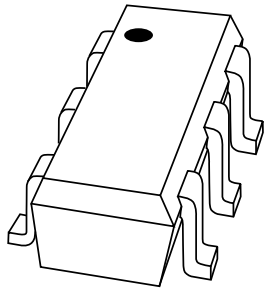


# DATA SHEET



## **BGA2022** MMIC mixer

Product specification  
Supersedes data of 2000 Jun 06

2000 Dec 04



# MMIC mixer

# BGA2022

## FEATURES

- Large frequency range:
  - Cellular band (900 MHz)
  - PCS band (1900 MHz)
  - WLAN band (2.4 GHz)
- High isolation
- High linearity
- High conversion gain.

## APPLICATIONS

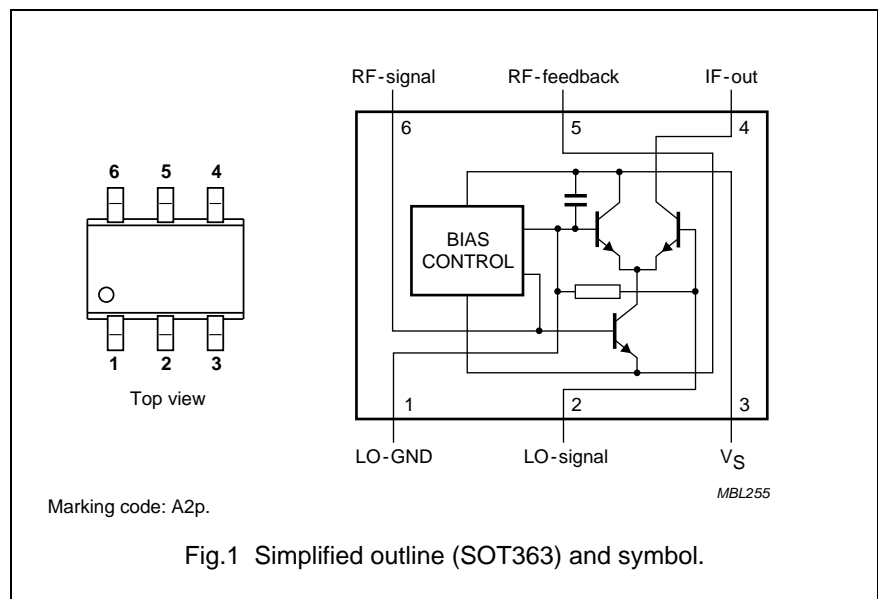
Receiver side of wireless systems that require high conversion gain and high linearity at low supply current, such as CDMA.

## DESCRIPTION

Silicon double poly MMIC mixer in a 6-lead SOT363 plastic package.

## PINNING

PIN	DESCRIPTION
1	LO - GND
2	LO - signal
3	V <sub>S</sub>
4	IF - out
5	RF - feedback
6	RF - signal



## QUICK REFERENCE DATA

V<sub>S</sub> = 2.8 V; I<sub>S</sub> = 6 mA; P<sub>LO</sub> = 0 dBm; f<sub>RF</sub> = 1800 MHz; f<sub>LO</sub> = 2080 MHz; f<sub>IF</sub> = 280 MHz.

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
G <sub>conv</sub>	conversion gain	4	6	8	dB
NF	noise figure (DSB)	–	12	–	dB
IP <sub>3</sub>	output third order intercept point	–	7	–	dBm

## CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling.

## MMIC mixer

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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>S</sub>	supply voltage		–	4	V
I <sub>S</sub>	supply current		–	10	mA
P <sub>LO</sub>	oscillator power	note 1	–	10	dBm
P <sub>RF</sub>	RF power	note 1	–	10	dBm
P <sub>tot</sub>	total power dissipation	T <sub>s</sub> ≤ 100 °C; note 2	–	40	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C

**Notes**

- LO and RF signals always AC coupled; 50 Ω source; no external DC voltage supplied to pins 1, 2 and 6.
- T<sub>s</sub> is the temperature at the soldering point of the ground tab.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	VALUE	UNIT
R <sub>th j-s</sub>	thermal resistance from junction to solder point	375	K/W

**CHARACTERISTICS**

V<sub>S</sub> = 2.8 V; I<sub>S</sub> = 6 mA; T<sub>j</sub> = 25 °C; unless otherwise specified.

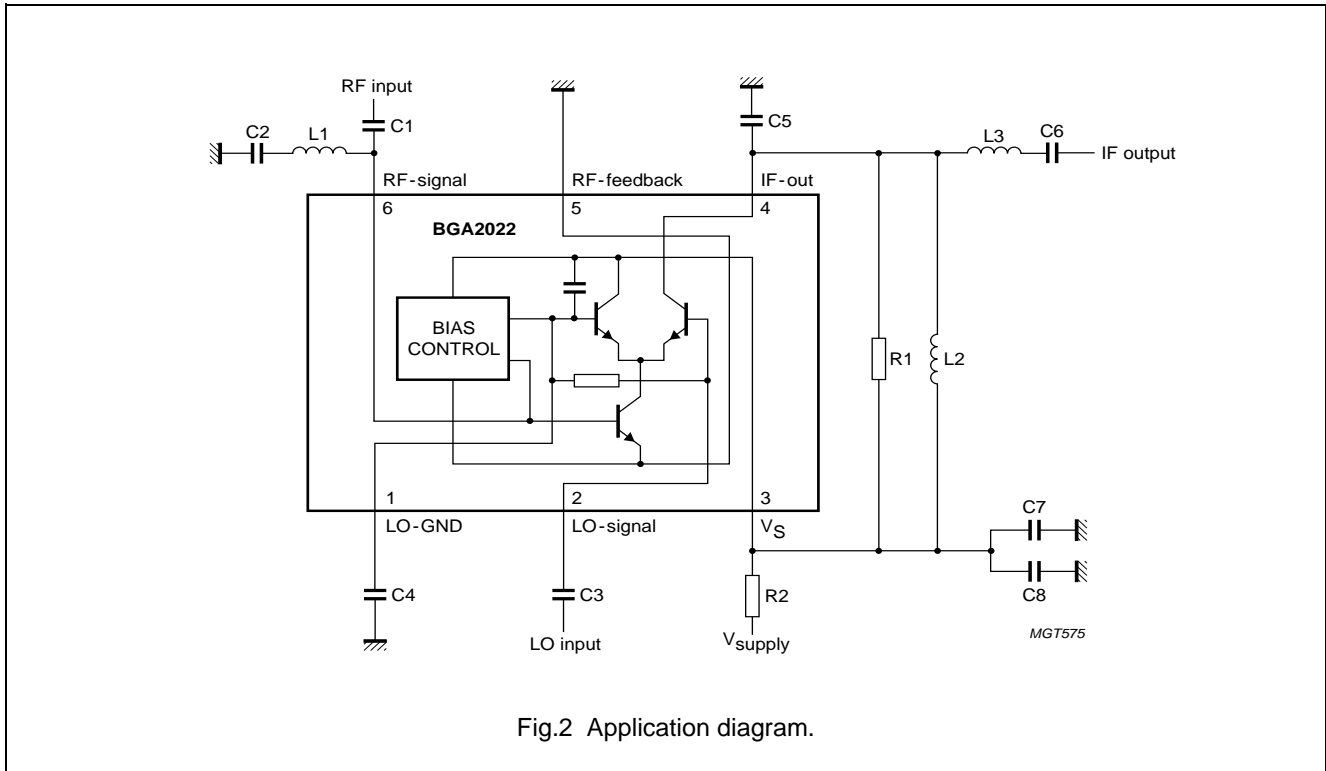
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>S</sub>	supply current	V <sub>S</sub> = 2.8 V	4	6	8	mA
G <sub>conv(p)</sub>	power conversion gain	P <sub>RF</sub> = –25 dBm; P <sub>LO</sub> = 0 dBm				
	880 MHz		–	5	–	dB
	1800 MHz		4	6	8	dB
	1950 MHz		–	5	–	dB
	2450 MHz		–	6	–	dB
NF	noise figure	DSB				
	880 MHz		–	9	–	dB
	1800 MHz		–	12	–	dB
	1950 MHz		–	9	–	dB
	2450 MHz		–	9	–	dB
IP <sub>3</sub>	intercept point third order input	output referred				
	880 MHz		–	4	–	dBm
	1800 MHz		–	7	–	dBm
	1950 MHz		–	7	–	dBm
	2450 MHz		–	10	–	dBm
VSWR <sub>LO</sub>	return losses at LO port	P <sub>LO</sub> = 0 dBm; f = 0 to 3 GHz	–	–	2:1	

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APPLICATION INFORMATION

See application note number AN00059.

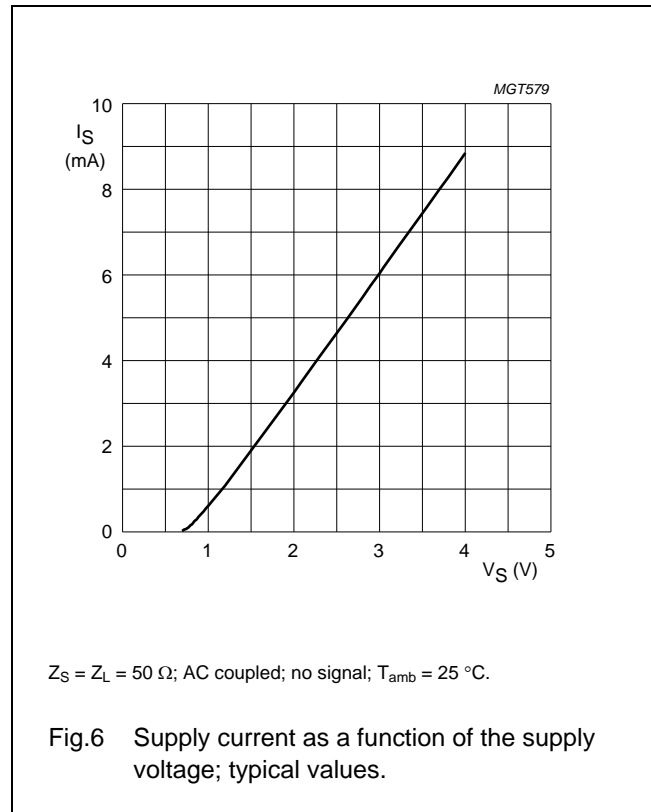
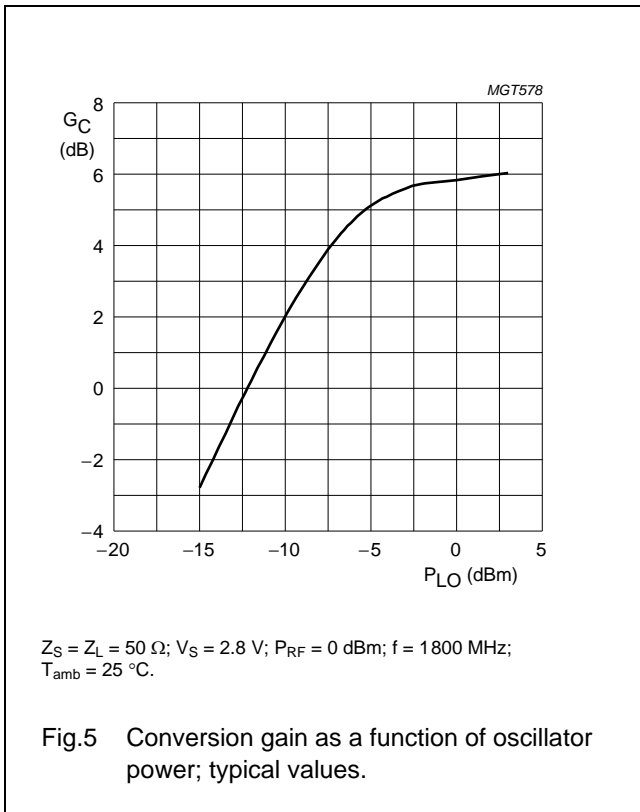
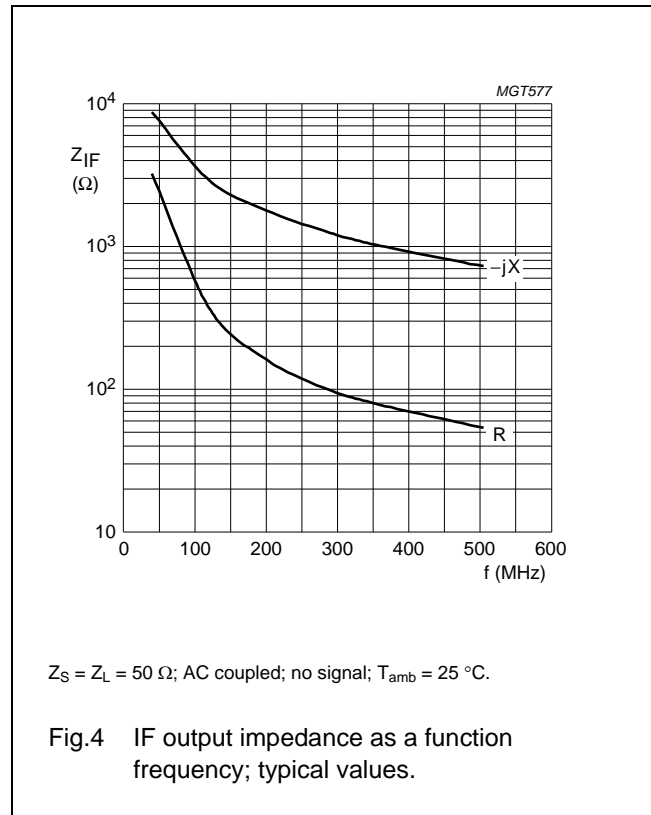
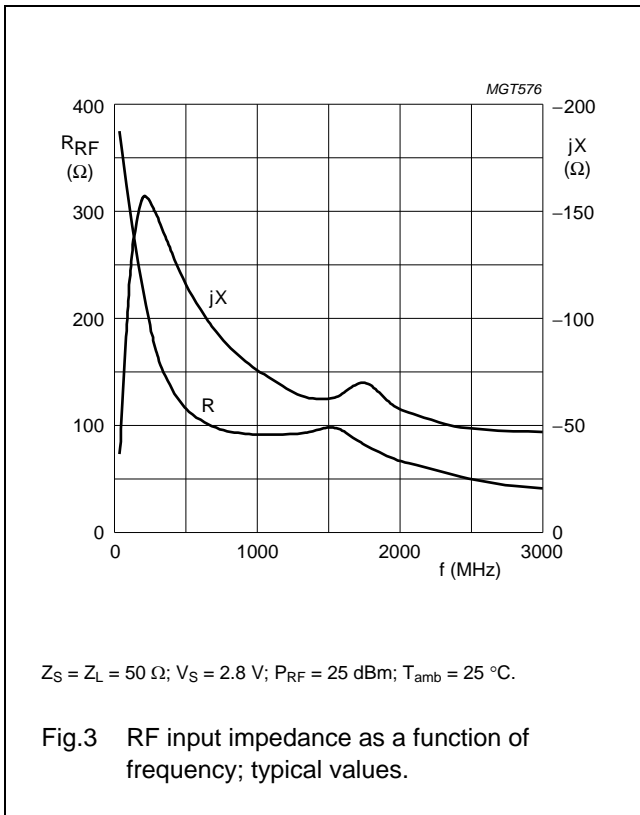


List of components (see Fig.2)

COMPONENT	APPLICATION BOARD			
	880 MHz (IF = 80 MHz)	1800 MHz (IF = 280 MHz)	1950 MHz (IF = 80 MHz)	2450 MHz (IF = 280 MHz)
R1	1.2 kΩ	2.7 kΩ	2.2 kΩ	3.3 kΩ
R2	22 Ω	22 Ω	22 Ω	18 Ω
C1	12 pF	1.2 pF	1.5 pF	1.0 pF
C2	390 pF	5.6 pF	1.5 nF	82 pF
C3, C4	39 pF	6.8 pF	6.8 pF	2.7 pF
C5	27 pF	2 pF	15 pF	2.2 pF
C6	100 pF	100 pF	10 pF	100 pF
C7	22 nF	22 nF	22 nF	22 nF
C8	56 pF	8.2 pF	10 pF	6.8 pF
L1	10 nH	2.7 nH	2.7 nH	1.8 nH
L2	220 nH	110 nH	150 nH	220 nH
L3	470 nH	120 nH	–	120 nH

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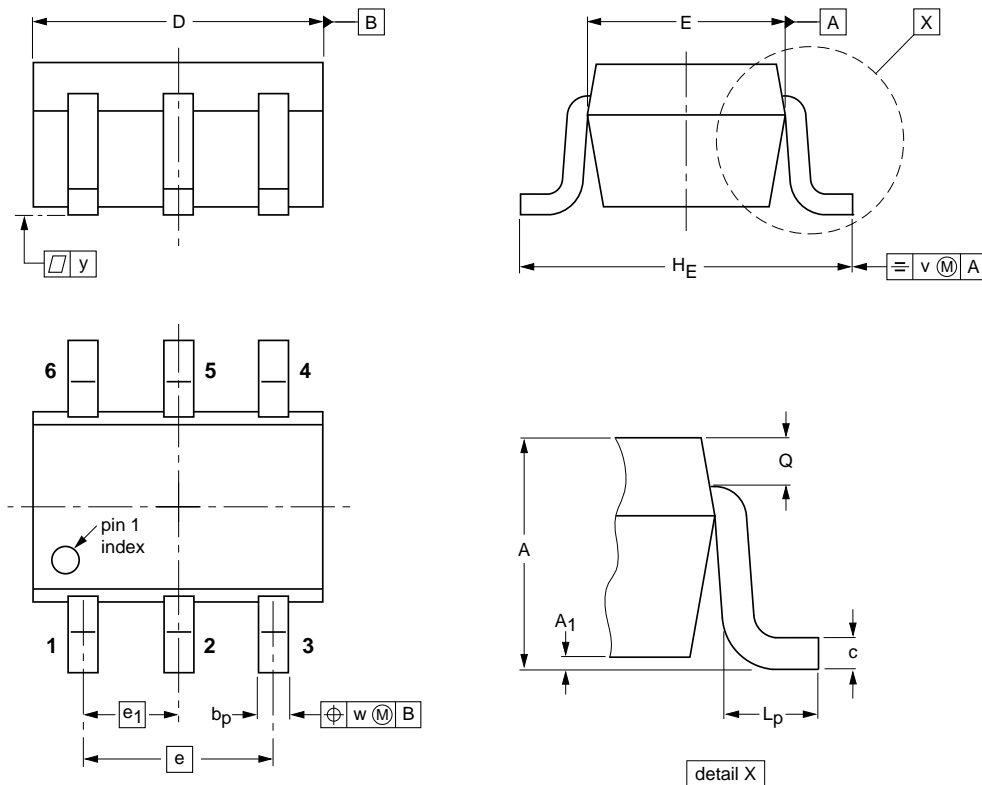
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PACKAGE OUTLINE

Plastic surface-mounted package; 6 leads

SOT363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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	JEITA			
SOT363			SC-88			04-11-08 06-03-16

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**DATA SHEET STATUS**

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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