

H646GM-V



GPON Gigabit ONT with Wi-Fi Service

The H646GM-V from DZS is the ideal solution based on GPON and EasyMesh compliant Wi-Fi Network for home users.

Features & Benefits

- + Triple-play service: Internet, IPTV, VOIP
- + Functions as an ONT & Wifi Easy mesh controller
- + One 1.25/Gbps2.5Gbps GPON WAN port
- + Four gigabit multi-rate 10/100/1000M Ethernet interfaces
- + Dual-band 2.4GHz 2x2 802.11n, 5GHz 2x2 802.11ac Carrier-grade Wi-Fi 5 interfaces
- + Easy device setup and subscriber self-installation

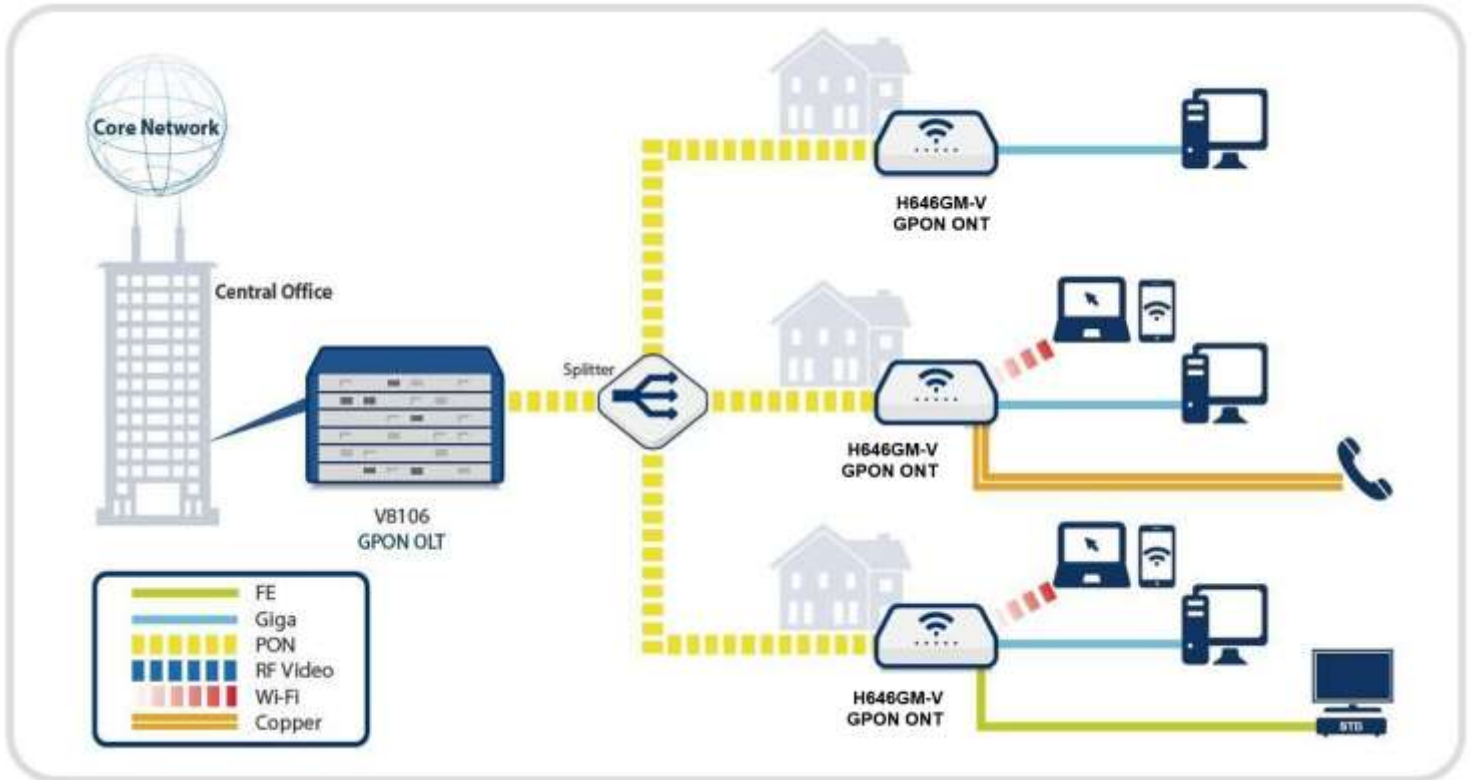
H646GM-V optical network terminal is targeted for all subscribers requiring high-speed data interfaces in a cost-effective indoor housing. Fully compliant with ITU-T G.984 standards, the H646GM-V supports data rates of 1.25Gbps upstream and 2.5Gbps downstream. With our leading-edge GPON technology, users can enjoy bandwidth-intensive multimedia services such as real-time audio, and gaming much easier and faster than ever before.

The H646GM-V provides one GPON uplink port, four Gigabit Ethernet (10/100/1000Base-T) ports and Wireless LAN interface that enhance the ability to deliver demanding data/Wi-Fi services. The H646GM-V supports the delivery 24/7 of all types multiple of services, such as High Speed Internet at L2 bridge or L3 route (with support of NAT/static route); VoIP (SIP/H323 protocol), video services (IPTV) at L2 bridge. H646GM-V can also provide L2 bridge service for Layer 2 VPN, IP Camera monitoring or any L2 service at L2 bridge and/or Layer VPN service is terminated at ONT

The H646GM-V contains both built-in wire-speed L2 switch and L3 routing gateway with port forwarding, NAT and NAT address translation, Internet WAN (PPPoE client, Static IP address, DHCP client) support for high speed Internet service.

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Service Scenario for PON



A PON consists of an Optical Line Termination (OLT) located at the Central Office and a set of Multi Dwelling Units (MDUs) or Optical Network Terminals (ONTs) located at the customer's premises. Between them is the optical distribution network (ODN) comprised of fibers and passive optical splitters or couplers. A splitter is a device that divides an optical signal into two or more signals. The OLT connects the PON to the IP network that controls and manages the PON clients. An MDU (ONT) connects the user-specific network to the PON. The ONT can be utilized by a single subscriber or used as a multi-dwelling gateway for a local network.

ONT acting as a router, establishing a PPPoE connection session and performing DHCP, NAT / PAT functions so that client on the LAN can access the Internet. Acting as an L2 bridge device as the setting environment for PPPoE/DHCP connection session from STB (IPTV) devices; telephones (VoIP) and computers (HSI) are located behind ONT devices.

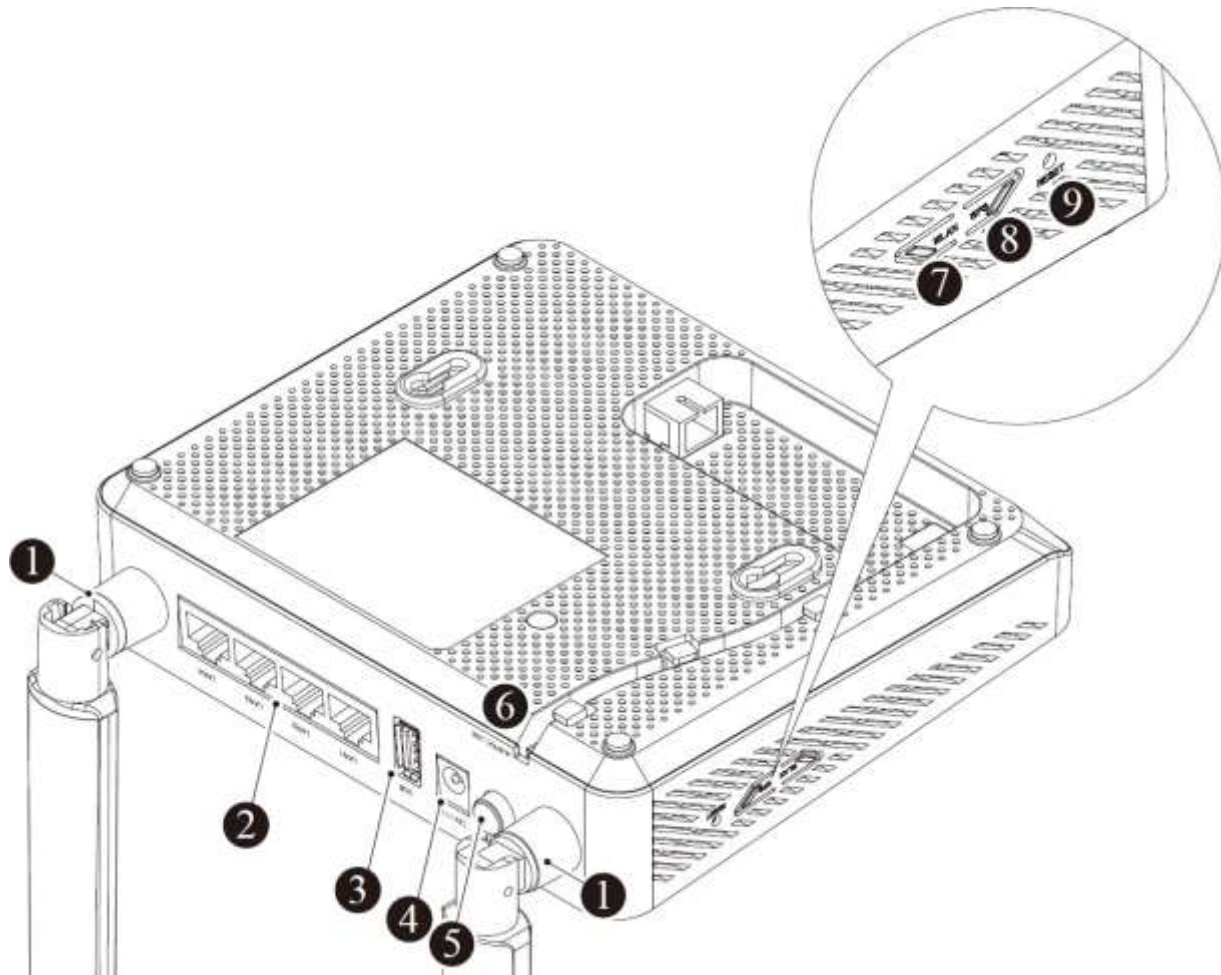
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Interface Layout

The following drawing shows the interface layout of the product.

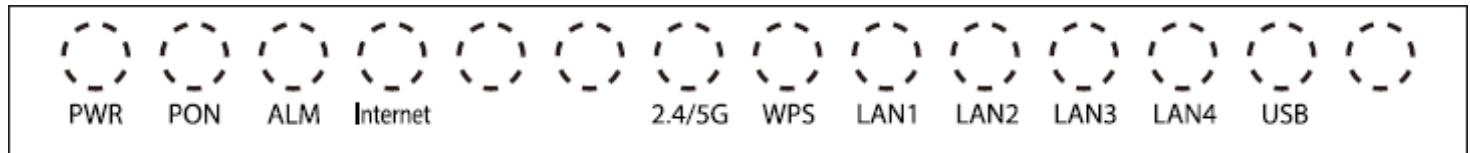


Interface Name	Description	Connector Type
① Antenna	Transmit and receive Wi-Fi packets.	-
② LAN 1-4	Connect to PC or LAN. 4 10/100/1000Base-T interfaces for data communication.	RJ45
③ USB	Connect an external USB drive.	USB
④ Power port	Connect an external power supply.	-
⑤ ON/OFF button	Turn on/off/reboot the unit	-
⑥ Optic Line	Connect to OLT via a passive optical splitter. 1 GPON uplink interface.	SC/APC
⑦ WLAN	Enable Wi-Fi function.	-
⑧ WPS	Enable WPS process.	-
⑨ RESET button	Restore the unit to default factory setting.	-

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Operating Status LEDs

The status of the ONT is indicated by the LEDs located on the front of unit. LED indicators illuminate to show normal ONT operation and will blink and/or turn off to indicate the status or errors. Refer to the following table for details of each LED state.



Label	Color	Status	Description
PWR	Green	On	Power on.
		Off	Power off.
PON	Red	On	No optical received power.
	Green	Blinking	Ranging Fail or Un-configuration on OLT side.
		On	Successful activation and it is received the configuration from OLT side.
ALM	Red	On	Optical received power is less than -28dBm or No optical power or upgrade firmware failed.
		Blinking	ONT is downloading/uploading firmware via OMCI.
		Off	No alarm.
Internet	Green	On	Internet (WAN) gets IP address (Either IPv4 address or IPv6 address).
		Off	Internet (WAN) does not get IP address.
WLAN	Green or Blue	On	Wi-Fi is turned on.
		Off	Wi-Fi is turned off.
WPS	Green	Blinking	WPS is turned on and press WPS button then WPS LED will blink until 2-3 minutes then off.
		On	WPS is turned on and working for during 5 seconds when client is connected successfully.
		Off	WPS is turned off.
LAN 1-4	Green	On	LAN get received signal.
		Blinking	LAN is transmitting traffic.
		Off	LAN does not get received signal.
USB	Green	On	USB is connected and working normally.
		Blinking	Data is being transmitted.
		Off	USB is not connected or power is not fed.

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Features, Protocols, Interfaces

System

- 128MB Flash/Embedded 256MB SDRAM
- CPU: 900MHz with dual-core
- GPON Interface Capacity: Up 1.25Gbps / Down 2.5Gbps

GPON ONT

- ITU-T G.984.x, G.988 compliant
- AES 128-bit encryption
- Bidirectional Forward Error Correction (FEC)
- Support up to 8 T-CONTs & 32 GEM ports per device
- Flexible mapping GEM port and T-CONT
- OMCI channel encryption with variable lengths
- Priority queues and scheduling on Upstream
- Dying Gasp
- Support TR255 for IoP

L2 Features

- IEEE 802.1q (VLAN)
- IEEE 802.1ad (QinQ)
- VLAN 4K (1 – 4094)
- Source MAC learning via VLAN,PON/LAN port
- 2K MAC address table
- Maximum 8 bridge group (8 VLAN group)
- Support transparent control protocol packet (BPDU, IGMP, OSPFv2, RIPv1, PIMv2, ARP, VRRPv2) through L2 bridge mode/QinQ

Multicast

- IGMP v1/v2/v3
- IGMP snooping/proxy
- MLDv1/v2

Quality of Service

- HW-based internal IEEE 802.1p (CoS)
- Support SP+WRR; Queue capacity \geq 4Mbyte
- 802.1Q (VLAN tag) QoS mapping, ToS/CoS
- 8 queues per port

Management

- ITU_T 984.4 compliant OMCI interface
- IEEE802.3x flow control
- LED indications for maintenance
- Support management ONT by TR069,TR142 via ip-host 1
- ONT service provisioning (By OLT via OMCI)
- Web-based management
- Remote management by http/Telnet/SSH via WAN interface
- Restore factory default setting by Web GUI or OLT via OMCI
- Diagnostic tool in WEB GUI (ping, trace)
- Backup/Restore/Reset configuration in Web GUI
- Local/Remote upgrade via Web GUI or OMCI
- Parental control
- Auto Reboot
- Network Time Protocol NTP
- Dual OS for upgrade/rollback firmware
- Display ONT Serial Number or SLID (base on text string that input by user) on WEB GUI.

Wireless LAN

- IEEE 802.11 a/b/g/n/ac compliant
- Multiple SSIDs (4 SSID in 2.4Ghz and 4 SSID in 5Ghz), separate user traffic base per SSID.
- Up to 32 devices can accessed simultaneously
- Operating Frequencies : 2.4GHz, 5GHz
- Antenas: 2T2R MIMO, Max. data rate: 300Mbps in 802.11n, 867Mbps in 802.11ac
- Auto/Manual Channel width 20 MHz/ 40 MHz/ 80MHz (11ac)
- Auto/Manual Wifi channel selection
- Security: WEP(64/128bits), WPA-PSK (TKIP) & WPA2-PSK (AES)
- Wi-Fi Protected Setup (WPS:PBC)
- Enable/Disable Wifi (enable by default)
- Wifi Tx Power (Standard(50%)/ Medium(75%)/ High(100%)
- Wifi Client list
- RSSI Threshold
- Broadcast/Hidden SSID

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Features, Protocols, Interfaces

Security Features

- Unique password login WEB GUI
- Activation with automatic discovered Serial Number and password (LOID/SLID).
- VLAN Filter on LAN/WAN
- Unicast MAC address is learned by VLAN or basic interface
- L2 access control by (LAN MAC, Wifi MAC) Filter
- L3 access control by (LAN IP Address) Filter
- URL Filter
- BPDU Filter
- Prevent: DOS/DDOS attack
- Not allow storing and executing strange code automatically.
- Disable Web management on WAN by default
- Integrated stateful packet inspection IPv4/IPv6 firewall with ACL

Wi-Fi Mesh Features

- Following the Easy Mesh Standard
- Connection type: Ethernet and Wifi
- Support 8 Wi-Fi extended connection
- Easy doing service provisioning configuration, synchronized configuration, roaming, mesh for all Wi-Fi Extender in the network by Wifi Controller: through many ways as LAN/PBC WPS/PBC Web
- Display Mesh Topology through Web GUI
- Support Star, Daisy Chain Topology
- Support multi-backhaul, auto switching (the default priority is Ethernet -> Wifi 5Ghz -> Wifi 2.4Ghz)

Residential Gateway Unit Features

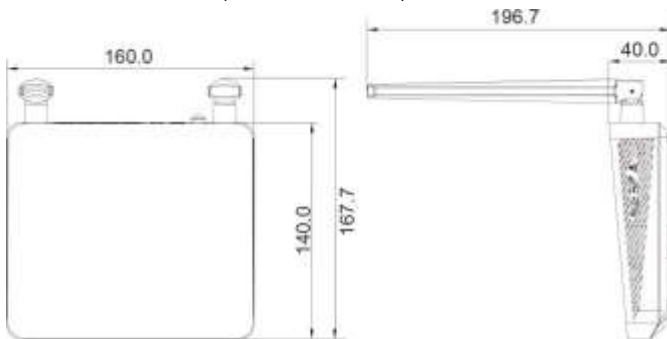
- Support VLAN (Tag,Untag, Transparent, Passthrough) for L2/L3 WAN
- WAN L2: Bridge
- WAN L3: PPPoE/ DHCP/IPoE
- L2 MTU size: 2000; L3 MTU size: 1500
- IPv4/IPv6/Dual stack
- Static route; Default route
- DNS proxy: Auto/Manual; DNS Relay server (DNS relay, DNS transparent)
- NAT/NAPT; NAT session management (by default 4K NAT session, maximum 8K NAT session); NAT loop back
- Port forwarding
- DMZ
- ALG (FTP, H323, PPTP, L2TP, SIP, RTSP, TFTP, IPSEC)
- UpnP
- Port Triggering
- DHCP server in LAN interface
- DDNS (No IP, Dyn DNS)
- Port Mapping between WAN vs LAN/WLAN
- Support up to 5 VPN session via L2TP / IPSec / PPTP protocols in passthrough mode (L2 throughput \geq 200Mbps full duplex, L3 throughput \geq 90Mbps full duplex).

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Physical & Environmental Specifications

Mechanics

- Dimensions:
160x167.7x196.7cm
160x167.7x40cm (Antennas folded)



Environmental Conditions

- Operating temperature: 23 to 122°F (-5 to 50°C)
- Storage temperature: -22 to 140°F (-30 to 60°C)
- Operating humidity: 5 to 90% (non-condensing)

Interface Parameters

- GPON interface
1 GPON port (SC/APC type)
- Gigabit Ethernet interface
4 10/100/1000Base-T ports (RJ45), IEEE 802.3ab compliant
- Wireless LAN interface
IEEE802.11a/b/g/n/ac compliant
Antennas: 2x2 MIMO 2.4GHz/5GHz dual external, maximum data rate: 300Mbps in 802.11n, 867Mbps in 802.11ac
Tx Power (EIRP): ≥ 18 dBm
Antenna Gain: 5 dBi

Power Voltage (AC/DC Adapter)

- Switching power adapter
- Input: 100-240VAC, Nominal frequency 50/60Hz (adaptive frequency range 47-63Hz)
- Output: 12VDC/1.0A
- Power consumption: Max 12W
- Power efficiency $\geq 80\%$
- Limited input current: 400mA Max
- Maximum inrush current: 20A at 220VAC
- ONT nominal load current: 150mA
- Protect from overvoltage input: $\geq 2KA@8\mu s/20\mu s$, uses MOV accessories.
- The output over voltage protection (OVP) of the adapter operates when it is over 13.2V
- Ripple and output noise voltage : $\leq \pm 1\%$ Nominal Voltage
- Over voltage when power on/off: $\leq 110\%$ Nominal Voltage
- Nominal output current greater than 3.3 times the average load current
- Overcurrent resistant: The Over output current protection (OCP) operates when it is over 1.3A ($>130\%$) based on AC input 220V.
- Overcurrent protection, output short circuit: Adapter will stop working when operating in overcurrent protection, short circuit and resume operation when the output is no longer overcurrent or short circuit.
- Insulation between input (AC) and output (DC): $\geq 1.5kV$, leakage current $<5mA$
- Insulation resistance between input (AC) and output (DC): $\geq 10 M\Omega$
- AC power plug: 2-pin round type
- DC power connector 5.5mm x 2.1mm
- DC power cable: Flexible double copper wire length $\geq 1.5 m$, cross-section copper conductor suitable for rated power ($\leq 6A / mm^2$)
- IEC 60950 safety
- Not affect the device when the power is turned on and off continuously.
- Operating temperature: 0 to 40°C
- Operating humidity: 20-85% RH

Ordering Information

Model	
H646GM-V	G-PON (Class B+, ITU-T G.984), 4-Port 10/100/1000Base-T, Wi-Fi (802.11a/b/g/n/ac) <ul style="list-style-type: none">- PON MAC : Econet, Flash 128MB & SDRAM 256MB- SC/APC Connector type- External antenna- Power Adaptor : Input 100~240VAC, Output 12V/1.0A

NOTICE:

The software functions can be adjusted without notice depends on firmware version!

Maximum wireless signal rate derived from IEEE standard 802.11 specifications. Actual data throughput and wireless coverage will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate and wireless coverage!

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