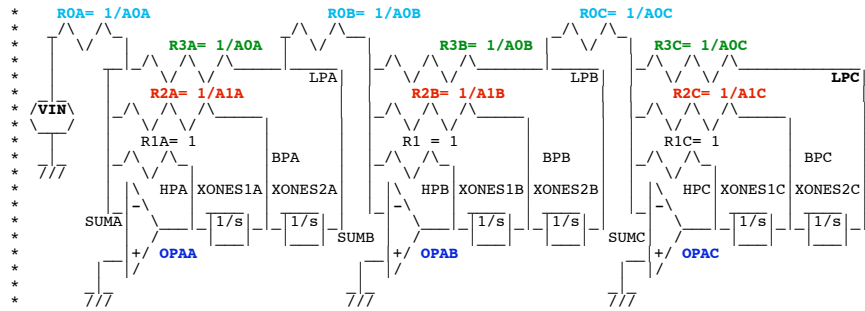


Bessel_6P_State_Variable

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 * 4/15/08



Bessel terms

$$(s^2 + 1.861s + 3.63) * (s^2 + 2.76s + 2.85) * (s^2 + 3.143s + 2.57)$$

```

.OPTIONS GMIN=1e-18 METHOD=trap srcsteps = 1 gminsteps = 1
*****
V IN VIN 0 PWL( 0 0 2 0 2.05 1 2.1 1 2.15 0 15 0 15.5 1 30 1 30.5 0) AC = 1
ROA VIN SUMA .333
R1A SUMA HPA 1
R2A SUMA BPA .54
R3A SUMA LPA .333
XOPA1A SUMA 0 HPA OPA
XONES1A HPA BPA ONE_S
XONES2A BPA LPA ONE_S
ROB LPA SUMB .35
R1B SUMB HPB 1
R2B SUMB BPB .362
R3B SUMB LPB .35
XOPA1B SUMB 0 HPB OPA
XONES1B HPB BPB ONE_S
XONES2B BPB LPB ONE_S
ROC LPB SUMC .389
R1C SUMC HPC 1
R2C SUMC BPC .318
R3C SUMC LPC .389
XOPA1C SUMC 0 HPC OPA
XONES1C HPC BPC ONE_S
XONES2C BPC LPC ONE_S
  
```

A Bessel is Best for Low Phase Distortion

```

.control
set outfile = "transTest.txt"
*op
tran 1 40 0
run
plot -1*lpc vin
ac dec 500 .01 10
run
plot db(lpc)
.endc
.SUBCKT OPA INP INN OUT
*E_GAIN# NODE_P NODE_N CNTL_P CNTL_N GAIN
*R_NUMB NODE1 NODE2 RVALUE
*C_NUMB NODE1 NODE2 CVALUE
EGN1 O1 0 INP INN -1
EGN2 OUT 0 IP 0 -1000000
R1 O1 IP 10k
C1 OUT IP 10p
.ends
.SUBCKT ONE_S IN OUT
*E_GAIN# NODE_P NODE_N CNTL_P CNTL_N GAIN
*R_NUMB NODE1 NODE2 RVALUE
*C_NUMB NODE1 NODE2 CVALUE
EGN1 O1 0 IP 0 -1000000
EGN2 OUT 0 O1 0 -1
R1 IN IP 1
C1 IP O1 1
.ends
  
```


Graph 30 - ac31: Bessel_6P_State_Variable

