



TiW alloy adhesion layer for integration of anodic aluminum oxide on substrates

A method for developing an integrated via structure for improved performance in CMOS applications at millimeter- and submillimeter-wave frequencies

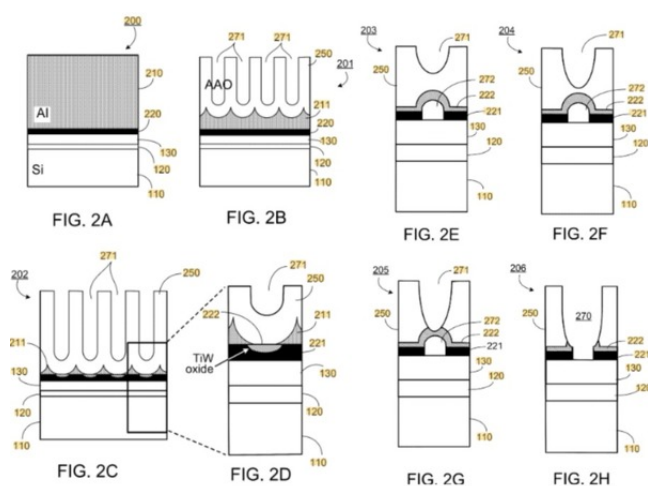
Technology ID

2021-171

Category

All Technologies
Engineering & Physical
Sciences/Nanotechnology
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Sciences/Processes
Engineering & Physical
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IP Status: US Patent Issued; Patent No. 12,100,879

Applications

- Submillimeter-Wave Communications
- Millimeter-Wave Communications
- Internet of Things Devices
- 3D integrated circuits

Technology Overview

In IC circuits and systems, vias play a significant role in providing high-density interconnections between active devices, however, as the communication frequency band expands progressively into millimeter and even submillimeter-wave frequencies, higher skin depth loss and parasitic inductance for vias become prohibitive. Researchers at the University of Minnesota have developed a method for using a TiW adhesion layer to integrate anodic aluminum oxide (AAO) on substrates, removing the commonly formed barrier layer for electrical contact, and widening the pores of the AAO for various nanomaterials and devices. Using this structure, bundles of nanowires are fabricated in an ultrathin device, resulting in a decrease in total power loss at high frequencies with improved integration.

Phase of Development

TRL: 4

Working prototypes have been developed.



Desired Partnerships

This technology is now available for:

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- Sponsored research
- Co-development

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Press Releases

[University of Minnesota College of Science & Engineering](#) January 29, 2021

Researchers

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- [Rhonda Franklin](#) Professor, Department of Electrical and Computer Engineering

References

1. Yali Zhang; Joseph Um; Bethanie Stadler; Rashaunda Henderson; Rhonda Franklin(2021) , <https://ieeexplore.ieee.org/document/9369363>, IEEE Microwave and Wireless Components Letters, 31, 693 - 696