

# **KEGH-FM3 Spurious Emissions Report**

Ensign Peak - Salt Lake City, Utah

On the evening of September 2<sup>nd</sup>, 2014 equipment performance measurements were made for broadcast booster station KEGH-FM3 permit No. BNPFTB-20131209XFJ

This Engineering evaluation report and RF proof of performance measurements were prepared in support of the operation of the specified transmitting system herein as to comply with 47 C.F.R. Section 73.317 (b) through 73.317 (d). KEGH-FM3 (107.1 MHz) is one of eight stations sharing a master antenna system at the Ensign Peak Communications site located in Salt Lake City, Utah. The outputs of the eight stations are combined using a constant impedance balanced bandpass filter combining system Model RCCC-29A – 0.8 designed and fabricated by Jampro antenna Systems of Sacramento, CA.

Measurements were made while all stations broadcast programming material. All stations were operating into the combined antenna system at the full permitted power during measurements.

In the case of the KEGH-FM3 transmission system, the measurement equipment was feed by a directional coupler at the combined output. Measurements were made on the station's carrier frequency for reference purposes and to look at occupied bandwidth for any spurious emissions. The use of the IFR AN940 Serial Number 1009 spectrum analyzer within current calibration was used to make all measurements. The assigned carrier frequency level was recorded. All other harmonic intermodulation products or spurious emission levels were referenced to this initial carrier frequency reference level with a noise floor of -81dBC. The radio spectrum from 50 MHz up to the stations 10<sup>th</sup> carrier frequency harmonic was tuned to look for any unusual emissions.

A set of Trilithic bandpass filters model VF-40003 Serial #200514038 was used to reduce the effects of multi signal mixing in the IFR AN940 analyzer; all insertion losses have been accounted for to reflect accuracy in this report.

The intermodulation products measured in this study were calculated as the common  $2 \times A - B$  = intermodulation product. As in the case herein the carrier frequency of the station under test was multiplied times 2 and then the carrier frequency of the each of the combined individual stations was subtracted one at a time from the 2X sum to find the common intermodulation product.

All of the signals noted were identified as being either signals from other stations in the combined system or ingress from other known transmitters.

No intermodulation products, spurious signals or harmonics were found that could be attributed to the operation of KEGH-FM3.

With consideration to the KEGH-FM3 Ensign Peak SLC transmission system, I believe that the station is in compliance with the requirements of 47 CFR § 73.1590 (a) & (b) and 47 CFR § 73.317 (b-d). This report and associated exhibits were prepared by me and are based on measurements made by myself. I believe them to be true and accurate to the best of my knowledge.

Respectfully submitted,

A handwritten signature in black ink that reads "Scot W. Mathews". The signature is written in a cursive, flowing style.

Scot W. Mathews  
Consultant Engineer

# Spurious Emissions

AN940

Serial # 1009

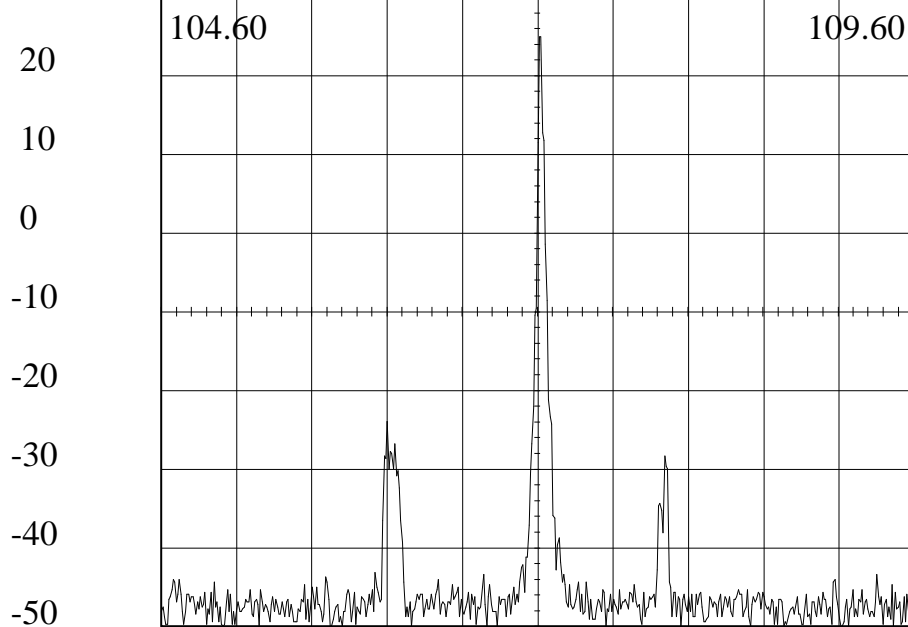
500.0  
kHz/Div

107.10  
MHz

9  
kHz Res

107.1 without MOD  
09/02/2014 21:46:32

dBm  
30



30 dB Attn

Gen --- dBm

50 mSecs

0 dB IF Gain

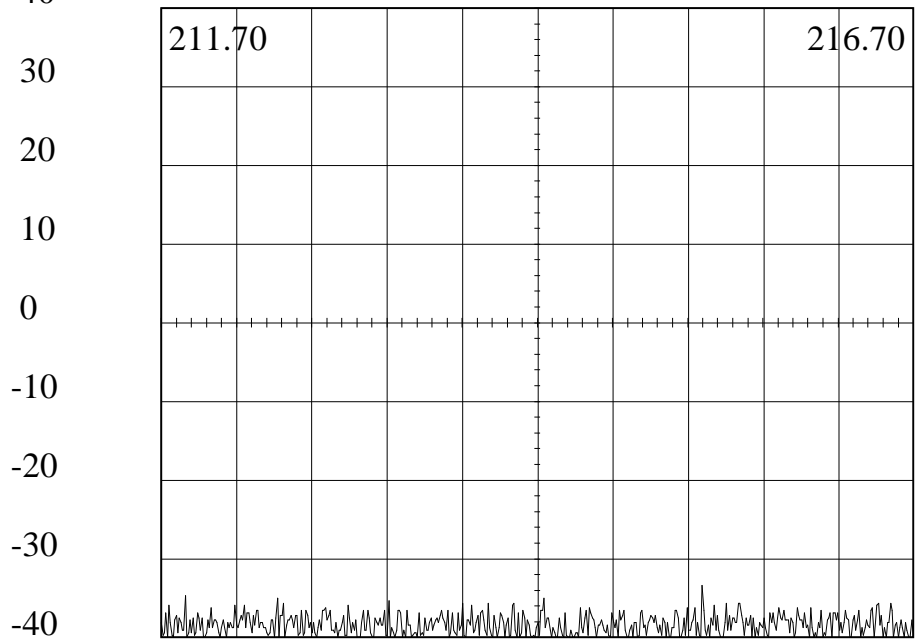
Video Filter: 1 kHz

Peak Freq: 107.115

Peak Level: 24.98

# Spurious Emissions

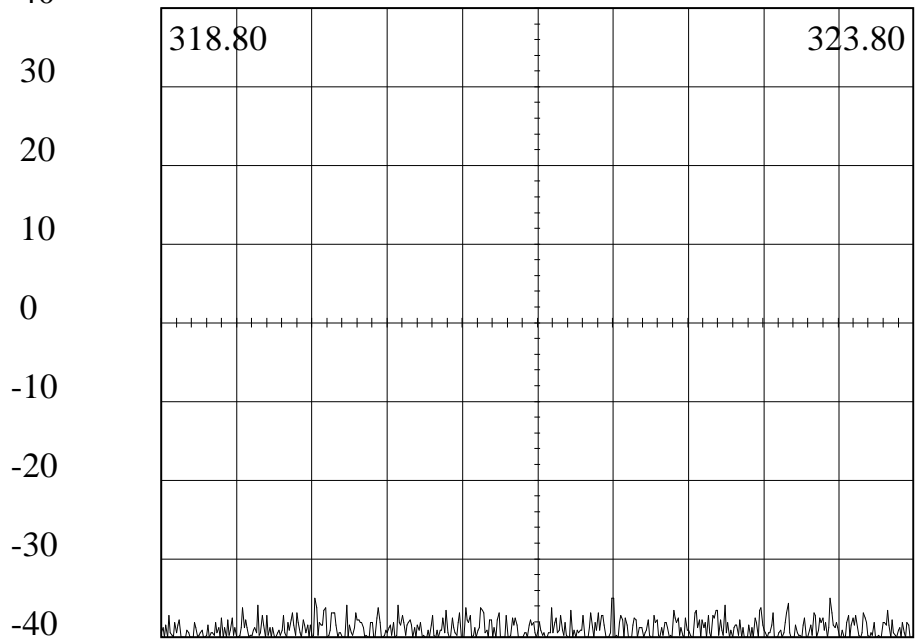
AN940 Serial # 1009  
500.0 214.20 9 107.1 2nd Order  
kHz/Div MHz kHz Res 09/02/2014 21:48:24



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 215.2972 Peak Level: -33.41

# Spurious Emissions

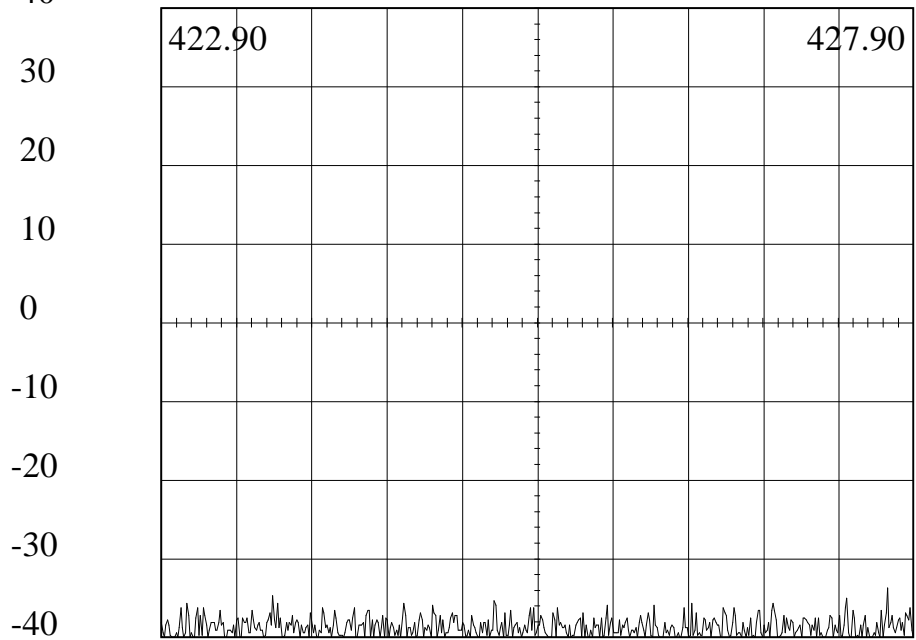
AN940 Serial # 1009  
500.0 321.30 9 107.1 3rd Order  
kHz/Div MHz kHz Res 09/02/2014 21:49:03



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 319.822 Peak Level: -34.98

# Spurious Emissions

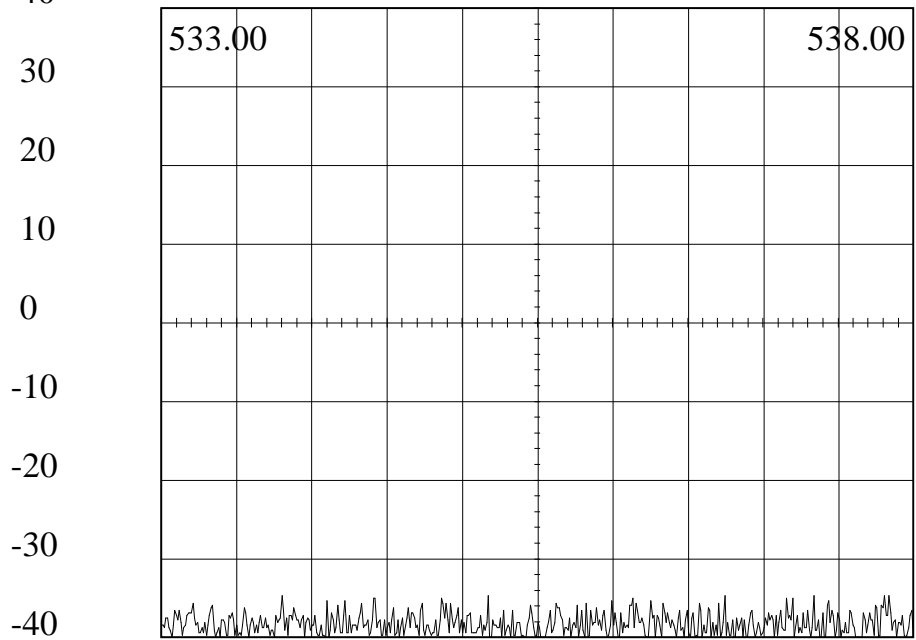
AN940 Serial # 1009  
500.0 425.40 9 107.1 4th Order  
kHz/Div MHz kHz Res 09/02/2014 21:49:55



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 427.7297 Peak Level: -33.73

# Spurious Emissions

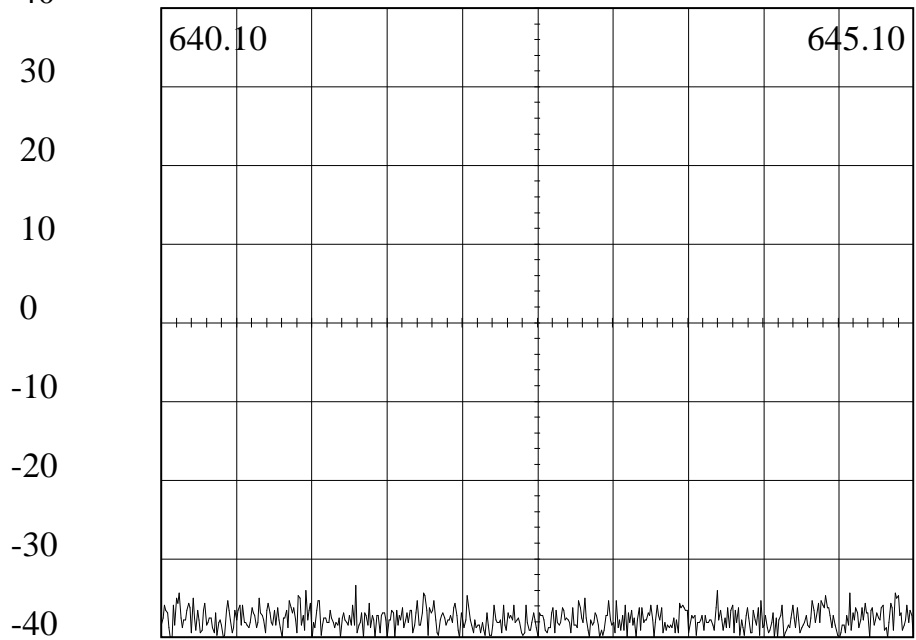
AN940 Serial # 1009  
500.0 535.50 9 107.1 5th Order  
kHz/Div MHz kHz Res 09/02/2014 21:51:13



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 533.8016 Peak Level: -34.67

# Spurious Emissions

AN940 Serial # 1009  
500.0 642.60 9 107.1 6th Order  
kHz/Div MHz kHz Res 09/02/2014 21:53:23

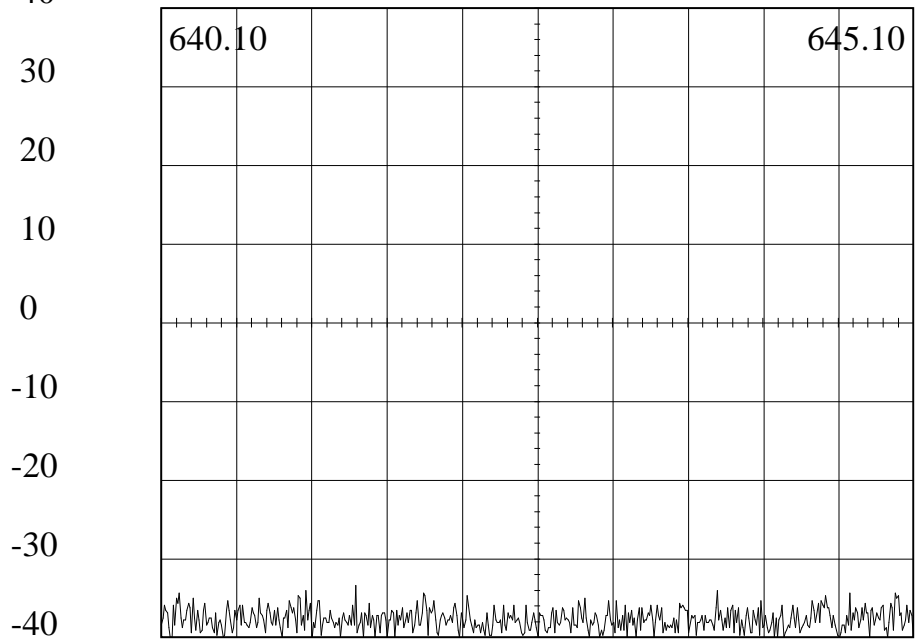


40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 641.3926 Peak Level: -33.41



# Spurious Emissions

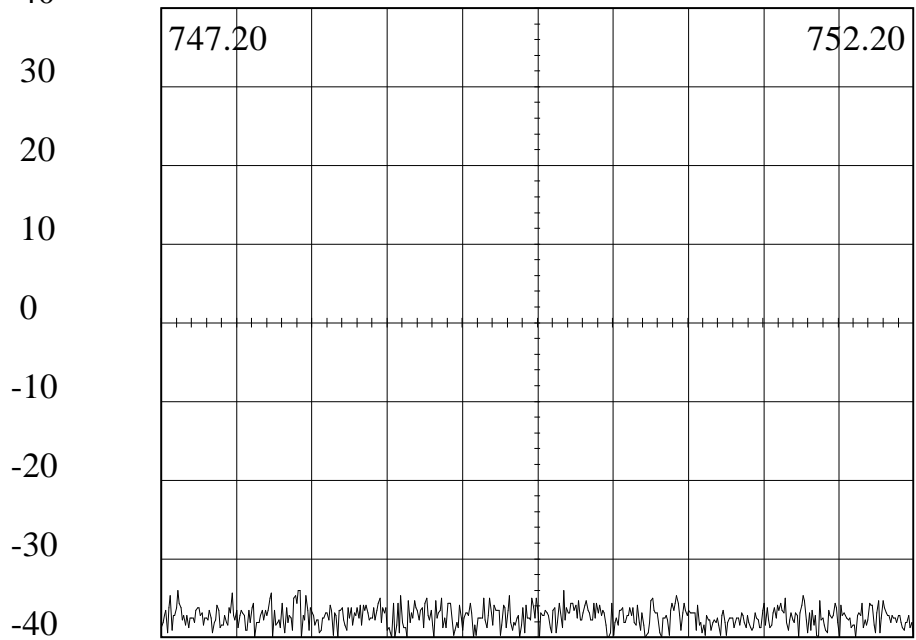
AN940 Serial # 1009  
500.0 642.60 9 107.1 6th Order  
kHz/Div MHz kHz Res 09/02/2014 21:53:23



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 641.3926 Peak Level: -33.41

# Spurious Emissions

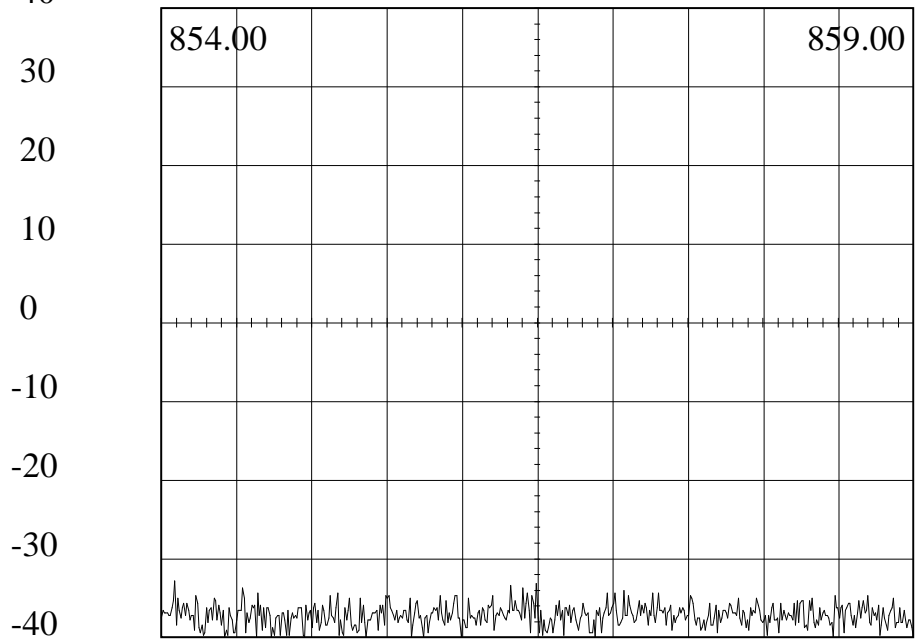
AN940 Serial # 1009  
500.0 749.70 9 107.1 7th Order  
kHz/Div MHz kHz Res 09/02/2014 21:55:15



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 747.3102 Peak Level: -34.04

# Spurious Emissions

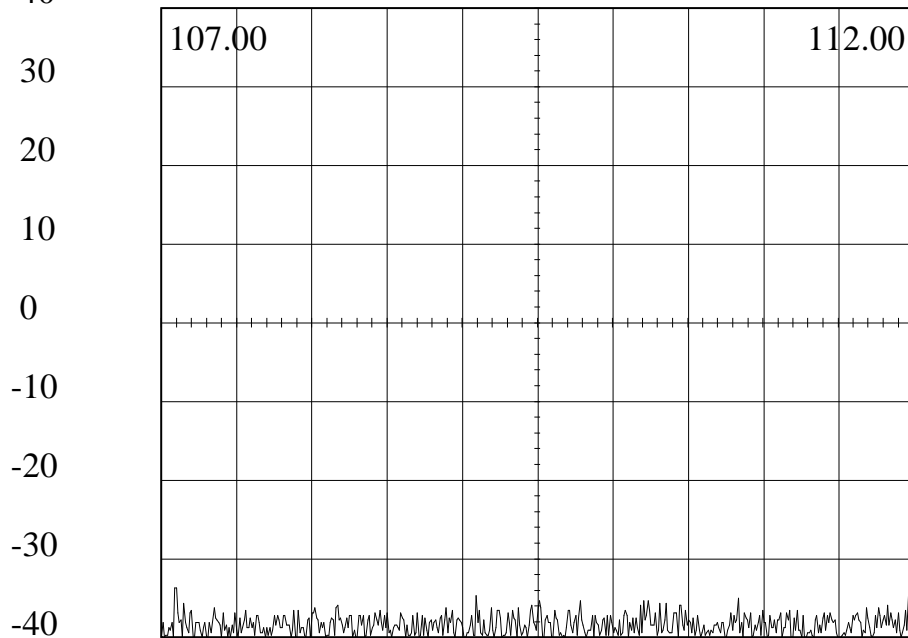
AN940 Serial # 1009  
500.0 856.50 9 107.1 8th Order  
kHz/Div MHz kHz Res 09/02/2014 21:55:58



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 854.0902 Peak Level: -32.78

# Spurious Emissions

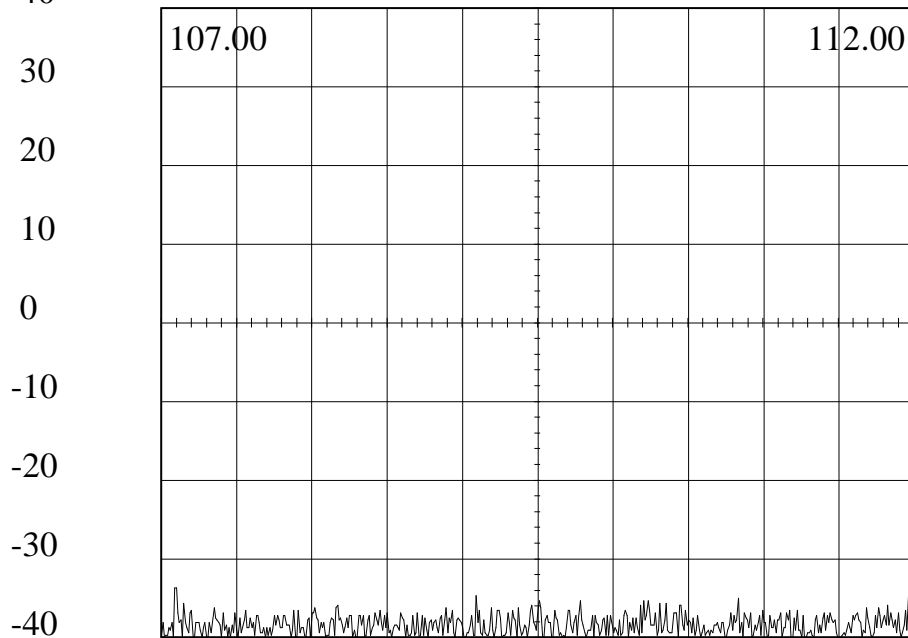
AN940 Serial # 1009  
500.0 109.50 9 107.1 IM with 104.7  
kHz/Div MHz kHz Res 09/02/2014 22:15:15



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 107.0902 Peak Level: -33.73

# Spurious Emissions

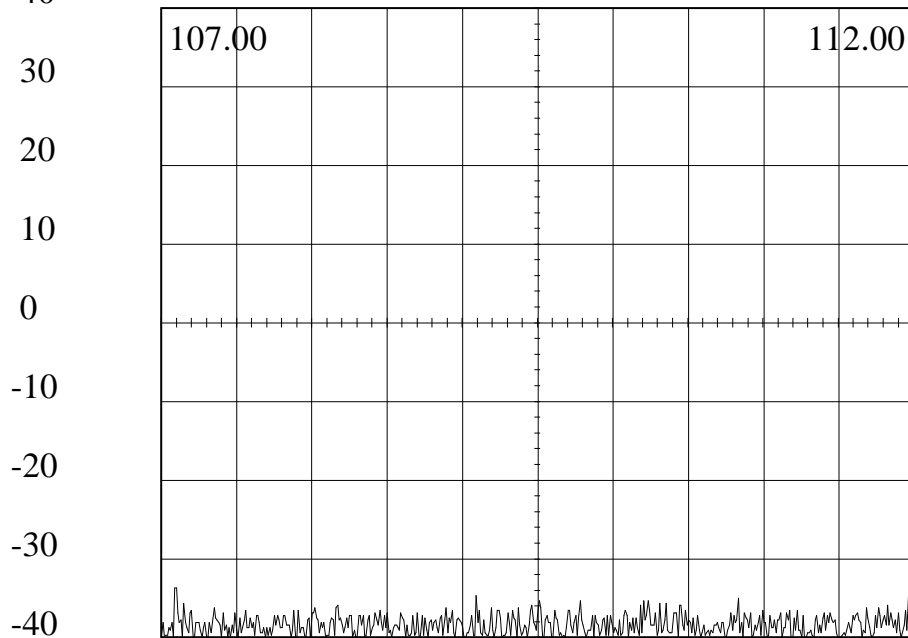
AN940 Serial # 1009  
500.0 109.50 9 107.1 IM with 104.7  
kHz/Div MHz kHz Res 09/02/2014 22:15:15



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 107.0902 Peak Level: -33.73

# Spurious Emissions

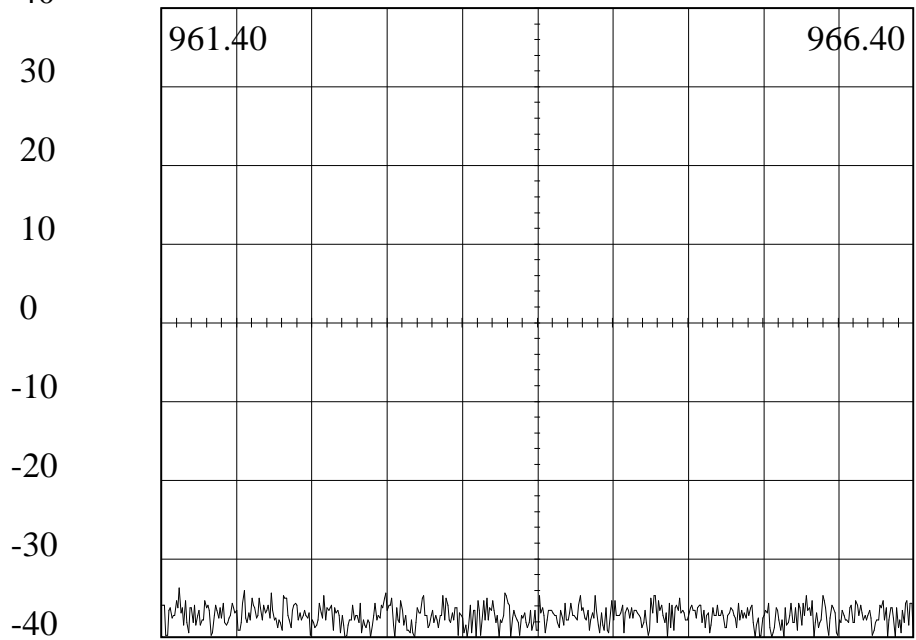
AN940 Serial # 1009  
500.0 109.50 9 107.1 IM with 104.7  
kHz/Div MHz kHz Res 09/02/2014 22:15:15



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 107.0902 Peak Level: -33.73

# Spurious Emissions

AN940 Serial # 1009  
500.0 963.90 9 107.1 9th Order  
kHz/Div MHz kHz Res 09/02/2014 21:58:01



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 961.5202 Peak Level: -33.73

# Spurious Emissions

AN940

Serial # 1009

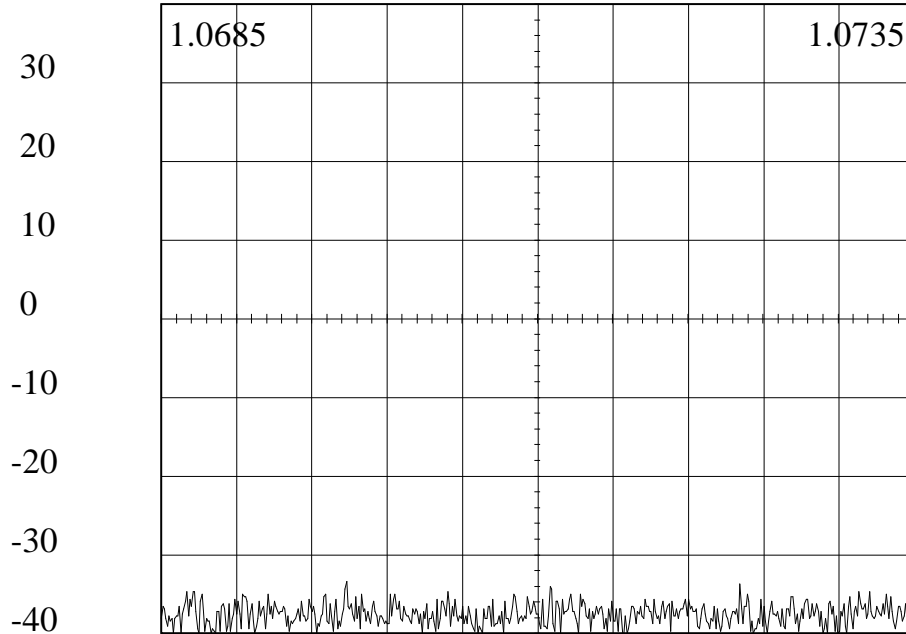
dBm  
40

500.0  
kHz/Div

1.071  
GHz

9  
kHz Res

107.1 10th Order  
09/02/2014 21:59:59



40 dB Attn

Gen --- dBm

50 mSecs

0 dB IF Gain

Video Filter: 1 kHz

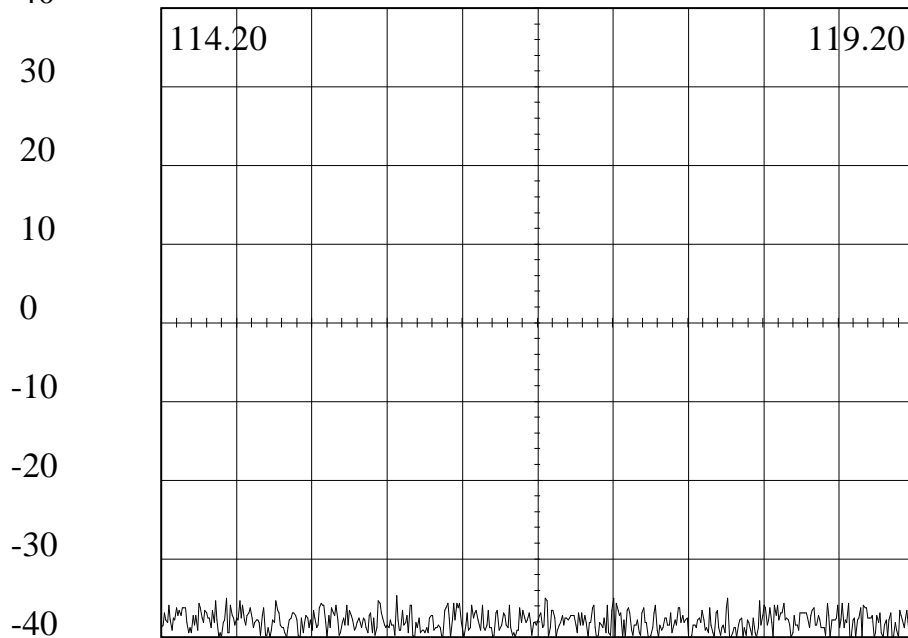
Peak Freq: 1069.7325

Peak Level: -33.41



# Spurious Emissions

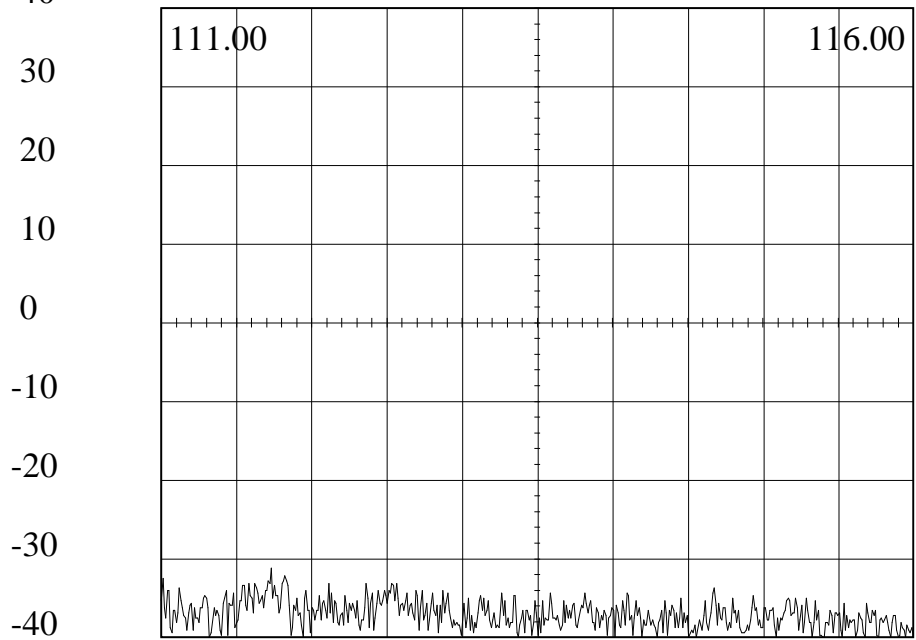
AN940 Serial # 1009  
500.0 116.70 9 107.1 IM with 97.5  
kHz/Div MHz kHz Res 09/02/2014 22:09:05



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 115.7631 Peak Level: -34.67

# Spurious Emissions

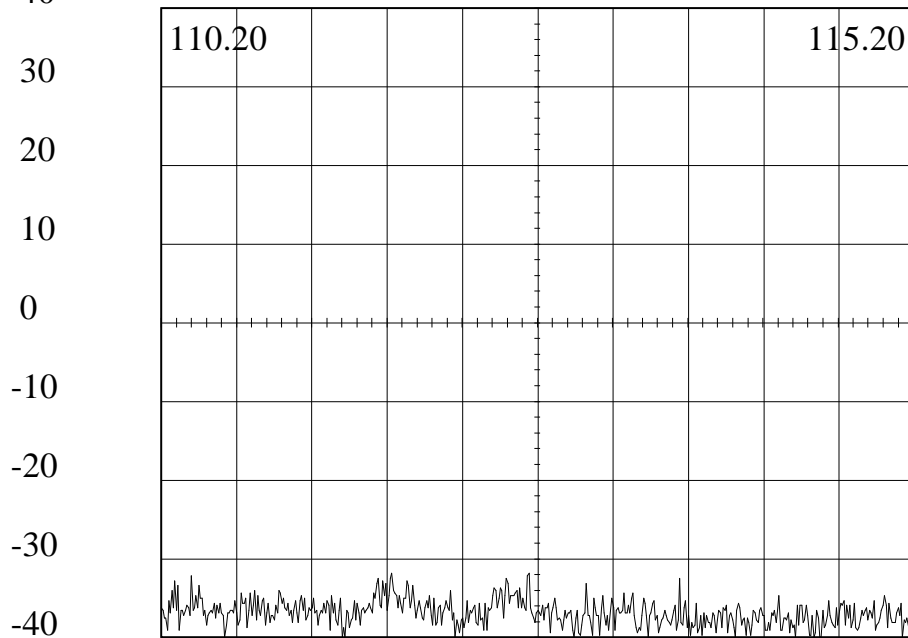
AN940 Serial # 1009  
500.0 113.50 9 107.1 IM with 100.7  
kHz/Div MHz kHz Res 09/02/2014 22:10:13



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 111.7315 Peak Level: -31.22

# Spurious Emissions

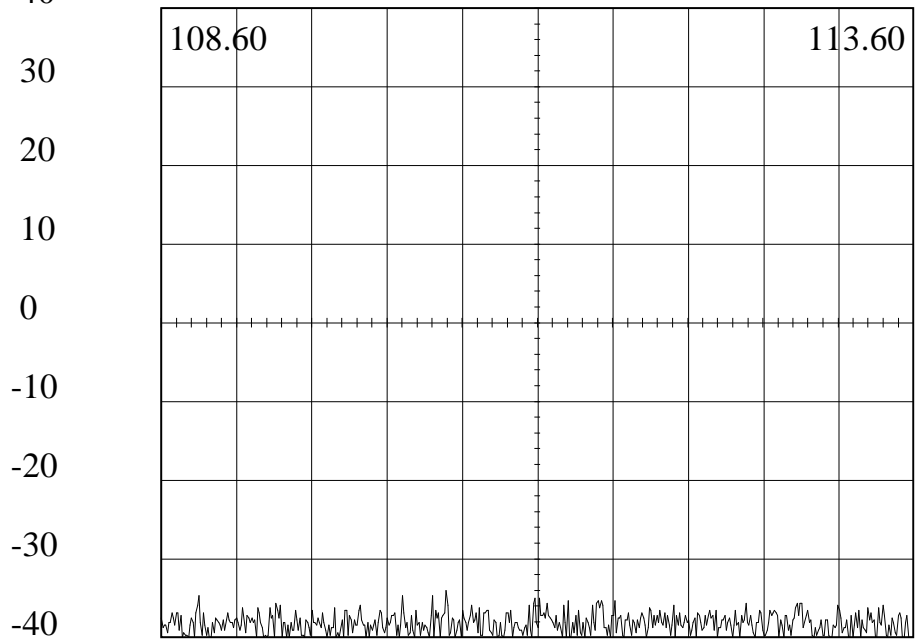
AN940 Serial # 1009  
500.0 112.70 9 107.1 IM with 101.5  
kHz/Div MHz kHz Res 09/02/2014 22:11:07



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 111.7331 Peak Level: -31.84

# Spurious Emissions

AN940 Serial # 1009  
500.0 111.10 9 107.1 IM with 103.1  
kHz/Div MHz kHz Res 09/02/2014 22:14:06



40 dB Attn Gen --- dBm 50 mSecs  
0 dB IF Gain Video Filter: 1 kHz  
Peak Freq: 110.4938 Peak Level: -34.04