Abstracts

Capacitively-Coupled Stub Filter (Correspondence)

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A method of designing an easily realized narrow-band band-stop filter by modifying the exact design procedure is described herein. Although this design method is not exact, it yields a response curve that follows the desired response over a broad band. The modification consists of replacing each open-circuited high-impedance shunt stub with a short-circuited capacitively coupled stub of medium impedance, i.e., the same order of magnitude as the connecting line impedance, and slightly less than lambda/sub 0//4 in length, as shown in Fig. 1. The stubs are thus easily realized in coaxial line or strip-line, whereas by the exact method they would (in the case of very narrow-band filters) be difficult to realize unless coupled-line sections were used. A modified three-stub filter having ideally a five per cent stop-band width and 0.1-dB ripple in the pass-band was analyzed. The response in the frequency range 0 to 1.5f/sub 0/ was found to deviate only a negligible amount from the exact response, while the filter was usable over a still broader range. This is clearly illustrated in Fig. 2 which shows the computed response of the three-stub exact-design filter (solid lines) and the computed response of the capacitively-coupled stub filter (dashed lines). In Fig. 2(b), the attenuation loss in the first stop band near omega/omega/sub 0/ = 1 for the exact-design case is similar to the curve for the capacitively-coupled-stub filter; therefore only a solid line is shown in that region.

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