電腦輔助電路設計

作業

班級： 電 二 乙

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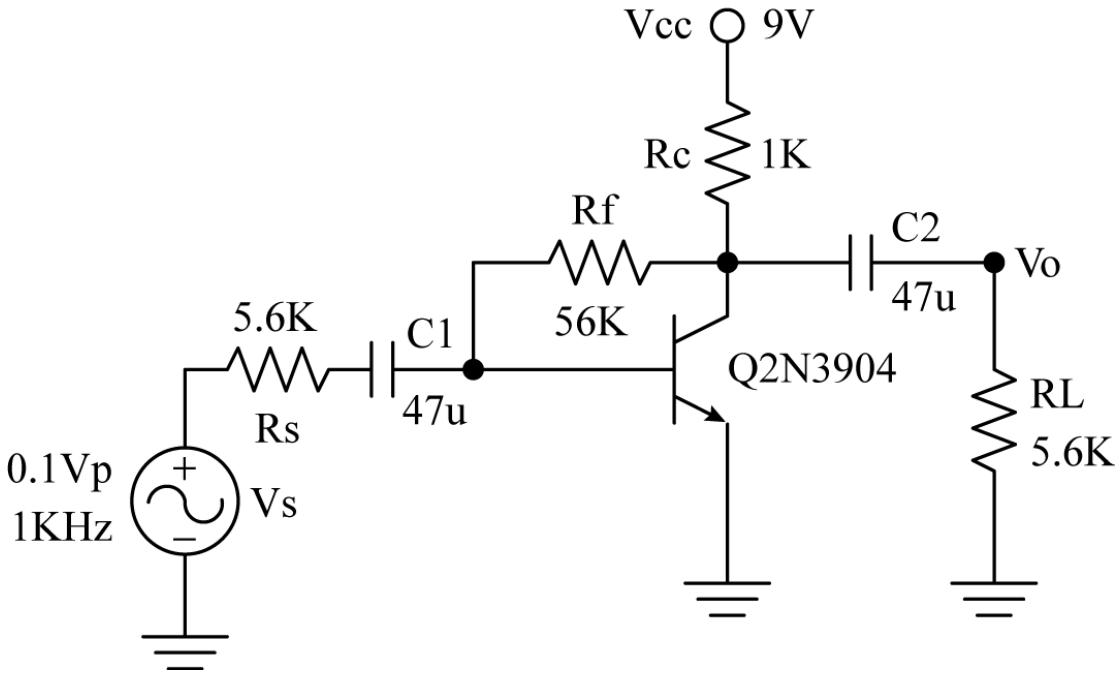
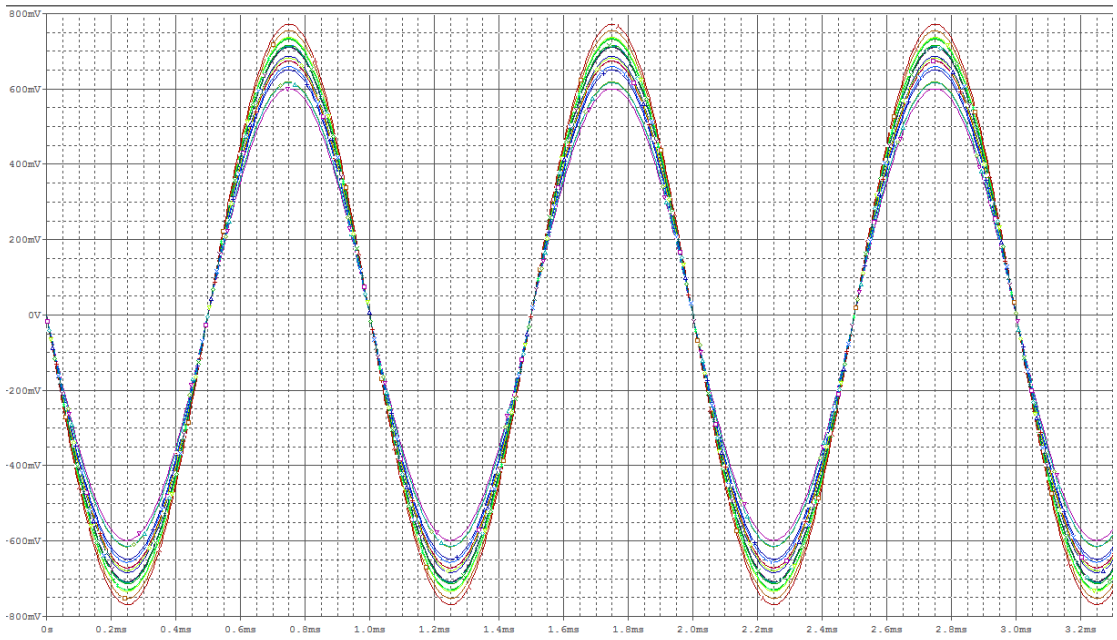
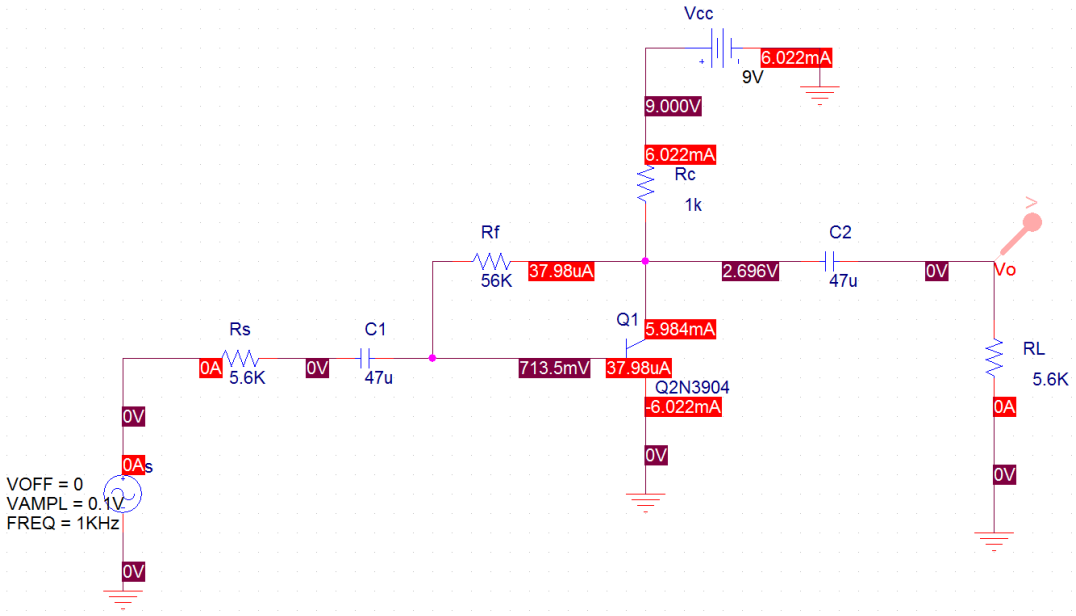
例題 34 蒙地卡羅分析、誤差分析







**** SORTED DEVIATIONS OF V(VO) TEMPERA

TURE = 27.000 DEG C

MONTE CARLO SUMMARY

****

****

Mean Deviation = 113.5900E-06

Sigma = .0501

RUN MAX DEVIATION FROM NOMIN

AL

Pass 18 .0976 (1.95 sigma) higher at T = 1.7515E-03

(114.47% of Nominal)

Pass 11 .0808 (1.61 sigma) lower at T = 1.2515E-03

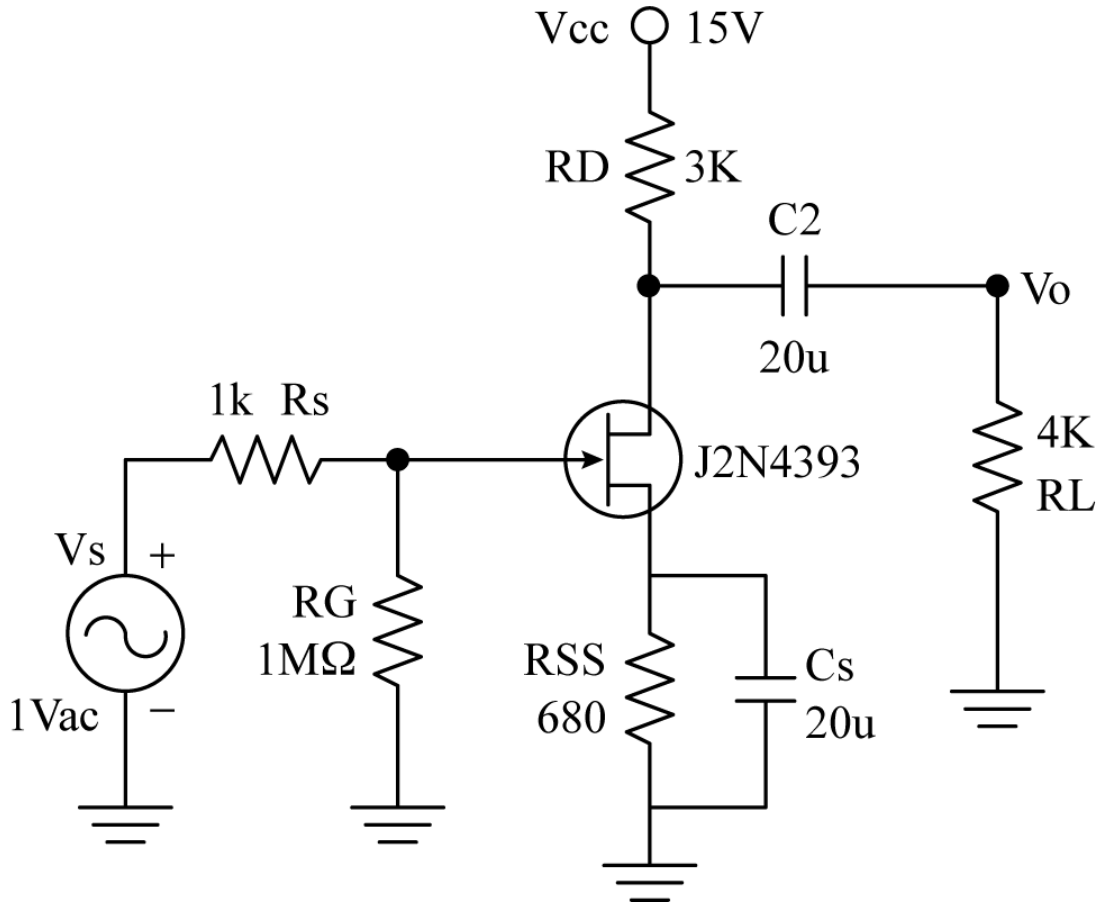
(112.03% of Nominal)

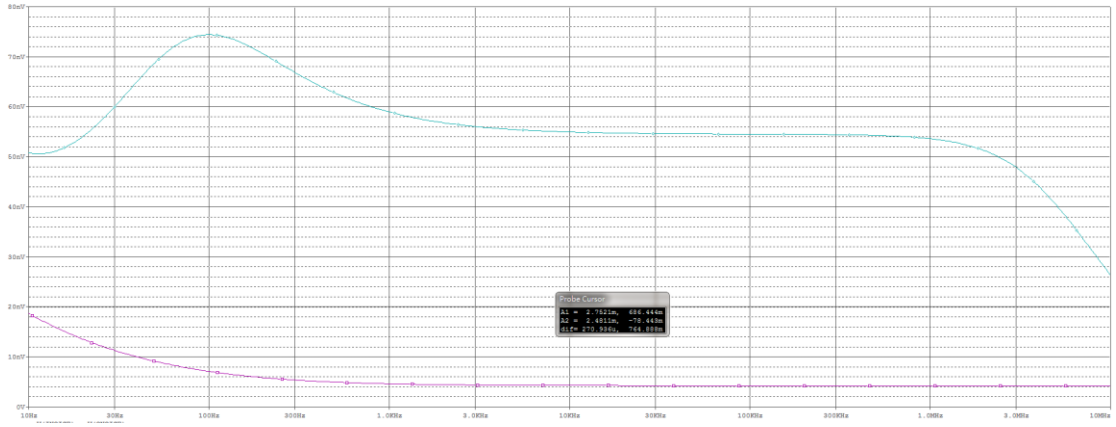
B=5.984m/37.98u=157.55

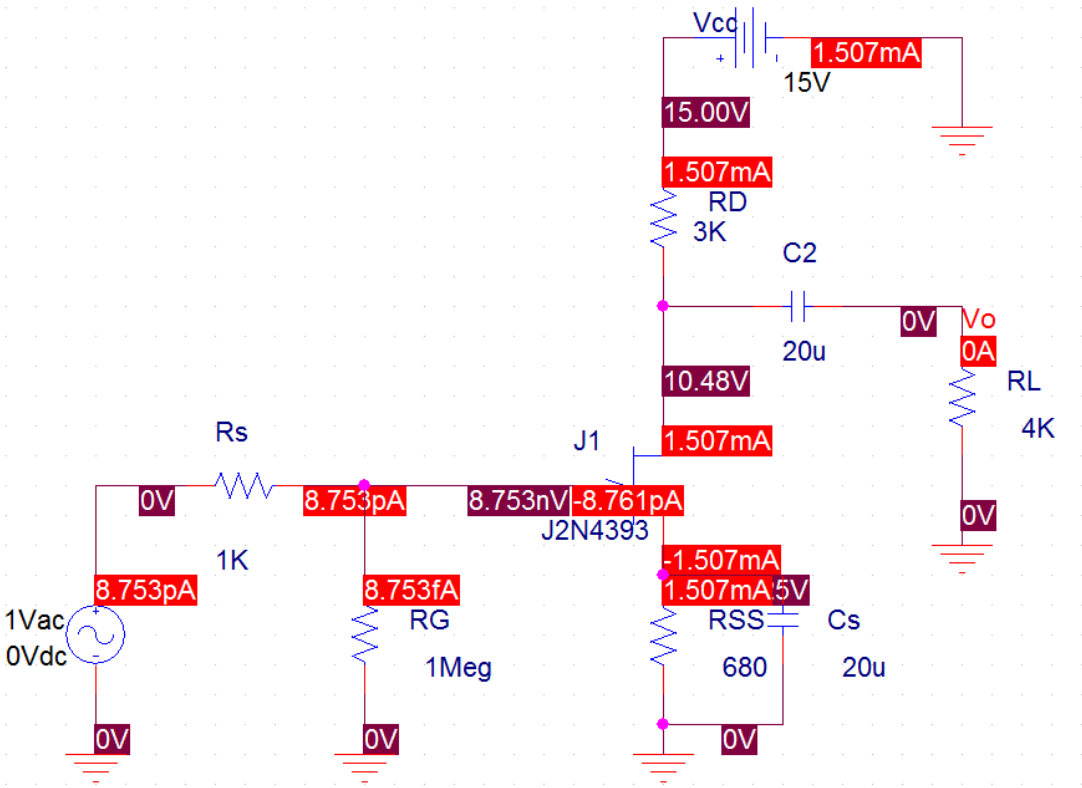
Vce=9-(6.022*1)=2.978

Vce>0.2,工作於作用區

例題 35　Noise 分析和訊號對雜訊比(SNR)


Vcc
15V
RD
3K
C2
20u
Vo
1k
Rs
J2N4393
4K
RL
Vs
+
RG
1MΩ
RSS
680
Cs
20u
1Vac
−





FREQUENCY = 1.000E+03 HZ

****** JFET SQUARED NOISE VOLTAGES (SQ V/HZ)**

J_J1

RD 3.397E-24

RS 2.697E-18

ID 2.355E-16

FN 5.187E-16

TOTAL 7.570E-16

****** RESISTOR SQUARED NOISE VOLTAGES (SQ V/HZ)**

	R_RG	R_Rs	R_RSS	R_RL	R_RD
TOTAL	**2.686E-18**	**2.686E-15**	**2.512E-19**	**1.183E-17**	**1.578E-17**

****** TOTAL OUTPUT NOISE VOLTAGE = 3.474E-15 SQ V/HZ**

= 5.894E-08 V/RTHZ

TRANSFER FUNCTION VALUE:

V(VO)/V_Vs = 1.273E+01

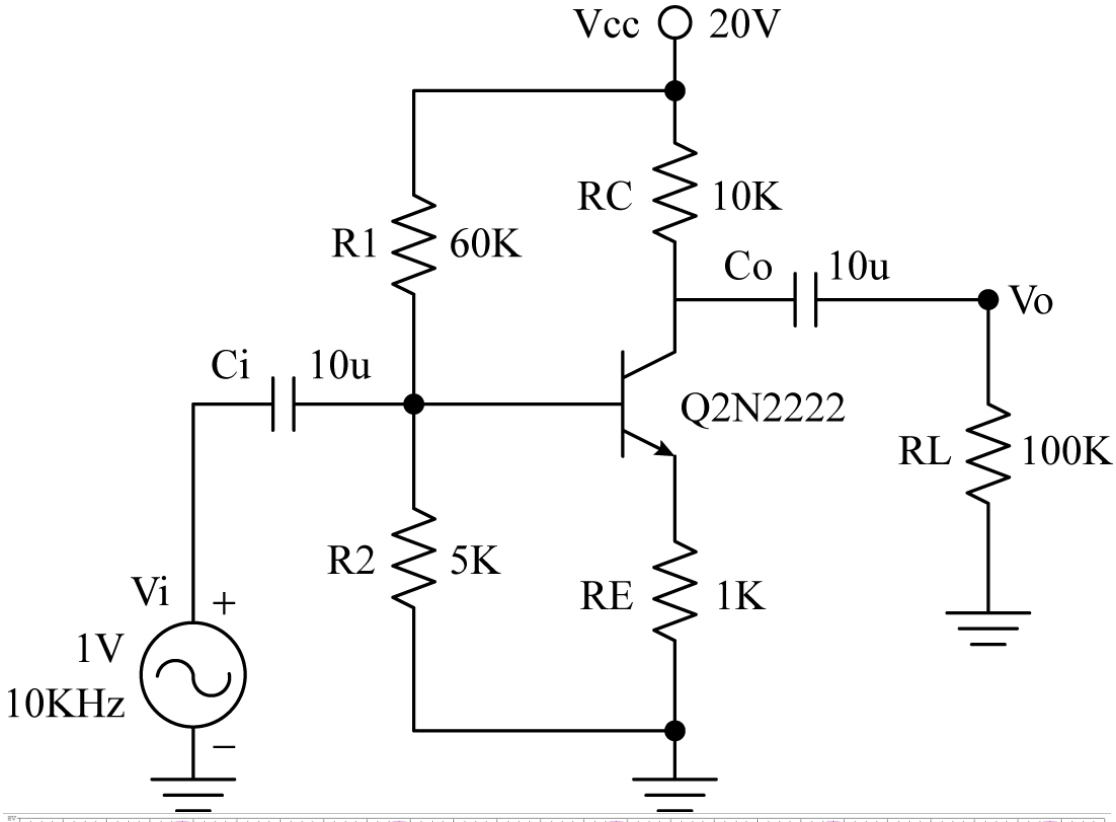
EQUIVALENT INPUT NOISE AT V_Vs = 4.630E-09

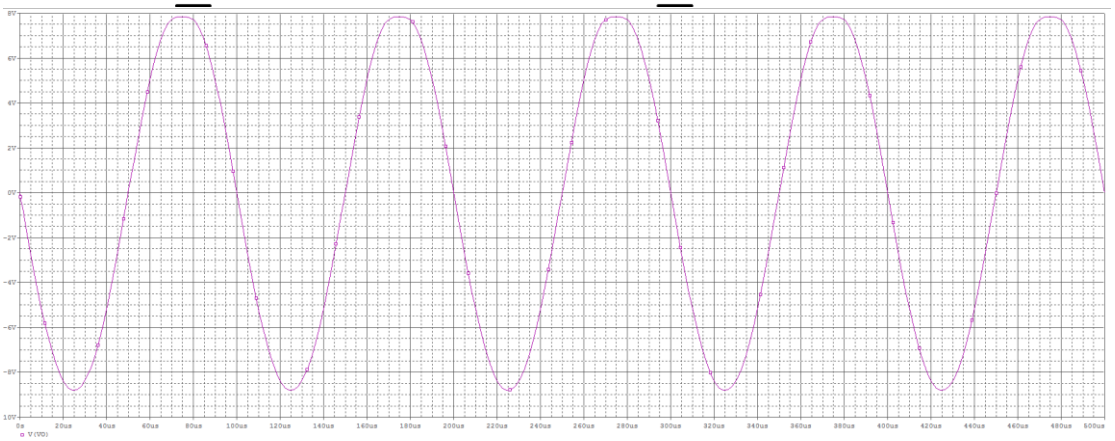
V/RT HZ

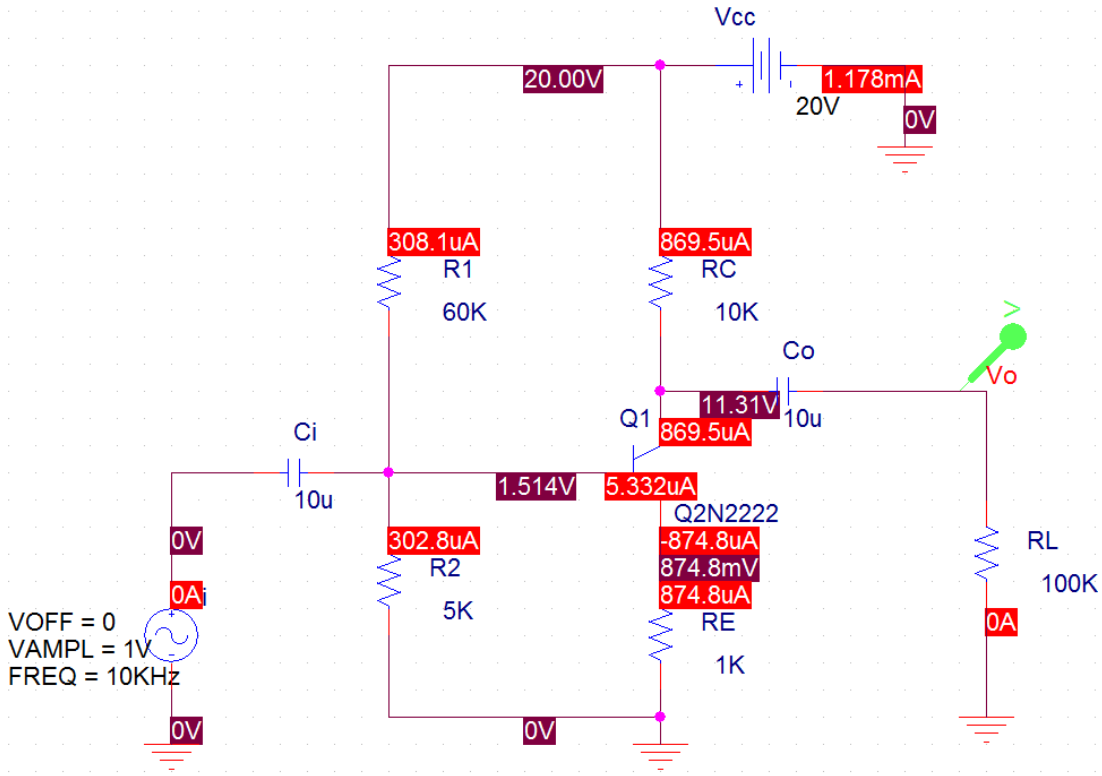
增益為 12.76

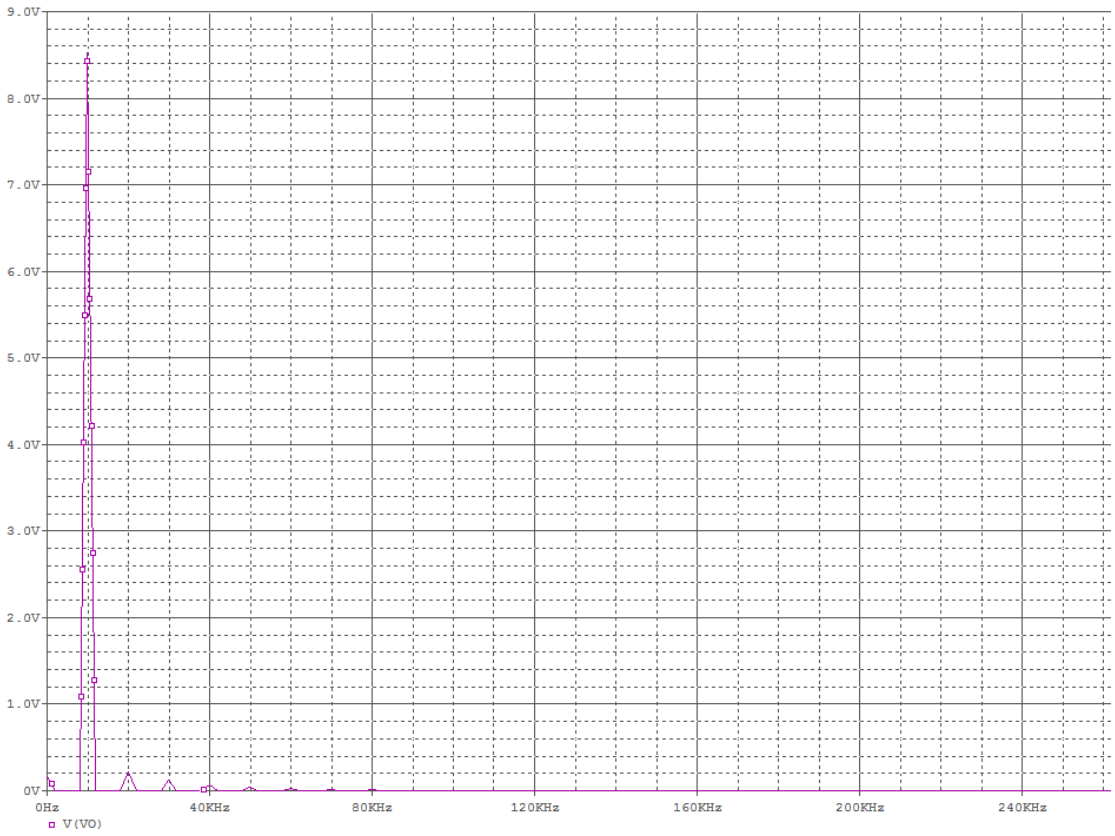
SNR=12.73

例題 36 傅力葉分析和總諧波失真


Vcc
20V
RC
10K
R1
60K
Co
10u
Vo
Ci
10u
Q2N2222
RL
100K
R2
5K
RE
1K
Vi
+
1V
10KHz
−




Vcc
20.00V
1.178mA
20V
0V
308.1uA
R1
60K
869.5uA
RC
10K
Co
Vo
11.31V
10u
Q1
869.5uA
Ci
10u
1.514V
5.332uA
Q2N2222
-874.8uA
874.8mV
874.8uA
RE
1K
302.8uA
R2
5K
RL
100K
0A
VOFF = 0
VAMPL = 1V
FREQ = 10KHz
0V


9.0V
8.0V
7.0V
6.0V
5.0V
4.0V
3.0V
2.0V
1.0V
0V
0Hz
40KHz
80KHz
120KHz
160KHz
200KHz
240KHz
V(VO)

FOURIER COMPONENTS OF TRANSIENT RESPONSE V(VO)

DC COMPONENT = -1.598570E-01

HARMONIC FREQUENCY FOURIER NORMALIZED PHASE NORMALIZED
NO (HZ) COMPONENT COMPONENT (DEG) PHASE (DEG)

1 1.000E+04 8.512E+00 1.000E+00 1.799E+02 0.000E+00

2 2.000E+04 2.154E-01 2.531E-02 8.881E+01 -2.710E+02

3 3.000E+04 1.220E-01 1.433E-02 -1.79

1E+02 -7.188E+02

4 4.000E+04 7.155E-02 8.406E-03 -9.06

5E+01 -8.102E+02

TOTAL HARMONIC DISTORTION = 3.027504E+

00 PERCENT

B=ic/ib=869.5u/5.332u=163

VCE=VCC-IERE-ICRC=20-(10K*869.5u)-(1K*874.8u)=20-8.

695-0.8748=10.4302

VCE=10.4302V