

## Introduction

Easy-to-use NAND analyzer system, suitable for massive quantity NAND acceptance inspection, operation verification, and error investigation.

This System consists of the main-board (with FPGA-based NAND controller), sub-board(s), on which NAND for test are set, and Windows-based analysis software.

## Features

### 1. Main-board (Sp3993)

Sub-board	1~8 set(s) connectable
NAND number	1~128 NAND chip(s) simultaneous test
PC I/F	USB2.0, USB3.0, Giga Ethernet
LED	Communication indicator (NAND/PC)

### 2. Sub-board (Sp3993-x)

NAND	1~16 NAND chip(s) simultaneous test
Cable	Up-to 2m connection to Main-board
Power	Supplied by Main-board, each Sub-board has ON/OFF switch
Voltage Control	voltages supplied to NAND are controllable by analysis software
Operating Temperature	-40°C~85°C

### 3. Analysis software

Analysis software enables: (part of features)

- NAND interface timing setting
- NAND device power voltage setting
- NAND device ID information and status check
- Bad Block scan and management
- Access time measurement
- P/E cycle dependence of access time



- NAND command (Erase, Program, Read)
- Program pattern settings (Increment, Pseudo Random, Page Stripe etc.)
- Dump of read data and save to file
- P/E Cycle (P/E cycle number, flexible settings of program patterns)
- Script execution(Siglead Script Language; SSL)
- Error rate measurement(Bit ER, Page ER after ECC)
- ECC strength settings (code length and correctable error number)
- Data retention measurement(time vs bit error)
- Program disturb measurement(P/E cycle vs bit error)
- Error distribution(page/column dependence)
- NAND devices support
  - ONFI 3.2 / Toggle DDR 2.0(SLC / MLC / TLC)
  - NAND IF : Asynchronous / Synchronous / Toggle DDR
  - Package : TSOP 48pin, BGA 63/100/132/152pin
  - Verified to work with latest NAND device (Toshiba 19nm, Micron/Intel 20nm, Samsung 21nm)
  - In case that device doesn't work, please contact us, system adjustment can be tried to make it work

## Support

- 1 year technical support (via telephone and email)
- 1 year free version update/bug-fix of analysis software
- For the support after 1 year since purchase, an extra support contract is needed

## Deliverables

Deliverables consists of the following parts. Immediate analysis can be carried out at the date of delivery

### <Main-board set>

- Main-board(Sp3993)
- Power unit
- Analysis software
- NAND controller circuit and firmware
- Operational Guide
  - \* USB cable and LAN cable are not attached

### <Sub-board>

- Sub-board(Sp3993-x)
- Cable(standard length is 1m, 2m max)

Products and specifications introduced herein are subject to change by Siglead without notice

Please contact us for further works such as customization and peripheral circuit design

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