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| **4gSr. No.** | **Query** | **Remarks** |
|  | Minimum signal detectable by the CODEC device (considering CODEC gain = 0). | * Calculation method provided in PDF is correct.
* Revised value of minimum detectable signal by ADC is:
* $\frac{2}{2^{14.8239}-1}=68.96 μV$
* Kindly confirm this value.
* To get the LSB, use $\frac{2}{2^{16}}=30.69μV$
* Note this is an ideal value.
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|  | Does the value calculated in Sr. No. 1 imply that my microphone shall produce analog audio signal > 68.96 µV for it to get detected by the CODEC device if I’m keeping PGA = 0 dB? | * TI comment required.
* Yes, this statement is correct. The LSB indicates what voltage represents a single ADC code.
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|  | Minimum signal detectable by the CODEC device (considering CODEC gain = ***x dB***). | * How to determine this value? Shall it be simply 68.96 x (10^(x/20))
* TI comment required.
* With gain in the equation, you want to use the equation $\frac{LSB}{10^{\frac{x}{20}}}$
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|  | As suggested by Aaron, considering 2 Vpp as the full scale voltage and 59.5 dB (944V) of gain, the max level ADC would be able to see is 168 mVpp.  | * Why additional amplification is required between mic and ADC for this case?
* As stated before, you want the input of the ADC to be as close to full scale as possible. This utilizes the full range of the ADC and helps reduce the amount of quantization noise. For microphone applications, the user can use the internal Automatic Gain Control (AGC). Using the AGC allows the user to set a threshold so any signals below this threshold are amplified to meet said threshold.
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|  | It is specified in the data sheet that for speaker, maximum drive level by the CODEC device is 400 mW. For speaker with sensitivity of 88 dBA (0.1W/0.1m), I assume maximum volume I’m going to get is 88 + 3 dB + 3 dB = 94 dBA. | * Is the calculation correct? TI comment required.
* For 88dBA at .1W/.1m, yes, that calculation is correct. For the speaker sound to increase by 3dB, the amplifier power needs to double. So at .1W, 88dBA is present on the speaker out. .2W, 91dBA and .4W, 94dBA.
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