



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

23ECB202 – LINEAR INTEGRATED CIRCUITS

II YEAR/ III SEMESTER

UNIT 1 – OP AMP CHARACTERISTICS

TOPIC 1- 6 AC characteristics of Op Amp

2/12/2025



AC Characteristics

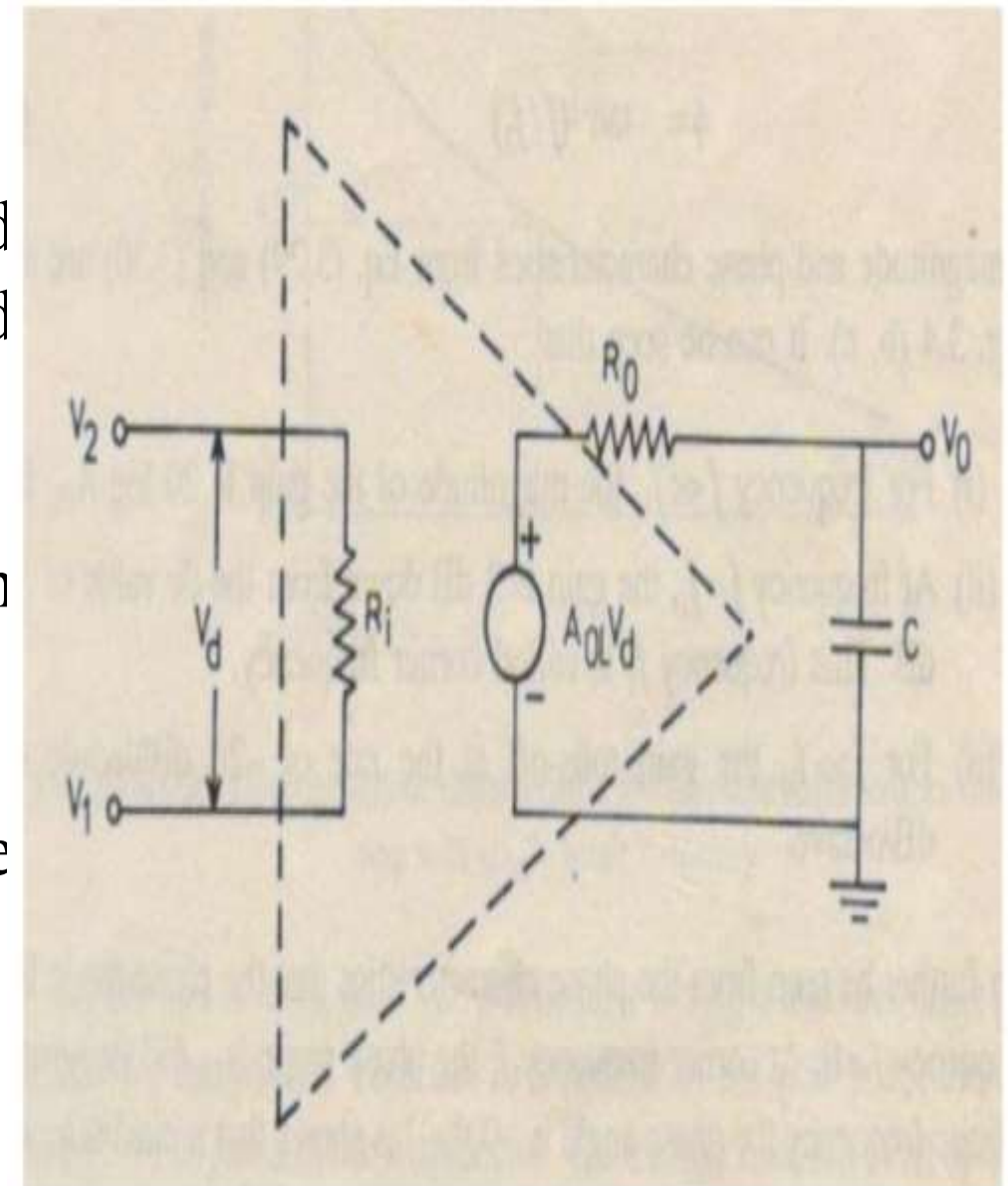
- Purpose of this circuit is to amplify a small **AC** input signal, such as an audio or radio frequency signal
- A small **AC** voltage is applied to the input, through a coupling capacitor
- Hence, such a circuit is useful only as an **AC amplifier**
- To amplify DC signals separate operational **amplifier** circuit is used
- For small signal sinusoidal applications the AC characteristics are
 1. Frequency response.
 2. Slew rate



Frequency response



- An ideal op-amp has infinite band width
- Its open loop gain is 90dB with d.c.signal and this gain should remain the same through audio and radio frequency
- But practically op-amp gain decreases at high frequency
- This is due to a capacitive component in the equivalent circuit of op-amp.



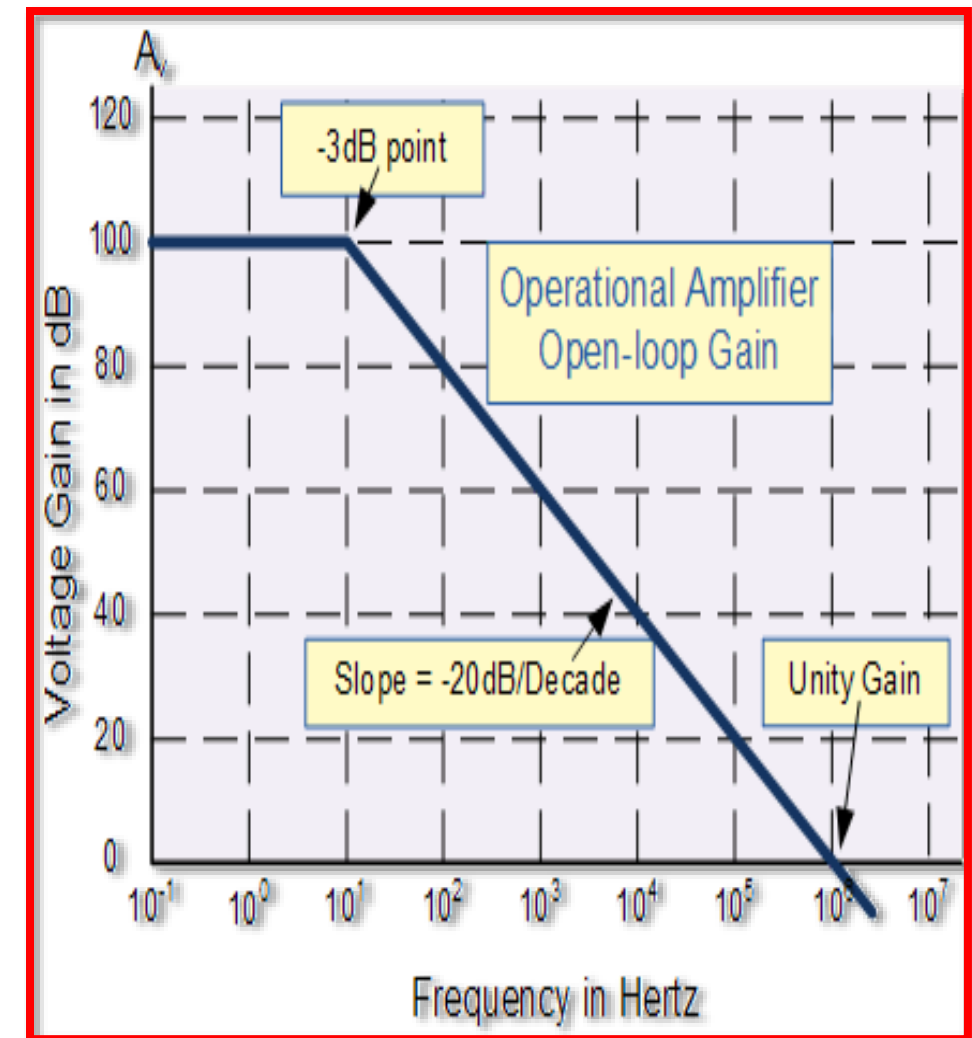
HIGH FREQUENCY MODEL OF OPAMP



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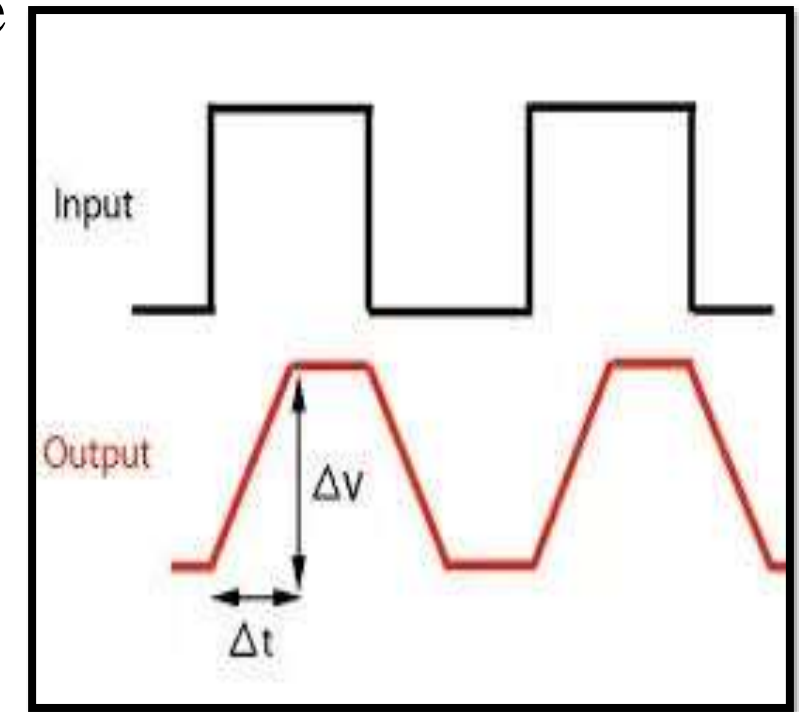
Slew rate



- The slew rate is defined as the maximum rate of change of output voltage caused by a step input voltage.,

Specified in $V/\mu s$

eg : 1V/micro sec. slew rate denotes the output rises or falls by 1 volts in 1 micro seconds



- The rate at which the voltage across the capacitor dV_c/dt is given by

$$dV_c/dt = I/C, \text{ Slew rate } SR \ dV_c/dt|_{\max} = I_{\max}/C$$

- For IC741, $I_{\max} = 15$ micro amps, $C = 30$ Pico farad

$$\text{Slew rate} = 0.5V/\text{micro sec}$$



THANK YOU