CHOS Analog Design
Project: Rail-to-Rail opausp.
Design How :-
Requirement:- gain of & 3+ages > 100 dB.
We want to get avviound 600 dB gain from stage 1. and Rest from the class AB stage.
from the class AB stage.
Vthp=0.42 \ [given in the model file - Principonies]
Gain of stage 1 is given by
Av. ~ gmilgm10 8010 808)
Assuming gm = 0.25 ms = gm = gm = gm y
Ipo = Ipo = Sou A. Ipo = Ipu = Sou A.
love con get (W/-) of M, M2 M8 My)
using formula
1 gm = 2 Iouncon (m/L)
la vides = vdss = 0.15 v to the fail current sources.
-> providing vdss = vdsr = 0.15 v to the tail current sources. (ms and m6)
-> Vdd=1.8 v (given)
(Ms and Mo) > Vdd=1.8 v (given) -) dividing Vdd among M7 M8, M9, M9, M10, M11, M12, M13, M14 M15 M Vds for M7, M8, M17 M18, M11 M12 M13 M14 = 0.8 V
Vds for M7, M8, M17 M18, M1, M12 M13 M14 = 0.8V
vas for Ma, Mio, Mis Mib = 0. Arv (tuse may goin trioderegion first

ofrom vols and convent in the Inansistor we con . calculate the (W/L) of all Inansistors.
from vas and consider in this
and I was I was I all Jumpistons.
calculate the (W/L) of an estimate
) for finding bias voltages -
701 Timolivia Dias vollage
and any and compared on the street with a
Vbs-Vgsm11-Vgs+-Vdd=0
V03 - V351111
Vby - Vgs 14 - Vgs 17 = 0
004 19317 = 0
- Vha + Vasa & Vda -
2 1 13 13 4 103 14 = 0
-Vb2 + Vgs15 + Vds17 = 0 - Vdd + Vsd7 + Vsg15 + Vb1=0
- Vdd + Vsd 7 + Vsg 15 + Vb1 = 0
CALL BASES TO WAS SELECTION OF THE PROPERTY OF
→ To com be calculateged using formula.
-> To com be calculatega moning Torring
Mn-1 an=0.03 (given-
$Y_0 = \frac{1}{d \Gamma_0} \qquad dm = 0.05 \text{ given}.$
$\gamma_0 = \frac{1}{\sqrt{10}}$ $\gamma_0 = 0.1$ $\gamma_0 = 0.1$
A NOV.
in the late of the second seco
-> according to the above assumption,
u la lation agrica is -
Hand Calculation gain is -
Dumot pmar

AV,=2380 ' | AV, = 67.5 dB

with Simulation AV2= 68,20dB Stage 1 gain.

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