



# LA8123TT

## Monolithic Linear IC For Digital CATV/Cable Modem Receiver AGC Amplifier

### Overview

LA8123TT is an AGC amplifier. It is ideally suited for use with Digital TV, Digital CATV, Cable modem receiver and IP Telephony receiver.

### Functions

- IF AGC control
- IF AGC amplifier
- Driver amplifier

### Specifications

#### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max	Pin 1	7.0	V
Input voltages	V <sub>in</sub>	Pin 2, 3, 4	-0.3 to V <sub>CC</sub> op+0.3	V
Circuit Current	I <sub>6</sub>	Pin 6 sink current	2	mA
	I <sub>7</sub>	Pin 7 sink current	2	mA
Allowable Power Dissipation	P <sub>d</sub> max	Ta ≤ 85°C *	310	mW
Operating Temperature Range	T <sub>opr</sub>		-20 to 85	°C
Storage Temperature Range	T <sub>stg</sub>		-55 to 150	°C

\* : Specified board : 45.0mm × 43.0mm × 1.6mm, glass epoxy board.

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## Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>	Pin 1	5.0	V
Operating supply voltage range	V <sub>CC op</sub>	Pin 1	4.5 to 5.5	V
AGC control voltage range	V <sub>agc</sub>	Pin 4	0 to 3.3	V

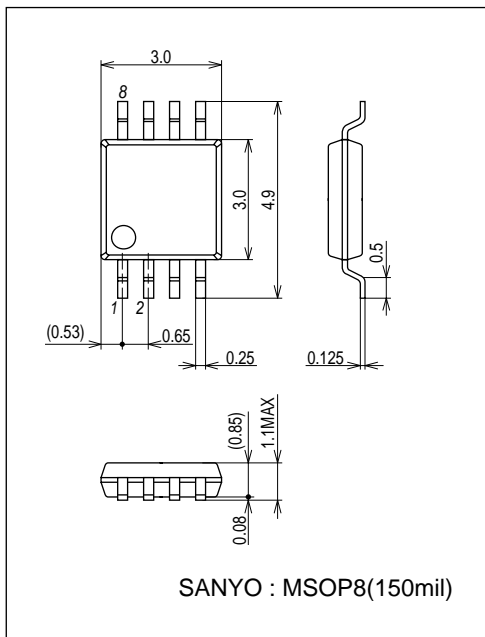
## Electrical Characteristics at Ta = 25°C, V<sub>CC</sub> = 5.0V

Parameter	Symbol	Pin No.	Conditions	Test circuit	Ratings			Unit
					min	typ	max	
Circuit current	I <sub>total</sub>	1	No signal	1	33	38	43	mA
Input frequency range	f <sub>in</sub>	2, 3	f <sub>c</sub> : -3dB	1	30		70	MHz
Noise figure	NF	6, 7	V <sub>4</sub> = 3.0V, f = 45MHz	2		5		dB
Inter modulation	IM3	6, 7	V <sub>4</sub> = 3.0V, f <sub>1</sub> = 44MHz, f <sub>2</sub> = 45MHz, Output level = 104dBμV/tone	1	50			dBc
Total amplifier gain	G (AGC1)	6/2, 3 7/2, 3	V <sub>4</sub> = 3.0V, f = 45MHz	1	57	60	63	dB
AGC range	GR (1)	6/2, 3 7/2, 3	Output level = 110dBμV V <sub>4</sub> = 0.3V to 3.0V, f = 45MHz	1	40			dB
	GR (2)	6/2, 3 7/2, 3	Input level = 50dBμV V <sub>4</sub> = 0.3V to 3.0V, f = 45MHz	1	45			dB
Maximum Output Level	V <sub>O</sub>	6, 7	f = 45MHz	1	1.8			Vp-p
Output offset	dV <sub>O</sub>	6, 7	V <sub>4</sub> = 3.0V, f = 45MHz Output level = 110dBμV (Pin 7 output) - (Pin 6 output)	1	-0.5	0	0.5	dB
Maximum gain AGC control voltage	V <sub>4H</sub>	4	Maximum gain	1	3.0		3.3	V
Minimum gain AGC control voltage	V <sub>4L</sub>	4	Minimum gain	1	0		0.3	V
Input impedance	Z <sub>in</sub>	2, 3	V <sub>4</sub> = 0V, f = 45MHz	3		1/4.7		kΩ/pF

## Package Dimensions

unit : mm (typ)

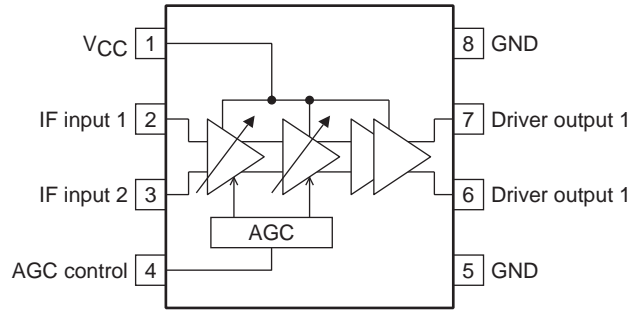
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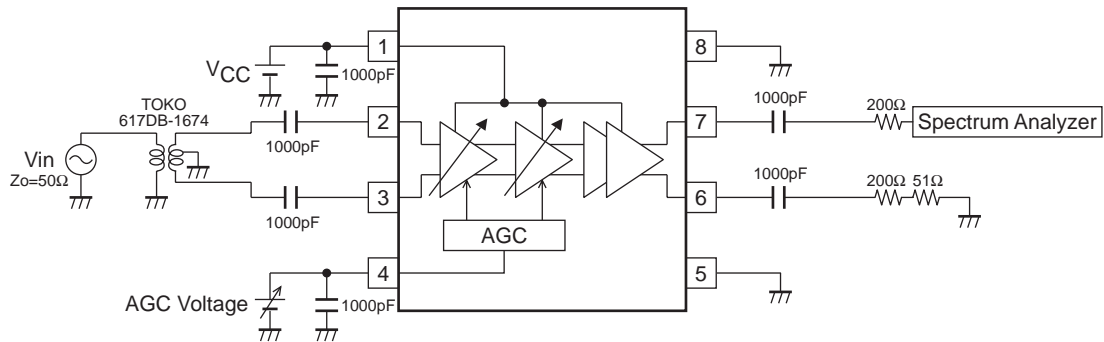
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## Block Diagram

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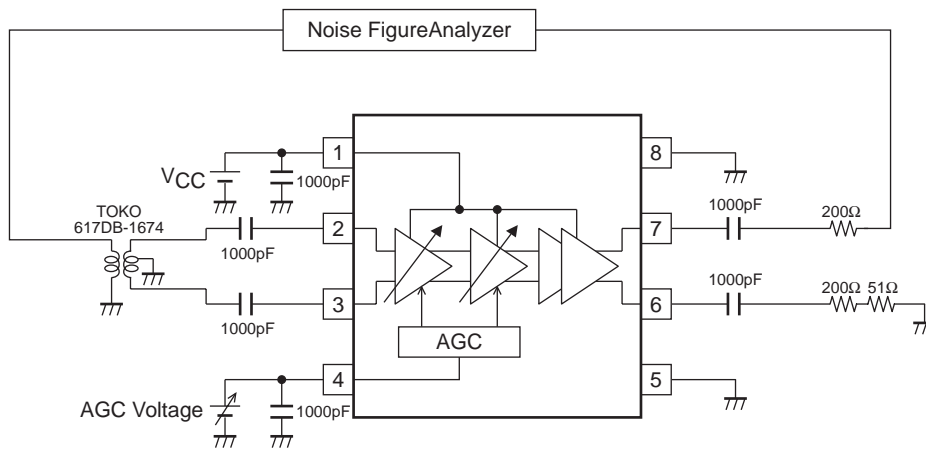


## Test Circuit 1

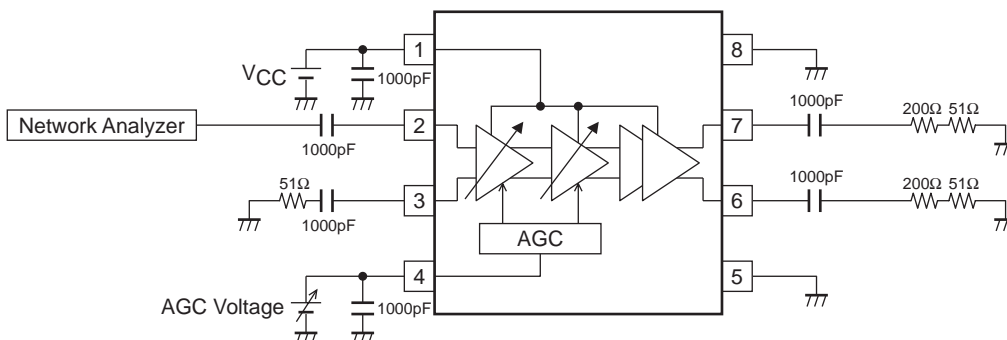


Output Voltage is divided by  $50\Omega / (200+50)\Omega$

## Test Circuit 2



## Test Circuit 3



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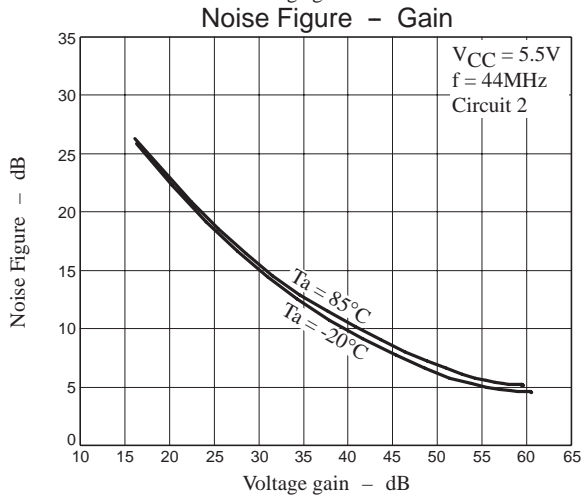
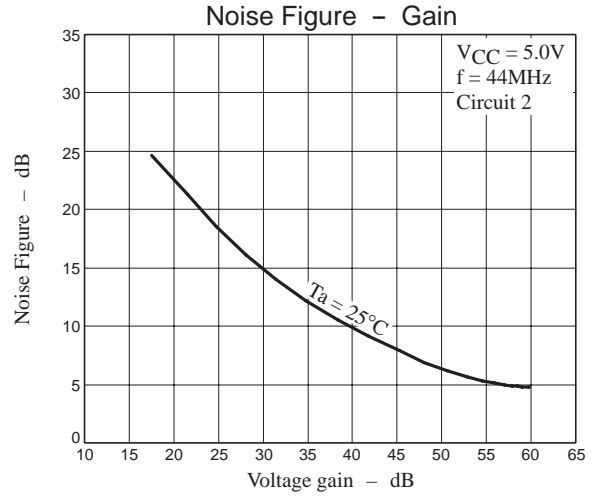
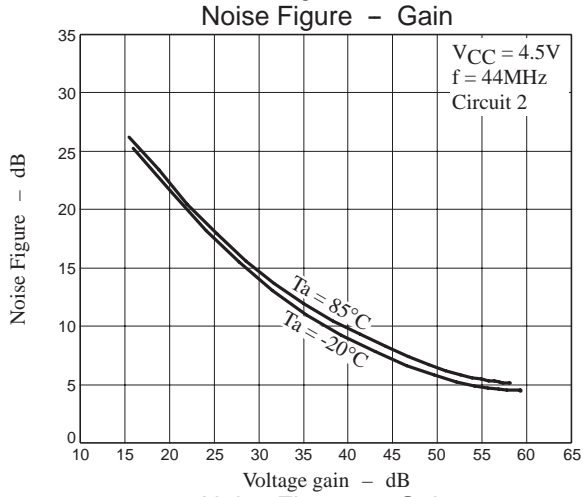
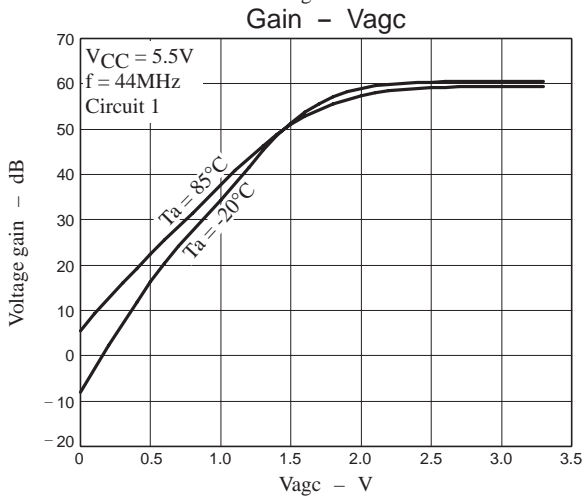
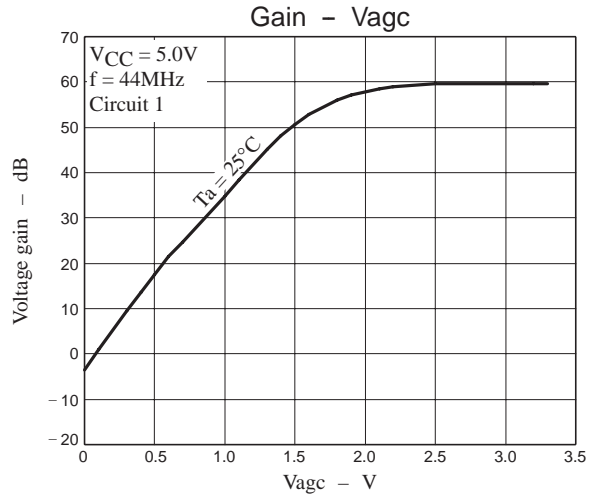
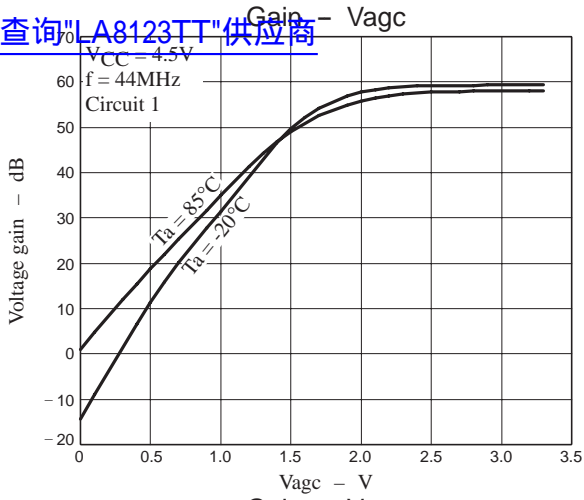
## Pin Function

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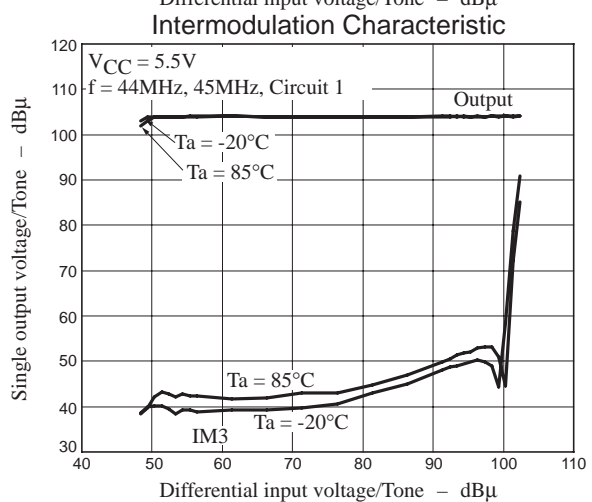
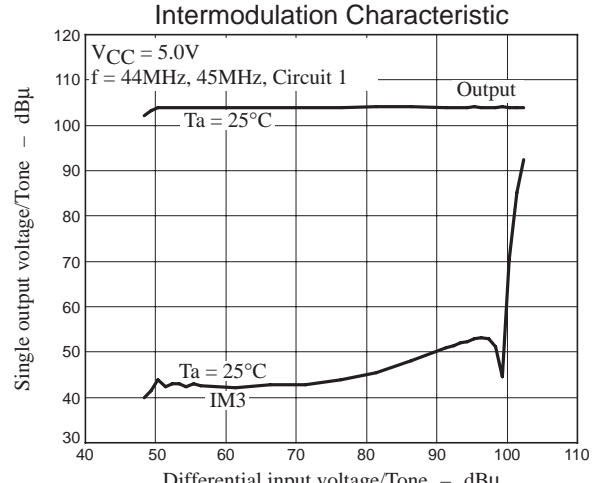
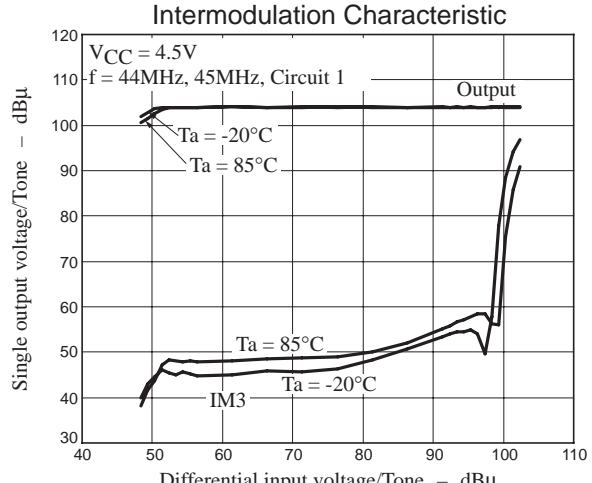
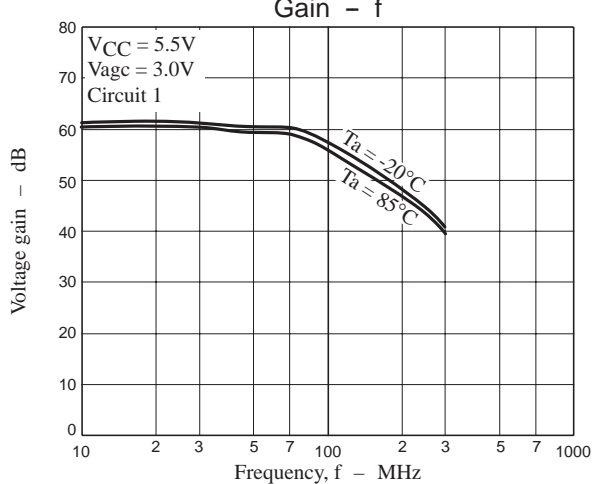
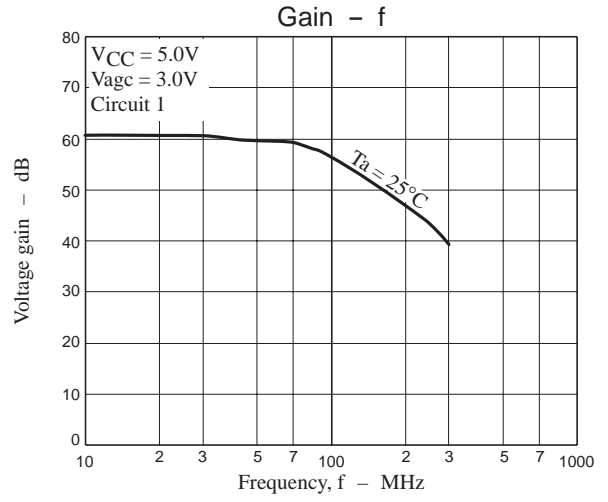
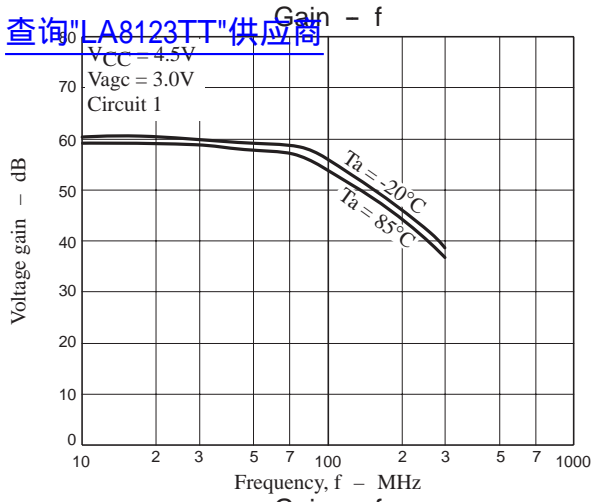
Pin No.	Function	Equivalent circuit
1	V <sub>CC</sub>	
2 3	IF input.	
4	AGC control.	
5	Gain control Switch.	
6 7	Driver output.	
8	GND	

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