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SEMICONDUCTOR DEVICE TESTING APPARATUS

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to a semiconductor device testing apparatus with which is connected or integrated a semiconductor device transporting and handling apparatus (commonly called handler) for transporting semiconductor devices (such as semiconductor integrated circuits) to test and sort out the tested semiconductor devices on the basis of the test results, and particularly to improvements on that section of the testing apparatus for testing/measuring semiconductor devices under test (commonly called DUT) which have been brought into the test section of the semiconductor device transporting and handling apparatus (which will be called handler hereinafter) by the automatic transporting mechanism incorporated in the handler.

2. DESCRIPTION OF THE RELATED ART

A semiconductor device testing apparatus for testing semiconductor devices has often connected therewith a handler for transporting semiconductor device under test to subject them to predetermined tests and sort out the tested semiconductor devices on the basis of the test results as noted above. For simplicity of description, in the following disclosure will be taken as an example the semiconductor device testing apparatus (commonly referred to as IC tester)

for testing semiconductor integrated circuits as will be referred to as IC hereinbelow which are typical of semiconductor devices.

Fig. 4 is a schematic side view illustrating an example of the semiconductor device testing apparatus (which will be called IC tester hereinafter) of the type described above. The IC tester comprises a tester proper 11 in which various electrical circuits, power source or supply and the like are mainly accommodated, a handler 12 equipped with therein an automatic transporting mechanism for transporting ICs, and a test head 13 electrically connected with but constructed separately from the tester proper 11 and mounted to the test section of the handler 12.

ICs under test which have been brought into the test section of the handler 12 by the automatic transporting mechanism of the handler 12 are brought into electrical contact with the test head 13 (specifically the IC socket or sockets mounted in the test head 13), and hence electrically connected with the tester proper 11 through a bundle of cables 14. A test signal having a predetermined pattern as supplied from the tester proper 11 through the bundle of cables 14 is applied to the ICs under test and response signals read out from the ICs are transmitted to the tester proper 11 through the test head 13 and the cables 14, thereby to measure the electric characteristics of the ICs.

The test section of the handler is disposed in a constant temperature chamber (not shown) for giving a predetermined

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temperature stress to ICs under test to meet the requirement that ICs under test be tested in an atmosphere at a predetermined temperature. In order to permit ICs under test brought into the test section to be electrically contacted with the IC socket or sockets mounted in the test head 13, the constant temperature chamber is provided in its bottom wall with an opening in which there is fitted and fixed a mounting fixture (which will be referred to as "device specific adapter" hereinafter as it is called so in the art) for electrically connecting the test head 13 of the IC tester with the test section in the constant temperature chamber of the handler 12.

Fig. 3 illustrates the construction of an example of the device specific adapter for connecting the test section in the constant temperature chamber of the handler 12 described above and the test head 13 together with the test head 13 and the test section in the constant temperature chamber of the handler 12. The bottom wall of the constant temperature chamber of the handler 12 is formed with an opening 21 in which a device specific adapter 23 is mounted. A framing 12B surrounding the opening 21 is defined by the insulated wall of the bottom of the constant temperature chamber.

The device specific adapter 23 comprises a perimeter frame 24, a plurality of (two in the illustrated example) socket boards 27 mounted on one side surface 24A (upper surface in the illustrated example) of the perimeter frame 24 with spacers 26 interposed therebetween, a plurality of (two

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in the illustrated example) insulation boards 30 mounted on the opposite side surface 24B (undersurface in the illustrated example) of the frame 24, and connecting boards 29 for electrically connecting the socket boards 27 and the insulation boards 30. The perimeter frame 24 is generally formed of resin-based insulating material so as to prevent the temperature of the constant temperature chamber from leaking to the exterior.

Two IC sockets 22 are mounted on the top of the two respective socket boards 27 attached to the upper surface 24A of the perimeter frame 24 while a predetermined number of male contacts 28 are mounted on each of the two insulation boards 30 affixed to the undersurface 24B of the frame 24 such that the male contacts 28 extend outwardly of the insulation boards. The terminals of each IC socket 22 are electrically connected with the corresponding male contacts 28 by means of connecting boards 29 in this example electrically connecting the socket boards 27 and the insulation boards 30 attached to the upper surface 24A and the undersurface 24B, respectively of the frame 24. It will be obvious to one skilled in the art that the electrical connection between the terminals of each IC socket 22 and the corresponding male contacts 28 may be made by any suitable connection means such as cables and wires other than the connecting boards 29.

The male contacts 28 of the device specific adapter 23 are electrically connected with a plurality of contacts

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(female contacts in this example) 31 attached to the upper surface of the mother board means 25. More specifically, the mother board means 25 comprises a peripheral frame 25F, an upper insulation board 37 attached to the top edge of the frame 25F, and a second insulation board 33 attached to the bottom edge of the frame 25F. The above noted plurality of female contacts 31 are affixed to the upper insulation board 37 while a plurality of contacts (male contacts in this example) 38 are mounted to and extend outwardly of the lower insulation board 33.

The female contacts 31 on the upper surface of the mother board means 25 are configured to be both electrically and mechanically connected with the male contacts 28 at the undersurface of the perimeter frame 24. Likewise, the male contacts 38 on the lower surface of the mother board means 25 are adapted to be both electrically and mechanically connected with female contacts 39 which are in turn mounted on a performance board (not shown).

While the female contacts 31 on the upper surface of the mother board means 25 and the male contacts 38 on the lower surface of the mother board means 25 are shown in this example as being electrically interconnected by coaxial cables 32, it is needless to say that the invention is not limited to the use of such coaxial cables, but that any other suitable connection means such as conventional connecting cables, wires or connecting boards may be employed.

Mounted on the top of the test head 13 is the performance

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board, not shown on which there is mounted the mother board means 25 on the top of which in turn there is mounted the device specific adapter 23 carrying the IC sockets 22. The combination of the device specific adapter 23 and the mother board means 25 is commonly called "Hi-fix" base or "Test Fixture" in the art concerned.

It is thus to be understood that ICs 34 under test may be electrically connected with a gang of drivers DR in the test head 13 for applying a predetermined pattern of test signals to the ICs under test, a gang of comparators CP for determining whether the output signals read out of the ICs under test are a high (H) logic signal or a low (L) logic signal having a predetermined value of voltage, respectively, and a power line through the female contacts 39 on the performance board, the male contacts 38 on the lower surface of the mother board means 25, the coaxial cables 32, the female contacts 31 on the upper surface of the mother board means 25 and the male contacts 28 on the lower surface of the device specific adapter 23, the connecting boards 29 and the IC sockets 22 on the upper surface of the device specific adapter 23.

The device specific adapter 23 constructed as described above is mounted in the opening 21 defined in the bottom wall of the constant temperature chamber of the handler 12 such that a plurality of IC sockets 22 mounted on the upper surface 24A of the perimeter frame 24 are exposed in the constant temperature chamber. It is thus noted that ICs 34

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under test which have been brought into the test section in the constant temperature chamber by the automatic transporting mechanism may be put into electrical contact with the IC sockets 22 to test the ICs 34 under test for their electrical characteristics. While two IC sockets 22, 22 are shown as mounted in Fig. 3, this is only illustrative of the invention, and it is a matter of course that the number of IC sockets may be varied depending on the configuration of the handler.

Although a gap is shown in Fig. 3 between the upper frame surface 24A of the perimeter frame 24 and the downwardly facing surface 21A of the stepped wall surrounding the opening 21 of the handler 12, these surfaces 24A and 21A are brought into abutment with each other in practical use. That is, there is no gap between the surfaces 24A and 21A. With these surfaces in abutment, the top surface (shown in dotted lines) of the IC socket 22 is arranged to mate with the presented surface 35 of the IC 34 under test (undersurface of the package of the 34). In this mated position, the perimeter frame 24 is fixed to the handler 12 by means of hold-down means. In this way, the top surface of the IC socket 22 and the presented surface 35 of the IC 34 are maintained in the mated position to ensure that the terminals of the IC 34 under test are in contact with the terminals of the IC socket 22.

Since the IC socket 22 is mounted on the socket board 27 which is in turn attached to the upper surface 24A of the

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perimeter frame 24 via the spacer 26 as noted above, it is to be appreciated that the amount or extent of projection (distance or length) HH of the IC socket 22 from the upper surface 24A (the surface of the device specific adapter 23 abutting against the surface surrounding the opening 21 of the handler 12, namely, the reference plane of the device specific adapter 23) of the perimeter frame 24 is defined depending on the thickness of the spacer 26 and that of the socket board 27, and the amount of projection HH in turn determines the extent to which the device specific adapter 23 is inserted in the opening 21 of the handler 12.

It should be noted here that if the type of ICs 34 to be tested is changed to a different one having a different length of terminals, for example, it would necessitate the amount of projection HH of the IC socket 22 to be varied.To this end, it has heretofore been to set the amount of projection HH of the IC socket 22 by varying the thickness of the spacer 26 and the height of the connecting boards 29.

This means that a change of design necessitated. Accordingly, each time the type of IC is changed, it has been required in the prior art to replace the device specific adapter 23 with another one so prepared as to have the amount of projection HH of the IC socket 22 conform with the new type of IC.

The similar situation also occurs in the case where IC sockets having various heights are employed. This requires that users of IC testers to test a number of types of ICs

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have a number of types of device specific adapters 23 in hand, resulting undesirably in an increase in the economic burden to be borne.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a semiconductor device testing apparatus which is capable of conducting the IC test using a single type of device specific adapter even if there are many types of ICs to be tested and if IC sockets having different heights are employed.

According to a first aspect of the present invention, the foregoing and other objects of the invention are accomplished by providing a semiconductor device testing apparatus comprising a handler having incorporated therein an automatic semiconductor device transporting mechanism, a device specific adapter mounted to an opening of the handler, a socket inserted and supported in the opening of the handler so as to project from the device specific adapter in such an amount of projection that the socket will contact with a semiconductor device under test as transported in by the automatic semiconductor device transporting mechanism to electrically connect the semiconductor device under test with a tester proper, and a thickness adjusting means attached to either one of the opposing surfaces of the device specific adapter and the handler for adjusting the amount of projection of the socket by selecting the thickness of the thickness adjusting means across the gap between the handler

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and the device specific adapter.

According to a second aspect of the present invention, the foregoing and other objects of the invention are accomplished by providing a semiconductor device testing apparatus comprising: a handler including a constant temperature chamber for giving a predetermined temperature stress to semiconductor devices to be tested, a test section accommodated in the constant temperature chamber for testing semiconductor devices, and an automatic transporting mechanism for transporting semiconductor devices to the test section; a device specific adapter mounted to an opening formed through the bottom wall of the constant temperature chamber of the handler for electrically connecting the test section and a tester proper, at least one socket supported above the device specific adapter so as to project upwardly a predetermined distance from the device specific adapter such that the socket will contact with a semiconductor device under test as transported in by the automatic semiconductor device transporting mechanism to electrically connect the semiconductor device under test with the tester proper in the condition in which the device specific adapter is mounted to the opening of the bottom wall of the constant temperature chamber with the socket positioned in the test section; and a thickness adjusting means attached to either one of the abutment surface of the device specific adapter and the opposing abutment surface surrounding the opening in the bottom wall of the constant temperature chamber for adjusting

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the distance by which the socket will project into the test section when the device specific adapter is mounted to the opening of the bottom wall of the constant temperature chamber.

In a preferred embodiment of the present invention, the device specific adapter may comprise a perimeter frame, at least one socket board mounted on one side surface of the perimeter frame with spacer means interposed therebetween, at least one insulation board mounted on the opposite side surface of the perimeter frame, and connecting means for electrically connecting the socket board and the insulation board.

The thickness adjusting means may comprise a plurality of adjusting members different in thickness stacked one on another. Alternatively, the thickness adjusting means may comprise a single frame-like member having a predetermined thickness.

Preferably, the thickness adjusting means may comprise a plurality of frame-like adjusting members different in thickness stacked one on another, the frame-like adjusting members having approximately the same shape and dimensions as those of the perimeter frame as described hereinbefore.

In a preferred embodiment of the invention, the thickness adjusting means comprising the plurality of frame-like adjusting members stacked one on another is attached to that abutment surface of the device specific adapter which is to be abutted against the wall portion of the bottom wall of the

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constant temperature chamber surrounding the opening.

While the thickness adjusting means may be attached to the abutment surface of the device specific adapter, the surface of the device specific adapter opposite from the aforesaid abutment surface may also be provided with means for attaching the thickness adjusting means thereto, so that when one or more of the plurality of adjusting members comprising the thickness adjusting means is or are removed from the abutment surface of the device specific adapter to adjust the thickness, the removed adjusting member or members may be carried on the opposite surface of the device specific adapter by means of the aforesaid attachment means.

In another preferred embodiment, the thickness adjusting means comprising a plurality of frame-like adjusting members stacked one on another may be attached to that surface of that wall portion of the bottom wall of the constant temperature chamber surrounding the opening which is to be abutted against the device specific adapted.

It will thus be appreciated that according to the present invention, the semiconductor device testing apparatus is capable of handling various standards of semiconductor devices as well as various heights of sockets without the need for modifying the construction of the device specific adapter, whereby the practical benefit of greatly reducing the running costs may be provided in practising the semiconductor device testing apparatus.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic cross-sectional view showing the construction of the principal portion of a first embodiment of the IC tester according to the present invention;

Fig. 2 is a schematic cross-sectional view showing the construction of the principal portion of a second embodiment of the IC tester according to the present invention;

Fig. 3 is a schematic cross-sectional view of showing the construction of the principal portion of an example of the prior art IC tester; and

Fig. 4 is a side view illustrating the general arrangement of the IC tester.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 is a schematic cross-sectional view showing the construction of the principal portion of the first embodiment of the test section of the IC tester according to the present invention. That is, there are shown only that portion of the IC tester including the opening 21 formed through the bottom wall of the constant temperature chamber of the handler 12 and the device specific adapter 23. Those portions or components which correspond to portions or components shown in Fig. 3 are designated by the like reference numerals and will not be discussed again unless needed.

The present invention is characterized in that thickness adjusting means 41 for adjusting the extent of projection (the extent or length of the projection from the reference

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plane of the device specific adapter 23) HH of the IC socket 22 mounted to the device specific adapter 23 from that adapter is attached to either one of (A) that abutment surface of the device specific adapter 23 (the reference plane of the device specific adapter 23) inserted in the opening 21 of the handler 12 which is to abut against the abutment surface of the perimeter portion of the opening 21 and (B) the abutment surface of the perimeter portion of the opening 21 which is to be contacted by the abutment surface of the device specific adapter 23.

The first embodiment shown in Fig. 1 represents the configuration (A) in which the frame-like thickness adjusting means 41 is attached to that abutment surface of the device specific adapter 23 inserted in the opening 21 of the handler 12 which is to abut against the perimeter portion of the opening 21, more specifically to the upper frame surface 24A of the perimeter frame 24 which is to abut against the downwardly facing surface 21A of the stepped wall surrounding the opening 21.

The thickness adjusting means 41 may comprise a plurality of adjusting members in the form of frame-like metal sheets stacked one on another, each metal sheet having a predetermined thickness. Each of the frame-like adjusting members has approximately the same shape and dimensions as those of the perimeter frame 24 (actually, narrower in width by the width of the spacer 26 than the frame 24), and is superposed on the upper frame surface 24A of the perimeter

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frame 24.

Ordinarily, various frame-like members having different thicknesses are prepared and held in stock, so that various thicknesses of frame-like members may be stacked one on another to form a desired thickness of the thickness adjusting means 41. The thus obtained thickness adjusting means 41 comprising a number of superposed frame-like members may then be affixed to the upper frame surface 24A of the perimeter frame 24. It is thus to be appreciated that the extent of projection HH of the IC socket 22 may be defined by various combinations of various thicknesses of frame-like members stacked one on another. It should be noted, however, that a plurality of frame-like members need not necessarily have different thicknesses from each other.

In the first embodiment shown in Fig. 1, the upper frame surface 24A of the perimeter frame 24 except for that portion to which the spacer 26 is fixed is preliminarily reduced in height by the thickness of the thickness adjusting means 41. More specifically, that portion of the upper frame surface 24A of the perimeter frame 24 which is to be contacted by the abutment surface 21A of the perimeter portion of the opening 21 of the handler 12 has its material removed by the thickness of the thickness adjusting means 41 so as to have a correspondingly reduced thickness. The thickness adjusting means 41 comprising a number of superposed frame-like members is affixed to that portion thinned by the material removal, namely the newly formed upper frame surface 24A of the

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perimeter frame 24 to thereby make the thickness of that portion substantially equal to the thickness AA of the conventional of the perimeter frame 24.

With the construction as described above, the amount of projection HH of the IC socket 22 may be defined by the distance (length) from the top surface (the new reference plane of the device specific adapter 23 abutting against the peripheral surface of the opening 21 of the handler 12) of the uppermost layer (adjusting member) of the thickness adjusting means 41 to the top surface of the IC socket 22. When it is desired to increase the amount of projection (the extent or length of the projection from the reference plane of the device specific adapter 23) HH, it is only required to increase the number of the frame-like adjusting members comprising the thickness adjusting means 41. In this embodiment, a plurality of frame-like adjusting members comprising the thickness adjusting means 41 are fastened to the upper frame surface 24A of the perimeter frame 24 by means of screws or the like. Accordingly, the total thickness of the thickness adjusting means 41 may readily be varied by simply removing the screws and increasing or decreasing the number of frame-like adjusting members.

It is preferable that all of the plurality of frame-like adjusting members prepared preliminarily to form the thickness adjusting means 41 be superposed one on another and that when the thus formed thickness adjusting means 41 is placed on the upper frame surface 24A of the perimeter frame

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24, the IC socket 22 be located in its lowest position where ICs with terminals having a maximum length can be tested. When ICs with terminals shorter in length are successively to be tested, one or more (a predetermined number) of the frame-like adjusting members comprising the thickness adjusting means 41 need only be removed from the upper frame surface 24A to successively elevate the position of the IC socket 22 in preparation for testing new successive lots of ICs with terminals shorter than those of the preceding lots with the IC socket 22 set at the appropriate elevation, whereby the efficiency of operation may be significantly enhanced.

It is also to be noted that this embodiment is configured so as to permit any frame-like adjusting member or members removed from the upper frame surface 24A of the frame 24 to be reattached to the opposite lower frame surface 24B. To this end, the lower frame surface 24B is also formed with screw holes to provide for reattaching the frame-like adjusting member dislodged from the upper frame surface 24A to the lower frame surface 24B by screws.

It can be appreciated that reattaching the frame-like adjusting member dislodged from the upper frame surface 24A of the perimeter frame 24 to the opposite lower frame surface 24B permits the total thickness of the perimeter frame 24 to be always maintained at the constant value AA. This arrangement provides the advantage that the hold-down means 36 is permitted to press the perimeter frame 24 down to the handler 12 under the always constant condition. In Fig. 1,

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the frame-like adjusting members removed from the upper frame surface 24A and reattached to the lower frame surface 24B are shown in dotted lines 41'.

Fig. 2 is a schematic cross-sectional view showing the construction of the principal portion of the second embodiment of the IC tester according to the present invention. This second embodiment represents the configuration (B) in which the frame-like thickness adjusting means 41 is attached to that abutment surface of the perimeter portion of the opening 21 of the handler 12 which is to be contacted by the device specific adapter 23 (specifically, the upper frame surface 24A of the perimeter frame 24 which is the reference plane of the device specific adapter 23) inserted in the opening 21 of the handler 12, more specifically to the downwardly facing surface 21A of the stepped wall surrounding the opening 21.

In this embodiment as well, the thickness adjusting means 41 may comprise a plurality of adjusting members in the form of frame-like metal sheets stacked one on another, each metal sheet having a predetermined thickness. Each of the frame-like adjusting members has approximately the same shape and dimensions as those of the downwardly facing surface 21A of the stepped wall surrounding the opening 21, and is secured to the upper frame surface 24A in superposed relation thereon.

As is the case with the first embodiment discussed above, ordinarily, various frame-like members having different

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thicknesses are prepared and held in stock, so that various thicknesses of frame-like members may be stacked one on another to form a desired thickness of the thickness adjusting means 41. The thus obtained thickness adjusting means 41 comprising a number of superposed frame-like members may then be affixed to the downwardly facing surface 21A of the stepped wall surrounding the opening 21. It is thus to be understood that the extent of projection (the extent or length of the projection from the reference plane of the device specific adapter 23) HH of the IC socket 22 may be defined by various combinations of various thicknesses of frame-like members stacked one on another in this embodiment as well. It should be noted, however, that a plurality of frame-like members need not necessarily have different thicknesses from each other.

A plurality of frame-like adjusting members comprising the thickness adjusting means 41 are fastened to the downwardly facing surface 21A of the stepped wall surrounding the opening 21 by means of screws or the like. Accordingly, the total thickness of the thickness adjusting means 41 may readily be varied by simply removing the screws and increasing or decreasing the number of frame-like adjusting members.

Further, like the first embodiment described above, if the provision is made for permitting any frame-like adjusting member or members removed from the downwardly facing surface 21A of the stepped wall surrounding the opening 21 to be

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reattached to the lower frame surface 24B, this second embodiment may also provide the advantage that the hold-down means 36 is permitted to press the perimeter frame 24 down to the handler 12 under the always constant condition.

While the thickness adjusting means 41 is shown as being constituted by stacking a plurality of frame-like adjusting members one on another in the various embodiments described above, the thickness adjusting means 41 may comprise a single frame-like thickness adjusting member. In the latter case, the thickness of single thickness adjusting member 41 is determined in accordance with the length of the terminals of ICs to be tested as well as with the height of the IC socket 22, so that a thickness adjusting member 41 having a thickness corresponding to the type of ICs to be tested and the height of the IC socket 22 used need only be attached to either the upper frame surface 24A of the perimeter frame 24 or the downwardly facing surface 21A of the stepped wall surrounding the opening 21.

While the invention has been described in the foregoing discussion as being applied to the IC tester adapted to test ICs which are typical of semiconductor devices, it will be apparent to those skilled in the art that the invention is also applicable, with equal advantages, to various types of semiconductor device testing apparatus for testing semiconductor devices other than ICs.

As is discussed above, in a semiconductor device testing apparatus in which a socket board 27 having sockets 22

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mounted thereon is affixed to the upper surface 24A of the perimeter frame 24 which is a component of a device specific adapter 23 with a spacer 26 interposed therebetween, the sockets 22 being arranged to be electrically connected through connecting boards 29 with a test head 13, the present invention provides for varying the amount of projection (the extent or length of the projection from the reference plane of the device specific adapter 23) HH of the sockets 22 from the reference plane of the device specific adapter (the surface of the device specific adapter 23 abutting against the peripheral surface of the opening 21 of the handler 12, specifically, the top surface of the thickness adjusting means 41 or the upper surface 24A of the perimeter frame 24) by changing the thickness of the thickness adjusting means only without the need for varying the heights of the spacers 26 and the connecting boards 29. It will thus be appreciated that each time the type of semiconductor devices to be tested is changed or each time the height of the sockets 22 used is varied, it is not required to replace the device specific adapter with another particular adapter prepared so as to establish an amount of projection HH of socket corresponding to the new type of semiconductor devices and the height of the sockets 22 selected, as was required of the prior art. Otherwise stated, it is not required to prepare many types of the device specific adapter 23.

Consequently, the same single type of device specific adapter 23 may be adapted for testing various standards of

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semiconductor devices, and may also be applied to various heights of sockets. In this way, the present invention provides the remarkable advantages of greatly reducing the economic burden on the users of the semiconductor device testing apparatus of the type concerned as well as significantly saving the running costs of such apparatus.

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WHAT IS CLAIMED IS:

1. A semiconductor device testing apparatus comprising:

a handler having incorporated therein an automatic semiconductor device transporting mechanism;

a device specific adapter mounted to an opening of the handler;

a socket inserted and supported in said opening of the handler so as to project from said device specific adapter in such an amount of projection that the socket will contact with a semiconductor device under test as transported in by said automatic semiconductor device transporting mechanism to electrically connect the semiconductor device under test with a tester proper; and

a thickness adjusting means attached to either one of the opposing surfaces of said device specific adapter and said handler for adjusting the amount of projection of the socket by selecting the thickness of said thickness adjusting means across a gap between the handler and said device specific adapter.

2. The semiconductor device testing apparatus according to Claim 1, wherein said opening of the handler is formed through the bottom of a constant temperature chamber for giving a predetermined temperature stress to semiconductor devices to be tested.

3. The semiconductor device testing apparatus according

* C L M S *

to Claim 1, wherein said device specific adapter comprises a perimeter frame, at least one socket board mounted on one side surface of said perimeter frame with spacer means interposed therebetween, at least one insulation board mounted on the opposite side surface of said perimeter frame, and connecting means for electrically connecting said socket board and said insulation board.

4. A semiconductor device testing apparatus comprising:

a handler including a constant temperature chamber for giving a predetermined temperature stress to semiconductor devices to be tested, a test section accommodated in the constant temperature chamber for testing semiconductor devices, and an automatic transporting mechanism for transporting semiconductor devices to the test section;

a device specific adapter mounted to an opening formed through a bottom wall of said constant temperature chamber of the handler for electrically connecting said test section and a tester proper;

at least one socket supported above said device specific adapter so as to project upwardly a predetermined distance from the device specific adapter such that said socket will contact with a semiconductor device under test as transported in by said automatic semiconductor device transporting mechanism to electrically connect the semiconductor device under test with said tester proper in the condition in which said device specific adapter is mounted to said opening in

the bottom wall of said constant temperature chamber with said socket positioned in the test section in said constant temperature chamber; and

a thickness adjusting means attached to either one of the abutment surface of said device specific adapter and the opposing abutment surface surrounding the opening in the bottom wall of the constant temperature chamber for adjusting the distance by which the socket will project into the test section when the device specific adapter is mounted to the opening of the bottom wall of the constant temperature chamber.

5. The semiconductor device testing apparatus according to Claim 4, wherein said device specific adapter comprises a perimeter frame, at least one socket board mounted on one side surface of said perimeter frame with spacer means interposed therebetween, at least one insulation board mounted on the opposite side surface of said perimeter frame, and connecting means for electrically connecting said socket board and said insulation board.

6. The semiconductor device testing apparatus according to Claim 4, wherein said thickness adjusting means comprises a plurality of adjusting members different in thickness stacked one on another.

7. The semiconductor device testing apparatus according

* C L M S *

to Claim 1 or 4, wherein said thickness adjusting means comprises a single frame-like member having a predetermined thickness.

8. The semiconductor device testing apparatus according to Claim 5, wherein said thickness adjusting means comprises a plurality of frame-like adjusting members different in thickness stacked one on another, said frame-like adjusting members having approximately the same shape and dimensions as those of said perimeter frame.

9. The semiconductor device testing apparatus according to Claim 8, wherein said thickness adjusting means comprising the plurality of frame-like adjusting members stacked one on another is attached to that abutment surface of said device specific adapter which is to be abutted against that portion of said bottom wall of the constant temperature chamber surrounding said opening.

10. The semiconductor device testing apparatus according to Claim 8, wherein said thickness adjusting means comprising the plurality of frame-like adjusting members stacked one on another is attached to that portion of said bottom wall of the constant temperature chamber surrounding said opening which is to be contacted by said device specific adapter.

11. The semiconductor device testing apparatus according

* C L M S *

to Claim 4, wherein said thickness adjusting means comprises a plurality of adjusting members different in thickness stacked one on another and is attached to that abutment surface of said device specific adapter which is to be abutted against that portion of said bottom wall of the constant temperature chamber surrounding said opening, the surface of said device specific adapter opposite from said abutment surface is provided with means for holding said thickness adjusting means to said opposite surface, so that when one or more of the plurality of adjusting members comprising said thickness adjusting means is or are removed from said abutment surface of said device specific adapter to adjust the thickness, the removed adjusting member or members may be held to said surface of said device specific adapter opposite from said abutment surface.

12. The semiconductor device testing apparatus according to Claim 3, wherein said thickness adjusting means comprises a plurality of frame-like adjusting members different in thickness stacked one on another, said frame-like adjusting members having approximately the same shape and dimensions as those of said perimeter frame.

13. The semiconductor device testing apparatus according to Claim 3, wherein said thickness adjusting means comprising the plurality of frame-like adjusting members stacked one on another is attached to that abutment surface of said device

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specific adapter which is to be abutted against that portion of said bottom wall of the constant temperature chamber surrounding said opening.

14. The semiconductor device testing apparatus according to Claim 3, wherein said thickness adjusting means comprising the plurality of frame-like adjusting members stacked one on another is attached to that portion of said bottom wall of the constant temperature chamber surrounding said opening which is to be contacted by said device specific adapter.

15. The semiconductor device testing apparatus according to Claim 1, wherein said thickness adjusting means comprises a plurality of adjusting members different in thickness stacked one on another and is attached to that abutment surface of said device specific adapter which is to be abutted against that portion of said bottom wall of the constant temperature chamber surrounding said opening, the surface of said device specific adapter opposite from said abutment surface is provided with means for holding said thickness adjusting means to said opposite surface, so that when one or more of the plurality of adjusting members comprising said thickness adjusting means is or are removed from said abutment surface of said device specific adapter to adjust the thickness, the removed adjusting member or members may be held to said surface of said device specific adapter opposite from said abutment surface.