



NEC's SiGe LOW NOISE AMPLIFIER FOR GPS/MOBILE COMMUNICATIONS

UPC8211TK

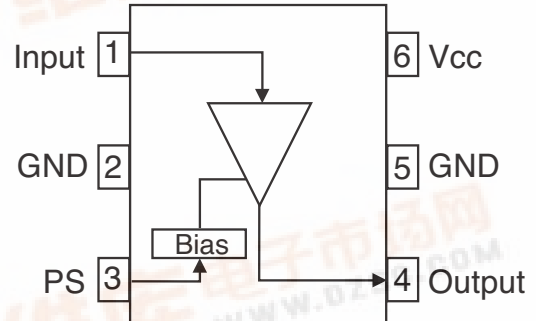
FEATURES

- **LOW NOISE:**
NF = 1.3 dB TYP.
- **HIGH GAIN:**
GP = 18.5 dB TYP.
- **LOW CURRENT CONSUMPTION:**
I_{CC} = 3.5 mA TYP. at V_{CC} = 3.0 V
- **BUILT-IN POWER SAVE FUNCTION:**
- **HIGH-DENSITY SURFACE MOUNTING:**
6-pin lead less minimold package (1.5 x 1.3 x 0.55 mm)

APPLICATION

- Low Noise amplifier for GPS and mobile communications
- General purpose low noise amplifier

INTERNAL BLOCK DIAGRAM



DESCRIPTION

NEC's UPC8211TK is a silicon germanium (SiGe) monolithic integrated circuit designed as low noise amplifier for GPS and as a general low noise amplifier for mobile communications.

The package is 6-pin lead-less minimold (1.5 x 1.3 x 0.55 mm) suitable for surface mount and optimized for very densely populated compact designs.

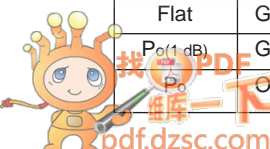
This IC is manufactured using NEC's 60 GHz f_T-UHS2 (Ultra High Speed Process) silicon bipolar process. This process can realize excellent low noise performance and low power consumption simultaneously.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

ELECTRICAL CHARACTERISTICS,

(Unless otherwise specified, T_A = +25°C, V_{CC} = 3.0 V, f_{in} = 1575 MHz, V_{PS} = 3.0 V)

| PART NUMBER PACKAGE OUTLINE | | | UPC8211TK S06 | | |
|--------------------------------|---|-------|------------------|-------|------|
| SYMBOLS | PARAMETERS AND CONDITIONS | UNITS | MIN | TYP | MAX |
| I _{CC} | Circuit Current (no input signal) | mA | - | 3.5 | 4.5 |
| | At power save mode (V _{PS} < 0.8V) | μA | - | - | 1 |
| GP | Power Gain | dB | 15.5 | 18.5 | 21.5 |
| NF | Noise Figure | dB | - | 1.3 | 1.5 |
| IIP ₃ | 3rd Order Distortion Input Intercept Point (Gain = 18.5 dB) | dBm | - | -12 | - |
| RLIN | Input Return Loss | dB | - | -7.5 | -6 |
| RLOUT | Output Return Loss | dB | - | -14.5 | -10 |
| ISO | Isolation | dBm | - | -32.5 | - |
| V _{PS} ON | Rising Voltage from Power-Saving Mode | V | 2.2 | - | - |
| V _{PS} OFF | Falling Voltage from Power-Saving Mode | V | - | - | 0.8 |
| Flat | Gain Flatness (f _{in} ±2.5 MHz) | dB | - | - | Δ0.5 |
| P _o (1 dB) | Gain 1 dB Compression Output Power | dBm | - | -4 | - |
| | Output Power | dBm | -1.5 | +2.0 | - |



UPC8211TK

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|------------------|-------------------------------|-------|-------------|
| V _{CC} | Supply Voltage | V | 4.0 |
| P _D | Power Dissipation | mW | 232 |
| T _A | Operating Ambient Temperature | °C | -40 to +85 |
| T _{STG} | Storage Temperature | °C | -55 to +150 |
| P _{IN} | Input Power | dBm | +10 |

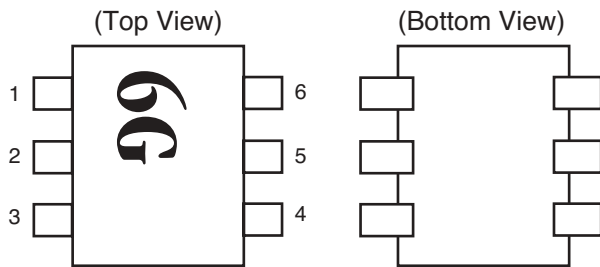
Notes:

1. Mounted on a double-sided copper-clad 50 x 50 x 1.6 mm epoxy glass PWB

RECOMMENDED OPERATING CONDITIONS

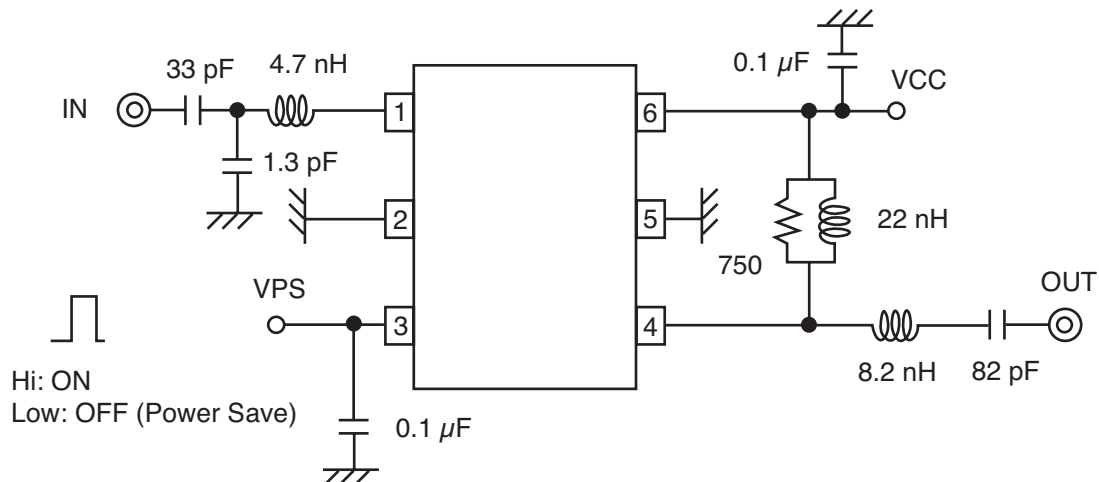
| SYMBOLS | PARAMETERS | UNITS | MIN | TYP | MAX |
|-----------------|-------------------------------|-------|-----|------|-----|
| V _{CC} | Supply Voltage | V | 2.7 | 3.0 | 3.3 |
| T _A | Operating Ambient Temperature | °C | -25 | +25 | +85 |
| f _{in} | Operating Frequency Range | MHz | - | 1575 | - |

PIN CONNECTIONS



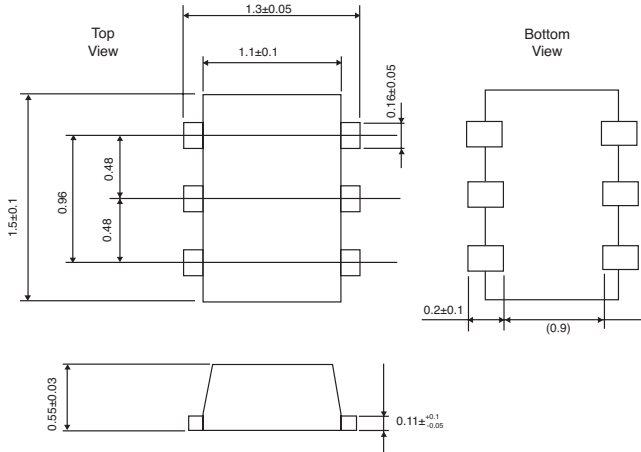
| PIN NO. | PIN NAME |
|---------|-----------------|
| 1 | INPUT |
| 2 | GND |
| 3 | PS |
| 4 | OUTPUT |
| 5 | GND |
| 6 | V _{CC} |

TEST CIRCUITS



OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S06



ORDERING INFORMATION

| PART NUMBER | QTY |
|--------------|---------|
| UPC8211TK-E2 | 5K/Reel |

Note:

Embossed tape, 8 mm wide. Pins 4, 5, 6 are in tape pull-out direction.