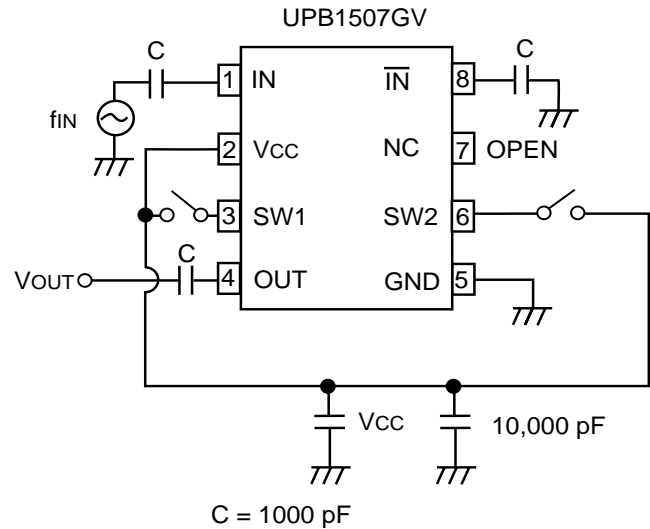


FEATURES

- HIGH FREQUENCY OPERATION TO 3 GHz
- SELECTABLE DIVIDE RATIO: ÷64, ÷128, ÷256
- LOW CURRENT CONSUMPTION: 19 mA @ 5 V
- SMALL PACKAGE: 8 pin SSOP
- AVAILABLE IN TAPE AND REEL

TEST CIRCUIT



DESCRIPTION

The UPB1506GV and UPB1507GV are Silicon MMIC digital prescalers manufactured with the NESAT™ IV silicon bipolar process. They feature high frequency response to 3 GHz, selectable divide-by-64, 128, or 256 modes, and operate on a 5 volt supply while drawing only 19 mA. The devices are housed in a small 8 pin SSOP package that contributes to system miniaturization. These devices are designed for use in a PLL synthesizer for DBS and CATV settop and WLAN applications.

ELECTRICAL CHARACTERISTICS (TA = -40 to +85°C, VCC = 4.5 to 5.5 V, Zs = 50Ω)

| PART NUMBER PACKAGE OUTLINE | | | UPB1506GV,UPB1507GV S08 | | |
|--------------------------------|--|------------------|----------------------------|-----------------|------|
| SYMBOLS | PARAMETERS AND CONDITIONS | UNITS | MIN | TYP | MAX |
| I _{CC} | Circuit Current | mA | 12.5 | 19 | 26.5 |
| f _{IN(U)} | Upper Limit Operating Frequency, P _{IN} = -15 to +6 dBm | GHz | 3.0 | | |
| f _{IN(L)1} | Lower Limit Operating Frequency, P _{IN} = -10 to +6 dBm | GHz | | | 0.5 |
| f _{IN(L)2} | Lower Limit Operating Frequency, P _{IN} = -15 to +6 dBm | GHz | | | 1.0 |
| P _{IN1} | Input Power, f _{IN} = 1.0 to 3.0 GHz | dBm | -15 | | +6 |
| P _{IN2} | Input Power, f _{IN} = 0.5 to 1.0 GHz | dBm | -10 | | +6 |
| V _{OUT} | Output Voltage, C _L = 0.8 pF | V _{P-P} | 1.2 | 1.6 | |
| V _{IN(H)} | Division Ratio Control Input High | V | | V _{CC} | |
| V _{IN(L)} | Division Ratio Control Input Low | V | | OPEN or GND | |

UPB1506GV, UPB1507GV

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|------------------|--------------------------------|-------|-------------------------------|
| V _{CC} | Supply Voltage | V | -0.5 to 6.0 |
| V _{IN} | Input Voltage | V | -0.5 to V _{CC} + 0.5 |
| P _{IN} | Input Power | dBm | +10 |
| P _D | Power Dissipation ² | mW | 250 |
| T _{OP} | Operating Temperature | °C | -45 to +85 |
| T _{STG} | Storage Temperature | °C | -55 to +150 |

Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- Mounted on a double-sided copper clad 50x50x1.6 mm epoxy glass PWB (T_A = +85°C).

RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | UNITS | MIN | TYP | MAX |
|-----------------|-----------------------|-------|-----|-----|-----|
| V _{CC} | Supply Voltage | V | 4.5 | 5.0 | 5.5 |
| T _{OP} | Operating Temperature | °C | -40 | +25 | +85 |

PRODUCT LINEUP

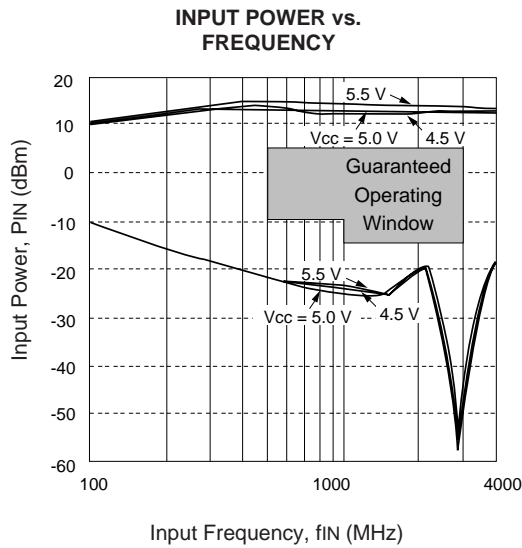
| Features (Division, Freq.) | Part No. | I _{CC} (mA) | f _{IN} (GHz) | V _{CC} (V) | Package |
|-------------------------------|------------------|-------------------------|--------------------------|------------------------|-----------|
| +512, +256, 2.5GHz | UPB586G | 28 | 0.5 to 2.5 | 4.5 to 5.5 | 8 pin SOP |
| +128, +64, 2.5GHz | UPB588G | 26 | 0.5 to 2.5 | 4.5 to 5.5 | |
| +256, +128, +64 3.0 GHz | UPB1505GR | 14 | 0.5 to 3.0 | 4.5 to 5.5 | |
| | UPB1506GV | 19 | 0.5 to 3.0 | 4.5 to 5.5 | 8 pin SOP |
| | UPB1507GV | 19 | 0.5 to 3.0 | 4.5 to 5.5 | |

PIN DESCRIPTIONS

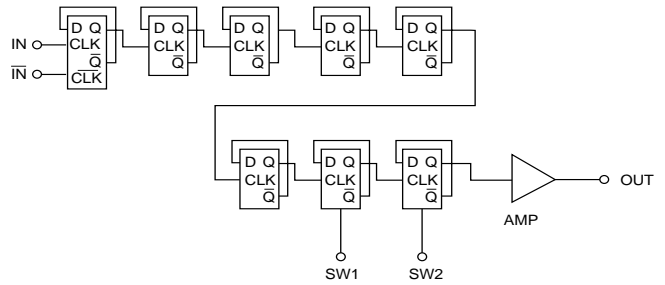
| Pin no. | | Pin Name | Applied Voltage (V) | Pin Voltage (V) | Description | | | | | | | | | | | | | | | |
|-----------|-----------|------------------------|---------------------|-----------------|---|--|--|-----|--|--|--|---|---|-----|---|-----|------|---|------|------|
| UPB1506GV | UPB1507GV | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | IN | – | 2.9 | Signal input pin. This pin should be coupled to the source with a capacitor (eg 1000 pF). | | | | | | | | | | | | | | | |
| 3 | 8 | $\overline{\text{IN}}$ | – | 2.9 | Signal input bypass pin. This pin must be equipped with a bypass capacitor (eg 1000 pF) to ground. | | | | | | | | | | | | | | | |
| 4 | 5 | GND | 0 | – | Ground pin. Ground pattern on the board should be formed as wide as possible to minimize ground impedance. | | | | | | | | | | | | | | | |
| 1 | 3 | SW1 | H/L | – | Divided ratio input pin. The ratio can be controlled by the following input data to these pins. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">SW2</th> </tr> <tr> <th colspan="2"></th> <th>H</th> <th>L</th> </tr> </thead> <tbody> <tr> <th rowspan="2">SW1</th> <th>H</th> <td>+64</td> <td>+128</td> </tr> <tr> <th>L</th> <td>+128</td> <td>+256</td> </tr> </tbody> </table> | | | SW2 | | | | H | L | SW1 | H | +64 | +128 | L | +128 | +256 |
| | | SW2 | | | | | | | | | | | | | | | | | | |
| | | H | L | | | | | | | | | | | | | | | | | |
| SW1 | H | +64 | +128 | | | | | | | | | | | | | | | | | |
| | L | +128 | +256 | | | | | | | | | | | | | | | | | |
| 6 | 6 | SW2 | | | These pins should be equipped with a bypass capacitor (e.g. 1000 pF) to ground. | | | | | | | | | | | | | | | |
| 8 | 2 | VCC | 4.5 to 5.5 | – | Power supply pin. This pin must be equipped with bypass capacitor (eg 1000 pF) to ground. | | | | | | | | | | | | | | | |
| 7 | 4 | OUT | – | 2.6 to 4.7 | Divided frequency output pin. This pin is designed as an emitter follower output. This pin can be connected to CMOS input due to 1.2 V _{p-p} MIN output. | | | | | | | | | | | | | | | |
| 5 | 7 | NC | – | – | No connection. This pin must be opened. | | | | | | | | | | | | | | | |

TYPICAL PERFORMANCE CURVES

(TA = +25°C unless otherwise noted)



INTERNAL BLOCK DIAGRAM



ORDERING INFORMATION

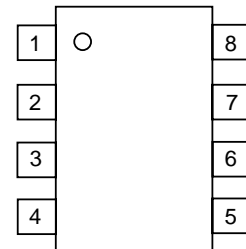
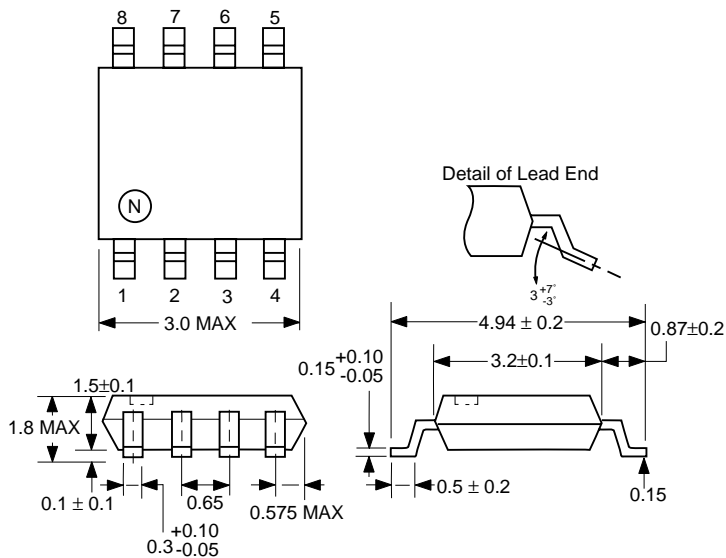
| PART NUMBER | QUANTITY | MARKING |
|--------------|-----------|---------|
| UPB1506GV-E1 | 1000/Reel | 1506 |
| UPB1507GV-E1 | 1000/Reel | 1507 |

NOTE:

- Embossed tape 8 mm wide.
Pin 1 is in the tape pull-out direction.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S08



PIN CONNECTIONS

| Pin No. | UPB1506GV | UPB1507GV |
|---------|-----------|-----------|
| 1 | SW1 | IN |
| 2 | IN | Vcc |
| 3 | IN-bar | SW1 |
| 4 | GND | OUT |
| 5 | OPEN | GND |
| 6 | SW2 | SW2 |
| 7 | OUT | OPEN |
| 8 | Vcc | IN-bar |

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