



# **SNS COLLEGE OF TECHNOLOGY**

**Department of Electronics and Communication Engineering**

**COURSE NAME : 16EC402-MICROWAVE AND OPTICAL  
ENGINEERING**

## **Unit 1-MICROWAVE ACTIVE DEVICES Topic-GUNN DIODE**

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# Guess the Topic????





# CONTENTS

- ❖ **Introduction of Gunn Diode**
- ❖ **Symbol and construction of Gunn Diode**
- ❖ **Working of Gunn diode.**
- ❖ **Equivalent circuit of Gunn diode**
- ❖ **Characteristics of Gunn diode**
- ❖ **Applications**
- ❖ **Assessment**
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# GUNN DIODE-INTRODUCTION



**Also known as  
transferred electron  
device**

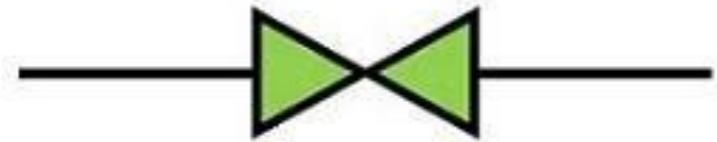




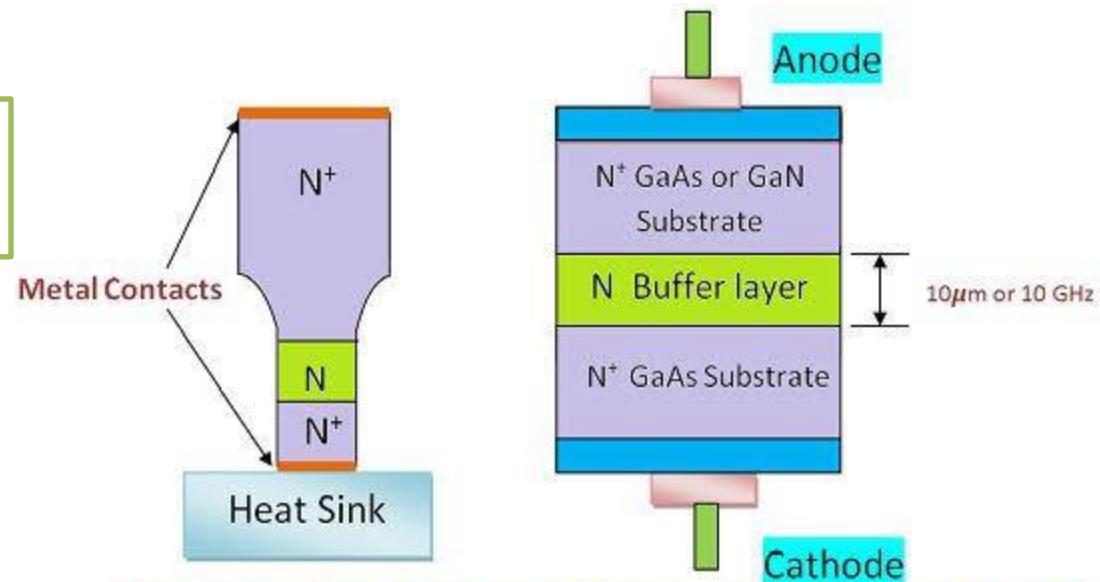
# GUNN DIODE-SYMBOL & CONSTRUCTION

Two terminal semiconductor electronic component

Works on the principal of Gunn Effect



Symbol of Gunn Diode



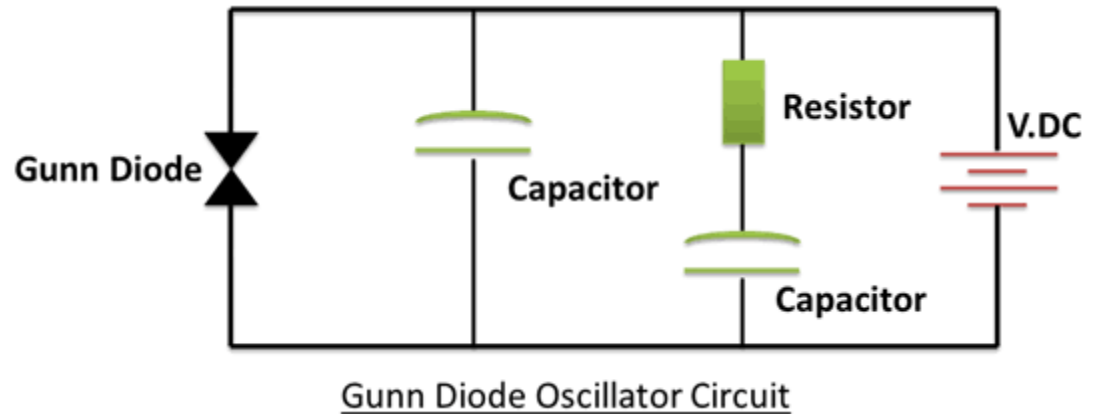
Construction of Gunn Diode

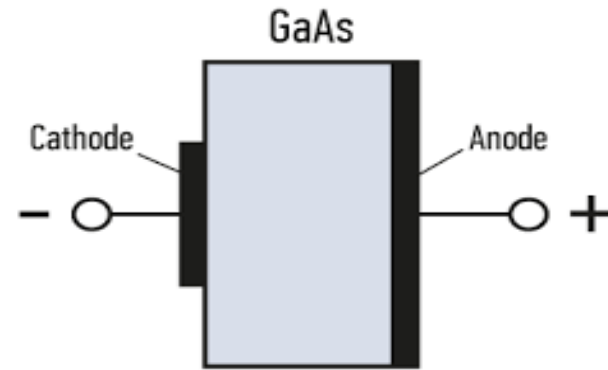


# GUNN DIODE-WORKING PRINCIPLE



It consists of only N-doped semiconductor

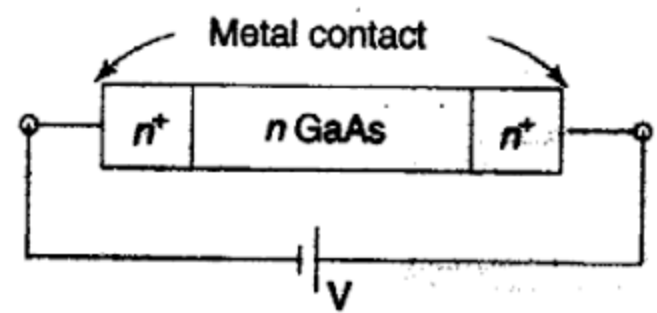
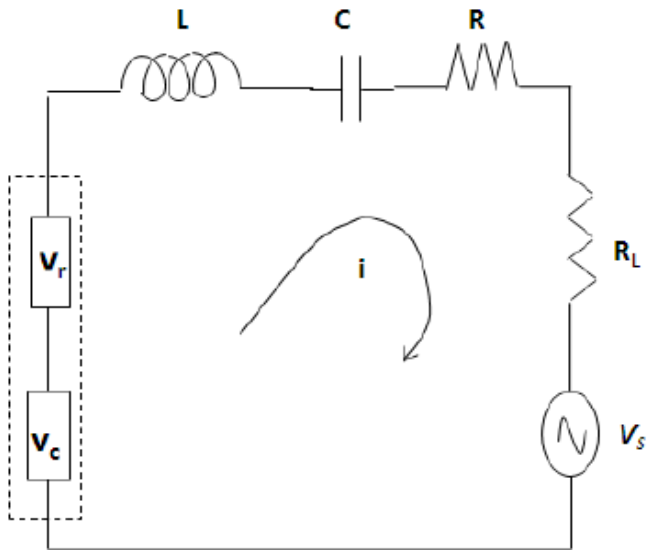




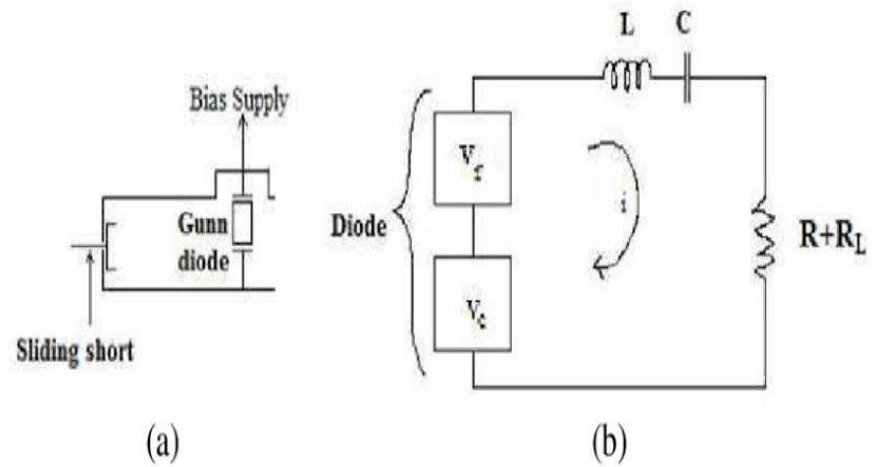
**There exist three regions, two of those are heavily N doped on each terminal with a thin layer of lightly n doped material**



# GUNN DIODE-EQUIVALENT CIRCUIT



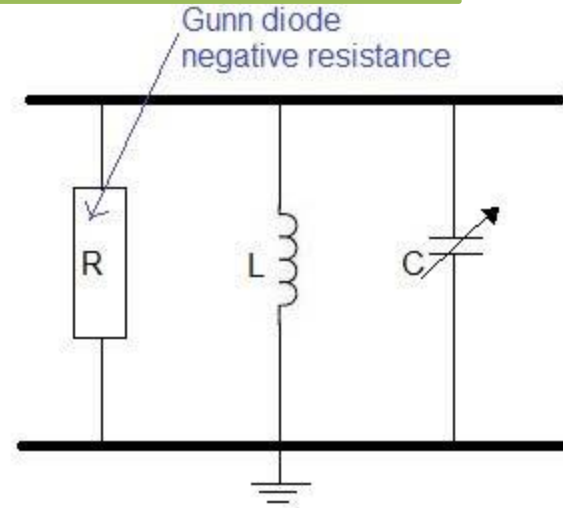
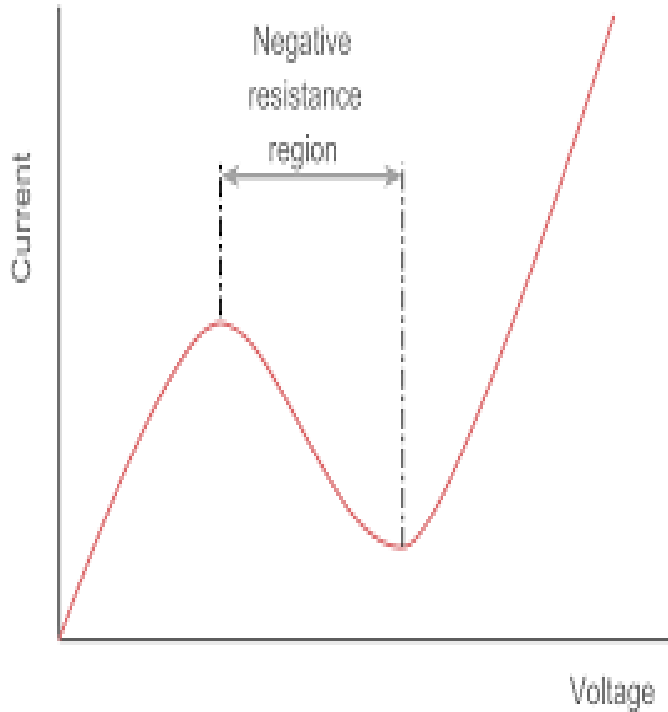
## Equivalent circuit







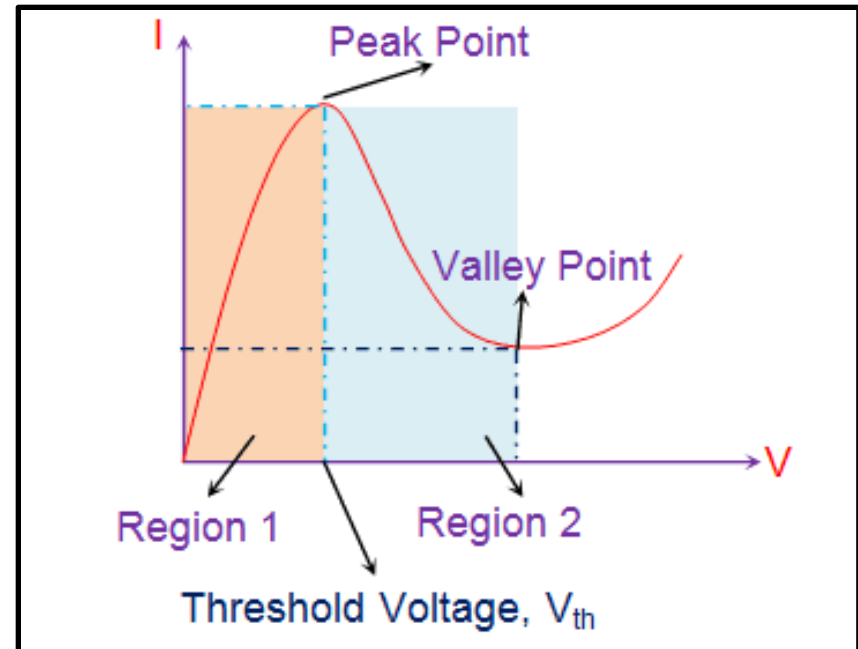
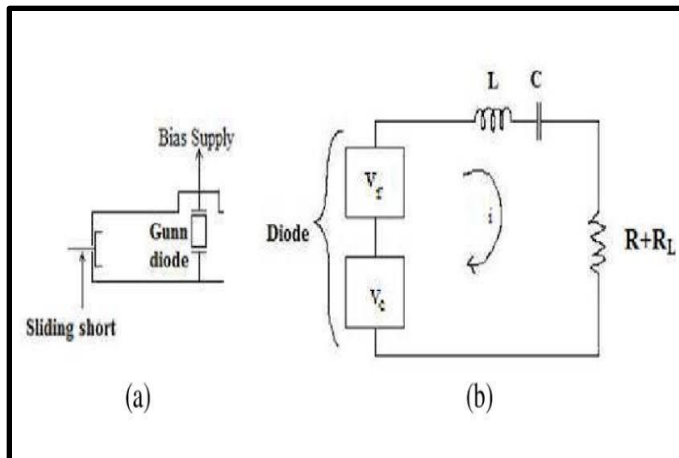
# GUNN DIODE-CHARACTERISTICS



**Gunn Diode exhibits negative resistance**



Used to build oscillators for generating microwaves with frequency ranging from 10GHz to THz





## APPLICATIONS



- Gunn's are used for amplification and oscillation.
- These are used as a sensor in the Collision avoidance radar systems in electronic communication.
- These are used in Vehicle ABS system.
- They are used as Traffic analyzer sensors



## ASSESSMENT TIME



**Is Gunn Diode a PN junction Diode?**

**Ans: A Gunn diode does not contain a pn junction yet it is termed as diode due to the two terminals of the externally applied dc voltage.**

**It possesses negative resistance characteristic due to which these are widely used in high-frequency applications.**



# REFERENCES

1. [www.electrical4u.com/gunn-diode/](http://www.electrical4u.com/gunn-diode/)
2. <https://www.electrical4u.com/gunn-diode>
3. <https://electronicsdesk.com/gunn-diode.html>

**THANK YOU**