

# SMN7109

## 1/2 INCH SURFACE MOUNT AMPLIFIED NOISE SOURCE

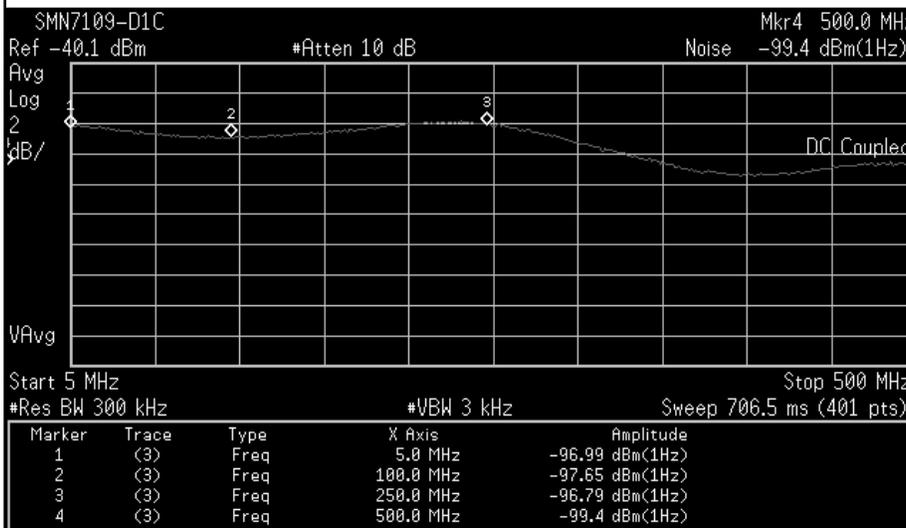
## 5 MHz TO 500 MHz



### 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.

### SPECIFICATIONS

- Frequency: 5 MHz to 500 MHz
- Noise Power Spectral Density ( $N_0$ ): -101 dBm/Hz (min)
- Noise Power (N): -16 dBm
- Spectral Flatness: 4 dB (total window)
- Bias: 12 Vdc Internally Regulated
- Peak Factor: 5:1
- Operating Temp: -55 to +85 C
- Storage Temp: -55 to 125 C

### APPLICATION NOTE

#### Common Noise Applications

#### 1. 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  $E_b/N_0$  for built-in stimulated BER testing of digital demodulation.

2. *Barrage Jamming*: The noise signal is fed into the tuning port of a VCO. The resulting sinusoidal signal hops randomly around the desired frequency band to be jammed. Signal processing circuitry can be employed between the noise source and tuning port to shape the noise probability function (PDF) for the designed jamming effect.

3. *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 techniques 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.

# MICRONETICS

NOISE PRODUCTS

### USEFUL NOISE EQUATIONS

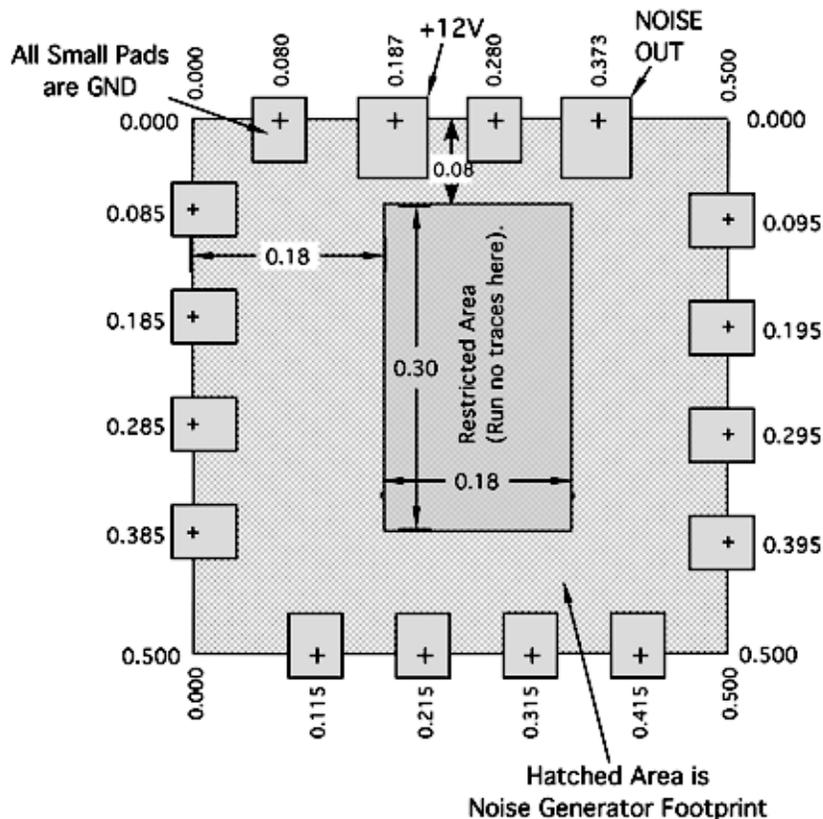
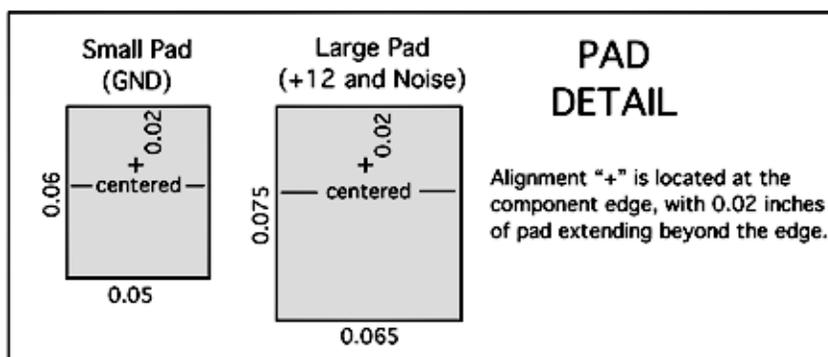
Converting ENR to noise spectral density ( $N_0$ ):  $0 \text{ dB ENR} = -174 \text{ dBm/Hz}$

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



# SMN7109

## SURFACE MOUNT AMPLIFIED NOISE SOURCE

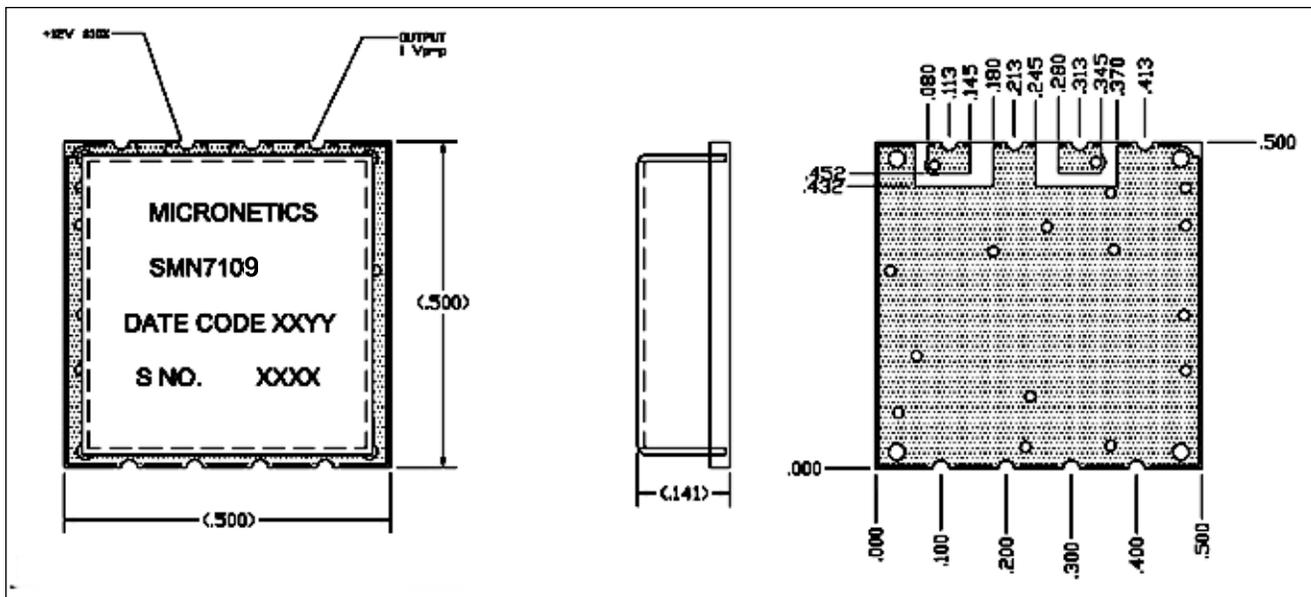
5 MHz TO 500 MHz

### How To ORDER

Model # SMN7109-D1C

*Indicate Bulk or Tape and Reel when ordering*

### PACKAGE OUTLINE DRAWING



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NOISE PRODUCTS