

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“Jnana Sangama” Belagavi – 590 018



**PROJECT REPORT ON
“ DESIGN, SIMULATION AND CHARACTERIZATION
OF LOW FREQUENCY CANTILEVER BEAM ”**

Submitted in partial fulfillment of the requirements for the award of degree

**BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING**

Submitted By

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ALVA'S
Education Foundation

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

MOODBIDRI – 574 225.

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ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

MOODBIDRI – 574 225

(Affiliated to VTU, BELAGAVI)

A+, Accredited by NAAC & NBA (ECE & CSE)

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the project work entitled "DESIGN, SIMULATION AND CHARACTERIZATION OF LOW FREQUENCY CANTILEVER BEAM" is a bona fide work carried out by

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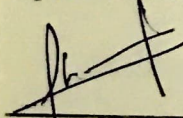
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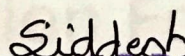
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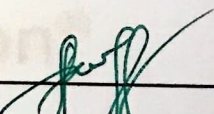
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in partial fulfillment for the award of BACHELOR OF ENGINEERING in ELECTRONICS & COMMUNICATION ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2022–2023. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of the Project work prescribed for the Bachelor of Engineering Degree.


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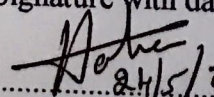

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ABSTRACT

Piezo electric properties which are suitable for design and fabrication of low frequency applications. Multiple piezoelectric materials are available for the design of low frequency cantilever beam among them some of are here like, ceramic, lead zirconate titanate, composite material, barium titanate, quartz, pvdf, lithium niobate, lithium tantalate, zinc oxide, piezoelectric ceramics, among this here we compared two piezo electric materials they are P(VDF-TrFE) and copolymer such as ZnO and BaTiO₃. This process has been done through annealing and sonication. Initial process begin with simulation which includes calculation of eigen frequency of an compared elements, further the characterization of an BaTiO₃ and ZnO will be done by FTIR spectroscopy, XRD analysis and tensile strength.

Piezoelectric materials are the materials that may produce electric energy upon application of mechanical stress. The mechanical and piezoelectric properties vary among these distinct piezoelectric materials. ZnO and BaTiO₃ can be used in low frequency applications such as energy harvesting, cantilever beams, acoustic applications and so on. Cantilevered beams are the most ubiquitous structures in the field of microelectromechanical systems (MEMS).