

# MN3007

## 1024-STAGE LOW NOISE BBD

### General Description

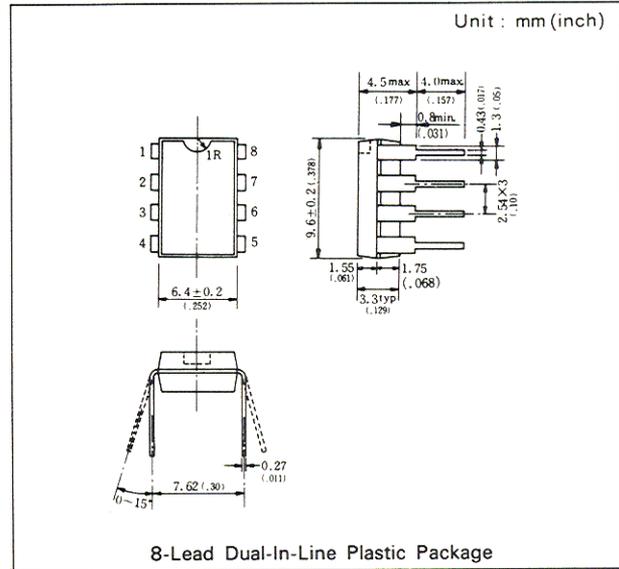
The MN3007 is a 1024-stage long delay BBD (Bucket Brigade Device) that provides a signal delay of up to 51.2msec. The MN3007 is particularly suitable for use as variable signal delay lines in audio frequency range.

### Features:

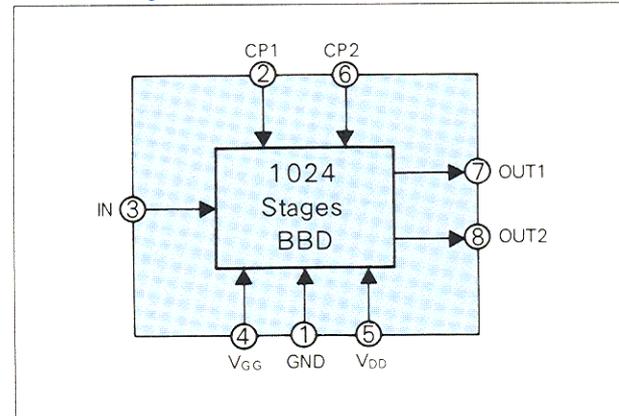
- Wide range of variable delay time: 5.12~51.2msec.
- Clock component cancellation capability.
- No insertion loss:  $L_i \approx 0$  dB typ.
- Wide dynamic range: S/N  $\approx 80$  dB typ.
- Wide frequency response:  $f_i < 12$ kHz.
- Total harmonic distortion: THD=0.5% typ. ( $V_i=0.78V_{rms}$ )
- Clock frequency range: 10~100kHz.
- P-channel silicon gate, tetrode MOS transistors configuration
- 8-lead dual-in-line plastic package.

### Applications:

- Reverberation effect of echo microphones and stereo equipment.
- Chorus effects in electronic musical instruments.
- Variable or fixed delay of analog signals.



### Block Diagram



### Quick Reference Data

Item	Symbol	Value	Unit
Supply Voltage	$V_{DD}, V_{GG}$	$-15, V_{DD}+1$	V
Signal Delay Time	$t_D$	5.12~51.2	msec
Total Harmonic Distortion	THD	0.5	%
Signal to Noise Ratio	S/N	80	dB

**Absolute Maximum Ratings** (Ta=25°C)

Item	Symbol	Ratings	Unit
Terminal Voltage	V <sub>DD</sub> , V <sub>GG</sub> , V <sub>CP</sub> , V <sub>I</sub>	-18~+0.3	V
Output Voltage	V <sub>O</sub>	-18~+0.3	V
Operating Temperature	T <sub>opr</sub>	-20~+60	°C
Storage Temperature	T <sub>stg</sub>	-55~+125	°C

**Operating Conditions** (Ta=25°C)

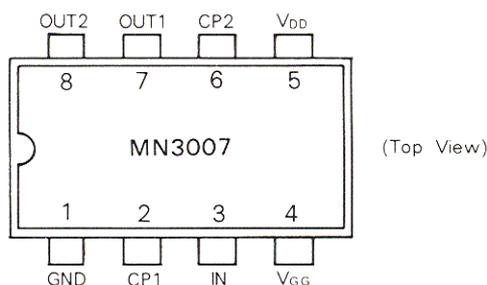
Item	Symbol	Min.	Typ.	Max.	Unit
Drain Supply Voltage	V <sub>DD</sub>	-14	-15	-16	V
Gate Supply Voltage	V <sub>GG</sub>		V <sub>DD</sub> +1		V
Clock Voltage "H" Level	V <sub>CPH</sub>	0		-1	V
Clock Voltage "L" Level	V <sub>CPL</sub>		V <sub>DD</sub>		V
Clock Input Capacitance	C <sub>CP</sub>			700	pF
Clock Frequency	f <sub>CP</sub>	10		100	kHz
Clock Pulse Width *2	t <sub>cpw</sub>			0.5T*1	
Clock Rise Time *2	t <sub>cpr</sub>			500	nsec
Clock Fall Time *2	t <sub>cpf</sub>			500	nsec
Clock Cross Point	V <sub>X</sub>	0		-3	V

\*1 T=1/f<sub>CP</sub> \*2 Clock Pulse Waveforms

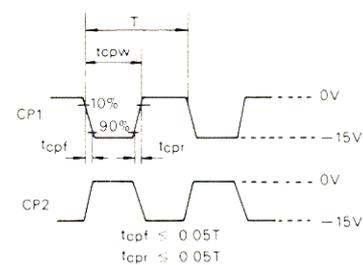
**Electrical Characteristics** (Ta=25°C, V<sub>DD</sub>=V<sub>CPL</sub>=-15V, V<sub>CPH</sub>=0V, V<sub>GG</sub>=-14V, R<sub>L</sub>=100kΩ)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Signal Delay Time	t <sub>d</sub>		5.12		51.2	msec
Input Signal Frequency	f <sub>i</sub>	f <sub>CP</sub> =40kHz, V <sub>i</sub> =1.5Vrms, 3dB down (0dB at f <sub>i</sub> =1kHz)			12	kHz
Input Signal Swing	V <sub>i</sub>	f <sub>CP</sub> =40kHz, f <sub>i</sub> =1kHz, THD=2.5%			1.5	Vrms
Insertion Loss	L <sub>i</sub>	f <sub>CP</sub> =40kHz, f <sub>i</sub> =1kHz, V <sub>i</sub> =1.5Vrms	-4	0	4	dB
Total Harmonic Distortion	THD	f <sub>CP</sub> =40kHz, f <sub>i</sub> =1kHz, V <sub>i</sub> =0.78Vrms		0.5	2.5	%
Noise Voltage	V <sub>no</sub>	f <sub>CP</sub> =100kHz Weighted by "A" curve			0.30	mVrms
Signal to Noise Ratio	S/N			80		dB

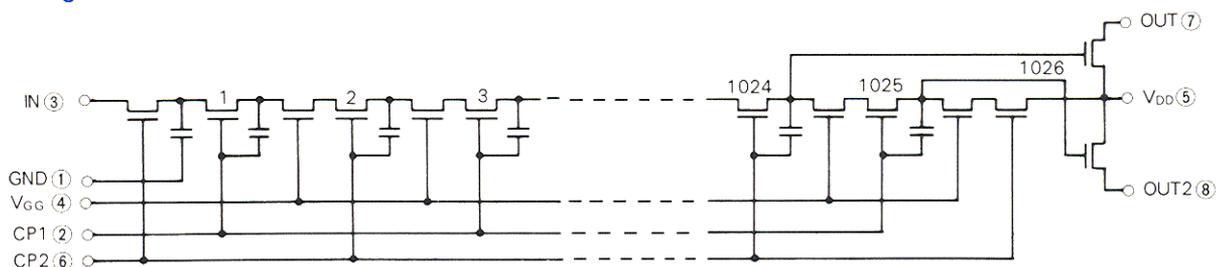
**Terminal Assignments**



**Clock Pulse Waveforms**



**Circuit Diagram**



Typical Electrical Characteristic Curves

