

Abstract Submitted
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Low-cost broadband RF impedance spectroscopy in micromachined microfluidic channels SHIUL KHADKA, BRYAN BLANKENAGEL, MATTHIEU GIRAUD-CARRIER, AARON HAWKINS, KARL WARNICK, BRIAN MAZZEO — Microfluidic impedance spectroscopy can be used to detect, identify, and characterize analytes in aqueous solutions, including biological materials such as proteins. We demonstrate a low-cost microfluidic device for impedance spectroscopy of samples over a broadband frequency range (200 MHz to 20GHz). The device consists of coplanar waveguide fabricated on a low-loss Isola RF substrate using a bonded two-layer structure with a milled microfluidic channel. Transmission line parameters of the device with various solutions in the channel were measured using a vector network analyzer. These measurements are compared with results obtained from numerical simulation using HFSS (High Frequency Structure Simulator) and broadband measurements obtained with a commercial probe. The results demonstrate the ability of the fabricated device to measure varying transmission parameters due to changing sample properties.

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