



## **Product Introduction – Noise Reduction Chips and Software for Wireless Handsets, Conference Phones, and Handheld Devices**

Li Creative Technologies (LcT), Inc.

Li Creative Technologies (LcT), Inc. located in Florham Park, New Jersey, USA, has been advancing state-of-the-art noise reduction and speech enhancement technology for telecommunications for years. LcT is now ready to introduce its new products – microelectronic chips and DSP software for noise reduction for commercial applications, especially for wireless handsets, conference phones, and handheld devices.

**Where is the noise in wireless communication from?** Noise is everywhere in today's communication networks. It is an even more serious problem in wireless communications, where different kinds of noise are included, such as background noise, electronic noise, coding noise, transmission noise, computation noise, etc. When a speaker is using a wireless handset on the streets, the sounds of traffic can be picked up by the handset microphone as background noise. While the speech signal is being transmitted through the wireless and the landline networks, additional noise is involved. Finally, the electronic devices of the receiver's handset can generate noises as well. Essentially, any stage of wireless communication can introduce noise, and these noises can significantly affect speech quality, as we have experienced in our daily use of cell phones.

**Where is the noise in using a conference phone from?** When people are using conference phones, the speakers are far away from the microphone; thus background noise is easily involved and the noise level is higher than when using handsets.

**What is LcT's technology?** LcT's noise reduction/speech enhancement techniques were developed by emulating the human hearing system, which is robust to background noise in human speech communications. We defined mathematic models to imitate the functions of the human hearing systems, and then developed our own unique algorithm for noise reduction and speech enhancement. This algorithm is now implemented into chips and software as our products, for real applications.

**Noise Reduction Demos:** Demos on noise reduction/speech enhancement are available at our website: [www.licreativetech.com/demos](http://www.licreativetech.com/demos), for wireless, conference phone, and PDA communications. One can play the audio files and compare the differences with and without using our noise reduction technique. Our algorithm can improve the signal-to-noise ratio by 15 dB or more, which is a significant number in the research area.

**What is the noise reduction chip?** Our noise reduction chip is a system-on-chip solution. It includes a pre-amplifier, an A/D converter, a DSP processor, and a D/A converter. The inputs and outputs can be analogue or digitized speech signals. The chip can be inserted into existing

wireless handsets with minimum changes on the circuits. No changes are necessary for the handset software.

**Who needs these chips?** LcT's noise reduction chips can be used in any speech communication, recording, or processing devices, such as cell phones, ear phone, walky-talky, conference phones, wireless stations, recorders, speaker phones, PDA's, etc. Manufacturers or service providers can put LcT's chips in their products to reduce noise and improve the voice quality of their products.

**Where would one put these chips?** Technically, the chip can be inserted anywhere in the wireless or landline communication channels; however, for the best performance, we suggest inserting the chip right behind the microphone component, in front of the loudspeaker, in earphone, or in the wireless stations.

**High quality, small, low cost, and low power consumption:** Developed by state-of-the-art technology, the chip has 16-bits dual channel I/O and low power consumption (0.05 mW/MIPS). It is very small in size (about 2x4x1 ~ 8x8x1 mm), and the price is acceptable by cell phone users. The chip packaging can be changed based on customers' requirements. Other DSP functions, such as voice activity detection, coding, Bluetooth, earphone, etc., can be added to the chip as required by customers.

**What is the software solution?** For some specific applications, we can consider porting our algorithm to customers' specific hardware platform. Please contact the company for details.

### **Company Introduction:**

LcT is a high-tech company established by former Bell Labs research scientists in 2002. The company focuses on the research and development of acoustic signal processing, noise reduction, microphone array, and speech recognition technologies. Because of its cutting-edge technologies and its world-class research, the company is considered one of the nation's top scientific and engineering firms, and its research has been supported by several U.S. government agencies. The company has been awarded several research contracts related to noise reduction, speech enhancement, microphone array, speech recognition, and signal processing. The research scientists at LcT are highly recognized in the speech research society, and they all have extensive research and product experience.

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