



## TECHNOLOGY

# Superconductor/Insulator Metal-Oxide Heterostructures for Electric Field Tunable Microwave Devices

## OVERVIEW

It is desirable to have active circuit elements to be used in superconducting microwave device applications. Among various methods to modulate the microwave response of a circuit (i.e. obtain active response), the electric field induced modulation has clear advantages such as low energy consumption, input-output current isolation and high input resistance.

Metal-oxide superconductor/insulator heterostructures offer unique advantages over other structures for electric field induced modulation. Some of the advantages offered by this invention, developed by researchers at the University of Maryland, College Park, Department of Physics, include:

- High transition temperature and low carrier density for superconducting compounds such as  $\text{YBa}_2\text{Cu}_3\text{O}_7$ ;
- High and tunable dielectric constant for insulating compounds such as  $\text{SrTiO}_3$ ; and
- Physical and chemical compatibility of various heterostructure forms of these metal-oxides for easy device fabrication.

For more information, contact the Office of Technology Commercialization, 301-405-3947 or [otc@umd.edu](mailto:otc@umd.edu).

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## Additional Information

### INSTITUTION

University of Maryland, College Park

### PATENT STATUS

A U.S. patent, # 5,538,941, has issued

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### EXTERNAL RESOURCES

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