

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886
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Telephone: 781-981-5400
Fax: 781-981-0590

To: EDGES Group
From: Alan E.E. Rogers
Subject: Minor adjustments to LNA for improved S11 below 100 MHz.

The S11 of the LNA can be improved to be below about -30 dB from 50 to 100 MHz with the following minor adjustments:

1. Adding 2.2 μH in parallel with the 2.5 μH inductance on the LNA input.
2. Bypassing the 40 ohms on the ERA-1SM output with 1000 pf
3. Increasing the 100 pf output coupling from 100 pf to 390 pf
4. Slight adjustment in the ATF-54143 bias by putting 430 ohms in parallel with the 150 ohm bias resistor.

These changes made smaller improvements above 100 MHz. While the circuit simulations show that change #1 should improve the low end for all units the other changes may be specific to characteristics of the individual ATF-54143. Changing the 1000 ohm feedback resistor is not easy and was not attempted since small changes in resistance are limited by the available values of resistance. Adding a resistor in series or parallel in this case is not an option as the capacitance of the resistor combination will be significantly different. Change #2 increases the gain by about 3 dB. To get back to about the same gain the attenuator on the output should be changed to 12 dB (Minicircuits BW-S12W2+).

