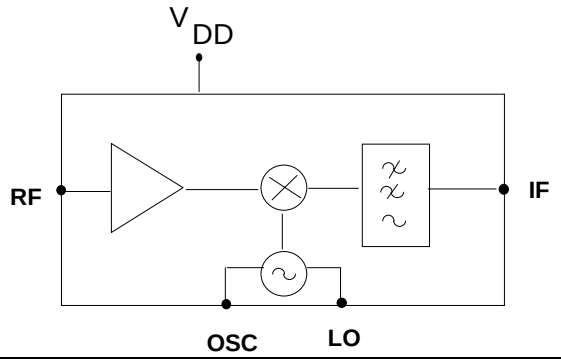
ADC20013
950 – 2050 MHz DBS Tuner IC
Data Sheet

Rev 8

FEATURES	FUNCTIONAL BLOCK DIAGRAM
■ Monolithic BS tuner IC ■ On Chip Oscillator ■ 6 dB Noise Figure ■ 11 dB Conversion Gain ■ Single + 5V Supply ■ Small Size ■ Low Cost ■ High Reliability ■ Surface Mount Package	

The ANADIGICS DBS (Direct Broadcast Satellite) Tuner IC is intended for use in high volume, low cost manufacturing of compact DBS tuners for satellite receivers and integrated satellite ready TV/VTR receivers.
The ADC20013 Tuner IC provides DBS tuner manufacturers the ability to produce, in high volumes, tuners with low component count, minimal tuning, small size, high reliability and exceptional price-performance ratios.
The ADC20013 offers a high degree of functionality in a very small and user friendly configuration.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	MAX.	UNITS
V_{DD}/V_{IF}	0	+7	V
V_{LO}	- 5	+.5	V
V_{RF}	- 10	+.5	V
V_{OSC}	- 5	+ 5	V
Case Temperature	- 55	+ 85	^{o}C
Storage Temperature	- 55	+ 100	^{o}C
Input Power RF		+ 10	dBm
Input Power LO		+ 17	dBm

ELECTRICAL SPECIFICATIONS

(Packaged unit, T_A = 25 ^{O}C, V_{DD} = + 5V)

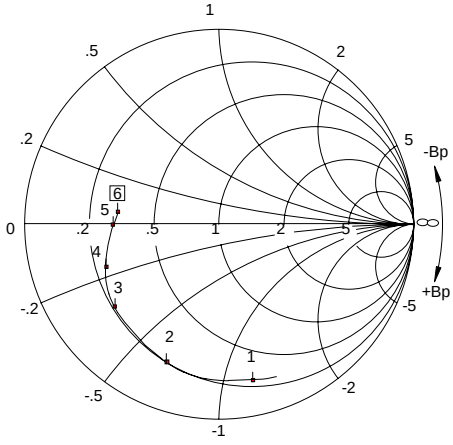
PARAMETER	MIN.	TYP.	MAX.	UNITS
Frequency RF LO[1] IF	 950 1430	 480	 2050 2530	 MHz MHz MHz
Conversion Gain[6]	6	11		dB
SSB Noise Figure[6]		6.5	11	dB
Third Order IMD[4] (-20 dBm Tones, 5 MHz Apart)		- 40	-35	dBc
Second Order IMD (-20 dBm Input Level)		- 25	- 20	dBc
LO Leakage [1,2] RF Port IF Port		 - 30 0	 - 25 3	 dBm dBm
LO Output Level for PLL [3]	-8	- 4		dBm
Tuning Voltage [1](V_T)	1		20	Volts
VCO Phase Noise[5] 10 kHz Offset 100 kHz Offset		 - 70 - 100	 - 65 - 95	 dBc/Hz dBc/Hz
Input Impedance[7]				
Output Impedance [7]				
Power Supply Current (+ 5V)		60	85	mA

NOTES

1. Measured in ANADIGICS test fixture with Toshiba 1SV186 off-chip-varactor.
2. Includes external coupling through test fixture.
3. Oscillator output for external PLL. (Pin 14)
4. Measured at 1450 & 1750 MHz.
5. Measured using PLL (LBW =1KHz, Reference = 1.25 MHz, Step Size = 10 MHz).
6. Measured in ANADIGICS test set-up.
7. See Smith charts.

INPUT IMPEDANCE DATA (RF)

1. IMPEDANCE REFERENCE AT PIN 6
2. VCO ON Vt = 3.20 VOLTS
3. Vdd = + 5 VOLTS
4. USE EXTERNAL BIAS TEE FOR IF



MEASURED IN 50 Ω SYSTEM

1 0.950 GHz
8.40 Ω
- 61.53 j Ω

2 1.250 GHz
8.12 Ω
-34.53 j Ω

3 1.550 GHz
10.13 Ω
- 19.90 j Ω

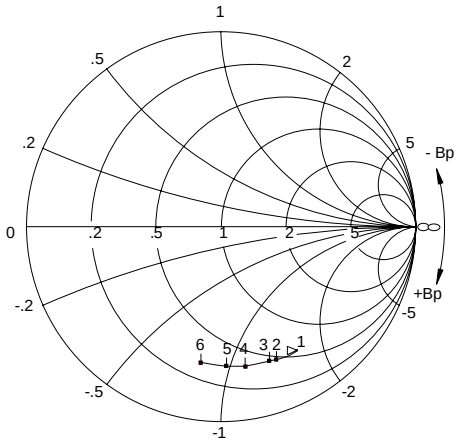
4 1.750 GHz
12.75 Ω
- 8.70 j Ω

5. 1.900 GHz
15.23 Ω
- 3.03 jΩ

6. 2.050 GHz
16.33 Ω
- 0.27 j Ω

OUTPUT IMPEDANCE DATA (IF)

1. IMPEDANCE REFERENCE AT PIN 2
2. VCO ON Vt = 3.20 VOLTS
3. Vdd = + 5 VOLTS
4. USE EXTERNAL BIAS TEE FOR IF



MEASURED IN 50 Ω SYSTEM

1 0.40 GHz
26.8 Ω
- 82.8 j Ω

2 0.48 GHz
22.2 Ω
- 70.0 j Ω

3 0.50 GHz
21.4 Ω
- 67.5 j Ω

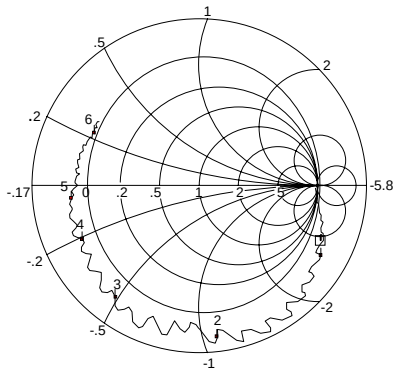
4 0.60 GHz
18.1 Ω
- 56.2 j Ω

5. 0.70 GHz
15.9 Ω
- 48.7 jΩ

6. 0.80 GHz
14 Ω
- 41.2 j Ω

LO IMPEDANCE DATA

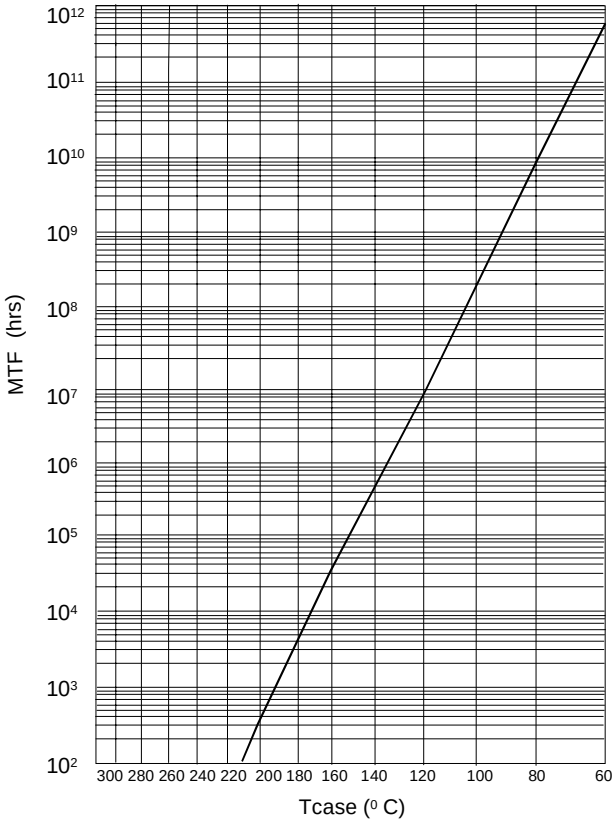
1. IMPEDANCE REFERENCE AT PIN 11
2. Vdd = + 5 VOLTS



MEASURED IN 50 Ω SYSTEM

1	500.0 MHz - 60.83 Ω - 169.80 j Ω
2	1000.0 MHz -15.15 Ω -54.41 j Ω
3	1430.0 MHz - 5.71 Ω - 24.62 j Ω
4	1700.0 MHz - 2.80 Ω - 12.02 j Ω
5.	1922.0 MHz - 2.83 Ω - 4.25 jΩ
6.	2768.0 MHz 0.54 Ω --11.31 j Ω

MTF vs Tcase
(ADC Series)



$\theta_{JC} \simeq 60^0$ C/W