

The ferroelectric (FE)-antiferroelectric (AFE) transition in  $\text{Hf}_{1-x}\text{Zr}_x\text{O}_2$  (HZO) is for the first time shown in a metal-ferroelectric-semiconductor (MFS) stack based on the III-V material InAs.

In order to realize a quantum capacitance standard, a vacuum-gap cryogenic capacitor based on a coaxial design has been developed. A tuning mechanism allows adjustment of the room temperature value of the capacitance to obtain the value of 1 pF at cryogenic temperature. ...  $\text{TiO}_3$  has a potential application as a capacitance thermometer for ...

"  $C_{eq} = 2\pi fJA^2 + B^2$ , where (3) . An effective length and surface area of electrodes of a typical chip tantalum capacitor are 1 -3 mm and  $S \sim 100 \text{ cm}^2$ , and the thickness of  $\text{Ta}_2\text{O}_5$  dielectric,  $h$ ,  $\sim 3 \sim 10 \text{ nm}$ . At room temperature, the values of the specific volume resistivity,  $\rho_v$  of  $\text{MnO}_2$  vary from  $1 \text{ Ohm}\cdot\text{cm}$  to  $10 \text{ Ohm}\cdot\text{cm}$  [4,7,8]. At these conditions the equivalent specific resistivity,

Cryogenic Power Electronics: Capacitors and Inductors. C Park 1, O Obadogbonyi 1 and L Graber 1. Published under licence by IOP Publishing Ltd ... Pamidi S and Graber L 2017 The critical electric field of gas mixtures over the extended range of cryogenic operating conditions J. Appl. Phys. 122 153301.

NP0 is the most suitable material for ceramic capacitors, while most film capacitors can work well at cryogenic temperatures. Both electrolytic and tantalum capacitors have worse performance. Metal film, thin film, and wirewound are candidates for resistors.

V. Performance of decoupling and load capacitors at cryogenic conditions. V.1. Ceramic capacitors. V.2. RC network. V.3. Tantalum and niobium capacitors. VI. Conclusions. VII. References. II. Degradation due to hot-carrier injection (HCI). The activation energy for HCI degradation is assumed to be between -0.1 and -0.2 eV [7]. For

The polypropylene and PPS capacitors showed little change in capacitance when they were cooled from room temperature to 77 K (Table 1), while the polyester and polycarbonate capacitors showed a slight decrease ( $\sim 5\sim 10\%$ ) in capacitance in the same temperature range. All of the polymer film capacitors exhibited virtually no change in capacitance under DC bias up to ...

A ferroelectric field-effect transistor (FeFET) with scaled dimensions (170 nm and 24 nm of gate width and length, respectively) and a 10 nm thick Si doped  $\text{HfO}_2$  ferroelectric in the gate oxide ...

In addition, passive components, inductors and capacitors, in general, show improved quality factors, around 100%, at cryogenic temperatures, which is advantageous for high-frequency designs 37 ...

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For these cryogenic circuits, capacitors are needed for AC biasing, filtering and AC coupling. Commercially available capacitors are not specified for operation at 77 K or 4 K, and some devices showed a dramatic decrease of capacitance at cryogenic temperature.

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