GainStar 1 GHz Amplifier with 42/54 MHz Split

The 1 GHz GainStar Amplifier (GSA) is specifically designed for use in HFC networks. The GSA provides excellent forward and reverse path performance combined with high-reliability and a user-friendly layout. All new GainStar products share common plug-in accessories and perform to 1 GHz in the forward path. The GSA provides two high-level RF output ports or four lower-level RF output ports in a strand or pedestal mount configuration.

The GSA utilizes GaAsFET technology optimized for superior distortion performance.

The GSA can be field-upgradable from a forward only configuration to a forward and reverse path configuration. The GSA can also be field upgradable to a node. Standard plug-in attenuators can be used to adjust the gain and equalization.

Features

- Can be set up for 862 MHz or 1 GHz performance
- Modular design for ease of service and maintenance
- Dual high-level RF output ports
- Each high-level RF output port is configurable with an onboard signal director to create two lower-level output ports
- Standard plug-in attenuators are used to adjust the gain and equalization
- Field-upgradable from an amplifier to a node
- Surge-resistant circuitry ensures resistance to high voltage transients (6 kV)
- Thermal RF control minimizes gain movement over temperature
- 10 A current capacity (steady state) and 15 A surge survivability
- Supports ROSA® network management system with an optional HMS transponder
- Outdoor housing is IP68 dustproof and watertight
- Strand and pedestal mount housing configurations are available
- All ports are PG11 or 5/8″ with included adapter
- RoHS 6 of 6

Figure 1. GainStar 1 GHz Amplifier Strand

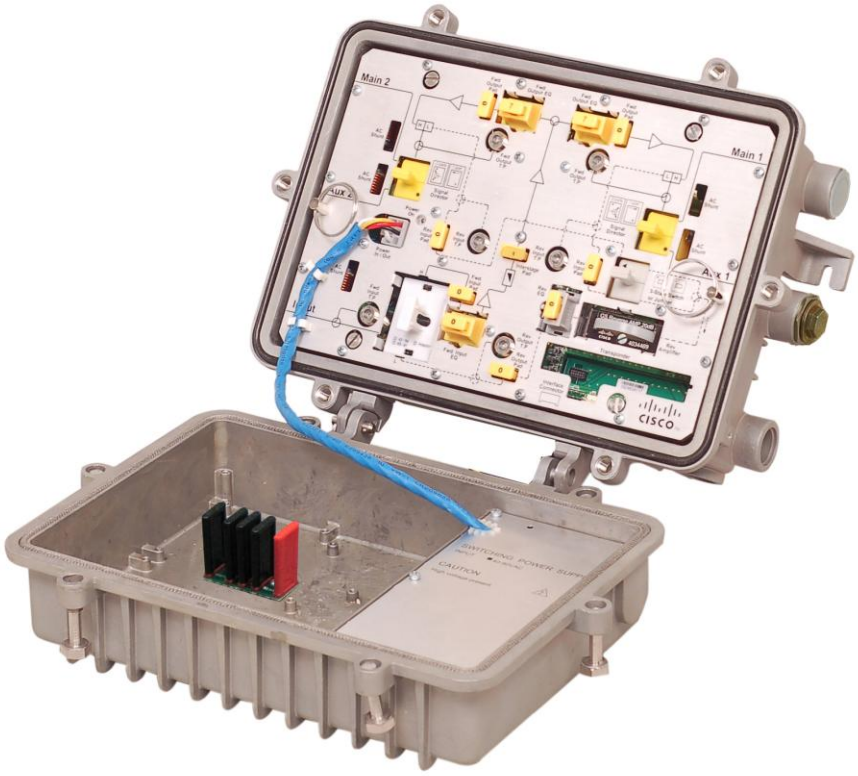


Figure 2. GainStar 1 GHz Amplifier Pedestal

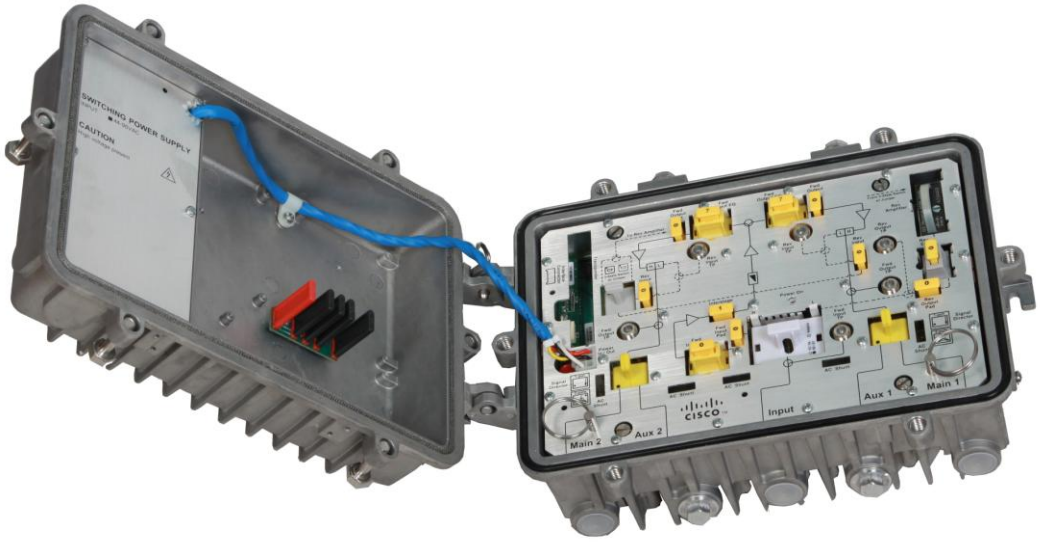
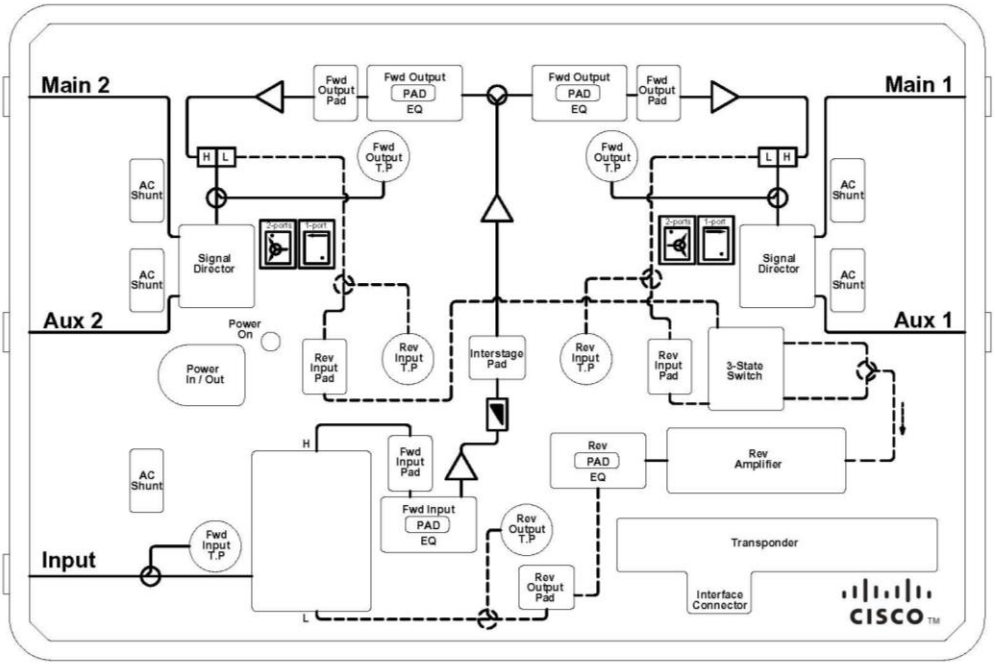
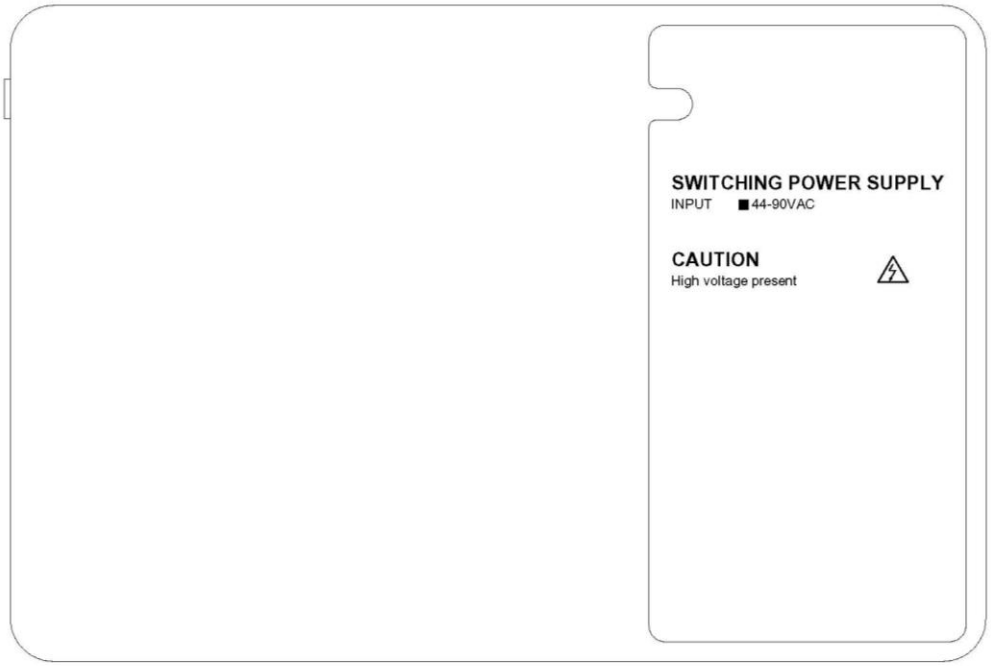


Figure 3. Block Diagram





Specifications

Table 1. Forward RF Specifications

Item	Units	Value	
Forward RF			
Frequency Range	MHz	54–862	54–1000
Gain[2,3]	dB	42, 2 ports 38.5, 4 ports	
Internal Tilt[1]	dB	12 ±1 @ 862 MHz	14 ±1 @ 1 GHz
Frequency Response	dB	±0.75	
Output Return Loss	dB	≥ 16	
RF Output Test Point	dB	–20 ±1, 2 ports –16.5 ±1, 4 ports	
Hum	dB	65 @10 A	
Noise Figure[2,3]	dB	< 9	
Distortion @ 79 NTSC + Digitial[3,4,5] CTB CSO XMOD	dB	 72 65 66	
Distortion @ 64 PAL B/G + Digital[3,4,5] CTB CSO	dB	 75 72	
Distortion @ 42 Cenelec[3,4] CTB ≥ 60 dB CSO ≥ 60 dB	dBµV	 114 111	

Notes: Unless otherwise noted, specifications reflect typical performance and are referenced to 20 ºC.

1. Forward internal tilt specified is primarily due to an on-board equalizer 6 dB (862 MHz band) or 7 dB (1 GHz band) and a factory configured 6 dB (862 MHz band) or 7 dB (1 GHz band) linear output equalizer.
2. Forward Gain and Noise Figure measured with 0 dB input EQ and 0 dB input pad.
3. With 1 dB interstage Pad installed for 1 GHz, 0 dB interstage Pad installed for 862 MHz.
4. Tilt 12 dB @ 862 MHz and 14 dB @ 1 GHz.
5. Distortion performance reference output level is 50 dBmV (2 ports). Digital refers to 550 MHz to 862 MHz or 1 GHz loading with QAM carriers at -6 dB relative to analog CW carrier levels.

Table 2. Reverse RF Specifications

Item	Units	Value
Reverse RF		
Frequency Range	MHz	5–42
Frequency Response	dB	±0.75
Gain[1,3,4]	dB	20, 2 ports 16.5, 4 ports
Output Level IMD3 ≥ 60 dB IMD2 ≥ 60 dB	dBµV	 104 105
Hum	dB	65 @ 10 A
Input Return Loss	dB	≥ 16
Test Point	dB	–20, 2 ports –23.5, 4 ports
Noise Figure[1,3]	dB	< 9
Optional Reverse 3-state Switch[2]	dB	0, –6, Off

Notes: Unless otherwise noted, specifications reflect typical performance and are referenced to 20ºC.

1. Reverse Gain and Noise Figure measured with 0 dB EQ, 0 dB input pad, and 0 dB output pad.
2. Controlled by HMS Transponder.
3. If 3-state switch is installed, reduce Gain by 2 dB, and increase Noise Figure by 2 dB.

Table 3. Station Delay Characteristics

Station Delay Characteristics			
Forward (Chrominance to Luminance)		**Reverse (Group Delay in 1.5 MHz BW)**	
Frequency (MHz)	Delay (ns)	Frequency (MHz)	Delay (ns)
55.25–58.83	37	5.0–6.5	60
61.25–64.83	14	6.5–8.0	24
67.25–70.83	9	8.0–9.5	12
77.25–80.83	6	37.5–39.0	23
		39.0–40.5	30
		40.5–42.0	49

Table 4. Electrical Specifications

Item	Units	Value
Electrical		
Max. AC Through Current (continuous)	Amps	10
Max. AC Through Current (surge)	Amps	15

Table 5. Station Powering Data

Station Powering Data												
I_{DC} *		AC Voltage										
		90	85	80	75	70	65	60	55	50	45	40
1.77	AC Current (A)	0.56	0.59	0.62	0.65	0.68	0.72	0.77	0.82	0.89	0.97	1.10
	Power (W)	30.7	30.6	30.5	30.5	30.5	30.5	30.5	30.7	30.7	30.7	30.9

*Data is based on stations configured for 2-way operation. AC currents specified are based on measurements made with typical CATV type ferroresonant AC power supply (quasi-square wave),

Table 6. Mechanical, Environmental and Other Specifications

Item	Units	Value	
Mechanical			
Water/Dust Ingress Rating	–	IP68	
Dimensions (H x W x D)	mm in.	Strand 132 x 292 x 225 5.2 x 11.5 x 8.9	Pedestal 132 x 306 x 212 5.2 x 12.1 x 8.4
Weight	kg lb	6 13.2	
Environmental			
Operating Temperature	°C °F	–40 to +60 –40 to +140	
Storage Temperature	°C °F	–40 to +85 –40 to +185	
Others			
Element Management	–	ROSA	
Compliance	–	EU RoHS 6/6, IEC/EN 60728-11, IEC/EN 60065, EN 50083-2, FCC Part 76, Subpark K, CB Scheme Certification w/All National Deviation & CENELEC Common Mods	

Ordering Information

The GainStar Amplifier is available in a wide variety of configurations. This section contains ordering information for required and optional accessories. Consult your Customer Service Representative or Applications Engineer to determine the best configuration for your particular application.

Table 7. Required Accessories

Required Accessories for RF Module	Part Number
Plug-in Pads (attenuators)—Available in 1 dB steps from 0 to 20 dB • 1 required for forward input • 2 required for reverse inputs (Not required for forward only configuration) • 1 required for reverse output (Not required for forward only configuration)	4036021 (0 dB) sequentially through 4036041 (20 dB)
Plug-in Forward Equalizer—Available from 0 to 14 dB • 1 required for forward input; 1 Pad also required and plugged into EQ 862 MHz platform: GainStar Forward Cable Equalizer 0 to 4 dB GainStar Forward Cable Equalizer 5 to 9 dB GainStar Forward Cable Equalizer 10 to 14 dB 1000 MHz platform: GainStar Forward Cable Equalizer 0 to 4 dB GainStar Forward Cable Equalizer 5 to 9 dB GainStar Forward Cable Equalizer 10 to 14 dB	 4034450 4034451 4034452 4034453 4034454 4034455

Table 8. Optional Accessories

Optional Accessories	Part Number
Forward Inverse Equalizer	
Plug-in Forward Inverse Equalizer—Available from 0 to 14 dB • 1 required for forward input; 1 Pad also required and plugged into EQ GainStar Forward Inverse Equalizer, 0 to 4 dB 54MHz Platform GainStar Forward Inverse Equalizer, 5 to 9 dB 54MHz Platform GainStar Forward Inverse Equalizer, 10 to 14 dB 54MHz Platform	 4035729 4035730 4035731
Reverse Equalizer	
Plug-in Reverse Equalizer—Available from 0 to 10 dB (Not required for forward only configuration) 0 to 5 dB EQ (4034465) and 0 dB Pad (4036021) are provided—Other values must be ordered. • 1 required for reverse input; 1 Pad also required and plugged into EQ 42 MHz platform: GainStar Reverse Cable Equalizer 0 to 5 dB GainStar Reverse Cable Equalizer 6 to 10 dB	 4034465 4034466
GainStar Amplifier Upgrade to Node Kit	
GainStar Upgrade Kit, FP Transmitter, SC/APC, 2 dBm, Strand Housing	4034479
GainStar Upgrade Kit, FP Transmitter, FC/APC, 2 dBm, Strand Housing	4034480
GainStar Upgrade Kit, DFB Transmitter, SC/APC, 3 dBm, Strand Housing	4034481
GainStar Upgrade Kit, DFB Transmitter, FC/APC, 3 dBm, Strand Housing	4034482
GainStar Upgrade Kit, FP Transmitter, SC/APC, 2 dBm, Pedestal Housing	4034483
GainStar Upgrade Kit, FP Transmitter, FC/APC, 2 dBm, Pedestal Housing	4034484
GainStar Upgrade Kit, DFB Transmitter, SC/APC, 3 dBm, Pedestal Housing	4034485
GainStar Upgrade Kit, DFB Transmitter, FC/APC, 3 dBm, Pedestal Housing	4034486
Reverse Amplifier Module	
GainStar Reverse Amplifier Module, 20 dB Gain	4034469
Related Equipment	
GainStar 3-state Switch	4034472
GainStar HMS Transponder	4034731
RF Test Probe	1010409
Plug-in 75 ohm Pad	4036140

When upgrading from forward only to a forward and reverse, the Reverse Amplifier Module, Reverse Equalizer with PAD, Reverse input PAD, and Reverse output PAD accessories are required.

Cisco Systems, Inc.
1-800-722-2009 or 678-277-1000
www.cisco.com

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