

Ordering number : ENN8387



SANYO Semiconductors

DATA SHEET

LA8151V

Monolithic Linear IC
Downconverter IC
for Digital CATV

Overview

The LA8151V is a downconverter IC for digital CATV. It accepts RF input frequencies from 50 to 280 MHz and supports the DOCSIS (USA) and Euro-DOCSIS (Europe) standards.

Features

- RF Attenuator.
- RF Mixer.
- Driver for SAW filter.
- IF AGC amplifier.
- IF Driver amplifier for ADC.

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$	Pin 5, 10, 14, 15	6.0	V
Circuit voltages	V max	Pin 6	V_{CC}	V
Circuit current	$I_{8,9}$	Pin 8, 9 sink current	2	mA
Allowable power dissipation	$Pd\ max$	$T_a \leq 70^\circ\text{C}$	510*	mW
Operating temperature range	T_{opr}		-20 to 70	$^\circ\text{C}$
Storage temperature range	T_{stg}		-55 to 150	$^\circ\text{C}$

* On the board (114.3×76.1×1.6mm)

Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	Pin 5, 10, 14, 15	5.0	V
Operating supply voltage range	$V_{CC\ op}$	Pin 5, 10, 14, 15	4.5 to 5.5	V

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AC Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$

Parameter	Symbol	Pin No.	Conditions	Ratings			Unit
				min	typ	max	
Circuit current	I_{total}	5, 10, 14, 15	No Signal	55	65	78	mA
RF input frequency range*1	$f_{(\text{RF})}$	16, 17	$F_c = -3\text{dB}$	50		280	MHz
RF AGC range*1	GR1	19, 20	$V_6 = 0.5$ to 2.5V	30	36		dB
Mixer conversion gain*1	CG1	19/16, 17 20/16, 17	$V_6 = 2.5\text{V}$	21	24	27	dB
Mixer inter modulation 1*1	IM3 1	19/16, 17 20/16, 17	Input = $70\text{dB}\mu\text{V}$ $V_6 = 2.5\text{V}$	50	55		dB
IF input frequency range*2	$f_{(\text{IF})}$	2, 3	$F_c = -3\text{dB}$	30		100	MHz
IF amplifier gain *2	$G_{(\text{AGC})}$	8/2, 3 9/2, 3	$V_6 = 2.5\text{V}$	34	38	42	dB
IF inter modulation 2*2	IM3 2	8/2, 3 9/2, 3	Output = $104\text{dB}\mu\text{V}$ @2tone each	45	50		dB
IF AGC range *2	GR2	8, 9	IF Output Level $< \pm 1\text{dB}$	6	8		dB
IF output level*2	$V_{O(\text{IF})1}$	8	Single output		1.0		Vp-p
IF output level*2	$V_{O(\text{IF})2}$	9	Single output		1.0		Vp-p

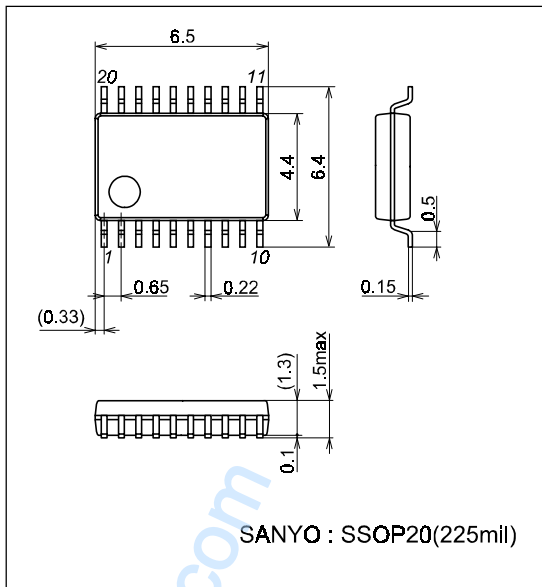
*1 Measurement circuit 1

*2 Measurement circuit 2

Package Dimensions

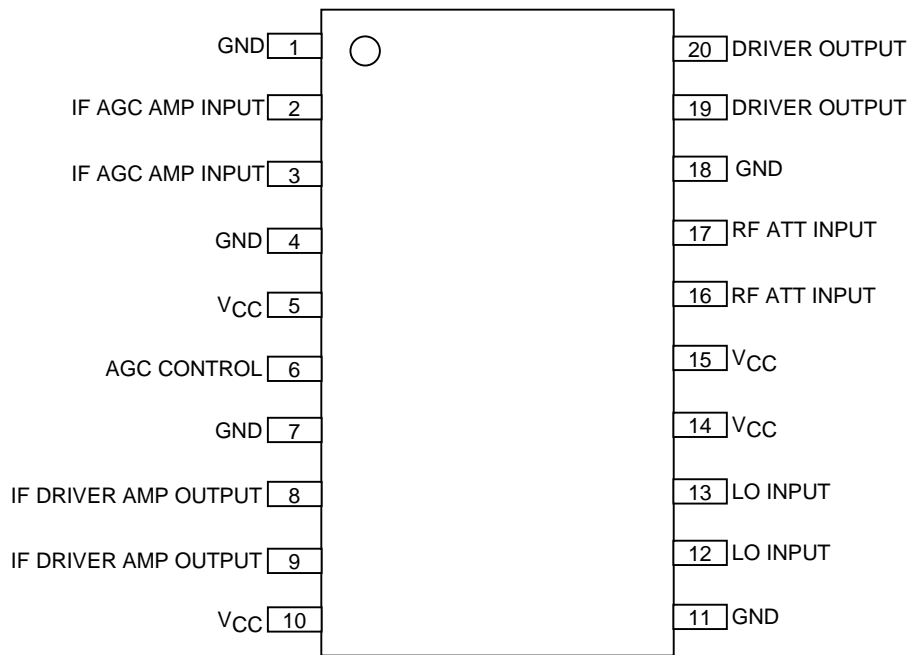
unit: mm

3179C

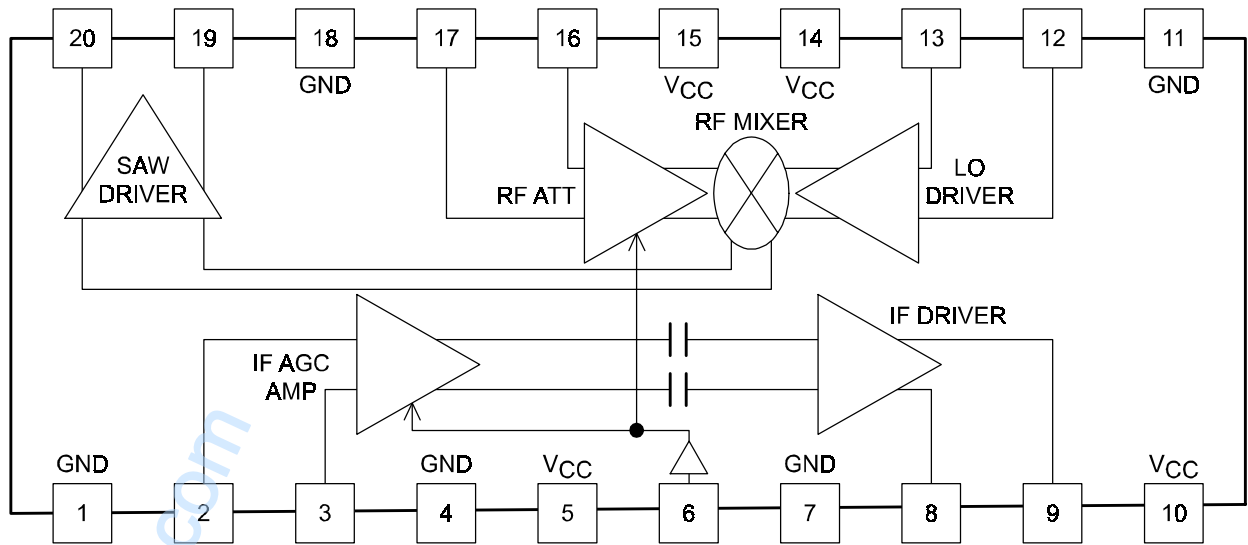


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Pin Assignment



Block Diagram

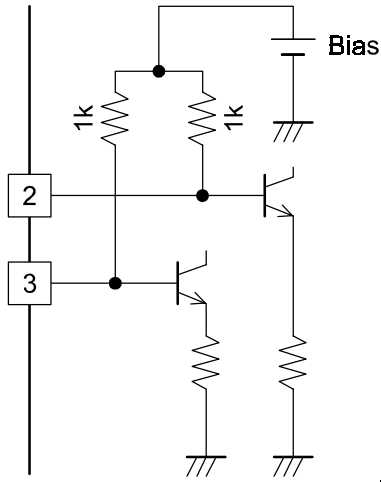
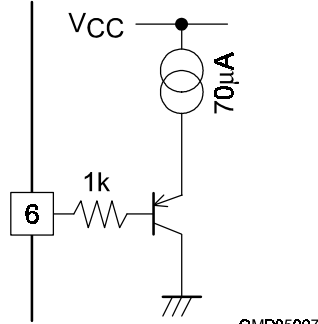
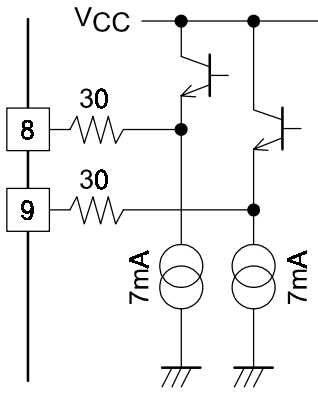


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Pin Description

(unit: Ω)

Pin Number	Description	Equivalent circuit
1	GND	
2 3	AGC Amp Input	 <p style="text-align: right;">OMP05096</p>
4	GND	
5	V _{CC}	
6	AGC Control	 <p style="text-align: right;">OMP05097</p>
7	GND	
8 9	Post Amp Outputs	 <p style="text-align: right;">OMP05098</p>
10	V _{CC}	
11	GND	

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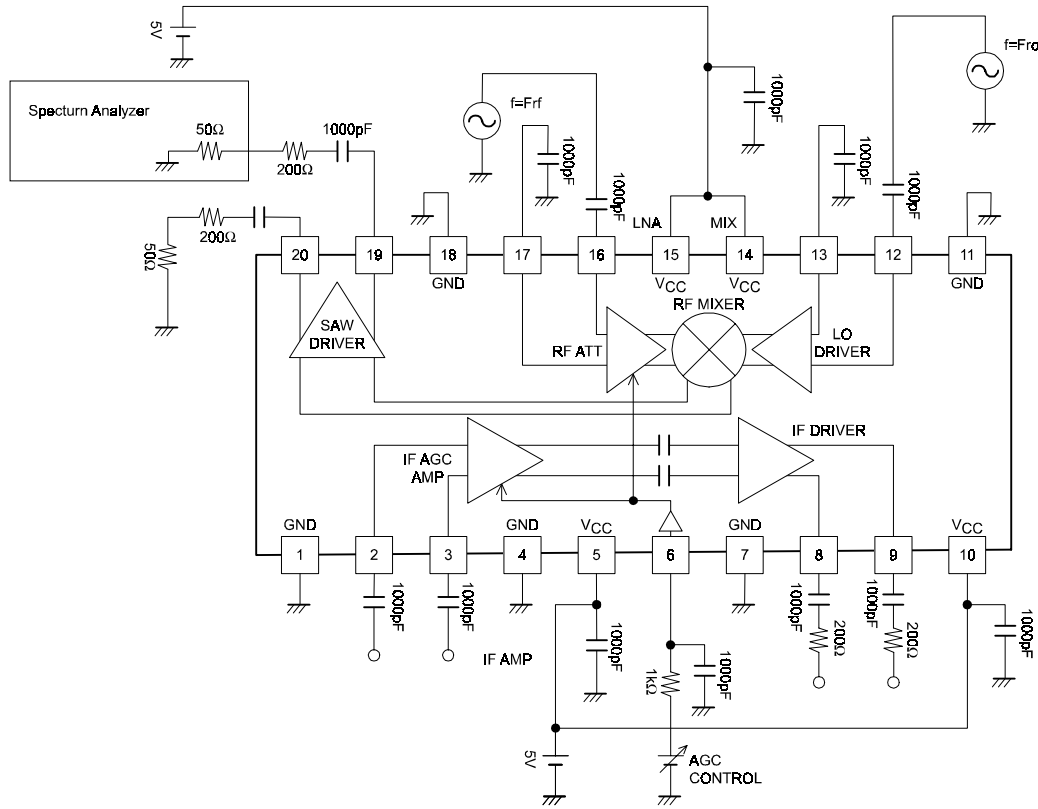
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(unit: Ω)

Pin Number	Description	Equivalent circuit
12 13	LO Input	<p>OMP05099</p>
14 15	V_{CC}	<p>OMP05100</p>
16 17	LNA Inputs	<p>OMP05100</p>
18	GND	
19 20	Driver Outputs	<p>OMP05101</p>

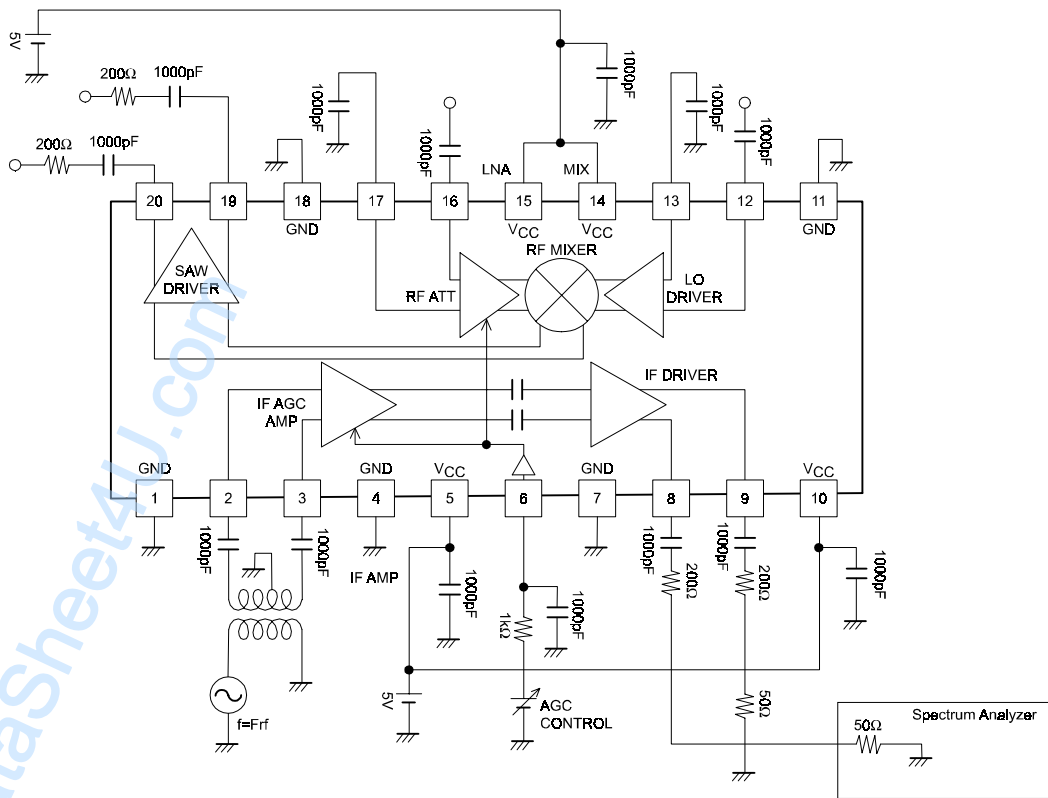
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Measurement Circuit 1



OMB05025

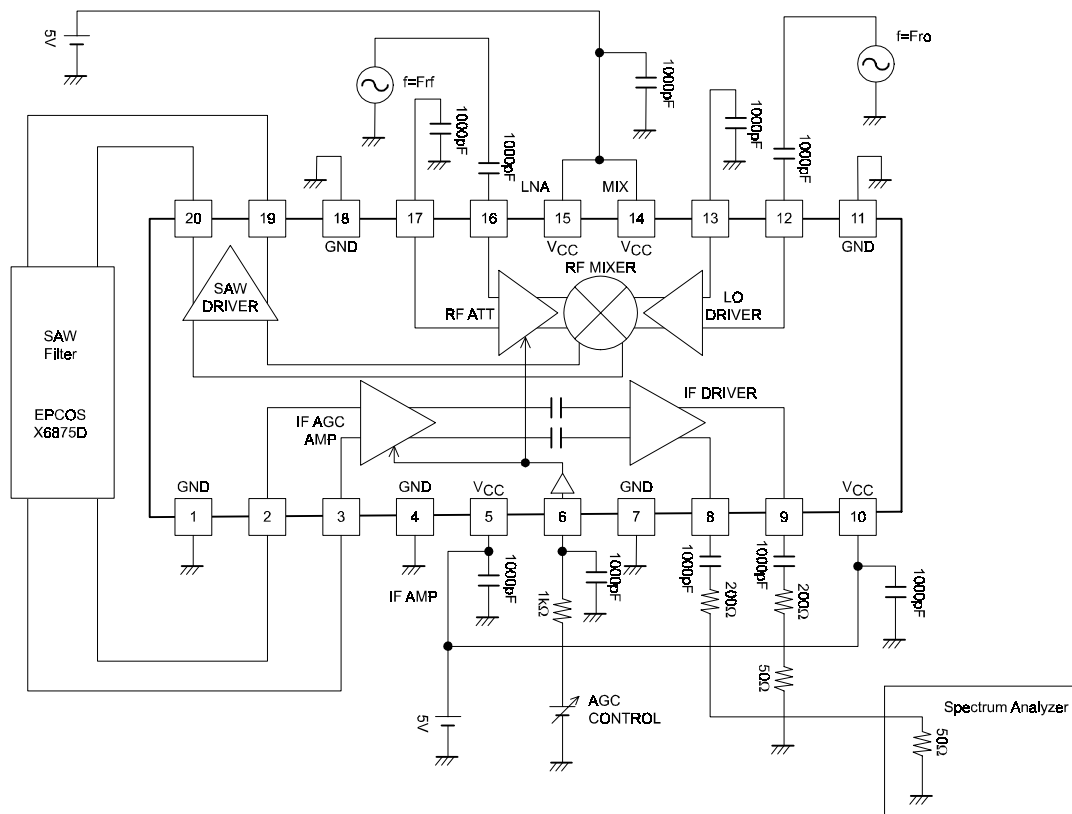
Measurement Circuit 2



OMB05026

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Application Circuit



OMB05024

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