Vesper VM1000 Piezoelectric Microphone: Structure and Cost Analysis

Description:
Vesper has developed the first piezoelectric MEMS technology microphone. This breaks new ground in the MEMS microphone world, which has been exclusively composed of capacitive silicon MEMS for more than ten years. It is a very robust technology. The VM1000 is an IP68 microphone, meaning it is water- and dustproof, taking a step towards the waterproof smartphone.

This piezoelectric microphone targets consumer applications: smartphones, wearables and the Internet of Things (IoT). It also positions Vesper to compete with Knowles, Goertek, STMicroelectronics and others for applications in harsh environments.

Vesper’s VM1000 microphone device is manufactured using a proprietary MEMS technology based on recent innovations in piezoelectric material for semiconductors and more precisely for the latest BAW filters.

The sensing element in the VM1000 is based on a flexible piezoelectric material membrane formed above a cavity. Sound moves the membrane, which generates an electric current. The VM1000 has a very complex design to optimize signal to noise ratio.

The VM1000 is naturally immune to water and dust, which qualifies it for the IP68 ingress protection rating. It is very stable over time and in harsh environments.

This report presents a detailed analysis of sensor structure and cost. It also compares characteristics with the Knowles and Goertek capacitive microphones for the iPhone 7, highlighting differences in technical choices made by the companies.

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