



"Manufacturing process for high 2DEG density heterostructure based on Zinc Oxide "

"Seeking industrial partners for co-development, production and marketing"

Preface

- World is facing unprecedented chip shortage.
- The automobile industry will lose \$210 billion in revenue because of the lack of computer chips, according to one recent report. Game console makers have missed targets. Even the seemingly unstoppable smartphone manufacturers are facing slowdowns.
- With intent to position India as global hub for Electronic System Design and Manufacturing, Union Cabinet has approved a program with an outlay of Rs.76,000 crore (>10 billion USD).
- The programme aims to provide attractive incentive support to companies / consortia that are engaged in Silicon Semiconductor Fabs, Display Fabs, Compound Semiconductors / Silicon Photonics / Sensors (including MEMS) Fabs, Semiconductor Packaging (ATMP / OSAT), Semiconductor Design.
- **Its high time to invest in semiconductor fabrication and we have an efficient fabrication technology available for licensing on flexible terms.**

Market Size & Growth Projection

- The Global market for high electron mobility transistor is forecast to reach \$2.8 billion by 2026, growing at a CAGR of 15.2% from 2021 to 2026. [High Electron Mobility Transistor Market 2021 - 2026 (industryarc.com)]
- Recently announced Performance Linked Incentives by the Government of India will catalyze electronic manufacturing and increase demand of high performance semiconductor material.
- Impetus on indigenous military materials under DAP 2020 will enable preferential procurement by defence forces.
- Recent chip crunch has led many electronic companies to expand their manufacturing capabilities.

Competition

Patented process has competitive edge in terms of cost, ease of implementation, and product quality making it an ideal choice for manufacturing enhanced performance high electron mobility transistors (HEMT) devices.

The Technology

An enhanced dual ion beam sputtering (DIBS) deposition method for fabrication of bilayer heterostructure based on zinc oxide.

Innovator

Indian Institute of Technology Indore

Value Proposition

- Fabricates high 2DEG density ZnO heterostructure
- Better compositional stoichiometry and uniformity
- Improved sheet resistance and 2DEG mobility
- Better adhesion on the substrate
- Economic, simple, reliable and repeatable process
- Suitable for larger area fabrication

Industrial Utility

- Advantageously suitable for Zinc Oxide based HEMT devices
- Radio astronomy
- Remote sensing
- Imaging
- Telecommunications (5G network)
- Signal amplifiers, power amplifiers & oscillators
- Direct broadcast receivers – DBS
- RADAR (Radio Detection and Ranging System)

Intellectual Property

- *Granted patent in India*

Development Status

- *Proof of concept established through extensive experimentation.*

On Offer

- *Right to use and have used the process*
- *Right to manufacture, use, import, export, sell, and offer to sale the product obtained from the process*

Technical Support

- *Optional Technical Consultancy on payment basis*

Contact us at: reema.fitt@gmail.com

i-TTO, a regional tech transfer office established at FITT with support from NBM, BIRAC



07 January, 2022