Abstracts

High-Q TE01 mode DR filters for PCS wireless base stations

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This paper presents the state of the art of high-Q TE01 mode DR cavity filters for PCS wireless base station applications. In order to have TE01 mode filter to be competitive with other high-Q cavity technologies, employment of nonadjacent coupling to implement advanced filter features and easy filter machining and integration are essential. The quadruplet and trisections are regarded as basic blocks to implement symmetric and asymmetric transmission zeros in filter stop band. The relative alignment of the magnetic mode field across the coupled adjacent cavities is analyzed to identify the sign of nonadjacent coupling. A direct cascading of a wide band combine filter to a TE01 mode dielectric resonator (DR) filter is proposed to suppress the spurious response of the DR cavity filter. This approach simplifies the integration between the DR filter and the spurious suppression device and has been proved to be very cost effective. Experimental eight- and six-pole quasi-elliptic function filters show the typical performances. To take advantage of the special property of magnetic mode field alignment across the adjacent cavities, a five-pole canonical asymmetric filter with three transmission zeros in low side is implemented. We believe this filter is a new design for high-Q cavity filter, while a three-pole elliptic function filter is new for DR filter technology.

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