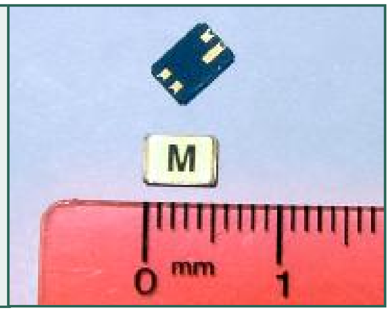
SMN3018

SURFACE MOUNT NOISE SOURCE 200 MHz TO 6.0 GHz

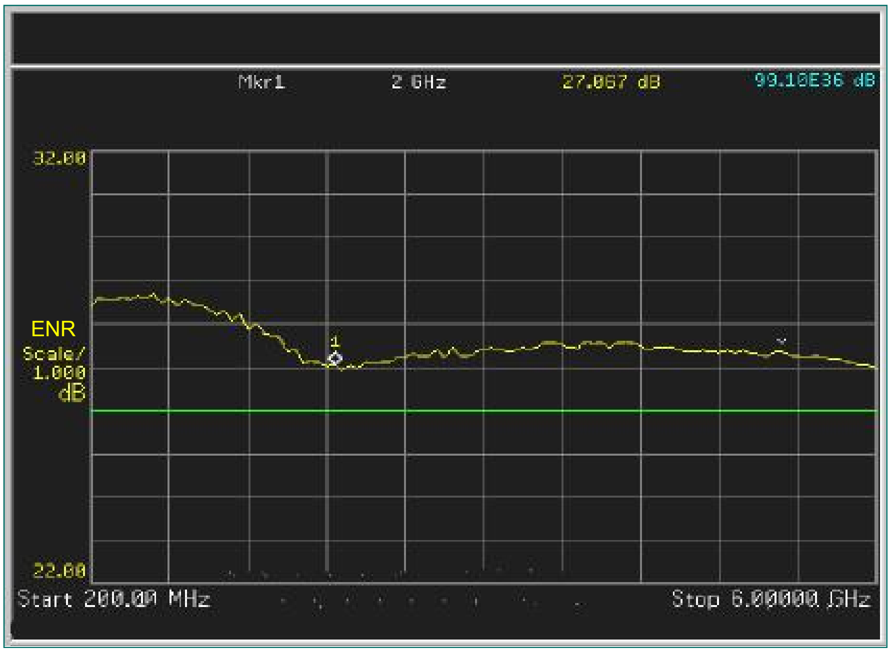
The world's
smallest packaged
noise source



DESCRIPTION

The SMN3018 noise module is the world's smallest packaged noise source. This 0.150" x 0.220" surface mount device has all the biasing circuitry built-in so all that is required is a DC source and ground. This module is designed for built-in-test (BIT) and calibration of receivers. The module is broadband, 200 MHz to 6.0 GHz for a wide range of receiver applications from cellular base stations to radio-astronomy telescopes.

SMN3018 DATA



SUITABLE FOR HIGH VOLUME PRODUCTS:

The SMN3018 noise source being surface mount, having a small footprint and available on tape and reel make them ideal for production manufacturing. Traditionally packaged microwave noise sources have been large and costly rendering them unsuitable for all but large expensive systems. The benefits of having built-in test and calibration can now be brought to mass produced products so they can now realize the benefits of an onboard noise source.

APPLICATION NOTE

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

SPECIFICATIONS

- Frequency: 200 MHzto 6.0 GHz
- ENR: 26 dB min
- Flatness: 2 dB max
- Impedance: 50 ohms
- Bias: +12 Vdc models
  +15 Vdc models
- Voltage Sens: 1.0 dB/V (typ)
- Temp Sens: 0.015 dB/^{o}C (typ)
- Current: 12 mA max
- Operating Temp: -40 to +125^{o}C
- Storage Temp: -54 to +150^{o}C

MICRONETICS
NOISE PRODUCTS

SMN3018

Surface Mount Noise Source 200 MHz - 6.0 GHz

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

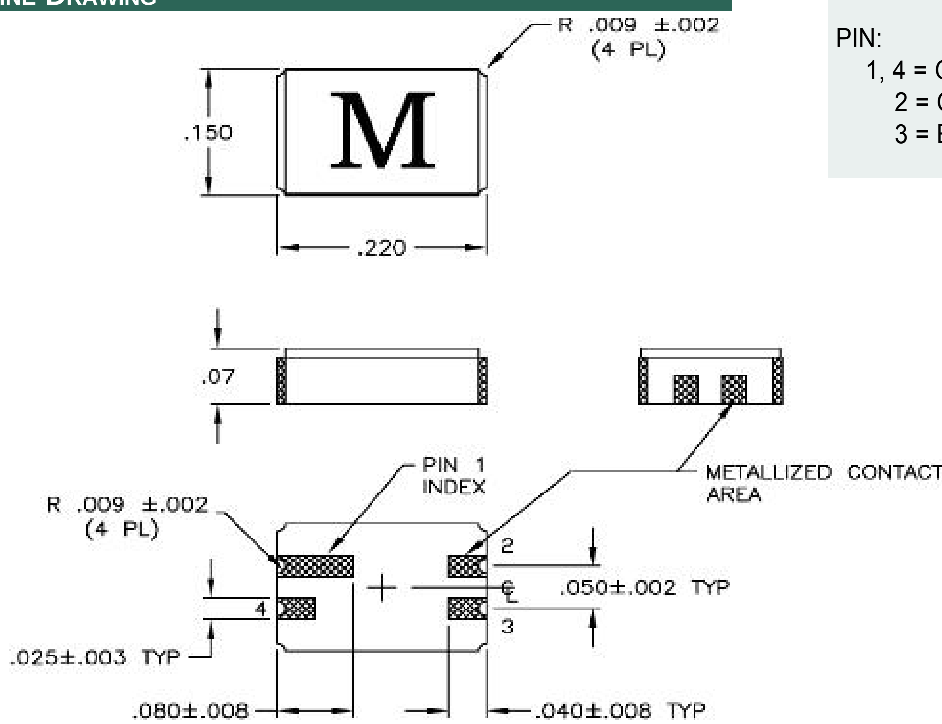
Calculating noise power in a given bandwidth (BW) from noise spectral density:
Power (dBm) = N_0 + 10log(BW)

How To Order

Model # S M N 3 0 1 8 - X 1 D

Nominal Voltage
D = 12 V
E = 15 V

Package Outline Drawing



PIN:
1, 4 = Ground
2 = Output
3 = Bias

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