

FEATURES

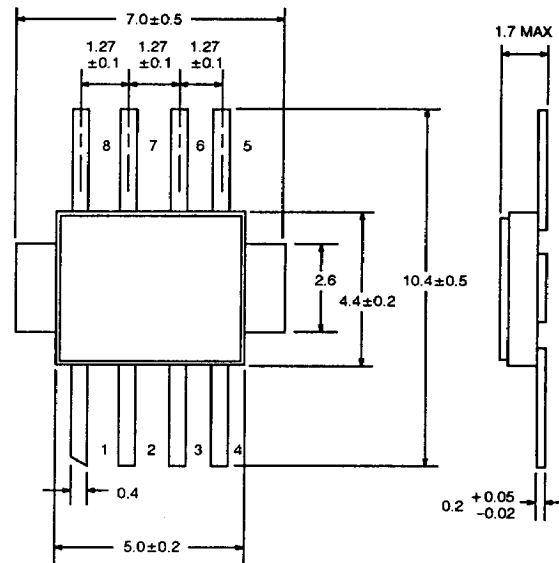
- **WIDE OPERATING FREQUENCY RANGE:**
 $f_{IN} = 1.5 \text{ GHz to } 5 \text{ GHz}$ ($T_A = 25^\circ\text{C}$)
- **SINGLE SUPPLY VOLTAGE:** $V_{DD} = +10 \text{ V}$
- **DIVISION RATIO OF 4**
- **HERMETICALLY SEALED PACKAGE ASSURES HIGH RELIABILITY**
- **GUARANTEED PERFORMANCE OVER AN AMBIENT TEMPERATURE RANGE OF -25°C TO $+75^\circ\text{C}$**

DESCRIPTION AND APPLICATIONS

The UPG501B/P is a GaAs divide-by-4 prescaler capable of operating up to 5 GHz. It is intended to be used in the frequency synthesizers of microwave communications systems and measurement equipment. The UPG501B/P is a static divider with 2 master-slave D-type flip-flops using Source-Coupled-FET-Logic (SCFL). It requires only one supply voltage to operate. It is housed in a hermetically sealed 8 lead ceramic flat package that is easy to install and provides high reliability in Mil-Spec environments.

OUTLINE DIMENSIONS (Units in mm)

OUTLINE BF08



PIN CONNECTIONS

- | | |
|-----------|----------|
| 1. OUTPUT | 5. INPUT |
| 2. NC* | 6. VGG** |
| 3. NC* | 7. NC* |
| 4. VDD | 8. GND |

FLANGE: GND

- *No Connection
**Normally open. This Terminal can be used to suppress self-oscillation.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

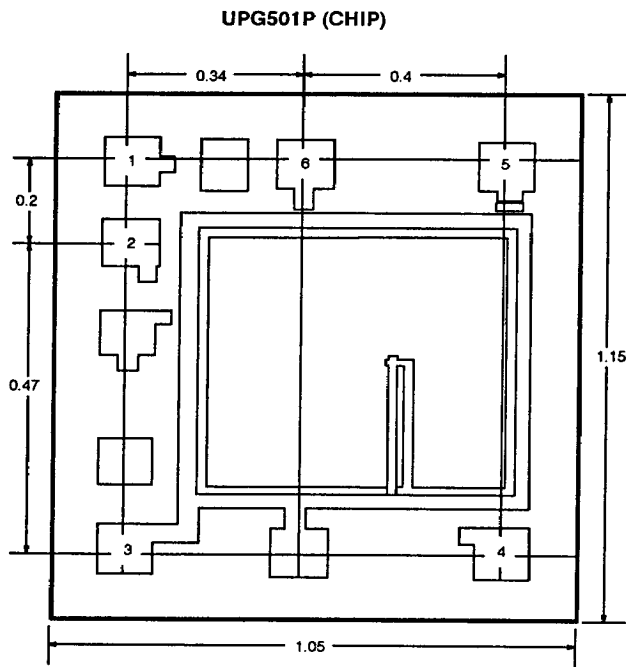
| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|-----------|--------------------------|------------------|-------------|
| V_{DD} | Supply Voltage | V | +12 |
| I_{DD} | Supply Current | mA | 150 |
| P_T | Total Power Dissipation* | W | 1.5 |
| P_{IN} | Input Power | dBm | +20 |
| T_{OP} | Operating Temperature | $^\circ\text{C}$ | -65 to +125 |
| T_{STG} | Storage Temperature | $^\circ\text{C}$ | -65 to +175 |

* $T_c = \leq 125^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = -25^\circ\text{C}$ to $+75^\circ\text{C}$, $V_{DD} = 10$, $V_{GG} = \text{Open}$)

| PART NUMBER PACKAGE OUTLINE | | | UPG501B, UPG501P BF08 | | |
|--------------------------------|--|------------|--------------------------|-----|-----|
| SYMBOLS | PARAMETERS AND CONDITIONS | UNITS | MIN | TYP | MAX |
| I_{DD} | Supply Current | mA | 50 | 70 | 90 |
| $f_{IN(U)}$ | Upper Limit of Input Frequency | GHz | 5 | 5.3 | |
| $f_{IN(L)}$ | Lower Limit of Input Frequency | dBm | | 0.7 | 1.5 |
| P_{IN} | Input Power, $f_{IN} = 1.5 \text{ to } 5 \text{ GHz}$ $f_{IN} = 1.5 \text{ to } 4.5 \text{ GHz}$ | dBm dBm | 10 6 | | 10 |
| P_{OUT} | Output Power at $f_{IN} = 5 \text{ GHz}$ | dBm | -1 | 2 | |

OUTLINE DIMENSIONS (Units in mm)



RECOMMENDED CHIP ASSEMBLY CONDITIONS

Die Attachment

Atmosphere: N₂ gas
 Temperature: 320 ± 3°C
 AuSn Preform: UPG501P 0.5 x 0.5 x 0.05^t
 (mm), 1 piece

The hard solder such as AuSi or AuGe which has a higher melting point than AuSn should not be used.

Base material:

CuW, Cu, KV
 Epoxy Die Attach is not recommended

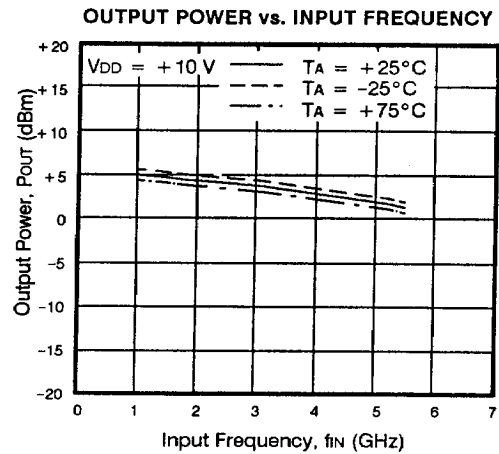
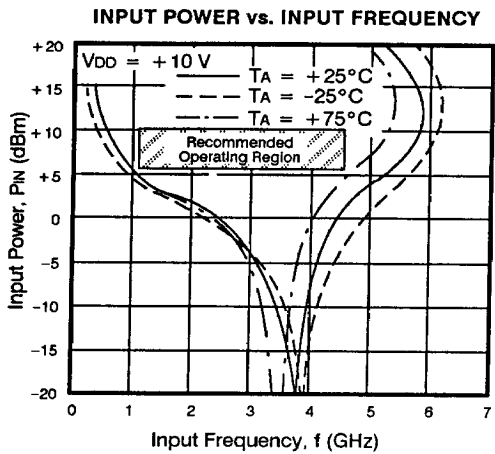
Bonding:

Machine: TCB
 Wire: 30 μm diameter Au wire
 Temperature: 260 ± 10°C
 Strength: 44 ± 5g
 Atmosphere: N₂ gas

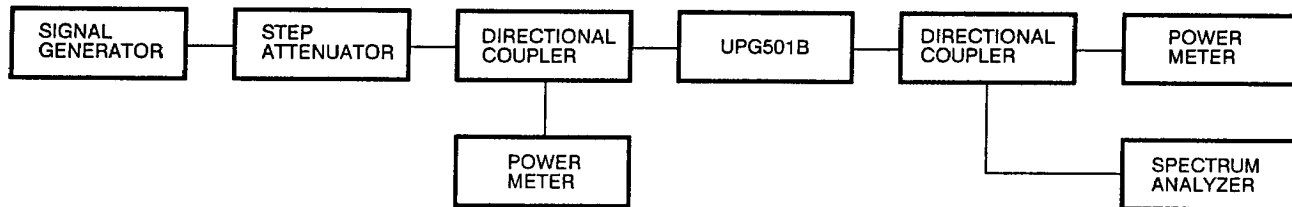
- 1. IN
- 2. V_{GG}
- 3. GND
- 4. OUT
- 5. V_{DD}
- 6. GND

Note: t = 0.14

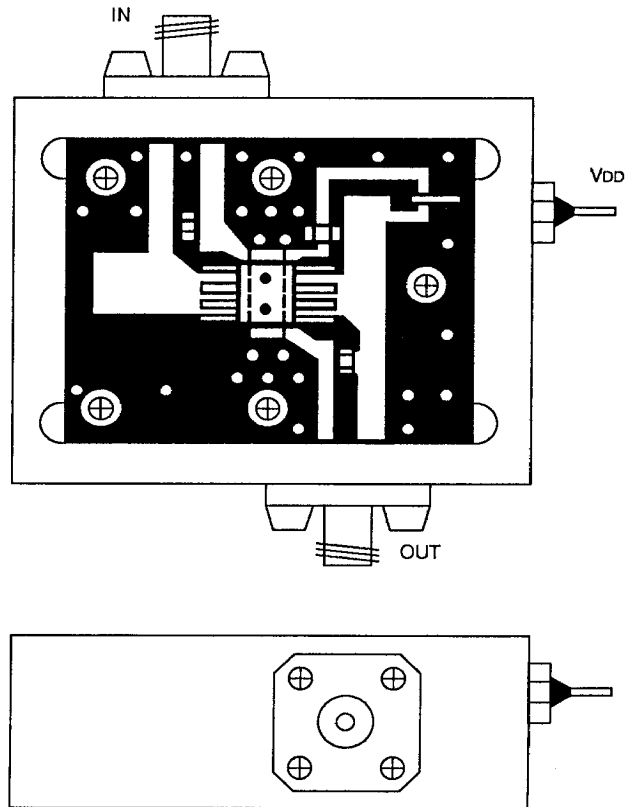
TYPICAL PERFORMANCE CHARACTERISTICS (T_A = 25°C)



TEST CIRCUIT BLOCK DIAGRAM



TEST JIG DRAWING



TEST CIRCUIT SCHEMATIC

