

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

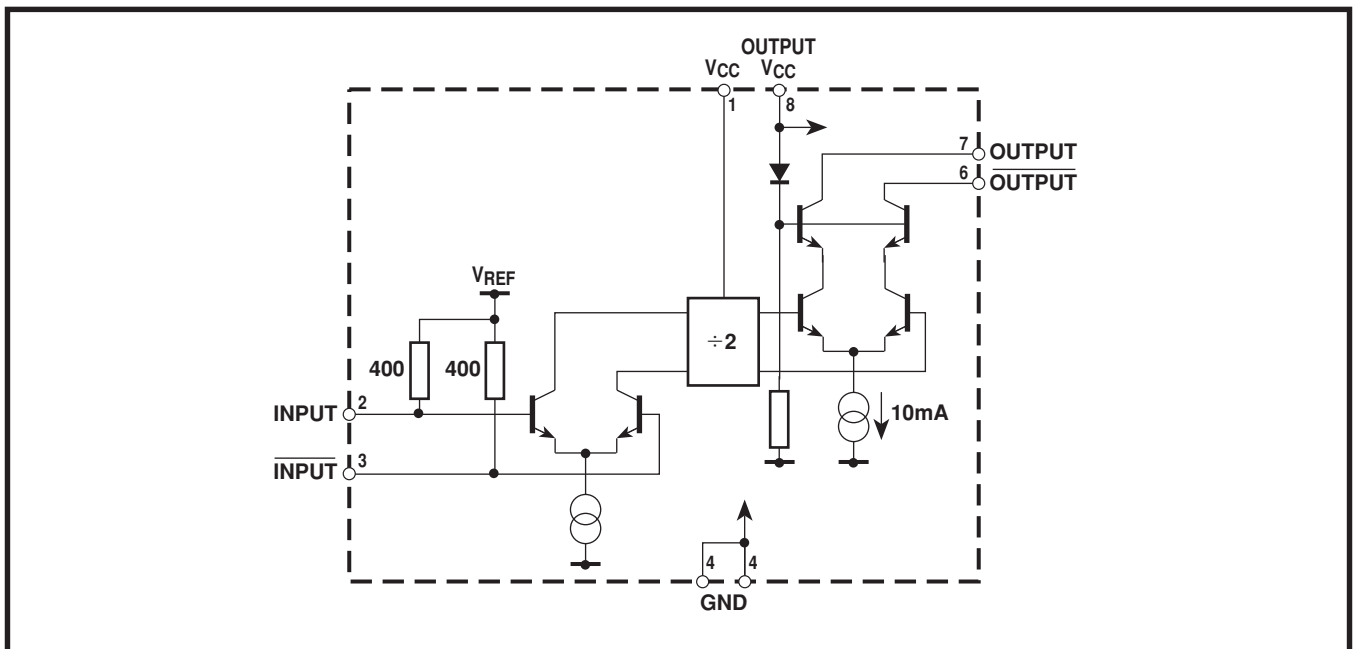


Figure 1 block diagram

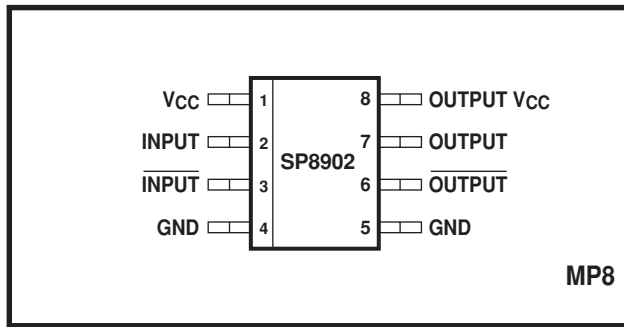


Figure 2 Pin connections - top view

Electrical Characteristics

These characteristics are guaranteed by either production test or design over the following range of operating conditions unless otherwise stated: $T_{AMB} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{CC} = 4.75\text{V}$ 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 | $f_{IN} = 1\text{GHz}$ and 4.2GHz |
| Input sensitivity | 2, 3 | - | - | 570 | mVrms | $f_{IN} = 5\text{GHz}$ |
| Input overload | 2, 3 | 440 | - | - | mVrms | $f_{IN} = 1\text{GHz}$ and 3GHz |
| Input overload | 2, 3 | 700 | - | - | mVrms | $f_{IN} = 5.0\text{GHz}$ 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 | $f_{IN} = 1\text{GHz}$ and 5GHz (see note 1) |

NOTE

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

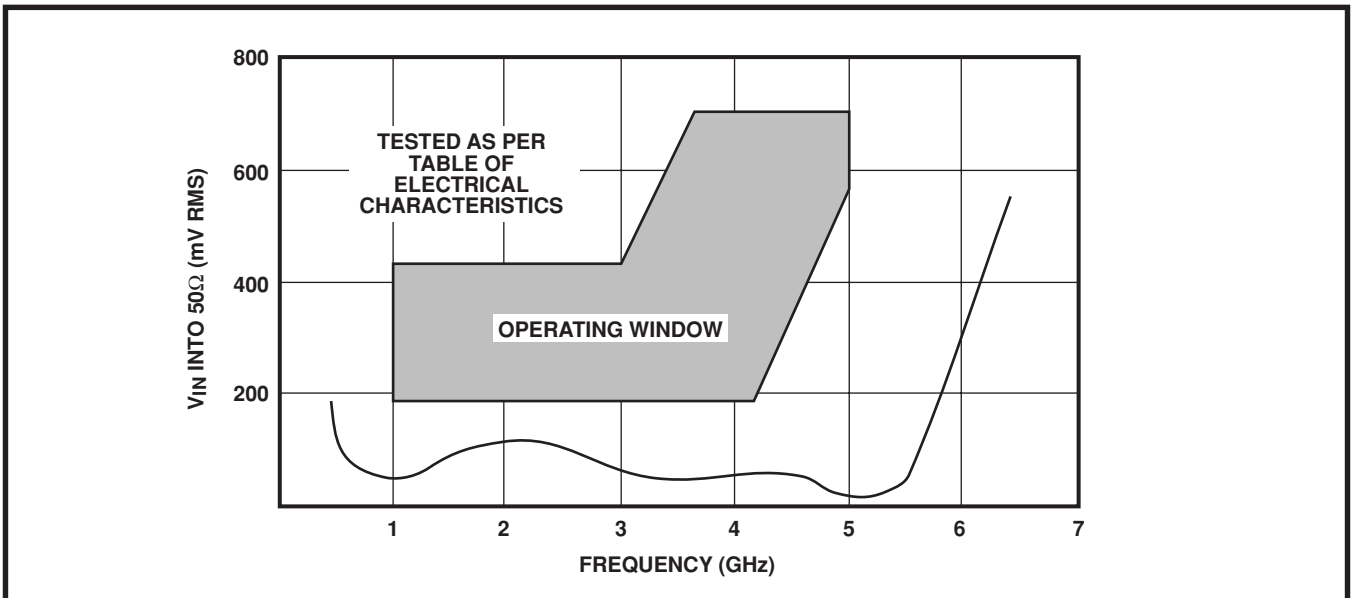


Figure3 Typical input sensitivity (sinewave drive)

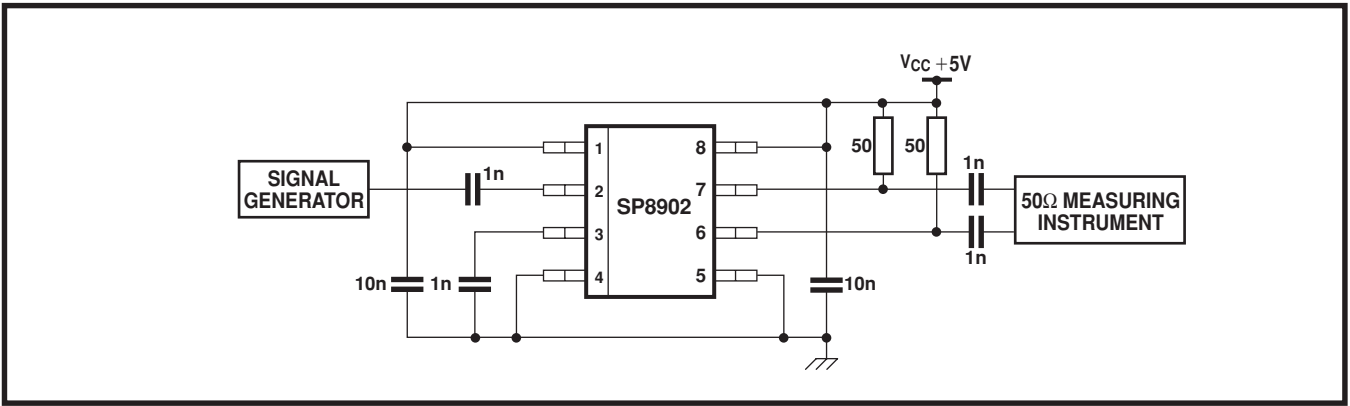


Figure 4 Typical application and test circuit

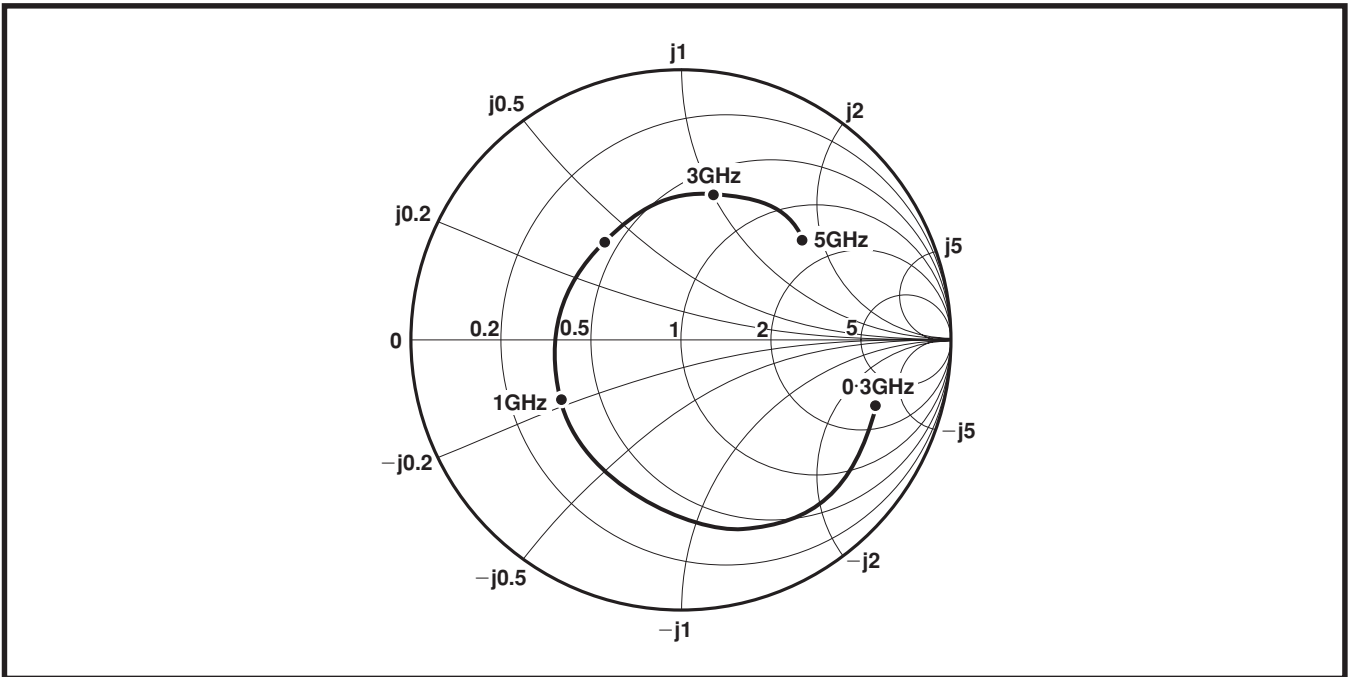


Figure 5 Typical input impedance

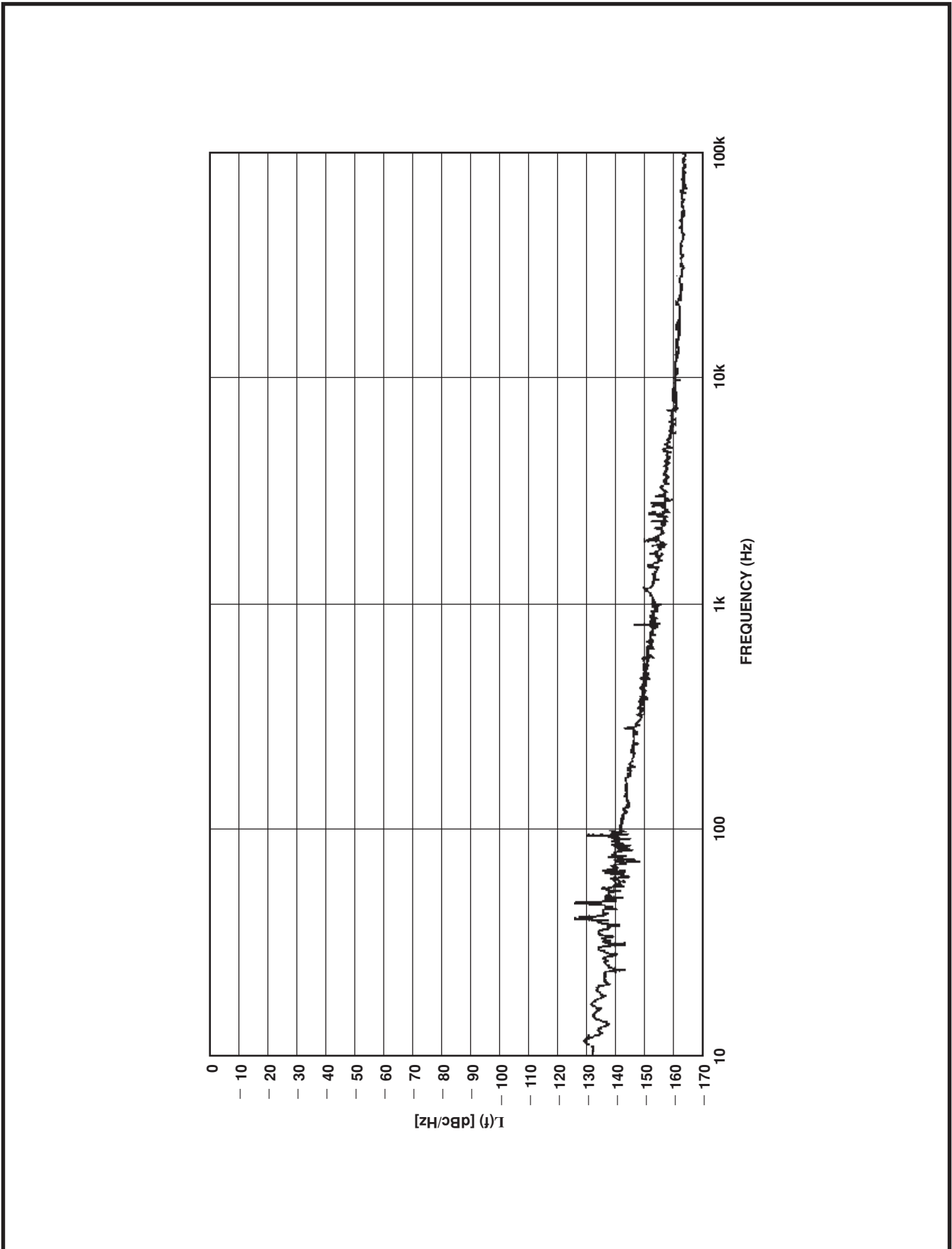
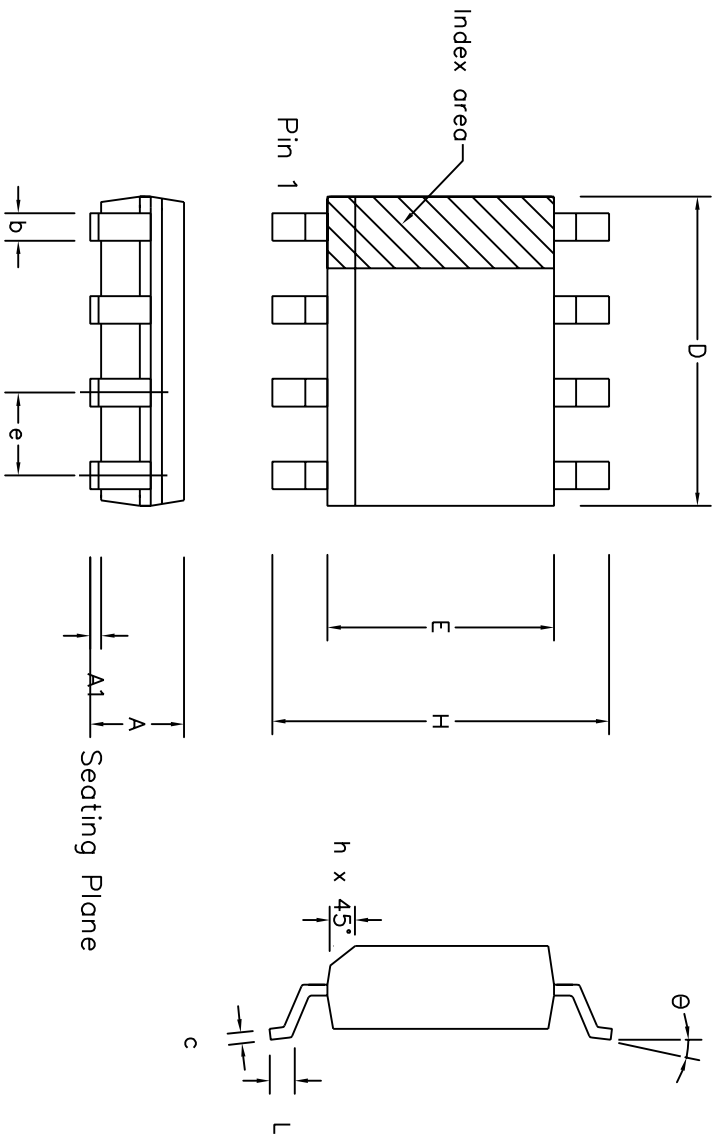


Figure 6 Typical phase noise, input frequency = 3GHz



| | Min 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 |
| O | 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.

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Previous package codes

MP / S

Package Code DC

Package Outline for
8 lead SOIC
(0.150" Body width)

GPD00010



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