

# Abstract

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## **The Transfer function of the distortionless SAW Duplexer for IS'95, GSM and UMTS Mobile systems**

This paper presents the transfer function of three mobile systems (IS'95, GSM and UMTS) of the distortionless surface acoustic wave duplexer for different window lengths (0.2  $\mu$  sec and 2.0  $\mu$  sec) using the Fourier transform convolution technique. The closed form of the transfer function of the systems is expressed in terms of the sine integral function. The surface acoustic wave duplexer is considered the main part of the mobile communication devices because of its advantages (small size, high reliability, low cost, high quality factor, temperature stability, wide dynamic range, linear phase response, ruggedness, high stability, reproducibility and achieve superior performance bandwidth). The obtained results show the comparison between the performances of these three mobile systems, the Fresnel ripples in the pass bands and Gibbs ripples in the stop bands are decreased by increasing the window length (SAW transducer time length).