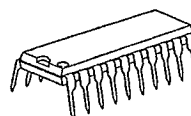


**BBE®****SOUND ENHANCEMENT AUDIO PROCESSOR****■ GENERAL DESCRIPTION**

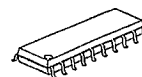
The NJM2150 is a sound enhancement audio processor which regenerates high definitive and nearly real clearness sound.

It includes BBE ON/OFF switch and two-grade boost switches in low and high band (Low Band: 2.5 or 5.5dB, High Band: 4.5dB or 7.5dB).

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

**■ PACKAGE OUTLINE**

NJM2150D



NJM2150M



NJM2150V

**■ FEATURES**

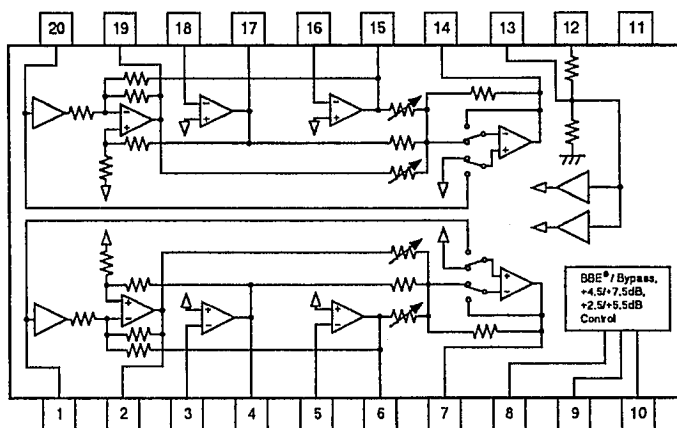
- Operating Voltage (4.5 to 13V)
- Low Operating Current (8mA typ.)
- Low Output Noise (10  $\mu$ Vrms typ. at BBE ON)
- Bypass Gain (0dB typ.)
- BBE ON/OFF Switch
- Independent High/Low Boost two-grade Switch  
(Low Band: 2.5 or 5.5dB, High Band: 4.5 or 7.5dB)
- Bipolar Technology
- Package Outline 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\*
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**

D, M, V TYPE  
(Top View)



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V*	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+=9V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	FUNCTION		MIN.	TYP.	MAX.	UNIT
			BBE	Boost Level				
Opoeating Voltage	V*	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+	V
	VthL				0	—	0.5	V
Boost Level	Boost1	f=20Hz	ON	Low	1.5	2.5	3.5	dB
	Boost2	f=20Hz	ON	High	4.5	5.5	6.5	dB
	Boost3	f=1kHz	ON		-1.2	-0.2	0.8	dB
	Boost4	f=20kHz	ON	Low	3.5	4.5	5.5	dB
	Boost5	f=20kHz	ON	High	6.5	7.5	8.5	dB
Bypass Gain	G <sub>BYP</sub>	f=1kHz	BYPASS		-1	0	1	dB
Maximum Input Voltage	Vinmax	f=1kHz, R <sub>L</sub> =10kΩ THD=10%	BYPASS		2.8	—	—	Vrms
Total Harmonic Distortion	THD	f=1kHz, Vin=0.1Vrms	ON	Low	—	0.04	0.1	%
Output Noise	Vno	Vin=GND A-Weighting	ON	Low	—	-100 (10)	-90 (32)	dBV (μVrms)

■ SWITCH FUNCTION

Switch Terminal	Control Voltage Level	FUNCTION
BBE	High	BBE ON
	Low	BYPASS
PROCESS	High	+7.5dB
	Low	+4.5dB
LO CONTOUR	High	+5.5dB
	Low	+2.5dB

■ 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	

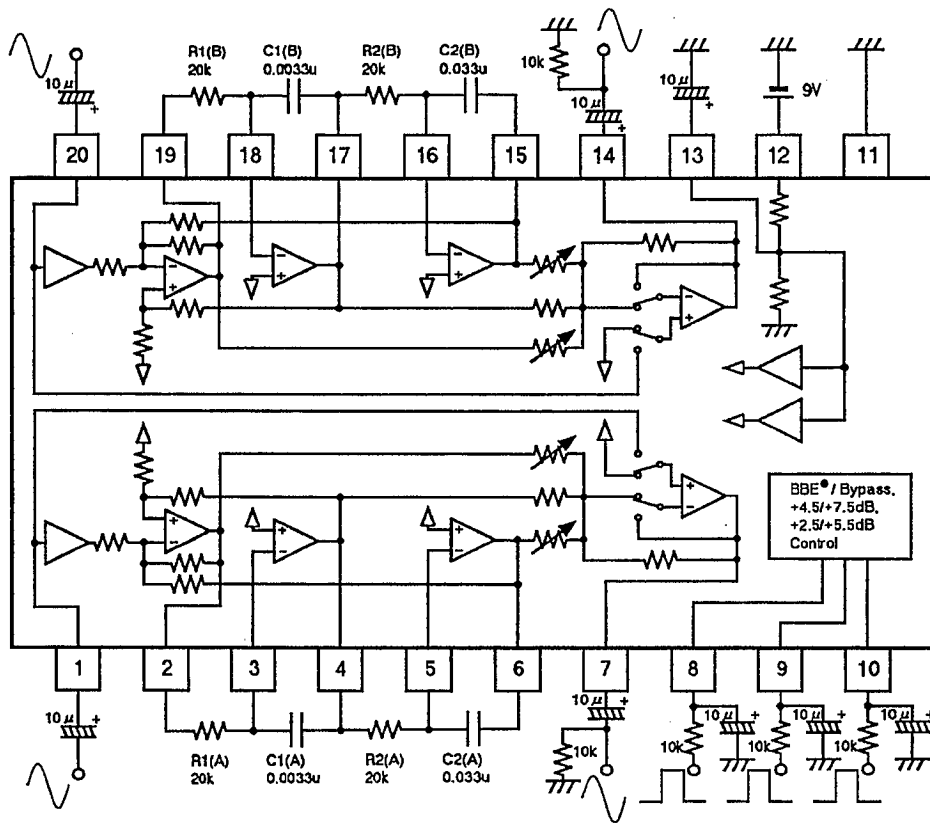
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■ TERMINAL DESCRIPTION

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	

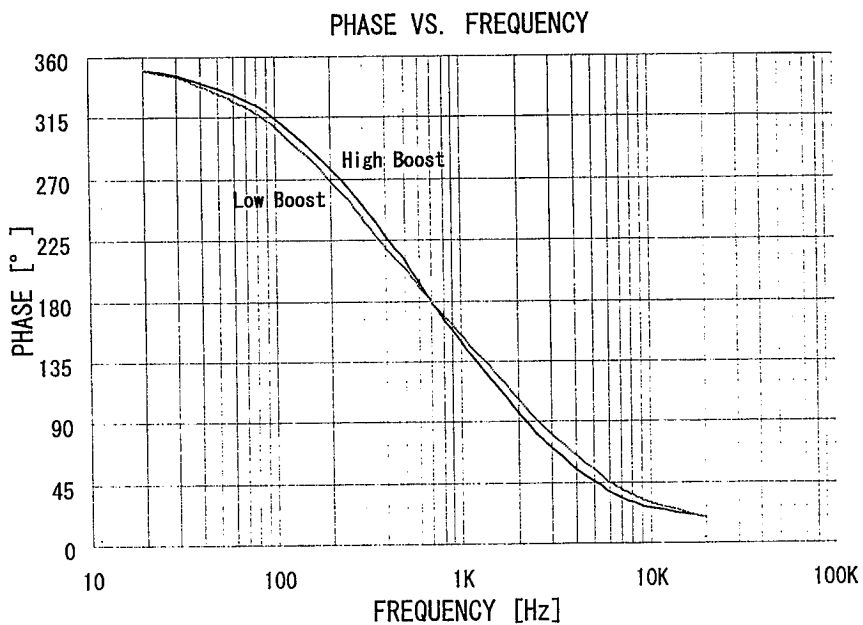
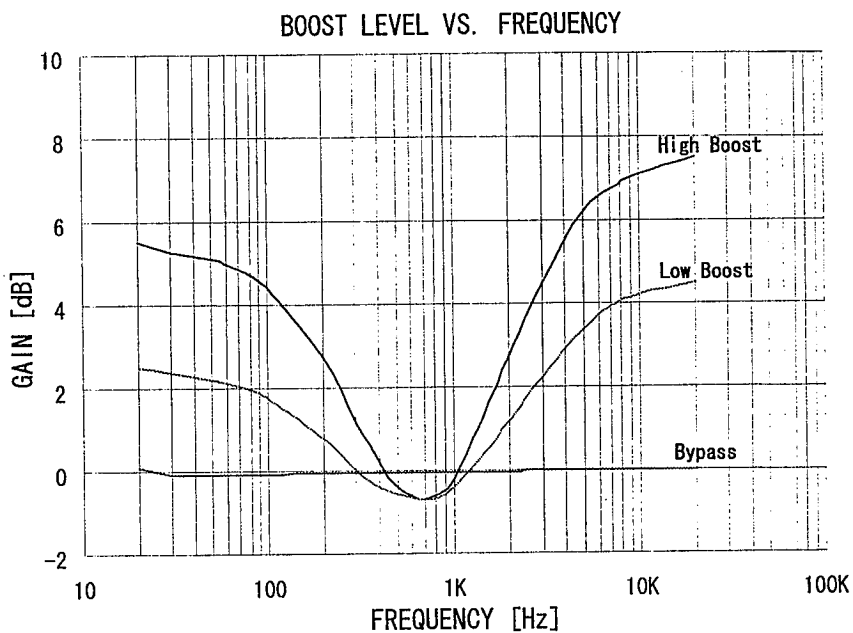
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■ APPLICATION CIRCUIT



4

## ■ TYPICAL CHARACTERISTICS



■ NOTE

The NJM2150 is manufactured by New Japan Radio Co., Ltd under license from BBE Sound Inc.  
BBE is a registered trademark of BBE Sound Inc.  
A license from BBE Sound Inc. is required before the NJM2150 can be purchased from New Japan Radio Co., Ltd.

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## MEMO

**[CAUTION]**

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