

# TA4303F

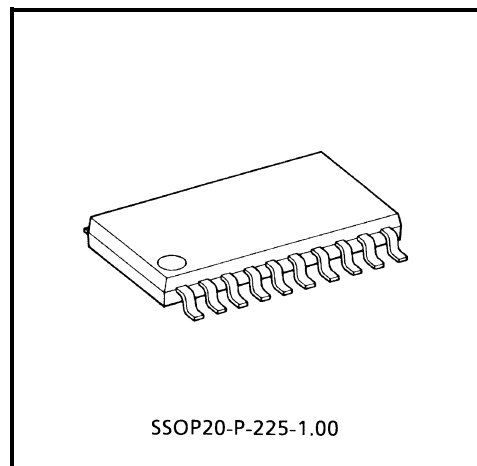
## Down Converter for BS/CS Tuner IC

### Description

The TA4303F is a monolithic IC to down-convert the L-band (900~2150 MHz) signal for the satellite tuners. It's integrated circuits that perform the mixer/oscillator function. They have double-balanced mixer, local oscillator, IF amplifier, OSC buffer amplifier and prescaler buffer amplifier circuits.

### Features

- Single chip full band solution, compatible with digital and analog transmissions.
- Single 5 V power supply operation
- Full band constant conversion Gain and Noise Figure
- Local oscillator output circuit for PLL
- Low Phase Noise local oscillator



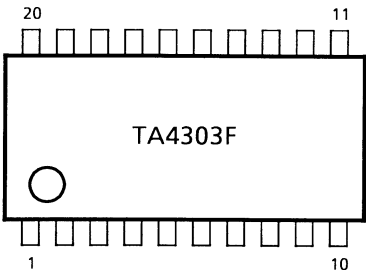
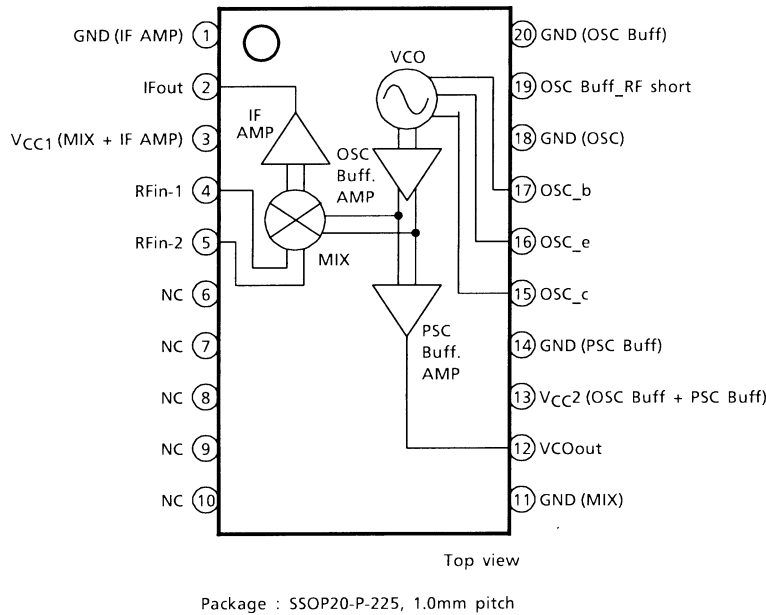
Weight: 0.17 g (typ.)

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Pin Connection Function Block Diagram

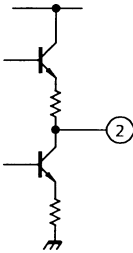
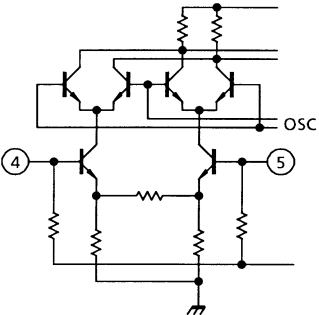
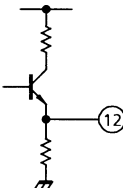
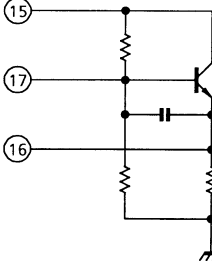
Marking

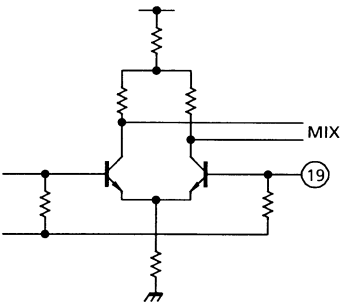


Caution

This devices is electrostatic sensitivity.

## Explanation

| Pin No. | Pin Name                   | Pin Voltage | Explanation                                 | Equivalent Circuit  |
|---------|----------------------------|-------------|---|---|
| 1       | GND (IF Amp)               | 0           | GND pin for IF Amp.                         | —   |
| 2       | IF out                     | 2.2         | IF output pin.                              |    |
| 3       | VCC1 (MIX + IF Amp)        | 5.0         | Supply voltage for MIX + IF Amp.            | —   |
| 4       | RFin-1                     | 1.7         | RF input pin.                               |   |
| 5       | RFin-2                     | 1.7         | RF input pin.                               |   |
| 6       | NC                         | —           | —   | —   |
| 7       | NC                         | —           | —   | —   |
| 8       | NC                         | —           | —   | —   |
| 9       | NC                         | —           | —   | —   |
| 10      | NC                         | —           | —   | —   |
| 11      | GND (MIX)                  | 0           | GND pin for MIX.                            | —   |
| 12      | VCOout                     | 2.0         | OSC output pin.                             |  |
| 13      | VCC2 (OSC Buff + PSC Buff) | 5.0         | Supply voltage pin for OSC Buff + PSC Buff. | —   |
| 14      | GND (PSC Buff)             | 0           | GND pin for PSC Buff.                       | —   |
| 15      | OSC-c                      | 5.0         | OSC collector pin, supply voltage pin.      |  |
| 16      | OSC-e                      | 1.8         | Emitter pin for OSC.                        |   |
| 17      | OSC-b                      | 2.6         | Base pin for OSC.                           |   |

| Pin No. | Pin Name          | Pin Voltage | Explanation           | Equivalent Circuit  |
|---------|-------------------|-------------|-----------------------|---|
| 18      | GND (OSC)         | 0           | GND pin for OSC.      | —   |
| 19      | RF GND (OSC Buff) | 1.4         | RF GND pin.           |  |
| 20      | GND (OSC Buff)    | 0           | GND pin for OSC Buff. | —   |

**Maximum Ratings (Ta = 25°C)**

| Characteristic          | Symbol                 | Rating  | Unit |
|-------------------------|------------------------|---------|------|
| Supply voltage          | V <sub>CC</sub>        | 6       | V    |
| Total power dissipation | P <sub>D</sub> (Note1) | 1100    | mW   |
| Operating temperature   | T <sub>opr</sub>       | -20~85  | °C   |
| Storage temperature     | T <sub>stg</sub>       | -45~150 | °C   |

Note 1: 100 cm<sup>2</sup> × 1.6 t (Cu layer area: 36%) on glass epoxy resins.

**Recommended Operating Range**

| Characteristic           | Symbol                | Rating    | Unit |
|--------------------------|-----------------------|-----------|------|
| Supply voltage           | V <sub>CC</sub> (Amp) | 4.75~5.25 | V    |
| Supply voltage           | V <sub>CC</sub> (OSC) | 4.75~5.25 | V    |
| Input frequency range    | f <sub>in</sub>       | 900~2150  | MHz  |
| IF Input frequency range | f <sub>IF</sub>       | 350~550   | MHz  |

**Electrical Characteristics (Ta = 25°C) (Note 2)**

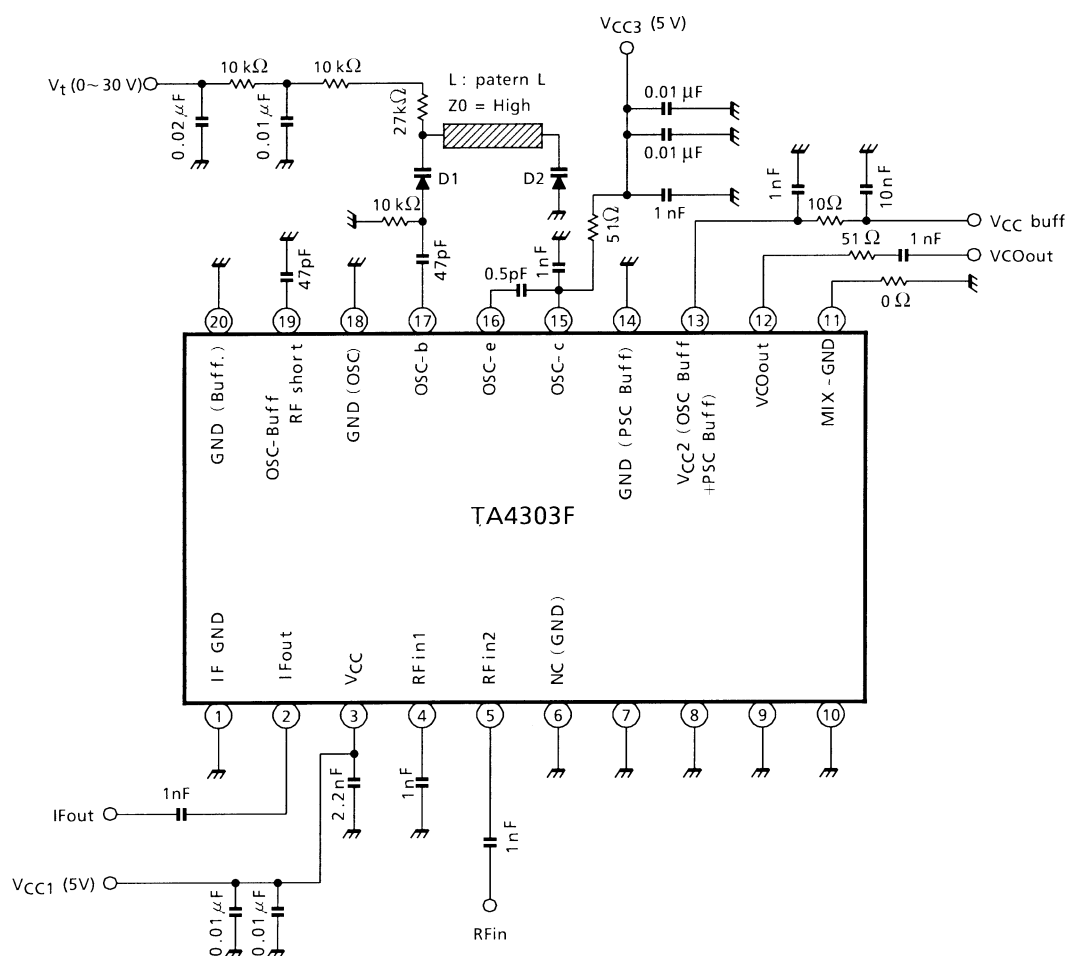
| Characteristics       | Symbol                  | Test Circuit | Test Condition   | Min | Typ. | Max | Unit |
|-----------------------|-------------------------|--------------|--|-----|------|-----|------|
| Supply current        | I <sub>CC</sub> (Total) | 1            | V <sub>CC</sub> = 5 V, No RF input   | 61  | 74   | 87  | mA   |
| Conversion gain       | G <sub>c</sub>          | 1            | f <sub>in</sub> = 1.6 GHz, f <sub>IF</sub> = 400 MHz                       | 14  | 18   | 25  | dB   |
| Noise figure          | NF                      | 1            | f <sub>in</sub> = 1.6 GHz, f <sub>IF</sub> = 400 MHz                       | —   | 15   | 22  | dB   |
| Saturation output     | P <sub>O</sub> (sat)    | 1            | f <sub>in</sub> = 1.6 GHz, f <sub>IF</sub> = 400 MHz                       | 5   | 10   | —   | dBmW |
| Third-order intercept | IP3                     | 1            | f <sub>in</sub> = 1.596 GHz, 1.6 GHz<br>f <sub>IF</sub> = 400 MHz, 404 MHz | 12  | 17   | 24  | dBmW |
| Posc                  | POSC                    | 1            | f <sub>LO</sub> = 2.0 GHz  | -14 | -8   | —   | dBmW |

Note 2: All electrical characteristics measured in Supply Voltage 5.0 V (Amp, OSC, OSC Buffer)

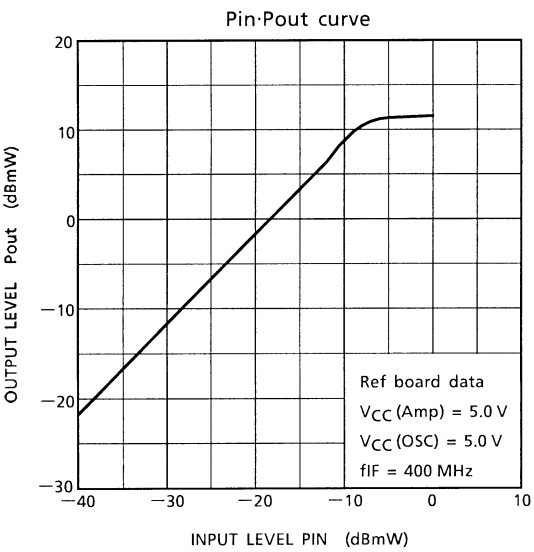
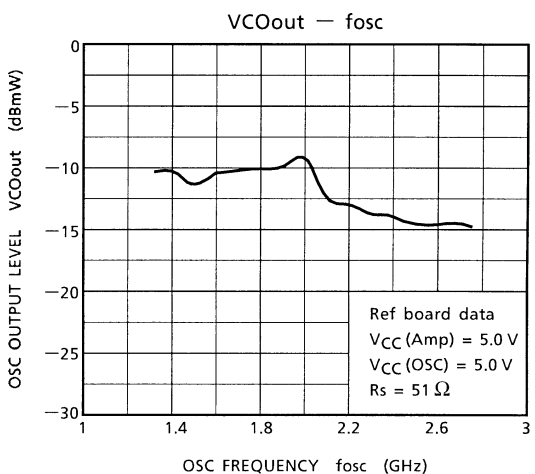
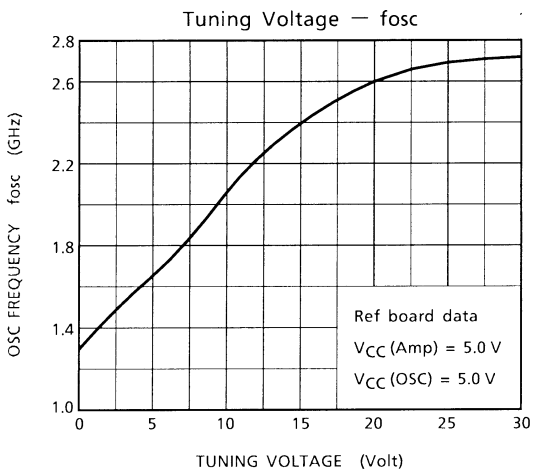
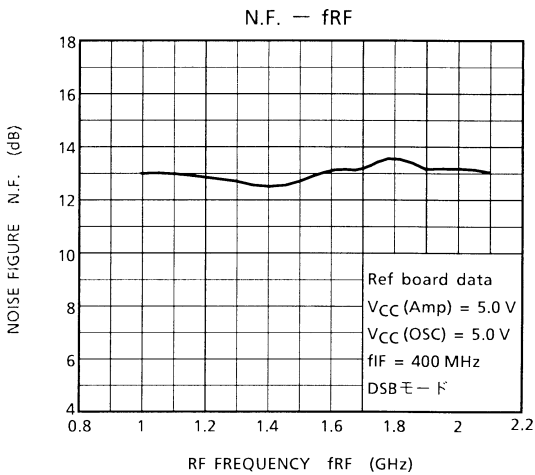
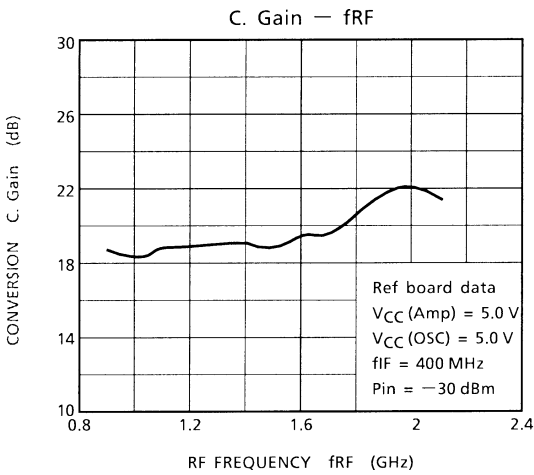
**Reference Characteristic (Note 3)**

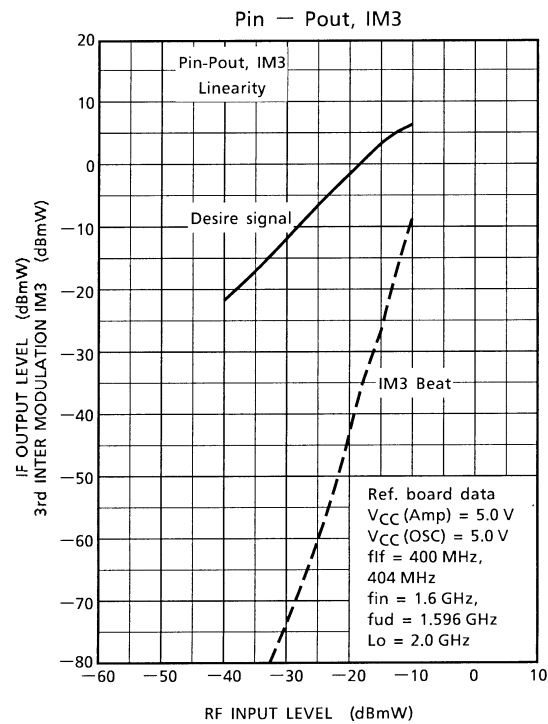
| Characteristics | Symbol                | Test Circuit | Test Condition                     | Typ. | Unit |
|-----------------|-----------------------|--------------|------------------------------------|------|------|
| Supply current  | I <sub>CC</sub> (Amp) | 1            | V <sub>CC</sub> = 5 V, No RF input | 36   | mA   |
| Supply current  | I <sub>CC</sub> (OSC) | 1            | V <sub>CC</sub> = 5 V, No RF input | 38   | mA   |

Note 3: All electrical characteristics measured in Supply Voltage 5.0 V (Amp, OSC, OSC Buffer)



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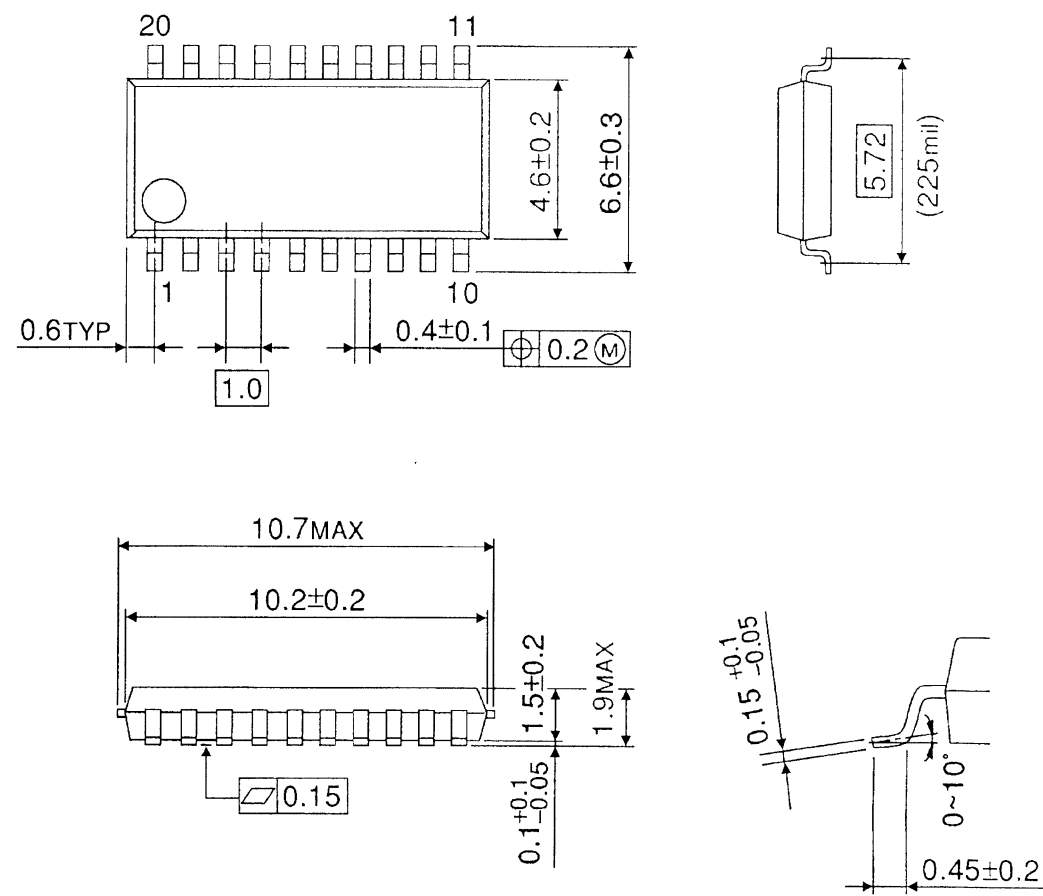




Package Dimensions

SSOP20-P-225-1.00

Unit : mm



Weight : 0.17 g (Typ.)