

# 2 Stage RC Coupled Amplifier using BJT

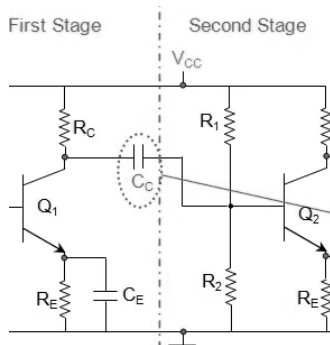
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**Abstract**— A Resistance Capacitance coupled amplifier is basically a multi stage amplifier circuit used in RF and Optical Communications. Whenever large amplification needs with good impedance matching is required using active devices called Transistors usually it will not up to mark with the single stage for amplification to get desired. So we go for Multi stage amplifier which is perfect where output is in front of coupled to input follows. As there are many coupling types employed in electronics circuits in that RC Coupling is popularly used coupling because it provides excellent accuracy over a wide range of frequency. It is usually employed for communication sectors.

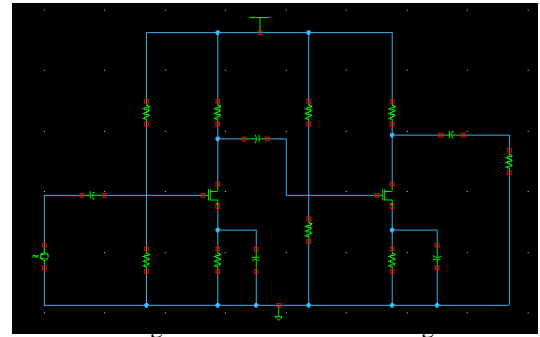
## Reference Circuit details

This circuit is an RC coupled which produce a phase shift of  $360^\circ$  out-of-phase with respect to the input, which in turn indicates that the phase of the input signal and the phase of the output signal obtained at stage II will be identical. The 2 stage RC coupled amplifier consists of 2 transistors which are identical and a common power supply is used as shown in the circuit RC is the collector load resistance resistors are one hour 2 and re provided as required bias the bypass capacitor prevents the loss of amplification due to negative feedback the output of the first stage gets coupled to the input of the second stage via coupling capacitor  $C_c$  which also serves as blocking capacitor to keep the DC component of the output of the first stage from reaching the input of the second stage and to pass AC component and the amplified output appears across its collectors load the first stage across RC is given to the base of second stage transistor through a coupling capacitor  $C_c$  the signal at the base of transistor 2 is further amplified and its face gets reversed hence the output signal is twice the amplified replica of input signal.



Coming to the mid frequency range the gain will be constant because of the coupling and bypass capacitors act as good short circuits. Also if frequency increases, the reactance of  $C_c$  decreases which leads the increase in gain if not compensated by the fact that the reduction in reactance leads to an increase in the loading effect. Due to this reason, the gain of the amplifier remains uniform/constant throughout the mid-frequency band.

## Reference Circuit Design



## Output Waveform

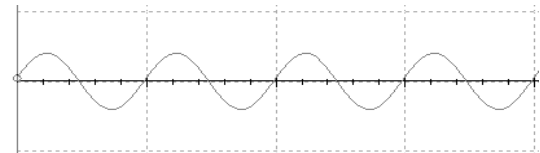


Figure 2: Reference waveform

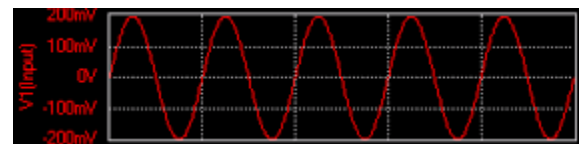


Figure 3: Output Reference waveform

## References

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