



SOUND ENHANCEMENT AUDIO PROCESSOR

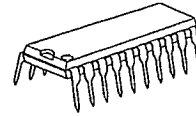
■ GENERAL DESCRIPTION

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

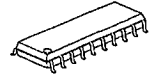
It includes BBE ON/OFF switch and two-grade boost switches in low and high band (Low Band: 6.0 or 9.0dB, High Band: 6.0dB or 9.0dB).

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

■ PACKAGE OUTLINE



NJM2150AD



NJM2150AM



NJM2150AV

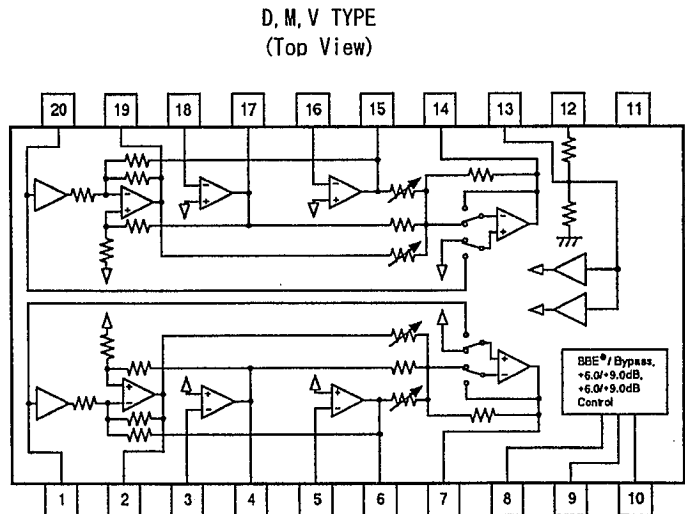
■ FEATURES

- 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

■ 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<sup>+</sup>
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 (DMP20) 350 (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 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 A-Weighting	ON	Low	—	-97 (14)	-87 (45)	dBV (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 20	INPUT (A) INPUT (B)	Signal Input	
3 5 16 18	CR1 (A) CR2 (A) CR2 (B) CR1 (B)	Filter	
2 4 6 7 14 15 17 19	HPF (A) BPF (A) LPF (A) OUTPUT (A) OUTPUT (B) LPF (B) BPF (B) HPF (B)	Filter Output Signal Output	

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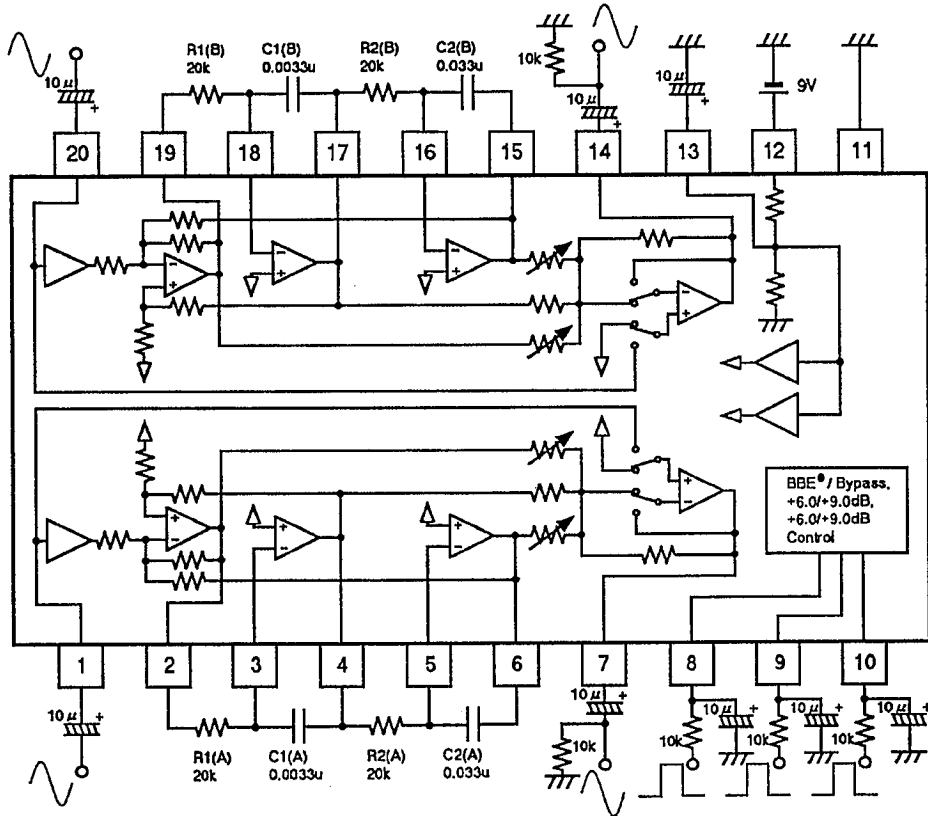
# NJM2150A

## ■ TERMINAL DESCRIPTION

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

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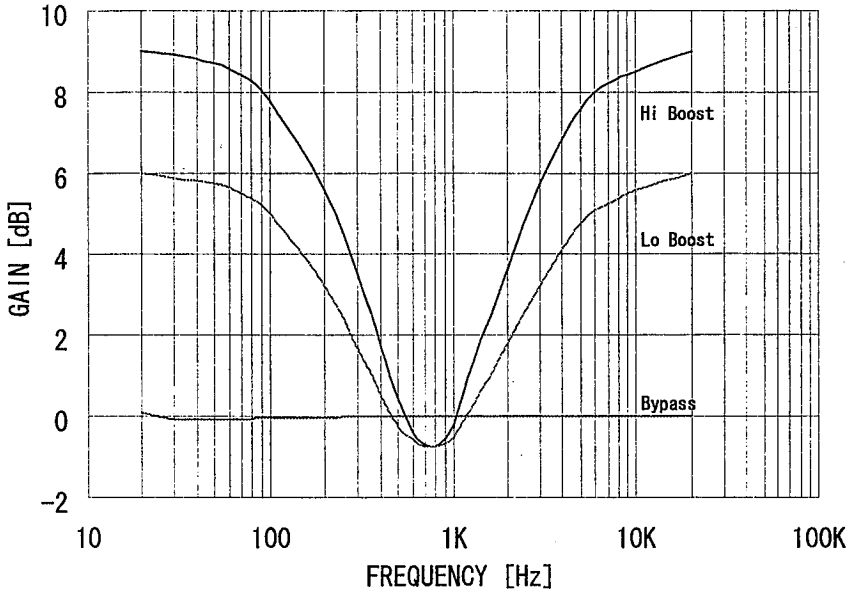
■ APPLICATION CIRCUIT



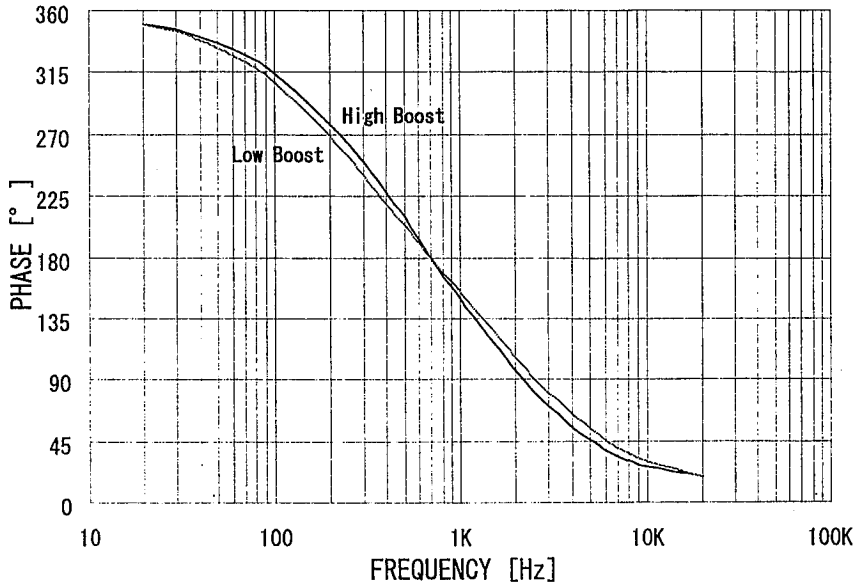
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## ■ TYPICAL CHARACTERISTICS

### BOOST LEVEL VS. FREQUENCY



### PHASE VS. FREQUENCY



**■ 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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## MEMO

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