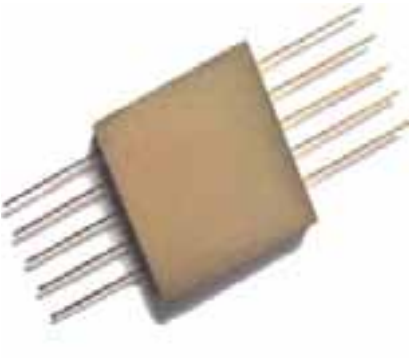
NFP1003 Hermetic Microwave Surface Mount Noise Source

100 MHz to 3 GHz

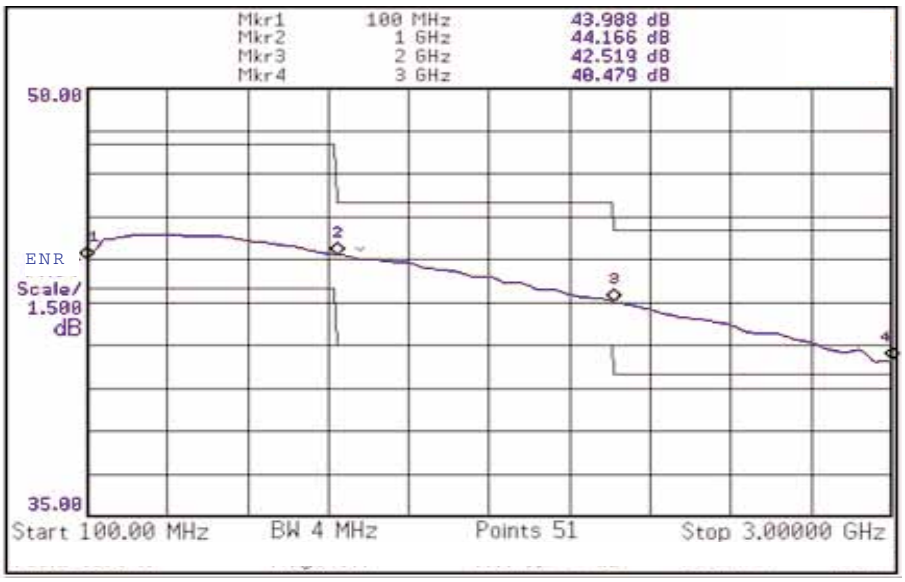


The NFP1003 Noise Source features high ENR output in a small SMT package, ideal for military and other harsh environment applications.

The high output can allow for significant circuit loss such as that caused by power splitters, switches and directional couplers, and still have enough noise signal without additional amplification.

All biasing circuitry is built-in making it easy to design into your system. The NFP1003 features a built-in voltage regulator for highly stable output even if your DC supply lines are not.

NFP1003 Typical Data



Specifications

- Frequency: 100 MHz to 3GHz
- ENR:
  - 100 MHz - 1 GHz 43 - 48 dB
  - 1 GHz - 2 GHz 41 - 46 dB
  - 2 GHz - 3 GHz 40 - 45 dB
- ENR Temp COEF: 0.04 db/^{o}C max
- VSWR: 2.0:1 max, On or Off state
- BIAS: +12 to +28Vdc @50mA max
- Hermetic Seal: 1x10^{-7} atm cc/s
- Operating Temp: -40 to +85 C
- Storage Temp: -54 to +125 C

Common Applications:

Using noise for built-in test: There are two primary uses for employing a noise signal for built-in test.

1. Noise Temperature (noise figure) or sensitivity testing: This test uses the noise source to supply a known excess noise ratio (ENR) to a device under test for a Y-factor measurement. By taking two receiver readings, one with the noise on and one with it off, Y-factor can be determined. By knowing the ENR and Y-factor, one can calculate noise temperature (figure) or sensitivity.
2. Frequency Response: The noise source being broadband can be used as a replacement of a swept source to calculate frequency response of a receiver or other device. By putting in a known spectral signal at the input and taking a reading at the output, one can determine the gain or loss over frequency of the entire system. Noise sources are inherently extremely stable devices. In addition, the circuitry is much simpler than a swept source which increases reliability and lowers cost.

For more information on using noise for built-in-test, read the Feb 2004 Microwave Journal article authored by Patrick Robbins of Micronetics.

http://www.micronetics.com/articles/microwave_journal_02-04.pdf

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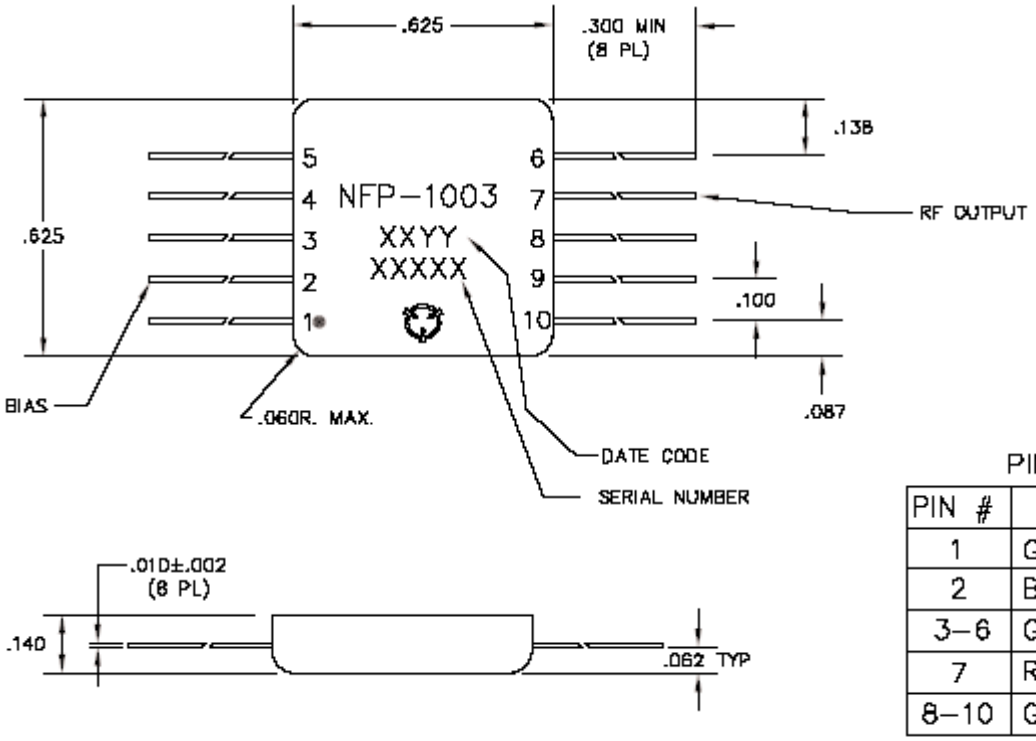
Outline Drawing



PIN TABLE

PIN #	FUNCTION
1	GROUND
2	BIAS
3–6	GROUND
7	RF OUTPUT
8–10	GROUND

Useful Noise Equations

Calculating Y-Factor: $Y_{Fact} = N_2 / N_1$ Where N_2 is measured power output with noise source on and N_1 is the measured power output with noise source off.

Calculating noise figure from ENR and Y-Factor: NF(dB) = ENR (dB) - 10 log10 (Y_{Fact} -1)

Converting ENR to noise spectral density (N_0): 0 dB ENR = -174 dBm/Hz

Calculating noise power in a given bandwidth (BW) from noise spectral density: Power (dBm) = N_0 + 10log(BW)

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