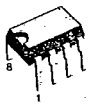
LB1026

PRELIMINARY DATA
AN AT&T PRODUCT

LEVEL EXPANDER

- REDUCES BACKGROUND NOISE DURING PAUSE IN CONVERSATION
- LB1026AA SUPPLIED WAFER FORM
- LB1026AB SUPPLIED IN MINIDIP

The LB1026 functions as a voice-frequency level expander that is used to condition amplified signals from electret-type microphones. A characteristic of this level expander is to attenuate low-level signals from the microphone that typically originate from background room noise, while passing normal amplitude speech at unity gain. The end effect of using this device is that the quality of the conversation is enhanced, for both the talker (via receiver sidetone) and listener, by reducing background sounds that might be heard during periods when the talker is silent.
This device operates from a single 2 to 15 V power supply and must be ac-coupled at the input and output. In addition, a 1.0μF response-time control capacitor must be provided by the user if the specified attack and release times are to be obtained. The LB1026 may be supplied in wafer form to the customer who is then responsible for subsequent processing to obtain the usable device. Each chip has six pads for wire bond attachment (see outline drawing).



Minidip-A Plastic

ORDERING NUMBERS: LB1026AA
LB1026AB

PIN CONFIGURATION

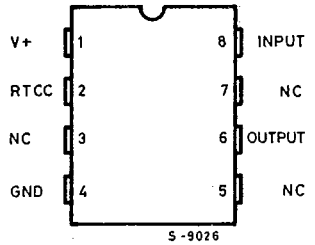
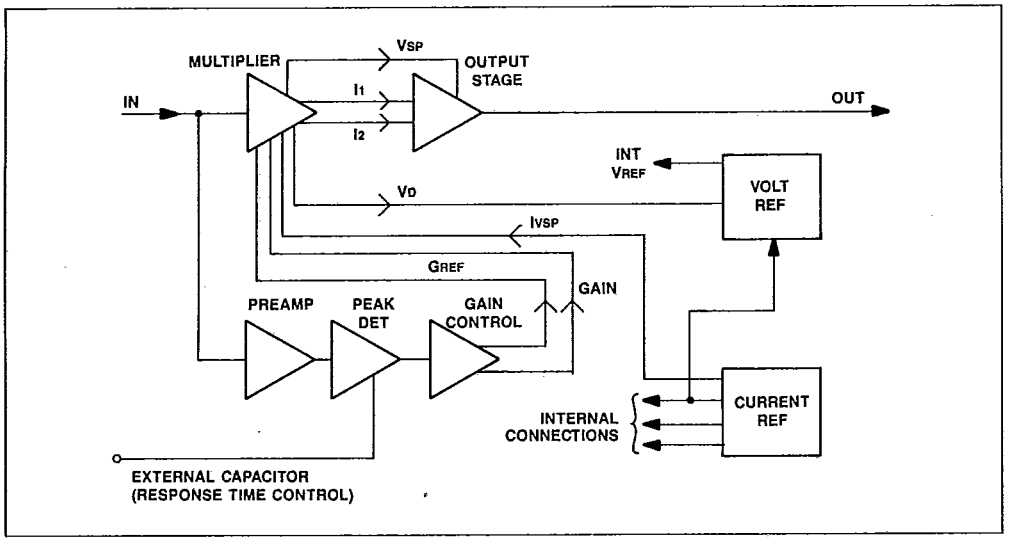


Fig. 1 - Block Diagram



PAD & PIN DESCRIPTION

Pad	Pin	Symbol	Description
1	1	V+	Connection for the power supply voltage.
6	2	RTCC	Response Time Control Capacitor.
	3	NC	No Connection, should not be used as a tie point.
15	4	GND	Ground.
	5	NC	No Connection, should not be used as a tie point.
16	6	OUTPUT	Device output.
22	7	GND	This pin can be connected to ground. This connection is not to be considered the ground terminal for this device.
21	8	INPUT	Device input.

ABSOLUTE MAXIMUM RATINGS (at 25°C unless otherwise specified)

Parameter	Value	Unit
Voltage (on Pads 1, 15, 22)	25	V
Storage Temperature Range	−40 to +125	°C
Ambient Operating Temperature Range	0 to 50	°C
Pin Temperature (Soldering 15 sec)	300	°C

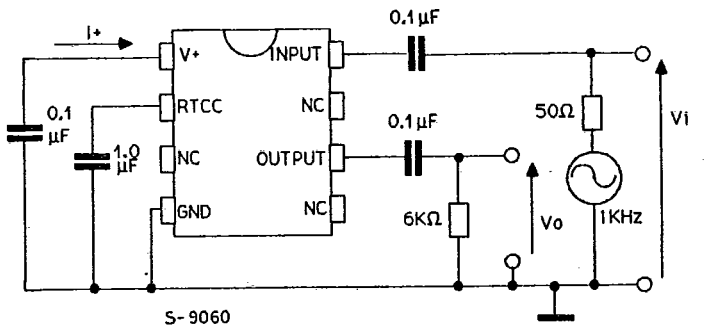
Stresses in excess of those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions in excess of those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS (At 25°C unless otherwise specified see test fig. 2)

Parameter	Test Conditions	Min	Max	Unit
Power Supply Voltage		2.0	15	V
Power Supply Current	V+ = 15V	—	1.0	mA
Power Supply Current	V+ = 3.0V	—	700	μA
Output Voltage	R_L = 6KΩ	—	1.0	V_{PP}(1)
Maximum Input Gain Ratio(3)	Input = 388mVrms	0.94	1.15	
High-Level Gain Ratio(3)	Input ≥ 50mVrms	0.94	1.1	
Mid-Level Gain Ratio(3)	Input = 12.5mVrms	0.38	0.6	
Low-Level gain Ratio(3)	Input = 1.0mVrms	0.19	0.28	
Attack Time		10.5	17.5	ms(2)
Decay Time		105	175	

1. Maximum undistorted sine-wave.
2. Attack and decay times are defined as the time required for the output to settle to within 90% of the values shown in Figure 2 after the input is instantaneously changed from 3.16mV_{RMS} respectively. For this specific response, a 1.0μF capacitor must be connected from lead number 6 of the device to ground in addition to the normal input, output and supply connections. These response times are not directly measured, but are guaranteed by desing.
3. Gain Ratio are defined as V_O/V_I

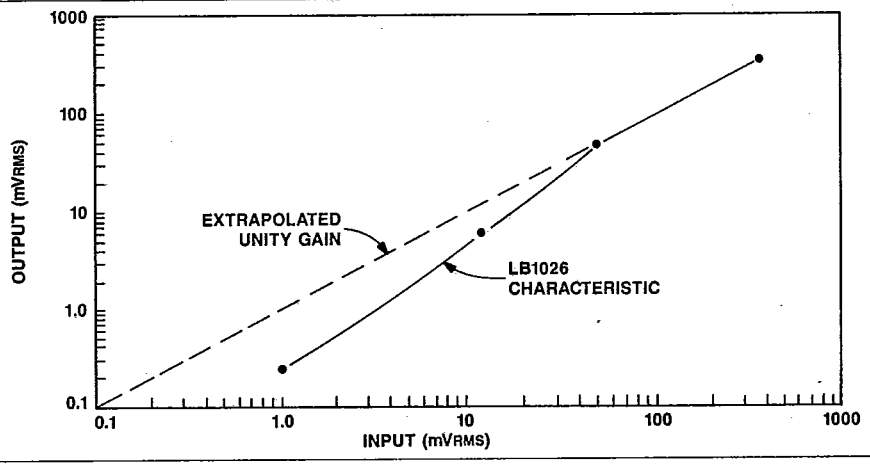
Fig. 2 - Test Circuit



APPLICATIONS

The following information summarizes the basic operation of a voice frequency level expander in electret-type microphone applications.

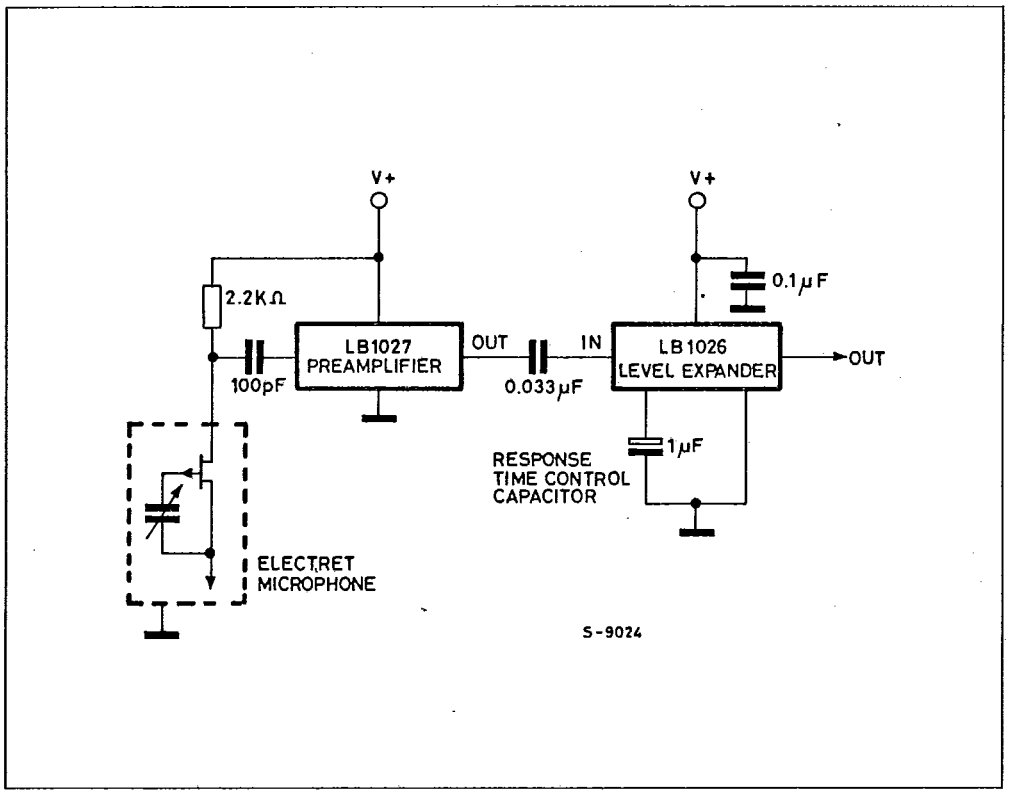
Fig. 3 - Typical Expander Characteristics



Attack and decay times are defined as the time required for the output (V_O) to settle within 90% of the valued (output mVrms, Figure 3) after the input is istantaneously changed from 3.16 mVrms to 31.6 mVrms or from 31.6 mVrms to 3.16 mVrms, respectively. For this specific response, a 1.0 µF capacitor mus be connected from pin 2 of the device to ground in addition to the normal input, output, and supply connections.

APPLICATIONS (Continued)

Fig. 4



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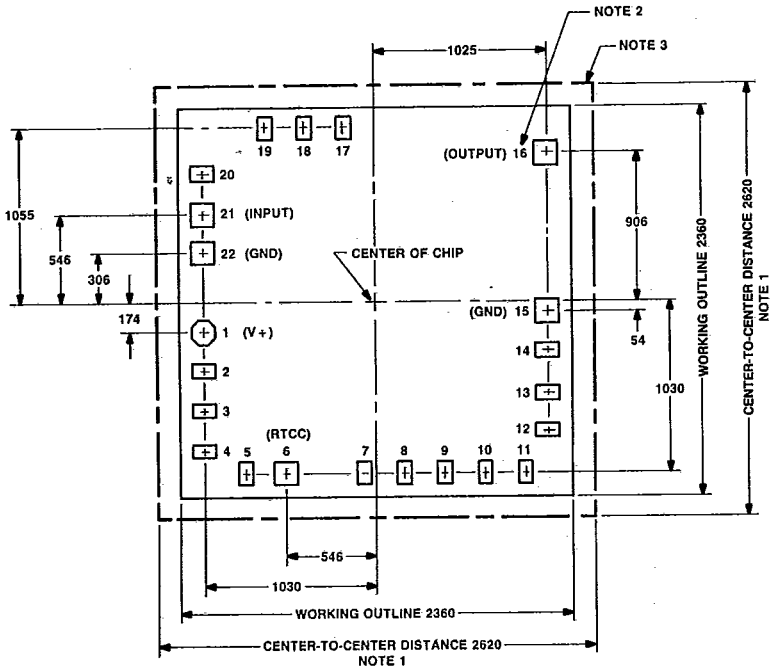
MOUNTING AND CONNECTION

Epoxy bonding is the preferred method of attaching the chip to the substrate.
Thermo-compression bonding is the preferred method of attaching gold wire to the device contact.

Use minimum pressure during bonding. Bonding temperature shall not exceed 340°C
Care shall be taken during wire-to-contact bonding so as not to damage the device.

OUTLINE DRAWING



NOTES:

All dimensions are reference dimensions and are shown in micrometers.

1. The actual chip size equals the center-to-center dimensions less the saw kerf width, typically 50 to 70 micrometers
2. Chip pad location numbers are for reference only and do not appear on the chip. The complete metallization pattern is not shown.
3. The thickness may vary as determined by the wafer diameter used in fabrication. However, the thickness dimension will be in the range of 480 micrometers (.0189 inches) minimum and 700 micrometers (.0275 inches) maximum.