

# Industrial SD Card

## 3SE3

**Customer:** \_\_\_\_\_  
**Customer**  
**Part**  
**Number:** \_\_\_\_\_  
**Innodisk**  
**Part**  
**Number:** \_\_\_\_\_  
**Innodisk**  
**Model Name:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

| Innodisk Approver | Customer Approver |
|-------------------|-------------------|
|                   |                   |

**Total Solution For  
Industrial Flash Storage**

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## REVISION HISTORY

| Revision        | Description                                                         | Date        |
|-----------------|---------------------------------------------------------------------|-------------|
| Preliminary 0.1 | First release                                                       | Nov, 2020   |
| V1.0            | Update Capacity information                                         | Jan, 2021   |
| V2.0            | Update TBW ,PNM Rule and ROHS information                           | Feb, 2021.  |
| V2.1            | Operating temperature correction                                    | July 2022   |
| V2.2            | Update NAND Description                                             | Oct., 2023  |
| V2.3            | Amend the description pertaining to the capacity                    | March, 2024 |
| V2.4            | Update speed class UHS-1 Description, SMART information and CID/CSD | March, 2024 |

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# 1. Product Overview

## 1.1 Introduction of Innodisk Industrial SD 3SE3

Innodisk 3SE3 is an industrial-grade SD card solution with an integrated industrial controller, which is designed for embedded applications. With enhanced flash technologies and a powerful configurable BCH ECC engine, SD 3SE3 can achieve high-speed data transfer rates.

Innodisk industrial SD 3SE3 provides a wide range of capacities from 4GB to 32GB with SLC NAND Flash, and is fully compliant with SD3.0 and SD2.0 specifications.

Innodisk industrial SD 3SE3 are specifically designed for industrial PC and embedded applications for high performance. With its low power consumption and the above mentioned features, Innodisk industrial SD 3SE3 can be applied for industrial automation, SBC (single-board computer), medical equipment, infotainment, and mobile applications.

## 1.2 Product View and Models

Innodisk Industrial SD 3SE3 is available from 4GB up to 32GB capacities within SLC Flash IC.



**Figure 1: Innodisk Industrial SD 3SE3**

## 1.3 SD 3.0 Interface

Innodisk Industrial SD 3SE3 support SD 3.0 interface, and backward compliant to SD 2.0 interface.

## 2. Product Specifications

### 2.1 Capacity and Device Parameters

Innodisk Industrial SD card device parameters are shown in Table 1.

**Table 1: Device parameters**

| Capacity | LBA      |
|----------|----------|
| 4GB      | 7929856  |
| 8GB      | 15859712 |
| 16GB     | 31719424 |
| 32GB     | 63438848 |

### 2.2 Performance

Burst Transfer Rate: up to 104 MB/s in SD 3.0 SDR104

**Table 2: Performance**

| Capacity                           | 4GB          | 8GB          | 16GB         | 32GB         |
|------------------------------------|--------------|--------------|--------------|--------------|
| <b>Class</b>                       | 10           | 10           | 10           | 10           |
| <b>UHS Class</b>                   | U1           | U1           | U1           | U3           |
| <b>Sequential Read<br/>(max.)</b>  | 37<br>MB/sec | 37<br>MB/sec | 37<br>MB/sec | 37<br>MB/sec |
| <b>Sequential Write<br/>(max.)</b> | 28<br>MB/sec | 28<br>MB/sec | 28<br>MB/sec | 30<br>MB/sec |

Note: Base on CrystalDiskMark 6.0.2 with file size 1000MB

### 2.3 Electrical Specifications

#### 2.3.1 Power Requirement

**Table 3: Industrial SD card 3SE3 Power Requirement**

| Item          | Symbol          | Rating    | Unit |
|---------------|-----------------|-----------|------|
| Input voltage | V <sub>IN</sub> | 2.7V~3.6V | V    |

#### 2.3.2 Power Consumption

**Table 4: Power Consumption**

| Mode        | Power Consumption (mA) |      |      |      |
|-------------|------------------------|------|------|------|
| Capacity    | 4GB                    | 8GB  | 16GB | 32GB |
| Read (rms)  | 102                    | 103  | 108  | 113  |
| Write (rms) | 108                    | 107  | 109  | 123  |
| Peak (max)  | 200                    | 184  | 205  | 192  |
| Idle (rms)  | 0.1                    | 0.12 | 0.16 | 0.22 |

## 2.4 Environmental Specifications

### 2.4.1 Temperature Ranges

**Table 5: Temperature range for Industrial SD card**

| Temperature | Range                            |
|-------------|----------------------------------|
| Operating   | Standard Grade: -25°C to +85°C   |
|             | Industrial Grade: -40°C to +85°C |
| Storage     | -55°C to +95°C                   |

### 2.4.2 Humidity

Relative Humidity: 10-95%, non-condensing

### 2.4.3 Shock and Vibration

**Table 6: Shock/Vibration Testing for Industrial SD card**

| Reliability      | Test Conditions                 | Reference Standards |
|------------------|---------------------------------|---------------------|
| Vibration        | 7 Hz to 2K Hz, 20G, 3 axes      | IEC 60068-2-6       |
| Mechanical Shock | Duration: 0.5ms, 1500 G, 3 axes | IEC 60068-2-27      |

### 2.4.4 Mean Time between Failures (MTBF)

Table 7 summarizes the MTBF prediction results for various Industrial SD card configurations. The analysis was performed using a RAM Commander™ failure rate prediction.

- **Failure Rate:** The total number of failures within an item population, divided by the total number of life units expended by that population, during a particular measurement interval under stated condition.
- **Mean Time between Failures (MTBF):** A basic measure of reliability for repairable items: The mean number of life units during which all parts of the item perform within their specified limits, during a particular measurement interval under stated conditions.

**Table 7: Industrial SD Card MTBF**

| Product                     | Condition                 | MTBF (Hours) |
|-----------------------------|---------------------------|--------------|
| Innodisk Industrial SD 3SE3 | Telcordia SR-332 GB, 25°C | >3,000,000   |

## 2.5 CE and FCC Compatibility

Industrial SD card conforms to CE and FCC requirements.

## 2.6 RoHS Compliance

Industrial SD card is fully compliant with RoHS directive.

## 2.7 Reliability

| Parameter                                   | Value                 |
|---------------------------------------------|-----------------------|
| Read Cycles                                 | Unlimited Read Cycles |
| Flash endurance                             | 60,000 P/E cycles     |
| Wear-Leveling Algorithm                     | Support               |
| Bad Blocks Management                       | Support               |
| Error Correct Code                          | Support               |
| TBW(Sequential Write)                       | SLC                   |
| 4GB                                         | 213                   |
| 8GB                                         | 426                   |
| 16GB                                        | 852                   |
| 32GB                                        | 1704                  |
| *TBW Base on Industrial SD 3.0 SLC solution |                       |

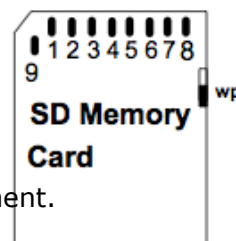
## 2.8 Transfer Mode

Industrial SD Card 3SE3 support following transfer mode:

SD 3.0 / SD 2.0

## 2.9 Pin Assignment

Innodisk Industrial SD Card 3SE3 compliant with standard SD Card SPEC., please refer to Table 8 for pin assignment.

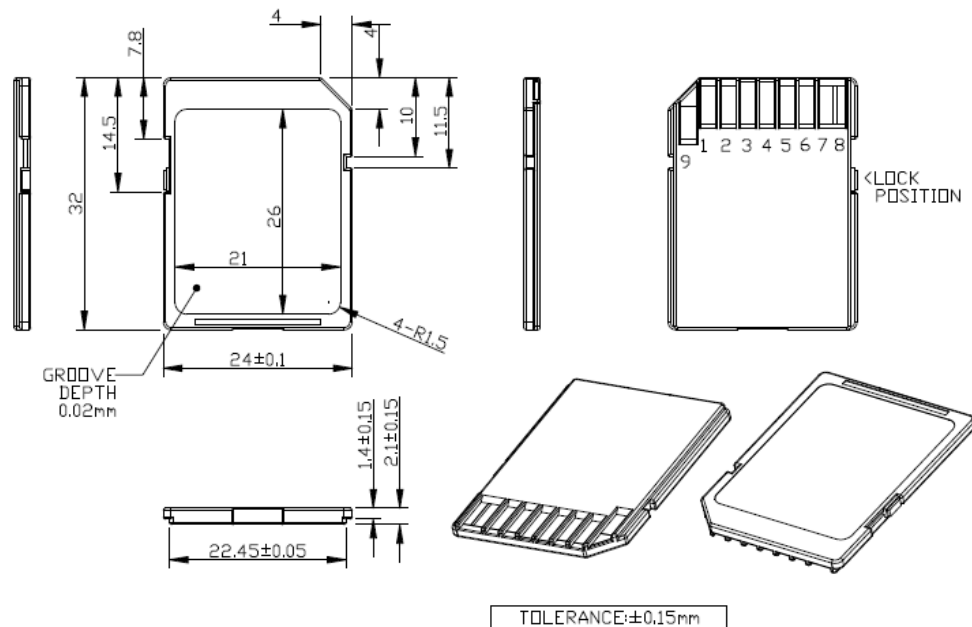


**Table 8: Industrial SD Card 3SE3 Pin Assignment**

| Pin # | SD Mode              |                     |                               | SPI Mode         |                   |                         |
|-------|----------------------|---------------------|-------------------------------|------------------|-------------------|-------------------------|
|       | Name                 | Type <sup>1</sup>   | Description                   | Name             | Type <sup>1</sup> | Description             |
| 1     | CD/DAT3 <sup>2</sup> | I/O/PP <sup>3</sup> | Card Detect/Data Line [Bit 3] | CS               | I <sup>3</sup>    | Chip Select (Neg. True) |
| 2     | CMD                  | I/O/PP              | Command/Response              | DI               | I                 | Data In                 |
| 3     | V <sub>SS1</sub>     | S                   | Supply voltage ground         | V <sub>SS</sub>  | S                 | Supply voltage ground   |
| 4     | V <sub>DD</sub>      | S                   | Supply voltage                | V <sub>DD</sub>  | S                 | Supply voltage          |
| 5     | CLK                  | I                   | Clock                         | SCLK             | I                 | Clock                   |
| 6     | V <sub>SS2</sub>     | S                   | Supply voltage ground         | V <sub>SS2</sub> | S                 | Supply voltage ground   |
| 7     | DAT0                 | I/O/PP              | Data Line [Bit 0]             | DO               | O/PP              | Data Out                |
| 8     | DAT1 <sup>4</sup>    | I/O/PP              | Data Line [Bit 1]             | RSV              |                   |                         |

|   |                   |        |                   |     |  |  |
|---|-------------------|--------|-------------------|-----|--|--|
| 9 | DAT2 <sup>5</sup> | I/O/PP | Data Line [Bit 2] | RSV |  |  |
|---|-------------------|--------|-------------------|-----|--|--|

## 2.10 Mechanical Dimensions



## 2.11 Assembly Weight

An Innodisk Industrial SD Card 3.0 within SLC flash ICs, 8GB's weight is 2 grams approx.

## 2.12 Seek Time

Innodisk Industrial SD Card is not a magnetic rotating design. There is no seek or rotational latency required.

## 2.13 Hot Plug

The SD Card support hot plug function and can be removed or plugged-in during operation.

## 2.14 NAND Flash Memory

Innodisk Industrial SD Card 3SE3 uses Single Level Cell (SLC) NAND flash memory, which is non-volatility, high reliability and high speed memory storage.

## 2.15 Card Identification Register (CID)

The Card IDentification (CID) register is 128 bits wide. It contains the card identification information used during the card identification phase. Every individual flash card shall have a unique identification number. The structure of the CID register is defined in the following table.

**Table 9: Industrial SD card 3SE3 CID**

| CID bit   | Width | Name                  | Field |
|-----------|-------|-----------------------|-------|
| [127:120] | 8     | Manufacturer ID       | MID   |
| [119:104] | 16    | OEM/Application ID    | OID   |
| [103:64]  | 40    | Product Name          | PNM   |
| [63:56]   | 8     | Product Revision      | PRV   |
| [55:24]   | 32    | Product Serial Number | PSN   |
| [23:20]   | 4     | Reserved              | ---   |
| [19:8]    | 12    | Manufacturing Date    | MDT   |
| [7:1]     | 7     | CRC7 check sum        | CRC   |
| [0]       | 1     | Not used, always '1'  | ---   |

## 2.16 Card Specific Data Register (CSD)

The Card-Specific Data register provides information on how to access the card contents. The CSD defines the data format, error correction type, maximum data access time, data transfer speed, whether the DSR register can be used etc. The programmable part of the register can be changed by CMD27.

**Table 10: Industrial SD card 3SE3 CSD (Version 2.0)**

| CSD bit   | Width | Name                                            | Field                | Value                        | Note               |
|-----------|-------|-------------------------------------------------|----------------------|------------------------------|--------------------|
| [127:126] | 2     | CSD Structure                                   | CSD_STRUCTURE        | 01 b                         | v.2.0 (>2GB card)  |
| [125:120] | 6     | Reserved                                        | ---                  | ---                          | ---                |
| [119:112] | 8     | Data read access time 1                         | (TAAC)               | 0E h                         |                    |
| [111:104] | 8     | Data read access time 2 in CLK cycle (NSA *100) | (NSAC)               | 00 h                         |                    |
| [103:96]  | 8     | Max. data transfer rate                         | (TRAN_SPEED)         | 32 h<br>5A h<br>0B h<br>2B h |                    |
| [95:84]   | 12    | Card command classes                            | CCC                  | 5F5h                         | (*1)               |
| [83:80]   | 4     | Max. read data block length                     | (READ_BLK_LEN)       | 9 h                          | 512bytes(*3)       |
| [79]      | 1     | Partial block read allowed                      | (READ_BLK_PARTIAL)   | 0 b                          | Not Supported (*3) |
| [78]      | 1     | Write block misalignment                        | (WRITE_BLK_MISALIGN) | 0 b                          | Not Supported (*3) |
| [77]      | 1     | Read block misalignment                         | (READ_BLK_MISALIGN)  | 0 b                          | Not Supported (*3) |
| [76]      | 1     | DSR implemented                                 | DSR_IMP              | 0 b                          | Not supported (*3) |
| [75:70]   | 6     | Reserved                                        | ---                  | 000000b                      | ---                |
| [69:48]   | 22    | Device size                                     | C_SIZE               | (*2)                         | (*2)               |

|         |   |                              |                    |       |                    |
|---------|---|------------------------------|--------------------|-------|--------------------|
| [47]    | 1 | Reserved                     | ---                | 0 b   | ---                |
| [46]    | 1 | Erase single block enable    | (ERASE_BLK_EN)     | 1 b   | Allowed (*3)       |
| [45:39] | 7 | Erase sector size            | (SECTOR_SIZE)      | 7Fh   | 64KB (*3)          |
| [38:32] | 7 | Write protect group size     | (WP_GRP_SIZE)      | 00h   | (*3)               |
| [31]    | 1 | Write protect group enable   | (WP_GRP_ENABLE)    | 0 b   | Not Supported (*3) |
| [30:29] | 2 | Reserved                     | ---                | ---   | ---                |
| [28:26] | 3 | Write speed factor           | (R2W_FACTOR)       | 010 b | 4X (*3)            |
| [25:22] | 4 | Max. write data block length | (WRITE_BL_LEN)     | 9 h   | 512bytes (*3)      |
| [21]    | 1 | Partial block write allowed  | WRITE_BL_PARTIAL   | 0 b   | Not Supported (*3) |
| [20:16] | 5 | Reserved                     | ---                | ---   | ---                |
| [15]    | 1 | File format group            | (FILE_FORMAT_GRP)  | 0 b   | HD like FAT (*3)   |
| [14]    | 1 | Copy flag                    | COPY               | 0 b   | Not copied         |
| [13]    | 1 | Permanent write protection   | PERM_WRITE_PROTECT | 0 b   | Not protected      |
| [12]    | 1 | Temporary write protection   | TMP_WRITE_PROTECT  | 0 b   | Not protected      |
| [11:10] | 2 | File format                  | (FILE_FORMAT)      | 00 b  | HD like FAT (*3)   |
| [9:8]   | 2 | Reserved                     | ---                | 00 b  | ---                |
| [7:1]   | 7 | CRC                          | CRC                | ---   | ---                |
| [0]     | 1 | Not used, always '1'         | ---                | 1 b   | ---                |

(\*1) The Support command classes 0,2,4,5,6,7,8 and 10, including: Basic, Block read/write, Erase, Write protection, Application command, Lock card and Switch function. Class 1 (stream read) and class 3 (stream write) are not supported.

(\*2) This field is not a constant value.

(\*3) The field name in parenthesis is set to fixed value and indicates that the host is not necessary to refer these fields. The fixed values enable host, which refers to these fields, to keep compatibility to CSD Version 1.0.

## 2.17 SMART Attribute

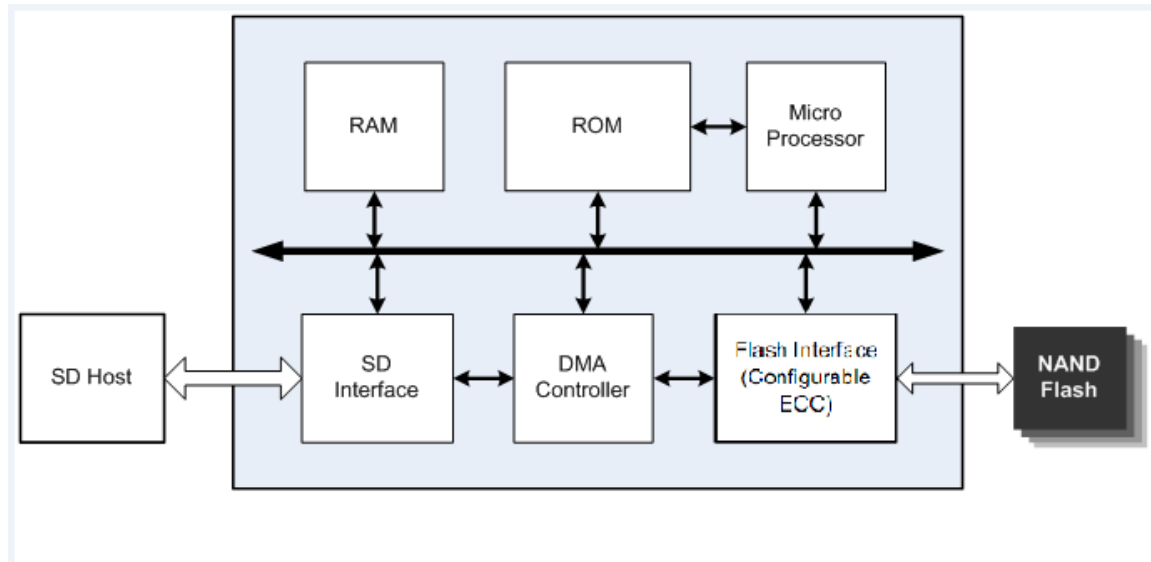
**Table 11: Industrial SD card 3SE3 SMART Attribute List**

| Offset    | Byte Count | Attribute Name            |
|-----------|------------|---------------------------|
| 0x00~0x1F | 16         | Unique ID                 |
| 0x10      | 1          | Bus Width                 |
| 0x11      | 1          | Secured Mode              |
| 0x12      | 1          | Speed Class               |
| 0x13      | 1          | UHS Speed Grade           |
| 0x14~0x17 | 4          | Protected Area Size       |
| 0x18      | 1          | Spare Block Count         |
| 0x19      | 1          | Original Bad Count        |
| 0x1A      | 1          | Run Time Bad Block Count  |
| 0x1B      | 1          | Spare utilization RATE    |
| 0x1C~0x1F | 4          | SPOR Failure Count        |
| 0x20~0x23 | 4          | Min Erase Count           |
| 0x24~0x27 | 4          | Max Erase Count           |
| 0x28~0x2B | 4          | Total Erase Count         |
| 0x2C~0x2F | 4          | Avg Erase Count           |
| 0x30      | 1          | RTBB For Early retirement |
| 0x35~0x44 | 16         | ISP Version               |

## 3. Theory of Operation

### 3.1 Overview

Figure 2 shows the operation of Innodisk Industrial SD Card 3SE3 from the system level, including the major hardware blocks.



**Figure 2: Innodisk Industrial SD 3SE3 Block Diagram**

Innodisk Industrial SD Card 3SE3 integrates a SD 3.0 controller and NAND flash memories. Communication with the host occurs through the host interface, using the standard SD interface.

### 3.2 SD 3.0 Controller

Innodisk Industrial SD Card 3SE3 is designed with a SD 3.0 controller, which has single channel for flash interface.

### 3.3 Error Detection and Correction

Highly sophisticated Error Correction Code algorithms are implemented. The ECC unit consists of the Parity Unit (parity-byte generation) and the Syndrome Unit (syndrome-byte computation). This unit implements an algorithm that can correct up to 43 bits per 1024 bytes in an ECC block. Code-byte generation during write operations, as well as error detection during read operation, is implemented on the fly without any speed penalties.

### 3.4 Wear-Leveling

Flash memory can be erased within a limited number of times. This number is called the **erase cycle limit** or **write endurance limit** and is defined by the flash array vendor. The erase cycle limit applies to each individual erase block in the flash device.

Innodisk Industrial SD 3SE3 uses a global wear-leveling algorithm to ensure that consecutive writes of a specific sector are not written physically to the same page/block in the flash. This spreads flash media usage evenly across all pages, thereby extending flash lifetime.

### 3.5 Bad Blocks Management

Bad Blocks are blocks that contain one or more invalid bits whose reliability are not guaranteed. The Bad Blocks may be presented while the product is shipped, or may develop during the life time of the SD card. When the Bad Blocks is detected, it will be flagged, and not be used anymore. The SD card implement Bad Blocks management, Bad Blocks replacement, Error Correct Code to avoid data error occurred. The functions will be enabled automatically to transfer data from Bad Blocks to spare blocks, and correct error bit.

### 3.6 Garbage Collection

Garbage collection is used to maintain data consistency and perform continual data cleansing on SD card. It runs as a background process, freeing up valuable controller resources while sorting good data into available blocks, and deleting bad blocks. It also significantly reduces write operations to the drive, thereby increasing the SD's speed and lifespan.

### 3.7 Power cycling

Innodisk's SD/MSDs provide the complete data protection mechanism during every abnormal power shutdown situation. Such as: power failure at programming data, updating system tables, erasing blocks, etc. The mechanism can maintain the data correctness and increase the reliability of the data stored in the NAND Flash memory.

## 4. Installation Requirements

### 4.1 Industrial SD card Pin Directions

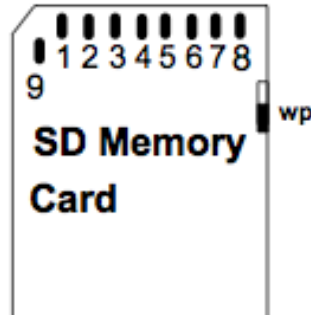


Figure 3: Signal Segment and Power Segment

### 4.2 Device Drive

No additional device drives are required.

## 5. Part Number Rule

| CODE                                                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                                                        | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------------------------------------|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------|----|----|----|----|----|----|----|----|----|----|
|                                                      | D | E | S | D | C | - | 3 | 2 | G | S                                                         | 0  | 2  | A  | E  | 1  | S  | B  | -  | X  | X  |
| Definition                                           |   |   |   |   |   |   |   |   |   |                                                           |    |    |    |    |    |    |    |    |    |    |
| Code 1 <sup>st</sup> (Disk)                          |   |   |   |   |   |   |   |   |   | Code 13 <sup>th</sup> (Flash Mode)                        |    |    |    |    |    |    |    |    |    |    |
| D : Disk                                             |   |   |   |   |   |   |   |   |   | A: Async Flash                                            |    |    |    |    |    |    |    |    |    |    |
| Code 2 <sup>nd</sup> ~ 5 <sup>th</sup> (Form Factor) |   |   |   |   |   |   |   |   |   | Code 14 <sup>th</sup> (Operation Temperature)             |    |    |    |    |    |    |    |    |    |    |
| ESDC: Industrial SD                                  |   |   |   |   |   |   |   |   |   | E: Extended Grade (-25°C~ +85°C)                          |    |    |    |    |    |    |    |    |    |    |
| Code 7 <sup>th</sup> ~9 <sup>th</sup> (Capacity)     |   |   |   |   |   |   |   |   |   | W: Industrial Grade (-40°C~ +85°C)                        |    |    |    |    |    |    |    |    |    |    |
| 04G: 4GB                                             |   |   |   |   |   |   |   |   |   | Code 15 <sup>th</sup> (Internal control)                  |    |    |    |    |    |    |    |    |    |    |
| 08G: 8GB                                             |   |   |   |   |   |   |   |   |   | Code 16 <sup>th</sup> (Channel of data transfer)          |    |    |    |    |    |    |    |    |    |    |
| 16G: 16GB                                            |   |   |   |   |   |   |   |   |   | S: Single Channel                                         |    |    |    |    |    |    |    |    |    |    |
| 32G: 32GB                                            |   |   |   |   |   |   |   |   |   | Code 17 <sup>th</sup> (Flash Type)                        |    |    |    |    |    |    |    |    |    |    |
|                                                      |   |   |   |   |   |   |   |   |   | B: Kioxia SLC                                             |    |    |    |    |    |    |    |    |    |    |
| Code 10 <sup>th</sup> ~12 <sup>th</sup> (Series)     |   |   |   |   |   |   |   |   |   | Code 19 <sup>th</sup> ~20 <sup>th</sup> (Customized Code) |    |    |    |    |    |    |    |    |    |    |
| S02: 3SE3 Series                                     |   |   |   |   |   |   |   |   |   |                                                           |    |    |    |    |    |    |    |    |    |    |

# 宜鼎國際股份有限公司 Innodisk Corporation

Tel:(02)7703-3000 Fax:(02) 7703-3555 Internet: <http://www.innodisk.com/>

## RoHS 自我宣告書 (RoHS Declaration of Conformity)

### Manufacturer Product: All Innodisk EM Flash and Dram products

- 一、 宜鼎國際股份有限公司（以下稱本公司）特此保證售予貴公司之所有產品，皆符合歐盟 2011/65/EU 及 (EU) 2015/863 關於 RoHS 之規範要求。

Innodisk Corporation declares that all products sold to the company, are complied with European Union RoHS Directive (2011/65/EU) and (EU) 2015/863 requirement.

- 二、 本公司同意因本保證書或與本保證書相關事宜有所爭議時，雙方宜友好協商，達成協議。

Innodisk Corporation agrees that both parties shall settle any dispute arising from or in connection with this Declaration of Conformity by friendly negotiations.

| Name of hazardous substance | Limited of RoHS ppm (mg/kg) |
|-----------------------------|-----------------------------|
| 鉛 (Pb)                      | < 1000 ppm                  |
| 汞 (Hg)                      | < 1000 ppm                  |
| 鎘 (Cd)                      | < 100 ppm                   |
| 六價鉻 (Cr 6+)                 | < 1000 ppm                  |
| 多溴聯苯 (PBBs)                 | < 1000 ppm                  |
| 多溴二苯醚 (PBDEs)               | < 1000 ppm                  |
| 鄰苯二甲酸二(2-乙基己基)酯 (DEHP)      | < 1000 ppm                  |
| 鄰苯二甲酸丁酯苯甲酯 (BBP)            | < 1000 ppm                  |
| 鄰苯二甲酸二丁酯 (DBP)              | < 1000 ppm                  |
| 鄰苯二甲酸二異丁酯 (DIBP)            | < 1000 ppm                  |

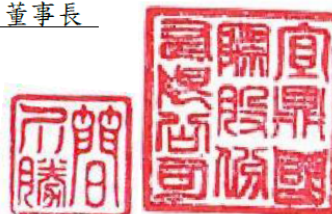
### 立 保 證 書 人 (Guarantor)

Company name 公司名稱： Innodisk Corporation 宜鼎國際股份有限公司

Company Representative 公司代表人： Randy Chien 簡川勝

Company Representative Title 公司代表人職稱： Chairman 董事長

Date 日期： 2018 / 07 / 01



# 宜鼎國際股份有限公司 Innodisk Corporation

Tel:(02)7703-3000 Fax:(02) 7703-3555 Internet: <http://www.innodisk.com/>

## REACH Declaration of Conformity

### Manufacturer Product: All Innodisk EM Flash and Dram products

1. 宜鼎國際股份有限公司（以下稱本公司）特此保證此售予貴公司之產品，皆符合歐盟化學品法案(Registration, Evaluation and Authorization of Chemicals; (EC) No 1907/2006 REACH) 以及附錄 XIV 中的限用物質之規定 (<http://www.echa.europa.eu/de/candidate-list-table> last updated: 12/01/2017, SVHC's 173)。

所提供之產品包含：(1) 產品或產品所使用到的所有原物料；(2)包裝材料；(3)設計、生產及重工過程中所使用到的所有原物料。

We Innodisk Corporation hereby declare that our products are in compliance with the requirements according to the (EC) No 1907/2006 REACH Regulation and restricted substances in Annex XIV (<http://www.echa.europa.eu/de/candidate-list-table> last updated: 12/01/2017, SVHC's 173 ).

Products include : 1) Product and raw material used by the product ; 2) Packaging material ; 3) Raw material used in the process of design, production and rework.

2. 本公司同意因本保證書或與本保證書相關事宜有所爭議時，雙方宜友好協商，達成協議。  
InnoDisk Corporation agrees that both parties shall settle any dispute arising from or in connection with this Declaration of Conformity by friendly negotiations.

### 立 保 證 書 人 (Guarantor)

Company name 公司名稱： InnoDisk Corporation 宜鼎國際股份有限公司

Company Representative 公司代表人： Randy Chien 簡川勝

Company Representative Title 公司代表人職稱： Chairman 董事長

Date 日期： 2017 / 02 / 08



## DECLARATION OF CONFORMITY

*This Declaration of Conformity is hereby issued to the below named company and for below described device, based on*

**Technical Standard: FCC 47 CFR Part 15  
Subpart B, Class B  
ISED ICES-003 Issue 6, 2016**

### General Information

Applicant: Innodisk Corporation  
5F., No. 237, Sec. 1, Datong Rd., Xizhi Dist.,  
New Taipei City 22161, Taiwan (R.O.C)

### Product Description

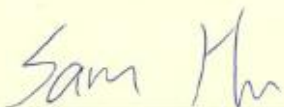
EUT Description: SD 3.0  
Brand Name: Innodisk  
Model Number: SD 3S\*#  
\$:Flash type: (S:SLC, I:SLC, M:MLC, T:3D TLC, A~Z:Others);  
\*:Product line: (E:Embedded, G:EverGreen, R:InnoRobust, S:Server, V:InnoREC, A~Z:Others);  
#:Product Generation: (empty, 0~9);  
SD type include (Industrial SD Card SD 3.0)

### Measurement Facilities

Xindian Lab.: Compliance Certification Services Inc.  
No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, 23151 Taiwan.  
Tel: +886-2-22170894 / Fax: +886-2-22171029

*This device has been tested and found to be in compliance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report with the number: T170707D04-D*

*The test results shown in this report are applicable only to the investigated sample identified in this report.*



Sam Hu / Assistant Manager

Date: July 12, 2017



## VERIFICATION OF COMPLIANCE

*This Verification of Compliance is hereby issued to the below named company and for below described product, based on*

**Technical Standard: EMC DIRECTIVE 2014/30/EU  
(EN55032 / EN55024)**

### General Information

Applicant: Innodisk Corporation  
5F., No. 237, Sec. 1, Datong Rd., Xizhi Dist.,  
New Taipei City 22161, Taiwan (R.O.C)

### Product Description

EUT Description: SD 3.0  
Brand Name: Innodisk  
Model Number: SD 3\$\*#  
\$:Flash type: (S:SLC, I:iSLC, M:MLC, T:3D TLC, A~Z:Others);  
\*:Product line: (E:Embedded, G:EverGreen, R:InnoRobust, S:Server, V:InnoREC, A~Z:Others);  
#:Product Generation: (empty, 0~9);  
SD type include (Industrial SD Card SD 3.0)

### Measurement Standard

EN 55032: 2015 / AC: 2016  
CISPR 32: 2015 (Ed 2.0) / CI: 2016  
EN 61000-3-2: 2014  
EN 61000-3-3: 2013  
EN 55024: 2010 + A1: 2015  
(IEC 61000-4-2: 2008; IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010; IEC 61000-4-4: 2012;  
IEC 61000-4-5: 2014; IEC 61000-4-6: 2013; IEC 61000-4-8: 2009; IEC 61000-4-11: 2004)

### Measurement Facilities

Xindian Lab.: Compliance Certification Services Inc.  
No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, 23151 Taiwan.  
Tel: +886-2-22170894 / Fax: +886-2-22171029

*This device has been tested and found to be in compliance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report with the number: T170707D04-E*

*The test results shown in this report are applicable only to the investigated sample identified in this report.*

Sam Hu / Assistant Manager

Date: July 12, 2017