Cisco 1 GHz GainStar Line Extender with 85/105 MHz Split

The Cisco® 1 GHz GainStar Line Extender (GSLE) is specifically designed for use in hybrid fiber-coaxial (HFC) networks. It provides excellent forward and reverse path performance combined with high reliability and a user-friendly layout. All new Cisco GainStar products share common plug-in accessories and perform to 1 GHz in the forward path. The Cisco 1 GHz GSLE provides a single high-level output port or two lower-level RF output ports in a strand-mount configuration (Figure 1 and Figure 2).

The Cisco 1 GHz GSLE uses GaAsFET technology optimized for superior distortion performance.

Features

- 1-GHz performance
- Selectable single or dual outputs with an onboard signal director
- Standard plug-in attenuators that are used to adjust gain and equalization settings
- Surge-resistant circuitry that helps ensure resistance to high voltage transients (6 kV)
- Thermal RF control that reduces gain movement over temperature
- 10A current capacity (steady state) and 15A surge survivability
- Outdoor housing that is IP68 dustproof and watertight
- Strand-mount housing configurations available
- All ports are PG11 or 5/8□ with included adapter
- RoHS 6 of 6

Figure 1.   Cisco 1 GHz GainStar Line Extender
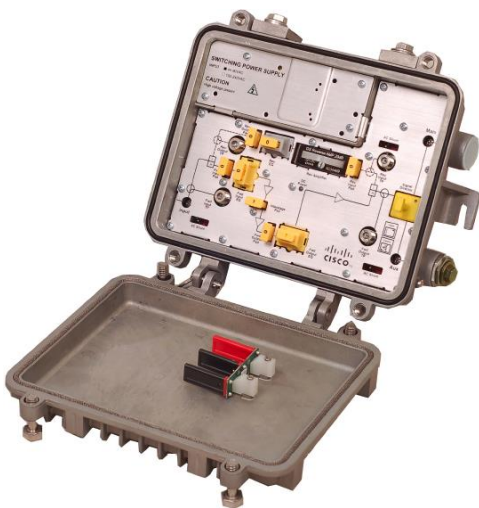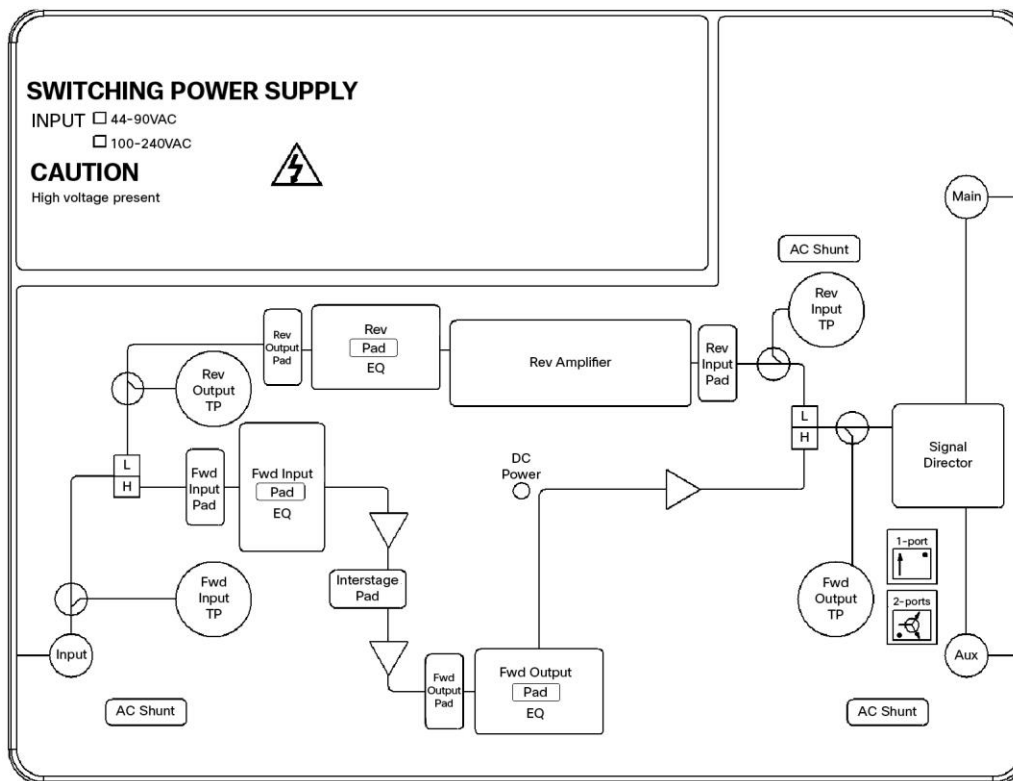
Figure 2.   Block Diagram

Specifications

Tables 1 through 7 provide product specifications for the Cisco 1 GHz GainStar Line Extender with 85/105 MHz Split.

Table 1.   Forward RF Section Specifications

Feature	Description
Forward RF	
Frequency range	105 to 1000 MHz
Internal tilt[1]	14 ±1 dB
Frequency response	±0.75 dB
Gain[2, 3]	39.5 dB, 1 port 36 dB, 2 ports
Return loss	≥ 16 dB
RF output test point	–20 ±1 dB, 1 port –16.5 ±1 dB, 2 ports
Hum	65 dB @10A
Noise figure[2, 3]	< 8 dB
Distortion @ 73 NTSC + digital[3, 4, 5]	
CTB	68 dB
CSO	63 dB
XMOD	60 dB

Feature	Description
Distortion @ 58 PAL B/G + digital[3, 4, 5]	
CTB	74 dB
CSO	67 dB
Distortion @ 42 Cenelec[3, 4]	
CTB ≥ 60 dB	114 dBμV
CSO ≥ 60 dB	112 dBμV

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

1. Forward internal tilt specified is primarily due to an on-board equalizer 7 dB and a factory configured 7 dB 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.
4. Tilt 14 dB.
5. Distortion performance reference output level is 50 dBmV (1 port). Digital refers to 550 MHz to 1 GHz loading with QAM carriers at -6 dB relative to analog CW carrier levels.

Table 2.   Reverse RF Section Specifications

Feature	Description
Reverse RF	
Frequency range	5 to 85 MHz
Frequency response	±0.75 dB
Gain[1] **With 20 dB Reverse Amp** **With 24 dB Reverse Amp**	20 dB, 1 port 16.5 dB, 2 ports 24 dB, 1 port 20.5 dB, 2 ports
Output level **IMD3 ≥ 60 dB** **IMD2 ≥ 60 dB**	99 dBμV 98 dBμV
Hum	65 dB @ 10A
Return loss	≥ 16 dB
Test point	–20 dB, 1 port –23.5 dB, 2 ports
Noise figure[1]	< 8 dB

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.

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)**
109.25 to 112.83	14	5.0 to 6.5	60
115.25 to 118.83	8	6.5 to 8.0	26
121.25 to 124.83	6	8.0 to 9.5	14
		80.5 to 82.0	12
		82.0 to 83.5	15
		83.5 to 85.0	19

Table 4.   Electrical Specifications

Feature	Description
Electrical	
Maximum AC through current (continuous)	10A
Maximum AC through current (surge)	15A

Table 5.   Station Powering Data (40 to 90V)

Station Powering Data													
I DC [*]		AC Voltage											
		90	85	80	75	70	65	60	55	50	45	40
0.8	AC current (A)	0.29	0.30	0.32	0.33	0.35	0.37	0.39	0.42	0.45	0.49	0.55
	Power (W)	15.1	15.1	15.1	15.0	15.0	15.0	15.0	15.0	15.1	15.2	15.3

[*]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.   Station Powering Data (100 to 240V)

Station Powering Data																
I DC [*]		AC Voltage														
		240	230	220	210	200	190	180	170	160	150	140	130	120	110	100
0.8	AC Current (A)	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.19	0.20	0.22	0.23
	Power (W)	14.7	14.6	14.5	14.4	14.3	14.2	14.2	14.2	14.2	14.3	14.3	14.3	14.3	14.2	14.2

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

Table 7.   Mechanical and Environmental Specifications

Feature	Description
Mechanical	
Water and dust ingress rating	IP68
Dimensions (H x W x D)	90 x 234 x 212 mm 3.5 x 9.2 x 8.4 in.
Weight	3.0 kg 6.6 lb
Environmental	
Operating temperature	−40 to 60°C −40 to 140°F
Storage temperature	−40 to 85°C −40 to 185°F
Compliance	EU RoHS 6/6, IEC/EN 60728-11, IEC/EN 60065, EN 50083-2, FCC Part 76, Subpark K, CB Scheme Certification with all national deviation and CENELEC Common Mods

Ordering Information

To place an order, visit the Cisco Ordering Home Page and refer to the ordering information provided in Tables 8 through 10.

Table 8.   Ordering Information

Product Description	Part Number
Cisco 1 GHz GainStar Line Extender, 85/105MHz split, Strand, Rev/20, 60V	S711G83001010000
Cisco 1 GHz GainStar Line Extender, 85/105MHz split, Strand, Rev/20, 220V, India Cord	S711G83002510000
Cisco 1 GHz Gainstar Line Extender,85/105 Hz split, Pedestal,100-240 VAC,24 dB Rev Amp,,Argentina Cord	S711G85002420000
Cisco 1 GHz Gainstar Line Extender,85/105 Hz split, Pedestal, 60 VAC,24 dB Rev Amp	S711G85001020000

Table 9.   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 • 1 required for reverse input (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 Cisco GainStar Forward Cable Equalizer 0 to 4 dB Cisco GainStar Forward Cable Equalizer 5 to 9 dB Cisco GainStar Forward Cable Equalizer 10 to 14 dB	4034453 4034454 4034455

Table 10.   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
  ◦ Cisco GainStar Forward Inverse Equalizer, 0 to 4 dB 105 MHz Platform
  ◦ Cisco GainStar Forward Inverse Equalizer, 5 to 9 dB 105 MHz Platform
  ◦ Cisco GainStar Forward Inverse Equalizer, 10 to 14 dB 105 MHz Platform
	
	GS-FIEQ-105-00-04
	GS-FIEQ-105-05-09
	GS-FIEQ-105-10-14

Reverse Amplifier Module	
Cisco GainStar Reverse Amplifier Module, 20dB Gain (5-85 MHz)	GS-REV-AMP-20-85
Reverse Equalizer	

Plug-in Reverse Equalizer: Available from 0 to 10 dB (not required for forward only configuration)
0 to 5 dB EQ (GS-REQ-85-00-05) 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 85 MHz platform:
  ◦ Cisco GainStar Reverse Cable Equalizer 0 to 5 dB
  ◦ Cisco GainStar Reverse Cable Equalizer 6 to 10 dB
	
	GS-REQ-85-00-05
	GS-REQ-85-06-10

Directional Coupler	
Cisco GainStar 1GHz 8dB Directional Coupler	GS-1G-DC-08
Cisco GainStar 1GHz 12dB Directional Coupler	GS-1G-DC-12
Related Equipment	
Cisco RF Test Probe	1010409
Cisco Plug-in 75 ohm Pad	4036140

For More Information

Cisco 1 GHz GainStar Line Extender products offer the industry's most complete range of high-performance components. For additional information, please go to https://www.cisco.com/en/US/products/ps9049/index.html

Printed in USA

C78-731474-01   08/17