

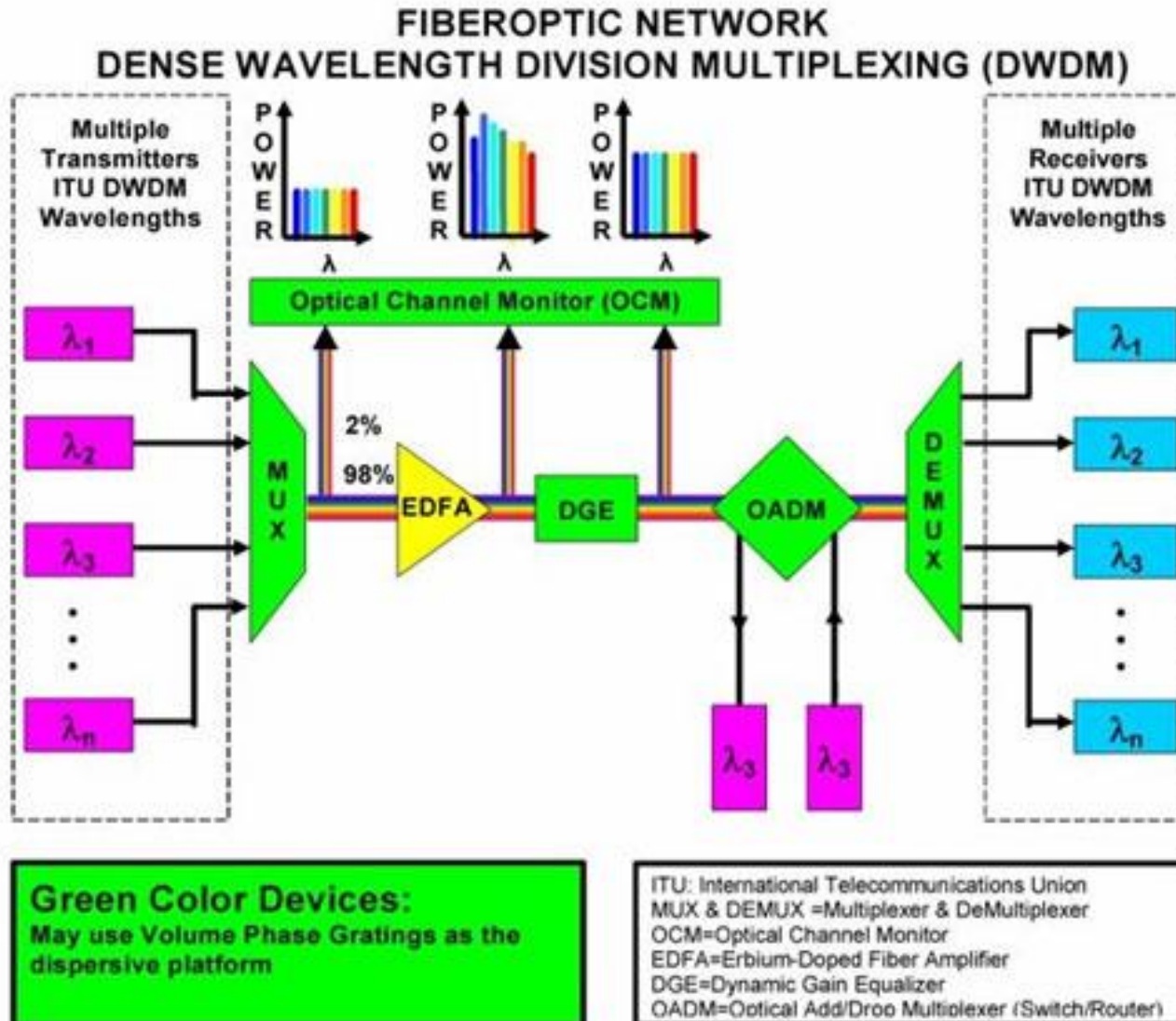
Optical Fiber Communications

Chapter XX

Tunable Laser Source

Basic Knowledge (Why Tunable?)

Why Tunable?



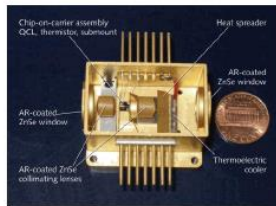
Tunable Laser Chip

Hierarchy in Fiber Optics



Laser Chip

Process : nm
Size : mm



Laser Diode
Package

Process : μm
Size : cm



Optical Transmitter
(Receiver) Package

Process : mm
Size : cm



Tunable Laser Structure

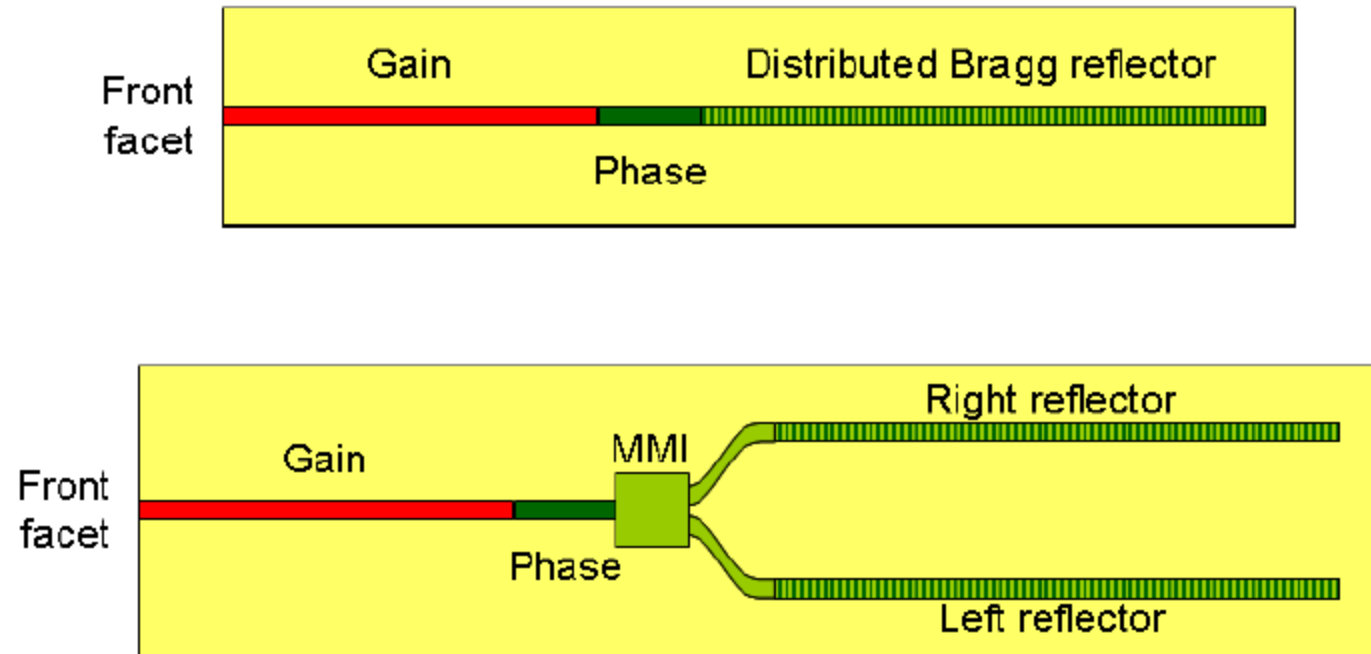


Figure 1 Schematic top view of a conventional distributed Bragg reflector laser and Finisar's modulated grating Y-branch (MG-Y) laser

Operating Principle

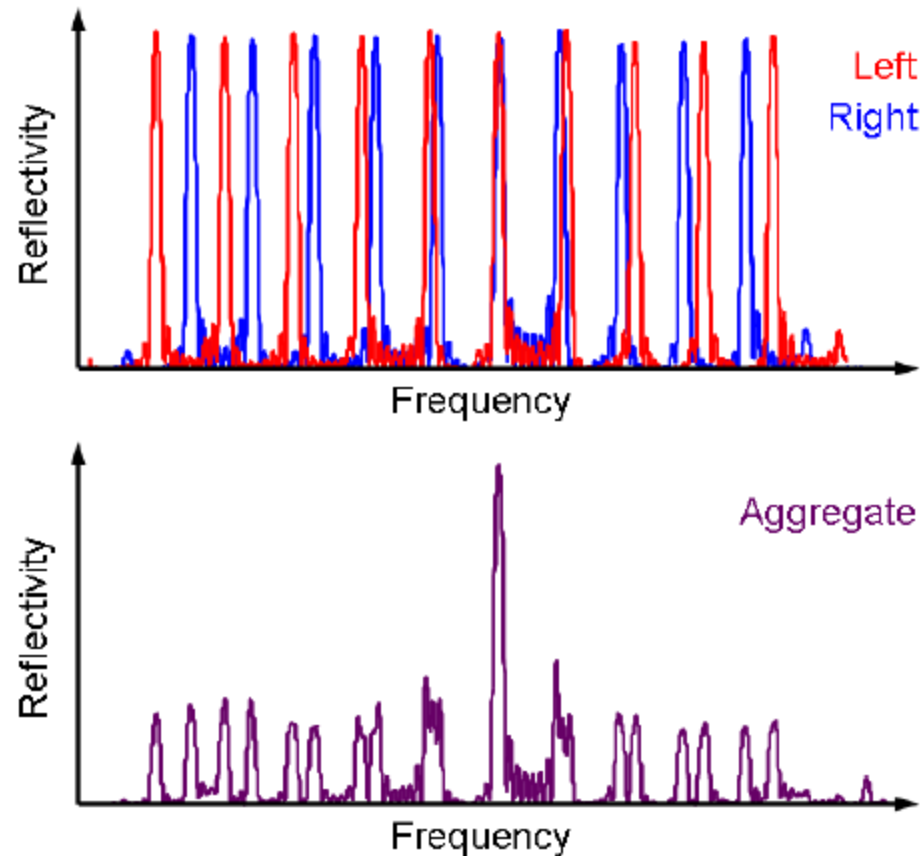


Figure 2 Reflectivity spectra of the left and right modulated grating reflector (top) and the aggregate reflectivity spectrum as seen from the input of the MMI splitter (bottom).

Control Method

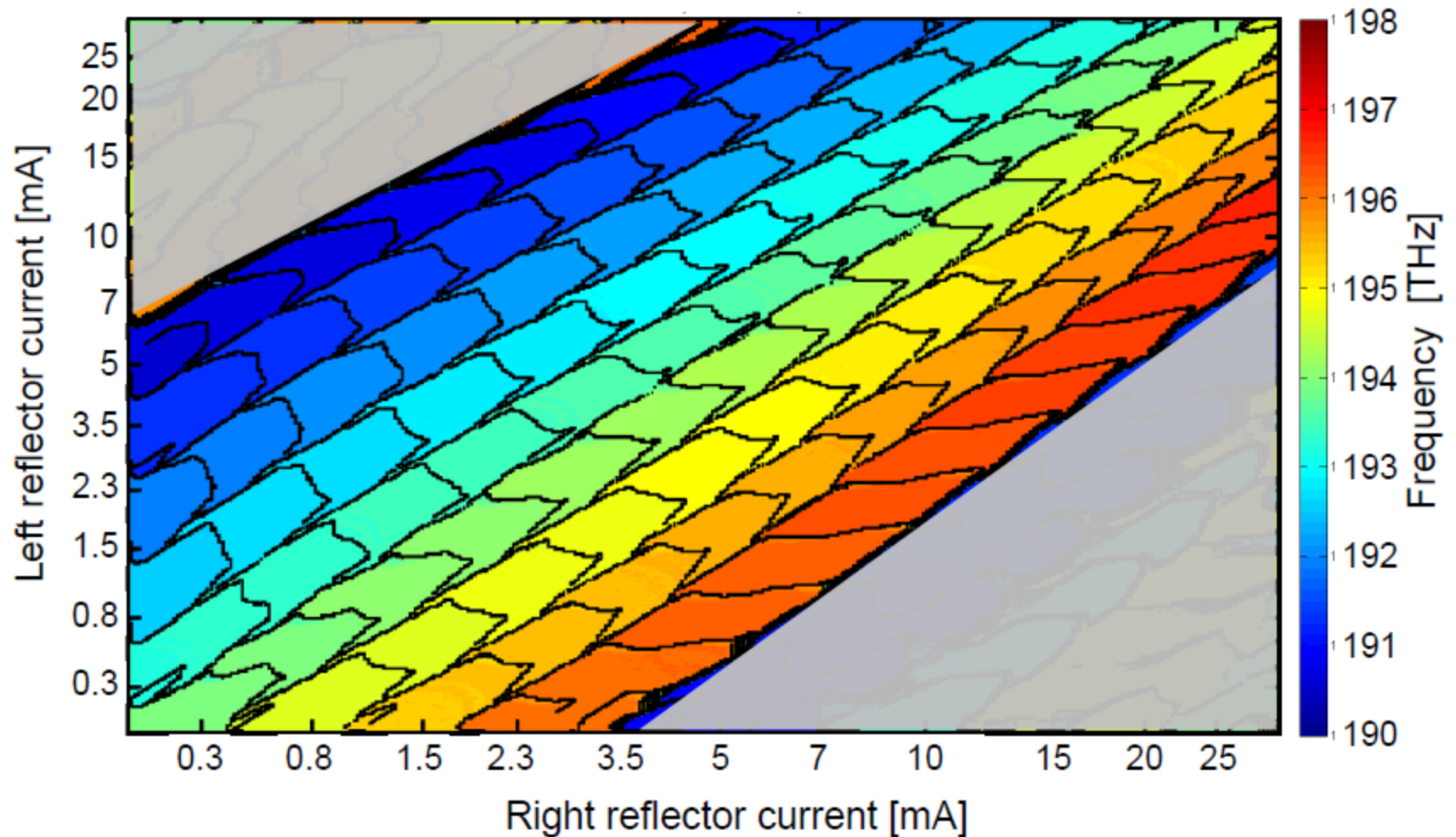


Figure 3 Emission frequency of an MG-Y laser plotted as a function of the left and right reflector currents. A discontinuous frequency change occurs at the boundaries indicated by the black contours.

Operating Principle with SOA

- Integrated SOA

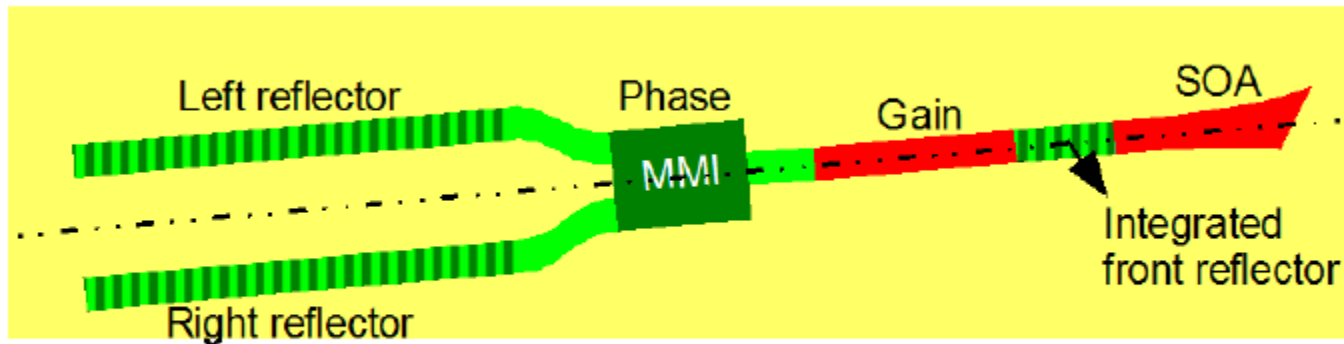


Figure 7 MG-Y laser with integrated semiconductor optical amplifier.

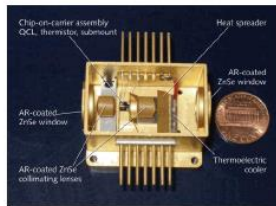
Tunable Laser Package

Hierarchy in Fiber Optics



Laser Chip

Process : nm
Size : mm



Laser Diode
Package

Process : μm
Size : cm



Optical Transmitter
(Receiver) Package

Process : mm
Size : cm



Tunable Laser Package

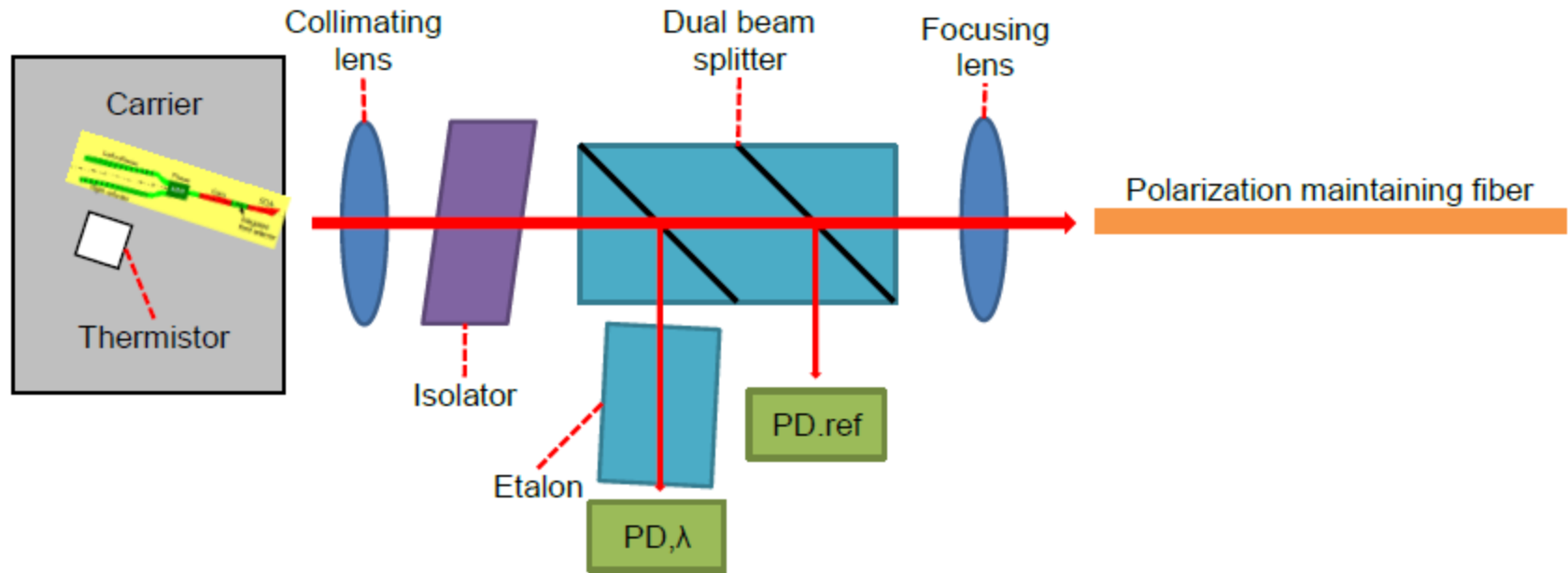


Figure 8 Block diagram of the S7500 tunable laser package.

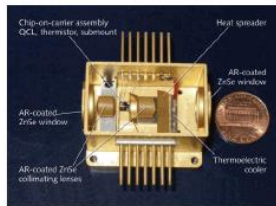
Tunable Laser Transmitter Package

Hierarchy in Fiber Optics



Laser Chip

Process : nm
Size : mm



Laser Diode
Package

Process : μm
Size : cm



Optical Transmitter
(Receiver) Package

Process : mm
Size : cm



Tunable Laser Transmitter Package

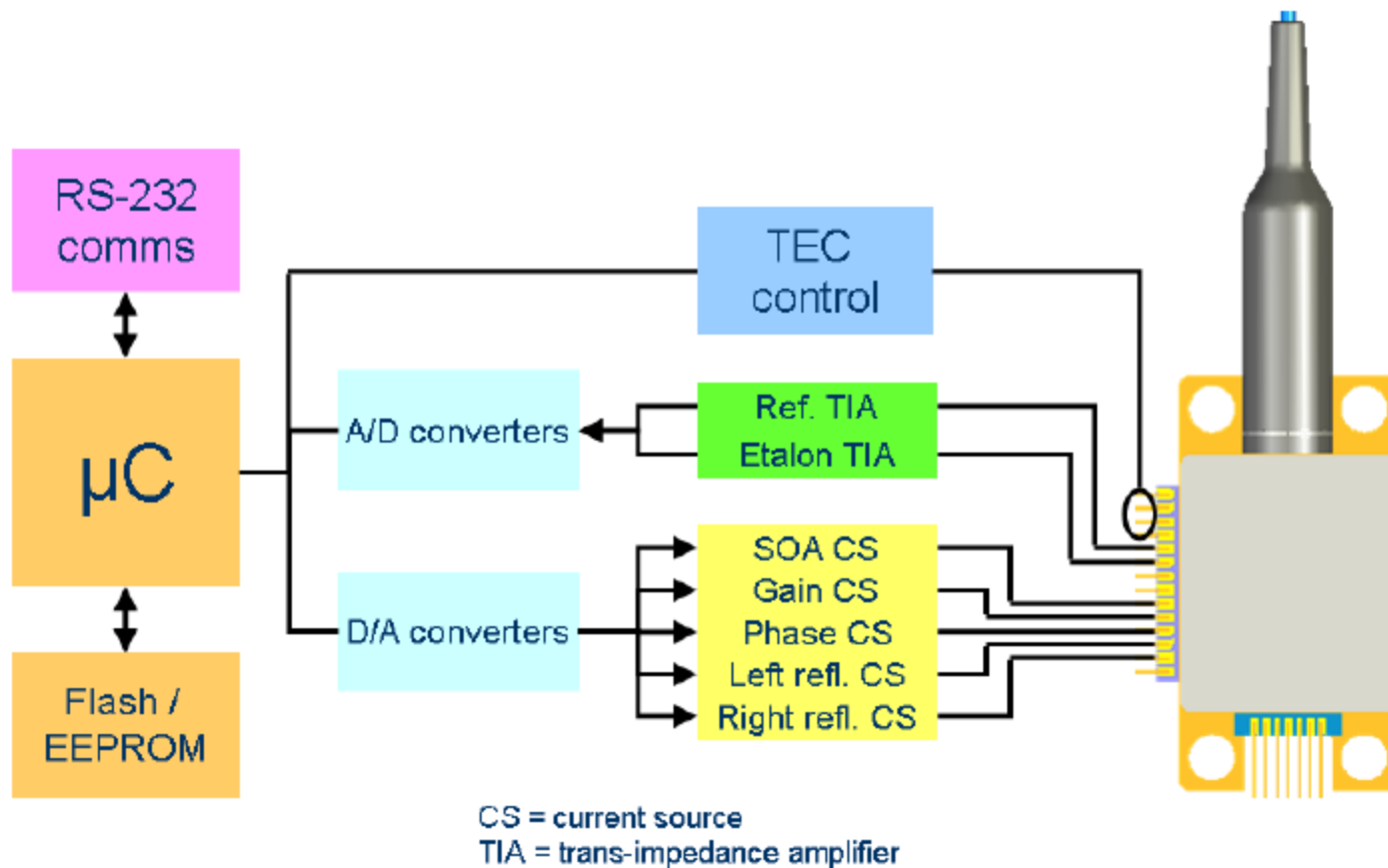
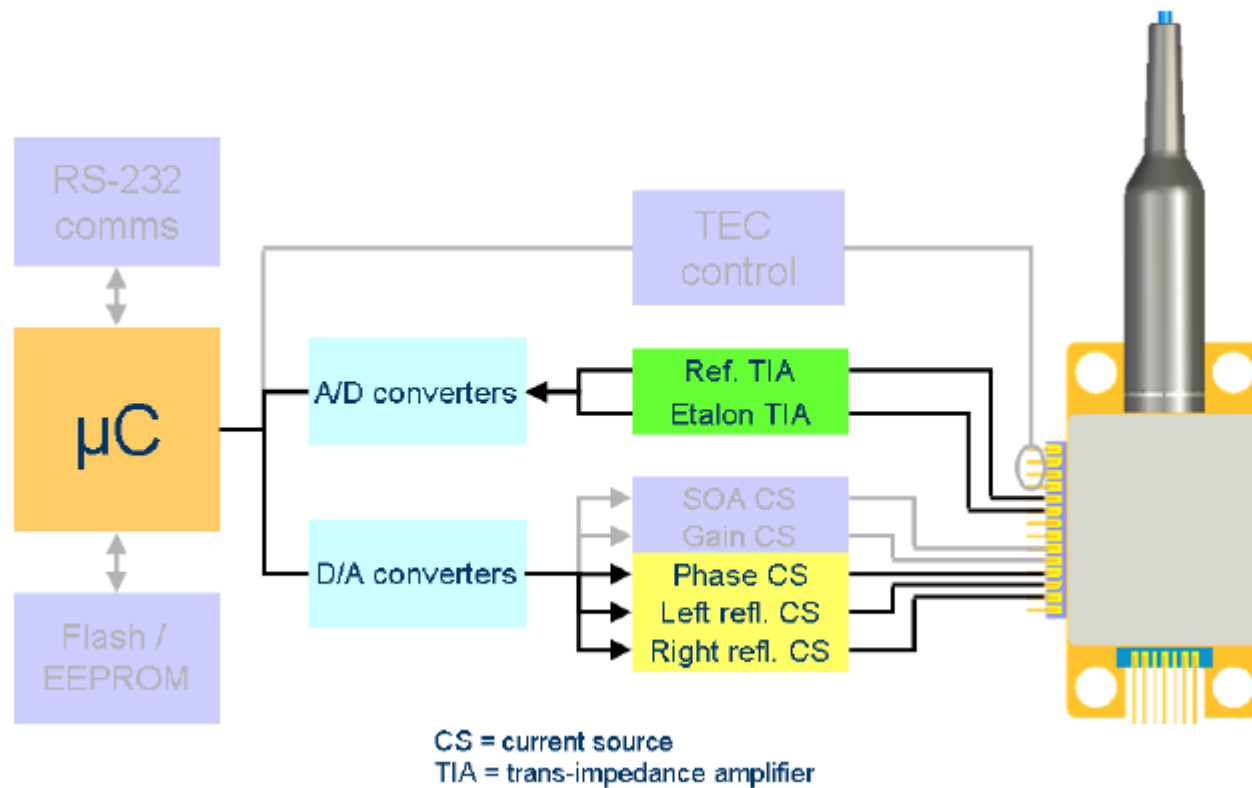
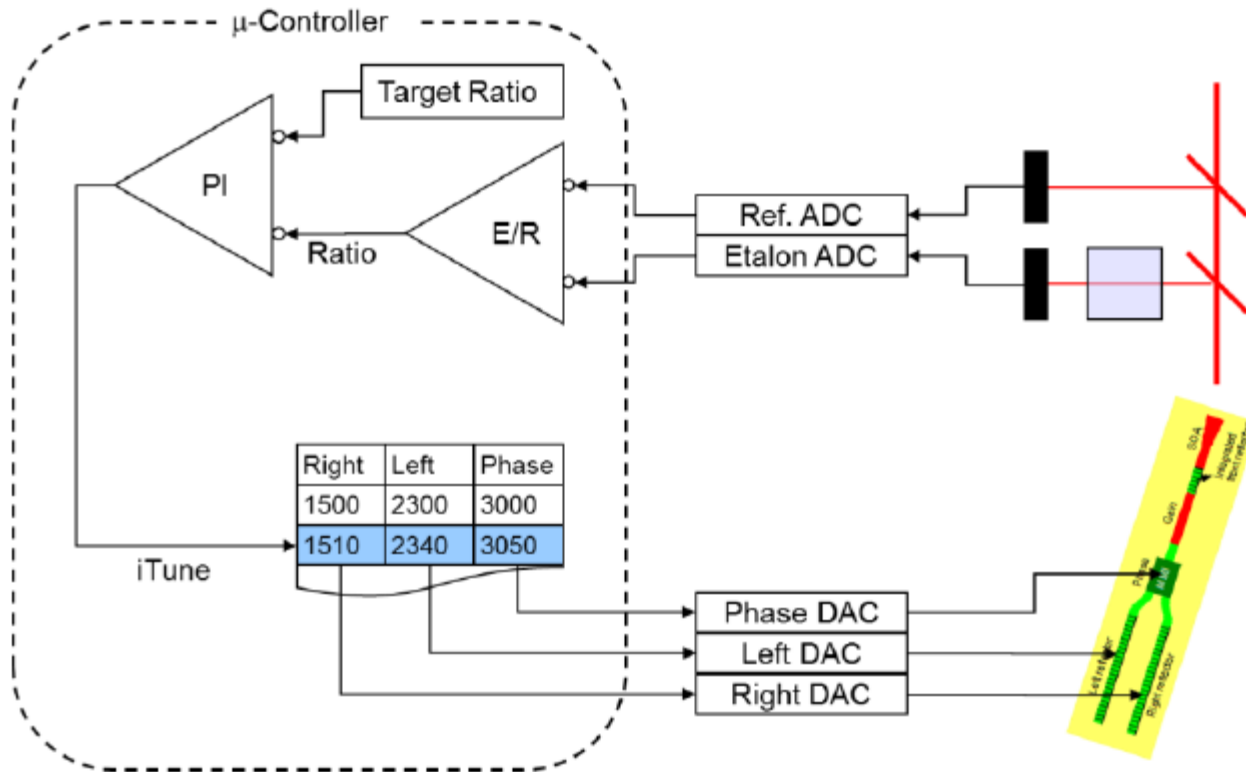


Figure 10 Block diagram of the control electronics for the S7500 tunable laser.

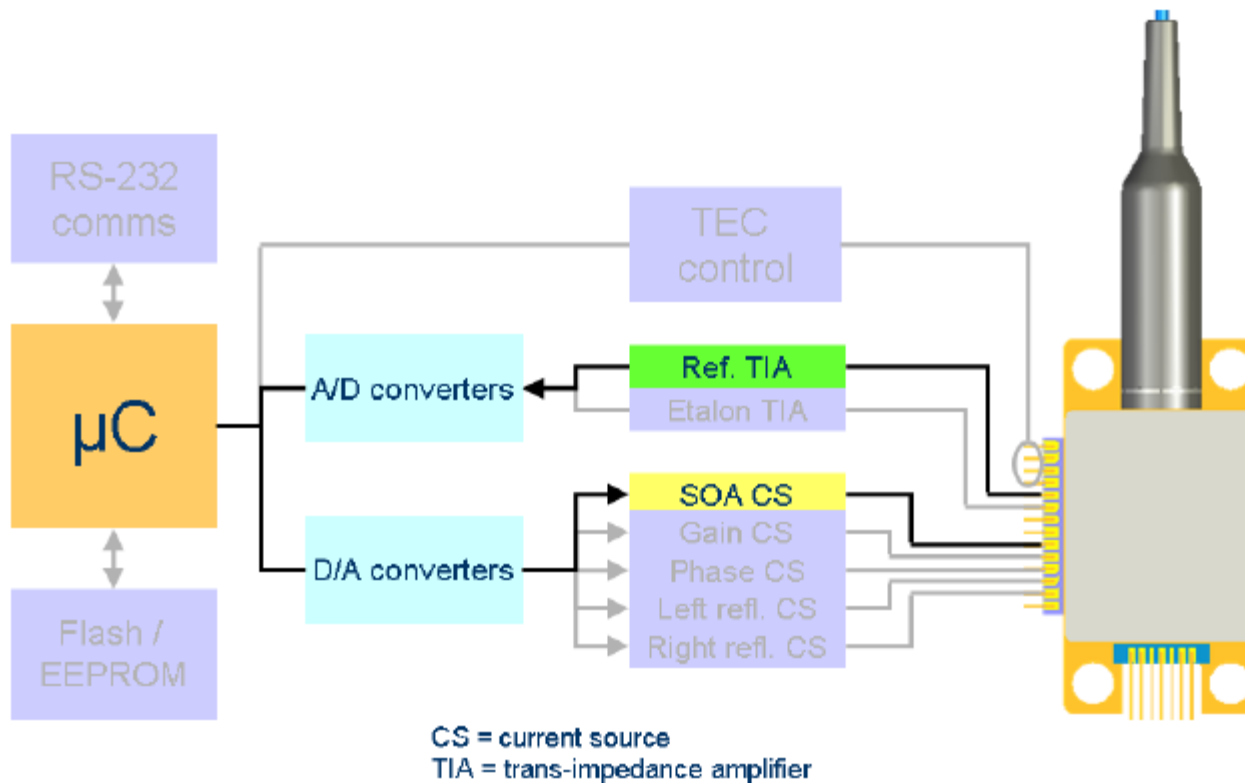
[Example] Frequency Control



[Example] Frequency Control



[Example] Power Control



[Example] Power Control

