



MEMS-based loudspeakers

High-End Loudspeakers for Smartphones & Small Appliances

What is a MEMS-based loudspeaker?

The best sound quality still comes from bulky high-end loudspeakers. CEA-Leti is going a step further into making loudspeakers compatible with micro-fabrication processes with a new piezoelectric micro-loudspeaker using almost exclusively silicon.

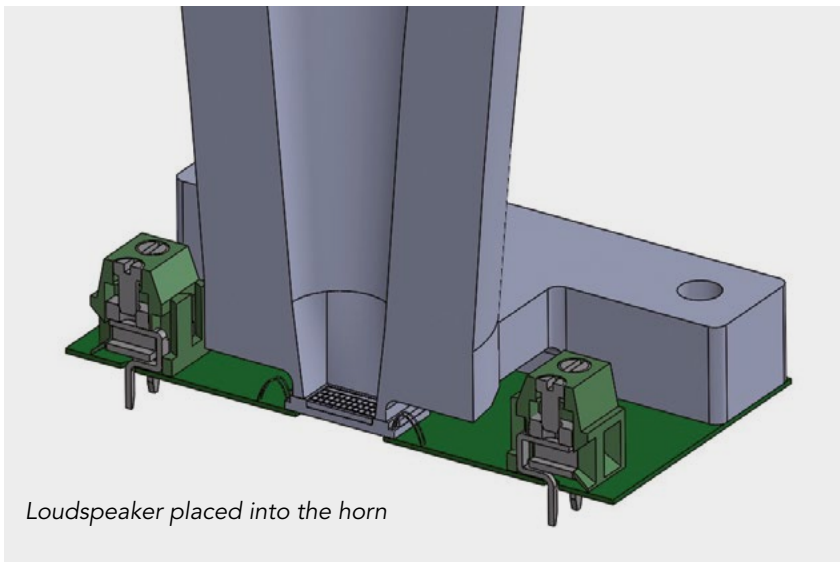
CEA-Leti small loudspeaker achieves similar performance as larger loudspeakers using conventional manufacturing techniques. It is fitted into a 3D printed horn that mechanically improves performances.

Applications

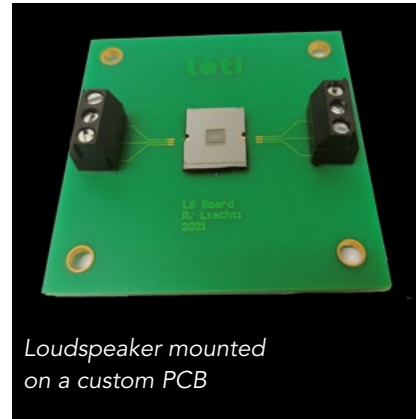
- Smartphones
- Smartwatches
- Earphones
- Headphones
- Connected IoT & Hardware

What's new?

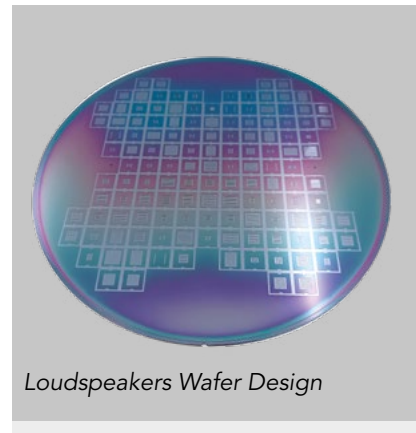
CEA-Leti researchers unveil an innovative manufacturing process using two types of 200 mm silicon wafers assembled with a polymeric glue. This technique helps separate the electro-mechanical transduction from the mechano-acoustical transduction. This innovation translates into greater performances for small-sized loudspeakers, with a sound pressure of 80 dB_{SPL} at 10 cm, starting at a frequency below 1 kHz.



Loudspeaker placed into the horn



Loudspeaker mounted on a custom PCB



Loudspeakers Wafer Design

What's next?

CEA-Leti researchers will tune this loudspeaker using a system approach to improve performances and make sure it fits well into current applications, such as smartphones and other IoT devices. Additional digital signal processing, acoustical tuning and packaging techniques will be investigated.

Interested in this technology?

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