



An IIA Company

Test Report – UL-FCC Part 90 Booster Class A (B9A)

Applicant: Fiplex Communications Inc.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 3/7/2023

This test report shall not be reproduced except in full without the written and signed permission of Timco Engineering Inc. (IIA). This test report relates only to the items tested as identified and is not valid for any subsequent changes or modifications made to the equipment under test.



Table of Contents

1.	CUSTOMER INFORMATION.....	6
1.1	TEST RESULT SUMMARY	6
2.	LOCATION OF TESTING	9
2.1	TEST LABORATORY.....	9
2.2	TESTING WAS PERFORMED, REVIEWED BY	9
3.	TEST SAMPLE(S) (EUT/DUT)	10
3.1	DEFINITIONS	10
3.2	DESCRIPTION OF THE EUT	11
3.3	CONFIGURATION OF EUT	12
3.4	TEST SETUP OF EUT	12
4.	TEST METHODS & APPLICABLE REGULATORY LIMITS.....	13
4.1	TEST METHODS/STANDARDS/GUIDANCE:.....	13
4.2	APPLIED LIMITS AND REGULATORY LIMITS:.....	13
5.	MEASUREMENT UNCERTAINTY.....	13
6.	ENVIRONMENTAL CONDITIONS	13
6.1	TEMPERATURE & HUMIDITY	13
7.	LIST OF TEST EQUIPMENT AND TEST FACILITY.....	14
7.1	LIST OF TEST EQUIPMENT	14
8.	TEST RESULTS	15
8.1	POWER AT THE FINAL AMPLIFIER.....	16
8.2	RF OUTPUT POWER & GAIN.....	17
8.3	OUT-OF-BAND REJECTION.....	19
8.3.1	700 Band, Uplink.....	20
8.3.2	800 Band Uplink.....	21
8.4	BANDWIDTH & EMISSION	22
8.5	INPUT VS OUTPUT SIGNAL COMPARISON	23
8.5.1	6.25 kHz FM, Input Signal	26
8.5.2	12.5 kHz FM, Input Signal.....	27
8.5.3	25 kHz FM, Input Signal.....	28
8.5.4	C4FM, Input Signal.....	29
8.5.5	H-CPM, Input Signal	30
8.5.6	H-DQPSK, Input Signal.....	31
8.5.7	6.25 kHz, FM, UL Mask C, AGC, 788.0125 MHz	32
8.5.8	6.25 kHz, FM, UL Mask C, AGC +3, 788.0125 MHz	33
8.5.9	12.5 kHz, FM, UL Mask C, AGC, 788.0125 MHz.....	34
8.5.10	12.5 kHz, FM, UL Mask C, AGC+3, 788.0125 MHz.....	35
8.5.11	25 kHz FM, UL Mask C, AGC, 788.0125 MHz.....	36
8.5.12	25 kHz FM, UL Mask C, AGC+3, 788.0125 MHz.....	37



8.5.13	C4FM, UL Mask C, AGC, 788.0125 MHz.....	38
8.5.14	C4FM, UL Mask C, AGC+3, 788.0125 MHz.....	39
8.5.15	H-CPM, UL Mask C, AGC, 788.0125 MHz.....	40
8.5.16	H-CPM, UL Mask C, AGC+3, 788.0125 MHz.....	41
8.5.17	H-DQPSK, UL Mask C, AGC, 788.0125 MHz.....	42
8.5.18	H-DQPSK, UL Mask C, AGC+3, 788.0125 MHz.....	43
8.5.19	6.25 kHz, FM, UL Mask C, AGC, 796 MHz.....	44
8.5.20	6.25 kHz, FM, UL Mask C, AGC+3, 796 MHz.....	45
8.5.21	12.5 kHz, FM, UL Mask C, AGC, 796 MHz.....	46
8.5.22	12.5 kHz, FM, UL Mask C, AGC+3, 796 MHz.....	47
8.5.23	25 kHz FM, UL Mask C, AGC, 796 MHz.....	48
8.5.24	25 kHz FM, UL Mask C, AGC+3, 796 MHz.....	49
8.5.25	C4FM, UL Mask C, AGC, 796 MHz.....	50
8.5.26	C4FM, UL Mask C, AGC+3, 796 MHz.....	51
8.5.27	H-CPM, UL Mask C, AGC, 796 MHz.....	52
8.5.28	H-CPM, UL Mask C, AGC+3, 796 MHz.....	53
8.5.29	H-DQPSK, UL Mask C, AGC, 796 MHz.....	54
8.5.30	H-DQPSK, UL Mask C, AGC+3, 796 MHz.....	55
8.5.31	6.25 kHz, FM, UL Mask C, AGC, 804.9875 MHz.....	56
8.5.32	6.25 kHz, FM, UL Mask C, AGC+3, 804.9875 MHz.....	57
8.5.33	12.5 kHz, FM, UL Mask C, AGC, 804.9875 MHz.....	58
8.5.34	12.5 kHz, FM, UL Mask C, AGC+3, 804.9875 MHz.....	59
8.5.35	25 kHz FM, UL Mask C, AGC, 804.9875 MHz.....	60
8.5.36	25 kHz FM, UL Mask C, AGC+3, 804.9875 MHz.....	61
8.5.37	C4FM, UL Mask C, AGC, 804.9875 MHz.....	62
8.5.38	C4FM, UL Mask C, AGC+3, 804.9875 MHz.....	63
8.5.39	H-CPM, UL Mask C, AGC, 804.9875 MHz.....	64
8.5.40	H-CPM, UL Mask C, AGC+3, 804.9875 MHz.....	65
8.5.41	H-DQPSK, UL Mask C, AGC, 804.9875 MHz.....	66
8.5.42	H-DQPSK, UL Mask C, AGC+3, 804.9875 MHz.....	67
8.5.43	6.25 kHz, FM, UL Mask H, AGC, 806.0125 MHz.....	68
8.5.44	6.25 kHz, FM, UL Mask H, AGC+3, 806.0125 MHz.....	69
8.5.45	12.5 kHz, FM, UL Mask H, AGC, 806.0125 MHz.....	70
8.5.46	12.5 kHz, FM, UL Mask H, AGC+3, 806.0125 MHz.....	71
8.5.47	25 kHz FM, UL Mask H, AGC, 806.0125 MHz.....	72
8.5.48	25 kHz FM, UL Mask H, AGC+3, 806.0125 MHz.....	73
8.5.49	C4FM, UL Mask H, AGC, 806.0125 MHz.....	74
8.5.50	C4FM, UL Mask H, AGC+3, 806.0125 MHz.....	75
8.5.51	H-CPM, UL Mask H, AGC, 806.0125 MHz.....	76
8.5.52	H-CPM, UL Mask H, AGC+3, 806.0125 MHz.....	77
8.5.53	H-DQPSK, UL Mask H, AGC, 806.0125 MHz.....	78
8.5.54	H-DQPSK, UL Mask H, AGC+3, 806.0125 MHz.....	79
8.5.55	6.25 kHz, FM, UL Mask E, AGC, 812 MHz.....	80
8.5.56	6.25 kHz, FM, UL Mask E, AGC+3, 812 MHz.....	81
8.5.57	12.5 kHz, FM, UL Mask D, AGC, 812 MHz.....	82
8.5.58	12.5 kHz, FM, UL Mask D, AGC+3, 812 MHz.....	83



8.5.59	25 kHz FM, UL Mask G, AGC, 812 MHz.....	84
8.5.60	25 kHz FM, UL Mask G, AGC+3, 812 MHz.....	85
8.5.61	C4FM, UL Mask D, AGC, 812 MHz.....	86
8.5.62	C4FM, UL Mask D, AGC+3, 812 MHz.....	87
8.5.63	H-CPM, UL Mask D, AGC, 812 MHz.....	88
8.5.64	H-CPM, UL Mask D, AGC+3, 812 MHz.....	89
8.5.65	H-DQPSK, UL Mask D, AGC, 812 MHz.....	90
8.5.66	H-DQPSK, UL Mask D, AGC+3, 812 MHz.....	91
8.5.67	6.25 kHz, FM, UL Mask E, AGC, 823.9875 MHz.....	92
8.5.68	6.25 kHz, FM, UL Mask E, AGC+3, 823.9875 MHz.....	93
8.5.69	12.5 kHz, FM, UL Mask D, AGC, 823.9875 MHz.....	94
8.5.70	12.5 kHz, FM, UL Mask D, AGC+3, 823.9875 MHz.....	95
8.5.71	25 kHz FM, UL Mask G, AGC, 823.9875 MHz.....	96
8.5.72	25 kHz FM, UL Mask G, AGC+3, 823.9875 MHz.....	97
8.5.73	C4FM, UL Mask D, AGC, 823.9875 MHz.....	98
8.5.74	C4FM, UL Mask D, AGC+3, 823.9875 MHz.....	99
8.5.75	H-CPM, UL Mask D, AGC, 823.9875 MHz.....	100
8.5.76	H-CPM, UL Mask D, AGC+3, 823.9875 MHz.....	101
8.5.77	H-DQPSK, UL Mask D, AGC, 823.9875 MHz.....	102
8.5.78	H-DQPSK, UL Mask D, AGC+3, 823.9875 MHz.....	103
8.6	NOISE FIGURE.....	104
8.7	OUT-OF-BAND/OUT-OF-BLOCK EMISSIONS (INTERMODULATION PRODUCTS).....	105
8.7.1	6.25 kHz Signal, Uplink, AGC, 788.0125 MHz.....	106
8.7.2	6.25 kHz Signal, Uplink, AGC+3dB, 788.0125 MHz.....	107
8.7.3	12.5 kHz Signal, Uplink, AGC, 788.0125 MHz.....	108
8.7.4	12.5 kHz Signal, Uplink, AGC+3dB, 788.0125 MHz.....	109
8.7.5	25 kHz Signal, Uplink, AGC, 788.0125 MHz.....	110
8.7.6	25 kHz Signal, Uplink, AGC+3dB, 788.0125 MHz.....	111
8.7.7	6.25 kHz Signal, Uplink, AGC, 796 MHz.....	112
8.7.8	6.25 kHz Signal, Uplink, AGC+3dB, 796 MHz.....	113
8.7.9	12.5 kHz Signal, Uplink, AGC, 796 MHz.....	114
8.7.10	12.5 kHz Signal, Uplink, AGC+3dB, 796 MHz.....	115
8.7.11	25 kHz Signal, Uplink, AGC, 796 MHz.....	116
8.7.12	25 kHz Signal, Uplink, AGC+3dB, 796 MHz.....	117
8.7.13	6.25 kHz Signal, Uplink, AGC, 804.9875 MHz.....	118
8.7.14	6.25 kHz Signal, Uplink, AGC+3dB, 804.9875 MHz.....	119
8.7.15	12.5 kHz Signal, Uplink, AGC, 804.9875 MHz.....	120
8.7.16	12.5 kHz Signal, Uplink, AGC+3dB, 804.9875 MHz.....	121
8.7.17	25 kHz Signal, Uplink, AGC, 804.9875 MHz.....	122
8.7.18	25 kHz Signal, Uplink, AGC+3dB, 804.9875 MHz.....	123
8.7.19	6.25 kHz Signal, Uplink, AGC, 806.0125 MHz.....	124
8.7.20	6.25 kHz Signal, Uplink, AGC+3dB, 806.0125 MHz.....	125
8.7.21	12.5 kHz Signal, Uplink, AGC, 806.0125 MHz.....	126
8.7.22	12.5 kHz Signal, Uplink, AGC+3dB, 806.0125 MHz.....	127
8.7.23	25 kHz Signal, Uplink, AGC, 806.0125 MHz.....	128
8.7.24	25 kHz Signal, Uplink, AGC+3dB, 806.0125 MHz.....	129



8.7.25	6.25 kHz Signal, Uplink, AGC, 812 MHz	130
8.7.26	6.25 kHz Signal, Uplink, AGC+3dB, 812 MHz	131
8.7.27	12.5 kHz Signal, Uplink, AGC, 812 MHz	132
8.7.28	12.5 kHz Signal, Uplink, AGC+3dB, 812 MHz	133
8.7.29	25 kHz Signal, Uplink, AGC, 812 MHz	134
8.7.30	25 kHz Signal, Uplink, AGC+3dB, 812 MHz	135
8.7.31	6.25 kHz Signal, Uplink, AGC, 823.9875 MHz	136
8.7.32	6.25 kHz Signal, Uplink, AGC+3dB, 823.9875 MHz	137
8.7.33	12.5 kHz Signal, Uplink, AGC, 823.9875 MHz	138
8.7.34	12.5 kHz Signal, Uplink, AGC+3dB, 823.9875 MHz	139
8.7.35	25 kHz Signal, Uplink, AGC, 823.9875 MHz	140
8.7.36	25 kHz Signal, Uplink, AGC+3dB, 823.9875 MHz	141
8.8	EMISSION MASK, OUT-OF-BAND	142
8.8.1	30 MHz to 1 GHz, 788.0125 MHz	143
8.8.2	1 GHz to 10 th Harmonic, 788.0125 MHz	144
8.8.3	30 MHz to 1 GHz, 796 MHz	145
8.8.4	1 GHz to 10 th Harmonic, 796 MHz	146
8.8.5	30 MHz to 1 GHz, 804.9875 MHz	147
8.8.6	1 GHz to 10 th Harmonic, 804.9875 MHz	148
8.8.7	30 MHz to 1 GHz, 806.0125 MHz	149
8.8.8	1 GHz to 10 th Harmonic, 806.0125 MHz	150
8.8.9	30 MHz to 1 GHz, 812 MHz	151
8.8.10	1 GHz to 10 th Harmonic, 812 MHz	152
8.8.11	30 MHz to 1 GHz, 823.9875 MHz	153
8.8.12	1 GHz to 10 th Harmonic, 823.9875 MHz	154
8.9	SPURIOUS RADIATED EMISSIONS	155
8.9.1	Uplink, 788.0125 MHz	156
8.9.2	Uplink, 796 MHz	157
8.9.3	Uplink, 804.9875 MHz	158
8.9.4	Uplink, 806.0125 MHz	159
8.9.5	Uplink, 812 MHz	160
8.9.6	Uplink, 823.9875 MHz	161
8.10	MODULATION CHARACTERISTICS	162
8.11	FREQUENCY STABILITY	163
8.12	TRANSIENT FREQUENCY BEHAVIOR	164
8.13	ADJACENT CHANNEL POWER LIMITS	165
9.	ANNEX-A - PHOTOGRAPHS OF THE EUT	166
10.	ANNEX-B – TEST SETUP PHOTOGRAPHS	166
11.	HISTORY OF TEST REPORT CHANGES	166



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

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



KDB 484596 D01 v01		
FCC KDB 935210 D05 Clauses	Description of the requirements	Result: (Pass, Fail, N/A)
3 a	Introduction	Reported
3 b	Explain the Differences	Reported
3 c	Spot-check Verification Data	Pass
3 d	Reference Section	Reported

Introduction

Equipment classes B9A and B9B are not allowed to be filed under the same FCC ID. However, FCC ID P3TDH7S-8A is electrically identical to FCC ID P3TDH7S-8B. The EUT uses software to limit the passband, converting the EUT from a Class B Industrial Signal Booster into a Class A Industrial Signal Booster. The test data is valid to be re-used due to the Class B operation of the EUT being worst-case in all aspects. The Class A operation represented in this filing was equal or more compliant with FCC Part 90 in all respects. Therefore all testing is to be considered identical, and has been re-used following the guidelines of KDB 484596.

Explain the Differences

FCC ID P3TDH17S-8A is electrically identical to FCC ID P3TDH7S-8B and has no difference in hardware. The EUT uses software to limit the passband from widths equal to or greater than 75 kHz to widths less than 75 kHz.

Spot-Check Verification Data

Please see sections Out-of-Band Rejection and Spurious Radiated Emissions in this report for Spot-Check data.

Reference Section

All original test data is from FCC ID P3TDH7S-8B, test report *"TR_6057-23_UL_FCC 90_Booster Class B_1.docx"*.



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

2. Location of Testing

2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA").

Testing was performed at Timco's permanent laboratory located at 849 NW State Road 45, Newberry, Florida 32669

FCC test firm # 578780

FCC Designation # US1070

FCC site registration is under A2LA certificate # 0955.01

ISED Canada test site registration # 2056A

EU Notified Body # 1177

For all designations see A2LA scope # 0955.01

2.2 Testing was performed, reviewed by

Dates of Testing: 1/25/23 – 2/3/23

Signature:

Sr. EMC Engineer
EMC-003838-NE



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

3/7/2023

Signature:

Name & Title:

Kristoffer Costa, EMC Technician

Date of Signature

3/7/2023



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

The test sample was received: 1/9/2023

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:	P3TDH7S-8A
Brief Description	BDA All In One Digital Signal Booster
Model(s) #	HONBDA-A
Firmware version	N/A
Software version	N/A
Serial Number	N/A

Technical Characteristics	
Frequency Range	Uplink: 788 MHz- 805 MHz & 806 MHz- 824 MHz
RF O/P Power (Max.)	23.76 dBm/ 0.239 W
Modulation	FM
Bandwidth & Emission Class	12K3F3E, 7K85F3E, 4K02F3E, 8K18F1D, 8K18F1E, 7K96F1W, 9K60F1D, 9K60F1E, 9K60D7W
Duty Cycle	100%
Antenna Connector	N Type
Voltage Rating (AC or Batt.)	110VAC, 24VDC Battery (Internal)

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)
700 MHz	Uplink	788.0125 MHz
		796 MHz
		804.9875 MHz
800 MHz	Uplink	806.0125 MHz
		812 MHz
		824.9875 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	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
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
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

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



8.1 Power at the Final Amplifier

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

Limits from FCC Part 2.1033 (c)(8)

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

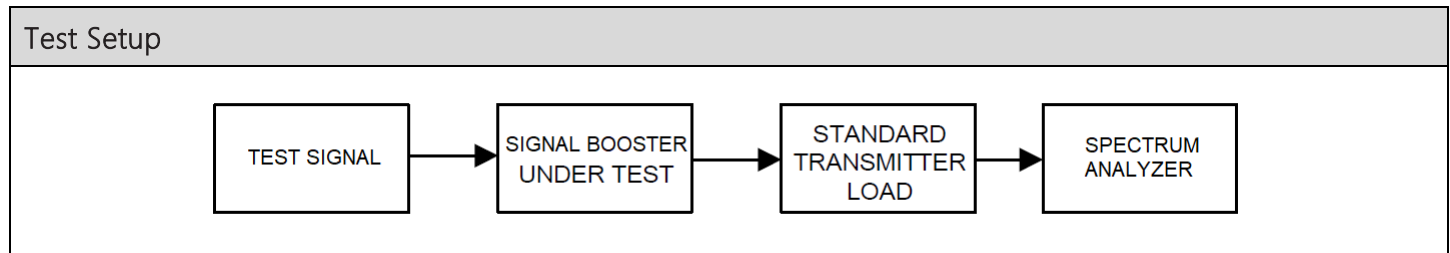
Test Results		
EUT Operating Voltage (V)	EUT Current (A)	Power at the Final Amplifier (W)
24	3.33	79.92



8.2 RF Output Power & Gain

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

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 Results, Power Output		
Link Direction	Max Power Output (dBm)	Max Power Output (W)
Uplink	23.76	0.239

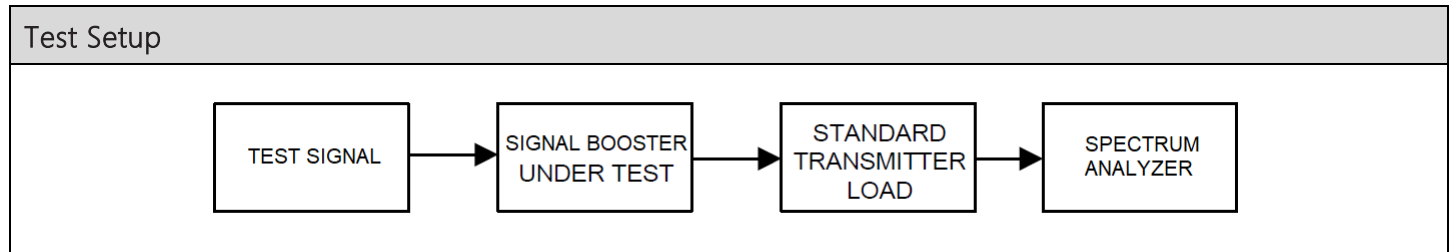


Test Results, Gain					
Link Direction	Tuned Frequency (MHz)	Input Level	Power Input (dBm)	Power Output (dBm)	Gain (dB)
Uplink 700 MHz	788.0125	AGC	-50	23.28	73.28
		AGC+3	-47	23.29	70.29
	796	AGC	-49	23.21	72.21
		AGC+3	-46	26.13	72.13
	804.9875	AGC	-50.5	23.56	73.98
		AGC+3	-47.5	26.35	73.85
Uplink 800 MHz	806.0125	AGC	-50.5	23.48	73.98
		AGC+3	-47.5	25.13	72.63
	812	AGC	-50	23.30	73.30
		AGC+3	-47	23.44	70.44
	823.9875	AGC	-50.5	23.76	74.26
		AGC+3	-47.5	26.00	73.50



8.3 Out-of-band Rejection

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

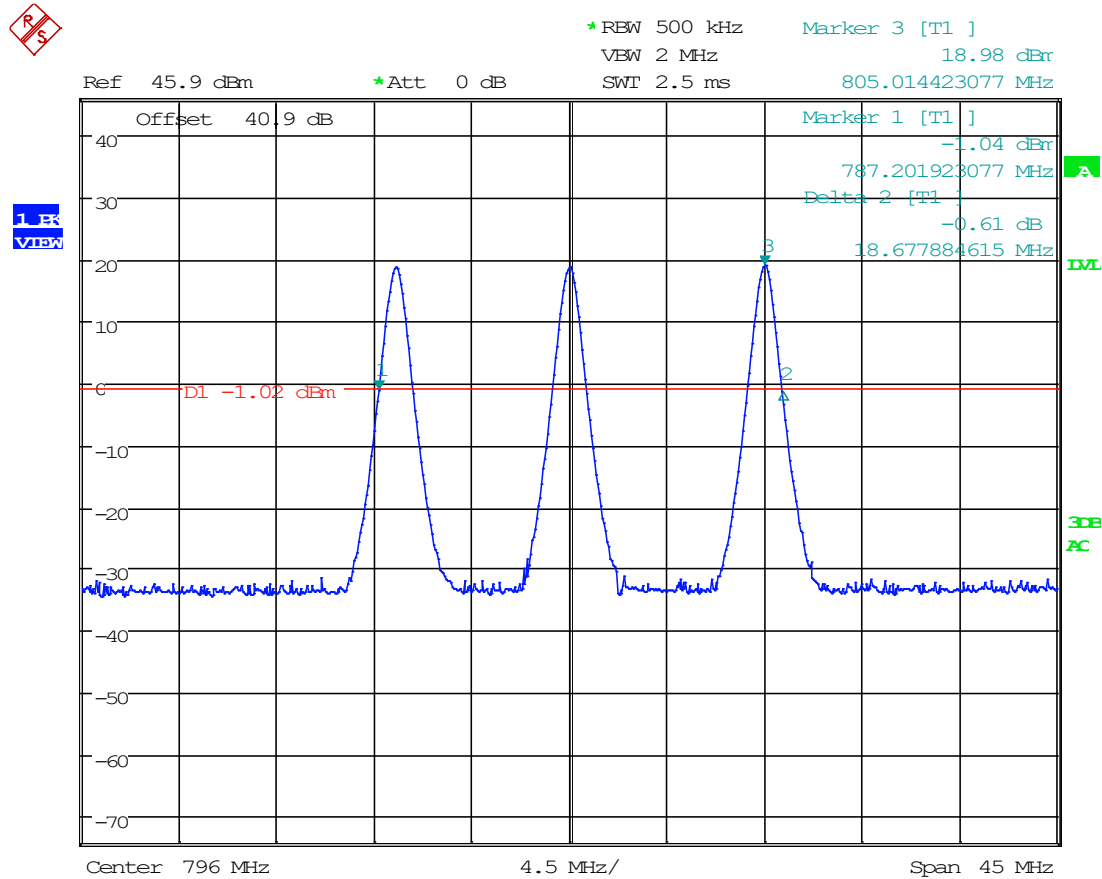


Test Results, Out-of-band Rejection and Class of Operation			
Operating Band (MHz)	Link Direction	Passband (kHz)	Class of Operation
700- 805 MHz	Uplink	< 75 kHz	Class A
806- 824 MHz	Uplink	< 75 kHz	Class A



Out-of-band Rejection, Spectrum Plots

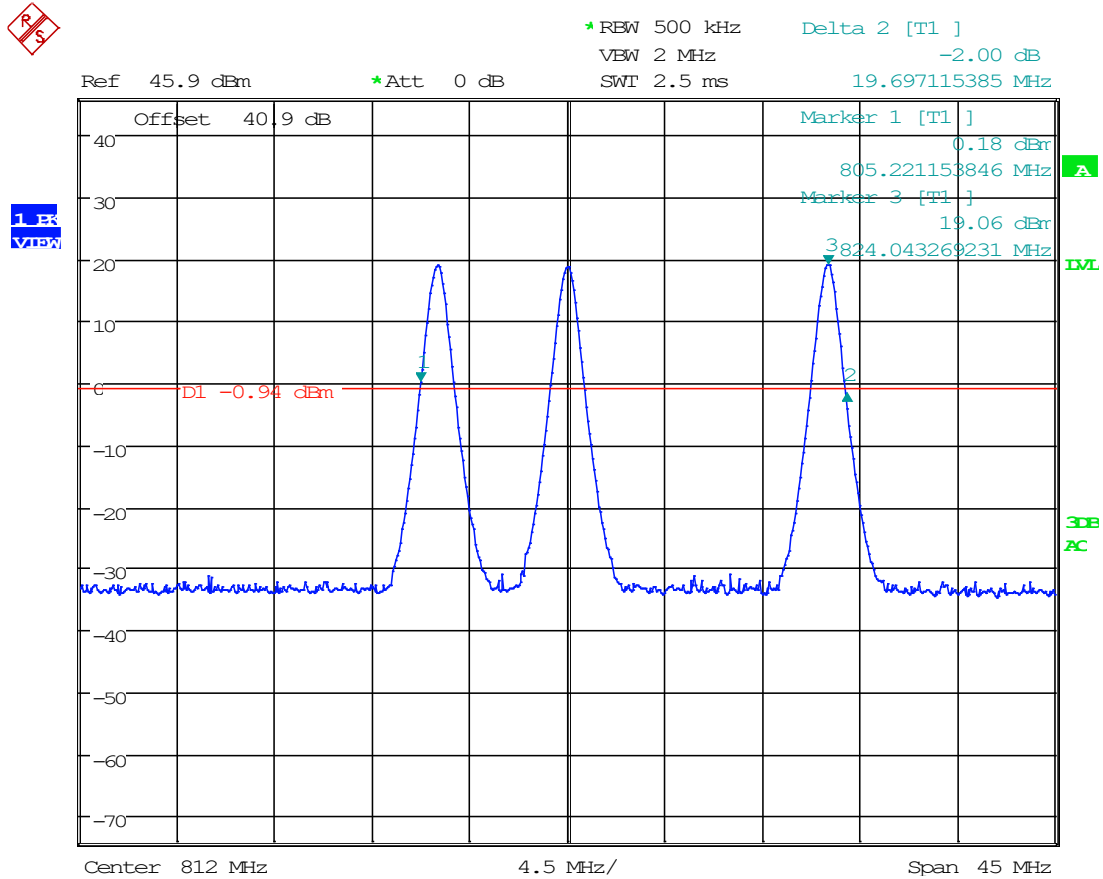
8.3.1 700 Band, Uplink



Date: 1.FEB.2023 15:52:17



8.3.2 800 Band Uplink



Date: 1.FEB.2023 15:55:38



8.4 Bandwidth & Emission

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

Limits from FCC Parts 2.202, 90.209 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.

Authorized Bandwidth		
Rule Part	Operating Range (MHz)	Authorized Bandwidth (kHz)
Part 90	788- 805 MHz	Unspecified
Part 90	806- 824 MHz	11.25/20

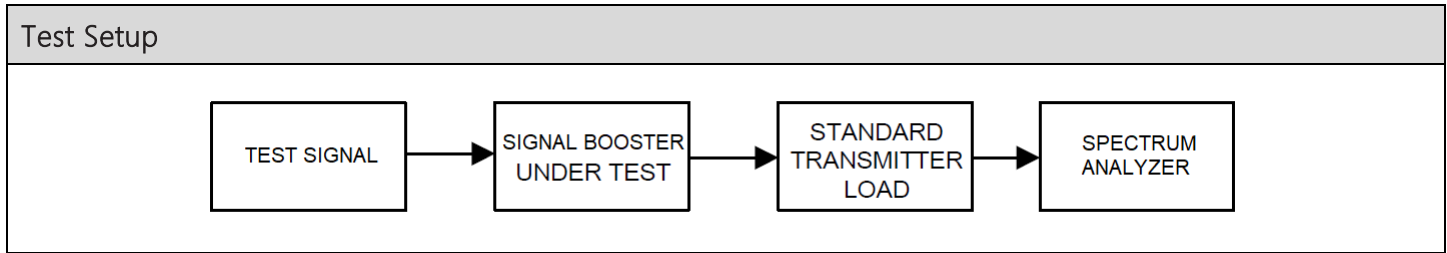
Applicable Input Signals		
Signal	Occupied Bandwidth (MHz)	Representative Emission Designator(s)
CW	N/A	N/A
25 kHz FM	12.36	12K3F3E
12.5 kHz FM	7.85	7K85F3E
6.25 kHz FM	4.02	4K02F3E
C4FM (P25 Phase I)	8.18	8K18F1D, 8K18F1E
HCPM (P25 Phase II SU)	7.96	7K96F1W
HDQPSK (P25 Phase II BS)	9.6	9K60F1D, 9K60F1E, 9K60D7W



8.5 Input VS Output Signal Comparison

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

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





700 Band Input VS Output Comparison

Test Results, Input VS Output Comparison						
Link Direction	Tuned Frequency (MHz)	Input Signal	AGC Level	99% OBW of Input (MHz)	99% OBW of Output (MHz)	Change (%)
Uplink	796	6.25 kHz FM	@ AGC	4.038	4.16	0.122
			@ AGC+3 dB	4.038	4.16	0.122
		12.5 kHz FM	@ AGC	6.21	7.69	1.48
			@ AGC+3 dB	6.21	7.69	1.48
		25 kHz FM	@ AGC	10.21	12.17	1.96
			@ AGC+3 dB	10.21	12.5	2.29
		C4FM	@ AGC	7.71	8.01	0.3
			@ AGC+3 dB	7.71	8.49	0.78
		HCPM	@ AGC	7.71	8.17	0.46
			@ AGC+3 dB	7.71	8.01	0.3
		HDQPSK	@ AGC	9.91	9.93	0.02
			@ AGC+3 dB	9.91	10.09	0.18



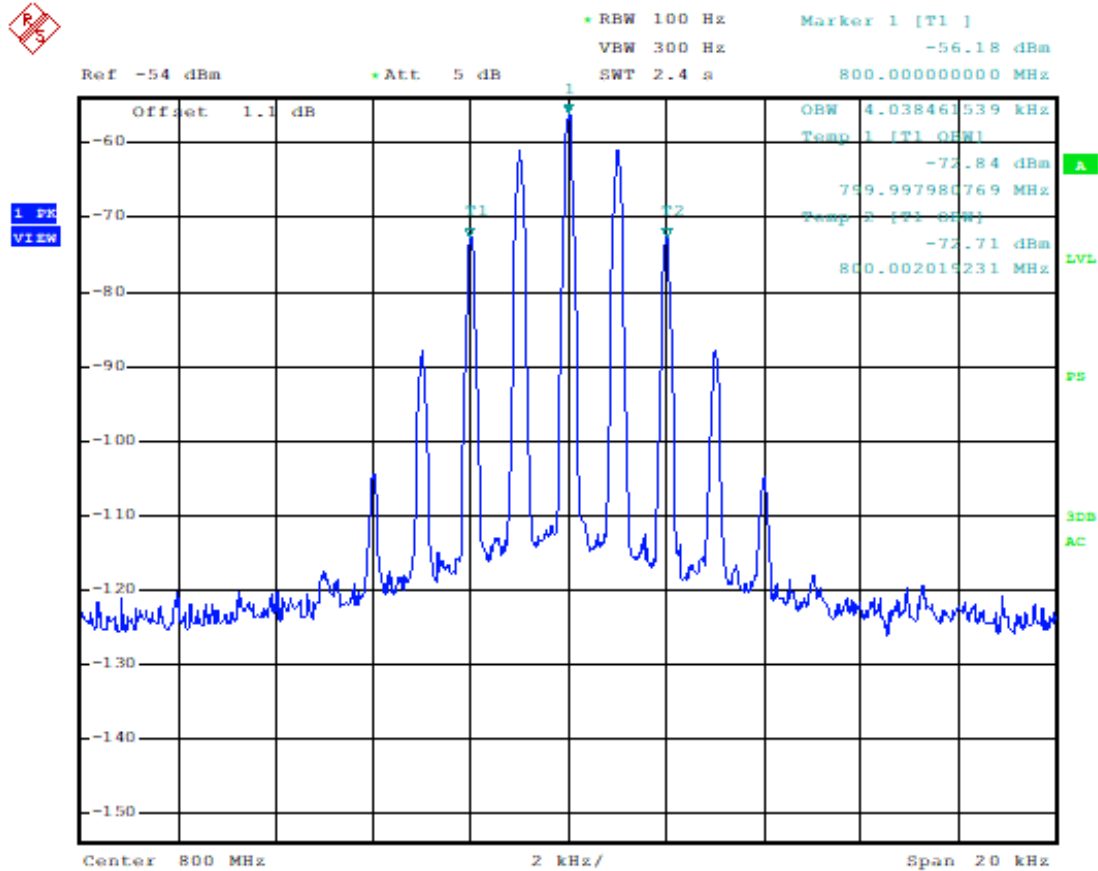
800 Band Input VS Output Comparison

Test Results, Input VS Output Comparison						
Link Direction	Tuned Frequency (MHz)	Input Signal	AGC Level	99% OBW of Input (MHz)	99% OBW of Output (MHz)	Change (%)
Uplink	812	6.25 kHz FM	@ AGC	4.03	4.03	0
			@ AGC+3 dB	4.03	4.03	0
		12.5 kHz FM	@ AGC	6.21	7.89	1.68
			@ AGC+3 dB	6.21	7.89	1.68
		25 kHz FM	@ AGC	10.21	12.33	2.12
			@ AGC+3 dB	10.21	12.33	2.12
		C4FM	@ AGC	7.71	8.13	0.42
			@ AGC+3 dB	7.71	7.93	0.22
		HCPM	@ AGC	7.71	7.93	0.22
			@ AGC+3 dB	7.71	8.13	0.42
		HDQPSK	@ AGC	9.91	9.69	0.22
			@ AGC+3 dB	9.91	9.65	0.26



Input VS Output, Input Spectrum Plots

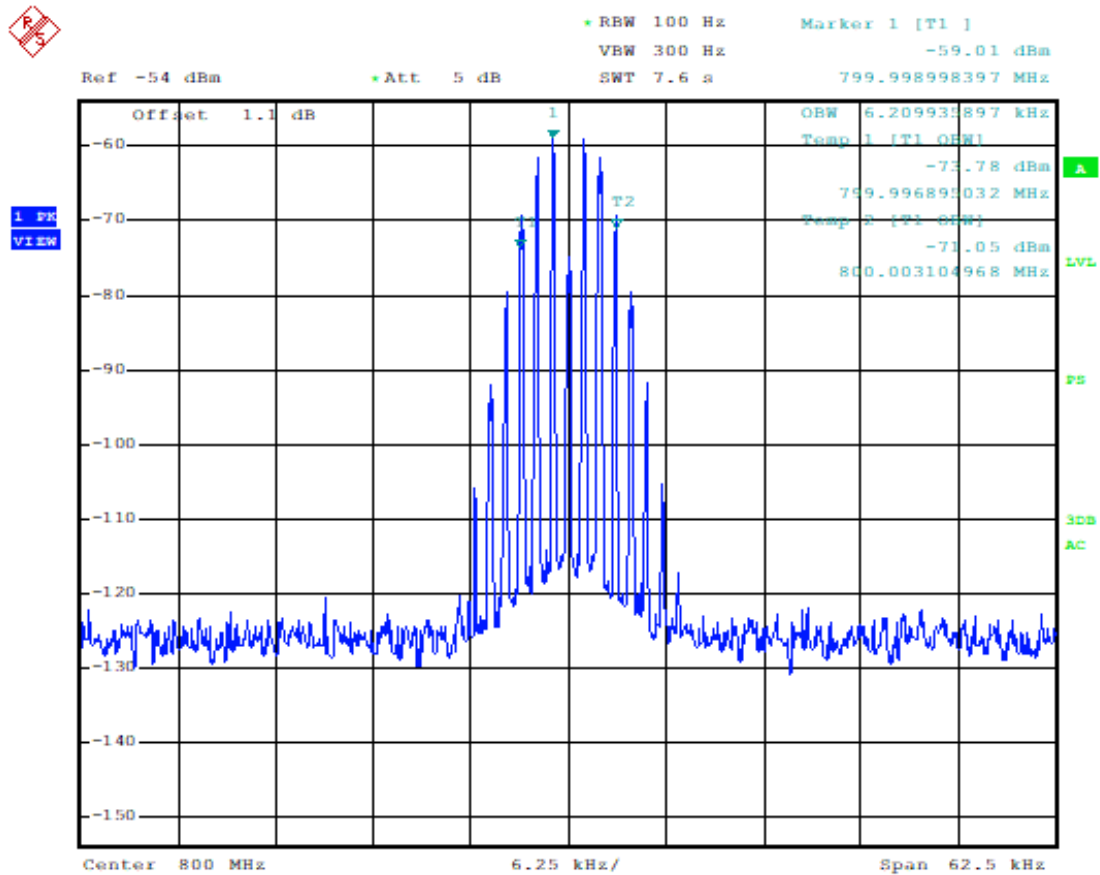
8.5.1 6.25 kHz FM, Input Signal



Date: 30.JAN.2019 13:10:11



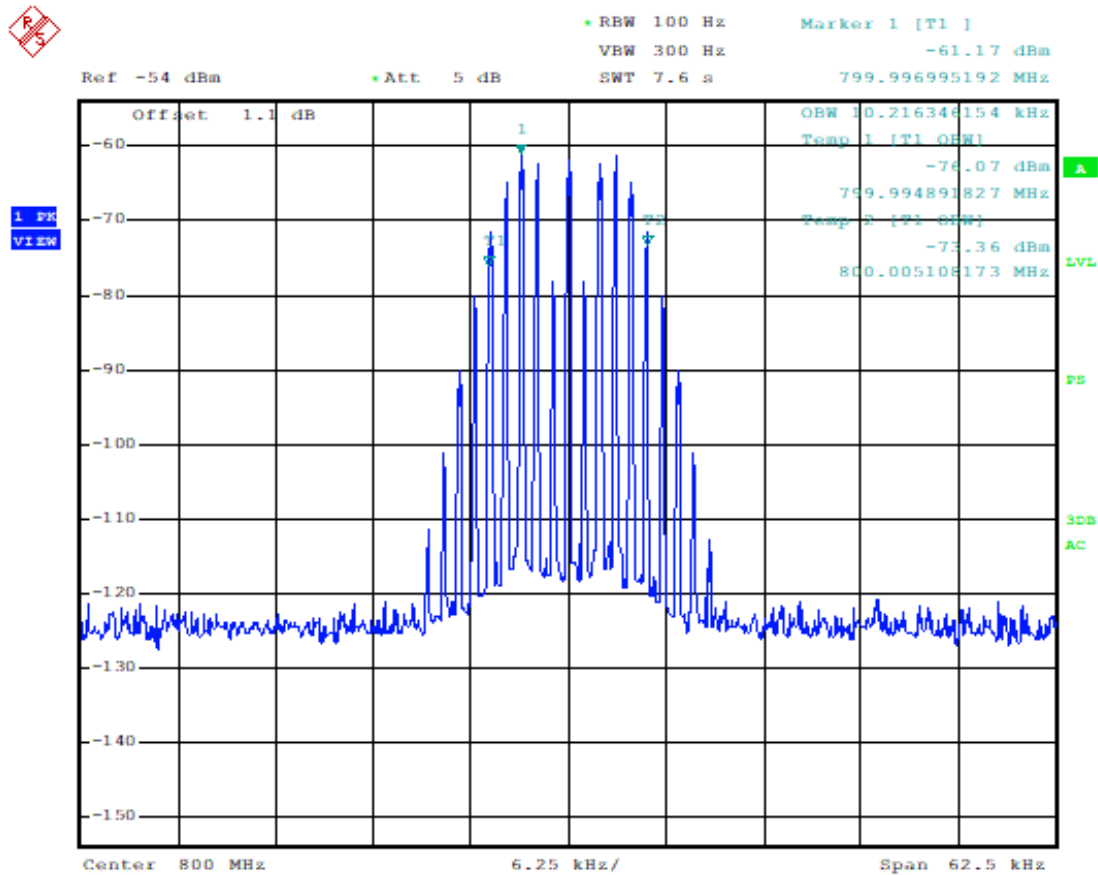
8.5.2 12.5 kHz FM, Input Signal



Date: 30.JAN.2019 14:19:45

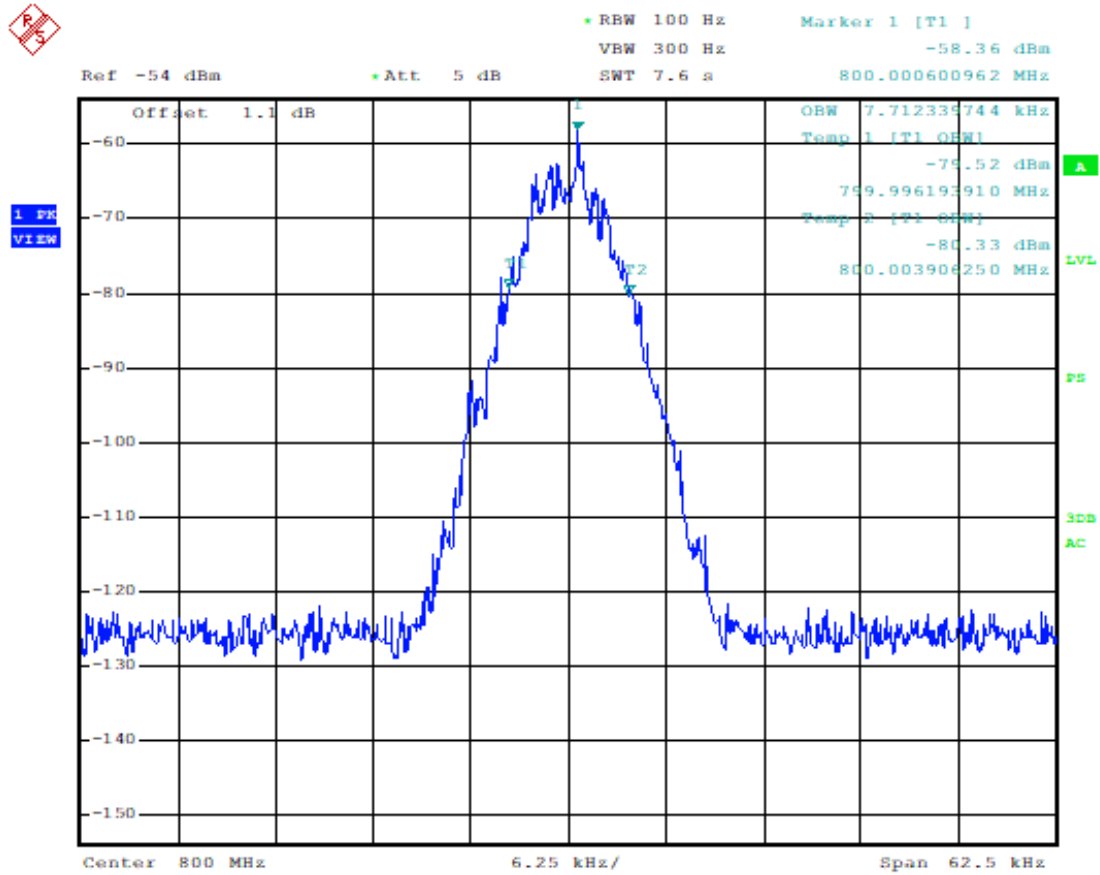


8.5.3 25 kHz FM, Input Signal



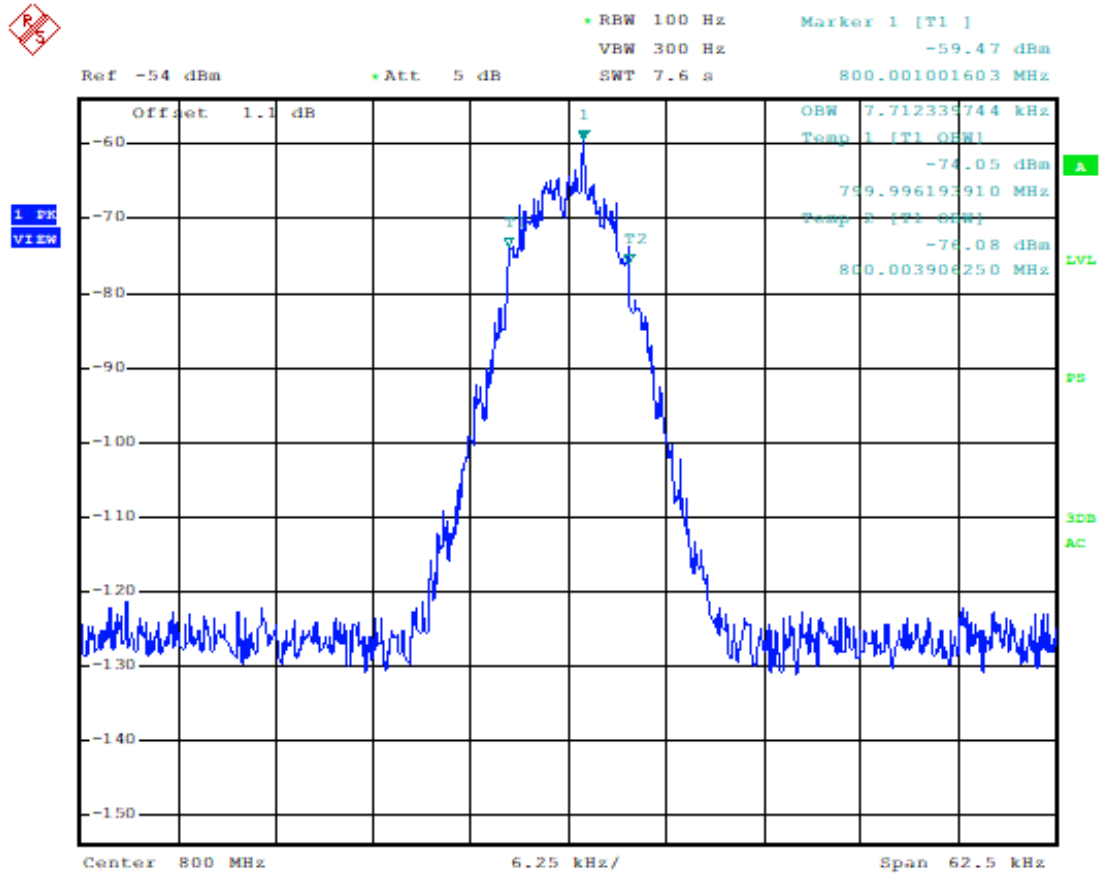
Date: 30.JAN.2019 14:23:14

8.5.4 C4FM, Input Signal



Date: 30.JAN.2019 14:28:58

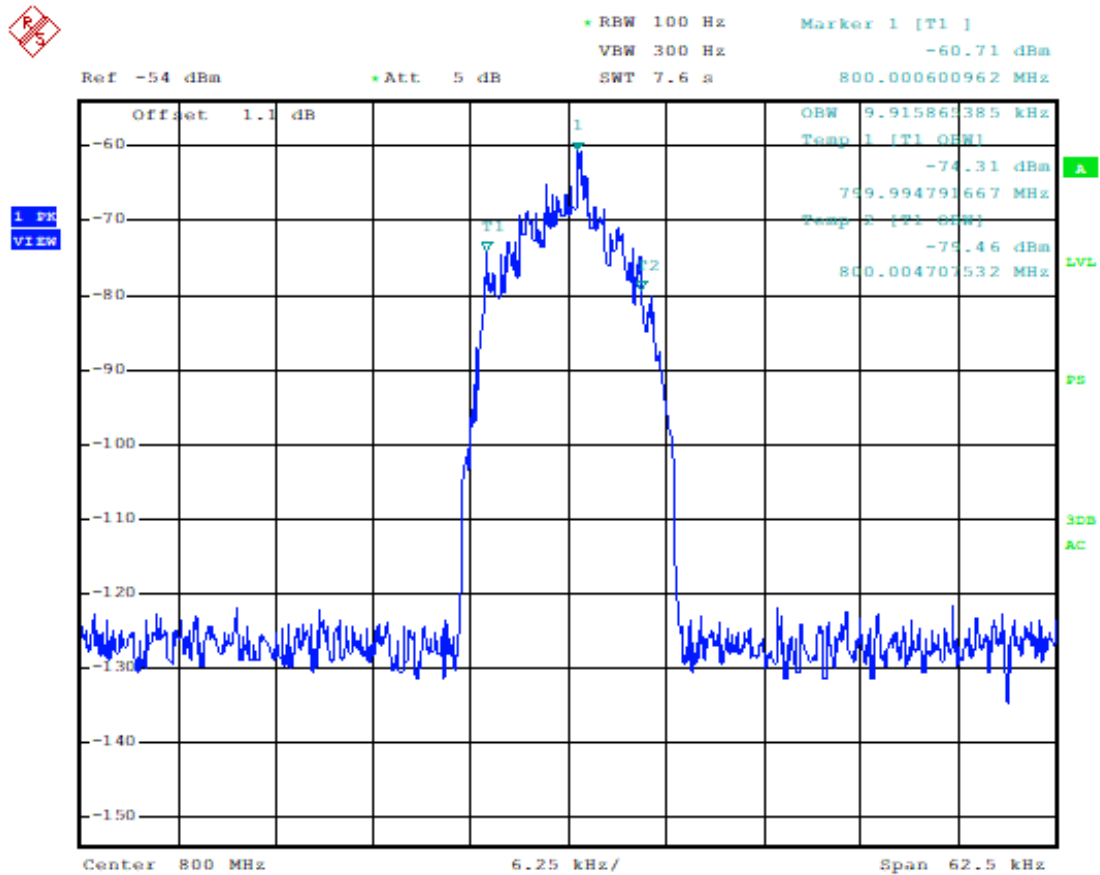
8.5.5 H-CPM, Input Signal



Date: 30.JAN.2019 14:30:47



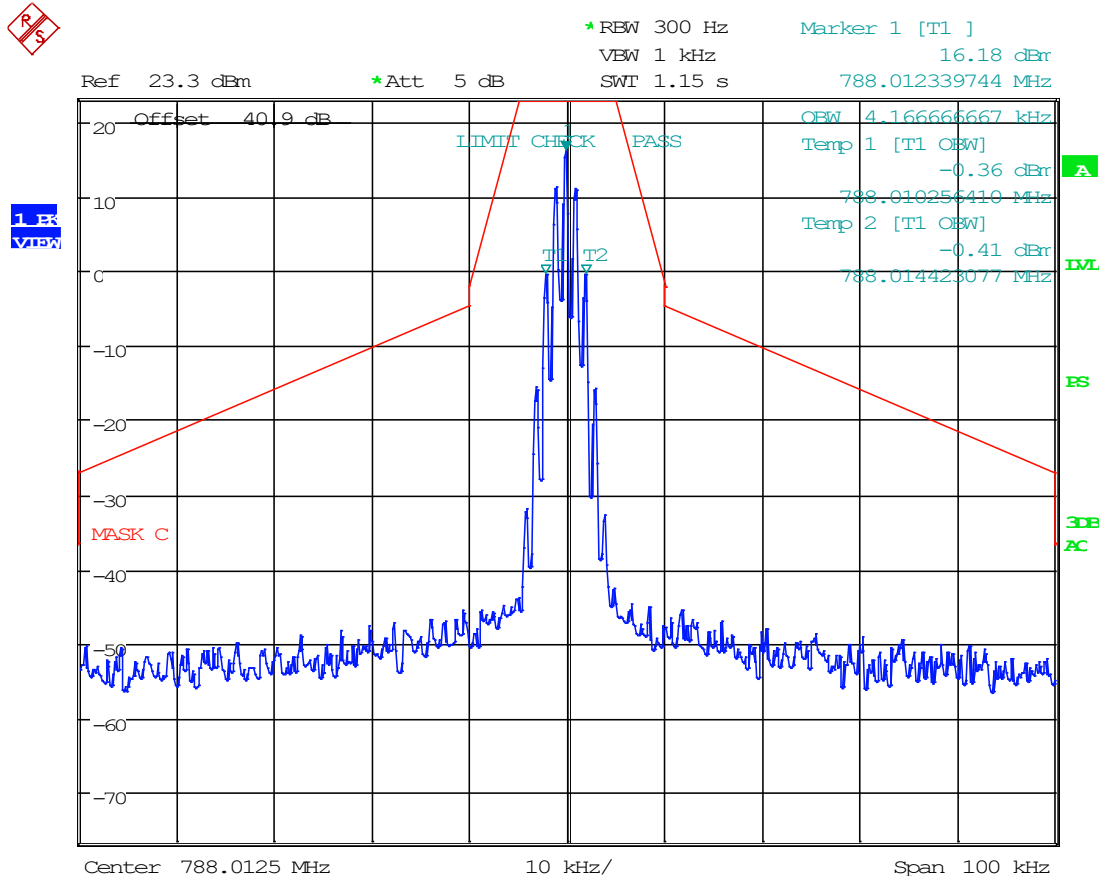
8.5.6 H-DQPSK, Input Signal



Date: 30.JAN.2019 14:32:35



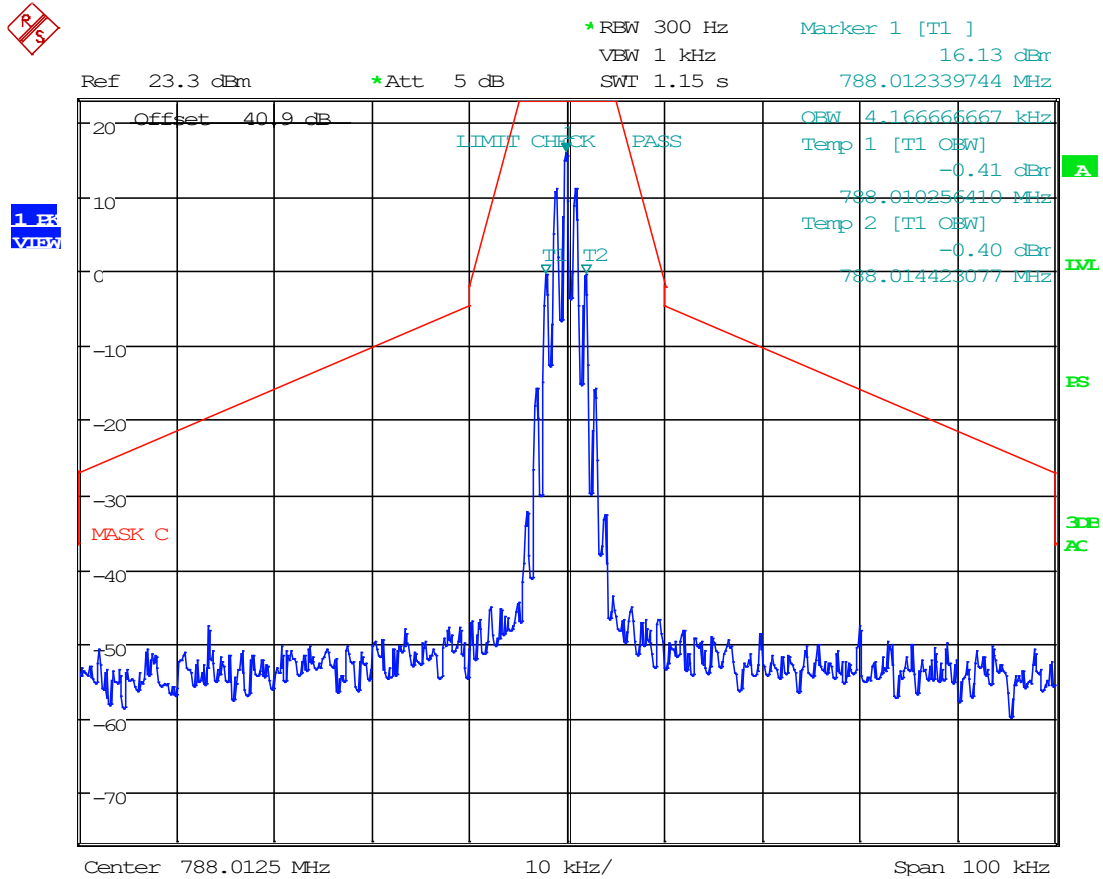
8.5.7 6.25 kHz, FM, UL Mask C, AGC, 788.0125 MHz



Date: 2.FEB.2023 09:50:25



8.5.8 6.25 kHz, FM, UL Mask C, AGC +3, 788.0125 MHz

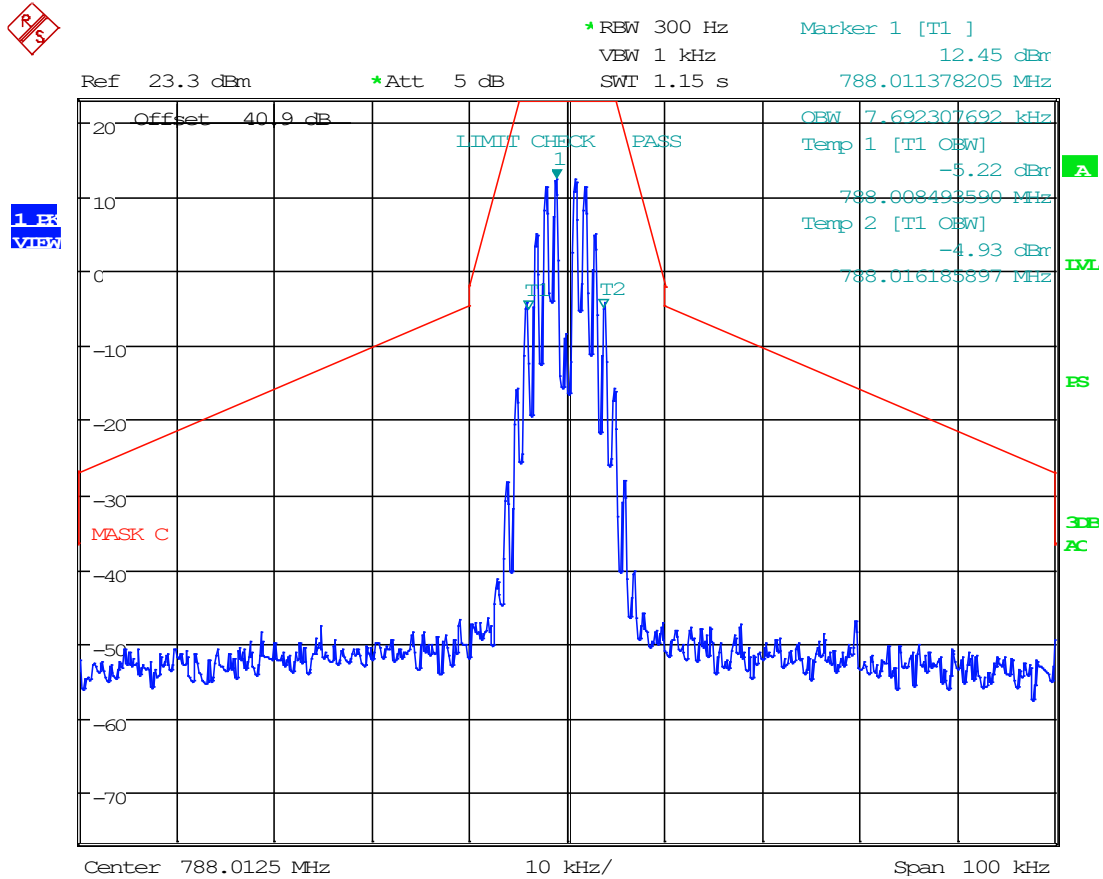


Date: 2.FEB.2023 11:26:22



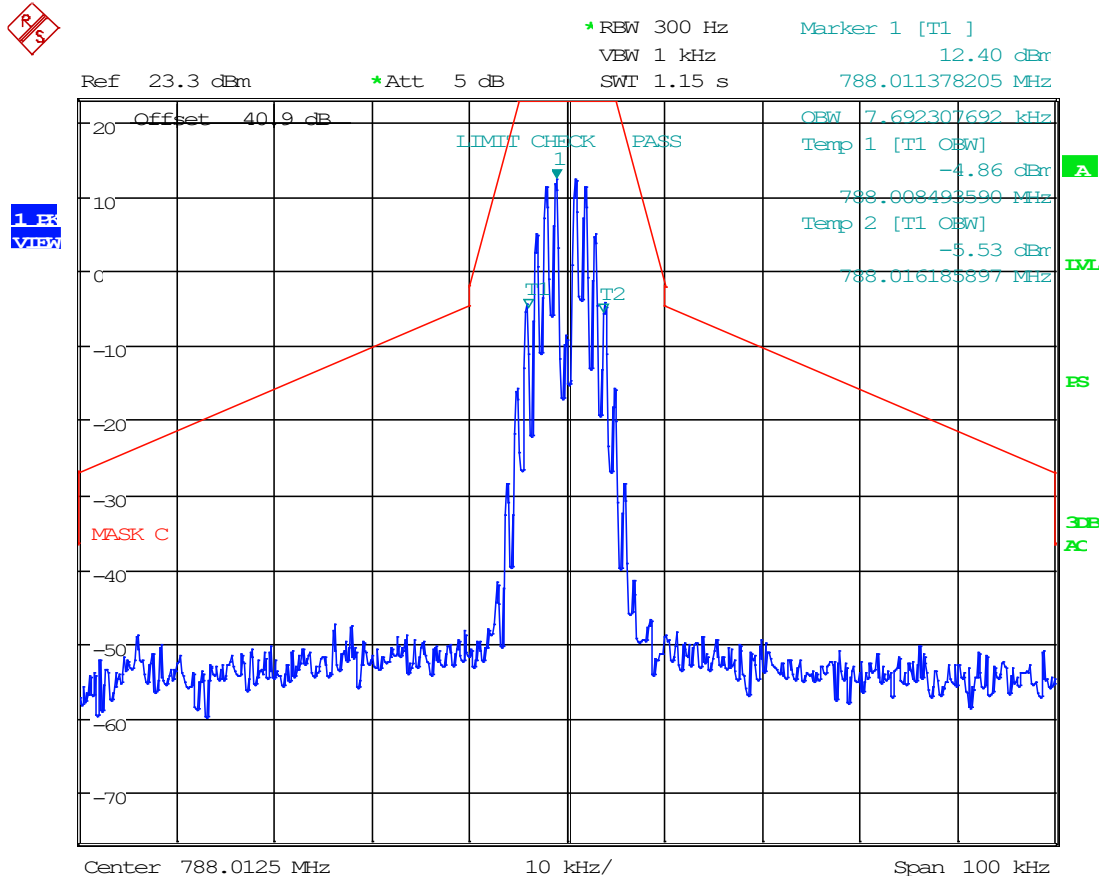
Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

8.5.9 12.5 kHz, FM, UL Mask C, AGC, 788.0125 MHz



Date: 2.FEB.2023 09:56:38

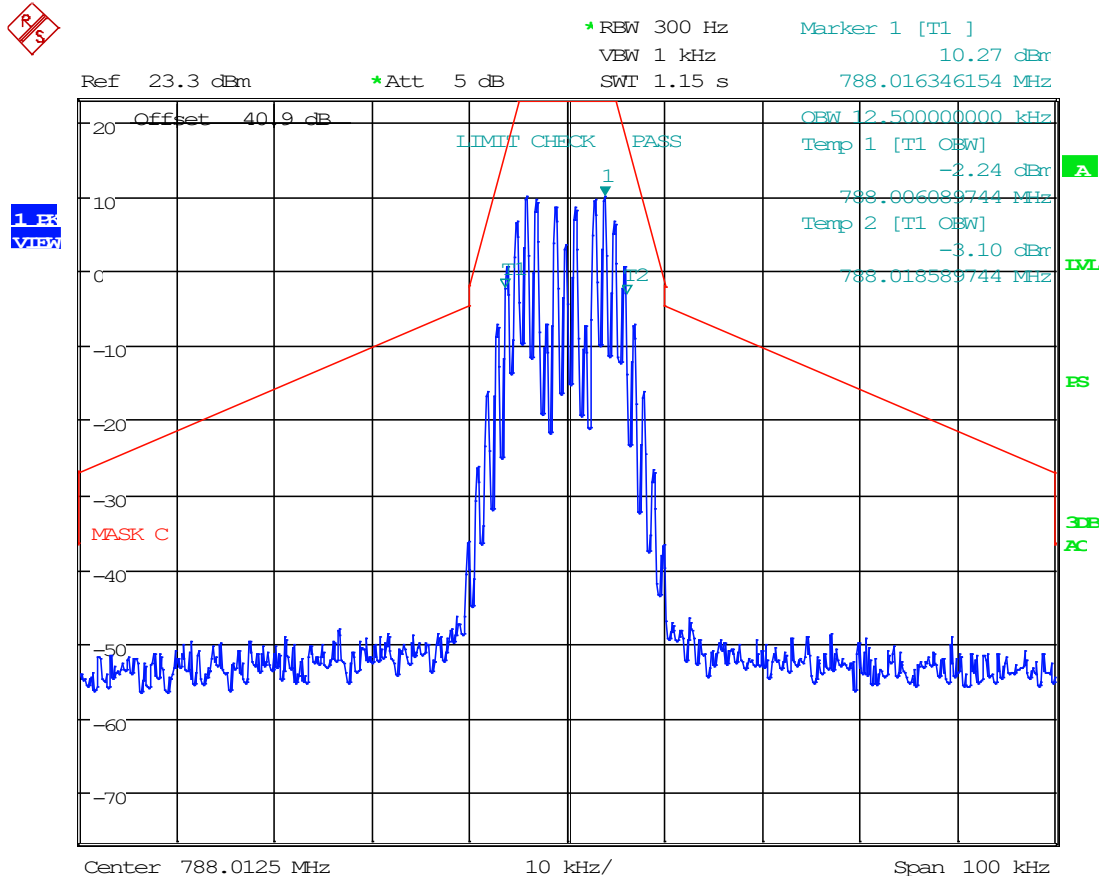
8.5.10 12.5 kHz, FM, UL Mask C, AGC+3, 788.0125 MHz



Date: 2.FEB.2023 11:28:31



8.5.11 25 kHz FM, UL Mask C, AGC, 788.0125 MHz

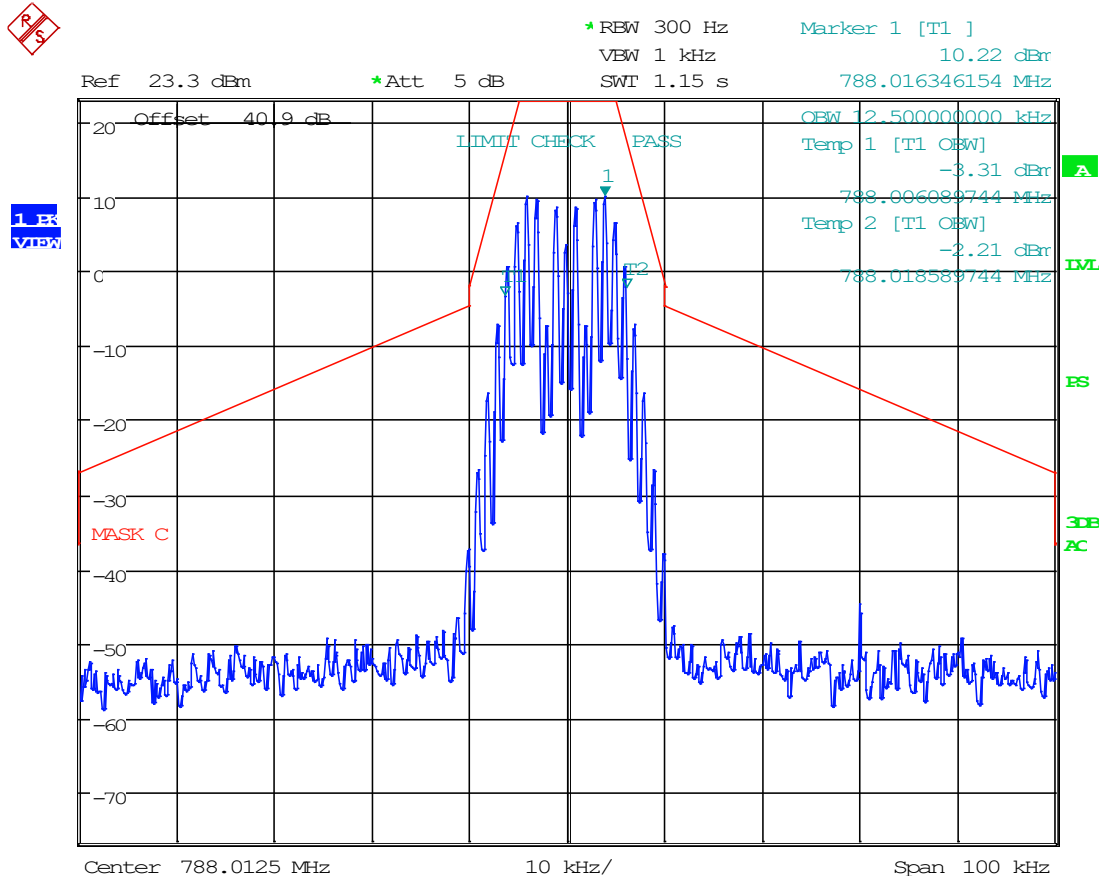


Date: 2.FEB.2023 09:57:54



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

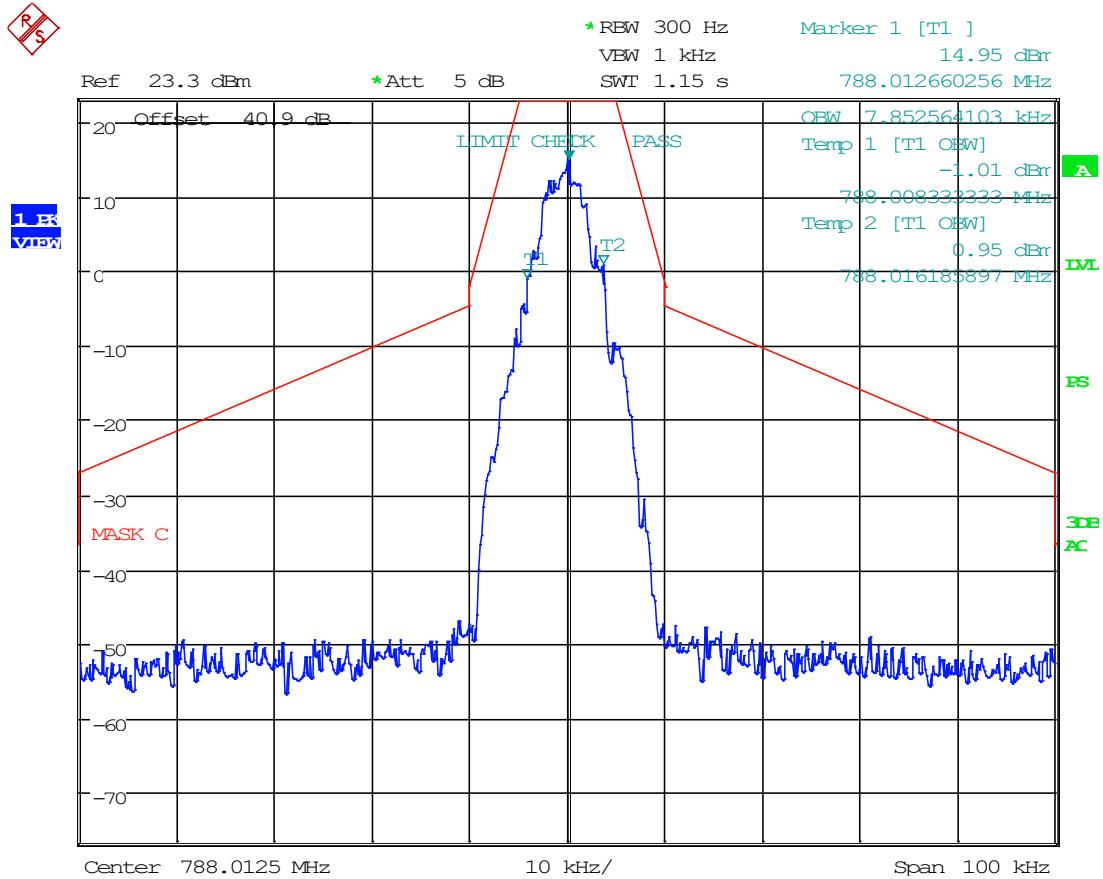
8.5.12 25 kHz FM, UL Mask C, AGC+3, 788.0125 MHz



Date: 2.FEB.2023 11:29:57

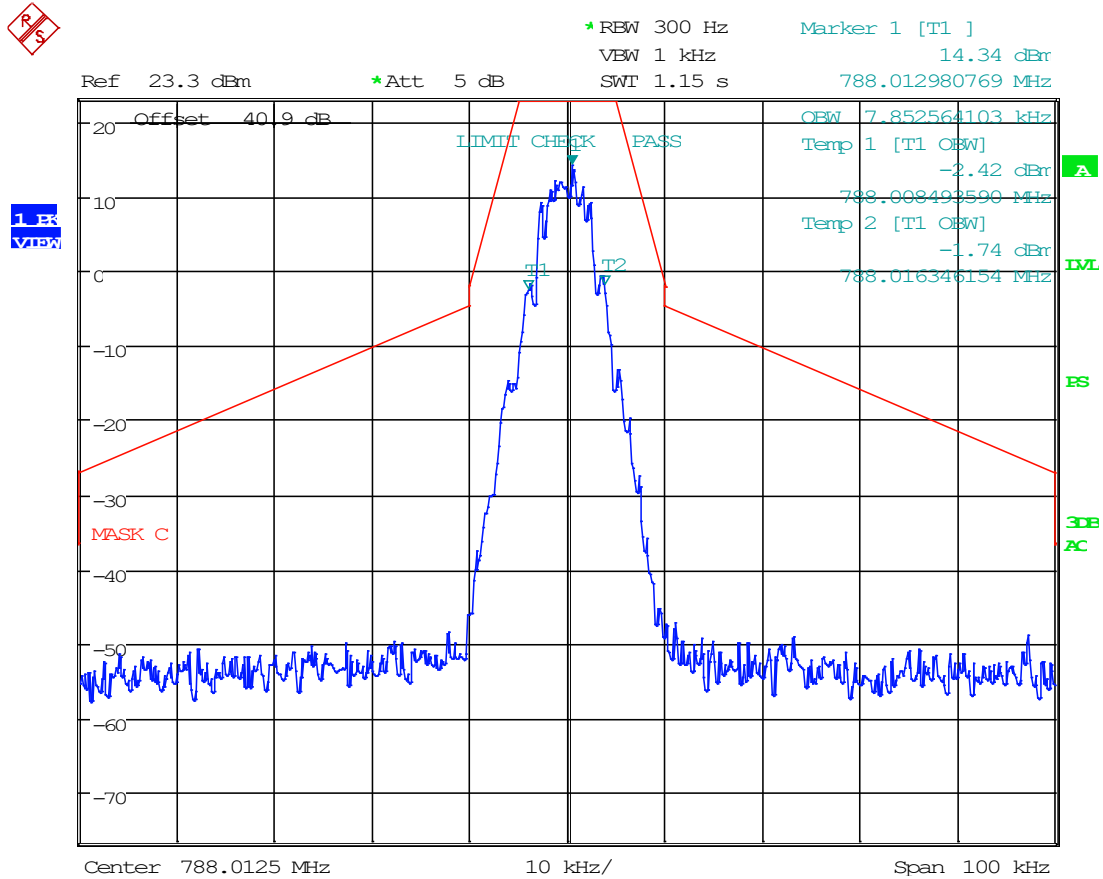


8.5.13 C4FM, UL Mask C, AGC, 788.0125 MHz



Date: 2.FEB.2023 10:09:39

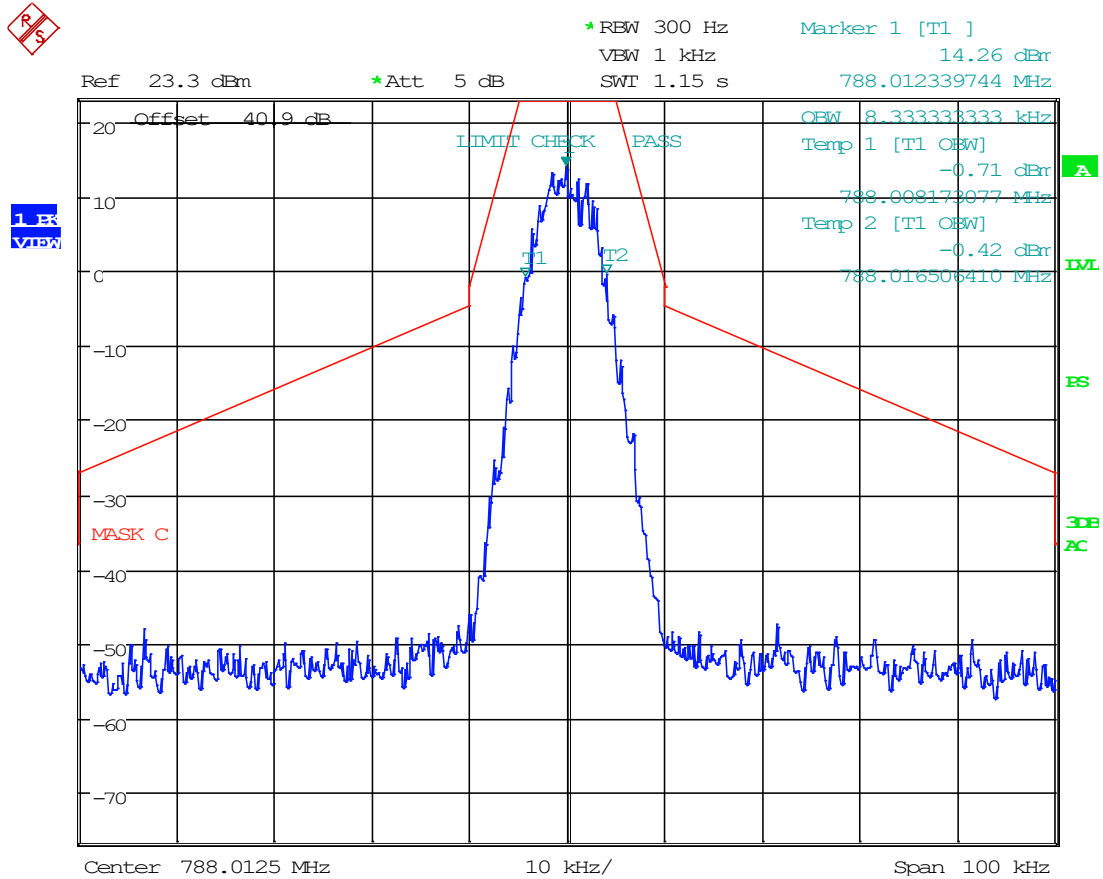
8.5.14 C4FM, UL Mask C, AGC+3, 788.0125 MHz



Date: 2.FEB.2023 11:32:45

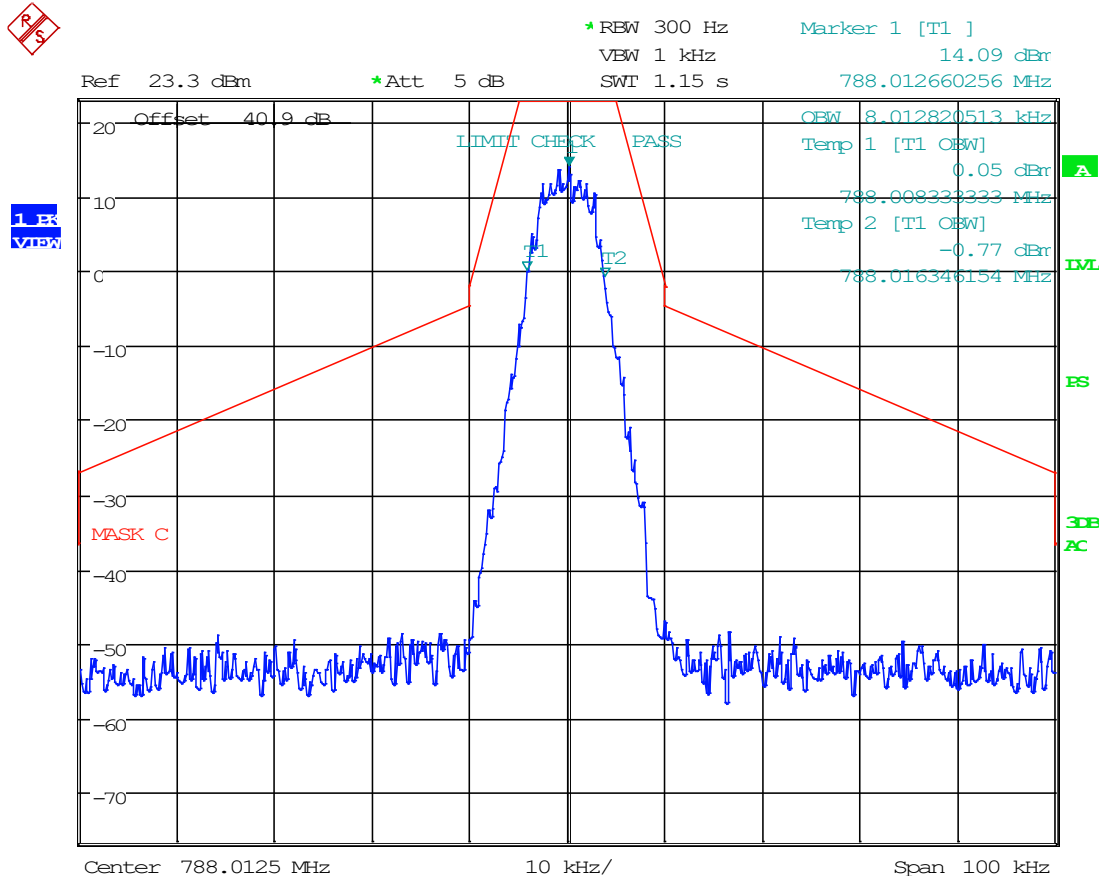


8.5.15 H-CPM, UL Mask C, AGC, 788.0125 MHz



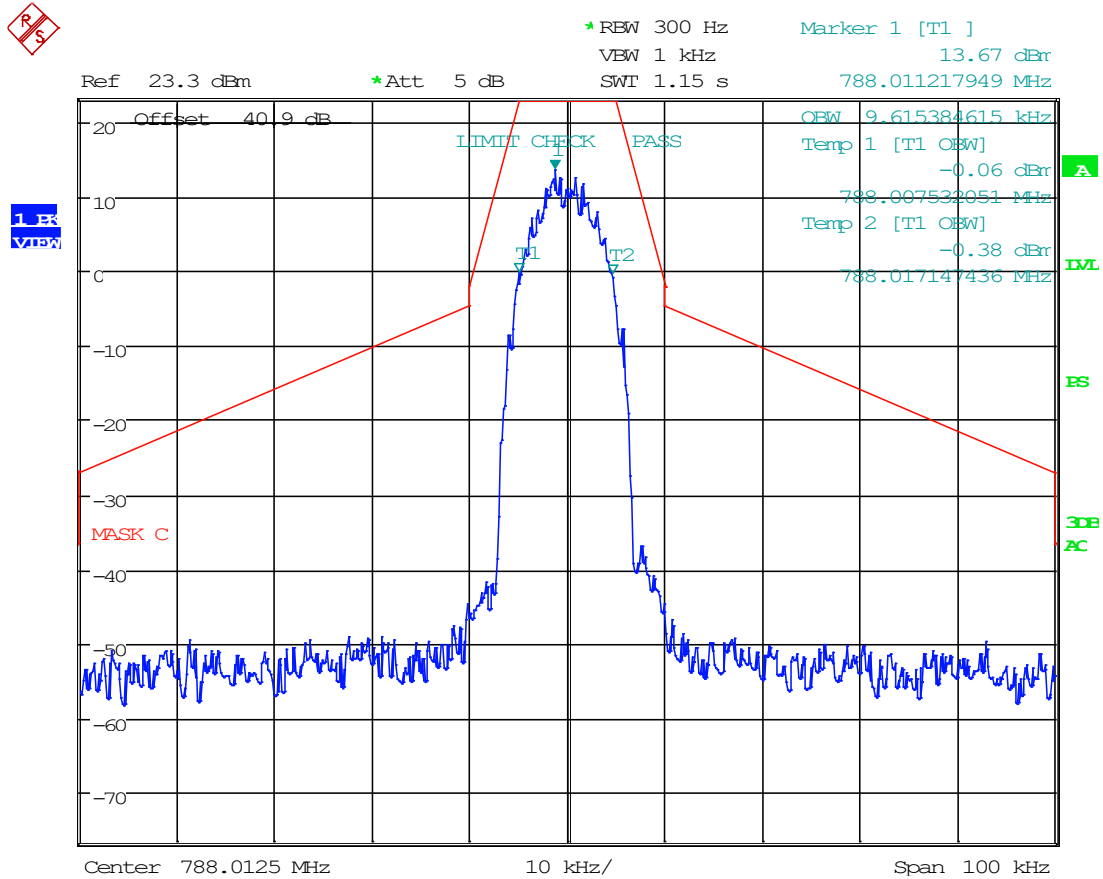
Date: 2.FEB.2023 10:10:36

8.5.16 H-CPM, UL Mask C, AGC+3, 788.0125 MHz



Date: 2.FEB.2023 11:33:58

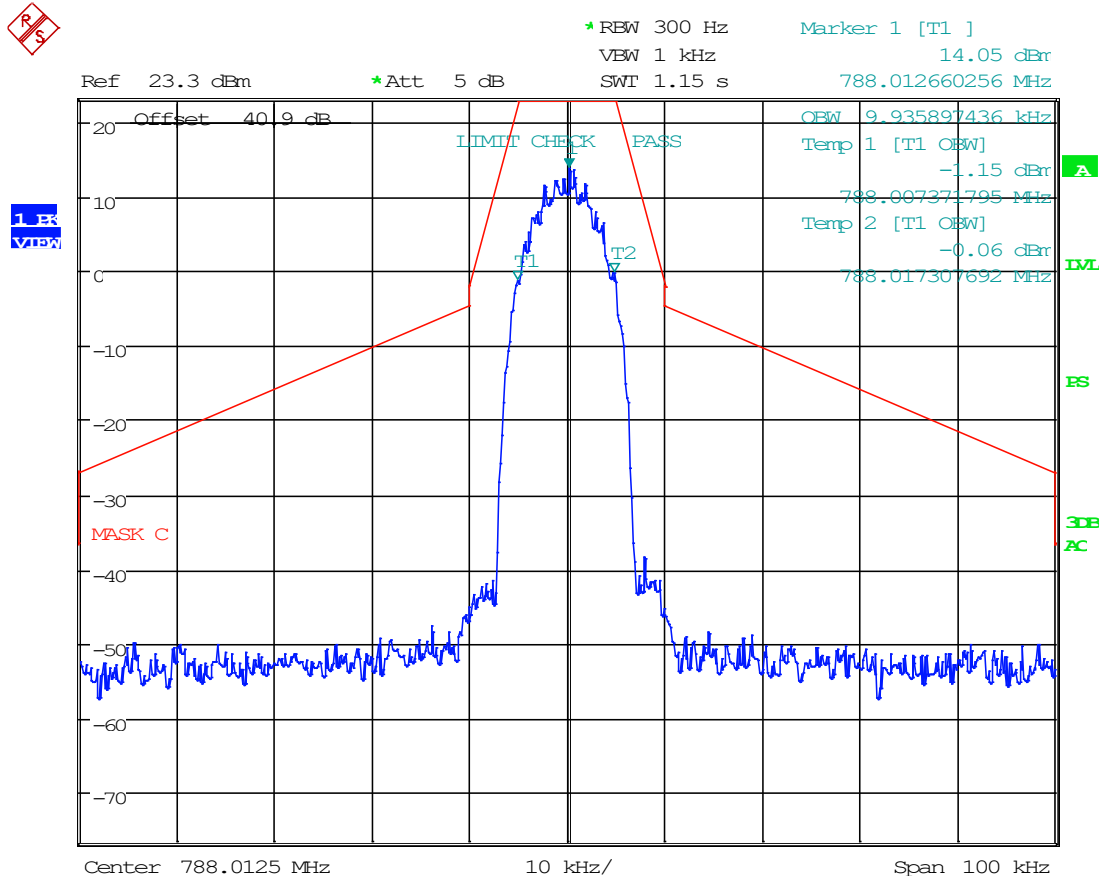
8.5.17 H-DQPSK, UL Mask C, AGC, 788.0125 MHz



Date: 2.FEB.2023 10:11:27



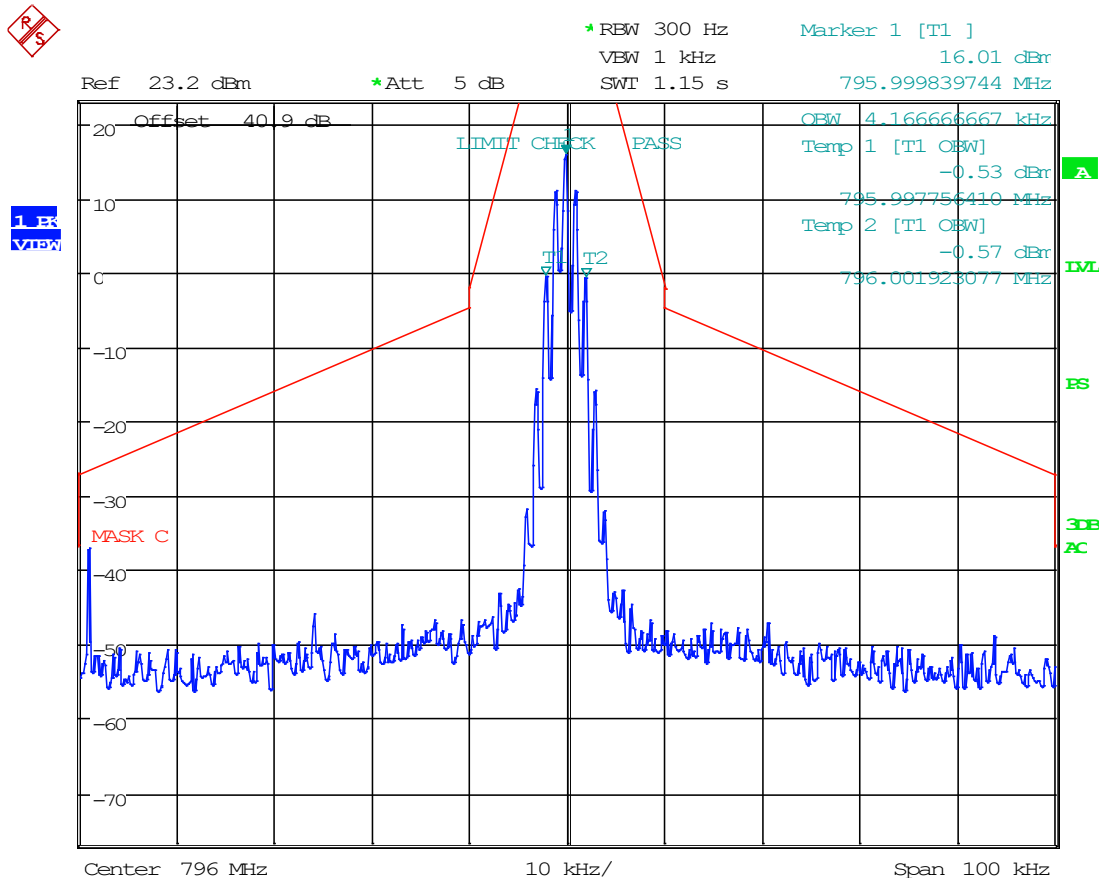
8.5.18 H-DQPSK, UL Mask C, AGC+3, 788.0125 MHz



Date: 2.FEB.2023 11:34:50



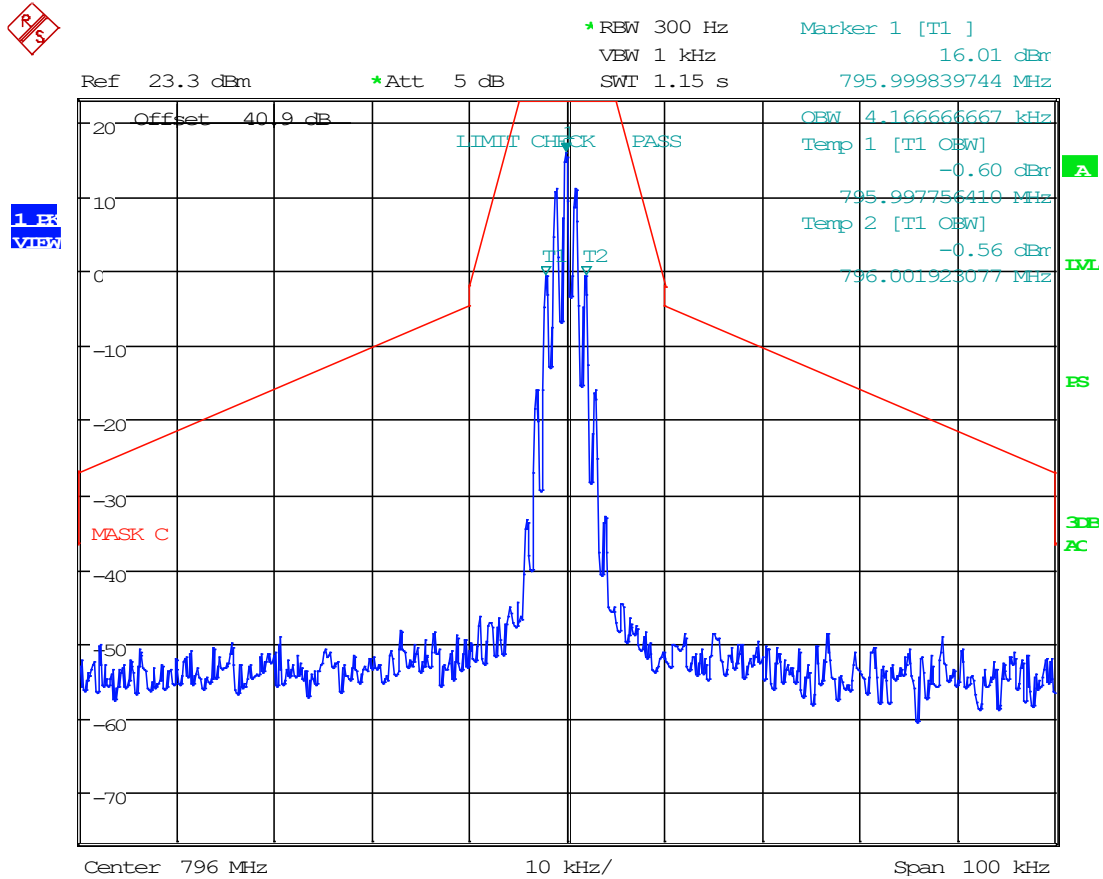
8.5.19 6.25 kHz, FM, UL Mask C, AGC, 796 MHz



Date: 2.FEB.2023 10:19:57



8.5.20 6.25 kHz, FM, UL Mask C, AGC+3, 796 MHz

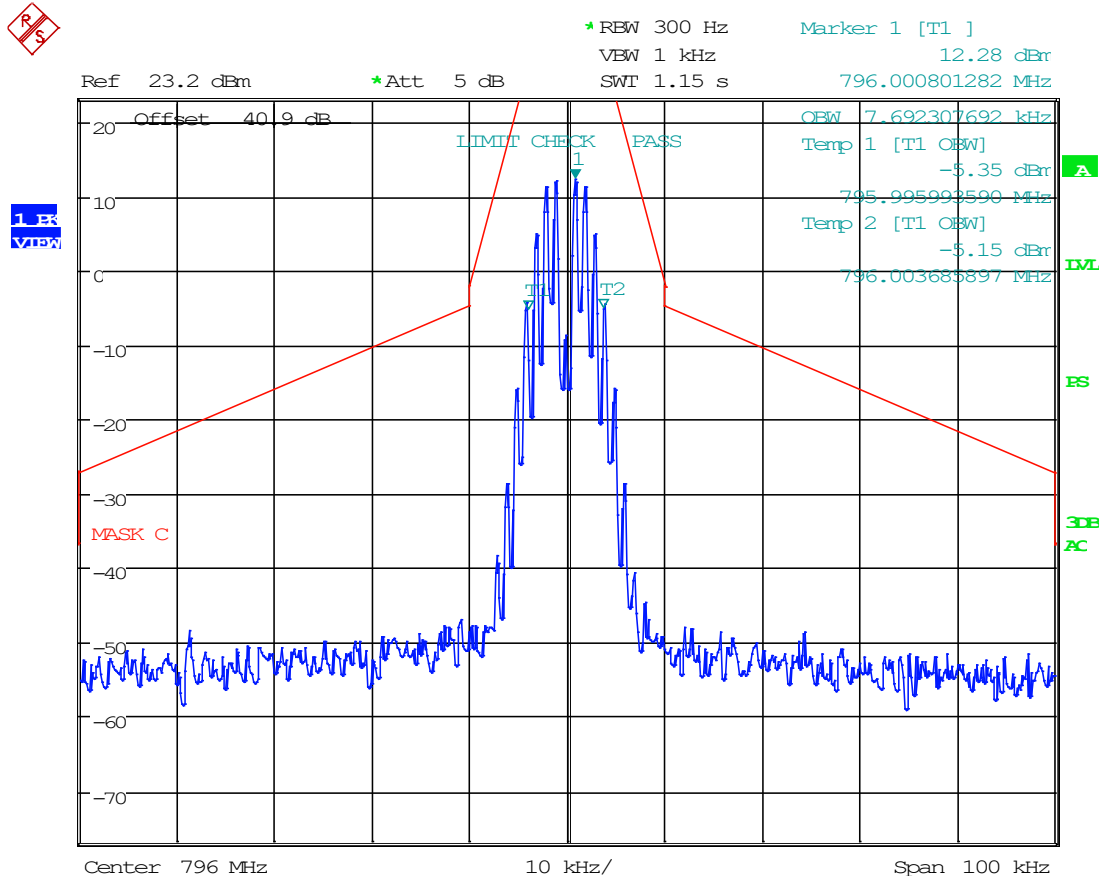


Date: 2.FEB.2023 11:35:52



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

8.5.21 12.5 kHz, FM, UL Mask C, AGC, 796 MHz

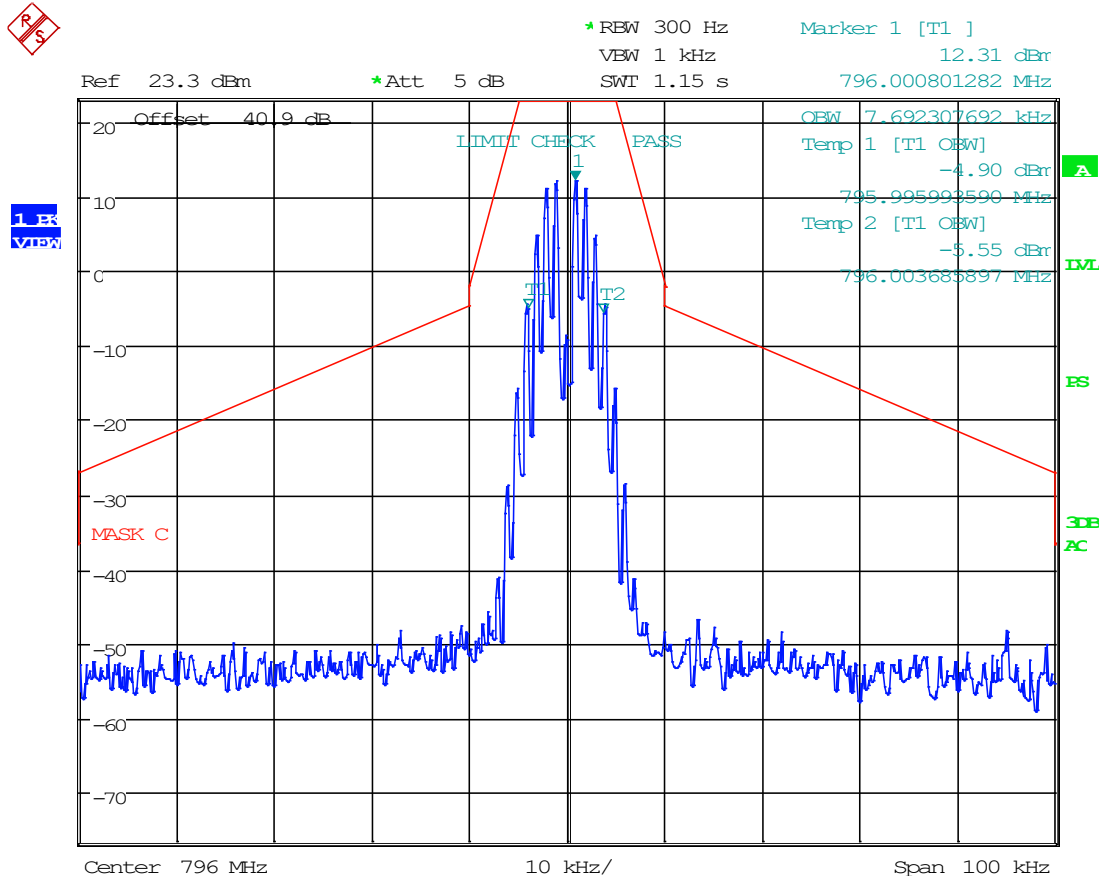


Date: 2.FEB.2023 10:20:52



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

8.5.22 12.5 kHz, FM, UL Mask C, AGC+3, 796 MHz

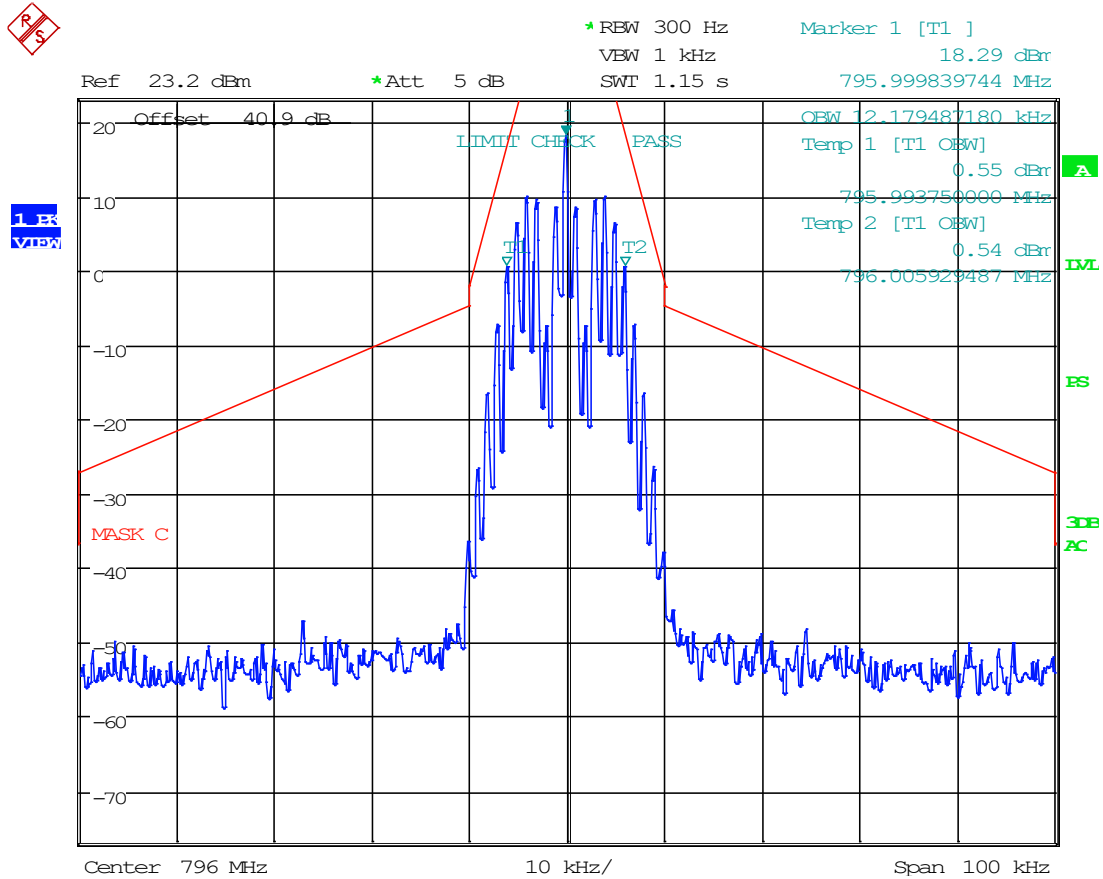


Date: 2.FEB.2023 11:37:58



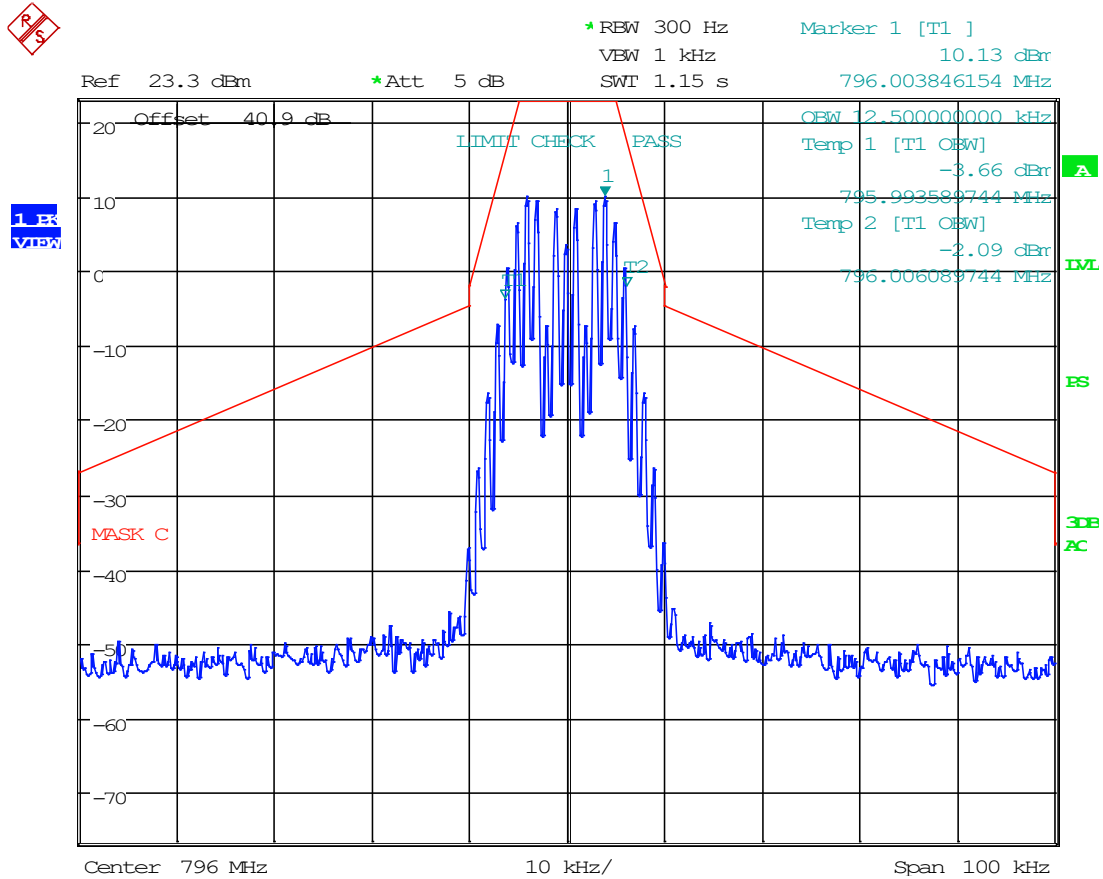
Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

8.5.23 25 kHz FM, UL Mask C, AGC, 796 MHz



Date: 2.FEB.2023 10:21:39

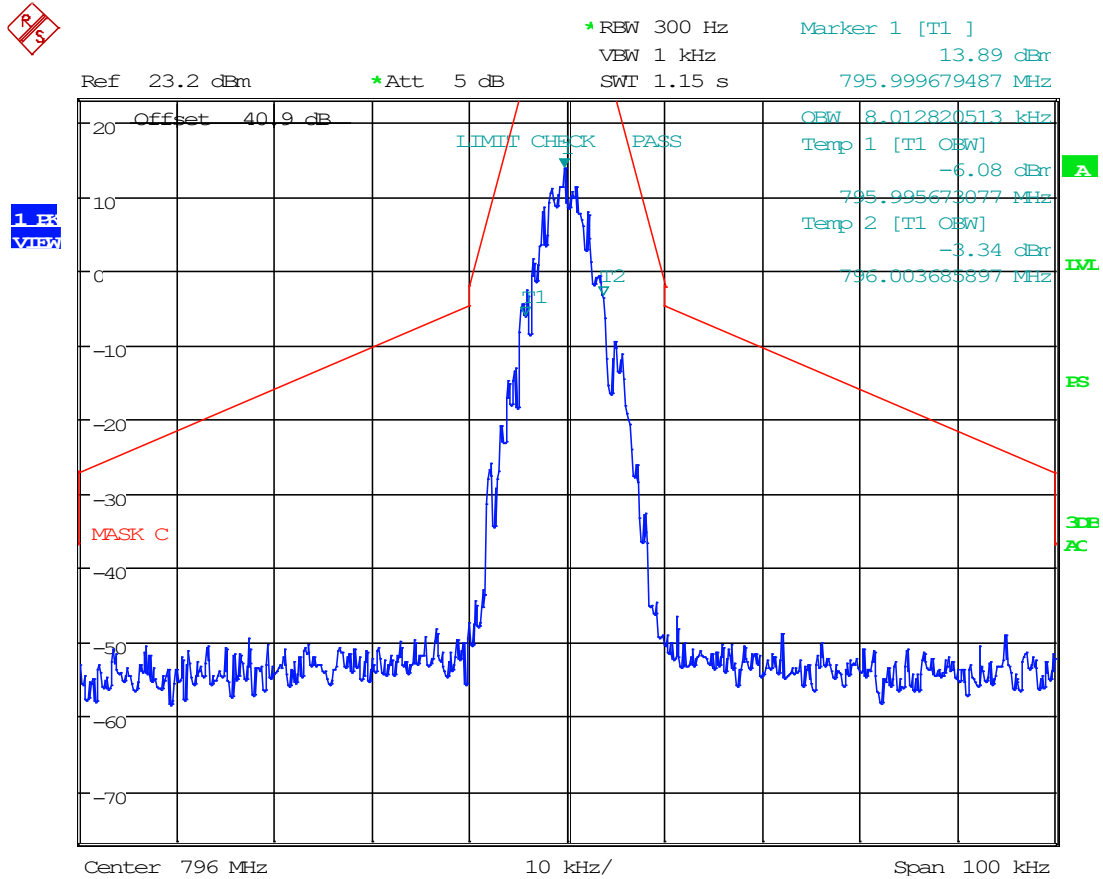
8.5.24 25 kHz FM, UL Mask C, AGC+3, 796 MHz



Date: 2.FEB.2023 11:40:15

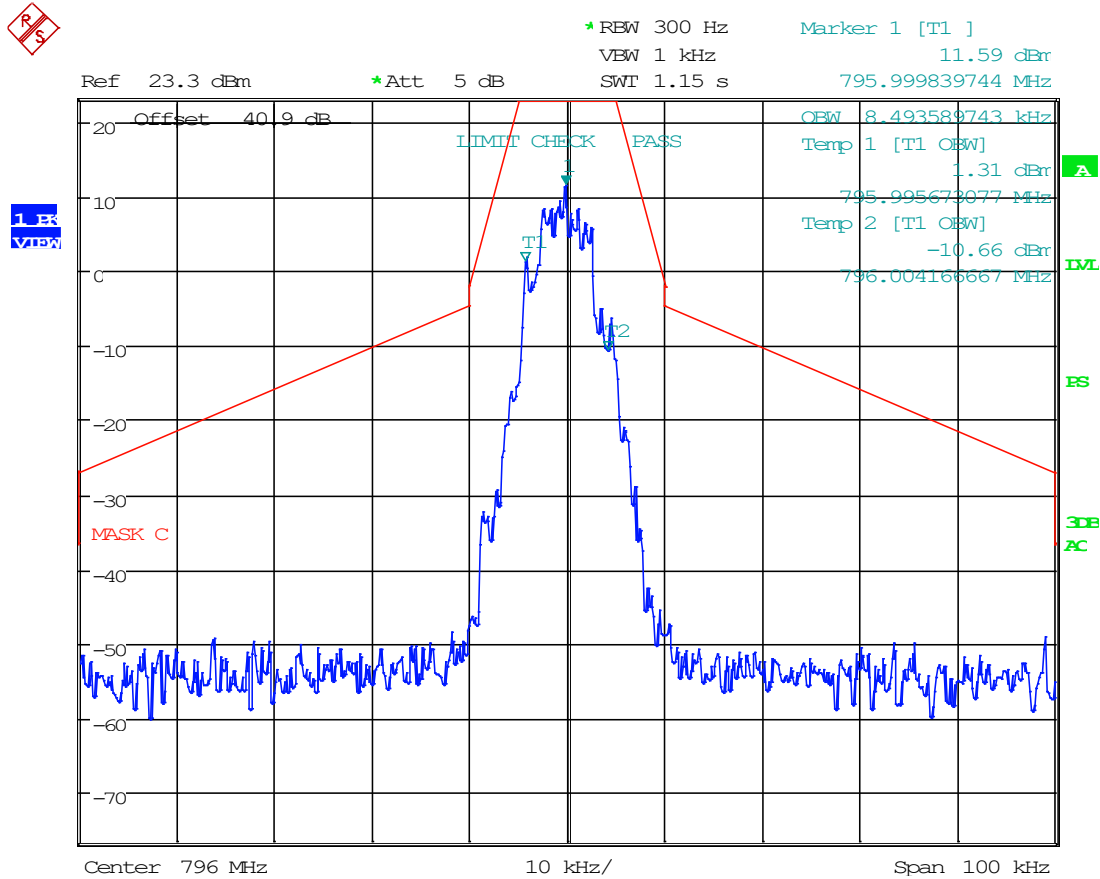


8.5.25 C4FM, UL Mask C, AGC, 796 MHz



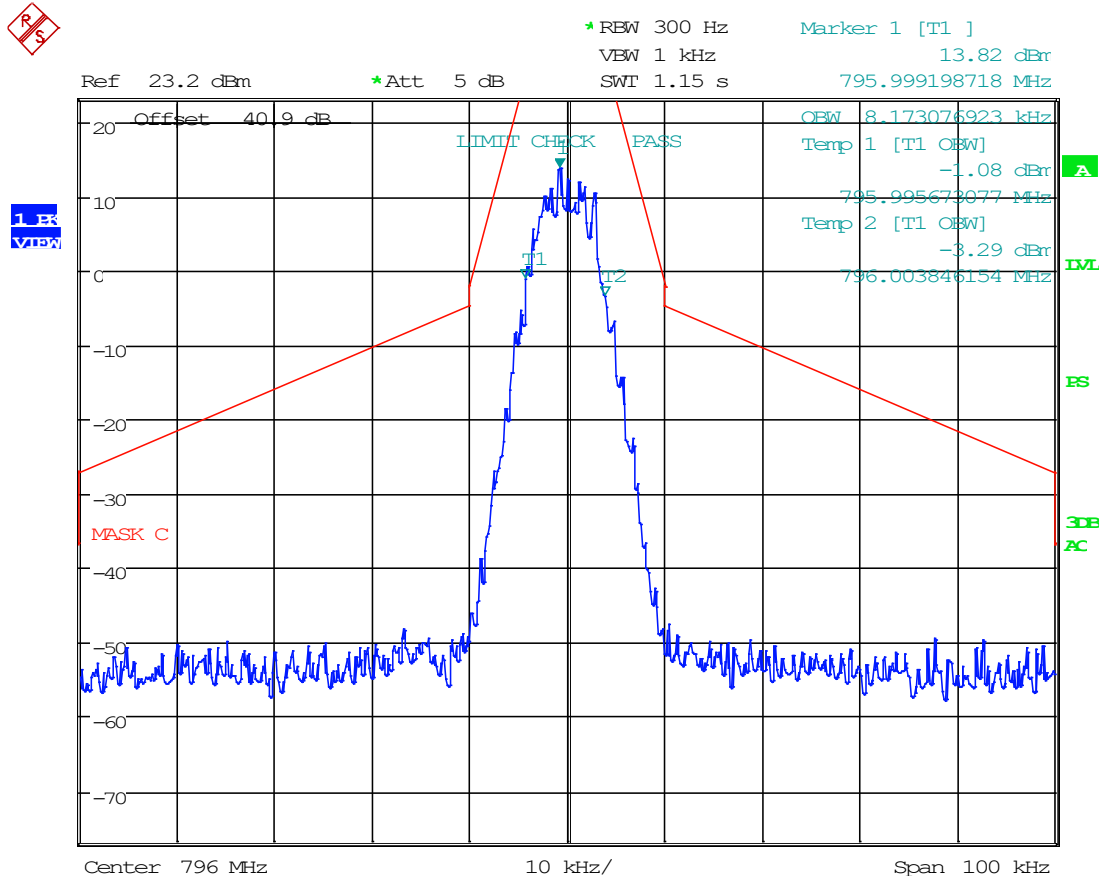
Date: 2.FEB.2023 10:24:01

8.5.26 C4FM, UL Mask C, AGC+3, 796 MHz



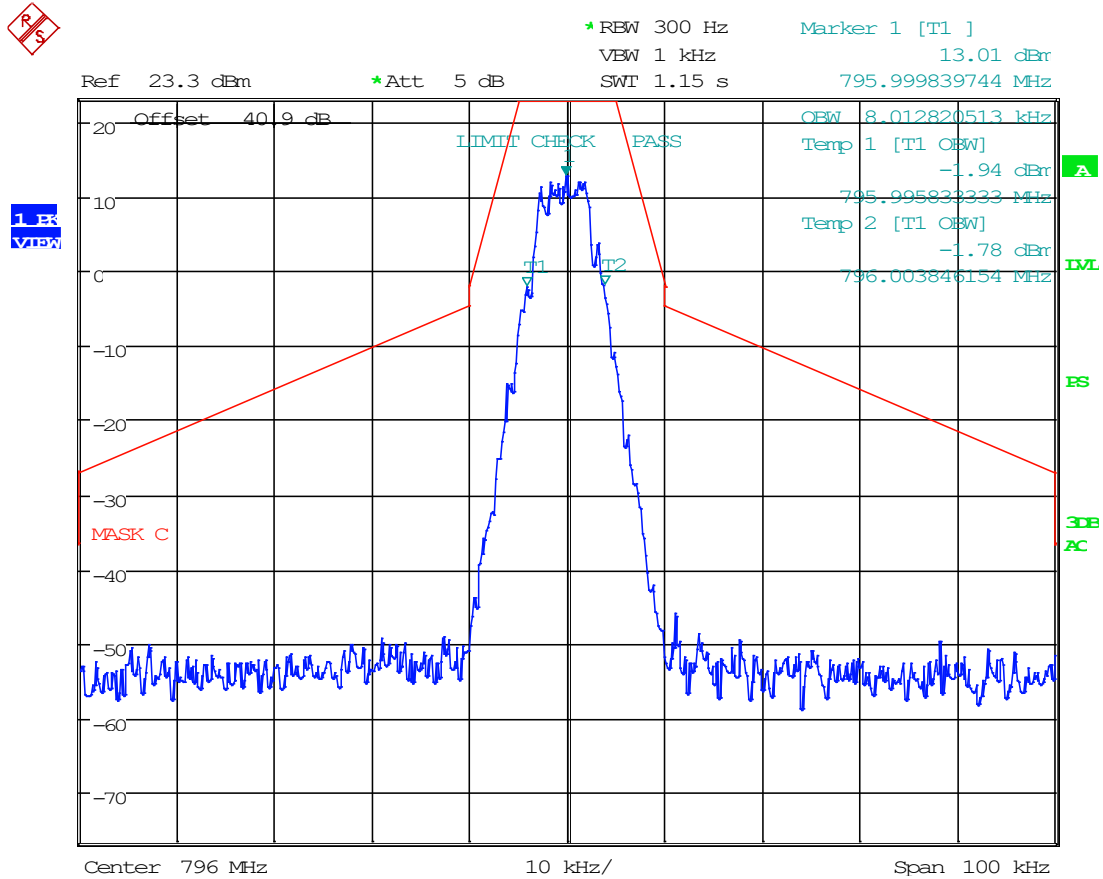
Date: 2.FEB.2023 11:41:53

8.5.27 H-CPM, UL Mask C, AGC, 796 MHz



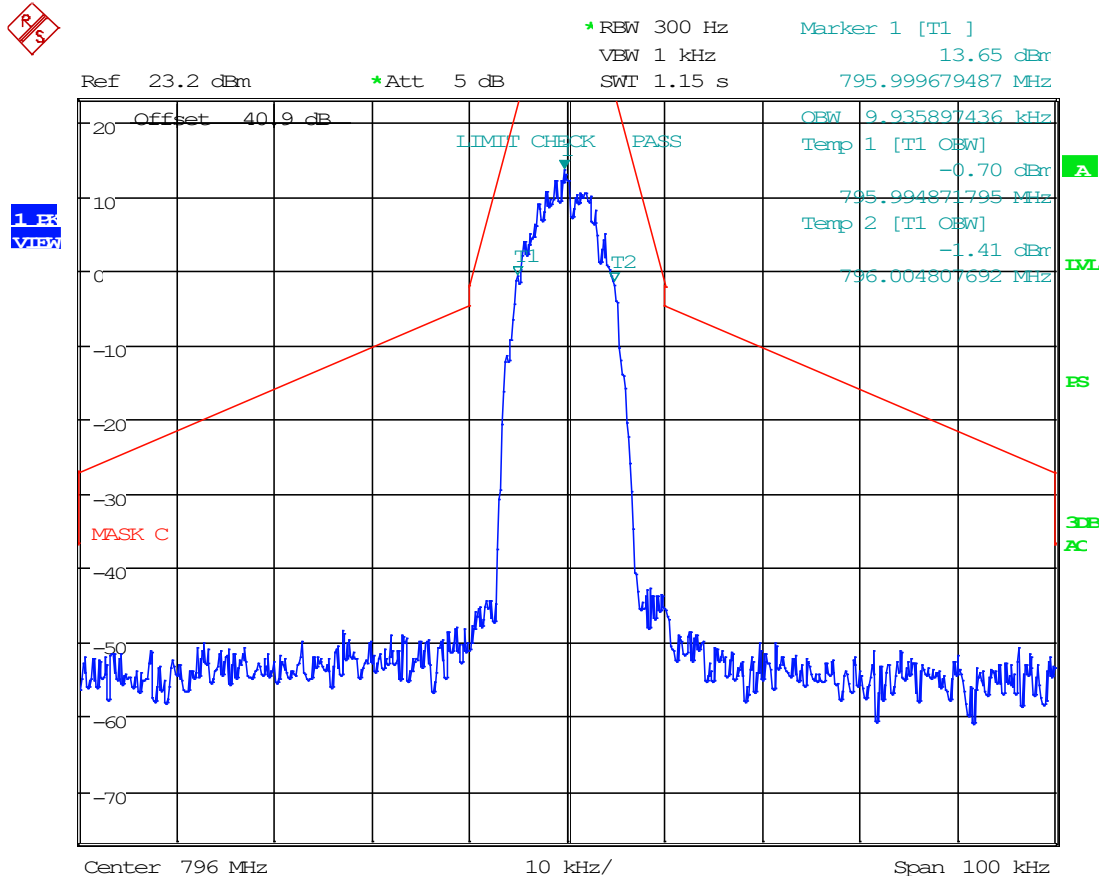
Date: 2.FEB.2023 10:25:04

8.5.28 H-CPM, UL Mask C, AGC+3, 796 MHz



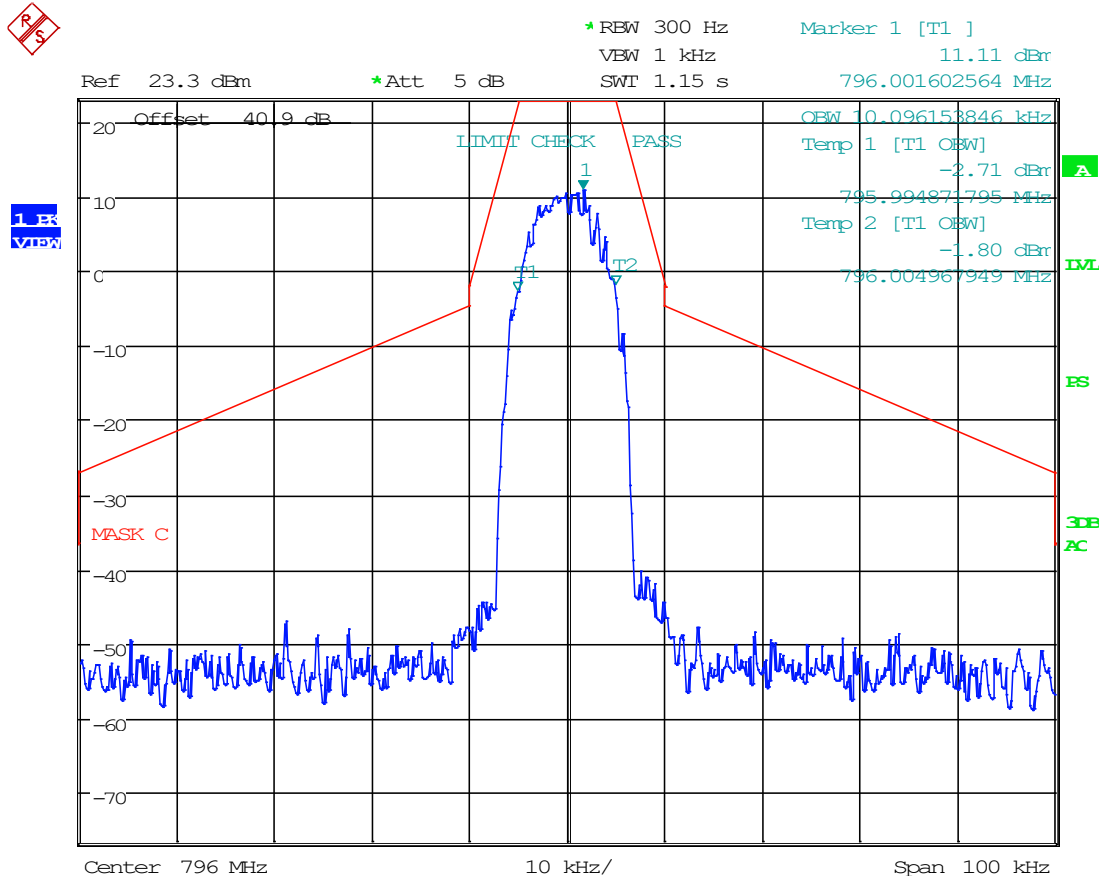
Date: 2.FEB.2023 11:42:58

8.5.29 H-DQPSK, UL Mask C, AGC, 796 MHz



Date: 2.FEB.2023 10:25:54

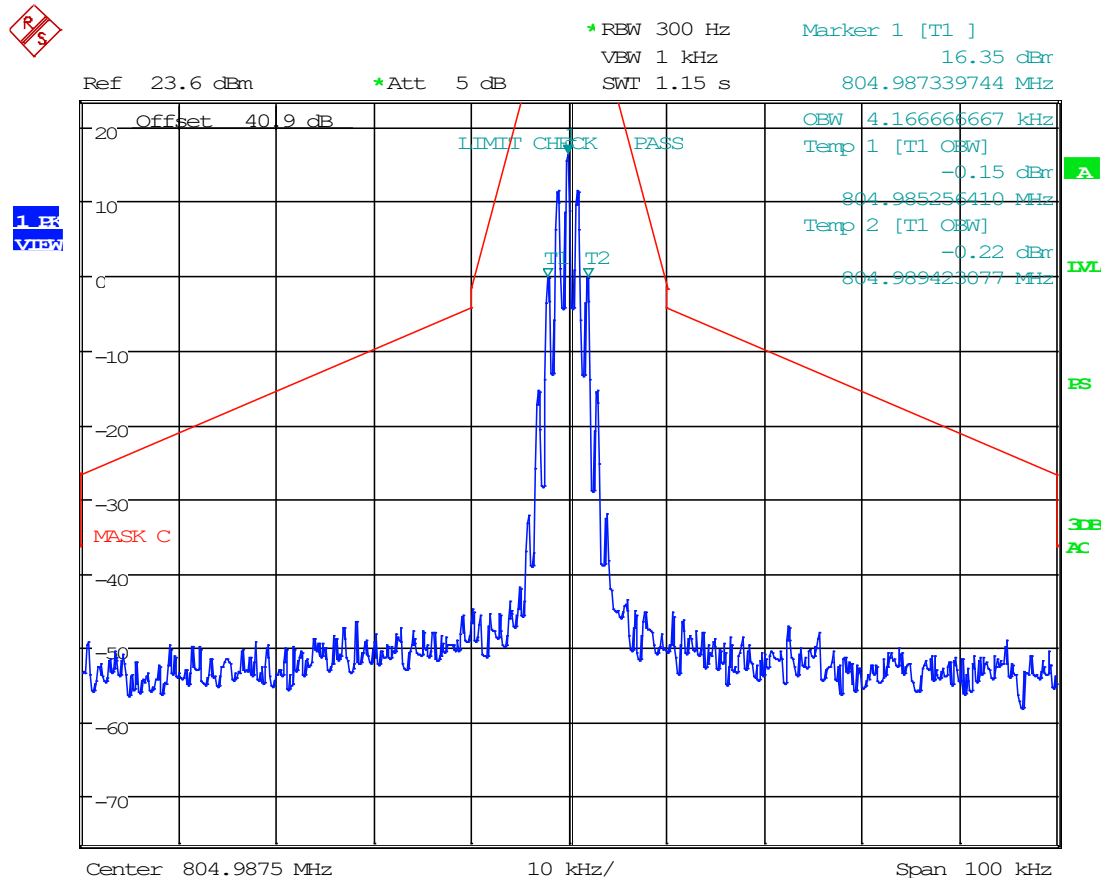
8.5.30 H-DQPSK, UL Mask C, AGC+3, 796 MHz



Date: 2.FEB.2023 11:43:51



8.5.31 6.25 kHz, FM, UL Mask C, AGC, 804.9875 MHz

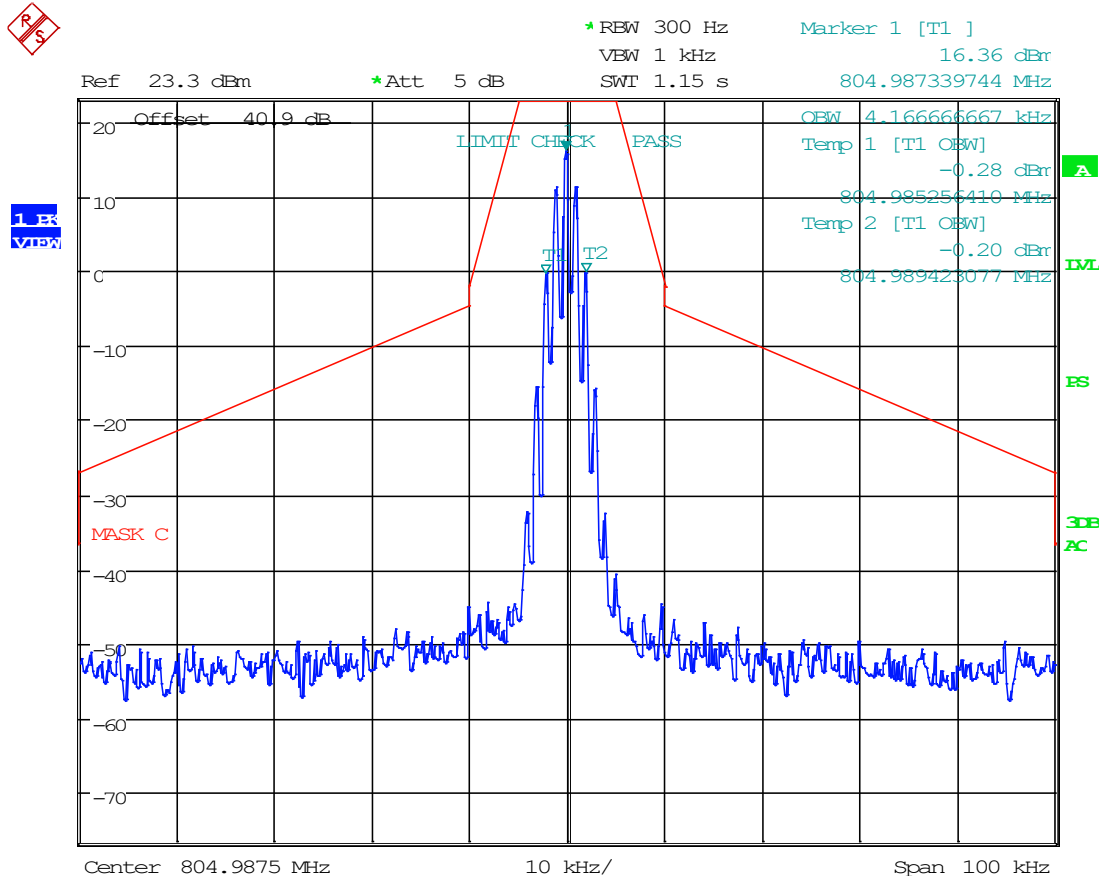


Date: 2.FEB.2023 10:27:52



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

8.5.32 6.25 kHz, FM, UL Mask C, AGC+3, 804.9875 MHz

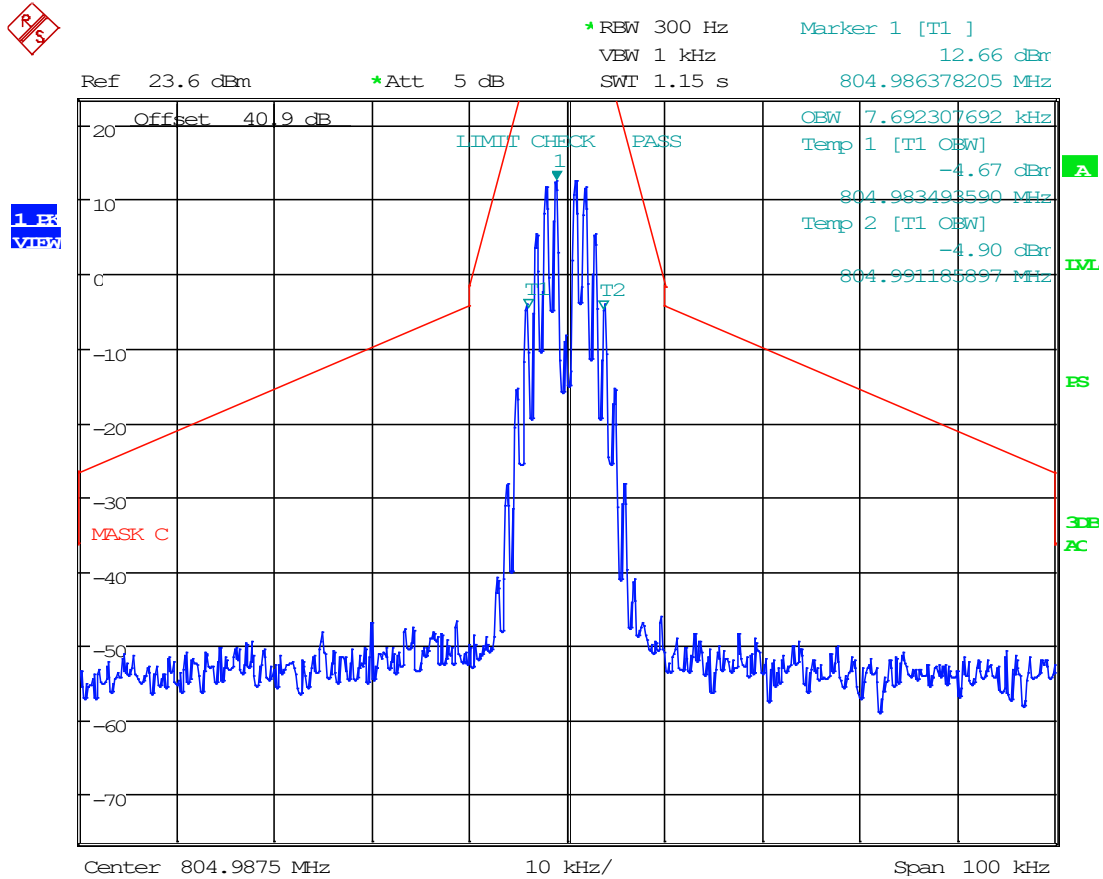


Date: 2.FEB.2023 11:45:13



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

8.5.33 12.5 kHz, FM, UL Mask C, AGC, 804.9875 MHz

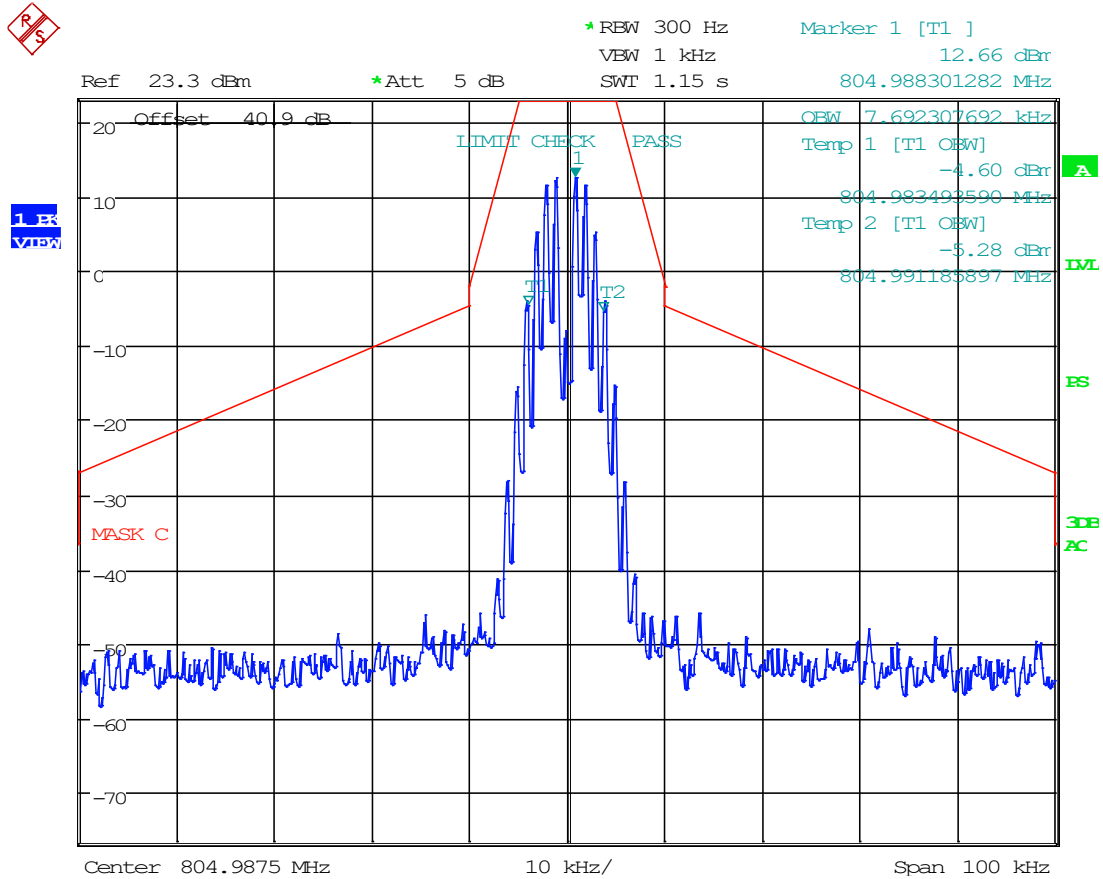


Date: 2.FEB.2023 10:28:48



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

8.5.34 12.5 kHz, FM, UL Mask C, AGC+3, 804.9875 MHz

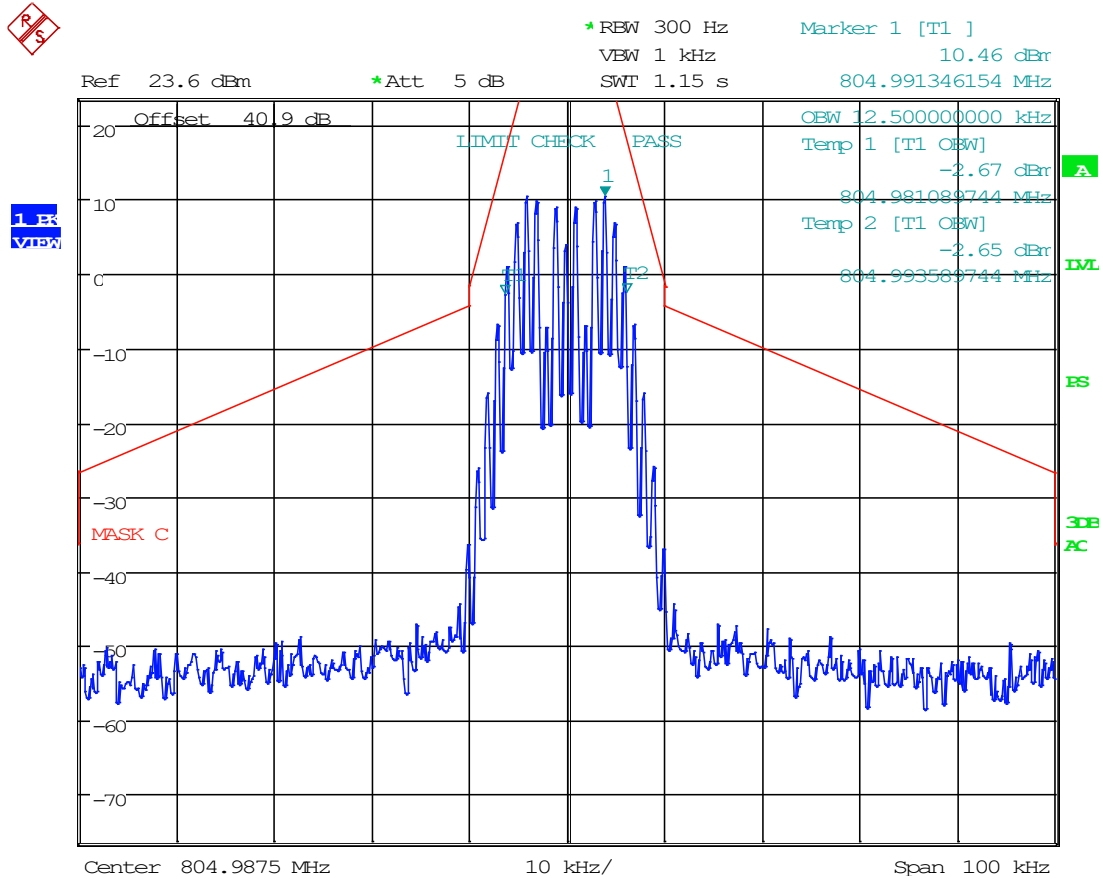


Date: 2.FEB.2023 11:46:12



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

8.5.35 25 kHz FM, UL Mask C, AGC, 804.9875 MHz

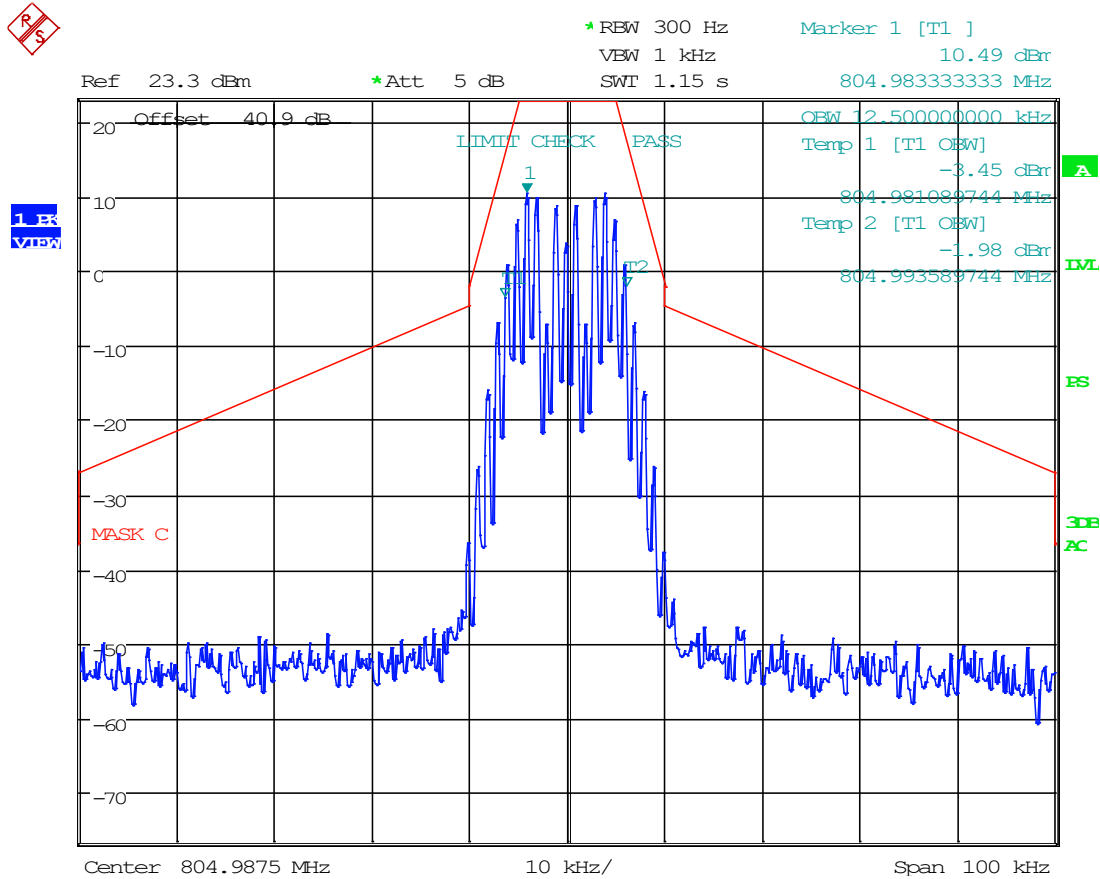


Date: 2.FEB.2023 10:29:55



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

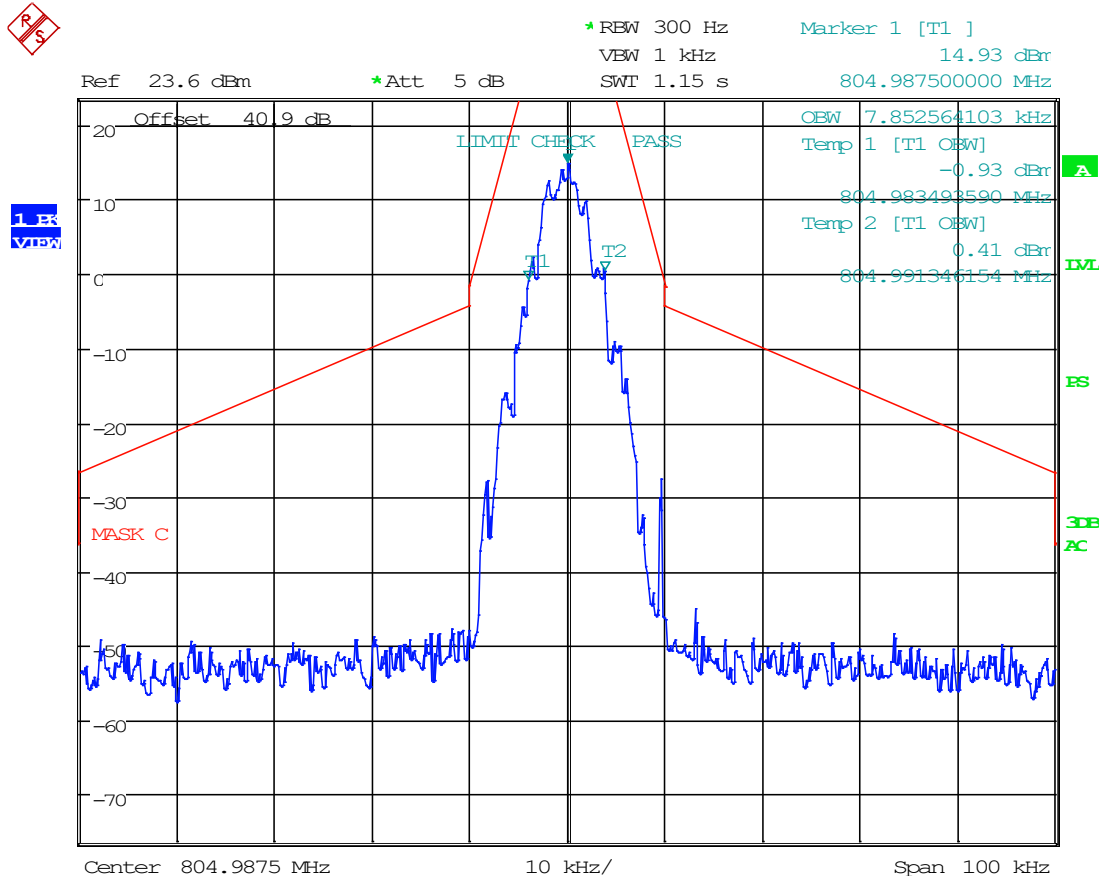
8.5.36 25 kHz FM, UL Mask C, AGC+3, 804.9875 MHz



Date: 2.FEB.2023 11:46:58



8.5.37 C4FM, UL Mask C, AGC, 804.9875 MHz

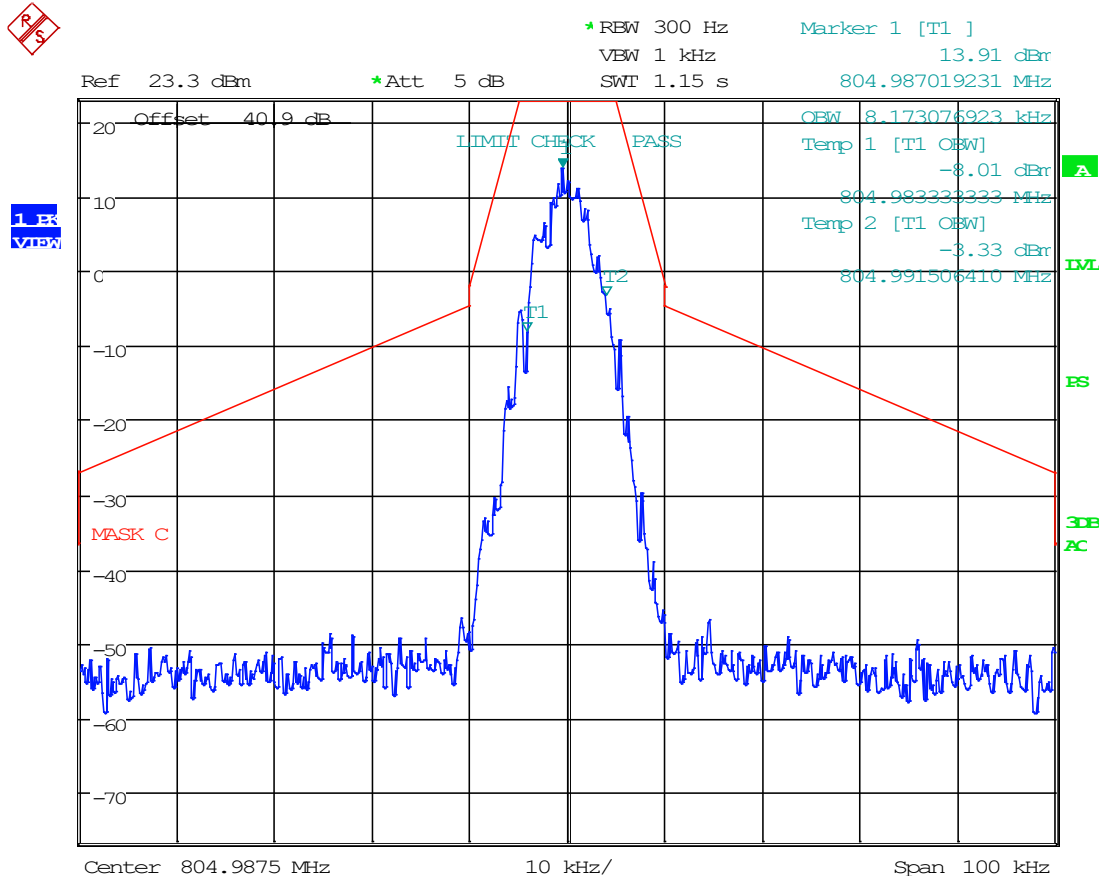


Date: 2.FEB.2023 10:30:51



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

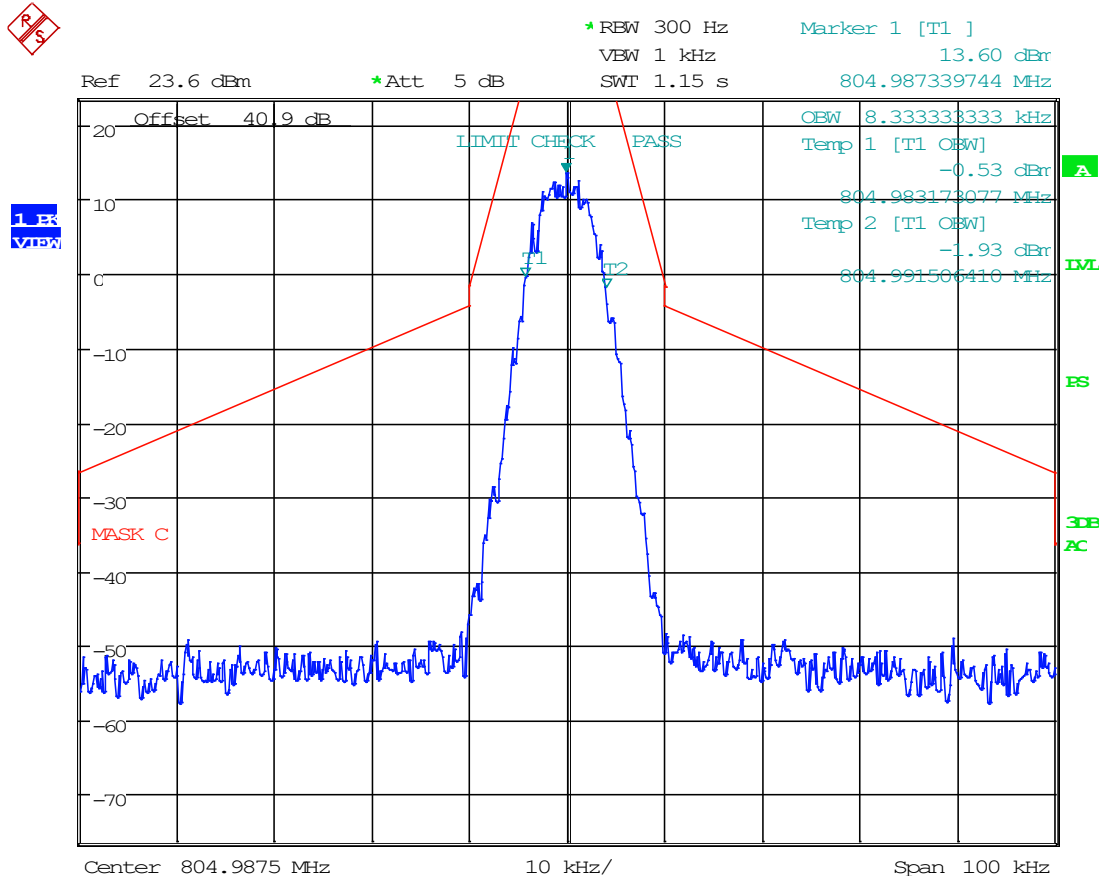
8.5.38 C4FM, UL Mask C, AGC+3, 804.9875 MHz



Date: 2.FEB.2023 11:49:33



8.5.39 H-CPM, UL Mask C, AGC, 804.9875 MHz

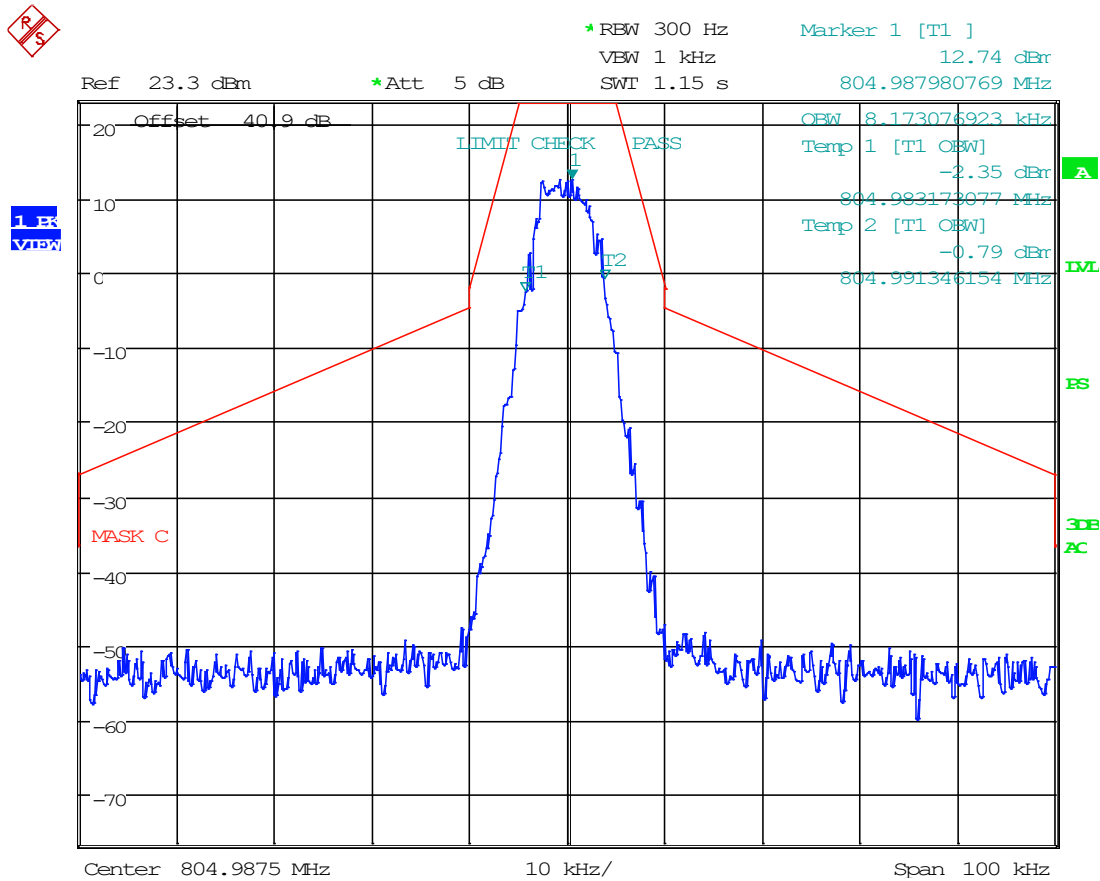


Date: 2.FEB.2023 10:32:00



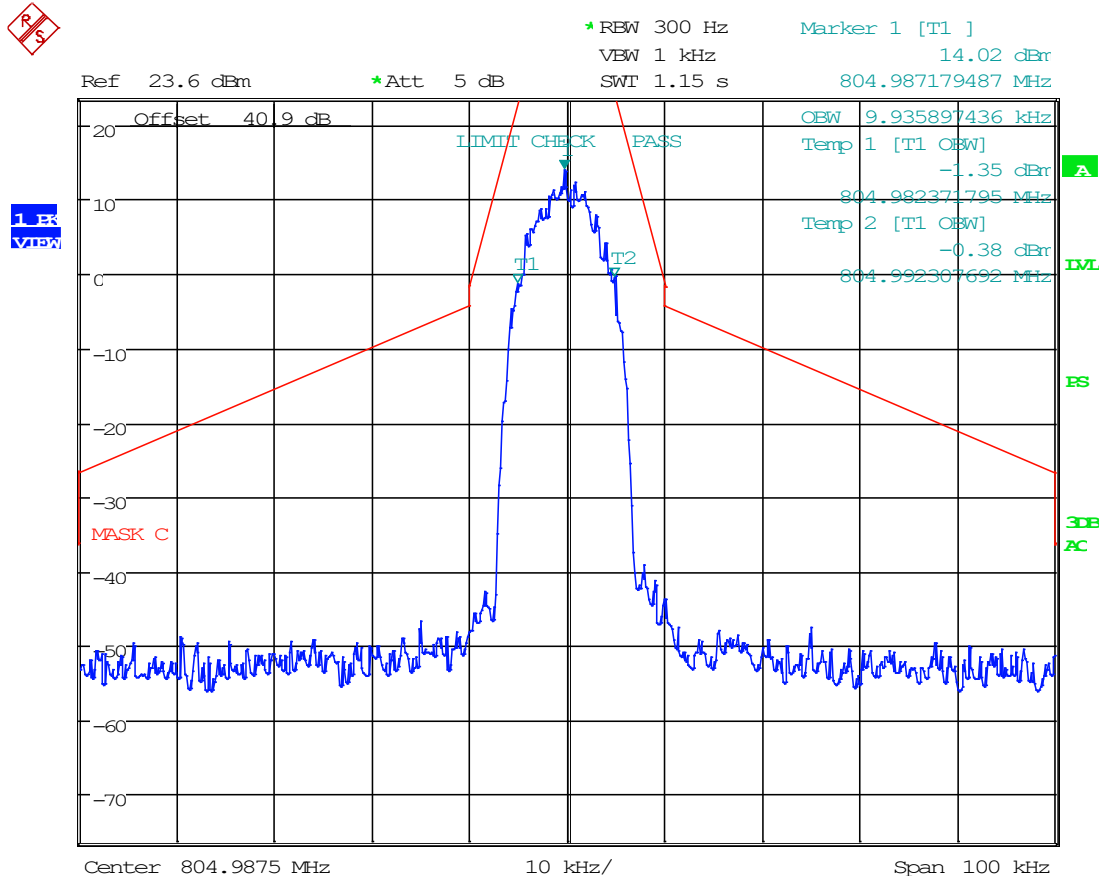
Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

8.5.40 H-CPM, UL Mask C, AGC+3, 804.9875 MHz



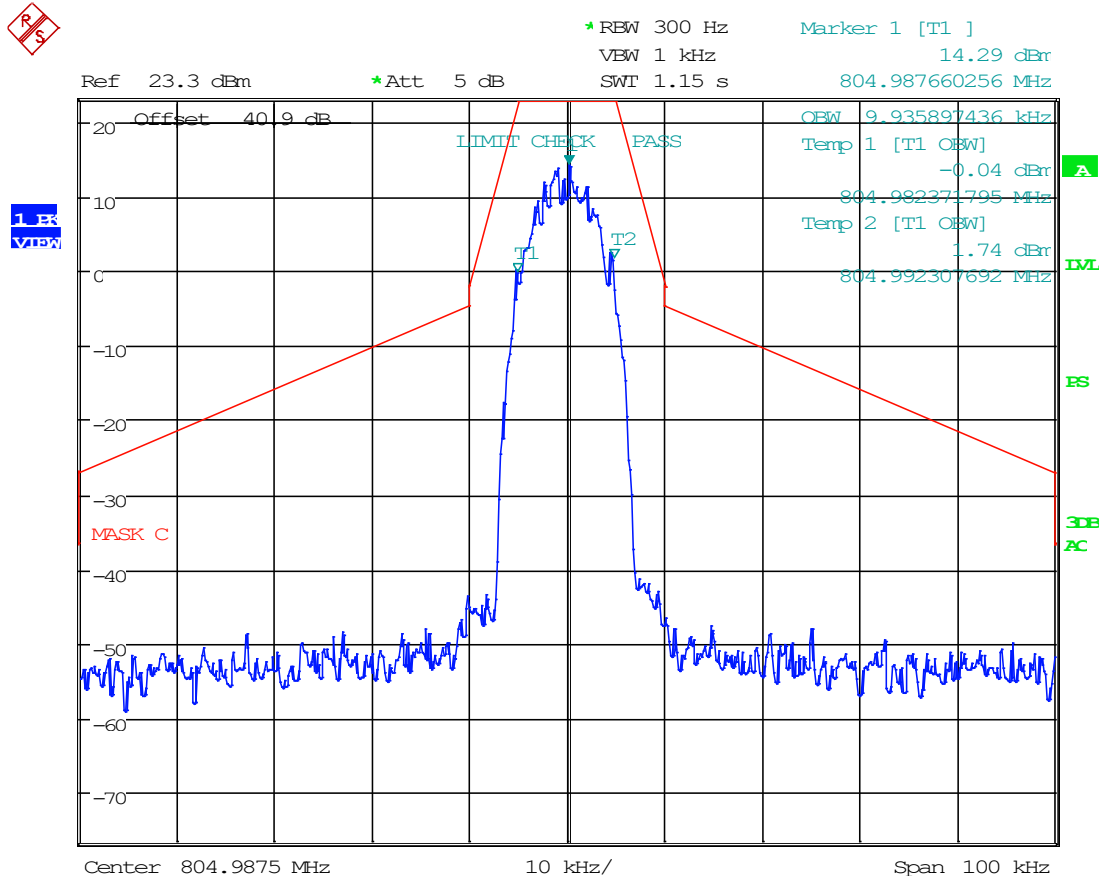
Date: 2.FEB.2023 11:50:30

8.5.41 H-DQPSK, UL Mask C, AGC, 804.9875 MHz



Date: 2.FEB.2023 10:32:58

8.5.42 H-DQPSK, UL Mask C, AGC+3, 804.9875 MHz

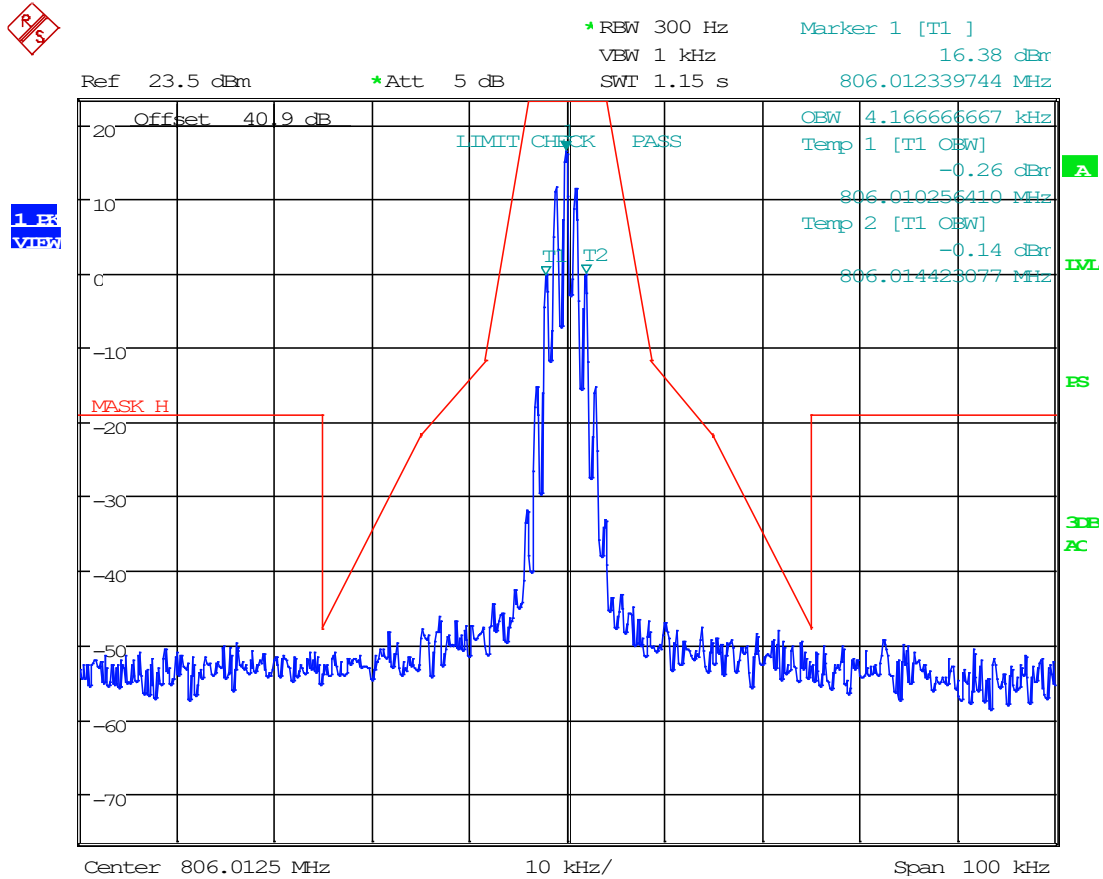


Date: 2.FEB.2023 11:51:14



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

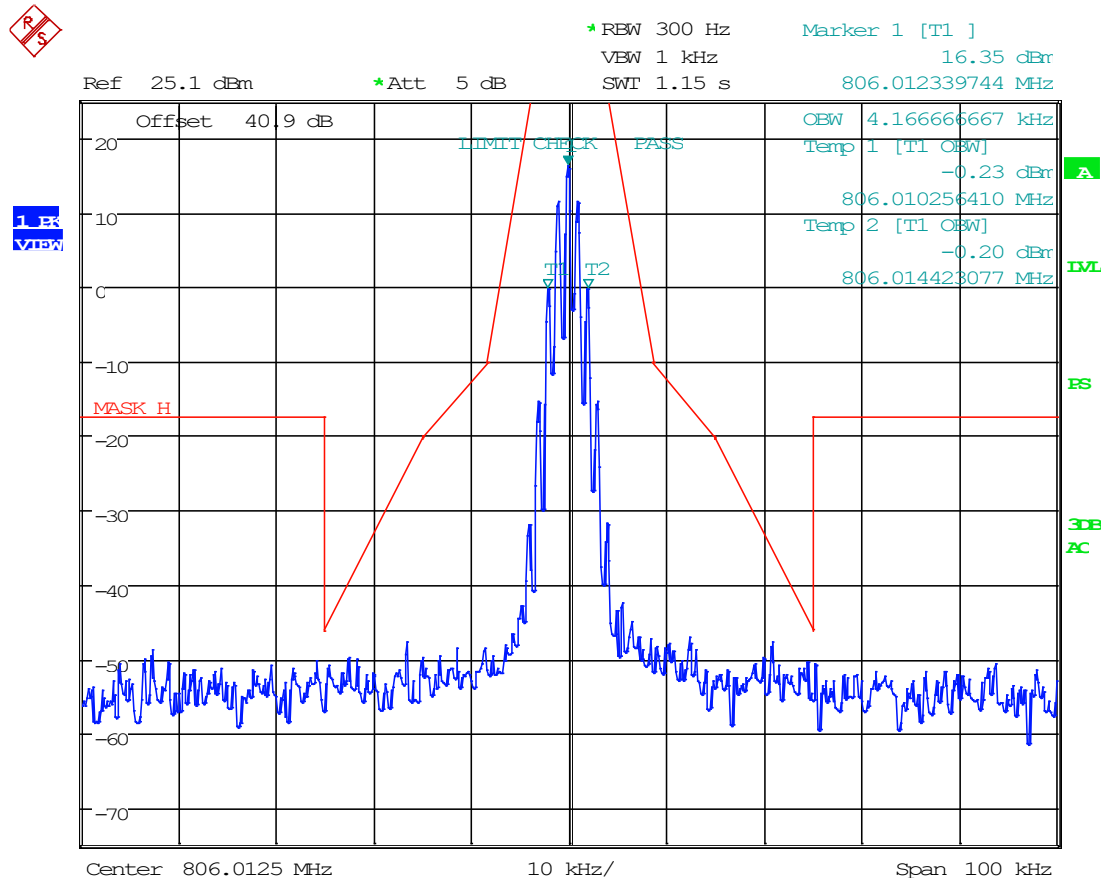
8.5.43 6.25 kHz, FM, UL Mask H, AGC, 806.0125 MHz



Date: 2.FEB.2023 14:27:04



8.5.44 6.25 kHz, FM, UL Mask H, AGC+3, 806.0125 MHz

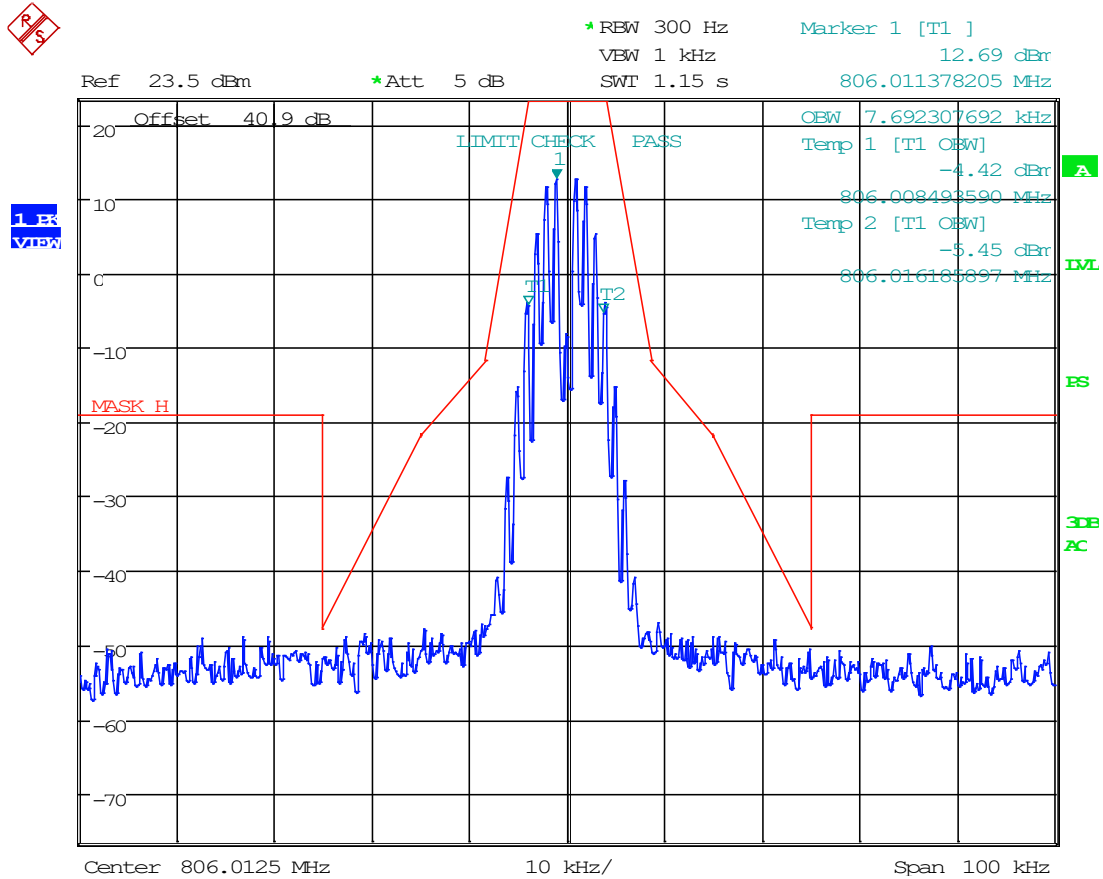


Date: 2.FEB.2023 14:34:06



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

8.5.45 12.5 kHz, FM, UL Mask H, AGC, 806.0125 MHz

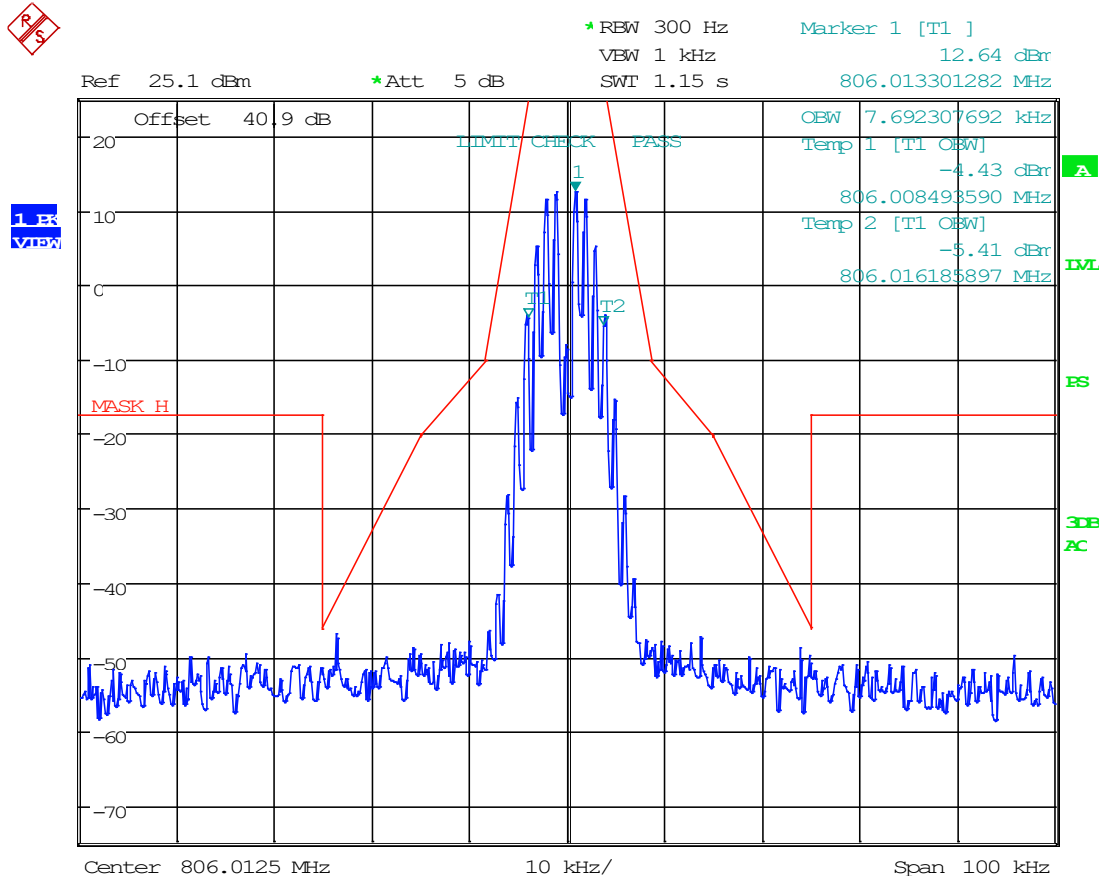


Date: 2.FEB.2023 14:27:51



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

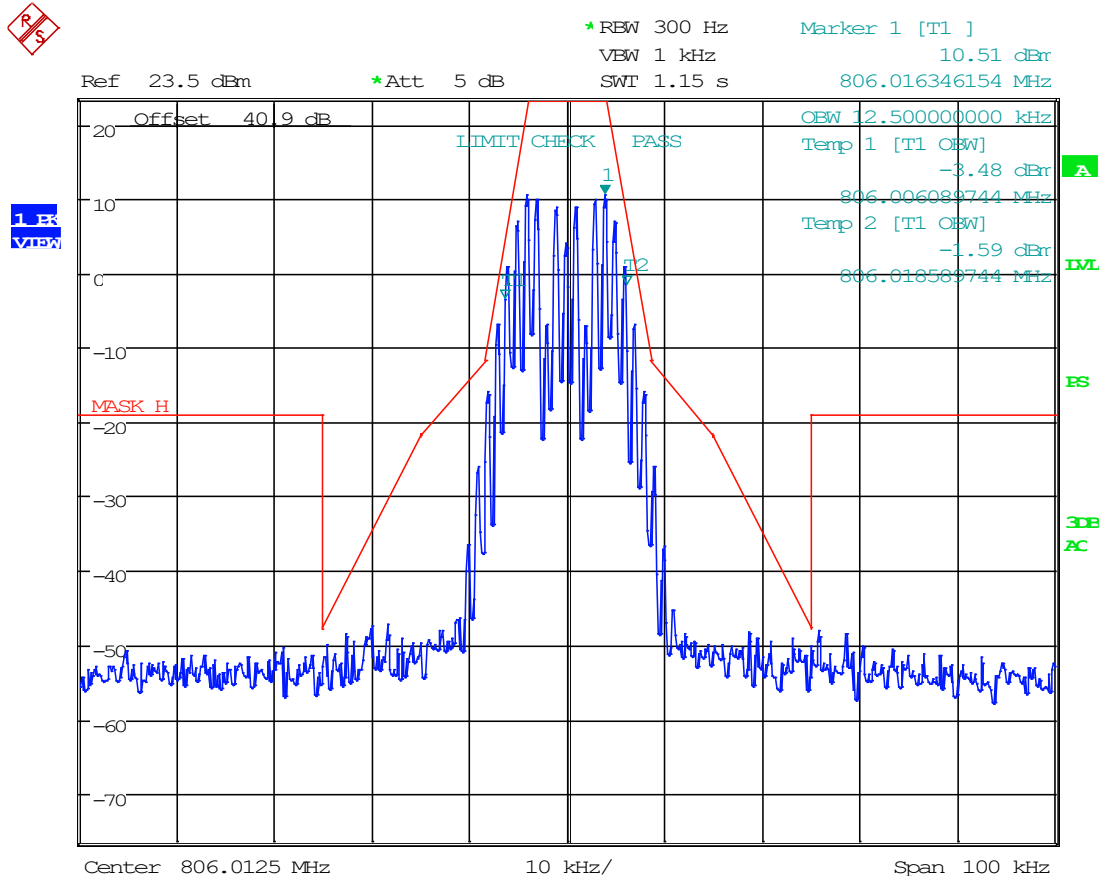
8.5.46 12.5 kHz, FM, UL Mask H, AGC+3, 806.0125 MHz



Date: 2.FEB.2023 14:35:39



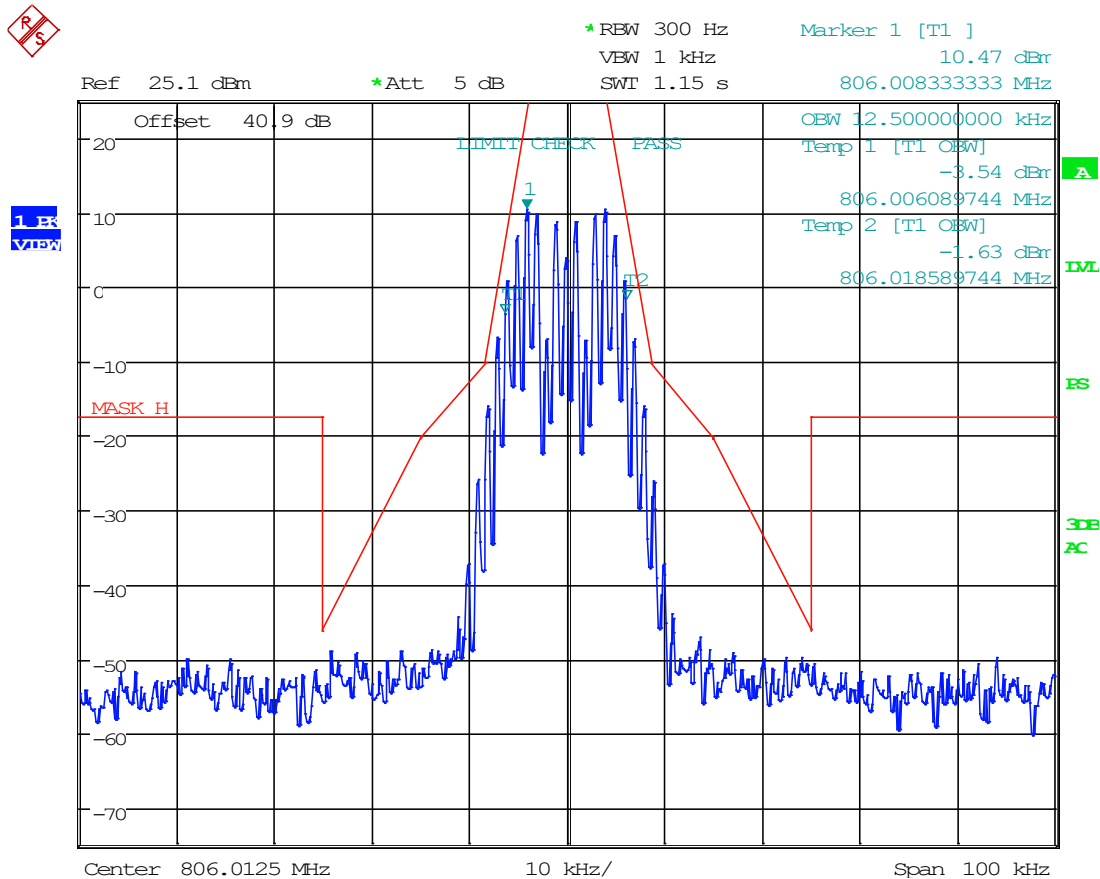
8.5.47 25 kHz FM, UL Mask H, AGC, 806.0125 MHz



Date: 2.FEB.2023 14:28:42



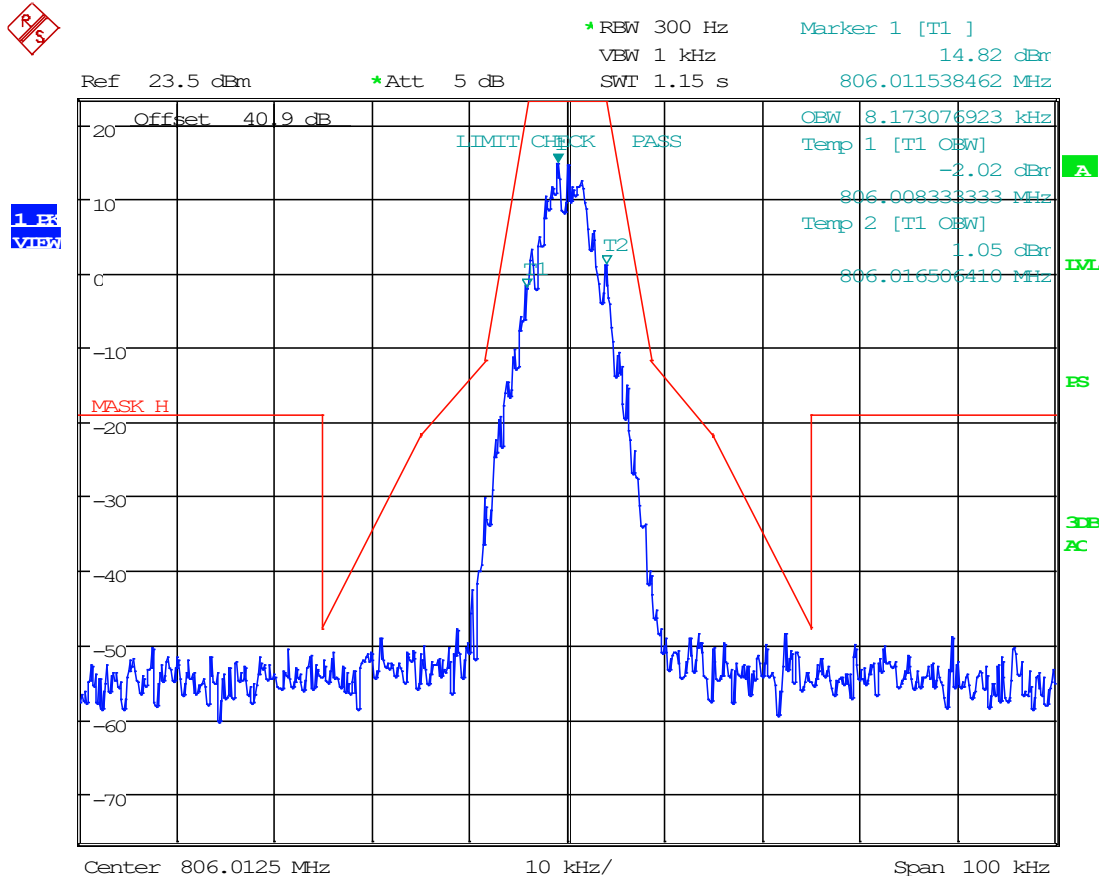
8.5.48 25 kHz FM, UL Mask H, AGC+3, 806.0125 MHz



Date: 2.FEB.2023 14:36:19



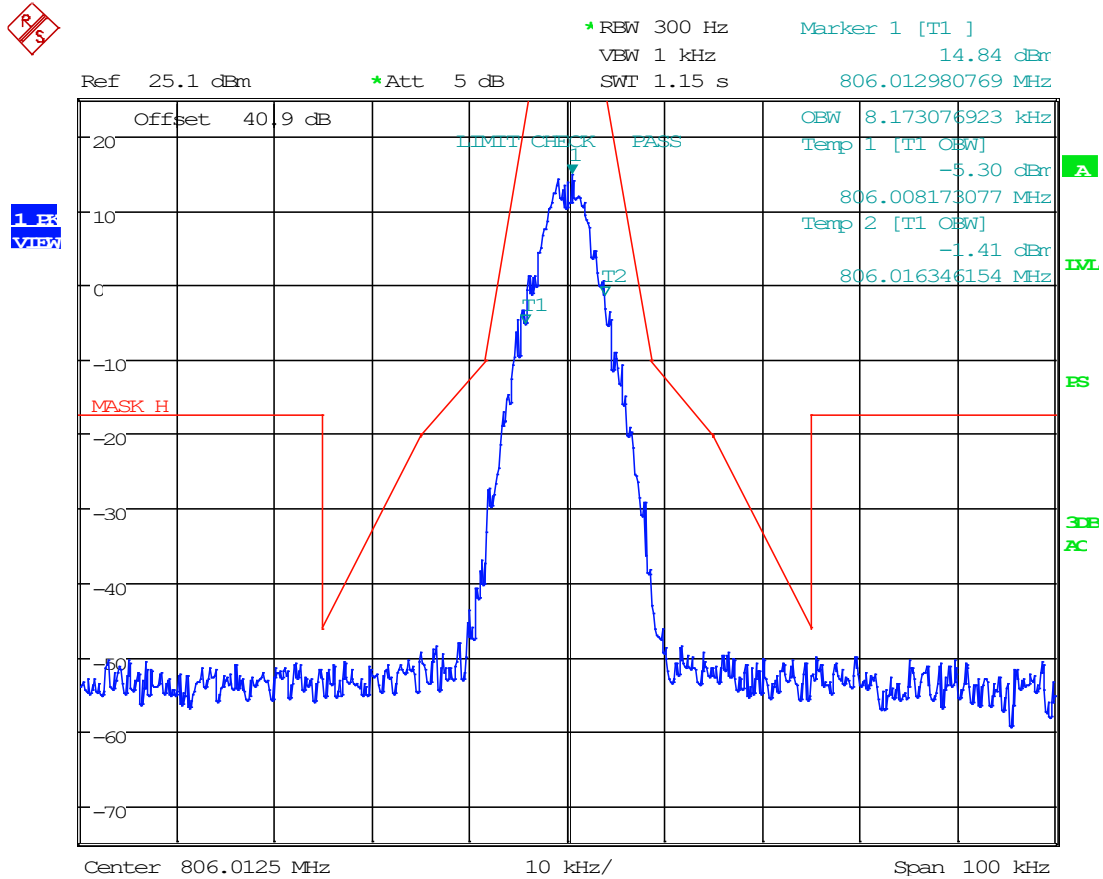
8.5.49 C4FM, UL Mask H, AGC, 806.0125 MHz



Date: 2.FEB.2023 14:29:41



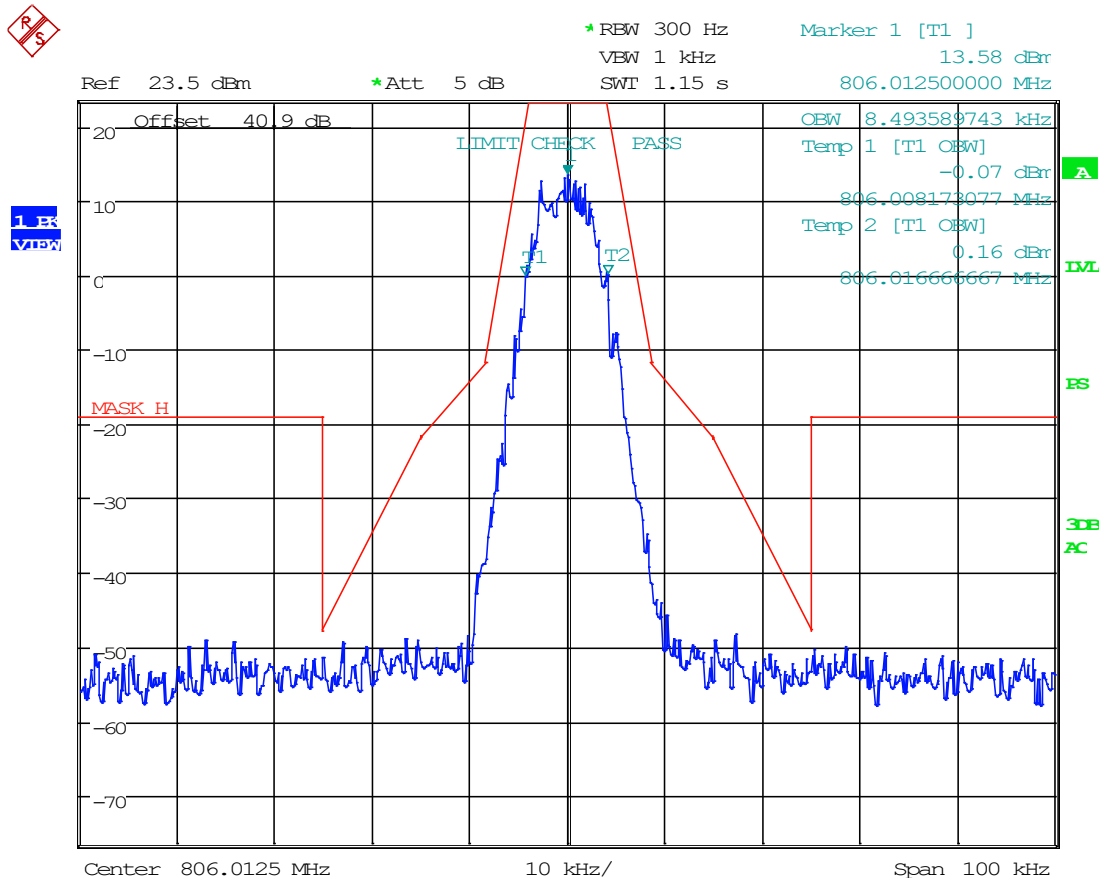
8.5.50 C4FM, UL Mask H, AGC+3, 806.0125 MHz



Date: 2.FEB.2023 14:37:22



8.5.51 H-CPM, UL Mask H, AGC, 806.0125 MHz

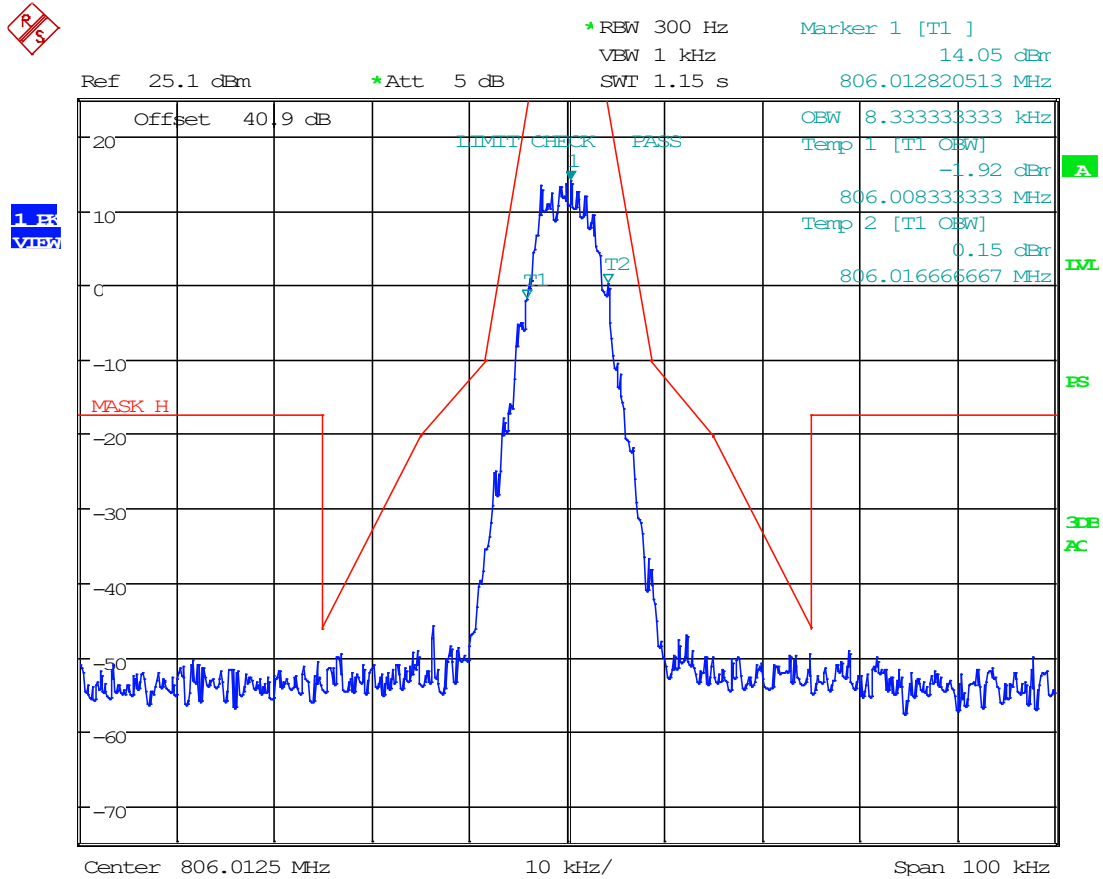


Date: 2.FEB.2023 14:30:43



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

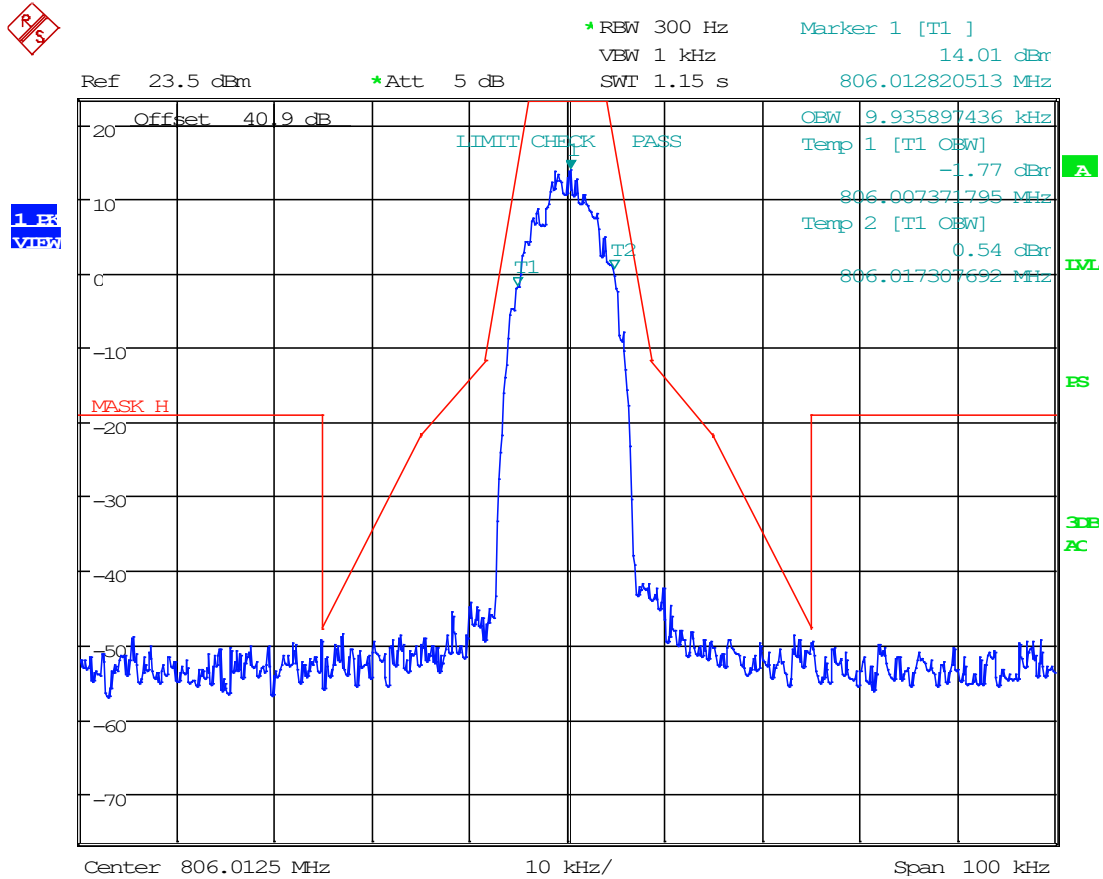
8.5.52 H-CPM, UL Mask H, AGC+3, 806.0125 MHz



Date: 2.FEB.2023 14:38:04

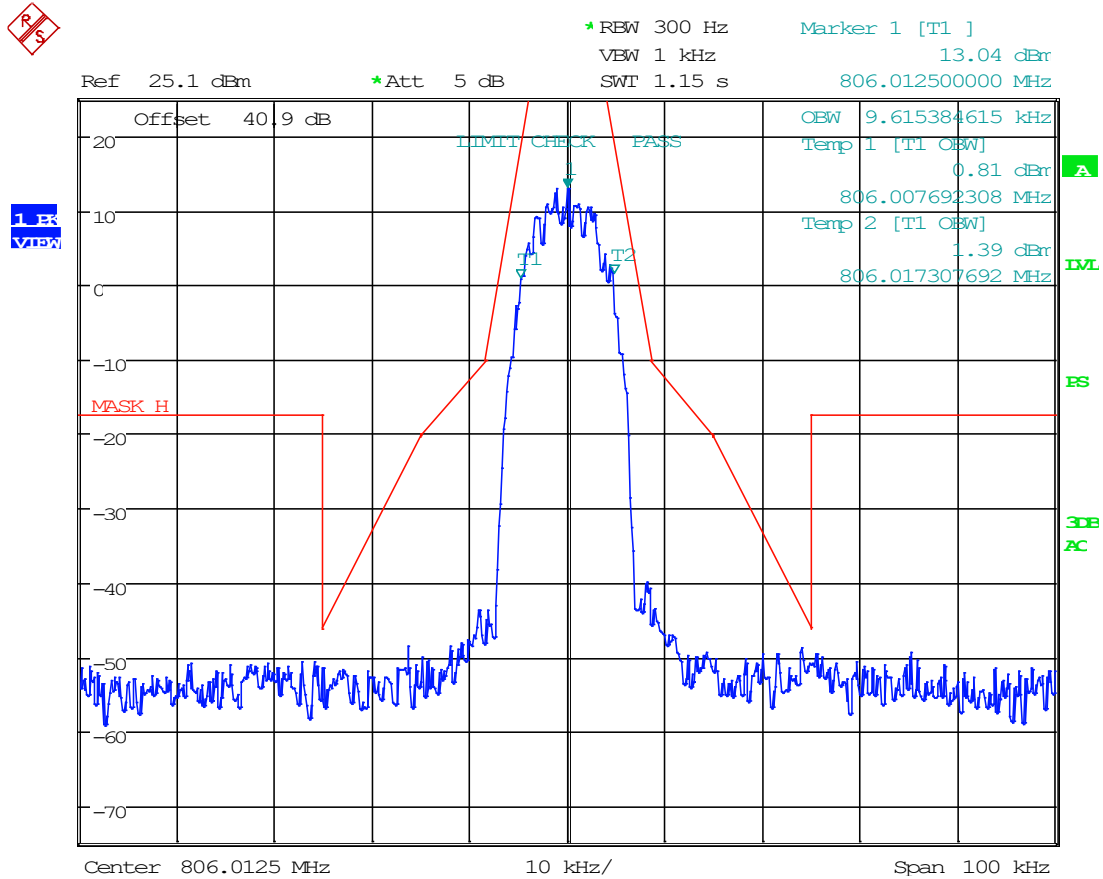


8.5.53 H-DQPSK, UL Mask H, AGC, 806.0125 MHz



Date: 2.FEB.2023 14:31:29

8.5.54 H-DQPSK, UL Mask H, AGC+3, 806.0125 MHz

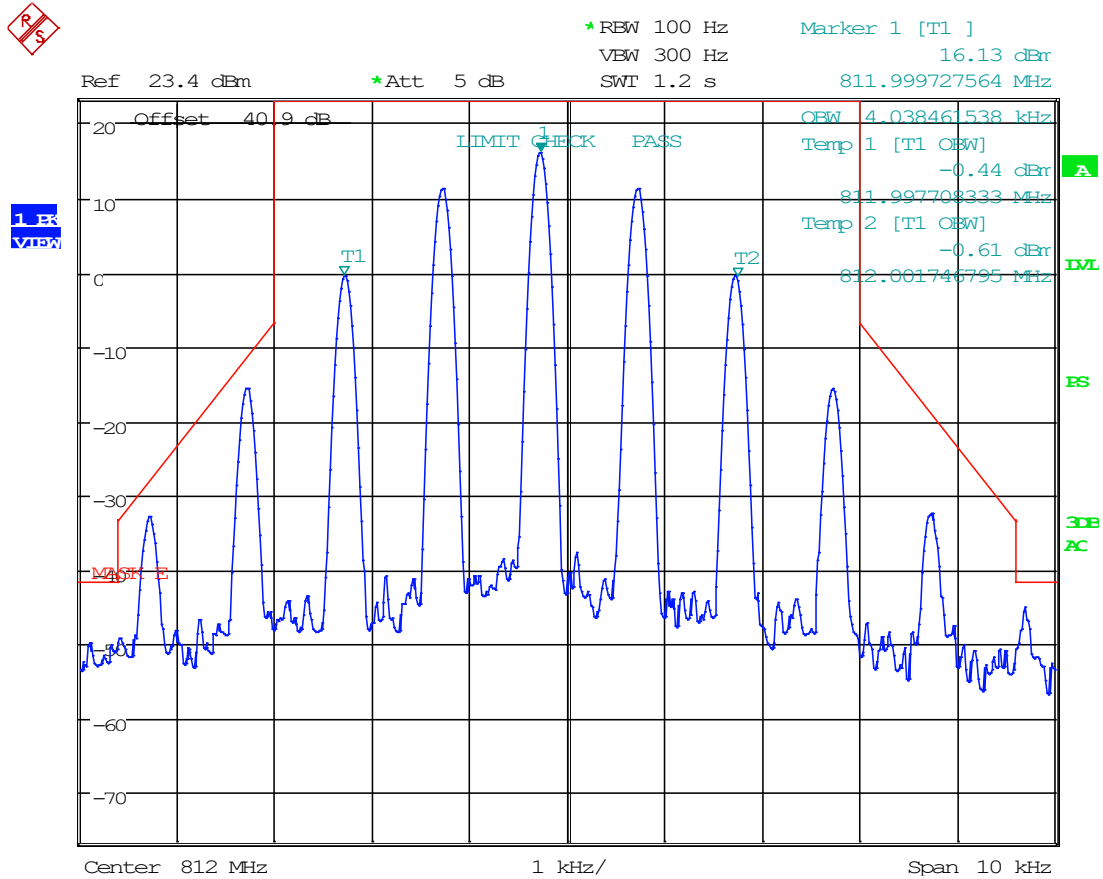


Date: 2.FEB.2023 14:39:06



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

8.5.55 6.25 kHz, FM, UL Mask E, AGC, 812 MHz

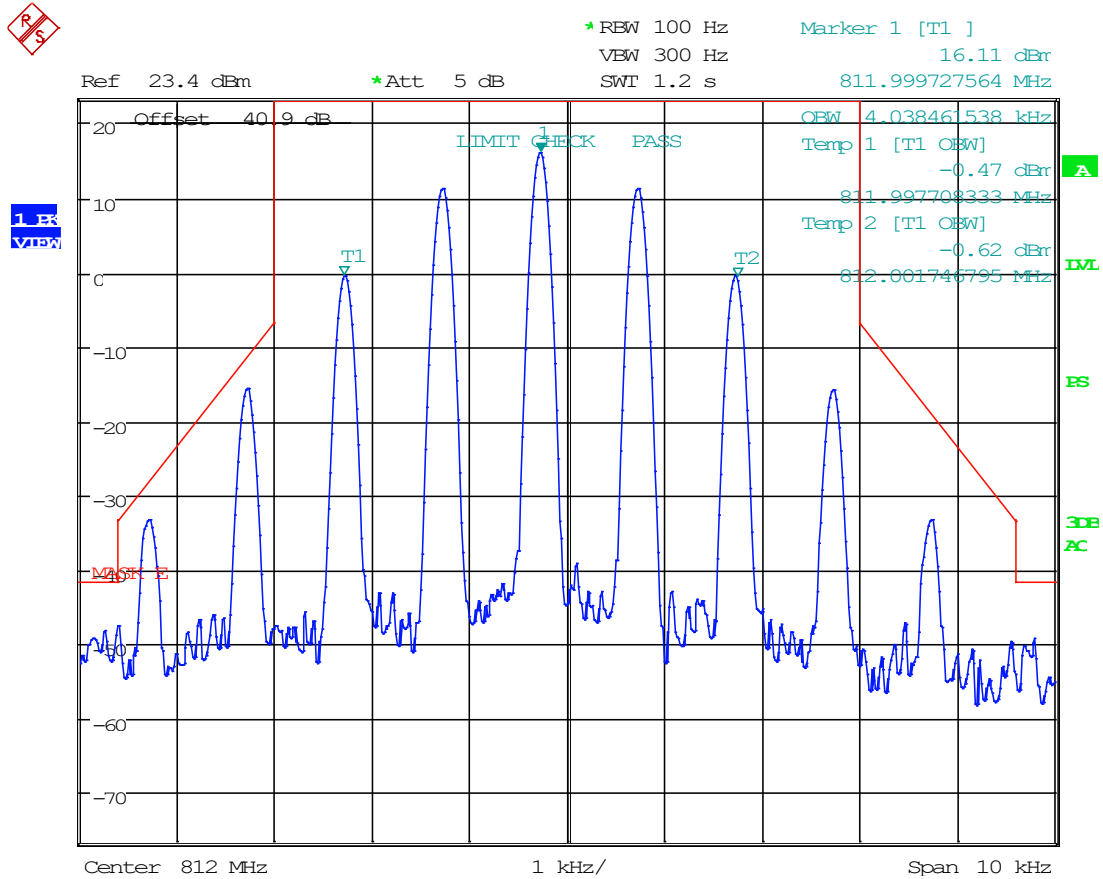


Date: 3.FEB.2023 08:41:39



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

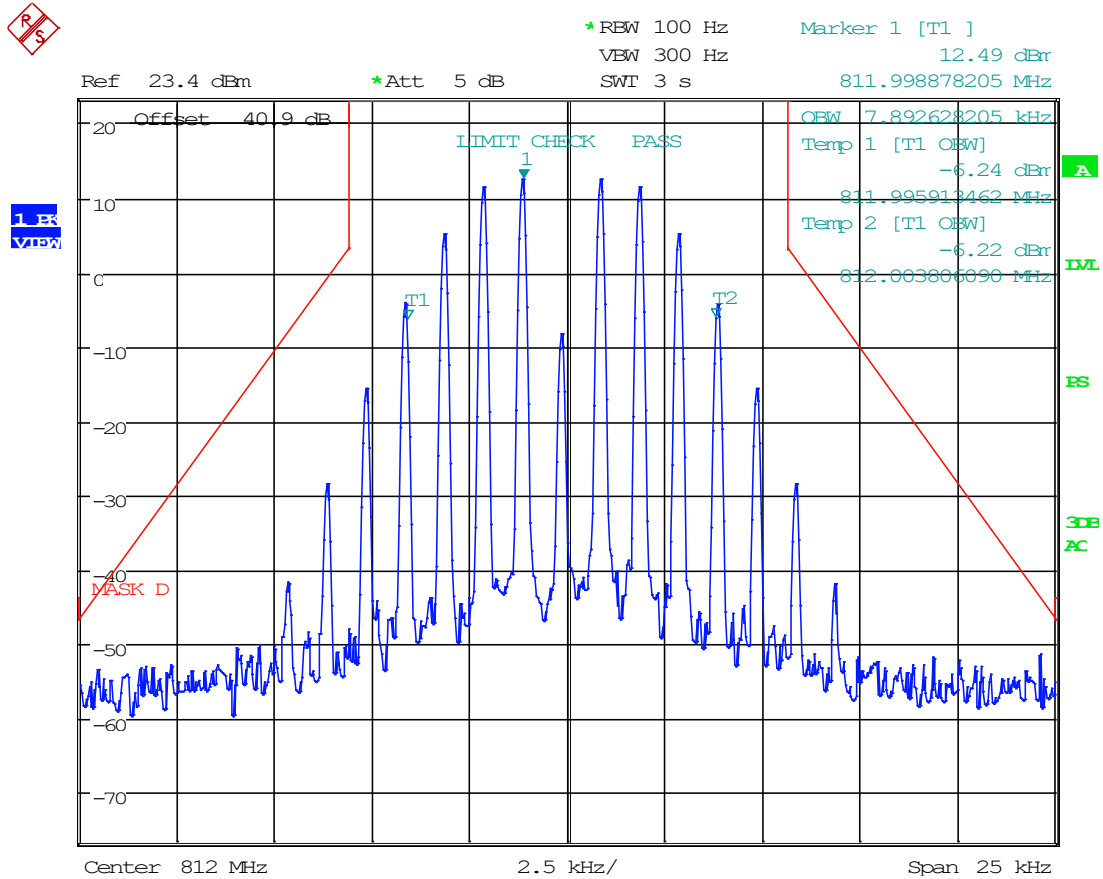
8.5.56 6.25 kHz, FM, UL Mask E, AGC+3, 812 MHz



Date: 3.FEB.2023 08:43:42



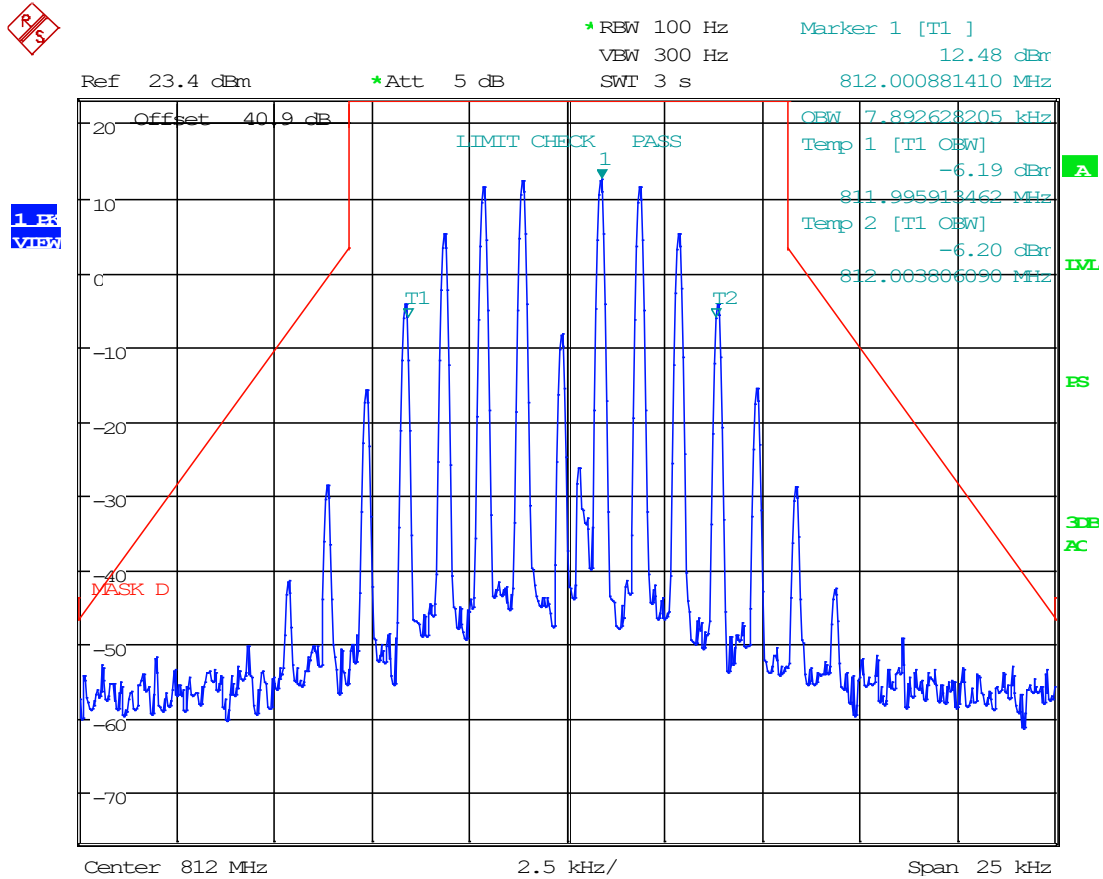
8.5.57 12.5 kHz, FM, UL Mask D, AGC, 812 MHz



Date: 2.FEB.2023 15:08:13



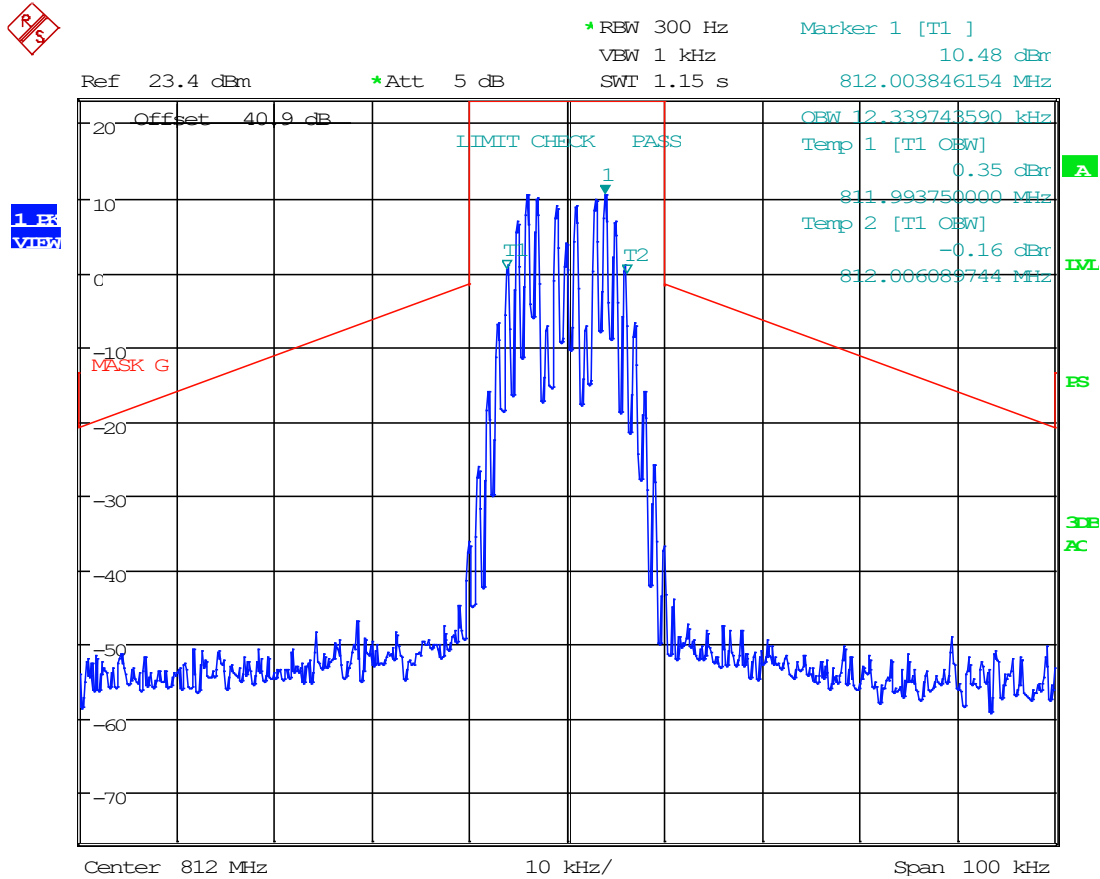
8.5.58 12.5 kHz, FM, UL Mask D, AGC+3, 812 MHz



Date: 2.FEB.2023 15:10:18



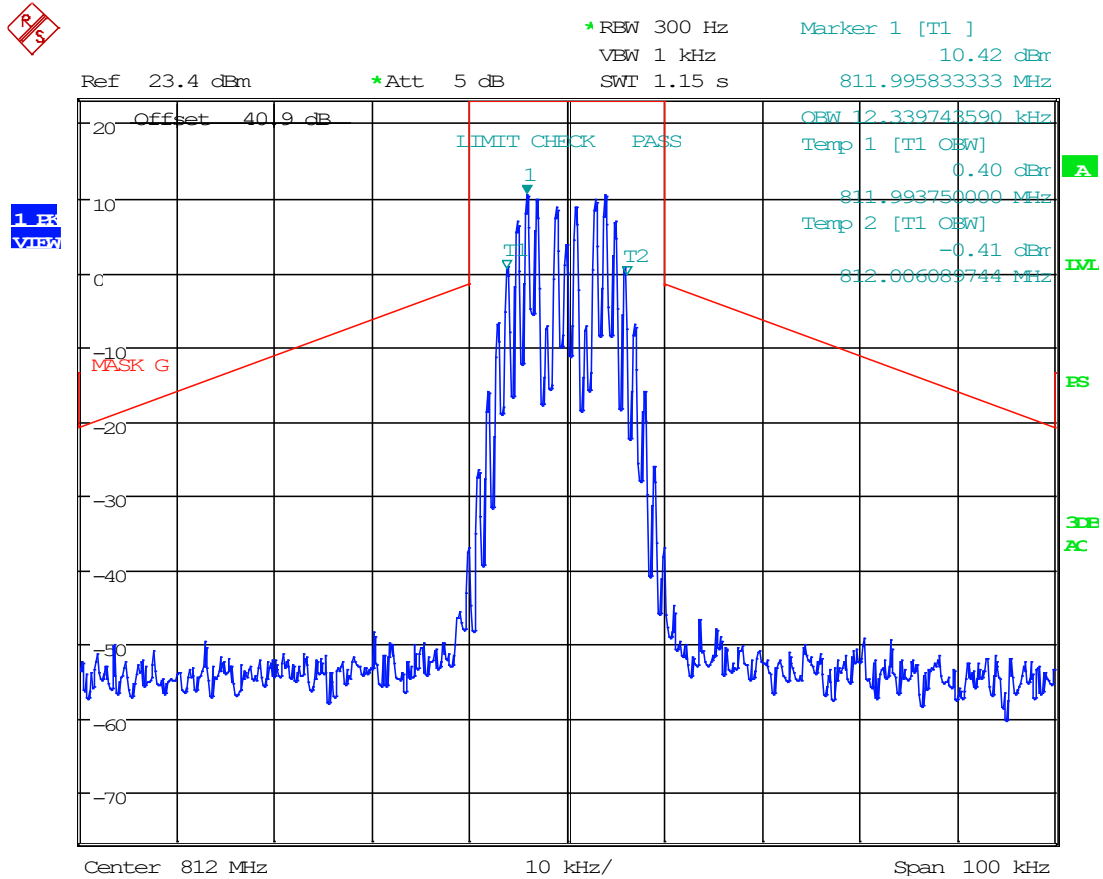
8.5.59 25 kHz FM, UL Mask G, AGC, 812 MHz



Date: 2.FEB.2023 17:04:45

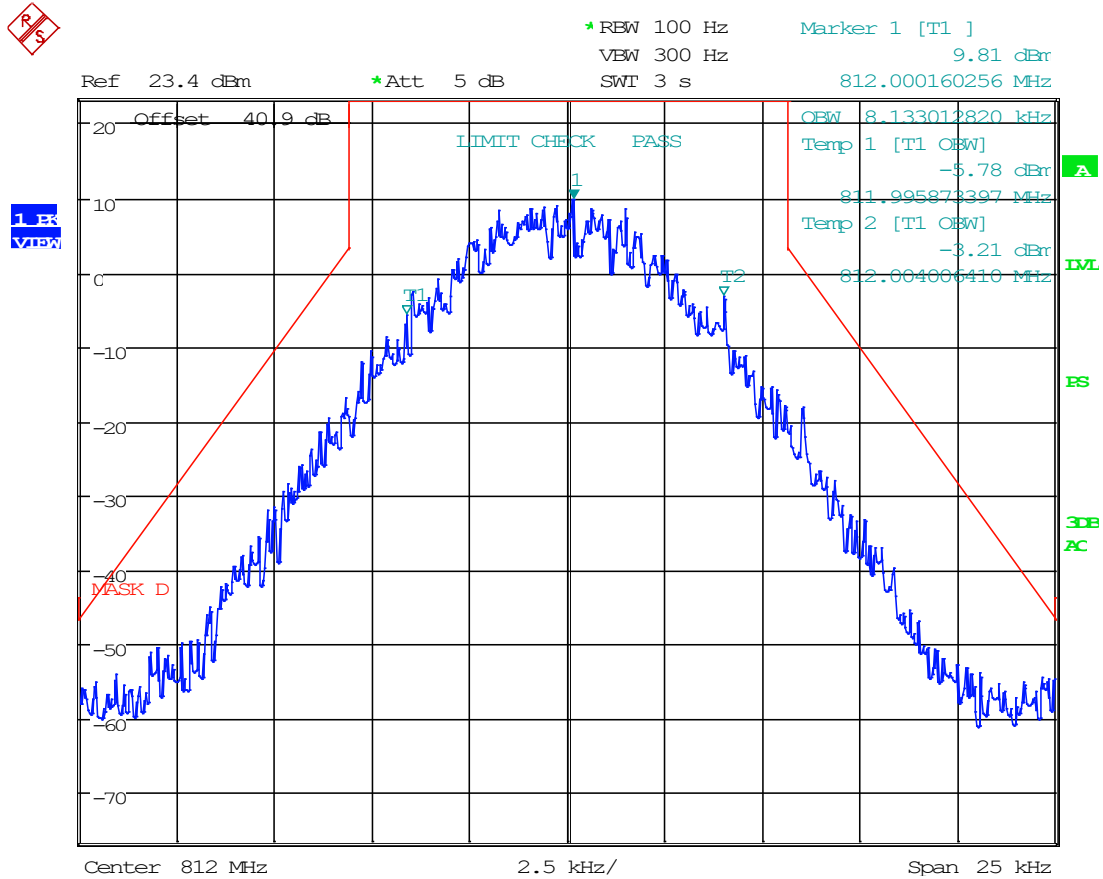


8.5.60 25 kHz FM, UL Mask G, AGC+3, 812 MHz



Date: 2.FEB.2023 17:07:48

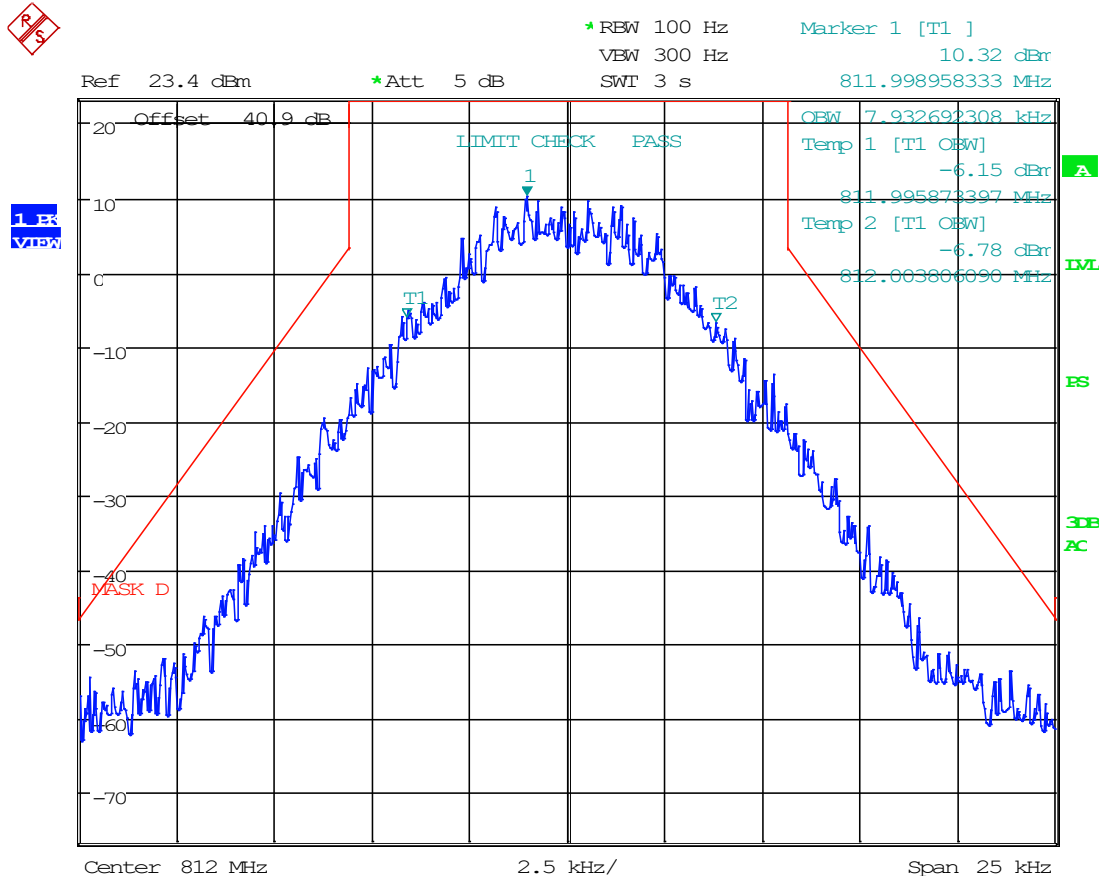
8.5.61 C4FM, UL Mask D, AGC, 812 MHz



Date: 2.FEB.2023 15:29:03

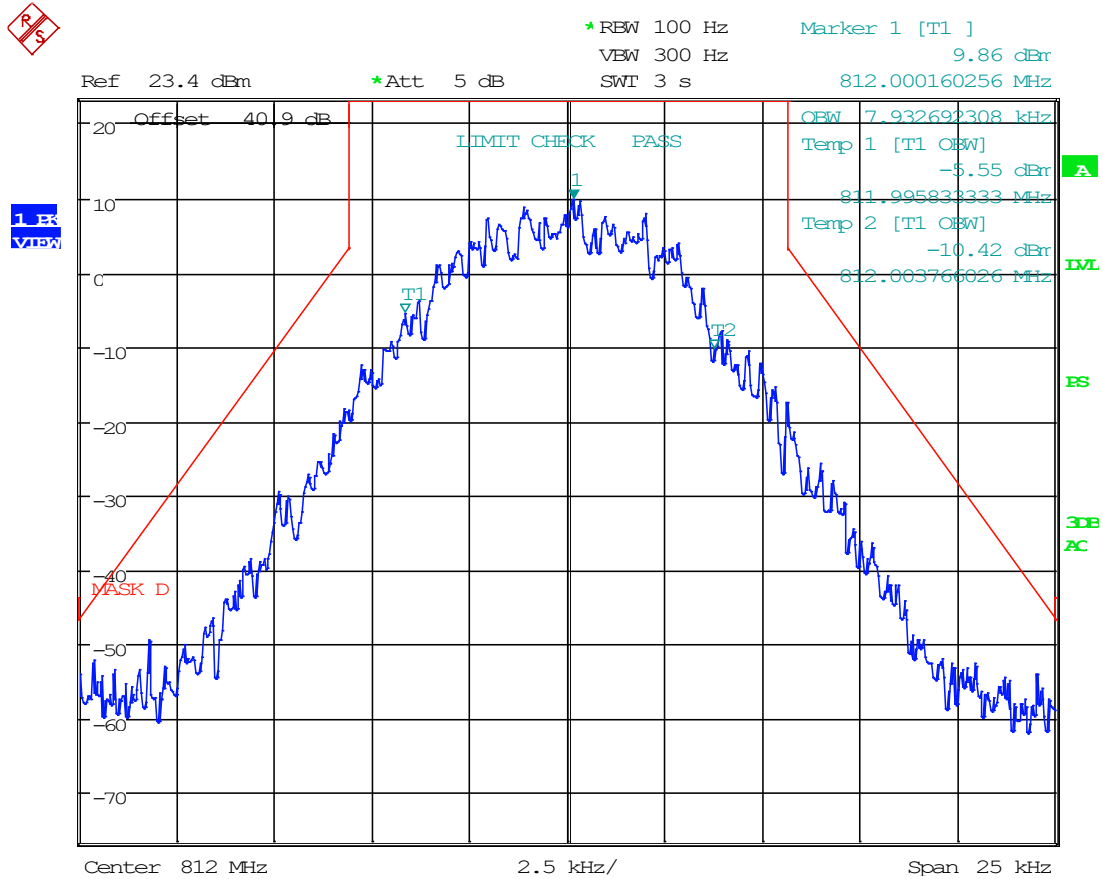


8.5.62 C4FM, UL Mask D, AGC+3, 812 MHz



Date: 2.FEB.2023 15:32:57

8.5.63 H-CPM, UL Mask D, AGC, 812 MHz

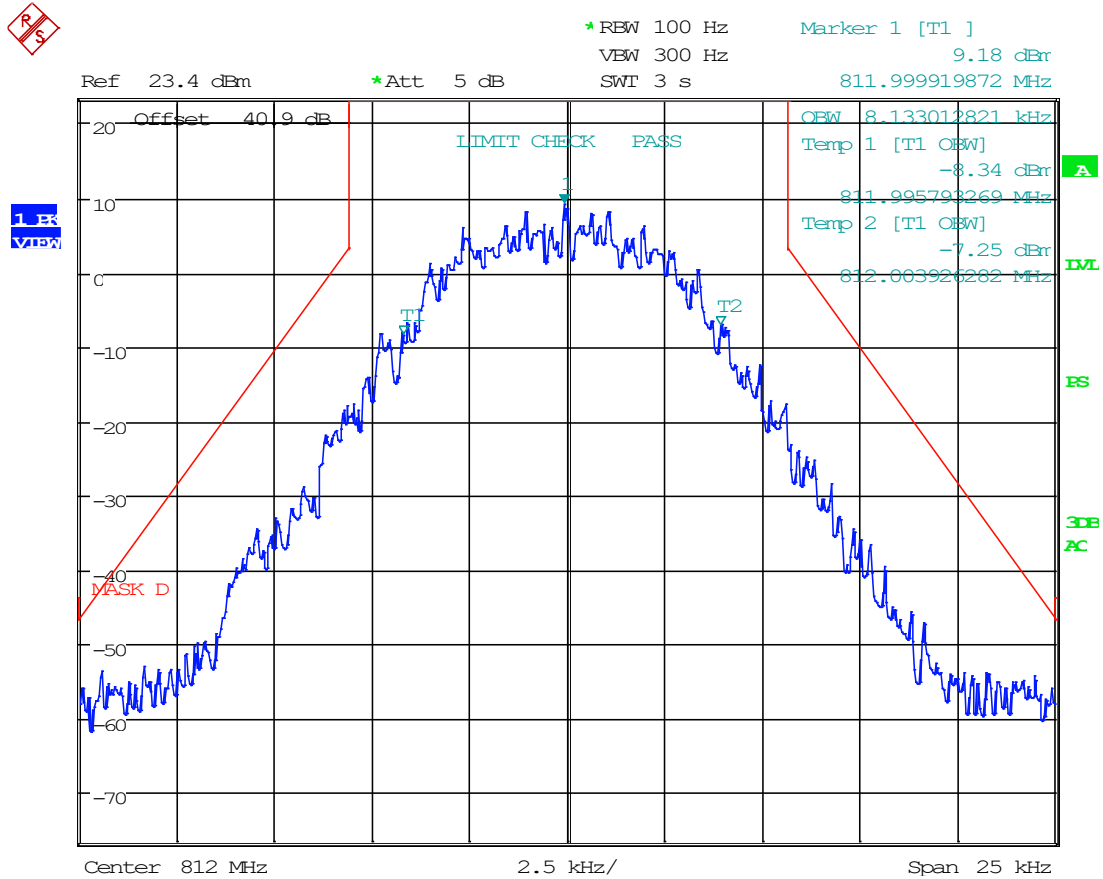


Date: 2.FEB.2023 15:31:12



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

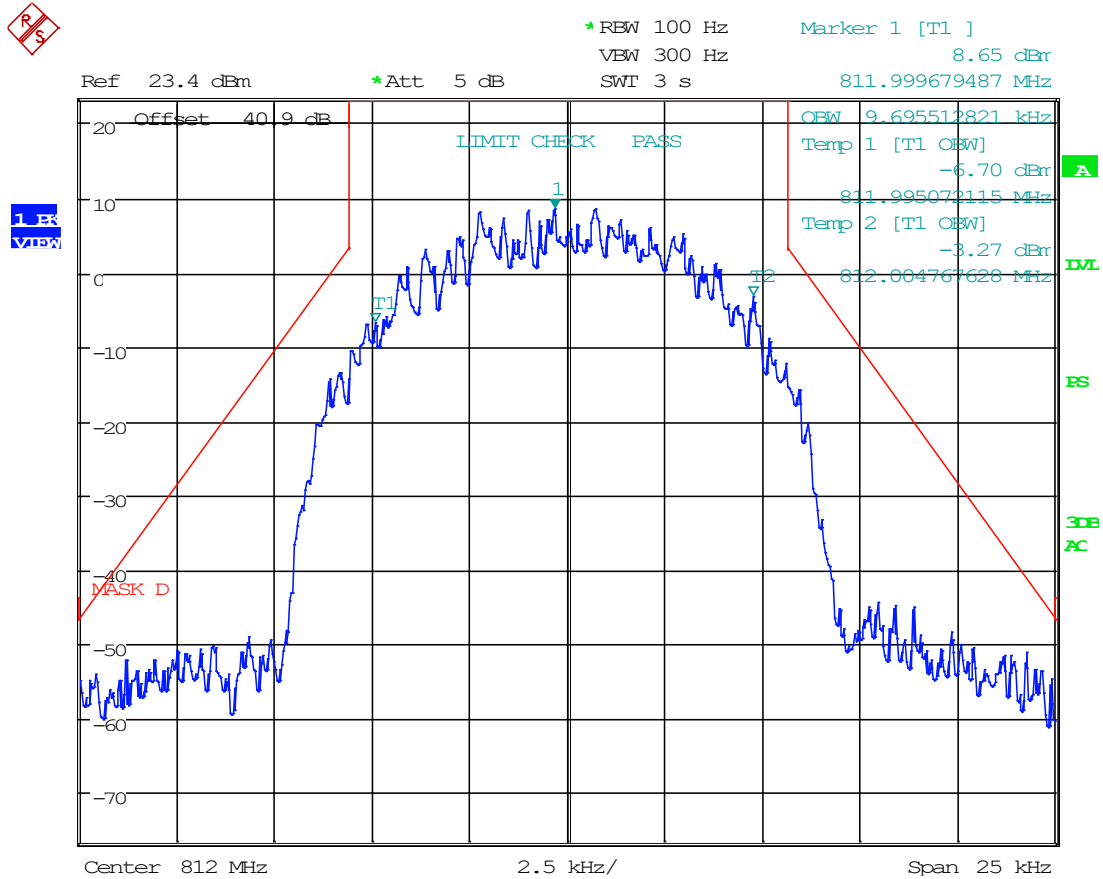
8.5.64 H-CPM, UL Mask D, AGC+3, 812 MHz



Date: 2.FEB.2023 15:33:51

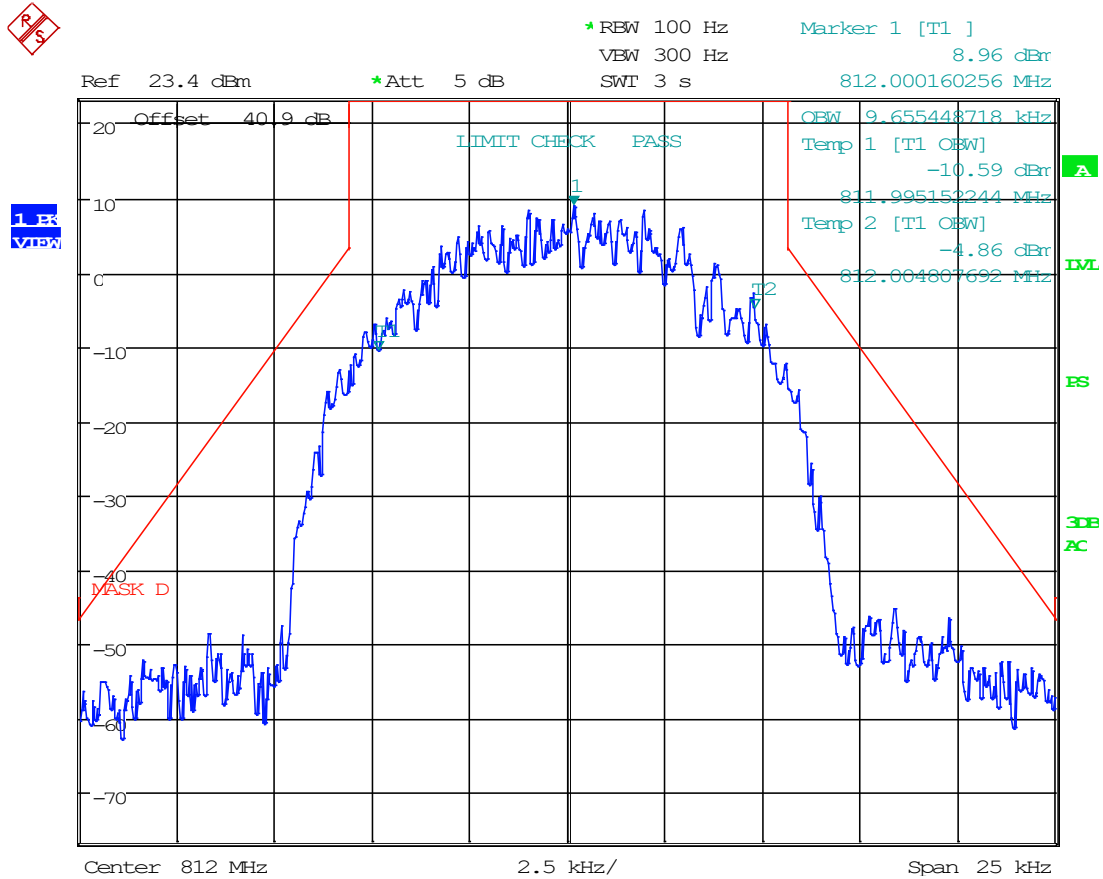


8.5.65 H-DQPSK, UL Mask D, AGC, 812 MHz



Date: 2.FEB.2023 15:32:03

8.5.66 H-DQPSK, UL Mask D, AGC+3, 812 MHz

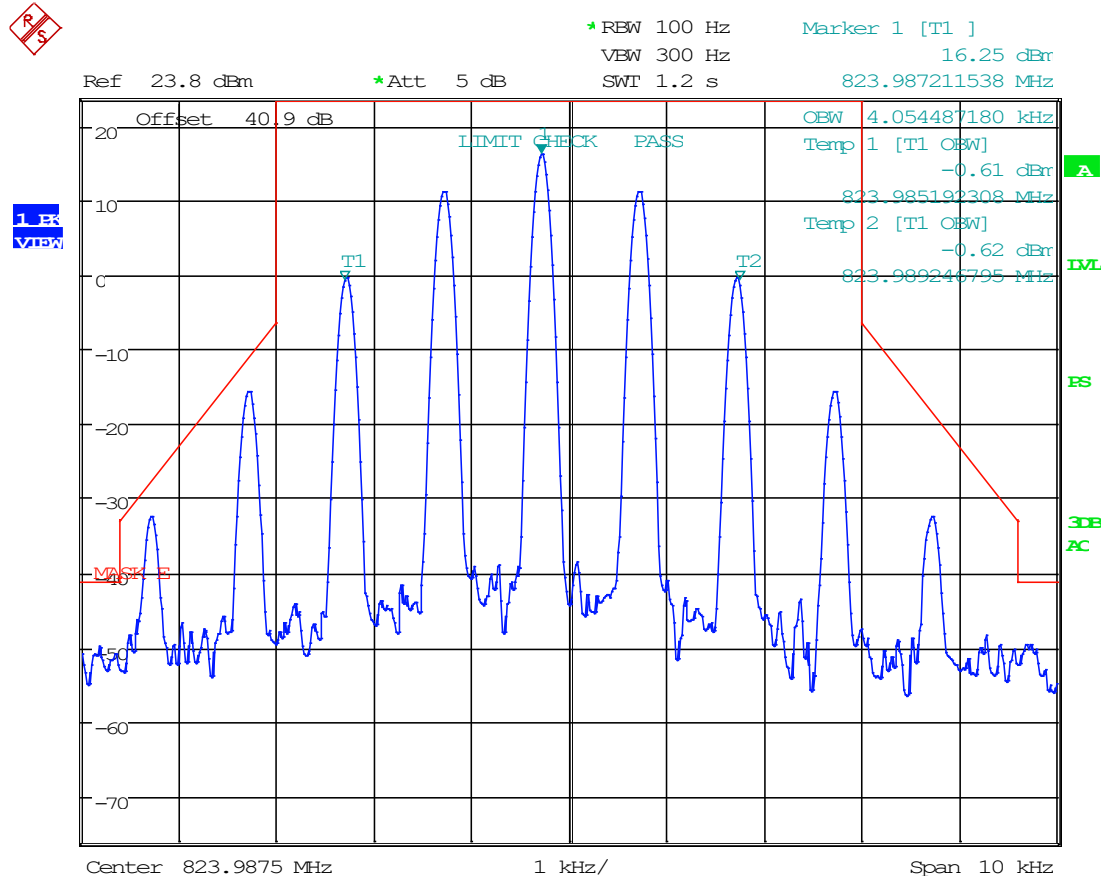


Date: 2.FEB.2023 15:34:35



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

8.5.67 6.25 kHz, FM, UL Mask E, AGC, 823.9875 MHz

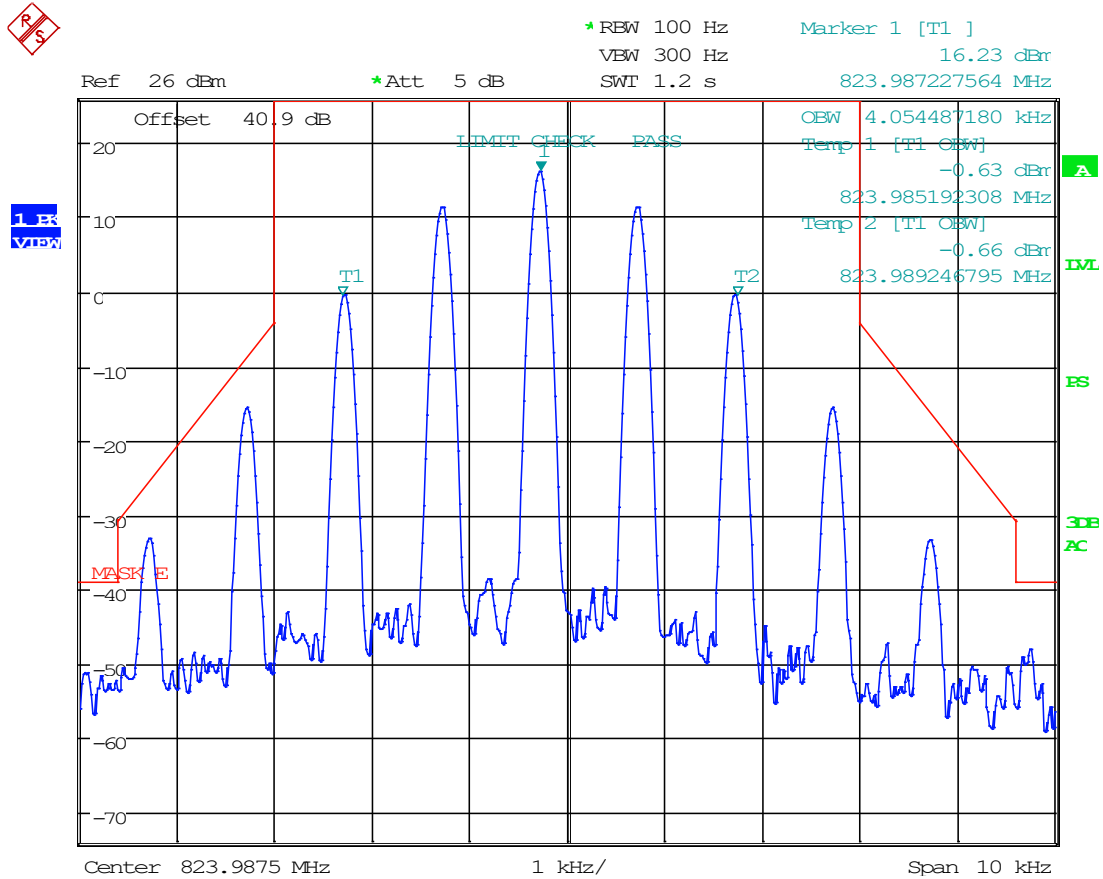


Date: 3.FEB.2023 08:45:21



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

8.5.68 6.25 kHz, FM, UL Mask E, AGC+3, 823.9875 MHz

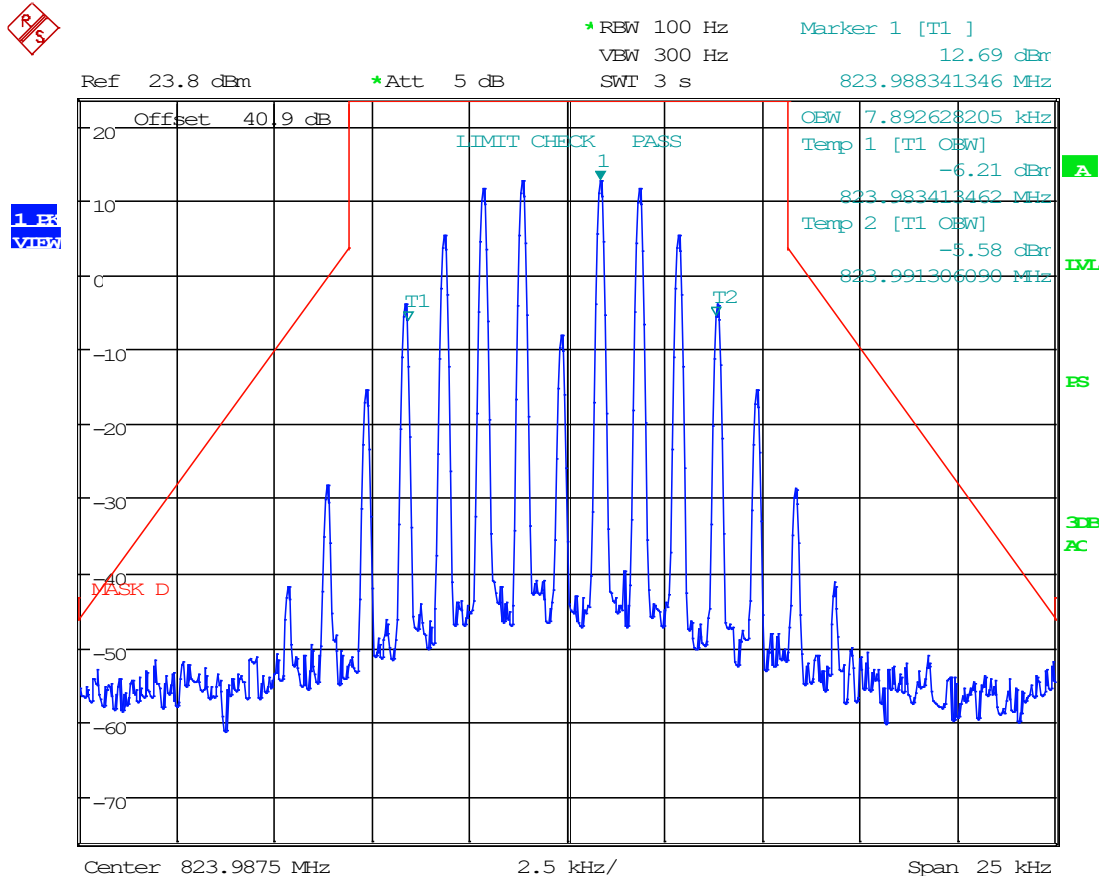


Date: 3.FEB.2023 08:46:43



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

8.5.69 12.5 kHz, FM, UL Mask D, AGC, 823.9875 MHz

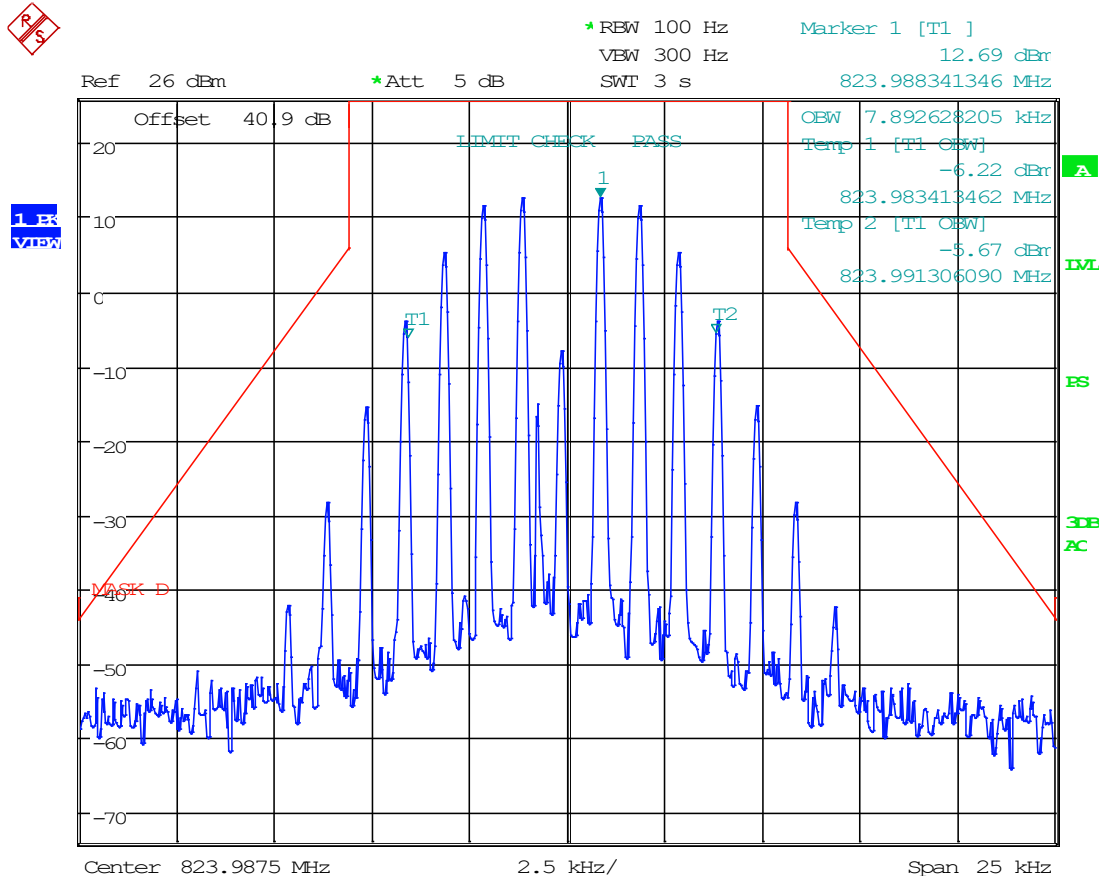


Date: 2.FEB.2023 15:15:06



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

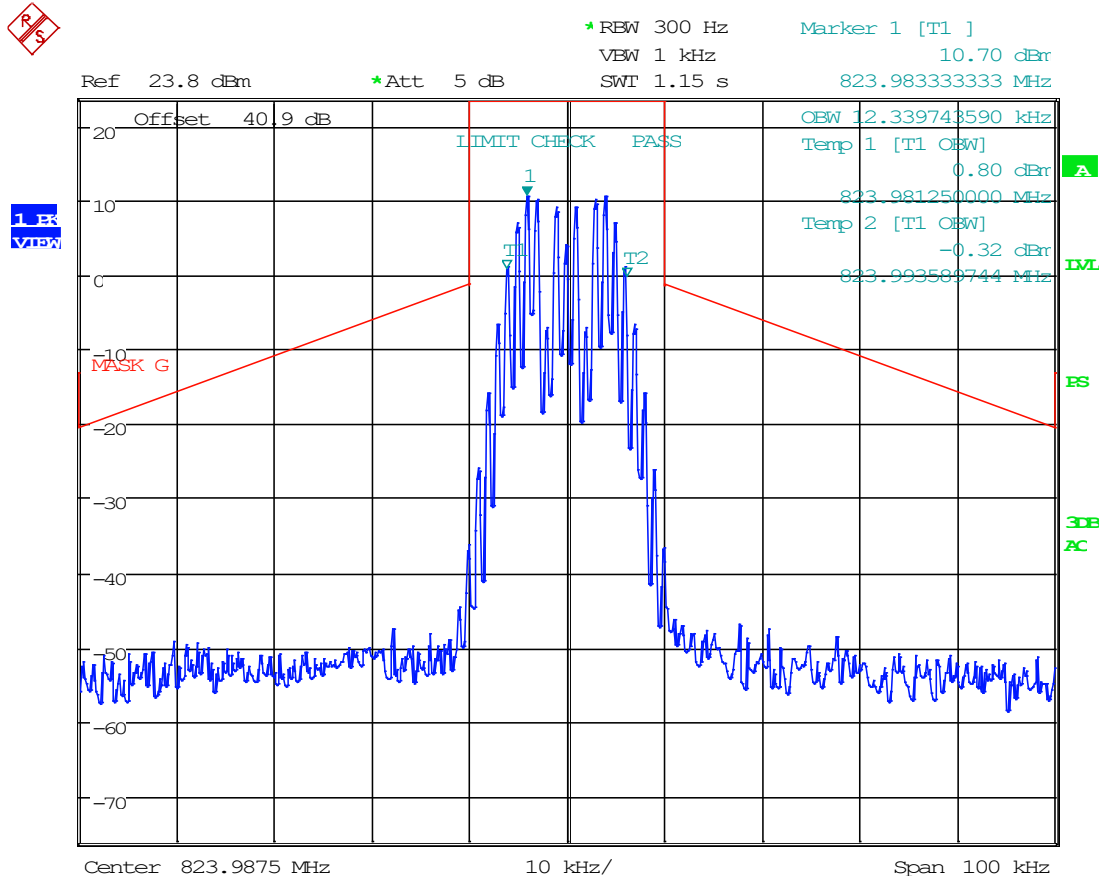
8.5.70 12.5 kHz, FM, UL Mask D, AGC+3, 823.9875 MHz



Date: 2.FEB.2023 15:16:30



8.5.71 25 kHz FM, UL Mask G, AGC, 823.9875 MHz

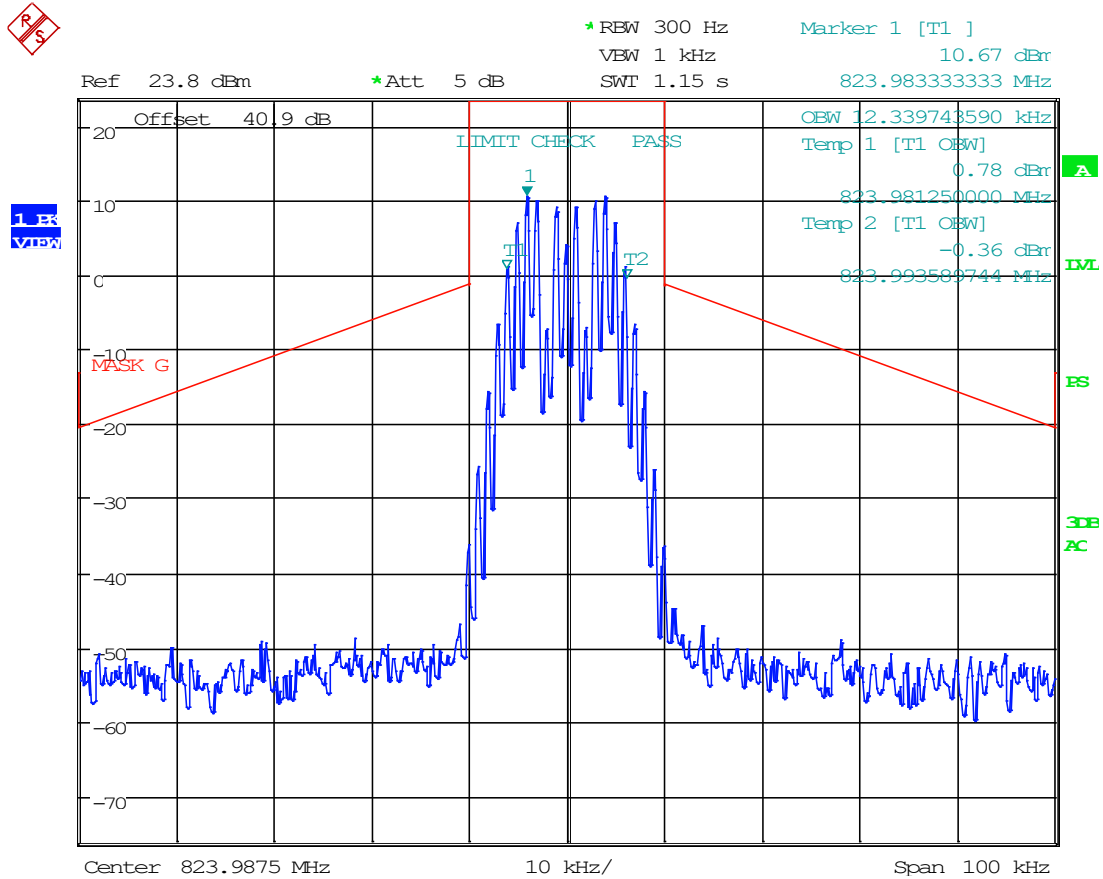


Date: 2.FEB.2023 17:10:18

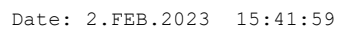


Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

8.5.72 25 kHz FM, UL Mask G, AGC+3, 823.9875 MHz



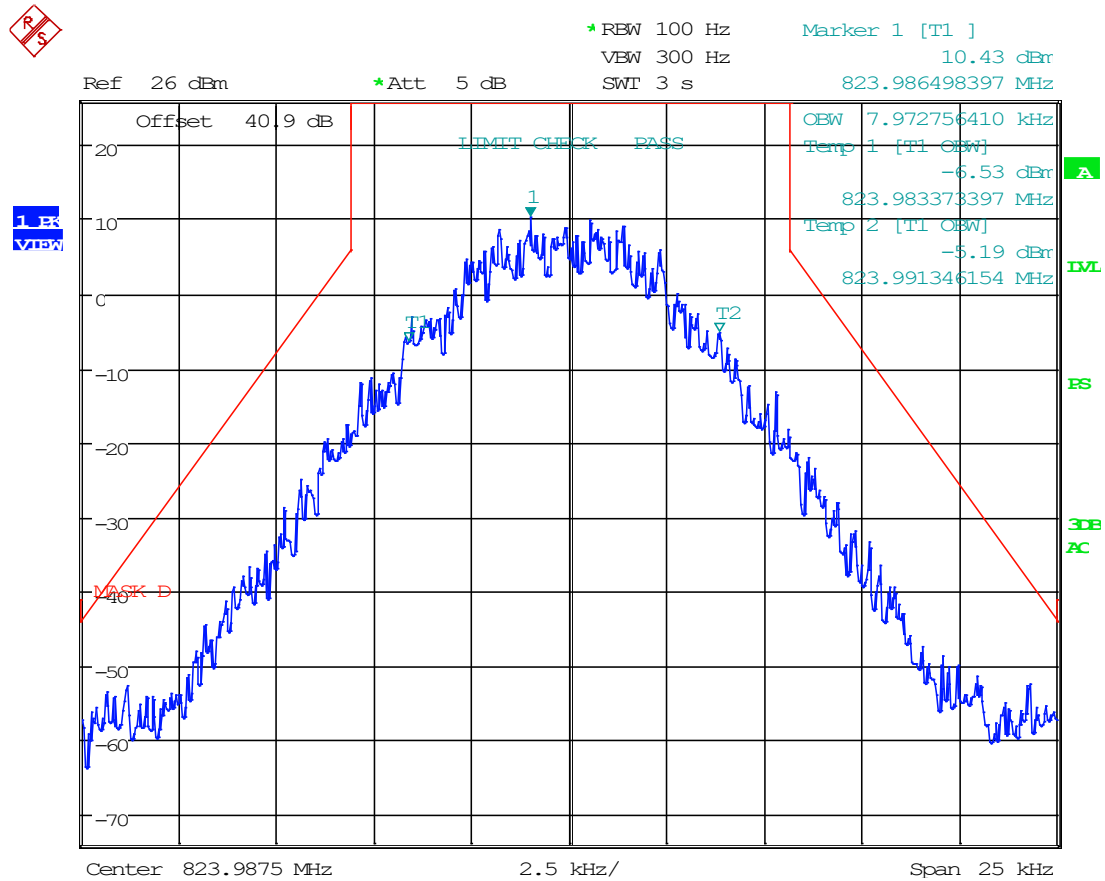
Date: 2.FEB.2023 17:11:28





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

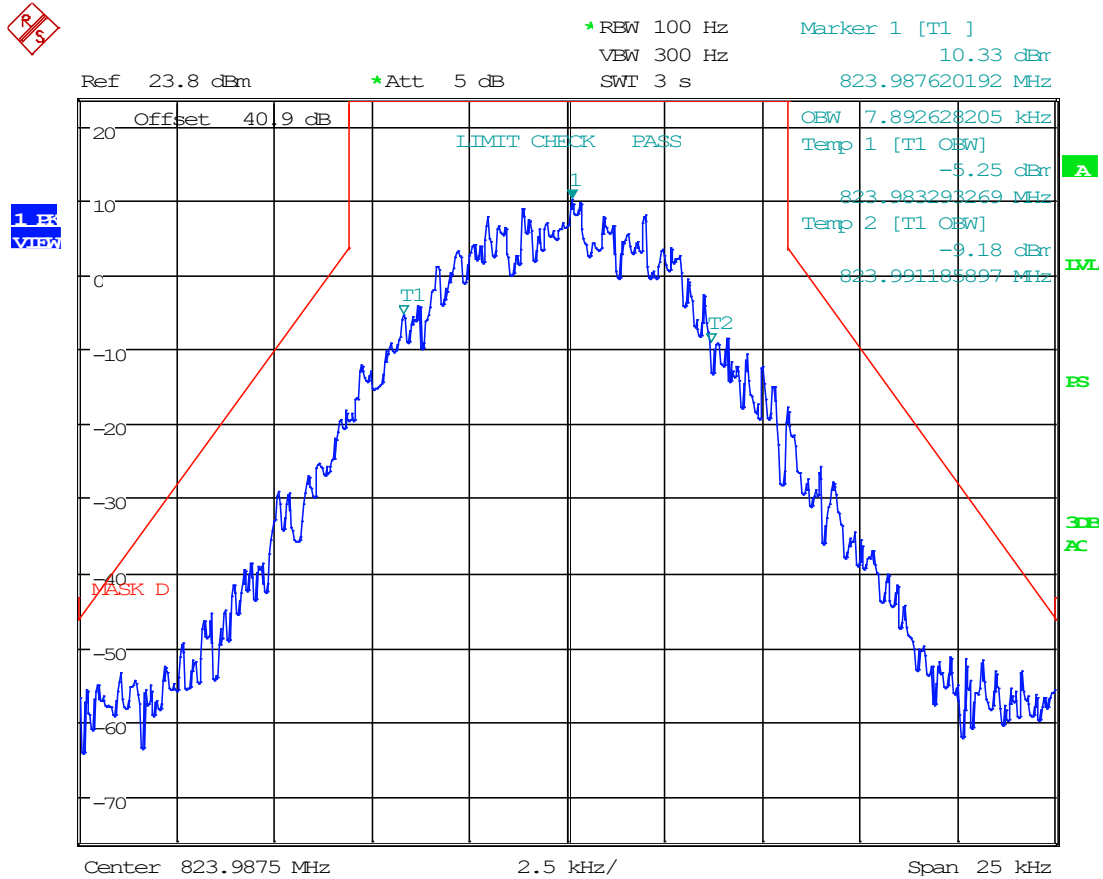
8.5.74 C4FM, UL Mask D, AGC+3, 823.9875 MHz



Date: 2.FEB.2023 15:45:33



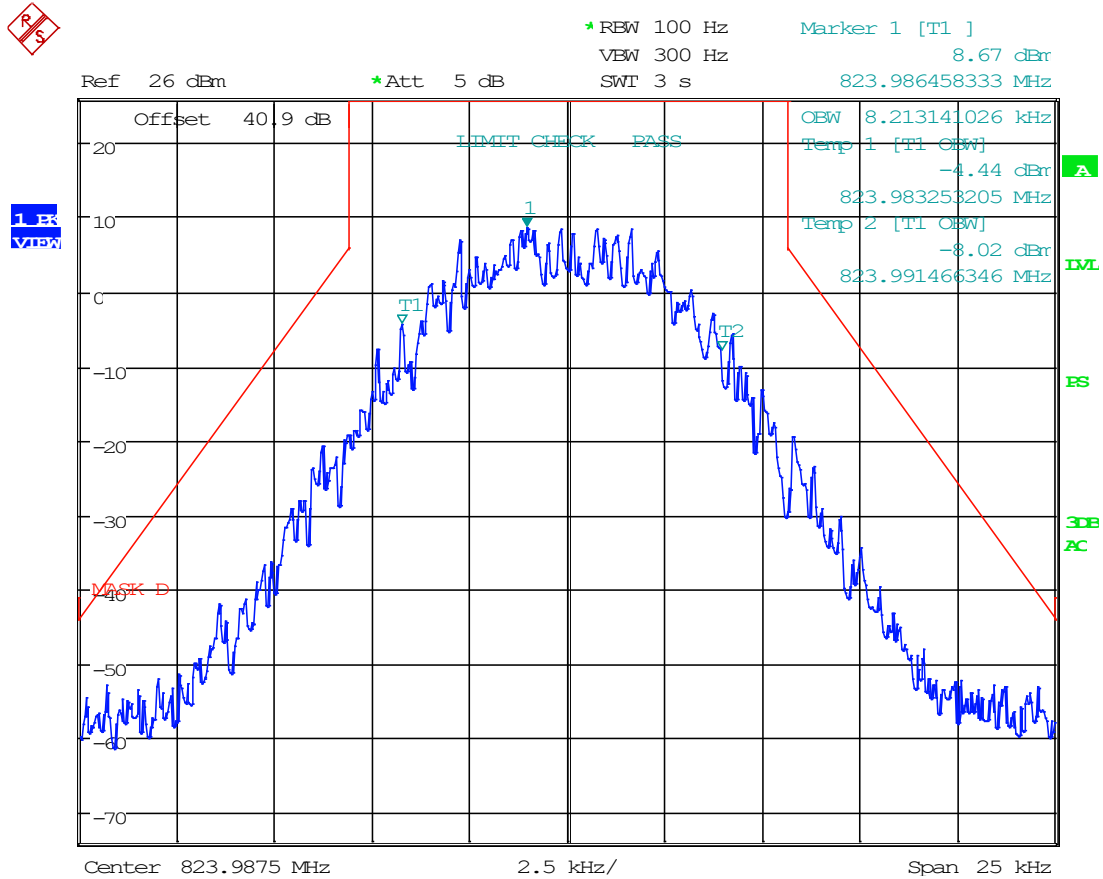
8.5.75 H-CPM, UL Mask D, AGC, 823.9875 MHz



Date: 2.FEB.2023 15:43:17



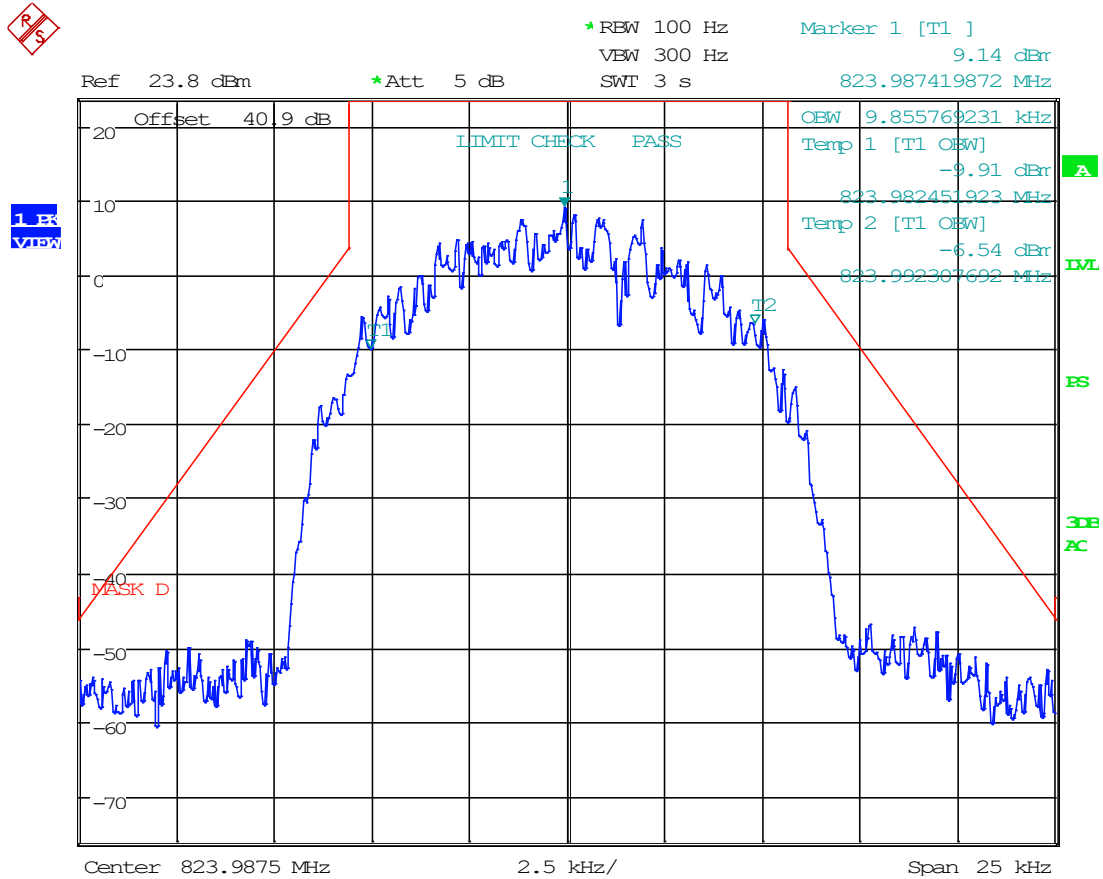
8.5.76 H-CPM, UL Mask D, AGC+3, 823.9875 MHz



Date: 2.FEB.2023 15:47:08



8.5.77 H-DQPSK, UL Mask D, AGC, 823.9875 MHz

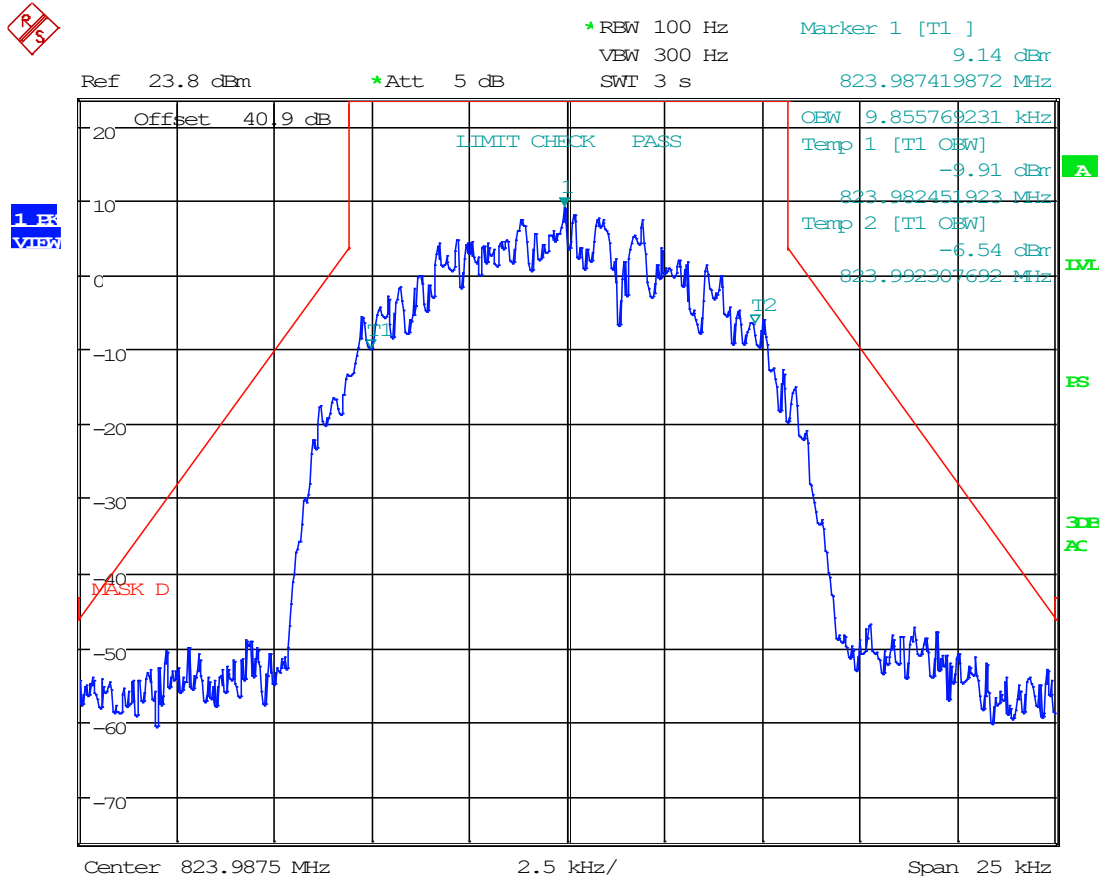


Date: 2.FEB.2023 15:44:05



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

8.5.78 H-DQPSK, UL Mask D, AGC+3, 823.9875 MHz



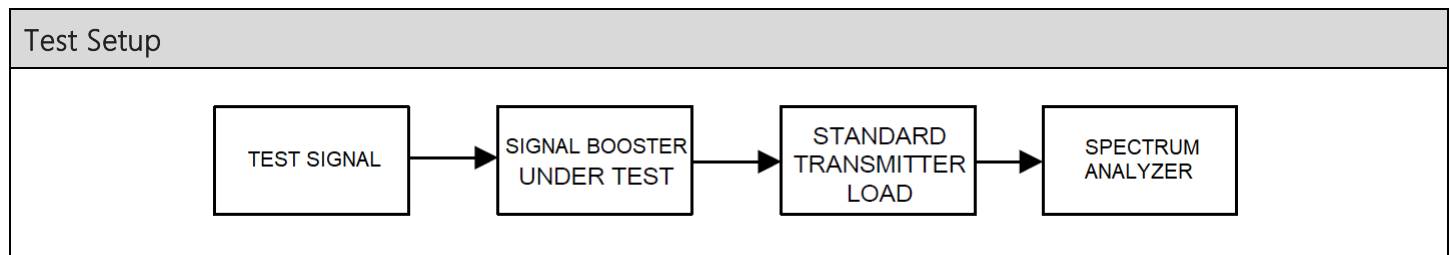
Date: 2.FEB.2023 15:44:05



8.6 Noise Figure

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

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 Results, Out-of-band Rejection and Class of Operation			
Operating Band (MHz)	Link Direction	Noise Figure (dB)	Limit (dB)
788- 805 MHz	Uplink	8.83	< 9 dB
806- 824 MHz	Uplink	0.67	< 9 dB

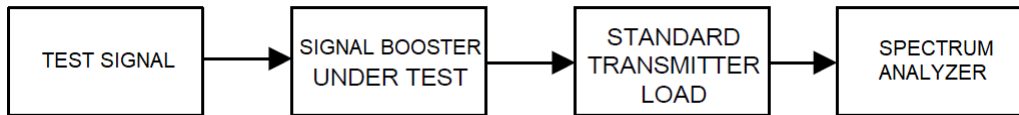


8.7 Out-of-Band/Out-of-Block Emissions (Intermodulation Products)

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

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.

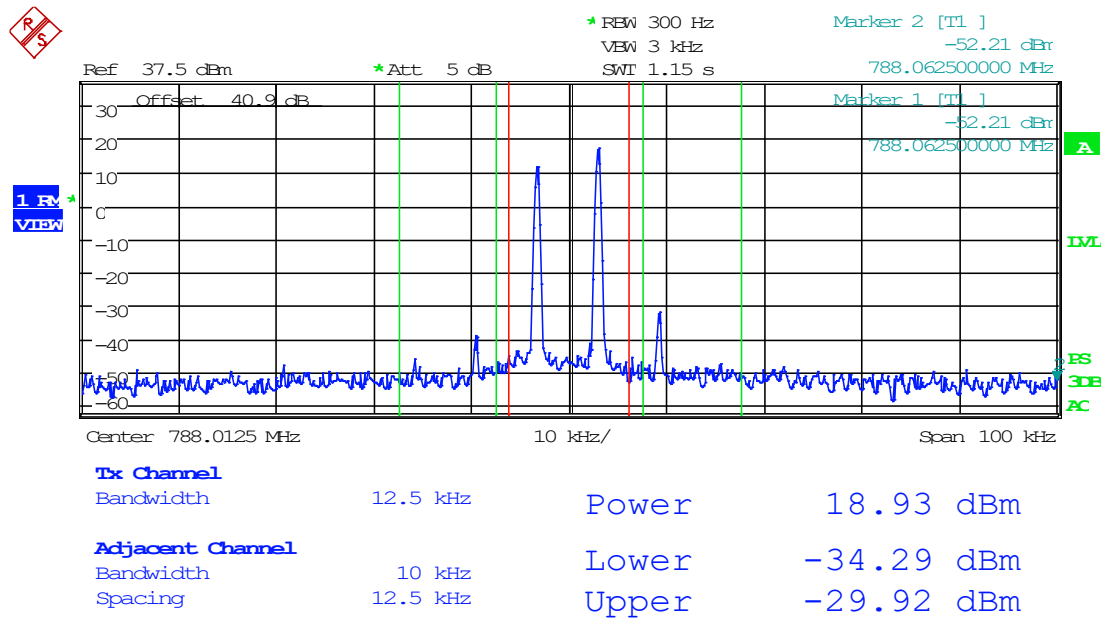
Test Setup





Intermodulation Products Spectrum Plots

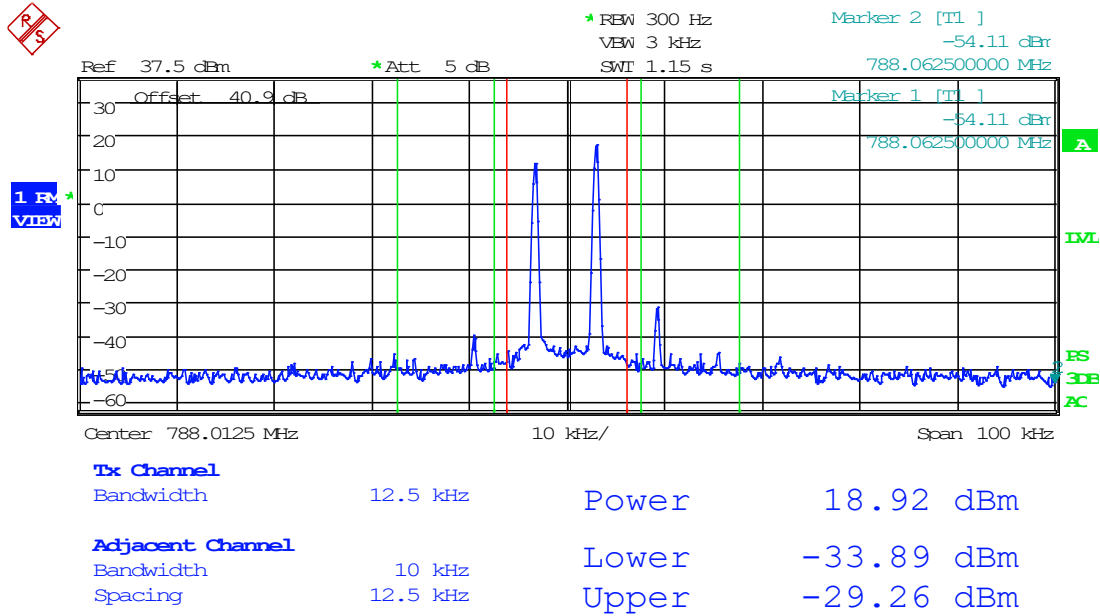
8.7.1 6.25 kHz Signal, Uplink, AGC, 788.0125 MHz



Date: 31.JAN.2023 15:17:24



8.7.2 6.25 kHz Signal, Uplink, AGC+3dB, 788.0125 MHz

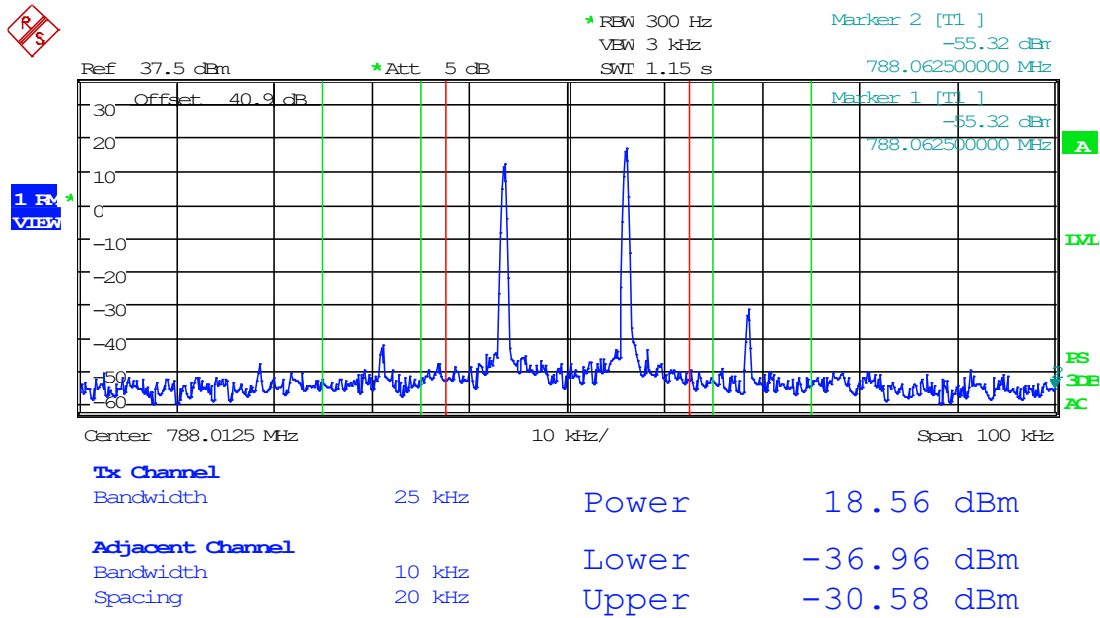


Date: 31.JAN.2023 15:19:24



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

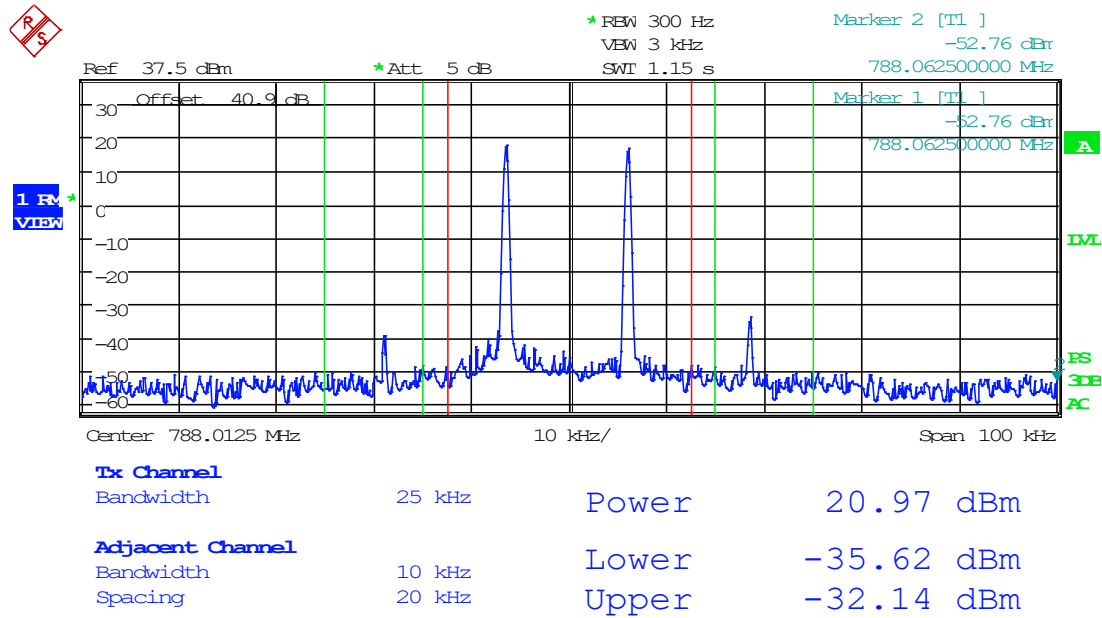
8.7.3 12.5 kHz Signal, Uplink, AGC, 788.0125 MHz



Date: 1.FEB.2023 07:47:46



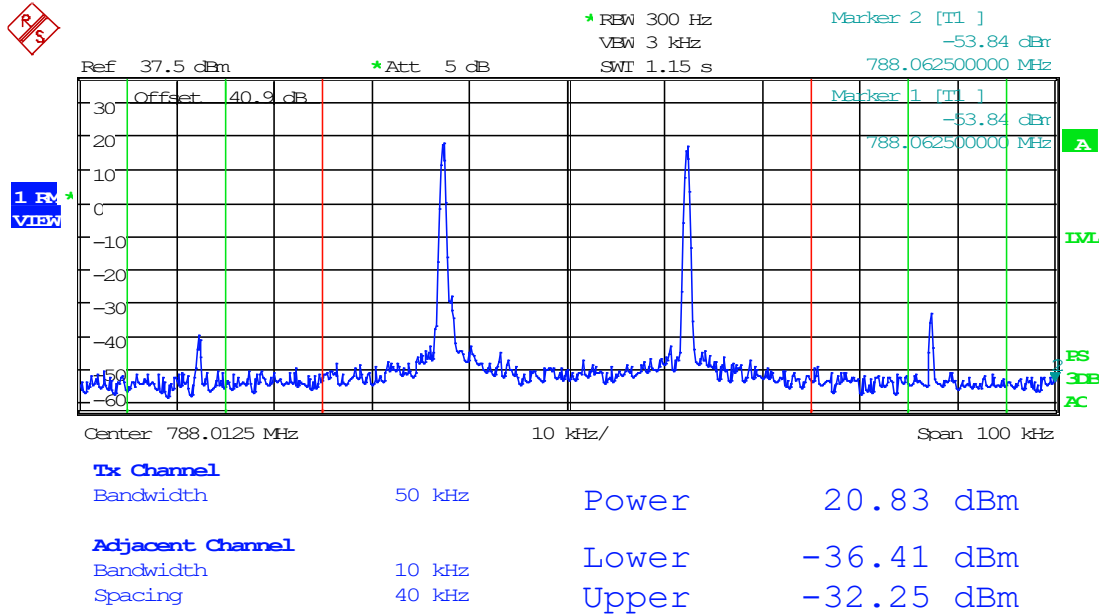
8.7.4 12.5 kHz Signal, Uplink, AGC+3dB, 788.0125 MHz



Date: 1.FEB.2023 07:51:32



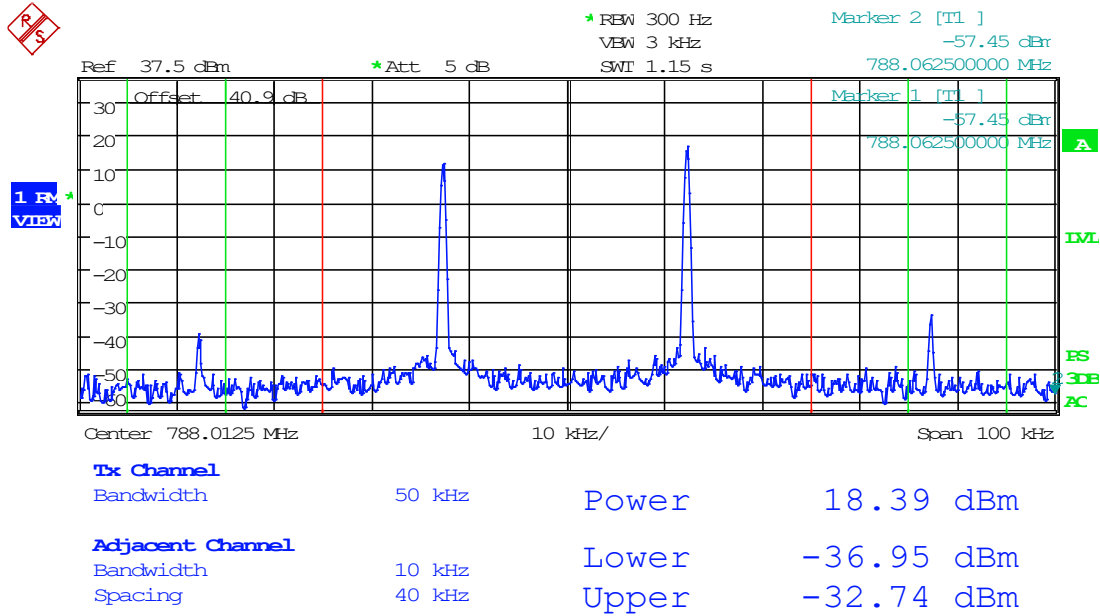
8.7.5 25 kHz Signal, Uplink, AGC, 788.0125 MHz



Date: 1.FEB.2023 08:32:31



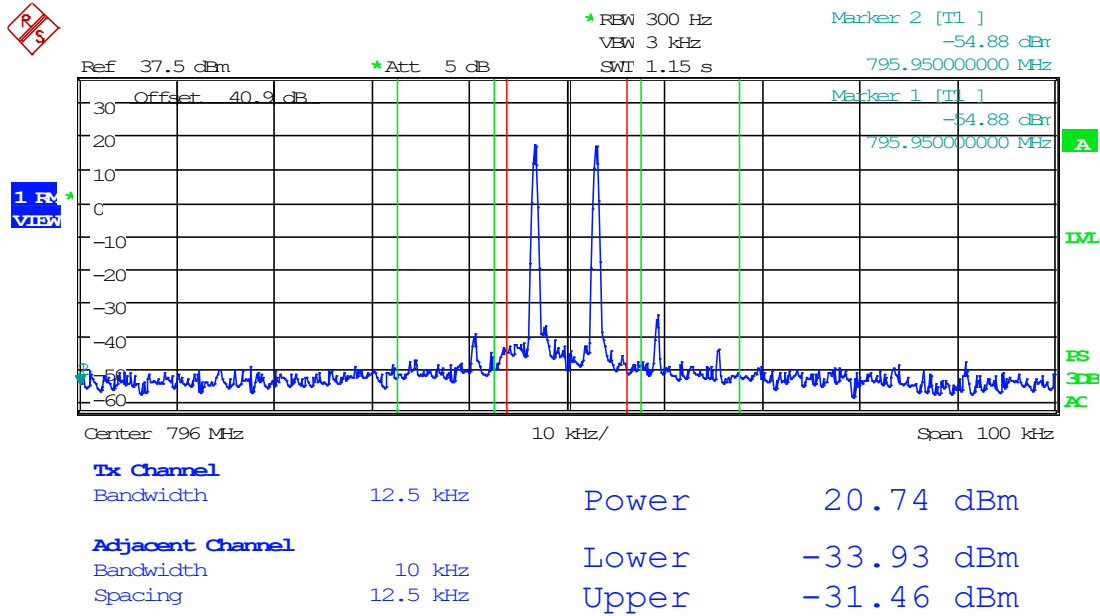
8.7.6 25 kHz Signal, Uplink, AGC+3dB, 788.0125 MHz



Date: 1.FEB.2023 08:33:38



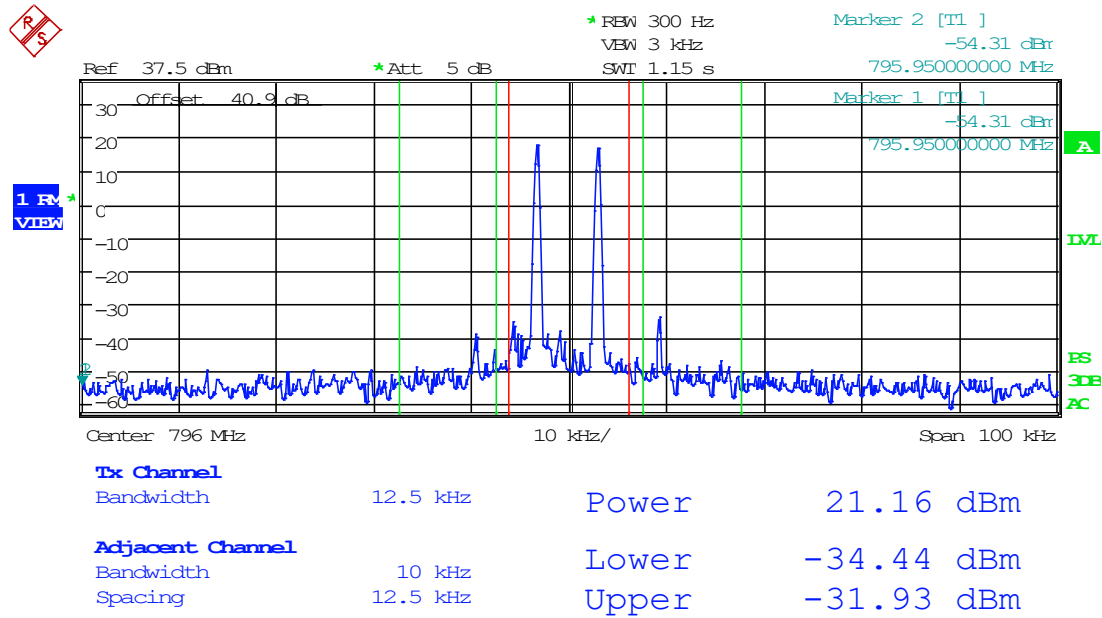
8.7.7 6.25 kHz Signal, Uplink, AGC, 796 MHz



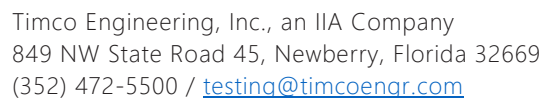
Date: 31.JAN.2023 15:40:24



8.7.8 6.25 kHz Signal, Uplink, AGC+3dB, 796 MHz



Date: 31.JAN.2023 15:43:01



Ref 37.5 dBm *Att 5 dB SWI 1.15 s 795.950000000 MHz

Offset 40.9 dB Marker 1 [T1] -52.39 dBm 795.950000000 MHz

1 RM VIEW

Center: 796 MHz 10 kHz/ Span 100 kHz

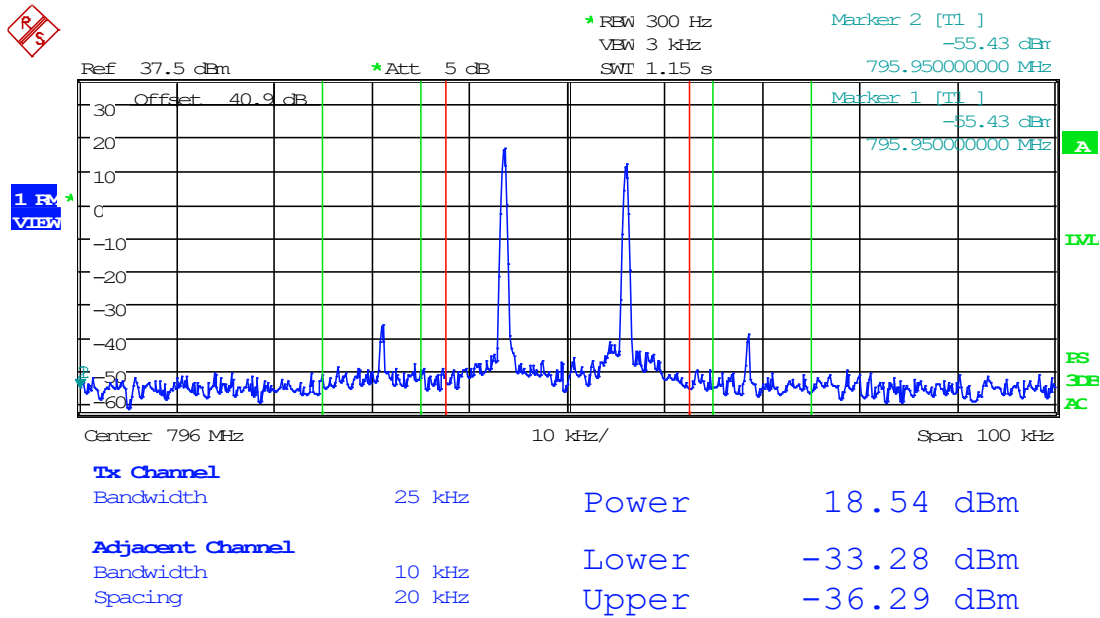
Tx Channel
 Bandwidth 25 kHz Power 18.57 dBm

Adjacent Channel
 Bandwidth 10 kHz Lower -32.30 dBm
 Spacing 20 kHz Upper -34.75 dBm

Page 114 of 167



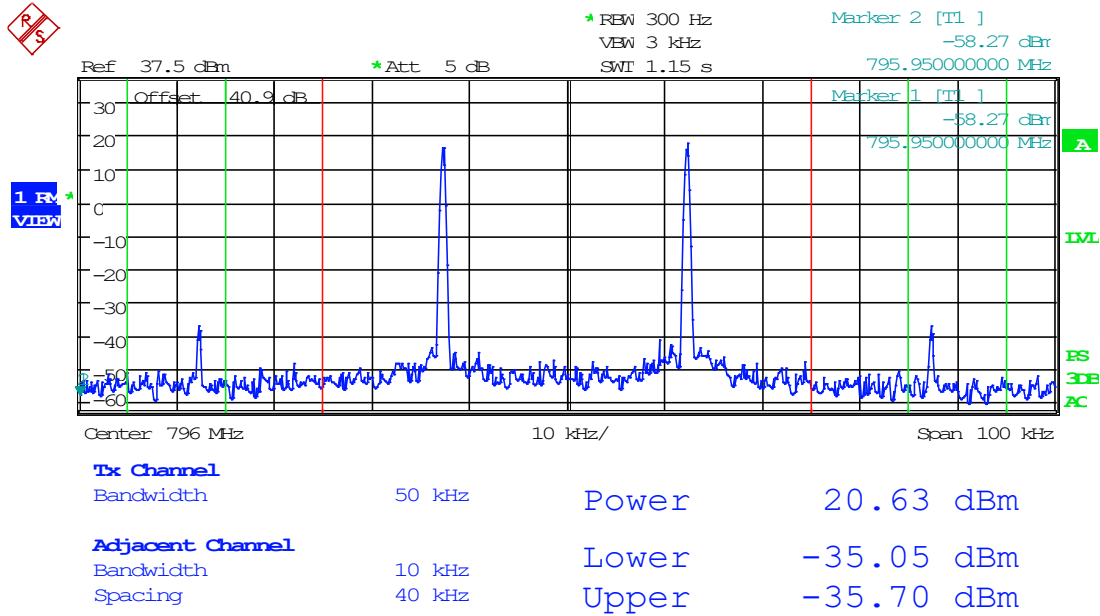
8.7.10 12.5 kHz Signal, Uplink, AGC+3dB, 796 MHz



Date: 1.FEB.2023 07:55:39



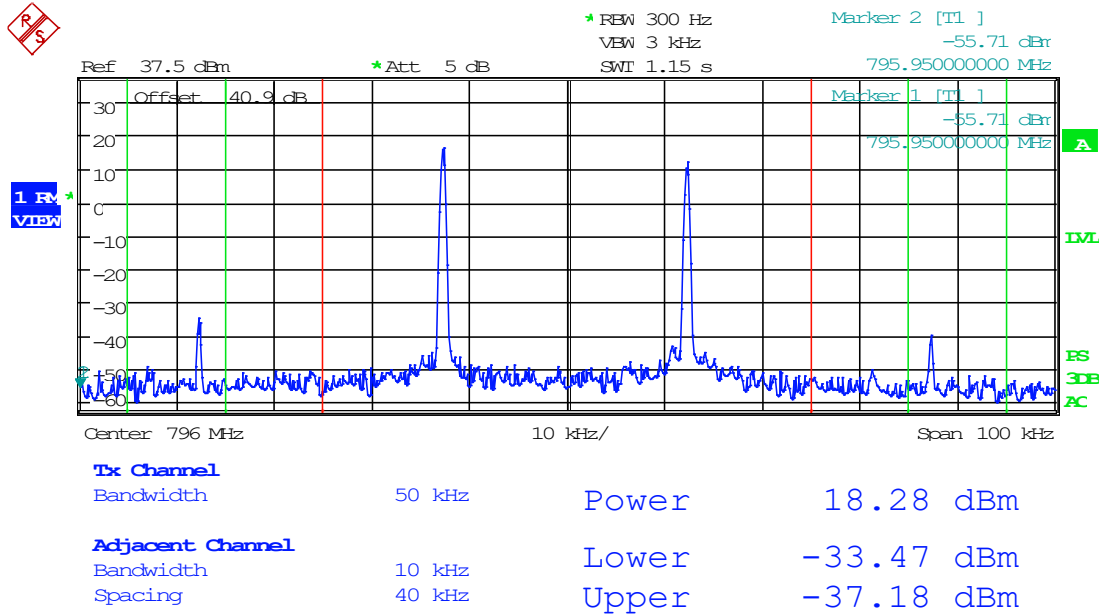
8.7.11 25 kHz Signal, Uplink, AGC, 796 MHz



Date: 1.FEB.2023 08:35:03



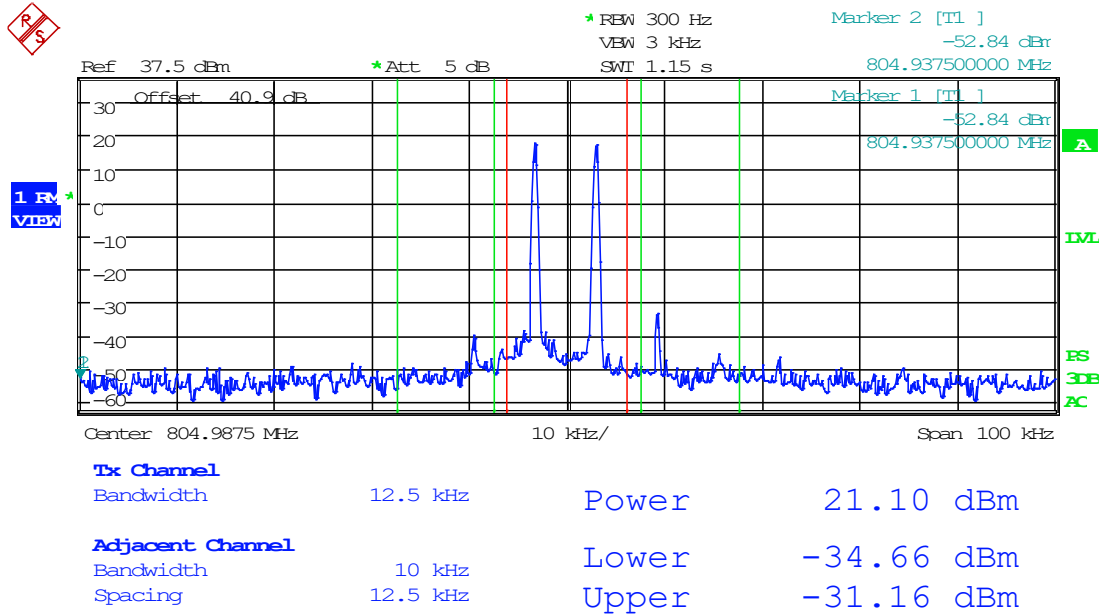
8.7.12 25 kHz Signal, Uplink, AGC+3dB, 796 MHz



Date: 1.FEB.2023 08:35:44



8.7.13 6.25 kHz Signal, Uplink, AGC, 804.9875 MHz

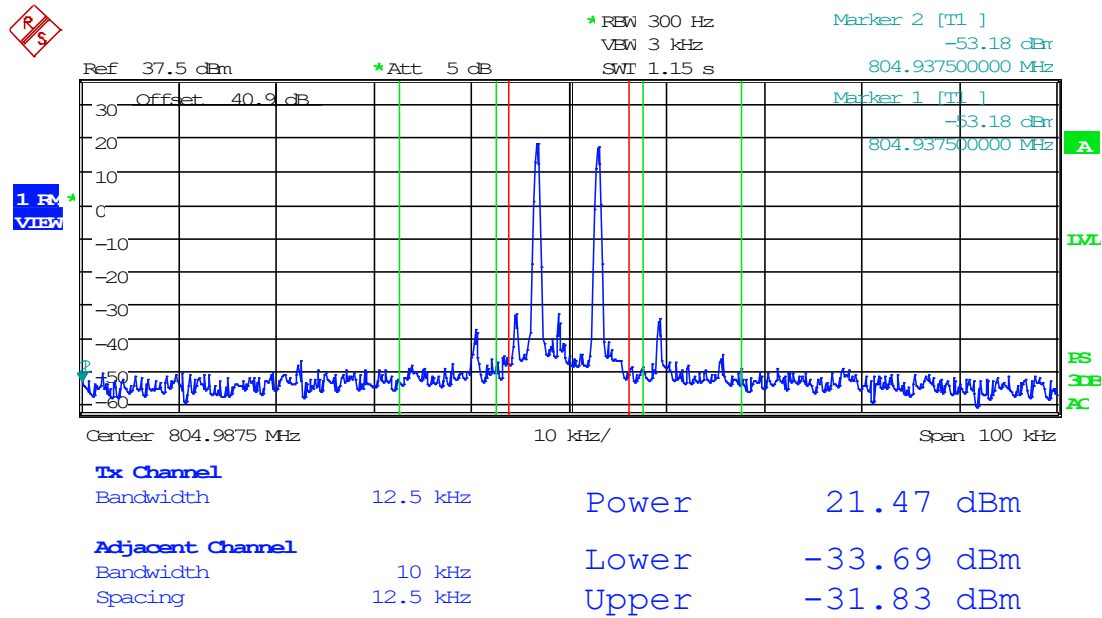


Date: 31.JAN.2023 15:46:42



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

8.7.14 6.25 kHz Signal, Uplink, AGC+3dB, 804.9875 MHz

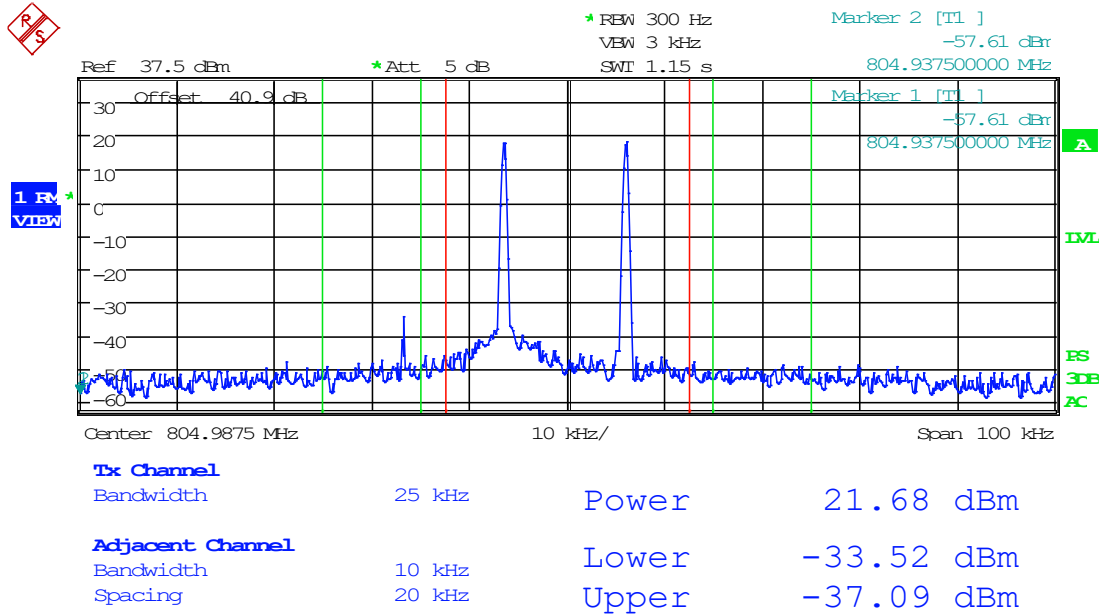


Date: 31.JAN.2023 15:49:47



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

8.7.15 12.5 kHz Signal, Uplink, AGC, 804.9875 MHz

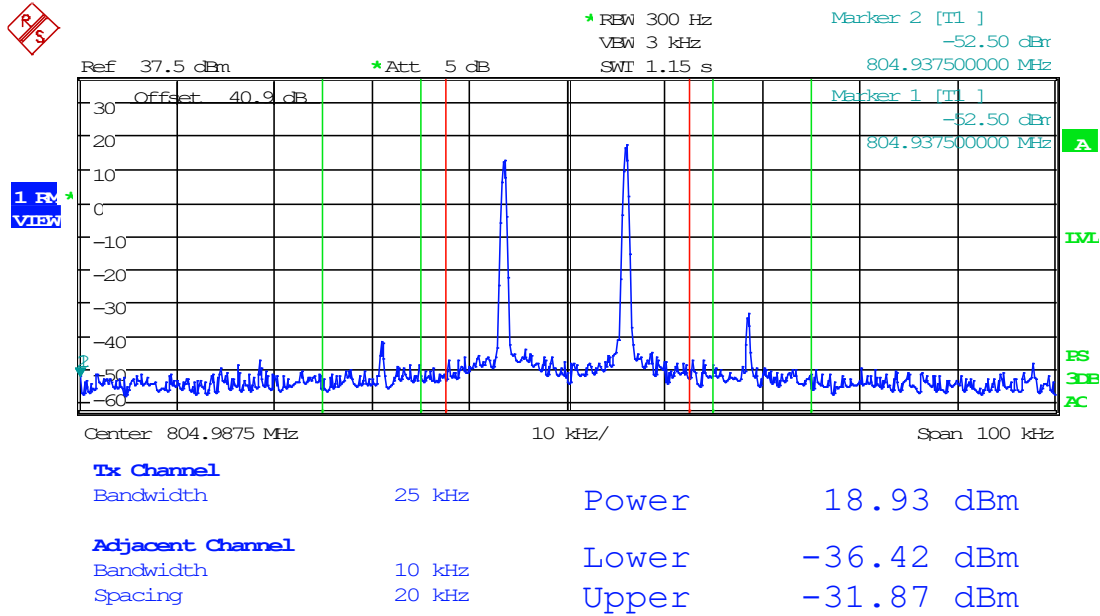


Date: 1.FEB.2023 08:00:16



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

8.7.16 12.5 kHz Signal, Uplink, AGC+3dB, 804.9875 MHz

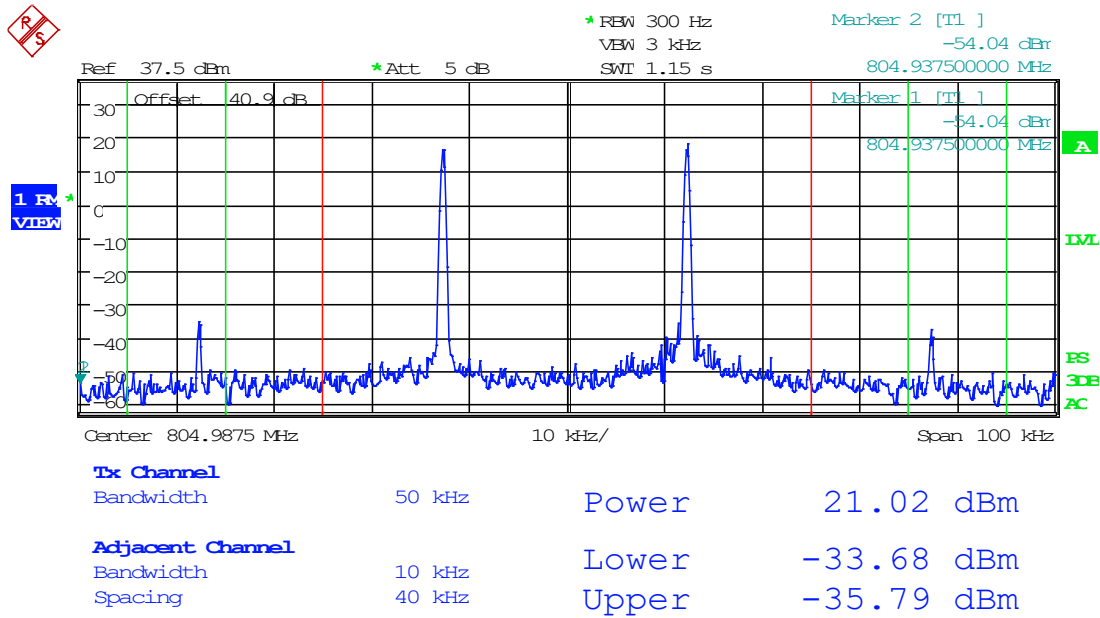


Date: 1.FEB.2023 08:01:13



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

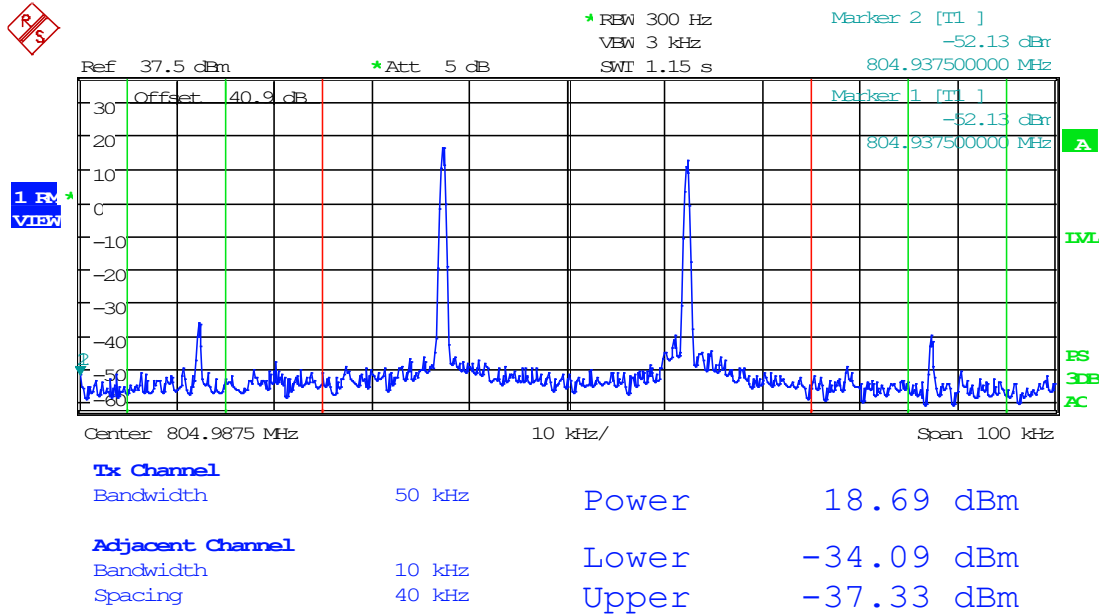
8.7.17 25 kHz Signal, Uplink, AGC, 804.9875 MHz



Date: 1.FEB.2023 08:37:20



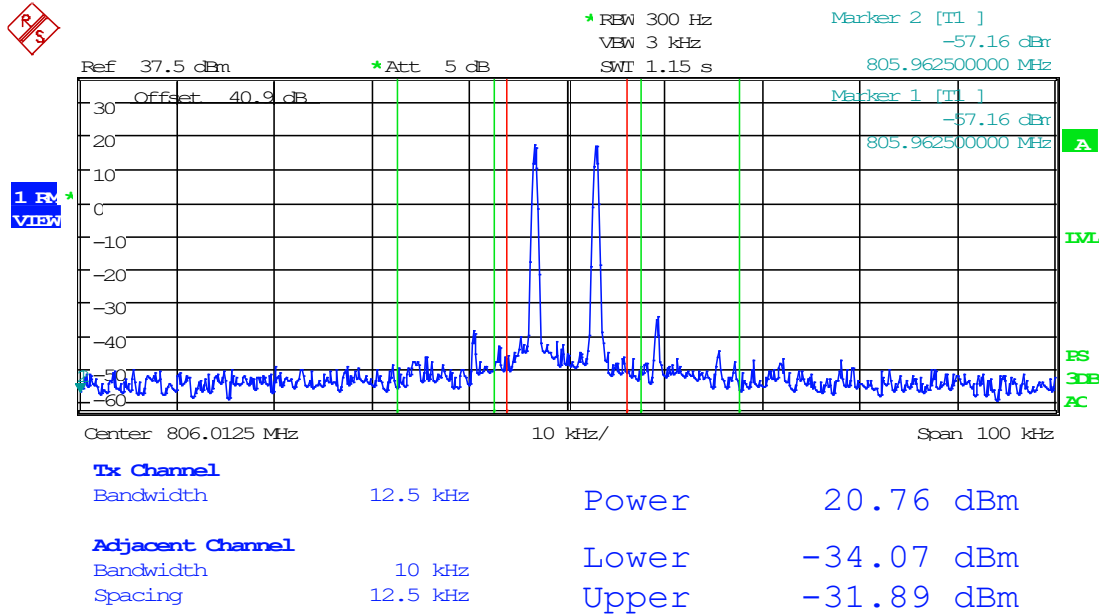
8.7.18 25 kHz Signal, Uplink, AGC+3dB, 804.9875 MHz



Date: 1.FEB.2023 08:37:59



8.7.19 6.25 kHz Signal, Uplink, AGC, 806.0125 MHz

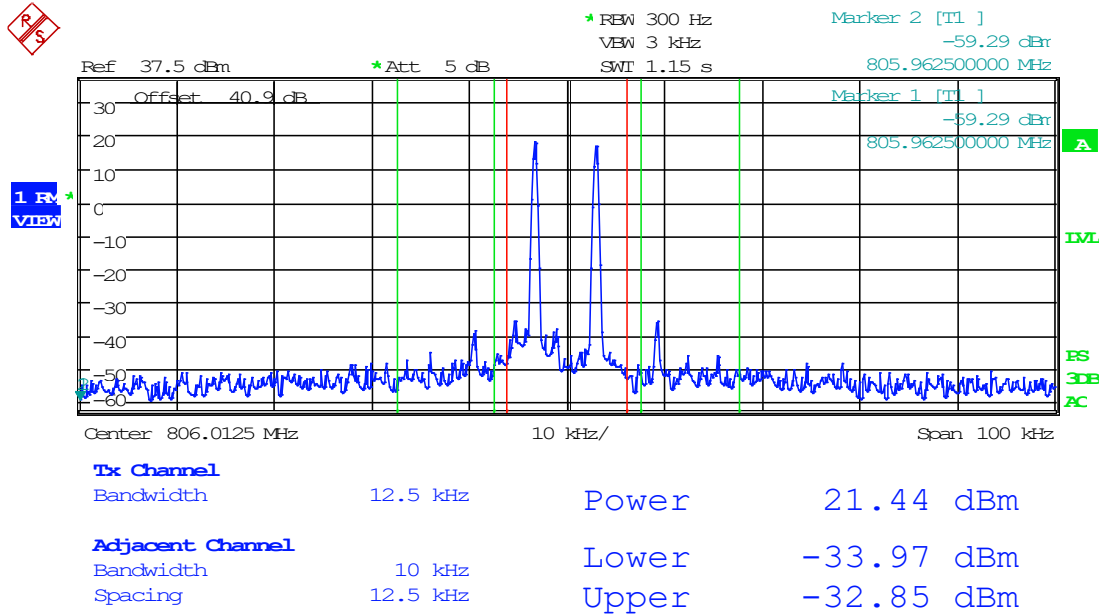


Date: 31.JAN.2023 15:51:48



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

8.7.20 6.25 kHz Signal, Uplink, AGC+3dB, 806.0125 MHz

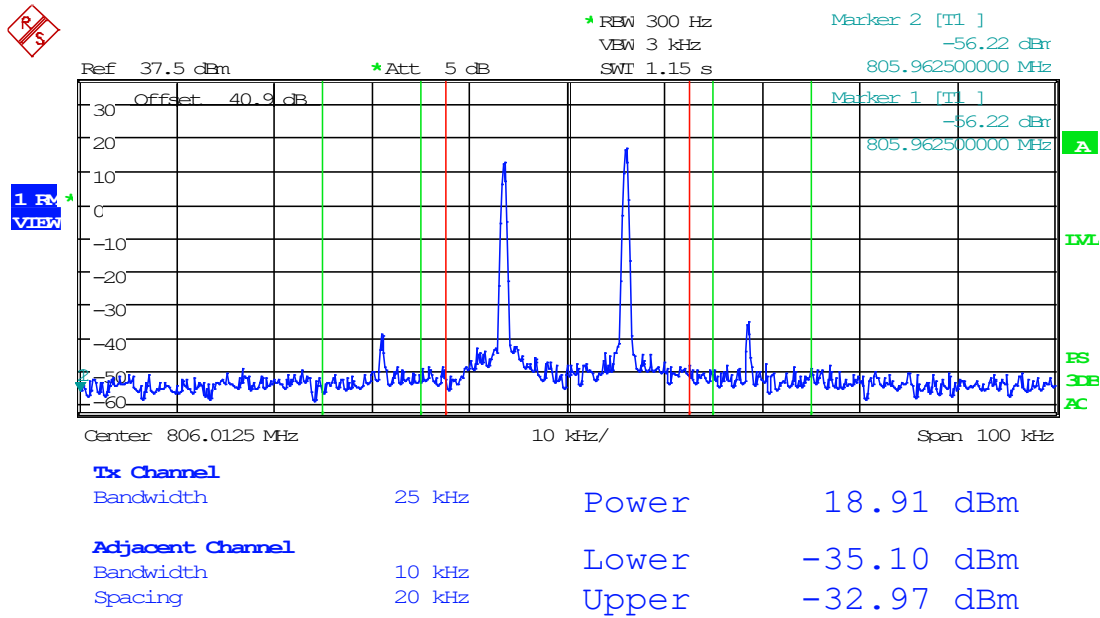


Date: 31.JAN.2023 15:52:53



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

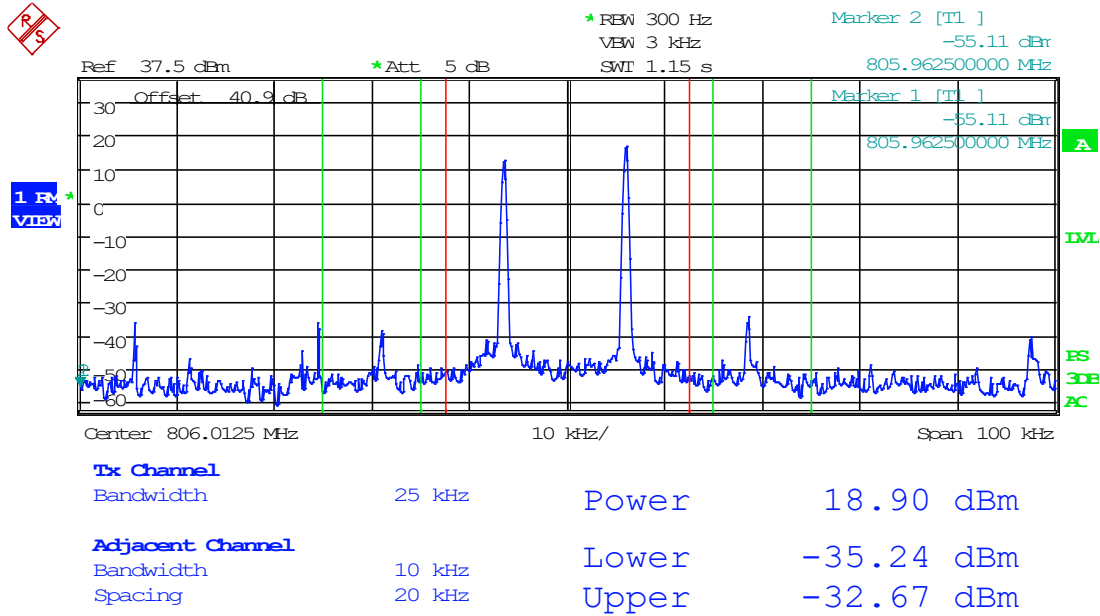
8.7.21 12.5 kHz Signal, Uplink, AGC, 806.0125 MHz



Date: 1.FEB.2023 08:02:48



8.7.22 12.5 kHz Signal, Uplink, AGC+3dB, 806.0125 MHz

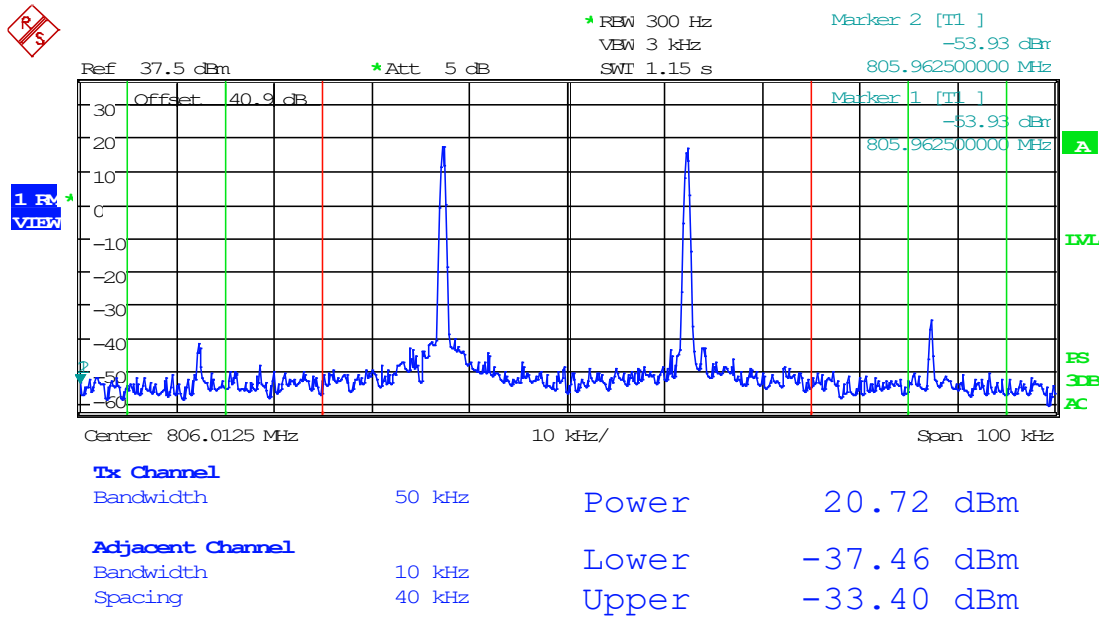


Date: 1.FEB.2023 08:03:45



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

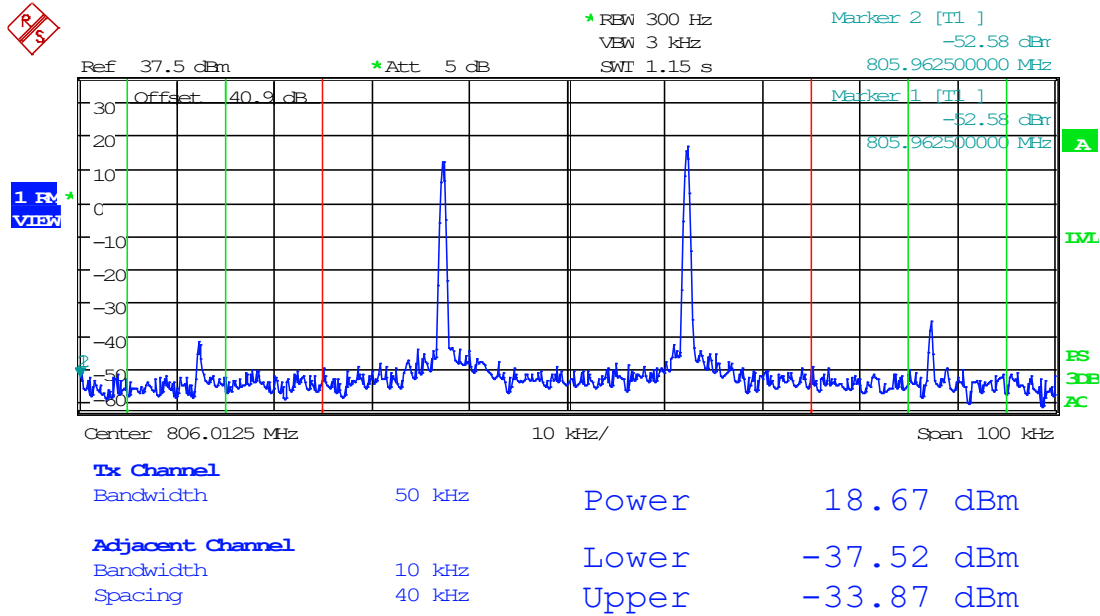
8.7.23 25 kHz Signal, Uplink, AGC, 806.0125 MHz



Date: 1.FEB.2023 08:39:20



8.7.24 25 kHz Signal, Uplink, AGC+3dB, 806.0125 MHz

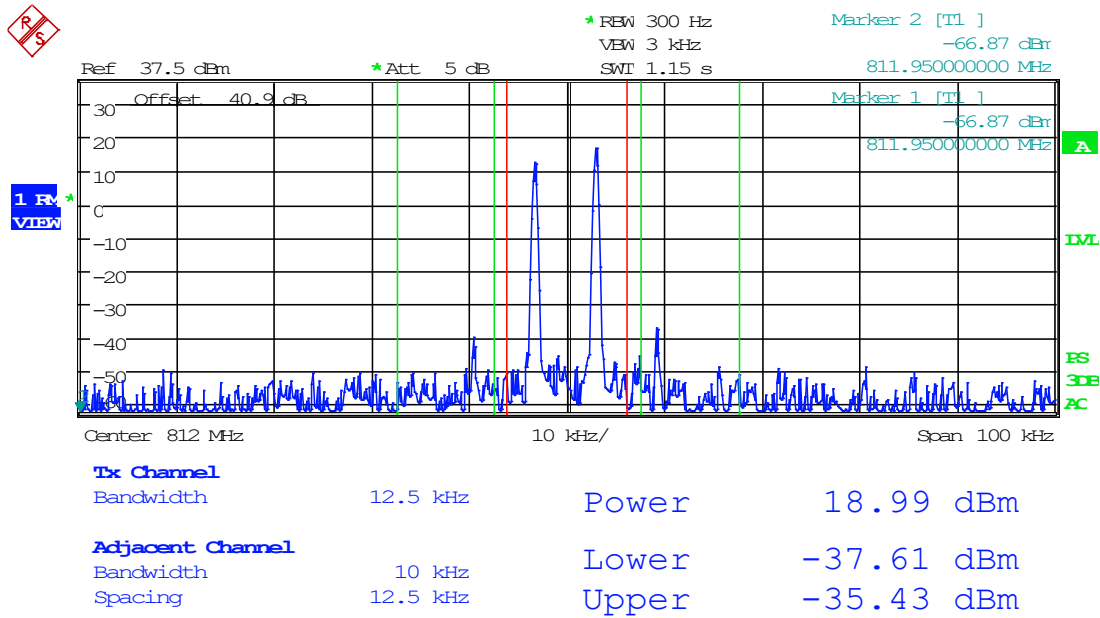


Date: 1.FEB.2023 08:39:59



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

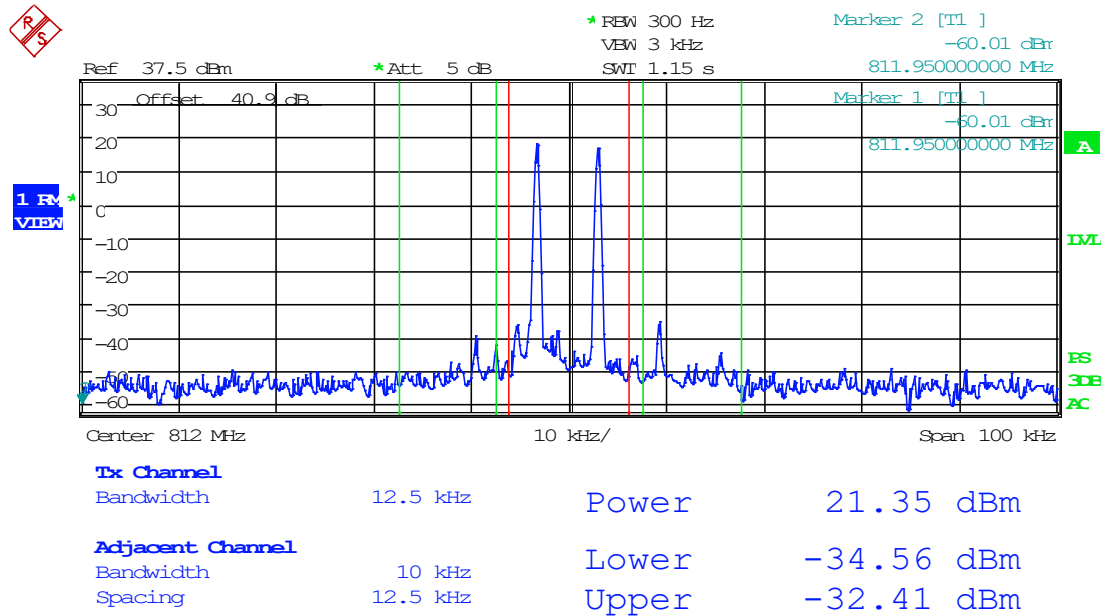
8.7.25 6.25 kHz Signal, Uplink, AGC, 812 MHz



Date: 31.JAN.2023 15:55:07



8.7.26 6.25 kHz Signal, Uplink, AGC+3dB, 812 MHz

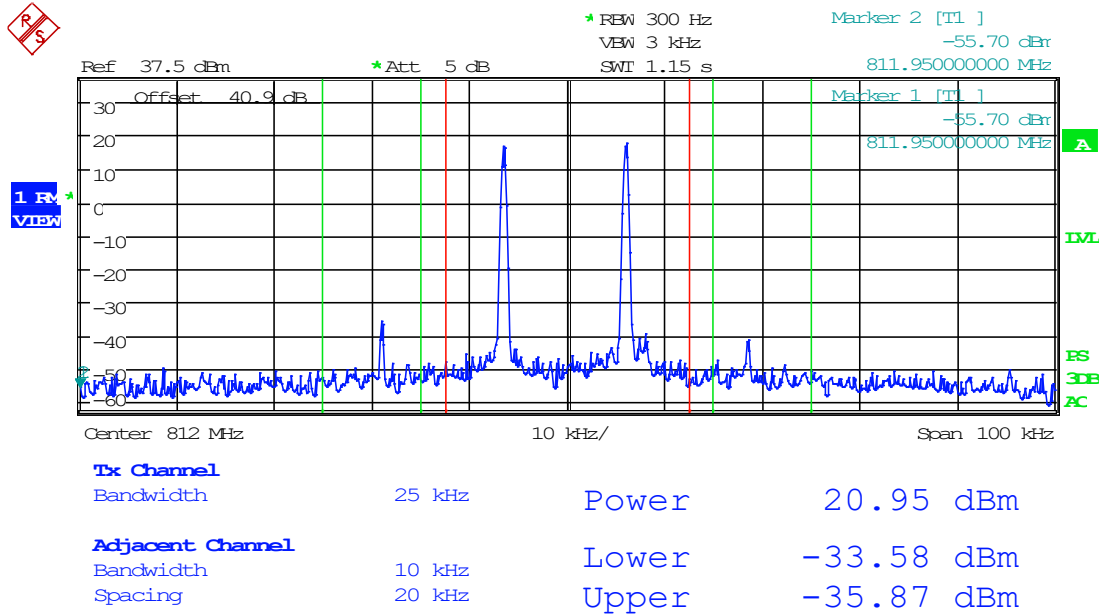


Date: 31.JAN.2023 15:55:56



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

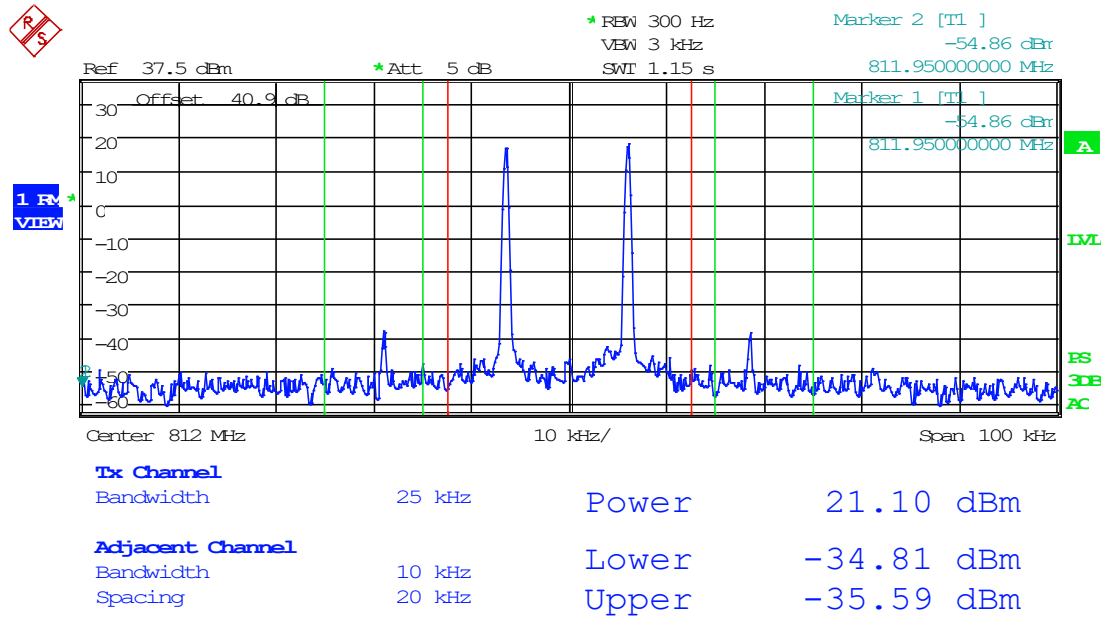
8.7.27 12.5 kHz Signal, Uplink, AGC, 812 MHz



Date: 1.FEB.2023 08:05:26

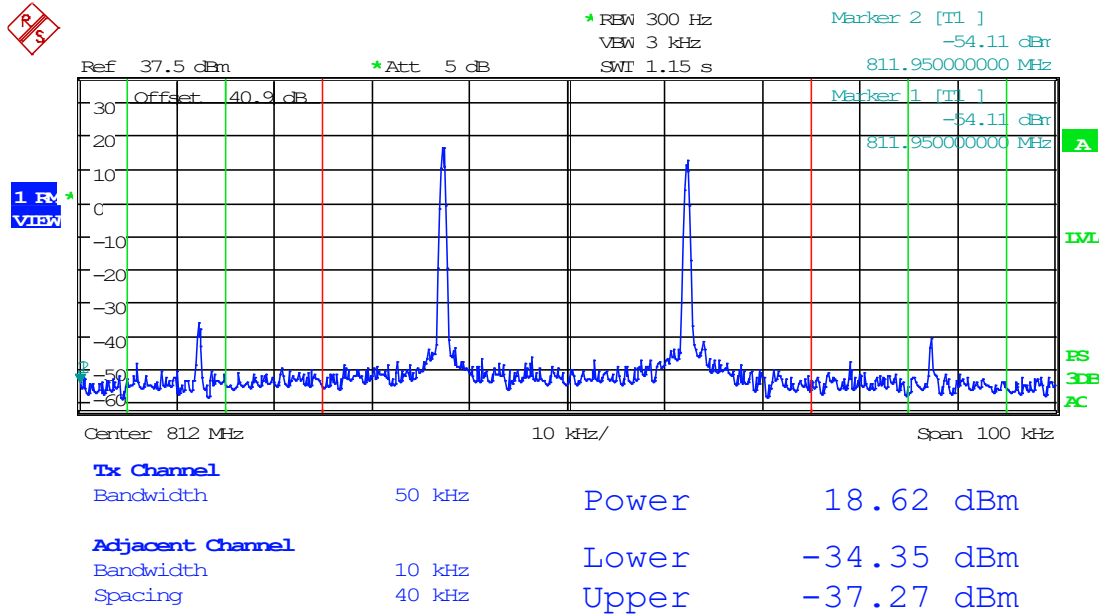


8.7.28 12.5 kHz Signal, Uplink, AGC+3dB, 812 MHz



Date: 1.FEB.2023 08:06:11

8.7.29 25 kHz Signal, Uplink, AGC, 812 MHz

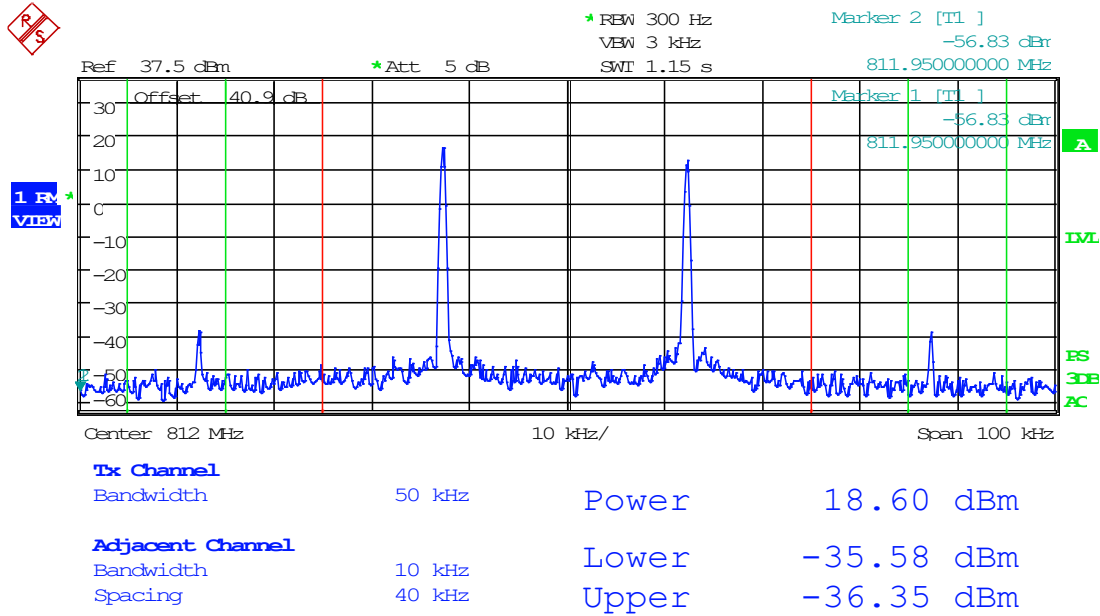


Date: 1.FEB.2023 08:41:21



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

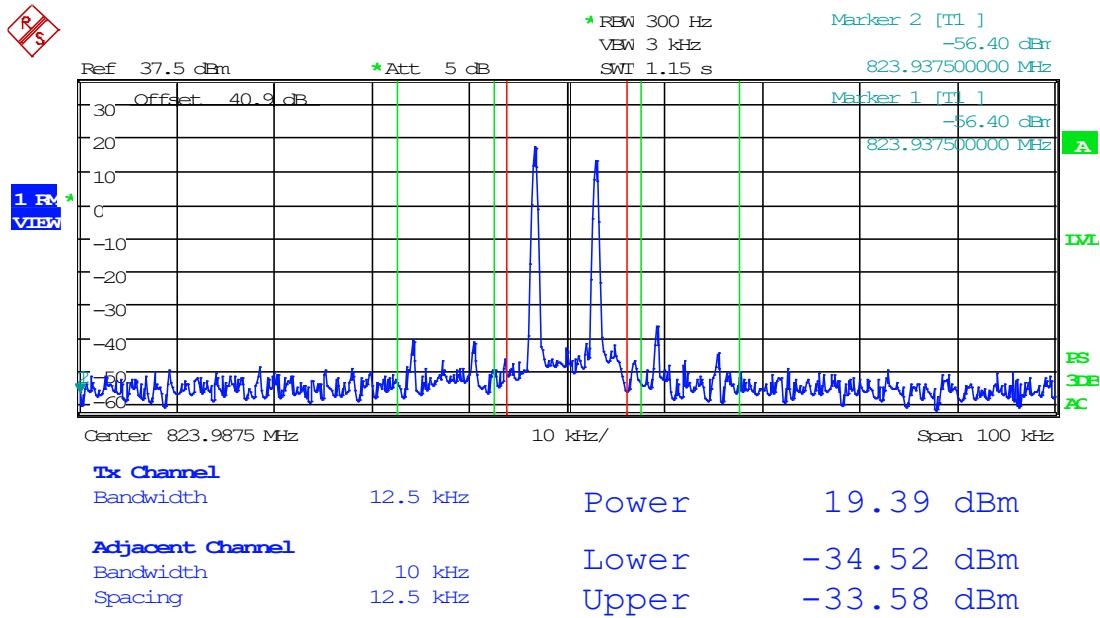
8.7.30 25 kHz Signal, Uplink, AGC+3dB, 812 MHz



Date: 1.FEB.2023 08:42:01



8.7.31 6.25 kHz Signal, Uplink, AGC, 823.9875 MHz

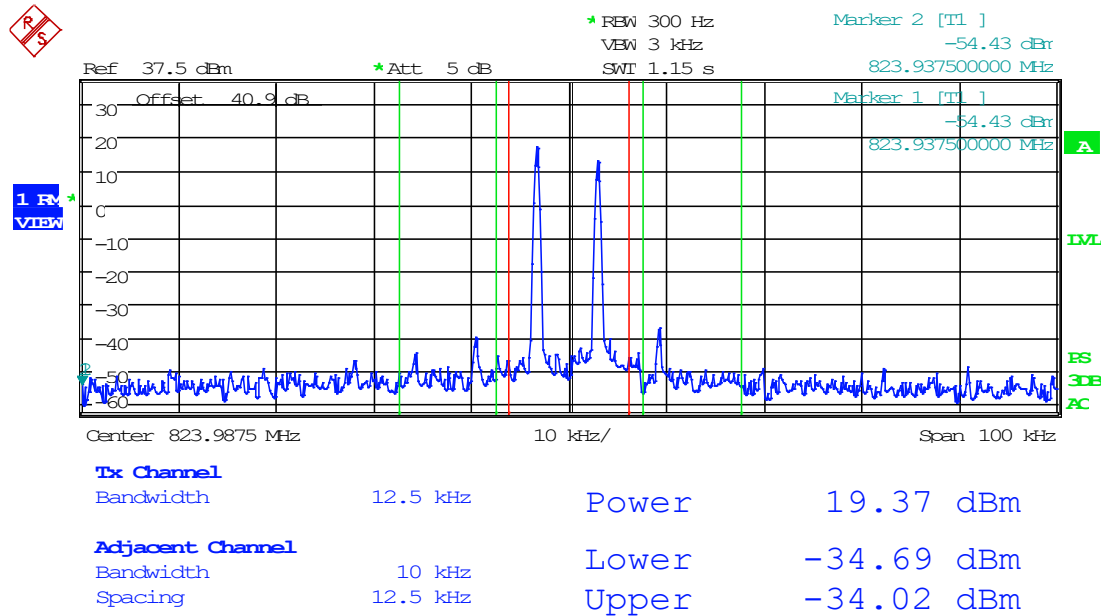


Date: 31.JAN.2023 15:59:56



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

8.7.32 6.25 kHz Signal, Uplink, AGC+3dB, 823.9875 MHz

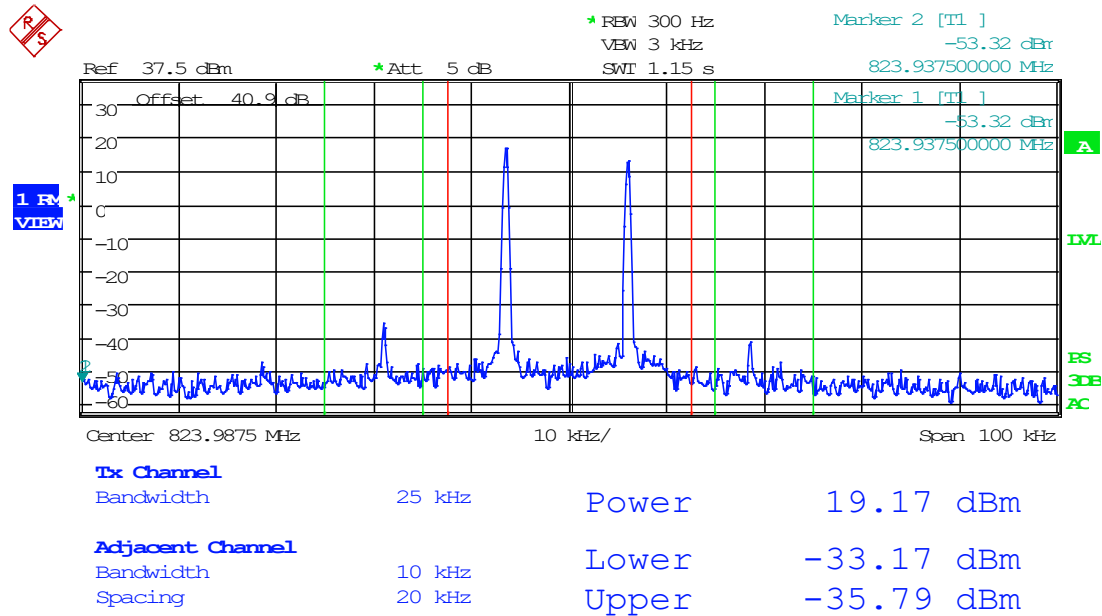


Date: 31.JAN.2023 15:58:29



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

8.7.33 12.5 kHz Signal, Uplink, AGC, 823.9875 MHz

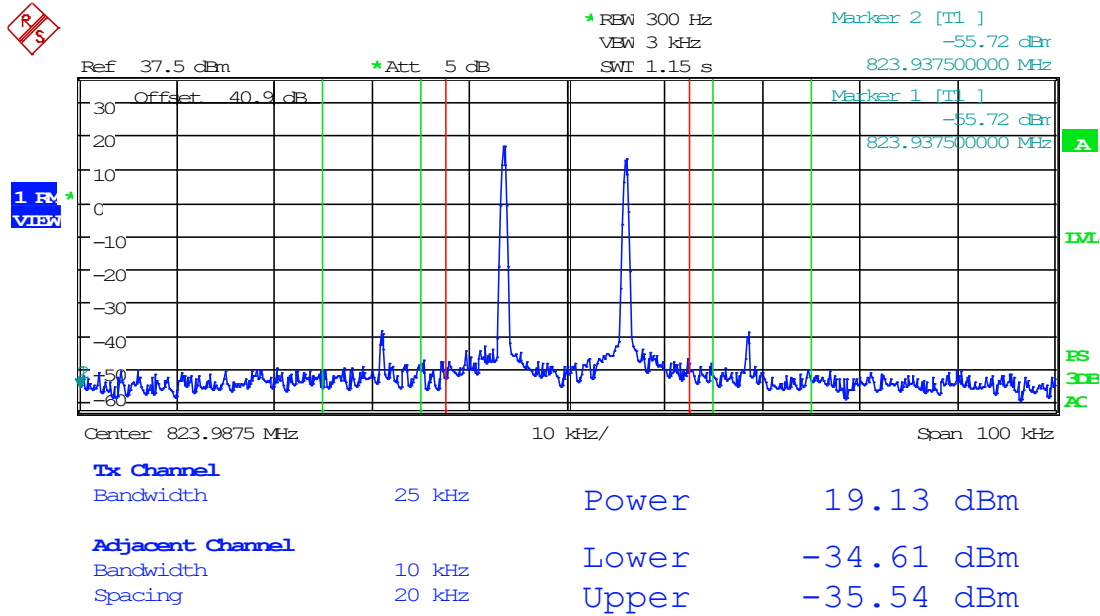


Date: 1.FEB.2023 08:07:46



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

8.7.34 12.5 kHz Signal, Uplink, AGC+3dB, 823.9875 MHz

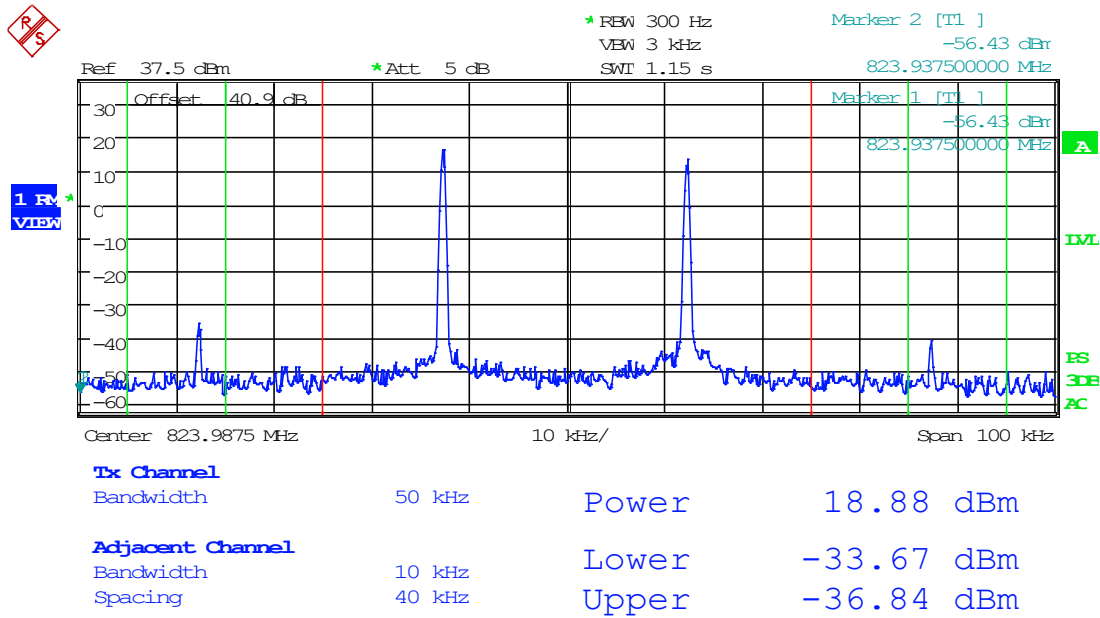


Date: 1.FEB.2023 08:08:35



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

8.7.35 25 kHz Signal, Uplink, AGC, 823.9875 MHz

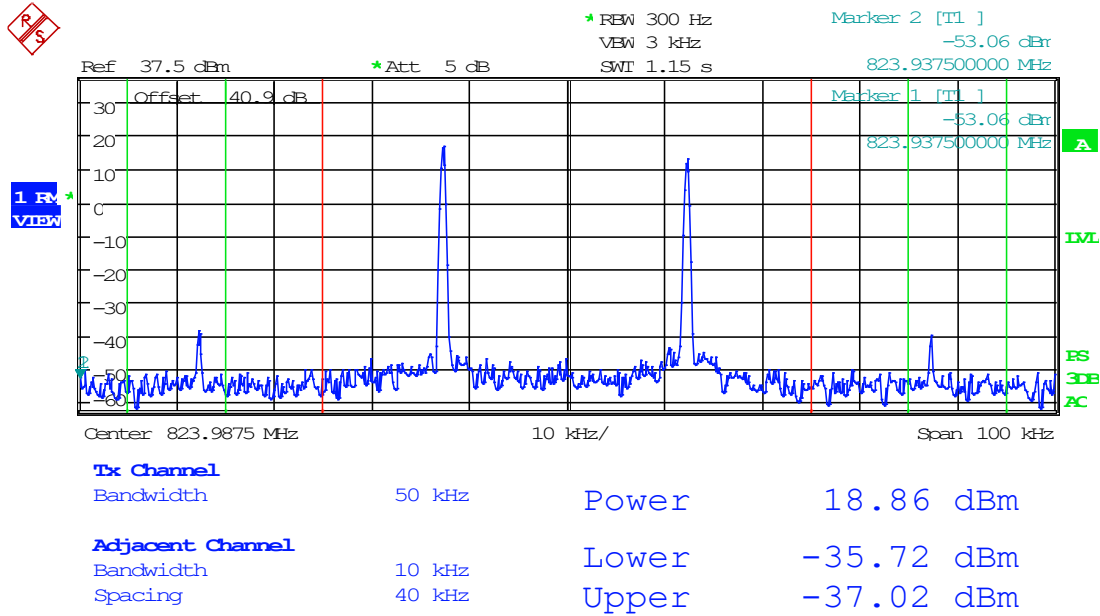


Date: 1.FEB.2023 08:44:15



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

8.7.36 25 kHz Signal, Uplink, AGC+3dB, 823.9875 MHz



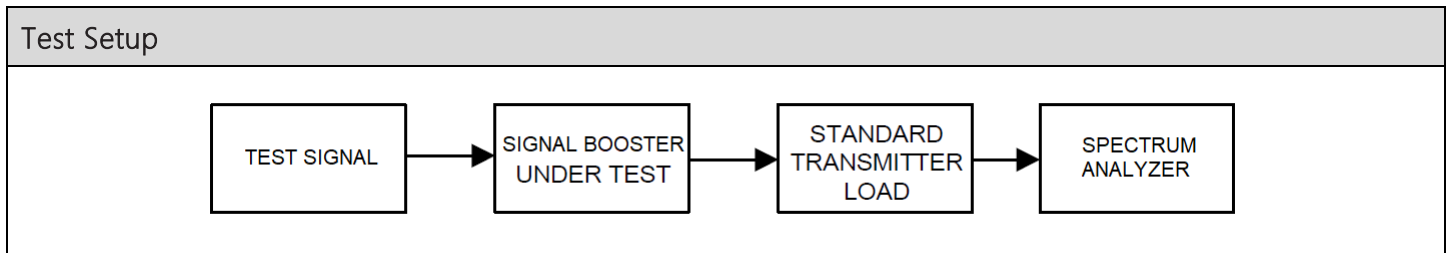
Date: 1.FEB.2023 08:45:04



8.8 Emission Mask, Out-of-Band

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

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.

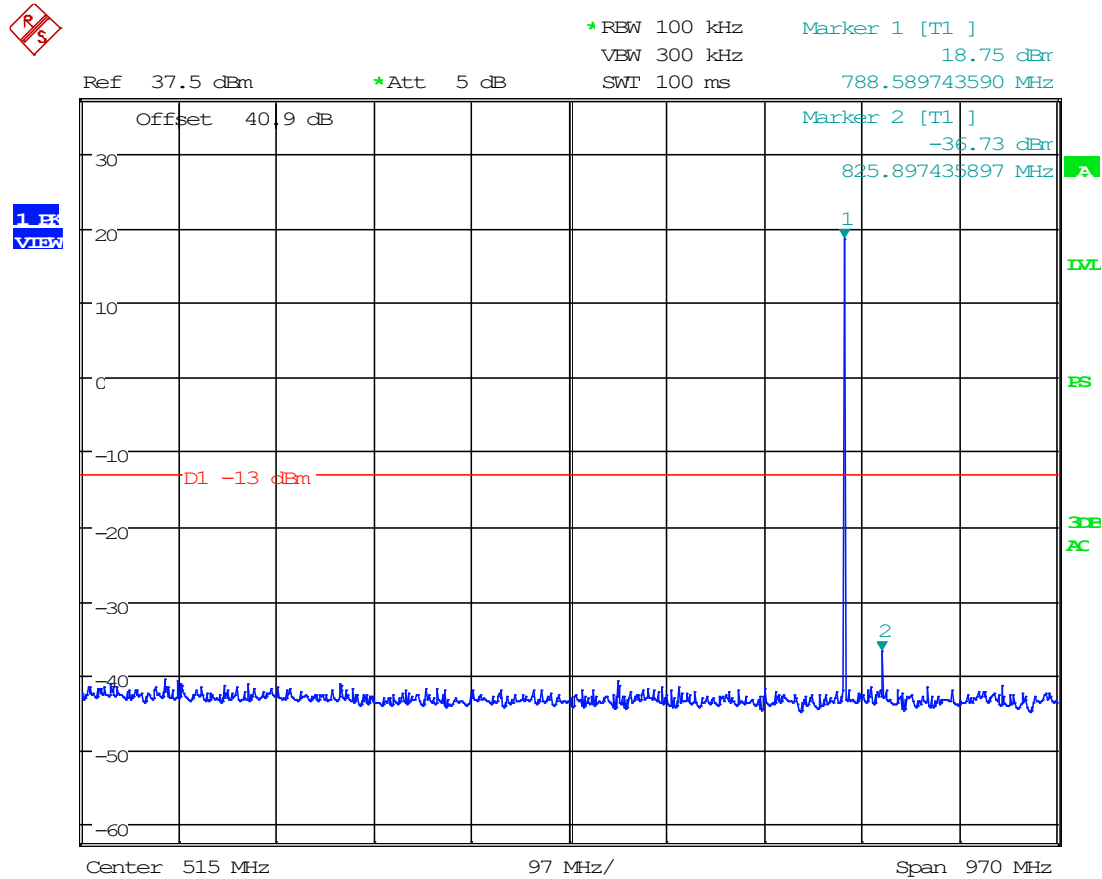


Note: Testing was done simultaneously on all combinations of Uplinks and Downlinks to address co-location of signals.



Conducted Emissions Spectrum Plots

8.8.1 30 MHz to 1 GHz, 788.0125 MHz

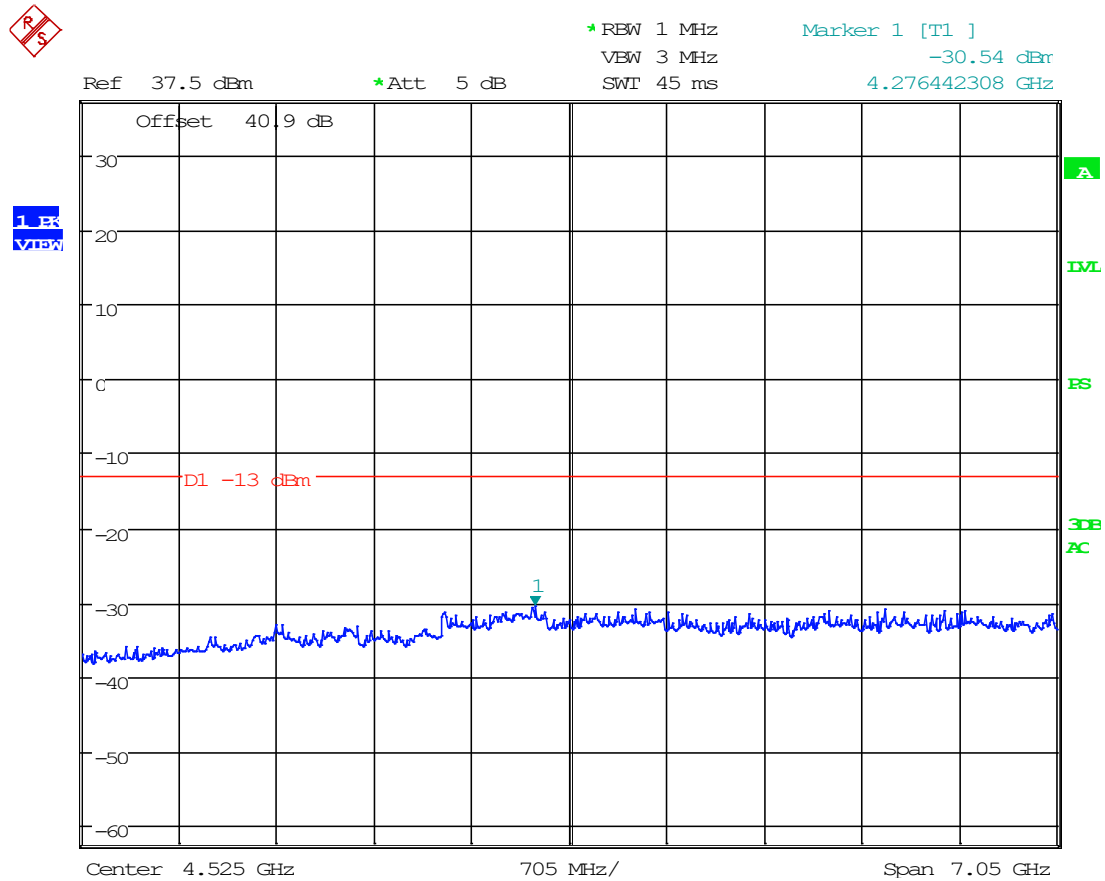


Date: 30.JAN.2023 16:31:10



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

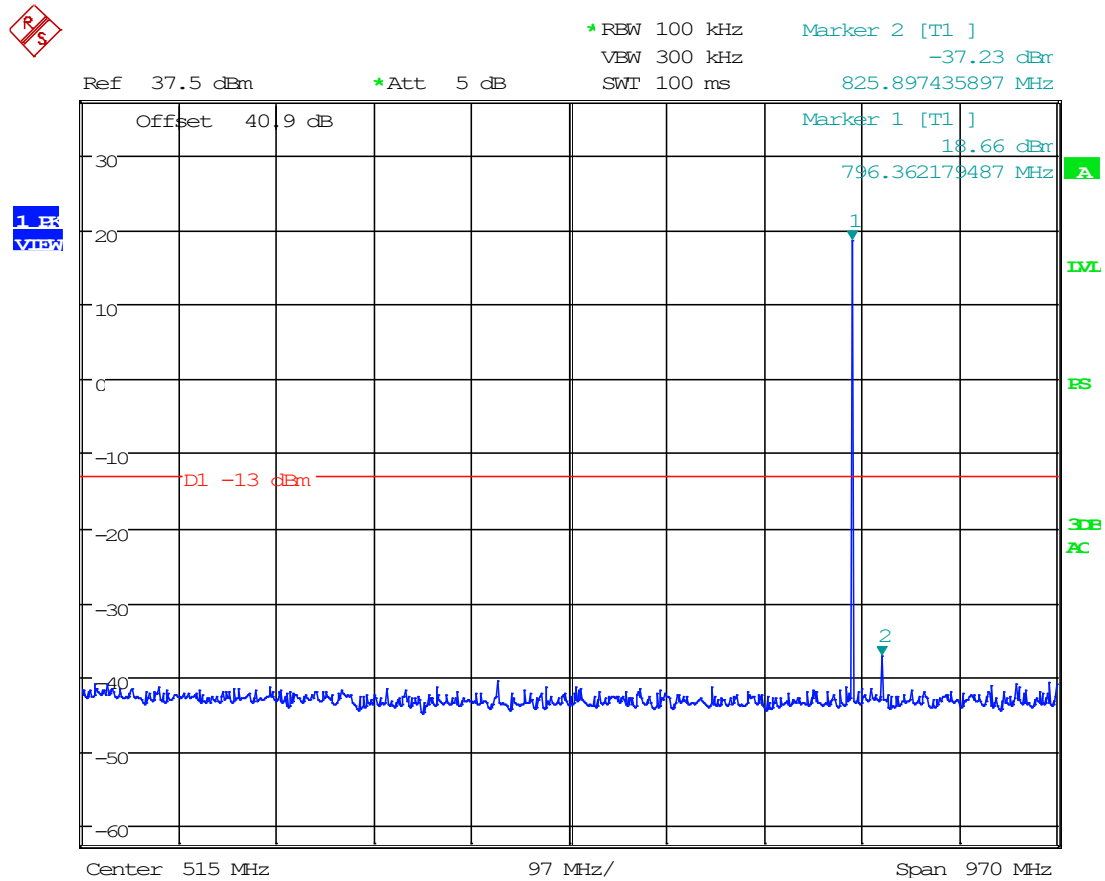
8.8.2 1 GHz to 10th Harmonic, 788.0125 MHz



Date: 30.JAN.2023 17:05:05



8.8.3 30 MHz to 1 GHz, 796 MHz

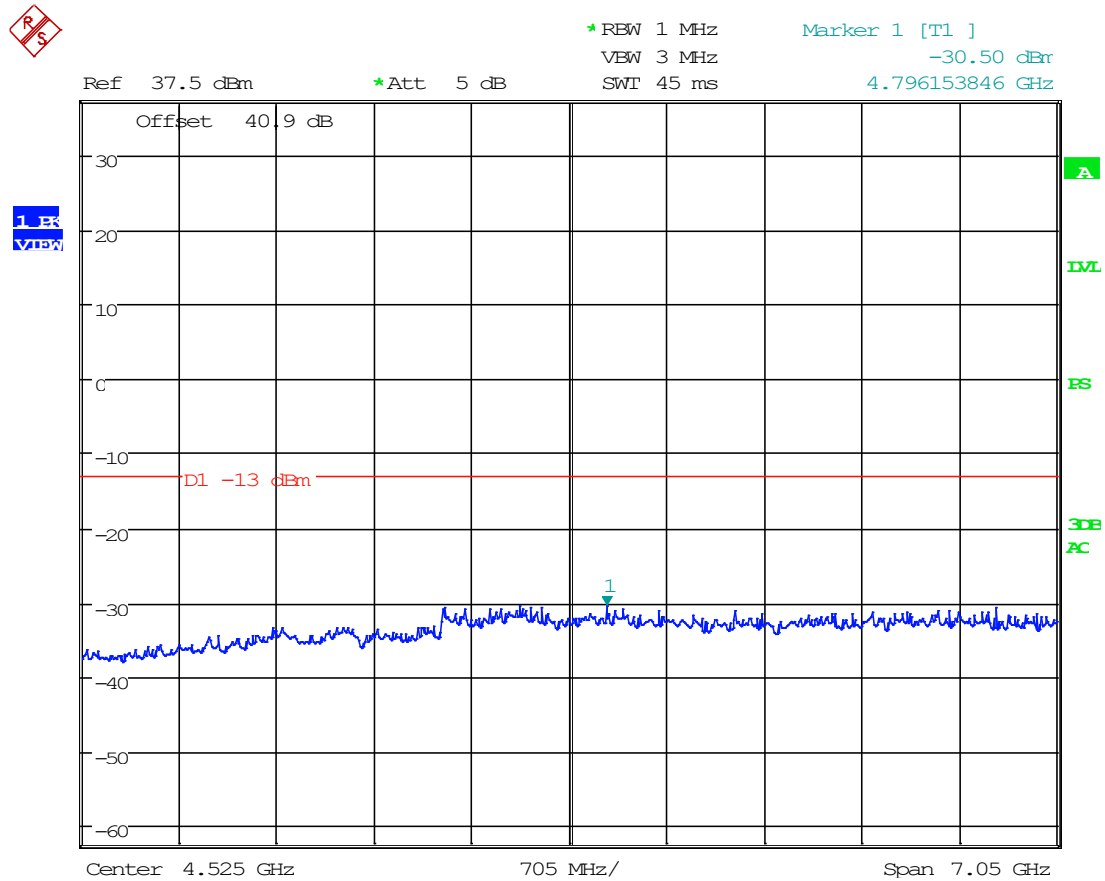


Date: 30.JAN.2023 16:46:04



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

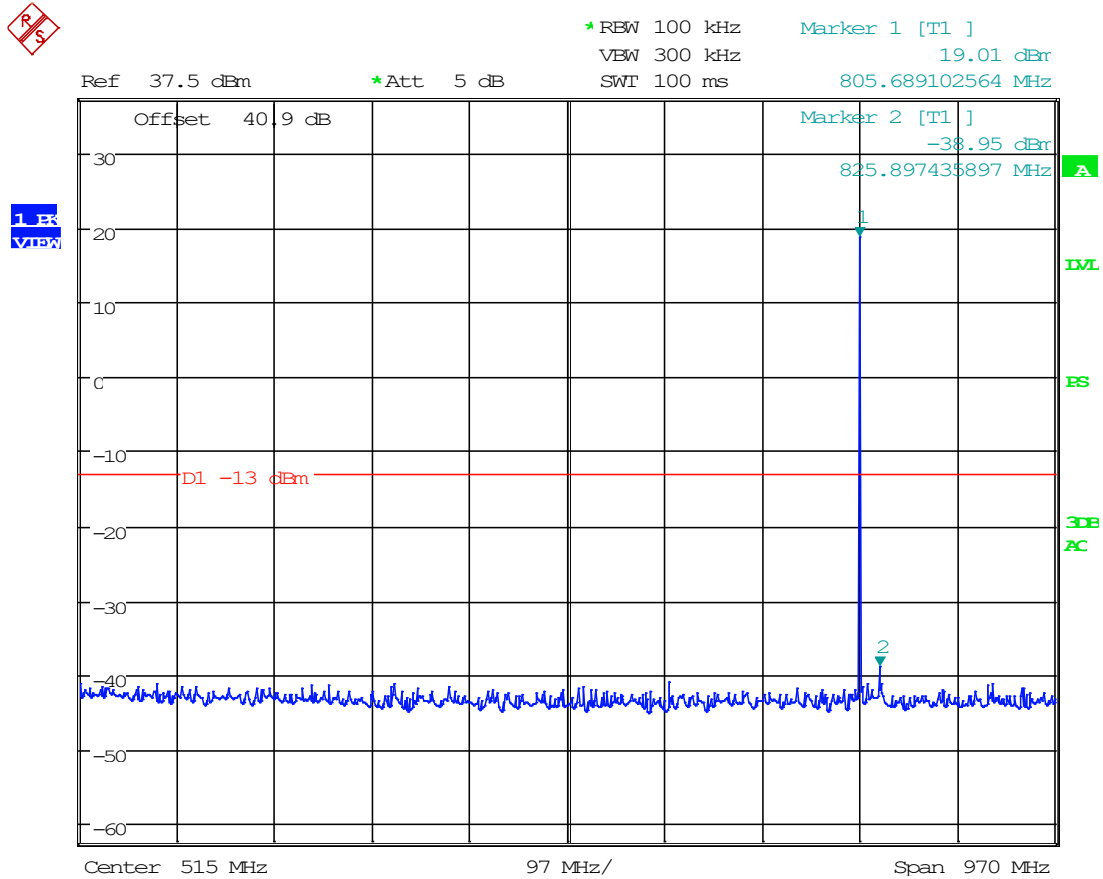
8.8.4 1 GHz to 10th Harmonic, 796 MHz



Date: 30.JAN.2023 17:05:58



8.8.5 30 MHz to 1 GHz, 804.9875 MHz

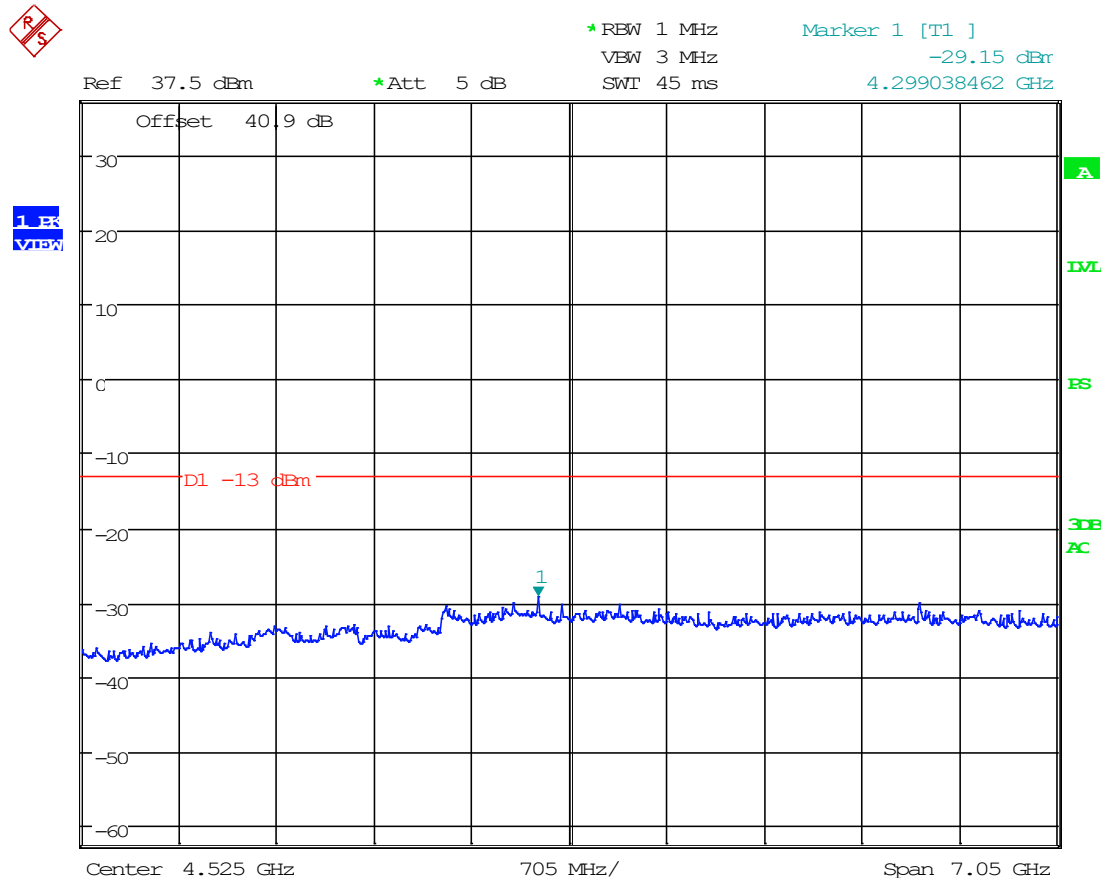


Date: 30.JAN.2023 16:47:02



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

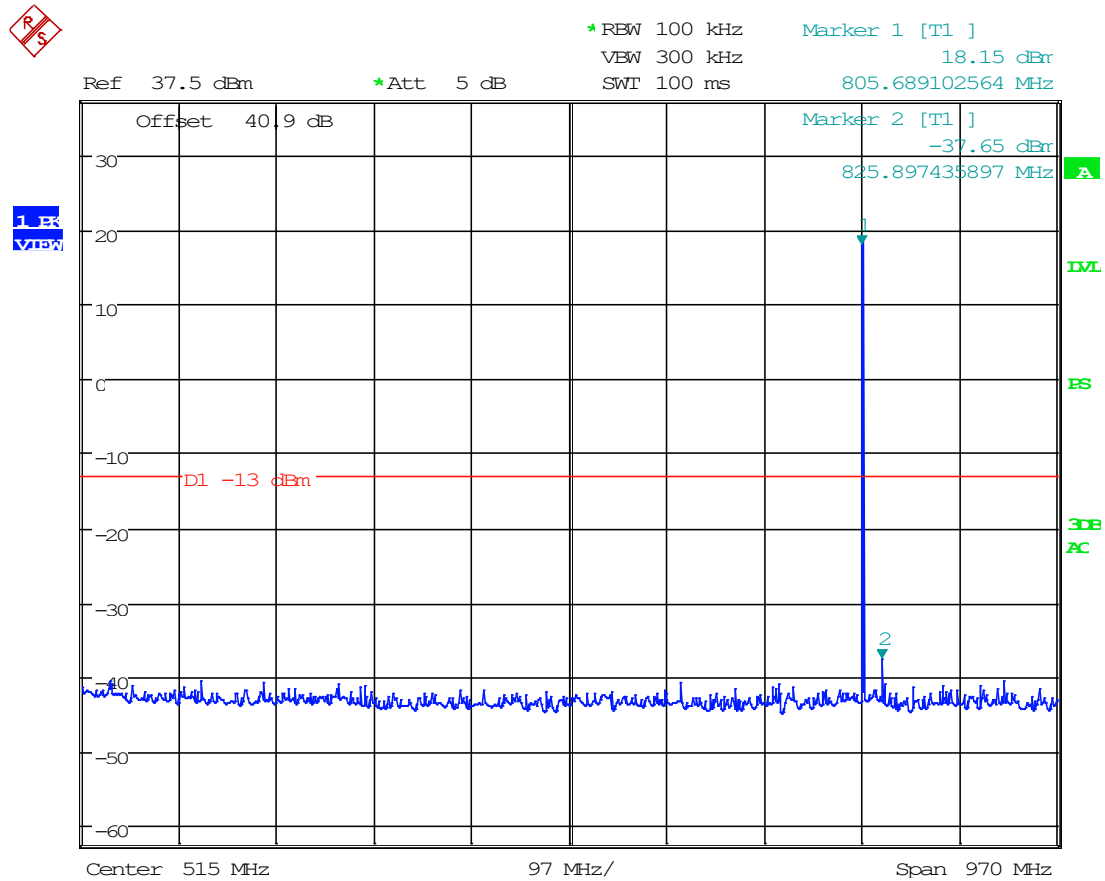
8.8.6 1 GHz to 10th Harmonic, 804.9875 MHz



Date: 30.JAN.2023 17:07:14



8.8.7 30 MHz to 1 GHz, 806.0125 MHz

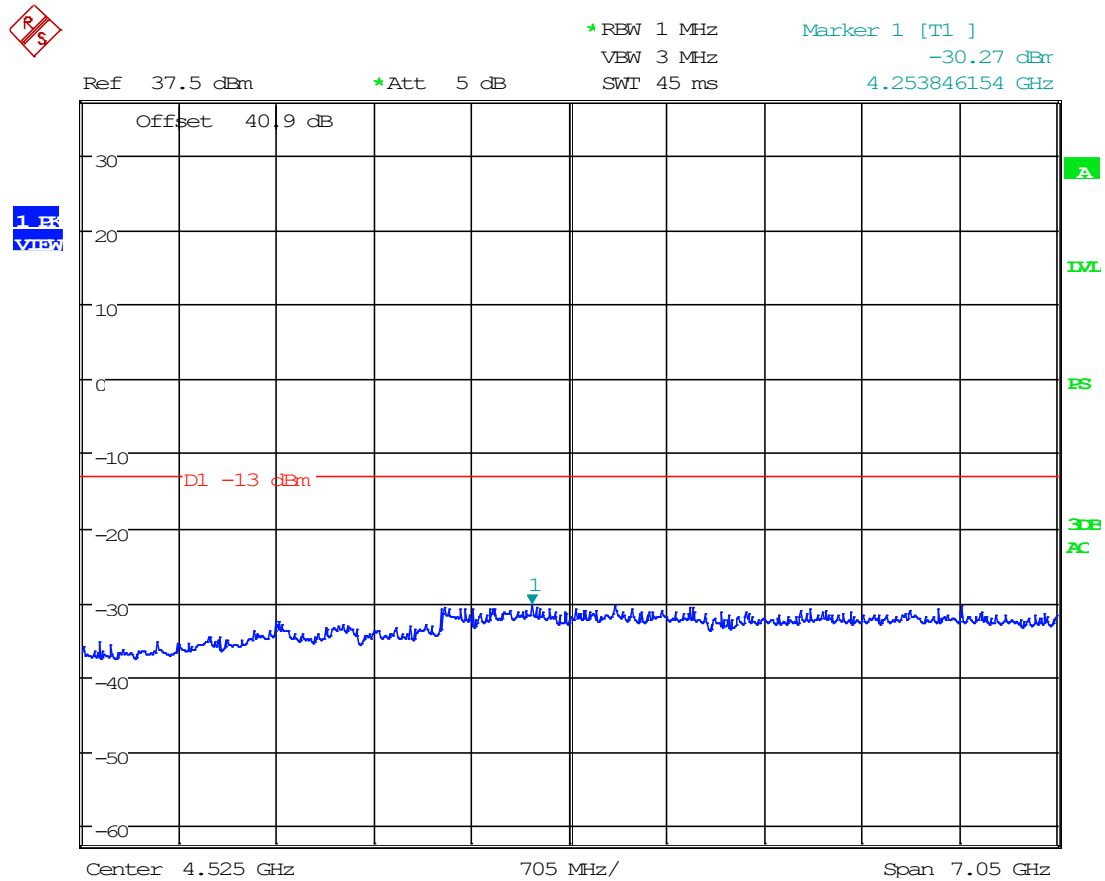


Date: 30.JAN.2023 16:47:50



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

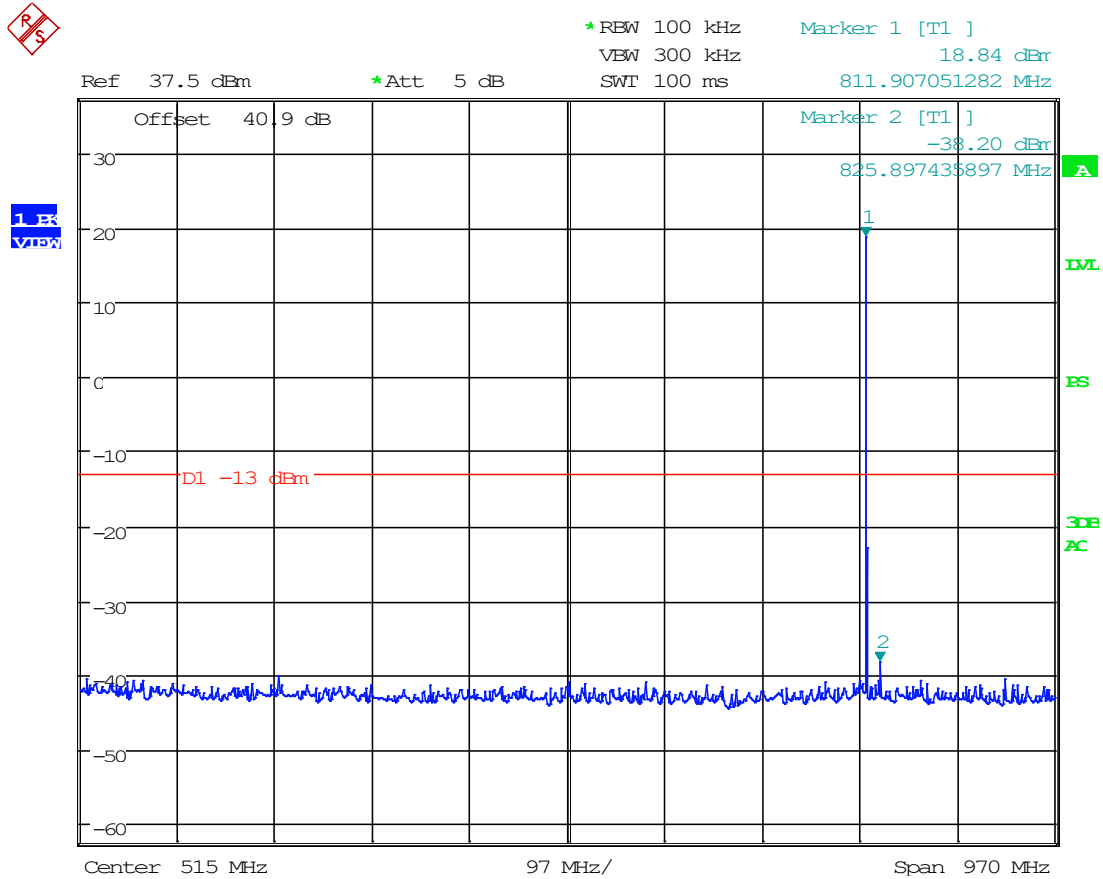
8.8.8 1 GHz to 10th Harmonic, 806.0125 MHz



Date: 30.JAN.2023 17:08:04



8.8.9 30 MHz to 1 GHz, 812 MHz

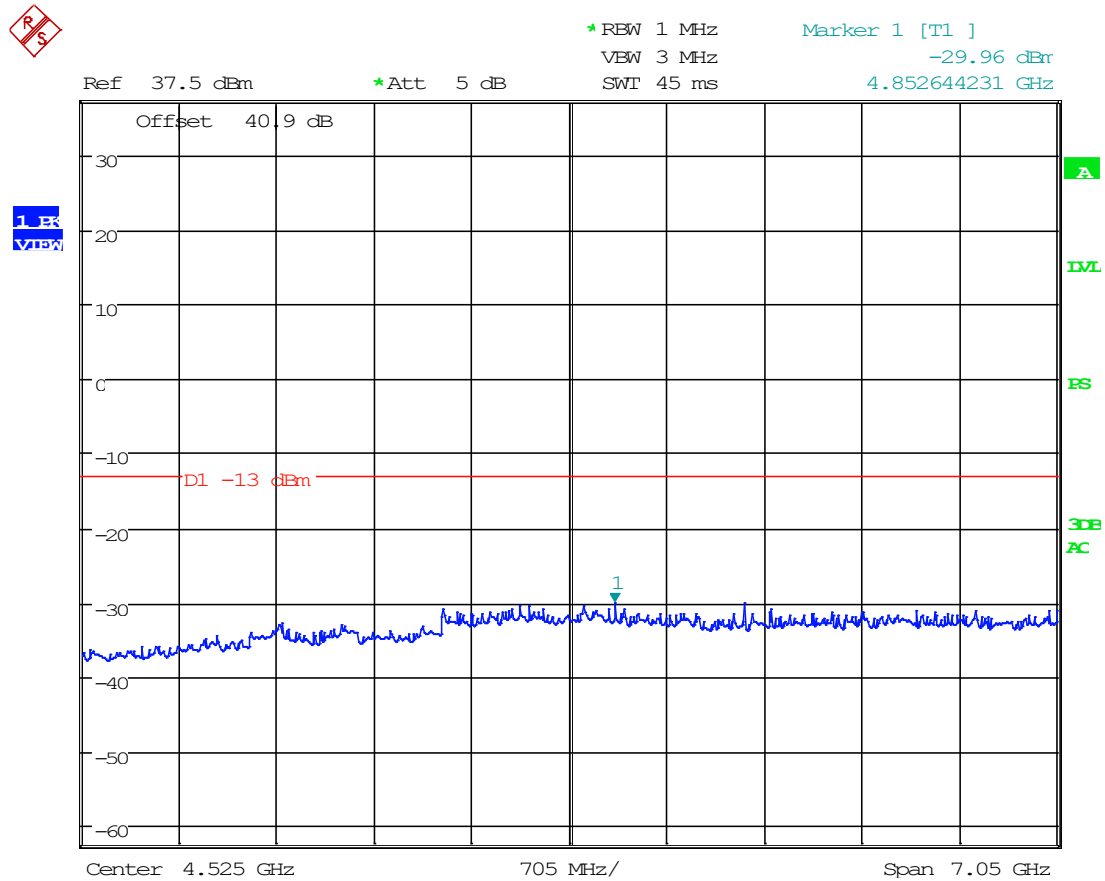


Date: 30.JAN.2023 16:48:36



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

8.8.10 1 GHz to 10th Harmonic, 812 MHz

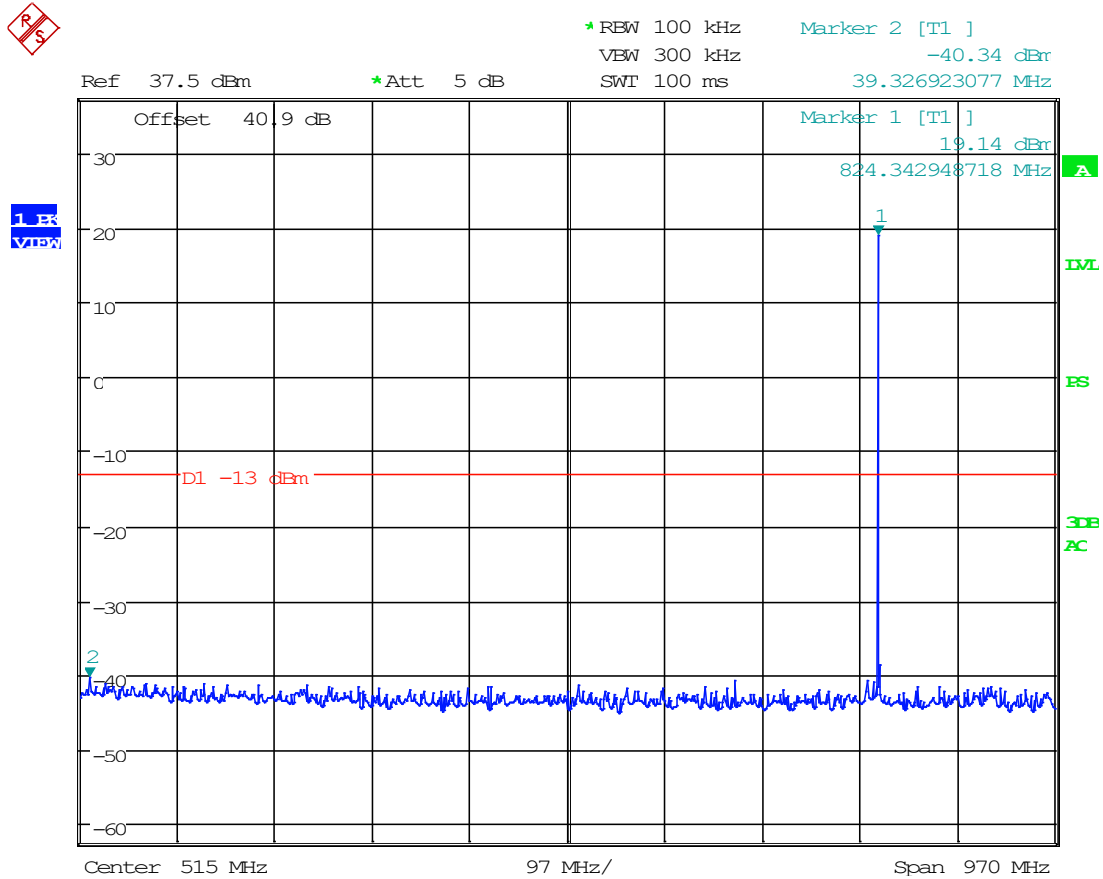


Date: 30.JAN.2023 17:08:47



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

8.8.11 30 MHz to 1 GHz, 823.9875 MHz

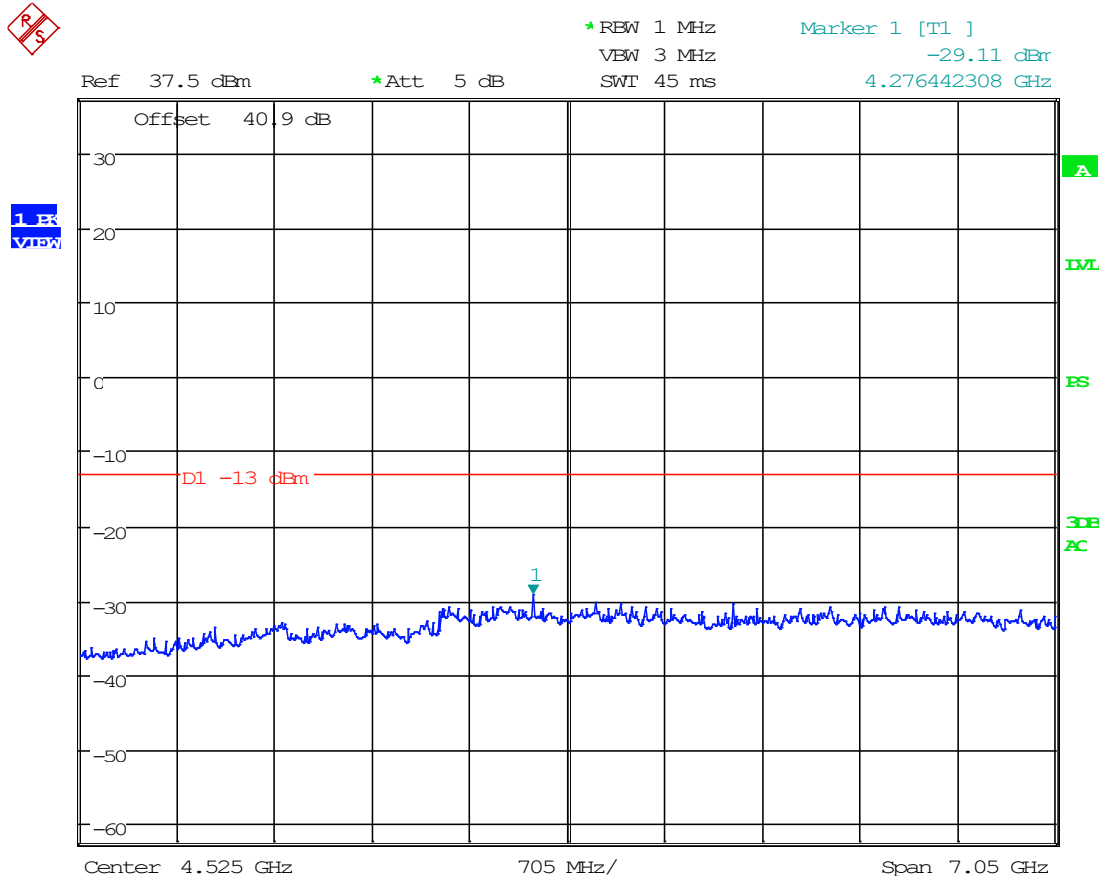


Date: 30.JAN.2023 16:49:32



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

8.8.12 1 GHz to 10th Harmonic, 823.9875 MHz

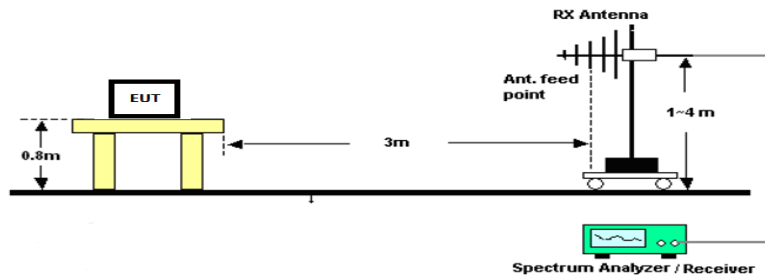


Date: 30.JAN.2023 17:09:32

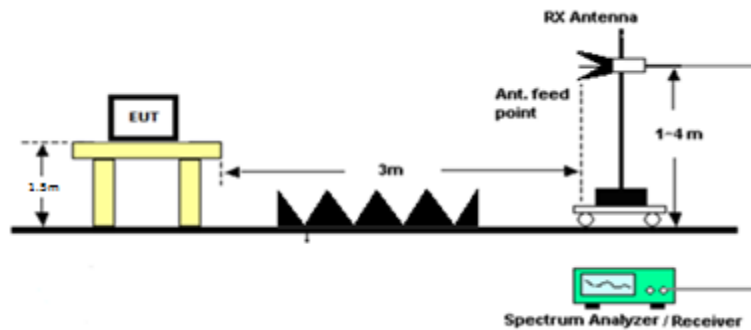
8.9 Spurious Radiated Emissions

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





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

Radiated Emissions, Tabular Data

8.9.1 Uplink, 788.0125 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)
788.0125	1576.0250	PK	10.60	H	4.61	27.92	3.00	43.13	-54.25	-13.00	41.25
788.0125	1576.0250	PK	10.30	V	4.61	27.92	3.00	42.83	-54.55	-13.00	41.55
788.0125	2364.0375	PK	12.10	H	5.60	31.91	3.00	49.61	-47.76	-13.00	34.76
788.0125	2364.0375	PK	12.20	V	5.60	31.91	3.00	49.71	-47.66	-13.00	34.66
788.0125	3152.0500	PK	13.30	H	6.53	32.77	3.00	52.60	-44.77	-13.00	31.77
788.0125	3152.0500	PK	13.70	V	6.53	32.77	3.00	53.00	-44.37	-13.00	31.37
788.0125	3940.0625	PK	16.70	H	7.27	33.34	3.00	57.31	-40.07	-13.00	27.07
788.0125	3940.0625	PK	16.60	V	7.27	33.34	3.00	57.21	-40.17	-13.00	27.17
788.0125	4728.0750	PK	13.90	H	7.05	33.89	3.00	54.85	-42.53	-13.00	29.53
788.0125	4728.0750	PK	14.40	V	7.05	33.89	3.00	55.35	-42.03	-13.00	29.03
788.0125	5516.0875	PK	14.60	H	8.06	34.45	3.00	57.11	-40.27	-13.00	27.27
788.0125	5516.0875	PK	14.10	V	8.06	34.45	3.00	56.61	-40.77	-13.00	27.77
788.0125	6304.1000	PK	14.90	H	8.59	35.39	3.00	58.87	-38.50	-13.00	25.50
788.0125	6304.1000	PK	14.80	V	8.59	35.39	3.00	58.77	-38.60	-13.00	25.60
788.0125	7092.1125	PK	14.20	H	9.44	36.31	3.00	59.95	-37.42	-13.00	24.42
788.0125	7092.1125	PK	13.90	V	9.44	36.31	3.00	59.65	-37.72	-13.00	24.72
788.0125	7880.1250	PK	14.50	H	10.16	35.86	3.00	60.51	-36.86	-13.00	23.86
788.0125	7880.1250	PK	13.80	V	10.16	35.86	3.00	59.81	-37.56	-13.00	24.56



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

8.9.2 Uplink, 796 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)
796.0000	1592.00	PK	10.20	H	4.64	28.02	3.00	42.86	-54.52	-13.00	41.52
796.0000	1592.00	PK	10.40	V	4.64	28.02	3.00	43.06	-54.32	-13.00	41.32
796.0000	2388.00	PK	11.50	H	5.62	31.89	3.00	49.01	-48.37	-13.00	35.37
796.0000	2388.00	PK	11.60	V	5.62	31.89	3.00	49.11	-48.27	-13.00	35.27
796.0000	3184.00	PK	14.00	H	6.61	32.71	3.00	53.32	-44.06	-13.00	31.06
796.0000	3184.00	PK	13.40	V	6.61	32.71	3.00	52.72	-44.66	-13.00	31.66
796.0000	3980.00	PK	16.60	H	7.26	33.39	3.00	57.25	-40.13	-13.00	27.13
796.0000	3980.00	PK	16.80	V	7.26	33.39	3.00	57.45	-39.93	-13.00	26.93
796.0000	4776.00	PK	13.80	H	7.01	33.92	3.00	54.73	-42.64	-13.00	29.64
796.0000	4776.00	PK	14.20	V	7.01	33.92	3.00	55.13	-42.24	-13.00	29.24
796.0000	5572.00	PK	15.50	H	8.09	34.42	3.00	58.01	-39.37	-13.00	26.37
796.0000	5572.00	PK	14.70	V	8.09	34.42	3.00	57.21	-40.17	-13.00	27.17
796.0000	6368.00	PK	15.10	H	8.91	35.42	3.00	59.43	-37.95	-13.00	24.95
796.0000	6368.00	PK	14.30	V	8.91	35.42	3.00	58.63	-38.75	-13.00	25.75
796.0000	7164.00	PK	14.40	H	9.50	36.38	3.00	60.28	-37.10	-13.00	24.10
796.0000	7164.00	PK	14.20	V	9.50	36.38	3.00	60.08	-37.30	-13.00	24.30
796.0000	7960.00	PK	13.90	H	9.82	35.72	3.00	59.44	-37.93	-13.00	24.93
796.0000	7960.00	PK	13.90	V	9.82	35.72	3.00	59.44	-37.93	-13.00	24.93



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

8.9.3 Uplink, 804.9875 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)
804.9875	1609.9750	PK	10.60	H	4.67	28.18	3.00	43.45	-53.93	-13.00	40.93
804.9875	1609.9750	PK	12.00	V	4.67	28.18	3.00	44.85	-52.53	-13.00	39.53
804.9875	2414.9625	PK	11.60	H	5.61	31.87	3.00	49.08	-48.30	-13.00	35.30
804.9875	2414.9625	PK	11.90	V	5.61	31.87	3.00	49.38	-48.00	-13.00	35.00
804.9875	3219.9500	PK	13.80	H	6.63	32.68	3.00	53.11	-44.27	-13.00	31.27
804.9875	3219.9500	PK	13.30	V	6.63	32.68	3.00	52.61	-44.77	-13.00	31.77
804.9875	4024.9375	PK	13.90	H	7.23	33.39	3.00	54.51	-42.86	-13.00	29.86
804.9875	4024.9375	PK	13.80	V	7.23	33.39	3.00	54.41	-42.96	-13.00	29.96
804.9875	4829.9250	PK	13.70	H	7.17	33.94	3.00	54.81	-42.57	-13.00	29.57
804.9875	4829.9250	PK	13.80	V	7.17	33.94	3.00	54.91	-42.47	-13.00	29.47
804.9875	5634.9125	PK	14.40	H	8.20	34.51	3.00	57.11	-40.26	-13.00	27.26
804.9875	5634.9125	PK	15.20	V	8.20	34.51	3.00	57.91	-39.46	-13.00	26.46
804.9875	6439.9000	PK	14.30	H	8.96	35.51	3.00	58.76	-38.61	-13.00	25.61
804.9875	6439.9000	PK	14.00	V	8.96	35.51	3.00	58.46	-38.91	-13.00	25.91
804.9875	7244.8875	PK	15.50	H	9.51	36.32	3.00	61.33	-36.04	-13.00	23.04
804.9875	7244.8875	PK	14.20	V	9.51	36.32	3.00	60.03	-37.34	-13.00	24.34
804.9875	8049.8750	PK	14.40	H	9.89	35.77	3.00	60.06	-37.31	-13.00	24.31
804.9875	8049.8750	PK	14.70	V	9.89	35.77	3.00	60.36	-37.01	-13.00	24.01



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

8.9.4 Uplink, 806.0125 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)
806.0125	1612.0250	PK	10.70	H	4.68	28.20	3.00	43.58	-53.80	-13.00	40.80
806.0125	1612.0250	PK	10.80	V	4.68	28.20	3.00	43.68	-53.70	-13.00	40.70
806.0125	2418.0375	PK	12.20	H	5.61	31.86	3.00	49.68	-47.70	-13.00	34.70
806.0125	2418.0375	PK	11.80	V	5.61	31.86	3.00	49.28	-48.10	-13.00	35.10
806.0125	3224.0500	PK	14.70	H	6.64	32.68	3.00	54.01	-43.36	-13.00	30.36
806.0125	3224.0500	PK	13.80	V	6.64	32.68	3.00	53.11	-44.26	-13.00	31.26
806.0125	4030.0625	PK	14.10	H	7.22	33.39	3.00	54.70	-42.67	-13.00	29.67
806.0125	4030.0625	PK	14.40	V	7.22	33.39	3.00	55.00	-42.37	-13.00	29.37
806.0125	4836.0750	PK	13.90	H	7.18	33.94	3.00	55.03	-42.35	-13.00	29.35
806.0125	4836.0750	PK	14.00	V	7.18	33.94	3.00	55.13	-42.25	-13.00	29.25
806.0125	5642.0875	PK	14.60	H	8.18	34.52	3.00	57.30	-40.07	-13.00	27.07
806.0125	5642.0875	PK	14.20	V	8.18	34.52	3.00	56.90	-40.47	-13.00	27.47
806.0125	6448.1000	PK	14.00	H	8.97	35.52	3.00	58.49	-38.88	-13.00	25.88
806.0125	6448.1000	PK	14.00	V	8.97	35.52	3.00	58.49	-38.88	-13.00	25.88
806.0125	7254.1125	PK	15.50	H	9.51	36.31	3.00	61.33	-36.05	-13.00	23.05
806.0125	7254.1125	PK	14.60	V	9.51	36.31	3.00	60.43	-36.95	-13.00	23.95
806.0125	8060.1250	PK	14.40	H	9.88	35.78	3.00	60.05	-37.32	-13.00	24.32
806.0125	8060.1250	PK	14.10	V	9.88	35.78	3.00	59.75	-37.62	-13.00	24.62



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

8.9.5 Uplink, 812 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)
812.00	1624.00	PK	10.50	H	4.70	28.33	3.00	43.53	-53.85	-13.00	40.85
812.00	1624.00	PK	10.50	V	4.70	28.33	3.00	43.53	-53.85	-13.00	40.85
812.00	2436.00	PK	12.60	H	5.61	31.85	3.00	50.06	-47.32	-13.00	34.32
812.00	2436.00	PK	12.20	V	5.61	31.85	3.00	49.66	-47.72	-13.00	34.72
812.00	3248.00	PK	13.50	H	6.65	32.68	3.00	52.83	-44.55	-13.00	31.55
812.00	3248.00	PK	13.90	V	6.65	32.68	3.00	53.23	-44.15	-13.00	31.15
812.00	4060.00	PK	13.80	H	7.17	33.38	3.00	54.35	-43.02	-13.00	30.02
812.00	4060.00	PK	14.90	V	7.17	33.38	3.00	55.45	-41.92	-13.00	28.92
812.00	4872.00	PK	13.90	H	7.28	33.93	3.00	55.11	-42.26	-13.00	29.26
812.00	4872.00	PK	14.20	V	7.28	33.93	3.00	55.41	-41.96	-13.00	28.96
812.00	5684.00	PK	14.10	H	8.04	34.58	3.00	56.73	-40.65	-13.00	27.65
812.00	5684.00	PK	14.30	V	8.04	34.58	3.00	56.93	-40.45	-13.00	27.45
812.00	6496.00	PK	14.40	H	9.08	35.53	3.00	59.01	-38.36	-13.00	25.36
812.00	6496.00	PK	14.40	V	9.08	35.53	3.00	59.01	-38.36	-13.00	25.36
812.00	7308.00	PK	14.50	H	9.62	36.27	3.00	60.39	-36.99	-13.00	23.99
812.00	7308.00	PK	14.10	V	9.62	36.27	3.00	59.99	-37.39	-13.00	24.39
812.00	8120.00	PK	13.70	H	9.96	35.80	3.00	59.46	-37.92	-13.00	24.92
812.00	8120.00	PK	13.50	V	9.96	35.80	3.00	59.26	-38.12	-13.00	25.12



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

8.9.6 Uplink, 823.9875 MHz

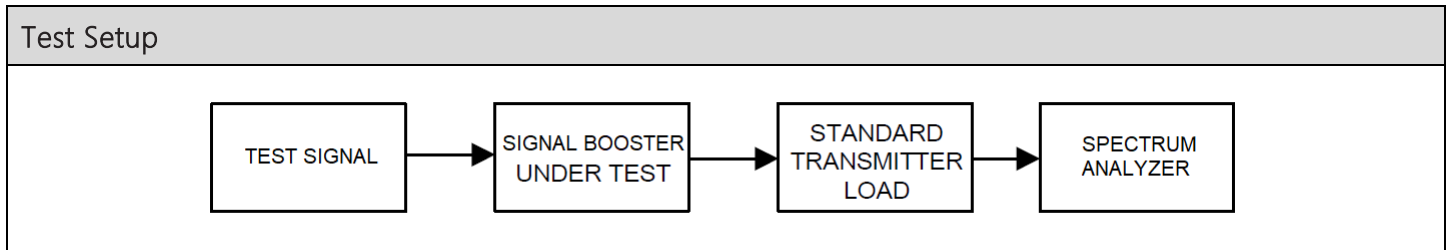
Tuned Frequency (MHz)	Emission Frequency (MHz)	Detector	Meter Reading (dBuV)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBuV/m)	ERP (dBm)	Spurious Limit (dBm)	Margin (dB)
823.9875	1647.9750	PK	10.20	H	4.72	28.58	3.00	43.51	-53.87	-13.00	40.87
823.9875	1647.9750	PK	11.20	V	4.72	28.58	3.00	44.51	-52.87	-13.00	39.87
823.9875	2471.9625	PK	12.20	H	5.62	32.03	3.00	49.85	-47.53	-13.00	34.53
823.9875	2471.9625	PK	12.00	V	5.62	32.03	3.00	49.65	-47.73	-13.00	34.73
823.9875	3295.9500	PK	13.20	H	6.70	32.63	3.00	52.53	-44.85	-13.00	31.85
823.9875	3295.9500	PK	13.30	V	6.70	32.63	3.00	52.63	-44.75	-13.00	31.75
823.9875	4119.9375	PK	13.70	H	7.09	33.41	3.00	54.20	-43.18	-13.00	30.18
823.9875	4119.9375	PK	13.90	V	7.09	33.41	3.00	54.40	-42.98	-13.00	29.98
823.9875	4943.9250	PK	13.90	H	7.77	33.94	3.00	55.61	-41.77	-13.00	28.77
823.9875	4943.9250	PK	14.90	V	7.77	33.94	3.00	56.61	-40.77	-13.00	27.77
823.9875	5767.9125	PK	13.60	H	8.23	34.70	3.00	56.53	-40.85	-13.00	27.85
823.9875	5767.9125	PK	14.40	V	8.23	34.70	3.00	57.33	-40.05	-13.00	27.05
823.9875	6591.9000	PK	14.40	H	9.20	35.65	3.00	59.25	-38.13	-13.00	25.13
823.9875	6591.9000	PK	14.20	V	9.20	35.65	3.00	59.05	-38.33	-13.00	25.33
823.9875	7415.8875	PK	14.00	H	9.52	36.04	3.00	59.56	-37.82	-13.00	24.82
823.9875	7415.8875	PK	13.80	V	9.52	36.04	3.00	59.36	-38.02	-13.00	25.02
823.9875	8239.8750	PK	14.10	H	10.02	35.80	3.00	59.91	-37.46	-13.00	24.46
823.9875	8239.8750	PK	14.00	V	10.02	35.80	3.00	59.81	-37.56	-13.00	24.56



8.10 Modulation Characteristics

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

Limits from FCC Parts 2.1047, and test procedure from ANSI C63.26-2015.



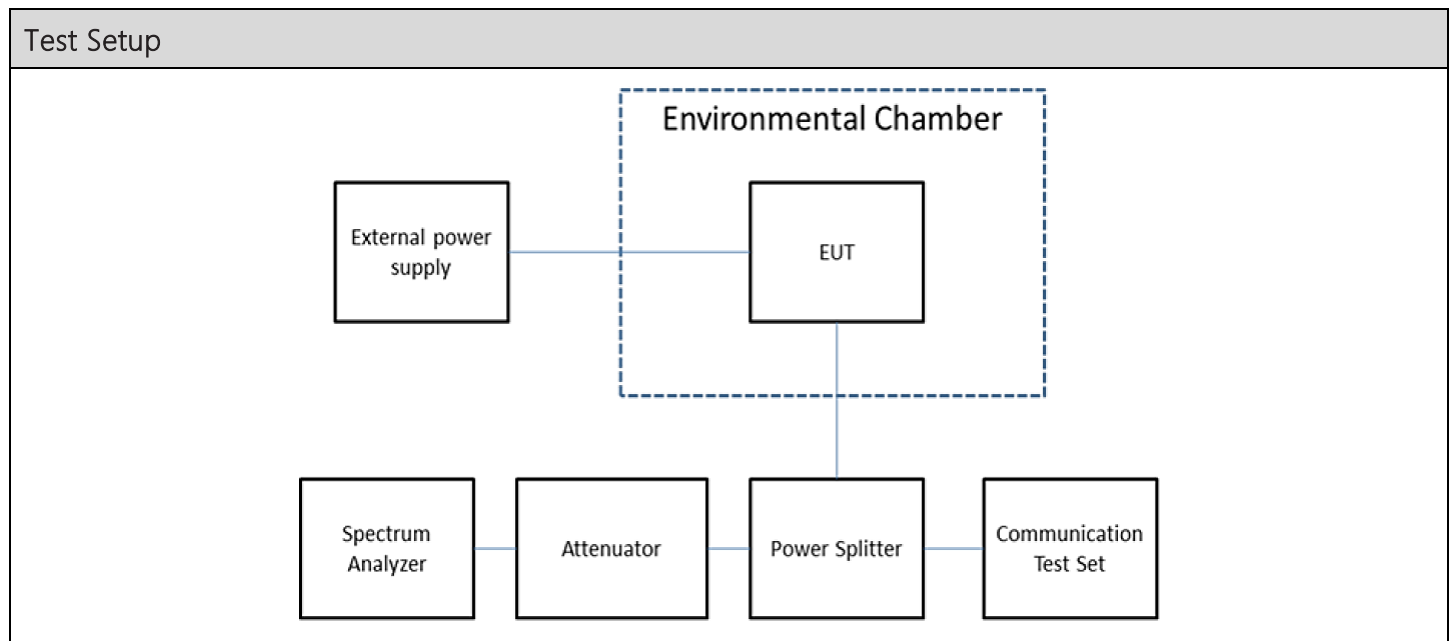
N/A. The EUT does not have any means to modulate the incoming signal.



8.11 Frequency Stability

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

Limits from FCC Parts 2.1055, 90.213 (a); and test procedure from ANSI C63.26-2015 and FCC KDB 935210 D05 v01r04 Industrial Signal Boosters.



Test Results, Mode 1		
Tuned Frequency (MHz)	Max Deviation (kHz)	Limit (ppm)
n/a	n/a	n/a

N/A. The EUT does not alter the input signal in any way.



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

8.12 Transient Frequency Behavior

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

Limits from FCC Part 90.214; and test procedure from ANSI C63.26-2015.

N/A. The EUT does not "key-on" or "key off", and instead transmits indefinitely.



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

8.13 Adjacent channel power limits

Referenced from test report "TR_6057-23_UL_FCC 90_Booster Class B_1.docx".

Limits from FCC Part 90.221, and test procedure from ANSI C63.26-2015.

N/A. Device does not operate in a band requiring ACP measurement.



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

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_6061-23_UL_FCC 90_Booster Class A_	1	Initial release	2/7/2023



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

END OF TEST REPORT
