

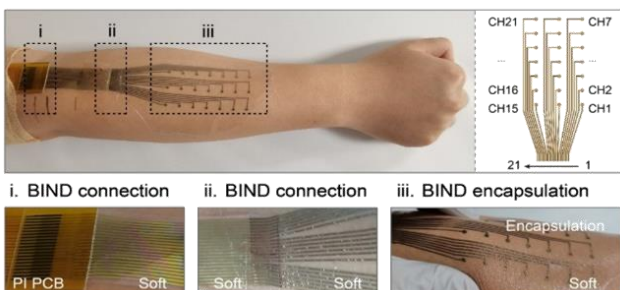
Flexible Electronics Integration & Packaging

TECHNOLOGY OVERVIEW

Flexible electronics integration and packaging have transformed industries with lightweight, adaptable devices like wearables, flexible displays, and medical sensors for enhanced user experiences.

Fostering innovations to expand its reach and versatility, this technology seeks to develop a universal connector that revolutionizes the assembly of stretchable devices akin to Lego modules while ensuring reliability under fatigue cycles.

BIND interface (BI-phasic, Nano-Dispersed interface), consisting of metal nanostructures and interpenetrating polymer, facilitates the fabrication of stretchable, diverse materials and multi-modular devices, such as wearables and soft robots. This innovation overcomes a longstanding challenge faced by flexible-rigid electronics connection, rendering more robust and reliable stretchable devices within market reach.



*Proof-of-concept as stretchable device (top)
for in vivo neuromodulation and on-skin
electromyography*

FEATURES & SPECIFICATIONS

- Exceptional stretchability up to 7 times without breaking with soft-soft modular joints demonstrating 600% and 180% mechanical and electrical stretchability, respectively
- Interfacial toughness of 0.24 N mm^{-1} for soft module encapsulation, outperforming conventional connectors by 60 times
- Robust electrical transmission even when stretched to 2.8 times

MARKET TRENDS & OPPORTUNITIES

- Global flexible electronics market estimated at US\$22 billion in 2022 has been projected to reach US\$89.2 billion by 2030 with a CAGR of 19.1%. Such significant growth has been driven by stretchable electronics and sensors, material and design advancements to enable stretchable interconnects in flexible circuits and new stretchable materials.
- With the greater deployment of electronics in bioelectronic medicine, new opportunities and potential applications has emerged.

POTENTIAL APPLICATIONS

- Healthcare
- Smart Wearables
- Soft Devices
- Digitalized and Autonomous Systems
- Smart Buildings