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Overcoming Scaling Problems in Miniaturized Silicon Microphones

Sung B. Lee, David E. Schafer and Peter V. Loeppert
Knowles Acoustics, 1151 Maplewood Dr, Itasca, IL 60143, USA

In 2008 it is projected that global demand for mobile devices will reach 1.2 billion units. Compared to electronic gadgets from 2002 when 430 million cell phones were sold world wide, these devices are smaller, have more features, and will generally be priced lower. In order to keep up with designers and manufacturers who relentlessly pursue efficient use of space at lower cost, it is required that component manufacturers pursue the same goal. For a microphone manufacturer like Knowles, this led to the introduction of world's first commercialized surface-mountable microphone, the SiSonic^{TM} microphone, in 2002. MEMS technology is used to manufacture the complex miniaturized components used in SiSonic^{TM} microphone. Straightforward miniaturization of microphone diaphragms made of silicon, a common material in MEMS technology, instead of traditional diaphragm materials leads to poor performing microphones. To take advantage of MEMS technology without sacrificing microphone performance we developed the free plate technology. In this presentation we discuss the use of free plate technology to overcome difficulties related to miniaturization in MEMS.