



SOUND ENHANCEMENT AUDIO PROCESSOR

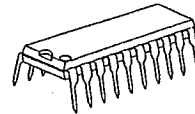
■GENERAL DESCRIPTION

The NJM2153 is a sound enhancement audio processor for professional audio equipments. It regenerates high definitive and nearly real sound.

The internal VCA (voltage controlled amplifier) suppresses the boost gain in high band to reduce noise when faint signals are inputted.

The NJM2153 is suitable for mixer and effector for musical instruments, and high-end audio equipment requiring low distortion and wide dynamic range.

■PACKAGE OUTLINE



NJM2153D

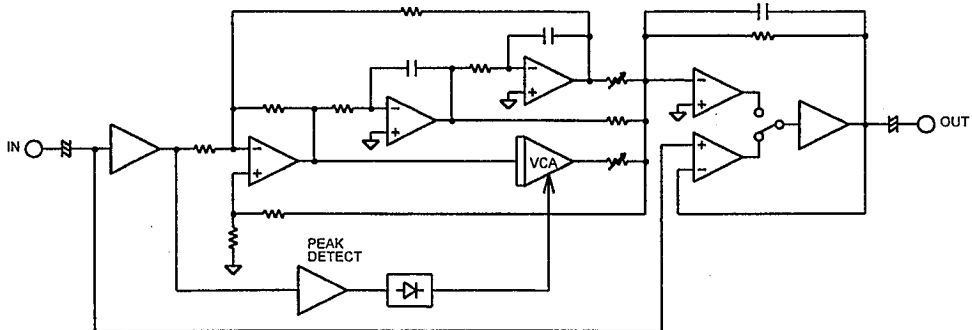


NJM2153M

■FEATURES

- Operating Voltage (±9 to ±18V)
- Low Operating Current (5.2mA typ.)
- Low Output Noise (20 μVrms typ. at BBE ON)
- Low Distortion (0.02% typ. at BBE ON)
- Internal BBE ON/OFF Switch
- Bipolar Technology
- Package Outline DIP20, DMP20

■BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V <sup>+</sup> /V <sup>-</sup>	±20	V
Power Dissipation	P <sub>D</sub>	(DIP20) 700 (DMP20) 350	mW
Operating Temperature Range	T <sub>OPR</sub>	-40 to +85	°C
Storage Temperature Range	T <sub>STG</sub>	-40 to +125	°C

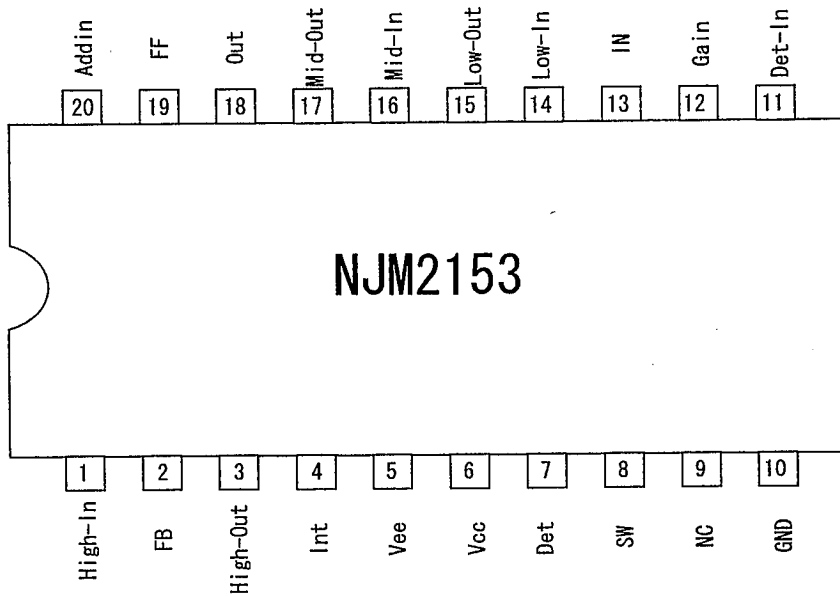
## ■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup>/V<sup>-</sup>=±15.0V, Ta=25°C, Vin=-12dBV/1kHz, Rg=600Ω, Rl=100kΩ)

PARAMETER	SYMBOL	TEST CONDITION	BBE	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sup>+</sup> /V <sup>-</sup>			±9.0	—	±18.0	V
Supply Current	I <sub>CC</sub>	No Signal	ON	—	5.2	8.0	mA
Low Voltage Gain	G <sub>VLF</sub>	f=50Hz	ON	10.0	12.0	14.0	dB
Mid Voltage Gain	G <sub>VHF</sub>	f=700Hz	ON	-2.3	-0.3	0.7	dB
High Voltage Gain 1	G <sub>VHF1</sub>	f=10kHz, Vin=0dBV	ON	10.5	12.0	13.5	dB
High Voltage Gain 2	G <sub>VHF2</sub>	f=10kHz, Vin=-35dBV	ON	7.2	9.2	11.2	dB
High Voltage Gain 3	G <sub>VHF3</sub>	f=10kHz, Vin=-50dBV	ON	-2.0	0.0	2.0	dB
Attack Time	T <sub>ATC</sub>	f=20kHz, -∞→0dBV	ON	—	100	—	μS
Recovery Time	T <sub>RCV</sub>	f=10kHz, 0dBV→-50dBV	ON	—	500	—	mS
Maximum Input Voltage	V <sub>IM</sub>	THD=1%	ON	5.0 (1.78)	6.5 (2.11)	—	dBV (V <sub>rms</sub> )
Maximum Output Voltage	V <sub>OM</sub>	THD=1%	ON	17.0 (7.08)	18.5 (8.41)	—	dBV (V <sub>rms</sub> )
Output Noise 1	V <sub>NO1</sub>	Rg=0Ω, DIN AUDIO	OFF	—	-100 (10)	-90 (31.6)	dBV (μV <sub>rms</sub> )
Output Noise 2	V <sub>NO2</sub>	Rg=0Ω, DIN AUDIO	ON	—	-94 (20)	-84 (63.1)	dBV (μV <sub>rms</sub> )
Total Harmonic Distortion 1	THD1	400Hz~30kHzBPF	OFF	—	0.01	0.05	%
Total Harmonic Distortion 2	THD2	400Hz~30kHzBPF	ON	—	0.02	0.1	%
SW Control Voltage Threshold	V <sub>th</sub>		ON	-2.0	0	2.0	V

## MODE SWITCH

MODE	SW
BYPASS	L
BBE	H

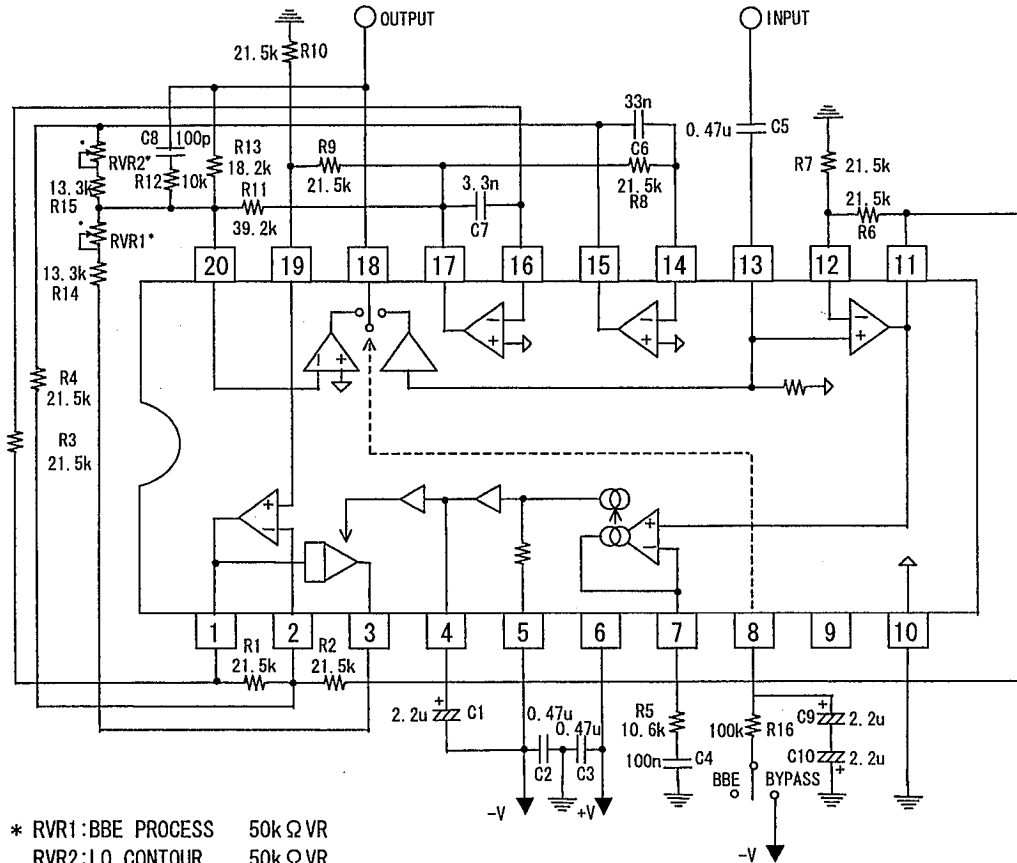
## PIN CONFIGURATION



## PIN FUNCTION

No.	SYMBOL	FUNCTION	No.	SYMBOL	FUNCTION
1	High-In	High Band Input	11	Det-In	Detector Input
2	FB	Feedback	12	Gain	Gain
3	High-Out	High Band Output	13	IN	Input
4	Int	Integral	14	Low-In	Low Band Input
5	Vee	Negative Power Supply	15	Low-Out	Low Band Output
6	Vcc	Positive Power Supply	16	Mid-In	Mid Band Input
7	Det	Detector	17	Mid-Out	Mid Band Output
8	SW	BBE ON/OFF Switch	18	Out	Output
9	NC	—	19	FF	Feedforward
10	GND	Ground	20	Addin	Add In

## APPLICATION CIRCUIT



\* RVR1:BBE PROCESS 50k Ω VR  
 RVR2:LO CONTOUR 50k Ω VR  
 13.3k Ω=+12dB Boost

PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1, C9, C10	2.2 μF	±20%	R1, R2, R3, R4, R6, R7, R8		
C2, C3, C5	0.47 μF	±5%	R9, R10	21.5k Ω	±1%
C4	100nF	±5%	R5	10.6k Ω	±1%
C6	33nF	±5%	R11	39.2k Ω	±1%
C7	3.3nF	±5%	R12	10k Ω	±1%
C8	100pF	±5%	R13	18.2k Ω	±1%
			R14, R15	13.3k Ω	±1%
			R16	100k Ω	±1%

■NOTE

The NJM2153 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 NJM2153 can be purchased from New Japan Radio Co., Ltd.

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## MEMO

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