# Four Layer P-N-P-N Switching Devices (Uni Junction Transistor)

## Lecture – 1

TDC PART – II
Paper - III (Group - A)
Chapter - 4


by:

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TDC PART – II

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Chapter - 4

- (Uni Junction Transistor)
- Lecture Content :-
  - Introduction of UJT
  - What is UJT? In Summary

# Introduction of UJT

- Recent interest in the **Uni-juction Transistor (UJT)** has, like that for the SCR, been increasing at an exponential rate. Although **first introduced in 1948,** the device did not become **commercially available until 1952.** The **low cost per unit** combined with the **excellent characteristics** of the device have warranted its use in a **wide variety of applications.**

- A few include **Oscillators, Trigger Circuits, Saw-tooth Generators, Phase-Control, Timing Circuits, Bi-stable Networks and Voltage or Current Regulated Power Supplies.** The fact that this device is, in general a **low power absorbing device** under **normal operating conditions** is a tremendous aid in the continual effort to design relatively **efficient system.**

- The **Uni Junction Transistor** or **UJT** in short, is another **Solid State Three Terminal Device** that exhibits **Negative Resistance** and **Switching Characteristics** for use as a **Relaxation Oscillator** and in **Phase Control Applications.** Basically, it is a **Three-Terminal Silicon Diode.** As its name indicates, it has only one **P-N Junction.**

- Like **Diodes, Uni Junction Transistors** are constructed from separate **P-type** and **N-type Semiconductor Materials** forming a single **(hence its name Uni-Junction) P-N Junction** within the main conducting **N-type channel** of the device. It differs from an ordinary diode in that it has **Three Leads** and it differs from a **FET** and **BJT** in that it has **no ability to Amplify.**

- Although the **Uni Junction Transistor** has the **name of a Transistor**, its **Switching Characteristics** are very different from those of a conventional **Bipolar or Field Effect Transistor** as it can not be used to amplify a signal but instead it is used as a **ON-OFF Switching Transistor.**

- However, it has the ability **to Control a Large AC Power with a Small Signal. UJT's** have **Unidirectional Conductivity** and it is also exhibits a **Negative Resistance Characteristic** which makes it **useful as an Oscillator.**

## What is UJT? In Summary:-

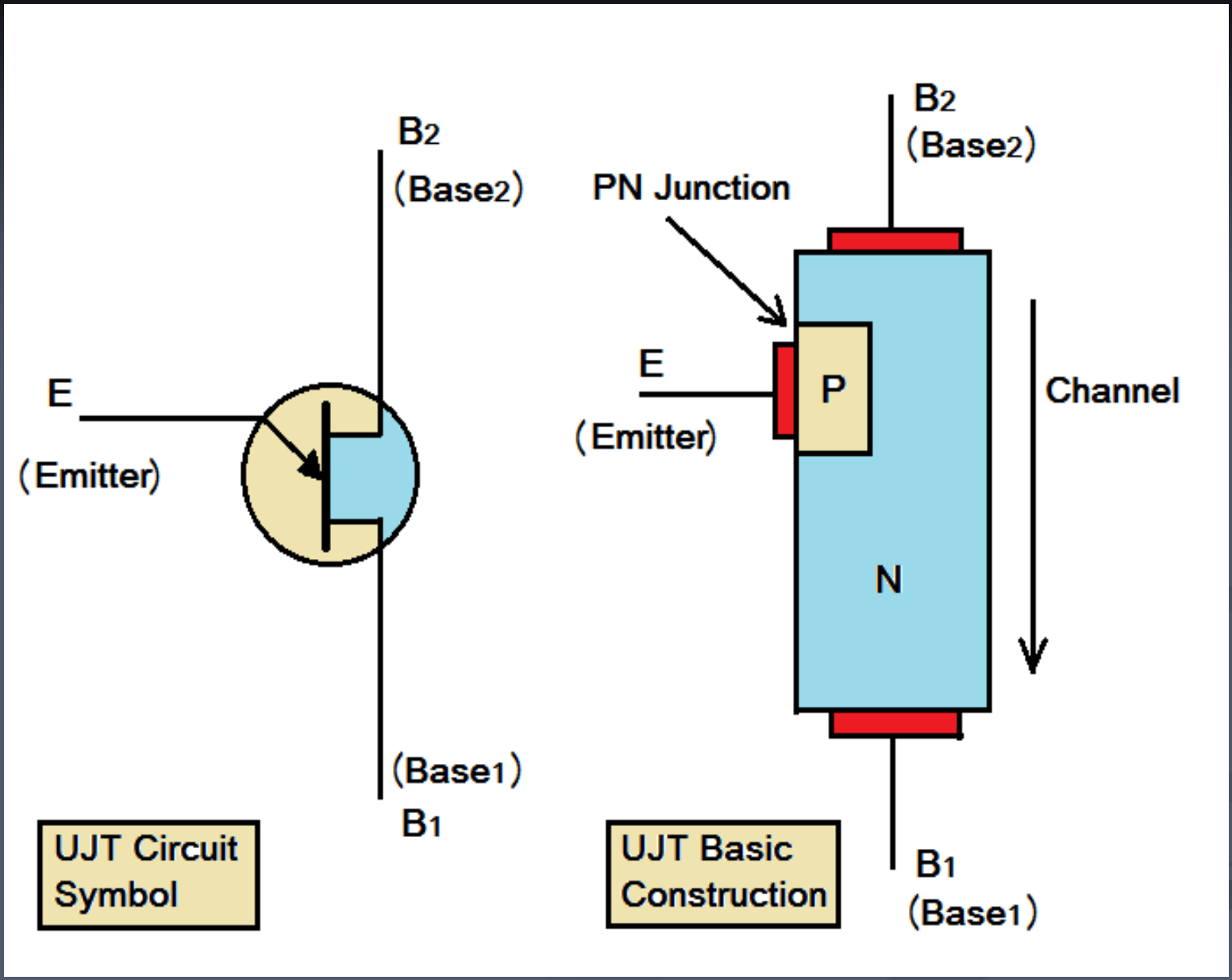
- The device has only **One Junction**, so it is called the **Uni Junction Device.**

- A **Uni Junction Transistor** is a **Three Terminal Semiconductor Device** having only one **P-N Junction** like **Diode** but has **Three Terminals.**

- This device has a unique characteristics that when it is **triggered,** the **Emitter Current increases Regeneratively** until is limited by **Emitter Power Supply.**

- **UJT** does not have ability to **Amplify** but it has the ability to **Control a Large AC Power** with a **Small Signal.** It exhibits a **Negative Resistance Characteristic** and so it can be employed as an **Oscillator**.

- The **Uni Junction Transistor** can be employed in a variety of applications like **Switching Pulse Generator, Saw Tooth Generator, Relaxation Oscillator, Sine wave Generator, Timing and Trigger Circuits, Pulse Generation, Phase Control, Switching** etc. The **Circuit Symbol of UJT** and its **Basic Construction** is shown in below **Figure (1).**




- **Fig (1) Shown UJT** Circuit Symbol and Its Basic Construction

to be continued .....