Digital Baseband Generator

PRODUCT DESCRIPTION

The Digital Baseband Generator is a conduction cooled board in a custom form factor which generates various types of signal waveforms, such as multiple carriers and AM/FM modulated signals on-the-fly with minimal switching time (<20μs) using Direct Digital Synthesis (DDS) technique.

The board receives input commands over Ethernet/optical interface and the FPGAs generate the desired waveforms up to 600 MHz. The output waveforms are interfaced to external world via SMA connectors. The board operates from external clock source over SMA connectors.

The board is used in electronic warfare applications such as baseband signal generation and jammer applications.

KEY FEATURES

- Digital generation of modulations and modulating signals
- Option to use external modulating signal (upto 100 KHz)
- Broadband signal generation through pre-computed waveforms
- Ability to generate AM and FM modulated signals
- Dual DAC operating @ 2 GHz and dual Virtex-5 FPGA for two independent waveform generation
- Onboard DAC clock generation with external reference clock
- 10 Mps ADC and 10 Mps DAC

PERFORMANCE

- RF output frequency range : 1.5 MHz - 600 MHz
- RF output level : 7 dBm +/- 3 dBm
- Multicarrier generation : upto 6 FDM, upto 24 TDM
- Sweep band width : 250 MHz
- Phase noise : < -100dBc/Hz @ 1 KHz carrier
- Spurious : < -55dBc
- Harmonics : < -55dBc

SPECIFICATIONS

FPGAs / Processor

- Xilinx Virtex-5 SX95T FPGA
- Xilinx Virtex-5 SX240T FPGA
Interfaces
- One GigE via RJ45 connector
- External 100 MHz reference clock
- Optical interfacing through one SFP transceiver (upto 2.5 Gbps)
- Backplane connectivity via Euro-card type connector
- Control interface over Ethernet or optical link

Software
- Custom application software running on MicroBlaze processor, receives command over the Ethernet interface/optical interface
- GUI interface on host PC for stand-alone validation
- Debug over UART port

Additional Information
- Clock input : 100 MHz, 0dBm sinewave
- Internal modulating signals : Single tone, two tone, band limited noise and configurable custom waveforms
- External modulating signals : up to 100 KHz analog

MECHANICAL
- Conduction-cooled board in custom form factor

POWER CONSUMPTION
- The unit consumes 60W
- Input voltage is 12V and 5V

ENVIRONMENTAL
- Qualification : Class L3 of JSS 55555
- Temperature range : −20°C and +85°C (Storage)
  −10°C and +55°C (Operational)

PART NUMBER(S)

| CB10E0 | Digital Baseband Generator |