

MN3008

2048-STAGE LOW NOISE BBD

General Description

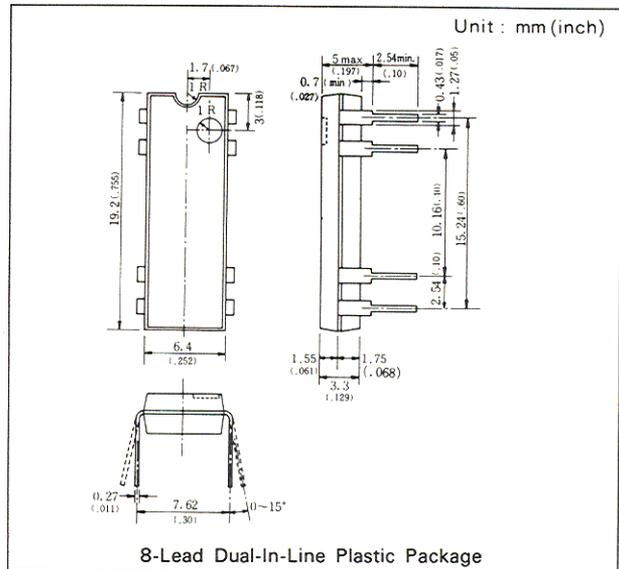
The MN3008 is a 2048-stage long delay BBD (Bucket Brigade Device) that provides a signal delay of up to 102.4msec. The MN3008 is particularly suitable for use as variable signal delay lines in audio frequency range.

Features:

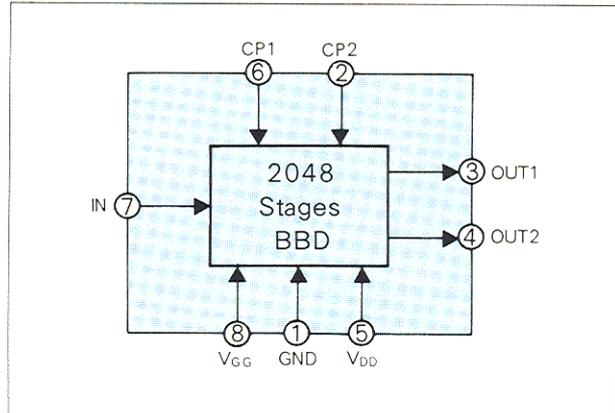
- Wide range of variable delay time: 10.24~102.4msec.
- Clock component cancellation capability.
- No insertion loss: $L_i \approx 0$ dB typ.
- Wide dynamic range: S/N \approx 78dB typ.
- Wide frequency response: $f_i < 12$ kHz.
- Total harmonic distortion: THD=0.5% typ. ($V_i=0.78V_{rms}$)
- Clock frequency 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	10.24~102.4	msec
Total Harmonic Distortion	THD	0.5	%
Signal to Noise Ratio	S/N	78	dB

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Unit
Terminal Voltage	V _{DD} , V _{GG} , V _{CP} , V _I	-18~+0.3	V
Output Voltage	V _O	-18~+0.3	V
Operating Temperature	T _{opr}	-20~+60	°C
Storage Temperature	T _{stg}	-55~+125	°C

Operating Conditions (Ta=25°C)

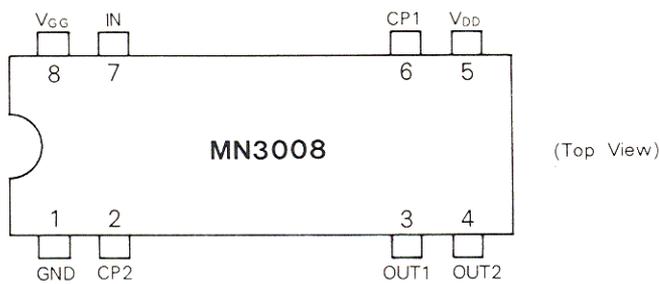
Item	Symbol	Min.	Typ.	Max.	Unit
Drain Supply Voltage	V _{DD}	-14	-15	-16	V
Gate Supply Voltage	V _{GG}		V _{DD} +1		V
Clock Voltage "H" Level	V _{CPH}	0		-1	V
Clock Voltage "L" Level	V _{CPL}		V _{DD}		V
Clock Input Capacitance	C _{CP}			1400	pF
Clock Frequency	f _{CP}	10		100	kHz
Clock Pulse Width *2	t _{cpw}			0.5T *1	
Clock Rise Time *2	t _{cpr}			500	nsec
Clock Fall Time *2	t _{cpf}			500	nsec
Clock Cross Point	V _x	0		-3	V

*1 T=1/f_{CP} *2 Clock Pulse Waveforms

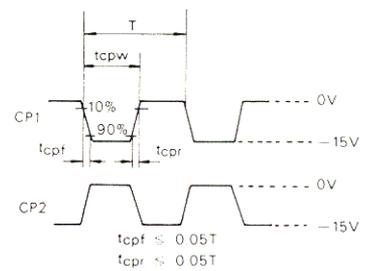
Electrical Characteristics (Ta=25°C, V_{DD}=V_{CPL}=-15V, V_{CPH}=0V, V_{GG}=-14V, R_L=100kΩ)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Signal Delay Time	t _D		10.24		102.4	msec
Input Signal Frequency	f _i	f _{CP} =40kHz, V _i =1.3Vrms. 3dB down (0dB at f _i =1kHz)			12	kHz
Input Signal Swing	V _i	f _{CP} =40kHz, f _i =1kHz, THD=2.5%			1.5	Vrms
Insertion Loss	L _i	f _{CP} =40kHz, f _i =1kHz, V _i =1.3Vrms		0		dB
Total Harmonic Distortion	THD	f _{CP} =40kHz, f _i =1kHz, V _i =0.78Vrms		0.5		%
Noise	V _{no}	f _{CP} =100kHz Weighted by "A" curve			0.30	mVrms
Signal to Noise Ratio	S/N			78		dB

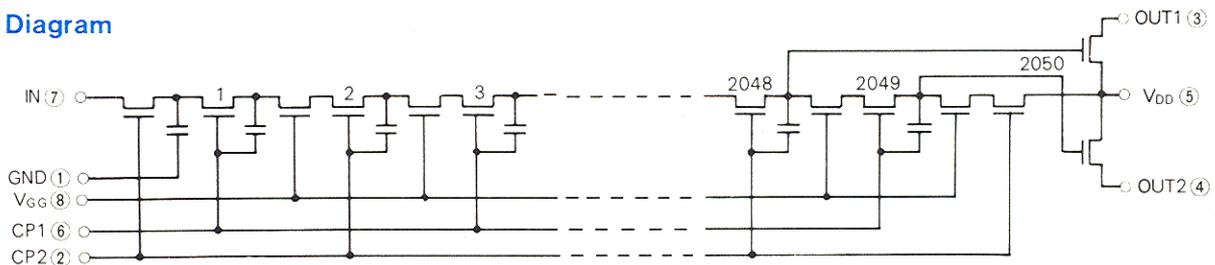
Terminal Assignments



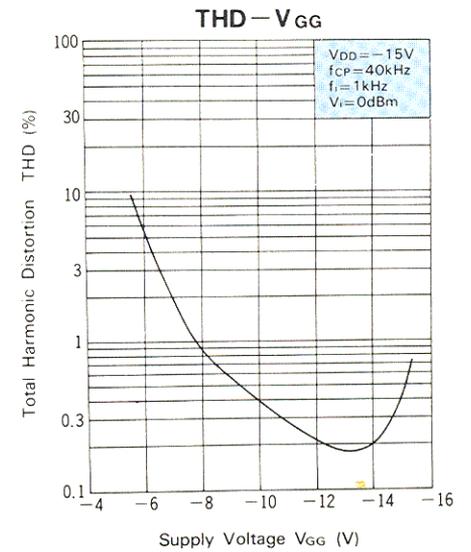
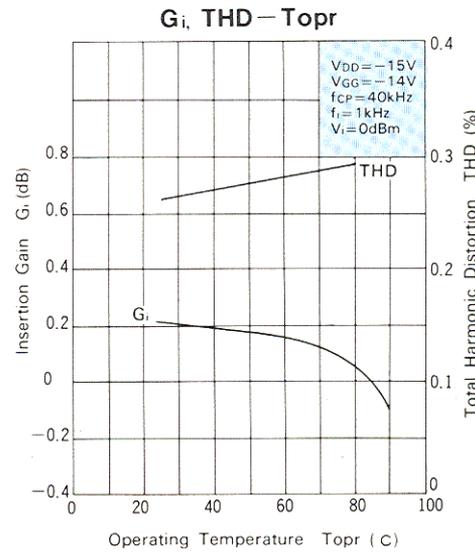
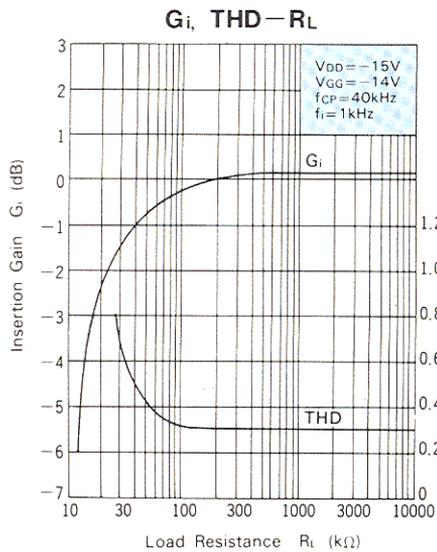
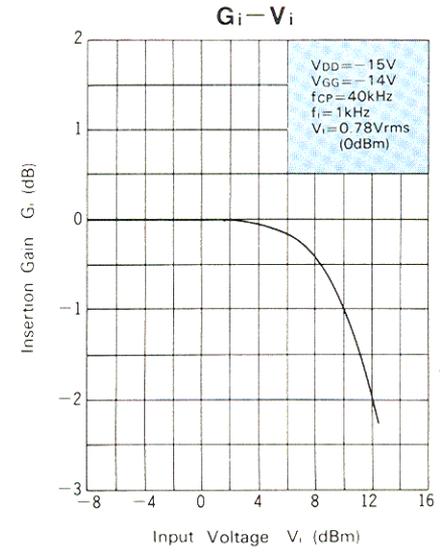
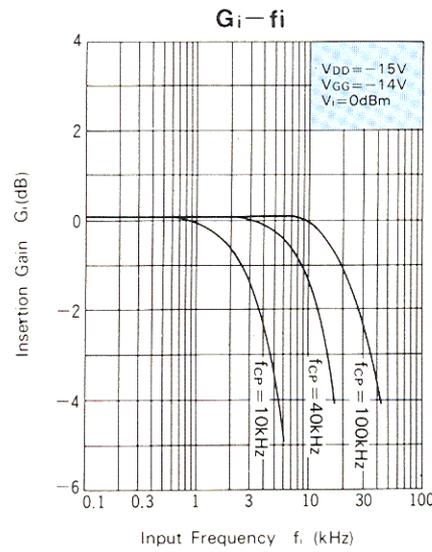
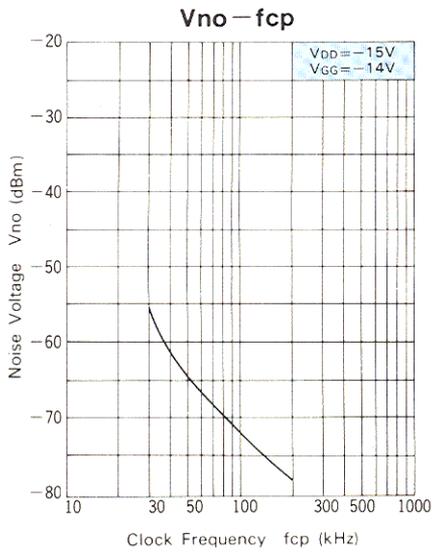
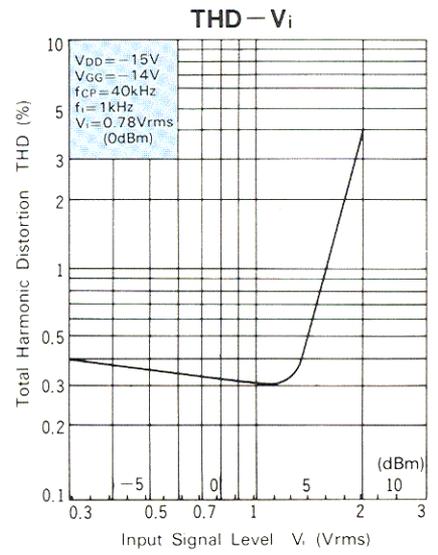
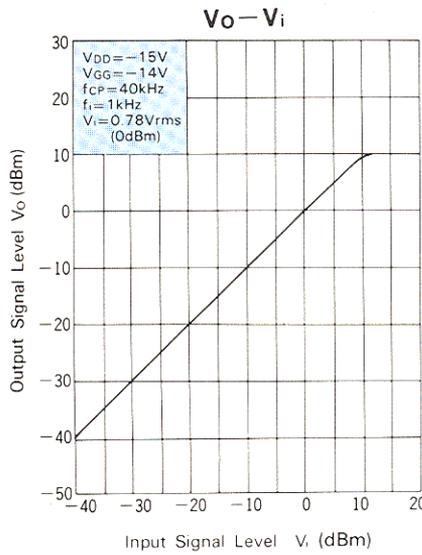
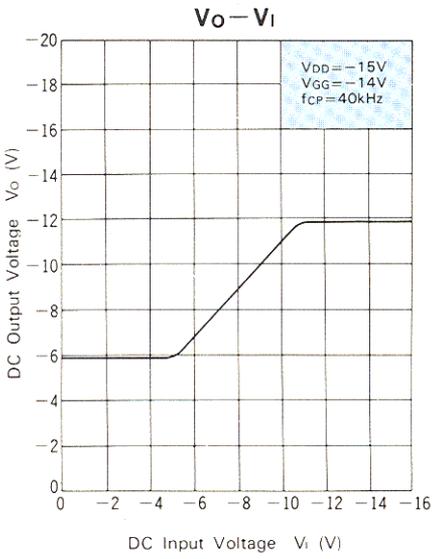
Clock Pulse Waveforms



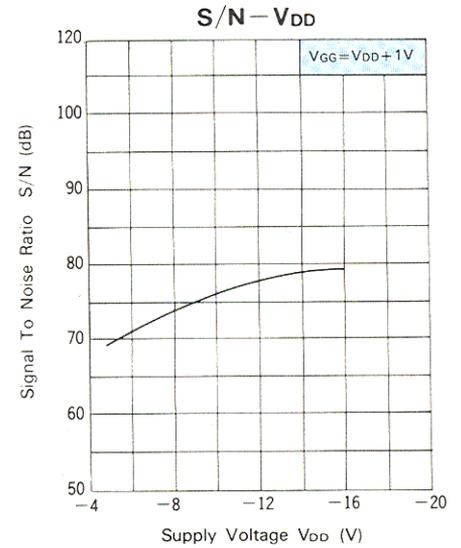
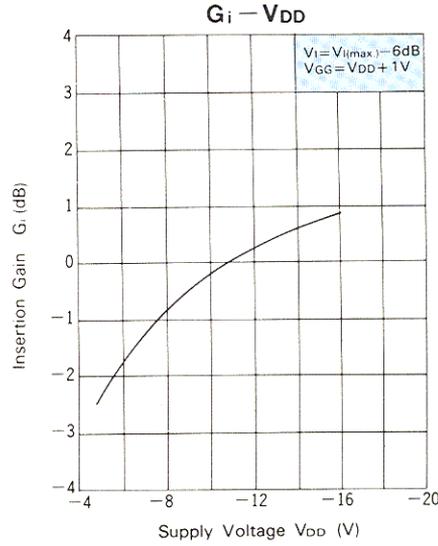
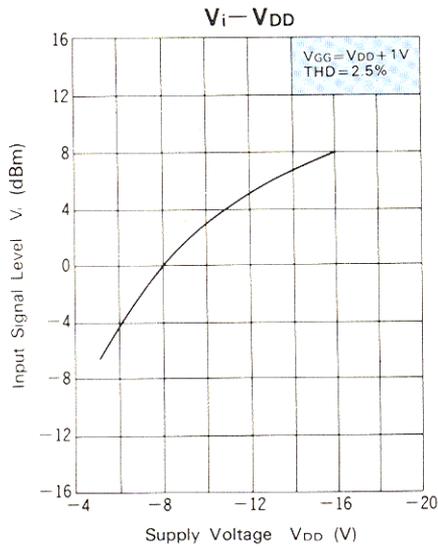
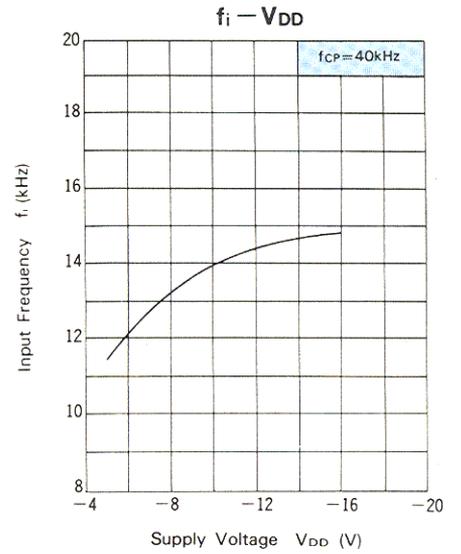
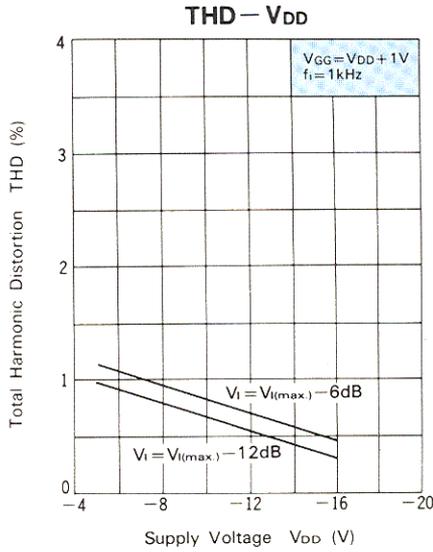
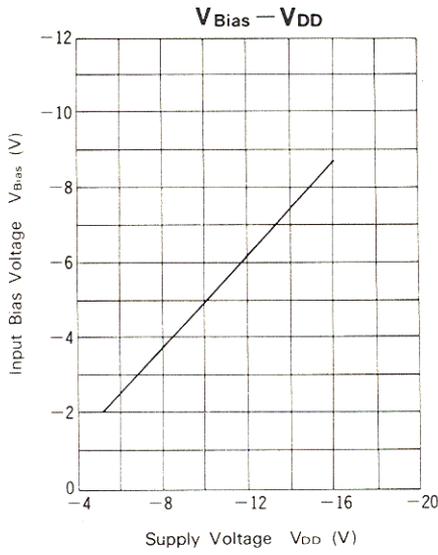
Circuit Diagram



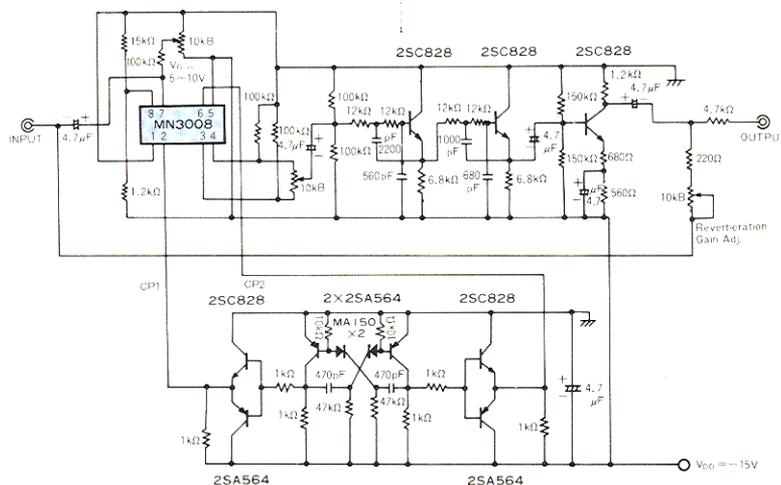
Typical Electrical Characteristic Curves



Supply Voltage Characteristics



Application Circuit



Reverberation Effect Generation Circuit (Signal Delay Over 100msec.)