

PRODUCT CATALOG



noisecom.com

Noisecom Products

Noisecom has been a leading provider of RF & Microwave noise generating equipment used in commercial and military applications since 1985. We provide noise diodes, built-in-test modules (BITE), calibrated noise sources, jitter sources, cryogenic noise standards, and computer controlled instruments that provide either Precision C/N, or broadband white Gaussian noise. Our additive white Gaussian noise can be used for signal jamming and impairment, or calibration. We offer high power broad-

band noise to interfere with communication signals, and instruments that gradually change SNR using Gaussian, high crest factor noise to determine the robustness of a receiver.

Noisecom manufactures calibrated noise sources from audio to millimeter wavelengths in both coaxial or waveguide modules. They can be used for instrument calibration or noise figure test systems.



A Word About Customization

Many of our customers integrate Noisecom products into their test systems. To keep costs down and avoid long lead times we have created products with modular characteristics that provide highly repeatable results. Beginning with our modules and ending with our instruments, Noisecom can provide customized units to simplify the integration process.

The amplified noise module is the basic building block of our product line. The standard module provides AWGN (additive white Gaussian noise) with a variety of power levels and noise bandwidths. The noise bandwidth and power output can be configured for high power, high crest factor, or a specific filter response. Optional control lines for switching paths and changing attenuation with either single ended, or differential outputs are possible. Our NC6000A/8000A bench top units can deliver high power over wide bandwidths with manual attenuator control for fast accurate noise testing.

The UFX, CNG, JV9000 and J7000A series computer controlled instruments can provide multiple AWGN, or CW sources, internal combiners, RF path filters, RF switching, precision digital attenuation down to 0.1dB attenuation step size, and high power up to 40 GHz. The DNG7500 digital noise generator begins with 70MHz of pseudorandom noise, but can be up-converted with internal or external mixers to 2GHz. Our modular designs allow for repeatable performance without excessive cost or delayed lead times.

For more information about product options, or more detail about custom solutions please see our website at www.noisecom.com, or contact your local WTG salesperson.

SNR Noise Generator: CNG-EbNo

The CNG-EbNo is a fully automated instrument that sets and maintains a highly accurate ratio between a user-supplied carrier and internally generated noise, over a wide range of signal power levels and frequencies. Since the CNG-EbNo automatically compensates for parameters like bit rates and bandwidth, taking measurements is as simple as pressing a button. Operating modes include carrier-to-noise, carrier-to-noise density, carrier-to-interference, bit energy-to-noise density and more. The touch screen streamlines manual control, LAN, GPIB and RS-232 are available for remote control in ATE systems.



Specifications:

Operating Modes

Carrier-to-noise (C/N), carrier-to-noise density (C/N_0), bit energy-to-noise density (E_b/N_0), carrier-to-interferer (C/I), noise generator, power meter

Carrier Path

Input power range	-55 dBm to +5 dBm
Maximum input power	+21 dBm (with no damage)
Output power range	-55 dBm to +5 dBm
Nominal gain	± 1.0 dB
Gain resolution	0 to -60 dB in 0.1 dB steps
Gain flatness	± 0.2 dB for 70 MHz ± 20 MHz ± 0.3 dB for 140 MHz ± 40 MHz ± 0.4 dB for others
Group delay	± 0.20 ns/40 MHz for frequencies above 20 MHz

Noise Path

Output power range	-55 dBm to +5 dBm
Flatness	± 0.2 dB/40 MHz ± 0.3 dB/80 MHz ± 0.4 dB/200 MHz ± 0.5 dB/300 MHz
Attenuation range	60 dB (0.1 dB steps)
Ratio accuracy	± 0.2 dB RSS, ± 0.3 dB WCU
Power meter range	-55 dBm to +5 dBm
Power meter accuracy	± 0.5 dB
Interferer input	-4 dBm ± 2 dB, frequency range is equal to the noise bandwidth

Model Number	Frequency Range	Applications
CNG-EbNo-70	50 to 90 MHz	General purpose/SATCOM
CNG-EbNo-IF1	50 to 90 MHz 100 to 180 MHz	Intelsat, SATCOM
CNG-EbNo-105	65 to 75 MHz 50 to 90 MHz 100 to 180 MHz 10 to 200 MHz	Covers the same noise specs as HP3708A
CNG-EbNo-900	800 to 1000 MHz	Cellular
CNG-EbNo-750	650 to 850 MHz	Iridium, LTE
CNG-EbNo-1550A	950 to 2150 MHz	Single Band
CNG-EbNo-2050L	1700 to 2400 MHz	Cellular/PCS
CNG-EbNo-2450	2200 to 2700 MHz	PCS
CNG-EbNo-5500	5000 to 6000 MHz	802.11a Wireless LAN
CNG-EbNo-20000	18 to 22 GHz	Custom frequency ranges available
CNG-EbNo-70/1200	50-90 MHz 1120-1280 MHz	Multiple Carrier Input Capabilities

AWGN Noise Generator: UFX7000A Series

The UFX7000A broadband noise generator has a powerful architecture used to create complex custom noise signals for advanced test systems. This versatile platform allows the user to meet their most challenging design requirements. Precision components provide high output power with superior flatness, and the flexible computer allows control of multiple attenuators, switches, and filter banks. The touch screen streamlines manual control, LAN, GPIB and RS-232 are available for remote control in ATE systems.



Specifications:

UFX7000A Series

Output Characteristics

Model	Frequency Band	Power	dBm / Hz (dBm)	Flatness (dB)
UFX7101A	10 Hz - 20 kHz	+13	-30	±0.5
UFX7103A	10 Hz - 500 kHz	+13	-44	±0.5
UFX7105A	10 Hz - 10 MHz	+13	-57	±0.5
UFX7107A	100 Hz - 100 MHz	+13	-67	±0.75
UFX7108A	100 Hz - 500 MHz	+10	-77	±1.0
UFX7111A	1 GHz - 2GHz	+10	-80	±1.5
UFX7113A	10 MHz - 3 GHz	0	-95	±2.5
UFX7116A	10 MHz - 6 GHz	-12	-110	±3.0
UFX7128A	10 MHz - 10 GHz	-17	-117	±3.5
UFX7218A	2 GHz - 18 GHz	-20	-122	±2.0
UFX7240A	2 GHz - 40 GHz	-20	-126	±4.0

UFX7900A Series (1 Watt output) Output Characteristics

Model	Frequency Band	Power	dBm/Hz	Flatness (dB)
UFX7905A	500 Hz - 10 MHz	+30	-40	±2
UFX7908A	1 MHz - 200 MHz	+30	-53	±2
UFX7910A	2 MHz - 500 MHz	+30	-57	±2
UFX7911A	5 MHz - 1 GHz	+30	-60	±3

AWGN Noise Generator: UFX-NPR-7000A

The UFX-NPR series Instruments perform automatic distortion measurements on amplifiers, receivers and systems. The instrument has two sections, the noise/notch generator, and the measurement/receiver section (optional). If the measurement section is not purchased the NPR measurement has to be performed using an external receiver like a spectrum analyzer.

Specifications

Noise Output Power	-60 to 0 dBm
Output Resolution	0.1dB
Crest Factor	5:1 (14dB) Min
Noise bandwidth	200MHz, (this is customizable)
Notch Width	10, 20, 50, 100MHz notches available (This is customizable)
Notch Depth	40dB Typical
Center Frequency of Noise	Can be anywhere in the 70MHz to 45GHz Band. This has to be identified at time of quotation



Jitter Noise Generator: J7000

The J7000 series has 6 standard models, but custom frequencies, power, and flatness specifications can be provided. This instrument has up to five optional band-limiting filters that can be added for specific serial data applications. Differential inputs and outputs are available in the J9000 series.



Features and Benefits

- Serial Data sources and specialized filters available (consult factory)
- Provides > 18 dB crest factor ($\pm 7\sigma$)
- 127 dB attenuation in 1 dB, or optional 0.1 dB steps
- Units > 2 GHz have 79.9 dB total attenuation
- Summing input for CNR, or Eb/No measurements
- Standard Ethernet, or optional GPIB remote control
- Optional rear panel connectors

J7000A Series

Output Characteristics

Model	Frequency Band	Power (dBm)	Vrms	dBm/Hz	Flatness (dB)
J7105A	1 MHz - 10 MHz	-3	0.16	-73	± 0.25 / 40 MHz
J7107A	10 MHz - 100 MHz	-3	0.16	-83	± 0.25 / 40 MHz
J7108A	10 MHz - 500 MHz	-3	0.16	-90	± 0.25 / 40 MHz
J7109A	10 MHz - 1 GHz	-3	0.16	-93	± 0.25 / 40 MHz
J7112A	10 MHz - 2 GHz	-3	0.16	-96	± 0.25 / 40 MHz
J7115A	10MHz - 5 GHz	-3	0.16	-100	± 2.5 dB
J7113A	1 GHz - 13 GHz	-3	0.16	-107	± 3 dB

Specifications

Output noise power	-3 dBm (± 0.5 dBm)
Output noise band	up to 32 GHz
Noise attenuation	0 to 63 dB in 0.1 dB steps
Noise attenuator	± 0.2 dB or 0.5%
Signal path gain	0 ± 1 dB
Standard connectors	SMA female
Power	115 VAC, 60 Hz
Operating Temperature:	-10° to +65°C
6.25" color VGA, TFT touch screen	
Ultra-low distortion signal path	

Adjustable Vcc Noise Generator: JV9000

The JV9000 Adjustable Vcc Noise Generator is designed to test components that need to be qualified for immunity to specific interference levels. The instrument has the capability to inject noise and deterministic jitter (Dj) signals into Vcc lines. JV9000 is a very useful instrument to analyze Power Supply Rejection Ratio.



Features and Benefits:

- Noise Generator (white Gaussian noise): 500 Hz to 2 GHz, 0dBm
- CW/Spur Generator: up to 3 GHz (optional)
- Higher input current options
- Customized inputs, outputs and signal levels possible
- All computerized versions and remote programmable

Input

Maximum Voltage	5V
Maximum Current	500 mA, higher options available (opt23 and opt24)
Connector	BNC (F)

Noise Source (white Gaussian noise)

Impedance	50 Ohms SMA, optional BNC (F) - (opt01)
Frequency Range	1 kHz to 500 MHz (500 Hz - 2 GHz operational), custom frequency (opt09)
Output Power	0 dBm min. (at the output of bias-T), adjustable 127 dB, 0.1dB step into 50 Ohms Higher power (+10 dBm - opt05)

CW/Spur Generator (optional)

Impedance	50 Ohms (typ.)
Frequency Range Options	1 kHz to 25 MHz (opt21), programmable, 100 Hz resolution or 1 Hz resolution (opt06) 25 MHz to 3 GHz (opt22), programmable, 100 kHz resolution or 1 kHz resolution (opt07)
Output Power	0 dBm min. (at the output of bias-T), adjustable, 127 dB, 0.1 dB step, into 50 Ohms, harmonics 20 dBc or less (40 dBc for discrete tones optional) Higher power (+10 dBm - opt05)

Auxiliary Input (opt08-x)

Input Frequency Range	1 KHz - 3 GHz
Maximum Input Power	+10 dBm
Auxiliary Input Connector	50 Ohm SMA, optional BNC (opt01)
Level Control	adjustable, 127 dB, 0.1 dB step

AWGN Noise Generator: NC6000/8000A Series

The NC6000/8000A series noise generators are manually operated for the RF benchtop. Designed for General-Purpose Broadband Noise Applications on the Bench, or in a Rack Test Station. The manual controls make it simple to operate with reduced test set up time. Standard units can be modified for specific customer requirements. Please consult the factory for pricing and availability.

Specifications:

Output	White Gaussian noise
Manual Attenuator range	0 to 10 dB in 1 dB steps
Optional Attenuation	100 dB attenuator in 10 dB steps
Optional Attenuation	1 dB attenuator in 0.1 dB steps
Impedance	50 Ohms
Typical VSWR	1.5:1
Standard connector	SMA female (K female for NC6226A)



NC6000A

Output Characteristics

Model	Frequency Band	Power	PSD dBm/Hz	Flatness (dB)	uV/root (Hz)
NC6101A	10 Hz-20 kHz	+13	-30	±0.5	7071
NC6103A	10 Hz-500 kHz	+13	-44	±0.5	1414
NC6105A	10 Hz-10 MHz	+13	-57	±0.75	316
NC6107A	100 Hz-100 MHz	+13	-67	±1.0	100
NC6108A	100 Hz-500 MHz	+10	-77	±1.5	31.6
NC6109A	100 Hz-1 GHz	+10	-80	±2.0	22.4
NC6110A	100 Hz-1.5 GHz	+10	-82	±2.0	18.2
NC6111A	1 GHz-2 GHz	+10	-80	±2.0	22.4
NC6112A	1 MHz-2 GHz	0	-93	±2.5	5.01
NC6113A	1 MHz-3 GHz	0	-95		
NC6114A	1 MHz-4 GHz	-3	-100		
NC6124A	2 GHz-4 GHz	-10	-103	±2.5	1.58
NC6126A	2 GHz-6 GHz	-15	-111	±2.5	0.63
NC6218A	2 GHz-18 GHz	-20	-122	±3.0	0.18
NC6226A	2 GHz-26.5 GHz	-20	-124	±3.0	0.14
NC6128A	10 MHz-10 GHz	-17	-117	±3.5	0.32

Cryogenic Primary Noise Standards: NBS-Series



Calibration standards based on the primary physic constants of thermal noise and blackbody radiation. This provides the ultimate accuracy when measuring extremely low noise figures (noise temperatures). Simple, and versatile to use, the NBS-Series is an ideal solution for noise source calibrations, radiometer test references and low noise amplifier tests.

Features and Benefits:

- Expandable frequency range from 18 to 325 GHz
- 2 to 3 times better accuracy
- Automatic Nitrogen purge eliminates pressurized helium equipment
- Primary calibration standard
- Radiometer reference source
- SATCOM earth station conformance verifications

Applications:

- Noise temperature calibrations
- Noise source calibrations
- Radiometer reference sources
- Low noise amplifier (LNA) noise figure
- (NF) measurements
- Antenna system effective input noise temperature tests
- SATCOM earth station conformance verifications

Model	Frequency Range (GHz)	Output Noise Temperature (K)	Temperature Accuracy (K)	Waveguide
NBS-26	18.0 - 26.5	75.97	+0.24/-0.34	WR-42
NBS-33	22.0 - 33.0	75.93	+0.24/-0.36	WR-34
NBS-40	26.5 - 40.0	75.98	+0.25/-0.39	WR-28
NBS-50	33.0 - 50.0	76.03	+0.27/-0.43	WR-22
NBS-60	40.0 - 60.0	76.10	+0.29/-0.47	WR-19
NBS-75	50.0 - 76.04	76.01	+0.31/-0.52	WR-15
NBS-90	60.0 - 90.0	76.00	+0.33/-0.56	WR-12
NBS-110	75.0 - 110.0	75.99	+0.37/-0.64	WR-10
NBS-140	90.0 - 140.0	76.17	+0.44/-0.77	WR-8
NBS-170	110.0 - 170.0	76.22	+0.51/-0.90	WR-6
NBS-220	140.0 - 220.0	75.99	+0.61/-1.06	WR-5
NBS-260	170.0 - 260.0	75.76	+0.68/-1.19	WR-4
NBS-325	220.0 - 325.0	75.30	+0.81/-1.40	WR-3

Calibrated Noise Source: NC346 Broadband Coaxial

The NC346 Noise Source is designed for precision noise figure measurements using a dedicated noise figure analyzer or a spectrum analyzer with noise figure capability. The module's low VSWR increases noise figure measurement accuracy.



Features and Benefits

- Broadband coverage
- Extremely good temperature stability
- Superior voltage stability
- Noise figure meter-compatible

Specifications

Calibration	1 GHz steps
Temperature coefficient	< 0.009 dB/°C
Operating temperature	0°C to +55°C
Input power	+28 VDC ±2 VDC at 30 mA

Model	RF Connector	Frequency (GHz)	Output ENR (dB)	VSWR (maximum @ on/off)					I (max) (mA)
				0.01 - 5 GHz	5 - 18 GHz	18 - 26.5 GHz	26.5 - 40 GHz	40 - 60 GHz	
NC346A	SMA Male	0.01 - 18.0	5 - 7	1.15:1	1.25:1				30
NC346B	SMA Male	0.01 - 18.0	14 - 16	1.15:1	1.25:1				30
NC346C	APC3.5 Male	0.01 - 26.5	13 - 17	1.15:1	1.25:1	1.35:1			30
NC346D	SMA Male	0.01 - 18.0	19 - 25*	1.50:1	1.50:1				30
NC346E	APC3.5 Male	0.01 - 26.5	19 - 25*	1.50:1	1.50:1	1.50:1			30
NC346Ka	K Male**	0.10 - 40.0	10 - 17	1.25:1	1.30:1	1.40:1	1.50:1		30
NC346V	V Male	0.10 - 55.0	7 - 21	1.50:1	1.50:1	1.75:1	2.00:1	2.50:1	30

* Flatness better than ±2 dB ** Compatible with SMA and APC3.5

Calibrated Noise Source: NC5000 Millimeter Wave

The NC5000 Series Noise Sources Feature Outstanding Stability, Switching Speed, and Ripple-Free Response Over Standard Waveguide Bands

The high stability of the NC5000 Series allows these units to replace cumbersome gas tube noise sources for most applications. Ripple in the output has a direct effect on measurement accuracy, so Noisecom has tailored the response to minimize this ripple throughout the specified frequency range.



Applications

- Noise figure measurement
- Radiometers
- 5G mm wave applications

Specifications

Noise output rise and fall times	< 1 μs
Noise output variation with temperature	< 0.01 dB/°C
Noise output variation with voltage	< 0.1 dB/1 %AV
Operating temperature	0 to +85°C
Input power	+28 VDC at 30 MA MAX

Model	Frequency Range (GHz)	Noise Output ENR (dB)	Noise Output Flatness (dB)	Typical VSWR	Mating Flange	Calibration Frequencies	Waveguide	I (max) (mA)
NC5142	18 - 26.5	15.5	±0.75	1.3:1*	UG595/U	1 GHz steps	WR42	30
NC5128	26.5 - 40	15.5	±0.75	1.3:1*	UG599/U	1 GHz steps	WR28	30
NC5122	33 - 50	15.5	±1.0	1.3:1*	UG383/U	1 GHz steps	WR22	30
NC5115	50 - 75	15.5	±2.5	1.6:1*	UG385/U	1 GHz steps	WR15	30
NC5110	75 - 105	15	±5.5	1.6:1*	UG387/U	1 GHz steps	WR10	30
NC5112	60 - 90	15	±3	1.6:1*	UG387/U	1 GHz steps	WR12	30

* Maximum VSWR with isolator - Option 5

Calibrated Noise Source: NC3000 Coaxial

Well suited for receiver testing, noise figure measurements, or applications which require broadband noise and fast switching times. Several models include output isolators, and voltage regulators that provide excellent stability over varying temperature and voltage ranges. The NC3000 Series includes the NC3100 units with 15 dB ENR output for noise-figure meters, and the NC3200 Series high output noise sources with outputs between 26 and 35 dB ENR for radar and satellite communications system testing.



Features and Benefits:

- Noise output rise and fall times less than 1 μ s
- VSWR < 1.35:1 for units with 15.5 dB ENR
- Noise output variation with temperature < 0.01dB/°C
- Noise output variation with voltage < 0.1dB/ 1% Δ V

Specifications:

Operating temperature	-55 to + 85°C
Storage temperature	-65 to 125°C
Input power	+28 VDC at 30 mA max.

15.5 dB Noise Figure Meter Compatible Types

Mode	Frequency Range (GHz)	Noise Output ENR (dB)	Maximum VSWR ON	Calibration Frequencies
NC3101	0.01 - 8	15.5 \pm .75	1.35:1	10 MHz, 100 MHz, 1 GHz steps
NC3102	.01 - 12	15.5 \pm 1.0	1.35:1	10 MHz, 100 MHz, 1 GHz steps
NC3103	1 - 12	15.5 \pm .75	1.35:1	1 GHz steps
NC3104	1 - 18	15.5 \pm .75	1.35:1	1 GHz steps
NC3105	12 - 18	15.5 \pm .75	1.35:1	1 GHz steps
NC3108	0.5 - 18	15-16 \pm 1	1.5:1	1 GHz steps

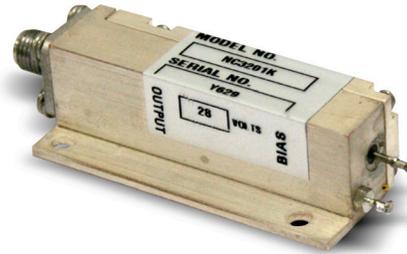
High Noise Output Types

Model	Frequency Range (GHz)	Noise Output ENR (dB)	Flatness (dB)	Calibration Frequencies
NC 3201	0.1 - 1	30-35	\pm 1	10, 100, 500, 1000 MHz
NC 3202	0.1 - 0.6	30-35	\pm 1	10, 100, 600 MHz
NC 3203	1 - 2	30-35	\pm 1	1, 1.5 & 2 GHz
NC 3204	2 - 4	30-35	\pm 1	1 GHz steps
NC 3205	4 - 8	30-35	\pm 1	1 GHz steps
NC 3206	8 - 12	28-33	\pm 1	1 GHz steps
NC 3207	12 - 18	26-32	\pm 1	1 GHz steps
NC 3208	1 - 18	26-32	\pm 1	1 GHz steps
NC 3240	2 - 40	>20	1	1 GHz steps

Calibrated Noise Source: NC3200K Coaxial

Offers a high ENR output over a wide frequency range. These calibrated noise sources have excellent stability with temperature and voltage for tough environments. The compact package is designed for severe environments such as military EW Radar Warning Receiver (RWR) systems. Special configurations are available upon request.

The NC3200 Series features hermetically sealed noise diodes and each noise source is supplied with calibration data for the full frequency band.



Features and Benefits:

- Noise output rise and fall times less than 1 μ s (NC3208K)
- VSWR less than 3:1
- Noise output variation with temperature less than 0.01 dB/ $^{\circ}$ C
- Noise output variation with voltage less than 0.1 dB/1% Δ V

Specifications:

Operating temperature -55 $^{\circ}$ to 85 $^{\circ}$ C
Storage temperature -65 $^{\circ}$ to +125 $^{\circ}$ C
Input power +28 VDC 20 mA typical
Noise output 23 to 27 dB ENR

High Noise Output Types

Model	Frequency Range (GHz)	Noise Output ENR (dB)	Flatness (dB)	VSWR	Calibration Frequencies	I (max) (mA)
NC 3201K	10 kHz - 1 GHz	23-27	\pm 1	3:1	10, 100, 500 and 1000 MHz	30
NC 3208K	1 GHz - 18 GHz	23-27	\pm 1	3:1	1 GHz steps	30

Option Number	Description
NC3Kopt01	+15 VDC input voltage

Calibrated Noise Source: NC3400 High ENR Coaxial

Excellent choice for applications requiring high ENR and immunity to large incident RF power found in radiometer and radar systems. The calibration accuracy and flatness of the NC3400 Series noise sources are enhanced by their low VSWR. The built-in isolator provides almost constant output impedance as the noise source bias is switched on and off. The isolator also protects the noise diode from incident RF power (consult the factory for high power units).



An SMA female connector is standard for the RF output and a BNC female connector is standard for the bias input. Other connectors are available as options.

Applications:

- Radar systems
- High NF device measurements
- Automated test equipment (ATE)

Specifications:

ENR	Up to 35 dB
VSWR	< 1.25:1
Standard input voltage	+28 VDC
Noise output rise and fall times	< 1 μ s
Maximum incident RF power	1 W average, 100 W peak
Typical current	12 to 15 mA

15.5 dB Noise Figure Meter Compatible Types

Mode	Frequency Range (GHz)	Noise Output ENR (dB)	Flatness Full band (dB)	Maximum VSWR (on/off) **	I (max)(mA)
NC3404	2 - 4	30 - 36	± 0.75	1.25:1	30
NC3405	4 - 8	30 - 35	± 0.75	1.25:1	30
NC3406	8 - 12	28 - 33	± 0.75	1.25:1	30
NC3407	12 - 18	26 - 32	± 0.75	1.25:1	30

* 0.25 dB. Improved VSWR may also be obtained for units with reduced bandwidth.

** VSWR for models with N connector is 1.35:1 up to 12 GHz. N connectors are not recommended for frequencies above 12 GHz.

Note: Standard calibration points are located at every 1 GHz.

Option Number	Description
NC34opt01	N male output connector
NC34opt02	SMA male output connector
NC34opt03	+15 VDC input voltage
NC34opt04	+28 VDC with regulation (stabilized output for ± 2 V variation)
NC34opt05	TTL control "high" is on (add suffix T)
NC34opt06	SMC male bias connector
NC34opt07	Solder lug for bias connection

High ENR Noise Source: NC3600 Coaxial

The NC3600 offers a High ENR Output Over a Wide Frequency Range. The NC3600 Series coaxial noise sources are an excellent choice for applications requiring high ENR, such as ATE, radiometer, and radar systems.

An SMA male connector is standard for the RF output and feed thru for bias input. SMA female is an option. Custom frequencies and flatness available. Contact the factory with your request.



Applications:

- Radar systems
- High NF device measurements
- Automated test equipment (ATE)

Specifications

ENR	>40dB
Standard input voltage	+15V
Flatness	+/- 1.5dB
Typical current	100 mA
Callibration	Every 1 GHz

Model	Frequency Range (GHz)	Noise Output ENR (dB)	Flatness (dB)
NC3608	2 GHz -18 GHz	>40	+/- 1.5
NC3609	0.2 GHz-18 GHz	>40	+/- 1.5
NC3610	18-40 GHz	>33	+/- 2.0
NC3611	2 – 40 GHz	>30	+/- 2.0
NC3612	20 – 45 GHz	>30	+/- 3.0

Option Number	Description
NC36opt01	SMA Female output connector

High Power Modules: NC1000

Amplified noise modules with AWGN up to +13 dBm, and bandwidths up to 10 GHz. The high power modules are designed to test noise immunity for Cable TV equipment, secure communication channels, and military jamming systems. The lower power modules, ≤ 0 dBm, are random jitter sources for many applications including, PCIeexpress, Infiniband, and 10 GigE. The Bandwidth, output power, and flatness can be modified for specific applications. A newly developed TTL controlled attenuation feature and differential outputs are available options.



Applications:

- 100 GbE
- IEEE 802.3
- PCIeexpress
- CATV
- Jamming systems

Specifications:

Power	Up to +13 dBm
Standard input Voltage	+28VDC (below 1.5 GHz) +15 VDC (above 1.5 GHz)
Operating temperature	-35° to +100°C
Storage temperature	-65° to +150°C
Typical temperature coefficient	0.025 dB/°C
Supply voltage sensitivity	0.25 dB/1%ΔV
Output connector	SMA female connector

High Power Modules

Model	Frequency Range	Output Characteristics				I (max) (mA)
		Power (dBm)	dBm/Hz	Flatness (dB)	$\mu\text{V}/\Delta\text{Hz}$	
NC1101A	10 Hz - 20 kHz	+13	-30	± 0.5	7071	70
NC1103A	10 Hz - 500 kHz	+13	-44	± 0.5	1414	150
NC1105A	10 Hz - 10 MHz	+13	-57	± 0.75	316	160
NC1107A	100 Hz - 100 MHz	+13	-67	± 1.0	100	160
NC1108A	100 Hz - 500 MHz	+10	-77	± 1.5	31.6	160
NC1109A	100 Hz - 1 GHz	+10	-80	± 2.0	22.4	160
NC1110A	100 Hz - 1.5 GHz	+10	-82	± 2.0	18.2	160

High Crest Factor Modules

Model	Frequency Range	Output Characteristics				I (max) (mA)
		Power (dBm)	dBm/Hz	Flatness (dB)	$\mu\text{V}/\Delta\text{Hz}$	
NC1111A	1 GHz - 2 GHz	-10	-100	± 2.0	2.24	250
NC1111B	1 GHz - 2 GHz	0	-90	± 2.0	7.07	250
NC1112A	20 MHz - 2 GHz	-10	-103	± 2.5	1.58	250
NC1112B	20 MHz - 2 GHz	0	-93	± 2.5	5.02	250
NC1113A	10 MHz - 3 GHz	-10	-105	± 2.5	1.12	250
NC1113B	10 MHz - 3 GHz	0	-95	± 2.5	5.02	250
NC1124A	2 GHz - 4 GHz	-10	-103	± 2.5	1.58	250
NC1126A	2 GHz - 6 GHz	-14	-110	± 2.5	0.71	250
NC1128A	10 MHz - 10 GHz	-17	-117	± 3.0	0.32	250
NC1128B	10 MHz - 10 GHz	0	100	± 3.0	2.24	300

Circuit Board Components: NC500/500SM Series

The NC500 (through-hole) and 500SM (surface mount) series noise modules are an economical solution for built-in test requirements. They contain complete bias circuits and require no external components. Some models contain additional gain stages for high power ENR output (51 dB). The surface mount package is suitable for mounting on micro strip. The modules have extremely flat output power versus frequency characteristics that are insensitive to temperature and voltage variations.



Applications:

- Built-in test equipment (BITE)
- Signal strength meters for cellular, PCS and CATV
- Calibrators
- Spectrum analyzers
- Radar warning receivers (RWR)
- Dither A/D quantization error
- Gain-bandwidth product testing

Specifications:

Output	White Gaussian noise
Minimum power output	31 dB ENR (-143 dBm/Hz) 51 dB; ENR (-123 dBm/Hz)
Crest factor	5:1
Supply current	0.2 to 5 mA (NC500 Series) 10 to 20 mA (NC510 Series)
Temperature coefficient	0.01 dB/°C
Supply sensitivity	0.1 dB/% ΔV
Operating temperature	0° C to +70° C (surface mount) -55° C to 85° C (drop-in/through-hole)
Storage temperature	-65° to +150° C
Packaging	Through-hole or surface mount
Power	+12, +15 V or +28 V
Absolute maximum input voltage	+30 V for +15 V models +40 V for +28 V models

Model For +12 V Supply	Model For +15 V Supply	Model For +28 V Supply	Frequency Range	Typical Output ENR (dB) @ R _i (Ω)		Output Flatness (dB)	I (Max) (mA)
NC501/12	NC501/15	NC501	200 kHz - 500 MHz	31	50	±0.5	10
NC502/12	NC502/15	NC502	200 kHz - 1 GHz	31	50	±1.0	10
NC503/12	NC503/15	NC503	200 kHz - 2 GHz	31	50	±1.5	10
NC504/12	NC504/15	NC504	200 kHz - 3 GHz	31	50	±1.5	10
NC505/12	NC505/15	NC505	200 kHz - 4 GHz	31	50	±2.5*	10
NC506/12	NC506/15	NC506	200 kHz - 5 GHz	31	50	±3.0*	10
NC511/12	NC511/15	N/A	200 kHz - 500 MHz	51	50	±2.0	30
NC512/12	NC512/15	N/A	200 kHz - 1 GHz	51	50	±2.0	30
NC513/12	NC513/15	N/A	200 kHz - 2 GHz	51	50	±2.0	30

Note 1: Military version in compliance with MIL-E-5400T Class 2 (add suffix M). Not available in surface mount, NC501 to NC506 Series only.

Note 2: Add SM for surface mount. Otherwise TO-8 is standard.

Low Voltage Surface Mount Noise Source: NC520

The NC520 low voltage (surface mount) noise module is an economic solution for built-in test requirements. It contains complete bias circuits and require no external components.

The surface mount package is suitable for mounting on microstrip. The modules produce extremely flat output power versus frequency characteristic that is insensitive to temperature and voltage variations.

Typical applications for the NC520 module includes built-in test equipment (bite), signal strength meters for cellular, pcs, catv, calibrators, spectrum analyzers, radar warning receivers (rwr), and dither A/D quantization error. Noise Com can optimize frequency range and output levels for specific applications.



Applications:

- Built-in test equipment (bite)
- Signal strength meters for cellular, pcs and catv
- Calibrators
- Spectrum analyzers
- Radar warning receivers (rwr)
- Dither A/D quantization error
- Gain-bandwidth product testing

Specifications:

Output	White Gaussian noise
Minimum power output	25 dB ENR (-143 dBm/Hz) min
Crest factor	5:1
Flatness	+/-3dB
Supply current	30 mA (max)
Temperature coefficient	0.01 dB/°C
Supply sensitivity	0.1 dB/% ΔV
Operating temperature	0° C to +70° C
Storage temperature	-65° to +150° C
Packaging	Surface mount
Power	+5 V
TTL	On/Off control
RoHS	Compliant

Circuit Board Components: NC2000/4000 Series

The NC2000 Series modules are housed in 24, or 14-pin dual-inline packages. The NC4000 series modules are housed in a 40-pin module that cover similar noise bands to the NC2000, but have higher crest factor, and 60 dB of TTL controlled attenuation. Modified BW, output power, and flatness specifications are available for these modules. Please consult Noisecom for availability, and appropriate package style.



Applications:

- Dither circuitry for A/D converters
- Communications jamming
- Jitter applications including PCIeexpress, 10GigE, & SATA
- Built-in test equipment (BITE)

Specifications:

Crest factor	5:1
High-end roll off	6 dB per octave typical
Operating voltage	+15 VDC, +12 VDC optional
Storage temperature	-65° to +125°C
Operating temperature	Commercial -40° to +85° C; Military -55° to +125° C
Typical temperature coefficient	0.025 dB/° C
Housing	24-pin packages; 14-pin optional
Noise output	23 to 27 dB ENR

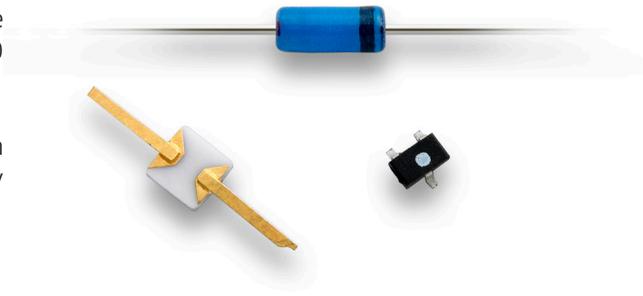
Model	Frequency Range	Output Characteristics				Load Ω	I (max) (mA)
		Output Level	Flatness (dB)	dBm/Hz	μ V/Hz		
NC2101	100 Hz - 20 kHz	0.150 Vrms	± 0.75	-63	1061.0	2200	10
NC2102	100 Hz - 100 kHz	0.150 Vrms	± 0.75	-70	474.0	2200	10
NC2105	500 Hz - 10 MHz	0.150 Vrms	± 1.0	-87	47.4	1000	10
NC2201*	1 MHz - 100 MHz	+5 dBm	± 0.75	-75	40.0	50	100
NC2401*	1 MHz - 500 MHz	0 dBm	± 1.0	-87	10.0	50	100
NC2501*	1 MHz - 1 GHz	-5 dBm	± 1.0	-95	4.0	50	100
NC2601*	1 MHz - 2 GHz	-5 dBm	± 2.0	-98	2.8	50	100

*Crest factor is 2:1 for these models

Diodes: NC100/200/300/400 Series

Noisecom noise diodes are categorized by their noise output and special response. The NC100/NC200 series diodes are designed for audio and RF applications, while the NC300/NC400 series are designed for microwave applications.

Noisecom noise diodes can deliver symmetrical white Gaussian noise with a flat output power, but performance may vary depending on circuit design.



Features and Benefits:

- Custom electrical testing available upon request
- Wide package variety with custom configurations
- NC100 & 200 series for audio and RF applications
- NC300 & 400 series for microwave applications

Specifications:

Output	White Gaussian Noise
Operating temperature	0°C to +55°C temperature for NC100 series; -55°C to +125°C for all others
Storage temperature	-65°C to +150°C

Audio & VHF Types

Model	Frequency Range	Operating Conditions			Minimum Output ($\mu\text{V}/\sqrt{\text{Hz}}$)	Package
		V_b (V)	I_{op}	R_L (Ω)		
NC101	0.1 Hz - 100 kHz	7 - 10	30 - 60 μA	2200	3.0	DO-35
NC102	0.1 Hz - 500 kHz	7 - 10	30 - 60 μA	2200	3.0	DO-35
NC103	0.1 Hz - 1 MHz	7 - 10	30 - 60 μA	2200	3.0	DO-35
NC104	0.1 Hz - 3 MHz	7 - 10	30 - 60 μA	2200	3.0	DO-35
NC201	0.1 Hz - 10 MHz	7 - 10	0.2 - 0.5 mA	2200	0.1	DO-35
NC202	0.1 Hz - 25 MHz	7 - 10	0.2 - 0.5 mA	2200	0.1	DO-35
NC203	0.1 Hz - 100 MHz	7 - 10	0.2 - 0.5 mA	50	0.05	DO-35

RF & Microwave Types

Model	Frequency Range	Operating Conditions			Output ENR (dB)	Package
		V_b (V)	I_{op} (mA)	R_L (Ω)		
NC302	10 Hz - 3 GHz	8-12	8	50	30-35	DO-35, BL, CH1
NC302L	10 Hz - 3 GHz	6 - 8	6	50	30 - 35	DO-35, BL, CH1
NC303	10 Hz - 8 GHz	8 - 12	8	50	30 - 35	DO-35, BL, CH1
NC303SQ	10 Hz - 10 GHz	8 - 12	8	50	30 - 35	SQ
NC303SOT	10 Hz - 8 GHz	8 - 10	8	50	30 - 35	SOT323
NC305	10 MHz - 11 GHz	8 - 12	10	50	29 - 34	BL, CH1
NC401	100 MHz - 18 GHz	8 - 12	10	50	30 - 35	C10, C50H, CH2
NC403	100 MHz - 27 GHz	8 - 12	12	50	24 - 28	C50, CH3
NC404	18 GHz - 50 GHz	8 - 12	15	50	20 - 25	C50, CH3
NC405	18 GHz - 75 GHz	8 - 12	20	50	15 - 25	C50, CH3
NC406	18 GHz - 110 GHz	8 - 12	25	50	15 - 25	C50, CH3
NC407	1 GHz - 110 GHz	8 - 12	15	50	15 - 25	B

Specific Noise Parameters to Know Before Placing an Order for a Noise Solution

Solution Signal Characteristics:

- Start Frequency: _____ kHz, MHz, GHz
- Stop Frequency: _____ kHz, MHz, GHz
- Start Freq. roll-off: _____ dB @ _____ kHz, MHz, GHz offset
- Stop Freq. roll-off: _____ dB @ _____ kHz, MHz, GHz offset
- Flatness vs. Freq.: _____ dB (over the entire bandwidth)
- Flatness vs. Freq.: _____ dB (over custom freq. range, specify band)
- Total output power level: _____ dBm
- Normalized output power: _____ dBm/Hz
- Crest Factor: _____ dB (peak to average ratio requirement)

Solution Form Factor:

- Diode
- Calibrated or Amplified Noise (Through Hole or Surface mount)
- Calibrated or Amplified Noise (Connectorized)
- Manually controlled instrument
- Programmable instrument

Mechanical Requirements:

- Location of connectors: _____ Front _____ Rear
- Type of connector: _____ BNC ___ SMA ___ N ___ APC ___ K ___ V

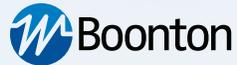
Instrument Specific Requirements:

- Noise Attenuator
- Noise Attenuator Range: _____ dB in _____ dB steps
- Signal combiner
- Signal Attenuator
- Signal Attenuator Range: _____ dB in _____ dB steps

Note: Not all combinations may be available or feasible for a particular module or instrument. Consult factory. Multiple noise sources and switchable filter bank to provide different band noise channels in one instrument are available. Consult factory.

Who We Are

Wireless Telecom Group comprised of Boonton Electronics, CommAgility, Microlab and Noisecom, is a global designer and manufacturer of advanced RF and microwave components, modules, systems and instruments. Serving the wireless, telecommunication, satellite, military, aerospace, semiconductor and medical industries, Wireless Telecom Group products enable innovation across a wide range of traditional and emerging wireless technologies. With a unique set of high-performance products including peak power meters, signal analyzers, signal processing modules, LTE PHY and stack software, power splitters and combiners, GPS repeaters, public safety monitors, noise sources, and programmable noise generators, Wireless Telecom Group enables the development, testing, and deployment of wireless technologies around the globe.



Boonton Electronics is a leader in high performance RF and microwave test equipment for radar, avionics, electronic warfare, satellite and wireless communications, and EMI/EMC applications. Used across the semiconductor, military, aerospace, medical and communications industries for more than 70 years, Boonton products enable a wide range of RF power measurements and signal analysis for RF product design, production, maintenance and system integration. The Boonton product portfolio is designed and manufactured in the USA and includes peak and average RF power meters, Real-Time USB Power sensors, RF voltmeters, modulation analyzers, and audio analyzers.



CommAgility is a developer of embedded signal processing and RF modules, and LTE PHY/stack software, for 4G and 5G mobile network and related applications. Combining the latest DSP, FPGA and RF technologies with advanced, industry-leading software, CommAgility provides compact, powerful, and reliable products for integration into high performance test equipment, specialized radio and intelligence systems, and R&D demonstrators. CommAgility engineers work closely with customers to provide hardware and software solutions for the most demanding real-time signal processing, test and control challenges in wireless baseband, semiconductor processing, medical imaging, radar and sonar applications.



Microlab is a leader in low PIM (passive intermod) RF and microwave products enabling signal distribution and deployment of in-building DAS (distributed antenna systems), wireless base stations and small cell networks. High performance passive components such as power combiners, directional couplers, attenuators, terminators and filters are developed for broadband applications to support public safety networks, GPS reference signaling, television transmitters and aircraft landing systems. Active solutions from Microlab include GPS signal repeaters for cellular timing synchronization and passive safety monitors for real-time in-building DAS system diagnostics.



Noisecom is a leader of RF and microwave noise sources for signal jamming and impairment, reference level comparison and calibration, receiver robustness testing, and jitter injection. Electronic noise generation devices from Noisecom come in a variety of product types including, noise diodes, built-in-test modules (BITE), calibrated noise sources, jitter sources, cryogenic noise standards and programmable instruments. Calibrated noise sources are available from audio to millimeter wavelengths in coaxial or waveguide modules. Programmable instruments are highly configurable and able to generate precise Carrier-to-Noise, Signal-to-Noise and broad band white noise. Noisecom products are customizable to meet the unique needs of challenging applications and can be designed for high power, high crest factor, specific filter responses with a wide selection of input and output options.