

Line Extender III Type 3 750 MHz with 55/70 MHz Split



23025

Note: The output tilt referenced in this document is defined as a LINEAR output tilt (as opposed to a CABLE output tilt). The distortion and noise figure specifications are applicable across the full operational temperature range (as opposed to being referenced to 68°F).

When calculating end of line performance, the specifications used for all of the amplifiers in a given cascade must be of similar format, due to the fact that all amplifiers in a cascade must operate with a similar output tilt (either all LINEAR output tilt or all CABLE output tilt).

DESCRIPTION

The Line Extender III (LEIII) family of RF amplifiers provide optimum performance and reliability for broadband network applications. All LEIII amplifier modules offer 15 amp current carrying capacity, and are preconfigured with diplexers and reverse amplifier for optimum reverse performance.

The Type 3 versions of LEIII amplifier module are additionally preconfigured with interstage equalizer, interstage pad, and either AGC for a 3A or Thermal for a 3T, in order to achieve optimum station performance and simplify set up.

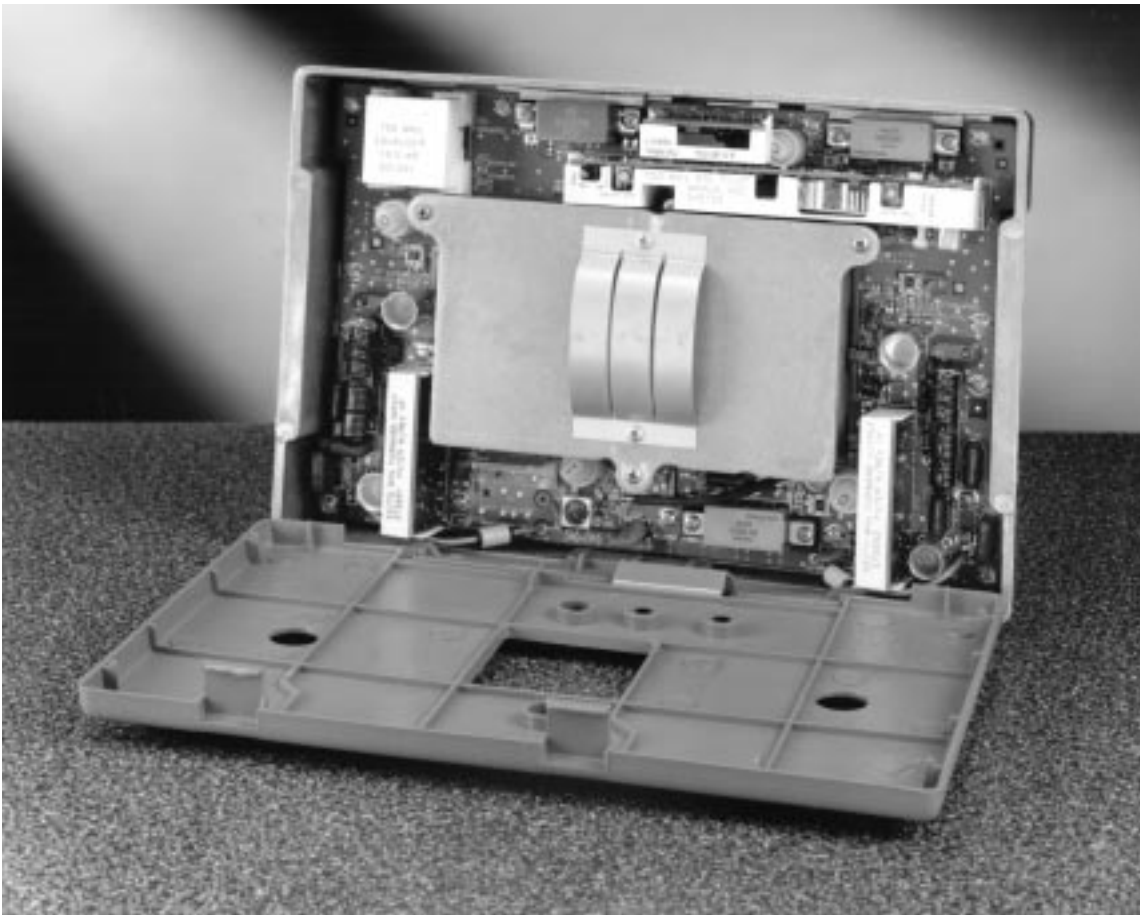
Additionally, maximum flexibility in reverse signal path alignment is

achieved via the reverse test point and plug-in pad for the reverse input.

The Type 3 amplifier module provides one (bridger level) output.

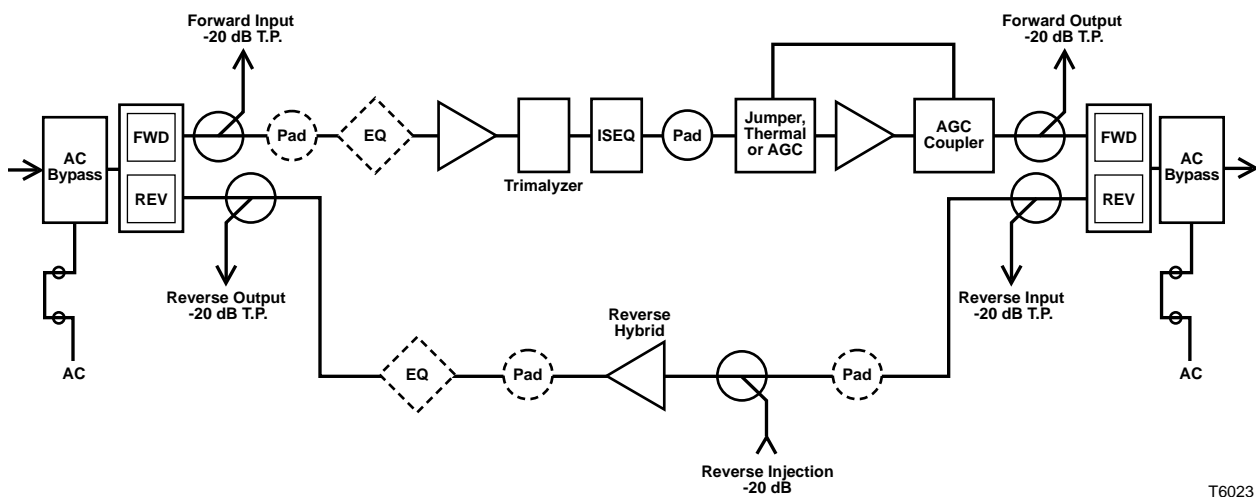
FEATURES

- 60 and 90 V AC powering capability
- 15 ampere current capacity (steady state) and 25 ampere surge survivability
- Integrated reverse amplifier, with optimized diplex filter group delay for forward and reverse paths
- Reverse input test point and input pad allowing optimum reverse path alignment
- Improved station frequency response
- Unitized design (amplifier and power supply in a single module) enabling simplified and faster maintenance
- High efficiency, transformerless power supply lowering system operating cost
- Directional Coupler RF testpoints provide optimum accuracy
- Surge Resistant™ Circuitry ensuring hybrid protection without fuses or other nuisance failure causing devices



23026

LINE EXTENDER III-TYPE 3 – 5-55/70-750 MHz



T6023

LINE EXTENDER III TYPE 3 – 5-55/70-750 MHz

General Station Performance Data

	Units	Forward		Reverse
Pass Band	MHz	70-750		5-55
Amplifier Type	---	PHD		PP
Operational Temperature Range	degrees	-40 to +60 C		-40 to +60 C
Frequency Response	dB	±0.5		±0.5
Auto Slope & Gain Range	dB	±4		N/A
Return Loss	dB	16		16
Operational AC Through Current	Amps	15		N/A
Max AC Through Current (2 hrs)	Amps	25		N/A
Hum Modulation @ 10 A (over specified frequency range)	dB	70 (70-750 MHz)		58 (5-15 MHz) 65 (16-55 MHz)
Hum Modulation @ 15 A (over specified frequency range)	dB	62 (70-150 MHz) 60 (151-600 MHz) 58 (601-750 MHz)		50 (5-15 MHz) 59 (16-55 MHz)
Test Points (±0.5 dB)	dB	-20		-20
Reference Output Level—High Freq.	dBmV	47.5 @ 750 MHz 44 @ 550 MHz		35 @ 55 MHz ⁷
Reference Output Level—Low Freq.	dBmV	35 @ 70 MHz		35 @ 5 MHz ⁷
Reference Output Tilt ¹	dB	+12.5		0
Interstage Level Control (type)		3T	3A	N/A
		Thermal	AGC w/ Man. Backoff	
Interstage Equalizer (value - type)	dB	14.5 - fixed	9 - fixed	N/A
Current Draw @ 24 V DC	Amps	0.63	0.73	0.13
Operational Gain (minimum) ^{3,9}	dB	29.5	28.5	18.5
Internal Tilt ² (±0.5 dB)	dB	+6.7	+6.7	0
Noise Figure ^{3,8} @ 70 MHz	dB	7.5	7.5	---
Noise Figure ^{3,8} @ 750 MHz	dB	9	9	---
Reverse Noise Figure ^{8,9}	dB	---	---	6

Forward and Reverse Performance with Specified Channel Loading

	Units	3T	3A	Reverse
CW Channel Loading	NTSC	76 w/digital ⁴	76 w/digital ⁴	6
Composite Triple Beat ^{5,8}	dB	71	70	92
Cross Modulation ^{6,8}	dB	67	65	80
Composite Second Order ^{5,8} (high side)	dB	68	67	82

Delay Characteristics

Forward (Chrominance to Luminance Delay)		Reverse (Group Delay in 1.5 MHz BW)	
Freq. (MHz)	Delay (ns)	Freq. (MHz)	Delay (ns)
72.00 - 76.43	25	53.5 - 55.0	19
91.25 - 94.83	4	48.5 - 50.0	7
		10.0 - 11.5	7
		5.0 - 6.5	56

Notes:

- (1) Reference output tilt is specified as "LINEAR" tilt (as opposed to traditional "cable" tilt).
- (2) Down tilt, the effect of cable, is represented by a (-). Up tilt, the effect of equalization, is represented by a (+).
- (3) Forward gain and noise figure measured with 0 dB input EQ and 1 dB input pad.
- (4) "Digital" refers to 550-750 MHz loading with 33 QAM carriers at -6 dB levels relative to analog video carrier levels.
- (5) CTB and CSO measured using CW carriers, with spectrum analyzer as the measurement device.
- (6) X-Mod (@ 15.75 kHz) specified using 100% synchronous modulation and frequency selective measurement device.
- (7) Reverse output reference level with a 0 dB output equalizer and 1 dB output pad.
- (8) Distortions and noise figures are typical and specified over the operational temperature range.
- (9) Reverse gain and noise figure for station, with 0 dB reverse input pad, 0 dB reverse output EQ, and factory-selected reverse output pad.

Unless otherwise noted, the above specifications reflect typical station performance at stated reference levels in the recommended operating configuration, including the input equalizer and reverse filters where applicable. Unless otherwise noted, specifications are based on measurements made in accordance with NCTA Practices for Measurements on Cable Television Systems using standard frequency assignments and are referenced to 68°F (20°C).

Line Extender III-Type 3 — 5-55/70-750 MHz

Station Powering Data

Line Extender III		I DC (Amps)	AC Voltage											
			90	85	80	75	70	65	60	55	50	45	40	35
Type 3T	AC Current (A)	0.76	0.38	0.41	0.42	0.44	0.46	0.48	0.49	0.52	0.55	0.58	0.61	0.67
	Power (W)		22.2	21.8	21.8	21.9	21.5	21.8	21.8	21.7	22.3	22.3	21.8	22.2
Type 3A	AC Current (A)	0.86	0.42	0.46	0.46	0.48	0.50	0.52	0.54	0.57	0.60	0.64	0.68	0.76
	Power (W)		24.7	24.4	24.3	24.4	24.2	24.3	24.4	24.3	24.8	24.8	24.4	24.6

Data is based on stations configured for 2-way operation. Power supply has 30 V AC undervoltage lockout. AC currents specified are based on measurements made with typical CATV type ferro-resonant AC power supply (quasi-square wave).

ORDERING INFORMATION

Amplifier Module - 1 required

• # 573887 - Type 3T amplifier module with Thermal
Note: 3T amplifier module also comes configured with reverse amplifier, 14.5 dB interstage EQ, interstage pad, reverse output pad, 0 dB reverse output EQ, 55/70 diplex filters, integrated power supply.

• # 573889 - Type 3A amplifier module with AGC. AGC has 451.25 MHz pilot frequency and manual temperature backoff control.

Note: 3A amplifier module also comes configured with reverse amplifier, 9.0 dB interstage EQ, interstage pad, reverse output pad, 0 dB reverse output EQ, 55/70 diplex filters, integrated power supply.

Housing - 1 required (all have 15 amp capacity)

- # 545443 Uncoated 2-port housing
- # 545444 Coated 2-port housing

Required Accessories

- Plug-in Pads (attenuators):
 - 1 required for forward (1 input)
 - 2 required for reverse (1 input., 1 output)
 - 1 required for AGC only if amplifier output level at pilot frequency is NOT 42 dBmV (AGC comes configured with a 14 dB pad, which is appropriate for a 42 dBmV amplifier output level at pilot).

Available in 0.5 dB steps from 0 to 20 dB. Order Model PP-* (* denotes pad value); specify value.

- Plug-in Forward Input Equalizer, 1 required. Available in 1.5 dB steps from 0 to 28.5 dB at 750 MHz. Order Model EQ750-* (* denotes equalizer value); specify value.
- Plug-in Reverse Output Equalizer, 1 required. Available in 1.0 dB steps from 1.0 to 12.0 dB at 55 MHz. Order Model EQ55S -* (* denotes equalizer value); specify value.

Optional Accessories

- #467351 230 V AC Crowbar Surge Protector
- Plug-in Cable Simulator. Simulates cable losses, creating tilt opposite that of Equalizers. Use in place of Forward Input Equalizer as needed to maintain proper output tilt in short spaced locations. Available in 1.5 dB steps from 1.5 dB to 12.0 dB cable loss at 750 MHz. Order Model CS 750-* (* denotes CS value); specify value.

Related Equipment

- #501111 Long Reach Test Point Adapter
- #276982 Reverse Injection Probe (3 dB insertion loss)
- #548771 Pad Insertion/Removal Tool

MECHANICAL SPECIFICATIONS

Housing Dimensions

11.5 in. L x 9.5 in. H x 4.0 in. D
 292.1 mm L x 241.3 mm H x 101.6 mm D

Weight

Housing 6 lbs, 6 oz; 2.9 kg
 Module 2 lbs, 13 oz; 1.3 kg

Specifications and product availability are subject to change without notice.

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