MN3007

1024-STAGE LOW NOISE BBD

General description

The MN3007 is a 1024-stage long delay low noise BBD that provides a signal delay of up to 51.2msec.

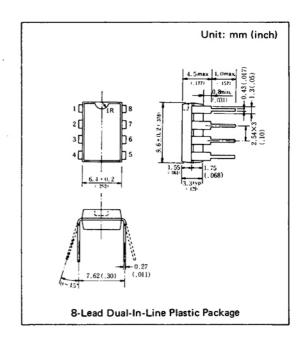
The MN3007 is particularly suitable for use as reverberation effect of electronic musical instrument such as stereo equipment due to its long delay times.

Features

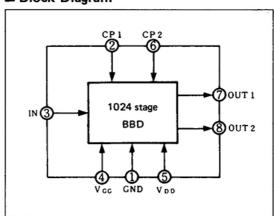
- Variable delay time of audio signal: 5.12 ~ 51.2ms.
- Clock component cancellation capability.
- No insertion loss: Li = 0dB typ.
- Wide dynamic range: S/N \simeq 80dB typ.
- Wide frequency response: f_i ≤ 12KHz.
- Low distortion: THD = 0.5% typ. (V_i = 0.78Vrms).
- Clock frequency range: 10 ~ 100KHz.
- P channel silicon gate process.
- 8-Lead Dual-In-Line Plastic Package.

Applications

- Reverberation effect of echo microphone and stereo equipment.
- Chorus effect in electronic musical instrument.
- Variable or fixed delay of analog signals.
- Telephone time compression and delay line for voice communication systems, etc.



■ Block Diagram



Quick Reference Data

ltem	Symbol	Value	Unit
Supply Voltage	V _{DD} , V _{GG}	-15, V _{DD} +1	V
Signal Delay Time	t _D	5.12~51.2	ms
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 _{DD} , V _{GG} , V _{CP} , V _I	-18~+0.3	V	
Output Voltage	V _o	-18~+0.3	V	
Operating Temperature	Topr	-20~+60	ర	
Storage Temperature	Tstg	−55∼+125	င	

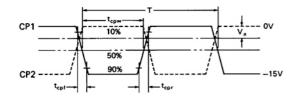
■ Operating Conditions (Ta = 25°C)

Item	Symbol	Condition	Min.	Тур.	Max.	Unit
Drain Supply Voltage	V _{DD}		-14	-15	-16	V
Gate Supply Voltage	V _{GG}			V _{DD} +1		٧
Clock Voltage "H" Level	V _{CPH}		0		-1	V
Clock Voltage "L" Level	V _{CPL}			V _{DD}		٧
Clock Input Capacitance	C _{CP}				700	pF
Clock Frequency	fop		10		100	kHz
Clock Pulse Width *1	t _{cpw}				0.5T * 2	
Clock Rise Time *1	t _{cpr}				500	ns
Clock Fall Time *1	t _{cpf}				500	ns
Clock Cross Point *1	V _X		0		-3	V
Input DC Bias	V _{Bias}		— 5		-10	٧

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

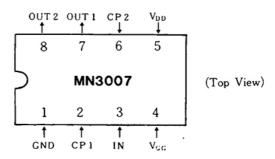
Item	Symbol	Condition	Min.	Тур.	Max.	Unit
Signal Delay Time	t _D		5.12		51.2	ms
Input Signal Frequency	fi	f _{cp} = 40kHz, V _i = 1.5Vrms, 3dB down (0dB at f _i = 1kHz)	12			kHz
Input Signal Swing	Vi	f_{CP} =40kHz, f_i = 1 kHz, THD =2.5%	1.5			Vrms
Insertion Loss	Li	f_{CP} =40kHz, $f_i = 1$ kHz, $V_i = 1.5$ Vrms	— 4	0	4	dB
Total Hamonic Distortion	THD	f_{CP} =40kHz, $f_i = 1$ kHz, $V_i = 0.78$ Vrms		0.5	2.5	%
Noise Voltage	V _{no}	f _{cp} = 100kHz Weighted by "A" curve			0.3	mVrms
Signal to Noise Ratio	S/N			80		dB

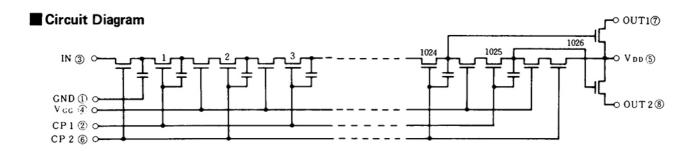
*1 Clock Pulse Waveforms



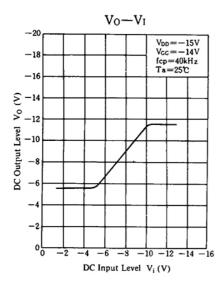
*2 T = 1/f_{CP} (Clock period)

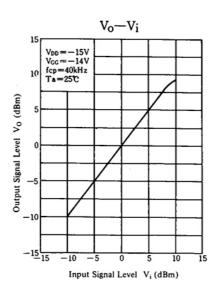
Terminal Assignments

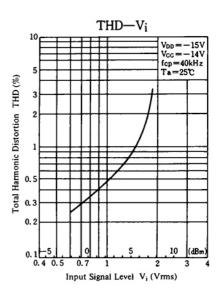


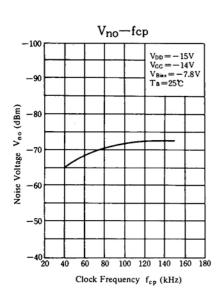


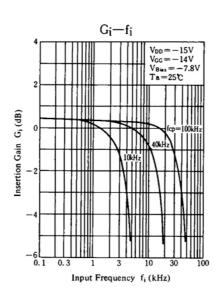
■ Typical Electrical Characteristic Curves

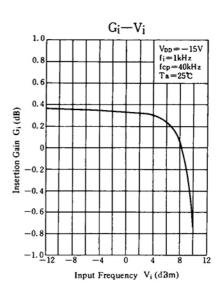


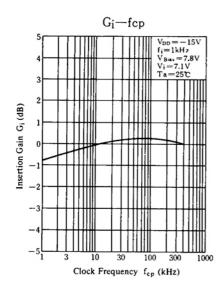


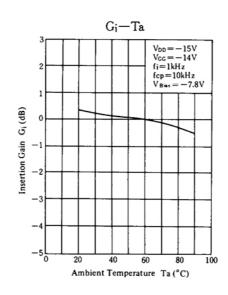


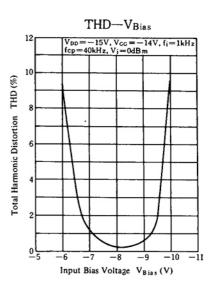




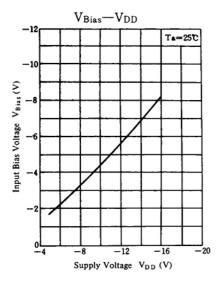


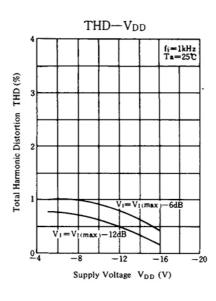


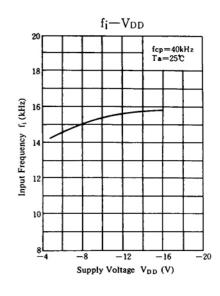


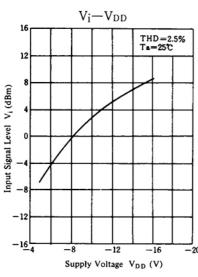


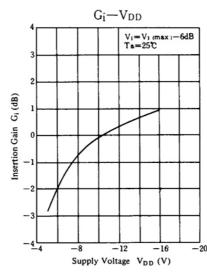
■ Supply Voltage Characteristics

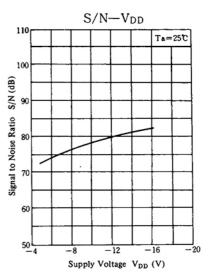




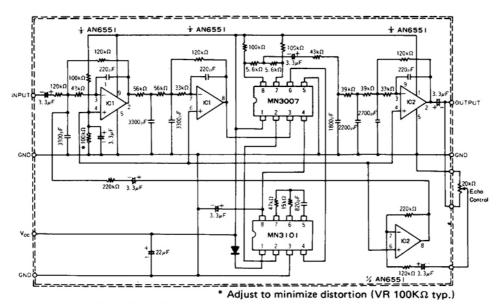








■ Application Circuit



Echo Effect Generation Circuit (Signal Delay Over 10msec.)