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PPU NEW DEVELOPMENTS FOR HET, GIT AND NEW SPACE

Abstract

This paper presents the Power Processing Units in Airbus DS Space Equipment, describing the existing products and mainly focusing in new developments for HET and GIT with special mention on the latest PPU development for New Space.

Four new PPU designs are under development, two per technology: HET and GIT Thrusters. This paper presents the development status, including product architectures and features, and qualification status, making emphasis on the main performances achieved and demonstrated by test, as follows:

- PPU for 5 kW HET (Elektro) and New Space PPU (< 1 kW) focusing on EQM results
- High Voltage PPUs for 5 Kw RIT 2X and T6/T7 focusing on EM results

PPU for HET, ELEKTRO: Elektro PPU motivation is to respond to Satcom market towards full Electrical Propulsion solutions. It is a new innovative concept of PPU, able to drive up to six different thrusters with one single PPU. ELEKTRO is compatible to the main HET thrusters in the market. The product has been fully qualified in July 2017. Product qualification will be presented, including test results to demonstrate the good behavior of the product.

PPU for LEO applications (≤ 1 kW): Development status and main highlight for this innovative design will be presented. The PPU so called TOPAZ has been designed to answer to New Space market. It is a full COTS design but keeping quality standards. The main driver is the cost to have a competitive design and being able to answer to the new market trends. TOPAZ has been baselined already for mega-constellations. Latest development status will be presented, qualification and flight model production.

High Voltage new PPUs development covering 5 kW gridded ion thrusters: RIT 2X and T6/T7. The 5kW PPU designs aim at full electric geostationary satellites. It covers the complete performance range necessary for orbit raising and station keeping. In both cases, PPUs are new generation concepts able to answer to the commercial market trends, in particular: dual mode in voltage to get the optimum performances between thrust to power ratio versus ISP, and product flexibility to change thruster parameters and operation in flight. Product architecture and features will be presented including EM performance and coupling test performed with the different thrusters.

Conclusion: This paper introduces the product features and architectures for the new PPUs under development with special mention on New Space products. Airbus DS PPUs cover the main EP technologies HET GIT, thrust versus ISP.