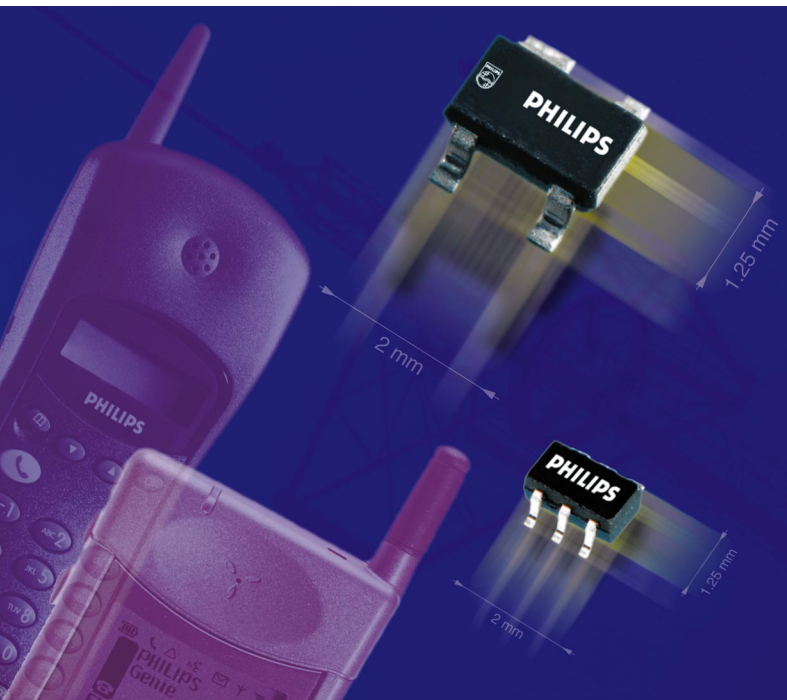


The BGA20XX family of MMIC amplifiers and mixers provides unrivalled RF gain for silicon devices. Operating up to and beyond 2.4 GHz, the MMICs feature several optimized passive components on-chip to automatically compensate for temperature and process variations. Consequently, they can reduce the size and design time for many mobile communications products.

Silicon MMICs

Smart RF solutions for mobile communications products



Design Features

- Reduced RF component count with greater functionality
- Easy circuit design-in for rapid product development and fast times-to-market
- Reduced board size (up to 75% of discrete transistor solution) to enable smaller and lighter mobile products
- Lower bill of materials, and lower assembly and logistics costs.

Performance Features

- Very high gain
- Low noise figure
- Low current consumption for extended talk-times and battery life
- High reverse isolation (mixer)
- High efficiency.

Description

Developed by enhancing Philips Semiconductors' double-polysilicon transistor technology, this new family of MMICs (Monolithic Microwave Integrated Circuits) takes Si RF integration to a new level. The single-chip MMICs integrate advanced wideband transistors and many of the discrete components that would normally surround discrete RF transistors. With inductance loops, resistors and capacitors on-chip, the MMICs include active bias circuitry, creating the first smart RF silicon 'transistors' that automatically compensate for temperature and process variations.

By taking the small-scale RF integration route, Philips Semiconductors offers several building blocks rather than a single device. This gives designers all the advantages of discretely – flexibility, ease of customization, very small SMD packaging and good price/performance ratios – while incorporating the difficult-to-design functions on chip.

Applications

Ideal for all mobile and cordless phone standards, including GSM, (W-)CDMA, DECT and PHS, the MMICs can also be used in any application that requires high gain and low noise at high frequencies. These include pagers, set-top boxes, CATV amplifiers, RF power modules for base stations, radar detectors and RF road toll applications.

Added Value

The integration of temperature compensation bias circuitry gives the MMICs a linear response with little spread over a -20 to $+85^{\circ}\text{C}$ temperature range. The performance of the MMIC is therefore very stable and predictable, so phone designers save valuable time during design-in, and the expense of rigorous thermal testing.

With a complete offering of high-performance silicon RF devices, Philips Semiconductors' portfolio now includes MMICs, discrete transistors and power modules for mobile phones and base stations.

Product Overview

| type | remarks | V_S (V) | I_S (mA) | NF (dB) | gain (dB) | IP3 (dBm) | @ (GHz) | enable ¹ | package |
|----------------------|--------------------------------------|--------------|---------------|------------|-----------------|------------------|---------------|---------------------|---------|
| BGA2001 | amp | 2.5 | 4 | 1.5 | 19 ² | - | 2 | | SOT343R |
| BGA2003 | amp | 2.5 | 10 | 1.9 | 19 ² | 5 | 2 | • | SOT343R |
| BGA2022 ³ | mixer (30 dB LO- RF isolation) | 3 | 7 | 9 | 5 ⁴ | +5 | 0.8 to 1.9 | | SOT363 |
| BGA2031 ⁵ | variable-gain (55 dB) amp | 3 | 10 | - | 22 ⁶ | -48 ⁷ | 1.9 | • | SOT363 |

¹ on/off switch, ² MSG, ³ preliminary specification, ⁴ G_C

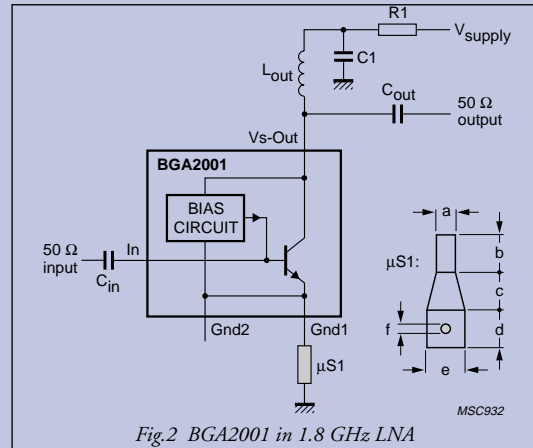
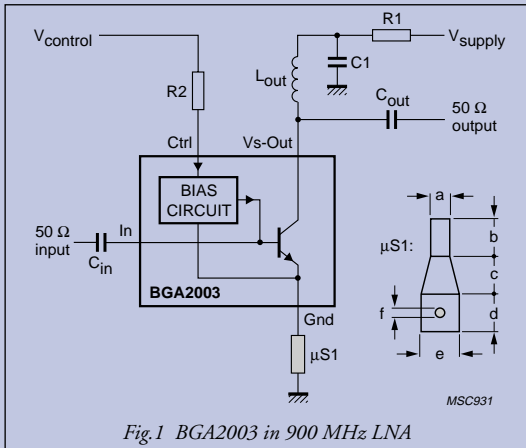
⁵ power control pin, ⁶ G_p , ⁷ ACPR in dBc

Let's make things better.

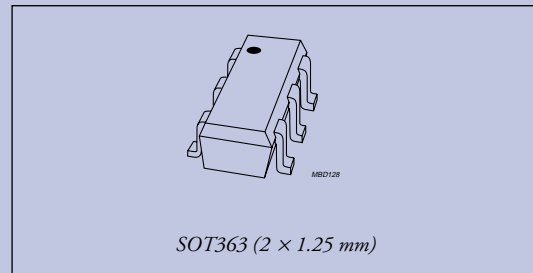
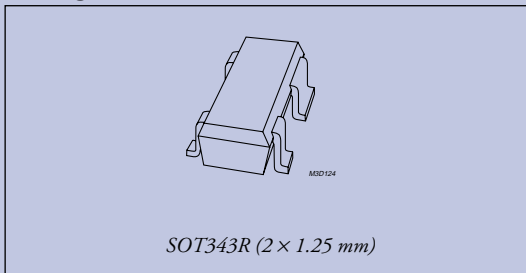


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Application Diagrams



Packages



Application Notes - Overview

| Title | Number |
|-----------------------------|-------------------|
| LNA with BGA2003 at 900 MHz | RNR-T45-98-B-0374 |
| LNA with BGA2001 at 1.8 GHz | RNR-T45-98-B-0260 |

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