Subject: Are all screw-on piezo horn drivers similar ?
Posted by freddyi on Fri, 30 Mar 2001 19:32:27 GMT
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Dear Wayne and group -I tested a Chinese piezo driver on an exponential horn having a mouth ~3.5" by 13.5" with a throat to mouth path of about 5.5".the graphs I made on and ~20 degrees off axis show the low end to go to about 2.2Khz then dropping off like a rock below (maybe 8th order? - probably a combo of piezo mechanical resonance and horn cutoff) -a mid power dip around 4Khz then a peak about 12Khz perhaps 9dB followed by a similar amplitude dip - after that the response goes out nicely to 20Khz wihtout much rolloff - the upper peak & dip - maybe result of phase plug?anyhow - do all piezo drivers basically follow this type of response on this type horn? - just curious how to improve these things (I don't think hte heat-sealed driver can be easily disassembled)- the sound is "good' - would think "better" if the piezo driver was more "sophisticated" - but - I think this import driver can sometimes be sourced for $1 - hard to beat at that price!Freddy

Subject: Re: Are all screw-on piezo horn drivers similar ?
Posted by Wayne_Parham on Fri, 30 Mar 2001 22:01:28 GMT
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You mentioned piezo's, and so I grabbed a moment to post a spec sheet. The specs for the KSN 1038, 1041 and 1056 are shown above. Pay particular attention to the frequency response curve and distortion specs - the response is quite linear and distortion at 4v is only about 1%. So even though it's a "cheapie" - its performance is good. It isn't the same as the screw-on units, but thought you might be interested in the data sheet anyway.

Subject: Re: Are all screw-on piezo -thanx Motorola sheet - using piezo w. tube
Posted by freddyi on Fri, 30 Mar 2001 22:33:55 GMT
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Wayne -A Piezo can be quite good - I wouldn't worry about the rising Z using with a tube amp IF its a speaker without an xover on the woofer but has a 'Zoebel" conjugate network on that woofer - then the overall Z seen will be ~ that of the woofer plus conjugate in he xover region.I might want a small resistor in series with the piezo in case the amp doesn't like capacitive loads at HF - what value of series do you suggest? (I think~2 ohm ok without much loss)btw - you can try using a little speaker distribution xformer to get more spl out of the piezo - I think you then need a conjugate RL network to compensate for the capacitive nature - you might get ~105dB sensitivity that way - kinda a hassle when Foster horns are available cheapBest Wishes!!!!!Freddy

Subject: Re: Are all screw-on piezo -thanx Motorola sheet - using piezo w. tube
Posted by Wayne_Parham on Sat, 31 Mar 2001 01:24:43 GMT
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I've seen some implementations of transformers for piezoelectric tweeters but I've never used them because I've always put piezos in entry-level speakers with mid-ninties sensitivity levels.

Subject: More piezo stuff - high order networks, etc.
Posted by Wayne_Parham on Sat, 31 Mar 2001 19:36:48 GMT
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In this case, a capacitive load, series resistance will act as a low pass filter since the motor's impedance at high frequencies is so much lower than it is at low frequencies. In the top octave, the tweeter's impedance gets smaller and smaller, so the voltage divider becomes more and more proportioned towards the series resistance. Still, if the series resistance is small enough, it won't adversely affect performance and will protect the system from very high frequency oscillation.I used to connect 1 ohm, 1/4 watt resistors in series - just for this purpose. It acted as a fuse. And I think two ohms is just as appropriate as one. I don't install this component anymore, but there is no harm in it - and it most certainly does provide protection from UHF oscillation. The only reason I stopped is that I've never blown a quartz tweeter, nor have I ever found an amp that oscillated because of one. But that doesn't mean they can't be blown or that a person can't find an amp that will oscillate from this load. And the tiny added resistance may improve such a situation.

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Paul C. on Thu, 03 May 2001 04:07:34 GMT
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Years ago I had read in Speaker Builder re the KSN1025 (the "2x6" horn) that the frequency response was fairy good. In fact, my own listening tests, no equipment, seem to agree. This is the driver that rolls in about 1800 hz.The driver used in the other Motorolas (such as KSN1005), the ones that roll in around 3.5 khz use a driver whose diaphragm is connected to the piezo element via a small metal lever, and this lever apparently resonates around 5K... giving a harsh one note cymbal tone.The larger driver in the KSN1025, and there is a screw on driver only version, has the diaphragm, or cone, glued directly to the piezo element. Anyway, it is a much smoother sounding horn.I have had several of these burn out in PA speakers. The amp was a

240 series Peavy PA head. Generally Peavey stuff is well designed, so I don't know if there is an inherent occillation problem. We were occasionally picking up two-way radio signals over the PA. Perhaps some RF sneaking in? Anyway, there was quite literally SMOKE coming out of the KSN1025! I had several of these burn at that same place (a civic center). Who knows.But, does anyone have a spec sheet/response graph of the KSN1188a screw in driver? This is the large (4" dia) one that rolls in at 800hz. How do these work for home stereo? Or are they limited to PA speaker use?FYI, I have been able to cross over these Motorolas easily by wiring an 8 ohm, 20 wt resistor parallel to Motorola drivers.

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Wayne_Parham on Thu, 03 May 2001 04:42:05 GMT
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The tweeters I use don't have any sort of connector lever. They all have a small 1" paper cone that is directly glued to the quartz element. This is the case for the KSN1038, 1041 and 1056. Motorola piezoelectric tweeters in this family use the same motor/diaphram - having this 1" paper cone and three screws that mount it to the horn flare.All of my larger speakers use compression drivers, and I only use the piezo in speakers that won't be used much above 30v. I really like the little Motorola tweeters, but I find them best suited for smaller systems. But then again, I've run 'em for years on ultra high powered Crown amps, and never smoked one. They should burn out at about 40v, but I've just never smoked one. The woofers in these systems will fail long before the tweeters, and that is probably one reason why I haven't damaged a quartz tweeter. They're just in smaller systems.

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Paul C. on Thu, 03 May 2001 05:34:39 GMT
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Thanks for the informative response.The times I smoked the piezos... the PA was not running very loud. I think it was inaudible frequencies being picked up, perhaps something RF. Also, there is a huge Datacom tower with a gazillion microwave dishes nearby. And the driver actually had a melted spot. Interestingly, it seemed to be the internal 22 ohm resistor that actually burned.The drivers you describe with three screws, these all roll in at 3.5 khz. The larger drivers used on the KSN1165a, KSN1025a, and KSN1142a all roll in at 1800hz.What are the actual spls you measure with the Motorolas? I have seen widely differing SPL's for the same drivers. For example, I have seen the 1025 listed as low as 90 db/wt/mt (I suppose they mean 2.83v) to a high of 94 db.In actuality, they seem louder than this. What is your take?

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Wayne_Parham on Thu, 03 May 2001 05:53:44 GMT
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Perhaps UHF was your problem. Above 30kHz, the impedance of the piezoelectric tweeter drops to almost nothing. But they do produce sound at very high frequency which is why you'll occasionally see devices like bug repellants with piezo's in them - they're running them way up high like that. You can see from the response chart in earlier posts, that these drivers have a peak around 27kHz. But they don't handle much power there.

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Paul C. on Thu, 03 May 2001 06:27:34 GMT
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Again, I want to thank you for your responses.The KSN1025's were merely wired parallel to some older Peavey 2x10 PA cabinets. These were rated 8 ohms each cab, so there were two 16 ohm 10's in each. With no HP driver, just the 2x10's on each side, regardless of how loud, or how you set the EQ, the vocals were muffled sounding... just no clarity. I built some little boxes, covered them with matching black vinyl to hold the 1025's. These little boxes were merely plugged into the parallel jack on the back of the 2x10 cabs. No caps, no resistors, nothing. Could the inductance of the voice coils of the woofers be the problem?

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Wayne_Parham on Thu, 03 May 2001 07:12:42 GMT
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The woofer's voice coil can create a problem in rare cases, in the form of back EMF. I've seen woofers "chirp" piezo tweeters from back-EMF, but most woofers don't do that.

Subject: Re: More piezo stuff - high order networks, etc.
Posted by Paul C. on Wed, 09 May 2001 19:24:16 GMT
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That's interesting. They weren't chirping though, so that's not it. I've only had two instances of burning the resistors internally mounted in the drivers. But it only happened twice and never

happened again.