

1. Qualification Test: Rev.031

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 Driver 3. CPU-Z check CPU info 4. Run AIDA64 Cache and Memory Benchmark Ver.5.60.3700 1 time 5. Run Passmark Performance Test 8.0 Build1053 1 time 6. Run 3DMark for Windows Ver.1.5.915 BenchMark 3 times 7. S3/Hibernate Test 3 times
Test Criteria	It should be no problem for all tests

No.	CPU	Type	CPU Temp.	Result
1	Intel / 2.00GHz	Core i7-6822EQ (Skylake-H/QJQF) / 25W / LGA1440	28 °C	Pass
2	Intel / 2.80GHz	Core i7-6820EQ (Skylake-H/QJQB) / 45W / LGA1440	48 °C	Pass
3	Intel / 1.90GHz	Core i5-6442EQ (Skylake-H/QJQG) / 25W / LGA1440	44 °C	Pass
4	Intel / 2.70GHz	Core i5-6440EQ (Skylake-H/QJQC) / 45W / LGA1440	53 °C	Pass
5	Intel / 2.70GHz	Core i3-6100E (Skylake-H/QJQE) / 35W / LGA1440	28 °C	Pass
6	Intel / 1.90GHz	Core i3-6102E (Skylake-H/QJQH) / 25W / LGA1440	30 °C	Pass
7	Intel / 2.80GHz	Xeon E3-1515M v5(Skylake-H/QK9L) / 45W / LGA1440	38 °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.5.60.3700 1 time 4. Run Passmark Performance Test 8.0 Build1053 1 time 5. Run 3DMark for Windows Ver.1.5.915 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
3	DIMM Slot1	Pass
4	DIMM Slot2	Pass

1.2.2 Application Test:

No.	Software	Test Keypoint	Test Environment	Result
1	MemTest86 Ver.6.0.0	1. Burn-In test 12 hours.	M/B: SH960-QM170BS-6822EQ Rev.3 (031) (BSF500900002) & COM332-B Rev.2 (021) (BMF390200038) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i7-6822EQ (Skylake-H/QJQF) / 2.0GHz DDR4: Transcend (TS2GSH64V1B 1.2V) [512Mx8b,CL=15,tRCD=15,tRP=15] / SEC (K4A8G085WB-BCPB) / PC4-17000 (DDR4-2133) / 16GB *2 SSD: Intel / SSDSC2CT080A4 SATA3 80GB/2.5" Display: On Board (using D-Sub) DVD-ROM: Pioneer / DVD-232DW 18X SATA Power: Jagier / KY-580ATX 480W O.S.: DOS	Pass

1.2.3 DDR4 SO-DIMM Approved List:

No.	Brand	Chip	Size	Type	Chip Model No.	Vendor Part No.	Result
1	Innodisk	SEC	16GB	PC4-17000 (DDR4-2133)	K4A8G085WB-BCPB	M4SR-AGS10C0G-B 1.2V [1Gx8b-x16/2048Mx64b 1066MHz@CL=15,tRCD=15,tRP=15]	Pass
2	Transcend	SEC	16GB	PC4-17000 (DDR4-2133)	K4A8G085WB-BCPB	TS2GSH64V1B 1.2V [512Mx8b,CL=15,tRCD=15,tRP=15]	Pass
3	ADATA	SEC	16GB	PC4-17000 (DDR4-2133)	K4A8G085WB-BCPB	AD4S2133316G15-BSSB 1.2V [512Mx8/1024Mx8,CL=15,tRCD=15,tR P=15]	Pass
4	Transcend	SEC	8GB	PC4-17000 (DDR4-2133)	K4A4G085WD-BCPB	TS1GSH64V1H 1.2V [512Mx8b,CL=15,tRCD=15,tRP=15]	Pass
5	Kingston	SKhynix	8GB	PC4-17000 (DDR4-2133)	H5AN4G8NAFR-TFC	CBD21D4S15HAG 1.2V [512Mx8-bit/Data Rate:2133Mbps z@CL=15,tRCD=15,tRP=15]	Pass
6	ADATA	ADATA	4GB	PC4-17000 (DDR4-2133)	4WQA-0915A-M1511V	AD4S2133W4G15-BHYM 1.2V [512Mx8b-x8/512Mx64b 1066MHz@CL=15,tRCD=15,tRP=15]	Pass
7	Innodisk	SEC	4GB	PC4-17000 (DDR4-2133)	K4A4G085WD-BCPB	M4SR-4GSSNC0G-D 1.2V [512Mx8b-x8/512Mx64b 1066MHz@CL=15,tRCD=15,tRP=15]	Pass
8	Transcend	SEC	4GB	PC4-17000 (DDR4-2133)	K4A4G085WD-BCPB	TS512MSH64V1H 1.2V [512Mx8b,CL=15,tRCD=15,tRP=15]	Pass
9	Kingston	SKhynix	4GB	PC4-17000 (DDR4-2133)	H5AN4G8NAFR-TFC	CBD21D4S15HAG 1.2V [512Mx8-bit/Data Rate:2133Mbps z@CL=15,tRCD=15,tRP=15]	Pass

1.2.4 DDR4 SO-DIMM Module Test Procedures:

No.	DDR4 Module	Test Environment	Result
1	Innodisk (M4SR-AGS1OC0G-B 1.2V) [1Gx8b-x16/2048Mx64b 1066MHz@CL=15,tRCD=15,tRP=15] / SEC (K4A8G085WB-BCPB) / PC4-17000 (DDR4-2133) / 16GB *2	M/B: SH960-HM170BS-6100E Rev.3 (031) (BSF501200002) & COM332-B Rev.2 (021) (BMF390200035) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i3-6100E (Skylake-H/QJQE) / 2.7GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: WD / WD800AAJS-00PSA0 SATA2 NCQ 80GB Display: On Board (using D-Sub) DVD-ROM: Asus / DVD-E818A9T 18X SATA Power: Delta / GPS-500BB 500W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:22.1°C CPU Temp.:29.0°C CPU Temp. after 3DMark:29.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:29404 MB/s WRITE:32454 MB/s COPY:29862 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:4254 Memory Mark:2480 3.3DMark for Windows Ver.1.5.915 Cloud Gate:5297 Ice Storm:36578 Sky Diver:3038 Strike Test:761	Pass

2	<p>Transcend (TS2GSH64V1B 1.2V) [512Mx8b,CL=15,tRCD=15,tRP=15] / SEC (K4A8G085WB-BCPB) / PC4-17000 (DDR4-2133) / 16GB *2</p>	<p>M/B: SH960-QM170BS-6822EQ Rev.3 (031) (BSF500900002) & COM332-B Rev.2 (021) (BMF390200038) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i7-6822EQ (Skylake-H/QJQF) / 2.0GHz DIMM Slot: DIMM-1/2 (Dual channel) SSD: Intel / SSDSC2CT080A4 SATA3 80GB/2.5" Display: On Board (using D-Sub) DVD-ROM: Pioneer / DVD-232DW 18X SATA Power: Jagier / KY-580ATX 480W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:19.2℃ CPU Temp.:27.0℃ CPU Temp. after 3DMark:28.0℃ 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:29949 MB/s WRITE:32323 MB/s COPY:305011 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:7325 Memory Mark:2333 3.3DMark for Windows Ver.1.5.915 Cloud Gate:7646 Ice Storm:44681 Sky Diver:3975 Strike Test:938</p>	Pass
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No.	DDR4 Module	Test Environment	Result
3	ADATA (AD4S2133316G15-BSSB 1.2V) [512Mx8/1024Mx8,CL=15,tRCD=15,tRP=15] / SEC (K4A8G085WB-BCPB) / PC4-17000 (DDR4-2133) / 16GB *2	M/B: SH960-QM170BS-6820EQ Rev.3 (031) (BSF500800010) & COM332-B Rev.2 (021) (BMF390200040) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i7-6820EQ (Skylake-H/QJQB) / 2.8GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: Seagate / ST3320620SV SATA2 NCQ 320GB/7200RPM Display: On Board (using D-Sub) DVD-ROM: Pioneer / DVD-232DW 18X SATA Power: FSP / RAIDER RA450 450W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:19.4°C CPU Temp.:49.0°C CPU Temp. after 3DMark:48.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:29794 MB/s WRITE:31628 MB/s COPY:29940 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:9197 Memory Mark:2647 3.3DMark for Windows Ver.1.5.915 Cloud Gate:8294 Ice Storm:50938 Sky Diver:3991 Strike Test:944	Pass

4	<p>Transcend (TS1GSH64V1H 1.2V) [512Mx8b,CL=15,tRCD=15,tRP=15] / SEC (K4A4G085WD-BCPB) / PC4-17000 (DDR4-2133) / 8GB *2</p>	<p>M/B: SH960-QM170BS-6440EQ Rev.3 (031) (BSF501000003) & COM332-B Rev.2 (021) (BMF390200037) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i5-6440EQ (Skylake-H/QJQC) / 2.7GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: WD / WD800AAJS-00PSA0 SATA2 NCQ 80GB Display: On Board (using D-Sub) DVD-RW: Lite-On / It iHAS324-07 SATA Power: Delta / GPS-400BB 400W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:20.2°C CPU Temp.:43.0°C CPU Temp. after 3DMark:53.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:30624 MB/s WRITE:32339 MB/s COPY:30486 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:6923 Memory Mark:2555 3.3DMark for Windows Ver.1.5.915 Cloud Gate:7392 Ice Storm:51840 Sky Diver:3931 Strike Test:939</p>	Pass
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No.	DDR4 Module	Test Environment	Result
5	Kingston (CBD21D4S15HAG 1.2V) [512Mx8-bit/Data Rate:2133Mbps z@CL=15,tRCD=15,tRP=15] / SKhynix (H5AN4G8NAFR-TFC) / PC4-17000 (DDR4-2133) / 8GB *2	M/B: SH960-QM170BS-6442EQ Rev.3 (031) (BSF501100002) & COM332-B Rev.2 (021) (BMF390200036) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i5-6442EQ (Skylake-H/QJQG) / 1.9GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: WD / WD800AAJS-00PSA0 SATA2 NCQ 80GB Display: On Board (using D-Sub) DVD-ROM: Pioneer / DVD-232DW 18X SATA Power: Delta / GPS-400BB 400W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:19.5°C CPU Temp.:45.0°C CPU Temp. after 3DMark:44.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:30012 MB/s WRITE:32778 MB/s COPY:30234 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:5402 Memory Mark:2221 3.3DMark for Windows Ver.1.5.915 Cloud Gate:6687 Ice Storm:48590 Sky Diver:3855 Strike Test:932	Pass



6	<p>ADATA (AD4S2133W4G15-BHYM 1.2V) [512Mx8b-x8/512Mx64b 1066MHz@CL=15,tRCD=15,tRP=15] / ADATA (4WQA-0915A-M1511V) / PC4-17000 (DDR4-2133) / 4GB *2</p>	<p>M/B: SH960-HM170BS-6100E Rev.3 (031) (BSF501200002) & COM332-B Rev.2 (021) (BMF390200035) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i3-6100E (Skylake-H/QJQE) / 2.7GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: WD / WD800AAJS-00PSA0 SATA2 NCQ 80GB Display: On Board (using D-Sub) DVD-ROM: Asus / DVD-E818A9T 18X SATA Power: Delta / GPS-500BB 500W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:21.0°C CPU Temp.:30.0°C CPU Temp. after 3DMark:28.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:29900 MB/s WRITE:31734 MB/s COPY:26866 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:4263 Memory Mark:2277 3.3DMark for Windows Ver.1.5.915 Cloud Gate:5445 Ice Storm:37298 Sky Diver:3099 Strike Test:770</p>	Pass
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No.	DDR4 Module	Test Environment	Result
7	Innodisk (M4SR-4GSSNC0G-D 1.2V) [512Mx8b-x8/512Mx64b 1066MHz@CL=15,tRCD=15,tRP=15] / SEC (K4A4G085WD-BCPB) / PC4-17000 (DDR4-2133) / 4GB *2	M/B: SH960-HM170BS-6100E Rev.3 (031) (BSF501200002) & COM332-B Rev.2 (021) (BMF390200035) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i3-6100E (Skylake-H/QJQE) / 2.7GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: WD / WD800AAJS-00PSA0 SATA2 NCQ 80GB Display: On Board (using D-Sub) DVD-ROM: Asus / DVD-E818A9T 18X SATA Power: Delta / GPS-500BB 500W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:21.3°C CPU Temp.:32.0°C CPU Temp. after 3DMark:29.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:29944 MB/s WRITE:32559 MB/s COPY:30170 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:4266 Memory Mark:2389 3.3DMark for Windows Ver.1.5.915 Cloud Gate:5270 Ice Storm:35776 Sky Diver:2996 Strike Test:749	Pass

8	<p>Transcend (TS512MSH64V1H 1.2V) [512Mx8b,CL=15,tRCD=15,tRP=15] / SEC (K4A4G085WD-BCPB) / PC4-17000 (DDR4-2133) / 4GB *2</p>	<p>M/B: SH960-HM170BS-6102E Rev.3 (031) (BSF501300001) & COM332-B Rev.2 (021) (BMF390200010) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i3-6102E (Skylake-H/QJQH) / 1.9GHz DIMM Slot: DIMM-1/2 (Dual channel) SATA HDD: Seagate / ST500DM002 SATA3 NCQ 500GB Display: On Board (using D-Sub) DVD-ROM: Asus / DVD-E818A9T 18X SATA Power: Delta / GPS-500BB 500W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:18.4°C CPU Temp.:29.0°C CPU Temp. after 3DMark:30.0°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:27149 MB/s WRITE:31700 MB/s COPY:25842 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:3057 Memory Mark:1793 3.3DMark for Windows Ver.1.5.915 Cloud Gate:4984 Ice Storm:33287 Sky Diver:3302 Strike Test:813</p>	Pass
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No.	DDR4 Module	Test Environment	Result
9	Kingston (CBD21D4S15HAG 1.2V) [512Mx8-bit/Data Rate:2133Mbps z@CL=15,tRCD=15,tRP=15] / SKhynix (H5AN4G8NAFR-TFC) / PC4-17000 (DDR4-2133) / 4GB *1	M/B: SH960-QM170BS-6822EQ Rev.3 (031) (BSF500900002) & COM332-B Rev.2 (021) (BMF390200038) [VGA/LVDS] M/B BIOS: Insyde 01/21/2016 EC FW Rev.: 1.3 M/B Driver: Demo ver.0.2.1601.0 CPU: Intel / Core i7-6822EQ (Skylake-H/QJQF) / 2.0GHz DIMM Slot: DIMM-1 (Single channel) SSD: Intel / SSDSC2CT080A4 SATA3 80GB/2.5" Display: On Board (using D-Sub) DVD-ROM: Pioneer / DVD-232DW 18X SATA Power: Jagier / KY-580ATX 480W O.S.: Windows 8.1 Embedded Pro 64Bit (with update 1) (English) Test Summary: Environment Temp.:24.1°C CPU Temp.:28.0°C CPU Temp. after 3DMark:27.5°C 1.AIDA64 Cache and Memory Benchmark Ver.5.60.3700 READ:16548 MB/s WRITE:15929 MB/s COPY:15869 MB/s 2.PassMark PerformanceTest 8.0 build 1053 CPU Mark:6799 Memory Mark:1719 3.3DMark for Windows Ver.1.5.915 Cloud Gate:6653 Ice Storm:38934 Sky Diver:3600 Strike Test:764	Pass