

## Specifications and Applications Information

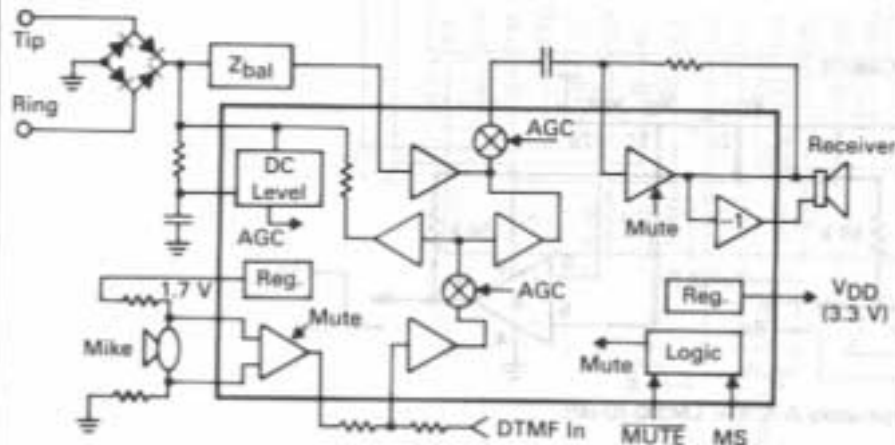
### TELEPHONE SPEECH NETWORK WITH DIALER INTERFACE

The MC34114 is a monolithic integrated telephone speech network designed to replace the bulky magnetic hybrid circuit of a telephone set. The MC34114 incorporates the necessary functions of transmit amplification, receive amplification, and sidetone control, each with externally adjustable gain. Loop length equalization varies the gains based on loop current. The microphone amplifier has a balanced, differential input stage designed to reduce RFI problems. A MUTE input mutes the microphone and receive amplifiers during dialing. A regulated output voltage is provided for biasing of the microphone, and a separate output voltage powers an external dialer, microprocessor, or other circuitry. The MC34114 is designed to operate at a minimum of 1.2 volts, making party line operation possible.

A circuit using the MC34114 can be made to comply with Bell Telephone, British Telecom (BT), and NTT (Nippon Telegraph & Telephone) standards. It is available in a standard 18-pin DIP, and a 20-pin SOIC (surface mount) package.

- Operation Down to 1.2 Volts
- Externally Adjustable Transmit, Receive, and Sidetone Gains
- Differential Microphone Amplifier Input Minimizes RFI Susceptibility
- Transmit, Receive, and Sidetone Equalization on Both Voice and DTMF Signals
- Regulated 1.7 Volts Output for Biasing Microphone
- Regulated 3.3 Volts Output for Powering External Dialer or MPU
- Microphone and Receive Amplifiers Muted During Dialing
- Differential Receive Amplifier Output Eliminates Coupling Capacitor
- Operates with Receiver Impedances of 50 Ohms and Higher
- Complies with NTT, Bell Telephone and BT Standards

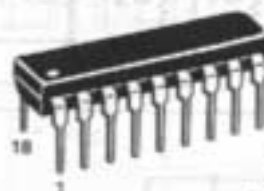
### SIMPLIFIED BLOCK DIAGRAM



## MC34114

### TELEPHONE SPEECH NETWORK WITH DIALER INTERFACE

SILICON MONOLITHIC INTEGRATED CIRCUIT

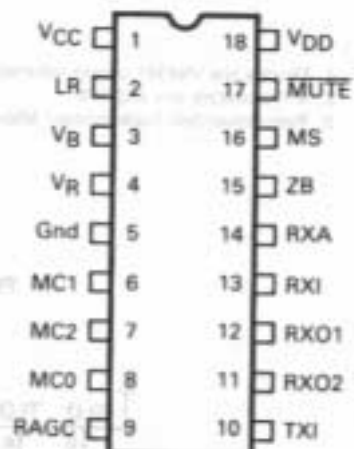


P SUFFIX  
 PLASTIC PACKAGE  
 CASE 707-02



DW SUFFIX  
 PLASTIC PACKAGE  
 CASE 751D-03

### PIN CONNECTIONS (Top View) (DIP Package)



### ORDERING INFORMATION

Package	Part No.
18-Pin Plastic DIP	MC34114P
20-Pin Surface Mount	MC34114DW

## ABSOLUTE MAXIMUM RATINGS

Parameter	Value	Units
V <sub>CC</sub> Supply Voltage	-1.0, +12	Vdc
Voltage at V <sub>DD</sub> (Externally Applied, V <sub>CC</sub> = 0)	-1.0, +6.0	Vdc
Voltage at MUTE, MS (V <sub>CC</sub> > 1.5 Volts)	-1.0, V <sub>DD</sub> + 0.5	Vdc
Voltage at MUTE, MS (V <sub>CC</sub> = 0)	-1.0, +6.0	Vdc
Voltage at RAGC (0 < V <sub>CC</sub> < 12 Volts)	-1.0, +6.0	Vdc
Current through V <sub>CC</sub> , LR	130	mA
Current into Z <sub>B</sub> (Pin 15)	3.0	mA
Storage Temperature	-65, +150	°C

"Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices can be operated at these limits. The "Recommended Operating Conditions" provides conditions for actual device operation.

## RECOMMENDED OPERATING LIMITS

Parameter	Min	Typ	Max	Units
V <sub>CC</sub> Voltage (Speech, Pulse Mode) (Tone Dialing Mode)	+1.2 +3.3	—	+10.5 +10.5	Vdc
Loop Current (into V <sub>CC</sub> ) (Speech, Pulse Mode) (Tone Dialing Mode)	4.0 15	—	120 120	mA
Receiver Impedance	50	—	—	Ω
Voltage at MUTE, MS (V <sub>CC</sub> > 1.5 Volts)	0	—	V <sub>DD</sub>	Vdc
R1 (Resistor from V <sub>CC</sub> to V <sub>B</sub> )	100	—	1800	Ω
Ambient Temperature	-20	—	+70	°C

All limits are not necessarily functional concurrently.

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C, See Figure 1)

Parameter	Symbol	Min	Typ	Max	Units
<b>SUPPLY CURRENT</b>					
Supply Current into V <sub>CC</sub> (Pin 2 open, R12 = 25 k, V <sub>DD</sub> unloaded)					mA
Speech Mode (Figure 2)	I <sub>ccsp</sub>	4.0	5.0	5.5	
V <sub>CC</sub> = 1.2 Volts		9.0	11	12	
V <sub>CC</sub> = 3.5 Volts		10	12	14	
V <sub>CC</sub> = 8.0 Volts		—	13	—	
V <sub>CC</sub> = 10.5 Volts		—	14	—	
Tone Mode (Figure 4)	I <sub>cct</sub>	—	14	—	
V <sub>CC</sub> = 3.3 Volts		—	16	—	
V <sub>CC</sub> = 8.0 Volts		—	18	—	
V <sub>CC</sub> = 10 Volts		—	—	—	

## VOLTAGE REGULATORS

Parameter	Symbol	Min	Typ	Max	Units
V <sub>R</sub> Voltage (I <sub>R</sub> = 65 μA, V <sub>CC</sub> = 2.5 V, Figure 5)	V <sub>R</sub>	1.6	1.7	1.85	Vdc
Load Regulation (0 < I <sub>R</sub> < 300 μA, V <sub>CC</sub> = 2.5 V)		—	0.2	0.5	Vdc
Line Regulation (I <sub>R</sub> = 65 μA, 2.5 < V <sub>CC</sub> < 10.5 V)		-70	±20	+70	mVdc
V <sub>DD</sub> Voltage (V <sub>CC</sub> ≥ 3.8 V, I <sub>DD</sub> = 0, Figure 6)	V <sub>DD</sub>	3.1	3.3	3.7	Vdc
Line Regulation (I <sub>DD</sub> = 0, 5.0 V < V <sub>CC</sub> < 10.5 V)		-70	±30	+70	mVdc
Maximum Output Current (V <sub>CC</sub> = 3.8 V, V <sub>DD</sub> ≥ 3.0 V)	I <sub>DDMAX</sub>	0.8	1.0	—	mA
Speech Mode		2.2	2.5	—	
Pulse, Tone Mode		—	—	—	
Input Leakage Current (V <sub>CC</sub> = 0, 3.3 Volts applied to V <sub>DD</sub> )	I <sub>lkg</sub>	—	0.02	0.5	μA
Mute open or at V <sub>DD</sub>		—	180	—	
Mute = 0 Volts		—	—	—	