Wireless Healthcare

eStethoscope Is Hard To Beat

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AMI Semiconductor, a designer and manufacturer of integrated mixed-signal and structured digital products for the automotive, medical and industrial markets has announced the availability of a reference design and support materials for a complete DSP-based electronic stethoscope. Targeted at OEM's and harnessing the power of AMI Semiconductor's BelaSigna 250 DSP-based audio processing system, the electronic stethoscope reference design (ESRD) allows for improved accuracy in assessing and classifying cardio-respiratory pathologies for medical professionals.
Electronic stethoscopes are digital devices that are ergonomically similar to traditional acoustic stethoscopes. The AMIS e-stethoscope reference design supports the bell, diaphragm and extended operating modes of first generation electronic stethoscopes. Enabled by the BelaSigna 250 audio processing system, the e-stethoscope also allows for digital recording of cardiac and pulmonary sounds into non-volatile memory, an enhanced user-interface and minimal CPU usage along with the flexibility for OEM's to customize and even develop their own unique signal processing algorithms. Enhanced features of the e-stethoscope reference design include:

- Amplification and equalization - Low-delay, frequency-specific amplification for improved and faster diagnosis in noisy environments.

- Recording and playback - Enhanced controls, including a half-speed playback mode for detailed review of pathologies that may be otherwise difficult for physicians to diagnose.

- Selectable mode and convenient user interface - Button selection for bell, diaphragm and extended modes, with volume control, battery monitoring and low-power indication.

- Flexible design - Software-based implementation on BelaSigna 250's unique dual-core architecture allows for additional features. For example, developers can implement heart rate detection or adaptive processing schemes, including two sensor schedules for separation of the maternal and fetal heartbeats.

- Ultra-low power DSP subsystem - BelaSigna 250 offers extended battery life, while highly-integrated design reduces need for external components, improving reliability and reducing cost.

- Wireless capability - BelaSigna 250 has interfaces that seamlessly connect to Bluetooth chips and other wireless systems. The design can easily be expanded in the future to incorporate wireless links enabling the transfer of data to a PC or handheld device where it can be stored, shared and retrieved for further analysis.

The AMIS e-stethoscope reference design was tested and reviewed by paramedics, including Advanced Care Paramedic Paul W. Boshart, who comments, "During my field assessment of the prototype, I was impressed by the ability to clearly amplify transmitted sounds with the e-stethoscope. The comparison between this product and a general use stethoscope is unmistakable in its clarity and ability to magnify even faint breath sounds to a level that are audible."

"Electronic stethoscopes can dramatically improve a physician's ability to make a diagnosis," said Morry Marshall, vice president of strategic technologies at Semico Research Corp. "The incorporation of AMI Semiconductor's DSP technology into electronic stethoscopes provides improved amplification,

recording and, in the future, wireless transmission capabilities that will further increase that diagnostic advantage."

"The development of this electronic stethoscope reference design represents the first of many exciting new applications of AMI Semiconductor's ultra-low power DSP and signal processing capability in the medical market segment," said Chris King, CEO of AMIS. "We are excited about the possibilities of this device and the opportunities we see on the horizon as we leverage the technical and market synergies in our new medical and wireless product line." http://www.amis.com