ACD0900S3C

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

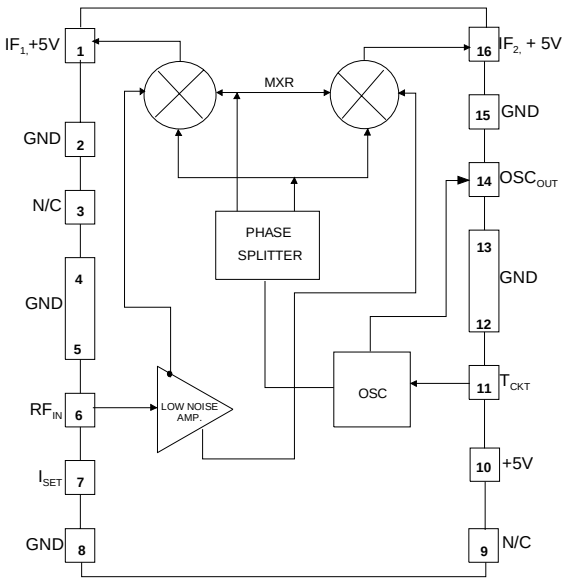
FEATURES
- **Integrated Monolithic Downconverter**
- **8 dB Noise Figure**
- **10 dB Conversion Gain**
- **High Linearity**
- **Small Size**
- **Low Cost**
- **High Reliability**

DESCRIPTION
The ACD0900 MMIC is a high performance downconverter fabricated entirely in GaAs. It is designed for use as the 2nd 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.

OPERATING RANGES

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



S3C
16 Pin SOIC Package

ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	MAX.	UNITS
$V_{DD}/V_{IF}/V_{OSC}/V_{LO}$	-	9	Volts
V_{RF}/V_{TCKT}*	-	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

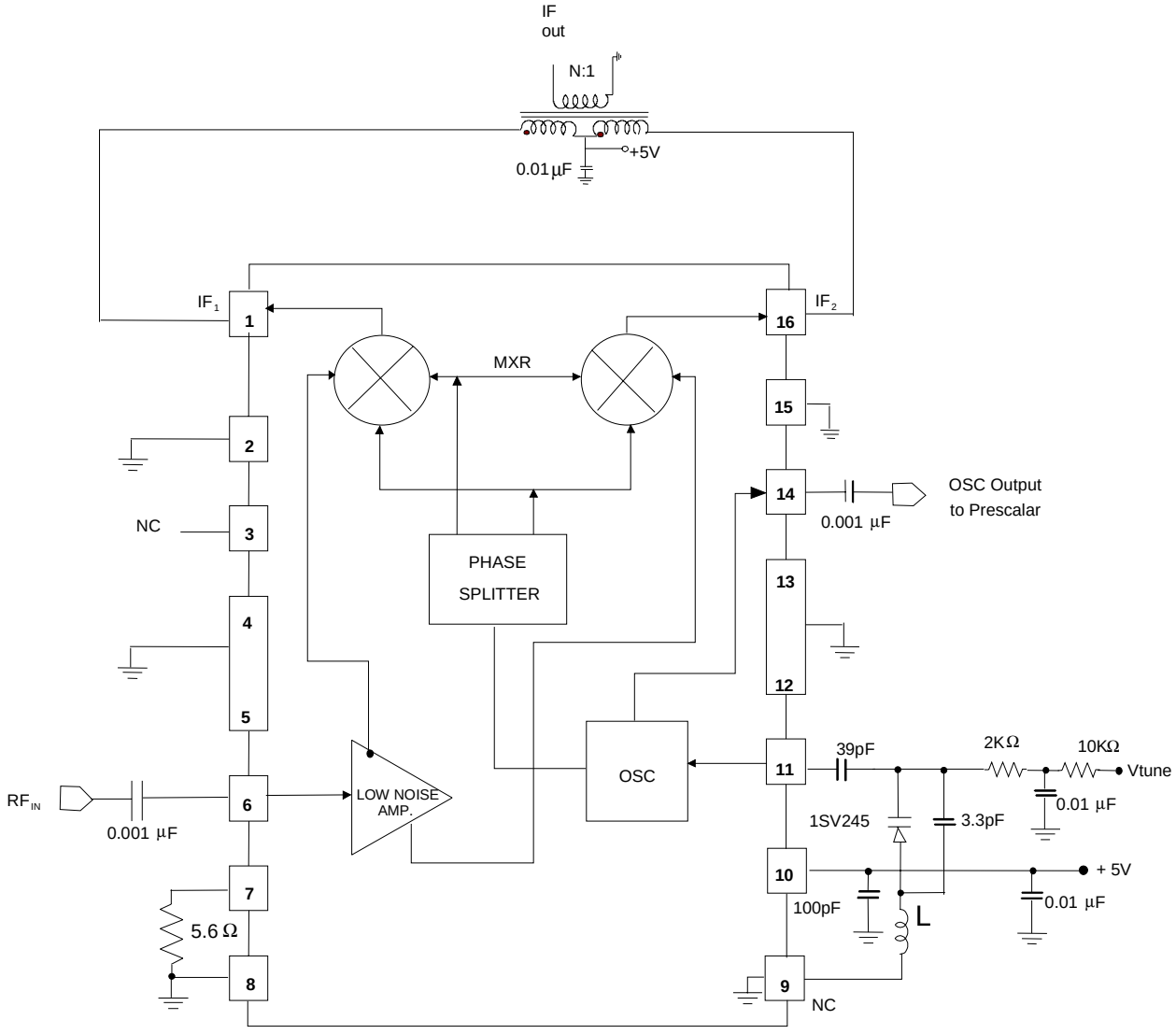
*V_{TCKT} : Maximum voltage that may be applied to pin 11 of the device without damaging the IC. DC blocking capacitor (1500pF) between pin11 and the external tuning circuit is mandatory.

ELECTRICAL SPECIFICATIONS: (Packaged Units, T_A = +25˚C, V_{DD} = +5V)

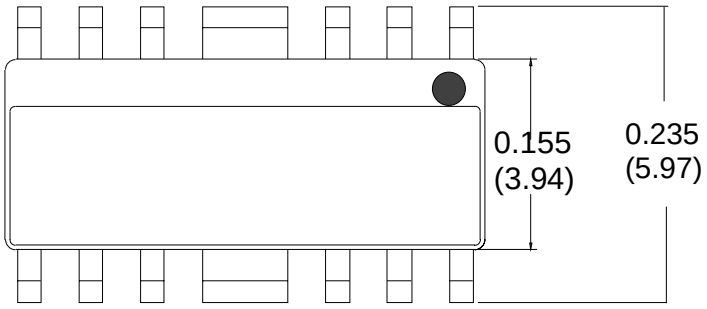
PARAMETER	MIN.	TYP	MAX.	UNITS
Frequencies RF LO IF	-	 1170 1245 75	-	 MHz
Current	-	80	-	mA
Power Consumption @ 5.0V	-	400	-	mW
Phase Noise @ 10 KHz Offset	-	- 89	- 85.5	dBc/Hz
Noise Figure	-	8.0	9.5	dB
Gain (200Ω Load)[1]	7.8	9.5	-	dB
3rd Order IMD (200Ω Load)[2]		- 59	- 54	dBc
3rd Order Input IP (200Ω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

1.Combined output (IF_1 + IF_2) 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

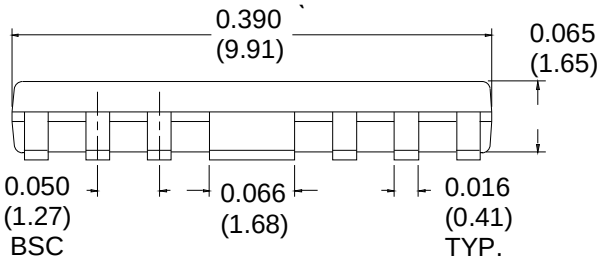


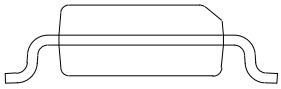
PACKAGE OUTLINE



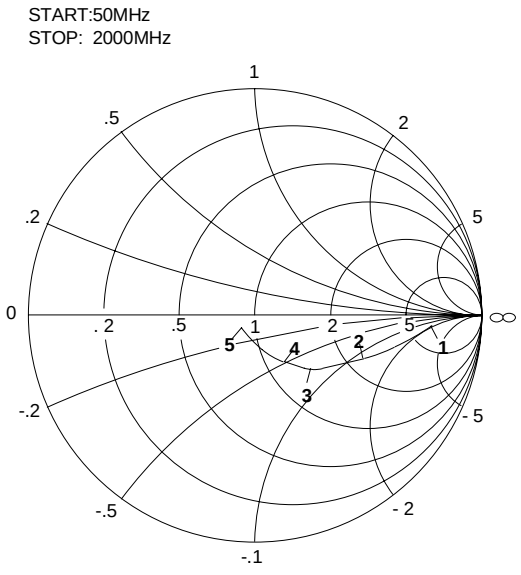
PIN	Function
1	$IF_{1,}$ +5 V
2	GND
3	NC
4	GND
5	GND
6	RF_{IN}
7	ISET
8	GND
9	NC*
10	+ 5V
11	T_{CKT}
12	GND
13	GND
14	OSC Out
15	GND
16	$IF_{2,,}$ +5V

* Do not connect pin 9 to GND





RF INPUT IMPEDANCE



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

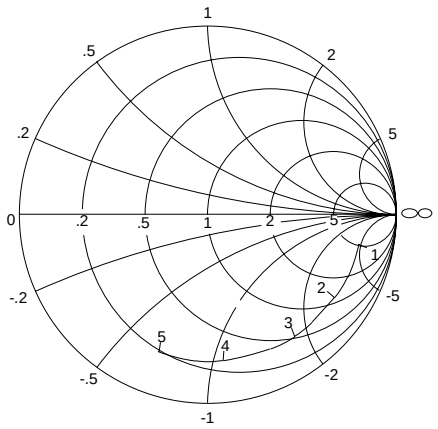
5 : 2000 MHz
43.79Ω
-4.71 jΩ

MEASURED IN 50Ω SYSTEM

IMPEDANCE REFERENCE PLANE AT PIN 6

IF OUTPUT IMPEDANCE

START: 50 MHz
STOP: 500 MHz

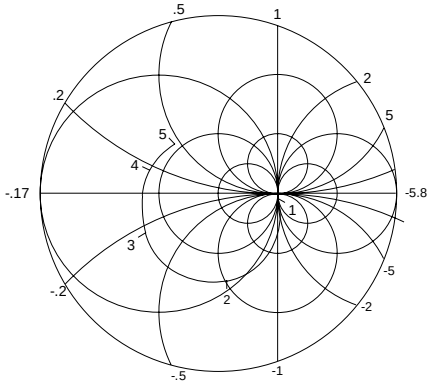


1:	50 MHz	251.64Ω - 222.35 jΩ
2:	150 MHz	60.89Ω -144.22 jΩ
3:	250 MHz	26.32Ω - 89.16 jΩ
4:	400 MHz	13.24Ω - 49.55 jΩ
5 :	500 MHz	10.08Ω - 34.10 jΩ

MEASURED IN 50Ω SYSTEM
IMPEDANCE REFERENCE PLANE AT PIN 16

LO IMPEDANCE

START: 50 MHz
STOP: 2000 MHz



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

MEASURED IN 50Ω SYSTEM
IMPEDANCE REFERENCE PLANE AT PIN 11

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