Mic interface with TLV320AIC3310

Considerations and Assumptions

- Audio CODEC being used to interface external mic and external speakers is: TLV320AIC3110
- Microphone sensitivity: -47 dBV
- Input sound: 60 dB SPL

Audio CODEC ADC analysis

- ACD minimum signal level:
  - ADC resolution considered: 16 bits (Table 3-1, datasheet)
  - Analog reference voltage: 3.3 V (section 5.3, datasheet)
  - SNR: 91 dB
  - Effective resolution:
    - ∞ SNR = 6.02 x N + 1.72
    - ∞ 91 = 6.02 x N + 1.72
    - ∞ N = 14.8239
  - Minimum detectable signal by ADC = $\frac{3.3}{2^{14.8239}-1} = 113.78\ \mu V$
- Microphone sensitivity: - 47 dBV (1 Pa) => for 1 Pa (94 dB SPL) of input audio signal, mic will produce 4.4668 mV signal.
- Considering the same, for 60 dB SPL input signal, the mic will produce 89.336 µV of signal at its output.

Queries

- Considering PGA = 0 dB, since this signal level is smaller as compared to what ADC of CODEC requires, how the configuration will work?
- There is a provision in CODEC of 59.5 dB of preamp gain. How shall I used it for calculations?