



TEST REPORT nr. R08000401_rev30

Federal Communication Commission (FCC)

This test report cancel and replace document nr. R08000401_rev20 date 25.02.08

Test item

Description.....: A828US OEM UHF Compact reader
Trademark.....: CAEN RFID
Model/Type.....: A828US

Test Specification

Standard: See inside at page 3

Client's name.....: CAEN RFID

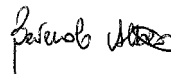
Address: Via Vetraria, 11 - 55049 Viareggio (LU) – ITALY

Manufacturer's name.: Same ad client

Address:

Report

Tested by.....: A. Bertezzolo - *Technician*



Approved by: R. Beghetto - *Laboratory Manager*



Date of issue.....: 14.03.08

Contents: 50 pages

This test report shall not be reproduced except in full without the written approval of CMC.
The test results presented in this report relate only to the item tested.



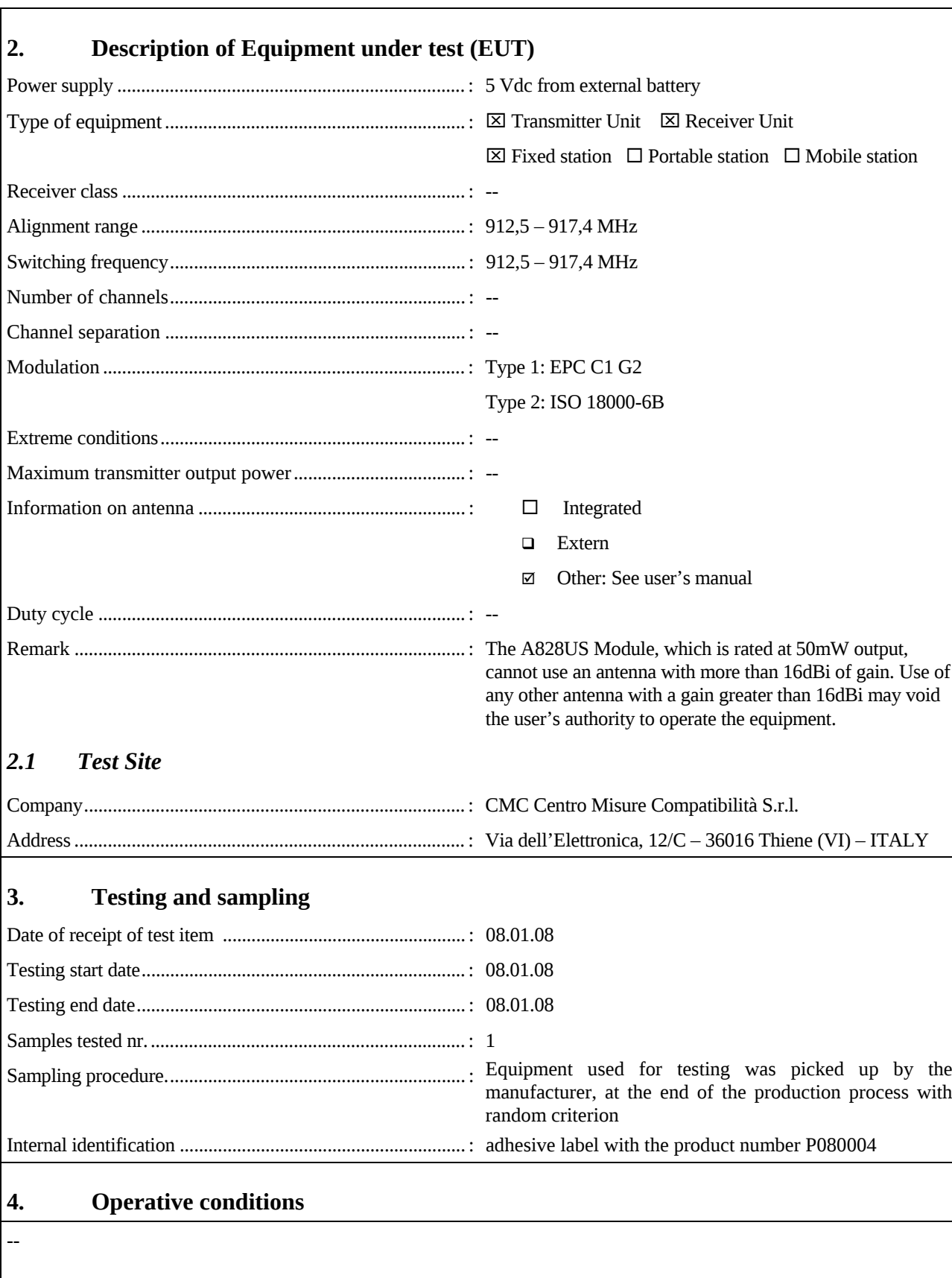
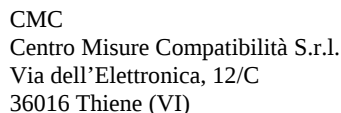
Index

1. SUMMARY	3
2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT).....	4
2.1 TEST SITE.....	4
3. TESTING AND SAMPLING.....	4
4. OPERATIVE CONDITIONS	4
5. PHOTOGRAPH(S) OF EUT	5
6. EQUIPMENT LIST	7
7. MEASUREMENT UNCERTAINTY	8
8. REFERENCE DOCUMENTS	9
9. DEVIATION FROM TEST SPECIFICATION.....	10
10. TEST CASE VERDICTS	10
11. RESULTS	10
11.1 PEAK OUTPUT POWER	11
11.2 CONDUCTED SPURIOUS.....	12
11.3 RADIATED SPURIOUS.....	13
12. GRAPHS AND TABLES.....	15



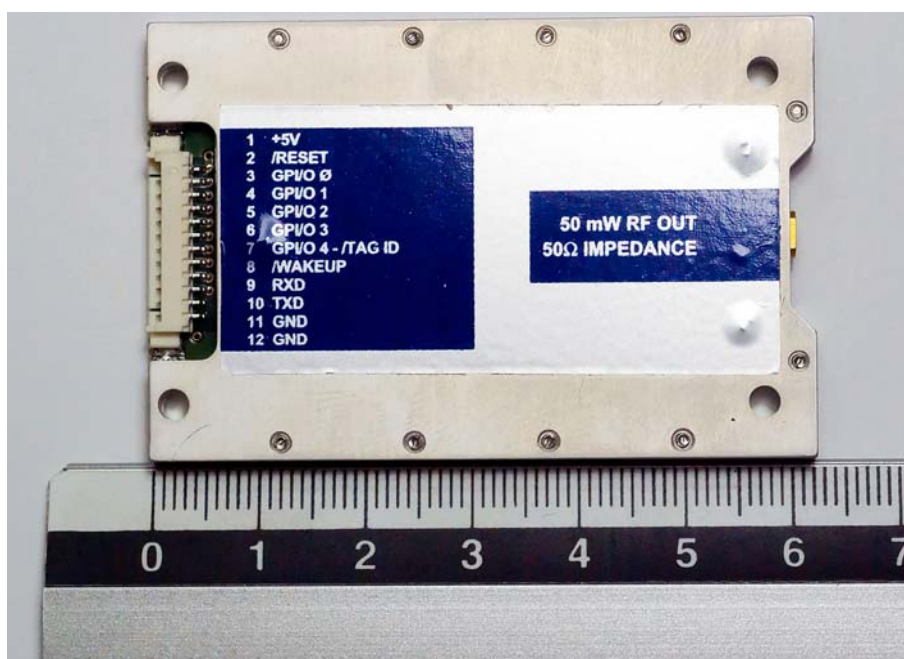
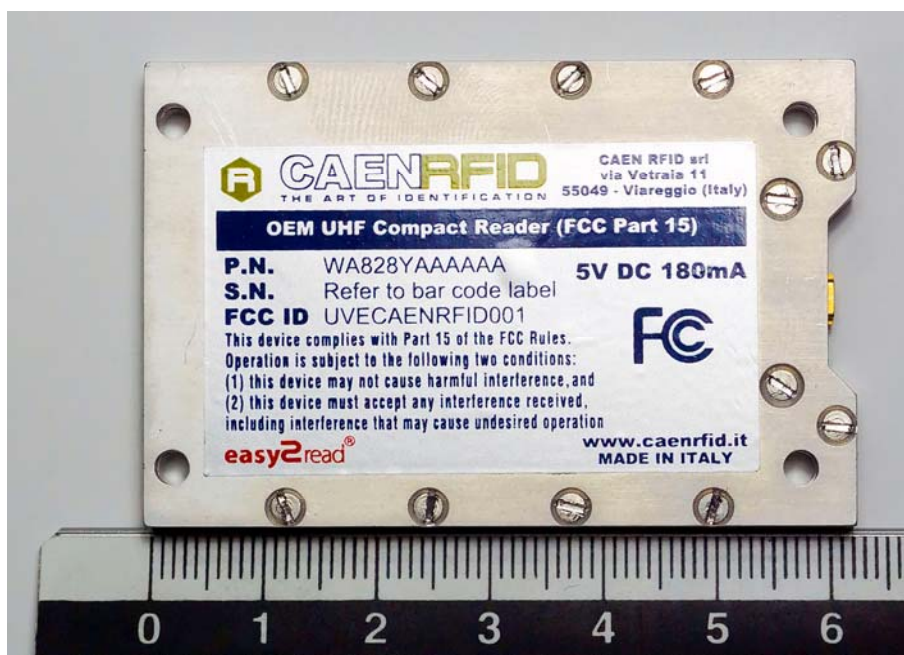
1. Summary			
Emission: FCC Rules & Regulations, Title 47			
Test specifications	Environmental Phenomena	Tests sequence	Result
Part 15.247(b)	Peak Output Power conducted	1	Complies
Part 15.247(c) Part 15.209	Radiated Spurious	2	Complies
Part 15.247(c) Part 15.209	Conducted Spurious	3	Complies

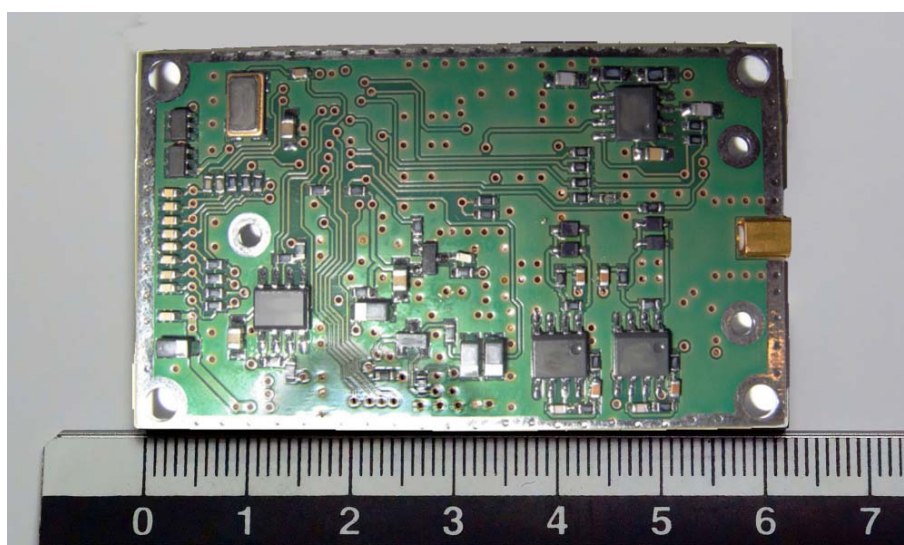
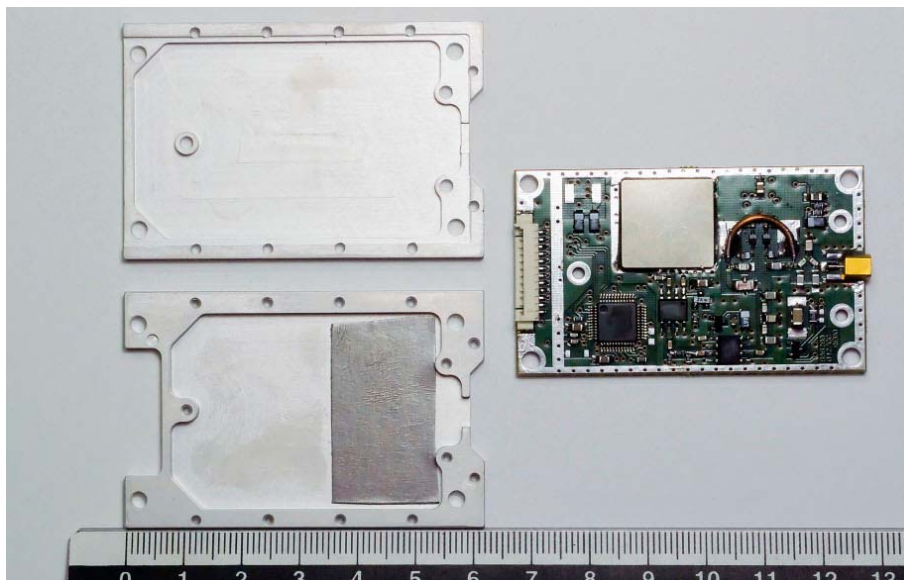
The Test Report was given to the Client representatives for necessary documentation of ratification of the tested equipment and it is valid for the FCC certification.





5. Photograph(s) of EUT







6. Equipment list

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>	<i>Last calibration</i>	<i>Due date calibration</i>
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	December '07	December '08
CMC S136	Schwarzbeck	VULB 9163	Broadband Antenna	9136-205	May '07	May '09
CMC S108	Emco	3115	Horn antenna	9811-5622	April '07	April '09



7. Measurement uncertainty

Test	Value
Conducted disturbance test – continuous and discontinuous - (9 kHz – 30 MHz)	2.1 dB
Insertion loss test	1.9 dB
Radiated electromagnetic disturbance test (loop antenna)	1.9 dB
Radiated disturbance test	4.7 dB
Disturbance power test	2.0 dB
Harmonic current emissions test	0.8 %
Voltage fluctuation and flicker test	6,2 %
Electrostatic discharge immunity test	< 10 % I _{pk}
	< 30 % I(30 ns)
	< 30 % I(60ns)
Electrical fast transients / burst immunity test	< 10 % V _{pk}
	< 30 % Tr
	< 30 % Td
Radiated electromagnetic field immunity test	0.7 V/m at 3V/m
Pulse modulated radio-frequency electromagnetic field immunity test	0.7 V/m at 3V/m
Surge immunity test	< 10 % V _{pk}
	< 20 % Tr
	< 20 % Td
Injected currents immunity test (150 kHz – 230 MHz)	0.5 V at 3V
Power frequency magnetic field immunity test	0.6 A/m at 3 A/m
Short interruption immunity test	< 5 %



8. Reference documents

Reference no.	Description
FCC Rules and Regulation Title 47 part 15	--
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz – 40GHz
Internal Procedure PM001 rev. 2.0 (Quality Manual)	Measure Procedure
Internal procedure INC_M rev. 6.0 (Quality Manual)	Measurement uncertainty calculation



9. Deviation from test specification

In agreement with the client, emission tests were performed with peak detector .

At the frequencies where the measures exceed the limit or within 6dB from it, the test was repeated with quasi-peak detector and/or average detector.

10. Test case verdicts

Test case does not apply to the test object : N / N.A.

Test item does meet the requirement..... : P / Pass / Complies

Test item does not meet the requirement : F / Fail / Does not comply

Test not performed : NE / Not Executed

11. Results

In this clause tests results are reported.

All measurements are done in accordance with the Filling and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA-705

Measurement uncertainty is in accordance with document CMC INC_M rev. 6.0.



11.1 Peak Output Power

Test configuration and test method

Test site Laboratory
Auxiliary equipment None

Environmental conditions

Temperature 19 °C Atmospheric pressure 100 kPa Relative humidity 42 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247(b)
- DA 00-705, march 30, 2000
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Acceptance limits

Frequency range	RF power output
902 – 928 MHz	1,0 W / 30dBm

Result

Channel	Modulation	Graphs	Results	Remark
0	Type 1	G08000425 *	13,83 dBm	--
25	Type 1	G08000426 *	13,88 dBm	--
49	Type 1	G08000427 *	13,91 dBm	--
0	Type 2	G08000428 *	13,85 dBm	
25	Type 2	G08000429 *	13,90 dBm	
49	Type 2	G08000430 *	13,91 dBm	

Remarks

* Used +20dBm of attenuation during the test.

Reference documents See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report) CMC S164

Result The requirements are met



11.2 Conducted Spurious

Test configuration and test method

Test site Semi-anechoic chamber
Auxiliary equipment None

Environmental conditions

Temperature 19 °C Atmospheric pressure 100 kPa Relative humidity 42 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247(c) and Part 15.209
- DA 00-705, march 30, 2000
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Acceptance limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement. Attenuation below the general limits specified in cl. 15.209(a) is not required. In addition, radiated which fall in the restricted bands, as defined in cl. 15.205(a), must also comply with the radiated emission limits specified in cl. 15.209(a).

Result

Channel	Modulation	Graph(s)	Remarks	Result
Ch 0	Type 1	G08000431	--	Complies
Ch 25	Type 1	G08000432	--	Complies
Ch 49	Type 1	G08000433	--	Complies
Ch 0	Type 2	G08000434	--	Complies
Ch 25	Type 2	G08000435	--	Complies
Ch 49	Type 2	G08000436	--	Complies

Remarks

Up to 7GHz, the measured level is more than 20dB below the limit.

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S164

Measurement uncertainty: See clause 7 of this test report

Result

The requirements are met



11.3 Radiated Spurious

Test configuration and test method

Test site Semi-anechoic chamber
Auxiliary equipment None

Environmental conditions

Temperature 19 °C Atmospheric pressure 100 kPa Relative humidity 42 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247(c) and Part 15.209
- DA 00-705, march 30, 2000
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

For measurements below 1GHz the resolution bandwidth is set to 100kHz.

For measurements above 1GHz the resolution bandwidth is set to 1MHz.

EUT exercising

See clause 4 of this test report

Acceptance limits

In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in cl. 15.205(a), must also comply with the radiated emission limits specified in cl. 15.209(a) (see cl.15.205(c)).

Result

Channel	Modulation	Polarization	Frequency Range (MHz)	Graph(s) (peak measurements)	Remarks	Result
Ch 0	Type 1	Horizontal	30 – 1000	G08000401	--	Complies
Ch 0	Type 1	Vertical	30 – 1000	G08000402	--	Complies
Ch 25	Type 1	Vertical	30 – 1000	G08000403	--	Complies
Ch 25	Type 2	Horizontal	30 – 1000	G08000404	--	Complies
Ch 49	Type 2	Horizontal	30 – 1000	G08000405	--	Complies
Ch 49	Type 2	Vertical	30 – 1000	G08000406	--	Complies
Ch 0	Type 1	Vertical	30 – 1000	G08000407	--	Complies
Ch 0	Type 1	Horizontal	30 – 1000	G08000408	--	Complies
Ch 25	Type 1	Horizontal	30 – 1000	G08000409	--	Complies
Ch 25	Type 2	Vertical	30 – 1000	G08000410	--	Complies
Ch 49	Type 2	Vertical	30 – 1000	G08000411	--	Complies
Ch 49	Type 2	Horizontal	30 – 1000	G08000412	--	Complies
Ch 0	Type 1	Vertical	1000 – 10000	G08000413	--	Complies
Ch 0	Type 1	Horizontal	1000 – 10000	G08000414	--	Complies
Ch 25	Type 1	Horizontal	1000 – 10000	G08000415	--	Complies
Ch 25	Type 2	Vertical	1000 – 10000	G08000416	--	Complies
Ch 49	Type 2	Vertical	1000 – 10000	G08000417	--	Complies
Ch 49	Type 2	Horizontal	1000 – 10000	G08000418	--	Complies
Ch 0	Type 1	Horizontal	1000 – 10000	G08000419	--	Complies
Ch 0	Type 1	Vertical	1000 – 10000	G08000420	--	Complies
Ch 25	Type 1	Vertical	1000 – 10000	G08000421	--	Complies
Ch 25	Type 2	Horizontal	1000 – 10000	G08000422	--	Complies
Ch 49	Type 2	Horizontal	1000 – 10000	G08000423	--	Complies
Ch 49	Type 2	Vertical	1000 – 10000	G08000424	--	Complies



CMC
Centro Misure Compatibilità S.r.l.
Via dell'Elettronica, 12/C
36016 Thiene (VI)



Remarks

During the test, the EUT was connected with antenna mod. WANTENNAX010.

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S108, CMC S136, CMC S164

Measurement uncertainty: See clause 7 of this test report

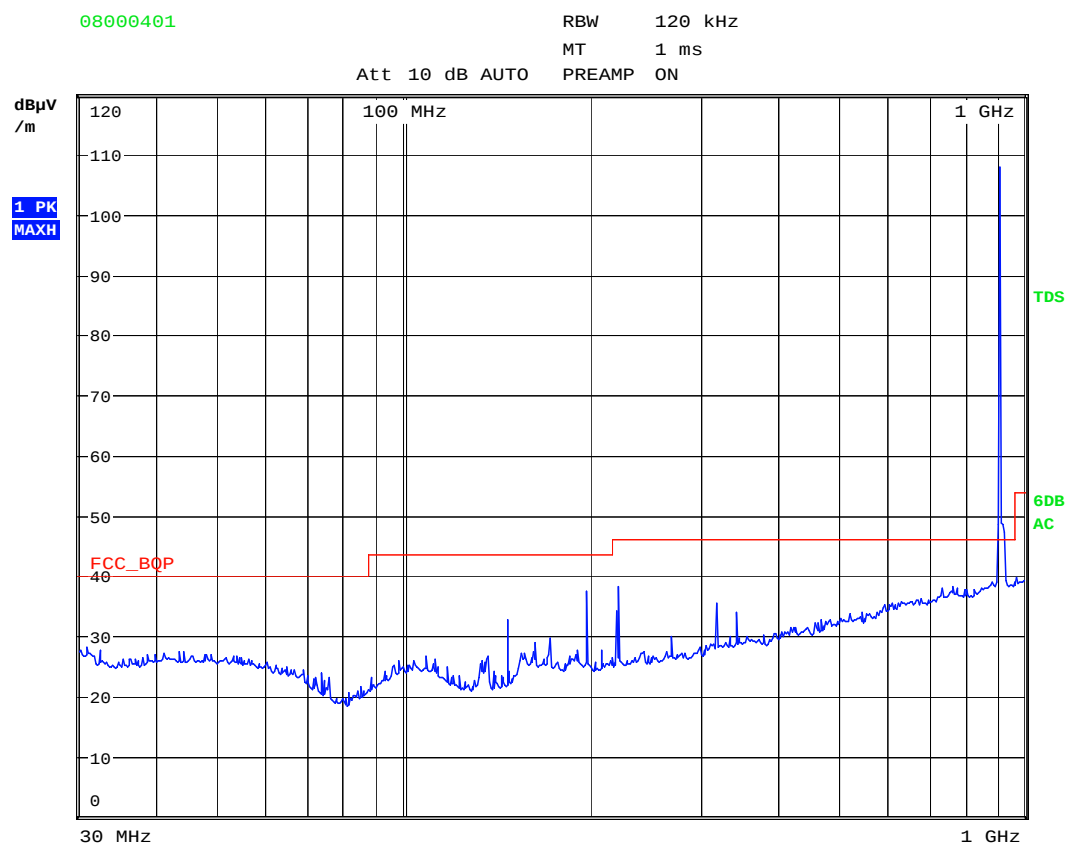
Result

The requirements are met



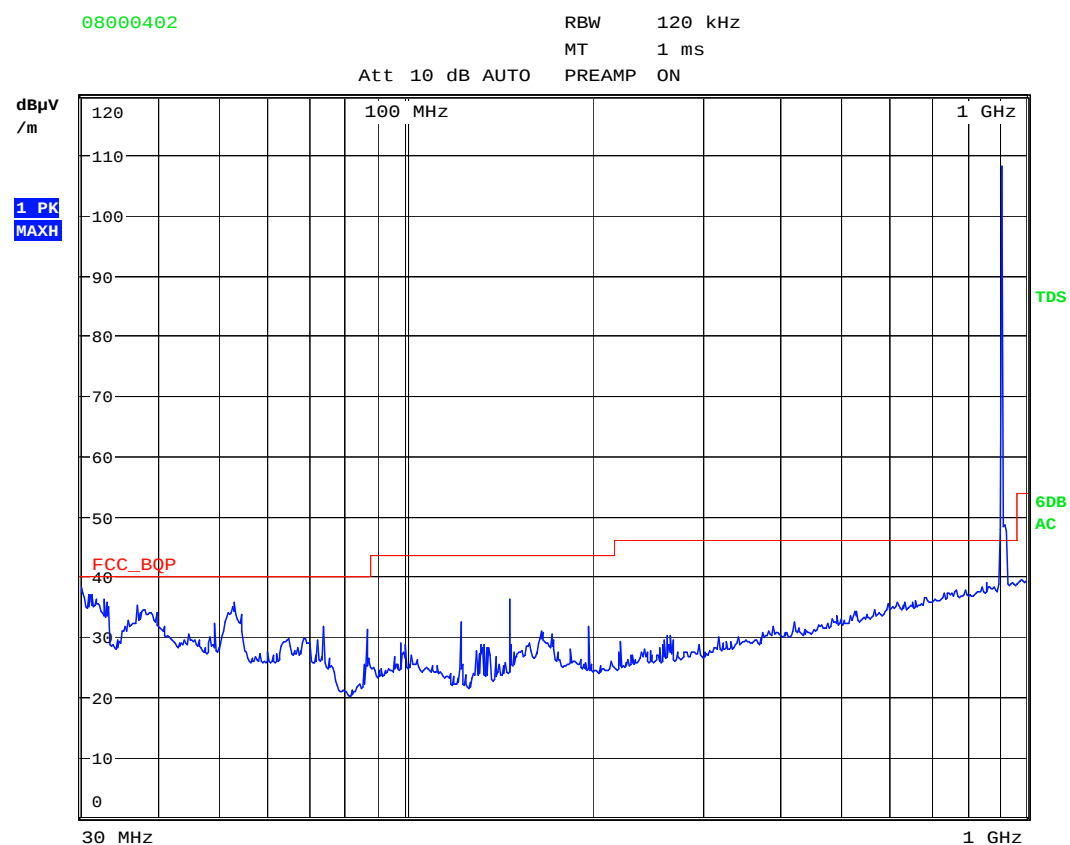
12. Graphs and Tables

G08000401



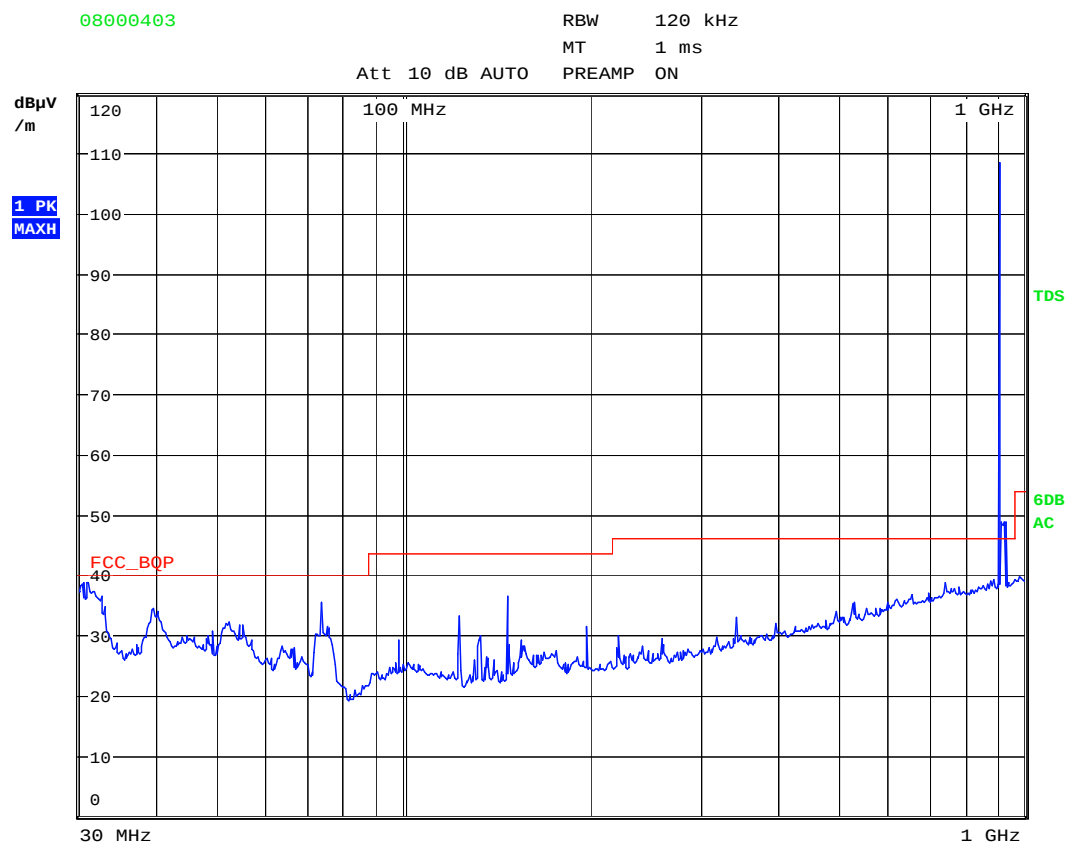


G08000402



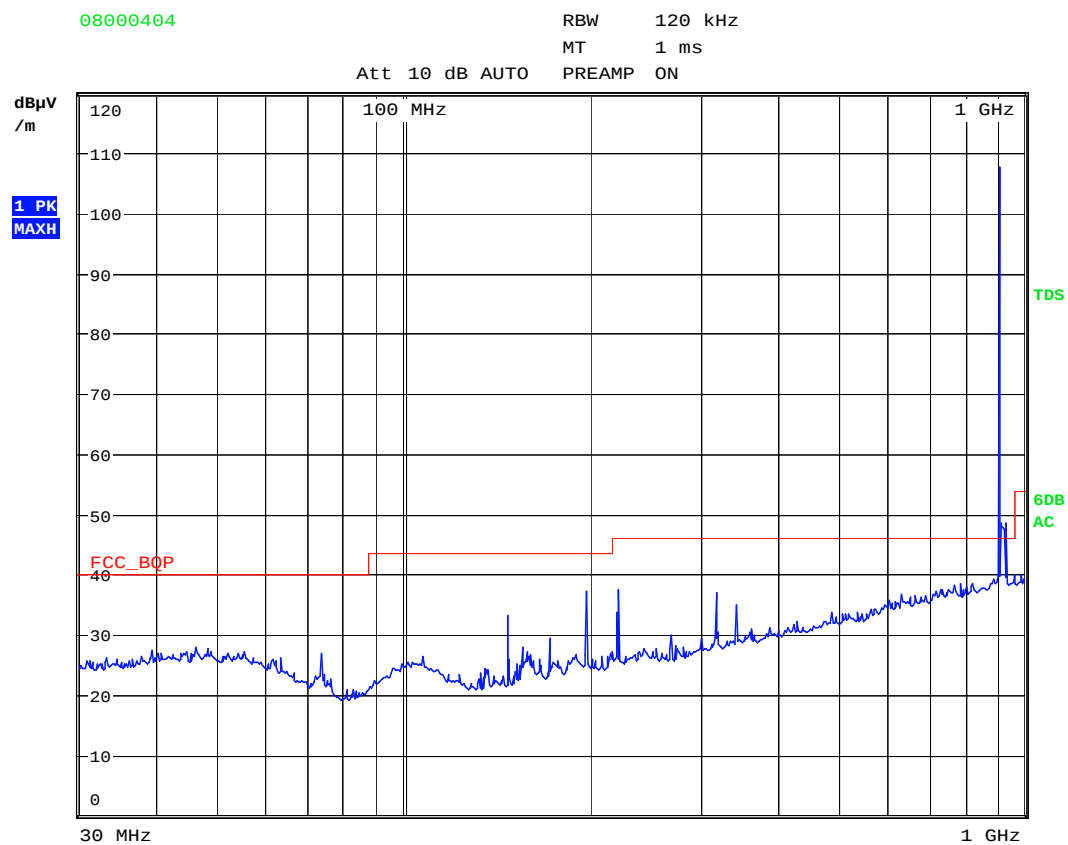


G08000403



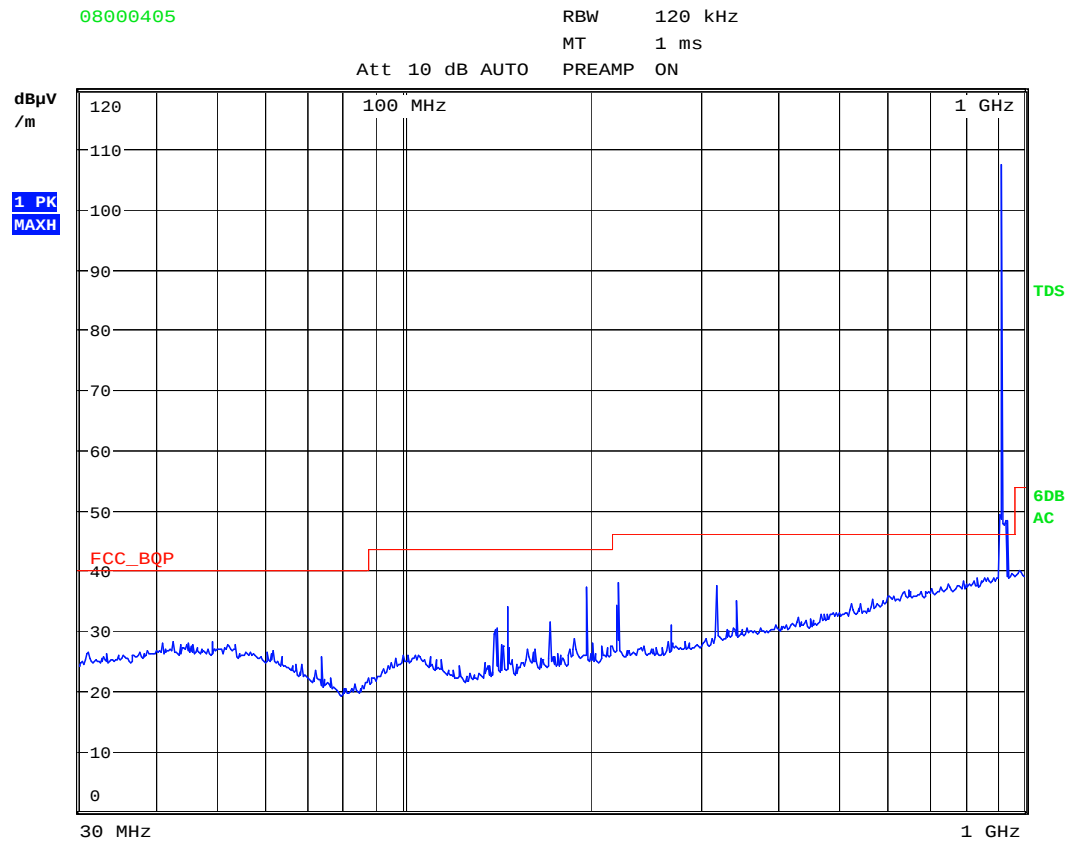


G08000404



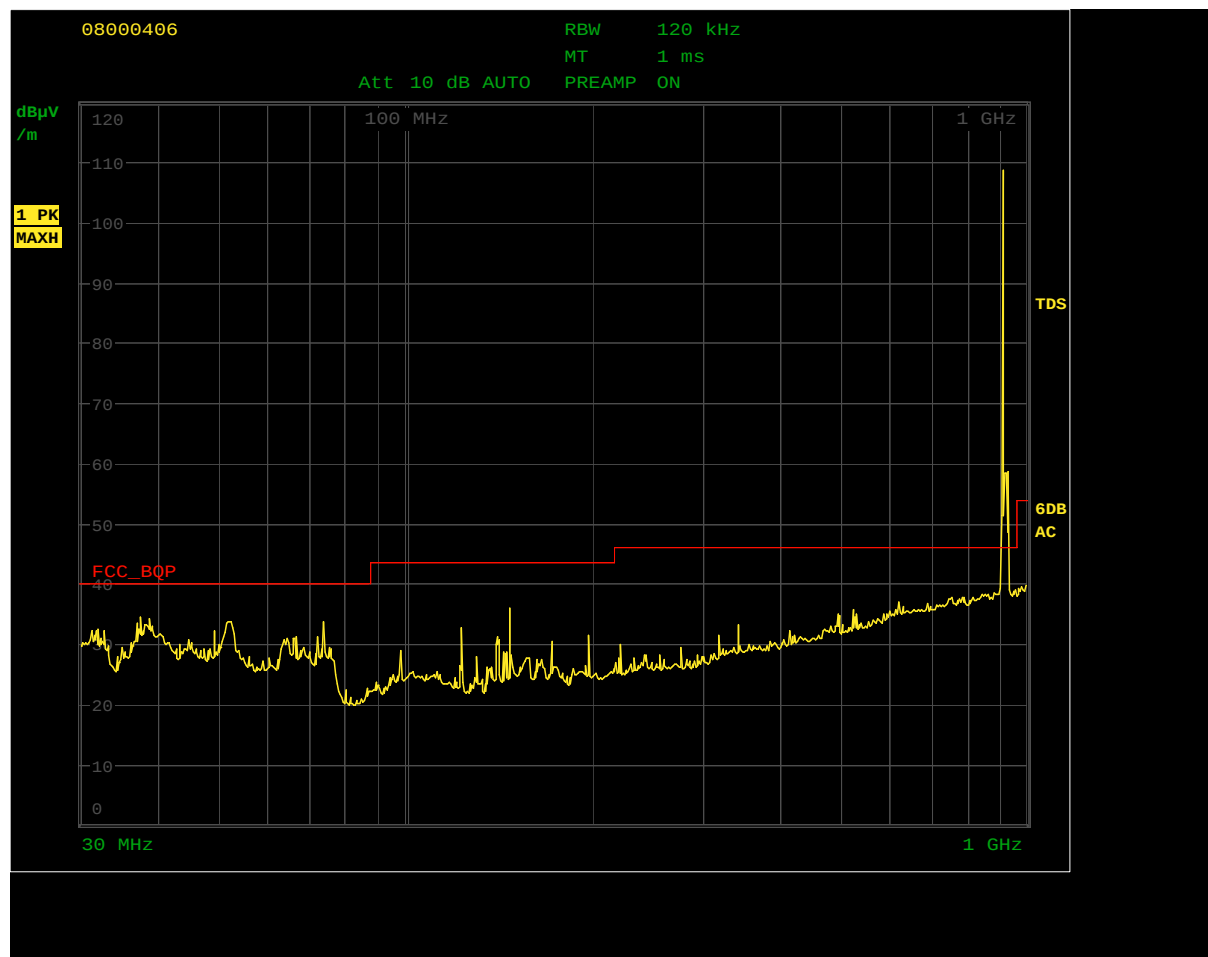


G08000405



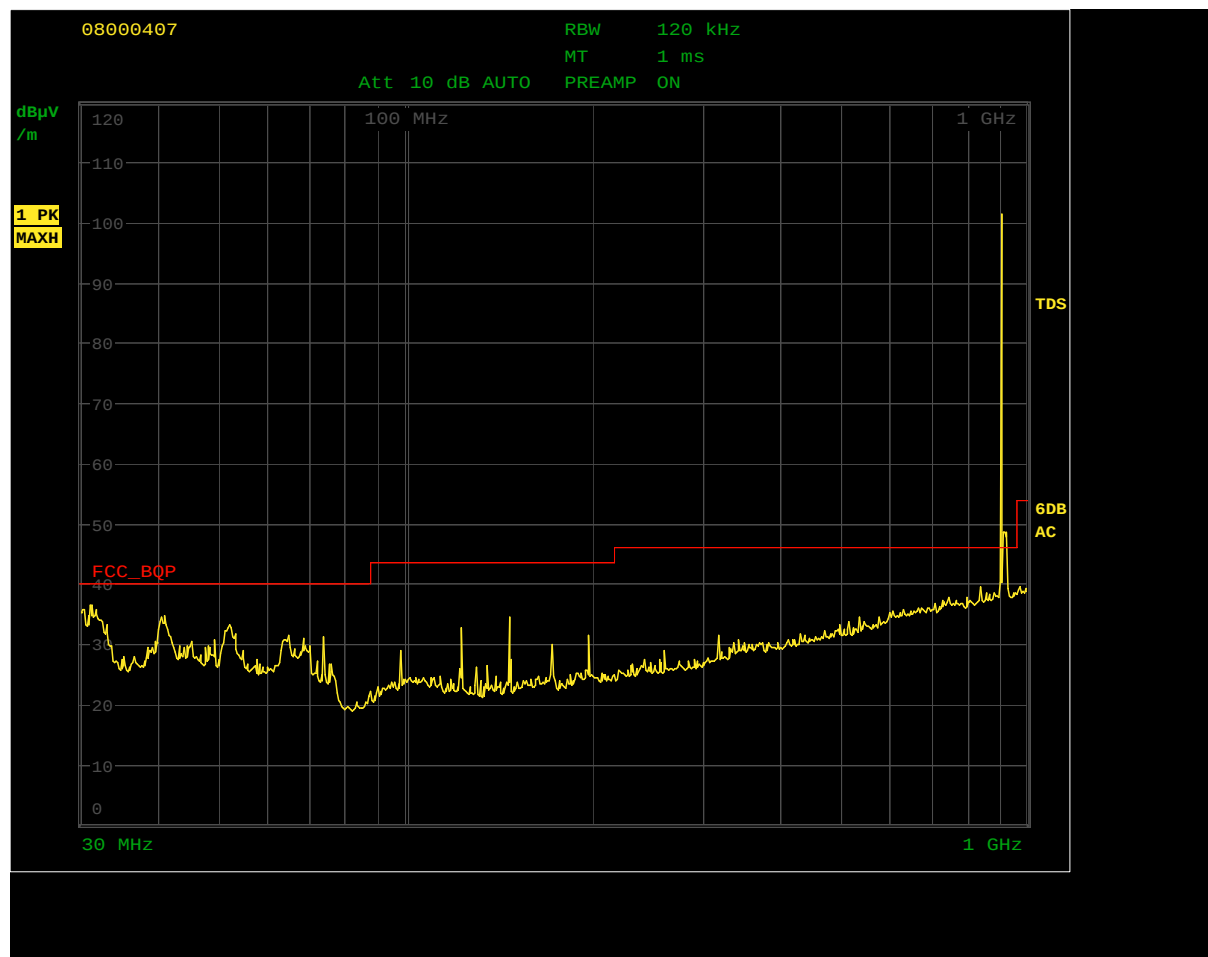


G08000406



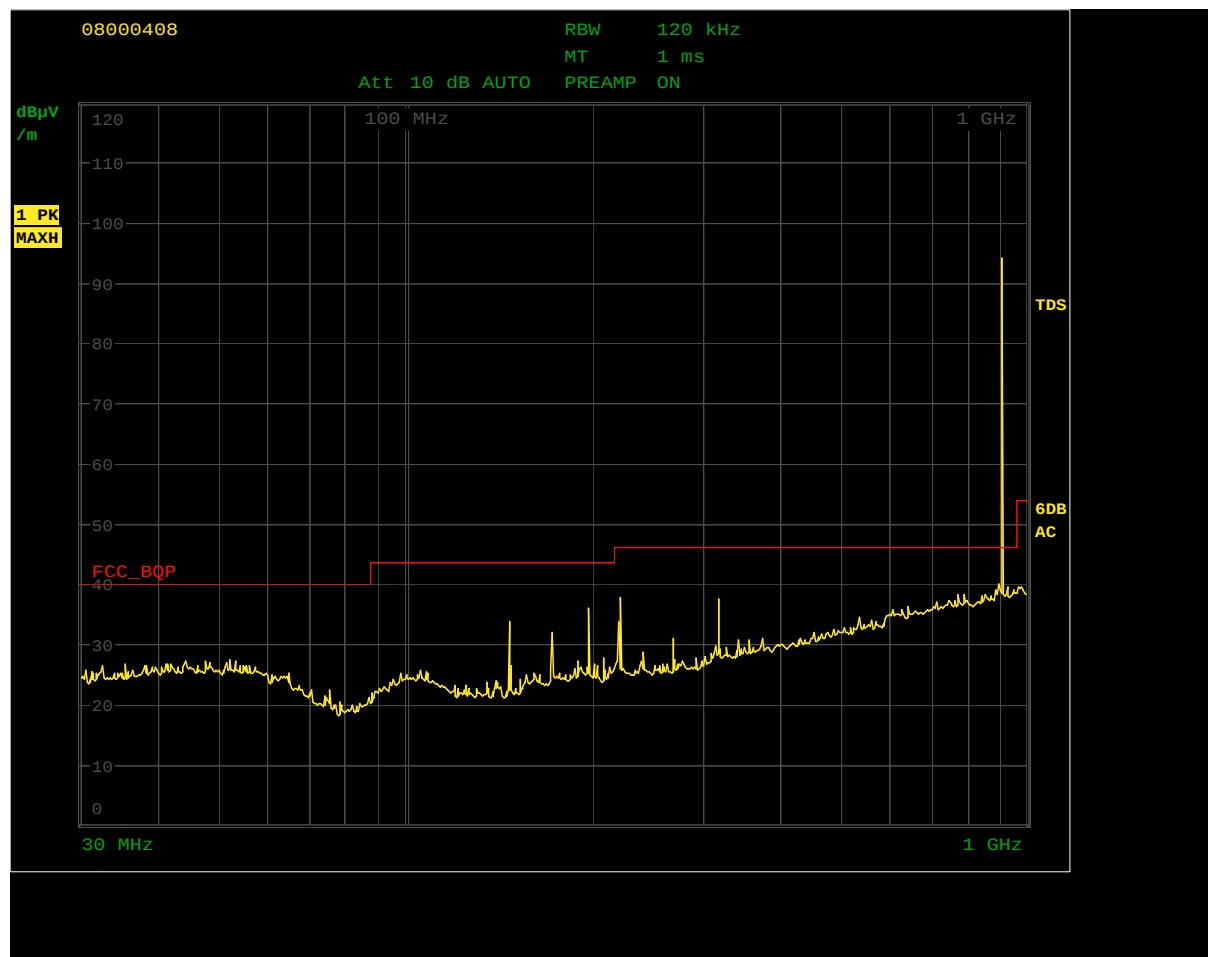


G08000407



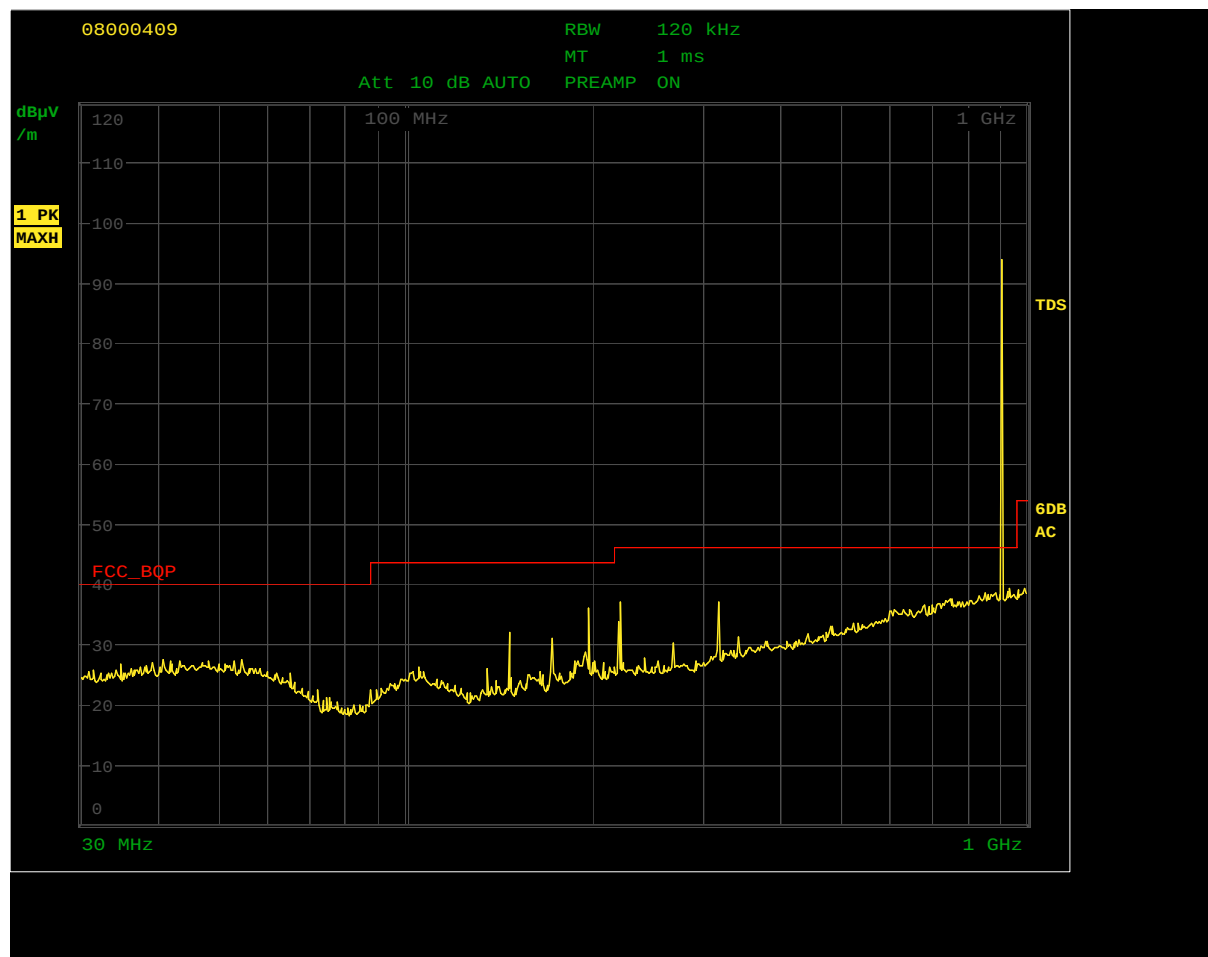


G08000408



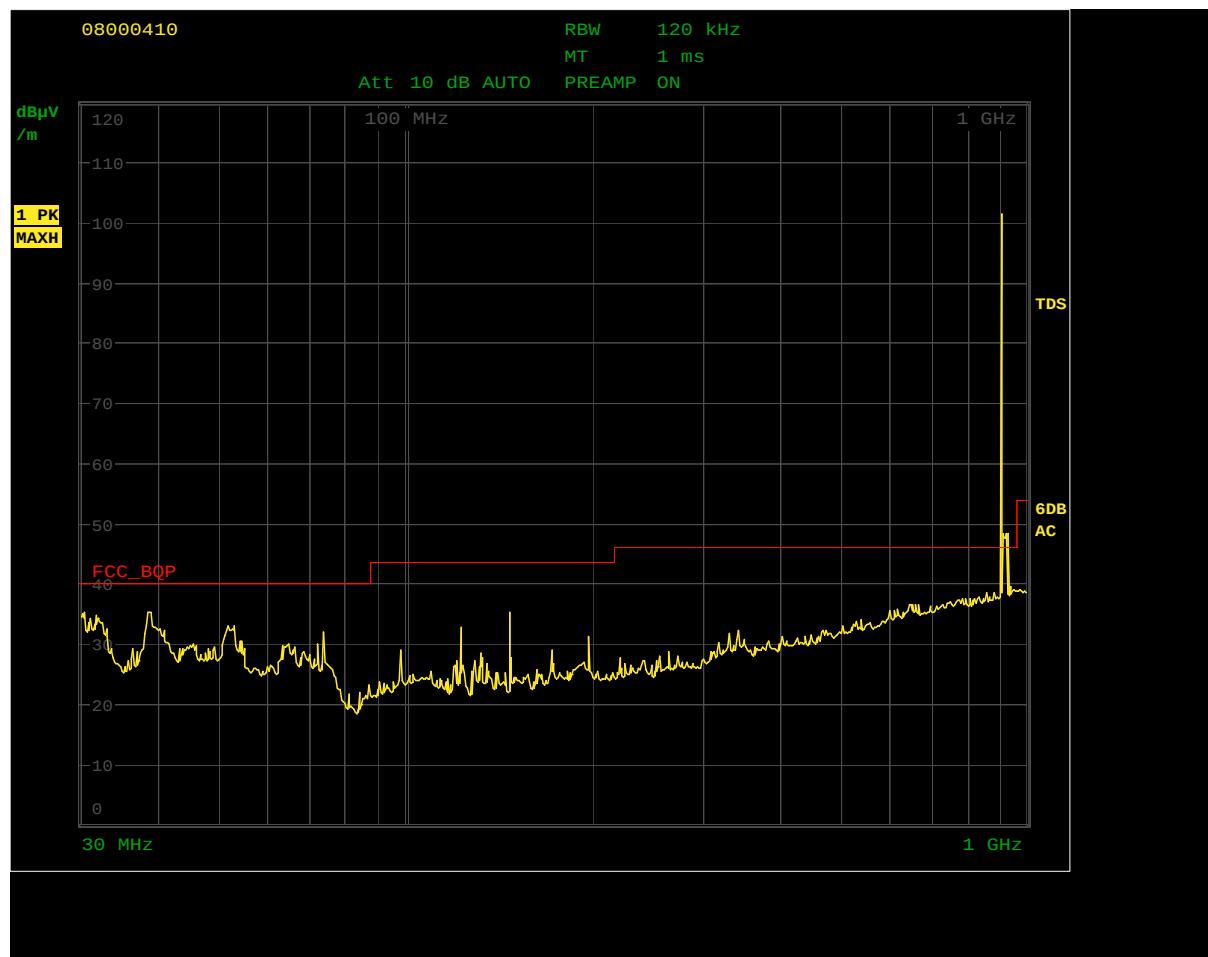


G08000409



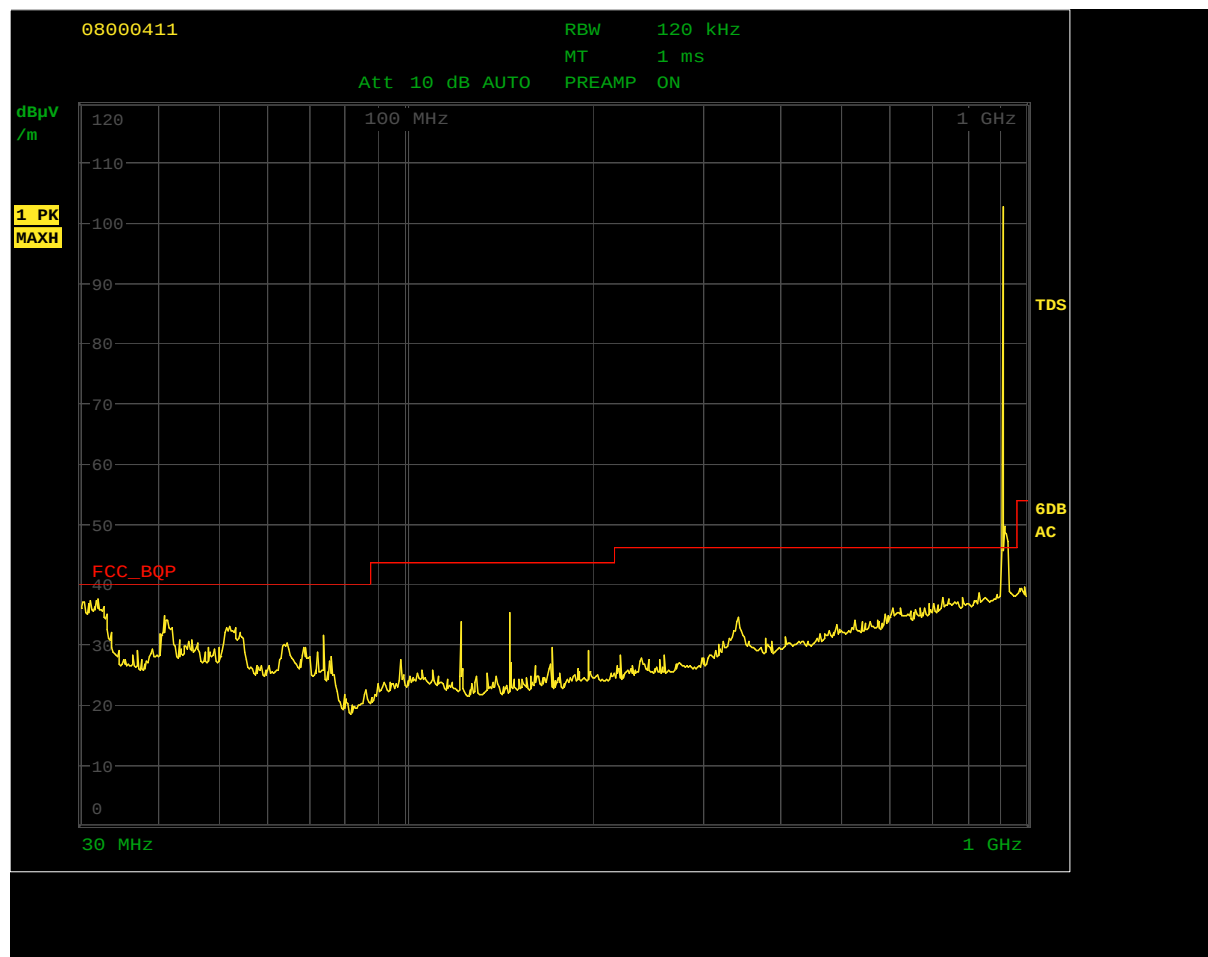


G08000410



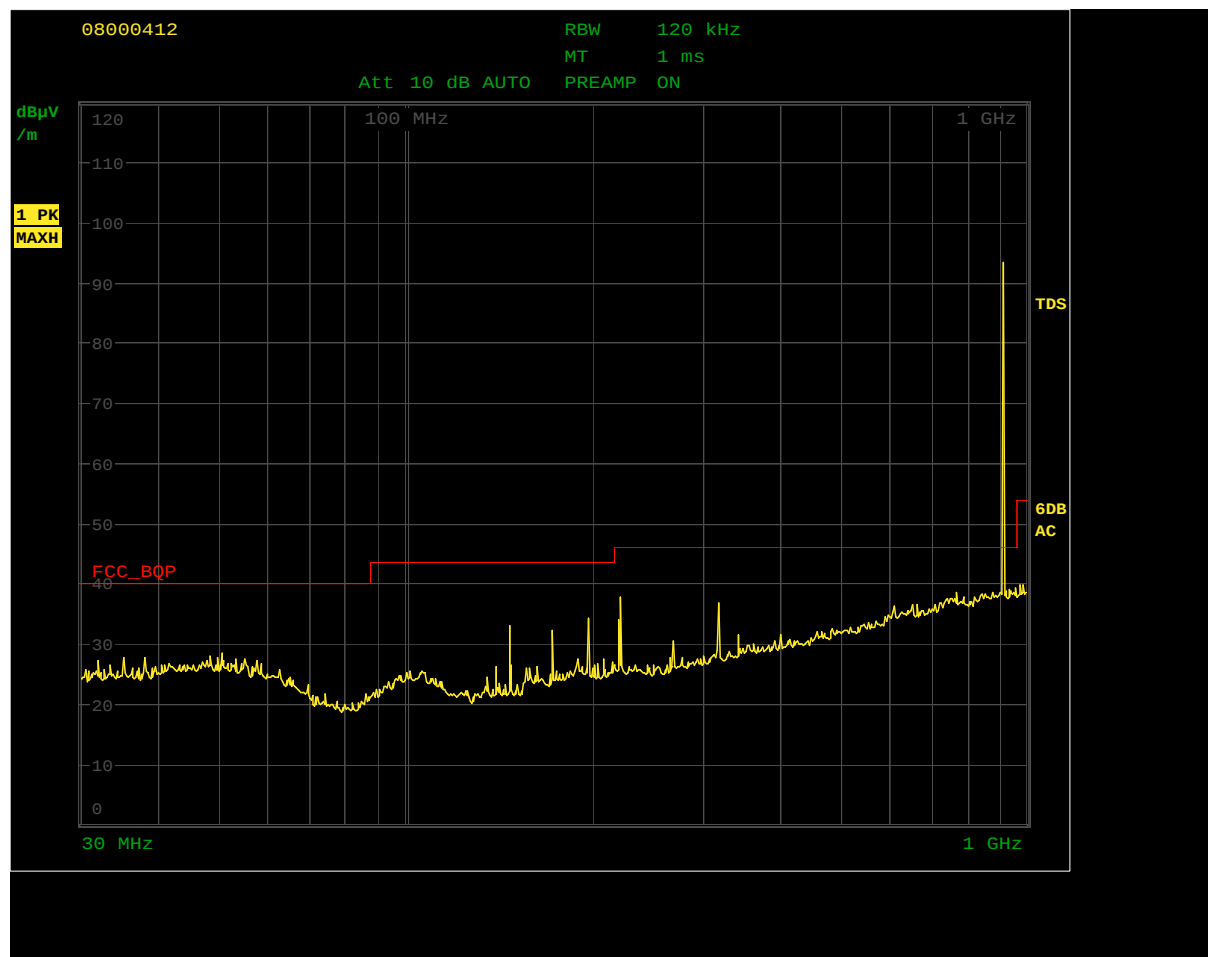


G08000411



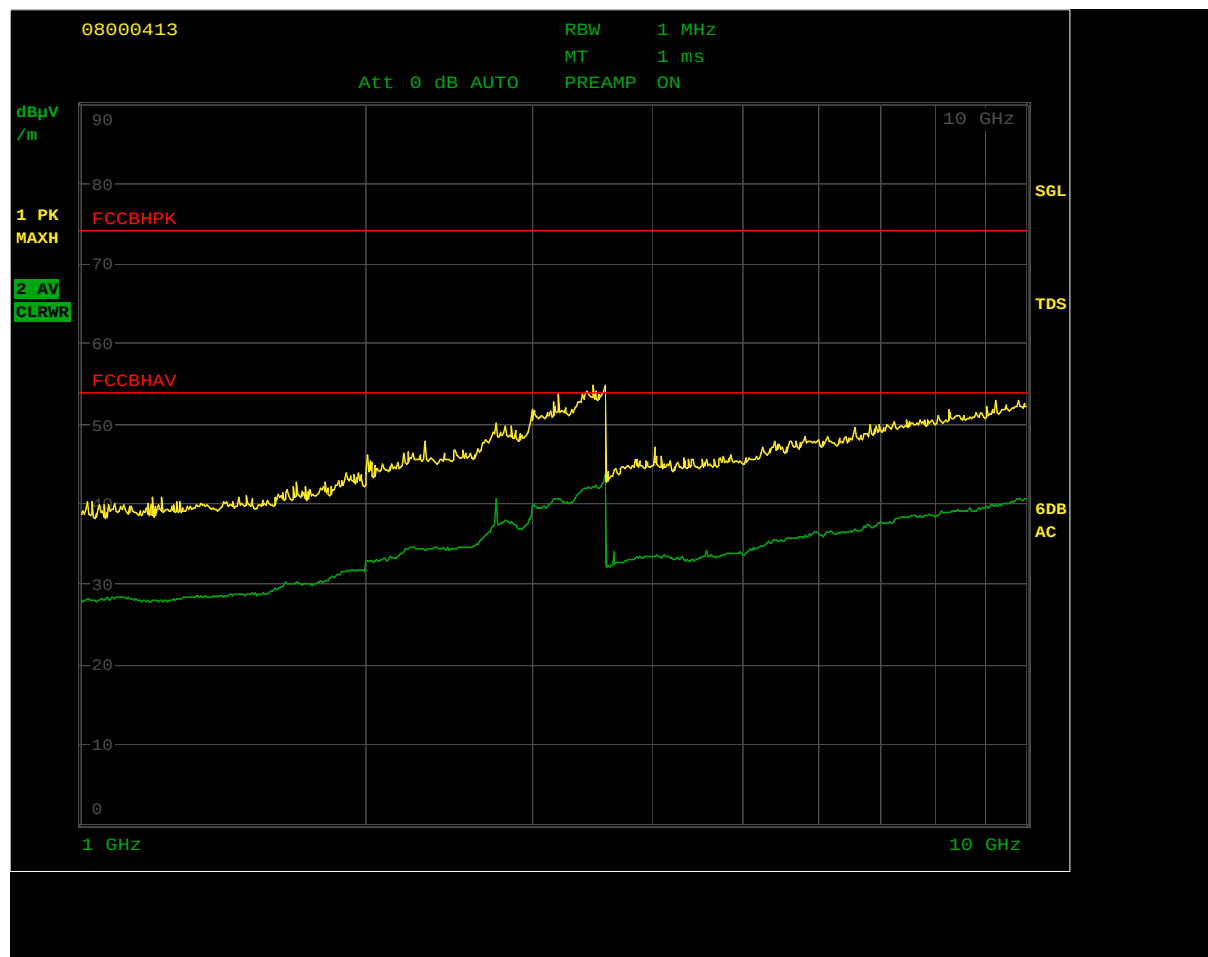


G08000412



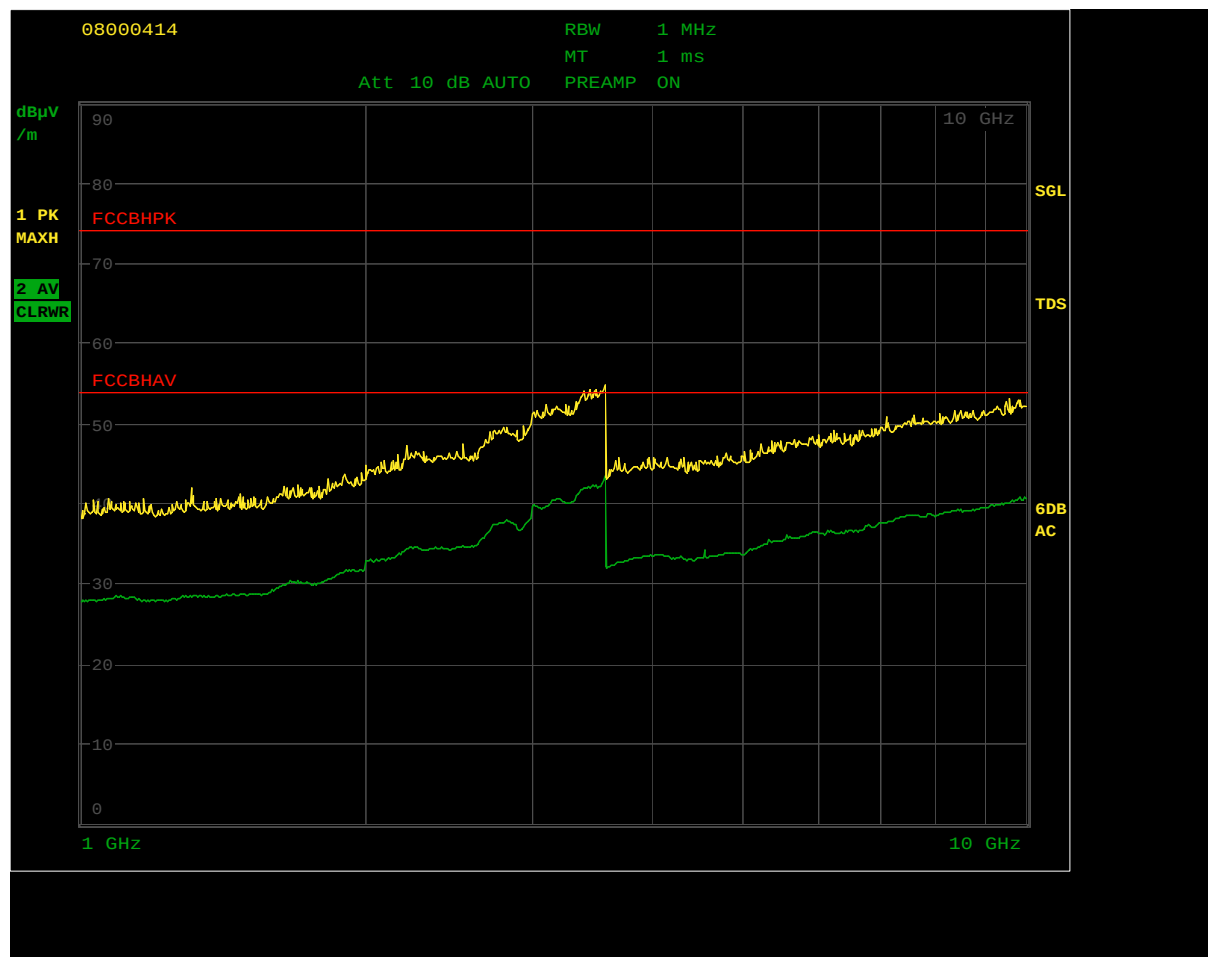


G08000413



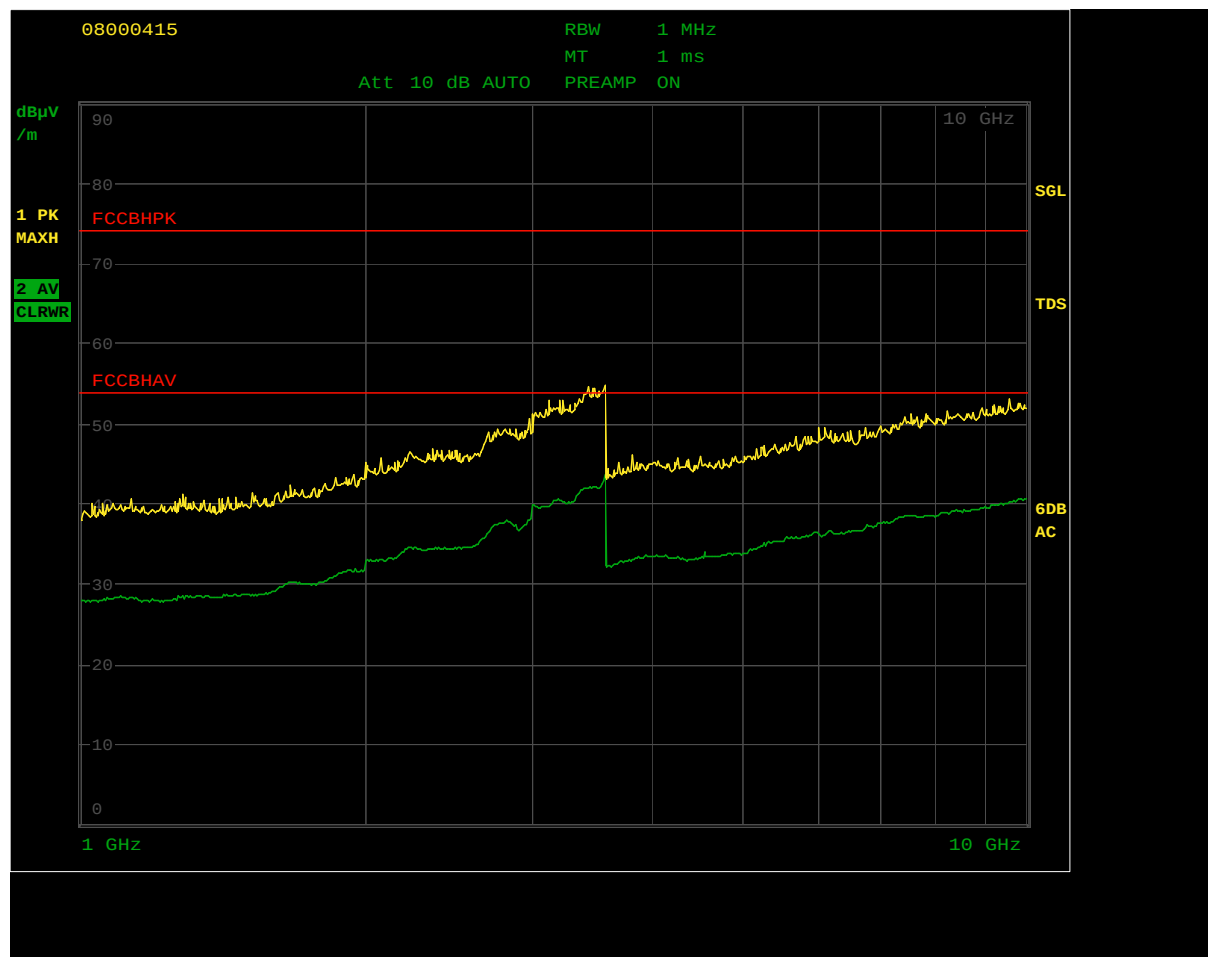


G08000414



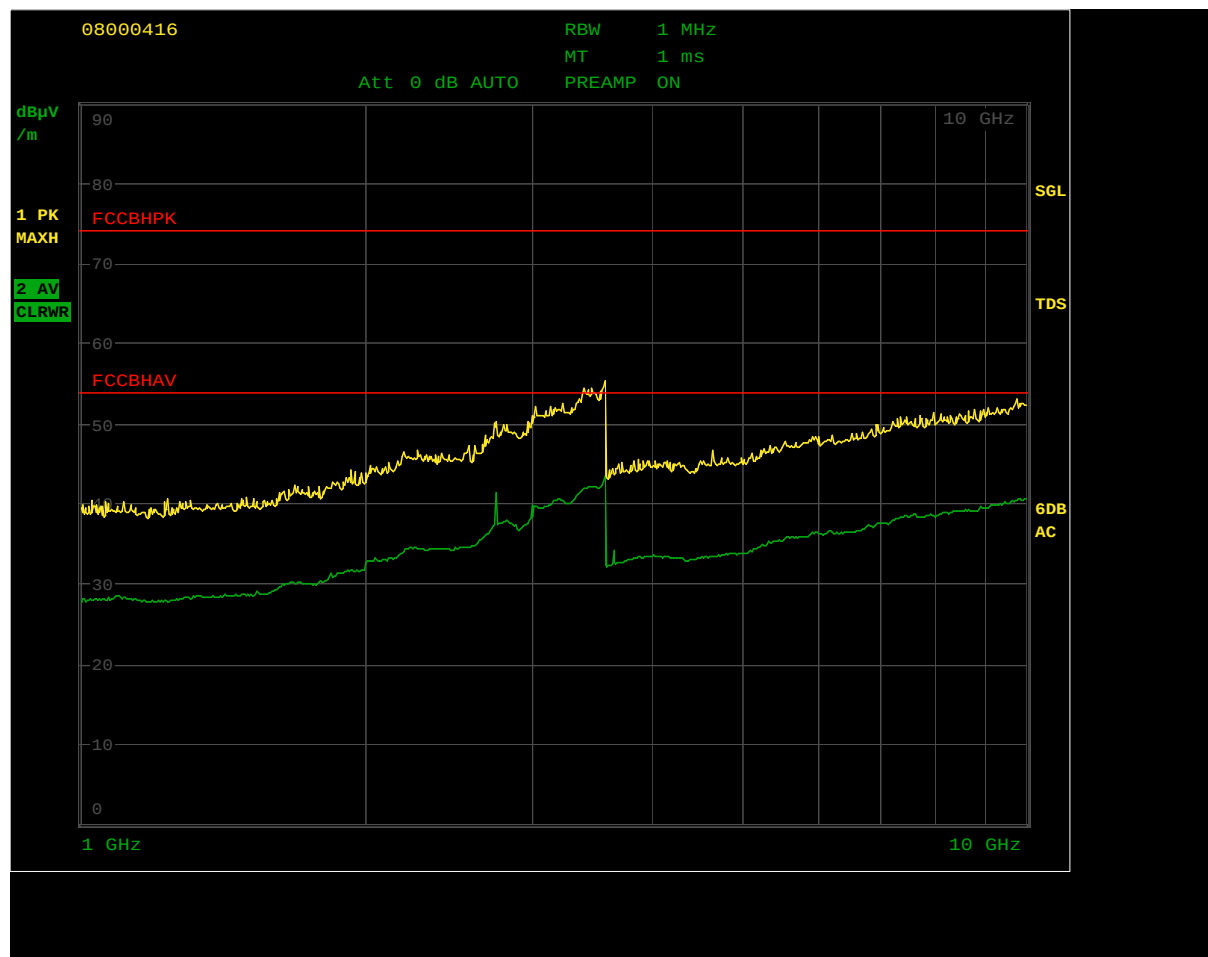


G08000415



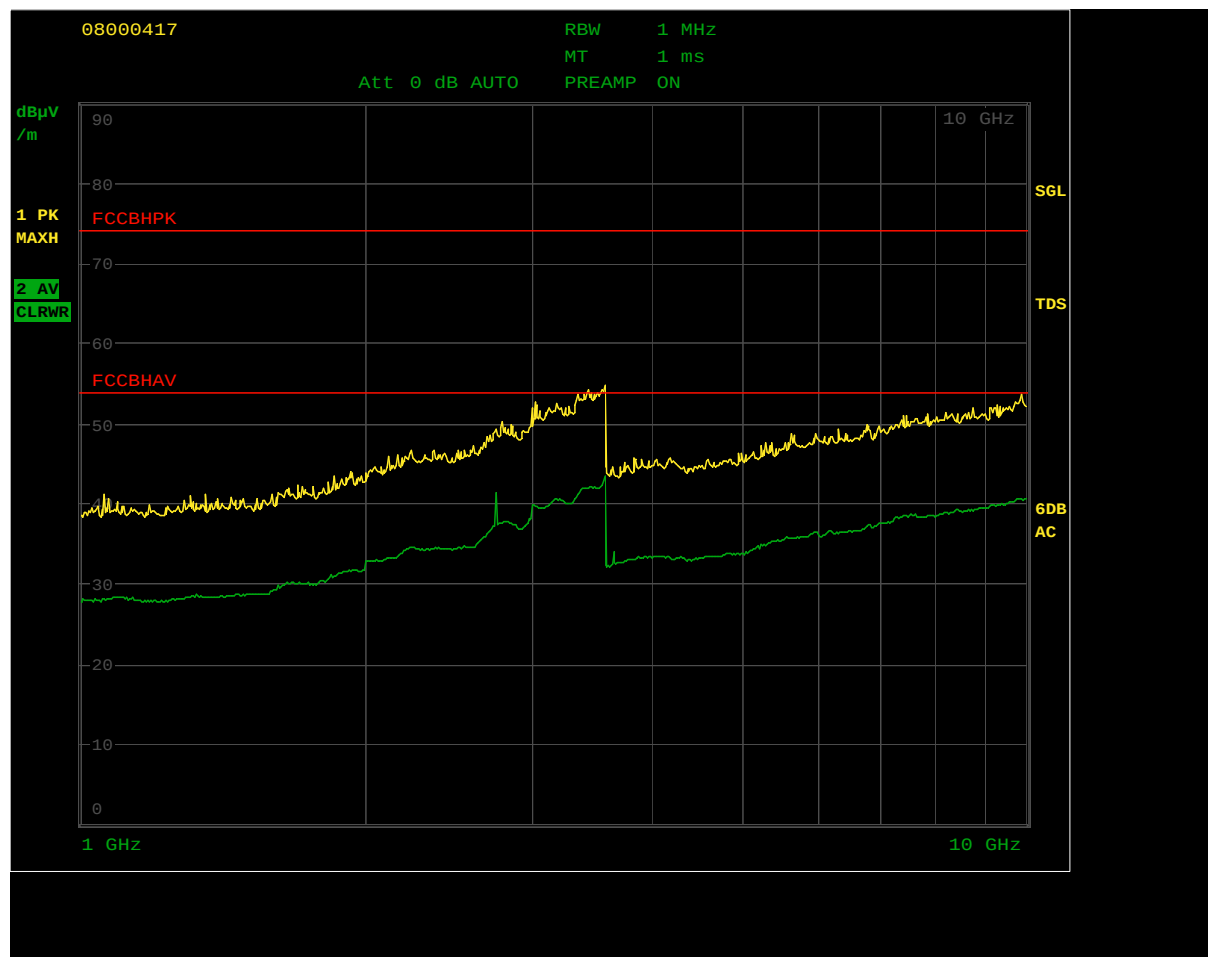


G08000416



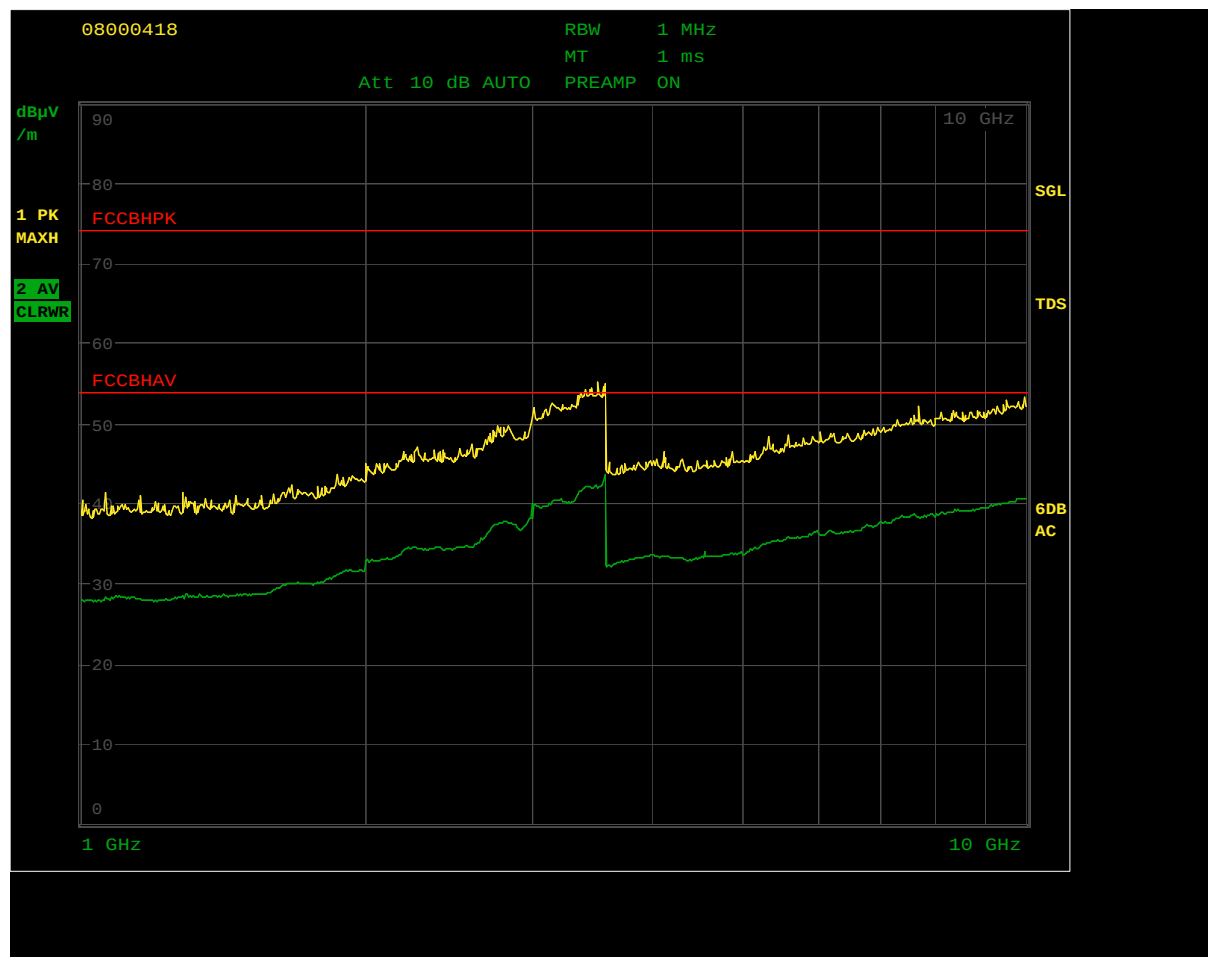


G08000417



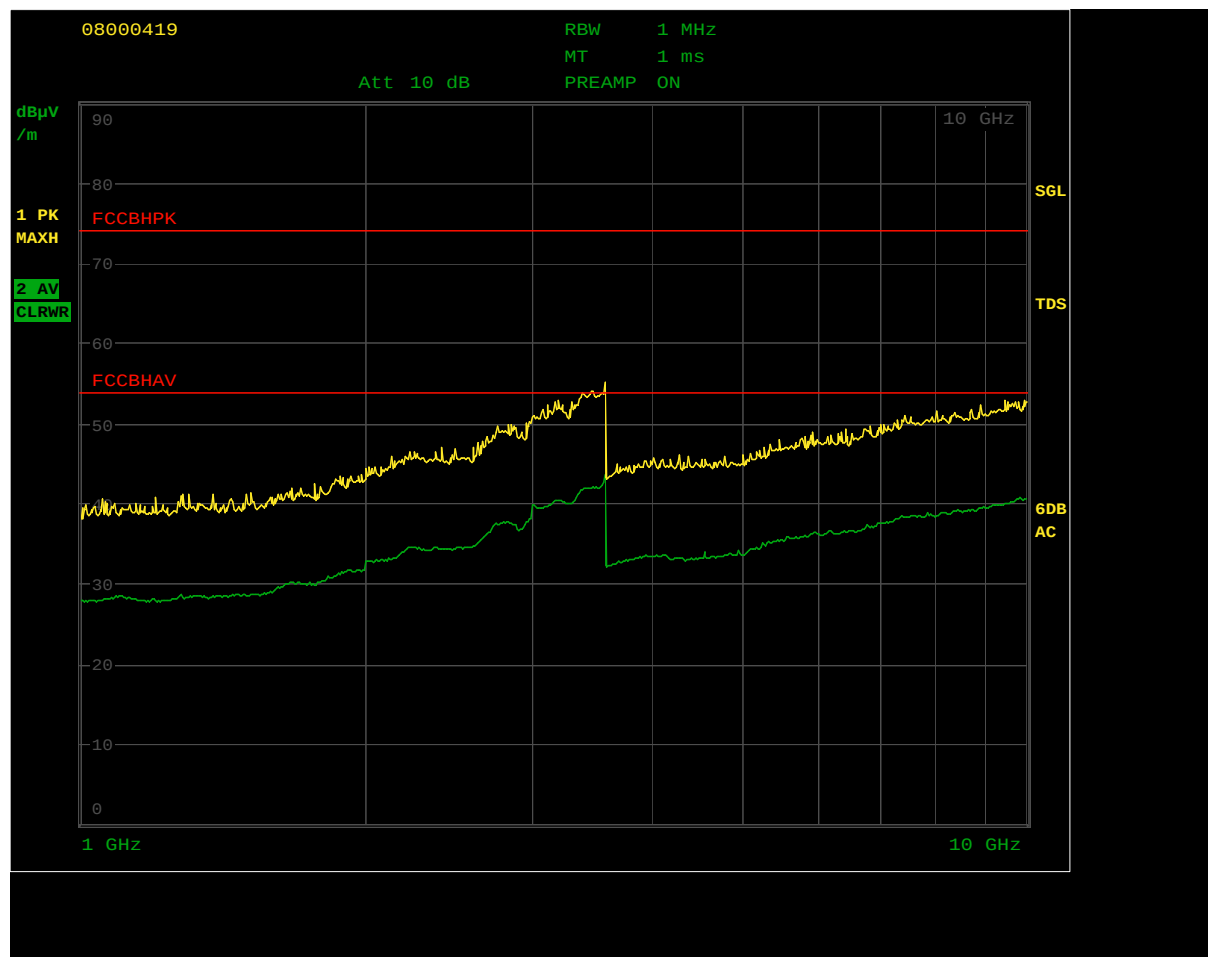


G08000418



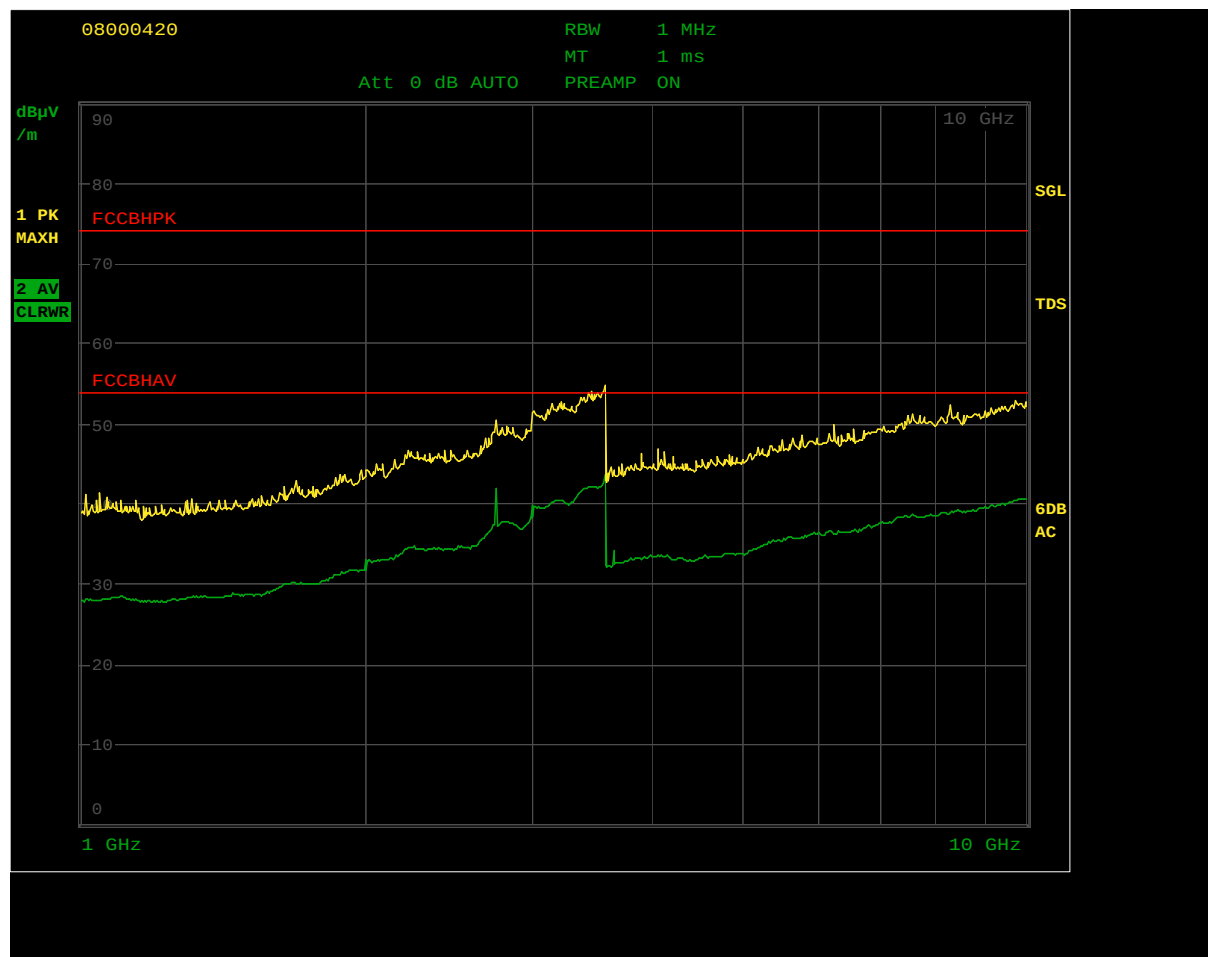


G08000419



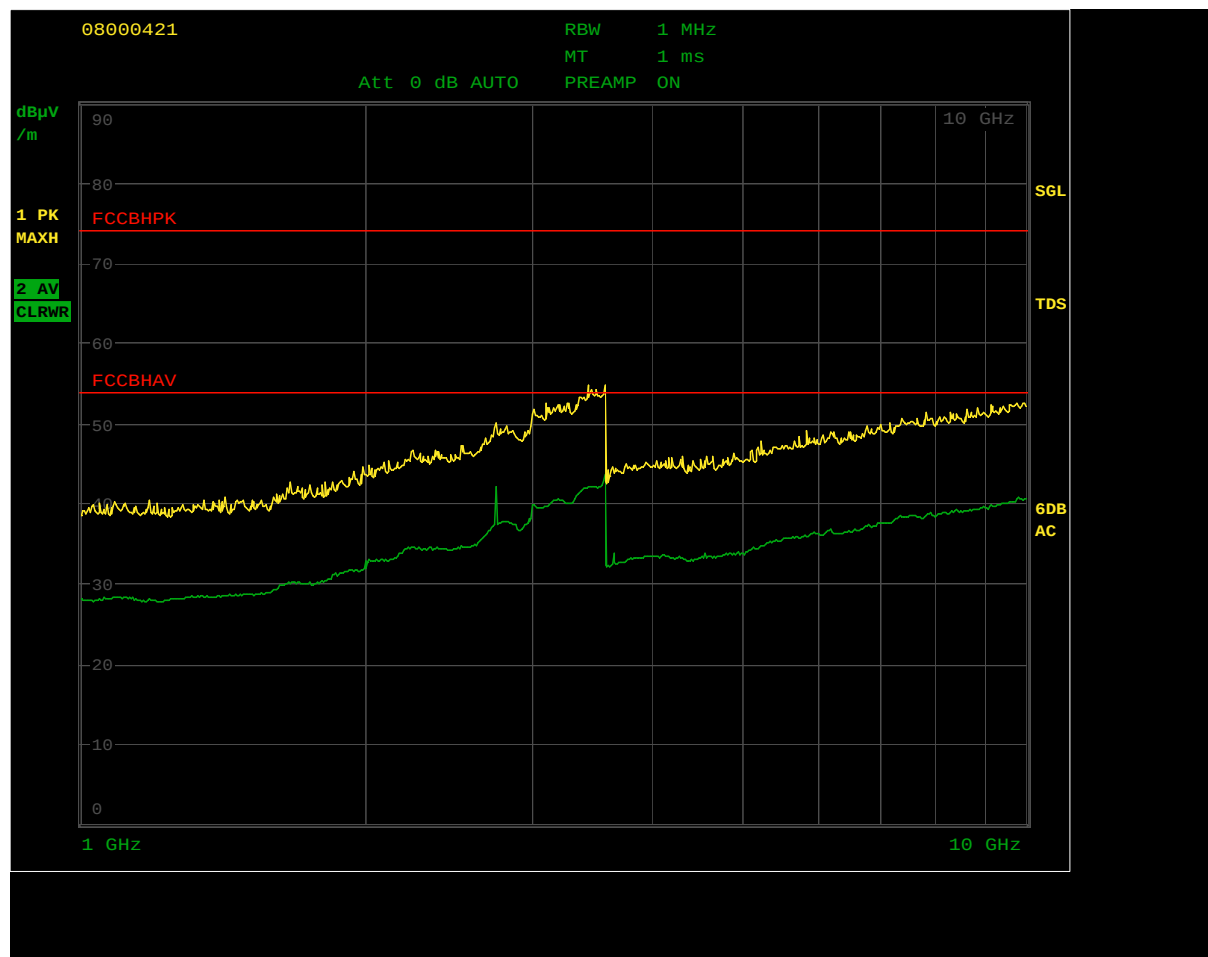


G08000420



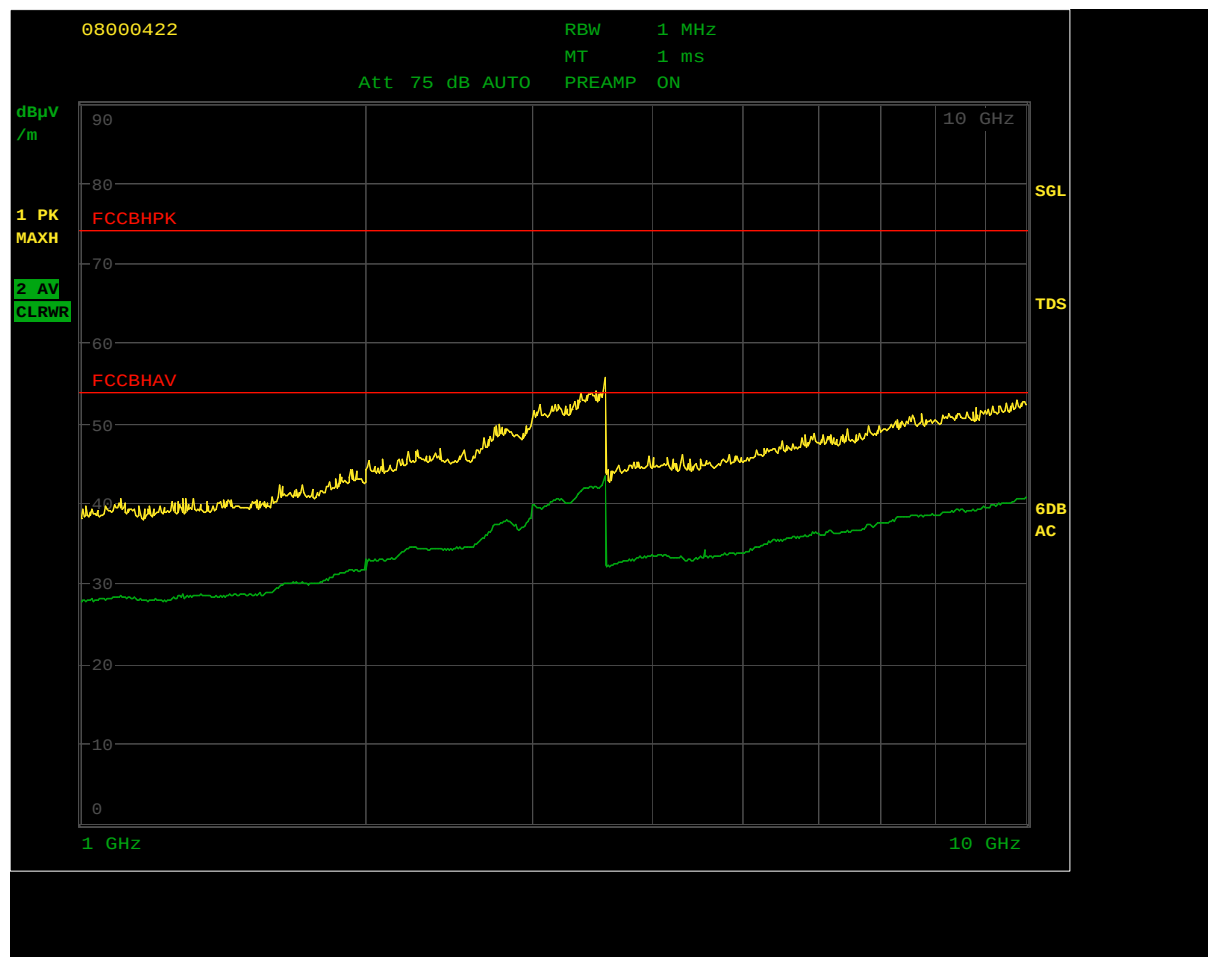


G08000421



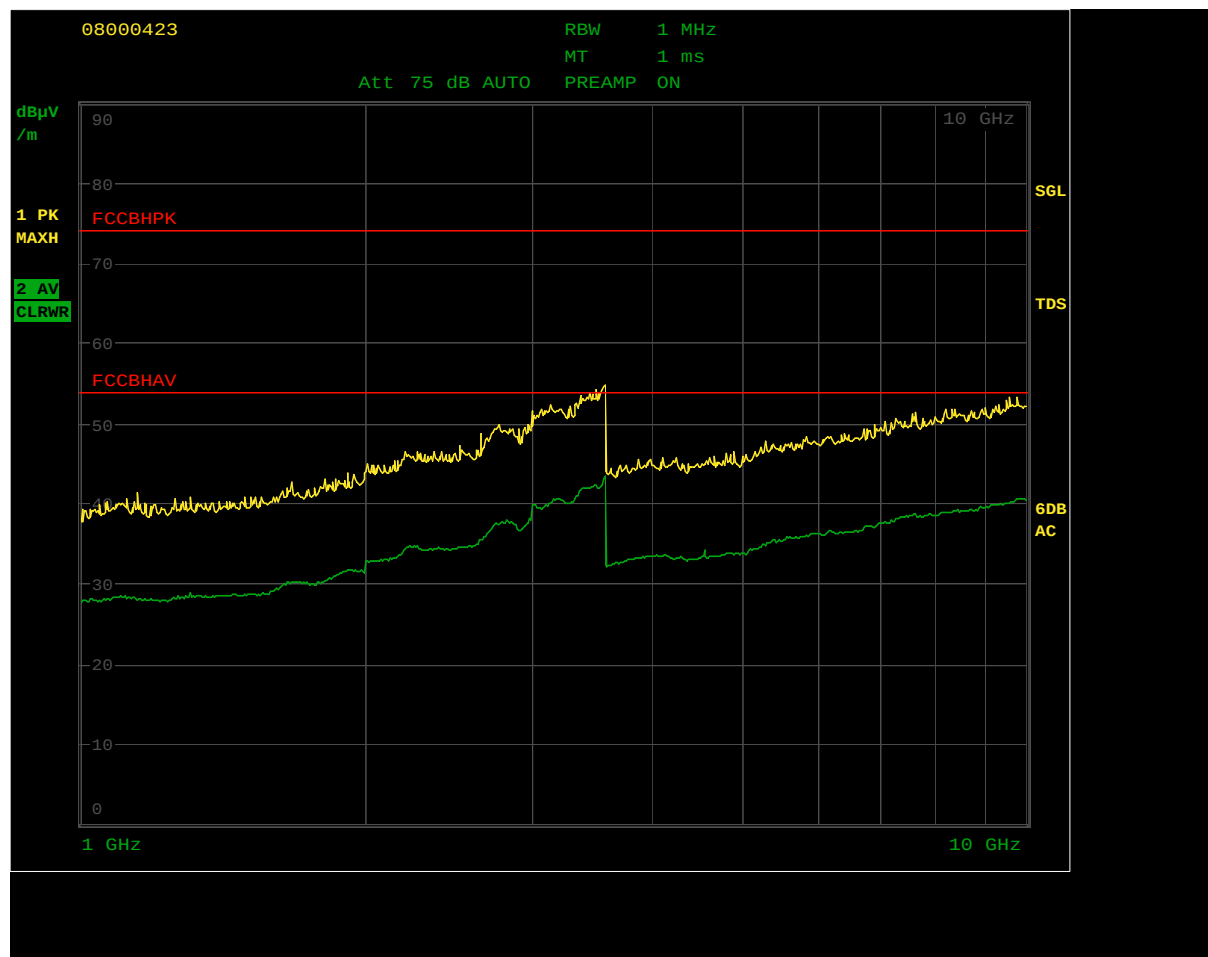


G08000422



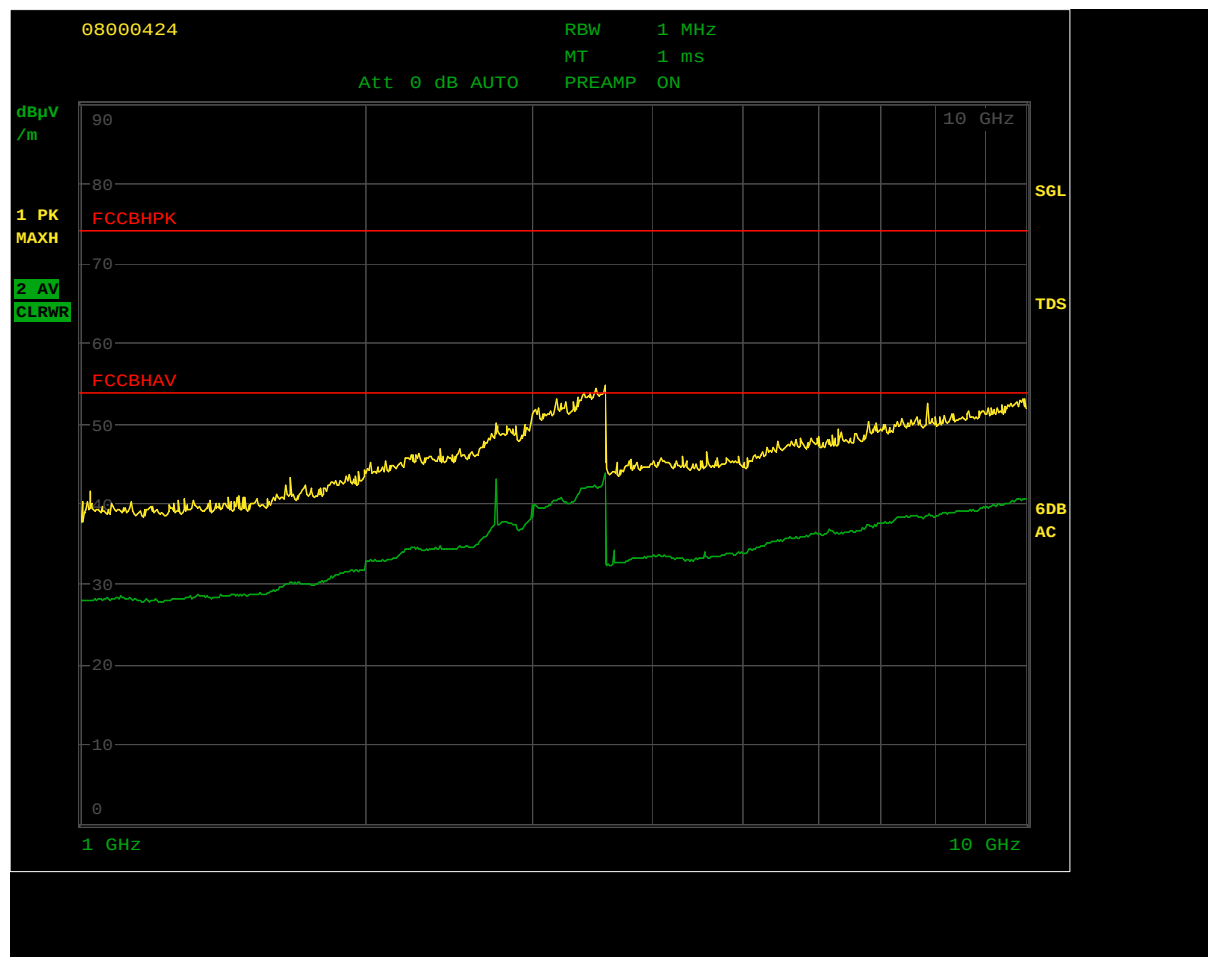


G08000423



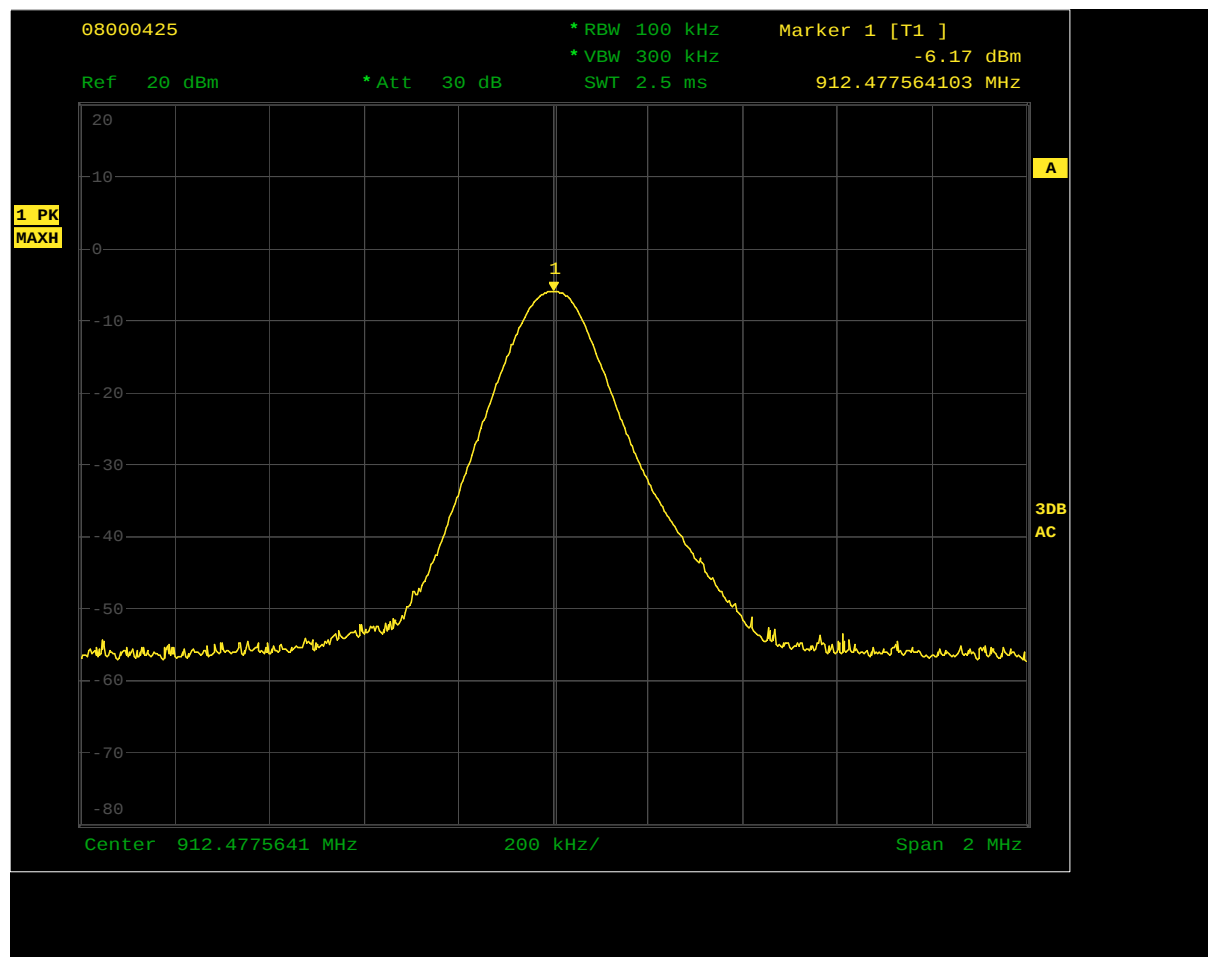


G08000424



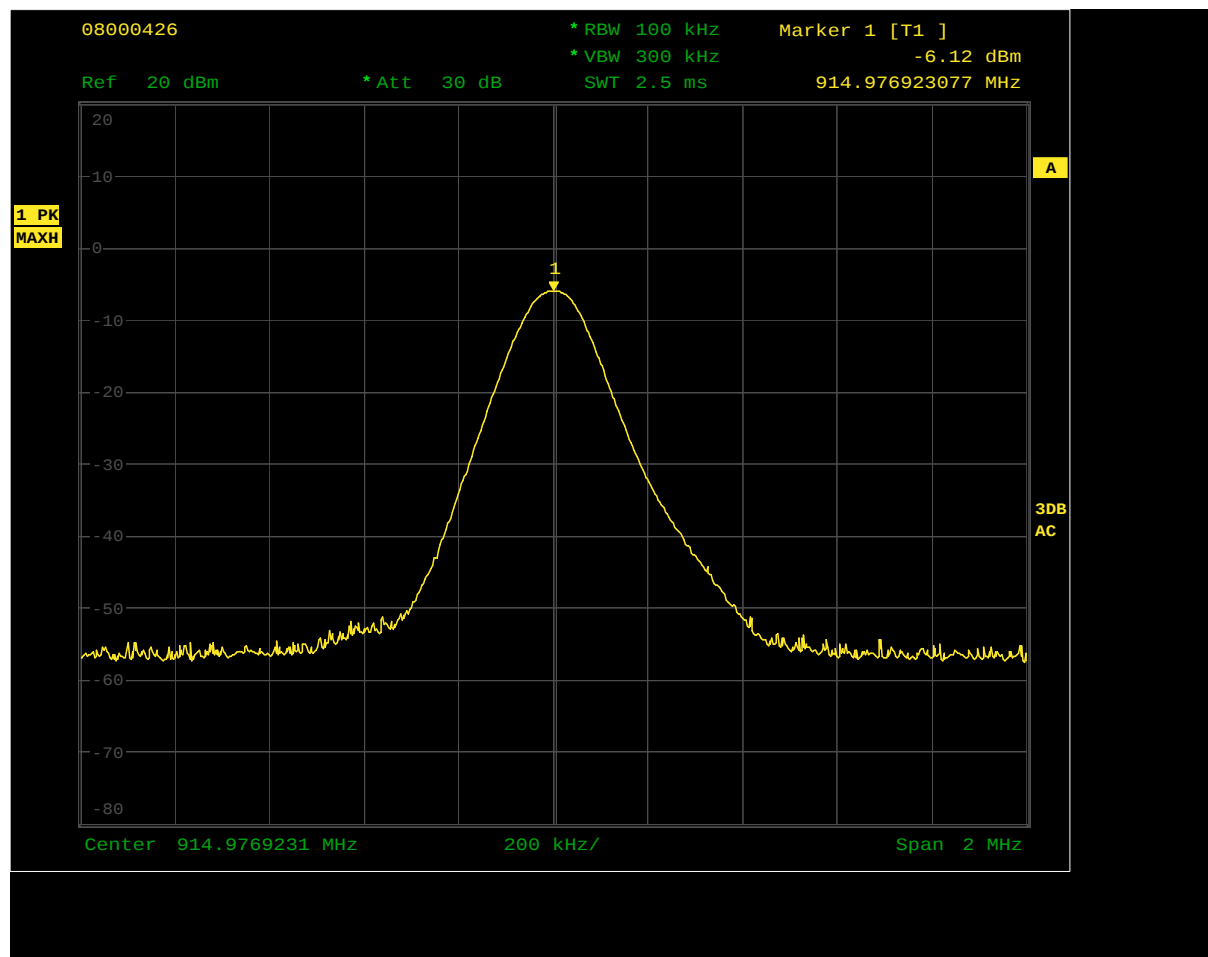


G08000425



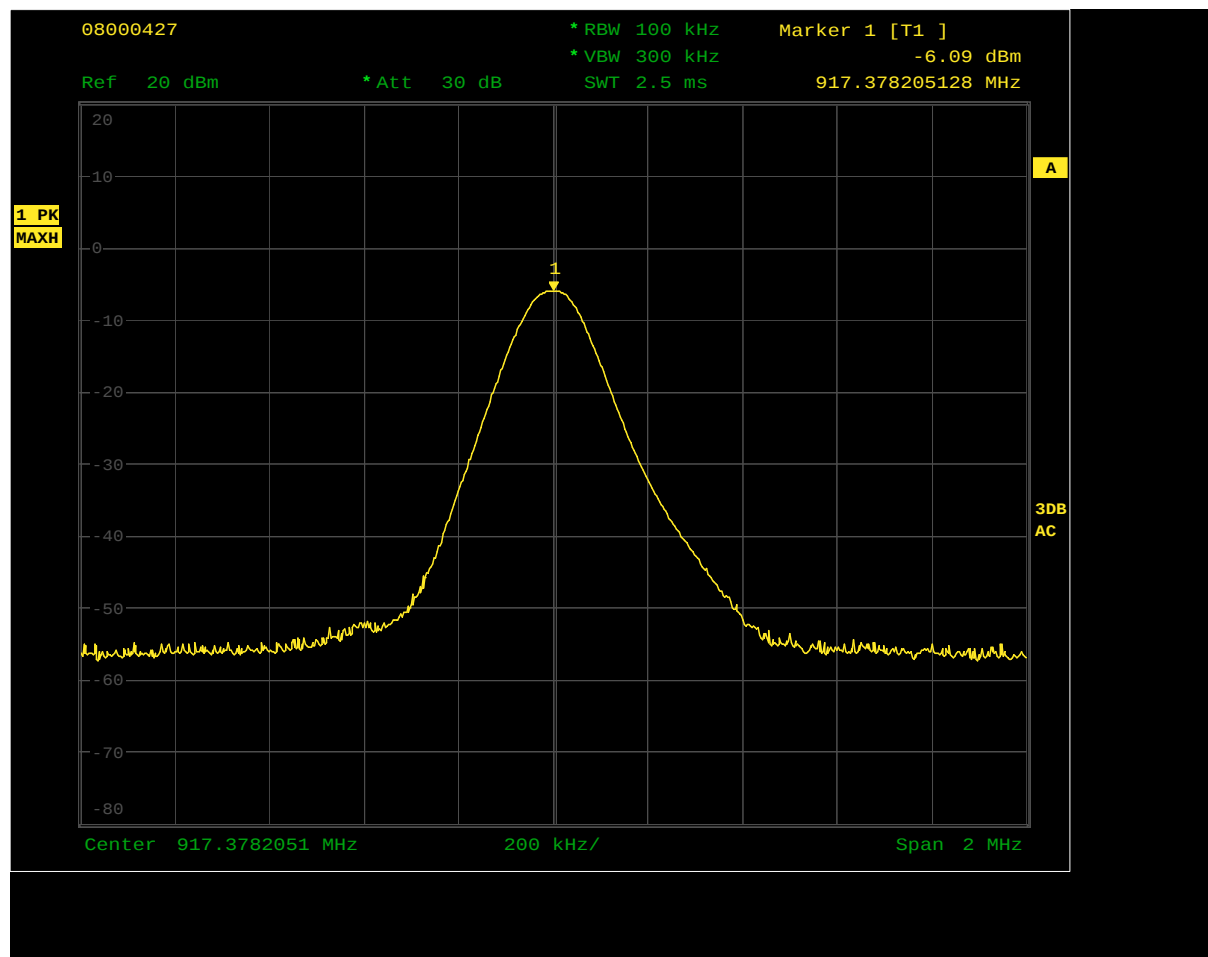


G08000426



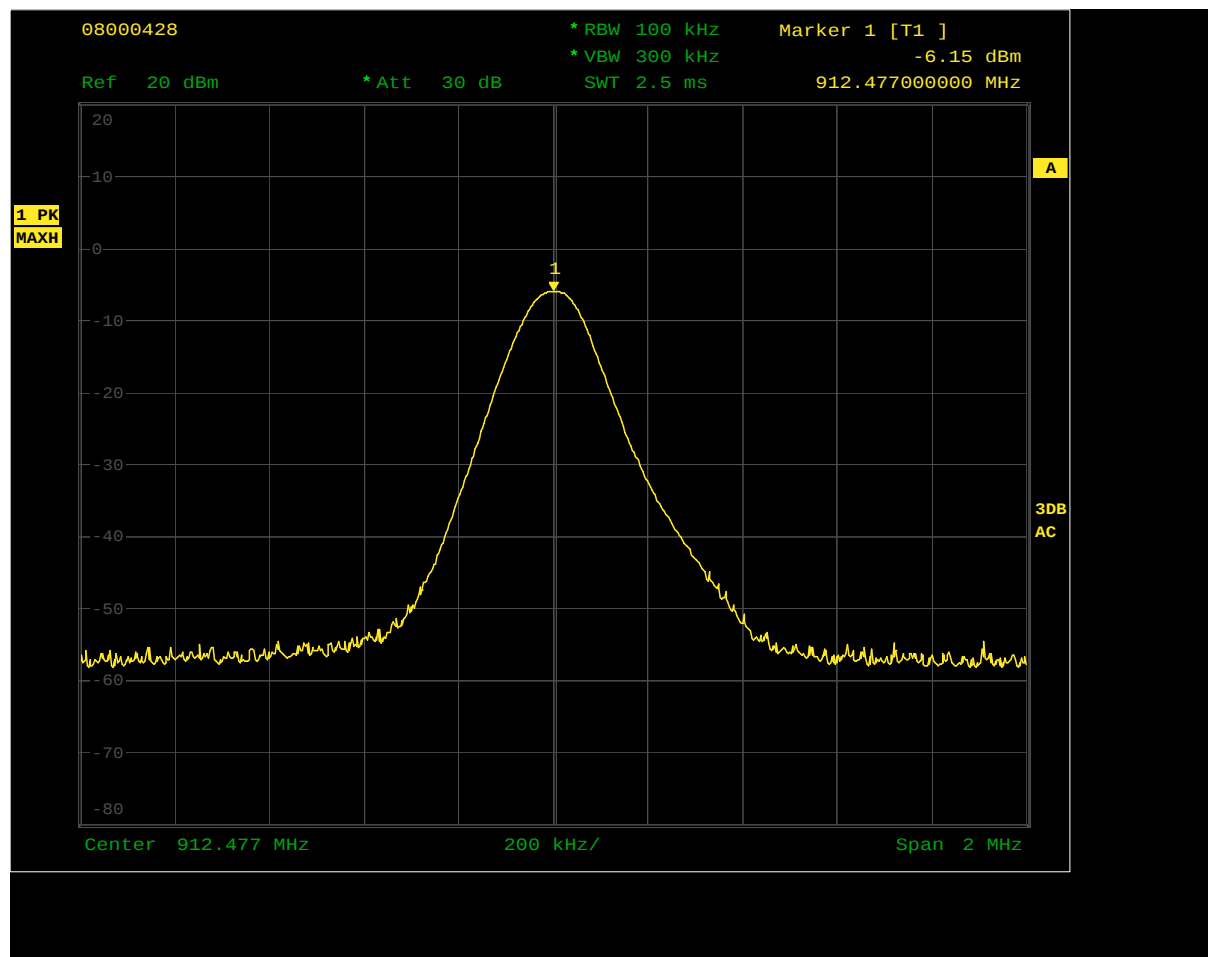


G08000427



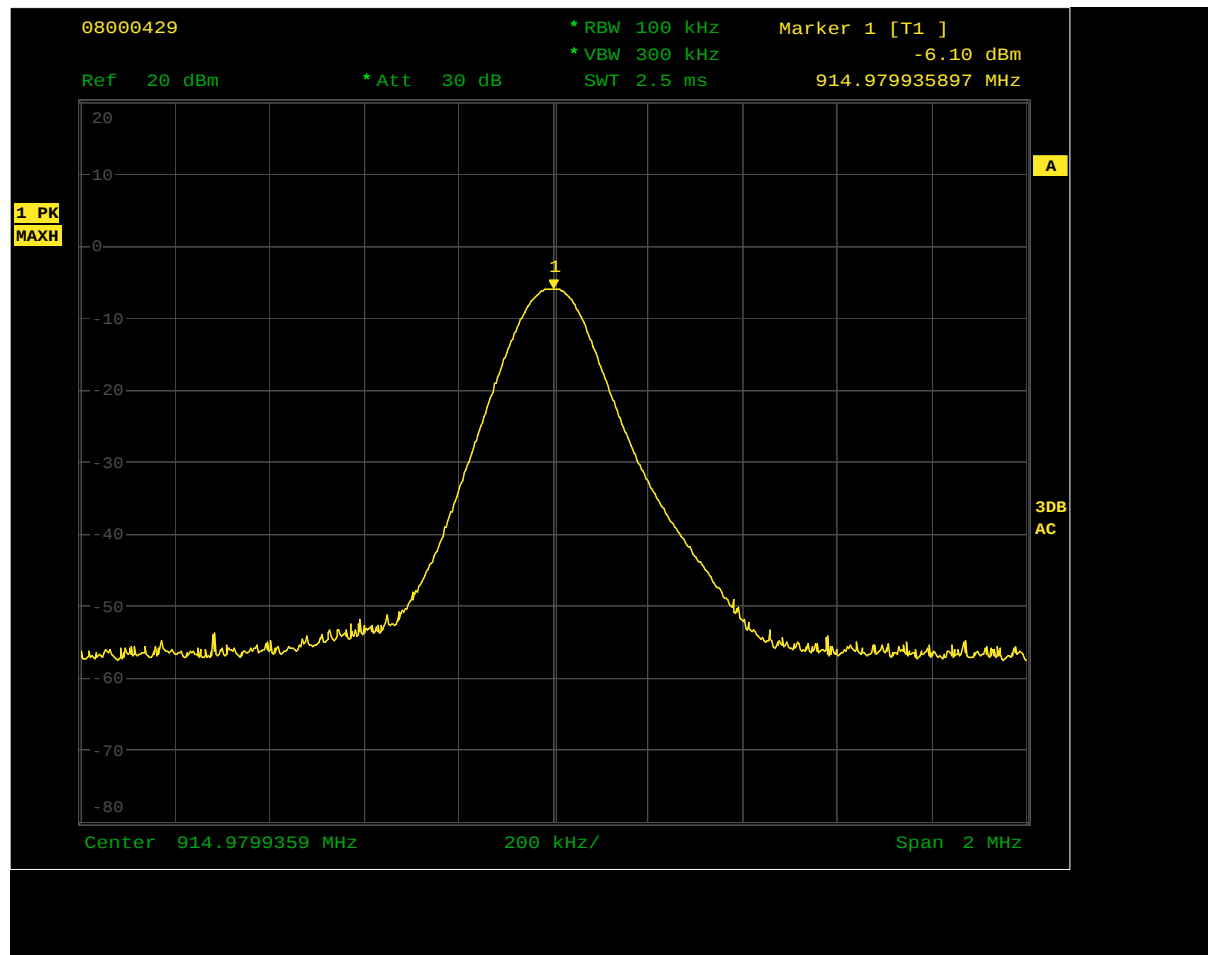


G08000428



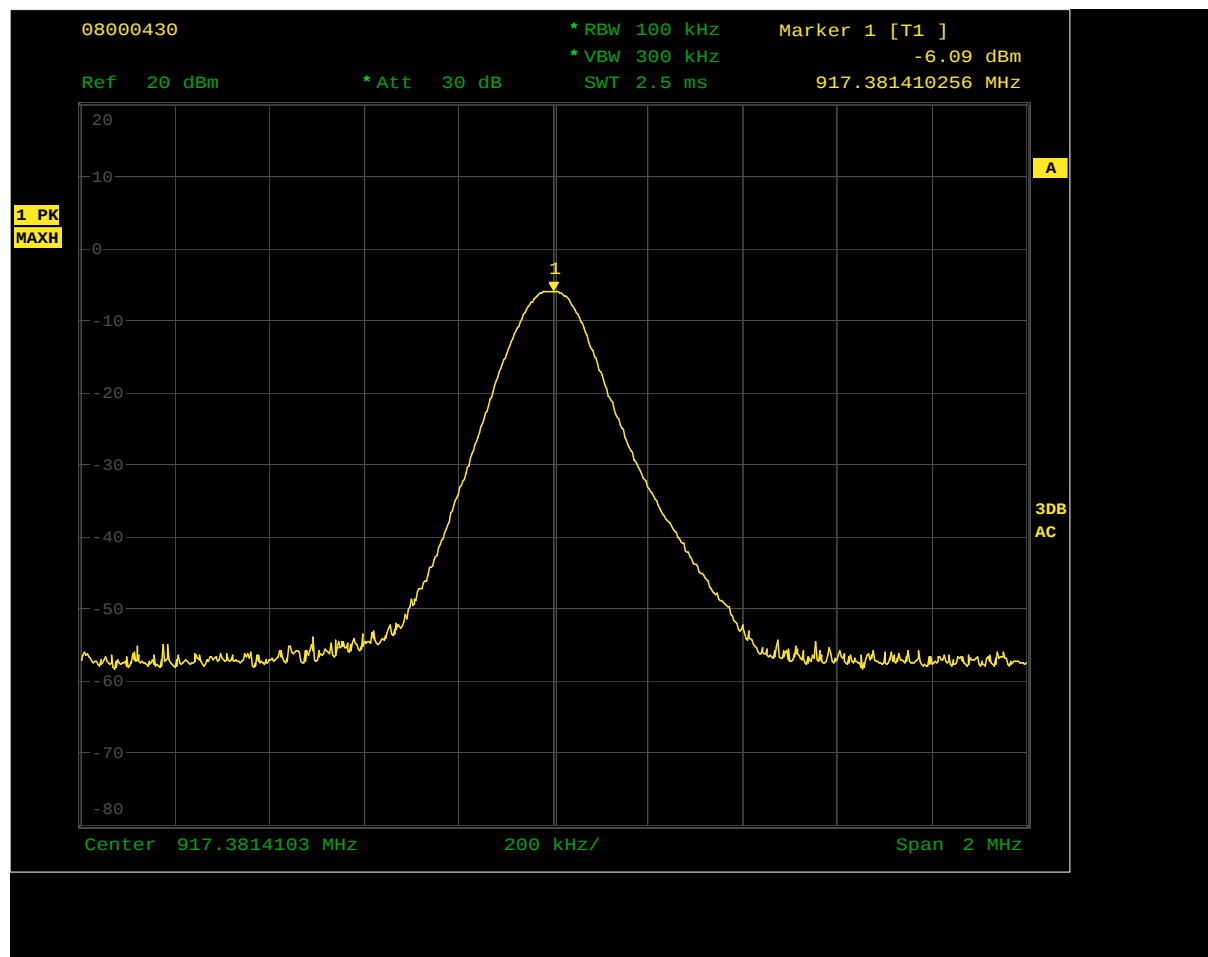


G08000429



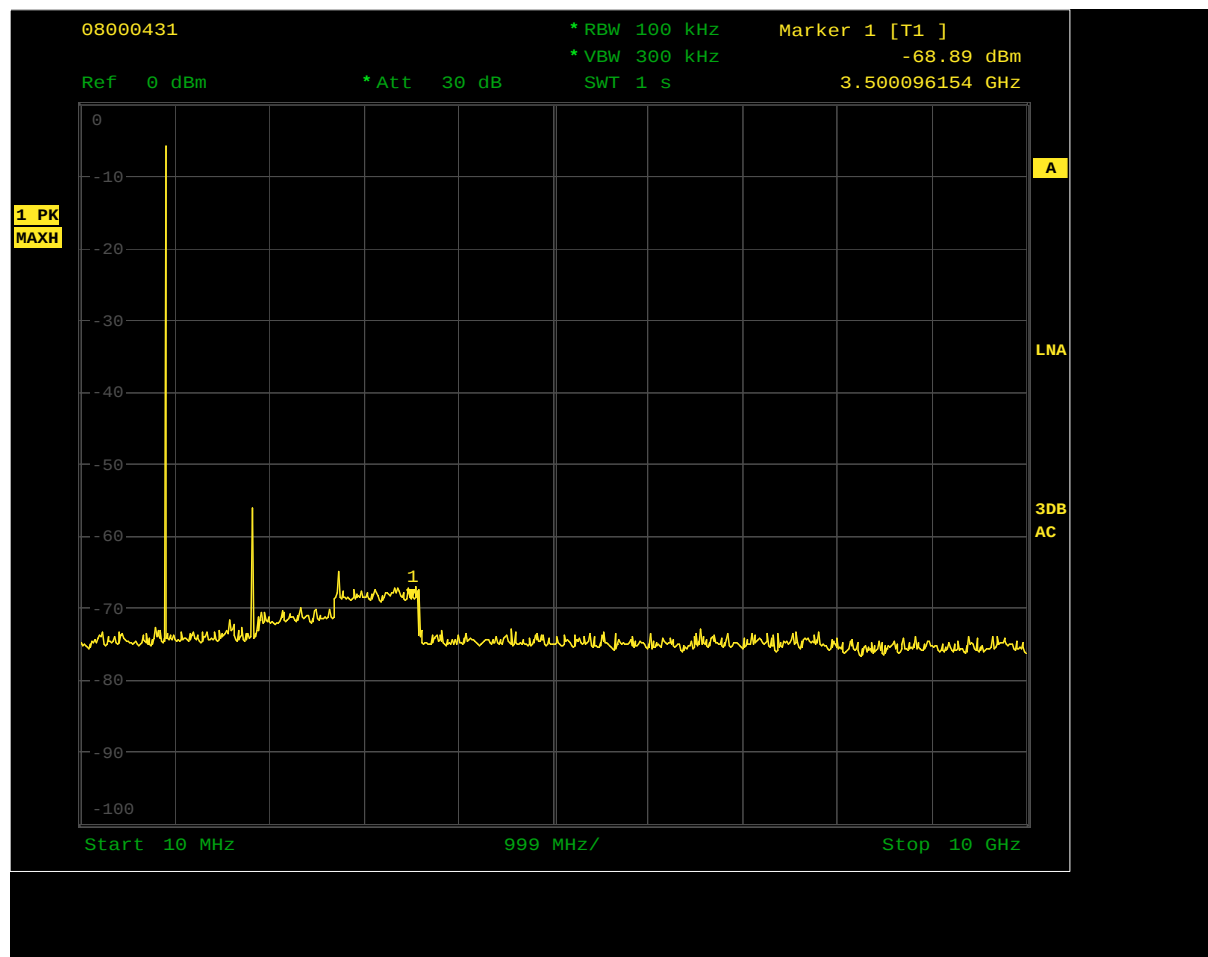


G08000430



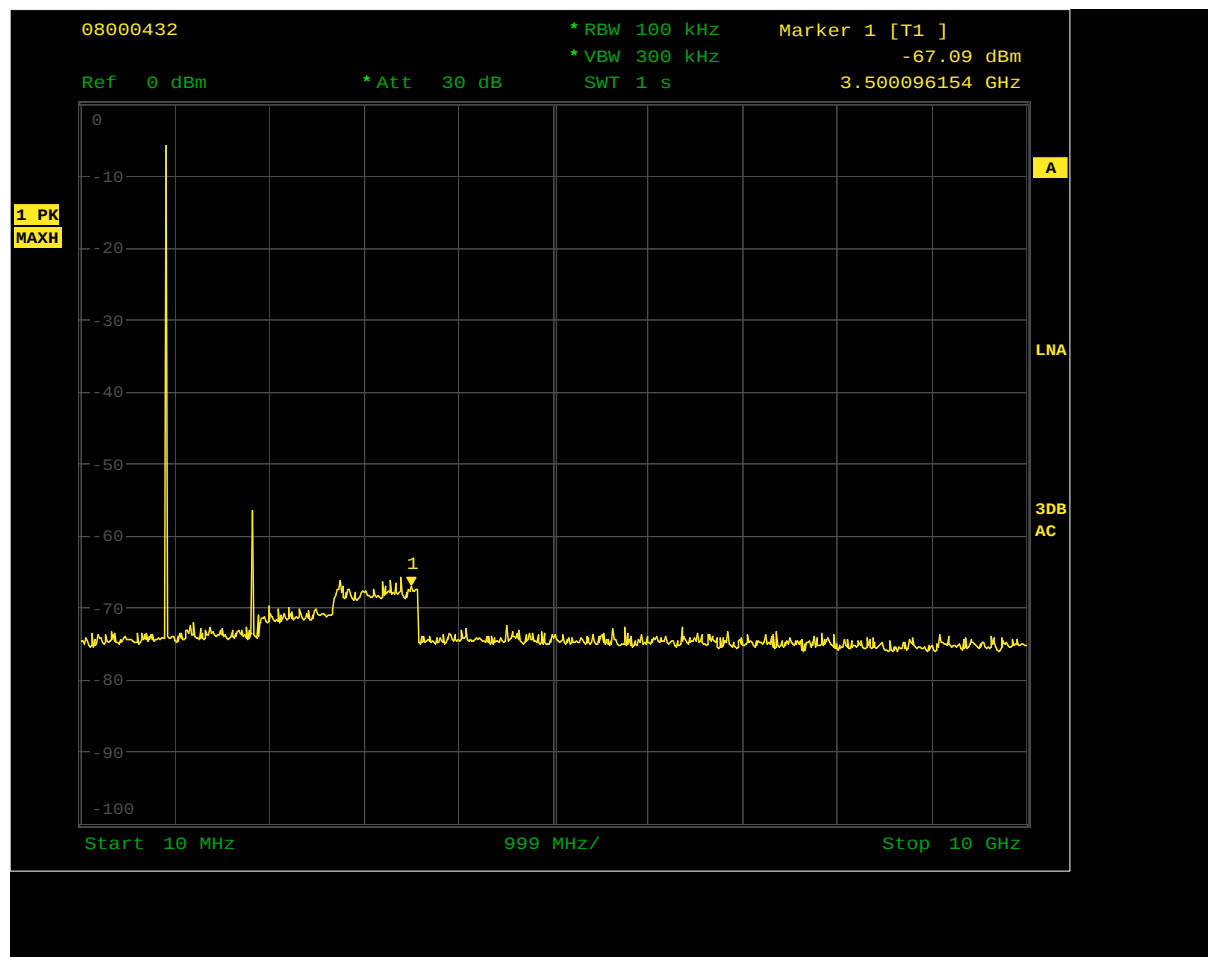


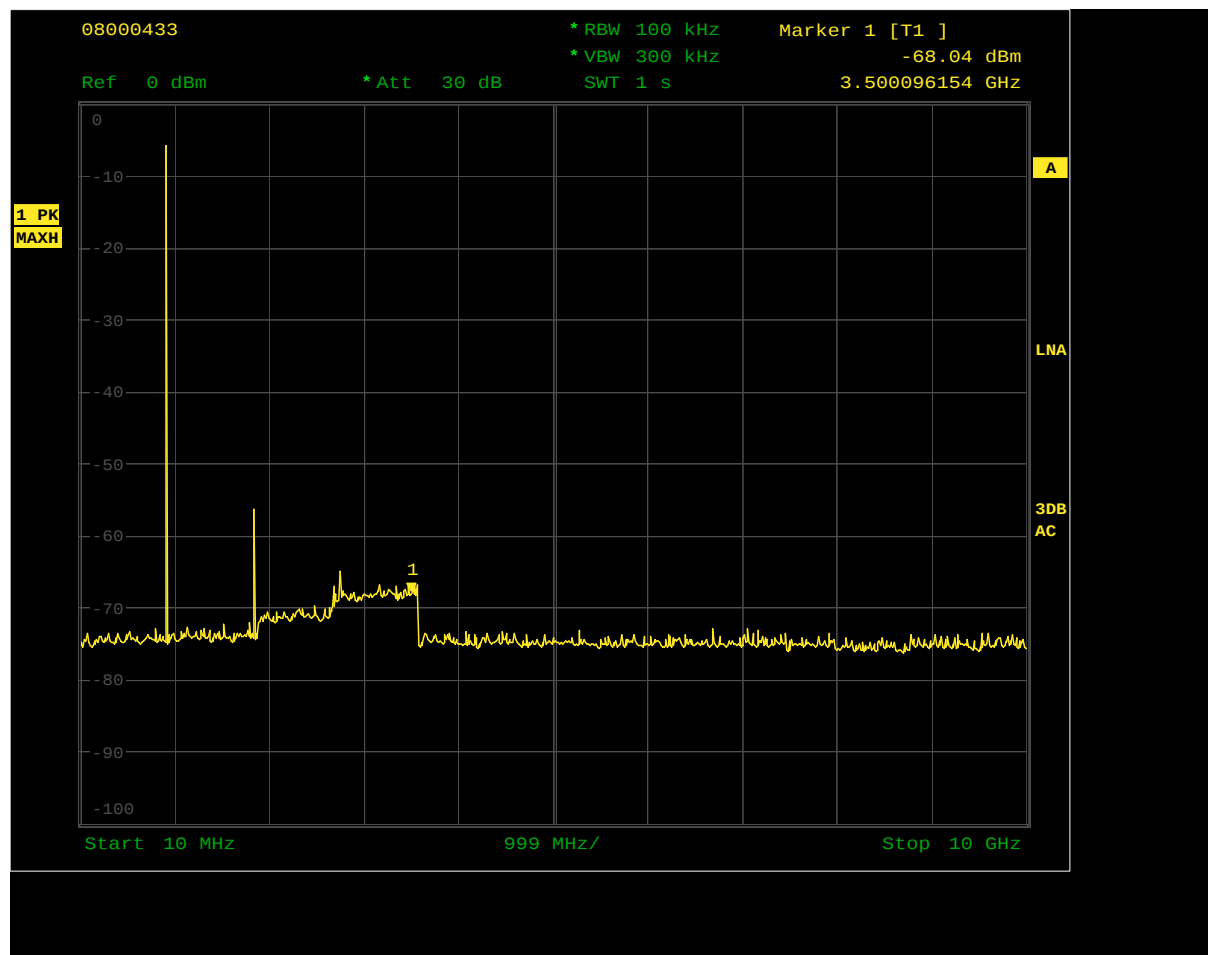
G08000431





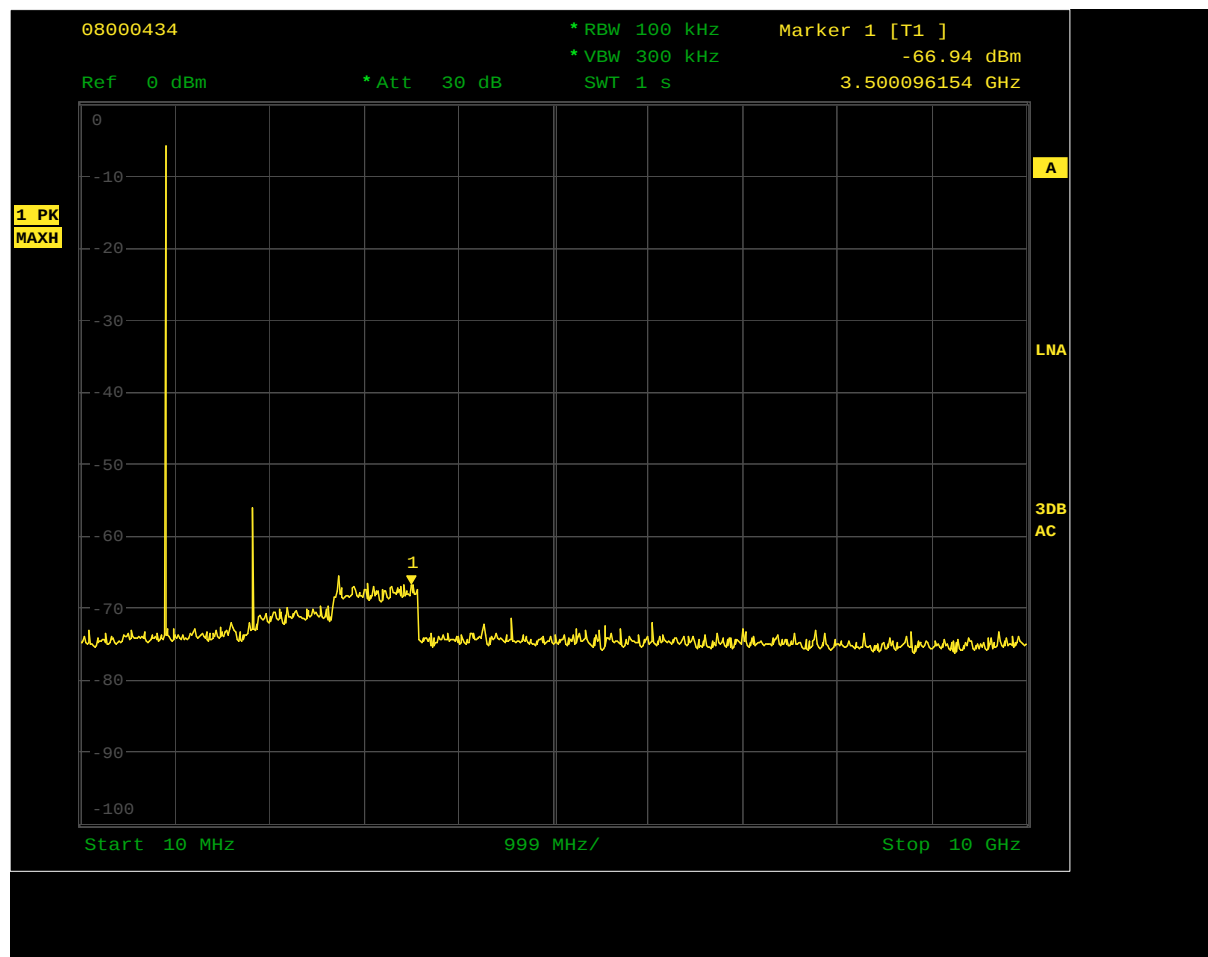
G08000432





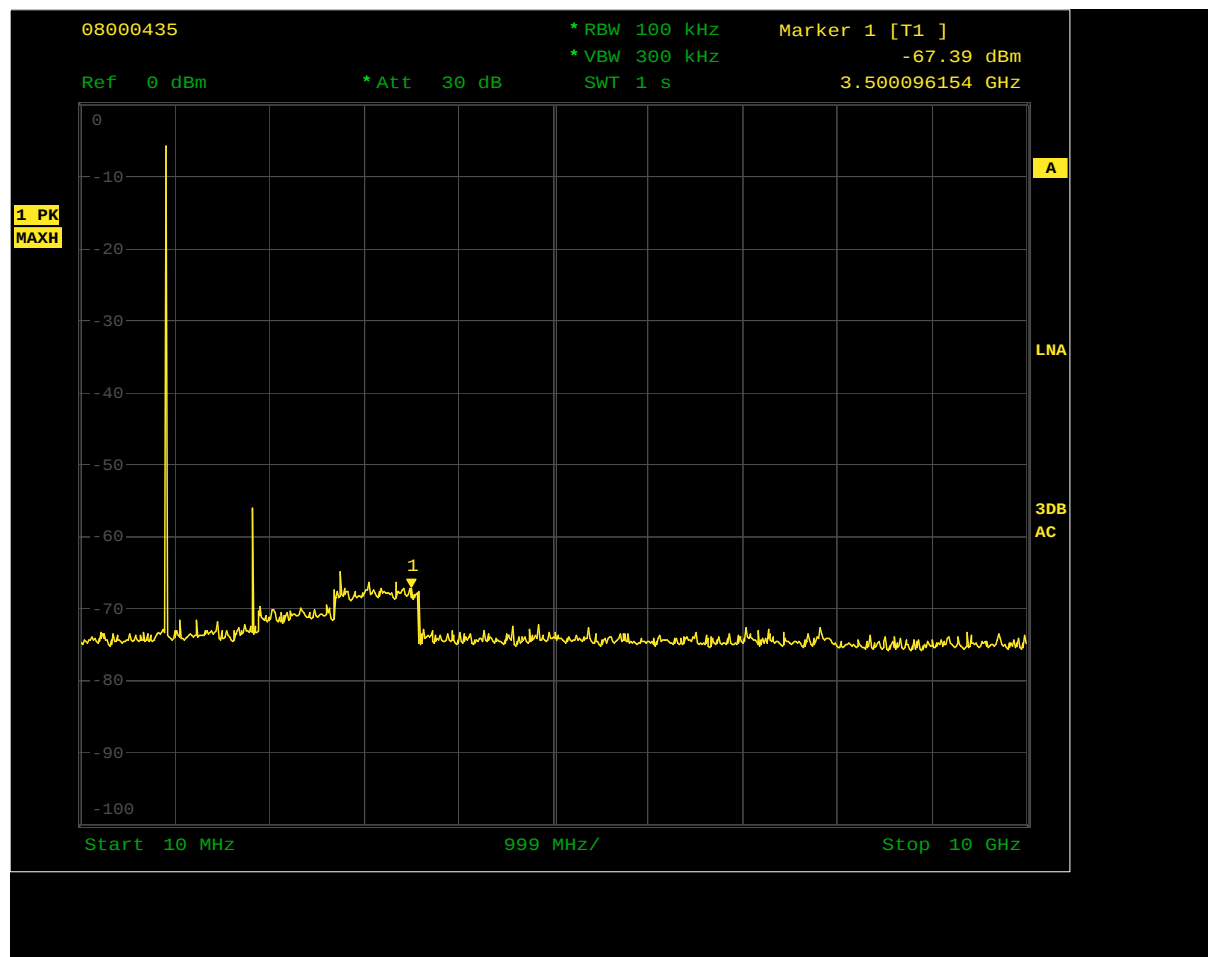


G08000434





G08000435





G08000436

