

## Bed320 Test SOP

### Updated History

Date	Ver.	Update Items	Remark
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表單編號 Form No. :

頁數/總頁數 Page/Total Pages : 1/9

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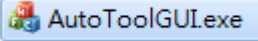
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2021/6/28	V1.0	First release	
2021/7/12	V2.0	Increase the guide of fail analysis	

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## 1. Touch panel test program Installation of Test Program

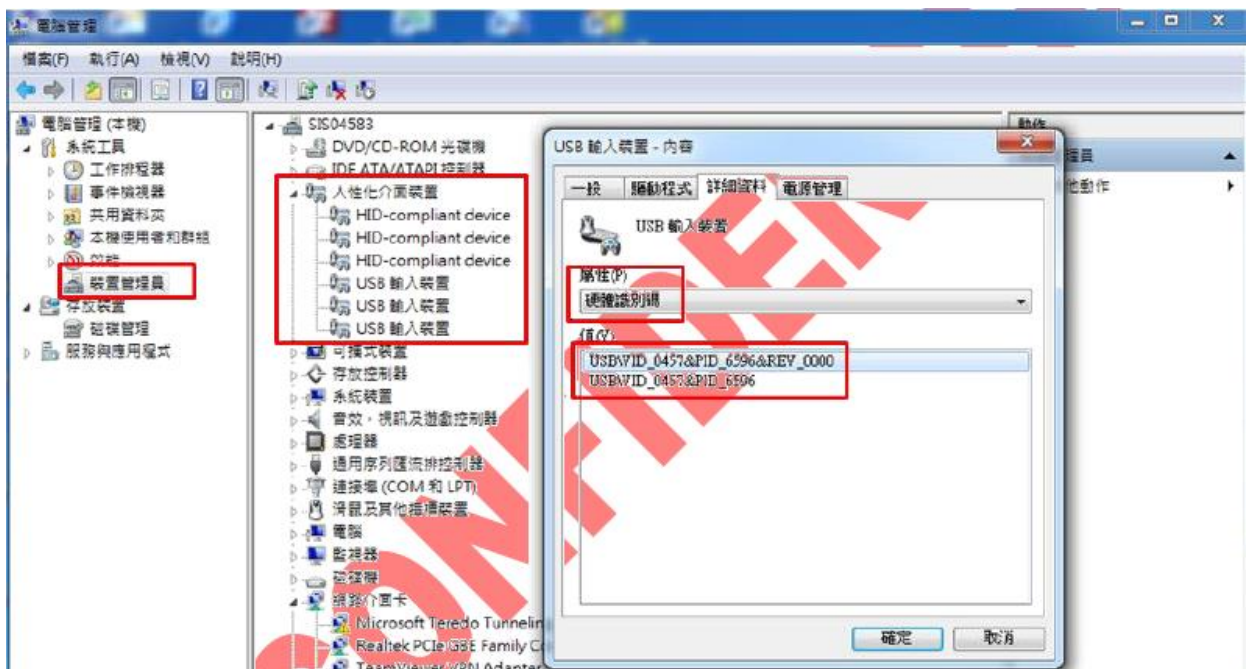
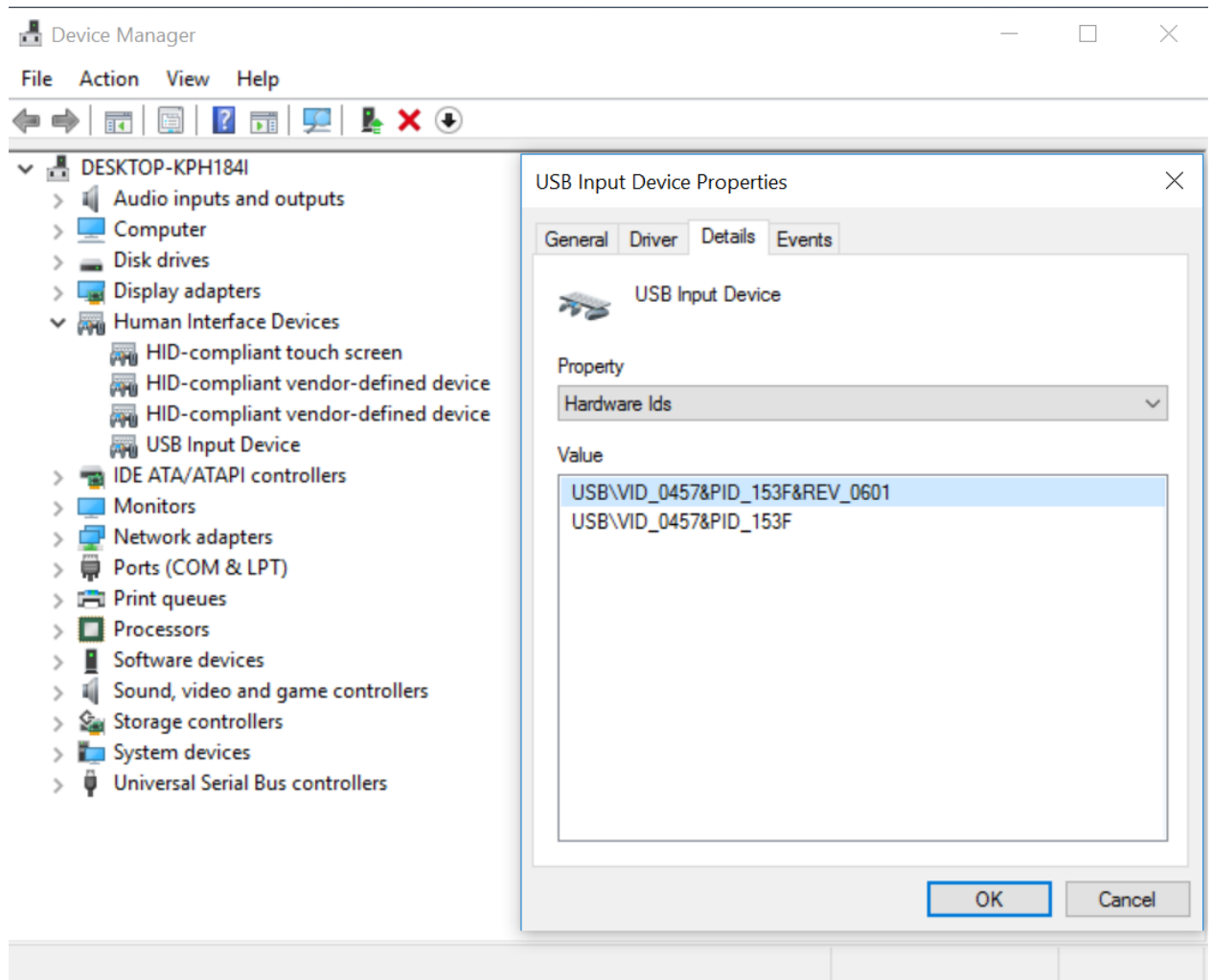
This Test Program don't need install, direct to open QAutoTool folder to execute AutoToolGUI.exe. 

## 2. Hardware Connection (Hardware Connection) :

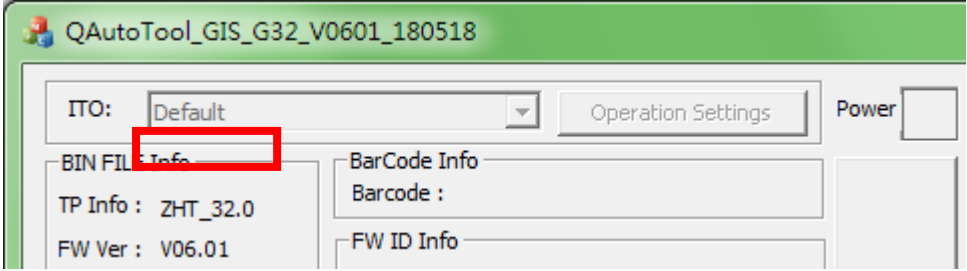
As shown in the figure, connect the SIS cable to the PCBA (follow the indicated direction) and then to the USB port of the mainboard.



When connected to mainboard, please following the steps below figure that **Device Manager>Human Interface Devices>** check each **USB Input Device**, and right click to enter **Properties**, and check label of **Details** to drop-down list to found the **VID\_0457** string in the Hardware Ids.



### 3. Test Procedure

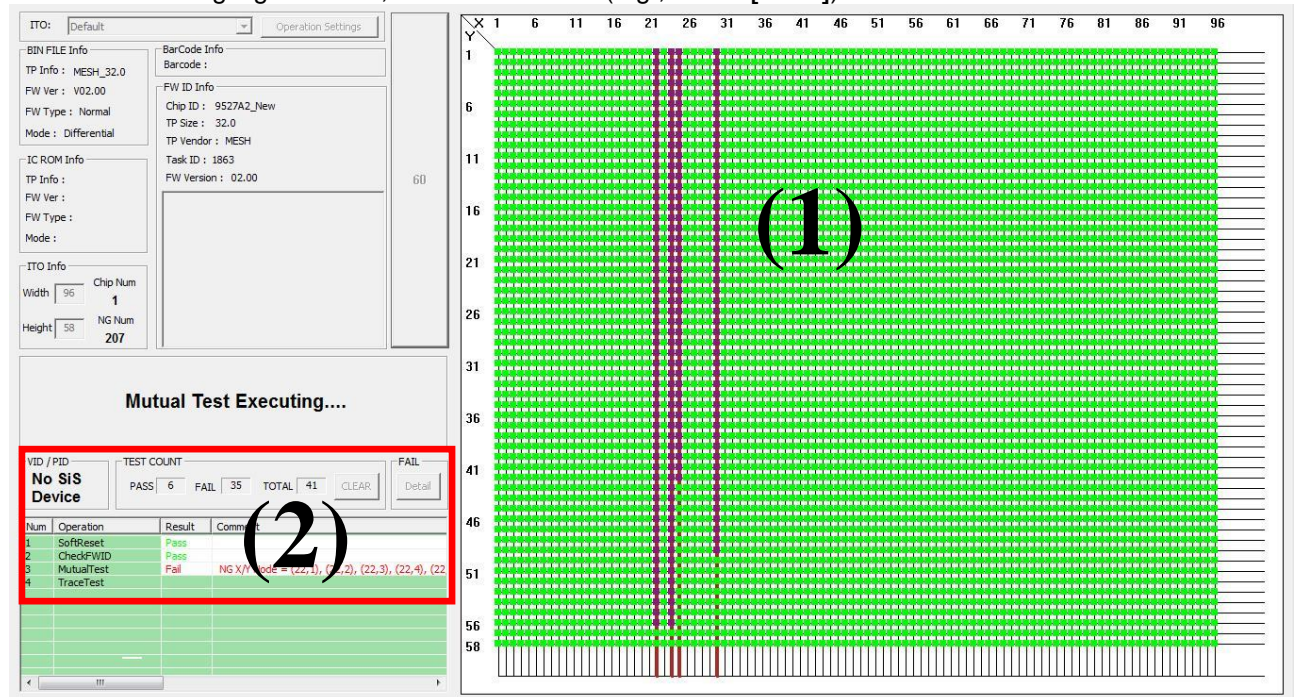
<p>(A) Execute Test Program AutoToolGUI.exe</p>	<p>Before running the software, first connect the FPC cable, then the main cable. Launch AutoToolGUI.exe; the window below should appear.</p> <p>If the device is properly connected, the system will display <b>Device connected</b>, and the <b>TEST</b> button will be enabled. If not, it will display <b>Warning! Device Disconnected!</b>, and the <b>TEST</b> button will be disabled.</p>
<p>(B) Check Firmware Information</p>	<p>Ensure that the <b>software version</b> and Click the <b>TEST</b> button.</p> <p>⚠ Do not touch the test sample area during the test. are correct.</p> 
<p>(C) Run Touch Panel Test</p>	<p>Click the <b>TEST</b> button.</p> <p>⚠ Do not touch the test sample area during the test.</p>
<p>(D) After Testing, Record the Results</p>	<p>Once the test is complete, the system will show the result.</p> <p>✓ Passed Sample ✗ Failed Sample</p>
<p>(E) Remove the sample</p> <p>To continue testing the next sample:</p>	<p>To continue testing the next sample:</p> <ul style="list-style-type: none"> <li>To remove: disconnect the main cable first, then the FPC cable.</li> <li>To install: connect the FPC cable first, then the main cable.</li> </ul> <p>⚠ Avoid hot-swapping or touching PCB components while powered on.</p>
<p>(F) Log File Storage Path</p>	<p>Test log files will be saved in separate folders: OK and NG.</p>

## 4. Failure Analysis

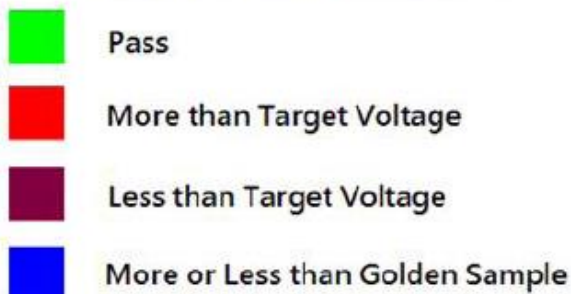
There are three ways to identify NG (fail) points:

**(1) Via the Visual Diagram:**

Hover over the highlighted area; the node number (e.g., **Node[96:1]**) will be shown.



### The colors of Mutual Test Result



(2) **Via the Text Column:**

Shorts are listed by channel (e.g., Rx 55, 56 short).

Num	Operation	Result	Comment
1	ScanBarcode	Pass	
2	SoftReset	Pass	
3	CheckFWID	Pass	
4	MutualTest	Fail	NG Y Channel = 55.56

Opens are listed per node (e.g., Rx20 open shows (20,1), (20,2)...).

Num	Operation	Result	Comment
1	ScanBarcode	Pass	
2	SoftReset	Pass	
3	CheckFWID	Pass	
4	MutualTest	Fail	NG X/Y Node = (20,1), (20,2), (20,3), (20,4), (20,5)

### (3) Via the Log File:

32				
33	X NG Char	X22	X24	X25
34	Y NG Channel			X30
35				
36	Table1:	CalibLoopcnt		
37	Y\X	X1		
38	Y1	3		

## 4.1 Test Items

The test items are categorized as follows:

1. **CheckFWID** – Verify that the firmware version is correct
2. **MutualTest** – Check for **short circuits** and **open circuits**
3. **TraceTest** – Line drawing test (optional)

### Mutual Test

The upper and lower thresholds currently configured can be viewed in the log file. For example:

Target Voltage Threshold (%)	Post	15	239.20V	Neg	10	187.20V
Line Constraints						
Threshold (%)	Calib Time	-20	20			
Out of Spec Node (%)	Tx	50	Rx	50		

**OPEN** (points to the 'Neg' column)

**Shutdown** (points to the 'Rx' column)

Detailed failure conditions can be confirmed using **Table 3** and **Table A**.

### Open Circuit Case

When an open circuit occurs, the charging voltage in **Table 3** will drop.  
The higher the resistance of the open circuit, the lower the voltage reading.

⚠ If the voltage drop exceeds the **Target Voltage Threshold**, it will trigger an **Open Fail** result.

Table3:	Voltage	(Target Voltage	208)						
Y\X	X1	X2	X3	X4	X5	X6	X7	X8	X9
Y1	128	208	128	125	210	209	208	208	205
Y2	128	207	128	125	207	207	207	207	208
Y3	128	206	128	125	207	207	207	207	208
Y4	128	206	128	125	207	207	207	207	208



## Table A – Open Circuit Case

When an open circuit occurs, the charging time recorded in **Table A** will increase.  
In the following example, nodes **X1 to X4** and **Y1 to Y7** are open.

The threshold is expressed as a percentage (%).

TableA:	Difference(%) \ Time Base \ Calibration Time				
Y\X	X1	X2	X3	X4	X5
Y1	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y2	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y3	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y4	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y5	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y6	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y7	281\21.0\80.0	-14\21.0\18.0	281\21.0\80.0	281\21.0\80.0	0\22.0\22.0
Y8	0\22.0\22.0	0\22.0\22.0	-5\22.0\21.0	-5\22.0\21.0	0\22.0\22.0
Y9	0\22.0\22.0	0\22.0\22.0	-5\22.0\21.0	-5\22.0\21.0	0\22.0\22.0

## Channels Short Circuit Case

A short circuit between channels does **not** cause a change in charging voltage.  
Instead, variations in charging time are observed in **Table A**.

If the charging time variation exceeds the defined **Calibration Time**,  
**and** the number of abnormal points exceeds the **Out of Spec Node** threshold,  
the system will **display a "Short Fail"** result.

The threshold is expressed as a percentage (%).

TableA:	Difference(%) \ Time Base \ Calibration Time					
Y\X	X1	X2	X3	X4	X5	X6
Y52	5\21.0\22.0	0\21.0\21.0	-5\21.0\20.0	-5\21.0\20.0	0\21.0\21.0	0\21.0\21.0
Y53	5\21.0\22.0	0\21.0\21.0	-5\21.0\20.0	-5\21.0\20.0	0\21.0\21.0	0\21.0\21.0
Y54	0\21.0\21.0	0\21.0\21.0	-5\21.0\20.0	-5\21.0\20.0	0\21.0\21.0	0\21.0\21.0
Y55	71\21.0\36.0	67\21.0\35.0	62\21.0\34.0	62\21.0\34.0	67\21.0\35.0	67\21.0\35.0
Y56	71\21.0\36.0	67\21.0\35.0	62\21.0\34.0	62\21.0\34.0	67\21.0\35.0	67\21.0\35.0
Y57	0\21.0\21.0	-5\21.0\20.0	-5\21.0\20.0	-5\21.0\20.0	0\21.0\21.0	0\21.0\21.0



## Channel Short to GND

If a channel is shorted to **GND (Ground)**, the **CalibSampleTime** will increase because the node fails to reach the normal charging voltage.

Table2:	CalibSampleTime							
Y\X	X1	X2	X3	X4	X5	X6	X7	X8
Y1	104	67	59	57	60	59	62	62
Y2	104	70	62	59	61	61	64	64
Y3	104	69	62	59	61	61	64	64
Y4	104	70	70	60	61	61	64	66
Y5	104	69	62	59	61	61	64	64
Y6	104	69	62	59	61	61	64	64
Y7	104	69	61	59	61	60	64	64
Y8	104	69	62	59	61	60	64	64
Y9	104	67	60	57	61	59	64	62
Y10	104	67	68	59	61	60	64	64

Table3:	Voltage	(Target Voltage	208)					
Y\X	X1	X2	X3	X4	X5	X6	X7	X8
Y1	0	212	204	212	208	209	213	216
Y2	0	210	206	209	206	206	213	213
Y3	0	208	206	208	206	206	213	213
Y4	0	211	217	210	205	207	213	216
Y5	0	210	208	209	207	207	214	213
Y6	0	210	207	209	206	207	213	213
Y7	0	208	205	209	207	205	214	213
Y8	0	208	206	209	207	205	214	213
Y9	0	207	205	207	207	205	214	212
Y10	0	208	216	210	206	206	214	214