Ordering number : ENN8386

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

LA7784 — Monolithic Linear IC Downconverter IC for Digital CATV

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)

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

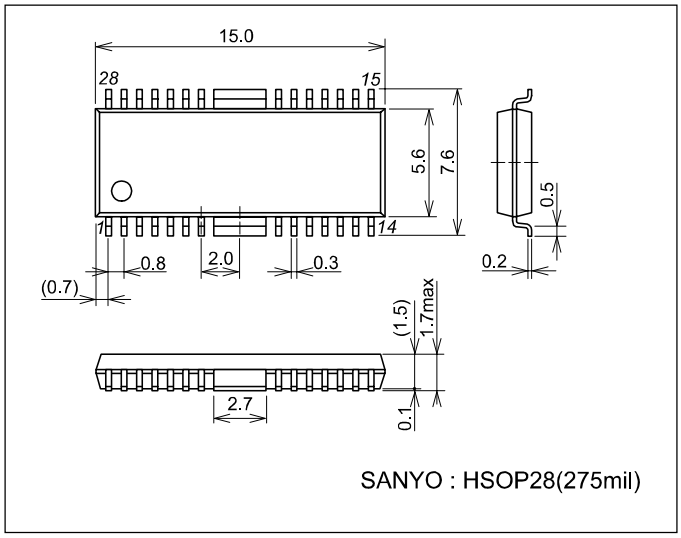
AC Characteristics at Ta = 25°C, V_{CC} = 3.3V

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

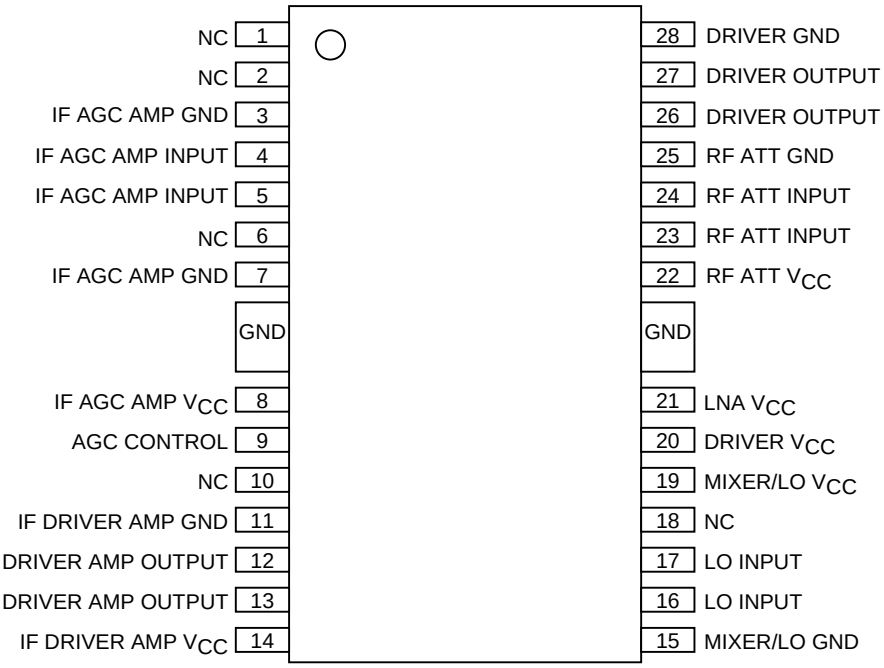
Package Dimensions

unit: mm

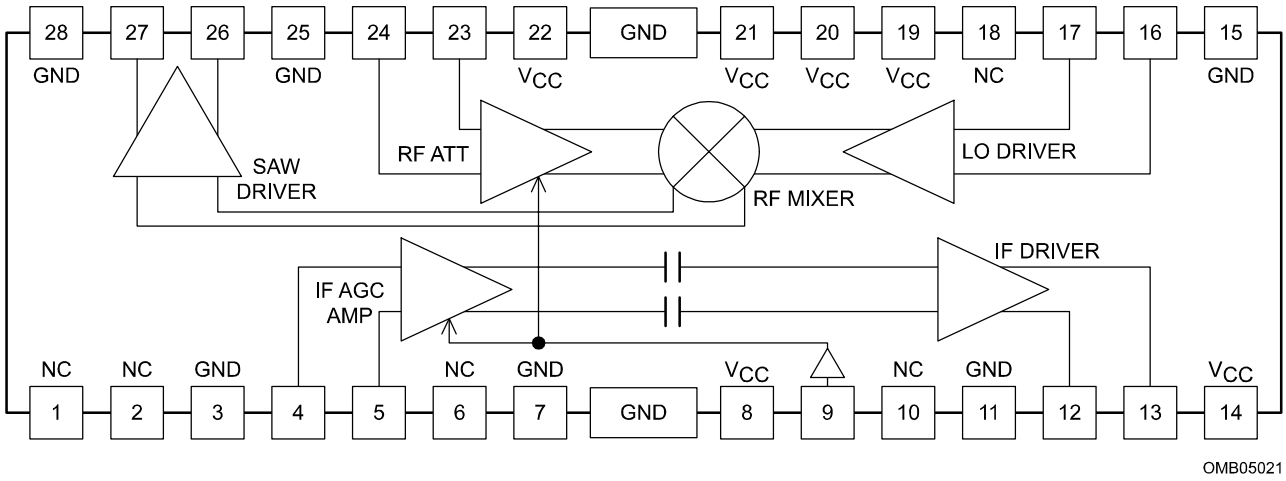
3222A



Pin Assignment

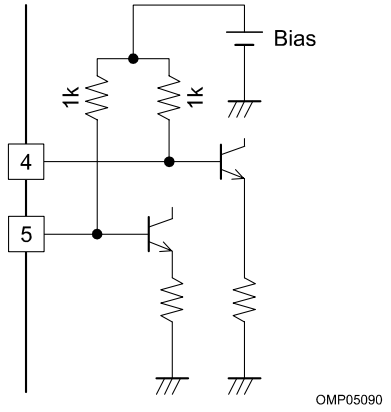
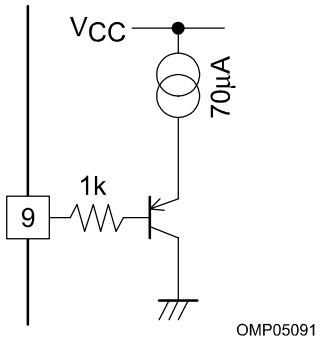


Block Diagram



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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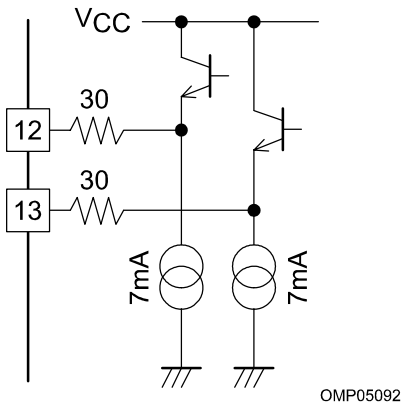
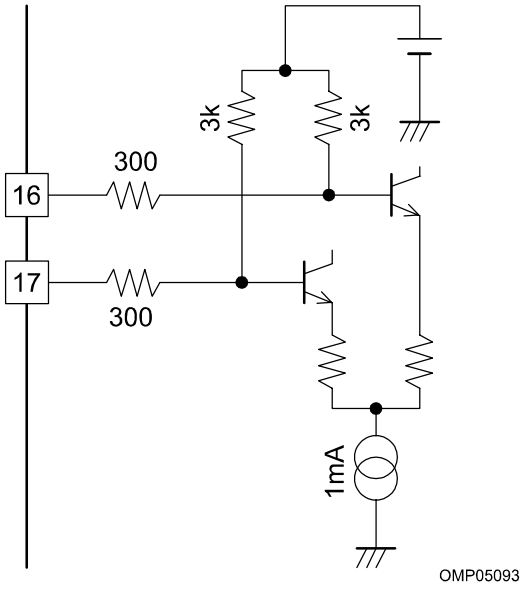
(unit: Ω)

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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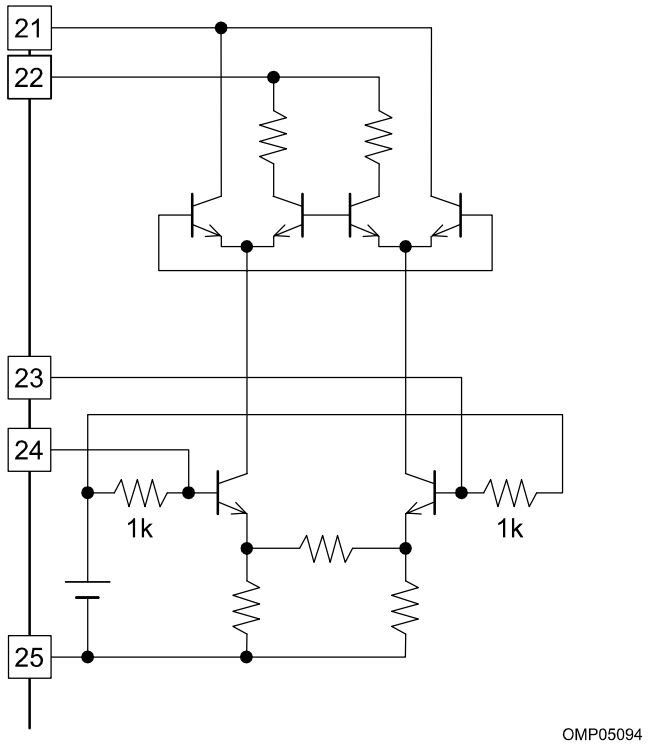
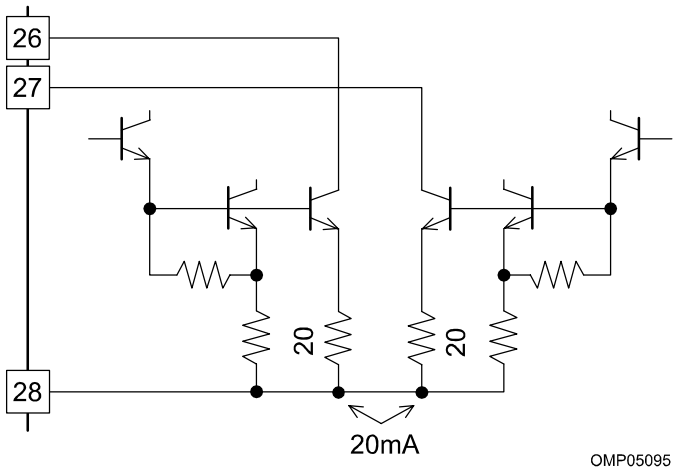
(unit: Ω)

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