WIDE BANDWIDTH TOROIDAL STEP-UP TRANSFORMER FOR ELECTROSTATIC LOUDSPEAKERS

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| TYPE & APPLICATION | : | VDVST105PP; ESL step-up | | |
| Step-Up Ratio ( = Ns / Np ) | : | Ratio = 50.233 | [ ] | |
| Nominal Power | : | Pnom = 50 | [Watt] | (1) |
| Nominal Power to be delivered in | : | Zout = 4 | [Ω] | (1) |
| Secondary Inductance (maximum value) | : | Ls = 693 | [H] | (2) |
| Effective Secondary Leakage Inductance | : | Lsse = 10 | [mH] | |
| Primary DC Resistance | : | Rip = 0.2 | [Ω] | |
| Secondary DC Resistance | : | Ris = 162 | [Ω] | |
| Effective Secondary Internal Capacitance | : | $Cis = 2.22 \cdot 10^{-10}$ | [F] | |
| LOW FREQUENCY INFORMATION: | | | | |
| -3dB Power Bandwidth starting at | : | fu = 35.355 | [Hz] | (3) |
| Tuning Resistor in series with Primary | : | Rep = 1.5 | [Ω] | (4) |
| -3dB Bandwidth (with Rep) starting at | : | f3L = 0.985 | [Hz] | (5) |
| Primary Impedance at 10 Hz (with Rep) | : | Z10 = 17.397 | [Ω] | (6) |
| HIGH FREQUENCY INFORMATION (with Ces & Rep) | | | | |
| Capacitance of Electrostatic Loudspeaker | : | $Ces = 1 \cdot 10^{-9}$ | [F] | |
| 2-nd order Resonance Frequency | : | Fo = 45.529 | [kHz] | (7) |
| Q-factor 2-nd order HF filter section | : | Q = 0.643 | [ ] | (8) |
| -3dB High Frequency Bandwidth | : | f3H = 41.005 | [kHz] | (8) |
| Effective Primary Impedance at 20 kHz | : | Z20k = 2.732 | [Ω] | |

(1): A step-up transformer transforms Voltages; V-primary = (Pnom.Zout)^0.5
(2): Ls is not constant; see M. van der Veen, Glass Audio 5/97 starting pp.20
(3): -3dB means 1/2*Pnom at fu; Pnom at 1.4*fu; 2*Pnom at 2*fu; etc.
(4): Rep (= series resistor with primary) stops High Frequency ringing.
This resistor is an important external High Frequency tuning device.
(5): With Ls,max (see (2)) and Rep; values upto 6*f3L can be met in practice.
(6): This impedance is based on Ls,max (see (2)) and Rep.
At small primary Voltages values of 1/6*Z10 can be measured.
(7): This fundamental frequency is determined by Lss and Cis + Ces.
(8): Rep influences Q, f3H, Zp; Select Rep for 0.50 < Q < 0.74

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