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THE RESEARCH OF SOLID COOL GAS MICRO-PROPULSION MODULE TECHNOLOGY WITH
HIGH TOTAL IMPULSE AND LOW POWER CONSUMPTION

Abstract

Micro-nano satellites formation flight, station keeping and other tasks require the propulsion system with higher total impulse, lower power consumption, modular design, plugging in and playing. We have designed a solid cool gas micro-propulsion module with high performance and completed relevant performance tests. The solid cool gas micro-propulsion module includes solid cool gas generators, a control circuit, 3 thruster components, a sensor and module chamber structure. The module just needs the micro-nano satellites' power and communication interface, through threaded connections and mechanical connections with the satellite to meet the plug-and-play. The solid cool gas micro-propulsion module using the cylinder charge and micro igniter has high total impulse and low power consumption. 1U(100mm100mm100mm) module's weight is 975g, and the total impulse is more than 100Ns. 0.7U module's weight is 640g, total impulse is more than 30Ns. The module instantaneous power is less than 1.5W, usual power is less than 50mW. The overall dimension of the 1U module is 96mm96mm98mm. The overall dimension of the 0.7U module is 91mm95mm70mm. The single generator's producing gas efficiency is more than 45