Development of the small switched capacitor filter for smallplasma wave instruments

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In recent years, the need of light weight instruments onboard satellites has been increasing in small satellite missions or planetary missions. The analogue circuits occupies most of the electric circuits of general plasma wave instruments, because they need filters in order to suppress waves beyond or below the target frequencies range and to eliminate the aliasing effect caused by sampling processes. In order to realize small plasma wave instruments, we attempt to make use of the analog ASIC (Application Specific Integrated Circuit) technology. In the ASIC, we can design analogue filters by combination of MOS FET and small capacitance to be implemented inside the ASIC. The present paper focuses the development of the switched capacitor filters, which are used as the anti-aliasing filter in general plasma wave instruments. In the commercial ICs, we cannot find any packages, which include many channels of anti-aliasing filter. Therefore, the size and weight of electric circuits increase by applying an individual package of the switched capacitor filter to each channel of plasma wave instruments. However, when we can develop the specific IC, which includes many channels of the switched capacitor filter, it enables us to make the size of plasma wave instruments to be small. Thus, we attempt to develop the ASIC which includes multi-components of switched capacitor filter. In the present paper, we show the desing and the characteristics of the first test ASIC developed by ourselves. We also show the results of environment tests of the developed ASIC.