MINIATURE SOLID STATE BATTERIES FOR VAGUS NERVE STIMULATION

NEUROMODULATION

Neurostimulation technology is a rapidly evolving field of medicine which has the potential to transform management of chronic pain, neurological disorders and psychiatric conditions. Implanted neurostimulation devices, work by delivering targeted electrical impulses to specific neural structures.

VNS

Vagus nerve stimulation (VNS) is a technique that involves stimulating the vagus nerve electrically, to treat conditions such as epilepsy, depression, anxiety, Alzheimer's disease... A small, battery-powered device is implanted under the skin in the chest, typically on the left side. This device is connected to the vagus nerve in the neck via a wire.

PAIN POINTS FOR DESIGNERS

Current VNS devices face challenges. Many require patients to visit medical facilities for treatment, limiting accessibility. The need for external wires increases infection risks, while fully implanted devices often necessitate invasive surgery. Additionally, current battery-powered implants require bulky power sources, leading to frequent surgical battery replacements. A VNS device powered by a mm-size battery would resolve these limitations.

STEREAX SOLID STATE BATTERIES

Stereax M300 is a rechargeable, miniature solid state battery with:

- 300 µAh
- 3.5 V
- 3 mA pulse current
- 1000 cycles
- 5.6 x 3.6 x 1.1 mm

PRODUCT DESIGN BENEFITS

- Millimetre-scale format, enable real miniaturisation
- Rectangular form factor, fits easily on PCB
- High power, capable of powering most comms and therapies
- High cycle life, can be recharged numerous times
- Can be recharged wirelessly
- Rapid charging, improves patient compliance to charging at home

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