

filter_z3_p3.gce

Attributes

```
mainvars: x y
stparams:
+   x_sv=0 x1_sv=0 x2_sv=0
+   y_sv=0 y1_sv=0 y2_sv=0
igparams:
iparms:
rparams:
+   a0=1 a1=1 a2=1 a3=1
+   b0=1 b1=1 b2=1 b3=1
+   f0=0.15915
```

Description

filter_z3_p3.gce satisfies the s -domain relationship,

$$y(s) = \frac{a_0 + a_1 s + a_2 s^2 + a_3 s^3}{b_0 + b_1 s + b_2 s^2 + b_3 s^3} x(s).$$

f0 specifies the frequency value to be used for scaling of the filter coefficients, the default value being $1/2\pi$ Hz. The start-up parameters **x_sv**, **x1_sv**, **x2_sv**, **y_sv**, **y1_sv**, and **y2_sv** provide the starting values for x , dx/dt , d^2x/dt^2 , y , dy/dt , and d^2y/dt^2 , respectively, in start-up simulation.

Note that there are two options for assigning the filter coefficients:

- (a) Enter coefficients for $\omega_c = 1$ rad/s and then enter the actual (desired) f_c in Hz.
- (b) Enter coefficients as required for the desired f_c but leave the default value of f0 unchanged.

In the first case, the coefficients will be changed internally; in the second case, they will be taken as assigned by the user.

In AC analysis, the above equation holds (with $s = j\omega$).