EXOTERRA

Halo12: **Hall-Effect** Thruster

Halo12

Qualification Test Unit

Hot Fire Test

Product Overview

ExoTerra's Halo12 is a compact Hall-effect thruster designed for the micro and small satellite market. The rideshare-compatible family of Halo thrusters extends the lifespan and utility of microsats, making possible new applications and mission architectures that were previously limited to larger spacecraft.

Electric Propulsion Optimized for High Impulse Missions

ExoTerra's revolutionary Halo12 Hall-Effect Thruster allows small satellites to perform high impulse missions. Halo12 is a magnetically shielded Hall-Effect thruster optimized for interplanetary missions with a projected lifetime of 28,000 hours and 25,000 ignitions with propellant throughput of 100-500kg. This high impulse enables small satellites to perform a wide variety of missions, including LEO-GEO transit, rendezvous, inclination change, interplanetary missions and even non-traditional orbits. This enables affordable interplanetary and deep space science, lunar activities, or robust long life LEO & GEO missions.

Hall-effect thrusters provide superior total impulse performance to combustion, electrospray, or pulsed plasma propulsion options for small satellite applications. This enables a broader spectrum of missions and greater satellite lifetime.

The TRL 6 thruster has completed a robust flight qualification program, including vibration, shock, and thermal vacuum testing.

Mass: 3.4 kg
Volume: ~1.5 U
Input Power Range: 355- 1110 W
Total I_{SP} Range: 1200-1950 s
Thrust Range: 15-68 mN
Impulse: Up to 7000 kNs
Propellant: Xenon

Big Propulsion for Small Satellites

Halo12 demonstrated thrust range of 15 to 68 mN decreases total transfer time over ion engine alternatives. Specific impulse correspondingly ranges from 1200s to 1950s, allowing Halo 10 to produce greater ΔV from a given propellant mass than chemical or water options.

This high thrust and high efficiency fits into a compact space. Halo12 weighs a mere 3.4 kg and fits within a 11.8 cm diameter by 14.3 cm long envelope (excluding mission-unique gas fittings). Halo12 nominally uses Xenon as a propellant, but Krypton is an alternative.

The accompanying PPU is just 2 kg and occupies 20 x 10 x 11 cm. With over 100 kRad TID capacity, it matches Halo XL's GEO and interplanetary capabilities.

For more information contact:
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About ExoTerra

ExoTerra was founded in 2011 with a vision of reducing the cost of space exploration. We pursue this goal by developing affordable technologies that minimize spacecraft mass and volume while enhancing their performance and offering unique capabilities.

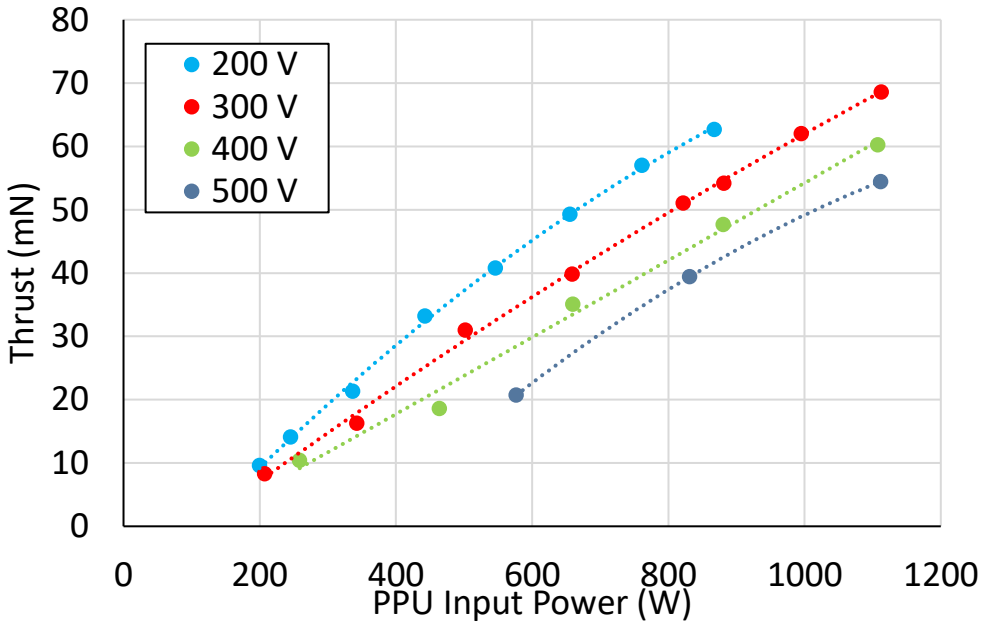
Halo Development

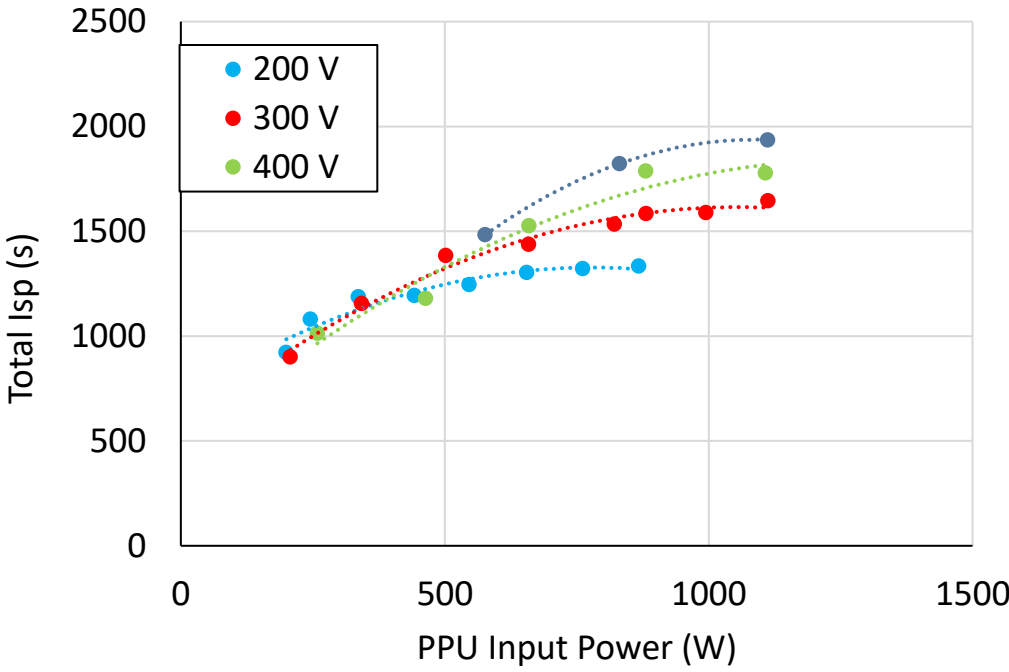
The Halo12 Thruster has completed environmental testing to levels encompassing a wide range of launch vehicles and spacecraft architectures. Life Testing is ongoing with a projected lifetime of 28,000 hrs. Halo12 is expected to complete qualification testing in 2021.

Part of an Integrated Propulsion System

ExoTerra offers satellite makers a full electric propulsion system solution for small satellites. The Halo XL EP module includes the thruster, a propellant storage and distribution system, and power processing unit. ExoTerra offers the module as a kit that can be assembled by the customer, or we can provide custom solutions to integrate the system into the customer's satellite, This service includes, component, tube & harness mounting and routing, thermomechanical analysis, tooling, assembly onto the customer's satellite, weld, and testing prior to delivery.

Halo12 Demonstrated Thrust and Total Specific Impulse





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