Designation: B885 – 09 (Reapproved 2020)

Standard Test Method for Presence of Foreign Matter on Printed Wiring Board Contacts[1]

This standard is issued under the fixed designation B885; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method defines a resistance probing test for detecting the presence of foreign matter on Printed Wiring Board (PWB) contacts or fingers that adversely affects electrical performance. This test method is defined specifically for such fingers coated with gold. Application of this test method to other types of electrical contacts or to fingers coated with other materials may be possible and desirable but may require some changes in fixturing, procedures, or failure criteria.

1.2 Practice B667 describes another contact resistance probe method that has more general application to electrical contacts of various materials and shapes. Practice B667 should be used for more fundamental studies. This test method provides a fast inspection method for printed wiring board fingers.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar will all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety, health, and environmental practices, and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B539 Test Methods for Measuring Resistance of Electrical Connections (Static Contacts)

B542 Terminology Relating to Electrical Contacts and Their Use

B667 Practice for Construction and Use of a Probe for Measuring Electrical Contact Resistance

3. Terminology

3.1 *Definitions*—Terms used in this test method related to electrical contacts are defined in accordance with Terminology B542.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *edgecard connector, n*—an electrical connector designed to connect physically and electrically with a compatible PWB equipped with gold fingers.

3.2.2 *printed wiring board (PWB) contacts, PWB fingers, n*—areas near the edge of a printed wiring board coated with gold and designed to function as electrical contacts when the board is plugged into a compatible edgecard connector.

4. Summary of Test Method

4.1 Two closely spaced electrodes are brought into contact with a single PWB finger in such a manner that they contact the surface with a minimum of wipe. A fixture loads each electrode to apply a force in the range of 0.5 to 0.7 N to the surface of the finger. Two electrical leads attached to each electrode are used to make a four-wire resistance measurement to detect elevated resistance indicative of the presence of a film or other contaminant on the finger.

5. Significance and Use

5.1 This test method provides a way to detect contamination on printed wiring board fingers that affects the electrical performance of such fingers. Such contamination may arise during PWB manufacture, circuit assembly, or service life and

[1] This test method is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.05 on Precious Metals and Electrical Contact Materials and Test Methods.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

may include solder mask, solder flux, hardened lubricants, dust, or other materials. This test method provides a nondestructive method of inspecting such fingers at any point in the life of the product including after original manufacture, after assembly of circuit components to the PWB, and after time in service such as when returned for repair. Because this test method uses two probes to finger contacts in series, it provides a sensitive test for contaminants that may increase electrical resistance when the fingers are plugged into an edgecard connector that typically makes contact to the finger through only one contact to finger interface.

5.2 Practice B667 describes a more general procedure for measuring contact resistance of any solid material in practically any geometrical form. The method in Practice B667 should be used for general studies and fundamental studies of electrical contact materials.

6. Apparatus

6.1 *Four-Wire mΩ Meter,* with a resolution of 0.0001 Ω or better, capable of performing dry circuit resistance measurements in accordance with Test Methods B539, Test Method C.

6.2 *Two Gold-Tipped Electrodes (Probes),* with a radius not less than 3.0 mm at the tips. Each electrode shall have two wires attached. One wire, the voltage lead, shall be attached within 2 mm of the tip end. The other wire, the current lead, shall be attached at any convenient location that is at least 0.5 mm farther away from the tip than the attachment point of the voltage lead.

6.3 *Fixture,* to hold the PWB securely while it is being probed and a fixture to hold the two electrodes, such that the distance between the centers of the electrodes is 2.0 to 2.5 mm and both electrodes will be centered roughly on a single PWB finger. Fig. 1 shows an example of a suitable fixture. Other fixtures that provide the same capability may be used. Locate this fixture to minimize shock and vibration reaching the probes. Placement on a foam pad on a bench top has been found suitable.

6.4 *Two Springs,* one for each electrode, having a spring constant and a pretension that will apply a load in the range of 0.5 to 0.7 N when the electrode is brought to rest on the finger being tested. Other mechanisms that achieve the same result are acceptable.

6.5 *Mechanism,* that will move the electrode fixture from an open position to the closed position on the finger in such a manner that the electrodes meet the surface of the contact with a minimum of wipe.

6.6 *Lens Tissue,* for cleaning the electrodes.

6.7 *Beakers,* 100-mL size, two required.

6.8 *Hot Plate,* suitable for warming two breakers.

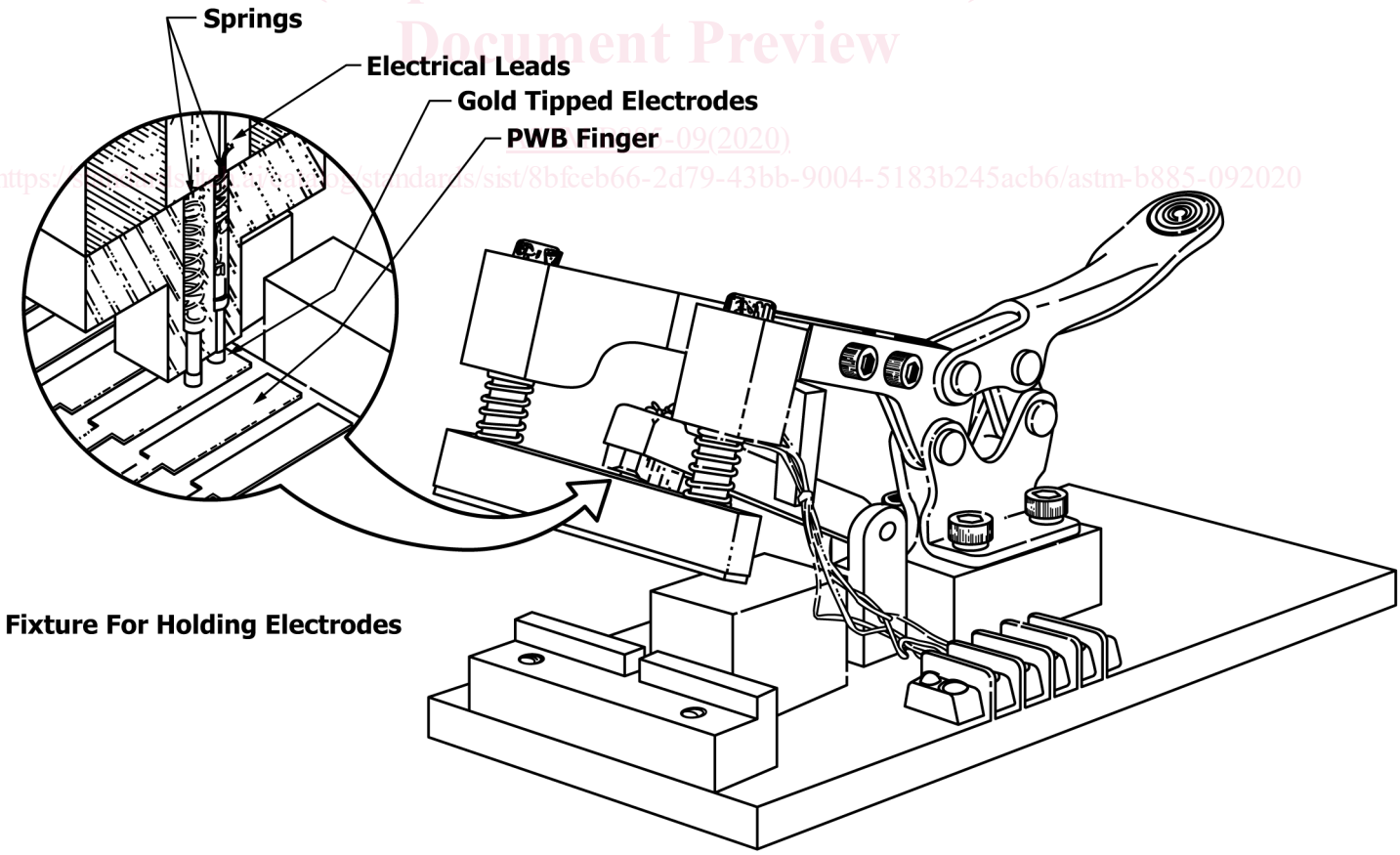

FIG. 1 Resistance Probe