

# TA4302F

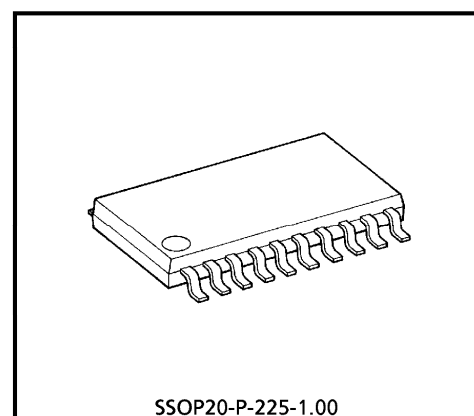
## DOWN CONVERTER FOR CATV

### DESCRIPTION

The TA4302F is a monolithic IC to down-convert the L-band signal for the CATV 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.

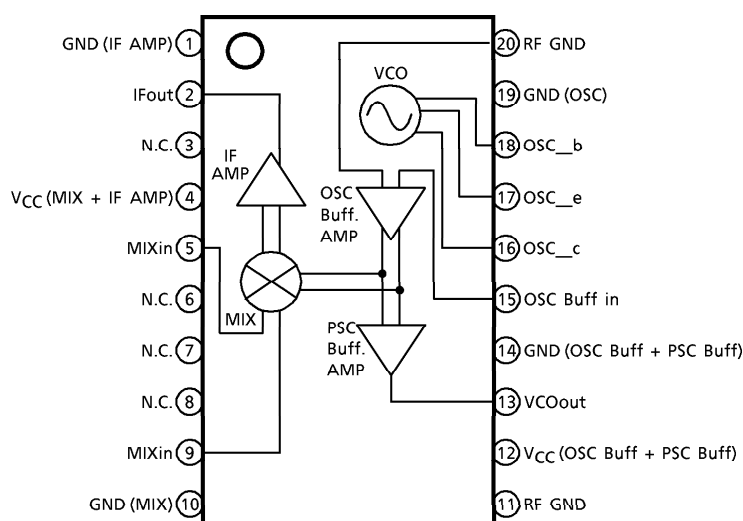
### FEATURES

- Single 5 V power supply operation
- Local oscillator output circuit for PLL
- Low Phase Noise local oscillator

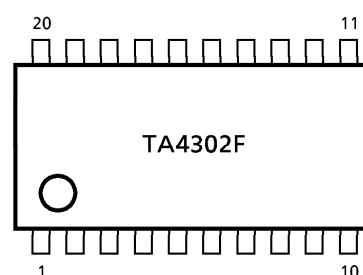


Weight : 0.17 g (Typ.)

### PIN CONNECTION / FUNCTION BLOCK DIAGRAM



### MARKING



980910EBA1

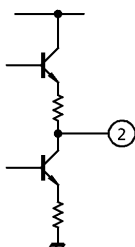
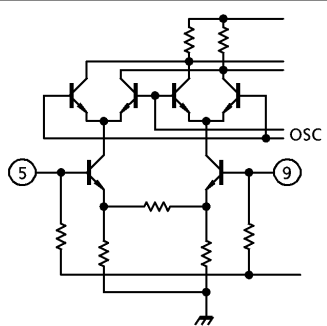
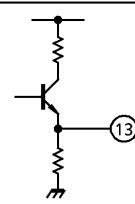
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## PIN DESCRIPTION

| PIN No. | PIN SYMBOL             | PIN VOLTAGE | DESCRIPTION                                                | EQUIVALENT CIRCUIT                                                                    |
|---------|------------------------|-------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1       | GND                    | 0           | IF amp GND pin                                             | —                                                                                     |
| 2       | IFout                  | 2.2         | IF output pin                                              |    |
| 3       | NC                     | —           | —                                                          | —                                                                                     |
| 4       | V <sub>CC</sub> (Amp)  | 5.0         | MIX IF amp power pin                                       | —                                                                                     |
| 5       | MIXin-1                | 1.6         | RF input pin                                               |   |
| 6       | NC                     | —           | —                                                          | —                                                                                     |
| 7       | NC                     | —           | —                                                          | —                                                                                     |
| 8       | NC                     | —           | —                                                          | —                                                                                     |
| 9       | MIXin-2                | 1.6         | RF GND pin                                                 | See the equivalent circuit for pin 5.                                                 |
| 10      | GND                    | 0           | MIX GND pin                                                | —                                                                                     |
| 11      | GND                    | 0           | GND pin for OSC buffer amp and PSC buffer amp              | —                                                                                     |
| 12      | V <sub>CC</sub> (Buff) | 5.0         | Power pin for OSC buffer amp and PSC buffer amp            | —                                                                                     |
| 13      | VCOout                 | 1.4         | Output pin for local oscillator signal from PSC buffer amp |  |
| 14      | GND (Buff)             | 0           | GND pin for OSC buffer amp and PSC buffer amp              | —                                                                                     |

| PIN No. | PIN SYMBOL  | PIN VOLTAGE | DESCRIPTION                                                         | EQUIVALENT CIRCUIT                    |
|---------|-------------|-------------|---------------------------------------------------------------------|---------------------------------------|
| 15      | OSC Buff in | 1.4         | Input pin for local oscillator signal from OSC buffer amp           |                                       |
| 16      | OSC-c       | 5.0         | OSC collector pin, power pin, or local oscillator signal output pin |                                       |
| 17      | OSC-e       | 1.6         | OSC emitter pin                                                     |                                       |
| 18      | OSC-b       | 2.4         | OSC base pin                                                        |                                       |
| 19      | GND (OSC)   | 0           | OSC GND pin                                                         | —                                     |
| 20      | RF GND      | 1.4         | RF GND pin                                                          | See the equivalent circuit for pin 5. |

**MAXIMUM RATINGS** (Ta = 25°C)

| CHARACTERISTIC          |         | SYMBOL                | RATING   | UNIT |
|-------------------------|---------|-----------------------|----------|------|
| Supply Voltage          | For Amp | V <sub>CC</sub> (Amp) | 6        | V    |
|                         | For OSC | V <sub>CC</sub> (OSC) | 6        |      |
| 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) 100 cm<sup>2</sup> × 1.6 t (Cu layer area : 36%) on glass epoxy resins.

**RECOMMENDED OPERATING RANGE**

| CHARACTERISTIC | SYMBOL                        | VALUE   | UNIT |
|----------------|-------------------------------|---------|------|
| Supply Voltage | V <sub>CC</sub><br>(Amp, OSC) | 4.5~5.5 | V    |

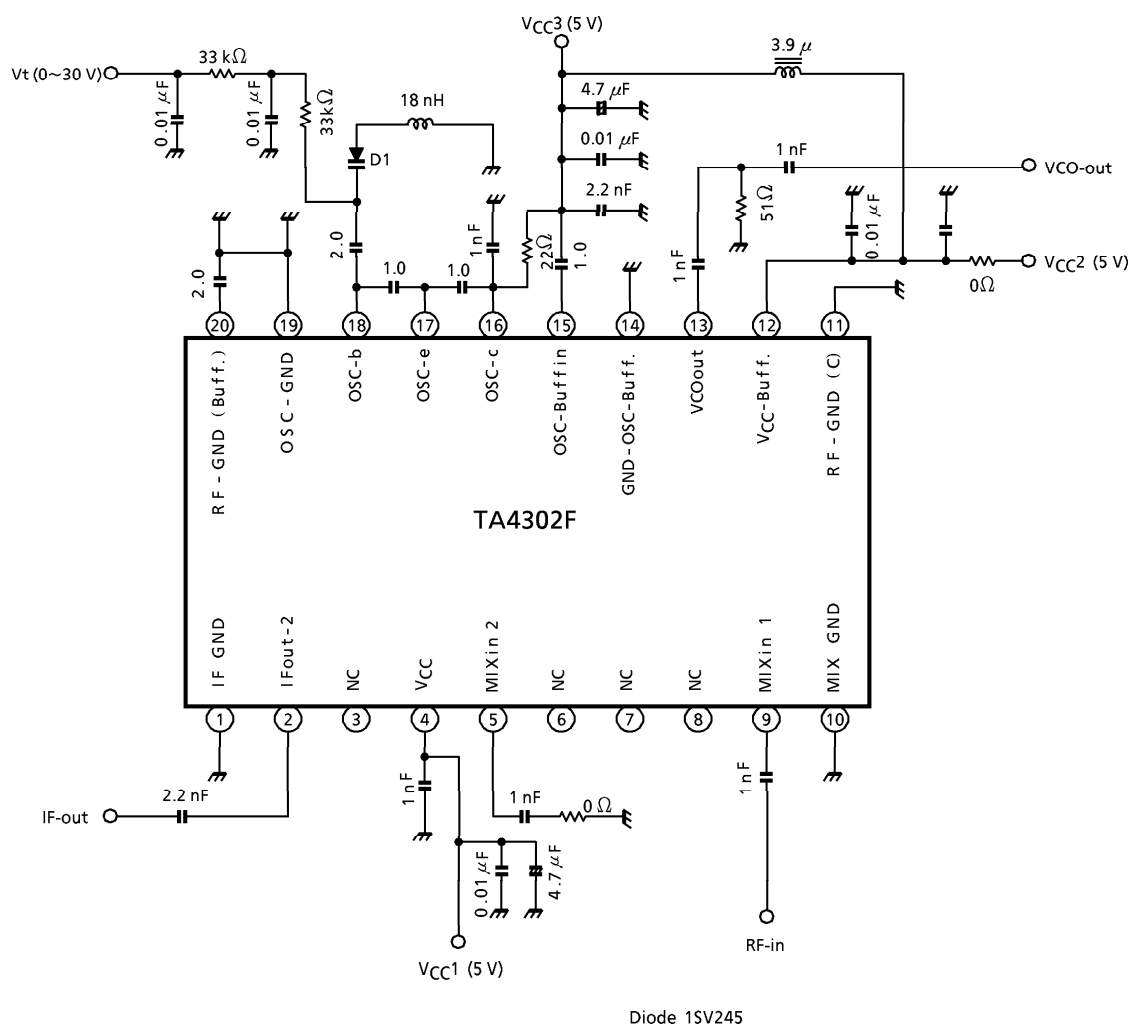
**ELECTRIC CHARACTERISTICS** (Reference) (Ta = 25°C)

| CHARACTERISTIC          | SYMBOL                | TEST CIR-CUIT | TEST CONDITION                                                 | MIN. | TYP.       | MAX. | UNIT     |
|-------------------------|-----------------------|---------------|----------------------------------------------------------------|------|------------|------|----------|
| Supply Current          | I <sub>CC</sub> (Amp) | 1             | V <sub>CC</sub> = 5.0 V, No RF input                           | 34   | 42         | 50   | mA       |
| Supply Current          | I <sub>CC</sub> (OSC) | 1             | V <sub>CC</sub> = 5.0 V, No RF input                           | 27   | 32         | 40   | mA       |
| Conversion Gain         | G <sub>c</sub>        | 1             | f <sub>in</sub> = 955 MHz,<br>f <sub>IF</sub> = 45 MHz         | —    | 18         | 23   | dB       |
| Noise Figure            | NF                    | 1             | f <sub>in</sub> = 955 MHz (SSB),<br>f <sub>IF</sub> = 45 MHz   | —    | 17.0       | —    | dB       |
| Saturation Output       | P <sub>o</sub> (sat)  | 1             | f <sub>in</sub> = 955 MHz,<br>f <sub>IF</sub> = 45 MHz         | —    | (*)<br>+ 9 | —    | dBmW     |
| Third-order Intercept   | IP3                   | 1             | f <sub>in</sub> = 949, 955 MHz<br>f <sub>IF</sub> = 39, 45 MHz | —    | + 15       | —    | dBmW     |
| Phase Noise             | P / N                 | 1             | f <sub>osc</sub> = 910 MHz,<br>10 kHz offset                   | —    | – 85       | – 80 | dBc / Hz |
| Oscillator Output Power | VCOout                | 1             | f <sub>osc</sub> = 910 MHz                                     | —    | – 5        | —    | dBmW     |

(\*) IP3 : Pin = – 25 dBmW

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

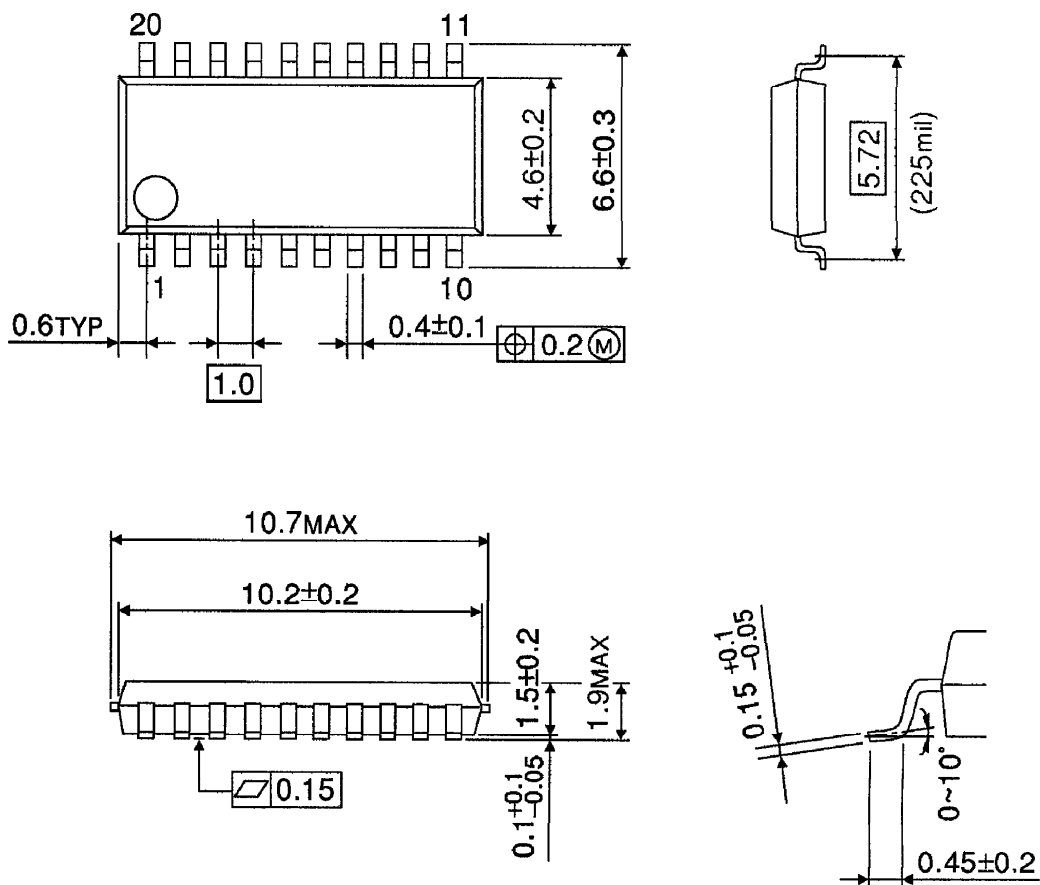
## TEST CIRCUIT 1



## OUTLINE DRAWING

SSOP20-P-225-1.00

Unit : mm



Weight : 0.17 g (Typ.)