URN etd-0407109-183703-194
Author Chu-Yuan Huang
Author's Email Address No Public.
Statistics This thesis had been viewed 51 times. Download 0 times.
Department
Year 2007
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Fabricate Wide-Band and Ultra-Wide-Band Filters on the Al2O3 Ceramic Substrates
Date of Defense 0000-00-00
Page Count 76
Keyword
wide-band filter
ultra-wide-band filter
Al2O3 ceramic substrate

Abstract
Recently, wide-band, ultra-wide-band, and multi-band filters were developed very fast and be widely used in microwave systems. The filters, oscillators, mixers and RF amplifiers are the basic elements of the microwave circuit, and microstrip line is the basic and popular transmission line structure in the microwave circuit, because of its simple architecture, low cost, and easy to apply in the printed-circuit technology. The wide-band and ultra-wide-band filters have merits of low loss, high transmission speed, low interference, high secure, and low cost, and in the future, miniaturization would be a very important tendency. Microwave dielectric materials exhibit the advantages of high dielectric constant and low dielectric loss, which are suit for the applications of antennas, oscillators, and microwave filters. In this thesis, wide-band and ultra-wide-band filters were fabricated on the Al2O3 ceramic substrates. Owing to the higher dielectric constant and better quality factor (er =9.8, Q×f=300,000 GHz) than that of FR4 substrates, it would reveal better microwave characteristics and miniaturization in the microwave band, and the requirements of low loss and wide-band were achieved.
For the wide-band filters, three-order parallel-coupled micro-strip lines are used to fabricate them, and reduce the distances of each resonator to increase the coupling. The frequency band of the fabricated wide-band filters is 5.04~6.14 GHz, and the insertion loss is only 0.44 dB. It could be applied in WLAN and Bluetooth communication systems. And for the ultra-wide-band filters, Multiple-Mode Resonators (MMRs) are used to generate the main frequencies and U-typed structures are used to enhance coupling, and the Stepped Impedance Resonator (SIR) structures were adopted at the input and output ends of the filters, which could improve the depth of the left and right transmission zeros. The frequency band of the fabricated ultra-wide-band filters is 3.73~11.7 GHz, the insertion loss is only 0.13 dB. It could be applied in satellite and short distance of high speed transmission communication.
Advisory Committee Cheng, Chien-Min - advisor

Files No Any Full Text File.
Date of Submission 2008-07-04