

# Development of signal and channel models, circuits, and antennas for next generation wireless systems with emphasis on vehicular communication

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**Funding Agency – MeitY (AA: No. 13(32)/2020-CC&BT Dated 15.01.2021)**

**Amount Sanctioned : 476.96 Lakhs**

## Approved Objectives:

Design and implementation of mm-wave transceiver having the following sub modules

Low Noise Amplifier, Mixer, Oscillator,  
Power Amplifier, Broadband IF stage

Characterization of above circuits in the wired configuration.

## Deliverables

1<sup>st</sup> Year : Design of PA, Receiver at 39GHz

2<sup>nd</sup> Year: Fabrication and Testing of **first chip** and design of transceiver

3<sup>rd</sup> Year: Fabrication and Testing of the transceiver

At present the designs of power amplifier and LNA are being carried out  
First tape out is planned on January 2022.

In addition, the team is carrying out investigations on OTFS modulation, V2X communication, Antenna design, Channel modelling employing Deep Learning. The outcome of these research activities will be published as research papers.

To best of our knowledge, this would be the first attempt in India to design such circuits at 39GHz band. This project is primarily for capacity building and will train manpower in different areas.

