

Fault Tolerant Computing and VLSI Testing

Lab 1

1. Above questions:

- How many scan cells do you have? 3
- How many rule violations do you have? 0
- How many scan chains will you have? 1
- How much is the area overhead of scan? 23.4%
- How much is the timing overhead of scan? 4.7%
- What type of DFF before dft_compiler? reg
- What type of DFF after dft_compiler? HDSDFPQ1
- What two pins did dft_compiler add? test_si, test_se

2.

| Circuit name | Area without scan chain | Area with scan chain |
|--------------|-------------------------|----------------------|
| s298 | 1380.55 | 1483.78 |
| s344 | 1509.57 | 1664.41 |
| s349 | 1509.57 | 1664.41 |
| s382 | 1899.87 | 2170.83 |
| s386 | 1077.34 | 1154.76 |

3.

| Circuit name (registered inputs and outputs) | Area without scan chain | Area with scan chain |
|--|-------------------------|----------------------|
| Full adder | 280.63 | 332.24 |
| 4 bit | 503.20 | 496.75 |
| 8 bit | 825.75 | 941.88 |
| 16 bit | 1599.90 | 1819.25 |
| 32 bit | 3148.19 | 3573.98 |
| 64 bit | 6244.76 | 7083.46 |

4.

| Command | Example |
|------------------------|--|
| create_clock | create_clock -period 10 CK |
| current_design | current_design s27 |
| compile | compile -scan |
| set_dft_signal | set_dft_signal -view existing_dft - type ScanClock -port CK -timing [list 40 60] |
| create_test_protocol | create_test_protocol |
| dft_drc | dft_drc |
| set_scan_configuration | set_scan_configuration -chain_count 1 |
| insert_dft | insert_dft |
| write | write -format verilog -hierarchy - output s27_dft.v |
| report_area | report_area |
| report_timing | report_timing |
| report_power | report_power |