## MASK - PROGRAMMABLE SPEECH CIRCUITS

SPEECH CIRCUIT

- MINIMUM NUMBER OF INEXPENSIVE EXTERNAL COMPONENTS, 6 CAPACITORS AND 10 RESISTORS
- MUTE FUNCTION FOR PARALLEL OPERATION WITH DTMF GENERATOR OR DECADING IMPULSING
- LOW VOLTAGE OPERATION, DOWN TO 3.3V
- VERY SHORT START-UP TIME
- CURRENT-SOURCE GENERATOR FOR ACTIVE MICROPHONES

DESCRIPTON

PBL3726/8 is a standard version of the PBL3726 family of the mask-programmable, monolithic integrated speech circuits for use in electronic telephones. It is designed for use with a low impedance microphone. Sending and receiving gain is regulated with the line length. Different ranges of amplifier regulation for various current feeds can be obtained by mask programming. Typical current feeds such as 48V 2 x 800 , and 36V 2 x 500 can be handled.

DIP-16
(Plastic)

ORDER CODE : PBL3726/6
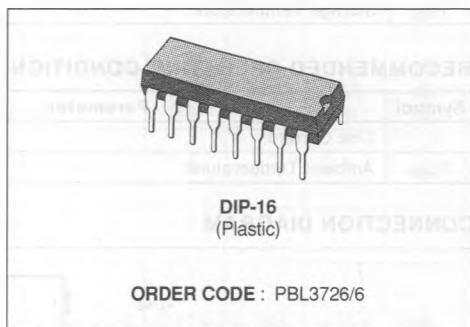
Application-dependent parameters are line balance, sidetone level and frequency response are set by external components. Parameters are set independently which means easy adaptation for various market needs. An extra 20dB amplifier can be used for various purposes such as extra receiving gain with volume control or active sidetone balance.
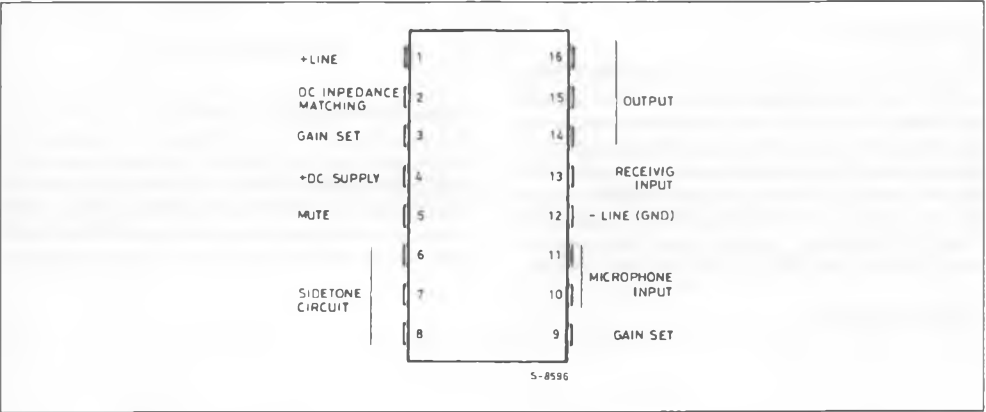
TEST CIRCUIT

S - 8594/1
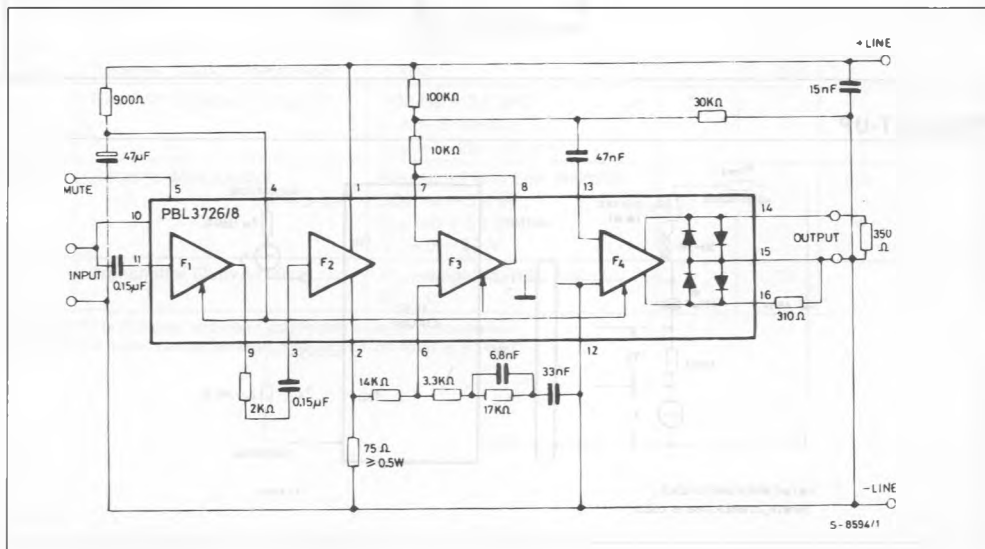
ABSOLUTE MAXIMUM RATINGS
Maximum Ratings over Operating Free-air Temperature Range (unless otherwise stated)

Symbol	Parameter	Test Conditions	Unit
V_{DC}	Line Voltage, $t_p = 2$ s	22	V
I_{DC}	Continuous Operating Line Current	100	mA
T_I	Junction Temperature	150	°C
T_{amb}	Operating Ambient Temperature	-40 to $+70$	°C
T_{stg}	Storage Temperature	-55 to $+150$	°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min.	Typ.	Max.	Unit
I_L	Line Current	10		60	mA
T_{amb}	Ambient Temperature	-15		45	°C

CONNECTION DIAGRAM

TEST SET-UP

(✱) 1µF WHEN LINE IS USED
(✱✱) R_L = 0 WHEN LINE IS USED

S - 8761/3

SGS-THOMSON
MICROELECTRONICS
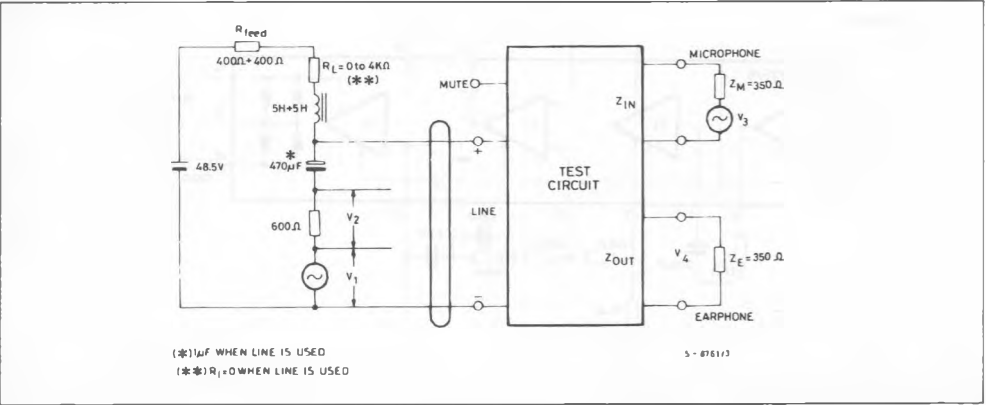
THERMAL DATA

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

ELECTRICAL CHARACTERISTICS (electrical characteristics over recommended operating conditions)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DC}	Terminal Voltage	I_{DC} = 10 mA I_{DC} = 60 mA	3.0 7	3.5 9	4.0 10.5	V V
G_T	Transmitting Gain *	$20 \cdot \log10 \left(\dfrac{V_2}{V_3} \right)$ 1 kHz $R_L = 0$ E = E + 10 % $R_L = 400\ \Omega$ $R_L = 900\ \Omega - 2.2$ kHz	 33 35.5 38	 34 36.5 39	 35 37.5 40	 dB dB dB
REG_T	Transmitting Range of Regulation	1 kHz $R_L = 0\ \Omega$ E = E + 10 % to $R_L = 900\ \Omega$	3	5	7	dB
Lin_T	Transmitting Frequency Response	200 Hz to 3.4 kHz	− 1		1	dB
G_R	Receiving Gain (*)	$20 \cdot \log10 \left(\dfrac{V_4}{V_1} \right)$ 1 kHz $R_L = 0\ \Omega$ E = E + 10 %	 − 17.9	 − 16.5	 − 15.1	 dB
REG_R	Receiving Range of Regulation	1 kHz $R_L = 0\ \Omega$ E = E + 10 % to $R_L = 900\ \Omega$	3	5	7	dB
Lin_R	Receiving Frequency Response	200 Hz to 3.4 kHz	− 1		1	dB
Z_{IN}	Transmitter Input Impedance	1 kHz	17	20		kΩ
V_T	Transmitter Dynamic Output	200 Hz − 3.4 kHz ≤ 2 % Distortion I_{DC} = 11.25 − 50 mA	1.1			V_p
V_T	Transmitter Max Output	200 Hz − 3.4 kHz I_{DC} = 0 − 50 mA V_3 = 0 − 1 V			3	V_p
Z_{OUT}	Receiver Output Impedance	1 kHz		3 + 310		Ω
V_R	Receiver Dynamic Output **	200 Hz − 3.4 kHz ≤ 3 % Distortion I_{DC} = 11.25 − 50 mA	0.4			V_p
V_R	Receiver Max Output	Measured with Line Rectifier 200 Hz − 3.4 kHz I_{DC} = 0 − 50 mA V_1 = 0 − 50 V			0.9	V_p
N_T	Transmitter Output Noise	P_{sof}-weighted, REL 1 V $R_L = 0$		− 75		

* Adjustable to both higher and lower values with external components
** The dynamic output can be doubled. See application notes at R14

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ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
N_R	Receiver Output Noise	A-weighted, REL 1 V, with Cable 0-5 Km ∅ 0.5 mm ; 0-3 Km ∅ 0.4 mm		– 85		dB_A
I_M	Mute Input Current		0.1			mA
V_{DC}	Minimum DC-line Voltage when Muted	$I_{DC} = 2.5$ mA $I_M = 0.1$ mA	3.0			V
I_S	Supply Current for Microphone Amplifier	$I_{DC} = 11.25 - 50$ mA	300			µA
I_{DC}	DC Voltage for Microphone Amplifier	$I_{DC} = 11.25 - 50$ mA			2	V

* Adjustable to both higher and lower values with external components.
** The dynamic output can be doubled. See application notes at R14.

Figure 1 : Typical Application.

(✱) ELECTRETE MICROPHONE