

20 November 2014

Attachment to FCC File No. 0777-EX-PL-2014

Modulating Signal Description

Note: this attachment is not subject to the confidentiality request.

The modulating signal is a complex burst digital waveform with a maximum rate of 2400 baud per 3-kHz channel allocation. The signal is filtered for spectral containment and has a 3-dB passband of 2700 Hz, with the lower passband edge offset by 300 Hz from DC for single sideband (SSB) transmission. Information is modulated using an underlying combination of phase and amplitude shift keying techniques. The composite signal will occupy up to eight contiguous or non-contiguous 3-kHz SSB channels modulated in this manner. The signal has a non-constant envelope as depicted in the example in-phase and quadrature signals components of Figure 1. Provisions for preventing interference to adjacent channels are incorporated, including suitable power amplification (PA) input back-off (IBO) to mitigate spectral distortion from PA 3rd order intermodulation products as well as waveform peak-to-average power ratio (PAPR) reduction.

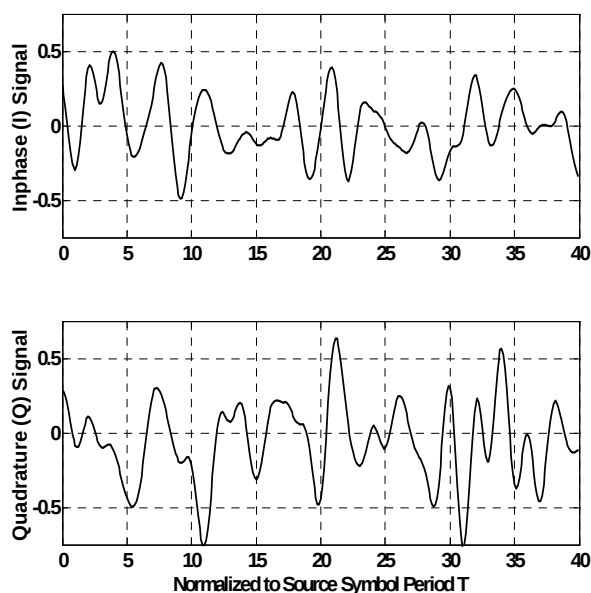


Figure 1. Example of Modulating Signal I and Q Components

The modulating signal described in this attachment will be used in **all of the 15 frequency ranges for each of the 4 transmitters** associated with this application (0777-EX-PL-2014). Only **1 of the 15 frequency ranges** will be used at any given time. The minimum emission bandwidth is 3 kHz. The signal will be contained within a bandwidth not to exceed 48 kHz. The single radio signal may utilize various emission masks, where some portions of the specified bandwidth may or may not contain transmitted energy.

The experimental content of these emissions will be random bits, ASCII characters, images, or voice, used as references for bit error rate and signal quality measurements.