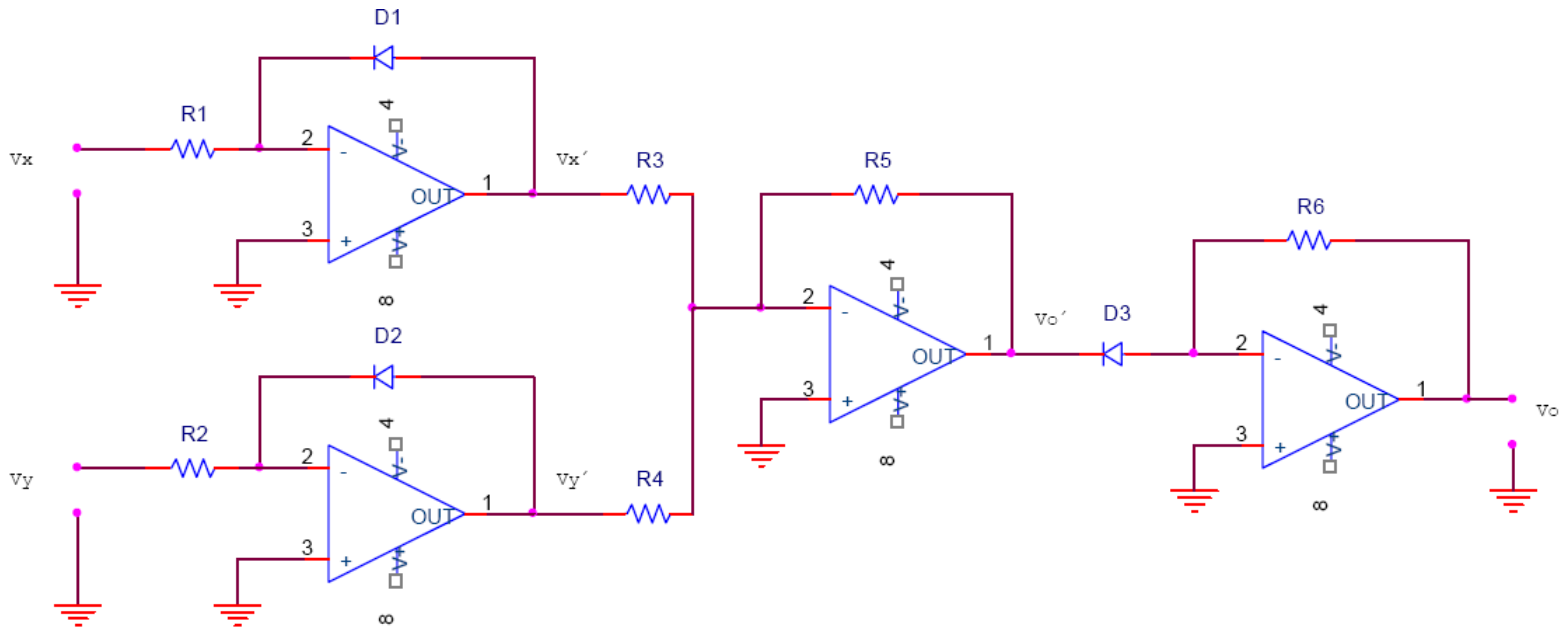
Multiplicador

$$v_o = v_x . v_y$$

$$\ln(v_o) = \ln(v_x . v_y) = \ln(v_x) + \ln(v_y)$$

$$e^{\ln(v_o)} = e^{[\ln(v_x)+\ln(v_y)]} = v_o$$

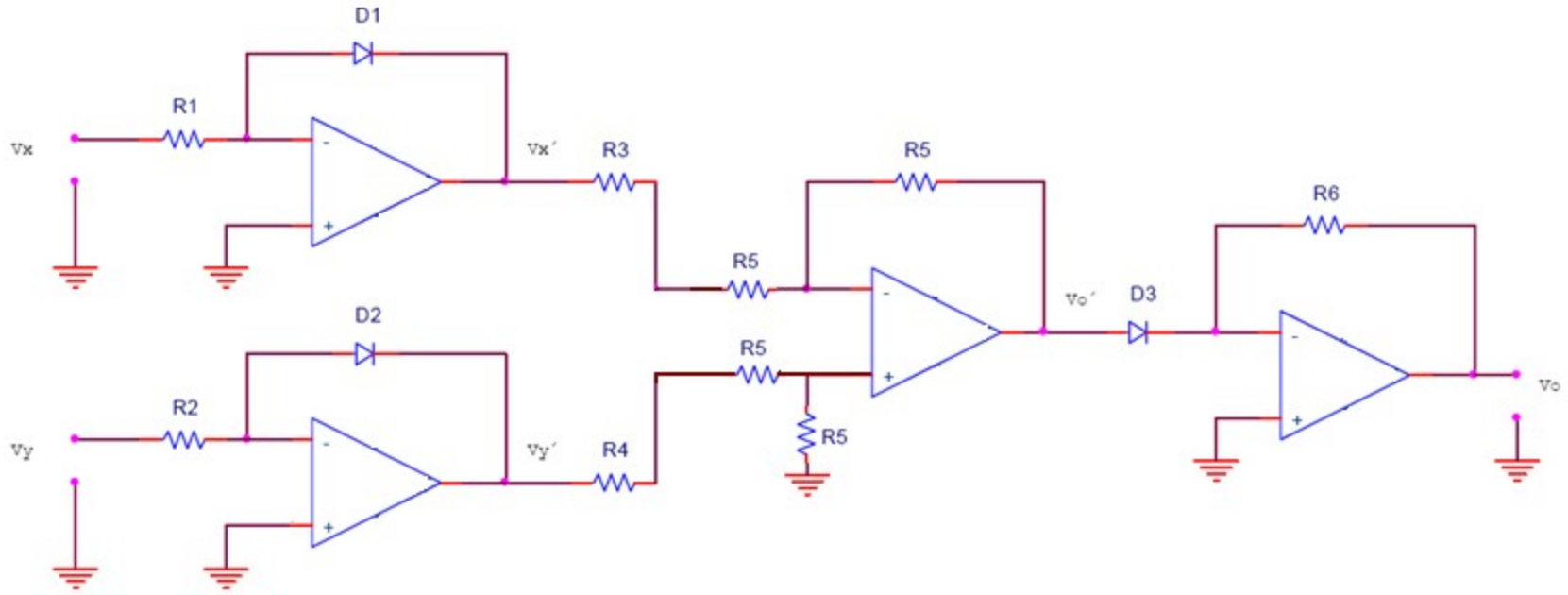


Divisor

$$v_o = v_x / v_y$$

$$\ln(v_o) = \ln\left(v_x / v_y\right) = \ln(v_x) - \ln(v_y)$$

$$e^{\ln(v_o)} = e^{[\ln(v_x) - \ln(v_y)]} = v_o$$

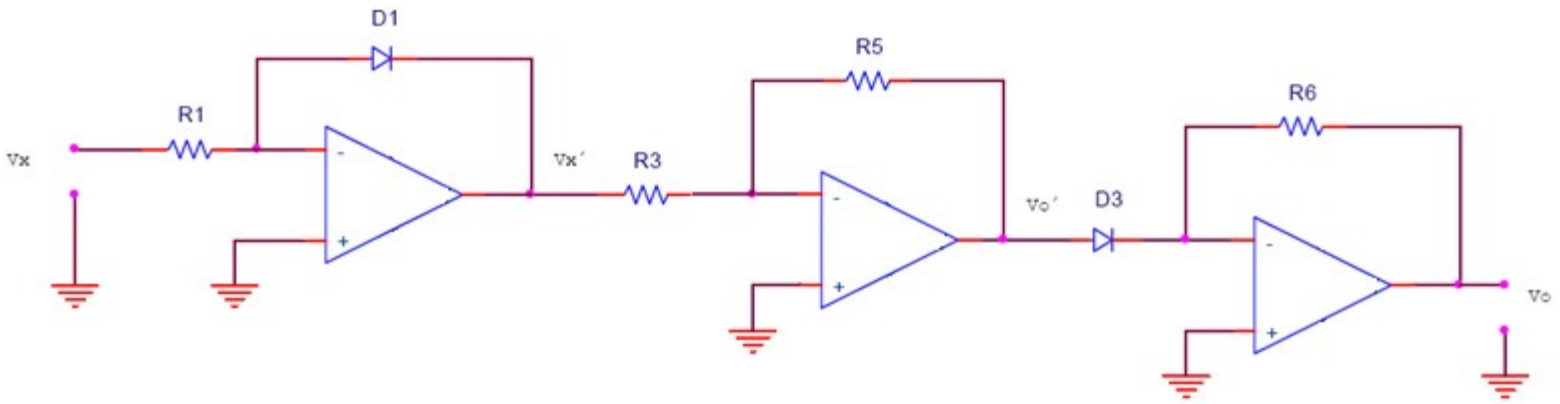


Radiciação

$$v_o = \sqrt[n]{v_x} = v_x^{\frac{1}{n}}$$

$$\ln(v_o) = \ln\left(v_x^{\frac{1}{n}}\right) = \frac{1}{n}\ln(v_x)$$

$$e^{\ln(v_o)} = e^{\left[\frac{1}{n}\ln(v_x)\right]} = v_o$$



Operadores Multifunção

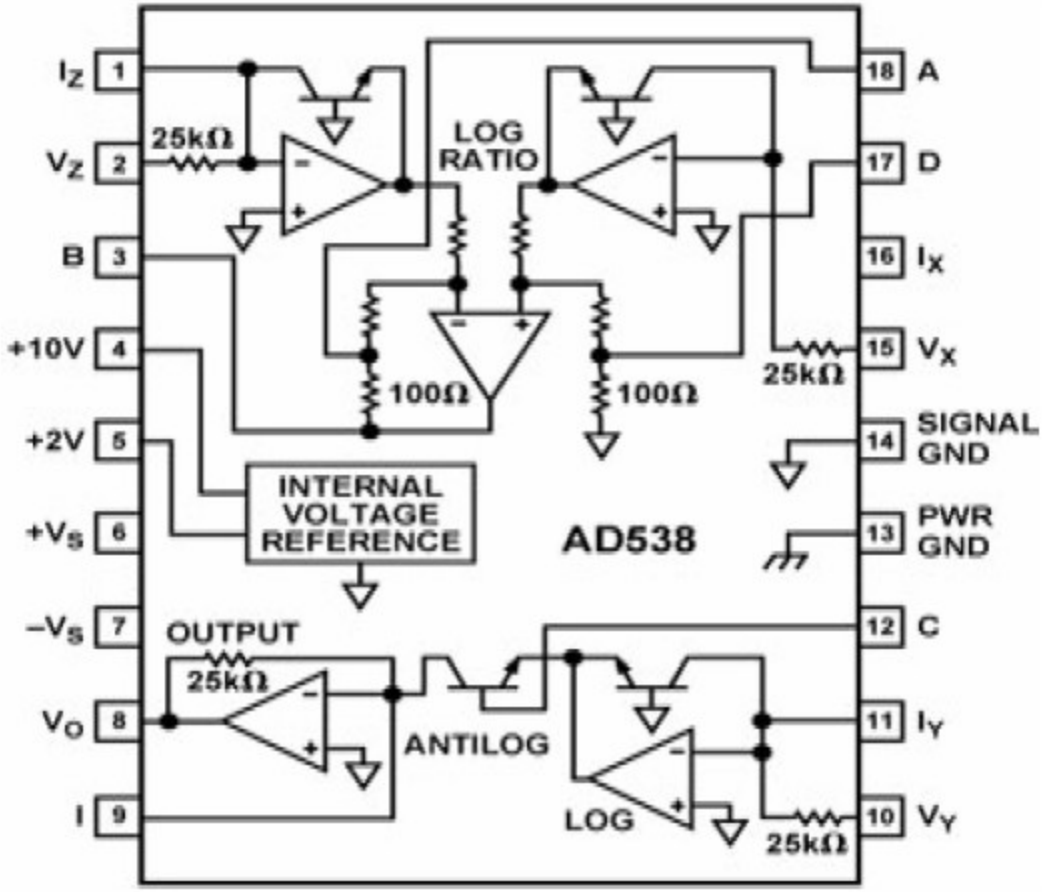
São circuitos integrados capazes de processar eletricamente a seguinte equação matemática:

$$v_o = K.v_y\left(\frac{v_z}{v_x}\right)^m$$

Exemplos de CI´s comerciais:

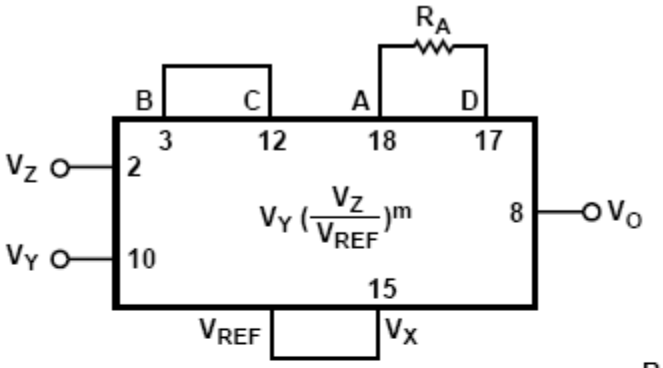
- LH094 (Nacional) ;
- AD433 (Analog Devices);
- AD538 (Analog Devices).

Diagrama em blocos do circuito operador multifunção AD538



$$V_O = V_Y \frac{V_Z}{V_X}, \; para \; V_C = V_B$$

Configurações para potenciação e radiciação

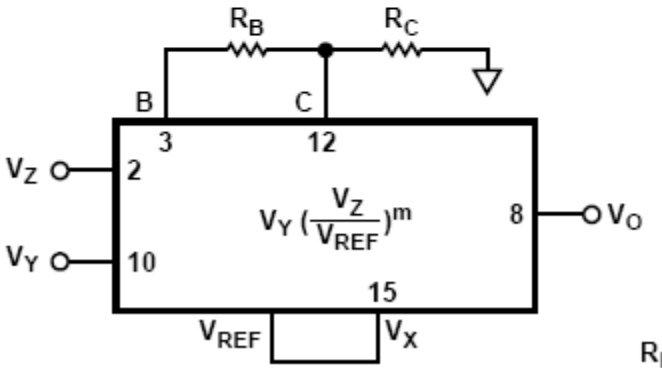


POWERS

m	R_A
2	196Ω
3	97.6Ω
4	64.9Ω
5	48.7Ω

$$R_A = \frac{196\Omega}{M-1}$$

$$R_B = R_C \leq 200\Omega$$



ROOTS

m	R_B	R_C
1/2	100Ω	100Ω
1/3	100Ω	49.9Ω
1/4	150Ω	49.9Ω
1/5	162Ω	40.2Ω

$$\frac{R_B}{R_C} = \frac{1}{M} - 1$$