

1. Stability Test:

1.1 CPU Function Test:

Test Purpose	Test CPU functions work normally under Windows operating system
Test Procedure	<ol style="list-style-type: none"> 1. Install Windows operating system 2. Install M/B device drivers 3. CPU-Z check CPU info 4. Run AIDA64 Cache and Memory Benchmark Ver.5.90.4200 - 1 time 5. Run PassMark Performance Test 9.0 Build1013 - 1 time 6. Run 3DMark for Windows Ver.2.3.3693 BenchMark - 3 times 7. S3(Sleep)/S4(Hibernate)/S5(Shutdown) test - 3 times
Test Criteria	It should be correct for each test step

No.	CPU	Type	CPU Temp.	Result
1	Intel / 3.6GHz	Core i7-7700 (KabyLake/SR338) / 65W / LGA1151	54 °C	Pass
2	Intel / 3.5GHz	Core i5-7600 (KabyLake/SR334) / 65W / LGA1151	51 °C	Pass
3	Intel / 4.0GHz	Core i3-7300 (KabyLake/SR359) / 51W / LGA1151	52 °C	Pass
4	Intel / 3.8GHz	XEON E3-1275v6 (KabyLake/SR32A) / 73W/ LGA1151	52 °C	Pass

1.2 Memory Function Test:

Test Purpose	Test Memory functions work normally under Windows Operating System
Test Procedure	<ol style="list-style-type: none"> 1. Install Windows Operating System 2. Install M/B Device Driver 3. Run AIDA64 Cache and Memory Benchmark Ver.5.90.4200 1 time 4. Run Passmark Performance Test 9.0 Build1013 1 time 5. Run 3DMark for Windows Ver.2.3.3693 BenchMark 3 times 6. S3/Hibernate Test 3 times
Test Criteria	It should be no problem for the test

1.2.1 DDR4:

No.	Function	Result
1	Single Channel mode	Pass
2	Dual channel mode	Pass



1.2.2 Application Test:

No.	Software	Test Keypoint	Test Environment	Result
1	MemTest86 Ver.7.1	1. Stress test 12 hours.	M/B: KD331-Q170 Rev.1 (011) (BSH230910008) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i7-7700 CPU 3.60GHz DDR4: DDR4-2400/ADATA-AD4U240038G17-BHYA / SKhynix-H5AN8G8NAFR / 8GB*4 / DR043-1/2/3/4 (DIMM-1/2/3/4) DUAL CHANNEL. Onboard Intel SSDSC2CT080A4 Solid State Drive (Intel SSD 335 Series, 80GB 2.5in 6Gb/s SATA SSD 80G 5V 1A). Pioneer DVD-232DW DVD-ROM. DELTA GPS-500BB(500W). DVD-ROM: ASUS VS228H 21.5" LED Wide Screen Power: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI,Color:16.7M)(Using VGA). LCD: DOS O.S.:	Pass

1.2.3 DDR4 Approved List:(NON-ECC)

No.	Brand	Chip	Size	Type	Chip Model No.	Vendor Part No.	Result
1	ADATA	SKhynix	8GB	DDR4-2400	H5AN8G8NAFR	AD4U240038G17-BHYA	Pass
2	Kingston	Micron	8GB	PC4-19200 (DDR4-2400)	6RB77-D9TGG	CBD24D4U7D8MB-8	Pass
3	Transcend	SEC	8GB	PC4-19200 (DDR4-2400)	K4A46085WE-BCRC	TS1GLH64V4H	Pass
4	Transcend	SEC	8GB	PC4-19200 (DDR4-2400)	K4A46085WE-BCRC	TS1GLH64V4H	Pass
5	Transcend	SEC	4GB	DDR4-2133	K4A4G085WD-BCPB	TS512MLH64V1H	Pass



1.2.4 DDR4 Module Test Procedures:

No.	DDR4 Module	Test Environment	Result
1	DDR4-2400/ADATA-AD4U240038G17-BHYA / SKhynix-H5AN8G8NAFR / 8GB*4 (NON-ECC).	<p>M/B: KD331-Q170 Rev.1 (011) (BSH230910008) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i7-7700 CPU 3.60GHz DIMM Slot: DIMM-1/2/3/4 DUAL CHANNEL. Onboard Display: Intel SSDSC2CT080A4 Solid State Drive (Intel SSD 335 Series, 80GB 2.5in 6Gb/s SATA SSD 80G 5V 1A). SSD: Pioneer DVD-232DW DVD-ROM. DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Test Summary: Environment Temp.: 25.0°C CPU Temp.: 51.0°C CPU Temp. after 3DMark: 54.0°C AIDA64 Cache and Memory Benchmark(V5.90.4200) DUAL CHANNEL (DIMM-1/2/3/4) READ:33353 MB/s WRITE:36446 MB/s COPY:33030 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:11425.9 Memory Mark:2887.1 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:10241 Ice Storm:64006 Sky Diver:5103 Strike Test:1198</p>	Pass
2	PC4-19200(DDR4-2400) / Kingston-CBD24D4U7D8MB-8 / Micron-6RB77-D9TGG / 8GB*1 (NON-ECC).	<p>M/B: KD331-Q170 Rev.1 (011) (BSH230910008) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i3-7300 CPU 4.00GHz DIMM Slot: DIMM-1 SINGLE CHANNEL. Onboard Display: Intel SSDSC2CT080A4 Solid State Drive (Intel SSD 335 Series, 80GB 2.5in 6Gb/s SATA SSD 80G 5V 1A). SSD: Pioneer DVD-232DW DVD-ROM. DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Test Summary: Environment Temp.: 24.7°C CPU Temp.: 57.0°C CPU Temp. after 3DMark: 58.0°C AIDA64 Cache and Memory Benchmark(V5.90.4200) SINGLE CHANNEL (DIMM-1) READ:17938 MB/s WRITE:17819 MB/s COPY:18024 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:6165.7 Memory Mark:2131.2 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:6628 Ice Storm:45273 Sky Diver:4062 Strike Test:881</p>	Pass



<p style="text-align: center;">3</p>	<p>DDR4-2400 / Transcend-TS1GLH64V4H / SEC-K4A46085WE-BCRC / 8GB*1 (NON-ECC).</p>	<p>M/B: KD331-Q170 Rev.1 (011) (BSH230910008) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GH DIMM Slot: DIMM-3 SINGLE CHANNEL. Onboard Display: Intel SSDSC2CT080A4 Solid State Drive (Intel SSD 335 Series, 80GB 2.5in 6Gb/s SATA SSD 80G 5V 1A). SSD: Pioneer DVD-232DW DVD-ROM. DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Test Summary: Environment Temp.: 25.7°C CPU Temp.: 54.0°C CPU Temp. after 3DMark: 55.0°C AIDA64 Cache and Memory Benchmark(V5.90.4200) SINGLE CHANNEL (DIMM-3) READ:18241 MB/s WRITE:17676 MB/s COPY:18446 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:8826.7 Memory Mark:2349.5 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:7785 Ice Storm:52329 Sky Diver:4486 Strike Test:950</p>	<p style="text-align: center;">Pass</p>
<p style="text-align: center;">4</p>	<p>DDR4-2400 / Transcend-TS1GLH64V4H / SEC-K4A46085WE-BCRC / 8GB*2 (NON-ECC)</p>	<p>M/B: KD331-Q170 Rev.1 (011) (BSH230910008) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GHz DIMM Slot: DIMM-1/2 DUAL CHANNEL. Onboard Display: Seagate / ST500DM002-1BD142 500GB.(HD015). SSD: Pioneer DVD-XD01 (Slim DVD-ROM,x8). DVD-ROM: DELTA GPS-500BB(500W). Power: LENOVO L2232wD(21.5",LED Wide Screen Monitor(1920x1080 Full HD,WSXGA+,16:9)(Using DVI). LCD: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Test Summary: Environment Temp.: 25.4°C CPU Temp.: 44.0°C CPU Temp. after 3DMark: 45.5°C AIDA64 Cache and Memory Benchmark(V5.90.4200) SINGLE CHANNEL (DIMM-1/2) READ:18027 MB/s WRITE:18004 MB/s COPY:18596 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:8744.8 Memory Mark:2487.8 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:7966 Ice Storm:52767 Sky Diver:4557 Strike Test:943</p>	<p style="text-align: center;">Pass</p>



5	DDR4-2133 / Transcend-TS512MLH64V1H / SEC-K4A4G085WD-BCPB / 4GB*2 (NON-ECC)	M/B: KD331-Q170 Rev.1 (011) (BSH230910008) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GHz DIMM Slot: DIMM-3/4 DUAL CHANNEL. Onboard Display: Intel SSDSC2CT080A4 Solid State Drive (Intel SSD 335 Series, 80GB 2.5in 6Gb/s SATA SSD 80G 5V 1A). SSD: Pioneer DVD-XD01 (Slim DVD-ROM,x8). DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Test Summary: Environment Temp.: 24.7°C CPU Temp.: 57.0°C CPU Temp. after 3DMark: 58.5°C AIDA64 Cache and Memory Benchmark(V5.90.4200) SINGLE CHANNEL (DIMM-3/4) READ:16106 MB/s WRITE:15648 MB/s COPY:16483 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:7813.6 Memory Mark:2112.8 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:7411 Ice Storm:48858 Sky Diver:4364 Strike Test:890	Pass
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1.2.5 DDR4 Module Test Procedures: (ECC)

No.	DDR4 Module	Test Environment	Result
1	Kingston-KVR24E17D8/16MA / Micron-6AJ47-D9SRJ / 16GB*4 (DDR4-2400) (ECC)	M/B: KD331-C236 (Rev:1) (011) (BSH231010006) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GHz DIMM Slot: DIMM-1/2/3/4 DUAL CHANNEL. Onboard Display: Seagate / ST500DM002-1BD142 500GB.(HD015). SSD: Pioneer DVD-232DW DVD-ROM. DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Test Summary: Environment Temp.: 24.1°C CPU Temp.: 54.0°C CPU Temp. after 3DMark: 55.5°C AIDA64 Cache and Memory Benchmark(V5.90.4200) DUAL CHANNEL (DIMM-1/2/3/4) READ:32165 MB/s WRITE:36424 MB/s COPY:33851 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:8385 Memory Mark:2760 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:7661 Ice Storm:56113 Sky Diver:4237 Strike Test:1010	Pass



2	Kingston-KVR24E17S8/8MA / Micron-6GA77-D9SRJ / 8GB*4 (DDR4-2400) (ECC)	<p>M/B: KD331-C236 (Rev:1) (011) (BSH231010006) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GHz DIMM Slot: DIMM-1/2/3/4 DUAL CHANNEL. Onboard Display: Seagate / ST500DM002-1BD142 500GB. (HD015). SSD: Pioneer DVD-XD01 (Slim DVD-ROM,x8). DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Environment Temp.: 24.6°C Test Summary: CPU Temp.: 54.0°C CPU Temp. after 3DMark: 55.5°C AIDA64 Cache and Memory Benchmark(V5.90.4200) DUAL CHANNEL (DIMM-1/2/3/4) READ:31931 MB/s WRITE:35493 MB/s COPY:32321 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:8464.1 Memory Mark:2892.2 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:8921 Ice Storm:64578 Sky Diver:5035 Strike Test:1176</p>	Pass
3	DDR4-2133 / Transcend-TS1GLH72V1H / SEC-K4A4G085WD-BCPB / 8GB*4 (ECC)	<p>M/B: KD331-C236 (Rev:1) (011) (BSH231010006) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i3-7300 CPU 4.00GHz. DIMM Slot: DIMM-1/2/3/4 DUAL CHANNEL. Onboard Display: Seagate / ST500DM002-1BD142 500GB. (HD015). SSD: Pioneer DVD-232DW DVD-ROM. DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Environment Temp.: 24.1°C Test Summary: CPU Temp.: 54.0°C CPU Temp. after 3DMark: 55.5°C AIDA64 Cache and Memory Benchmark(V5.90.4200) DUAL CHANNEL (DIMM-1/2/3/4) READ:31683 MB/s WRITE:32598 MB/s COPY:30724 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:6490.4 Memory Mark:3037.8 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:7969 Ice Storm:57622 Sky Diver:4600 Strike Test:1076</p>	Pass



4	<p>DDR4-2133 / Transcend-TS8AAEESD(TS512MLH72V1H) / SEC-K4A4G085WD-BCPB / 4GB*4 (ECC)</p>	<p>M/B: KD331-C236 (Rev:1) (011) (BSH231010006) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GHz DIMM Slot: DIMM-1/2/3/4 DUAL CHANNEL. Onboard Display: Seagate / ST500DM002-1BD142 500GB. (HD015). SSD: Pioneer DVD-XD01 (Slim DVD-ROM,x8). DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Environment Temp.: 25.3°C Test Summary: CPU Temp.: 54.5°C CPU Temp. after 3DMark: 56.0°C AIDA64 Cache and Memory Benchmark(V5.90.4200) DUAL CHANNEL (DIMM-1/2/3/4) READ:29982 MB/s WRITE:31944 MB/s COPY:30105 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:8398.7 Memory Mark:2723.4 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:8793 Ice Storm:62952 Sky Diver:4962 Strike Test:1151</p>	Pass
5	<p>Kingston-KVR24E17S8/4MB / SEC-61B77-D9TGG / 4GB*4 (DDR4-2400) (EEC)</p>	<p>M/B: KD331-C236 (Rev:1) (011) (BSH231010006) M/B BIOS: B176.30A(Insyde) M/B Driver: Driver_643-KD0000-000G_170704_03.iso CPU: Intel Core i5-7600 CPU 3.50GHz DIMM Slot: DIMM-1/2/3/4 DUAL CHANNEL. Onboard Display: Seagate / ST500DM002-1BD142 500GB. (HD015). SSD: Pioneer DVD-XD01 (Slim DVD-ROM,x8). DVD-ROM: DELTA GPS-500BB(500W). Power: ASUS VS228H 21.5" LED Wide Screen LCD: Monitor(1920*1080,WSXGA+,16:9,D-Sub,DVI-I,HDMI, Color:16.7M)(Using VGA). O.S.: Windows 10 IOT Enterprise CBB x64 (Version 1607 Build 14393.1358)UEFI. Environment Temp.: 25.2°C Test Summary: CPU Temp.: 58.0°C CPU Temp. after 3DMark: 59.0°C AIDA64 Cache and Memory Benchmark(V5.90.4200) DUAL CHANNEL (DIMM-1/2/3/4) READ:33306 MB/s WRITE:36978 MB/s COPY:33024 MB/s PassMark PerformanceTest 9.0 Build 1013 CPU Mark:8497.9 Memory Mark:2825.1 3DMark for Windows(3times)(Ver.2.3.3693) Cloud Gate:8983 Ice Storm:65080 Sky Diver:5095 Strike Test:1191</p>	Pass