

# SMN7109

## 1/2 INCH SURFACE MOUNT AMPLIFIED NOISE SOURCE

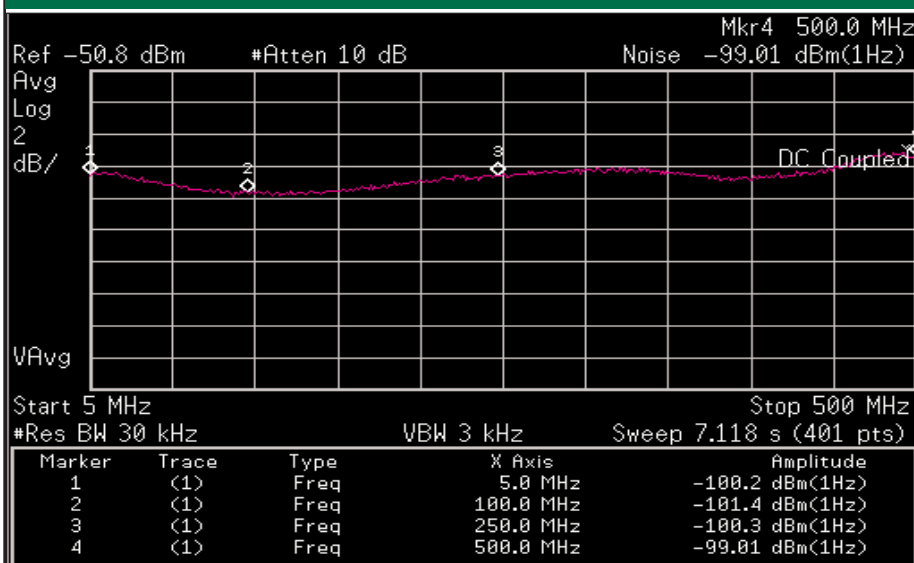
## 5 MHz TO 500 MHz



### DESCRIPTION

The SMN7109 noise module is designed for a wide range of applications. It features high noise output amplitude for uses ranging from encryption to jamming. All biasing and amplification circuitry is built-in making it easy to design into your system. It features a built-in voltage regulator for highly stable output even if your DC supply lines are not.

### SMN7109 TYPICAL DATA



### SUITABLE FOR HIGH VOLUME PRODUCTS:

The SMN7109 noise sources being surface mount, having a small footprint and available on tape and reel, make them ideal for production manufacturing. Traditionally packaged noise sources have been large and costly rendering them less suitable for all but the more expensive, exotic systems. Noise can now be thought of as lower cost, more reliable, smaller and an easier to implement alternative to costly microprocessor based solutions such as PN generators, arbitrary waveform generators and DSP processors.

### APPLICATION NOTE

#### Common Noise Applications

- Built-in IF Testing:** Highly stable flat over frequency noise sources serve to provide built-in test for an IF subsystem. By injecting a stable signal reference through the IF chain, one can calibrate the gain/loss and frequency response. In addition, the noise source can be used to set up Eb/No for built-in stimulated BER testing of digital demodulation.
- Barrage Jamming:** The noise source is fed into the tuning port of a VCO via a bias tee and a positive DC voltage. The random nature of noise makes the output of the VCO to hop around in a given frequency band randomly making an ideal jamming signal. Further circuitry can be used between the noise source and tuning port to shape the noise probability density function (PDF) for the desired jamming effect.
- Random Number Generation for Encryption:** Noise sources being truly random (not pseudorandom) give the ultimate in secure communication because of their ability to generate a truly random number pattern. This can be used to seed an encryption key for authentication. The noise signal can be fed directly into an A/D converter for sampling or a simpler technique might use a comparator. Further shaping of the noise is often employed whether either analog if in front of the A/D converter or afterwards using DSP.

### SPECIFICATIONS

- Frequency: 5 MHz to 500 MHz
- Noise Power Spectral Density ( $N_0$ ): -103 dBm/Hz (min)
- Noise Power (N): -16 dBm
- Spectral Flatness: 3 dB (total window)
- Bias: 12 Vdc Internally Regulated
- Current Draw: 50 mA Max
- Peak Factor: 5:1
- Operating Temp: -55 to +85 C
- Storage Temp: -55 to 125 C

**MICRONETICS**  
NOISE PRODUCTS

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## USEFUL NOISE EQUATIONS

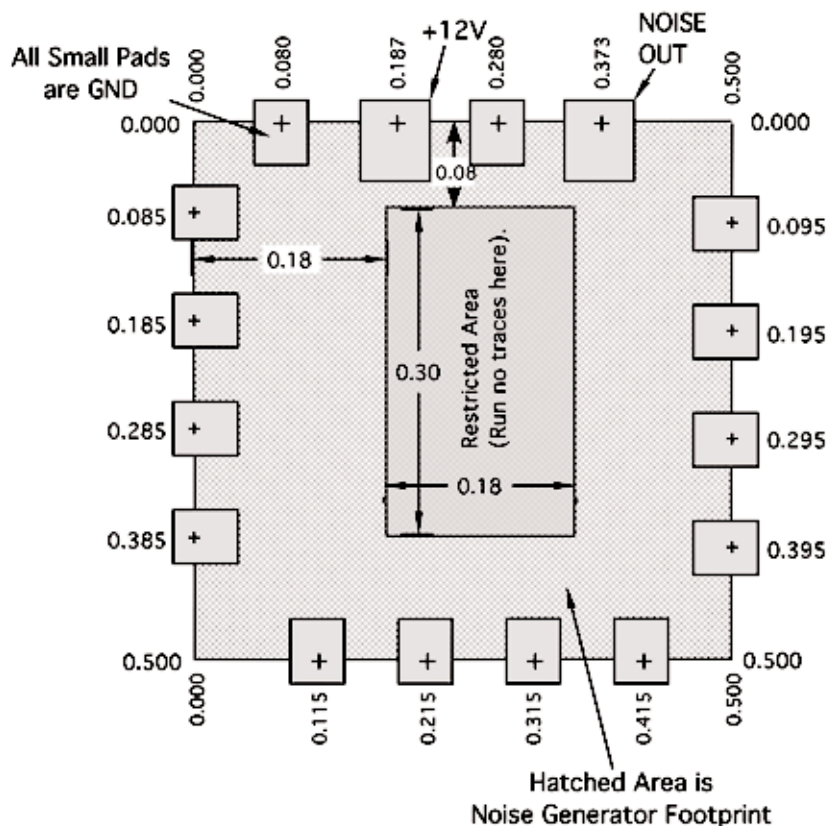
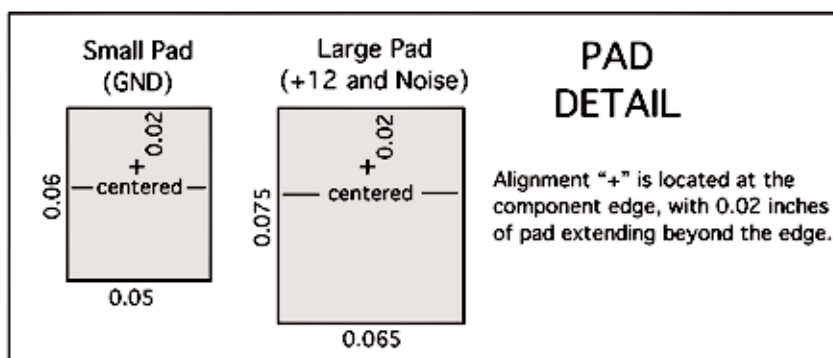
Converting ENR to noise spectral density ( $N_0$ ): 0 dB ENR = -174 dBm/Hz

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

## PAD OUTLINE DRAWING

NOISE GENERATOR ("HIGH")  
SURFACE MOUNT PAD LAYOUT

VIEWED FROM TOP  
ALL DIMENSIONS IN INCHES



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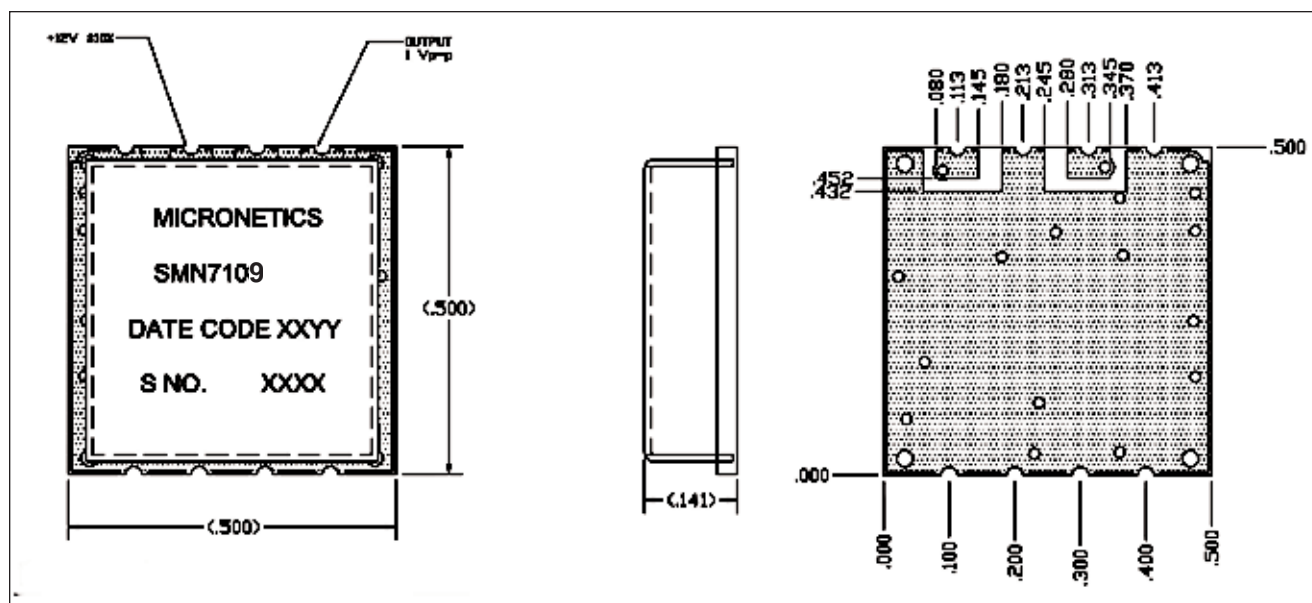
5 MHz TO 500 MHz

### How To ORDER

Model # SMN7109-D1C

*Indicate Bulk or Tape and Reel when ordering*

### PACKAGE OUTLINE DRAWING



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