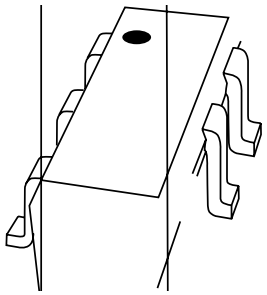
DATA SHEET



BGA2712
MMIC wideband amplifier

Objective specification

2001 Sep 11

Philips
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MMIC wideband amplifier BGA2712

FEATURES

- Internally matched
- Wide frequency range
- Very flat gain
- High output power
- High linearity
- Unconditionally stable.

APPLICATIONS

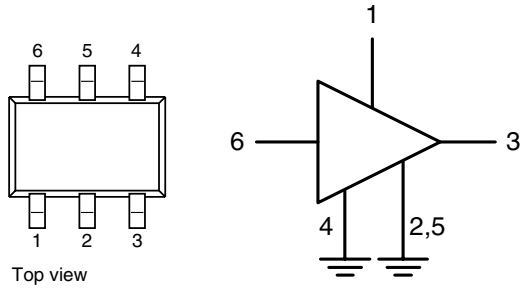
- Cable systems
- LNB IF amplifiers
- General purpose
- ISM.

DESCRIPTION

Silicon Monolitic Microwave Integrated Circuit (MMIC) wideband amplifier with internal matching circuit in a 6-pin SOT363 plastic SMD package.

PINNING

PIN	DESCRIPTION
1	V_S
2, 5	GND 2
3	RF out
4	GND 1
6	RF in



Marking code:

Fig.1 Simplified outline (SOT363) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_S	DC supply voltage		5	6	V
I_S	DC supply current		12.4	–	mA
$\|S_{21}\|^2$	insertion power gain	f = 1 GHz	21	–	dB
NF	noise figure	f = 1 GHz	3.9	–	dB
$P_{L\ sat}$	saturated load power	f = 1 GHz	6.5	–	dBm

CAUTION
This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_S	DC supply voltage	RF input AC coupled	–	6	V
I_S	supply current		–	25	mA
P_{tot}	total power dissipation	$T_s \leq 80$ °C	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	150	°C
P_D	maximum drive power		–	0	dBm

THERMAL RESISTANCE

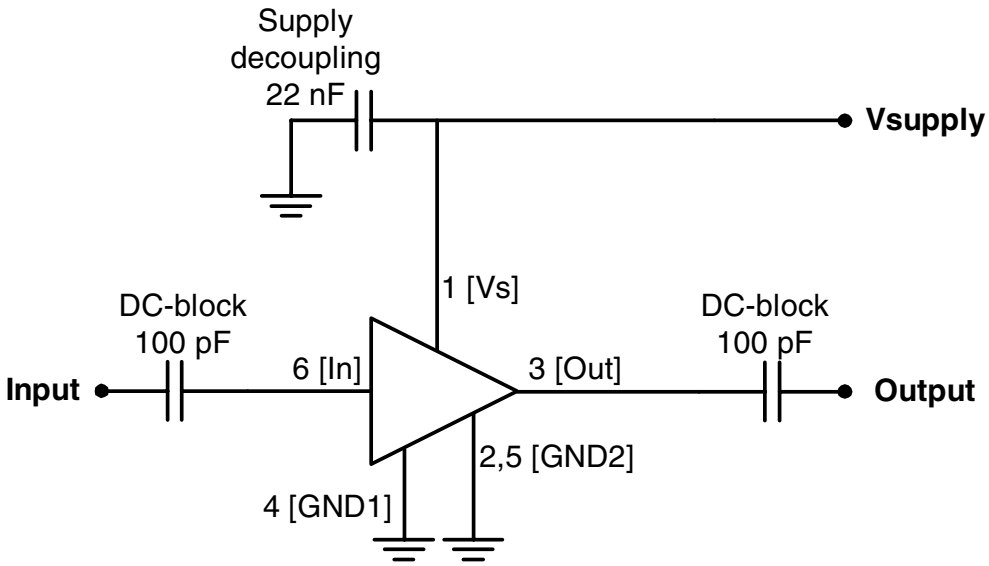
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to solder point	P_{tot} = 200 mW; $T_s \leq 80$ °C	300	K/W

CHARACTERISTICS

V_S = 5 V; I_S = 12.6 mA; f = 1 GHz; T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_S	supply current		10	12.4	16	mA
$\lvert S_{21}\rvert^2$	insertion power gain	f = 1 GHz	–	21	–	dB
		f = 2.2 GHz	–	21	–	dB
$R_{L\ IN}$	return losses input	f = 1 GHz	–	14	–	dB
		f = 2.2 GHz	–	11	–	dB
$R_{L\ OUT}$	return losses output	f = 1 GHz	–	18	–	dB
		f = 2.2 GHz	–	15	–	dB
NF	noise figure	f = 1 GHz	–	4.0	–	dB
		f = 2.2 GHz	–	4.0	–	dB
BW	bandwidth	at $\lvert s_{21}\rvert^2$ –3 dB below flat gain at 1 GHz	–	3	–	GHz
K	stability factor	f = 1 GHz	–	1.6	–	–
		f = 2.2 GHz	–	2.1	–	–
$P_{L\ sat}$	saturated load power	f = 1 GHz	–	6.5	–	dBm
		f = 2.2 GHz	–	3	–	dBm
$P_{L\ 1\ dB}$	load power	at 1 dB gain compression; f = 1 GHz	–	1	–	dBm
		at 1 dB gain compression; f = 2.2 GHz	–	1	–	dBm
$IP3_{(in)}$	input intercept point	f = 1 GHz	–	–9	–	dBm
		f = 2.2 GHz	–	–10	–	dBm
$IP3_{(out)}$	output intercept point	f = 1 GHz	–	12	–	dBm
		f = 2.2 GHz	–	11	–	dBm

APPLICATION INFORMATION



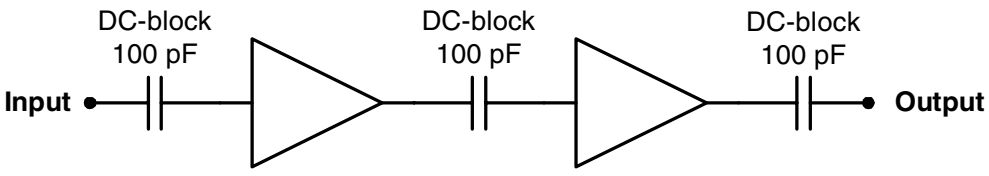
The MMIC is internally matched for 50 Ω and therefore it does not need any external matching.

The input and output DC-block capacitors are to be 100 pF or less for operation above 100 MHz.
For operation below 100 MHz, their value should be increased.

The supply decoupling capacitor should be placed as close as possible to the MMIC.

Separate paths have to be used for the ground plane of the GND1 and GND2 pins and the paths should be as short as possible.
When using vias, use multiple vias per pin in order to limit ground path induction.

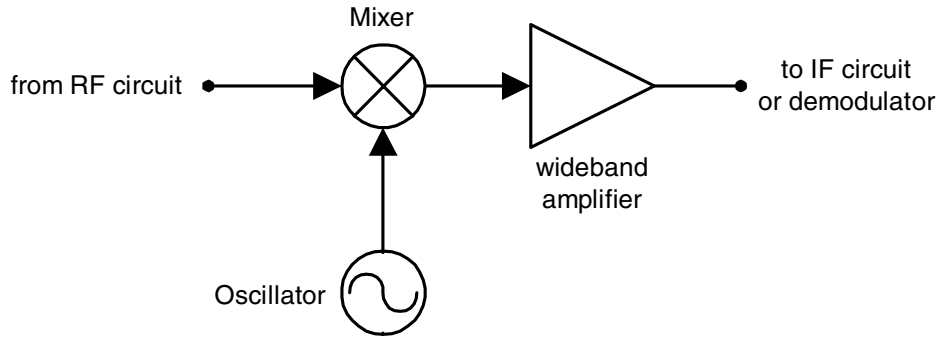
Fig.2 Typical application circuit



Cascading two MMICs doubles the gain, preserving the good broadband characteristics.
Supply decoupling and grounding for each MMIC should be performed as for the typical application.

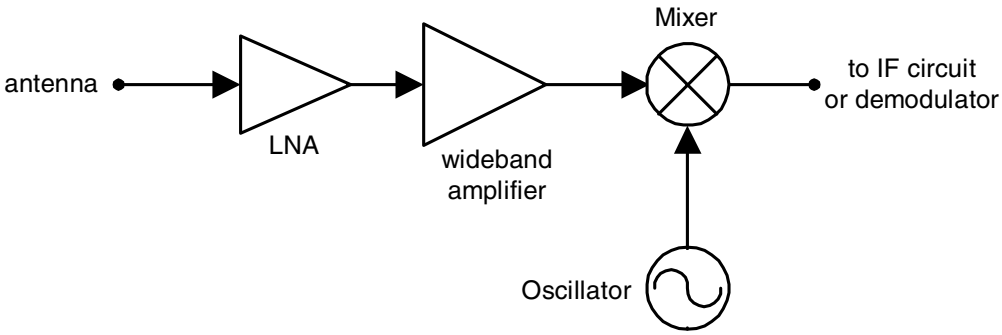
Fig.3 Easy cascading application circuit

Application examples



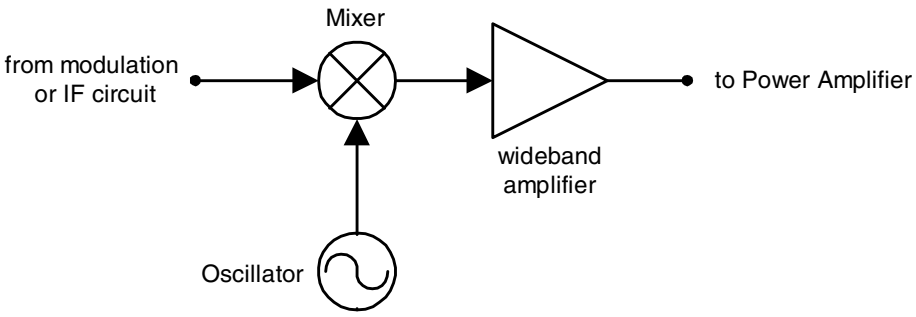
The MMIC is very suitable as IF amplifier in e.g. LNB's.
The excellent wideband characteristics make it an easy building block.

Fig.4 Application as IF amplifier



As second amplifier after an LNA, the MMIC offers an easy matching, low noise solution

Fig.5 Application as RF amplifier

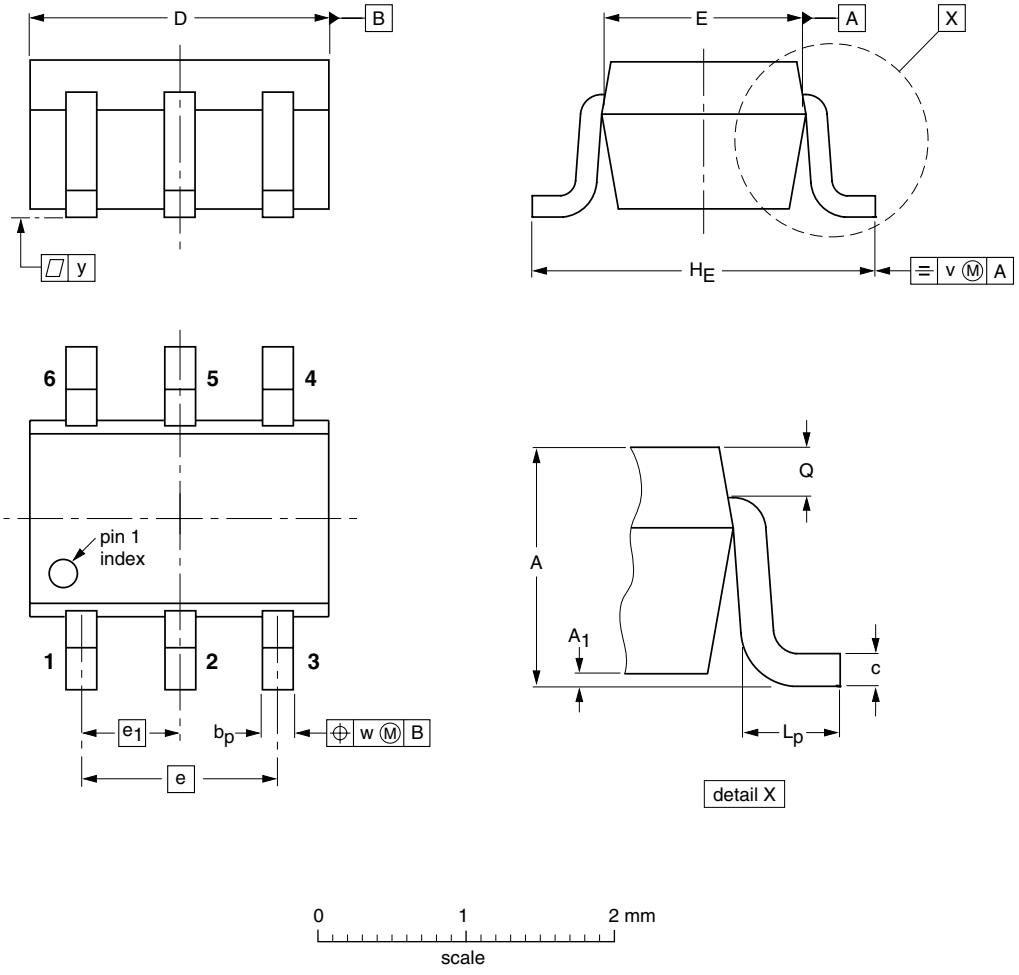


As driver amplifier in the TX path, the good linear performance and matched in- and output offer quick design

Fig.6 Application as driver amplifier

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads **SOT363**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT363			SC-88			97-02-28

DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
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