Type 43 and 35T Transformer Material Compared

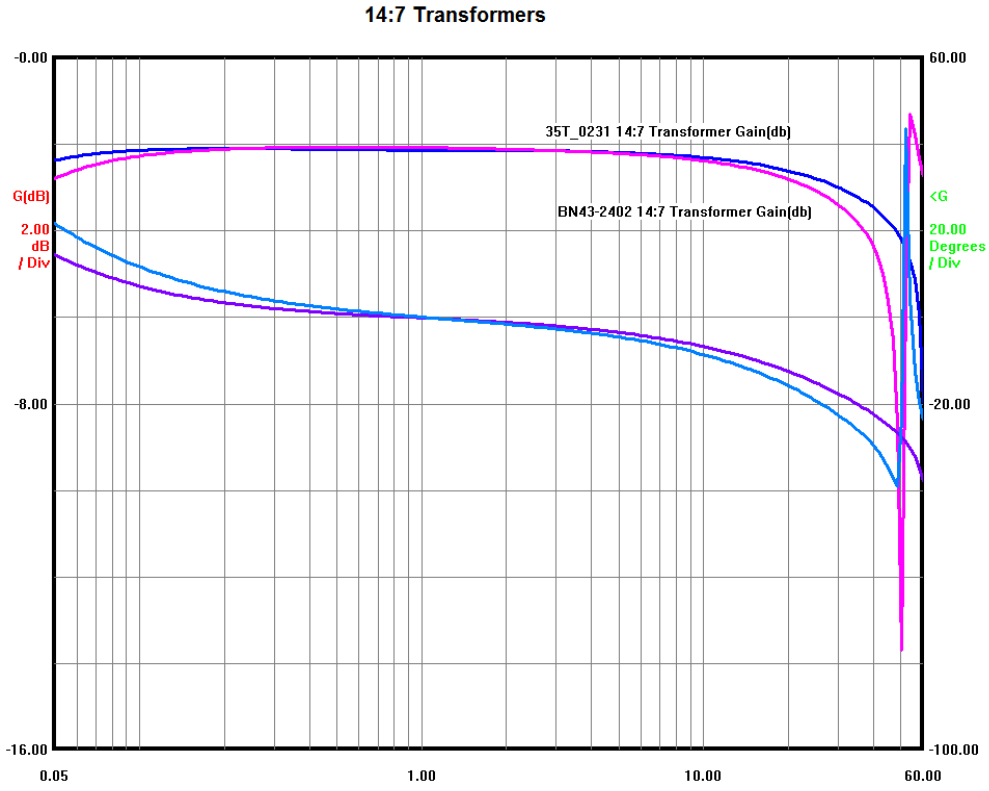

Figure 1: Gain through the transformer

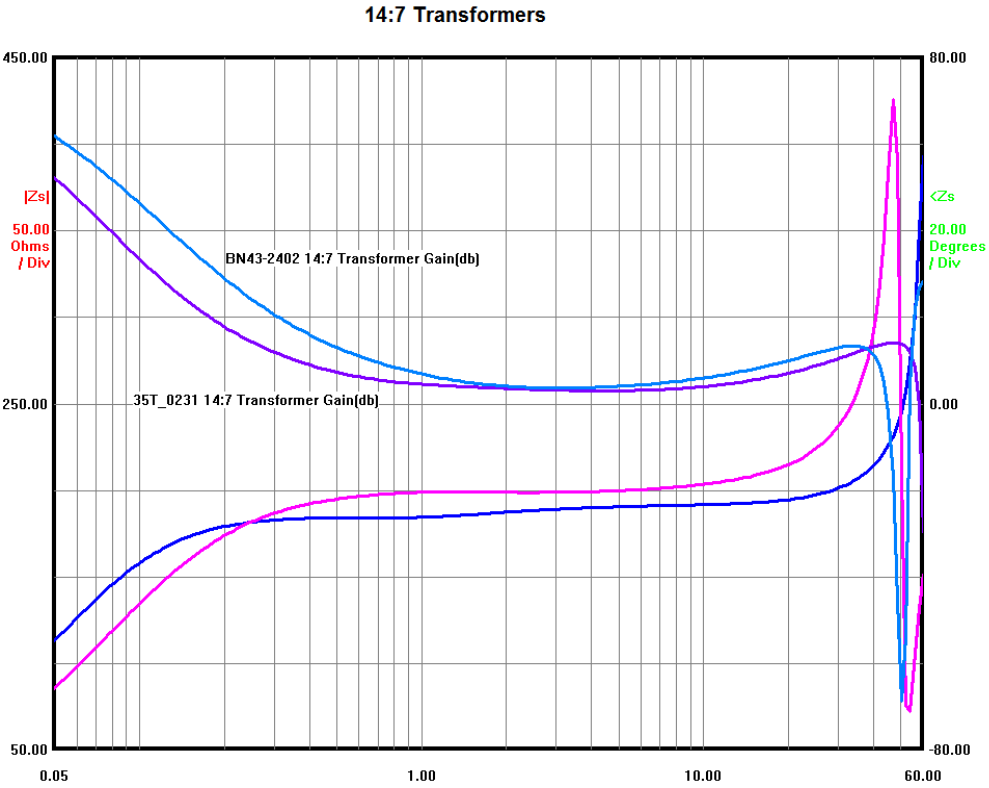

Figure 2: Impedance at the 14 turn port

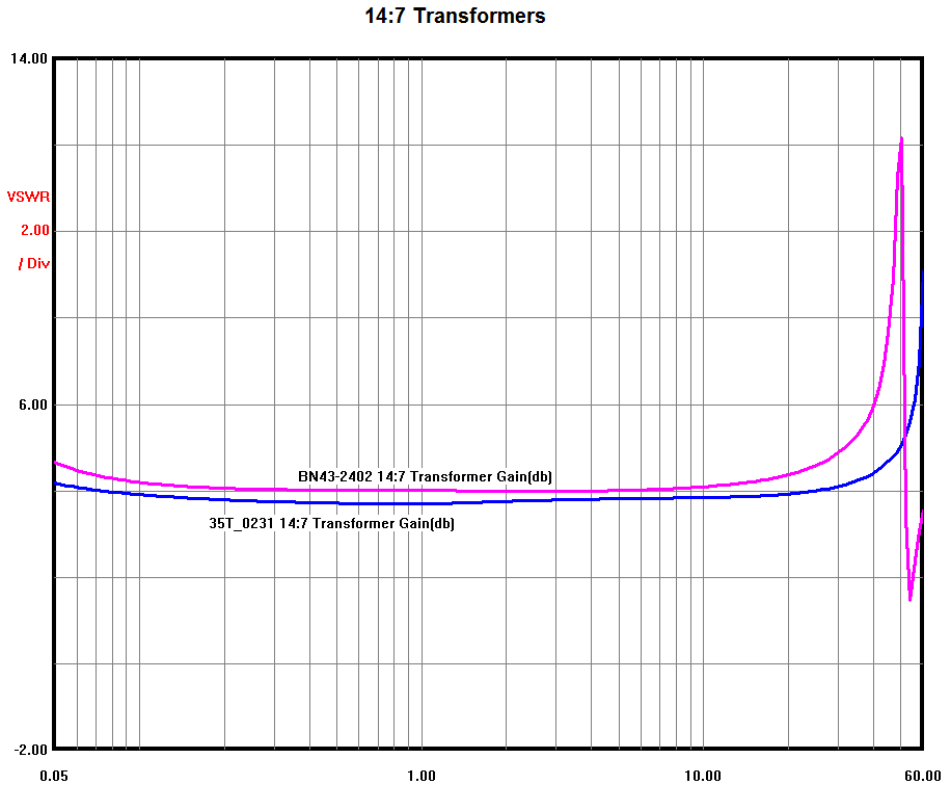

Figure 3: VSWR at the 14 turn port (The antenna is set at 50 ohms the SWR should be 4:1)

The type 43 transformer was wound 7 turns trifilar on a BN43-2402 binocular core (initial permeability 850). The type 35T transformer was wound 7 turns trifilar on a Steward 35T-0231-20P toroidal core (initial permeability 5000). The 43 core is available from Kits & Parts. The 35T core is available from Digikey.

In every graph the 35T core outperforms the 43 core both at the high and low frequency ends of the scale. A transformer wound on an FT37-43 core will have slightly worse performance than the BN43-2402 binocular core. The 43 core seems to have a resonance about 50MHz. The same resonance for the 35T core is higher in frequency. Neither resonance has significance below 30MHz. The SWR should be 4:1 in an ideal transformer.

The graphs of Figures 1 and 2 also contain unlabeled phase plots. The 35T transformer has less phase shift than the 43. The different traces can be identified by looking for the resonance of the 43 core.

The BN43-2402 required a trifilar winding using AWG 38 enameled wire (very difficult to work with). The 35T core was wound with AWG 30 enameled wire. Both finished cores are about the same size and will fit inside the DVB-T dongle case.

These scans were taken with my N2PK VNA using MyVNA software. The horizontal axis is frequency in MHz.
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