

Structure : Silicon Monolithic Integrated Circuit
 Product : Ground isolation amplifier for car audio systems

Type : **BA3121F**

- Function :
1. Large capacitors not required
 2. High common-mode rejection ratio (57dB typ. at f = 1kHz).
 3. Low noise ($V_{NO} = 3.5 \mu V_{rms}$ Typ.).
 4. Low distortion (THD = 0.002% Typ.).
 5. Two channels.

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Power supply voltage	Vcc	18	V
Power dissipation	Pd	450*	mW
Operating temperature	Topr	-30 ~ +85	°C
Storage temperature	Tstg	-55 ~ +125	°C

※This value decreases 4.5 mW/°C for Ta=25°C or more.

Operating Voltage Range (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply voltage	Vcc	4	12	18	V	Single power source

Application example

Note that ROHM cannot provide adequate confirmation of patents.

The product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys).

Should you intend to use this product with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

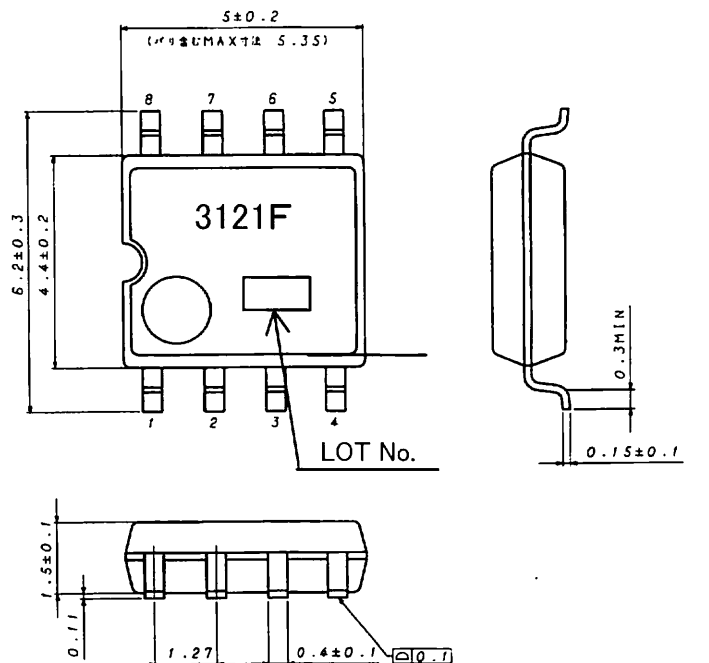
Electrical characteristics

(unless otherwise noted, $T_a=25^{\circ}\text{C}$, $V_{CC}=12\text{V}$, $f=1\text{kHz}$, $R_g=1.8\text{k}\Omega$)

Parameter	Symbol	Limit			Unit	Conditions
		Min.	Typ.	Max.		
Quiescent current	I_Q	5.6	9.0	14.0	mA	$V_{IN}=0V_{rms}$
Output noise voltage	V_{NO}	—	3.5	8.0	μV_{rms}	BPF=20Hz~20kHz
Voltage gain	G_V	-1.5	-0.04	1.5	dB	$V_O=-10\text{dBm}$, $R_g=0\Omega$
Maximum output voltage	V_{OM}	1.8	2.0	—	V_{rms}	THD=0.1%, $V_{CC}=8\text{V}$
Total harmonic distortion	THD	—	0.002	0.02	%	$V_O=0.7V_{rms}$
Common-mode rejection ratio	CMRR	41	57	—	dB	
Common-mode voltage	V_{CM}	2.5	3.75	—	V_{rms}	$V_{CC}=8\text{V}$, CMRR=40dB
Ripple rejection ratio	RR	72	80	—	dB	$f_{RR}=100\text{Hz}$, $V_{RR}=-10\text{dBm}$, $R_g=0\Omega$
Channel separation	CS	—	82	—	dB	$V_{IN}=-10\text{dBm}$, $R_g=1.8\text{k}\Omega/\text{OPEN}$
Slew rate	SR	—	2.0	—	$\text{V}/\mu\text{S}$	
Input resistance	R_{IN}	44	55	66	$\text{k}\Omega$	

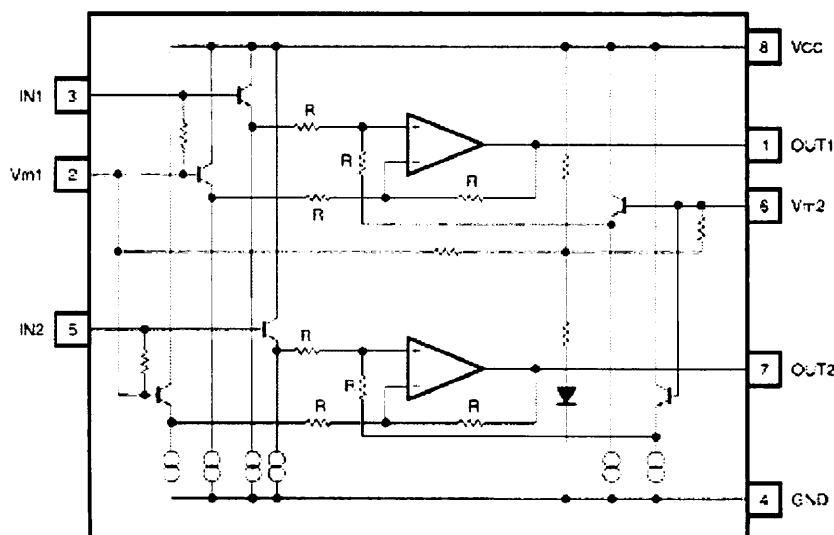
※Not designed for radiation resistance.

Outline Dimension



SOP8 (Unit:mm)

Block Diagram



Terminal Number/ Terminal Name

Terminal Number	Terminal Name
1	OUT1
2	Vm1
3	IN1
4	GND
5	IN2
6	Vm2
7	OUT2
8	VCC

Application example

- (1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
- (2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
- (3) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.
- (4) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
- (5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
- (6) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.

(7) Operation in strong magnetic fields

Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

- (8) The capacitors of 2pin (V_{m1}), and 6pin (V_{m2}) should maintain the ratio of 2:1 for ripple removal characteristics. Maintaining this ratio will not cause ripple removal rate to reduce significantly even if the capacitance reduces to a half.
- (9) Setting the capacitor to the double or half will make the CMRR in the low range to +6dB or -6dB respectively.

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