DATA SHEET

SA577

Unity gain level programmable power compandor

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

1997 Nov 07

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 expandor 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 (10mV$_{RMS}$ to 1.0V$_{RMS}$)
- 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

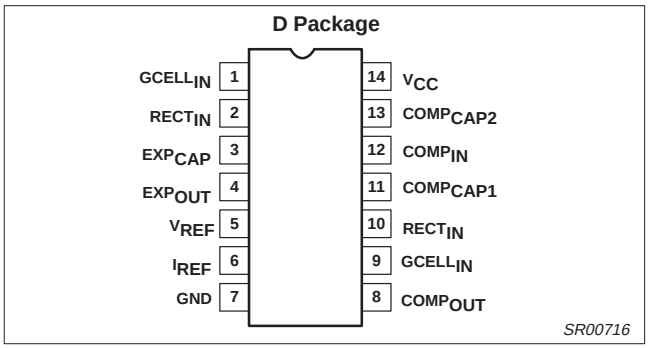


Figure 1. Pin Configuration

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	
V_{CC}	Supply voltage	8	V
T_A	Operating ambient temperature range	–40 to +85	°C
T_{STG}	Storage temperature range	–65 to +150	°C
θ_{JA}	Thermal impedance SO	125	°C/W

ELECTRICAL CHARACTERISTICS

$T_A = 25^oC$, $V_{CC} = 3.6VDC$, compandor 0dB level = –20dBV = $100mV_{RMS}$, output load $R_L = 10k\Omega$, Freq = 1kHz, unless otherwise specified. R1, R2 and R3 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 $R_2 = 100k\Omega$		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, $R_S = 0\Omega$		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, $C_{REF} = 10\mu F$		–80	–65	dB
V_O	Output swing low			0.2		V
	Output swing high			$V_{CC} – 0.2$		

NOTE:
1. Operation down to $V_{CC} = 1.8V$ 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 –40dBV = $10mV_{RMS}$ and 0dBV = $1.0V_{RMS}$. For details see application note AN1762.

BLOCK DIAGRAM and TEST AND APPLICATION CIRCUIT

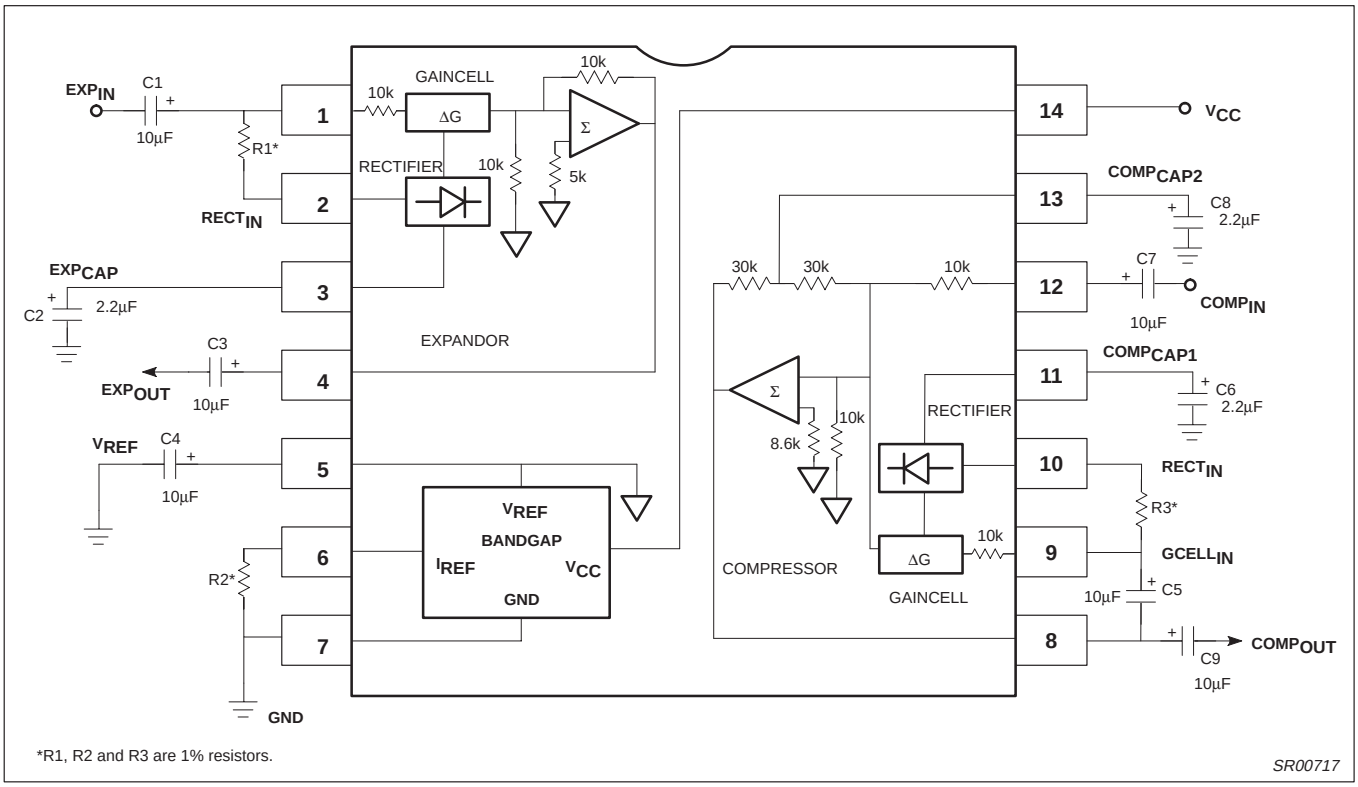


Figure 2. Block Diagram and Test and Application Circuit

TYPICAL PERFORMANCE CHARACTERISTICS

V_{CC} = 3.6V, T_A = 25°C, R1=R3=7.15kΩ, R2=100kΩ, 0dB level = 100mV, Freq. = 1kHz

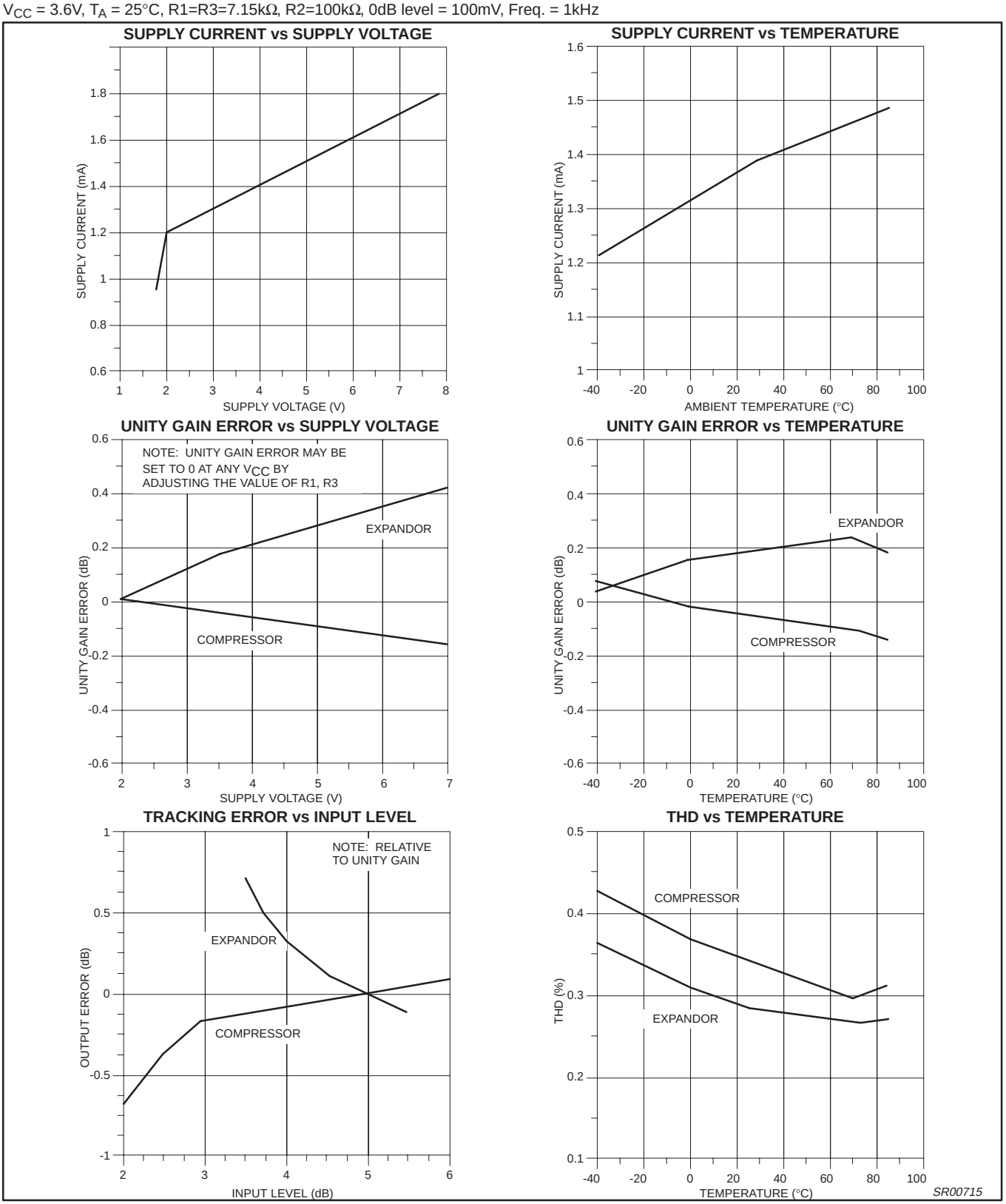
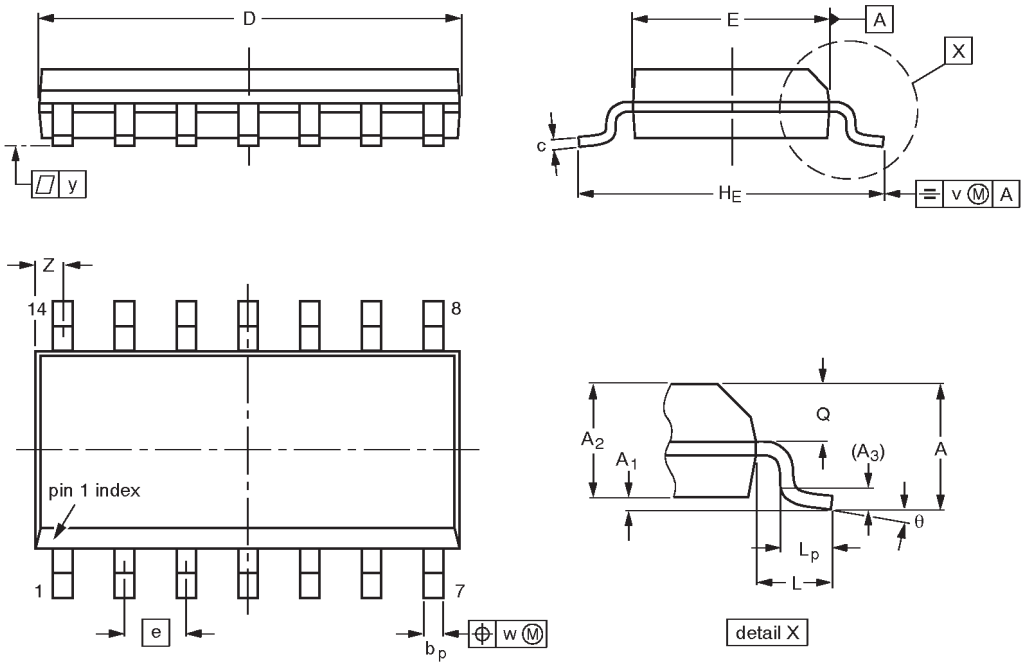
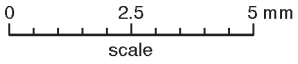


Figure 3. Typical Performance Characteristics

SO14: plastic small outline package; 14 leads; body width 3.9 mm **SOT108-1**





DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	8.75 8.55	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.0098 0.0039	0.057 0.049	0.01	0.019 0.014	0.0098 0.0075	0.35 0.34	0.16 0.15	0.050	0.24 0.23	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT108-1	076E06S	MS-012AB				~~91-08-13~~ 95-01-23

DEFINITIONS

Data Sheet Identification	Product Status	Definition
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