



GONU11B

GEPON ONU client unit

User's Guide



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1 Product Overview

1.1 Overview

With the increase of Internet users and the development of the services such as video meeting and G-Byte file transmission, the world demands more and more network bandwidth. Optical fiber transmission provides an effective way to meet these requirements. Through combining the widely-used Ethernet technologies with the passive optical network (PON) technologies, Ethernet passive optical network (EPON) can provide a good solution for point-to-multiple-point accesses.

GONU11B ONU provide high bandwidth over a distance of 10 km, breaking through the limitations on bandwidth and transmission distance and making the access solution more flexible. Due to their large-scale coverage, this product reduces the number of offices and meets the operators' demand of using less office for larger capacity.

1.2 Introduction

GONU11B is an EPON ONU device designed with one standard 10/100Base-T Ethernet port plus one standard 10/100 /1000 Base-T Ethernet port for subscriber access and for indoor residential installation. It is a cost-effective GE-PON customer premise system and can provide 1000M Broadband services by connected subscriber's gateway or computers. As compared to other broadband access technologies such as xDSL and cable modem, Passive Optical Network (PON) technology offers some competing advantages, including a long-term life expectancy of the fiber infrastructure, lower operating costs through the reduction of "active" components, support for greater distance between equipment nodes, and most importantly, much greater bandwidth. Well satisfying the high speed access demand, GE-PON has a more prosperous perspective.

GONU11B adopts TK3713 as main chip, which provides the core functionality of an 802.3ah Ethernet Passive Optical Network (EPON) Optical Network Unit (ONU) solution. In addition, the device also offers some advanced functions such as QoS, AES, FEC, and in-band OAM. A powerful Ethernet Lookup Engine is provided to allow for traffic prioritization, local address filtering, and statistics gathering. Forty internal FIFOs provide buffering for upstream and downstream traffic along with 802.3ah OAM traffic. A dedicated processor provides management control and responds to in-band OAM commands and Host Interface messages for configuration and statistics gathering. By means of configuring personal variables accordingly, you will get a device that will fit your application very well.

1.3 Features

- One IEEE 802.3ah compliant EPON
- One 802.3 compliant 10 /100 Base-T

- One 802.3 compliant 10 /100/1000 Base-T
- 128-bit Advanced Encryption Standard (AES) encryption for both downstream and upstream directions
- QoS support, base upon Port, IEEE802.1p, IPv4 Type of Service(ToS)or Differentiated Services(Diff-Serv), IPv6 Traffic Class, 802.1Q VLAN ID, MAC Destination address or MAC Source address
- Supports 802.3ah Forward Error Correction for an improved link budget
- Supports buffer threshold reporting for compatibility with dynamic threshold control Dynamic Bandwidth Allocation (DBA) algorithms
- Integrated SERDES and Clock Data Recovery (CDR) , Ultra low jitter
- 802.1x authentication engine with remote administration for device and user authentication
- Supports up to eight Logical Link IDs (LLID)
- Supports 64 Mac Addresses
- Supports 802.1Q VLAN
- Supports 802.1P
- Supports 40 queues (20 upstream/20 downstream)
- 1.5 MB of integrated buffering
- Supports up to 256 layer-2/3/4 classification rules
- Supports full-duplex 802.3x flow control and backpressure
- Full management through an Operation Administration Management (OAM) protocol based on IEEE 802.3ah
- Internal Management Information Base (MIB) counters for network statistics
- Ease of use, Fully customizable to suit your application
- Conforms to the requirements of the European Union Restriction on the use of Hazardous Substances (RoHS) Directive, 2002/95/EC

1.4 Rear panel

As shown in Figure 1, GONU11B ONU provides one PON interface (PON), one 10/100/1000 BASE-T interface (GE), one 10/100 BASE-T interface (FE), one reset button (RESET), one power socket (POWER) and one power button from left to right on its rear panel.

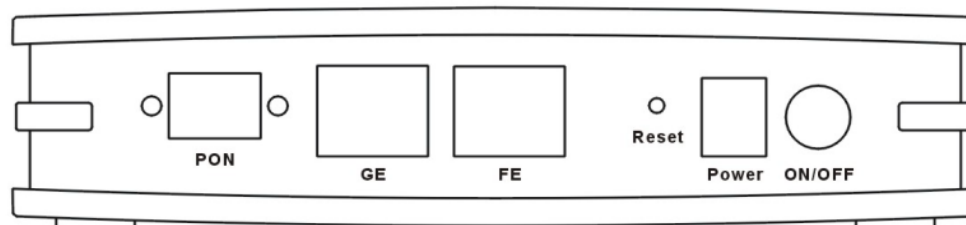


Figure 1

1.5 LED Description (See table 1)

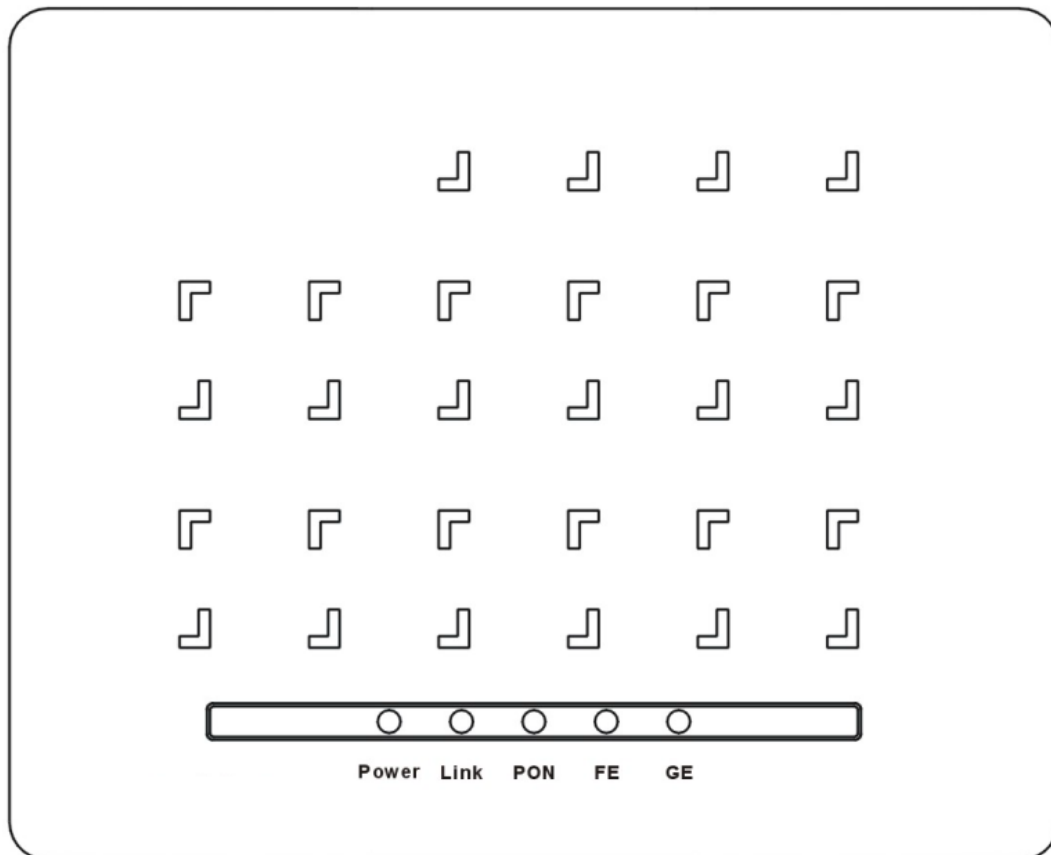


Figure 2

Table 1 Display of status (LED)

Item	LED Label	Color	Status	Description
1	POWER	Green	ON	Power is on
			OFF	Power is off
2	Link	Green	ON	Service offered
			OFF	No service offered
3	PON	Green	OFF	Normal operation
			Flashing	Optical alarm
4	FE	Green	ON	Ethernet Link up
			OFF	Ethernet Link down
5	GE	Green	ON	Ethernet Link up
			OFF	Ethernet Link down
			Flashing	Receive/transmit data

1.6 Technical Specifications

1.6.1 Regulatory Compliance

This product has been tested according to American and European product safety and electromagnetic compatibility regulations (See Table 2).

Table 2 Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Duplex LC Receptacle	IEC 61000-4-2 GR-1089-CORE	Compliant with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B	Compliant with standards
Immunity	IEC 61000-4-3	Compliant with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN(IEC) 60825-1 EN(IEC) 60825-2	Compliant with Class I Laser Product TUV Certificate No. 50030043
Component Recognition	FCC, CE and CCC	Compliant with standards

1.6.2 Absolute Maximum Rating

Absolute Maximum Ratings are those values, beyond which, some damage may occur to the systems. Exposure to conditions above the Absolute Maximum Ratings listed in Table 3 may negatively impact the reliability of the products.

Table 3 Absolute Maximum Conditions

Parameter	Symbol	Min.	Max.	Units
Storage temperature range	Tst	-20	70	°C
Storage humidity	-	5	95	%
Operating temperature range	T	0	45	°C
Operating humidity	-	10	90	%
Supply voltage range	Vcc	4	13.2	V
Power consumption	-	TBD	10	W
Pigtail fiber Bending Radius	-	30	-	mm
Contact temperature on pigtail fiber	-	-40	85	°C

1.6.3 Recommended Operation Conditions

Functional operation of the system is implied at Recommended Operating Conditions (shown in Table 4).

Table 4 Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage range	Vcc	4.75	12	12.6	V
Supply current	Icc		TBD	2000	mA
Operating ambient Temperature	TC	0	25	45	°C
Operating humidity range	Hopr	10		90	%

1.6.4 Technical Specification

Table 5 Optical interface specifications

Item	Specification	
Max. number of split	Up to 32 subscribers within 10 km radius	
Transmission speed	Downstream: 1.25Gbps, Upstream: 1.25 Gbps	
Connector	SC/UPC connector	
Optical physical condition	IEEE803.2ah-2004 1000 BASE-PX10	
Optical specification	Downstream	Wavelength: 1490nm
		Min receive sensitivity: -26dBm
		Max. receive saturation power: -3dBm
		Receiver damage threshold: +2dBm
	Upstream	Wavelength: 1310nm
		Min. output optical power: -1dBm
		Max. output optical spectrum width (RMS): 3nm
Connection cable	Standard single Mode Fiber	
Connector	0.5m long SM fiber and inner standard SC (non-angled) connector	

Table 6 LAN interface specifications

Parameter	Specification/Value
Standard	It shall comply with IEEE802.3, IEEE802.3au and IEEE802.3x
LAN	10/100 Base-T or 10/100/1000 Base-T auto-negotiation
Number of ports	2 Ports (10/100 Base-T plus 10/100/1000 Base-T)
Type of connector	RJ-45
Impedance	100 Ohm
Auto negotiation	IEEE 802.3 10/100/1000 BASE-T Auto-negotiation Full duplex/Half duplex, support RJ-45 MCI-X
VLAN	IEEE 802.1q

Parameter	Specification/Value
Supported Link Distance	Maximum 100m

Table 7 Performance

Parameter	Specification
Remote loopback	Remote loopback of ONU initiated from OLT shall be supported
Management	Telnet, console interface with CLI Remote system software upgrade
QoS	based upon Port, IEEE802.1p, IPv4 Type of Service (ToS) or Differentiated Services (Diff-Serv), IPv6 Traffic Class, 802.1Q VLAN ID, Destination MAC address or Source MAC address
User Authentication	IEEE 802.1x

1.6.5 Power Supply Specification (adapter)

Table 8 Power supply specification

Parameter	Value
Input AC Voltage	AC 85V ~ 265 V, 47 ~ 63 Hz
Max. AC power consumption	14W or less
Output Power from the Power Adapter	5V DC, 2A or 12V DC, 1A (supports Dyinggasp)

1.6.6 Physical specification

Table 9 Physical specifications

Parameter	Value
Dimensions (WxDxH)(mm)	138 x 111 x 34
Weight	Less than 300g (TBD)

1.7 Network Applications: FTTX (FTTH, FTTB etc.)

The OLT device is deployed in the central equipment room. The ONU devices are connected to the OLT device through an optical splitter, which forms a P2MP (point-to-multiple-point) topology, then to the switches or to the Ethernet ports of computers, as shown in Figure 3.

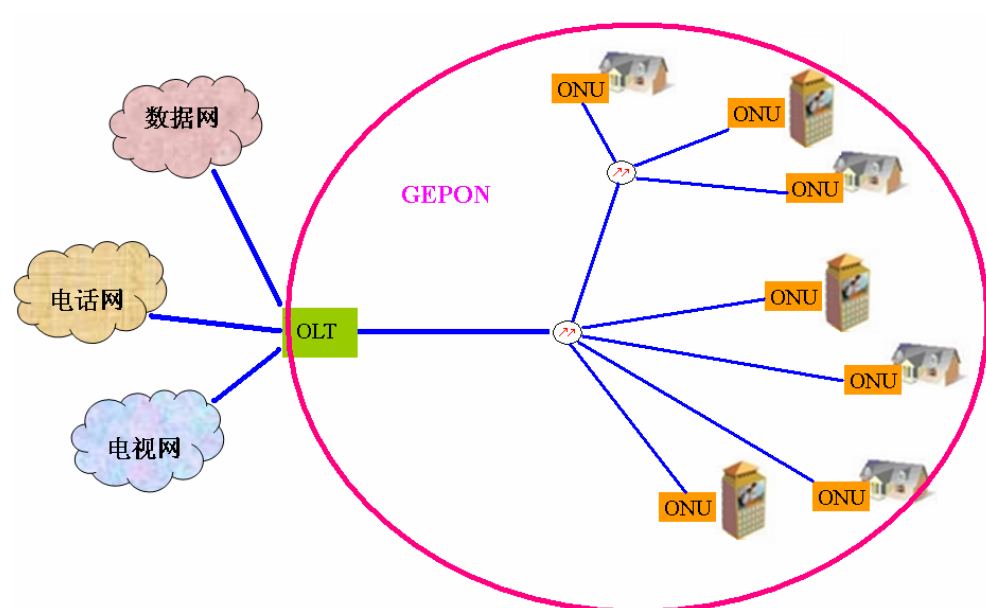


Figure 3

2 Hardware Installation

2.1 Safety Precautions

- Make sure the GEPON service is enabled.
- Ensure that the optical fiber is long enough to achieve the desired installation place.
- Put the ONU on a sturdy table.
- When installing the ONU on a vertical surface, you should properly fix the ONU device and the power adapter to avoid them falling down.
- Don't open the device when the ONU is operating.
- Contact your local agent for permission if you want to remove the chassis.
- Allow about 10 cm of clearance around the ONU chassis for heat dissipation.
- When an ONU device is to be installed outdoors, take lightning protection into consideration.

2.2 Installing the ONU

2.2.1 Installing the ONU on a workbench

Put the ONU on a clean, flat, sturdy workbench. You must keep the clearance more than 10cm for heat dissipation.

2.2.2 Installing the ONU on a Vertical Surface

You can install the ONU on a vertical surface by using the molded mounting brackets on the bottom of the ONU chassis and two pan-head screws.

Before installing, make sure:

- Make sure the screws are well fastened.
- Make sure the power adapter of the ONU is firmly fixed and will not fall down from the unit.

And then follow these processes to hang the ONU:

Step 1 Drill two holes in the wall, the holes must be in the same horizontal line and the distance between them must be 96 mm.

Step 2 Insert two alignment tubes into the two holes.

Step 3 Drive two pan-head screws into the alignment tubes, leaving at least 1.5 mm between the screw caps and the wall.

Step 4 Hang the ONU on these screws through the notches on the bottom of the ONU.

2.3 Network Cable Connection

Step 1 Insert one end of the network cable (RJ-45) into the 10/100/1000BASE-T or the 10/100BASE-T interface of the ONU.

Step 2 Insert the other end of the cable (RJ-45) into the RJ-45 port on the peer device.

2.4 Fiber Cable Connection

Before connection, please note:

- Keep the optical connector and the optical fiber clean.
- Make sure the bending diameter of the fiber is more than 6cm. Otherwise, the optical signal loss may be increased, or even signals may be unavailable.
- Cover a protective cap to guard against dust and water when the fiber is not used.

Step 1 Remove the protective cap of the optical fiber.

Step 2 Remove the protective cap of the ONU optical interface (PON interface).

Step 3 Insert the fiber into the PON interface.

2.5 Power Adapter and Cable Connection

Step 1 Connect the output end of the power adapter to the power socket on the ONU.

Step 2 Insert one end of the power cable into the input socket of the power supply adapter.

Step 3 Insert the other end of the power cable into a power outlet.

Step 4 Turn on the power-switch, then check whether the POWER LED is on. If not, check the connection between the power cable and the adapter.

2.6 Verifying the Installation

After the ONU is powered on, check whether the PON interface status LED (Link) is on. If yes, the connection is normal; otherwise check the connection of the optical fiber.

Environmental Protection

This product has been designed to comply with the requirements on environmental protection. For the proper storage, use and disposal of this product, national laws and regulations must be observed.