FCC Certification Report

STI Engineering Pty Ltd.
22 Boulder Road
Malaga, Western Australia 6090
Australia

Model: RFI-900 250
FCC ID: P5MRFI900

August 17, 2018

Standards Referenced for this Report	
Part 2: 2017	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 22: 2017	Public Mobile Services
Part 90: 2017	Private Land Mobile Radio Services
ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

Frequency Range (MHz)	Rated Conducted Output Power (W)	Frequency Tolerance (ppm)	Transmit Mode	Emission Designator
929-930, 931-932	250	0.3	POCSAG 512 PRBS NB	6K78F1D
929-930, 931-932	250	0.3	POCSAG 1200 PRBS NB	8K56F1D
929-930, 931-932	250	0.3	POCSAG 2400 PRBS NB	8K77F1D
929-930, 931-932	250	0.3	FLEX-2 1600 PRBS NB	9K86F1D
929-930, 931-932	250	0.3	FLEX-2 3200 PRBS NB	10K6F1D
929-930, 931-932	250	0.3	FLEX-4 3200 PRBS NB	7K74F1D
929-930, 931-932	250	0.3	FLEX-4 6400 PRBS NB	10K1F1D
929-930, 931-932	250	0.3	POCSAG 512 PRBS WB	12K4F1D
929-930, 931-932	250	0.3	POCSAG 1200 PRBS WB	13K5F1D
929-930, 931-932	250	0.3	POCSAG 2400 PRBS WB	13K5F1D
929-930, 931-932	250	0.3	FLEX-2 1600 PRBS WB	14K9F1D
929-930, 931-932	250	0.3	FLEX-2 3200 PRBS WB	14K9F1D
929-930, 931-932	250	0.3	FLEX-4 3200 PRBS WB	14K8F1D
929-930, 931-932	250	0.3	FLEX-4 6400 PRBS WB	15K0F1D

Report Prepared By: Daniel W. Baltzell

Document Number: 2018010

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANAB. Refer to certificate and scope of accreditation AT-1445.

Table of Contents

Table of Figures

Table of Tables

Table of Plots

Table of Appendixes

Table of Photographs

1 Test Result Summary

Test	FCC Reference	Result
RF Power Output	2.1046(a), 22.535(a); 90.205(m), 90.494	Complies
Spurious Emissions at Antenna Terminals	2.1051, 90.210, 22.359(a)	Complies
Field Strength of Spurious Radiation	2.1053(a), 90.210, 22.359(a)	Complies
Occupied Bandwidth/ Emission Masks	2.1049(c)(1), 22.359(a)	Complies
Frequency Stability vs. Temperature and Voltage	2.1055, 22.355	Complies

2 General Information

The following Certification Report is prepared on behalf of STI Engineering Pty Ltd. in accordance with the Federal Communications Commission rules and regulations. The Equipment Under Test (EUT) was Model RFI-900 250; FCC ID: P5MRFI900.

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2, 22 and 90. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

2.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc., 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to, and approved by, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

2.2 Related Submittal(s)/Grant(s)

This is a new FCC certification application.

2.3 Grant Notes

The output power is variable from 20 W to 250 W. Output power is conducted. The antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures. RF exposure compliance is addressed at the time of licensing.

2.4 Tested System Details

The test sample was received on June 26, 2018. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

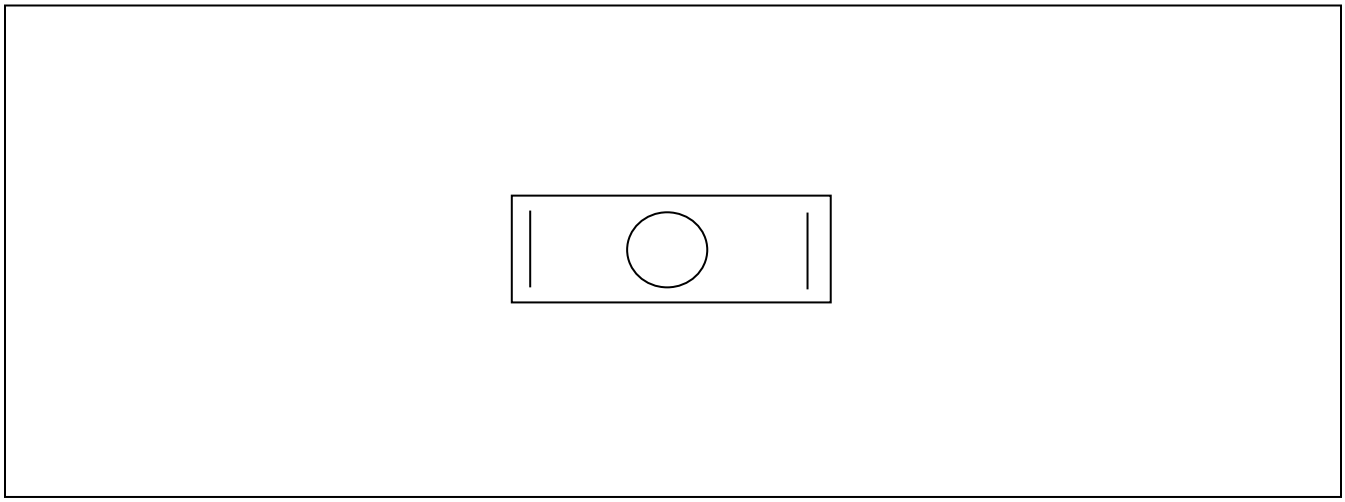
The device was programmed for multiple modes of operation and modulation types:

- 20W, 200W, and 250W from 929-932 MHz
- POCSAG 512 PRBS
- POCSAG 1200 PRBS
- POCSAG 2400 PRBS
- FLEX-2 1600 PRBS
- FLEX-2 3200 PRBS
- FLEX-4 3200 PRBS
- FLEX-4 6400 PRBS

Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	FCC ID	Serial Number	RTL Bar Code
900 MHz Paging Transmitter	STI Engineering Pty Ltd.	RFI-900 250	P5MRFI900	H03132K01390	23013

Figure 2-1: Configuration of Tested System



3 FCC Part 2.1033(C)(8): Voltages and Currents through the Final Amplifying Stage

Table 3-1: Voltages and Currents through the Final Amplifying Stage

Power Output (W)	Voltage (AC)	Current (A)
20	115	1.5
200	115	5
250	115	5.7

4 FCC Part 2.1046(a): RF Power Output: Conducted; Part 90.205(m); Part 90.494(f); Part 22.535(a) Effective Radiated Power Limits

4.1 Test Procedure

ANSI 63.26, section 5.2

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance.

Manufacturer's rated power: 250 W

4.2 Test Data

Table 4-1: RF Conducted Output Power – Measured

Frequency (MHz)	Power (dBm)	Power (W)
929.0125	54.0	250.0
931.9375	54.0	250.0

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 dB

Notes: Data presented is for analog mode. All other modes were investigated and found to have equivalent power within measurement tolerances.

Table 4-2: Test Equipment Used for Testing RF Power Output – Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901291	Pasternack	PE7031-20	300W Attenuator, DC - 1 GHz, 20 dB	NA	8/24/18
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	9/1/18
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	8/21/18

Test Personnel:

Daniel W. Baltzell		June 29, 2018
EMC Test Engineer	Signature	Date of Test

5 FCC Part 2.1051: Spurious Emissions at Antenna Terminals; Part 90.210: Emission Limitations; Part 22.359(a) Out of band emissions

5.1 Test Procedure

ANSI 63.26, section 5.2

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

Device with digital modulation: Modulated to its maximum extent using a pseudo-random data sequence.

5.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to 10 x Fc

Limits: 43 + 10 LOG P(W))

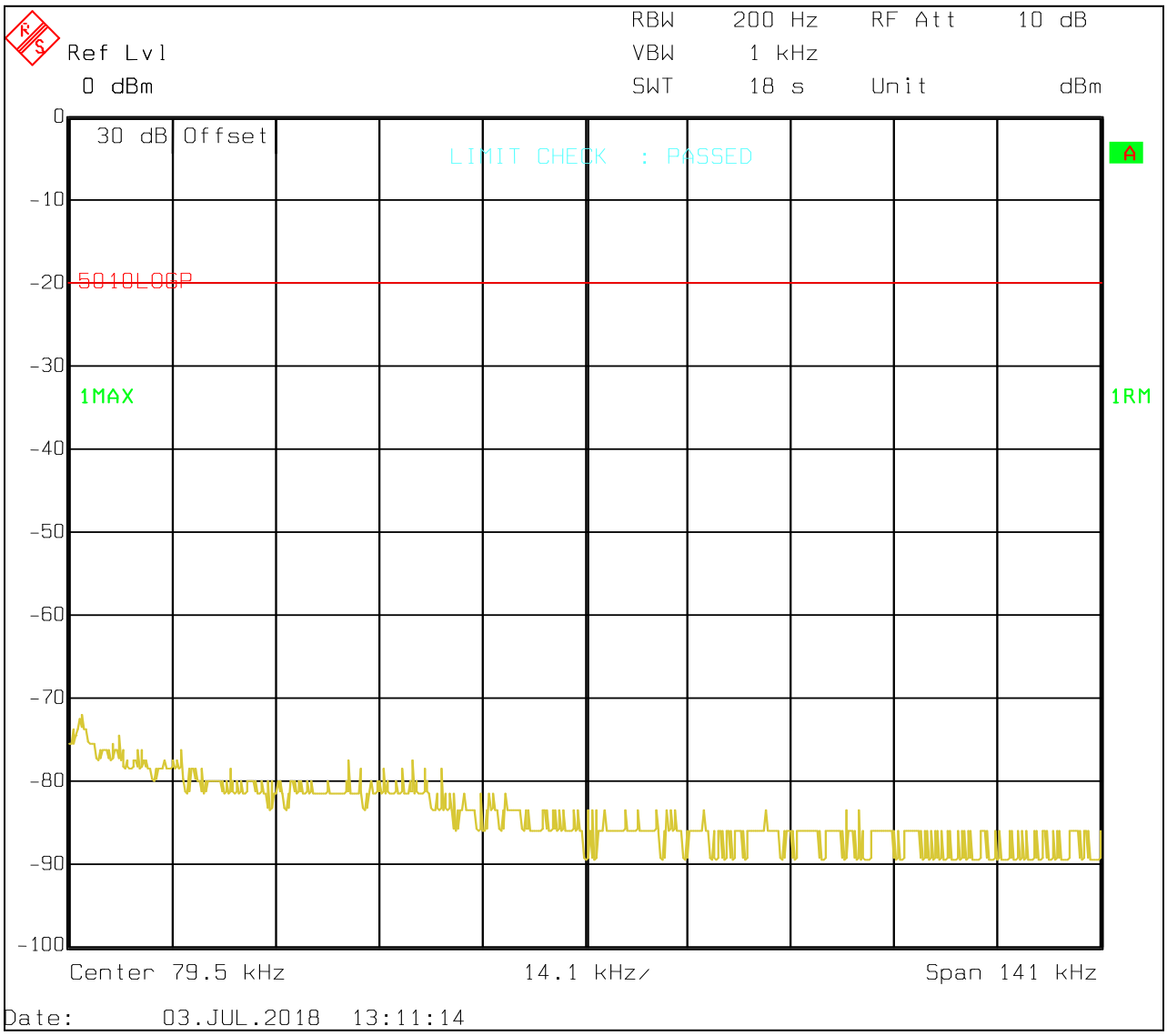
The following frequencies (in MHz) were investigated: 929.0125 and 931.9375.

All modes and powers were investigated; high power is presented as worst case.

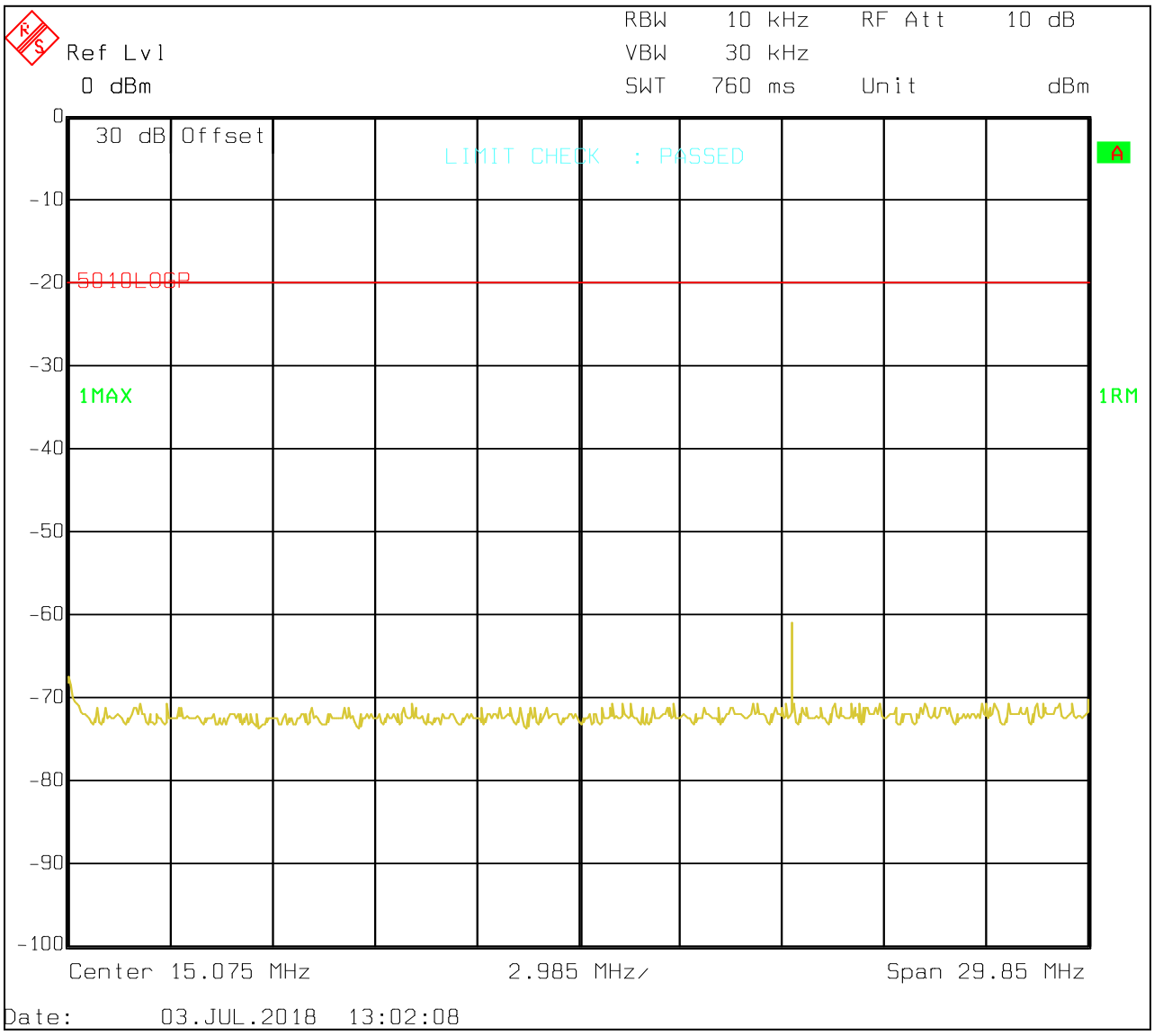
Part 22.359(a) Out of band emissions: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB

(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 30 kHz or more. In the 60 kHz bands immediately outside and adjacent to the authorized frequency range or channel, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 30 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

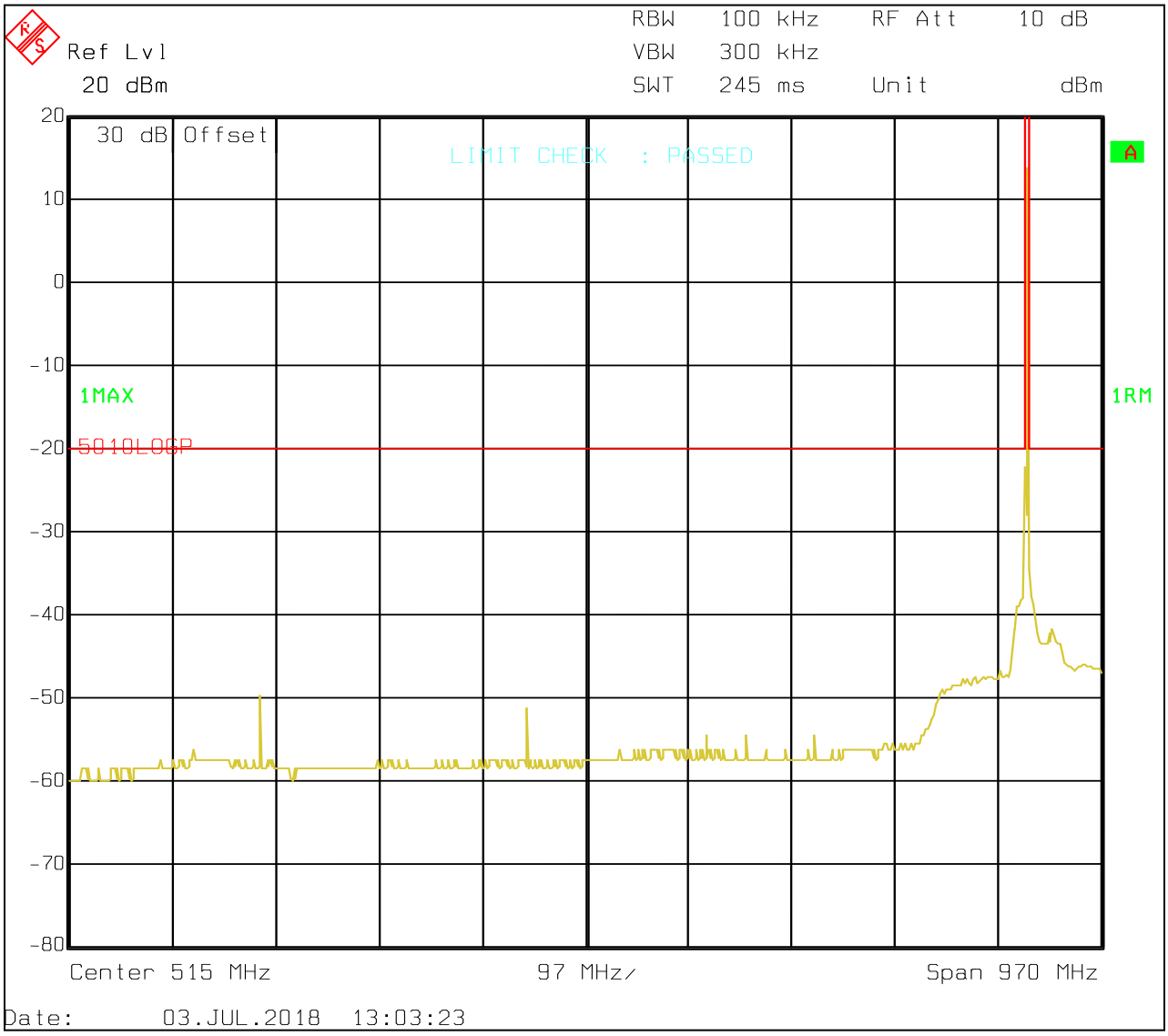
Plot 5-1: Conducted Antenna Spurious Emissions – 929.0125 MHz; 9–150 kHz; 12.5 kHz BW; 250W



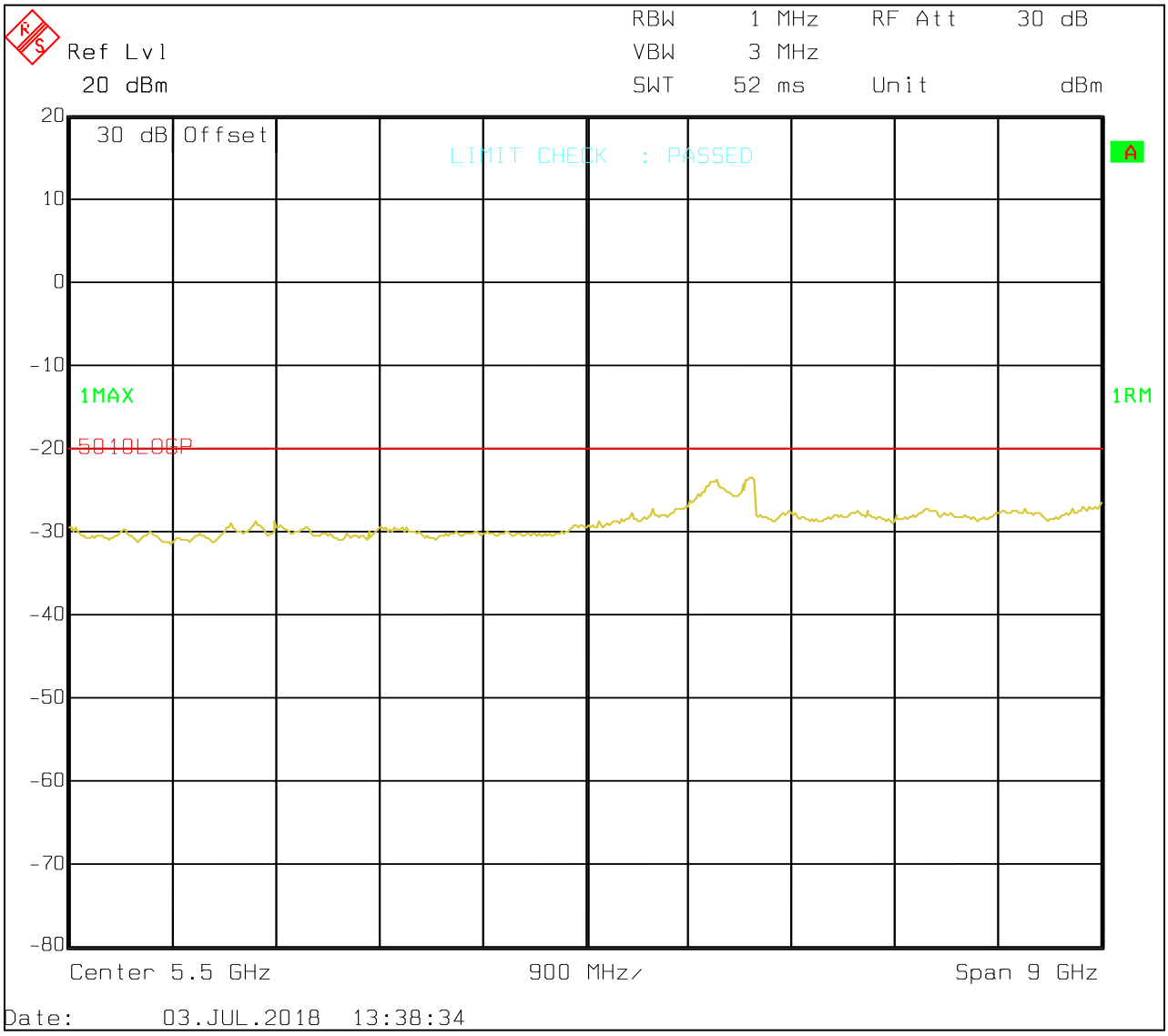
Plot 5-2: Conducted Antenna Spurious Emissions – 929.0125 MHz; 150 kHz-30 MHz; 12.5 kHz BW; 250W



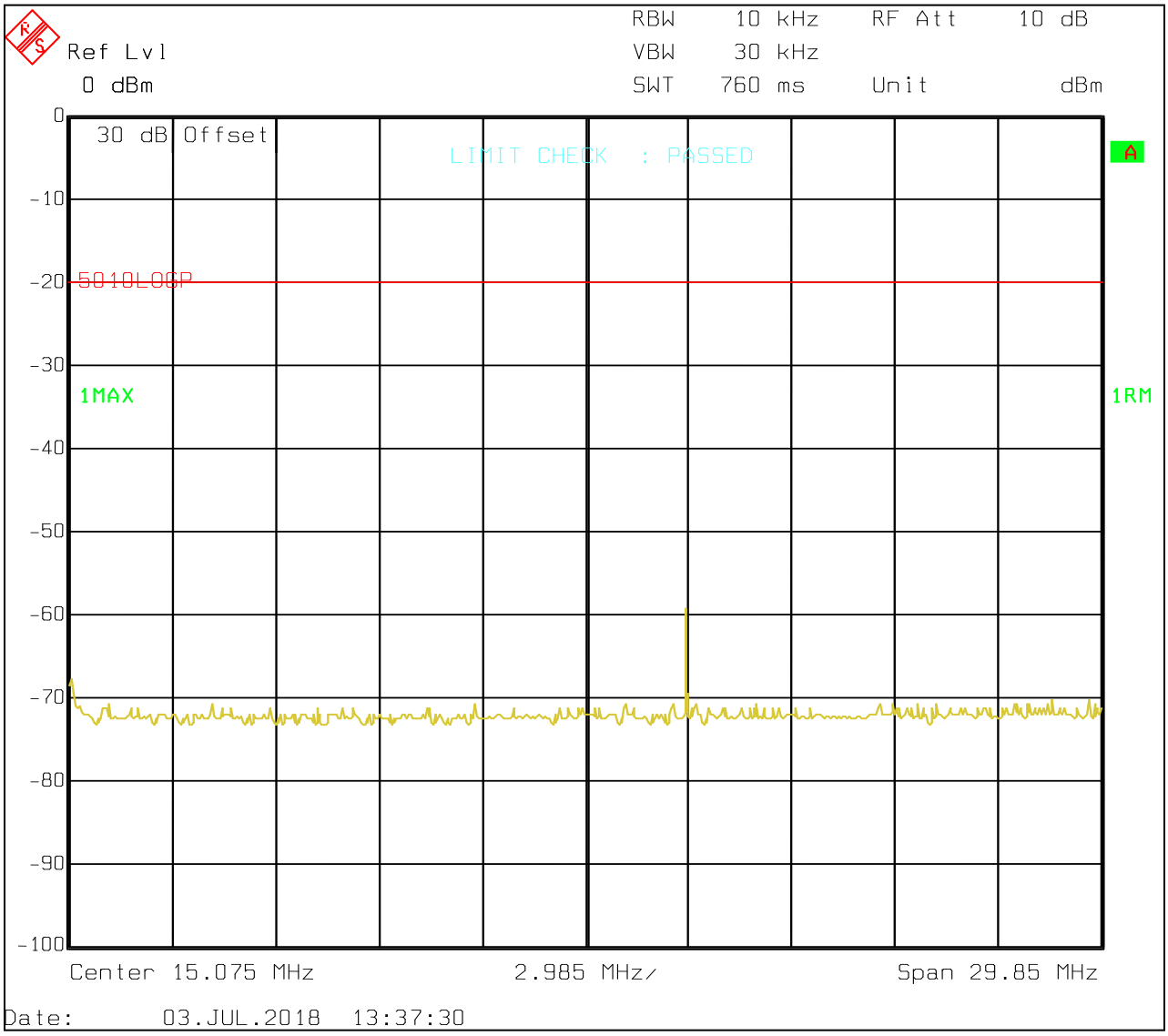
Plot 5-3: Conducted Antenna Spurious Emissions – 929.0125 MHz; 30 MHz–1 GHz; 12.5 kHz BW; 250W



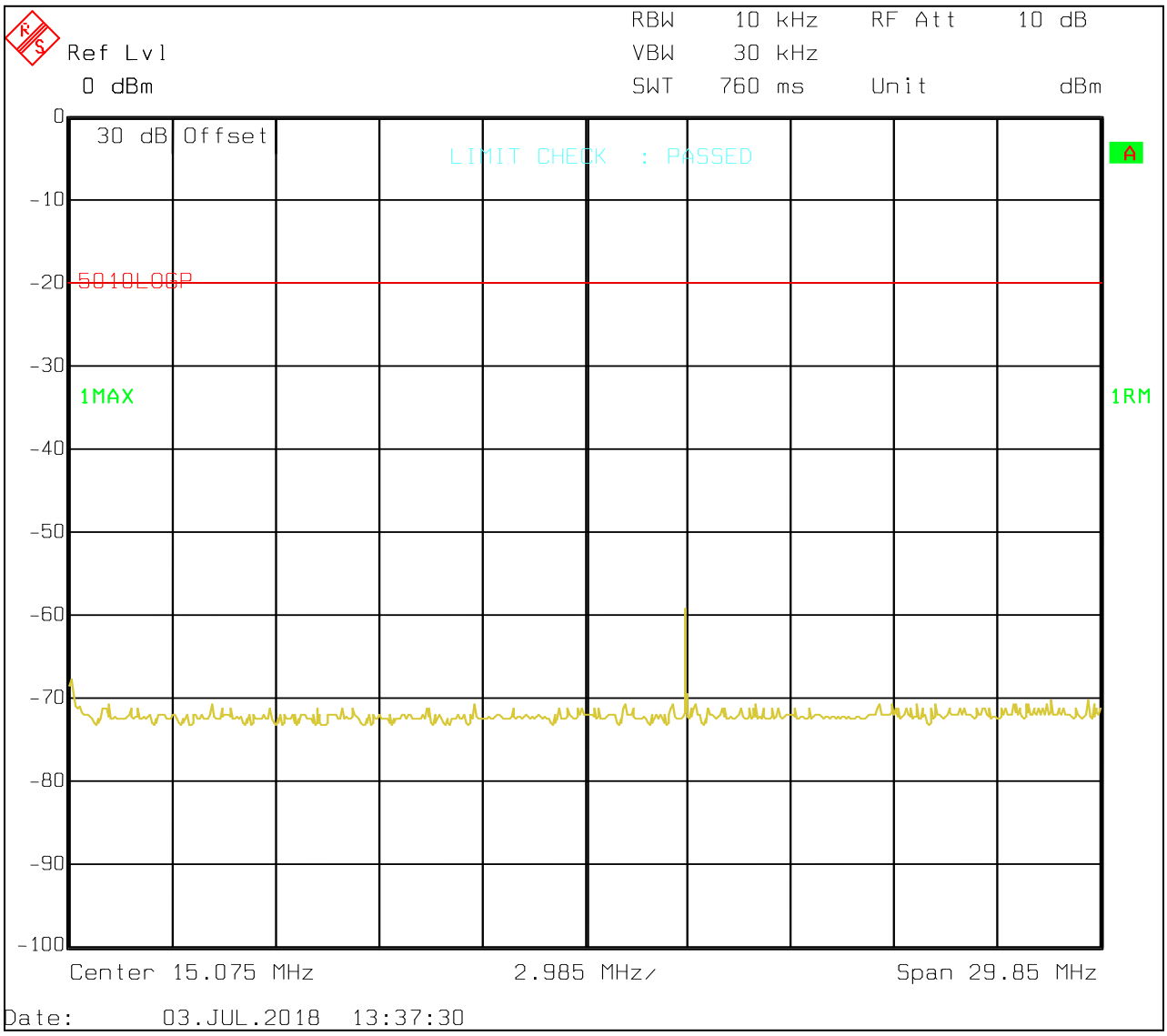
Plot 5-4: Conducted Antenna Spurious Emissions – 929.0125 MHz; 1–10 GHz; 12.5 kHz BW; 250W



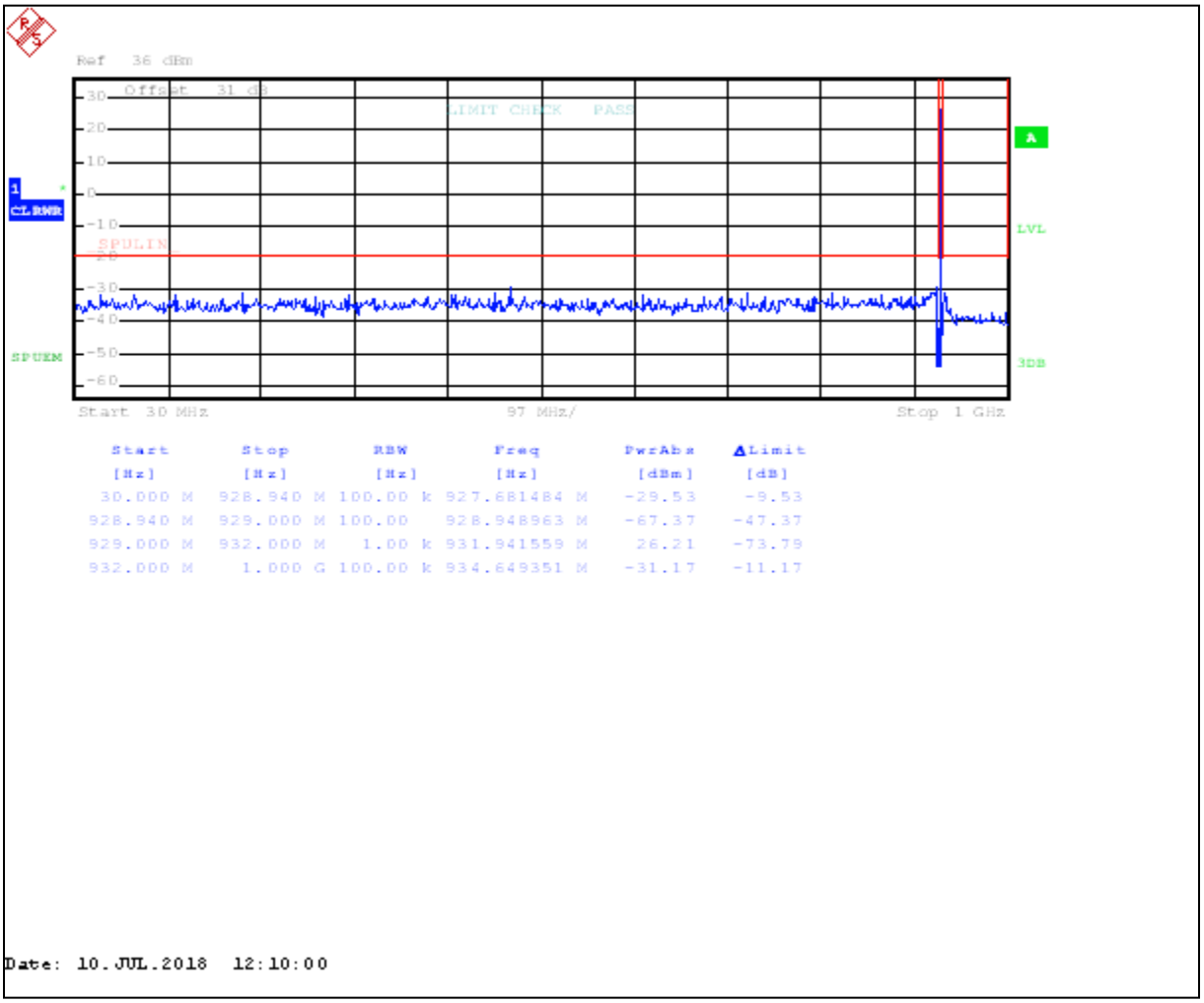
Plot 5-5: Conducted Antenna Spurious Emissions – 931.9375 MHz; 9–150 kHz; 12.5 kHz BW; 250W



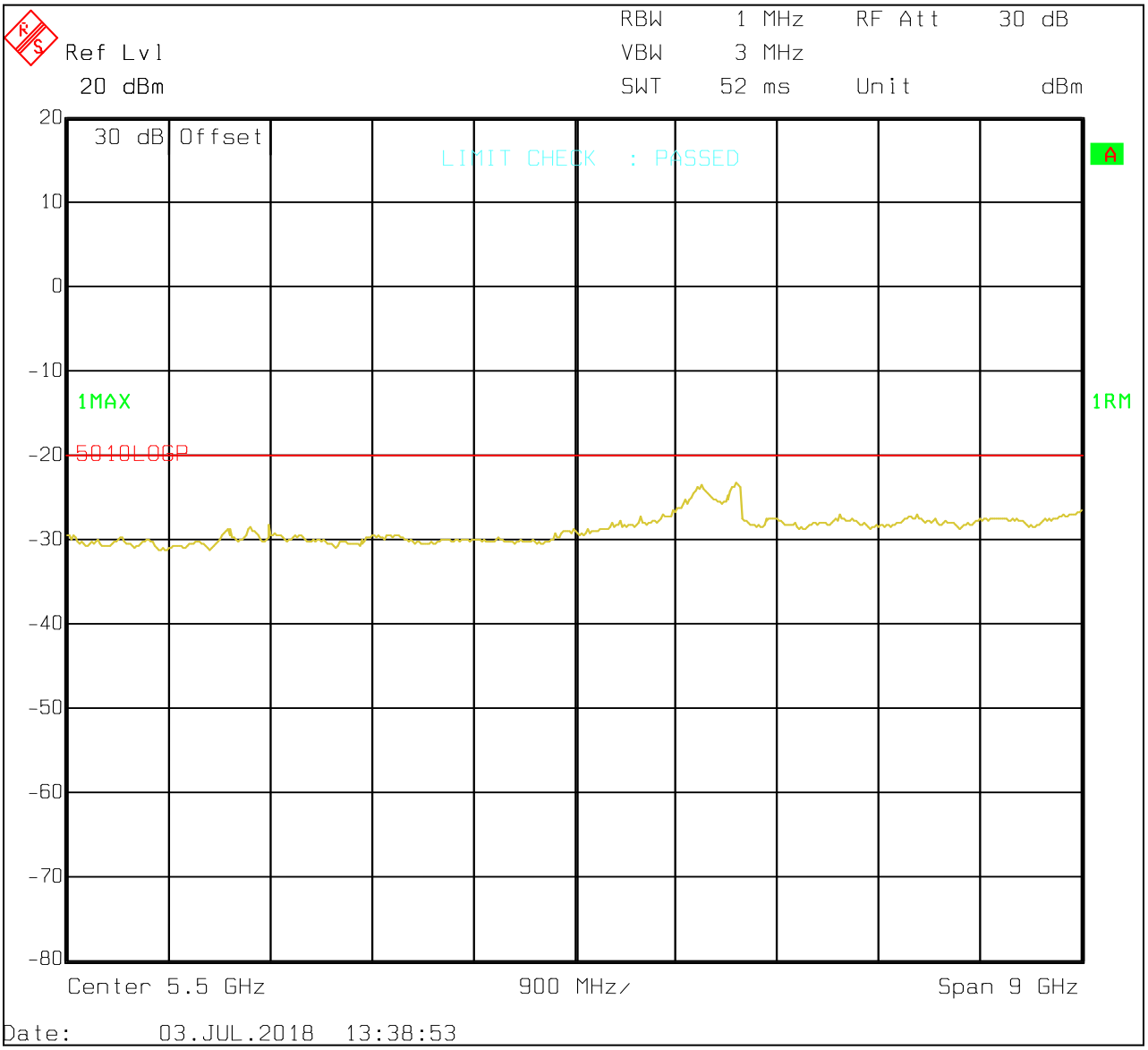
Plot 5-6: Conducted Antenna Spurious Emissions – 931.9375 MHz; 150 kHz–30 MHz; 12.5 kHz BW; 250W



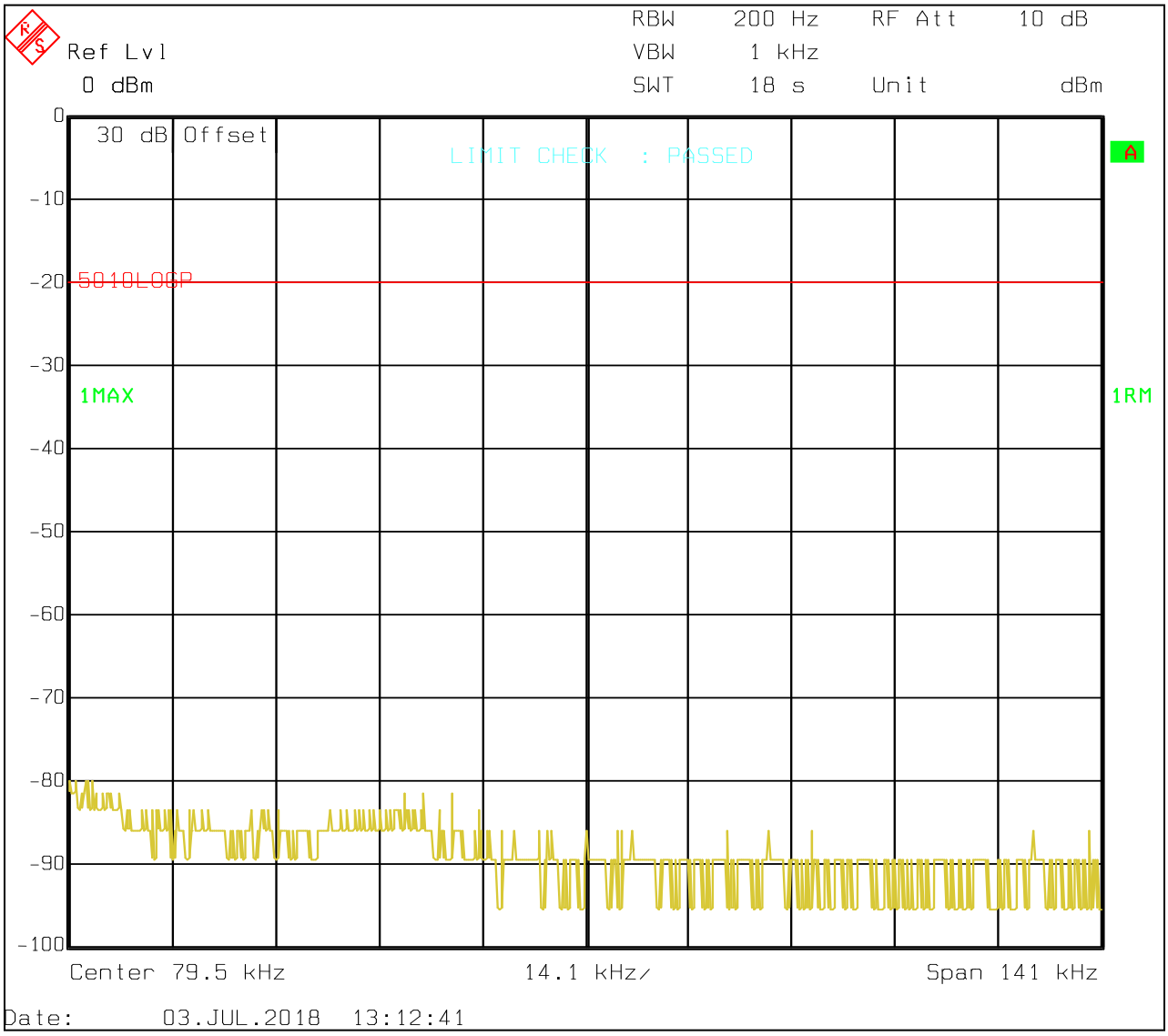
Plot 5-7: Conducted Antenna Spurious Emissions – 931.9375 MHz; 30 MHz–1 GHz; 12.5 kHz BW; 250W



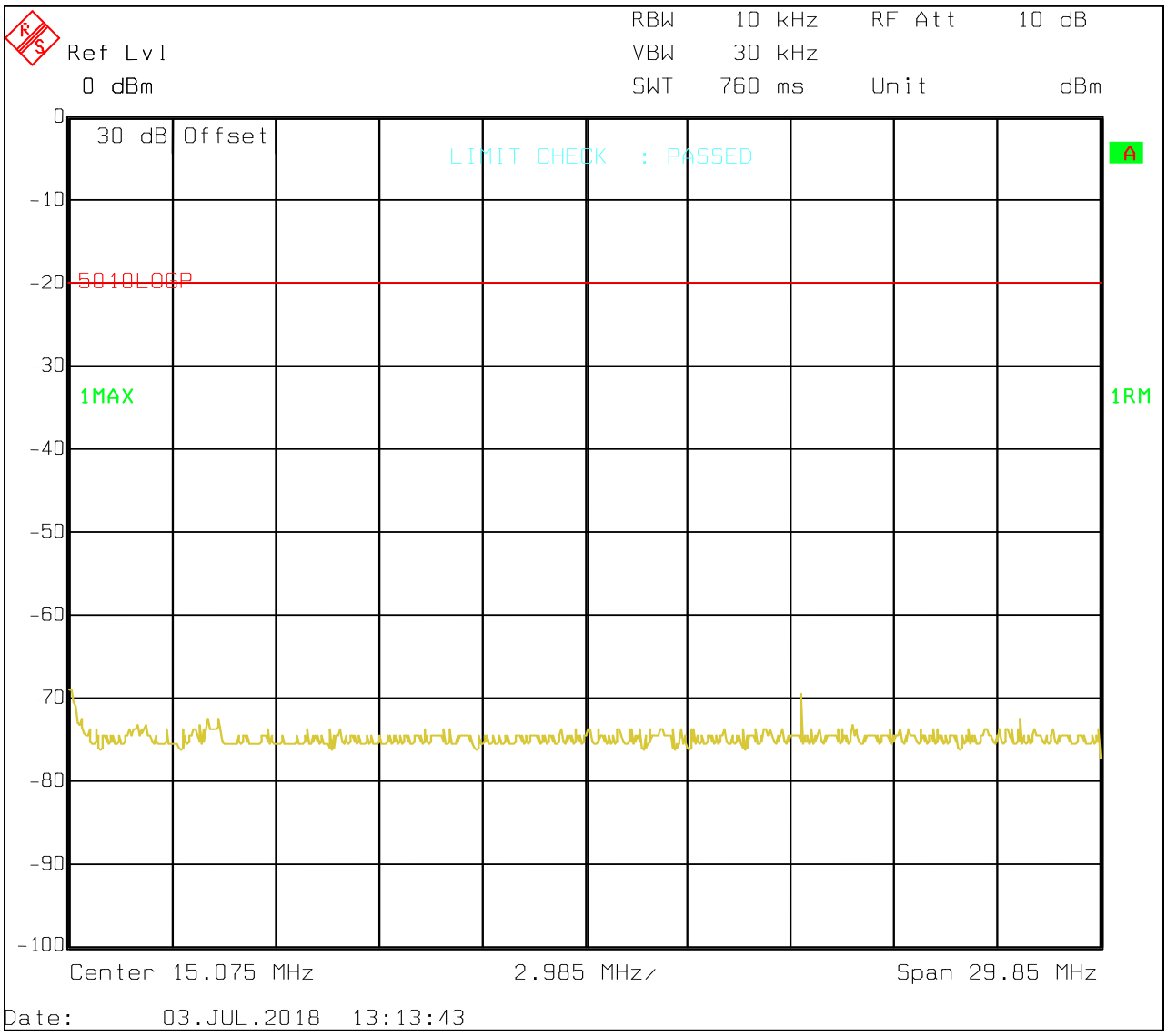
Plot 5-8: Conducted Antenna Spurious Emissions – 931.9375 MHz; 1-10 GHz; 12.5 kHz BW; 250W



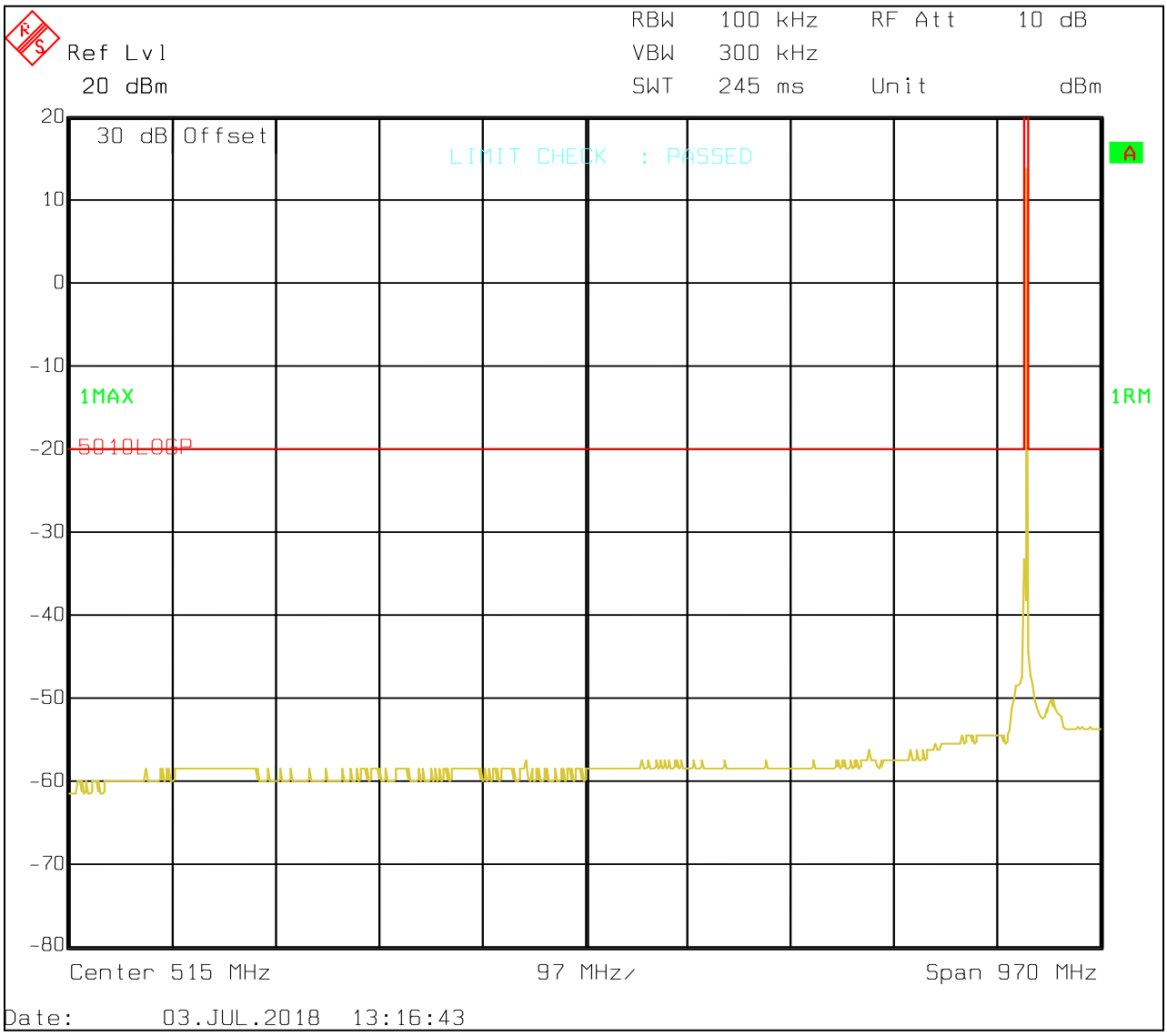
Plot 5-9: Conducted Antenna Spurious Emissions – 929.0125 MHz; 9-150 kHz; 12.5 kHz BW; 20W



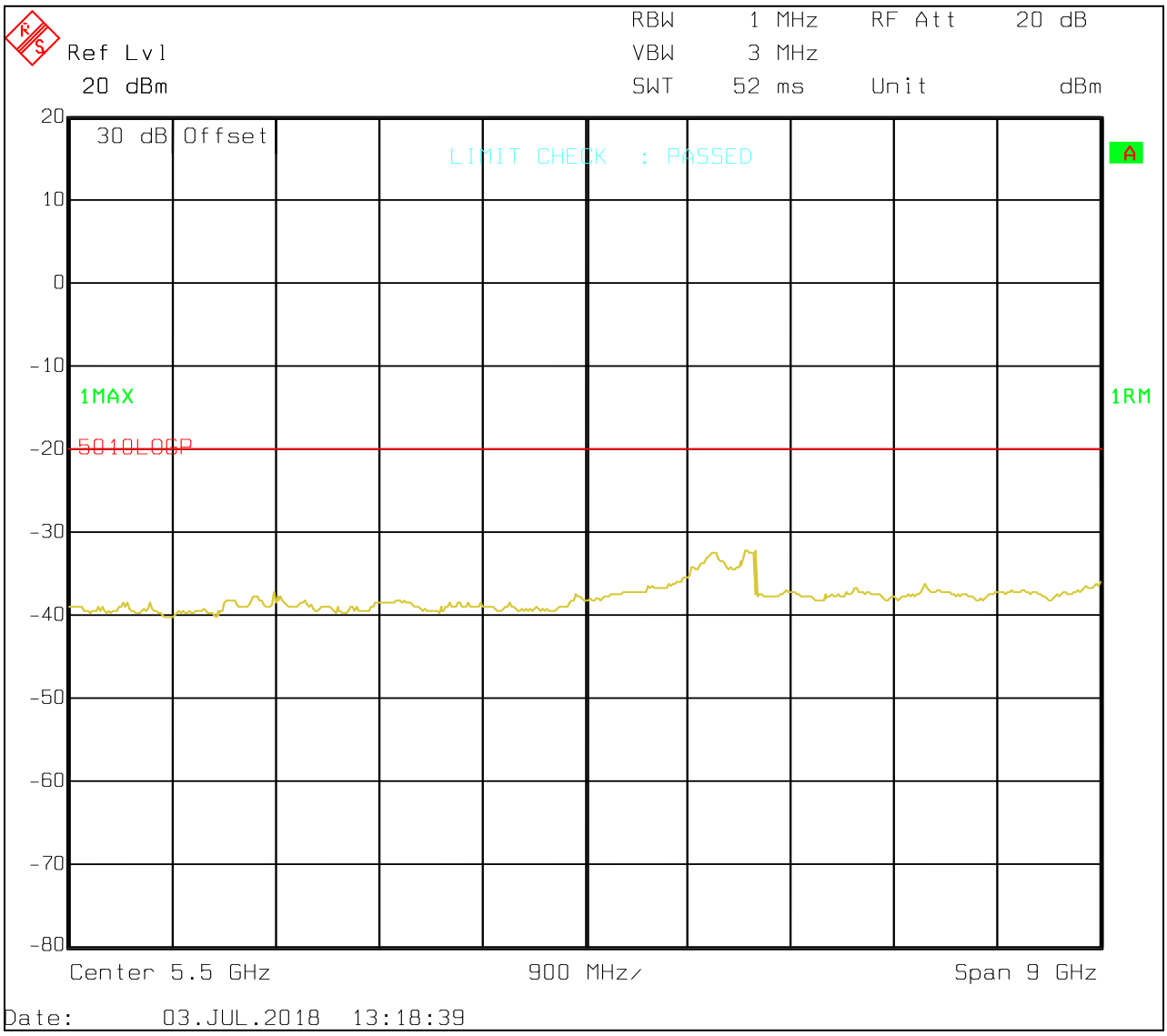
Plot 5-10: Conducted Antenna Spurious Emissions – 929.0125 MHz; 150-30 MHz; 12.5 kHz BW; 20W



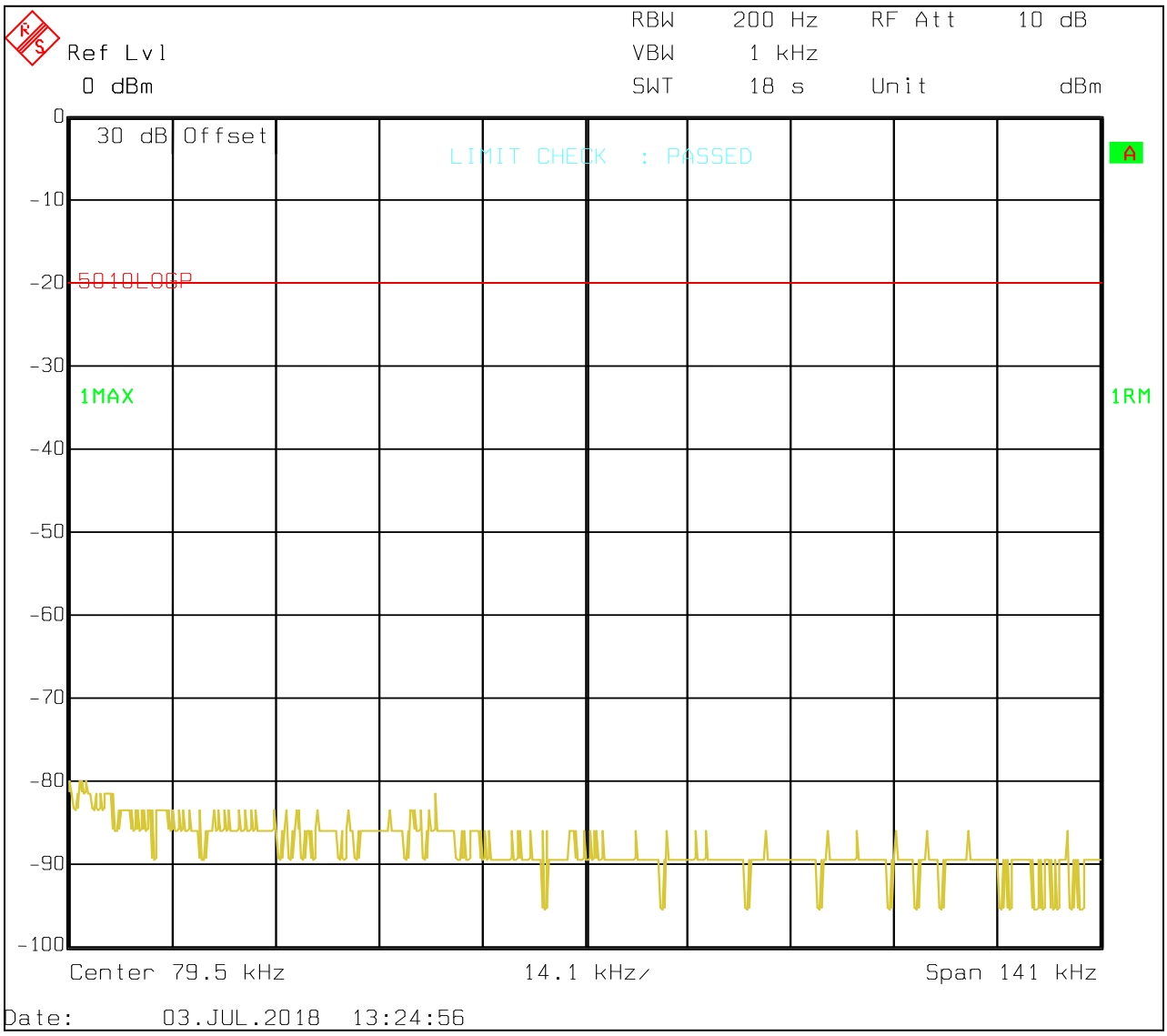
Plot 5-11: Conducted Antenna Spurious Emissions –929.0125 MHz; 30 MHz-1 GHz; 12.5 kHz BW; 20W



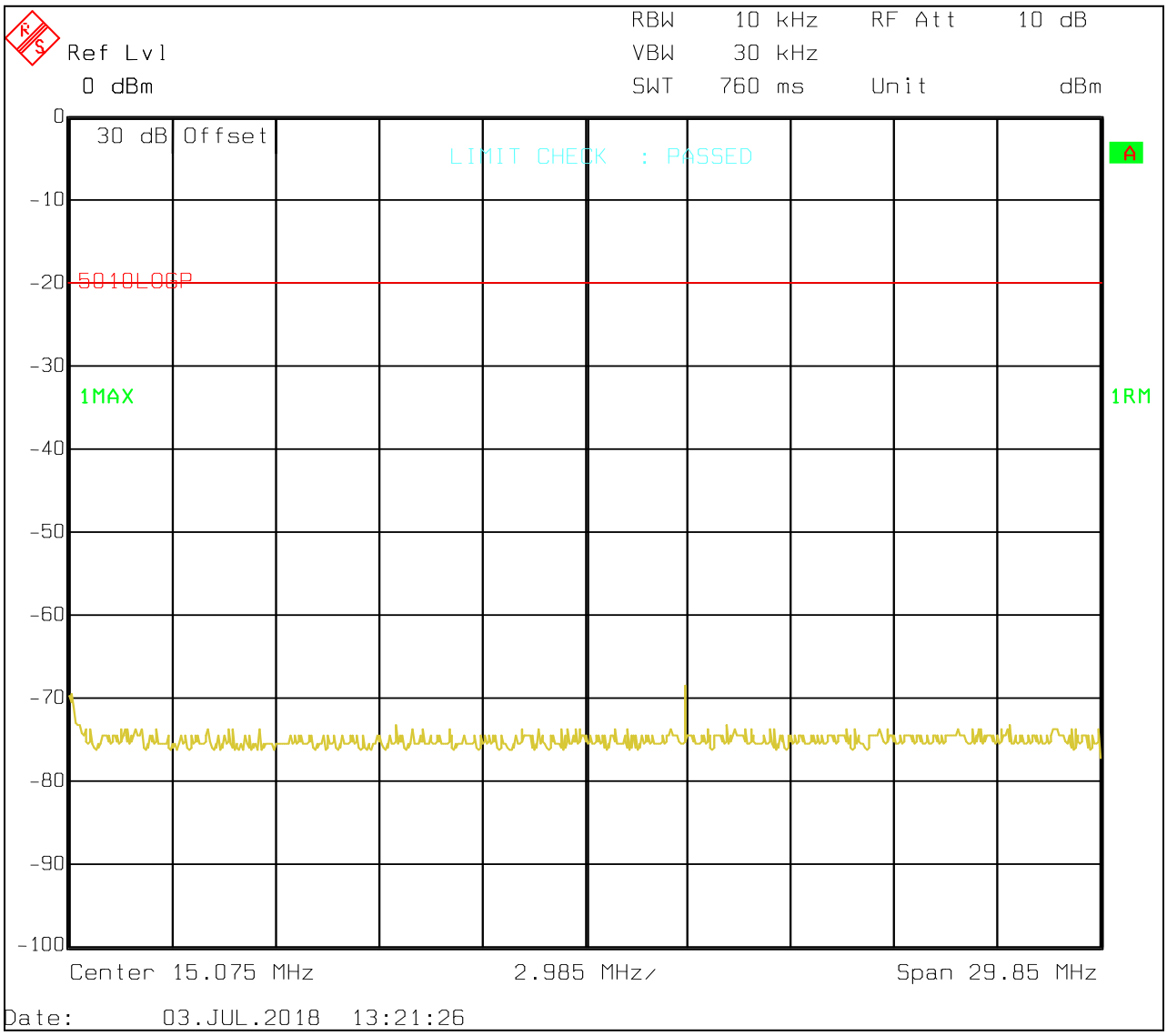
Plot 5-12: Conducted Antenna Spurious Emissions –929.0125 MHz; 1-10 GHz; 12.5 kHz BW; 20W



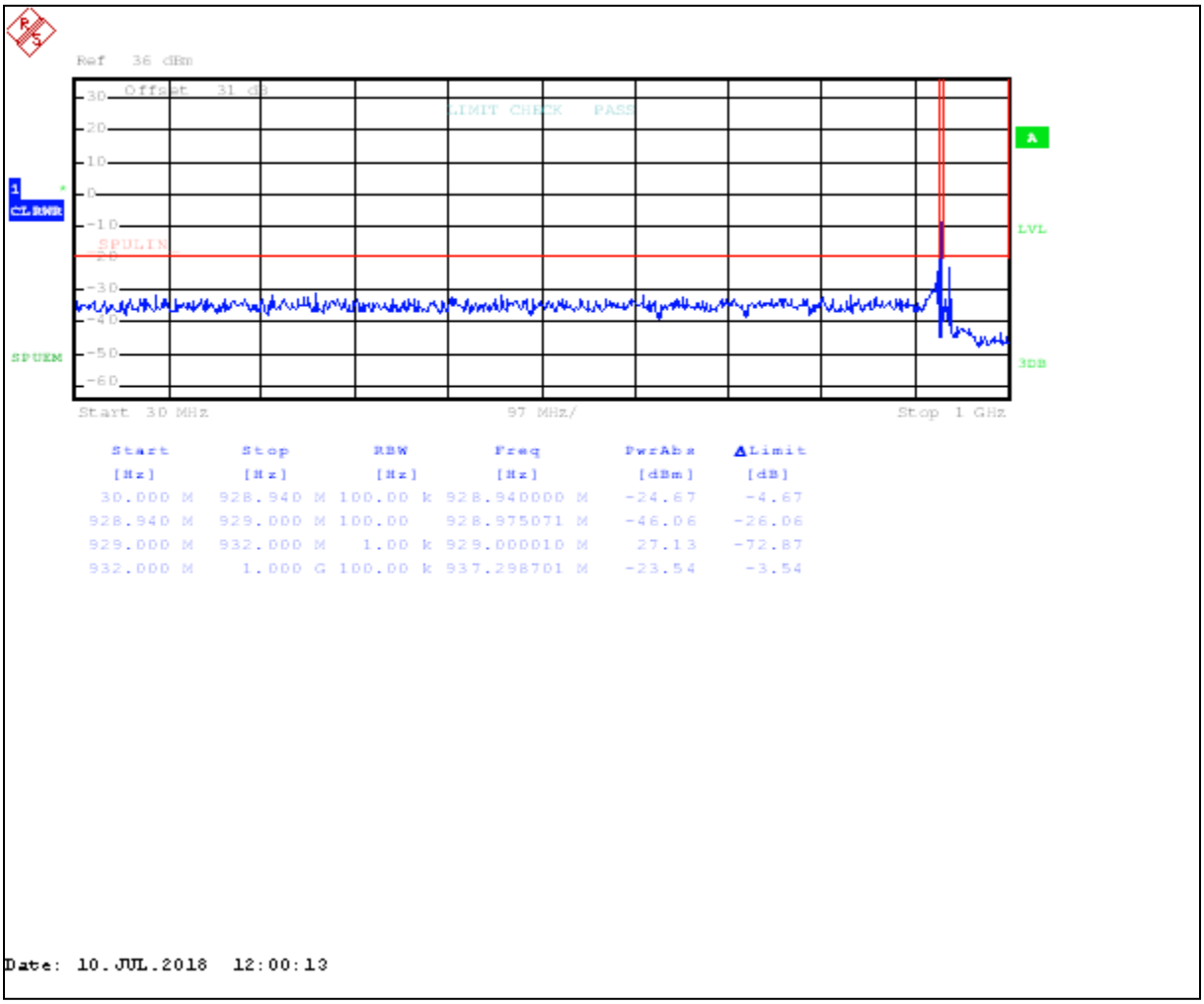
Plot 5-13: Conducted Antenna Spurious Emissions – 931.9375 MHz; 9-150 kHz; 12.5 kHz BW; 20W



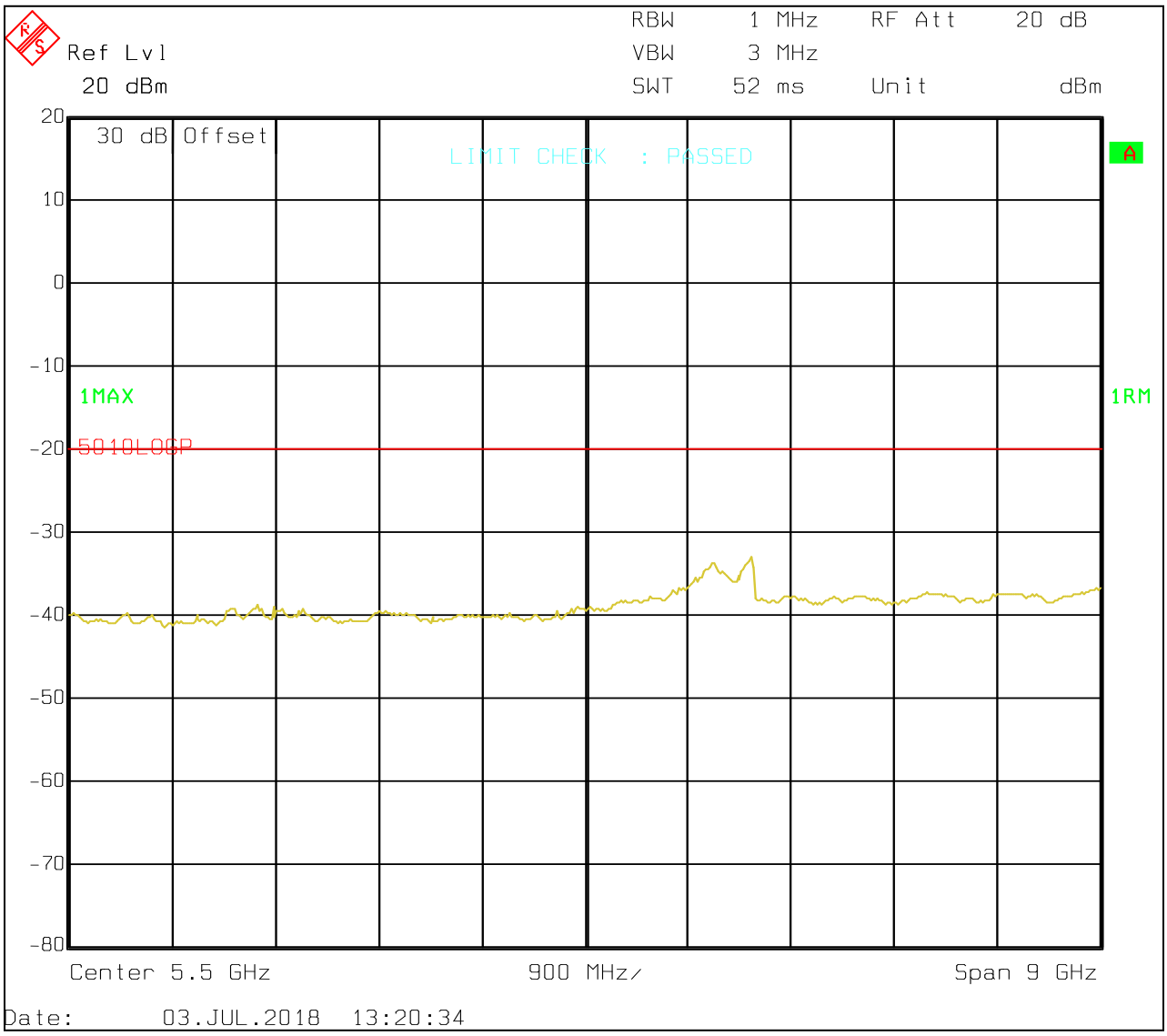
Plot 5-14: Conducted Antenna Spurious Emissions – 931.9375 MHz; 150-30 MHz; 12.5 kHz BW; 20W



Plot 5-15: Conducted Antenna Spurious Emissions – 931.9375 MHz; 30 MHz-1 GHz; 12.5 kHz BW; 20W



Plot 5-16: Conducted Antenna Spurious Emissions – 931.9375 MHz; 1-10 GHz; 12.5 kHz BW; 20W



Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 dB

Table 5-1: Test Equipment Used for Testing Antenna Port Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901672	Rohde & Schwarz	FSEM30	Spectrum Analyzer	FSEM30	4/17/19
901291	Pasternack	PE7031-20	300W Attenuator, DC - 1 GHz, 20 dB	NA	8/24/18
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	9/1/18
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	8/21/18

Test Personnel:

Daniel W. Baltzell		July 3-10, 2018
EMC Test Engineer	Signature	Dates of Test

6 FCC Part 2.1053(a): Field Strength of Spurious Radiation; Part 22.359(a) Out of Band Emissions

6.1 Test Procedure

ANSI 63.26, section 5.5.

The device uses digital modulation modulated to its maximum extent using a pseudo-random data sequence.

The spurious emissions levels were measured, and the device under test was replaced by a substitution antenna connected to a signal generator. This signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna (dBi) was added to achieve the EIRP level, then converted from the corrected signal generator level (dBm) to dBc, and compared to the limit.

Part 22.359
(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

6.2 Test Data

Table 6-1: Field Strength of Spurious Radiation – 929.0125 MHz
Conducted Power 54 dBm; 250 W; Limit=43+10LogP=67 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1858.0250	35.7	-36.2	0.5	8.6	82.1	-15.1
2787.0375	31.8	-44.0	0.6	0.0	98.6	-31.6
3716.0500	28.7	-45.3	0.8	9.3	90.8	-23.8
4645.0625	33.5	-38.2	0.9	11.1	82.1	-15.1
5574.0750	25.0	-46.7	1.1	10.8	91.0	-24.0
6503.0875	21.9	-48.7	1.2	11.9	92.0	-25.0
7432.1000	22.2	-47.0	1.4	10.9	91.5	-24.5
8361.1125	17.1	-47.7	1.5	11.5	91.7	-24.7
9290.1250	9.2	-55.4	1.6	11.5	99.6	-32.6

Table 6-2: Field Strength of Spurious Radiation – 931.9375 MHz
Conducted Power 54 dBm; 250 W; Limit=43+10LogP=67 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
1863.8750	36.1	-37.9	0.5	8.5	83.8	-16.8
2795.8125	34.3	-41.5	0.6	0.0	96.1	-29.1
3727.7500	35.9	-38.1	0.8	9.3	83.6	-16.6
4659.6875	35.2	-36.5	0.9	11.1	80.4	-13.4
5591.6250	24.7	-46.5	1.1	10.9	90.7	-23.7
6523.5625	22.0	-48.3	1.2	11.9	91.7	-24.7
7455.5000	27.5	-41.7	1.4	11.0	86.1	-19.1
8387.4375	10.3	-50.5	1.5	11.5	94.5	-27.5
9319.3750	9.7	-54.9	1.6	11.5	99.1	-32.1

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±4.6 dB

Table 6-3: Test Equipment Used for Testing Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	OATS1	N/A
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/18/18
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	N/A
900791	Chase	CBL6111B	Bilog Antenna (30 MHz–2000 MHz)	N/A	10/4/20
900321	EMCO	3161-03	Horn Antenna (4.0-8.2 GHz)	9508-1020	4/9/19
900323	EMCO	3160-07	Horn Antenna (8.2-12.4 GHz)	9605-1054	4/9/19
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	4/9/19
901582	Rohde & Schwarz	1167.0000.02	Signal Generator	101903	4/24/21
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	8/21/18
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridged Guide Antenna (1-18 GHz)	2310	2/4/19
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	8/21/18

Test Personnel:

Daniel W. Baltzell		July 5, 2018
Test Engineer	Signature	Date of Test

7 FCC Part 2.1055: Frequency Stability; Part 90.213: Frequency Stability; Part 22.355 Frequency Stability

7.1 Test Procedure

ANSI 63.26, section 5.6.

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

The EUT was evaluated over the temperature range -30°C to +55°C. The temperature was initially set to -30°C and a 1-hour period was observed for stabilization of the EUT. The frequency stability was measured within one minute after application of primary power to the transmitter. The temperature was raised at intervals of 10 degrees centigrade through the range. A ½-hour period was observed to stabilize the EUT at each measurement step and the frequency stability was measured within one minute after application of primary power to the transmitter. Additionally, the supply voltage to the EUT was varied +/-15% nominal input voltage.

Part 90.213 - 929-930 MHz, Base Station Fixed: 1.5 ppm

Part 22.355 – 929-960 MHz, Base, Fixed: 1.5 ppm

7.2 Test Data

7.2.1 Temperature Frequency Stability

Table 7-1: Temperature Frequency Stability – 929.0125 MHz

Temperature (°C)	Measured Frequency (MHz)	ppm
-30	929.012751	0.27
-20	929.012779	0.30
-10	929.012751	0.27
0	929.012751	0.27
10	929.012558	0.06
20 (reference)	929.012500	0.00
30	929.012475	-0.03
40	929.012447	-0.06
50	929.012502	0.00

Table 7-2: Temperature Frequency Stability – 931.9375 MHz

Temperature (°C)	Measured Frequency (MHz)	ppm
-30	931.937749	0.27
-20	931.937719	0.23
-10	931.937721	0.24
0	931.937721	0.24
10	931.937528	0.03
20 (reference)	931.937500	0.00
30	931.937457	-0.05
40	931.937429	-0.08
50	931.937472	-0.03

7.2.2 Frequency Stability/Voltage Variation

Table 7-3: Frequency Stability/Voltage Variation – 929.0125 MHz

Voltage (VAC)	Measured Frequency (MHz)	ppm
97.75	929.012514	0.01
115 (reference)	929.012500	0.00
132.25	929.012486	-0.01

Table 7-4: Frequency Stability/Voltage Variation – 931.9375 MHz

Voltage (VAC)	Measured Frequency (MHz)	ppb
97.75	931.937500	0.00
115 (reference)	931.937500	0.00
132.25	931.937500	0.00

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Results: The EUT is compliant.

Table 7-5: Test Equipment Used for Testing Frequency Stability

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901350	Meterman	33XR	Multimeter	040402802	4/26/19
901672	Rohde & Schwarz	FSEM30	Spectrum Analyzer	FSEM30	4/17/19
900946	Tenney Engineering, Inc	TH65	Temperature Chamber with Humidity	11380	3/26/19
901291	Pasternack	PE7031-20	300W Attenuator, DC - 1 GHz, 20 dB	NA	8/24/18
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	9/1/18
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	8/21/18

Test Personnel:

Daniel W. Baltzell		July 1, 2018
EMC Test Engineer	Signature	Date of Test

8 FCC Part 2.1049(c)(1): Occupied Bandwidth; Part 90.210(g): Emission Masks; Part 22.359(a) Emission Limitations

ANSI C63.26 5.4.3

8.1 Test Procedure

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

Device with digital modulation: Modulated to its maximum extent using a pseudo-random data sequence.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set to 3 × RBW.
c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
NOTE: Step a), step b), and step c) may require iteration to adjust within the specified tolerances.
d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "X dB" requirement, i.e., if the requirement calls for measuring the 26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
f) Determine the reference value by either of the following:
1) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
2) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
g) Determine the "X dB amplitude" as equal to (Reference Value X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
h) If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).
i) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "X dB amplitude" determined in step f). If a marker is below this "X dB amplitude" value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers. The spectral envelope can cross the "X dB amplitude" at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the "X dB amplitude."
j) The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Limits
§ 22.359 Emission Limitations
The rules in this section govern the spectral characteristics of emissions in the Public Mobile Services, except for the Air-Ground Radiotelephone Service (see §22.861, instead) and the Cellular Radiotelephone Service (see §22.917, instead).
(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 30 kHz or more. In the 60 kHz bands immediately outside and adjacent to the authorized frequency range or channel, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 30 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and

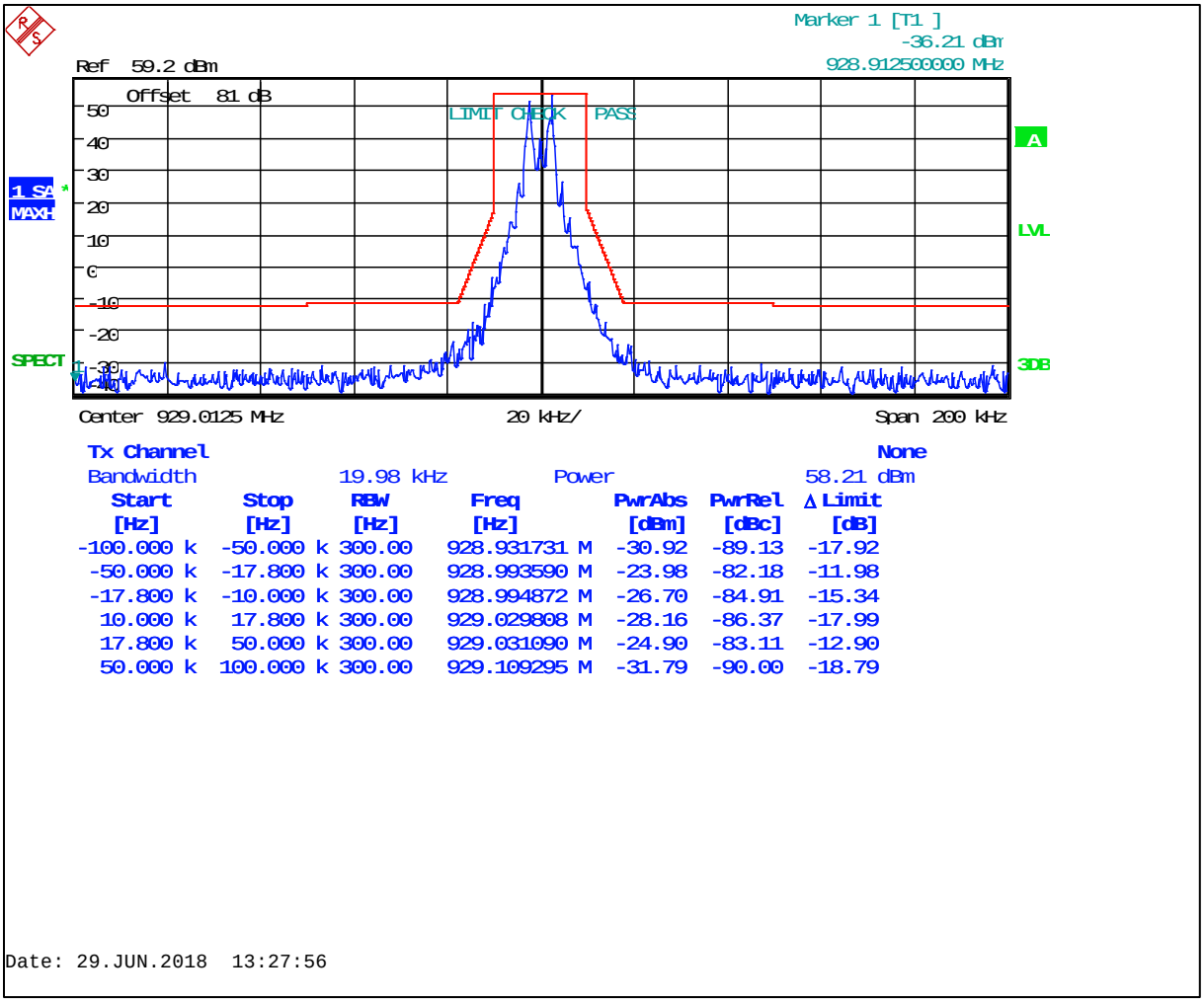
one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Part 90.210(g): *Emission Mask G.* For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:
(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but no more than 250 percent of the authorized bandwidth: At least 116 log (f_d/6.1) dB, or 50 + 10 log (P) dB, or 70 dB, whichever is the lesser attenuation;
(2) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

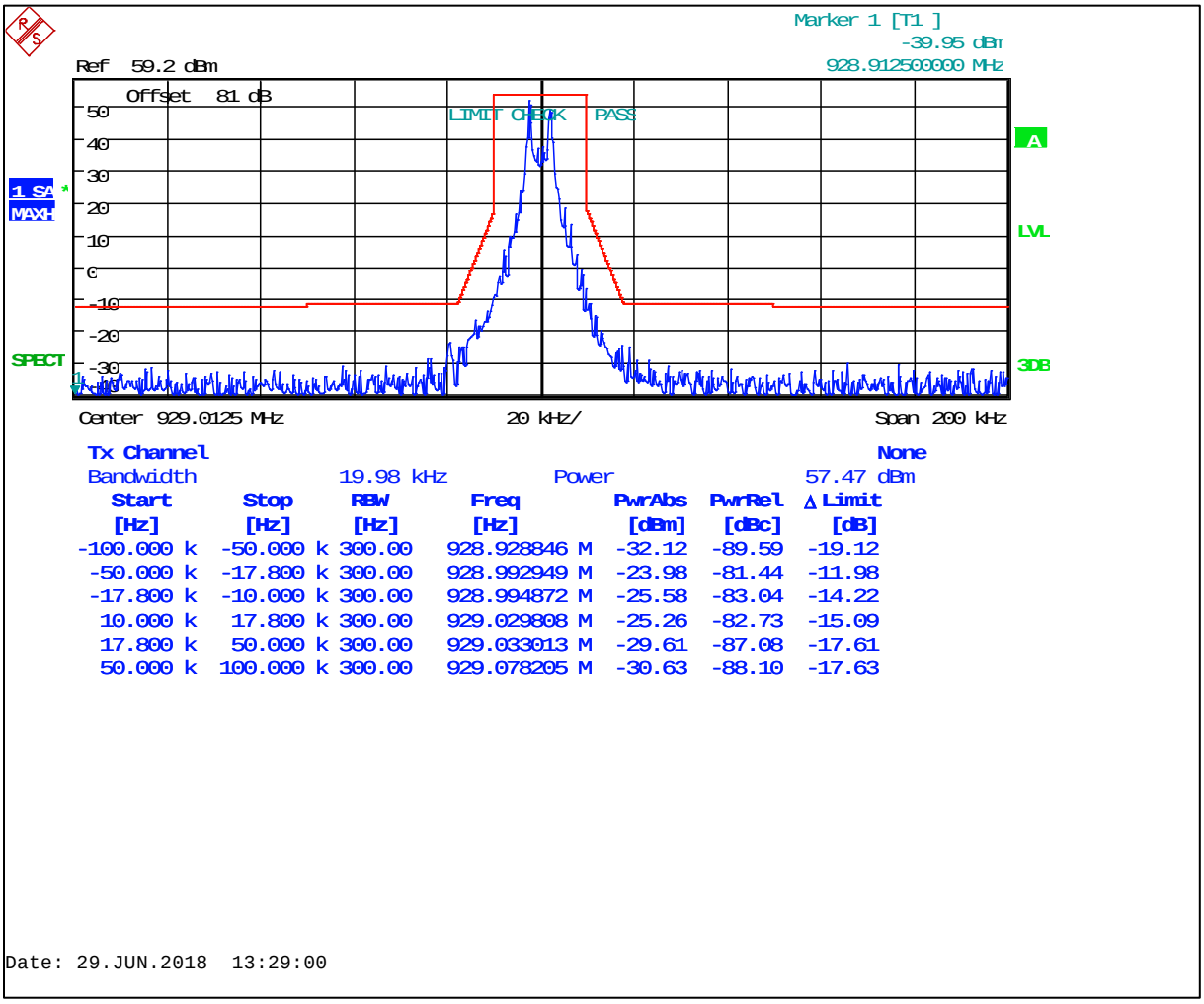
Note: The limit from the slope out to the 250% point should be -16 dBm rather than what is shown in the plots; upon inspection all emissions are compliant.

8.2 Test Data

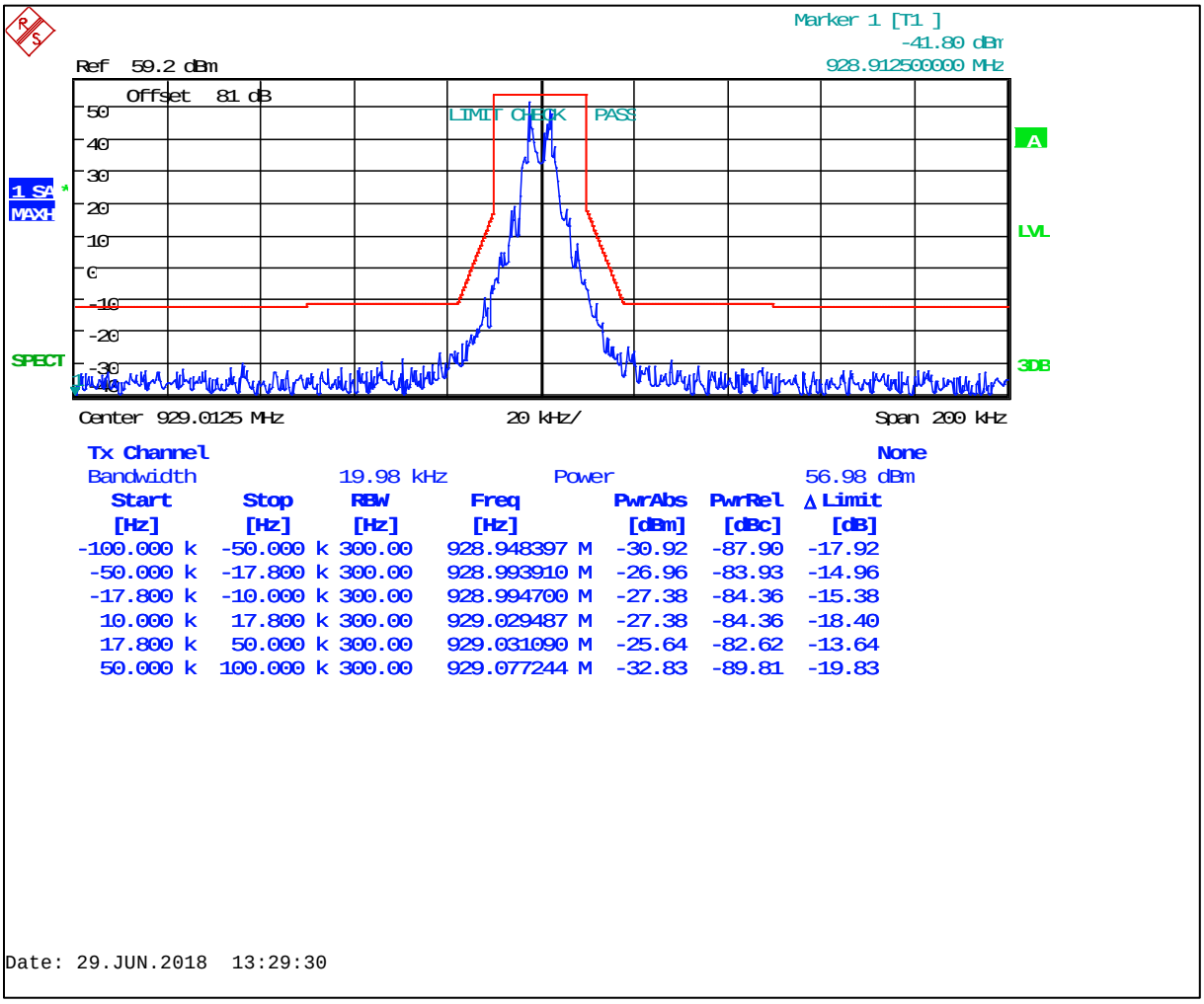
Plot 8-1: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 512 PRBS - Mask G



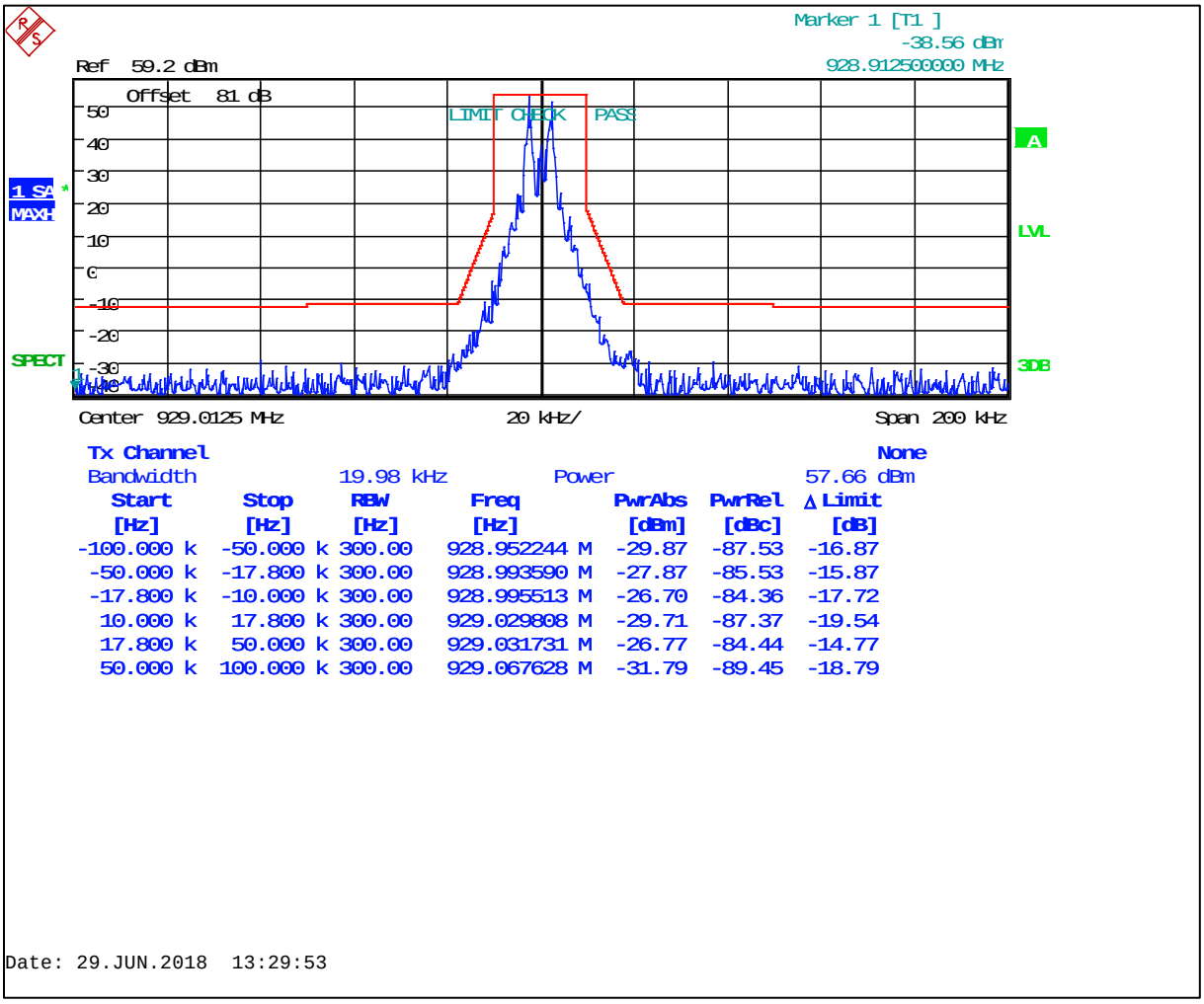
Plot 8-2: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 1200 PRBS- Mask G



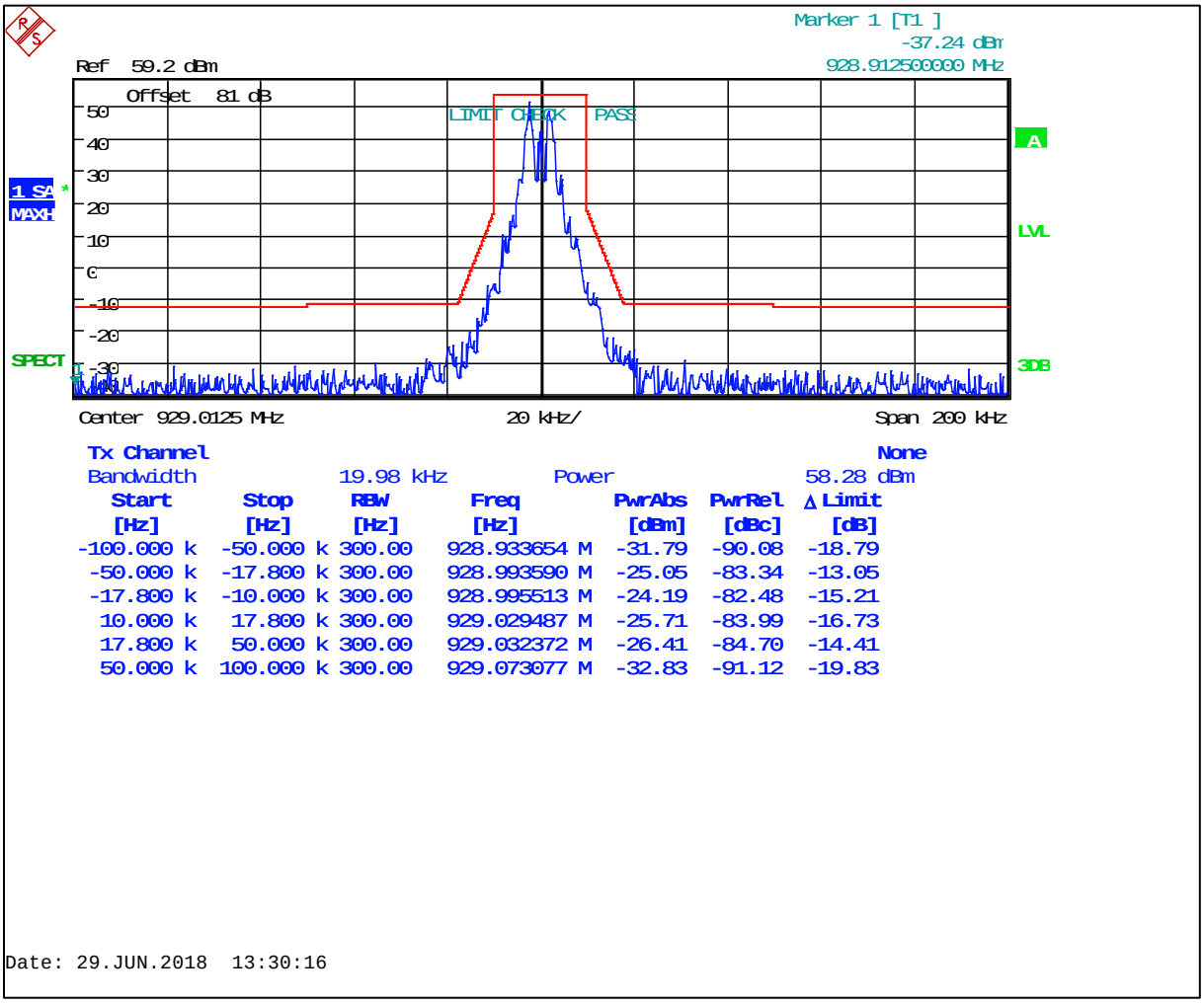
Plot 8-3: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 2400 PRBS- Mask G



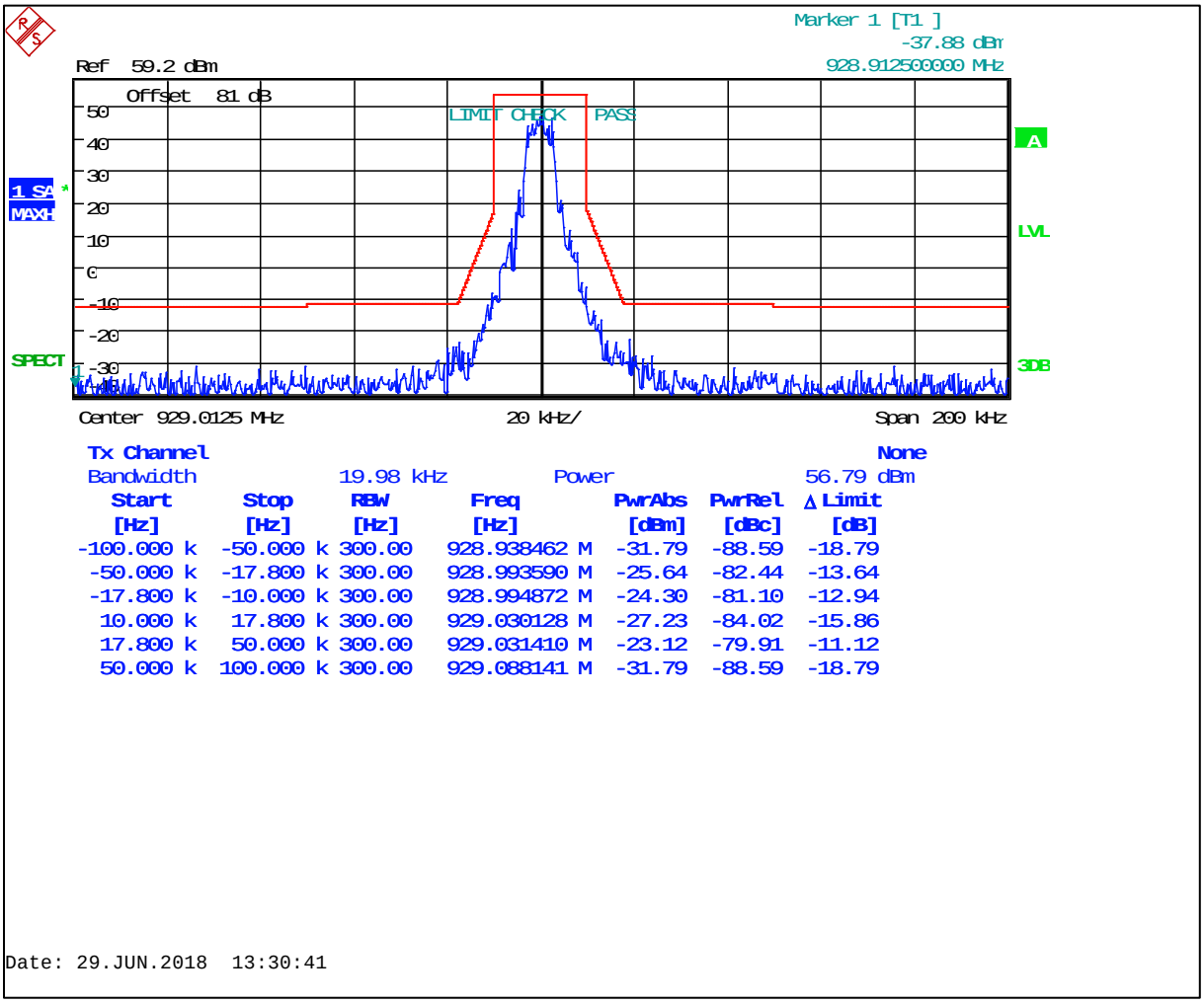
Plot 8-4: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 1600 PRBS- Mask G



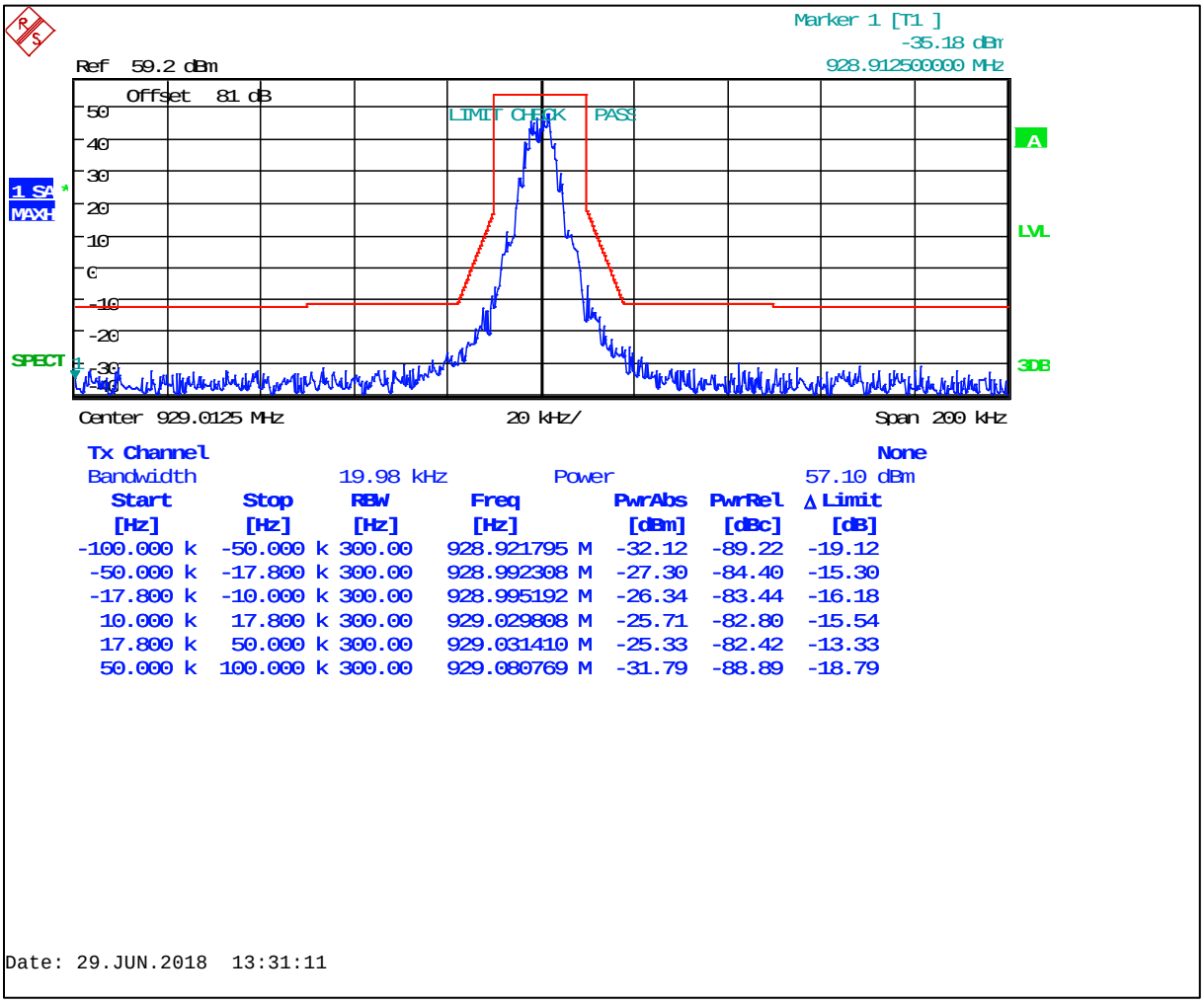
Plot 8-5: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 3200 PRBS- Mask G



Plot 8-6: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 3200 PRBS- Mask G

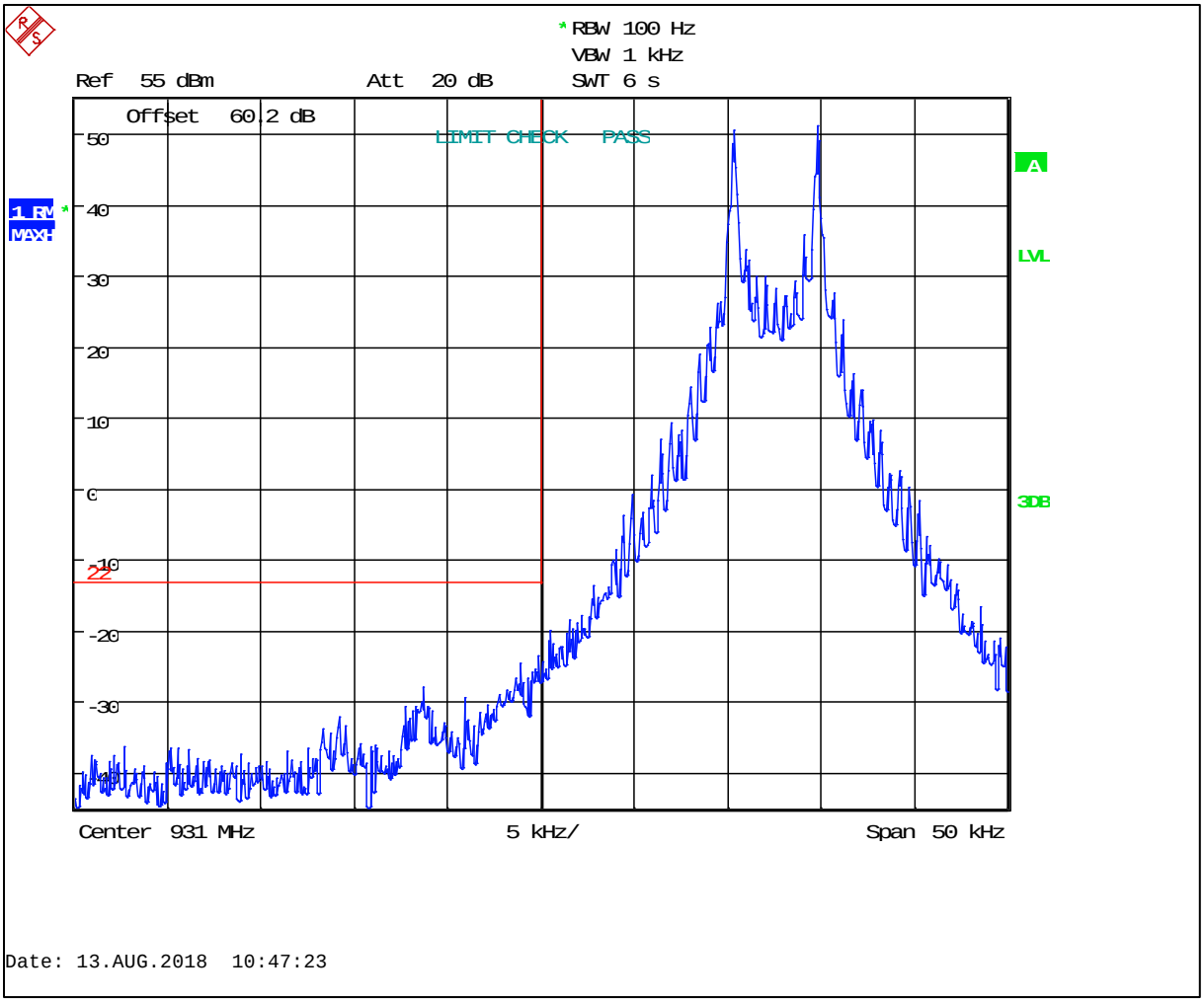


Plot 8-7: Emission Masks - 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 6400 PRBS- Mask G

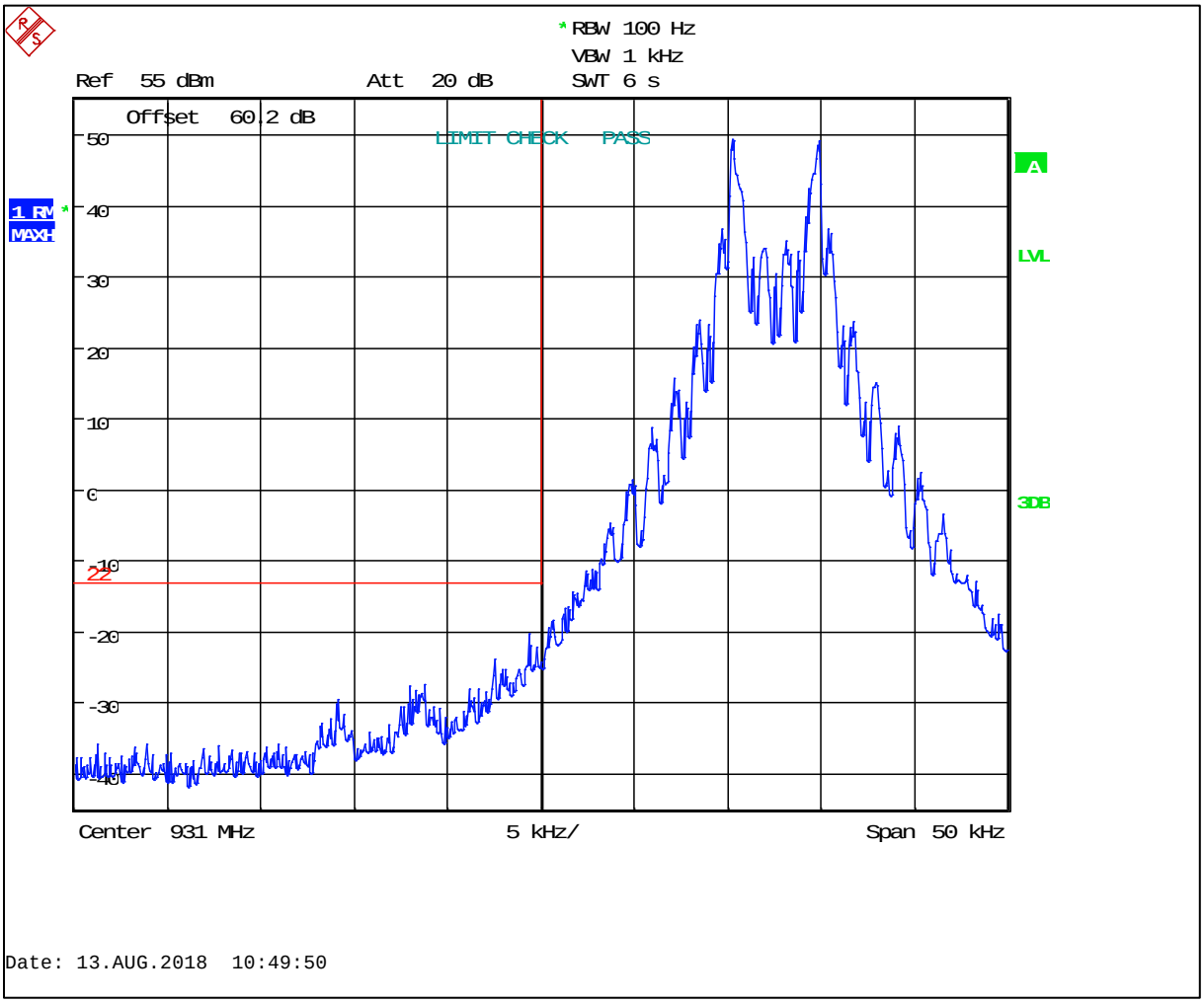


8.2.1 Part 22 Emission Limitations

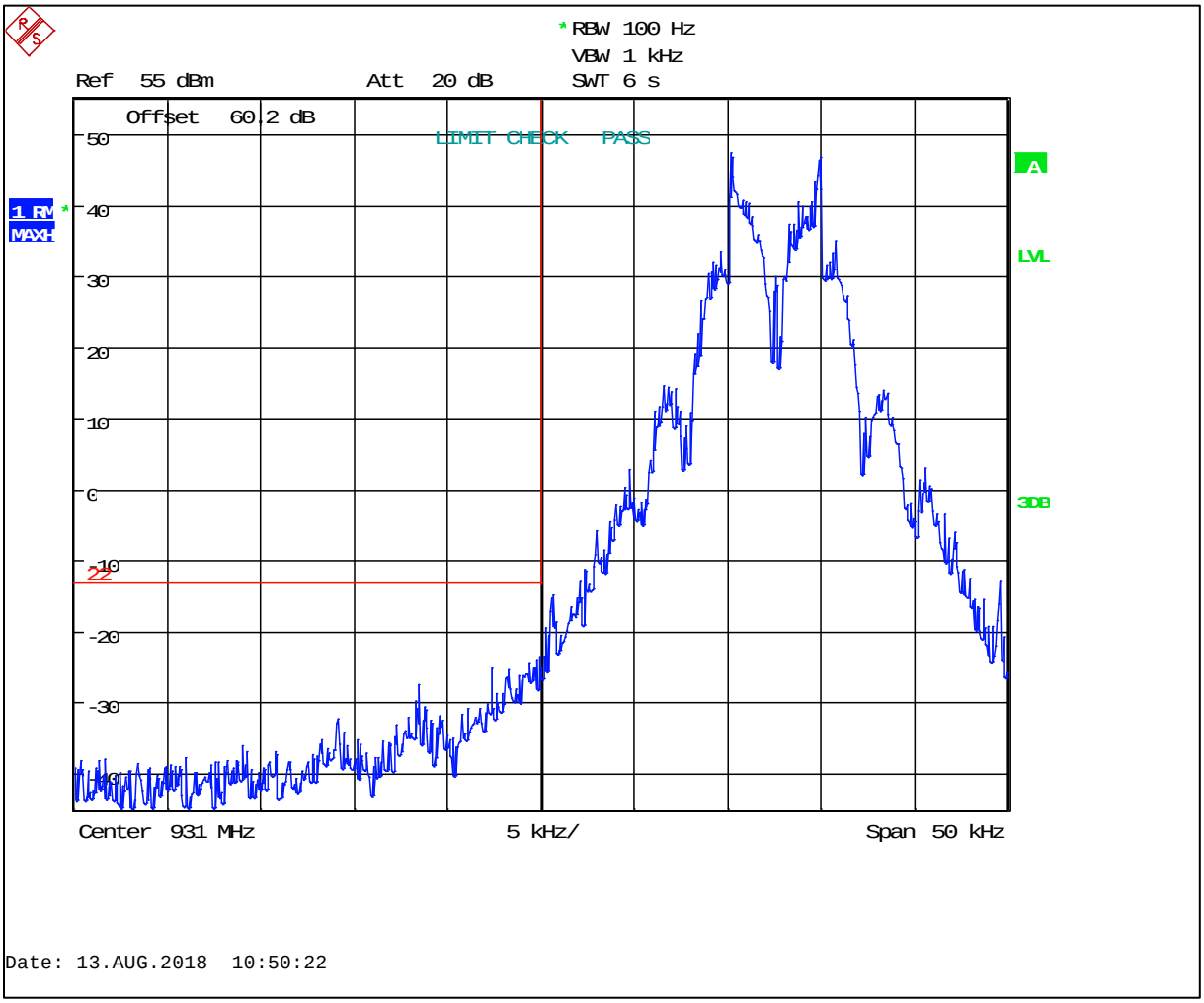
Plot 8-8: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 512 PRBS



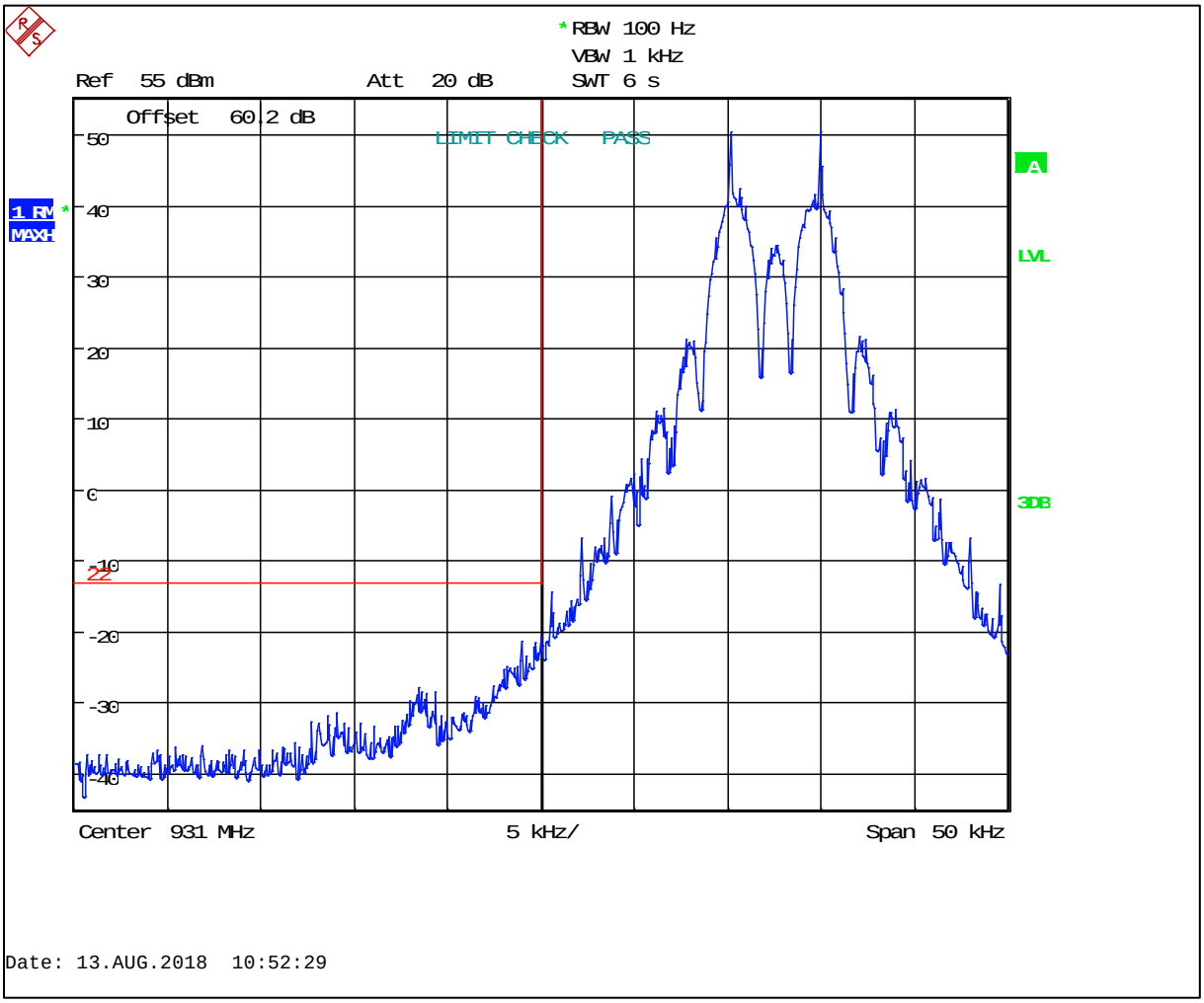
Plot 8-9: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 1200 PRBS



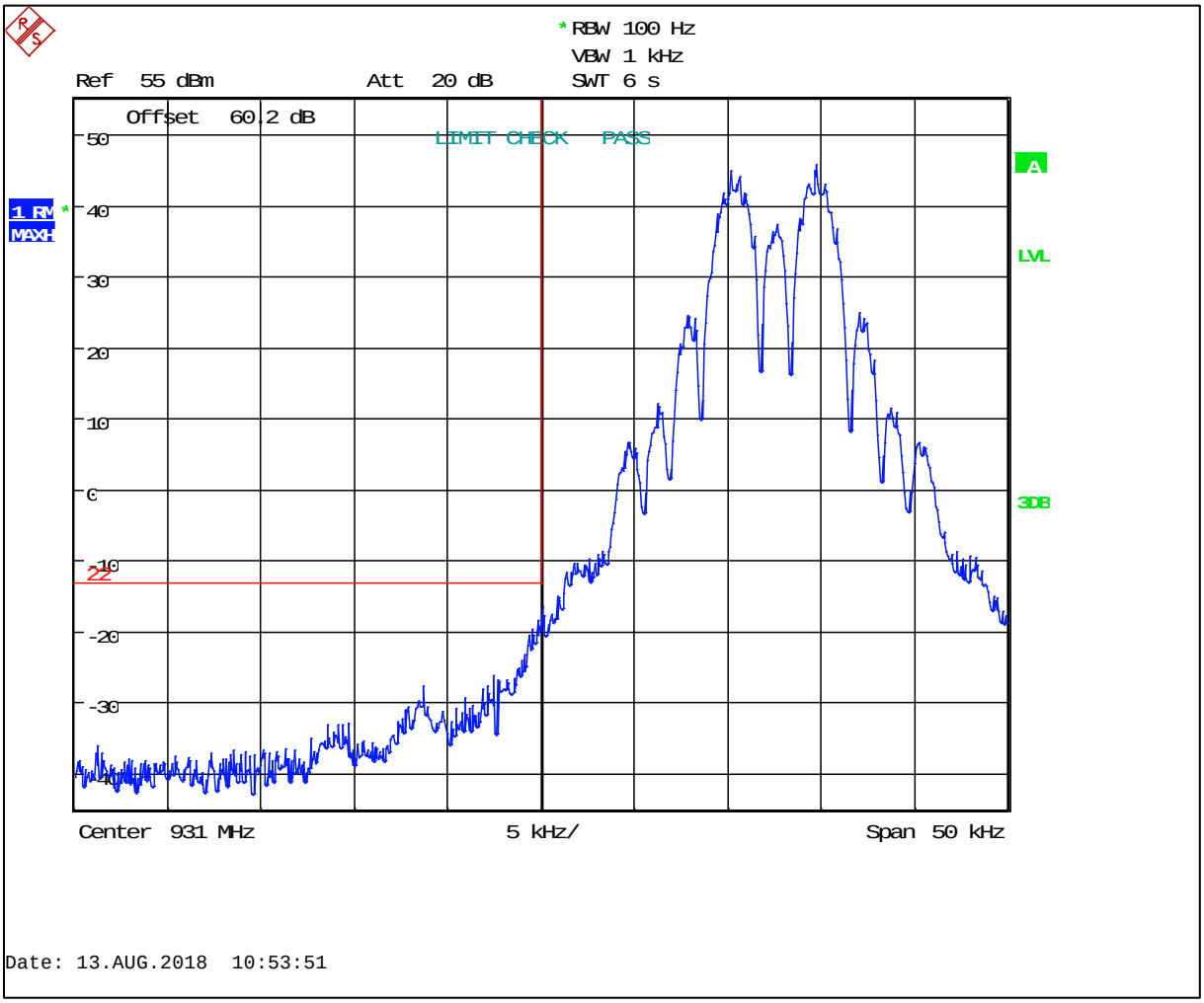
Plot 8-10: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 2400 PRBS



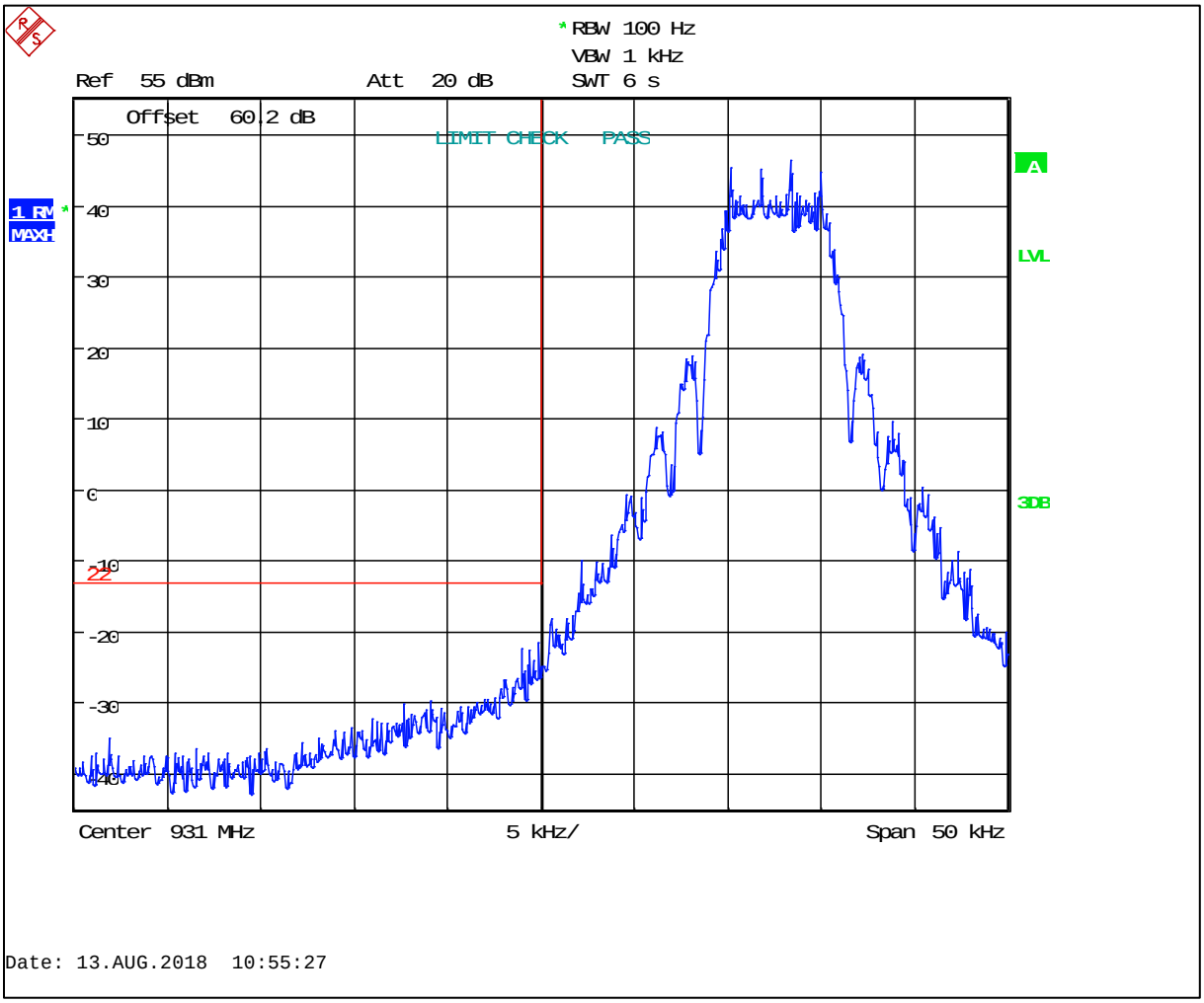
Plot 8-11: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



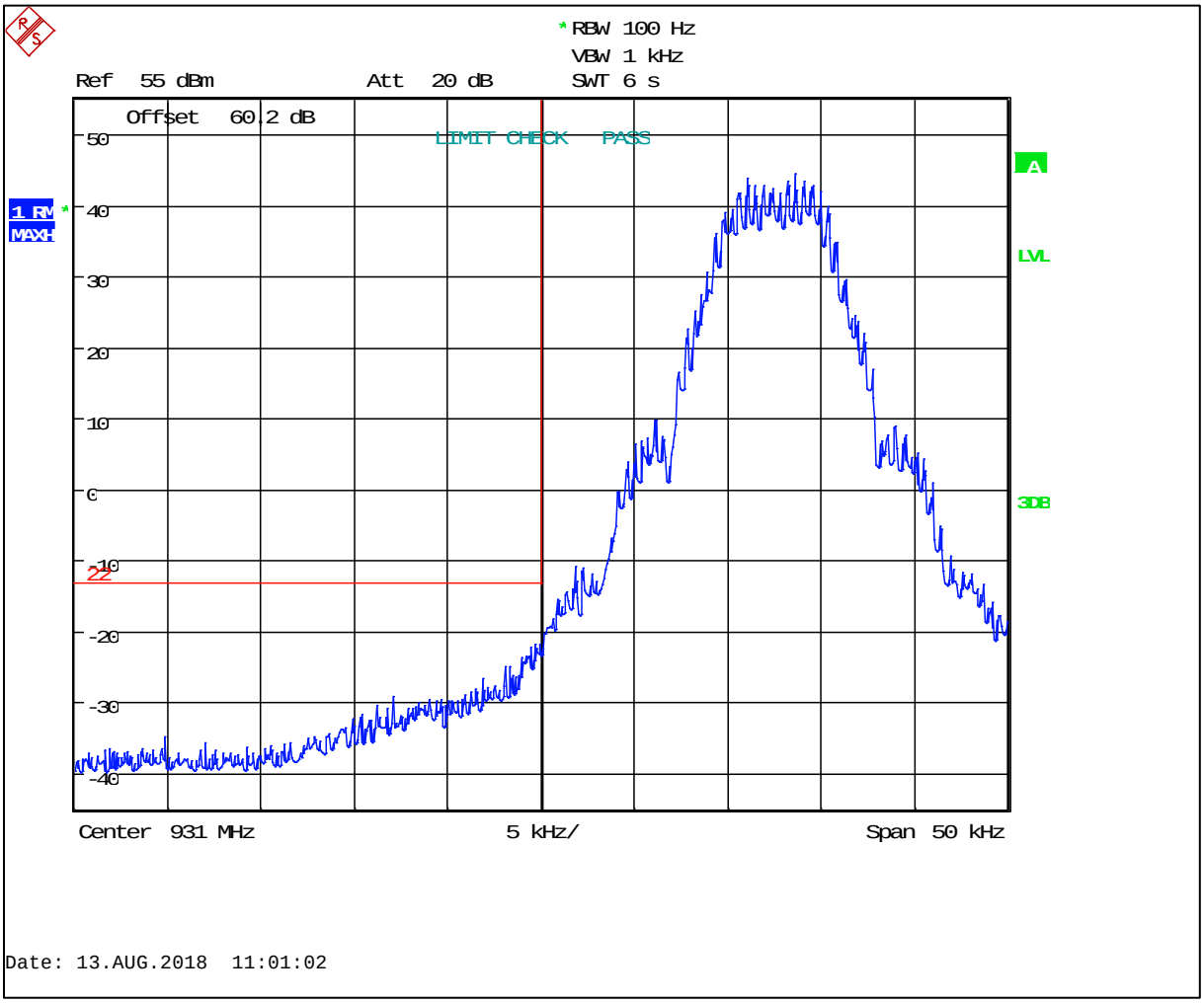
Plot 8-12: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



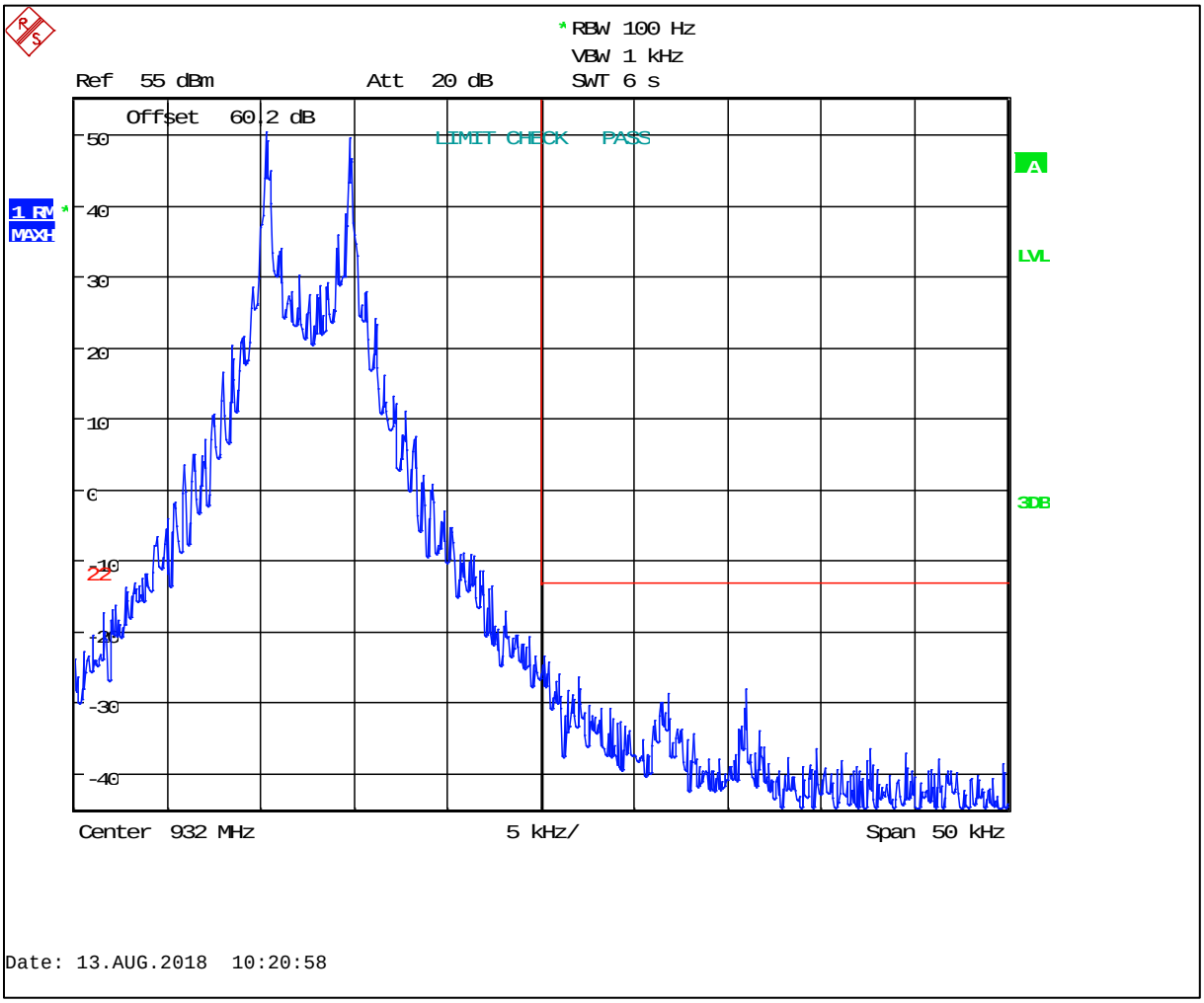
Plot 8-13: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



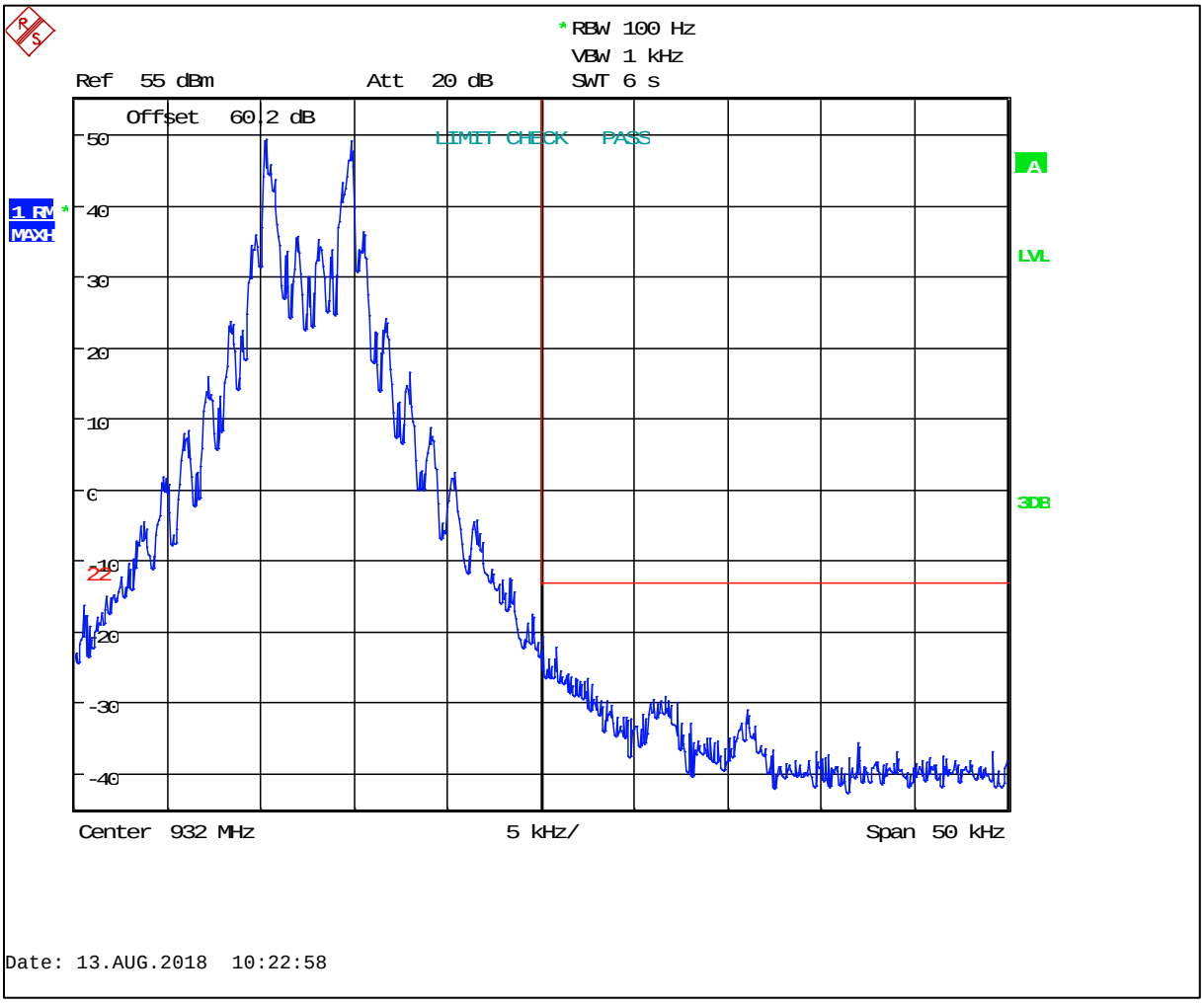
Plot 8-14: 931.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



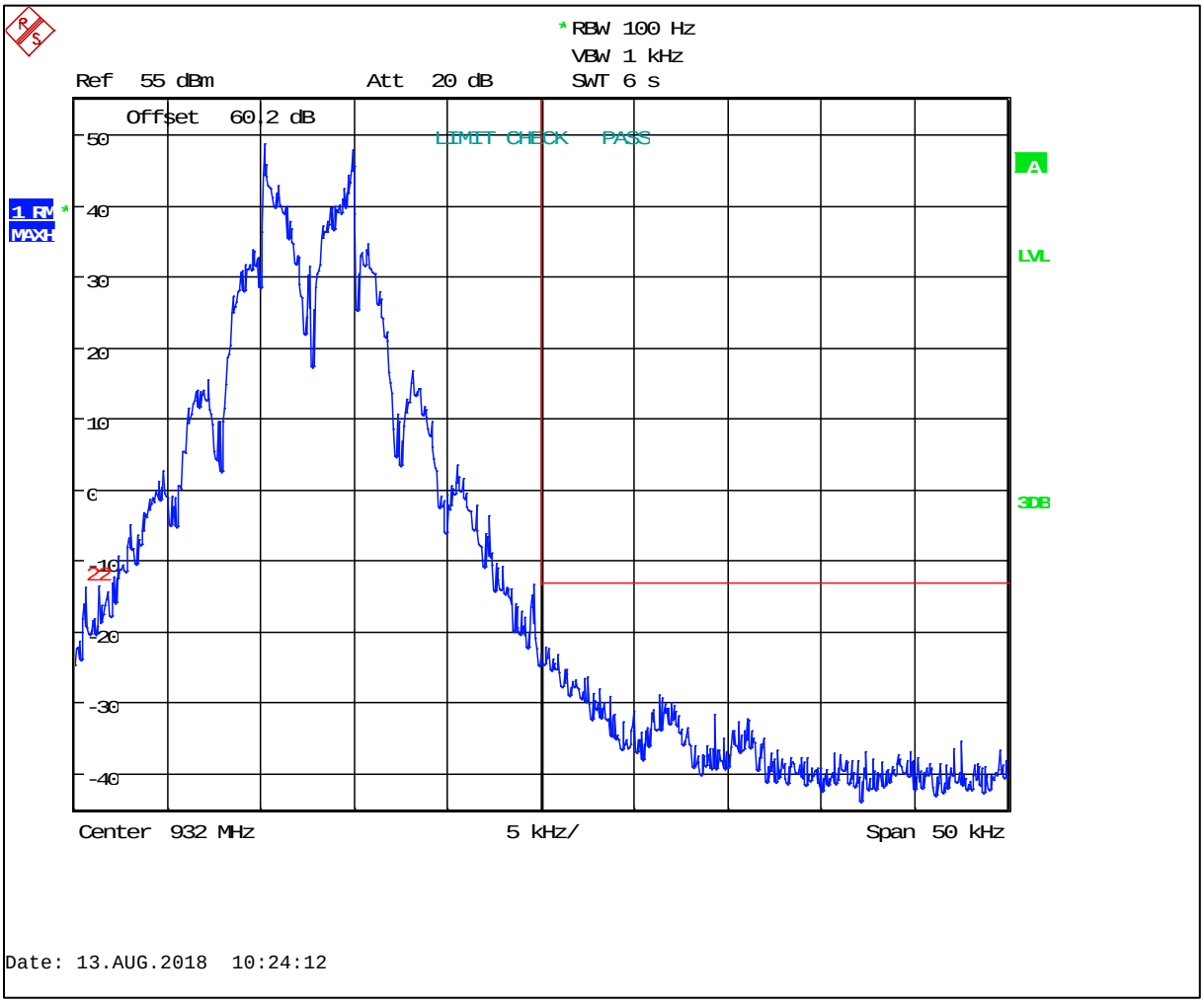
Plot 8-15: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 512 PRBS



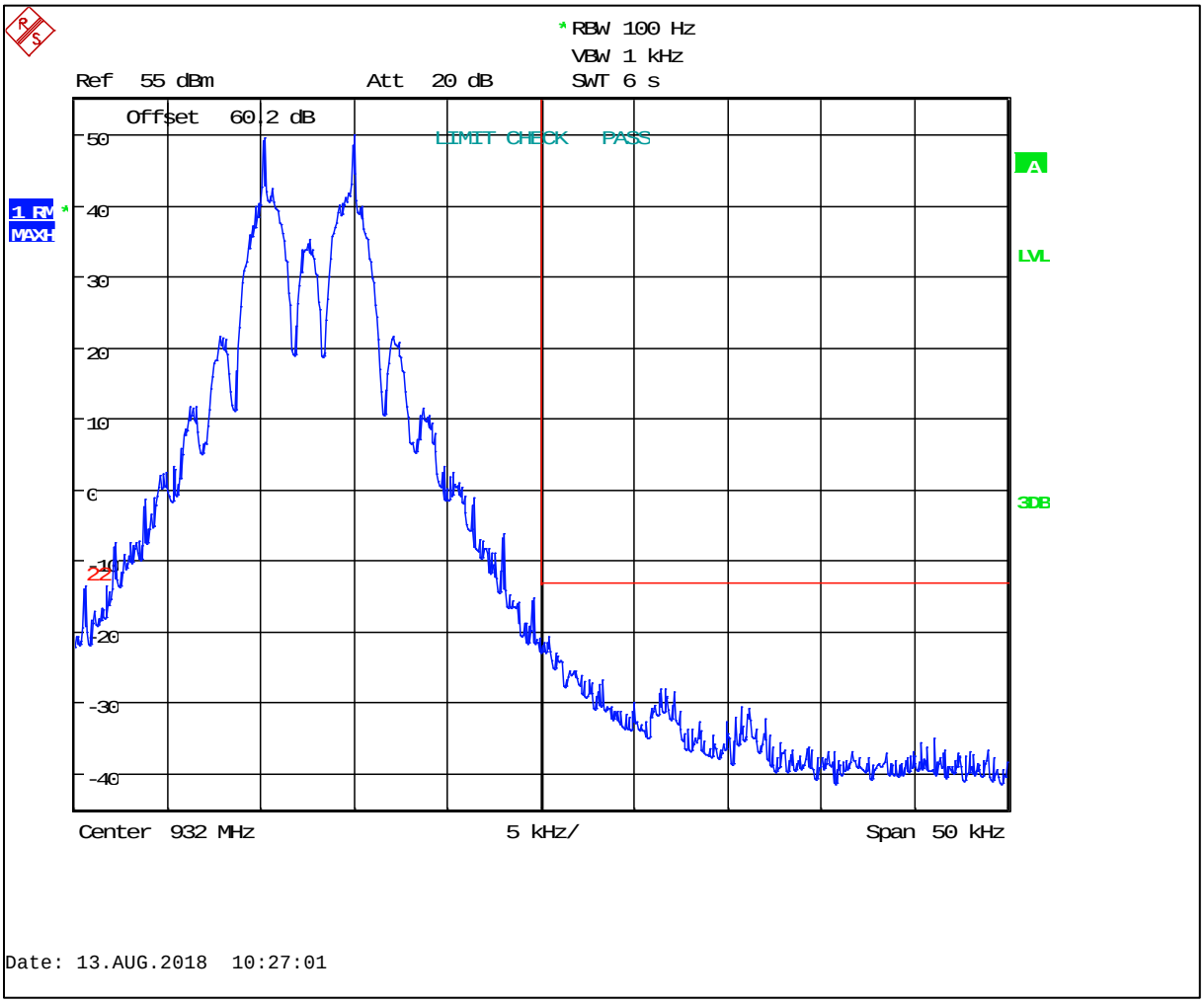
Plot 8-16: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 1200 PRBS



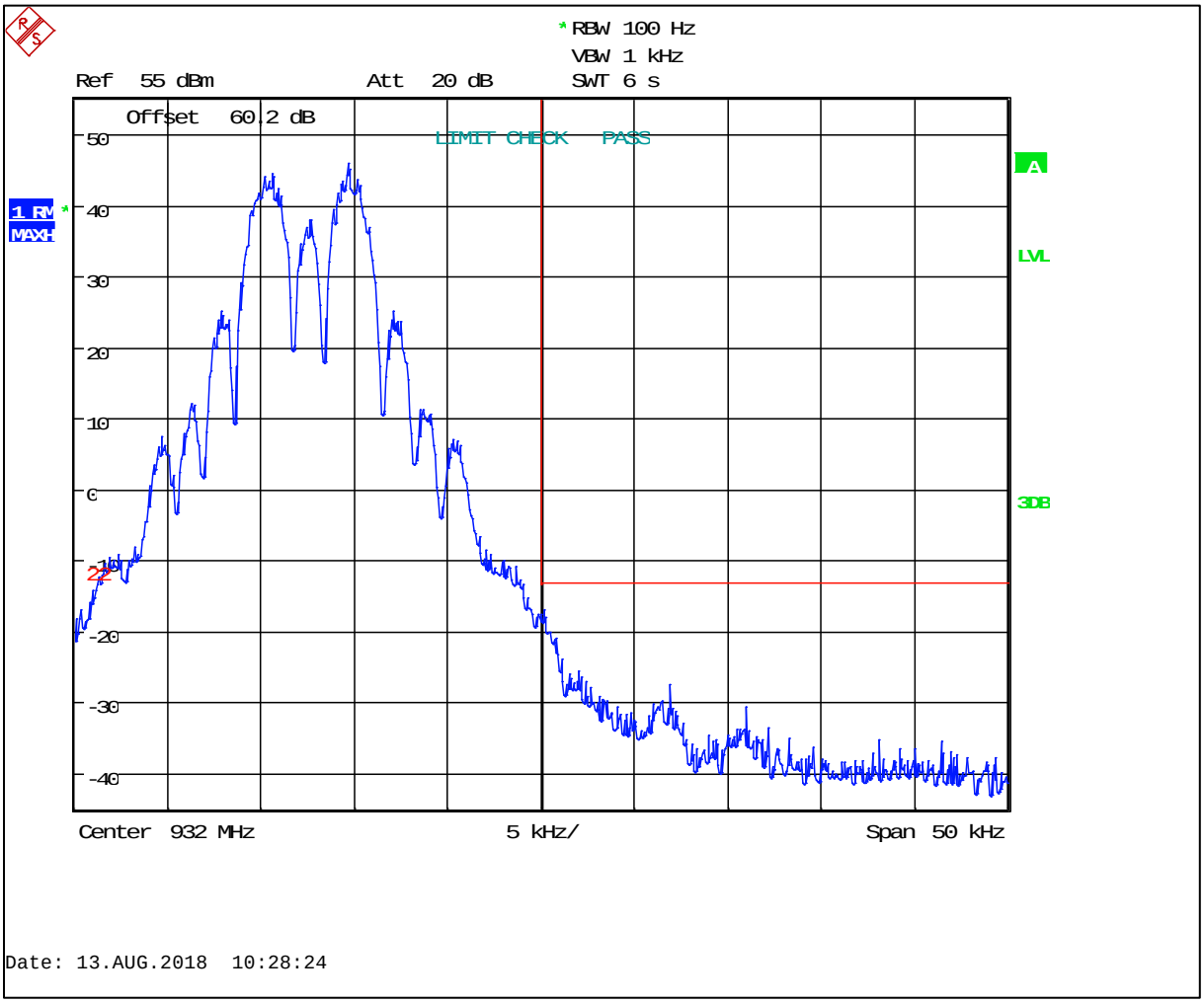
Plot 8-17: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 2400 PRBS



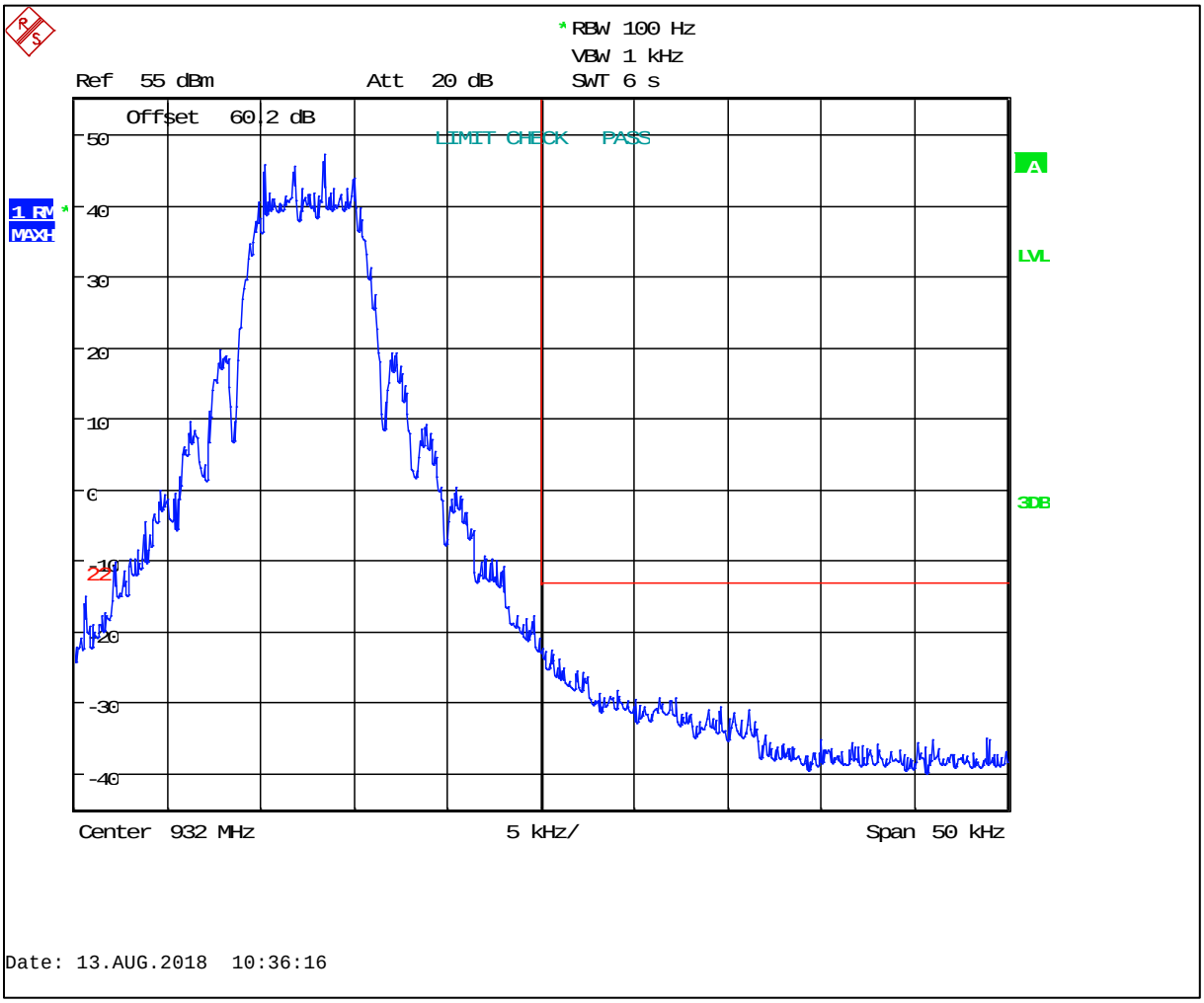
Plot 8-18: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



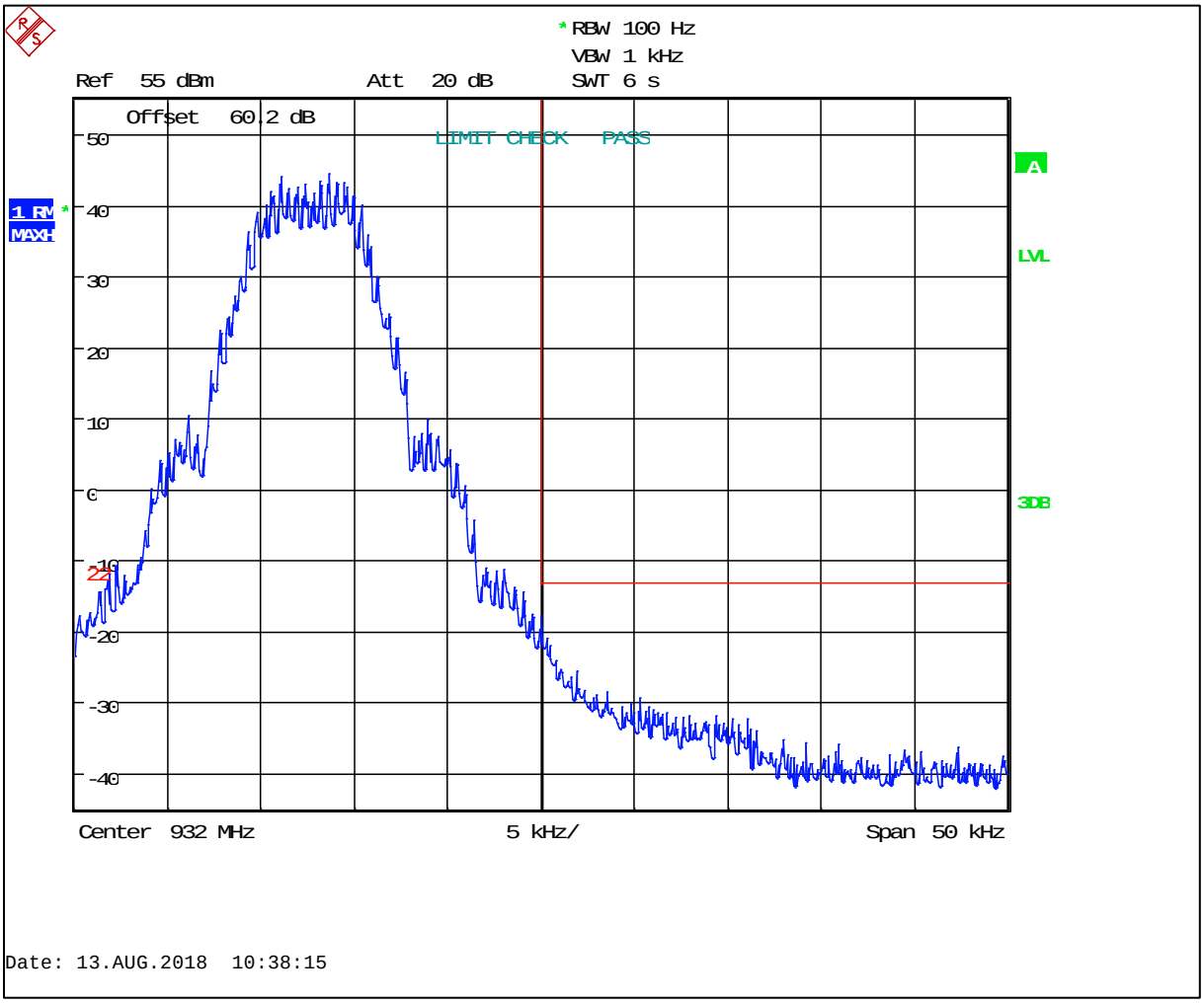
Plot 8-19: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



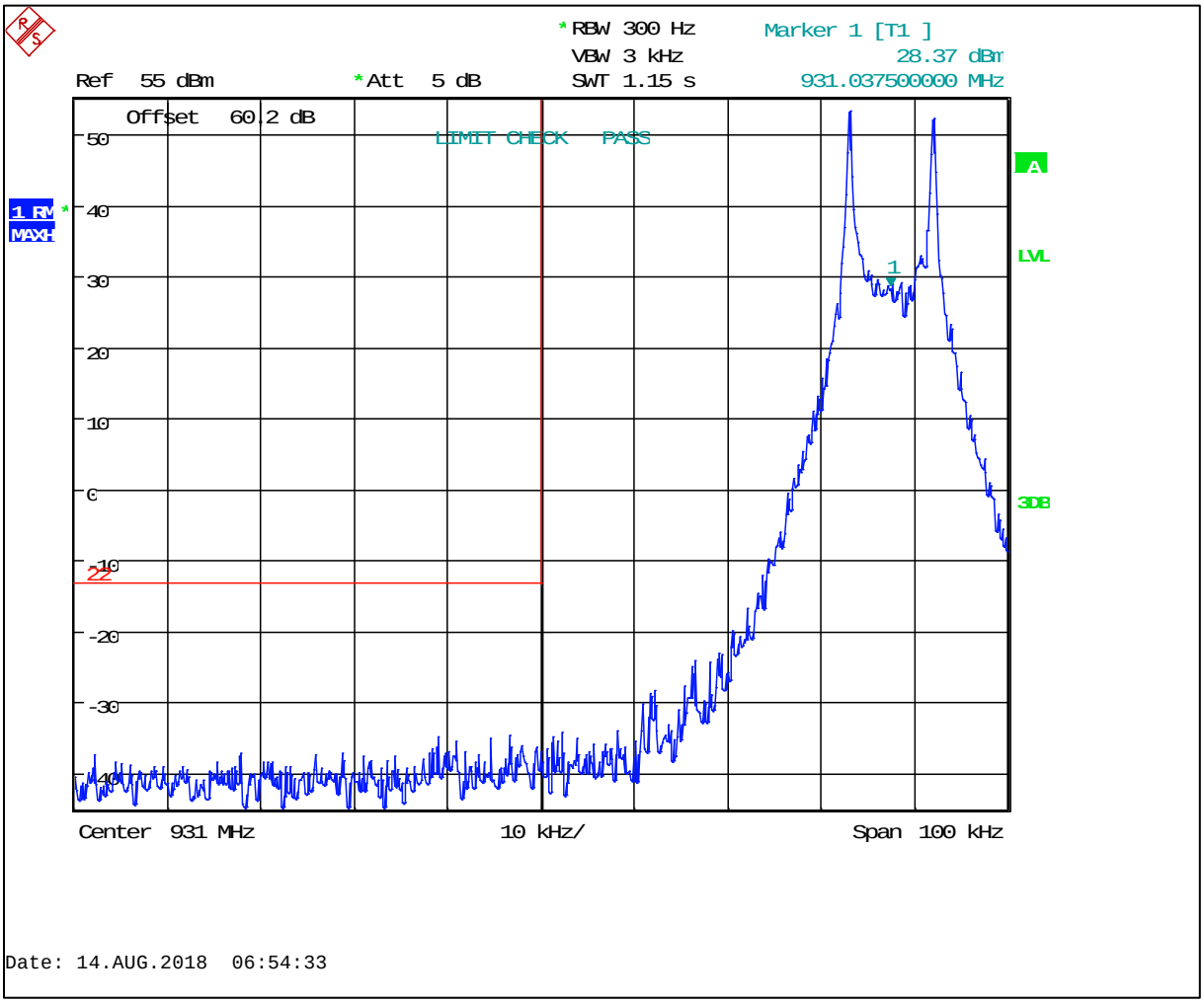
Plot 8-20: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



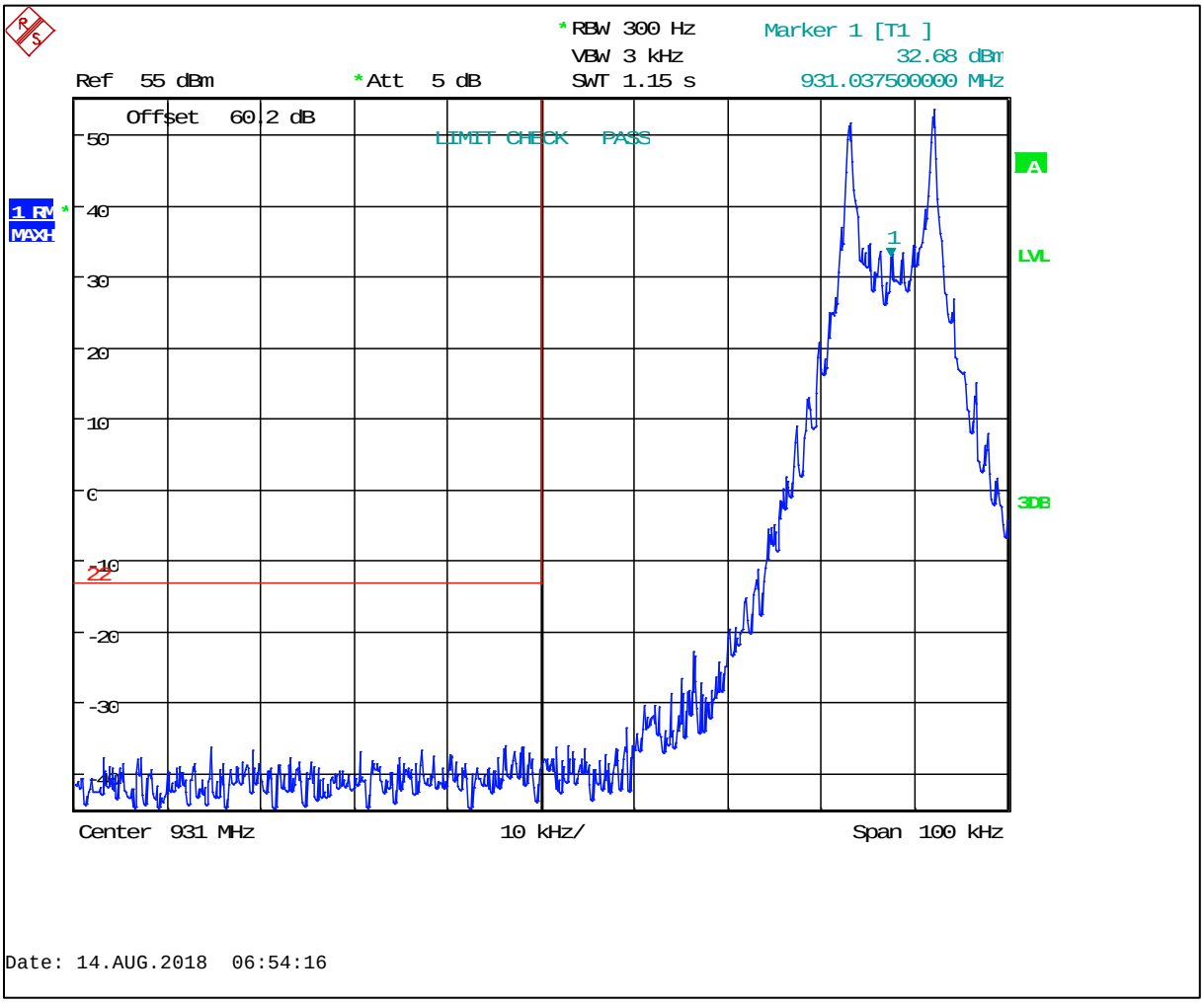
Plot 8-21: 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



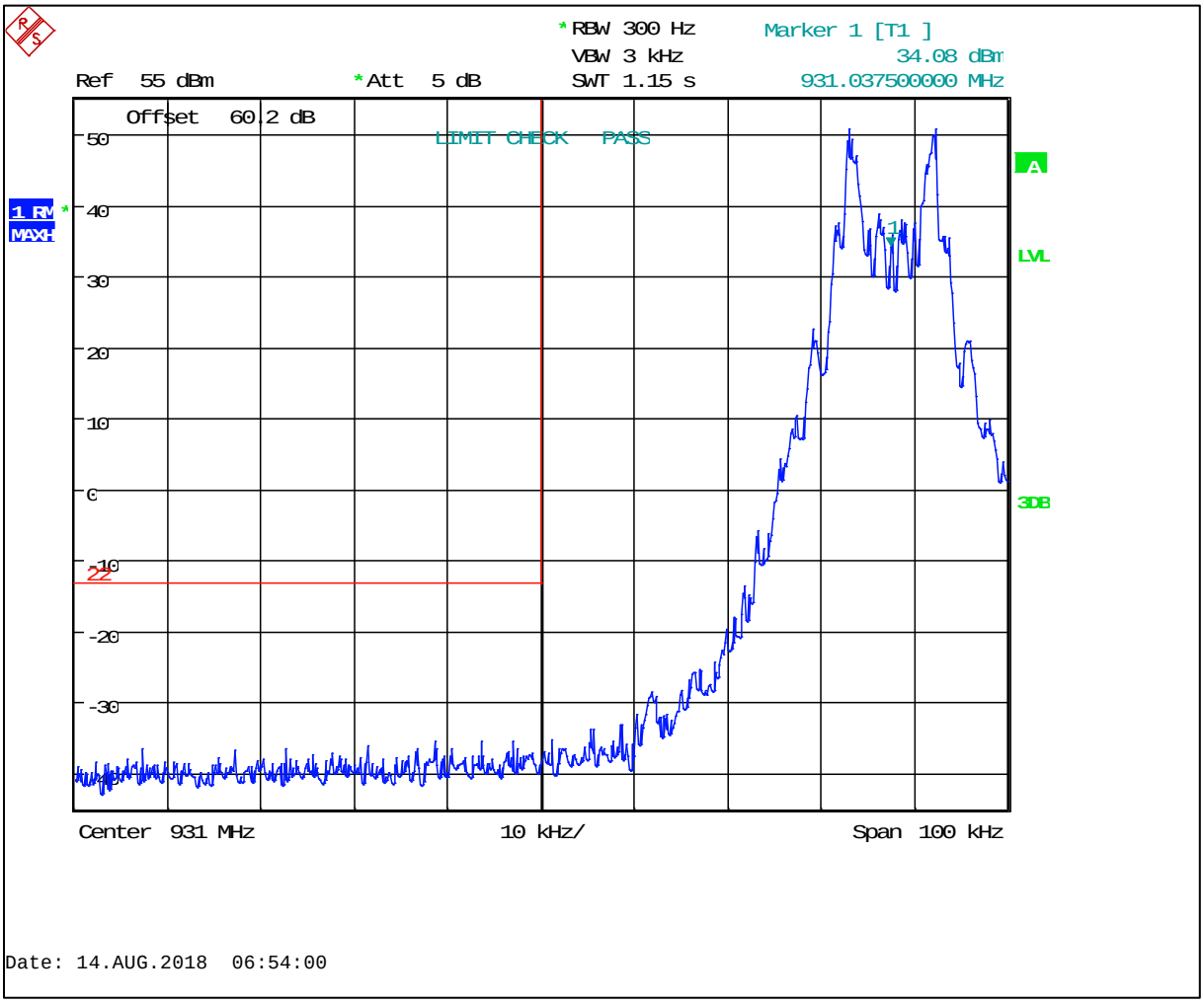
Plot 8-22: 931.0375 MHz, 25 kHz Bandwidth, High Power; POCSAG 512 PRBS



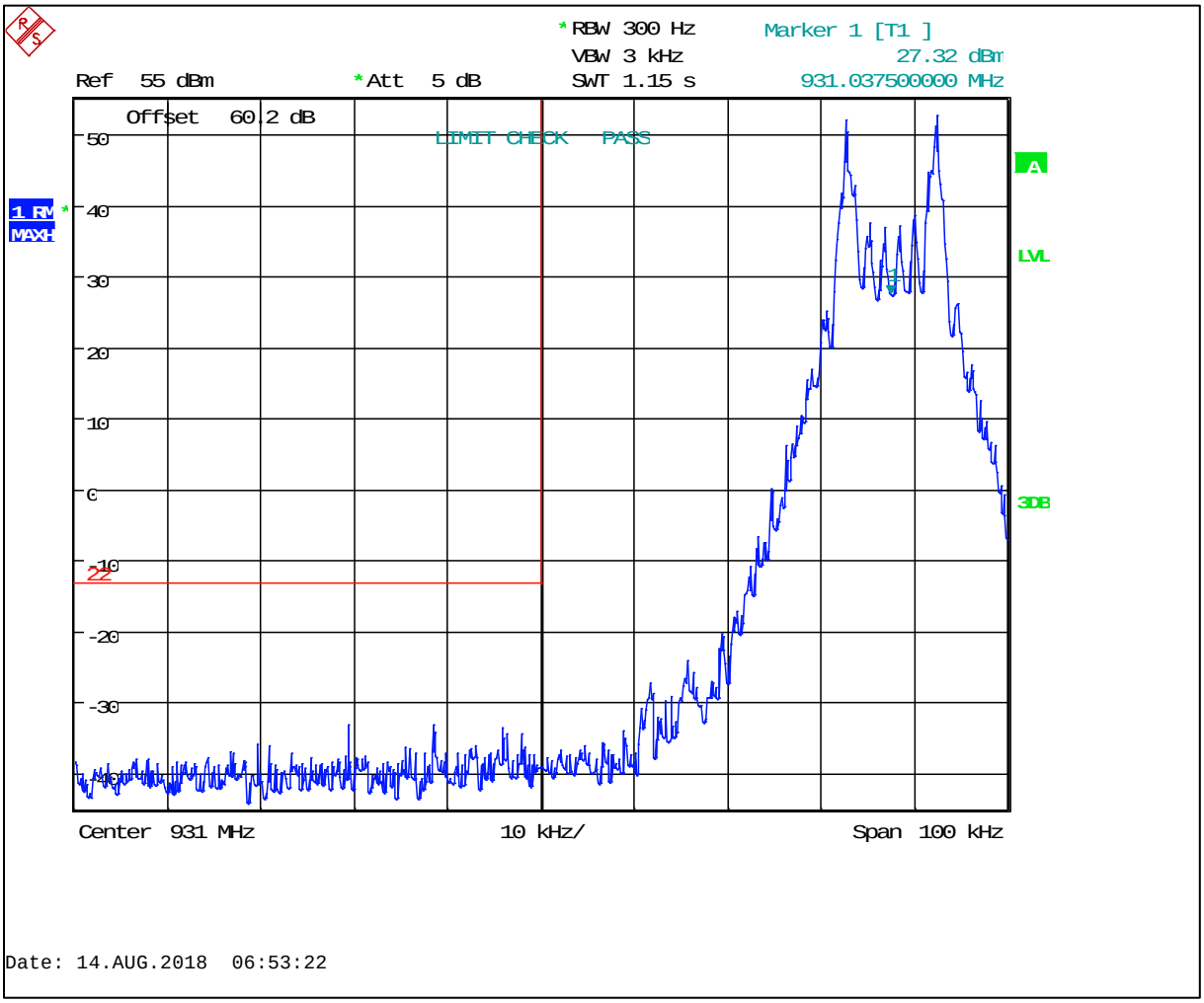
Plot 8-23: 931.0375 MHz, 25 kHz Bandwidth, High Power; POCSAG 1200 PRBS



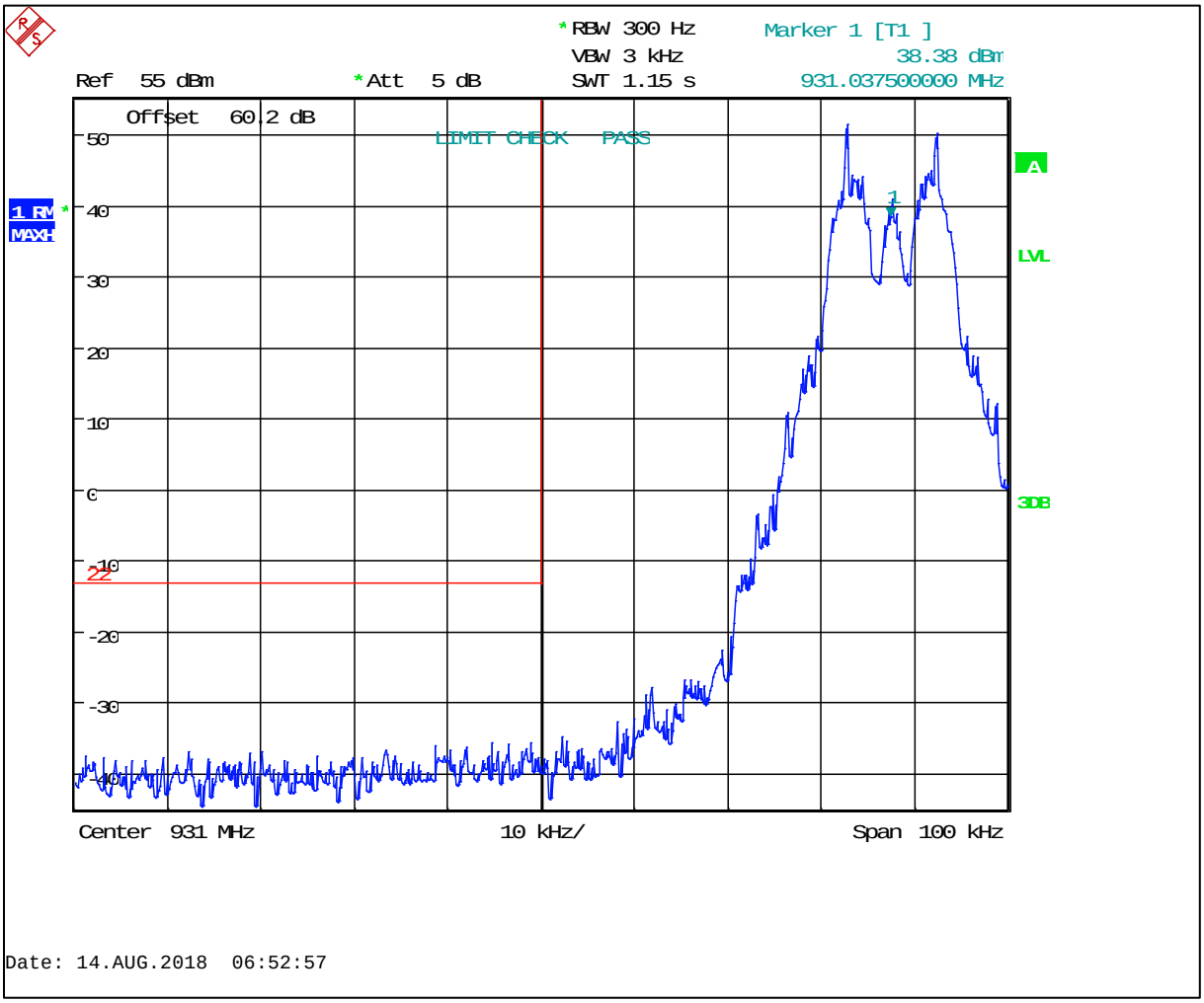
Plot 8-24: 931.0375 MHz, 25 kHz Bandwidth, High Power; POCSAG 2400 PRBS



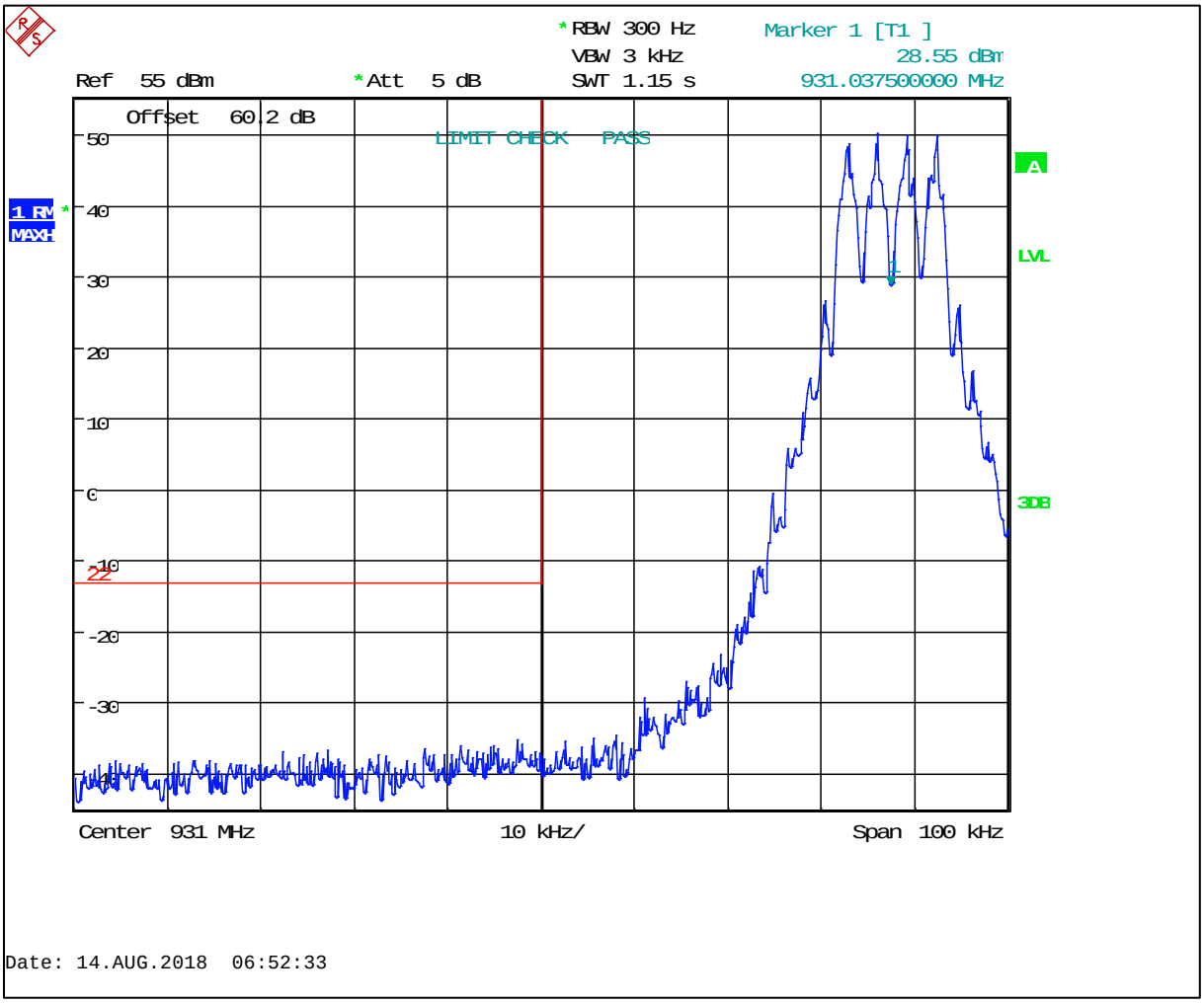
Plot 8-25: 931.0375 MHz, 25 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



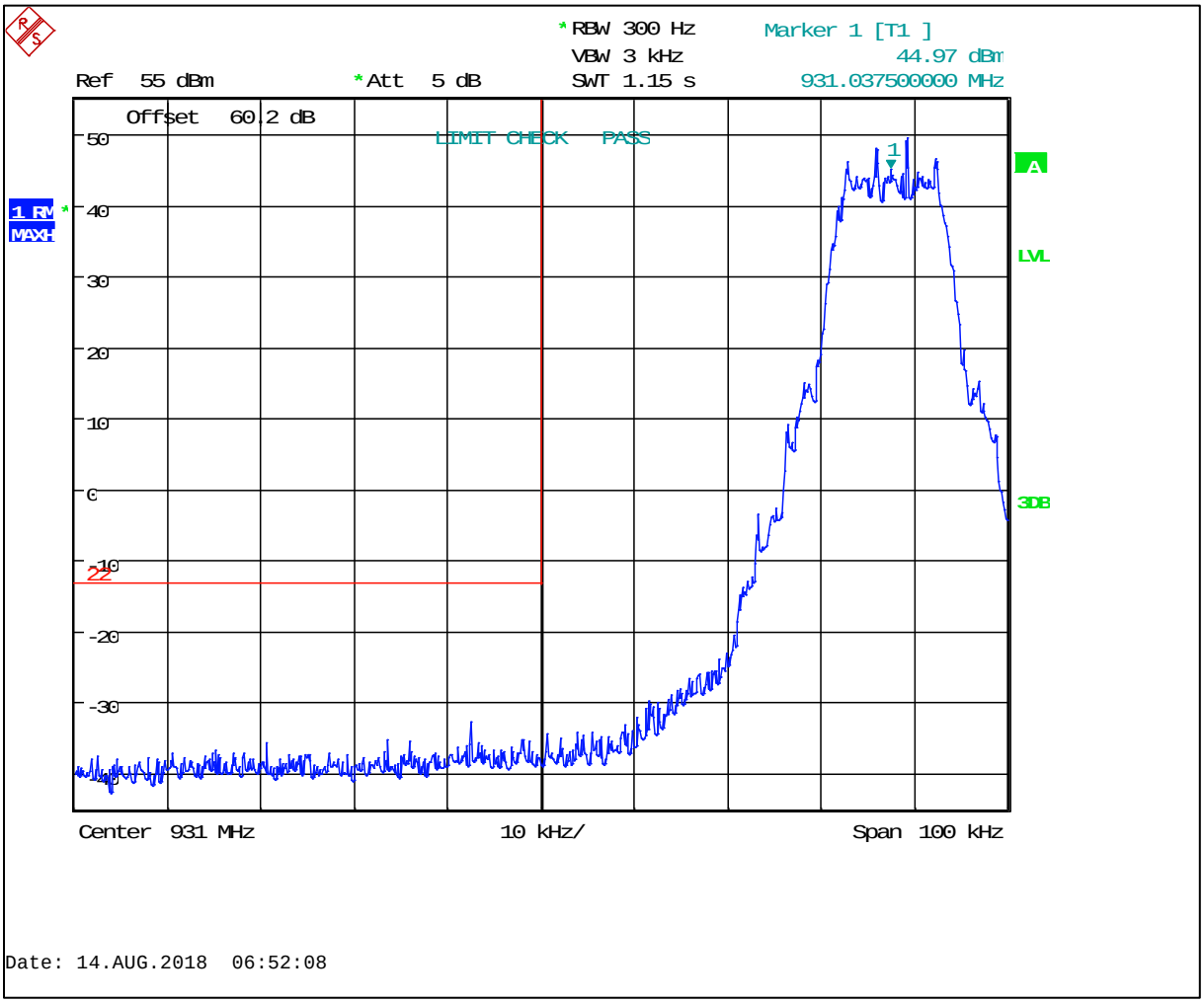
Plot 8-26: 931.0375 MHz, 25 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



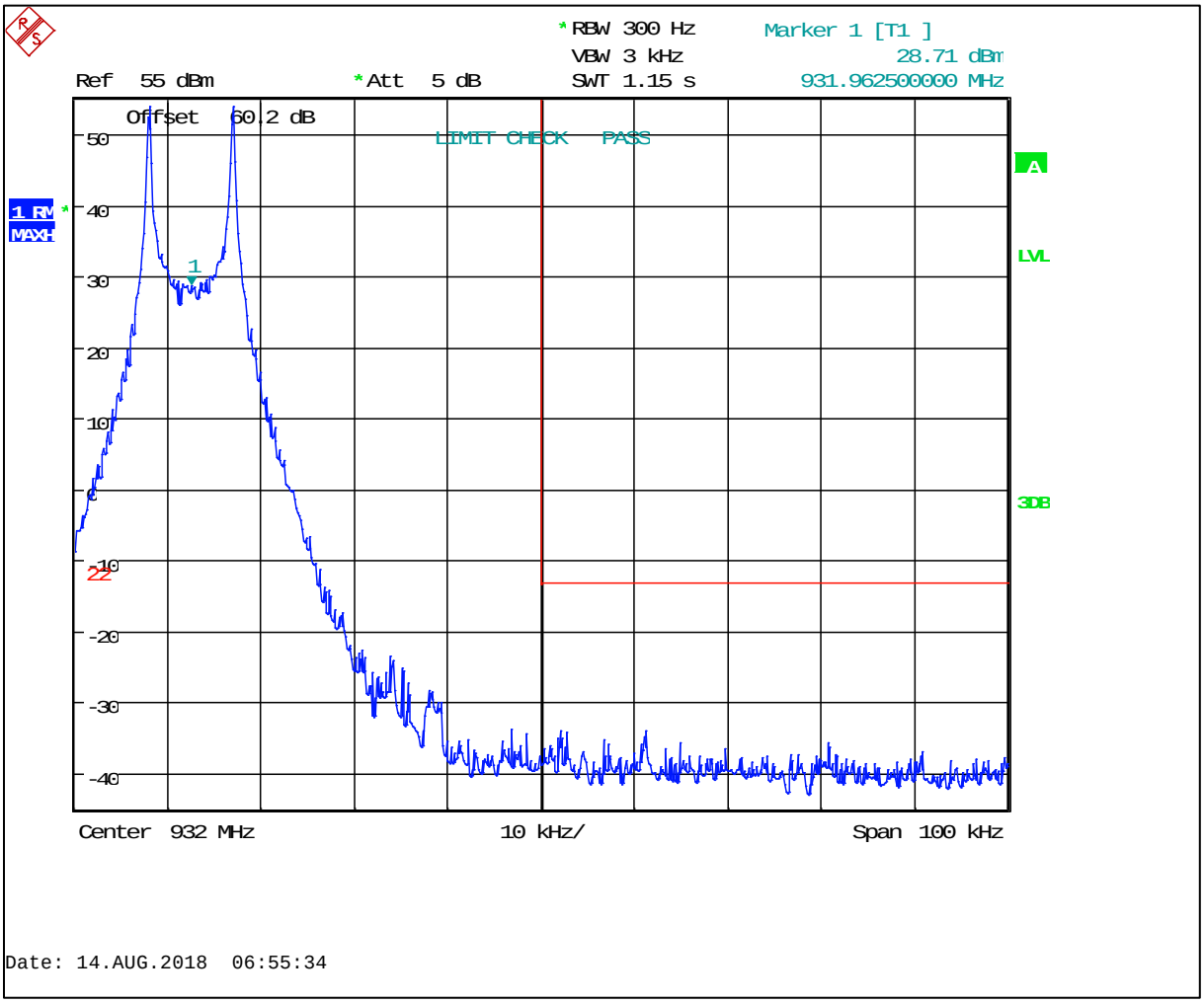
Plot 8-27: 931.0375 MHz, 25 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



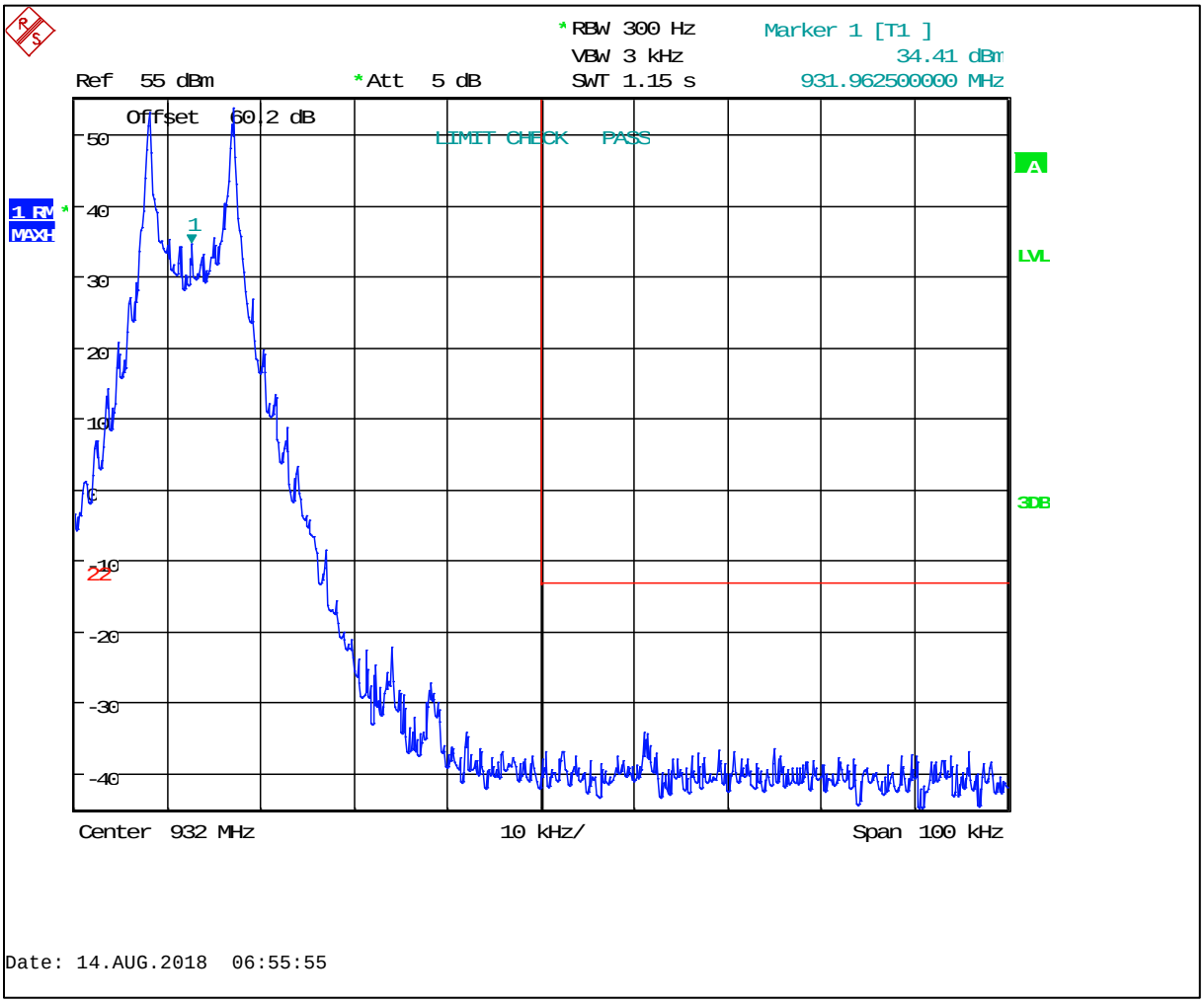
Plot 8-28: 931.0375 MHz, 25 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



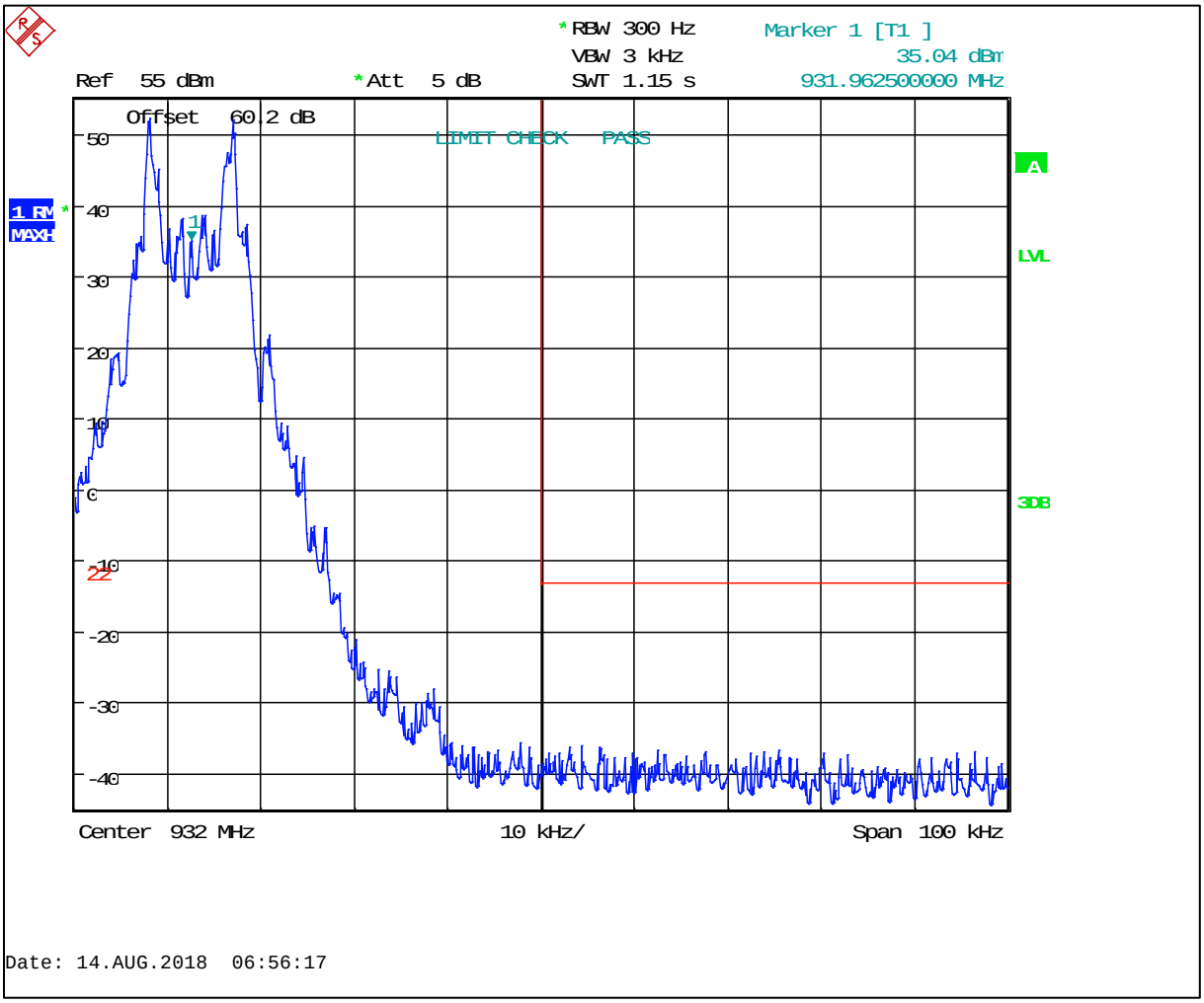
Plot 8-29: 931.9625 MHz, 25 kHz Bandwidth, High Power; POCSAG 512 PRBS



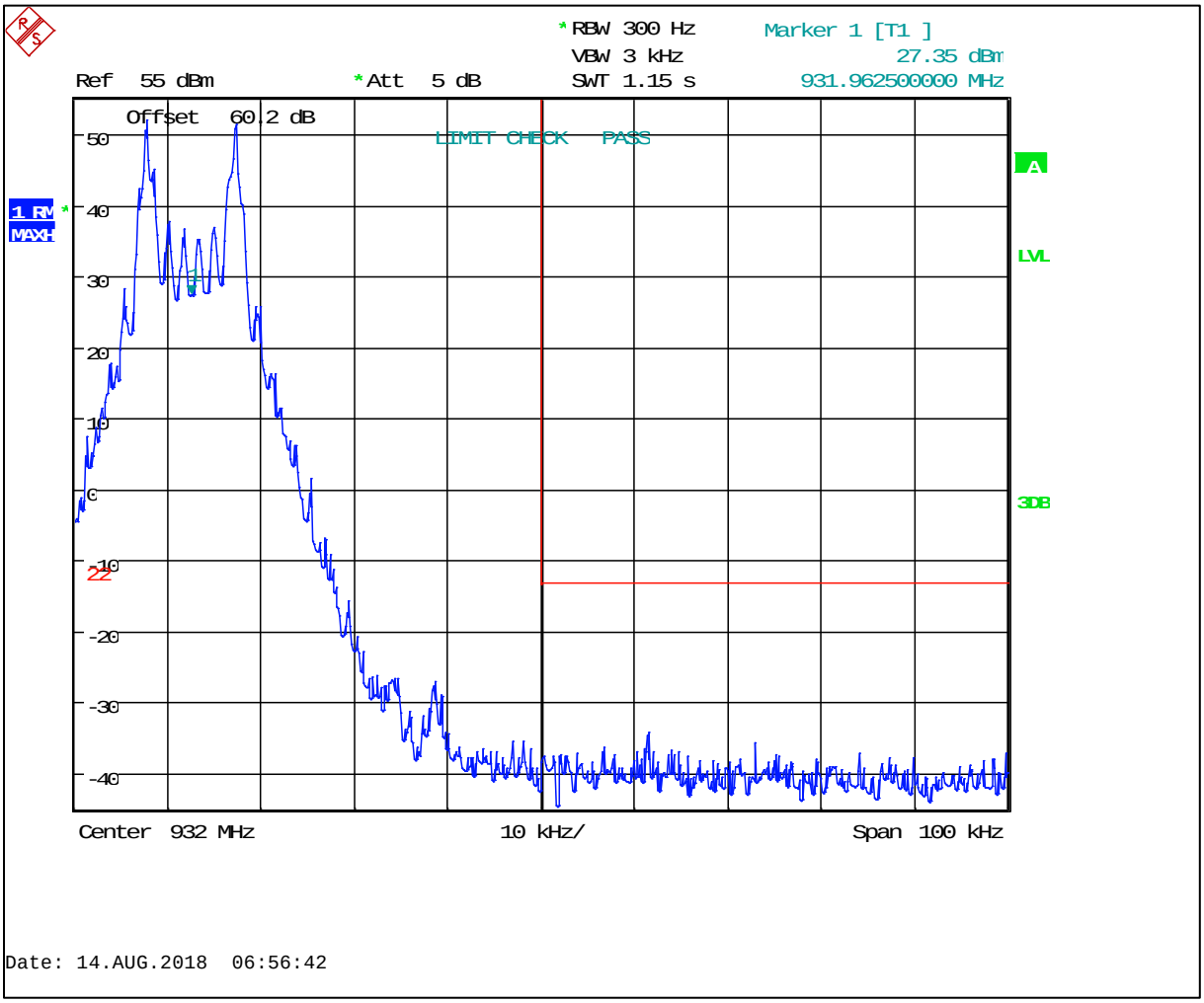
Plot 8-30: 931.9625 MHz, 25 kHz Bandwidth, High Power; POCSAG 1200 PRBS



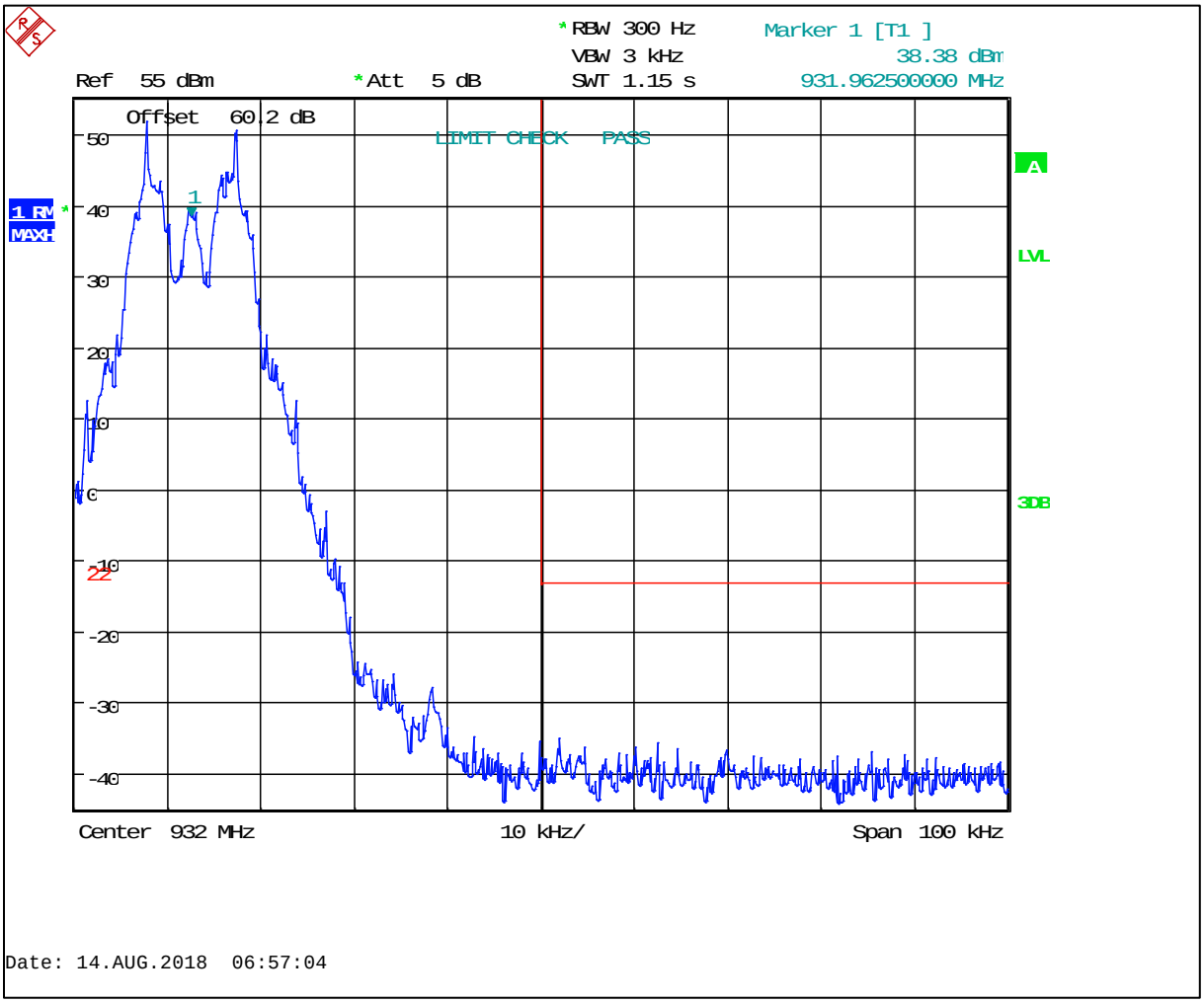
Plot 8-31: 931.9625 MHz, 25 kHz Bandwidth, High Power; POCSAG 2400 PRBS



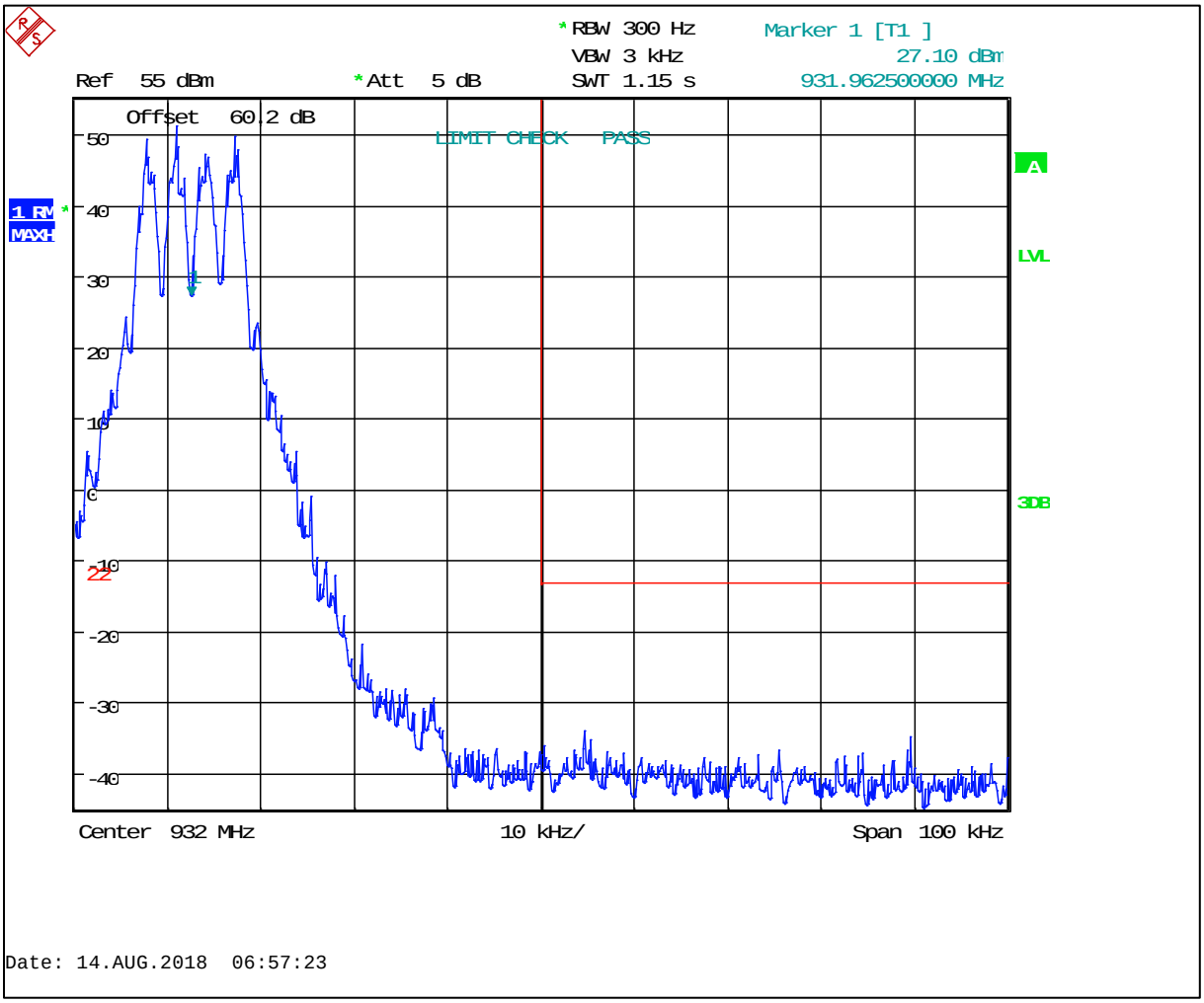
Plot 8-32: 931.9625 MHz, 25 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



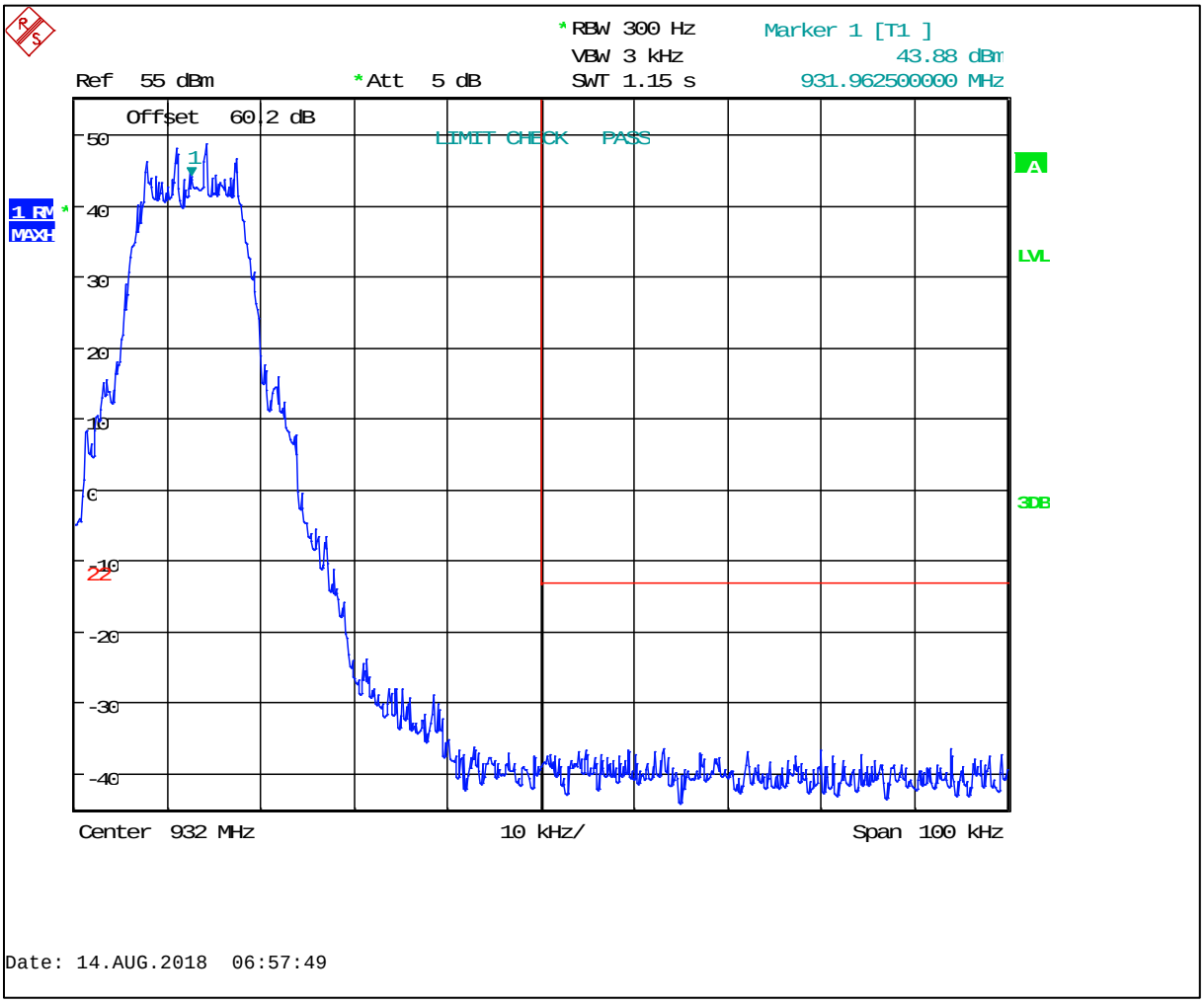
Plot 8-33: 931.9625 MHz, 25 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



Plot 8-34: 931.9625 MHz, 25 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



Plot 8-35: 931.9625 MHz, 25 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



8.2.2 26 dB Bandwidth

The following frequencies (in MHz) were investigated: 929.0125 and 931.9375 MHz.

Table 8-1: 26 dB Bandwidth - 929.0125 MHz; Narrowband

Modulation	26 dB BW (kHz)
POCSAG 512 PRBS	6.8
POCSAG 1200 PRBS	8.6
POCSAG 2400 PRBS	8.7
FLEX-2 1600 PRBS	7.7
FLEX-2 3200 PRBS	10.5
FLEX-4 3200 PRBS	7.7
FLEX-4 6400 PRBS	9.7

Table 8-2: 26 dB Bandwidth - 931.9375 MHz; Narrowband

Modulation	26 dB BW (kHz)
POCSAG 512 PRBS	6.8
POCSAG 1200 PRBS	8.4
POCSAG 2400 PRBS	8.8
FLEX-2 1600 PRBS	9.9
FLEX-2 3200 PRBS	10.6
FLEX-4 3200 PRBS	7.7
FLEX-4 6400 PRBS	10.1

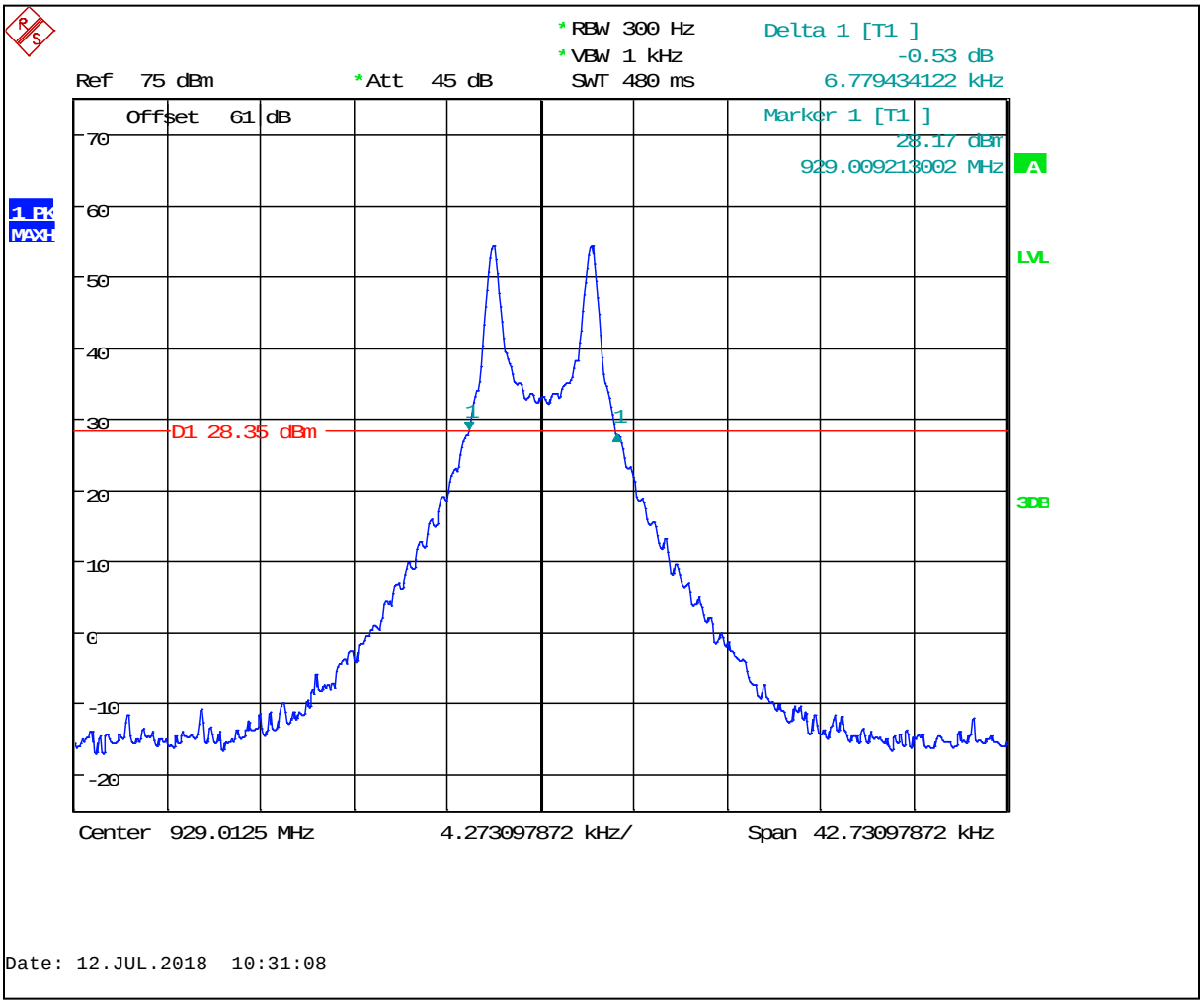
Table 8-3: 26 dB Bandwidth - 929.0125 MHz; Wideband

Modulation	26 dB BW (kHz)
POCSAG 512 PRBS	12.4
POCSAG 1200 PRBS	13.5
POCSAG 2400 PRBS	13.5
FLEX-2 1600 PRBS	14.9
FLEX-2 3200 PRBS	14.9
FLEX-4 3200 PRBS	14.8
FLEX-4 6400 PRBS	15.0

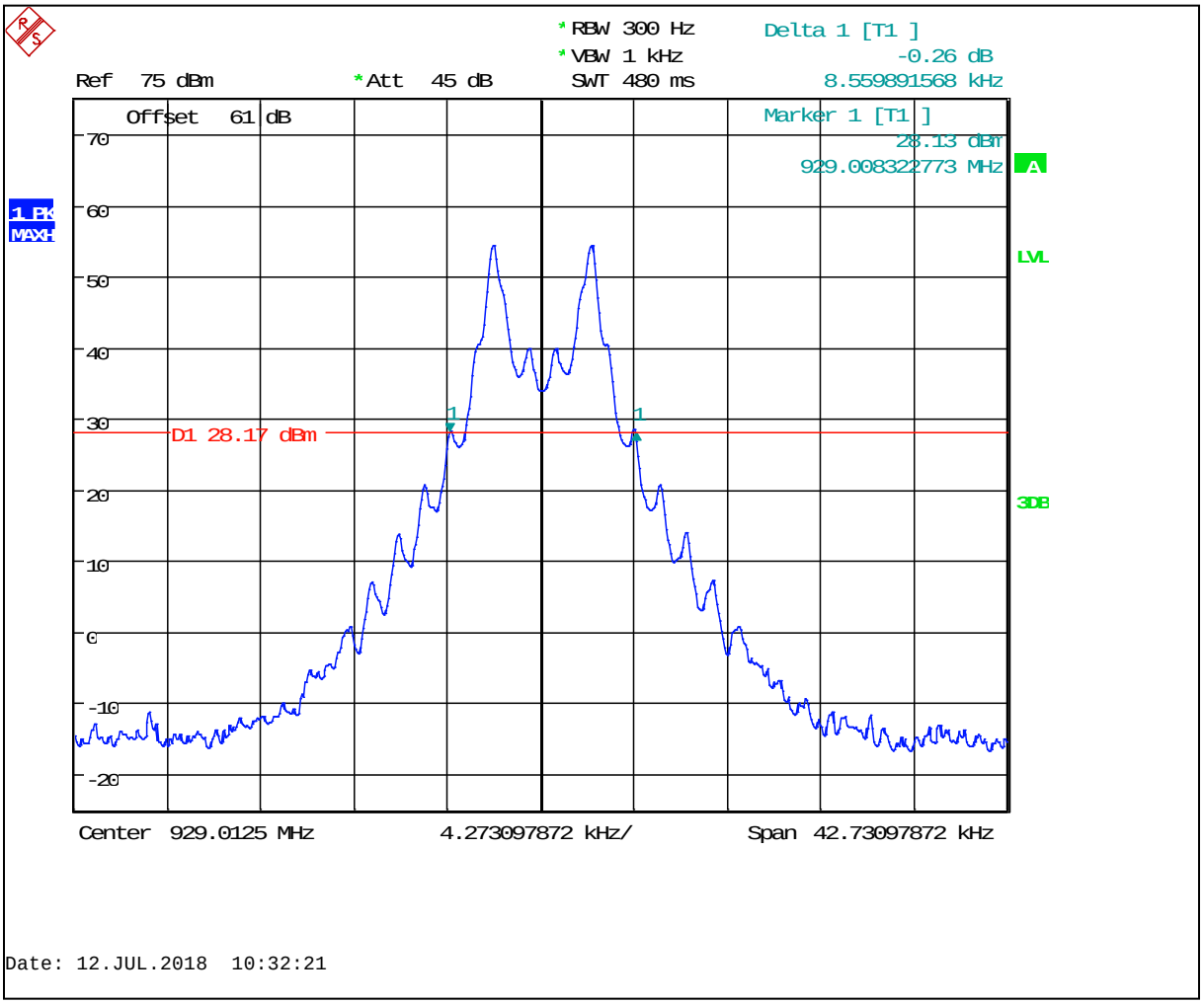
Table 8-4: 26 dB Bandwidth - 931.9375 MHz; Wideband

Modulation	26 dB BW (kHz)
POCSAG 512 PRBS	12.4
POCSAG 1200 PRBS	13.4
POCSAG 2400 PRBS	13.4
FLEX-2 1600 PRBS	14.9
FLEX-2 3200 PRBS	14.9
FLEX-4 3200 PRBS	14.7
FLEX-4 6400 PRBS	15.0

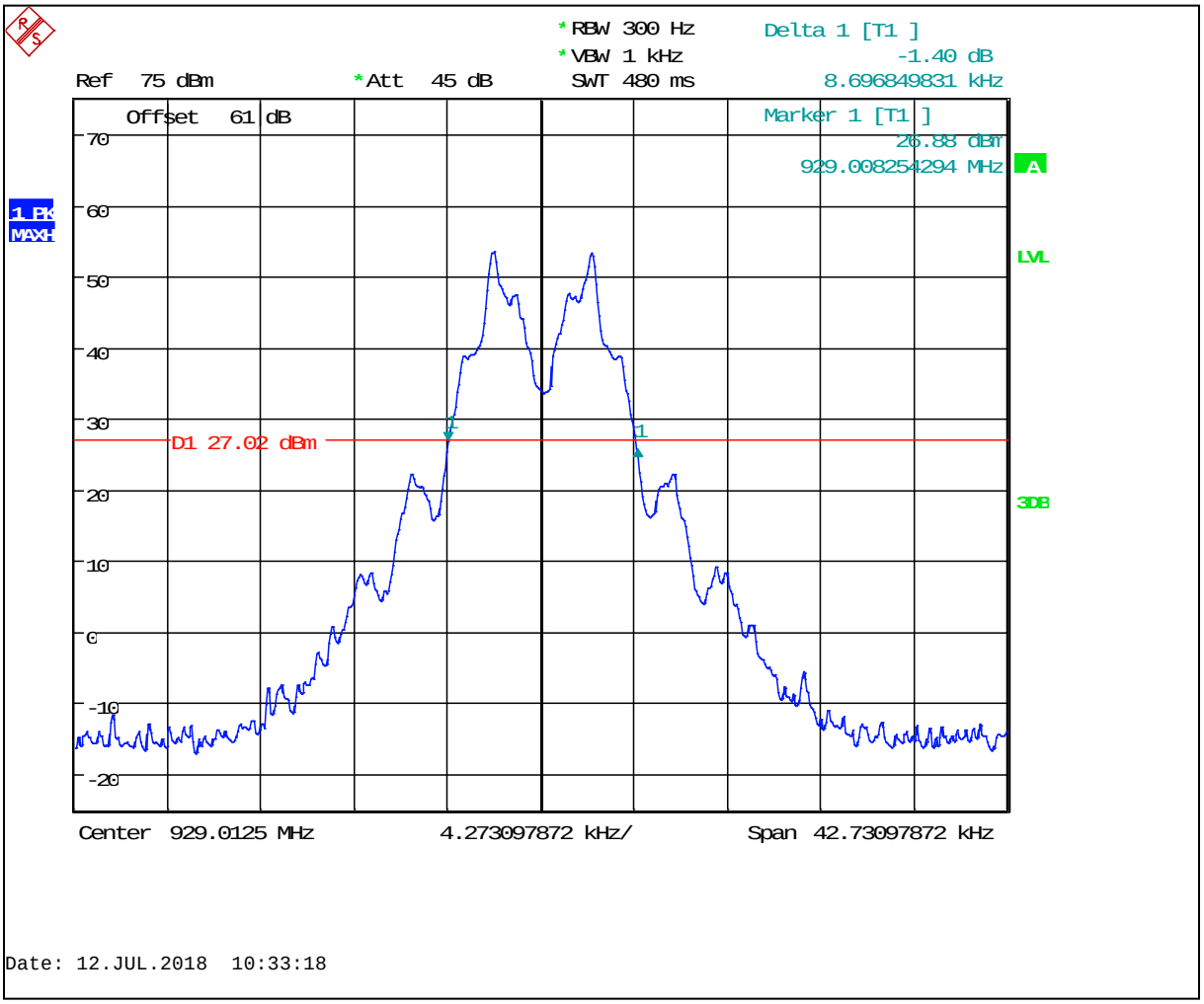
Plot 8-36: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 512 PRBS



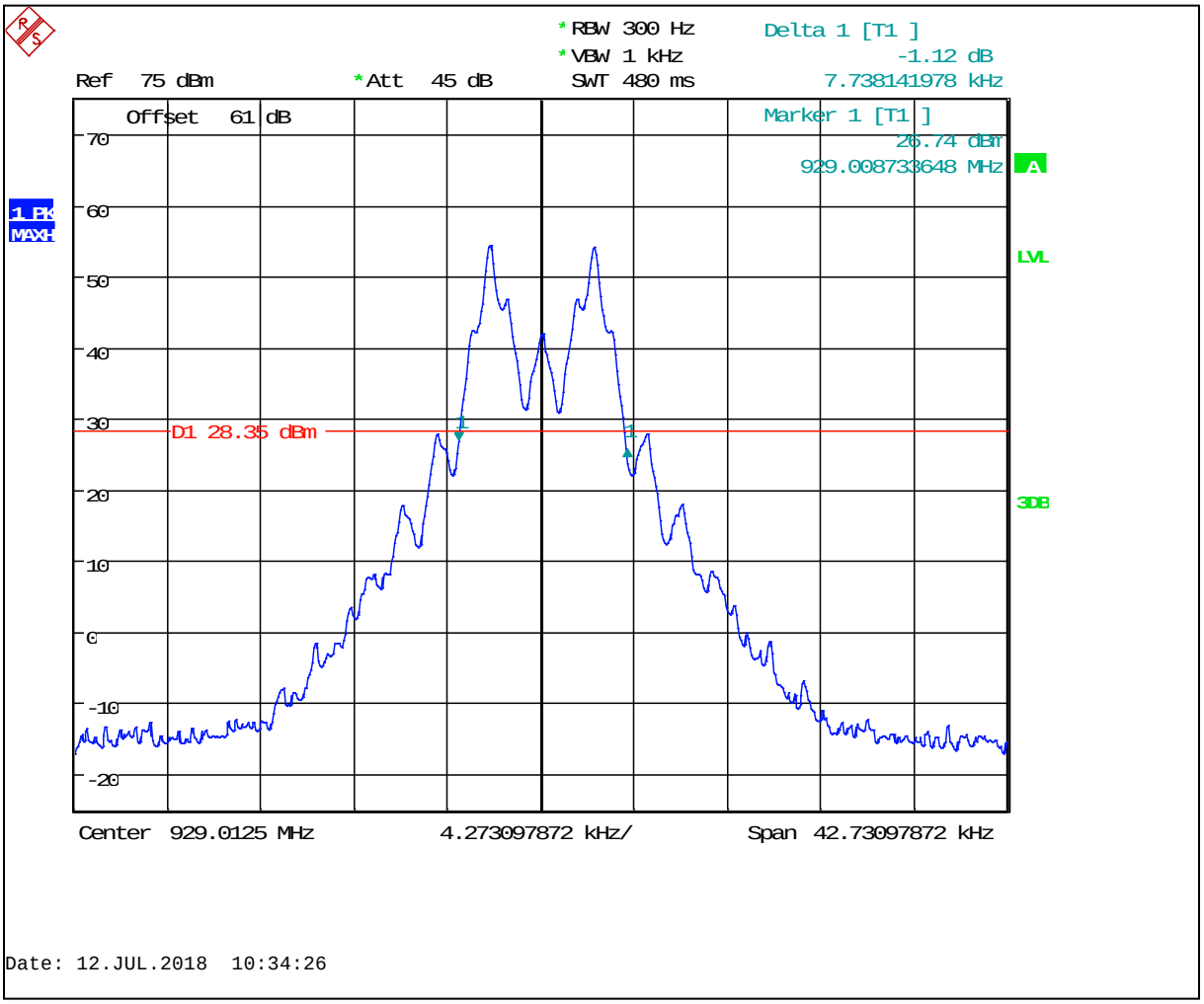
Plot 8-37: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 1200 PRBS



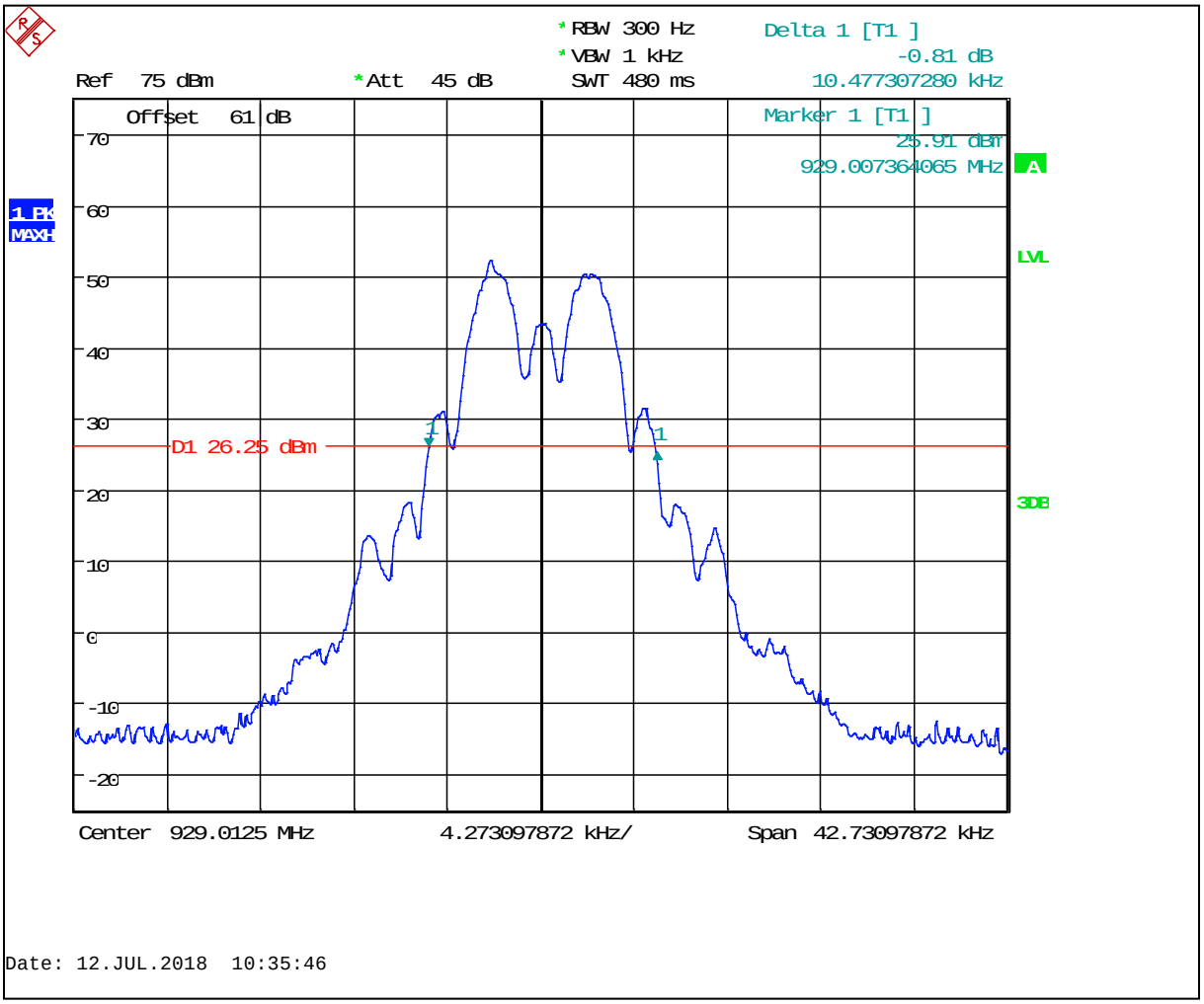
Plot 8-38: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 2400 PRBS



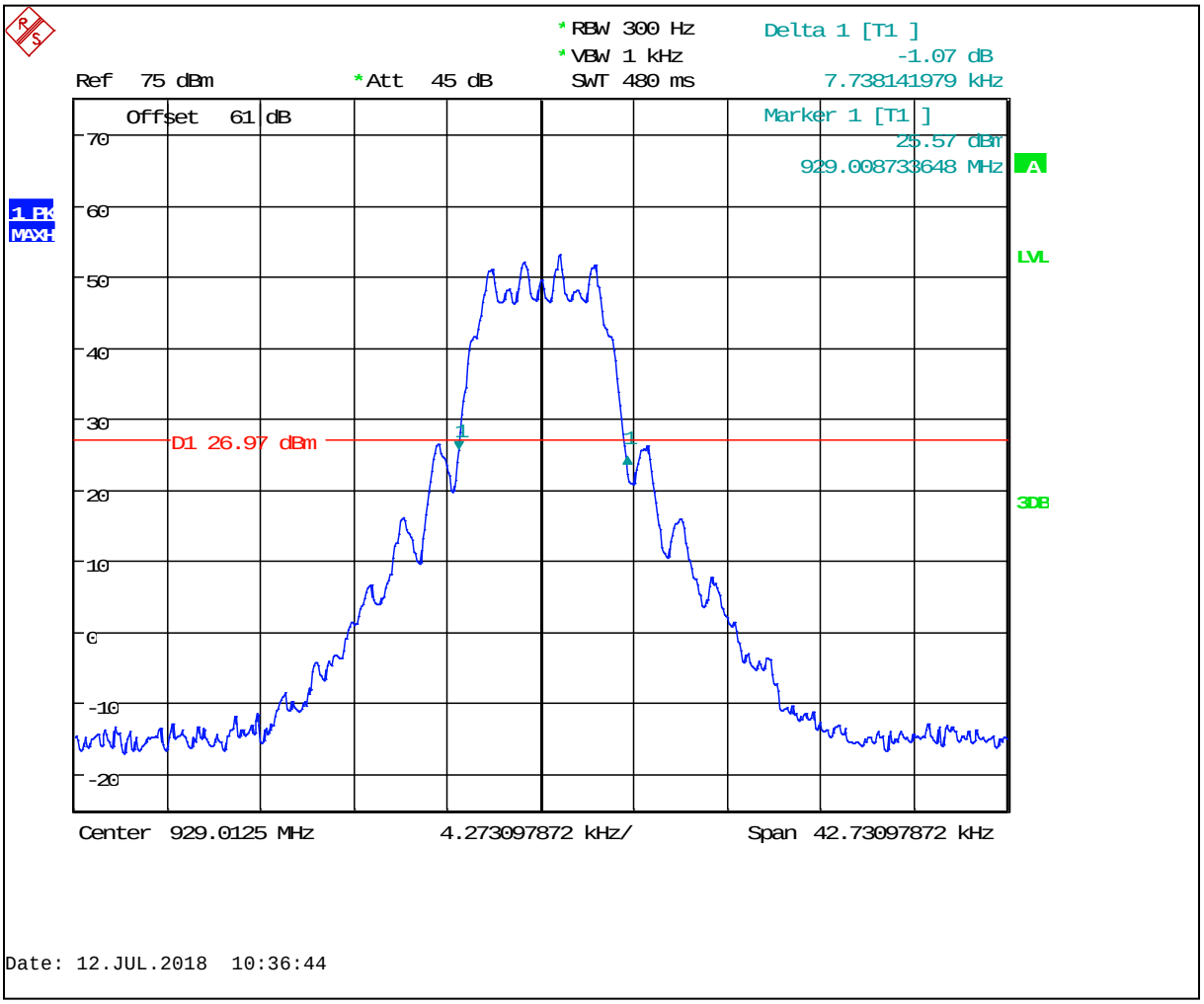
Plot 8-39: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



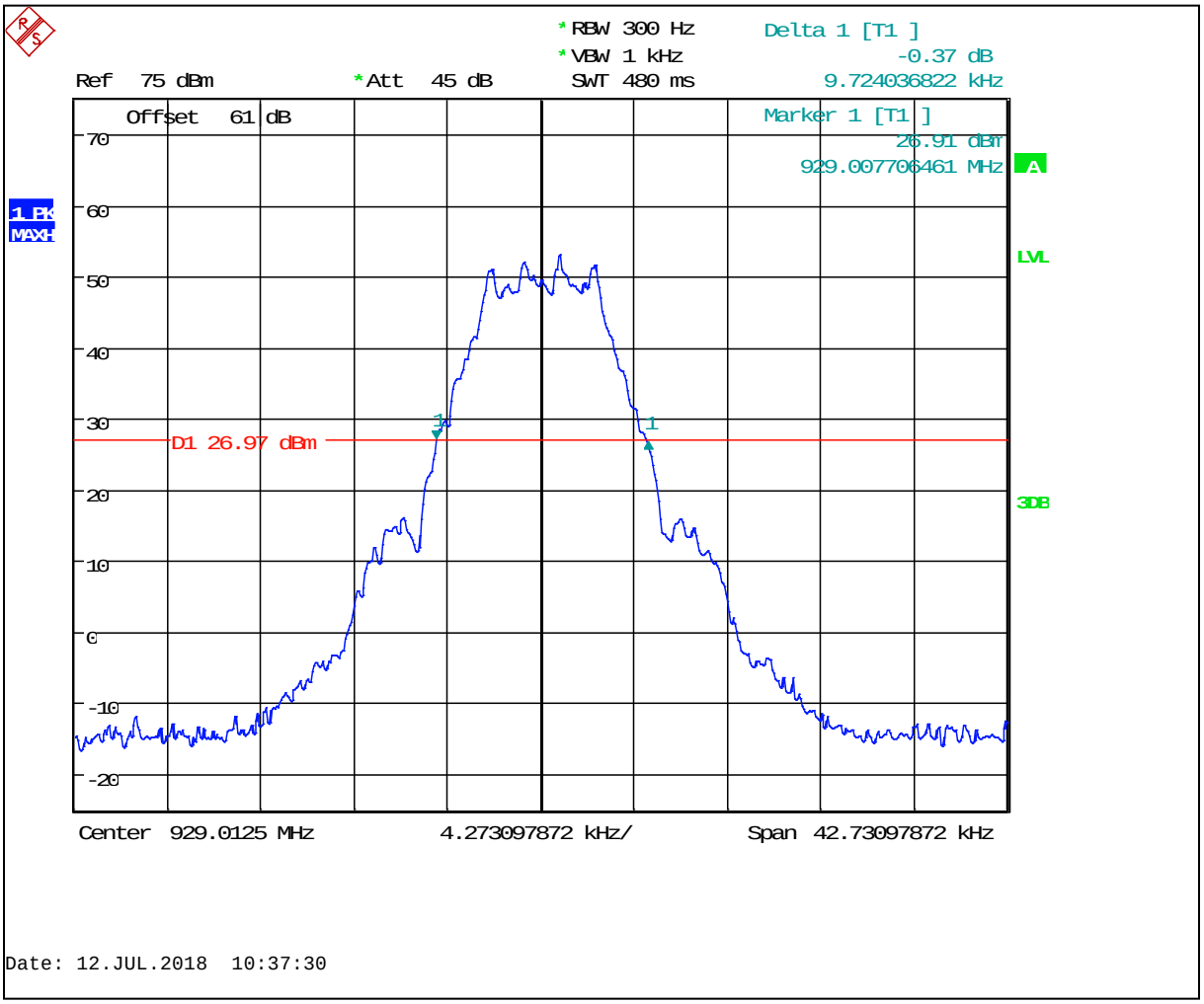
Plot 8-40: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



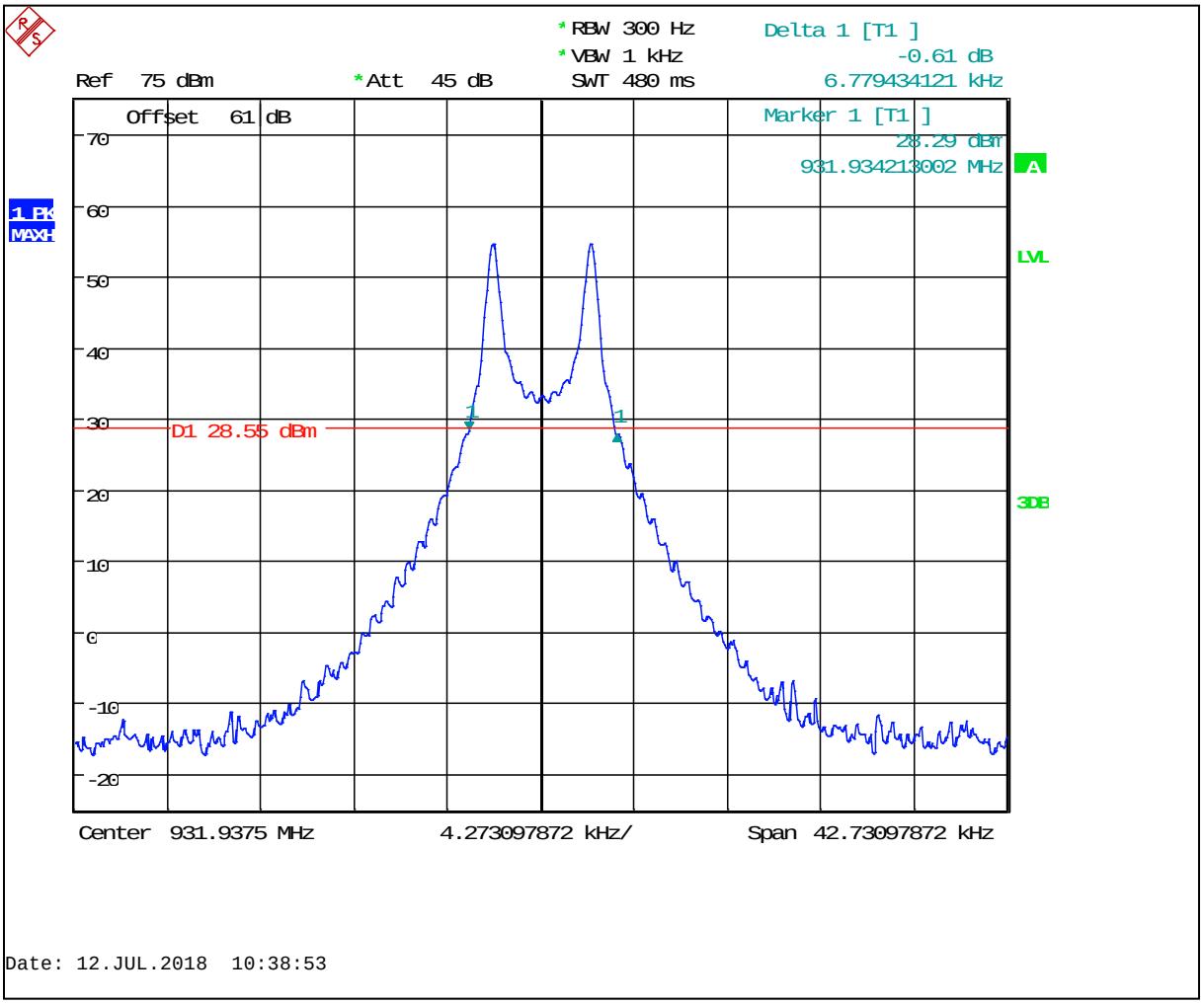
Plot 8-41: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



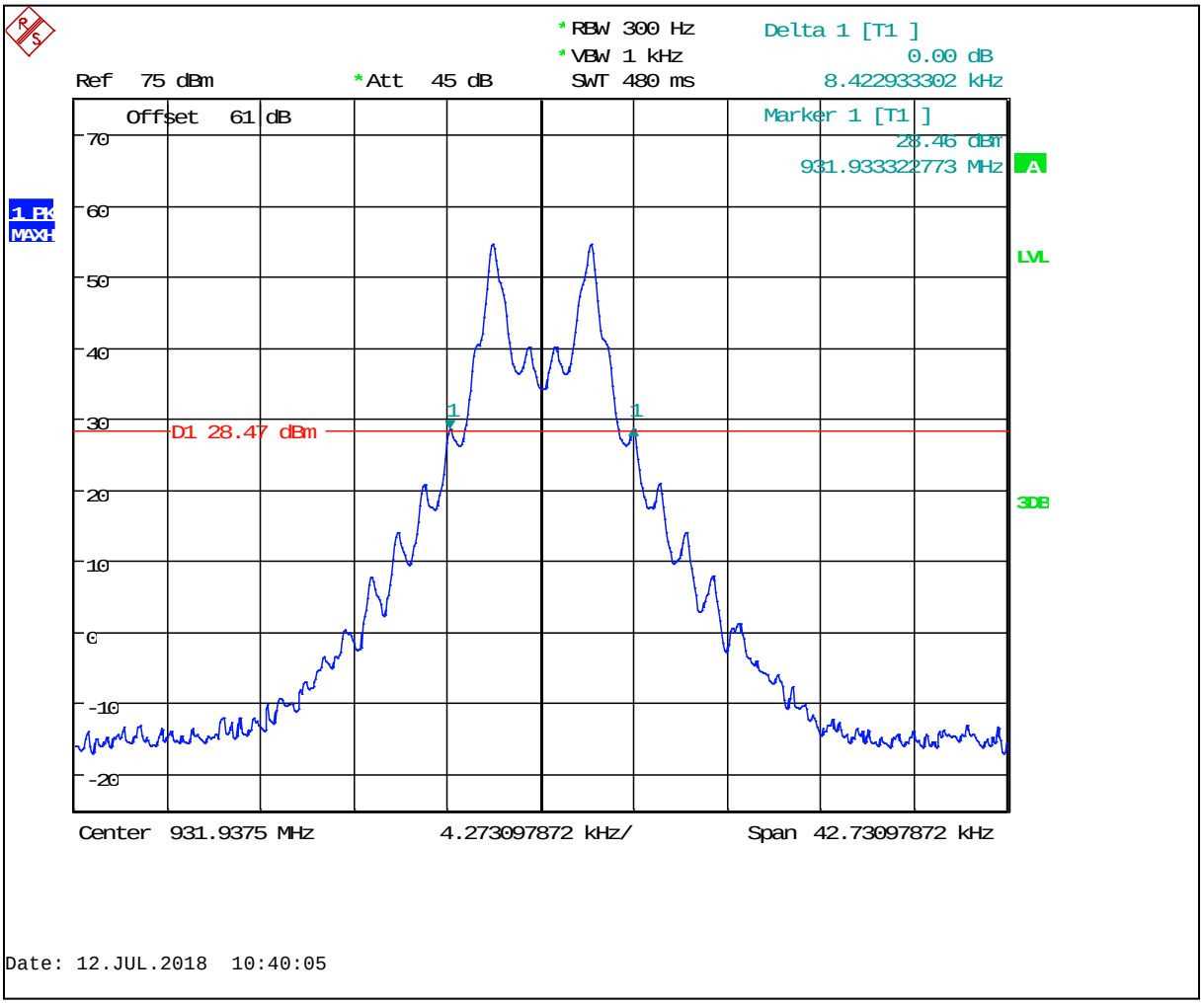
Plot 8-42: 26 dB Bandwidth – 929.0125 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



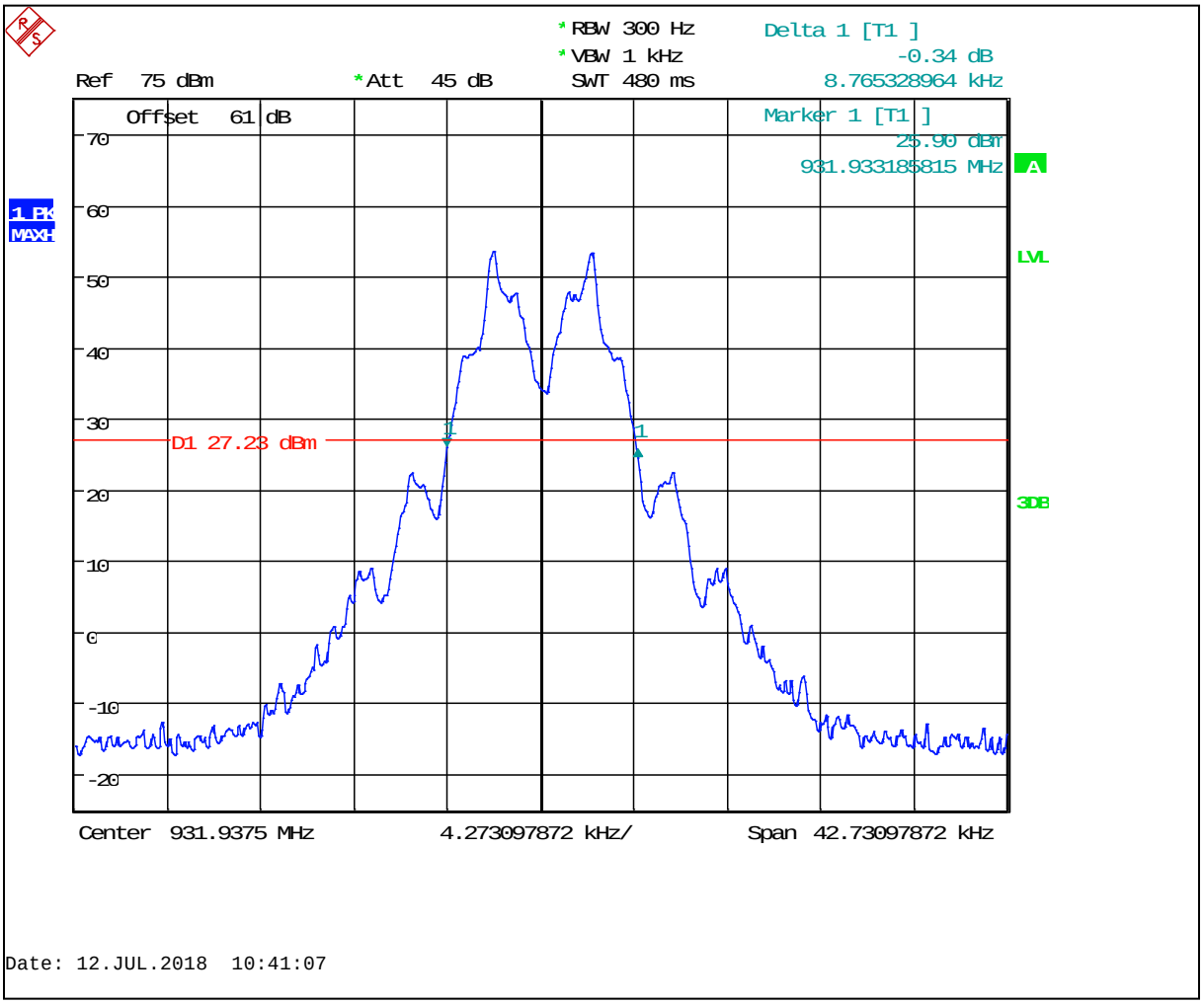
Plot 8-43: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 512 PRBS



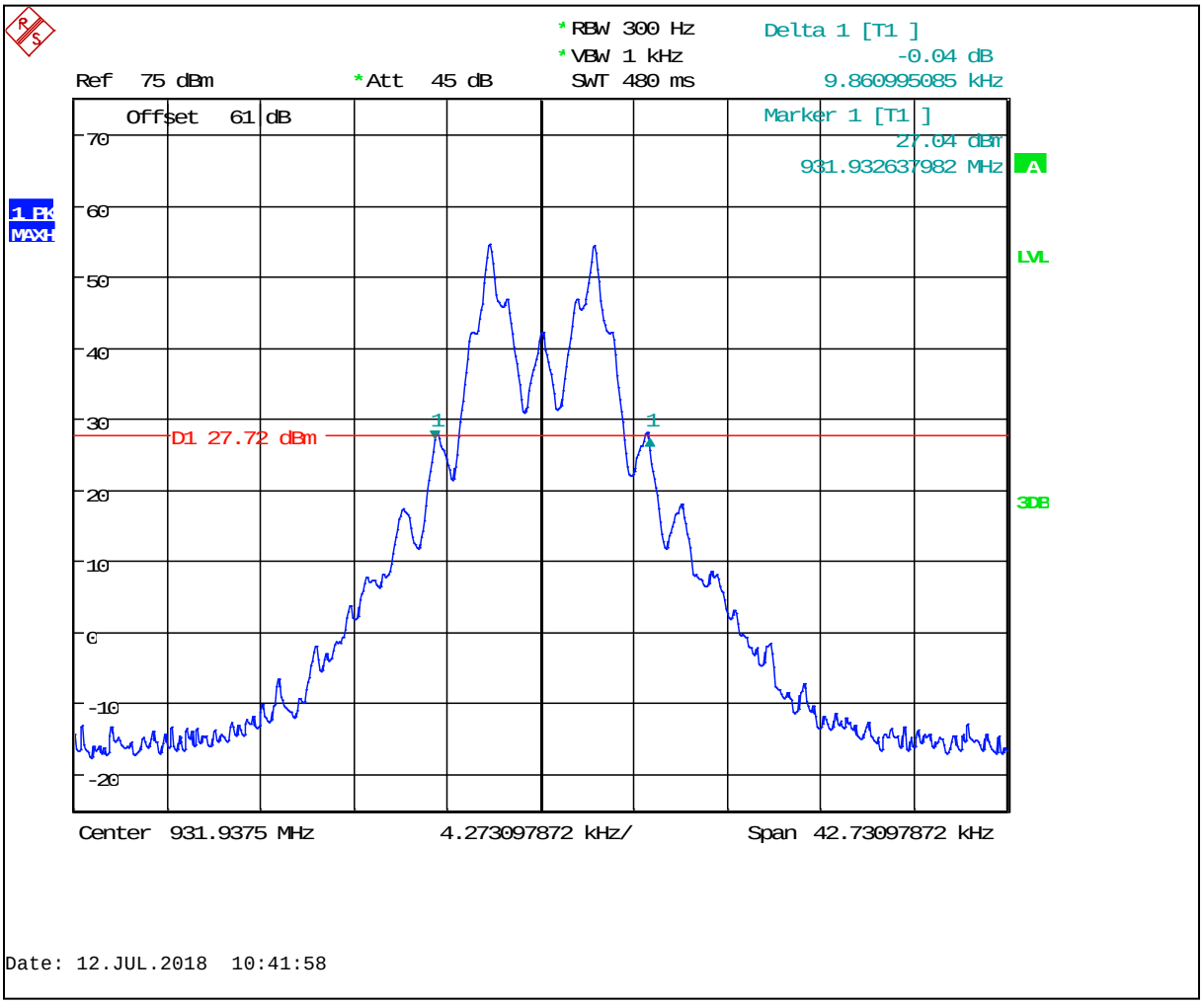
Plot 8-44: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 1200 PRBS



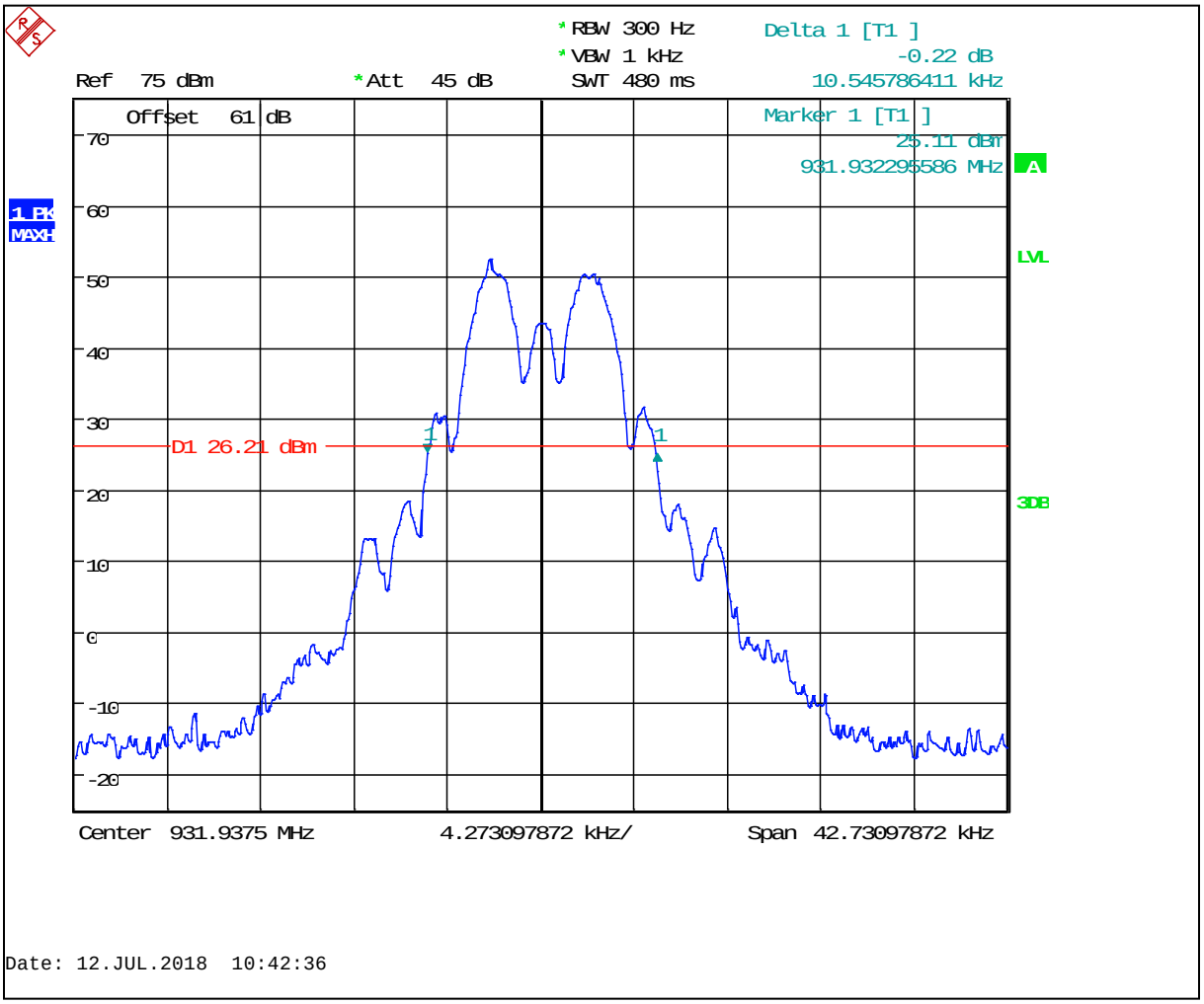
Plot 8-45: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; POCSAG 2400 PRBS



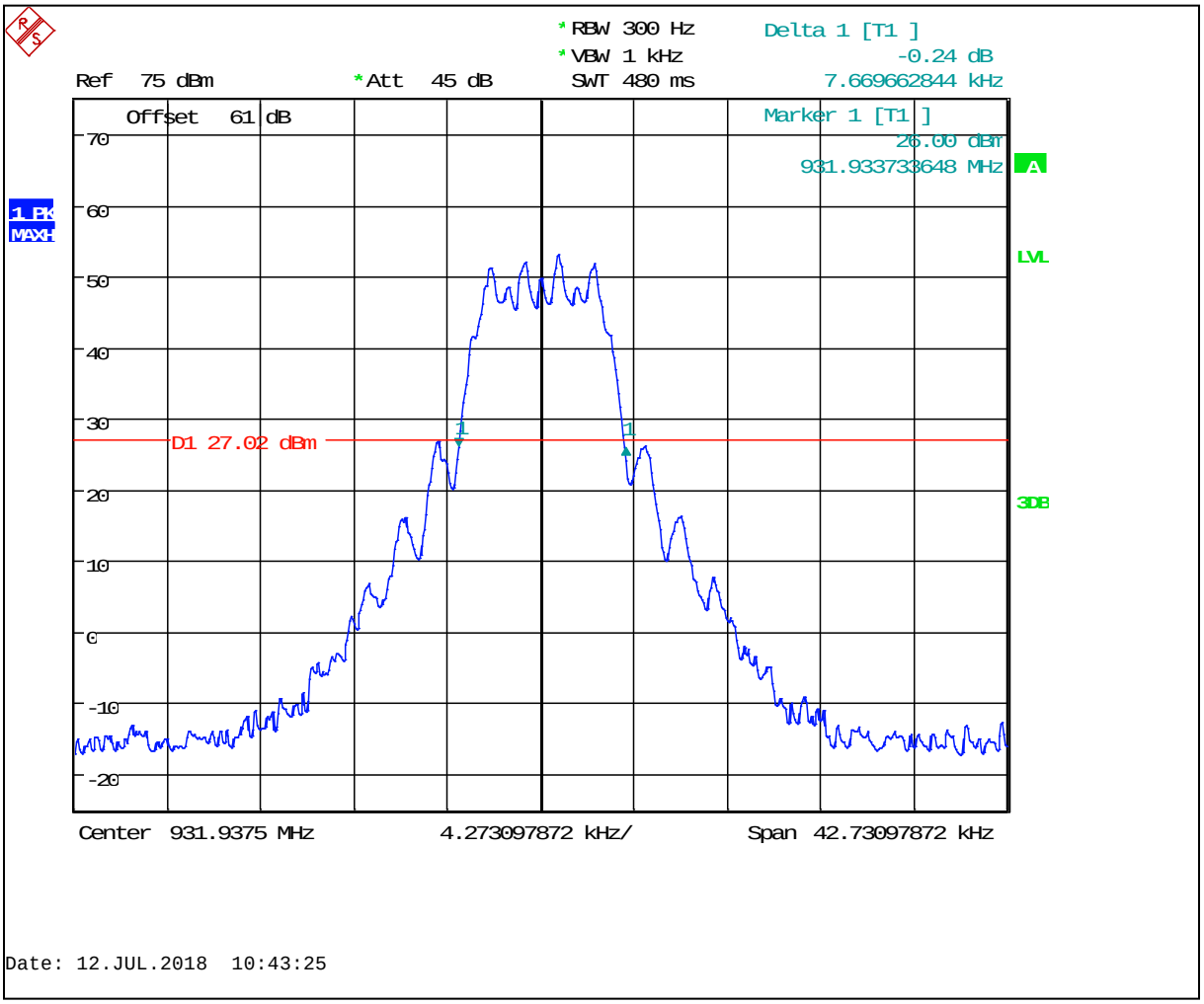
Plot 8-46: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



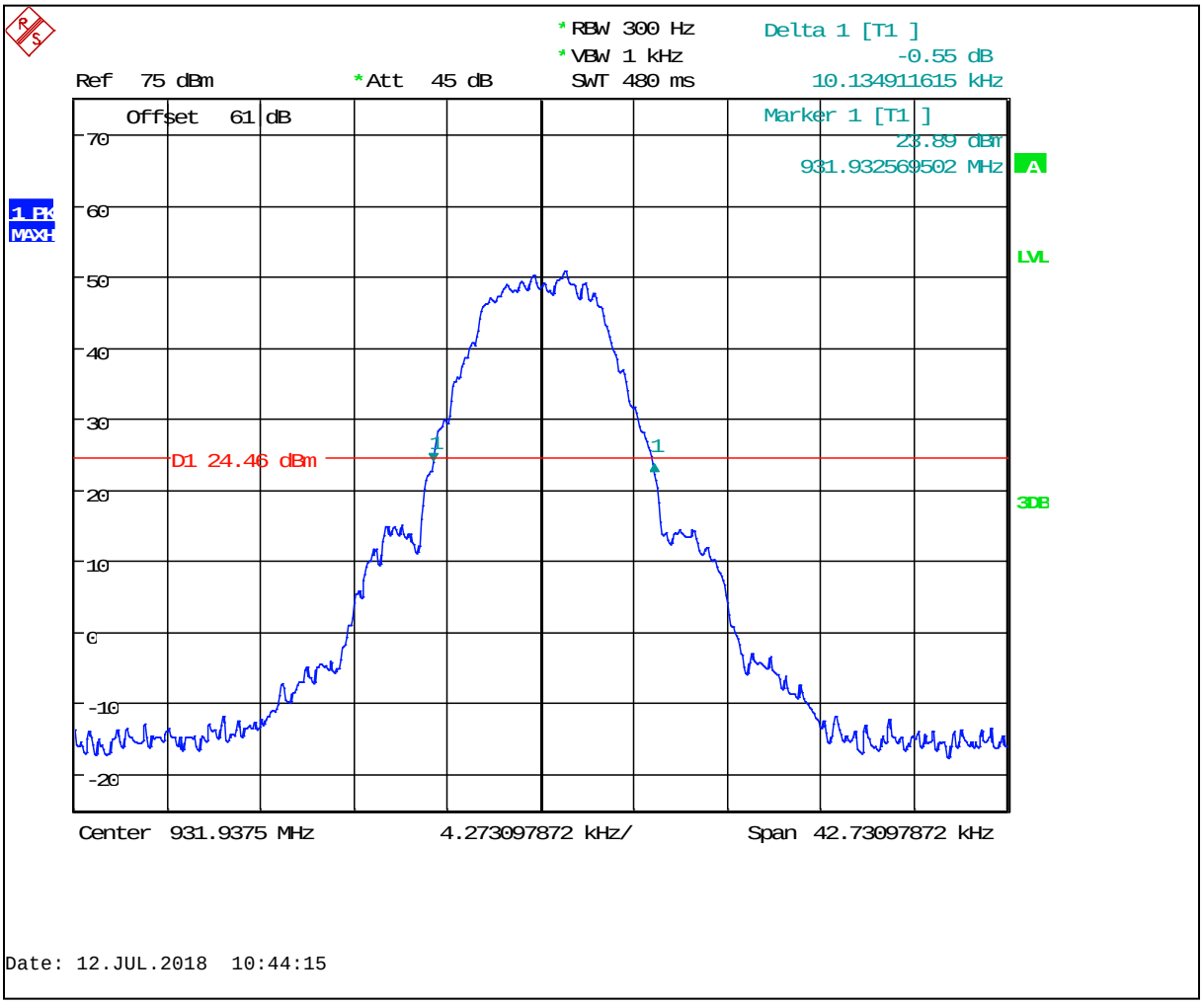
Plot 8-47: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



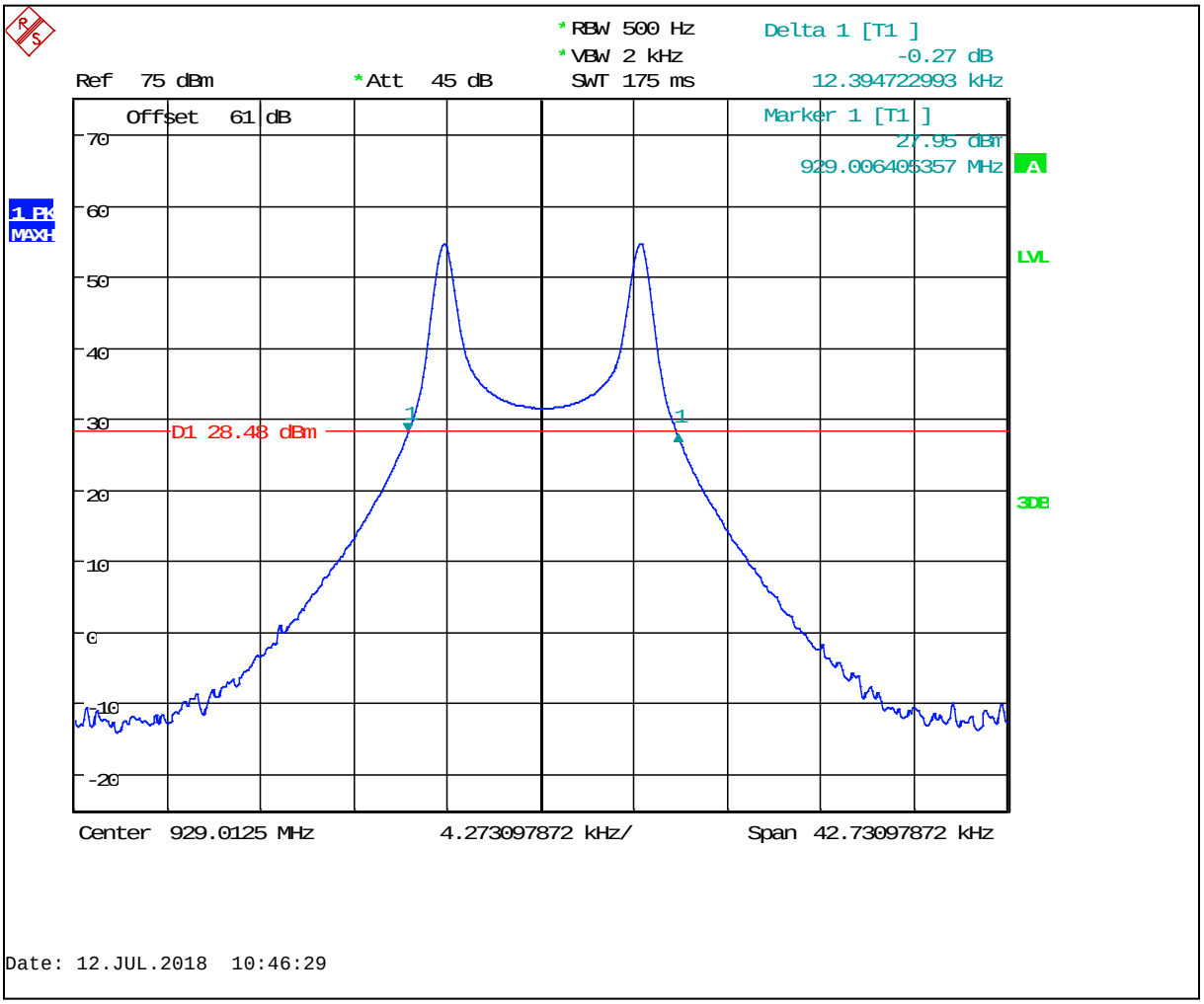
Plot 8-48: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



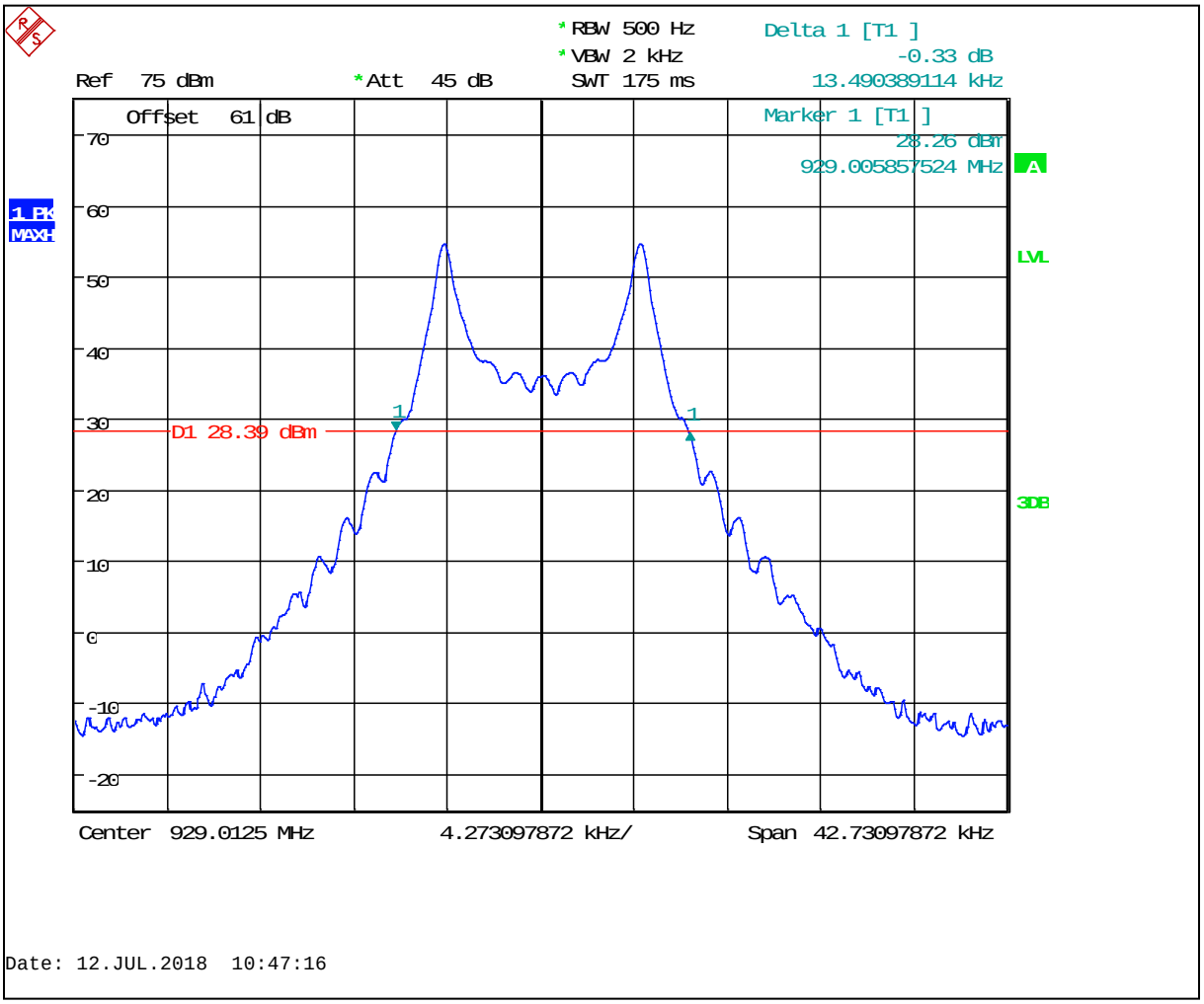
Plot 8-49: 26 dB Bandwidth – 931.9375 MHz, 12.5 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



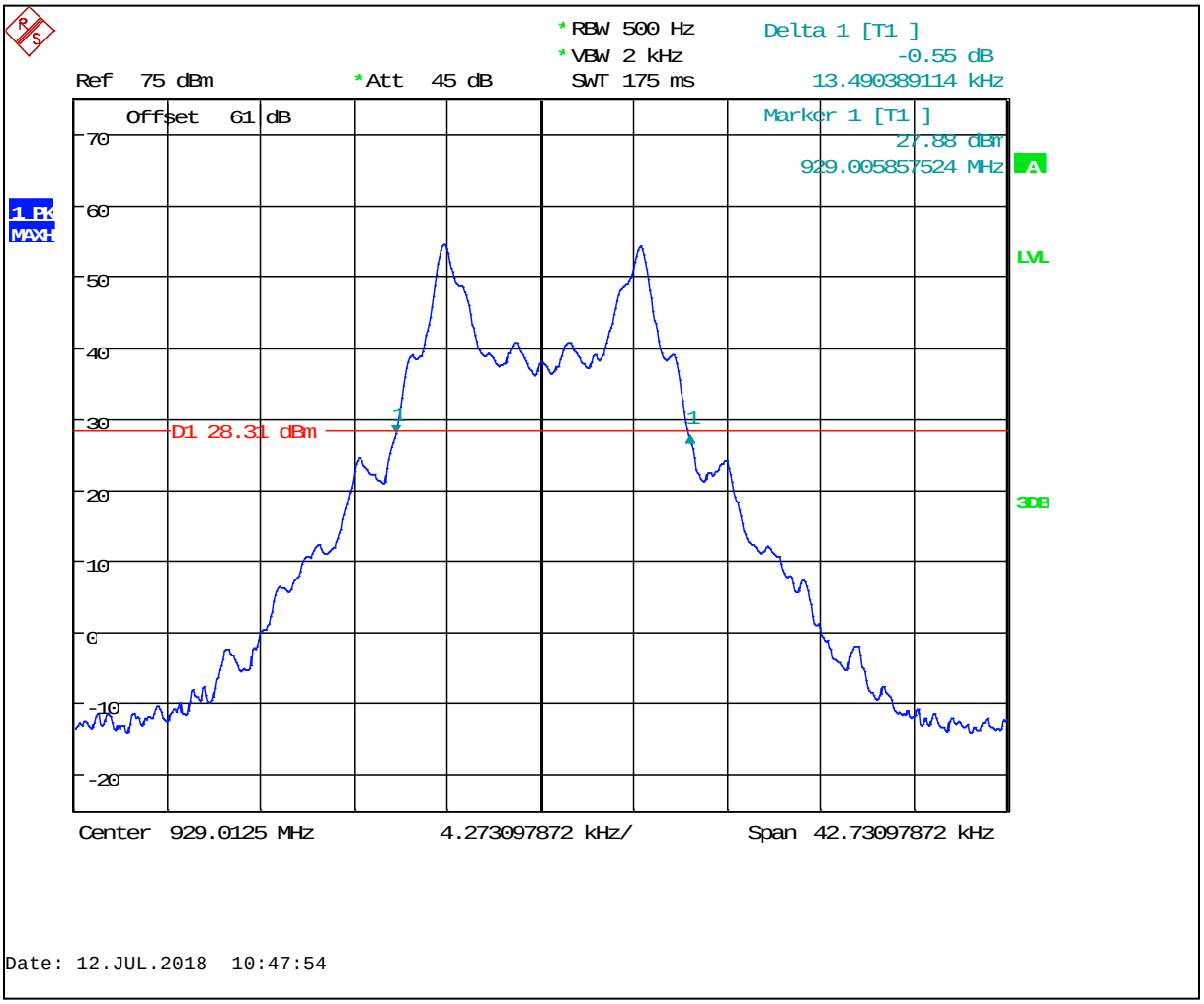
Plot 8-50: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; POCSAG 512 PRBS



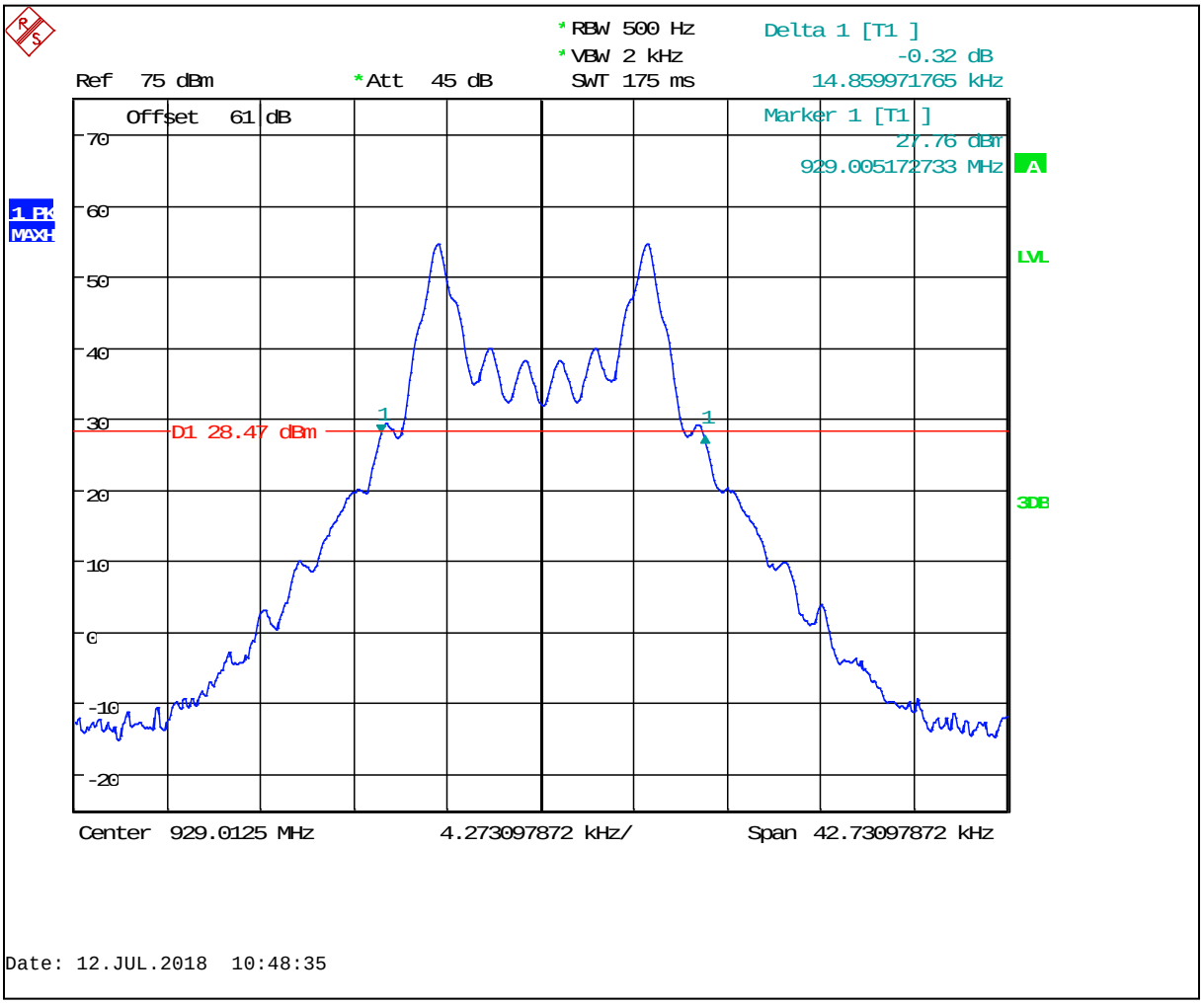
Plot 8-51: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; POCSAG 1200 PRBS



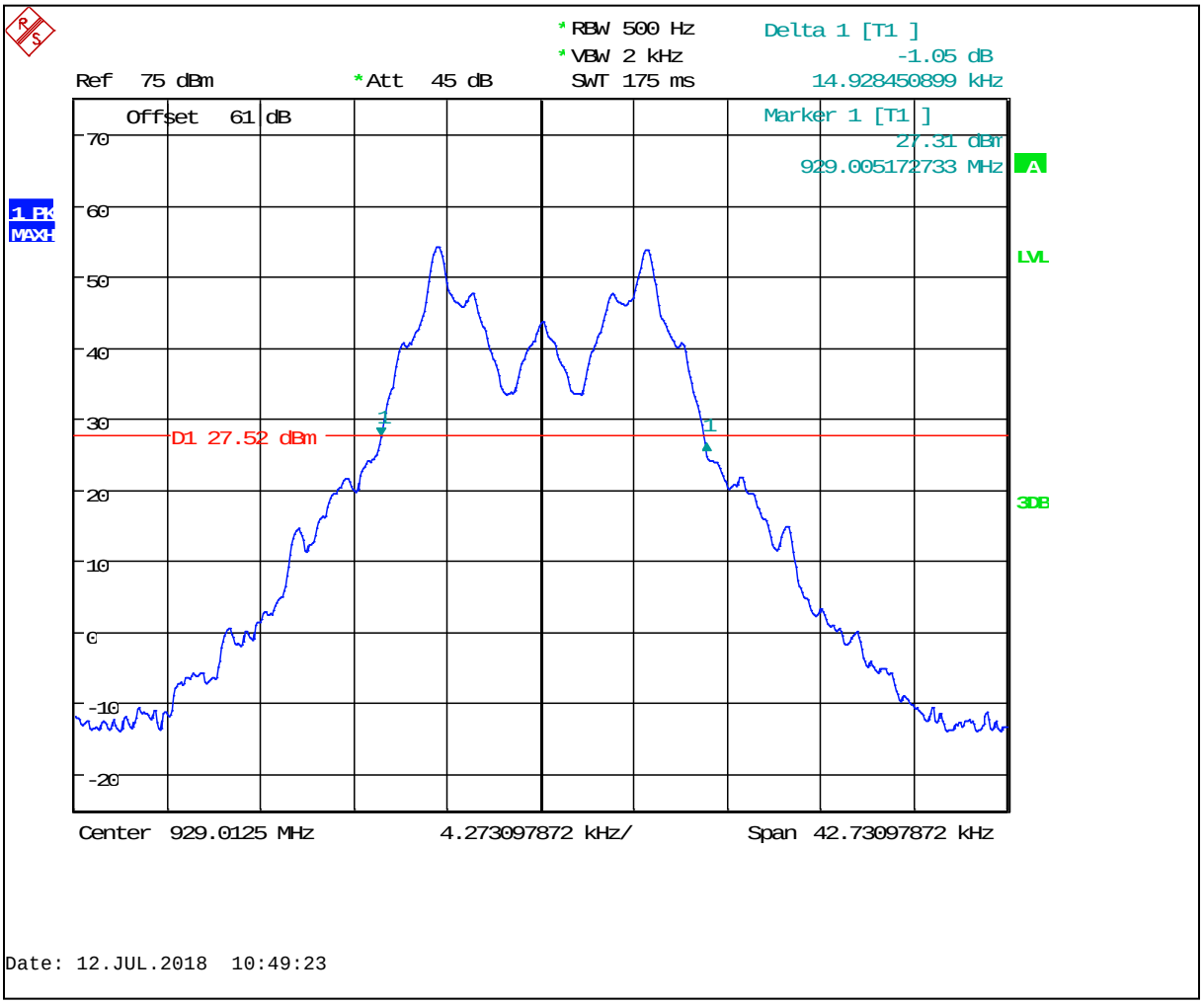
Plot 8-52: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; POCSAG 2400 PRBS



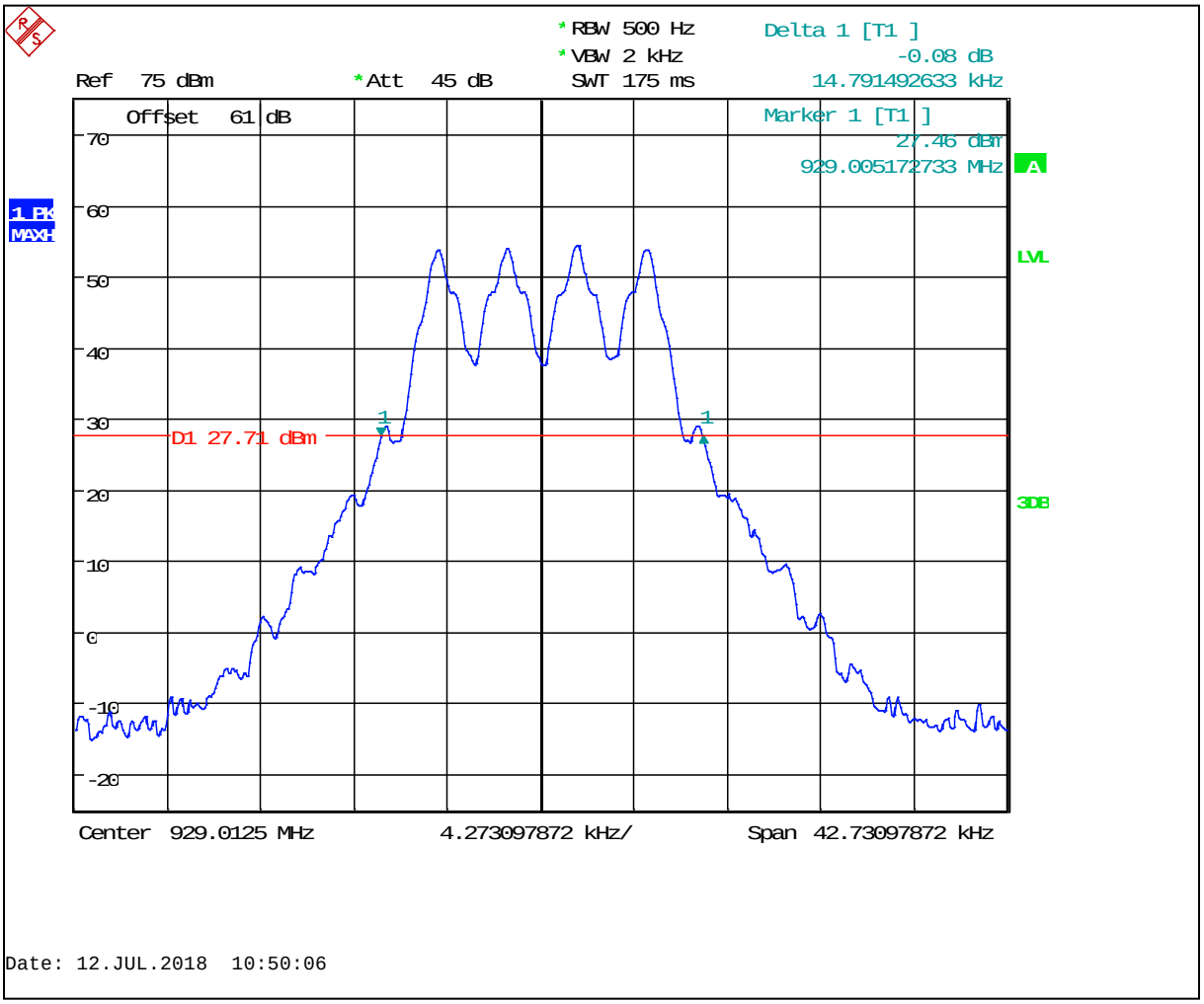
Plot 8-53: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



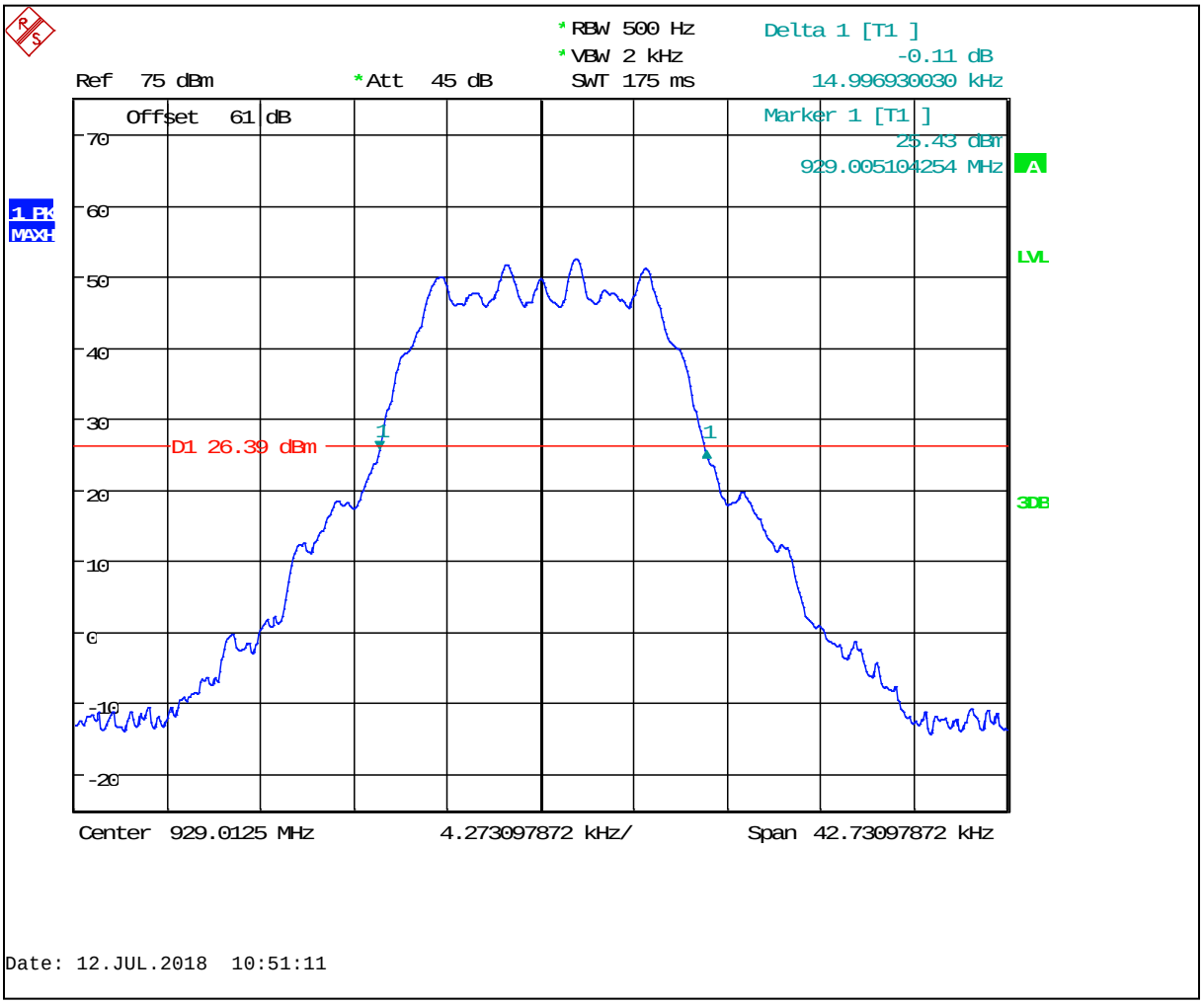
Plot 8-54: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



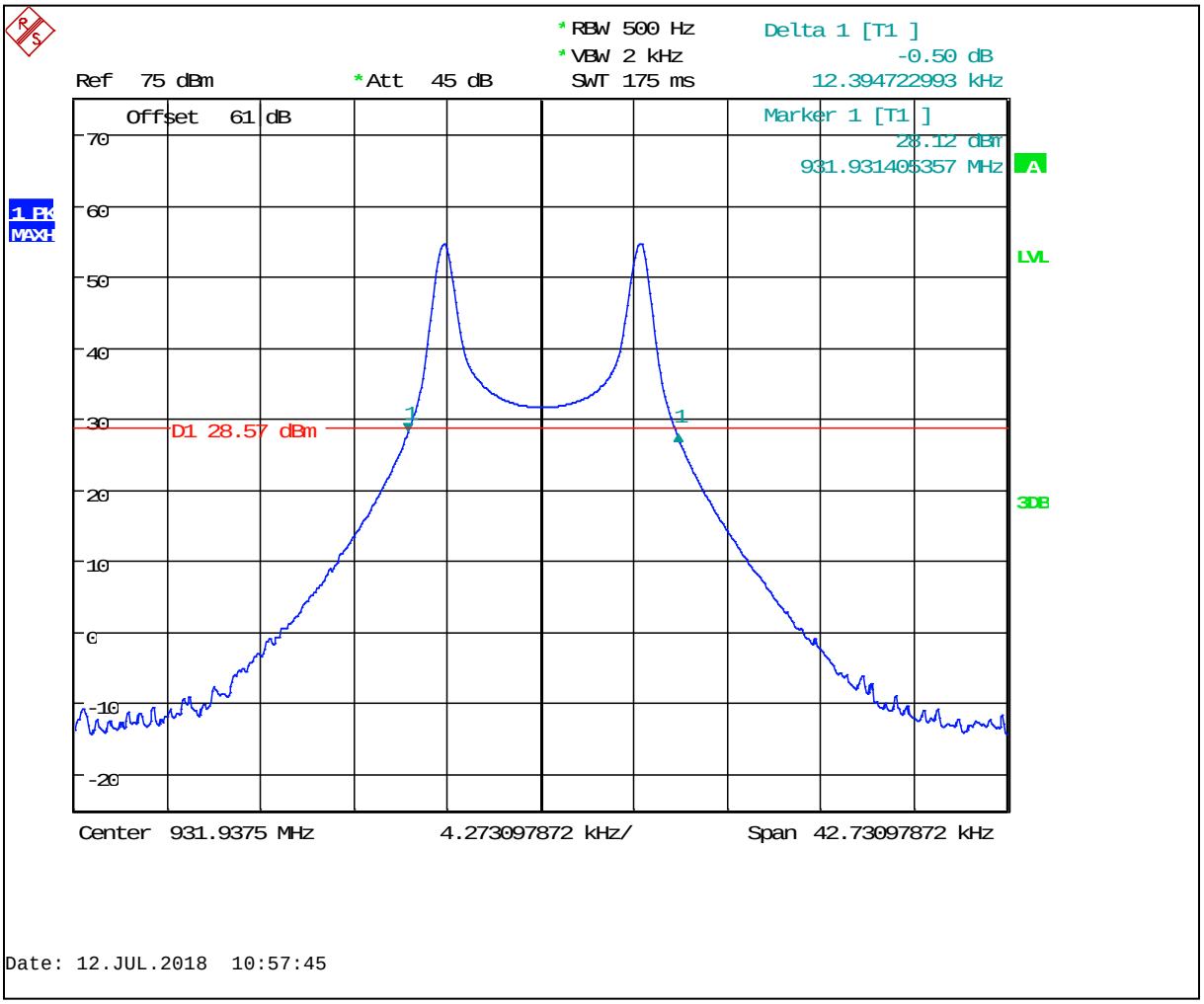
Plot 8-55: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



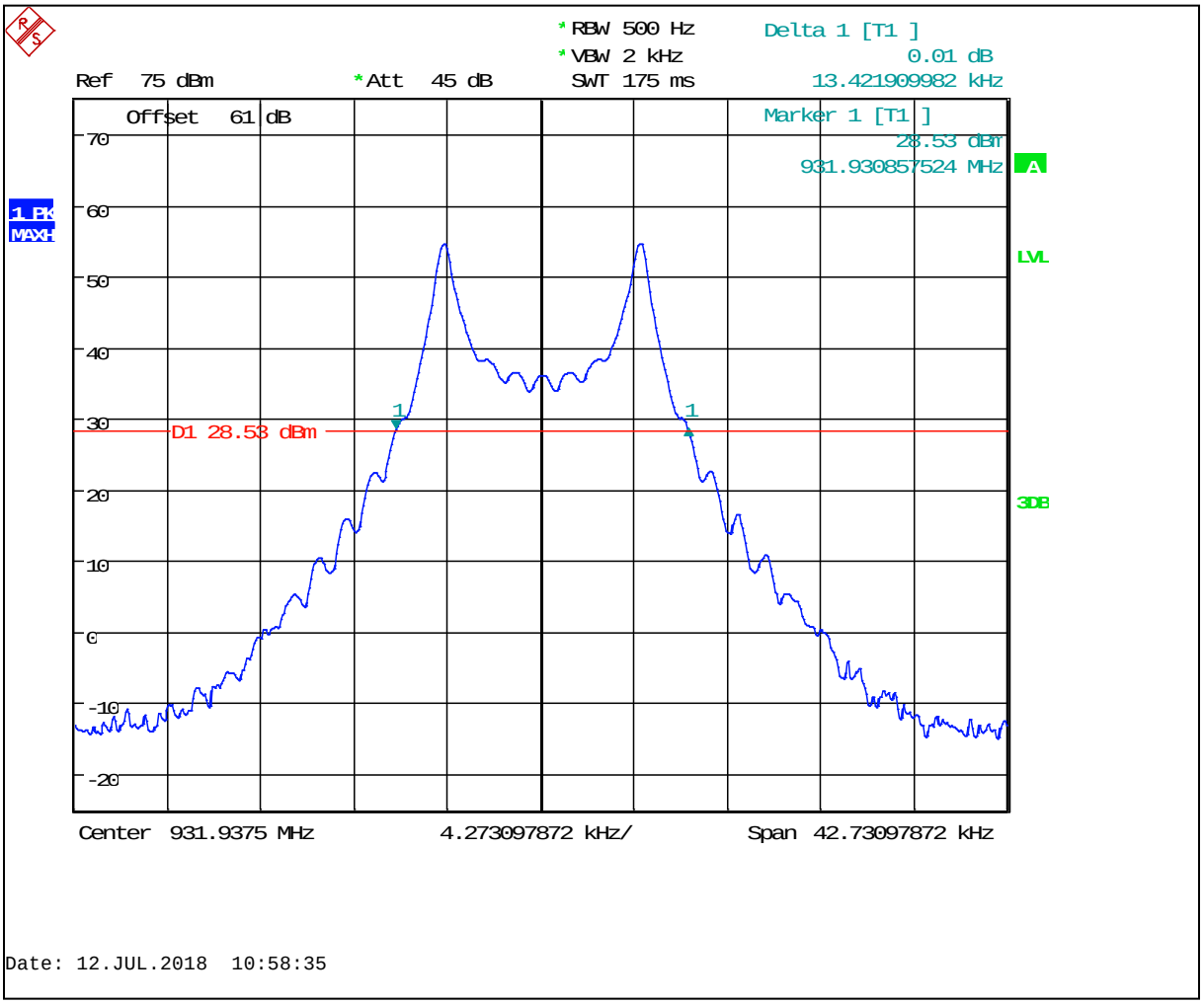
Plot 8-56: 26 dB Bandwidth – 929.0125 MHz, 25 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



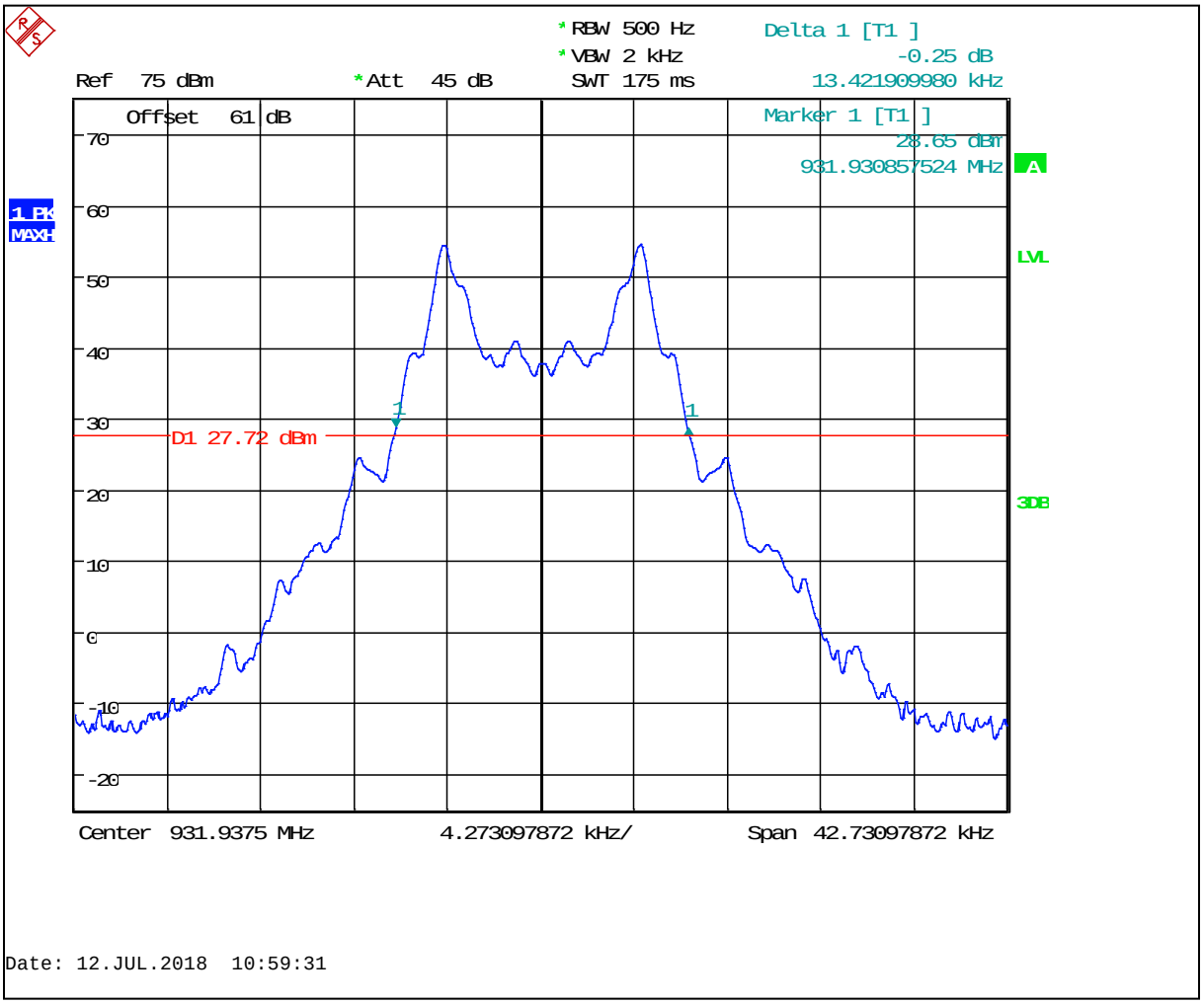
Plot 8-57: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; POCSAG 512 PRBS



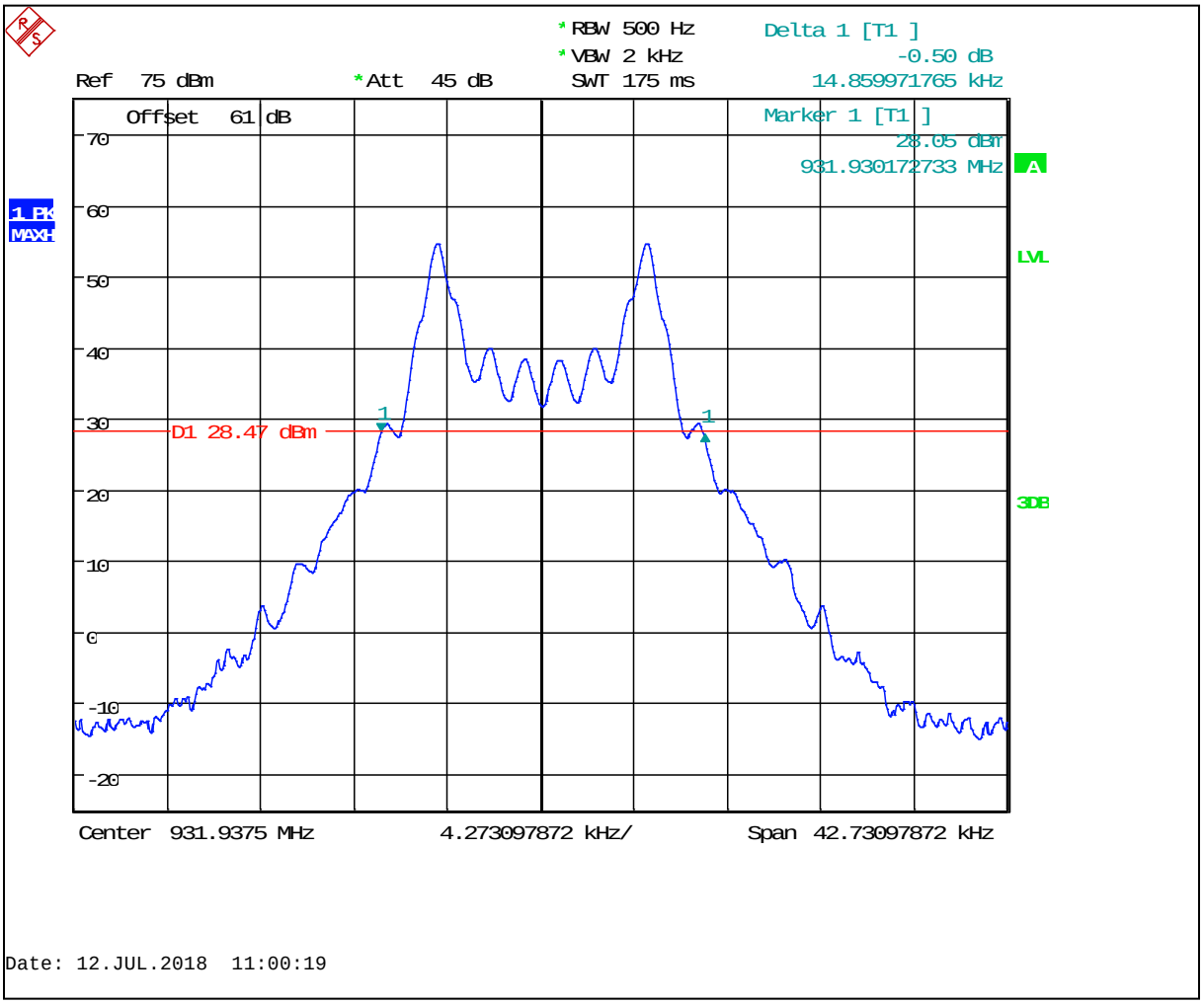
Plot 8-58: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; POCSAG 1200 PRBS



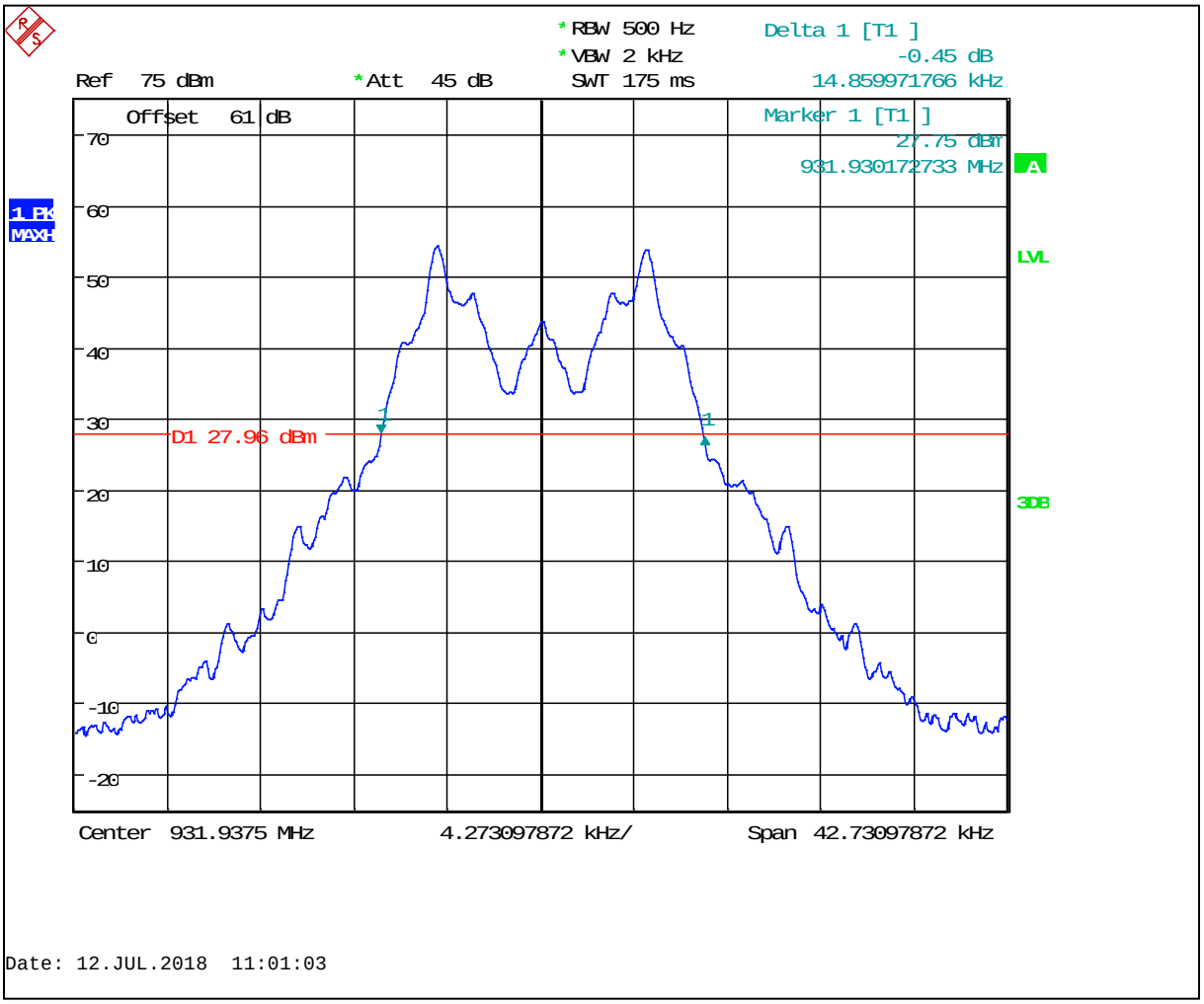
Plot 8-59: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; POCSAG 2400 PRBS



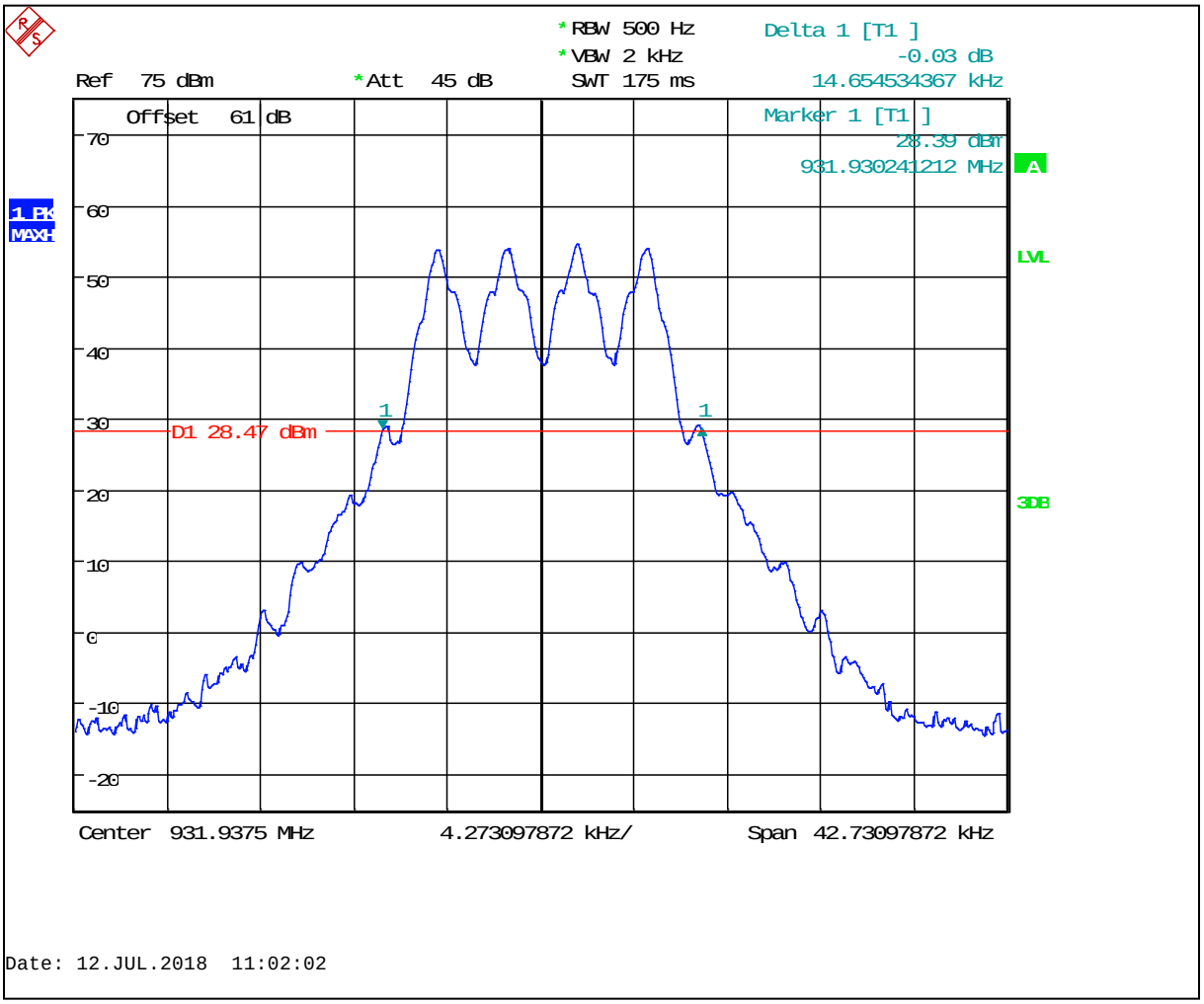
Plot 8-60: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; FLEX-2 1600 PRBS



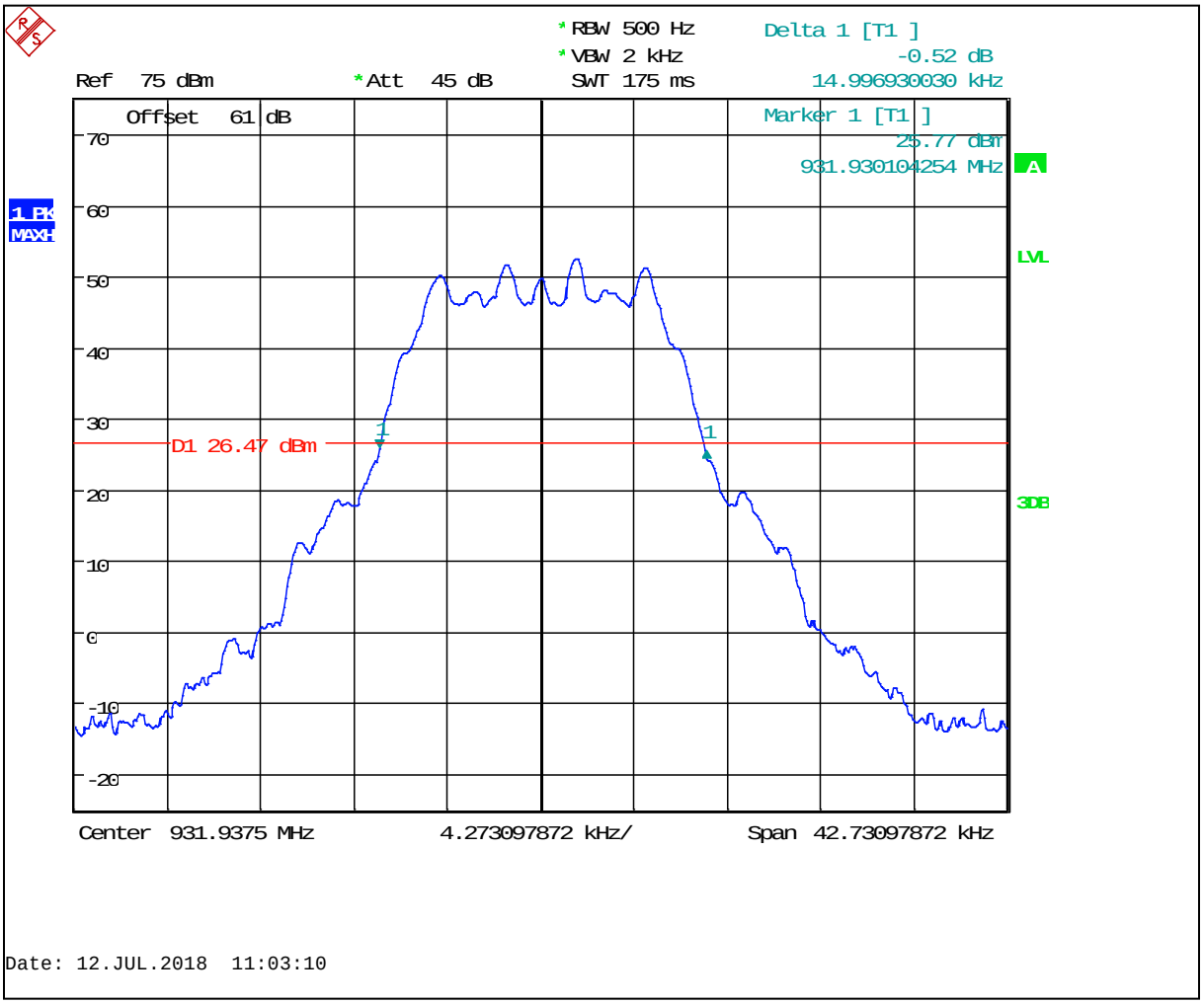
Plot 8-61: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; FLEX-2 3200 PRBS



Plot 8-62: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; FLEX-4 3200 PRBS



Plot 8-63: 26 dB Bandwidth – 931.9375 MHz, 25 kHz Bandwidth, High Power; FLEX-4 6400 PRBS



Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Table 8-5: Test Equipment Used for Testing 26 dB Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/21
901291	Pasternack	PE7031-20	300W Attenuator, DC - 1 GHz, 20 dB	NA	8/24/18
901724	Weinschel Corporation	48-40-34	Attenuator DC-18 GHz 40 dB 100W	CJ8921	7/12/19
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	8/21/18

Test Personnel:

Daniel W. Baltzell		July 12- August 14, 2018
EMC Test Engineer	Signature	Date of Test

9 Conclusion

The data in this measurement report shows that the STI Engineering Pty Ltd. Model RFI-900 250, FCC ID: P5MRFI900, complies with the applicable requirements of FCC Parts 2, 22 and 90 of the FCC Rules.