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Indigenous Development of MIC-Based C-Band Dual Chain Down Converter Unit for GEOSAT-Spacecraft Checkout System

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Abstract: *As part of miniaturization, the development work for the C-band dual-chain down converter, which is extensively used in TM (Telemetry) data acquisition system in GEOSAT spacecraft checkout system has been taken up in MIC (Microwave Integrated Circuit) approach using microstrip line structure. A prototype unit is realized using standard surface mount devices (SMD) and few indigenously developed MIC components namely, the directional couplers, the power dividers etc. The MIC-based down converter module, which forms the heart of the unit is housed in an Aluminium milled box having the dimension of 150 x 150 x 25 mm^3. Except internal Local Oscillator (LO), RF Switches and Power supply, all other circuitry are mounted withinthis milled box which is housed in 1U chassis. It meets all the requirements of a conventional down converter. The paper describes the salient features of the unit, its detailed design approach and realization plan and finally the test and evaluation results of the prototype unit developed indigenously.*

Keywords: Microwave Integrated Circuit (MIC), Tracking, Telemetry and Command (TTC), Local Oscillator (LO), Conversion gain, Low Noise Amplifier (LNA), Gain characteristics, SSB (Single Sideband) phase noise