

Inter Modulation Field Report

Statement of Andrew M Pickard

On the Study of Stations

KJMR, KXAI, and KLTG

Operating from a single tower

I am a radio engineer with 31 years of experience, who has preformed spectrum analysis through out my career. I state my findings as follows:

This office has been authorized by Tejas Broadcasting Corporation to conduct a study of the spectrum intermix or intermodulation of the three stations collocated on the tower.

Date May16, 2014

Call Sign: KMJR, KLTG, & KXAI

Frequencies: KMJR 98.3, KLTG 96.5, KXAI 103.7

Work Description: Investigate Intermix / Intermodulation components of the transmission system.

Test equipment used: Anritsu MS2711D Spectrum Master serial number 431056.

The equipment as adjusted is capable of displaying intermix components to a level -110dB below the carrier reference level.

Test point: The output sample section of the Shively combiner

After completing an intermodulation study it was determined that we were concerned about 22 frequencies in this study.

2nd order

2A= 202.0Mhz

3A= 5.4 Mhz

3rd order

4A= 305.7 Mhz

5A= 109.1 Mhz

6A= 300.3 Mhz

7A= 92.9 Mhz

8A= 298.5 Mhz

9A= 101.9 Mhz

10A= 91.1 Mhz

5th order

11A= 87.5 Mhz
12A= 114.5 Mhz
13A= 112.7 Mhz
14A= 107.3 Mhz
15A= 100.1 Mhz
16A= 85.7 Mhz
17A= 83.9 Mhz

7th order

18A= 119.9 Mhz
19A= 82.1 Mhz
20A= 119.9 Mhz
21A= 109.1 Mhz
22A= 80.3 Mhz
23A= 76.7 Mhz

Notes: It was necessary to readjust the display reference level only, in order to display both the fundamental signal peaks, and the noise floor of the instrument. The only adjustment to the analyzer was the display reference level for clarity.

On the first display signals were found at 103.7. KXAI 103.7 is colocated at this site, and mathematically can not be an intermix product so was not investigated further. A signal was found at 100.1 mHz. This signal displays at -80 on the scale. Since the carrier reference is +0, this signal is -80 dbc, so meets FCC requirements. A signal was found at 76.9 mHz. This signal displays at -96 on the scale. Since the carrier reference is +0, this signal is -96 dbc, so meets FCC requirements.

The same examination was undertaken with an uncalibrated antenna connected in a similar fashion to sample radiated signals directly off air at a distance of approximately 1 kilometer from the transmitter tower. We found no spurious signals that could be attributed to this facility.

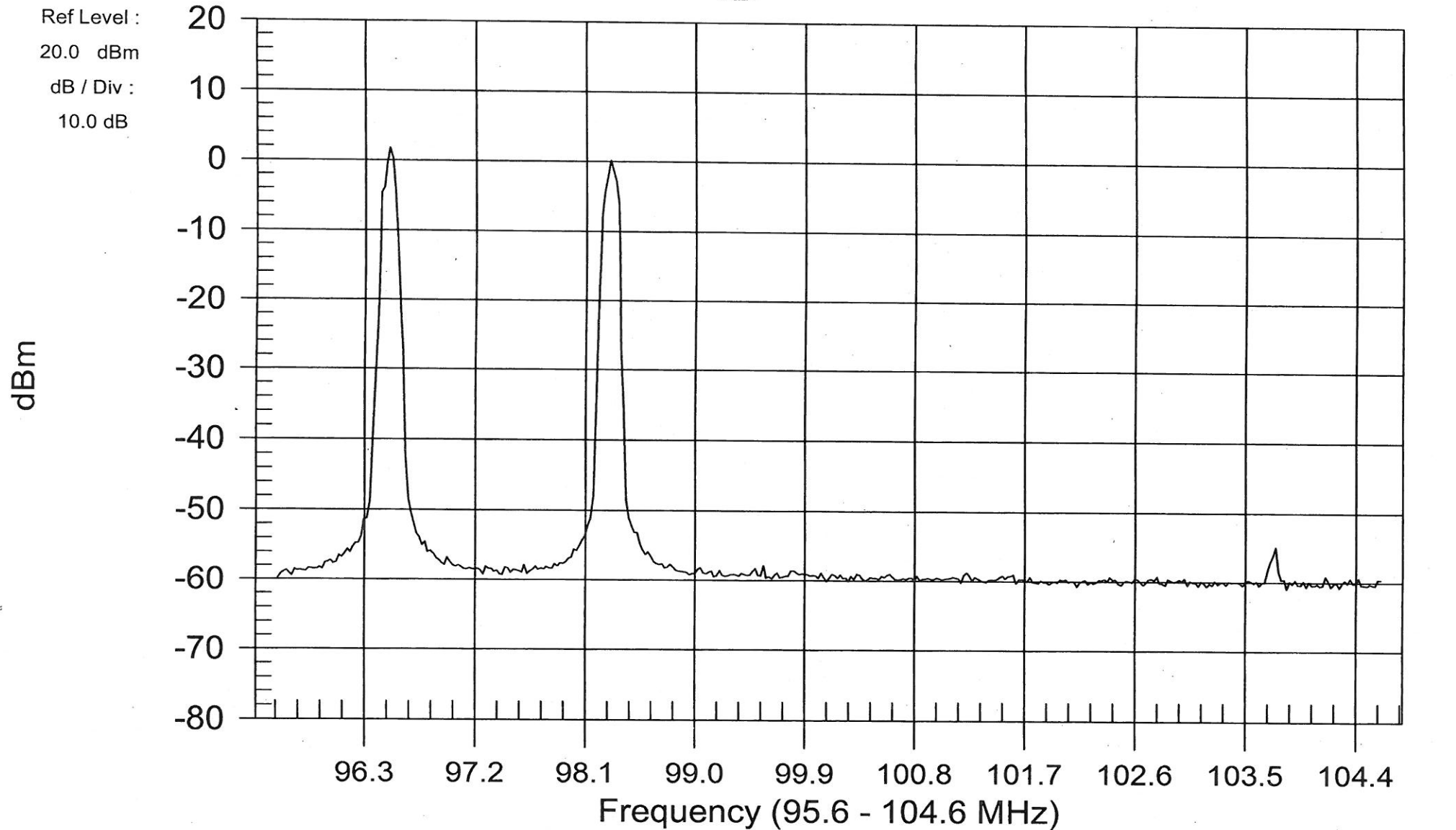
By the following displays of the spectrum analyzer it has been determined that the equipment are operating within manufacturers specifications and that any residual mix products are below FCC minimums as published in the Rules for this class of station and service.



Andrew Pickard

Spectrum Analyzer

1B



CF: 100.1 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 9.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

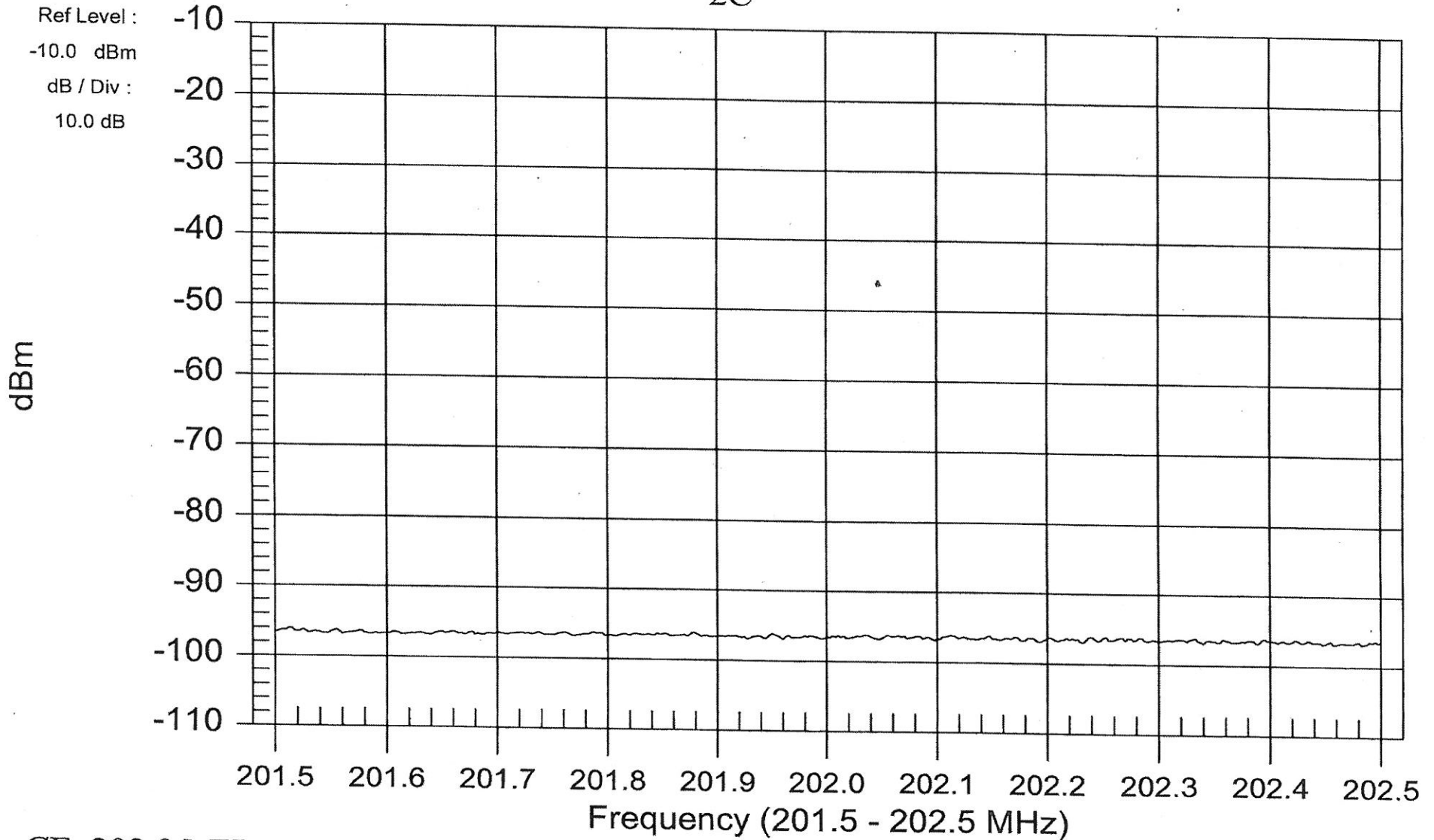
Detection: Pos. Peak

Time: 11:44:49

Serial #: 00431056

Spectrum Analyzer

2C



CF: 202.0 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

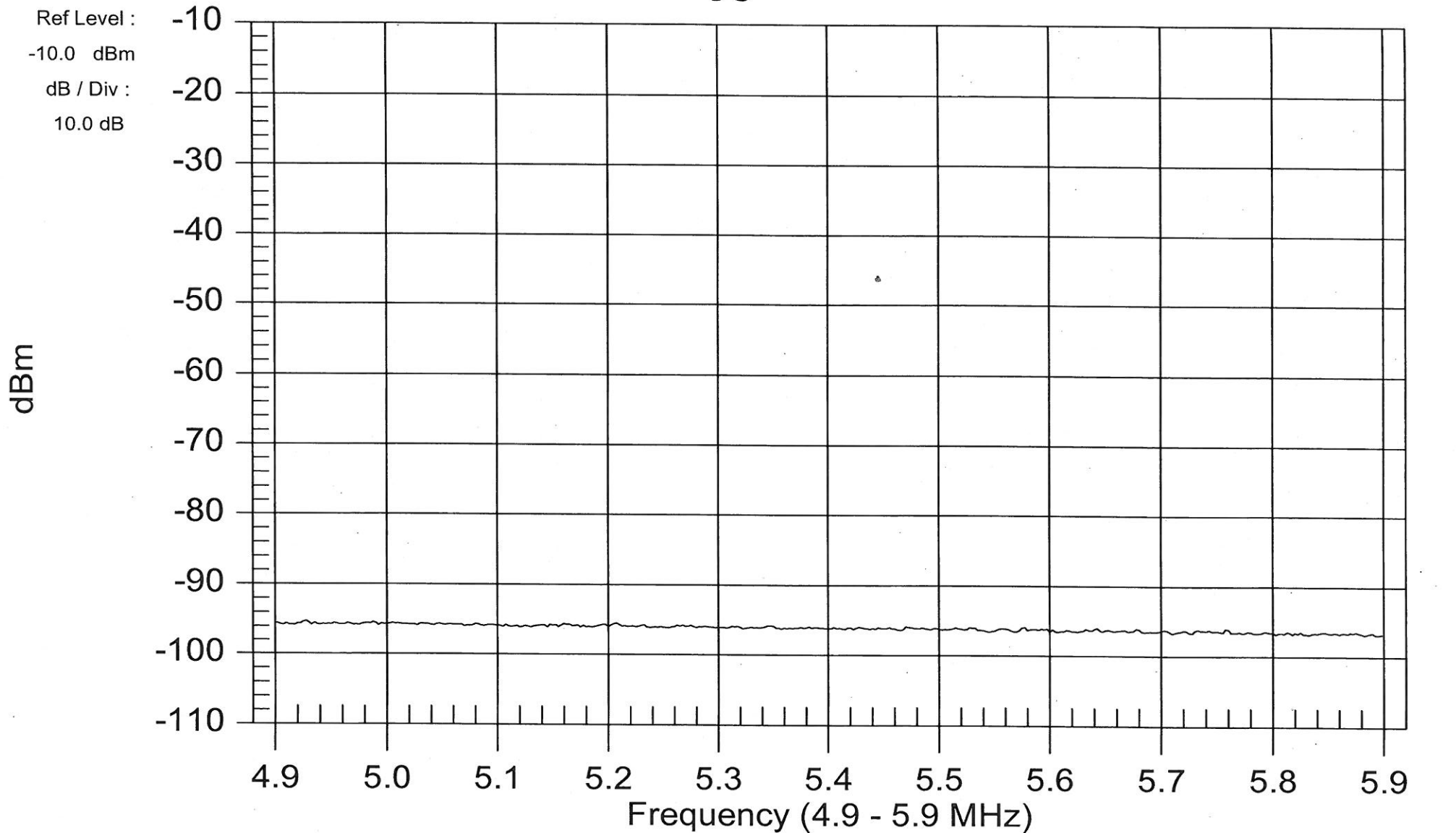
Detection: Pos. Peak

Time: 12:32:35

Serial #: 00431056

Spectrum Analyzer

3C



CF: 5.4 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

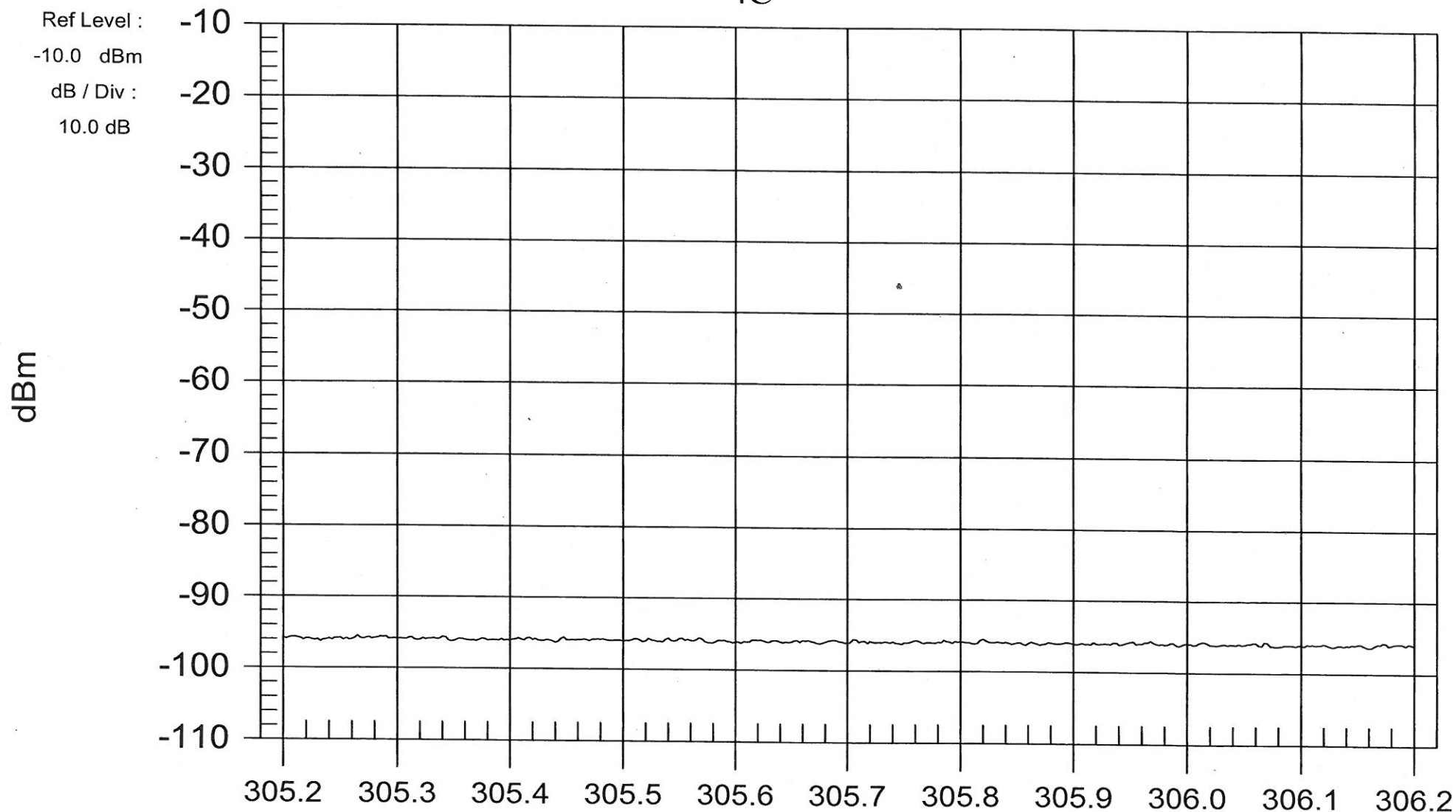
Detection: Pos. Peak

Time: 12:33:09

Serial #: 00431056

Spectrum Analyzer

4C



CF: 305.7 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

Frequency (305.2 - 306.2 MHz)

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

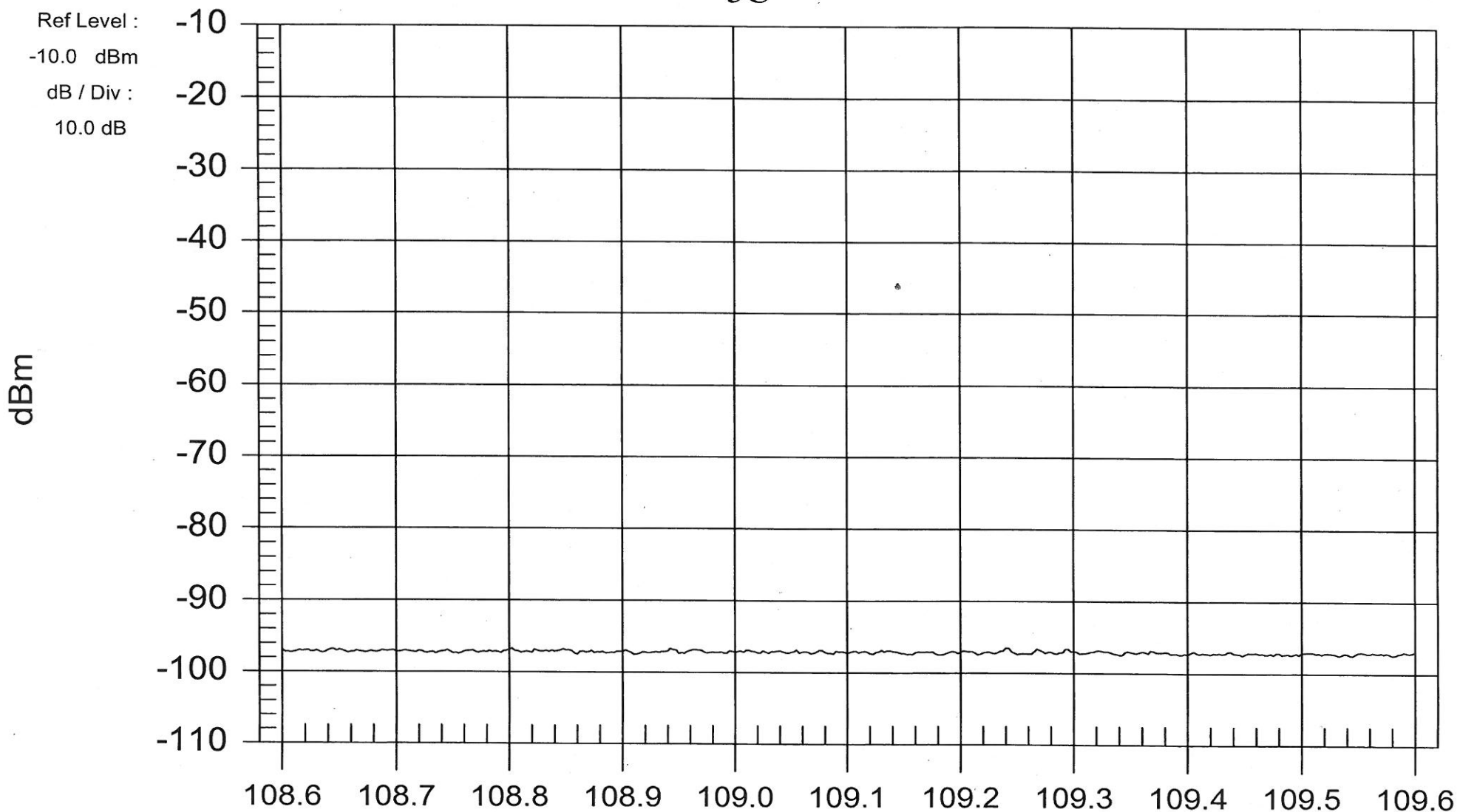
Detection: Pos. Peak

Time: 12:33:52

Serial #: 00431056

Spectrum Analyzer

5C



CF: 109.1 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

Frequency (108.6 - 109.6 MHz)

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

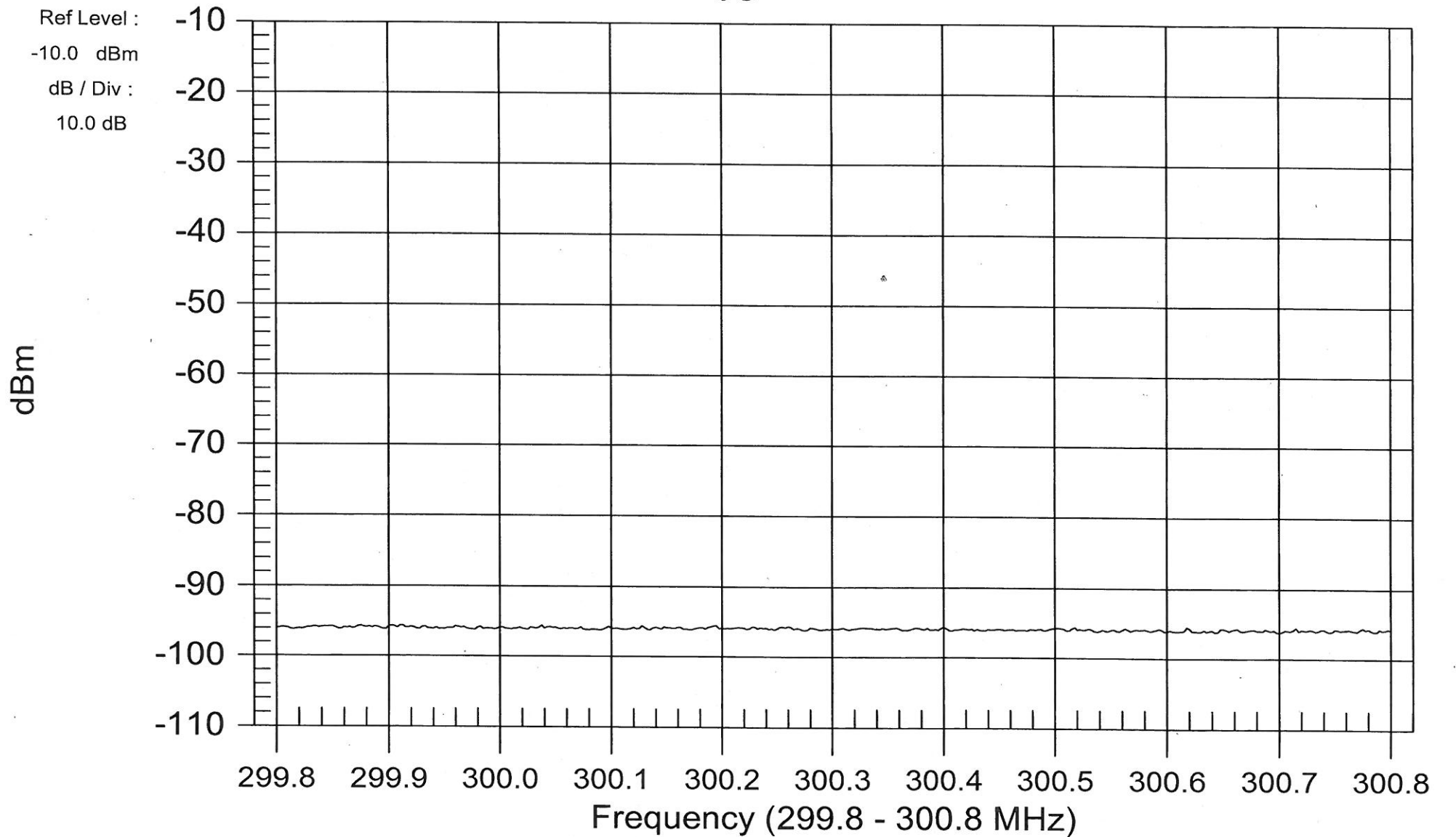
Detection: Pos. Peak

Time: 12:34:26

Serial #: 00431056

Spectrum Analyzer

6C



CF: 300.3 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

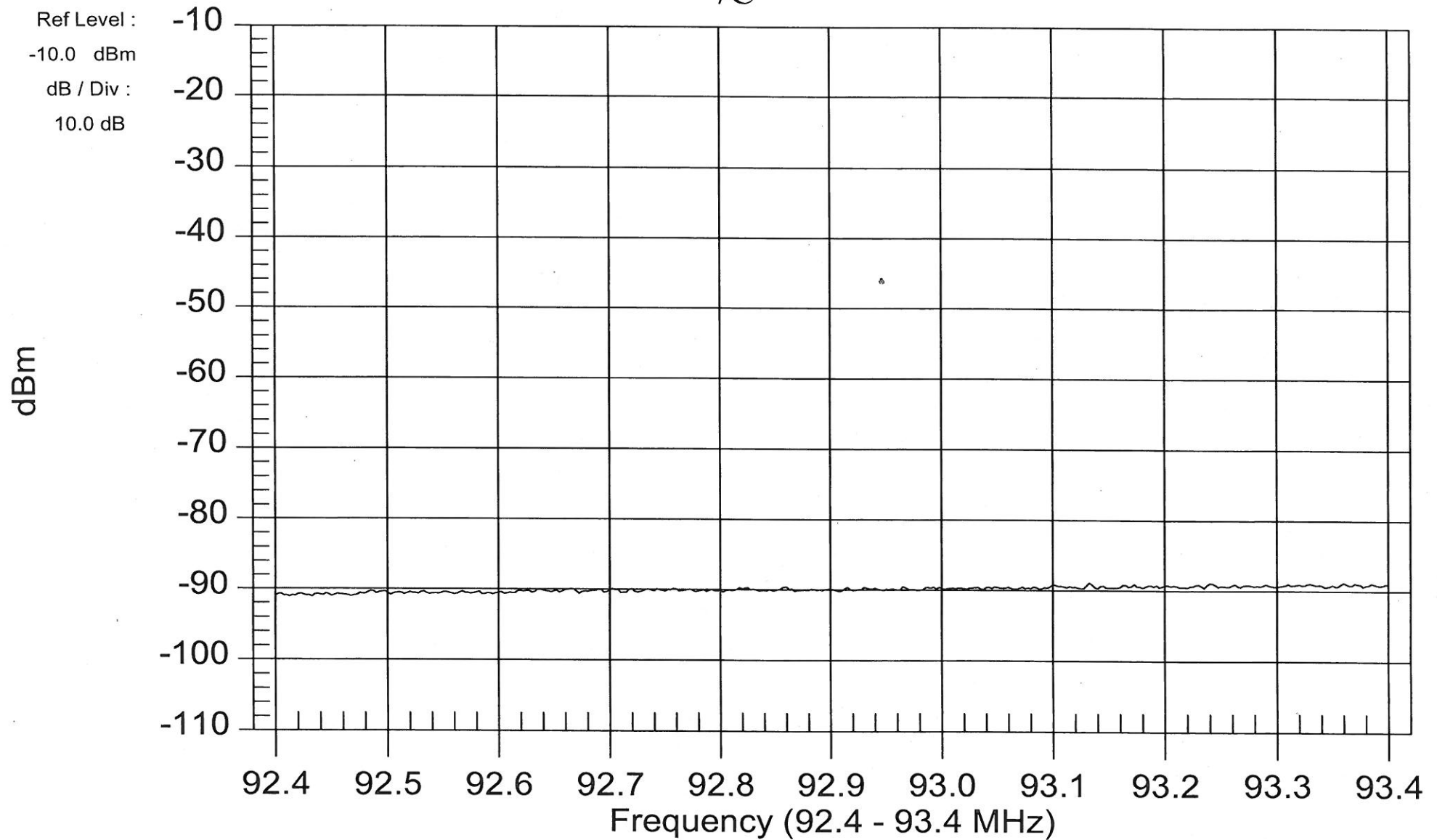
Detection: Pos. Peak

Time: 12:35:09

Serial #: 00431056

Spectrum Analyzer

7C



CF: 92.9 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

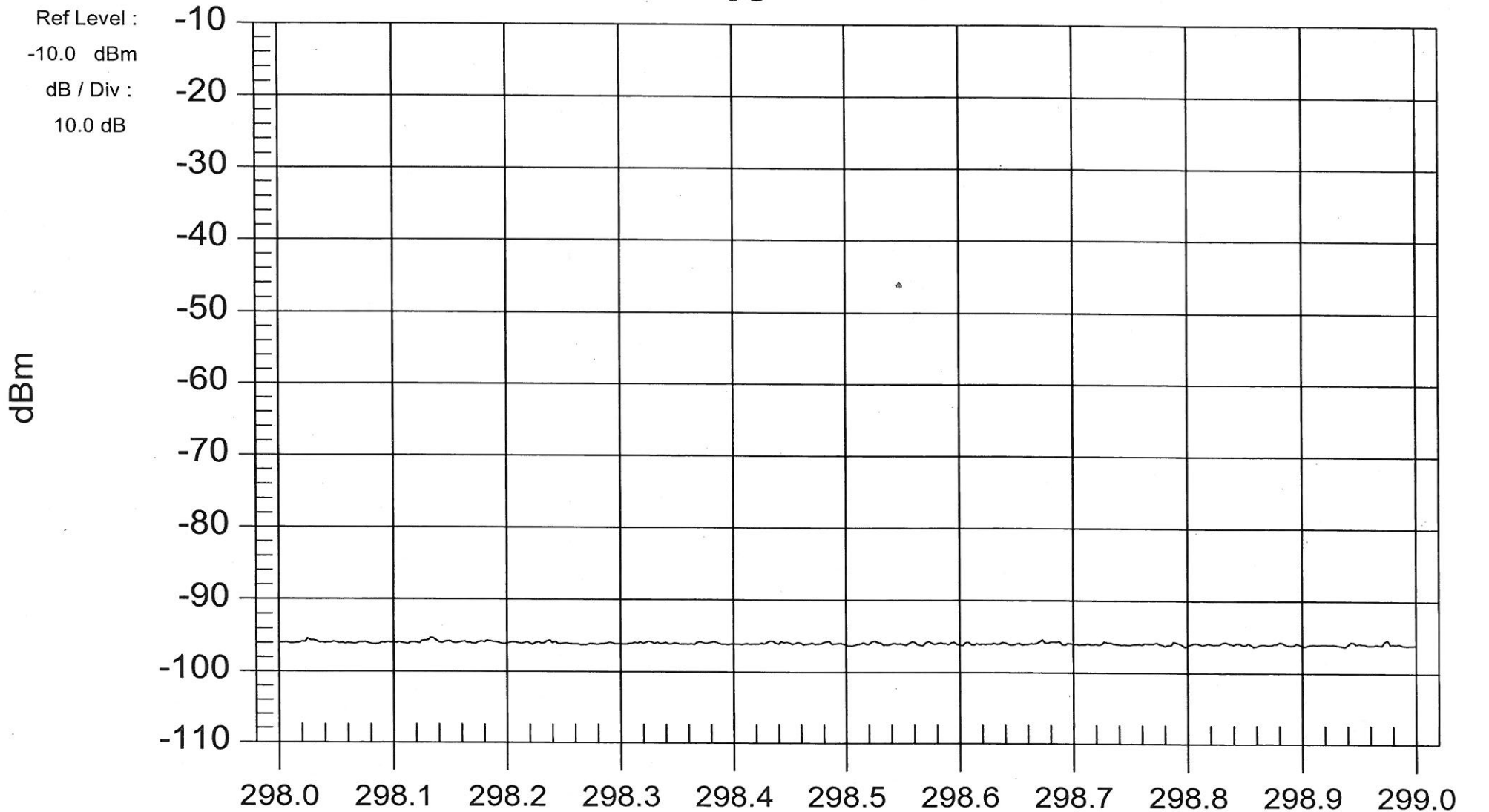
Detection: Pos. Peak

Time: 12:35:47

Serial #: 00431056

Spectrum Analyzer

8C



Frequency (298.0 - 299.0 MHz)

CF: 298.5 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

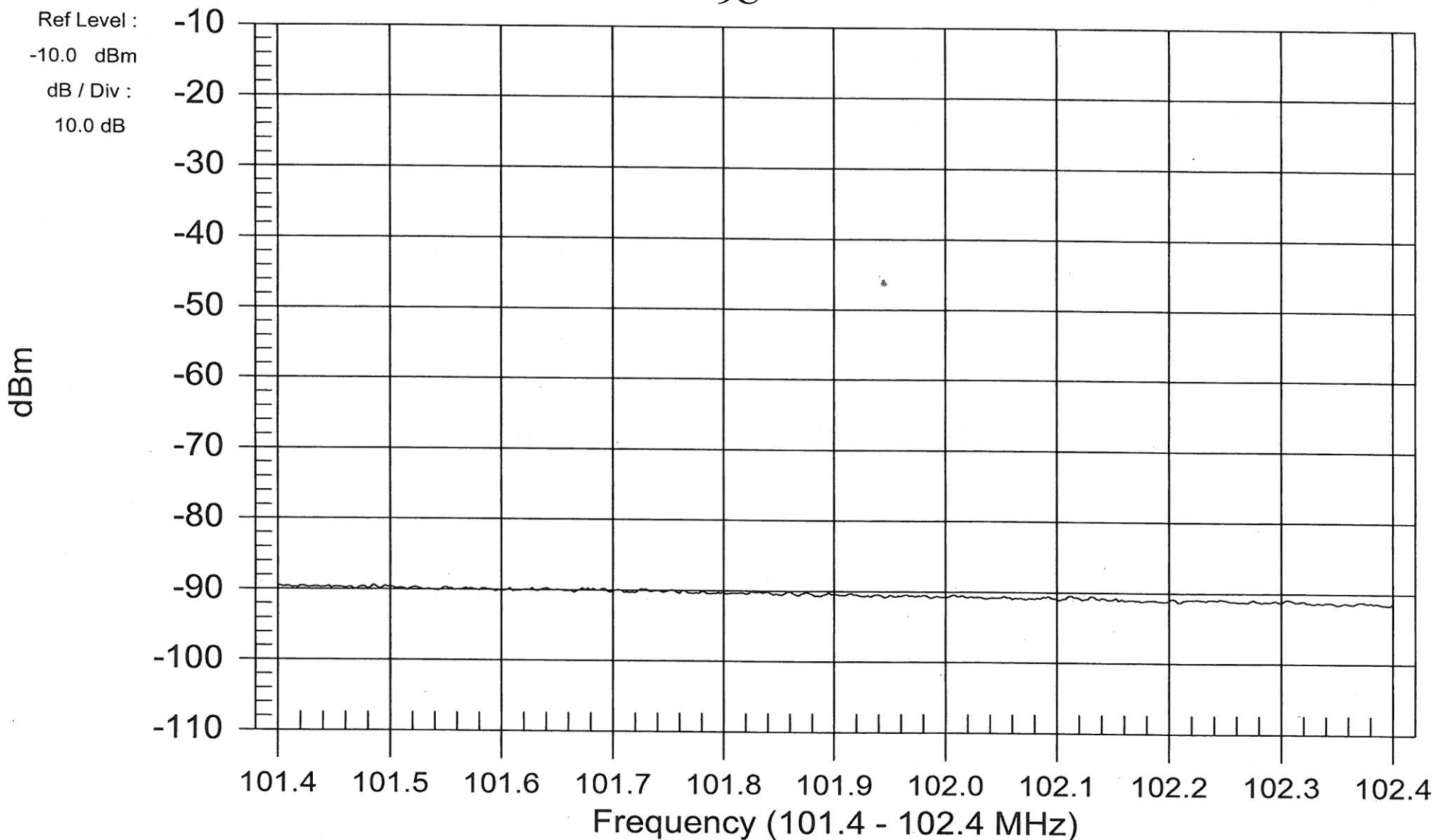
Detection: Pos. Peak

Time: 12:38:08

Serial #: 00431056

Spectrum Analyzer

9C



CF: 101.9 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

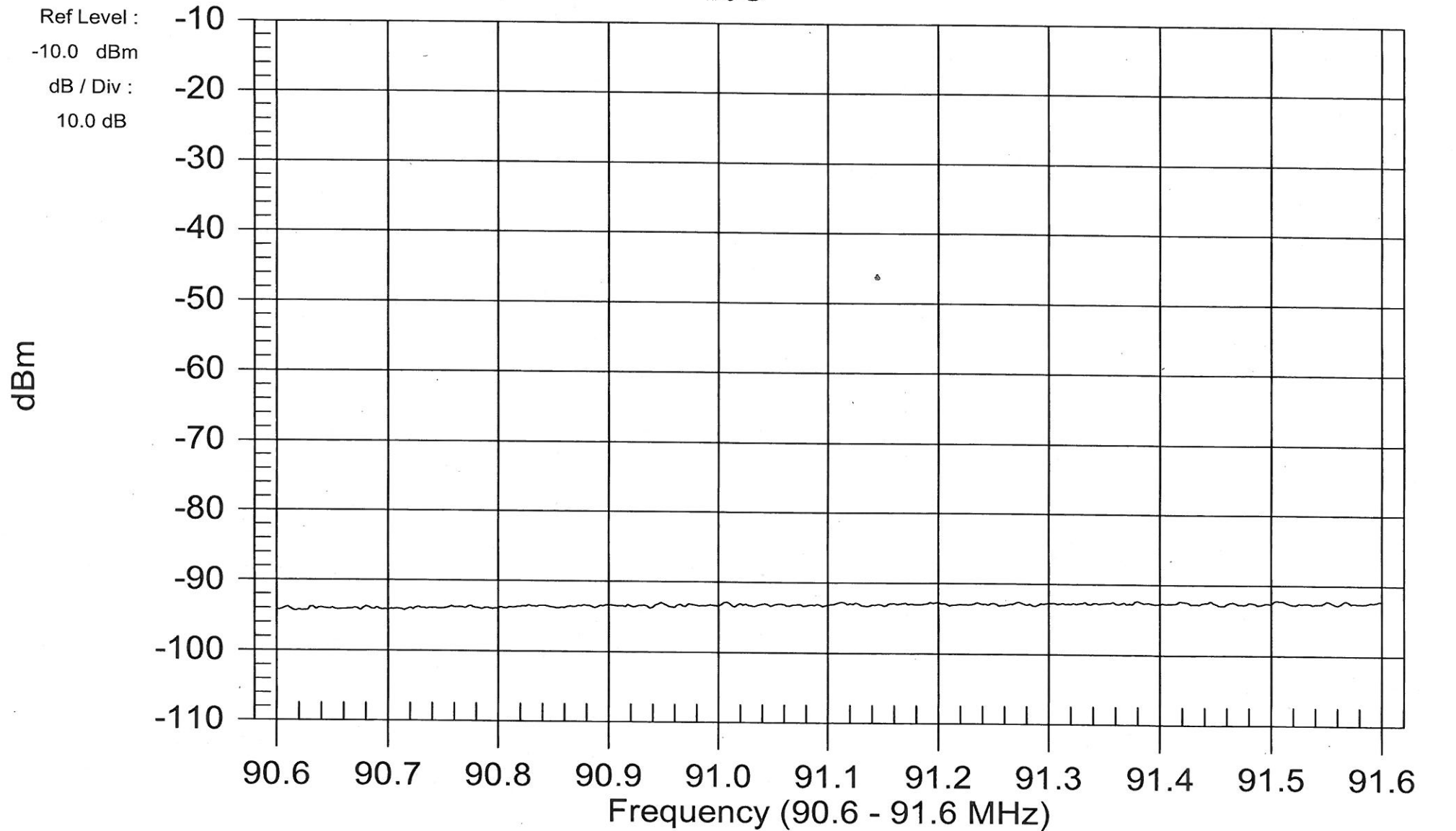
Detection: Pos. Peak

Time: 12:38:46

Serial #: 00431056

Spectrum Analyzer

10C



CF: 91.1 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

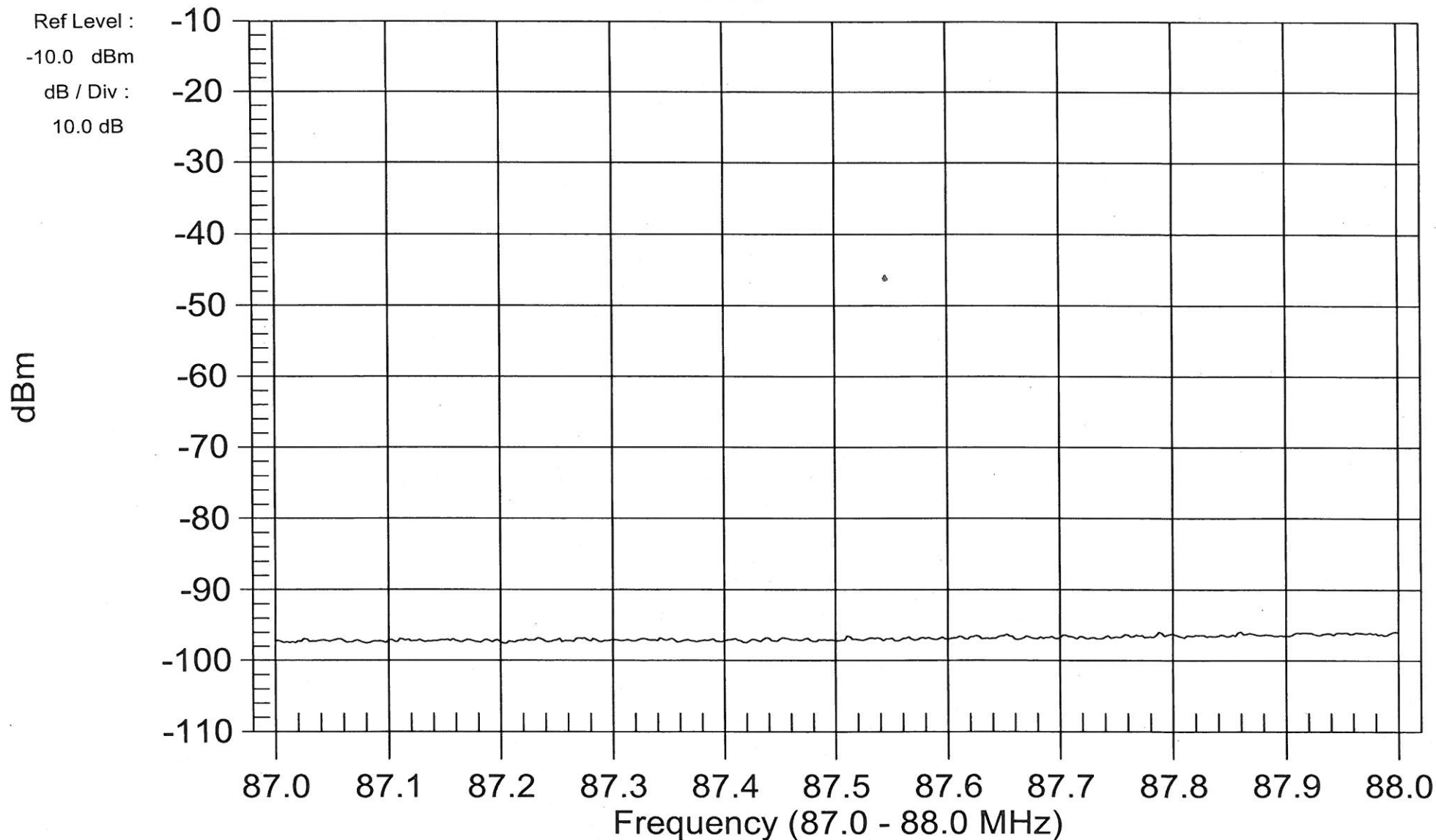
Detection: Pos. Peak

Time: 12:39:29

Serial #: 00431056

Spectrum Analyzer

11C



CF: 87.5 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Time: 12:40:03

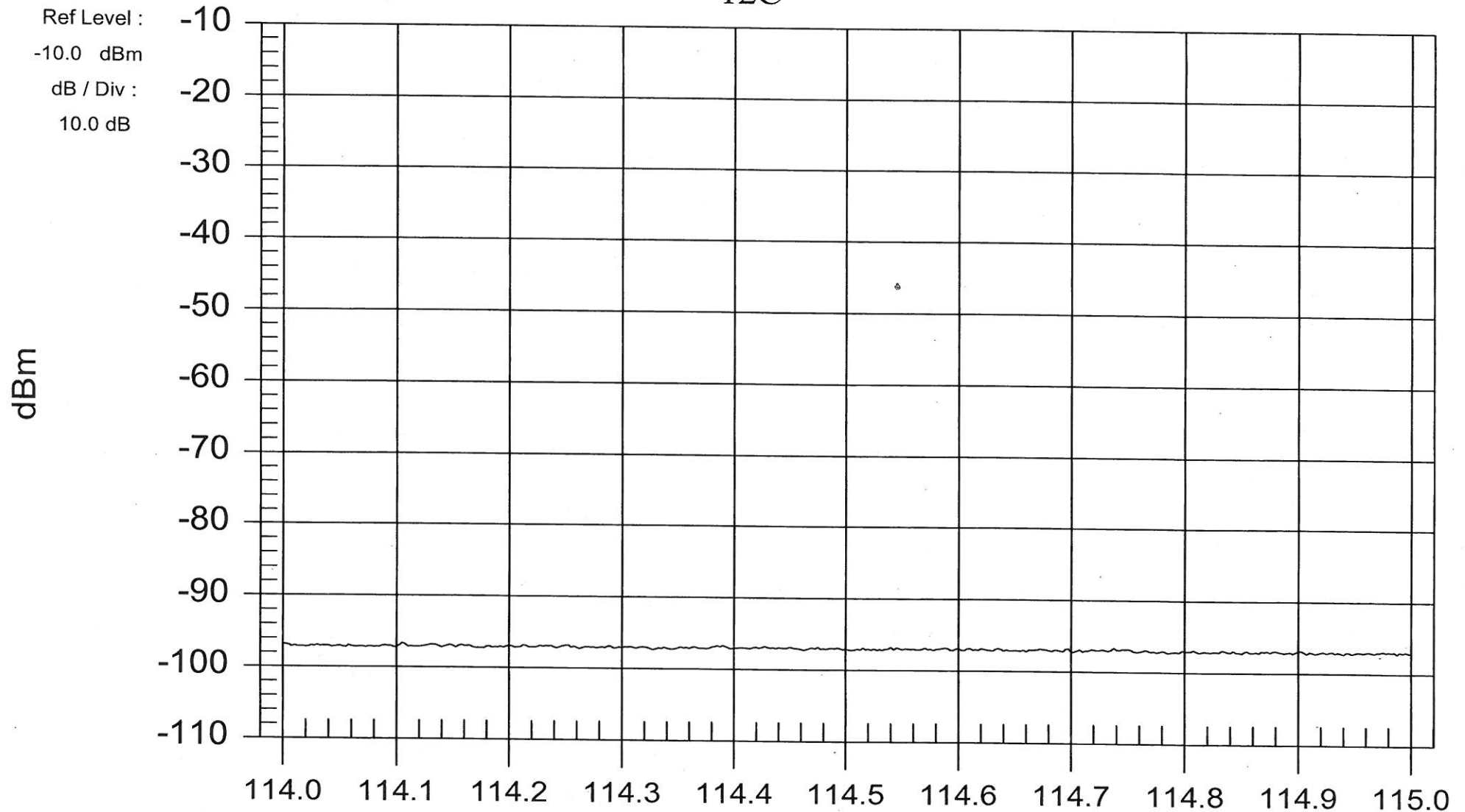
Serial #: 00431056

Attenuation: 35 dB

Detection: Pos. Peak

Spectrum Analyzer

12C



CF: 114.5 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

Frequency (114.0 - 115.0 MHz)

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

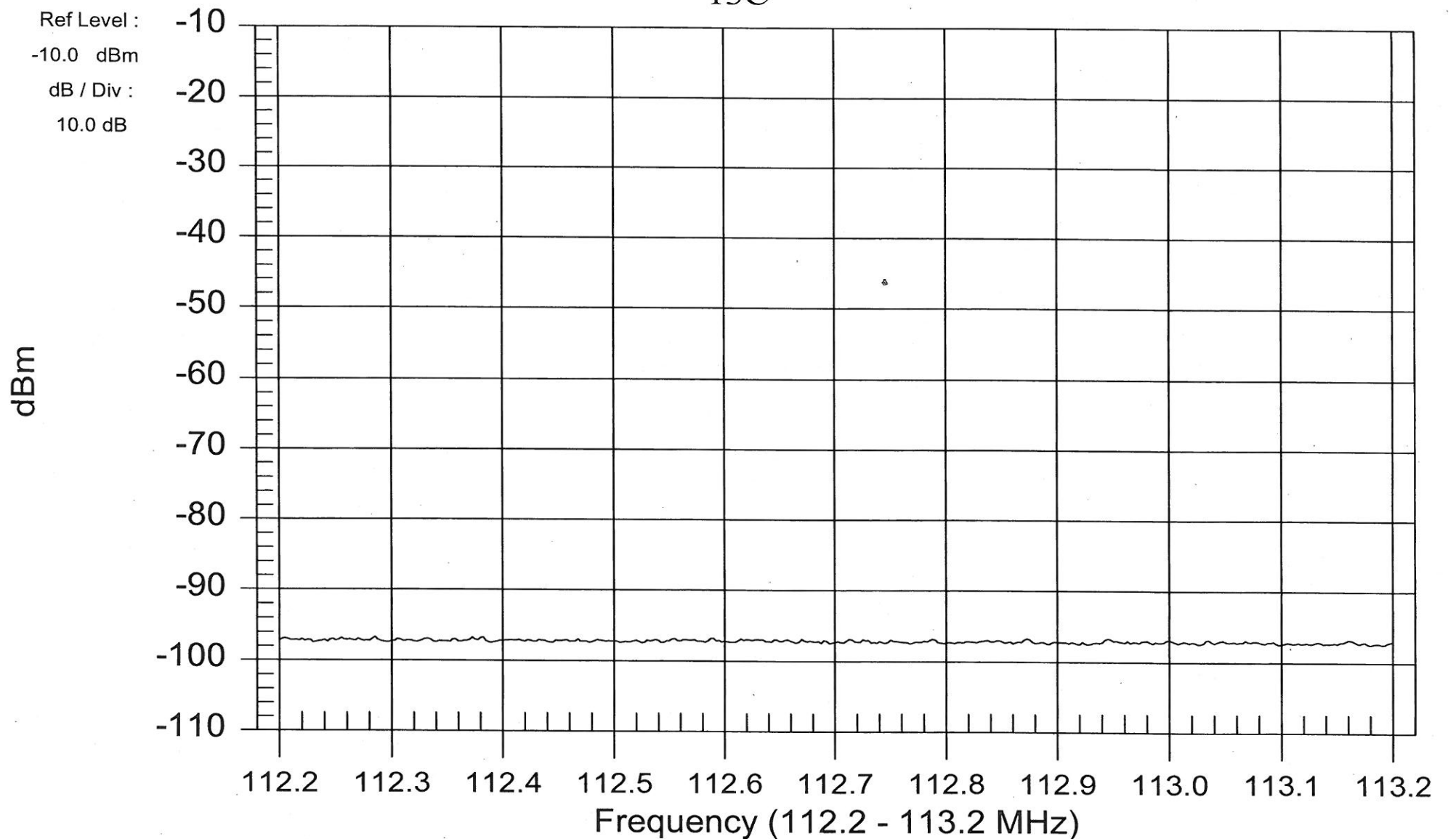
Detection: Pos. Peak

Time: 12:41:08

Serial #: 00431056

Spectrum Analyzer

13C



CF: 112.7 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

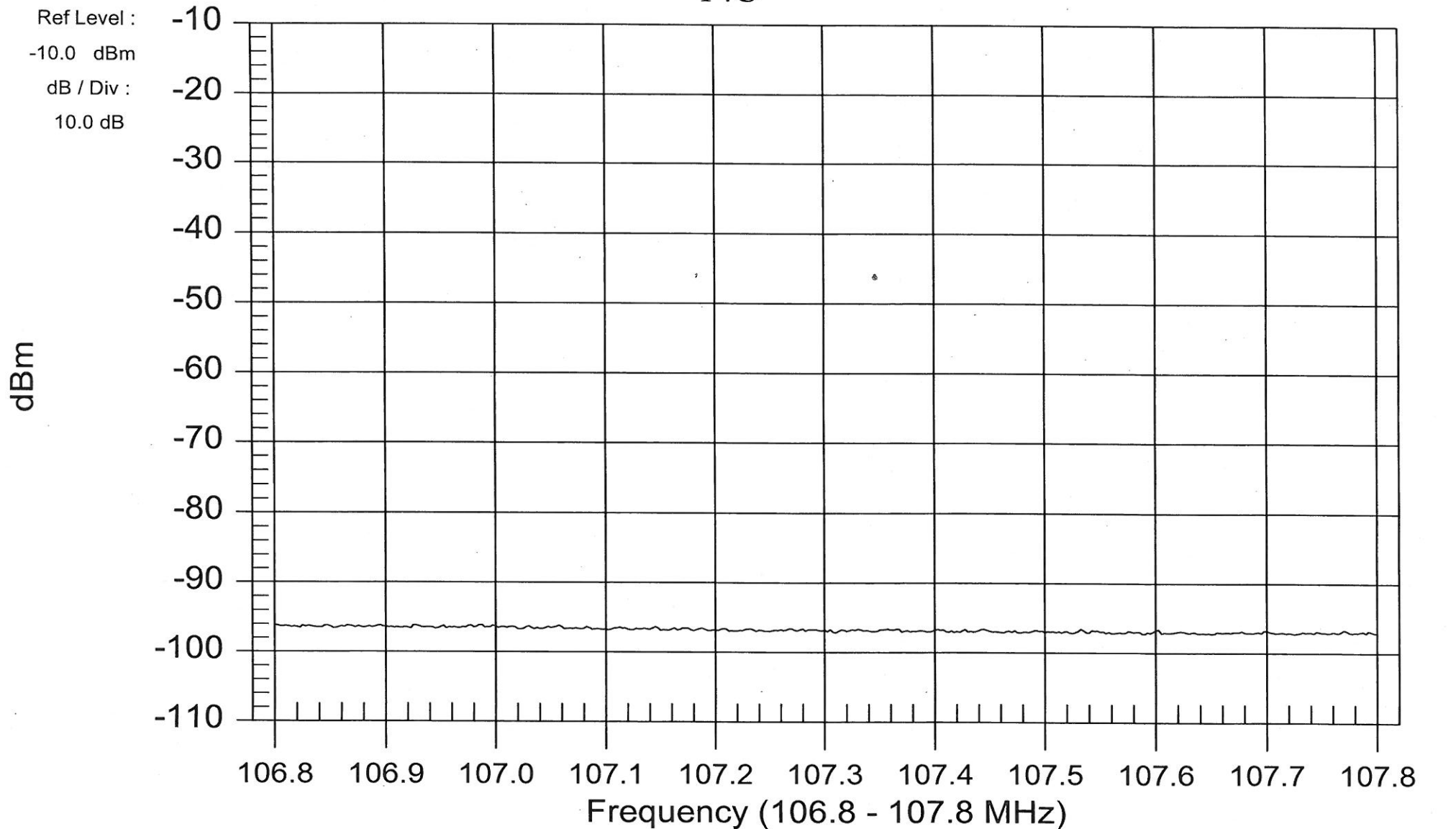
Detection: Pos. Peak

Time: 12:41:49

Serial #: 00431056

Spectrum Analyzer

14C



CF: 107.3 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

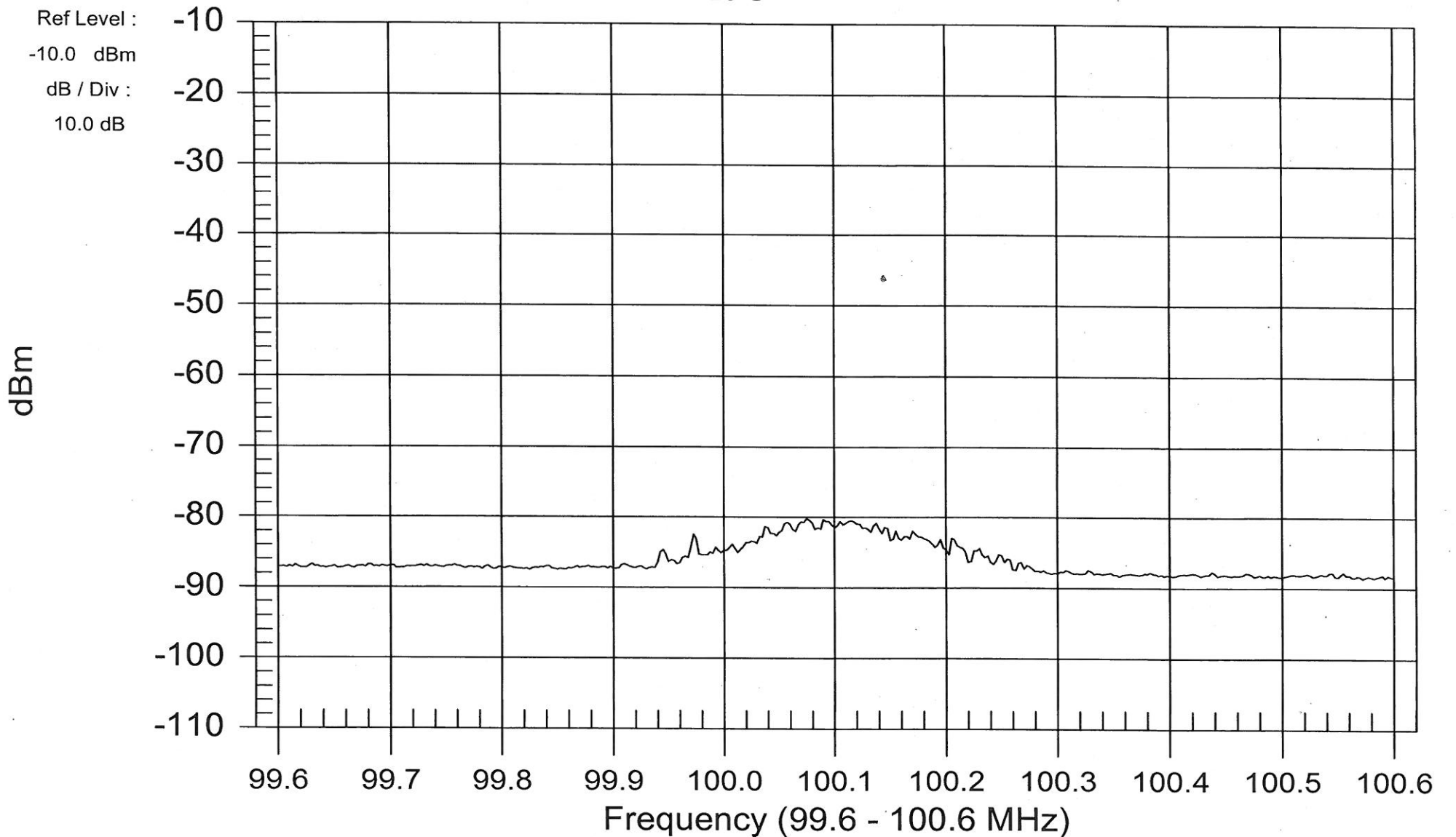
Detection: Pos. Peak

Time: 12:42:58

Serial #: 00431056

Spectrum Analyzer

15C



CF: 100.1 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

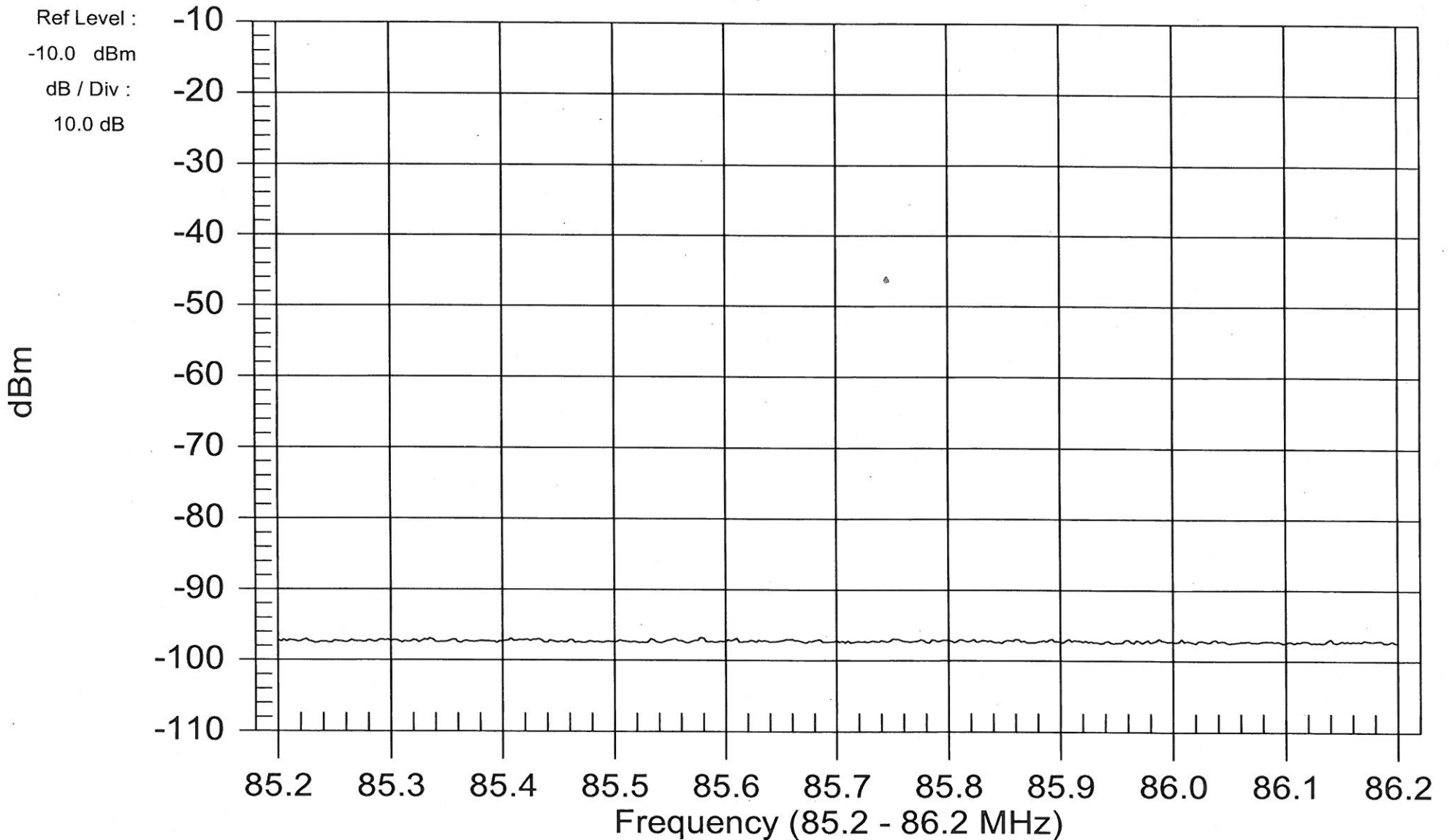
Detection: Pos. Peak

Time: 12:43:48

Serial #: 00431056

Spectrum Analyzer

16C



CF: 85.7 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

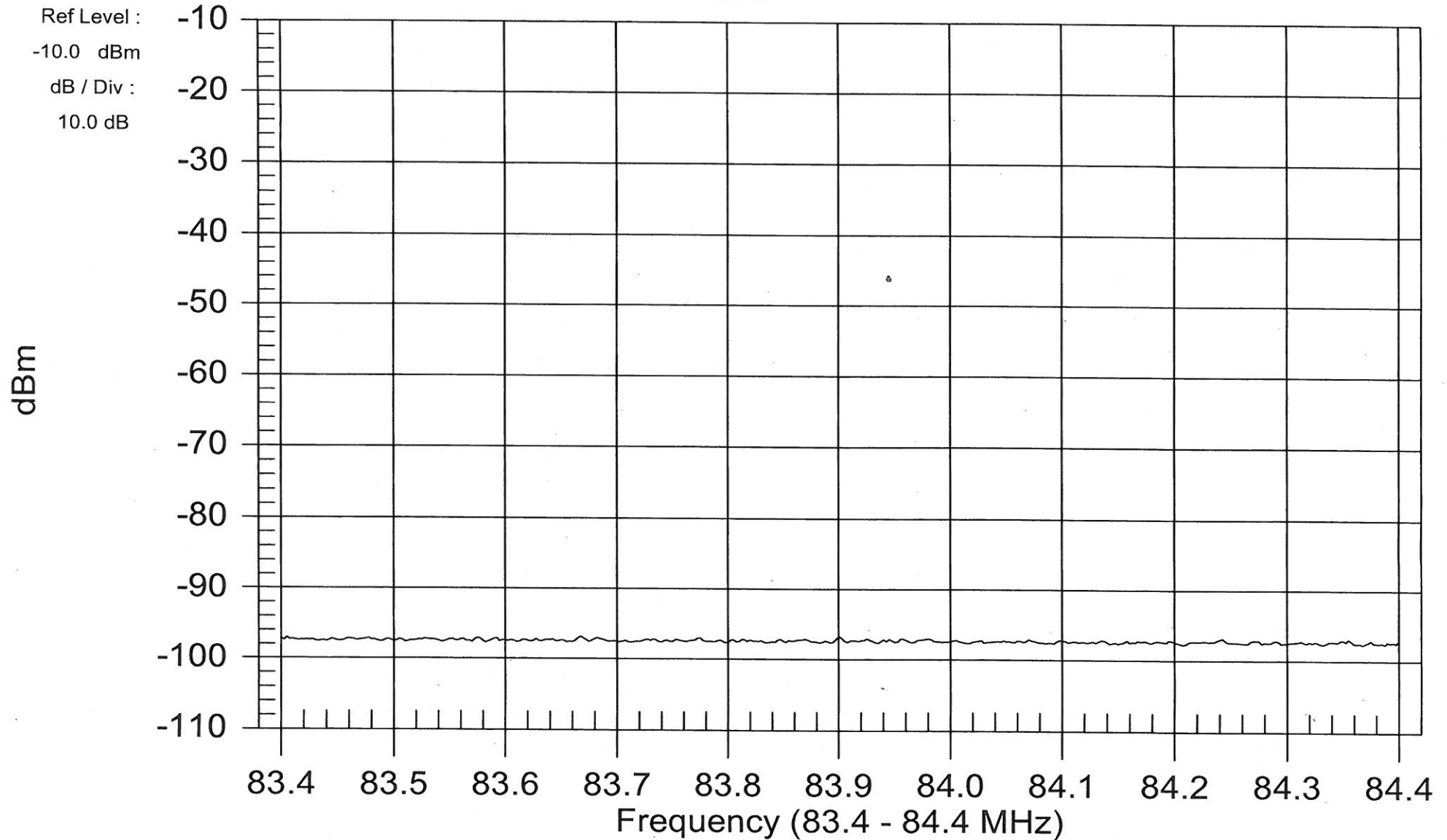
Detection: Pos. Peak

Time: 12:44:38

Serial #: 00431056

Spectrum Analyzer

17C



CF: 83.9 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

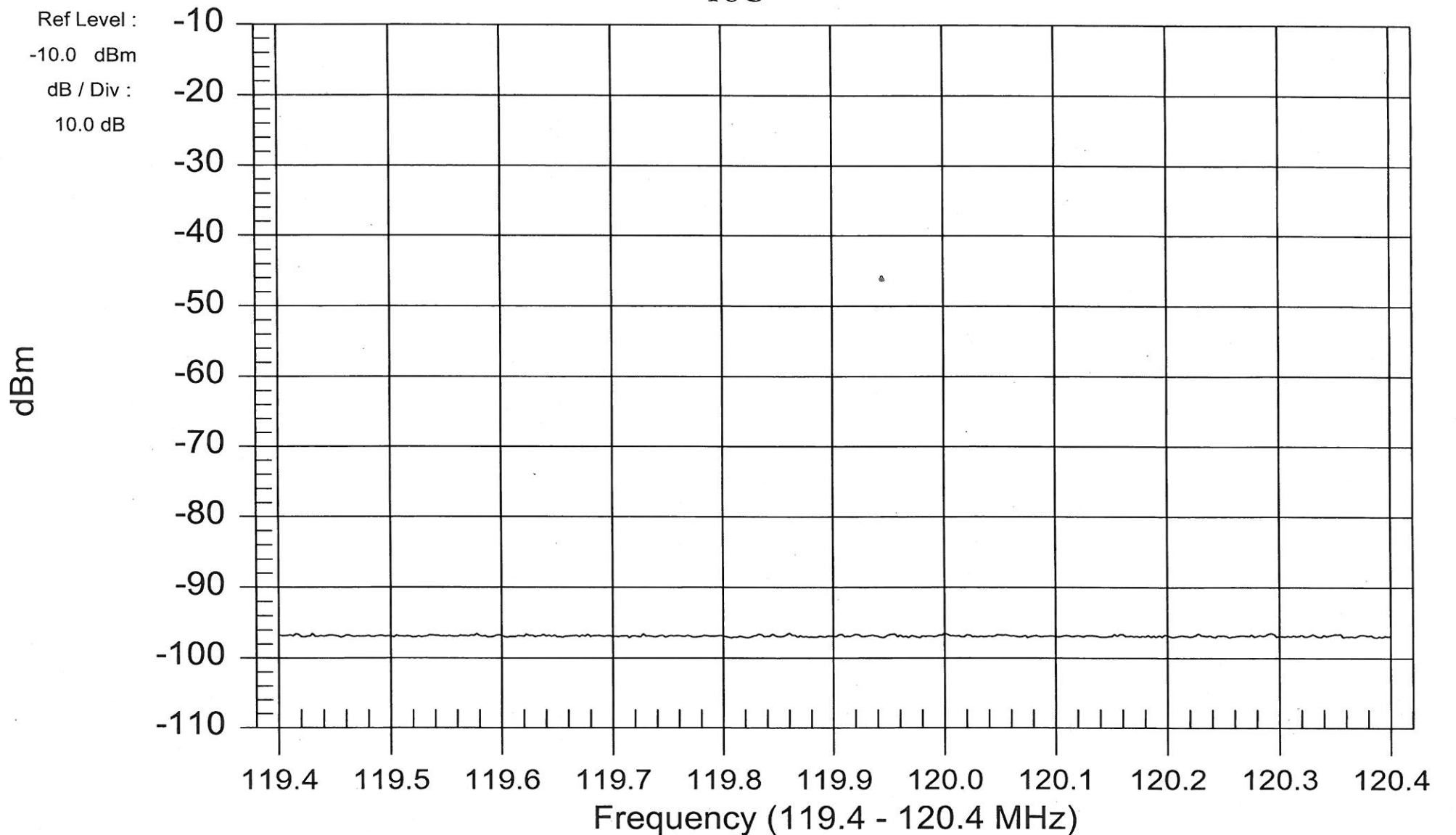
Detection: Pos. Peak

Time: 12:45:20

Serial #: 00431056

Spectrum Analyzer

18C



CF: 119.9 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

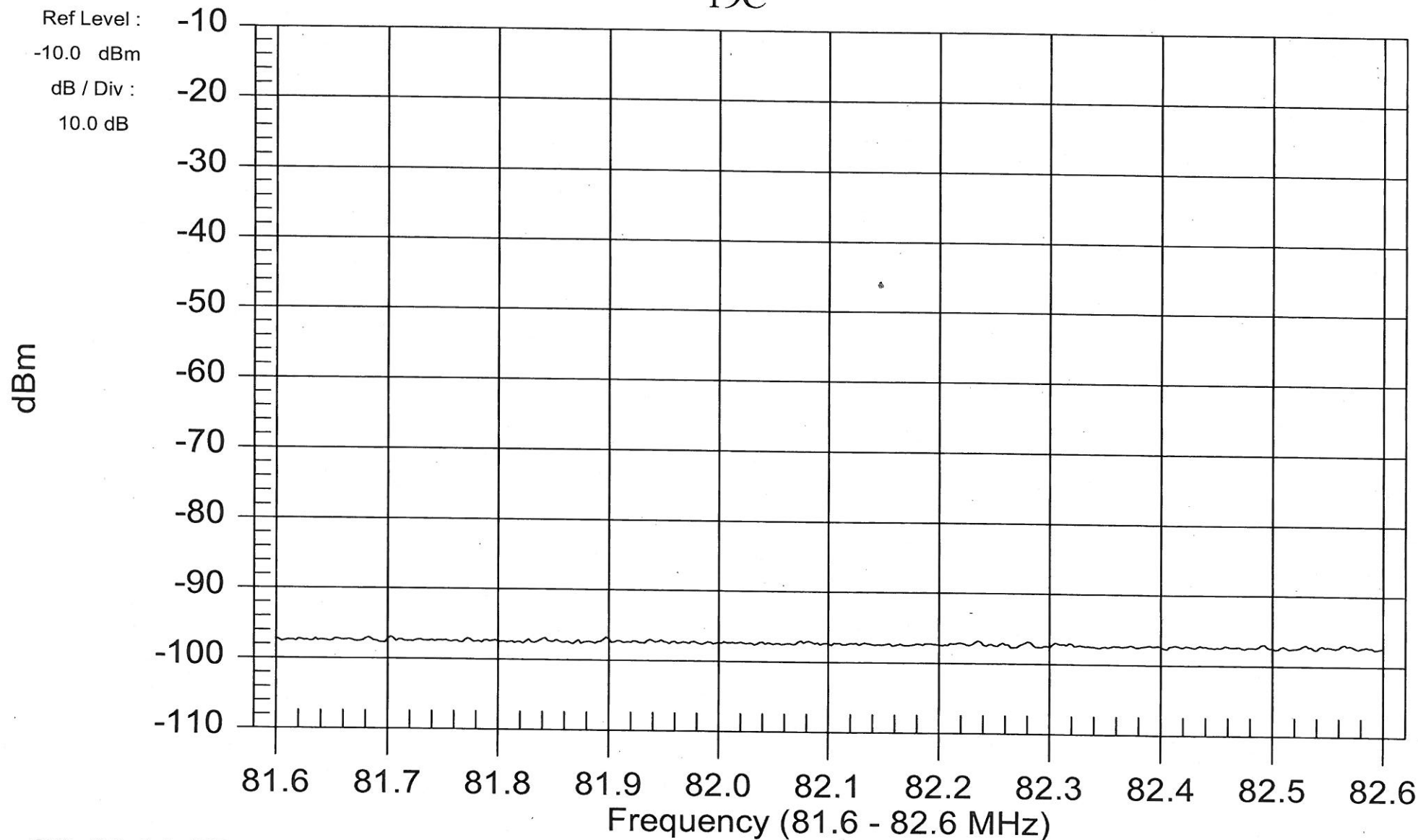
Detection: Pos. Peak

Time: 12:58:24

Serial #: 00431056

Spectrum Analyzer

19C



CF: 82.1 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

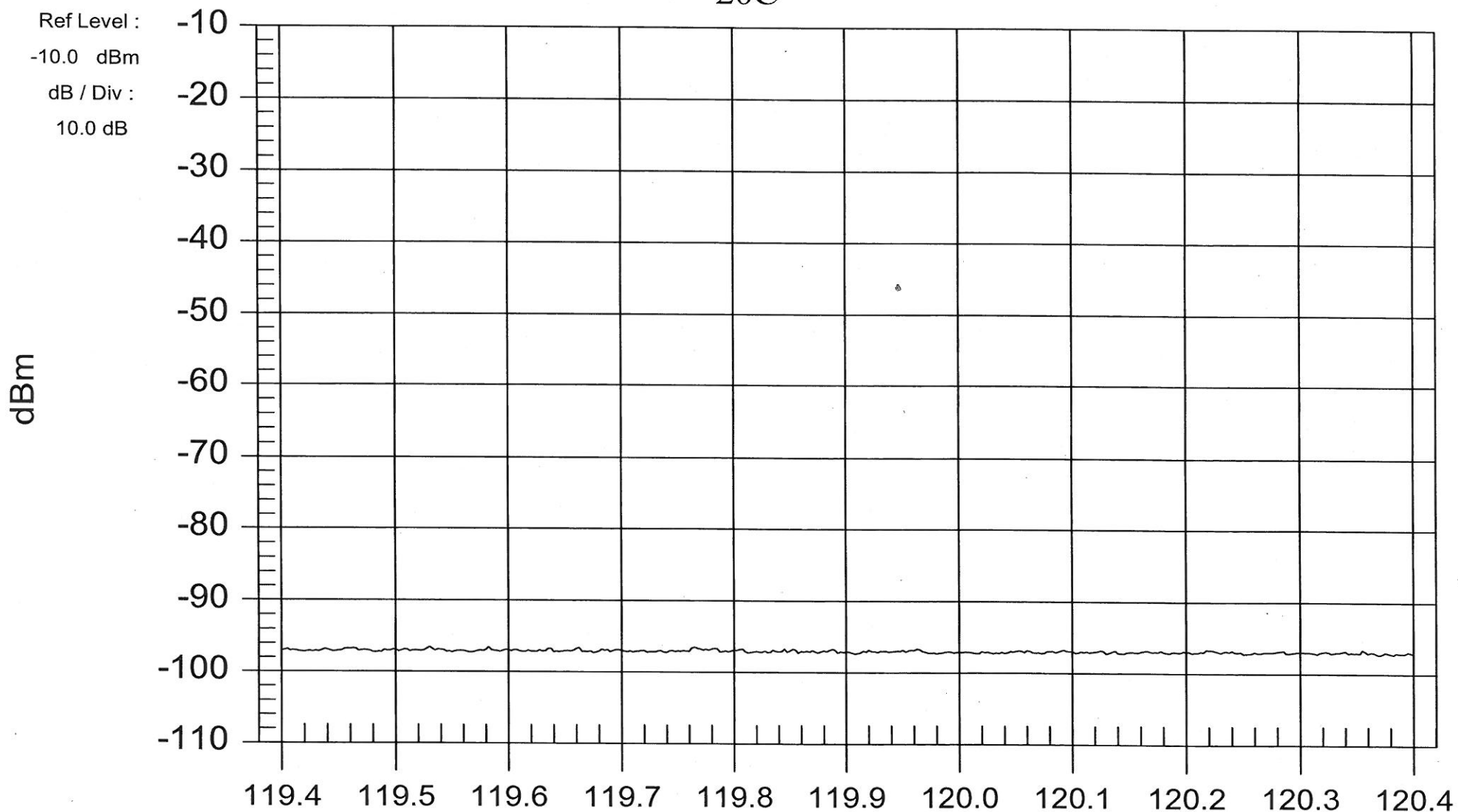
Detection: Pos. Peak

Time: 12:58:57

Serial #: 00431056

Spectrum Analyzer

20C



CF: 119.9 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

Frequency (119.4 - 120.4 MHz)

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

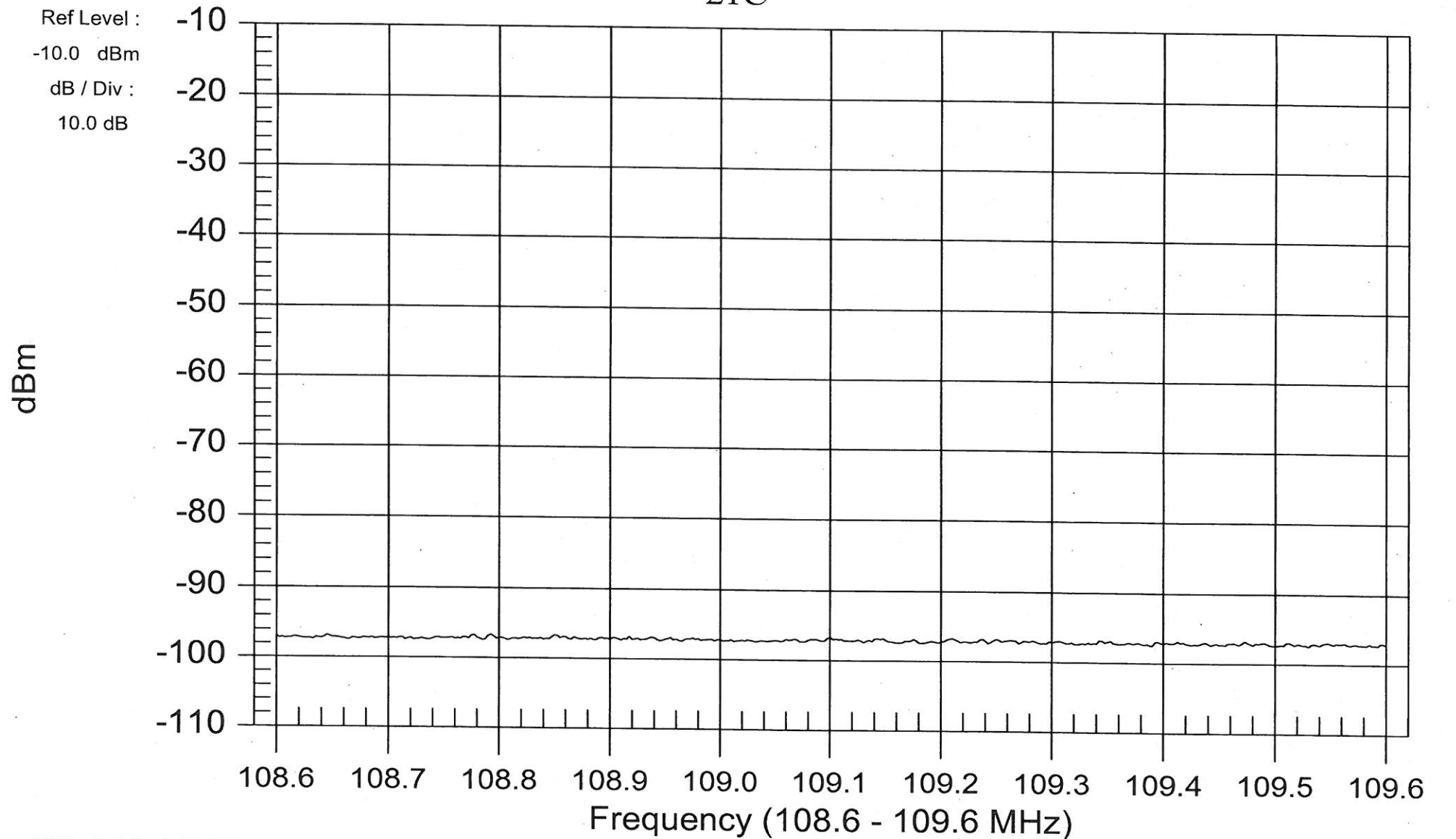
Detection: Pos. Peak

Time: 12:59:51

Serial #: 00431056

Spectrum Analyzer

21C



CF: 109.1 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

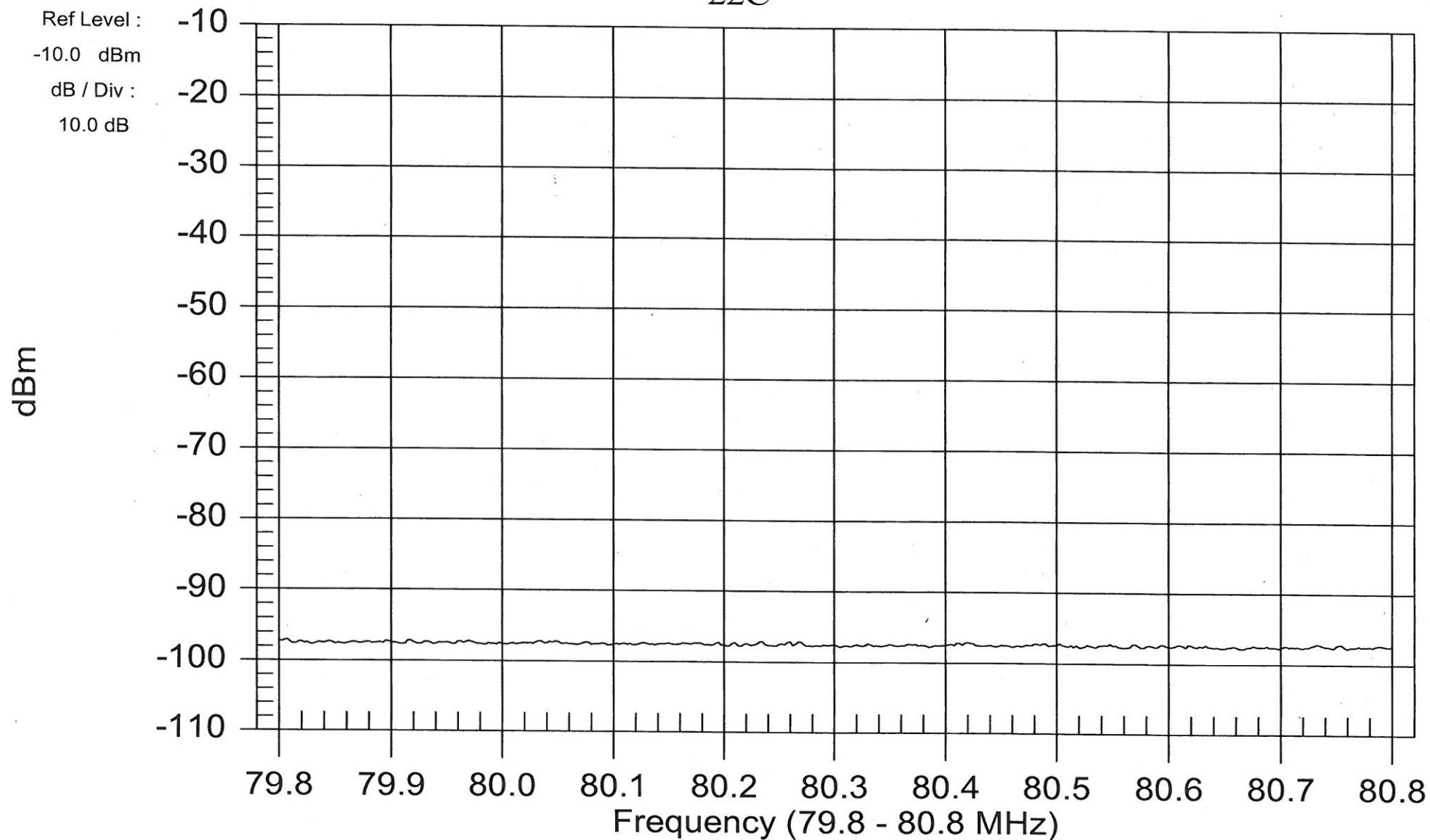
Detection: Pos. Peak

Time: 13:00:36

Serial #: 00431056

Spectrum Analyzer

22C



CF: 80.3 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

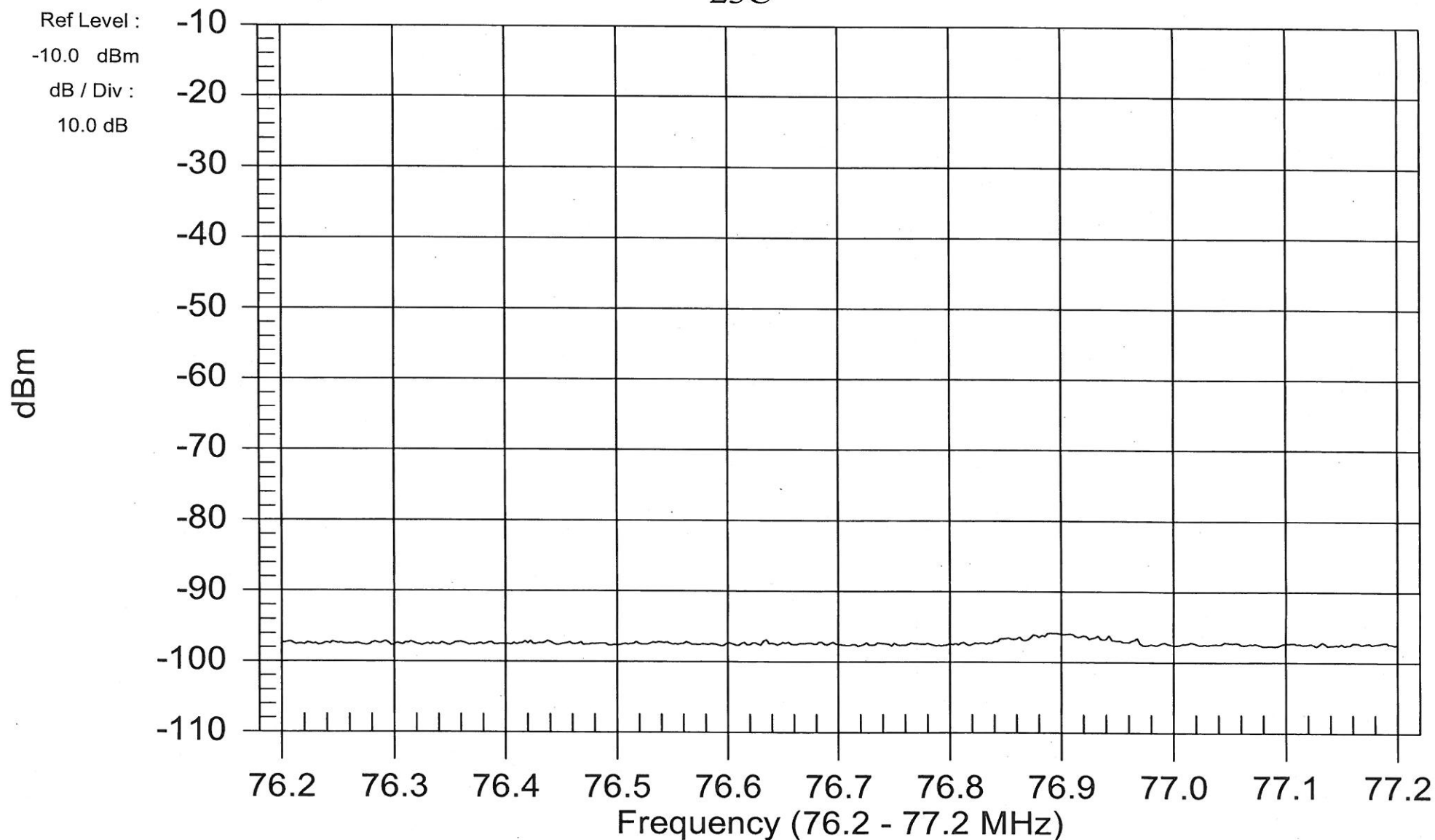
Detection: Pos. Peak

Time: 13:01:11

Serial #: 00431056

Spectrum Analyzer

23C



CF: 76.7 MHz

RBW: 30 kHz

MaxHold: ON

Min Sweep Time: 5.05 Milli Sec

Date: 06/16/2014

Model: MS2711D

SPAN: 1.00 MHz

VBW: 100 Hz

Attenuation: 35 dB

Detection: Pos. Peak

Time: 13:01:56

Serial #: 00431056