

JEDEC STANDARD

Byte Addressable Energy Backed Interface

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Foreword

This standard has been prepared by JEDEC. The purpose of this standard is definition of an energy backed byte addressable function on a nonvolatile dual in-line memory module (NVDIMM). This standard defines the feature set and commands implemented by the energy backed byte addressable function on the NVDIMM.

Introduction

NVDIMM is a DDR-based memory module that can be integrated into a standard platform. An Energy Backed Byte Addressable Function on a NVDIMM is designed to preserve data in the event of the power failure. An Energy Backed Byte Address Function is backed by a combination of SDRAM and non-volatile memory (e.g., NAND flash) on the NVDIMM. It operates at DDR speeds and can provide persistent storage by backing up the SDRAM contents into the non-volatile memory in the event of a power failure. This is made possible by an Energy Source (e.g., super-capacitor) which maintains charge on the module enabling back-up of data from SDRAM to the non-volatile memory, providing a storage-class memory solution.

To be able to provide interoperability and the ability for platform and platform software (e.g., BIOS) to support NVDIMMs from various manufacturers, standardization of the host to module interface, discovery mechanism, the feature set and command operations are required, as described in this document.

BYTE ADDRESSABLE ENERGY BACKED INTERFACE

(From JEDEC Board Ballot JCB-15-44, formulated under the cognizance of the JC-45.6 Subcommittee on Hybrid Modules.)

1 Scope

This standard specifies the host and device interface for a DDR4 DIMM interface module that achieves non-volatility by copying SDRAM contents into non-volatile memory when Host power is lost using an Energy Source managed by either the module or the Host.

Although this standard is targeted towards DDR4 NVDIMM only, it does not preclude adoption of this standard by other implementations (e.g., DDR3 NVDIMM).

2 Normative References

The following normative documents contain provisions that, through reference in this text, constitute provisions of this standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

DDR4 SPD Contents NVDIMM Revision 0.5
 EE1004 and TSE2004 Device Specification SPD4_01_06
 I²C Bus Specification Revision 4
 System Management Bus (SMBus) Specification Version 2.0

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in the document included in clause 2 “Normative References” and the following apply:

3.1 Acronyms

DDR3	Double Data Rate version 3
DDR4	Double Data Rate version 4
NVM	Non-Volatile Memory
DIMM	Dual In-line Memory Module
NVDIMM	Non-volatile Dual In-line Memory Module
SPD	Serial Presence Detect
I ² C	Inter-IC
ES	Energy Source
SDRAM	Synchronous Dynamic Random Access Memory