

The Creonic AWGN Channel IP implements an AWGN noise generator capable of working up to a maximum of 512 symbols in parallel. The IP was developed with the aim of allowing the performance evaluation of a digital communication system in the presence of Additive White Noise and with a major emphasis on dealing with low bit-error-rates. Unlike a software-based AWGN generator, which might take several hours and even days for the stated purpose, a hardware-based AWGN generator requires significantly less time (reduces time by several orders of magnitude).

Benefits

- Design-time configuration of the number of symbols in parallel, quantization of input and output and pre-calculation of standard variation, for adjustment of resource utilization.
- Low-power and low-complexity design.
- AXI4-Stream for easy integration
- Available for ASIC and FPGAs (Xilinx).

Performance Figures

- Symbol rate of 122.9 Gsymb/s at 240 MHz.
- Latency of 37.5 ns at 240 MHz.

Channel Performance

The following figures depict bit-error-rate (BER) of the AWGN Channel as well as the SNR estimation.

Features

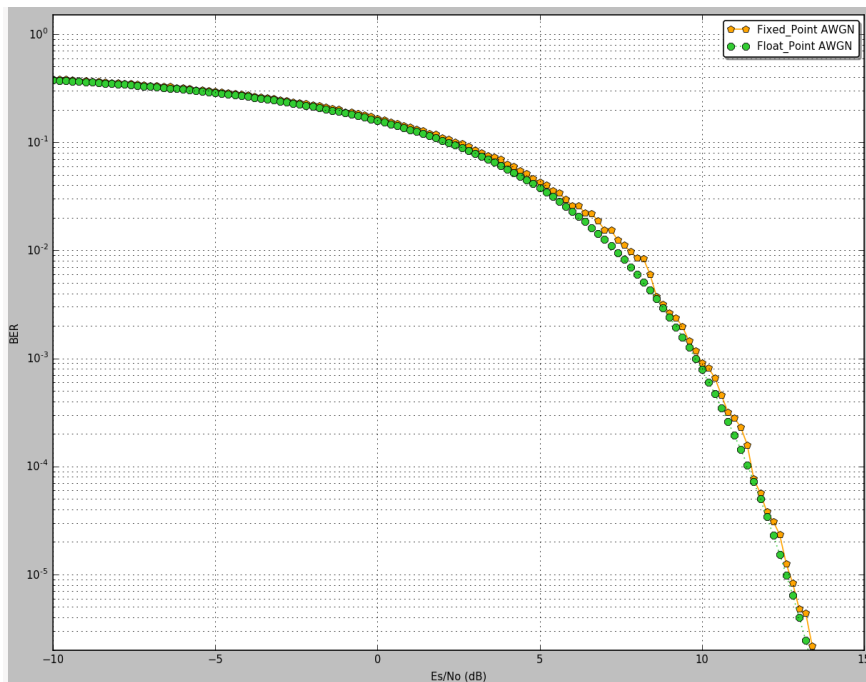
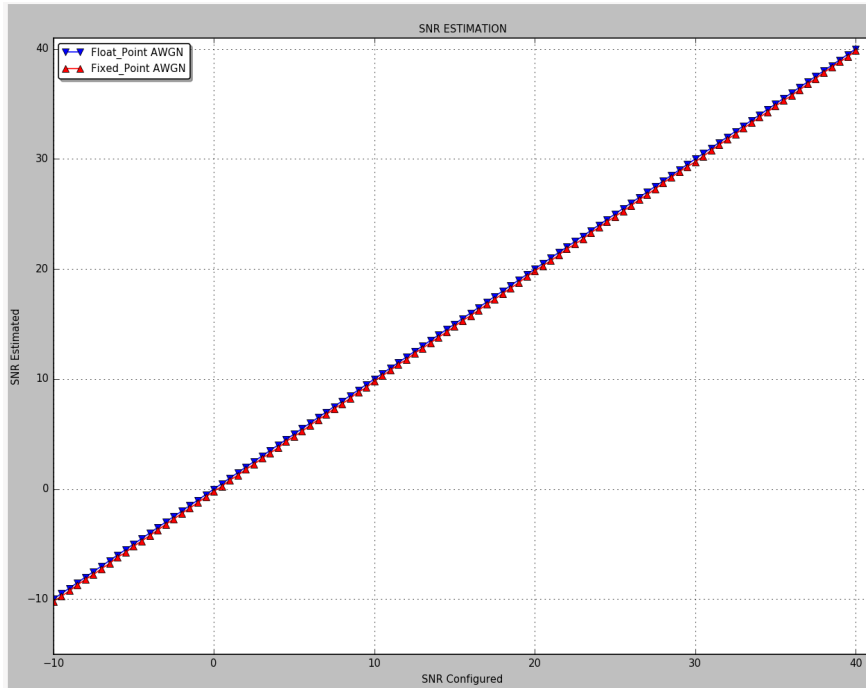
- Support for up to 512 symbols in parallel @ 240 MHz
- Support for SNR (E_s/N_0) in the range from -10 to 41 dB with steps of 0.1
- Synchronous design with one clock
- Noise sequence periodically generated at $\sim 2^{64} \approx 2 \times 10^{19}$ samples
- Based on Box-Muller algorithm

Applications

- Digital communication systems for which an AWGN channel is required

Deliverables

- VHDL source code or synthesized netlist
- HDL simulation models e.g. for Aldec's Riviera-PRO
- VHDL testbench
- bit-accurate Matlab, C or C++ simulation model
- comprehensive documentation



About Creonic

Creonic is an ISO 9001:2015 certified provider of ready-for-use IP cores for several algorithms of communications such as forward error correction (LDPC, Turbo, Polar), modulation, and synchronization. The company offers the richest product portfolio in this field, covering standards like 5G, 4G, DVB-S2X, DVB-RCS2, DOCSIS 3.1, WiFi, WiGig, and UWB. The products are applicable for ASIC and FPGA technology and comply with the highest requirements with respect to quality and performance. For more information please visit our website at www.creonic.com.

Contact

Creonic GmbH
Bahnhofstr. 26-28
67655 Kaiserslautern
Germany

Phone: +49 631 3435 9880
Fax: +49 631 3435 9889
Web: www.creonic.com
E-mail: sales@creonic.com

Twitter: [Creonic_IPCores](#)
Facebook: [Creonic](#)
LinkedIn: [Creonic](#)
