

MN3205

4096-STAGE LOW VOLTAGE OPERATION LOW NOISE BBD

General description

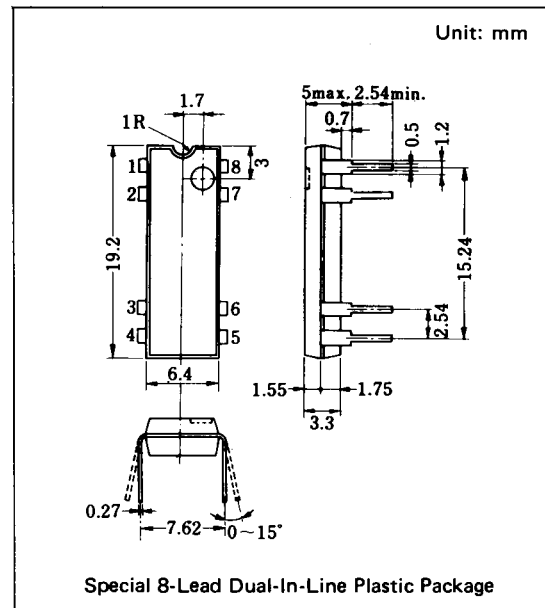
The MN3205 is a 4096-stage low voltage operation ($V_{DD} = 5V$) BBD that provides a signal delay of up to 204.8ms at clock frequency 10KHz and is suitable for use as reverberation effect of audio equipments such as portable stereo and radio cassette recorders which need low voltage and long delay time since S/N is 67dB in spite of many stages.

Features

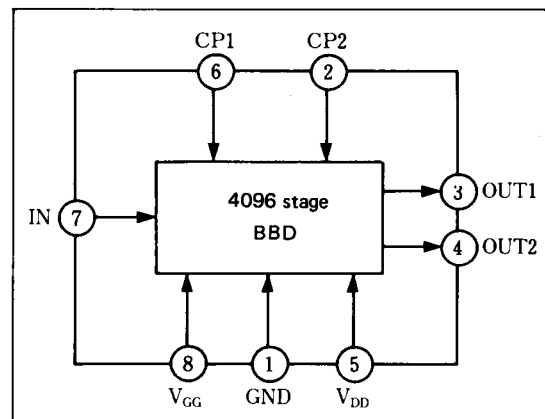
- Variable delay of audio signals: 20.48ms ~ 204.8ms.
- Wide power supply voltage: 4 ~ 9V.
- No insertion loss: $L_i = 0dB$ typ.
- Wide dynamic range: $S/N = 67dB$ typ.
- N channel silicon gate process.
- Special 8-Lead Dual-In-Line Plastic Package.

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 of electronic musical instruments.
- Variable or fixed delay of analog signals.
- Telephone time compression and delay line for voice communication system.



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	20.48~204.8	ms
Total Harmonic Distortion	THD	0.8	%
Signal to Noise Ratio	S/N	67	dB

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit
Terminal Voltage	$V_{DD}, V_{GG}, V_{CP}, V_i$	-0.3~+11	V
Output Voltage	V_o	-0.3~+11	V
Operating Ambient Temperature	T_{opr}	-20~+60	°C
Storage Temperature	T_{stg}	-55~+125	°C

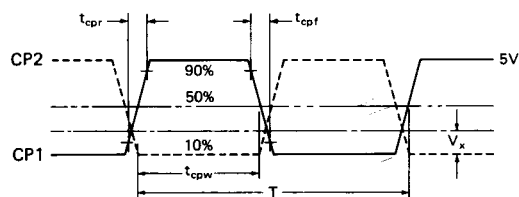
Operating Condition (Ta = 25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain Supply Voltage	V_{DD}		+4	+5	+9	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		+0.5	V
Clock Frequency	f_{CP}		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 Input Capacitance	C_{CP}				2800	pF
Clock Cross Point *1	V_X		0		$0.3V_{CPH}$	V

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

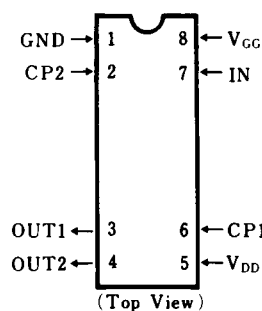
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Signal Delay Time	t_D		20.48		204.8	ms
Input Signal frequency	f_i	$f_{CP} = 40kHz$, Output Attenuation $\leq 3dB$	6			kHz
Input Signal Swing	V_i	THD=2.5%	0.36			Vrms
Insertion Loss	L_i	$f_{CP}=40kHz$, $f_i=1kHz$	-4	0	4	dB
Total Harmonic Distortion	THD	$f_{CP}=40kHz$, $f_i=1kHz$, $V_i=0.25V_{rms}$		0.8	2.5	%
Output Noise Voltage	V_{no}	$f_{CP} = 100kHz$, Weighted by "A" curve			0.35	mVrms
Signal to Noise Ratio	S/N			67		dB

*1 Clock Pulse Waveforms

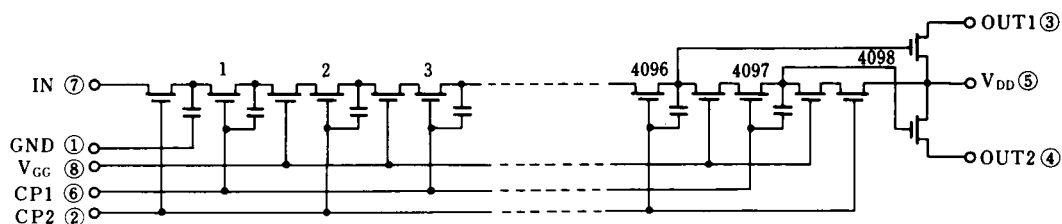


*2 $T = 1/f_{CP}$ (Clock Period)

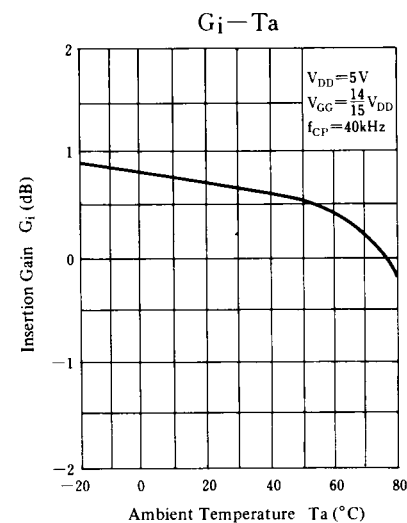
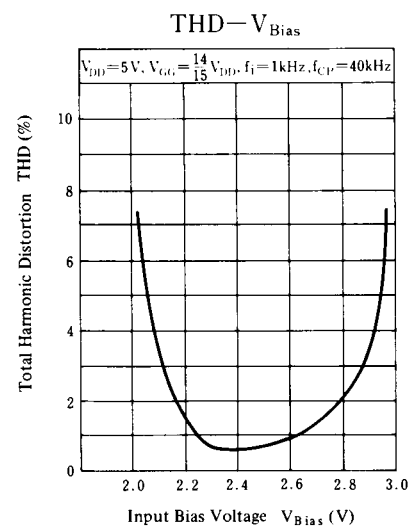
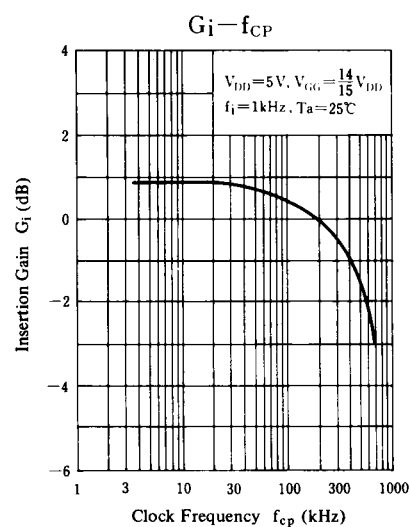
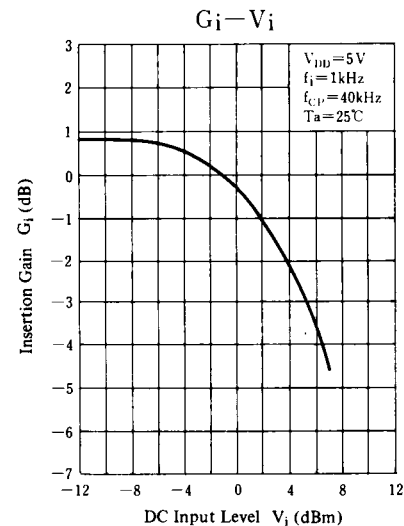
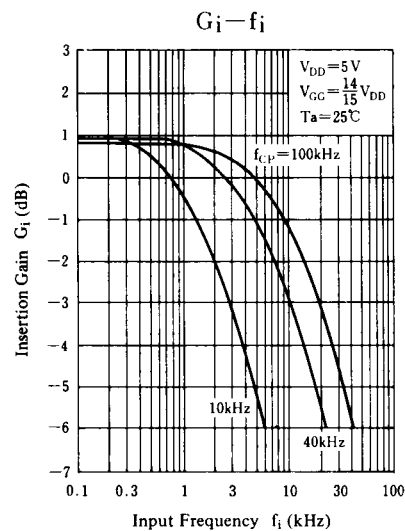
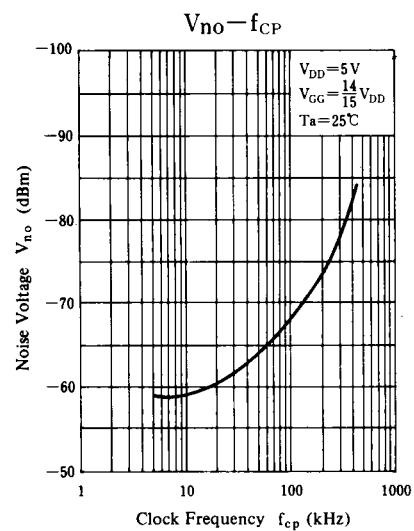
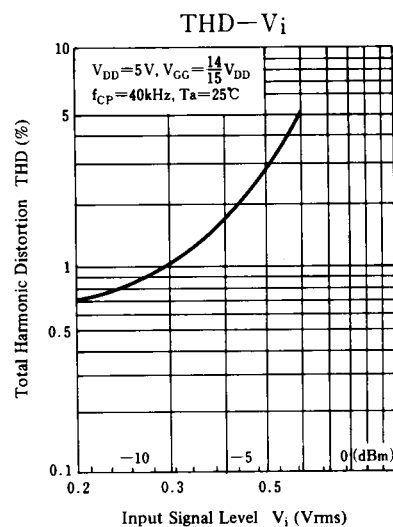
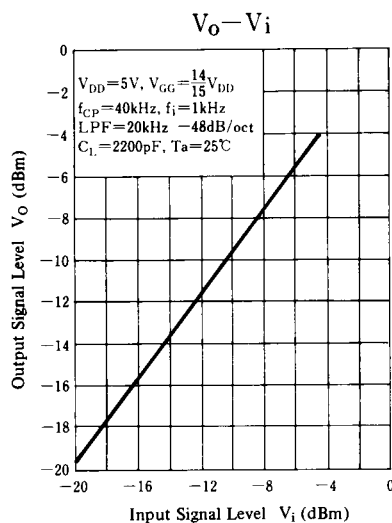
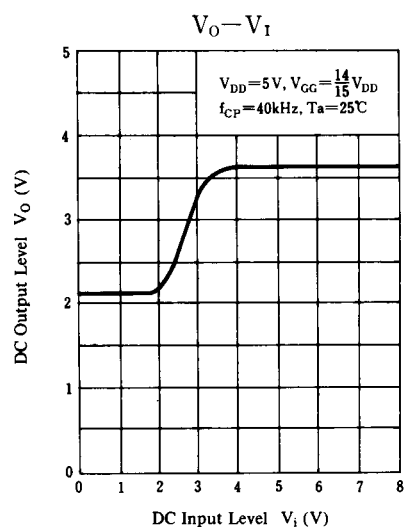
Terminal Assignments

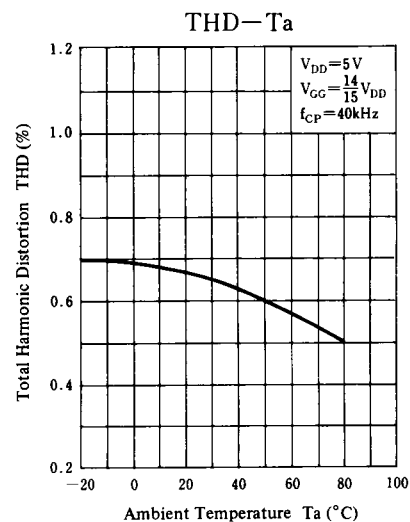
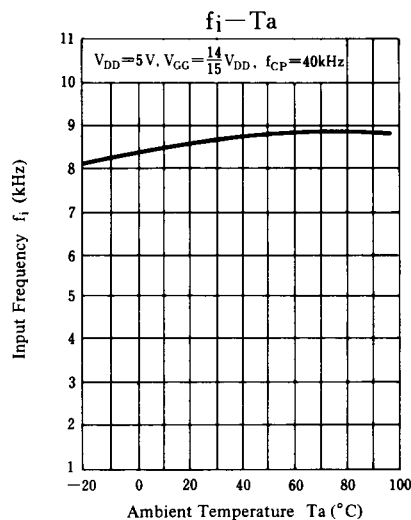
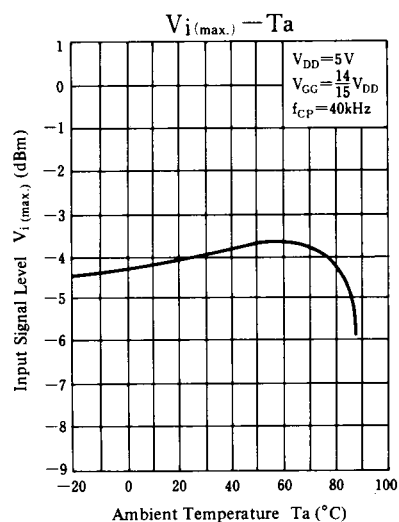


Circuit Diagram

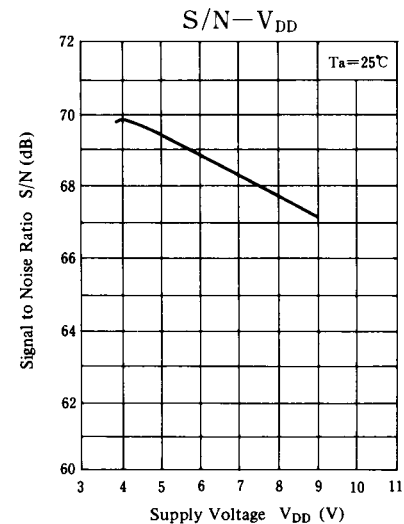
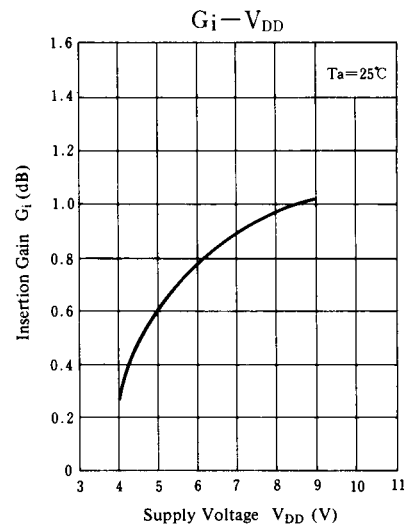
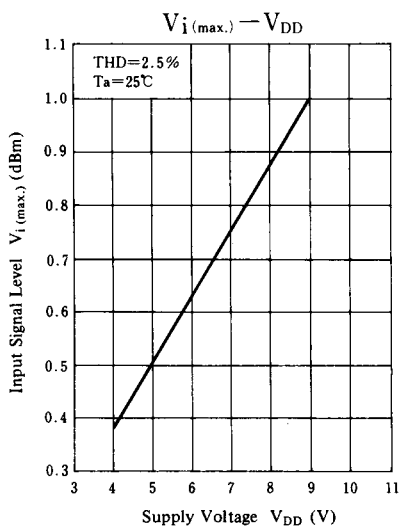
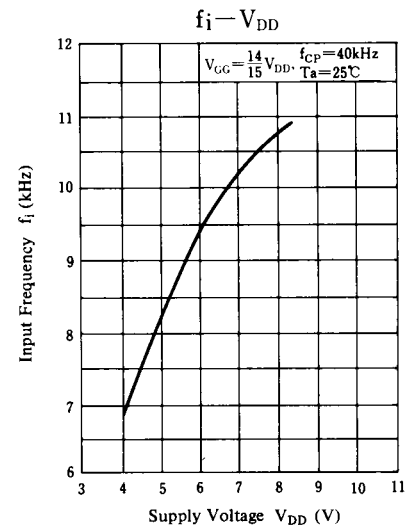
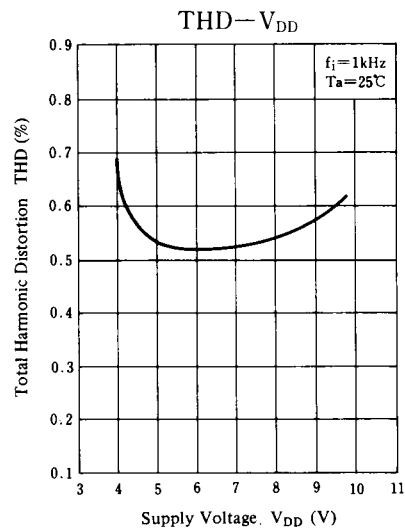
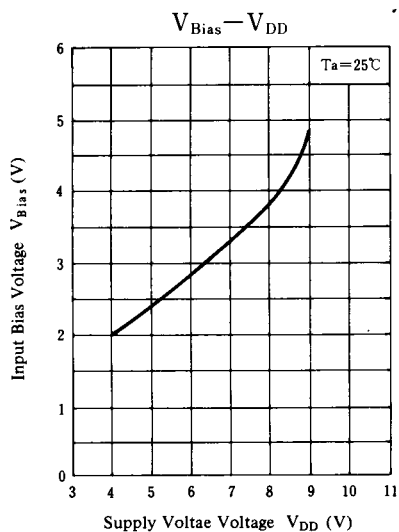


■ Typical Electrical Characteristic Curves

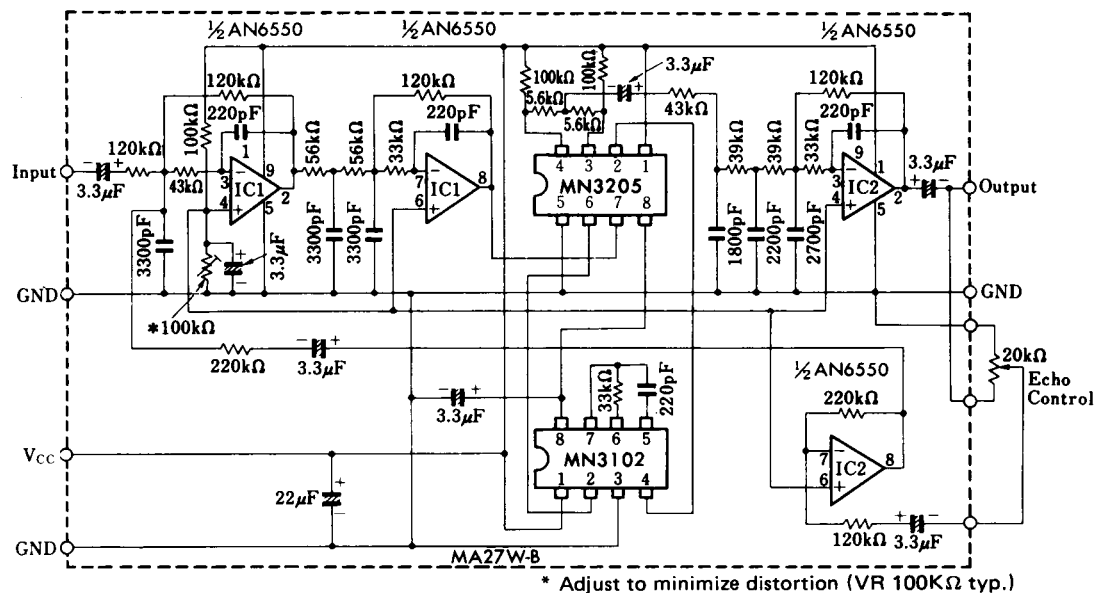




Supply Voltage Characteristics



■ Application Circuit



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