Teledyne Scientific V-, W-, D-, and G-band PA's

50-250 GHz Broadband, High Power Amplifier MMICs in InP HBT

- Amplifier ID: TSC 70-130G-4S2C
  - 22-25 dB S21 gain from 55-130 GHz, typical.
  - 100-120 mW saturated RF output power, $P_{sat}$.
    - 16-18 dB power gain at $P_{sat}$ with 7.5-8% PAE.
  - DC bias, $P_{DC} = 1.4$-W. Size: 1.86-mm x 0.64-mm.

- Amplifier ID: TSC 160-180G-5S2C
  - 20-23 dB S21 gain from 160-180 GHz, typical.
  - 100-125 mW saturated RF output power, $P_{sat}$.
    - 13-14 dB power gain at $P_{sat}$ with 6-8% PAE.
  - DC bias, $P_{DC} = 1.5$-W. Dimensions: 1.86-mm x 0.64-mm.

- Amplifier ID: TSC 70-130G-3S4C
  - 16-20 dB S21 gain from 70-130 GHz, typical.
  - 160-240 mW saturated RF output power, $P_{sat}$.
    - 13-14 dB power gain at $P_{sat}$ with 7-10% PAE.
  - DC bias, $P_{DC} = 2.1$-W. Size: 1.86-mm x 0.92-mm.

- Amplifier ID: TSC 160-180G-5S4C
  - 19-21 dB S21 gain from 160-180 GHz, typical.
  - 175-225 mW saturated RF output power, $P_{sat}$.
    - 12.5-14 dB power gain at $P_{sat}$ with 5-7% PAE.
  - DC bias, $P_{DC} = 3.0$-W. Dimensions: 2.05-mm x 0.86-mm.

- Amplifier ID: TSC 115-145G-5S4C
  - 23-25 dB S21 gain from 115-145 GHz, typical.
  - 210-225 mW saturated RF output power, $P_{sat}$.
    - 14-16 dB power gain at $P_{sat}$ with 5-6.5% PAE.
  - DC bias, $P_{DC} = 3.5$-W. Size: 2.05-mm x 0.92-mm.

- Amplifier ID: TSC 185-205G-6S2C
  - 20-22 dB S21 gain from 185-205 GHz, typical.
  - 80-90 mW saturated RF output power, $P_{sat}$.
    - 12-13 dB power gain at $P_{sat}$ with 4-4.5% PAE.
  - DC bias, $P_{DC} = 1.8$-W. Dimensions: 1.86-mm x 0.64-mm.

- Amplifier ID: TSC 125-185G-5S2C
  - 20-22 dB S21 gain from 125-185 GHz, typical.
  - 75-100 mW saturated RF output power, $P_{sat}$.
    - 13-14 dB power gain at $P_{sat}$ with 5-7.5% PAE.
  - DC bias, $P_{DC} = 1.4$-W. Size: 1.86-mm x 0.64-mm.

- Amplifier ID: T04 3S4C-G1-P1 (190-245 GHz)
  - 23-28 dB S21 gain from 190-245 GHz, typical.
  - 50-80 mW saturated RF output power $P_{sat}$.
    - 16-18 dB power gain at $P_{sat}$ with 3-4.5% PAE.
  - DC bias, $P_{DC} = 1.6$-W. Dimensions: 1.92-mm x 0.80-mm.

For additional information, pricing and quotation, and to order, contact Teledyne at tsi.electronics@teledyne.com

For custom PA design services using the InP HBT technology, contact Teledyne at zach.griffith@teledyne.com

Packaged versions of the Teledyne MMICs shown are available from VDI: https://vadiodes.com/en/products-6/amplifier

For additional packaged power amplifier information from Virginia Diodes (VDI), contact: vdirfq@vadiodes.com

2020-March Amplifier datasheet subject to change without notice Amplifier MMIC ECCN: 3A001.b.2.h
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Additional amplifier MMICs from Teledyne:

**TSC 70-130G-3S2C power amplifier.** Its performance is very similar to the TSC 70-130G-4S2C PA, only lower gain.
- 16-20 dB $S_{21}$ gain from 70-130 GHz, typical.
- 100-120 mW saturated RF output power, $P_{sat}$.
  - $13-14$ dB power gain at $P_{sat}$ with 10-11% PAE.
- DC bias, $P_{DC} = 1.1$-W. Size: 1.86-mm x 0.64-mm.

**TSC 70-130G-3S1C power amplifier.** Its performance is very similar to the TSC 70-130G-3S2C PA, less output power.
- 16-20 dB $S_{21}$ gain from 70-130 GHz, typical.
- 55-65 mW saturated RF output power, $P_{sat}$.
  - $14.5-15$ dB power gain at $P_{sat}$ with 11-12% PAE.
- DC bias, $P_{DC} = 0.55$-W. Size: 1.30-mm x 0.50-mm.

**TSC 94G-3S2C-E20 power amplifier.** An 88-104 GHz, 26-30 dB gain, high-efficiency power amplifier.
- 26-30 dB $S_{21}$ gain from 88-104 GHz, typical.
- 100-110 mW saturated RF output power, $P_{sat}$.
  - $18-20$ dB power gain at $P_{sat}$ with 19-23% PAE.
- DC bias, $P_{DC} = 0.42$-W. Size: 1.86-mm x 0.64-mm.

**TSC 190G-5S1C amplifier.** A 190-GHz, 25-dB gain, low-power amplifier.
- 23-25 dB $S_{21}$ gain from 185-200 GHz, typical.
- 9-10 dBm saturated RF output power, $P_{sat}$.
  - $16$ dB power gain at $P_{sat}$ with 9-9.5% PAE.
  - Output 1-dB gain compression power, $OP_{1dB} = 3$-dBm.
- DC bias, $P_{DC} = 80$-mW. Size: 0.93-mm x 0.48-mm.

Publication list summarizing Teledyne’s 50 – 250 GHz power amplifiers:

8. Z. Griffith et al., “A 50-80 mW SSPA from 190.8-244 GHz at 0.5-mW $P_{in}$”, IEEE MTT-S International Microwave Symposium, Tampa, FL, June 1-6, 2014.