

The Radiation Qualification of the Taiwanese CMOS Image Sensor for the Remote Sensing Satellite

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FORMOSAT-5 is the first space program that National Space Organization (NSPO) takes full responsibility for the complete satellite systems engineering designs including payload(s). FORMOSAT-5 will operate in a sun synchronous orbit at 720-km altitude. The satellite has the optical Remote Sensing Instrument (RSI), which provides 2-m resolution panchromatic (PAN) and 4-m resolution multi-spectral (MS) images. This made-in-Taiwan optical payload will be the first commercial remote sensing instrument using the CMOS image sensor and this sensor IC is design, manufacturing, and verification by the Taiwanese teams.

This paper presents the CMOS image sensor chip radiation qualification analysis as well as the test result for FORMOSAT-5 remote sensing satellite. A total of 100Krad cobalt -60 radiation dose tests of the CMOS image sensor chip have been successful performed and evaluated its test results. This test result has proven that the CMOS image sensor developed by domestic manufacture in Taiwan meets the five years mission radiation requirement for the FORMOSAT-5. The CMOS image sensor chip has also successful proven that it will be able to perform its functional design goal in the outer space environment.

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