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 1999

Introduction

The performance of surface acoustic wave (SAW) filters depends on a number of external factors. These include source and load impedances presented to the filter by external matching networks, the quality of the connections to the filter, the proximity of other circuitry and conducting structures, and the layout of the printed circuit board (PCB) that the filter is soldered to. This application note addresses the later from a practical point of view. The quality of the PCB design can affect critical passband characteristics as well as the ultimate rejection of a SAW band-pass filter. This tutorial outlines the basic principles of PCB design required to obtain the best performance from SAW filters. It is provided as a guide especially for the RF circuit designer with little or no experience in applying SAW filters or in SAW filter PCB layout. Knowledge of appropriate general PCB design rules and standard RF layout principles is assumed.

Background

Many SAW filters have excellent ultimate rejection characteristics inherent to their fundamental designs. These characteristics are shown to best advantage in test fixtures used for production electrical tests. These fixtures are available from SAW filter manufacturers for the purpose of correlating electrical characteristics between the filter manufacturer and the filter customer. These fixtures, usually complete with external impedance matching to 50 ohms, are ideal for correlation purposes. However, these fixtures often contain a great deal of isolation between the coaxial input and output. The typical commercial application requires a much simpler and less costly layout, with no shielding and often in tight spaces. Consequently performance of the SAW filter in the end application is sometimes not as good as in the test fixture or as advertised.

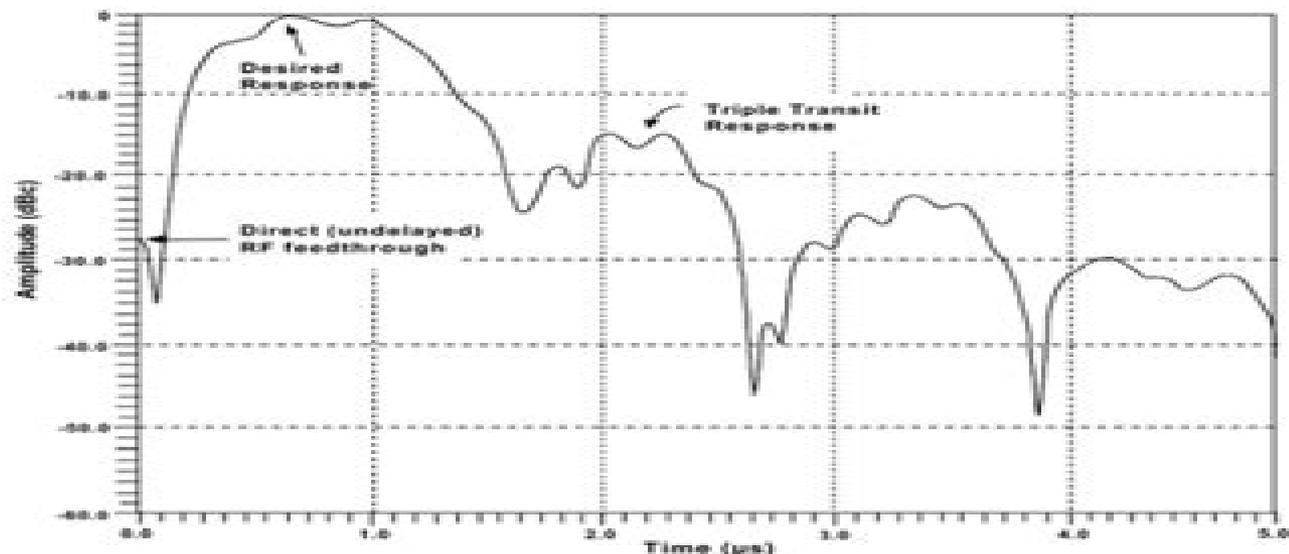


Figure 1
 Representative Impulse Response

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RJ Shavelson



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