Ti SNR Computation in Cfar

In TI Software CFAR has the following parameters:

|  |  |  |
| --- | --- | --- |
| Comments | CFAR Parameters | Range (In SW) |
|  | numRxAnt | 4 |
|  | numTxAnt | 1 |
| const2 | noiseDivShift (log2(2\*winlen)) | 4 |
|  | guardLen | 4 |
| noiselen | winLen | 8 |
|  | numInteg | 4 |
| This is the threshold for detecting an object expressed in power to noise density | SNR dB | 14 |
|  | SNR Linear (Amplitude ratio) | 5.011872336 |
|  | SNR (Amplitude ratio) dB in Log2 scale | 2.325349666 |
|  | Number of Fractional Bits | 8 |
|  | scaleFactor | 1024 |
|  | SNR\_2dB | 2.325349666 |
| const1 | Thld | 2381.158058 |

The input to CFAR processing is log2(abs(FFT Output)). This part is still not clear as to why TI chose to perform all the operations in log2 instead of log10. Maybe, LUT based conversion from linear to log2 is more efficient than conversion to log10.

After summing up the noisebins, the division is performed using shifting by Const2-1. For a noiseLen or winLen of 8 (as in range CFAR) the value of Const2-1 is 3. Const2=log2(Winlen) same as Const2 = log2(2\*winlen)-1. This is equivalent to dividing sum of noisebins by noiseLen

Ti CFAR operates in amplitude domain. Makes assumption that noise amplitude (abs of fft output) is constant across frequency and calculates noise density from this.









Ti operates FFT output in q8 format.

Notes on CFAR detection process:

Ti SW first evaluates the Doppler bin and looks for Doppler bins that meet the 14 dB SNR criteria. This has the following benefits:

-For any number of range returns, all should have almost same Doppler