
This Thesis is
Dedicated to
My Beloved Mother

Late Asha Rani Baghel

Certificate

This is to certify that the thesis titled *Study and Implementation of Millimeter Wave Antennas and Array using Substrate Integrated Coaxial Line (SICL) Technology*, submitted by *Naman Baghel (P17EE005)* to the Indian Institute of Technology Jodhpur for the award of the degree of *Doctor of Philosophy*, is a bonafide record of the research work done by him under my supervision. To the best of my knowledge, the contents of this report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

Soumava Mukherjee

Dr. Soumava Mukherjee
Ph.D. Thesis Supervisor

Declaration

I hereby declare that the work presented in this thesis entitled *Study and Implementation of Millimeter Wave Antennas and Array using Substrate Integrated Coaxial Line (SICL) Technology* submitted to the Indian Institute of Technology Jodhpur in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy, is a bonafide record of the research work carried out under the supervision of Dr. Soumava Mukerjee. The contents of this thesis in full or in parts, have not been submitted to, and will not be submitted by me to, any other Institute or University in India or abroad for the award of any degree or diploma.



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Abbreviation

5G	Fifth Generation
AMPS	Advanced Mobile Phone System
CPW	Coplanar Waveguide
CBSA	Cavity Backed Slot Antenna
CDMA	Code Division Multiple Access
CP	Circular Polarization
DGS	Defected Grounded Structure
DL	Down Link
FCC	Federal Communications Commission
FDA	Full Duplex Array
FTBR	Front-to-Back Ratio
GSM	Global System for Mobile Communication
GCPW	Grounded Coplanar Waveguide
HD	High Definition
HFSS	High Frequency Structural Simulator
HMSICL	Half Mode Substrate Integrated Coaxial Line
HMSIW	Half Mode Substrate Integrated Waveguide
IMT	International Mobile Telecommunications
IoT	internet of Things
LP	Linear Polarization
SICL	Substrate Integrated Coaxial Line
SIW	Substrate Integrated Waveguide
SMA	Sub-miniature Version A
SMS	Short Message Service
SPDT	Single Pole Double Throw
STAR	Simultaneous Transmission and Reception
MIMO	Multiple-Input Multiple-Output
mm	millimeter
NR	New Radio
PCB	Printed Circuit Board
PTH	Plated Through Hole
LTE	Long Term Evolution
TE	Transverse Electric
TM	Transverse Magnetic
TEM	Transverse Electromagnetic
UL	Up Link
UMTS	Universal Mobile Telecommunication Systems
xG	Next Generation

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