Docket #: S20-286

Wideband push-pull T-network class-ef2 power amplifier architecture

This single-stage resonant inverter architecture achieves constant power and efficiency over a large bandwidth, solving one of the largest problems with state-of-the-art resonant inverter power amplifier architectures. Current amplifiers operating outside their nominal frequency experience fluctuations in performance, thus requiring power amplifier stages or components that need to be manually swapped or adjusted which is unsustainable for applications requiring adjustable RF frequencies. This wideband resonant inverter design features a push-pull power amplifier stage driving a bandpass filter, followed by a balun and matching network stage. The push-pull class-ef2 circuit power amplifier stage uses a T network to provide zero-voltage switching and shunt the second harmonic current to shape the voltage waveform. This circuit topology presents lower device stress compared to the popular class-e circuit, enabling higher power levels and efficiency. Combined with a variable capacitor, this allows for the resonant frequency of the T-network to be adjusted. Further along, the added feature helps the power amplifier stage to achieve zero-voltage switching and near zero-derivative-voltage-switching, which minimizes switching loss and circulating current throughout the converter. Thus, this network helps the wideband circuit to achieve high efficiency.

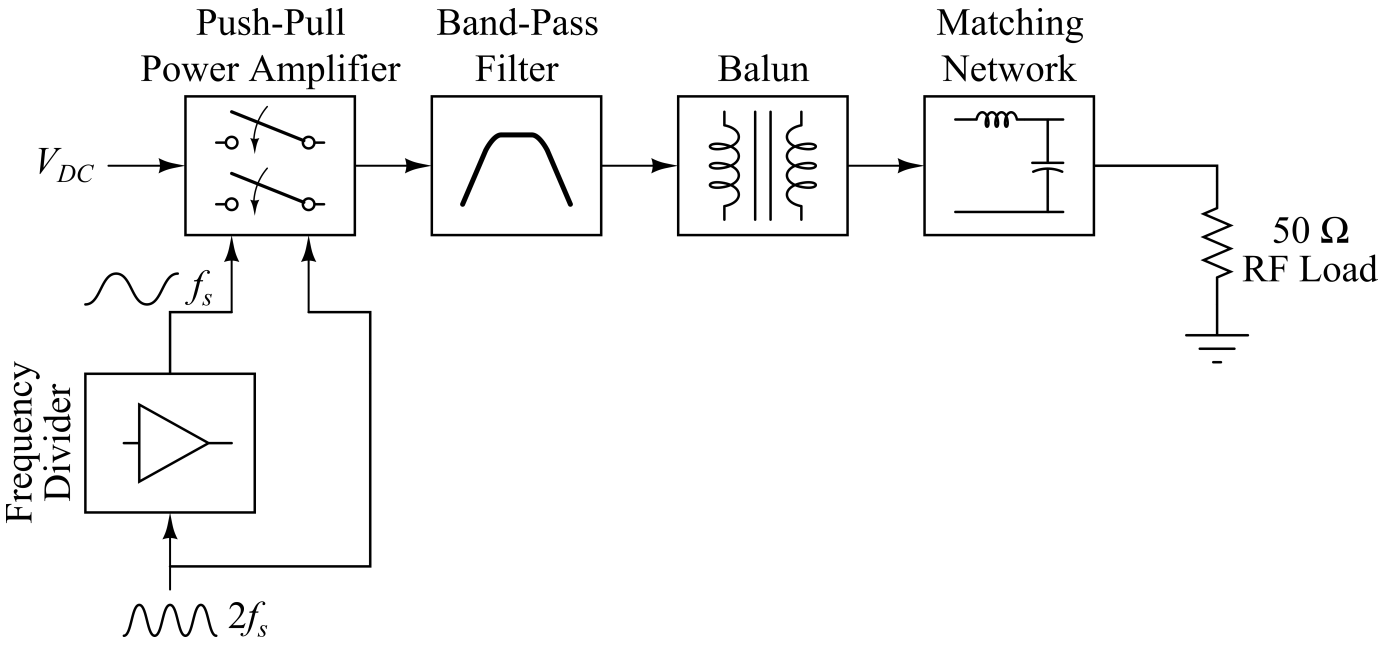


Photo description: Block diagram of the wideband resonant inverter.

Stage of Research

- Prototype

Applications

- **RF Power Generators**

Advantages

- **Constant power and maintained high performance outside point of resonance**
- Best suited for applications requiring RF power frequency adjustments

Innovators

- Zikang Tong
- Lei Gu
- Juan Rivas-Davila

Licensing Contact

Michael Spaid

Technology Licensing Associate 2

Email