

DATA SHEET

SA577

Unity gain level programmable power
compandor

Product specification
Replaces data of December 15, 1993
IC17 Data Handbook

1997 Nov 07

Philips Semiconductors



PHILIPS

Unity gain level programmable low power compandor

SA577

DESCRIPTION

The SA577 is a unity gain level programmable compandor designed for low power applications. The SA577 is internally configured as an expander and a compressor to minimize external component count.

FEATURES

- Operating voltage range: 1.8V to 7V
- Low power consumption (1.4mA @ 3.6V)
- 0dB level programmable (10mVRMS to 1.0VRMS)
- Over 90dB of dynamic range
- Wide input/output swing capability (rail-to-rail)
- Low external component count
- SA577 meets cellular radio specifications
- ESD hardened

PIN CONFIGURATION

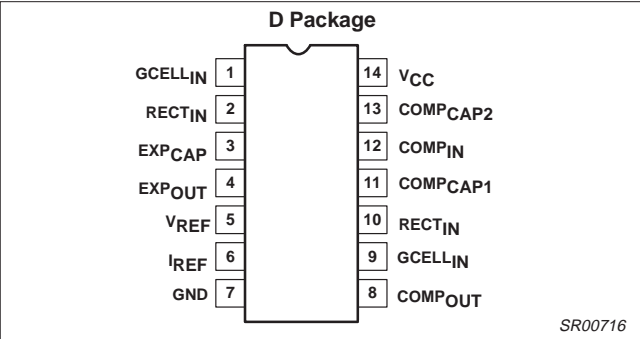


Figure 1. Pin Configuration

APPLICATIONS

- High performance portable communications
- Cellular radio
- Cordless telephone
- Consumer audio
- Wireless microphones
- Modems
- Electric organs
- Hearing aids
- Automatic level control (ALC)

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
14-Pin Plastic Small Outline (SO)	−40 to +85°C	SA577D	SOT108-1

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNITS
		SA577	
VCC	Supply voltage	8	V
TA	Operating ambient temperature range	−40 to +85	°C
TSTG	Storage temperature range	−65 to +150	°C
θJA	Thermal impedance SO	125	°C/W

Unity gain level programmable low power compandor

SA577

ELECTRICAL CHARACTERISTICS

$T_A = 25^\circ\text{C}$, $V_{CC} = 3.6\text{VDC}$, compandor 0dB level = $-20\text{dBV} = 100\text{mV}_{\text{RMS}}$, output load $R_L = 10\text{k}\Omega$, Freq = 1kHz , unless otherwise specified. R_1 , R_2 and R_3 are 1% resistors.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNITS
			SA577			
			MIN	TYP	MAX	
V _{CC}	Supply voltage ¹		2	3.6	7	V
I _{CC}	Supply current	No signal R ₂ = 100kΩ		1.4	2	mA
V _{REF}	Reference voltage ²	V _{CC} = 3.6V	1.7	1.8	1.9	V
R _L	Summing amp output load		10			kΩ
THD	Total harmonic distortion	1kHz, 0dB, BW = 3.5kHz		0.25	1.5	%
E _{NO}	Expandor output noise voltage	BW = 20kHz, R _S = 0Ω		10	25	μV
0dB	Unity gain level	0dB at 1kHz	−1.5	0.18	1.5	dB
	Programmable range ³	R1 = R3 = 18.7kΩ, R2 = 24.3kΩ		0		dBV
		R1 = R3 = 22.6kΩ, R2 = 100kΩ		−10		
		R1 = R3 = 7.15kΩ, R2 = 100kΩ		−20		
		R1 = R3 = 1.33kΩ, R2 = 200kΩ		−40		
V _{OS}	Output voltage offset	No signal	−150	1	150	mV
	Expandor output DC shift	No signal to 0dB	−100	7	100	mV
	Tracking error relative to 0dB output	-20dB expandor	−1.0	0.3	1.0	dB
	Crosstalk, COMP to EXP	1kHz, 0dB, C _{REF} = 10μF		−80	−65	dB
V _O	Output swing low			0.2		V
	Output swing high			V _{CC} − 0.2		

NOTE:

1. Operation down to $V_{CC} = 1.8\text{V}$ is possible, see application note AN1762.
2. Reference voltage, V_{REF} , is typically at $1/2 V_{CC}$.
3. Unity gain level can be adjusted CONTINUOUSLY between $-40\text{dBV} = 10\text{mV}_{\text{RMS}}$ and $0\text{dBV} = 1.0\text{V}_{\text{RMS}}$. For details see application note AN1762.

Unity gain level programmable low power compandor

SA577

BLOCK DIAGRAM and TEST AND APPLICATION CIRCUIT

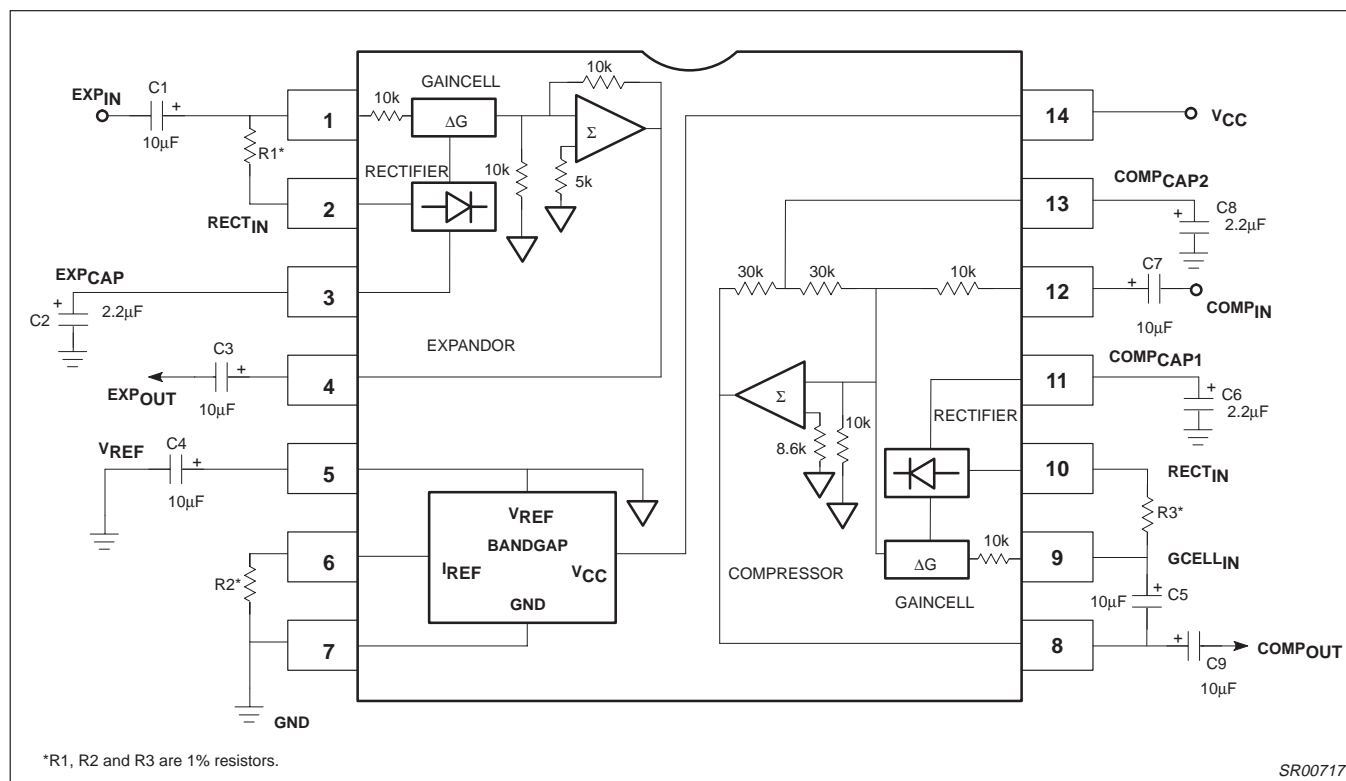


Figure 2. Block Diagram and Test and Application Circuit

Unity gain level programmable low power compandor

SA577

TYPICAL PERFORMANCE CHARACTERISTICS

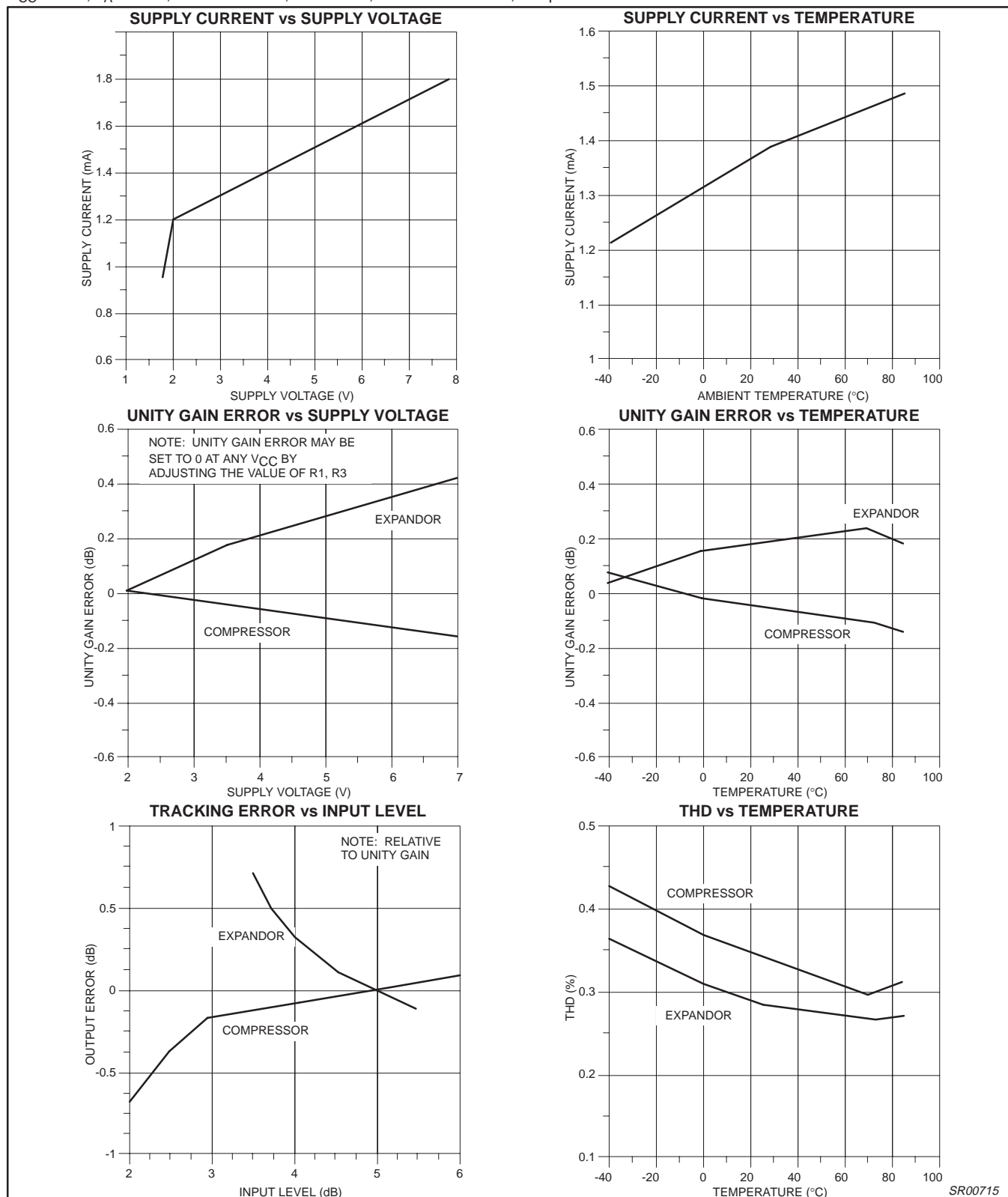
 $V_{CC} = 3.6V$, $T_A = 25^\circ C$, $R_1=R_3=7.15k\Omega$, $R_2=100k\Omega$, 0dB level = 100mV, Freq. = 1kHz


Figure 3. Typical Performance Characteristics

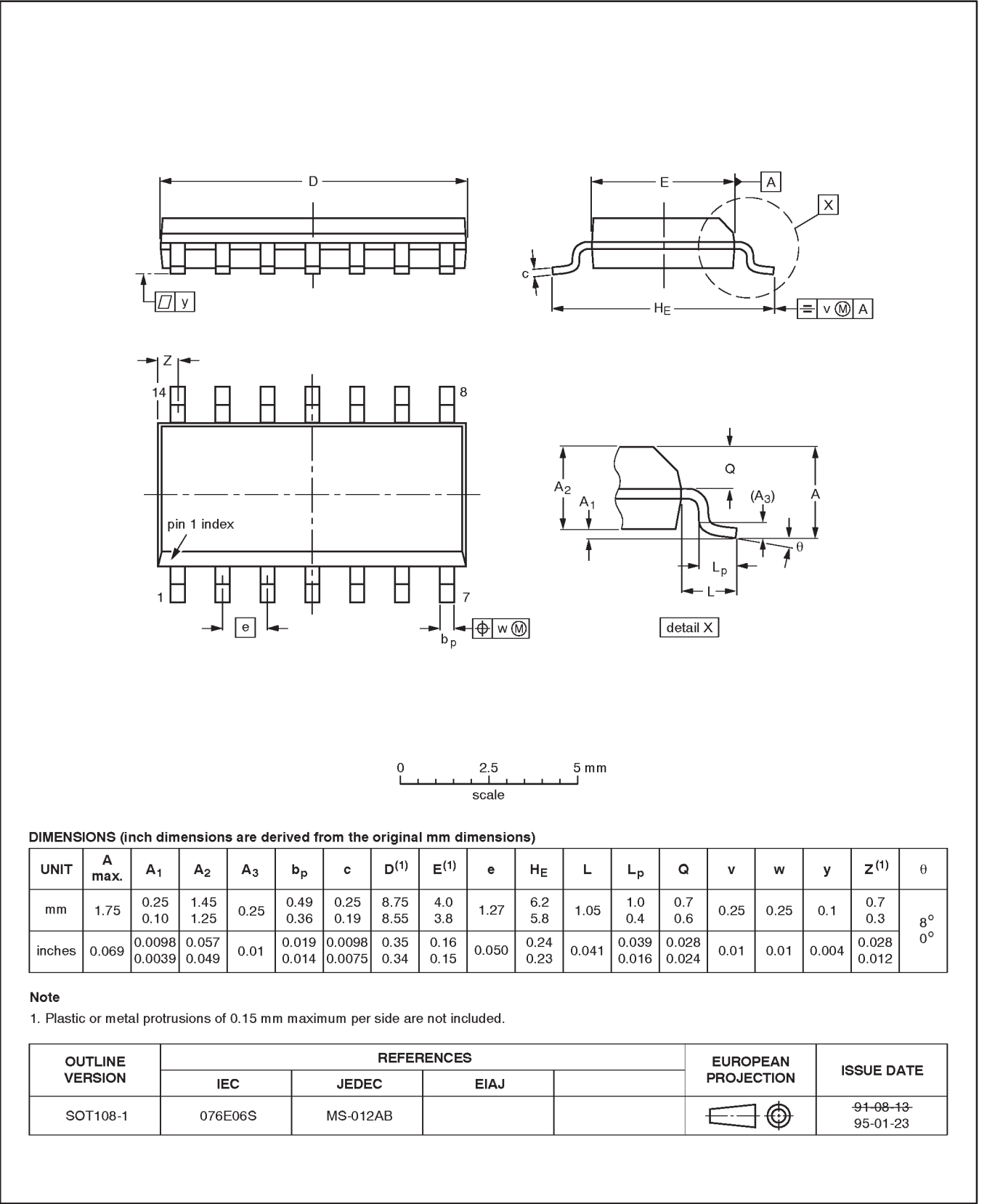
SR00715

Unity gain level programmable power compandor

SA577

SO14: plastic small outline package; 14 leads; body width 3.9 mm

SOT108-1



Unity gain level programmable power compandor

SA577

DEFINITIONS		
Data Sheet Identification	Product Status	Definition
Objective Specification	Formative or in Design	This data sheet contains the design target or goal specifications for product development. Specifications may change in any manner without notice.
Preliminary Specification	Preproduction Product	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product Specification	Full Production	This data sheet contains Final Specifications. Philips Semiconductors reserves the right to make changes at any time without notice, in order to improve design and supply the best possible product.

Philips Semiconductors and Philips Electronics North America Corporation reserve the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

LIFE SUPPORT APPLICATIONS
Philips Semiconductors and Philips Electronics North America Corporation Products are not designed for use in life support appliances, devices, or systems where malfunction of a Philips Semiconductors and Philips Electronics North America Corporation Product can reasonably be expected to result in a personal injury. Philips Semiconductors and Philips Electronics North America Corporation customers using or selling Philips Semiconductors and Philips Electronics North America Corporation Products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors and Philips Electronics North America Corporation for any damages resulting from such improper use or sale.

Philips Semiconductors
811 East Arques Avenue
P.O. Box 3409
Sunnyvale, California 94088-3409
Telephone 800-234-7381

© Copyright Philips Electronics North America Corporation 1997
All rights reserved. Printed in U.S.A.