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RNAS-1200 Series
Component Compatibility Guide

A list of peripheral components suitable for use with the RNAS-1200 series of computers

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1. Introduction

This document lists hardware components that are proven to provide the performance listed in the specification when used with the Moxa RNAS-1200 series of embedded computers, or computers that share basic design features with the RNAS-1200 series. Moxa computers come with multiple peripheral options and are engineered to work with components having different hardware specifications. This flexibility could sometimes lead to compatibility issues. When used with the RNAS-1200 series of embedded computers, peripherals from one manufacturer may not work as well as the ones made by another manufacturer. Moxa provides this list of RNAS-1200 series-compatible components, so that users can be certain of a reliable performance from the RNAS-1200 series, when it is used with the components listed in this document.

2. Testing Methods

To validate that a component meets the Moxa standards for quality and performance, the following five key compatibility tests are run:

- Ambient temperature burn-in
- Low temperature hard start
- Heat/humidity burn-in
- Cyclic high-low temperature burn-in
- Vibration test

Additionally, tests for compliance with safety and performance standards may also be run.

For this device, the following compatibility and compliance tests have been run:

- Ambient temperature burn-in
- Low temperature hard start
- EN-50155-T1 test
- EN-50155-TX test

The tests are described below:

Ambient Temperature Burn-In

The component is mounted on to a RNAS-1200 computer and put through a series of stress tests at an ambient temperature of around 25˚C, for a specified period of time. The duration of the test is determined based on the class of peripherals being tested.

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Low Temperature Hard Start

The component is mounted on to an unpowered RNAS-1200 computer and then the system is booted up at an extremely low temperature. The designated low temperature value depends on the computer model being tested.

EN-50155 T1 Mode Confirmation

Components are mounted on to an unpowered RNAS-1200 computer and then the system is booted up at -25˚C.

EN-50155 TX Mode Confirmation

Components are mounted on to an unpowered RNAS-1200 computer and then the system is booted up at -40˚C.

3. Storage Endurance

Storage media, such as SSDs, CF cards, SD cards, Disk on Module, and Cfast, are composed of different electrical components. The main electrical components in these storage media, the NAND-flash memory and NAND-flash controller, impact the storage endurance and lifespan of the storage media.

NAND-Flash Memory Endurance

NAND-flash memories have a limit on the number of times they can be programmed and erased (P/E). The P/E cycle as well as the erase count of a NAND-flash memory can be used to determine this limit. For example, an SLC (single-level cell) flash memory has a 60,000 P/E cycle, an MLC (multi-level cell) flash memory has a 3,000 P/E cycle, and TLC NAND flash memories have P/E cycle values up to 1,000. Each flash memory type has a different endurance level, which is why the storage lifespan is based on the flash memory type. Storage that uses SLC type flash memory could have the best endurance level compared with the MLC type storage. SLC storage usually comes with a 5-year OEM warranty (the actual warranty period depends on the original manufacturer). MLC storage only comes with a 1- to 3-year warranty. The major differences between SLC and MLC are: (a) The SLC NAND flash has a lifespan that is around 20 times that of an MLC, and (b) The price can differ by a factor of 4 to 5. The SLC type of storage is recommended for systems that are expected to have high reliability, and for applications that need to frequently write data to a storage medium.

Terabytes Written (TBW)

TBW is the unit used to evaluate SSD endurance. In actual applications, storage is used for routine operations and data access. Therefore the physical P/E cycle is not appropriate for describing the total rewritable data capacity. The management efficiency of the storage controller also affects the total rewritable data capacity result. For these reasons, Joint Electron Device Engineering Council

(JEDEC) has defined a standard for SSD endurance evaluation called JESD218, which uses TBW to measure the endurance of the storage memory. By referring to this TBW value, users can easily estimate the storage specification and select a suitable storage for real-life use cases. For example, when routine operations need a maximum of 20 GB and the expected storage lifespan is 3 years, the total rewritable data demand would be 21.9 TBW (20 GB x 365 x 3). In this case, a storage that has more than 21.9 TBW will meet the requirement. We recommend selecting a storage media with a TBW that is greater than the calculated value.

4. Declaration for Liability Exclusion

The specifications, warranty terms, and liability of items listed in this guide are the sole responsibility of the original manufacturers. Moxa does not take any responsibility in this regard. Please visit the manufacturers' official websites for up-to-date product information before purchasing the components.

5. Compatible Components

Peripheral components that have been tested and found suitable for use with the RNAS-1200 series of computers are listed in this section. The following table lists the Test Codes and their descriptions:

Test Code	Description
A	The component passed ambient temperature verification
B	The component passed EN50155 T1 verification
C	The component passed EN50155 TX verification
D	Component has not been tested, but shares materials and design with another component that has been verified.

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HDD						
Vendor	**Storage Size**	**Moxa's PN**	**Vendor's MPN**	**Controller**	**Firmware**	**Condition Code**
HGST	100 GB	N/A	HEJ421010G9SA00	N/A	N/A	B, C
HGST	250 GB	N/A	HCC545025A7E380	N/A	N/A	D
HGST	250 GB	N/A	HCC545025A7E680	N/A	N/A	D
HGST	320 GB	N/A	HCC545032A7E380	N/A	N/A	D
HGST	320 GB	N/A	HCC545032A7E680	N/A	N/A	D
HGST	500 GB	N/A	HCC545050A7E380	N/A	N/A	D
HGST	500 GB	N/A	HCC545050A7E680	N/A	N/A	D
HGST	500 GB	N/A	HCC547550A9E380	N/A	N/A	D
HGST	500 GB	N/A	HTS725050A7E630 / 0J38075	N/A	N/A	A
HGST	640 GB	N/A	HCC541064A9E680	N/A	N/A	D
HGST	640 GB	N/A	HCC547564A9E380	N/A	N/A	D
HGST	640 GB	N/A	HTS541064A9E680	N/A	N/A	D
HGST	640 GB	N/A	HTS541064A9E681	N/A	N/A	D
HGST	750 GB	N/A	HCC541075A9E680	N/A	N/A	D
HGST	750 GB	N/A	HCC547575A9E380	N/A	N/A	D
HGST	750 GB	N/A	HTS541075A9E680	N/A	N/A	D
HGST	750 GB	N/A	HTS541075A9E681	N/A	N/A	D
HGST	1 TB	N/A	HTS721010A9E630 / 0J22423	N/A	N/A	A
HGST	1 TB	N/A	HCC541010A9E680	N/A	N/A	A
HGST	1 TB	N/A	HCC541010A9E680	N/A	N/A	B
HGST	1 TB	N/A	HTE541010A9E680	N/A	N/A	D
HGST	1 TB	N/A	HTS541010A9E680	N/A	N/A	A
HGST	1 TB	N/A	HTS541010A9E681	N/A	N/A	D
Samsung	2TB	N/A	ST2000LM003	N/A	N/A	A
Seagate	500 GB	N/A	ST9500325AS	N/A	N/A	B
TOSHIBA	100 GB	N/A	MK1060GSC	N/A	N/A	C
TOSHIBA	500 GB	N/A	MK5061GSYN	N/A	N/A	B
WD	500 GB	N/A	WD5000BUCT	N/A	N/A	B
WD	500 GB	N/A	WD5000LPVT	N/A	N/A	B
WD	750 GB	N/A	WD7500BPKT	N/A	N/A	A
WD	1 TB	N/A	WD10JPVT	N/A	N/A	A
WD	1 TB	N/A	WD10JUCT	N/A	N/A	A
WD	1 TB	N/A	WD10SPCX	N/A	N/A	A