IEEE International Conference on Information, Communication, Instrumentation and Control

(ICICIC-2017)
August 17-19, 2017

Organized by

Department of Electronics Engineering & Electrical Engineering

Faculty of Engineering

MEDI-CAPS UNIVERSITY
Knowledge is Power

Technically Sponsored By:

IEEE

International Conference on Information, Communication,Instrumentation and Control
ICICIC-2017
Authore Index

Manju K. Chattopadhyay
Manoj Kumar Singh
Manoj Kumar Srivastav
Mayank Kumar Sharma
Mazin Alkathiri
Md. Imran
Mehulkumar D. Bhanderi
Minal Padlia
Monika Meena
Monika Rajput
MonikaA.Shejwal
Mukh Raj Yadav

N
Namita kure
Nandini Pillai
Nandkishor Kinhekar
Narendra Singh Dhakad
Nausheen Khilji
Navdeep Singh
Neha Maithil
Neha Singh
Nidhi gambhir
Nidhi Maheshwar
Nidhi Singh Pal
Nikhil D. Rahate
Nikita Baheti Kothari
Nilesh Parihar
Nitesh Kumar Dixit
Nitesh Kumar Soni
Nitin Jain

O
Omar A. Samereh

P
P. Abdulla
P. K. Butey
P. M. Jasmine
P. M. Raphika
P.Sandeep Reddy
P.V.N. Prasad
Pallavi Khatri
Pankaj Chouvisiya
Pankaj Naik
Pasham Shilpa
Pawan Kumar Inaniya
Pooja Meena
PRABHAT PATEL
Prabhat Sharma
Prabin K. Padhy
Pradeep Purey
Pradipta Kumar Das
Prafulla Kumar
Prajapati Barkha
Prakash Dwivedi
Prashant M. Chavan
Pratibha Sharma
Pravin R Nerkar
Preeti
PREMLATA JENA
Pritesh Gethewale
Prithviraj Singh Chauhan
Priya Sharma
Priya Tathawade
Priyambiga Rajamanickam
Priyanka Atre
Priyanka Goyal
Priyvrat Vtas
Puja Singh
Pushpa Bhatiya
Pushpendra Singh

Q
Querie Shakhiya

R
R. L. Sonlikar
R. P. Chaudhari
R.C. Gurjar
R.P. Yadav
R.S. Meena
Rabindra Nath Mahanty
Radha Pimpale
Radha Senthilkumar
Rahesha.Y Mulla
Rahul Agrawal
Rahul Kumar
Rahul R. Papalkar
Rahul Tiwari
Rajat B. Urade
Rajeev Gupta
Rajendra Fagna
Rajesh Kumar Vishwakarma
Rajesh M. Bodade
Rajiv Dey
Rakesh Saxena
Raksha Upadhayay
Ramanuja Vinayak
Ramesh Kumar Tripathi
Ranbeer Tyagi
Ranu Shukla
Ravi Kumar
Ravindra Singh Chauhan
Rekha Jain
Rishi Prakash,
ROHAN KUMAR GUPTA
Rohit Mondal
Roop Singh
Rovin Tiwari
Ruchi Sharma
Rupali Bhartiya
Rutuja Takale

S
S C Choube
S Narayanan
S. K. Jain
S. V. Athawale
S.C. Mittal
S.D.Bharkad
S.K. Jain
S.Meenakshi
S.R. Kapoor
Sachin K. Jain
Saloni Alwani
Samiksha Dubey
Samridhi Sajwan
Sandeep Kumar Yadav
Sandeep Pandey
Sandeep Sharma
Sandhya Rani Ganipalli,
Sangita Patil
Sanjay Bansal
Sanjay Chouhan
Sanjay Kumar Sharma
Sanjay Tanwani
Sanjeev Kumar
Sanjeev Yadav
Sanjiv K Jain
Sanju Kaler
Sanjyot Godase
Santosh Meena
Santosh S. Raghuwanshi
Sarfaraz Nawaz
Sarita Kansal
Saroj Ratnoo
Saurabh Chanana
Savitanandan Patidar
Seema Agrawal
Shahnawaj
Shashi Prakash
Shazma Khan
SHEPHALI SINGH
Shraddha Masih
Shraddha Rathore
Shrence Sharma
Shreshtha Agrawal
Shruti Khatri
Shruti Shrivastava
Shubham Atre
Shubham Chouhan
Shubham Sharma
Shweta Nagar
Sini Shibu
Somya Jain
Sonali Singh
Soumallya Chatterjee
Soumen Santra
Soumya Pani
Srinivas Nallagonda
Sukeshni Tirkey
Sukriti Solanki
Sunita Chahar
Sunita Prasad
Supriya Kelkar
Surabhi Agrawal
Sushil K. Surwase
Swapnajeet Nayak
Swastika Vats
Swati Arora

T
T. K. Rekha
T.Abhiram
Tanisha Gupta,
Tapsi Gupta
Tarannum Khan
Tarun Gupta
Tilakdhari Singh

Tripti Gupta
Trupti Wagh

U

Ujjwal Pathak
Uma K. Thakur
Umang Gupta

V

Vaibhav Kant Singh
Vaibhav Neema
Varsha Sharma
Varun Bajaj
Vebhav Tiwari
Vidhya Fulmali,
Vijay Laxmi kalyani
Vijay nath
Vikas Khare
Vineet Kumar
Vipul Tiwari
Vivek Shrivastava
Vrinda Tokekar

Y

Y Rakesh kumar
Y Vijaya Lata
Y.K.Vijay
Yash Pal
Yatindra Gopal
Yoges Payasi
Yogesh Kherajani
Yogesh Kumar Nagar

IEEE, International Conference on Information, Communication, Instrumentation and Control (ICICIC – 2017)

Metal Metalloid Thin Film For The Application of Field Effect Transistor

Swati Arora
Swami Keshvanand Institute of Technology, M&G
Vivekananda Global University, Jaipur, India
aroraswati14@gmail.com

Hemlata Panwar
Swami Keshvanand Institute of Technology, M&G
Jaipur,India

Y.K.Vijay
Vivekananda Global University, Jaipur, India
Jaipur, India
vijayyk@gmail.com

Abstract—**Metal Selenium thin film prepared as Metal Semiconductor Field Effect Thin film Transistor. Metal (Al/Cu) contact and metalloid (Se) channel used as a Field Effect Transistor on glass substrate by depositing the source, drain and top-gate Al/Cu contact. Metal gate is used to control flow of charge from source to drain. By varying the width of depletion layer channel has controlled using metal contact which modulates the thickness of conducting channel which causes flow of current between source and drain. The source and drain of the FET structure were defined by the metal layers Cu were sequentially deposited on the Se in the defined contact patterns by thermal evaporation technique at pressure of 10^{-5} torr using vacuum coating unit. Its electrical and structural properties were characterized. This device is used to control the flow of current by changeable potential applied between gate and source (V_{GS}), and free charge accumulation has induced at semiconductor interface.**

Keywords—Metal Semiconductor Field Effect, Thermal evaporation, schottky metal gate Introduction

I INTRODUCTION

III-VI group semiconductors made heterostructures promising Optoelectronic properties due to their close lattice matching [1,20] films are studied for their structural, optical and electrical properties [3,16]. thin-film transistor (TFT) is a field-effect transistor which has made by thin films deposition of semiconductor and dielectric layers using metallic contacts [2,13].Glass is used as a common substrate, due to its prime application in displays [3]. The leakage current as a result of thermionic field emission between gate and the channel limits the performance of these devices [4]. Selenium is a metalloid it has some characteristics of metal & some characteristics of non metal so it is also called as semiconductor. dissimilar metal-semiconductor-metal ratios results by evaporation of after heating in a vacuum chamber, resting on the confidence of size of crystallite, orientation preferential, unevenness, have been studied, In metal semiconductor interface gate made by metal forms a schottky barrier will be formed [5,21]. The free electrons are able to cross the depletion region with effect of energy source from one side to other. Source and drain are directly connected to semiconductor, determine transistor dimensions. Aluminum is used as contact material in IC's exhibits good corrosion resistance. As voltage which has applied to gate electrode bulk charge is involved with electric field applied which structure conducting channel. Glass plate is used as a substrate on which active layer is grown to make it partially insulating substrate. The higher transit frequency of the FET has common application in microwave circuits [6].

II. EXPERIMENTAL

The samples had equipped by thermal evaporation at a pressure of 10^{-5} torr. High purity of Aluminium sheet and Copper about 99×999% pure, and selenium Powder purchased from Koch-Light laboratories LTD, colnbrook Berks England [7, 18]. The properly cleaned glass substrate of 1x1 cm2 dimension, substrate cleaning is done using soap solution and keeps it in hot chromic acid and then cleaning done by deionized water then rinse in acetone, were placed in the holder situated above the tungsten boat which carrying materials. After reaching the high vacuum (10^{-5}torr) in the chamber the metal and Se heated by transient the current slowly to the electrodes [5,6].Selenium having thicknesses 1000 Å was first evaporated and later metal of constant thickness (500 Å) deposited over these films to get metal–Se bilayer structure. Thickness of the material on substrate was controlled using quartz crystal monitor ("Hind Hivac" Digital Thickness Monitor Model–DTM–101) [19, 22]. Metal having thicknesses 500 Å were again evaporated at high pressure and deposited on bilayer structure to form a Trilayer metal gate contact for thin film structure. The total thickness of the Metal-Se-Metal thin film is about 200 nm and the thickness of a single layer is 50 nm/100 nm/50 nm.

III RESULTS AND DISCUSSION

A. Electrical properties

We observed that the fabricated FET is gives the increase of the drain current at negative gate voltages of a MESFET (between 0 V to -10 V) and which has compared to quadratic expression

$$I_{D,sat} = \mu_n \frac{\varepsilon}{} \frac{W}{L} \frac{(V_G - V_T)^2}{2}$$

Where w is the width of depletion layer in channel layer [7]. The quadratic expression given as

$$V_G = \mathbb{0}_1 \text{ for } w = 3d/8$$