

$T_1 = 2N3904$

$T_2 = 2N3904$

$T_3 = 2N4427$

IN 2N4427 DATASHEET DOES NOT APPEAR  $r_o$  OF THE TRANSISTOR, BUT I FOUND A TABLE WITH APPROXIMATE VALUES OF POWER TRANSISTORS, IN MY CASE I'M GONNA WORK WITH 1W OF POWER, BUT THIS TRANSISTOR WORKS WITH MAXIMUM 3.5 W, SO IN THE TABLE I CHOOSE:  $R_B = 20 \Omega$ ,  $C_b = 200 \text{ pF}$

### INPUT FILTER

I ASSUME  $R_1 = 20 \Omega$ .

$$b = \frac{l_1 + l_2}{2} = \frac{88 + 108}{2} = 98 \text{ MHz}$$

$$BW = l_2 - l_1 = 108 - 88 = 20 \text{ MHz}$$

$$Q = \frac{98}{20} = 4.9 \approx 5$$

$$X_L = Q R_1 = (5)(20) = 100$$

$$X_{C1} = (50) \sqrt{\frac{20}{50} (1 + 25) - 1} = 153.2970 \Omega$$

$$X_{C2} = \frac{(20)(1 + 25)}{5 - \sqrt{\frac{20}{50} (26) - 1}} = 268.8647 \Omega$$

$$C_1 = \frac{1}{2\pi(98 \text{ MHz})(153.2970)} = 10.59 \text{ pF}$$

$$C_2 = 6.04 \text{ pF}$$

For  $L_1$  VALUE

$$X_{C5} = \frac{-j}{(2\pi)(98\text{MHz})(200\text{pF})} = -8.1201\Omega$$

$$X_L = 100 - 8.1201 = 91.8798\Omega$$

$$L_1 = \frac{91.8798}{(2\pi)(98\text{MHz})} = 0.149\mu\text{H}$$

OUTPUT FILTER

$$X_{C4} = \frac{50}{5} = 10\Omega$$

$$R_2 = \frac{q^2}{2} = 40.5\Omega$$

$$X_{C3} = (40.5) \sqrt{\frac{\frac{50}{40.5}}{(26) - \frac{50}{40.5}}} = 2.018\Omega$$

$$X_L = \frac{(5)(50) + \left(\frac{(50)(40.5)}{2.018}\right)}{26} = 48.2103\Omega$$

$$C_8 = 804.77\text{pF}$$

$$C_4 = 162.40\text{pF}$$

$$L_4 = \frac{48.2103}{(2\pi)(98\text{MHz})} = 0.0782\mu\text{H}$$

COLLECTOR CHOKE INDUCTANCE.

$$V_{CE} = 20\text{V}$$

$$I_C = 400\mu\text{A}$$

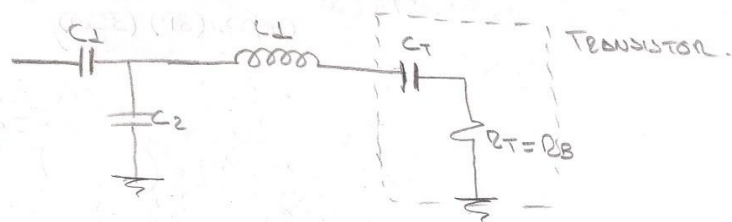
$$Z = \frac{20\text{V}}{400\mu\text{A}} = 50$$

$$L_3 = \frac{50}{4(98\text{MHz})} = 0.127\mu\text{H}$$

IN A ELECTRONIC MAGAZINE I  
FOUND THE FOLLOWING:

IN TABLE  $R_B = 20 \Omega$ ,  $C_b = 200 \text{ pF}$ ;  $\rho_o = \frac{108488}{2} = 98$

### INPUT FILTER



$$X_{CT} = \frac{1 \times 10^6}{(6.28)(98)(200)} = 8.1242$$

$$\rho_s = \frac{20}{\left(\frac{20}{8.1242}\right)^2 + 1} = 2.8327$$

$$X_{CS} = \frac{(20)(2.8327)}{8.1242} = 6.9734$$

$$X_{L1} = (3 \times 2.8327) + 6.9734 = 15.4715$$

$$L_1 = \frac{15.4715}{(6.28)(98)} = 0.025 \mu\text{H}$$

$$\Delta = \sqrt{\left(\frac{6.9734 \times 26}{35}\right) - 1} = 2.044$$

$$X_{C1} = (2.044)(35) = 71.5596$$

$$C_1 = \frac{1 \times 10^6}{(6.28)(98)(71.5596)} = 22.7063 \text{ pF}$$

$$X_{C2} = \frac{910}{5 - 2.044} = 307.8484$$

$$C_2 = \frac{1 \times 10^6}{(6.28)(98)(307.8484)} = 5.2780 \text{ pF}$$

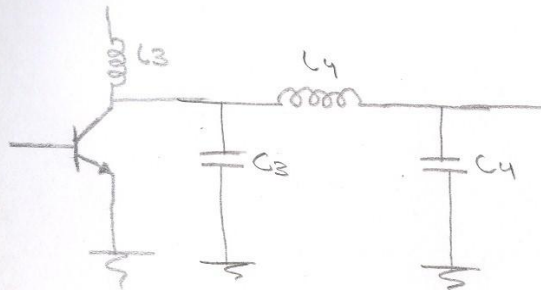
## OUTPUT FILTER

COLLECTOR  $Z_c$ .

$$V_{CE} = 20 \text{ V}$$

$$I_C = 400 \text{ mA}$$

$$Z_c = \frac{20}{400 \text{ mA}} = 50 \Omega$$



$$X_{CT} = 8.1242$$

$$X_{C1} = 5 \times Z_c = 5 \times 50 = 250$$

$$C_1 = \frac{1 \times 10^6}{(6.28)(98)(250)} = 6.49 \text{ pF}$$

$$X_{C2} = 52 \times \sqrt{\frac{50}{52-50}} = 260 \Omega$$

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$$C_2 = \frac{1 \times 10^6}{(6.28)(98)(260)} = 6.24 \text{ pF}$$

$$X_{L1} = (250 + 8.1242) + \left( \frac{50 \times 52}{260} \right) = 268.1242$$

$$L_1 = \frac{268.1242}{(6.28)(98)} = 0.435 \text{ mH}$$

$$L_3 = \frac{8.1242}{(6.28)(98)} = 0.0132 \text{ mH}$$

**TABLA N.º 2**

| Máx.<br>potencia<br>en Watt.<br>Transistor | Resistencia<br>base | Capacidad<br>base | Capacidad<br>colector |
|--|---------------------|-------------------|-----------------------|
| 0,5 W                                      | 50 ohm              | 60 pF             | 20 pF                 |
| 1 W  | 40 ohm              | 100 pF            | 35 pF                 |
| 2 W  | 30 ohm              | 150 pF            | 50 pF                 |
| 3 W  | 20 ohm              | 200 pF            | 80 pF                 |
| 4 W  | 15 ohm              | 250 pF            | 100 pF                |
| 5 W  | 10 ohm              | 300 pF            | 120 pF                |
| 6 W  | 9 ohm               | 350 pF            | 150 pF                |
| 7 W  | 8 ohm               | 400 pF            | 180 pF                |
| 8 W  | 7 ohm               | 450 pF            | 200 pF                |
| 9 W  | 5 ohm               | 500 pF            | 220 pF                |
| 10 W                                       | 4 ohm               | 550 pF            | 250 pF                |
| 15 W                                       | 3 ohm               | 600 pF            | 280 pF                |
| 20 W                                       | 2,5 ohm             | 650 pF            | 300 pF                |
| 25 W                                       | 2 ohm               | 700 pF            | 320 pF                |
| 30 W                                       | 1,8 ohm             | 750 pF            | 350 pF                |
| 35 W                                       | 1,7 ohm             | 800 pF            | 400 pF                |
| 40 W                                       | 1,6 ohm             | 850 pF            | 450 pF                |
| 45 W                                       | 1,5 ohm             | 900 pF            | 500 pF                |
| 50 W                                       | 1,4 ohm             | 950 pF            | 550 pF                |
| 60 W                                       | 1,3 ohm             | 1.000 pF          | 600 pF                |
| 70 W                                       | 1,2 ohm             | 1.100 pF          | 650 pF                |
| 80 W                                       | 1,1 ohm             | 1.200 pF          | 700 pF                |
| 90 W                                       | 1 ohm               | 1.300 pF          | 800 pF                |
| 100 W                                      | 0,8 ohm             | 1.400 pF          | 900 pF                |

Al no disponer de los datos requeridos en las fórmulas—esto es, Resistencia y Capacidad de Base y Capacidad de Colector—, podréis tomarlos de esta tabla. Aunque estos valores no correspondan exactamente a los de vuestro transistor, los resultados que obtengáis serán más que válidos para un montaje práctico. En esta tabla falta el valor de la «Resistencia de Colector», que habrá que calcular como explicamos en el artículo.