Ordering number : ENN8386

LA7784

Monolithic Linear IC

Downconverter IC for Digital CATV

ON Semiconductor®

http://onsemi.com

Overview

The LA7784 is a downconverter IC for digital CATV. It accepts RF input frequencies from 50 to 150MHz and supports the DOCSIS (USA) and Euro-DOCSIS (Europe) standards.

Features

- RF Mixer.
- Attenuation control for 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 8, 14, 19, 20, 21, 22, 26, 27	6.0	V
Circuit voltages	V max	Pin 9	V_{CC}	V
Circuit current	$I_{12, 13}$	Pin 12, 13 sink current	2	V
Allowable power dissipation	Pd max	Ta≤70°C	900*	mA
Operating temperature range	Topr		-20 to +70	mW
Storage temperature range	Tstg		-55 to +150	°C

* On the board (114.3×76.1×1.6mm)

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	Pin 8, 14, 19, 20, 21, 22, 26, 27	5.0	V
Operating supply voltage range	$V_{CC\ op}$	Pin 8, 14, 19, 20, 21, 22, 26, 27	4.5 to 5.5	V

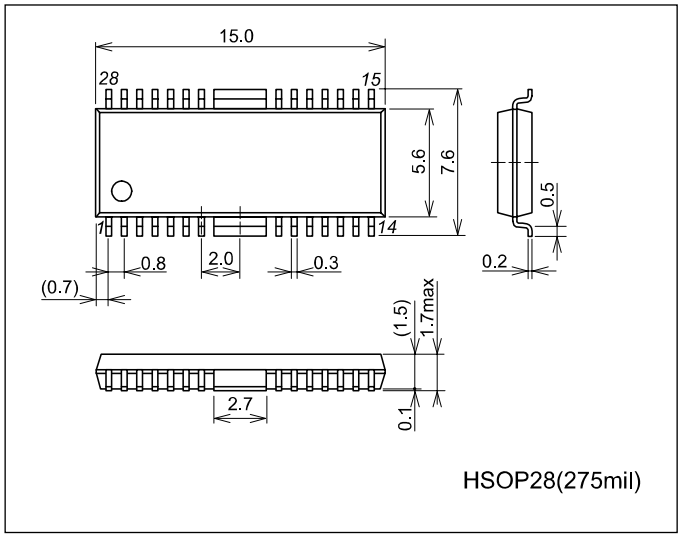
AC Characteristics at Ta = 25°C, V_{CC} = 3.3V

Parameter	Symbol	Pin No.	Conditions	Ratings			Unit
				min	typ	max	
Circuit current	I_{total}	8, 14, 19, 20, 21, 22, 26, 27	No Signal	80	105	130	mA
RF input frequency range	$f_{(RF)}$	23, 24	fc:-3dB	50		150	MHz
RF AGC range	GR1	26, 27	V9 = 2.5 to 0V	45	53		dB
Mixer conversion gain	CG1	26/23, 24 27/23, 24	V9 = 2.5V	19	22	25	dB
Mixer inter modulation 1	IM3 1	26/23, 24 27/23, 24	Input = 75dBμ V9 = 2.5V	40	50		dB
IF input frequency range	$f_{(IF)}$	4, 5	fc:-3dB	30		100	MHz
IF amplifier gain	$G_{(AGC)}$	12/4, 5 13/4, 5	V9 = 2.5V	51	55	59	dB
IF inter modulation 2	IM3 2	12/4, 5 13/4, 5	Output = 110dBμ	40	50		dB
Range	GR2	12, 13	IF Output Level < ±1dB	3	5		dB
IF AGC output level	$Vo_{(IF)}$ 1	12	Single output		1.0		Vp-p
IF output level	$Vo_{(IF)}$ 2	13	Single output		1.0		Vp-p

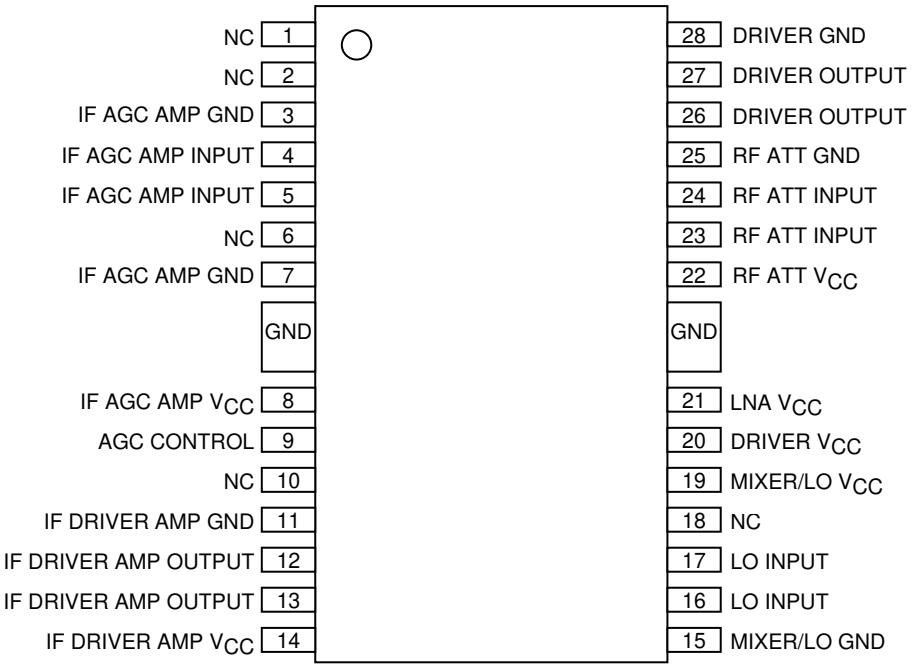
Package Dimensions

unit: mm

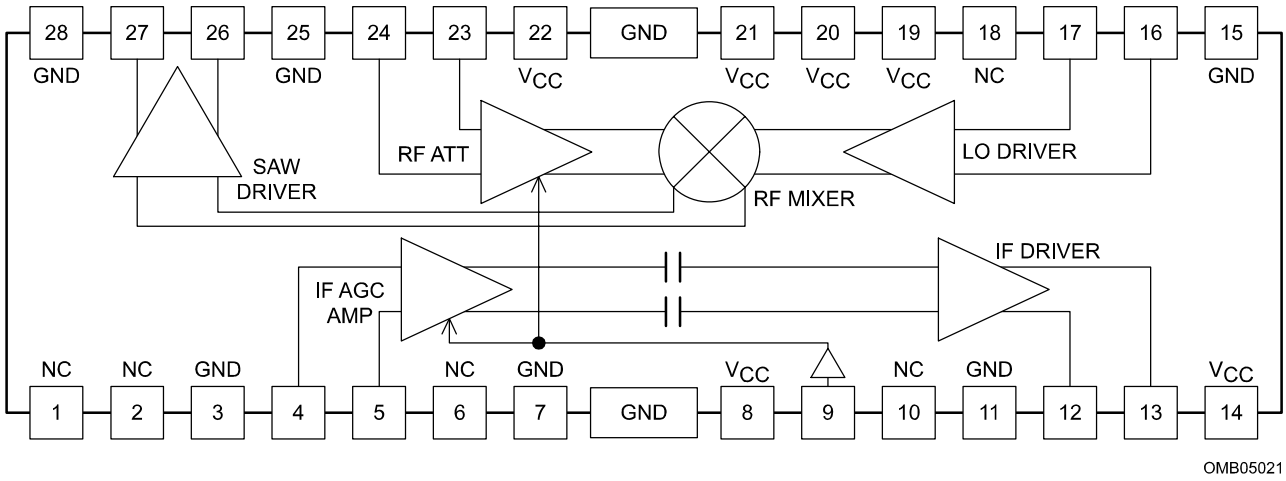
3222A



Pin Assignment

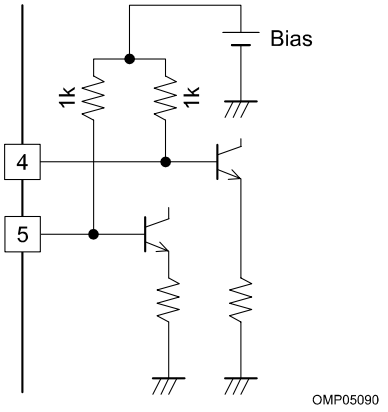
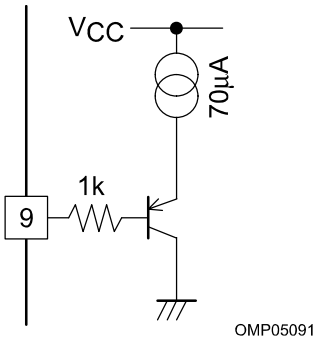


Block Diagram



Pin Description

(unit: Ω)

Pin Number	Description	Equivalent circuit
1	No Connection	
2	No Connection	
3	AGC Amp GND	
4 5	AGC Amp Input	
6	No Connection	
7	AGC Amp GND	
8	AGC Amp V_{CC}	
9	AGC Control	
10	No Connection	
11	Post Amp GND	

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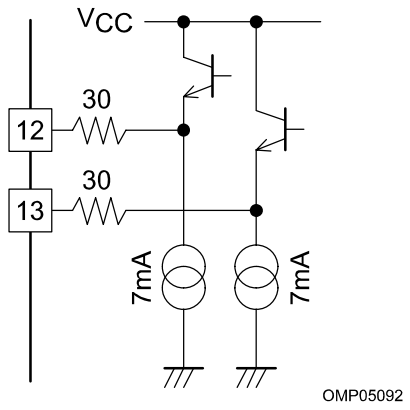
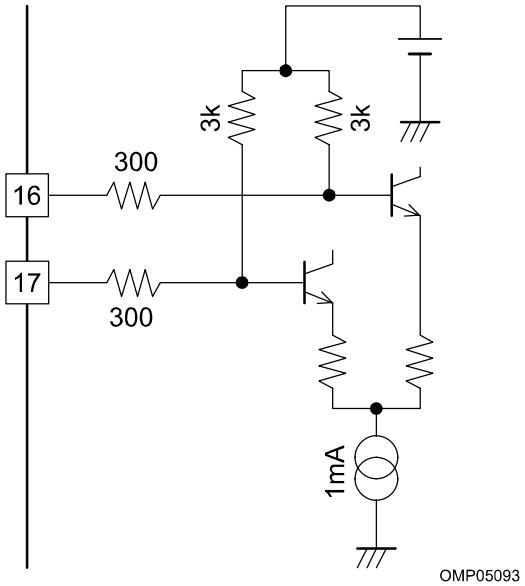
(unit: Ω)

Pin Number	Description	Equivalent circuit
12 13	Post Amp Outputs	
14	Post Amp V_{CC}	
15	Mixer/LO GND	
16 17	LO Input	
18	No Connection	
19	Mixer/LO V_{CC}	
20	Driver V_{CC}	

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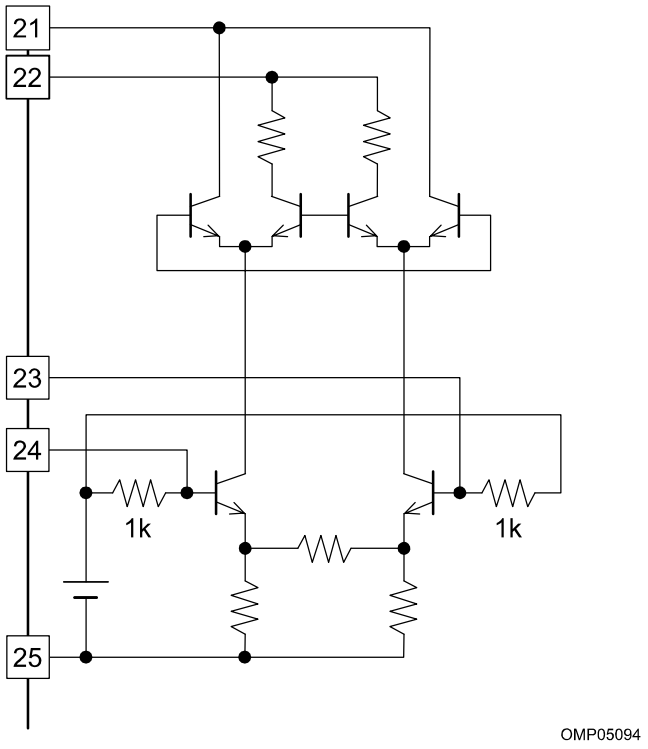
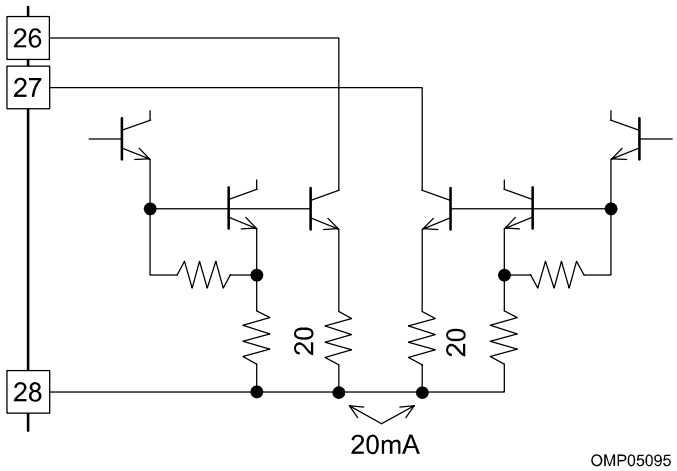
(unit: Ω)

Pin Number	Description	Equivalent circuit
21 22	LNA V_{CC}	
23 24	LNA Inputs	
25	LNA GND	
26 27	Driver Outputs	
28	Driver Gnd	

Test Circuit