

■ General description

The V3208D/V3208SD is a 2048-stage low voltage operation ($V_{DD} = 5V$) BBD that provides a signal delay of up to 102.4ms 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 71dB in spite of many stages.

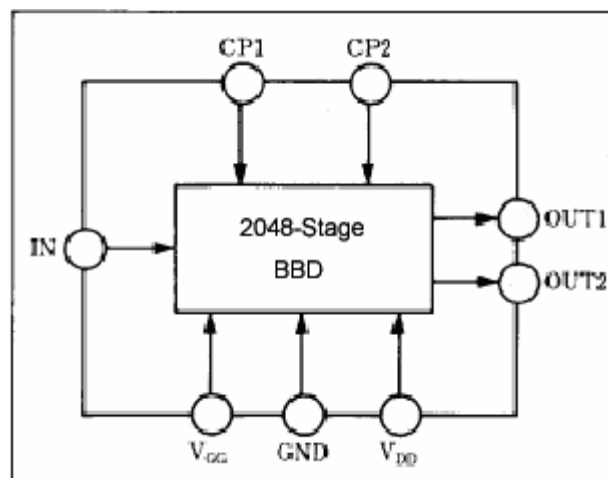
■ Features

- Variable delay of audio signals: 10.24ms ~ 102.4ms.
- Wide power supply voltage: 4 ~ 10V.
- No insertion noise: $L_i = 0dB$ typ.
- Wide dynamic range: $S/N = 71dB$.
- N Channel silicon gate process.
- DIP8 (-DIP8) for V3208D/Special 8-Lead Dual-In-Line plastic Package (-SDIP8) for V3208SD.

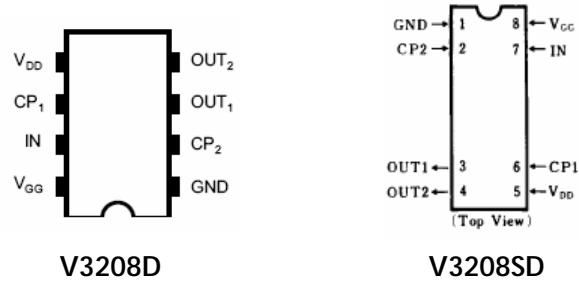
■ Applications

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

■ Block Diagram

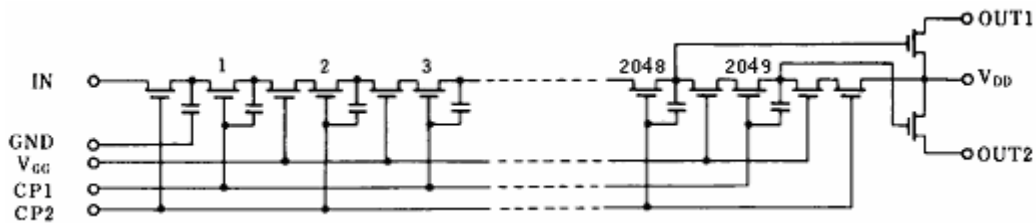


Pin Configuration



Symbol	Type	Description
GND	P	Ground
CP2	I	The second clock input
OUT1	O	Signal output, delayed 4096 times
OUT2	O	Signal output, delayed 4097 times
V _{DD}	P	Power
CP1	I	The first clock input
IN	I	Analog signal input
V _{GG}	I	Bias voltage input ($^{14}/_{15}V_{DD}$)

Circuit Diagram



Quick Reference Data

Item	Symbol	Value	Unit
Supply Voltage	V _{DD} , V _{GG}	+5, $^{14}/_{15}V_{DD}$	V
Signal Delay Time	t _D	10.24 ~ 102.4	ms
Total Harmonic Distortion	THD	2.5	%
Signal to Noise Ratio	S/N	71	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
Operation Ambient Temp.	T _{opr}	-20 ~ +60	°C
Storage Temp.	T _{stg}	-55 ~ +125	°C

Operating Condition (Ta = 25°C)

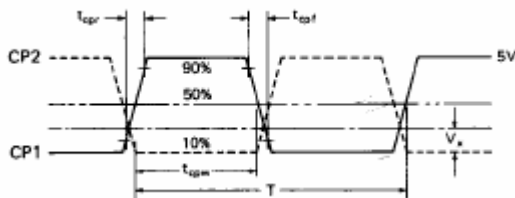
Item	Symbol	Condition	Min.	Typ.	Max	Unit
Drain Supply Voltage	V _{DD}		+4	+5	+10	V
Gate Supply Voltage	V _{GG}			¹⁴ / ₁₅ V _{DD}		V
Clock Voltage High	V _{CPH}			V _{DD}		V
Clock Voltage Low	V _{CPL}		0		+0.5	V
Clock frequency	f _{CP}		10		100	kHz
Clock Pulse Width *1	t _{CPW}				0.5T*2	
Clock Rise Time *1	t _{CPr}				500	ns
Clock fall Time *1	t _{CPf}				500	ns
Clock Input Cap.	C _{CP}				2800	pF
Clock Cross Point	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=100kΩ)

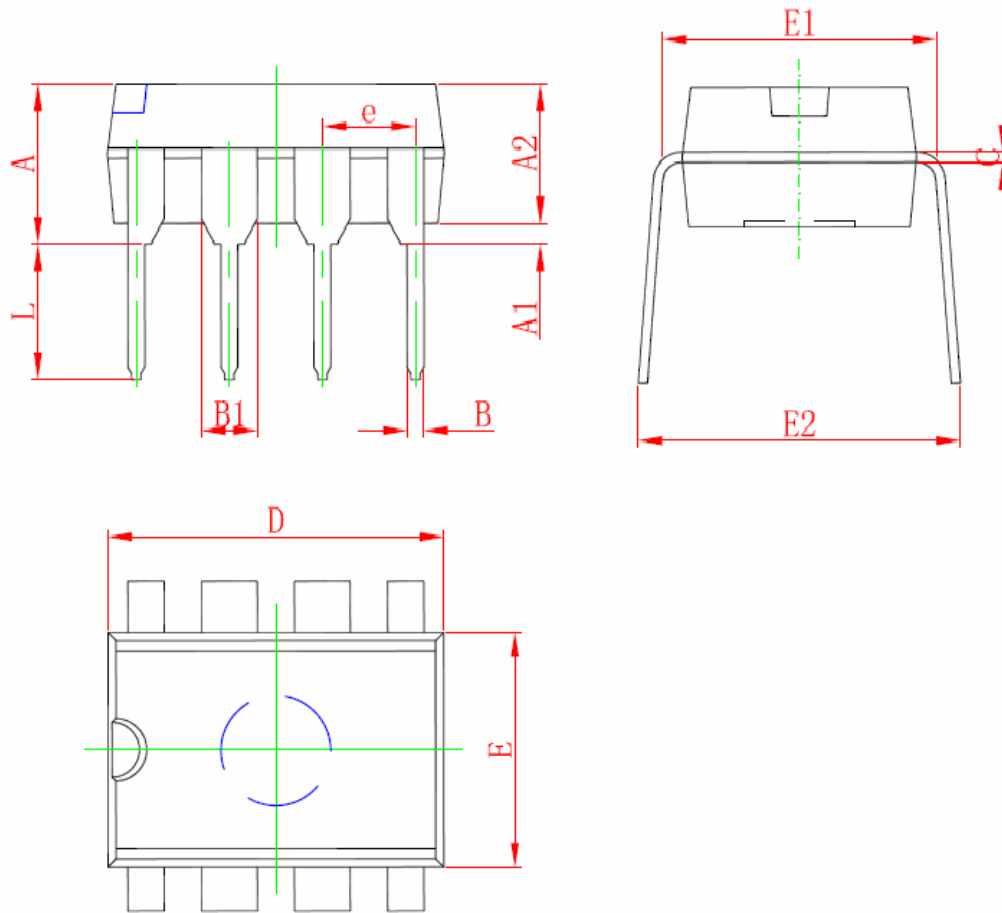
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Signal Delay time	t _o		10.24		102.4	ms
Input Signal Freq.	f _i	f _{CP} = 40kHz, Output Attenuation ≤ 3dB	10			kHz
Input Signal Swing	V _i	THD = 2.5%		0.36		V _{rms}
Insertion Loss	L _i	f _{CP} = 40kHz, f _i = 1kHz	-4	0	4	dB
Total Harm. Dist.	THD	f _{CP} = 40kHz, f _i = 1kHz, V _i = 0.25 V _{rms}		0.8	2.5	%
Output Noise Voltage	V _{ON}	t _{CP} = 100 kHz,			0.25	mV _{rms}
Signal to Noise Ratio	S/N	Weighted by "A" curve		71		dB

*1 Clock Pulse Waveform



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

DIP8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524 (BSC)		0.060 (BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354