Spurious Emissions

Spurious output from the transmitter and mask filter was measured as shown below. Because the spectrum analyzer used did not have a Resolution Bandwidth setting of 500kHz, a setting of 300kHz was used. A correction factor of -2.2dB is applied to all readings (note: relative readings all remain the same) and is calculated by the following equation:

$$A = A_{alt} + 10 * \log\left(\frac{BW_{alt}}{500}\right)$$

Note that these measurements **do not** include the external GPS filter (one supplied with every transmitter) which also provides an additional 85dB within the GPS frequency bands as well as better than 30dB at the second harmonic of the main channel. Typical tuning of this filter found in Figures 11 and 12.

Figure 6 shows the fundamental frequency at a span of 50MHz, showing the spectrum for three channels above and below the channel. Spurious emissions in the 2nd and 3rd adjacent channel are better than -65dB referenced to the fundamental (reference).

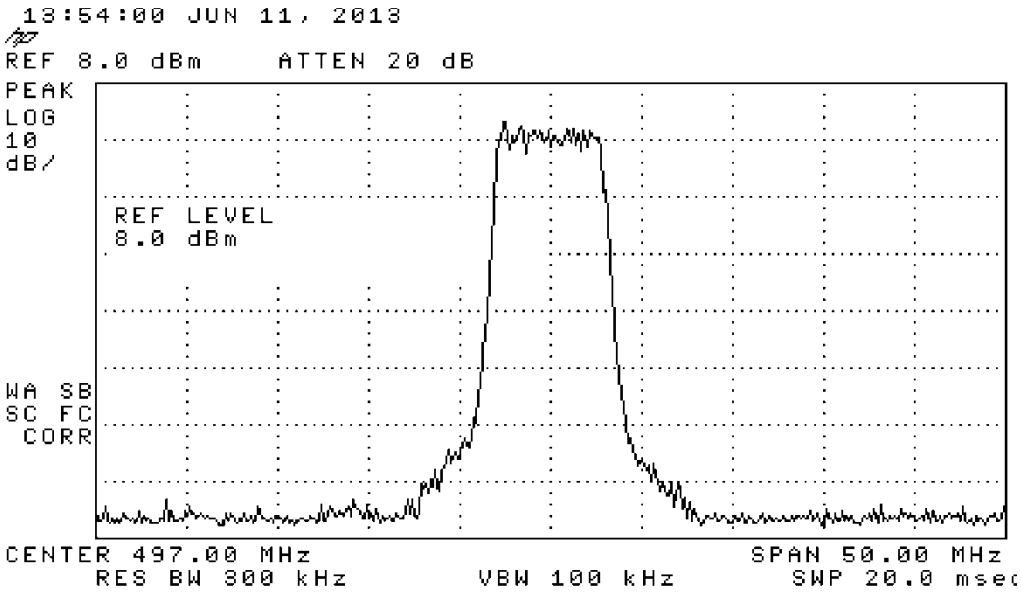

Figure 6: Fundamental

Figure 7 shows the second harmonic level of the transmitter. The reference is the same as for the previous filter. Should the second or third harmonic of the transmitter fall within the GPS frequency bands (1164-1240 MHz and 1559-1610 MHz) an addition GPS filter will add another 30dB to this value – resulting in emissions at the second harmonic being better than -85dB relative to the fundamental (reference)

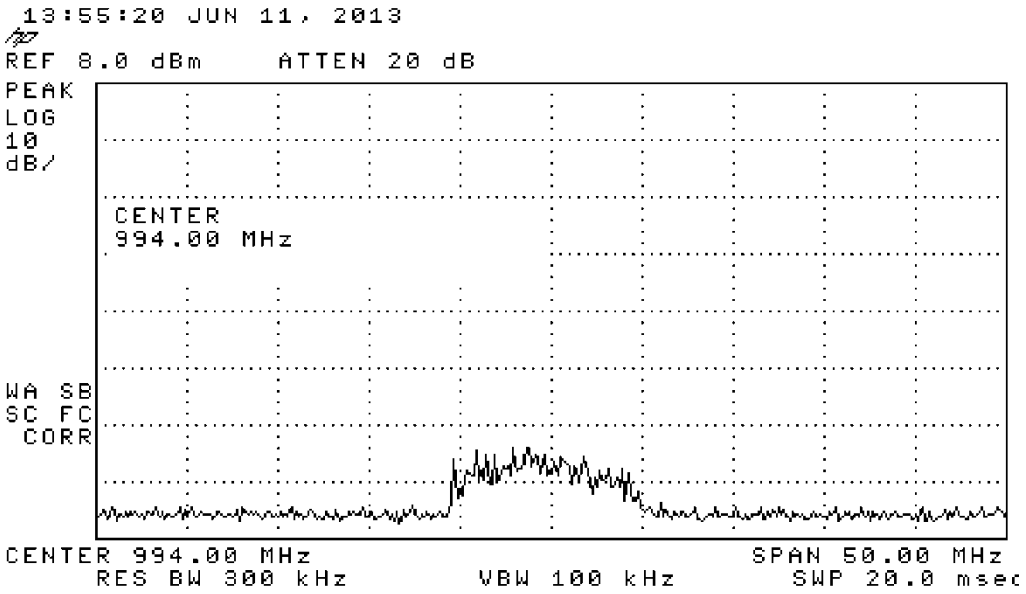

Figure 7: Second harmonic.

Figure 8 shows the spectral emissions from the transmitter across the band up to 2.9GHz (beyond the 5th Harmonic) again, prior to a GPS filter. All emissions up to the second harmonic are better than -60dB relative to the fundamental, and beyond the second harmonic are further attenuated by the GPS filter, should this be required, as shown in the filter response plots.

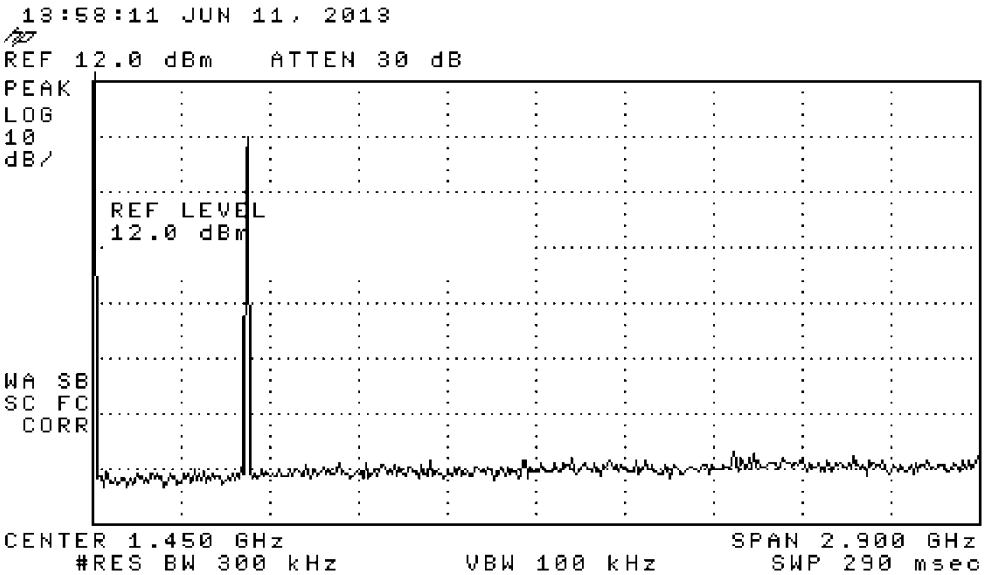

Figure 8: Frequency Spectrum up to 2.9GHz

Shown in Figure 9 is the emission mask tests for the stringent mask. Note, the same filter is used in both the stringent and the simple mask applications.

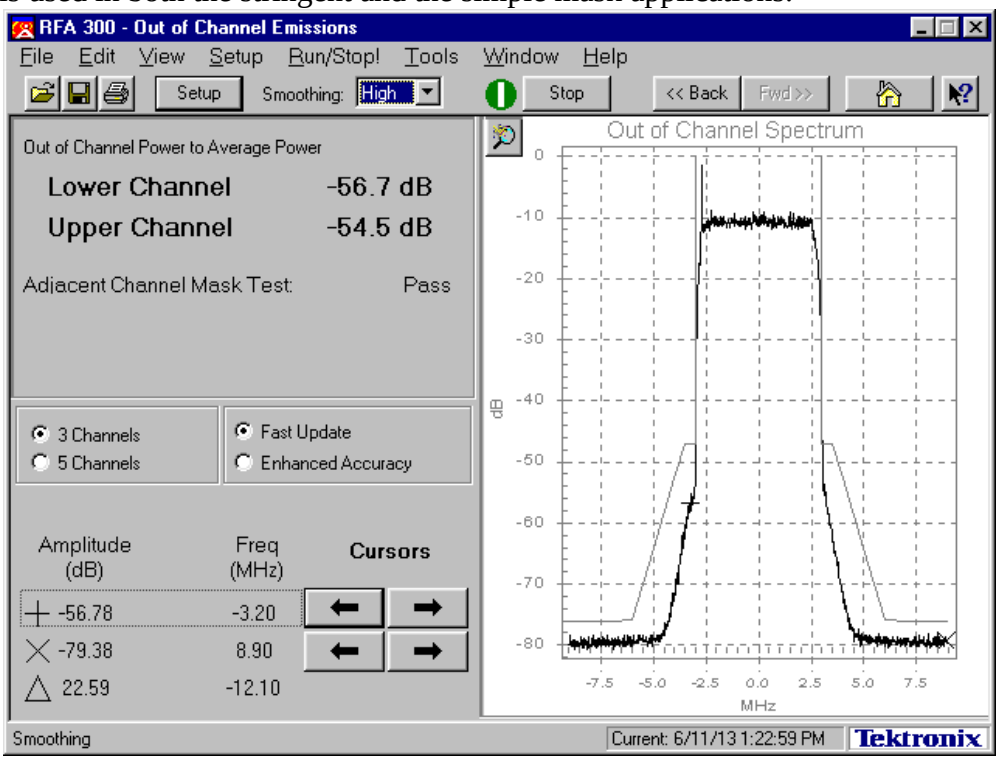

Figure 9: Simple mask test.

GPS filters are included when the second or third harmonics of the operating channel fall within the GPS frequency range (1164-1240 MHz and 1559-1610 MHz). The GPS filter tuning is given in Figures 11, and 12, showing a minimum attenuation of 65dB within the GPS frequency bands.

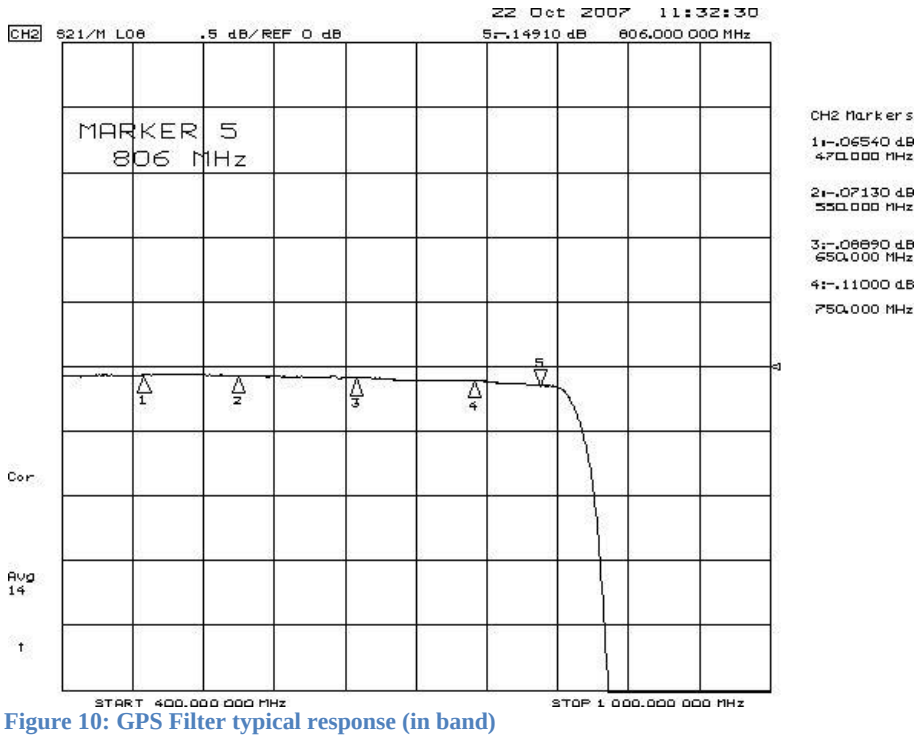

Figure 10: GPS Filter typical response (in band)

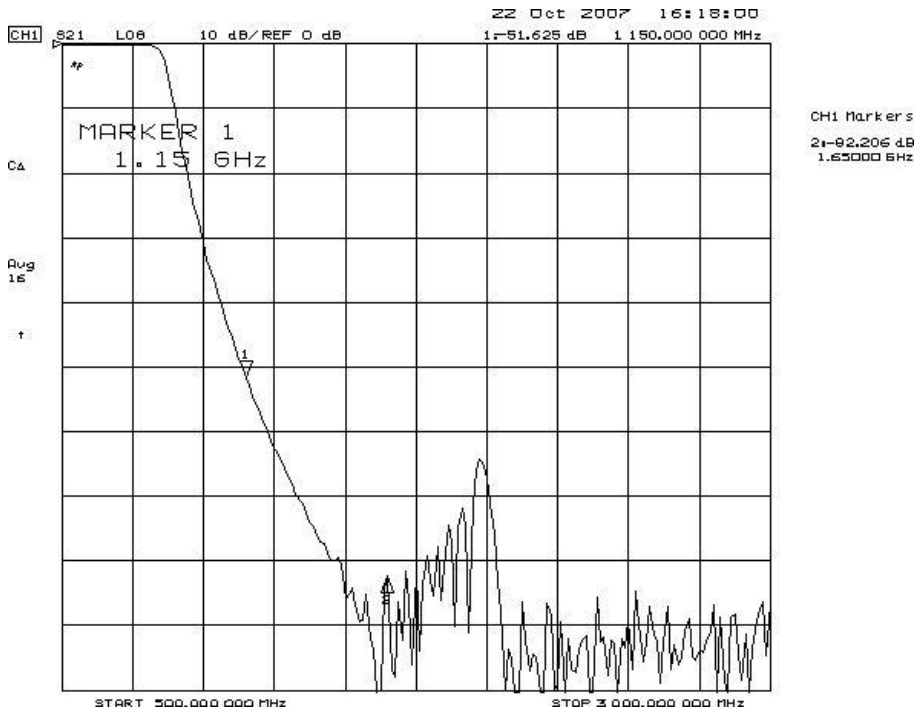

Figure 11: GPS Filter typical response (GPS Bands)