



SANYO Semiconductors

# DATA SHEET

## LA8153LF

### Monolithic Linear IC For Digital CATV Down Converter IC

#### Overview

The LA8153LF is a down converter IC for digital CATV. It accepts RF input frequencies 50MHz to 150MHz. It has the power save function.

#### Functions

- RF Mixer
- RF AGC amplifier
- Driver for SAW filter
- IF AGC amplifier
- IF Post amplifier for ADC
- Power save

#### Specifications

##### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max	Pins 3, 6, 17, 18, 27, 28	3.6	V
Circuit voltage	V max	Pin 11	V <sub>CC</sub>	V
Allowable power dissipation	Pd max	Ta ≤ 70°C, Mounted on a specified board. *	750	mW
Operating temperature	T <sub>opr</sub>		-20 to +70	°C
Storage temperature	T <sub>stg</sub>		-55 to +150	°C

\* Specified board: 40mm × 50mm × 0.8mm, FR4, 4 layer, without soldering the Exposed Die Pad to PCB.

##### Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended Supply Voltage	V <sub>CC</sub>	Pins 3, 6, 17, 18, 27, 28	3.3	V
Operating Supply Voltage Range	V <sub>CC</sub> op	Pins 3, 6, 17, 18, 27, 28	3.2 to 3.4	V

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# LA8153LF

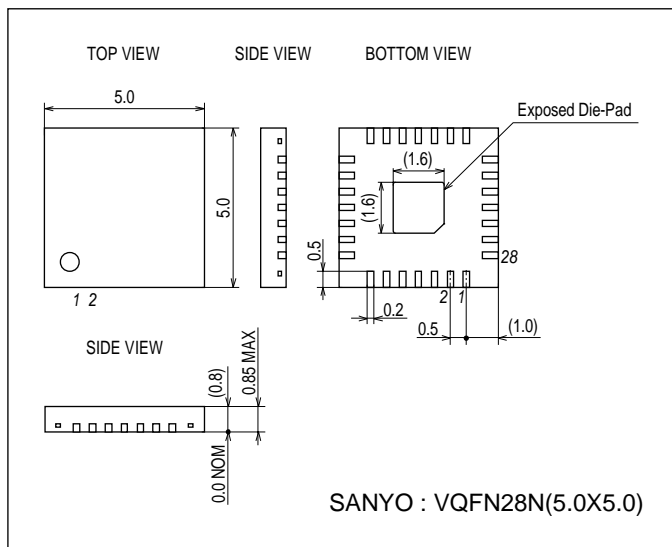
**Electrical Characteristics** at Ta = 25°C, VCC = 3.3V

Parameter	Symbol	Pin No.	Conditions	Ratings			Unit
				min	typ	max	
Circuit Current	I <sub>total</sub>	3, 6, 17, 18, 27, 28	No Signal	77	100	130	mA
Power Save Current	I <sub>ps</sub>	3, 6, 17, 18, 27, 28	No Signal	17	23	32	mA
RF Input Frequency Range	f(RF)	8, 9	f <sub>c</sub> = -3dB	50		150	MHz
RF AGC Range	GR1	27, 28	V11=2.5 to 0V	40	48		dB
Mixer Conversion Gain	CG1	27 / 8 28 / 8	V11=2.5V	23	26	29	dB
Mixer Inter Modulation 1	IM3 (1)	27 / 8 28 / 8	Input=70dBμV V11=2.5V	40	50		dB
IF Input Frequency Range	f(IF)	23, 24	f <sub>c</sub> = -3dB	30		100	MHz
IF Amplifier Gain	G(AGC)	19 / 23, 24 20 / 23, 24	V11=2.5V	50	54	58	dB
IF Inter Modulation 2	IM3(2)	19 / 23, 24 20 / 23, 24	Output=105dBμV (99dBμV / tone)	50	60		dB
IF AGC Range	GR2	19, 20	IF Output Level < ±1dB	3	5		dB
IF AGC Output Level	V <sub>O</sub> (IF)1	19	Single output		0.5		Vp-p
IF AGC Output Level	V <sub>O</sub> (IF)2	20	Single output		0.5		Vp-p

## Package Dimensions

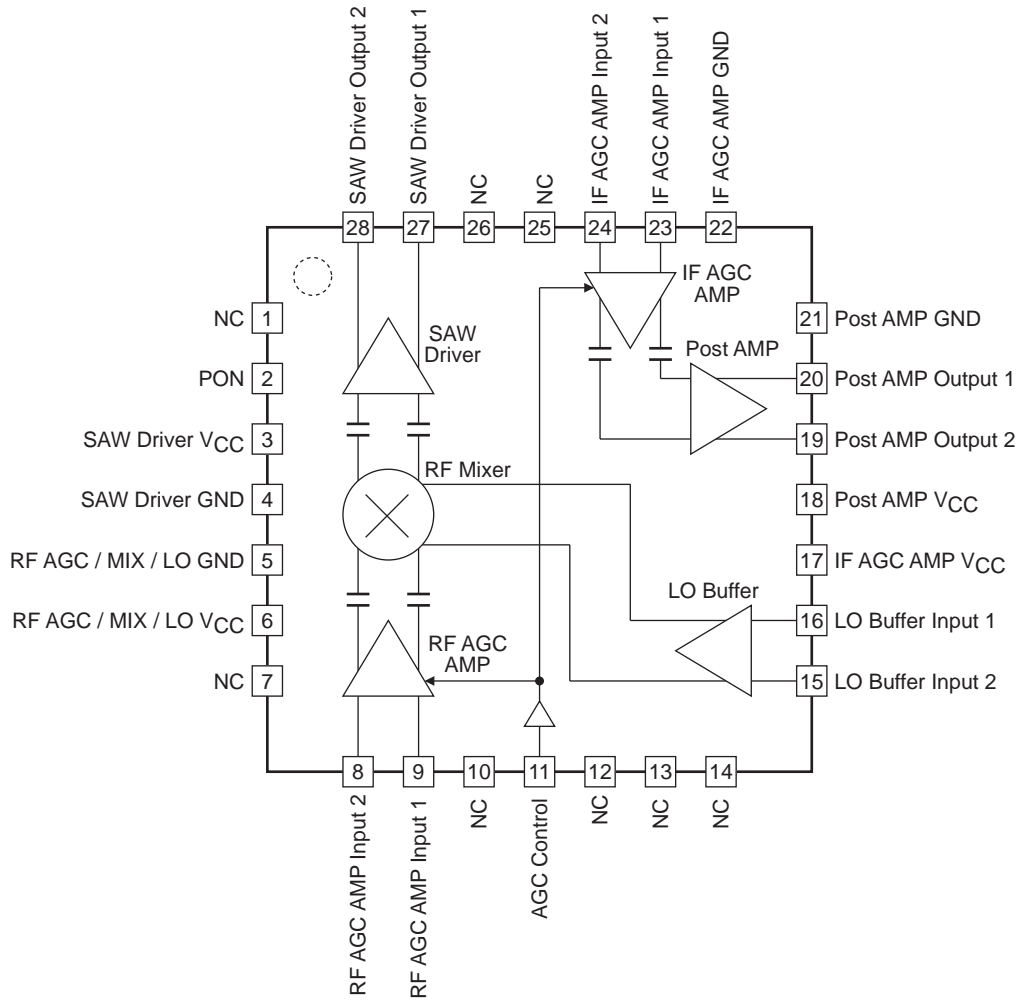
unit : mm (typ)

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## Pin Assignment and Block Diagram



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**Pin Description** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 3.3\text{V}$

Pin No.	Pin voltage	Description	Equivalent circuit
1	-	NC (connect to GND)	
2	0.3V	PON	
3	3.3V	SAW Driver $V_{CC}$	
4	0V	SAW Driver GND	
5	0V	RF AGC / MIX / LO GND	
6	3.3V	RF AGC / MIX / LO $V_{CC}$	
7	-	NC (connect to GND)	
8	1.35V	RF AGC Amplifier Input	
9	1.35V		
10	-	NC (connect to GND)	
11	-	AGC Control	
12, 13, 14	-	NC (connect to GND)	
15	1.6V	LO Buffer Inputs	
16	1.6V		
17	3.3V	IF AGC Amplifier $V_{CC}$	
18	3.3V	Post Amplifier $V_{CC}$	
19	1.0V	Post Amplifier Outputs	
20	1.0V		

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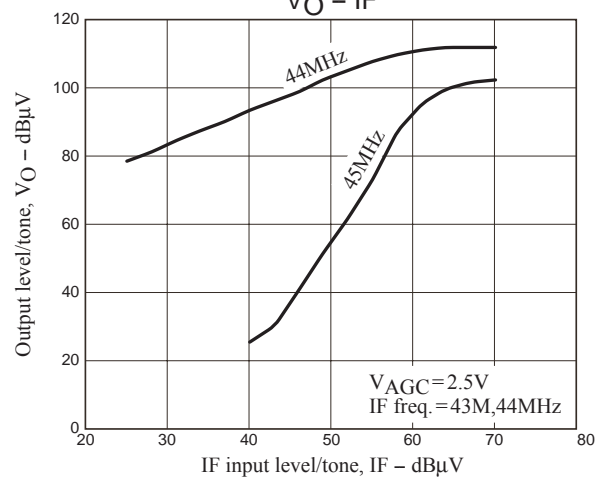
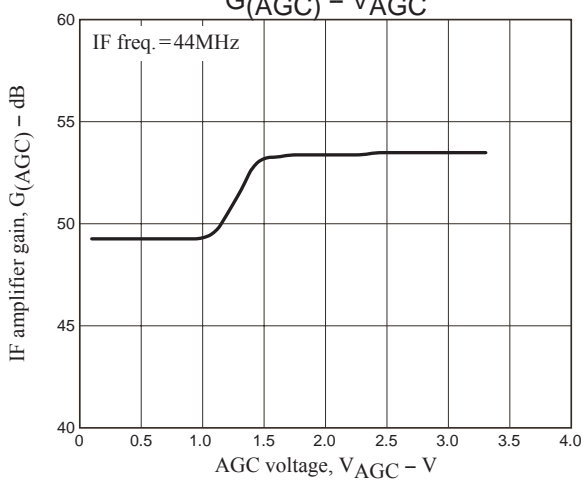
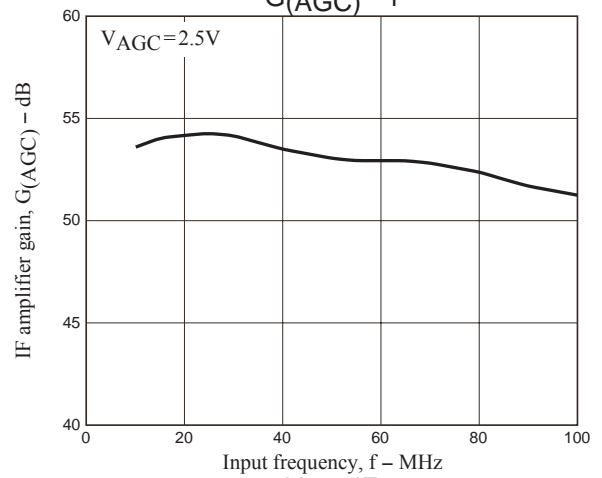
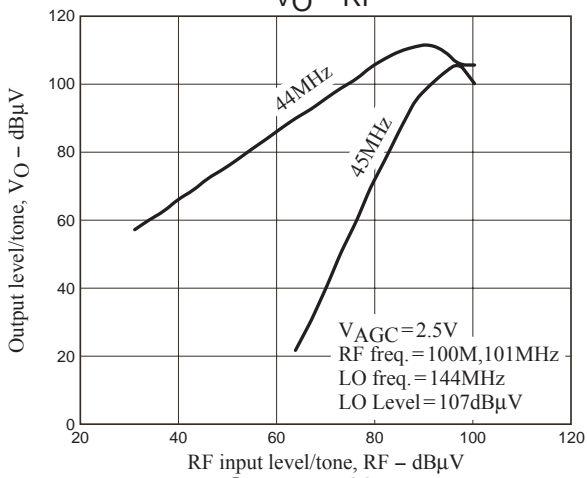
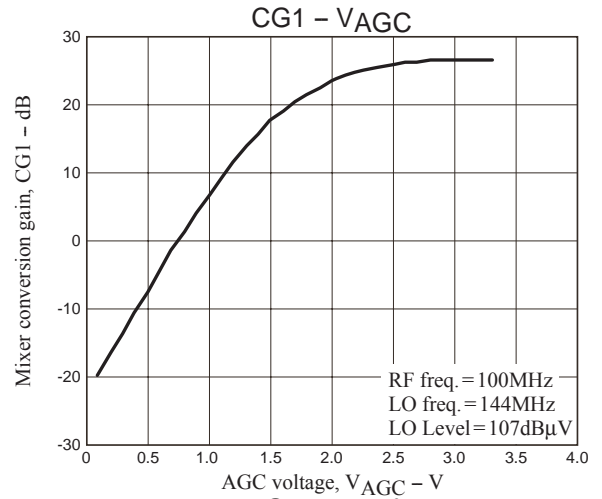
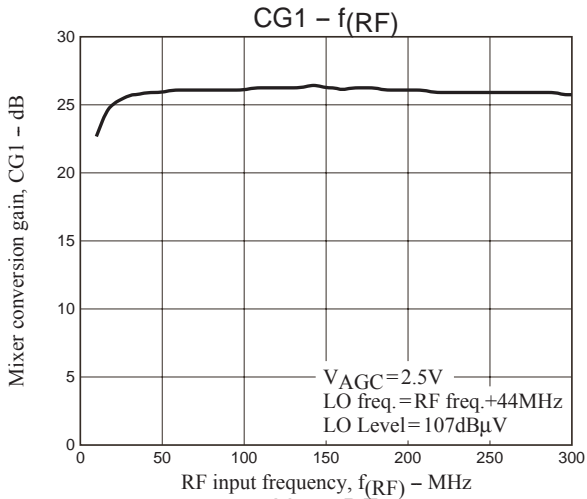
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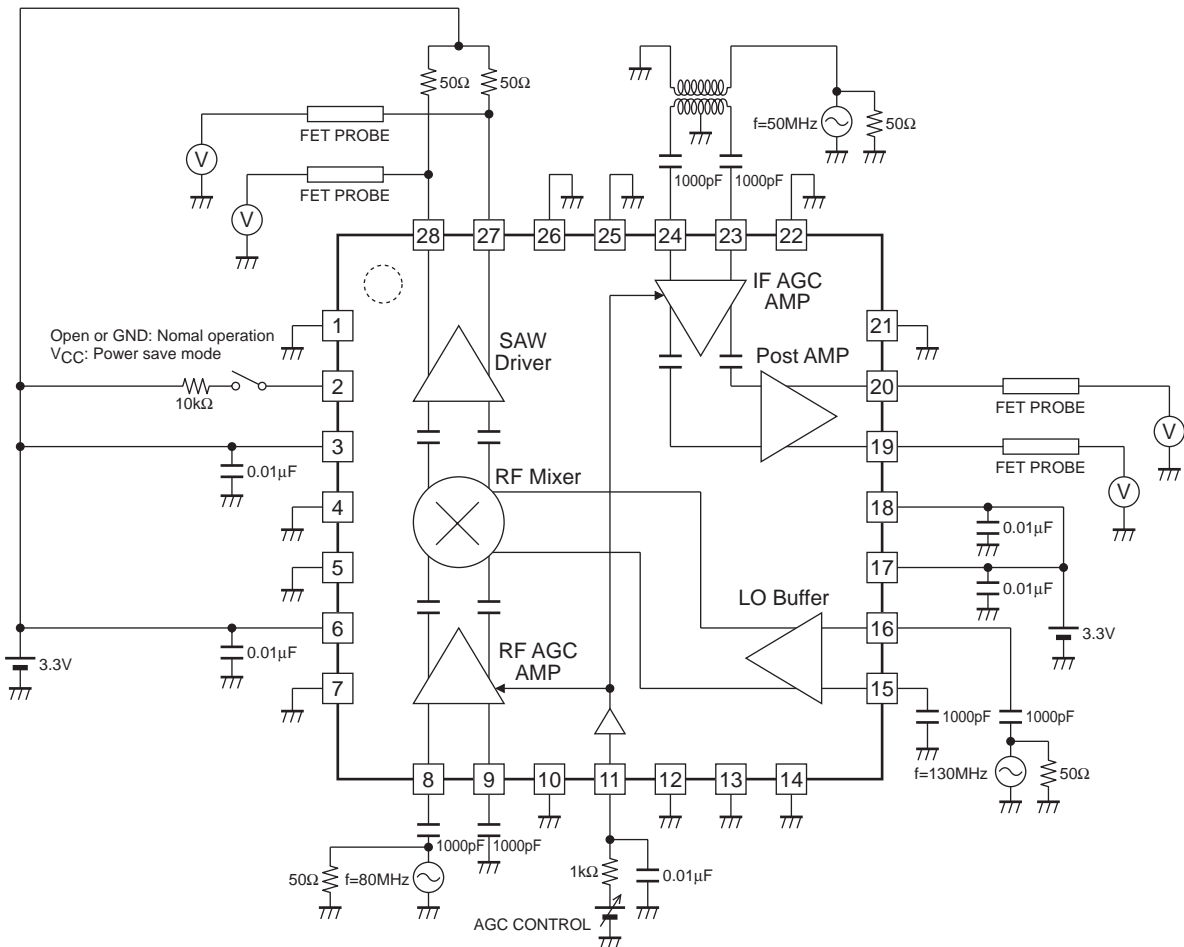
Pin No.	Pin voltage	Description	Equivalent circuit
21	0V	Post Amplifier GND	
22	0V	IF AGC Amplifier GND	
23 24	2.5V 2.5V	IF AGC Amplifier Inputs	
25, 26	-	NC (connect to GND)	
27 28	2.4V 2.4V	SAW Driver Outputs	

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AC Characteristics at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 3.3\text{V}$



Test Circuit



Attention

Electrostatic capacity of some pins is  $\pm 100V$  under the condition of  $C = 200pF$  and  $R = 0\Omega$ , so please handle carefully enough.

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