

RT9131 Data Sheet



Class AB Stereo Headphone Drive with Mute

General Description

The RT9131 is an integrated class AB stereo headphone driver contained in a SO-8 or DIP-8 plastic package with Mute feature. A class AB output stage bias control circuit is employed to maintain low distortion and power consumption. The RT9131 further integrates a voltage divider inside the chip. Thus, the external resistors can be eliminated. The device is fabricated in a CMOS process and has been primarily developed for portable digital audio applications.

- High Slew Rate
- Low Distortion
- Large Output Voltage Swing
- Flexible Mute Function
- Excellent Power Supply Ripple Rejection
- Low Power Consumption
- Short-circuit Elimination
- Wide Temperature Range
- No Switch ON/OFF Clicks
- Integrated Voltage Divider ($V_{DD}/2$) to Eliminate External Resistors

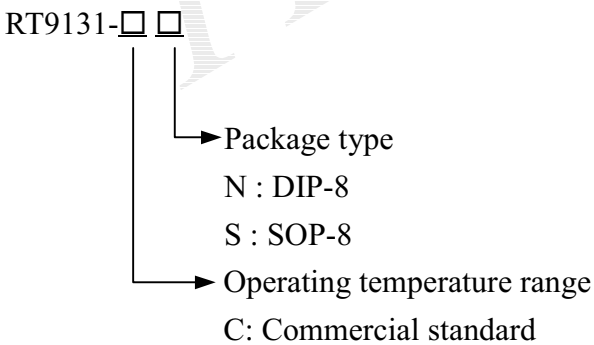
Applications

- Portable Digital Audio

Features

- High Signal-to-Noise Ratio

Ordering Information



Marking Information

Part Number	Marking
RT9131CN	RT9131CN
RT9131CS	RT9131CS

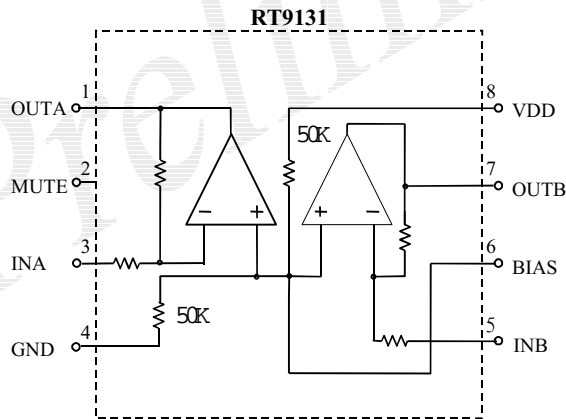
Pin Configurations

Part Number	Pin Configurations
RT9131CN (Plastic DIP-8)	
RT9131CS (Plastic SOP-8)	

Pin Description

Pin No.	Pin Name	Pin Function
1	OUTA	Channel A driver output
2	MUTE	Mute control input
3	INA	Channel A signal input
4	GND	Power GND
5	INB	Channel B signal input
6	BIAS	($V_{DD}/2$) bias pin, connected a capacitor to GND to reduce power on/off clicks
7	OUTB	Channel B driver output
8	VDD	Power supply input

Function Block Diagram



Absolute Maximum Ratings

- Supply Voltage 7V
- Operating Ambient Temperature Range -40°C to 85°C
- Maximum Junction Temperature 150°C
- Storage Temperature Range -60°C to 150°C
- Power Dissipation and Thermal Characteristics:
 - DIP Plastic Package, P_D @ $T_A=25^\circ C$ ----- 1.25W
 - Thermal Resistance, $R_{\theta JA}$ ----- 100°C/W
 - SOP Plastic Package, P_D @ $T_A=25^\circ C$ ----- 0.625W
 - Thermal Resistance, $R_{\theta JA}$ ----- 160°C/W
- Electrostatic Discharge -3000 to 3000V⁽¹⁾
 -200 to 200V⁽²⁾

Notes:

(1) Human body mode: C=100pF, R=1500Ω, 3 positive pulses plus 3 negative pulses

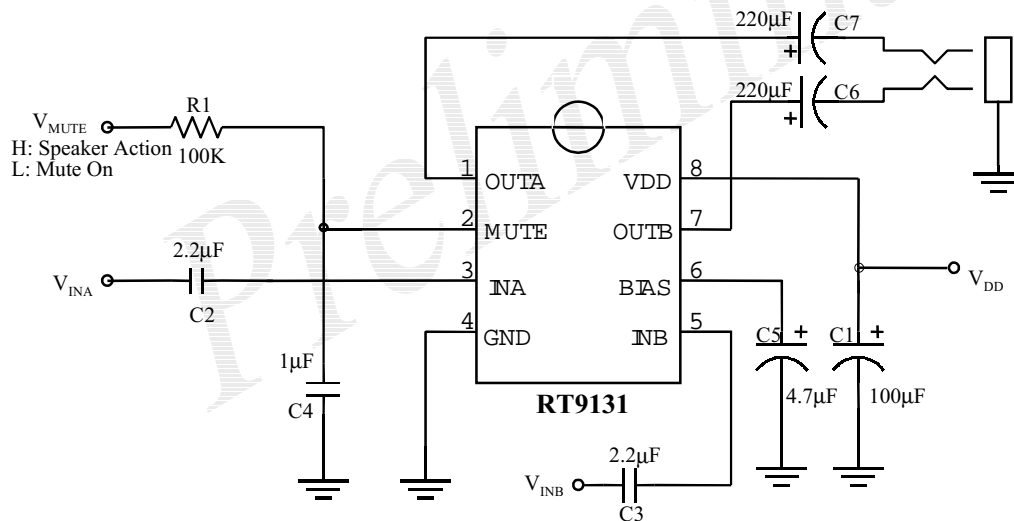
(2) Machine mode: C=200pF, L=0.5mH, R=0Ω, 3 positive pulses plus 3 negative pulses

Electrical Characteristics

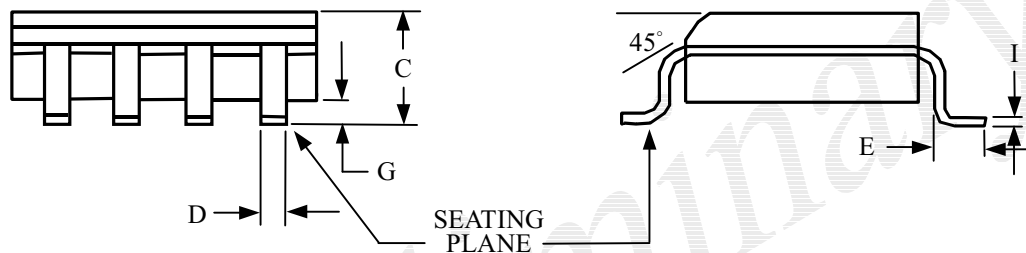
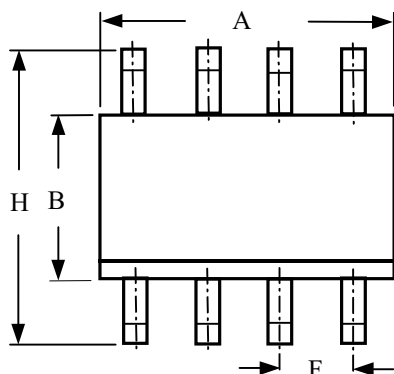
($V_{IN}=0\text{dBV}$, $V_{CC}=5\text{V}$, $T_A=25^\circ\text{C}$, $f=1\text{kHz}$, $R_L=32\ \Omega$, unless otherwise noted)

Parameter	Test Conditions	Min	Typ	Max	Units
Quiescent Current	$V_{IN}=0\ \text{Vms}$		3	5	mA
Mute Terminal Voltage		0.3	0.7	1.6	V
Voltage Gain		-2		2	dB
Differential Channel Voltage Gain		-0.5		0.5	dB
Total Harmonic Channel Distortion Factor	$BW=20\sim 20\text{KHz}$		0.02	0.1	%
Rated Output Power 1	$R_L=32\ \Omega$, $\text{THD}<0.1\%$	25	31		mW
Rated Output Power 2	$R_L=16\ \Omega$, $\text{THD}<0.1\%$	50	62		mW
Output Noise Voltage	$BW=20\sim 20\text{KHz}$, $R_G=0\ \Omega$		-93	-85	dBv
Channel Separation	$R_G=0\ \Omega$	65	75		dB
Mute Attenuation	$R_G=0\ \Omega$		60		dB
Ripple Rejection	$F_{RR}=100\text{Hz}$, $F_{RR}=-20\text{dBv}$	50	57		dB

Typical Application Circuits:

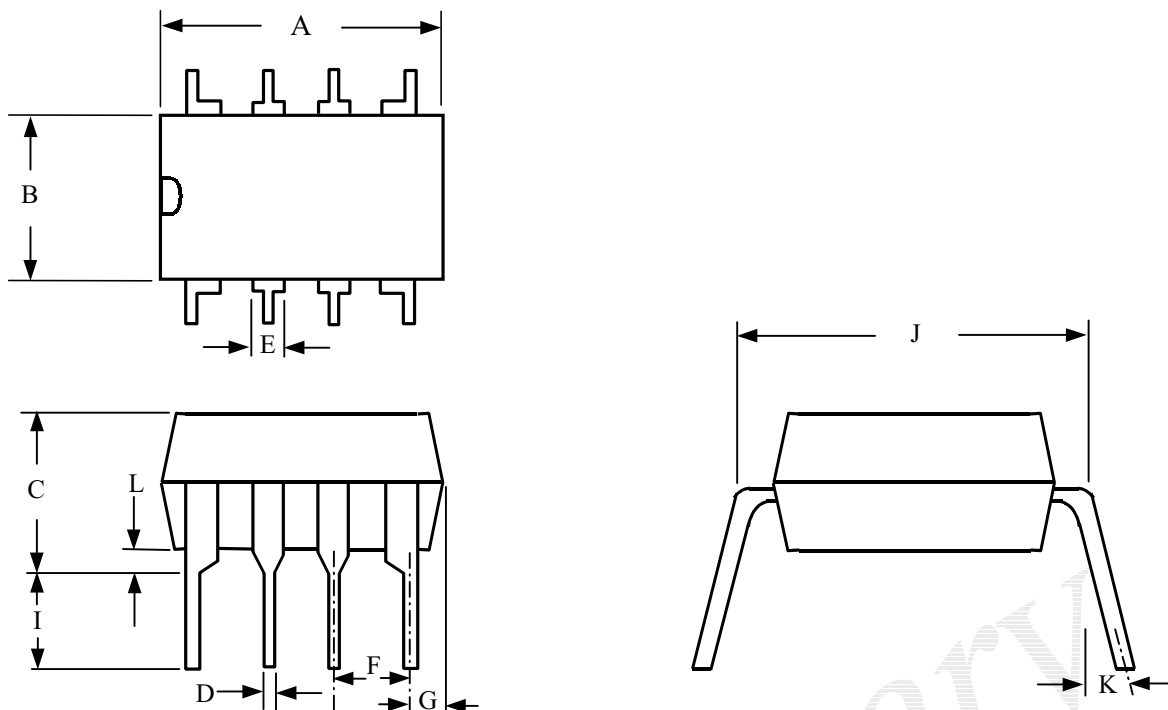


Package Information



Symbols	Dimensions In Inches			Dimensions In Millimeter		
	Min	Norm	Max	Min	Norm	Max
A	0.185	0.191	0.197	4.70	4.85	5.00
B	0.150	0.153	0.157	3.80	3.90	4.00
C	0.054	0.061	0.068	1.35	1.55	1.75
D	0.012	0.016	0.020	0.30	0.40	0.50
E	0.016	--	0.050	0.40	--	1.27
F	--	0.050	--	--	1.27	--
G	0.004	0.006	0.009	0.10	0.17	0.25
H	0.229	0.237	0.244	5.80	6.00	6.20
I	0.007	0.008	0.009	0.18	0.22	0.25

8-Lead SOP Plastic Package



Symbols	Dimensions In Inches			Dimensions In Millimeter		
	Min	Norm	Max	Min	Norm	Max
A	0.357	0.362	0.367	9.00	9.30	9.60
B	0.244	0.254	0.264	6.20	6.45	6.70
C	--	--	0.180	--	--	4.57
D	0.016	0.018	0.020	0.35	0.45	0.55
E	0.040	0.055	0.070	1.02	1.40	1.78
F	--	0.100	--	--	2.54	--
G	--	0.035	0.050	--	0.89	1.27
I	0.120	0.130	0.140	3.05	3.30	3.55
J	0.290	0.300	0.310	7.60	8.00	8.40
K	--	--	15°	--	--	15°
L	0.015	0.025	0.035	0.39	0.64	0.89

8-Lead DIP Plastic Package