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# *ENGINEERING REPORT*

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## **HARMONICS AND SPURIOUS EMISSIONS REPORT**

### **KMFY FM 96.9 MHz and KBAJ FM 105.5 MHz**

Performed by James R Offerdahl, Chief Engineer for Offerdahl Broadcast Service, Inc of Fosston MN. Mr Offerdahl has been a broadcast engineer since 2002.

Measurements for Mix Products of 96.9 MHz and 105.5 MHz, Harmonics and Spurious Emissions from the combined signals of KMFY FM operating on 96.9 MHz at a TPO of 17.5kW and KBAJ FM operating on 105.5 MHz at a TPO of 17.8kW into a Dielectric combiner were performed on December 16, 2018.

A new Dielectric 12 Bay antenna was installed as well as a Dielectric combiner in order to combine the two signals into one antenna.

Measurements were made utilizing an Anritsu MS2721B Spectrum analyzer and return loss bridge. Measurements were made from a sample port on the output of the combiner. Both transmitters were operating at the calculated TPO at the time.

The attached exhibits provide proof that all emissions are with limits imposed by the FCC rules.

This information is true and correct to the best of my knowledge.

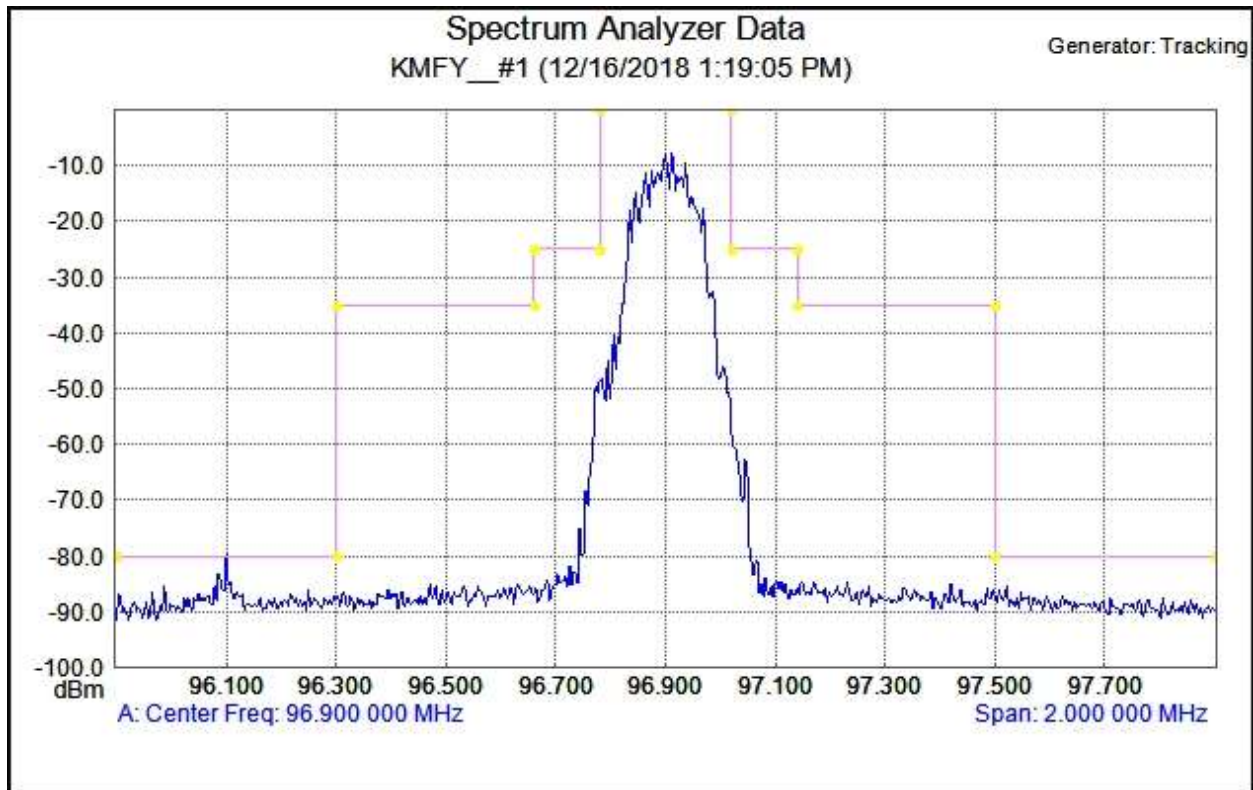
 December 16, 2018

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# ENGINEERING REPORT

## KMFY FM OCCUPIED BANDWIDTH 200 MHz SPAN



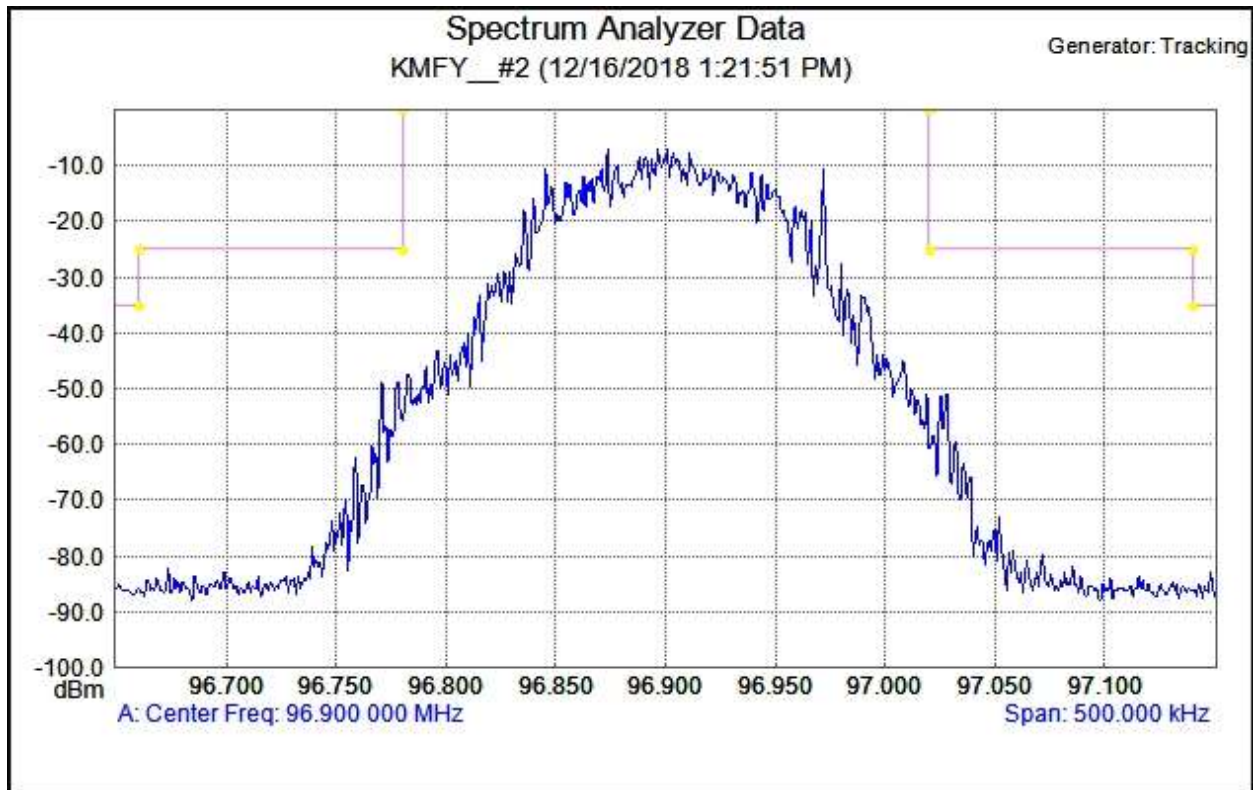
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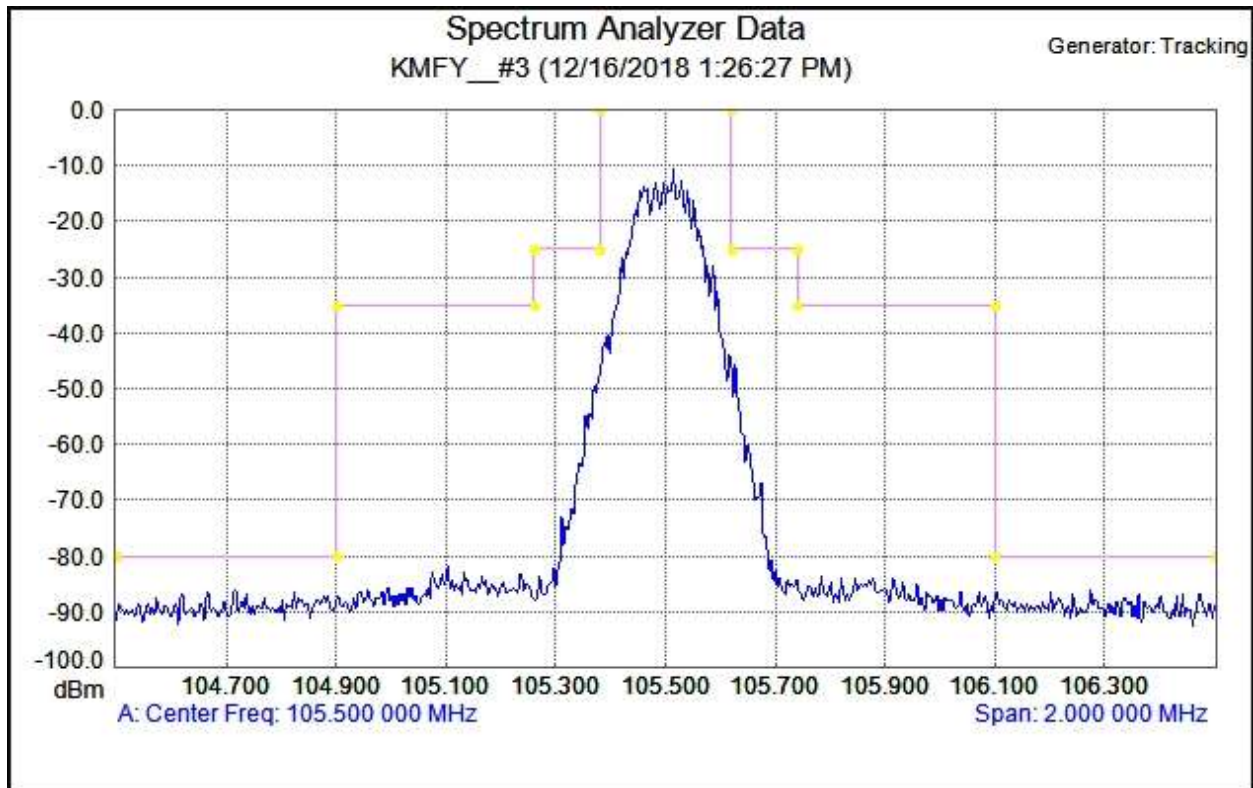
## KMFY FM OCCUPIED BANDWIDTH 500 kHz SPAN



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# ENGINEERING REPORT

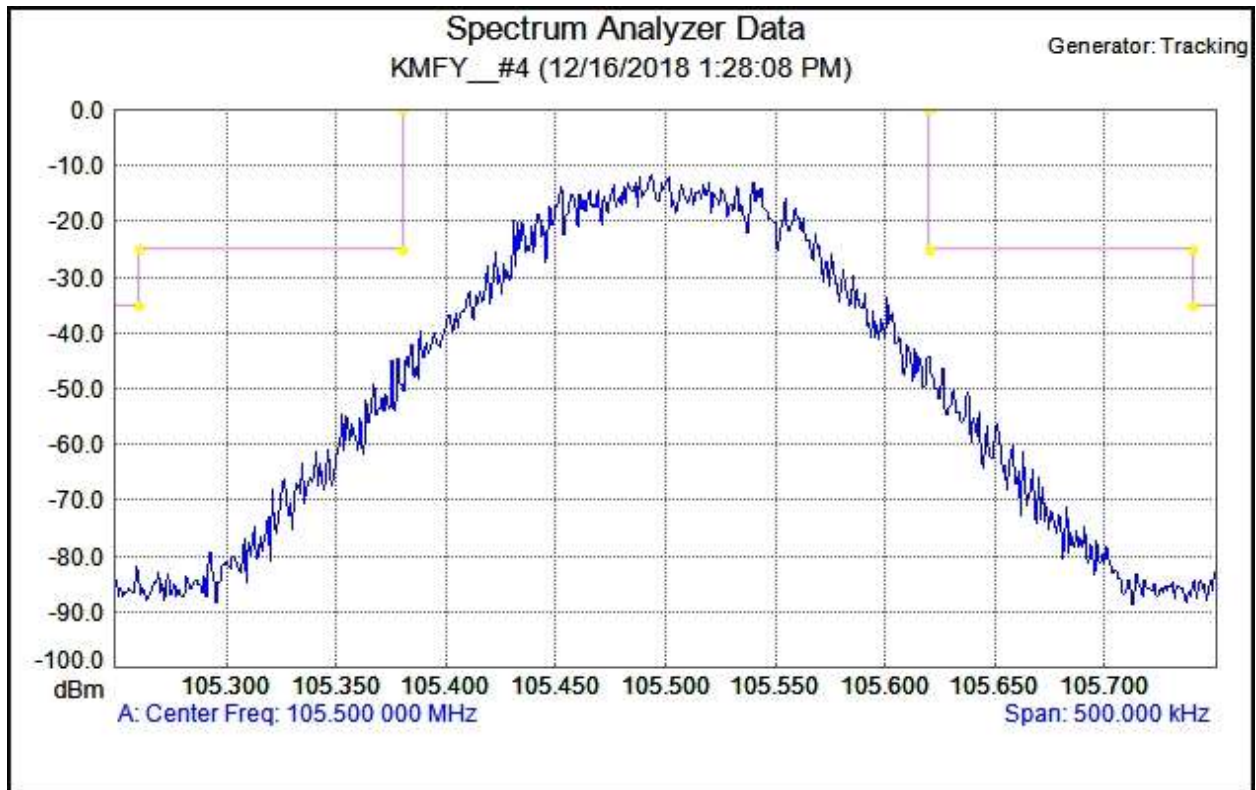
KBAJ 105.5 MHz 200 MHz SPAN



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## KBAJ FM 105.5 MHz OCCUPIED BANDWIDTH 500 kHz SPAN



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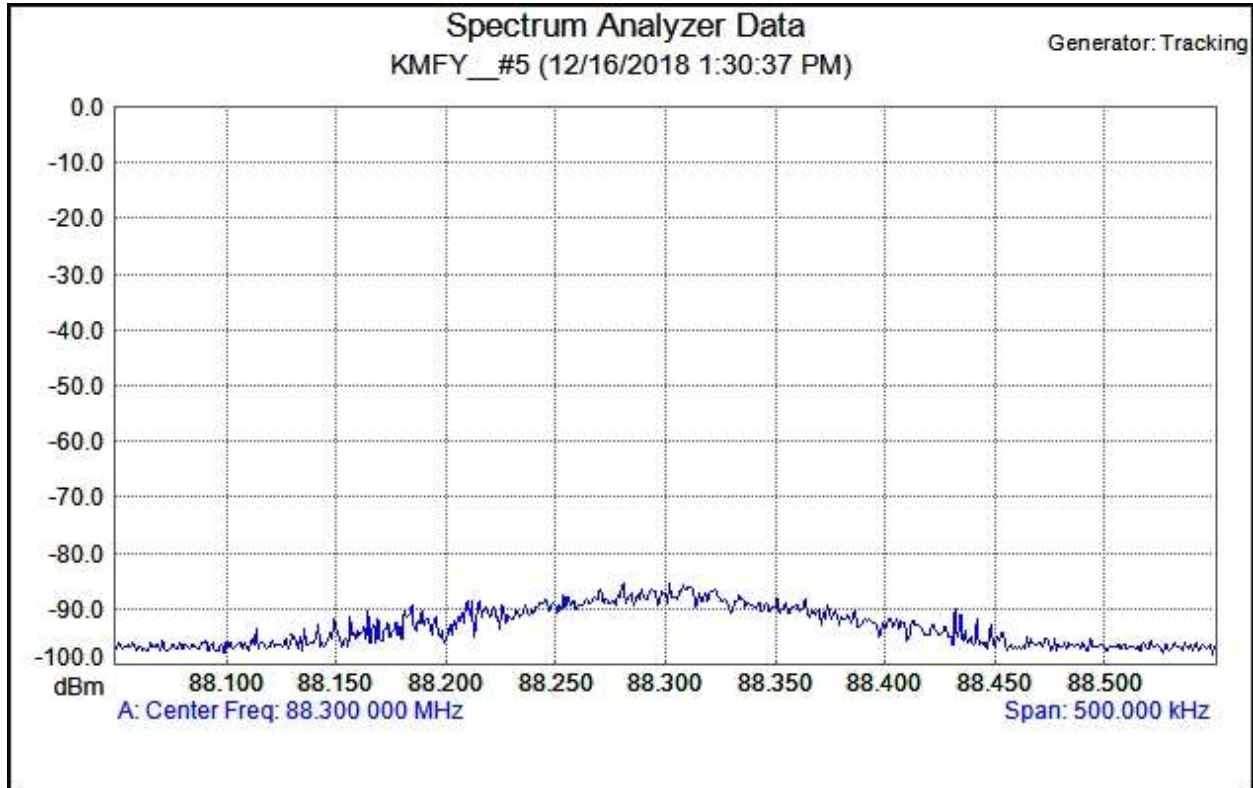
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## ANTICIPICATED MIX PRODUCT

$$105.5 - 96.9 = 8.6$$

$$96.9 - 8.6 = 88.3$$



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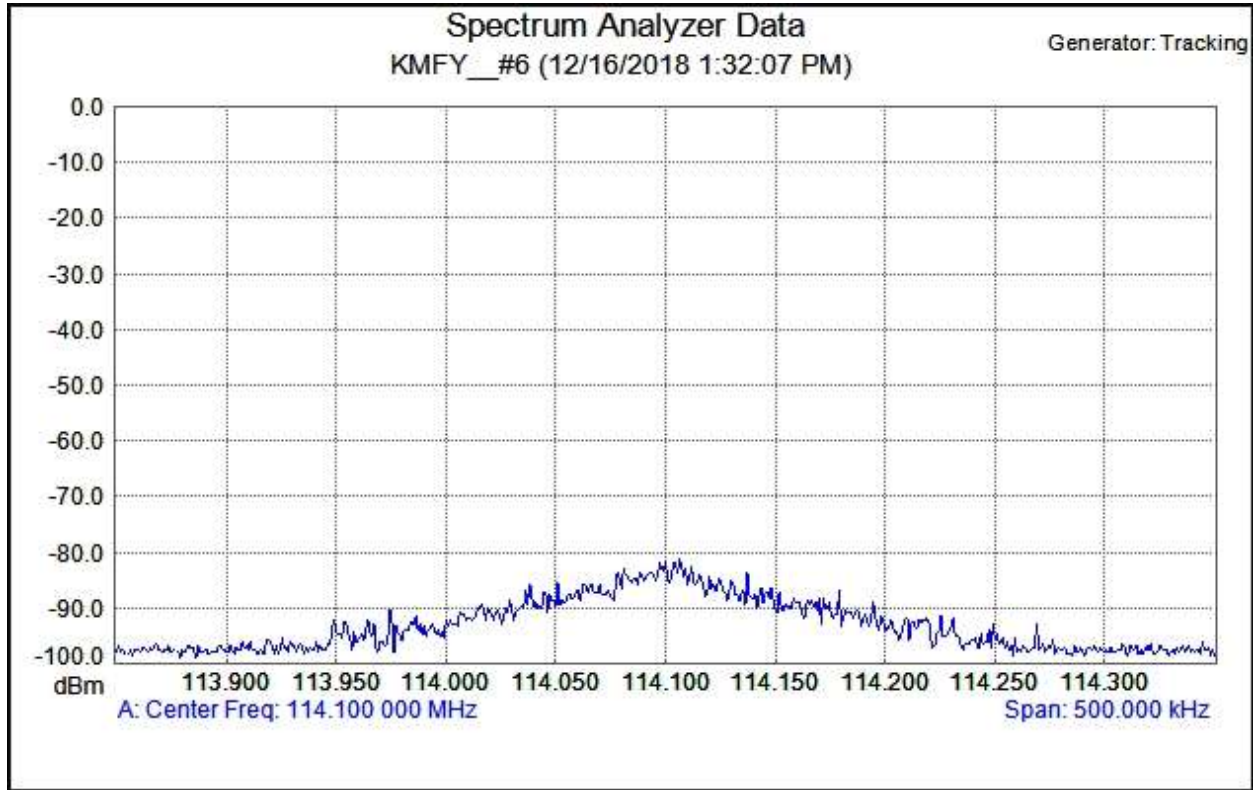
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ANTICIPATED MIX PRODUCT OF 114.1

$105.5 - 96.9 = 8.6$

$105.5 + 8.6 = 114.1$

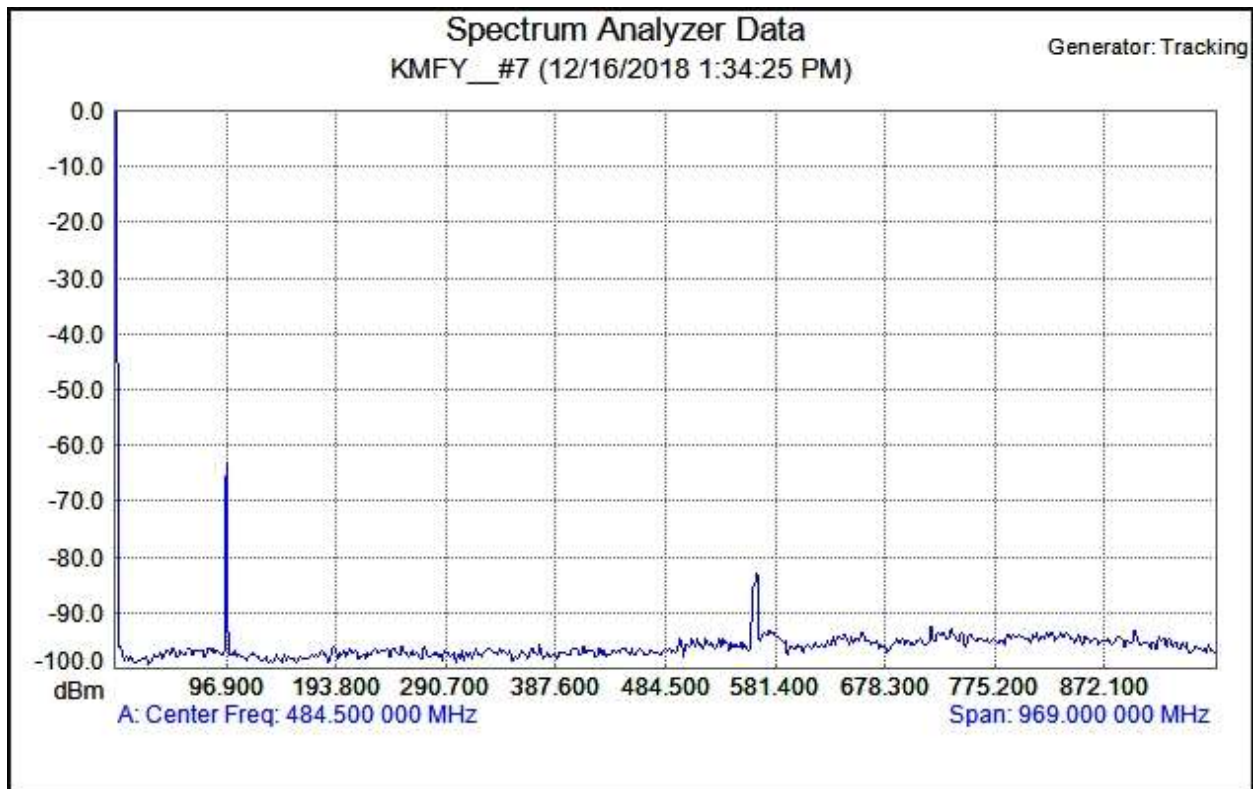


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KMFY SPECTRUM 0 – 969.0 MHz

(with MFC Bandstop filter in line)



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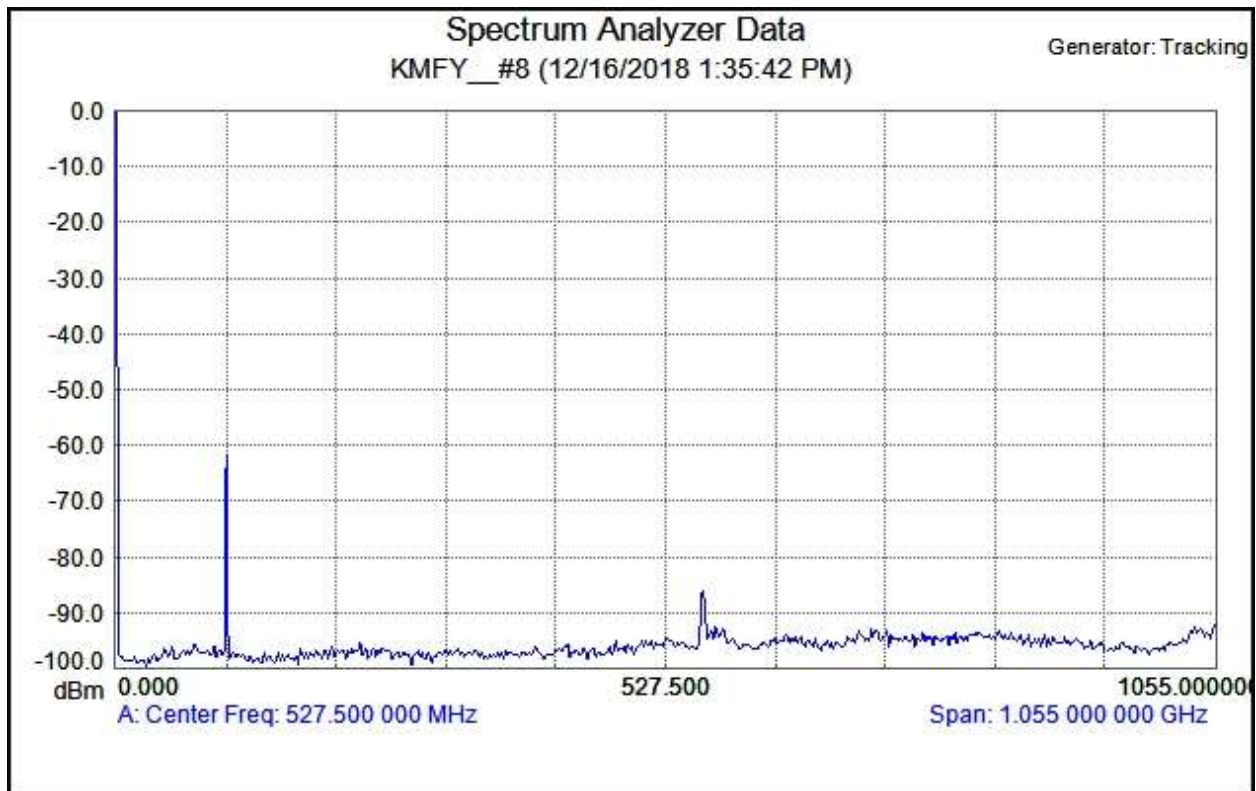
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KBAJ FM SPECTRUM 0 – 1055.0 MHz

(with MFC Bandstop filter in line)



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