

# MN3206

## 128-STAGE LOW VOLTAGE OPERATION LOW NOISE BBD

### General description

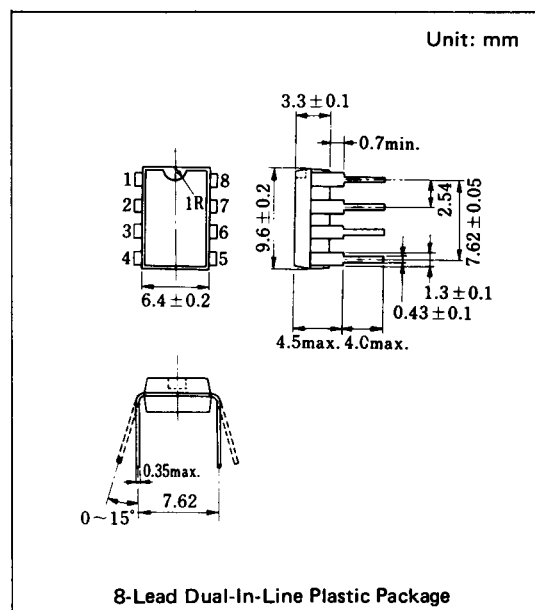
The MN3206 is a 128-stage low voltage operation ( $V_{DD} = 5V$ ) BBD that provides a signal delay of up to 6.4ms and is suitable for use as reverberation effect of audio equipments operated by low voltage such as portable stereo and radio cassette recorder.

### Features

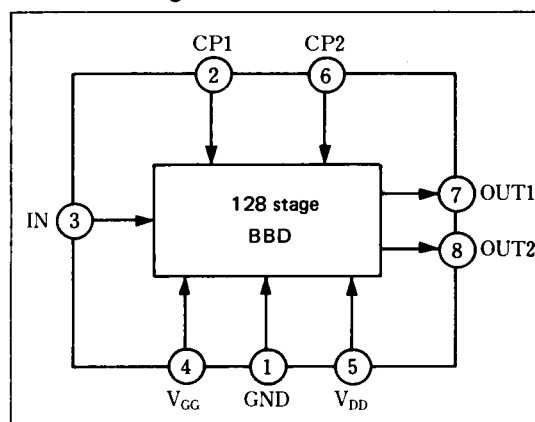
- Variable delay of audio signals: 0.32ms ~ 6.4ms.
- Wide power supply voltage: 4 ~ 10V.
- No insertion loss:  $L_i = 0dB$  typ.
- Wide dynamic range:  $S/N = 83dB$  typ.
- Low distortion:  $THD = 0.3\%$  typ. ( $V_i = 0.25V_{rms}$ )
- Clock frequency range: 10KHz ~ 200KHz.
- N channel silicon gate process.
- 8-Lead Dual-In-Line Plastic Package.

### Applications

- Reverberation and echo effects of audio equipments 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, $\frac{1}{18} V_{DD}$	V
Signal Delay Time	$t_D$	0.32~6.4	ms
Total Harmonic Distortion	THD	0.3	%
Signal to Noise Ratio	S/N	83	dB

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

Item	Symbol	Ratings	Unit
Terminal Voltage	$V_{DD}, V_{GG}, V_{CP}, V_i$	-0.3~+11	V
Output Voltage	$V_o$	-0.3~+11	V
Operating Temperature	$T_{opr}$	-20~+70	°C
Storage Temperature	$T_{stg}$	-55~+125	°C

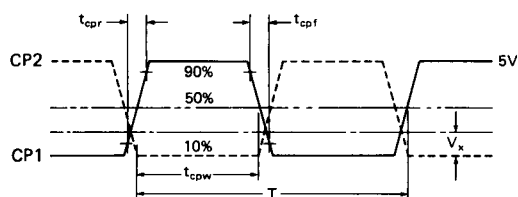
### Operating Condition (Ta = 25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain Supply Voltage	$V_{DD}$		+4	+5	+10	V
Gate Supply Voltage	$V_{GG}$			$\frac{14}{15} V_{DD}$		V
Clock Voltage "H" Level	$V_{CPH}$			$V_{DD}$		V
Clock Voltage "L" Level	$V_{CPL}$		0		+1	V
Clock Frequency	$f_{CP}$		10		200	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 Input Capacitance	$C_{CP}$				700	pF
Clock Cross Point *1	$V_X$		0		$0.3V_{CPH}$	V

### Electrical Characteristics (Ta=25°C, $V_{DD}=V_{CPH}=5V$ , $V_{CPL}=0V$ , $V_{GG}=\frac{14}{15}V_{DD}$ , $R_L=100k\Omega$ )

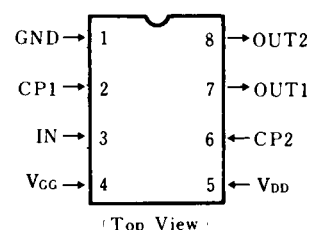
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Signal Delay Time	$t_D$		0.32		6.4	ms
Input Signal Frequency	$f_i$	$f_{CP} = 40kHz$ , Output -3dB down	12			kHz
Input Signal Swing	$V_i$	THD=2.5%	0.6			Vrms
Insertion Loss	$L_i$	$f_{CP}=40kHz$ , $f_i=1kHz$	-4	0	4	dB
Total Harmonic Distortion	THD	$f_{CP}=40kHz$ , $f_i=1kHz$ , $V_i=0.25V_{rms}$		0.3	2.5	%
Noise Voltage	$V_{no}$	$f_{CP} = 100kHz$ , Weighted by "A" curve			0.1	mVrms
Signal to Noise Ratio	S/N			83		dB

#### \*1 Clock Pulse Waveforms

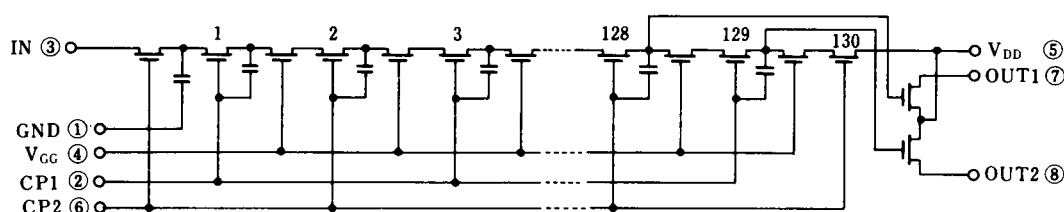


\*2  $T = 1/f_{CP}$  (Clock Period)

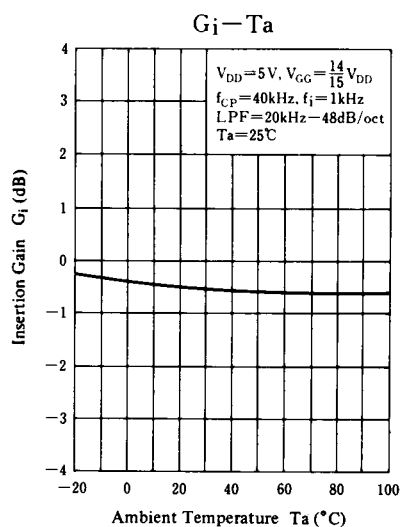
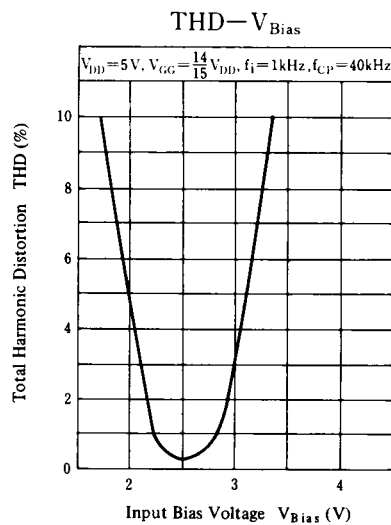
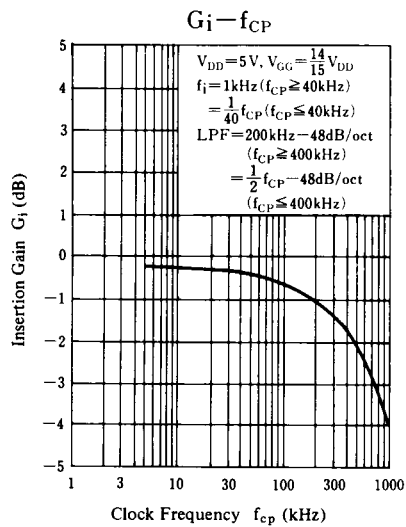
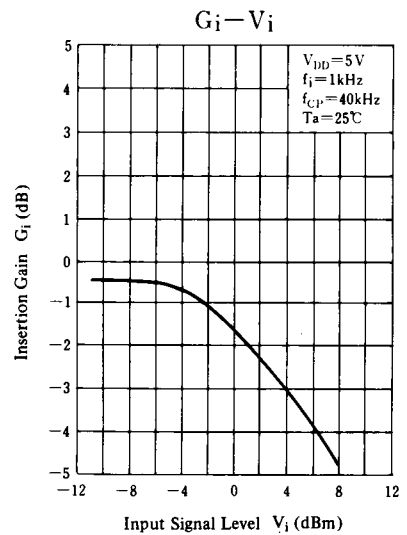
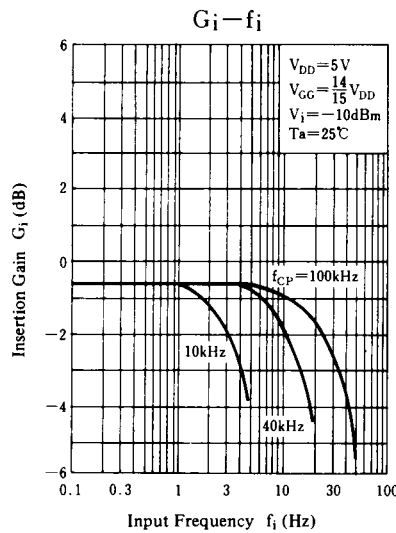
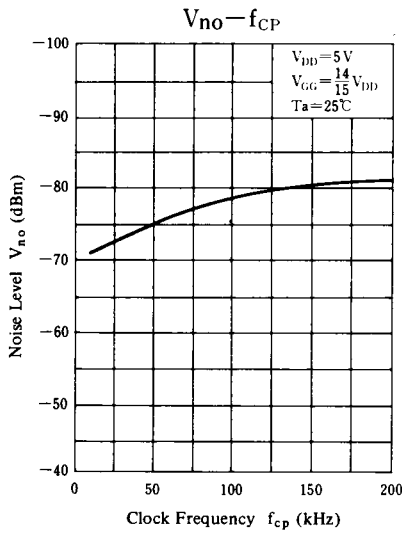
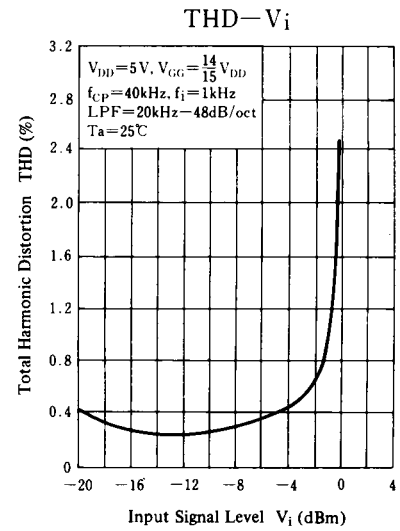
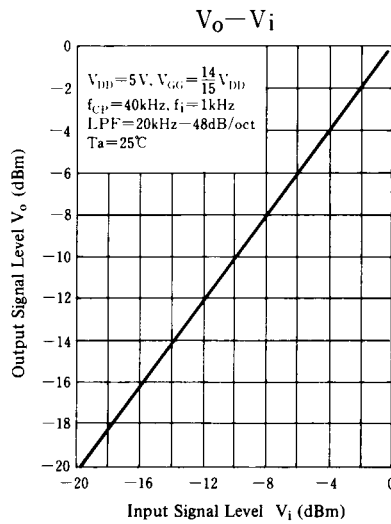
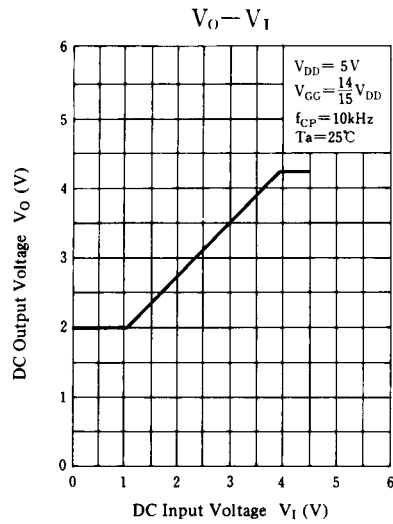
#### Terminal Assignments

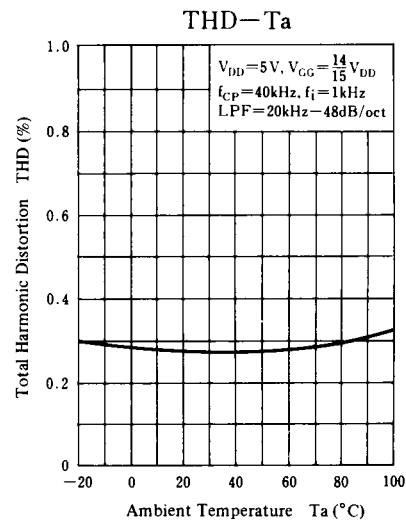
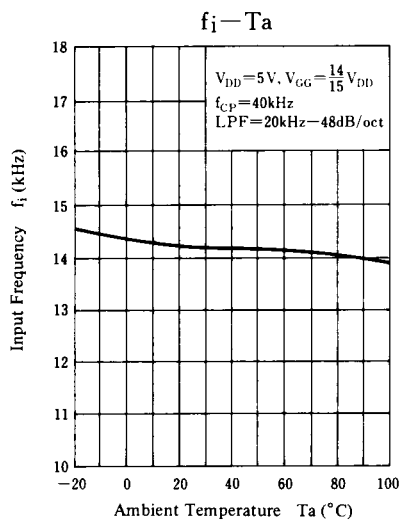
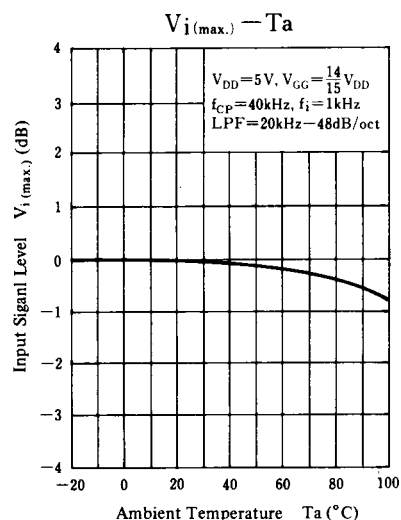


#### Circuit Diagram

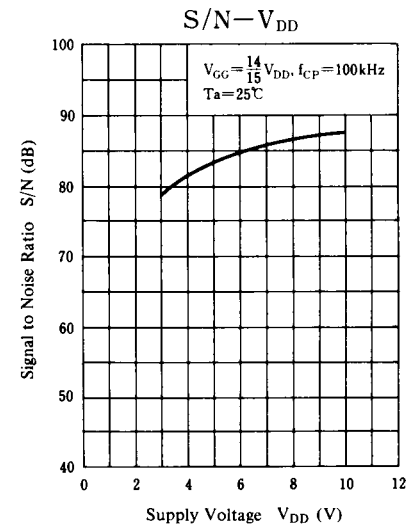
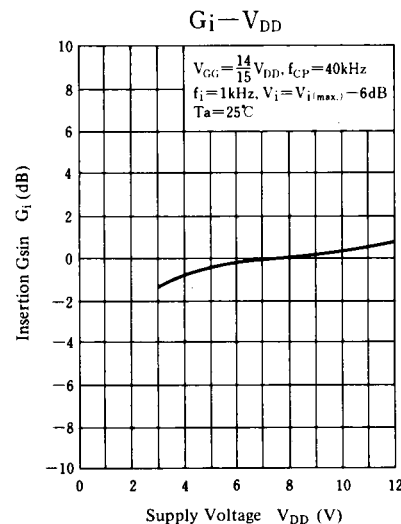
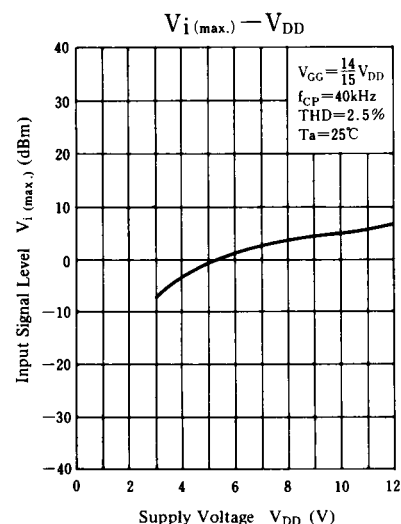
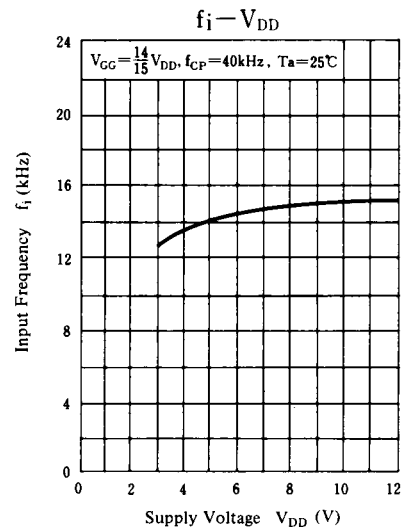
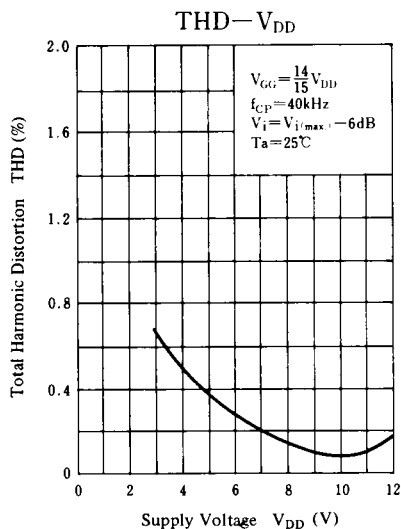
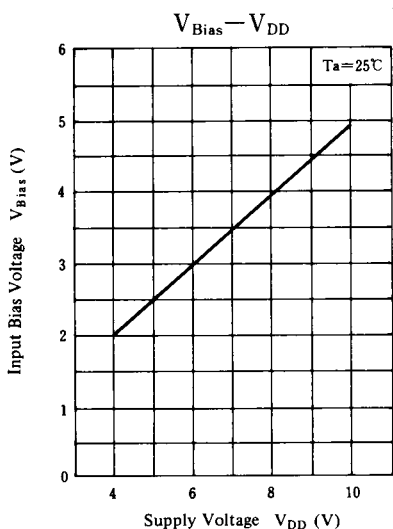


■ Typical Electrical Characteristic Curves





# Supply Voltage Characteristics



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