Metal dielectric capacitors

Do dielectric materials affect MIM capacitor performance?
The effect of the different dielectric constants (k) to the performance of the MIM capacitors is also studied, whereas this work investigates the effect of using low-k and high-k dielectric materials. The dielectric materials used in this study with high-k are Al2O3 and HfO2, while the low-k dielectric materials are SiO2 and Si3N4.

Which dielectric materials produce the highest capacitance?
The dielectric materials used in this study with high-kare Al2O3 and HfO2,while the low-k dielectric materials are SiO2 and Si3N4. The results demonstrate that the dielectric materials with high-k produce the highest capacitance. Results also show that metal-Al2O3 interfaces increase the performance of the MIM capacitors.

What is the interface between a dielectric thin film and a metal electrode?
The interface between a dielectric thin film and a metal electrode is studied to improve reliability as well as electrical properties of the metal-insulator-metal (MIM) capacitorin dynamic random-access memory (DRAM) devices.

Why are metal insulator metal dielectric capacitors used in silicon integrated RF and ICS?
Metal-insulator-metal (MIM) dielectric capacitors (DCs),as one of the crucial and typical components,have been widely used in silicon integrated RF and ICs devices due to their low resistance and low parasitic capacitance[1,2,3,4,5,6,7,8].

What are the characteristic curves of 25 nm dielectric capacitors?
C - Q and C - Vcharacteristic curves of 25 nm Al 2 O 3,TiO 2,and HfO 2 dielectric capacitors. (a - c) The C - Q characteristic curves of three kinds of 25 nm dielectric capacitors,respectively. (d - f) The corresponding C - V characteristic curves of three kinds of 25 nm dielectric capacitors at different frequencies.

How are dielectric capacitors based on Al 2 O 3 & TiO 2 fabricated?
The dielectric capacitors based on Al 2 O 3,TiO 2,and HfO 2 with controllable thicknesses are successfully fabricated by ALD,and the thicknesses of the dielectric film are measured with a spectroscopic ellipsometer. The relevant test principle is shown in Figures S2-S5,Supporting Information.

Embedded three-dimensional (3-D) metal-insulator-metal (MIM) decoupling capacitors with high-k dielectric films of high capacitance and long-life time are increasingly needed on integrated ...

Metal-insulator-metal (MIM) dielectric capacitors (DCs), as one of the crucial and typical components, have been widely used in silicon integrated RF and ICs devices due to their low ...

In this study, the reliability characteristics of metal-insulator-semiconductor (MIS) capacitor structures with

low-dielectric-constant (low-k) materials have been ...

Metal-insulator-metal (MIM) dielectric capacitors (DCs), as one of the crucial and typical components, have been widely used in silicon integrated RF and ICs devices ... of a dielectric capacitor with a capacitance density of 6.05 fF 2 m, intended for RF and mixed-signal integrated circuits applications [20]. Boris"s group focused on the ...

This study presents the construction and dielectric properties investigation of atomic-layer-deposition Al2O3/TiO2/HfO2 dielectric-film-based metal-insulator-metal (MIM) ...

For metal-insulator-metal (MIM) capacitors with an amorphous ZrTiO4 film as the dielectric, the impact of top electrode including Ni and Al on electrical stress reliability was ...

An electrolytic capacitor is a polarized capacitor whose anode or positive plate is made of a metal that forms an insulating oxide layer through anodization.This oxide layer acts as the ...

Abstract: Metal-insulator-metal (MIM) capacitors are inevitable and critical passive components in analog, mixed-signal, and memory applications. These capacitors occupy nearly 40% of circuit ...

This study presents the construction and dielectric properties investigation of atomic-layer-deposition Al2O3/TiO2/HfO2 dielectric-film-based metal-insulator-metal (MIM) capacitors. The influence of the dielectric layer material and thickness on the performance of MIM capacitors are also systematically investigated. The morphology and surface roughness of ...

The organic dielectric capacitor of a metal foil electrode is made of two layers of plastic film or sheet. Each layer is interspersed with thin aluminum metal foil or sheet, serving ...

Metal-insulator-metal (MIM) capacitor is an important passive component in RF, analog and mixed signal (RF-AMS) circuits. It takes a large circuit area of integrated circuits (ICs) compared to other passive and active components. ... This has made a trend to design high capacitance density MIM capacitors with novel dielectric materials. In this ...

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