



i11C-G1050Ti-UT

Rugged Fanless MXM-GPU Server THERMAL TEST REPORT

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INDEX

1. SYSTEM SPEC

1-1.PRODUCT PHOTOS

1-2.SYSTEM COFIGURATION

2. TEST PLAN

2-1.THERMAL MEASUREMENT PROCESS

2-2.i11C-G1050Ti-UT TEST RESULT

2-2-1. TEMPERATURE CYCLE

2-2-2. I/O FUNCTION

3. THERMAL TEST PHOTOS

4. PHOTOS IN LAB

5. PERFORMANCE RESULT

1. SYSTEM SPEC

1-1. PRODUCT PHOTOS



1-2. SYSTEM COBFIGURATION

System Configuration	
Motherboard	INS8365B
CPU	Intel® Core™ i7-9700TE Processor 1.8 GHz
PCH	Intel Q370
Memory	SAMSUNG 32GB DDR4 SODIMM 2666
SATA port1	Solid State Drive 2.5" (SP010TISSD355SE0) SATA3 SSD350 S/R 1TB TLC Wide Temp.
LAN1	Intel® i219 LM GbE LAN
LAN2	Intel® i210 GbE LAN
Graphic Card	NVidia GTX 1050Ti

2. Test Plan

2-1. Thermal Measurement Process

Test Purpose	The purpose of performing thermal profile test is to identify potential thermal problem of the EUT. And it is to aid products in reliability assessment considering that semiconductor failure rates rise rapidly with increasing junction temperature In case of systems cooling, patterns will vary with stacking choices, temperature/thermal mapping can aid in the development of optimum tacking arrangements																
Test Equipment	1. KSON THS-B4T-150 Chamber 2. YOKOGAWA MV1000, Thermometer (FLUKE50D K/J) 3. Infrared thermal imaging camera Model TVS-200EX																
Quantity Tested	Minimum 1 Set																
Test Software	Passmark Burn-In Test under Windows 10																
Test Procecedure	1. Thermal pre-scan measurement: Temperature:40~75°C Capture thermal IR photo for whole boards after the EUT execute passmark burn-in test with 100% lading during 1 hour at least. 2. Thermal actual measurement: a. Select the test points according to the IR photo and attach thermocouples to the hot points b. Put the EUT in thermal chamber and set the temperature profile of as test specification c. Turn on the thermal chamber and power on the EUT to enter windows environment to run Max Power Test + 3DMARK 2003 application program d. After the EUT executing the test software for 4 hours, record thermal maximum value for each thermocouples point. e. Turn off the thermal chamber and EUT f. Verify and check recorded figure of each components to its' operating temperature range listed in specification/approval sheet of each measured component																
Test diagram of curves	Environment defines for 4 hours <table border="1"> <caption>Thermal Profile Data</caption> <thead> <tr> <th>Time (hour)</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>0 - 4</td> <td>50</td> </tr> <tr> <td>4 - 4.5</td> <td>50 to 60</td> </tr> <tr> <td>4.5 - 9</td> <td>60</td> </tr> <tr> <td>9 - 13.5</td> <td>60 to 70</td> </tr> <tr> <td>13.5 - 17.5</td> <td>70</td> </tr> <tr> <td>17.5 - 18</td> <td>70 to 75</td> </tr> <tr> <td>18 - 22</td> <td>75</td> </tr> </tbody> </table>	Time (hour)	Temperature (°C)	0 - 4	50	4 - 4.5	50 to 60	4.5 - 9	60	9 - 13.5	60 to 70	13.5 - 17.5	70	17.5 - 18	70 to 75	18 - 22	75
Time (hour)	Temperature (°C)																
0 - 4	50																
4 - 4.5	50 to 60																
4.5 - 9	60																
9 - 13.5	60 to 70																
13.5 - 17.5	70																
17.5 - 18	70 to 75																
18 - 22	75																

2-2. i11C-G1050Ti-UT TEST RESULT

TEST ITEM:

2-2-1. TEMPERATURE CYCLE

Burn-in test under each temperature with maximum quantity of external devices on all I/O connected and full loading status on each device

Test Temperature	Test Result
40°C	PASS
50°C	PASS
60°C	PASS
70°C	PASS
75°C	PASS

2-2-2. I/O FUNCTION

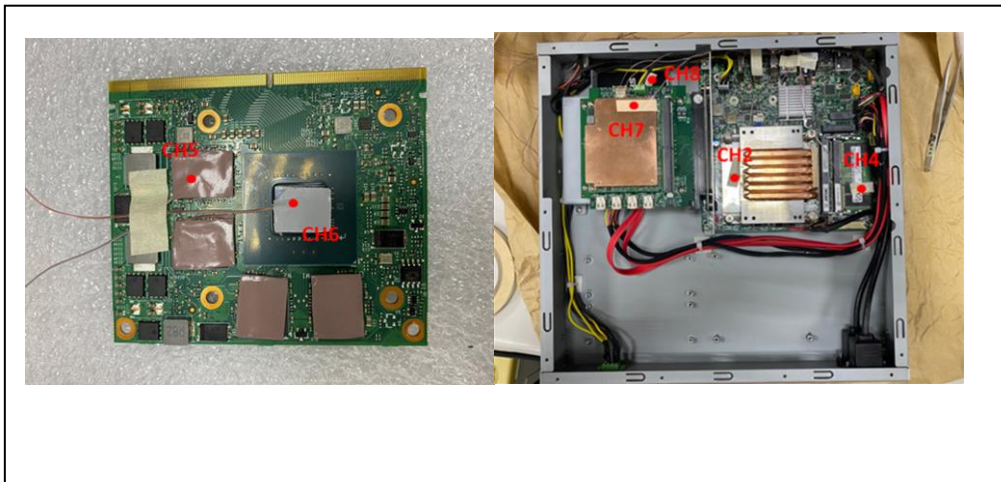
#Confirm the system specifications and I/O connection to ensure that they are functioning properly

Item	Criteria	Result
USB3.0 *4	USB3.0 can use any USB device	PASS
	Loopback Plugs for USB 3.0 Trouble shooting and Testing	
USB2.0 *4	USB2.0 can use any USB device	PASS
	Loopback Plugs for USB 3.0 Trouble shooting and Testing	
DP1/DP2	Check work well	PASS
HDMI	Check work well	PASS
LAN	Check work well	PASS

3. THERMAL TEST PHOTOS



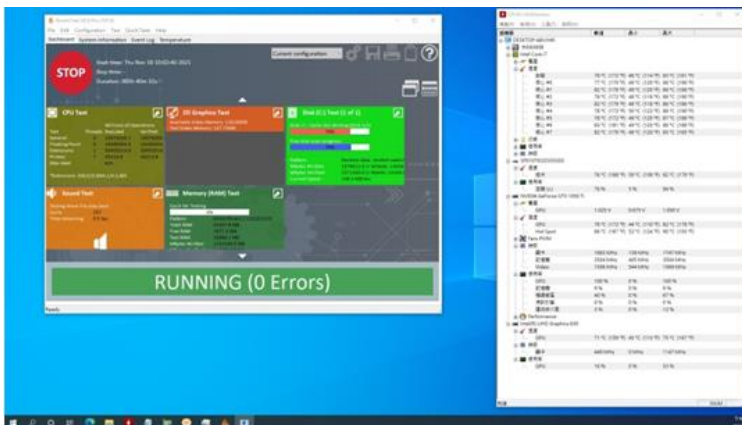
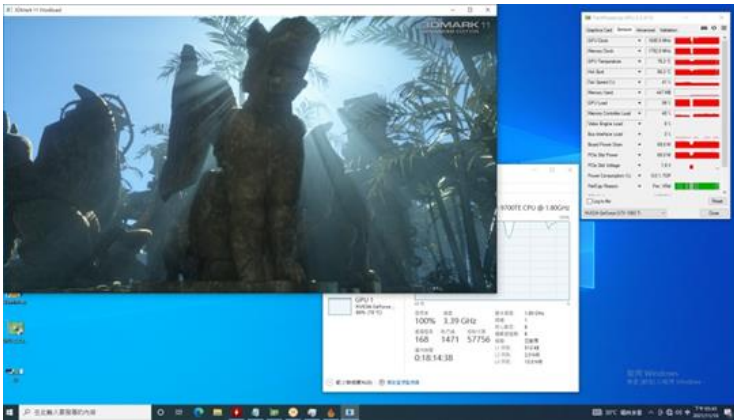
CH1	CPU
CH2	CPU HEAT SINK
CH3	CPU TOP HEAT SINK
CH4	DRAM



CH5	GPU DRAM
CH6	GPU
CH7	GPU HEAT SINK
CH8	SSD

4. PHOTO IN LAB

- Chamber in +40°C

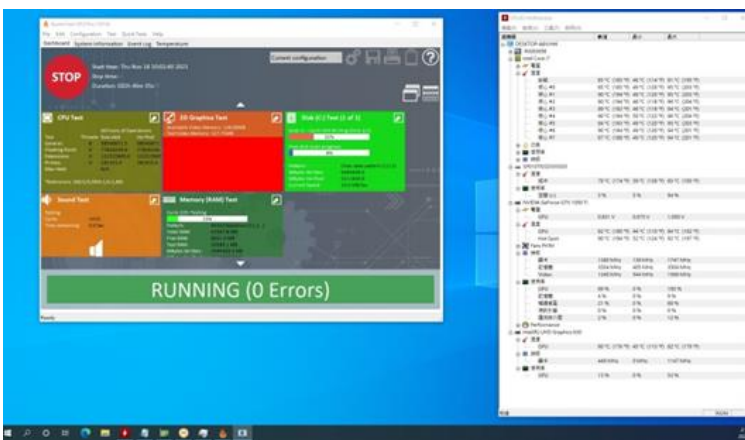
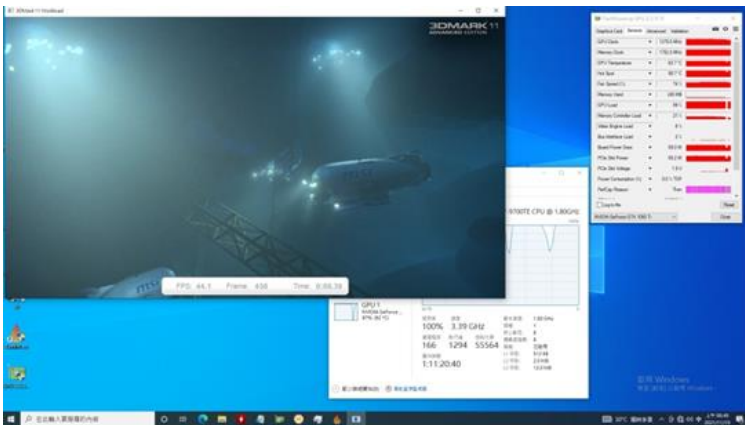


TEST POINT NO.	TEMP.	40°C
	CPU FRQ.	78
	CPU TJ.	3.39GHz
	GPU FRQ	78
	GPU TJ	1683MHz
1	CPU	67.4
2	CPU HEAT SINK	61.2
4	RAM	82.2
5	GPU RAM	62.2
6	GPU	71.9
7	GPU HEAT SINK	59.1
8	SSD	59

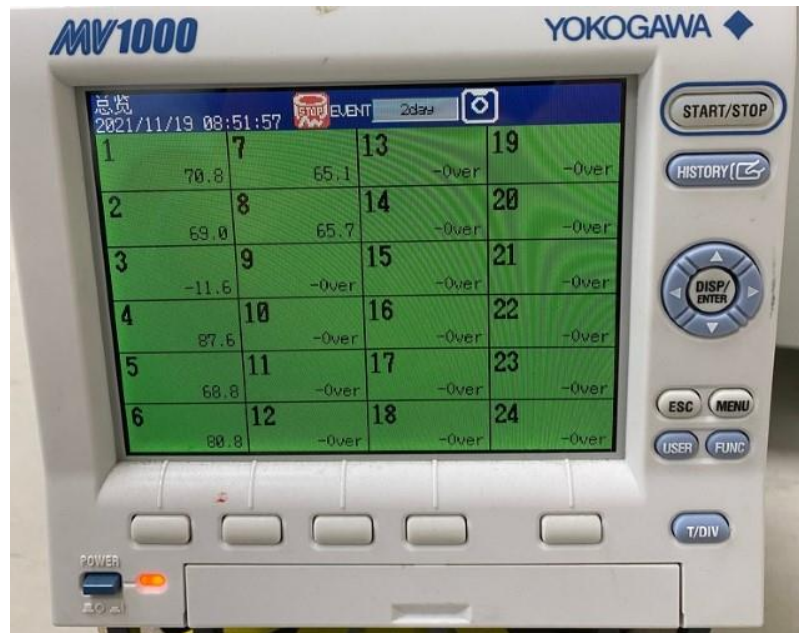


i11C-G1050Ti

- Chamber in +50°C

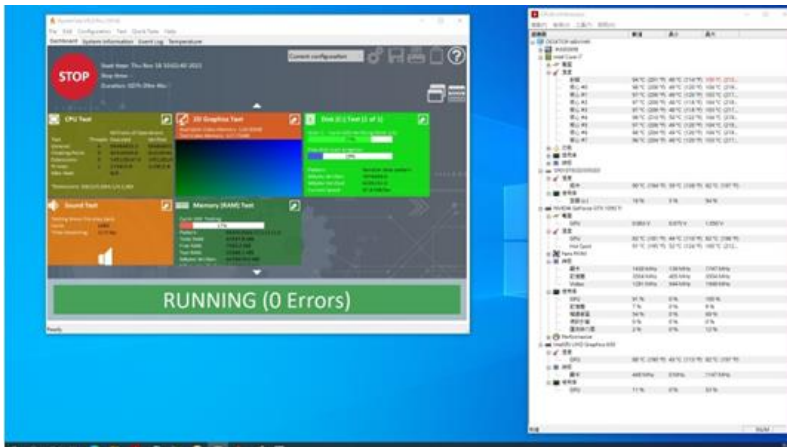
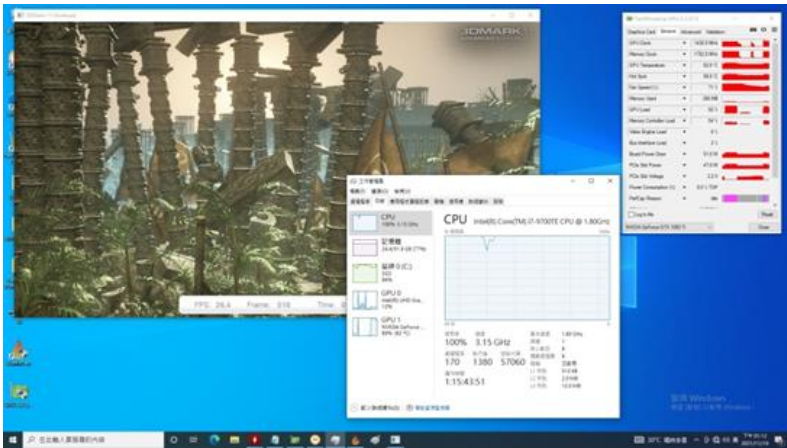


TEST POINT NO.	TEMP.	50°C
	CPU FRQ.	85
	CPU TJ.	3.39GHz
	GPU FRQ	82
	GPU TJ	1380MHz
1	CPU	70.8
2	CPU HEAT SINK	69
4	RAM	87.6
5	GPU RAM	68.8
6	GPU	80.8
7	GPU HEAT SINK	65.1
8	SSD	65.7

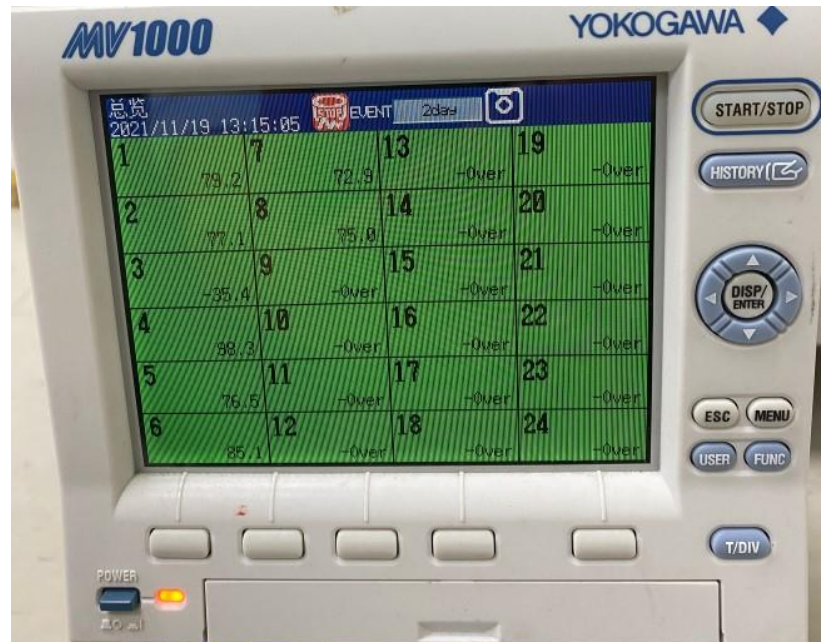


i11C-G1050Ti

- Chamber in +60°C

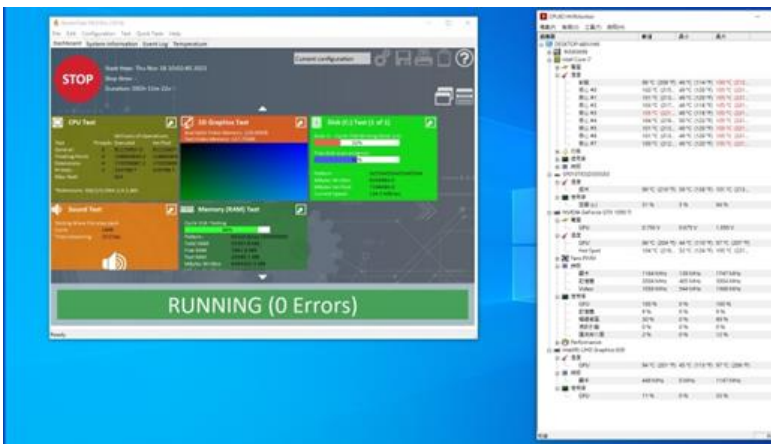
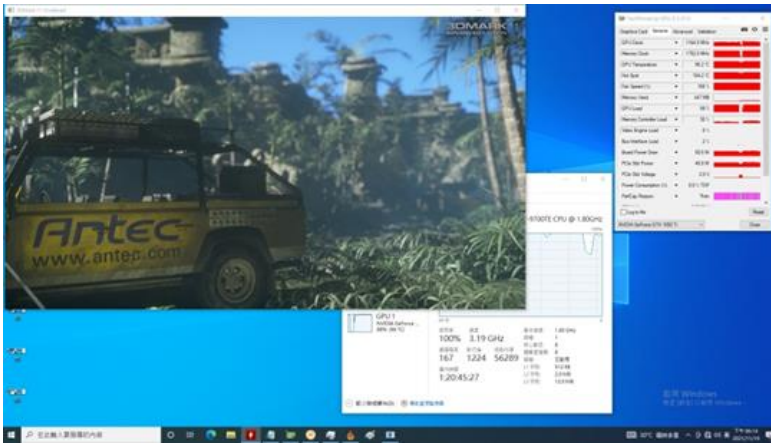


TEST POINT NO.	TEMP.	60°C
	CPU FRQ.	94
	CPU TJ.	3.15GHz
	GPU FRQ	83
	GPU TJ	1430MHz
1	CPU	79.2
2	CPU HEAT SINK	77.1
4	RAM	98.3
5	GPU RAM	76.5
6	GPU	85.1
7	GPU HEAT SINK	72.9
8	SSD	75



i11C-G1050Ti

- Chamber in +70°C

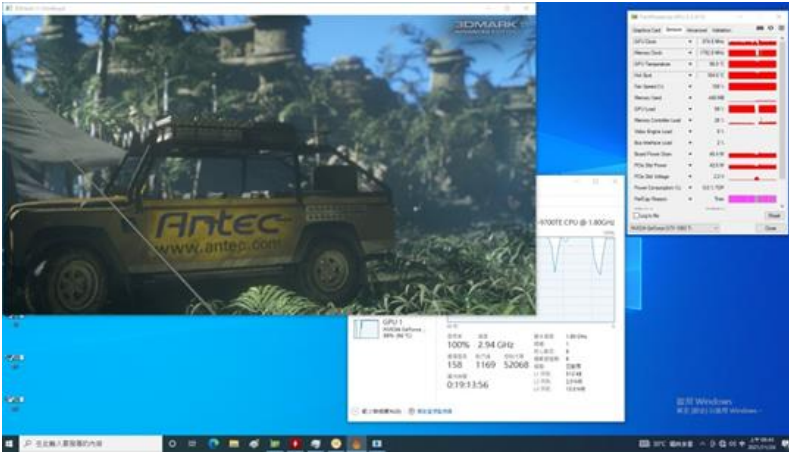


TEST POINT NO.	TEMP.	70°C
CPU FRQ.		98
CPU TJ.		3.19GHz
GPU FRQ		96
GPU TJ		1164MHz
1	CPU	92.7
2	CPU HEAT SINK	84.4
4	RAM	103.6
5	GPU RAM	85.4
6	GPU	92.7
7	GPU HEAT SINK	81.8
8	SSD	81.2

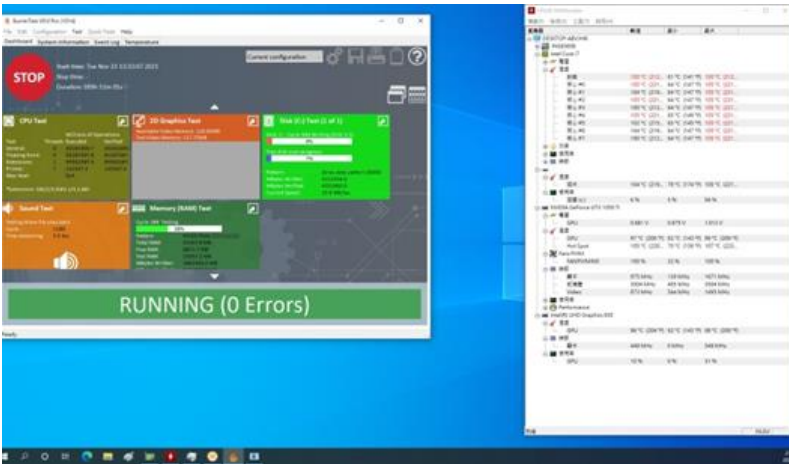


1	7	13	19
	92.7	81.8	-Over
2	8	14	20
	84.4	81.2	-Over
3	9	15	21
	-48.0	-Over	-Over
4	10	16	22
	103.6	-Over	-Over
5	11	17	23
	85.4	-Over	-Over
6	12	18	24
	92.7	-Over	-Over

- Chamber in +75°C



TEST POINT NO.	TEMP.	75°C
CPU FRQ.		100
CPU TJ.		2.94GHz
GPU FRQ		97
GPU TJ		975MHz
1	CPU	95.8
2	CPU HEAT SINK	90.1
4	RAM	112
5	GPU RAM	89
6	GPU	94.9
7	GPU HEAT SINK	85.9
8	SSD	89.3



1	7	13	19
95.8	85.9	-Over	-Over
2	8	14	20
90.1	89.3	-Over	-Over
3	9	15	21
-42.6	-Over	-Over	-Over
4	10	16	22
112.0	-Over	-Over	-Over
5	11	17	23
89.0	-Over	-Over	-Over
6	12	18	24
94.9	-Over	-Over	-Over

5. i11C-G1050-UT THERMAL TEST RESULT (40~+75 DEGREE)

TEST POINT NO.	TEMP.	40°C	50°C	60°C	70°C	75°C
	CPU FRQ.	78	85	94	98	100
	CPU TJ.	3.39GHz	3.39GHz	3.15GHz	3.19GHz	2.94GHz
	GPU FRQ	78	82	83	96	97
	GPU TJ	1683MHz	1380MHz	1430MHz	1164MHz	975MHz
1	CPU	67.4	70.8	79.2	92.7	95.8
2	CPU HEAT SINK	61.2	69	77.1	84.4	90.1
4	RAM	82.2	87.6	98.3	103.6	112
5	GPU RAM	62.2	68.8	76.5	85.4	89
6	GPU	71.9	80.8	85.1	92.7	94.9
7	GPU HEAT SINK	59.1	65.1	72.9	81.8	85.9
8	SSD	59	65.7	75	81.2	89.3