



SOUND ENHANCEMENT AUDIO PROCESSOR

■ GENERAL DESCRIPTION

The NJM2150A is a sound enhancement audio processor which regenerates high definitive and nearly real clearness sound.

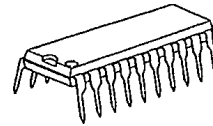
It includes BBE ON/OFF switch and two-grade boost switches in low and high band (Low Band: 6.0 or 9.0dB, High Band: 6.0dB or 9.0dB).

It is suitable for audio items such as TV, AV receiver, CD radio-cassette, speaker system, car audio, and others.

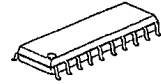
■ FEATURES

- Operating Voltage (4.5 to 13V)
- Low Operating Current (8mA typ.)
- Low Output Noise (14 $\mu$ Vrms typ. at BBE ON)
- Bypass Gain (0dB typ.)
- BBE ON/OFF Switch
- Independent High/Low Boost two-grade Switch (Low Band: 6.0 or 9.0dB, High Band: 6.0 or 9.0dB)
- Bipolar Technology
- Package Outline DIP20, DMP20, SSOP20

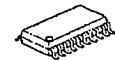
■ PACKAGE OUTLINE



NJM2150AD



NJM2150AM

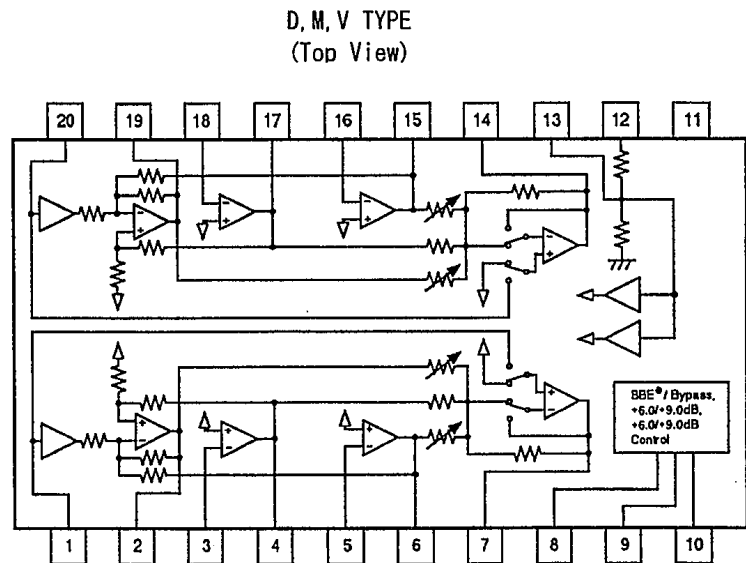


NJM2150AV

■ PIN CONFIGURATION

1. INPUT (A)
2. HPF (A)
3. CR1 (A)
4. BPF (A)
5. CR2 (A)
6. LPF (A)
7. OUTPUT (A)
8. PROCESS
9. LO CONTOUR
10. BBE
11. GND
12. V\*
13. VREF
14. OUTPUT (B)
15. LPF (B)
16. CR2 (B)
17. BPF (B)
18. CR1 (B)
19. HPF (B)
20. INPUT (B)

■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| PARAMETER                   | SYMBOL           | RATING                                     | UNIT |
|-----------------------------|------------------|--|------|
| Supply Voltage              | V <sup>+</sup>   | 15   | V    |
| Power Dissipation           | P <sub>D</sub>   | (DIP20) 700<br>(DMP20) 350<br>(SSOP20) 300 | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -40~+85                                    | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40~+125                                   | °C   |

## ■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=9V, Ta=25°C)

| PARAMETER                    | SYMBOL             | TEST CONDITION                               | FUNCTION |             | MIN. | TYP.        | MAX.           | UNIT                        |
|------------------------------|--------------------|--|----------|-------------|------|-------------|----------------|-----------------------------|
|                              |                    |  | BBE      | Boost Level |      |             |                |                             |
| Operating Voltage            | V <sup>+</sup>     | No Signal                                    |          |             | 4.5  | 9.0         | 13.0           | V                           |
| Supply Current               | I <sub>cc</sub>    |  |          |             | —    | 8.0         | 12.0           | mA                          |
| Reference Voltage            | VREF               |  |          |             | 4.0  | 4.5         | 5.0            | V                           |
| SW Control Voltage Threshold | VthH               |  |          |             | 2.0  | —           | V <sup>+</sup> | V                           |
|                              | VthL               |  |          |             | 0    | —           | 0.5            | V                           |
| Boost Level                  | Boost1             | f=20Hz                                       | ON       | Low         | 5.0  | 6.0         | 7.0            | dB                          |
|                              | Boost2             | f=20Hz                                       | ON       | High        | 8.0  | 9.0         | 10.0           | dB                          |
|                              | Boost3             | f=1kHz                                       | ON       |             | -1.2 | -0.2        | 0.8            | dB                          |
|                              | Boost4             | f=20kHz                                      | ON       | Low         | 5.0  | 6.0         | 7.0            | dB                          |
|                              | Boost5             | f=20kHz                                      | ON       | High        | 8.0  | 9.0         | 10.0           | dB                          |
| Bypass Gain                  | G <sub>BYP</sub>   | f=1kHz                                       | BYPASS   |             | -1   | 0           | 1              | dB                          |
| Maximum Input Voltage        | V <sub>inmax</sub> | f=1kHz, R <sub>L</sub> =10kΩ<br>THD=10%      | BYPASS   |             | 2.8  | —           | —              | V <sub>rms</sub>            |
| Total Harmonic Distortion    | THD                | f=1kHz, V <sub>in</sub> =0.1V <sub>rms</sub> | ON       | Low         | —    | 0.05        | 0.11           | %                           |
| Output Noise                 | V <sub>no</sub>    | V <sub>in</sub> =GND<br>A-Weighting          | ON       | Low         | —    | -97<br>(14) | -87<br>(45)    | dBV<br>(μV <sub>rms</sub> ) |

## ■ SWITCH FUNCTION

| Switch Terminal | Control Voltage Level | FUNCTION |
|-----------------|-----------------------|----------|
| BBE             | High                  | BBE ON   |
|                 | Low                   | BYPASS   |
| PROCESS         | High                  | +9.0dB   |
|                 | Low                   | +6.0dB   |
| LO CONTOUR      | High                  | +9.0dB   |
|                 | Low                   | +6.0dB   |

■ TERMINAL DESCRIPTION

| No.                                      | SYMBOL   | FUNCTION                       | EQUIVALENT CIRCUIT |
|--|--|--------------------------------|--------------------|
| 1<br>20                                  | INPUT (A)<br>INPUT (B)   | Signal Input                   |                    |
| 3<br>5<br>16<br>18                       | CR1 (A)<br>CR2 (A)<br>CR2 (B)<br>CR1 (B)   | Filter                         |                    |
| 2<br>4<br>6<br>7<br>14<br>15<br>17<br>19 | HPF (A)<br>BPF (A)<br>LPF (A)<br>OUTPUT (A)<br>OUTPUT (B)<br>LPF (B)<br>BPF (B)<br>HPF (B) | Filter Output<br>Signal Output |                    |

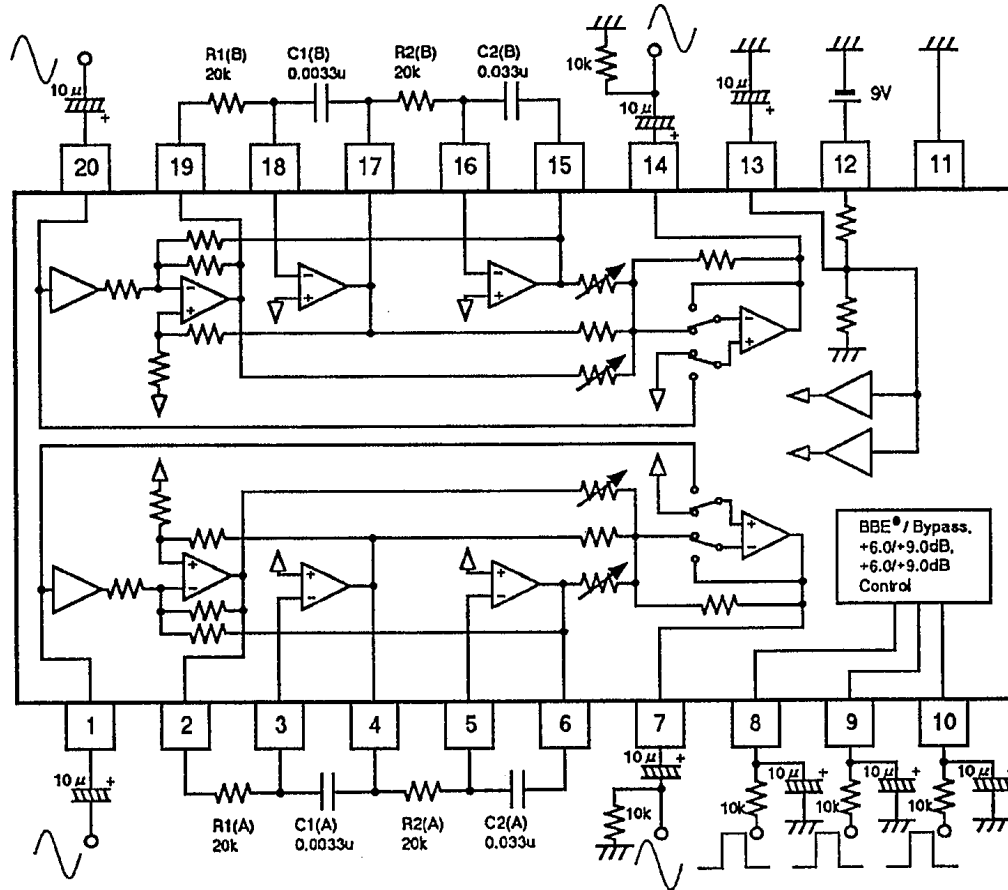
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## ■ TERMINAL DESCRIPTION

| No.          | SYMBOL                       | FUNCTION                              | EQUIVALENT CIRCUIT |
|--------------|------------------------------|---------------------------------------|--------------------|
| 8<br>9<br>10 | PROCESS<br>LO CONTOUR<br>BBE | Boost Level Control<br>Bypass Control |                    |
| 11           | GND                          | GND                                   |                    |
| 12           | V+                           | Power Supply                          |                    |
| 13           | VREF                         | Reference Voltage Output              |                    |

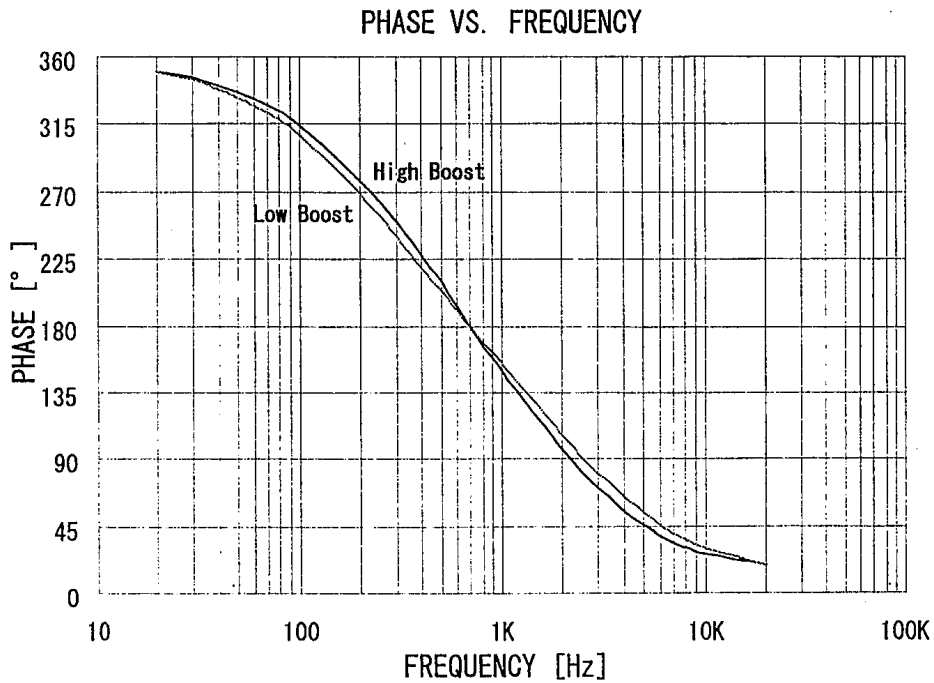
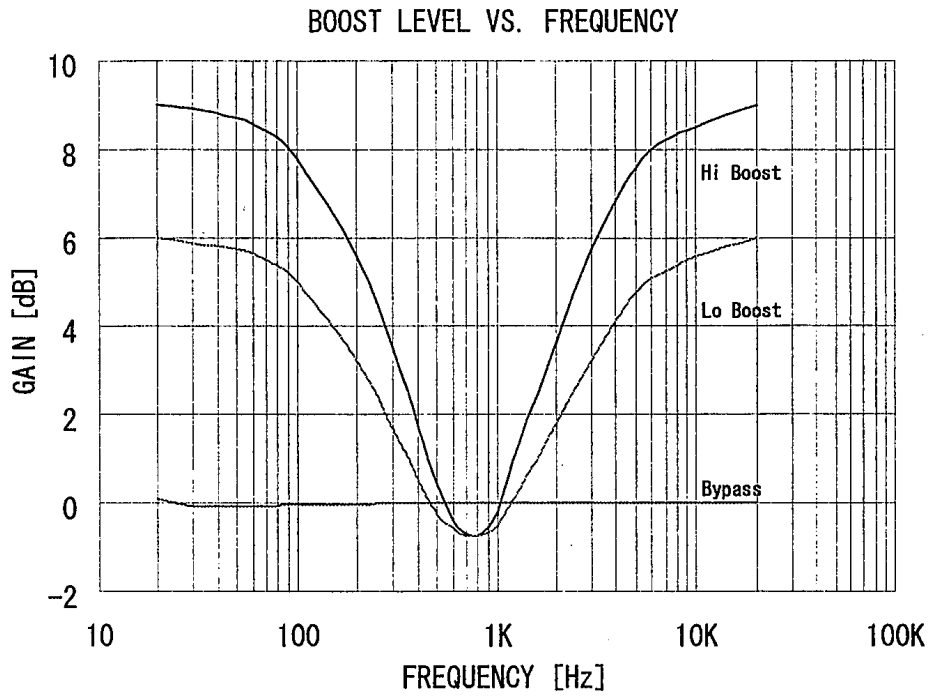
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■ APPLICATION CIRCUIT



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## ■ TYPICAL CHARACTERISTICS



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## ■ NOTE

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A license from BBE Sound Inc. is required before the NJM2150A can be purchased from New Japan Radio Co., Ltd.

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# NJM2150A

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## MEMO

**[CAUTION]**

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