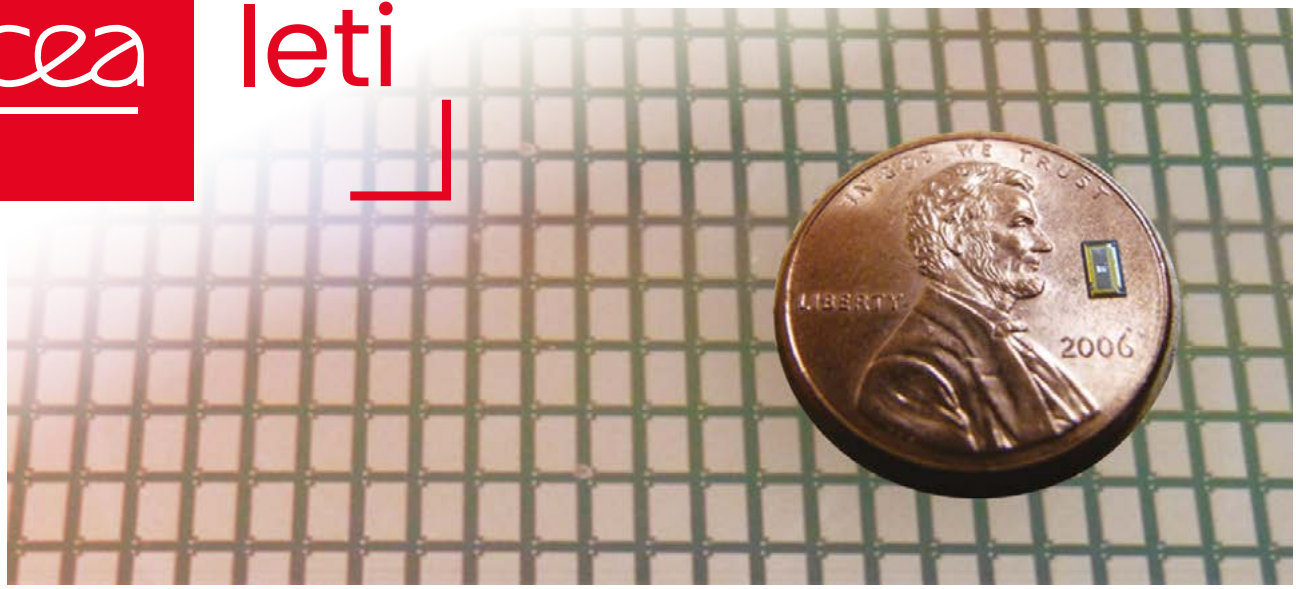


TINY batteries

Towards highly integrated energy storage solutions

What is TINY?

TINY is a solid-state rechargeable thin film battery, introducing CEA-Leti's latest electrochemical energy storage solution for IoT devices. This technology addresses companies' rapidly growing interest in a range of integrated power sources that will help them embed higher energy density while reducing both the footprint and cost. TINY microbatteries make IoT devices even more compact and energy efficient. CEA-Leti's 100% solid state Lithium ion micro-batteries are manufactured using conventional MEMS production equipment. With typical sizes in the mm^3 range, they safely operate within the µAh to mAh capacity.

Applications

CEA-Leti's technology is tailored to several components including:

Wearable/implantable devices to be used in:
- Medical and healthcare monitoring

Self-powered sensors to be used in:
- Industry 4.0
- Transportation
- Buildings/structural health monitoring

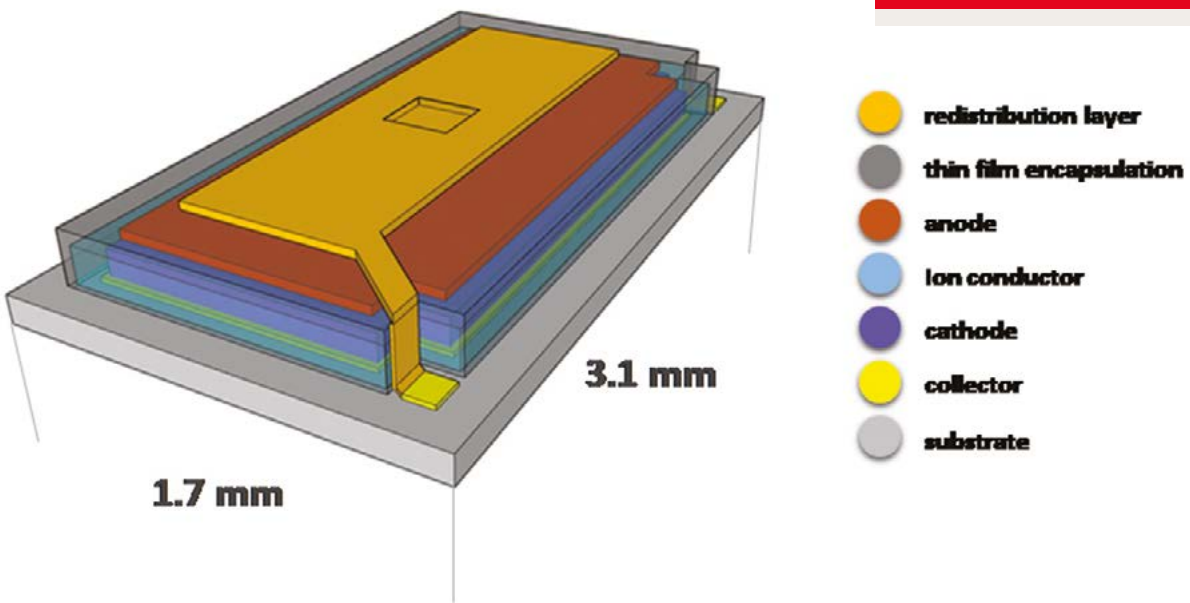
Standby/back-up power to be used in:
- Dust computing
- Portable devices

Publications

- "Millimeter Scale Thin Film Batteries for Integrated High Energy Density Storage", S. Oukassi, A. Bazin, C. Secouard, I. Chevalier, S. Poncet, S. Poulet, J. Boissel, F. Geffraye, J. Brun. IEEE Int. Electron Devices Meet. 2019, 618–621.
- "Minimal Architecture Lithium Batteries: Toward High Energy Density Storage Solutions", J. Celè, S. Franger, Y. Lamy, S. Oukassi, Small 2023, 2207657.

What's new?

To achieve miniaturized and ultra-high energy density microbatteries, CEA-Leti worked on an aggressive design and very thick electrode (20+ µm) device architectures, the whole being achieved using advanced microfabrication technologies. The TINY batteries exhibit 5 mm² of footprint, a total thickness of 100 µm and 20 µAh of discharge capacity, which is the highest reported energy density for microbatteries with such dimensions.



What's next?

CEA-Leti is currently working on:

- Increasing energy and power densities
- Stacking of TINY batteries
- Novel designs tailored for specific IoT applications

Interested in this technology?

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