



SOUND ENHANCEMENT AUDIO PROCESSOR

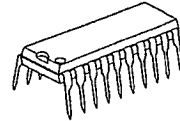
■ GENERAL DESCRIPTION

The NJM2152 is a sound enhancement audio processor which regenerates high definitive and nearly real clearness sound.

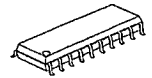
It includes BBE ON/OFF switch and three-grade boost switches in high band (High Band:5.0/8.0/11.0dB).

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

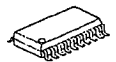
■ PACKAGE OUTLINE



NJM2152D



NJM2152M



NJM2152V

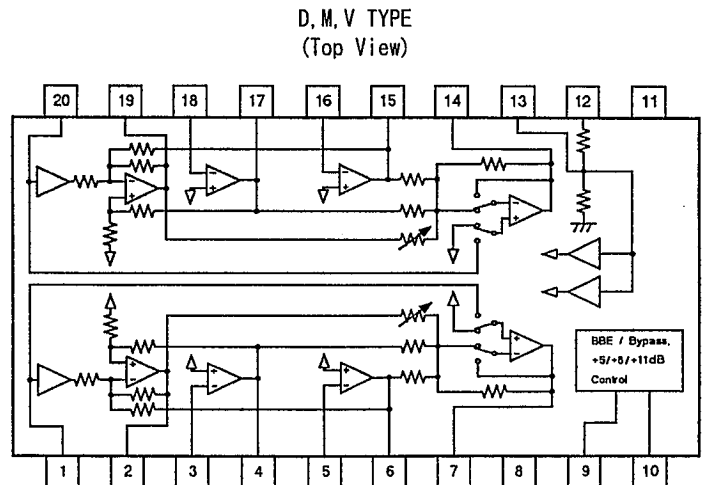
■ FEATURES

- Operating Voltage (4.5 to 13V)
- Low Operating Current (8mA typ.)
- Low Output Noise (14μVrms typ. at BBE ON)
- Bypass Gain (0dB typ.)
- BBE ON/OFF Switch
- Independent High Boost three-grade Switch (High Band:5.0/8.0/11.0dB typ.)
- Fixed Low Boost Level (4.0dB typ.)
- Bipolar Technology
- Package Outline DIP20, DMP20, SSOP20

■ PIN CONFIGURATION

1. INPUT
2. HPF
3. CR1
4. BPF
5. CR2
6. LPF
7. OUTPUT
8. NC
9. SW1
10. SW2
11. GND
12. V\*
13. V<sub>REF</sub>
14. OUTPUT
15. LPF
16. CR2
17. BPF
18. CR1
19. HPF
20. INPUT

■ BLOCK DIAGRAM



## ■ 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				
Operating Voltage	V*				4.5	9.0	13.0	V
Supply Current	I <sub>CC</sub>	No Signal			-	8.0	12.0	mA
Reference Voltage	V <sub>REF</sub>				4.0	4.5	5.0	V
SW Control Voltage Threshold	V <sub>thH</sub>				2.0	-	V*	V
	V <sub>thL</sub>				0	-	0.5	V
Boost Level	Boost1	f=20Hz	ON		3.0	4.0	5.0	dB
	Boost2	f=1kHz	ON	Low	-1.3	-0.3	0.7	dB
	Boost3	f=20Hz	ON	Low	4.0	5.0	6.0	dB
	Boost4	f=20Hz	ON	Mid	7.0	8.0	9.0	dB
	Boost5	f=20Hz	ON	High	10.0	11.0	12.0	dB
Bypass Gain	G <sub>BYP</sub>	f=1kHz	BYPASS		-1	0	1	dB
Channel Balance	BAL	f=1kHz	BYPASS		-1	0	1	dB
Channel Separation	CS	f=1kHz	ON	High	65.0	90	-	dB
Maximum Input Voltage	V <sub>inMAX1</sub>	f=1kHz, R <sub>L</sub> =10kΩ, THD=10%	BYPASS		2.8	3.3	-	V <sub>rms</sub>
	V <sub>inMAX2</sub>	f=1kHz, R <sub>L</sub> =10kΩ, THD=1%	BYPASS		2.3	2.6	-	V <sub>rms</sub>
Total Harmonic Distortion	THD	f=1kHz, Vin=0. V <sub>rms</sub>	ON	Low	-	0.05	0.11	%
Output Noise	V <sub>no1</sub>	Vin=GND, A-Weighting	BYPASS		-	-115 (1.8)	-90 (32)	dBv (μV <sub>rms</sub> )
	V <sub>no2</sub>	Vin=GND, A-Weighting	ON	High	-	-97 (14)	-87 (45)	dBv (μV <sub>rms</sub> )

## ■ SWITCH FUNCTION

FUNCTION	SW1	SW2
Bypass	L	L
5dB	L	H
8dB	H	L
11dB	H	H

■ PIN FUNCTION

No.	SYMBOL	FUNCTION	EQUIVALENT CURCUIT
1 20	INPUT (A) INPUT (B)	Signal Input	
3 5 16 18	CR1 (A) CR2 (A) CR2 (B) CR3 (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	

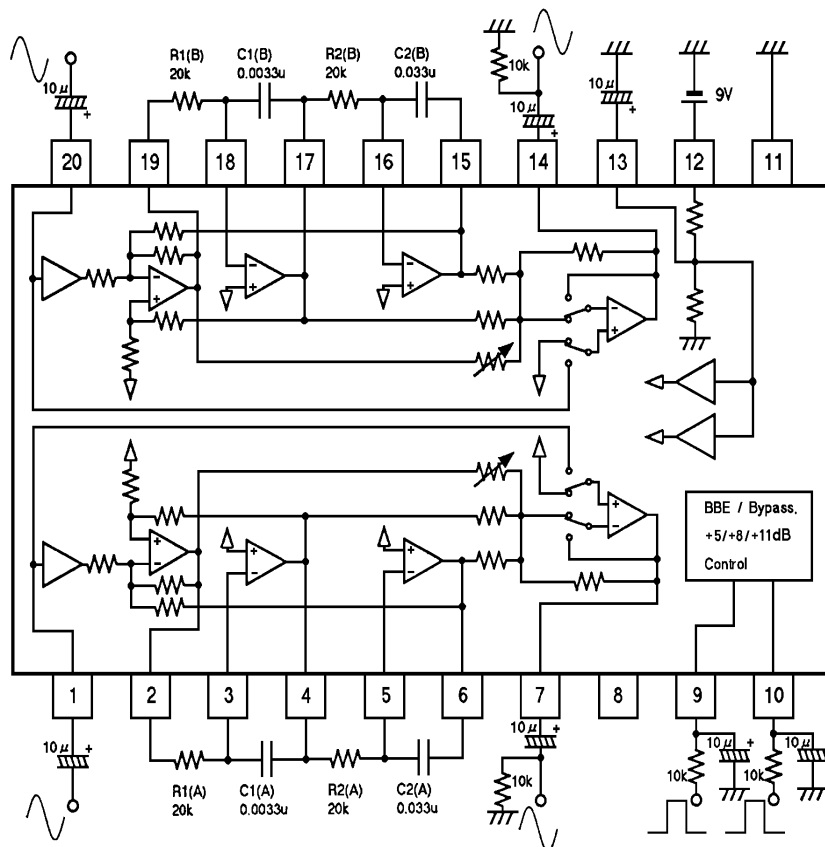
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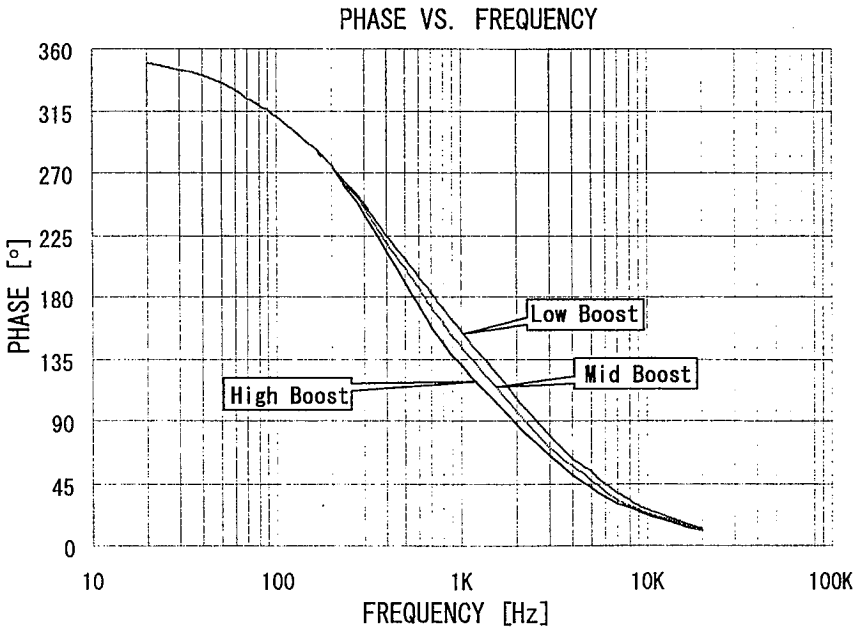
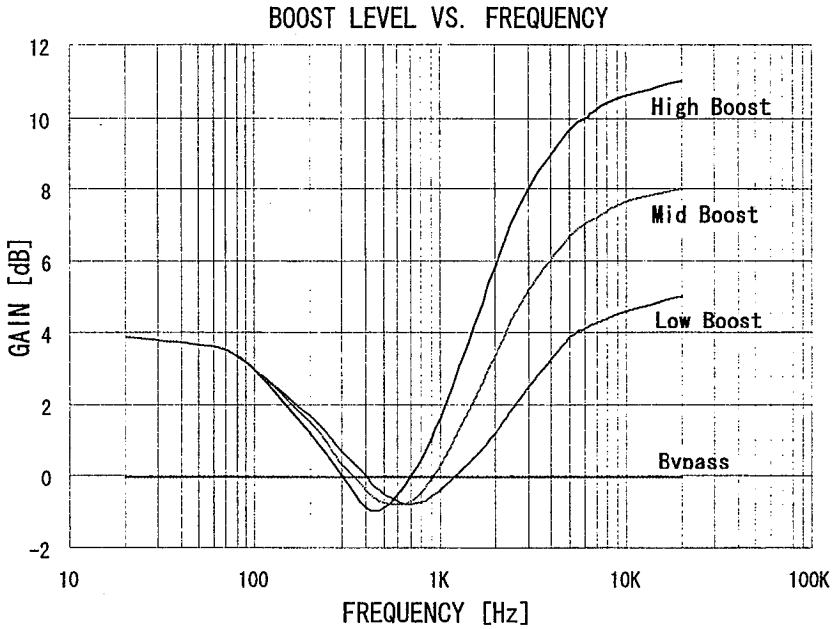
No.	SYMBOL	FUNCTION	EQUIVALENT CURCUIT
9	SW1	Boost Level Control Bypass Control	<p>The diagram for SW1 shows a circuit with a V+ supply at the top and ground at the bottom. A 150k resistor is connected between the V+ supply and a node. A diode is connected between this node and ground. The circuit includes several transistors in a multi-stage configuration, with various interconnections between their bases, emitters, and collectors. A terminal symbol is shown on the left side of the circuit.</p>
10	SW2	Boost Level Control Bypass Control	<p>The diagram for SW2 shows a circuit with a V+ supply at the top and ground at the bottom. A 150k resistor is connected between the V+ supply and a node. A diode is connected between this node and ground. The circuit includes several transistors in a multi-stage configuration, with various interconnections between their bases, emitters, and collectors. A terminal symbol is shown on the left side of the circuit.</p>
11	GND	GND	<p>The diagram for GND shows a simple horizontal line representing a connection to ground, with a terminal symbol on the left and a ground symbol on the right.</p>

No.	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
12	$V^+$	$V^+$	
13	$V_{REF}$	Reference Voltage Output	

## APPLICATION CIRCUIT



## ■ TYPICAL CHARACTERISTICS



■ NOTE

The NJM2152 is manufactured by New Japan Radio Co., Ltd under license from BBE Sound Inc. BBE is a registered trade mark of BBE Sound Inc. is required before the NJM2152 can be purchased from New Japan Radio Co., Ltd.

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## MEMO

[CAUTION]

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