fiber I.F. receiver

Dick Plambeck, 8/1/2007

Function: Converts I.F. from fiber to coax in the correlator room.

Brief circuit description: Each chassis contains 8 modules. Each module consists of a Discovery Semiconductor DSC50S photodiode followed by a JCA110-317 amplifier (30 dB gain, 1-10 GHz) and a MAC Technology CA4226-16C directional coupler (15 dB coupling, 0.9-10 GHz). A circuit board mounted against the front panel provides DC bias to each photodiode from a MAX4004, which also provides a convenient current monitor. The 30 dB amplifier should approximately compensate for loss through the fiber link; hence the IF output power from the fiber receiver should be comparable with the output power from the PAM on the receiver itself.

Input:

- 1550 nm optical signal on singlemode fiber, FC-APC connector, from the OTX on each antenna. The expected optical intensity (allowing for up to 3 dB loss in fiber) is -6 to +3 dBm

Output:

- I.F. output on SMA (rear panel); output level depends on PAM attenuation at the receiver, as well as fiberoptic losses
- I.F. sample on SMA (front panel)
- 25-pin D female with photodiode current monitors (wiring diagram, table 1); the scale factor is 1.8 V/mW

Indicator LEDs:

- *green* indicates adequate optical input power (photodiode current monitor > 0.5V, corresponding to laser input power > 0.25 mW)
- *yellow* indicates marginal optical input power (0.5 V < photodiode current monitor < 0.09 V, corresponding to 0.25 mW < optical pwr < 0.05 mW)
- *off* indicates optical input power is unacceptably low (< 0.05 mW)

25-pin D-subminiature connector, female:

1	**mon 1 (1.8 V/mW)**
14	**gnd**
2	
15	**mon 2**
3	**gnd**
16	
4	**mon 3**
17	**gnd**
5	
18	**mon 4**
6	**gnd**
19	
7	**mon 5**
20	**gnd**
8	
21	**mon 6**
9	**gnd**
22	
10	**mon 7**
23	**gnd**
11	
24	**mon 8**
12	**gnd**
25	
13	

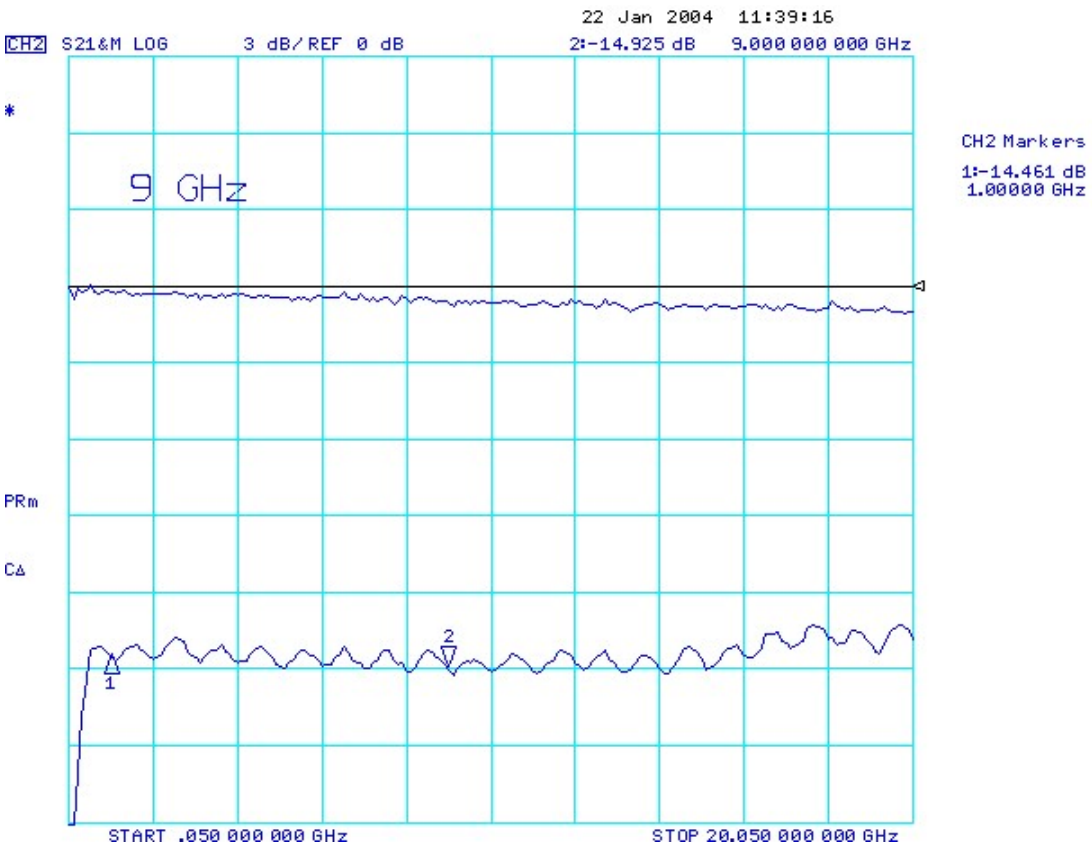


Fig 1. Test data on MAC Technology CA4226-16 directional coupler.

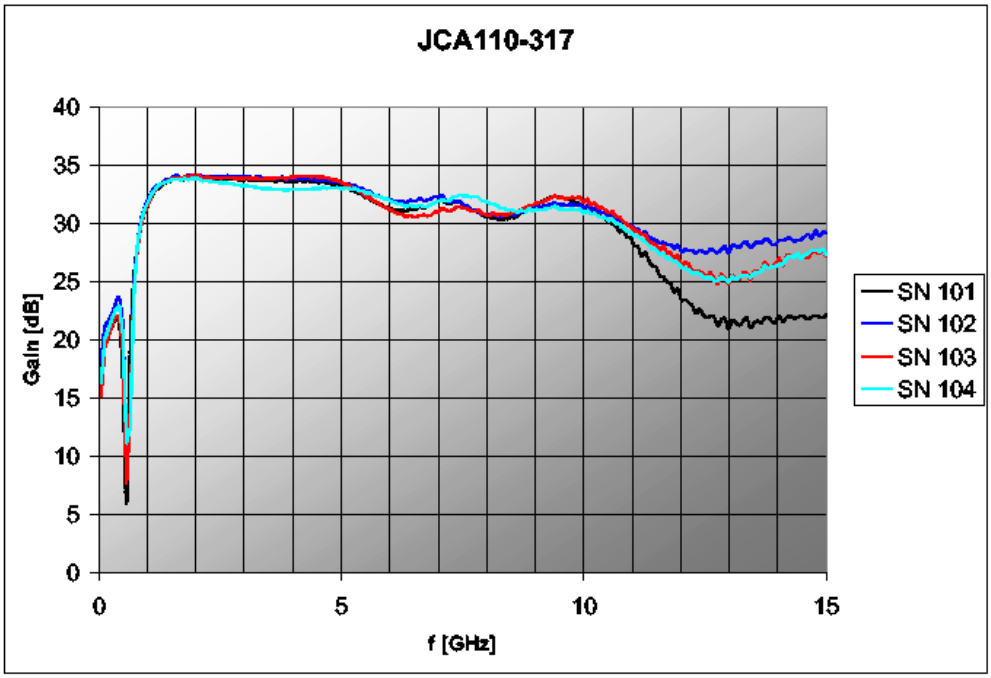
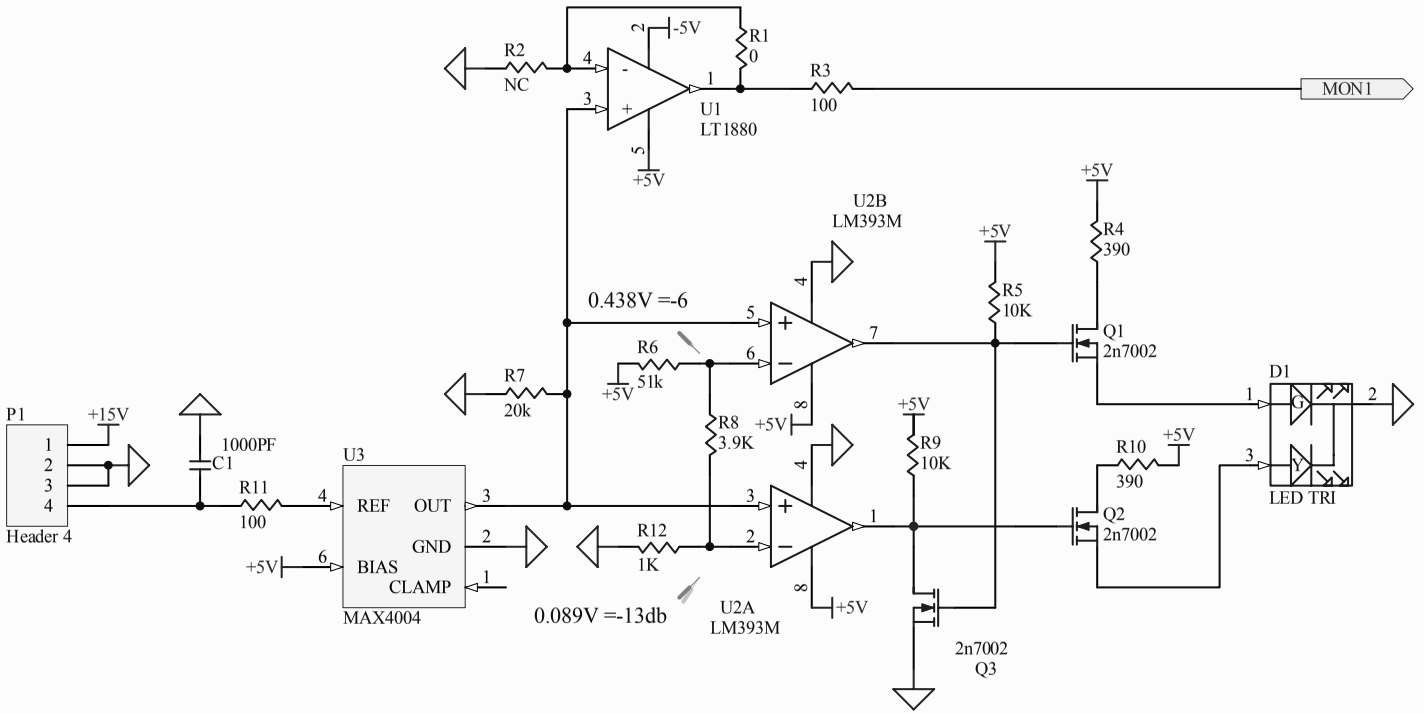


Figure 2. Measured gain vs. frequency for 4 JCA amplifiers.



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