

# MAX-Q670A

## SAP & ATRF Test Report

Summary	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass with Deviation (Comment: _____)			
	Test Results Category			
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

<b>Issue date</b>	<b>Manager</b>	<b>Test Engineer</b>
2024-05-22	Benson Wang	Aslen Hsieh

**SAP & ATRF Request:****14EX001965, (TF)BIOS Firmware.32MB.CS07E8h.MAX-Q670A.R4.2.MA67AM42.05072024, A.1 (Design)**

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BIOS Revision: MA67AM42  
Build Date: 2024/05/07  
Checksum: 07E8h  
IPC ID: 001C

Action:

- 1.Dynamically adjust CPU fan speed according to CPU DTS temperature.
- 2.Disable PCH PCIE Power Gating to fixed Xtium2-CLHS PX8 issue.
- 3.Enable GNA Device.
- 4.Enable DMA Control Guarantee.
- 5.Enable RC6(Render Standby).

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BIOS Revision: MA67AM41  
Build Date: 2024/02/26  
Checksum: 1737h  
IPC ID: 0017

Action:

- 1.Disable power LED after enter to S3.

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BIOS Revision: MA67AM40  
Build Date: 2024/02/02  
Checksum: BF4Fh  
IPC ID: 0014

Action:

- 1.Support RPL refresh cpu.
- update ME version to 16.1.30.2269 .

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BIOS Revision: MA67AM38  
Build Date: 2024/01/16  
Checksum: F911h  
IPC ID: 0013

Action:

- 1.Support RPL refresh cpu.
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**Platform Information:**

Item	Device Information	Note
Product of department	IPC-BU	
CPU Board / Version	MAX-Q670A R1.01	
BIOS / Version	MAX-Q670A R4.1 (MA67AM41) (02/26/2024)	
	MAX-Q670A R4.2 (MA67AM42) (05/07/2024)	
ME / Version	16.1.30.2269	
Driver folder	DP00000710, MAX-Q670A Driver Package, A.1	
	DP00000742, MAX-Q670A Driver Package 20240430, A.1	
CPU Type	I9-14900 RAPTOR LAKE REFRESH DT LGA B-0 65W 2.0GHz 8+16 P2 vPro 36MB 32EU Q37Q QS	
Memory Type	Innodisk DDR5 5600 32GB (SEC K4RAH086VP-BCWM) x4pcs	
	Transcend DDR5 5600 32GB (SEC K4RAH086VP-BCWM) x 4pcs	
	Apacer DDR5 5600 32GB (SK hynix H5CD48AGBD X018 323V) x 4pcs	
SATA HDD	Transcend SSD 470 TS256GSSD470K-AEN / 256GB	
VGA	LG E2260	
HDMI / DP Monitor	BenQ EL2870U	
LVDS	AUO M215HW03 V1 / 21"/ 1920*1080 / 48bit	
eDP	AUO G101UAN01.0 / 10.1"/ 1920*1200	
PCI-e card	Intel GIGABIT CT DESKTOP ADAPTER	PCI-e x 1
	Uptech UTB242 USB3.0 4 port (TI TUSB7340)	
	Vecow UE-1008 USB3.0 8 ports card	PCI-e x 4
	Intel GIGABIT ET2 Quad Port Svr Adptr	
	High Poing RocketRAID 2720SGL PCI-e 2.0 RAID HOST adapter	PCI-e x 8
	ASUS AMD Radeon R7250-1GD5	
	ZOTAC GAMING GEFORCE RTX3070 TWIN EDGE 8GB 256BIT GDDR6 PCI-Express x16 Graphics Card	PCI-e x 16
Nvidia RTX A4000 PCIe GEN4 x16 GDDR6 16GB Graphics card		
M.2 2230 E Key	SparkLan,WNFQ-258ACN(BT) Wireless LAN Kit M.2 2230 802.11ac/a/b/g/n + BT4.0,2T2R,with 2 sets of cable & antenna	
USB Type C	SILVER Stone MS12 USB type-C to NVME Enclosure (20Gb/s)	
Operating System	Windows 10 Enterprise English Version 64Bit V21H2	
ATX Power Supply	FSP HYDRO G PRO / HG2-650 / 650W	

## Test Result for Certification

### 1. Install OS to SATA SSD:

Installation	Result		
	Pass	Fail	N/A
English Windows 10 Enterprise 64bit V21H2 UEFI mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 2. CPU information Test

		Result			Note
		Pass	Fail	N/A	
CPU information	Information in BIOS menu	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Information in Windows	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	CPU speed, turbo boost function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	CPU Utilization	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### 3. CPU information Test

CPU Information (Information and frequency should show correct value)	Result			Note
	Pass	Fail	N/A	
14 <sup>th</sup> GEN CPU \ Raptor Lake Refresh(保留 SPEC 規格 CPU 即可)				
i9-14900 RAPTOR LAKE REFRESH DT LGA B-0 65W 2.0GHz 8+16 P2 vPro 36MB 32EU Q37Q QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i9-14900T RAPTOR LAKE REFRESH DT LGA B-0 35W 1.1GHz 8+16 P2 vPro 36MB 32EU Q37P QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	QE CPU
i7-14700 RAPTOR LAKE REFRESH DT LGA B-0 65W 2.1GHz 8+12 P1 vPro 33MB 32EU Q3RX QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i7-14700T RAPTOR LAKE REFRESH DT LGA B-0 35W 1.3GHz 8+12 P1T vPro 33MB 32EU Q3JR QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i5-14500 RAPTOR LAKE REFRESH DT LGA C-0 65W 2.6GHz 6+8 MS1 vPro 24MB 32EU Q37Y QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i5-14500T RAPTOR LAKE REFRESH DT LGA C-0 35W 1.7GHz 6+8 MS1T vPro 24MB 32EU Q37X QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i5-14400 RAPTOR LAKE REFRESH DT LGA B-0 65W 2.5GHz 6+4 MS0 20MB 24EU Q37T QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i5-14400T RAPTOR LAKE REFRESH DT LGA C-0 35W 1.5GHz 6+4 MS0T 20MB 24EU Q381 QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i5-14400F RAPTOR LAKE REFRESH DT LGA C-0 65W 2.5GHz 6+4 MS0F 20MB 0EU Q3ZE QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i3-14100 RAPTOR LAKE REFRESH DT LGA H-0 60W 3.5GHz 4+0 T1 12MB 24EU Q3E4 QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i3-14100T RAPTOR LAKE REFRESH DT LGA H-0 35W 2.7GHz 4+0 T1T 12MB 24EU Q3DE QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
300 RAPTOR LAKE REFRESH DT LGA H-0 46W 3.9GHz 2+0 L1 6MB 16EU Q3E6 QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
300T RAPTOR LAKE REFRESH DT LGA H-0 35W 3.4GHz 2+0 L1T 6MB 16EU Q3E7 QS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

#### 4. Memory Compatibility Test

Memory Information (a. Information and frequency should show correct value. b. System should boot up and into OS normally.)	AAEON P/N	Result			Note
		Pass	Fail	N/A	
<b>DDR5 U-DIMM</b>					
Transcend DDR5 5600 8GB (SEC K4RAH165VP-BCWM)	TS1GLA64V6G	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend DDR5 5600 16GB (SEC K4RAH086VP-BCWM)	TS2GLA64V6E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transcend DDR5 5600 32GB (SEC K4RAH086VP-BCWM)	TS4GLA64V6E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk DDR5 5600 8GB (SEC K4RAH165VP-BCWM)	M5U0-8GSY1CZ Q-26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk DDR5 5600 16GB (SEC K4RAH086VP-BCWM)	M5U0-AGS2JCZ Q-26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Innodisk DDR5 5600 32GB (SEC K4RAH086VP-BCWM)	M5U0-BGS2KCZ Q-26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Apacer DDR5 5600 8GB (SK hynix H5CD48AGBD X018 323V)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Apacer DDR5 5600 16GB (SK hynix H5CD48AGBD X018 323V)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Apacer DDR5 5600 32GB (SK hynix H5CD48AGBD X018 323V)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Configuration					
CPU	Intel® Core™ i9-14900 Processor 2.00 GHz 65W				
DDR5 Long-DIMM Memory Configurations	Memory Frequency	Result			Note
		Pass	Fail	N/A	
Memory	Innodisk DDR5 5600 8GB M5U0-8GSY1CZQ-26 (SEC K4RAH165VP-BCWM) x 4pcs				
	Innodisk DDR5 5600 16GB M5U0-AGS2JCZQ-26 (SEC K4RAH086VP-BCWM) x 4pcs				
	Innodisk DDR5 5600 32GB M5U0-BGS2KCZQ-26 (SEC K4RAH086VP-BCWM) x 4pcs				
DIMM_A2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_B2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_A2 + DIMM_B2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_A1+DIMM_A2+DIMM_B1+ DIMM_B2	4000MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8GB / 16GB
	3600MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32GB

Configuration					
CPU	Intel® Core™ i9-14900 Processor 2.00 GHz 65W				
DDR5 Long-DIMM Memory Configurations	Memory Frequency	Result			Note
		Pass	Fail	N/A	
Memory	Transcend DDR5 5600 8GB (SEC K4RAH165VP-BCWM) x 4pcs				
	Transcend DDR5 5600 16GB (SEC K4RAH086VP-BCWM) x 4pcs				

Transcend DDR5 5600 32GB (SEC K4RAH086VP-BCWM) x 4pcs					
DIMM_A2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_B2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_A2 + DIMM_B2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_A1+DIMM_A2+DIMM_B1+ DIMM_B2	4000MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8GB / 16GB
	3600MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32GB

Configuration					
CPU	Intel® Core™ i9-14900 Processor 2.00 GHz 65W				
DDR5 Long-DIMM Memory Configurations	Memory Frequency	Result			Note
		Pass	Fail	N/A	
Memory	Apacer DDR5 5600 8GB (SK hynix H5CD48AGBD X017 337V) x 4pcs				
	Apacer DDR5 5600 16GB (SK hynix H5CD48AGBD X018 323V) x 4pcs				
	Apacer DDR5 5600 32GB (SK hynix H5CD48AGBD X018 323V) x 4pcs				
DIMM_A2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_B2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_A2 + DIMM_B2	4400MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIMM_A1+DIMM_A2+DIMM_B1+ DIMM_B2	4000MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8GB / 16GB
	3600MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32GB

## 5. I/O Peripheral Function Test

I/O Peripheral Function Test - I/O Function	Result		
	Pass	Fail	N/A
SATA 1/2/3/4/5/6/7/8 Connector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VGA output	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HDMI output (include audio)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DP output (include audio)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LVDS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
eDP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Audio Connector (Line out / MIC / Line in)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USB 3.2 Gen2x2 Type C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USB3.2 Gen1 Type A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USB2.0_1/2 Ports [ USB 2.0 Header ]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USB3.2 Gen1_1/2 ports [ USB 3.0 BOX Header ]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USB3.0_1/2/3/4 ports	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCI-e x16 slot1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCI-e x16 slot2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCI-e x4 slot1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCI-e x4 slot2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

M.2 2242/80 M key slot1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M.2 2242/80 M key slot2		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M.2 3042/3052/2242 B-key slot		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M.2 2230 E-key slot [Wireless LAN]		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DIO Connector		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RS232 for COM1 ~ COM6 Ports		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5V / 12V /RI for COM1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RS422 / 485 for COM1 Port		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Front Panel</b>	<b>Result</b>			
		<b>Pass</b>	<b>Fail</b>	<b>N/A</b>
HDD LED		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power LED		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buzzer		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Button		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reset Button		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>LAN1/2 Connector &amp; Function</b>	<b>Result</b>			
		<b>Pass</b>	<b>Fail</b>	<b>N/A</b>
LAN1/2 Gigabit Ethernet [ Intel i225LM ]		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LAN Speed LED	LAN1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LAN2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LAN Active LED	LAN1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LAN2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WOL from S3/4/5	LAN1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LAN2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>LAN3/4 Connector &amp; Function</b>	<b>Result</b>			
		<b>Pass</b>	<b>Fail</b>	<b>N/A</b>
LAN 3/4 Gigabit Ethernet [ Intel® I219LM ] [Intel® I210AT]		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LAN Speed LED	LAN3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LAN4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LAN Active LED	LAN3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LAN4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WOL from S3/4/5	LAN3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LAN4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ACPI</b>	<b>Result</b>			
		<b>Pass</b>	<b>Fail</b>	<b>N/A</b>
S3		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S4		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S5		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reset		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 6. Performance Test

Testing Software	Criteria		Result		
			Pass	Fail	N/A
PCMark 10 v2.1.2662	1. No error or hang during test. 2. To compare with reference score and the deviation should < -20%.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Score		Note		
<b>i9-14900</b>					
BIOS Version	MA67AM41	MA67AM42			
PCMARK10 Score	6273	6171			
Essentials	12053	11478			
Productivity	8585	8059			
Digital Content Creation	6473	6903			
<b>i9-13900E</b>					
BIOS Version	MA67AM41	MA67AM42	Reference score:		
PCMARK10 Score	5784	5922			
Essentials	11250	11142			
Productivity	7394	7438			
Digital Content Creation	6312	6802			

Testing Software	Criteria		Result		
			Pass	Fail	N/A
3DMark-v2-28-8228 Time Spy	1. No error or hang during test. 2. To compare with reference score and the deviation should < -20%.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Score		Note		
<b>i9-14900</b>					
BIOS Version	MA67AM41	MA67AM42			
Score	705	946	Reference score:		
Graphics score	604	812			
Graphics test 1	3.95 FPS	5.32 FPS			
Graphics test 2	3.48 FPS	4.64 FPS			
CPU score	14848	15007			
CPU test	49.89 FPS	50.42 FPS			
<b>i9-13900E</b>					
BIOS Version	MA67AM42				
Score	955		Reference score:		
Graphics score	819				
Graphics test 1	5.35 FPS				
Graphics test 2	4.69 FPS				
CPU score	17247				
CPU test	57.95 FPS				

Testing Software	Criteria		Result		
			Pass	Fail	N/A
3DMark-v2-28-8228 Fire Strike	1. No error or hang during test. 2. To compare with reference score and the deviation < -20%.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Score		Note		
<b>i9-14900</b>					
BIOS Version	MA67AM41	MA67AM42			



Score	2106	2861	Reference score:
Graphics score	2149	2946	
Graphics test 1	9.97 FPS	13.68 FPS	
Graphics test 2	8.79 FPS	12.04 FPS	
Physics score	43140	43816	
Physics test	136.95 FPS	139.11 FPS	
Combined score	818	1093	
Combined test	3.80 FPS	5.09 FPS	
<b>i9-13900E</b>			
<b>BIOS Version</b>	<b>MA67AM42</b>		
Score	2809		
Graphics score	2880		
Graphics test 1	13.33 FPS		
Graphics test 2	11.81 FPS		
Physics score	44342		
Physics test	140.77 FPS		
Combined score	1085		
Combined test	5.05 FPS		

Testing Software	Criteria	Result		
		Pass	Fail	N/A
<b>Performance Test 10.0</b>	1. No error or hang during test. 2. To compare with reference score and the deviation should < -20%.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Score</b>	<b>Note</b>		
<b>i9-14900</b>				
<b>BIOS Version</b>	<b>MA67AM41</b>	<b>MA67AM42</b>		
PassMark Rating	4276.9	4383.6		
CPU Mark	43604.4	44075.5		
2D Graphics Mark	611.4	801.5		
3D Graphics Mark	1645.4	1843.1		
Memory Mark	3260.6	3108.6		
Disk Mark	3302.8	2046.3		
<b>i9-13900E</b>				
<b>BIOS Version</b>	<b>MA67AM41</b>	<b>MA67AM42</b>		
PassMark Rating	4463.3	4686.4		
CPU Mark	42152.5	44157.6		
2D Graphics Mark	721.4	808.3		
3D Graphics Mark	1568.7	1856.1		
Memory Mark	2995.4	3159.2		
Disk Mark	3295.7	2639.6		
<b>i9-14900T</b>				
PassMark Rating	4261.0		<b>BIOS : MA67AM41</b>	
CPU Mark	30038.1			
2D Graphics Mark	714.2			
3D Graphics Mark	1419.8			
Memory Mark	3059.8			
Disk Mark	3257.1			
<b>I7-14700</b>				
PassMark Rating	4364.8		<b>BIOS : MA67AM41</b>	
CPU Mark	39147.6			
2D Graphics Mark	736.2			
3D Graphics Mark	1416.0			

Memory Mark	2982.4	
Disk Mark	3269.9	
<b>I7-14700T</b>		
PassMark Rating	4282.9	BIOS : MA67AM41
CPU Mark	29859.5	
2D Graphics Mark	728.0	
3D Graphics Mark	1432.8	
Memory Mark	2965.2	
Disk Mark	3284.4	
<b>I5-14500</b>		
PassMark Rating	4319.6	BIOS : MA67AM41
CPU Mark	30861.0	
2D Graphics Mark	710.5	
3D Graphics Mark	1503.2	
Memory Mark	3030.6	
Disk Mark	3297.2	
<b>I5-14500T</b>		
PassMark Rating	4105.2	BIOS : MA67AM41
CPU Mark	23158.6	
2D Graphics Mark	669.8	
3D Graphics Mark	1461.3	
Memory Mark	3079.6	
Disk Mark	3265.0	
<b>I5-14400</b>		
PassMark Rating	4051.0	BIOS : MA67AM41
CPU Mark	27258.1	
2D Graphics Mark	691.5	
3D Graphics Mark	1288.4	
Memory Mark	2915.8	
Disk Mark	3253.1	
<b>I5-14400T</b>		
PassMark Rating	4086.1	BIOS : MA67AM41
CPU Mark	20490.5	
2D Graphics Mark	695.6	
3D Graphics Mark	1430.1	
Memory Mark	3013.2	
Disk Mark	3283.4	
<b>i5-14400F</b>		
PassMark Rating	4930.7	BIOS : MA67AM41
CPU Mark	26568.1	
2D Graphics Mark	N/A	
3D Graphics Mark	N/A	
Memory Mark	3164.0	
Disk Mark	3302.2	
<b>i3-14100</b>		
PassMark Rating	3952.4	BIOS : MA67AM41
CPU Mark	16748.6	
2D Graphics Mark	698.2	
3D Graphics Mark	1393.9	
Memory Mark	2918.1	
Disk Mark	3244.4	
<b>i3-14100T</b>		
PassMark Rating	3801.4	BIOS : MA67AM41
CPU Mark	14177.3	

2D Graphics Mark	666.2	
3D Graphics Mark	1401.4	
Memory Mark	2868.2	
Disk Mark	3253.9	
<b>300 (Q3E6)</b>		
PassMark Rating	2767.2	BIOS : MA67AM41
CPU Mark	7209.0	
2D Graphics Mark	497.6	
3D Graphics Mark	934.3	
Memory Mark	2625.2	
Disk Mark	3253.5	
<b>300T (Q3E7)</b>		
PassMark Rating	2545.8	BIOS : MA67AM41
CPU Mark	5578.5	
2D Graphics Mark	465.3	
3D Graphics Mark	931.1	
Memory Mark	2504.4	
Disk Mark	3270.3	

## 7. Power consumption

24pin ATX power 使用

Test Equipment ( i9-14900 65W )						
Equipment		DC/AC TRMS mA CLAMP METER				
Manufacturer		PROVA 11				
Model name		Model 11				
Test condition						
Power supply		FSP HYDRO G PRO / HG2-650 / 650W				
Keyboard / mouse (TYPE-C)		USB keyboard & mouse x1				
Test Item		Voltage	Current	P		Note
<b>Full Loading Mode:</b> Measure the current value when system running Burnintest test.(CPU, RAM, Network, Disk, Sound, Video, GPU, 2D, 3D, COM ports)	Peak	(+12V)	23.06	A	276.72	BIOS : MA67AM41 USB2.0 dummy load x 2 USB3.0 dummy load x 6 USB keyboard & mouse x1 LAN x 4 COM loopback x 6
		(+5V)	9.94		49.73	
		(+3.3V)	0.89		2.937	
		(-12V)	0		0	
		(5VSB)	0.35		1.75	
	Steady-state	(+12V)	7.26	A	111.12	
		(+5V)	9.10		45.5	
		(+3.3V)	0.41		1.353	
		(-12V)	0		0	
		(5VSB)	0.33		1.65	
<b>CPU heavy loading:</b> (Steady-state) Measure the current value when system running Prime95(Balance current)	(+12V)	7.01	A	84.12	107.709	W
	(+5V)	4.17		20.85		
	(+3.3V)	0.33		1.089		
	(-12V)	0		0		
	(5VSB)	0.33		1.65		
<b>Win. Idle mode:</b> Measure the current value when system in windows mode and without running any program	(+12V)	0.92	A	11.04	22.796	W
	(+5V)	1.81		9.05		
	(+3.3V)	0.32		1.0565		
	(-12V)	0		0		
	(5VSB)	0.33		1.65		
<b>S3 mode:</b> Measure the current value when system in S3 mode of windows and without running any	(+12V)	0.06	A	0.72	3.02	W
	(+5V)	0		0		
	(+3.3V)	0		0		
	(-12V)	0		0		
	(5VSB)	0.46		2.3		

S5 mode: Measure the current value when system in S5 mode of windows and without running any	(+12V)	0	A	0	1.1	W	
	(+5V)	0		0			
	(+3.3V)	0		0			
	(-12V)	0		0			
	(5VSB)	0.22		1.1			

## 8. BIOS Function Test

### 8.1. Advanced Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
CPU configuration	Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Hyper-threading	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled
	Virtualization Technology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled
	Turbo mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled
Trusted Computing	TPM SUPPORT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Clear TPM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PTT Configuration	TPM Device Selection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	dTPM / PTT
SATA Configuration	SATA Controller	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Enable VMD controller	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	SATA6G 0 ~ 7port	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Hot plug	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
USB Configuration	USB Mass Storage Driver Support	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Hardware Monitor	Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fan Speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Voltage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SIO Configuration	Serial port 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled
	RS232	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	RS422	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	RS485	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Serial port 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Serial port 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Serial port 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Serial port 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PCH-FW Configuration	ME version 16.1.30.2269	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ME version can't be 0.0.0.0
NVME Configuration		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Power Mode	ATX Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Restore AC Power Loss	Last State	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Always On	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Always Off	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
RI Wake Event		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
RTC Wake System from S5	Disabled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fixed Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Dynamic Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Digital IO port Configuration	DIO port 1~8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MEBx ( Web GUI )	Intel AMT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled
	Un-configure ME	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
After BIOS menu modified, check if system reset time is too long.		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(example > 20sec)
Case Open Warning		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled

## 8.2. Chipset Test

Test Item (Following item should work properly)		Result			Note	
		Pass	Fail	N/A		
System Agent (SA) Configuration	Memory Configuration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	CH7513	Disabled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		eDP mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		LVDS mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PCH-IO Configuration	HD Audio	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enabled /Disabled	

## 8.3. Boot Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Quiet Boot		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Network Stack		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From Hard Disk		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From CDRom		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From USB HDD		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From USB Floppy		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Boot From USB CD-ROM		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Disable		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 8.4. Clear CMOS and Load Default Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Clear CMOS by jumper (under G3 status)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear date, time, setting, password, secure boot
Clear CMOS by remove battery (under G3 status)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear date, time, setting, password, secure boot
Load default		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BIOS setting should be restored to default.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Boot option priorities should restore from <b>disable</b> to default.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 8.5. Supervisor / User Password Test

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Administrator Password	Password Case Sensitive	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	If admin password only, system should not entry BIOS menu by press "Enter key".	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
User Password	Password Case Sensitive	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**8.6. Secure Boot Test**

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Secure boot disable	Boot into Windows and UEFI shell should work normal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Secure boot enable	System can't boot into UEFI shell	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Boot into Windows should work normal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**8.7. Hi-safe Test**

Test Item (Following item should work properly)		Result			Note
		Pass	Fail	N/A	
Hi-Safe-v3_20221111_3_15_2_44		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MA67A
System Information	CPU Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Model Name	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Display Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	RAM Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
H/W Monitor	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fan Speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Voltage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DIO	DIO1~4 High	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	DIO1~4 Low	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	DIO5~8 High	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	DIO5~8 Low	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
WatchDog	10sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Actual 11.45 sec
	1min	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Actual 62.38sec
	255sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Actual 257.10sec
	Auto Reload	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SmartFan	CPU Fan manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	CPU Fan Auto	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SMBus	Device Address	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0xA0
	Read Byte	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Read Word	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Result / Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Backlight controller	LVDS Mode Brightness 0~100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	eDP mode Brightness 0~100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 9. Stability Test

### 9.1. Run In Test

OS: Windows 10 Enterprise English 64bit

Test Item	Result			Note		
	Pass	Fail	N/A			
Burn In Test V10.2 (1012 above ) Duty: 100 Time: over 12 hours <System should not error or hang during testing.>	CPU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	RAM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	COM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	COM1~6 (Tx / Rx)	
	Video	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	2D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	3D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Disk	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Sound	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Network	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<Advanced>	
	GPGPU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	USB	2.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Note: COM PORT Speed Set cycle to 115200.

### 9.2. ACPI G3 Cold Boot Test

OS: UEFI Shell

Test Point:

Make sure system boot up is stable.

Make sure boot function support AC power restored in short time.

Test item	Result			Note
	Pass	Fail	N/A	
G3(AC loss) cold boot over 1000 cycles Setting: Power on- 40sec ; Power off-- 20sec. <loss rate: 0 /1000 times>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> BIOS select " power on" or <input type="checkbox"/> Jumper setting auto power button

### 9.3. Memory Test

OS: UEFI

Tool: Passmark Memtest version7.0 UEFI

Memory information:

Test item	Result			Note
	Pass	Fail	N/A	
Memory Test for 4 loops. < Memtest result should not error or hang..>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Remark:Test by Innodisk DDR5 5600 32GB (SEC K4RAH086VP-BCWM)

### 9.4. Reboot Test

OS: Windows 10 Enterprise English 64bit

Test Tool: Passmark rebooter.exe

Test item	Result			Note
	Pass	Fail	N/A	
Reboot test for 500 cycles <a. System should not error or hang during testing.> <b. Device manager should not loss any devices or yellow bang >	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Win+R -> systempropertiesadvanced.exe -> startup and recovery setting -> automatically restart

**9.5. Heavy loading test with Max/Min voltage.**

OS: Windows10 Enterprise 64bit

AP: Intel TAT or Prime95 (Use TAT as first priority)

Test item	Voltage	Criteria	Result			Note
			Pass	Fail	N/A	
Voltage input / 2 hours heavy loading	12V	System no power down, hang or BSOD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	