

15GHz 線性化射頻功率控制系統

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摘 要

本論文將介紹 15GHz 線性化通訊發射機功率控制系統。其架構功能不同於現有的通訊電路將 RF Attenuation、linearizer 分開，而採用控制輸出級 PHEMT device 的閘極直流偏壓，利用不同的工作點改變其增益，相較於一般只有 20dB 用 PIN Diode 設計的反射式衰減器，其 power control dynamic range 可達到 40dB。並利用控制放大器閘極電壓來補償因較大的訊號輸入 power amplifier 時所造成的非線性失真，在大功率輸出時其非線性的互調失真仍可有 3dBc 的改善。

The 15GHz Linear RF Power Control System

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ABSTRACT

This thesis illustrates the 15GHz linear RF power control system. The architecture is distinct from the circuit that RF attenuation and linearizer are separated. I control the gate DC voltage of output PHEMT device to change the gain by different bias point. The dynamic range can reach the 40dB compared with the only 20dB reflecting pin diode attenuator.

It is used to control the gate voltage to compensate the nonlinear distortion when large signal input the power amplifier. The improvement of 3dBc inter-modulation have been achieved.