

The PGA-105+ is a 15dB gain monolithic amplifier for the 40-2600MHz range with excellent gain flatness and a high dynamic range (1dB compression point: 19.3dBm @ 2GHz).

S parameters for the PGA-105+ can be found [here](#).

Unconditional stability requires stability factor  $k > 1$  and stability measure  $B > 0$ . However, an analysis of the S-parameters shows the amplifier has  $k < 1$  for frequencies under 60MHz.

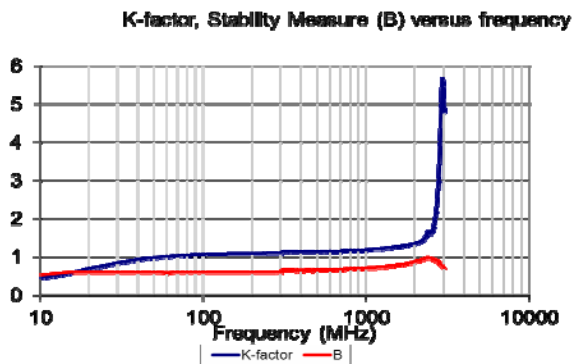


Figure 1 - PGA-105+: stability parameters

In order to improve stability, addition components need to be added at input and output, see Figure 2:

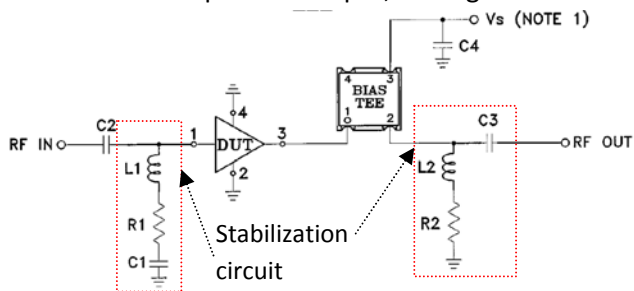


Figure 2: stabilization circuit

Component	Value
DUT	PGA-105+
C1	330pF
C2, C3	1nF
C4	100nF
R1	422Ω
R2	47.5 Ω
L1, L2	330nH
Bias-Tee	Mini Circuits TCBT-14+

The stability parameters of the amplifier with the stabilizing network are shown in Figure 3. Note:  $k > 1$  and  $B > 0$  over entire range.

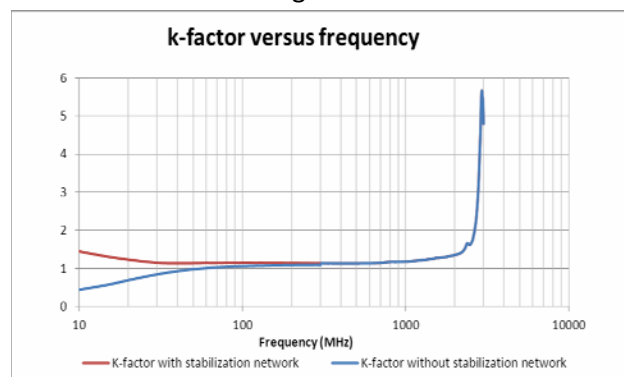


Figure 3 - PGA-105+: k-factor

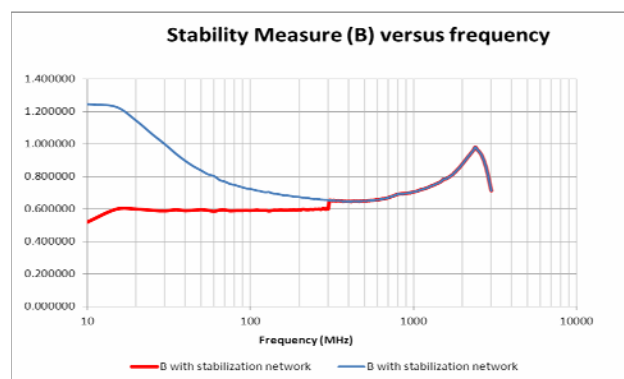


Figure 4: PGA-105+: Stability Measure

The stabilized amplifier has an amplification of about 14.5 dB

The performance of the stabilized amplifier:

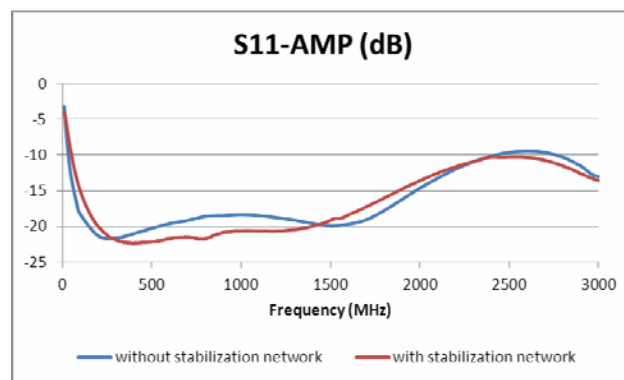


Figure 5 - Return Loss

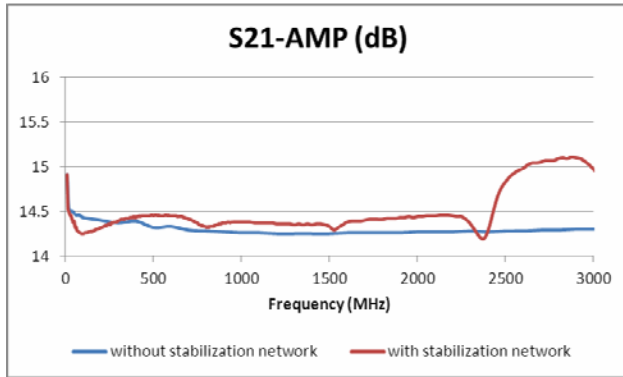


Figure 6 – Amplification

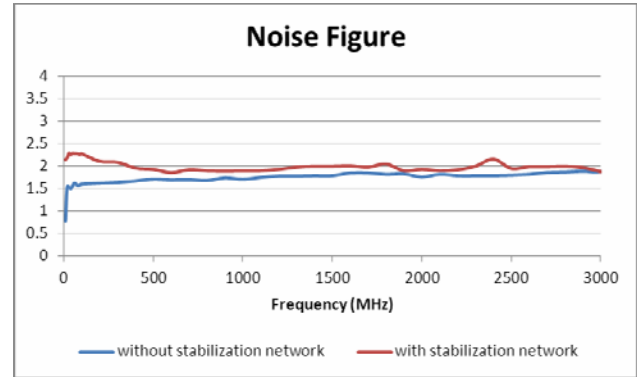


Figure 9 - Noise Figure

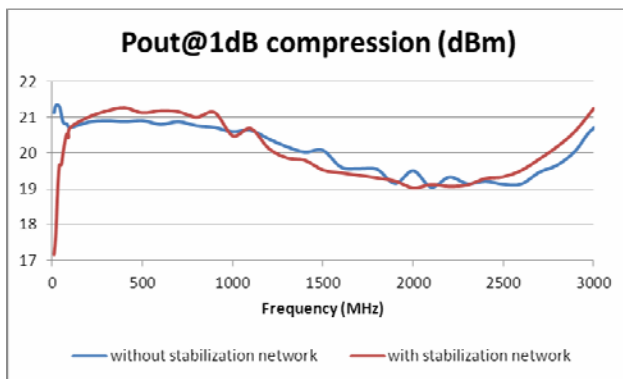


Figure 7 – Compression

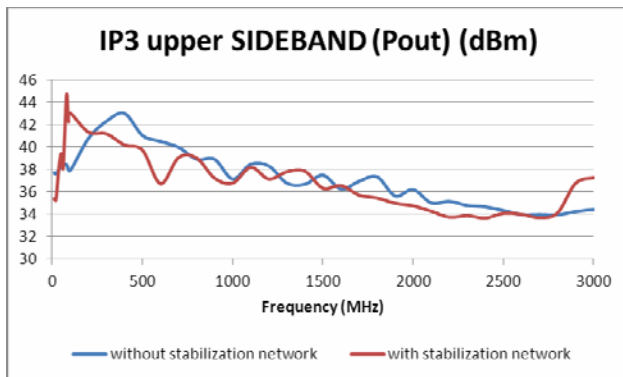


Figure 8 - IP3

### Conclusion:

- Use of the stabilization circuitry has minor impacts on all parameters.
- The use of the stabilization circuitry guarantees amplifier's unconditional stability.

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