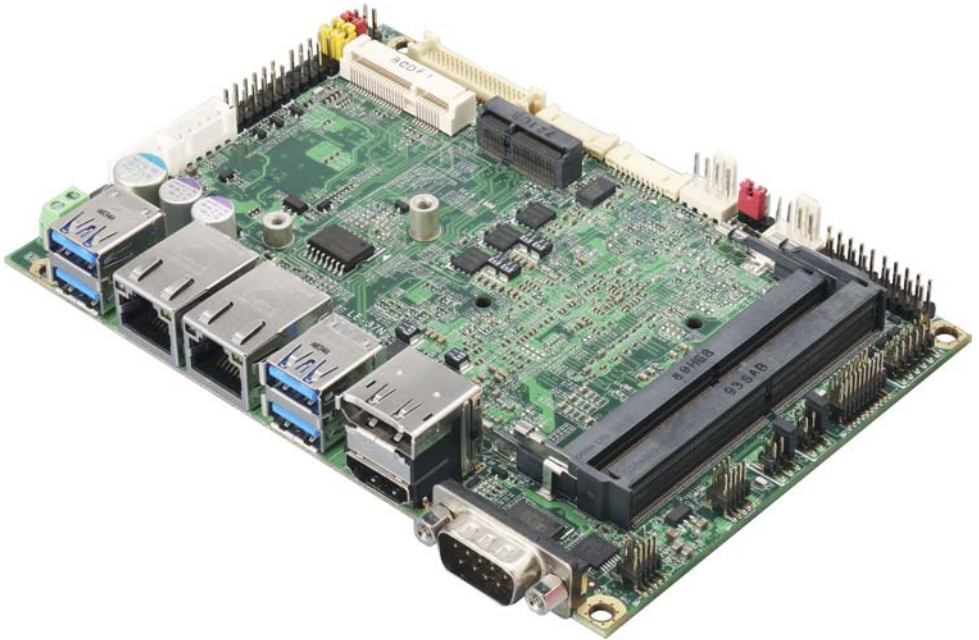


Product Test Report



Product Name	LE-37N
Product Version	A
Issued Date	2021.04.08
Report Edition	1.0
BIOS Version	1.0
Testing Engineer	Perry
Check Engineer	Daniel

REVISION HISTORY

DATE	REVISION NO.	PAGE	DESCRIPTONS
2019.08.28	Ver. 1.0	48	Initial Release
2021.04.08	Ver. 1.1	49	Increase Memory Test

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1. Function test

1.1 Hardware functions

Base Function Test

Item	Description	Result
1	Power Button	PASS
2	Reset	PASS
3	Power LED	PASS
4	HDD LED	PASS
5	CPUFAN	PASS
6	SYSFAN	PASS
7	CN_AUDIO	PASS
8	LAN1(I219)	PASS
9	LAN2(I210)	PASS
10	DDR4_A/B	PASS
11	CN_SATA3-1/2	PASS
12	USB3 - 1/2/3/4	PASS
13	CN_USB2 - 1/2	PASS
14	COM 1	PASS
15	CN_COM 2/3/4	PASS
16	PS2	PASS
17	HDMI	PASS
18	Display Port	PASS
19	LVDS	PASS
20	MINI_CRAD	PASS
21	M2	PASS

Jumper

Item	Description	Result
1	JRTC	PASS
2	JAT	PASS
3	JMSATA	PASS
4	JVLCD	PASS

1.2 BIOS function

Item	Description	Result	Remark
1	Press 'Del' to run Setup Utility	PASS	
2	Ctrl-Alt-Del – Soft-Reboot	PASS	
3	Save & Exit Setup	PASS	
4	Date & Time Setting	PASS	
5	Selection Language	PASS	
6	Numlock	PASS	
7	Active Processor Cores	PASS	
8	Hyper-Threading	PASS	
9	Channel A&B DIMM Control	PASS	
10	LCD Control	PASS	
11	HD Audio	PASS	
12	Wake On LAN	PASS	
13	LVDS Configuration	PASS	
14	COM Port 1~4	PASS	
15	Keyboard Controller	PASS	
16	Power Loss	PASS	
17	Watch Dog Timer	PASS	

Item	Description	Result	Remark
18	Auto Wake on S5	PASS	
19	iAMT	PASS	

1.3 Driver

CD edition : IPCI2-1.0

1. Windows 10 64 bit Driver Test

Item	Description	Result	Version
1	Chipset Driver	PASS	
2	VGA Driver	PASS	26.20.100.6861
3	Audio Driver	PASS	6.0.1.8036
4	LAN Driver	PASS	I219LM:12.18.8.9 I210: 12.15.184.0

2. Compatibility test

2.1 CPU Test

Test environment:

OS: Windows 10 64bit

Test program : BurnIn Test8.1 & AIDA64

Spec	CPU Speed	Family	Processor	TDP	Smart Cache	Result
SRFDS	1.7GHz	CORE	i7-8665UE	15W	8 MB	PASS
SRFDU	1.6GHz	CORE	i5-8365UE	15W	6 MB	PASS
SRFDT	2.2GHz	CORE	i3-8145UE	15W	4 MB	PASS

2.2 Memory Test

Test environment:

OS: Windows 10 64bit

Test program : BurnIn Test8.1 & MemTest64 & MemTest86+

Manufacturer	Chip	Frequency	Capacity Mbytes	Memory test Source
Kingston KVR24S17D8/16	SKhynix H5AN8G8NCJR -VKC	DDR4 2400	16 GB	PASS
Kingston KVR24S17S8/8	Micron 7WE75D9VPP	DDR4 2400	8 GB	PASS
Kingston KVR24S17S6/4	Micron 7UE75D9WFH	DDR4 2400	4 GB	PASS
DSL D41SS1G082SH34A-B	SEC 931 K4A8G08 5WB BCRC	DDR4 2400	16 GB	PASS
ACPI CMA6-4HD01BAR27A00	SKhynix H5AN8G8NAFR -UHC	DDR4 2400	16 GB	PASS
innodisk M4S0-AGSIOCSJ	SEC 049 K4A8G08 5WB BCRC	DDR4 2400	16 GB	PASS

2.3 HDMI Graphic Quality Test

Test environment:

OS Windows 10 64bit

Driver version : 26.20.100.6861

Resolution	Color	Result	Remark
800 x 600	32bit	PASS	
1024 x 768	32bit	PASS	
1152 x 864	32bit	PASS	
1280 x 600	32bit	PASS	
1280 x 720	32bit	PASS	
1280 x 768	32bit	PASS	
1280 x 800	32bit	PASS	
1280 x 960	32bit	PASS	
1280 x 1024	32bit	PASS	
1360 x 768	32bit	PASS	
1366 x 768	32bit	PASS	
1400 x 1050	32bit	PASS	
1440 x 900	32bit	PASS	
1600 x 900	32bit	PASS	
1680 x 1050	32bit	PASS	
1920 x 1080	32bit	PASS	
3840 x 2160	32bit	PASS	

2.4 Display Port Graphic Quality Test

Test environment:

OS Windows 10 64bit

Driver version : 26.20.100.6861

Resolution	Color	Result	Remark
800 x 600	32bit	PASS	
1024 x 768	32bit	PASS	
1152 x 864	32bit	PASS	
1280 x 600	32bit	PASS	
1280 x 720	32bit	PASS	
1280 x 768	32bit	PASS	
1280 x 800	32bit	PASS	
1280 x 960	32bit	PASS	
1280 x 1024	32bit	PASS	
1360 x 768	32bit	PASS	
1366 x 768	32bit	PASS	
1400 x 1050	32bit	PASS	
1440 x 900	32bit	PASS	
1600 x 900	32bit	PASS	
1600 x 1050	32bit	PASS	
1920 x 1080	32bit	PASS	
3840 x 2160	32bit	PASS	

2.5 Audio

Test environment:

OS Windows 10 64-bit

Driver version : 6.0.1.8036

Item	Description	Result	Remark
1	2.1CH	PASS	
2	Microphone	PASS	

OS Ubuntu 16.04 / 18.04

Item	Description	Result	Remark
1	2.1CH	PASS	

OS Fedoro 28 Workstation

Item	Description	Result	Remark
1	2.1CH	PASS	

2.6 HDD Test

Test environment:

OS Windows 10 64bit

Test program : BurnIn Test8.1 & CrystalDiskMark

HDD Model	Interface	Capacity	HDD Size Detect	HDD Data Transfer	HDD LED Check
INTEL SSDSC2BW240A4	SSD	240 GB	PASS	PASS	PASS
SPCC Solid State disk(S55)	SSD	120 GB	PASS	PASS	PASS

CT120 BX500	SSD	120 GB	PASS	PASS	PASS
WD 10EZEX	HDD	1 TB	PASS	PASS	PASS
Kingston DT100G3/32G	USB	32 GB	PASS	PASS	PASS
Kingston DT Hyper X 3.0	USB	63 GB	PASS	PASS	PASS
Crucial_CT 120M500SSD	mSATA	120 GB	PASS	PASS	PASS
Innodisk 3MV2-P DVMSR-64GD81BC 1QC	mSATA	64 GB	PASS	PASS	PASS
ACPI MSS4F-M SATA III	mSATA	64 GB	PASS	PASS	PASS

2.7 DVD-ROM Test

Test environment:

OS Windows 10 64bit

DVD-ROM Model	Interface	DVD-ROM Detect	DVD-ROM Data Transfer	Play DVD
Transcend DVD TS8XDVDS-K	USB	PASS	PASS	PASS
LITEON DVD eTAU108	USB	PASS	PASS	PASS
PIONEER DVD DVR-XD11T	USB	PASS	PASS	PASS
ZYNET GT32N A201	USB	PASS	PASS	PASS

2.8 USB Test

1. Windows 10 64-bit

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
DVD-ROM	PASS	
USB Mass storage	PASS	

2. Ubuntu 16.04 / 18.04

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
DVD-ROM	PASS	
USB Mass storage	PASS	

3. Fedora 28 Workstation

Item	Result	Remark
External USB Keyboard Test	PASS	
External USB Mouse Test	PASS	
Hot plugging test	PASS	
DVD-ROM	PASS	
USB Mass storage	PASS	

2.9 Serial Port Test

1. Windows 10 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	RS-232 Mouse Test	PASS	

2.10 PS2 Keyboard 、 Mouse Test

1. Windows 10 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

2. Ubuntu 16.04 / 18.04

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

3. Fedoro 28 Workstation

Item	Description	Result	Remark
1	Device Manager Check	PASS	
2	Keyboard Typing Test	PASS	
3	Mouse Detect Test	PASS	

2.11 LAN Test

Data Transfer Test environment:

-CAT 6 UTP 100M

-8 HR. continuous

1. Windows 10 64-bit

Item	Description	Result	Remark
1	Device Manager Check	PASS	(IPERF)
2	Data Transfer Test	PASS	(IPERF)

2. Ubuntu 16.04 / 18.04

Item	Description	Result	Remark
1	Device Manager Check	PASS	

3. Fedoro 28 Workstation

Item	Description	Result	Remark
1	Device Manager Check	PASS	

2.12 Power Supply Test

Item	Type	Description	Result	Remark
1	ATX Power	Thermaltake TR2-450AH2NCB	PASS	
2	ATX Power	SEED BS400	PASS	
3	ATX Power	Seasonic SS-520GB 520W	PASS	
4	ATX Power	AcBel PC7008 430W	PASS	

2.13 OS Install

Item	Description	Result	Remark
1	Windows 10 64 bit	PASS	
2	Ubuntu16.04 (ubuntu-16.04.5-desktop-amd64)	PASS	
3	Ubuntu18.04 (ubuntu-18.04.1-desktop-amd64)	PASS	
4	Fedora 28 (Fedora-Workstation-Live-x86_64-28-1.1)	PASS	

2.14 PCI Express Mini Card

Motherboard	PCI Express mini card	Result	Remark
LE-37N	MPX-M2E+M2-210	PASS	
	MPX-210D	PASS	
	MPX-210D2	PASS	
	MPX-574D	PASS	
	MPX-574D2	PASS	
	MPX-350	PASS	
	MPX-8188	PASS	

2.15 M2(Key E) Expansion slot

Motherboard	PCI Express mini card	Result	Remark
LE-37N	M2-210	PASS	

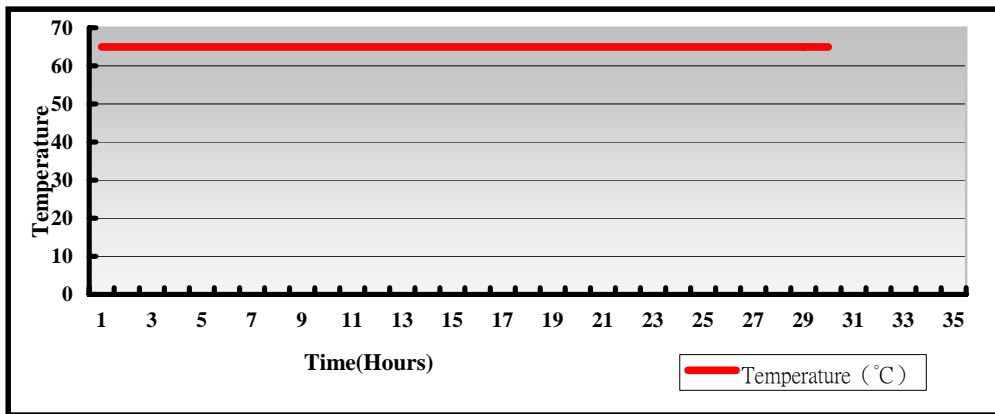
3. Environmental test

3.1 Temperature Test

Hardware Device list:

System Board	LE-37N
CPU	Intel(R) Core(TM) i7-8665UE 1.7GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB (WDS250G2B0A-00SM50)
Operating OS	Windows 10 64bit
Test Equipment	GIANT FORCE GTH-150-60-SP-AR LCD-9530 Programmer/Controller
Test Program	BurnIn 8.1

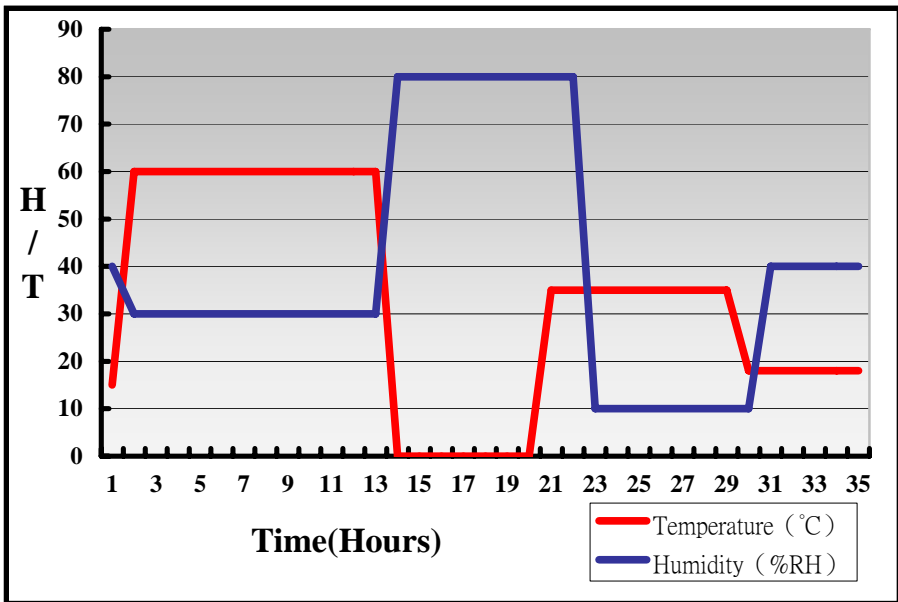
Test Result:



Hardware Device list:

System Board	LE-37N
CPU	Intel(R) Core(TM) i7-8665UE 1.7GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB (WDS250G2B0A-00SM50)
Operating OS	Windows 10 64bit
Test Equipment	GIANT FORCE GTH-150-60-SP-AR LCD-9530 Programmer/Controller
Test Program	BurnIn 8.1

Test Result:



Boot up Test:

Hardware Device list:

System Board	LE-37N
CPU	Intel(R) Core(TM) i7-8665UE 1.7GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB (WDS250G2B0A-00SM50)

Temperature	Result	Remark
-20°C	PASS	50 Times
75°C	PASS	50 Times

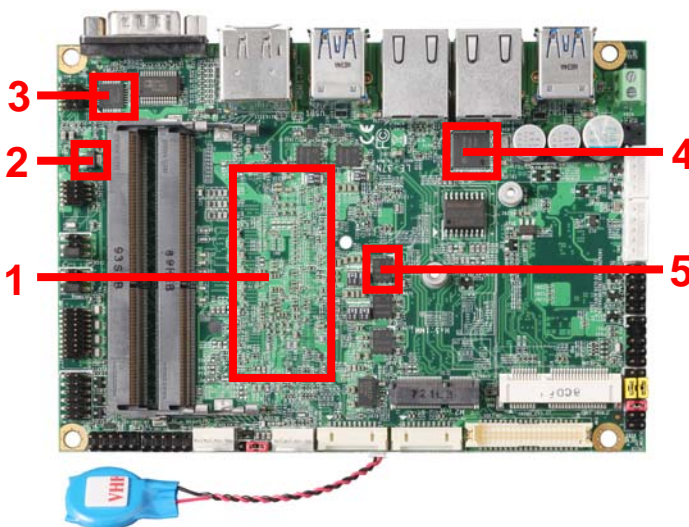
3.2 Thermal measurements at various points on the board

Test Environment:

CPU	Intel(R) Core(TM) i7-8665UE 1.7GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB (WDS250G2B0A-00SM50)
Power	Thermaltake TR2-450AH2NCB
Operating System	Windows 10 64-bit
Test Program	3DMARK+Prime95

Test Result:

Item	Environmental temperature	25°C
1	CPU(Bottom)	56°C
2	U1	50.2°C
3	U3	42°C
4	U12	44.5°C
5	Q9	47.9°C



4. Reliability Test

4.1 Power Consumption Test

1. Test Environment:

Motherboard	LE-37N
CPU	Intel(R) Core(TM) i7-8665UE 1.7GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB(WDS250G2B0A-00SM50)

Power Supply: GW INSTEK SPS-3610(DC Power Supply)

Voltage	MS-DOS Boot up		Windows 10 64bit 3DMARK 2006 + Prime95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	1.53	18.36	6.88	82.56
19V	1.01	19.19	4.29	81.51
24V	0.85	20.4	3.39	81.36

1. a. Test Environment:

The same as above but with LCD

Display Panel	AUO M215HW03 V1 21.5”LCD
----------------------	---------------------------------

Power Supply: GW INSTEK SPS-3610(DC Power Supply)

Voltage	MS-DOS Boot up		Windows 10 64bit 3DMARK 2006 + Prime95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.8	33.6	8.4	100.8
19V	1.9	36.1	5.27	100.13
24V	1.58	37.92	4.32	103.68

2. Test Environment:

Motherboard	LE-37N
CPU	Intel(R) Core(TM) i5-8365UE 1.6GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB(WDS250G2B0A-00SM50)

Power Supply: GW INSTEK SPS-3610(DC Power Supply)

Voltage	MS-DOS Boot up		Windows 10 64bit 3DMARK + Prime95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	1.39	16.68	6.64	79.68
19V	0.96	18.24	4.16	79.04
24V	0.82	19.68	3.34	80.16

2. a. Test Environment:

The same as above but with LCD

Display Panel	AUO M215HW03 V1 21.5”LCD
----------------------	---------------------------------

Power Supply: GW INSTEK SPS-3610(DC Power Supply)

Voltage	MS-DOS Boot up		Windows 10 64bit 3DMARK + Prime95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.64	31.68	8.32	99.84
19V	1.72	32.68	5.13	97.47
24V	1.42	34.08	4.12	98.88

3. Test Environment:

Motherboard	LE-37N
CPU	Intel(R) Core(TM) i3-8145UE 2.2GHz
Memory	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC)
HDD	WD BLUE 3D NAND SSD 250GB(WDS250G2B0A-00SM50)

Power Supply: GW INSTEK SPS-3610(DC Power Supply)

Voltage	MS-DOS Boot up		Windows 10 64bit 3DMARK + Prime95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	1.32	15.84	3.71	44.52
19V	0.95	18.05	2.40	45.6
24V	0.78	18.72	1.96	47.04

3. a. Test Environment:

The same as above but with LCD

Display Panel	AUO M215HW03 V1 21.5"LCD
----------------------	---------------------------------

Power Supply: GW INSTEK SPS-3610(DC Power Supply)

Voltage	MS-DOS Boot up		Windows 10 64bit 3DMARK + Prime95	
	Current (A)	Power (W)	Current (A)	Power (W)
12V	2.72	32.64	5.53	66.36
19V	1.78	33.82	3.51	66.69
24V	1.48	35.52	2.78	66.72

5. Performance Test

5.1 3D MARK VANTAGE

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	P5942
2	GPU SCORE		PASS	4793
3	CPU SCORE		PASS	21157

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	P5482
2	GPU SCORE		PASS	4406
3	CPU SCORE		PASS	20464

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	P5231
2	GPU SCORE		PASS	4193
3	CPU SCORE		PASS	20349

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	P6249
2	GPU SCORE		PASS	5053
3	CPU SCORE		PASS	21511

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	P5640
2	GPU SCORE		PASS	4532
3	CPU SCORE		PASS	21191

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	P5407
2	GPU SCORE		PASS	4337
3	CPU SCORE		PASS	20800

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	P5327
2	GPU SCORE		PASS	4468
3	CPU SCORE		PASS	12588

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	P4839
2	GPU SCORE		PASS	4027
3	CPU SCORE		PASS	12243

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	P4524
2	GPU SCORE		PASS	3743
3	CPU SCORE		PASS	12096

5.2 3D MARK 11

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	P1543
2	Graphics SCORE		PASS	1346
3	Physics SCORE		PASS	7219
4	Combined SCORE		PASS	1432

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	P1477
2	Graphics SCORE		PASS	1313
3	Physics SCORE		PASS	5944
4	Combined SCORE		PASS	1247

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	P1403
2	Graphics SCORE		PASS	1276
3	Physics SCORE		PASS	5021
4	Combined SCORE		PASS	1054

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	P1663
2	Graphics SCORE		PASS	1455
3	Physics SCORE		PASS	7336
4	Combined SCORE		PASS	1530

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	P1564
2	Graphics SCORE		PASS	1408
3	Physics SCORE		PASS	5646
4	Combined SCORE		PASS	1250

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	P1478
2	Graphics SCORE		PASS	1369
3	Physics SCORE		PASS	4638
4	Combined SCORE		PASS	1042

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	P1375
2	Graphics SCORE		PASS	1208
3	Physics SCORE		PASS	4709
4	Combined SCORE		PASS	1345

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	P1386
2	Graphics SCORE		PASS	1242
3	Physics SCORE		PASS	4514
4	Combined SCORE		PASS	1190

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	3DMARK SCORE	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	P1221
2	Graphics SCORE		PASS	1113
3	Physics SCORE		PASS	3947
4	Combined SCORE		PASS	939

5.3 3D MARK

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	347
2	Graphics SCORE		PASS	301
3	CPU SCORE		PASS	2710

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	326
2	Graphics SCORE		PASS	283
3	CPU SCORE		PASS	2399

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	310
2	Graphics SCORE		PASS	270
3	CPU SCORE		PASS	2046

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	367
2	Graphics SCORE		PASS	319
3	CPU SCORE		PASS	2836

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	339
2	Graphics SCORE		PASS	295
3	CPU SCORE		PASS	2326

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	322
2	Graphics SCORE		PASS	281
3	CPU SCORE		PASS	2016

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	325
2	Graphics SCORE		PASS	284
3	CPU SCORE		PASS	1885

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	304
2	Graphics SCORE		PASS	266
3	CPU SCORE		PASS	1753

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	Time Spy	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	286
2	Graphics SCORE		PASS	250
3	CPU SCORE		PASS	1680

5.4 PC MARK 7 & 8

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i7-8665UE 1.7GHz	PASS	6582
PCMARK 8 Scores	Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	5217

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i7-8665UE 1.7GHz	PASS	6307
PCMARK 8 Scores	Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	5320

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i7-8665UE 1.7GHz	PASS	6155
PCMARK 8 Scores	Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	5153

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	991
PCMARK 8 Scores		PASS	1420

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	963
PCMARK 8 Scores		PASS	1433

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	943
PCMARK 8 Scores		PASS	1384

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	917
PCMARK 8 Scores		PASS	1411

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	897
PCMARK 8 Scores		PASS	1434

Windows 10 64-bit

Weighted Suite	Test Environment	Result	Remark
PCMARK 7 Scores	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	877
PCMARK 8 Scores		PASS	1408

5.5 PC MARK10

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	PCMark Scores	PASS	3928
2	Essentials	PASS	8101
3	Productivity	PASS	7144
4	Digital Content Creation	PASS	2842

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	PCMark Scores	PASS	3833
2	Essentials	PASS	7869
3	Productivity	PASS	7019
4	Digital Content Creation	PASS	2768

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	PCMark Scores	PASS	3743
2	Essentials	PASS	7645
3	Productivity	PASS	6854
4	Digital Content Creation	PASS	2717

5.6 PerformanceTest 9.0

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	3686.3
2	CPU Mark		PASS	9543.1
3	2D Graphics Mark		PASS	850.2
4	3D Graphics Mark		PASS	969.6
5	Memory Mark		PASS	2988.3
6	Disk Mark		PASS	4863.7

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	3301.8
2	CPU Mark		PASS	8292.6
3	2D Graphics Mark		PASS	860.5
4	3D Graphics Mark		PASS	858.2
5	Memory Mark		PASS	2157.4
6	Disk Mark		PASS	5019.9

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	3030.9
2	CPU Mark		PASS	7538.8
3	2D Graphics Mark		PASS	829.7
4	3D Graphics Mark		PASS	807.7
5	Memory Mark		PASS	1760.8
6	Disk Mark		PASS	4892.1

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	3494.4
2	CPU Mark		PASS	9630.2
3	2D Graphics Mark		PASS	765.7
4	3D Graphics Mark		PASS	907.6
5	Memory Mark		PASS	2875.9
6	Disk Mark		PASS	4836.7

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	3210.3
2	CPU Mark		PASS	8369.0
3	2D Graphics Mark		PASS	829.0
4	3D Graphics Mark		PASS	809.3
5	Memory Mark		PASS	2172.2
6	Disk Mark		PASS	4782.2

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	2989.3
2	CPU Mark		PASS	7594.6
3	2D Graphics Mark		PASS	837.5
4	3D Graphics Mark		PASS	774.9
5	Memory Mark		PASS	1726.4
6	Disk Mark		PASS	4824.6

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50	PASS	3176.1
2	CPU Mark		PASS	6045.1
3	2D Graphics Mark		PASS	789.2
4	3D Graphics Mark		PASS	912.0
5	Memory Mark		PASS	2842.1
6	Disk Mark		PASS	4834.5

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50	PASS	2782.5
2	CPU Mark		PASS	5663.9
3	2D Graphics Mark		PASS	773.9
4	3D Graphics Mark		PASS	733.1
5	Memory Mark		PASS	2029.0
6	Disk Mark		PASS	4813.2

Windows 10 64-bit

Item	Weighted Suite	Test Environment	Result	Remark
1	PassMark Rating	Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50	PASS	2645.7
2	CPU Mark		PASS	5327.7
3	2D Graphics Mark		PASS	802.8
4	3D Graphics Mark		PASS	696.2
5	Memory Mark		PASS	1713.3
6	Disk Mark		PASS	4848.4

5.7 Geekbench 4

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	5190
		Multi-core		17503
2	Run Compute Benchmark (OpenCL Score)		PASS	23775

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4883
		Multi-core		14486
2	Run Compute Benchmark (OpenCL Score)		PASS	17757

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4851
		Multi-core		13711
2	Run Compute Benchmark (OpenCL Score)		PASS	18157

Test Environment
Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4806
		Multi-core		16970
2	Run Compute Benchmark (OpenCL Score)		PASS	23868

Test Environment
Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4580
		Multi-core		13675
2	Run Compute Benchmark (OpenCL Score)		PASS	18444

Test Environment
Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4419
		Multi-core		12656
2	Run Compute Benchmark (OpenCL Score)		PASS	16689

Test Environment
Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4631
		Multi-core		9086
2	Run Compute Benchmark (OpenCL Score)		PASS	22206

Test Environment
Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4298
		Multi-core		8335
2	Run Compute Benchmark (OpenCL Score)		PASS	17316

Test Environment
Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite		Result	Remark
1	Run CPU Benchmark Score	Single-core	PASS	4293
		Multi-core		8093
2	Run Compute Benchmark (OpenCL Score)		PASS	17040

5.8 Cinebench R15

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	43.83 fps
2	CPU	PASS	569 cb

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	37.36 fps
2	CPU	PASS	576 cb

Test Environment
Intel(R) Core(TM) i7-8665UE 1.7GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	38.80 fps
2	CPU	PASS	550 cb

Test Environment
Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	47.51 fps
2	CPU	PASS	607 cb

Test Environment
Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	42.12 fps
2	CPU	PASS	603 cb

Test Environment
Intel(R) Core(TM) i5-8365UE 1.6GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	39.11 fps
2	CPU	PASS	580 cb

Test Environment
Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17D8/16 16GBx2 (SKhynix H5AN8G8NCJR-VKC) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	41.09 fps
2	CPU	PASS	339 cb

Test Environment
Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S8/8 8GB (Micron 7WE75D9VPP) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	36.91 fps
2	CPU	PASS	347 cb

Test Environment
Intel(R) Core(TM) i3-8145UE 2.2GHz Kingston KVR24S17S6/4 4GB (Micron 7UE75D9WFH) WDS250G2B0A-00SM50

Windows 10 64-bit

Item	Weighted Suite	Result	Remark
1	OpenGL	PASS	34.95 fps
2	CPU	PASS	340 cb

5.9 Storage Performance

5.9.1 HDD

Test environment:

OS Windows 10 64bit

Program: HD Tune

HDD Model	Interface	Capacity	Average	Burst Rate	Access Time
INTEL SSDSC2BW240A4	SSD	240 GB	315.3 MB/sec	293.3 MB/sec	0.213 ms
SPCC Solid State disk(S55)	SSD	120 GB	179.6 MB/sec	95.0 MB/sec	0.054 ms
CT120 BX500	SSD	120 GB	324.2 MB/sec	151.1 MB/sec	0.059 ms
WDS250G2B0A	SSD	250 GB	422.3 MB/sec	38.6 MB/sec	0.085 ms
Kingston SV300S37A	SSD	240 GB	241.2 MB/sec	138.6 MB/sec	0.155 ms
Kingston DT100G3/32G	USB	32 GB	67.3 MB/sec	49.6 MB/sec	0.318 ms
ADATA UV128/16GB	USB	16 GB	106.8 MB/sec	35.0 MB/sec	1.85 ms
Acpi CSC064GR5-G710A00D	mSATA	64 GB	396.0 MB/sec	93.7 MB/sec	0.068 ms

5.9.2 DVD-ROM

Test environment:

OS Windows 10 64bit

Program (NERO)

DVD-ROM Model	Interface	Average Speed	Full Read	Burst Rate	DVD
Transcend DVD TS8XDVDS-K	USB	2.86 x	308 ms	18 MB/s	1 - 16 x
LITEON DVD eTAU108	USB	5.57 x	208 ms	18 MB/s	1 – 16 x
PIONEER DVD DVR-XD11T	USB	5.80 x	181 ms	20 MB/s	1 - 16 x
ZYNET GT32N A201	USB	5.70 x	213 ms	20 MB/s	1 - 16 x