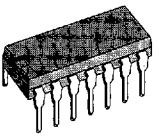
LOW VOLTAGE TELEPHONE SPEECH CIRCUIT

ADVANCE DATA

- OPERATION DOWN TO 1.3 V/5 mA
- DTMF & BEEP TONE INPUTS
- EXTERNAL MUTING FOR EARPHONE AND MICROPHONE
- MUTE TURNS ON BEEP TONE & DTMF INPUTS AND TURNS OFF EARPHONE & MICROPHONE
- SUITABLE FOR DYNAMIC OR PIEZO EARPHONES AND PIEZO, DYNAMIC OR ELECTRET MICROPHONES



DIP14 (0.25)

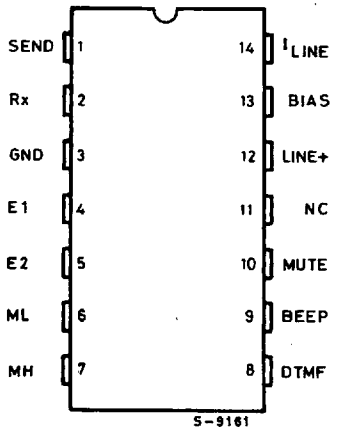
ORDERING NUMBER : L3280AB

DESCRIPTION

The L3280 is a brand new low voltage speech circuit designed to replace hybrid circuits in telephone sets. It is designed for sets that may be operated in parallel. It features both DTMF input and Beep tone input ; ALC on send and receive and muting input.

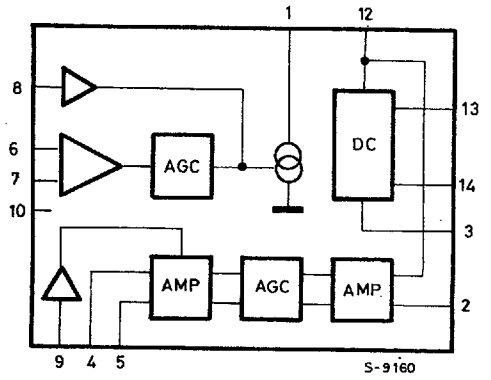
Various DC - characteristics can be programmed at pin 14 replacing testing resistor (43Ω) with proper network value.

PIN CONNECTION (top view)



This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_L	Line Voltage (3 ms pulse)	20	V
I_L	Line Current	150	mA
P_{tot}	Total Power Dissipation, T_{amb} = 70 °C	1	W
T_{op}	Operating Temperature	– 20 to 55	°C
T_j	Junction Temperature	– 65 to 150	°C

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	80	°C/W

Figure 1 : Test Circuits.

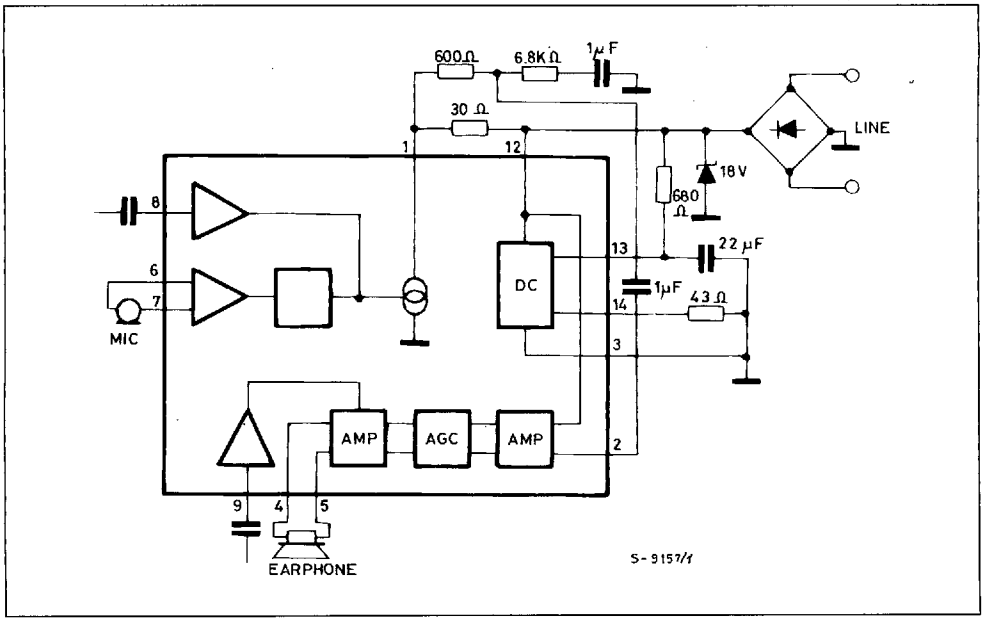
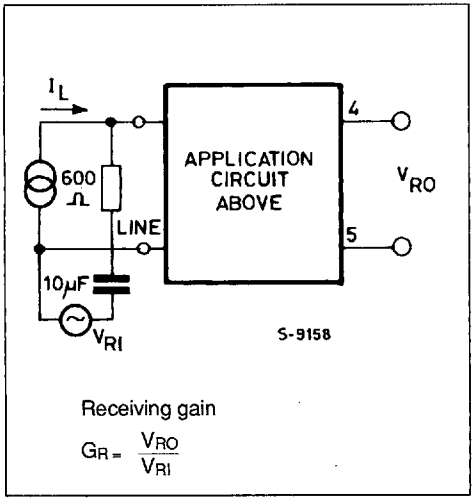


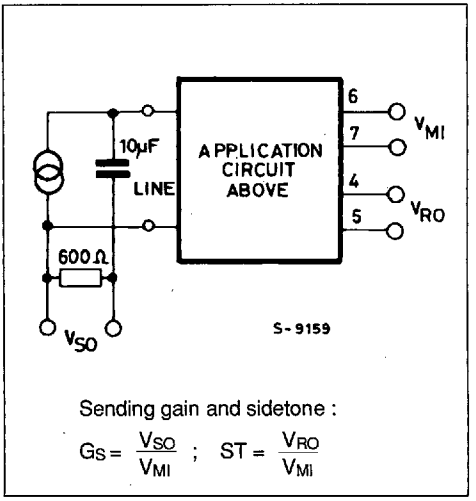
Figure 2 .



Receiving gain

$$G_R = \frac{V_{RO}}{V_{RI}}$$

Figure 3.



Sending gain and sidetone :

$$G_S = \frac{V_{SO}}{V_{MI}} \; ; \; ST = \frac{V_{RO}}{V_{MI}}$$

ELECTRICAL CHARACTERISTICS
(T_{amb} = 25°C ; f = 1kHz ; I_L = 20mA : mute low ; R1 (pin 14) = 43Ω, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_L	Line Voltage	I_L = 20 mA		3.05	3.35	V
V_L	Line Voltage	I_L = 50 mA		5.8	6.2	V
V_L	Line Voltage	I_L = 80 mA		8.5	10	V
C_{MRR}	Common Mode Rej. Ratio		50			dB
G_S	Sending Gain	V_{MI} = 2 mV, I_L = 20 mA	47.8	49.3	50.8	dB
D_{GS}	Delta Sending Gain	I_L = 70 mA, V_{MI} = 2 mV	– 7	– 5.5	– 4	dB
T_{HDS}	Sending Distortion	V_{SO} = 700 mV			5	%
N_{TX}	Sending Noise	I_L = 50 mA, V_{MI} = 0 V		– 71		dBm
Z_{MI}	Mic. Input Impedance	V_{MI} = 2 mV	40			KΩ
G_R	Receiving Gain	I_L = 20 mA, V_{RI} = 0.2 V	7.7	9.2	10.7	dB
D_{GR}	Delta Receiving Gain	I_L = 70 mA, V_{RI} = 0.2 V	– 7	– 5.5	– 4	dB
T_{HDR}	Receiving Distortion	V_{RO} = 615 mV			5	%
N_{RX}	Receiving Noise	V_{RI} = 0 V		300		μV
Z_{RO}	Receiving Output Imped.	R_1 = 200 Ω, V_{RO} = 50 mV		10		Ω
	Sidetone	V_{MI} = 2 mV		40		dB
Z_{ML}	Line Match. Impedance	V_{RI} = 0.2 V	500	600	700	Ω
V_L	Line Voltage	I_L = 5.5 mA		1.5	1.8	V
V_{SO}	Sending Output Voltage	I_L = 5.5 mA, T_{HD} = 5 %	100			mV
I_{RO}	Rec. Output Current	I_L = 5.5 mA, T_{HD} = 5 %	0.7			mA
	OPERATION @ I_L = 16 mA					
MULO	Mute Input Low	(speaking mode)			1	V
MUHI	Mute Input High	(dialling mode)	2			V
GMF	DTMF Gain	V_{in} = 2 mV ; Mute = 2 V	25	26.5	28	dB
RMF	DTMF Input Impedance	Mute = 2 V	6	8.5		KΩ
THDMF	DTMF Distorsion	Mute = 2 V ; V_{in} = 25 mV			5	%
G_{beep}	Beeptone Gain	Mute = 2 V ; V_{in} = 25 mV		8.5		dB
R_{beep}	Beeptone Input Imped.	Mute = 2 V	12			KΩ
THD	Beeptone Distorsion	Mute = 2 V ; V_{Bt} = 100 mV			5	%
DV_L	DELTA V_{LINE}	Mute = 2 V ; I_L = 20 mA	0.5		1.2	V
G_{BACK}	Back Tone Gain		–	–	–3.0	dB

CHARACTERISTIC AT 1 KHz

Figure 4 : Receive Characteristic and Max Output at 2 % THD.

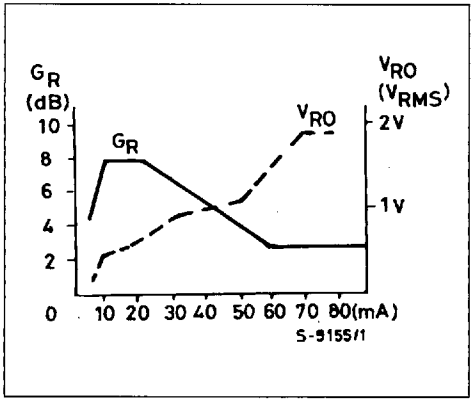


Figure 5 : Sending ALC Characteristic and Max Output at 2 % THD.

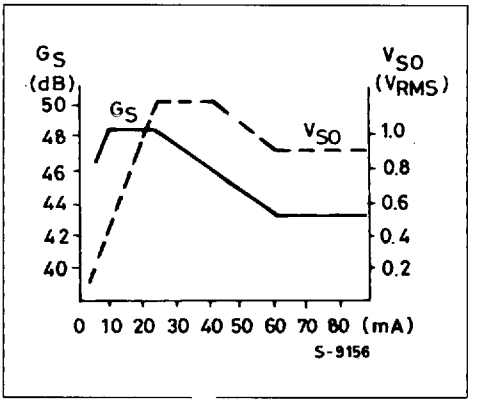
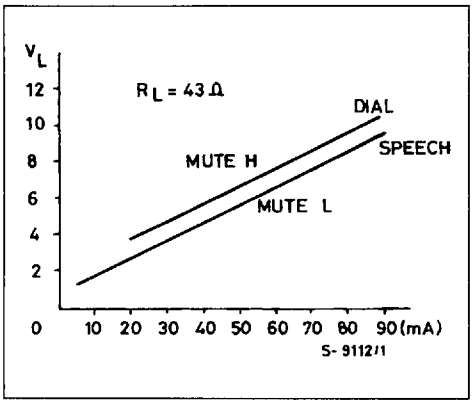


Figure 6 : DC Characteristic Measured between Line and GND.



LOGIC OF MUTE SWITCHING

	DTMF	BEEP	MIC INPUT	RECEIVE INPUT
MUTE H	ACTIVE TO LINE OUTPUT	ACTIVE TO EARPHONE OUTPUT	MUTED	MUTED
MUTE L	MUTED	MUTED	ACTIVE	ACTIVE

Figure 7 : Application Circuit for Dynamic Transducer.