



Coarse Wavelength Division Multiplexing system is designed to learn and understand the concept of wavelength multiplexing in a single fiber core. It covers practical aspect of implementing the design by study of optical component parameters and verifying their performance. Demultiplexing of wavelengths is demonstrated along with the recovery of the transmitted signal. Channel addition and deletion (dropping) is implemented using Bragg grating and three port optical circulator.

This training system is a bench top model capable of demonstrating CWDM with Add-Drop functionality. This system operates in standalone as well as in PC control mode.

Specifications

Lasers

- 1.25Gbps CWDM Laser Diode Modules at wavelengths of 1510nm, 1530nm, 1550nm, 1570nm
- In built Isolator
- Channel spacing : 20 nm
- Threshold Current I_{th} : 10 mA Typical
- Output power : @ $I_{th} + 30$ mA - > 0.7 mW @ ~ 58 mA -> 1.4 mW
- Operating voltage : 1.1V Typical
- Modulation : Digital modulation with maximum modulation frequency 5MHz

Detectors

- 1.5 GHz InGaAs PIN Photo diode Module
- Responsivity : Typical 0.9 A/W in 9/125 μ m fiber
- Spectral Range : 1250nm to 1600nm
- Reverse Voltage : 30V max

CWDM multiplexer and demultiplexer (4 channels)

- Center Wavelength : 1510nm, 1530nm, 1550nm, 1570nm
- Channel spacing : 20nm
- Passband @ 0.5dB : ITU +/- 6.5 nm
- Insertion Loss @ MUX / DEMUX Port : <= 2.9 dB
- Adjacent Channel Isolation : >= 30 dB
- Non Adjacent Channel Isolation : >= 40 dB
- Max Optical Power : 300 mW

Three Port Circulator

- Polarization Independent Optical Circulator
- Ports : 3 Nos
- Band : C+L
- Wavelength Range : 1525nm to 1610nm
- Transmission Direction : 1->2, 2->3
- Channel Isolation : >40 dB
- Insertion loss : <= 0.9dB

Note: Specifications are subject to change.

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FiberBraggGrating

- CentralWavelength : 1550±0.5nm
- Bandwidth@3dB : 0.02–5nm
- SLSR : >15dB
- Reflectivity : >90%

Software

- User friendly GUI for monitoring, controlling of CWDM system
- Operating modes like CW mode, VI characteristics mode, Internal & ExternalModulation
- LASER control like Supply ON/OFF, wavelength selection and driving current
- Real time signal levelmonitoring ofPhoto-detector.
- Graphical representation : XY plot of VI characteristics and Internal Modulation
- COMSettings : USB2.0
- OperatingSystem : XP, VISTA, Windows7, Windows8
- Interface : USBinterface

Experiments

Component characteristics

- Diode laser characterization
- MUX & DEMUX characterization
- Optical circulatorcharacterization
- Bragg Grating characterization

Optical communication system

- 4 Channel CWDM by internal & external modulation
- Add/Drop using Circulator & Bragg Grating

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