Abstracts

Design of a Low Loss SAW Reflector Filter with Extremely Wide Bandwidth for Mobile Communication Systems

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Design and performance of a new low loss surface acoustic wave (SAW) reflector filter are presented. The structure is a dual-track configuration incorporating two interdigital transducers (IDT's) and reflectors in each track. Extremely wide bandwidth can be obtained if chirped IDT's and reflectors are used. From the theoretical conditions for low loss operation of the reflector filter a design rule for the distances between the chirped components and for their lengths has been derived. Due to the fact that the transfer function of the filter is predominantly determined by the reflectors, we have developed a new synthesis method for chirped reflectors. For the design of the reflectors we used phase-weighting and finger width-weighting techniques in order to reduce passband distortions and to improve both the shape factor and the stopband rejection. The filter has been fabricated on 128° YX-LiNbO/sub 3/. The center frequency and fractional bandwidth were 200 MHz and 10%, respectively. A minimum insertion loss of 4 dB, a small passband ripple of about 1 dB, and a stopband rejection better than 35 dB have been measured. Excellent agreement between simulation and measurement has been found.

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