SONY

CXA1777N

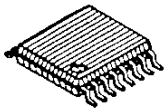
Wide band Differential Amplifier

For the availability of this product, please contact the sales office.

Description

The CXA1777N is a bipolar IC which has been developed as a playback preamplifier for VTR. It is a 2-channel wide band differential amplifier which incorporates an output enable logic circuit.

16 pin VSOP (Plastic)



Features

- Ultra wide band frequency characteristics: DC to 180MHz (–3dB down point) with differential gain 45.3dB
- Low output offset voltage: Within ± 100mV
- Small input capacitance: 5.1pF (Typ.)

Function

2-channel wide band differential amplifier (Incorporates output enable logic circuit)

Structure

Bipolar silicon monolithic IC

Application

- Playback preamplifier for VTR
- Wide band amplifier

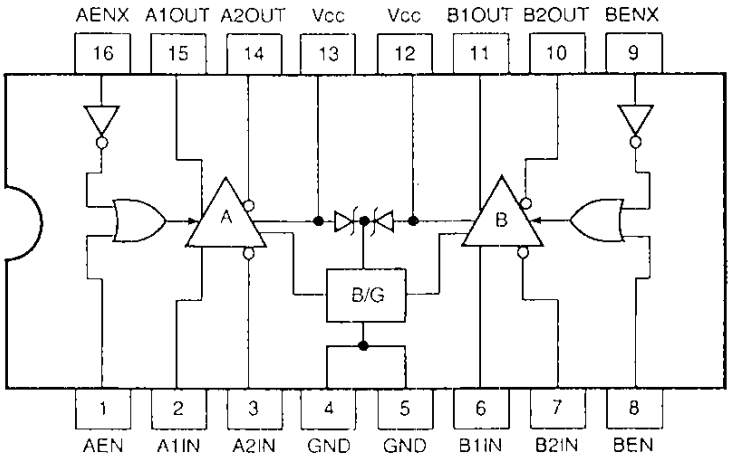
Absolute Maximum Rating (Ta=25°C)

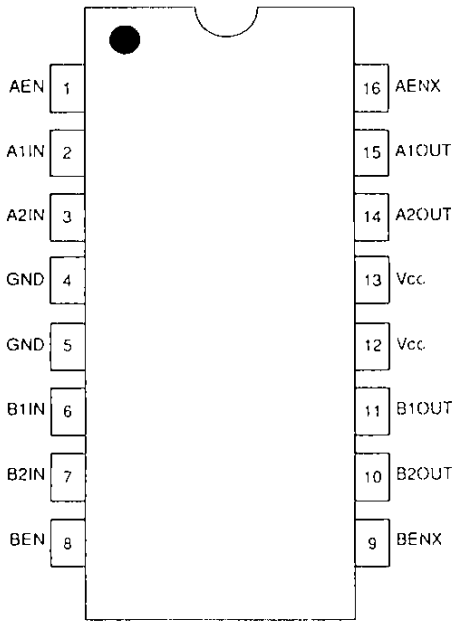
• Supply voltage	Vcc	7	V
• Operating temperature	Topr	–25 to +75	°C
• Storage temperature	Tstg	–55 to +150	°C
• Allowable power dissipation	PD	410	mW

Recommended Operating Condition

Supply voltage	Vcc	5.0 ± 0.5	V

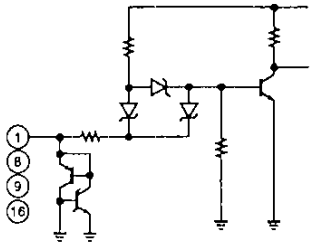
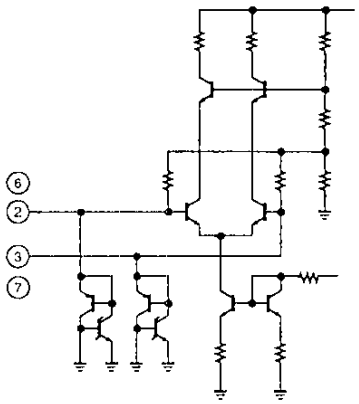
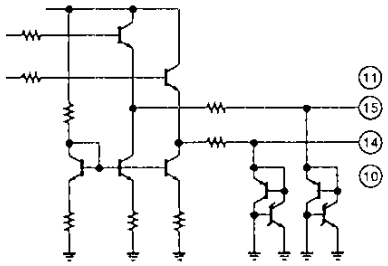
Block Diagram and Pin Configuration





E92Z16–ST

Pin Description

No.	Symbol	Voltage	Equivalent circuit	Description
1 8 9 16	EN IN ENX IN	1V		Output control input pin
2 3 6 7	VIN	2.2V		Signal input pin
10 11 14 15	VOUT	2.4V		Signal output pin

Electrical Characteristics

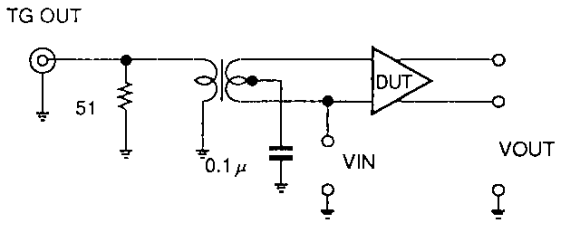
(Ta=25°C, Vcc=5V, VEN, VENX: OPEN)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Differential amplifier voltage gain	AVD	f=100kHz	42.8	45.3	47.8	dB
Frequency bandwidth	BW	−3dB down point	—	180	—	MHz
Input resistance	RIN		—	3	—	kΩ
Input capacity	CIN		—	5.1	—	pF
Output resistance	Ro (ON)	VEN: OPEN, f=100kHz	—	52.5	—	Ω
Output capacity	Co (OFF)	VEN: GND, f=1MHz	—	6	—	pF
Output offset voltage	ΔVo		−100	0	+100	mV
Crosstalk between channels	XTALK	f=30MHz	—	−60	—	dB
In-phase voltage elimination ratio	CMRR	f=30MHz	—	57	—	dB
Supply voltage fluctuation elimination ratio	SVRR	f=30MHz	—	48	—	dB
Circuit current	Icc	When outputting both channels	22	30	45	mA
		When outputting a single channel	18	24	35	mA
		When both channel outputs are OFF	12	17	24	mA
Input conversion noise	En	Inputs short-circuit	—	1.1	—	nV/√Hz
	In	Input open	—	2.4	—	pA/√Hz
Controlling voltage	VL	Low level		—	0.56	V
	VH	High level	1.6	—		V
Controlling current	IL	VL=0.6V	−180	−110	—	μA
	IH	VH=1.6V	—		1	μA
ON-OFF time	TON EN	VH=5V, VL=0V	—	42	100	ns
	TOFF EN	VH=5V, VL=0V		38	100	ns

Electrical Characteristics Test Circuit

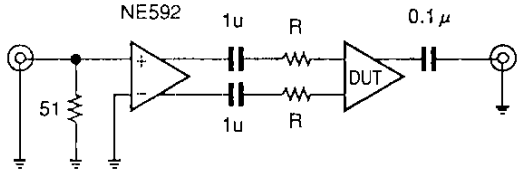
1) Measuring instrument
Network analyzer HP4195A

2) Gain and frequency characteristics



Gain and frequency characteristics test circuit

3) Input impedance



Input impedance test circuit

Obtains the input impedance by calculating each level difference after inputting 1K and 2K to the value R.

Description of Operation

The circuit of the built-in pre-amplifier (2 channels) operates by the principle of difference input, and is subjected to self-bias.

Signals are input to the input pins (A: pin 2 and pin 3, B: pin 6 and pin 7) and output from the output pins (A: pin 14 and pin 15, B: pin 10 and pin 11). The output impedance of the differential amplifier is approx. 50 Ω and the structure of its output stage is emitter follower circuit.

The output signal of the differential amplifier can be controlled by the control signal of the TTL circuit. This truth table is shown below.

Truth Table

ENX A: 16 B: 9 \ EN A: 1 B: 8	L	H
L	OUT	OUT
H	High Z	OUT

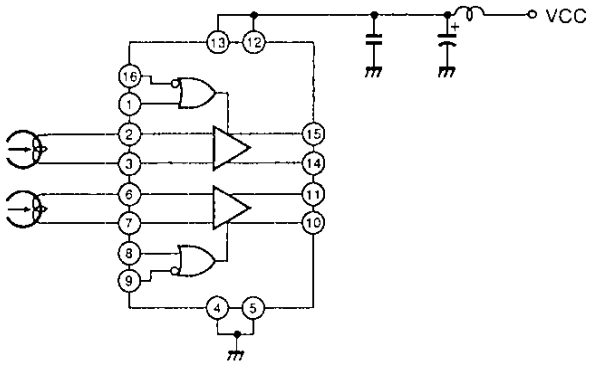
L : Input Low Level
H : Input High Level
OUT : Amp Output
High Z : High Impedance

Since the built-in 2 channels circuit is completely separated except the power supply, the output control section can also operate independently.

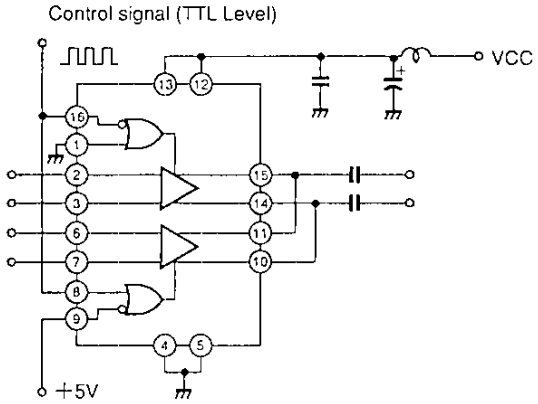
Application circuit

Three application circuit examples of this IC are as follows.

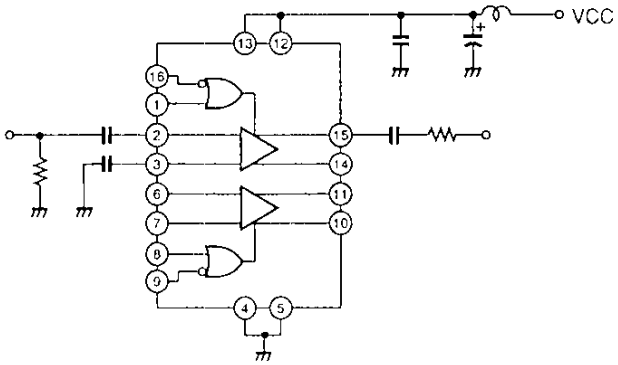
1) Head amplifier for VCR, etc.
(The output enable logic circuit is not used.)



2) Wide band amplifier when the output enable logic circuit is used



3) Wide band amplifier for single input and single output



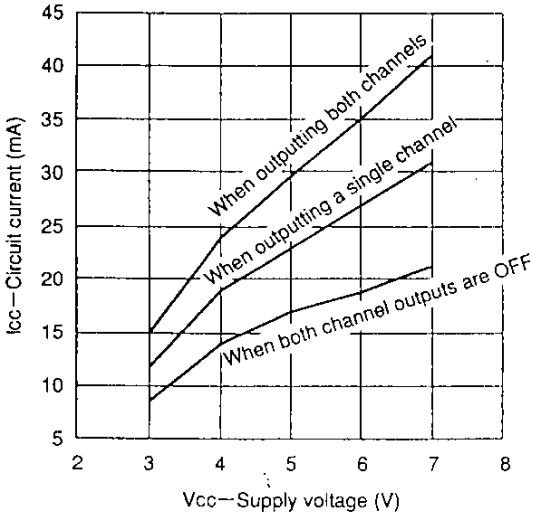
Notes on Operation

The CXA1777N has high-voltage gain (approximately 45dB), so that the following precautions should be taken.

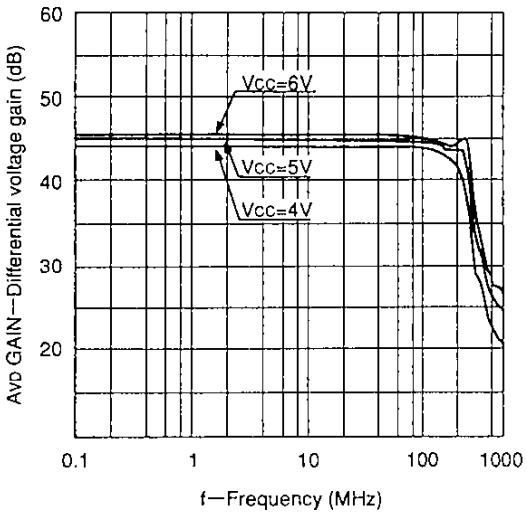
1. The power supply circuit should be decoupled by coil and capacitor.
2. Oscillation may occur when capacitative load is connected to output.
3. Regulator power supply is recommended for power supply.
4. Cross talk between channels (–60dB (typ.) at f=30MHz) may not be exercised as specifications depending on the pattern layout of board.
5. High frequency noise may leak to signal output via floating capacitance between pins when it appears on control pins. In this case, approximately 1 kΩ resistor should be inserted to control pins series.

Example of Representative Characteristics

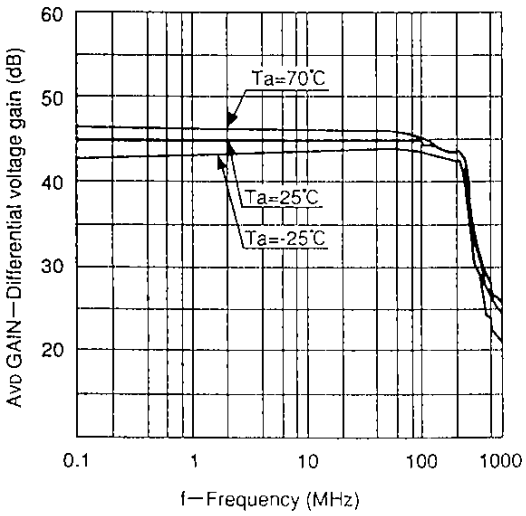
Circuit current vs. Supply voltage



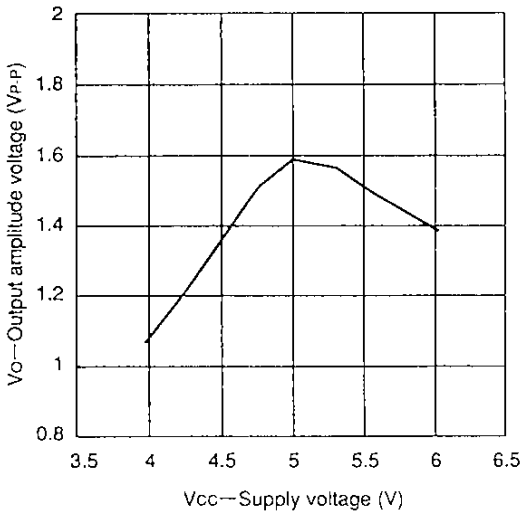
Frequency characteristics-2



Frequency characteristics-1

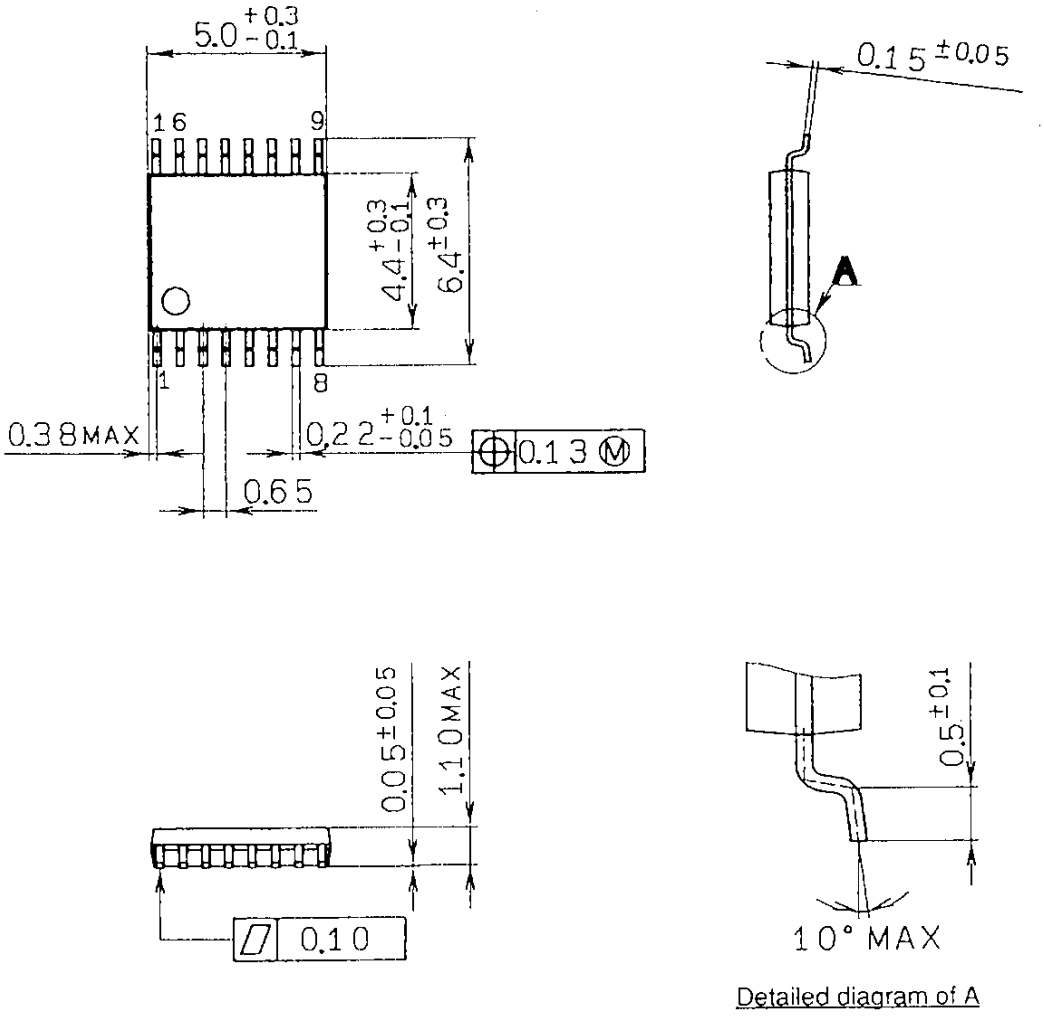


Output voltage swing vs. Supply voltage



Package Outline Unit: mm

16pin VSOP (Plastic)



Detailed diagram of A

SONY NAME	VSOP-16P-L121
EIAJ NAME	SSOP016-P-0225-AX
JEDEC CODE	————