

FEATURES

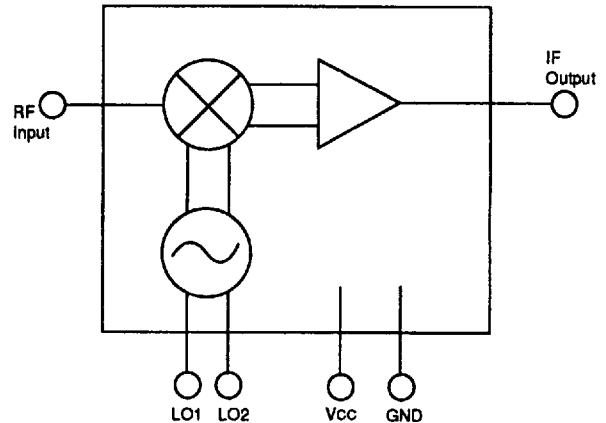
- WIDE BAND OPERATION: RF = 0.1 to 2.0 GHz
- ON BOARD OSCILLATOR
- LOW CURRENT CONSUMPTION: 6 mA
- SUPER SMALL T06 PACKAGE
- TAPE AND REEL PACKAGING OPTION AVAILABLE

DESCRIPTION

The UPC2756T is a silicon monolithic integrated circuit which is manufactured using the NESAT III process. The NESAT III process produces transistors with f_t approaching 20 GHz. This amplifier was designed as the first down converter for GPS and wireless communications. Operating on a 3 volt supply, this IC is ideally suited for hand held portable designs.

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

INTERNAL BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS (TA = 25 °C, ZL = Zs = 50 Ω, Vcc = 3 V)

| PART NUMBER PACKAGE OUTLINE | | | UPC2756T T06 | | |
|--------------------------------|---|--------|-----------------|-----|-----|
| SYMBOLS | PARAMETERS AND CONDITIONS | UNITS | MIN | TYP | MAX |
| Icc | Circuit Current (no signal) | mA | 3.5 | 6.0 | 8.0 |
| fRF | RF Frequency Response (3 dB down from the gain at fRF = 900 MHz, fIF = 150 MHz) | GHz | 0.1 | | 2.0 |
| fIF | IF Frequency Response (3 dB down from the gain at fRF = 900 MHz, fIF = 150 MHz) | MHz | 10 | | 300 |
| CG | Conversion Gain ¹ fRF = 900 MHz, fIF = 150 MHz fRF = 1.6 GHz, fIF = 20 MHz | dB | 11 | 14 | 17 |
| | | dB | 11 | 14 | 17 |
| NF | Noise Figure, fRF = 900 MHz, fIF = 150 MHz fRF = 1.6 GHz, fIF = 20 MHz | dB | | 10 | 13 |
| | | dB | | 13 | 16 |
| PSAT | Saturated Output Power ² , fRF = 900 MHz, fIF = 150 MHz fRF = 1.6 GHz, fIF = 20 MHz | dBm | -11 | -8 | |
| | | dBm | -15 | -12 | |
| IP3 | SSB Output 3rd Order Intercept Point, fRF = 0.8~2.0 GHz, fIF = 100 MHz | dBm | | 0 | |
| ISO | LO Leakage, fLO = 0.8~2.0 GHz at RF pin at IF pin | dBm | | -35 | |
| | | dBm | | -23 | |
| PN | Phase Noise ³ fosc = 1.9 GHz | dBc/Hz | | -68 | |
| RTH (J-A) | Thermal Resistance (Junction to Ambient) Free Air Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB | °C/W | | | 620 |
| | | °C/W | | | 230 |

Notes:

1. P_{IN} = -40 dBm.

2. P_{IN} = -10 dBm.

3. See Application Circuit.

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|------------------|--------------------------------------|-------|-------------|
| V _{CC} | Supply Voltage | V | 5.5 |
| P _T | Total Power Dissipation ² | mW | 280 |
| T _{OP} | Operating Temperature | °C | -40 to +85 |
| T _{STG} | Storage Temperature | °C | -55 to +150 |

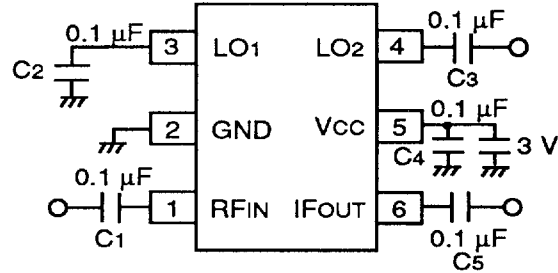
Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB (T_A = +85°C).

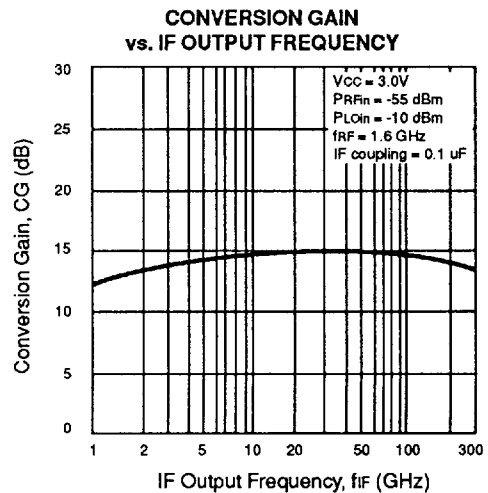
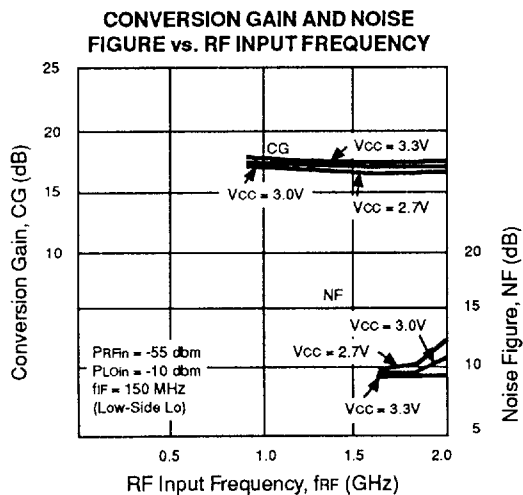
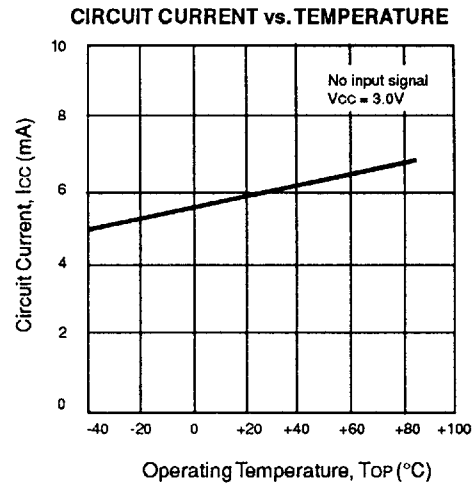
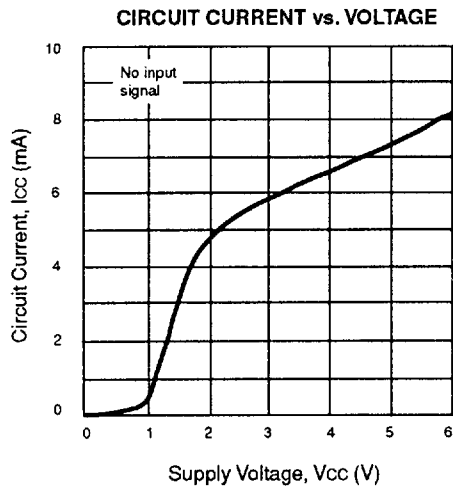
RECOMMENDED OPERATING CONDITIONS

| SYMBOLS | PARAMETERS | UNITS | MIN | TYP | MAX |
|-----------------|-----------------------|-------|-----|-----|-----|
| V _{CC} | Supply Voltage | V | 2.7 | 3.0 | 3.3 |
| T _{OP} | Operating Temperature | °C | -40 | +25 | +85 |

TEST CIRCUIT



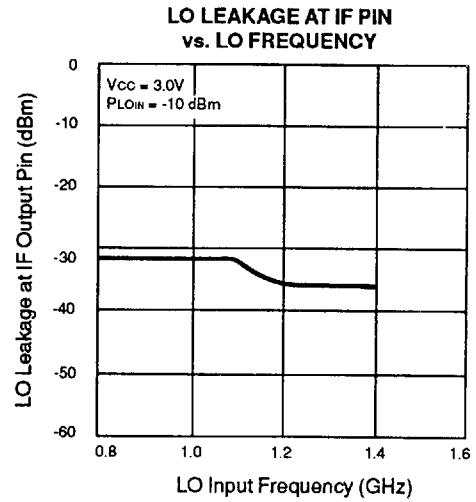
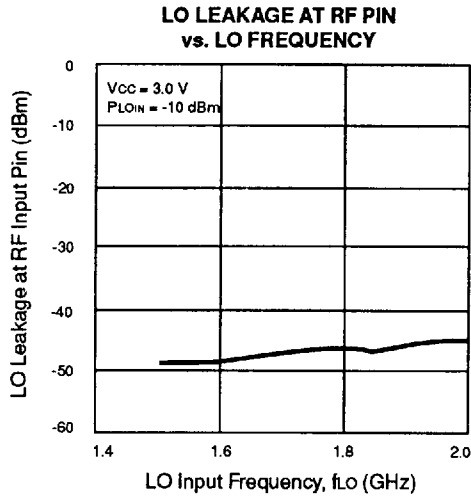
TYPICAL PERFORMANCE CURVES (T_A = 25°C unless otherwise specified)



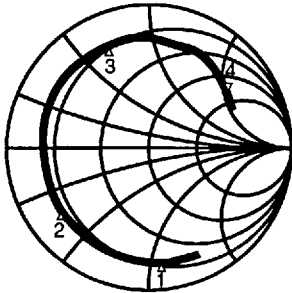
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UPC2756T

TYPICAL PERFORMANCE CURVES (TA = 25°C)

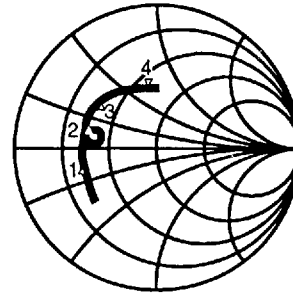


UPC2756T SCATTERING PARAMETERS



RF Port
V_{CC} = 3 V

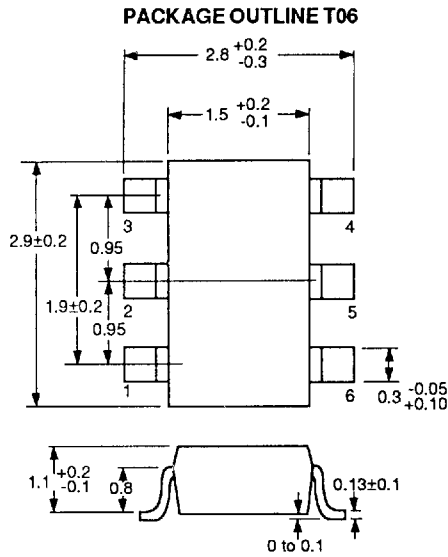
- 1: 500 MHz 7.4 - j 54.8
- 2: 900 MHz 5.9 - j 14.9
- 3: 1500 MHz 9.7 + j 34.3
- 4: 1900 MHz 85.6 + j 104.4



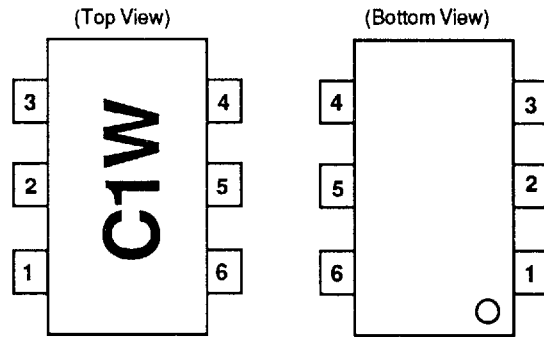
IF Port
V_{CC} = 3 V

- 1: 20 MHz 18.0 - j 8.5
- 2: 80 MHz 18.9 - j 5.7
- 3: 130 MHz 21.1 + j 13.5
- 4: 240 MHz 29.8 + j 26.2

OUTLINE DIMENSIONS (Units in mm)



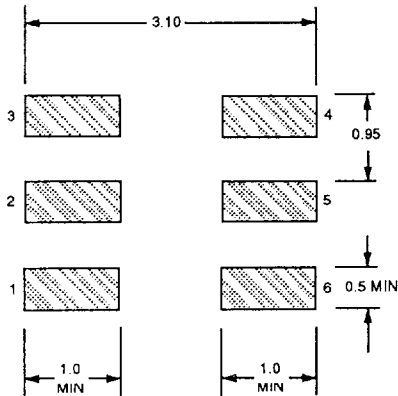
LEAD CONNECTIONS



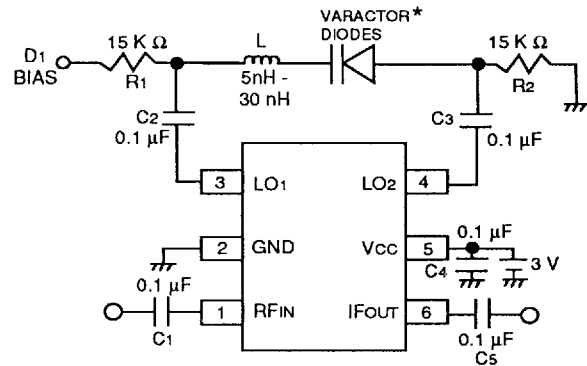
- 1. RF INPUT
- 2. GND
- 3. LO1
- 4. LO2
- 5. Vcc
- 6. IF OUTPUT

RECOMMENDED P.C.B. LAYOUT (Units in mm)

Note:
All dimensions are typical unless otherwise specified.



APPLICATION CIRCUIT EXAMPLE



* Recommended Varactor Diodes: Alpha SMV1204-4,
Toshiba 1SV186
or equivalent

ORDERING INFORMATION

| PART NUMBER | QTY |
|-------------|---------|
| UPC2756T-E3 | 3K/Reel |

Note:
Embossed Tape, 8 mm wide,
Pins 1, 2, 3 are in tape pull-out direction.

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