PH 211

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POUL NO: - 22022 - 2 20121072

Experiment Name - (CE) Single Stage Homplifier.

Experiment No:-1

Date -07/08/23.

PH-211

Experiment 1: lingle stage Amplifica

Objective: To observe the operating characteristics of the common emitter (CE) configuration and to leave how it can be used for small signal amplification

· To determine voltage gain of amplifier

· To find out the clipping voltages for positive and regative polarity peaks of the output signal.

· To study the proguency response to calculate bandwidth for sinusoidal wave.

· To compare the input and output frequency spectrum.

Formulae:

DC Equipalent Gravit and Analysis (i) Voltage Gain Av=

Av (theoritical) = MRc
Re

Av (in decibels) = 20 $\log_{10} \left(\frac{V_{\text{out}}(\rho-\rho)}{V_{\text{in}}(\rho-\rho)} \right)$

Voul (P-P) = Output voltage (reak to peak).

Vin(p-p) - Input voltage (peak to peak).

Bandwidth = (f2-f1) Hz

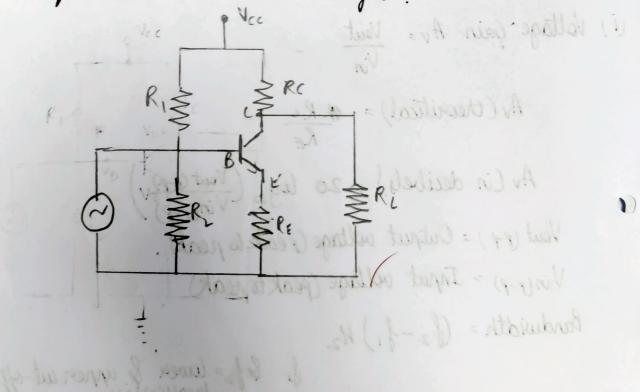
& 12 = lawer & upper ent-off frequencies. IE = IB+IC

d=Ic B= Ic IB

IE = Emitter awarent Ic = Bose Current.

General Genuils PH-211 Expressioner 221 = 15V or stage Amphilia Objective: To observe the greating characteristics of the common amutic (CE) while weather and to leasur nuitas jupas long is RE470K 10 100 RE204,74 work C=224F } C=224F Vin-zamulzanv.) | 8 innaza | luf errut and outrut " Je comme of "

D (Equivalent Circuit and Analysis



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Expected Waveform: Olympolism: Void 1 Allicop. Output Voltag No. of Propoency In Pairel (m) (m) 1 0. N 50.258 OH 1. P 2 9.10 04 41-1 31.82 0 t:21 3] 13.1 t=0 32-67 -V32-77 04 1.14 32.6 044 35-1 35.87 1.82 33.16 1.85 V 31.8/ 0 4 SI 0.4 03 55-77 1.74 03) 32.67 172 43 15 0.4 32.56 MISS 05.1 0.4 0.000 00.1 0. 51 30.88 3750 04-1 004 12.62 04 5.90 10.0 34.83 34 808.0 0001 26.32 59.0 5000 1500

Observation:

No. of	Frequency (KHZ)	I yout Voltage	Output Voltage	Voltage	gain(Ay
	(2)	(Vin) (mr)	(Vow) in V		In Decidel
John		40	0.842	21-20	
2	2_	40	1-14	28.5	29.10
3	5	40	1.54	3 9	31.82
4	lo	40			
5	20	40	1.72	43	32.67
6	30		1.72	43	32-67
7	40	40	1.74	4 3.5	32-77
8	50	40	1.74	43.5	32.73
9		40	1-78	44	32.87
	60	40	1.82	45.5	33.16
10	70	40	1.82	45-5	
11	80	40	1.82		33.16
12	90	40		45.5	33.16
13	100	40	1.76	94	32.87
14	150	40	1.74	43-5	32-77
15	200	40	1.72	43	32.67
16	300	40	1.70	4125	32-56
17	400	40	1.60	410.0	32
18			1-30	345.0	30.88
19	500	40	1.16	29	29.24
	600	40	1.06	26.5	28.46
20	1000	.40	0.909	227	27.12
21	2000	40	0.828	20.7	26-32

oh to

nature Breadboard Digital Storage Oscilloscope, Function Generator, lewer Supply, Resistore: [470K, 4.7K, 33 K, 2205] Capacitor: (22 uf-2, Juf-1) 2N2222 Transitors, wire

a priserue EX8=10

Calculation

12= 470 KHZ f2-1, Band width 11 = 3 KHz 3470-3 KM2 (from graph calculated = 467 KHZ. · tre dipping occus at = 104mV P-P at -3 decibel from reak to «-ue dipping occus at = 144m v p-p get 50% 1

· Voltage gain (stable) = 33.16 dB

Not stimulation for the regative digging was observed and regative digging was observed and regative

Summary of Results:

- > Output signal and input signal is 180° out of phax.
- -> Band width = 467 kHz.

- Av at $f_2 = 33.16 \, \text{KH}_2$.

 The dipping was of $104 \, \text{mV} \, p p$ The graph remains constant from 60 kHz to 90 kHz.

 The graph of voltage gain initially increases from $1 \, \text{KH}_2$ to $60 \, \text{KH}_2$ and then stablise from $100 \, \text{KH}_2$ to $90 \, \text{KH}_2$.
- -> The voltage gain then decreases from 100 KHz-2000 KHz.
- -> The common emitter amplifier transnaturely amplifies the amplitude of voltage. The amplification is highest in the bondwichth region of lokkz to 200 KHZ

-> Positive dipping occurs when the by t is cut off i-e its becomes as open circuit while regative dipping occurs at saturated region.

Precartion: Proposition Stange Oscallagory business in many

-> Make sure the connection are tight.

→ Vin should remain constant.

→ Make sure the teransistor is working in the active region.

→ Be Check the exeristances of the recistor.

are longe arie loose

→ Check and make more the teransister is not broken

→ Make succe all appropriatus is and machines are
working

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- Output signal and input signal is 180° out of plan.

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The graph rumours writing from 60 KHz to 9 OKHL. sted the group of voltage gain insteally inscious from

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