Subject: Power Handling of individual components
Posted by Adrian Mack on Thu, 22 May 2003 12:21:30 GMT
View Forum Message <> Reply to Message

Hey Wayne.Sorry for asking all these questions, I bet your sick of me by now :PI have carefully read the power handling section of the speaker crossover document for information on selecting correctly rated caps/resistors/inductors for their power handling. I notice what you've done is used a swept sine wave of 50VRMS (~312Wrms) to take the measurements (312W is HUGE for midrange/tweeter... am wondering why you've used such a high value?). Anyway, my question is, how do I do the sine wave sweep in SPICE so I can analyise the voltage going accross particular components? Also, how do you select which component (EG: C4, R2, etc) that you wish to analysize? (in the diagrams, v6 is used for a number of components). In the example given in the speaker crossover document, it requires 100W or so resistors... a very high value. It does say though that resistors 25 or 50% of the wattage can be used for the tweeter part (not woofer though? :(not much point using smaller ones for the tweeter then if thats so, because you'd need to get 100W ones for the rest of the circuit anyway). Parts Express has resistors with maximum power of 20W, but dont come in many values. They are wirewound type, this is OK?What exactly

different circuits?BTW: For the other 8db attenuation for the midrange (4ohm resistor in series then parallel with midrange), how can I determine what components for maximum power handling I would need. Do I need to make a SPICE model of them? Again, sorry for all the questions. Its all in the spirit of DIY though :D Thanks!Adrian

Subject: Re: Power Handling of individual components
Posted by Wayne Parham on Thu, 22 May 2003 18:20:07 GMT
View Forum Message <> Reply to Message

Hi Adrian!You wrote:>> I notice what you've done is used a swept sine wave of 50VRMS>> (~312Wrms) to take the measurements (312W is HUGE for>> midrange/tweeter... am wondering why you've used such a high value?).The crossovers are used with speaker motors that handle up to 1000 watts. So this voltage was chosen because it represents a level that is commonly presented to these crossovers. It shows the power curve for each part too, which is what I most wanted to show. It is interesting that power handling requirements aren't specific values, but rather are a function of frequency and are different for each part.>> Anyway, my question is, how do I do the sine wave sweep in SPICE>> so I can analyise the voltage going accross particular components?When you do AC analysis, it asks a range of frequencies to chose. Your earlier model of the crossover used this same sort of thing to make the response graph.>> Also, how do you select which component (EG: C4, R2, etc) that you>> wish to analysize? (in the diagrams, v6 is used for a number of>> components).Instead of plotting V1 and V6 (the woofer and tweeter) you may choose to plot the voltage across any other part.In the example given in the speaker crossover document, it requires 100W or so resistors... a very high value. It does say though that resistors 25 or 50% of the wattage can be used for the tweeter part (not woofer though? :(not much point using smaller ones for the tweeter then if thats so, because you'd need to get 100W ones for the rest of the circuit anyway). Parts Express has resistors with maximum power of 20W,

but dont come in many values. They are wirewound type, this is OK?I'd suggest you use non-inductive resistors. Parts Express has 10 watt, 100 watt and 200 watt non-inductive

Wouldn't this be different for different circuits?The formula describes the relationship between inductance, frequency and impedance. So if you know the inductance of a coil and the frequency you will present to it, the formula will tell you its impedance. You can also rearrange the formula to find any other term you wish.>> For the other 8db attenuation for the midrange (4ohm resistor in>> series then parallel with midrange), how can I determine what>> components for maximum power handling I would need. Do I need to>> make a SPICE model of them?You could. You could also calculate it by hand - There are formulas for power distribution in the "Pi Alignment Theory" document. These are standard formulas, so you can also find them in any electronics textbook.Wayne