

Agilent 88000 ATS-620 Series Array Test System

Product Overview



Provides full TFT array testing of a-Si LCDs used in manufacturing FPDs

Introduction

Flat-panel displays (FPDs) continue to grow in popularity, as evidenced by their widespread use in mobile phones and computer displays. And, most recently, there has been explosive world-wide growth in the use of FPDs in large-screen televisions. Correspondingly, there is increased competition among FPD manufacturers as they strive to reduce costs and improve quality. In addition, the FPD manufacturing process has evolved to the point where seventh- and eighth-generation fabrication lines can now accommodate more than four square meters of total glass area.

Industry Challenges

Providing full thin film transistor (TFT) testing of a-Si LCDs used in manufacturing FPDs is a challenging process. Adding to this test challenge is the dramatic increase in glass size as large- and wide-screen televisions become more popular. Because picture quality is a major competitive differentiator in the marketplace, FPD manufacturers must affordably test all panels with sure defect detection, while decreasing test time and increasing quality and yield. The majority of the cost of manufacturing an LCD panel is incurred during the back-end process, i.e. the cell and module processes.

To avoid unnecessary cost in the back-end process, ideal FPD testing is necessary. This enables accurate selection of good panels and repair of defective panels, wherever possible, so that defective panels do not advance through the back-end process. Panel manufacturers must continuously improve process yield by monitoring process quality and acting to address “unusual” process behavior.

Most currently available FPD test solutions fall short in addressing the challenges presented by rapidly evolving technologies and markets:

- **Insufficient defect detection**

Testers in high-volume production environments must have highly sensitive detection capabilities to adequately characterize the complex pixel structure of today’s high-quality FPDs.

- **Inadequate testing speed**

Because TFT array testers are built into the fabrication line, testing time (as measured by total average cycle time, TACT) immediately impacts production throughput and economics. With many FPD manufacturers targeting a 60-second TACT per glass, today’s test solutions require more testers to accommodate larger glass size.



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- **Lack of quality standards**

No definitive standard test technologies or associated metrics exist for assessing panel picture quality. Among manufacturers there are wide variations in quality as defined by uniformity and moving picture performance.

- **Immature test processes**

Test results cannot be linked with repair directives to achieve predefined quality goals. Continued inefficient operation impairs the realization of highly productive fabrication lines.

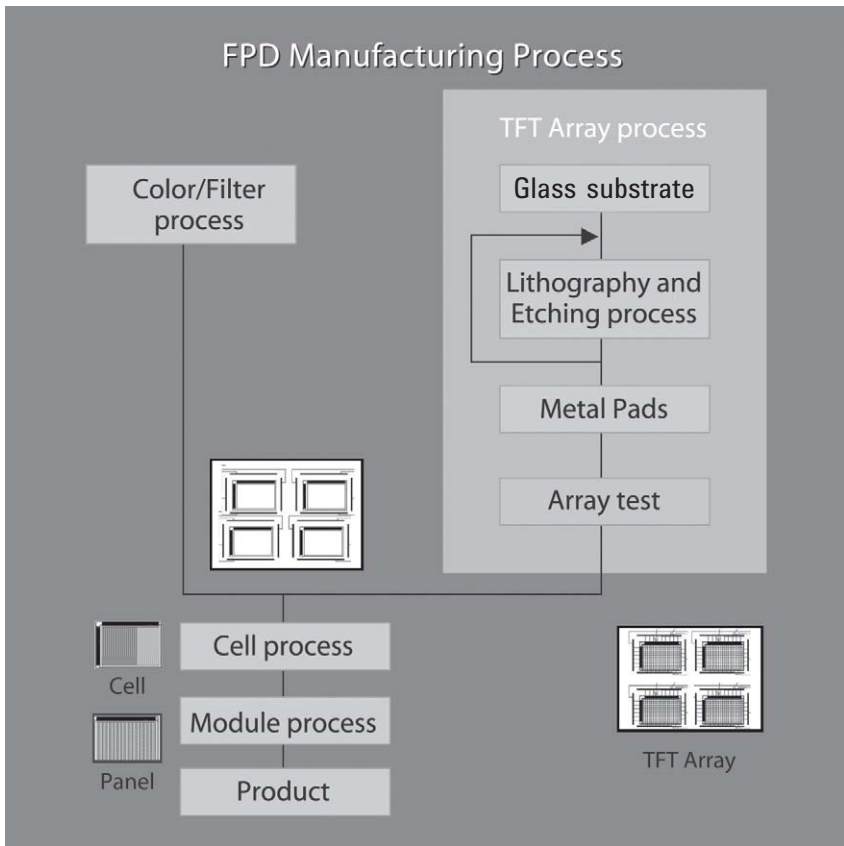
Agilent Solutions Meet FPD Test Challenges

The Agilent 88000 ATS-620 Series tests TFT arrays of a-Si LCD panels based on TN, MVA, IPS, and other modes, with wide coverage of ultra high resolution panels such as QUXGA-Wide panels. The ATS-620 reduces manufacturing costs and improves process quality and yield by providing precise upstream defect detection in large and wide-size FPDs, while reducing TACT.

The ATS-620 is a fast and proven solution for testing FPDs on seventh- and eighth-generation production lines, with greater sensitivity than competitive solutions. This means the ATS-620 can detect more performance inconsistencies, which helps reduce scrap cost, improve quality, and boost yield.

- **Sure defect detection with short TACT**

Through the use of up to four test heads, multiple gate activation, and up to 15,360 data channels on two test heads, the ATS-620 can achieve the fastest throughput of the current generation of testers. This makes full testing an efficient and much less costly option for manufacturers.



Features and Benefits

Feature	Benefit
Precise and wide range measurement for various panel and pixel designs	Highest defect detection in the industry. Applicable to both production test and engineering analysis.
Improved TACT using multiple test heads	Reduced test time produces higher test productivity with smaller investment.
Automatic defect classification	Helps achieve superior process quality and determine suitable repair action.
Highly integrated test environment with prober and probe unit	Safe buy and easy to operate, backed by total support from Agilent and prober and probe unit suppliers.
Test application support and optimization consulting	Quick start-up of effective test and analysis according to panel design and test objective.

Key Specifications

Primary test target	TFT arrays of a-Si LCD panels
Maximum number of test heads	4
Typical evaluation item	Line and Pixel area: Open, Short, Ion, Ioff, Vth, Cs
Number of channels	15,360 data and 2560 gate
Multi site test	Up to 8

- **High test sensitivity improves process and product quality**

The ATS-620 enables electrical testing of all pixels and sub-pixels covering transistor, capacitance, electrodes, and bus lines. This prevents any defective pixels in the array process from flowing into the next phase. The tester automatically checks the TFT characteristics and the open/short status of the lines and pixels, which effectively analyzes the defect mode based upon the result of the check.

- **Efficient process feedback and productivity improvement**

The ATS-620's full array test capability eliminates process defects, leading to a large increase in process yield, improved manufacturing productivity and a significant reduction in cost.

Tester Components

- Tester Rack (Mainframe)
 - Control Unit
 - AC Unit
 - Power Unit
 - Controller
- Test Head
- Master Controller
- System Software

Total test solution

The ATS-620 Series is a complete test solution comprising hardware, software, services, and application consulting. It lowers test cost and, through close collaboration with probe and probe unit suppliers, shortens the ramp-up period for achieving effective test results. The complete line of Agilent 88000 Series FPD Test Systems provides manufacturers with high-quality, low-cost production test solutions for all key technologies in the rapidly growing FPD market.

Ordering Information

N2455B Agilent 88000 ATS-620 Series Array Test System

For more information about Agilent and its products, go to www.agilent.com.

For more information about the ATS-620 or the complete line of Agilent 88000 Series of FPD test systems, please call one of the centers listed below and ask to speak with an Agilent sales representative.

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Brazil (11) 4197-3600
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