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CONFIGURABLE X-BAND TRANSMITTER FOR SMALL SATELLITE

Abstract

An X-band Transmitter designed to be modular that is able to accommodate different small satellite mission is described in this paper. The design is suitable for Low Earth Orbit and Near Equatorial Orbit. The design allows the transmitter data rates to be configured linearly up to 100 Mbps. The modulation method can be programmed either QPSK or OQPSK according to the CCSDS standard. The method of development allow for faster development of satellite transmitter and using modular architecture and digital implementation. A Solid State Power Amplifier with +40dBm output power is baseline as the threshold to satisfy small satellite power requirements. Homodyne system for up conversion is used to achieve 8 GHz frequency for minimal component with excellent stability is implemented. The design of the transmitter is discussed in this paper and the test results and performance are presented.