



ED5229 Series (GP, SR & GR) EDFA for PON or HFC Network Multiple Optical Outputs

The ACI ED5229 series is a high-power multi-ports EDFA optical booster with gain spectrum bandwidth from 1545 to 1563 nm for HFC network. It is designed for the amplification of 1550nm single channel or multi-channel wavelengths (ITU wavelength) with WDM option for GPON (OLT) signal overlay. With WDM devices integrated it can combine GPON OLT(IP) signals of wavelengths 1310nm (upstream) & 1490nm(downstream) with 1550nm signal in the same fiber. A built-in optical receiver is optional for directly monitoring the 1550nm RF signal. An optical switch is also built in for protection of the 1550nm signal. This series of EDFA offers a flexible solution for large area coverage of metropolitan and medium-size cities.

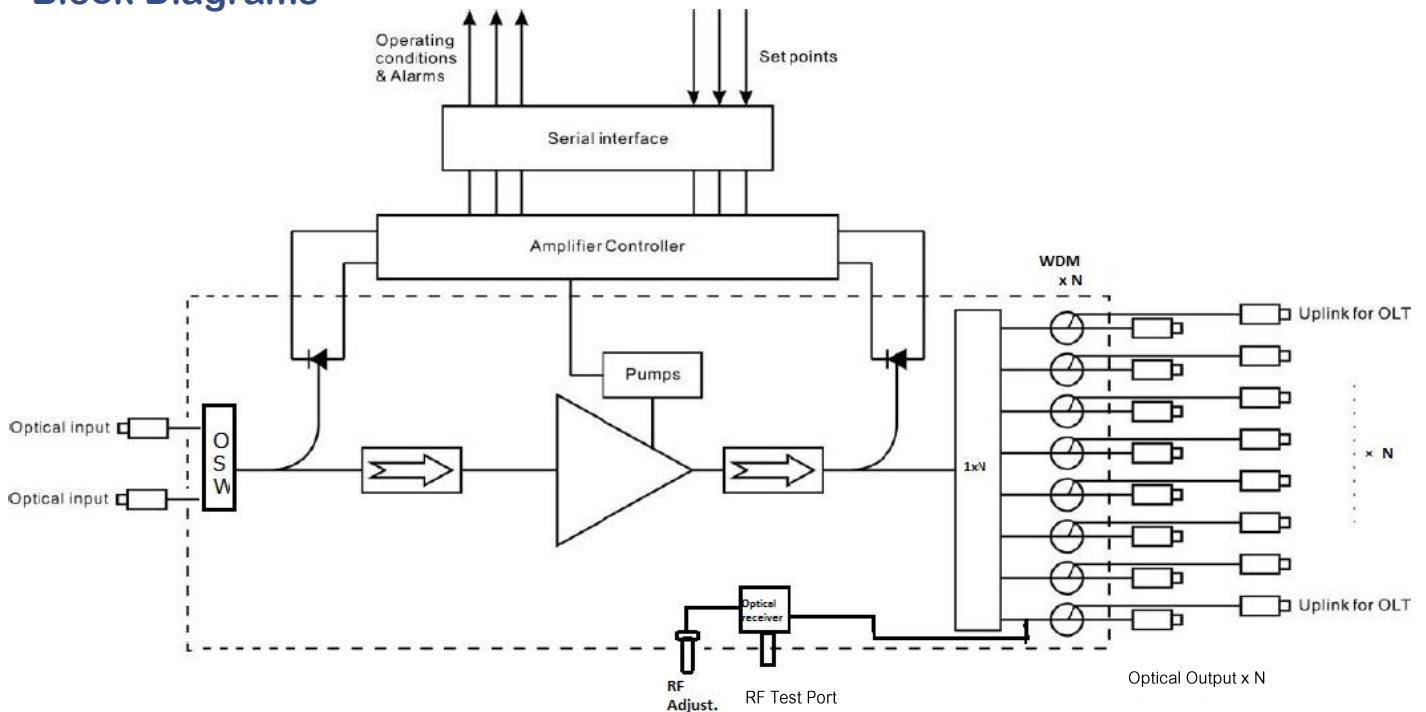
The ED5229 EDFA adopts the world's top-class pump lasers and Erbium/Ytterbium-doped special optical fiber for generating high optical output. Perfect APC control, excellent design in the ventilation and heat-dissipation ensures the long life and high reliability of the product. The pump laser will switch off automatically if the input optical signal power is missing, which offers safety protection for the laser.

The LCD display and LED indicators on the front panel provide system information, real-time monitoring and alarm functions for operating this equipment. A RJ-45 interface is available for controlling the unit from a remote PC by a GUI software. Network management via SNMP protocol is possible using the RJ-45 port on the front panel

Features

- 1545~1563 nm operating wavelengths range
- 8, 16, 32 or 64 port outputs
- Built-in WDM for GPON signal (ED5229GP & ED5229GR)
- Built-in Optical switch for 1550nm signal protection (optional)
- Built-in optical receiver for direct monitoring of 1550nm RF signal (ED5229GR or ED5229SR)
- Low noise, high reliability
- APC control
- Powerful RS232 supervisory instruction
- Efficient space, flexible installation and easy operation
- A high-performance optical output driver circuit and laser TEC to provide a highly reliable EDFA.
- A Built-in microprocessor allows the unit to monitor the system parameters.
- The pump laser auto shutdown function is available.
- LED indicator on the front panel shows the alarm status.
- LCD display on the front panel shows the system parameters.
- Support firmware upgrade download.
- Support SNMP for network management (option).
- External 5-volt DC power supply available on back panel

Block Diagrams



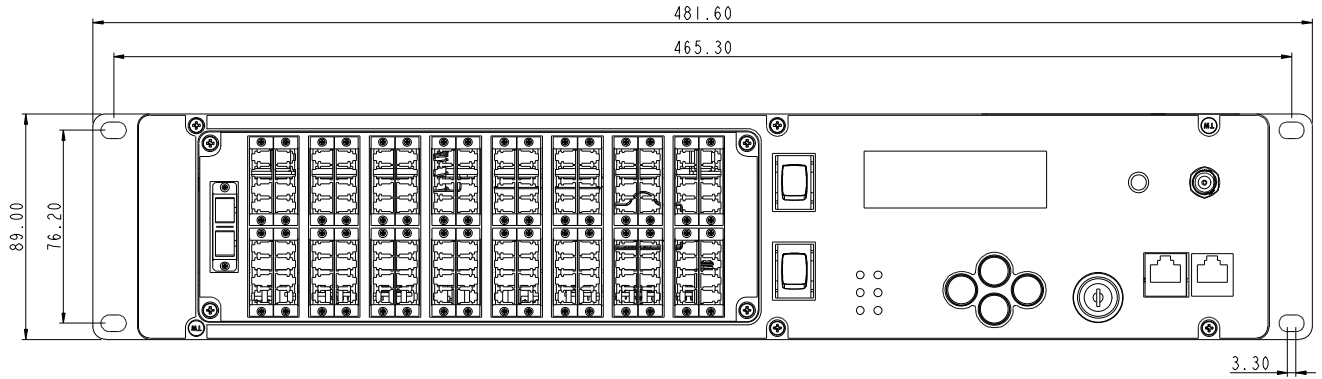
Specifications

| ACI | | | | | | | | ED5229 Series EDFA for PON or HFC Network (Multiple optical outputs) | | | |
|------|---|--|-------|-----------------|-----------|------------|---|---|--|--|--|
| No. | PARAMETERS | CONDITIONS | UNITS | SPECIFICATION | | | NOTES | | | | |
| 0. | Environmental Conditions | | | Min. | Typ. | Max. | | | | | |
| 0.1 | Power Consumption | | Watt | | | 130 | | | | | |
| 0.2 | Operation Case Temperature | | °C | 0 | | 50 | | | | | |
| 0.3 | Operation Humidity | | %RH | 0 | | 85 | Without Condensation | | | | |
| 0.4 | Storage Case Temperature | | °C | -20 | | 70 | | | | | |
| 0.5 | Storage Humidity | | %RH | 0 | | 85 | Without Condensation | | | | |
| 1. | Optical Specifications | | | Min. | Typ. | Max. | | | | | |
| 1.1 | Optical Wavelength (GPON / IP) | In vacuum | nm | 1270 | 1310 | 1350 | Pass through | | | | |
| | | | | 1480 | 1490 | 1505 | Pass through | | | | |
| 1.2 | Optical Wavelength | In vacuum | nm | 1545 | 1550 | 1563 | | | | | |
| 1.3 | Total Input Power Range | @ $\lambda_{OP}=1550$ nm | dBm | -6 | | +8 | | | | | |
| 1.4 | Saturated Output Power (per port) | @ $P_{in} \geq -6$ dBm @ $\lambda_{OP}=1550$ nm | dBm | Pout | Pout +0.3 | Pout +1 | Pout is selected by customer, eg. Pout= 19 dBm | | | | |
| 1.5 | Output Power After WDM | Adjustable | | Pout -0.5 | Pout | | Pout is selected by customer, eg. Pout = 19 dBm | | | | |
| 1.6 | Output Power Stability | Over λ_{OP} | dB | -0.5 | | +1 | | | | | |
| 1.7 | Output Power Uniformity | Among output ports | dB | | ± 1 | | | | | | |
| 1.8 | Noise Figure @ $P_{in}=0$ dBm (1550 nm) | ≤ 20 dBm | dB | - | | ≤ 6.0 | Including optical switch & WDM insertion loss 1 dB each | | | | |
| 1.9 | PDG (Polarization Dependent) | Over λ_{OP} | dB | - | - | 0.5 | | | | | |
| 1.10 | PMD (Polarization Mode Dispersion) | Over λ_{OP} | Ps/nm | - | - | 0.5 | | | | | |
| 1.11 | Optical Return Loss | All ports, min. | dB | 50 | | | | | | | |
| 1.12 | Input Isolation | | dB | 25 | | | | | | | |
| 1.13 | Output Isolation | ≤ 17 dBm ≤ 23 dBm | dB | 25 45 | | | | | | | |
| 1.14 | Insertion Loss (OLT/IP wavelength) | @ 1310nm & 1490nm | dB | | | 1.0 | | | | | |
| 1.15 | Residual Pump LD Power | 970 ~ 980 nm | dBm | | | -30 | | | | | |
| 1.16 | Control Mode | Auto Power Control | | | APC | | | | | | |
| 1.17 | Number of output ports | 1550 nm+IP | | 64, 32, 16 or 8 | | | 64/32/16/8 ports | | | | |
| 1.18 | Number of input ports | 1550 nm input | | 2 | | | | | | | |
| | | IP(OLT) inputs | | 64, 32, 16 or 8 | | | 64/32/16/8 ports | | | | |

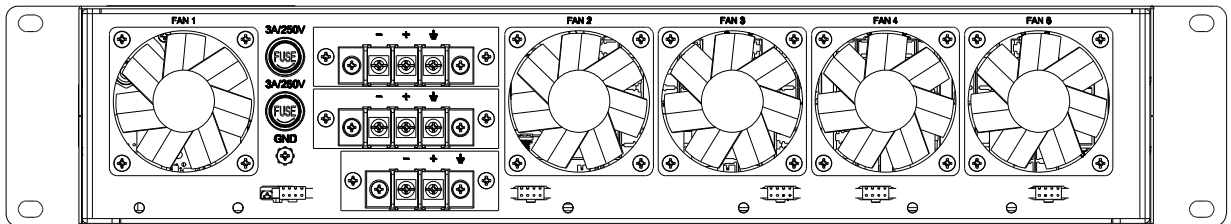
| No. | PARAMETERS | CONDITIONS | UNITS | SPECIFICATION | | | NOTES | |
|---|--|--|--------|---|------------|------------|---------------------------------------|--|
| 2. Mechanical / Power / Interface Specifications | | | | | | | | |
| 2.1 | Dimension (W x L x H) | 19", 2RU Rack mount | | 19" x 14.7" x 3.5" (48.26 x 37.34 x 8.89 cm) | | | 64/32/16/8 ports | |
| 2.2 | Power Supply | Dual power module/ 1+1 hot standby | Volt | -48 VDC (-30 ~ -72 VDC) | | | | |
| 2.3 | Pump Laser Switch | | | Key Switch | | | | |
| 2.4 | LED Indicators | | | Power, Input, Pump, Alarm | | | | |
| 2.5 | User Interface | | | RJ45 (Ethernet) | | | | |
| 2.6 | Fiber type | Single Mode | μm | 9/125 | | | | |
| 2.7 | Optical Connector | Output ports IP input ports 1550nm input ports | | LC/APC LC/UPC SC/APC | | | with built-in WDM & optical switch | |
| 3. Built-in WDM Specifications (for GPON signal ED5229GP Model only) | | | | Min. | Typ. | Max. | | |
| 3.1 | Transmission band Reflection band | For GPON signal | nm | | 1550 | | downstream | |
| | | | | | 1490,1310 | | upstream | |
| 3.2 | Insertion loss: Transmission band Reflection band | ≡ | dB | | | 0.8 0.6 | | |
| 3.3 | PDL | ≡ | dB | | | 0.1 | | |
| 3.4 | PMD | | ps | | 0.1 | | | |
| 3.5 | Isolation | ≡ | dB | 40 | | | Station ports | |
| 3.6 | PON signal pass-through when EDFA is turned off | PON Optical signal pass through | nm | | 1490, 1310 | | | |
| 3.7 | Maximum power | Max. | dBm | | | 26 | | |
| 4. Built-in Optical Switch (Optional) | | | | | | | | |
| 4.1 | Number of inputs | Main(A), secondary(B) | | | 2 | | | |
| 4.2 | Insertion loss | ≡ | dB | | | 1.0 | | |
| 4.3 | Switching time | ≡ | second | | | 0.5 | | |
| 4.4 | Switching mode: | | | | | | | |
| 4.4.1 | Switching to secondary input when main input is below predefined level | | | | | | | |
| 4.4.2 | Automatic back to main input when main input is turned on again | | | | | | | |
| 4.3 | When both main and secondary inputs are below the threshold, the EDFA selects the higher input | | | | | | | |
| 5. Built-in Optical Receiver (Optional) | | | | | | | | |
| 5.1 | Built-in optical receiver (for 1550nm RF test port) | @ output of EDFA for tivi signal testing | | | | | | |
| 5.2 | Optical receiver input | -6 to 0 dBm (typical) | | | | | | |
| 5.3 | RF output level | 70 dBμV min., manual adjustable | | | | | | |
| 5.4 | CNR performance | 47 dB min. | | | | | | |

| | | | |
|-----------|--|---|--|
| 6. | Configuration and Management | | |
| 6.1 | Constant Output | @ variable optical input: -6 ~ +8 dBm | |
| 6.2 | Output Adjustable Range | (Pout -3) to Pout dBm | Pout is selected by customer, eg. Pout= 19 dBm |
| 6.3 | Configuration Method | Through button panel and web interface | |
| 6.4 | Management Method | By Web interface with 10/100Mbps Ethernet port and SNMP | |
| | | Settable threshold of switching, | |
| | | MIB file document available for third party integration | |
| 6.5 | Managed Information | Input power, output power, power supply status, bias current of pump laser, laser temperature | |
| | | Alarm threshold setting for : input power, output power, bias current of laser, laser temperature | |
| 7. | Key Parts Information | | |
| 7.1 | Pump Laser Brand & Origin | Lumentum (JDSU or Oclaro) or IPG or similar / USA or Russia | |
| 7.2 | Manufacturer Origin | Taiwan | |
| 7.3 | Laser Cooling Method | Thermoelectric cooler (TEC) | |
| 7.4 | EDFA Lifetime | ≥10 years | |
| 8. | Others | | |
| 8.1 | DC power supply output for external load | 5 VDC, max 2 A, Terminal block connection on back panel | |

Front Panel



Back Panel



Ordering Matrix

ACI ED5229 Series Multi-port EDFA Configuration Sheet

Customer: _____

Created By: _____ Order Date: _____

ORDERING MATRIX

February 14, 2020

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|--------------------|----------|----------|----------|----------|----------|----------|---|---|---|----|----|----|----|----|----|----|----|----|----|
| PART NUMBER | E | D | 5 | 2 | 2 | 9 | | | | | | - | | | | | | | |

7--8 **WDM Option**
 GP: with GPON WDM/without RF monitor
 SR: without WDM/with RF monitor
 GR: with GPON WDM/with RF monitor

16 **MAIN POWER**
 1: 110/220 VAC (Default)
 2: Dual 110/220 VAC
 3: Dual -48 VDC

9 **CONTROL INTERFACE**
 0: None (Default)
 1: SNMP (RJ45)
 2: RS232

17 **POWER CORD SETS**
 0 = None
 1 = North America
 2 = International / Europe
 3 = Japan

10--11 **NUMBER OF OUTPUT PORT**
 08: 8 output ports
 16: 16 output ports
 32: 32 output ports
 64: 64 output ports

4 = Australia
 5 = Argentina
 6 = DC Wire Set (AWG14) with lugs type terminal,
 Black Negative (-), Red Positive (+)
 7 = DC power connector (DB2 type) with wire terminal
 Black Negative (-), Red Positive (+)
 8 = DC power connector (DB2 type) with wire terminal
 Red Negative (-), Black Positive (+)
 9 = DC Wire Set (AWG14) with lugs type terminal,
 Red Negative (-), Black Positive (+)
 X = Custom - (Determined by product management)

13--14 **OUTPUT POWER (per port)**
 13: 13 dBm Adjustable range
 14: 14 dBm Less 3dBm
 15: 15 dBm
 16: 16 dBm
 17: 17 dBm
 18: 18 dBm
 19: 19 dBm
 20: 20 dBm
 21: 21 dBm (32 ports maximum)
 22: 22 dBm (32 ports maximum)

18 **PON OLT INPUT CONNECTOR**
 0= No IP input
 1= LC/UPC
 2= LC/APC
 3= SC/UPC
 4= SC/APC

15 **OPTICAL CONNECTOR(input - output)**
 1: SC/APC - LC/APC
 2: SC/APC - SC/APC

19 **Optical Switch**
 " " (blank) = with optical switch
 0 = without optical switch

NOTES:



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