Subject: switching power supply used in amps
Posted by bqc on Thu, 25 Jul 2002 13:06:12 GMT
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Anyone has any experience with the new QSC PLX series which uses switching power supply in their newer amps versus the traditional linear supply in their old amps the QSC USA series.Is switching power supply bad in general for power amps?I heard that it may be ok for powering subs, but not full range speakers,is that true?

Subject: Re: switching power supply used in amps
Posted by pickle on Thu, 25 Jul 2002 15:50:13 GMT
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You might try asking this question

here. Bob Lee is from QSC and may weigh in

Subject: Re: switching power supply used in amps
Posted by Anonymous on Thu, 25 Jul 2002 19:47:04 GMT
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They do this in car audio amplifiers, it's a common practice goingback 20 years. Do these car audio amplifier lack sonicallyvs. home audio amplifiers? noway. Why would they want to do this in home/pro audio amplifiers?One reason is space. Since you are dealing with 50/60hztransformers you need "big uns" to get some high powered amplifiersplus "big uns" transformers are very ineffecient, alot of poweris lost to heat.High frequency switching power supplies done correctly canreduce size because they require a much smaller transformer(toroidal typically), they are more effecient. The reductionin size is because they switch the transformer on/off notat 50/60 hz but perhaps anywhere from 20khz - 100khz dependingon who designed the circuit. Some people may argue that switching noises may leak into the audiosignal path. Sure, if the amplifier is poorly designed. Plus,can your ears hear this noise ?I've done car audio for 10 years and didn't experience any leakagenoise problems, even with cheaper amplifiers.Still not sure? go listen to one and be 100% sure.Oh, the reason most home amplifier companies don't do thisis because of cost. It's cheaper to just buy a beefy 50 poundtransformer, add a bridge rectifier and some storage capacitorsand the power supply circuit is done and it's realiable.Ask the same designer to convert to a high frequency switchingpower supply and he will say "oh no, now I have to do somereal engineering work".

Subject: Re: switching power supply used in amps
Posted by Wayne Parham on Thu, 25 Jul 2002 22:03:36 GMT
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Actually, the trend towards switching supplies is motivated by cost. It is much cheaper to build switching supplies than it is to build large transformers. And they perform better too, in a price/performance comparison.The reason is actually pretty simple, it's easier to work at higher voltage and lower current and it's also easier to filter HF than LF. The large coils and caps required to filter 100Hz or 120Hz (full wave rectified) power are more expensive, and the components required to channel higher currents are more expensive too. All the same reasons we distribute power at kilovolt potential and then transform it down to household current levels.None of this really suggests which type is better, because there is no better type. Both can be made to perform very well. It's all the "same stuff" really, just "smooshed" into different forms.

Subject: Re: switching power supply used in amps
Posted by Anonymous on Fri, 26 Jul 2002 00:32:45 GMT
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--Actually, the trend towards switching supplies is motivated by--cost. It is much cheaper to build switching supplies than it is to--build large transformers.Perhaps today that is the case since mosfet transistors are muchcheaper now than say 10-20 years ago. Plus, more people are actuallyfiguring out how to make them, designing one 20+ years ago wasconsidered a black art. hehe Most of those bipolar switchers weren'tthat good, but they worked..Still, most if not all home audio amplifiers are not going withthis method, not sure exactly why. I haven't seen any trendtoward switchers in home audio.If I was designing a switcher vs. traditional methods the first thingthat comes to mind is this.50/60hz toroidal transformers are much cheaper now, 10-15 yearsago getting one stock off the shelf was impossible that metyour requirements. Getting it custom made cost alot of money.Last year I was researching this and more companies offer thesetoroidals with voltage specifications tailored for amplifier usestandard in their catalogs, no need for custom ones anymore = muchcheaper. I think I priced a beefy one at $100-$150 each.If I use one of these, I have to sacrifice real estate, it'sa big core. What if I convert to a switcher that is able to run 1000W ?I need more heatsink area to accomodate the mosfets, added cost.I need mosfets, added cost. I need a smaller toroidal core.Since switchers are "fly by design", can't really find a toroidal"off the shelf" that meets my voltage, current and frequencyrequirements? I can probably alter my design and work aroundwith given specs. For a switcher I don't need as many large capacitors*BUT* you know how audiophiles are, they want a bank of 60kuf-120kufper rail or they are not happy. They want the extra energystorage for transients and what not. It would be hard toconvince these people that they don't need as much. hehehThe last thing that comes to mind is reliability. That shouldn'tbe a problem, but having a bank of switching mosfets is justanother failure mechanism, one shorts out and whole bank can be blownwhich means that the amplifiers is coming back for repair - hehehIt's hard to punish a 50hz/60hz transformer and wall outletis a pretty reliable source of frequency. So what do I do as an amplifier designer? Use the traditional method or make a switcher?What type of poison do I want to drink ?heheheCar audio folks had no choice - hehehe

Subject: TI text from 1978 shows you how to build one!
Posted by Sam P. on Wed, 31 Jul 2002 16:16:58 GMT
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"Switching mode power supplies, particularly in their isolated form, fill a niche which has arisen, for example, with the developement of 'add on' units such as vcr's and hi-fi sound, games, etc. in TV receivers. In some parts of the world, e.g. Australia, isolation is mandatory for safety reasons"the part "fill a niche which has arisen" caught my eye. it implies that these are specialized solutions to specific issues, not "just another" p/s topology. Sam