

**ENGINEERING REPORT  
FM OCCUPIED SPECTRUM ANALYSIS**

CFR 47 §73.317 Compliance

**W252DA(FX) – Petoskey, MI, FID # 144605**

**W277DY(FX) – Petoskey, MI, FID # 202117**

**Plus Additional Mixing Products**

**December 2021**

# **FM OCCUPIED SPECTRUM ANALYSIS**

## **Discussion:**

The measurement data obtained for this report indicates the operation of W252DA(FX) and W277DY(FX) to be IN COMPLIANCE with the provisions of CFR 47 §73.317 of the FCC rules regarding FM Broadcast Stations. Occupied Spectrum measurements taken during the regular broadcast day, December 13, 2021 by Edmond R. Trombley, staff engineer in the regular employ of Munn-Reese. The stored spectrum data gathered by the analyzer has been processed and displayed in this report as Figure A, Figure B, Figure C and Figure D. In addition, spurious emission and harmonic measurements were made using a calibrated spectrum analyzer and a Bird through line section employing a Bird sample slug. The Bird line section was inserted after the output of the power combiner feeding the antenna and the sample slug feeds the input to the spectrum analyzer. Spurious mixing products and harmonic measurements were then conducted and logged in Table A.

## **Equipment Employed**

Anritsu MS2721B, Spectrum Master. Technical specifications of the Anritsu MS2721B are available on the Internet at [www.anritsu.com](http://www.anritsu.com).

Bird Line section and sample system technical specifications are available on the Internet at [www.BirdRF.com](http://www.BirdRF.com).

## **EXHIBITS**

**Figure A** - Plot of W252DA(FX) Occupied Spectrum using a Span of 50 kHz/division

**Figure B** - Plot of W252DA(FX) Occupied Spectrum using a span of 200 kHz/division

**Figure C** - Plot of W277DY(FX) Occupied Spectrum using a Span of 50 kHz/division

**Figure D** - Plot of W277DY(FX) Occupied Spectrum using a span of 200 kHz/division

Harmonic measurements and mixing products up to the fourth harmonic were measured using the Anritsu 2721B and the Bird sample system. The Anritsu Spectrum Master was setup and calibrated in accordance with the manufacturer's instructions, and the readings taken on the fundamental carrier frequencies and up to the fourth harmonic.

Other stations located on the same tower are included in the measurements of the mixing products. One translator stations in question operate at 99 watts ERP and the other operated at 250 watts ERP. For this power level combination all mixing products must be 67.0 dB below the carriers of the translator stations. Table A indicates that all mixing products are well below the -67.0 dB limit.

**TABLE A**

Tab	Relation	Frequency MHz.	Level in dB	Note
1	A	96.300	Carrier	
2	B	103.300	Carrier	
3	C	104.700	Carrier	
4	D	107.100	Carrier	
5	2D-A	117.900	-86.4 dB	FAA Band
6	2A	192.600	-96.4 dB	
7	A+B	199.600	-86.0 dB	
8	A+C	201.000	-96.0 dB	
9	A+D	203.400	-87.0 dB	
10	2B	206.600	-70.1 dB	
11	B+C	208.000	-94.6 dB	
12	2C	209.400	-96.3 dB	
13	B+D	210.400	-85.3 dB	
14	C+D	211.800	-96.3 dB	
15	2D	214.200	-78.3 dB	
16	3A	288.900	-93.1 dB	
17	2A+A	288.900	-94.3 dB	

18	2A+B	295.900	-94.2 dB
19	2A+C	297.300	-95.6 dB
20	2A+D	299.700	-99.6 dB
21	2B+A	302.900	-88.4 dB
22	2C+A	305.700	-94.6 dB
23	3B	309.900	-78.4 dB
24	2D+A	310.500	-96.4 dB
25	2B+C	311.300	-87.4 dB
26	2C+B	312.700	-96.4 dB
27	2B+D	313.700	-94.6 dB
28	3C	314.100	-88.6 dB
29	2C+D	316.500	-91.3 dB
30	2D+B	317.500	-84.5 dB
31	2D+C	318.900	-81.6 dB
32	3D	321.300	-88.1 dB
33	2A+2A	385.200	-95.6 dB
34	2A+2B	399.200	-95.3 dB
35	2A+2C	402.000	-95.6 dB
26	2A+2D	406.800	-87.5 dB

This report has been prepared by properly trained electronics specialists under the direction of the undersigned whose qualifications are a matter of record before the Federal Communications Commission. I declare under penalty of laws of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

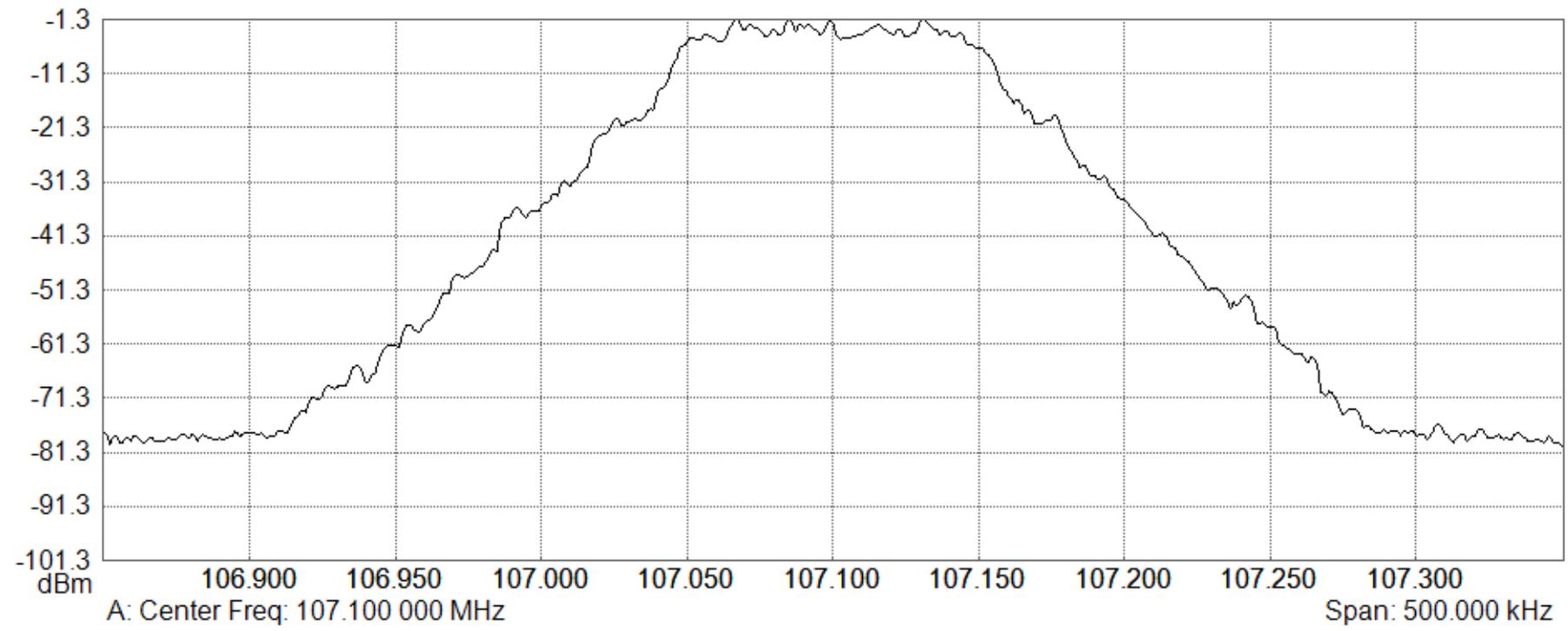
December 16, 2021

By   
 Edmond R. Trombley, Senior Engineer

# Spectrum Analyzer Data

W252DA-FX-A (12/13/2021 4:44:15 PM)

Spectrum Analyzer

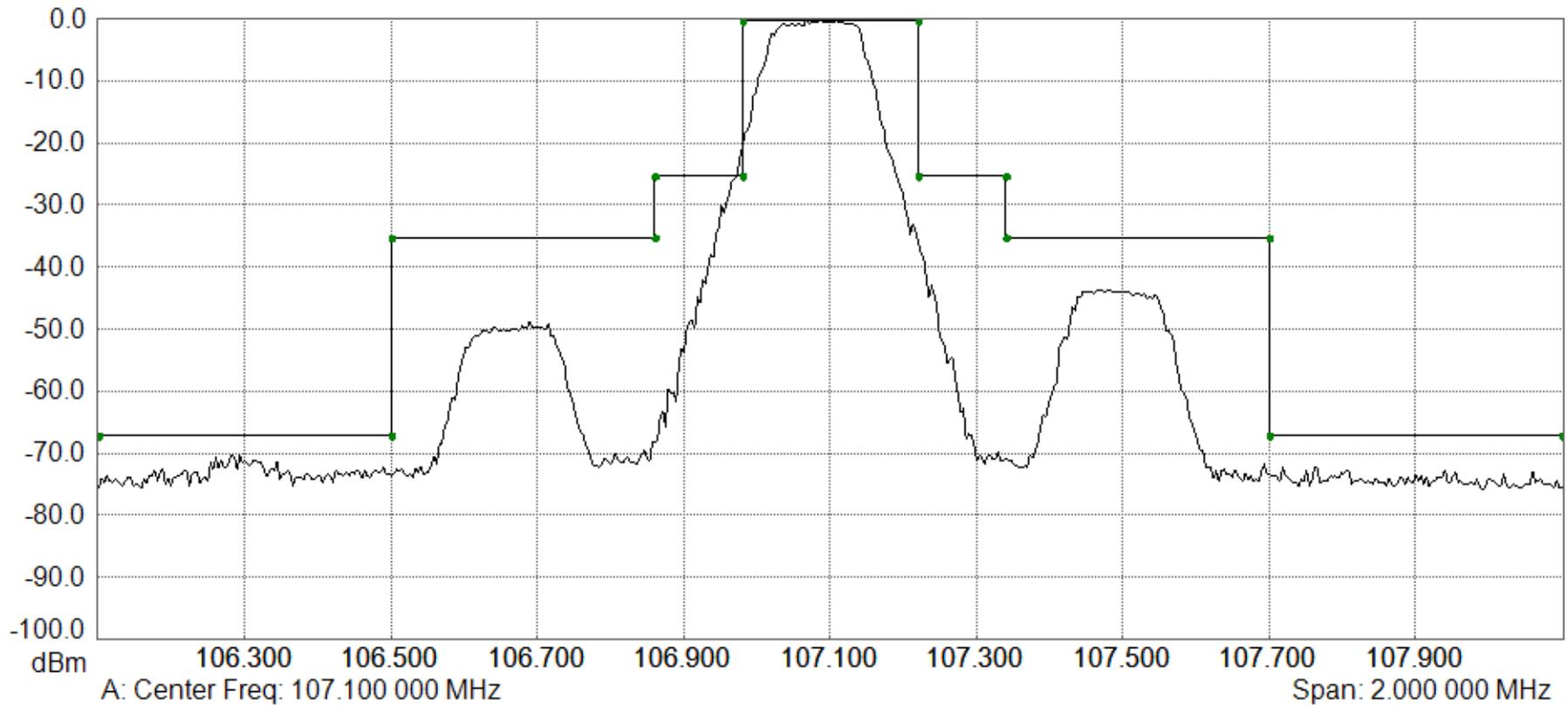


Occ BW % of Power	
Percent: 99.00 %	Occ BW: 123.412 kHz
	Measured XdB: 13.50 dB

Trace A data:	Input Attenuation = 20.0 dB	Start Frequency = 106.850 000 MHz
Trace Mode = Max Hold	RBW = 3.0 kHz	Stop Frequency = 107.350 000 MHz
Preamp = OFF	VBW = 1.0 kHz	Frequency Span = 500.000 000 kHz
Min Sweep Time = 0.001 S	Detection = Peak	Reference Level = -1.300 dBm
Reference Level Offset = 0 dB	Center Frequency = 107.100 000 MHz	Scale = 10.0 dB/div

Spectrum Analyzer Data  
W252DA-FX-B (12/13/2021 4:37:22 PM)

Spectrum Analyzer



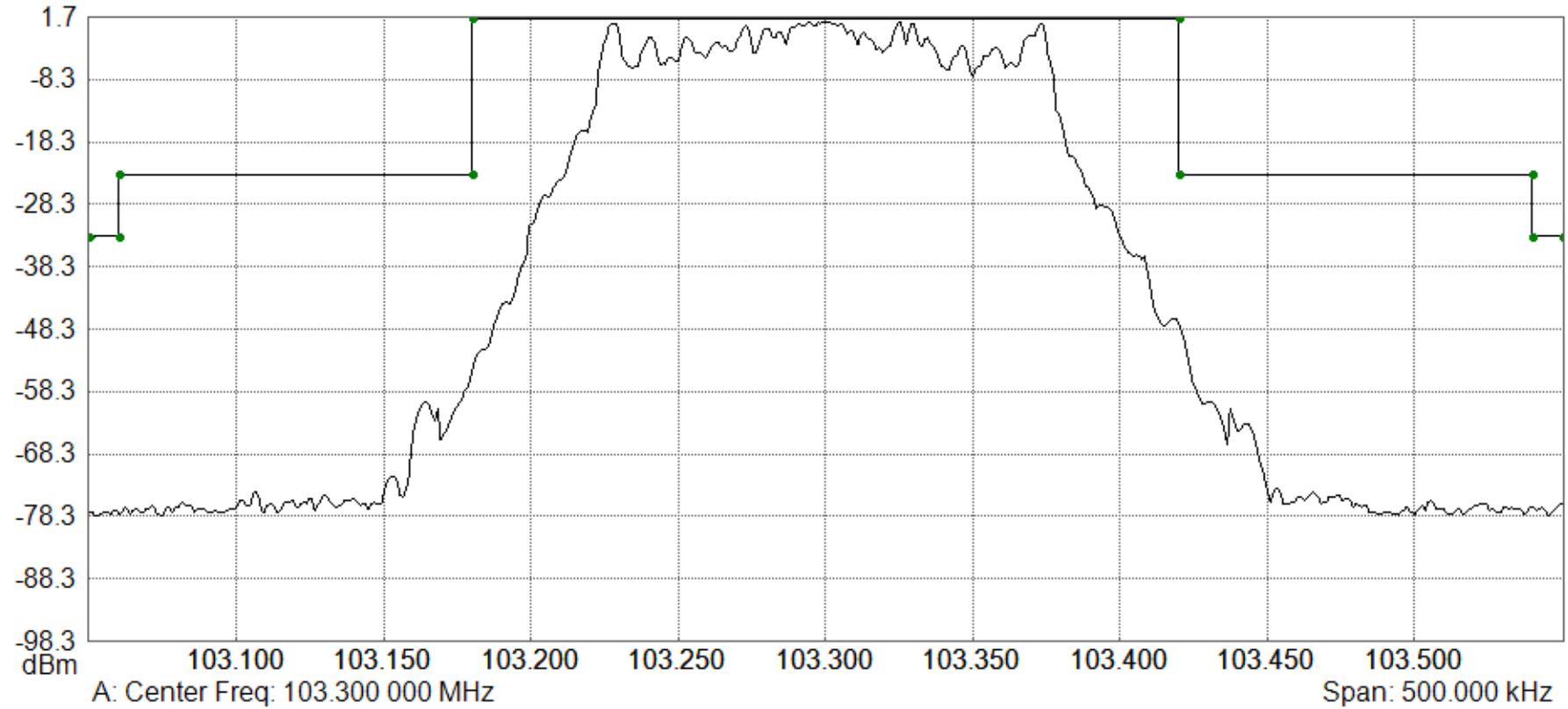
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Trace Mode = Max Hold  
Preamp = OFF  
Min Sweep Time = 0.001 S  
Reference Level Offset = 0 dB

Input Attenuation = 20.0 dB  
RBW = 30.0 kHz  
VBW = 10.0 kHz  
Detection = Peak  
Center Frequency = 107.100 000 MHz

Start Frequency = 106.100 000 MHz  
Stop Frequency = 108.100 000 MHz  
Frequency Span = 2.000 000 MHz  
Reference Level = 0.000 dBm  
Scale = 10.0 dB/div

Spectrum Analyzer Data  
W277DY-FX-A (12/13/2021 4:17:54 PM)

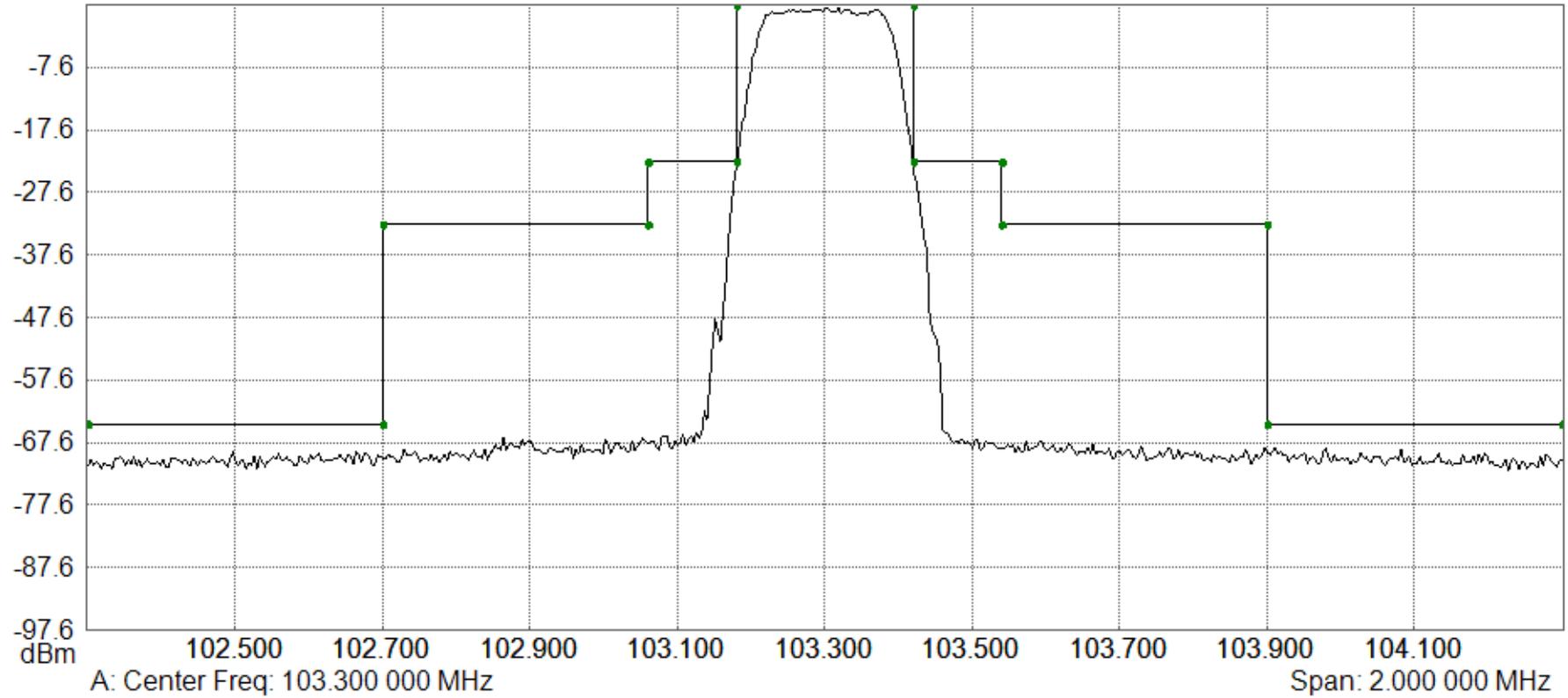
Spectrum Analyzer



Trace A data:	Input Attenuation = 25.0 dB	Start Frequency = 103.050 000 MHz
Trace Mode = Max Hold	RBW = 3.0 kHz	Stop Frequency = 103.550 000 MHz
Preamp = OFF	VBW = 1.0 kHz	Frequency Span = 500.000 000 kHz
Min Sweep Time = 0.001 S	Detection = Peak	Reference Level = 1.700 dBm
Reference Level Offset = 0 dB	Center Frequency = 103.300 000 MHz	Scale = 10.0 dB/div

Spectrum Analyzer Data  
W277DY-FX-B (12/13/2021 4:15:38 PM)

Spectrum Analyzer



Trace A data:  
Trace Mode = Max Hold  
Preamp = OFF  
Min Sweep Time = 0.001 S  
Reference Level Offset = 0 dB

Input Attenuation = 25.0 dB  
RBW = 30.0 kHz  
VBW = 10.0 kHz  
Detection = Peak  
Center Frequency = 103.300 000 MHz

Start Frequency = 102.300 000 MHz  
Stop Frequency = 104.300 000 MHz  
Frequency Span = 2.000 000 MHz  
Reference Level = 2.400 dBm  
Scale = 10.0 dB/div