MITEL
SEMICONDUCTOR

# SP8902 (MP)

## 5GHZ ÷2 Fixed Modulus Divider
Preliminary Information

DS4375 Issue 1.4 September 1999

The SP8902 is one of a range of very high speed low power prescalers for professional applications. The dividing elements are static D type flip flops and therefore allow operation down to DC if the drive signal is a pulse waveform with fast risetime. The output stage has a differential current output and provides a direct drive into a 50 ohm load.

**Ordering Information**

SP8902/KG/MP1S (tubes)
SP8902/KG/MP1T (tape and reel)

### Features

- Very High Operating Speed
- Operation down to DC with Square Wave Input
- Silicon Technology for Low Phase Noise (Typically better than −140dBc/Hz at 1KHz)
- 5V Single Supply Operation
- Low Power Dissipation: 335mW (Typ.)
- Surface Mount Plastic Package

### Absolute Maximum Ratings

| | |
|---|---|
| Supply voltage, $V_{CC}$ | 6·5V |
| Storage temperature | −65°C to +150°C |
| Maximum junction temperature | +150°C |
| Prescaler input voltage | 2·5Vp-p |
| Operating temperature | KG−40°C to +85°C $T_{CASE}$ |

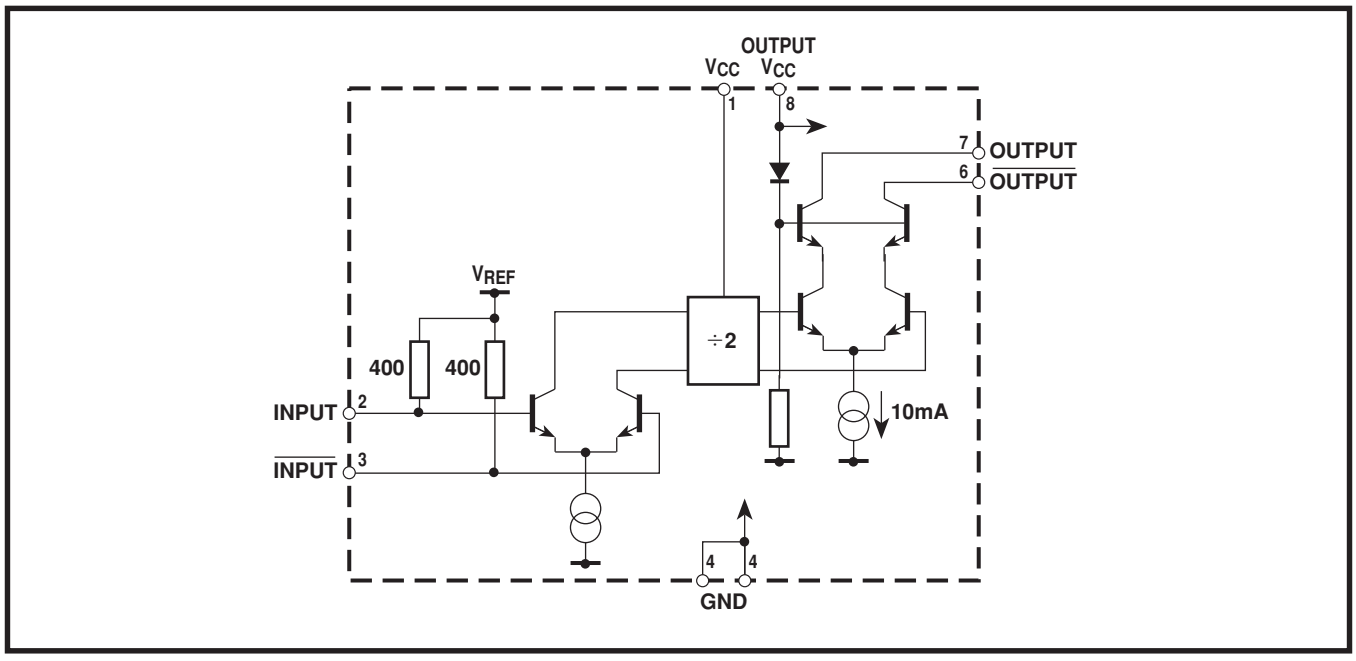



**Figure 1 block diagram**

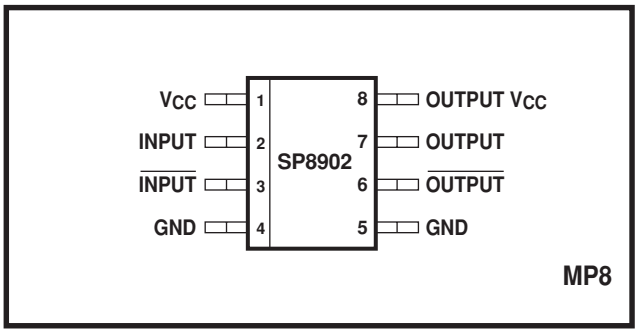



**Figure 2 Pin connections - top view**

## Electrical Characteristics

These characteristics are guaranteed by either production test or design over the following range of operating conditions unless otherwise stated: $T_{AMB}$ = −40°C to +85°C, $V_{CC}$ = 4·75V to 5·25V

| Characteristic | Pin | Value | | | Units | Conditions |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Supply current | 1, 8 | - | 67 | 92 | mA | |
| Input frequency | 2, 3 | 1·0 | - | 5·0 | GHz | RMS sinewave |
| Input sensitivity | 2, 3 | - | - | 180 | mVrms | $f_{IN}$ = 1GHz and 4.2GHz |
| Input sensitivity | 2, 3 | - | - | 570 | mVrms | $f_{IN}$ = 5GHz |
| Input overload | 2, 3 | 440 | - | - | mVrms | $f_{IN}$ = 1GHz and 3GHz |
| Input overload | 2, 3 | 700 | - | - | mVrms | $f_{IN}$ = 5.0GHz and 3.8GHz |
| Output voltage | 6, 7 | - | 0·5 | - | Vp-p | Into 50Ω pullup resistor |
| Output power | 6, 7 | −15·0 | +12 | +2·0 | dBm | $f_{IN}$ = 1GHz and 5GHz (see note 1 ) |

NOTE
1. Measured into 50Ω measuring instrument in parallel with 50Ω pullup resistor. See Figure 5.

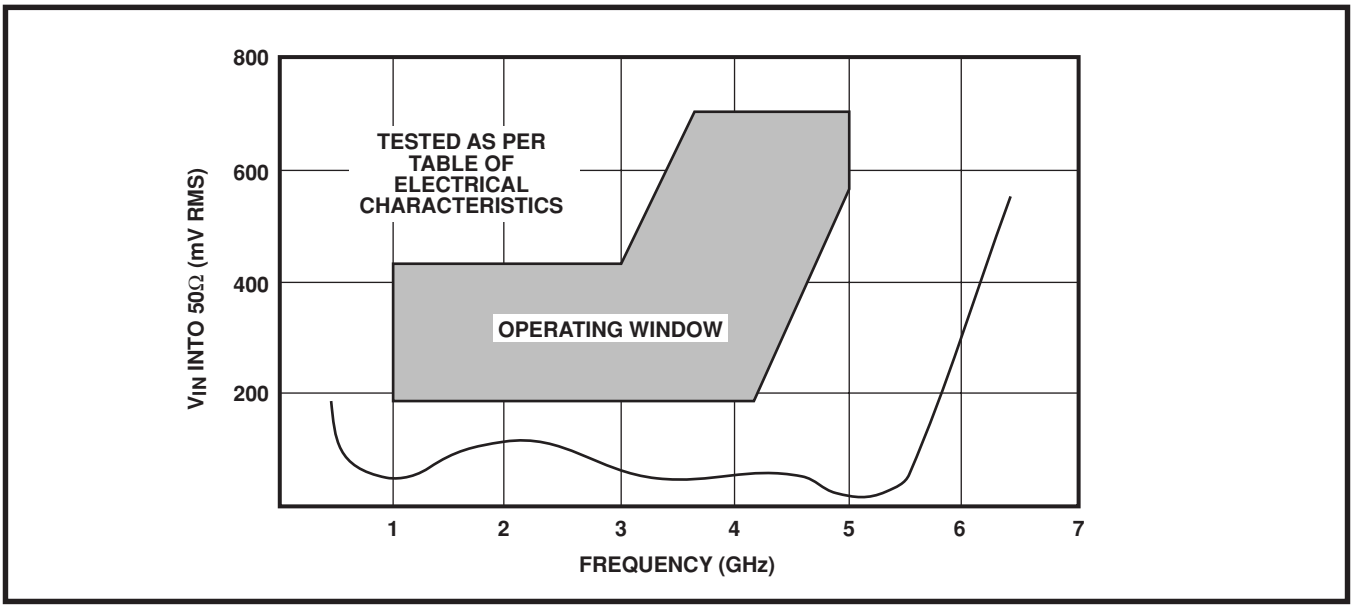



**Figure3 Typical input sensitiviy (sinewave drive)**

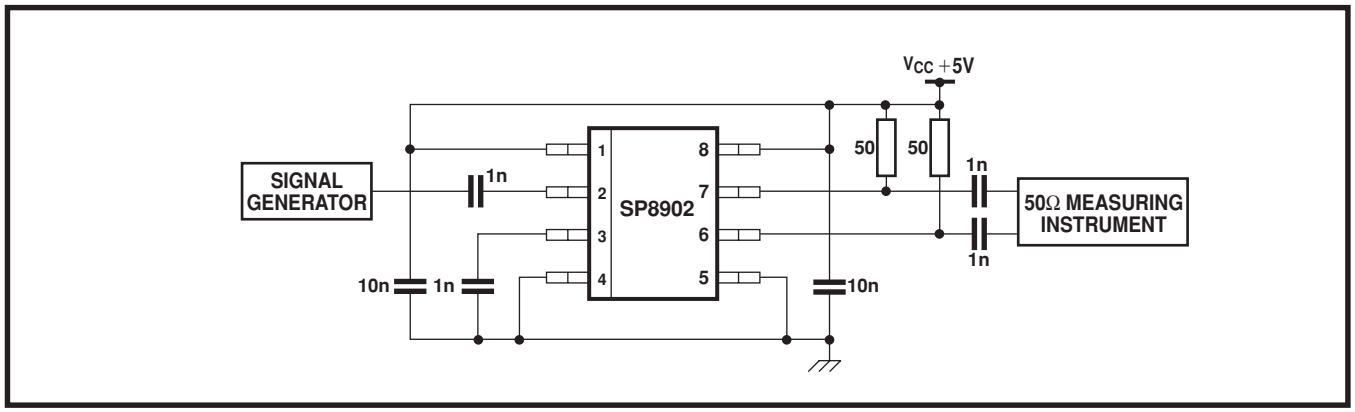



**Figure 4 Typical application and test circuit**

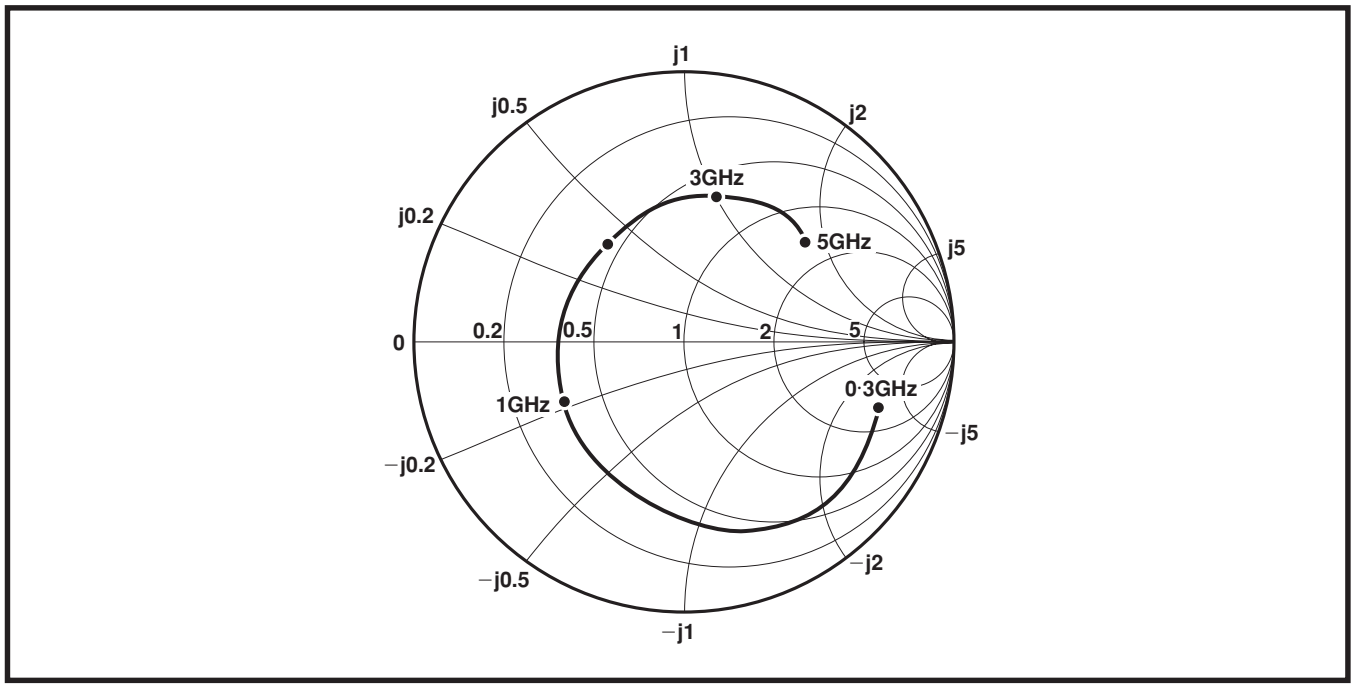



**Figure 5 Typical input impedance**

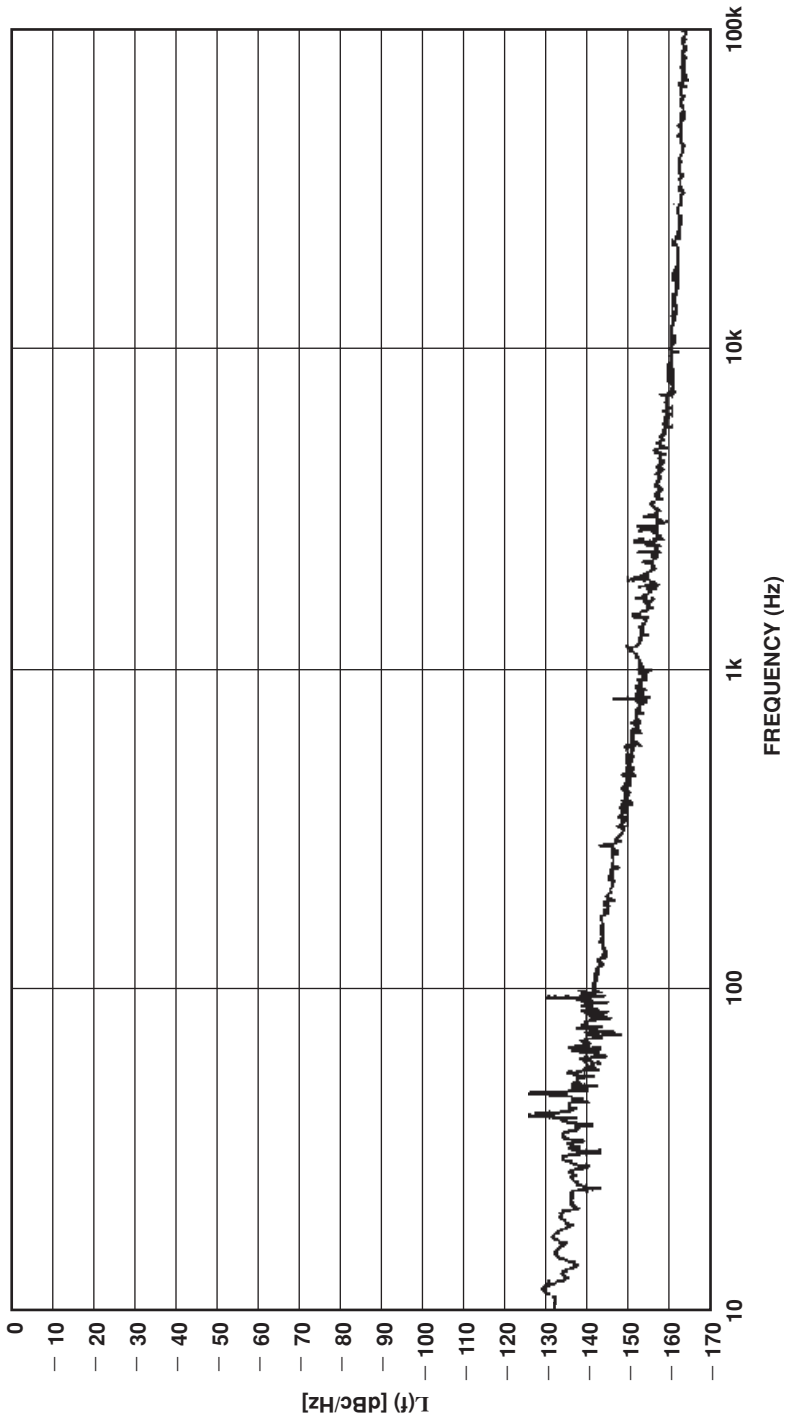
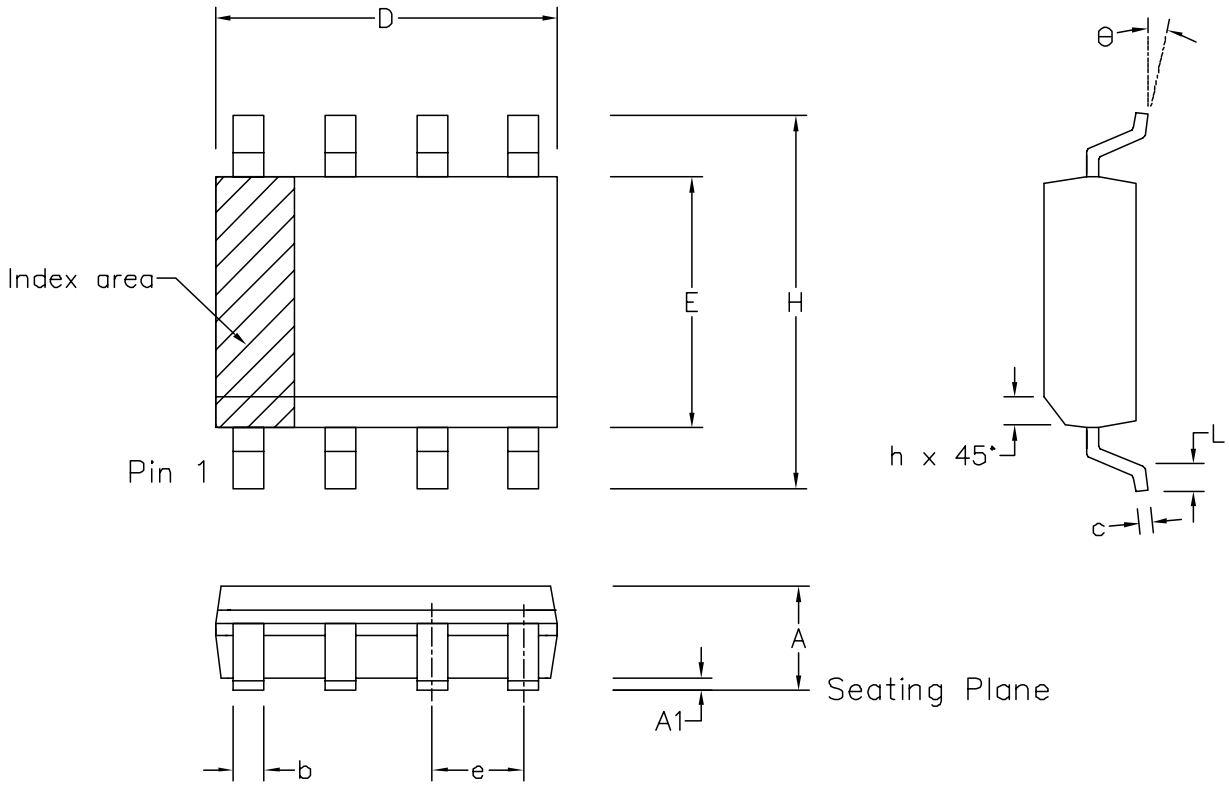



**Figure 6 Typical phase noise, input frequency = 3GHz**




| | Min mm | Max mm | Min inch | Max inch |
|---|---|---|---|---|
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.197 |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| L | 0.40 | 1.27 | 0.016 | 0.050 |
| e | 1.27 BSC | | 0.050 BSC | |
| b | 0.33 | 0.51 | 0.013 | 0.020 |
| c | 0.19 | 0.25 | 0.008 | 0.010 |
| Θ | 0° | 8° | 0° | 8° |
| h | 0.25 | 0.50 | 0.010 | 0.020 |
| | Pin Features | | | |
| N | 8 | | 8 | |
| Conforms to JEDEC MS-012AA Iss. C | | | | |

Notes:
1. The chamfer on the body is optional. If it not present, a visual index feature, e.g. a dot, must be located within the cross-hatched area.
2. Controlling dimension are in inches.
3. Dimension D do not include mould flash, protusion or gate burrs. These shall not exceed 0.006" per side.
4. Dimension E1 do not include inter-lead flash or protusion. These shall not exceed 0.010" per side.
5. Dimension b does not include dambar protusion/intrusion. Allowable dambar protusion shall be 0.004" total in excess of b dimension.



ORIGINATING SITE: SWINDON

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MITEL SEMICONDUCTOR

Title: Package Outline Drawing for 8 lds SOIC(N)-0.150" Body Width (MP)

Drawing Number
GPD00010


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