

Think Silicon

VLSI Design & Consultancy

DATASHEET

**Twin Port FF memory
Version 1.0**

1 Overview

The Think-Silicon *Twin Port FF memory* is a synchronous synthesizable twin port memory generator.

2 Features

- Easy to use Graphical Web User Interface
- Synchronous operation
- Separate Port A Read and Write and Port B interfaces
- Configurable memory size

3 Architecture

3.1 Block Diagram

Figure 3-1 represents the basic functional block of the *tpmem* module generated by the *Twin Port FF memory* toolkit. The memory structure consists of N M -bit registers. For the N registers there is write and read access capability through *portA* and only read capability through *portB*. As shown in Figure 3-1 there are separate memory pointers for each port. Thus it is possible to perform write access to a memory location A (*mem_reg0*) through *portA* and at the same time read access to a different location B through the *portB* (*mem_reg2*). All operations are fully synchronous to *clk* clock.

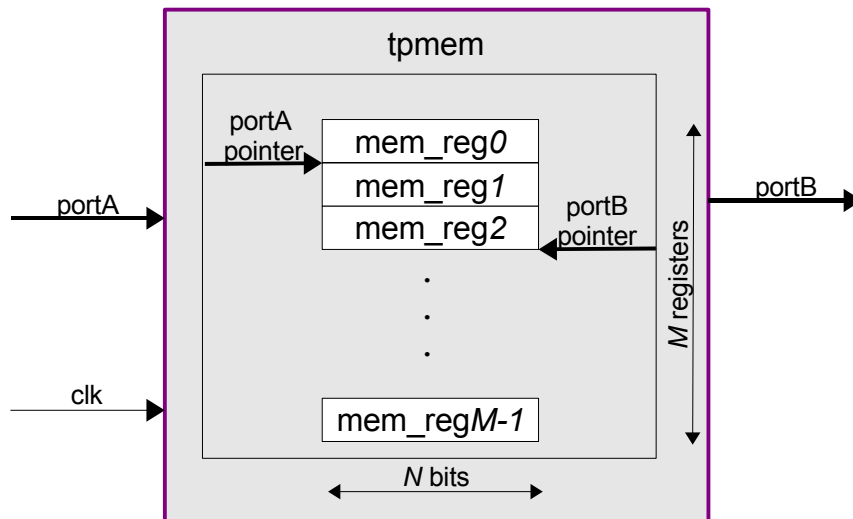


Figure 3-1 *tpmem* Block Diagram

3.2 Port Diagram

The *tpmem* Port Diagram is shown in Figure 3-2.

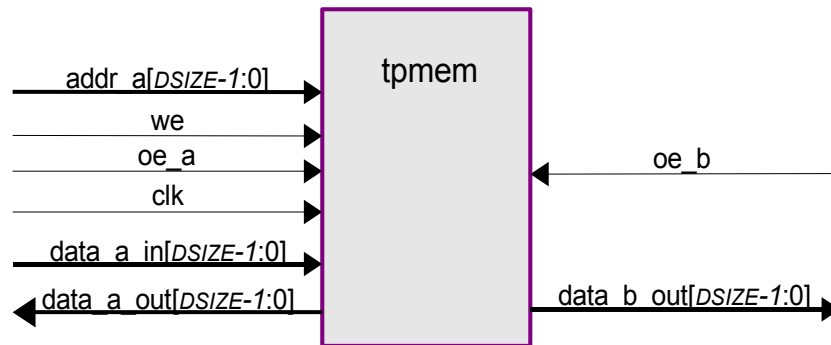


Figure 3-2 *tpmem* Port Diagram

3.3 Port Interface

The port signals of *tpmem* module are listed in Table 3-1.

Table 3-1 *tpmem* Port Interface

PORT	TYPE	DESCRIPTION
addr_a[ASIZE-1:0]	Input	Port A address
addr_b[ASIZE-1:0]	Input	Port B address
data_a_in[DSIZE-1:0]	Input	Port A data input
oe_a	Input	Output enable for port A
oe_b	Input	Output enable for port B
we	Input	Write enable for Port A
data_a_out[DSIZE-1:0]	Output	Port A data output
data_b_out[DSIZE-1:0]	Output	Port B data output
clk	Input	Clock input

Note: The symbol *DSIZE* refers to the size of Read and Write data ports. The symbol *ASIZE* refers to the size of the address port. Both parameters can be defined by the user through the "With" parameter in the Twin Port FF memory GUI (see 4. Generator Usage).

4 Generator Usage

The *Twin Port FF memory* generator employs a graphical web user interface (GUI) for configuring and generating the *tpmem* module. In order to use the GUI you must sign-in Think Silicon Ltd web site. If already registered, click on *Sign-in* link in the upper, right side of the web page. Otherwise click on *Register* link first and follow the instructions. The *Twin Port FF memory* generator GUI page is shown in Figure 4-1.



Figure 4-1 Twin Port FF memory generator GUI

As shown in Figure 4-1, the size of the *tpmem* memory can be arbitrarily defined by the user. There is also the option to synchronize the read operation by ticking the *Synchronous read* box. After having completed the configuration parameters, press the *Generate* button in order to generate the *tpmem* module.

5 Deliverables

The package generated with *Twin Port FF memory* consists of the present document and source code files in Verilog™¹ HDL language. The files are listed in Table 5-1.

Table 5-1 Twin Port FF memory Deliverables

FILE	DESCRIPTION
<i>tpmem_DIMENSION.v</i>	<i>tpmem</i> top module
<i>parameters.txt</i>	<i>tpmem</i> generation parameters
<i>TSi_tpmems.pdf</i>	The present document

Note: The "DIMENSION" substring refers to memory dimensions and has the form "memory locations x location size in bits", "256x32" for example.

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