Moxa Inc.
Fl.4, No. 135, Lane 235, Baoqiao Rd. Xindian Dist.,
New Taipei City 23145, Taiwan, R.O.C.
TEL: 02-8919-1230
FAX: 02-8919-1231
Email: info@moxa.com
www.moxa.com

IA3341 Series
Component Compatibility Guide

A list of peripheral components suitable for use with IA3341 series computers

2015/07/07 V1.1

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Technical Support Contact Information

www.moxa.com/support

Moxa Americas

Toll-free: 1-888-669-2872

Tel: +1-714-528-6777

Fax: +1-714-528-6778

Moxa China (Shanghai office)

Toll-free: 800-820-5036

Tel: +86-21-5258-9955

Fax: +86-21-5258-5505

Moxa Europe

Tel: +49-89-3 70 03 99-0

Fax: +49-89-3 70 03 99-99

Moxa Asia-Pacific

Tel: +886-2-8919-1230

Fax: +886-2-8919-1231

Moxa India

Tel: +91-80-4172-9088

Fax: +91-80-4132-1045

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1. Introduction

The hardware components listed in this document have either been proven to provide up-to-spec performance when used with the Moxa IA3341 series of embedded computers, or which share basic design features with such components.

As Moxa computers come with different peripheral options and are engineered to differing hardware specifications, compatibility issues may sometimes arise. When paired with Moxa's IA3341 series of embedded computers, peripherals from one manufacturer may not work as well as those made by another. For this reason, Moxa provides this list of compatible components, so that users can be certain to get the reliability they expect from Moxa's IA3341 series.

2. Testing Methods

To validate a component as meeting Moxa standards of quality and environmental tolerances, five key compatibility tests may be run:

- Ambient Temperature Burn-In
- Low Temperature Hard Starts
- Heat/Humidity Burn-In
- Cyclic High-Low Temperature Burn-in
- Vibration Test

Ambient Temperature Burn-in

Components are mounted in an IA3341 computer and run through a series of stress tests at an ambient temperature of around 25˚C for a specified period of time. Test periods are determined according to the class of peripherals being tested.

Low Temperature Hard Start

Components are mounted in an unpowered IA3341 computer and then the system is booted up from an extremely low temperature. The designated temperature depends on the model being tested.

Heat/Humidity Burn-in

Components are mounted in an IA3341 computer, placed in a temperature- and humidity-controlled enclosure, and then run through the burn-in test for a specific time. The temperature, humidity, and time targets vary depending on model specification.

Cyclic High-Low Temperature Burn-in

Components are mounted in an IA3341 computer, placed in a temperature controlled enclosure, and then put through the burn-in test as temperatures are cycled from very high to very low and back again over a specified period of time. The target temperatures and time vary depending on model specifications.

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Vibration Test

Components are mounted in an IA3341 computer, which is bound in an electromagnetic vibrator, and then run through random vibration tests about three axes: longitudinal, transverse, and vertical. The vibration tests are compliant with EN50155/IEC61373 vibration standards.

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 components related to storage endurance and life time are NAND Flash memory and NAND Flash controller.

NAND Flash memory endurance

Any NAND Flash memory has its physical program and erase (P/E) limitation, and we can specifically use the P/E cycle as well as the so-called erase count to identify it. For instance, SLC (Single level cell) flash memory has a 60,000 P/E cycle, MLC (Multi-level cell) flash memory has a 3,000 P/E cycle, and TLC NAND Flash memory has up to a 1,000 P/E cycle. Each type of flash memory has different endurance, which is why the storage life time is based on flash memory type and storage that uses SLC type flash memory could have the best endurance compared to MLC type storage. SLC storage usually supports a 5-year OEM warranty (the actual warranty period depends on the original manufacturer). Comparatively, MLC storage only supports a 1- to 3-year warranty. The major difference between SLC and MLC is that SLC NAND Flash has around 20 times lifespan of MLC, and the price may differ by a factor of 4 to 5. For systems that are expected to be highly reliable and work without fail 24 hours a day, SLC type storage is recommended, especially when the storage is running an OS and is required to provide service for a longer time, or for applications that need to frequently write data to the storage medium.

TBW

The term TeraBytes Written, abbreviated as TBW, means something similar to endurance. TBW is defined by JEDEC based on the program unit to identify its storage life time. In actual applications, storage is used for routine operations and data access. The physical P/E cycle is not appropriate for describing total rewritable data capacity, and the management efficiency of the storage controller also affects the total rewritable data capacity result. For these reasons, JEDEC defined a standard, JESD218, for SSD endurance evaluation, and uses TBW to describe the test result. By referring to this TBW value, users can easily estimate demand and select suitable storage for real-use cases. For example, when routine operations need a maximum of 20 GB and the expected storage life time is 3 years, the total rewritable data demand would be 21.9 TBW (20GB x 365 x 3). In this case, you could choose storage that has more than 21.9 TBW to match this demand; we recommend selecting a TBW that is greater than the calculated value.

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Declaration for Liability Exclusion in the CCG

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

4. Compatible Components

Check the following table for validation condition codes and their description.

Test Code	Description
A	The component passed ambient temperature verification
B	The component passed low temperature verification
C	The component passed heat/humidity verification
D	The component passed cyclic high-low temperature verification
E	The component has not been tested, but shares materials and design with another component that has been verified.
F	The component passed vibration verification

The following list shows which peripherals have been tested, and for what specifications, on Moxa's embedded computers.

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SD

Vendor	Size	Moxa's PN	Vendor's PN	Flash Brand	Flash Spec	Controller	Firmware	Warranty years	Warranty exclusion	Test Codes
Apacer	32 GB	N/A	AP-ISD32GCD4A-2CM	Micron	MLC	Phison	N/A	2 years	Endurance > 3,000	A
Apacer	16 GB	N/A	AP-ISD16GCS4A-2CM	Micron	MLC	Phison	N/A	2 years	Endurance > 3,000	E
Apacer	8 GB	N/A	AP-ISD08GCS4A-2CM	Micron	MLC	Phison	N/A	2 years	Endurance > 3,000	E
Apacer	4 GB	N/A	AP-ISD04GCS4A-2CM	Micron	MLC	Phison	N/A	2 years	Endurance > 3,000	E
Apacer	32 GB	N/A	AP32GSDHC10U1-R	Toshiba	MLC	Phison	N/A	2 years	Endurance > 3,000	A
Apacer	16 GB	N/A	AP16GSDHC10U1-R	Toshiba	MLC	Phison	N/A	2 years	Endurance > 3,000	E
Apacer	8 GB	N/A	AP8GSDHC10U1-R	Toshiba	MLC	Phison	N/A	2 years	Endurance > 3,000	E
Apacer	32 GB	N/A	AP32GSDHC10U2-R	Toshiba	MLC	Phison	N/A	2 years	Endurance > 3,000	A
Apacer	16 GB	N/A	AP16GSDHC10U2-R	Toshiba	MLC	Phison	N/A	2 years	Endurance > 3,000	E
Silicon Power	1 GB	N/A	SP001GBSDI000W201T	Toshiba	SLC	ITE	N/A	3 years	N/A	A
ADATA	8 GB	N/A	ASDH8GUICL10-R	N/A	N/A	N/A	N/A	lifetime	N/A	E
ADATA	16 GB	N/A	ASDH16GUICL10-R	N/A	N/A	N/A	N/A	lifetime	N/A	E
ADATA	32 GB	N/A	ASDH32GUICL10-R	N/A	N/A	N/A	N/A	lifetime	N/A	A
Transcend	8 GB	N/A	TS8GSDU1	N/A	MLC	SM2702BA	N/A	2 years	N/A	E
Transcend	8 GB	N/A	TS8GSDHC10U1	N/A	MLC	SM2702BA	N/A	2 years	N/A	E
Transcend	16 GB	N/A	TS16GSDU1	N/A	MLC	SM2702BA	N/A	2 years	N/A	E
Transcend	16 GB	N/A	TS16GSDHC10U1	N/A	MLC	SM2702BA	N/A	2 years	N/A	E
Transcend	32 GB	N/A	TS32GSDU1	N/A	MLC	SM2702BA	N/A	2 years	N/A	A
Transcend	32 GB	N/A	TS32GSDHC10U1	N/A	MLC	SM2702BA	N/A	2 years	N/A	A