

# DVBS2 MODULATOR CORE

## General Description

The DVBS2 modulator core performs the digital baseband functionality for the transmission side of Digital Video Broadcasting Satellite link.

The modulator core implements the framing functions as defined by ETSI EN 302 307 V1.1.1 (2009-08).

It is configurable to supports all configurations regard to constellation 4QAM, 8PSK, 16 APSK and 32APSK, code rate 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9 and 9/10.

The error protection used is based on LDPC algorithm followed by the bit interleaver.

Squared-root raised cosine (SRRC) filter, with roll-off factors 0,35 or 0,25 or 0,20 is used.

Microblaze or external processor interface, with status and control registers, is available for controlling and managing the core.

TS over IP is available, for IP based contribution. ASI interface is available too.

Internal 20-bit architecture for high level Modulation Error Ratio (MER) and Bit Error Ratio (BER) performances.

FPGA netlist only or complete design environment package are deliverable.

## Features

Compliant with ETSI EN 302 307 V1.2.1 (2009-08)

Support all code rate, all constellation type

Support Single and Multiple stream

Internal or external microcontroller interface

AD9747 or AD9789 interface available, with interpolation stages. Other DAC interfaces are available under customer request

Typical MER > 43 dB at UHF band

SRRC filter used

Digital Linear – Non Linear – Group Delay Precorrection Option

## Performance and Resources Utilization

Family	Device	Slices	SliceReg	LUTs	DSP 48E1	Bram	Speed (MHz)
Artix 7	XC7A200T	3521	8942	8894	14	49	160

## Verification

The core has been verified through extensive simulation and physical implementation on Xilinx Artix™ 7 and Xilinx Zynq™ FPGA technology.

## Deliverables

The following deliverables are available:

- FPGA netlist and Xilinx ISE constraint files
- User guide
- Block level design document
- VHDL test bench and test vectors

Optional deliverables:

- Fully synthesizable VHDL source code
- Synthesis script for XST

## Typical Application

