
High-frequency characteristics measurement system

Micro Prober MP Series "MP502/MP502-A" Started to receive order

Yamaha Fine Technologies Co., Ltd. (HQ: 283 Aoya-cho, Minami-ku, Hamamatsu; CEO: Yasuhiro Nakada) has started to receive the order for the Micro Prober MP series MP502 and MP502-A that continuously inspect the high-frequency characteristics of circuit boards at high speed and high precision, on Friday, October 18.



MP502

The production of circuit boards using materials such as LCP and MPI that are suitable for high-frequency signals has increased in the electronic circuit board market in recent years due to the launch and spread of 5G communication services, and these substrates require to have better frequency characteristics. Until now, inspections of frequency characteristics have been conducted using sample inspections of test coupons.

In contrast, the new MP502 and MP502-A systems enable high-speed, high-accuracy inspections of high-frequency characteristics of actual product patterns when combined with a commercial vector network analyzer. This enables inspections of actual products that were formerly problematic, and measurement of all relevant mass-produced products.

<Summary>

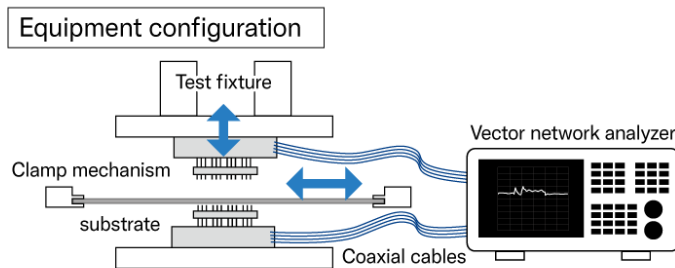
- Allows high-speed transmission circuit boards to be inspected during mass production in a panel form.
- $\pm 20 \mu\text{m}$ high-precision positioning allows for inspections with high repeatability
- Supports independent upper and lower positioning to support multi-layer substrates with inspection points on both surfaces
- Can be combined with the latest vector network analyzers provided by measuring instrument manufacturers

■ For general inquiries on this product:

Yamaha Fine Technologies Co., Ltd., FA Business Division, FA Sales Division, Tel. 053-467-3601

Product	Product no.	Orders accepted from:
Micro Prober Series	MP502	Friday, October 18
	MP502-A	

□ Estimated sales during initial FY (both domestic and overseas): 20 systems total



<Major Features>

1. High stability and inspection reproducibility

$\pm 20 \mu\text{m}$ repeatability positioning precision using image alignment provides accurate probing contact with substrates. The step and repeat method achieves stable inspection performance by repeating substrate image alignment, inspection using test fixtures, and worksheet movement. Even with thin PCBs, clamping the subject in four corners and applying optimal force allows for flat contact with the test fixture. The cable orientation remains largely unchanged during lowering and rising inspection fixture operations, reducing the impact on high-frequency characteristics caused by changes to the cable configuration.

These functions make it possible to obtain automatic, stable, and highly-repeatable inspection results regardless of inspection operator skill levels.

2. Fast and simultaneous measurement of multiple pieces

A multiport-compatible vector network analyzer can be connected as an inspection system, allowing high-speed, high-precision inspections to be conducted simultaneously for multiple pieces placed on a worksheet. Vector network analyzers are typically capable of measuring insertion loss and return loss. However, various measurement items such as TDR can also be added, depending on the selected VNA.

3. Simple operation

When changing the setup, the fixture can be released simply by pressing a software button. After the operator replaces the fixture and configures this in accordance with the instructions displayed in the software dialog box, the system then automatically adjusts the positions of the fixture and clamp hands. Once inspection items and other settings have been set by an engineer, the operator only needs to set the product on the system and press the start button to inspect all pieces on the worksheet. The MP502-A comes equipped with an automated transfer, so simply setting multiple products on the stocker and pressing the start button supplies and removes products automatically, further improving work efficiency.

<Development Background>

Until now, high-frequency characteristic inspections were limited to sampling several panels within a lot and checking test coupons placed outside of products. It was impossible to inspect the high-frequency characteristics of all actual products. Previously, it was difficult to accurately understand and analyze measurement results, because this relied upon the skills of workers and on the state of probe contact with the substrate, which could cause frequency characteristics to change; and because it was impossible to determine whether a defect occurred before or after mounting parts.

These and other issues can be resolved through the use of the MP502. In the recently developed MP502, image processing is used to calibrate the position of a bare substrate and make contact with the inspection fixture, making automatic inspection of all items possible. MP502 also allows for inspections to be automated so that they are not dependent on operator skill, and allows for inspections of defects formerly only revealed during a function inspection after mounting parts, to be performed prior to these being mounted.

This system keeps head movement to a minimum when the fixture makes contact with the substrate and uses image alignment to make accurate probe contact with the substrate at a positioning accuracy of $\pm 20 \mu\text{m}$, allowing it to maintain uniform contact during inspections. Because the movement of the head is kept to a minimum, changes in the configuration of the cable connected to the inspection fixture of the contact area are also minimized, reducing external impact on high-frequency characteristics as much as possible.

<Product Specifications>

Series	Micro Prober MP series	
Model	MP502	MP502-A
Applications	Rigid PCBs, Flexible PCBs, Rigid-flex PCBs etc., with high speed transmission circuits	
Worksheet size	W150 to 510 mm, D150 to 610 mm	
Max. fixture size	W200 mm x D200 mm	
Positioning accuracy*1	$\pm 20 \mu\text{m}$	
Worksheet transfer	Loading: Manual Unloading: Manual	Loading: Automatic Unloading: Automatic
External dimensions	W1,700(+650) x H1,600 x D2,170	W1,880(+650) x H1,785 x D2,545
Weight	Approx. 2,500 kg	Approx. 3,000 kg
Measurement items *2	Insertion loss, Return loss, VSWR, Isolation, TDR etc.	

Please see the product website for detailed product specifications.

https://www.yamahafinetech.co.jp/en/fa_products/mp_micro_prober/

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■ For media-related inquiries on this product

Yamaha Fine Technologies Co., Ltd., FA Business Division, FA Sales Division

TEL: 053-467-3601

Email: fa-info-ML@music.yamaha.com

Website: <https://www.yamahafinetech.co.jp/en/support/contact/>

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