

SIMPLE PFC & FULL BRIDGE SMPS FOR CLASS AB AMPLIFIER SUPPLY.(330W Continuous)
 $V_{in} = 90-265VAC$; $V_{out} = +/-40V$ at 330W

[Boost Inductor is 36 turns on a TDK PQ50/50 ferrite core (N92 material). (Part number = B66365G0000X187)
 This is centre-post-gapped to 1.8mm.
 (Gap size evolved out by adjusted reluctance calculation...need to check inductance with windings)
 The inductance is to be 300uH.
 The winding is made of 2 parallel strands of SWG21 enamelled copper wire.
 (2 full layers of 16 turns and 4 turns on the 3rd layer.)
 Single layer Mylar tape between each layer.
 Allow for Peak coil current is 9A4.
 (RMS) = 5A3.
 (Switching frequency of SMPS is 60KHz)
 Requisite layers of tape between layers for isolation.
 PQ50/50 core is 50x32x50mm.

FULL BRIDGE TRANSFORMER:
 Ferrite core set is Epcos/TDK ETD44/22/15 (Material = N87) (Part number = B66365G0000X187)
 Centre leg is gapped to 0.1mm.
 $L_{pri}=1.9mH$; $L_{sec1} = 211uH$; $L_{sec2} = 211uH$.
 Primary is 36 turns in total, Secondary is 24 turns in total.
 (Enamelled copper wire is used)
 There are 4 full layers altogether. (no fractional layers)
 There are 2 equal primary layers & 2 equal secondary layers.
 These interleave each other..PRI/SEC/PRI/SEC
 (This reduces leakage)
 Each primary layer is 18 turns of 2 strands of SWG25.
 Each secondary layer is 12 turns of 2 strands of SWG21.
 This makes as full use as possible of the bobbin length.
 (obviously there are 3mm margins for isolation purpose.)
 The requisite isolatory tape layers are used between layers.
 Primary current is 1.8A RMS; Secondary current is 2.6A RMS
 Leakage measured at primary with secondaries short circuit should be no more than 30uH. (k=0.992).
 (Leakage should be as low as possible.)
 Allow for peak primary magnetising current of 0.7A peak
 (Switching frequency of SMPS is 117KHz)
 Requisite layers of tape between layers for isolation.
 The primary coil current puts the field the opposite direction to that of the secondary coil current.
 ETD 44/22/15 core dimensions are 44x45x15mm.

Coupled inductor is TDK/Epcos PQ50/50 Core set (N92 material). (Part number = B65981A0000R051)
 Centre leg gapped to 0.7mm.
 Each coil measures 113uH with the other open.
 Each coil is 1 layer of 15 turns of 2 strands of SWG21 Enamelled copper wire.
 Put a layer of mylar tape between the layers.
 Peak current in each coil is 5A3.
 (Thus no saturation at twice this current)
 RMS current in each coil is 4.2A RMS.
 (Switching frequency of SMPS is 117KHz)
 Requisite layers of tape between layers for isolation.
 Both coils put the field lines in the same direction in the core.
 PQ50/50 core is 50x32x50mm.

