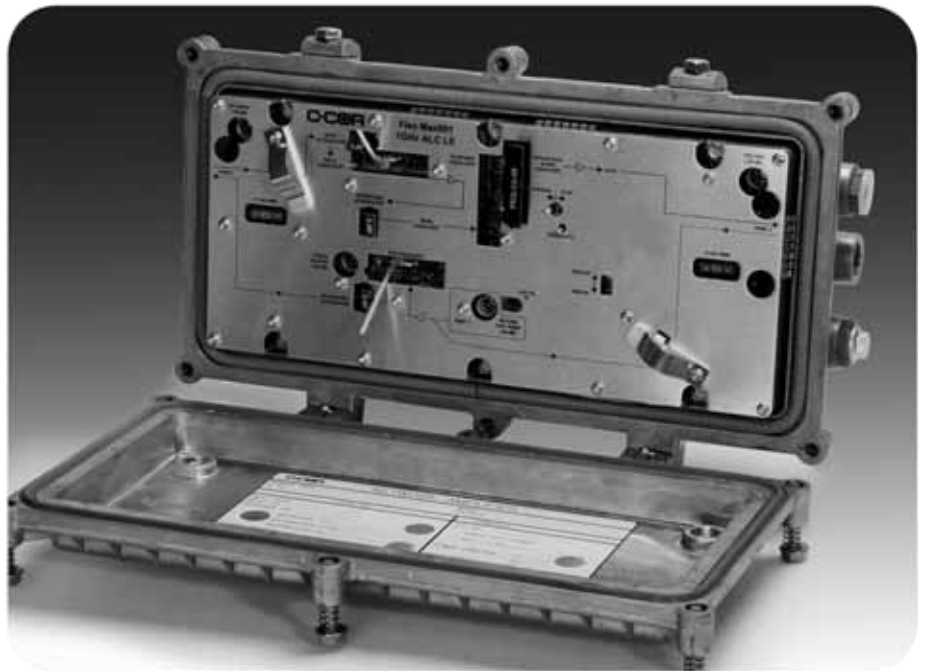




C-COR® Flex Max601

Line Extender



- 1 GHz GaAs technology
- Designed to drop into existing 9-NH Series style housings to effectively upgrade a network from 750 or 870MHz to 1 GHz bandwidth
- Plug-in diplex filters
- Built-in surge protection
- ALSC, TLC, and Manual options

The new Flex Max601 Line Extender is C-COR's latest edition to its extensive 1GHz RF Amplifier and Node offerings. The FM601 was designed using the legacy 9-NH Series housing as its base and can easily be deployed as either a new build/system extension amplifier or used as a drop-in module upgrade to existing Legacy 9-NH series housings.

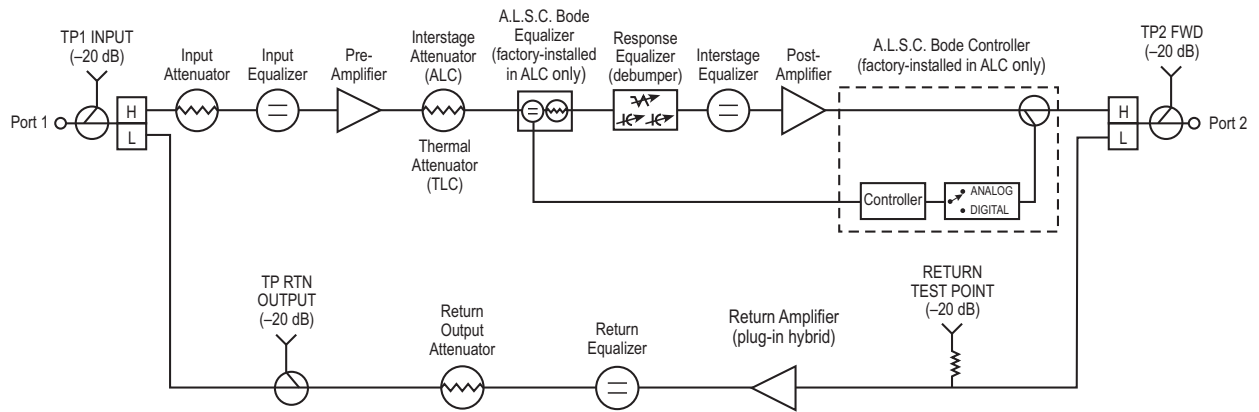
Offering the latest in 1GHz technology, these amplifiers also accept legacy style 750/870MHz EQs and Pads so you can efficiently extend or upgrade your network of GNA or G3A line extender amplifiers using common style plug-ins.

The Flex Max601 Line Extender amplifiers provide one high level RF distribution output.

Features

- Offers a forward operational gain of 36dB (manual)/33dB (thermal and ALSC @ 711MHz QAM) and an operational return gain of 18dB
- Pilot frequency available at 711.00 MHz (QAM)
- Directional coupler forward input and output testpoints. Directional coupler return output testpoint and resistive return input testpoint.
- Uses common legacy style equalizers and attenuators with guide pins

Functional Block Diagram



Accessories

Plug-ins for a Flex Max601	Plug-in Series
Factory-Installed Plug-Ins	
Circuits or jumpers are factory-installed in these positions according to customer or product requirements.	
Automatic Level and Slope Control, ALSC (under cover, not user-changeable) for ALSC model	6-ALSC
Interstage Slope Equalizer (ALSC model)	PEQ-1G-09 (1 GHz) ¹
Interstage Slope Equalizer (TLC model)	PEQ-1G-10 (1 GHz) ¹
Required Plug-Ins	
The Flex Max601 is shipped with these positions empty. Install values based on the station's location.	
Input Attenuator	10-A-WC ²
Return Output Attenuator	Jumper or 10-A-WC ²
Optional Plug-Ins	
Jumpers, or "zero" value circuits, may be shipped in these positions. Install different values based on system design.	
Input Equalizer	PEQ-1G (1 GHz) ¹
Interstage Attenuator (ALSC model)	Jumper or 10-A-WC ²
Interstage Attenuator (TLC model)	0707424-804
Response Equalizer (debumper) ³	1503691-001/1503691-002
Return Output Equalizer	7-REF-WC

1. 7-2E-WC (862/750MHz) EQs can be used if the upper frequency is 870/750MHz.

2. 9-A-WC series PADs are compatible with 10-A-WC series PADs

3. Response of 1503691-001 is flat in the center and is approximately 5 dB higher at the lower (54MHz) and upper (1002MHz) ends of the frequency range. Response of 1503691-002 is flat from 54 to 200MHz and then sharply rises toward the upper frequency range.

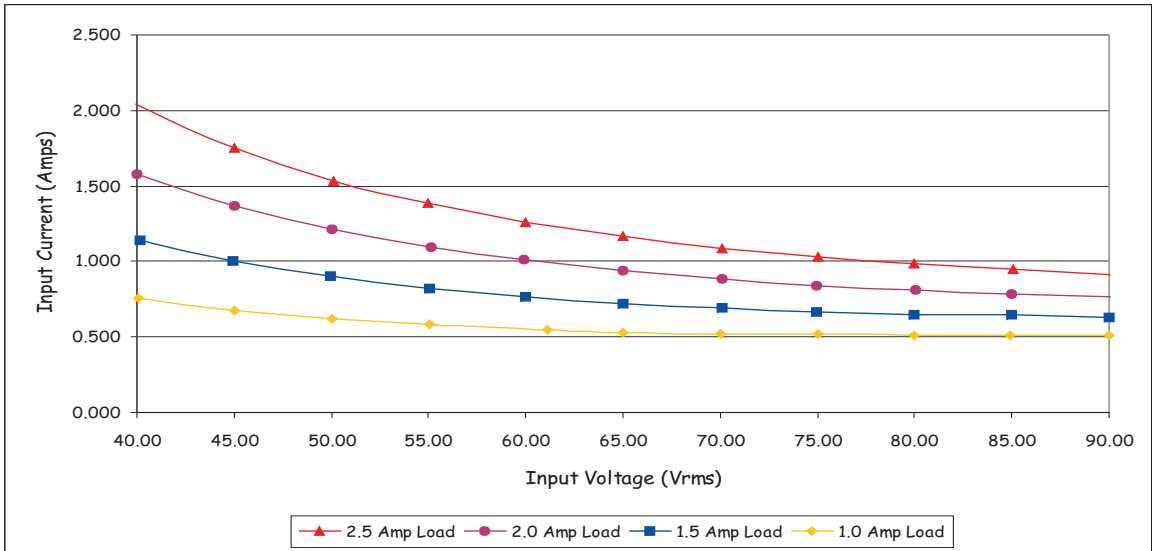
Power Supply Specifications

Characteristic	Specification
Input Voltage Range, 50/60Hz, Quasi-square wave	40 to 90V RMS
Input Frequency	50/60Hz
Output Voltage, VDC	24 ± 0.5
DC Output Current, max., A	2.5
Output Voltage Ripple, mVRMS, 0 to 100kHz	8
Output Voltage Ripple, mVp-p, 100MHz	150
Output Voltage Protection, max., VDC	33
Efficiency, typ.	85%
Short Circuit Current, max., ADC	<1 amp, pulse limited
Hold up Time @ 2.5ADC 40V, min., msec	7
Hold up Time @ 2.5ADC 60V, min., msec	25
Continuous Operation Input Voltage, min., VRMS	40
Re-start Voltage, min., VRMS	38
Low Voltage Turn Off, VRMS	20
Operating Temperature, °C ¹	-40 to 60

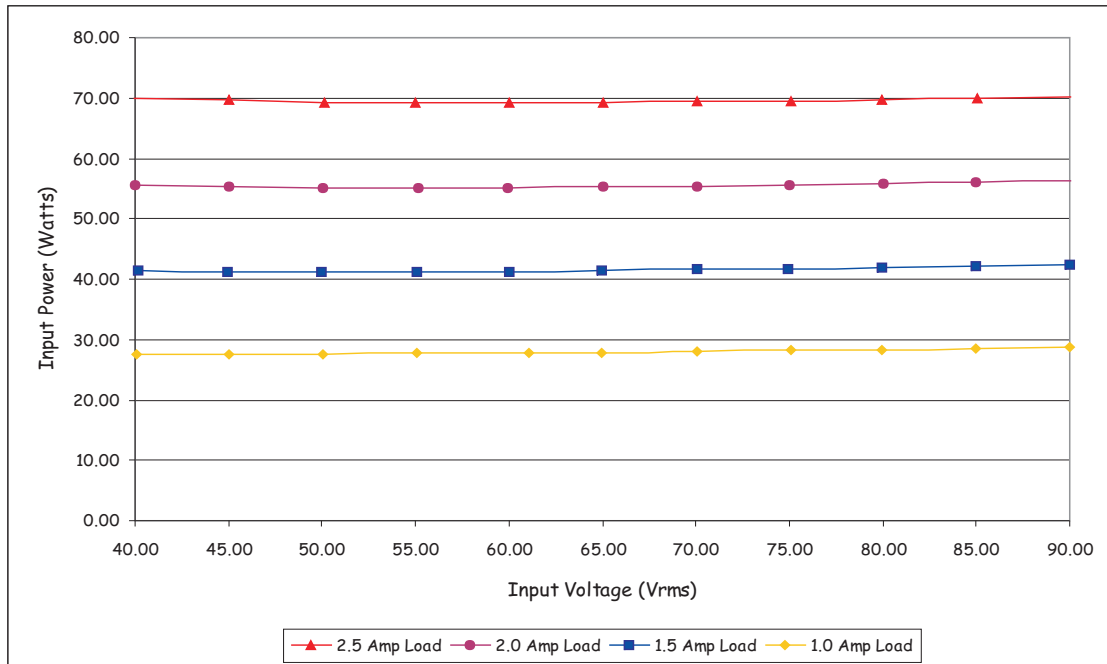
Specification Document Number 1503595 Rev A

1. Reflects an external ambient temperature range.

Specifications subject to change without notice



Flex Max601 Line Extender Power Supply — Input Current vs. Input Voltage



Flex Max601 Line Extender Power Supply — Input Power vs. Input Voltage

Flex Max601 Specifications

	FORWARD			RETURN
General				
Pass Band, MHz	54–1002			5–42
Housing, MHz	1002			—
AC Current PAssing, Amp	15			15
Typical Operating Conditions				
Operational Gain, dB (–0, +1.0dB) ¹	36/33/33			18
Channels, Number of NTSC ²	79			6
Operating Levels, Recommended				
Frequency, MHz	1002/870/750/550/54			42/5
Input,dBmV min., Manual ³	16/13.5/12.5/10/8.5			17/17
Input,dBmV min., Thermal or ALSC ³	19/16.5/15.5/13/11.5			17/17
Output, dBmV ^{4,5}	52/49.5/47.5/44/35			35/35
Performance Characteristics at Recommended Levels (Temperature Range: –40°C to 60°C)				
Carrier-to-Interference Ratio, dB ⁶	Manual/Thermal/ALSC			
Composite Triple Beat	75/72/72			80
Second Order Beat (F1 ± F2)	—			—
Cross Modulation ⁷ (per NCTA std.)	69/66/66			74
Third Order Beat (F1 ± F2 ± F3)	—			—
Composite 2IM	72/69/69			82
Comp. Intermodulation Noise CIN ⁸	71			—
Comp. Intermodulation Noise CIN ⁹	76			—
Noise Figure¹⁰ (without EQ)				
Frequency, MHz	1002/870/750/550/54			42
Manual NF, dB	10/10/9.5/9/10.5			7.5
Thermal NF, dB	10/9.5/9/9/10			7.5
ALSC NF, dB	10/9.5/9/9/10			7.5
Noise, Manual, 4MHz, 75 Ω	64/61.5/61/59/56			68.5
Noise, Thermal and ALSC, 4MHz, 75 Ω	67/65/64.5/62/59.5			68.5
Full Gain, dB (without EQ and ALC, without EQ and Thermal, and without EQ)	37			19
Factory Alignment, with ALC Reserve, Without EQ				
Cable Loss, dB @ 1002MHz	Manual	Thermal	ALSC	Return
Flat Loss, dB	13	13	13	—
Gain Slope, dB	24	21	21	19
Flatness (@ Gain Slope), dB	±1.0	±1.0	±1.0	±1.0
Return Loss, dB Minimum, All Entry Ports	±0.8	±0.8	±0.8	±0.8
	16	16	16	16
Testpoint Accuracy				
–20dB Forward Input Test Point, dB (Directional Coupler Type)	± 0.5 (54 to 550MHz) ± 1.0 (550 to 1002MHz)			—
–20dB Forward Output Testpoint(s), dB (Directional Coupler Type)	± 0.5 (54 to 550MHz) ± 1.0 (550 to 1002MHz)			—
–20dB Return Input Testpoint, dB (Resistive Type)	—			± 0.75
–20dB Return Output Testpoint, dB (Directional Coupler Type)	—			± 0.5

	FORWARD						RETURN
	Manual		Thermal		ALSC		
Powering Requirements¹¹							
AC Voltage, 60Hz	60V	90V	60V	90V	60V	90V	—
AC Power, Watts, Max./Typ.	27/23	27/23	27/23	27/23	29/24. 5	29/24. 5	—
AC Current, mA	610/52	375/32	610/52	375/32	655/55	405/34	—
DC Current, mA @ 24 ± 0.5, max./typ.	865/800		865/800		965/890		—
Level Control							
Range, dB @ 1002 MHz	—		—		± 3.0		—
Accuracy, dB (–40°C to 60°C)	—		—		± 1.0		—
Operating Level Range, dBmV (at pilot frequency) ¹²	—		—		37 to 52		—
Pilot Frequency, (Recommended)	—		—		711 MHz		—
Gain Control							
Plug-In Pad	9-A-WC, 10-A-WC						9-A-WC, 10-A-WC
Equalization To Compensate For Cable Loss							
Plug-in Equalizers for Additional Equalization	PEQ-1G-xx						7-REF-WC
Chrominance/Luminance Delay, Max.							
Channel 2, ns/3.58 MHz	28						—
Channel 3, ns/3.58 MHz	12						—
Channel 4, ns/3.58 MHz	7						—
Channel 5, ns/3.58 MHz	4						—
Return Group Delay, Maximum							
5.5–7MHz, ns	—						55
10–11.5MHz, ns	—						10
35–36.5MHz, ns	—						10
38.5–40MHz, ns	—						30
Hum Modulation (Time Domain at 15 A)							
5–10MHz, –dBc	—						55
11–42MHz, –dBc	—						65
54–1002MHz, –dBc	60						—

Specification Document Number 1503615 Rev A

1. Forward spacing at highest frequency with PEQ-1G-xx equalizer installed. Return spacing includes losses due to housing, diplex filters, and return EQ.
2. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.
3. Recommended minimum forward input level includes loss due to equalizer.
4. Recommended maximum return output level at 42MHz.
5. At specified operational tilt, maximum output level for 1 GHz or 870MHz loading is 56.5dBmV @ high frequency.
6. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6dB below equivalent video channels.
7. Cross modulation specification number indicates typical cascade performance.
8. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002MHz at levels 6dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54 to 550 frequency spectrum.
9. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870MHz at levels 6dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54 to 550MHz frequency spectrum.
10. The Noise Figure and C/N specifications are typical within specified passband where C/N=Input Level (dBmV) + 59 – NF.
11. Powering requirements. See 333995-37 power curves for additional information.
12. Denotes range of operating levels at pilot frequency where ALSC will set up and operate. For operating levels below 45dBmV, ALSC attenuator should be set to "DIGITAL" position.

Specifications subject to change without notice.

Ordering Information

1	2	3	4	5	6	7		8	9	10	11	12	13	14	15
F	M	6	L	3	D	J	-	x	x	6	A	6	x	x	N

1-3	Platform
FM6	Flex Max601 Series, 1GHz

4	Amplifier Type
L	Line Extender

5	Internal/Output Tilt (dB)
3	17dB tilt

6	Spacing
D	36dB (manual)/33dB (Thermal or ALC)

7	Frequency Split
J	42/54MHz

8-9	Level Control
TH	Thermal Level Control
RM	711.00MHz QAM

10	Return Gain
6	18dB active gain

11	Output Configuration
A	1 active output with -20dB internal testpoint

12	Powering/Surge
6	2.5 amp, 90 volt with surge protection

13	Housing	
A	None	a
T	4 port 9-NH15 series, 1GHz, internal testpoint, strand mount housing	
<i>a) Required when ordering RF module only.</i>		

14	Housing Finish	
1	Standard Finish or N/A	a
4	Corrosion protected finish	
<i>a) Select "1" when ordering RF module only.</i>		

15	Future Option
N	N/A

Flex Max601 Line Extender Amplifier



The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice. ARRIS, the ARRIS logo, C3™, C4™, CableEdge™, Cadant™, C-COR™, CHP Max™, Cornerstone™, CXM™, D5™, Digicon™, Flex Max™, Keystone™, MONARCH™, n5™, nABLE™, NSM™, nVision™, PLEXIS™, Regal™, ServAssure™, TeleWire Supply™, Touchstone™, VoiceAssure™, and WorkAssure™ are all trademarks of ARRIS Group, Inc. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and the names of their products. ARRIS disclaims proprietary interest in the marks and names of others. © Copyright 2008 ARRIS Group, Inc. All rights reserved. Reproduction in any manner whatsoever without the express written permission of ARRIS Group, Inc., is strictly forbidden. For more information, contact ARRIS.

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