

Calculation values

Given					
Av	24 db		15.8489319		
Rs	25000	25 k			
ZL	5000	5 k			
	2.2E-09 nF				
fHin	40000	40 kHz			
Step 2					
Cin	7.95775E-11	79.5774715 pF			
Step 3					
Rout	1808.578899	Choose Rc	1780	1.78 kΩ	
(getting Ic)					
RL Rc	1312.684366				
gm	0.012073681	12.0736807 mA/V			
Ic > gm/35	0.344962306 mA				
Choose Vcc	66				
approx ic	0.018539326				
Pdiss	0.611797753	611.797753 mW			
max Pdiss	625 mW				
Step 4					
re drop	6.6	round to	7		
approx re	377.5757576	Pick Re	379		
(Load Line)					
Re+Rc	2159				
Ic	0.030569708	30.5697082 mA			
Quiescent Ic	0.015				
Vce	33.615				
Vce ΔIc	53.30526549				
Ic ΔVce	0.030569708	30.5697082			
final available signal swing	46.3052655	>22			
Step 5					
Ve	11.58591941				
Vb1	12.98591941				
Vb2	38.95775822				
			pick		
pick R3	1000000	1000	1000 k		
R2	2000000	2000	2000 k		
R1	2082427.969	2082.42797	2100 k		
Rin = R3 ((R1+R2)		803.921569	>100k, ok		
Step 6					
gm	1.069939787	1069.93979 mA/V			
Av2	-1404.49323	62.950393 dB			
β	0.062383734				
Re1	81.89015212	pick Re1	82.5 Ω		
High Avo approx: Re1=		82.8247842			
Re2	297.1098479	pick Re2	294 Ω		

Equations Displayed

Given					
Av	24	db	$=10^{(B3/20)}$		
Rs	25000	$=B4/1000$	k		
ZL	5000	$=B5/1000$	k		
	$=0.0000000022$	nF			
fHin	40000	$=B7/1000$	kHz		
Step 2					
Cin	$=1/(2*PI()*B4*B7*2)$	$=B10*10^{12}$	pF		
Step 3					
Rout (getting Ic)	$=1/(2*PI()*B7*B6)$	Choose Rc	1780	$=D13/1000$	kΩ
RL Rc	$=1/(1/D13+1/B5)$				
gm	$=D3/B15$	$=B16*1000$	mA/V		
Ic > gm/35	$=C16/35$	mA			
Choose Vcc	66				
approx ic	$=(B18/2)/D13$				
Pdiss	$=(B18/2)*B19$	$=B20*1000$	mW		
max Pdiss	625	mW			
Step 4					
re drop	$=0.1*B18$	round to	7		
approx re (Load Line)	$=D24/B19$	Pick Re	379		
Re+Rc	$=D13+D25$				
Ic	$=B18/B27$	$=B28*1000$	mA		
Quiescent Ic	0.015				
Vce	$=B18-B29*B27$				
Vce ΔIc	$=B30+B29*B15$				
Ic ΔVce	$=B29+B30/B27$	$=B32*1000$			
final available signal swing		$=B31-D24$	>22		
Step 5					
Ve	$=D25*B28$				
Vb1	$=B36+1.4$				
Vb2	$=B37*3$				
			pick		
pick R3	1000000	$=B40/1000$	1000	k	
R2	$=B18*B40/B37-B42-B40$	$=B41/1000$	2000	k	
R1	$=B40/B37*(B18-B38)$	$=B42/1000$	2100	k	
Rin = R3 (R1+R2)		$=1/(1/D40+1/(D41+D42))$	>100k, ok		
Step 6					
gm	$=35*B28$	$=B46*1000$	mA/V		
Av2	$=B46*B15$	$=20*LOG(ABS(B47),10)$	dB		
β	$=(ABS(B47)-D3)/(ABS(B47)*D3)$				
Re1	$=B48*B15$	pick Re1	82.5	Ω	
High Avo approx: Re1=		$=B15/D3$			
Re2	$=D25-B49$	pick Re2	294	Ω	