



# PERFORMANCE TEST REPORT



**IV320-RH-KD5**

S/N: SR202512180201

Product Manager	Mechanical Engineer	System Engineer	Test Engineer
Honwen Huang	Chen Jie Tong	William Cheng	Mike Chen

Date: March 24, 2026

# PERFORMANCE TEST REPORT

## IV320-RH-KD5

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# 1. SPECIFICATION

## 1-1. SYSTEM CONFIGURATION

<b>Motherboard</b>	SK515M+COM Express CPU module BIOS Version/Date: 0.0.0 08/23/2023 SMBIOS Version: 3.5 Wide Range DC 9V~36V Input Extreme Temperature Support -40°C to 85°C
<b>CPU</b>	Intel® Core™ i7-13800HRE Processor Total Cores: 14 # of Performance-cores: 6 # of Efficient-cores: 8 Total Threads: 20 Max Turbo Frequency: 5.00 GHz Performance-core Max Turbo Frequency: 5.00 GHz Efficient-core Max Turbo Frequency: 4.00 GHz Processor Base Frequency: 2.50 GHz Cache 24 MB Intel® Smart Cache TDP: 45 W
<b>Memory</b>	64GB DDR5 SO-DIMM wide temp. (0C02AM425R4GD00L*2pcs)
<b>Storage</b>	2* 2TB SATA SSD wide temperature (2 x Swappable Tray) ( 0I05077SL02TB00L*2pcs)
<b>GPU</b>	NVIDIA Quadro RTX5000 Mobility BIOS Version: 95.03.39.00.16 GPU boost clock: 2115 MHz Max Power Consumption: 80 W
<b>Power Module</b>	7Starlake SK708 Wide Input Range: 9V to 36V 12V DC Output up to 33 Amp Extended Temperature -40°C to 85°C

## 1-2. PRODUCT INTERIOR PHOTO



## 2. TEST PLAN

### 2-1. THERMAL MEASUREMENT PROCESS

<p><b>Test Purpose</b></p>	<p>The purpose of conducting thermal profile testing is to identify potential thermal issues in the Equipment Under Test (EUT). Given that semiconductor failure rates increase significantly with rising junction temperatures, this testing contributes to the overall assessment of product reliability.</p> <p>As the system undergoes a cooling phase, operational modes may shift depending on stack configuration, temperature, and heat dissipation characteristics. Thermal mapping provides critical insight for optimizing thermal management strategies and determining the most effective component layout and monitoring arrangements.</p>																																							
<p><b>Test Equipment</b></p>	<p>1. KSON THS-B4T-150 Chamber.</p>																																							
<p><b>Quantity Tested</b></p>	<p>Minimum 1 Set</p>																																							
<p><b>Test Software</b></p>	<p>CPU Stress: PassMark BurnIn Test v9.0                  GPU Stress: AIDA64 Business v7.70                  LAN Speed Test: iPerf3</p>																																							
<p><b>Test Procedure</b></p>	<ol style="list-style-type: none"> <li>1. Thermal Pre-Scan Measurement:                         <ul style="list-style-type: none"> <li>Temperature Range: <b>-40°C to 60°C</b></li> <li>Humidity Condition: <b>60% RH</b> (when temperature exceeds 25°C)</li> </ul> </li> <li>2. Actual Thermal Measurement Procedure:                         <ol style="list-style-type: none"> <li>2.1. Identify the test points using the infrared thermal image and attach thermocouples to the identified hot spots.</li> <li>2.2. Place the Equipment Under Test (EUT) in the thermal chamber and configure the test temperature profile according to the specified requirements.</li> <li>2.3. Power on the EUT after closing the thermal chamber. Boot into Windows 10 Pro and initiate a maximum power consumption and stress test.</li> <li>2.4. After running the test software continuously for 8 hours, record the peak temperature observed at each thermocouple measurement point.</li> <li>2.5. Power off both the thermal chamber and the EUT.</li> <li>2.6. Verify that the recorded temperature data for each component remains within its specified operating temperature range, as defined in the component specification or approval documents.</li> </ol> </li> </ol>																																							
<p><b>Test Diagram of Curves</b></p>	<p>Environment defines for 60 hours.</p> <table border="1"> <caption>Test Diagram Data Points</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>-40</td><td>0</td></tr> <tr><td>9.0</td><td>-40</td><td>0</td></tr> <tr><td>18.0</td><td>26</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>43.0</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> </tbody> </table>	Time (hour)	Temperature (°C)	Humidity (%RH)	0.0	25	0	1.0	-40	0	9.0	-40	0	18.0	26	0	26.5	25	60	34.5	25	60	35.0	40	60	43.0	40	60	43.5	50	60	51.5	50	60	52.0	60	60	60.0	60	60
Time (hour)	Temperature (°C)	Humidity (%RH)																																						
0.0	25	0																																						
1.0	-40	0																																						
9.0	-40	0																																						
18.0	26	0																																						
26.5	25	60																																						
34.5	25	60																																						
35.0	40	60																																						
43.0	40	60																																						
43.5	50	60																																						
51.5	50	60																																						
52.0	60	60																																						
60.0	60	60																																						

**2-2. TEST RESULT**

2-2-1. Temperature Cycle

# Aging tests were performed on individual components across a range of temperature settings, under both maximum load and full load conditions, to evaluate thermal endurance and operational stability over time.

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

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### 2-2-2. I/O Function

# Confirm that the system specifications and all input/output (I/O) interfaces are correctly configured and functioning as intended, in accordance with the defined technical standards.

Item	Test Criteria	Result
<b>X1 Port – 1GbE LAN</b>	2-meter Cat.8 Ethernet cable shall be used to connect the Device Under Test (DUT) to another test computer equipped with a 1GbE network interface. The network connection shall be established and verified to ensure the link speed is negotiated at 1Gbps.	<b>PASS</b>
<b>X2 Port – 1GbE LAN</b>	2-meter Cat.8 Ethernet cable shall be used to connect the Device Under Test (DUT) to another test computer equipped with a 1GbE network interface. The network connection shall be established and verified to ensure the link speed is negotiated at 1Gbps.	<b>PASS</b>
<b>X3 Port – CANBus</b>	The CAN interface of the Device Under Test (DUT) shall be connected to a Loopback test fixture via the CANH and CANL signal lines. The loopback setup enables internal transmission and reception of CAN frames for communication verification without the need for an external CAN Bus analyzer or USB-to-CAN converter.	<b>PASS</b>
<b>X3 Port – CANBus</b>	The CAN interface of the Device Under Test (DUT) shall be connected to a Loopback test fixture via the CANH and CANL signal lines. The loopback setup enables internal transmission and reception of CAN frames for communication verification without the need for an external CAN Bus analyzer or USB-to-CAN converter.	<b>PASS</b>
<b>X4 Port – RS485</b>	The RS485 communication port of the Device Under Test(DUT) shall be connected to a USB-to-RS485 converter through the DB9 interface according to the defined pin assignment (D+ / D- / GND). A host PC is used to transmit and receive serial data through the RS485 interface.	<b>PASS</b>
<b>X4 Port – RS485</b>	The RS485 communication port of the Device Under Test(DUT) shall be connected to a USB-to-RS485 converter through the DB9 interface according to the defined pin assignment (D+ / D- / GND). A host PC is used to transmit and receive serial data through the RS485 interface.	<b>PASS</b>

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<b>X5 Port – RS485</b>	The RS485 communication port of the Device Under Test(DUT) shall be connected to a USB-to-RS485 converter through the DB9 interface according to the defined pin assignment (D+ / D- / GND). A host PC is used to transmit and receive serial data through the RS485 interface.	<b>PASS</b>
<b>X5 Port – RS485</b>	The RS485 communication port of the Device Under Test(DUT) shall be connected to a USB-to-RS485 converter through the DB9 interface according to the defined pin assignment (D+ / D- / GND). A host PC is used to transmit and receive serial data through the RS485 interface.	<b>PASS</b>
<b>X8 Port – USB 3.0</b>	A PassMark USB 3.0 Loopback plug shall be connected to each USB 3.0 port of the Device Under Test (DUT). The USB 3.0 Loopback Test software shall be executed on the host operating system to perform the loopback verification.	<b>PASS</b>
<b>X9 Port – USB 3.0</b>	A PassMark USB 3.0 Loopback plug shall be connected to each USB 3.0 port of the Device Under Test (DUT). The USB 3.0 Loopback Test software shall be executed on the host operating system to perform the loopback verification.	<b>PASS</b>
<b>X10 Port – mDP</b>	Check work well. (Max Resolution: 4K at 3840 x 2160)	<b>PASS</b>

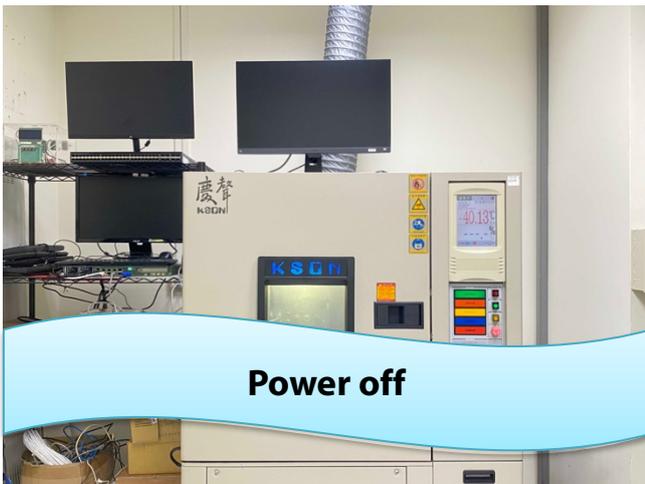
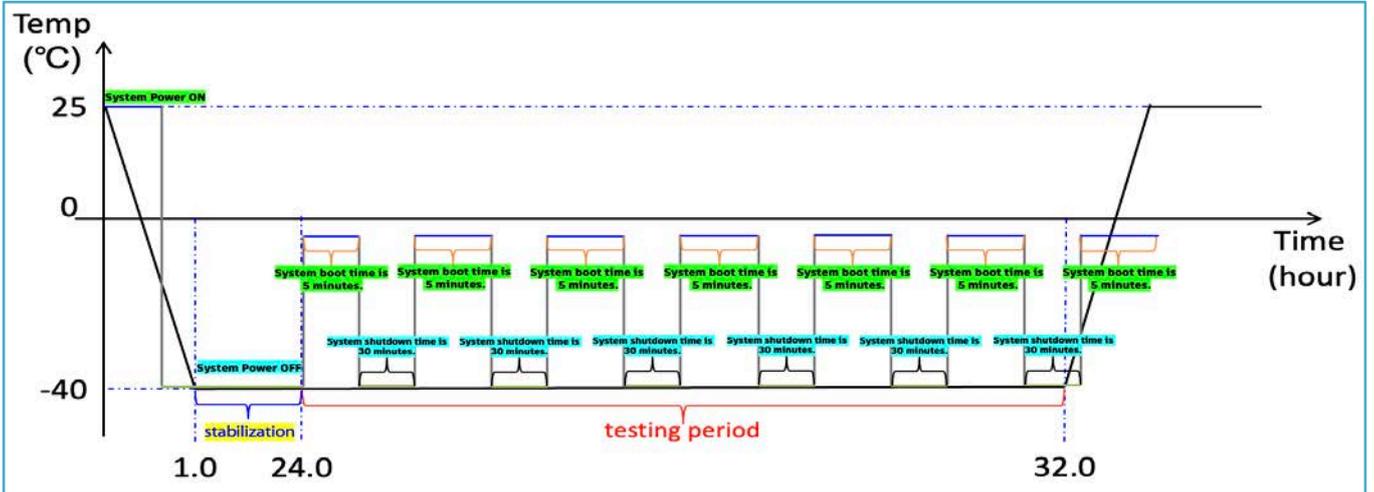
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## IV320-RH-KD5

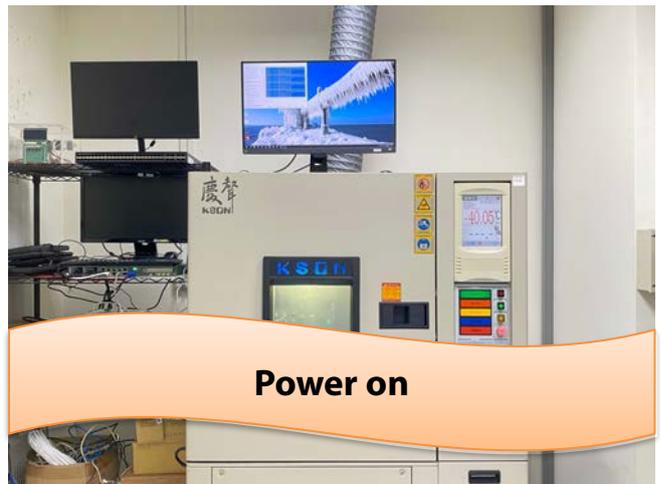
### 2-2-3.Low Temperature Power Cycle Test

# Apply power to the system under a -40°C ambient condition and confirm successful system boot-up, ensuring stable initialization and operation at low temperatures.

Ambient Temp.	Cold Boot Test Times	Test Result
-40°C	10 times	<b>PASS</b>



**Power off**



**Power on**



**Cold Boot Test Times**

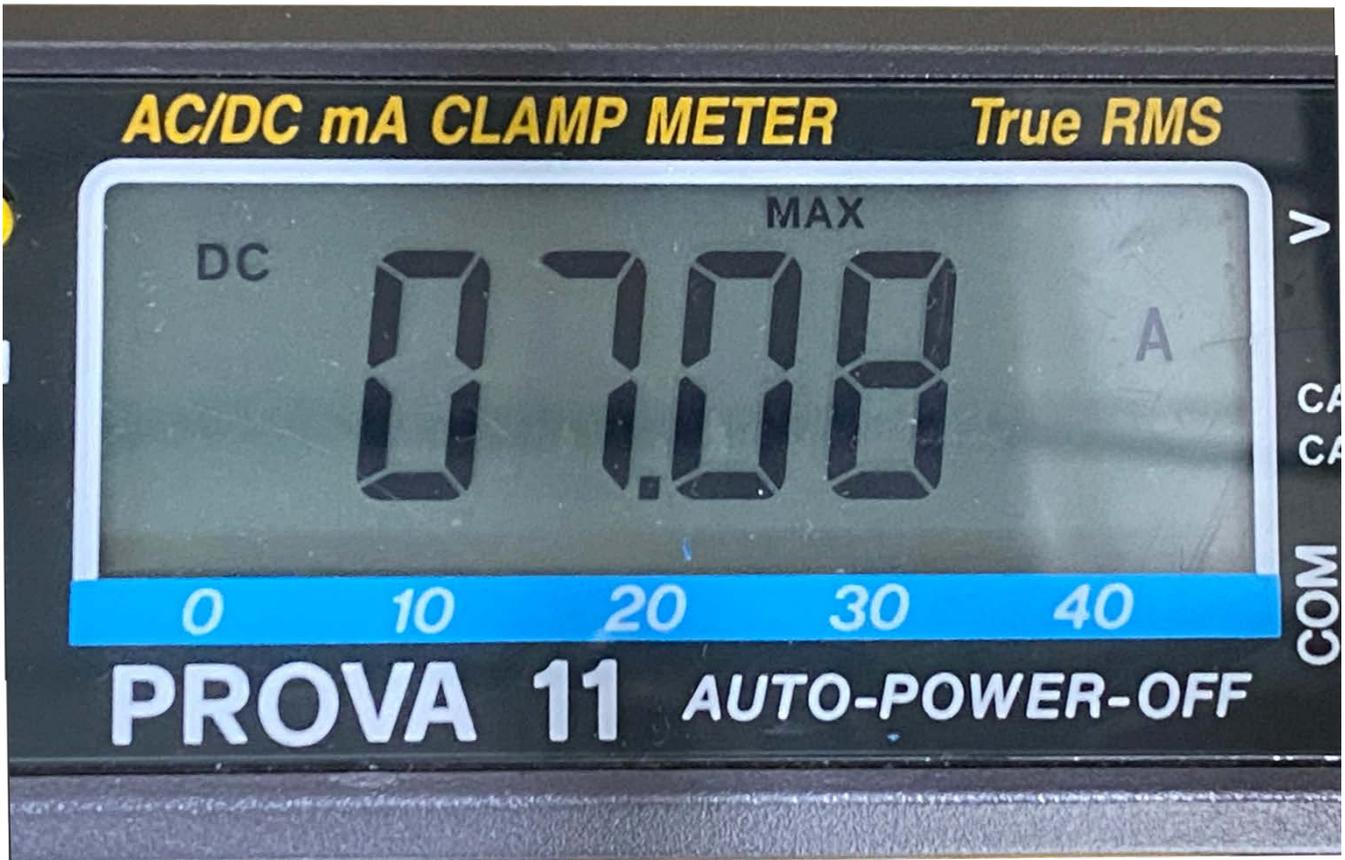
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## 2-3. PEAK INSTANTANEOUS CURRENT AND POWER

Maximum instantaneous current and power measured during the entire period from system power-on to operating system initialization.

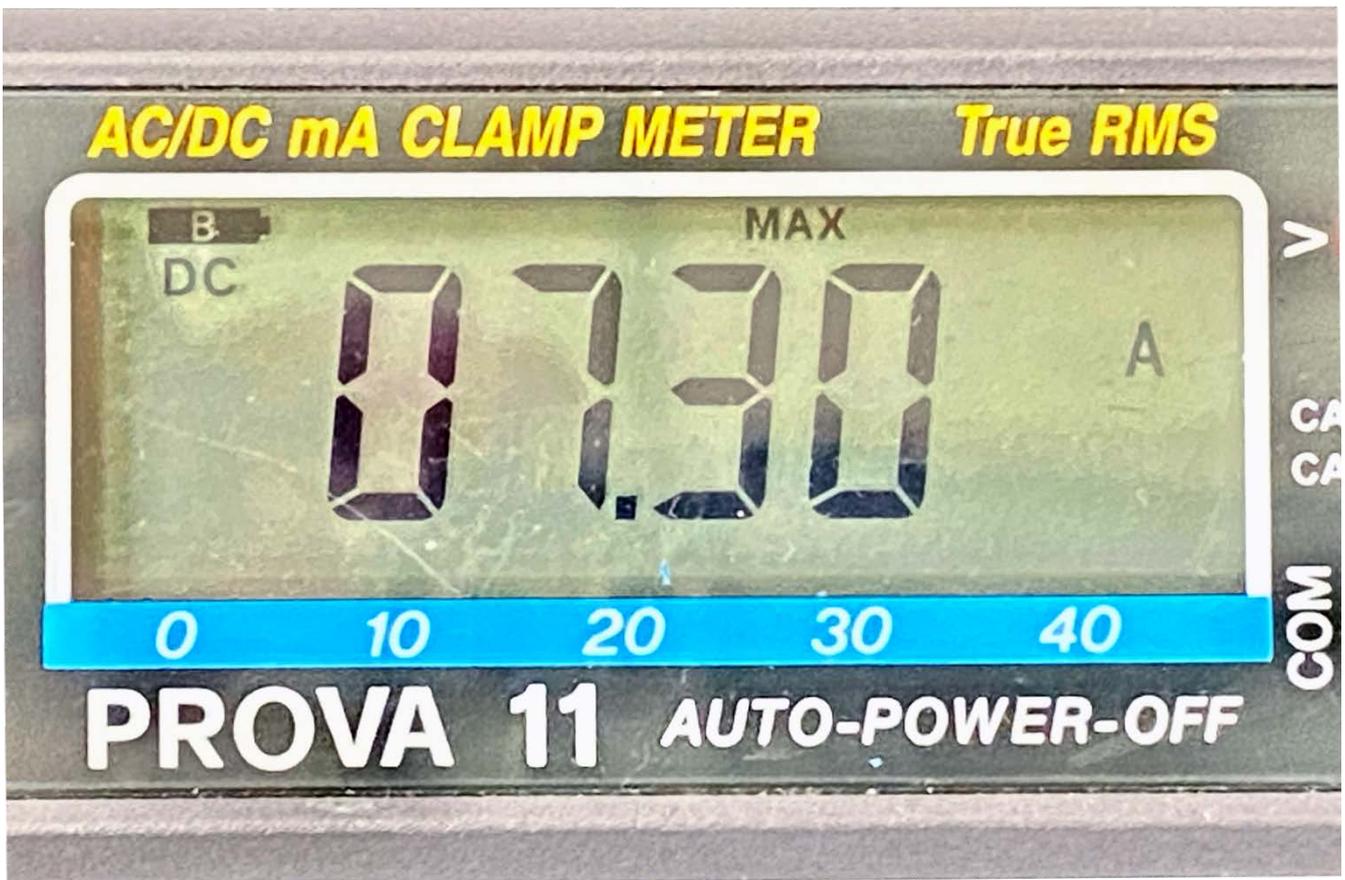
Voltage (V)	Peak Instantaneous Current (A)	Peak Instantaneous Power (W)
24.0	7.08	169.92



### 2-4. POWER CONSUMPTION

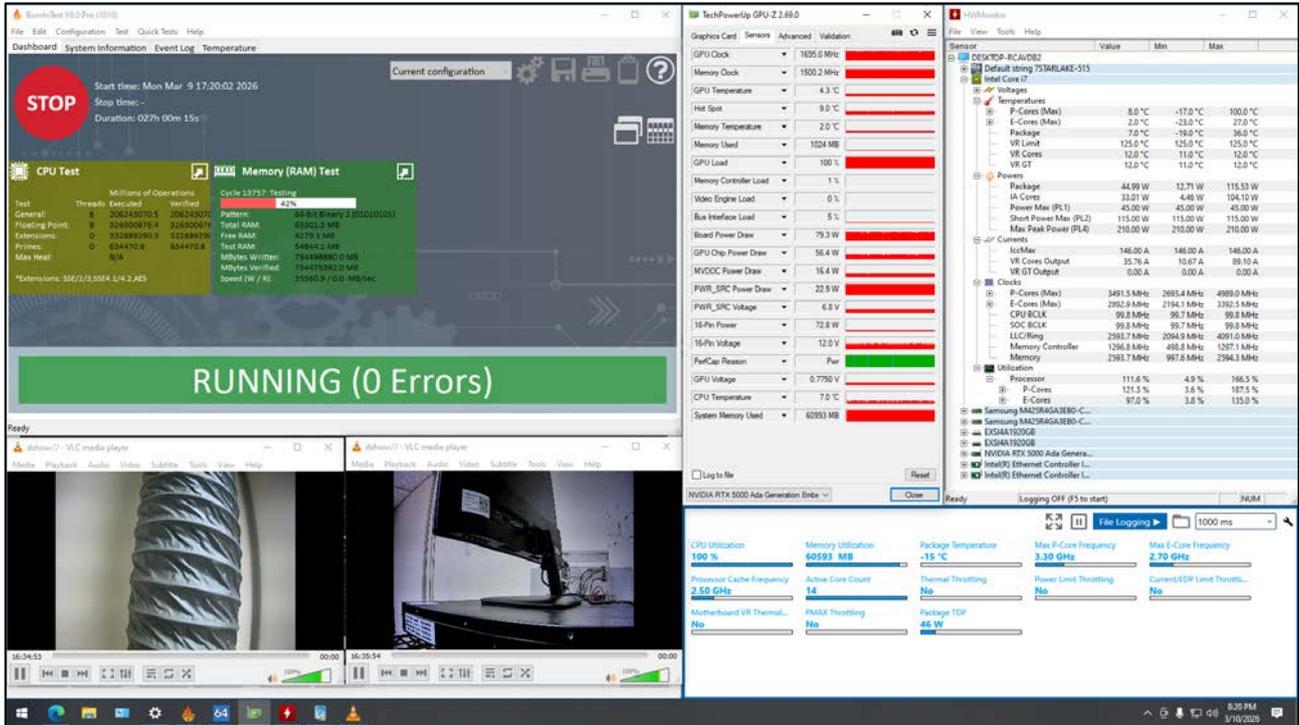
The total electrical power consumed by the system under defined workload and configuration, measured at the power supply input.

Voltage (V)	Current (A)	Wattage (W)
24.0	7.30	175.20



### 3. TEST PHOTO IN LAB

- Chamber in -40°C / 0%RH



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### - Chamber in -20°C / 0%RH

The screenshot displays a performance test interface with the following data:

- Test Status:** STOP. Start time: Mon Mar 9 17:20:02 2026. Stop time: --. Duration: 047h 13m 42s.
- CPU Test:** Millions of Operations: 32. Threads: 2681454675. Verified: 2681454675. Flopping Point: 7. Extensions: 0. Primes: 0. Make Heat: N/A.
- Memory (RAM) Test:** Cycle 28089. Testing: 32%. Pattern: 05-80-0998111111111111. Total RAM: 65502.0 MB. Free RAM: 4479.2 MB. Text RAM: 5484.2 MB. Bytes Written: 992114442.0 MB. Bytes Verified: 992029424.0 MB. Speed (W/R): 0.0/3.2305.7 MB/sac.
- GPU Test (NVIDIA RTX 5000 Ada Generation):**
  - GPU Clock: 1635.0 MHz
  - Memory Clock: 1500.2 MHz
  - GPU Temperature: 23.7 °C
  - Hot Spot: 29.7 °C
  - Memory Temperature: 22.0 °C
  - Memory Used: 1021 MB
  - GPU Load: 100 %
  - Memory Controller Load: 1 %
  - Video Engine Load: 0 %
  - Bus Interface Load: 6 %
  - Board Power Draw: 77.5 W
  - GPU Chip Power Draw: 53.9 W
  - MFODC Power Draw: 17.0 W
  - PWR\_SRC Power Draw: 23.5 W
  - PWR\_SRC Voltage: 6.9 V
  - 16-Pin Power: 71.0 W
  - 16-Pin Voltage: 12.0 V
  - Pe/Cap Reason: Fur
  - GPU Voltage: 0.7450 V
  - CPU Temperature: 23.0 °C
  - System Memory Used: 60416 MB
- System Sensor Data:**
  - DESKTOP-PC4VD82: 24.0 °C
  - Intel Core 07: 24.0 °C
  - Temperatures:
    - P-Cores (Max): 24.0 °C
    - E-Cores (Max): 20.0 °C
    - Package: 24.0 °C
    - VR Leds: 125.0 °C
    - VR Cores: 12.0 °C
    - VR GT: 12.0 °C
  - Power:
    - Package: 45.02 W
    - IA Cores: 33.06 W
    - Power Max (PL1): 45.00 W
    - Short Power Max (PL2): 115.00 W
    - Max Peak Power (PL4): 210.00 W
  - Clocks:
    - P-Cores (Max): 3192.2 MHz
    - E-Cores (Max): 2593.7 MHz
    - CPU BCLK: 99.8 MHz
    - SOC BCLK: 99.8 MHz
    - LLC/Ring: 286.9 MHz
    - Memory Controller: 1296.8 MHz
    - Memory: 2393.7 MHz
  - Utilization:
    - Processor: 115.1 %
    - P-Cores: 125.3 %
    - E-Cores: 99.8 %



# PERFORMANCE TEST REPORT

## IV320-RH-KD5

### - Chamber in 0°C / 0%RH

The screenshot displays a performance testing interface with the following data:

- Test Status:** STOP. Start time: Mon Mar 9 17:20:02 2026. Duration: 07h 08m 58s.
- CPU Test:** Cycle 20590. Testing 100%. Millions of Operations: 13,385,502,297. Pattern: 64-bit sequential (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F).
- Memory (RAM) Test:** Total RAM: 65,503.3 MB. Free RAM: 453.2 MB. Text RAM: 5494.2 MB. Mbytes Written: 11,292,344.0 MB. Mbytes Verified: 11,292,344.0 MB. Speed (W / R): 0.0 / 38009.4 MB/sec.
- GPU (NVIDIA RTX 5000 Ada Generation):** GPU Clock: 1655.0 MHz, Memory Clock: 1500.2 MHz, GPU Temperature: 40.7°C, Hot Spot: 48.2°C, Memory Temperature: 38.0°C, Memory Used: 994 MB, GPU Load: 100%, Memory Controller Load: 1%, Video Engine Load: 0%, Power Max (PL1): 45.00 W, Bus Interface Load: 5%, Board Power Draw: 80.3 W, GPU Chip Power Draw: 55.8 W, MVDCC Power Draw: 18.0 W, PWR\_SRC Power Draw: 24.5 W, PWR\_SRC Voltage: 7.1 V, 16-Pin Power: 79.8 W, 16-Pin Voltage: 12.0 V, Fan/Case Reason: Fan, GPU Voltage: 0.7250 V, CPU Temperature: 44.0°C, System Memory Used: 60769 MB.
- System Temperatures:** P-Cores (Max): 46.0°C, E-Cores (Max): 40.0°C, Package: 42.0°C, VR Limit: 125.0°C, VR Cores: 36.0°C, VR GT: 31.0°C.
- Power:** Package: 44.81 W, IA Cores: 33.21 W, Power Max (PL1): 45.00 W, Sheet Power Max (PL2): 115.00 W, Max Peak Power (PL4): 210.00 W.
- Currents:** Package: 146.00 A, VR Cores Output: 36.39 A, VR GT Output: 0.00 A.
- Clocks:** P-Cores (Max): 3192.2 MHz, CPU BCLK: 99.8 MHz, SOC BCLK: 99.8 MHz, LLC/Ring: 2563.7 MHz, Memory Controller: 1256.8 MHz, Memory: 2593.7 MHz.
- Utilization:** Processor: 113.6%, P-Cores: 123.8%, E-Cores: 96.3%.



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### - Chamber in 25°C / 60%RH

The screenshot displays a performance test environment. On the left, the 'CPU Test' window shows a 'STOP' button and test statistics. The 'Memory (RAM) Test' window shows 'Cycle 34167 Testing' with a progress bar at 43%. The 'GPU Test' window shows 'NVIDIA RTX 5000 Ada Generation' with various metrics like GPU Clock (1620.0 MHz) and GPU Temperature (74.7°C). The 'Sensors' window shows the chamber temperature at 25.05°C and 60.5%RH. The 'Ready' window shows two monitors displaying a video player with a timer at 44:27.



# PERFORMANCE TEST REPORT

## IV320-RH-KD5

### - Chamber in 40°C / 60%RH

The screenshot displays a comprehensive performance testing interface. On the left, a 'CPU Test' window shows a 'STOP' button and a 'RUNNING (0 Errors)' status. The test results include:
 

- Test: Cycle 111720: Testing (1.1%)
- General: 5 360780368.5 160780368
- Floating Point: 4 2698614027.2 269861402
- Extensions: 3 281114062.2 28111406
- Primes: 2 552028.4 552028.4
- Max Heat: N/A
- Extensions: SSE2/SSE4.1/4.2/AVX

 The 'Memory (RAM) Test' window shows:
 

- Pattern: 64-Bit Sequential (DLL, J)
- Total RAM: 65502.3 MB
- Free RAM: 4918.4 MB
- Test RAM: 54844.2 MB
- Memory Write: 812718766.0 MB/s
- Memory Verify: 812718766.0 MB/s
- Speed (W/R): 0.0 / 23982.8 MB/sec

 The central 'System Monitoring' window shows:
 

- GPU Clock: 1620.0 MHz
- Memory Clock: 1500.2 MHz
- GPU Temperature: 80.8 °C
- GPU Hot Spot: 90.7 °C
- Memory Temperature: 82.0 °C
- Memory Used: 501 MB
- GPU Load: 100%
- Memory Controller Load: 0%
- Video Engine Load: 0%
- Bus Interface Load: 4%
- Board Power Draw: 79.5 W
- GPU Chip Power Draw: 53.4 W
- MICROC Power Draw: 19.7 W
- PWR\_SRC Power Draw: 26.2 W
- PWR\_SRC Voltage: 7.2 V
- 16-Pin Power: 79.1 W
- 16-Pin Voltage: 12.0 V
- FanCap Reason: Fan
- GPU Voltage: @ 0.6950
- CPU Temperature: 91.0 °C
- System Memory Used: 60981 MB

 The right-hand 'Hardware Monitor' window shows:
 

- Sensors: DESKTOP-RCAJDEI, Intel Core 7
- Voltages: P-Cores (Max) 90.0 °C, E-Cores (Max) 87.0 °C, Package 89.0 °C, VR Limit 125.0 °C, VR Cores 75.0 °C, VR GT 75.0 °C
- Powers: Package 43.33 W, IA Cores 13.18 W, Power Max (PL1) 45.00 W, Short Power Max (PL2) 115.00 W, Max Peak Power (PL4) 210.00 W
- Currents: Package 146.00 A, VR Cores Output 37.02 A, VR GT Output 0.00 A
- Clocks: P-Cores (Max) 2992.7 MHz, E-Cores (Max) 2964.1 MHz, CPU BCLK 99.8 MHz, SOC BCLK 99.8 MHz, LLC Ring 2964.8 MHz, Memory Controller 1296.8 MHz, Memory 2983.7 MHz
- Utilization: Processor 106.2%, P-Cores 114.9%, E-Cores 93.1%

 At the bottom, a video player shows two monitors displaying the test results. A summary bar at the bottom right indicates:
 

- CPU Utilization: 100%
- Memory Utilization: 60983 MB
- Package Temperature: 90 °C
- Max P-Core Frequency: 3.04 GHz
- Max E-Core Frequency: 2.51 GHz
- Processor Cache Frequency: 2.30 GHz
- Active Core Count: 14
- Thermal Throttling: No
- Power Limit Throttling: No
- Current/EDP Limit Throttling: No
- Motherboard VR Thermal: No
- IMAX Throttling: No
- Package TDP: 45 W



# PERFORMANCE TEST REPORT

## IV320-RH-KD5

### - Chamber in 50°C / 60%RH

**STOP** Start time: Mon Mar 9 17:20:02 2026  
Stop time: -  
Duration: 195h 24m 22s

**CPU Test**  
Millions of Operations verified  
Test: 2 365098951.0 165098951.0  
Threads Executed: 3 274175091.0 274175091.0  
General: 4 2899029402.2 2899029402.2  
Floating Point: 3 5474184.0 5474184.0  
Extensions: 3 356723584.174.2.AES

**Memory (RAM) Test**  
Cycle: 114728, Testing  
Pattern: 65-Bit Strain (000000000)  
Total RAM: 66501.0 MB  
Free RAM: 4424.4 MB  
Test RAM: 54844.2 MB  
Memory Written: 629226468.0 MB  
Memory Verified: 6295128798.0 MB  
Speed (W / R): 28294.5 / 0.0 MB/sec

**GPU Test**  
GPU Clock: 1395.0 MHz  
Memory Clock: 1500.2 MHz  
GPU Temperature: 87.0 °C  
Hot Spot: 97.8 °C  
Memory Temperature: 88.0 °C  
Memory Used: 974 MB  
GPU Load: 100 %  
Memory Controller Load: 1 %  
Video Engine Load: 0 %  
Bus Interface Load: 5 %  
Board Power Draw: 77.8 W  
GPU Chip Power Draw: 51.4 W  
NVDEC Power Draw: 19.9 W  
PWR\_SRC Power Draw: 26.4 W  
PWR\_SRC Voltage: 7.3 V  
16-Pin Power: 71.3 W  
16-Pin Voltage: 12.0 V  
PwrCap Reason: Tsm  
GPU Voltage: 0.6500 V  
CPU Temperature: 96.0 °C  
System Memory Used: 60879 MB

**System Information**  
Sensor: DESKTOP-RCAD0E2  
Default string: 75STARLAKE-515  
Intel Core i7  
Temperatures  
P-Cores (Max): 99.0 °C -17.0 °C 100.0 °C  
E-Cores (Max): 95.0 °C -23.0 °C 99.0 °C  
Package: 97.0 °C -19.0 °C 100.0 °C  
VR Limits: 125.0 °C 125.0 °C 125.0 °C  
VR Cores: 82.0 °C 11.0 °C 82.0 °C  
VR GT: 82.0 °C 11.0 °C 82.0 °C  
Powers  
Package: 45.57 W 12.71 W 115.53 W  
IA Cores: 32.40 W 4.46 W 104.10 W  
Power Max (PL1): 45.00 W 44.50 W 40.00 W  
Short Power Max (PL2): 115.00 W 115.00 W 115.00 W  
Max. Peak Power (PL4): 210.00 W 210.00 W 210.00 W  
Currents  
IcchMax: 146.00 A 146.00 A 146.00 A  
VR Cores Output: 35.76 A 10.67 A 89.10 A  
VR GT Output: 0.00 A 0.00 A 0.00 A  
Clocks  
P-Cores (Max): 2892.9 MHz 2693.4 MHz 4899.0 MHz  
E-Cores (Max): 2394.1 MHz 2064.3 MHz 3792.1 MHz  
CPU BCLK: 99.8 MHz 99.7 MHz 99.8 MHz  
SOC BCLK: 99.8 MHz 99.7 MHz 99.8 MHz  
LLC Ring: 2394.1 MHz 2064.3 MHz 4091.0 MHz  
Memory Controller: 1296.8 MHz 486.7 MHz 1297.1 MHz  
Memory: 2593.7 MHz 997.3 MHz 2594.3 MHz  
Utilization  
Processor: 105.1 % 4.9 % 166.5 %  
P-Cores: 114.0 % 3.6 % 187.5 %  
E-Cores: 91.9 % 3.8 % 135.0 %

**System Metrics**  
CPU Utilization: 100 %  
Memory Utilization: 60879 MB  
Package Temperature: 100 °C  
Max P-Core Frequency: 2.90 GHz  
Max E-Core Frequency: 2.39 GHz  
Processor Cache Frequency: 9.48 GHz  
Active Core Count: 14  
Thermal Throttling: Yes  
Power Limit Throttling: No  
Mushroom VR Thermal: No  
PMax Throttling: No  
Package TDP: 46 W



# PERFORMANCE TEST REPORT

## IV320-RH-KD5

### - Chamber in 60°C / 60%RH

The screenshot displays a performance testing interface with several windows:

- BurnInTest V9.0 Pro (1916):** Shows a 'STOP' button and test details: Start time: Mon Mar 9 17:20:02 2026, Stop time: --, Duration: 230h 32m 46s. A large green banner at the bottom indicates 'RUNNING (0 Errors)'. The CPU Test window shows 'Cyclic 214728: Testing' at 83% completion.
- SecfiPower (GPU 2.1.68):** Displays GPU metrics such as GPU Clock (300.0 MHz), Memory Clock (1500.2 MHz), GPU Temperature (87.1 °C), and GPU Power Draw (36.4 W).
- HWMonitor:** Shows sensor data for temperatures (P-Cores Max: 100.0 °C, E-Cores Max: 99.0 °C), powers (Package: 40.56 W), and currents (P-Cores: 2793.2 MHz).
- Task Manager:** Shows system resource usage: CPU Utilization 100%, Memory Utilization 28413 MB, Package Temperature 99 °C, Max P-Core Frequency 2.80 GHz, and Max E-Core Frequency 2.30 GHz.



## 4. THERMAL TEST RESULT(-40°C ~ +60°C)

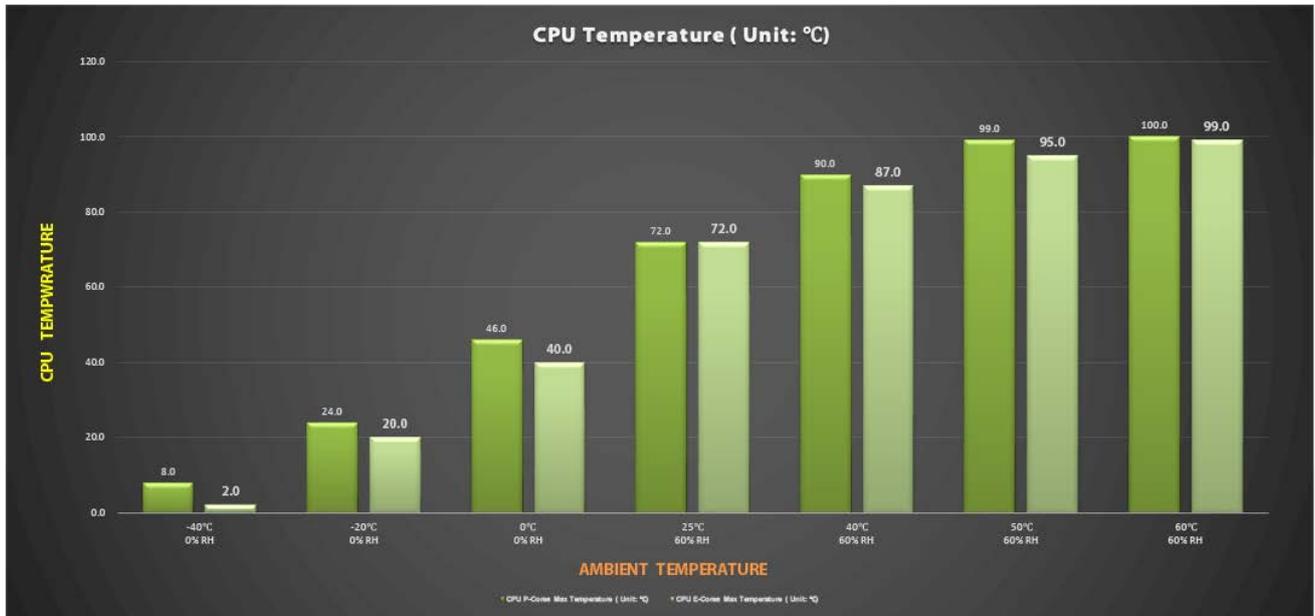
CPU & GPU Temperature and Frequency

Temperature Frequency	Ambient Temp.	-40°C 0% RH	-20°C 0% RH	0°C 0% RH	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
CPU P-Cores Max Temperature ( Unit: °C)		8.0	24.0	46.0	72.0	90.0	99.0	100.0
CPU E-Cores Max Temperature ( Unit: °C)		2.0	20.0	40.0	72.0	87.0	95.0	99.0
CPU P-Cores Frequency (Unit: GHz) <small>Processor Base Frequency: 2.50 GHz</small>		3.30	3.20	3.10	3.10	3.04	2.90	2.80
CPU E-Cores Frequency (Unit: GHz)		2.70	2.60	2.60	2.60	2.51	2.39	2.30
GPU Temperature ( Unit: °C)		4.3	23.7	40.7	65.5	80.8	87.0	87.1
GPU Hot Spot Temperature ( Unit: °C)		9.0	29.7	48.2	74.7	90.7	97.8	99.2
GPU Frequency (Unit: MHz)		1695	1695	1665	1620	1620	1395	930

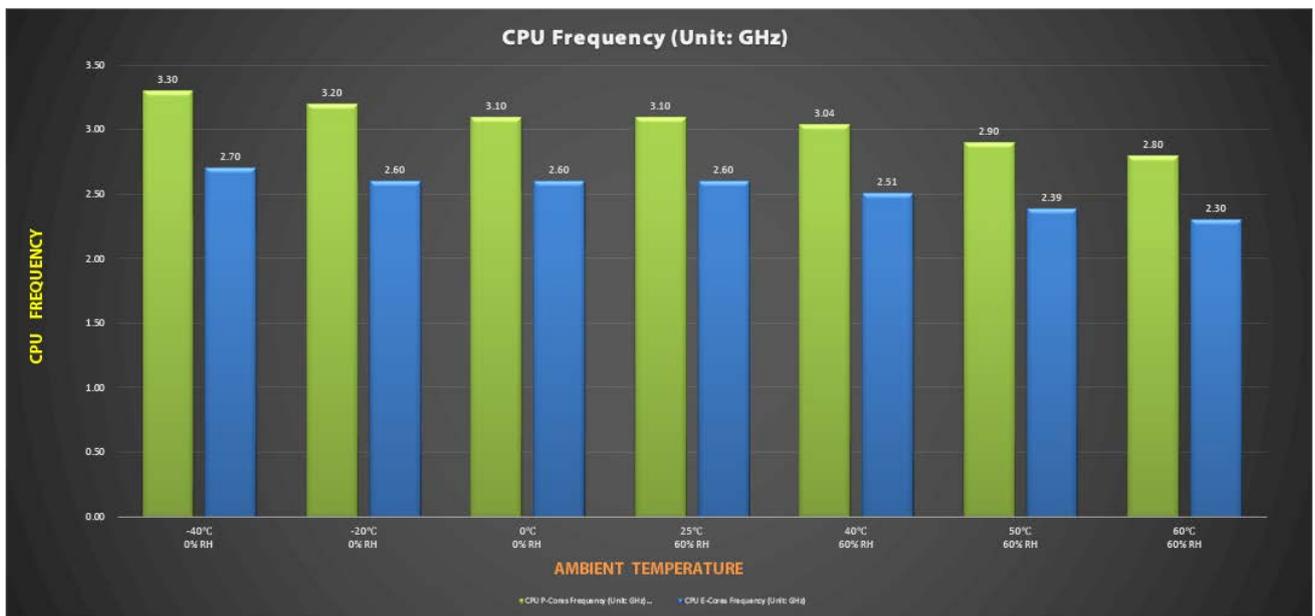
# PERFORMANCE TEST REPORT

## IV320-RH-KD5

CPU Core Temperature \ Ambient Temperature	-40°C 0% RH	-20°C 0% RH	0°C 0% RH	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
CPU P-Cores Max Temperature ( Unit: °C)	8.0	24.0	46.0	72.0	90.0	99.0	100.0
CPU E-Cores Max Temperature ( Unit: °C)	2.0	20.0	40.0	72.0	87.0	95.0	99.0



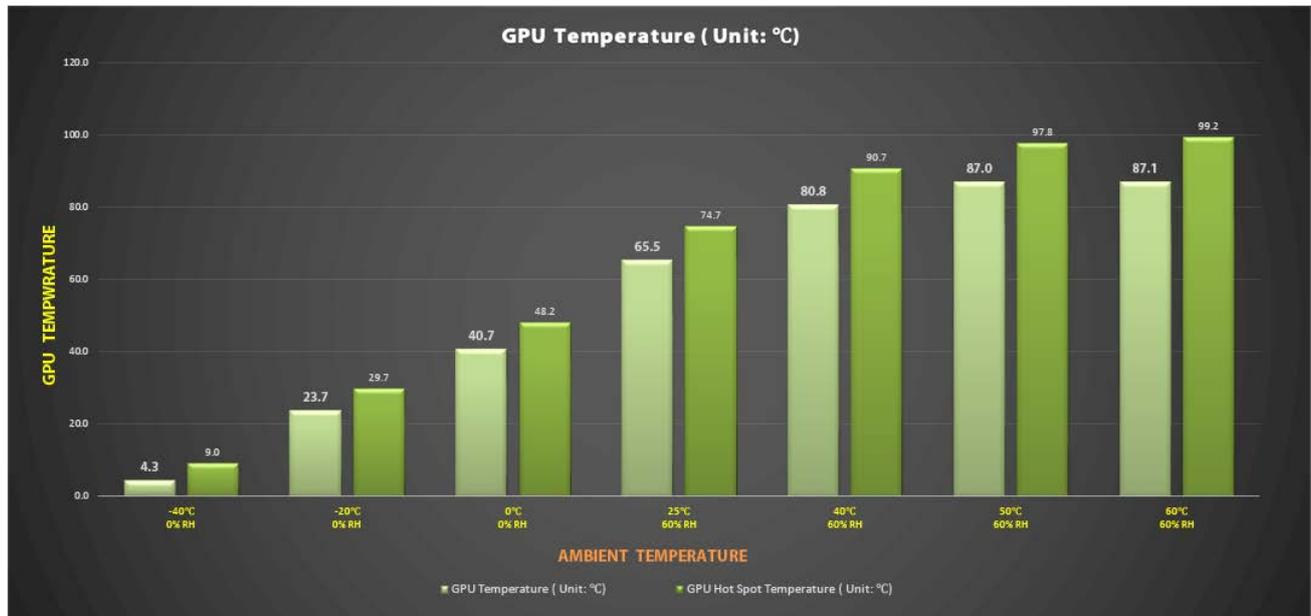
CPU Frequency \ Ambient Temperature	-40°C 0% RH	-20°C 0% RH	0°C 0% RH	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
CPU P-Cores Frequency (Unit: GHz)	3.30	3.20	3.10	3.10	3.04	2.90	2.80
Processor Base Frequency: 2.50 GHz							
CPU E-Cores Frequency (Unit: GHz)	2.70	2.60	2.60	2.60	2.51	2.39	2.30



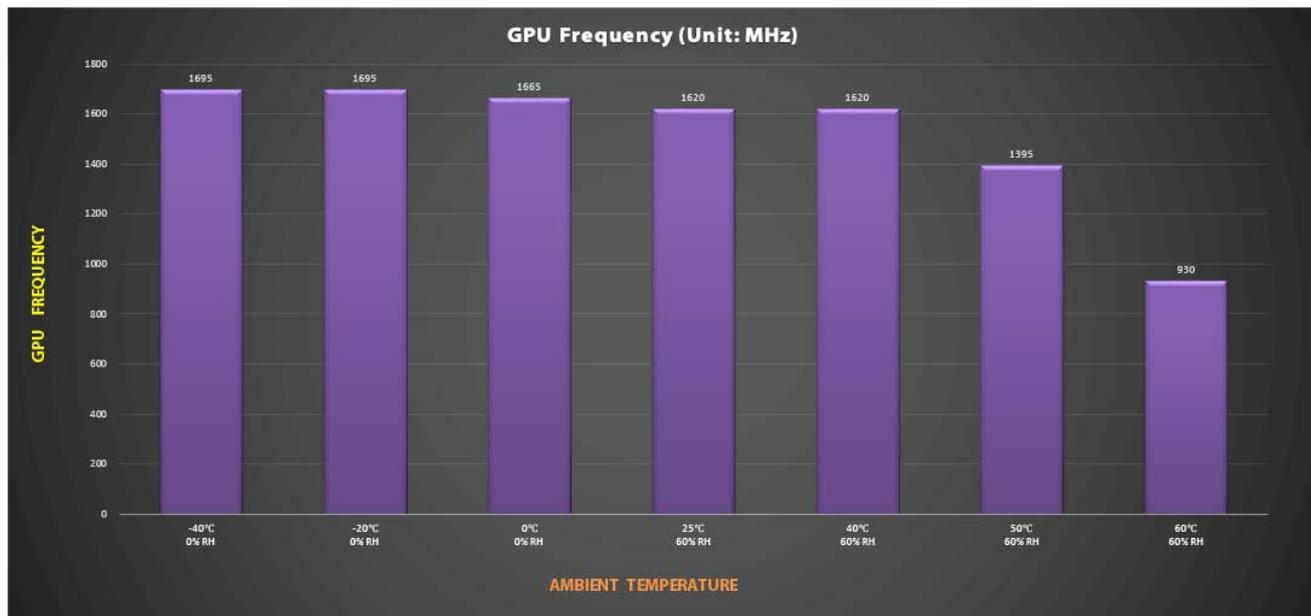
# PERFORMANCE TEST REPORT

## IV320-RH-KD5

GPU Temperature	Ambient Temperature	-40°C 0% RH	-20°C 0% RH	0°C 0% RH	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
GPU Temperature ( Unit: °C)		4.3	23.7	40.7	65.5	80.8	87.0	87.1
GPU Hot Spot Temperature ( Unit: °C)		9.0	29.7	48.2	74.7	90.7	97.8	99.2



GPU Frequency	Ambient Temperature	-40°C 0% RH	-20°C 0% RH	0°C 0% RH	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
GPU Frequency (Unit: MHz)		1695	1695	1665	1620	1620	1395	930





# PERFORMANCE TEST REPORT

## IV320-RH-KD5

LAN SPEED

LAN Data-Packet

X2-LAN 2

The screenshot displays two windows. The left window is a Command Prompt showing the results of a LAN speed test. The right window is another Command Prompt showing the results of a LAN data-packet test. In the center, an 'Ethernet 4 Status' window is open, showing network connectivity and activity statistics.

**LAN Speed Test Results:**

ID	Role	Interval	Transfer	Bitrate	Retr
5	[TX-C]	0.00-1000.00	sec 85.1 GBytes	731 Mbts/sec	
5	[RX-C]	0.00-1000.02	sec 85.1 GBytes	731 Mbts/sec	
7	[TX-C]	0.00-1000.00	sec 109 GBytes	930 Mbts/sec	
7	[RX-C]	0.00-1000.02	sec 109 GBytes	930 Mbts/sec	58

**LAN Data-Packet Test Results:**

```
Ping statistics for 192.168.1.99:
Packets: Sent = 1000, Received = 1000, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

LAN Speed Test Result: Pass

LAN Data-Packet Test Result: 0 Lost (0% loss)

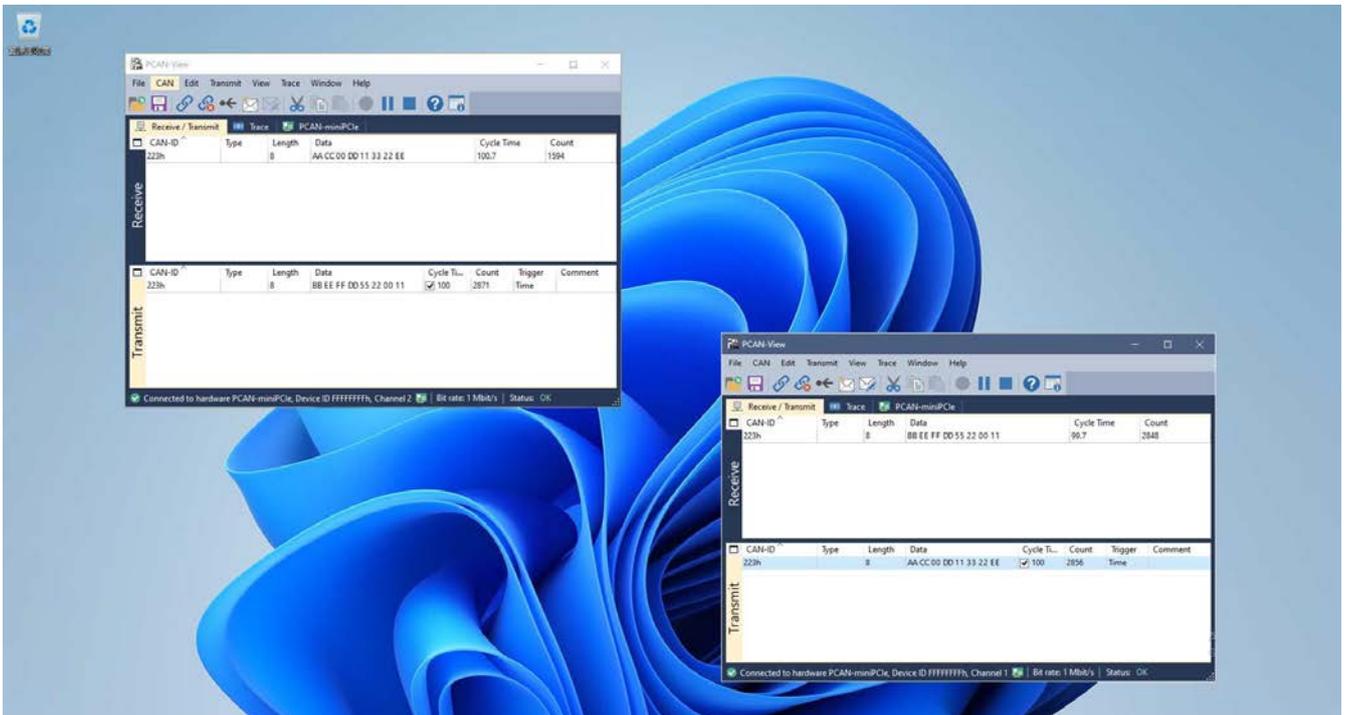
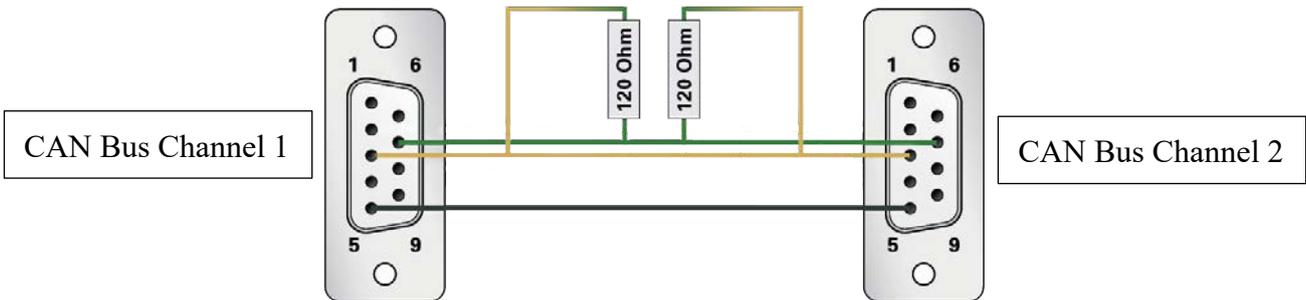
### 5-2. CAN Bus



**CAN Bus**

CAN-Bus Loopback Test Fixture

- 3: CAN-Low
- 7: CAN-High
- 5: GND



### 5-3. SERIES PORT ( RS485 )



RS485

COM8, 115200, None, 8, 1, Dumb Terminal

```
D2C0B613073329B38B785A1E514ACF2B2FCBA75B12607DDA35CABC7A2E41A968B960D048623A8F3  
8862897F7C605332A978649411FDB2DD8CC52C439407BD70B372841ED7BA2D34FDF57AE6007D5AA0  
753E9F9C2E32A5FFDCE1A92903B8A09D3FE7221184E793405A90C623702B4C0B917D9D2FD4CA1741  
FC0AEDF16FC98D7037770B53EC1D947888AB0AB9727432A15577316380852BC7E97746DB19F3758B  
897BAA764537AA2DB863DE4DE5E2A249551BCBAA24D9FC9B78267C9C90F359270C5EB17FEC7E39  
99E30B5AFC906E28BA54F6A005A5FB57FADCB41E243CF22E271B5  
9799E6DB2527C8CDBD3743836DA76F02079E37A44711ABC19AFC3C  
814AF7412E5FF9A4FF78A793D0E561700AC3C079CF07E9A5577697  
1BA984018A4D0558DBA5E8F35127473370508A054824B0063206  
B5635E5803F04E97EM4826D63A81C24139C4A148665A4BF4C168  
B2F95D3B26F19F357CFED2021806FE2311C69FF5349B74273EC64  
79DD5E3F5396F4172A8C0091632E41F79907418AFAEE40CF6994  
FF6F9E20AE7302FDC63A2463BC258B4A78F1F7614F04D726AC4C6  
8353EE326C0740C9400996FC59B9BA41C1C681D8C5CA4CB5519102  
EFABC0805F2C2CF9F44BBFA8D08E8F47AA114C1BBA6F89120A5FD04  
6524220164870F54D9D600BDF8F0F2AB679C5227B28806ABF72FB0  
D18A232FBFA4D005111B27219898C517AA66C75DA808CF42BDC6F0  
D1B3593441424BA7850BC40B7B3569C4868AE291D5B648DA56B88  
AC6E695CDBE29EF6815B3CFBE746FE2CECF08E2BF05C2E2BA443A9B  
54FD075AB0E542825A2A51548BDA19C989494A4BE58EB2CA967D151  
E7BBF8CAFA18C8E0D6DA53688979A8EBC2BD7F86C8440349EFOA  
10EDED18F5E3C2D06F545899474D954E0215E402A3F76933106D  
99A3E2A37CF545A68451CFCE7A61B85FFACA40C2EFC5E99E9911226  
AGE10574596C708E6BFOA071F619AD414A64800CA21EBA144D5F12  
33DEFB2A8E3EDDBE2F09697147A7E38
```

COM3, 115200, None, 8, 1, Dumb Terminal

h) The provisions of this Agreement that require or contemplate performance after the expiration or termination of this Agreement shall be enforceable notwithstanding such expiration or termination.

i) You may not assign, or otherwise transfer by operation of law, your rights or obligations hereunder, in whole or in part, in any merger or sale of all or substantially all of your assets.

j) If any dispute arises under this Agreement, the prevailing party shall be entitled to recover its reasonable attorney's fees and costs.

k) The headings to the sections of this Agreement are for convenience only and shall have no substantive meaning.

l) FinalWire may use your name in any customer reference material issued by FinalWire regarding the licensing of the software.

DISCLAIMER OF WARRANTY: The software and documentation provided without warranty. FinalWire gives no guarantee of performance or quality of the software. The risk thereof lies on you.

COM7, 115200, None, 8, 1, Dumb Terminal

```
5* 5j|| $Ló|ó(QCBE3D4ABC52F6EAD48D06A77D2C0B613073329B3 "Q( L;BDIDEA1  
29799E6DB2527C8CDBD3743836DA76F020F9E37A447F1ABC19 :P8263BC258B4A7F81F7614F04D7  
26AC4C6C87FA581075D8AD22A764F077y &T$P*9CB8BCBCEB80FC254FD057AB0E564252AA5154  
8BDA19C yý''5" $!*(Q;865F16D6DF5B75EC7EB4C1FD46BDC2503418F9 "S! &T$MM;7E8160A1E7  
133ED1226224F6FC6394A4BF96B93D003124E85D54AD24418B079DF87FDADBF3281C42385A217  
A79C6872 0069539F31ADFE85892C4CF8854FD88277B21F84F78EC3EF1057873A7E9EF4P0*E* S  
E|U*+S* NNE4E618B40C882868FF8DC0E7E125E2AC98ABC82a" O$;C630E0878E1D233DBB  
A0239C8D0B67667287C7F45" ó &&&LQNM0(N*0607B95A85F48421841DB81ECDF32EEB5B303EA  
D9DC568982281CCE3B85D06B107E4612735A8FD10FF3C2A0766BF2E64C3 1FC0AEDF16FC98D7037  
770B53EC1D947888AB0AB9727432A1557731638139C4A14B665A4BF4C168BF4C168BF4C168BF4C  
DF2D1B2F95 PQMMMF6F9E20AE7302FDC63A2463BC258B4A7F81F7614F04D726AC4C6C87FA5810  
75D8AD22A764F077383535E1 B8BCBCEB80FC254FD057AB0E564252AA51548BDA19C989494A4BE  
5EB2CA96 Y*8$0 LLD46BDC2503418F9F113C04373C1384D4F43025DDE0CE59C6C5C 4BF9  
6B93D07323B744BB81B339058A561134D9393052850F7CCBA
```

# PERFORMANCE TEST REPORT

IV320-RH-KD5

## 5-4. USB PORT



**USB 3.0**

PassMark(TM) USB3Test

Select USB Device

Device: PMU33ZQ2CX (SuperSpeed 5Gb/s)

Connection Type: SuperSpeed 5Gb/s

Test mode

Loopback

Benchmark

**Results** Status: BENCHMARK test - Complete

Duration: 000h 30m 00s Operations: 0 Errors: 0

Write block 2382: 3370.7 Mb/s (421.3 MB/s)
Read block 2383: 3371.7 Mb/s (421.5 MB/s)
Write block 2383: 3371.0 Mb/s (421.4 MB/s)
Read block 2384: 3368.2 Mb/s (421.0 MB/s)
Write block 2384: 3371.4 Mb/s (421.4 MB/s)
Read block 2385: 3369.4 Mb/s (421.2 MB/s)
Write block 2385: 3092.7 Mb/s (386.6 MB/s)
Read block 2386: 3371.0 Mb/s (421.4 MB/s)

**OVERALL BENCHMARK RESULT:**

Test Start time:

Duration: 000h 30m 00s

Total number of bytes written: 304087 MB

Total number of bytes read: 304215 MB

Maximum Write Data Rate: 3372.1 Mb/s (421.5 MB/s)

Maximum Read Data Rate: 3372.5 Mb/s (421.6 MB/s)

Minimum Write Data Rate: 2726.0 Mb/s (340.8 MB/s)

Minimum Read Data Rate: 2720.0 Mb/s (340.0 MB/s)

Average Write Data Rate: 3350.0 Mb/s (418.8 MB/s)

Average Read Data Rate: 3361.8 Mb/s (420.2 MB/s)

Average Data Rate: 3355.9 Mb/s (419.5 MB/s)

Minimum Data Rate: 2720.0 Mb/s (340.0 MB/s)

Max. Rate 3372

4000

3000

2000

1000

0 (Mb/s) R/W

Voltage 4.98V

Speed 5Gb/s

Duration 30 Minutes

Start Stop

Configure Flash LEDs

Clear Serial Save Log

Reset All Help

About Exit

# PERFORMANCE TEST REPORT

## IV320-RH-KD5

The screenshot shows the PassMark(TM) USB3Test application window. The interface includes a configuration section at the top left with a 'Select USB Device' dropdown set to 'PMU33ZQ2DG (SuperSpeed 5Gb/s)' and a 'Connection Type' dropdown set to 'SuperSpeed 5Gb/s'. The 'Test mode' section has 'Benchmark' selected. The main results area displays a table of performance metrics for various block sizes (805-809) and overall benchmarks. A vertical bar chart on the right indicates the maximum rate of 3372 Mb/s. On the right side of the window, there is a 'Voltage 5.01V Speed 5Gb/s' display and a control panel with buttons for 'Start', 'Stop', 'Configure', 'Flash LEDs', 'Clear Serial', 'Save Log', 'Reset All', 'Help', 'About', and 'Exit'. The duration is set to 10 minutes.

Results	Status: BENCHMARK test - Complete
Duration: 000h 10m 00s	Operations: 0 Errors: 0
Write block 805: 3371.2 Mb/s (421.4 MB/s)	
Read block 806: 3363.3 Mb/s (420.4 MB/s)	
Write block 806: 3371.1 Mb/s (421.4 MB/s)	
Read block 807: 3371.7 Mb/s (421.5 MB/s)	
Write block 807: 3371.6 Mb/s (421.4 MB/s)	
Read block 808: 3362.5 Mb/s (420.3 MB/s)	
Write block 808: 3091.8 Mb/s (386.5 MB/s)	
Read block 809: 3372.8 Mb/s (421.6 MB/s)	
<b>OVERALL BENCHMARK RESULT:</b>	
Test Start time:	
Duration: 000h 10m 00s	
Total number of bytes written: 103020 MB	
Total number of bytes read: 103147 MB	
Maximum Write Data Rate: 3372.5 Mb/s (421.6 MB/s)	
Maximum Read Data Rate: 3372.8 Mb/s (421.6 MB/s)	
Minimum Write Data Rate: 3091.8 Mb/s (386.5 MB/s)	
Minimum Read Data Rate: 3361.3 Mb/s (420.2 MB/s)	
Average Write Data Rate: 3370.2 Mb/s (421.3 MB/s)	
Average Read Data Rate: 3369.3 Mb/s (421.2 MB/s)	
Average Data Rate: 3369.7 Mb/s (421.2 MB/s)	
Minimum Data Rate: 3091.8 Mb/s (386.5 MB/s)	

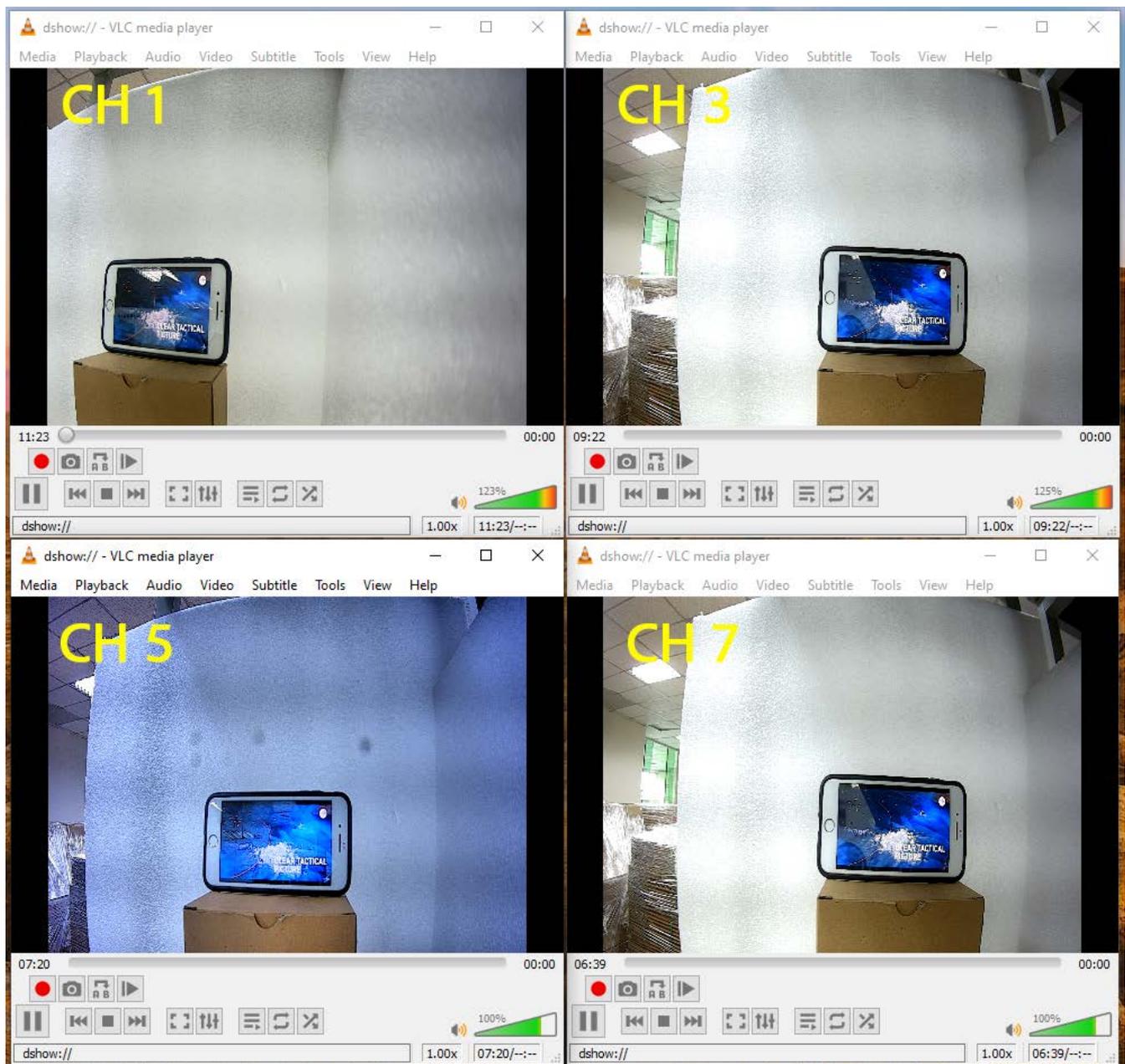
### 5-5. MINI DISPLAY PORT



mDP



### 5-6. 3G-SDI



# PERFORMANCE TEST REPORT

## IV320-RH-KD5



-----END-----