



# ACD0900S3C

## VHF/UHF CATV/TV Tuner Downconverter DATA SHEET - Rev . 0

### FEATURES

- **Integrated Monolithic Downconverter**
- **8 dB Noise Figure**
- **10 dB Conversion Gain**
- **High Linearity**
- **Small Size**
- **Low Cost**
- **High Reliability**

### DESCRIPTION

The ACD0900 MMIC is a high performance downconverter fabricated entirely in GaAs. It is designed for use as the 2<sup>nd</sup> conversion stage in double-conversion tuners and cable modems, downconverting 900 -1200 MHz RF inputs to a fixed IF of 35 - 150 MHz (depending on LO frequency).

The IC incorporates a low noise amplifier, high linearity double balanced mixer, phase splitter and oscillator in a SOIC 16 lead surface mount package. The high degree of functionality allows tuner manufactures to reduce size and cost by lowering the component count and decreasing the amount of production alignment steps, while significantly improving performance and reliability.



**S3C**  
**16 Pin SOIC Package**

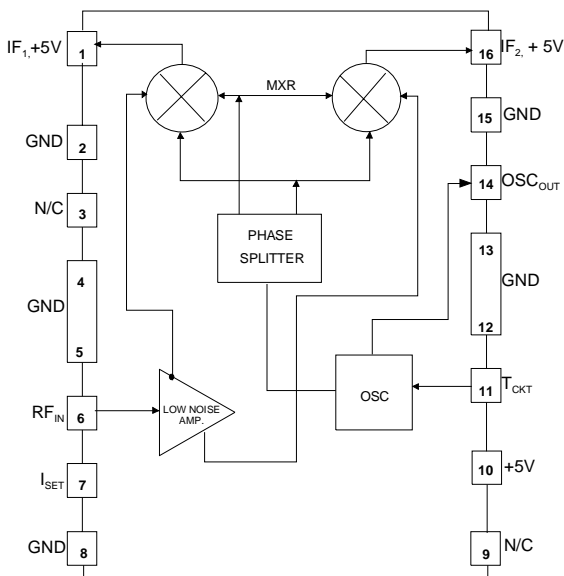
### OPERATING RANGES

PARAMETERS	MIN	TYP	MAX	UNITS
Frequency				
RF	900	-	1200	MHz
LO	935		1350	
IF	35		150	
VDD	4.75	5.0	5.25	Volts
IDD		-	110	MA
Case Temperature	- 55	-	85	°C

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	MAX.	UNITS
VDD/VIF/VOSC/VLO	-	9	Volts
V <sub>RF</sub> /V <sub>TCKT</sub> *	-	0	Volts
Storage Temperature	- 55	200	°C
Soldering Temperature	-	260	°C
Soldering Time	-	5	Sec.
RF Input Power	-	+ 10	dBm
LO Input Power	-	+ 17	dBm
Thermal Resistance	-	25	°C/W

\*V<sub>TCKT</sub> : Maximum voltage that may be applied to pin 11 of the device without damaging the IC. DC blocking capacitor (1500pF) between pin11 and the external tuning circuit is mandatory.

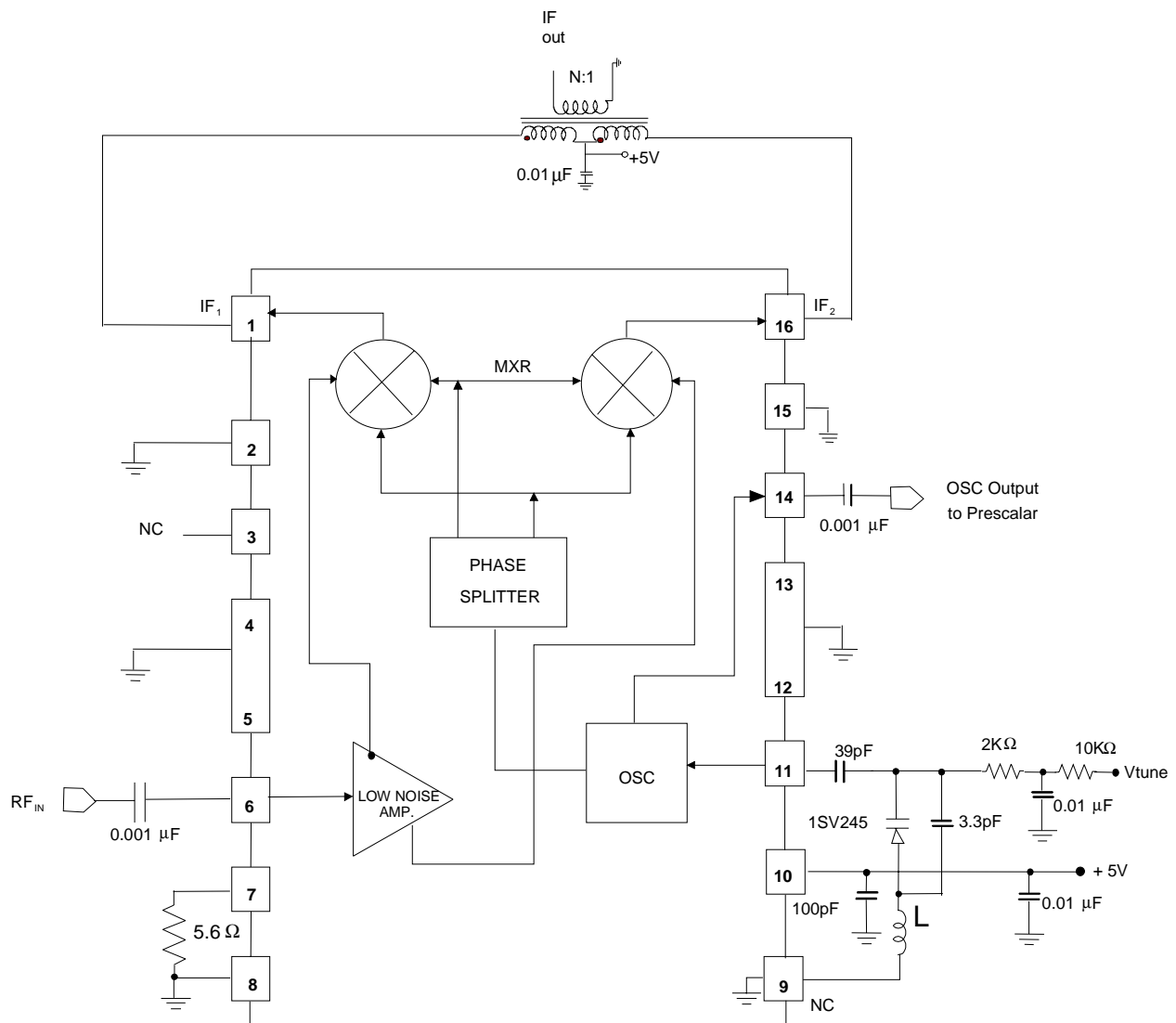


**ELECTRICAL SPECIFICATIONS: (Packaged Units, T<sub>A</sub> = +25°C, V<sub>DD</sub> = +5V)**

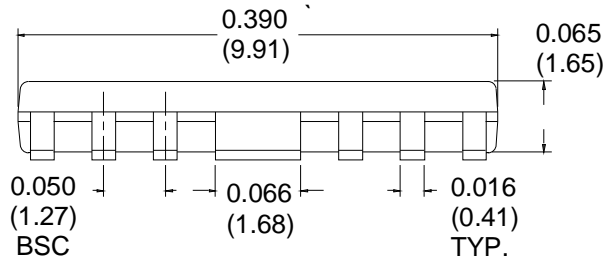
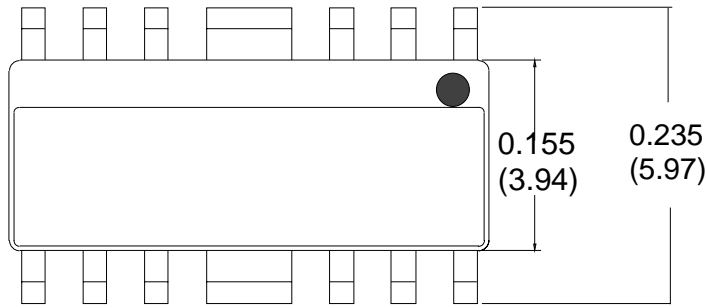
PARAMETER	MIN.	TYP	MAX.	UNITS
Frequencies				
RF	-	1170	-	MHz
LO	-	1245	-	MHz
IF	-	75	-	MHz
Current	-	80	-	mA
Power Consumption @ 5.0V	-	400	-	mW
Phase Noise @ 10 KHz Offset	-	- 89	- 85.5	dBc/Hz
Noise Figure	-	8.0	9.5	dB
Gain ( 200Ω Load) <sup>1</sup>	7.8	9.5	-	dB
3rd Order IMD (200Ω Load) <sup>2</sup>		- 59	- 54	dBc
3rd Order Input IP ( 200Ω Load) <sup>2</sup>	+ 12	-	-	dBm
Cross Modulation @ 15 KHz, <sup>2</sup> 99% AM Modulation	-	- 56	-	dBc

1. Combined output ( IF<sub>1</sub> + IF<sub>2</sub>) using a balun. NOTE: Gain at either port (uncombined), with unused port terminated in 50Ω, is 3 dB lower

2. Two tones @ - 15 dBm per tone

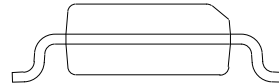


PACKAGE OUTLINE



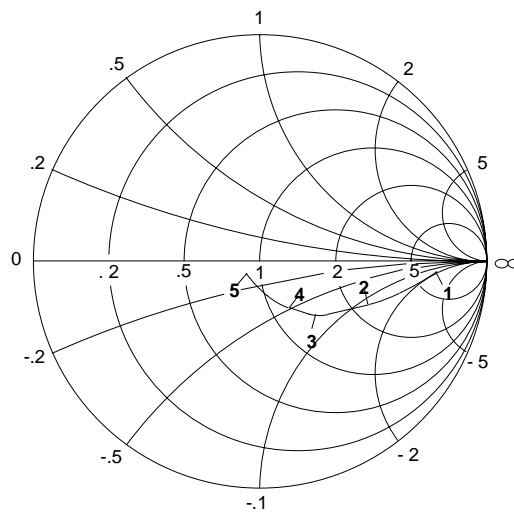
PIN	Function
1	IF <sub>1</sub> , +5V
2	GND
3	NC
4	GND
5	GND
6	RFIN
7	ISET
8	GND
9	NC*
10	+ 5V
11	T <sub>CKT</sub>
12	GND
13	GND
14	OSC Out
15	GND
16	IF <sub>2</sub> , +5V

\* Do not connect pin 9 to GND



RF INPUT IMPEDANCE

START:50MHz  
STOP: 2000MHz

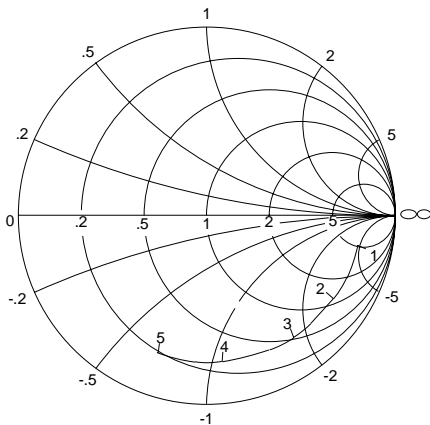


1:	50 MHz 183.00Ω - 21.75 jΩ
2:	250 MHz 135.48Ω -58.21 jΩ
3:	750 MHz 75.92Ω - 43.12 jΩ
4:	1000 MHz 64.93Ω - 32.29 jΩ
5:	2000 MHz 43.79Ω -4.71 jΩ

MEASURED IN 50Ω SYSTEM  
IMPEDANCE REFERENCE PLANE AT PIN 6

**IF OUTPUT IMPEDANCE**

START: 50 MHz  
 STOP: 500 MHz

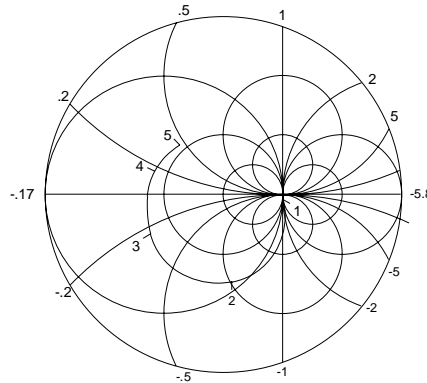


MEASURED IN 50Ω SYSTEM  
 IMPEDANCE REFERENCE PLANE AT PIN 16

1:	50 MHz	251.64Ω	- 222.35 jΩ
2:	150 MHz	60.89Ω	-144.22 jΩ
3:	250 MHz	26.32Ω	- 89.16 jΩ
4:	400 MHz	13.24Ω	- 49.55 jΩ
5:	500 MHz	10.08Ω	- 34.10 jΩ

**LO IMPEDANCE**

START: 50 MHz  
 STOP: 2000 MHz



MEASURED IN 50Ω SYSTEM  
 IMPEDANCE REFERENCE PLANE AT PIN 11

1:	50 MHz	259.67Ω	- 1200 jΩ
2:	612 MHz	- 20.97Ω	- 50.63 jΩ
3:	1000 MHz	- 9.28Ω	- 14.88 jΩ
4:	1500 MHz	- 5.36Ω	7.99 jΩ
5:	2000 MHz	0.64Ω	27.12 jΩ

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