Subject: an alternative design
Posted by MQracing on Tue, 20 Dec 2005 13:21:47 GMT
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Damir wrote::::Direct measuring with capacitance-meter gives horrible ~700pF winding capacitance (not real, I hope:-), haha...:::If the amount of winding capacitance concerns you here is an alternative design that you might want to consider.EI 625 x 1/2" stack12000 turns of #40 wirecalc self capacitance of approx. 68.6pfcalc L of approx. 1170 henriescalc L sub l of approx. 1.31 henriescalc flux density at 60vrms and 20 hz = 3101 gaussdcr of approx 3250 ohmsAt 100vrms and 20 hz the calc flux density would be 518 gauss.The inductance listed above assumes use of M6 core material. If you substitute 50% nickel this inductance figure will conservatively be increased to approx 1720 henries which is what your unit is listed at. If you substitute in 80% nickel core... then your L will be greater than the AE-Europe design.But no matter which core material is chosen... the winding capacitance is approx only 10% of the number you have listed above. And the winding resistance has been cut by close to 60 percent. and the flux density is even at 100vrms and 20 hz below the published sarturation induction for 80 percent nickel. And it would be easy to house this design in a channel frame which would provide a mounting mehtod straight from the manufacturer.Disscussion:What is intersting also in this design... is to take a look at what two "buzzwords" bought us... many folks go oow and awe at the prospect of a c-core and amorphous as a core material.But... first let us look at this from the vantage point of reducing Cw. the AMCC 8 core has a window length of approx 1.08". The winding length of the EI 625 bobbin is only .856". All other things being equal the shorter the winding length the less eff capacitance you will get. The EI 625 wins out here.Now... let's look at magnetic path length. The longer the path length the less efficient the core will be as an inductance producer all other things being equal. The AMCC 8 has a magnetic path length of approx 5.2" while the EI 625 has a magnetic path length of 3.75". Next: Gross core area comparison. The AMCC 8 has a gross core area of approx .28 sq in. The EI 625 on a 1/2" stack has a gross core area of .3125". This is as close to equaling the gross core area btwn the two candidates as possible if we stick to widely available bobbins.Next: Net core area comparison. The AMCC 8 has a predicted net core area of approx .22 square inches. While the predicted net core area of the EI 625 by 1/2" core has a net area of .28 sq in. This is because the stacking factor of the AMCC 8 is only 79% while the stacking factor of the EI lamination is 90%. In other words you get more metal into the stack with the EI than you do the c-core made of amorphous strip. And this helps keep your flux density lower as well as increasing your inductance all other things being equal.This is why I recommend that you always reject "buzzwords" as indisputable guides to gaining a notion of quality. What this example also shows... is that, again, given a limited number of parameters to consider it is easy to "trump" any other design brought forth which has been designed to optimize a wider range of performance parameters.Designing to one or two or three isolated variables is trivially easy.msl