XR-1075

BBE® Sound Enhancement Audio Processor

FEATURES

- Recreate Concert Sound Without Initial Encoding
- Transducer Independent
- No Extra Speakers Needed
- Matched Circuits for Stereo Applications
- No UndesirableAudio Artifacts
- Fixed or Variable Definition and Bass Boost Control

BENEFITS

- Smaller Package
- Fewer External Components
- Uses Less Space on PC Boards

APPLICATIONS

- Stereo Systems for the Home
- Portable Stereo Systems (i.e. Boomboxes)
- Sound Systems for Automobiles
- Sound for Radios and Televisions
- Powered Speakers or Sound Cards for Personal Computers
- Karaoke Machines
- Electronics Musical Instruments

GENERAL DESCRIPTION

BBE® sound enhancement provides more realism to music regardless of its source. It is designed for use in a variety of electronic sound systems. A single pass technique is used that does not require initial encoding. BBE® sound enhancement does not require additional speakers and is compatible with full-sized and headphone transducers. The XR-1075 incorporates BBE® sound enhancement in a dual-channel audio integrated circuit.

The XR-1075 is fabricated using bipolar technology for low noise, low distortion and low power consumption, and is available in 18-lead plastic DIP.

ORDERING INFORMATION

Part No.	Package	Operating Temperature Range
XR-1075CP	18-LEAD 300 MIL PDIP	-30°C to 75°C

BLOCK DIAGRAM

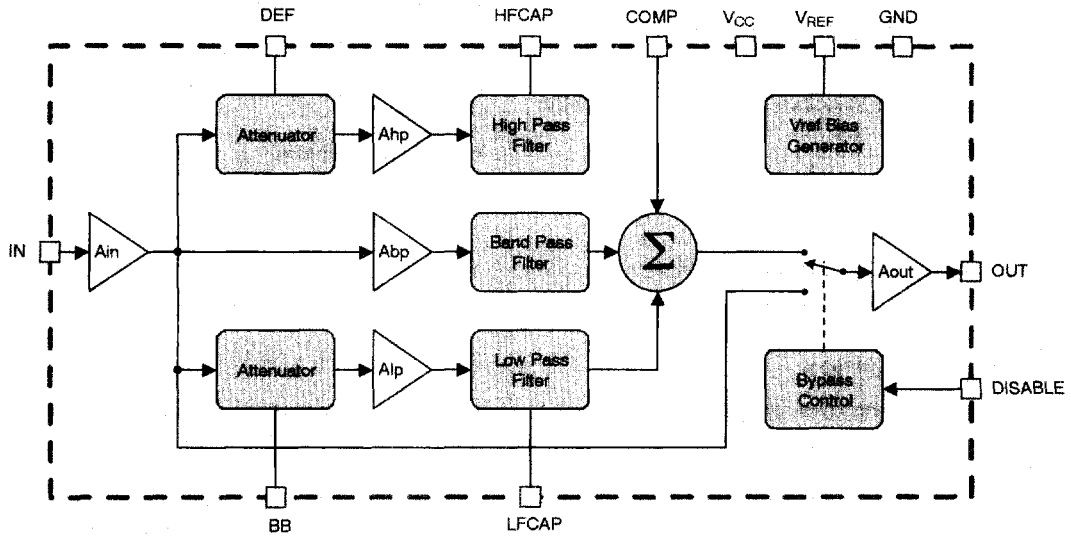
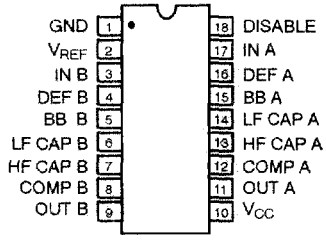


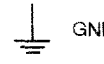
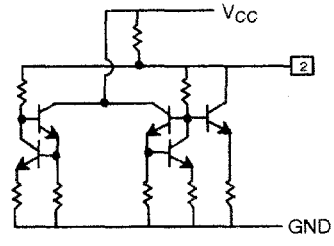
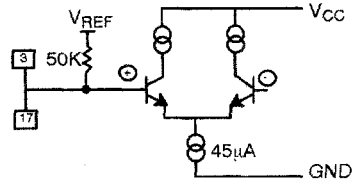
Figure 1. Block Diagram
One Channel of XR-1075

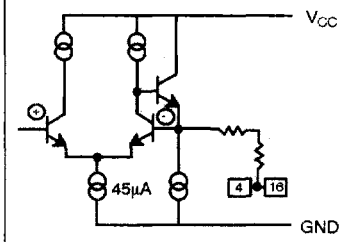
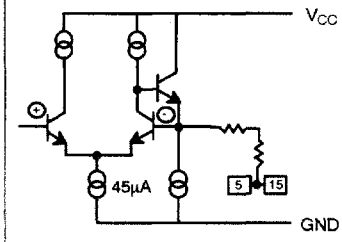
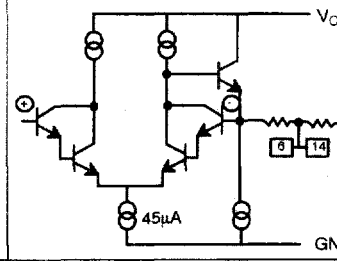
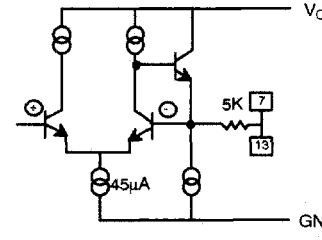
PIN CONFIGURATION

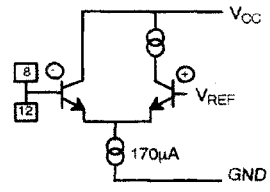
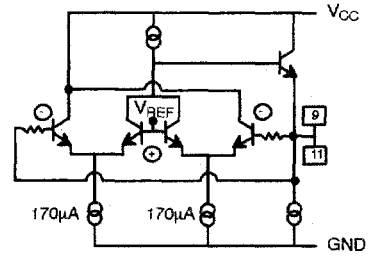
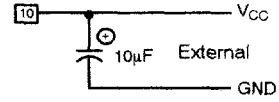
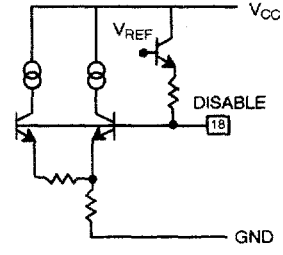


18-Lead PDIP (0.300")

PIN DESCRIPTION

PIN #	SYMBOL	I/O	EQUIVALENT CIRCUIT	DESCRIPTION
1	DGN	I		Power Ground
2	V_{REF}	O		Voltage Reference of Circuitry
3 17	IN B IN A	I I		Left, Right Channel Inputs

PIN #	SYMBOL	I/O	EQUIVALENT CIRCUIT	DESCRIPTION
4 16	DEF B DEF A	O O		Left, Right Channel Connection Point for Resistivity Pot to Control High Pass Gain
5 15	BB B BB A	O O		Left, Right Channel Connection Point for Resistivity Pot to Control Low Pass Gain
6 14	LFCAP B LFCAP A	I I		Left, Right Channel Connection Point for Unity Gain Low Pass Filter
7 13	HFCAP B HFCAP A	I I		Left, Right Channel Connection Point for Unity Gain High Pass Filter

PIN #	SYMBOL	I/O	EQUIVALENT CIRCUIT	DESCRIPTION
8 12	COMP B COMP A	I I		Left, Right Channel Compensation Point for Summing Amplifier
9 11	OUT B OUT A	O O		Left, Right Channel Output of Summing Amplifier
10	V_{CC}	I		Power Supply Voltage
18	DISABLE	I		Disable Input Pin. Controls Both Channels. BBE On: Short Disable Input Pin to Ground. BBE Bypass: Leave Disable Input Pin Open.

DC ELECTRICAL CHARACTERISTICS

Test Conditions: V_{CC} = 12VDC, T_A = +25°C unless otherwise specified.

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
Supply and Reference						
V_{CC}	Supply Voltage	6.0		24.0	V	
I_{CC}	Supply Current			15.0	mA	
V_{REF}	Voltage Reference	5.4		6.2	V	No load
Filter Section	**Vin - 1 Vrms**					
ALBmin	Loband Minimum Gain	0.0		2.5	dB	f = 40Hz
ALBmax	Loband Maximum Gain	9.0		13.0	dB	f = 40Hz
AMBmin	Midband Minimum Gain	0.5		2.5	dB	f = 700Hz
AMBmax	Midband Maximum Gain	-2.5		-0.5	dB	f = 700Hz
AHBmin	Hiband Minimum Gain	-4.2		-1.2	dB	f = 20kHz
AHBmax	Hiband Maxiumum Gain	9.0		13.0	dB	f = 20kHz
AOFF	Gain of BBE Off	-1.0		1.0	dB	f = 40 Hz, 700Hz and 20kHz
AC Characteristics						
NOISE On	Noise in BBE On Mode		-86		dBA	Input is grounded
NOISE Off	Noise in BBE Off Mode		-95		dBA	Input is grounded
THD BBE On	Total Harmonic Distortion in BBE On Mode		0.05		%	Vin = 245m Vrms @ f = 1kHz
THD BBE Off	Total Harmonic Distortion in BBE Off Mode		0.02		%	Vin = 245m Vrms @ f = 1kHz
CS	Channel Separation		-63		dB	Vin = 1 Vrms, f = 1kHz

Specifications are subject to change without notice

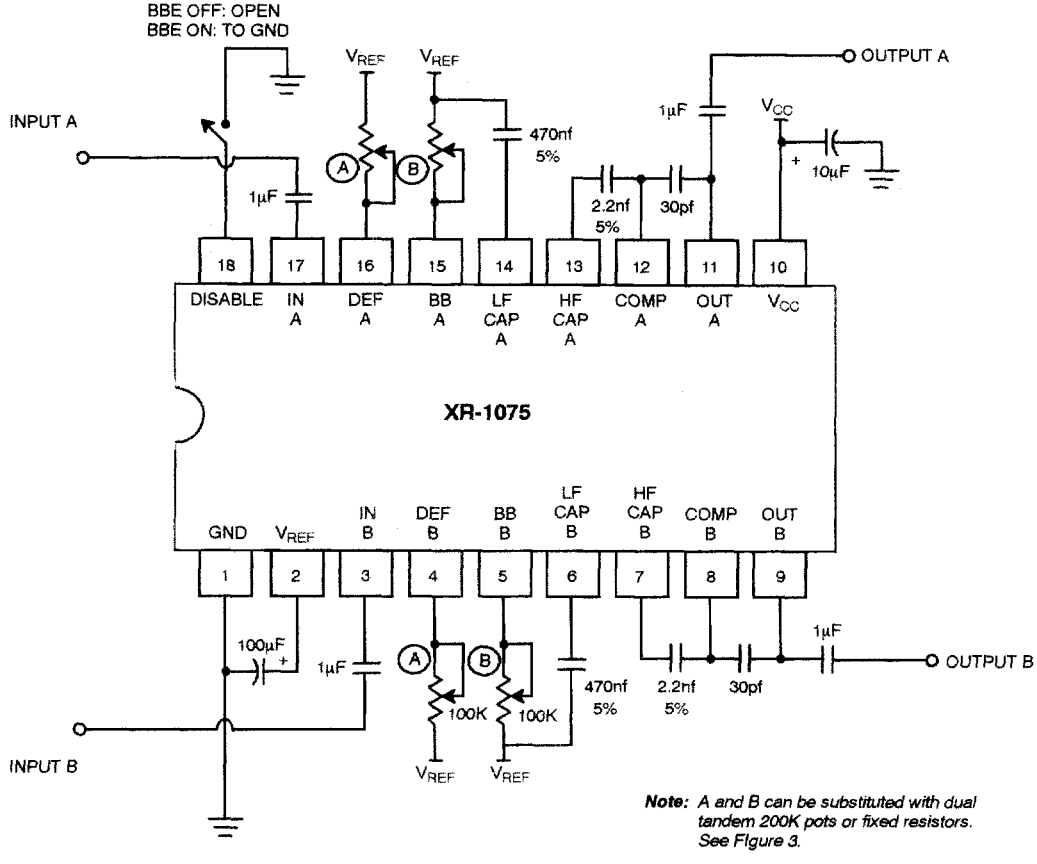
ABSOLUTE MAXIMUM RATINGS

Power Supply Voltage ..... 26 Vdc
Package Dissipation (limitation) @ 25°C .....
18-Pin PDIP Package 1000mW
Derate above 25°C 13mW/C

Storage Temperature ..... -65°C to +150°C
Maximum Input Voltage ..... V_{CC} +0.3V
Minimum Input Voltage ..... GND - 0.3V

LICENSE AGREEMENT

The XR-1075 is manufactured by EXAR under license from BBE® Sound, Inc. BBE® is a registered trademark of BBE® Sound, Inc. A license from BBE® Sound, Inc. (telephone 714-897-6766) is required before the XR-1075 can be purchased from EXAR.



Note: A and B can be substituted with dual tandem 200K pots or fixed resistors. See Figure 3.

Figure 2. XR-1075 Single Supply Application Schematic

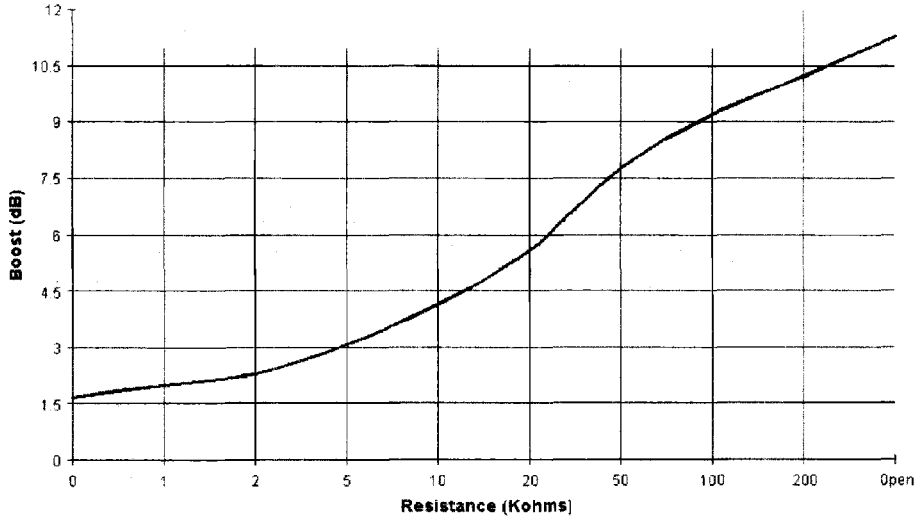


Figure 3. XR-1075 Definition and Bass Boost vs. External Resistance