Application of polysilicon capacitors

Are polysilicon capacitors used in digital CMOS?
Pure digital CMOS technologies rarelyallow the use of polysilicon resistors (with silicide block) or double-poly linear capacitors. Most analog applications,however,require high-quality capacitors characterized by high specific capacitance,low-voltage and low-temperature coefficients.

What is polysilicon used for?
In addition to its integrated-circuitapplications,polysilicon is becoming vital as the active layer in the channel of thin-film transistors in place of amorphous silicon. When polysilicon thin-film transistors are used in advanced active-matrix displays,the peripheral circuitry can be integrated into the same substrate as the pixel transistors.

What is polycrystalline silicon for integrated circuits & displays?
Polycrystalline Silicon for Integrated Circuits and Displays, Second Edition presents much of the available knowledge about polysilicon. It represents an effort to interrelate the deposition, properties, and applications of polysilicon.

Can polysilicon be integrated with electronics?
(Left) close up of an epi-poly structure (reproduced with kind permission of Gennissen) and (right) mechanical structure fabricated in the Sandia multi-level polyprocess (reproduced with kind permission of Sandia labs). With polysilicon there are a number of process options to integrate with electronics. This can be: post-processing.

Can polysilicon be used as a mechanical layer?
An alternative approach is to use existing polysilicon layers. Many IC processes use polysilicon and this can be used as a mechanical layer,as shown in Fig. 19 . This process,developed at Siemens,uses the polysilicon gate as the mechanical layer and the field oxide as the sacrificial layer.

Can polysilicon be used in microelectromechanical systems?
When polysilicon thin-film transistors are used in advanced active-matrix displays,the peripheral circuitry can be integrated into the same substrate as the pixel transistors. Recently,polysilicon has been used in the emerging field of microelectromechanical systems(MEMS),especially for microsensors and microactuators.

0; Polysilicon, also known as polycrystalline silicon or simply poly-Si, is a core material that serves as the backbone of various vital technologies that empower the ...

This compatibility also permits polysilicon to be used early in the fabrication process for trench isolation and dynamic random-access-memory (DRAM) storage capacitors. In addition to its integrated-circuit applications, polysilicon ...

Application of polysilicon capacitors

The progress in IC technology is unthinkable without the extensive use of polysilicon for a wide variety of purposes. These range from simple passive components like resistors and contacts through more complex structures such as recrystallized layers for SOI and 3D techniques, poly-Si filled isolation trenches and electrodes of DRAM capacitors to active ...

A new polysilicon process has been developed to obtain high packing density, high speed, and low-power LSIs. The new process, called the polysilicon self-aligned (PSA) method is based ...

In previous chapters we considered the properties of polysilicon that make it useful in integrated circuits. In this chapter, we want to proceed further and discuss the applications of polysilicon ...

The key idea of this work is to include the depletion effects of the polysilicon gate and bulk in that model. Several test structures based on MOS capacitors in accumulation have ...

The results presented in this work are relevant to the development of polysilicon-insulator-polysilicon structures in a range of applications, such as DRAM and EEPROM cells, double polysilicon capacitors in analog applications and to the ...

In short, capacitors have various applications in electronics and electrical systems. They are used in power supply circuits to smooth out voltage fluctuations, in ...

Metal-to-Silicided Polysilicon Capacitors. A schematic cross section of a metal-to-silicided polysilicon capacitor is shown in Fig. 8.31. ... One typical application of high-? capacitors is on-chip decoupling. In addition to the existing capacitors, dedicated capacitors are often required to further reduce the power supply noise. ...

ELSEVIER Microelectronic Engineering 36 (1997) 215-218 iii MICROELE["RONIC ENGINEERING Impact of the Polysilicon Doping Level on the Properties of the Sificon/Oxide Interface in PolysilicomCOxide/Sflicon Capacitor Structures C.Leveuglea, P.K. Hurleya, A. Mathewsona, S. Morana, E, Sheehana, A. Kalnitskyb, A.Lepertb, LBeinglassc, and M. ...

The metal-oxide-semiconductor (MOS) structure is the heart of MOS technology. When this structure, commonly referred as MOS capacitor, is connected as a two terminal device, with one electrode connected to the metal and the other electrode connected to the semiconductor, a voltage dependent capacitance results. The MOS capacitor is a very useful device both for ...

The characteristics of polysilicon resistors for CMOS ULSI applications have been investigated. Based on the presented sub-quarter micron CMOS borderless contact, both n + and p + polysilicon resistors with Ti- and Co-silicide self-aligned process are used at the ends of each resistor. A simple and useful model is proposed to analyse and calculate some important ...

Application of polysilicon capacitors

Stacked capacitors are formed using hemispherical grain (HSG) bottom electrode via seeding and anneal amorphous silicon and SixGe1-x layers. Typical ONO dielectrics are used; polysilicon and SixGe1-x are used for top electrodes. After thermal activation, C-V and I-V are measured for the capacitor characterizations. RESULTS

However, Capacitors used in high-power or high-voltage devices may also break abruptly as the dielectric materials split down and volatize. 6. Hold-up capacitor applications. With this capacitor, the charge enclosed by the capacitor usually ...

The authors describe and analyze two capacitors which are incorporated in a baseline BiCMOS technology without added process complexity. The first capacitor is formed between degenerated doped polysilicon and silicon. The second is formed between two degenerately doped polysilicon layers. In both structures, the insulator is a deposited or grown oxide. The sensitivity of the ...

U.S. Pat. No. 5,658,821 issued to Chen et al. describes a process for the formation of capacitors having a polysilicon first capacitor plate, an oxide dielectric, and a metal second...

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