

# MN3207

## 1024-STAGE LOW VOLTAGE OPERATION LOW NOISE BBD

### General description

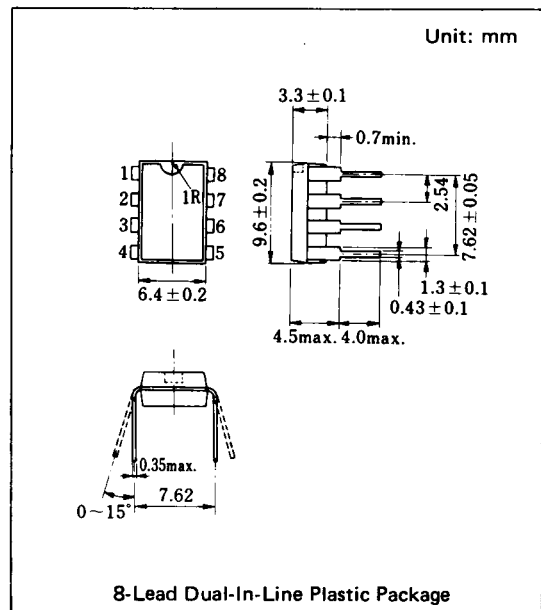
The MN3207 is a 1024-stage long delay low noise BBD that provides a signal delay of up to 51.2ms and is particularly suitable as a device for generation of reverberation effect in audio equipment such as low voltage operation portable stereo and radio cassette recorders.

### Features

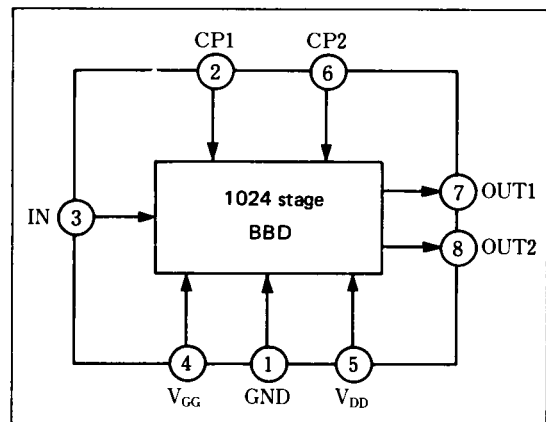
- Variable delay of audio signals: 2.56ms ~ 51.2ms.
- Wide supply voltage: 4 ~ 10V.
- No insertion loss:  $L_i = 0\text{dB typ.}$
- Wide dynamic range:  $S/N = 73\text{dB typ.}$
- Low distortion:  $\text{THD} = 0.4\% \text{ typ. (} V_i = 0.25 V_{\text{rms}} \text{)}$ .
- Clock frequency range: 10KHz ~ 200KHz.
- N-channel silicon gate process.
- 8-lead dual-in-line plastic package.

### Applications

- Reverberation and echo effects of audio equipment such as radio cassette recorder, car radio, portable radio, portable stereo, echo microphone and pre-taped musical accompaniment (Karaoke), etc.
- Sound effect in electronic musical instruments.
- Variable or fixed delay of analog signals.



### Block Diagram



### Quick Reference Data

Item	Symbol	Value	Unit
Supply Voltage	$V_{DD}, V_{GG}$	+ 5, $\frac{1}{3} V_{DD}$	V
Signal Delay Time	$t_D$	2.56~51.2	ms
Total Harmonic Distortion	THD	0.4	%
Signal to Noise Ratio	S/N	73	dB

■ Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit
Terminal Voltage	V <sub>DD</sub> , V <sub>GG</sub> , V <sub>CP</sub> , V <sub>I</sub>	-0.3~+11	V
Output Voltage	V <sub>O</sub>	-0.3~+11	V
Operating Temperature	T <sub>opr</sub>	-20~+60	°C
Storage Temperature	T <sub>stg</sub>	-55~+125	°C

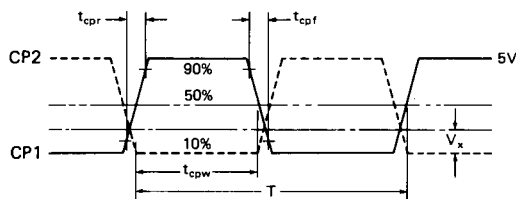
■ Operating Condition (Ta = 25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain Supply Voltage	V <sub>DD</sub>		+4	+5	+10	V
Gate Supply Voltage	V <sub>GG</sub>			$\frac{14}{15}V_{DD}$		V
Clock Voltage "H" Level	V <sub>CPH</sub>			V <sub>DD</sub>		V
Clock Voltage "L" Level	V <sub>CPL</sub>		0		+1	V
Clock frequency	f <sub>CP</sub>		10		200	kHz
Clock Pulse Width *1	t <sub>CPW</sub>				0.5T *2	
Clock Rise Time *1	t <sub>CPr</sub>				500	ns
Clock Fall Time *1	t <sub>CPf</sub>				500	ns
Clock Input Capacitance	C <sub>CP</sub>				700	pF
Clock Cross Point *1	V <sub>X</sub>		0		0.3V <sub>CPH</sub>	V

■ Electrical Characteristics (Ta = 25°C, V<sub>DD</sub> = V<sub>CPH</sub> = 5V, V<sub>CPL</sub> = 0V, V<sub>GG</sub> = 4.67V, R<sub>L</sub> = 100kΩ)

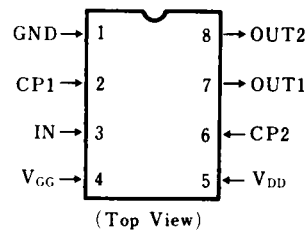
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Signal Delay Time	t <sub>D</sub>		2.56		51.2	ms
Input Signal Frequency	f <sub>i</sub>	f <sub>CP</sub> = 40kHz, V <sub>i</sub> = 0.35Vrms 3dB down (0dB at f <sub>i</sub> = 1kHz) = 1kHz	10			kHz
Input Signal Swing	V <sub>i</sub>	f <sub>CP</sub> = 40kHz, f <sub>i</sub> = 1kHz, THD = 2.5%	0.36			Vrms
Insertion Loss	L <sub>i</sub>	f <sub>CP</sub> = 40kHz, f <sub>i</sub> = 1kHz, V <sub>i</sub> = 0.36Vrms	-4	0	4	dB
Total Harmonic Distortion	THD	f <sub>CP</sub> = 40kHz, f <sub>i</sub> = 1kHz, V <sub>i</sub> = 0.25Vrms		0.4	2.5	%
Noise Voltage	V <sub>no</sub>	f <sub>CP</sub> = 100kHz, Weighted by "A" curve			0.25	mVrms
Signal to Noise Ratio	S/N			73		dB

\*1 Clock Pulse Waveforms

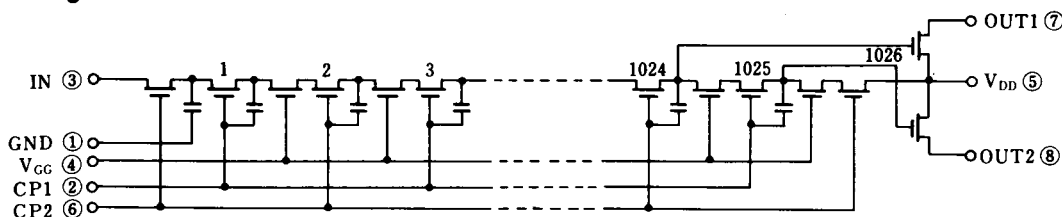


\*2 T = 1/f<sub>CP</sub> (Clock Period)

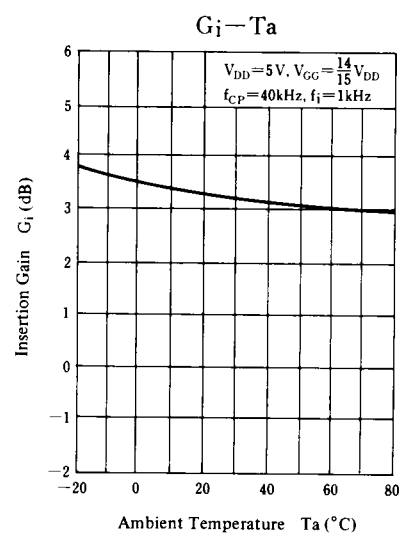
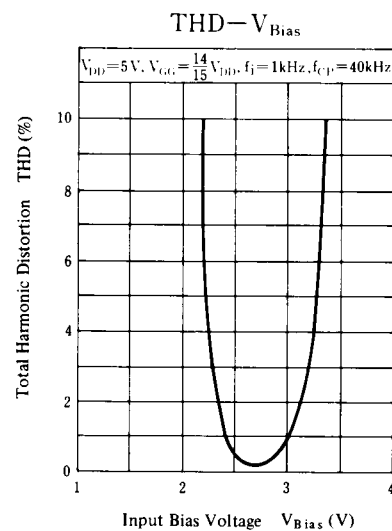
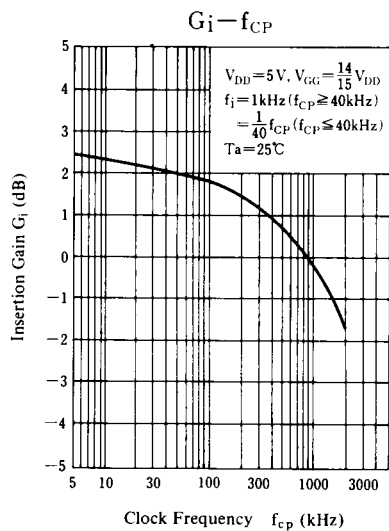
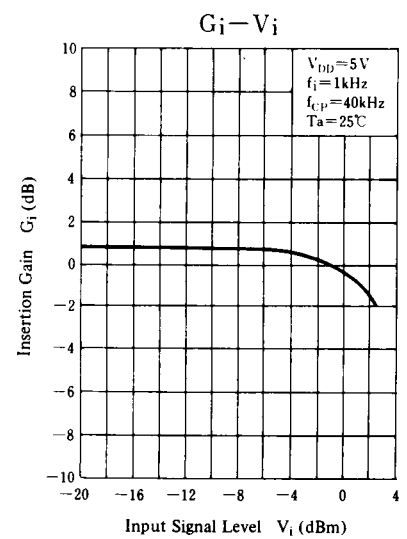
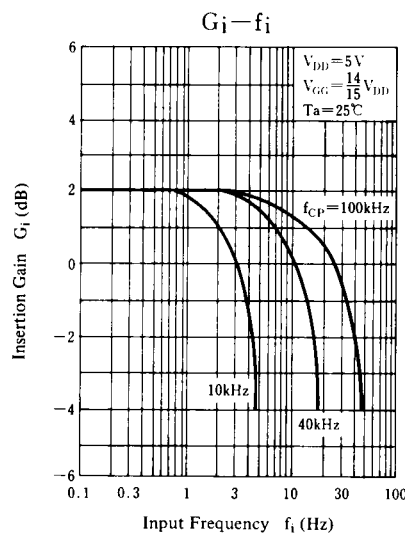
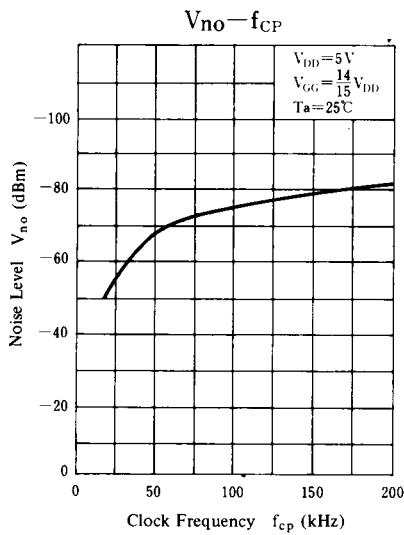
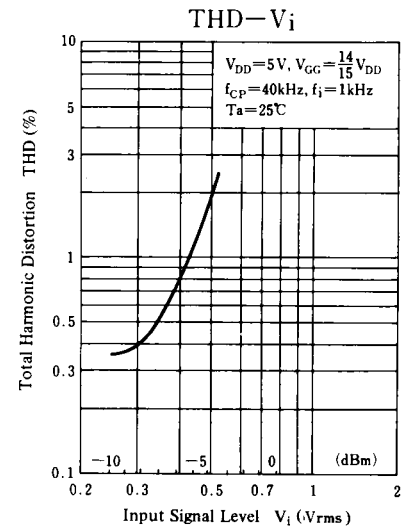
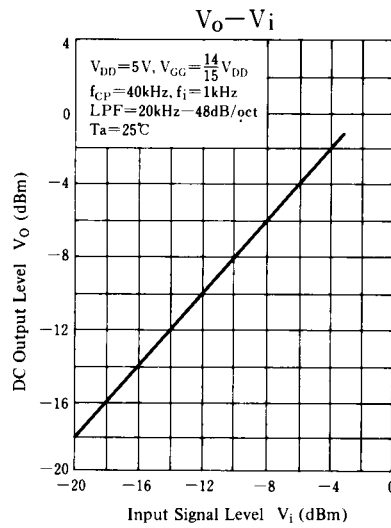
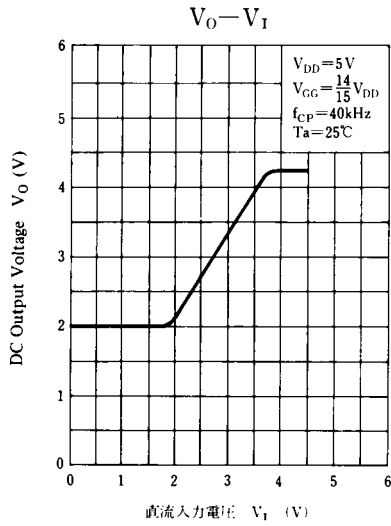
■ Terminal Assignments

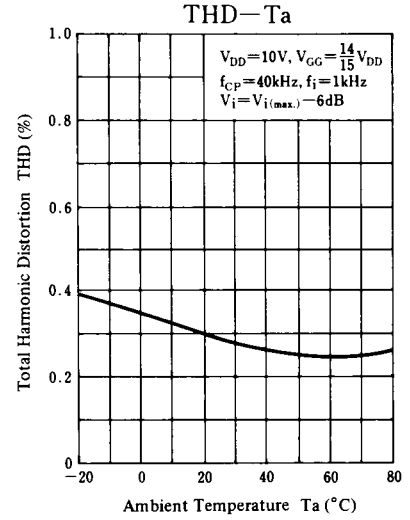
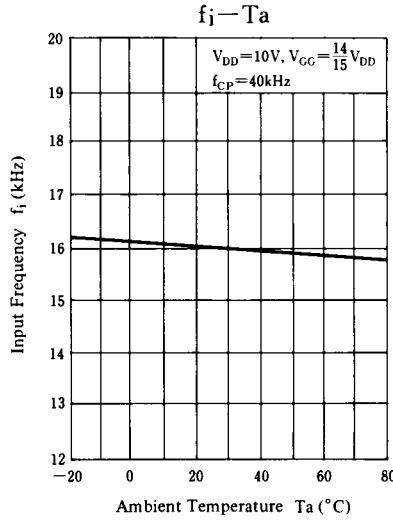
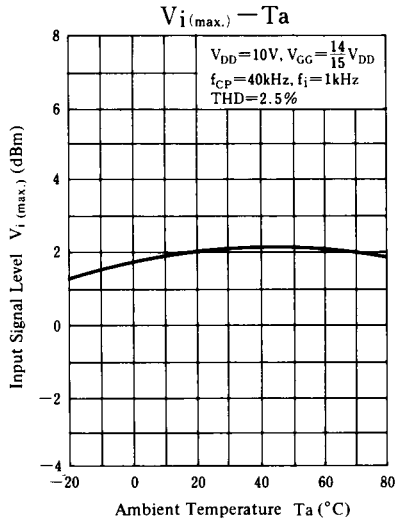


■ Circuit Diagram

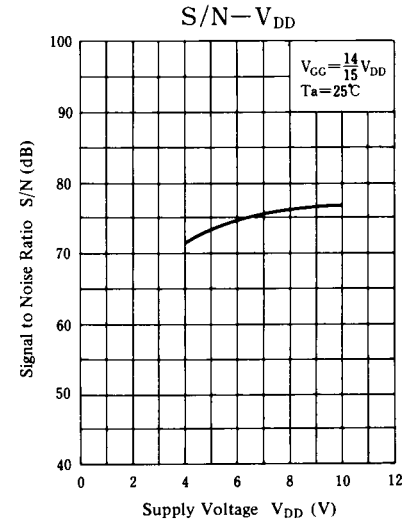
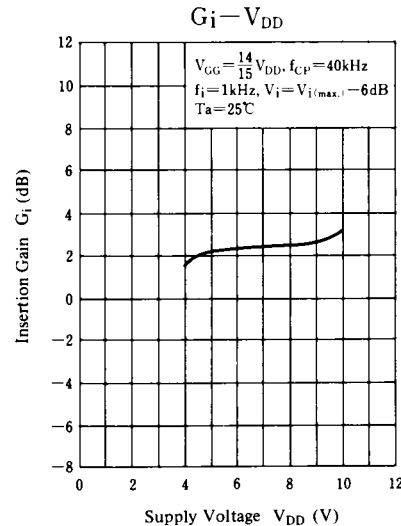
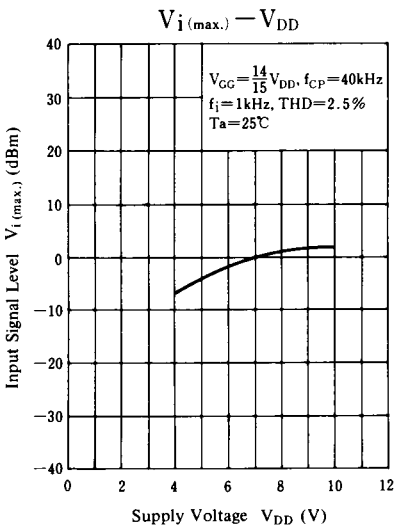
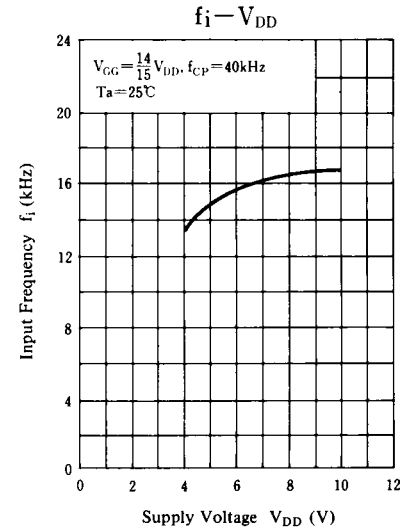
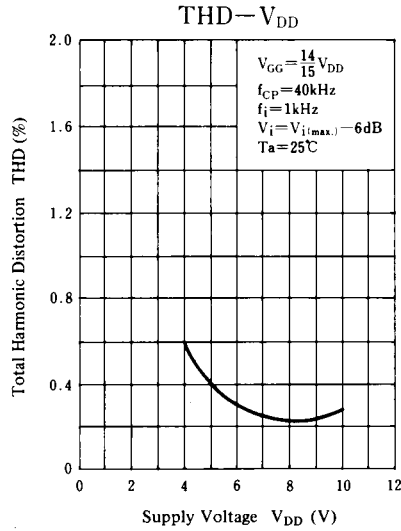
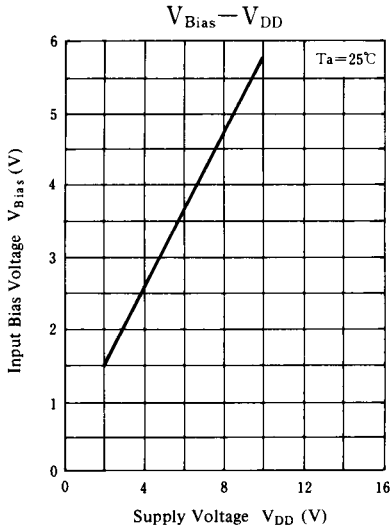


■ Typical Electrical Characteristic Curves

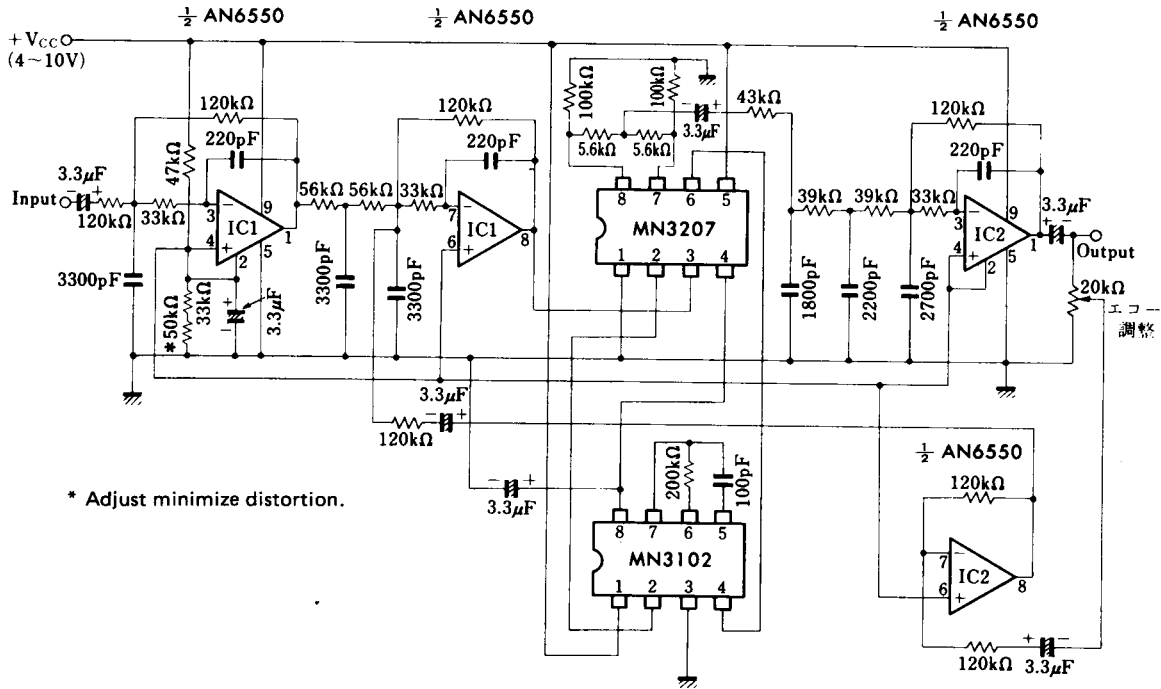




■ Supply Voltage Characteristics



■ Application Circuit



Echo Effect Generation Circuit