Subject: minimizing Cw and evaluating tradeoffs....
Posted by MQracing on Thu, 15 Dec 2005 04:41:43 GMT
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Here is a quick example to consider regarding tradeoffs and designing for one parameter. Transformer A EI 100 x 1" stack6000 turns of #32 wirecalc self capacitance of 133.1 pfcalc L of 681.49 henriescalc L sub l of .658 henriescalc flux density at 60vrms and 20 hz = 1938 gaussdcr of 456 ohmsTransformer B EI 50 by 1/2" stack6000 turns of #40 calc self capacitance of 14.8 pfcalc L of 269 henries calc L sub l of 1.62 henries calc flux density at 60vrms at 20 hz = 7753 gaussdcr of 1581 ohmsthe above examples assume use of M6 core material in each case.so... what do we have? If we pick on the basis of which unit has the lowest winding capacitance then surely transformer B wins hands down... it has only 11 percent of the calc self capacitance of transformer A. But what did we pay to cut out nearly 90 percent of the capacitance of transformer A?Our winner has only about 39 percent of the inductance of transformer A.Our winner has 246 percent more leakage inductance than transformer A.Our winner operates at 400 percent higher flux density level than transformer A. Our winner has 347 percent more winding resistance (dcr) than transformer A. Is transformer B really the winner just because it has less winding self capacitance than transformer A?Were they good trade offs?msl