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# DEVELOPMENT OF LOW PASS FILTER FOR STSAT-3 COMMUNICATION SUBSYSTEM

**Abstract**

A Science and Technology Satellite-3 (STSAT-3) is developed to verify the performance of composite panel, Li-ion battery, and hall effect thruster. The STSAT-3 is supposed to be launched on 2010 with infrared ray camera and small image spectroscope. We cooperate with Satellite Technology Research Center (SaTReC) of KAIST to develop the communication subsystem of STSAT-3 whichisoperatedonS-bandandX-bandfrequencies.S-band transmitter/receiver and X-band receiver need low pass filter to eliminate unnecessary high frequency band components. However, the conventional analog low pass filter is vulnerable to the group delay and the amplitude distortion. Thus, we focus on improving the performance of conventional analog low pass filter using FPGA for digital signal processing. The digital signal processing unit is consisted of analog to digital converter, digital signal processor, and digital to analog converter. To develop the digital signal processing unit, we first obtain the filter coefficient using Matlab. Then, analog to digital converter and digital to analog converter are attached to the digital signal processor which is designed with Xilinx chip. In order to ensure the functional independence of each parts, we design them by module. Through experiments of the digital signal processing unit, we know that the digital signal processing unit depends on the performance of digital to analog converter and analog to digital converter. As a result, In this paper, we show the procedure to design a digital low pass filter which is applicable to the communication subsystem of STSAT-3 and test results.