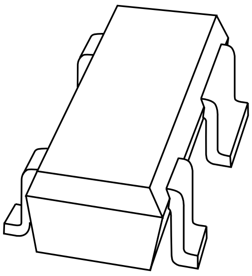
DATA SHEET



BGA2002

silicon MMIC amplifier

Objective specification

File under Discrete Semiconductors, SC14

1998 Sep 01

Philips
Semiconductors

PHILIPS

FEATURES

- Low current, low voltage
- Very high power gain
- Low noise figure
- Integrated temperature compensated biasing
- Supply and RF output pin combined

APPLICATIONS

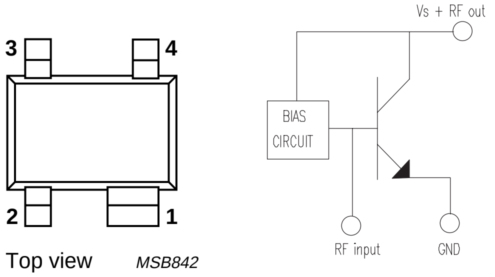
- RF front end
- Wideband applications, e.g. analog and digital cellular telephones, cordless telephones (PHS, DECT, etc.)
- Radar detectors
- Low noise amplifiers
- Satellite television tuners (SATV)
- High frequency oscillators.

DESCRIPTION

Silicon MMIC amplifier consisting of an NPN double polysilicon transistor with integrated biasing for low voltage applications in a plastic, 4-pin dual-emitter SOT343R package.

PINNING SOT343R

PIN	DESCRIPTION
1	ground
2	RF input
3	ground
4	V_S + RF output



Marking code: A2.

Fig.1 Simplified outline and symbol

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_S	DC supply voltage	RF input AC coupled	–	4.5	V
I_S	DC supply current	V_S = 2.5 V; RF input AC coupled	10	–	mA
MSG	maximum stable gain	V_S = 2.5 V; f = 2 GHz; T_{amb} = 25 °C	19	–	dB
F	noise figure	V_S = 2.5 V; f = 2 GHz; $\Gamma_S = \Gamma_{opt}$	2.0	–	dB

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_S	supply voltage	RF input AC coupled	–	4.5	V
I_S	supply current (DC)	forced by DC voltage on RF input	–	30	mA
P_{tot}	total power dissipation	up to T_s = 100 °C	–	135	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	350	K/W

CHARACTERISTICS

RF input AC coupled; T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_S	supply current	V_S = 1 V	–	1.3	–	mA
		V_S = 2.5 V	–	10	–	mA
		V_S = 4.5 V	–	19	–	mA
MSG	maximum stable gain	V_S = 2.5 V; I_S = 10 mA; f = 900 MHz	–	25	–	dB
		V_S = 2.5 V; I_S = 10 mA; f = 2 GHz	–	19	–	dB
$\|S_{21}\|^2$	insertion power gain	V_S = 2.5 V; I_S = 10 mA; f = 900 MHz	–	21	–	dB
		V_S = 2.5 V; I_S = 10 mA; f = 2 GHz	–	16	–	dB
F	noise figure	V_S = 2.5 V; I_S = 10 mA; f = 900 MHz; $\Gamma_S = \Gamma_{opt}$	–	1.9	–	dB
		V_S = 2.5 V; I_S = 10 mA; f = 2 GHz; $\Gamma_S = \Gamma_{opt}$	–	2.0	–	dB

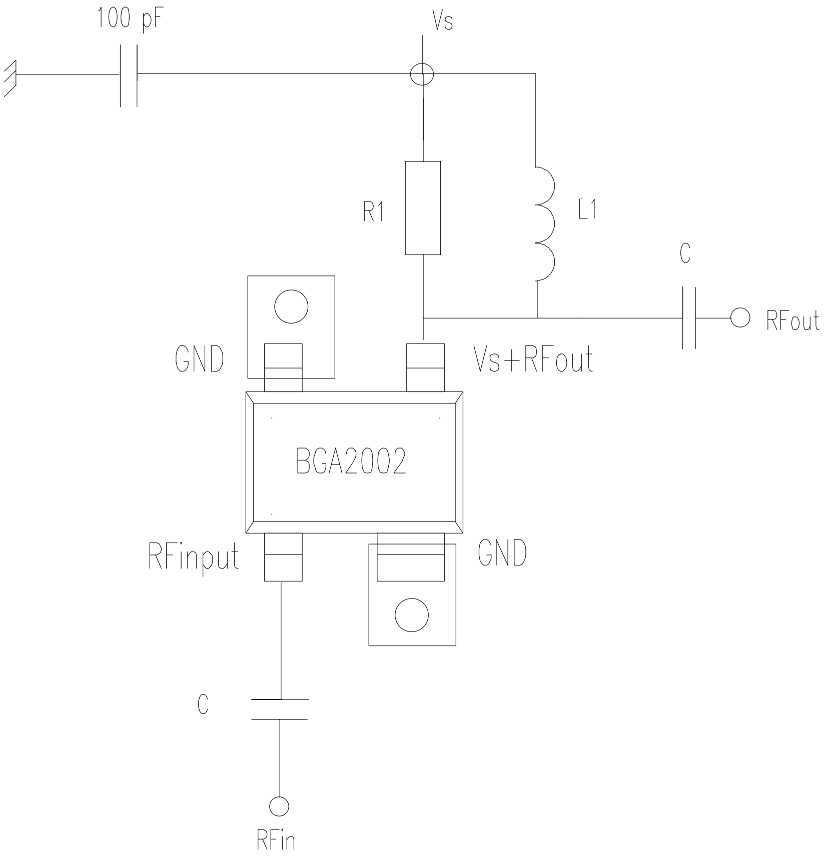
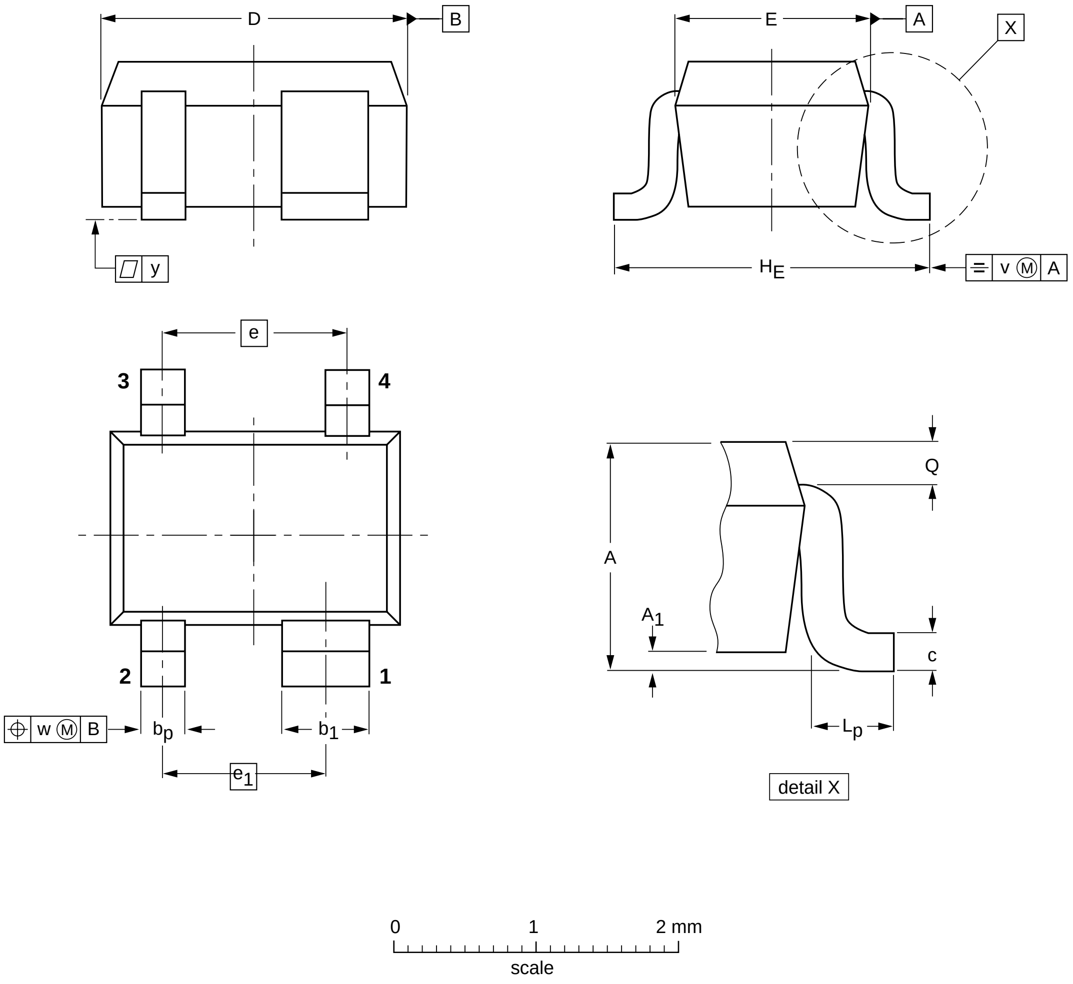


Fig.2 Typical application circuit

PACKAGE OUTLINE

Plastic surface mounted package; reverse pinning; 4 leads SOT343R



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	b_1	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.4 0.3	0.7 0.5	0.25 0.10	2.2 1.8	1.35 1.15	1.3	1.15	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT343R						97-05-21

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.