

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  $-140\text{dBc/Hz}$  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          | $-65^{\circ}\text{C}$ to $+150^{\circ}\text{C}$              |
| Maximum junction temperature | $+150^{\circ}\text{C}$                                       |
| Prescaler input voltage      | 2.5Vp-p  |
| Operating temperature        | KG $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ $T_{CASE}$ |

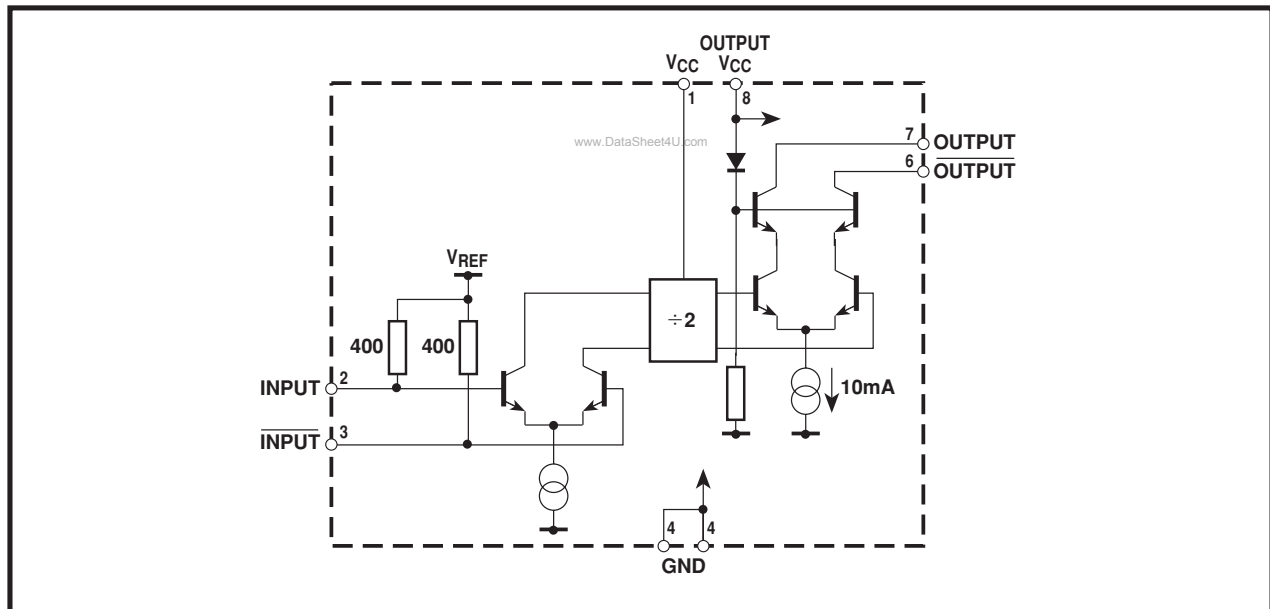


Figure 1 block diagram

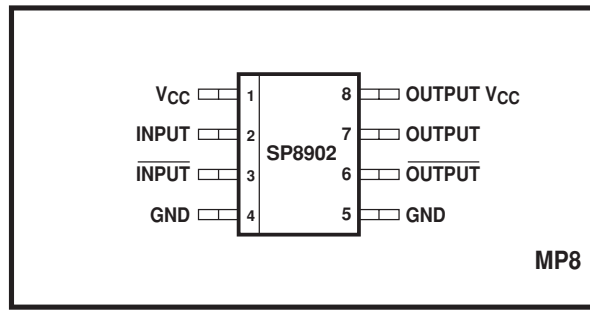


Figure 2 Pin connections - top view

**Electrical Characteristics**

These characteristics are guaranteed by either production test or design over the following range of operating conditions unless otherwise stated:  $T_{AMB} = -40^{\circ}C$  to  $+85^{\circ}C$ ,  $V_{CC} = 4.75V$  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 $50\Omega$ pullup resistor         |
| Output power      | 6, 7 | -15.0 | +12  | +2.0 | dBm   | $f_{IN} = 1GHz$ and $5GHz$ (see note 1) |

NOTE

1. Measured into  $50\Omega$  measuring instrument in parallel with  $50\Omega$  pullup resistor. See Figure 5.

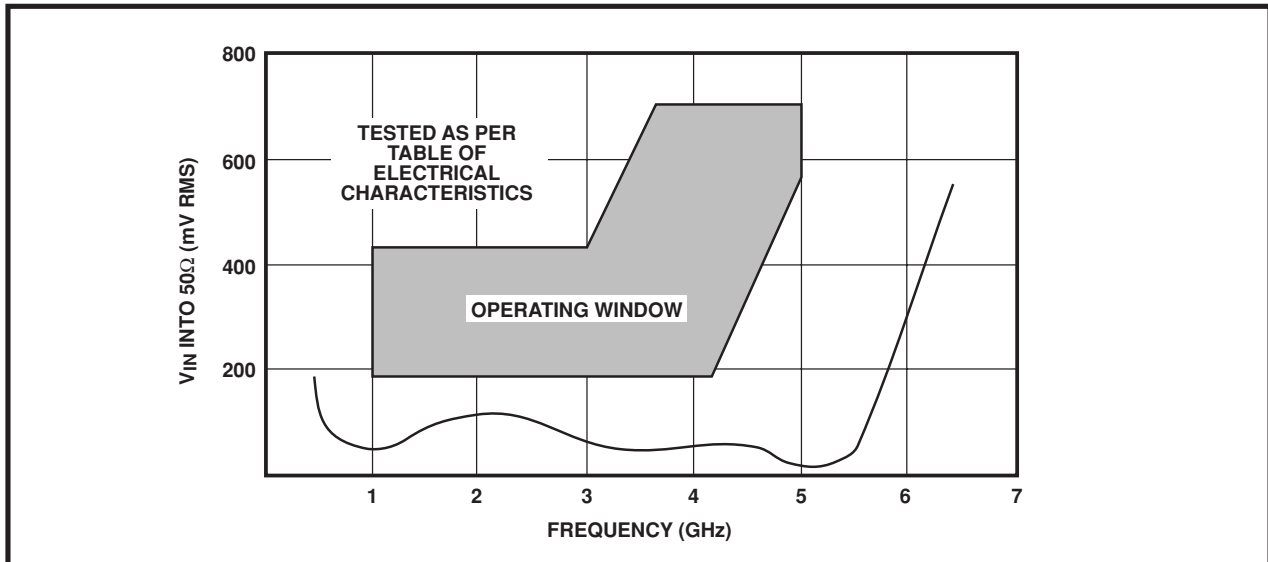


Figure3 Typical input sensitivity (sinewave drive)

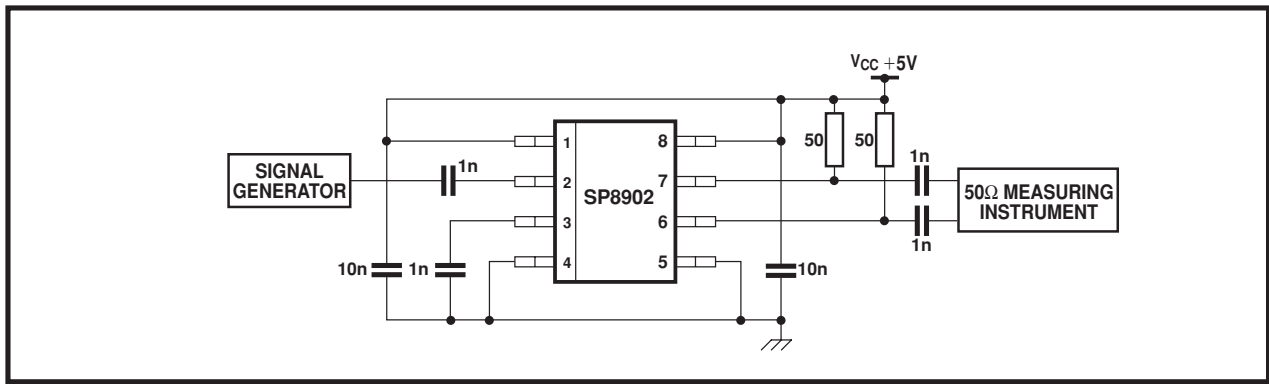


Figure 4 Typical application and test circuit

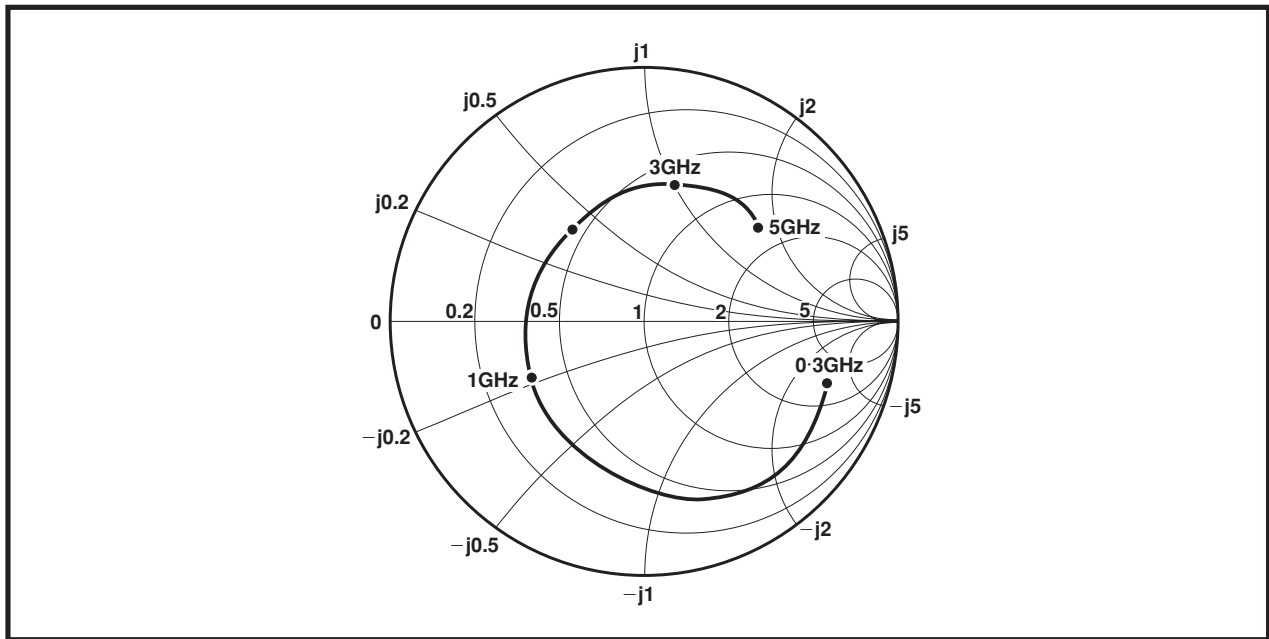


Figure 5 Typical input impedance

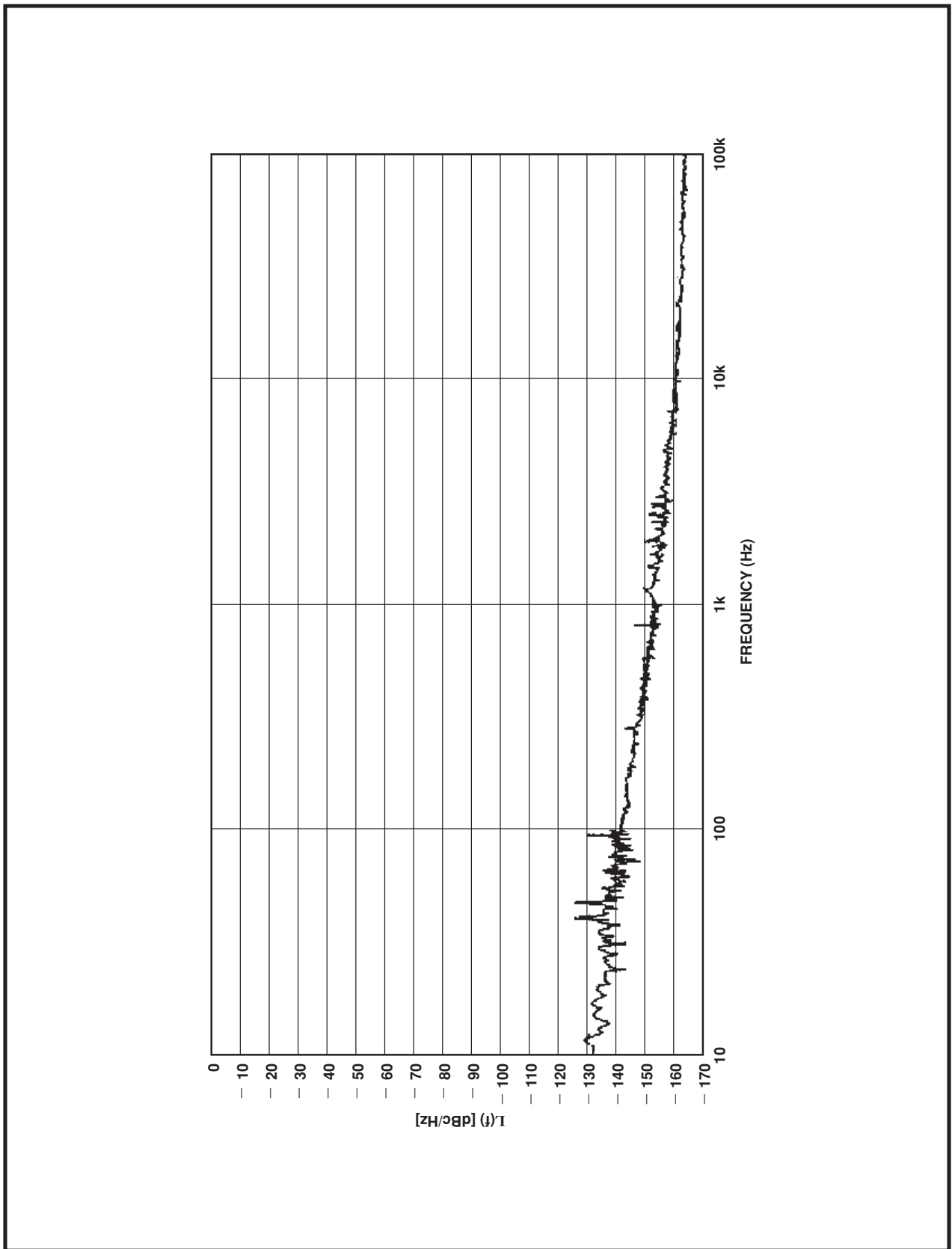
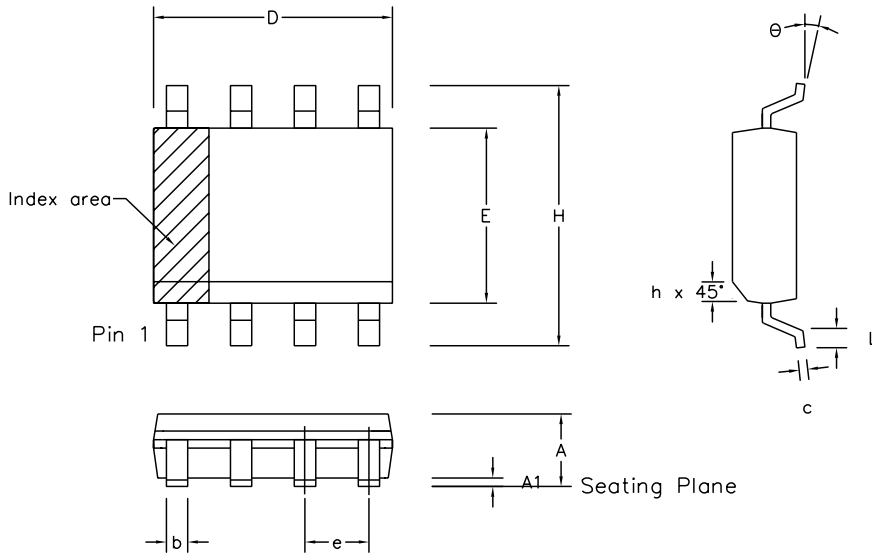



Figure 6 Typical phase noise, input frequency = 3GHz



|                                   | Min<br>mm | Max<br>mm | Min<br>inch | Max<br>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 not present, a visual index feature, e.g. a dot, must be located within the cross-hatched area.
2. Controlling dimensions 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.

|   |        |         |         |        |         |   |                        |   |
|---|--------|---------|---------|--------|---------|---|------------------------|---|
| © Zarlink Semiconductor 2002 All rights reserved. |        |         |         |        |         |  | Package Code           | DC  |
| ISSUE   | 1      | 2       | 3       | 4      | 5       |   | Previous package codes | Package Outline for 8 lead SOIC (0.150" Body width) |
| ACN   | 6745   | 201936  | 202595  | 203705 | 212424  |   | MP / S                 |   |
| DATE  | 5Apr95 | 27Feb97 | 12Jun97 | 9Dec97 | 22Mar02 |   |                        |   |
| APPRD.  |        |         |         |        |         |   |                        | GPD00010  |



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