This review study has been conducted to provide insights and technology data for a large range of functions based on piezoelectric material characteristics.

Piezoelectric materials allow interactions between electronic components and the mechanical world, so that actuator and sensor functions can be integrated directly with electronic die. That’s why piezoelectric materials are used in more and more modules. Traditional products include printheads, ultrasonic transducers, and radiofrequency (RF) filters. New MEMS products include microphones and speakers. The report proposes a study of 16 piezoelectric technologies from 16 manufacturers including Qualcomm, Broadcom, Qorvo, Panasonic, Silicon Sensing, XAAR-Ricoh, Epson, Fujifilm, Vesper, Usound, Kyocera, Toshiba, OCE, and Paratek.

System Plus consulting has been performing reverse engineering and costing of a large variety of components based on the piezoelectric effect for more than 10 years. However, only the latest generations are presented in this report. This review has been conducted to provide insights into the structures, technical and design choices of the components at the center of the most innovative functions.

We analyzed and compared two ultrasonic sensors, six printheads, five MEMS dies and three RF components.

This report contains a physical analysis and a cost estimation of the integration of piezoelectric material in a system or wafer. We base our analysis on full teardowns of the piezoelectric material and electrodes to unveil the technological choices made by the different manufacturers. Finally, it features an exhaustive comparison between the studied samples, highlighting the similarities and differences and their impact on cost.
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LINKED REPORT

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