BBE Mach3Bass Audio Processor

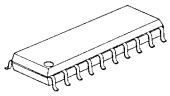
■GENERAL DESCRIPTION

NJM2156 is a BBE Mach3Bass processor, which includes BBE sound enhancement and Mach3Bass system.

The BBE reproduces high definitive and Mach3BASS provides rich and loss less bass sound.

The **NJM2156** is suitable for audio items such as TV, AV receiver, CD radio-cassette, speaker system, and others.

■PACKAGE OUTLINE

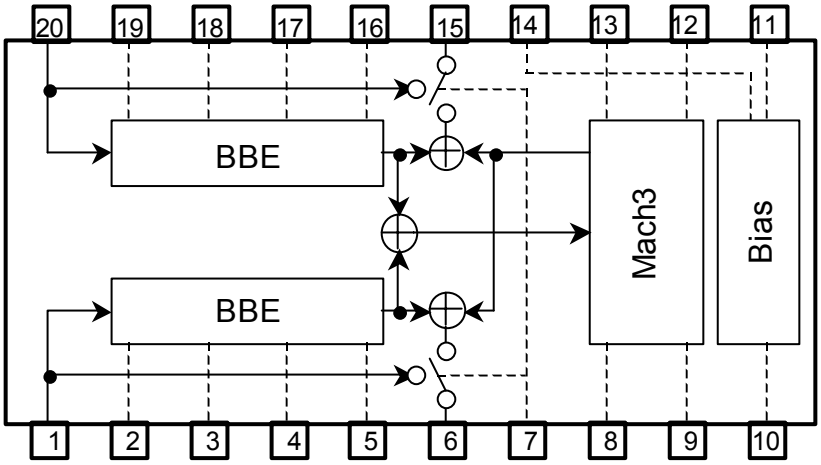


NJM2156M

■FEATURES

- ●Operating Voltage 4.7 to 13V
- ●Low Operating Current 8mA typ.
- ●BBE Sound Enhancement Function
  (Low Band: 2.5dB, High Band: 6.0dB)
- ●BBE Mach3Bass Function
  (Adjustable boost gain and center frequency by external parts)
- ●Internal Mach3Bass/Bypass Switch
- ●Bipolar Technology
- ●Package Outline DMP20

■BLOCK DIAGRAM & PIN CONFIGRATION



1. InA
2. HInA
3. HOutA
4. LInA
5. LOutA
6. OutA
7. BBE
8. LPOut
9. LPIn
10. V+
11. GND
12. GOut
13. GIn
14. Vref
15. OutB
16. LOutB
17. LInB
18. HOutB
19. HInB
20. InB

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

PARAMETER	SYMBOL	TEST CONDITION	UNIT
Supply Voltage	V^+	15	V
Power Dissipation	P_D	350	mW
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-40 to +125	°C

■**ELECTRICAL CHARACTERISTICS** (Ta=25°C, V^+=9V, Rg=600Ω, RL=47kΩ, Vin=100mVrms/1kHz, VR1[*1)] =500Ω, VR2[*1)] =36kΩ)

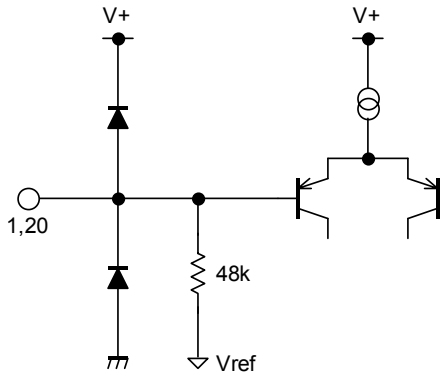
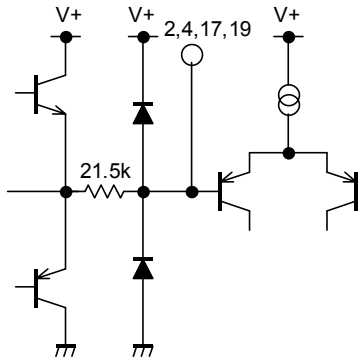
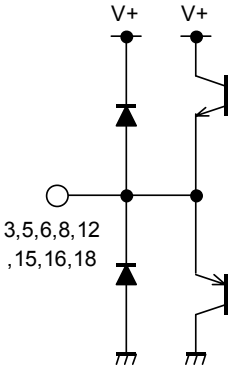
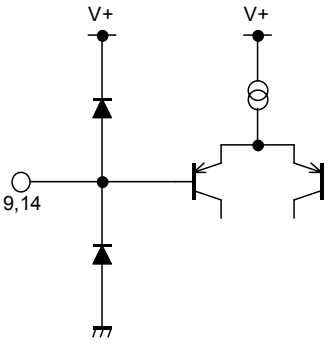
PARAMETER	SYMBOL	TEST CONDITION	MODE	MIN	TYP	MAX	UNIT
Operating Voltage	V^+		-	4.7	9.0	13.0	V
Operating Current	I_{cc}	No Signal	BYPASS	4.0	8.0	12.0	mA
Maximum Input Voltage	V_{IM}	f=1kHz, THD=10%	BYPASS	2.8	-	-	Vrms
Boost Level	Boost1	f=20Hz	Mach3	-	2.5	-	dB
	Boost2	f=1kHz	Mach3	0.0	0.6	1.2	
	Boost3	f=20kHz	Mach3	-	6.0	-	
Mach3 Boost	Mach3	fc=80Hz	Mach3	8.0	10.0	12.0	dB
Bypass Gain	G_{VBYP}	f=1kHz	BYPASS	-1.0	0.0	1.0	dB
Total Harmonic Distortion	THD	f=1kHz	Mach3	-	0.05	0.11	%
Output Noise	V_{NO}	Vin=GND A-Weighting	Mach3	-	-94 (20)	-84 (63)	dBV (μVrms)
Mode Select Control Voltage	V_{IH}	Vin=High Level		2.0	-	V^+	V
	V_{IL}	Vin=Low Level		0	-	0.5	

∗1), ∗2): Refer to APPLICATION CIRCUIT

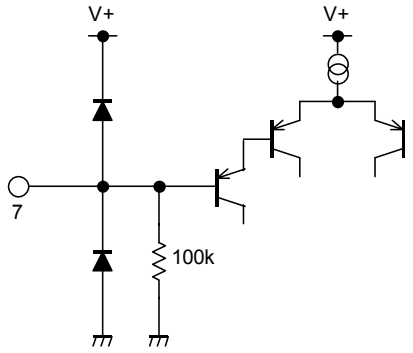
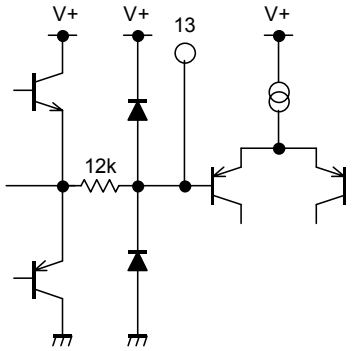
■**SWITCH FUNCTION**

Switch Terminal	Control Voltage Level	FUNCTION
BBE	Low	BYPASS
	High	BBE Mach3Bass ON

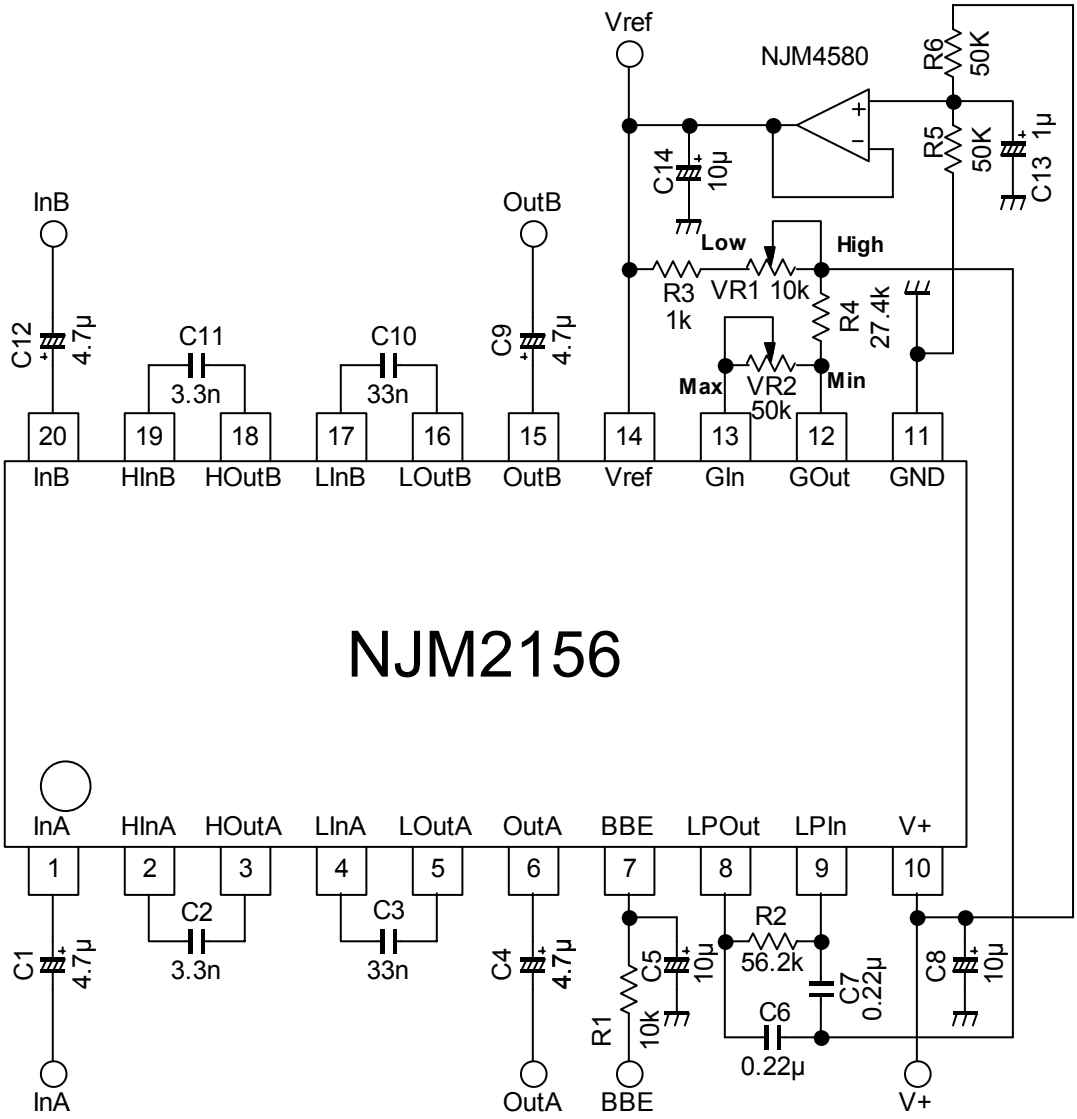
■TERMINAL DESCRIPTION

No	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
1 20	InA InB	Audio Signal Input (Ach) Audio Signal Input (Bch)		V+/2
2 4 17 19	HinA LinA LinB HinB	BBE High Pass Filter Input (Ach) BBE Low Pass Filter Input (Ach) BBE Low Pass Filter Input (Bch) BBE High Pass Filter Input (Bch)		V+/2
3 5 6 8 12 15 16 18	HOutA LOutA OutA LPOut GOut OutB LOutB HOutB	BBE High Pass Filter Output (Ach) BBE Low Pass Filter Output (Ach) Audio Signal Output (Ach) Mach3Bass Filter Output Output for Mach3Bass Gain Adjustment Audio Signal Output (Bch) BBE Low Pass Filter Output (Bch) BBE High Pass Filter Output (Bch)		V+/2
9 14	LPIn Vref	Mach3Bass Filter Input Reference Voltage Input Terminal		V+/2

■TERMINAL DESCRIPTION

No	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
7	BBE	BBE Mach3BASS ON/Bypass Control		0V
13	Gin	Input for Mach3Bass Gain Adjustment		V+/2
10	V+	Power Supply	———	V+
11	GND	GND	———	0V

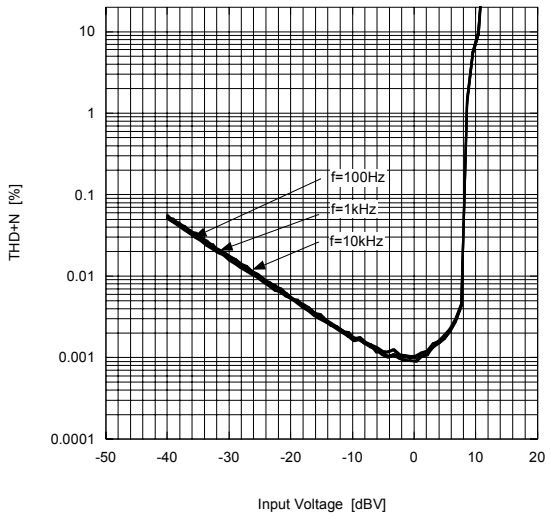
■APPLICATION CIRCUIT



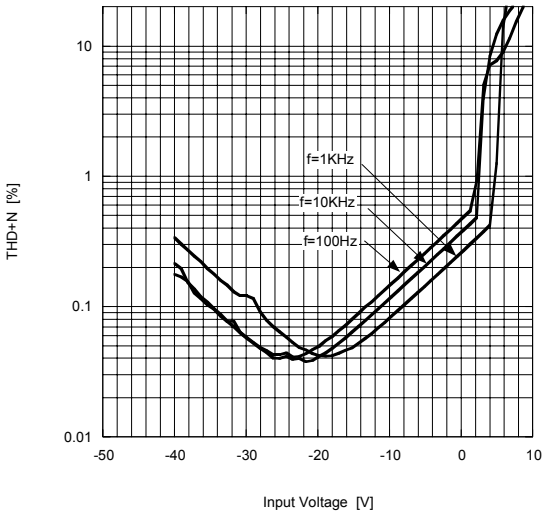
∗1) C2, C3, C10 and C11 decide the BBE characteristics. Use the specified value.
∗2) C6, C7, R2, R3 and R4 decide the Mach3Bass characteristics. Use the specified value.
∗3) VR1 controls Center Frequency for Mach3Bass.
∗4) VR2 controls Boost Gain for Mach3Bass.

■TYPICAL CHARACTERISTICS

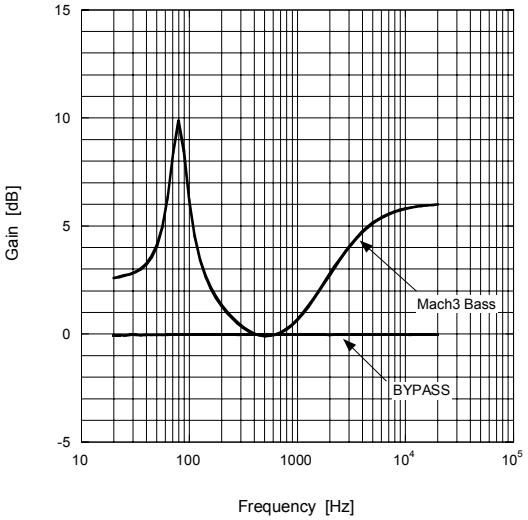
Total Harmonic Distortion vs. Input Voltage
(BYPASS)
V+=9V, Vin=Lch , Vout=Lch, RL=47k Ω
Rg=25Ω, BW=10-80KHz



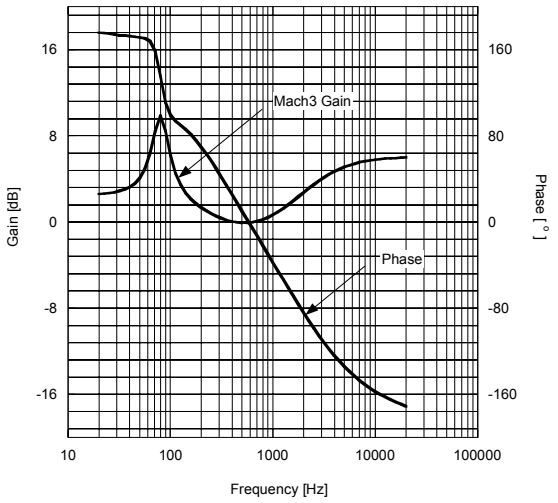
Total Harmonic Distortion vs. Input Voltage
(Mach3 BASS)
V+=9V, Vin=Lch , Vout=Lch, RL=47k Ω
Rg=25Ω, BW=10-80KHz



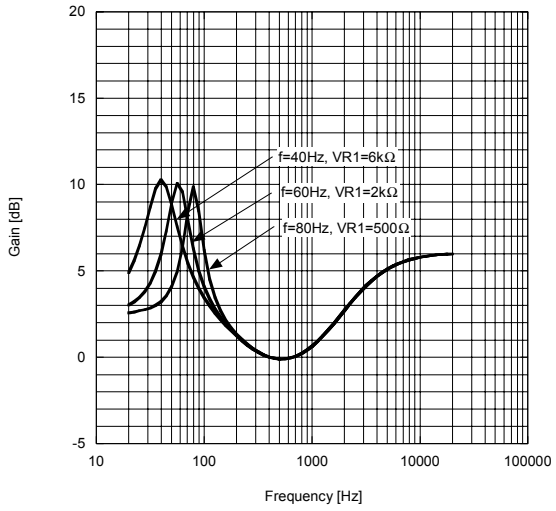
Voltage Gain vs. Frequency
V+=9V, Vin=-20dBV Lch, Vout=Lch, RL=47k Ω
Rg=25Ω



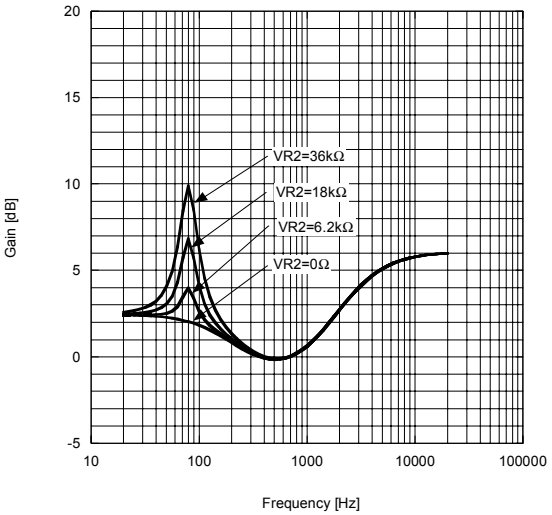
Mach3 Phase vs. Frequency
V+=9V, Vin=-20dBV Lch, Vout=Lch, RL=47k Ω
,Rg=25Ω



Mach3 Gain vs. Frequency
V+=9V, Vin=-20dBV Lch, Vout=Lch, RL=47k Ω
,Rg=25Ω



Mach3 Gain vs. Frequency
V+=9V, Vin=-20dBV Lch, Vout=Lch, RL=47k Ω
Rg=25Ω



■**NOTE**

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A license from BBE Sound Inc. is required before the **NJM2156** can be purchased from New Japan Radio Co., Ltd.

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