



PERFORMANCE MATRICES FOR CUA PROPULSION SYSTEMS

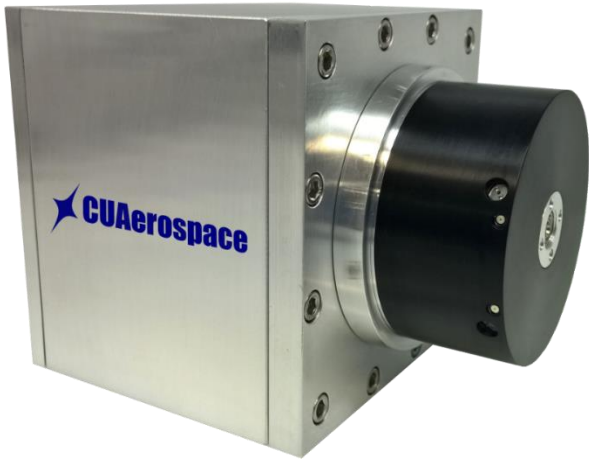
WELL-DEVELOPED SYSTEMS:

PARAMETER / PROPULSION SYSTEM	CHIPS (1U)	PUC (1U)	MVP (1U)	UNITS
Thruster System Package Volume	865	865	1,000	cm ³
Available Tank Volume	627	667	495	cm ³
Propulsion Technology	Micro-resistojet	Micro-plasma discharge	Micro-resistojet + 3D Printer	–
Propellant	R134a (R236fa opt.)	SO ₂	Polymer Fiber (Delrin)	–
Nominal Power Draw	25	15	35	W
Specific impulse	76	70	83	sec
Mass Flow Rate	40	6.5	8.2	mg/s
Thrust	31	5	6.7	mN
Total impulse	478	593	540	N-s
Vol. Impulse (total impulse / system volume)	553	653	540	N-s/liter
Propellant Mass	617	815	660	g
Dry Mass	758	641	540	g
Propulsion System Wet Mass	1,375	1,500	1,200	g
Delta-V capability (for 4 kg s/c Wet Mass)	125	167	150	m/s
ACS Capability	Yes	No	No	m/s
Maximum continuous thrust time (rest time)	10 (6)	20 (10)	15 (2)	min
TRL	5-6	6	5-6	–

EVOLVING SYSTEMS (ESTIMATED DEVELOPED PERFORMANCE):

PARAMETER / PROPULSION SYSTEM	MPUC (1U)	FPPT		UNITS
		1U	1.5U	
Thruster System Package Volume	1,000	1,000	1,500	cm ³
Available Tank Volume	550	150	395	cm ³
Propulsion Technology	Monopropellant	Pulsed Plasma Thruster		–
Propellant	H ₂ O ₂ -Ethanol	Teflon Fiber		–
Nominal Power Draw	3	48		W
Specific impulse	185	1,000 – 1,700	1,600 – 2,400	sec
Mass Flow Rate	82	0.014 – 0.040		mg/s
Thrust	160	0.28 – 0.33	0.27 – 0.35	mN
Total impulse	1,140	3,260 – 5,640	13,500 – 20,700	N-s
Vol. Impulse (total impulse / system volume)	1,140	3,260 – 5,640	9,000 – 13,800	N-s/liter
Propellant Mass	627	330	870	g
Dry Mass	650	1,180	1,880	g
Propulsion System Wet Mass	1,277	1,510	2,750	g
Delta-V capability (Propulsion Wet Mass + 4 kg)	230	610 – 1,060	2,150 – 3,290	m/s
TRL	4	5		–

CUA PROPULSION SYSTEMS



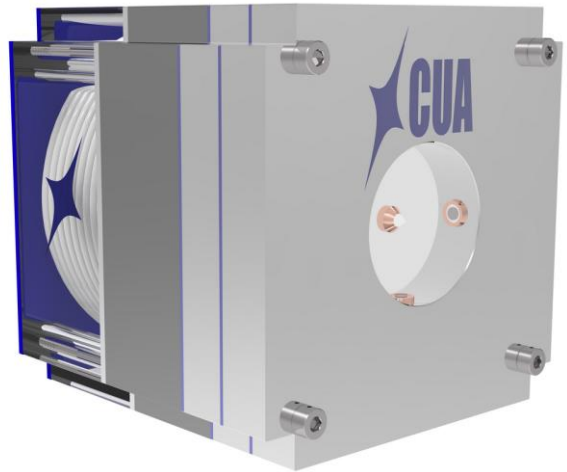
CHIPS Prototype Hardware



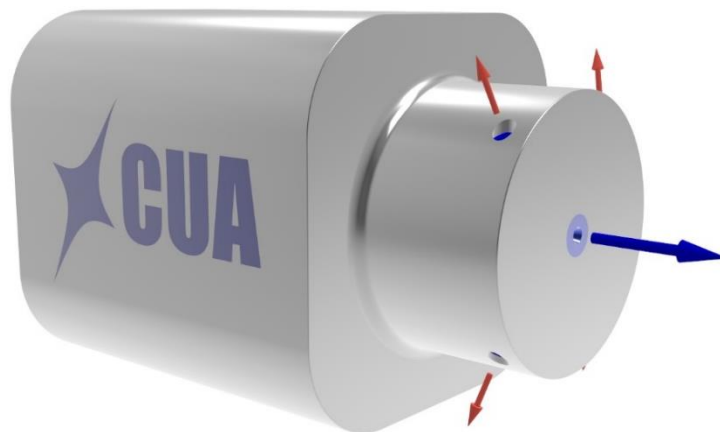
PUC Flight Hardware



MVP Flight Hardware



FPPT Flight Design Concept



MPUC Flight Concept