



# **DAA Digital Node DN 1218**

## **Product Specifications**

## Product Highlights

### High Bandwidth

- ✓ High-performance DOCSIS 3.1 supporting 6\*192 MHz and 2\*96 MHz downstream and upstream bandwidth respectively per Service Group (SG).
- ✓ Capacity upstream expansion and reducing return of investment cost by adding two service groups (SGs) in the upstream direction to expand the service bandwidth.

### Flexible Integration

- ✓ Internal Edge Quadrature Amplitude module (EQAM) and WDM provide saving investment and reducing the networking complexity and maintenance cost of the distribution hub.
- ✓ Thanks to its modular design, internal components can be easily replaced when a fault occurs.
- ✓ Small and new PSU size is achieved for controlling lack of space on cabinets.

### Converged Services

- ✓ Can be easily fit in either any centralized or distributed MSOs architectures, sharing FttLA and FttH scenarios over same provisioning platform.
- ✓ Unified solution for video and data services using EQAM module, simplifying legacy networking integration.
- ✓ Broadcasting (BC) redundancy protection TV service flows. Ensuring system reliability during TV platform faults.
- ✓ 4K and 8K video are supported to increase customer video experience.

### Simple Maintenance and Management

- ✓ Supports **Unified Mode** also known as **OaDN**. Under this mode the DN1218 inherently download its own configuration from an aggregation device located at the HeadEnd via OMCI.
- ✓ The DN1218 is a plug-and-play when xPON technology is being used at aggregation device.
- ✓ Simple and efficient maintenance and operations are performed on the aggregation node when **Unified Mode** is used.
- ✓ Supports upstream spectrum scanning. Upstream cable channels are prone to interference from upstream external noises, which adversely affect CMs and user QoE services.

## Application Scenarios

- ✓ Provides high demand Quad-Play services ( HSI, VoD, BC, VoIP) expanding MSOs service requirements at technology edges.
- ✓ Provides Business to Business technologies flexibilities such as L2VPN/L3VPN to be promoted over BSoD technology.
- ✓ WLAN hotspot backhaul service by using APs can be easily deployed.

Typical DN1218 networking scenarios are divided as follows:

### OLT aggregation Distributed DN scenario (OaDN)

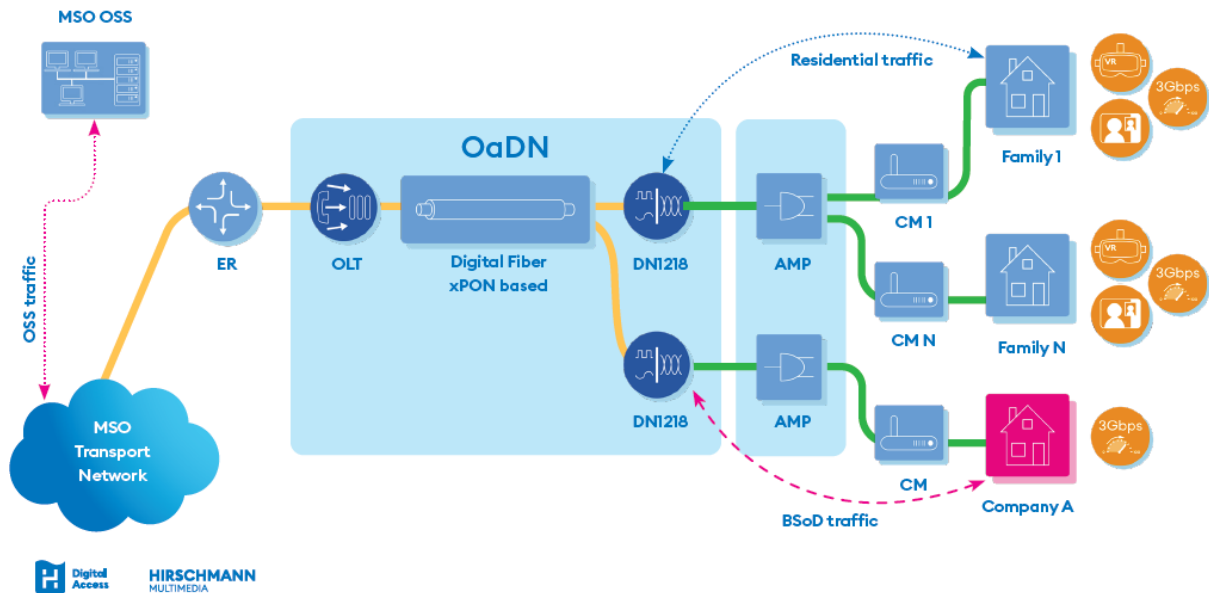


Figure 1 DN1218 in OaDN scenario

**Note:** 1:N splitter can be easily fit on.

## Product Appearance



Figure 2 DN1218 Product Appearance

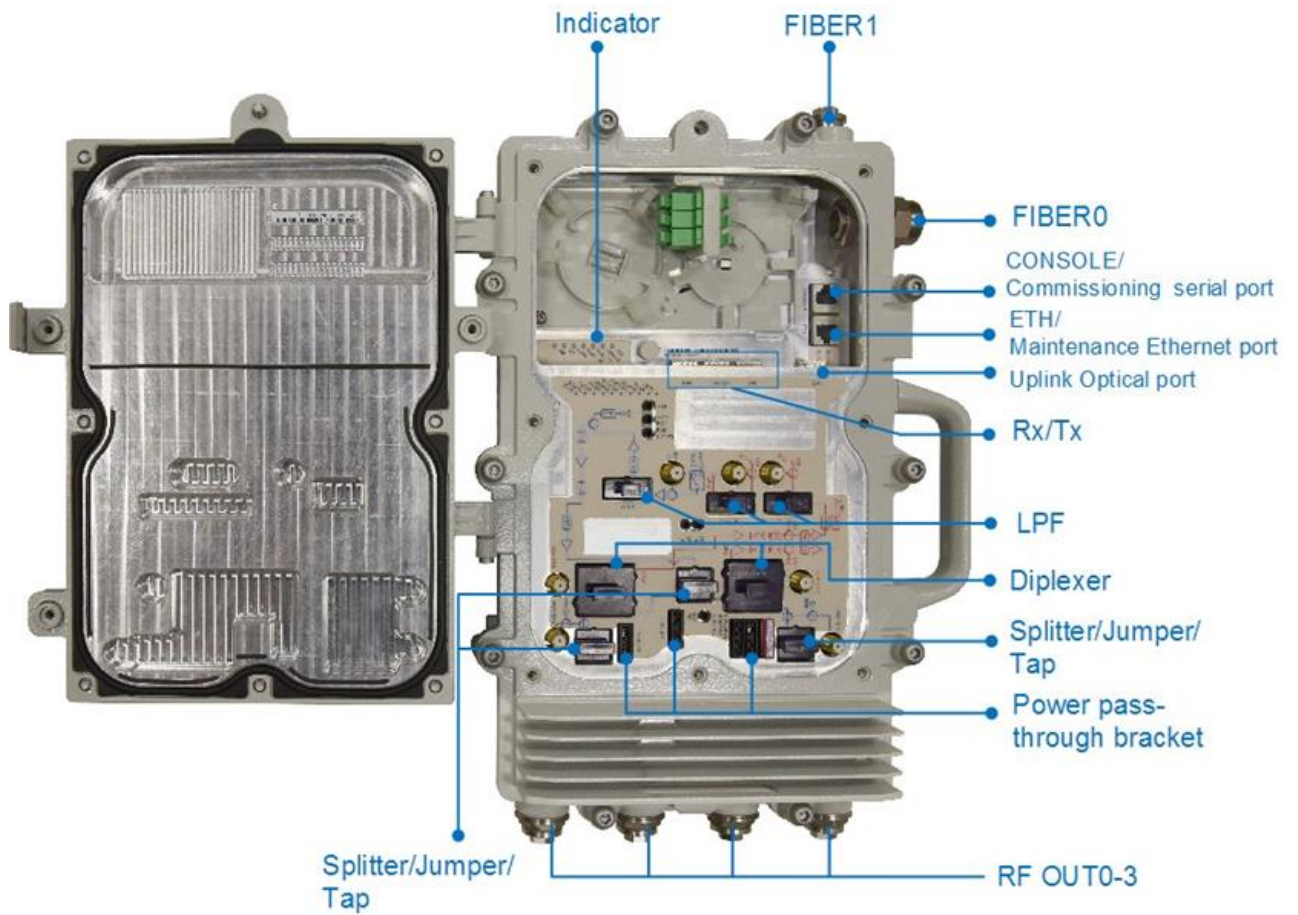


Figure 3 DN1218 Insight Product Appearance

## DN1218 Product Specifications

Item	Description
Weight	About 12 kg
Dimensions (width x depth x height)	365 mm x 165 mm x 220 mm
Number of Service Groups	1 DS, 2 US
Upstream port	1 * XGS-PON/XG-PON/GPON/10GE/GE
Channels supported per SG	DOCSIS 3.1: 6 DS x 2 US DOCSIS 3.0: 32 DS x 8 US + 80 SC-QAM (BC + VoD)
Number of concurrent online CMs	1023
Number of supported service flows	4000 in both downstream and upstream directions
Protection level	IP65
Operating power voltage	90 V AC to 300 V AC 35 V AC to 95 V AC
Surge protection level	RF port: 4 kV (differential mode); 6 kV (common mode) AC power port: 6 kV (common or differential mode)
Maximum throughput <b>NOTE</b> The rate is obtained at the PHY layer. DOCSIS 3.1: The test is performed under the conditions of 6*192 MHz OFDM channels and 2 *2*96 MHz OFDMA channels. DOCSIS 3.0: The test is performed under the conditions of 32 downstream channels (8 MHz/6 MHz per channel) and 16 upstream channels (6.4 MHz per channel).	DOCSIS 3.1: Downstream: 10Gbit/s @ 4096QAM Upstream: 1.5 Gbit/s @ 1024QAM DOCSIS 3.0 European-standard: Downstream: 1600 Mbit/s @ 256QAM Upstream: 480 Mbit/s @ 64QAM DOCSIS 3.0 U.S.-standard: Downstream: 1280 Mbit/s @ 256QAM Upstream: 480 Mbit/s @ 64QAM BC+VoD European-standard: 80*50 Mbit/s @ 256QAM BC+VoD U.S.-standard: 80*40 Mbit/s @ 256QAM
Maximum output level of CATV	112 dBuV @ 1218 MHz @ 4 RF OUT port outputs <b>NOTE</b> The output level is calculated based on the CW signal level of the equivalent analog TV. The maximum output level at 1218 MHz is calculated according to the following test conditions. After the maximum CW signal level is output at 1006 MHz, the equivalent level at 1218 MHz is calculated based on that at 1006 MHz and the corresponding EQ.



Item	Description
	<p>The test conditions are as follows:</p> <p>Temperature: 25°C</p> <p>EQ: 18 dB</p> <p>RX link configuration: input optical power 0 dBm; OMI = 3.5%</p> <p>Maximum output frequency range of the CATV link: 54–1006 MHz</p> <p>The DOCSIS link is normally connected but no service is configured (only background noise).</p>
Maximum output level of DOCSIS	<p>≥ 103.5 dBuV @ 1218 MHz @ 4 RF OUT port outputs</p> <p><b>NOTE</b></p> <p>This level is the total power level of equivalent 6 MHz of an OFDM channel. The test conditions are as follows:</p> <p>32 x D3.0 + 64 x SC - QAM + 2 x OFDM</p> <p>Temperature: 25°C</p> <p>EQ: 18 dB</p> <p>Maximum output frequency range of the DOCSIS link: 54–1218 MHz</p> <p>The CATV link has no optical signal input.</p> <p>The specifications are tested under 25°C based on the default configurations of the integrated system.</p> <p>The downstream flatness of the full temperature range is ±1.65 dB.</p>
Operating Temperature	<p>Horizontal installation: -40°C to +65°C (startup at lowest -25°C)</p> <p>Vertical installation: -40°C to +55°C (startup at lowest -25°C)</p> <p><b>NOTE</b></p> <p>The horizontal installation mode is recommended. You are advised to perform analysis and evaluation based on specific project requirements.</p>
Operating Humidity	5% RH to 95% RH
Atmospheric Pressure	70 kPa <sub>a</sub> to 106 kPa <sub>a</sub>
Altitude	<p>&lt; 4000 m</p> <p><b>NOTE</b></p> <p>The air density varies with the altitude, which affects the heat dissipation of the DN1218. Therefore, the operating temperature of the DN1218 varies with the altitude.</p>

## Primary Function List

<p><b>Cable Access</b></p> <ul style="list-style-type: none"> <li>Channel management</li> <li>Load balancing</li> <li>Channel bonding</li> <li>Spectrum management policy group</li> <li>Upstream 2SG</li> <li>OOB DS/US Signals</li> <li>BSoD</li> </ul> <p><b>Dynamic Voice</b></p> <ul style="list-style-type: none"> <li>PacketCable 1.0</li> <li>PacketCable 1.5</li> <li>PacketCable Multimedia</li> <li>PacketCable 2.0</li> </ul> <p><b>Video Service</b></p> <ul style="list-style-type: none"> <li>4K &amp; 8K video</li> <li>EQAM</li> <li>NGOD D6</li> </ul> <p><b>CM Management</b></p> <ul style="list-style-type: none"> <li>CM registration and management</li> <li>Limitation on the number of CPEs connected to a CM</li> <li>CM admission control</li> <li>CM information query</li> <li>Periodic statistics for CMs</li> <li>CM event reporting</li> </ul> <p><b>DOCSIS Multicast</b></p> <ul style="list-style-type: none"> <li>DOCSIS multicast authentication</li> <li>DOCSIS multicast encryption</li> <li>DOCSIS multicast QoS</li> </ul> <p><b>QoS</b></p> <ul style="list-style-type: none"> <li>Priority processing</li> <li>Traffic management</li> <li>Congestion management</li> <li>Access control list (ACL) policies</li> <li>Traffic burst</li> <li>QoS adjustment</li> </ul> <p><b>System Reliability</b></p> <ul style="list-style-type: none"> <li>xPON type B protection</li> </ul>	<p><b>IPv6</b></p> <ul style="list-style-type: none"> <li>IPv6 ACL</li> <li>DHCPv6 Option 18 or 37</li> <li>IPv6 neighbor discovery (ND)</li> <li>MLD Proxy/ MLD Snooping</li> </ul> <p><b>User Security</b></p> <ul style="list-style-type: none"> <li>DHCP Option 82</li> <li>Relay agent info option (RAIO)</li> <li>MAC address anti-spoofing</li> <li>MAC address anti-duplication</li> <li>Source address verification (SAV)</li> <li>User isolation</li> <li>BPI+</li> <li>X.509 authentication</li> <li>Message integrity check</li> <li>TFTP proxy</li> </ul> <p><b>System Security</b></p> <ul style="list-style-type: none"> <li>Destination IP address filtering (IP address access list)</li> <li>DoS anti-attack</li> <li>ICMP or IP address anti-attack</li> <li>Destination MAC address filtering</li> <li>Source route filtering</li> <li>Firewall and blacklist</li> <li>Setting of permitted or denied source IP address segments</li> </ul> <p><b>O&amp;M Security</b></p> <ul style="list-style-type: none"> <li>Simple Network Management Protocol (SNMP)</li> <li>Secure shell (SSH)</li> </ul> <p><b>Operator management</b></p> <ul style="list-style-type: none"> <li>Remote connection security</li> <li>Serial port shutdown</li> <li>Log management</li> <li>Centralized management</li> <li>DHCP dialup emulation</li> <li>DHCP GE upstream remote commissioning</li> <li>NAC GE upstream remote commissioning</li> </ul>
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