



Performance Test Report

7SL-XR5610

S/N: CN-04P36N-FCT00-3334-0017-A00

Product Manager	R&D Leader	Mechanical Engineer	System Engineer	Test Engineer
Vinnie Yuan	James Chan	ChenJieTong	Darren Chen	Mike Chen

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1. SPECIFICATION

1-1. SYSTEM CONFIGURATION #1

Motherboard	XR5610 System Motherboard, DAO
CPU	Intel® Xeon® Gold 5420+ Processor Total Cores: 28 Total Threads: 56 Max Turbo Frequency: 4.1 GHz Processor Base Frequency: 2.0 GHz Cache: 52.5 MB Intel® UPI Speed: 16 GT/s TDP: 205 W
Memory	8GB DDR5 RDIMM
Storage	480GB SATA SSD
Power Module	800W Redundant Power Supply

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2. TEST PLAN

2.1. THERMAL MEASUREMENT PROCESS

Test Purpose	<p>The purpose of performing thermal profile testing is to identify potential thermal issues with the EUT. Considering that semiconductor failure rates rise rapidly with increasing junction temperature, it can aid product reliability assessment.</p> <p>As the system cools down, the mode will change with stack selection, temperature/heat.</p> <p>Mapping can help develop the best tracking arrangements.</p>																																													
Test Equipment	1. KSON THS-B4T-150 Chamber.																																													
Quantity Tested	Minimum 1 Set																																													
Test Software	1. Stress CPU: PassMark Burn-in Test Software Ver 9.0																																													
Test Procedure	<ol style="list-style-type: none">1. Thermal pre-scan measurement: Temperature: -30°C~60°C Humidity: 60%RH (Temperature above 25°C)2. Actual thermal measurement:<ol style="list-style-type: none">2-1. Select the test point based on the infrared photo and connect the thermocouple to the hot spot.2-2. Place the EUT into the hot chamber and set the test temperature curve Specification.2-3. Open the hot cell and power up the EUT, enter the Windows Server 2022 Standard Evaluation (Version 10.0.20348 Build 20348) environment and perform a maximum power test and stress test.2-4. After the EUT executes the test software for 8 hours, record the maximum heat generation of each thermocouple point.2-5. Turn off the hot cell and EUT.2-6. Verify and check that the recorded information for each component complies with the operating temperature range listed in the specification/approval sheet for each component being tested.																																													
Test Diagram of Curves	<p>Environment defines for 60 hours.</p> <table border="1"><caption>Temperature and Humidity Profile Data</caption><thead><tr><th>Time (hour)</th><th>Temperature (°C)</th><th>Humidity (%RH)</th></tr></thead><tbody><tr><td>0.0</td><td>25</td><td>0</td></tr><tr><td>1.0</td><td>-30</td><td>0</td></tr><tr><td>9.5</td><td>-30</td><td>0</td></tr><tr><td>17.5</td><td>25</td><td>0</td></tr><tr><td>26.0</td><td>25</td><td>0</td></tr><tr><td>26.5</td><td>25</td><td>60</td></tr><tr><td>34.5</td><td>25</td><td>60</td></tr><tr><td>35.0</td><td>40</td><td>60</td></tr><tr><td>43.5</td><td>40</td><td>60</td></tr><tr><td>43.5</td><td>50</td><td>60</td></tr><tr><td>51.5</td><td>50</td><td>60</td></tr><tr><td>52.0</td><td>60</td><td>60</td></tr><tr><td>60.0</td><td>60</td><td>60</td></tr><tr><td>60.0</td><td>25</td><td>0</td></tr></tbody></table>	Time (hour)	Temperature (°C)	Humidity (%RH)	0.0	25	0	1.0	-30	0	9.5	-30	0	17.5	25	0	26.0	25	0	26.5	25	60	34.5	25	60	35.0	40	60	43.5	40	60	43.5	50	60	51.5	50	60	52.0	60	60	60.0	60	60	60.0	25	0
Time (hour)	Temperature (°C)	Humidity (%RH)																																												
0.0	25	0																																												
1.0	-30	0																																												
9.5	-30	0																																												
17.5	25	0																																												
26.0	25	0																																												
26.5	25	60																																												
34.5	25	60																																												
35.0	40	60																																												
43.5	40	60																																												
43.5	50	60																																												
51.5	50	60																																												
52.0	60	60																																												
60.0	60	60																																												
60.0	25	0																																												

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2.2. TEST RESULT <TEST ITEM>

2.2.1. Temperature Cycle

Aging test of various parts at different temperatures under maximum load and full load conditions.

Test Temperature	Test Result
-30°C	PASS
-20°C	PASS
0°C	PASS
25°C / 60%RH	PASS
40°C / 60%RH	PASS
50°C / 60%RH	PASS
60°C / 60%RH	PASS

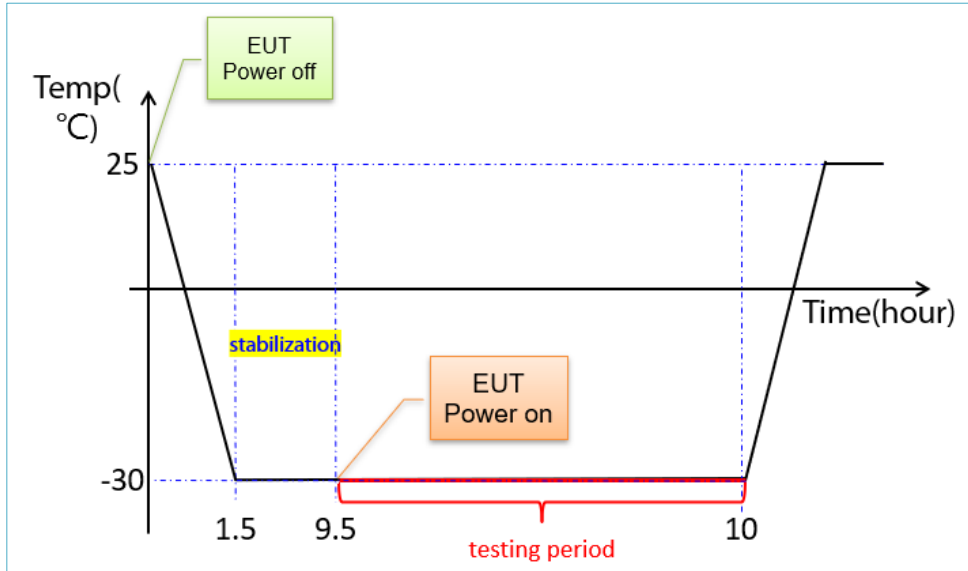
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2.2.2. Low-temperature & Boot-up

#Power supply under -30°C and ensure that the system boot up properly

Ambient Temp.	Test Result
-30°C	PASS



Power off



Power on



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7SL-XR5610 Intel® Xeon® Gold 5420+

3. TEST PHOTO IN LAB

- Chamber in -30°C

The screenshot displays three performance test windows: CPU Test, 2D Graphics Test, and Memory (RAM) Test. The CPU Test window shows a 'STOP' button and a 'RUNNING (0 Errors)' status. The 2D Graphics Test window shows 'Available Video Memory: 32.00MB' and 'Test Video Memory: 31.75MB'. The Memory (RAM) Test window shows 'Cycle 93: Testing' with a progress bar at 76%. Below the tests, a 'Compact View' panel shows various system metrics: Package Temperature (4°C), P-Core 0 Temperature (3°C), P-Core 1 Temperature (1°C), P-Core 2 Temperature (0°C), P-Core 3 Temperature (1°C), CPU Utilization (100%), Memory Utilization (15213 MB), Processor Cache Frequency (2.20 GHz), Power Limit Throttling (No), and Package TDP (153 W). To the right, the HWMonitor window shows a detailed list of sensors for the Intel Xeon Gold processor, including temperatures, voltages, powers, and utilization for each core.



Performance Test

7SL-XR5610 Intel® Xeon® Gold 5420+

- Chamber in -20°C

The screenshot displays the BumInTest V5.0 Pro (1014) interface. The main dashboard shows a 'STOP' button and test results for CPU, 2D Graphics, and Memory (RAM) tests. A large green banner at the bottom indicates 'RUNNING (0 Errors)'. The CPU test shows 100% utilization and 2.69 GHz frequency. The 2D Graphics test shows 60% completion. The Memory test shows 60% completion. The sensor monitoring window on the right shows various metrics including temperatures, powers, and utilizations for the Intel Xeon Gold processor. The compact view at the bottom shows a graph of package temperature over 3 minutes, with values ranging from 8°C to 6°C.



Performance Test

7SL-XR5610 Intel® Xeon® Gold 5420+

- Chamber in 0°C

The screenshot displays two software windows. The SunTest V9.0 Pro window shows a 'STOP' button and a 'RUNNING (0 Errors)' status. It includes sections for CPU Test, 2D Graphics Test, and Memory (RAM) Test. The HWMonitor window shows a detailed list of sensors and their values, including Intel Xeon Gold processor information, temperatures, power consumption, and clock speeds for 27 cores.

Sensor	Value	Min	Max
Intel Xeon Gold			
Package	25.0 °C	10.0 °C	26.0 °C
Cores (Max)	26.0 °C	9.0 °C	26.0 °C
Package	163.18 W	84.68 W	173.69 W
DRAM	1.05 W	0.88 W	4.40 W
Power Max (PL1)	205.00 W	205.00 W	205.00 W
Short Power Max (PL2)	246.00 W	246.00 W	246.00 W
Processor	127.2 %	0.4 %	134.9 %
Core #0	2500 MHz	2500 MHz	2700 MHz
Core #1	2700 MHz	2500 MHz	2700 MHz
Core #2	2500 MHz	2500 MHz	2700 MHz
Core #3	2700 MHz	2500 MHz	2700 MHz
Core #4	2500 MHz	2500 MHz	2700 MHz
Core #5	2500 MHz	2500 MHz	2700 MHz
Core #6	2500 MHz	2500 MHz	2700 MHz
Core #7	2500 MHz	2500 MHz	2700 MHz
Core #8	2500 MHz	2500 MHz	2700 MHz
Core #9	2500 MHz	2500 MHz	2700 MHz
Core #10	2700 MHz	2500 MHz	2700 MHz
Core #11	2500 MHz	2500 MHz	2700 MHz
Core #12	2700 MHz	2500 MHz	2700 MHz
Core #13	2500 MHz	2500 MHz	2700 MHz
Core #14	2500 MHz	2500 MHz	2700 MHz
Core #15	2500 MHz	2500 MHz	2700 MHz
Core #16	2500 MHz	2500 MHz	2700 MHz
Core #17	2500 MHz	2500 MHz	2700 MHz
Core #18	2500 MHz	2500 MHz	2700 MHz
Core #19	2500 MHz	2500 MHz	2700 MHz
Core #20	2500 MHz	2500 MHz	2700 MHz
Core #21	2500 MHz	2500 MHz	2700 MHz
Core #22	2500 MHz	2500 MHz	2700 MHz
Core #23	2700 MHz	2500 MHz	2700 MHz
Core #24	2500 MHz	2500 MHz	2700 MHz
Core #25	2500 MHz	2500 MHz	2700 MHz
Core #26	2500 MHz	2500 MHz	2700 MHz
Core #27	2500 MHz	2500 MHz	2700 MHz



Performance Test

7SL-XR5610 Intel® Xeon® Gold 5420+

- Chamber in 25°C / 60%RH

The screenshot displays a Windows desktop with several performance monitoring applications. On the left, **BurnInTest V9.0 Pro (1014)** is running a test. A large red "STOP" button is visible. The test status is "RUNNING (0 Errors)". The CPU test shows 100% utilization and 2.69 GHz frequency. The Memory (RAM) test shows 87% completion. In the center, a window displays system information for the **Core**, showing Turbo Boost Short Power Max at 246,000 W and Turbo Boost Power Time Window at 1 Second. On the right, **HWMonitor** displays a detailed list of sensors for the Intel Xeon Gold processor, including temperatures, voltages, powers, and clocks for 27 cores.

Sensor	Value	Min	Max
Package	51.0 °C	38.0 °C	65.0 °C
Cores (Max)	52.0 °C	38.0 °C	66.0 °C
Package	163.08 W	88.34 W	178.41 W
DRAM	0.31 W	0.01 W	1.85 W
Power Max (PL1)	205.00 W	205.00 W	205.00 W
Short Power Max (PL2)	246.00 W	246.00 W	246.00 W
Processor	127.0 %	0.4 %	133.0 %
Core #0	2700 MHz	2500 MHz	2700 MHz
Core #1	2700 MHz	2500 MHz	2700 MHz
Core #2	2700 MHz	2500 MHz	2700 MHz
Core #3	2700 MHz	2500 MHz	2700 MHz
Core #4	2700 MHz	2500 MHz	2700 MHz
Core #5	2700 MHz	2500 MHz	2700 MHz
Core #6	2700 MHz	2500 MHz	2700 MHz
Core #7	2700 MHz	2500 MHz	2700 MHz
Core #8	2700 MHz	2500 MHz	2700 MHz
Core #9	2700 MHz	2500 MHz	2700 MHz
Core #10	2700 MHz	2500 MHz	2700 MHz
Core #11	2700 MHz	2500 MHz	2700 MHz
Core #12	2700 MHz	2500 MHz	2700 MHz
Core #13	2700 MHz	2500 MHz	2700 MHz
Core #14	2700 MHz	2500 MHz	2700 MHz
Core #15	2700 MHz	2500 MHz	2700 MHz
Core #16	2700 MHz	2500 MHz	2700 MHz
Core #17	2700 MHz	2500 MHz	2700 MHz
Core #18	2700 MHz	2500 MHz	2700 MHz
Core #19	2700 MHz	2500 MHz	2700 MHz
Core #20	2700 MHz	2500 MHz	2700 MHz
Core #21	2700 MHz	2500 MHz	2700 MHz
Core #22	2700 MHz	2500 MHz	2700 MHz
Core #23	2700 MHz	2500 MHz	2700 MHz
Core #24	2700 MHz	2500 MHz	2700 MHz
Core #25	2700 MHz	2500 MHz	2700 MHz
Core #26	2700 MHz	2500 MHz	2700 MHz
Core #27	2700 MHz	2500 MHz	2700 MHz



Performance Test

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- Chamber in 40°C / 60%RH

The screenshot displays the results of a performance test suite. The main window shows a 'STOP' button and a 'RUNNING (0 Errors)' status. The test results are as follows:

Test	Threads Executed	Millions of Operations	Verified
General	56	47176951.1	47176951.1
Floating Point	0	78289391.0	78289391.0
Extensions	0	74266197.7	74266197.7
Primes	0	116216.4	116216.4
Max Heat	N/A	N/A	N/A

Additional test results include:

- 2D Graphics Test:** Available Video Memory: 32 DOOMB, Test Video Memory: 31.75MB
- Memory (RAM) Test:** Cycle B2-Testing: 94%, Pattern: 64-bit Binary 2 (01010101), Total RAM: 15897.6 MB, Free RAM: 649.2 MB, Test RAM: 11945.0 MB, Mbytes Written: 978235.4 MB, Mbytes Verified: 96960.5 MB, Speed (W/R): 22002.8 / 0.0 MB/sec

The HWMonitor window shows the following system metrics:

Sensor	Value	Min	Max
Intel Xeon Gold			
Temperatures			
Package	65.0 °C	51.0 °C	67.0 °C
Cores (Max)	64.0 °C	50.0 °C	67.0 °C
Powers			
Package	156.35 W	74.33 W	179.21 W
DRAM	0.99 W	0.24 W	3.54 W
Power Max (PL1)	205.00 W	205.00 W	205.00 W
Short Power Max (PL2)	246.00 W	246.00 W	246.00 W
Utilization			
Processor	134.8 %	0.2 %	135.0 %
Clocks			
Core #0	2700 MHz	2500 MHz	2700 MHz
Core #1	2700 MHz	2500 MHz	2700 MHz
Core #2	2700 MHz	2500 MHz	2700 MHz
Core #3	2700 MHz	2500 MHz	2700 MHz
Core #4	2700 MHz	2500 MHz	2700 MHz
Core #5	2700 MHz	2500 MHz	2700 MHz
Core #6	2700 MHz	2500 MHz	2700 MHz
Core #7	2700 MHz	2500 MHz	2700 MHz
Core #8	2700 MHz	2500 MHz	2700 MHz
Core #9	2700 MHz	2500 MHz	2700 MHz
Core #10	2700 MHz	2500 MHz	2700 MHz
Core #11	2700 MHz	2500 MHz	2700 MHz
Core #12	2700 MHz	2500 MHz	2700 MHz
Core #13	2700 MHz	2500 MHz	2700 MHz
Core #14	2700 MHz	2500 MHz	2700 MHz
Core #15	2700 MHz	2500 MHz	2700 MHz
Core #16	2700 MHz	2500 MHz	2700 MHz
Core #17	2700 MHz	2500 MHz	2700 MHz
Core #18	2700 MHz	2500 MHz	2700 MHz
Core #19	2700 MHz	2500 MHz	2700 MHz
Core #20	2700 MHz	2500 MHz	2700 MHz
Core #21	2700 MHz	2500 MHz	2700 MHz
Core #22	2700 MHz	2500 MHz	2700 MHz
Core #23	2700 MHz	2500 MHz	2700 MHz
Core #24	2700 MHz	2500 MHz	2700 MHz
Core #25	2700 MHz	2500 MHz	2700 MHz
Core #26	2700 MHz	2500 MHz	2700 MHz
Core #27	2700 MHz	2500 MHz	2700 MHz



Performance Test

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- Chamber in 50°C / 60%RH

The screenshot displays three main test windows: CPU Test, 2D Graphics Test, and Memory (RAM) Test. The CPU Test window shows a 'STOP' button and a 'RUNNING (0 Errors)' status. The 2D Graphics Test window shows 'Available Video Memory: 32.00MB' and 'Test Video Memory: 31.75MB'. The Memory (RAM) Test window shows 'Cycle 547-Testing' and '54%' completion. A central window shows 'Core Proposed' with 'Turbo Boost Short Power Max: 246.000 W' and 'Turbo Boost Power Max: 205.000 W'. A bottom panel shows 'Compact View' with various system metrics like CPU Utilization (100%), Memory Utilization (15282 MB), and Package Temperature (77°C). On the right, a 'HWMonitor' window displays a detailed sensor list for the Intel Xeon Gold processor, including temperatures, power, and clock speeds for 27 cores.



Performance Test

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- Chamber in 60°C / 60%RH

SunHTest V9.0 Pro (1014)
File Edit Configuration Test Quick Tests Help
Dashboard System Information Event Log Temperature

Start time: Mon Oct 7 09:56:50 2024
Stop time: -
Duration: 047h 32m 18s

STOP

CPU Test
Millions of Operations Executed: 269856657.3
Verified: 26985665.3
General: 50
Floating Point: 0
Extensions: 0
Primes: 6
Max Heat: N/A

2D Graphics Test
Available Video Memory: 32.00MB
Test Video Memory: 31.75MB

Memory (RAM) Test
Cycle 485: Testing
Pattern: 64-bit Sequence (0,1,2,...)
Total RAM: 15897.6 MB
Free RAM: 651.3 MB
Test RAM: 13944.9 MB
Mbytes Written: 5792470.5 MB
Mbytes Verified: 579297.5 MB
Speed (W / R): 0.0 / 26019.5 MB/sec

Core Proposed
Turbo Boost Short Power Max: 246.000 W
Turbo Boost Power Max: 205.000 W
Turbo Boost Power Time Window: 1 Seconds

WIN-8204452MVG
Intel Xeon Gold
Temperatures: Package (88.0 °C), Cores (Max) (88.0 °C)
Powers: Package (170.40 W), DRAM (1.59 W), Power Max (PL1) (205.00 W), Short Power Max (PL2) (246.00 W)
Utilization: Processor (134.5 %)
Clocks: Core #0-#27 (2700 MHz - 2500 MHz)

Package Temperature
Package Temperature: 89 °C
P-Core 0 Temperature: 85 °C
P-Core 1 Temperature: 87 °C
P-Core 2 Temperature: 85 °C
P-Core 3 Temperature: 88 °C

CPU Utilization
CPU Utilization: 100 %
Max P-Core Frequency: 2.69 GHz
Thermal Throttling: No
Motherboard VR Thermal: No

Memory Utilization
Memory Utilization: 15241 MB
Processor Cache Frequency: 2.20 GHz
Power Limit Throttling: No
PMAX Throttling: No

Package Temperature
Package Temperature: 89 °C
Active Core Count: 28
Current/EDP Limit Throttling: No
Package TDP: 171 W

Compact View | File Logging | 1000 ms

Ready | 9:29 AM | 10/9/2024



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5. THERMAL TEST RESULT(-30°C ~ 60°C)

CPU Temperature and Frequency

Temperature	Ambient Temp.	-30°C	-20°C	0°C	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
Frequency								
CPU P-Cores Max Temperature (Unit: °C)		2.0	8.0	26.0	52.0	64.0	77.0	88.0
CPU P-Cores Frequency (Unit: GHz) <small>Processor Base Frequency:2.00 GHz</small>		2.70	2.70	2.70	2.70	2.70	2.70	2.70

