

**TOSHIBA****TA4303F**

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA4303F

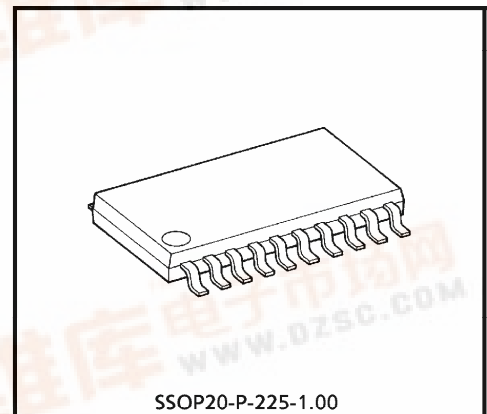
## DOWN CONVERTER FOR BS/CS TUNER IC

### DESCRIPTION

The TA4303F is a monolithic IC to down-convert the L-band (900~2150MHz) 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 5V power supply operation
- Full band constant conversion Gain and Noise Figure
- Local oscillator output circuit for PLL
- Low Phase Noise local oscillator

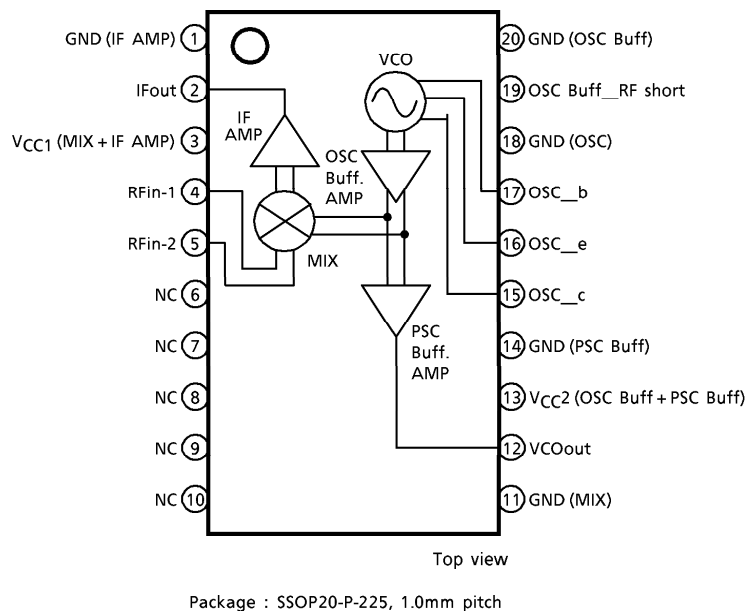


SSOP20-P-225-1.00

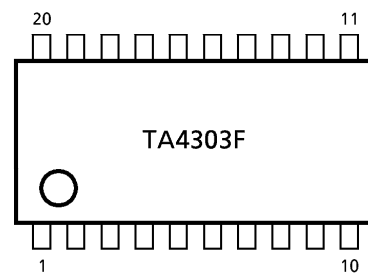
Weight : 0.17g (Typ.)

- 980508EBA1
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**PIN CONNECTION FUNCTION BLOCK DIAGRAM**

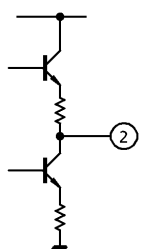
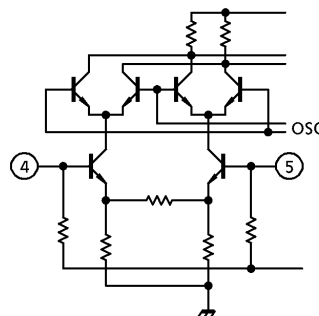
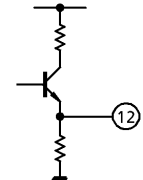


**MARKING**



(CAUTION) This devices is electrostatic sensitivity

## EXPLANATION

| PIN No. | PIN NAME                         | PIN VOLTAGE | EXPLANATION                                 | EQUIVALENT CIRCUIT                                                                    |
|---------|----------------------------------|-------------|---------------------------------------------|---------------------------------------------------------------------------------------|
| 1       | GND<br>(IF Amp)                  | 0           | GND pin for IF Amp.                         | —                                                                                     |
| 2       | IFout                            | 2.2         | IF output pin.                              |    |
| 3       | VCC1<br>(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<br>(OSC Buff<br>+ PSC Buff) | 5.0         | Supply voltage pin for OSC Buff + PSC Buff. | —                                                                                     |
| 14      | GND<br>(PSC Buff)                | 0           | GND pin for PSC Buff.                       | —                                                                                     |

| PIN No. | PIN NAME          | PIN VOLTAGE | EXPLANATION                            | EQUIVALENT CIRCUIT |
|---------|-------------------|-------------|----------------------------------------|--------------------|
| 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.                      |                    |
| 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> (Note) | 1100     | mW   |
| Operating Temperature   | T <sub>opr</sub>      | – 20~85  | °C   |
| Storage Temperature     | T <sub>stg</sub>      | – 45~150 | °C   |

(Note) 100cm<sup>2</sup> × 1.6t (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)

| CHARACTERISTIC        | SYMBOL                  | TEST CIR-CUIT | TEST CONDITION                                                         | MIN. | TYP. | MAX. | UNIT |
|-----------------------|-------------------------|---------------|------------------------------------------------------------------------|------|------|------|------|
| Supply Current        | I <sub>CC</sub> (Total) | 1             | V <sub>CC</sub> = 5V, No RF input                                      | 61   | 74   | 87   | mA   |
| Conversion Gain       | G <sub>c</sub>          | 1             | f <sub>in</sub> = 1.6GHz, f <sub>IF</sub> = 400MHz                     | 14   | 18   | 25   | dB   |
| Noise Figure          | NF                      | 1             | f <sub>in</sub> = 1.6GHz, f <sub>IF</sub> = 400MHz                     | —    | 15   | 22   | dB   |
| Saturation Output     | P <sub>o</sub> (sat)    | 1             | f <sub>in</sub> = 1.6GHz, f <sub>IF</sub> = 400MHz                     | 5    | 10   | —    | dBmW |
| Third-order Intercept | IP <sub>3</sub>         | 1             | f <sub>in</sub> = 1.596GHz, 1.6GHz<br>f <sub>IF</sub> = 400MHz, 404MHz | 12   | 17   | 24   | dBmW |
| Posc                  | Posc                    | 1             | f <sub>LO</sub> = 2.0GHz                                               | – 14 | – 8  | —    | dBmW |

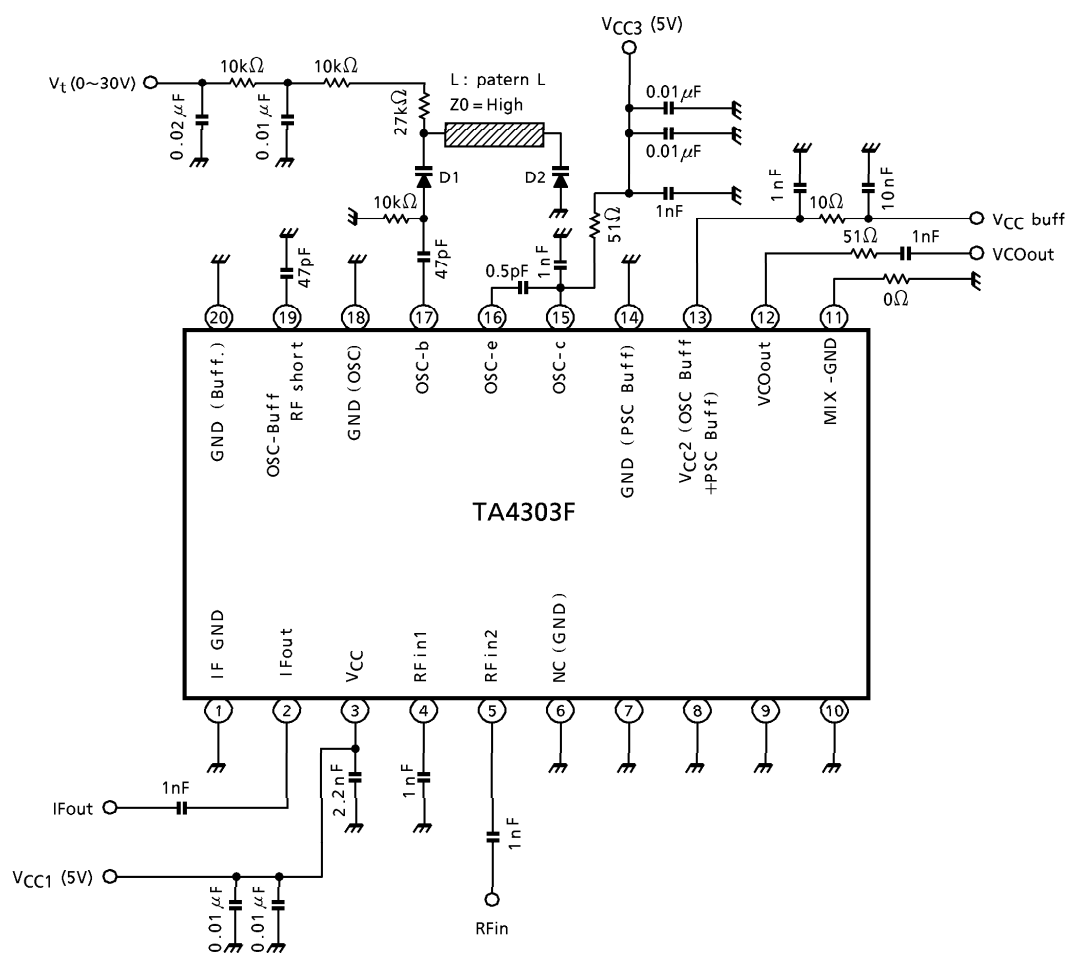
(Note) All electrical characteristics measured in Supply Voltage 5.0V (Amp, OSC, OSC Buffer)

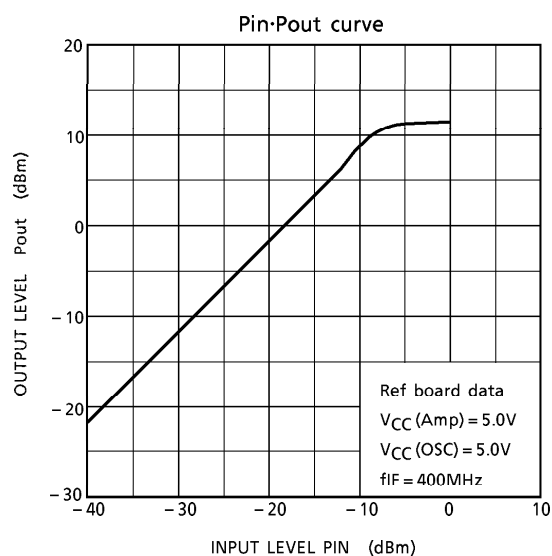
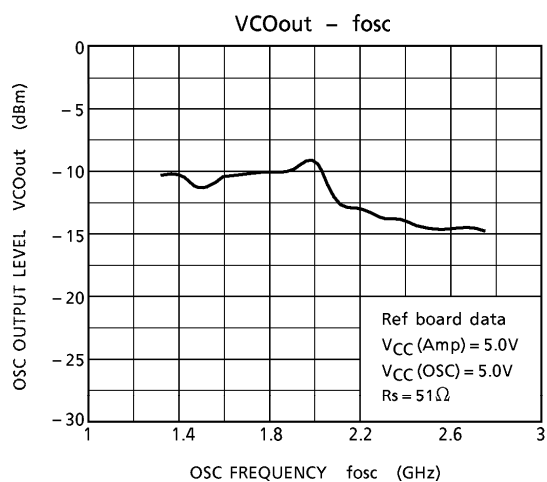
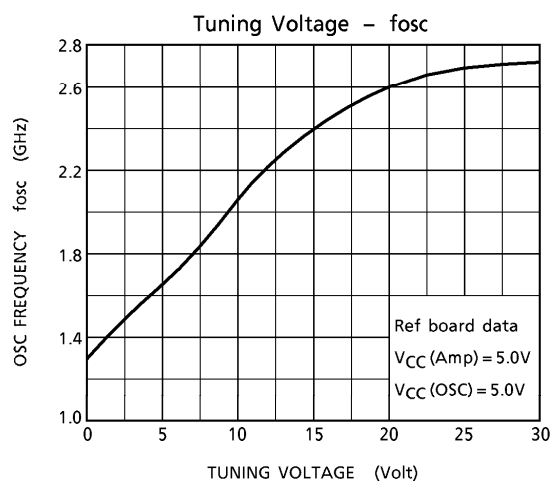
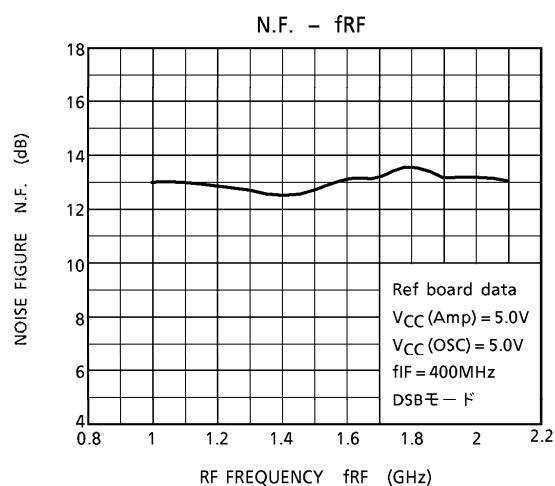
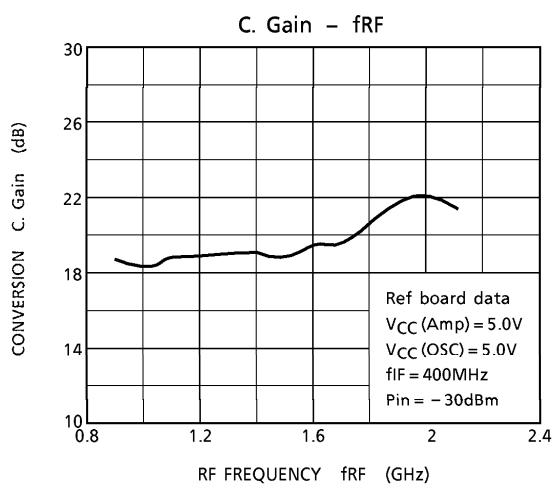
**REFERENCE CHARACTERISTIC**

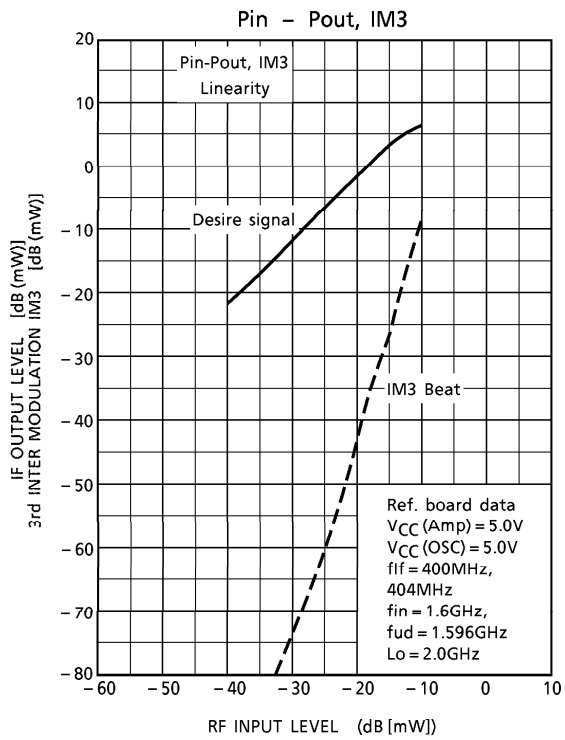
| CHARACTERISTIC | SYMBOL                | TEST CIR-CUIT | TEST CONDITION                    | TYP. | UNIT |
|----------------|-----------------------|---------------|-----------------------------------|------|------|
| Supply Current | I <sub>CC</sub> (Amp) | 1             | V <sub>CC</sub> = 5V, No RF input | 36   | mA   |
| Supply Current | I <sub>CC</sub> (OSC) | 1             | V <sub>CC</sub> = 5V, No RF input | 38   | mA   |

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

### TEST CIRCUIT

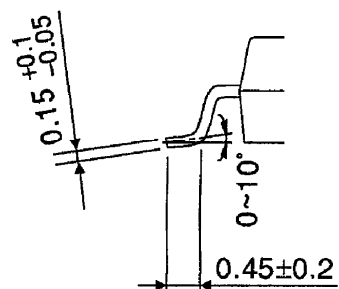
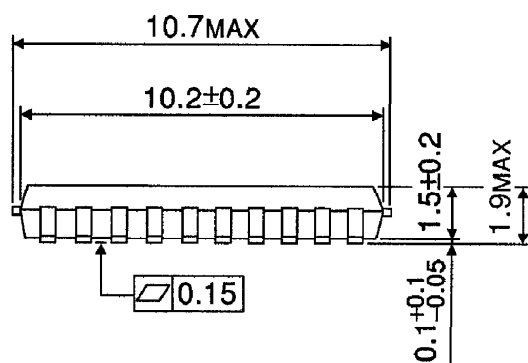
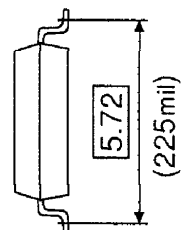
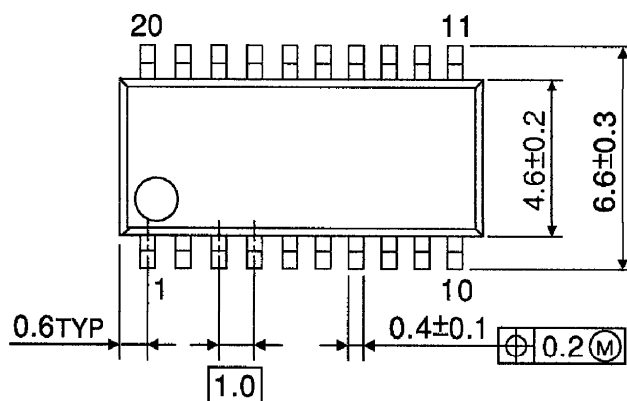






## OUTLINE DRAWING SSOP20-P-225-1.00

Unit : mm



Weight : 0.17g (Typ.)