

FEATURES

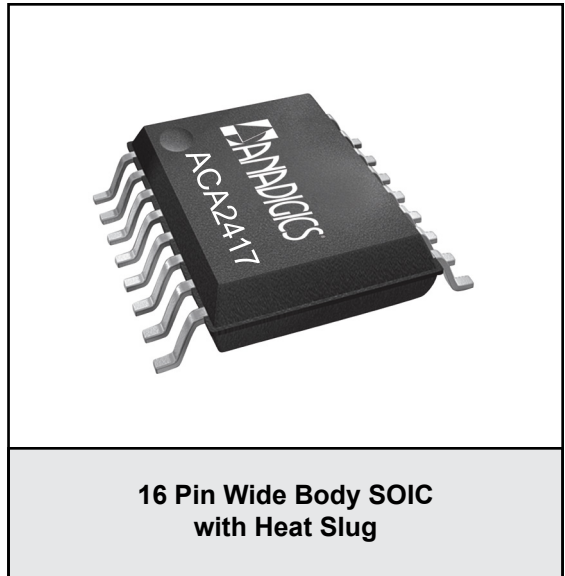
- 40 to 1218 MHz Frequency Range
- +44 dBmV Output Power
- 25 dB Gain at 1.218 GHz
- Single +24 V Supply
- Operating Current = 240 mA
- Surface Mount Package Compatible with Automatic Assembly and excellent reliability
- Halogen Free/RoHS Compliant

APPLICATIONS

- Advanced high power and high frequency HFC transmission systems
- FTTB, CATV Line Extenders, System Amplifiers, Distribution Nodes

PRODUCT DESCRIPTION

The ACA2417 is a highly linear, high output power integrated RF amplifier designed for CATV HFC distribution systems. The IC consists of two balanced amplifiers cascaded between two transmission line baluns that are optimized for exceptionally low distortion, high output power, and high crash point in a thermally enhanced surface mount package.



The ACA2417 provides high gain over the 40 to 1218 MHz CATV downstream band.

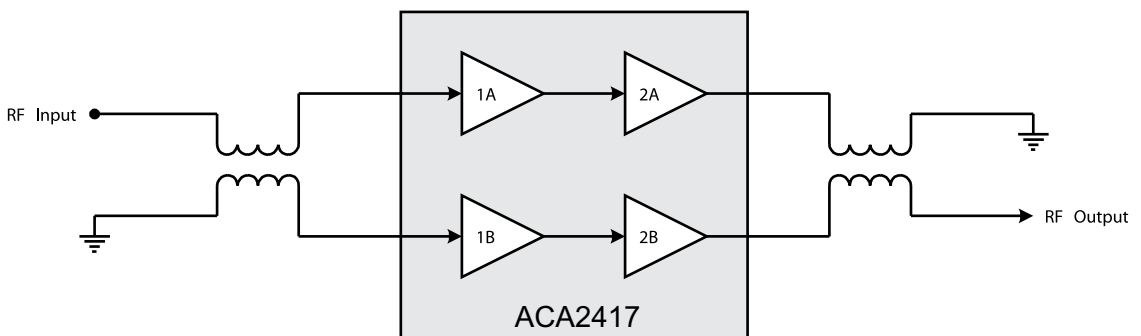


Figure 1: Block Diagram

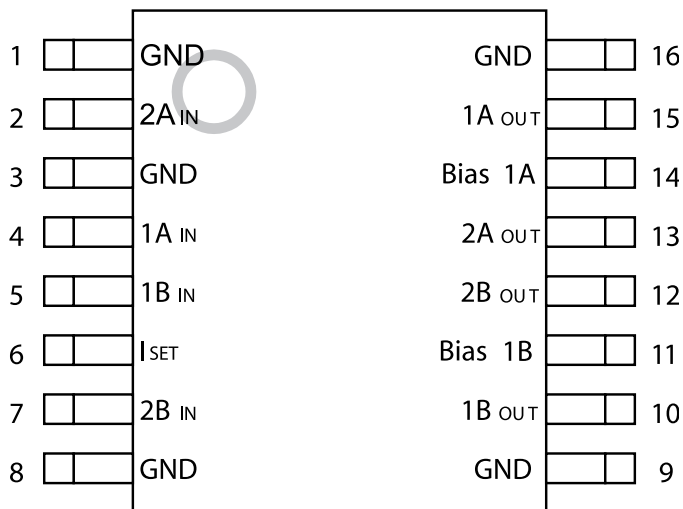


Figure 2: Pin Out

Table 1: Pin Description

PIN	NAME	DESCRIPTION	PIN	NAME	DESCRIPTION
1	GND	Ground	9	GND	Ground
2	2A _{IN}	Amplifier 2A Input	10	1B _{OUT}	Amplifier 1B Output
3	GND	Ground	11	Bias 1B	Bias for 1B Amplifier
4	1A _{IN}	Amplifier 1A Input	12	2B _{OUT}	Amplifier 2B Output and Supply
5	1B _{IN}	Amplifier 1B Input	13	2A _{OUT}	Amplifier 2A Output and Supply
6	I _{SET}	Current Adjust	14	Bias 1A	Bias for 1A Amplifier
7	2B _{IN}	Amplifier 2B Input	15	1A _{OUT}	Amplifier 1A Output
8	GND	Ground	16	GND	Ground

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Mimimum and Maximum Ratings

PARAMETER	MIN	MAX	UNIT
Supply (pins 12, 13)	0	+28	VDC
Current Adjust (pin 6)	0	+4	VDC
RF Power at Inputs (pins 4, 5)	-	+75	dBmV
Storage Temperature	-65	+150	°C
Soldering Temperature	-	+260	°C
Soldering Time	-	5.0	Sec

Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability.

Notes:

- (1) Pins 2, 4, 5 and 7 should be AC-coupled. No external DC bias should be applied.
- (2) Pin 6 should be AC-grounded and/or pulled to ground through a resistor for current control.
- (3) Pins 10, 11, 14 and 15 should have no other external bias applied.

Table 3: Operating Ranges

PARAMETER	MIN	TYP	MAX	UNIT
RF Frequency	40	-	1218	MHz
Supply Voltage (V _{DD})	-	+24	-	VDC
Case Temperature	-40	-	+110	°C

The device may be operated safely over these conditions; however, parametric performance is guaranteed only over the conditions defined in the electrical specifications.

Table 4: Electrical Specifications
(T_A = +25 °C, V_{DD} = +24 VDC, 75 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain (1218 MHz)	24.25	25	25.75	dB	f = 1218 MHz, See note 3
Cable Equivalent Slope	-	2	-	dB	See note 3
Gain Flatness to 1218 MHz	-	± 0.2	-	dB	See notes 2 & 3
Noise Figure	-	5	-	dB	
CTB	-	-68	-65	dBc	See note 1
CSO	-	-67	-65	dBc	See note 1
XMOD	-	-60	-62	dBc	See note 1
CIN	-	-65	-62	dBc	See note 1
Input Return Loss	-	-20	-18	dB	See note 3
Output Return Loss	-	-20	-18	dB	See note 3
Thermal resistance (θ _{Jc})	-	2.7	3.3	°C/W	Junction to case slug
Supply Current	-	240	270	mA	

Notes:

- (1) Parts measured with 79 NTSC analog channels plus digital QAM channels to 1000 MHz, +44 dBmV output power and 0.0 dB tilt.
- (2) Peak deviation from a straight line between gain value at 50 MHz and 1218 MHz.
- (3) Measured in application circuit in Figure 3.
- (4) All specifications as measured on ANADIGICS evaluation board.

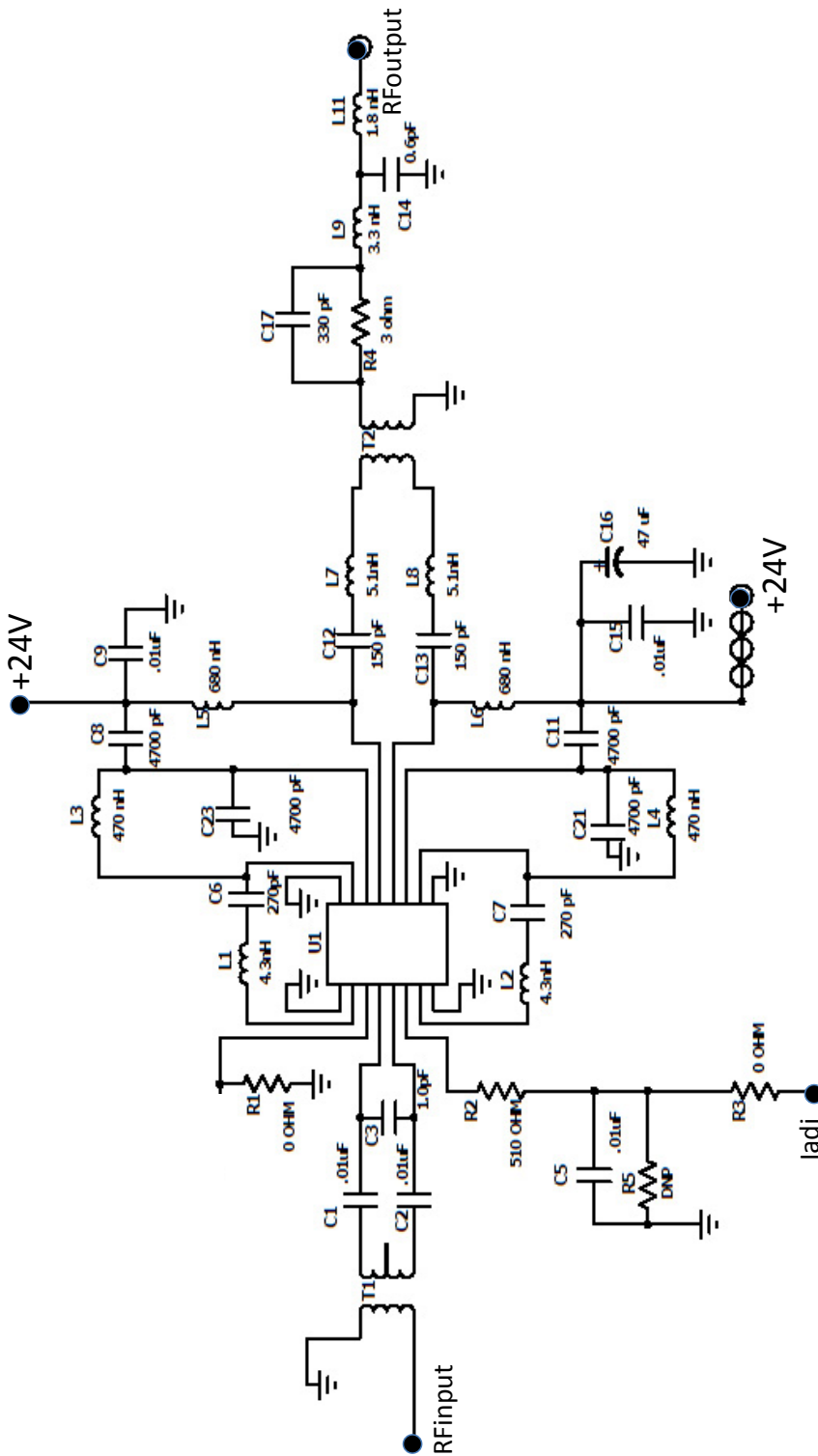
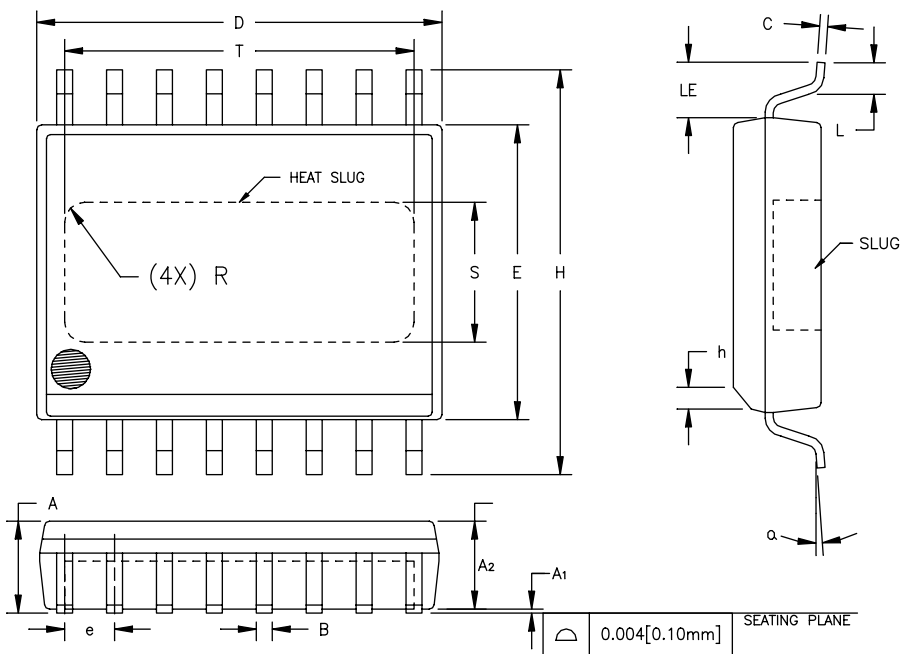


Figure 3: Application Schematic

Table 5: Bill of Materials

ITEM #	QTY	REFERENCE	DESCRIPTION
1	2	L3-4	0805 IND
2	5	C1-2 C5 C9 C15	0402 CAP
3	1	C14	0402 CAP
4	1	C3	0402 CAP
5	2	C12-13	0402 CAP
6	1	C17	0402 CAP
7	4	C8 C11 C21 C23	0402 CAP
8	2	C6-7	0603 CAP
9	1	C16	ELECTR CAP
10	1	L11	0402 IND
11	1	L9	0402 IND
12	2	L1-2	0402 IND
13	2	L7-8	0402 IND
14	2	L5-6	0603 IND
15	1	T2	Mintronix 2:1 BALUN
16	1	T1	Mintronix 1:1 BALUN
17	2	R1 R3	0402 RES
18	1	R4	0402 RES
19	1	R2	0402 RES
20	1	R5	0402 RES
21	1	U1	ACA2417

PACKAGE OUTLINE



SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	0.087	0.098	2.21	2.49	
A ₁	0.000	0.004	0.00	0.10	6
A ₂	0.087	0.094	2.21	2.39	
B	0.013	0.019	0.33	0.48	
C	0.007	0.009	0.18	0.23	
D	0.398	0.412	10.11	10.46	2
E	0.290	0.300	7.37	7.62	3
e	0.050 BSC		1.27 BSC		4
H	0.394	0.418	10.01	10.62	
h	0.010	0.028	0.25	0.71	
L	0.024	0.040	0.61	1.02	
LE	0.052	—	1.32	—	
a	0°	8°	0°	8°	
S	0.120	0.140	3.05	3.56	5
T	0.330	0.350	8.38	8.89	5
R	REF. 0.015		REF. 0.38		5

NOTES:

1. CONTROLLING DIMENSION: INCHES
2. DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED 0.006 [0.15mm] PER SIDE.
3. DIMENSION "E" DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSIONS SHALL NOT EXCEED 0.010 [0.25mm] PER SIDE.
4. MAXIMUM LEAD TWIST/SKEW TO BE ±0.005 [0.13mm].
5. DIMENSIONS "S", "T" AND "R" INDICATE EXPOSED SLUG AREA.
6. STANDOFF HEIGHT (A₁) MEASURED FROM BOTTOM OF SLUG.

Figure 4: Package Outline - 16 Pin Wide Body SOIC with Heat Slug

ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
ACA2417P0	-40 °C to +110 °C	16 Pin Wide Body SOIC with Heat Slug	Tubes
ACA2417P2	-40 °C to +110 °C	16 Pin Wide Body SOIC with Heat Slug	1,500 Piece Tape and Reel
ACA2417P9	-40 °C to +110 °C	16 Pin Wide Body SOIC with Heat Slug	Partial Reel

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