Abstracts

A New Class of Distributed Prototype Filters with Applications to Mixed Lumped/Distributed Component Design

R. Levy. "A New Class of Distributed Prototype Filters with Applications to Mixed Lumped/Distributed Component Design." 1970 Transactions on Microwave Theory and Techniques 18.12 (Dec. 1970 [T-MTT] (1970 Symposium Issue)): 1064-1071.

The distributed prototype filter consists of a cascade of shunt stubs of equal length alternating with uniform transmission lines, each of twice the stub length. If the stubs are open circuited, they may be replaced by lumped capacitors to synthesize a mixed lumped/distributed (L/D) filter having near optimum Chebyshev or Zolotarev characteristics. The rate of cutoff and the general character of the stopband region is predictable. The use of Zolotarev prototypes enables the impedance level within the filter to be controlled and gives greater selectivity. Designs suitable for either transverse electromagnetic (TEM) line or waveguide low-pass filters are presented. If the stubs are short-circuited, the prototype may be used to design quasi-high-pass or bandpass filters of very large bandwidth. An example is given of an inductive-iris-type filter of approximately 100-percent bandwidth for which previous theories have been unsuitable. The theory is capable of extension to more complicated mixed L/D structures containing both series and shunt elements.

❑ Return to main document.