**Stage One**

In this stage the main target is to get a high voltage amplitude of the signal such that it can pass through the push-pull part. For this we used a BC 547 Transistor model in CE configuration as it is the most simple and suitable method for high frequencies. Among other transistors this model shows more capabilities for this task. BC 547 has,

* Considerably high hFE (DC Current Gain)
* High Gain Bandwidth product
* Stable hFE with collector current (up to 100mA) and temperature.
* Fast switching / fast responding time

In this step we mainly focused on VCE to be placed at 6V in order to get the full swing of the voltage.

Since absolute maximum rated VEBO is 6V we decided to bias the base around 2.5V, therefore we selected base resistors as RB1 = 10k and RB2 = 2.8k such that VB = 2.625V. (Assuming that IB current is negligible).

Since the typical value of VBE is given as 0.7V,

According to the datasheet maximum Collector current that hFE steady is 100mA. BETAHOYALALIYANADA. Therefore, we selected RE such that IC to be lower than 30mA. Hence,

Next, we selected which makes IC  ≈ 27.5mA .

By deriving the DC load line,

Since our target was , by substituting above values we get

However, after implementing the protoboard, we had to change values in order to get a clear output waveform.

**Stage Two**

The purpose of this stage is to get a sufficient power amplification to drive the 8 load without any distortions. This is an AB Push Pull amplifier one of the most suitable methods for power amplification. After doing some research about power amplifiers, we found that TIP 31C/TIP 32C transistor models are good enough for our task.

* TIP 31C/TIP 32C has stable DC current gain (hFE) up to collector current = 10A.
* Tolerable for higher temperatures