Verification Report

AHB-LITE

# Introduction to the Device-Under-Test (DUT)

AHB-Lite is a subset of the full AHB specification for use in designs where only a single bus master is used. This can either be a simple single-master system, or a multi-layer AHB-Lite system where there is only one AHB master per layer.

AHB-Lite addresses the requirements of high-performance synthesizable  
designs. It is a bus interface that supports a single bus master and provides  
high-bandwidth operation

Masters designed to the AHB-Lite interface specification are significantly simpler in terms of interface design, than a full AHB master. AHB-Lite enables faster design and verification of these masters, and you can add a standard off-the-shelf bus mastering wrapper to convert an AHB-Lite master for use in a full AHB system.

Any master that is already designed to the full AHB specification can be used in an AHB-Lite system with no modification. The majority of AHB slaves can be used interchangeably in either an AHB or AHB-Lite system. This is because AHB slaves that do not use either the Split or Retry response are automatically compatible with both the full AHB and the AHB-Lite specification. It is only existing AHB slaves that do use Split or Retry responses that require you to use an additional standard off-the-shelf wrapper in your AHB-Lite system.

Any slave designed for use in an AHB-Lite system works in both a full AHB and an AHB-Lite design.

# Verification Plan

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Feature** | **Test Description** | **Ref.** | **Type** | **Result** | **Comments** |
| 1 | Send a low HRESET and read and write data | We send  Low HRESET and generate a 32 bit HADDR to read from memory | AMBA AHB-LITE.pdf/Sec.1 | TR |  |  |
| 2 | Keep HSEL low and send a transfer | Generate a transfer and give to AHB Lite memory while keeping HSEL low. | AMBA AHB-LITE.pdf/Sec.1 | TR |  |  |
| 3 | Send high HWRITE | Generate 32 bit HADDR and 32 bit HWDATA with high HWRITE signal | AMBA AHB-LITE.pdf/Sec.1 | TR |  |  |
| 4 | Send Low HWRITE | Send the same HADDR with the low HWRITE signal. | AMBA AHB-LITE.pdf/Sec.2 | TR |  |  |
| 5 | Send Low HREADY for 1 clock cycle | Send low HREADY with low HWRITE signal. Data should appear on HRDATA after 1 clock cycle wait | AMBA AHB-LITE.pdf/Sec.2 | A |  |  |
| 6 | Send low HREADY for 2 clock cycle | Send low HREADY with low HWRITE signal. Data should appear on HRDATA after 2 clock cycle wait | AMBA AHB-LITE.pdf/Sec.1 | A |  |  |
| 7 | Send 00 value of HTRANS | Send a transfer with HTRANS value set to 00. Slave should ignore transfer and set HRESP = 0(okay) | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 8 | Send 01 value of HTRANS | Send a transfer with HTRANS value set to 01. Slave should ignore transfer and set HRESP = 0(okay) | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 9 | Send high value of HMASTLOCK | Send HMASTERLOCK signal with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 10 | Send HSIZE signal with HBURST 000 | Generate 3 bit HBURST signal of value 000 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 11 | Send HSIZE signal with HBURST 001 | Generate 3 bit HBURST signal of value 001 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 12 | Send HSIZE signal with HBURST 010 | Generate 3 bit HBURST signal of value 010 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 13 | Send HSIZE signal with HBURST 011 | Generate 3 bit HBURST signal of value 011 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 14 | Send HSIZE signal with HBURST 100 | Generate 3 bit HBURST signal of value 100 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 15 | Send HSIZE signal with HBURST 101 | Generate 3 bit HBURST signal of value 101 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 16 | Send HSIZE signal with HBURST 110 | Generate 3 bit HBURST signal of value 110 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 17 | Send HSIZE signal with HBURST 111 | Generate 3 bit HBURST signal of value of 111 with constant HSIZE and send through AHB-lite interface with a transfer | AMBA AHB-LITE.pdf/Sec.3 | TR |  |  |
| 18 | Send Multiple Bursts | Send Multiple HBURST of different HSIZES. Perform read and write operation setting HWRITE low and high consecutively. | AMBA AHB-LITE.pdf/Sec.3 | A |  |  |
| 19 | Send Low HREADY signal during a burst | Generate a HBURST of size HSIZE and insert HREADY low during bead transfer to see the wait cycle delay | AMBA AHB-LITE.pdf/Sec.3 | A |  |  |
| 20 | Change HTRANS type by keeping HREADY low | Add idle state between two non-sequential states and keep HREADY low for transfer. Address must remain constant for non-sequential type until HREADY is high | AMBA AHB-LITE.pdf/Sec.3 | A |  |  |
| 21 | Send non-sequential transfer to a non-existent address | Generate an address that is not present in the memory. Send non seq. transfer to that address. HRESP should become high for such transfer | AMBA AHB-LITE.pdf/Sec.4 | A |  |  |
| 22 | Send sequential transfer to a non-existent address | Generate an address that is not present in the memory. Send seq. transfer to that address. HRESP should become high for such transfer | AMBA AHB-LITE.pdf/Sec.4 | A |  |  |