

## **SPECIFICATIONS**

### **2W and 5W optical amplifiers**

**BACKGROUND:** The Optical Frequency Measurement Group is part of the Time and Frequency Division (Div. 688) at the National Institute of Standards and Technology (NIST) in Boulder, CO. This group develops optical frequency comb sources for time and frequency metrology, and high spectral purity optical, millimeter-wave, microwave, and radio frequency signal generation.

**PURPOSE:** To acquire high power optical amplification of ultrashort optical pulses in the 1535 nm to 1565 nm telecommunications window.

**DELIVERABLES:** NIST requires two (2) high power short pulse optical amplifiers in the 1535 nm to 1565 nm window.

- One amplifier must supply up to 5W of average optical power.
- One amplifier must supply up to 2W of average optical power.

**TECHNICAL SPECIFICATIONS:** The contractor shall provide the following:

For the 2W optical amplifier:

- Signal gain for -20 dBm input: > 40 dB
- Wavelength range with required gain: at least 1535 nm – 1565 nm
- Noise figure:  $\leq 5$  dB for -20 dBm input
- Output saturation average power:  $\geq 33$  dBm
- Single mode fiber with FC/APC connectors on input and output
- Computer control either through RS-232, USB or GPIB interface
- Input and output power monitors
- Pulse distortion: for a 10 GHz input pulse train with 300 fs pulse width, output pulse width broadening must be < 100 fs

For the 5W optical amplifier:

- Signal gain for -10 dBm input: > 40 dB
- Wavelength range with required gain: at least 1535 nm – 1565 nm
- Noise figure:  $\leq 6$  dB
- Output saturation average power:  $\geq 37$  dBm
- Polarization maintaining, single mode fiber with FC/APC connectors on input and output
- Computer control either through RS-232, USB or GPIB interface
- Input and output power monitors
- Isolators with >45 dB isolation at input and output
- Pulse distortion: for a 10 GHz input pulse train with 300 fs pulse width, output pulse width broadening must be < 100 fs

**TECHNICAL CONSIDERATIONS:** For both amplifiers, achieving the gain and saturation output power over the full specified wavelength range with specified minimal pulse distortion is required for our application.

**GOVERNMENT FURNISHED PROPERTY OR INFORMATION:** None.

**DELIVERABLE SCHEDULE:** The contractor shall deliver no later than **8 weeks** after receipt of order.

**INSPECTION AND ACCEPTANCE:** The NIST Technical Point-of-Contact (TPOC) will inspect and test the merchandise upon delivery. The merchandise shall perform according to specifications.