



## ACU2108S3

CATV/TV/Cable Modem  
Upconverter MMIC

Advanced Product Information - Rev 0

### FEATURES

- Integrated Monolithic GaAs Upconverter
- Designed for Digital and Analog TV
- Very Low Oscillator Phase Noise
- Low Noise Figure & Low Distortion
- Low Power Consumption
- Small size
- Can be Shut Down Remotely
- Operates from 3.3 to 5 Volt Power Supply
- High Reliability

### APPLICATIONS

- CATV/TV Tuners
- Cable Telephony Tuners
- Cable Modem Tuners



**S3**  
**16 Pin SOIC Package**

### Description

The ACU2108 is a Monolithic GaAs IC incorporating all upconverter functions of a double conversion CATV, Cable Modem and TV tuner: gain block, oscillator and a double balanced mixer. The oscillator is optimized to meet the stability and phase noise requirements of 256QAM Digital TV, while the amplifier and mixer retain the low distortion necessary for Analog signals.

The part is supplied in a low profile 16-lead modified SOIC package and it requires only a single polarity 3.3 to 5 Volt power supply. This upconverter IC is well suited for double conversion tuner designs where small size, low cost, low auxiliary parts count and a no-compromise performance when handling both Digital and Analog TV signals is important. It lets tuner manufacturers reduce costs by lowering component count and dispensing with labor-intensive production alignment steps, while improving performance and reliability.

### Absolute Maximum Ratings

Parameter	Absolute Maximum	
$V_{DD}/V_{IF}/V_{OSC}$ (Pins 1,10,14,& 16)	9	$V_{DC}$
$V_{RF}/V_{TUNE}$ (Pins 6 & 11)	0	$V_{DC}$
RF Input Voltage	+60	dBmV
Storage Temperature	- 55 to +200	°C
Soldering Temperature	260	°C
Soldering Time	5	Sec.
Operating Case Temperature	- 40 to + 85	°C

# ACU2108S3

## Electrical Specifications

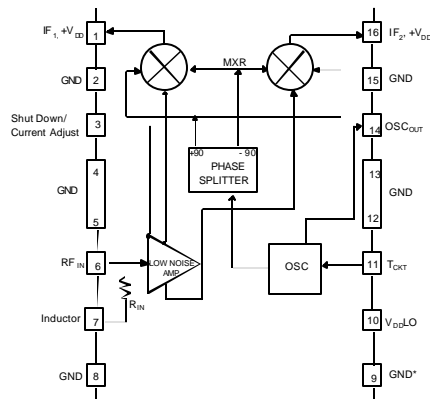
PARAMETER	MIN.	TYP.	MAX.	UNIT
Conversion Gain <sup>1</sup> 5V 3.3V	5.0 4.0	8.0 7.0	-	dB
Gain Flatness <sup>1</sup> 5V 3.3V	-	0.8 1.8	-	dB
SSB Noise Figure <sup>1</sup> 5V 3.3V	-	6.5 7.5	-	dB
CSO <sup>2</sup> 5V 3.3V	-	-60 -53	-	dBc
CTB <sup>2</sup> 5V 3.3V	-	-67 -60	-	dBc
Cross Modulation <sup>3</sup>	-	-62	-60	dBc
2-Tone 2nd Order Input IP <sup>4</sup> 5V 3.3V	-	95 88	-	dBmV
2-Tone 3rd Order Input IP <sup>4</sup> 5V 3.3V	-	70 66	-	dBmV
LO Phase Noise <sup>5</sup>	-	-86	-	dBc/Hz
LO Power to Prescaler	-7	-0	-	dBm
LO to RF Leakage	-	20	-	dBm
LO to IF Leakage	-	34	-	dBm
RF to IF Isolation	30	36	-	dB
Tuning Voltage <sup>1</sup>	1.0	-	27	V
VDDIF	3.14	5.0	5.25	V
VDDL0	3.14	5.0	5.25	V
IDDIF		65	85	mA
IDDL0		80	95	mA
Power Consumption 5V 3.3V		770 400	900	mW

Notes:

1. As measured in ANADIGICS test fixture
2. 128 Channels @ + 7 dBmV
3. 128 Channels, 99% Modulation @ 15 KHz
4. Two tones @ -15 dBm (33.75 dBmV) each
5. At 10 KHz offset

dBc = dB below carrier  
dBmV = dBm + 48.75

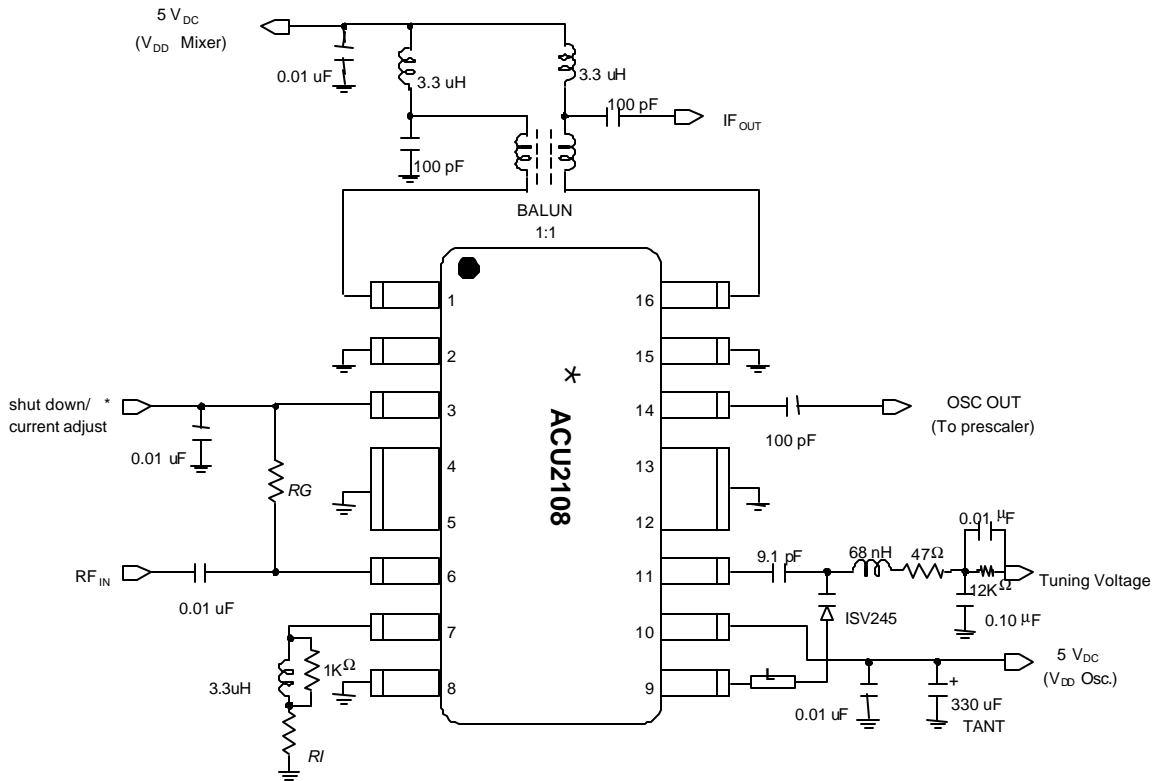
## Functional Block Diagram



\* Varactor return. Do not connect to common ground

Operating Ranges

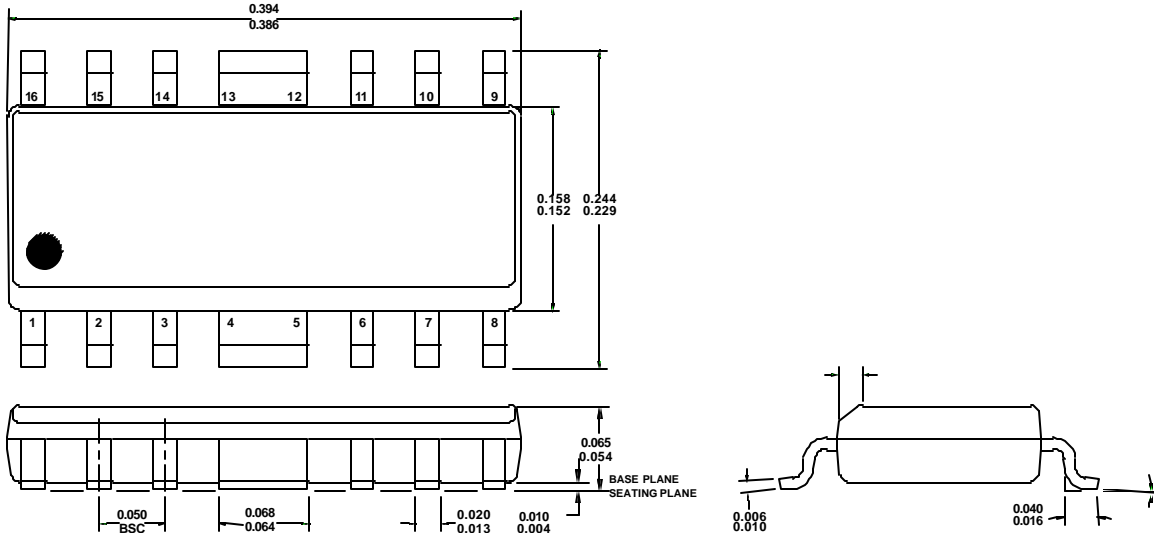
PARAMETER		MIN	TYP	MAX	UNITS
Frequency	RF	50	-	860	MHz
	IF	1000	-	1300	
	LO	950	-	2060	
$V_{TUNE}$		1.5	-	27	Volts
$V_{DDIF}$		3.14	5	5.25	Volts
$V_{DDL0}$		3.14	5	5.25	Volts
$I_{DDIF}$		-	65	85	mA
$I_{DDL0}$		-	80	95	mA



NOTES:

- L = Printed inductor
- RG = Gain control/impedance match resistor (240 W for 8 dB gain)
- RI = Current adjust resistor 2.7 W for 60 mA mixer current
- \* = Apply -2V DC for shutdown, 0 < VDC < 0.3 for 60 mA mixer current

Package Outline



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