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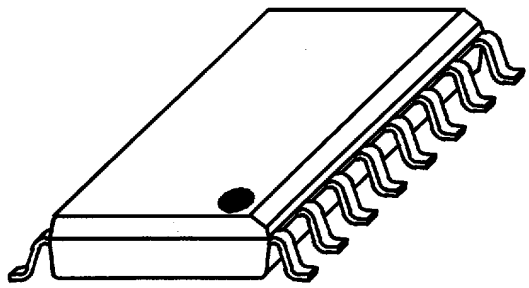
ACA0860
750/860 MHz CATV LINE AMPLIFIER MMIC
Advanced Product Information
Rev 2

DESCRIPTION

The ACA0860 family of surface mount monolithic GaAs RF Linear Amplifiers has been developed to replace, in new designs, the standard CATV Silicon Hybrid amplifiers currently in use. The MMICs consist of two parallel amplifiers, each with 12 dB gain. A Hybrid equivalent is formed when two ACA0860s are connected in series between two transmission line baluns. See ACA0860 application note for more information.

FEATURES	ACA0860
■ Flat Gain ■ Very Low Distortion ■ Excellent Input/Output Match ■ Low DC Power Consumption ■ Good RF Stability with high VSWR Load Conditions ■ Surface Mount Package ■ Package Fully Automatic Assembly Compatible ■ Low Cost ■ Repeatability of Monolithic Fabrication	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	MAX.	UNITS
V_{DD}/V_{RFOUT}	0	15	Vdc
RF_{IN}		+70	dBmV
Storage Temperature	- 65	+150	°C
Soldering Temperature		+260	°C
Soldering Time		5.0	Sec.
Thermal Resistance		6.0	°C/W

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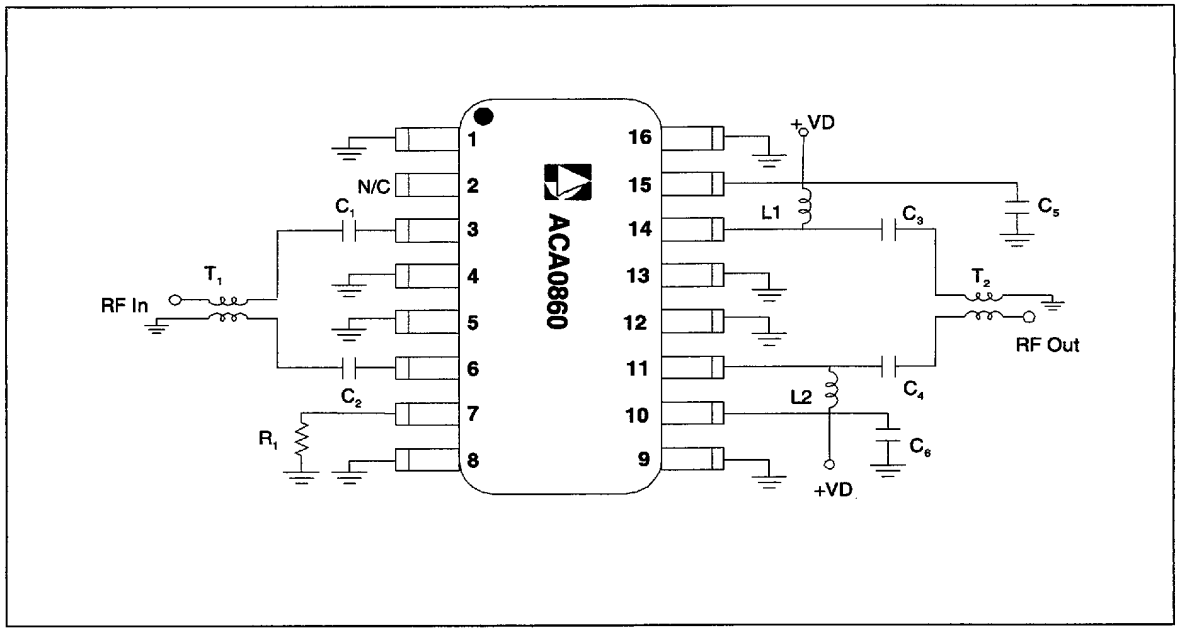
ISO 9001

ELECTRICAL SPECIFICATIONS (T_A = +25°C, TEST CIRCUIT SHOWN IN FIG. *1)*

	ACA0860A		ACA0860B		ACA0860C		ACA0860D		
PARAMETER	**MIN**	**MAX**	**MIN**	**MAX**	**MIN**	**MAX**	**MIN**	**MAX**	**UNITS**
Frequency Range	40	750	40	750	40	750	40	750	MHz
Gain[1]	11.5	12.5	11.5	12.5	11.5	12.5	11.5	12.5	dB
Gain Flatness [1]		± .3		±.3		±.3		±.3	dB
Return Loss (In/Out)[1]	18		18		18		18		dB
Noise Figure[2]		5		5		5		6	dB
Output Level	+ 34			+ 44		+ 34		+ 44	dBmV
CTB (110 CH Flat)[2, 3]		- 64		- 56		- 68		- 62.5	dB
CSO (110 CH Flat)[2, 3]		- 66		- 60		- 68		- 68	dBc
XMOD (110 CH Flat)[2,3]		- 56		- 50		- 62		- 61	dBc
Supply Voltage	+ 12		+ 12		+ 12		+ 12		Vdc
Supply Current[4]		200		330		275		515	mA
Cable Equivalent Slope	- .5	+ 1.0	- .5	+1.0	- .5	+1.0	- .5	+1.0	dB

Notes:

1. Measured performance of MMIC alone. Balun effects deimbedded from measurement.
2. Measured with a balun on input and output of the device. See Figure 1 for test setup.
3. All parts measured with 110 channel flat input. Parts A & C measured at +34 dBmV output. Parts B & D measured at 44 dBmV output (per channel).
4. A fixed resistor is needed for parts A thru C, part D does not need an external resistor. These resistors set the devices' current draw.



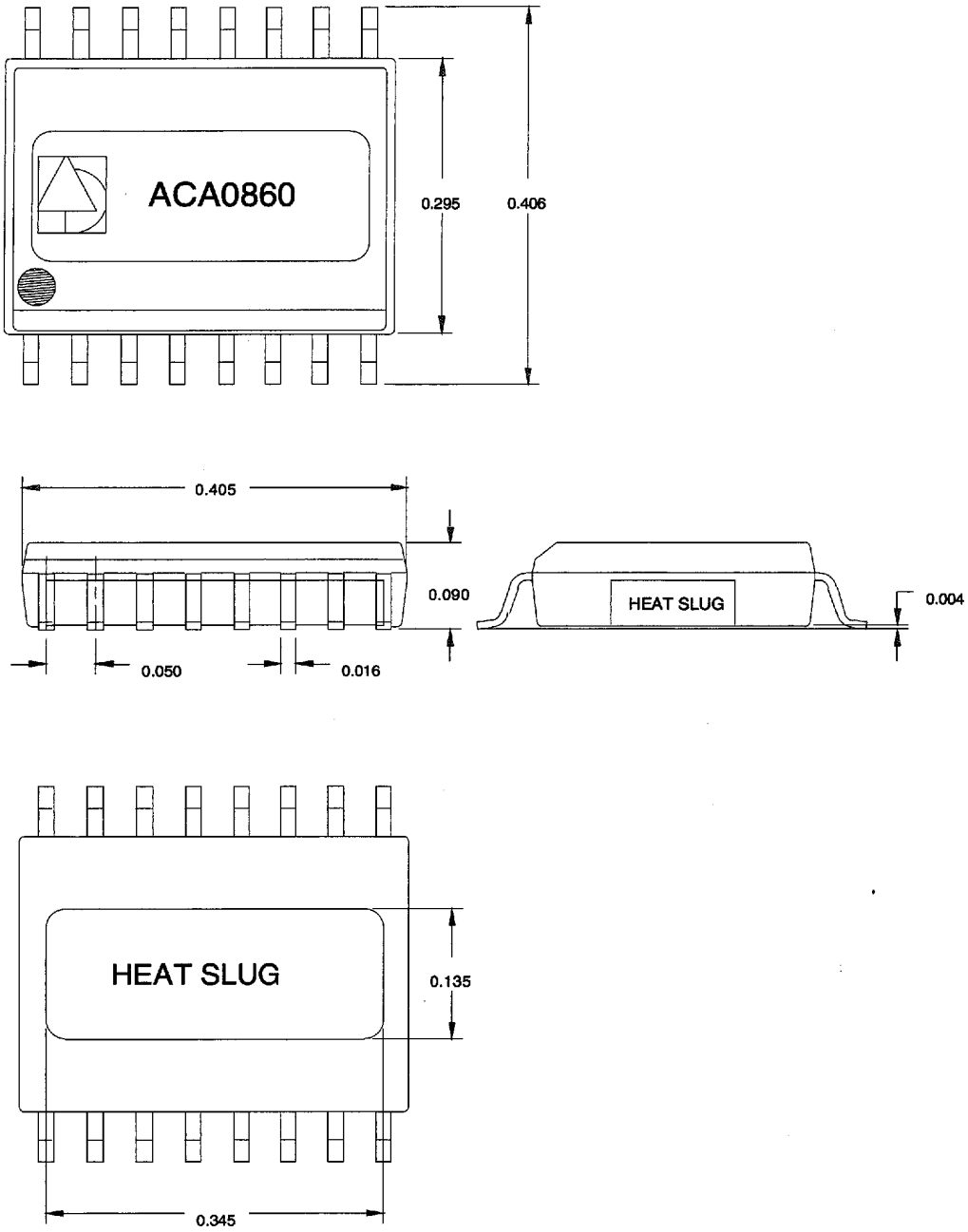
Note: Apply voltage to both VD lines simultaneously

PIN	FUNCTION
1	GND
2	Leave Open
3	RF IN #1
4	GND
5	GND
6	RF IN #2
7	I_{ADJ} Resistor
8	GND
9	GND
10	+VD
11	RF OUT #2
12	GND
13	GND
14	RF OUT #1
15	+VD
16	GND

TABLE I Current Set Resistor	
Part Suffix	R_1
ACA0860A	21.5 Ω
ACA0860B	274 Ω
ACA0860C	121 Ω
ACA0860D	OPEN

PART LIST	
Designation	Description
C1	.01μF
C2	.01μF
C3	.01μF
C4	.01μF
C5	.01μF
C6	.01μF
R_1	See Table I
L1, L2	910 nH
T_1, T_2	5 Turns, 75 Ω Twin Lead Around Ferrite Core
Ferrite Core	TDK H5C2-T3.1 -1.3 -1.3
Twin Lead	MWS B2383413

Figure 1. TEST CIRCUIT

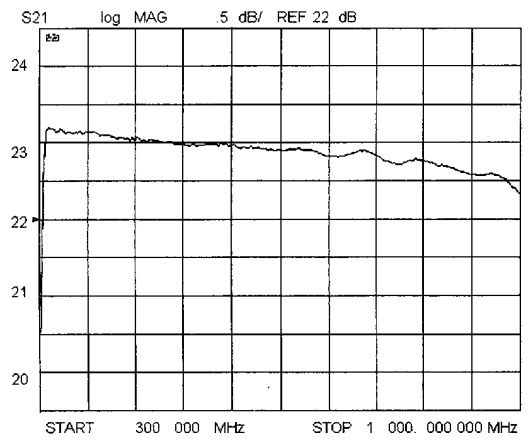


Dimensions in inches

FIGURE 2 PACKAGE DIMENSIONS

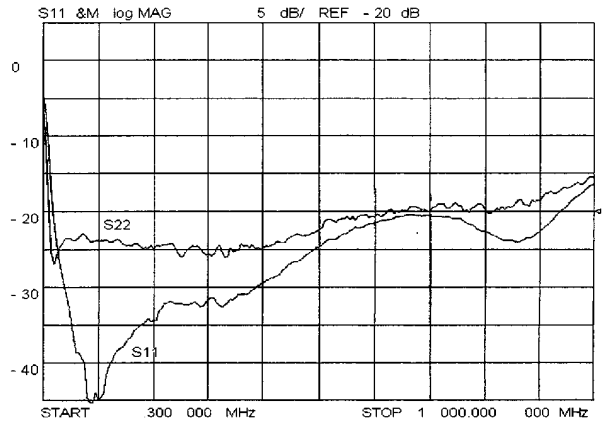
ACA0860C and ACA0860D CASCADE - TYPICAL DATA*
+44 dBmV Output - 110 Channel Loading

Gain



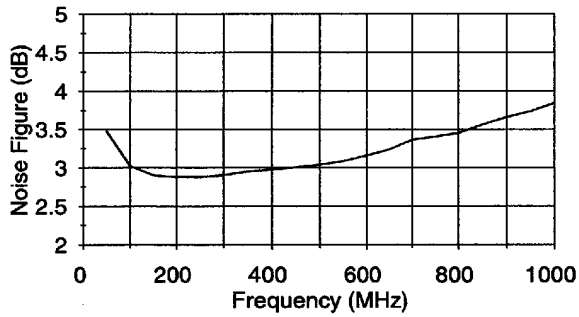
Frequency (MHz)

Return Loss

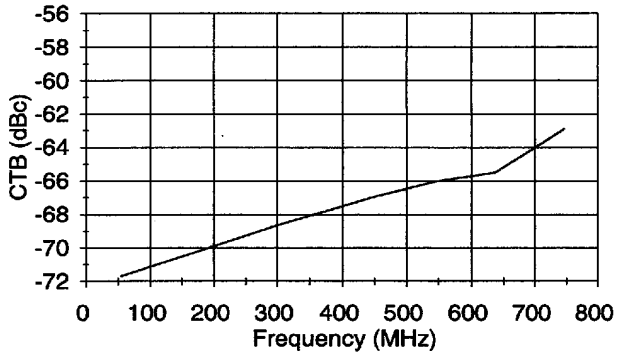


Frequency

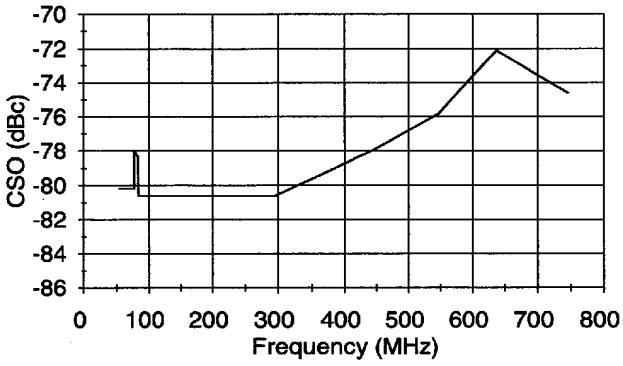
Line Amp Cascade Noise Figure
ACA0860C & ACA0860D



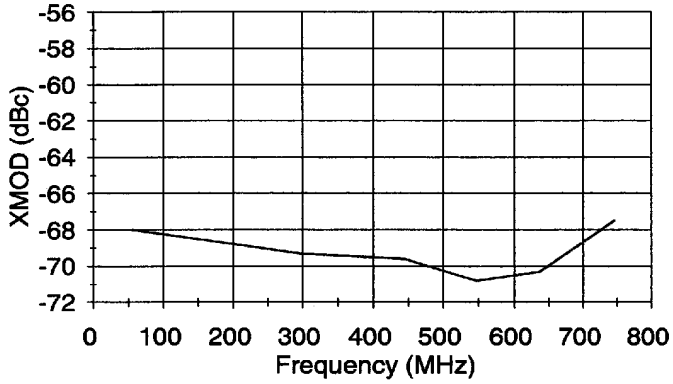
CTB vs FREQUENCY
+44 dBmV OUTPUT - 110 CHANNEL LOADING



CSO vs FREQUENCY
+44 dBmV OUTPUT - 110 CHANNEL LOADING



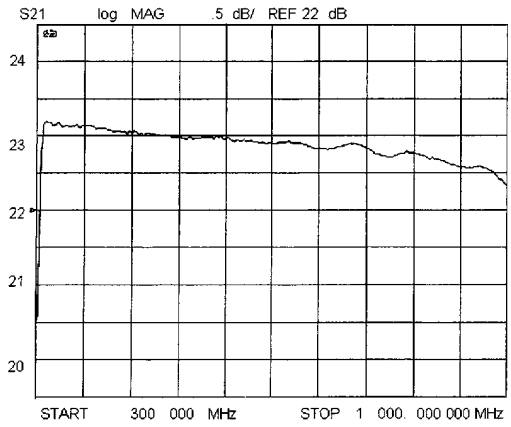
XMOD vs FREQUENCY
+44 dBmV OUTPUT - 110 CHANNEL LOADING



* NOTE: See Figure 3 for test circuit.

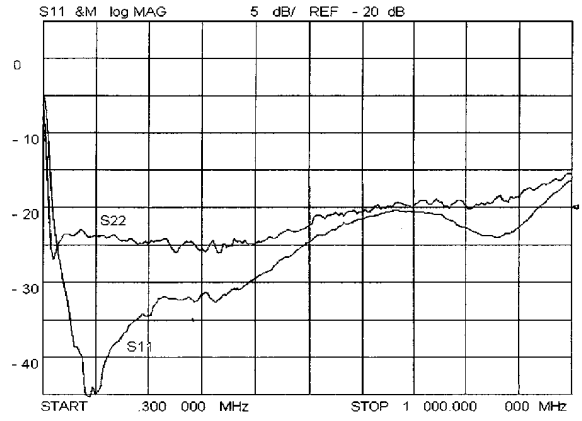
ACA0860C and ACA0860D CASCADE - TYPICAL DATA*
+ 44 dBmV Output - 128 Channel Loading

Gain



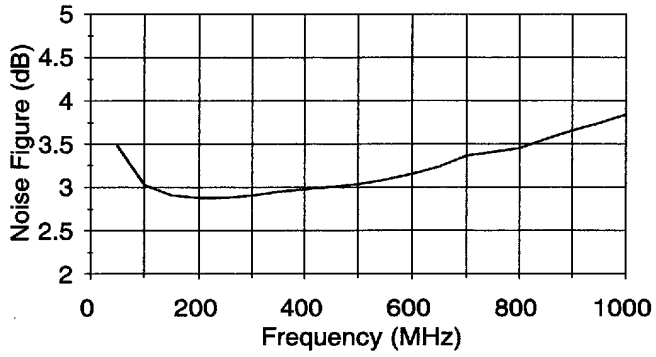
Frequency (MHz)

Return Loss

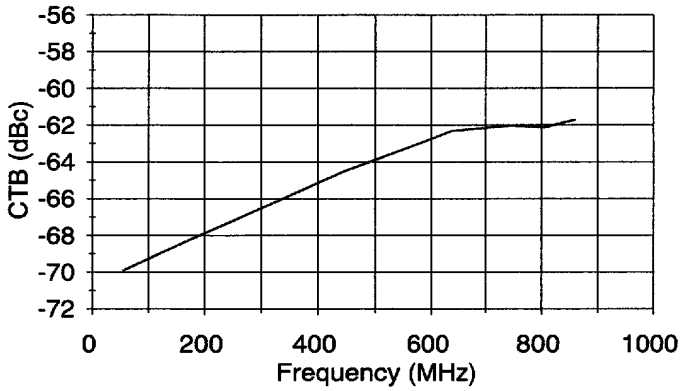


Frequency

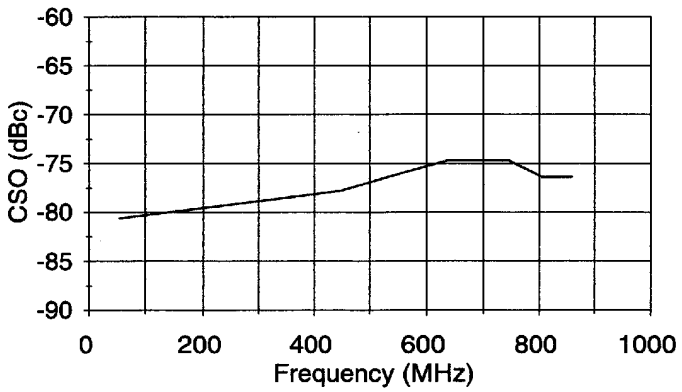
Line Amp Cascade Noise Figure
ACA0860C & ACA0860D



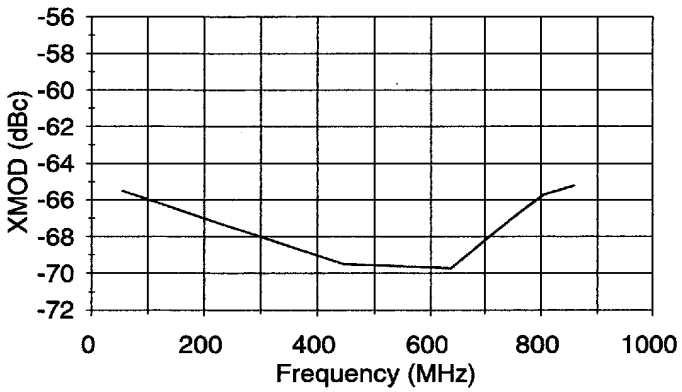
CTB vs FREQUENCY
+44 dBmV OUTPUT - 128 CHANNEL LOADING



CSO vs FREQUENCY
+44 dBmV OUTPUT - 128 CHANNEL LOADING



XMOD vs FREQUENCY
+44 dBmV OUTPUT - 128 CHANNEL LOADING



* NOTE: Figure 3 for Test Circuit

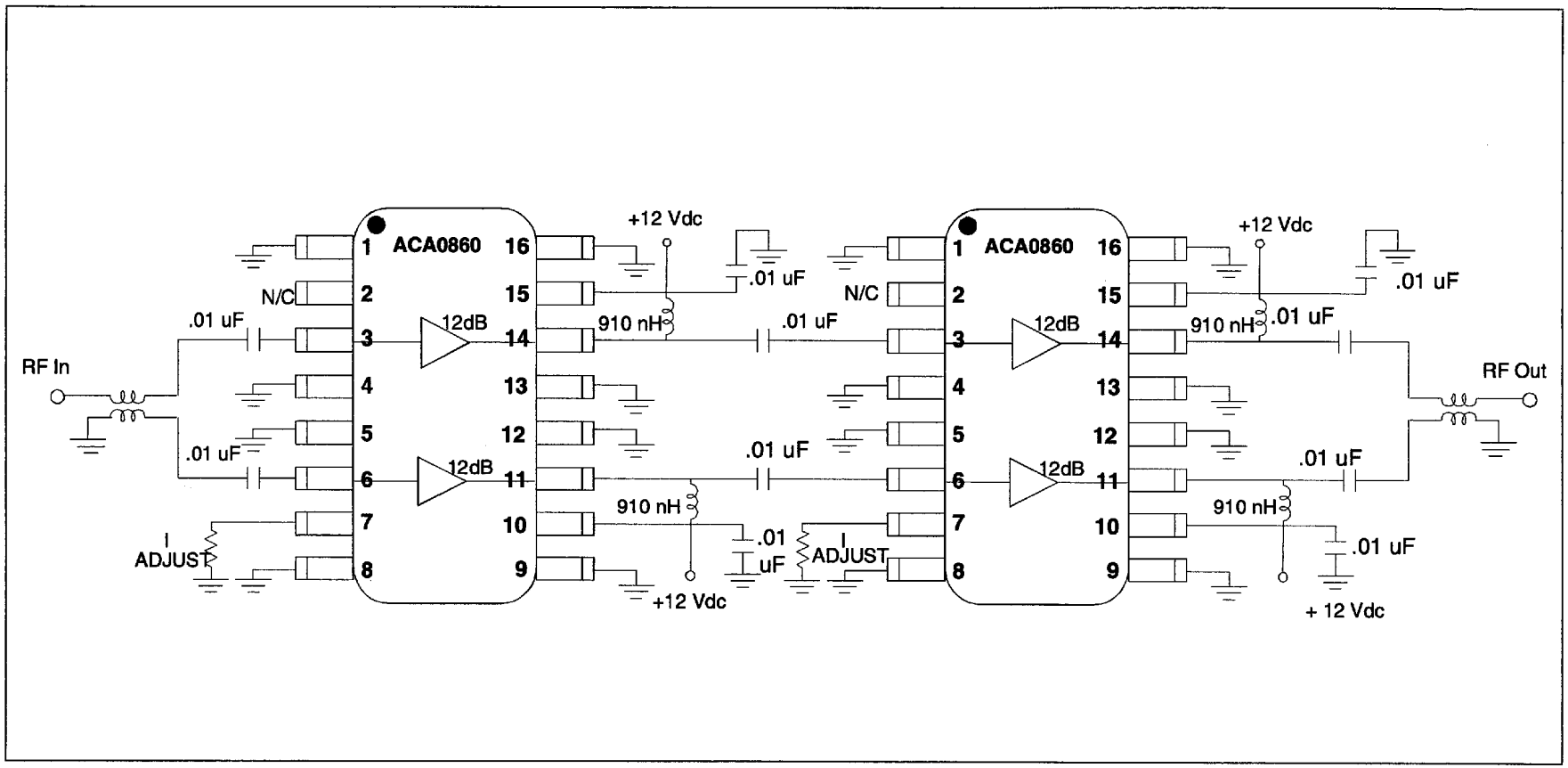


Figure 3. Hybrid Equivalent Test Circuit