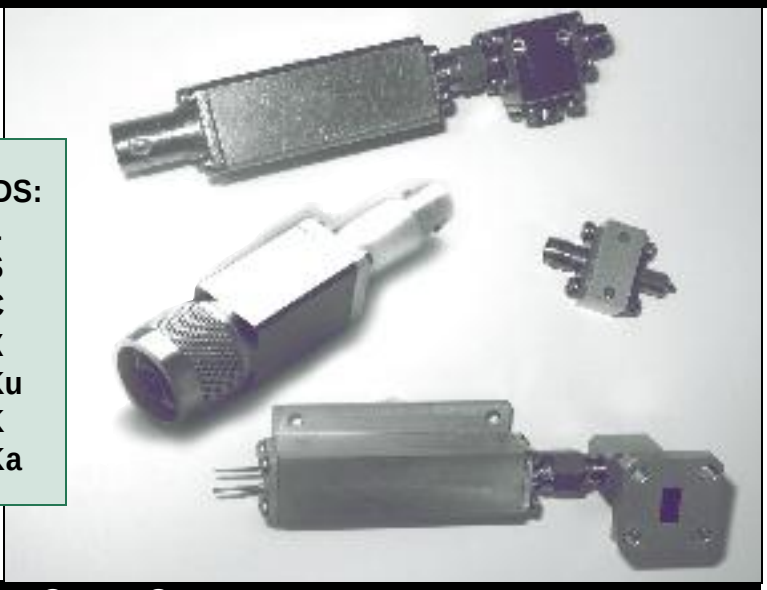
Return to Noise Index

FULLBAND CALIBRATED MICROWAVE NOISE SOURCES
L, S, C, X, KU, K, KA BANDS 1 GHZ TO 40 GHZ

BANDS:
- L
- S
- C
- X
- Ku
- K
- Ka



FULLBAND OUTPUT CHARACTERISTICS FOR USE IN SYSTEMS

MODEL	FREQUENCY	RF OUTPUT EXCESS NOISE RATIO (dB)	STYLE CODES
RFN25L	1.0 to 2.0 GHz	30(MIN)	N,N1 Q, X, W, Y
RFN25S	2.0 to 4.0 GHz	30(MIN)	N,N1 Q, X, W, Y
RFN25C	4.0 to 8.0 GHz	30(MIN)	N,N1 Q, X, W, Y
RFN25C1	3.95 to 5.85 GHz *(waveguide only)*	25(MIN)	N,N1 X, Y
RFN25C2	5.85 to 8.20 GHz *(waveguide only)*	25(MIN)	N,N1 X, Y
RFN25X *	8.0 to 12.4 GHz	25(MIN)	N,N1 Q, X, W, Y
RFN25Ku	12.4 to 18.0 GHz	25(MIN)	N,N1 Q, X, W, Y
RFN25K	18.0 to 26.5 GHz	25(MIN)	Y
NS2640	26.5 to 40 GHz	14 to 20 dB	*See Chart*

* *wavegide frequency is 8.2 to 12.4 GHz*

RUGGED/STABLE DESIGN:

The heart of these noise sources is a small chip and wire hermetic noise module. This is embedded in the housing with a precision launch to the coaxial jack. This design gives is much more stable and rugged than traditional coaxial noise sources which rely on pill packaged diodes and beryllium copper bellow assemblies which are not only are less reliable, but use hazardous materials.

CALIBRATION AND QUALITY ASSURANCE:

Each noise source is accurately calibrated using a reference noise source traceable to NIST/NPL Calibration data consists of 5 calibration points across the full-band. Data is supplied as a print out. Special calibration data can also be supplied upon request (consult factory). Standard choices are:

- **More calibration points across the spectrum**
- **Special discrete calibration frequencies**
- **Data supplied in soft format as screen capture or text file on floppy or CD-ROM.**

In addition to the calibration data, a certificate of calibration and a certificate of conformance is supplied with each unit.

DESCRIPTION

Micronetics' line of full band noise sources are specially designed for easy integration into microwave systems. They feature rugged construction with excellent long-term stability.

Configurable to your requirements:
Micronetics full band noise sources are based on a coaxial design as the base part. As standard options, noise sources can be ordered with either

- **Coaxial Isolator**
- **Waveguide Output**
- **Waveguide Isolator**

Each noise source is calibrated to the output port so no external deembedding of calibration data is necessary. In addition to the RF output choices, there are also different packages available to meet a wide range of mechanical constraints.

SPECIFICATIONS

- Operating Temp: -55 to +95°C
- Storage Temp: -65 to +125°C
- Supply Voltage: +15 , +28 VDC
- Temp Stability: 0.01 dB/°C
- Ouput Impedance: 50 ohm
- Peak Factor: 5:1

WAVEGUIDE CHART

Model	Frequency	Waveguide
RFN25C1	3.95 to 5.85 GHz	WR-187
RFN25C2	5.85 to 8.20 GHz	WR-137
RFN25X	8.20 to 12.4 GHz	WR-90
RFN25Ku	12.4 to 18.0 GHz	WR-62
RFN25K	18.0 to 26.5 GHz	WR-42
NS2640	26.5 to 40.0 GHz	WR-28

MICRONETICS NOISE PRODUCTS

Full Band Microwave Noise Sources
L, S, C, X, Ku, K, Ka Bands

Using Noise for Built-in-Test

There are three 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.

3. Amplitude Reference Source: The noise source can be used as a known reference signal. By switching in the noise source from the live signal, a quick test can be performed to check the health of the chain or calibrate the gain/loss. For this test, noise can be injected into the IF system as well as the RF to test/calibrate the path.

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

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

R F N 2 5 X - X X X

Model
L = L band *
S = S band *
C = C band
C1 = C band
C2 = C band
X = X band
Ku = Ku band
K = K band
Ka = Ka band

** waveguide not available on S and L models*

Package
N = N package
Q = Q package
X = X package
Y = Y package

Option
0 = Plain
1 = Coax Isolator
2 = Waveguide
3 = Waveguide Isolator

Bias Voltage
A = +28V
B = +15V

N S 2 6 4 0 - X X X

Package
A = Lug package
B = BNC package

Option
1= Coax Isolator, 2.92 mm (f)
2= Coax Isolator, 2.92 mm (m)
3= Waveguide
4= Waveguide Isolator
5= Plain, 2.92 mm (f)
6= Plain, 2.92 mm (m)

Bias Voltage
A = +28V
B = +15V

NS2640 26.5 TO 40 GHZ PAKAGING OPTIONS

Outline Dwg	Bias Connector	Bias Voltage	RF Output Type
NS2640-A1A-70	Lug	+28 Vdc	Coax Isolator, 2.92mm (F) Connector
NS2640-A2A-70	Lug	+28 Vdc	Coax Isolator, 2.92mm (M) Connector
NS2640-A3A-70	Lug	+28 Vdc	Waveguide
NS2640-A4A-70	Lug	+28 Vdc	Waveguide Isolator
NS2640-A5A-70	Lug	+28 Vdc	Plain, 2.92 mm (M) Connector
NS2640-A6A-70	Lug	+28 Vdc	Plain, 2.92 mm (F) Connector
NS2640-B1A-70	BNC (F)	+28 Vdc	Coax Isolator, 2.92mm (F) Connector
NS2640-B2A-70	BNC (F)	+28 Vdc	Coax Isolator, 2.92mm (M) Connector
NS2640-B3A-70	BNC (F)	+28 Vdc	Waveguide
NS2640-B4A-70	BNC (F)	+28 Vdc	Waveguide Isolator
NS2640-B5A-70	BNC (F)	+28 Vdc	Plain, 2.92 mm (M) Connector
NS2640-B6A-70	BNC (F)	+28 Vdc	Plain, 2.92 mm (F) Connector
NS2640-A1B-70	Lug	+15 Vdc	Coax Isolator, 2.92mm (F) Connector
NS2640-A2B-70	Lug	+15 Vdc	Coax Isolator, 2.92mm (M) Connector
NS2640-A3B-70	Lug	+15 Vdc	Waveguide
NS2640-A4B-70	Lug	+15 Vdc	Waveguide Isolator
NS2640-A5B-70	Lug	+15 Vdc	Plain, 2.92 mm (M) Connector
NS2640-A6B-70	Lug	+15 Vdc	Plain, 2.92 mm (F) Connector
NS2640-B1B-70	BNC (F)	+15 Vdc	Coax Isolator, 2.92mm (F) Connector
NS2640-B2B-70	BNC (F)	+15 Vdc	Coax Isolator, 2.92mm (M) Connector
NS2640-B3B-70	BNC (F)	+15 Vdc	Waveguide
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NS2640-B5B-70	BNC (F)	+15 Vdc	Plain, 2.92 mm (M) Connector
NS2640-B6B-70	BNC (F)	+15 Vdc	Plain, 2.92 mm (F) Connector

Please consult factory for models without active links to drawings. Tel: 603-883-2900 x346 or email *noisesales@micronetics.com*