
Subject: Re: Damping factor - SE vs. PP

Posted by [Steve](#) on Wed, 12 Oct 2005 21:48:02 GMT

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>>"we can't say that r_p (and Z_{out}) of SE amp vary wildly like in your example."It might be partly semantics Damir, so I will say the output Z and subsequent Damping Factor changes "somewhat". Even with a relatively horizontal loadline, the plate current should be held as high as possible, or keep the power down so the signal doesn't swing near the tube's cutoff. Specs from 300b data sheet (since that is the tube you mention.)At 60ma idle current at 100 volts or above, tube R_a is approx 600 ohms. At the 30ma point of the loadline, the R_a is approx 1000 ohms. The DF is no longer 3, but 1.8 at the 30ma point. (This means a peak to peak current swing of 30ma to 90ma. One can figure the output power from there.) At the 20ma point, at 100 volts or above, results in an R_a of approx 1200 ohms, double the 600 ohm R_a at 60ma. This means that a DF of 3 now becomes a DF of 1.5 at 20ma. (This means the current swings between 20ma and 100ma, with 60ma as quiescent.) If the plate current is allowed to drop to 10ma during a portion of the cycle, the R_a is approx 1450 ohms. DF now becomes 1.25. (peak to peak swing of 10ma to 110ma.) At 5ma, the R_a increases to approx 2000 ohms, or nearly 3 times that at 60ma. Df becomes approx 1. (peak to peak swing of 5ma to 115ma.)As the tube approaches cutoff, the R_a rises towards infinity till the tube isn't actually conducting.PP has virtually no drop off of DF, except because of variations in individual tube characteristics.PP therefore does not offer such a compromise in Damping factor as SE operation does.
