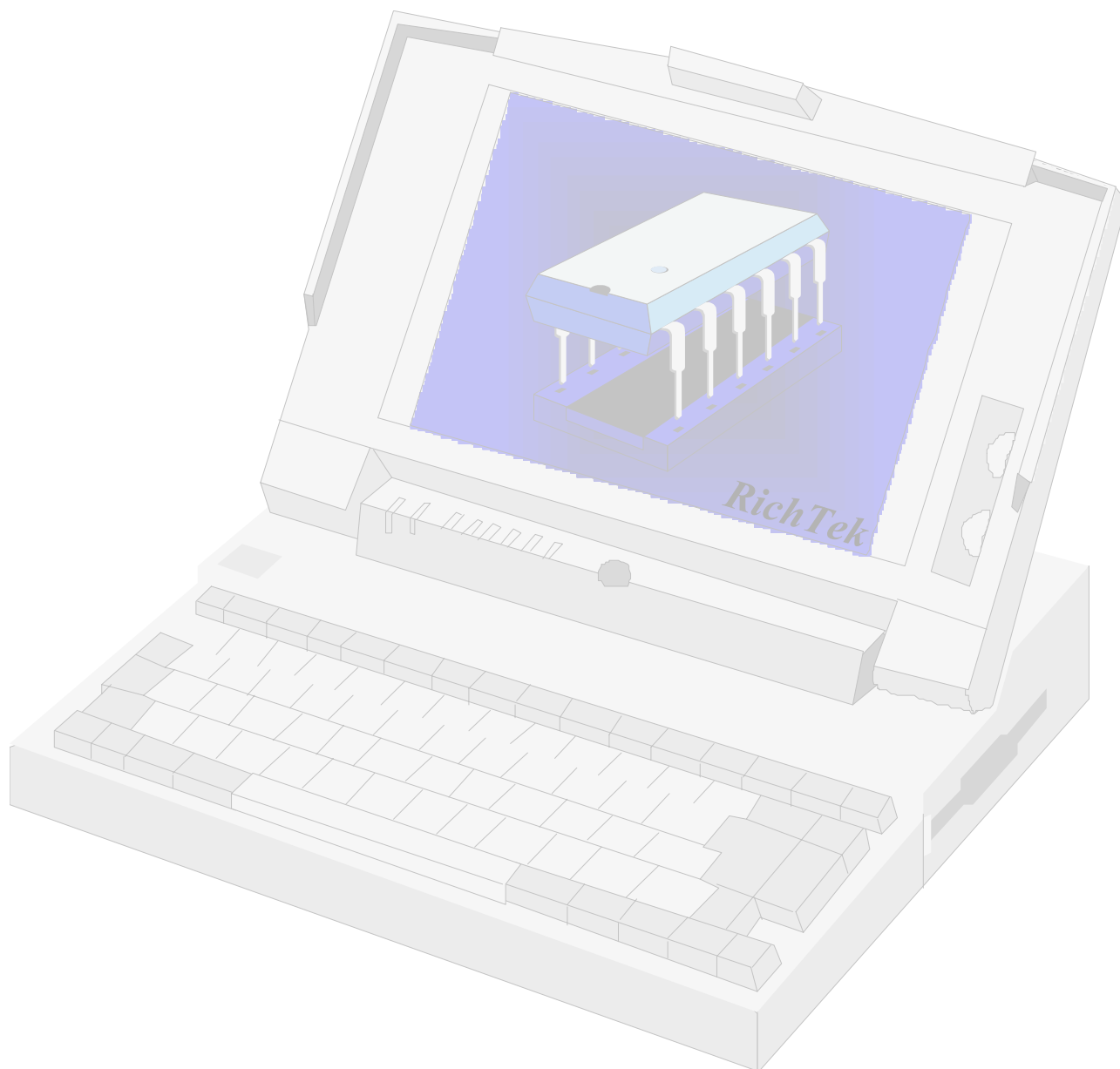


# RT9131 Data Sheet



**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

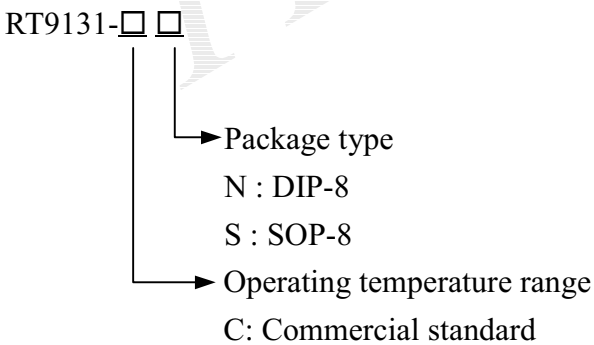
**Applications**

- Portable Digital Audio

**Features**

- High Signal-to-Noise Ratio

**Ordering Information**



**Marking Information**

Part Number	Marking
RT9131CN	RT9131CN
RT9131CS	RT9131CS

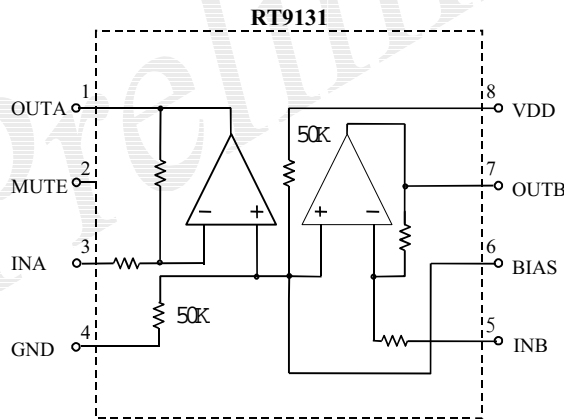
**Pin Configurations**

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,  $P_D$  @  $T_A=25^\circ\text{C}$  ..... 1.25W
  - Thermal Resistance,  $R_{\theta JA}$  ..... 100°C/W
  - SOP Plastic Package,  $P_D$  @  $T_A=25^\circ\text{C}$  ..... 0.625W
  - Thermal Resistance,  $R_{\theta JA}$  ..... 160°C/W
- Electrostatic Discharge ..... -3000 to 3000V<sup>(1)</sup>  
 ..... -200 to 200V<sup>(2)</sup>

Notes:

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

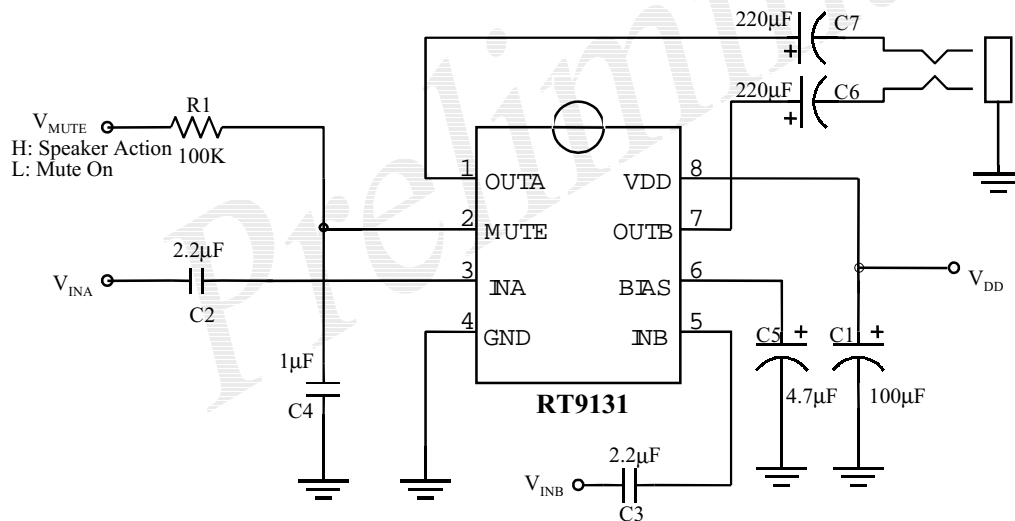
(2) Machine mode: C=200pF, L=0.5mH, R=0Ω, 3 positive pulses plus 3 negative pulses

## Electrical Characteristics

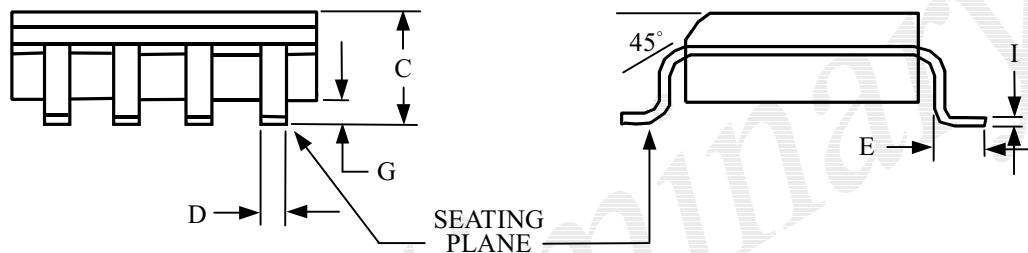
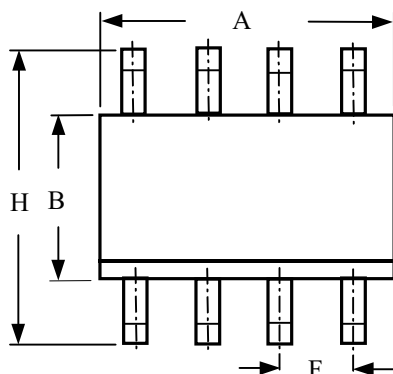
( $V_{IN}=0\text{dBV}$ ,  $V_{CC}=5\text{V}$ ,  $T_A=25^\circ\text{C}$ ,  $f=1\text{kHz}$ ,  $R_L=32\ \Omega$ , unless otherwise noted)

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:

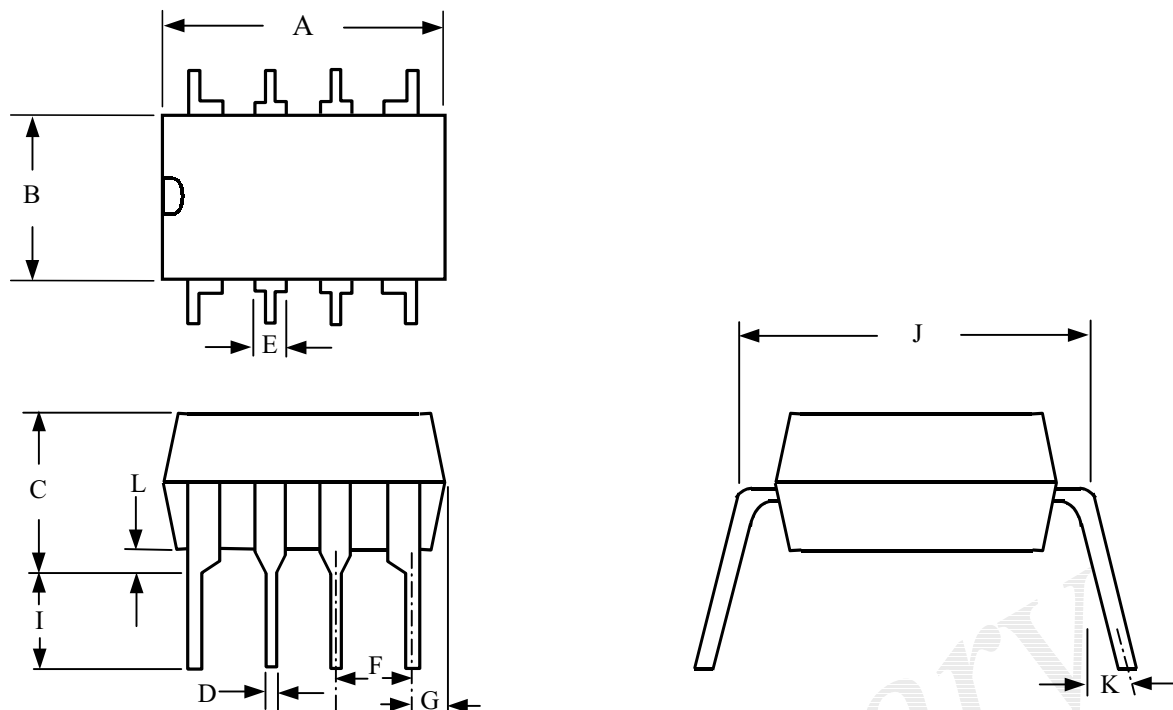


**Package Information**



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**