MAS_ALU REFERENCE DOCUMENT

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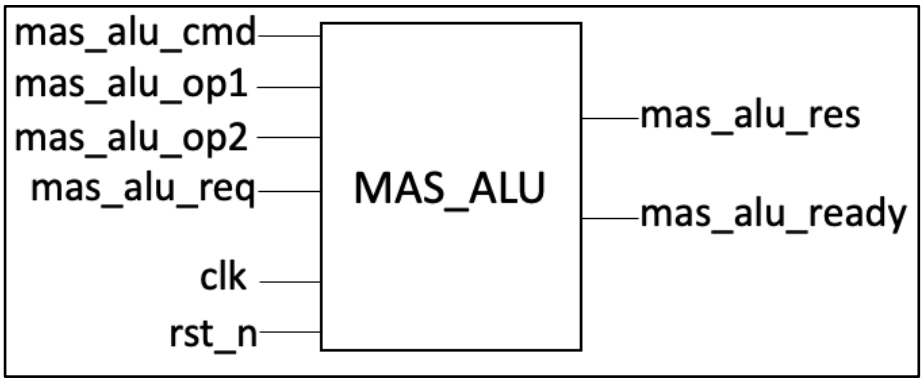
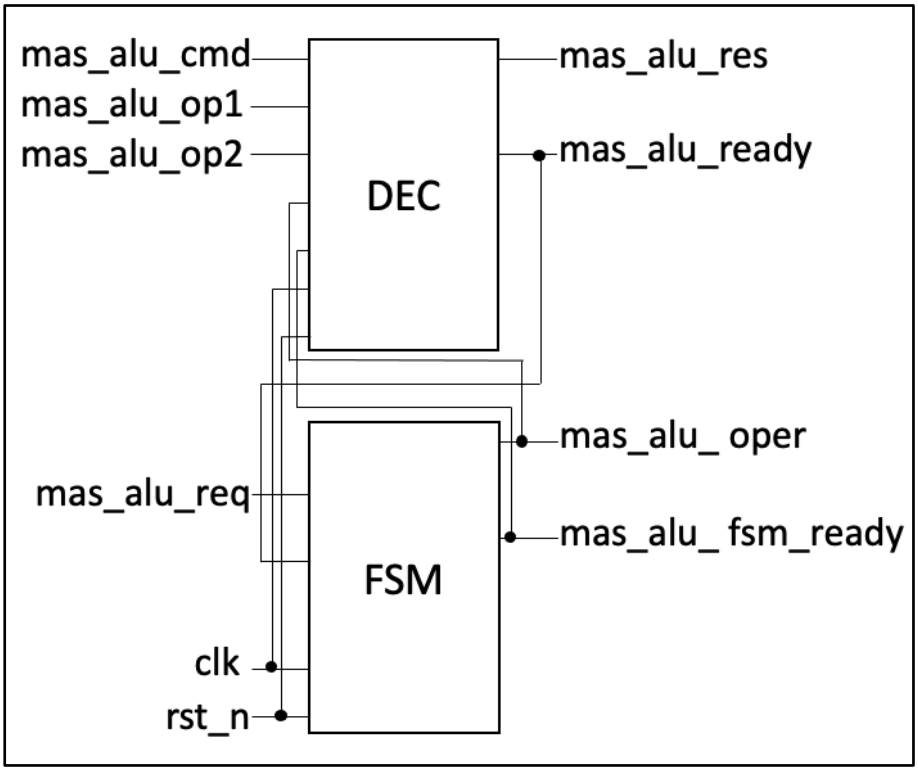
MAS_ALU Description

The MAS_ALU is a simple design consisting arithmetic function blocks, decoder block that determines function to be executed and finite state machine (FSM) to automate the process. The following diagrams show the top level of the design and interconnection between decoder and FSM.



MAS_ALU TOP LEVEL



Interconnection between decoder and FSM

Signals List (MAS_ALU TOP)

Signal	Description
mas_alu_cmd	Signal that contains command for decoder to determine function to be executed
mas_alu_op1	Operand 1
mas_alu_op2	Operand 2
mas_alu_req	External request signal for MAS_ALU to operate
mas_alu_res	Signal that contains results of arithmetic operation
mas_alu_ready	Signal that indicates MAS_ALU is ready to perform next operation

File List

File	Description
mas_alu_top.sv	Top level file that wraps on decoder and FSM modules.
mas_alu_decoder.sv	Determines function to be executed and wraps on arithmetic function modules.
mas_alu_fsm.sv	Contains FSM that automate the operation
mas_alu_adder.sv	Perform addition
mas_alu_subtractor.sv	Perform subtraction
mas_alu_right_shift.sv	Perform right shift
mas_alu_left_shift.sv	Perform left shift
mas_alu_architecture_description.svh	Contains MAS_ALU design configuration
mas_cmd.svh	Contains commands for alu operations

Testbench

The verification testbench covers broad and targeted testing on specific inputs, functionality checks, assertion and coverage model.

File List

File	Description
mas_alu_tb.sv	Top testbench file that consists of macros for testbench configuration.
mas_alu_tb.cov	Contains covergroup.
mas_add_sub_broadtest.sv	Insert randomized wide range of stimulus generated to DUT for addition & subtraction operations.
mas_add_sub_targettest.sv	Insert selected of stimulus to DUT for addition & subtraction operations.
mas_rl_shift_broadtest.sv	Insert randomized wide range of stimulus generated to DUT for right & left shift operations.
mas_rl_shift_targettest.sv	Insert selected of stimulus to DUT for right & left shift operations.
mas_test_class.sv	Consists of base class and derived classes for test stimulus generation with constraints.
mas_test_configuration.sv	Contains MAS_ALU test configuration