

NOTE:

For a Min-loss attenuator to match 200 Ohms to 50 Ohms which might be used with a Chinese AD985X Module See reference material.

For a 12 db Target Matching Pad

Attenuation = 12.0dB = 11.965dB with std values [VSWR = 1.04]

R1 = 3211.81	R1 = 3300
R2 = 186.47	R2 = 180
R3 = 57.70	R3 = 56

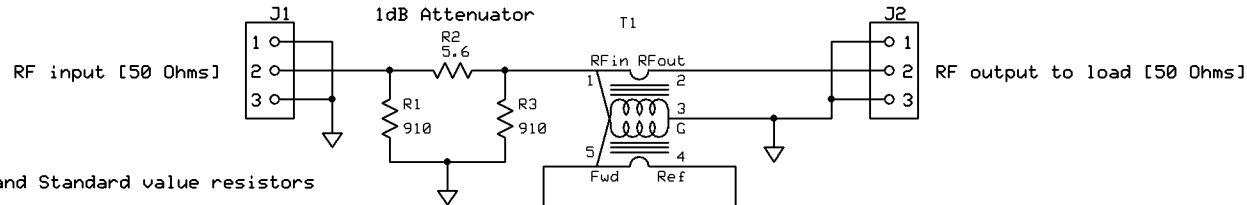
Attenuation = 11.44dB

R1 = Open Circuit

R2 = 173.21

R3 = 57.74

Therefore, when the load sees -10dBm [71mV/50 ohms] there will be -27dBm [10mV/50 ohms] at the Forward port.



Pi Pad Attenuators and Standard value resistors

Attenuation = 1dB
R1 & R3 = 910 Ohms
R2 = 5.6 Ohms

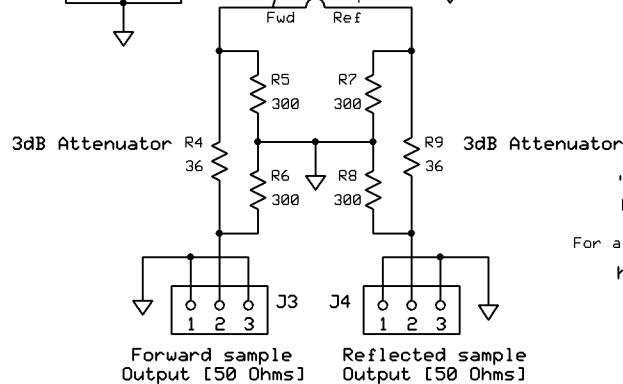
Attenuation = 2dB
R1 & R3 = 430 Ohms
R2 = 12 Ohms

Attenuation = 3dB
R1 & R3 = 300 Ohms
R2 = 18 Ohms

Attenuation = 6dB
R1 & R3 = 150 Ohms
R2 = 36 Ohms

Attenuation = 10dB
R1 & R3 = 100 Ohms
R2 = 68 Ohms

Attenuation = 20dB
R1 & R3 = 62 Ohms
R2 = 240 Ohms



Reference Material

"RF Directional Couplers" by Michael G. Ellis, Ph.D.
U.S. Patent #3,426,298, Broadband Directional Coupler

For a description of various AD985X DDS filters and their responses see:
<http://www.rudiswiki.de/wiki/AmateurRadioDDSgenerator>

The above design uses 3 pin 0.100" headers on PCB

At 5 Turn per side on the BN-43-202 the coupler yields 14dB isolation.

[If the windings are increased to 10 turns the isolation becomes 20dB.]

Therefore this design provides -18dB attenuation at the Forward and Reflected ports

All Outputs are 50 Ohms and must be terminated in 50 Ohms to operate properly.

RF input is 50 Ohms. 1db Pad will be eliminated if R2 is Zero Ohms.

This design can be used with R2 = 0 with a low power transmitter to measure SWR & Power.

The limiting factor is the power dissipation of the surface mount resistors.

For power of more than a few watts, the resistors &/or attenuators should be off the board.

The BN-43-202 core should easily handle far more than 25 Watts [not measured].

With 10 turn windings, R2=0 [20dB isolation] power should be under 10 Watts.

Directional Coupler

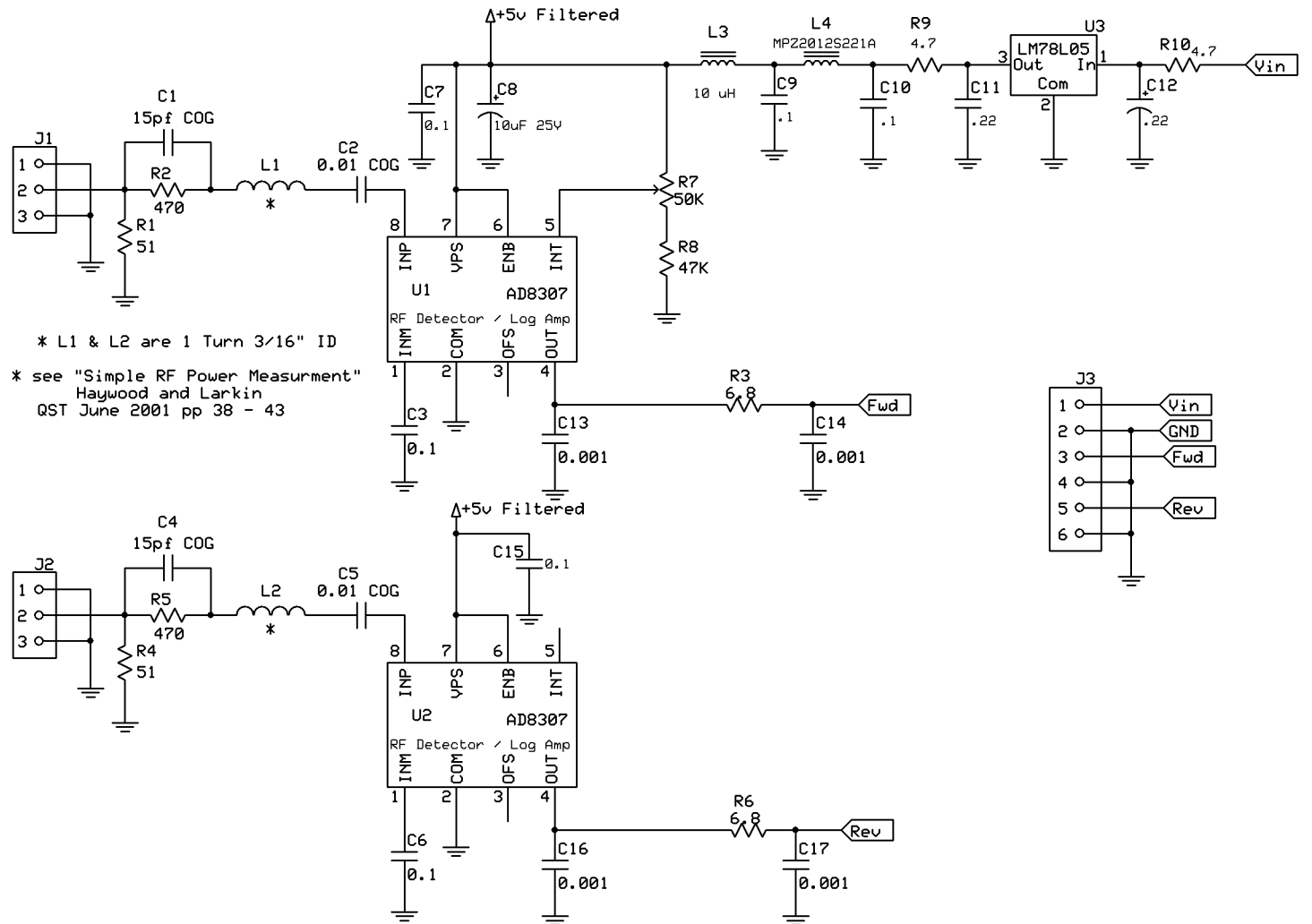
For VNA & Antenna Analyzer

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Dual Input AD8307 SWR Bridge
For QST Antenna Analyzer

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