TRAFCO-VDV-4133-ES ; toroidal step-up transformer for Electrostatic Loudspeakers

General specifications:

Step-Up Ratio (=Ns / Np)	: Ratio = 50	[ ]	
Nominal Power	: Pnom = 80	[Watt]	(1)
Nominal Power to be delivered in	: Zout = 4	[Ω]	(1)
Secondary Inductance (maximum value)	: Ls = 950	[H]	(2)
Effective Secondary Leakage Inductance	: Lsse = 24	[mH]	
Primary DC Resistance	: Rip = 0.063	[Ω]	
Secondary DC Resistance	: Ris = 180	[Ω]	
Effective Secondary Internal Capacitance	: Cis = 240	[pF]	

Low Frequency Information:

-3 dB Power Bandwidth starting at	: fu = 35	[Hz]	(3)
Tuning Resistor in series with Primary	: Rep = 2.5	[Ω]	(4,8)
-3dB Bandwith (with Rep) starting at	: f3L = 1.1	[Hz]	(5)
Primary Impedance at 10 Hz (with Rep)	: Z10 = 18	[Ω]	(6)

High Frequency Information (with Ces & Rep):

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Capacitance of Electrostatic Loudspeaker	: Ces = 1	[nF]	
2-nd order Resonance Frequency	: Fo = 29	[kHz]	(7)
Q-factor 2-nd order HF filter section	: Q = 0.668	[ ]	(8)
-3dB High Frequency Bandwidth	: F3H = 27	[kHz]	(8)
Effective Primary Impedance at 20 kHz	: Z20k = 3.0	[Ω]	

Conditional Remarks:
(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 up to 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
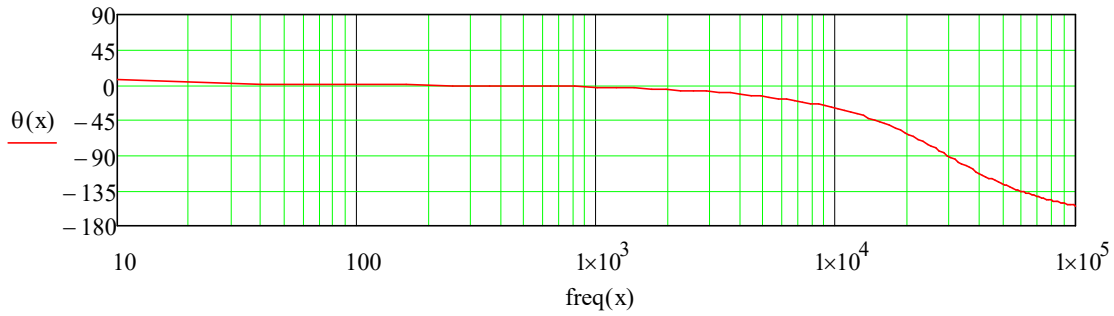Copyright: 2021 Menno van der Veen, Ir. bureau Vanderveen; Design date: 25-3-98
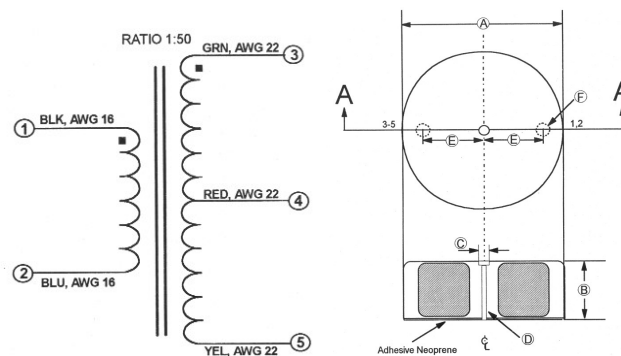
Dimension in mm: A = 130 ; B = 65 ; C = flat ; D = internal-M6-nut ; E = 55

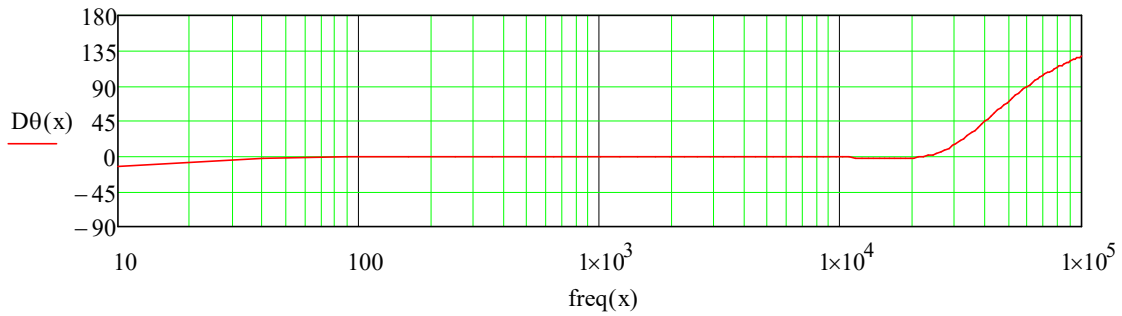# WIDE BANDWIDTH TOROIDAL STEP-UP TRANSFORMER TRAFCO-VDV-4133-ES

[dB]   Frequency Response; Vert.: 3 dB/div; with Rep and Ces
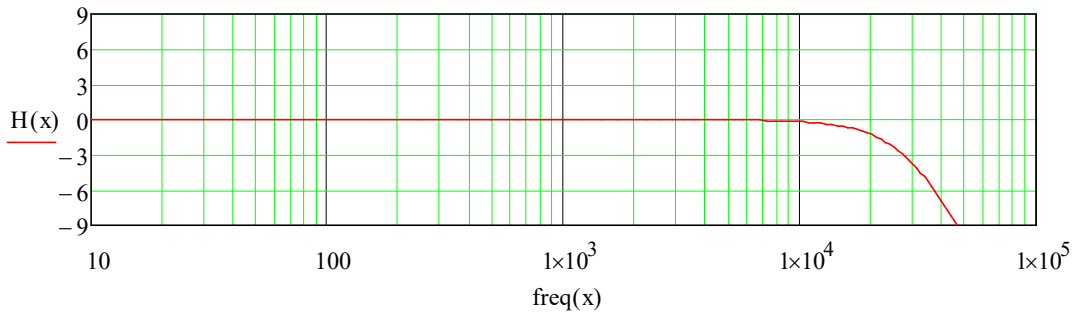
[Degr] Phase Response; Vert.: 45 Degr/div; with Rep and Ces

[Degr] Differential Phase Distortion; Leach JAES sept.89 pp.709 - 715

[Degr] Electrical Phase of Primary Impedance; Vert.: 30 Degr/div.