Abstracts

Injection Locking Performance of a 41-GHz 10-W Power Combining Amplifier

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Due to the ever growing and tremendous demand for satellite communications channels, and the resultant spectrum crowding, there is an increasing interest in developing hardware appropriate for communication satellite use in the EHF frequency spectrum, Even with the advent of the space shuttle, reliability is still of paramount importance for hardware intended for satellite applications. While the traveling-wave tube (TWT) is presently the industry workhorse for satellite downlink transmitter use, their poor record of reliability beeomes even worse as the operating frequency is increased from 4 GHz to 12 GHz, 30 GHz, 40 GHz, and beyond. For this reason and also the greater simplicity, particularly in the power supply requirements, attention is naturally directed toward a solid-state replacement for the TWT. This paper details the measured performance of a solid-state amplifier which delivers 10 W of RF output power at an operating frequency of 41 GHz. The development of this amplifier is a significant milestone toward building a space-qualified high-power solid-state transmitter for spacecraft use.

❑ Return to main document.