

**BIPOLAR LINEAR IC**

**DBL 5016**

**UNIVERSAL SPEECH NETWORK**

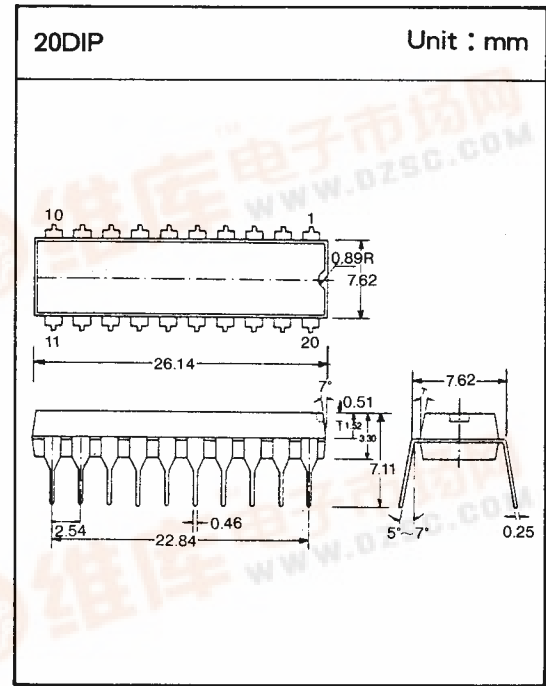
The DBL5016 can fulfill the standards of other countries by changing the external component. Dynamic or piezoelectric type can be used with receiver. Each gain is controlled with AGC in accordance with the line current. The DBL5016 has regulated voltage for dialer. (typ : 3.2V), MUTE and  $\overline{\text{MUTE}}$  function.

**FEATURES**

- Independent adjustment of DC resistance and AC impedance.
- Voltage regulator with adjustable static resistance
- Symmetrical high-impedance inputs for dynamic, magnetic or piezo-electric microphones
- Receiving amplifier for dynamic, magnetic or piezo-electric earpieces
- DTMF signal interface
- Regulated  $V_{DD}$  for dialer
- Mute,  $\overline{\text{Mute}}$  function
- DC line voltage adjustment facility

**MAXIMUM RATINGS**

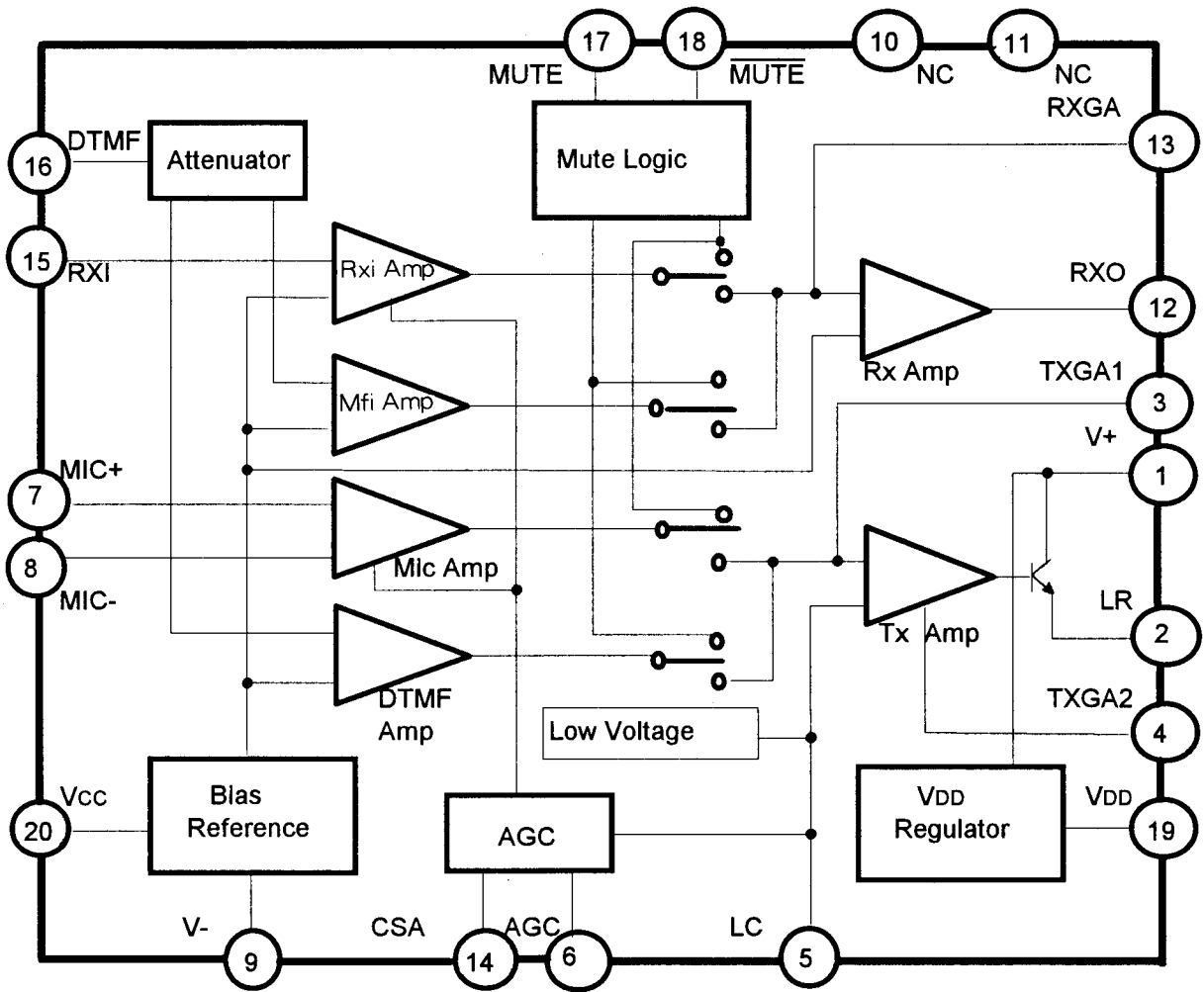
Characteristic	Symbol	Rating	Unit
Line Voltage	$V_L$	12	V
Line Current	$I_L$	140	mA
Power Dissipation	$P_D$	666	mW
Operating Temperature	$T_{OPr}$	-25 ~ +70	°C
Storage Temperature	$T_{stg}$	-40 ~ +125	°C



# DBL 5016

BIPOLAR LINEAR IC

BLOCK DIAGRAM



PIN DESCRIPTION

Pin No	Symbol	Description
1	V+	Positive power line and TX Amp output
2	LR	DC Resistance control
3	TXGA1	TX gain adjustment
4	TXGA2	TX gain adjustment
5	LC	Voltage stabilizer (DC Load capacitor)
6	AGC	Automatic gain control
7	MIC+	Mic (+) input

PIN DESCRIPTION

Pin No	Symbol	Description
8	MIC-	Mic(-) Input
9	V-	Ground
10, 11	NC	No connection
12	RXO	Rx output
13	RXGA	Rx gain adjustment
14	CSA	Current stabilizer
15	RXI	Rx input
16	DTMF	DTMF signal input
17	MUTE	'H' Mute input
18	<u>MUTE</u>	'L' Mute input
19	V <sub>DD</sub>	Regulated V <sub>DD</sub> for dialer or micom
20	V <sub>CC</sub>	Internal power supply pin

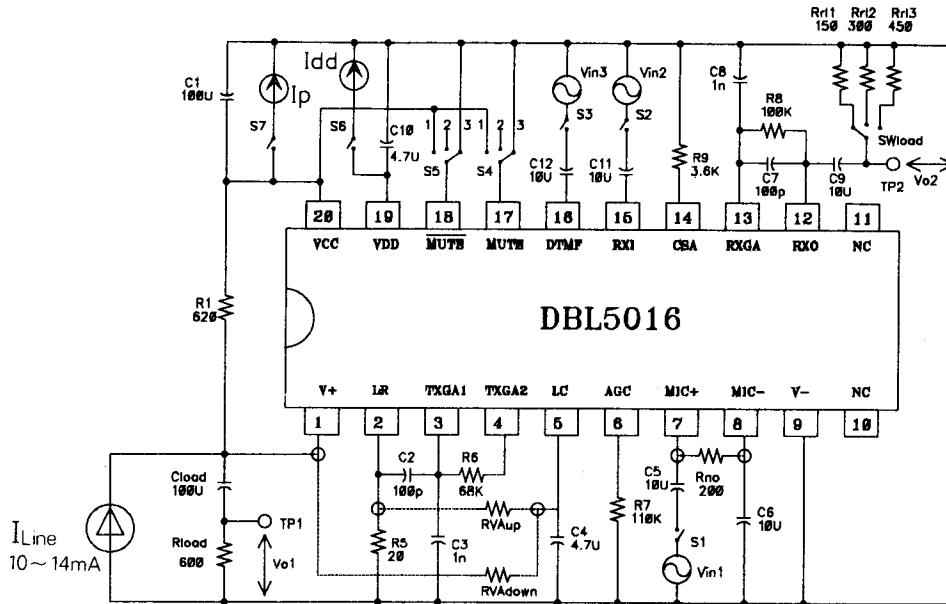
ELECTRICAL CHARACTERISTIC

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Line Voltage	V+	I Line=5mA	-	1.9	-	V	
		I Line=15mA	3.6	4	4.3		
		I Line=100mA	4.9	5.7	6.5		
		I Line=140mA	-	-	7.5		
Line Voltage-up	V+ up	Between pin 2 & pin5 R <sub>VA(up)</sub> =55K	-	4.5	-	V	
Line Voltage-down	V+ down	Between pin 2 & pin5 R <sub>VA(down)</sub> =68K	-	3.5	-	V	
Supply Voltage	V <sub>CC</sub>	R1=620Ω	-	3.4	-	V	
MIC Input Impedance	Z <sub>i(mic)</sub>	Between MIC- & MIC+	-	64	-	K	
		MIC- or MIC+ to V-	-	32	-		
Common mode rejection ratio	CMRR(Tx)	-	-	82	-	dB	
TX Gain	G <sub>v(Tx)</sub>	R6=68K, V <sub>in</sub> =3mV <sub>rms</sub>	50.5	52	53.5	dB	
TX Gain frequency response	ΔG <sub>TXF</sub>	f=300~3400Hz	-	±0.2	-	dB	
DTMF input impedance	Z <sub>i(MF)</sub>	-	-	20	-	K	
DTMF Gain	G <sub>v(MF)</sub>	R6=68K, DTMF mode	24	25.5	27	dB	
DTMF Gain response	ΔG <sub>MF</sub>	f=68K f=300~3400Hz	-	±0.2	-	dB	
TX Gain adjustment	ΔG <sub>v,adj(Tx)</sub>	R6=68K → 25K	-	-8	-	dB	
TX Dynamic output voltage	V <sub>o(Tx)</sub>	THD=10%	I <sub>L</sub> =5mA	-	0.8	-	V <sub>rms</sub>
			I <sub>L</sub> =15mA	1.7	2.3	-	
TX noise output voltage	V <sub>no(Tx)</sub>	R7=68K Between pin7 & pin8=200Ω	-	-69	-	dBmp	

### □ ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
RX input impedance	$Z_i(Rx)$	—	—	21	—	K	
RX output impedance	$Z_o(Rx)$	—	—	4	—		
RX Gain	$G_v(Rx)$	$R_8 = 100K, R_L = 300\Omega$	29.5	31	32.5	dB	
RX Gain frequency response	$\Delta G_{TXF}$	$f = 300 \sim 3400Hz$	—	$\pm 0.2$	—	dB	
RX Dynamic output voltage	$V_o(Rx)$	THD=2% $R_8 = 100K$	$R_L = 150\Omega$	0.22	0.33	—	V
			$R_L = 450\Omega$	0.3	0.48	—	
RX noise output voltage	$V_{no}(Rx)$	$R_L = 300\Omega, R_8 = 100K$ $I_L = 15mA, R_{xi} = \text{open}$	—	50	—	$\mu V$	
RX Gain adjustment	$\Delta G_{v,adj}(Rx)$	$R_8 = 100K \rightarrow 28K$	—	-11	—	dB	
Mute & $\overline{\text{Mute}}$ input voltage	$V_{IH(Mute)}$	—	1.5	—	$V_{CC}$	V	
	$V_{IL(Mute)}$	—	—	—	0.3		
	$V_{IH(\overline{\text{Mute}})}$	—	1.5	—	$V_{CC}$		
	$V_{IL(\overline{\text{Mute}})}$	—	—	—	0.3		
Mute & $\overline{\text{Mute}}$ input current	$I_{Mute}$	Mute = open	—	8	15	$\mu A$	
	$I_{\overline{\text{Mute}}}$	Mute = open or $V_{CC}$	—	40	50		
Mute & $\overline{\text{Mute}}$ attenuation	$Matt(TX)$	MIC+orMIC-toV+ (CCIT weighted)	$\overline{\text{Mute}}$	—	70	—	dB
			Mute	—	70	—	
	$Matt(RX)$	RXin to RXout (CCIT weighted)	$\overline{\text{Mute}}$	—	70	—	
			Mute	—	70	—	
DTMF Gain	$G_v(DTMF)$	voltage gain from DTMF to Rxo	$\overline{\text{Mute}}$	—	-19	—	dB
			Mute	—	-19	—	
TX Gain variation range by AGC	$\Delta G_{TXA}$	$R_7 = 110K$ $I_L = 15mA \sim 70mA$	-5	-5.5	—	dB	
RX Gain variation range by AGC	$\Delta G_{RXA}$	$R_7 = 110K$ $I_L = 15mA \sim 70mA$	-5	-5.5	—	dB	
Highest line current for maximum gain	$I_{HL(AGC)}$	$R_7 = 110K$	—	21	—	mA	
Lowest line current for minimum gain	$I_{LL(AGC)}$	$R_7 = 110K$	—	68	—	mA	
Regulator output voltage	$V_{DD}$	$I_L = 15 \sim 100mA$	3	3.3	3.5	V	
Regulator output current	$I_{DDSP}$	$I_L = 15 \sim 100mA$	Speech	375	550	1000	$\mu A$
	$I_{DDMF}$		DTMF	1.6	2	3.6	mA

□ TEST CIRCUIT



□ TEST METHOD

Test Mode	Switch	SW1	SW2	SW3	Mute		Mute		SW6	Test point
					SW4	SW5	SW4	SW5		
Transmit mode	Speech	on	off	off	2 or 3	2	1 or 2	1 or 2	off	Vo1
	DTMF	off	off	on	1	2	1 or 2	3	off	Vo1
Receive mode	Speech	off	on	off	2 or 3	2	1 or 2	1 or 2	off	Vo2
	DTMF	off	off	on	1	2	1 or 2	3	off	Vo2
Voltage regulator	Speech	off	off	off	2 or 3	2	1 or 2	1 or 2	on	pin19
	DTMF	off	off	off	1	2	1 or 2	3	on	pin19

\* NOTE) Switch(3pin) : 1=Vcc, 2=Open, 3=V- or GND



□ TYPICAL PERFORMANCE CHARACTERISTICS

