

Math to change the tuning range of the Hall notch filter in the EDN article from the given 750Hz – 1.5KHz to a new tighter 900Hz – 1.2KHz.

Agdr 1/22/2017

From the EDN paper:

<http://electronicdesign.com/analog/rediscover-truly-tunable-hall-network>

Desired tuning range = 900Hz to 1.2KHz (EDN range = 750Hz to 1.5KHz)

Tuning ratio = 1200Hz / 900Hz = 1.333333 (EDN ratio = 2)

TF(low) = 0.7 (same as EDN)

TF(high) = 0.863146 from EDN eq #6 [EDN TF(high) = 0.944410]

Rp exact = 9,487 ohms from EDN eq #7, round to 10K (same as EDN)

R(total) = 61,295 ohms from EDN eq #8 [EDN R(total) = 40,917 ohms] Note: have to carry out to 6+ digits past the decimal like this to get his number.

RA = 42,907 ohms from EDN eq #9 (EDN RA = 28,642 ohms)

RB = 8,388 ohms from EDN eq #10 (EDN RB = 2291 ohms) NOTE: now here he switches to 3 places behind the decimal. Geezzzz.... I'm retaining 6 places in mine to be consistent.

RA standard value = 43K [RG2012P-433-B] (EDN standard value = 27K)

RB standard value = 8.45K [ERA-6AEB8451V] (EDN standard value = 2.2K)

Actual tuning ratio using standard values from EDN eq #11 = 1.33096=1.33 (EDN actual tuning ratio = 2.01)

C = 3.625nF, standard value = 3.6nF [GRM2165C1H362JA01D] (EDN = 6.75nF, standard value 6.8nF)

R3 = 368,700 ohms. Using 50K pot, $\frac{1}{2}$ = 25K. R3(low) = 343,700 ohms. Standard value = 348K [ERA-6AEB3483V] (EDN R3 = 235K = 220K + 50K pot)

