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Necessary Bandwidth Description:

This document describes the three emitter bandwidths. The 903.5 and 948.5 MHz Emitters are based on the digital cellular radio standard GSM. This uses so-called BT = 0.3 GMSK modulation. The channel bit rate is 270.8333 kbps. The necessary bandwidth is calculated from the spectrum analyzer measurement in Figure 1. The bandwidth is defined as the frequency span required to exclude all signals 20dB below the peak spectrum power. This is approximately the bandwidth that captures 99% of the power. Under this definition, the necessary bandwidth is 350 KHz.
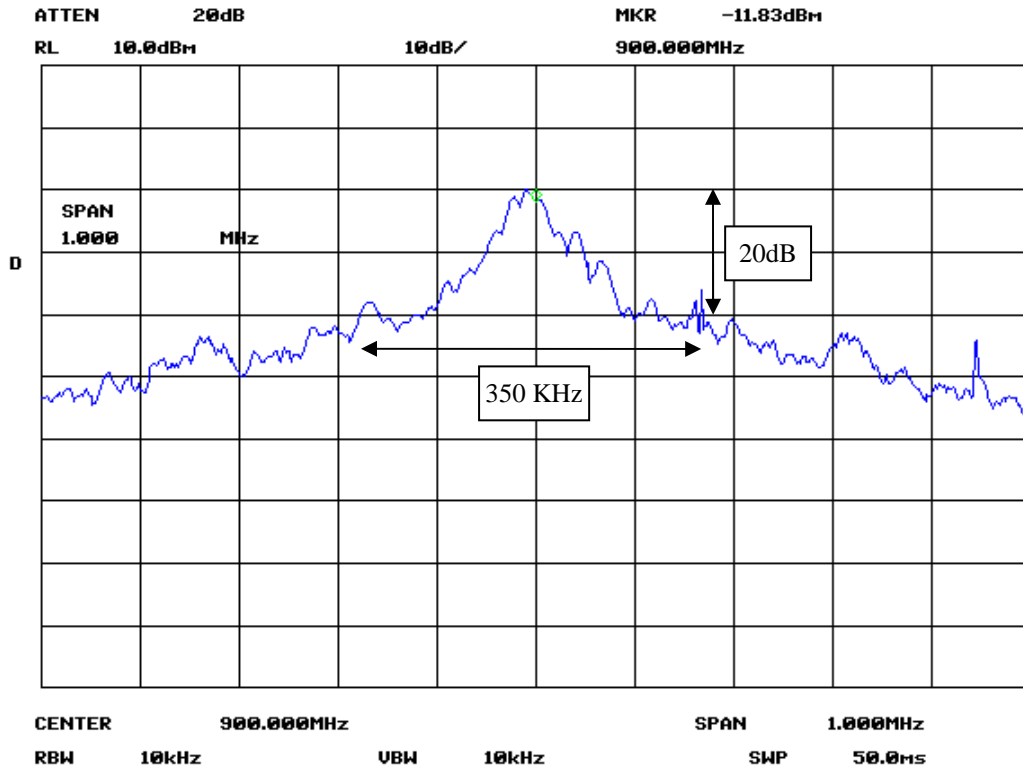

Figure 1: Spectrum of 900 MHz signals.

The 106.5 MHz signal is based on an FM handheld radio. The peak frequency deviation is 6.5KHz and the voice signal bandwidth is 300-3000 Hz. The necessary bandwidth is calculated from the spectrum analyzer measurement in Figure 2. Using the same definition as in Figure 1, the necessary bandwidth is 50 KHz.
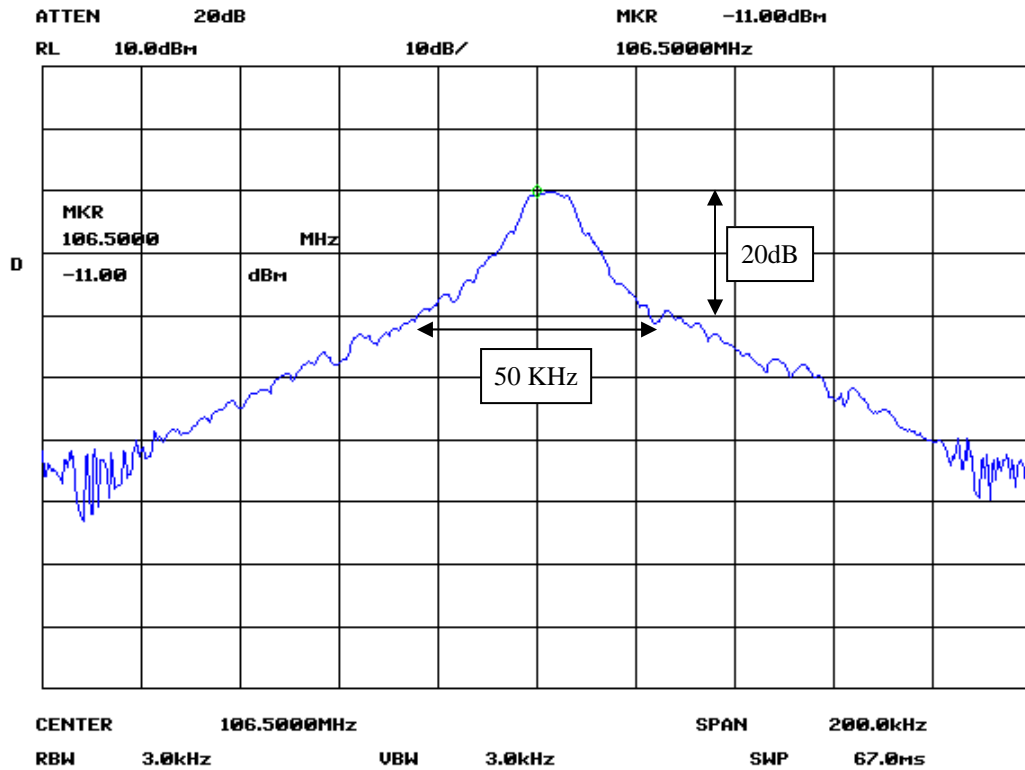

Figure 2: Spectrum of 106.5 MHz signals.