

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)  
Space Systems and Architectures Featuring Cross-Platform Compatibility (7)

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SDS-1 AND FUTURE PLANNED MISSIONS IN SMALL DEMONSTRATION SATELLITE PROGRAM  
OF JAXA

**Abstract**

In 2006, a program called Small Demonstration Satellite (SDS) was initiated. This program provides useful standard platforms by series of small satellites to newly developed components and advanced space technology with timely launch opportunity. The program will contribute as a strategic means of JAXA to improve reliability of space missions. This makes it possible to find out the unexpected risks, and it will open the door to adoption of the next generation space technology to our operational and science satellites. On the other hand, SDS programs also contribute to the human resource development of young engineers through in-house work, taking advantage of the short development cycle from conceptual design to launch and operation. Through the projects, they are expected to acquire comprehensive knowledge and ability to implement future space missions. SDS-1 is the first satellite in this program. Figure 1 shows its main characteristics. It has three main mission components: 1. Multi-mode Integrated Transponder (MTP), 2. Space-Wire demonstration Module (SWIM), 3. Advanced Micro processing In-orbit experiment equipment (AMI). The satellite was launched successfully as piggyback payload of H-IIA launch vehicle with Greenhouse Gases Observing Satellite (GOSAT) and another six small satellites in January 2009. After its early phase operation, now all missions are successful and achieving excellent results. Since March 2009, system design of the next SDS satellite (SDS-3) has been also started aimed for launch as piggyback payload of H-IIB launch vehicle in 2010. The mission is to measure atomic oxygen tolerability of new coating material in super low earth orbit using Thermoelectric Quartz Cristal Microbalance (TQCM). Figure 2 shows its main characteristics.