

## **Justification for 0.1% ACER Selection for Processing Gain Test**

**Reference: see FCC ID: CGK8001001**

The access code is decided as present if the number of correctly decoded symbols in the 64 bit sync word exceeds a certain threshold, T. If the probability of bit error in the access code is denoted by p, and the errors are assumed to be independent, then the FRR can be calculated as

$$FRR = 1 - \sum_{t=0}^{64-T} \binom{64}{t} p^t (1-p)^{64-t}$$

We have chosen to determine the PG when the FRR equals 0.1%. The major reason for this being that a smaller number results in a too long testing time. Furthermore, the SNR should preferably be somewhere between 15 and 25 dB. In the Bluetooth specification, 21 dB is the operating point where the raw BER in the payload is required not to exceed 0.1%. Referring to the equation for the FRR, and choosing T = 61, p becomes 0.3 %. Consequently, for a receiver that is just passing the sensitivity requirement in the Bluetooth specification, this corresponds to an operating point of about 19-20 dB.