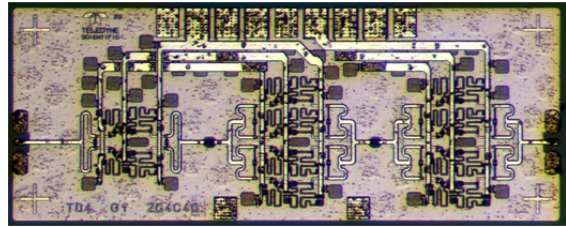


190-245GHz 50-70mW Solid-state Power Amplifier in 250nm InP HBT



Summary of the Amplifier

- ❑ 190-245GHz Solid-Stage Power Amplifier.
- ❑ Typical 23-30dB S_{21} gain from 190-250GHz.
- ❑ Typical output power P_{out} between 190-245GHz is 50-70mW at 0dBm input power P_{in} .
 - ❑ P_{out} for frequencies > 245GHz remains high.
 - ❑ $P_{out,max}$ @ 250GHz = 42mW, @ 255GHz = 37mW, @ 260GHz = 31mW, @ 265GHz = 22mW.
- ❑ DC power dissipation = 1.60W (no RF drive).
 - ❑ At $P_{out} = P_{sat}$, DC currents increase by 4-6%.
- ❑ No DC blocking capacitors between the MMIC and RF pads. Appropriate transitions required.
- ❑ Finished thickness: 3-mil, with thru-substrate vias for mode suppression within the InP substrate.
- ❑ InP MMIC die dimensions: 1.92mm × 0.80mm (± 0.01mm)

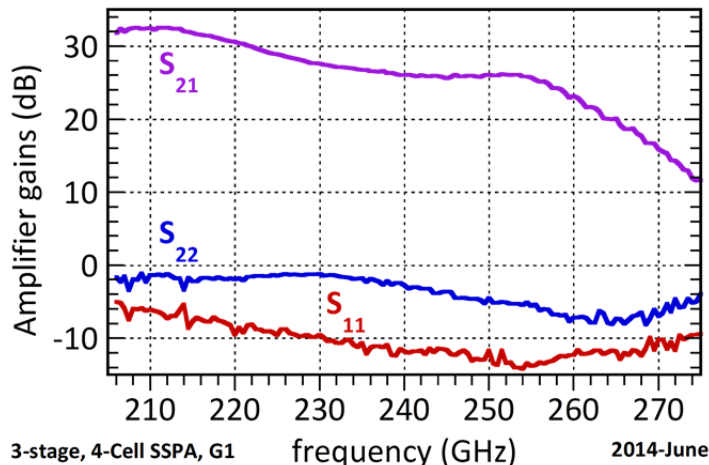
Description

The Teledyne Scientific T04 3S4C-G1-P1 MMIC is a three-gain-stage SSPA that produces 50-70mW RF output power between 190-245GHz for RF input powers between -16dBm to 2dBm.

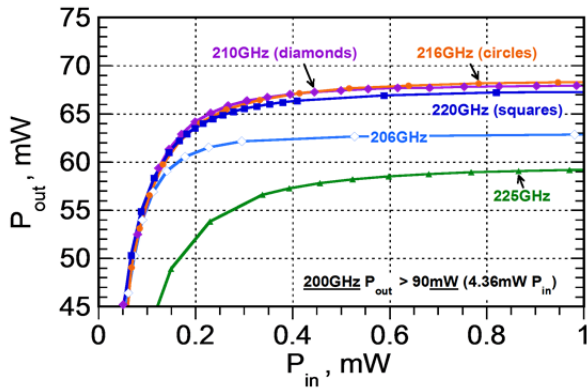
TABLE-1. DC Bias Specifications

Bias	Parameters/Conditions	Target Voltage (V)	Max Voltage (V)	Bias Current (mA)
V_{C1}	Common-emitter HBT bias	1.70	1.80	290
V_{C2}	Collector Bias, common-base HBT	1.70	1.75	333
V_{E2}	Emitter Bias, common-base HBT	-1.12	-1.15	350

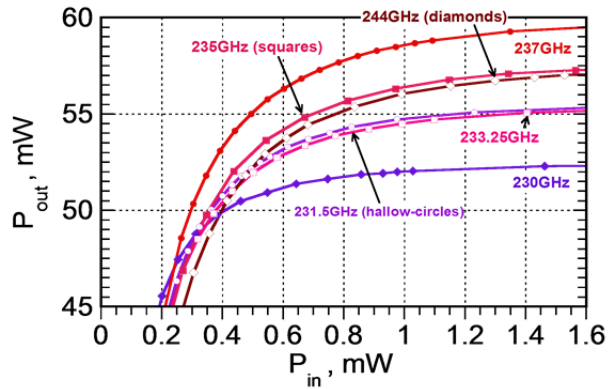
Summary of the RF Electrical Characteristics



Small-signal S-parameters of a representative T04 3S4C-G1-P1 SSPA.

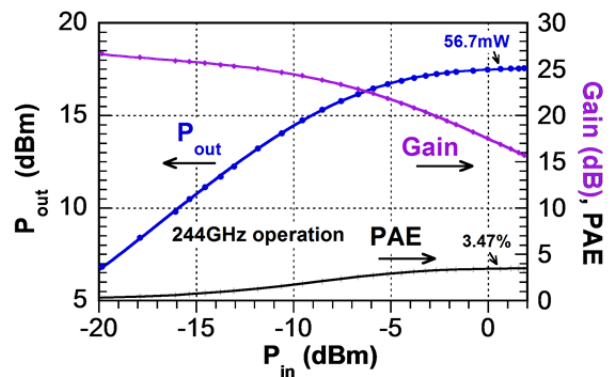
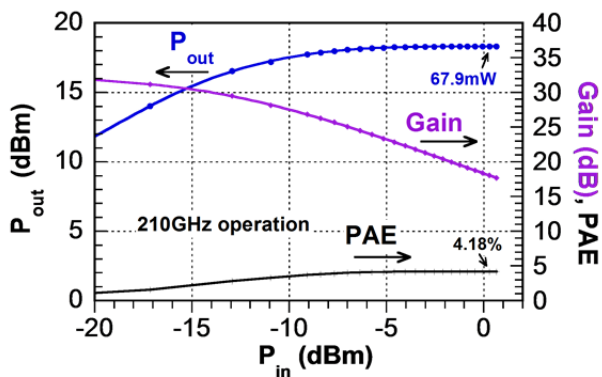
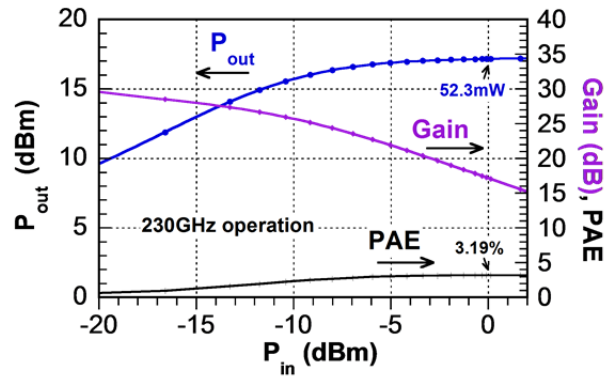
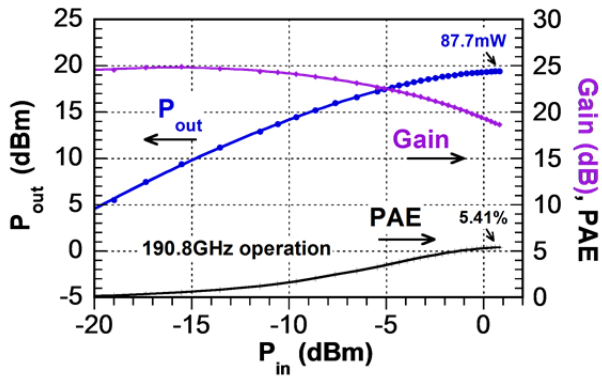


206-225GHz operation



230-244GHz operation

P_{out} vs. P_{in} (linear format) at different frequencies (206-244GHz).



P_{out}, Gain, and PAE vs. P_{in} at 190.8, 210, 230, and 244GHz Operation.

Contact Information for TSC SSPA information, queries, and assistance:

Zach Griffith, Teledyne Scientific Company, zgriffith@teledyne.com, 805-373-4104

Ordering information:

Part ID: T04 3S4C-G1-P1, ECCN: 3A001.b.2.h, Description: G-band PA, 190-245GHz, 50-70mW P_{out}