

Experimental Verification of Lumped Element Circuit Synthesis Method for Class-F Microwave Amplifier Using InGaP/GaAs HBT

Abstract - The validity of lumped element microwave class-F amplifier circuit design has been demonstrated experimentally. By means of the proposed class-F amplifier design method, more than 4th-order higher harmonic frequencies can be taken into account in class-F microwave amplifier design using only lumped element components.

In this approach, miniaturization of class-F amplifier circuit has also been realized. A collector efficiency of 71.2 % and a power-added efficiency of 69.2 % have been measured at an operating fundamental frequency of 1 GHz considering up to the 4th-order higher harmonic frequency.

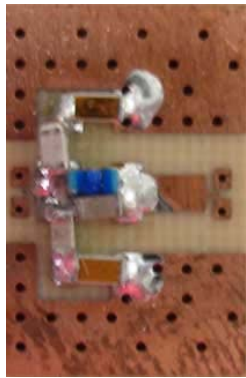


Fig.1 Lumped element load circuit

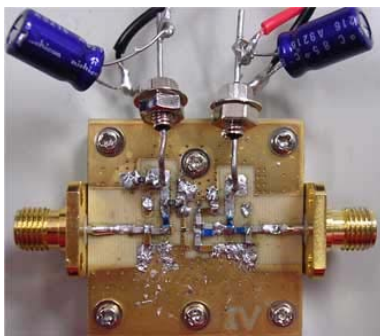
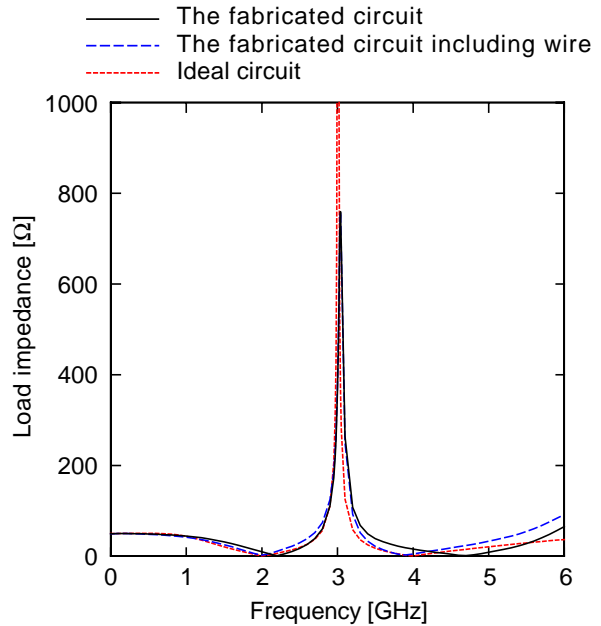


Fig.2 Fabricated class-F amplifier.

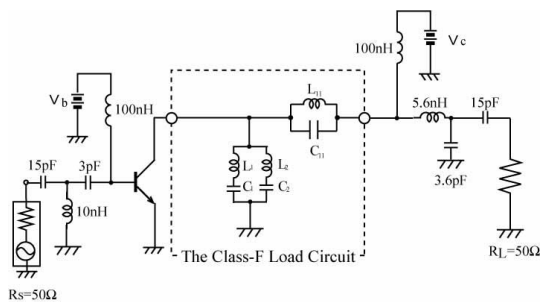


Fig.3 Equivalent circuit for fabricated amplifier.

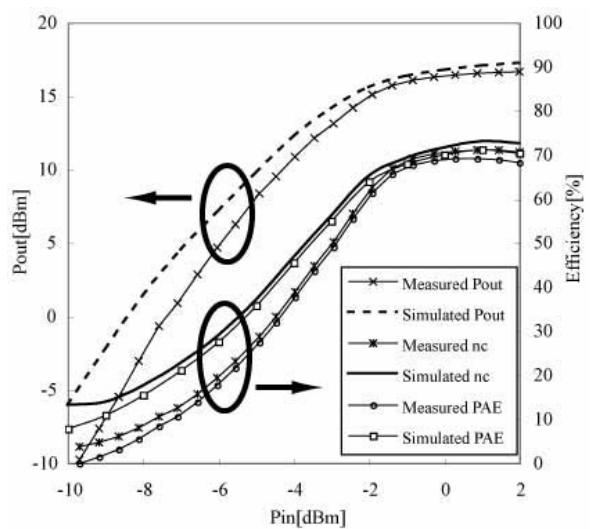


Fig.4 Efficiency and input/output power response for fabricated amplifier.