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 Ta = 25°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	Ta≤70 °C	510*	mW
Operating temperature range	Topr		-20 to 70	°C
Storage temperature range	Tstg		-55 to 150	°C

* On the board (114.3×76.1×1.6mm)

Operating Conditions at Ta = 25°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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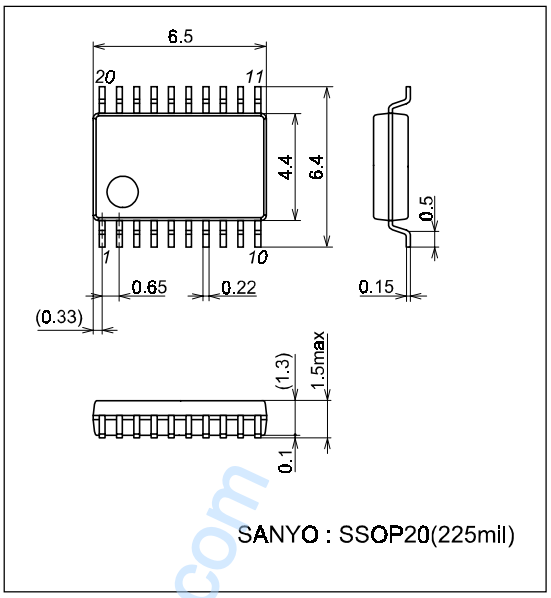
AC Characteristics at Ta = 25°C, V_{CC} = 5.0V

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	$f_{(RF)}$	16, 17	Fc = -3dB	50		280	MHz
RF AGC range*1	GR1	19, 20	V6 = 0.5 to 2.5V	30	36		dB
Mixer conversion gain*1	CG1	19/16, 17 20/16, 17	V6 = 2.5V	21	24	27	dB
Mixer inter modulation 1*1	IM3 1	19/16, 17 20/16, 17	Input = 70dBμV V6 = 2.5V	50	55		dB
IF input frequency range*2	$f_{(IF)}$	2, 3	Fc = -3dB	30		100	MHz
IF amplifier gain *2	$G_{(AGC)}$	8/2, 3 9/2, 3	V6 = 2.5V	34	38	42	dB
IF inter modulation 2*2	IM3 2	8/2, 3 9/2, 3	Output = 104dBμV @2tone each	45	50		dB
IF AGC range *2	GR2	8, 9	IF Output Level < ±1dB	6	8		dB
IF output level*2	$Vo_{(IF)}1$	8	Single output		1.0		Vp-p
IF output level*2	$Vo_{(IF)}2$	9	Single output		1.0		Vp-p

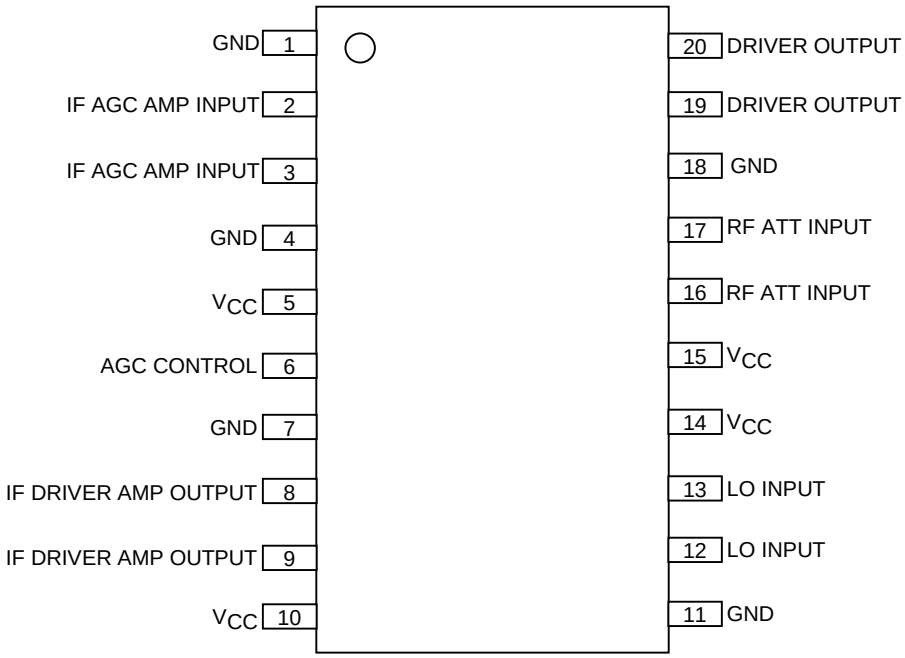
*1 Measurement circuit 1
*2 Measurement circuit 2

Package Dimensions

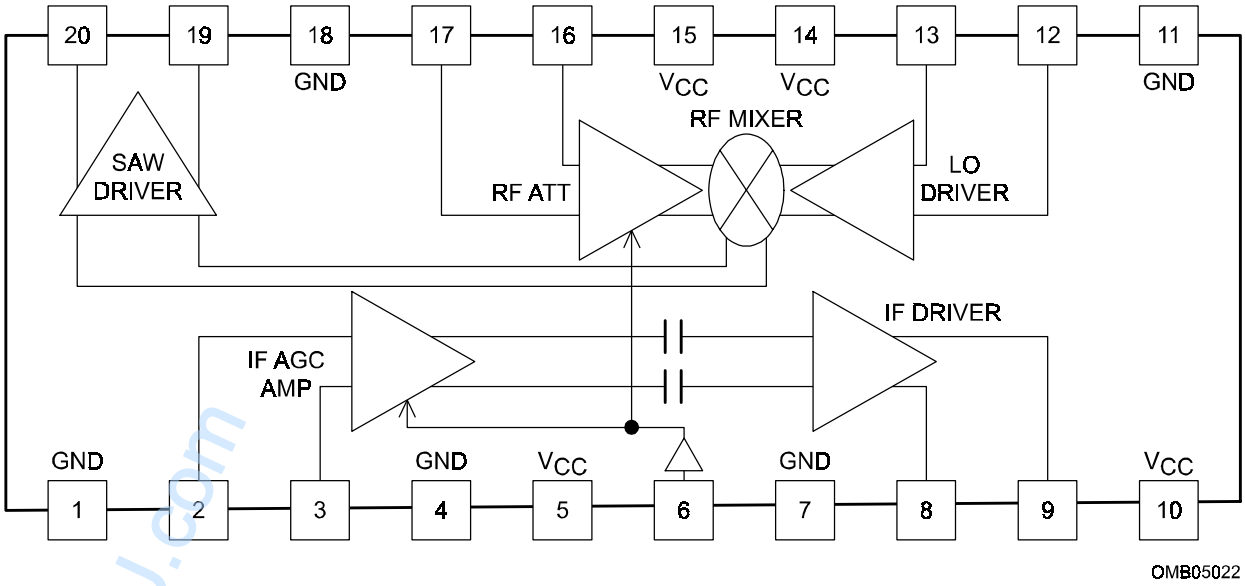
unit: mm
3179C



Pin Assignment

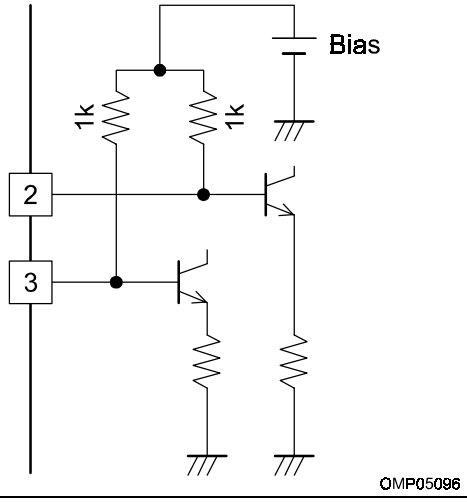
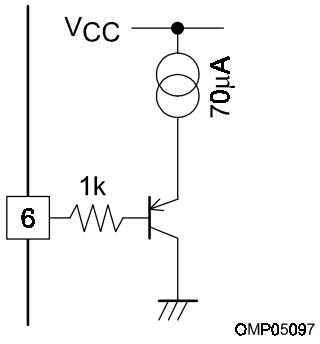
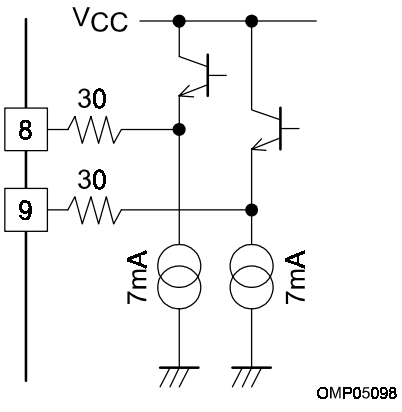


Block Diagram



Pin Description

(unit: Ω)

Pin Number	Description	Equivalent circuit
1	GND	
2 3	AGC Amp Input	
4	GND	
5	V_{CC}	
6	AGC Control	
7	GND	
8 9	Post Amp Outputs	
10	V_{CC}	
11	GND	

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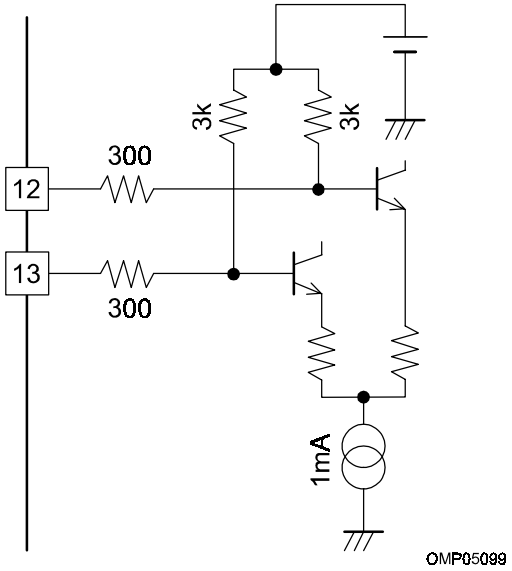
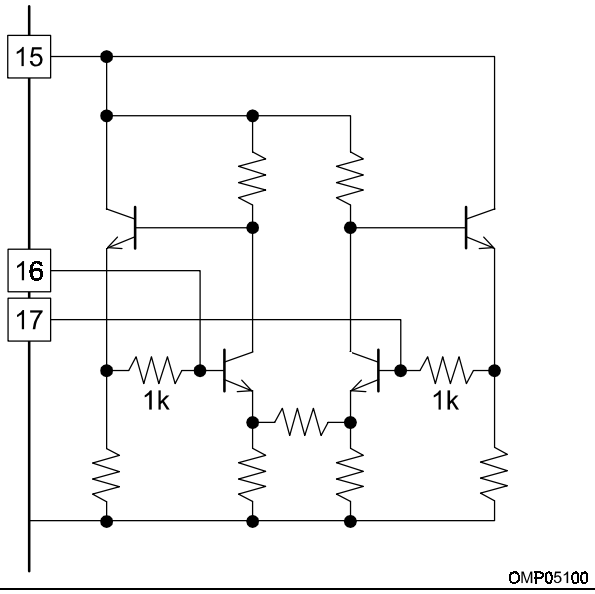
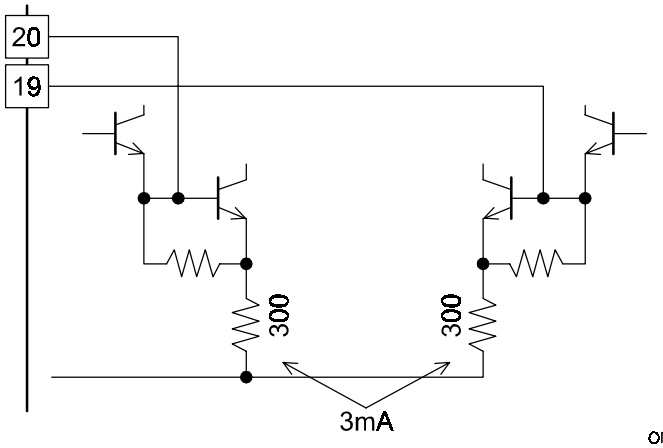
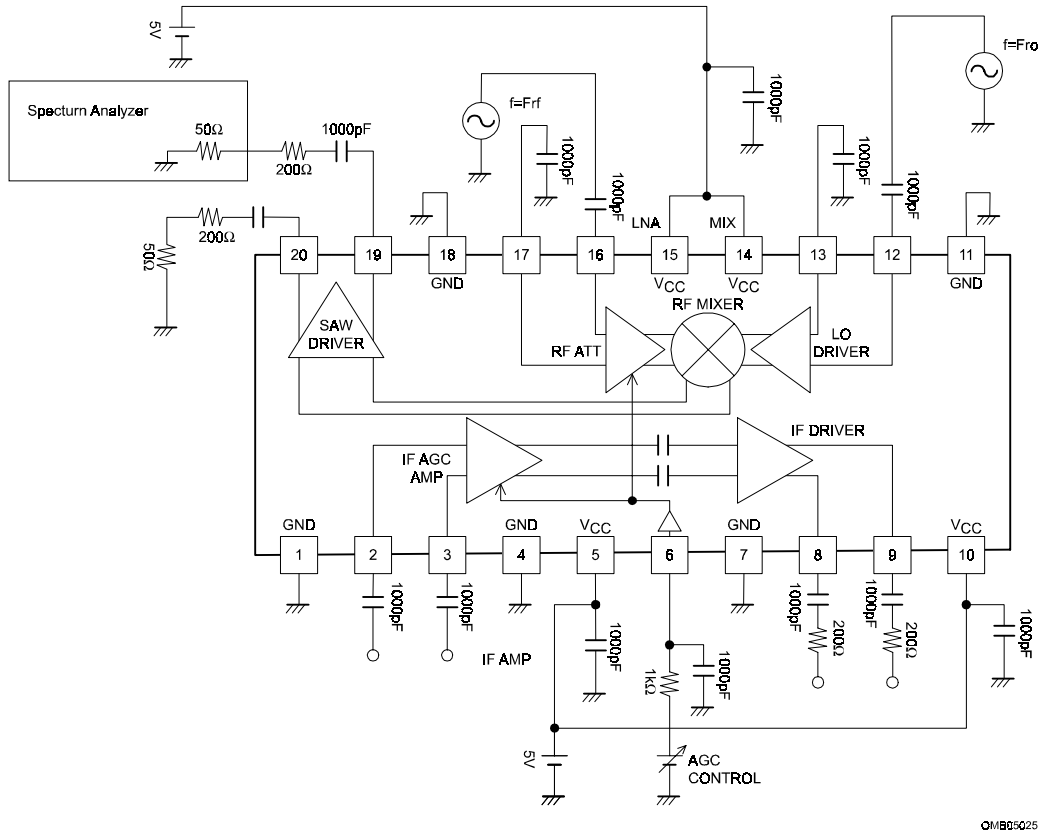
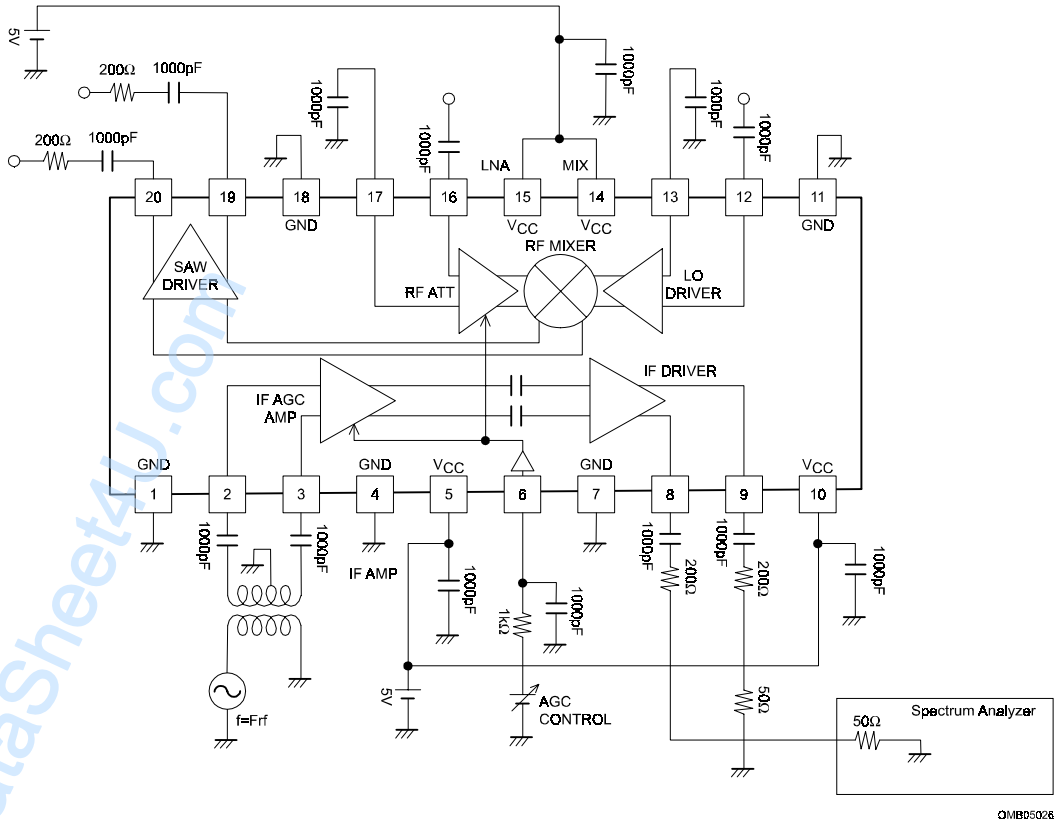
(unit: Ω)

Pin Number	Description	Equivalent circuit
12 13	LO Input	
14 15	V_{CC}	
16 17	LNA Inputs	
18	GND	
19 20	Driver Outputs	

Measurement Circuit 1



Measurement Circuit 2



Application Circuit