GPON/XGPON/XGSPON Optical Amplifier

RD-XG3-POA

1 Product Schematic

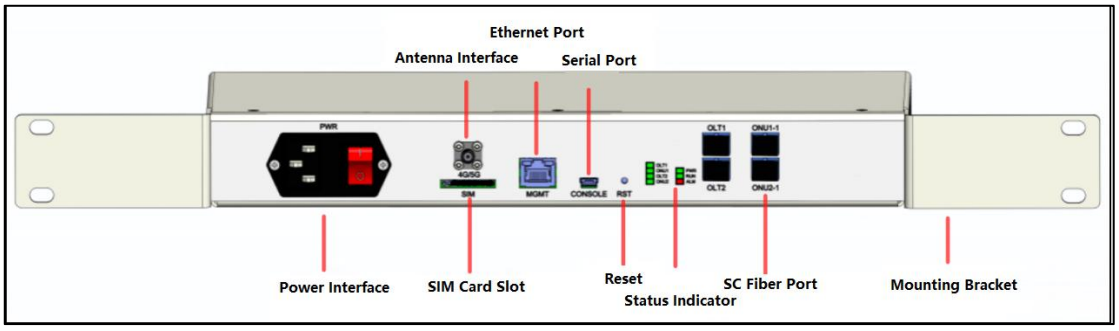

Figure 1

2 Product Overview

The RD-XG3-POA series amplifiers support optical power amplification for GPON, XGPON and XGSPON links, compatible with the three protocols. They directly amplify upstream and downstream optical signals without photoelectric conversion, effectively extending transmission distance and expanding the number of accessible subscribers in the network.

The device can be deployed in desktop box form, and optional rack mounting brackets are available for installation on 19-inch or 21-inch racks.

Figure 2

3 Functional Description

3.1 Service Features

- Extends network transmission distance and increases the number of access subscribers
- Supports up to 2 channels of upstream and downstream signal amplification
- Each channel supports independent amplification (1-in 1-out) or link expansion (1-in 2-out)
- Extendable transmission distance: 0–40 km
- Power budget improvement: 8~12 dB
- Transparent service transmission
- Supports cascading of multiple devices
- Power-off bypass protection (optional)
- VOA power adjustment function (optional)

3.2 Management Functions

- Local management via Ethernet port and serial port
- Remote connection and management over 4G/5G SIM card (optional)

3.3 Network Management

- Supports basic configuration, performance monitoring and alarm management
- Supports security management, log management and equipment maintenance
- Supports remote firmware upgrade

3.4 Power Supply

- Compatible with AC 110V/220V/230V or DC 48V power input

3.5 Heat Dissipation

- Fan speed adjustable in automatic or manual mode

4 Performance Specifications

Transmission Performance	
Supported Protocols	GPON(ITU-T G.984) XGPON(ITU-T G.987) XGSPON(ITU-T G.9807)
Upstream Rate / Signal Type / Wavelength	GPON ： 1.25G Burst Mode，Central Wavelength 1310nm XGPON ： 2.5G Burst Mode，Central Wavelength 1270nm XGSPON：10G Burst Mode，Central Wavelength 1270nm
Downstream Rate / Signal Type / Wavelength	GPON ： 2.5G Continuous Mode，Central Wavelength 1490nm XGPON ： 10G Continuous Mode，Central Wavelength 1577nm XGSPON：10G Continuous Mode，Central Wavelength 1577nm
Network Topology	Supports independent amplification or link expansion for each upstream and downstream channel. Enables relay amplification at any position within the network. Supports cascading of multiple devices. Facilitates network capacity expansion.
Compatibility	Compatible with OLT and ONU devices from various manufacturers Transparent transmission of all services
Power-off bypass protection (optional)	Maintains original physical optical link upon power failure
Optical Interface Parameters	
Downstream Input Optical Power	GPON：-24 dBm；（Central Wavelength 1490nm） XGPON：-24 dBm；（Central Wavelength 1577nm） XGSPON：-24 dBm；（Central Wavelength 1577nm）
Upstream Input Optical Power	GPON：-24 dBm；（Central Wavelength 1310nm） XGPON：-24 dBm；（Central Wavelength 1270nm） XGSPON：-24 dBm；（Central Wavelength 1270nm）
Operating Environment	
Power Supply	AC 220V/110V/230V or DC 48V

Power Consumption	<30W
Dimensions	330mm*204mm*43.6mm
Weight	<10kg
Operating Temperature	-20℃~+70℃
Storage Temperature	-40℃~+85℃

5 Product Configuration

5.1 Configuration 1: Optical Power Amplification

1-in 1-out design for direct optical power amplification; power-off bypass protection is optional.

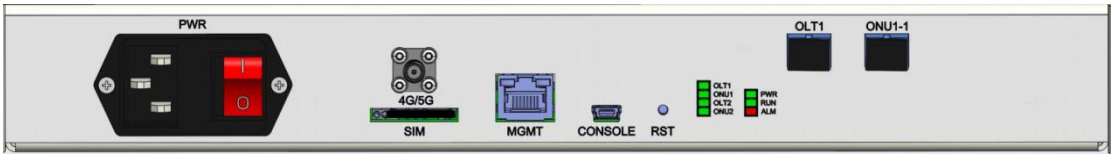

Figure 3 Single-channel Panel Diagram

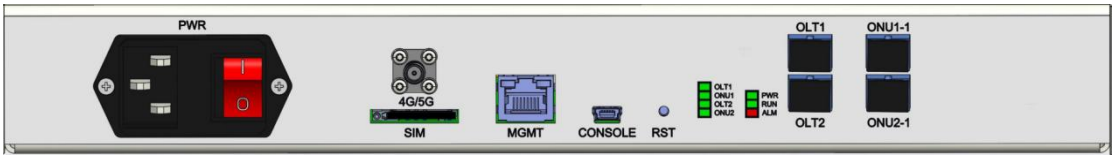

Figure 4 Dual-channel Panel Diagram

5.2 Configuration 2: Link Expansion

1-in 2-out design to expand the original optical link.

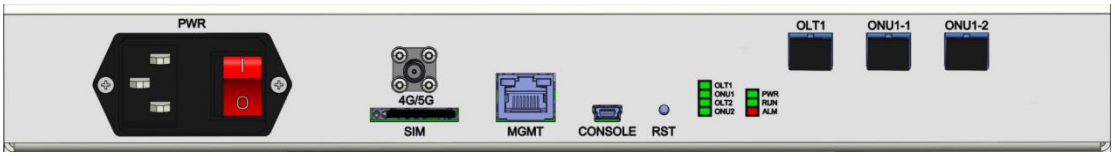

Figure 5 Single-channel Panel Diagram

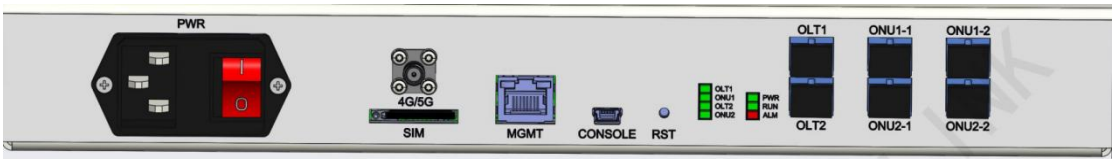

Figure 6 Dual-channel Panel Diagram

Model	Description
Configuration 1: Single Channel	Single-channel PON amplifier, optional power-off bypass protection function
Dual Channel	Dual-channel PON amplifier, optional power-off bypass protection function
Configuration 2: Single Channel	Single-channel PON amplifier with 1-in 2-out link expansion capability
Dual Channel	Dual-channel PON amplifier, each channel supports 1-in 2-out link expansion

6 Networking Application

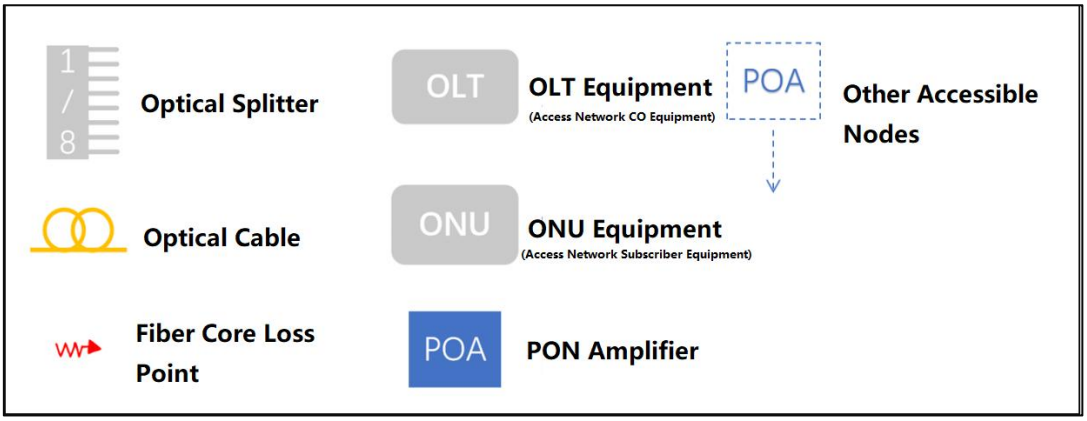

Figure 7 Device Sample Diagram

6.1 Installed between the OLT and the front end of optical cables:

6.1.1 Scenario 1: Expand original links to increase the number of accessible subscribers

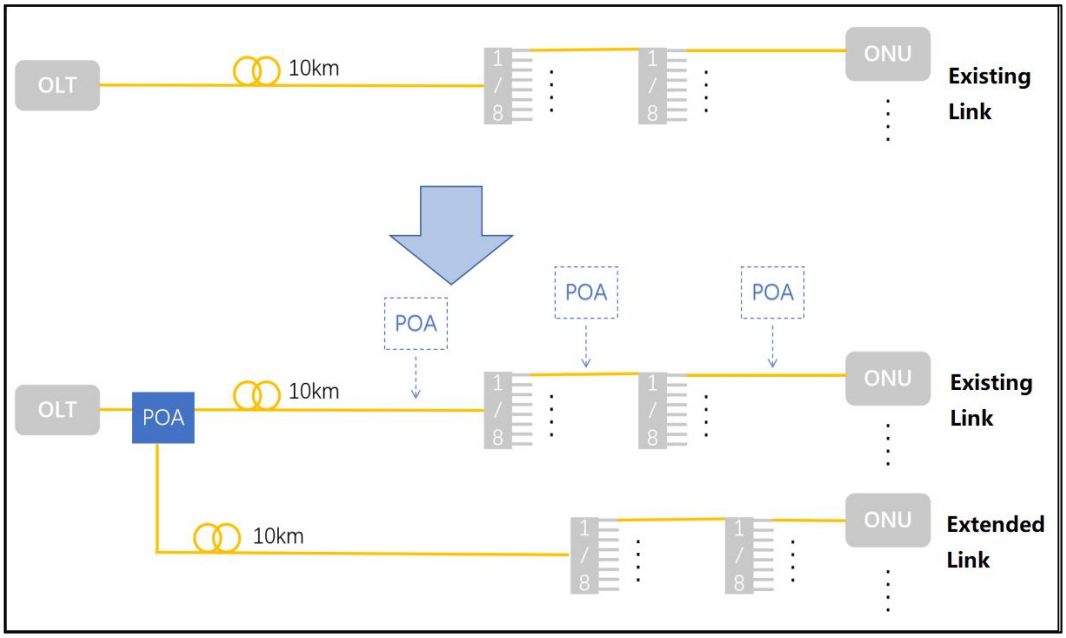

Figure 8

6.1.2 Scenario 2: Expand the existing link with a PON amplifier to extend transmission distance and boost the number of accessible subscribers.

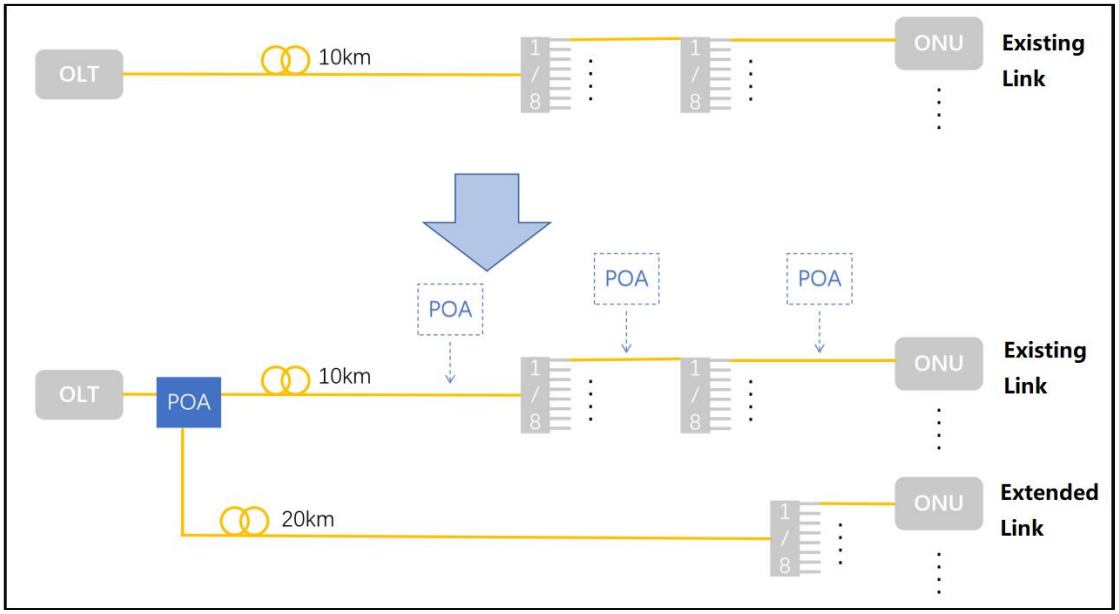

Figure 9

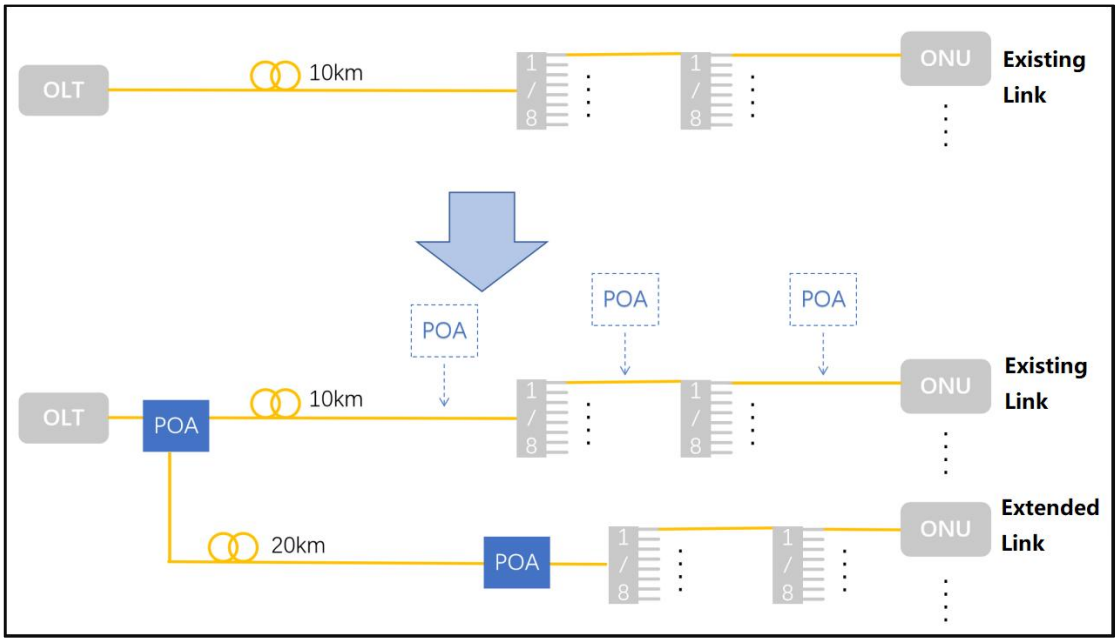

Figure 10

6.1.3 Scenario 3: Compensate transmission loss and improve subscriber activation rate

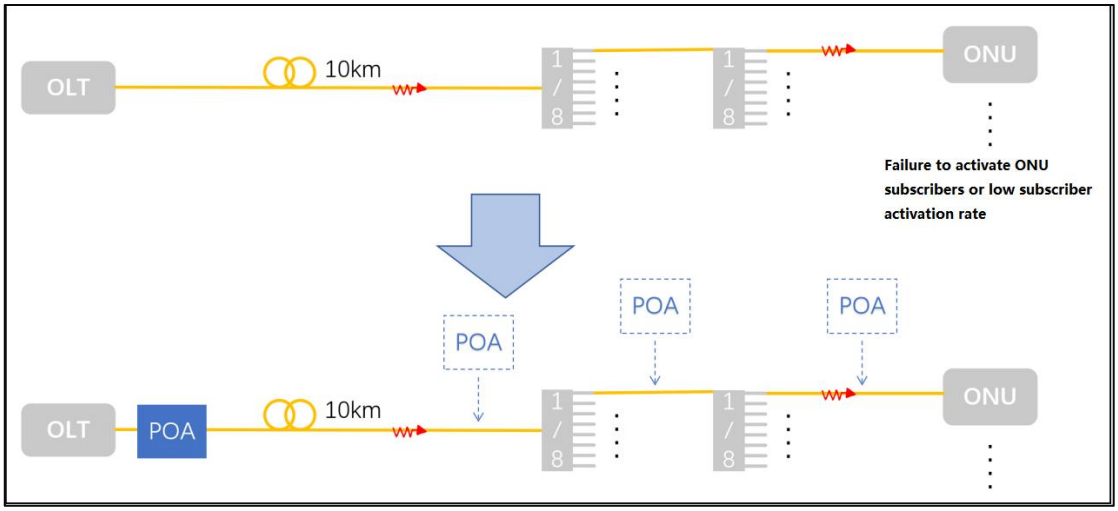

Figure 11

6.1.4 Scenario 4: Extend transmission distance to facilitate centralized deployment of OLTs

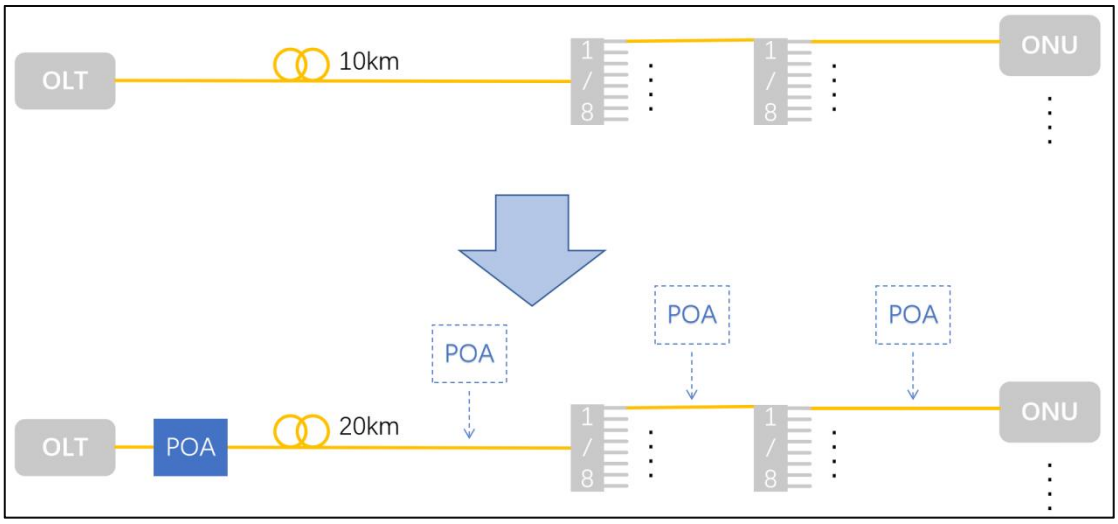

Figure 12

6.2 Installed after optical cables and before the primary splitter:

6.2.1 Scenario 1: Expand existing links to increase the number of accessible subscribers

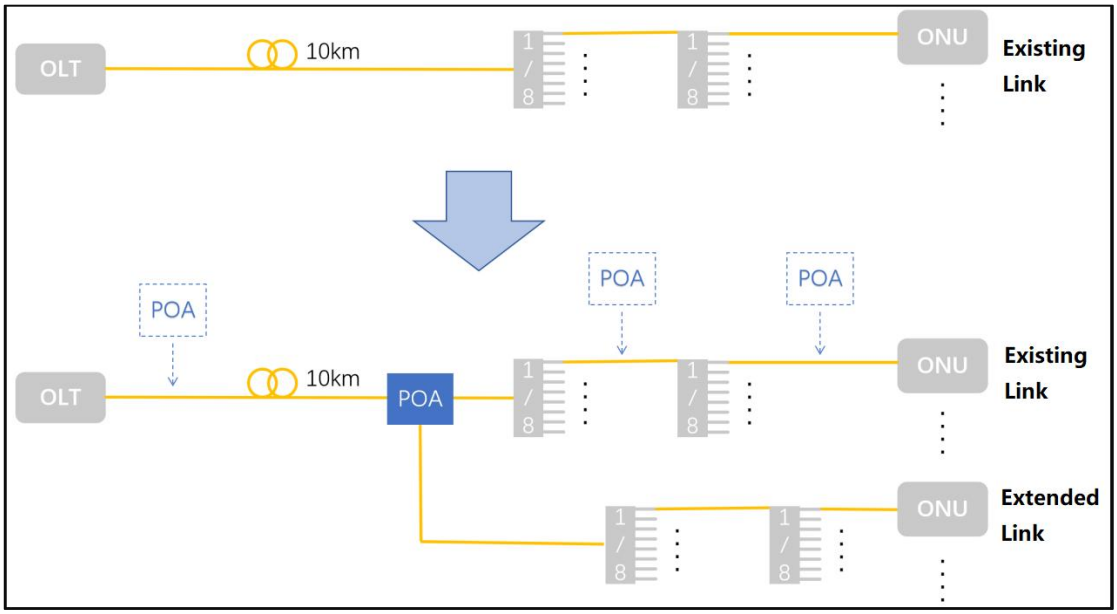

Figure 13

6.2.2 Scenario 2: Expand existing links with POA to extend transmission distance and increase accessible subscribers.

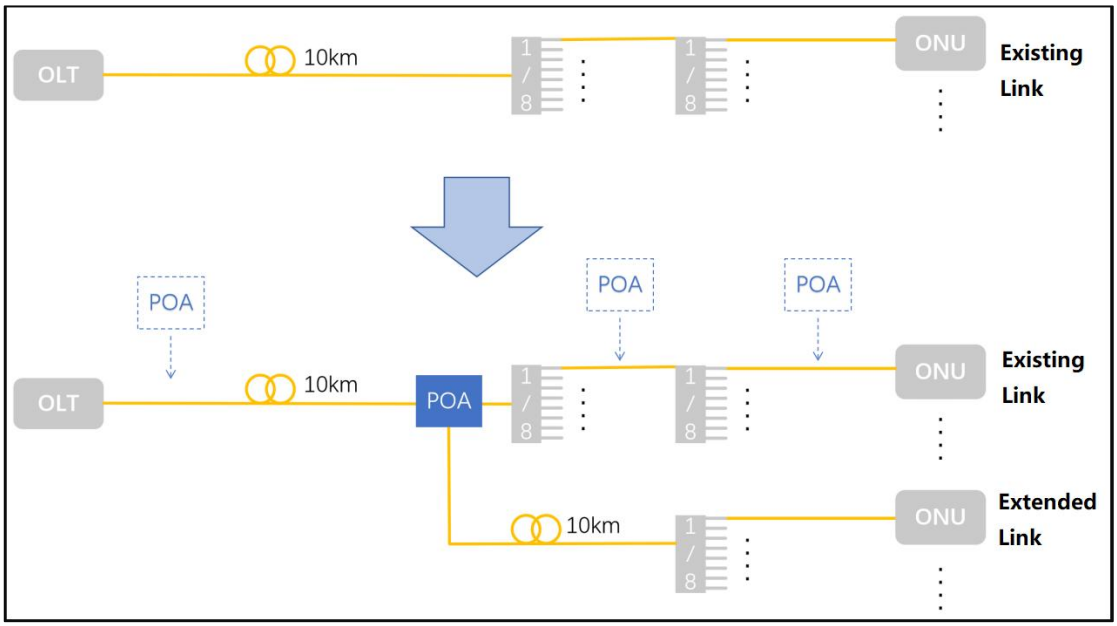

Figure 14

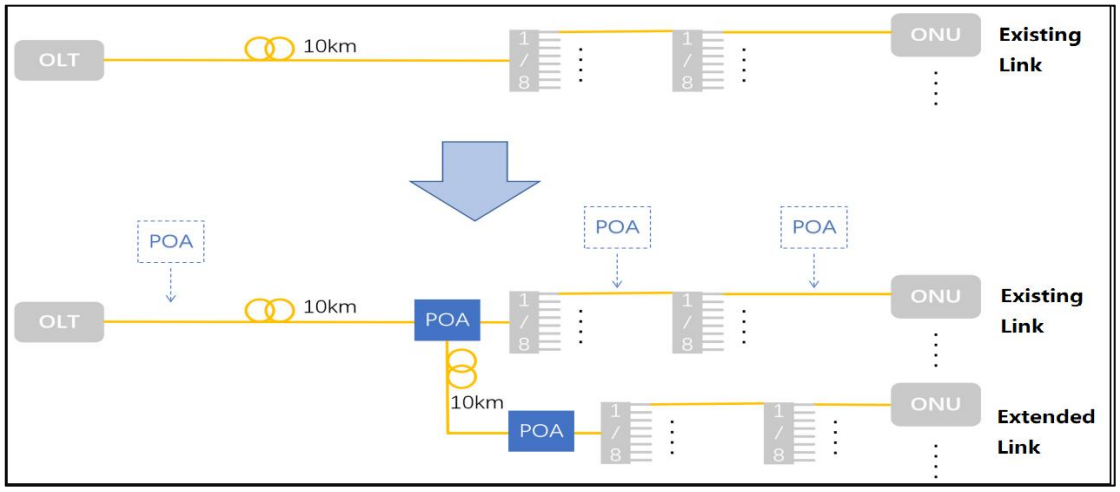

Figure 15

6.2.3 Scenario 3: Compensate transmission loss and raise subscriber activation rate

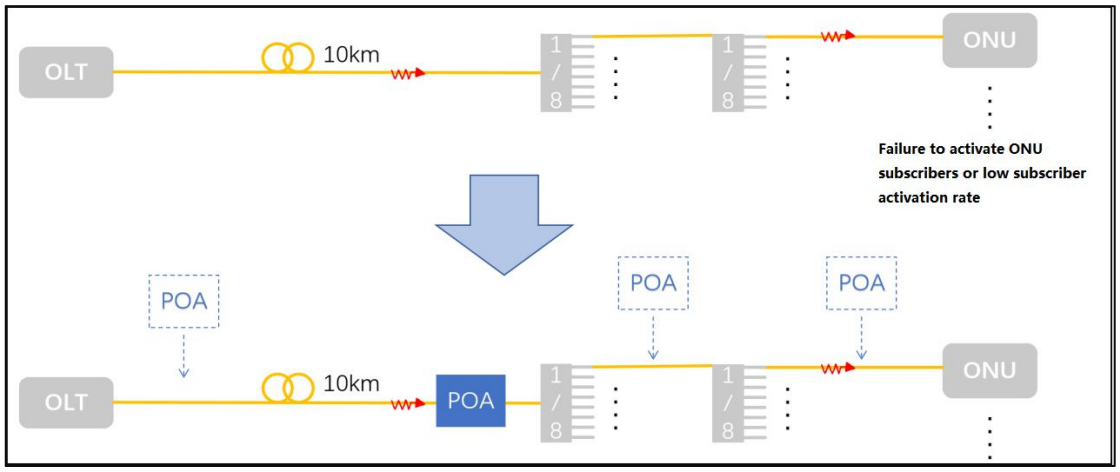

Figure 16

6.2.4 Scenario 4: Extend transmission distance to support centralized deployment of OLT devices

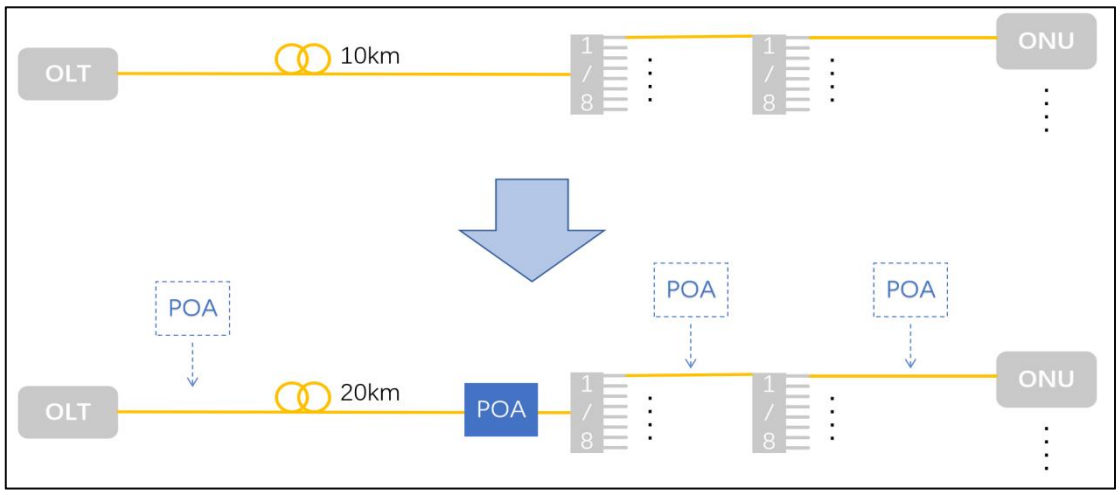

Figure 17

6.3 Deployed before the secondary splitter:

6.3.1 Scenario 1: Expand links to increase accessible subscribers

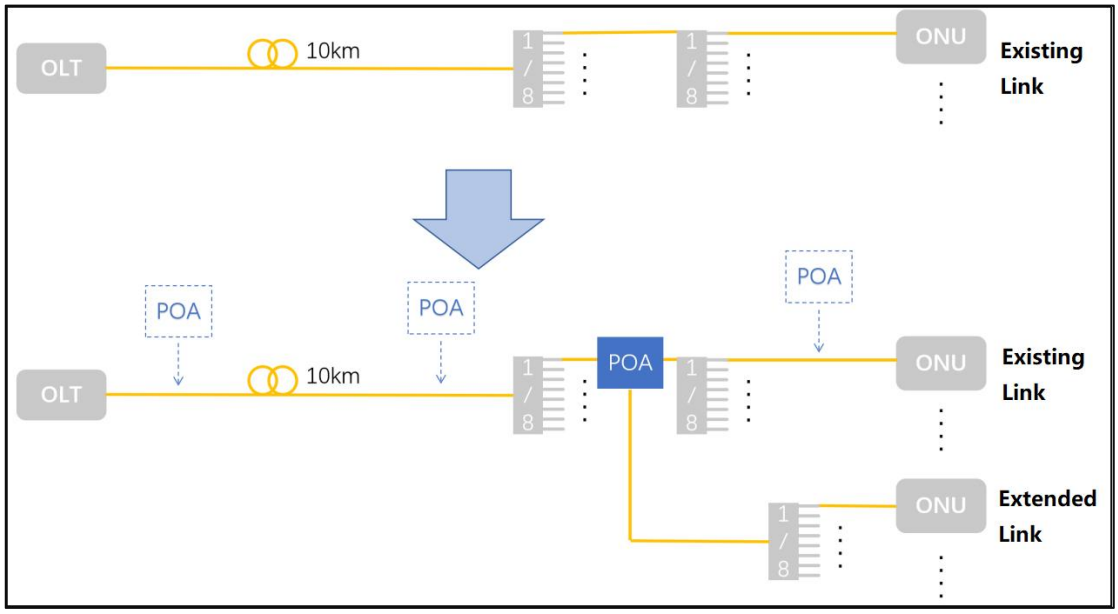

Figure 18

6.3.2 Scenario 2: Compensate transmission loss and improve subscriber activation rate

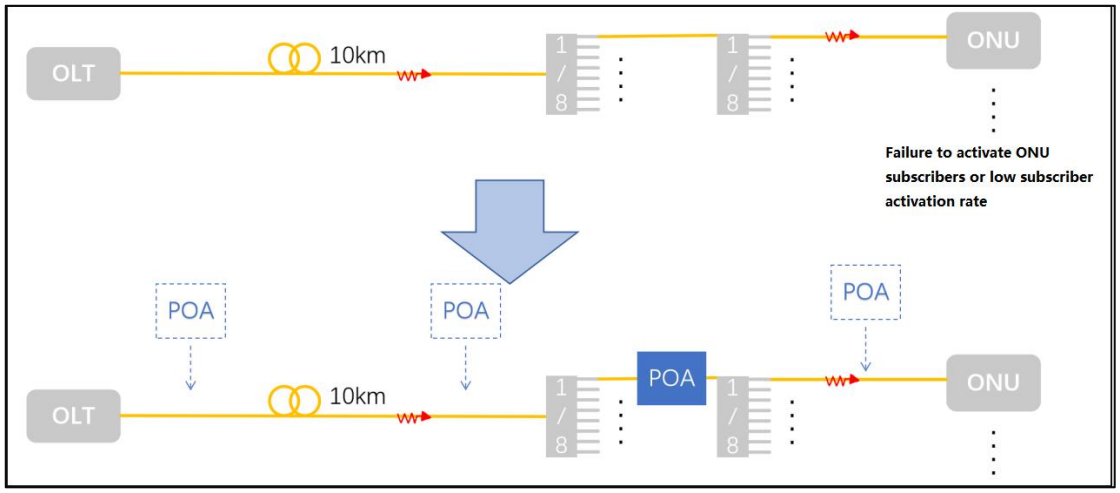

Figure 19

6.4 Deployed after the secondary splitter:

6.4.1 Scenario 1: Extend transmission distance, compensate transmission loss and solve insufficient optical power for individual subscribers

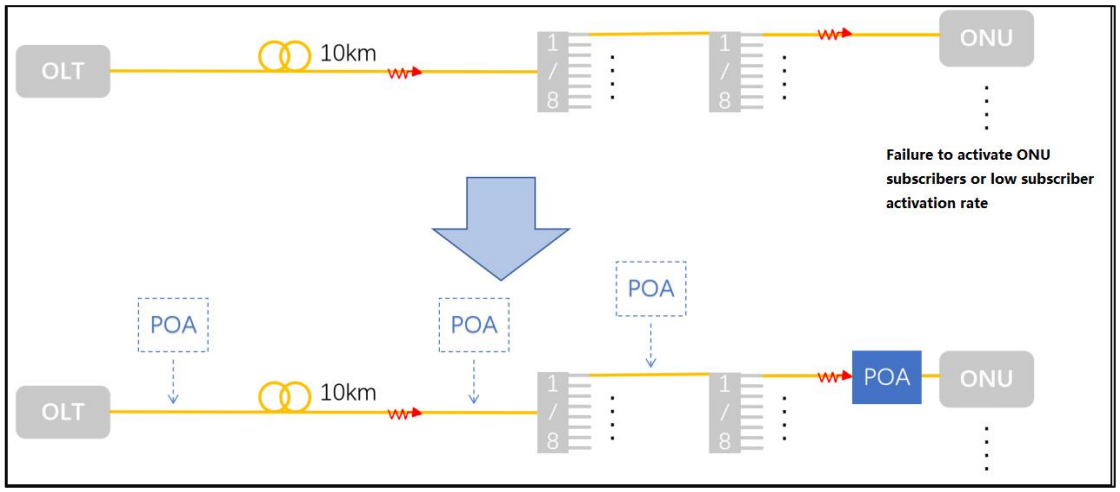

Figure 20

7 Ordering Information

Model	Description
RD-XG3-POA-SA	Single-channel PON amplifier, 1-in 1-out optical power amplification, wavelength 1270nm/1577nm, AC/DC power supply, power consumption <30W
RD-XG3-POA-DA	Dual-channel PON amplifier, each channel supports 1-in 1-out optical power amplification, wavelength 1270nm/1577nm, AC/DC power supply, power consumption <30W
RD-XG3-POA-SA-B	Single-channel PON amplifier, 1-in 1-out optical power amplification, wavelength 1270nm/1577nm, AC/DC power supply, power consumption <30W, equipped with power-off bypass protection
RD-XG3-POA-DA-B	Dual-channel PON amplifier, each channel supports 1-in 1-out optical power amplification, wavelength 1270nm/1577nm, AC/DC power supply, power consumption <30W, equipped with power-off bypass protection
RD-XG3-POA-SE	Single-channel PON amplifier, 1-in 2-out link expansion, wavelength 1270nm/1577nm, AC/DC power supply, power consumption <30W
RD-XG3-POA-DE	Dual-channel PON amplifier, each channel supports 1-in 2-out link expansion, wavelength 1270nm/1577nm, AC/DC power supply, power consumption <30W