Pre-Informe Electrónica Analógica

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Resultados Simulación Montaje 1

PL : 198 mW

Resultados Simulación Montaje 2

ICQ : 1.351 mA

I : 318.3 uA

VBB : 634.4 mV

Io Max: 67mA

Vo Max: 6.7V

Ai: 44.6

Av: 0.95

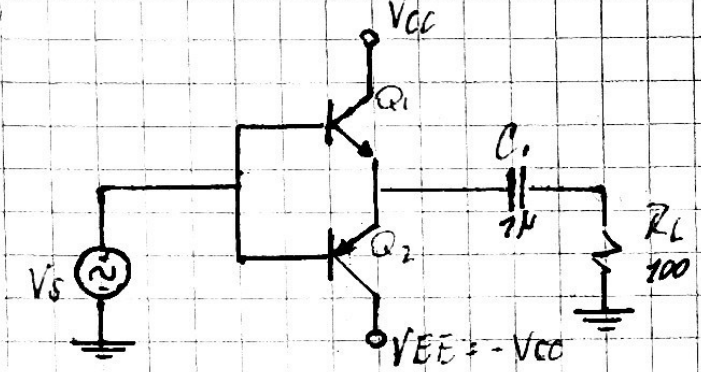
PL:0.224 W

PF: 0.29 W

%n: 77.2%

Laboratorio #2

1./

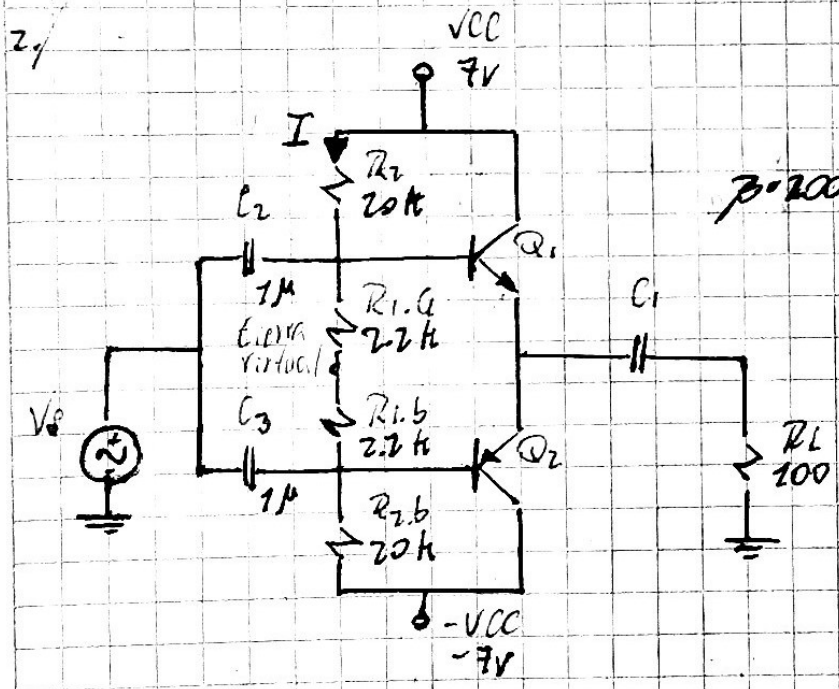


• $P_L = 200\ mW$

$$P_L = \frac{V_{CC}^2}{2R_L}$$

$$V_{CC} = \sqrt{2R_L P_L} = 6,32\ V$$

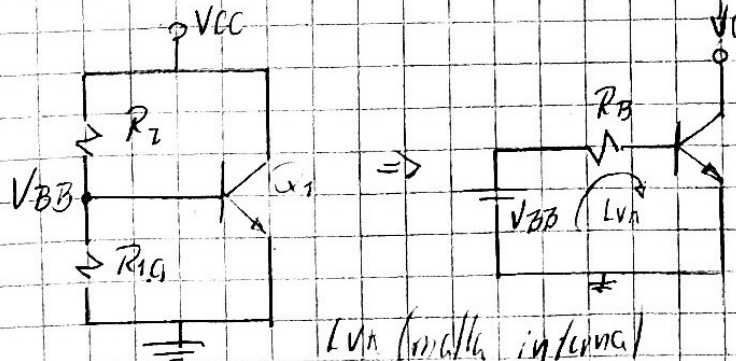
2./



$\beta = 200$

• $V_{BE} = 0.7$

Analisis DC (Semicircuito)



$$V_{BB} = \frac{V_{CC}\ R_{1.a}}{R_{1.a} + R_2} = 0,7\ V$$

$$R_B = \frac{(R_{1.a} / R_2}{(R_{1.a} + R_2} = 1,98\ k\Omega$$

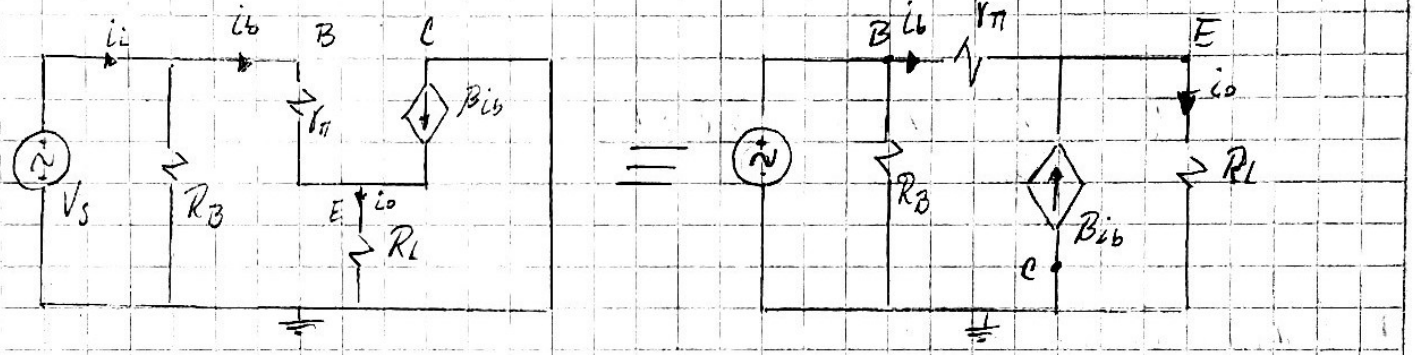
LVK (malla interna)

$$V_{BB} = \frac{I_C}{\beta} R_B + V_{BE} \Rightarrow I_{CQ} = \frac{V_{BB} - V_{BE}}{\frac{R_B}{\beta}} = 0\ mA$$

IVA (malla salida)

$V_{CC} = V_{CE} + V_{E4}$

Analisis A_i



- $i_{C\,max} = \frac{V_{CC}}{R_L}$; $I_{DC} = \frac{i_{C\,max}}{\pi}$; $I_{DC} = \frac{V_{CC}}{R_L \pi} = 22,28\ mA \Rightarrow r_\pi = \frac{3\,26\,mV}{I_{DC}} = 233,4\ \Omega$

- $A_V = \frac{V_o}{V_S}$
  - $V_o = (i_b + \beta i_b) R_L = i_b R_L (1+\beta)$
  - $i_b = \frac{V_S - V_o}{r_\pi} \Rightarrow V_S = i_b r_\pi + V_o \Rightarrow V_S = i_b r_\pi + \beta i_b R_L$
    $V_S = i_b (r_\pi + \beta R_L)$

$$A_V = \frac{i_b R_L (1+\beta)}{i_b (r_\pi + \beta R_L)} = 0.99 \approx 1$$

$$I = \frac{V_{CC}}{R_L + R_{in\,G}} = 0.32\,mA$$

$A_V = 1$

$A_i = 18,07$

- $A_i = \frac{i_o}{i_i}$
  - $i_o = \frac{V_o}{R_L} = i_b (1+\beta) \approx i_b \beta$
  - $V_i \approx V_o \rightarrow (i_i - i_b) R_B \approx i_b R_L (1+\beta)$
    $R_B i_i - i_b R_B \approx i_b R_L \beta$
    $i_b = \frac{i_i R_B}{\beta R_L + R_B}$

$$A_i = \frac{i_o}{i_i} = \frac{\beta R_B}{\beta R_L + R_B} = 18,07$$

$Z_{out} = \frac{r_\pi}{\beta} = 7,167\ \Omega$ $\quad$ $R_{in} = (r_\pi + \beta R_L) \,//\, R_3 = 1803,54\ \Omega$

▲ $P_L = \frac{V_{CC}^2}{2R_L} = 0,245\ W$

▲ $P_{DC} = \frac{2V_{CC}^2}{\pi R_L} = 0,317\ W$

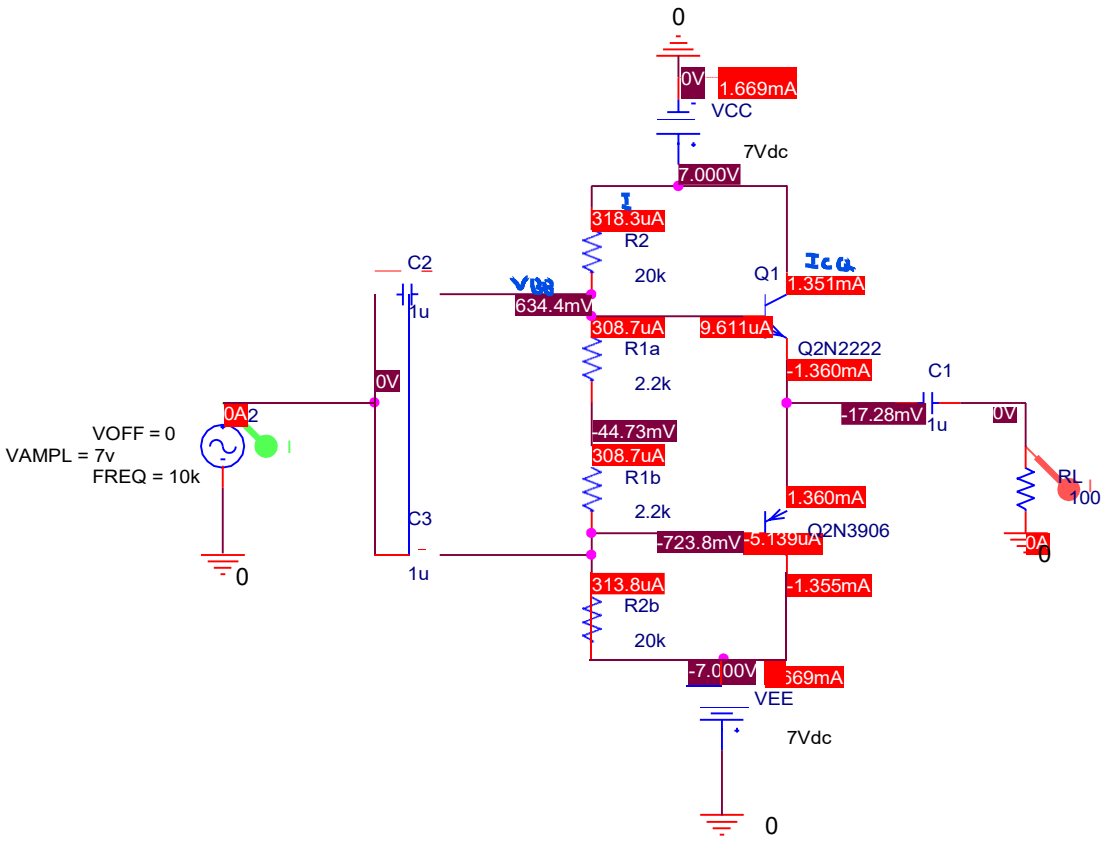
$\eta\% = \frac{P_L}{P_{DC}} \times 100 = 78,54\ \%$

▲ $I_{omax} = I_{cmax} = 0.07\ A$

$I_{imax} = \frac{I_{omax}}{A_i} = \frac{0.07\ A}{18.02} = 3,8\ mA$

▲ $V_{omax} = R_L I_{omax} = V_{CC} = 7\ V$

$V_{imax} = \frac{V_{omax}}{7} = 7\ V$



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Size A	Document Number <Doc>	Rev <RevCo
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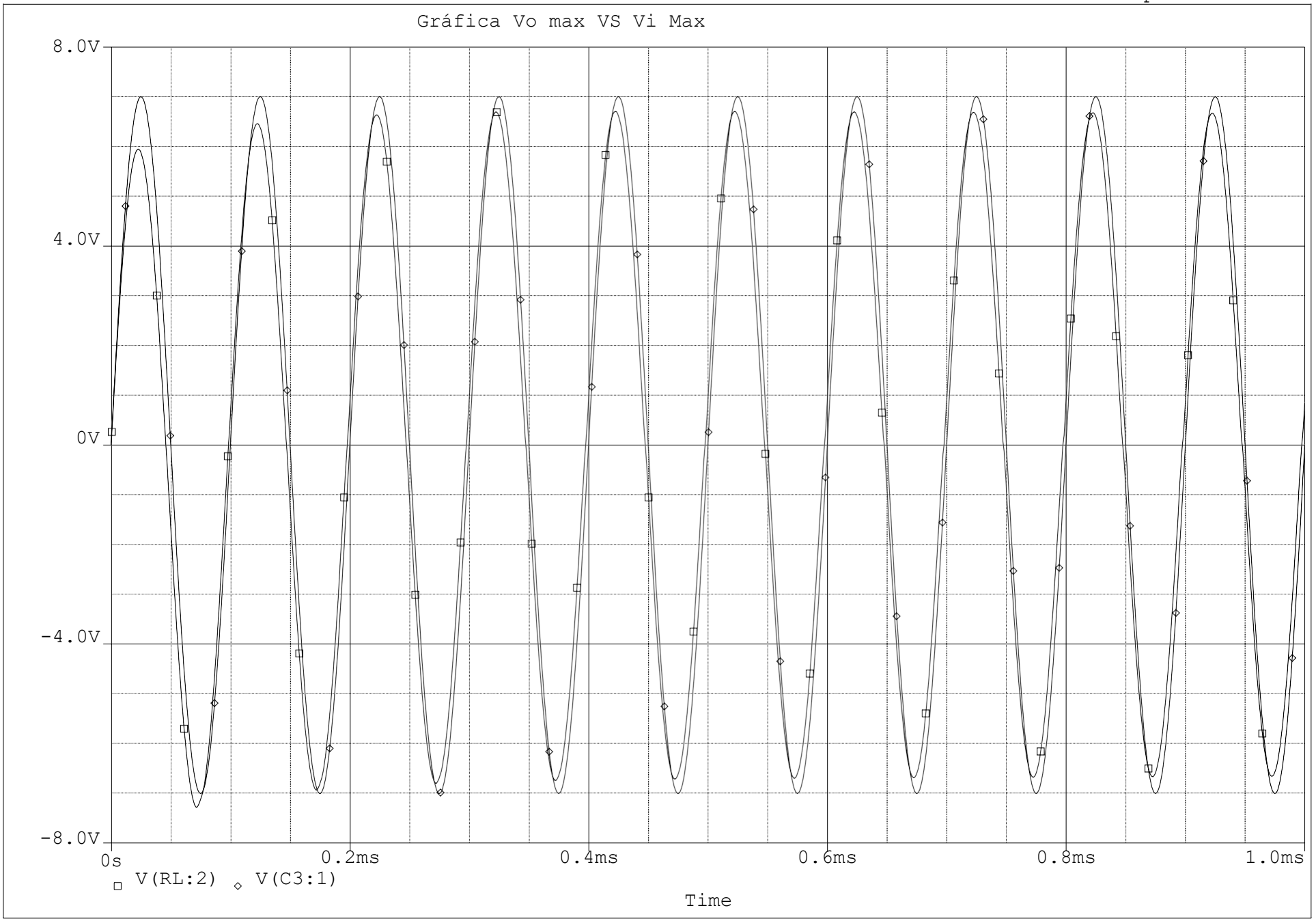
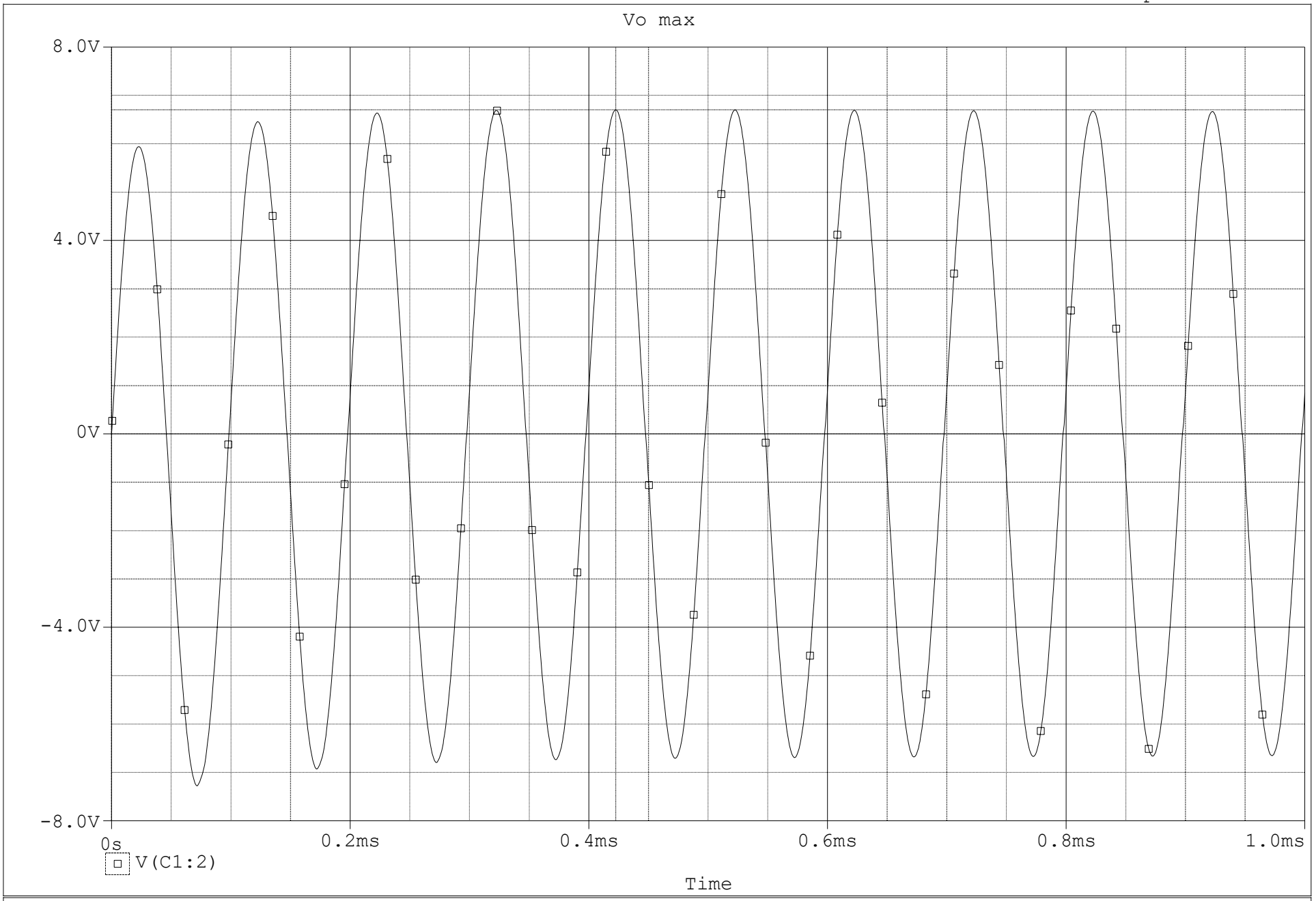

Gráfica Vo max VS Vi Max
8.0V
4.0V
0V
-4.0V
-8.0V
0s
0.2ms
0.4ms
0.6ms
0.8ms
1.0ms
V(RL:2)
V(C3:1)
Time

** Profile: "SCHEMATIC1-Bias" Gráfica Vo max

Date/Time run: 04/26/21 22:19:11

Temperature: 27.0

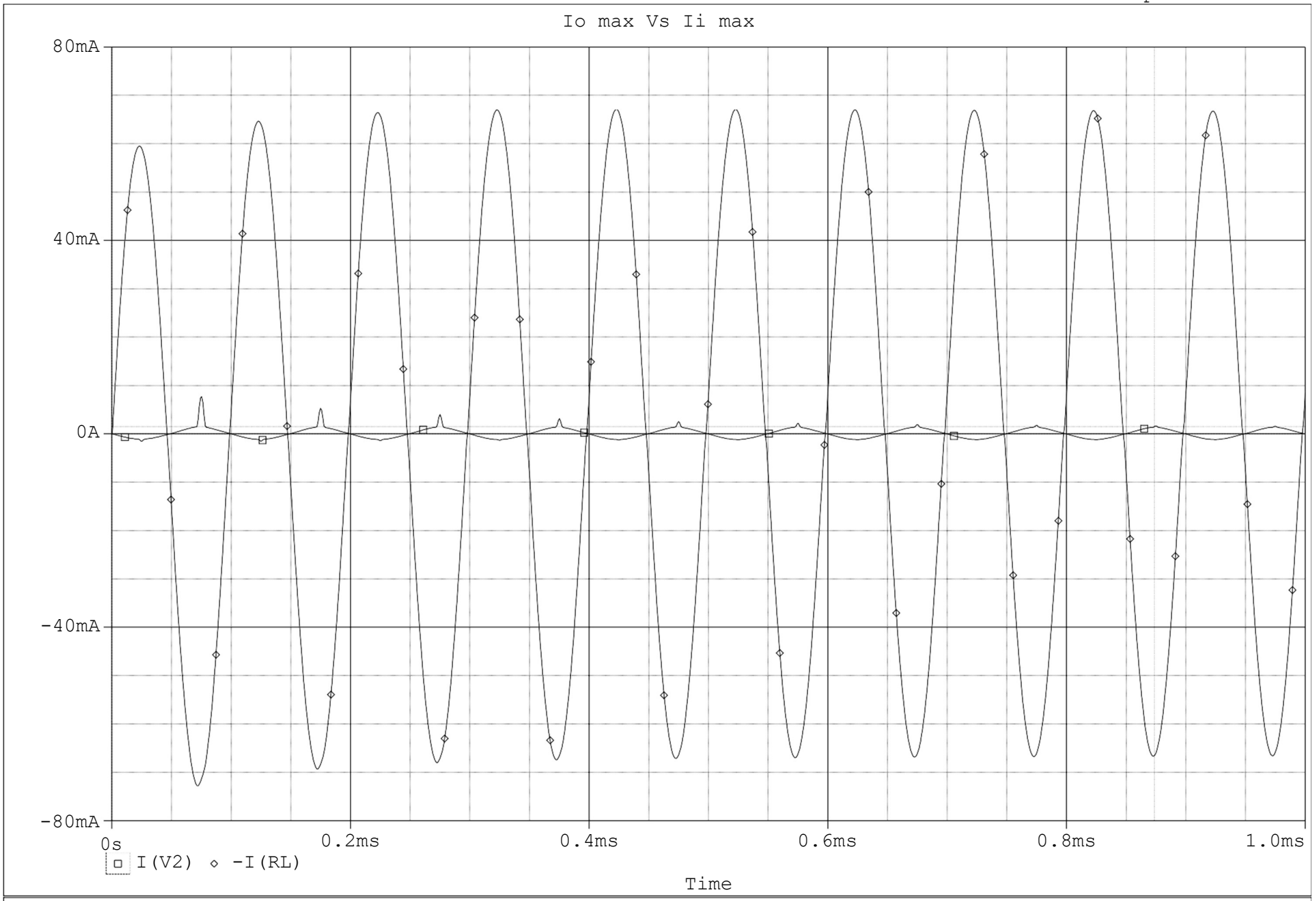


Vo max= 6.7046 V

** Profile: "SCHEMATIC1-Bias" Io max Vs Ii max

Date/Time run: 04/26/21 22:22:57

Temperature: 27.0

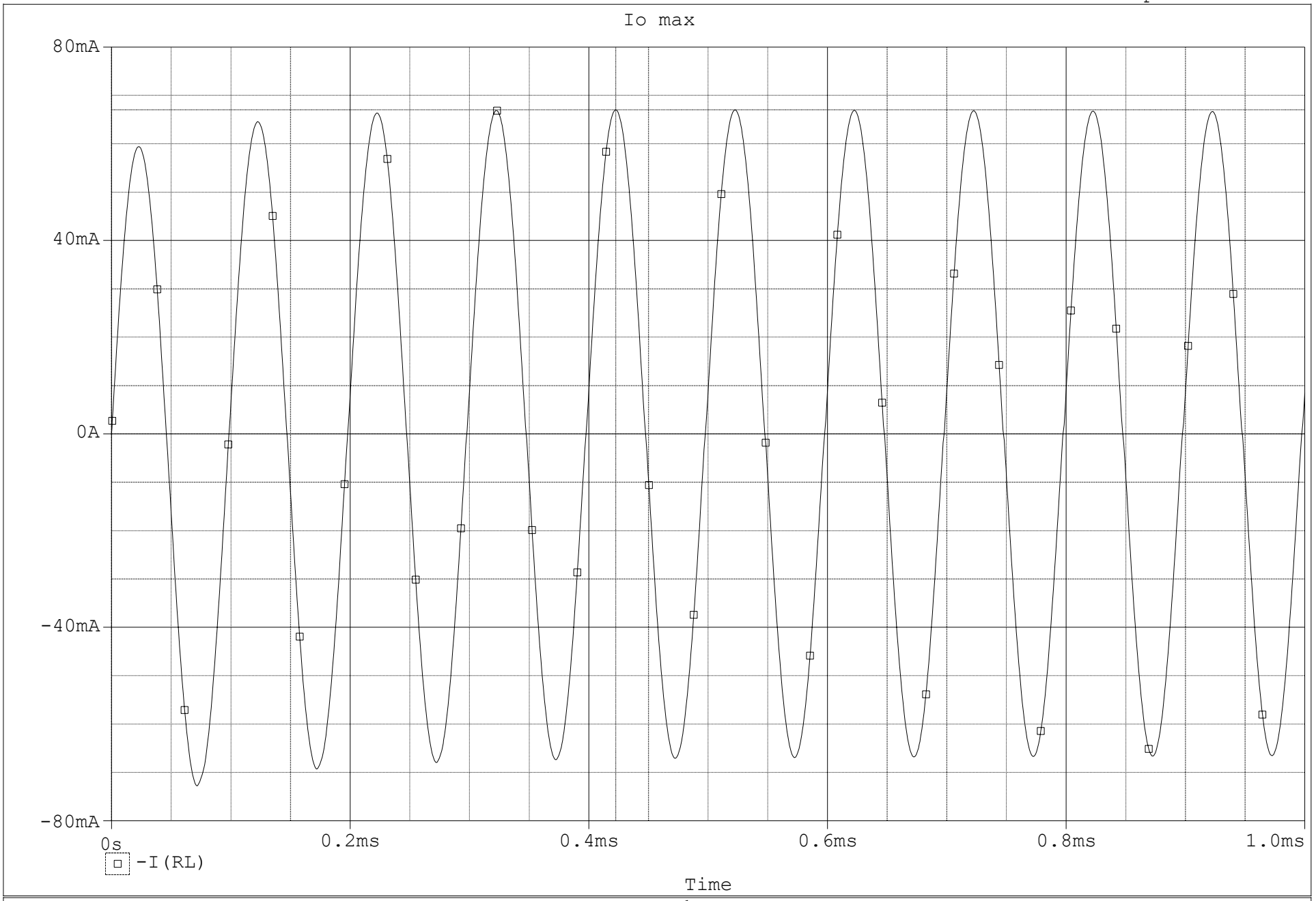


Ii max = 1.4878mA

** Profile: "SCHEMATIC1-Bias" Gráfica Io max

Date/Time run: 04/26/21 22:16:28

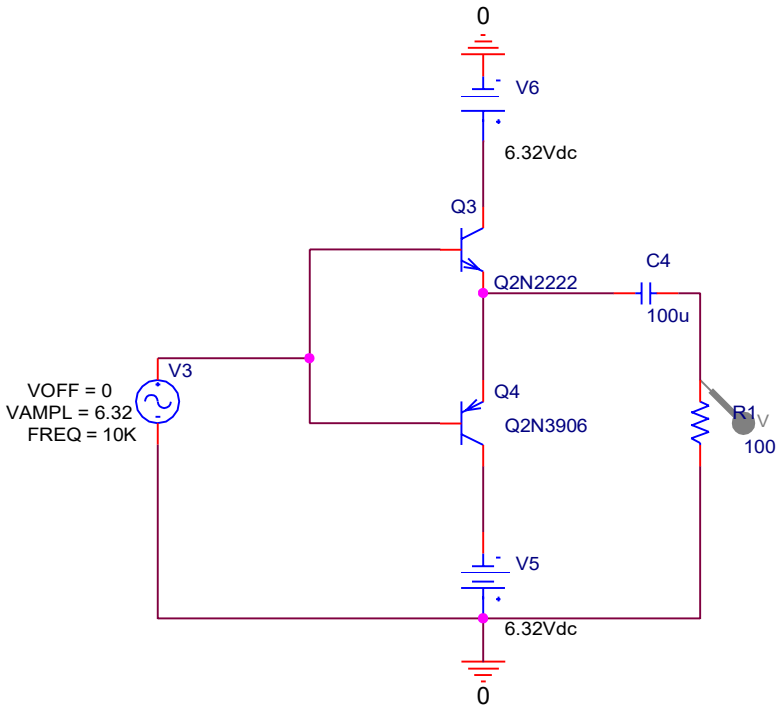
Temperature: 27.0



Io max = 67.046mA

Date: April 26, 2021

Time: 22:18:22



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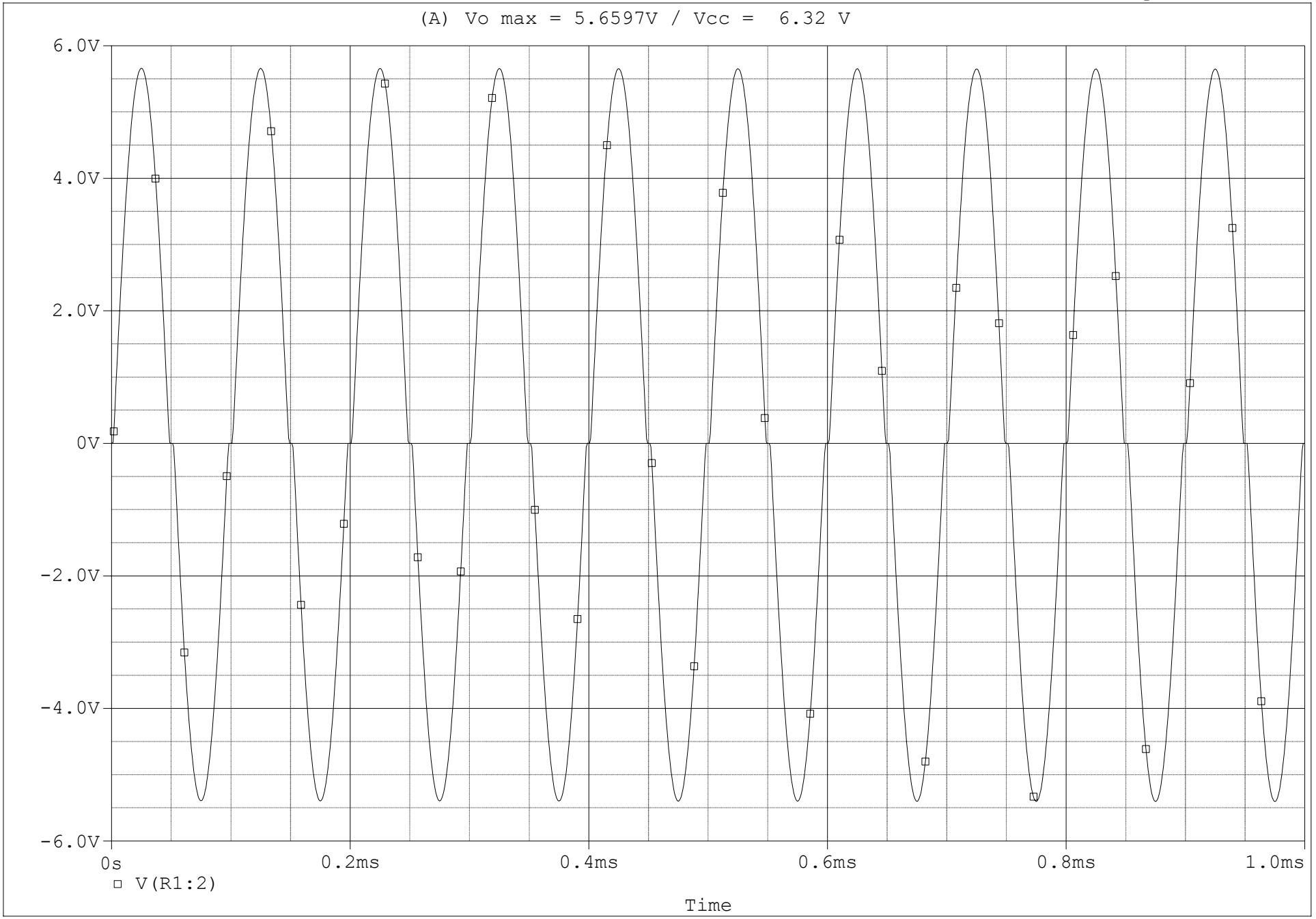
** Profile: "SCHEMATIC1-Bias" Vcc teórico

Date/Time run: 04/26/21 23:47:09

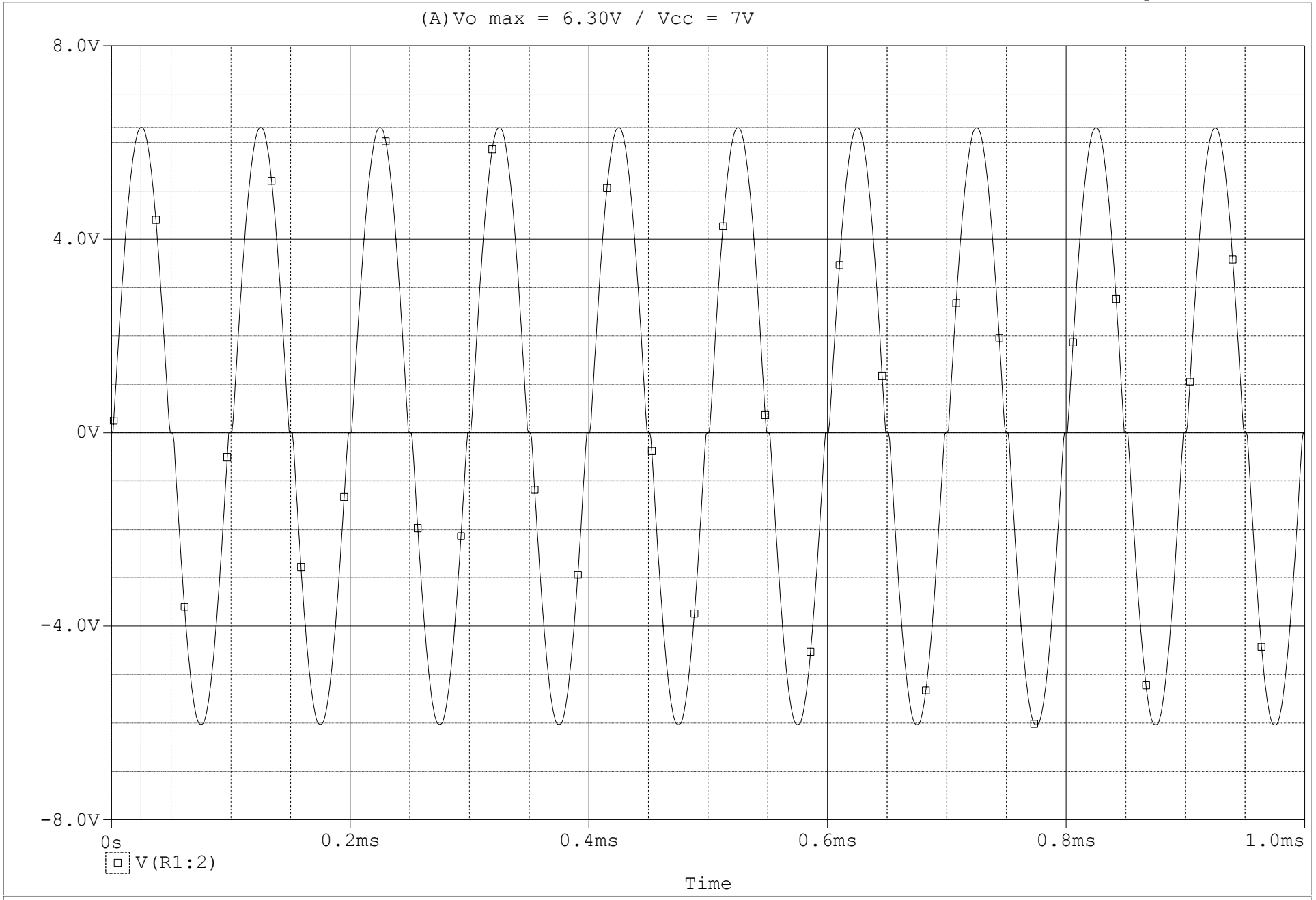
Temperature: 27.0



** Profile: "SCHEMATIC1-Bias" Vcc Encontrado simulación

Date/Time run: 04/26/21 23:45:57

Temperature: 27.0



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