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Author: Dr. Kyungin Kang

Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of, kikang@kaist.ac.kr

Mr. Chul-Woo Lim

Korea, Republic of, cwlim@satrec.kaist.ac.kr

Dr. Tae Seong Jang

Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of,
tsjang@satrec.kaist.ac.kr

Prof. Jun Ho Lee

Korea, Republic of, jhlsat@kongju.ac.kr

DEVELOPMENT OF HYPERSPECTRAL IMAGING ELECTRONICS FOR STSAT-3 SATELLITE

Abstract

STSAT-3 is the third experimental small satellite of the STSAT program designated in the Long-Term Plan for Korea's Space Development by the Ministry of Education, Science and Technology of Korea. The secondary payload of STSAT-3 is a hyperspectral imaging camera called the Compact Imaging Spectrometer (COMIS). Scientific applications of COMIS are for environmental monitoring such as inland water quality monitoring of Paldang Lake. Electronics of this hyperspectral imager include the focal plane electronics, video electronics, control electronics, and a low-voltage power supply. The focal plane electronics convert received photons to 8 16 bit electrical signals with noise reduction capability. The video electronics then sample and sum the sets of row-signals for spectral band selection. The gain of the detector can be varied identically to all channels for optimum usage of the analog-to-digital converter resolution at different latitudes and observation targets. The sampled and line-integrated data is then communicated to the mass memory unit of spacecraft with 100Mbps. The average power consumption for normal operation and in standby mode is 13 watts and 4.5watts, respectively. This paper presents the key ideas of the hyperspectral imaging electronics with performance test results.