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Electronic Design Validation Test Report for BFX-UA300 (K18X001T00)

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Revision Change History

Revision	Description of Change	Date
1.0	Initial Release	09/15/2021

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Purpose:

1. Provide a formal functional demonstration of the product Electronic Design Validation Test.
2. Identify H/W design discrepancies.

Scope:

This document describes the performance requirements, validation criteria and the validation tests.

The DUT H/W version is V125 and S/W revision is 19.524.23.

Voltage source:

1. U1312_MP1605GTF-Z_1.2V
2. U1310_MP1605GTF-Z_3.3V
3. U1311_MP1605GTF-Z_1.8V
4. U1308_MP2491C _5.0V

1. Pre-EDVT Test

Verify all function is O.K.

2. Electronic Design Validation Test (EDVT)

Electronic Design Verification Testing involves a detailed series of tests to verify conformity to all applicable interface standards, as well as all vendor specific specifications and diagnostic commands.

Performed to validate designs, EDVT is extremely rigorous and subjects the product to extreme temperature and voltage.

3. Test Margins

3.1 Voltage Margining

The logic power sources used on BFX-UA300 (K18X001T00) are 4 group, these voltages will be margined with +/- 5% deviation. Therefore the tested voltages are list as following.

- I. U1312_MP1605GTF-Z_1.2V for 1.2V +/- 5% : +1.26V and +1.14V
- II. U1310_MP1605GTF-Z_3.3V for 3.3V +/- 5% : +3.465V and +3.135V
- III. U1311_MP1605GTF-Z_1.8V for 1.8V +/- 5% : +1.89V and +1.71V
- IV. U1308_MP12491C_5.0V for 5.0V +/- 5% : +5.25V and +4.75V

3.2 Temperature margining

- i. Performance at 50°C.
- ii. Performance at - 5°C.
- iii. Effect of temperature gradient from - 5°C to + 50°C and from + 50°C to - 5°C.

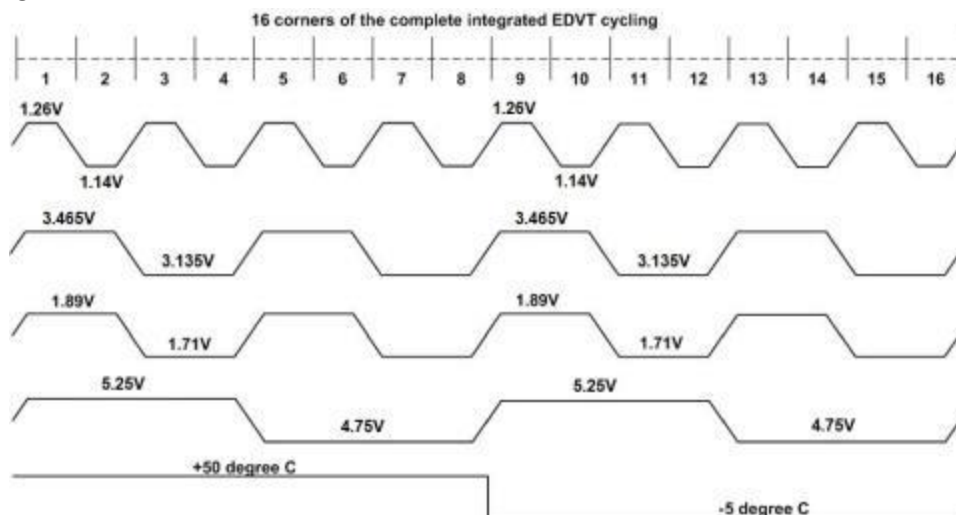
4. Power Cycling

Cycle the DC power to the product with fixed duration on and off time while margining the voltage and temperature to ensure proper functioning of initialization of the logic on the board under test.

5. Test Matrix

This defines various combinations of temperature and voltage, which will be tested in succession creating a single test sequence, which covers 16 corners of environment margining. The 4 voltages input varies between + 5% and - 5%. The temperature input varies between 50°C and - 5°C.

See the test figure as below:



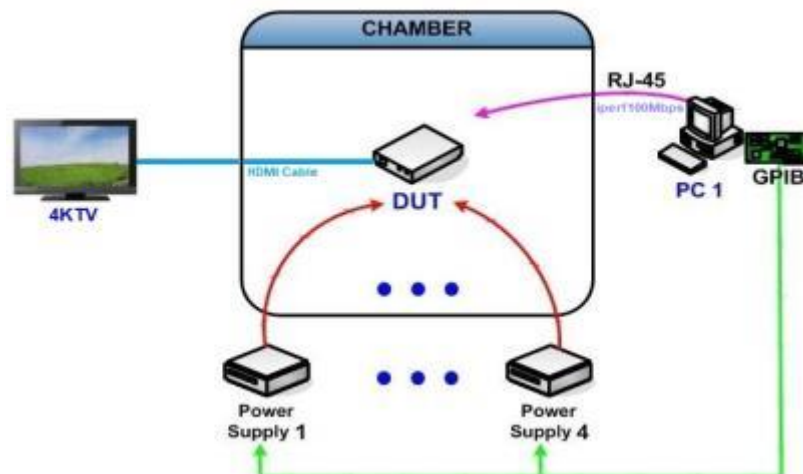
6. System data traffic test with Power cycling

6.1 Objective:

To test and verify functionality of major hardware blocks on the BFX-UA300 (K18X001T00) under voltage and temperature margins. Power cycling will verify the BFX-UA300 (K18X001T00) comes up and works every time the power is applied.

6.1 Test setup and function test:

1. Use the DUT which has been reworked for external power supply to provide the ability to margin voltages.
2. Setup the test script file for EDVT test. The power will be cycled at the end of every corner.
3. Every corner test time as 4 hours.
4. Run the test program for 16 corners of the voltage and temperature.
5. The DUT HDMI connects to 4K TV for playing local 4K video. Ethernet hub is for iperf 50Mbps run the upstream throughput and record the data.



6.2 Test Criteria:

DUT Ethernet hub is for iperf 100Mbps run the upstream throughput. Packet lost rate < 1%.

6.3 Test result:

NO	1	2	3	4
Voltage1 +1.2V	1.26V	1.14V	1.26V	1.41V
Voltage2 +3.3V	3.465V	3.465V	3.135V	3.135V
Voltage3 +1.8V	1.89V	1.89V	1.71V	1.71V
Voltage4 +5V	6.25V	6.25V	6.25V	6.25V
Temperature +50C/-5C	+50C	+50C	+50C	+50C
Test Throughput (Upstream)	90Mbits/sec	91Mbits/sec	91Mbits/sec	89Mbits/sec
Eth Ping Lost Rate (%)	0.3%	0.2%	0.1%	0.1%

NO	5	6	7	8
Voltage1 +1.2V	1.26V	1.14V	1.26V	1.41V
Voltage2 +3.3V	3.465V	3.465V	3.135V	3.135V
Voltage3 +1.8V	1.89V	1.89V	1.71V	1.71V
Voltage4 +5V	4.75V	4.75V	4.75V	4.75V
Temperature +50C/-5C	+50C	+50C	+50C	+50C
Test Throughput (Upstream)	89Mbps/sec	89Mbps/sec	90Mbps/sec	91Mbps/sec
Eth Ping Lost Rate (%)	0.4%	0.4%	0.2%	0.3%

NO	9	10	11	12
Voltage1 +1.2V	1.26V	1.14V	1.26V	1.41V
Voltage2 +3.3V	3.465V	3.465V	3.135V	3.135V
Voltage3 +1.8V	1.89V	1.89V	1.71V	1.71V
Voltage4 +5V	6.25V	6.25V	6.25V	6.25V
Temperature +50C/-5C	- 5C	- 5C	- 5C	- 5C
Test Throughput (Upstream)	91Mbps/sec	90Mbps/sec	90Mbps/sec	89Mbps/sec
Eth Ping Lost Rate (%)	0.3%	0.3%	0.3%	0.2%

NO	13	14	15	16
Voltage1 +1.2V	1.26V	1.14V	1.26V	1.41V
Voltage2 +3.3V	3.465V	3.465V	3.135V	3.135V
Voltage3 +1.8V	1.89V	1.89V	1.71V	1.71V
Voltage4 +5V	4.75V	4.75V	4.75V	4.75V
Temperature +50C/-5C	- 5C	- 5C	- 5C	- 5C
Test Throughput (Upstream)	91Mbps/sec	91Mbps/sec	90Mbps/sec	89Mbps/sec
Eth Ping Lost Rate (%)	0.2%	0.2%	0.3%	0.4%