ST-2 MINI-NOISE DIODES
10 KHZ TO 3 GHZ

MINI-NOISE DIODE SPECIFICATIONS

MODEL NUMBER	FREQUENCY RANGE	OUTPUT (1) ENR dB *(min)*	FLATNESS (2) dB (max)	TYP BIAS *(2)* CURRENT (max)	TYP DC+ BIAS
ST-2	10 KHz - 1 MHz	33	2.0	2-4 mA	5.2v
	1 MHz – 100 MHz	30	2.0	2-4 mA	5.2v
	100 MHz – 3 GHz	28	2.0	2-4 mA	5.2v

(1) ENR is measured in a 50 ohm system.

(2) Spectral response varies with bias current. Differing levels of ENR and in-band flatness can be realized by adjusting bias current.

Application Notes:

Microwave Receiver Calibration: There are two built-in tests commonly performed with noise. One is a straightforward noise figure or noise temperature test. The other is a spectral calibration, which uses the broadband flat frequency output of the noise to test frequency response. This test typically requires a higher amplitude noise signal than the noise temperature test and may require a gain stage to boost the signal.

A/D Converter Dithering Circuit: Sensitivity can be increased significantly when summing low frequency noise (in the range of 10 KHz - 5 MHz depending on the A/D converter) with the IF frequency prior to the input of the A/D Converter. The noise signal amplitude needs to be boosted significantly from the output of the noise diode. Designers usually take two approaches, one at 50 ohm in which standard radio frequency gain blocks are used and the noise is combined with the signal at 50 ohms. The signal +noise is then converted to high impedance prior to being fed into the A/D. The second uses op amps to boost the noise signal and the noise is summed with the signal all at high impedance and fed directly into the A/D.

Encryption: In this usage, the Gaussian output of the noise is used to generate random numbers by sampling the voltage of the noise using an A/D converter. Frequency requirements are usually a function of the system parameters of the random numbers desired. As with the dithering circuit, the noise amplitude form the diode needs to be boosted with gain. These circuits are typically high impedance.

DESCRIPTION

Micronetics' ST-2 Diode with its small, surface mount SOT-23 package are ideally suited for medium and high volume production circuits. Their Gaussian wideband highly stable noise characteristics make them ideal for several applications from built-in Microwave receiver calibration, to A/D dithering.

PINOUT

Pin 1 - Ground
Pin 2 - Bias/Noise Output
Pin 3 - N/C

See style code Z on our website for additional outline details:
http://www.micronetics.com

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