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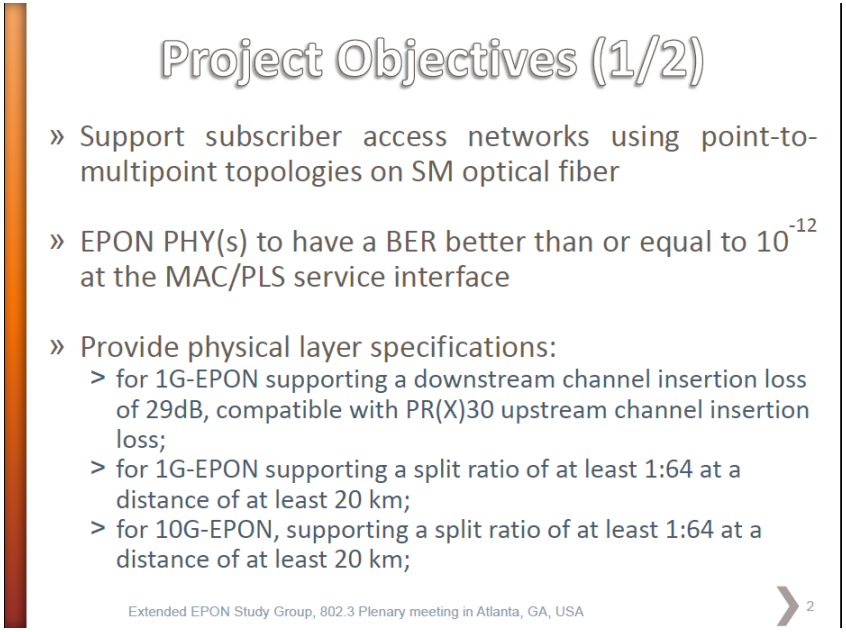
IEEE802.3 NG-EPON Study Group

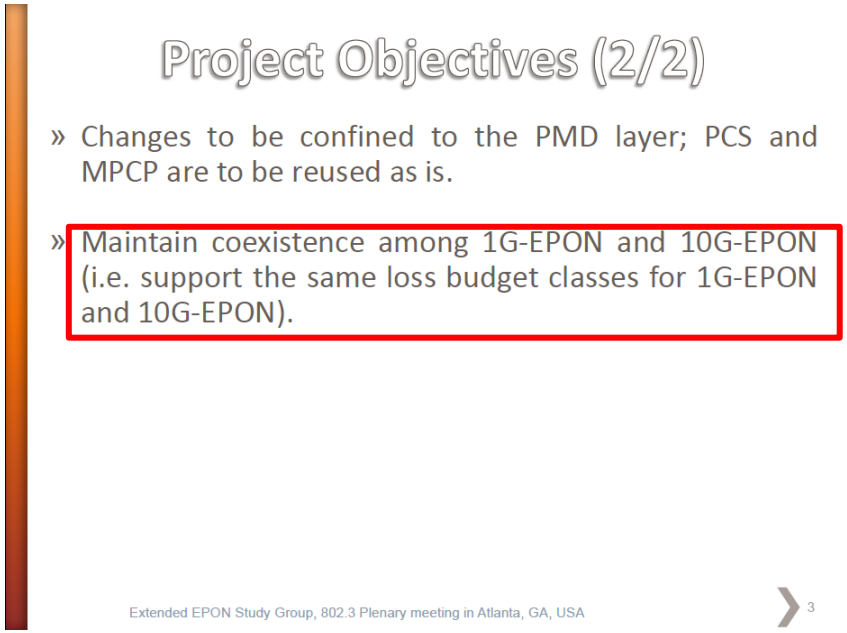
# Consideration of “NG-EPON and Legacy EPON Coexistence”

Akio Tajima
Green Platform Research Labs., NEC Corporation

# Introduction

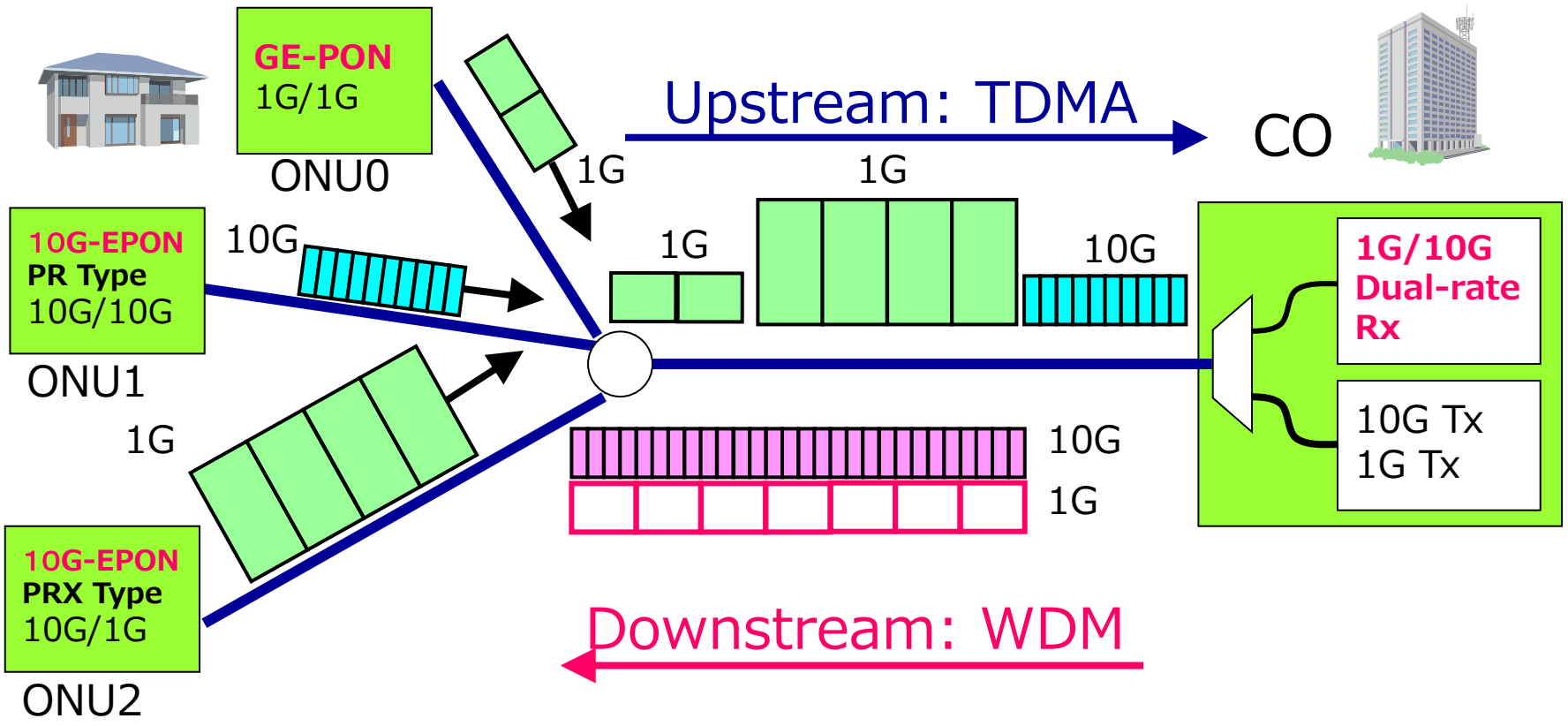
- As IEEE Std 802.3-2012 described, 10G-EPON and GE-PON can coexist on the same ODN.
  - Downstream: WDM
  - Upstream: TDMA
- NG-EPON is also required to coexist with legacy E-PON (GE-PON and/or 10G-EPON).

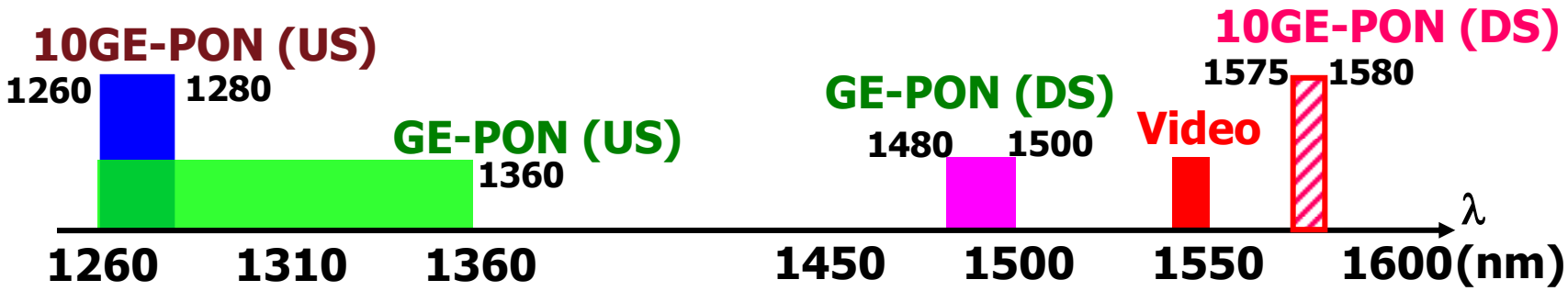



Extended EPON Objectives

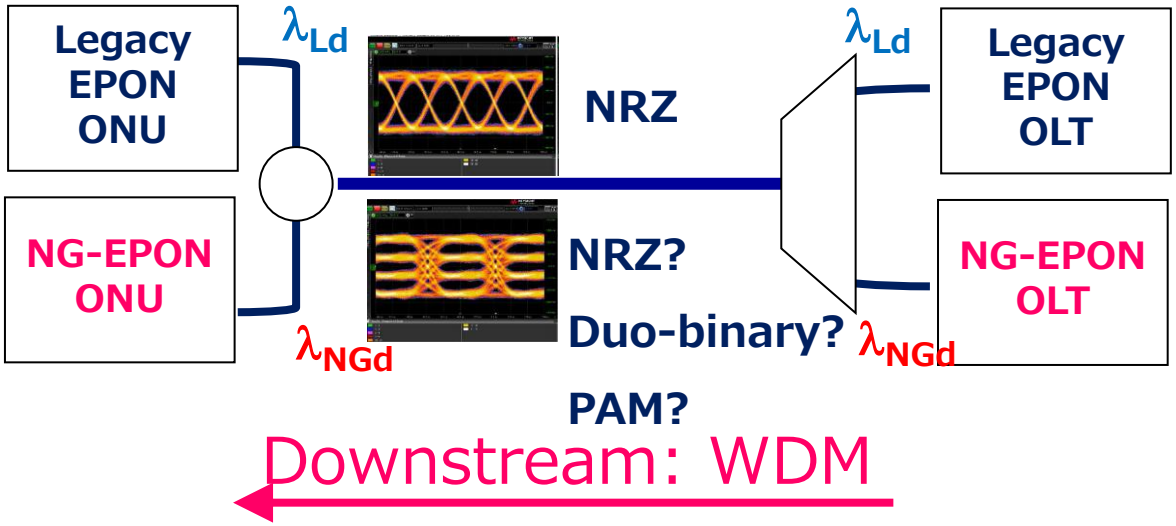
# Coexistence of 10G-EPON and GE-PON



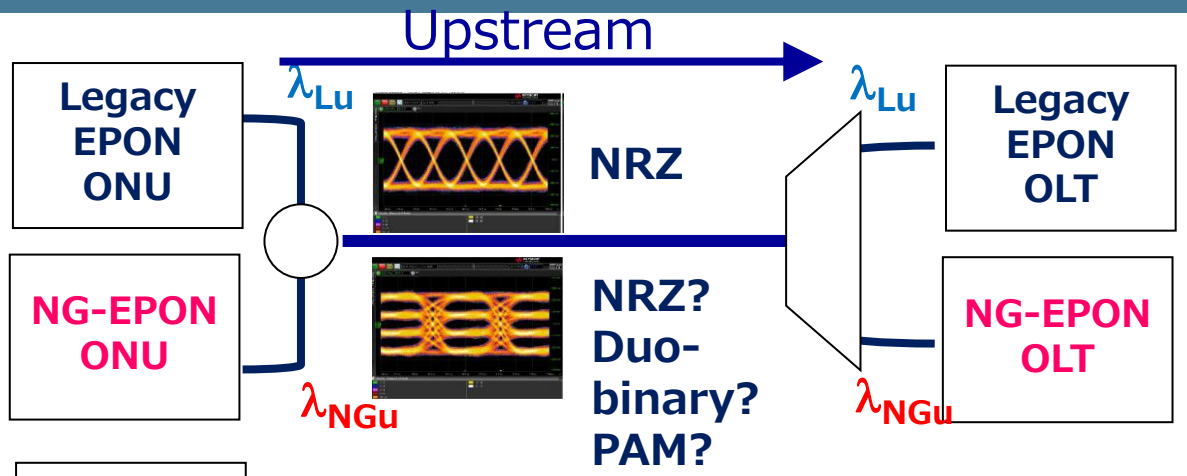
# NG-EPON and Legacy EPON coexistence (Downstream)

- In downstream, WDM technology will be used for coexistence as same as 10G-EPON.



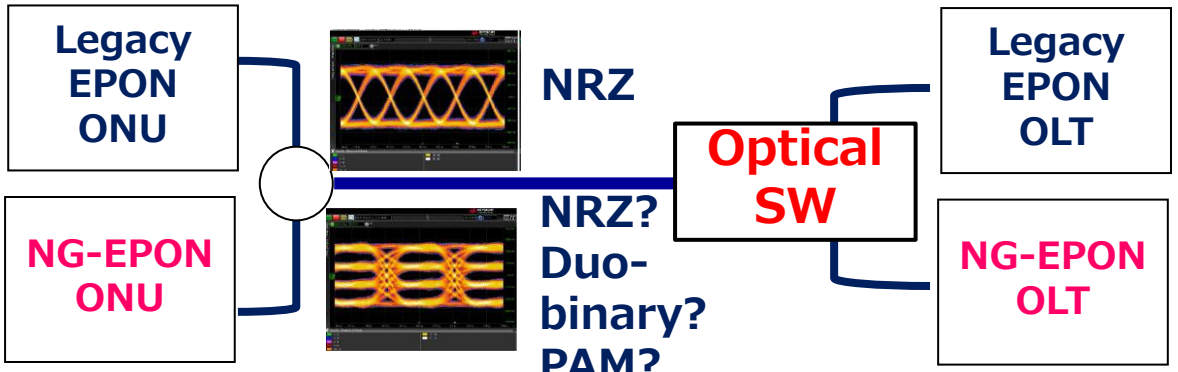
# NG-EPON and Legacy EPON coexistence (Upstream)

## WDM




## TDMA 1


## TDMA 2



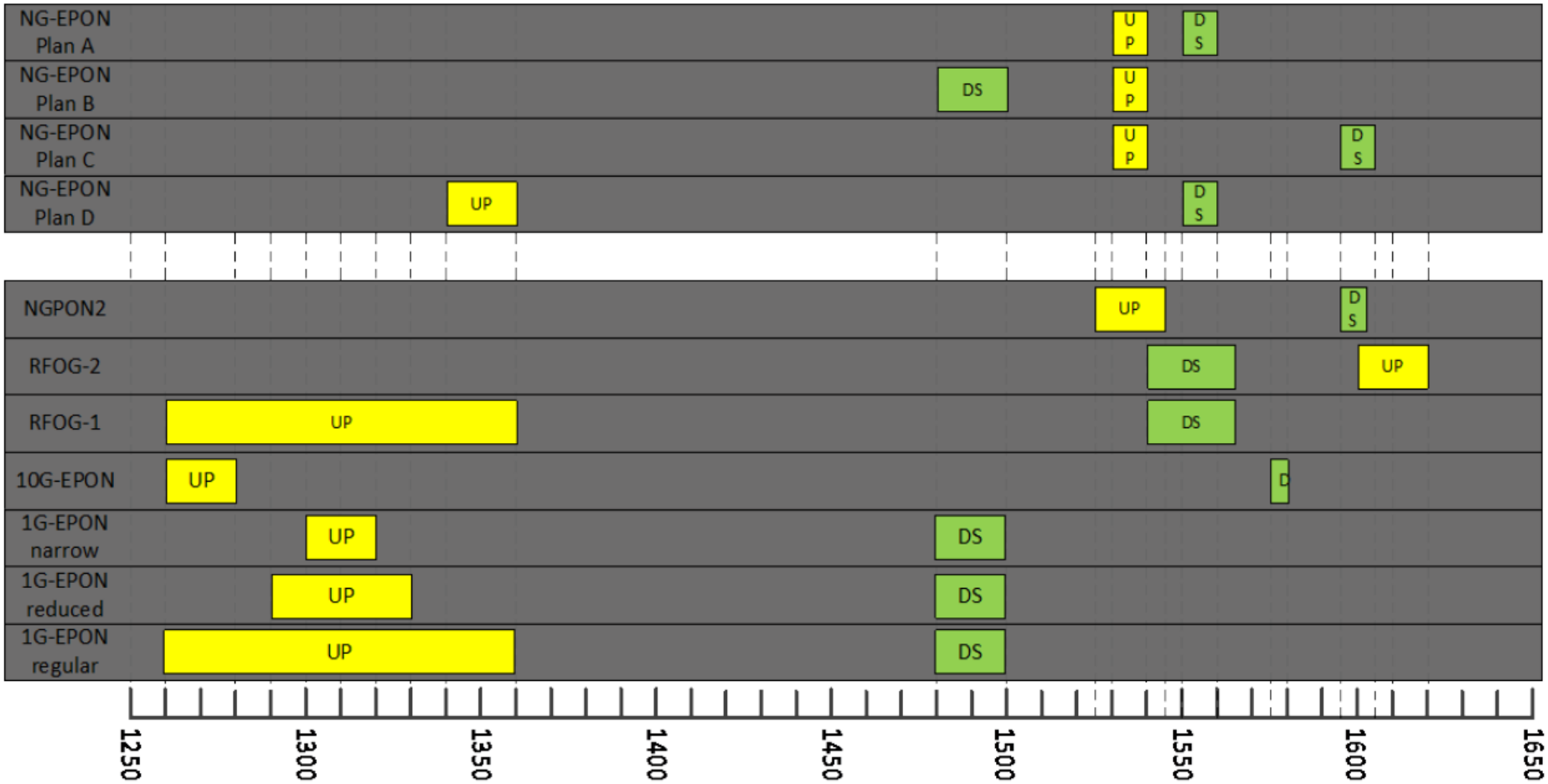
# NG-EPON and Legacy EPON coexistence Scenario

## WDM vs. TDMA comparison table

| | WDM | TDM | |
|---|---|---|---|
| | | Multi-rate Rx | Optical Switch |
| Pros. | • Mature<br>• Modulation format/rate independent | • Wavelength free. | • Wavelength free.<br>• Modulation format/rate independent |
| Cons. | • Wavelength allocation plan. | • Timing control (DBA).<br>• Multi-rate (multi-modulation format) burst mode Rx. | • Timing control (DBA).<br>• High-speed optical switch. |

# Wavelength allocation plans

- For WDM scenario, wavelength allocation plan is key issue.

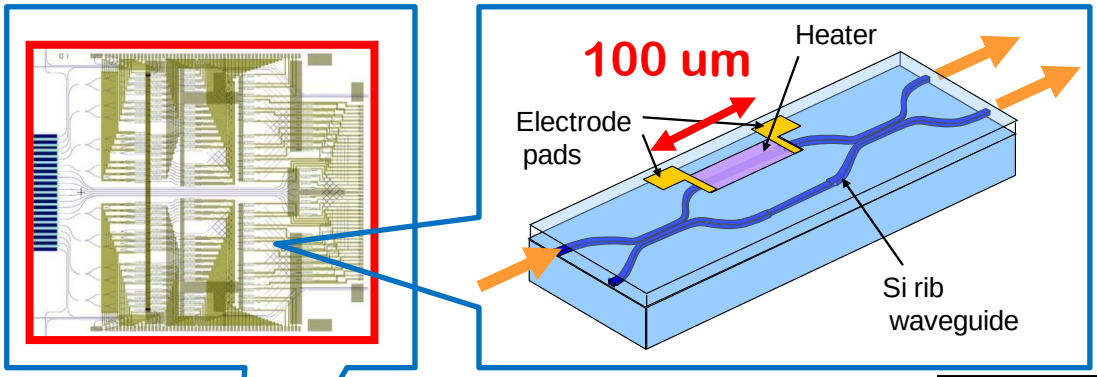


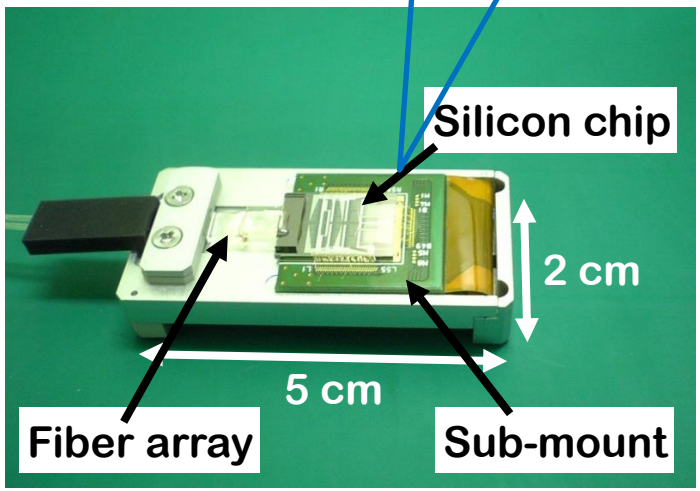

- Spectrum allocation bands for optical access defined in IEEE Std 802.3, SCTE, and ITU-T

IEEE 802.3 Industry Connections Feasibility Assessment for the Next Generation of EPON, Mar., 2015

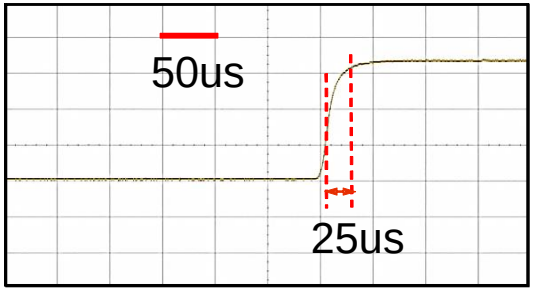
# High-speed Si optical switch

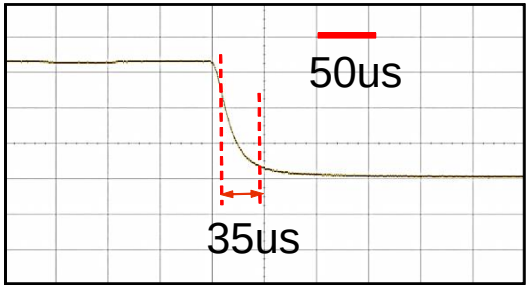
## Small size, high-speed Si optical switch




8 x 8 optical switch module




**Fast response of Si TO switch element**

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# Summary

- As NG-EPON is required to coexist with legacy EPON (GE-PON and/or 10G-EPON), coexistence will be described in Project Objectives.

- In downstream, WDM technology will be used for coexistence as same as 10G-EPON. In upstream, WDM and TDMA are candidate technologies.

- Since there are various options to realize coexistence, Objectives of NG-EPON should not limit to the specified technology.


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