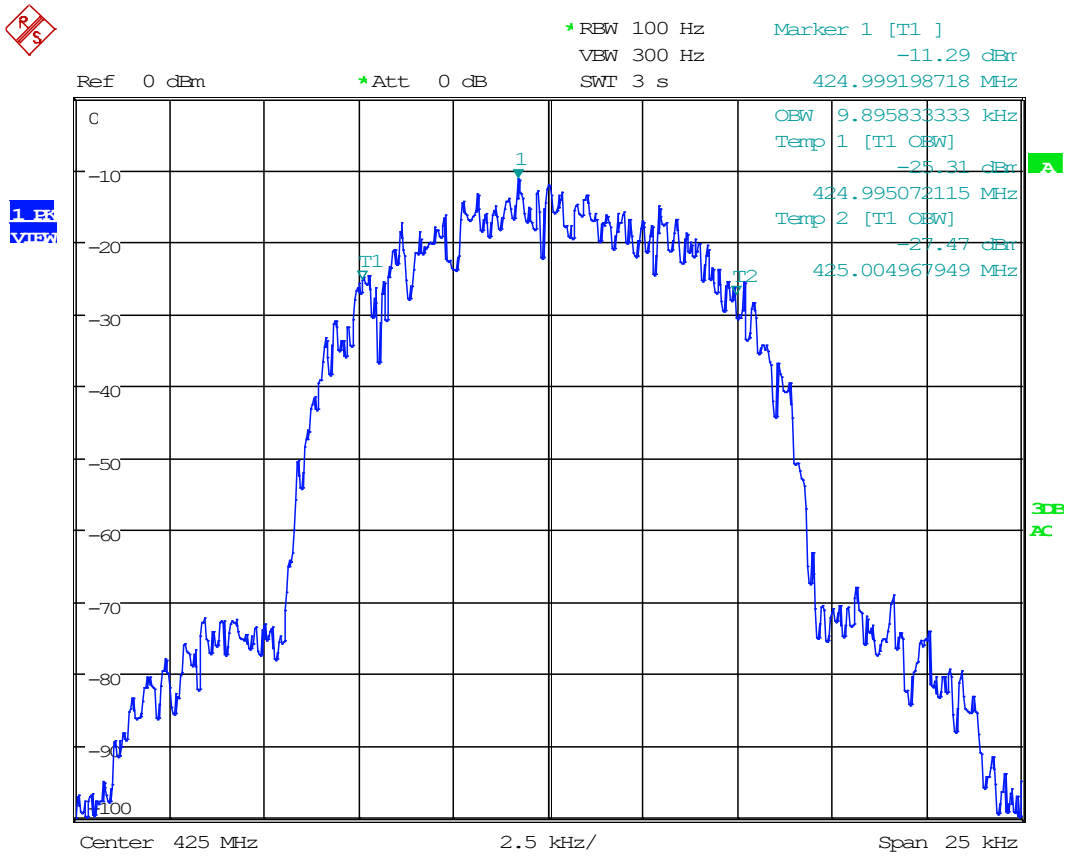
Date: 4.JAN.2021 11:42:36

8.5.5 H-CPM, Input Signal



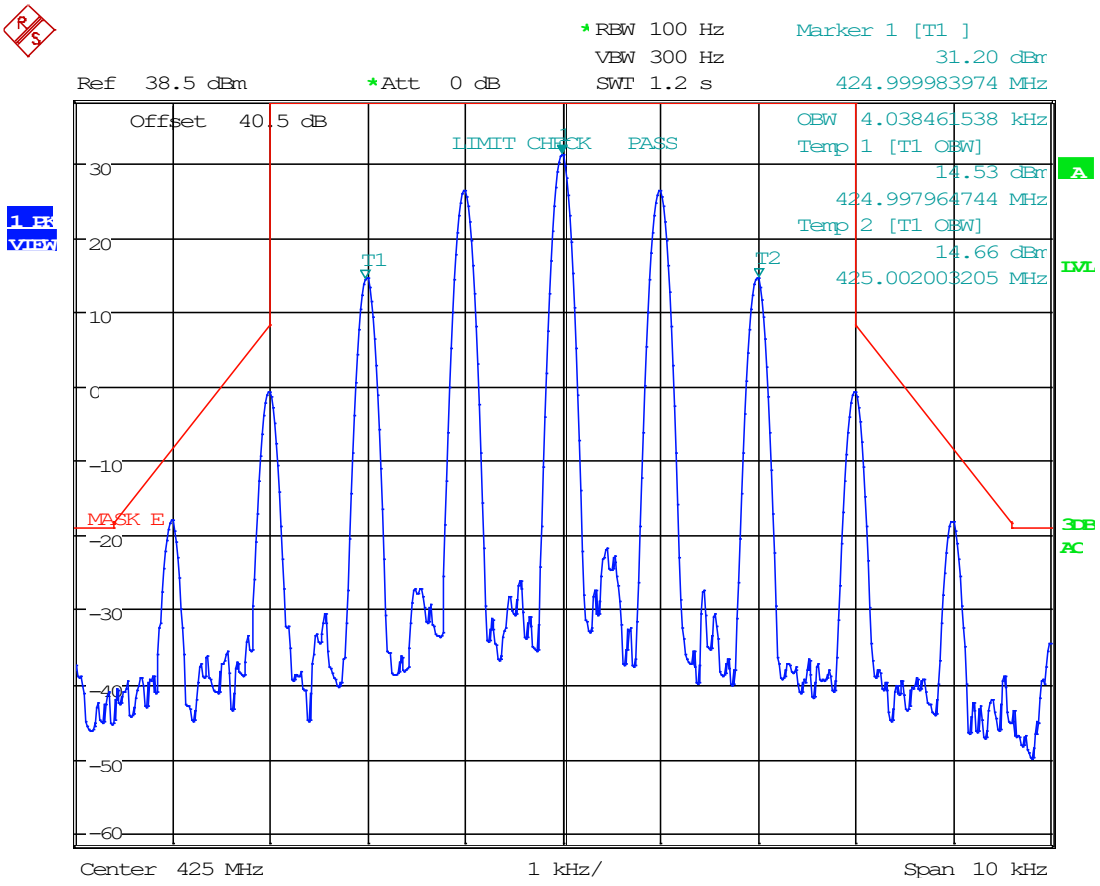
Date: 4.JAN.2021 11:43:53

8.5.6 H-DQPSK, Input Signal



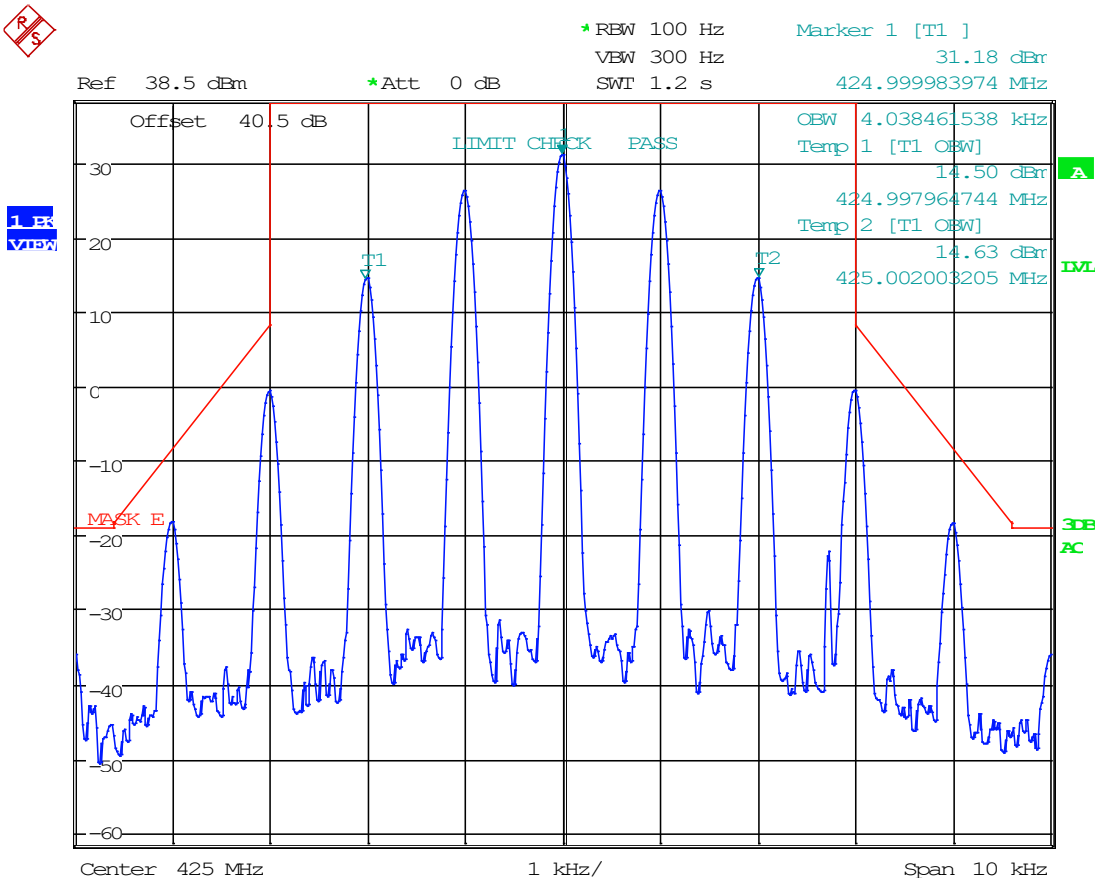
Date: 4.JAN.2021 11:45:31

8.5.7 6.25 kHz, FM, DL Mask E, AGC, 425 MHz



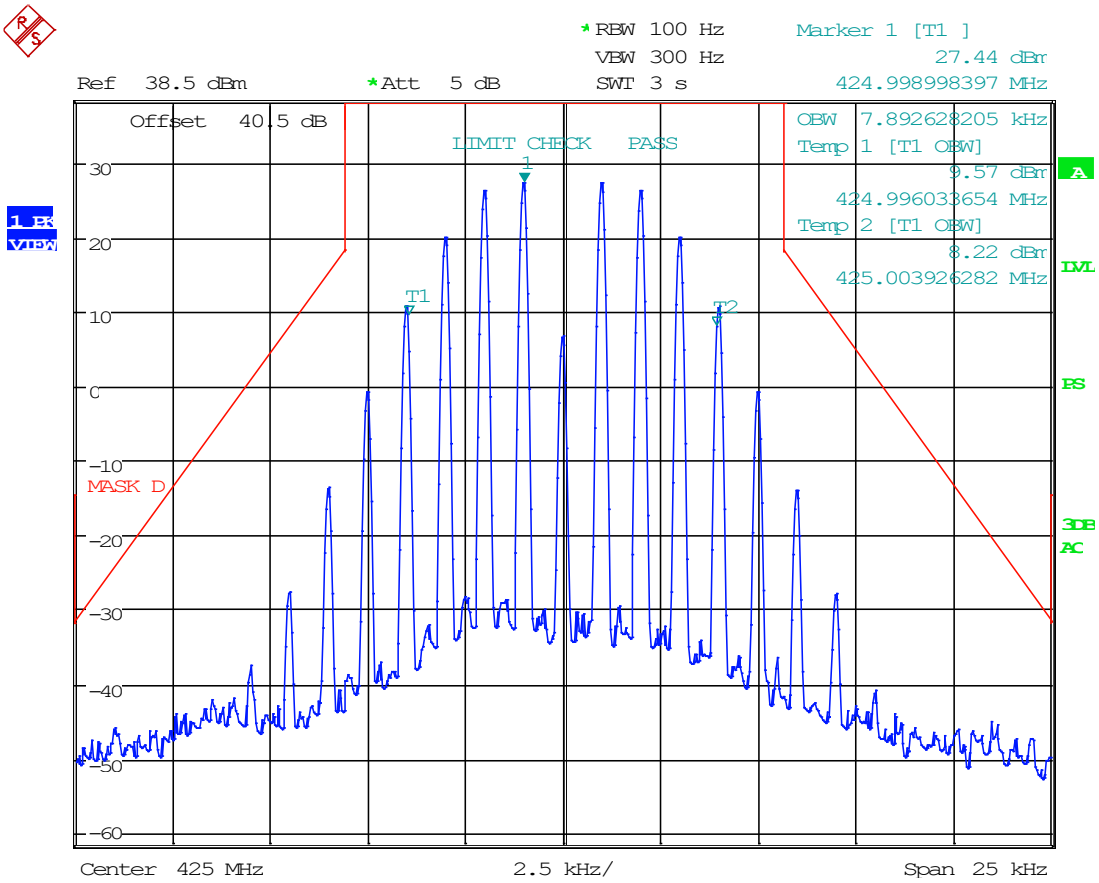
Date: 21.MAR.2023 13:53:28

8.5.8 6.25 kHz, FM, DL Mask E, AGC +3, 425 MHz



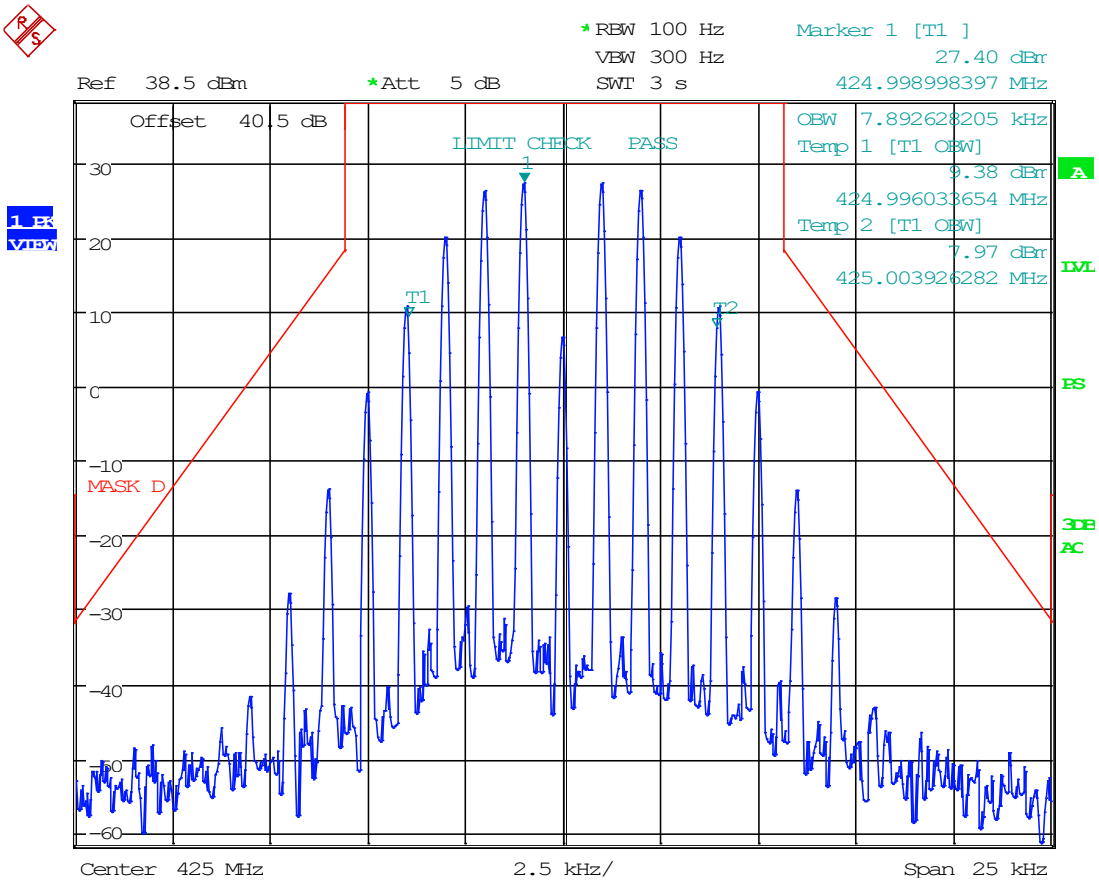
Date: 21.MAR.2023 13:52:56

8.5.9 12.5 kHz, FM, DL Mask D, AGC, 425 MHz



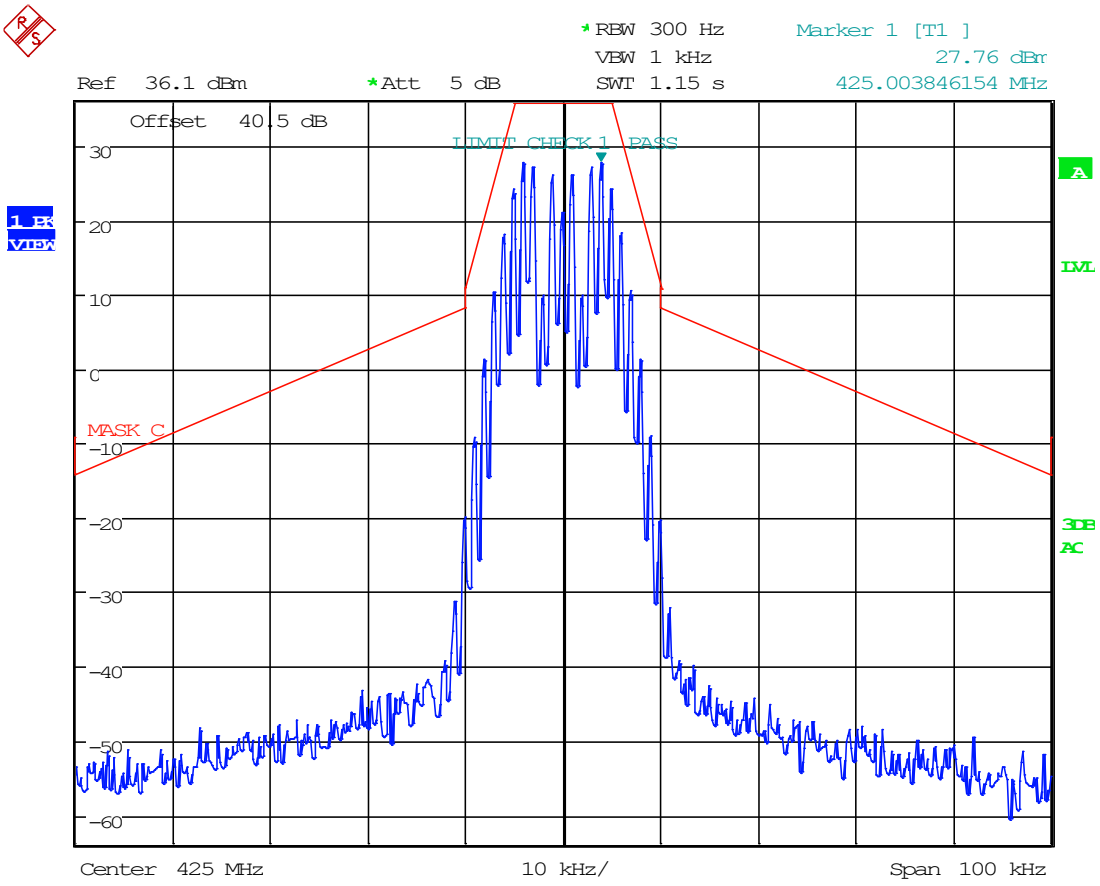
Date: 21.MAR.2023 13:57:19

8.5.10 12.5 kHz, FM, DL Mask D, AGC+3, 425 MHz



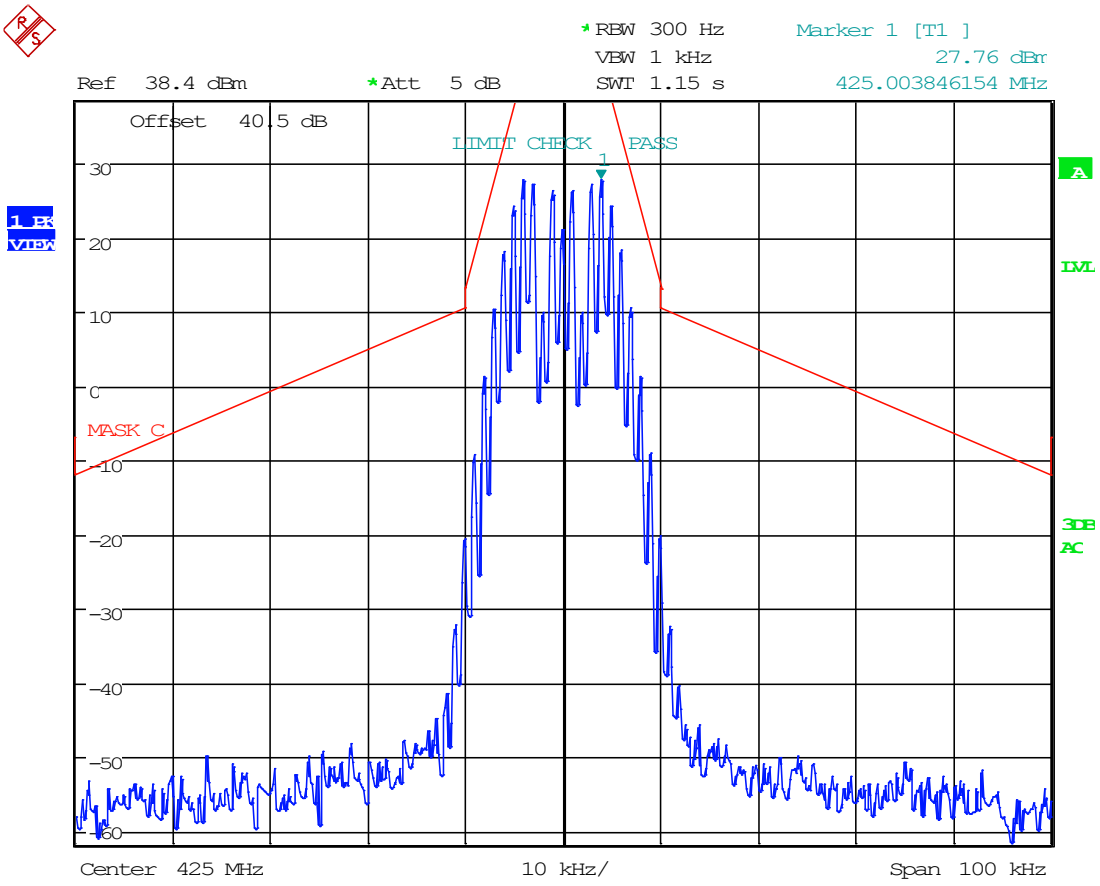
Date: 21.MAR.2023 13:57:55

8.5.11 25 kHz FM, DL Mask C, AGC, 425 MHz



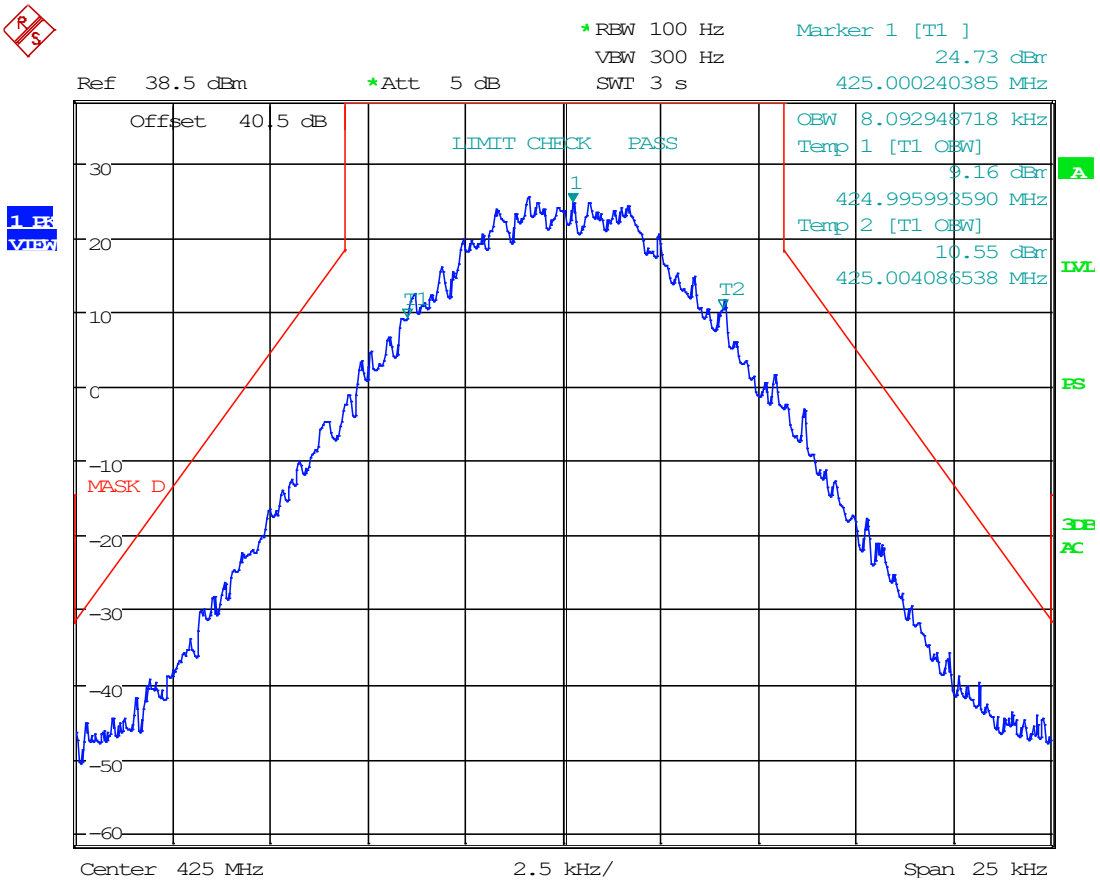
Date: 31.MAR.2023 08:48:33

8.5.12 25 kHz FM, DL Mask C, AGC+3, 425 MHz



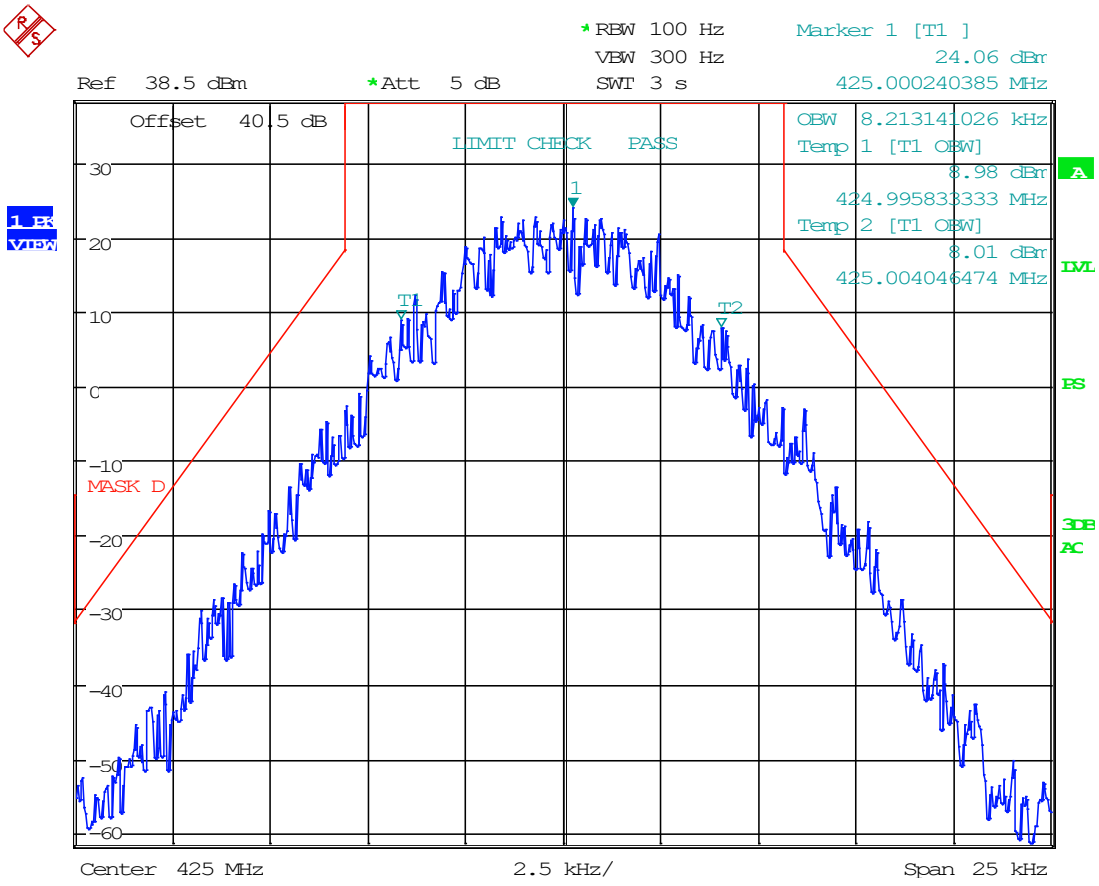
Date: 31.MAR.2023 08:49:41

8.5.13 C4FM, DL Mask D, AGC, 425 MHz

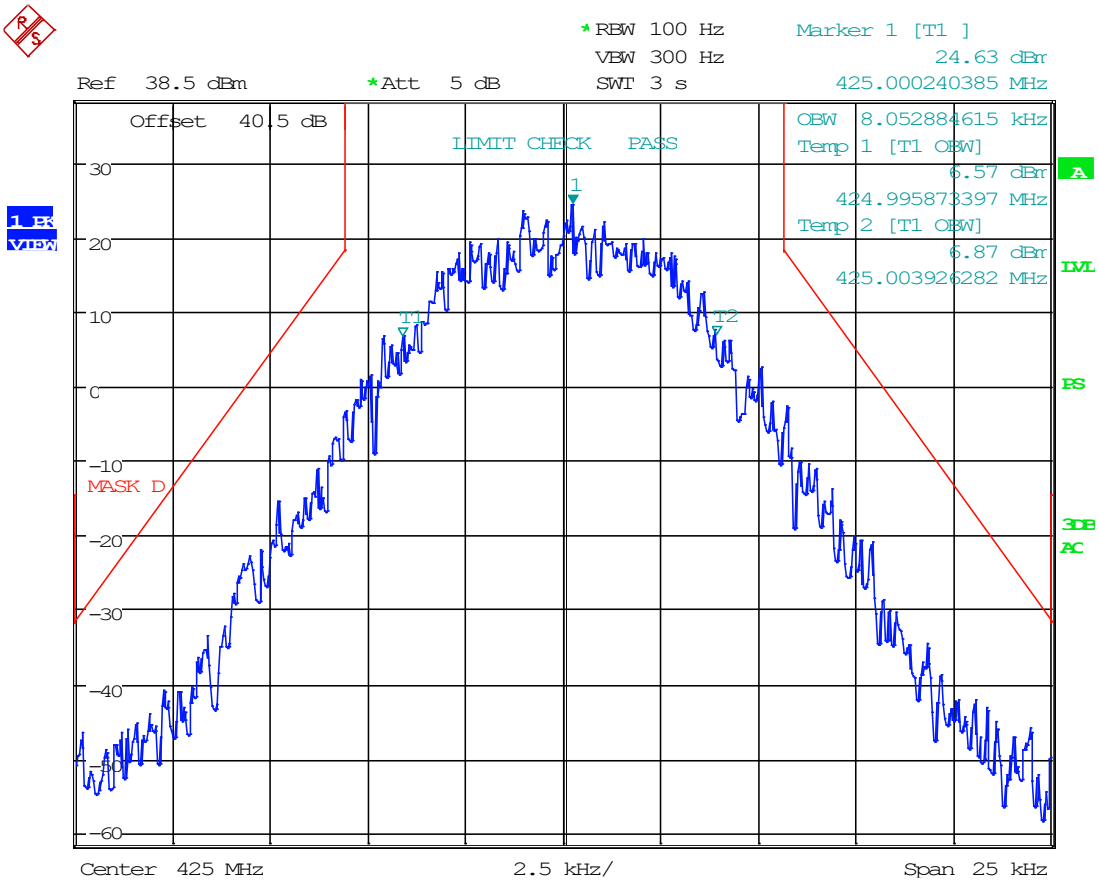


Date: 21.MAR.2023 14:09:51

8.5.14 C4FM, DL Mask D, AGC+3, 425 MHz

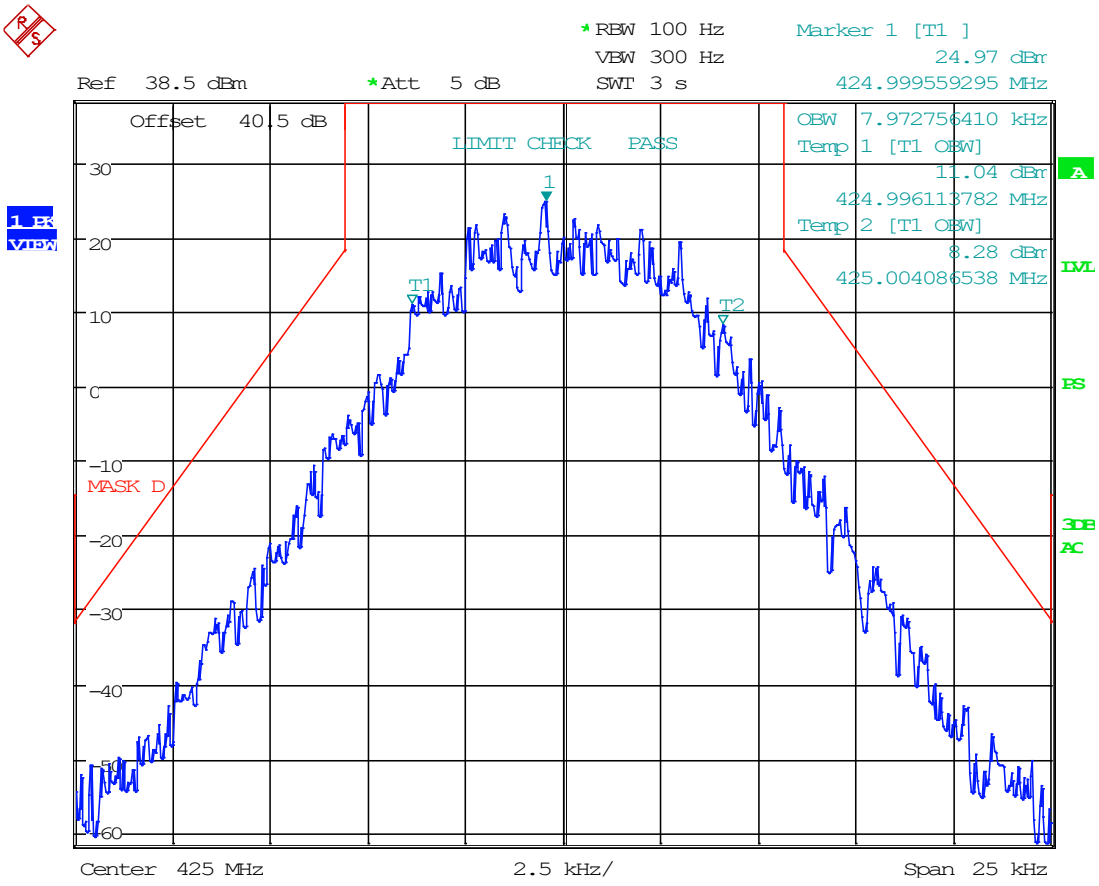


8.5.15 H-CPM, DL Mask D, AGC, 425 MHz



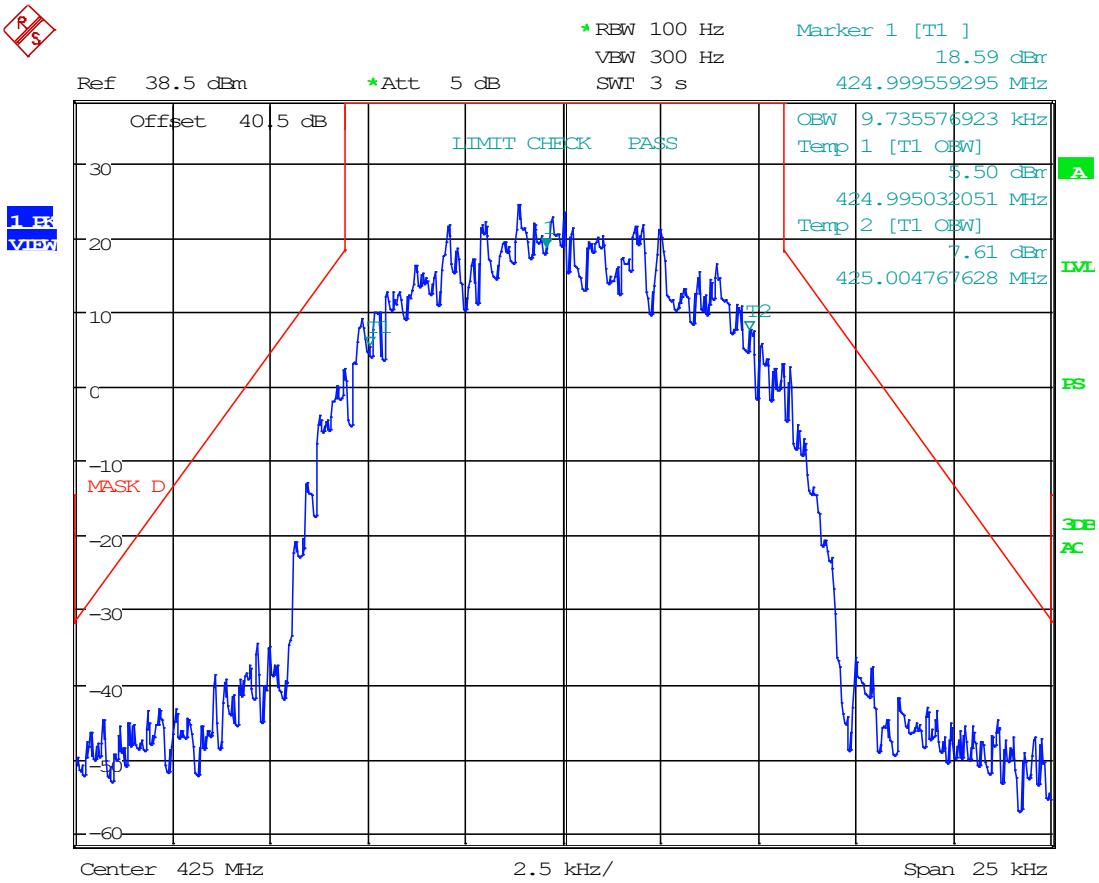
Date: 21.MAR.2023 14:10:28

8.5.16 H-CPM, DL Mask D, AGC+3, 425 MHz



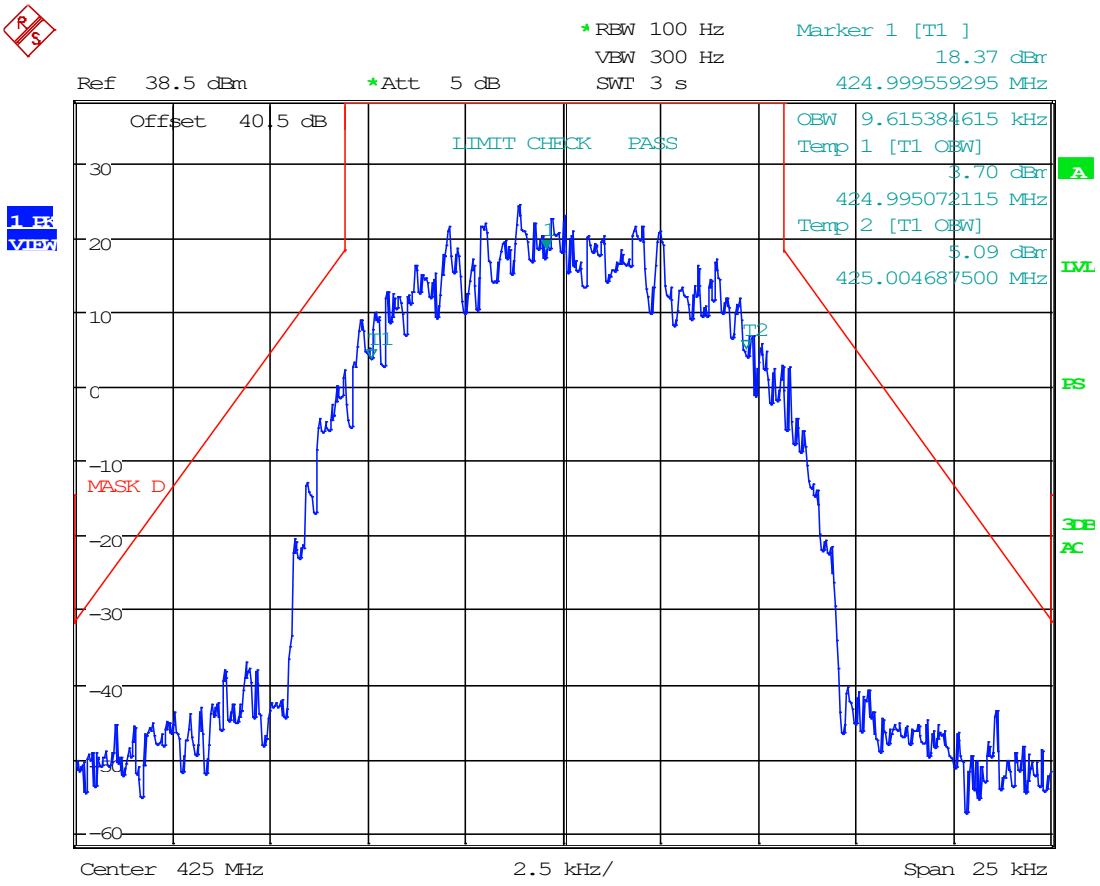
Date: 21.MAR.2023 14:10:58

8.5.17 H-DQPSK, DL Mask D, AGC, 425 MHz



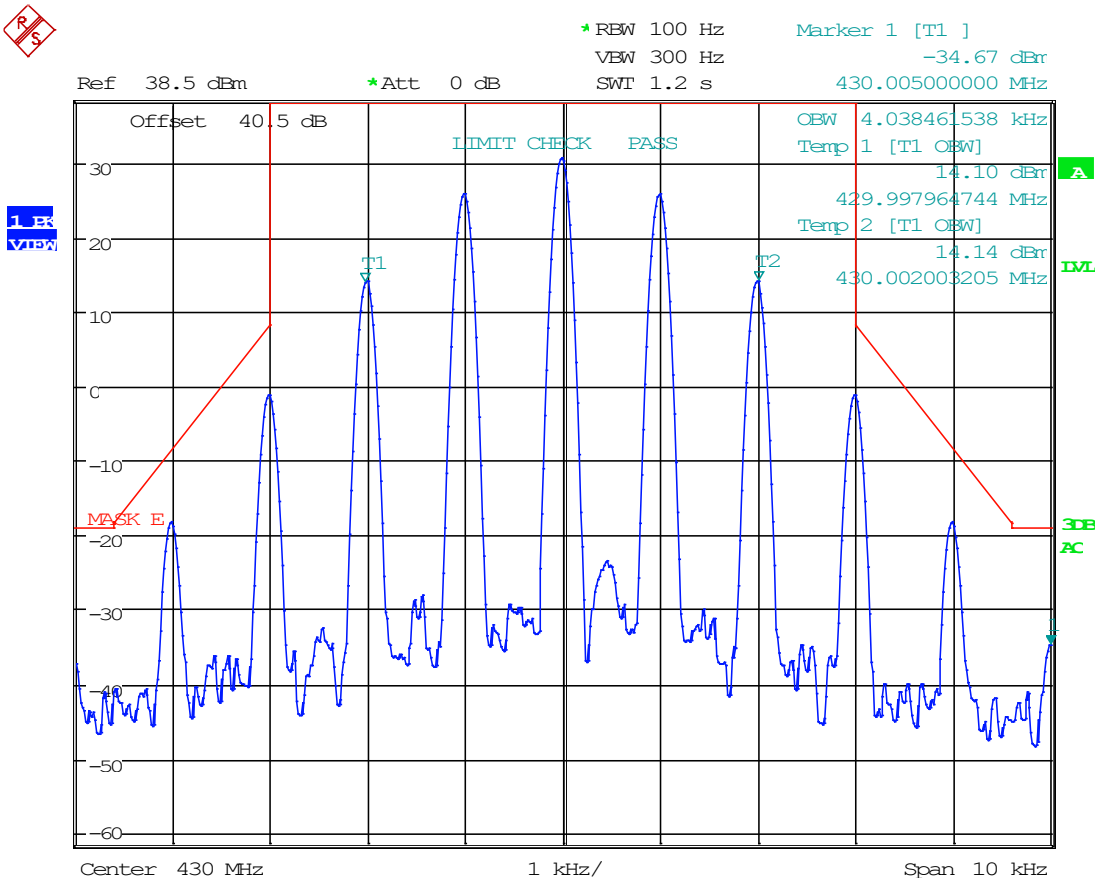
Date: 21.MAR.2023 14:12:01

8.5.18 H-DQPSK, DL Mask D, AGC+3, 425 MHz



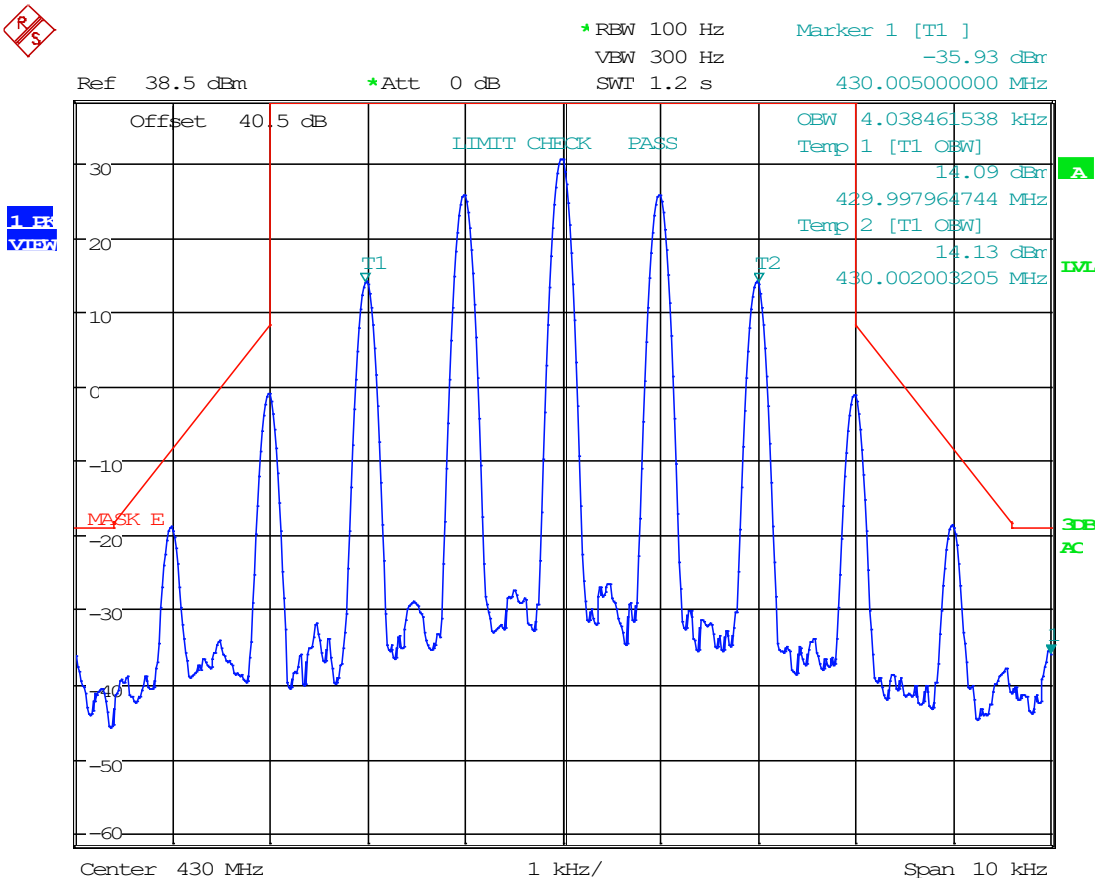
Date: 21.MAR.2023 14:11:30

8.5.19 6.25 kHz, FM, DL Mask E, AGC, 430 MHz



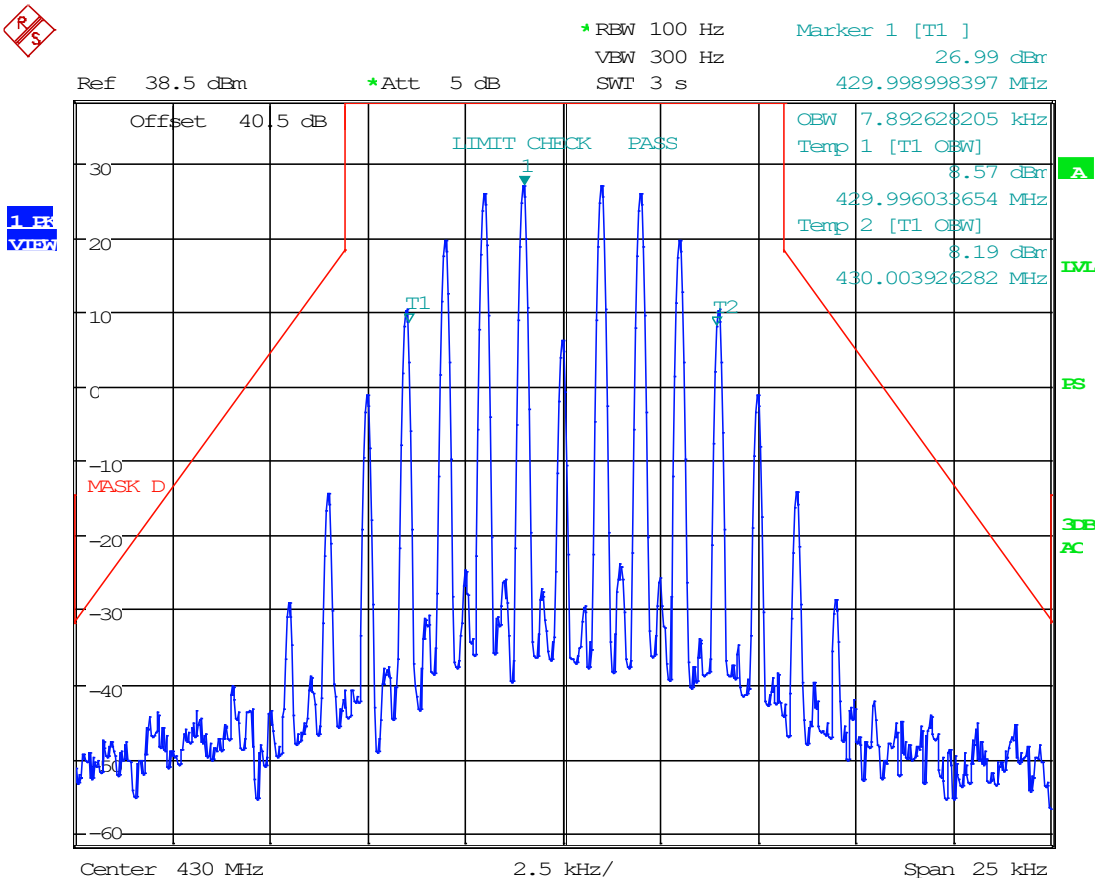
Date: 21.MAR.2023 11:34:54

8.5.20 6.25 kHz, FM, DL Mask E, AGC+3, 430 MHz



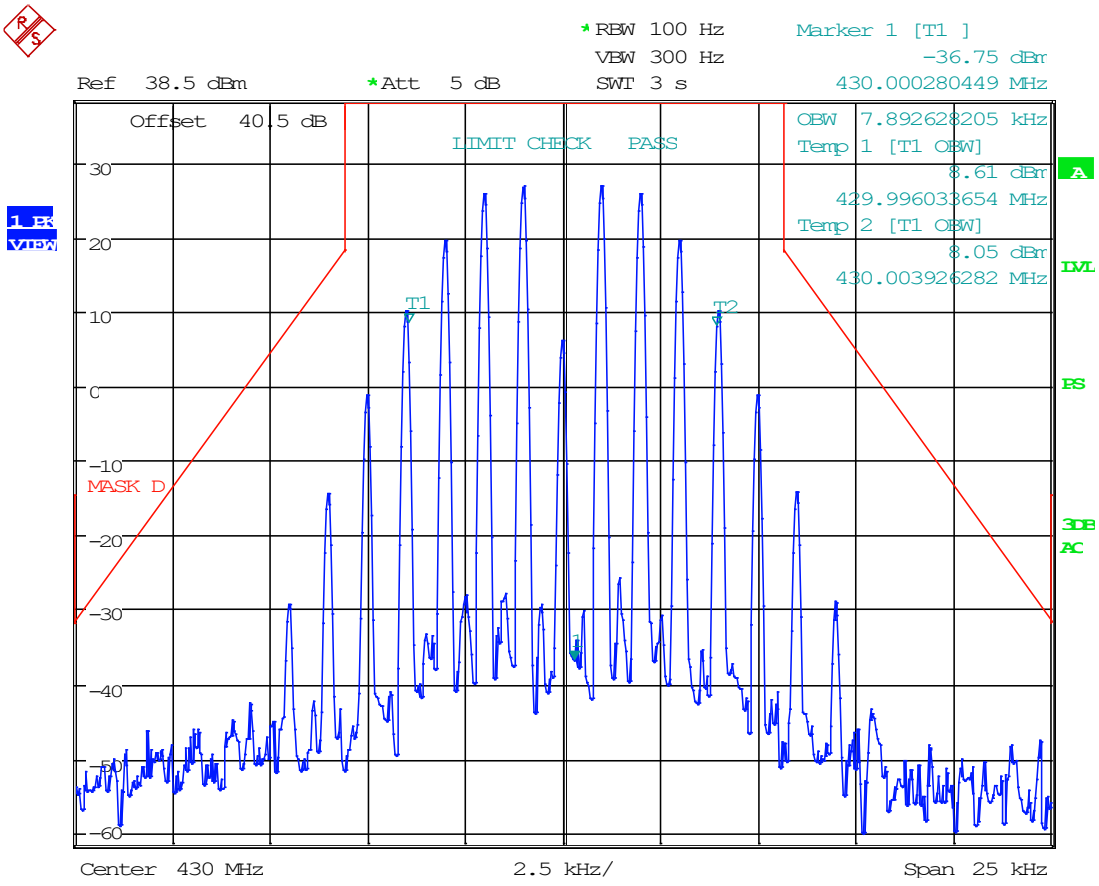
Date: 21.MAR.2023 11:38:17

8.5.21 12.5 kHz, FM, DL Mask D, AGC, 430 MHz



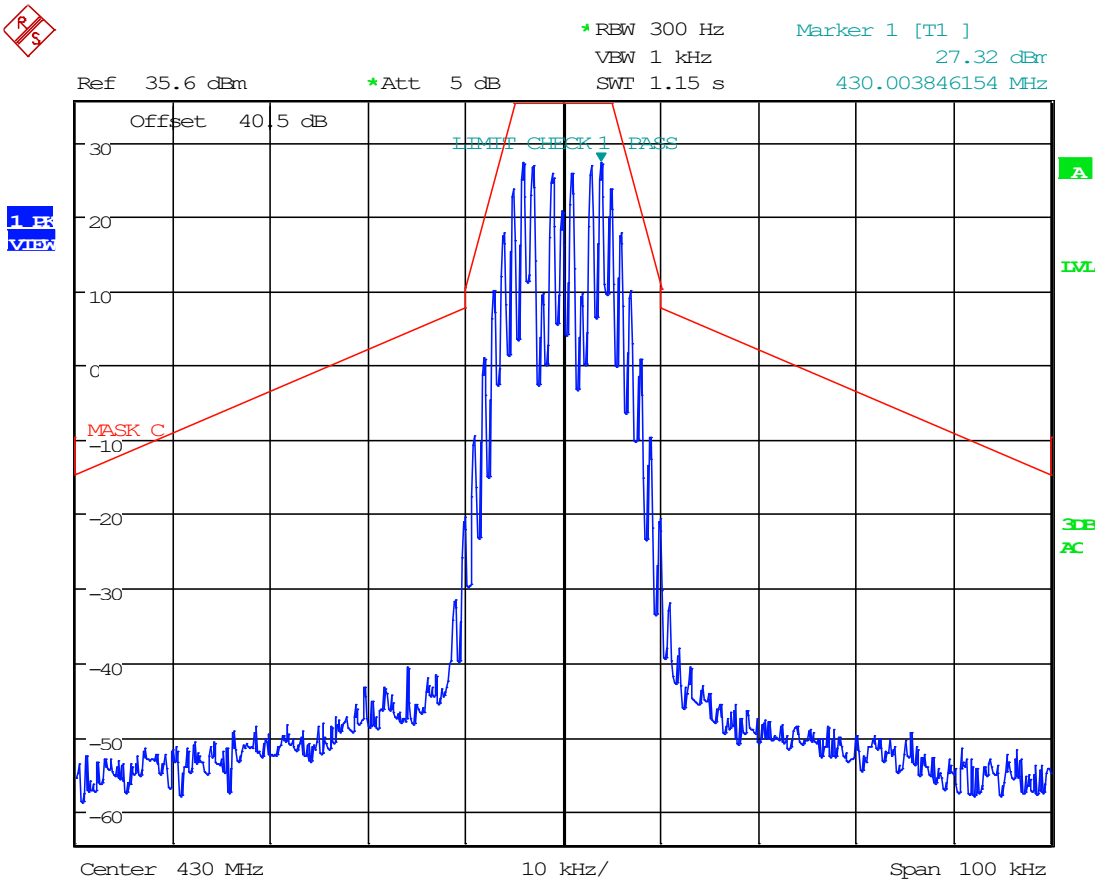
Date: 21.MAR.2023 14:23:22

8.5.22 12.5 kHz, FM, DL Mask D, AGC+3, 430 MHz



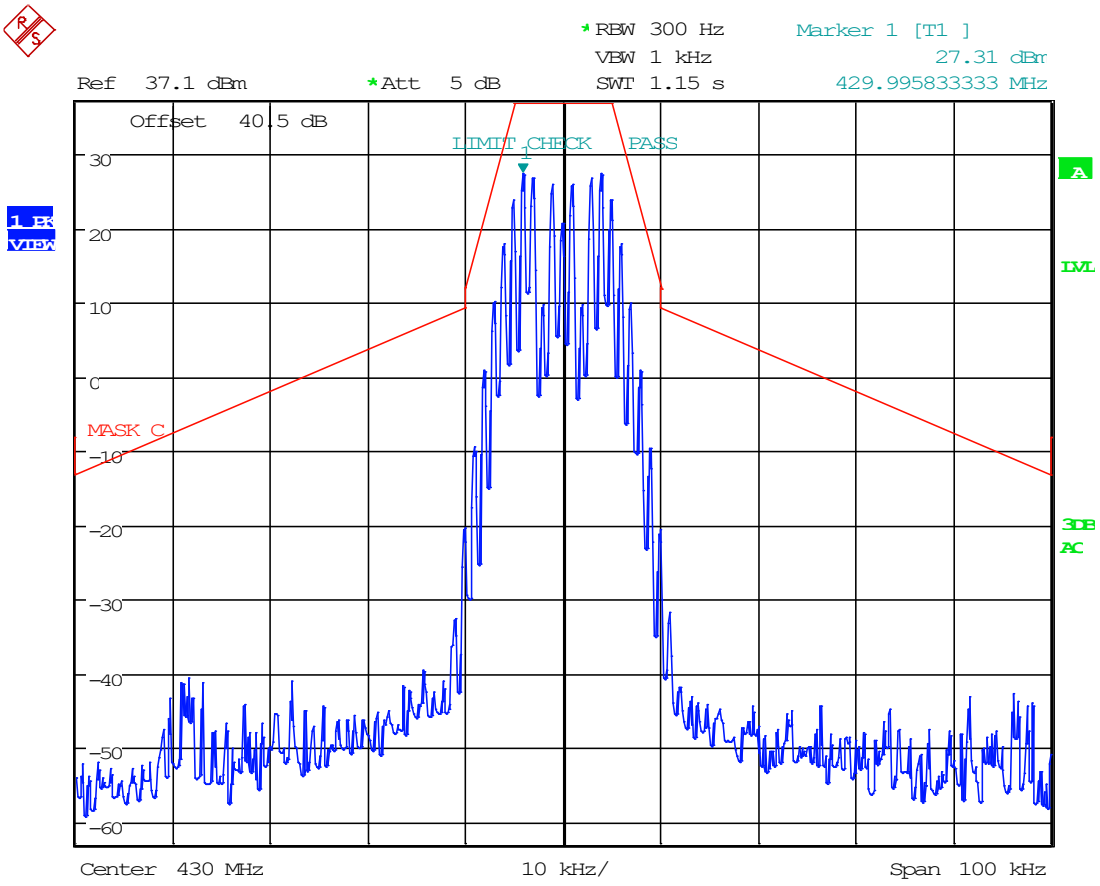
Date: 21.MAR.2023 14:22:47

8.5.23 25 kHz FM, DL Mask C, AGC, 430 MHz



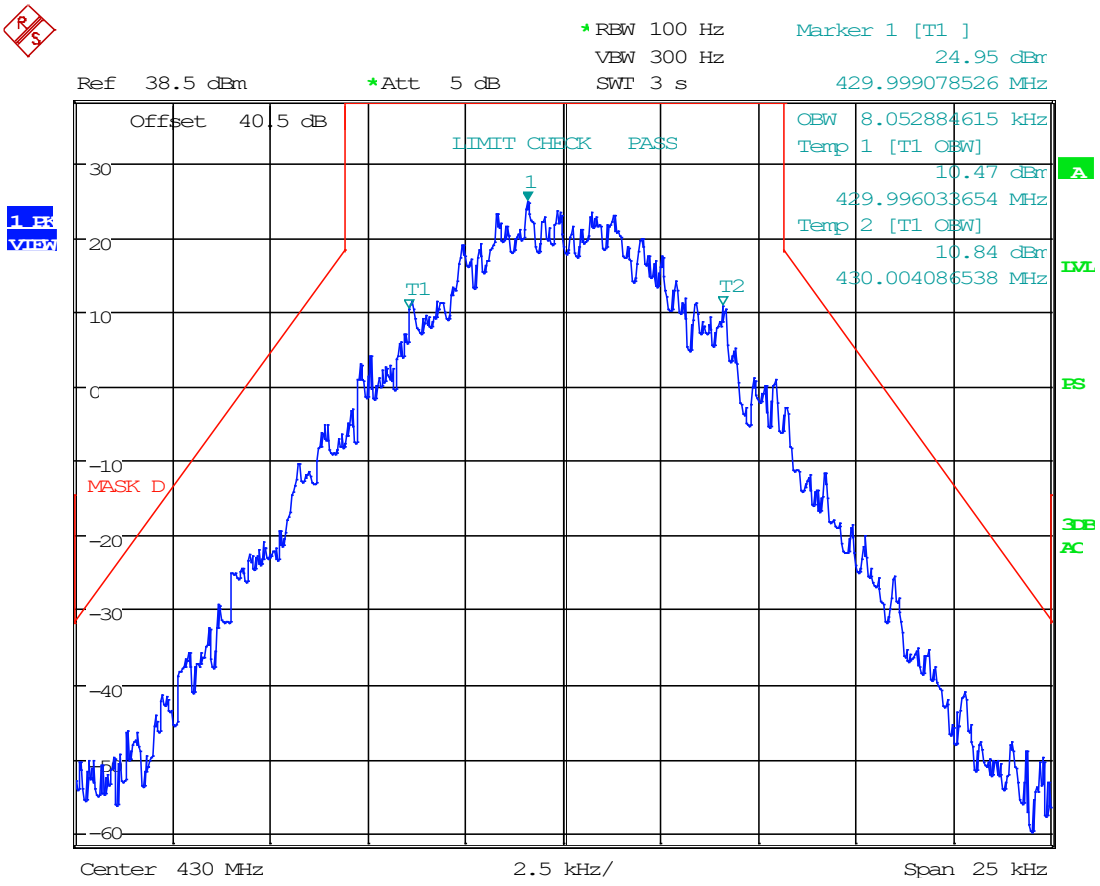
Date: 31.MAR.2023 08:44:36

8.5.24 25 kHz FM, DL Mask C, AGC+3, 430 MHz



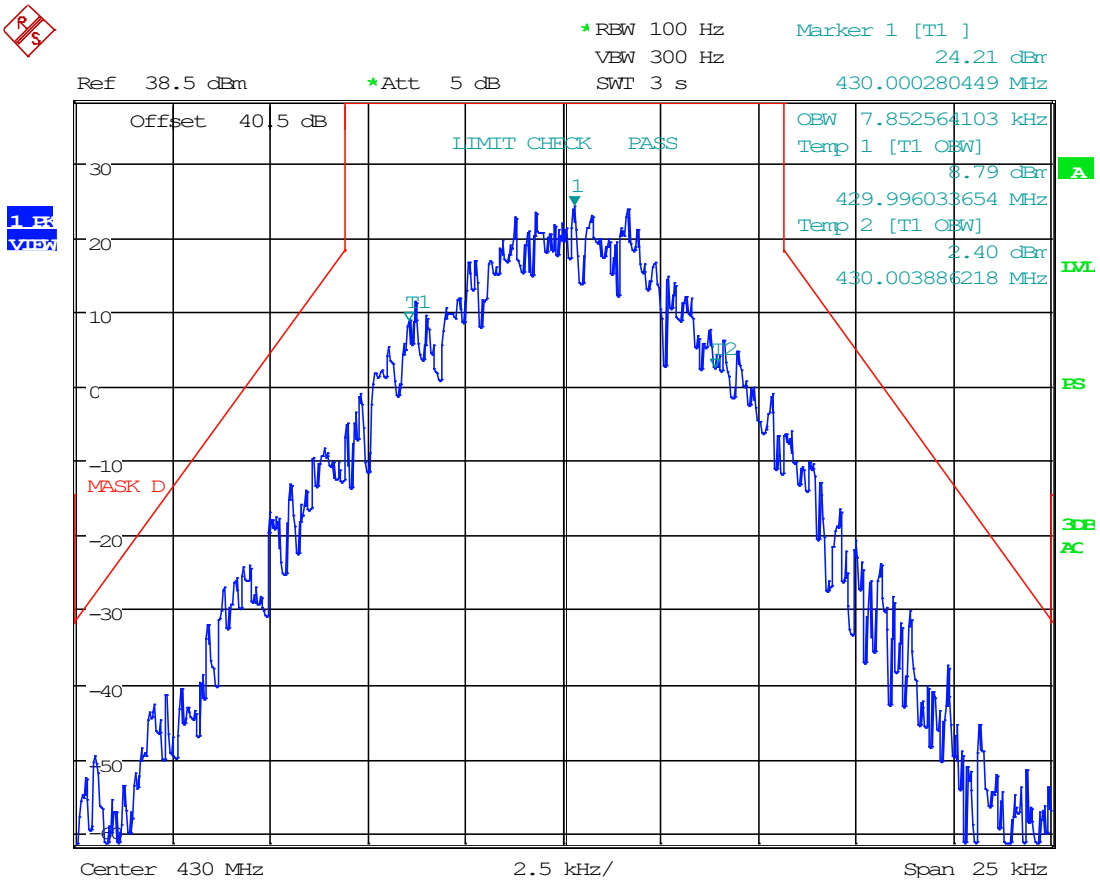
Date: 31.MAR.2023 08:46:09

8.5.25 C4FM, DL Mask D, AGC, 430 MHz



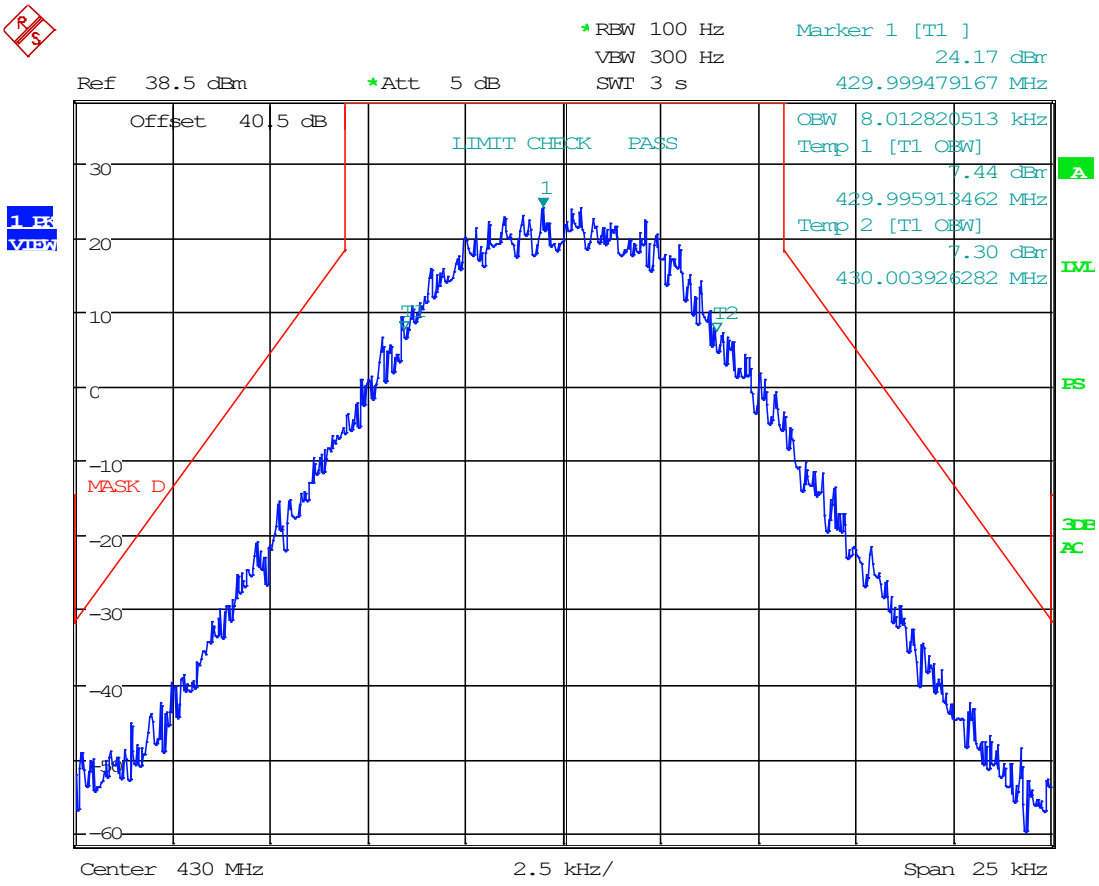
Date: 21.MAR.2023 14:21:01

8.5.26 C4FM, DL Mask D, AGC+3, 430 MHz



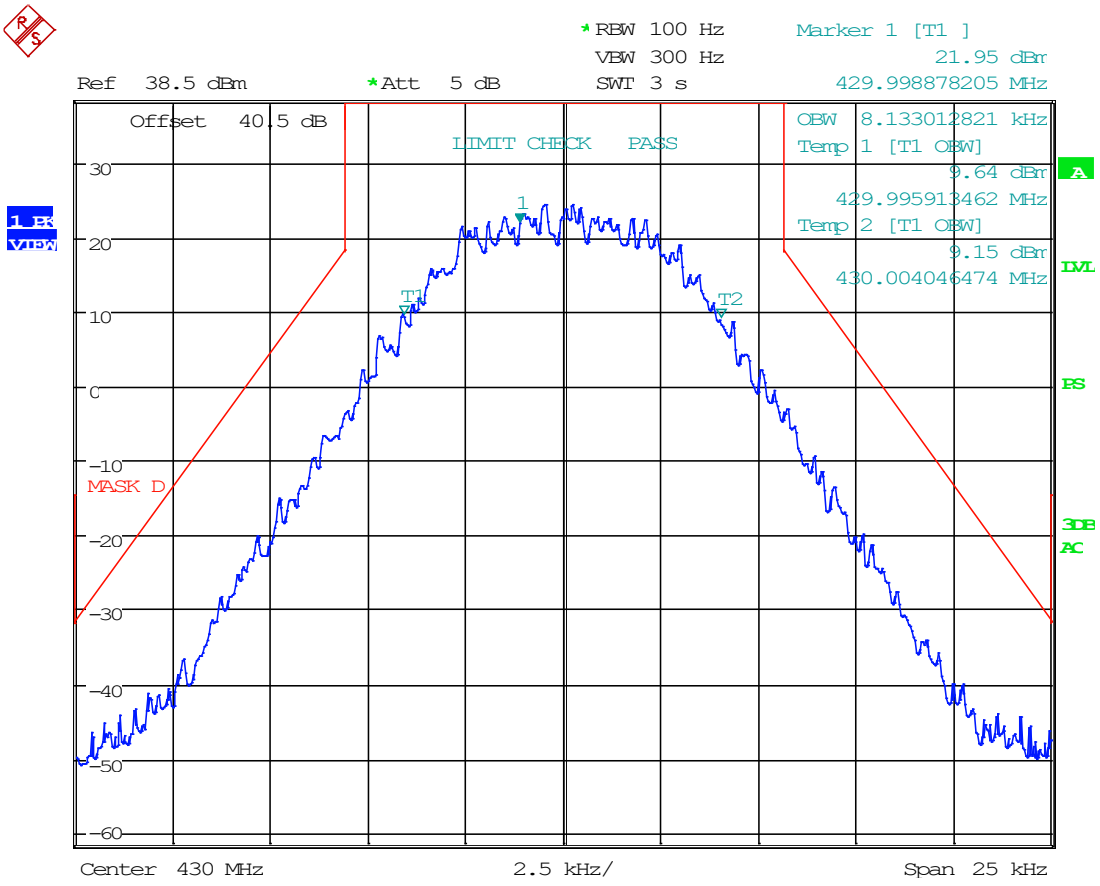
Date: 21.MAR.2023 14:21:32

8.5.27 H-CPM, DL Mask D, AGC, 430 MHz



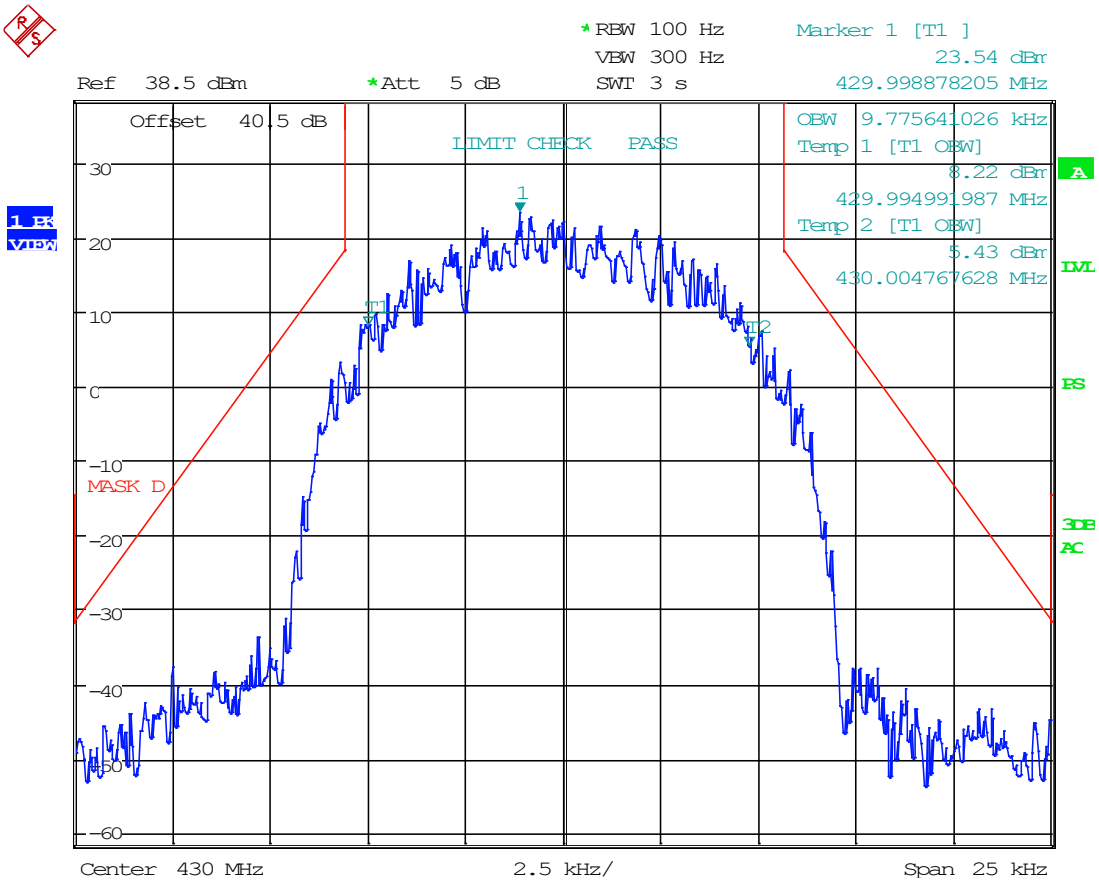
Date: 21.MAR.2023 14:19:55

8.5.28 H-CPM, DL Mask D, AGC+3, 430 MHz



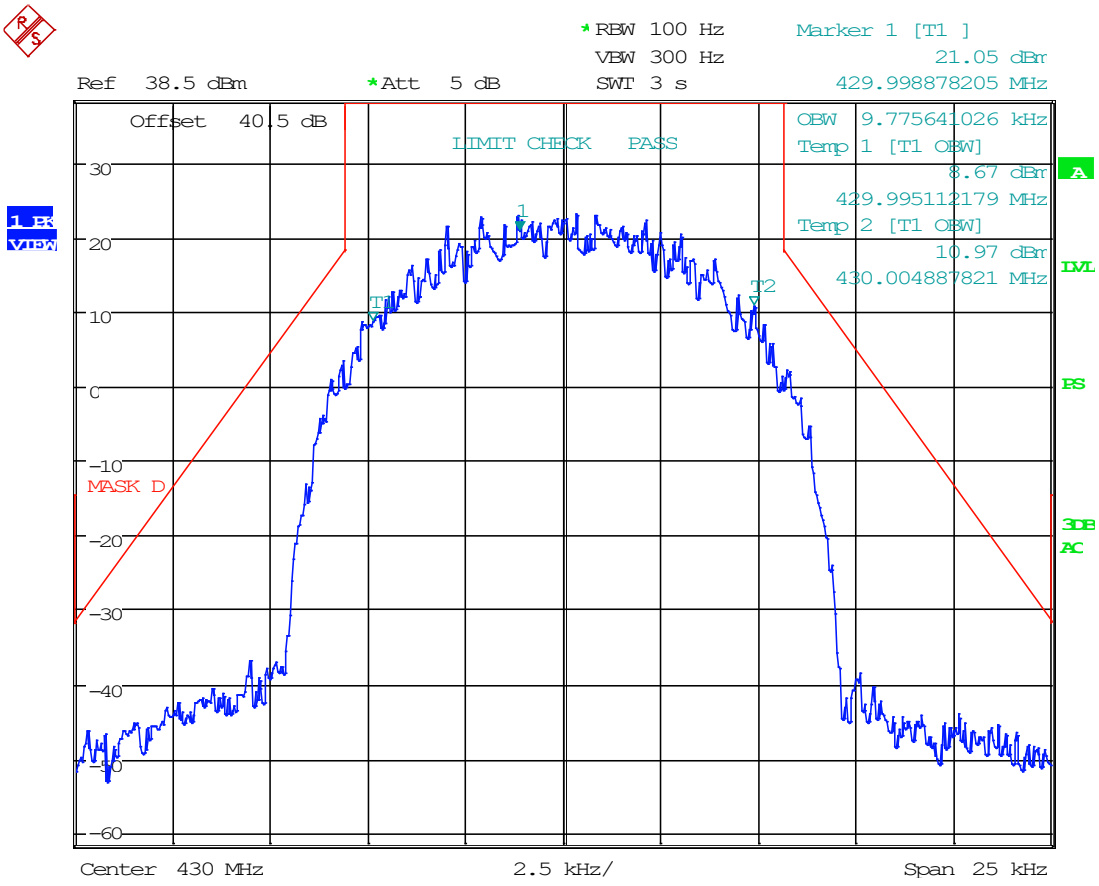
Date: 21.MAR.2023 14:18:50

8.5.29 H-DQPSK, DL Mask D, AGC, 430 MHz



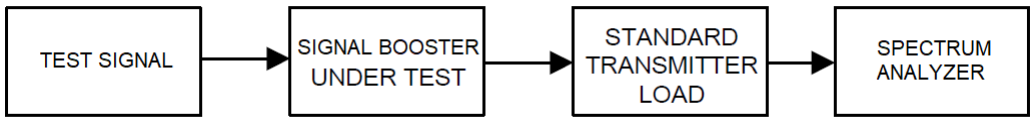
Date: 21.MAR.2023 14:12:41

8.5.30 H-DQPSK, DL Mask D, AGC+3, 430 MHz



8.6 Noise Figure

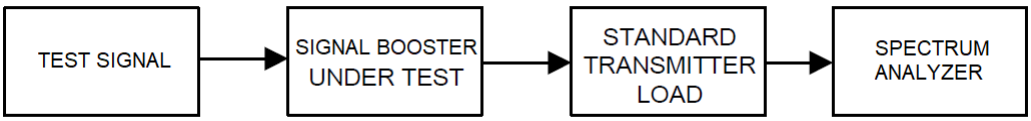
Limits from FCC KDB 935210 D05 v01r04 Industrial Signal Boosters. Test method from "Noise Figure Measurement Accuracy: The Y-Factor Method" by Keysight Technologies.

Test Setup


Test Results, Out-of-band Rejection and Class of Operation			
Operating Band (MHz)	Link Direction	Noise Figure (dB)	Limit (dB)
425 MHz	Downlink	6.49	< 9 dB
430 MHz	Downlink	4.01	< 9 dB

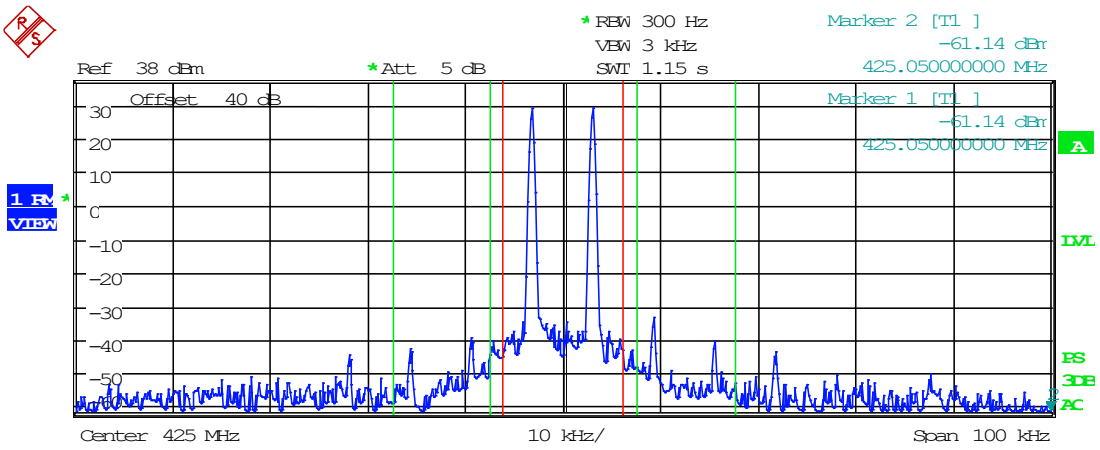
8.7 Out-of-Band/Out-of-Block Emissions (Intermodulation Products)

Limits from FCC Parts 2.1051, FCC Pt. 90.219(d)(6)(i), FCC Pt. 90.219(e)(3) and test procedure from ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Test Setup


Intermodulation Products Spectrum Plots

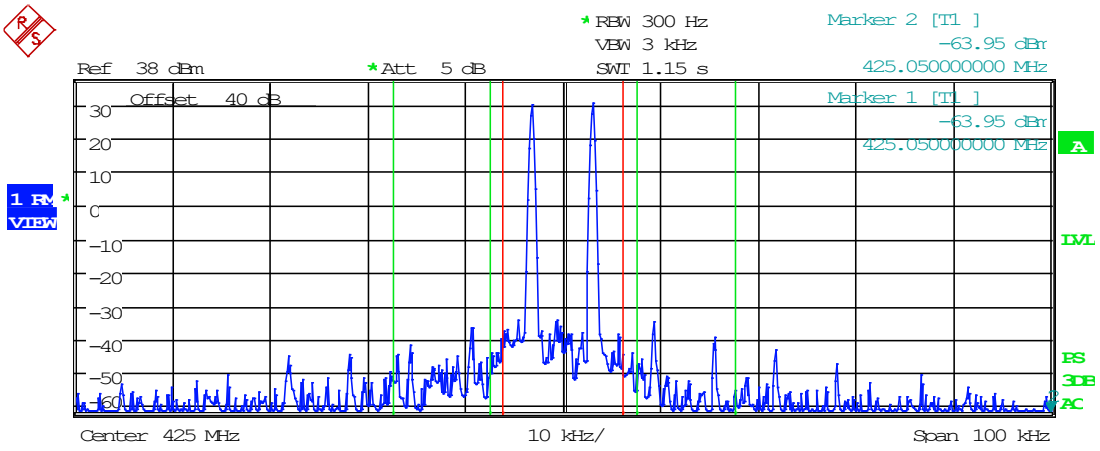
8.7.1 6.25 kHz Signal, Downlink, AGC, 425 MHz



Tx Channel			
Bandwidth	12.5 kHz	Power	32.80 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-34.73 dBm
Spacing	12.5 kHz	Upper	-31.27 dBm

Date: 24.MAR.2023 09:27:35

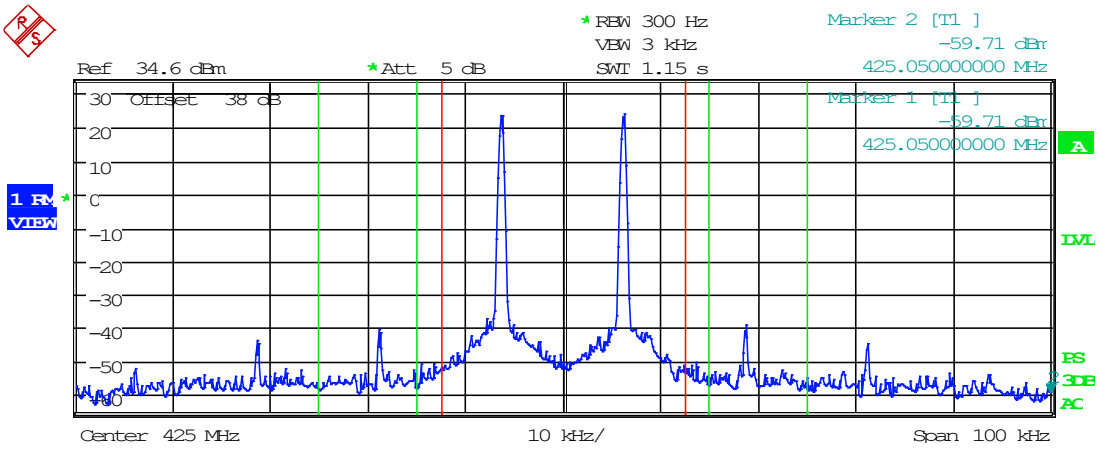
8.7.2 6.25 kHz Signal, Downlink, AGC+3dB, 425 MHz



Tx Channel			
Bandwidth	12.5 kHz	Power	33.77 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-32.71 dBm
Spacing	12.5 kHz	Upper	-33.01 dBm

Date: 24.MAR.2023 09:26:38

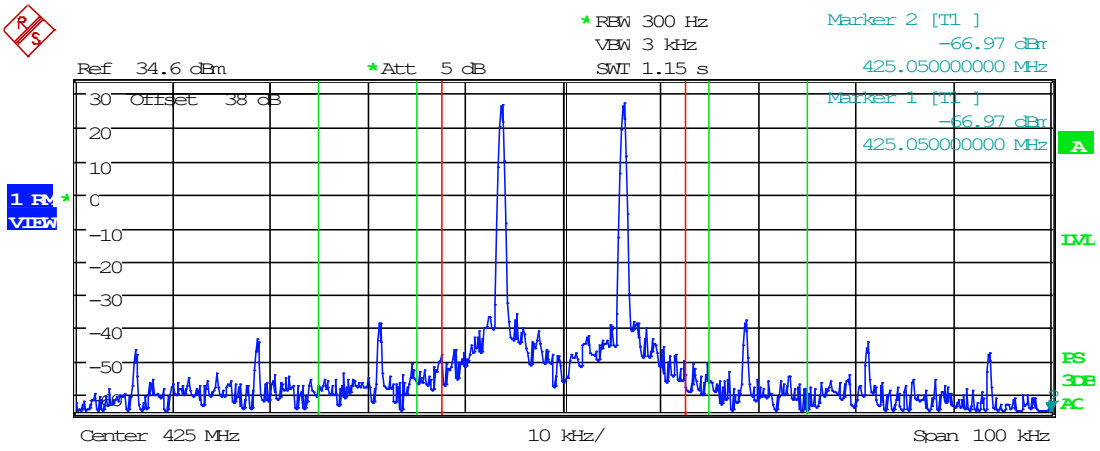
8.7.3 12.5 kHz Signal, Downlink, AGC, 425 MHz



Tx Channel			
Bandwidth	25 kHz	Power	27.76 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-37.59 dBm
Spacing	20 kHz	Upper	-36.84 dBm

Date: 24.MAR.2023 11:33:18

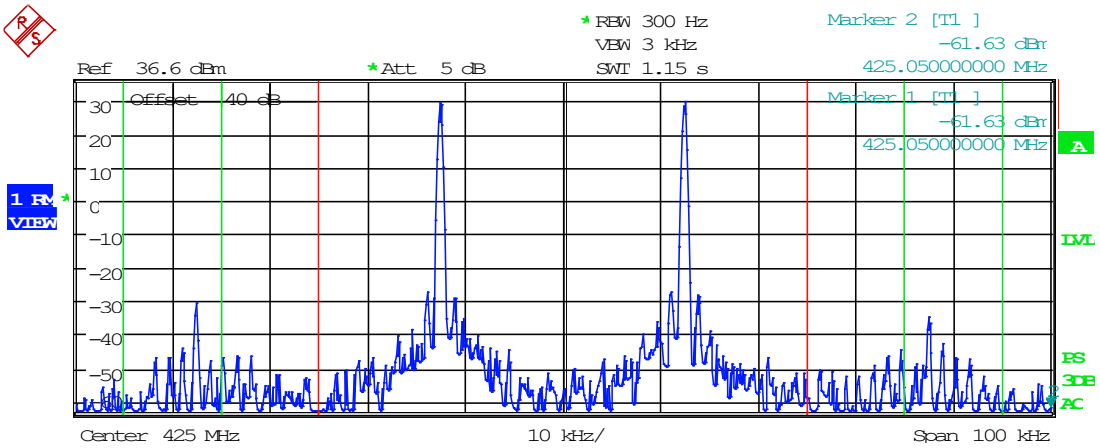
8.7.4 12.5 kHz Signal, Downlink, AGC+3dB, 425 MHz



Tx Channel			
Bandwidth	25 kHz	Power	30.77 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-36.47 dBm
Spacing	20 kHz	Upper	-36.15 dBm

Date: 24.MAR.2023 11:33:42

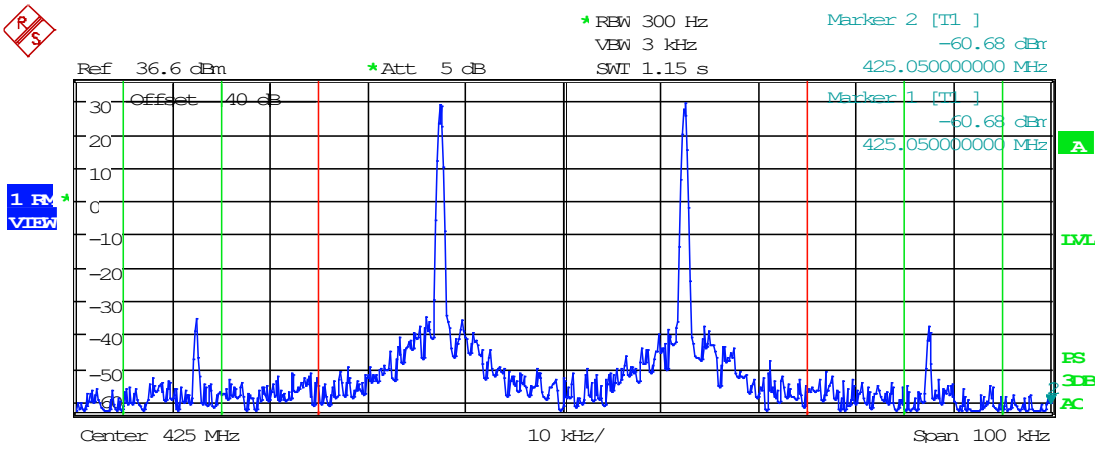
8.7.5 25 kHz Signal, Downlink, AGC, 425 MHz



Tx Channel			
Bandwidth	50 kHz	Power	33.15 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-30.26 dBm
Spacing	40 kHz	Upper	-33.20 dBm

Date: 24.MAR.2023 11:35:07

8.7.6 25 kHz Signal, Downlink, AGC+3dB, 425 MHz

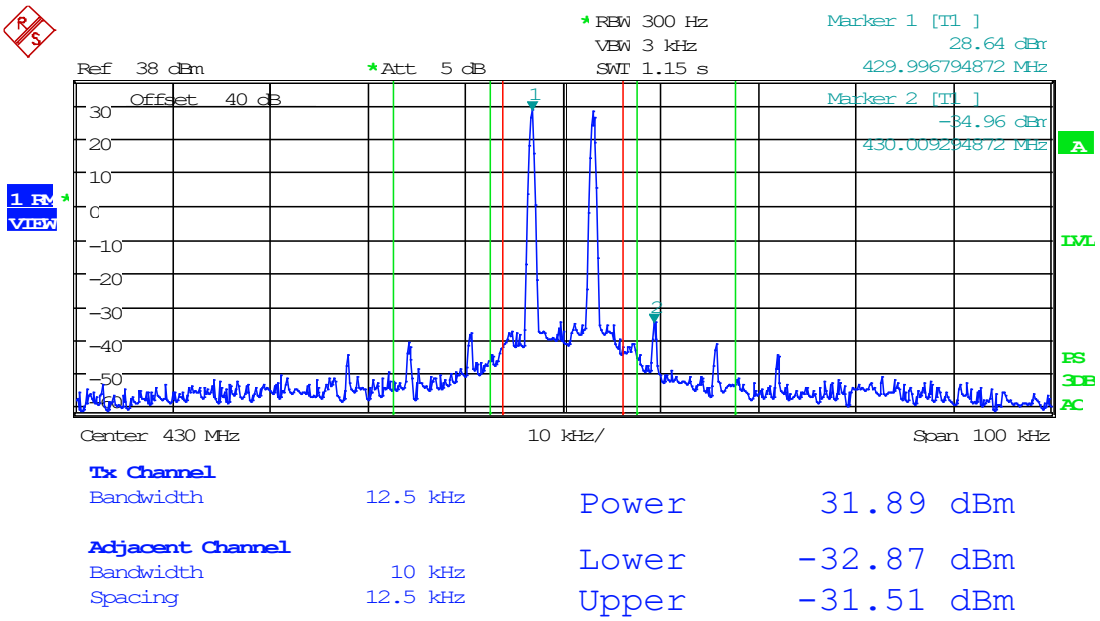


Tx Channel			
Bandwidth	50 kHz	Power	32.72 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-34.66 dBm
Spacing	40 kHz	Upper	-36.67 dBm

Date: 24.MAR.2023 11:34:36

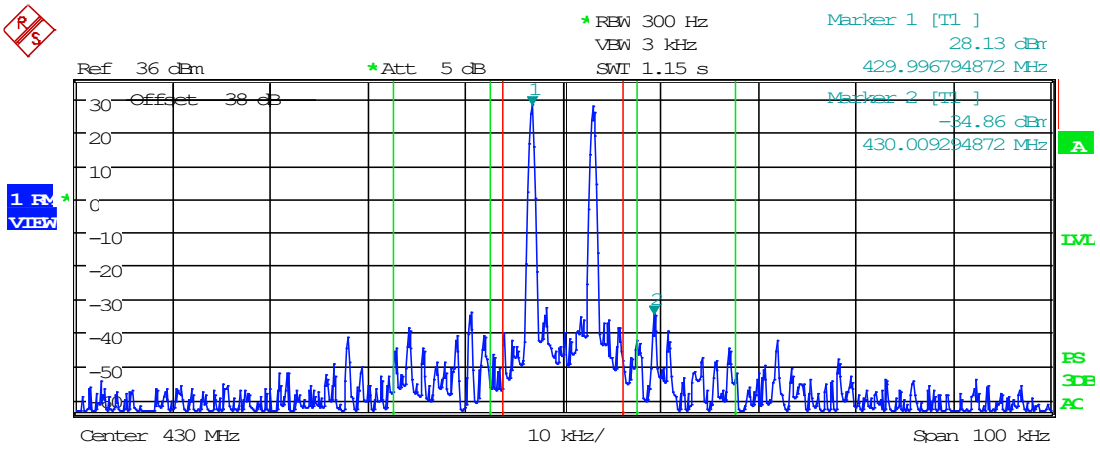
Intermodulation Products Spectrum Plots

8.7.7 6.25 kHz Signal, Downlink, AGC, 430 MHz



Date: 24.MAR.2023 09:28:37

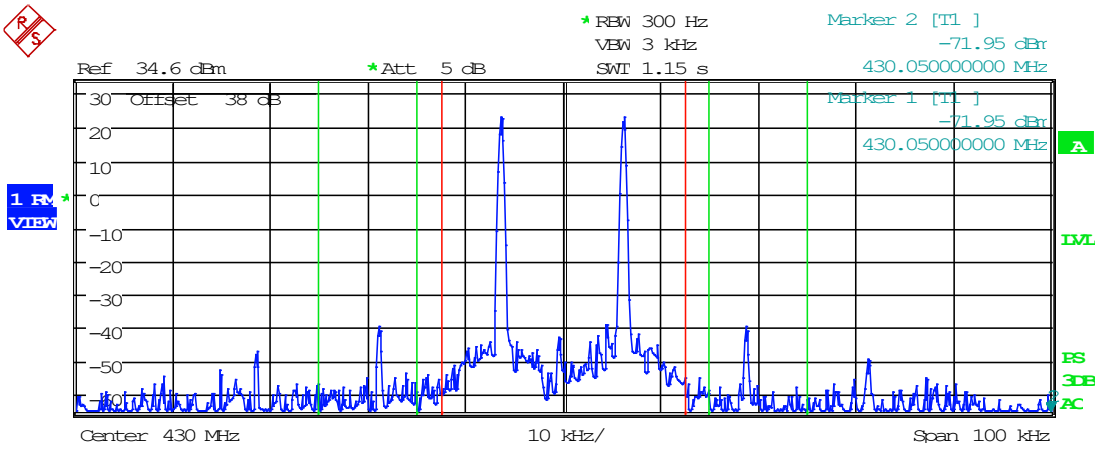
8.7.8 6.25 kHz Signal, Downlink, AGC+3dB, 430 MHz



Tx Channel			
Bandwidth	12.5 kHz	Power	31.31 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-30.35 dBm
Spacing	12.5 kHz	Upper	-31.48 dBm

Date: 24.MAR.2023 11:29:52

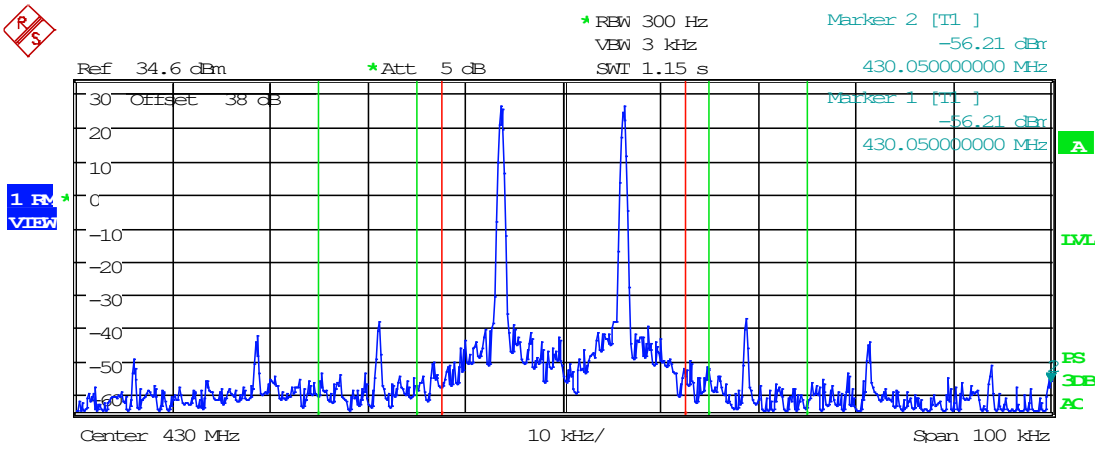
8.7.9 12.5 kHz Signal, Downlink, AGC, 430 MHz



Tx Channel			
Bandwidth	25 kHz	Power	26.81 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-38.07 dBm
Spacing	20 kHz	Upper	-38.61 dBm

Date: 24.MAR.2023 11:32:14

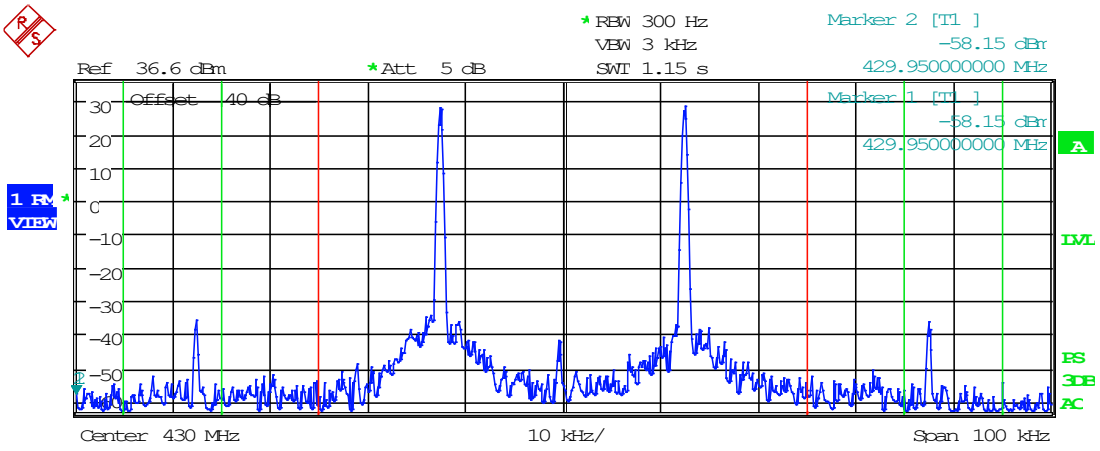
8.7.10 12.5 kHz Signal, Downlink, AGC+3dB, 430 MHz



Tx Channel			
Bandwidth	25 kHz	Power	29.78 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-37.02 dBm
Spacing	20 kHz	Upper	-36.61 dBm

Date: 24.MAR.2023 11:31:46

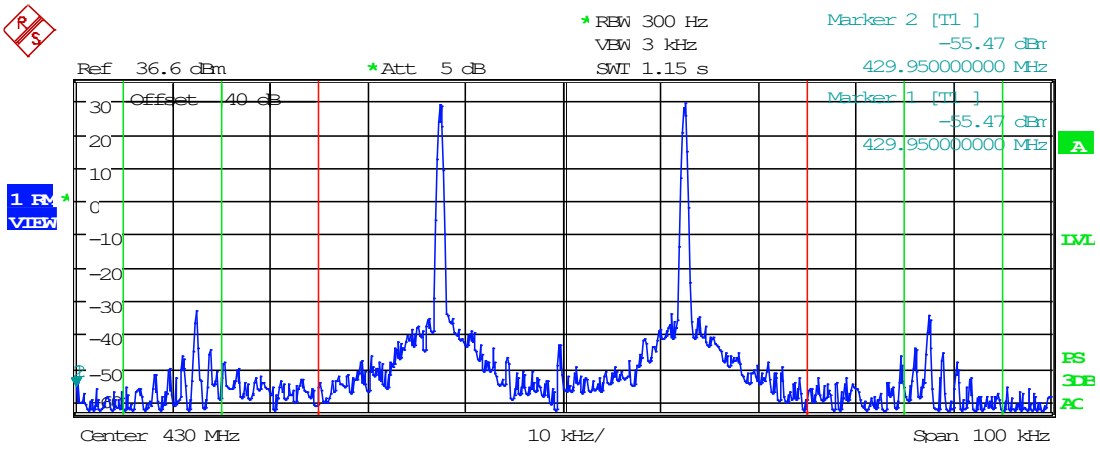
8.7.11 25 kHz Signal, Downlink, AGC, 430 MHz



Tx Channel			
Bandwidth	50 kHz	Power	31.83 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-34.75 dBm
Spacing	40 kHz	Upper	-35.53 dBm

Date: 24.MAR.2023 11:36:22

8.7.12 25 kHz Signal, Downlink, AGC+3dB, 430 MHz

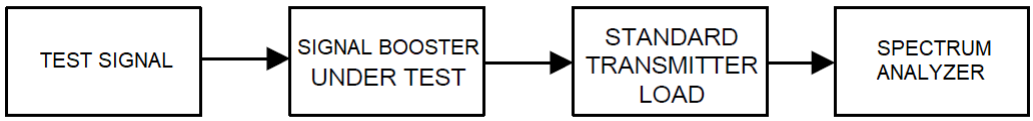


Tx Channel			
Bandwidth	50 kHz	Power	32.80 dBm
Adjacent Channel			
Bandwidth	10 kHz	Lower	-32.10 dBm
Spacing	40 kHz	Upper	-32.97 dBm

Date: 24.MAR.2023 11:35:54

8.8 Emission Mask, Out-of-Band

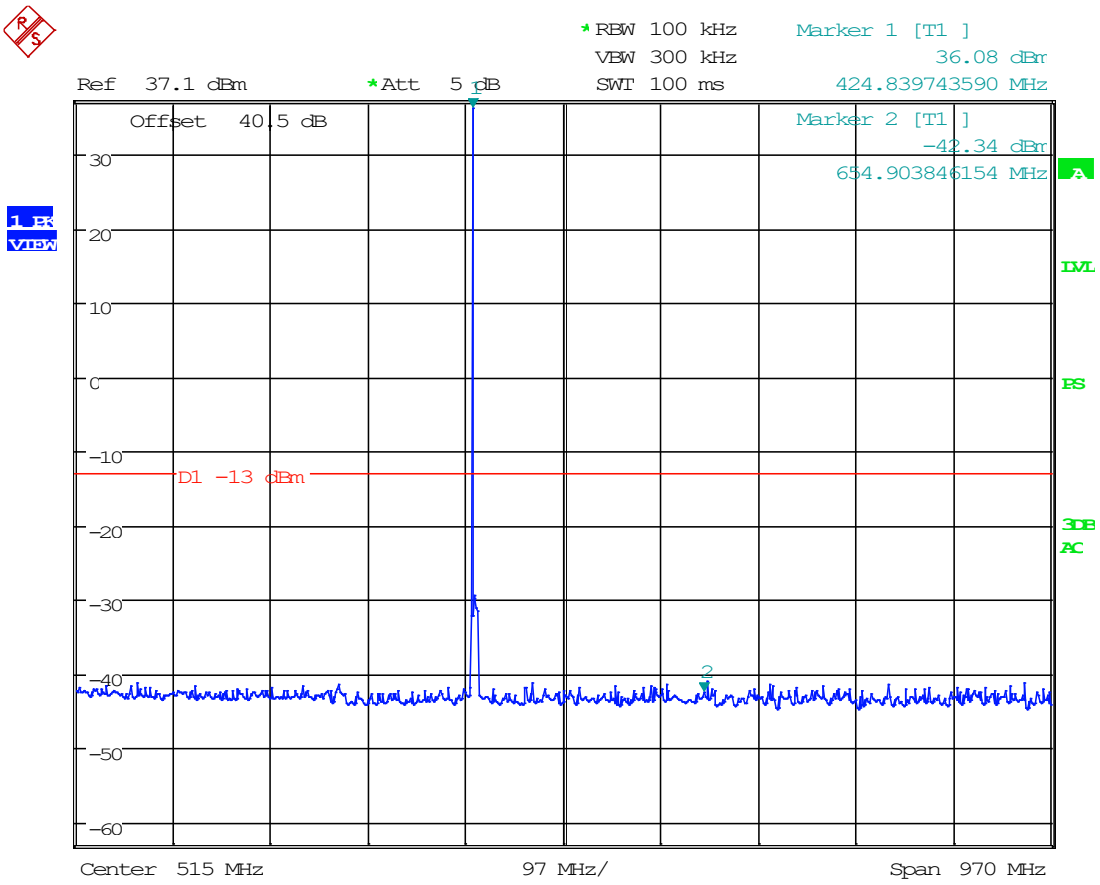
Limits from FCC Parts 2.1051, 90.210 and test procedure from ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Test Setup


Note: Testing was done simultaneously on all combinations of Uplinks and Downlinks to address co-location of signals.

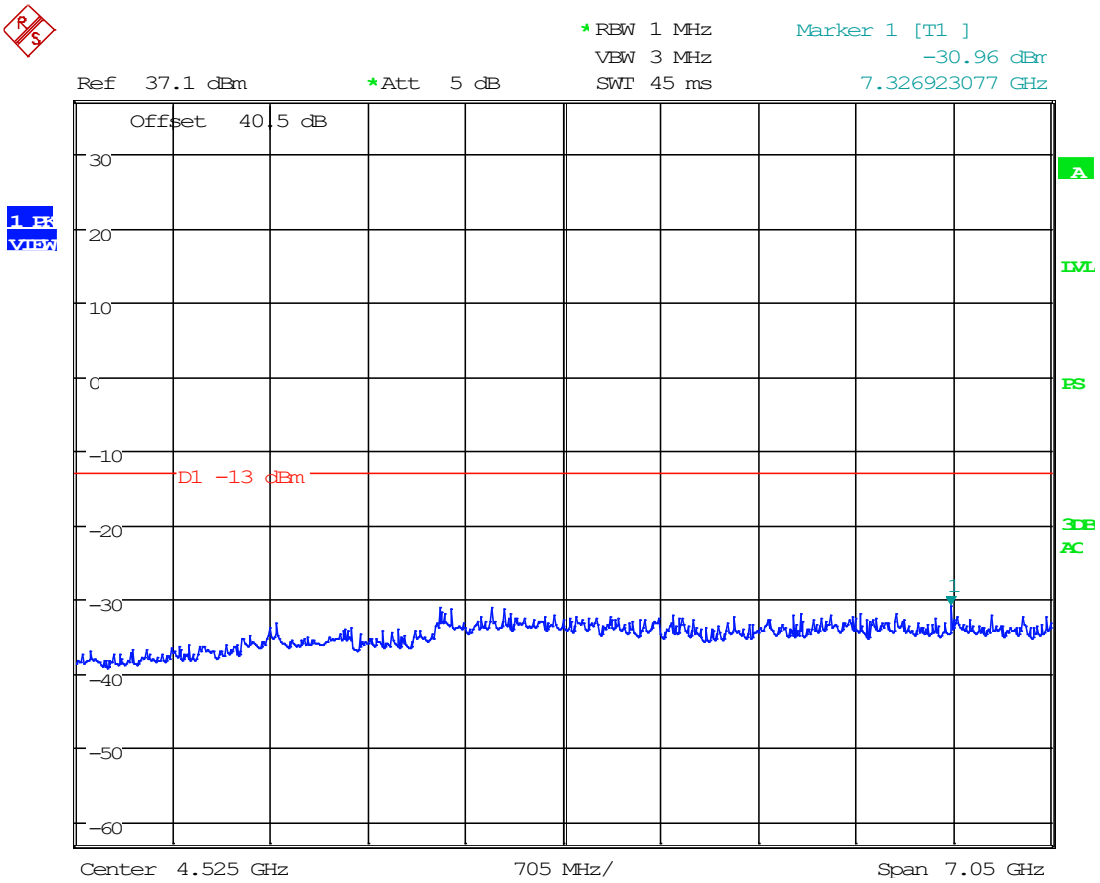
Conducted Emissions Spectrum Plots

8.8.1 30 MHz to 1 GHz, 425 MHz



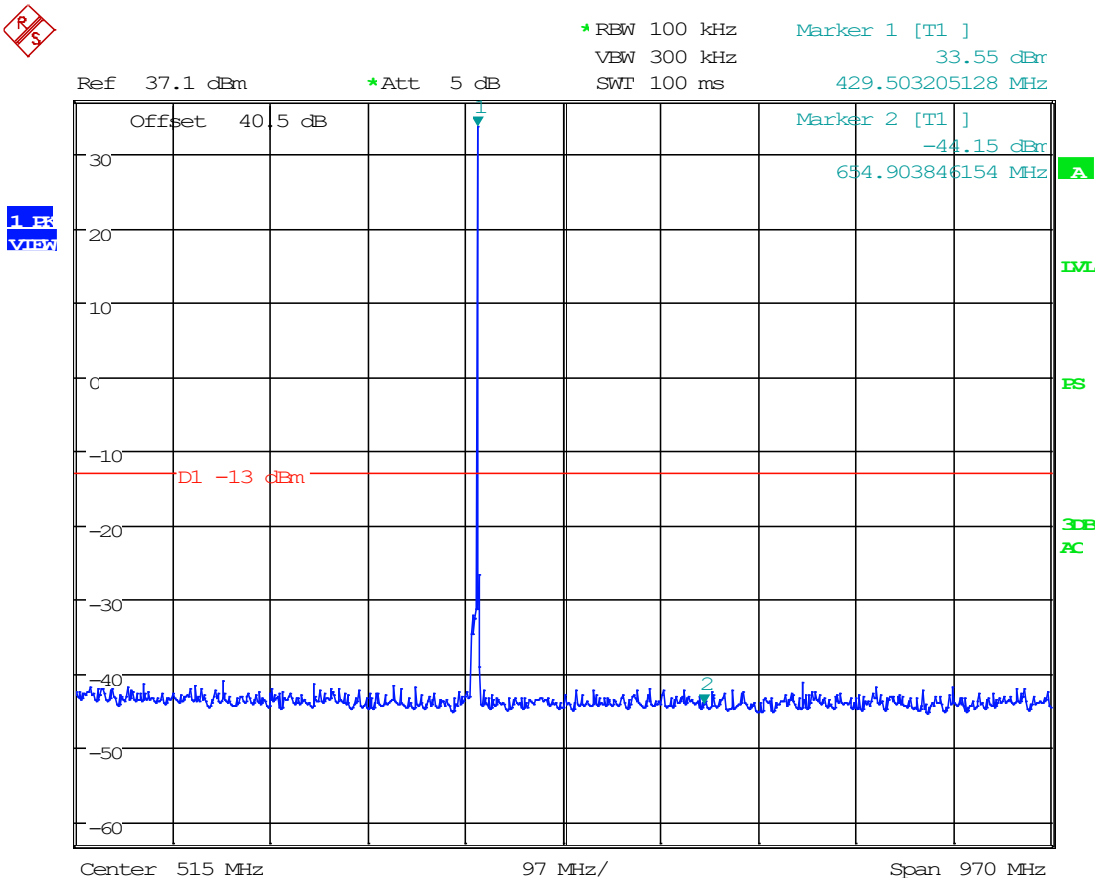
Date: 21.MAR.2023 16:53:47

8.8.2 1 GHz to 10th Harmonic, 425 MHz



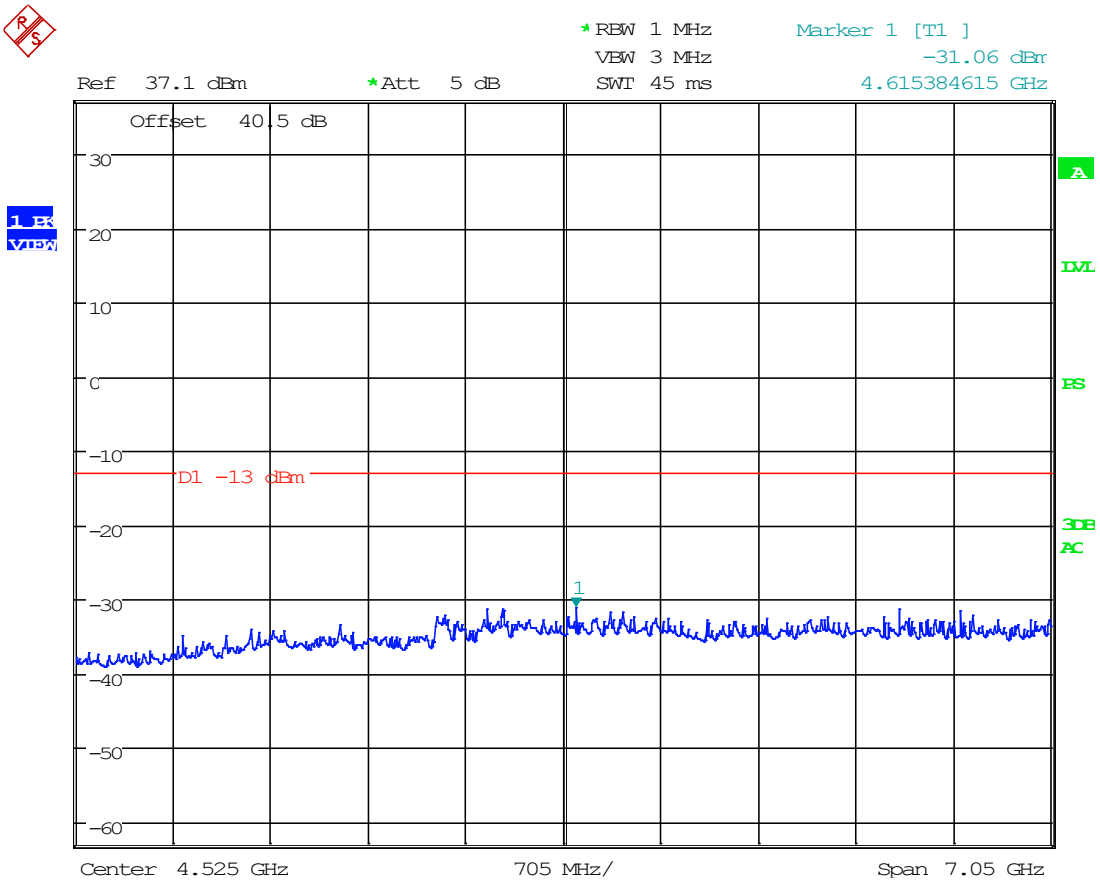
Date: 21.MAR.2023 16:55:58

8.8.3 30 MHz to 1 GHz, 430 MHz



Date: 21.MAR.2023 16:54:49

8.8.4 1 GHz to 10th Harmonic, 430 MHz

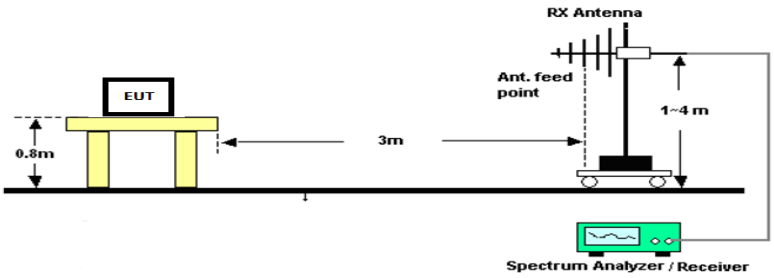


Date: 21.MAR.2023 16:55:31

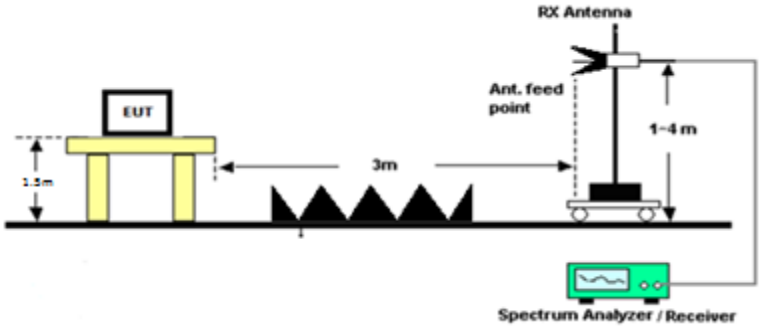
8.9 Spurious Radiated Emissions

Limits from FCC Parts 2.1053, 90.210 and test procedure from ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Radiated Test Setup, 30 – 1000 MHz



Radiated Test Setup, Above 1000 MHz



Radiated Emissions, Tabular Data

8.9.1 Downlink, 425 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)
425.00	850.00	PK	5.40	H	3.49	22.10	3.00	30.99	-66.39	-13.00	53.39
425.00	850.00	PK	0.70	V	3.49	22.10	3.00	26.29	-71.09	-13.00	58.09
425.00	1275.00	PK	10.00	H	4.12	28.55	3.00	42.67	-54.71	-13.00	41.71
425.00	1275.00	PK	10.20	V	4.12	28.55	3.00	42.87	-54.51	-13.00	41.51
425.00	1700.00	PK	10.90	H	4.78	29.07	3.00	44.75	-52.63	-13.00	39.63
425.00	1700.00	PK	10.70	V	4.78	29.07	3.00	44.55	-52.83	-13.00	39.83
425.00	2125.00	PK	11.20	H	5.36	31.14	3.00	47.70	-49.68	-13.00	36.68
425.00	2125.00	PK	11.70	V	5.36	31.14	3.00	48.20	-49.18	-13.00	36.18
425.00	2550.00	PK	13.00	H	5.69	32.61	3.00	51.30	-46.08	-13.00	33.08
425.00	2550.00	PK	12.10	V	5.69	32.61	3.00	50.40	-46.98	-13.00	33.98
425.00	2975.00	PK	13.30	H	6.31	32.43	3.00	52.04	-45.34	-13.00	32.34
425.00	2975.00	PK	13.10	V	6.31	32.43	3.00	51.84	-45.54	-13.00	32.54
425.00	3400.00	PK	12.80	H	6.79	32.65	3.00	52.24	-45.14	-13.00	32.14
425.00	3400.00	PK	13.50	V	6.79	32.65	3.00	52.94	-44.44	-13.00	31.44
425.00	3825.00	PK	16.10	H	6.44	33.17	3.00	55.71	-41.66	-13.00	28.66
425.00	3825.00	PK	15.60	V	6.44	33.17	3.00	55.21	-42.16	-13.00	29.16
425.00	4250.00	PK	13.90	H	7.19	33.34	3.00	54.43	-42.95	-13.00	29.95
425.00	4250.00	PK	14.70	V	7.19	33.34	3.00	55.23	-42.15	-13.00	29.15

8.9.2 Downlink, 430 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)
430.00	860.00	PK	1.20	H	3.49	22.20	3.00	26.89	-70.49	-13.00	57.49
430.00	860.00	PK	2.70	V	3.49	22.20	3.00	28.39	-68.99	-13.00	55.99
430.00	1290.00	PK	10.70	H	4.15	28.63	3.00	43.48	-53.90	-13.00	40.90
430.00	1290.00	PK	10.80	V	4.15	28.63	3.00	43.58	-53.80	-13.00	40.80
430.00	1720.00	PK	10.50	H	4.81	29.33	3.00	44.64	-52.74	-13.00	39.74
430.00	1720.00	PK	10.30	V	4.81	29.33	3.00	44.44	-52.94	-13.00	39.94
430.00	2150.00	PK	11.50	H	5.35	31.24	3.00	48.09	-49.28	-13.00	36.28
430.00	2150.00	PK	11.20	V	5.35	31.24	3.00	47.79	-49.58	-13.00	36.58
430.00	2580.00	PK	12.10	H	5.75	32.49	3.00	50.34	-47.04	-13.00	34.04
430.00	2580.00	PK	12.30	V	5.75	32.49	3.00	50.54	-46.84	-13.00	33.84
430.00	3010.00	PK	12.90	H	6.34	32.55	3.00	51.79	-45.59	-13.00	32.59
430.00	3010.00	PK	12.60	V	6.34	32.55	3.00	51.49	-45.89	-13.00	32.89
430.00	3440.00	PK	13.10	H	6.88	32.61	3.00	52.58	-44.79	-13.00	31.79
430.00	3440.00	PK	13.10	V	6.88	32.61	3.00	52.58	-44.79	-13.00	31.79
430.00	3870.00	PK	16.10	H	6.71	33.21	3.00	56.02	-41.36	-13.00	28.36
430.00	3870.00	PK	15.40	V	6.71	33.21	3.00	55.32	-42.06	-13.00	29.06
430.00	4300.00	PK	14.30	H	7.48	33.46	3.00	55.24	-42.14	-13.00	29.14
430.00	4300.00	PK	14.20	V	7.48	33.46	3.00	55.14	-42.24	-13.00	29.24

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_6949-23_FCC 90_Booster Class B_	1	Initial release	3/31/2021

END OF TEST REPORT