Data Sheet

Cisco Compact EGC GaN Segmentable Node A90201 with 85-105 MHz Split

The Cisco® Compact EGC GaN Segmentable Node A90201 with 85-105 MHz Split is designed to meet the growing need for network segmentation. The node provides advanced features and benefits, helps operators reduce operating costs by streamlining node segmentation deployments and configuration, and is well suited for migration toward Fiber to the Curb (FTTC) and Fiber to the Building (FTTB) architectures.

The node makes use of the latest developments in GaN (Gallium Nitride) monolithic microwave integrated circuits (MMICs), bringing excellent RF performance at a lower power consumption (compared to GaAs technology). It can be configured electronically for rapid initial setup or for adjustments that are needed as network requirements shift. All settings can be done without service interruption, an especially important capability in networks that deliver real-time interactive services such as Voice over IP (VoIP) and high-speed data transmission. The node's interface allows easy configuration through a handheld programmer terminal or by connection to a standard PC. This interface allows the settings to be stored and reapplied to streamline configuration.

The node provides flexible options because of its large optical input range and high RF output level. Thus, it can work with a large variety of reverse transmitters to support a variety of applications within the network.

The number of plug-ins has been minimized to help operators keep inventory and costs down. The full-range electronic attenuators and equalizers offer improved versatility and make it possible to achieve the same adjustment range as with conventional plug-ins or potentiometer solutions. A plug-in diplexer filter is used to determine the forward/reverse band split.

To meet future demands for more bandwidth, the node offers an electronic 862-MHz to 1-GHz field-programmable bandwidth extension, and reverse path that can be upgraded to 200 MHz.

The Cisco Compact EGC GaN Segmentable Node A90201 with 85-105 MHz Split can be configured with a Cisco status monitoring transponder (Status Monitoring and Control [SMC], Hybrid Management System [HMS], or DOCSIS) to enable remote monitoring of critical node parameters and remote control of the built-in 3-state reverse switch.

Figure 1. Cisco Compact EGC GaN Segmentable Node A90201 with 85-105 MHz Split

Features

- Improved distortion at a lower power consumption with GaN-based output stages
- RF output level adjustable over a wide range: 94 to 119 dBµV
- Wide optical input: -7 to +2 dBm
- Configurable for 1 GHz or 862 MHz operation
- Configured by Electronic Gain Control (EGC) technology
- Full segmentable in forward path and reverse path
- Automatic redundancy switching for forward path
- Easy setup and control

Product Diagrams

Figures 2, 3, and 4 provide an overview and block diagrams for the Cisco Compact EGC GaN Segmentable Node A90201 with 85-105 MHz Split.

Figure 2. Overview

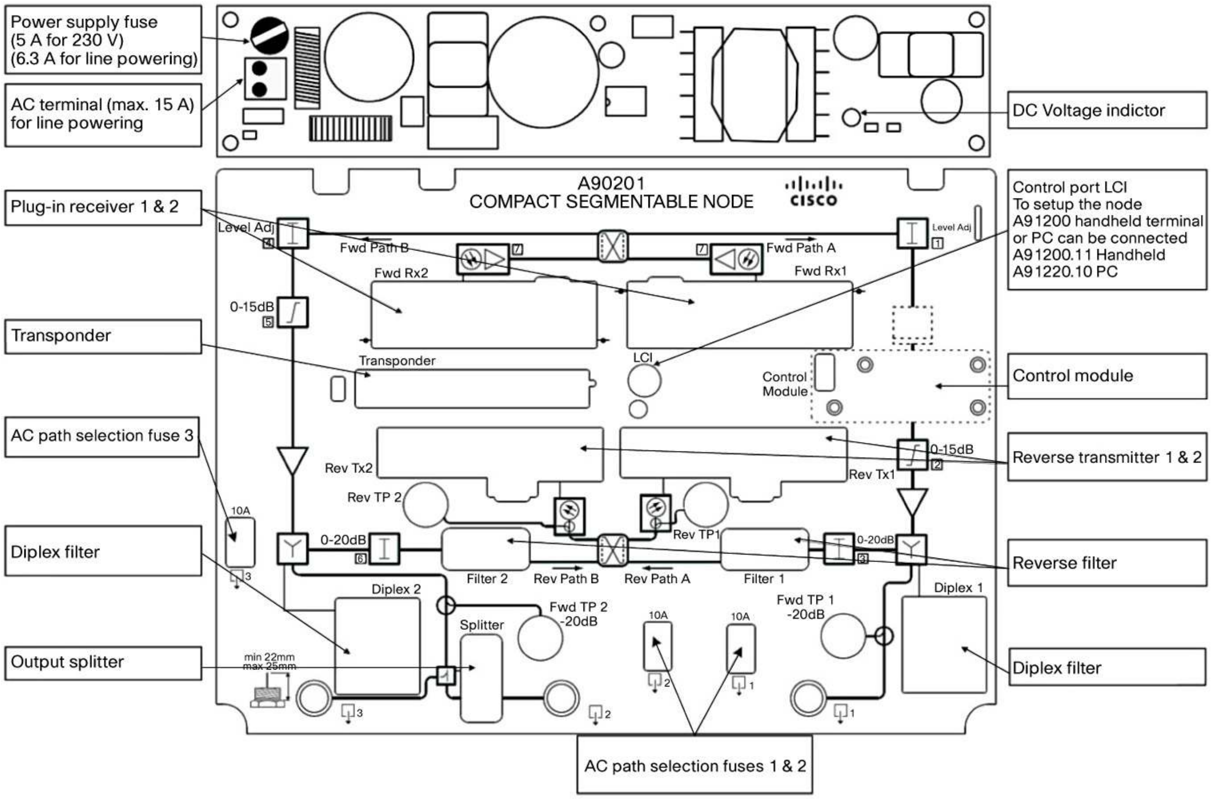


Figure 3. Block Diagram (with RTX)

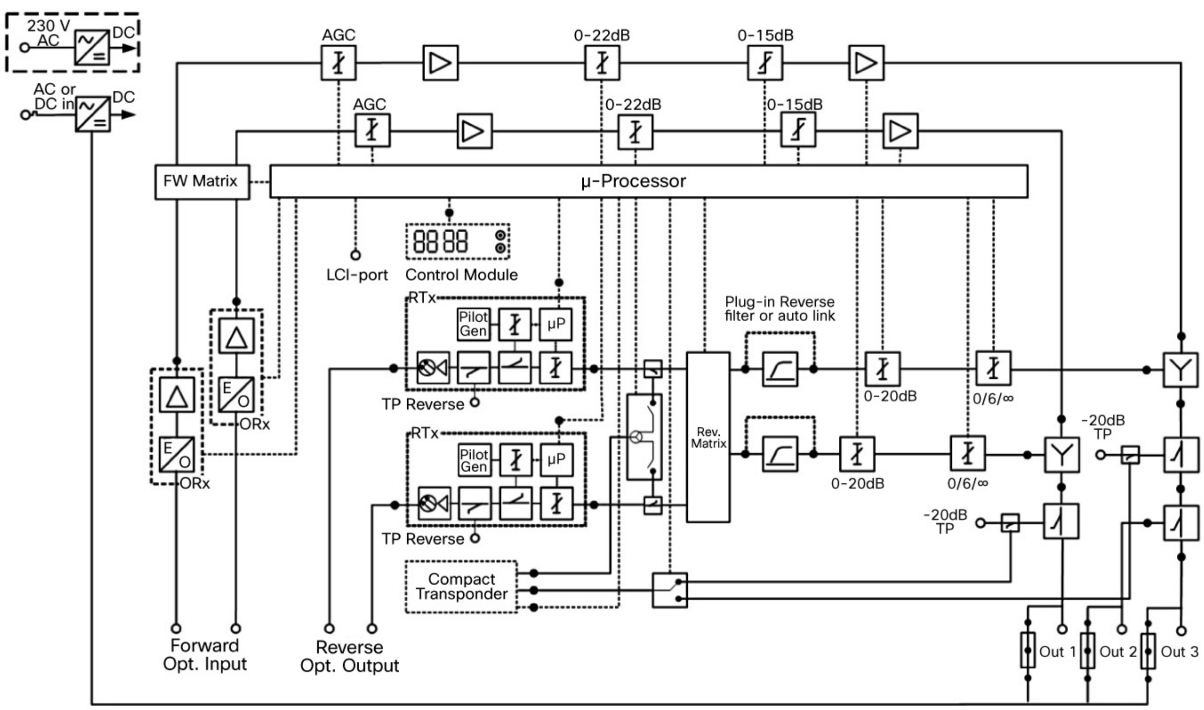
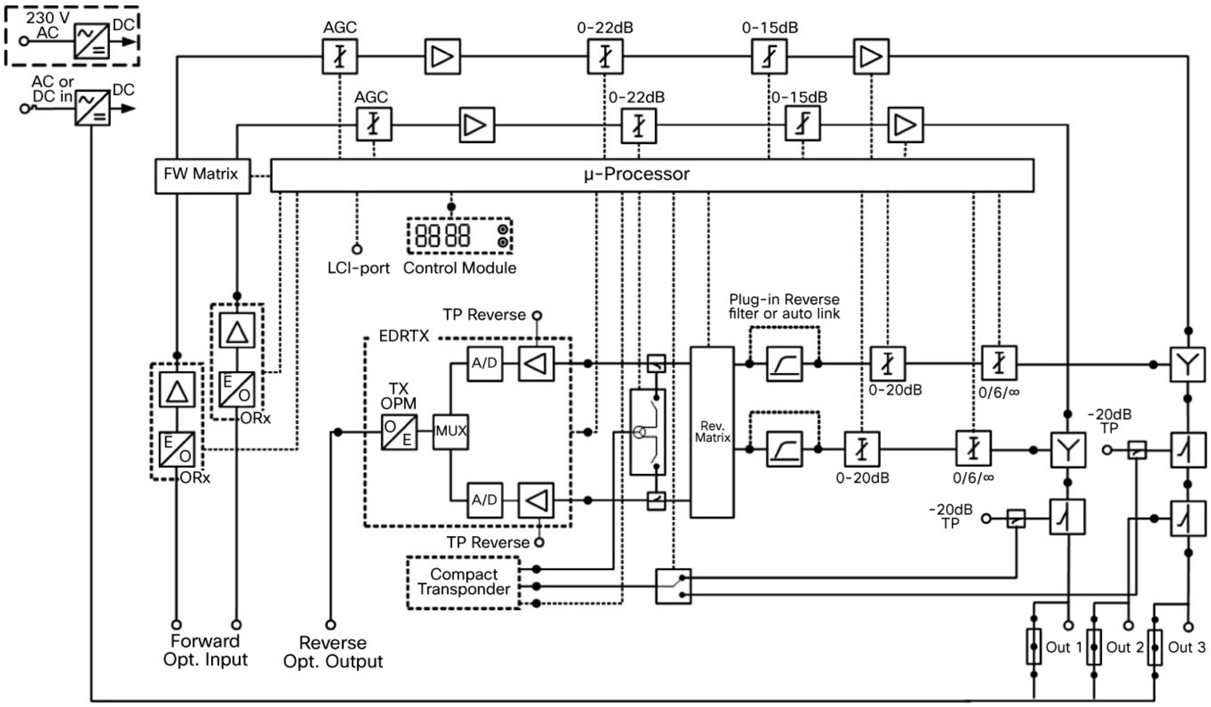


Figure 4. Block Diagram (with EDR TX)



Product Specifications

This section provides product specifications. Table 1 lists optical specifications, Tables 2 and 3 give forward and reverse RF specifications, and Table 4 lists station powering specifications. Table 5 provides environmental, mechanical, compliance, and safety specifications.

Table 1. Optical Specifications

Item	Value
Optical	
Optical wavelength	1200-1600 nm
Optical input level	-7 to +2 dBm
AGC accuracy	≤ ±0.5 dB
Equivalent Input Noise (EIN) current	7 pA/$\sqrt{\text{Hz}}$ at 86-862 MHz 8 pA/$\sqrt{\text{Hz}}$ at 86-1006 MHz

Table 2. Forward RF Specifications

Item	Value
Forward RF[1]	
Frequency range	Selectable 86-862 MHz or 86-1006 MHz
Output level range	94-119 dBμV at 3.25% OMI per ch
Responsivity	67.25 ±0.5 dB A/W at full gain, 1310 nm
Flatness	≤ ±0.75 dB at 86-862 MHz ≤ ±1.0 dB at 86-1006 MHz
Interstage tilt	0-15 dB, 0.5 dB step

Item	Value	
Path to path isolation	≥ +60 dB at 86-862 MHz ≥ +55 dB at 862-1006 MHz	
Output return loss	≥ 18 dB at 5-65 MHz, reduce 1.5 dB per octave	
Output test point return loss	≥ 20 dB at 5-65 MHz, reduce 1.5 dB per octave	
Output test point	-20 ±0.5 dB at 86-862 MHz, -20 ±0.75 dB at 86-1006 MHz	
Distortion[2] • CTB • CSO	 ≤ -60 dB ≤ -60 dB	
Distortion[3] **(with power saving on)** **CTB** **CSO**	 ≤ -60 dB ≤ -60 dB	
Hum modulation[4]	≤ -65 dB at 86-1006 MHz	
Thermal stability	≤ ±1.0 dB	
Redundant receiver switchover time	≤ 25 ms	
Number of optical inputs	2	
Number of RF output ports	2 active outputs + 1 additional output with plug-in output splitter	
Group delay	Δf = 1 MHz ≤ 3 nsec at 86-94 MHz ≤ 2 nsec at 95-112 MHz	Δf = 4.43 MHz ≤ 2 nsec at 112.25-116.68 MHz ≤ 1 nsec > 119.25 MHz
Transponder pick-off point[5]	-33 ±1.5 dB	

Notes:

1. Unless otherwise specified, all forward band specifications are tested with a 65/86 diplexer module installed.
2. CENELEC 42 ch, 3.25% OMI, 9 dB tilt, and output level 116 dBμV.
3. CENELEC 42 ch, 3.25% OMI, 9 dB tilt, and output level 113 dBμV.
4. At 8 Ampere AC current.
5. Relative to the level of the node output port.

Table 3. Reverse RF Specifications

Item	Value
Reverse RF[1]	
Frequency range	5-200 MHz
Tilt	Slope < 1.0 dB
Flatness	≤ ±0.5 dB
Path to path isolation	70 dB
Input return loss	≥ 18 dB at 5-65 MHz, reduce 1.5 dB per octave
RTx test point return loss	≥ 18 dB at 5-65 MHz, reduce 1.5 dB per octave
RTx test point	Refer to the RTx data sheet, part number 7018738, when RTx is installed Refer to the EDR data sheet, part number 95-7024051-01, when EDR is installed
Hum modulation[4]	≤ -65 dB at 5-65 MHz
Reverse input attenuator	0-20 dB, 0.5 dB step
Reverse tri-state switch	On, -6 dB, Off
Thermal stability	≤ ±0.7 dB

Item	Value
Redundant transmitter switchover time	≤ 25 ms
Group delay	Δf = 1 MHz ≤ 12 nsec at 5-6 MHz ≤ 7 nsec at 6-7 MHz ≤ 5 nsec at 7-8 MHz ≤ 3 nsec at 8-64 MHz ≤ 4 nsec at 64-65 MHz
Insertion loss[2]	≤ 5.0 dB
Insertion loss of transponder injection point[3]	30 ±1.5 dB
Notes: 1. Unless otherwise specified, all reverse band specifications are tested with a 65/86 diplexer module installed. 2. From RF port to the reverse transmitter input, input attenuator at 0 dB and tri-state switch at ON setting. 3. From the transponder's RF output to the reverse transmitter's input. 4. At 8 Ampere AC current.	

Table 4. Station Powering Specifications

Item	Value								
Power Supply									
65V remote powered	24-65 VAC								
230V mains powered	100-240 VAC								
Powering									
Maximum AC current	15A at power supply input								
Maximum AC current per port	8A								
Power Consumption									
Power consumption[1]	1 Tx, 1 Rx, 1 transponder ≤ 49.5W					2 Tx, 2 Rx, 1 transponder ≤ 54.0W			
Power reduction: • Power saving on • Dynamic power saving2 • Redundancy mode • Single output mode	 2.2W 6.8W per path 2.2W 21.3W								
Control module power consumption	0.5W								
Transponder	≤ 2.0W (HMS/SMC transponder) ≤ 2.5W (DOCSIS transponder)								
AC Current and AC Voltage									
AC input voltage	24V	30V	35V	40V	45V	50V	55V	60V	65V
AC current draw (A) **(1 Tx, 1 Rx, 1 transponder)**	2.31	1.88	1.60	1.41	1.27	1.14	1.05	0.98	0.95
AC current draw (A) **(2 TX, 2 Rx, 1 transponder)**	3.20	2.40	2.03	1.82	1.61	1.43	1.32	1.24	1.15

Notes:

1. Segmented mode; power saving mode off.

2. The availability of the dynamic power saving depends on the combination of the optical input level and the RF output level, as shown in the following graph.

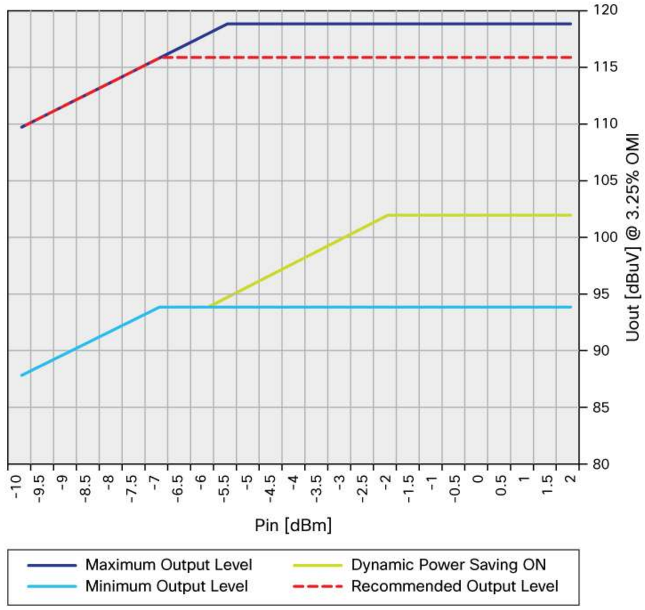


Table 5. Environmental, Mechanical, Compliance, and Safety Specifications

Item	Value
Environmental	
Operating temperature	-40 to +55 ℃ (-40 to +131 ℉)
Storage temperature	-40 to +85 ℃ (-40 to +185 ℉)
Water and dust ingress rating	IP67
Mechanical	
Connectors: • Optical • RF	 SC/APC PG11
Housing dimensions **(H x W x D)**	293 mm x 292 mm x 125 mm (11.5 in. x 11.5 in. x 4.9 in.)
Weight	8 kg (17.6 lb)
Compliance and Safety	
Electrical safety	EN 50083-1, EN 60065, IEC 60065
Laser safety	IEC/EN 60825-1
EMC dmissions	EN 50083-2
RoHS	Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, O.J. (L 19)

Ordering Information

This section contains ordering information for the node (Table 6) and required and optional accessories. Consult your account representative to determine the best configuration for your particular application.

Table 6. Cisco Compact EGC GaN Segmentable Node A90201 with 85-105 MHz Split Part Numbers

Description	Part Number for Ordering
Compact EGC GaN Segmentable Node, 1 Rx, 1 GHz, AGC, 230 VAC, EU Power Plug, 85/105 MHz	A90201.10285
Compact EGC GaN Segmentable Node, 1 Rx, 1 GHz, AGC, 230 VAC, US Power Plug, 85/105 MHz	A90201.10185
Compact EGC GaN Segmentable Node, 1 Rx, 1 GHz, AGC, 65 VAC, Lines Power, 85/105 MHz	A90201.10385

The **required accessories** listed in Table 7 must be ordered separately.

Table 7. Required Accessories and Part Numbers

Description	Part Number for Ordering
Output Splitter - 1 required, choose from the following:	
• 0 dB jumper	A74069.10
• 3.5/3.5 dB splitter	A77041.10
• 2/6 dB directional coupler	A77042.10
• 1/10.5 dB directional coupler	A77043.10
• 0.6/14 dB directional coupler	A77044.10
Reverse Transmitter (1 or 2) or EDR Module (only 1), choose from the following:	
• Reverse Transmitter for Compact Nodes, FP 0 dBm	A90080.10
• Reverse Transmitter for Compact Nodes, CWDM 3 dBm (1270 nm to 1610 nm)	A90083.10yyyy
• Reverse Transmitter for Compact Nodes, CWDM 6 dBm (1270 nm to 1610 nm)	A90086.10yyyy
• EDR C2185 Tx module with CWDM Tx OPM (1270 nm up to 1610 nm)	4042891.yyyy
• EDR C2185 Tx module with DWDM Tx (ITU ch. 17 up to ch. 61)	4042892.yy
• EDR C2185 Tx module without Optical Pluggable Module (OPM) (require 1 OPM)	4042889
◦ 3 dBm CWDM Tx OPM (1270 nm to 1610 nm)	4042872.yyyy
◦ 3 dBm DWDM Tx OPM (ITU ch. 17 to ITU ch. 61)	4042872.yy
Optical Adapter Internal optical connector is SC/APC, choose from the following:	
• Adapter SC/APC to E2108	A90540.1048
• Adapter SC/APC to FC/APC	A90540.1068
• Adapter SC/APC to SC/APC	A90540.1088

The **optional accessories** listed in Table 8 must be ordered separately.

Table 8. Optional Accessories and Part Numbers

Description	Part Number on Module	Part Number for Ordering
Transponder, choose from the following:		
• Plug-in Euro-DOCSIS/DOCSIS Transponder	4038489	4038498
• Plug-in Compact SMC Transponder		A91051.12
• Plug-in Compact HMS Transponder		A91065.10
• Plug-in Compact HMS Transponder with EDR		A91065.11
Handheld Terminal (required for configuration of the unit)		A91200.11
PC Configuration Kit (software and USB-cable)		A91220.10

Description	Part Number on Module	Part Number for Ordering
Plug-in Diplex Filter - 2 required, choose the following (included in the part numbers listed in Table 6):		
• 42/54 MHz split (left)		4008154
• 42/54 MHz split (right)		4008155
• 65/86 MHz split (left)		589690
• 65/86 MHz split (right)		589691
• 85/105 MHz split (left)	4028316	4044038
• 85/105 MHz split (right)	4028317	40440397
Single Reverse Filter - 1 required for each RTx, 2 required for EDR, choose from the following:		
• Single low pass filter 65 MHz		A75127.1065
• Single band pass filter 15/65 MHz		A75127.101565
• Single high pass filter 11/15 MHz		A75127.101115
• Single high pass filter 85 MHz		A75127.1085
• Single high pass filter 15/85 MHz		A75127.101585
Optical Receiver	4026169	4033722
Control Module	4026179	4034246
Kit, AC Path Selection Fuse 8 A Time Delay, Black Handle (1 Kit=10 pcs of 715123)		4043258
Kit, AC Path Selection Fuse 10 A Mini-Blade, Black Handle (1 Kit=4 pcs of 4036557)		4036876
Sleeve PG11 - 5/8 in. with O-ring (included in the part numbers listed in Table 6)		744576

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