Subject: Measurement equipment and software
Posted by Wayne Parham on Sun, 02 Dec 2001 01:59:16 GMT
View Forum Message <> Reply to Message

I suggest using the Woofer Tester from Parts Express or Speaker Workshop from Audia. You can also measure them yourself using the following technique and formulas:You'll need a signal generator and meter or scope. Put a test resistor in series, something between 10 and 1000 ohms.Find Re. It is the DC resistance of the voice coil.Find Fs. It is the frequency where impedance is highest.To find mechanical and electrical Q values, the following formulas are used:Qms = Fs * (Zmax/Re)0.5 / (Fh - Fl)Qes = Qms / (Zmax/(Re - 1))Qts = Qms * Qes / (Qms + Qes)whereFs is the resonant frequency of the speaker in free air (Hz)Zmax is the impedance of the speaker at resonance in free air (ohms)Re is the DC resistance of the voice coil (ohms)Fh is the frequency above Fs where speaker impedance is (Zmax*Re)0.5Fl is the frequency below Fs where speaker impedance is (Zmax*Re)0.5Note: Fl and Fh can also be found at the points where voltage across the test resistor is equal to Vq in the follwing formula:Vq = (Vmax*Vmin)0.5whereVmin is the voltage across the resistor at the speaker's resonant frequencyVmax is the voltage across the resistor at a frequency far from resonanceTo find Vas using the sealed box method, the following formula is used:Vas = Vb((Fb / Fs)2 - 1)whereVb is volume of the sealed cabinet (ft3, m3 or liters)Fb is the resonant frequency of the speaker in the box (Hz)Fs is the free-air resonance of the speaker (Hz)