



DRAM qualification report

in combination with embedded HW / SBC

Revision: 000

Date: 2021-08-05

Revision History

Rev.	Date	Author	Modifications
000	26.01.2021	C. Schubert	Initial revision

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1 Test results

Project no.	TKA 81004330
Ident. no.	12029335 conga-TC-175/i3-7100U MAN1 12049444 DDR4-SODIMM-2666MHz-8GB
Revision	A01 (12029339 Kit MAN)
Status of DUT	series production status [x] close-to-production sample [] functional sample []

All test cases: 100% pass

Executed & examined by

Approval / Head of R&D Display Solutions

C. Schubert

E. Kurz

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2 Description / specs of the devices under test

2.1 DRAM module(s)

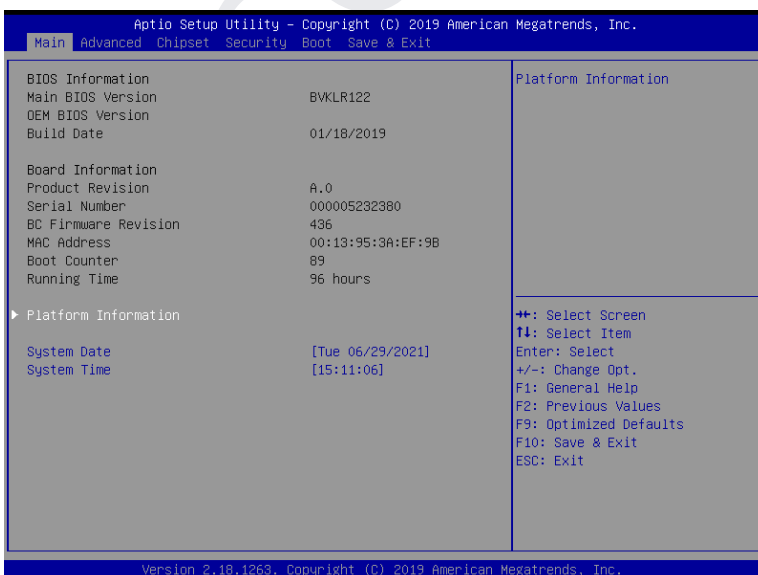
Vendor	Size	Speed	Type	ECC	SN	Vendor PN	Memory Manufacturer	Operating temperature
Data Modul	8 GB	DDR4 2666	SODIMM DDR4	No	350E3351h	12049444	Samsung	0°C to +85°C
Data Modul	8 GB	DDR4 2666	SODIMM DDR4	No	080E3351h	12049444	Samsung	0°C to +85°C

2.2 Embedded HW / SBC

Test Configuration:	
Item	Description
Model Name	Conga-TC175, Version A.0
SN:	5232380
Operating temp.	0°C to +60°C
BIOS / EC/IO Contr.	AMI 5.12, Version: BVKLR122, date: 2019-01-18 / conga emb. BC Ver. 436
CPU	Intel Core i3-7100U @ 2.40GHz, 15 Watt
DRAM type	Dual channel DDR4 2133MT/s
max. capacity	Up to 32 GB
socket	2 x 260-pin SODIMM
SSD	SATA, TS128GMSA370
PSU	Mean Well LRS-150F-24, DC 24V, 6.5A
LAN Driver	Intel I219-LM GbE
VGA Driver	Intel HD Graphics 620
Audio Driver	Realtek ALC888 HD Audio Codec
USB 3.0 Driver	Intel Host Controller USB 3.1 Gen1
OS	MemTest86 (bootable Linux Test suite) / Windows 10 Pro 21H1
Panel / Display	Acer B226HQL

COM Express module data sheet attached: **conga-TC175 (583344).pdf**

Screenshots: EFI (platform and memory info) and OS (memory module info read by Thaiphoon Burner)



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Main

Intel(R) Core(TM) i3-7100U CPU @ 2.40GHz	
Codename	Kabylake ULT
Processor Speed	2400 MHz
Processor Signature	0x806E9
Stepping	H0/J0
Processor Cores	2Core(s) / 4Thread(s)
Microcode Revision	9A
Processor Graphics Controller	GT2 (0x5916)
eDRAM Size	N/A
IGD VBIOS Version	N/A
IGD GOP Version	N/A
Total Memory	16384 MB
Memory Frequency	2133 MHz
PCH Information	
Codename	SKL PCH-LP
PCH SKU	(U) iHDCP 2.2 Premium
Stepping	C1
Hsio Revision	52
Production Type	Production

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F9: Optimized Defaults
 F10: Save & Exit
 ESC: Exit

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Chipset

▶ Memory Thermal Configuration	
▶ Memory Training Algorithms	
Memory Configuration	
Memory RC Version	2.8.1.0
Memory Frequency	2133 MHz
Memory Timings (tCL-tRCD-tRP-tRAS)	15-15-15-35
Channel 0 Slot 0	Populated & Enabled
Size	8192 MB (DDR4)
Number of Ranks	1
Manufacturer	UnKnown
Channel 0 Slot 1	Not Populated / Disabled
Channel 1 Slot 0	Populated & Enabled
Size	8192 MB (DDR4)
Number of Ranks	1
Manufacturer	UnKnown
Channel 1 Slot 1	Not Populated / Disabled
Memory ratio/reference clock options moved to	
Overclock->Memory->Custom Profile menu	
MRC ULT Safe Config	[Disabled]
Maximum Memory Frequency	[2133]

Memory Thermal Configuration Options

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F9: Optimized Defaults
 F10: Save & Exit
 ESC: Exit

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Memory module #1 info:

MEMORY MODULE		DRAM COMPONENTS									
MANUFACTURER Memorysolution GmbH		MANUFACTURER Samsung									
SERIES Not determined		PART NUMBER K4A8G085W?-BCTD									
PART NUMBER MS4S8G26AB2-SCTD		PACKAGE Standard Monolithic 78-ball FBGA									
SERIAL NUMBER 350E3351h		DIE DENSITY / COUNT 8 Gb / 1 die									
JEDEC DIMM LABEL 8GB 1Rx8 PC4-2666V-SA1-11		COMPOSITION 1024Mb x8 (64Mb x8 x 16 banks)									
ARCHITECTURE DDR4 SDRAM SO-DIMM		CLOCK FREQUENCY 1333 MHz (0,750 ns)									
SPEED GRADE DDR4-2666V downbin		MINIMUM TIMING DELAYS 19-19-19-43-61									
CAPACITY 8 GB (8 components)		READ LATENCIES SUPPORTED 20T, 19T, 18T, 17T, 16T, 15T									
ORGANIZATION 1024M x64 (1 rank)		SUPPLY VOLTAGE 1,20 V									
REGISTER MODEL N/A		XMP CERTIFIED Not programmed									
MANUFACTURING DATE May 24-28 / Week 21, 2021		XMP EXTREME Not programmed									
MANUFACTURING LOCATION Unknown: 00h		SPD REVISION 1.1 / September 2015									
REVISION / RAW CARD 0000h / A1 (8 layers)		XMP REVISION Undefined									
FREQUENCY	CAS	RCD	RP	RAS	RC	FAW	RRDS	RRDL	WR	WTRS	
1333 MHz	20	19	19	43	61	28	4	7	20	4	
1333 MHz	19	19	19	43	61	28	4	7	20	4	
1200 MHz	18	17	17	39	55	26	4	6	18	3	
1200 MHz	17	17	17	39	55	26	4	6	18	3	
1067 MHz	16	15	15	35	49	23	4	6	16	3	
1067 MHz	15	15	15	35	49	23	4	6	16	3	

Version: 16.0.1.0 Build 1014

Memory module #2 info:

MEMORY MODULE		DRAM COMPONENTS									
MANUFACTURER Memorysolution GmbH		MANUFACTURER Samsung									
SERIES Not determined		PART NUMBER K4A8G085W?-BCTD									
PART NUMBER MS4S8G26AB2-SCTD		PACKAGE Standard Monolithic 78-ball FBGA									
SERIAL NUMBER 080E3351h		DIE DENSITY / COUNT 8 Gb / 1 die									
JEDEC DIMM LABEL 8GB 1Rx8 PC4-2666V-SA1-11		COMPOSITION 1024Mb x8 (64Mb x8 x 16 banks)									
ARCHITECTURE DDR4 SDRAM SO-DIMM		CLOCK FREQUENCY 1333 MHz (0,750 ns)									
SPEED GRADE DDR4-2666V downbin		MINIMUM TIMING DELAYS 19-19-19-43-61									
CAPACITY 8 GB (8 components)		READ LATENCIES SUPPORTED 20T, 19T, 18T, 17T, 16T, 15T									
ORGANIZATION 1024M x64 (1 rank)		SUPPLY VOLTAGE 1,20 V									
REGISTER MODEL N/A		XMP CERTIFIED Not programmed									
MANUFACTURING DATE May 24-28 / Week 21, 2021		XMP EXTREME Not programmed									
MANUFACTURING LOCATION Unknown: 00h		SPD REVISION 1.1 / September 2015									
REVISION / RAW CARD 0000h / A1 (8 layers)		XMP REVISION Undefined									
FREQUENCY	CAS	RCD	RP	RAS	RC	FAW	RRDS	RRDL	WR	WTRS	
1333 MHz	20	19	19	43	61	28	4	7	20	4	
1333 MHz	19	19	19	43	61	28	4	7	20	4	
1200 MHz	18	17	17	39	55	26	4	6	18	3	
1200 MHz	17	17	17	39	55	26	4	6	18	3	
1067 MHz	16	15	15	35	49	23	4	6	16	3	
1067 MHz	15	15	15	35	49	23	4	6	16	3	

Version: 16.0.1.0 Build 1014

3 Test scope in details

3.1 Test criteria:

Supported memory speed, capacity, channel mode must meet specification.
 Proof: BIOS / SW tools.Values shown in BIOS / EFI:
 Memory frequency is 2133 MHz, which is the max. frequency supported by the CPU.
 The DUT must complete all test passes without error.

3.2 Test passes scenario:

3.2.1 1050 MemTest86 passes, ambient temperature: 60° C / maximum spec. temp.

Test algorithms: Test 6 [Block move, 64-byte blocks], Test 13 [Hammer test], logging via MemTest86 Pro of all test passes with date and timestamps, system temperatures.

DRAM Module	4 GB	2x8 GB	16 GB
Test passes	-	1050	-
Duration ¹	-	~350 h	-

3.2.2 420 MemTest86 passes, ambient temperature 0° C / minimum spec. temp.

Test algorithms: Test 6 [Block move, 64-byte blocks], Test 13 [Hammer test], logging via MemTest86 Pro of all test passes with date and timestamps, system temperatures.

DRAM Module	4 GB	2x8 GB	16 GB
Test passes	-	420	-
Duration ¹	-	~139 h	-

3.2.3 Full test suite MemTest86

Running a full test suite each with all detection algorithms after completing minimum & maximum temperature test passes to ensure that the module is still working without error.

DRAM Module	4 GB	2x8 GB	16 GB
Test passes	-	2	-
Duration	-	~4.5 h	-

¹ Low power embedded CPUs (Atom / Celeron) need ~18 minutes for one test pass of the selected test cases (test case 6: "block move" and test case 13 "row hammer"), desktop grade CPUs (Skylake based Core i7) need less than 4 minutes for one test pass. Fully automated test via MemTest86 config, soft reboot every 5 to 10 passes: 5 passes for large capacities (16 GB and up) 10 passes for 8 GB or less.

3.3 Test result log files:

3.3.1 1050 MemTest86 passes, ambient temperature: 60° C / maximum spec. temp.

MemTest86 logs attached: **MemTest86_logs_60°C_1050_passes.html**

DRAM Module	4 GB	2x8 GB	16 GB
Test passes	-	1050	-
Duration	-	~350 h	-
Result	-	PASS	-

3.3.2 420 MemTest86 passes, ambient temperature 0° C / minimum spec. temp.

MemTest86 logs attached: **MemTest86_logs_0°C_420_passes.html**

DRAM Module	4 GB	2x8 GB	16 GB
Test passes	-	420	-
Duration	-	~139 h	-
Result	-	PASS	-

3.3.3 Full test suite MemTest86

MemTest86 logs attached:

MemTest86_Full_Testsuite_logs_2_passes_after_60°C.html

MemTest86_Full_Testsuite_logs_2_passes_after_0°C.html

DRAM Module	4 GB	2x8GB	16 GB
Test passes	-	2	-
Duration	-	~4.5 h	-
Result	-	PASS	-

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