**********Draft**********

Write Read Simulation

04/07/21

**********Draft**********

Goal

. testbuilds/catzip-newautofpga/catzip/myenv-a.sh

devel@mypi3-16:~ $ cd testbuilds/catzip-newautofpga/catzip/sim/verilated/

devel@mypi3-16:~/testbuilds/catzip-newautofpga/catzip/sim/verilated $ ./arm-main_tb -trace wr-rd.vcd
Listening on port 8363
Listening on port 8364
> T
CMD: Only sent 0 bytes of 3!
Accepted CMD connection
POLL = 1
RCVD: 13 bytes
< A01000001W55
> A01000001K00000000
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 13 bytes
< A01000005Waa
> A01000005K00000000
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 12 bytes
< A01000009W1
> A01000009K00000000
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 12 bytes
< A0100000dW2
> A0100000dK00000000
POLL = 1
RCVD: 0 bytes

< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 16 bytes
< A01000011W10000
> A01000011K00000000
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 16 bytes
< A01000015W20000
> A01000015K00000000
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 11 bytes
< A01000001R
> A01000001R00000055
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 11 bytes
< A01000005R
> A01000005R000000aa
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 11 bytes
< A01000009R
> A01000009R00000001
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 11 bytes
< A0100000dR
> A0100000dR00000002
POLL = 1
RCVD: 0 bytes
< [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 11 bytes

```
< A01000011R
> A01000011R00010000
POLL = 1
RCVD: 0 bytes
<  [CLOSED]
Accepted CMD connection
POLL = 1
RCVD: 11 bytes
< A01000015R
> A01000015R00020000
POLL = 1
RCVD: 0 bytes
<  [CLOSED]
^C
```

```
devel@mypi3-16:~/testbuilds/catzip-newautofpga/catzip/sim/verilated $ gtkwave wr-rd.vcd
```

```
devel@mypi3-16:~ $ cd testbuilds/catzip-newautofpga/catzip/sw/host
```

```
devel@mypi3-16:~/testbuilds/catzip-newautofpga/catzip/sw/host $ ./wr.sh
01000000 (   SDRAM)-> 00000055
01000004 (       )-> 000000aa
01000008 (       )-> 00000001
0100000c (       )-> 00000002
01000010 (       )-> 00010000
01000014 (       )-> 00020000
01000000 (   SDRAM) : [...U] 00000055
01000004 (       ) : [....] 000000aa
01000008 (       ) : [....] 00000001
0100000c (       ) : [....] 00000002
01000010 (       ) : [....] 00010000
01000014 (       ) : [....] 00020000
```

Image 0

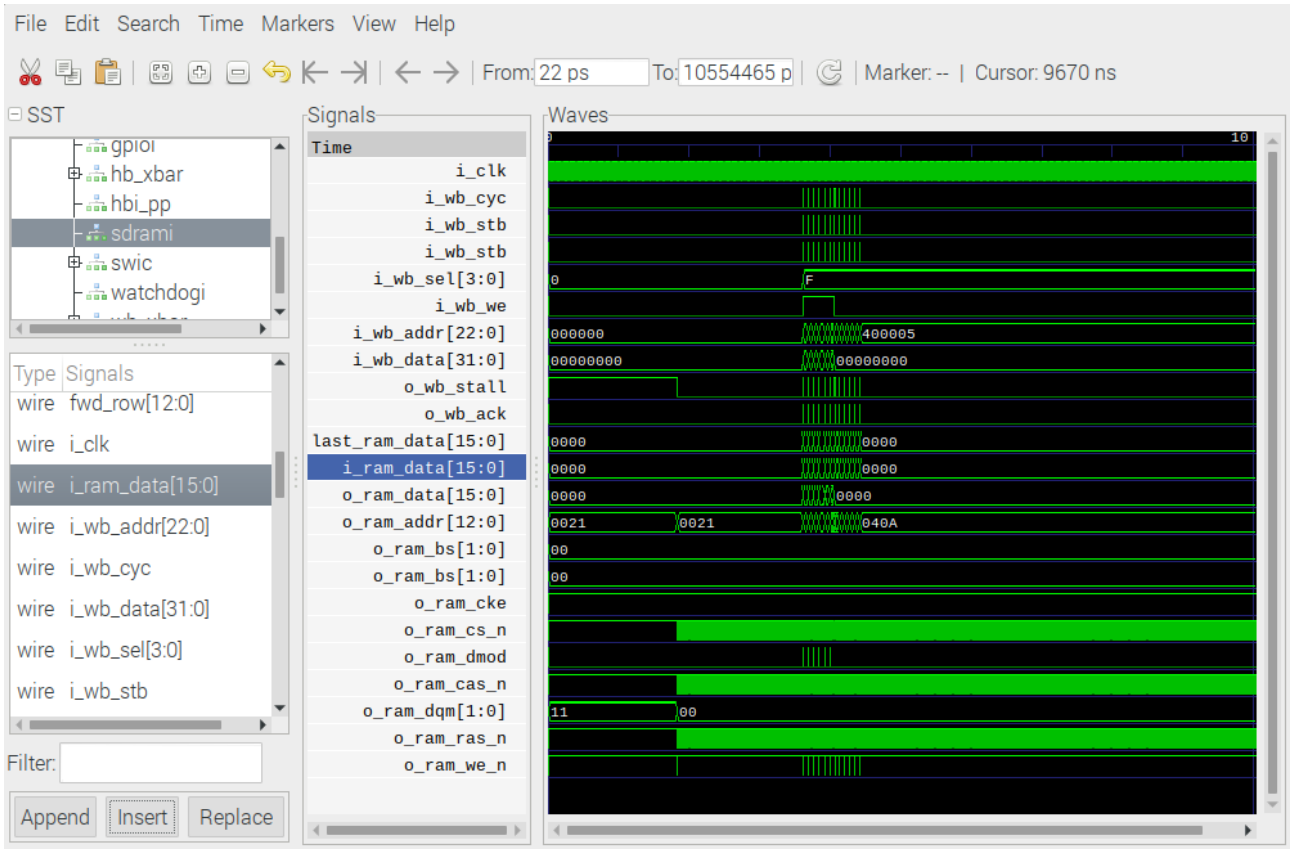


image 1

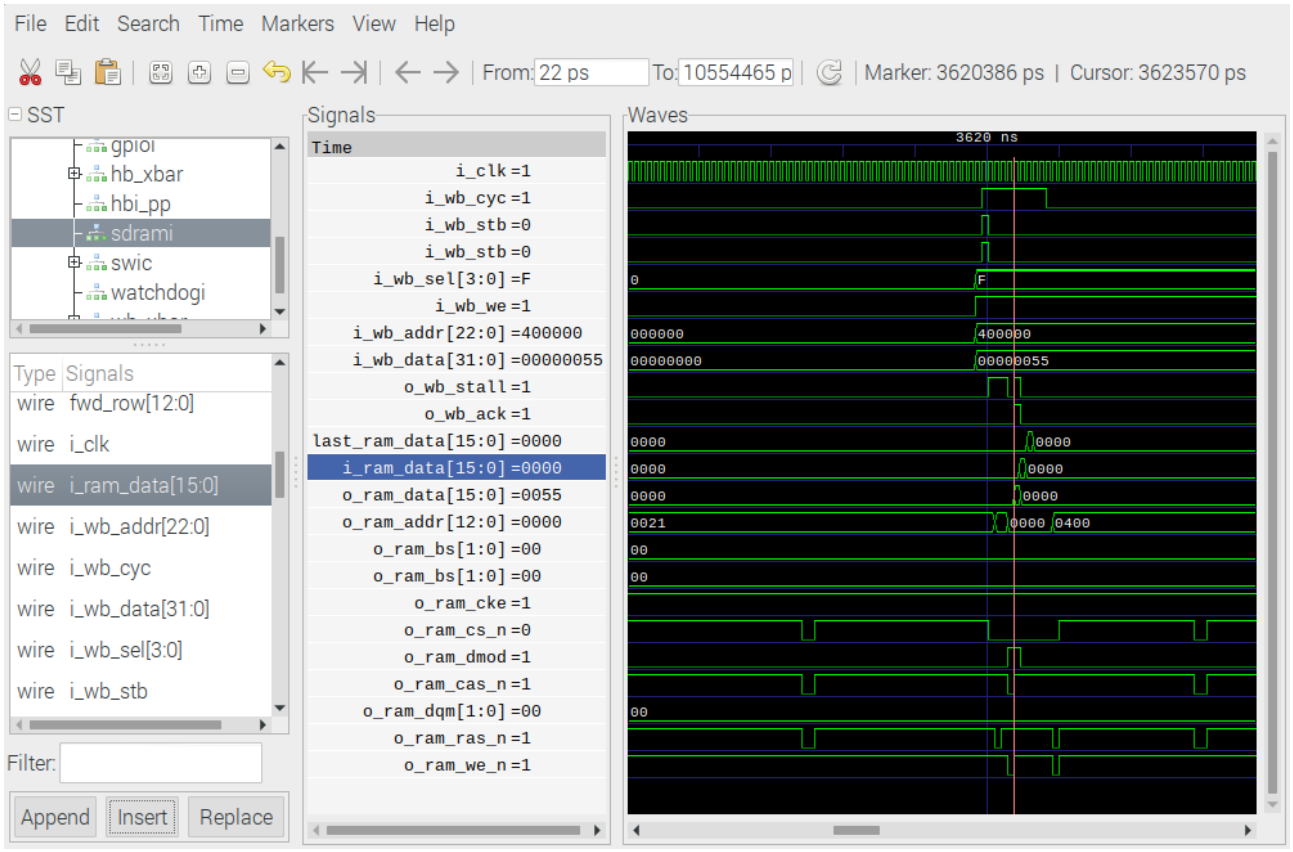


image 2

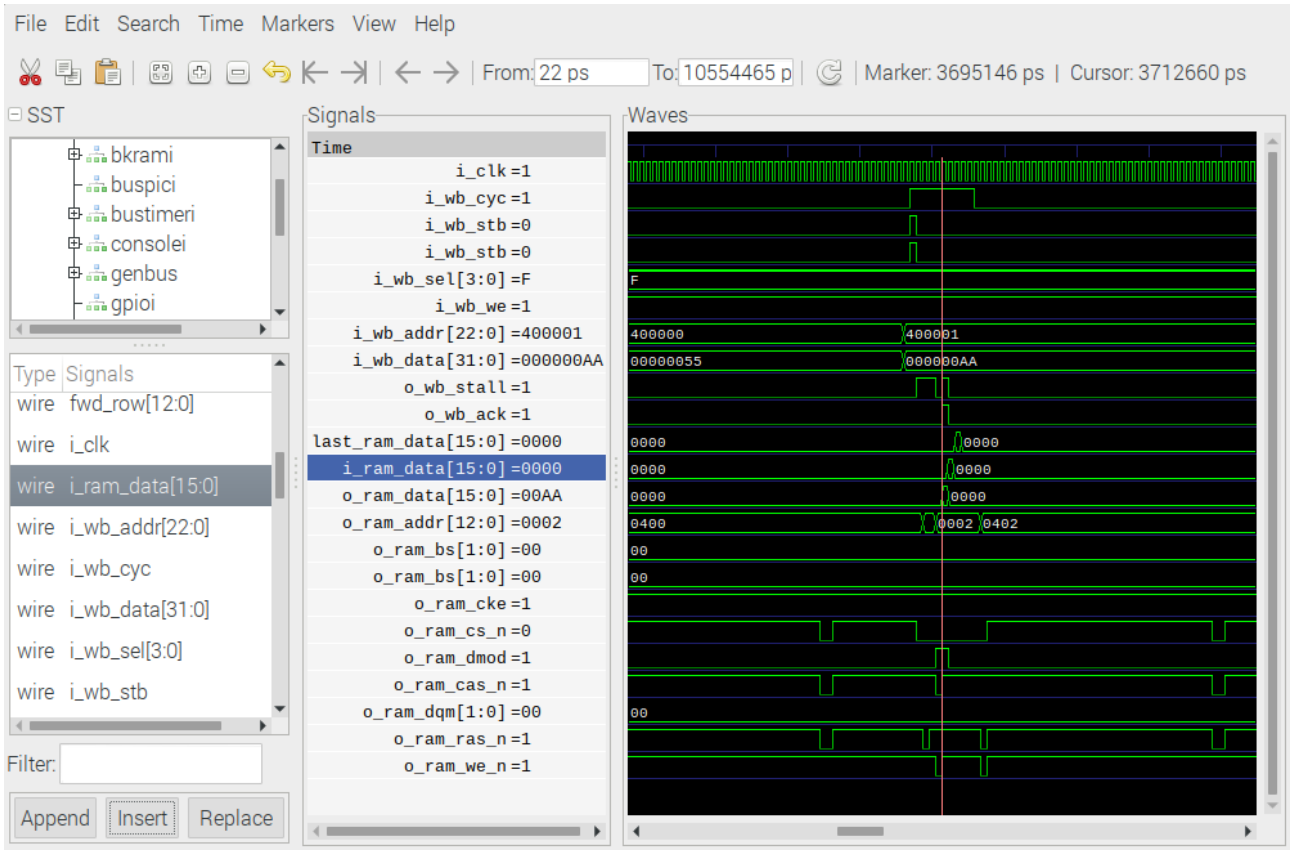


image 3

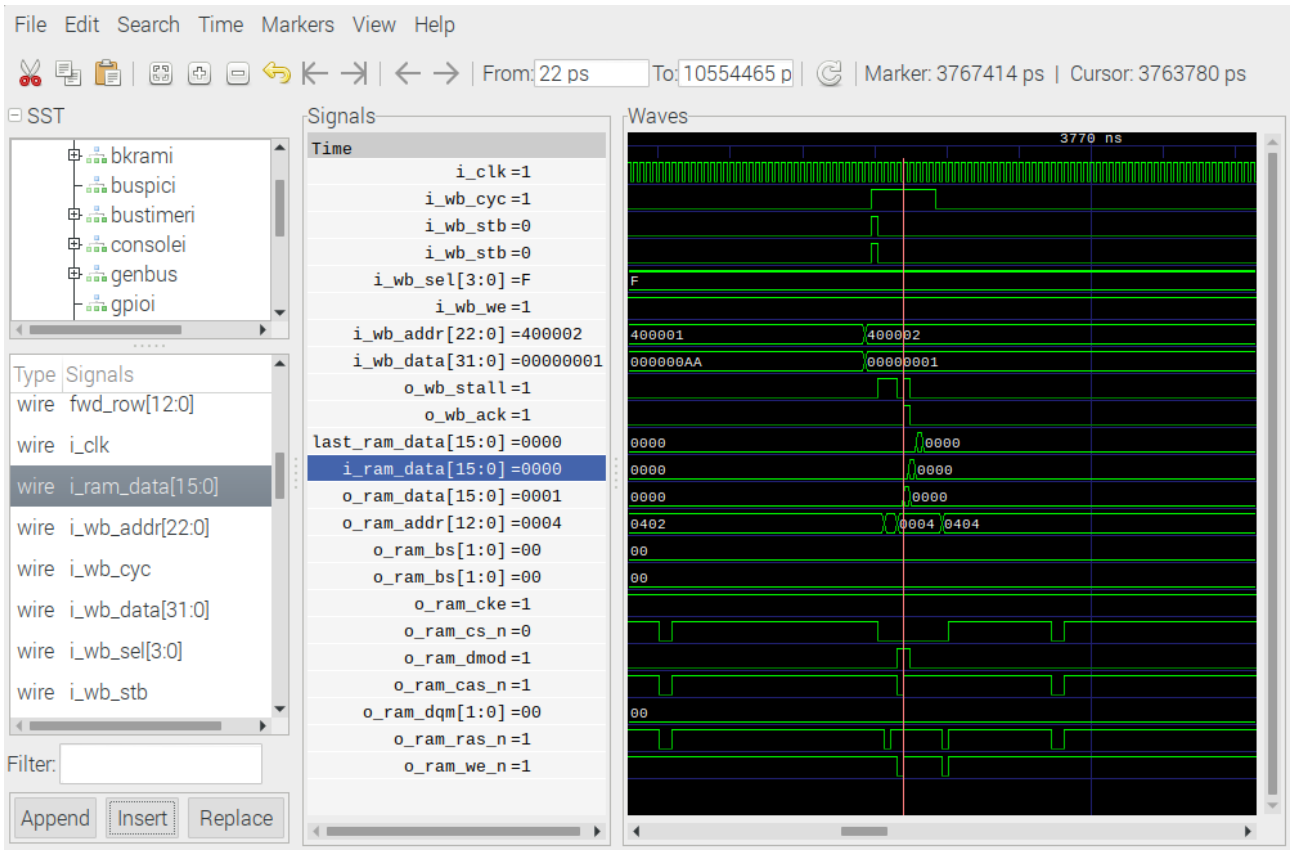


image 4

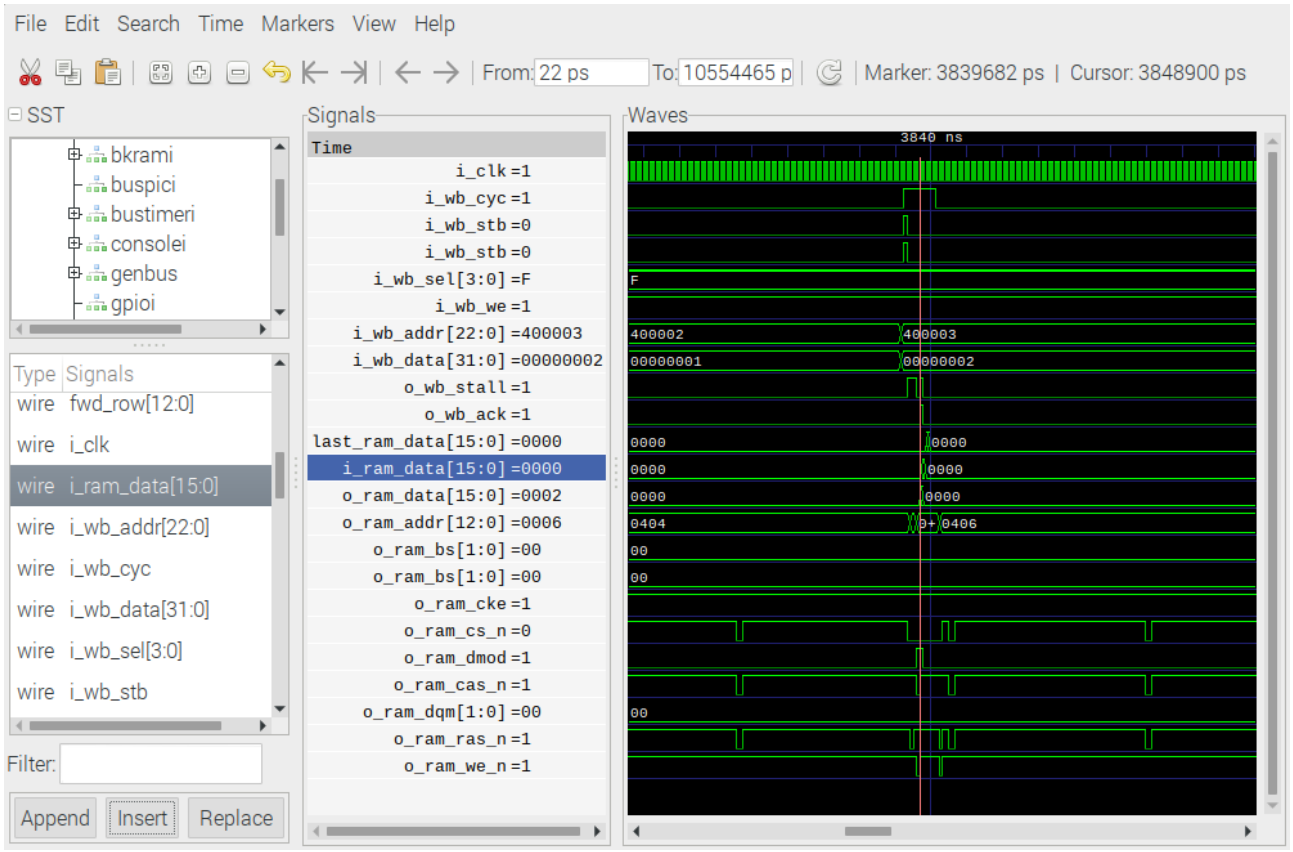

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 3839682 ps | Cursor: 3848900 ps
SST
bkrami
buspici
bustimeri
consolei
genbus
gpioi
Type Signals
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
wire i_wb_data[31:0]
wire i_wb_sel[3:0]
wire i_wb_stb
Filter:
Append Insert Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =1
i_wb_addr[22:0] =400003
i_wb_data[31:0] =00000002
o_wb_stall =1
o_wb_ack =1
last_ram_data[15:0] =0000
i_ram_data[15:0] =0000
o_ram_data[15:0] =0002
o_ram_addr[12:0] =0006
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =1
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
Waves
3840 ns
F
400002
400003
00000001
00000002
0000
0404
0406
00

image 5

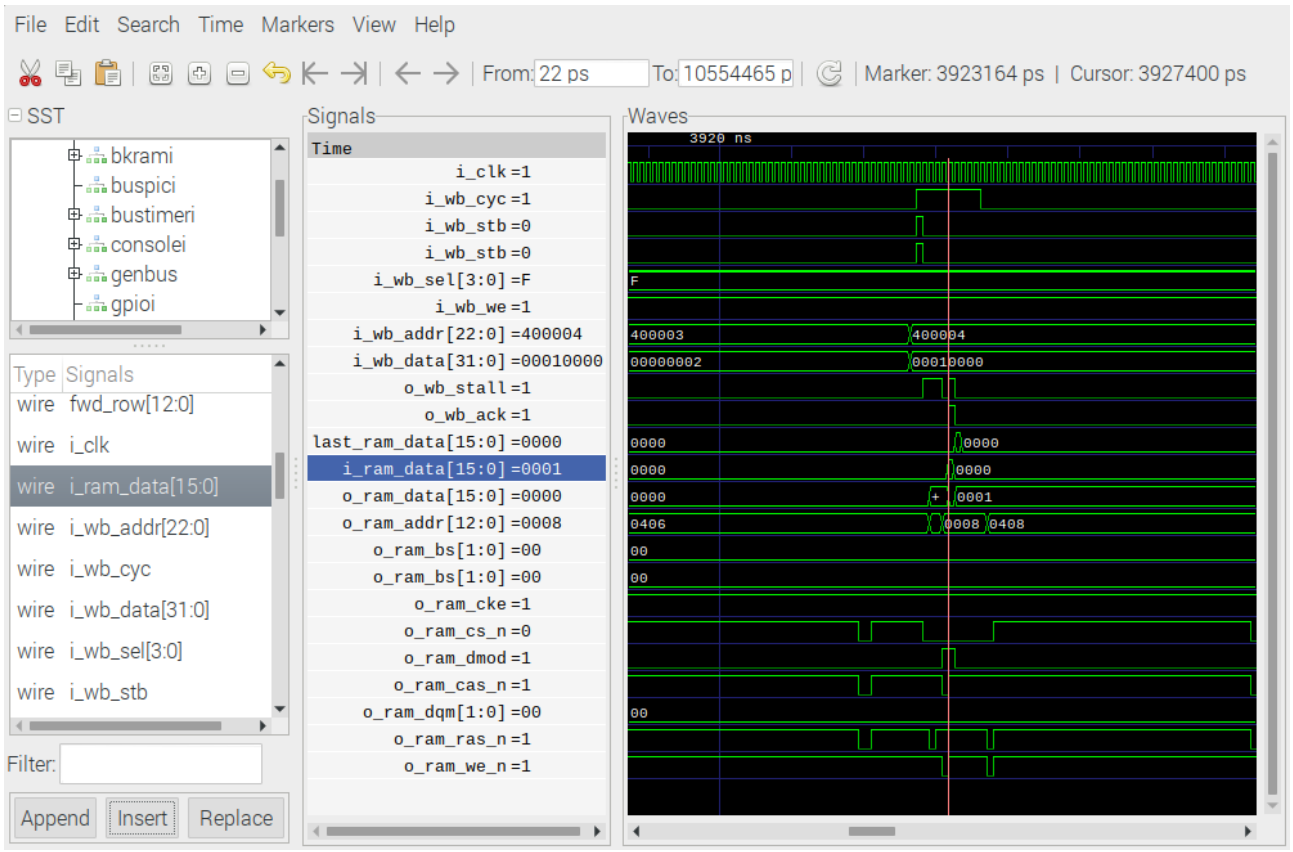

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 3923164 ps | Cursor: 3927400 ps
SST
bkrami
buspici
bustimeri
consolei
genbus
gpioi
Type Signals
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
wire i_wb_data[31:0]
wire i_wb_sel[3:0]
wire i_wb_stb
Filter:
Append Insert Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =1
i_wb_addr[22:0] =400004
i_wb_data[31:0] =00010000
o_wb_stall =1
o_wb_ack =1
last_ram_data[15:0] =0000
i_ram_data[15:0] =0001
o_ram_data[15:0] =0000
o_ram_addr[12:0] =0008
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =1
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
Waves
3920 ns
F
400003
400004
00000002
00010000
0000
0001
0406
0008
0408
00

image 6

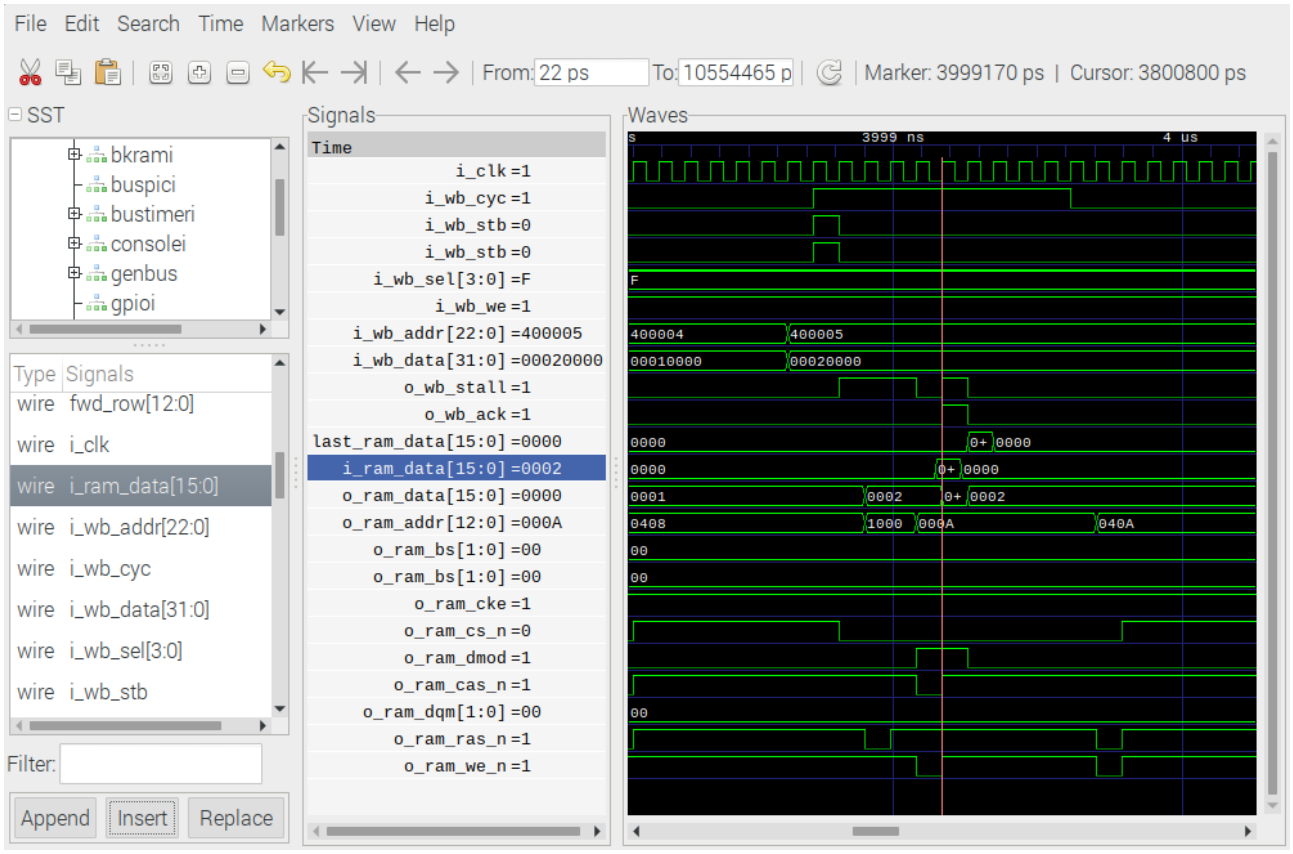


image 7

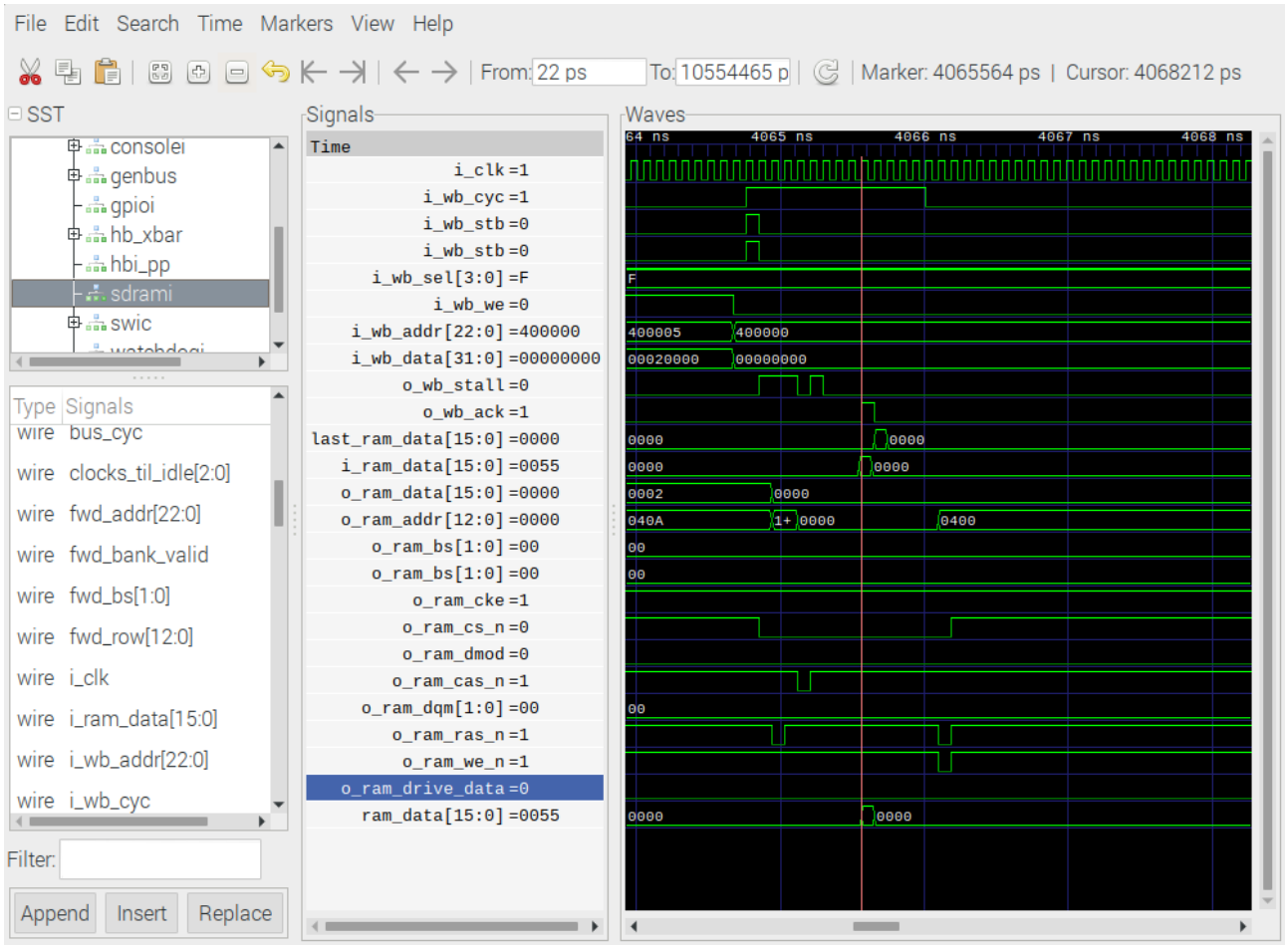

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 4065564 ps | Cursor: 4068212 ps
SST
consolei
genbus
gpioi
hb_xbar
hbi_pp
sdrami
swic
Type Signals
wire bus_cyc
wire clocks_til_idle[2:0]
wire fwd_addr[22:0]
wire fwd_bank_valid
wire fwd_bs[1:0]
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
Filter:
Append
Insert
Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =0
i_wb_addr[22:0] =400000
i_wb_data[31:0] =00000000
o_wb_stall =0
o_wb_ack =1
last_ram_data[15:0] =0000
i_ram_data[15:0] =0055
o_ram_data[15:0] =0000
o_ram_addr[12:0] =0000
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =0
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
o_ram_drive_data =0
ram_data[15:0] =0055
Waves
64 ns
4065 ns
4066 ns
4067 ns
4068 ns
F
400005
400000
00020000
00000000
0000
0000
0000
0000
0002
0000
040A
1+
0000
0400
00
00
00
0000
0000

image 8

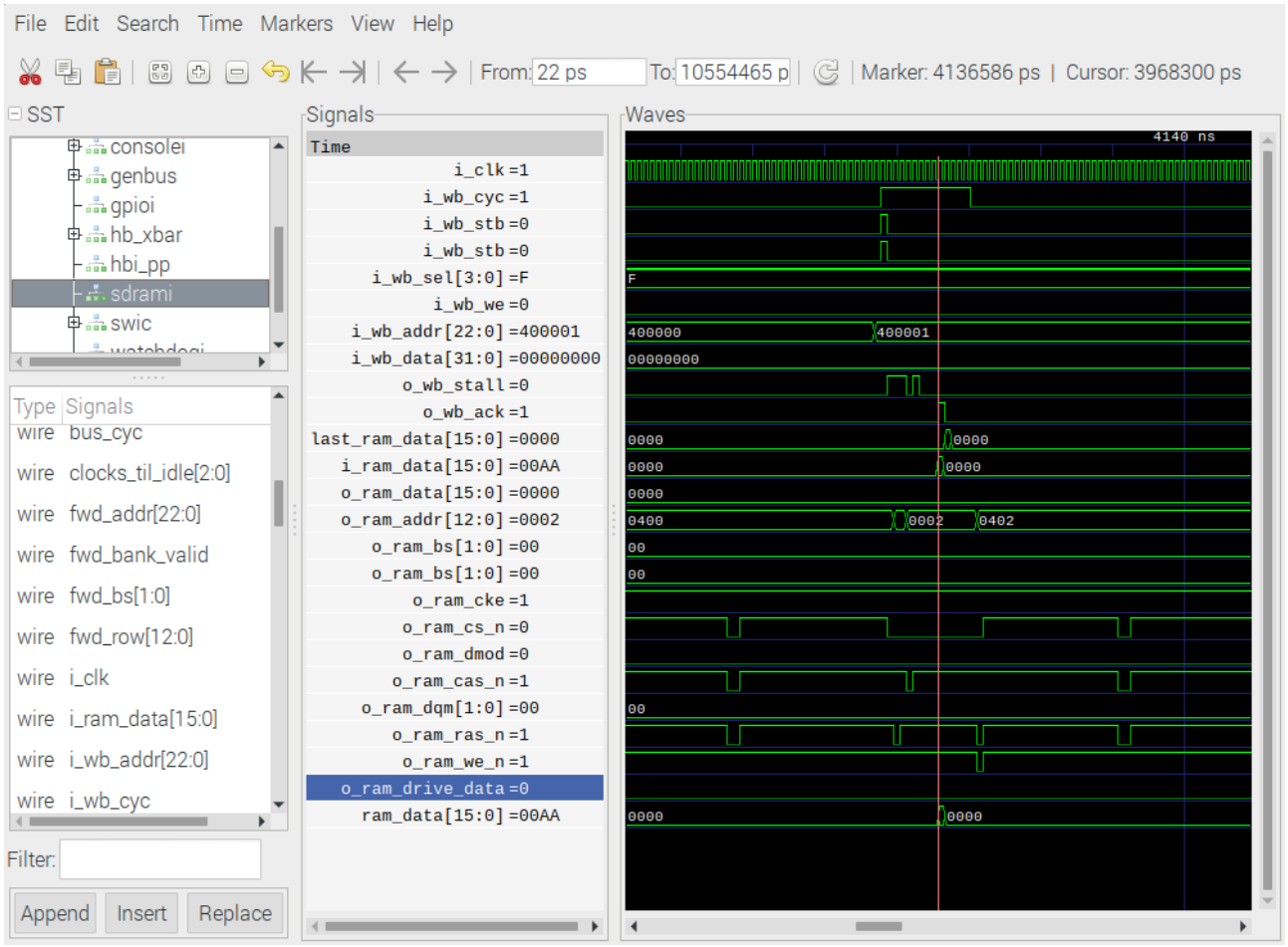

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 4136586 ps | Cursor: 3968300 ps
SST
consolei
genbus
gpioi
hb_xbar
hbi_pp
sdrami
swic
Type Signals
wire bus_cyc
wire clocks_til_idle[2:0]
wire fwd_addr[22:0]
wire fwd_bank_valid
wire fwd_bs[1:0]
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
Filter:
Append
Insert
Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =0
i_wb_addr[22:0] =400001
i_wb_data[31:0] =00000000
o_wb_stall =0
o_wb_ack =1
last_ram_data[15:0] =0000
i_ram_data[15:0] =00AA
o_ram_data[15:0] =0000
o_ram_addr[12:0] =0002
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =0
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
o_ram_drive_data =0
ram_data[15:0] =00AA
Waves
4140 ns
F
400000
400001
00000000
0000
0000
0000
0000
0000
0400
0002
0402
00
00
00
0000
0000

image 9

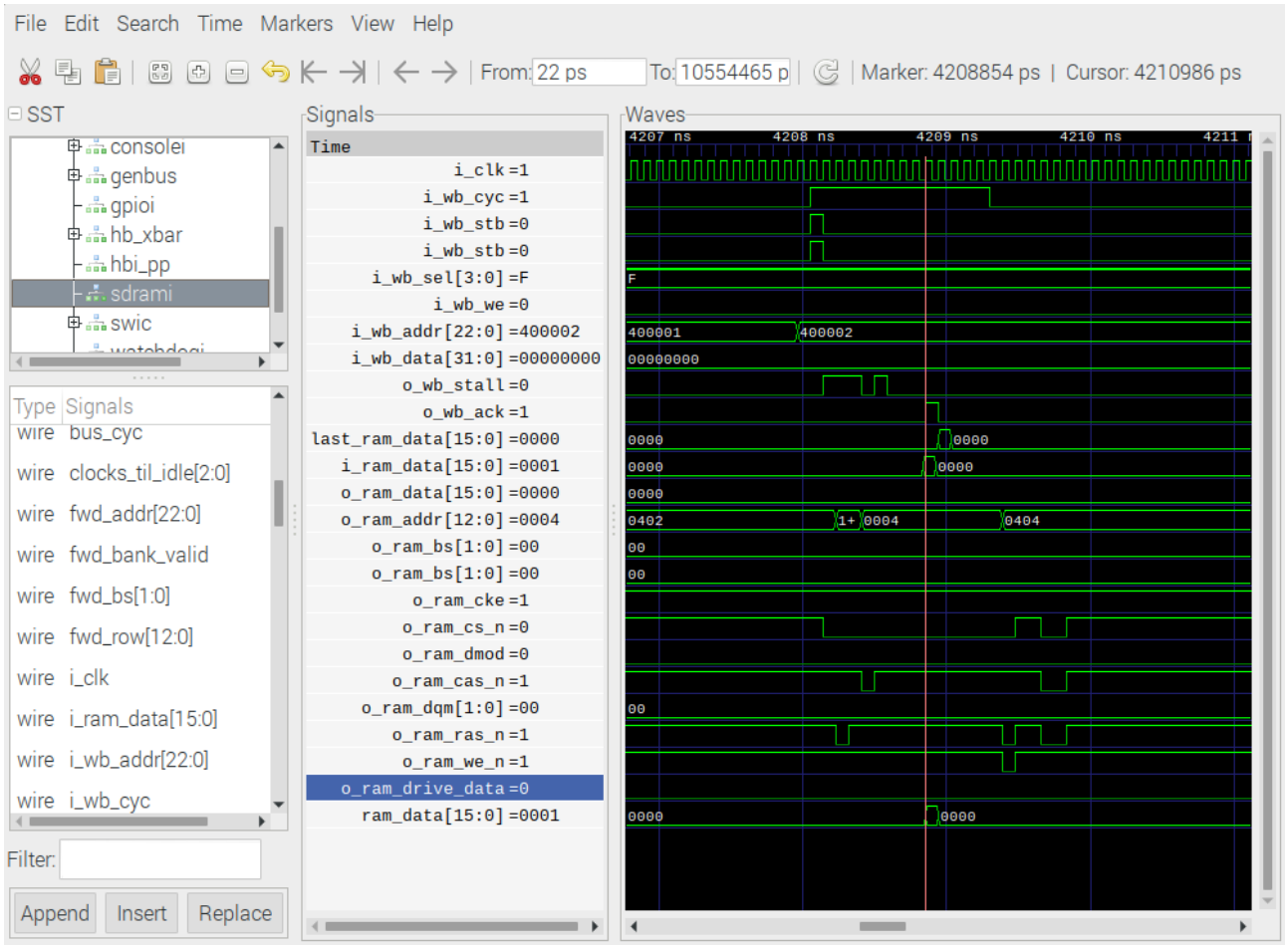

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 4208854 ps | Cursor: 4210986 ps
SST
consolei
genbus
gpioi
hb_xbar
hbi_pp
sdrami
swic
Type Signals
wire bus_cyc
wire clocks_til_idle[2:0]
wire fwd_addr[22:0]
wire fwd_bank_valid
wire fwd_bs[1:0]
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
Filter:
Append
Insert
Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =0
i_wb_addr[22:0] =400002
i_wb_data[31:0] =00000000
o_wb_stall =0
o_wb_ack =1
last_ram_data[15:0] =0000
i_ram_data[15:0] =0001
o_ram_data[15:0] =0000
o_ram_addr[12:0] =0004
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =0
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
o_ram_drive_data =0
ram_data[15:0] =0001
Waves
4207 ns
4208 ns
4209 ns
4210 ns
4211 n
F
400001
400002
00000000
0000
0000
0000
0000
0000
0402
1+
0004
0404
00
00
00
0000
0000

image 10

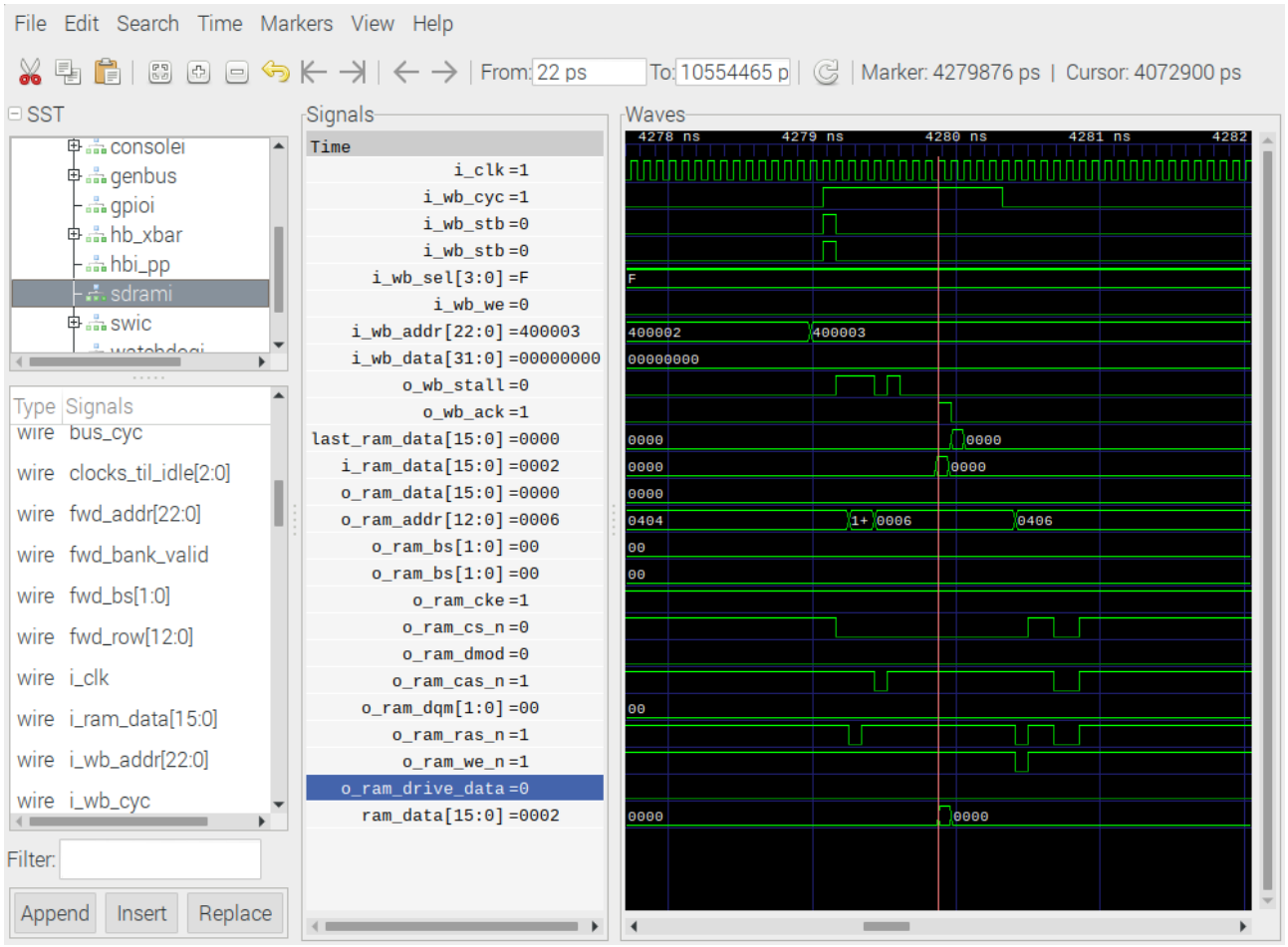

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 4279876 ps | Cursor: 4072900 ps
SST
consolei
genbus
gpioi
hb_xbar
hbi_pp
sdrami
swic
Type Signals
wire bus_cyc
wire clocks_til_idle[2:0]
wire fwd_addr[22:0]
wire fwd_bank_valid
wire fwd_bs[1:0]
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
Filter:
Append
Insert
Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =0
i_wb_addr[22:0] =400003
i_wb_data[31:0] =00000000
o_wb_stall =0
o_wb_ack =1
last_ram_data[15:0] =0000
i_ram_data[15:0] =0002
o_ram_data[15:0] =0000
o_ram_addr[12:0] =0006
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =0
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
o_ram_drive_data =0
ram_data[15:0] =0002
Waves
4278 ns
4279 ns
4280 ns
4281 ns
4282
F
400002
400003
00000000
0000
0000
0000
0000
0000
0404
1+
0006
0406
00
00
00
0000
0000

image 11

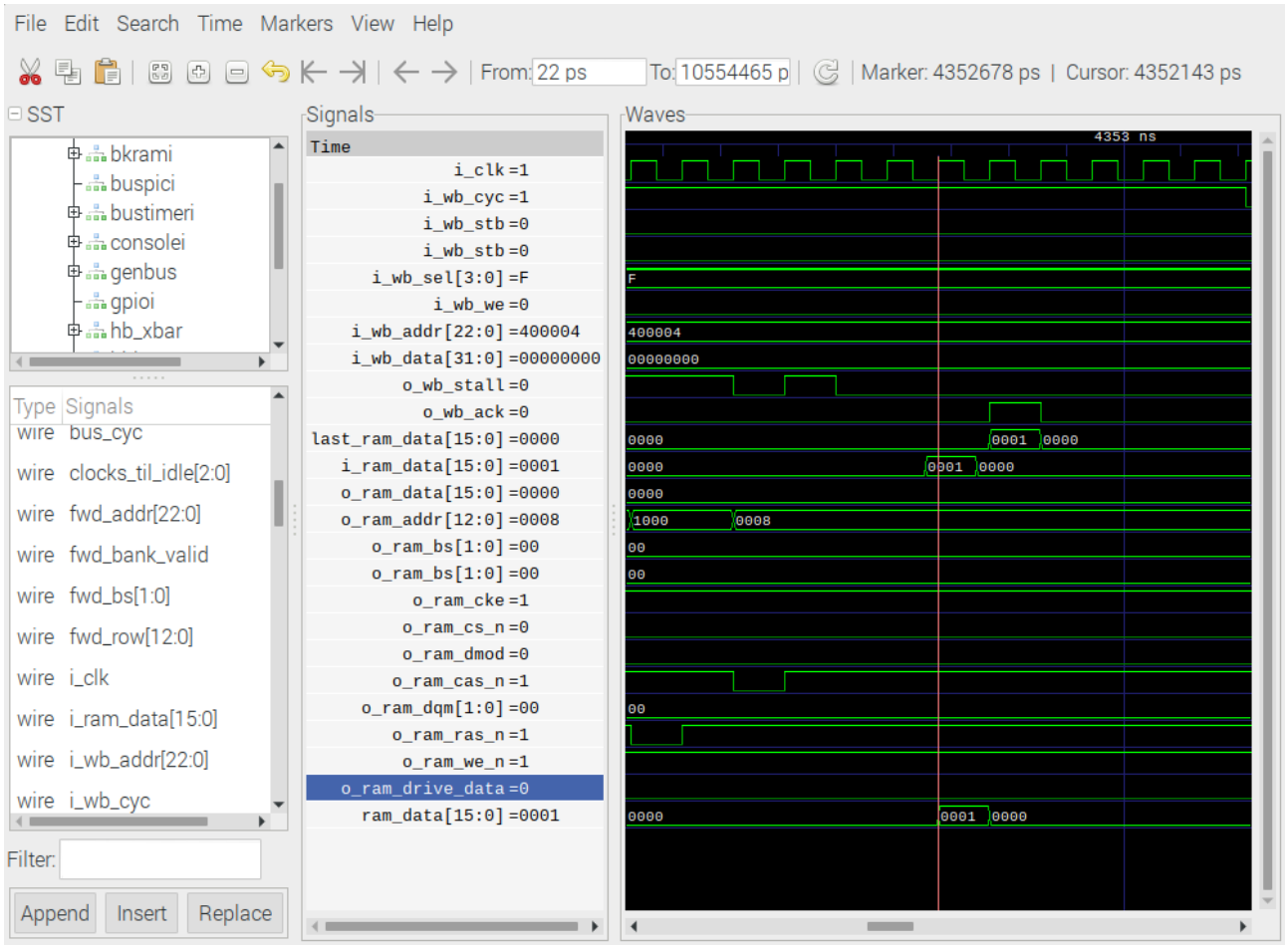
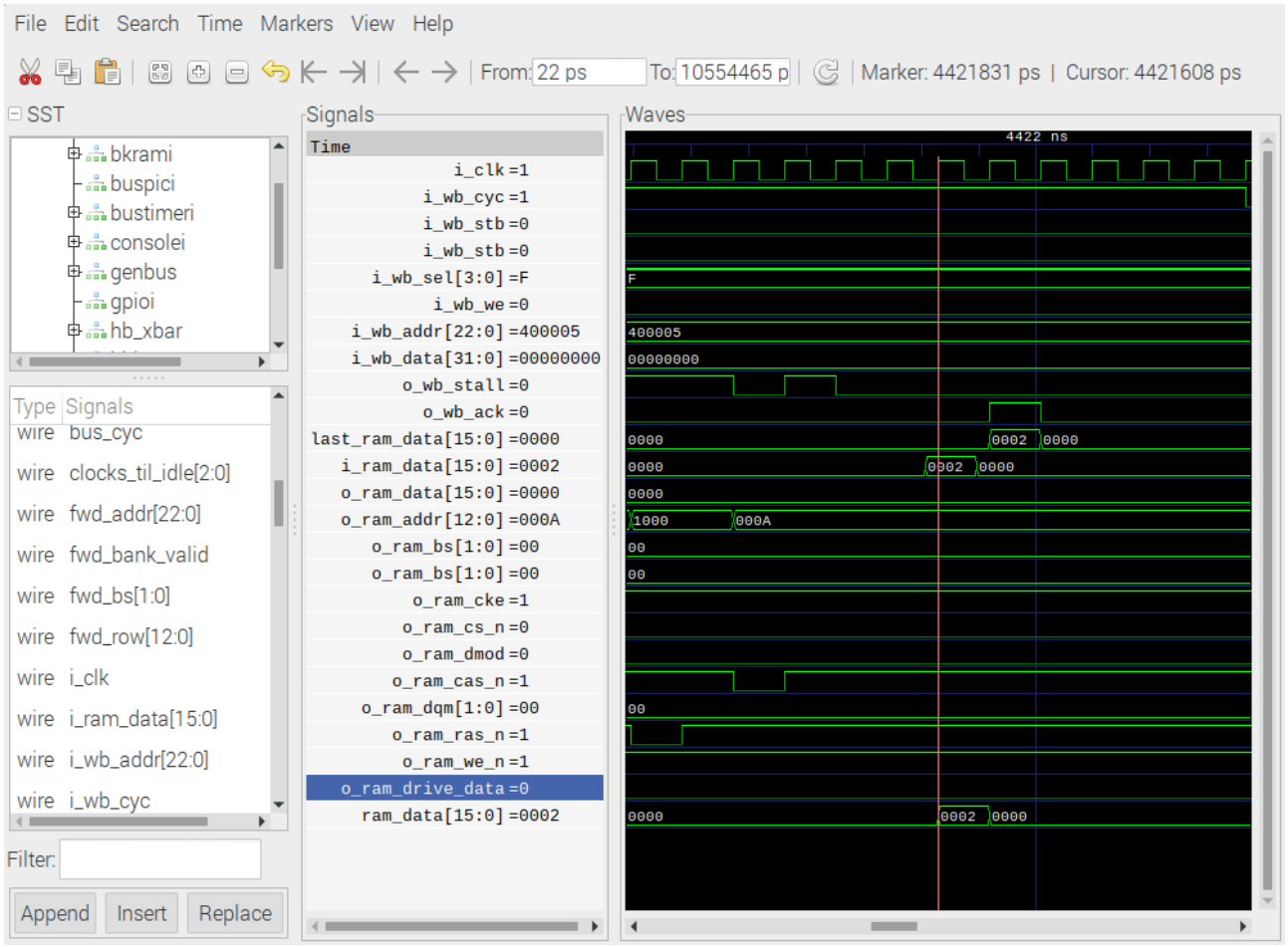

File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 4352678 ps | Cursor: 4352143 ps
SST
bkrami
buspici
bustimeri
consolei
genbus
gpioi
hb_xbar
Type Signals
wire bus_cyc
wire clocks_til_idle[2:0]
wire fwd_addr[22:0]
wire fwd_bank_valid
wire fwd_bs[1:0]
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
Filter:
Append
Insert
Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =0
i_wb_addr[22:0] =400004
i_wb_data[31:0] =00000000
o_wb_stall =0
o_wb_ack =0
last_ram_data[15:0] =0000
i_ram_data[15:0] =0001
o_ram_data[15:0] =0000
o_ram_addr[12:0] =0008
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =0
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
o_ram_drive_data =0
ram_data[15:0] =0001
Waves
4353 ns
F
400004
00000000
0000
0001
0000
1000
0008
00

image 12


File Edit Search Time Markers View Help
From: 22 ps
To: 10554465 p
Marker: 4421831 ps | Cursor: 4421608 ps
SST
bkrami
buspici
bustimeri
consolei
genbus
gpioi
hb_xbar
Type Signals
wire bus_cyc
wire clocks_til_idle[2:0]
wire fwd_addr[22:0]
wire fwd_bank_valid
wire fwd_bs[1:0]
wire fwd_row[12:0]
wire i_clk
wire i_ram_data[15:0]
wire i_wb_addr[22:0]
wire i_wb_cyc
Filter:
Append
Insert
Replace
Signals
Time
i_clk =1
i_wb_cyc =1
i_wb_stb =0
i_wb_stb =0
i_wb_sel[3:0] =F
i_wb_we =0
i_wb_addr[22:0] =400005
i_wb_data[31:0] =00000000
o_wb_stall =0
o_wb_ack =0
last_ram_data[15:0] =0000
i_ram_data[15:0] =0002
o_ram_data[15:0] =0000
o_ram_addr[12:0] =000A
o_ram_bs[1:0] =00
o_ram_bs[1:0] =00
o_ram_cke =1
o_ram_cs_n =0
o_ram_dmod =0
o_ram_cas_n =1
o_ram_dqm[1:0] =00
o_ram_ras_n =1
o_ram_we_n =1
o_ram_drive_data =0
ram_data[15:0] =0002
Waves
4422 ns
F
400005
00000000
0000
0002
0000
1000
000A
00