Medical MEMS: fully implanted battery-free platform for chronic spinal and muscular functional electrical stimulation – November 30, 2023

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TOP STORIES

Medical MEMS: fully implanted battery-free platform for chronic spinal and muscular functional electrical stimulation
Nature Communications - Nov 30, 2023
Electrical stimulation of the neuromuscular system holds promise for both scientific and therapeutic applications. Supplying and maintaining the power necessary to drive stimulation is a fundamental challenge in these applications. (read more)

ABB to add optical sensors to four more greenhouse gas monitoring satellites
ABB - Nov 30, 2023
The company has been a leader in gas sensing from orbit for over two decades, starting with the development of the Canadian Space Agency SCISAT mission payload, which profiles the concentration of more than 70 different gas types. (read more)

Printing microelectronics with copper at scale gets closer to reality
Fierce Electronics - Nov 30, 2023
Today, most of the semiconductor industry is using silver for printing, which has reliability issues. Silver reacts with the air and the humidity in the air, making small dendrites. (read more)

Nanostructured gas sensors: emerging technologies and applications
Optica - Nov 29, 2023
Metal oxide nanostructures could be particularly useful for improving the performance of gas sensors through nanoparticles of noble gases, metal doping, or mixing with other nanomaterials. (read more)

RF MEMS: selection of metallic liquid in antenna design for 6G networks
Scientific Reports - Nov 29, 2023
One advantage of a metallic liquid antenna in a microfluidic channel is its reconfigurability. Without sacrificing their electrical properties, liquid metals in microfluidic channels develop extremely flexible and mechanically stable antennas. (read more)

Triplebar raises $20 million to expand bioproduct design engine
AFN - Nov 29, 2023
"Essentially we take a test tube and miniaturize it into a microreactor. We create tens of millions of yeast strains [for example], encapsulate them in our microreactors, and add test reagents," said the company's CEO Maria Cho. (read more)

Medical MEMS: advanced nanofluidic chips and neuromorphic computing systems
AZo Quantum - Nov 28, 2023
Envue Technologies is developing technology utilizing its nanofluidic chips as tiny optical sensors, in combination with advanced light illumination and data analysis, to detect and measure individual biomolecules in solution. (read more)

MEMS equipment maker EV Group completes construction of new manufacturing building to expand capacity
PR Newswire - Nov 28, 2023
"New applications fueling the semiconductor industry, such as AI, high-performance computing, and autonomous driving, require massive innovations in advanced packaging," said Dr. Werner Thallner, Member of the company's Executive Board. (read more)

Power MEMS: new watch reportedly can run for over a decade on a single battery
IEEE Spectrum - Nov 28, 2023
French company SilMach is using a new wristwatch to demonstrate its advanced silicon MEMS technology with a new watch movement that's so efficient that it may only need to change the battery about once a decade. (read more)

Sensors in the oil and gas industry
AZo Sensors - Nov 27, 2023
The process of extracting, transporting, and refining oil and gas is complex and hazardous to workers and assets. One of the main risks involved is fires or explosions due to flammable gases and liquids being present. (read more)

QuantumDiamonds raises $7.7 million seed funding round for quantum sensing technology
TechEU - Nov 27, 2023
The company is developing atom-sized quantum sensors that enable non-destructive, nano-scale imaging of magnetic fields, with applications across various industries, including semiconductor manufacturing and medical diagnostics. (read more)

Power MEMS: miniature battery-free bioelectronics
Science - Nov 27, 2023
Large battery packs, cumbersome tethers, and intricate packaging architectures complicate device design and present numerous possible failure modes, which limits the widespread deployment of therapeutic implantable bioelectronic devices. (read more)

Innolux utilizes legacy production lines for MEMS-on-glass
DigiTimes Asia - Nov 27, 2023
The company is using its unique technology to achieve CMOS and MEMS processing on glass substrates. This allows components traditionally manufactured on wafers to be transferred to glass substrates. (read more)

NOTABLE NEW PATENTS AND PATENT APPLICATIONS

Title: Piexoelectric micromachined pressure transducer with high sensitivity
Application Number: 18/320876
Assignee: STMicroelectronics S.r.l.
Abstract: Micromachined pressure transducer including: a fixed body of semiconductor material, which laterally delimits a main cavity; a transduction structure, which is suspended on the main cavity and includes at least a pair of deformable structures and a movable region, which is formed by semiconductor material and is mechanically coupled to the fixed body through the deformable structures. Each deformable structure includes: a support structure of semiconductor material, which includes a first and a second beam, each of which has ends fixed respectively to the fixed body and to the movable region, the first beam being superimposed, at a distance, on the second beam; and at least one piezoelectric transduction structure, mechanically coupled to the first beam. The piezoelectric transduction structures are electrically controllable so that they cause corresponding deformations of the respective support structures and a consequent translation of the movable region along a translation direction.

Title: MEMS device and fabrication method thereof
Application Number: 17/826181
Assignee: Vanguard International Semiconductor Corporation
Abstract: A MEMS device includes a first substrate, an interconnect layer, a MEMS device layer, a stopper and a second substrate. The interconnect layer is disposed on the first substrate and includes a plurality of conductive layers and a plurality of dielectric layer stacked alternately. The MEMS device layer is bonded on the interconnect layer and includes a proof mass. The stopper is disposed directly under the proof mass and spaced apart from the proof mass, where the stopper is surrounded by a portion of the interconnect layer, and the stopper includes a bottom portion constructed of one of the plurality of conductive layers, and a silicon-based layer disposed on the bottom portion. The second substrate includes a cavity and is bonded on the MEMS device layer.

Title: Wearable data processing apparatus, system, and method
Application Number: 18/318839
Assignee: Sony Interactive Entertainment Inc.
Abstract: A wearable data processing apparatus includes one or more attachment members for attaching the wearable data processing apparatus to a part of a limb of a user, one or more sensors to generate user input data in response to one or more user inputs, wireless communication circuitry to transmit the user input data to an external device and to receive control data based on the user input data from the external device, processing circuitry to generate one or more output signals in dependence upon the control data and an output unit to output one or more of the output signals.

Title: MEMS thermoelectric generator, manufacturing process of the generator, heating systems
Application Number: 18/318612
Assignee: STMicroelectronics S.r.l.
Abstract: MEMS thermoelectric generator comprising: a thermoelectric cell including one or more thermoelectric elements partially extending on a cavity of the thermoelectric cell; a thermoplastic layer extending on the thermoelectric cell and having a top surface and a bottom surface opposite to each other along a first axis,

the bottom surface facing the thermoelectric cell and the thermoplastic layer being of thermally insulating material and configured to be processed through laser direct structuring, LDS, technique; a heat sink configured to exchange heat with the thermoelectric cell interposed, along the first axis, between the heat sink and the thermoplastic layer; and a thermal via of metal material, extending through the thermoplastic layer from the top surface to the bottom surface so that it is superimposed, along the first axis, on the cavity, wherein the thermoelectric cell may exchange heat with a thermal source through the thermal via.

Title: Multi-wavelength LIDAR system
Application Number: 18/364969
Assignee: OPSYS Tech Ltd.
Abstract: A multi-wavelength LIDAR system includes a first laser source that generates a first optical beam having a first wavelength and a second laser source that generates a second optical beam having a second wavelength. An optical element projects the first optical beam to form a first beam profile at a target plane and projects the second optical beam to form a second beam profile at the target plane. An optical receiver generates a first wavelength signal corresponding to the received reflected portion of the first beam profile and generates a second wavelength signal corresponding to the reflected portion of the second beam profile at the target plane. A controller generates a measurement point cloud from the first and second wavelength signals, wherein an angular resolution of the measurement point cloud depends on a relative position of the first and second beam profiles at the target plane.