ABSTRACT

Since 2010, Indonesian Nano Satellite Platform Initiative for Research and Education (INSPIRE), including IT TELKOM and some universities in Indonesia, tried to build a nano satellite called Indonesian Inter University Satellite 01 or IiNUSAT-01 in short. At the ground segment of IiNUSAT-01, an up converter converts VHF into S-Band with 2.4 GHz as the center frequency. That device consists of an oscillator, a mixer, and a bandpass filter. The up converter uses a microstrip bandpass filter because it's high frequency work operation.

In this final project, a bandpass filter is built at 2.1-2.7 GHz to work at ground segment of IiNUSAT-01. To make this filter, a FR-4 substrate with e_r = 4.3 and width = 1.6mm is used. A square ring resonator with direct-connected orthogonal feed lines and tuning stub method is used. CST simulator has been used for simulation. To measure this filter parameters, such as insertion loss, bandwidth, return loss, VSWR, impedance, and phase respon, a network analyzer is used.

Insertion loss in measuring showed 0.3dB. The measured bandwidth indicated 360MHz wider than specification. For return loss and VSWR are appropriate with the specification. Otherwise, the impedance showed an inappropriate value with the specification.

Keywords: bandpass filter, 2.1-2.7 GHz, square ring resonator.