

15W C Band Solid State Power amplifier

The GEOSAT program of ISRO is conceived to address the nation's growing need for satellite based connectivity for broadcast, communications and networking applications. The growing demand for bandwidth to support such applications is calling for a large number of transponders to be deployed in the coming years.

Solid State Power Amplifiers (SSPAs) are used extensively in such transponders. Space Applications Centre (SAC), ISRO has developed and qualified a design for normal C band operation, tailored to meet this requirement on board GEOSAT satellites. ISRO invites interested and capable parties to whom this technology can be transferred. Under this arrangement, qualified vendors will be enabled to undertake fabrication, testing, optimization and delivery of the RF assemblies required in these SSPAs. The SSPA consists of RF Assembly and an Electronic Power Conditioner [EPC] Assembly.

Attenuators

The SSPA has two PIN attenuator circuits. One is a two section commandable attenuator providing up to 24 dB of attenuation for on-board gain control. The second attenuator is used for compensation of gain variation against temperature. Each attenuator section employs 3 dB large couplers with two PIN diodes.

The commandable attenuator is externally controlled through serial commands. These commands are processed within the SSPA using a decoder comprising integrated circuits CD4050, CD40174, CD4015, CD40106 and CD4051. This decoder, along with biasing arrangements for all devices, is implemented on a PCB which is housed in a separate section of the RF assembly. The temperature compensation network is also included on this card.

RF Amplifier

The RF Assembly consists of low, medium and high power amplifier stages along with two attenuators.



The nominal RF output power of the SSPA is 15 Watts (41.8 dBm) in the specified operating frequency band. Nine amplifier stages provide the required 86 dB gain. The small signal stages employ five CFY25-20 devices in a 3 + 2 chain. These small signal stages will drive the medium power stages based on MGF2407 & MGF2430. All these stages are housed in one section of the RF package. The output of this section (i.e. small and medium power stages) is fed to the Power Amplifier section of the same housing, via co-axial cable. The Power Section houses the MGF38V and MGF44V devices, the latter being a 25 Watt output device. The space between the low power and high power sections is occupied by interconnections and harnessing.

Technology Transfer from ISRO

ISRO is willing to offer the knowhow of this technology to suitable entrepreneurs / industries in India. Capable manufacturing industries interested in acquiring this knowhow may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below: