Subject: measurement questions
Posted by artsybrute on Tue, 26 Aug 2003 17:06:02 GMT
View Forum Message <> Reply to Message

Hi Wayne,Some questions regarding measuring speaker parameters:1. "So simply measure the DC resistance of the driver with an ohmmeter, and use the impedance found when measuring the driver's resonant frequency for Zmax." I'm missing something here. All the tests until this point seem to give frequencies, not impedances. How do I determine the impedances Zmax and Zmin?2. It seems that the scope is used to determine highest voltage and .707 times that. Can I just use a voltmeter instead?3. When taking these measurements, is there a way to determine the speaker sensitivity? Should I just use an SPL while running the 1 volt RMS with the resistor? Will sensitivity change unequally for the drivers due to their different ensclosure volumes?TIA

Subject: measurement answers
Posted by Wayne Parham on Tue, 26 Aug 2003 18:00:33 GMT
View Forum Message <> Reply to Message

What we're looking for are impedance values at specific frequencies. So, for example, DC resistance is impedance at 0Hz and Zmax is impedance at the resonant frequency. Zmax is described by a frequency and an impedance. If you measure voltage with a scope, you'll see peak values and can find RMS by multiplying by 0.707. If you measure with a DVM, you'll read RMS values and can calculate peak by dividing by 0.707. As for SPL, sure, you can put a microphone 1 meter away and supply a 2.83v test signal to find the 2.83v/M level, or whatever levels you wish. But below 100Hz, the cabinet will have a lot of influence so keep that in mind. For that matter, so will the room unless you do the acoustic measurements outdoors.

Subject: Re: measurement answers
Posted by artsybrute on Tue, 26 Aug 2003 18:02:10 GMT
View Forum Message <> Reply to Message

I guess I'm a bit thick."What we're looking for are impedance values at specific frequencies. So, for example, DC resistance is impedance at 0Hz and Zmax is impedance at the resonant frequency. Zmax is described by a frequency and an impedance."OK, I can determine the frequency but how do I find the impedance?

Subject: Re: measurement answers
Posted by Wayne Parham on Tue, 26 Aug 2003 18:37:37 GMT
View Forum Message <> Reply to Message

Impedance can be found by measuring the voltage across the speaker motor and calculating the current through the circuit. This reactive circuit (inductance and resistance) forms a voltage divider, so you can use Ohms law and reactive circuit formulas to determine the impedance of the motor. Please see the Crossover Electronics 101 handout for these formulas and more information.

Subject: it's Greek to me
Posted by artsybrute on Tue, 26 Aug 2003 19:11:32 GMT
View Forum Message <> Reply to Message

Hey, I'm just a hobbyist trying to build a speaker."Impedance can be found by measuring the

inductive circuits. I assume I find resonance (and from this paper I understand that resonance is where inductive reactance and capacitive reactance are equal), then plug the values into that formula. But I don't know the inductance. Furthermore, from I=E/Z, we can derive Z=E/I. Fine. The signal generator I ordered puts out 1.2V RMS. I don't know the current it puts out.I'm to put a 10 ohm resistor in series with the speaker coil. Am I to break the circuit at Zmax and Zmin and measure current draw with a milliameter?Do I then measure voltage drop across the coil once I reconnect the circuit?"This reactive circuit (inductance and resistance) forms a voltage divider, so you can use Ohms law and reactive circuit formulas to determine the impedance of the motor."We put the resistor in series with the coil. I don't understand how this is a voltage divider. Where are we dropping the divider to ground?These questions certainly must seem naive to you, but again, I'm a hobbyist who just wants to build a speaker.

Subject: Re: it's Greek to me
Posted by Wayne Parham on Tue, 26 Aug 2003 20:22:31 GMT
View Forum Message <> Reply to Message

voltage across the resistor and find the current through the circuit using Ohm's law, I = E/R. Since it's a series circuit, that will tell you the current through the voice coil. Now measure the voltage across the voice coil at whatever frequency you are interested in. Don't just assume it is the difference between the source voltage and the resistor's voltage drop - it won't be. The coil and resistor are out of phase, so their voltage drops don't equal like in circuits with pure resistance. After finding the voltage across the voice coil and the current flowing through it, you can find its impedance using Ohm's law, Z = E/I. Substitute Z (impedance) for X (inductive reactance) and

Subject: Thanks
Posted by artsybrute on Tue, 26 Aug 2003 20:57:50 GMT
View Forum Message <> Reply to Message

It looks possible for me now.I'll take it a step at a time.Thanks.

Subject: Driver Quality
Posted by toxicport.e on Wed, 27 Aug 2003 03:12:42 GMT
View Forum Message <> Reply to Message

off topic-shiva,tempest,XLS,dpl12 compared on this site.somehow the DPL looks better than shiva i think..are these tests good enough to warrant calling the DPL12 lower distortion?at moment im designing my front chamber /horn expansion twist-change in dimension.>if the DPL12 is less distortion,is it worth choosing it instead of shiva? if i could even order it._Mike

http://www.mfk-projects.com/woofer_data.htm#shiva

Subject: Re: Thanks
Posted by Gabriel on Wed, 27 Aug 2003 13:42:39 GMT
View Forum Message <> Reply to Message

Hi,Please see this link, maybe it can help you out with your measurement, and just the information, all the voltage that used in this link is AC, so you can use AC voltmeter:http://sound.westhost.com/lr-passive.htmRegards,Gabriel

Subject: Thank you Gabriel
Posted by artsybrute on Wed, 27 Aug 2003 22:47:48 GMT
View Forum Message <> Reply to Message

I find the information provided on the site easy to understand. It certainly helps.

---

Subject: Good Luck!! (NT)
Posted by Gabriel on Sat, 30 Aug 2003 14:14:25 GMT
View Forum Message <> Reply to Message

nt

---

Subject: A Note about Measurements
Posted by Wayne Parham on Tue, 02 Sep 2003 18:52:37 GMT
View Forum Message <> Reply to Message

One should be aware that there is some ambiguity involved when using uncalibrated instruments. This is much less a problem when doing simple T/S measurements, because they are really limited to the electrical domain. There is some reflection of the mechanical parameters back through, and in fact, it is that which makes T/S measurements possible. But since the acoustic domain isn't measured, this is a whole level of setup complexity and accuracy that isn't required for the measurements to be reliable. Good electrical equipment is all that's required, and no calibrated microphones or acoustical measuring systems are needed.Still, the point I wanted to make is that handheld DVM's are really not particularly accurate. So much of the time, what is available to the do-it-yourself builder is not really very precise, and the results obtained are then somewhat ambiguous. These are good for ball-park readings, but one would be well-advised to consider the possibility of error.This fall, I'm planning to do an exercise where I'll measure the T/S parameters of speakers with the sealed box and added-mass methods and using various instruments. The idea is to compile a chart of values for comparison using oscilloscopes and DVM's of various qualities. So this should be an interesting exercise and will help to quantify the ambiguity of budget measurements.

---