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# Co-existence optical filter simulation

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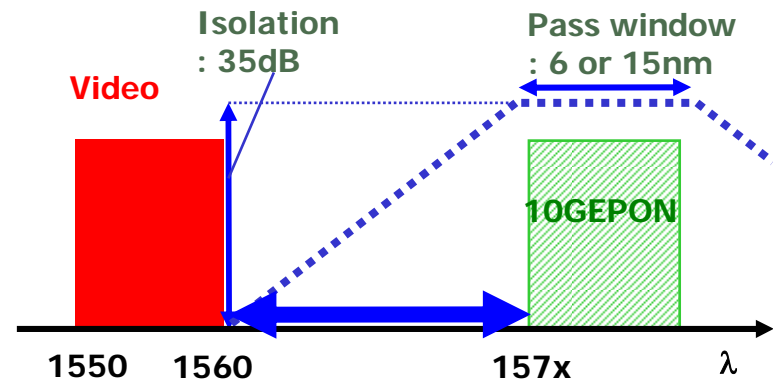
# Optical Filter Simulation

## Downstream receiver filter study

- Optical filter characteristics when pass band is 1574-1580nm
- Comparing pass wavelength window of 6nm and 15nm with shifting several nm

## Simulation assumption

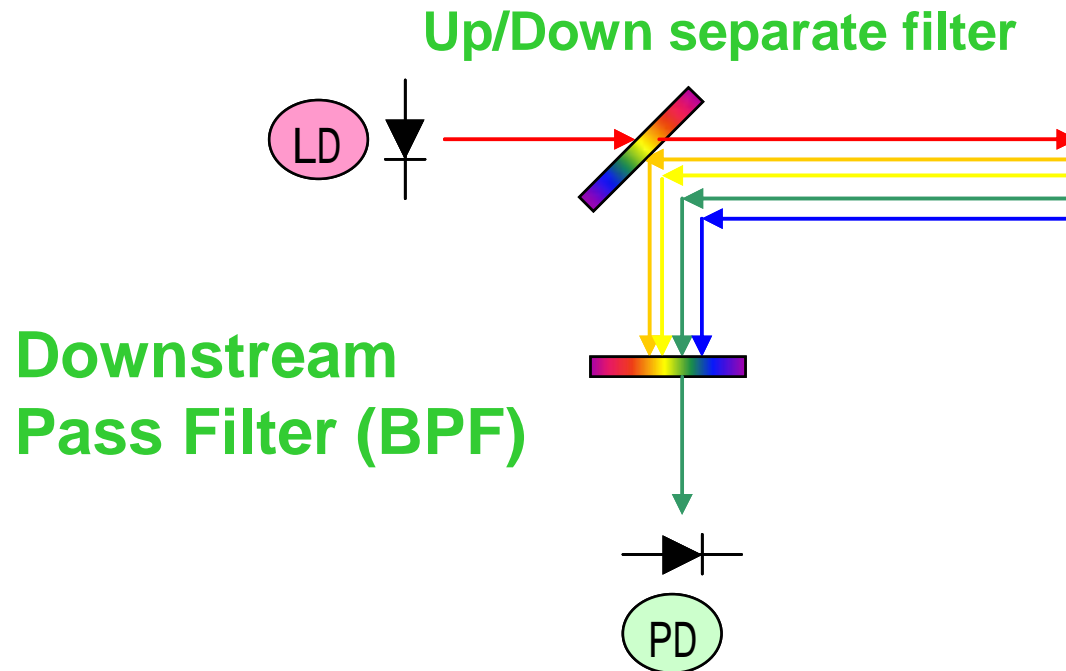
- Without additional filter for GE-PON and video
- Filter isolation : >35dB @1560nm
- Filter insertion loss :  
~0.5dB(typ.) , 1dB(max.)
- Inside optical module
- Without collimate lens



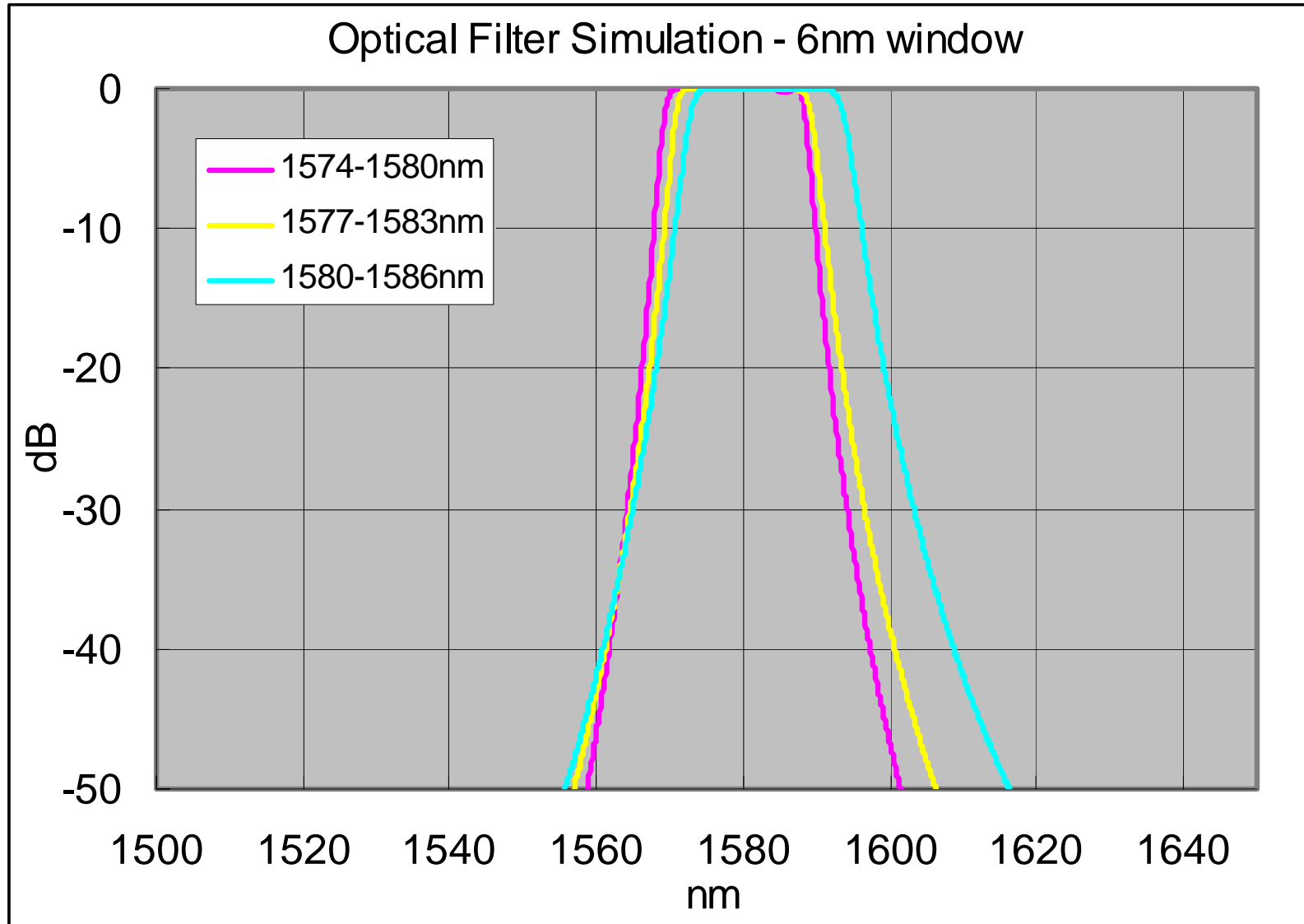
# Optical Filter Construction

Assuming Bi-directional optical module with

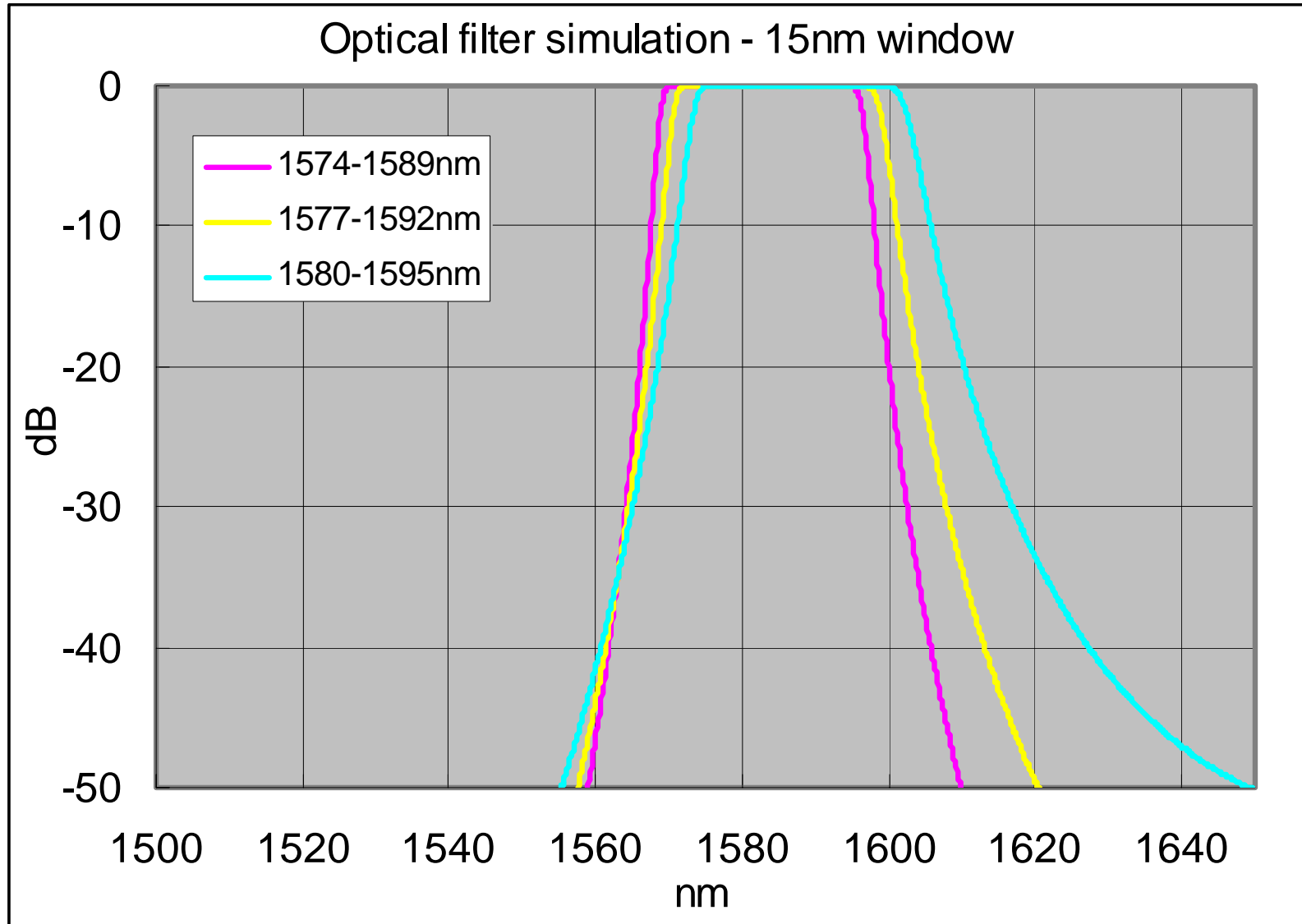
- 45-deg. Up/Down separate filter (Shorter wavelength pass -Longer wavelength reflect) with wide guard wavelength e.g. same filter used for GE-PON
- 0-deg. Downstream pass filter with rejecting other signals



# Simulation Result 1



# Simulation Result 2



# Summary

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- **Optical filter characteristics of several pass wavelength are simulated.**
- **Optical downstream pass filter with 1574-1580nm seems to be feasible.**
- **Consideration from simulation**
  - **As shorter pass wavelength limit is closer to 1560nm, filter thickness increases.**
  - **1571-1577nm filter will be theoretically possible, hard to manufacture due to severe tolerance.**
  - **The steep characteristics around shorter wavelength cut-off seems same between 6nm and 15nm window region. This means difficulty to have narrower guard band is the same.**