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(54) **MULTI-PASS NONLINEAR NETWORK FOR  
MICROWAVE GENERATION**

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**ABSTRACT**

A class of design topologies in the field of nonlinear networks (NLN) or nonlinear transmission lines (NLTL) that re-utilize direct current (DC) and low-frequency (LF) signal content reflected from a load or an output filter to yield increased pulse to radio frequency conversion efficiency and increased overall system efficiency. A nonlinear transmission line topology comprises a plurality of series inductive elements and a plurality of nonlinear capacitive elements. The inductive elements and the capacitive elements are arranged in a periodic structure forming a nonlinear network. An output coupling circuit connected across an output of the nonlinear network is configured to transmit high-frequency content to a load and to reflect back direct current and low-frequency content into the nonlinear network.

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