SPACECRAFT SYSTEMS

Micro-Newton Variable Thrust Module

The Micro-Newton Variable Thrust Module integrates a proportional thruster and a mass flow sensor. The proportional thruster adjusts thrust according to control commands by regulating the throat area of the proportional valve, achieving precise and continuous thrust control. The mass flow sensor measures the real-time gas flow rate to ensure feedback accuracy and closed-loop control. This module provides high-precision, ultra-low-thrust output, making it suitable for formation-flying satellites, drag-free control, and space science missions requiring ultra-stable micro-thrust environments.

TECHNICAL SPECIFICATIONS

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Dimensions (mm)	205 × 80 × 80
Mass (kg)	≤ 0.4
Mounting Material	TC4 (Titanium Alloy)
Operating Temperature (°C)	25–35
Storage Temperature (°C)	0–50
Electrical Interface	J36A / J14A Connectors
Thrust Range	1–50 μN
Thrust Resolution	0.5 μN
Thrust Noise	≤ 1.0 μN/Hz$^{1/2}$
Power Consumption	< 1 W

Quick Overview

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Key Features

- Continuously adjustable micro-Newton-level thrust.
- Low thrust noise.
- High thrust resolution.
- Piezoelectric drive mechanism.

Applications

- Used in **drag-free control systems** and **ultra-high-precision micro-satellite propulsion**, supporting missions such as scientific experiments and formation flying.

Documentation & Resources

- Technical Specifications
- Applications