

# DATA SHEET

## **SA2410**

2.45GHz RF power amplifier and T/R  
switch

Preliminary specification

1997 Sept 09

IC17 Data Handbook

# 2.45GHz RF power amplifier and T/R switch

# SA2410

## DESCRIPTION

The SA2410 is a GaAs monolithic power amplifier with an integrated T/R switch designed to meet requirements for 802.11 (WLAN). The SA2410 uses an on-chip 4 GHz oscillator to generate the negative bias, thus eliminating the need for a negative supply. It operates from 3V to 5.5V and consumes 125 mA with an output power of 18.5 dB (typ). It is suitable for other 2.45 GHz ISM band applications.

## FEATURES

- $V_{CC}=3V-5.5V$
- No negative bias needed
- $I_{CC}=125mA$  (typ) @ 3.3V
- $P_{OUT}=18.5$  dB(typ)  
IM3<-30dBc  
IM5<-50dBc
- Gain=29dB (typ)
- Attenuation range=16dB (typ)
- LQFP-32 package

## APPLICATIONS

- 802.11 WLAN
- 2.4-2.5 GHz ISM BAND

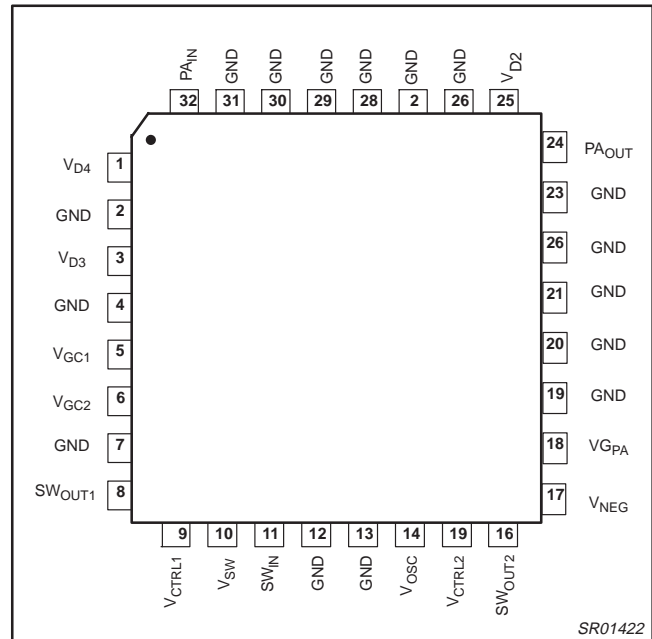


Figure 1. Pin Configuration

## ORDERING INFORMATION

| DESCRIPTION                           | TEMPERATURE RANGE | ORDER CODE | DWG #    |
|---------------------------------------|-------------------|------------|----------|
| 32-Pin Plastic Thin Quad Flat Package | -40° C+85°C       | SA2410     | SOT401-1 |

## GENERAL SPECIFICATIONS

| Symbol          | Parameter                  | Condition                                 | Min  | Typ       | Max | Unit    |
|-----------------|----------------------------|---|------|-----------|-----|---------|
| T               | Temperature                |   | -40  |           | +85 | C       |
| $V_{CC}$        | Supply V                   |   | 3    |           | 5.5 | V       |
| $I_{CC}$        | Supply I                   | 3.3 volts                                 |      | 125       |     | mA      |
| Power Amplifier |                            |   |      |           |     |         |
| $f_{RF}$        | Frequency Range            |   | 2.4  |           | 2.5 | GHz     |
| IM3             | IM3 2 tones                |   | 30   |           |     | dBc     |
| IM5             | IM5 2 tones                |   | 50   |           |     | dBc     |
| $T_{on}$        | Transmit power on          | Including neg. supply                     |      |           | 2   | $\mu s$ |
| $T_{off}$       | Xmit power down            |   |      |           | 2   | $\mu s$ |
| Gain            | Small signal gain          |   |      | 29        |     | dB      |
| $P_{out}$       | Output power               | IM3=30dBc<br>IM5=50dBc<br>125mA@3.3 volts | 17.5 | 18.5      |     | dBm     |
| Eff.            | Efficiency                 |   |      | 25        |     | %       |
| $\Delta Gt1$    | Gain variation with temp   | -40 to +85°C                              |      | $\pm 3.5$ |     | dB      |
| $\Delta Gt2$    | Gain variation with temp   | 0-70°C                                    |      | $\pm 2.0$ |     | dB      |
| $\Delta Gr$     | Ripple                     | 2.45 $\pm$ 0.05 GHz                       |      | $\pm 1$   |     | dB      |
| $\Delta Gvd$    | Gain variation with supply | 3.3 volts $\pm$ 0.3 V                     |      | 0.5       |     | dB      |

# 2.45GHz RF power amplifier and T/R switch

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| Symbol                  | Parameter              | Condition | Min | Typ | Max | Unit     |
|-------------------------|------------------------|-----------|-----|-----|-----|----------|
| Negative voltage supply |                        |           |     |     |     |          |
| $t_{on}$                | Power on time          |           | 10  |     | 100 | nS       |
|                         | 4 GHz spur             | Xmit Mode |     | TBD |     | dBm      |
| Linear Gain Control     |                        |           |     |     |     |          |
| Symbol                  | Parameter              | Condition | Min | Typ | Max | Unit     |
| $V_{GC}$                | Gain control voltage   |           |     | TBD |     | Volt     |
| $C_{GC}$                | Input C at gain pin    |           |     | TBD |     | pF       |
| $G_{CR}$                | Attenuation range      |           |     | 16  |     | dB       |
| Transmit/receive switch |                        |           |     |     |     |          |
| Symbol                  | Parameter              | Condition | Min | Typ | Max | Unit     |
| $L_{tx}$                | Insertion loss $T_x$   |           |     | 1.3 | 2   | dB       |
| $L_{rx}$                | Insertion loss $R_x$   |           |     | 1.3 | 2   | dB       |
| $t_{sw}$                | Switch response time   |           |     |     | 400 | nS       |
| $ISO_{PA}$              | Isolation switch to PA |           | 30  |     |     | dB       |
| $Z_{in}$                | Input impedance        |           |     | 50  |     | $\Omega$ |
| $Z_{out}$               | Output impedance       |           |     | 50  |     | $\Omega$ |
| $ISO_{SW}$              | Switch Isolation       |           | 17  | 19  |     | dB       |

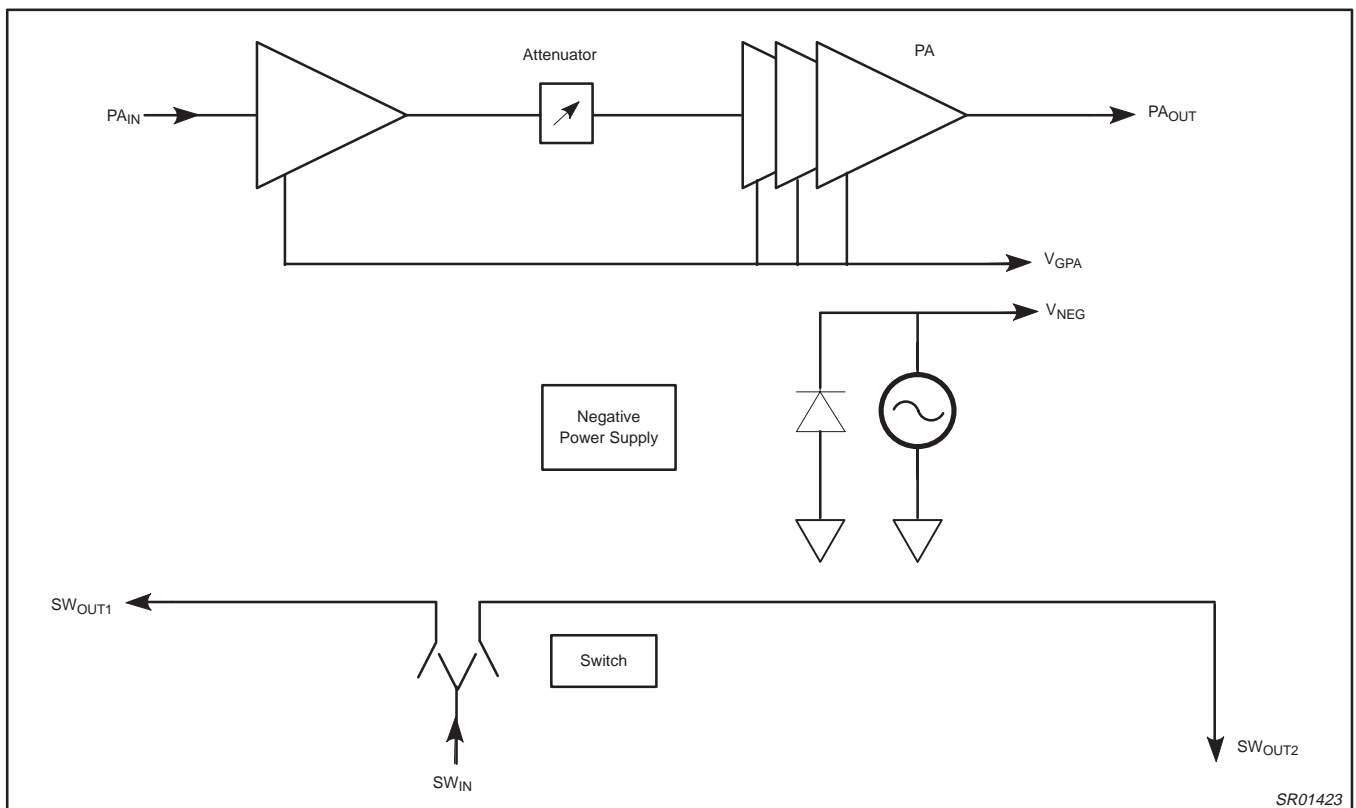


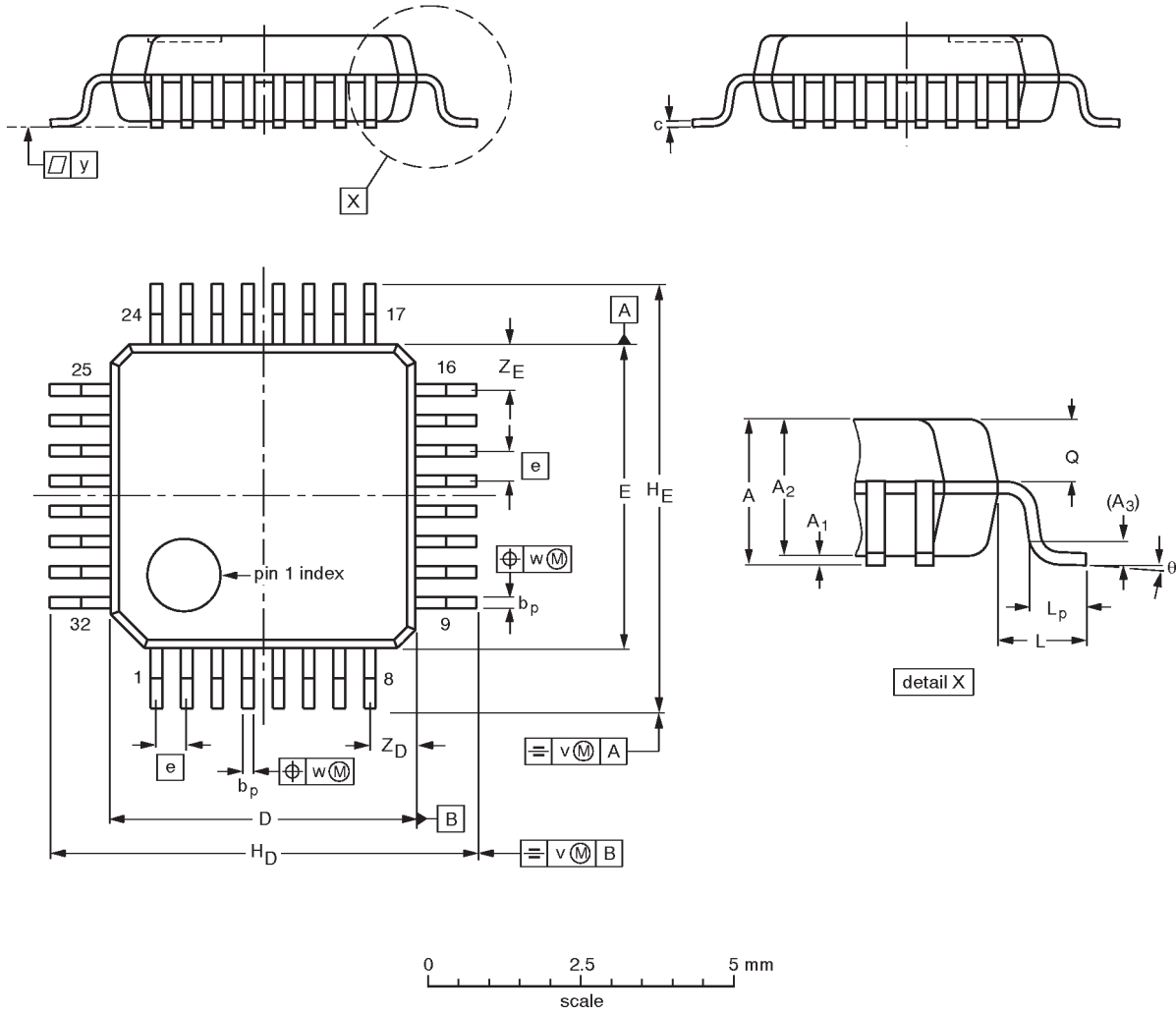
Figure 2. Block Diagram

2.45GHz RF power amplifier and T/R switch

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LQFP32: plastic low profile quad flat package; 32 leads; body 5 x 5 x 1.4 mm

SOT401-1



**DIMENSIONS (mm are the original dimensions)**

| UNIT | A<br>max. | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | b <sub>p</sub> | c            | D <sup>(1)</sup> | E <sup>(1)</sup> | e   | H <sub>D</sub> | H <sub>E</sub> | L   | L <sub>p</sub> | Q            | v   | w    | y   | Z <sub>D</sub> <sup>(1)</sup> | Z <sub>E</sub> <sup>(1)</sup> | θ        |
|------|-----------|----------------|----------------|----------------|----------------|--------------|------------------|------------------|-----|----------------|----------------|-----|----------------|--------------|-----|------|-----|-------------------------------|-------------------------------|----------|
| mm   | 1.60      | 0.15<br>0.05   | 1.5<br>1.3     | 0.25           | 0.27<br>0.17   | 0.18<br>0.12 | 5.1<br>4.9       | 5.1<br>4.9       | 0.5 | 7.15<br>6.85   | 7.15<br>6.85   | 1.0 | 0.75<br>0.45   | 0.70<br>0.57 | 0.2 | 0.12 | 0.1 | 0.95<br>0.55                  | 0.95<br>0.55                  | 7°<br>0° |

**Note**

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

| OUTLINE<br>VERSION | REFERENCES |       |      |  | EUROPEAN<br>PROJECTION | ISSUE DATE            |
|--------------------|------------|-------|------|--|------------------------|-----------------------|
|                    | IEC        | JEDEC | EIAJ |  |                        |                       |
| SOT401-1           |            |       |      |  |                        | 94-04-25-<br>95-12-19 |

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## DEFINITIONS

| Data Sheet Identification        | Product Status                | Definition   |
|----------------------------------|-------------------------------|--|
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