

V2400 Series

Component Compatibility Guide

A list of peripheral components suitable for use with the V2400 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 V2400 series of embedded computers, or computers that share basic design features with the V2400 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 V2400 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 V2400 series-compatible components, so that users can be certain of a reliable performance from the V2400 series, when used with the components listed in this document.

2. Testing Methods

To validate that a component meets the Moxa standards for quality and environmental tolerance, the following five key compatibility tests are 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

The component is mounted on to a V2400 computer and put through a series of stress tests at an ambient temperature of around 25°C, for a specified period of time. Test periods are determined based on the class of peripherals being tested.

Low Temperature Hard Start

The component is mounted on to an unpowered V2400 computer and then the system is booted up at an extremely low temperature. The designated temperature depends on the computer model being tested.

Heat/Humidity Burn-In

The components is mounted on to a V2400 computer, placed in a temperature- and humidity-controlled enclosure, and then put through the burn-in test for a specified period of time. The temperature, humidity, and time targets vary depending on the specification of the computer model used in the test.

Cyclic High-Low Temperature Burn-In

The components is mounted on to a V2400 computer, placed in a temperature controlled enclosure, and then put through the burn-in test as the temperature are cyclically varied from very high to very low and back again, over a specified period of time. The target temperature range and the duration of the test can vary depending on the specification of the computer model used in the test.

Vibration Test

The component is mounted on to a V2400 computer that is bound inside an electromagnetic vibrator, and then put through random vibration tests along three orthogonal axes: longitudinal, transverse, and vertical. The vibration tests are compliant with the 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 electrical components are NAND-Flash memory and NAND-Flash controller, which impact the storage endurance and lifespan of storage media.

NAND-Flash Memory Endurance

All NAND-Flash memories have a limit on their physical Program and Erase (P/E). The P/E cycle as well as the erase count can be used to determine this limit. For example, 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 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 application 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-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.

3. 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.

4. Compatible Components

Peripheral components that have been tested and found suitable for use with the V2400 series of computers are listed in this section. Check the following table for test codes and their descriptions:

Test Code	Description
A	The component has passed the ambient temperature verification test
B	The component has passed the low temperature verification test
C	The component has passed the heat/humidity verification test
D	The component has passed the cyclic high-low temperature verification test
E	The component has not been tested, but is similar to another component that has been tested in terms of its material and design.
F	The component has passed the vibration verification test

DOM										
Vendor	Size	Moxa's PN	Vendor's PN	Flash Brand	Flash Spec	Controller	Firmware	Warranty years	Warranty exclusion	Test Codes
InnoDisk	16 GB	N/A	DE4H-16GD31W1DT-A31	Micron	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
InnoDisk	2 GB	N/A	DE4H-02GD31W1D-A31	Samsung	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
InnoDisk	2 GB	N/A	DE4H-02GD31W1DR-A31	Samsung	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
InnoDisk	4 GB	N/A	DE4H-04GD31W1D-A31	Samsung	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
InnoDisk	4 GB	N/A	DE4H-04GD31W1DR-A31	Samsung	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
InnoDisk	8 GB	N/A	DE4H-08GD31W1D-A31	Samsung	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
InnoDisk	8 GB	N/A	DE4H-08GD31W1DT-A31	Micron	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
Memoright	1 GB	N/A	MRDEM2B001GB7P11A0	Samsung	SLC	SM2232	K0407	5 years	N/A	E
Memoright	2 GB	N/A	MRDEM2B002GB8P11A0	Samsung	SLC	SM2232	K1124	5 years	N/A	B, C, D
Memoright	4 GB	N/A	MRDEM2B004GB0P11A0	Samsung	SLC	SM2232	K0407	5 years	N/A	B, C, D
Memoright	8 GB	N/A	MRDEM2B008GN2P11A0	Micron	SLC	SM2232	K0407	5 years	N/A	B, C, D
Memoright	16 GB	N/A	MRDEM2B016GN4P11A0	Micron	SLC	N/A	N/A	5 years	N/A	B, C, D
Memoright	32 GB	N/A	MRDEM2B032GN5P11A0	Micron	SLC	SM2232	K0407	5 years	N/A	B, C, D
Transcend	1 GB	N/A	TS1GDOM44V-S	Samsung	SLC	SM223 AC	N/A	2 years	N/A	E
Transcend	2 GB	N/A	TS2GPTM510-44V	Samsung	SLC	SM2231 AD	N/A	2 years	N/A	E
Transcend	4 GB	N/A	TS4GPTM510-44V	Samsung	SLC	SM2231 AD	N/A	2 years	N/A	E
Transcend	8 GB	N/A	TS8GPTM510-44V	Samsung	SLC	SM2231 AD	N/A	2 years	N/A	A

CF

Vendor	Size	Moxa's PN	Vendor's PN	Flash Brand	Flash Spec	Controller	Firmware	Warranty years	Warranty exclusion	Test Codes
InnoDisk	4 GB	N/A	DC1M-04GD31W1DR	N/A	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
Transcend	128 MB	N/A	TS128MCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	256 MB	N/A	TS256MCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	512 MB	N/A	TS512MCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	1 GB	N/A	TS1GCF133	SanDisk/ Micron	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	1 GB	N/A	TS1GCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	2 GB	N/A	TS2GCF133	SanDisk/ Micron	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	2 GB	N/A	TS2GCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	4 GB	N/A	TS4GCF133	SanDisk/ Micron	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	4 GB	N/A	TS4GCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	A
Transcend	8 GB	N/A	TS8GCF400	SanDisk/ Micron	MLC	SM2236AC	N/A	2 years	N/A	E
Transcend	8 GB	N/A	TS8GCF133	SanDisk/ Micron	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	8 GB	N/A	TS8GCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	16 GB	N/A	TS16GCF1000	SanDisk/ Micron	MLC	SM2232ENAC	N/A	2 years	N/A	E
Transcend	16 GB	N/A	TS16GCF400	SanDisk/ Micron	MLC	SM2236AC	N/A	2 years	N/A	E
Transcend	16 GB	N/A	TS16GCF133	SanDisk/ Micron	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	16 GB	N/A	TS16GCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	32 GB	N/A	TS32GCF1000	SanDisk/ Micron	MLC	SM2236AC	N/A	2 years	N/A	A
Transcend	32 GB	N/A	TS32GCF400	SanDisk/ Micron	MLC	SM2236AC	N/A	2 years	N/A	A
Transcend	32 GB	N/A	TS32GCF133	SanDisk/ Micron	MLC	SM2232AD	N/A	2 years	N/A	E
Transcend	32 GB	N/A	TS32GCF200I	Samsung	MLC	SM2232AD	N/A	2 years	N/A	A
Apacer	32 GB	N/A	AP-CF032GL9FS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	A
Apacer	16 GB	N/A	AP-CF016GL9FS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	E
Apacer	8 GB	N/A	AP-CF008GL9FS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	E
Apacer	4 GB	N/A	AP-CF004GL9FS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	E
Apacer	32 GB	N/A	AP-CF032GLAFS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	A
Apacer	16 GB	N/A	AP-CF016GLAFS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	E
Apacer	8 GB	N/A	AP-CF008GLAFS-NR	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	E
Silicon Power	2GB	N/A	SP002GBCFI000V711T	Toshiba	SLC	SMI	N/A	3 years	N/A	A
Silicon Power	1GB	N/A	SP001GBCFI000V711T	Toshiba	SLC	SMI	N/A	3 years	N/A	E
Silicon Power	4GB	N/A	SP004GBCFI000V602T	Toshiba	SLC	SMI	N/A	3 years	N/A	A
Silicon Power	2GB	N/A	SP002GBCFI000V601T	Toshiba	SLC	SMI	N/A	3 years	N/A	E
Silicon Power	1 GB	N/A	SP001GBCFI000V601T	Toshiba	SLC	SMI	N/A	3 years	N/A	E
InnoDisk	32 GB	1352010322110	DECFC-32GD53RC1DC	Toshiba	MLC	N/A	N/A	2 years	Endurance > 3,000	B, C

SSD

Vendor	Size	Moxa's PN	Vendor's PN	Flash Brand	Flash Spec	Controller	Firmware	Warranty years	Warranty exclusion	Test Codes
InnoDisk	16 GB	N/A	D2ST-16GJ12W1	N/A	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D
Memoright	32 GB	N/A	MRSAJ6Q032GN225I00	Micron	SLC	MRV1.1.6	JMF612	5 years	N/A	B, C, D
Memoright	32 GB	N/A	MRSAJ9A032GTT25C00	Toshiba	MLC	MRV1.71b	JMF667	3 years	Endurance > 3,000	B, C, D
Memoright	32 GB	N/A	MRSAJ6C032GC125C00	Micron	MLC	JMF612	MRV1.1.5	3 years	Endurance > 3,000	E
Memoright	32 GB	N/A	MRSAJ9A032GTT25C00	Toshiba	MLC	JMF667	MRV1.71b	3 years	Endurance > 3,000	E
Memoright	32 GB	N/A	MRSAJ6C032GC125S00	Micron	MLC	JMF612	MRV1.1.5	3 years	Endurance > 3,000	E
Memoright	60 GB	N/A	MRSAD4B060GC225S00	N/A	MLC	N/A	N/A	3 years	Endurance > 3,000	E
Memoright	64 GB	N/A	MRSAJ6C064GC125C00	Micron	MLC	MRV1.1.5	JMF612	3 years	Endurance > 3,000	B, C, D
Memoright	64 GB	N/A	MRSAJ6Q064GN225I00	Samsung	SLC	MRV1.1.6	JMF612	5 years	N/A	B, C, D
Memoright	64 GB	N/A	MRSAJAA064GTW25C00	Toshiba	MLC	MRV1.71b	JMF667	3 years	Endurance > 3,000	B, C, D
Memoright	64 GB	N/A	MRSAJ6C064GC125S00	Micron	MLC	JMF612	MRV1.1.5	3 years	Endurance > 3,000	E
Memoright	120 GB	N/A	MRSAD4B120GC325S00	Micron	MLC	SF2281	MRV 1.50S	3 years	Endurance > 3,000	E
Memoright	128 GB	N/A	MRSAJ6C128GC225S00	Micron 25nm	MLC	MRV1.1.5	JMF612	3 years	Endurance > 3,000	B, C, D
Memoright	240 GB	N/A	MRSAD4B240GC325S00	Micron 25nm	MLC	MRV1.5.0	Sandforce	3 years	Endurance > 3,000	B, C, D
Transcend	16 GB	N/A	TS16GSSD500	Samsung	SLC	JM616	120820	2 years	N/A	E
Transcend	32 GB	N/A	TS32GSSD500	Samsung	SLC	JM616	120820	2 years	N/A	E
Transcend	64 GB	N/A	TS64GSSD320	SanDisk/ Micron	MLC	SF2281	N/A	2 years	N/A	E
Transcend	64 GB	N/A	TS64GSSD500	Samsung	SLC	JM616	120820	2 years	N/A	A
Transcend	128 GB	N/A	TS128GSSD320	SanDisk/ Micron	MLC	SF2281	N/A	2 years	N/A	E
Transcend	256 GB	N/A	TS256GSSD320	SanDisk/ Micron	MLC	SF2281	N/A	2 years	N/A	A
Apacer	64 GB	N/A	AP64GAS510SB	N/A	MLC	N/A	N/A	2 years	Endurance > 3,000	A
InnoDisk	16 GB	N/A	D2ST-16GJ12W1	N/A	SLC	N/A	N/A	5 years	Endurance > 60,000	F
InnoDisk	32 GB	N/A	DGS25-32GD67SC1QCP	Samsung	MLC	N/A	N/A	2 years	Endurance > 3,000	B, C, D
InnoDisk	32 GB	1352030322119	DGS25-32GD81SC1QCP	Toshiba	MLC	N/A	N/A	2 years	Endurance > 3,000	B, C
InnoDisk	16 GB	N/A	DES25-16GD06SWAQB	Toshiba	SLC	N/A	N/A	5 years	Endurance > 60,000	B, C, D

DRAM

Vendor	Size	Moxa's PN	Vendor's PN	Interface	Chip Brand	Speed	Test Codes
DSL	1 GB	1352110012031	D2SM64162XH30ABIS	DDR2	Micron	667	B, C, D
DSL	1 GB	1352110012040	D2SH28081XH30AB	DDR2	Hynix	667	B, C, D
DSL	1 GB	N/A	D2SP28081XH30ABIS	DDR2	ProMOS	667	B, C, D
DSL	1 GB	N/A	D2SP64162XH30AAIS	DDR2	ProMOS	667	B, C, D
DSL	2 GB	N/A	D2SP28082XH30ABIS	DDR2	ProMOS	667	B, C, D
DSL	2 GB	1352110022071	D2SM28082XH30ABIS	DDR2	Micron	667	B, C, D
DSL	2 GB	1352110022080	D2SH28082XH30AB	DDR2	Hynix	667	B, C, D
DSL	2 GB	N/A	D2SE28082XH30A	DDR2	ELPIDA	667	B, C, D
InnoDisk	2 GB	N/A	M2SK-2GPF2IJ6-B	DDR2	Hynix	667s	B, C, D
InnoDisk	1 GB	N/A	M2SJ-1GPF5W05-BA31	DDR2	ProMOS	667	B, C, D
InnoDisk	1 GB	N/A	M2SK-1GPF5IJ6-B	DDR2	ProMOS	667	B, C, D
InnoDisk	1 GB	N/A	M2SK-1GPF5IJ6-BA31	DDR2	ProMOS	667	B, C, D
InnoDisk	2 GB	N/A	M2SJ-2GPF2W05-B	DDR2	ProMOS	667	B, C, D
InnoDisk	2 GB	N/A	M2SK-2GPF2IJ6-BA31	DDR2	ProMOS	667	B, C, D
Unigen	1 GB	N/A	UG12T6400L8SU-6AP	DDR2	Hynix	667	B, C, D
Unigen	1 GB	N/A	UG12T6400M8SU-6AS	DDR2	Hynix	667	B, C, D
Unigen	1 GB	N/A	UG12T6408M8SU-6AS	DDR2	Micron	667	B, C, D
Unigen	1 GB	N/A	UG12T6408M8SU-6AS	DDR2	ProMOS	667	B, C, D
Unigen	2 GB	N/A	UG25T6408M8SU-6AP	DDR2	ProMOS	667	B, C, D
Unigen	2 GB	N/A	UG25T6400M8SU-8CP-000-00	DDR2	Hynix	800	B, C, D
Transcend	1 GB	N/A	TS128MSQ64V8U	DDR2	Samsung	800	E
Transcend	2 GB	N/A	TS256MSQ64V8U	DDR2	Samsung	800	A

HDD						
Vendor	Size	Moxa's PN	Vendor's PN	Controller	Firmware	Test Codes
HGST	1 TB	N/A	HCC541010A9E680	N/A	N/A	A
HGST	1 TB	N/A	HTS541010A9E680	N/A	N/A	A
WD	750 GB	N/A	WD7500BPKT	N/A	N/A	A
WD	1 TB	N/A	WD10JUCT	N/A	N/A	A
WD	1 TB	N/A	WD10JPVT	N/A	N/A	A
WD	1 TB	N/A	WD10SPCX	N/A	N/A	A
Samsung	2 TB	N/A	ST2000LM003	N/A	N/A	A
HGST	1 TB	N/A	HTS721010A9E630 / OJ22423	N/A	N/A	A
HGST	500 GB	N/A	HTS725050A7E630 / OJ38075	N/A	N/A	A
HGST	1 TB	N/A	HTS541010A9E650	N/A	N/A	A