DINT2FP

Integer to Floating Point Pipelined Converter

ver 2.32

OVERVIEW

The DINT2FP is the **pipelined** integer to floating point converter. The input and output numbers format is according to IEEE-754 standard. DINT2FP supports double word integers (4 Bytes) and single precision real numbers. Convert operation is pipelined to 3 levels. Input data are fed every clock cycle. The first result appears after latency equal to 3 clock periods and next results are available **each clock** cycle. Full precision and accuracy are accomplished.

APPLICATION

- Math coprocessors
- DSP algorithms
- Embedded arithmetic coprocessor
- Data processing & control

KEY FEATURES

- Full IEEE-754 compliance
- Double word integer input numbers (4 Bytes)
- Single precision real output numbers
- Simple interface
- No programming required
- 3 levels pipelining
- Full accuracy and precision
- Results available at every clock
- Fully configurable
- Fully synthesizable, static synchronous design with no internal tri-states

DELIVERABLES

- Source code:
  - VHDL Source Code or/and
  - VERILOG Source Code or/and
  - Encrypted, or plain text EDIF netlist
- VHDL & VERILOG test bench environment
  - Active-HDL automatic simulation macros
  - ModelSim automatic simulation macros
  - NCSim automatic simulation macros
  - Tests with reference responses
- Technical documentation
  - Installation notes
  - HDL core specification
  - Datasheet
- Synthesis scripts
- Example application
- Technical support
  - IP Core implementation support
  - 3 months maintenance
    - Delivery the IP Core updates, minor and major versions changes
    - Delivery the documentation updates
    - Phone & email support

LICENSING

Comprehensible and clearly defined licensing methods without royalty fees make using of IP Core easy and simply.

Single Design license allows using IP Core in single FPGA bitstream and ASIC implemen-

http://www.DigitalCoreDesign.com
http://www.dcd.pl

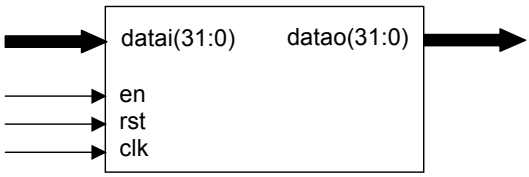
tation. It also permits FPGA prototyping before ASIC production.

Unlimited Designs license allows using IP Core in unlimited number of FPGA bitstreams and ASIC implementations.

In all cases number of IP Core instantiations within a design, and number of manufactured chips are unlimited. There is no time of use limitations.

- Single Design license for
  - *VHDL, Verilog source code called HDL Source*
  - *Encrypted, or plain text EDIF called Netlist*
- Unlimited Designs license for
  - *HDL Source*
  - *Netlist*
- Upgrade from
  - *Netlist to HDL Source*
  - *Single Design to Unlimited Designs*

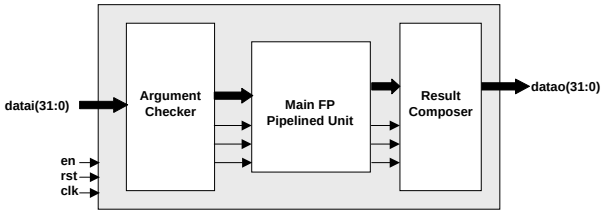
SYMBOL



PINS DESCRIPTION

PIN	TYPE	DESCRIPTION
clk	Input	Global system clock
rst	Input	Global system reset
en	Input	Enable computing
datai[31:0]	Input	Data bus input
datao[31:0]	Output	Data bus output

BLOCK DIAGRAM



Arguments Checker - performs input data analyze against IEEE-754 number standard compliance. The appropriate numbers and information about the input data classes are given as the results to Main FP Pipelined Unit.

Main FP Pipelined Unit - performs integer to floating point conversion. Gives the complex information about the results to Result Composer module.

Result Composer - performs result rounding function, and data alignment to IEEE-754 standard.

PERFORMANCE

The following table gives a survey about the Core area and performance in the ALTERA® devices after Place & Route :

Device	Speed grade	Logic Cells	F_{max}
FLEX10KE	-1	570	83 MHz
ACEX1K	-1	570	80 MHz
APEX20K	-1	470	61 MHz
APEX20KE	-1	470	73 MHz
APEX20KC	-7	470	87 MHz
APEX-II	-7	470	103 MHz
MERCURY	-5	570	157 MHz
STRATIX	-5	400	150 MHz
CYCLONE	-6	385	156 MHz
STRATIX-II	-3	330	234 MHz
CYCLONE-II	-6	410	149 MHz

Core performance in ALTERA® devices