# Smart I/O DDR5 Tester

User Manual



# **CONTENTS**

Copyright & Notice1
Function Description2
Package Contents
Information for first driver installation 4
Installing USB TO RS-232 driver
Instruction Guide5
Description of Error Detector Main Functions Page6
<b>1. TEST</b> 6
<b>2. SETUP</b>
<b>3.SPD</b> 7
<b>4. 4.LEARN</b>
<b>5. OPEN</b>
<b>6. SHORT</b>
Install USB to RS0232 driver
Install I/O DDR5 Tester Software
System Operation



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## <Smart I/O DDR5 Tester >

## **Brief Introduction**

<Smart I/O DDR5 Tester > has multiple functions, the combination of simple operation interface, software and Smart I/O DDR5 Error Tester Error Detector allows users to experience higher speed and accuracy while using.

## **Function Description**

<Smart I/O DDR5 Tester > provides the functions below:

- 1. Support DDR5 U-DIMM and R-DIMM module format
- 2. Able to run PCB cable Open/Short circuit functions on Smart I/O or through Windows system easily.
- 3. Provide a single module SPD recode function.
- 4. Wearable Error Detector allows you to use it anytime, anywhere.
- 5. Easy to operate with clear LCD functional interface.
- 6. Clear and easy understandable real-time display of memory module detecting status and measuring voltage
- 7. With RamCENTER I/O testing system software (Windows interface), you can run XMP EXPO for Overclocked Edtion, Compilation of Manufacturing Information, Auto-generate Serial Code Recoding and Date Code.
- 8. RS-232 interface can be applied to RamCENTER I/O testing system (Windows interface) for other functional Expansion DIMM Sockets.
- 9. I/O testing card help corresponding Adress and Date on the module when detecting OPEN/SHORT Circuit.



## Package Contents

Please check the package contents. If there is any device shortage, please connect us. The missing device will be delivered to you as soon as possible!





### Information for first driver installation

For the computer without RS-232 cable and using the RS-232 To USB, please install the <HL-340.EXE>, from the installation software..

After installation, please move to Microsoft Management Console. The device USB-SERIAL CH340 is under the Cable(COM and LPT). Choose COM1 if it is not the default.

If the picture on the right side occur, please check the driver of USB TO RS-232 port or the Cable option in management console for currect cable.

EZ-SPD-DDR5		х
Error I	No"8002' I port nur	nber
	ок	

### Installing USB TO RS-232 driver

The USB TO RS-232 cable is needed for installation. Install the <HL-340.EXE> from the installation Software.

💖 DriverSetup(X64)	DriverSetup
Device Driver Install / UnInstall	
Select INF File : CH341SER.INF WCH.CN L_USB-SERIAL CH340 L_04/07/2011, 3.2.201	Driver install success
HELP	

The Com1is the default for using the RS-232 cable. For using USB to RS-232 cable, check the COM cable in Computer Management.



## **Instruction Guide**

[Smart I/O DDR5 Tester] has the 2 parts:

- A. Smart I/O DDR5 Tester
- B. Windows interface Smart I/O DDR5 Software

The following will make an instruction for each part.

## Part A : Smart I/O DDR5 Tester

Smart I/O DIMM Sockets / Expansion DIMM Sockets



After powered up Smart I/O DDR5 Error Detector, 6 functions will be shown on the LCD screen. Please choose the button by contrasting the screen:





- 1. TEST : Test the condition of the module.
- 2. SETUP : Setting mode of < Power Short Circuit > < Cable Open Circuit> < <Cable Short Circuit> < <SPD Recode > < <SPD Verify>
- 3. SPD : Single module SPD function.
- 4. LEARN : Expansion Sockets module learning mode.
- 5. OPEN : Module OPEN circuit testing.
- 6. SHORT : Module SHORT circuit testing.

#### Description of Error Detector Main Functions Page

**※** To run TEST, OPEN, SHORT functions, insert an OK module into the "Expansion DIMM Socket", press <LEARN> to start the learning, then chose for TEST, OPEN and SHORT or other functions.



※IO DDR5 Host port can run a single module READ, COPY, VERIFY functions. Expansion DIMM Socket support LEARN, TEST, OPEN, SHORT, READ, COPY, VERIFY functions.

### **1. TEST**

Insert the module into "Expansion DIMM Socket", then press <TEST> to show the images below:





(3)	SHORT T	TESTING	
(4)	Fail Pass Pwr		DIM
(5)	e Fail Pass Pwr		

#### 2. SETUP

Press <SETUP> on the home page to show the following image on Smart I/O screen:

TEST SETUP	
[POWER][OPEN][SHORT][SPD_W][SPD_V]	EXIT

### 3.SPD

Press <SPD> to run for a single module recording, and the screen will show the following image:



#### • .READ

Press <READ>, Smart I/O will read the SPD data from module, Smart I/O screen will show the following images:







When shown the images above, press <AGAIN> to READ again. There is no need to return to <SPD> function page to restart the process. Press <SPD> to return to function page while finishing reading.

If the module is not well inserted or SPD HUB is damaged, press <READ> to show the images below, press <AGAIN> to READ again. Press <Exit> to return to <SPD> function page while finishing reading.



• COPY

Press <COPY> to copy SPD data to the module, the following images will be shown:



When the images above are shown, press <AGAIN> to <COPY> again. There is no need to return to <SPD> function page to restart the process. Press <SPD> to return to function page while finishing copying.



If the module isn't well inserted or SPD HUB is damaged, press <COPY> to show the images below, press <AGAIN> to copy again. Press <Exit> to return to <SPD> function page while finishing copying.



#### • VERIFY

Press <VERIFY>, Smart I/O DDR5 will verify SPD data from the module, and the following images will be shown:



When the images above are shown, press <AGAIN> to <VERIFY> again. There is no need to return to <SPD> function page to restart the process. Press <SPD> to return to function page while finishing verifying.

If the module is not well inserted or SPD HUB is damaged, press <VERIFY> to show the images below, press <AGAIN> to verify again. Press <Exit> to return to <SPD> function page while finishing verifying.



#### • VIEW-MODULE, TESTER, H\_REG, and P\_REG

Pressing <VIEW> can display the SPD code in the Writer and module:

- 1. <MODULE >: Display the SPD code in the module.
- 2. < TESTER>: Display the SPD code in the Writer.
- 3. < H\_REG>: Display the SPD HUB information in the module.
- 4. < P\_REG>: Display the PMIC information in the module.



SHOW ( MODULE	SPD	EST	TES ER	TER H_	) U REG	ALU P	E RE	G	SETUP	EXIT
00-07 08-0F	92 03	10 52	0B 01	02 08	03 00	19 00	00 30	01 00	DOWN	EXIT

• SPD SETUP- A\_s/n, V\_s/n, D\_s/n, and E\_code

Following picture will appear when pressing <SETUP>. There are 4 modes that can be set.

Selecting <EXIT> can return to the homepage:



A\_s/n=> <ON>: Auto setting serial number is on.

A\_s/n=><OFF>: Auto setting serial number is off



V\_s/n=> <ON>: Will verify all the SPD code information, including the serial number. The verification will fail if all the SPD codes are the same but the serial numbers are different.

V\_s/n=><OFF>: Will verify all the SPD code information except the serial number. The verification will succeed even if the serial numbers are different, because the serial number is not in the verified condition.



D\_s/n =>Can choose the arrangement of the serial number.

<H-L>: From high to low.

<L-H>: From low to high.

Ecode => Can choose the positional numeral system:

<HEX>: Hexadecimal

<DEC>: Decimal





#### 4.LEARN

Insert an OK module into "Expansion DIMM Socket", press <Learn> to start learning then run for TEST, OPEN and SHORT functions.



Press <DOWN> for the next page, <UP>, which is the first one on the left of <DOWN>, for the

previous page. Selecting <EXIT> can return to the homepage when finishing the process.

#### 5. **OPEN**

Insert the module into "Expansion DIMM Socket", press <OPEN> to estimate if the module is having an OPEN Circuit.



If it is having an OPEN circuit, find out which Address or Date is wrong according to the shown information.



#### 6. SHORT

Insert the module into "Expansion DIMM Socket", press <SHORT> to see if the module is having a SHORT Circuit.



If it is not having a SHORT Circuit, the following image will be shown.





If it is having a SHORT Circuit, find out which is wrong according to the shown information.



Use a probe to measure whether the voltage is normal





## Part B: Windows interface Smart I/O DDR5 Software

#### Install USB to RS0232 driver

USB to RS-232 converter cable is needed when installing this driver.





Install <HL-340.EXE> from disc driver.

#### Install I/O DDR5 Tester Software

This software has an English and Tradionnal Chinese version. Choose the needed version from the <SETUP.EXE> from the installation USB to execute installation for Smart IO DDR5 Tester.



## **System Operation**

The following image will be shown while entering Smart I/O DDR5 Tester software.



Password Setup			
Enter the New Password			
Rekey-IN Password			
	ОК	Cancel	

When entering the recoding system for the first time, users will be asked to set a code. After entering the system please log out then log in again.

🚱 Password			
Input Password :			
	OK	Cancel	

When users log in, a code is required, all function will be available only with a correct code.



Please make sure the power of the Smart I/O is switched on before entering the system, if not, the image on the left will be shown:



According to different functions chosen on Windows homepage, the following will be explained them in 3 parts :

Image: Smart I/O-DDR5	
File Pinout Tools View Window Help	
Byte0 Number of Bytes in SPD Device DDR5 SPD Information DDR5 SPD Information	UDIMM Channel A D0 D1 D2 D3 D4 D5 D6 D7 DM0 RS0 LS0
0-511 Byte) 512-1023 Byte	D8 D9 D10 D11 D12 D13 D14 D15 DMI RSI LSI
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F DUM Type DDR5 SDRA	M DI6 DI7 DI8 DI9 D20 D21 D22 D23 DM2 RS2 LS2
00 30 10 12 02 04 00 20 62 00 00 00 00 60 00 00 00 Module Density 16 GB	
10 00 00 00 00 65 01 00 00 72 ED 01 00 00 00 26 40 Module Ranks 1 Ranks	D24 D25 D26 D27 D28 D29 D30 D31 DM3 RS3 LS3
20 26 40 26 40 82 7D A8 BD 65 01 27 01 A0 00 82 00 Module Speed 5600 MHz	
30 00 00 00 00 00 00 00 00 00 00 00 00 0	2/32)
	CAO CAI CA2 CA3 CA4 CA5 CA6 CA7 CA8 CA9 CAIOCAIICAI2
60 00 00 00 00 00 00 00 00 00 00 00 00 0	IDIMM Changel D
70 00 00 00 00 00 00 00 00 00 00 00 00 0	DO DI D2 D3 D4 D5 D6 D7 DM0 R80 L80
80 00 00 00 00 00 00 00 00 00 00 00 00 0	
40 00 00 00 00 00 00 00 00 00 00 00 00 0	36 40 42 46 D8 D9 D10 D11 D12 D13 D14 D15 DMI RSI LSI
B0 00 00 00 00 00 00 00 00 00 00 00 00 0	
C0 10 00 80 B3 80 14 8A 8C 82 20 00 00 00 00 00 00 00 00 00 00 16422 ps (40 16422 ps (40 16422 ps (46 16422 p	
D0 00 00 00 00 00 00 00 00 00 00 00 00 0	T) D24 D25 D26 D27 D28 D29 D30 D31 DM3 RS3 LS3
EU UU UU UU UU UU UU UU 11 UI U2 81 UU 22 UU UU UU UU UU HRAS 32130 ps (90	
CO9B	115
100 00 00 00 00 00 00 00 00 00 00 00 00	4608 CAO CAI CA2 CA3 CA4 CA5 CA6 CA7 CA8 CA9 CAIOCAIICAI2
120 00 00 00 00 00 00 00 00 00 00 00 00 0	
130 00 00 00 00 00 00 00 00 00 00 00 00 0	/PGD/ALR /RST /ACT VRen
	CS0A CS1A CS0B CS1B CK0A/CK0A CK0B /CK0B
170 00 00 00 00 00 00 00 00 00 00 00 00 0	Setup SPD
190 00 00 00 00 00 00 00 00 00 00 00 00 0	Power Test
	Auto S/N
	SAN no Verify
1D0 00 00 00 00 00 00 00 00 00 00 00 00 0	Auto S/N Encode(HEX)
1E0 00 00 00 00 00 00 00 00 00 00 00 00 0	Copy SPD
	VEerify SPD Auto S/N Direction(Low to High)
Test	O SPD Write Protect



## Part I Test Setting

#### **IO Test Setup**

Choose different functions according to your needs:

<Power Short Circuit>, <Cable Open Circuit>, <Cable Short Circuit>, <SPD Record>, <SPD Verify>,

<SPD Write Protect>,<SPD Key Lock>

After setting, press <SETUP> to save then choose <TEST> for further testing instructions.

Image: Control by the intervent of the state in the state in the state intervent of	1	File	Pir	nout	Т	ools	Vi	ew	Wi	ndov	v H	Help														
Byed         Number of Bytes in SPD Device         DDR-5         UDIMM Channel A           0-511 Byte)         512-1023 Byte         C leecksum         C CRC         C Nase         Information 1         DDR-5           0         0         01         02         03         04         05         06         07         08         09         0A         0B         0C         0D         0E         0F         DDR-5         DDR-5 <t< th=""><th></th><th></th><th></th><th></th><th>¥.L</th><th>1</th><th></th><th></th><th></th><th>XMP</th><th></th><th>EXFO</th><th>1</th><th>1</th><th></th><th>200</th><th>2</th><th>-</th><th>2</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>					¥.L	1				XMP		EXFO	1	1		200	2	-	2							
0-511 Byte)         512-1023 Byte         C Clecksum         C RC         New         Information 1         Information 2         Parameter           0 <t< th=""><th>By Va</th><th>/teO alue</th><th>Ni 3</th><th>umbe 30</th><th>r of l</th><th>Byte:</th><th>: in Sl</th><th>PD D</th><th>evice</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>DDR5 SPD Ir</th><th>nformation DDR-5</th><th></th><th>Chann 1 D2</th><th>D3</th><th>D4</th><th>D5 I</th><th>26</th></t<>	By Va	/teO alue	Ni 3	umbe 30	r of l	Byte:	: in Sl	PD D	evice										DDR5 SPD Ir	nformation DDR-5		Chann 1 D2	D3	D4	D5 I	26
00         01         02         03         04         05         06         07         08         09         0A         0B         0C         0D         0E         OF         Diff	$\bigcap$	0-51	1 B	vte)	ľ	51	2-10	23 I	Byte		Che	eoksu	m	e c	RC	(	No	ne	Information 1	Information 2 Parameter	D8 D	9 D10	D11	D12	D13 1	014
20       26       40       26       40       82       70       A       00			00 30 00	01 10 00	02 12 00	03 02 00	04 04 65	05 00 01	06 20 00	07 62 00	08 00 72	09 00 ED	0A 00 01	0B 00 00	0C 60 00	0D 00 00	0E 00 26	0F 00 40	Memory Type DIMM Type Module Density Module Ranks	DDR5 SDRAM Unbuffer-DIMM 16 GB 1 Ranks	D16 D D24 D	17 D18	D19	D20	D21 I D29 I	)22 ) )30
40       00 <td< td=""><th>4</th><td>20</td><td>26</td><td>40</td><td>26</td><td>40</td><td>82</td><td>7D</td><td>A8 00</td><td>BD</td><td>65</td><td>01</td><td>27</td><td>01</td><td>A0 00</td><td>00</td><td>82</td><td>00</td><th>Module Speed Module Bus Width</th><td>5600 MHz 2 ch 64 hit(32/32)</td><td></td><td>••</td><td>•</td><td>•</td><td>•</td><td>•</td></td<>	4	20	26	40	26	40	82	7D	A8 00	BD	65	01	27	01	A0 00	00	82	00	Module Speed Module Bus Width	5600 MHz 2 ch 64 hit(32/32)		••	•	•	•	•
10       00 <td< td=""><th>4</th><td>10 50</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><th>Module Voltage SDRAM Density</th><td>1.1/1.1/1.8 ¥ 2 Gb</td><td>CAO CA</td><td>CA2 0</td><td>CA3 C</td><td>A4 C/</td><td>S CA</td><td>6 C/</td></td<>	4	10 50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Module Voltage SDRAM Density	1.1/1.1/1.8 ¥ 2 Gb	CAO CA	CA2 0	CA3 C	A4 C/	S CA	6 C/
9       00		70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	SDRAM With SDRAM Banks Number of Row	o bh 4 Banks 8 Groups 16	-UDIMM	Chann 1 D2	D3	D4	D5 I	26
C0       10       00       80       B3       80       14       8A       8C       92       00 <td< td=""><th>i i i i i i i i i i i i i i i i i i i</th><td>90 40 30</td><td>00 00 00</td><td>00 00 00</td><td>000000</td><td>00000</td><td>00</td><td>00000</td><td>00</td><td>00</td><td>00 00 00</td><td>00</td><td>00 00 00</td><td>00 00 00</td><td>00000</td><td>00 00 00</td><td>00000</td><td>00 00 00</td><th>Number of Col CL Support</th><td>10 22 28 30 32 36 40 42 46 48 50 52</td><td></td><td>9 D10</td><td>DII</td><td>D12</td><td>D13 1</td><td>014</td></td<>	i i i i i i i i i i i i i i i i i i i	90 40 30	00 00 00	00 00 00	000000	00000	00	00000	00	00	00 00 00	00	00 00 00	00 00 00	00000	00 00 00	00000	00 00 00	Number of Col CL Support	10 22 28 30 32 36 40 42 46 48 50 52		9 D10	DII	D12	D13 1	014
E0       00 <td< td=""><th>I</th><td></td><td>10</td><td>00</td><td>80</td><td>B3 00</td><td>80 00</td><td>14</td><td>8A 00</td><td>8C 00</td><td>82 00</td><td>20</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><th>tRCD tRP</th><td>16422 ps (46T) 16422 ps (46T) 16422 ps (46T)</td><td>D16 D D24 D</td><td>017 D18</td><td>D19</td><td>D20</td><td>D21 1 D29 1</td><td>D30</td></td<>	I		10	00	80	B3 00	80 00	14	8A 00	8C 00	82 00	20	00	00	00	00	00	00	tRCD tRP	16422 ps (46T) 16422 ps (46T) 16422 ps (46T)	D16 D D24 D	017 D18	D19	D20	D21 1 D29 1	D30
110       00 <t< td=""><th>H</th><td>50</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>01</td><td>02</td><td>81</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><th>tRAS CRC (0-509)</th><td>32130 ps (90T) C09B</td><td></td><td>••</td><td>•</td><td>•</td><td>•</td><td>•</td></t<>	H	50	00	00	00	00	00	00	00	01	02	81	00	00	00	00	00	00	tRAS CRC (0-509)	32130 ps (90T) C09B		••	•	•	•	•
130       00 <t< td=""><th>1</th><td>10</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><th>Part Number DRAM ID</th><td>516S5600CL460S 80CE</td><td></td><td></td><td>A3 CA</td><td>4 0</td><td>S CA</td><td>6 C/</td></t<>	1	10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Part Number DRAM ID	516S5600CL460S 80CE			A3 CA	4 0	S CA	6 C/
150       00 <t< td=""><th>1</th><td>30 40</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><th>Module ID</th><td>(SAMSONG) 0000</td><td>/PGD /ALR</td><td>CSOB C</td><td>ACT V</td><td>VRen CKOAA</td><td>CKOA</td><td>CKO</td></t<>	1	30 40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Module ID	(SAMSONG) 0000	/PGD /ALR	CSOB C	ACT V	VRen CKOAA	CKOA	CKO
180       00       <	1	60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Test	Test Report	tup	SI	PD		-	-
	1 1 1	80 90 A0	000000000000000000000000000000000000000	000000000000000000000000000000000000000	000000000000000000000000000000000000000	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	000000	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	000000000000000000000000000000000000000	00 00 00 00	000000	SPD Setup	□ SPD Write Protect □ S	PD Key Lock	Test Se	tup Pow	/er Te	st	



To run testing, insert an OK module into the "Expansion DIMM Socket", press <LEARN> on Smart I/O DDR5 or click <LEARN> on the software to start the learning, then run for further instructions.

\* Press <TEST> to start testing.

Choose <Test Report> to check the

testing process records

Smart I/O-DDR5		
	<b>Z</b>	
Byte0 Number of Bytes in SPD Device Value 30	DDR5 SPD Information DDR-5	DO DI D2 D3 D4
	Information 1         Information 2         Parameter           Memory Type         DbBt5 SDRAM         DiMM Type         DbBt5 SDRAM           DiMM Type         Dbbt7 SDRAM         DiMM Type         Dbbt7 SDRAM           Modub Density         16 GB         Modub Rask         Namis           Modub Speed         5000 MHs         Modub Speed         SDRAM Wath 2 ch 64 bat(2)/2)           Modub Voltage         1/1 1/1.8 V         SDRAM Wath 2 bb bat(2)/2)         Modub FDRAM Power           SDRAM Math         8 bat         SGroups         Number of Col         10           CL-MAA         16422 ps (461)         RR         16422 ps (461)         RR           CRC 0-509         COPB         Serial Number         5163500CL460S         DRAM ID         80CE           DRAM ID         80CE         CLAMAID         SOCE         Serial Test Report         Set	DB         D9         D10         D11         D12         D11         D12         D11         D12         D11         D12         D11         D12         D11         D12         D12         D12         D12         D12         D12         D14         D15         D14         D14         D14         D14         D14         D14         D14         D14         D15         D14         D14         D14         D14         D14         D14         D14         D14         D14         D14
File Pinout Tools View Window Help	2	
Byed         Number of Bytes in SPD Device           0-511         Byred         512-1023         Byret         Clackswn         C CRC         Nome         In           0         01         02         03         0         0         00	DDR5 SPD Information     DDR-5     JDDR-5     JDDR-5     JDDR5     SPD Information 2     Parameter     SPD Revision 1.0     SPD as (DT / RENESAS)     SPD Rev. 1.4     SPD Device Type Install SPD5118     MICO Rev. 20     MICO Device Type Install PMIC5100     PMICO Rev. 00     MICI Device Type NotInstall     PMIC2 RD 0000     Imacor Device Type NotInstall     MIC2 Rev. 00     Imacor Device Type NotInstall     Imacor Device Type NotInstall	IMM Channel A           00         D1         D2         D3         D4         F           05         D9         D10         D11         D12         F           06         D17         D16         D19         D20         F           06         D17         D16         D19         D20         F           06         CA1         CA2         CA3         CA4         CA           06         D17         D16         D19         D20         F           07         D15         D19         D20         F         D3           07         D15         D19         D20         F         D3           07         D15         D19         D20         F         D3
File Pinout Tools View Window Help		
Desc         Number of Bytes in SPD Device           Byte0         Number of Bytes in SPD Device           Value         30           0.511 Byte)         512-1023 Byte         C Clecksum         C CRC         Name           0         0.01 01 02 03 04 05 06 07 08 09 0A 08 0C 0D 0E 0F         C Clecksum         C CRC         Name           0.01 10 2 03 04 05 06 07 08 09 0A 08 0C 0D 0E 0F         O 00 00 00 00 00 00 00 00 00 00 00 00 00		DDIMM Channel A           D0 DI DI DI DI DI DI           DS DP DIO DII DI DI           DIG DI DI DI DI DI DI DI           DIG DI DI DI DI DI DI DI DI           DIG DI DI DI DI DI DI DI DI           DIG DI DI DI DI DI DI DI DI DI           DIG DI           DIG DI



## Part II Toolbar Function

#### <File> Function

Description for the selected functions:

New File: After opening a new file, SPD data can be edit from the homepage.

Open File: Open a file, it supports for \*.BIN and \*SPD file format.

#### <Pinout> Function

IC Pinout and Module Pinout.





		1	DDF	25-	UD	IM	<b>M</b> 2	88		DD	R5-UD	IMN	1
PDI	NAME	PIN	NAME	PIN	NAME	PDV	NAME	PIN	NAME	DDI	25-UD	IMN	1
1	VIN BULK	43	D25a	85	A08b	127	RS25	160	RS1a	DDI	35 SO	DIM	Μ
2	88 J	44	VSS	80	VSS	128	VSS	17.0	VSS	DDI	R5_RE	IMN	1
3	7.7'J	45	DbDs	87	2000	129	D206	171	D142	213	F.FU	255	VSS
4	HSCL	46	155	SS	A04b	130	VSS	172	1.55	214	RFU	255	D106
٢	HSDA	47	D284	89	VSS	151	E216	173	Ti15a	211	VSS	217	VSS
G	V33	48	V23	90	A02b	132	V33	174	133	216	-Cla	238	D115
7	RFU	49	D29a	91	A00b	133	D24b	175	D18a	217	Cla	259	VSS
8	VSS	50	VSS	92	VSS	134	VSS	176	227	218	VSS	260	LS1b
9	D04a	51	D32a	93	CSOL	135	D25b	177	D19a	219	RFU	261	RS15
10	V55	52	VSS	91	VSS	130	VSS	1.8	VSS	220	RFU	202	VSS
11	D01s	53	D331	95	F.ST	137	DM3b	179	DM2s	221	VSS	263	D148
12	V55	\$4	155	91	VSS	138	VSS	1.20	135	22.2	-C1h	264	VSS
13	1.50.9	11	1.54a	97	Dith	199	E12.8b	121	T) 22.8	223	+C1h	285	E115h
14	R 305	16	R94+	98	V33	140	V33	187	1.58	22.4	V33	266	V33
15	V33	57	VSS	99	DJJb	141	D29b	183	D23a	225	RFU	267	D18b
16	D04a	58	CSOs.	100	VSS	142	VSS	184	VSS	226	RFU	268	VSS
17	V55	96	VSS	101	DOOP	143	RFU	185	L/264	227	VSS	200	D109
18	Disa	50	A00a	102	VSS	144	RFU	186	1.82	228	Allb	270	VSS
1P	V55	61	AUZa	103	D019	143 V	N_SULK	187	L/2/4	229	AOSE	271	DMCR
20	D01s	62	1.52	104	V55	144 V	NINK	185	1.52	230	VSS	272	VSS
21	VRR	62	A04x	101	1.500	147	PG	129	1.33×	231	A075	273	E223
22	D09a	54	A06a	106	R50b	148	<b>DSA</b>	190	RS3a	232	A05b	274	VSS
23	V33	65	V23	107	V33	149	RFU	191	1.53	233	V33	275	D23b
24	DMla	56	ACBa	108	D04b	150	VSS	192	D30a	234	A03b	276	VSS
25	VSS	57	AlOa	109	VSS	151	PWim.	103	227	235	Volp	277	D266
25	D13s	68	VSS	110	D058	152	RFU	194	Dila	250	VSS	278	VSS
2/	V55	65	A12a	111	VSS	153	VSS	195	VSS	257	CSIB	210	L12/6
28	DI3s	70	FFU	112	DOSD	154	D024	190	D34a	231	VSS	280	VSS
7.9	V55	71	1355	113	VSS	111	VSS	197	135	239	1.54%	281	1.538
30	Diéa	72	-C0a	11+	D09b	136	D03a	198	D35a	240	R34b	282	R336
31	V33	75	+C0a	115	VSS	157	VSS	199	VSS	241	VSS	283	VSS
32	DI7a	74	VSS	116	DM15	158	DM0a	200	/ALR	242	D34b	284	D305
33	VSS	75	RFU	117	VSS	150	VSS	201	VSS	213	VSS	285	VSS
31	LS2a	70	RFU	115	DICB	160	L006a	202	CSIn	211	Ditt	280	Lis16
35	7.524	77	1.55	119	VSS	101	VSS	203	1.55	245	VSS	287	VSS
30	V55	78	-006	17.0	DIN	162	D07s	2.04	AC1a	7:46	TH022:	288	RFU
37	T07.0.9	70	+COB	121	VSS	165	VSS	201	A038	7,41	VSS		
38	V33	30	1.88	122	Diffe	164	D10a	206	1.53	241	D033:		
39	D21a	31	RFU	123	V55	165	VSS	207	A05a	249	VSS	-	-
40	V33	32	A125	124	D17b	166	Dlla	208	A07a	250	DM06		
41	D24a	3.5	VSS	125	V55	167	VSS	209	VES	251	V55		
12	VSS	81	401A	120	LSUD	168	LSIa	210	AUDa	252	Deep	1	



### **<T**

#### ool

#### **Function** >

#### Smart I/O-DDR5

File Pinout	Tools	View	Window	Help
	M	lanufac	ture Inform	ation
	SI	PD Timi	ng	
Byte0 Number	SI	PD Wiza	ards	
value 100	X	MP Viev	w(INTEL)	
0-511 Byte)	X	MP Wiz	ards(INTEL	.)
00 01 0	E	XPO Vie	w(AMD)	
00 30 10 1	EX	XPO Wi	zards(AMD	))
10 00 00 0	SI	PD Write	e Protect	

#### 1. Manufacturing Information : Set the information and parameters for the module.

Module Information Module Parameter ID Re	Module Information	Module Parameter	ID R
	DRAM Manufacture		_
Module ID m + m +	Samsung (80CE)	SK Hynix (80AD)	Micron (80)
(512-513)	Spectek (02B5)	Nanya (030B)	Winbond (8
Location 🔟 👻	Elpida (02FE)	PSC (04C8)	CXMT (OA
(514)	JHICC (0C83)		
Date 00 • 0 • 2024/7/2 27 weeks	Module Manufacture		
Carial Namber Inc. Inc. Inc.	RamCENTER (09A4)	Kingston (0198)	Adata (04C
	Transcend (014F)	Patroit (040D)	Apacer (017
DRAM ID 80 V CE V (SAMSUNG)	Team Group (04EF)	Innodisk (06F1)	Smart Modu
(552-553)	Ramaxel (0198)	POWEV (OC1C)	Kimtlgo (01
Part Number 516S5600CL460S	Panram (0770)	QuanXing (DC38)	Biwin (OCA
(521-550)	SPD-HUB Manufacture —		
Kevision 00 V	IDT/Renesas (80B3)	Montage Tech. (0632)	Rambus (06
Specific Data	Puya Semi. (09B5)		
(555-590)			

Module Information	Module P	arameter ID R
SPD ID	80 • B3 •	(IDT/RENESAS)
SPD Rev.	1.4 -	
SPD Type	Installed 💌	SPD 5118 -
PMIC0 ID	8A 🕶 8C 💌	(Richtek Power)
PMIC0 Rev.	2.0 👻	
РМІСО Туре	Installed 💌	PMIC 5100 -
PMIC1 ID	0. • 00 •	
PMIC1 Rev.	0.0 💌	
РМІС1 Туре	Not Installed 💌	PMIC 5000 -
PMIC2 ID	0. • 00 •	
PMIC2 Rev.	0.0 -	
РМІС2 Туре	Not Installed 💌	PMIC 5000 -
Tsensor ID	0 • 00 •	
Tsensor Rev.	0.0 -	



2. SPD Timing : Change the timings of SPD.

SPD Timing	
CL- Support	20       22       24       26       28       30       32         36       38       40       42       44       46       48         52       54       56       58       60       62       64         68       70       72       74       76       78       80         84       86       88       90       92       94       96
CL- tAA(min)	40 T
tRCD(min)	40 T • tRFC2(min) 160 r
tRP(min)	40 T <b>▼</b> tRFCsb(min) 130 r
tRAS(min)	77 T 👻

#### 3. SPD Wizards : Establish the needed specification for SPD by wizard.





There are 3 tabs for DDR5 module information in "DDR5 SPD information" in the mainpage.

-SPD Information		-SPD Information	-SPD Information
Information 1 Info	ormation 2 Parameter	Information 1 Information	Information 1 Information 2 Pau
Memory Type(2) DIMM Type(B) Module Density(1F) Module Ranks(5) Module Speed(9) Interface Level(8) SDRAM Density SDRAM Width(D) Refresh Time(C) Number of Row(3) Number of Col(4) CL Support(12)	Reserved Unbuffered Undefined Undefined TTL 16 Mb N/A 15.625us Undefined (B1)/ Undefined (B1)/ Undefined	Manufacture Location Manufacture Date Specific Data	SPD Revision         00           SPD ID         00000           SPD Rev.         00           SPD Device Type            PMIC0 ID         0000           PMIC0 Rev.         00           PMIC0 Device Type            PMIC1 ID         0000           PMIC1 ID         000
Trp(1B) Trrd(1C) Trrd(1D) Tras(1E) Checksum(3F) JEDEC ID (40-47) Location(48)	Undefined Undefined Undefined OO 0000000000000000000000000000000000		PMIC1 Device Type PMIC2 ID 0000 PMIC2 Rev. 00 PMIC2 Device Type Tsensor ID 0000

3. XMP View(Intel): Show the information of XMP.



4. XMP Wizards(Intel): Establish the needed specification for XMP by wizard.





3. EXPO View(AMD): Show the information of EXPO.

Module	[	Profile2	
Module Speed	4808 Mhz		
VDD Voltage	1.10 V	VPP Voltage	1.80 V
VDDQ Voltage	1.10 V	Enhance Block1	Disable
CL -tAA(min) tRCD(min)	16640 ps (40 T) 16640 ps (40 T)	tRRD_L(min) tCCD_L(min)	0 ps (0 T) 0 ps (0 T)
tRAS(min) tRC(min)	32032 ps (77 T) 48256 ps (116 T)	tCCD_L_WR(min) tCCD_L_WR2(min)	0 ps (0 T) 0 ps (0 T)
tWR(min) tRFC1(min)	29952 ps (72 T) 295 ns	tFAW(min) tWTR_L(min)	0 ps (0 T) 0 ps (0 T)
tRFC2(min) tRFCsb(min)	160 ns 130 ns	tWIK_S(min) tRTP(min)	0 ps (0 T) 0 ps (0 T)
CRC	38A8		

4. EXPO Wizards(AMD):

specification for EXPO by wizard.

MD	XMP Profile Module Speed	Profile 1 DDR5-4800	• •	
ΦO 1.0	Vdd Voltage Vddq Voltage	1.10 V 💌 1.10 V 💌	Vpp Voltage	1.80 V 💌
			Enhance Block1	
	CL-tAA(min)	40 T -	tRRD L(min)	12 T -
1	tRP(min)	40 I -	tCCD_L(min)	12 T 👻
2	tRAS(min)	40 I ▼ 77 T ▼	tCCD_L_WR(min)	48 T 👻
2	tRC(min)	116 T -	tCCD_L_WR2(min)	38 T 💌
	tWR(min)	72 T 👻	tFAW(min)	34 T 💌
	tRFC1(min)	295 ns 👻	tWTR_L(min)	24 T 💌
	tRFC2(min)	160 ns 👻	tWTR_S(min)	6T -
	tRFCsb(min)	130 ns 👻	tK1P(mm)	18 T 👻

Establish the needed





SPD Write Protect: Setting the writing protect for the block in needed





**Password Setting** : Besides the first code setting, the code may be changed here.

🖗 Password Setup	
Enter the New Password	Į.
Rekey-IN Password	

Communication: Choose the connecting port.

📇 Device Manager
File Action View Help
V 🗄 DESKTOP-LN949EK
> Audio inputs and outputs
> 💻 Computer
> 👝 Disk drives
> I Display adapters
> A DVD/CD-ROM drives
> A Floppy disk drives
> Hoppy drive controllers
> 🖓 Human Interface Devices
> 📷 IDE ATA/ATAPI controllers
> Keyboards
> II Mice and other pointing devices

RS-232 cable is preset to be Com1. For USB to RS-232 converter cable, please check Device Manager for the COM port, as the following images show:

🖨 Communication		
	RS-232 Com-Port —	
	C Comi	¢Ο
	C Com2	C C

## Part III SPD testing

10	Smai	rt I/C	DD-DD	R5																					
1	File	Pi	nout	T	ools	Vi	ew	Wi	ndov	v H	Help														
		6		NI.	1	•			XMP		EXFO	A			200		*	<b>Z</b>							
E	ByteO	N	umbe	rof	Bytes	s in S.	PD D	evice										DDR5 SPD	Information -		UDIM	M Chan	nel A		
)	/alue	1-	30	1															DDR-5			DI D2	D3	D4 D5	D6 D1
ſ	0-5	11 E	lvte)	ì	51	2-10	23 1	Byte		C b	ecksu	m	œ c	RC	(	C Ne	ne	Information 1	Information 2	Parameter	D8	D9 D1	0 D11	DI2 DI	3 DI4 DI
Γ		00	01	02	03	04	05	06	07	08	09	0A	0B	0C	OD	0E	0F	Memory Type	DDR5 SI	RAM	U2 - D16	DI7 DI	8 D19	D20 D2	1 D22 D2
-	0.0	20	1.0	10	0.2	0.4	0.0	20	10	0.0	0.0	0.0	0.0	<i>c</i> 0	0.0	0.0	0.0	Madula Danaitu	Unburier 16 CP	-DIMM	U3 🔴				
	10	30	10	12	02	604	00	20	00	72	UU FD	00	00	00	00	26	40	Module Density	1 Panke		D24	D25 D2	6 D27	D28 D2	9 D30 D3
	20	26	40	26	40	82	7D	48	BD	65	01	27	01	20	00	82	00	Module Speed	5600 MH	z	U4 🔶				
	30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Module Bus Wid	th 2 ch 64 b	it(32/32)	115				
	40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Module Voltage	1.1/1.1/1	8 V 8.	CAO	TAL CA2	C12 C	AA CAS	CA6 CA7
	50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	SDRAM Density	2 Gb		Chu	AI CAL		HH CAD	
	60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	SDRAM Width	8 bit		прим	M Chan	nal P		
	70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	SDRAM Banks	4 Banks	3 Groups	DO	DI D2	D3	D4 D5	D6 D7
	80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Number of Row	16		<b>M</b>				
	90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Number of Col	10	20.25.40.40	D8	D9 D1	D DII	DI2 DI	3 DI4 DI
	AU DO	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	CL Support	48 50 52	32 30 40 42 4	<sup>10</sup> U2 🔴				
	BU	10	00	00	00	00	14	00	00	00	20	00	00	00	00	00	00	CL-tAA	16422 ps	(46T)	D16	D17 D1	8 D19	D20 D2	I D22 D2
	DO	0.0	00	00	00	00	0.0	00	00	02	00	00	00	00	00	00	00	tRCD	16422 ps	(46T)	U3 🔶			• •	
	FO	00	00	00	0.0	00	00	11	01	02	81	00	22	00	0.0	00	00	tRP	16422 ps	(46T)	D24	D25 D2	6 D27	D28 D2	9 D30 D3
	FO	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	tRAS	32130 ps	(90T)	U4 🗢		•		
																		CRC (0-509)	C09B		115				
	110	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Port Number	5169560	0001.4609	CA0 C	CAL CA2	CA3 CI	4 CA5	CA6 CA7
	120	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	DRAMID	9108500 80CF	0014006			• •		••
	130	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Diama in	(SAMSUNG)		/PGD /A	LR /RST	ACT Y	/Ren	
	140	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Module ID	0000				•	•	
	150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	1			CS0A CS	IA CSOB	CSIB (	KOA/CKI	DA CKOB/
	160	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00						•		
	170	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Test	Test Rep	on :	Setup	S	PD		
:	180	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	-							
	190	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			Down	c= beol				
	1A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		_	Down				-	

#### SPD functions on client:

1. Download : Write in the SPD data from the module of Smart I/O shown on the client. The following images will be shown when writing success.



Smart-	O DDR5	
*****	SPD file transfer success !	***



Read Tester: Load the SPD data which are saved in client and show the detail information on the computer screen. The following images will be shown when loading success.



Smart-IO DDR5

\*\*\*\*\* Computer reads the DRAM-Module successfully

Load Module: Loading SPD data of module into PC Smart I/O and show the detail information. The following images when loading success.



-

Error will be shown when the module is not well inserted or SPD HUB is damaged:



Verify: Verify if the SPD data on Smart I/O match to data on PC-side.



Smart	-IO DDR5	
****	* PC and Tester's SPD verify success ! *	k
		į.

#### Verify Successfully







#### Verify Failure

Clear (00): Clear SDP data on Smart I/O.



Clearing

Smart-IO DDR5
\*\*\*\*\* Tester's SPD clear success ! \*\*\*\*\*

### **IO Testing functions on the Smart I/O:**

- 1. READ: Read the SPD data from module which is inserted in Smart I/O Error Detector and save the data in the host.
- 2. COPY: Copy SPD data from Smart I/O Error Detector to the module
- 3. VERIFY: Verify SPD data recorded from Smart I/O Error Detector with the SPD data from the module.
- 4.LEARN: Learn the mode of <Open Circuit> and <Short Circuit> on the module from Expansion Slot.



### I/O Testing card:

I/O Testing card help corresponding Address and Date on the module while running OPEN/SHORT functions.



