

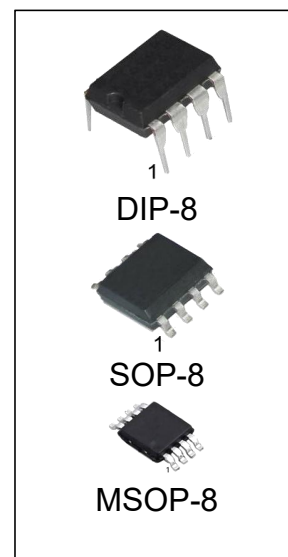
DUAL AUDIO OPERATIONAL AMPLIFIER

General Description

The JRC4560 is a high-gain, wide-bandwidth, dual operational amplifier capable of driving 20V peak-to-peak into 400-Ω loads. The JRC4560 combines many of the features of the JRC4558, but with wider bandwidth and higher slew rate, making this device ideal for active filters, data and telecommunications, and many instrumentation applications.

Features

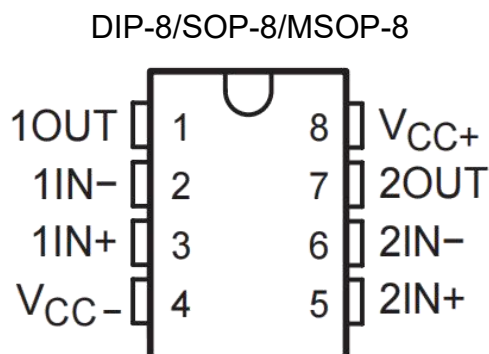
- Operating Voltage $\pm 2\text{ V}$ to $\pm 18\text{ V}$
- Low Noise Voltage $1.2\text{ }\mu\text{Vrms}$ (Typ)
- Wide GBW 15 MHz (Typ)
- Low THD 0.05% (Typ)
- Slew Rate $5.5\text{ V}/\mu\text{sec}$ (Typ)
- Suitable for Applications Such as Audio Preamplifier, Active Filter, Headphone Amplifier, Industrial Measurement Equipment



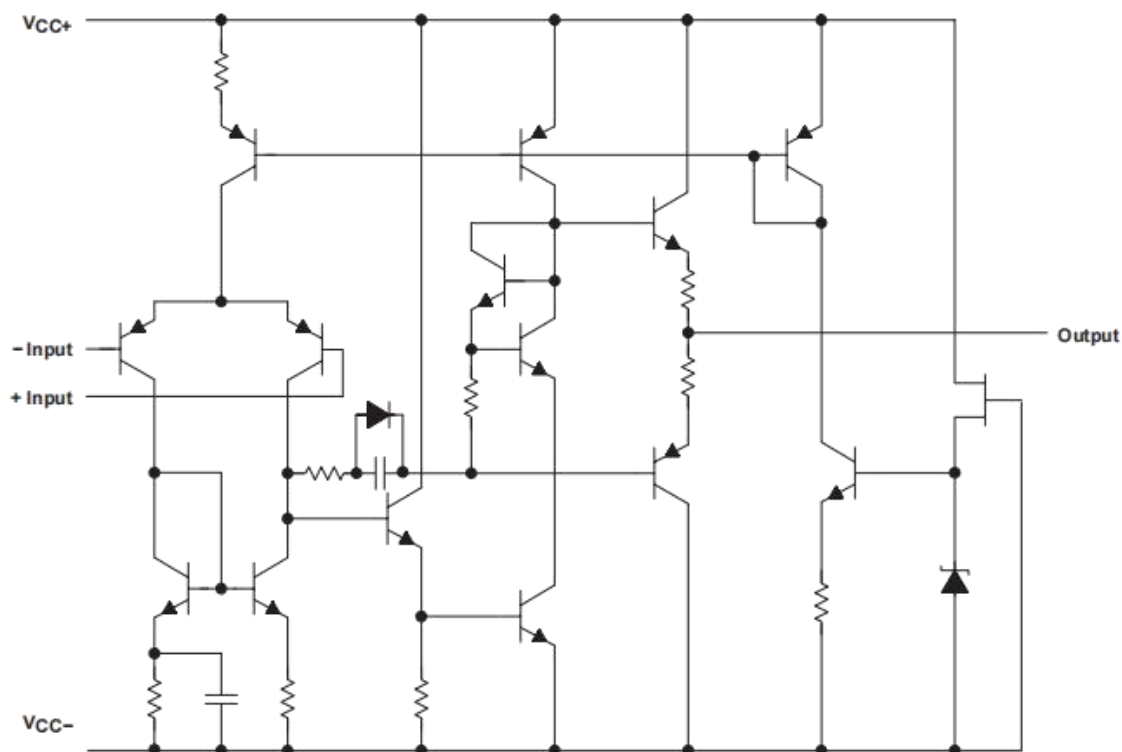
Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
JRC4560N	DIP-8	4560	TUBE	2000pcs/Box
JRC4560M/TR	SOP-8	4560	REEL	2500pcs/Reel
JRC4560MM/TR	MSOP-8	4560	REEL	3000pcs/Reel

Pin Connection



Equivalent Circuit



Absolute Maximum Ratings Over Operating Free-Air Temperature Range (Unless Otherwise Noted)†

Symbol	Condition	Min	Max	Unit
VCC±	Supply voltage	-18	+18	V
VCC±	Input voltage(any input)	-15	+15	V
ISC	Output current	-15	+15	mA
θJA	Package thermal impedance(see Notes 1 and 2):	SOP	97	°C/W
		MSOP	172	°C/W
		DIP	85	°C/W
TJ	Operating virtual junction temoerature	-	150	°C
TL	Lead Temperature (Soldering, 10 seconds)	-	245	°C
Tstg	Storage temperature range	-60	+125	°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum -rated conditions for extended periods may affect device reliability.

NOTES:

1. Maximum power dissipation is a function of TJ(max), θJA, and TA. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(\text{max}) - T_A) / \theta_{JA}$. Operating at the absolute maximum TJ of 150°C can affect reliability.

2. The package thermal impedance is calculated in accordance with JESD 51-7.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{CC+}	Supply voltage	2	16	V
V_{CC-}		-2	-16	
V_{ID}	Differential input voltage		± 30	V
V_{ICR}	Input common mode range	-14	14	V
T_A	Operating free-air temperature range	-40	85	°C

Electrical Characteristics, $V_{CC\pm} = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$ (unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IO}	Input offset voltage	$R_S \leq 10\text{K}\Omega$		0.5	6	mV
I_{IO}	Input offset current			5	200	nA
I_{IB}	Input bias current			40	500	nA
A_{VD}	Large-signal differential voltage amplification	$R_L \geq 2\text{K}\Omega, V_O = \pm 10\text{V}$	86	100		dB
r_i	Input resistance		0.3	5		M Ω
V_O	Output voltage swing	$R_L \geq 2\text{K}\Omega$	± 12	± 14		V
		$I_O = 25\text{mA}$	± 10	± 12.5		
V_{ICR}	Common-mode input voltage range		± 12	± 14		V
CMRR	Common-mode rejection ratio	$R_S \leq 10\text{K}\Omega$	70	90		dB
$k_{SVR}^\dagger$	Supply-voltage rejection ratio	$R_S \leq 10\text{K}\Omega$	76.5	90		dB
I_{CC}	Supply current (all amplifiers)			4.3	5.7	mA

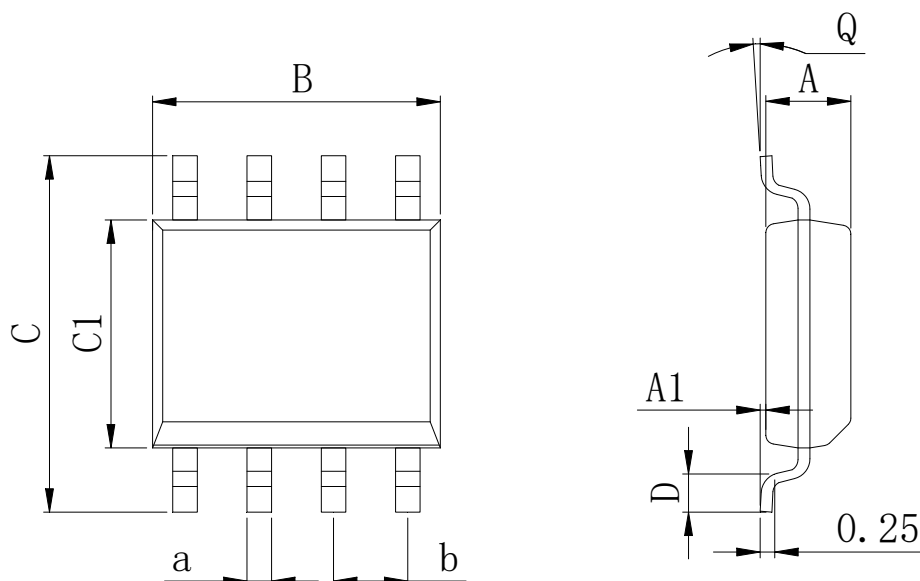
† Measured with $V_{CC\pm}$ differentially varied simultaneously from $\pm 4\text{ V}$ to $\pm 15\text{ V}$

Operating Characteristics, $V_{CC\pm} = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$ (unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
SR	Slew rate at unity gain			5.5		V/ μs
GBW	Gain bandwidth product			15		MHz
THD	Total harmonic distortion	$V_O = 5\text{V}, R_L = 2\text{K}\Omega, f = 1\text{KHz}, A_{VD} = 20\text{dB}$		0.05		%
V_n	Equivalent input noise voltage	RIAA, $R_S \leq 2\text{K}\Omega, 30\text{KHz LPF}$		1.2		μV_{rms}

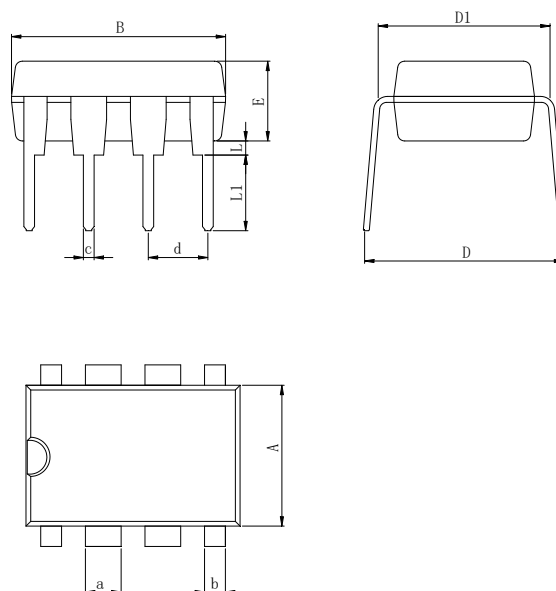
Physical Dimensions

SOP-8



Dimensions In Millimeters(SOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

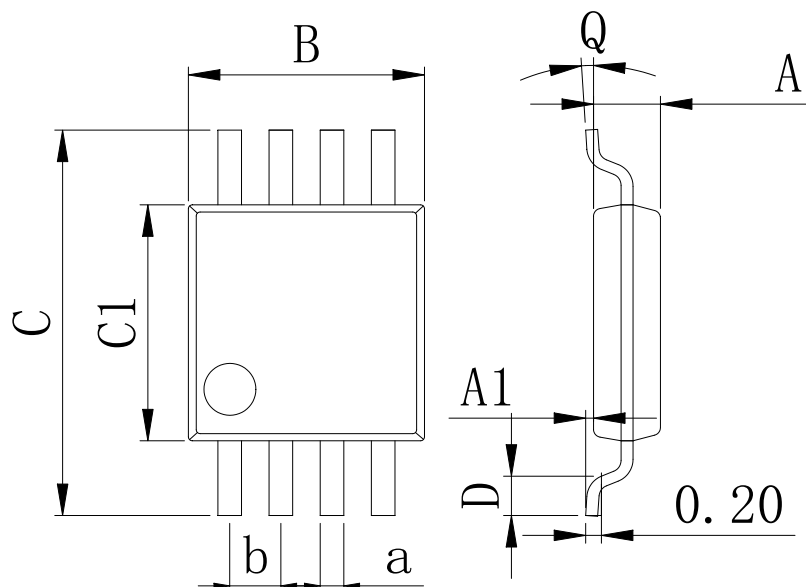
DIP-8



Dimensions In Millimeters(DIP-8)											
Symbol:	A	B	D	D1	E	L	L1	a	b	c	d
Min:	6.10	9.00	8.10	7.42	3.10	0.50	3.00	1.50	0.85	0.40	2.54 BSC
Max:	6.68	9.50	10.9	7.82	3.55	0.70	3.60	1.55	0.90	0.50	

Physical Dimensions

MSOP-8



Dimensions In Millimeters(MSOP-8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.80	0.05	2.90	4.75	2.90	0.35	0°	0.25	0.65 BSC
Max:	0.90	0.20	3.10	5.05	3.10	0.75	8°	0.35	

Revision History

DATE	REVISION	PAGE
2020-3-5	New	1-7
2024-8-20	Document reformatting	1-7

IMPORTANT STATEMENT:

Huaguan Semiconductor reserves the right to change its products and services without notice. Before ordering, the customer shall obtain the latest relevant information and verify whether the information is up to date and complete. Huaguan Semiconductor does not assume any responsibility or obligation for the altered documents.

Customers are responsible for complying with safety standards and taking safety measures when using Huaguan Semiconductor products for system design and machine manufacturing. You will bear all the following responsibilities: Select the appropriate Huaguan Semiconductor products for your application; Design, validate and test your application; Ensure that your application meets the appropriate standards and any other safety, security or other requirements. To avoid the occurrence of potential risks that may lead to personal injury or property loss.

Huaguan Semiconductor products have not been approved for applications in life support, military, aerospace and other fields, and Huaguan Semiconductor will not bear the consequences caused by the application of products in these fields. All problems, responsibilities and losses arising from the user's use beyond the applicable area of the product shall be borne by the user and have nothing to do with Huaguan Semiconductor, and the user shall not claim any compensation liability against Huaguan Semiconductor by the terms of this Agreement.

The technical and reliability data (including data sheets), design resources (including reference designs), application or other design suggestions, network tools, safety information and other resources provided for the performance of semiconductor products produced by Huaguan Semiconductor are not guaranteed to be free from defects and no warranty, express or implied, is made. The use of testing and other quality control technologies is limited to the quality assurance scope of Huaguan Semiconductor. Not all parameters of each device need to be tested.

The documentation of Huaguan Semiconductor authorizes you to use these resources only for developing the application of the product described in this document. You have no right to use any other Huaguan Semiconductor intellectual property rights or any third party intellectual property rights. It is strictly forbidden to make other copies or displays of these resources. You should fully compensate Huaguan Semiconductor and its agents for any claims, damages, costs, losses and debts caused by the use of these resources. Huaguan Semiconductor accepts no liability for any loss or damage caused by infringement.