



**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

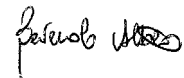
**Client's name.....: CAEN RFID**


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

**Manufacturer's name.: Same ad client**

Address .....:

**Report**

Tested by.....: A. Bertezolo - *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.



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<b>1. Summary</b>			
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.*



## 2. Description of Equipment under test (EUT)

Power supply ..... : 5 Vdc from external battery

Type of equipment ..... :  Transmitter Unit  Receiver Unit  
 Fixed station  Portable station  Mobile station

Receiver class ..... : --

Alignment range ..... : 912,5 – 917,4 MHz

Switching frequency ..... : 912,5 – 917,4 MHz

Number of channels ..... : --

Channel separation ..... : --

Modulation ..... : Type 1: EPC C1 G2  
 Type 2: ISO 18000-6B

Extreme conditions ..... : --

Maximum transmitter output power ..... : --

Information on antenna ..... :  Integrated  
 Extern  
 Other: See user's manual

Duty cycle ..... : --

Remark ..... : The A828US Module, which is rated at 50mW output, cannot use an antenna with more than 16dBi of gain. Use of any other antenna with a gain greater than 16dBi may void the user's authority to operate the equipment.

### 2.1 Test Site

Company ..... : CMC Centro Misure Compatibilità S.r.l.

Address ..... : Via dell' Elettronica, 12/C – 36016 Thiene (VI) – ITALY

## 3. Testing and sampling

Date of receipt of test item ..... : 08.01.08

Testing start date ..... : 08.01.08

Testing end date ..... : 08.01.08

Samples tested nr. .... : 1

Sampling procedure ..... : Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion

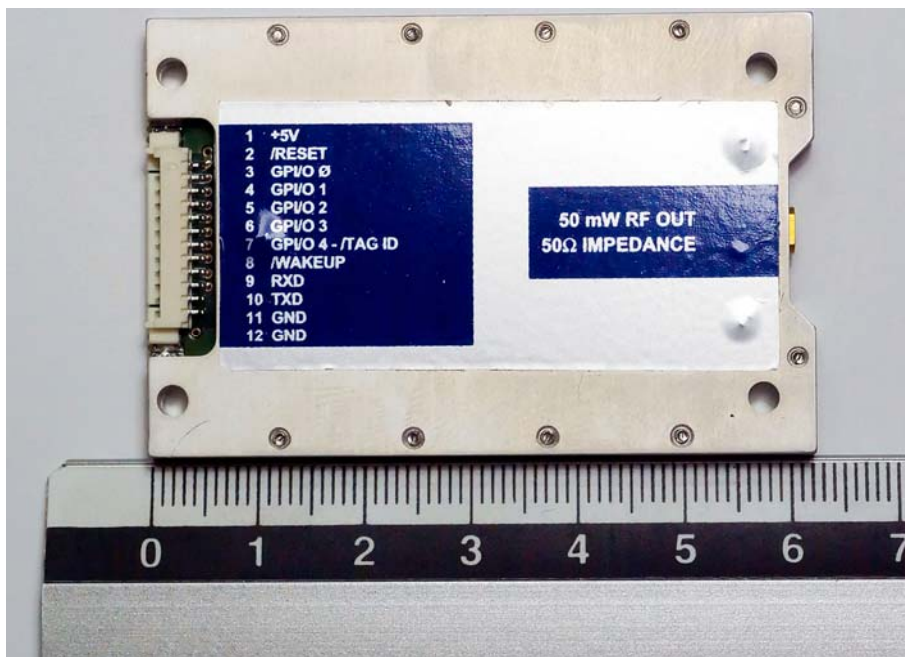
Internal identification ..... : adhesive label with the product number P080004

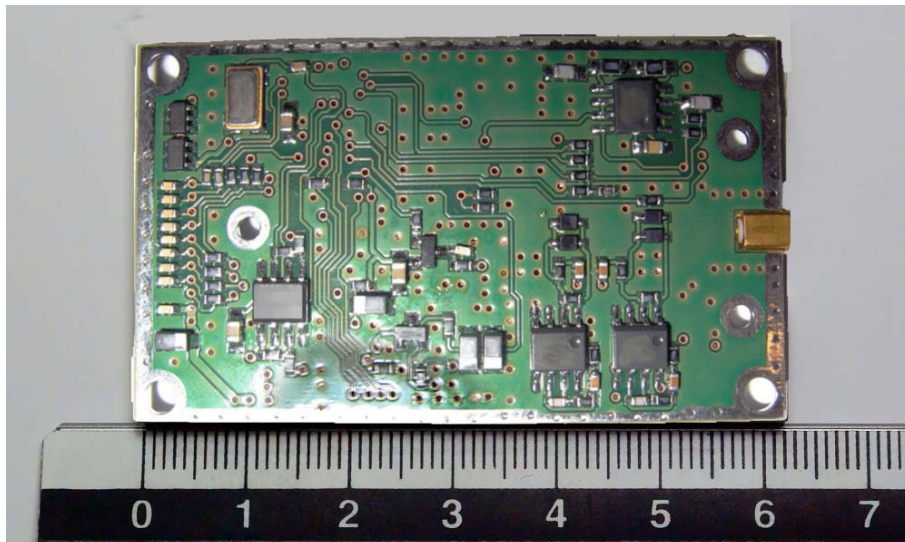
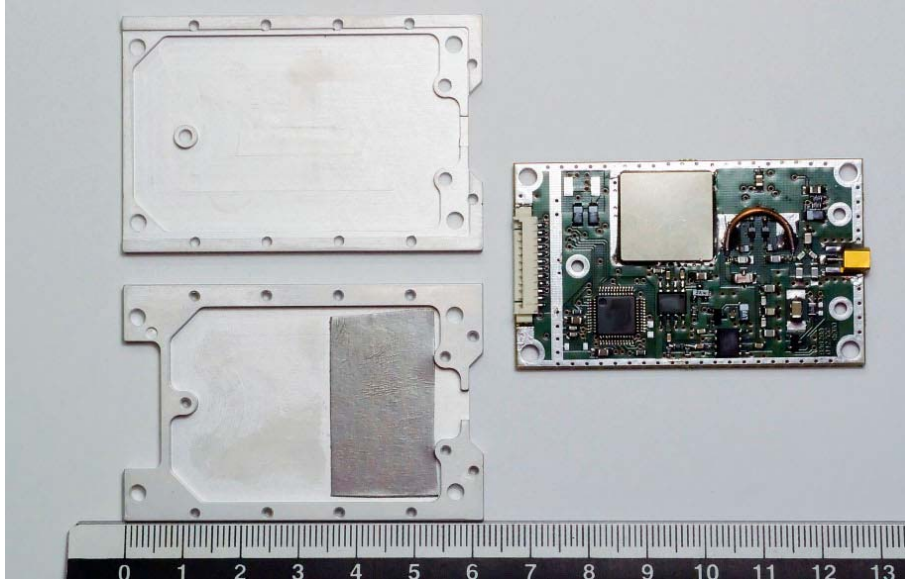
## 4. Operative conditions

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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

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





## 8. Reference documents

<i>Reference no.</i>	<i>Description</i>
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)



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## 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

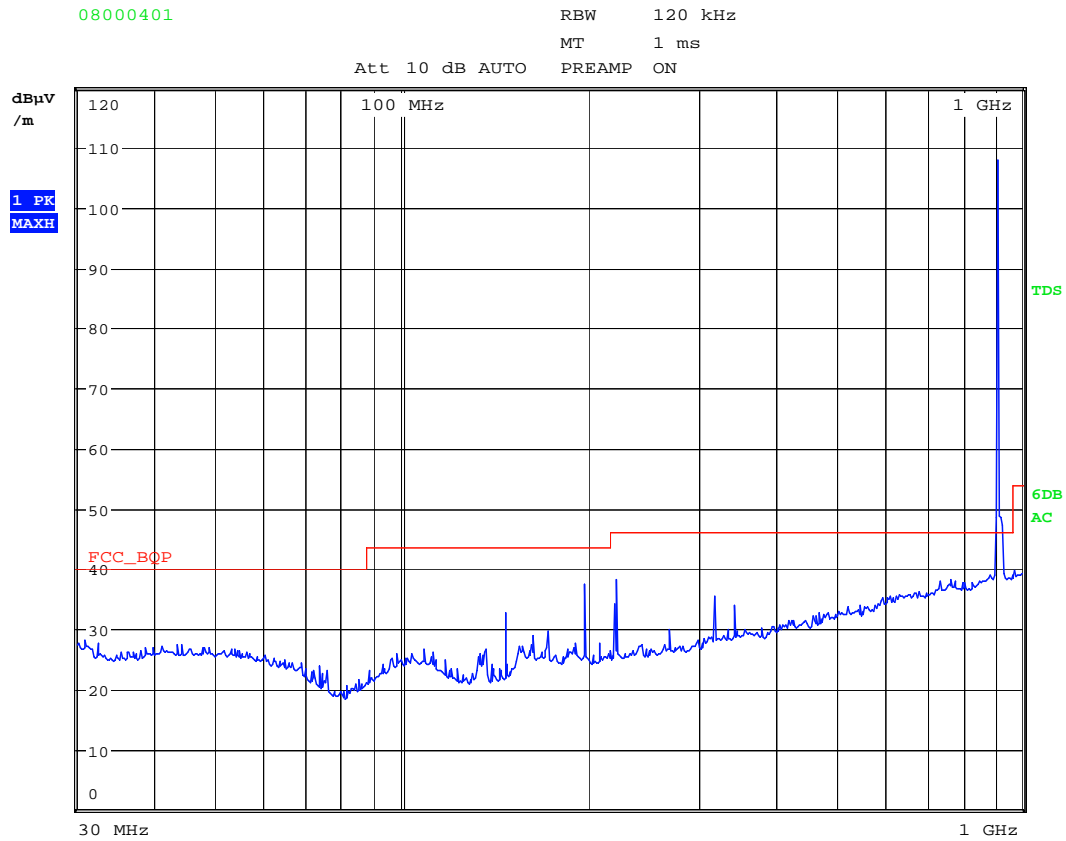
## Result

The requirements are met



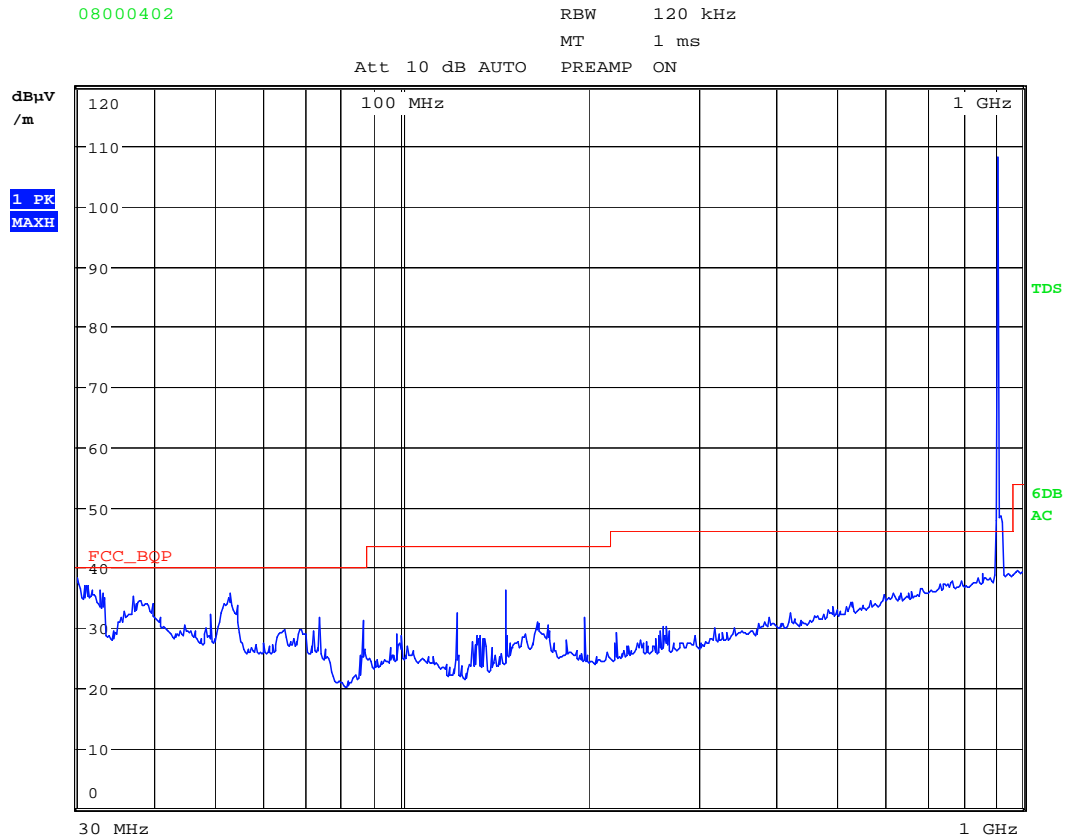
## 12. Graphs and Tables

G08000401





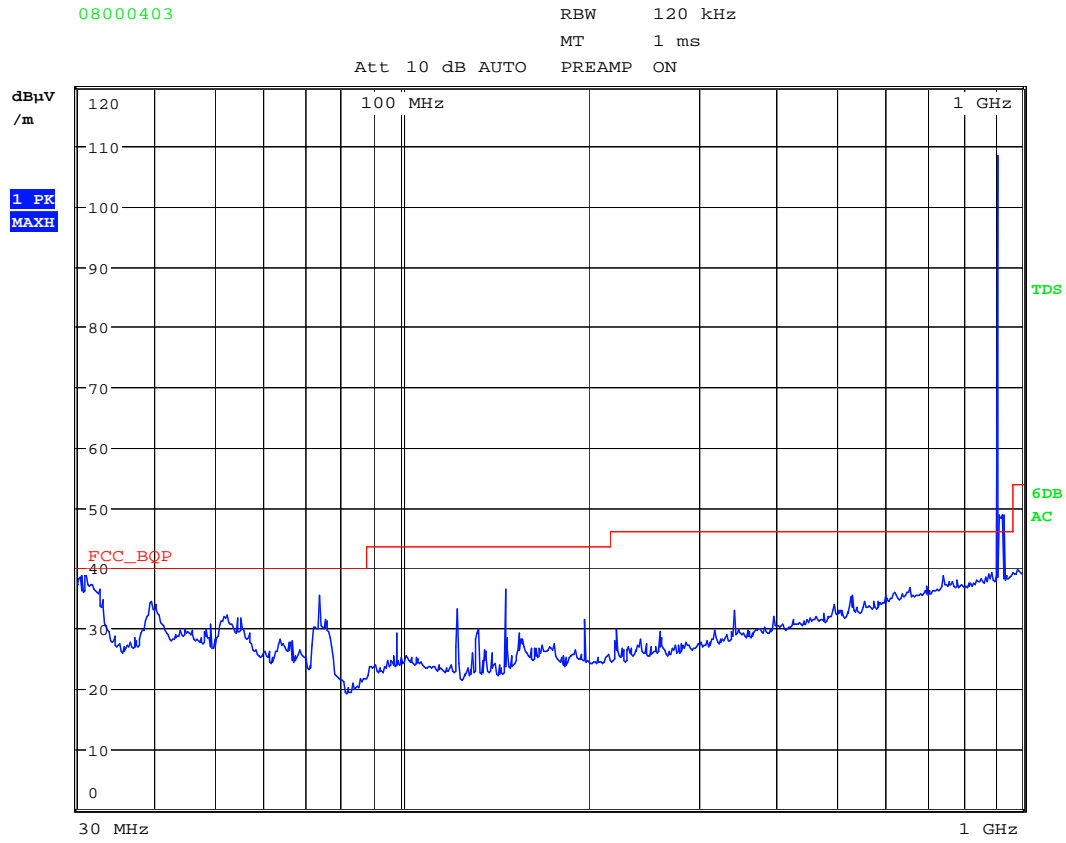
### G08000402





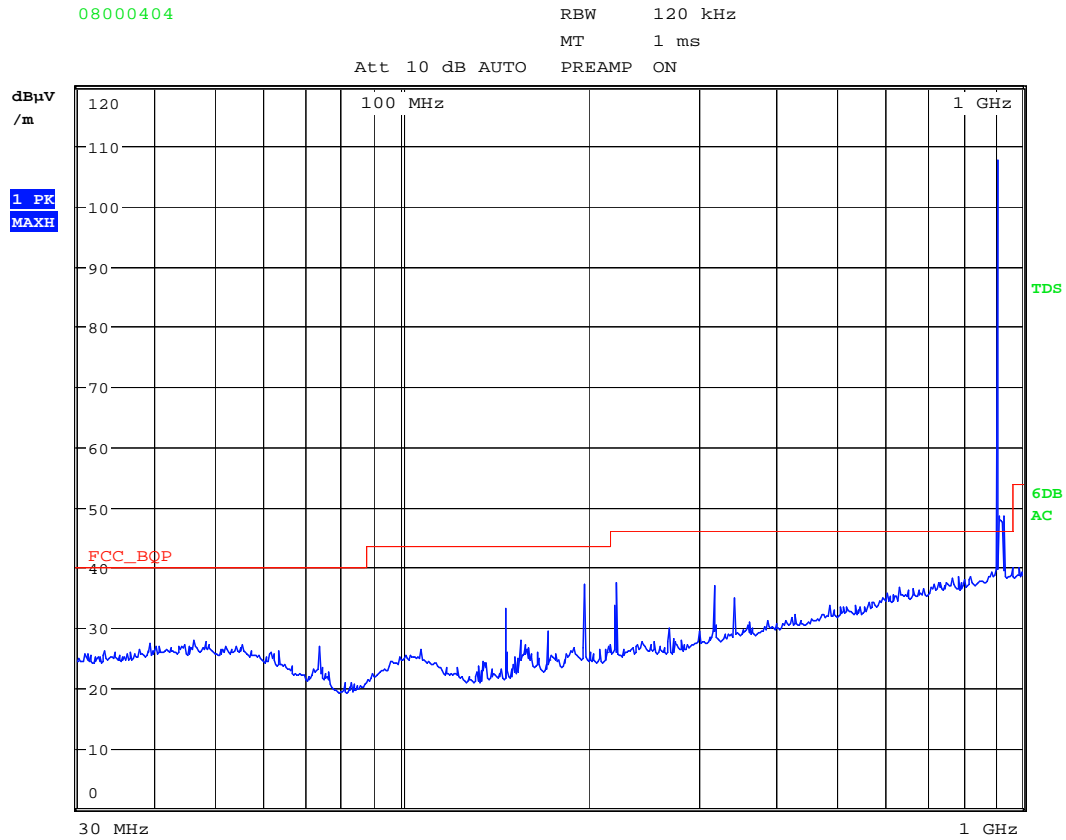


### G08000403



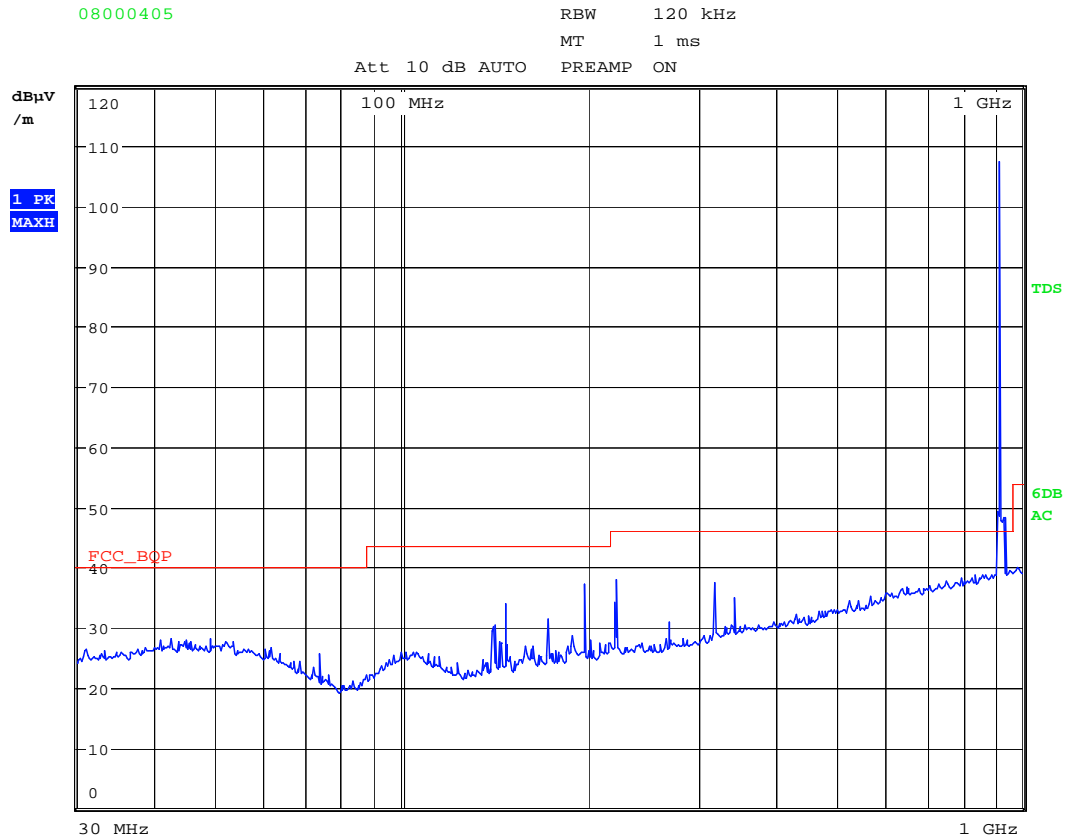


### G08000404



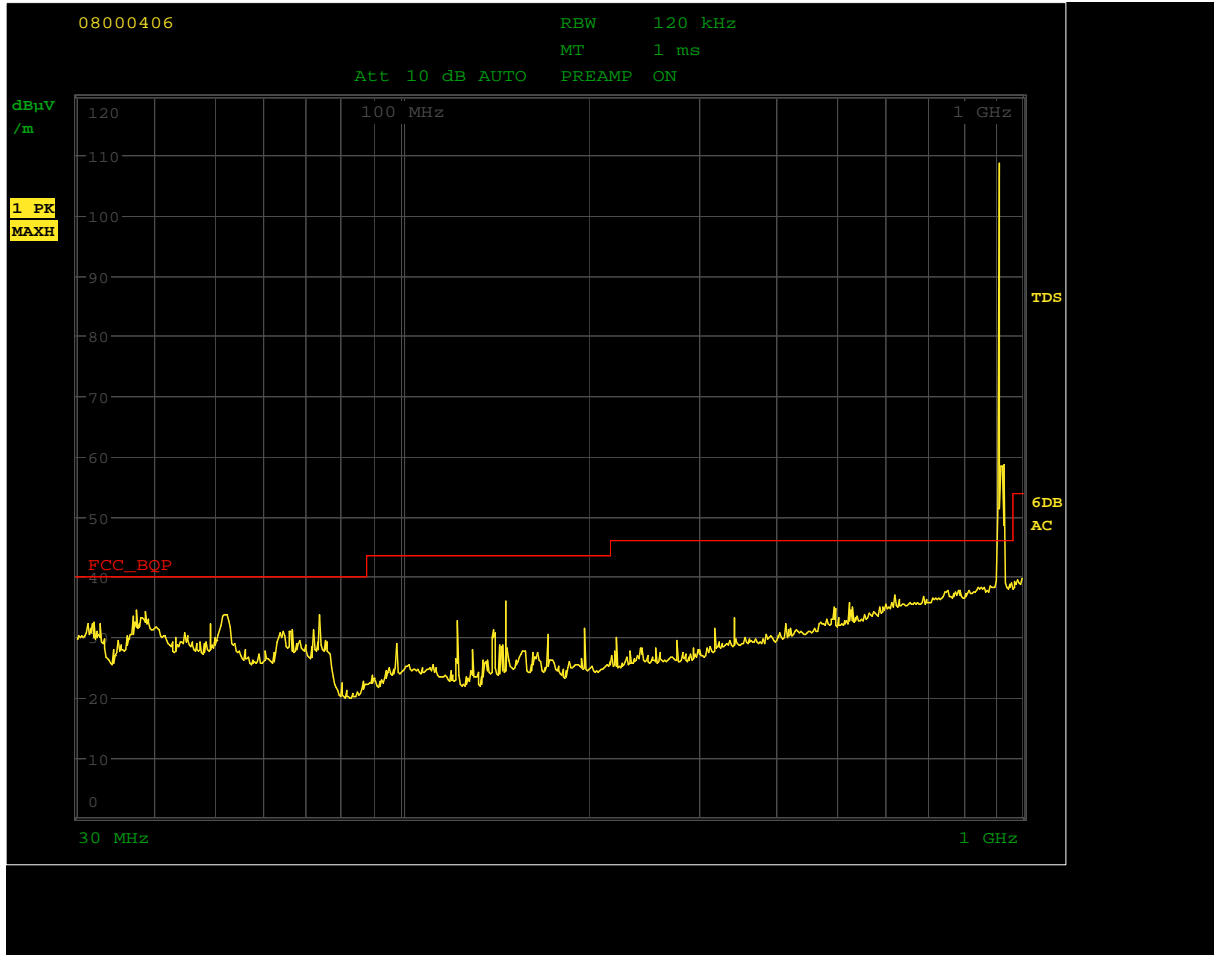


### G08000405



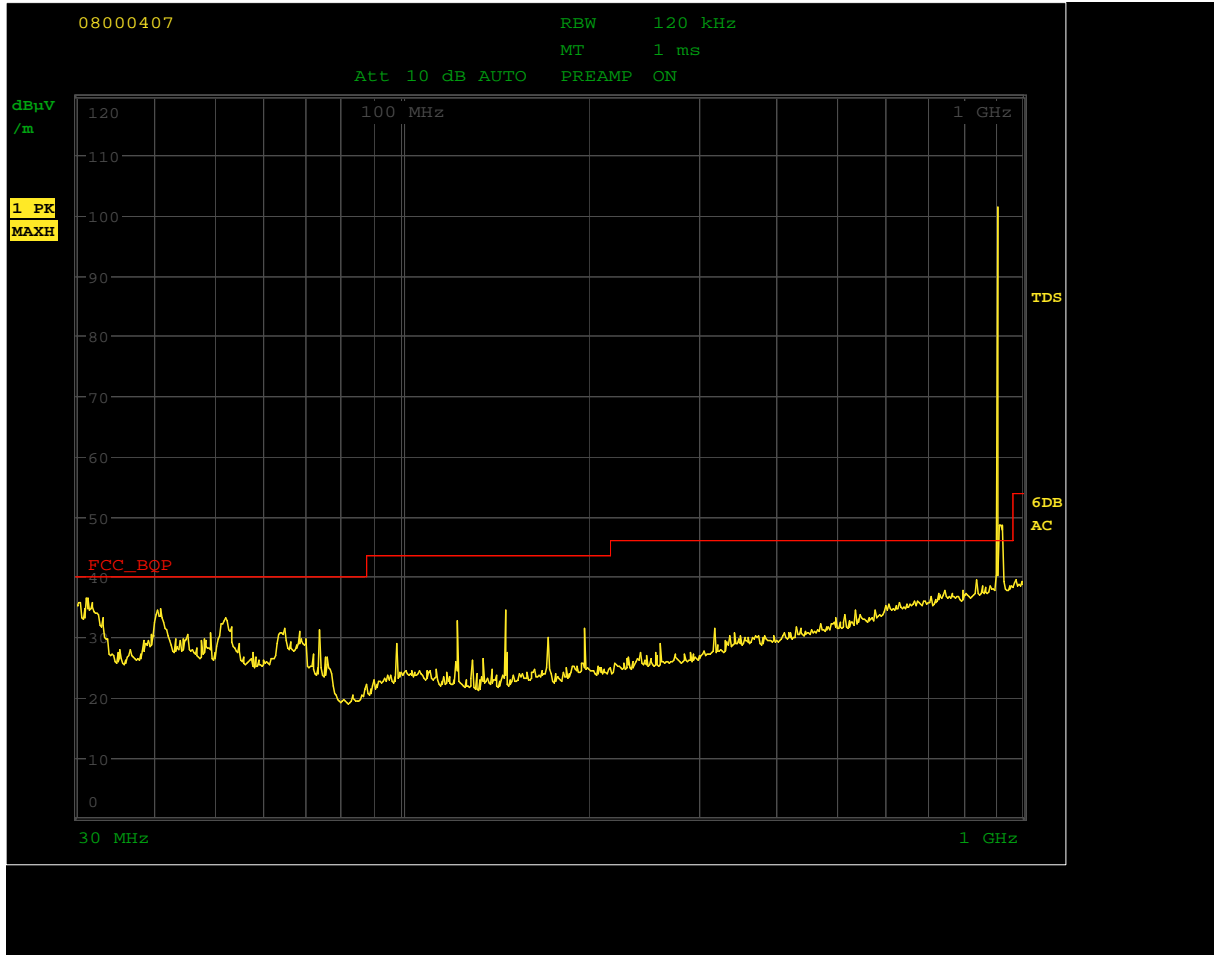


G08000406



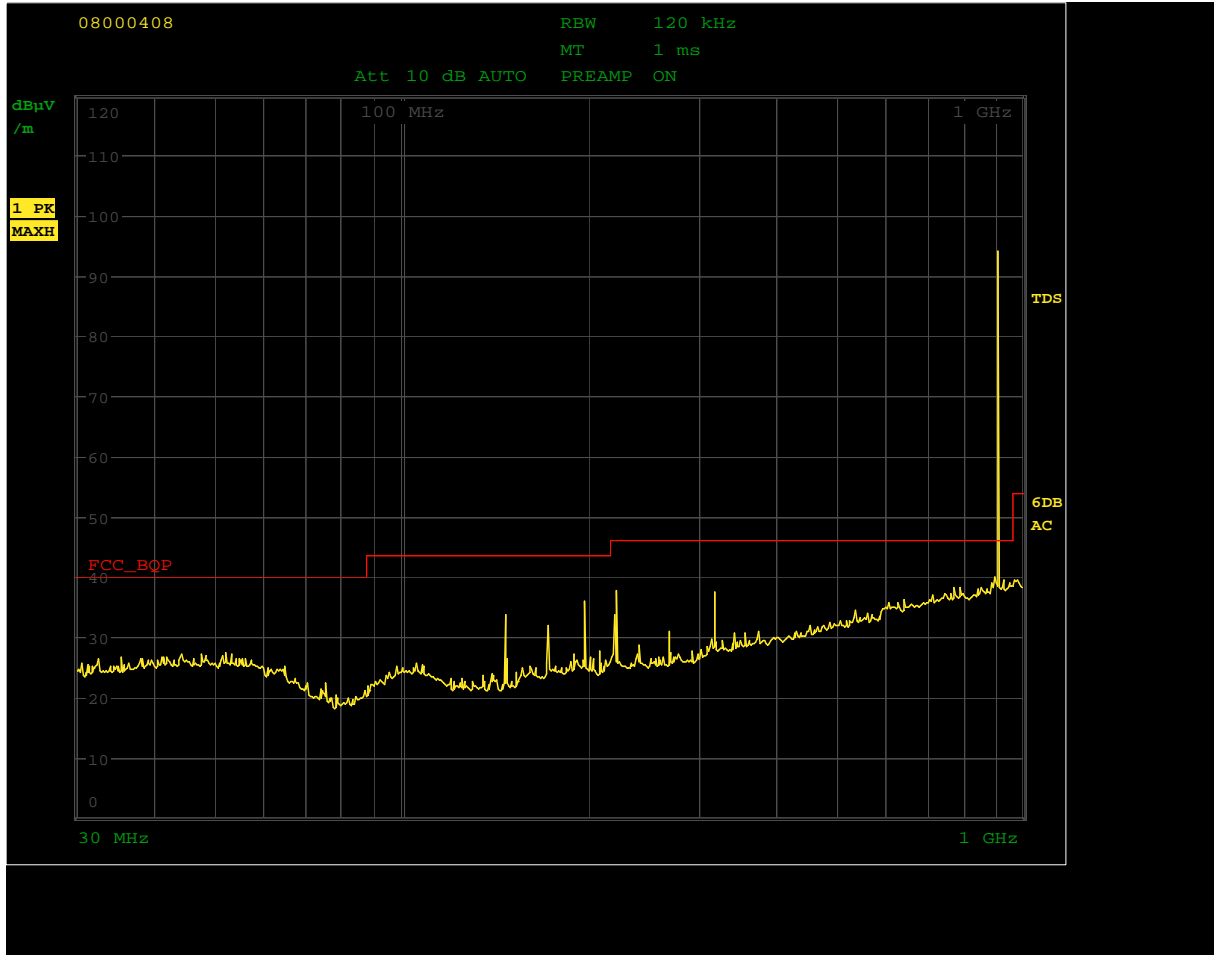


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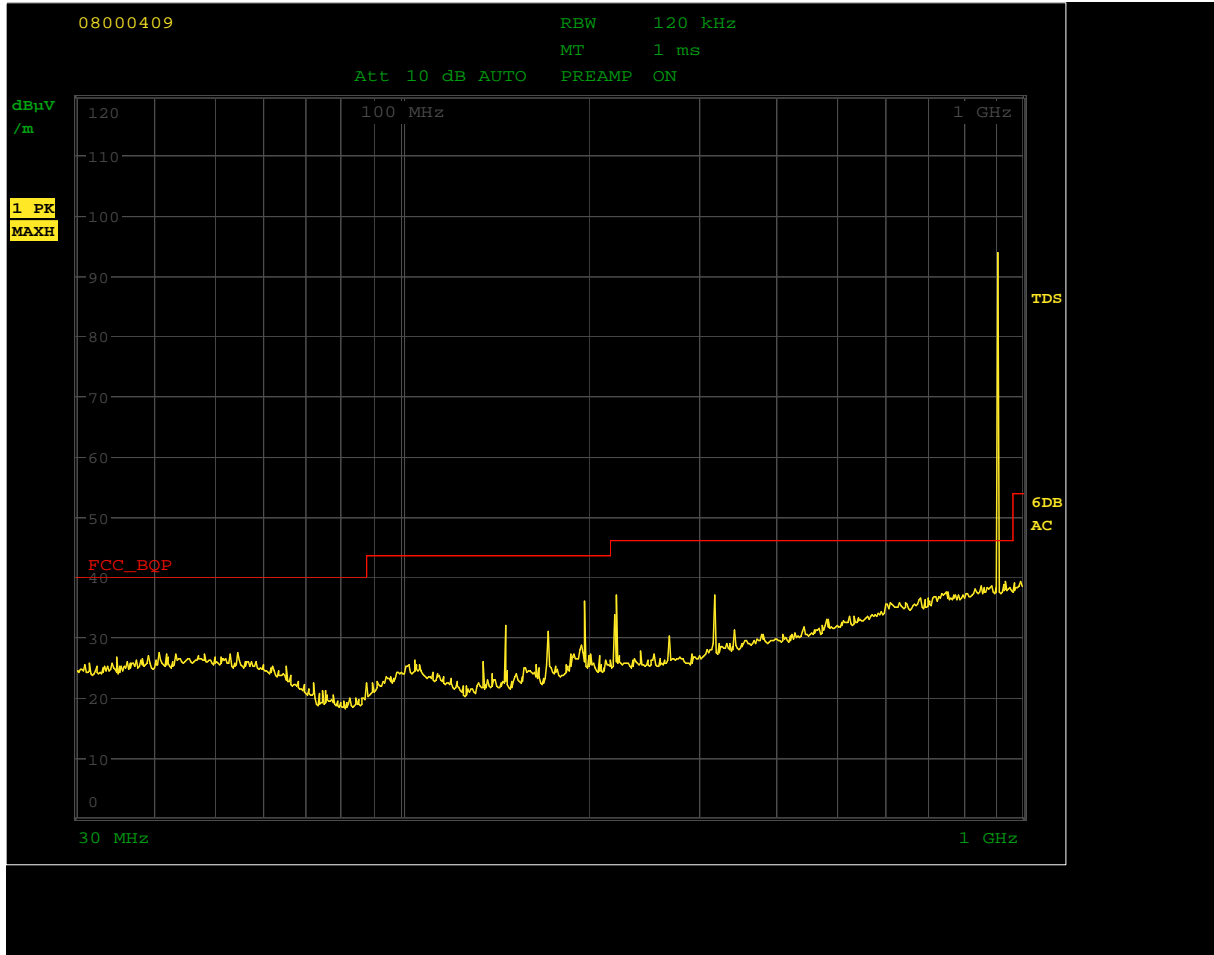


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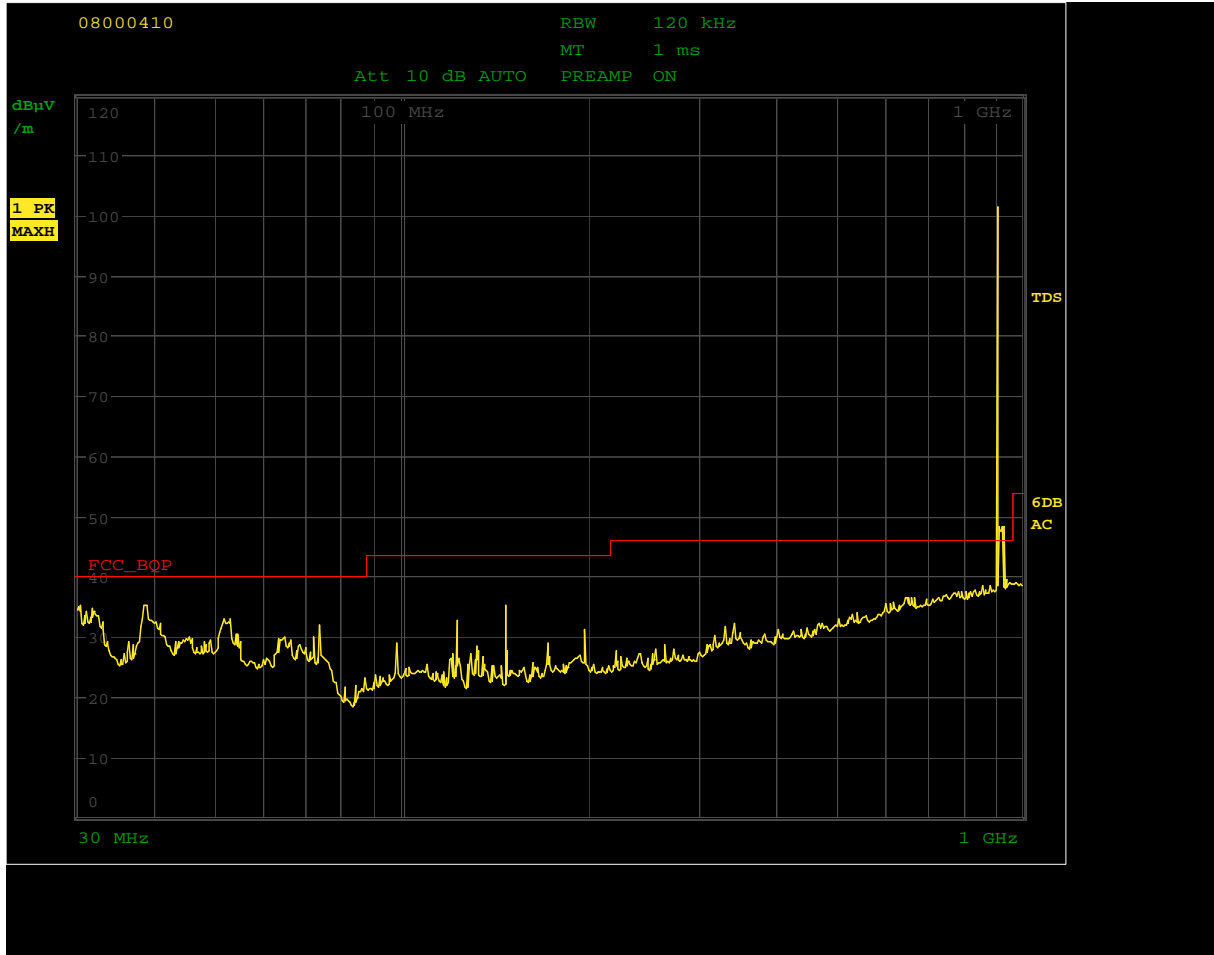


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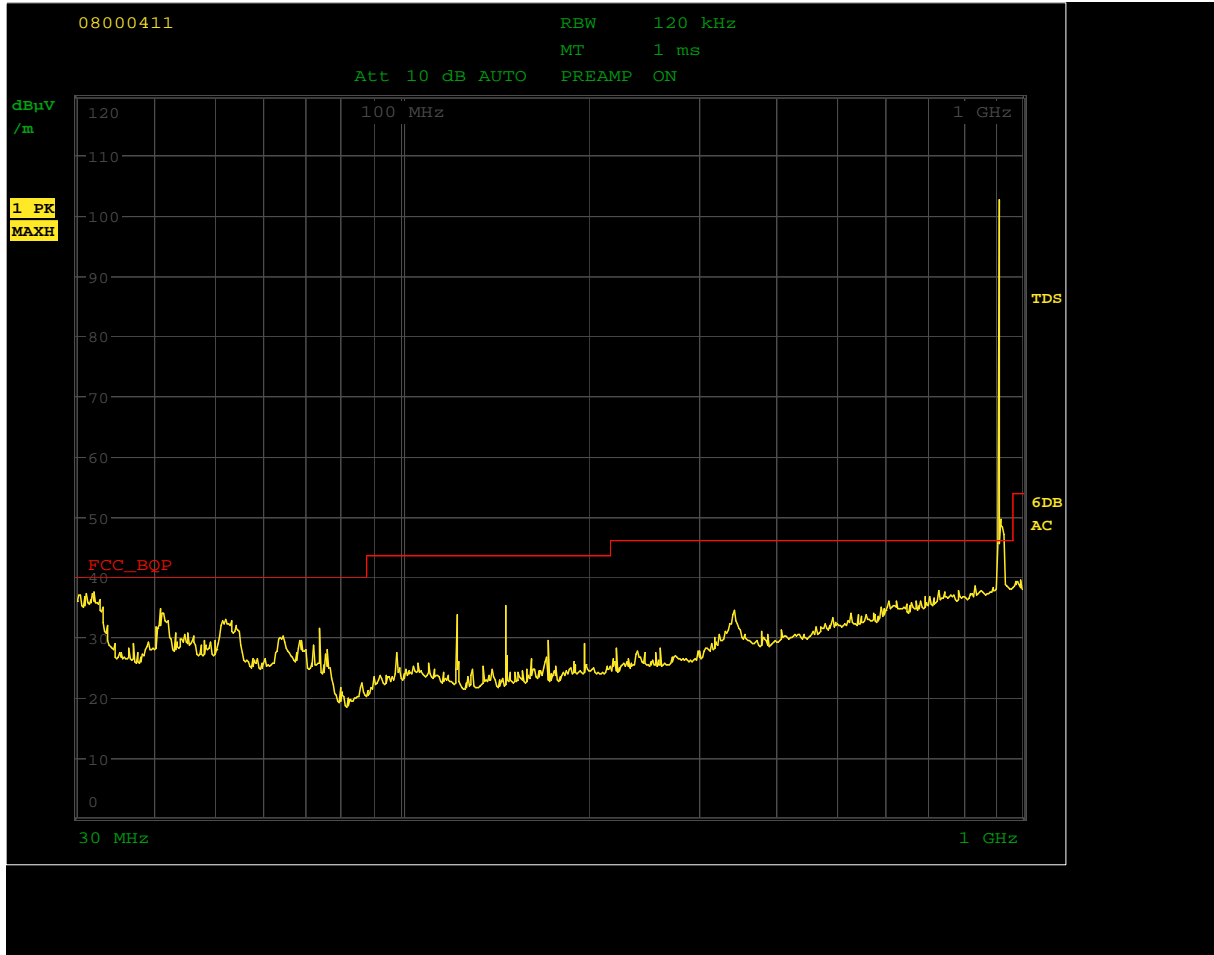
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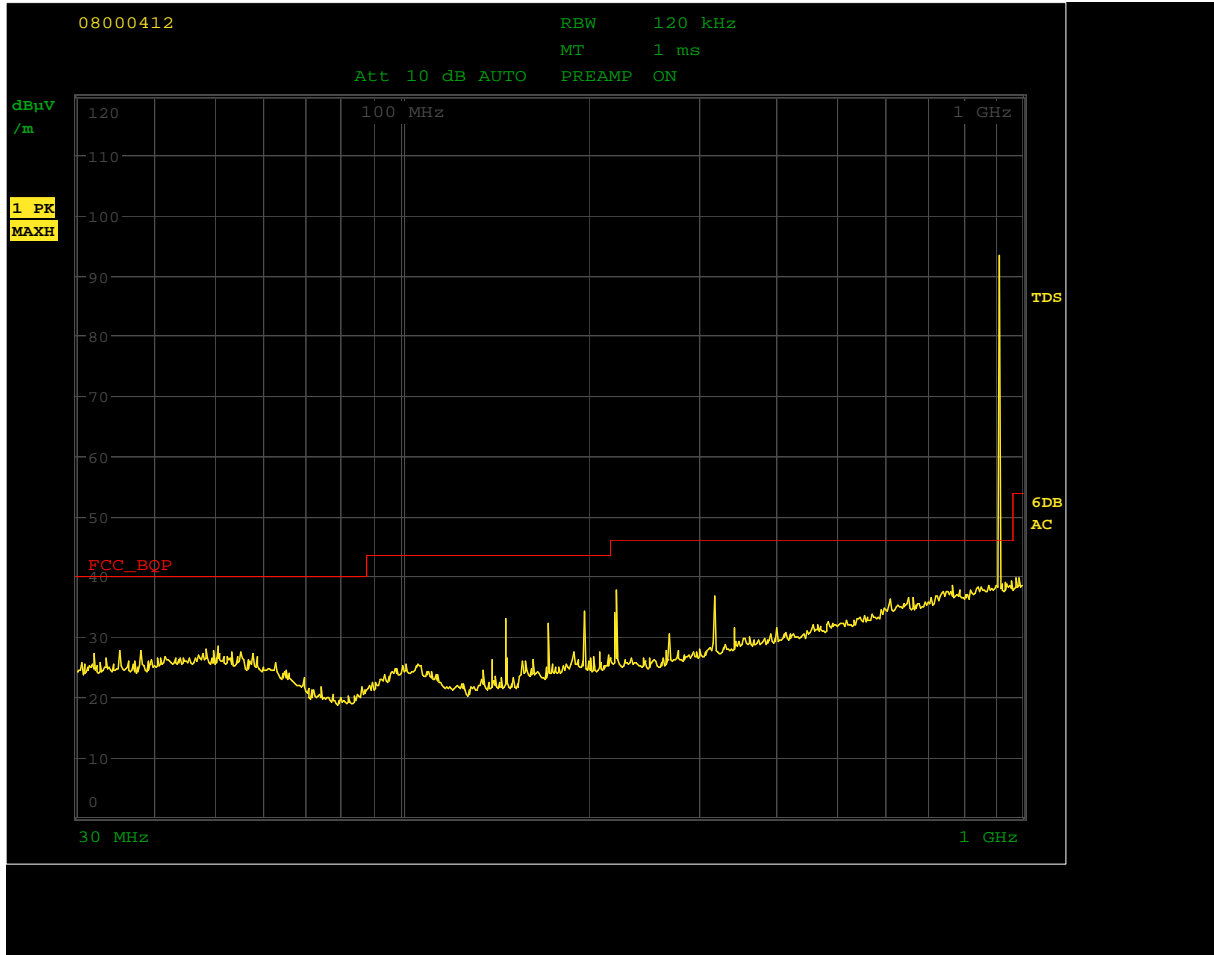


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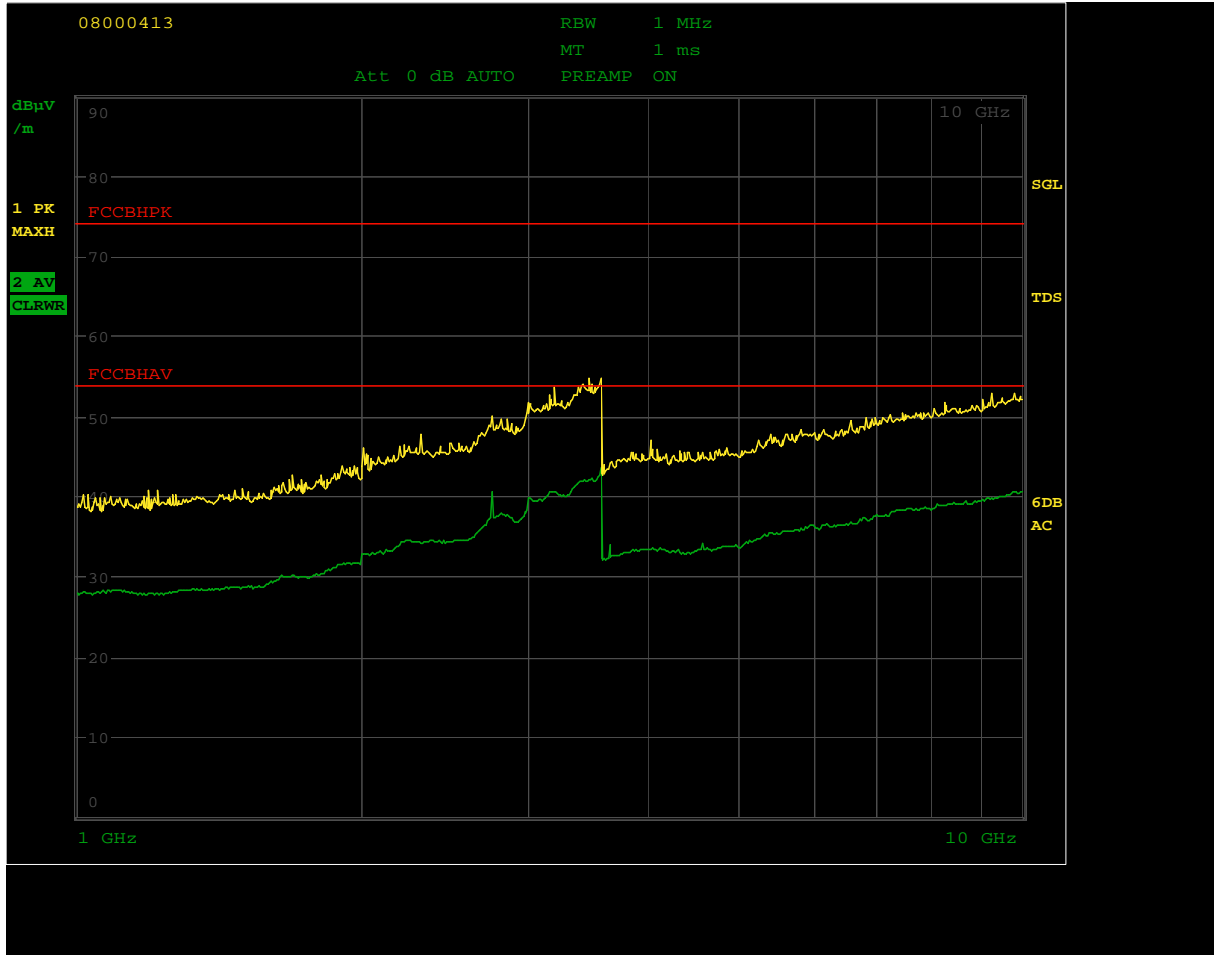


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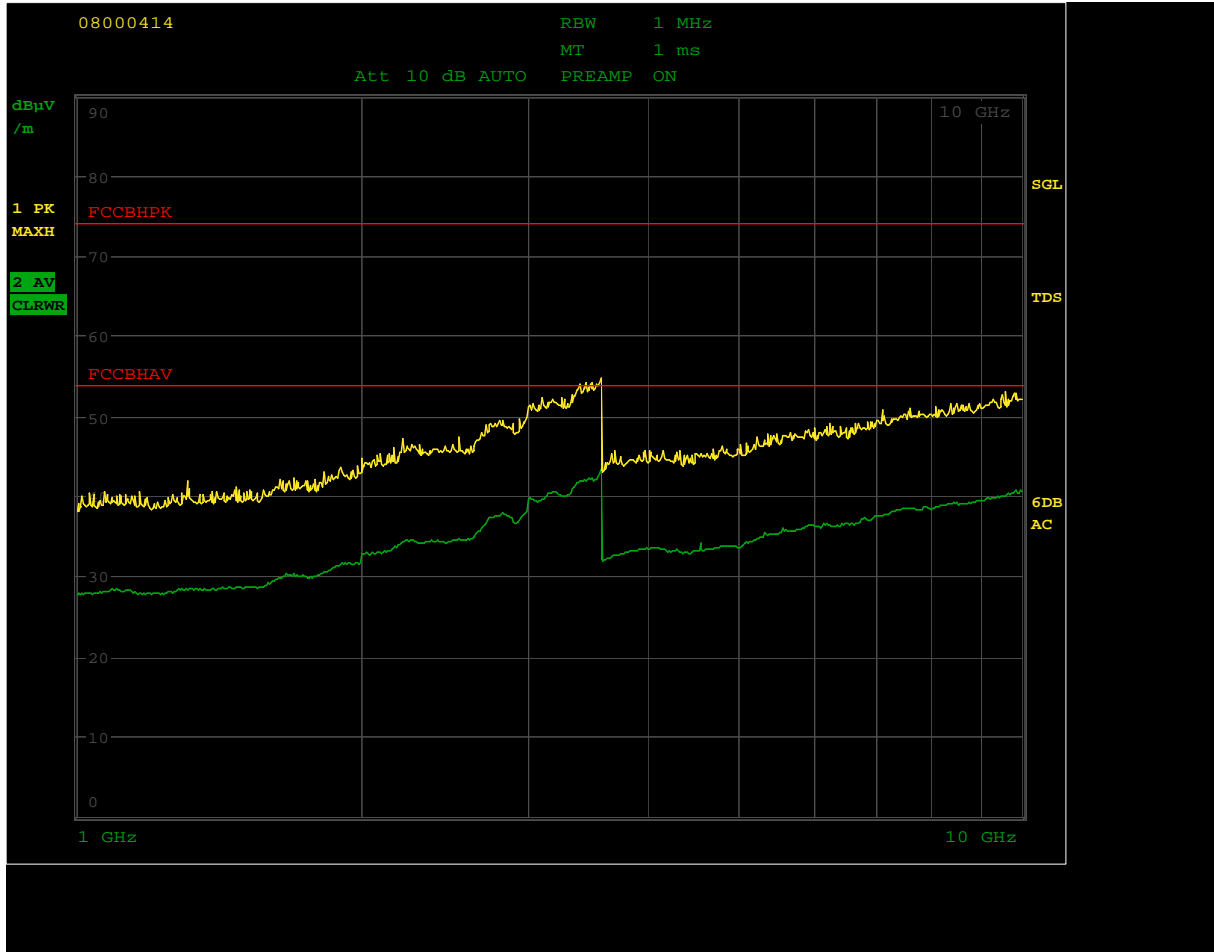


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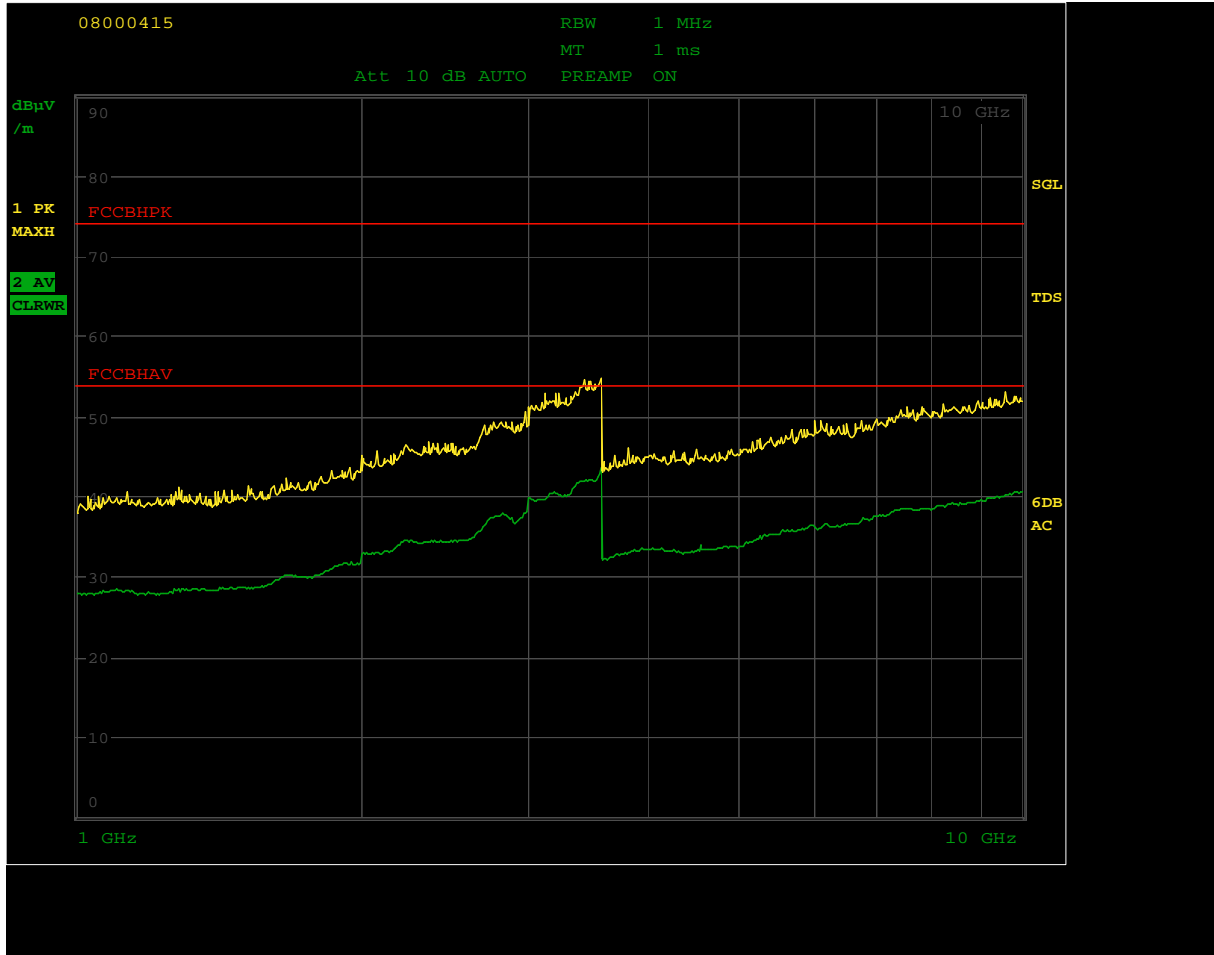


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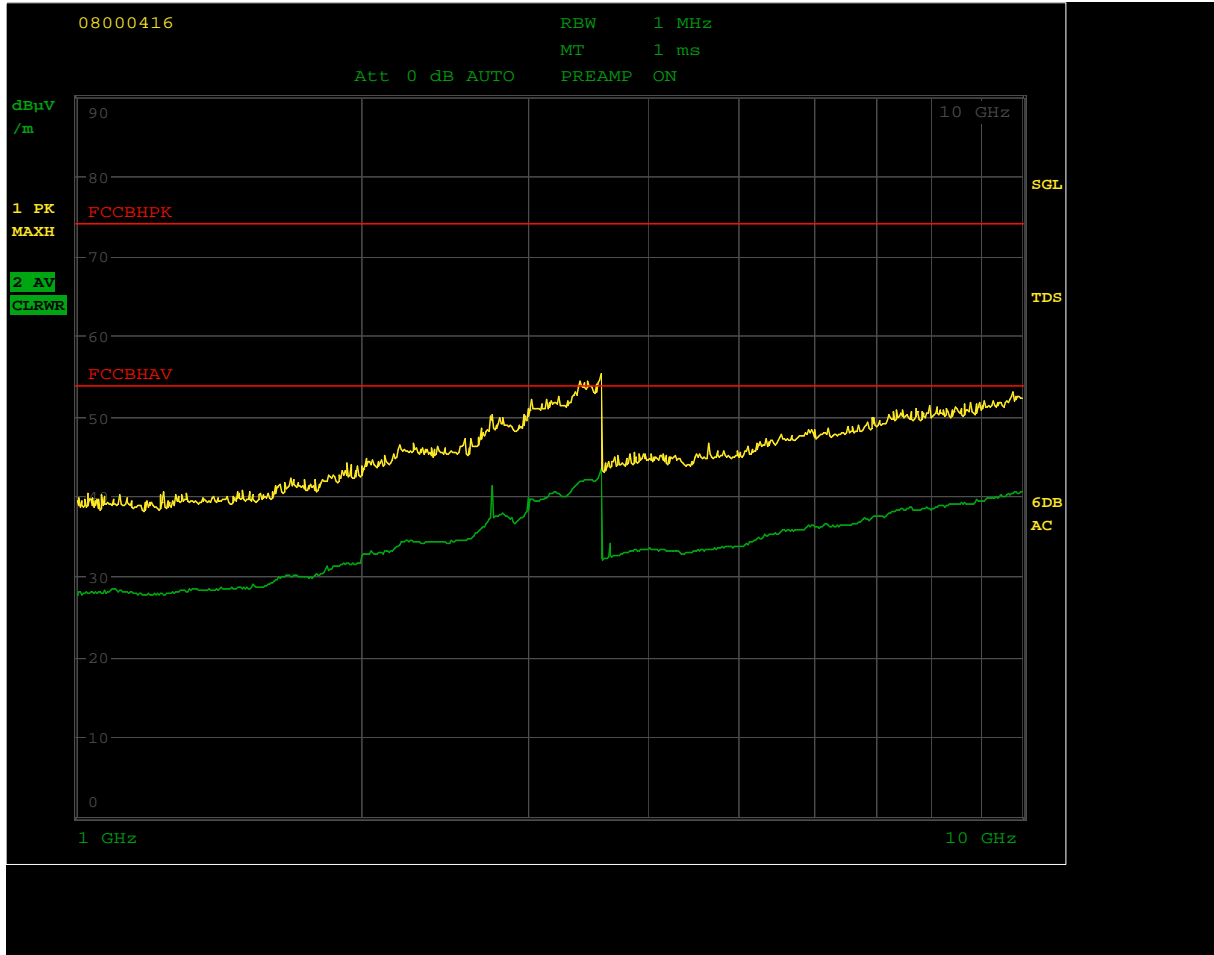


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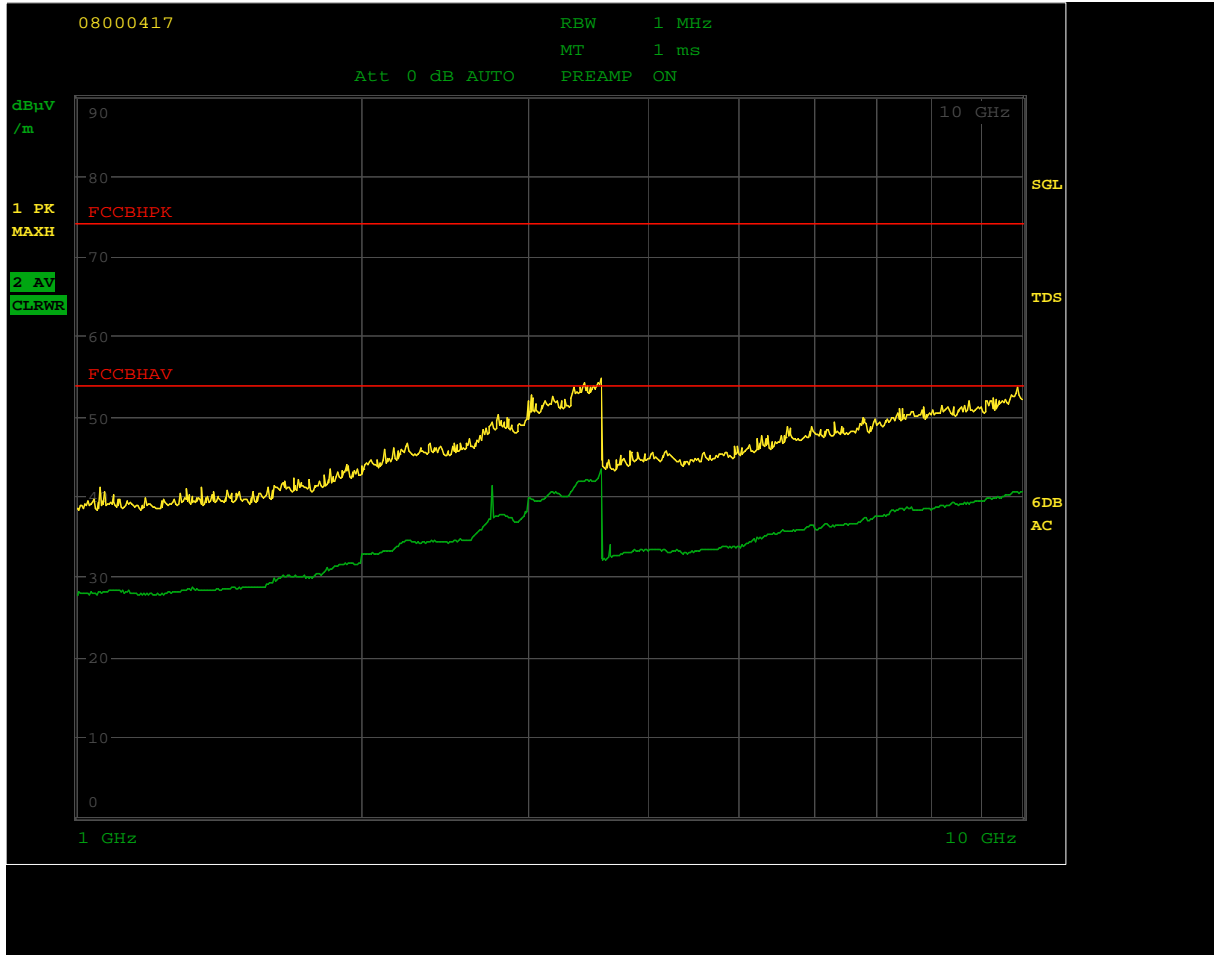


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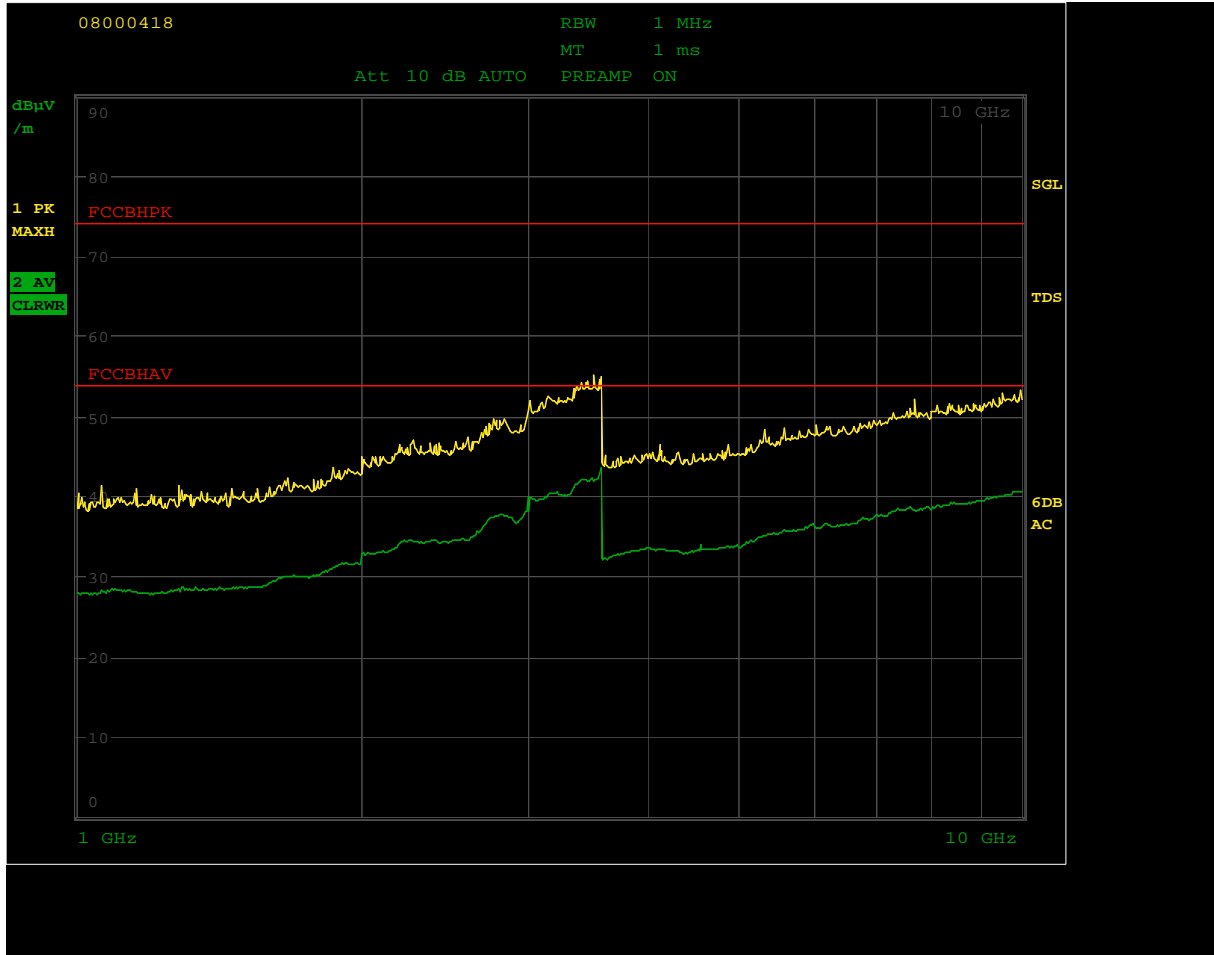


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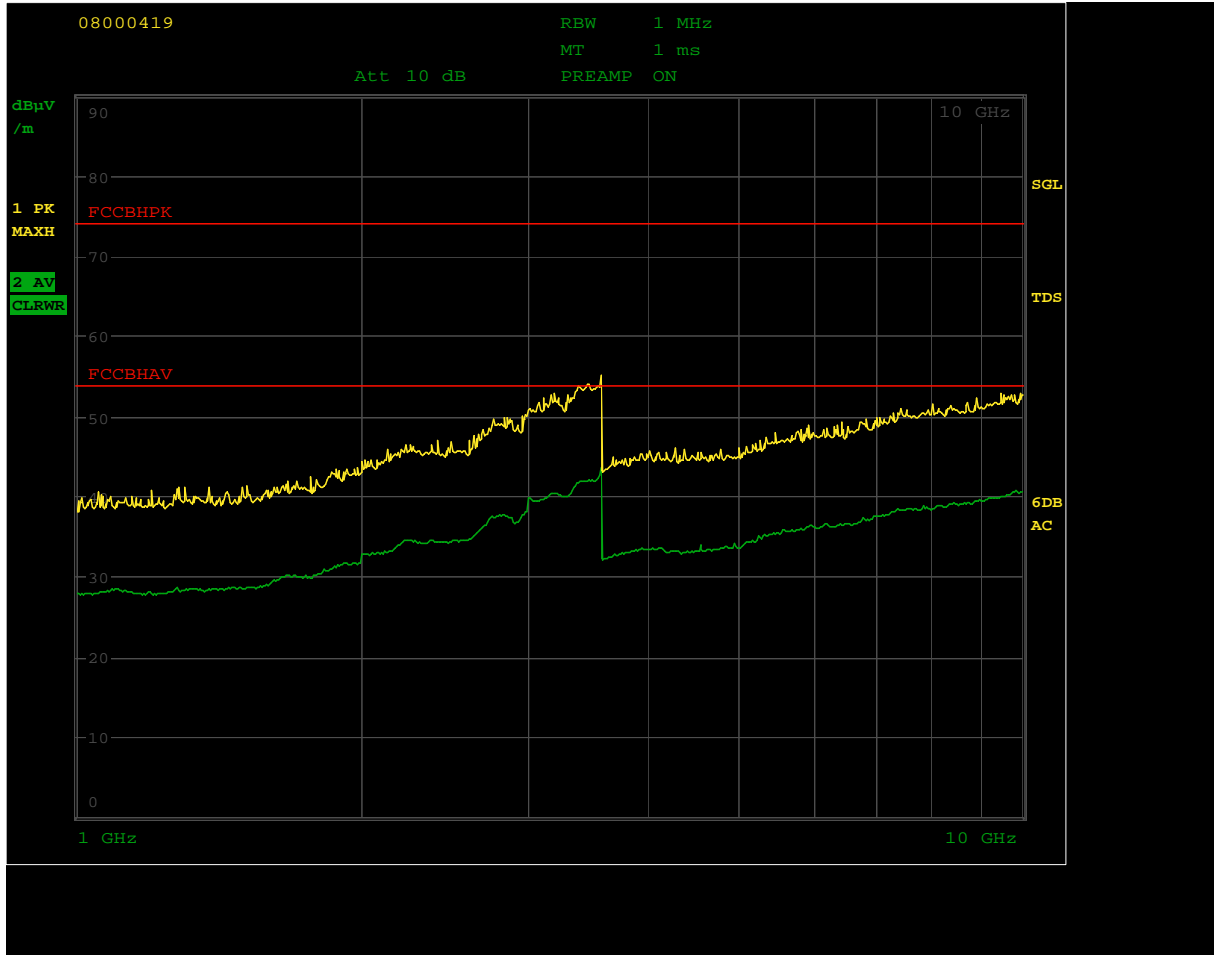
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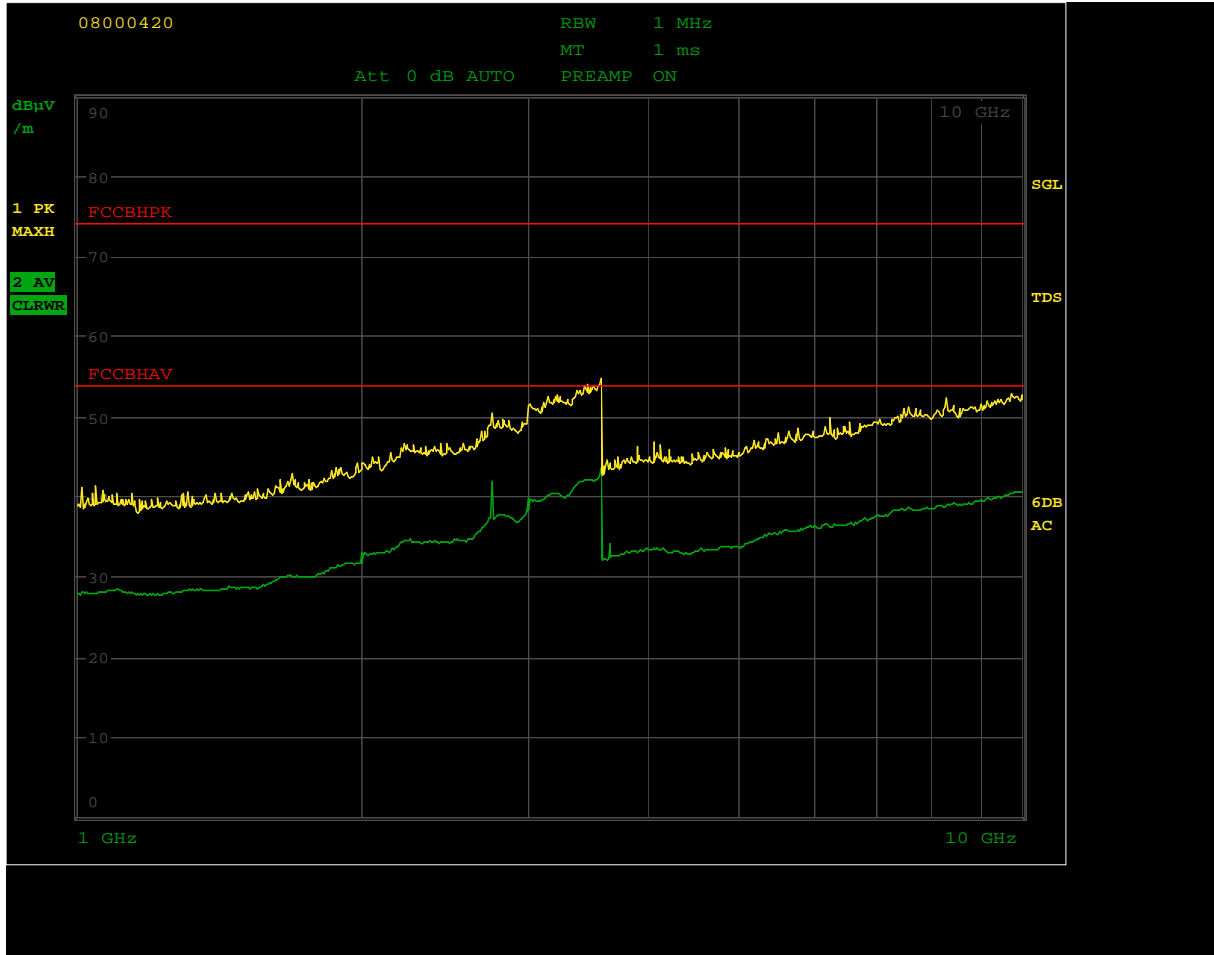


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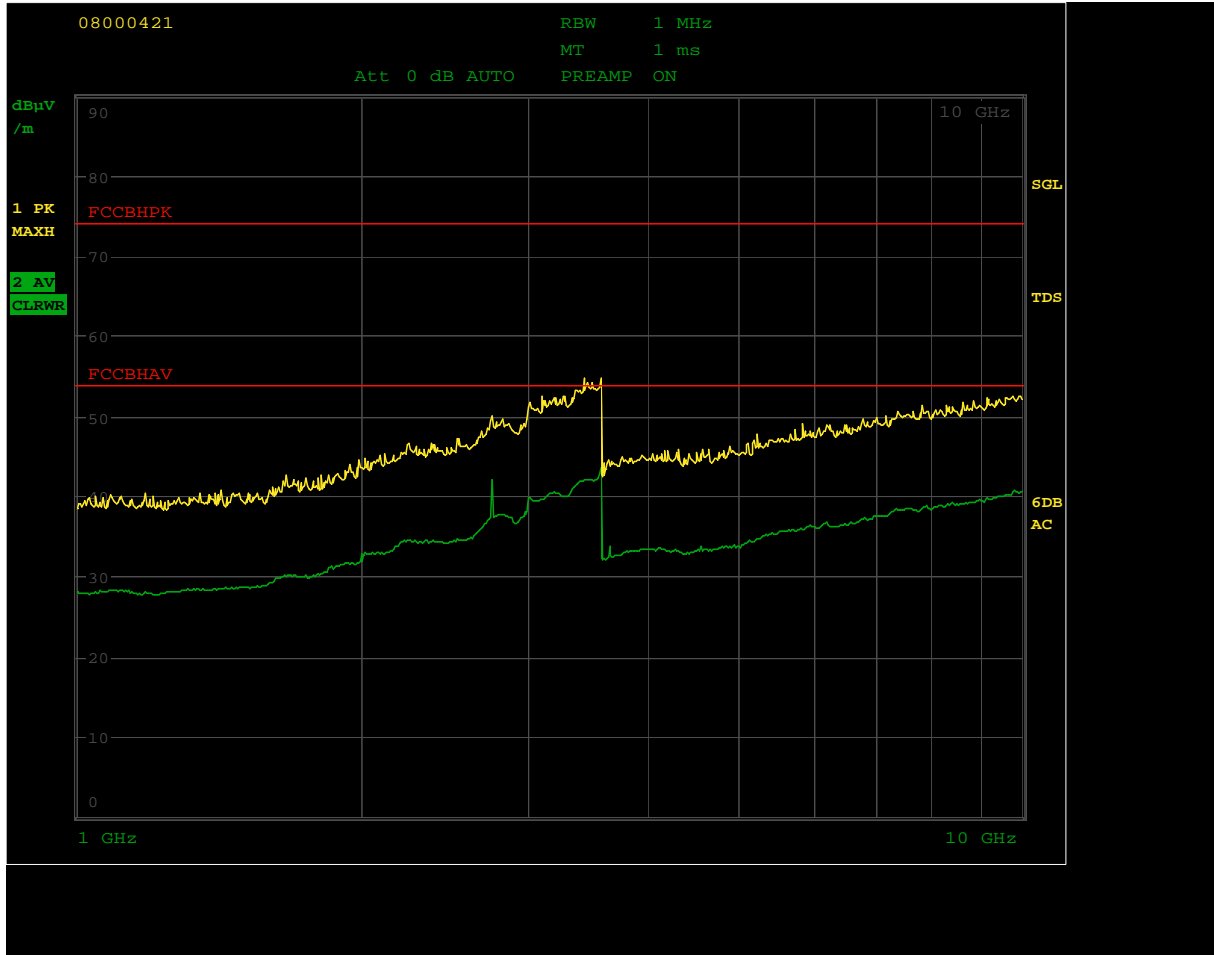


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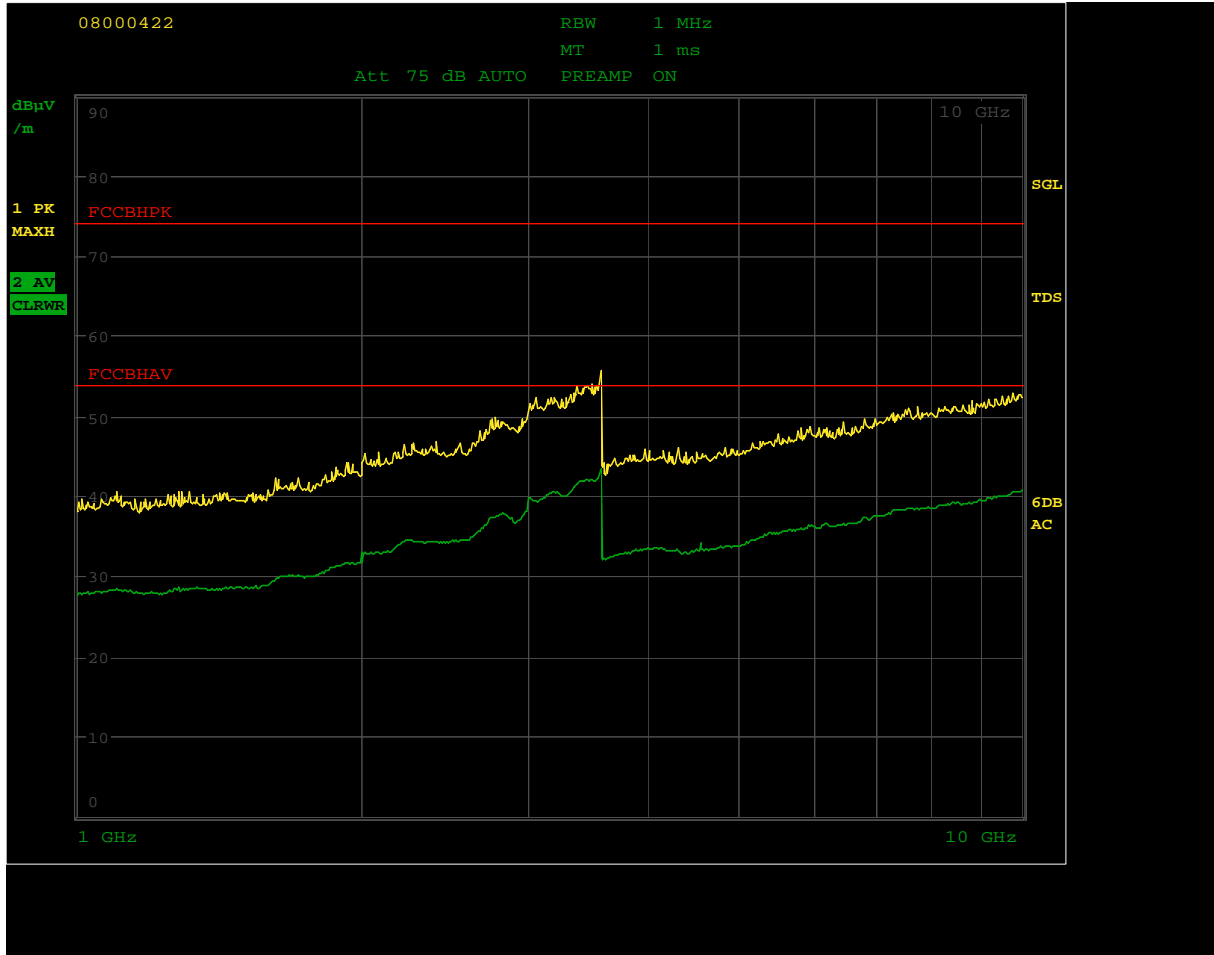


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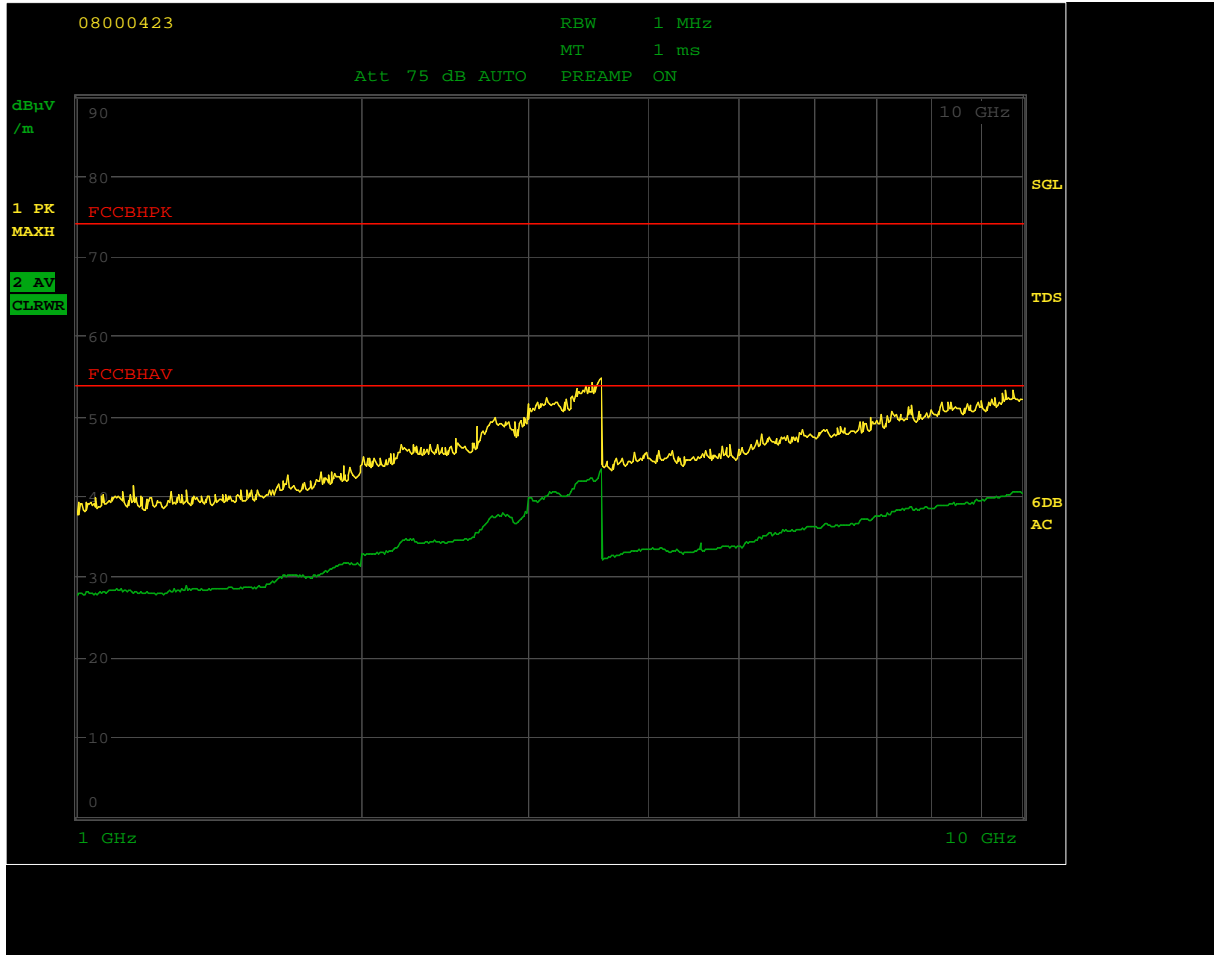


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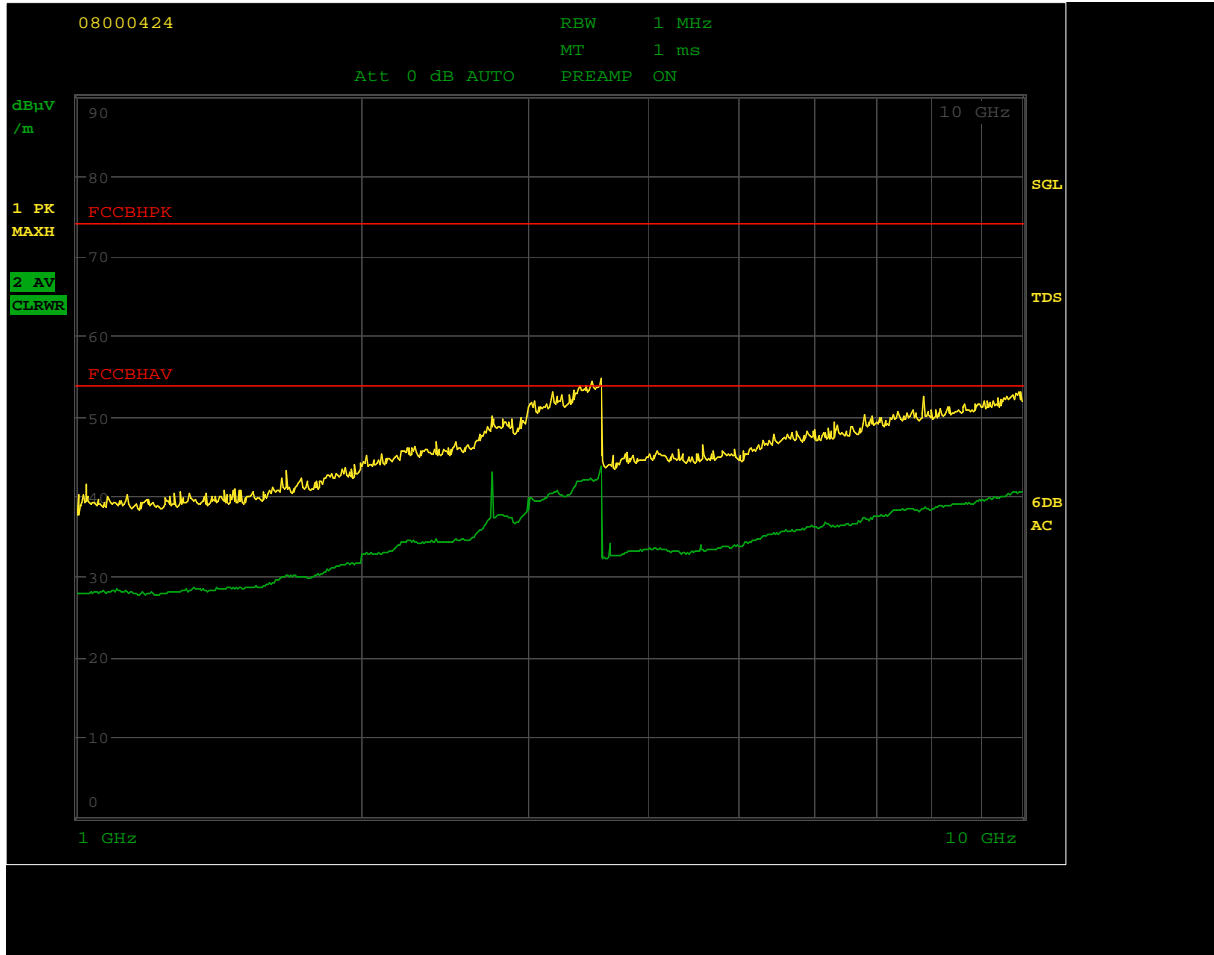


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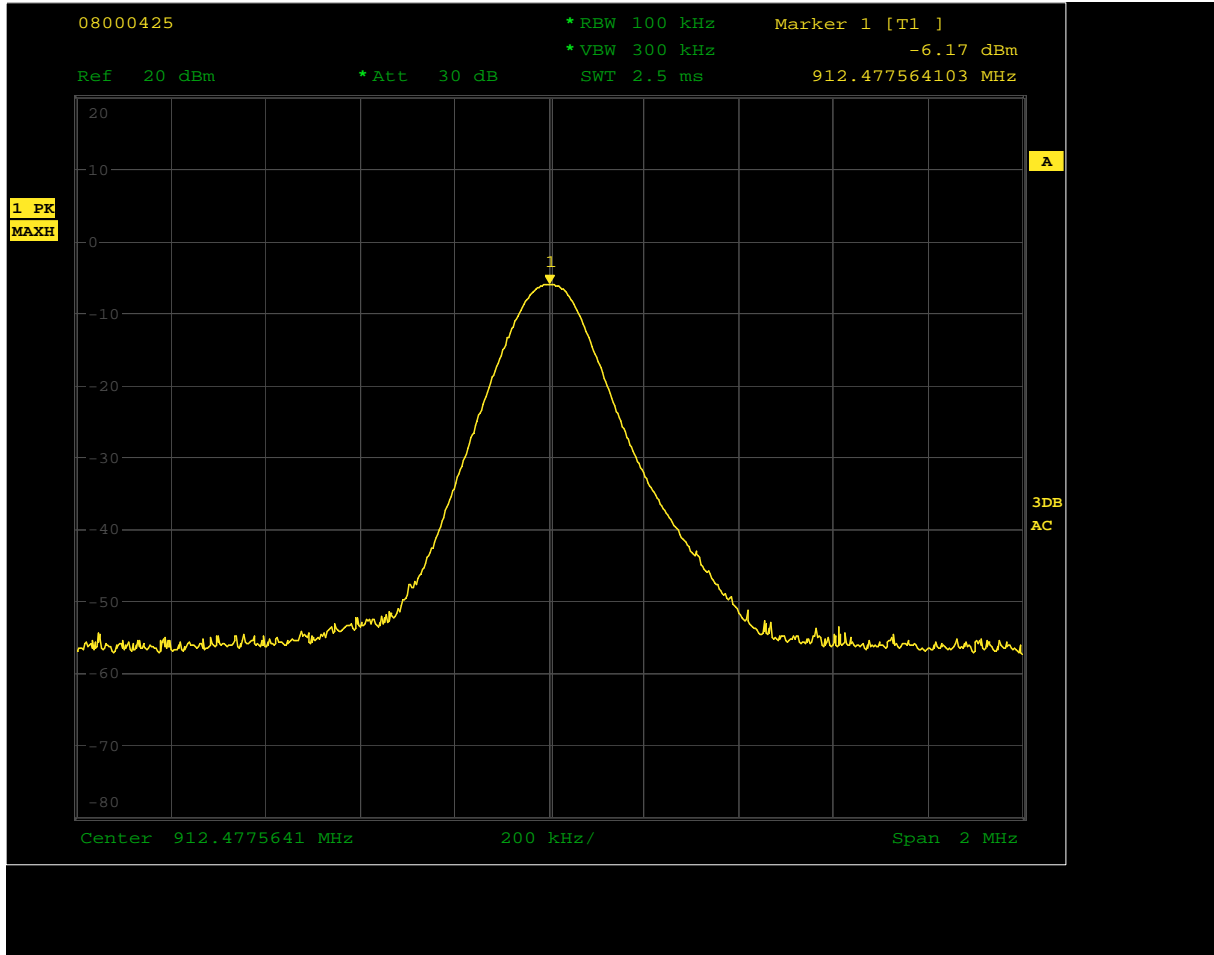


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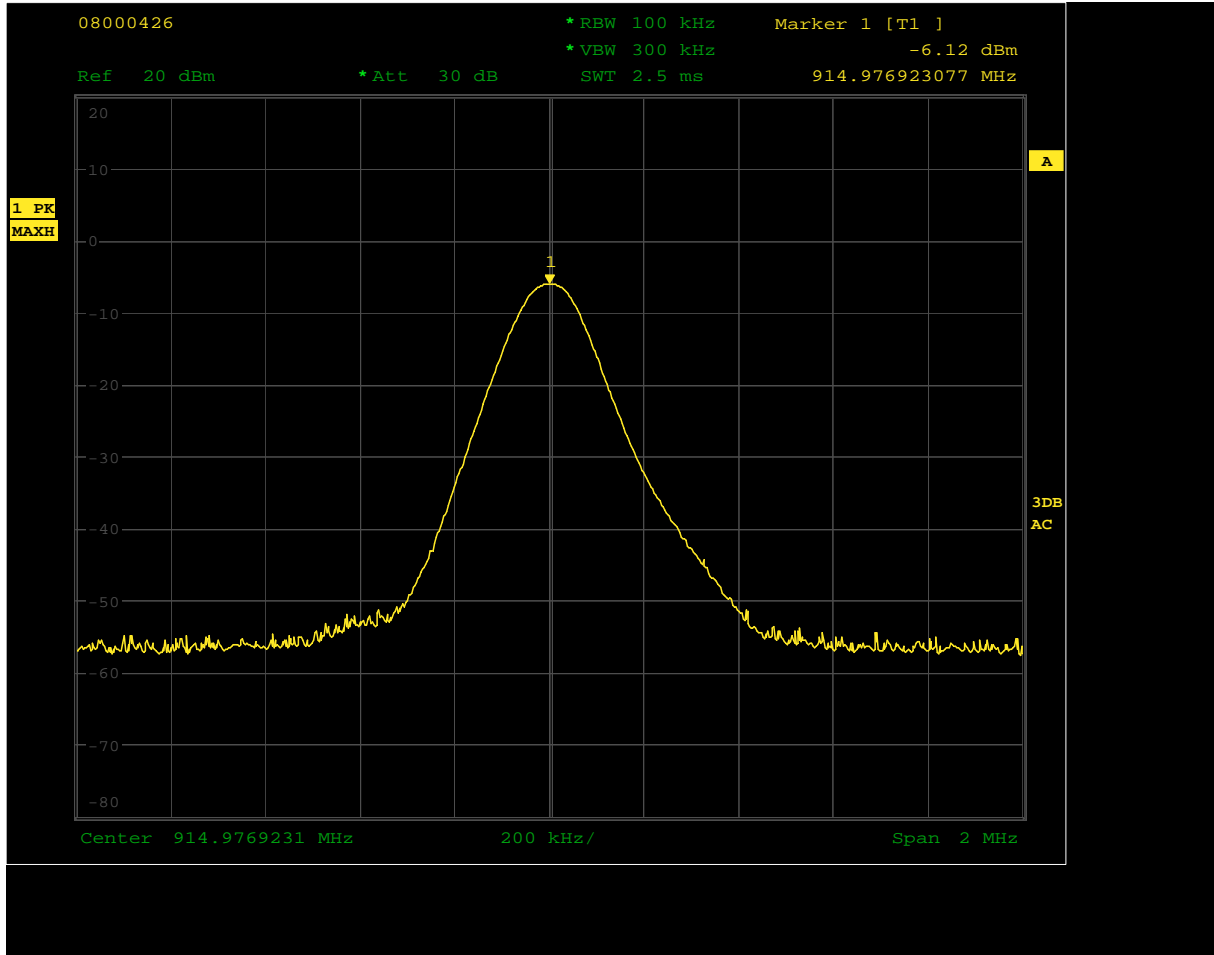


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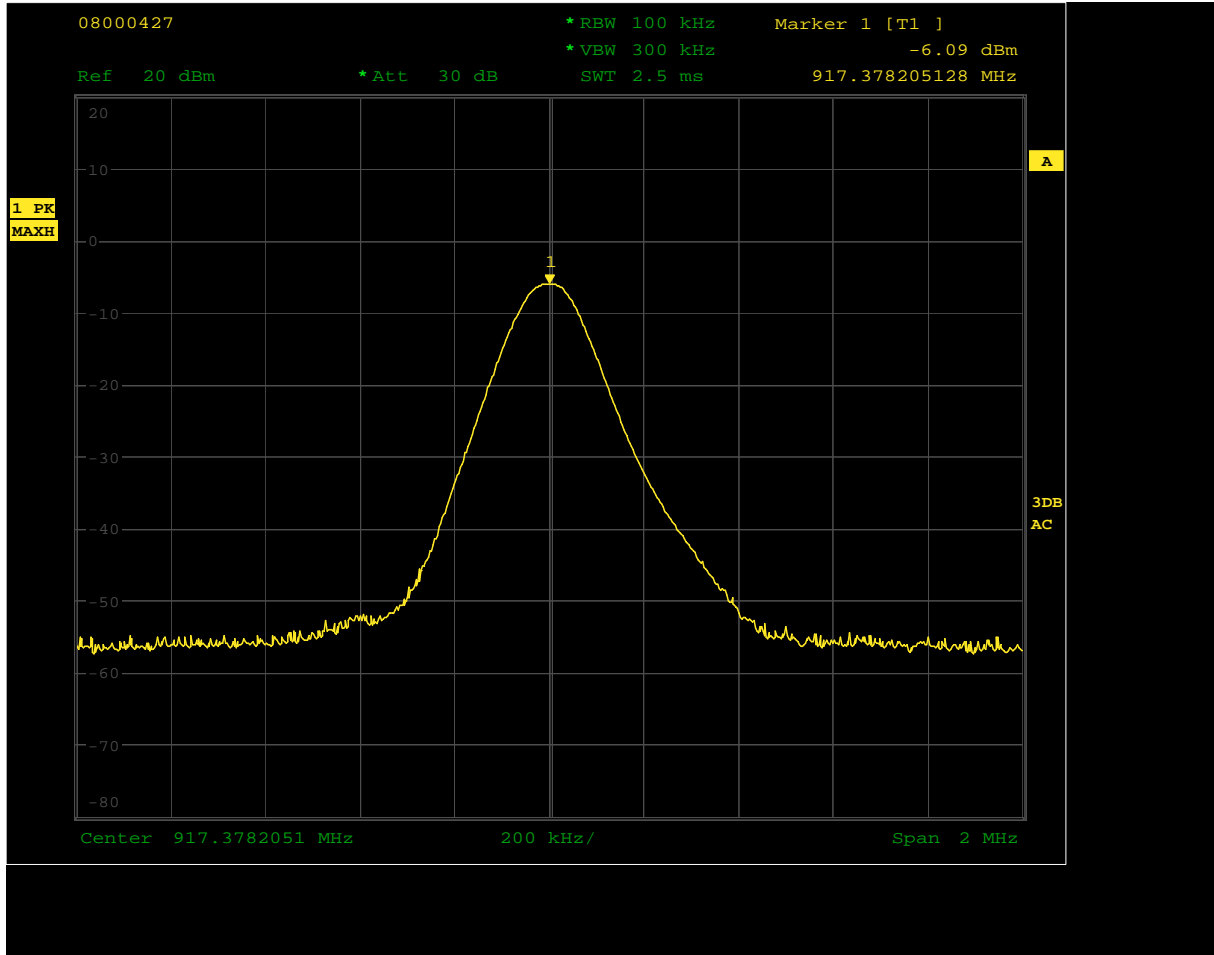
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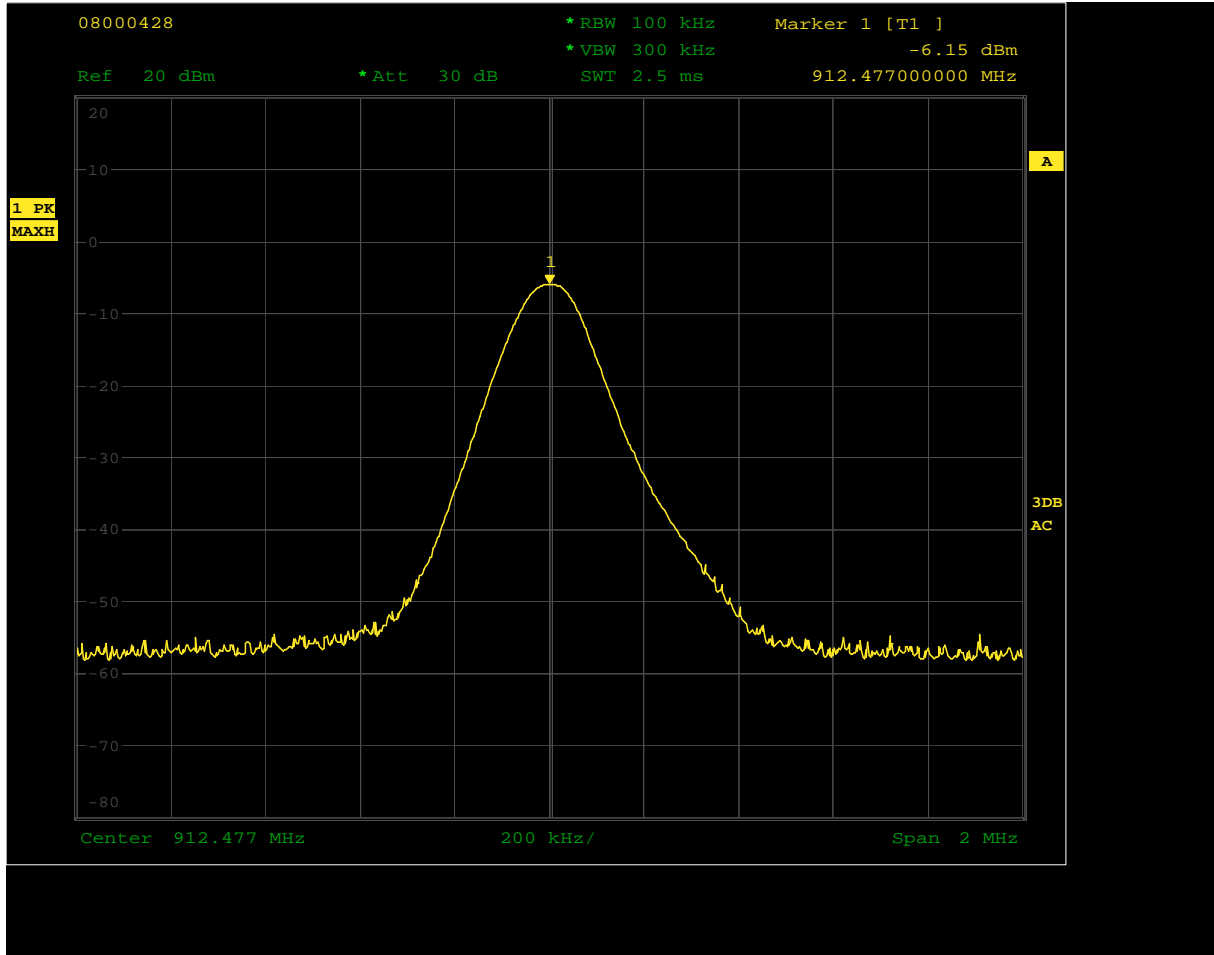


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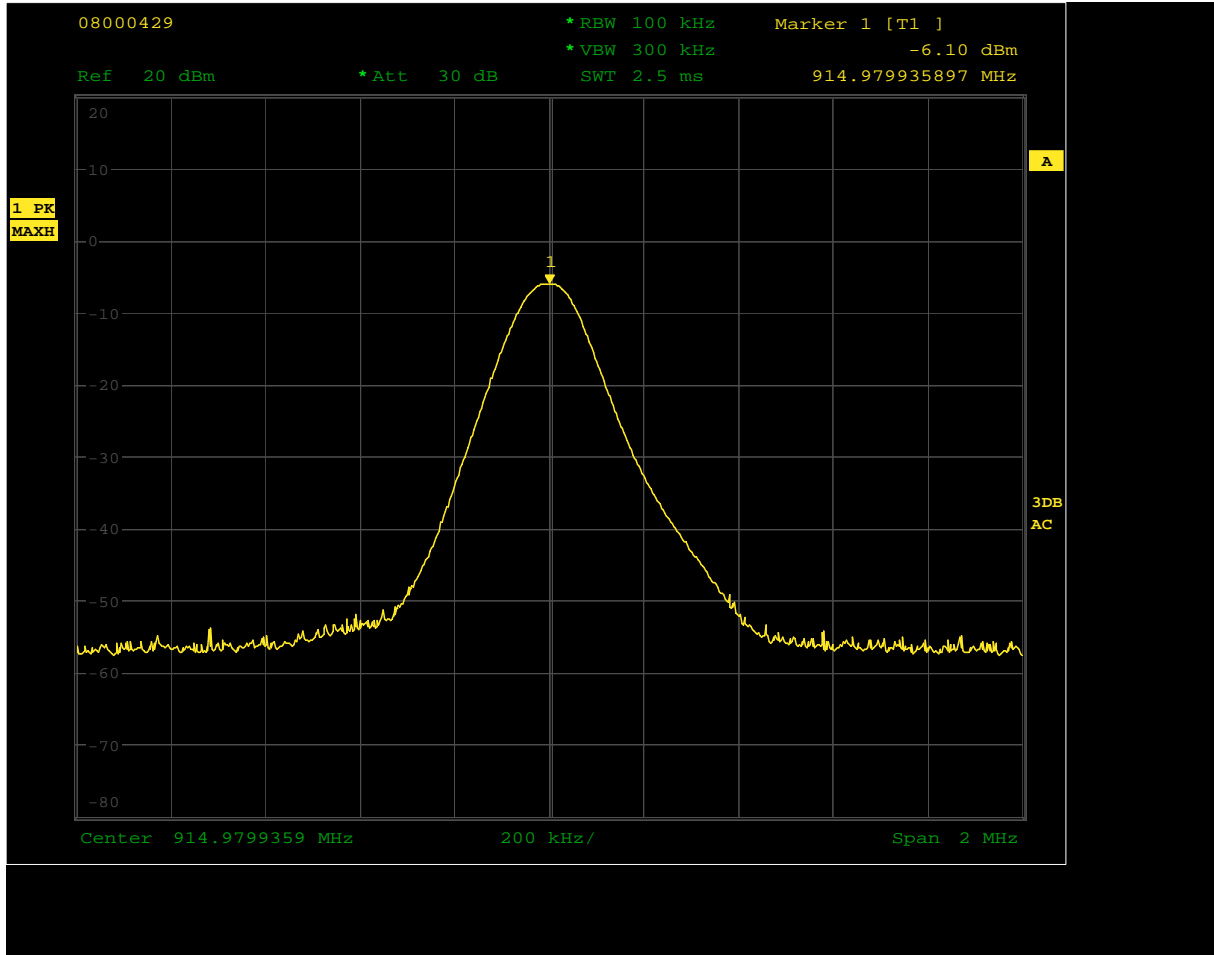


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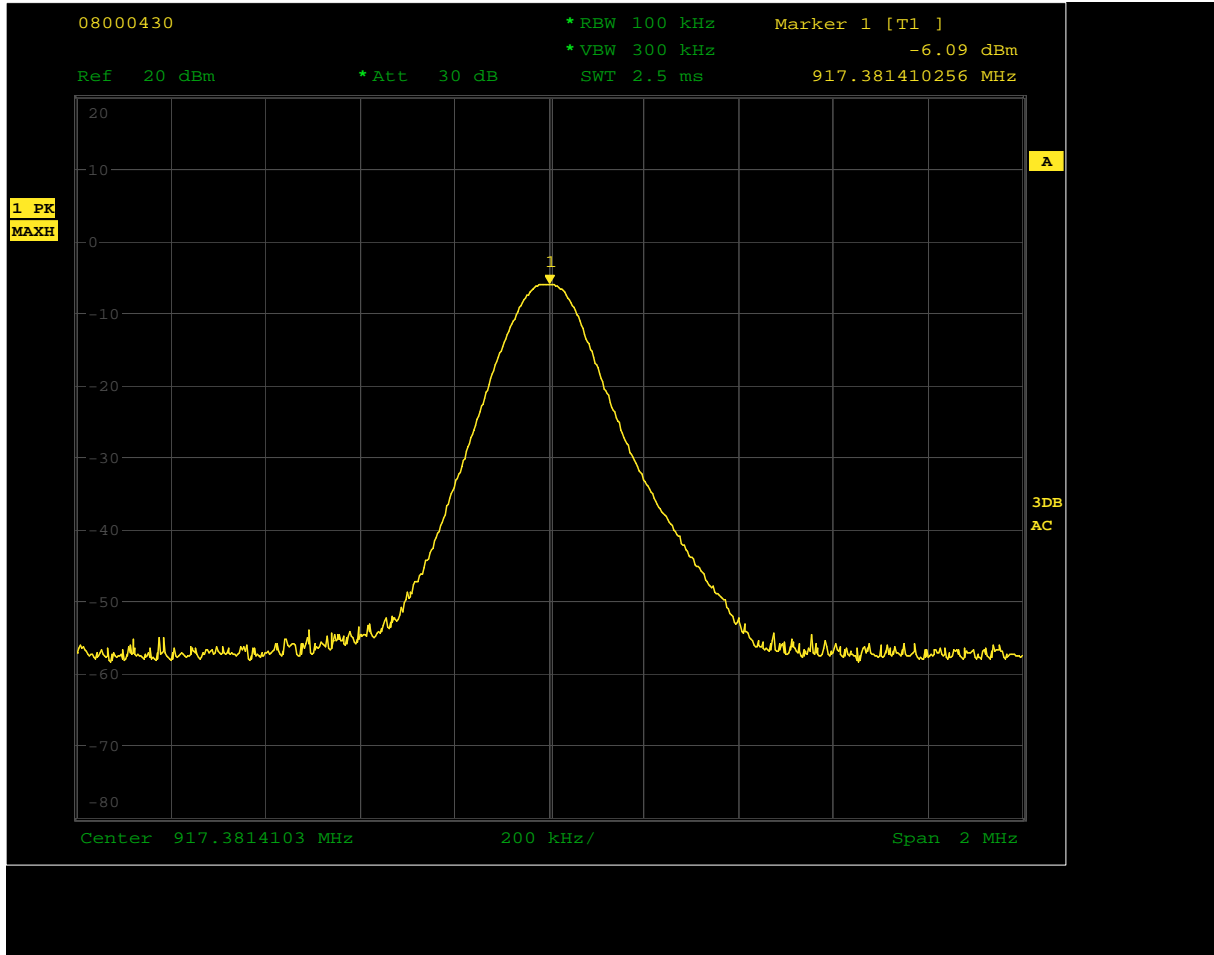


G08000429



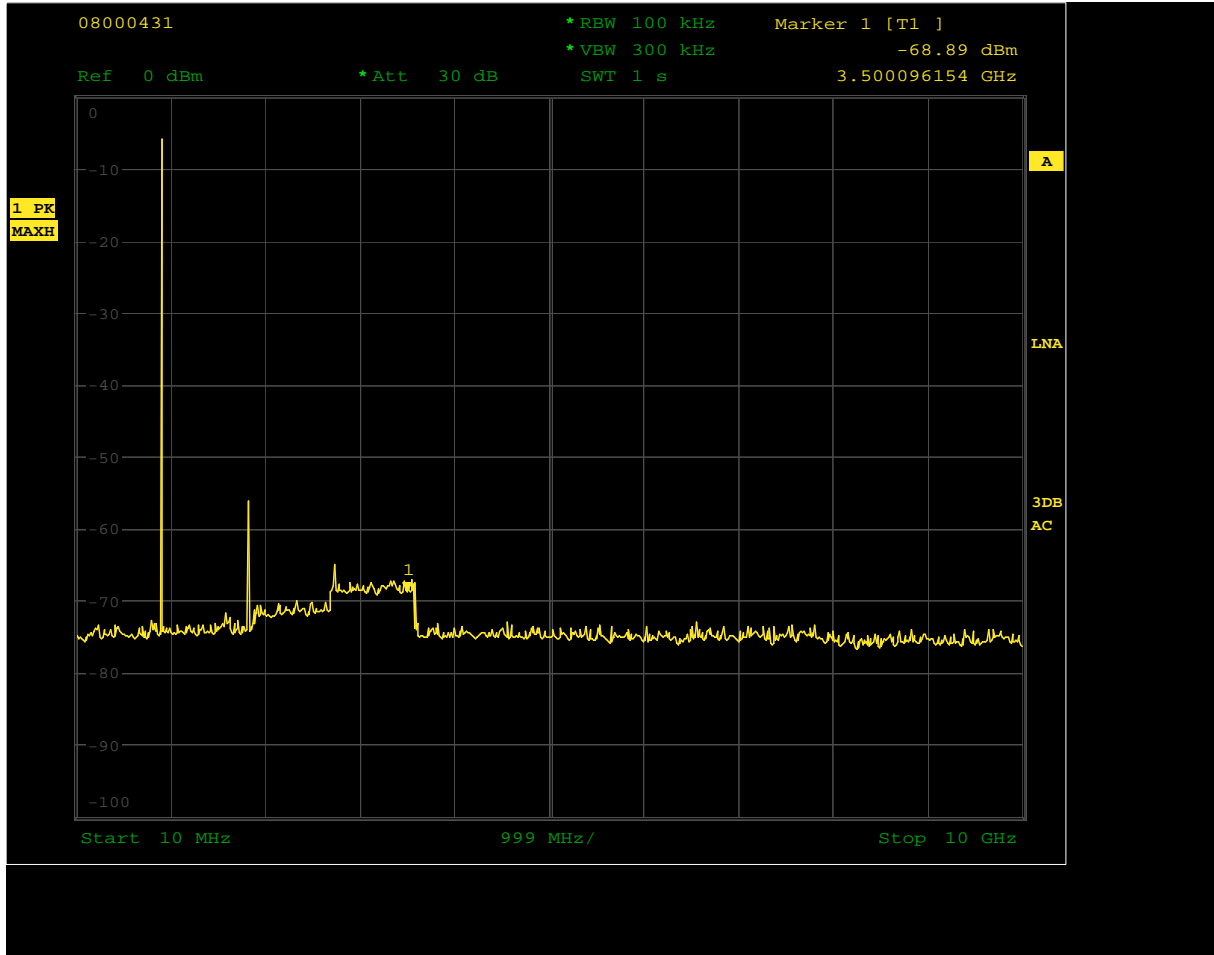


G08000430



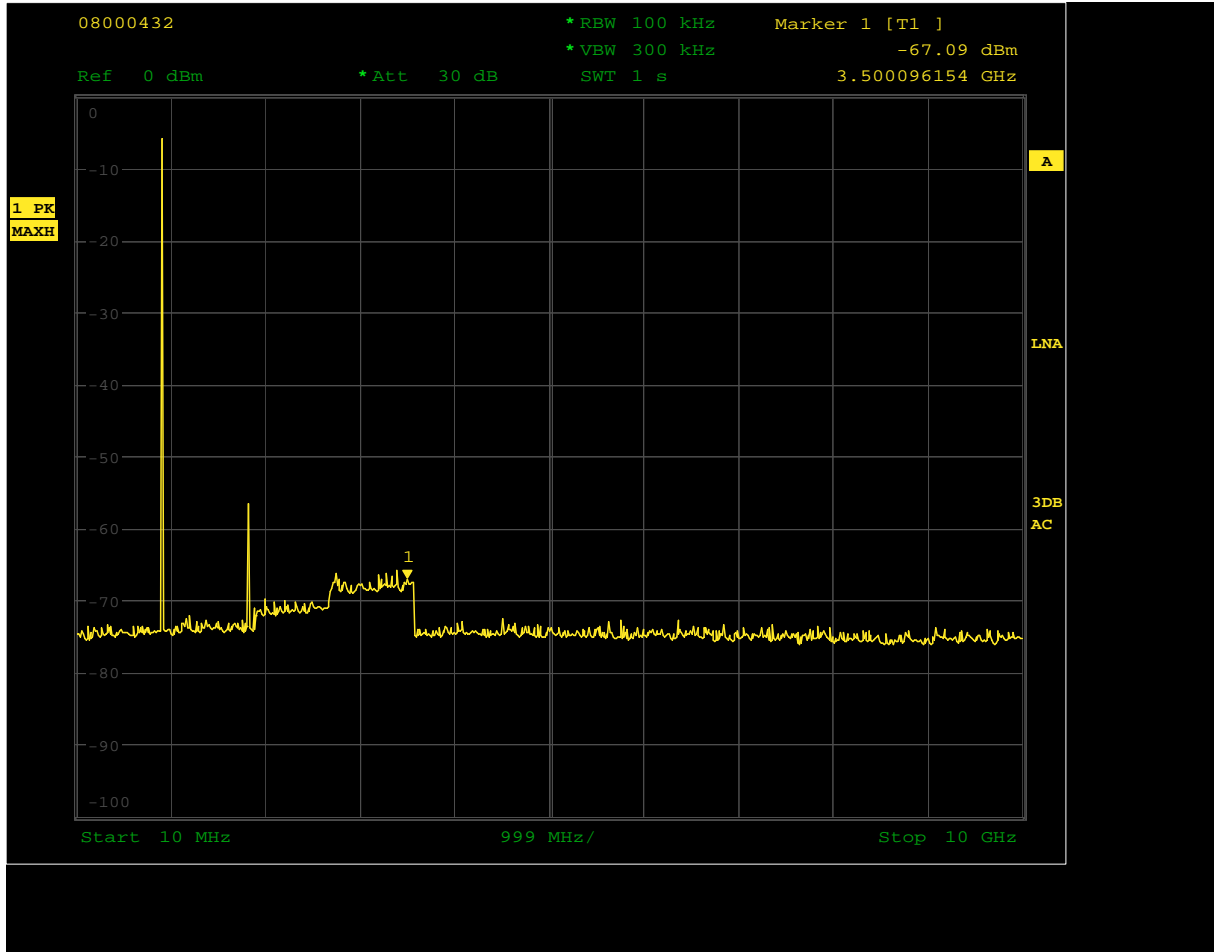


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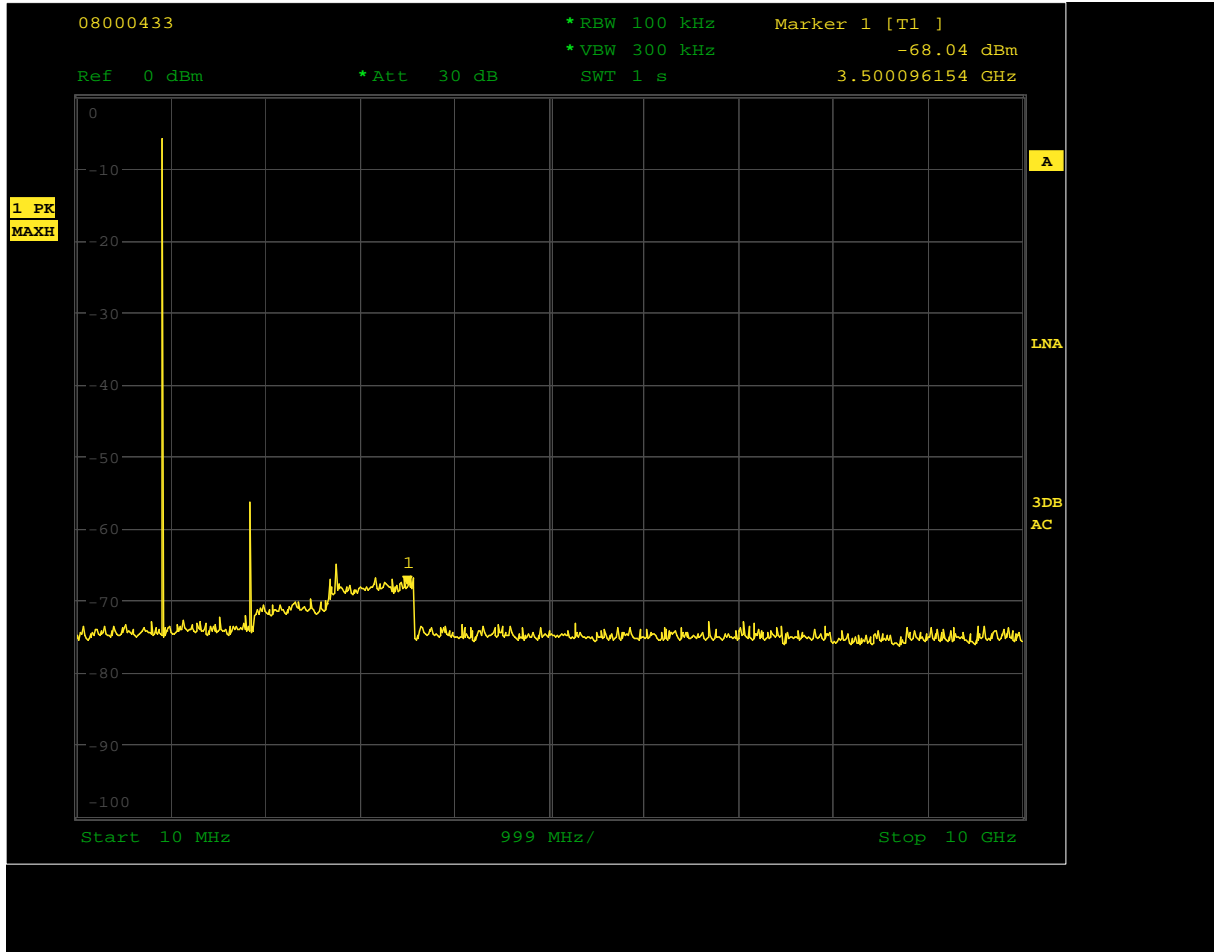


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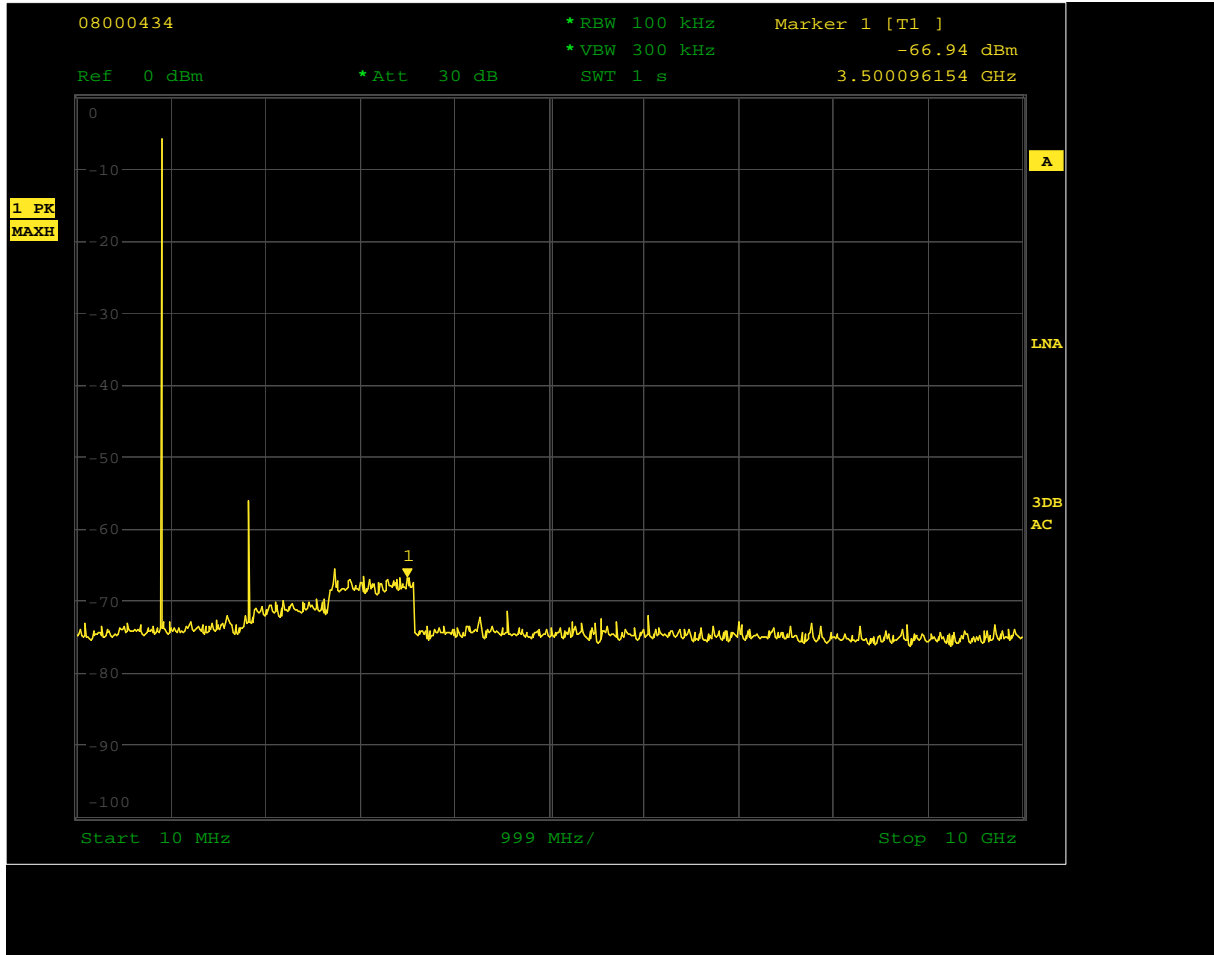


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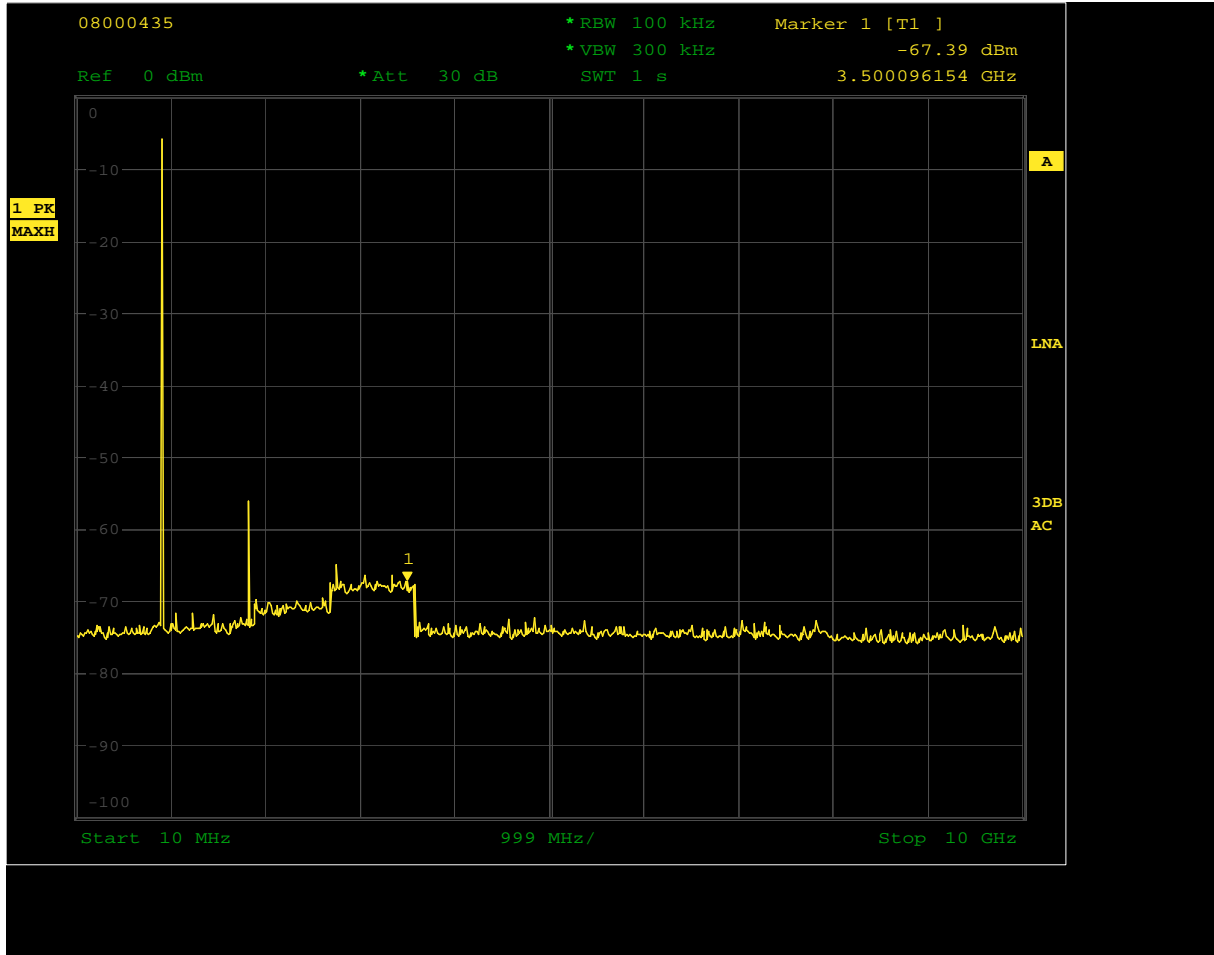
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G08000435





G08000436

