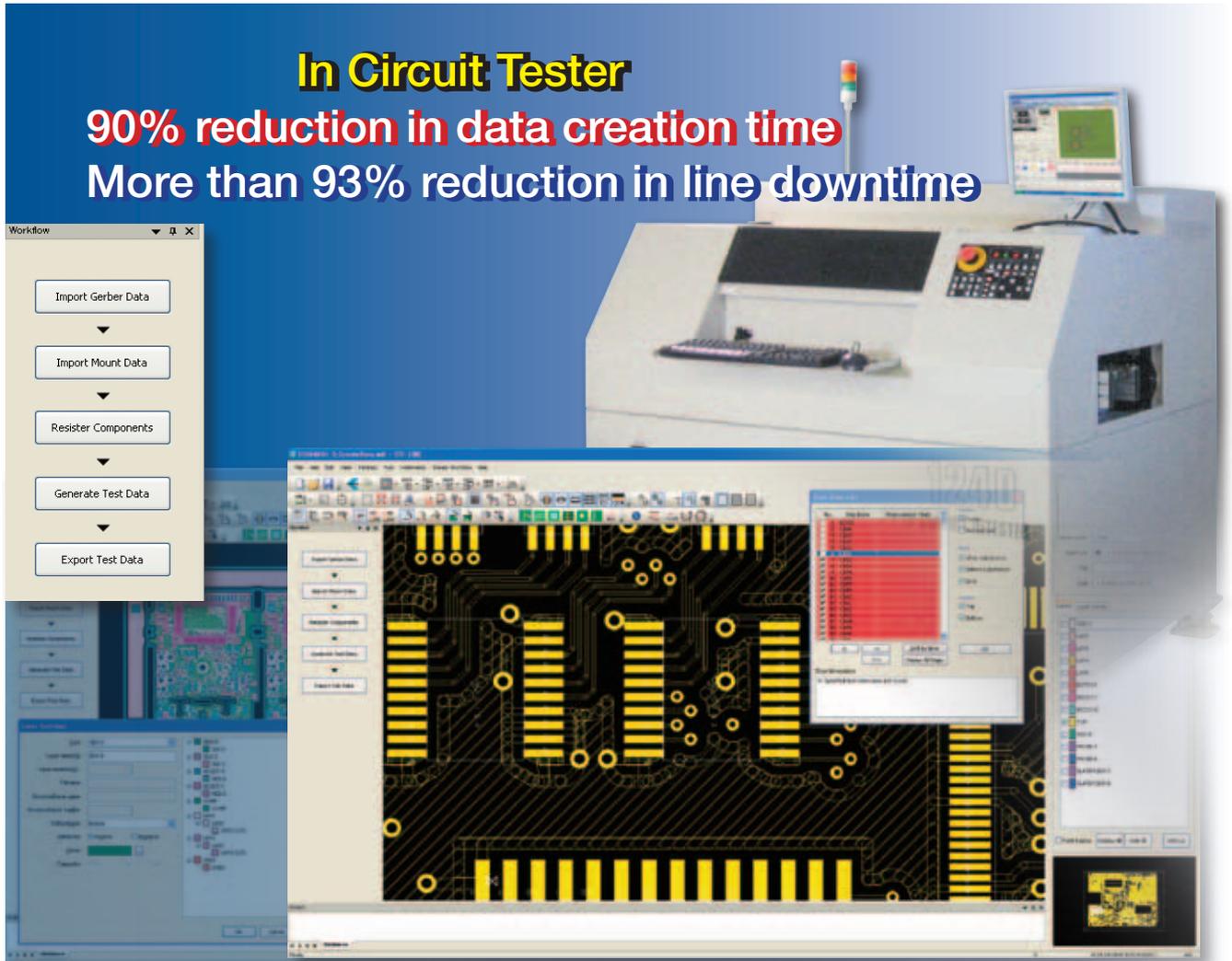




FIT-LINE INSPECTION DATA CREATION SYSTEM UA1780

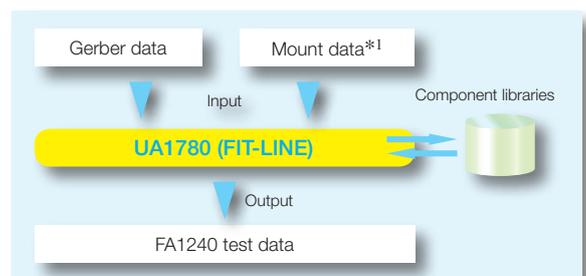
Automatic Testing Equipment


In Circuit Tester
90% reduction in data creation time
More than 93% reduction in line downtime

Data is created based on Gerber data and mount data*1 while referencing component library information. Introducing a Windows version of HIOKI's popular FIT-LINE application.

- No need to use camera teaching when creating test data
- No need to visually track patterns under components
- Easily create high-quality test data without boards
- Support for the FA1240's new data format

Thanks to these features, programs can be created easily during down time prior to the prototyping stage. Anybody can create high-quality test programs quickly and easily by using net information reverse-generated from Gerber data and component information libraries. Used in combination with HIOKI's new FA1240-50 flying-probe tester, FIT-LINE delivers the ultimate level of performance.


ISO 9001
JMI-0216

ISO 14001
JQA-E-90091

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HIOKI company overview, new products, environmental considerations and other information are available on our website.

*1 mount data refers to component placement data

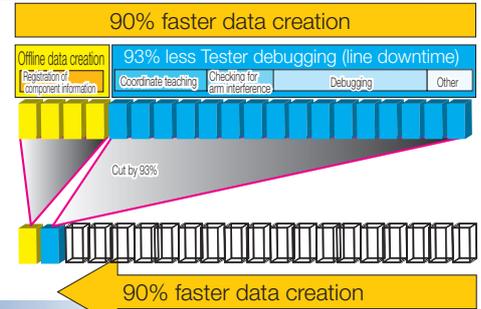
Five benefits when UA1780 is used in combination with the FA1240

Benefit 1 90% reduction in data creation time, more than 93% reduction in line downtime

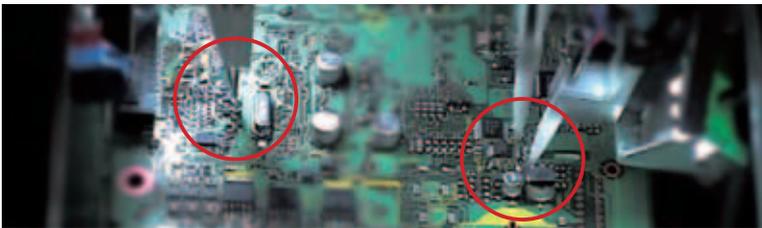
The UA1780 dramatically reduces the amount of time needed to create test data on the Tester by using board design data such as Gerber data, mount data*1, and component lists so that the large amount of information needed to create data efficiently can be entered offline. Simply by following the procedure outlined by the software's graphical user interface, operators can easily and quickly create high-quality data, even if they lack a high level of experience.

When you use test data generated with the UA1780 with the FA1240, you also realize Benefit 2, automatic avoidance of arm interference, and Benefit 3, net testing and ATG functionality using net information. These advantages make it possible to dramatically reduce the amount of debugging work that must be performed on the Tester, slashing line downtime by over 93% and reducing overall data creation time by 90% compared to the conventional approach.

*1 mount data refers to component placement data



Benefit 2 Arm selection and sorting based on 3D information

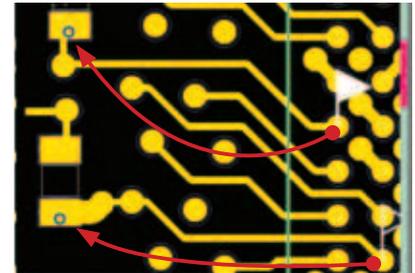


Since the addition of height information to component shape libraries makes it possible to ensure that test system measurement arms do not come into contact with components (*FA1240-50 function), debugging work can be performed smoothly without damaging components or probes.

Benefit 3 Use of net (circuit) information

Hidden test points for BGAs and other components can be moved automatically, pins can be assigned on a one-net/one-point basis as with bed-of-nails type testing, and an order of precedence can be configured for pin assignments. Additionally, the ability to use the FA1240's automatic debugging function (ATG)* efficiently based on net information makes it possible to create higher-reliability test programs more quickly.

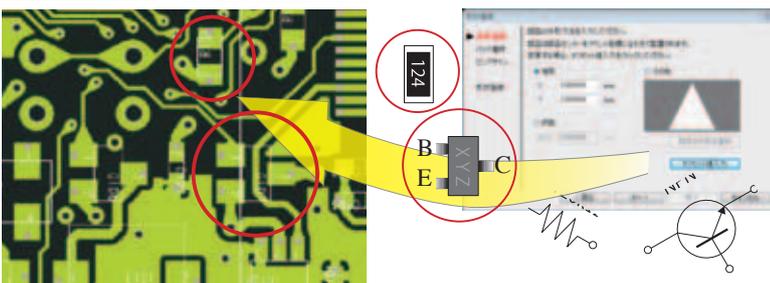
*ATG is a function of the 1240 application.



BGA point replacement processing

Realize two additional benefits when using the UA1780 in conjunction with the 1240, 1114, 1112, etc.

Benefit 4 High-quality data, regardless of who prepares it



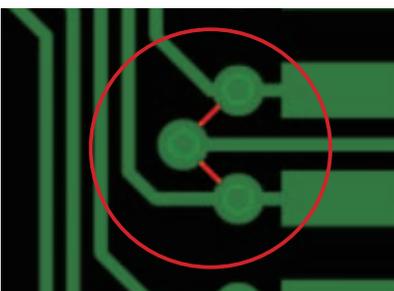
Application of library data

Component registration

Use of component libraries during the data creation process allows UA1780 FIT-LINE to automatically configure test point and test information. This approach makes it possible for multiple operators to create high-quality data quickly.

*Offline data creation also allows data to be created more quickly on the 1240, 1114, and 1112 (80% faster than the conventional approach).

Benefit 5 Automatic generation of data for detecting solder bridges between adjacent components



Automatic detection of adjacent points

Increasing density of mounted components makes formation of solder bridges more likely. Locations where bridge formation is a risk due to the physical proximity of circuit elements other than component pins, for example between closely spaced adjacent SMT components or between adjacent through-holes following a wave soldering process, can be automatically added to test programs.



Adjacent SMT components



Adjacent through-holes



Physically close circuit elements

■ FIT-LINE Test Data Creation System UA1780 (Specifications)

| UA1780 product configuration | |
|--|--|
| Application CD, license key (USB), user manual | |
| *Note: Computer, monitor, and other hardware not included. | |
| Recommended operating environment | |
| Recommended operating environment/Supported operating system | Windows 7 Professional 64-bit |
| CPU | Core i7 or equivalent |
| Memory | 4 GB or more |
| Display resolution | 1,920 × 1,080 or greater |
| Available disk space | 80 GB |
| Function details | |
| Gerber data input function | Loading of Gerber files (RS-274X, RS-274D), aperture files, and drill files |
| Mount data*1 input function | Loading of CSV files containing circuit names, layout coordinates, angles of rotation, shape names, and component names Support for operations such as rotation and mirroring; Display of mounting positions and other data |
| Graphical editing function | Figure copying, movement, deletion, etc. |
| Component library registration function | Display of component lists; registration of component size, height, and pin numbers; registration of test pin intervals, test modes, ratings (threshold values), and upper and lower limit values; duplication of libraries |
| Test data generation function | Reverse net generation, identification of test points based on components and patterns, automatic movement of test points lying underneath components, generation of open tests between closely spaced pads, etc. |
| Test point review function | Graphical display of test points |
| Test data output function | FA1240-50 files, 1240/1114 files |
| Data management function | Saving of databases and management of component libraries |
| Windows FIT-LINE functions | |
| Ability to easily create data based on Gerber data and mount data*1, start the data creation process after completion of the board design, and start testing with the prototype assembled board | |
| Inputting of component shapes and test methods (incorporation of detailed component information into libraries to allow accurate application of necessary information) | |
| Automatic movement of hidden test points, for example on BGAs, automatic identification of nets where solder bridge formation is likely, and automatic debugging using net information | |
| Generation of accurate programs with test method specification on a component-by-component basis; graphical reproduction of populated boards based on Gerber and mount data*1 to allow visual review | |
| Automatic creation of test points and test "recipes" based on registered library information | |

Supplemental information : Gerber data

The Gerber format is one of several data formats used in printed circuit board (PCB) design to store images of PCBs (copper layers, solder masks, symbol mask layers, etc.) and data for rendering drill and router data. The format encompasses the RS-274D and RS-274X specifications, which offer the following characteristics:

*1 mount data refers to component placement data

Example RS-274D file

```
*G90*G17*D10*D02*G01X0Y0*D02*D16*G01X25083Y37783*D03*X26353Y37783*D03*X
27623Y37783*D03*X28893Y37783*D03*X30163Y37783*D03*X32703Y37783*D03*X3524
3Y37783*D03*X36513Y37783*D03*X37465Y39053*D03*X39370Y39053*D03*X40323Y39053
*D03*X43815Y35560*D03*X43815Y34290*D03*X43815Y33338*D03*X44450Y31750*D03*X4
4450Y327
560*D03*
*X55880)
5Y36513*
D03*X59:
750Y2680
118Y35
970*D03
3*X5
Y37148*
D03*X62
35Y1809
*The RS-274D format, which is also known as "standard Gerber," is older than the RS-274X format. Because it does not include apertures (basic shape definition information), separate aperture files are required.
```

Example RS-274X file

```
%FSLAX53Y53*%
%MOMM*%
*ADD11C.0.10000*%
*ADD12C.0.20000*%
*ADD13C.0.30000*%
*ADD14C.0.40000*%
*ADD105R.0.27000X0.27000*%
*ADD113R.0.35000X0.35000*%
*ADD118R.0.40000X0.40000*%
*ADD120R.0.50000X0.50000*%
*ADD122R.0.60000X0.60000*%
*ADD264C.0.27000*%
*G54D10*G54D15*X131475Y136000D02*G55D03*X132125Y135500D02* G55D03*X1327
5Y136000D02*G55D03*X133425Y135500D02*G55D03*X134075Y136000D02*G55D03*X1
34725Y135500D02*G55D03*X135375Y136000D02*G55D03*X136025Y135500D02*G55D03
*X141050Y132250D02*G55D03*X141700Y131750D02*G55D03*X142350Y132250D02*G5
5D03*X143000Y131750D02*G55D03*X143650Y132250D02*G55D03*X144300Y131750D0
2*G55D03*X144950Y132250D02*G55D03*X145600Y131750D02*G55D03*X136025Y142
250D02*G55D03*X135375Y142000D02*G55D03*X134725Y141750D02*G55D03*X13407
5Y141500D02*G55D03*X133425Y141250D02*G55D03*X132775Y141000D02*G55D03*
X132125Y140750D02*G55D03*X131475Y140500D02*G55D03*X122875Y140750D02*G55
D03*X126125Y142000D02*G55D03*X125475Y141750D02*G55D03*X126775Y142250D02
*G55D03*X124825Y141500D02*G55D03*X123525Y141000D02*G55D03*X12175Y141250
D02*G55D03*X12225Y140500D02*G55D03*X113625Y140750D02*G55D03*X116875Y14
2000D02*G55D03*X116225Y141750D02*G55D03*X117525Y142250D02*G55D03*X115575
Y141500D02*G55D03*X114275Y141000D02*G55D03*X114925Y141250D02*G55D03*X112
975Y140500D02*G55D03*X104375Y140750D02*G55D03*X107625Y142000D02*G55D03*
```

*In the RS-274X Gerber format, which is also known as "extended Gerber" or "X-Gerber, lines enclosed in percent signs ("%") contain RS-274X parameters with tool information and other data. Consequently, separate tool information files are not needed.

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