# Digital stethoscope (DS) analog front end module for the C5505 DS medical development kit

The TMDXMDKDS3254 digital stethoscope (DS) analog front end (AFE) module is part of the **DS medical development kit (MDK)**, which consists of the DS AFE module, a processor board (C5505 DSP evaluation module), and a set of collateral and application software source code to implement the DS application. The DS MDK delivers a complete signal chain solution to enable developers to build an entire DS system quickly for evaluation and get to production faster.
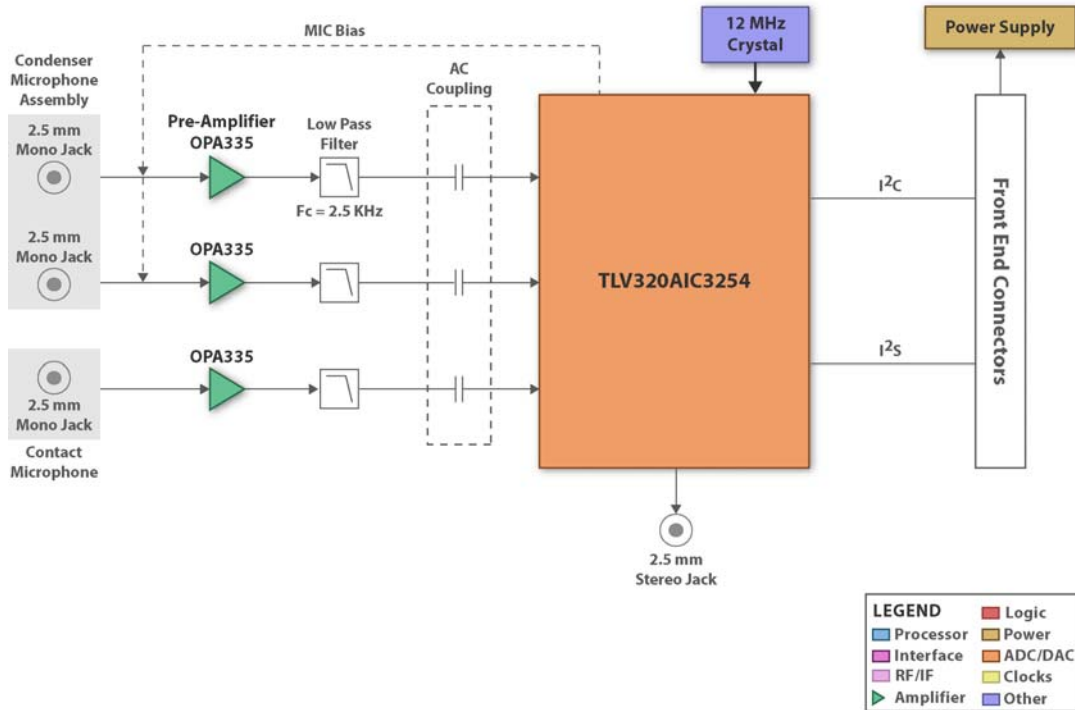
DS MDK features
- Audio output in three selectable modes
    - Bell mode (20Hz to 220Hz)
    - Diaphragm mode (50Hz to 600Hz)
    - Extended range (20Hz to 2000Hz)
- Three channel input, two condenser and one contact microphones
- Volume control and mute
- Real-time display of heart signal via onboard LCD and also on PC
- Store and playback option on PC side

DS AFE module key components
- TLV320AIC3254 – flexible, low-power, low-voltage stereo audio codec with programmable inputs and outputs
- OPA335 – 0.5-uV/°C, CMOS zero-drift operational amplifier

Flexibility is the key feature of the TLV320AIC3254, as the record path contains programmable input channel configurations covering single-ended and differential setups, as well as floating inputs or mixed input signals. It also includes a digitally controlled stereo microphone preamplifier and an integrated

microphone bias. Programmable filter blocks are available that can remove audible noise that may be introduced by mechanical coupling.

The playback path of the AIC3254 offers signal processing blocks for filtering, true differential output signals, flexible mixing of the digital-to-analog converter (DAC), analog input signals, and programmable volume controls.

As the microphone output is in the range of mV, the OPA335 provides appropriate amplification of the input signal. This is achieved by AC coupling the preamplifier and including variable gain to increase the signal-to-noise ratio (SNR).

The DS AFE module can seamlessly connect through standard interface to various processor platforms, such as the C550x EVM or the OMAP35xx Zoom Development Kit.