IN CIRCUIT HiTESTER

NEW 1220

1220-50 / 1220-51 / 1220-52 / 1220-55

HIOKI. ——— Certifying reliability.
An extensive range of measurement modes

Using the 1220-50 as a controller, you can perform active testing on the same pin fixture after ICT testing without the need to reconfigure the system.

**Extensive range of measurement modes**

**FET Active Testing**

The 1220-5x supports MOS-FET and J-FET measurements.

**Judgments are based on the operating status of the component under test.**

A PASS/FAIL judgment of FET operation is made by measuring the voltage and current between the drain and source when on and off voltages are applied to the MOS-FET or J-FET gate. (Both Nch and Pch devices are supported.)

A PASS/FAIL judgment is made based on the off current and on-resistance values.

A PASS/FAIL judgment is made based on the off current and measured current (IDSS).

**I2C support**

The 1220-5x delivers I2C control and leakage current testing functionality in response to growing demand for lower standby leakage currents in low-power-consumption devices such as mobile phones. ICs on the board under test are controlled using the I2C bus. Using its Ratoc Systems I2C controller, the 1220 can write data to target devices, verify write data, and generate controller DIO output. This functionality allows CURR-CV mode to be used to measure the leakage current after placing the target device in standby mode.

*I2C is a serial bus standard that is widely used in mobile phones and embedded systems.*
Easier analysis

**Point Viewer Function**

The Point Viewer display of pin coordinates, a useful feature when performing fixture maintenance, provides immediate access to information while eliminating the need to carry around printed documentation. You can select the top or bottom surface of the board, the perspective from which points are viewed, and the zoom factor, among other settings. FAIL pins are shown in red. During pin search operation, the pin number for the point in question is enlarged on the display.

Improved ease of use

**Pin Search Function with Audio Guidance**

This functionality provides spoken confirmation of pin numbers when using the pin search function, eliminating the need to look at the screen so that you can focus on identifying the target pin. The instrument can call out pin numbers in Japanese, English, and Chinese, and you can use a speaker to provide clear, easily intelligible spoken guidance without taking up space at your worksite.

Upgrade your HiTESTER software and install the audio callout software!

Use of the callout feature in Japanese requires separate purchase of a speech synthesis engine that supports Microsoft Speech API Ver. 5 (SAPI5) or later. The following speech synthesis product has been confirmed to work properly with the system:

Create System Development Co., Ltd.
(http://www.createsystem.co.jp/)
This product can be purchased and downloaded online.

Safer operation

**Operation History Function**

In the event you make an inadvertent or unintentional change to test data, the operation history lets you verify the change and revert the data to its previous state. If you experience a problem with the system, you can also use the operation log to help identify the cause of the problem.

Ask HIOKI to manufacture your pin fixture!

HIOKI will create a point information file along with the test data file. You can then enable the Point Viewer function simply by placing these two files in the same folder.
*Optional service. Please request when having your fixture manufactured.

Analysis and management of measurement data

**Log Output Function**

The 1220-5x allows you to switch output modes according to your application: select sheet output when you wish to group output by measurement target, or select log output when you wish to observe changes in the measurement target over time.

Log output

Sheet output

Callout of selected pin

*Example output
Test for incorrect fuse ratings

**Standard feature: 4-terminal measurement functionality**

Until now it was only possible to detect low resistance defects in short mode. But complex, high value-added boards require milliohm-level quality assurance. Enter 4-terminal measurement functionality, a standard feature on the 1220. Add a 1131-03 Relay Board to unleash the potential of measurement starting at just 40 μΩ.

Support for measurement of up to 100 V

**High-current/high-voltage diode testing**

Now it’s possible to test diodes and Zener diodes at their true rated values. Whereas characteristics testing of diodes was previously impossible due to power limitations, you can now test Zener diodes rated at up to 100 V.

(Requires 1131-03 Relay Board and 1137-01 High-voltage Measurement Unit.)

**From combined resistance to impedance measurement**

**Standard feature: Impedance measurement**

High-density circuit designs are making it increasingly difficult to place measurement pins. Where detection of pinless components had been implemented by taking a combined resistance reading, impedance measurements enable a higher level of precision.

**New measurement modes**

**Component Test**

Macro testing, which measures the impedance of a single user-selected pattern compared to all other patterns, performs similar measurements for all patterns. The advantage of macro testing lies in the fact that the number of measurement steps equals the number of measurement points, allowing the test to be performed in a shorter period of time. But this function does more than just reduce testing time. It also allows synthetic impedance judgments and other determinations to be made even when there is only limited space for probes to be applied, for example due to closely spaced components or the design of boards with embedded passive and active devices.

The actual test requires only a pin board and known-good reference board. Test data is generated automatically by an acquisition process, and no data is required. Component test steps can then be added as needed. We’ve also reduced manufacturing lead times for test fixtures and delivered a simple system that requires only that the operator connect the necessary connectors.

**Support for high-speed systems**

**Standard Barcode System**

Production sites for applications requiring high reliability, such as boards used on vehicles, require more advanced and rapid testing solutions, leading to increased demand for features such as test result management and automatic setup. The 1220 is designed to prevent human error and facilitate maximum automation, an approach that is also reflected in its networking support.

1. Read barcode/QR code.
2. Select/switch test data.
3. Check pinboard ID.
4. Perform test.
5. Save data by input code.

**Simple, programming-free operation**

**Macro Testing**

**Trilingual support**

**Standard Chinese Language Support**

Support for local languages is in demand as production shifts overseas. Against this backdrop, China is the focus of Japanese and worldwide attention as the world’s largest manufacturing nation. The 1220 includes Chinese language support as a means of boosting efficiency by allowing operators to interact with the device in their native language.

- Supported languages: Japanese, English, Chinese (simplified)
Support for high-density boards
HIOKI can install straight pins at pitches as low as 0.5 mm with a high-precision punching machine, enabling accurate probing of increasingly small points.

Probes
Probes must deliver a combination of high reliability and durability. We develop the most reliable probes in an industry with numerous probe manufacturers and select the optimal parts based on tip profile, diameter, pressure, and structure as we manufacture your pin board.

Optimized programming
Expert technicians conduct an optimized debugging process from your populated board to assess the most suitable tolerances, wait times, and guarding. The need for post-delivery debugging is minimized by performing the debugging process on the same testing equipment as operated by the customer.

Design that minimizes stress on the board
Warping of the board when the press is lowered subjects not only the board but also its components to significant stress. Extensive experience allows HIOKI to deliver consistent, warp-free probing.

Fast delivery
With the time from prototype to full production shrinking every year, the most effective way to assure product quality is to deploy an in-circuit testing solution at the earliest possible stage. HIOKI is currently working to revamp and streamline our manufacturing processes to enable us to meet customers’ demands for fast product delivery.

Newly Developed Probes

Durable, high-precision, high-quality
Comprehensive measurement, data, and pin board support

- High quality: The guarantee of genuine manufacturer parts
  Have you grappled with problems where it was difficult to trace the issue to either the fixture or ICT? If you use a genuine HIOKI fixture, HIOKI guarantees everything, right down to the test data. We can provide optimal debugging services based on our extensive measurement expertise.

- Point Viewer function
  (when used in combination with the 1220)
  The 1220 In-Circuit HiTESTER allows you to check a pin coordinate plot on the tester’s screen, a useful capability when you’re performing fixture maintenance. (Not available for all HiTESTER versions.)

1. Support for high-density boards
   HIOKI can install straight pins at pitches as low as 0.5 mm with a high-precision punching machine, enabling accurate probing of increasingly small points.

2. Probes
   Probes must deliver a combination of high reliability and durability. We develop the most reliable probes in an industry with numerous probe manufacturers and select the optimal parts based on tip profile, diameter, pressure, and structure as we manufacture your pin board.

3. Optimized programming
   Expert technicians conduct an optimized debugging process from your populated board to assess the most suitable tolerances, wait times, and guarding. The need for post-delivery debugging is minimized by performing the debugging process on the same testing equipment as operated by the customer.

4. Design that minimizes stress on the board
   Warping of the board when the press is lowered subjects not only the board but also its components to significant stress. Extensive experience allows HIOKI to deliver consistent, warp-free probing.

5. Fast delivery
   With the time from prototype to full production shrinking every year, the most effective way to assure product quality is to deploy an in-circuit testing solution at the earliest possible stage. HIOKI is currently working to revamp and streamline our manufacturing processes to enable us to meet customers’ demands for fast product delivery.

6. Documentation
   Every HIOKI pinboard ships with the documentation required for customer quality control and pinboard maintenance, including a debugging list, probe plot, and location diagram.

7. Extensive options
   In addition to electrical testing, pinboards can be used in a variety of tests:
   - **Stamp unit**
     Stamps PASS boards. A variety of print surfaces are available, from typical water-based ink to oil-based ink. (Requires tester with stamp mechanism.)
   - **Connector detection and reverse insertion test**
     Checks for improper manual connector insertion with a switch probe.
   - **Capacitor reverse insertion test**
     Detects reverse capacitor insertion by probing the tops of electrolytic capacitors with a special probe. (Requires tester with capacitor reverse insertion detection function.)
   - **Counter function and antistatic design**
     (Documentation required for manufacturing a test fixture:)
     (1)Circuit diagram (2)Component list (3)Bare board (4)Populated board(s) (as many as possible) (5)Component plot (6)Net list, etc.
   *Test fixtures can also be manufactured from Gerber data.

Additional benefits in terms of improved contact reliability

Newly developed probes deliver improved reliability with less tip wobble and low contact resistance.

1. Resistant to flux and oxide films: We have reassessed tip profiles to ensure optimal performance.
2. New line of tip profiles: New profiles including claw, single-blade, and flat lance designs offer more stable contact performance.
3. Tip wobble rigidity: Tip rigidity has been improved by about 200% (1.27 pitch).

<table>
<thead>
<tr>
<th>Resistance value [Ω]</th>
<th>Resistance Values When Probing Solder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous model</td>
</tr>
<tr>
<td></td>
<td>Average $\bar{x}$ [Ω]</td>
</tr>
<tr>
<td></td>
<td>$\bar{x}+3\sigma$ [Ω]</td>
</tr>
<tr>
<td>Probe life [applications]</td>
<td>1</td>
</tr>
<tr>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CP Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average $\bar{x}$ [Ω]</td>
</tr>
<tr>
<td>$\bar{x}+3\sigma$ [Ω]</td>
</tr>
<tr>
<td>Probe life [applications]</td>
</tr>
<tr>
<td>0.0</td>
</tr>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>1.0</td>
</tr>
<tr>
<td>1.5</td>
</tr>
<tr>
<td>2.0</td>
</tr>
</tbody>
</table>
The 1220 HiTESTER is controlled by a PC using the familiar Windows operating system. (*PC unit optional)

The 1220 line now features the standalone 1220-00 desktop measurement unit, which can be paired with a desktop press to form a truly compact testing environment. Space-saving configurations like this one are ideal for the growing cell production market.

**Exceptional Expandability**
Upgrade your system easily to accommodate the full gamut of needs.

---

**Unit Architecture**
- CPU board
- Standard I/O board
- AD board
- AC measurement board
- DC measurement board
- Scanner board
- Primary interface board
- Measurement line expansion connector

---

**Simple I/O Port Configuration**
- Simple external control capability

---

**Computer**
- (1) I/O port specification
- (2) GP-IB operating instrument specification
- (3) Cylinder control
- (4) Target test
- (5) Post-feedback measurement

---

**LAN**
- 1220 HiTESTER
- Expansion I/O board
- A/D conversion board
- AC measurement board
- DC measurement board
- GP-IB board

---

**Component measurement**
- Frequency counter
- DMM
- Power Supply

**Function measurement**
- External control equipment

*Function measurement including switch operation*
Input signal voltage range 0 to 24 V DC
Sink-type output 24 V DC
Max. rated voltage ON: Low optocoupler LED on (shorted) signal that turns AUTO/VCM on
OFF: High optocoupler LED off (open) signal that turns AUTO/VCM off
Input logic Sink-type output
Input type Lower
Input impedance 0.5 mA or less
Operating voltage ON voltage: 18 V or greater OFF voltage: 4.1 V or less

Circuit Diagram
Input
Output (A simple power supply can be used as both the external and drive power supply)

Simple control
1912-01 Expansion I/O Board (Option)
32 points each of input and output
Signal name Pin no. 1220 signal name Description
COM1 1 COMS Close S01 OUT
COM 2 COMS Close S02 OUT
COM 3 Close S03 OUT
COM 4 Close S04 OUT

Max. rated voltage -24 V DC
+COM applied supply voltage Sink-type output 24 V DC
Input signal range 0 to 24 V DC
Input impedance 10 kΩ
Input off current 0.5 mA or less
Operating voltage ON voltage: 18 V or greater OFF voltage: 4.1 V or less

External interface (I/O = 16/20) 50-pin
Signal name Pin no. 1220 signal name Description
VCM1 1 COMS Close S01 OUT
VCM 2 COMS Close S02 OUT
VCM 3 COMS Close S03 OUT
VCM 4 COMS Close S04 OUT
VCM 5 COMS Close S05 OUT
VCM 6 COMS Close S06 OUT
VCM 7 COMS Close S07 OUT
VCM 8 COMS Close S08 OUT
VCM 9 COMS Close S09 OUT
VCM 10 COMS Close S10 OUT
VCM 11 COMS Close S11 OUT
VCM 12 COMS Close S12 OUT
VCM 13 COMS Close S13 OUT
VCM 14 COMS Close S14 OUT
VCM 15 COMS Close S15 OUT
VCM 16 COMS Close S16 OUT
VCM 17 COMS Close S17 OUT
VCM 18 COMS Close S18 OUT
VCM 19 COMS Close S19 OUT
VCM 20 COMS Close S20 OUT
VCM 21 COMS Close S21 OUT
VCM 22 COMS Close S22 OUT
VCM 23 COMS Close S23 OUT
VCM 24 COMS Close S24 OUT
VCM 25 COMS Close S25 OUT
VCM 26 COMS Close S26 OUT
VCM 27 COMS Close S27 OUT
VCM 28 COMS Close S28 OUT
VCM 29 COMS Close S29 OUT
VCM 30 COMS Close S30 OUT
VCM 31 COMS Close S31 OUT
VCM 32 COMS Close S32 OUT
VCM 33 COMS Close S33 OUT
VCM 34 COMS Close S34 OUT
VCM 35 COMS Close S35 OUT
VCM 36 COMS Close S36 OUT
VCM 37 COMS Close S37 OUT
VCM 38 COMS Close S38 OUT
VCM 39 COMS Close S39 OUT
VCM 40 COMS Close S40 OUT

No. of outputs 52
Output type Open collector output (sink-type)
Isolation Optocoupler
Output logic ON: Low optocoupler LED on (shorted) OFF: High optocoupler LED off (open)
Max. rated voltage +50 V DC
+COM applied supply voltage +12 to 24 V DC
Max. output current 100 mA/output
**Computer**

- **Computer Unit 1913-01**
  You can use your own computer.
  ★ Requires at least 1 empty network port.

- **1220 PC Application (1137-02)**
  Controls the 1220 HITESTER from the computer using the familiar Windows operating system.

- **UPS Unit (1913-02)**
  available only in Japan

**Standalone operation**

- **1137-04 standalone operation software for the 1220 HITESTER**
  By using this software and connecting a keyboard, mouse, and display directly to the 1220 HITESTER, the instrument can be used to perform automatic testing and simple data editing in a standalone configuration without a control PC.

**Factory Option**

- **Model 1220 Data Creation Application (1137-05)**
  Allows Model 1220 data to be created on a general-purpose computer.

**Application software**

- **1220-50**
  Desktop Type
  The HITESTER and expansion box are both the size of a tower-type computer. The computer is sold separately, and you can use your own computer if desired. If the unit will be used primarily for automatic testing, the optional Standalone Application can be used to enable HITESTER operation without a computer for a more compact installation.

- **1220-51**
  Press Type
  This traditional horizontal type press can accommodate more test pins in recognition of the trend toward more pins due to the high mounting densities on today’s boards. Its versatile design allows the operator to either sit or stand.

**Expansion boxes**

- **Expansion Box 1912**
  • For 1220-00
  • Max. 640 pins

- **Extension Rack 1911-02**
  • For 1220-01/02/11
  • Max. 640 pins

**Extension boards**

- **Scanner Board 1131-01**
  • Analog switching (high-speed)
  • 64 pins/board, switchable between 2- and 4-terminal operation
  • Maximum rating: 30 V/20 mA

- **Relay Board 1131-03**
  • Read relay (high-voltage)
  • 64 pins/board, switchable between 2- and 4-terminal operation
  • Maximum rating: 250 V/500 mA

**Cables**

- **Scanner Cable (64-pin, shielded) 1156-01 (2m)**

- **Scanner Cable (64-pin) 1131-01 (0.8m)**

**Test Fixtures**

- **Press Unit (for use with part 1160) 1144**

- **Press Unit (for use with part 1162) 1142**
  • Connection to the 1220-00 requires a separately available 24 V power supply.

**Test Fixtures**

- **Press Unit (for use with part 1162) 1142**
  • Connection to the 1220-00 requires a separately available 24 V power supply.
Despite its mainstream tower design, this model provides 1,536 pins of testing capability—as much as most customers will ever need. It's all about getting the most power in the smallest possible space.

1220-52
Space-saving Type

Despite its mainstream tower design, this model provides 1,536 pins of testing capability—as much as most customers will ever need. It's all about getting the most power in the smallest possible space.

1220-55
Standard In-line Type

Designed for in-line applications, this model includes transport functionality to meet customers' demands for automated operation. It brings together a range of HIOKI technologies for faster, safer, and more reliable testing.
<table>
<thead>
<tr>
<th>Component data</th>
<th>Data</th>
<th>IC data</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 10,000 steps</td>
<td>500 steps</td>
<td>Max. 4000 pins/step</td>
<td>256 groups</td>
</tr>
<tr>
<td>2,176 steps</td>
<td>Group data</td>
<td>256 groups</td>
<td></td>
</tr>
<tr>
<td>2,176 pins</td>
<td>Charge data</td>
<td>0 samples</td>
<td></td>
</tr>
<tr>
<td>2,176 pins</td>
<td>Data</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test types and ranges</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round-robin short/open</td>
<td>4 Ω to 400 Ω</td>
</tr>
<tr>
<td>Macro test (Impedance)</td>
<td>1 Ω to 10 MΩ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component test</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance</td>
<td>400 mΩ to 40 MΩ</td>
</tr>
<tr>
<td>Low resistance</td>
<td>40 μΩ to 400 mΩ</td>
</tr>
<tr>
<td>Impedance</td>
<td>1 Ω to 10 MΩ</td>
</tr>
<tr>
<td>High-voltage low-resistance measurement</td>
<td>400 mΩ to 1 Ω</td>
</tr>
<tr>
<td>Isolation measurement</td>
<td>10 μΩ to 400 mΩ</td>
</tr>
<tr>
<td>Capacitors</td>
<td>1 μF to 100 μF</td>
</tr>
<tr>
<td>Diodes and transistors</td>
<td>0 V to 25 V</td>
</tr>
<tr>
<td>High-current-applied diodes</td>
<td>0 V to 9 V</td>
</tr>
<tr>
<td>Zener diodes</td>
<td>0 V to 25 V</td>
</tr>
<tr>
<td>High-voltage Zener diodes</td>
<td>1 V to 100 V</td>
</tr>
<tr>
<td>Switching transistors</td>
<td>0 V to 25 V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement unit</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltmeter</td>
<td>800 μV f.s. to 25 V f.s.</td>
</tr>
<tr>
<td>DC ammeter</td>
<td>100 μA f.s. to 250 mA f.s.</td>
</tr>
<tr>
<td>AC ammeter</td>
<td>10 μA rms to 10 mA rms</td>
</tr>
<tr>
<td>DC voltmeter</td>
<td>25 mV f.s. to 250 V f.s.</td>
</tr>
<tr>
<td>DC ammeter</td>
<td>1.2 μA f.s. to 120 mA f.s.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scanner unit</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog switching</td>
<td>64 channels/board</td>
</tr>
<tr>
<td>Read relay</td>
<td>64 channels/board</td>
</tr>
<tr>
<td>2-/4-terminal switchable</td>
<td>2-/4-terminal switchable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Judgment range</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>-99.9% to +999.9%</td>
<td>Absolute value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement ranges</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round-robin short/open</td>
<td>From approx. 0.8 ms/pin</td>
</tr>
<tr>
<td>Macro</td>
<td>From approx. 0.9 ms/pin</td>
</tr>
<tr>
<td>IC test</td>
<td>From approx. 2.0 ms/pin</td>
</tr>
<tr>
<td>Charge</td>
<td>From approx. 3.0 ms/set</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Guarding</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 points</td>
<td>Single range</td>
</tr>
</tbody>
</table>

**Self-test function**
- By unit (manual)/at startup
- Data:
  - Execution format:
    - Overall FAIL rate by test and group, graph display by month, histogram function, linked with Excel

<table>
<thead>
<tr>
<th>Statistical functions</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall FAIL rate by test and group, graph display by month, histogram function, linked with Excel</td>
<td>Single range</td>
</tr>
</tbody>
</table>

**Automatic data creation**
- LED function (automatic reference data acquisition and guard point configuration), acquisition of reference values from reference board, acquisition of wiring resistance, acquisition of high-precision measurement, group specification
- Data:
  - Group data:
    - 40 sets (with 1937 high-voltage and isolation measurement units installed)
  - Charge data:
    - 2,176 steps (with 1937 high-voltage and isolation measurement units installed)

<table>
<thead>
<tr>
<th>External I/O</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard I/O</td>
<td>28 input points and 28 output points (For more information, contact your nearest HIOKI Sales Office.)</td>
</tr>
</tbody>
</table>

**Operating environment**
- Operating temperature and humidity range:
  - 23°C ±10°C at 75% rh or lower
- Avoid using the HITESTER in environments characterized by the presence of dust, vibration, or corrosive gases.

**Control unit**
- Computer:
  - CPU: AT-compatible computer
  - Operating system:
    - Windows 2000/XP/98
  - Storage media:
    - Floppy disk and hard disk
  - Display:
    - 15" LCD
  - Input devices:
    - PS/2 keyboard, PS/2 mouse
  - External I/O:
    - USB-6 ports, Ethernet (LAN) 

**HITESTER**
- Control device:
  - Single-board computer
- Operating system:
  - Real-time OS
- Storage media:
  - CompactFlash × 1

**Other**
- Frontal contact test: reverse-polarity rectifier test function, FAIL stop, test jump, test-held function, test data, data test output function (printer RS-232C/disk), FAIL map display function, display pin configuration function, surplus test function, consecutive FAIL stop function, password protection function, automatic test data backup function, load/convert legacy data (1105 data, test data), test data switching function (A/B data), network connectivity, remote self-test function

*Optional equipment: Low-resistance measurement is a standard feature, but use of the 1131-05 relay board enables high-precision measurement (delivering an improvement in accuracy of about 3 times according to HIOKI comparisons). The 1131-05 relay board is required in order to make use of high-voltage low-resistance measurement, isolation measurement, and high-current diode measurement.

* This computer is optional equipment for the 1220-50.
### Macro Test Specifications

<table>
<thead>
<tr>
<th>No. of test steps</th>
<th>Data: Max. 2,176 steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test type and range</td>
<td>Impedance: 1 Ω to 10 MΩ</td>
</tr>
<tr>
<td>Test signals</td>
<td>0.2 to 0.5 V rms in 0.1 V steps (during testing of ATG step)</td>
</tr>
<tr>
<td></td>
<td>0.2 to 2.0 V rms in 0.1 V steps (during testing of specified pin pairs)</td>
</tr>
<tr>
<td></td>
<td>Frequency: 1.6 kHz</td>
</tr>
<tr>
<td>Measurement unit</td>
<td>Ammeter: 10 µA/100 µA/10 mA rms (4 ranges)</td>
</tr>
<tr>
<td>Judgment criteria</td>
<td>Comparison with value acquired from reference board</td>
</tr>
<tr>
<td></td>
<td>PASS judgment region: X ±(3σ)</td>
</tr>
<tr>
<td></td>
<td>X = Average value acquired from reference board</td>
</tr>
<tr>
<td></td>
<td>3σ = 3 × standard deviation (statistical tolerance)</td>
</tr>
<tr>
<td></td>
<td>α = Coefficient reflecting measurement accuracy</td>
</tr>
<tr>
<td>Measurement time</td>
<td>From 2.0 ms/step</td>
</tr>
<tr>
<td>Guarding</td>
<td>3 points/step (for tests of specified pin pairs only)</td>
</tr>
<tr>
<td>Data creation</td>
<td>Automatic generation with ATG function or manual creation of specified pin pairs</td>
</tr>
</tbody>
</table>

### Active Test Shared Specifications

<table>
<thead>
<tr>
<th>No. of test steps</th>
<th>Data: Max. 256 steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test types</td>
<td>DC voltage, DC high-voltage measurement*, AC voltage, timer, interval, frequency, waveform check, discharge</td>
</tr>
<tr>
<td>Generation unit</td>
<td>Dedicated board</td>
</tr>
<tr>
<td></td>
<td>1. Digital output (CMOS level)</td>
</tr>
<tr>
<td></td>
<td>2. LVDS output (differential signal)</td>
</tr>
<tr>
<td></td>
<td>3. Analog output</td>
</tr>
<tr>
<td></td>
<td>4. Expansion open collector output</td>
</tr>
<tr>
<td></td>
<td>5. Digital power supply (+5 V)</td>
</tr>
<tr>
<td>Measurement unit</td>
<td>1220 HiTESTER</td>
</tr>
<tr>
<td></td>
<td>DC voltmeter</td>
</tr>
<tr>
<td></td>
<td>DC voltmeter</td>
</tr>
<tr>
<td></td>
<td>Internal discharge</td>
</tr>
<tr>
<td>Interface unit</td>
<td>1120-01 Expansion I/O Board (32 sink input points, 32 open collector output points)</td>
</tr>
<tr>
<td></td>
<td>1936 GP-IB communications function (enables control of up to 14 external measuring instruments or other devices)</td>
</tr>
<tr>
<td>Other</td>
<td>External judgment result retrieval function, slave function (Other tests and shared functionality depend on the 1220 HiTESTER model)</td>
</tr>
</tbody>
</table>

*Notes on 1101 and 1102 data compatibility
Legacy 1101 and 1102 data cannot currently be converted for use by the 1220 due to an inability to supply the computers for running the necessary 1137 support software. For more information, please contact your HIOKI distributor.

*Legacy product (1220-00, -01, -02, -11) and 1220-5x data compatibility
Although data from legacy products can be used with the 1220, compatibility is not complete. You may need to repeat stray capacitance acquisition, wiring resistance acquisition, S/O data acquisition, IC data acquisition, and component test debugging. In particular, it is necessary to repeat stray capacitance acquisition for applications involving minute capacitance measurement.
CAUTION: To ensure safe and proper operation, be sure to read this product’s Instruction Manual before attempting to use it.

All information correct as of Nov.12, 2010. All specifications are subject to change without notice.

Note: Company names and Product names appearing in this catalog are trademarks or registered trademarks of various companies.