

Balanced TGA1172 Measured Performance

Objective:

Many times, multiple amplifiers must be power combined to achieve the required system power or IMD performance. This application note describes the measured performance achieved from a balanced TGA1172 amplifier design. TriQuint plans to introduce a balanced MMIC (TGA1193) based on this result design in early Q2 2001.

Observed Power and OTOI from Balanced Amplifier :

An experimental circuit consisting of 2 x TGA1172 amplifiers, power combined using Lange couplers was built and tested. Measured results were used to set realistic design goals for the planned TGA1193 MMIC. Figure 1 below illustrates the balanced amplifier assembly.

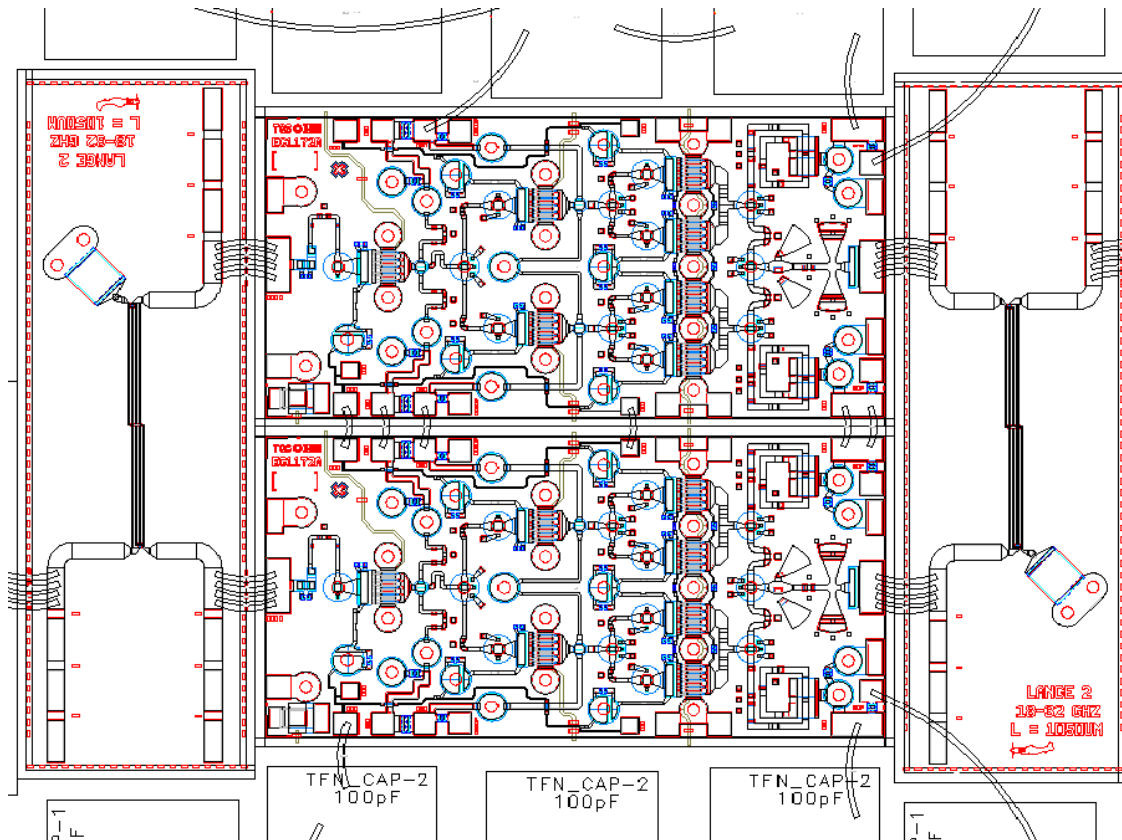


Figure 1 -- Balanced TGA1172 Assembly

Note: Devices described in this document are early in their development process. Specifications are subject to change without notice. Please contact TriQuint for additional details

Figures 2 and 3 below illustrate the performance from the balanced amplifier assembly at 150mA/mm bias. Total Id = 1.26A

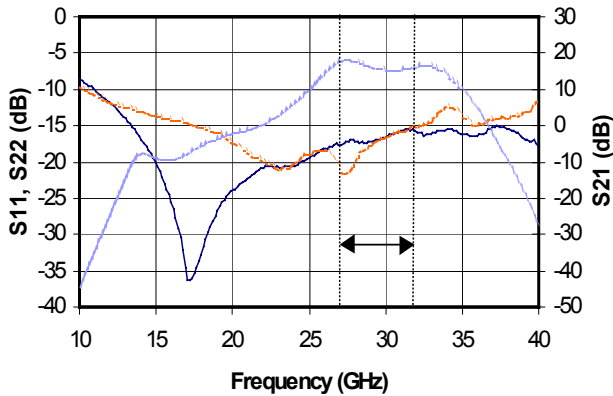


Figure 2 -- Average Wide band gain and RL performance for 9 balanced assemblies. In band gain of 15-19dB and I/O RL of better than 15dB was observed.

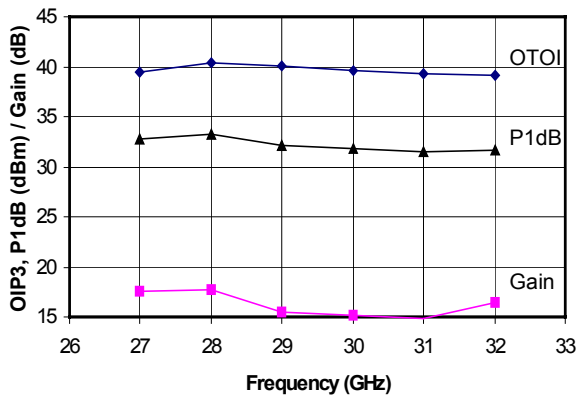


Figure 3 -- Gain, Power and OTOI for the balanced assembly. Note P1dB of 32-34dBm across the 27-32 GHz band with OTOI of 40dBm

Design Goals for new MMIC (TGA1193) :

Key performance goals for the new MMIC design are as follows:

- Frequency Band = 27 - 32 GHz
- Small Signal Gain = 17.5 dB nominal
- In/Out Return Loss > 15 dB
- P1dB > 31 dBm
- Output TOI > 38 dBm
- Device size < 9 mm²

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A preliminary device layout is illustrated in Figure 4. Layout and performance is subject to change without notice. Please contact TriQuint for latest information prior to using any of this preliminary information for design purposes. Current schedule information indicates device completion in Q101 with samples available by early Q201.

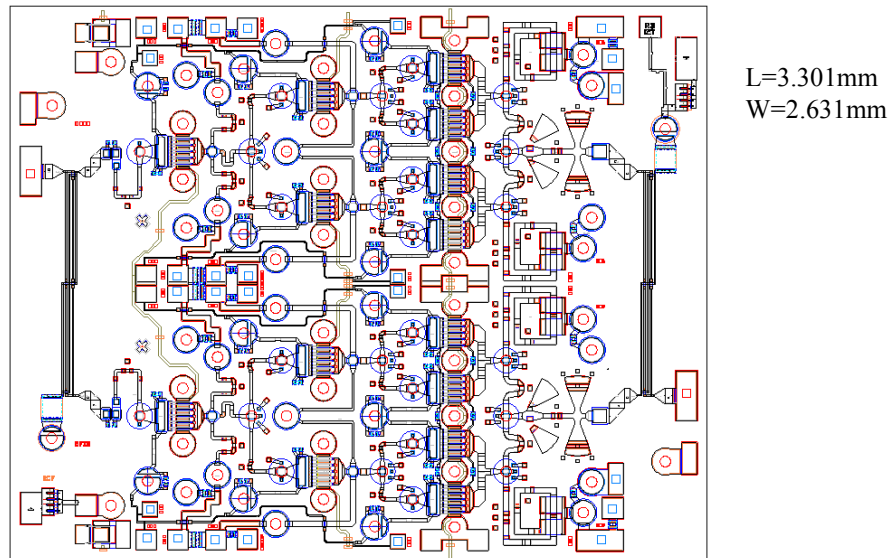


Figure 4 -- Preliminary TGA1193 Layout

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