

Home > [Proceedings of Trends in Electronics and Health Informatics](#) > Conference paper

Comparative Study of Different Material Tri-Gate MOSFET with Dielectric Material

| Conference paper | First Online: 22 March 2022

| pp 409–418 | [Cite this conference paper](#)



**Proceedings of Trends in
Electronics and Health
Informatics**

Rani Kiran, [Imran Ullah Khan](#) & [Yusra Siddiqui](#)

Part of the book series: [Lecture Notes in Networks and Systems](#) ((LNNS, volume 376))

660 Accesses

Abstract

In this paper, a near investigation of the design of the TG MOSFET tri-gate metal oxide semiconductor field effect transistor device utilizes the SILVACO TCAD. SILVACO TCAD will be widely utilized for circuitual plan and authorization. Device simulator system ATLAS is utilized. ATLAS tool, utilizes a single-material-gate (SMG), a double-material-gate (DMG), and three-material-gate (TMG) tri-gate MOSFET (TGMOSFET), respectively, with hafnium dioxide HfO_2 as dielectric materials are utilized. It shows a traditional model and better DC, AC execution of the tri-material-gate design, creates a high drive flow of the three-material-gate TGMOSFET with dielectric, and shows better electrical qualities contrasted with other device structures. In this paper, all the device boundaries of single-, dual-, and tri-material-gate TGMOSFETs are determined exhaustively, and HfO_2 and SiO_2 are dielectrics. HfO_2 is utilized to expand the gate capacitance in the device, subsequently expanding the drive current. Therefore, the presentation of the device can be improved. Analyze electrical boundaries like electric field, surface potential, electronic mobility, and flow thickness with HfO_2 as a dielectric. A correlation of channel flow, transconductance, and output conductivity between these models with dielectric is contemplated.

i This is a preview of subscription content, [log in via an institution](#) to check access.

Access this chapter

Log in via an institution

Chapter EUR 29.95 eBook EUR 192.59 Softcover Book EUR 229.99
Price includes VAT (India)

Available as PDF
Read on any device
Instant download
Own it forever

[Buy Chapter](#) →

Tax calculation will be finalised at checkout

Purchases are for personal use only

[Institutional subscriptions](#) →

References