

## Low power compandor

NE/SA576

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## DESCRIPTION

The NE/SA576 is a unity gain level programmable compandor designed for low power applications. The NE576 is internally configured as an expander and a compressor to minimize external component count.

The NE576 can operate at 1.8V. During normal operations, the NE576 can operate from at least a 2V battery. If the battery voltage drops to 1.8V, this part will still continue to function, however, turning on the part at a  $V_{CC}$  of 1.8V requires two external resistors to bring  $V_{REF}$  to half  $V_{CC}$ . One resistor connects between  $V_{CC}$  and  $V_{REF}$ ; the other connects from  $V_{REF}$  to ground. A typical value for these external resistors is approximately 20k. A lower value can be used, but the power consumption will go up.

The NE576 is available in a 14-pin plastic DIP and SO packages.

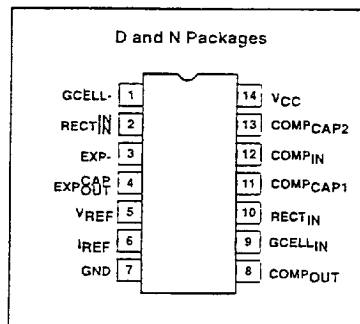
## FEATURES

- Operating voltage range 1.8V to 7V
- Low power consumption (1.4mA @ 3.6V)
- Over 80dB of dynamic range
- Wide input/output swing capability (rail-to-rail)
- Low external component count
- ESD hardened

## APPLICATIONS

- Cordless telephone
- Consumer audio
- Wireless microphones
- Modems
- Electric organs
- Hearing aids
- Automatic level control

## PIN CONFIGURATION



## ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
14-Pin Plastic Dual In-Line Package (DIP)	0 to +70°C	NE576N	0405B
14-Pin Plastic Small Outline (SO)	0 to +70°C	NE576D	0175D
14-Pin Plastic Dual In-Line Package (DIP)	-40 to +85°C	SA576N	0405B
14-Pin Plastic Small Outline (SO)	-40 to +85°C	SA576D	0175D

## ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING		UNITS
		NE576	SA576	
$V_{CC}$	Supply voltage	8	8	V
$T_A$	Operating ambient temperature range	0 to +70	-40 to +85	°C
$T_{STG}$	Storage temperature range	-65 to +150	-65 to +150	°C
$\theta_{JA}$	Thermal impedance	DIP	90	°C/W
		SO	125	°C/W

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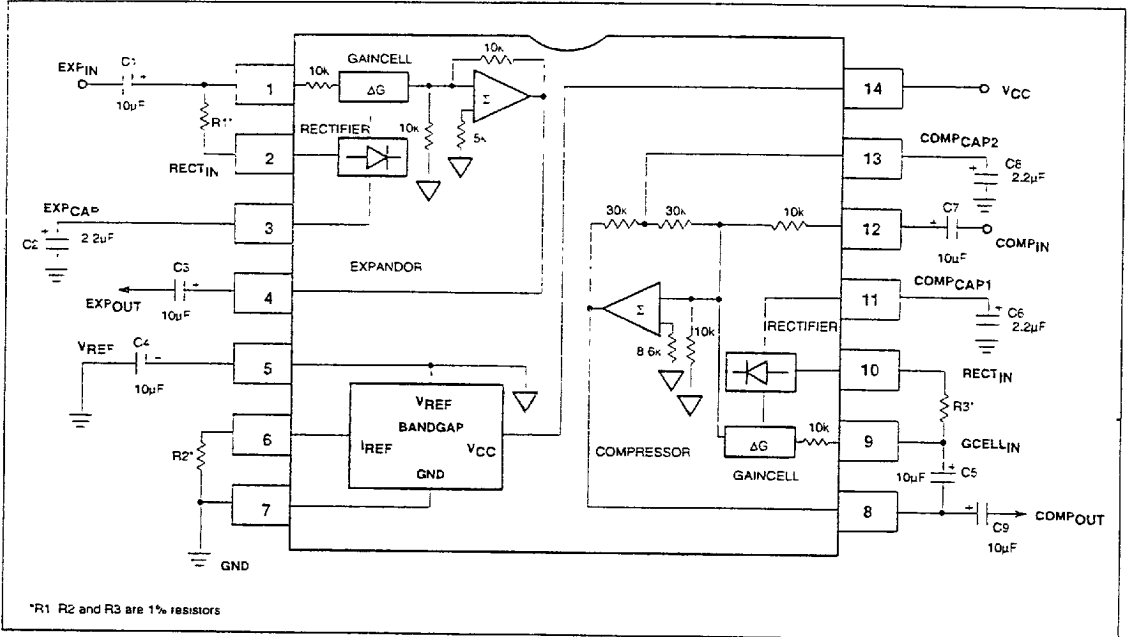
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BLOCK DIAGRAM and TEST AND APPLICATION CIRCUIT



ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, V<sub>CC</sub> = 3.6VDC, compandor 0dB level = -20dBV = 100mV<sub>RMS</sub>, output load R<sub>L</sub> = 10kΩ. Freq = 1kHz, unless otherwise specified  
R1, R2 and R3 are 1% resistors

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNITS
			NE/SA576			
			MIN	TYP	MAX	
V <sub>CC</sub>	Supply voltage <sup>1</sup>		2	3.6	7	V
I <sub>CC</sub>	Supply current	No signal R <sub>2</sub> = 100kΩ		1.4	3	mA
V <sub>REF</sub>	Reference voltage <sup>2</sup>	V <sub>CC</sub> = 3.6V		1.8		V
R <sub>L</sub>	Summing amp output load		10			kΩ
THD	Total harmonic distortion	1kHz, 0dB, BW = 3.5kHz		0.25	1.5	%
E <sub>NO</sub>	Expander output noise voltage	BW = 20kHz, R <sub>S</sub> = 0Ω		10	30	μV
0dB	Unity gain level	0dB at 1kHz	-1.5	0.18	1.5	dB
V <sub>OS</sub>	Output voltage offset	No signal	-150	1	150	mV
	Expander output DC shift	No signal to 0dB	-100	7	100	mV
	Tracking error relative to 0dB output	-20dB expander	-1.0	0.3	1.0	dB
	Crosstalk, COMP to EXP	1kHz, 0dB, C <sub>REF</sub> = 10μF		-80		dB
V <sub>O</sub>	Output swing low			0.2		V
	Output swing high			V <sub>CC</sub> - 0.2		V

NOTE:

1. Operation down to V<sub>CC</sub> = 1.8V is possible. see description on front page of NE576 data sheet.
2. Reference voltage. V<sub>REF</sub> is typically at 1/2 V<sub>CC</sub>

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TYPICAL PERFORMANCE CHARACTERISTICS

$V_{CC} = 3.6V$ ,  $T_A = 25^\circ C$ ,  $R_1=R_3=7.15k\Omega$ ,  $R_2=100k\Omega$ , 0dB level = 100mV,  $F_{red} = 1kHz$

