

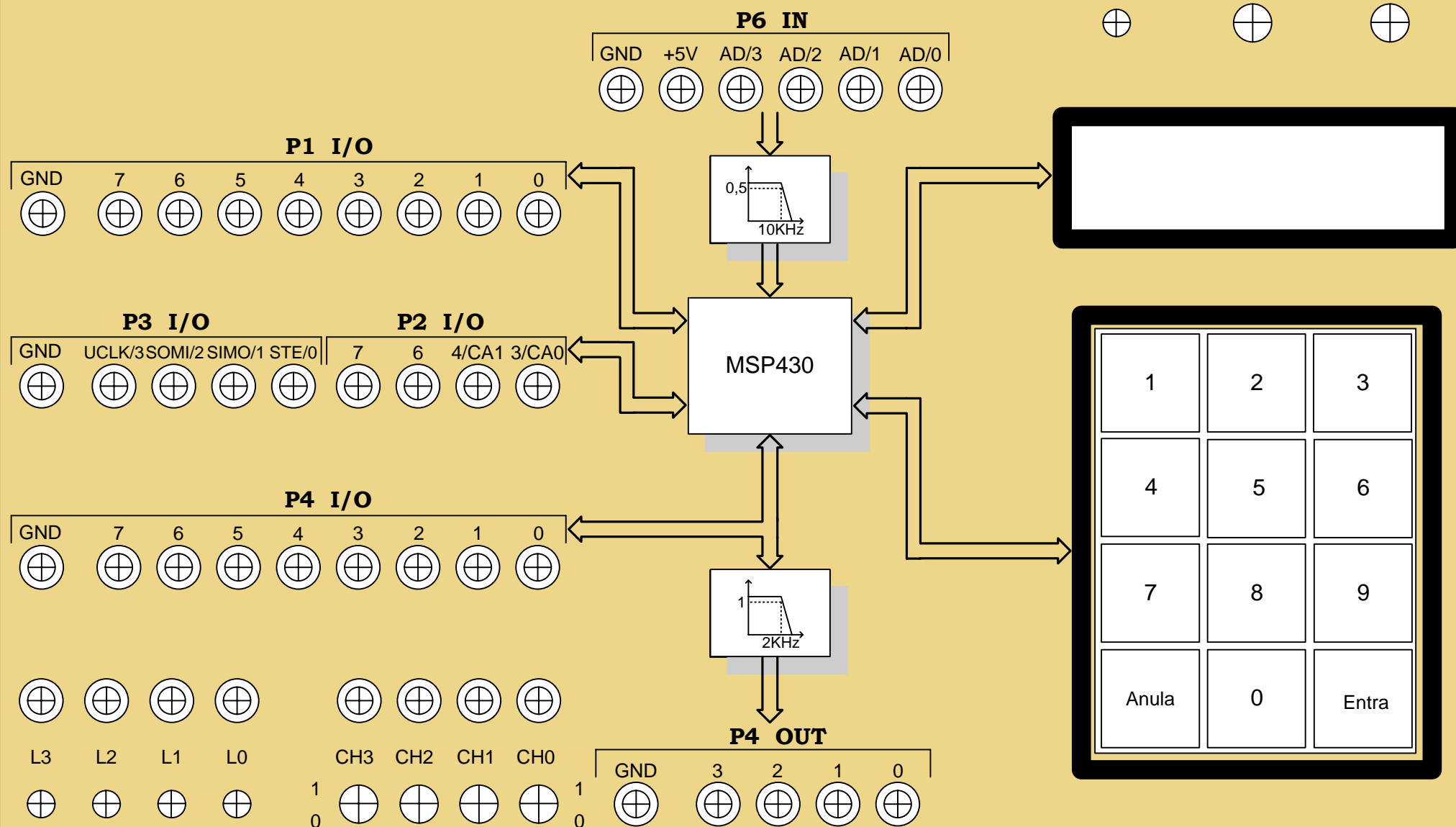


Laboratórios de
Eletrônica
2003

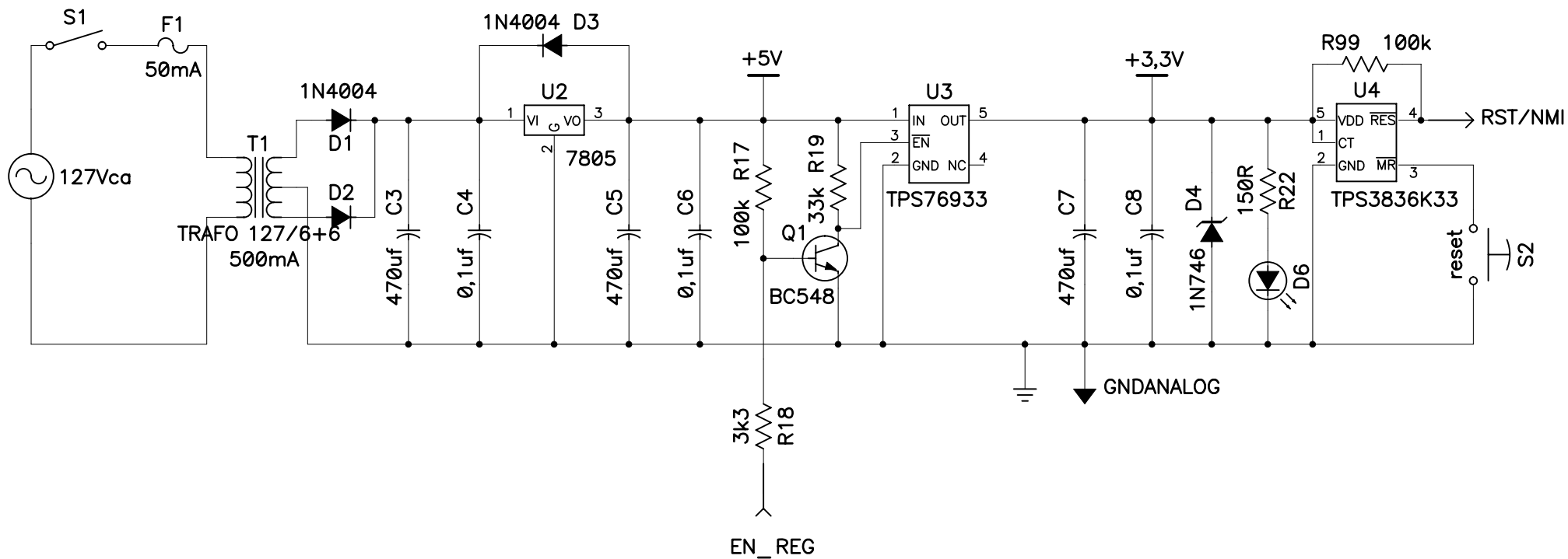
KIT MICROCONTROLADOR MSP430F149

LIGA

RESET

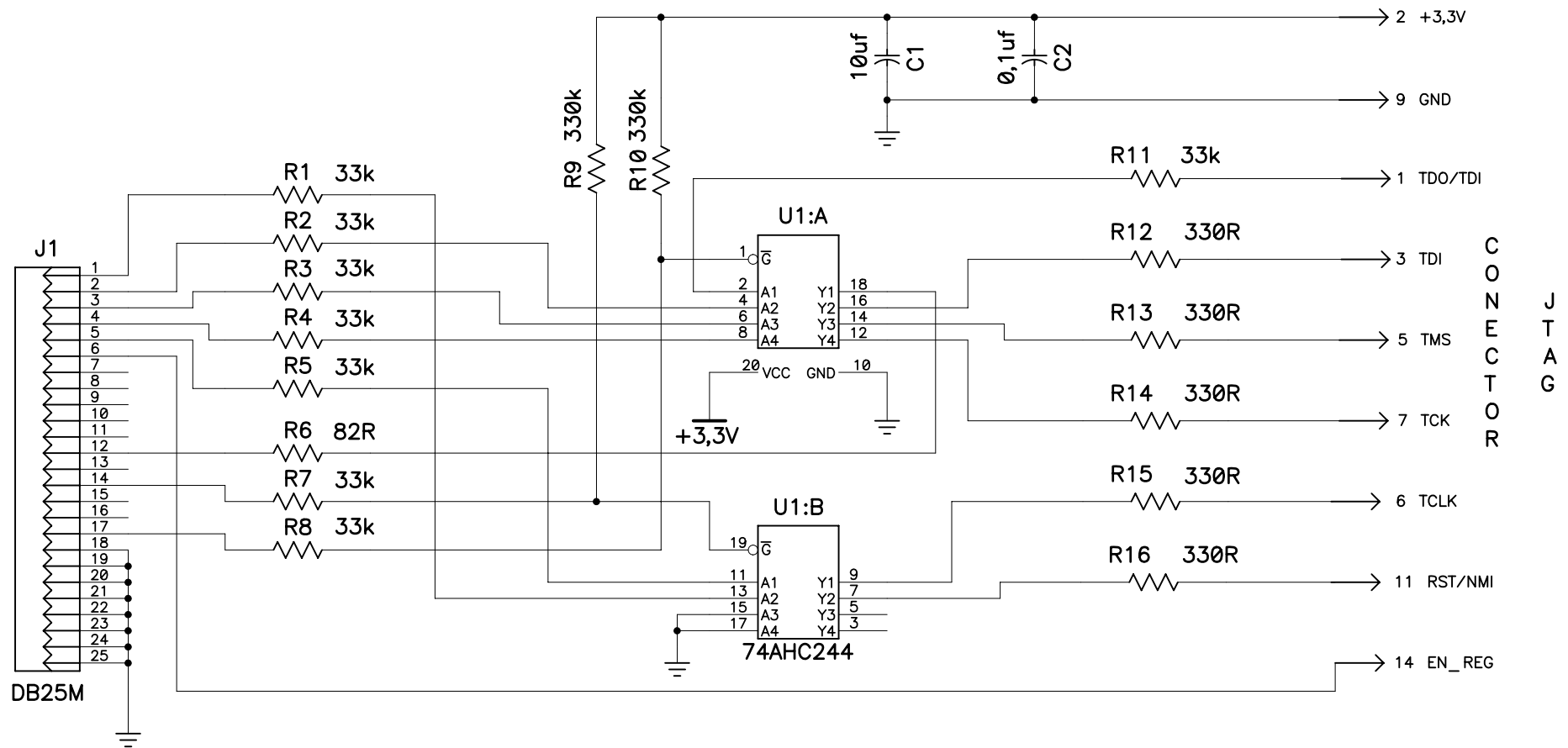


Fonte de Alimentacao



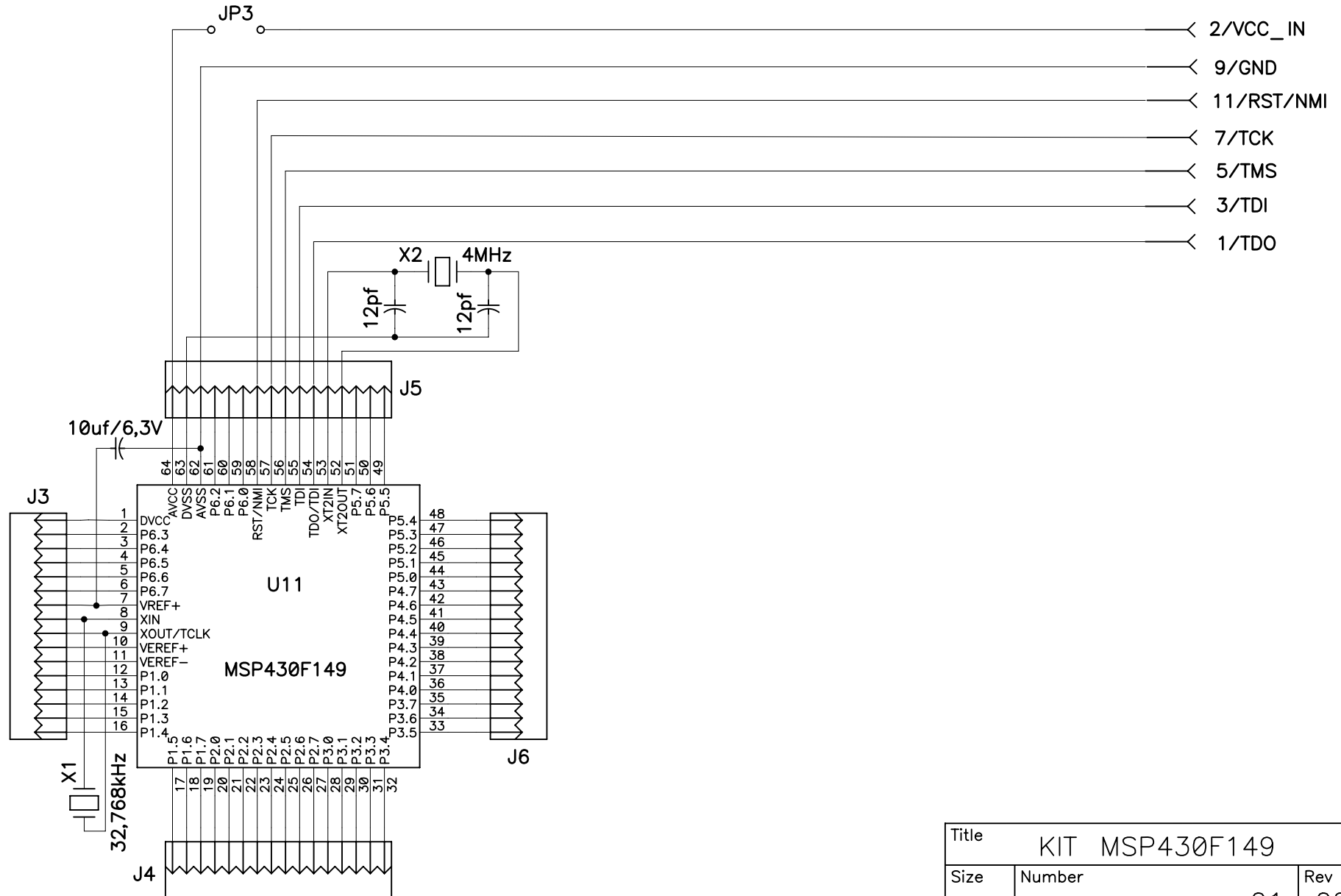
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Adaptador Jtag



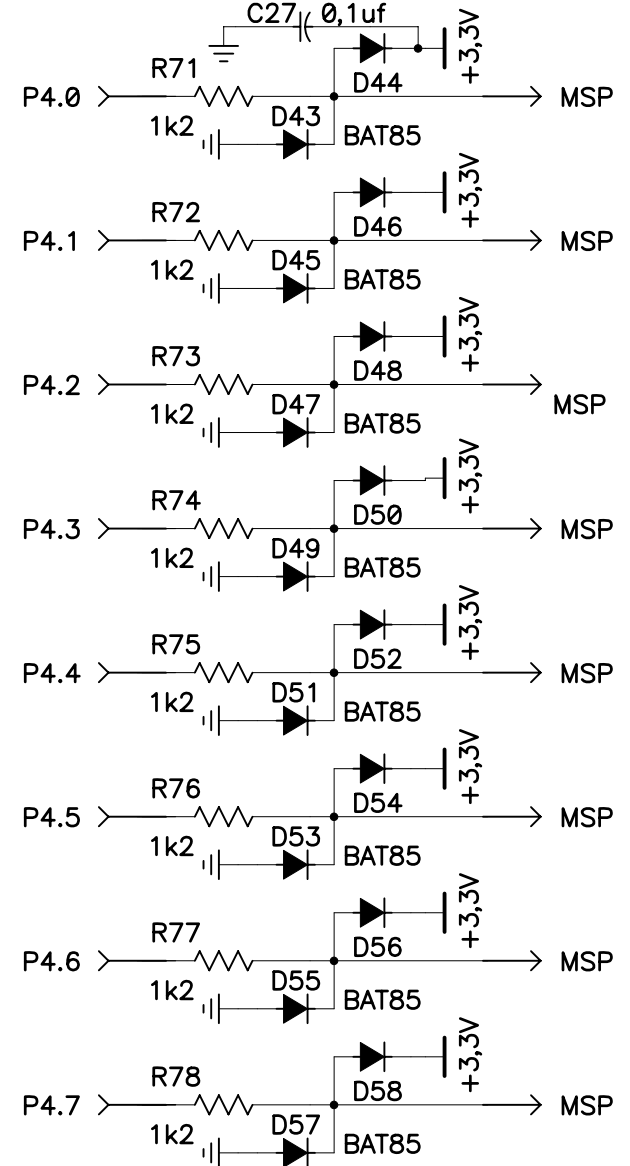
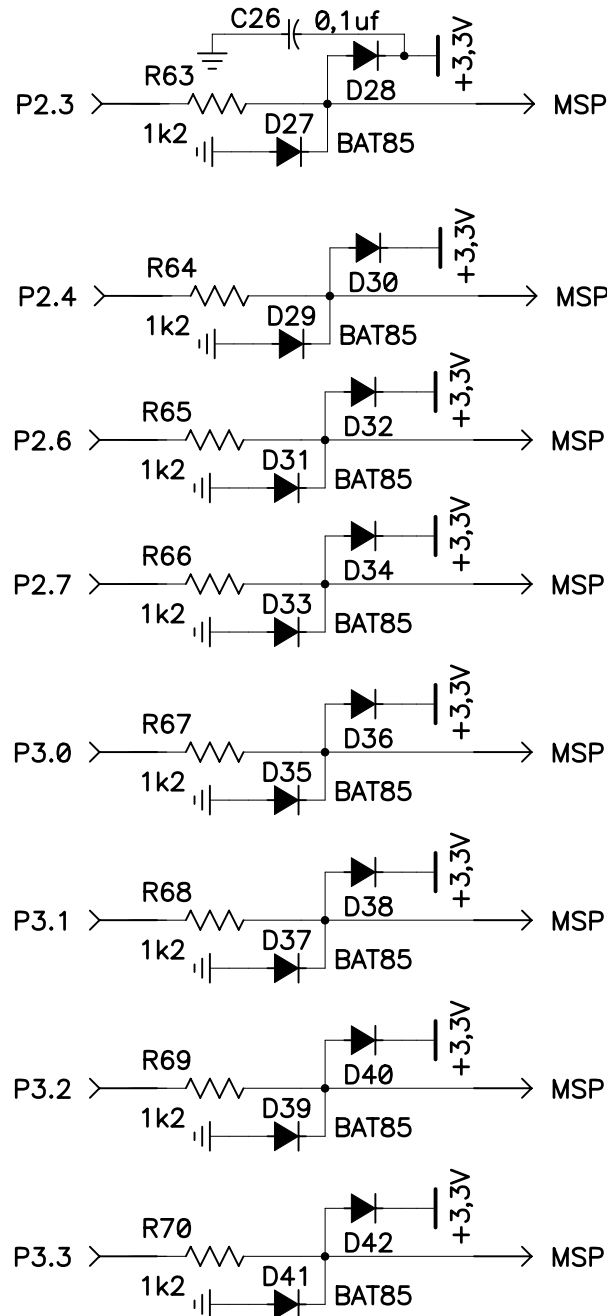
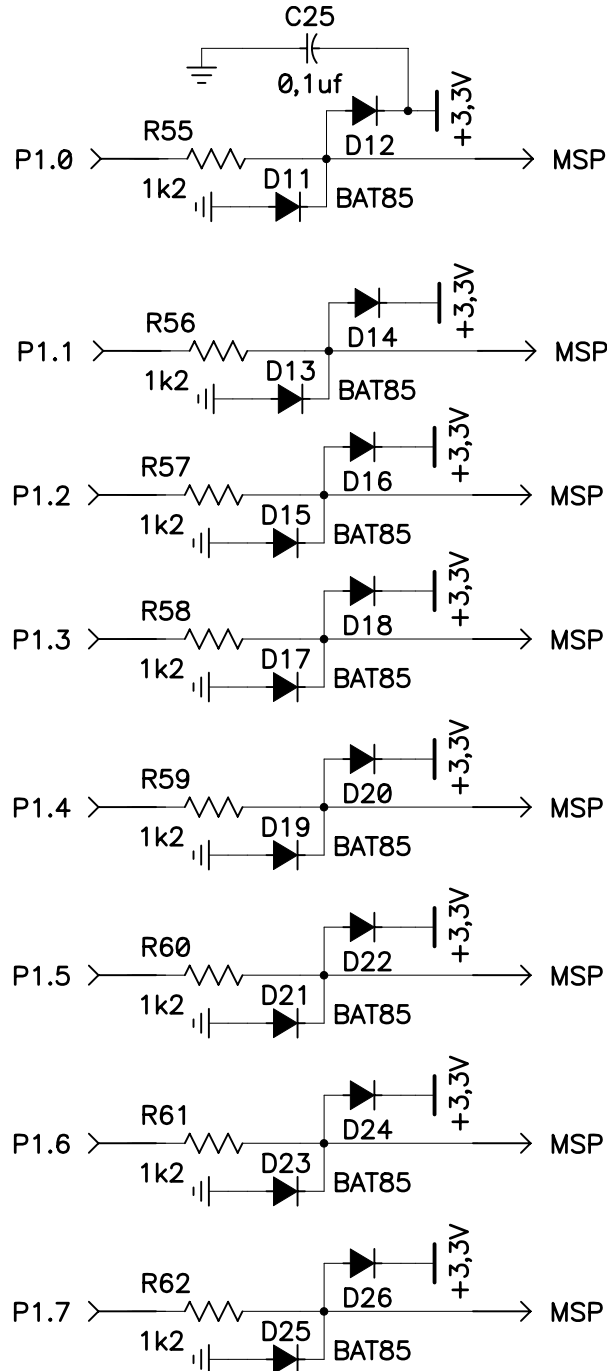
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Fechar se nao usar
fonte externa



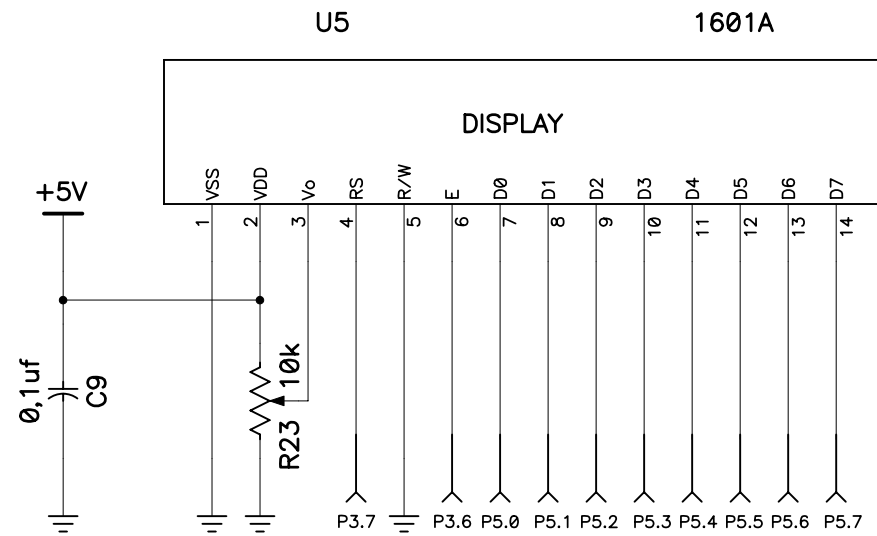
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Entradas e Saídas



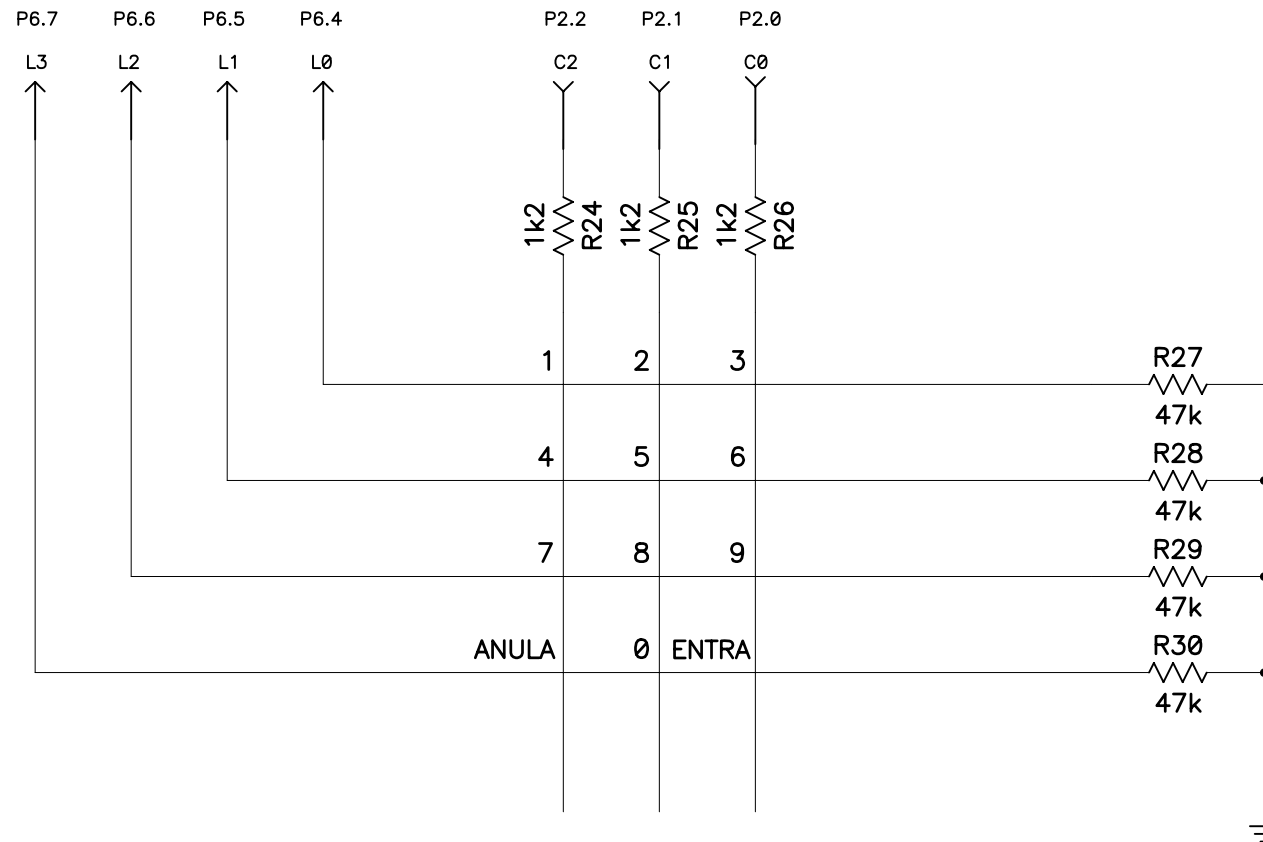
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Display



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Teclado



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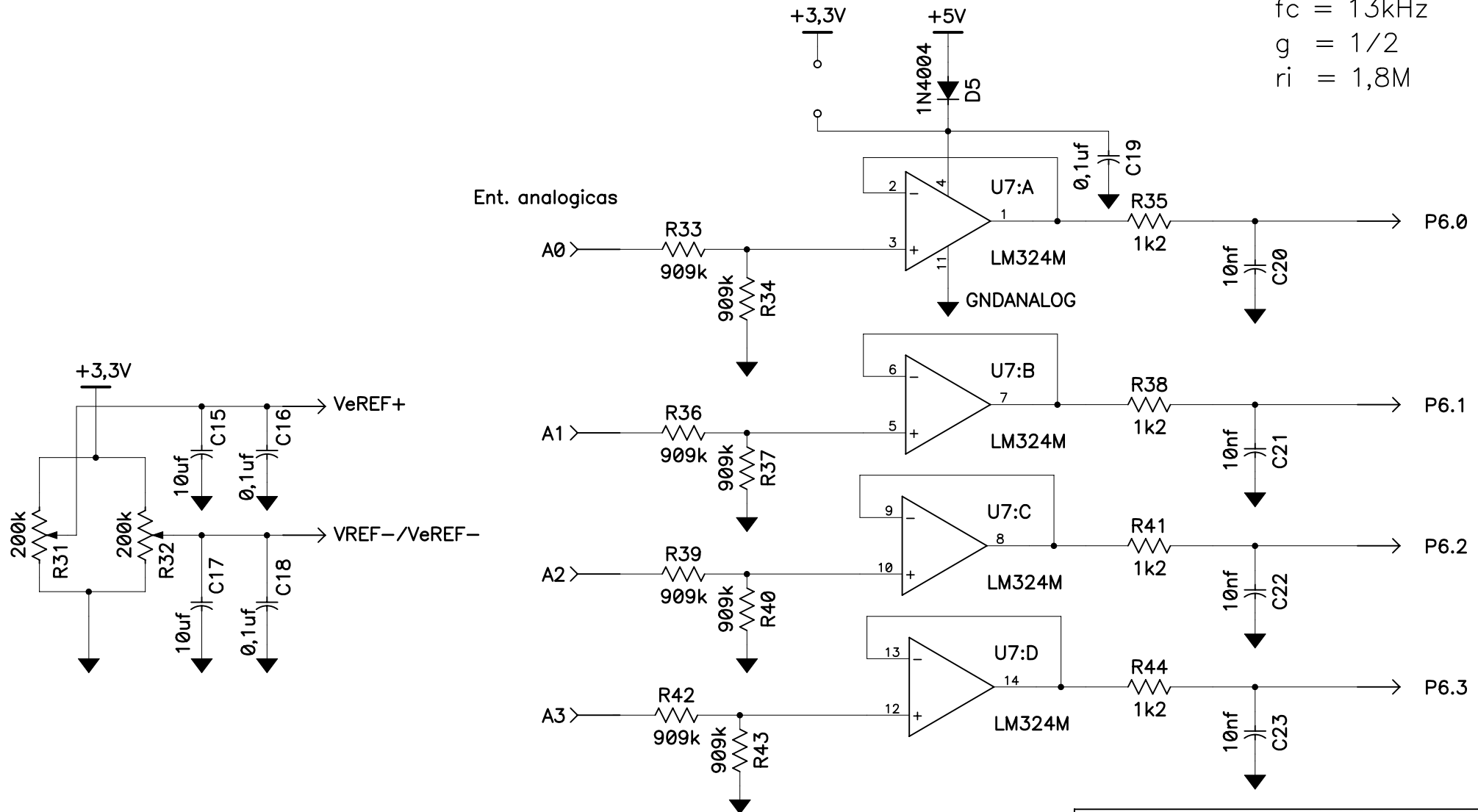
Entradas Analógicas

$$f_c = 1/2\pi RC$$

$$f_c = 13\text{kHz}$$

$$g = 1/2$$

$$r_i = 1,8\text{M}$$



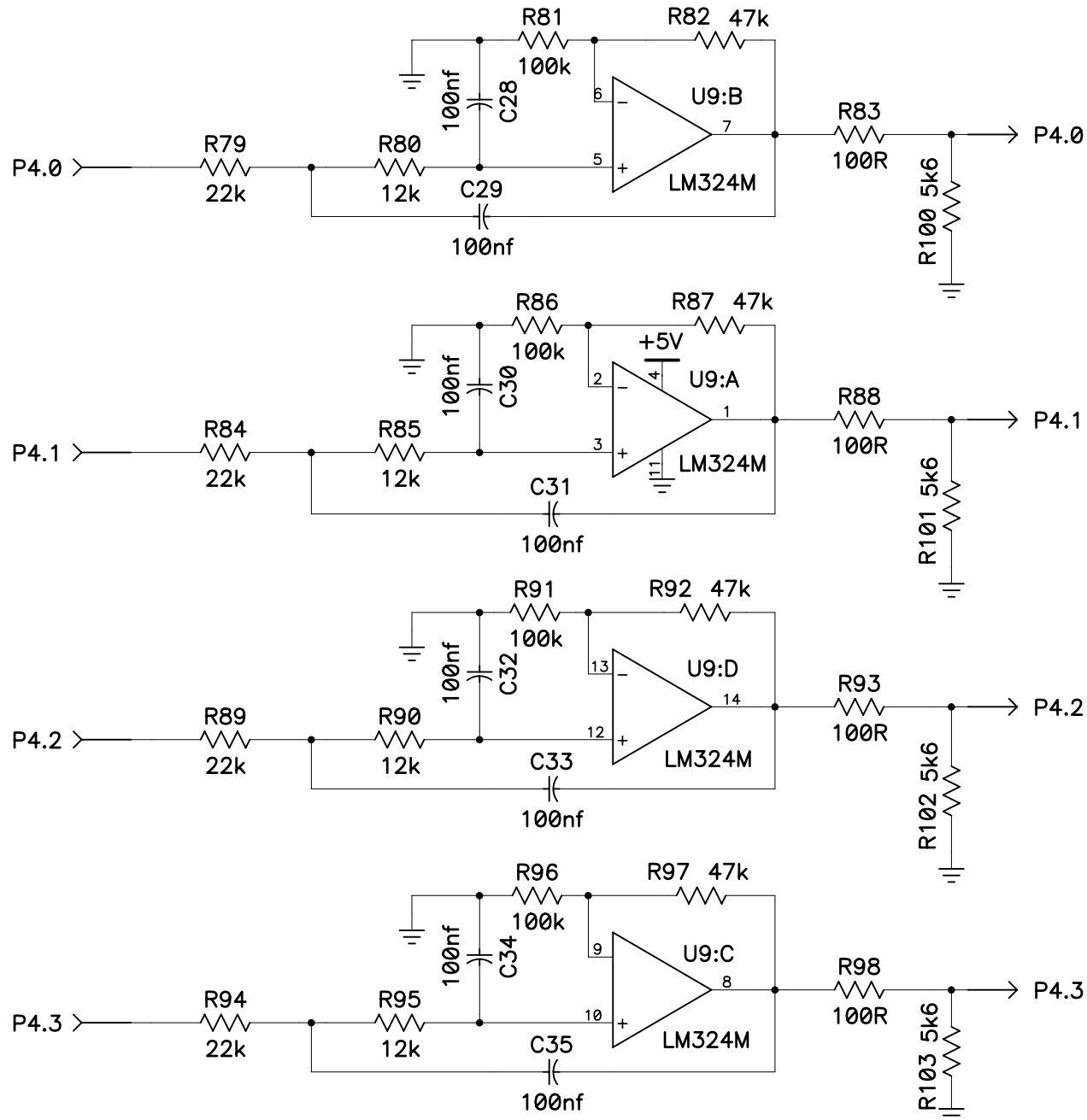
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Saidas Analógicas

Filtro Butherworth - 2º ordem
 $g = (47k + 100k)/100k = 1,47$
 $f_c = 1,3kHz$

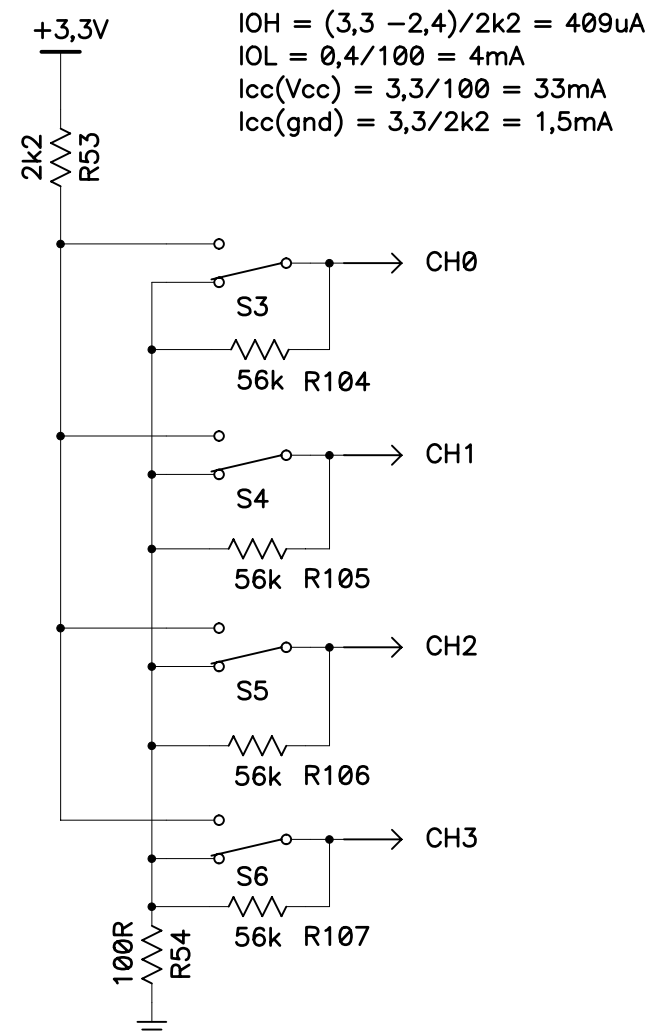
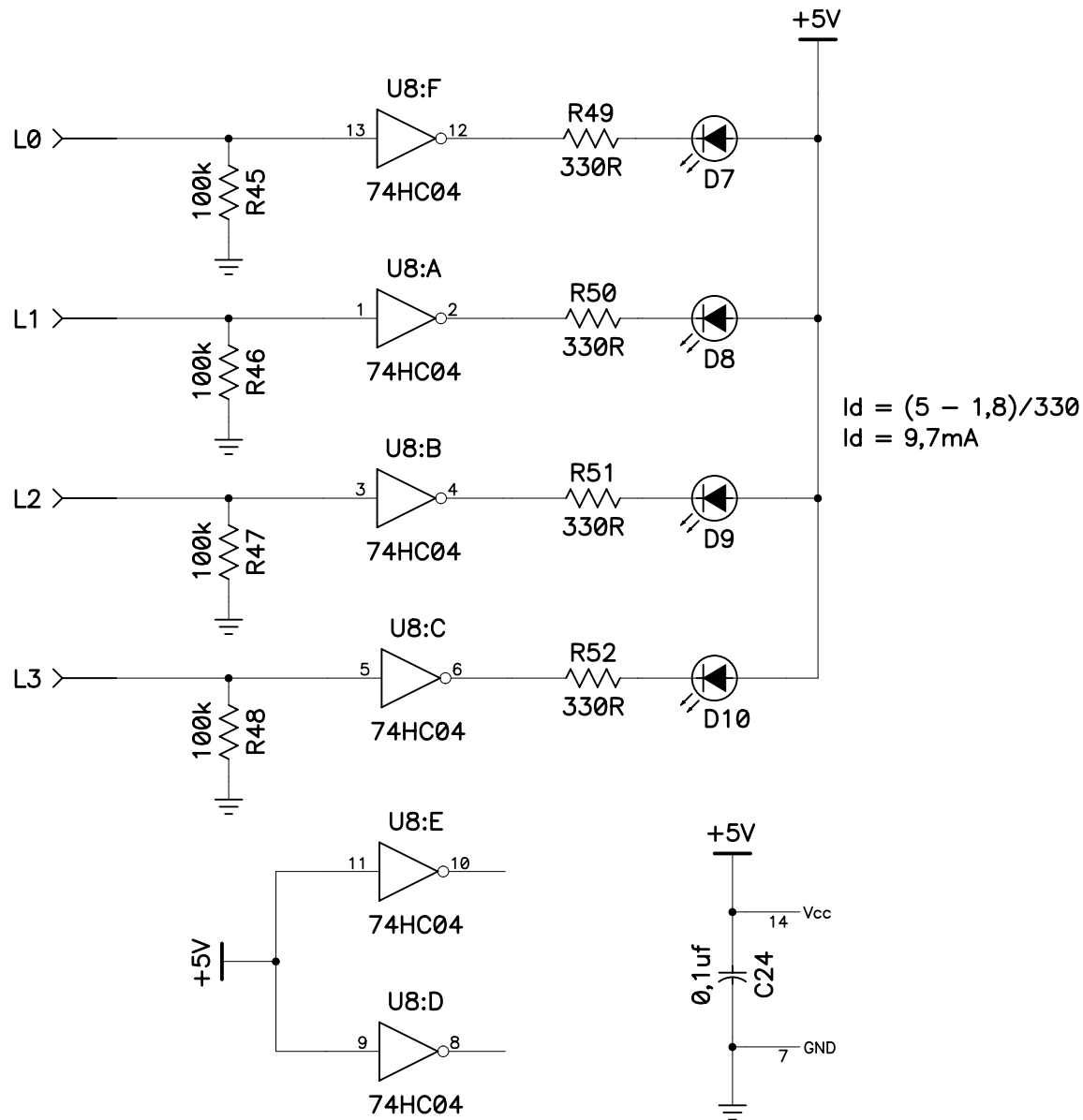
IN

OUT



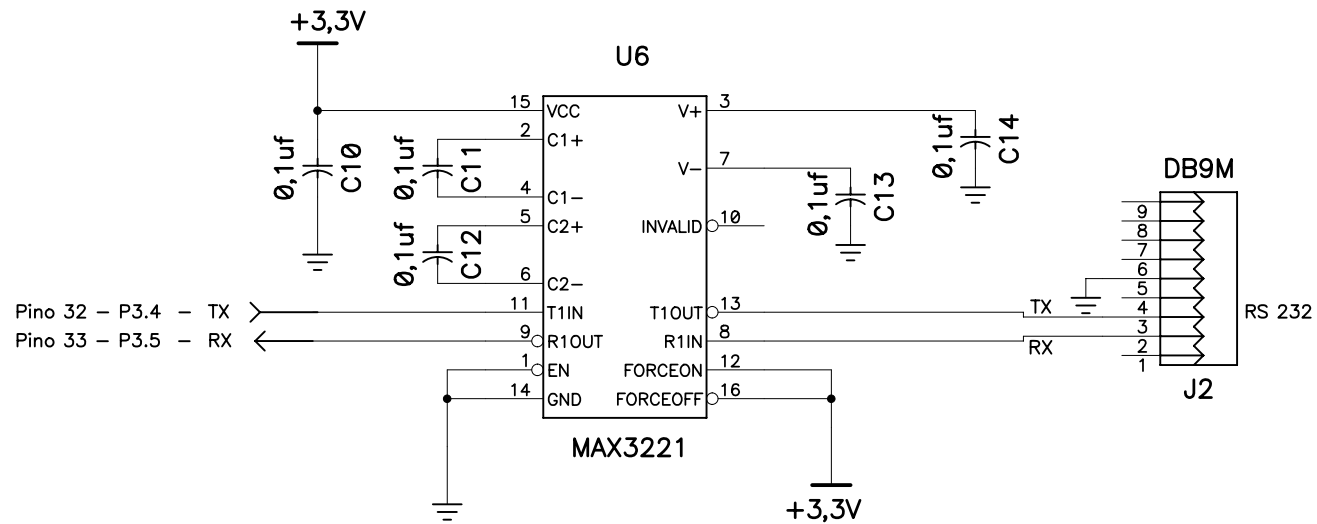
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Leds e Chaves



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Driver Serial



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Calculos

Entradas e saidas

MSP como saida

$$I_{cc} = 3,3 / 1k2 = 2,75mA$$

$$I_{OHmax} = (3,3 - 2,4) / 1k2 = 750uA$$

$$I_{OLmax} = 0,4 / 1k2 = 330uA$$

MSP como entrada

Entrada = +12V

$$\text{corrente p/ fonte} = (12 - 3,3 - 0,3) / 1k2 = 7mA$$

Entrada = -12V

$$\text{corrente p/ terra} = (12 - 0,4) / 1k2 = 9,6mA$$

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