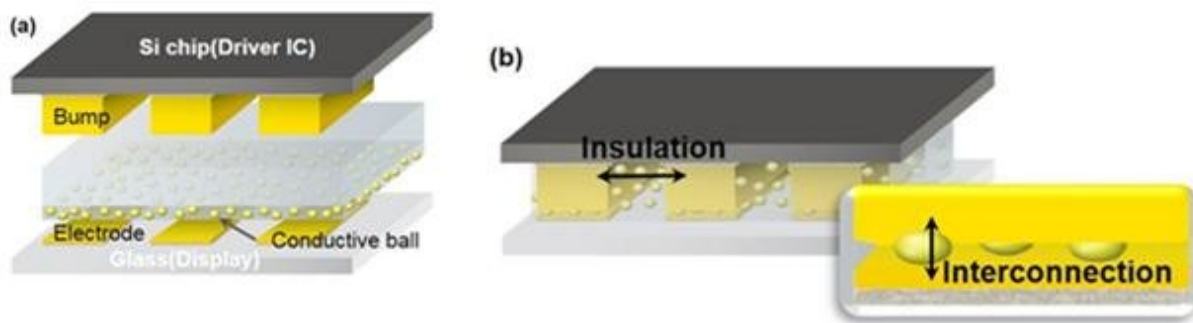


New anisotropic conductive film for ultra-fine pitch assembly applications

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Schematic image of display applications using conventional ACFs (a) before and (b) after ACFs bonding process. Credit: KAIST

High-resolution display devices increasingly need ultra-fine pitch assemblies. On that account, display driver interconnection technology has become a major challenge for upscaling display electronics.

Researchers have moved one step closer to realizing ultra-fine resolution for displays with a novel thermoplastic anchoring polymer layer structure. This new structure can significantly improve the ultra-fine [pitch](#) interconnection by effectively suppressing the movement of conductive particles. This film can be applied to mobile devices, large-sized OLED panels, and VR, among others. The new structure will

significantly improve the conductive particle capture rate, addressing electrical short problems in the ultra-fine pitch assembly process.

During the ultra-fine pitch bonding process, the conductive particles of conventional ACFs agglomerate between bumps and cause electrical short circuits. To overcome the electrical shortage problem caused by the free movement of conductive particles, higher tensile strength anchoring polymer layers incorporated with conductive particles were introduced into the ACFs to effectively prevent conductive particle movement.

The team used nylon to produce a single layer film with well-distributed and incorporated conductive particles. The higher tensile strength of nylon completely suppressed the movement of conductive [particles](#), raising the capture rate of [conductive particles](#) from 33 percent of the conventional ACFs to 90 percent. The nylon films showed no short circuit problem during the Chip on Glass assembly. Even more, they obtained excellent electrical conductivity, high reliability, and low cost ACFs during the ultra-fine pitch applications.

Professor Kyung-Wook Paik believes this new type of ACFs can further be applied not only to VR, 4K and 8K UHD [display](#) products, but also to large-size OLED panels and mobile devices.

His team completed a prototype of the film supported by the 'H&S High-Tech,' a domestic company and the 'Innopolis Foundation.' The study, whose first author is Ph.D. candidate Dal-Jin Yoon, is described in the October issue of *IEEE TCPMT*.

More information: Kyung-Wook Paik et al, A study on the novel anchoring polymer layer(APL) anisotropic conductive films (ACFs) for ultra fine pitch assembly applications, *2018 Pan Pacific Microelectronics Symposium (Pan Pacific)* (2018). [DOI](#):

[10.23919/PanPacific.2018.8318988](https://doi.org/10.23919/PanPacific.2018.8318988)

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