

SEMI D45-0706

MEASUREMENT METHODS FOR RESISTANCE OF RESIN BLACK MATRIX WITH HIGH RESISTANCE FOR FPD COLOR FILTER

This standard was technically approved by the global Flat Panel Display Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on May 16, 2006. It was available at www.semi.org in June 2006 and on CD-ROM in July 2006.

1 Purpose

1.1 This standard establishes practices for measuring characteristics of resin Black Matrix (BM) with high resistance for FPD color filter. These methods are applicable to manufacturing, quality control, and development operations.

2 Scope

2.1 These methods shall be used in general to measure the resistance of resin black matrix with high resistance for FPD color filter.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

3.1 SEMI Standards

SEMI D13 — Terminology for FPD Color Filter Assemblies

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

4 Terminology

4.1 Abbreviations and Acronyms

4.1.1 BM — Black Matrix

5 Summary of Method

- 5.1 Prepare the power supply and the resistance meter.
- 5.2 Connect the specimen, the power supply and the resistance meter.
- 5.3 Measure the resistance after charge up with predetermined voltage for prescribed time.
- 5.4 Record the measured data.

6 Apparatus

6.1 The measurement system shall have the following specifications.

6.1.1 Power Supply

6.1.1.1 This apparatus can generate arbitrary DC voltage.

6.1.2 Resistance Meter

6.1.2.1 This apparatus can detect minimum 10^{-12} A current.

7 Procedure

7.1 Manufacture method for measuring specimen (see Figure 1).

7.1.1 Substrate Size: 50–150 mm square.

NOTE 1: Use a glass substrate generally.

7.1.2 Generate electrode as under layer. Use ITO or metal.

7.1.3 Generate plain layer of BM. Thickness of BM is 1–10 μm . It is important to make the layer without pinhole.

7.1.4 Generate Electrode

7.1.4.1 Use ITO or metal generally in the case of generating electrode on the specimen. Shape is usually a circle and its diameter is 5–80 mmφ.

NOTE 2: Circle electrode generally has the guard ring.

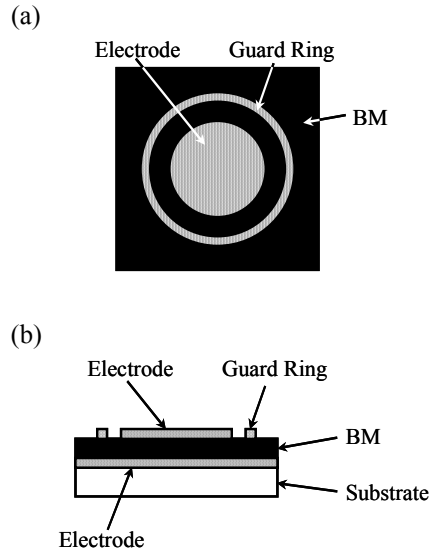


Figure 1
Example of Measuring Specimen, (a) Top View, (b) Side View

7.2 Prepare for Measurement

7.2.1 Prepare the power supply and the resistance meter.

NOTE 3: In general, the equipment that unites the power supply and the resistance meter is used for measurement.

7.2.2 Prepare measuring environment.

7.2.2.1 Measure in an environment-controlled room.

7.3 Set Measuring Conditions

7.3.1 Connect the specimen, the power supply, and, the resistance meter, to one another.

7.3.1.1 There are two types of connection methods. First one uses the circle electrode on the probe of the resistance meter and another one uses the circle electrode on the specimen.

7.3.2 Set measuring conditions.

7.3.2.1 Applied voltage; 0.5–50V.

7.3.2.2 Voltage applied time; 1 minute approximately.

7.3.2.3 Measuring environment; Temperature: 20–25°C, Humidity: 40–60%.

7.4 Measure

7.4.1 After predetermined voltage for prescribed time is applied, read the resistance. In the case that the measuring instrument indicates the current, read the current value.

NOTE 4: It is necessary that average value of plural measurement results should be employed. Extraordinary value occurred from the pinhole of the specimen is excluded.

7.5 Record of the Results

7.5.1 Record the measurement conditions and the results. In the case that the measuring instrument indicates the current, calculate the resistance.